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## PIN DIODE & SOLID STATE SWITCHES
(LATEST DEVELOPMENT)

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PRODUCT DESCRIPTIONS</th>
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<td>1.0</td>
<td>SPST - REFLECTIVE:</td>
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<td>SUMMARY TEST DATA ON 2.0 TO 18.0 GHz (USABLE TO 0.5 GHz), BALANCED ON/OFF, ULTRA-HIGH SPEED, VERY LOW VIDEO TRANSIENT, LOW LOSS, REFLECTIVE, SPST PIN DIODE SWITCHES/MODULATORS, <strong>August 29, 1995</strong></td>
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<td>RADIAL MULTI-THROW, SPNT REFLECTIVE/ABSORPTIVE: <em>(N = 3, 4, 5, 6 &amp; 7, SWN SERIES)</em></td>
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<td>SUMMARY TEST DATA ON 0.5 TO 18.0 GHz (10 MHZ TO 18 GHZ ALSO AVAILABLE), HIGH SPEED, LOW LOSS, RADIAL REFLECTIVE ABSORPTIVE, MULTI-THROW PIN DIODE SWITCHES (SP3T, SP4T, SP5T, SP6T &amp; SP7T), <strong>August 29, 1995</strong></td>
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<td>RADIAL MULTI-THROW, SPNT REFLECTIVE/ABSORPTIVE: N = 3, 4, 5, 6, 7 &amp; 8, SWN (1¾&quot; DIA) AND MSR (1 ½&quot; DIA) SERIES</td>
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<td>DATA SHEETS ON 0.5 TO 18.0 GHz (10 MBZ TO 18 GHz, OPTIONAL), LOW LOSS, HIGH SPEED, LOW, MEDIUM &amp; HIGH POWER, RADIAL, REFLECTIVE &amp; ABSORPTIVE, MULTI-THROW SOLID-STATE SWITCHES (SP3T, SP4T, SP5T, SP6T, SP7T &amp; SP8T), SWN (1¾&quot; DIA) AND MSR (1 ½&quot; DIA) SERIES, September 10, 1997</td>
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<td>DATA SHEETS ON 0.5 TO 18.0 GHz (10.0 MHZ TO 18.0 GHz, OPTIONAL), LOW LOSS, HIGH SPEED, LOW, MEDIUM AND HIGH POWER, RECTANGULAR, REFLECTIVE AND ABSORPTIVE MULTI-THROW SOLID-STATE SWITCHES (SP3T, SP4T, SP5T, SP6T, SP7T, SP8T, SP10T, SP12T, SP16T, &amp; SP32T), MSN AND MSNC (COMPACT) SERIES, August 15, 1997</td>
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PIN-DIODE & SOLID STATE SWITCHES
(EXISTING & NEW DEVELOPMENTS)

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| 7.0 PIN DIODE & SOLID STATE SWITCHES: | ● SP7T - REFLECTIVE  
● SP7T - NON-REFLECTIVE/ABSORPTIVE  
● SP8T - NON-REFLECTIVE/ABSORPTIVE (ALSO AVAILABLE REFLECTIVE)  
● TRANSFER SWITCHES |
| 8.0 SWITCHED FILTER BANKS: | ALL ABOVE AMC RECTANGULAR  
SWITCHES CAN BE USED FOR CUSTOM  
DESIGNED SWITCHED FILTER BANKS  
(PLEASE CONTACT FACTORY,  
TEL: 301-662-4700, FAX: 301-662-4938) |
| 9.0 SP8T PIN DIODE SWITCH: | TEST DATA ON 10 MHz TO 2 GHz (10 MHz TO 18 GHz ALSO AVAILABLE), LOW LOSS, HIGH ISOLATION, ABSORPTIVE & REFLECTIVE SP8T PIN DIODE SWITCHES,  
May 29, 1998 |
| 10.0 SP7T & SP8T PIN DIODE SWITCHES: | TEST DATA ON 10 MHz TO 18 GHz LOW LOSS, HIGH SPEED, HIGH ISOLATION, ABSORPTIVE & REFLECTIVE SP7T & SP8T PIN DIODE SWITCHES  
June 1, 1998 |
SUMMARY

TEST DATA
ON
2.0 TO 18.0 GHz
BALANCED ON/OFF
ULTRA-HIGH SPEED
VERY LOW VIDEO TRANSIENT
LOW LOSS
REFLECTIVE, SPST PIN DIODE SWITCH/MODULATORS

NEW DESIGNS
BY
A. K. GORWARA
REPORTS PREPARED
BY
P. WOOD

AUGUST 29, 1995
COMPARISON CHARTS
OF SEVEN NEW REFLECTIVE
SPST PIN DIODE SWITCH/MODULATORS

CONTENTS

- INSERTION LOSS vs FREQUENCY
- ISOLATION vs FREQUENCY
- RETURN LOSS vs FREQUENCY
- SWITCHING SPEED
- VIDEO TRANSIENTS
- MECHANICAL OUTLINES

NEW AMC MODEL NUMBERS:

- SWN-AGRA-IDR-ECL-GAK0-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, LOW LOSS, LOW VIDEO TRANSIENTS, (C)
  5ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH

- SWN-AGRA-IDR-TTL-GAK1-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, LOW LOSS, LOW VIDEO TRANSIENTS, (C)
  7ns-ULTRA HIGH SPEED, TTL LOGIC SPST PIN DIODE SWITCH

- SWN-AGRA-IDR-PTTL-GAK2-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, SINGLE SUPPLY, LOW LOSS, LOW VIDEO
  TRANSIENTS, (C), 10ns-ULTRA HIGH SPEED, TTL LOGIC, SPST PIN DIODE
  SWITCH

- SWN-AGRA-IDR-ECL-GAK3-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, LOW LOSS, LOW VIDEO TRANSIENTS, (C)
  5ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH

- SWN-AGRA-IDR-ECL-GAK3P-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, LOW LOSS, LOW VIDEO TRANSIENTS, (C)
  5ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH

- SWN-AGRA-IDR-TTL-GAX-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, LOW LOSS, 10ns-ULTRA HIGH SPEED, LOW
  VIDEO TRANSIENTS, (C) SPST PIN DIODE SWITCH

- SWN-AGRA-IDR-PTTL-GAX-LVT
  REFLECTIVE, 2.0 TO 18.0 GHZ, SINGLE SUPPLY, LOW LOSS, 10ns-ULTRA
  HIGH SPEED, SPST PIN DIODE SWITCH

NOTE: Contact Factory for Available Options.

NEW DESIGNS BY A. K. GORWARA
AUGUST 29, 1995
<table>
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<th>FREQUENCY IN GHz</th>
<th>0.5</th>
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<th>1</th>
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<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
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<td>SWN-AGRA-1DR-ECL-GAK0</td>
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<td>0.51</td>
<td>0.53</td>
<td>0.56</td>
<td>0.88</td>
<td>0.69</td>
<td>0.99</td>
<td>1.03</td>
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<td>0.91</td>
<td>0.67</td>
<td>0.92</td>
<td>1.09</td>
<td>1.23</td>
<td>1.43</td>
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<td>SWN-AGRA-1DR-PTTL-GAK2</td>
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<td>0.45</td>
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<td>0.68</td>
<td>0.83</td>
<td>0.81</td>
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<td>SWN-AGRA-1DR-PTTL-GAX</td>
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**NEW DESIGNS BY A. K. GORWARA**

FREQUENCY IS SHOWN-GHz
INSERTION LOSS MEASURED IN dB
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<tr>
<th>Frequency in GHz</th>
<th>SWN-AGRA-1DR-ECL-GAK0</th>
<th>SWN-AGRA-1DR-TTL-GAK1</th>
<th>SWN-AGRA-1DR-PITL-GAK2</th>
<th>SWN-AGRA-1DR-ECL-GAK3</th>
<th>SWN-AGRA-1DR-TTL-GAX</th>
<th>SWN-AGRA-1DR-PITL-GAX</th>
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**Frequency is shown in GHz.**

**Isolation as measured in dB.**

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**New Designs by A. K. Gorwar.**
## RETURN LOSS vs FREQUENCY

A COMPARISON OF SEVEN NEW SPST SWITCHES

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<td>SWN-AGRA-1DR-ECL-GAK0</td>
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<td>18.05</td>
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**NEW DESIGNS BY A. K. GORWARA**

FREQUENCY IS SHOWN-GHZ
RETURN LOSS MEASURED IN dB
# Switching Speed

A Comparison of Seven New SPST Switches

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<th>Rise</th>
<th>Fall</th>
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<th>Off</th>
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<td>8</td>
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**New Designs by A. K. Gorwara**

Switching Speed as Measured in Nanoseconds
# VIDEO TRANSIENTS

A COMPARISON OF SEVEN NEW SPST SWITCHES

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<th>100</th>
<th>300</th>
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</table>

**NEW DESIGNS BY A. K. GORWARA**

VIDEO TRANSIENTS MEASURED IN MILLIVOLTS PEAK-PEAK
MECHANICAL OUTLINES

DC Power Supply:
$\pm 5\text{vdc} \oplus \pm 60\text{mA Max.}$

![Figure 1. SWN-AGRA-1DR-TTL-GAK1-LVT](image1)
SWN-AGRA-1DR-TTL-GAX-LVT

DC Power Supply:
SINGLE SUPPLY
$+5\text{vdc} \oplus +60\text{mA Max.}$

![Figure 2. SWN-AGRA-1DR-PTTL-GAK2-LVT](image2)
SWN-AGRA-1DR-PTTL-GAX-LVT

DC Power Supply:
$\pm 5\text{vdc} \oplus \pm 60\text{mA Max.}$

![Figure 3. SWN-AGRA-1DR-ECL-GAK3-LVT](image3)
SWN-AGRA-1DR-ECL-GAK3-LVT
SWN-AGRA-1DR-ECL-GAK3P-LVT
SUMMARY

TEST DATA ON WIDEBAND LOW VIDEO TRANSIENT LOW LOSS HIGH SPEED HIGH ISOLATION REFLECTIVE & ABSORPTIVE

SPST PIN DIODE SWITCH/MODULATORS

NEW DESIGNS BY A. K. GORWARA

REPORTS PREPARED BY P. WOOD

SEPTEMBER 10, 1995
COMPARISON CHARTS
OF NEW REFLECTIVE & ABSORPTIVE
SPST PIN DIODE SWITCH/MODULATORS

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NEW AMC MODEL NUMBERS:

- **SWS-0518-IDR-HIM**
  REFLECTIVE, 0.5 TO 18.0 GHz, SLIM-LINE MINIATURE, LOW LOSS, FAST, SPST PIN DIODE SWITCH

- **SWS-RRA-1DR-ECL-LVT**
  REFLECTIVE, 1.0 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENTS (L/C), 0aS-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH

- **SWS-1TDR-ARG-LVT**
  REFLECTIVE, 1.0 TO 18.0 GHz, VERY LOW VIDEO TRANSIENTS (L/C), 10aS-ULTRA HIGH SPEED, HIGH ISOLATION SPST PIN DIODE SWITCH

- **SWS-0118-1DT-250**
  ABSORPTIVE, 10 MIL TO 18 GHz, LOW LOSS, SPST PIN DIODE SWITCH

- **SWS-WSP-IDR-118-HPM**
  REFLECTIVE, 0.5 TO 18.0 GHz, MINIATURE, LOW LOSS SPST PIN DIODE SWITCH

- **SWS-WSP-IDR-118-HPM-LVT**
  REFLECTIVE, 1.0 TO 18.0 GHz, LOW VIDEO TRANSIENT SPST PIN DIODE SWITCH

- **SWS-118-1DR-HPX-LVT**
  REFLECTIVE, 2.0 TO 18.0 GHz, LOW VIDEO TRANSIENTS (L/C), VERY LOW LOSS, 50aS-HIGH SPEED, BALANCED "ON/OFF" SPST PIN DIODE SWITCH

SEPTEMBER 10, 1995
CONTENTS
(CONTINUED)

- SWN-0518-1DR-12X-LVT
  REFLECTIVE, 0.5 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENTS(R/C) SPST PIN DIODE SWITCH

- SWN-0518-1DR-12X
  REFLECTIVE, 0.5 TO 18.0 GHz, 8aS HIGH SPEED SPST PIN DIODE SWITCH

- SWN-AKG-1DR
  REFLECTIVE, 0.5 TO 18.0 GHz, 100 dB ISOLATION SPST PIN DIODE SWITCH

- SWN-AKG-1DR-12X
  REFLECTIVE, 0.5 TO 18.0 GHz, VERY HIGH SPEED, VERY HIGH ISOLATION SPST PIN DIODE SWITCH

- SWN-AKG-1DR-12X-LVT
  REFLECTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, VERY HIGH ISOLATION, LOW VIDEO TRANSIENTS(R/C) SPST PIN DIODE SWITCH

- SWN-AKG-1DT
  ABSORPTIVE, 0.5 TO 18.0 GHz, 100 dB ISOLATION SPST PIN DIODE SWITCH

- SWN-AKG-1DT-12X
  ABSORPTIVE, 0.5 TO 18.0 GHz, 10us-ULTRA HIGH SPEED, HIGH ISOLATION SPST PIN DIODE SWITCH

- SWN-AKG-1DT-12X-LVT
  ABSORPTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, HIGH ISOLATION, LOW VIDEO TRANSIENTS(R/C) SPST PIN DIODE SWITCH

NOTES:

- Contact Factory for Available Options

AMC Model Numbers are defined as follows:

```
SW N - KRA - I D R - ECL - 12X - LVT
1 2 3 4 5 6 7 8 9
```

1. Switch
2. New
3. Model Number or Frequency of Operation
4. Number of Arms
5. Integral Driver
6. Reflective or Terminated(Absorptive)
7. Control Logic (TTL is Standard)
8. AMC internal design code
9. Low Video Transient option

SEPTEMBER 10, 1995
### Insertion Loss vs Frequency

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**A Comparison of SPST Switches**

**Insertion Loss vs Frequency**

**September 10, 1995**
# A Comparison of SPST Switches

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A review of new designs by A. K. Gorwara

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Footnotes:

1. A comparison of SPST switches with different isolation levels.
2. Frequency range from 0.1 to 18 GHz.
# A Comparison of SPST Switches

## Return Loss vs Frequency

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A review of new designs by A. K. Gorwara

x Axis: Measurement of return loss in dB

y Axis: Frequency in GHz
# A Comparison of SPST Switches

## Switching Speed

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<thead>
<tr>
<th>Switching Speed</th>
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*Note: The table shows a comparison of SPST switches based on their switching speed.*

---

**A Review of New Designs by A. K. Gorwara**

*X-axis: Measurement of switching speed in nanoseconds*
## VIDEO TRANSIENTS

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### A COMPARISON OF SPST SWITCHES

**BANDWIDTH**
- SWN-0518-1DR-HM
- SWN-1181-1DR-12X-LVT
- SWN-1181-1DR-12X-LVT
- SWN-1181-1DR-12X-LVT
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR
- SWN-AKG-1DR

**X-AXIS:** MEASUREMENTS IN MILLIWOLTS OR PEAK TO PEAK
**Y-AXIS:** BANDWIDTH IN MHz

**SEPTEMBER 10, 1995**
MECHANICAL OUTLINES

FIGURE 1. DC Power Supply: ±5vdc @ ±60mA Max.
- SWN-118-1DR-1IPX-LVT
- SWN-0518-1DR-12X-LVT
- SWN-0518-1DR-12X
- SWN-AKG-1DR
- SWN-AKG-1DR-12X
- SWN-AKG-1DR-12X-LVT
- SWN-AKG-1BT
- SWN-AKG-1BT-12X
- SWN-AKG-1BT-12X-LVT
- SWN-0118-1DT-250

FIGURE 2. DC Power Supply: ±5vdc @ ±80mA Max.
- SWN-RRA-1DR-FL1-LVT

AUGUST 29, 1995
MECHANICAL OUTLINES

FIGURE 3. DC Power Supply: ±5vdc @ ±60mA Max.
- SWN-1TDR-ARG-LVT

FIGURE 4. DC Power Supply: ±5vdc @ ±60mA Max.
- SWN-WSP-1DR-118-IIPM
- SWN-WSP-1DR-118-IIPM-LVT

AUGUST 29, 1995
MECHANICAL OUTLINES

FIGURE 5. DC Power Supply: ±5vdc @ ±60mA Max.

SWS-0518-1DR-1IM

AUGUST 29, 1995
SUMMARY

TEST DATA ON

0.5 TO 18.0 GHz

HIGH SPEED

LOW LOSS

RADIAL

REFLECTIVE & ABSORPTIVE

MULTI-THROW PIN DIODE SWITCHES

(SP3T, SP4T, SP5T, SP6T, & SP7T)

NEW DESIGNS

BY

A. K. GORWARA

REPORTS PREPARED

BY

P. WOOD

AUGUST 29, 1995
TYPICAL
COMPARISON CHARTS
OF REFLECTIVE & ABSORPTIVE
RADIAL MULTI-THROW PIN DIODE SWITCHES

CONTENTS

- INSERTION LOSS vs FREQUENCY PAGE 3
- ISOLATION vs FREQUENCY PAGE 4
- RETURN LOSS vs FREQUENCY PAGE 5
- SWITCHING SPEED PAGE 6
- MECHANICAL OUTLINES PAGE 8 - 10

NEW AMC MODEL NUMBERS:

- SWN-1170-3DT-12X
  SPTT, ABSORPTIVE, 0.5 TO 18.0 GHz, 10ns-ULTRA HIGH SPEED, HIGH ISOLATION, LOW PROFILE RADIAL PIN DIODE SWITCH

- SWN-1170-4DR-HPM
  SMT, REFLECTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, HIGH ISOLATION LOW PROFILE RADIAL PIN DIODE SWITCH

- SWN-1170-6DR-HPM
  SMT, REFLECTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, HIGH ISOLATION, LOW PROFILE, RADIAL PIN DIODE SWITCH

- SWN-1170-7DR-HPM
  SPTT, REFLECTIVE, 0.5 TO 18.0 GHz, HIGH SPEED, HIGH ISOLATION, LOW PROFILE, RADIAL PIN DIODE SWITCH

- SWN-1170-7DR-12M-DEC
  SPTT, REFLECTIVE, 0.5 TO 18.0 GHz, LOW LOSS, HIGH SPEED, HIGH ISOLATION, 3-BIT BINARY DECORDER, RADIAL PIN DIODE SWITCH

AUGUST 29, 1995
NOTES:

- Performance of the SP5T, SWN-1170-5DR-HPM, is similar to that of the SWN-1170-6DR-HPM.

- Performance of the High Speed Absorptive SP4T (SWN-1170-4DT-12X), SP5T (SWN-1170-5DT-12X), SP6T (SWN-1170-6DT-12X), and the SP7T (SWN-1170-7DT-12X) is similar to that of the SP3T (SWN-1170-3DT-12X) except that the Insertion Loss may be 0.5dB higher.

- All of the above noted switches are available in either the SWN-1170 or the SWN-1182 mechanical outline as are shown on pages 7 through 9.

- Standard DC Power Supply Voltage and Current Draw is:
  - ±5 vdc @ + 150 mA - 75 mA for SWN-1170/1182-3DR/T
  - ±5 vdc @ + 175 mA -100 mA for SWN-1170/1182-4DR/T
  - ±5 vdc @ + 250 mA -125 mA for SWN-1170/1182-5/6/7DR/T

- AMC Multi-Throw switch designations/Part Numbers are described as follows:
  - SWN-1170 or SWN-1182 : Model Number
  - 3DT or 3DR etc. : Number of Arms and,
    - D=Integral Driver
    - R=Reflective, T=Terminated(Absorptive)
  - 12X or HPM : Internal AMC design codes

AUGUST 29, 1995
A COMPARISON CHART OF 1170 AND 1182 SERIES RADIAL SWITCHES
INSERTION LOSS vs FREQUENCY

<table>
<thead>
<tr>
<th>FREQUENCY</th>
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<th>6</th>
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<th>14</th>
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<td>2.45</td>
<td>2.76</td>
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<tr>
<td>SWN-1170-4DR-HPM</td>
<td>0.96</td>
<td>0.73</td>
<td>0.93</td>
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<td>1.4</td>
<td>1.7</td>
<td>1.91</td>
<td>1.95</td>
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<td>2.69</td>
<td>2.93</td>
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ALL VALUES GIVEN ARE TYPICAL MEASUREMENTS FOR ALL ARMS
X AXIS: FREQUENCY AS MEASURED IN GHz
Y AXIS: INSERTION LOSS AS MEASURED IN dB
## A Comparison Chart of 1170 and 1182 Series Radial Switches

### Isolation vs Frequency

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<th>0.5</th>
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<th>6</th>
<th>8</th>
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<td>96</td>
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All values given are typical measurements for all arms

X axis: Frequency as measured in GHz

Y axis: Isolation as measured in dB
# A Comparison Chart of 1170 and 1182 Series Radial Switches

## Return Loss vs Frequency

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All values given are typical measurements for all arms.

X Axis: Frequency as measured in GHz

Y Axis: Return Loss as measured in dB
### Switching Speed

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</table>

All values given are typical measurements for all arms. Switching speed as measured in nanoseconds.
MECHANICAL OUTLINES

The SWN-1170 and SWN-1182 Series are Radial PIN Diode Switches which are virtually identical in mechanical outline. The Test Data shown in this report is indicative of either design as they may be used interchangeably as requirements demand. The following illustrates the entire SWN-1170 & SWN-1182 series of Radial Multi-Throw PIN Diode Switches.
MECHANICAL OUTLINES

SWN-1170-5DR/DT

SWN-1170-6DR/DT

SWN-1182-5DR/DT

SWN-1182-6DR/DT
MECHANICAL OUTLINES

SWN-1170-7DR/DT

SWN-1182-7DR/DT
MECHANICAL OUTLINES

SWN-1170-7DR-12M-DEC
DATA SHEETS
ON
0.5 TO 18 GHZ
(10 MHZ TO 18 GHZ, OPTIONAL)
LOW LOSS
HIGH SPEED
LOW, MEDIUM, & HIGH POWER
RADIAL
REFLECTIVE & ABSORPTIVE
MULTI-THROW SOLID-STATE SWITCHES
(SP3T, SP4T, SP5T, SP6T, SP7T, & SP8T)
SWN (1 1/4" DIA) AND MSR (1 1/2" DIA) SERIES
DESIGNED
BY
ASH GORWARA, RENE AFABLE, & WAYNE PURDHAM
REPORTS PREPARED
BY
EMILY KING
SEPTEMBER 10, 1997
WEB PAGE: HTTP://WWW.AMWAVE.COM
E-MAIL ADDRESS: AMCPMI@AOL.COM
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PRODUCT DESCRIPTION</th>
<th>PAGE</th>
</tr>
</thead>
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<td>SWN-1140-3DR/DT-DEC-SP with 2 Bit Decoder and Solder Pins</td>
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SPECIFICATIONS:

- **Frequency:** 0.5 GHz to 18 GHz
- **Insertion Loss:** Reflective: 2.75 db, Absorptive: 3.75 db
- **Isolation:** 0.5 GHz to 2 GHz: 60 db, 2 GHz to 18 GHz: 70 db
- **VSWR:** Reflective in/out: 2.0:1, Absorptive in/out: 2.0:1
- **Slew Rate:** Rise: 10 ns typical, 15 ns max., Fall: 10 ns typical, 15 ns max., Delay 0.5 ns typical, 10 % max., Delay OFF: 75 ns typical, 100 % max.
- **Power Input:** 0.089 thru W/4-40 THD 0.250 deep on mounting surface located on 1.00 circle, 2 places

OPTIONS:

- Independent control with solder pin standard
- Dec-SP: 2-bit decoder with solder pin

- **10 MHz to 18 GHz (Insertion Loss Increases 1.5 db at 10 MHz and 0.5 db at 18 GHz)**
- **100 MHz to 18 GHz (Insertion Loss Increases 1.5 db at 100 MHz and 0.5 db at 18 GHz)**
- **11.0:** 1 GHz to 10 GHz (No Change in Insertion Loss)
- **21.0:** 2 GHz to 18 GHz (No Change in Insertion Loss)
- **41.2:** 4 GHz to 12.4 GHz (No Change in Insertion Loss)
- **61.8:** 6 GHz to 18 GHz (No Change in Insertion Loss)
- **12.1:** 12 GHz to 16 GHz (No Change in Insertion Loss)
- **100 MHz to 20 GHz (Insertion Loss Increases 1.5 db at 100 MHz and 1.0 db at 20 GHz)**
- **22.0:** 2 GHz to 20 GHz (Insertion Loss Increases 1.5 db at 20 GHz)
- **102.0:** 10 GHz to 20 GHz (Insertion Loss Increases by 1.5 db at 20 GHz)

- **008:** Low Power - Specify CW Power, Peak Power, Pulse Width, Duty Cycle, RF Frequency and Bandwidth
- **007:** Custom Designed Product - Specify Initials of Customer
- **009:** Low Voltage Transients - Specify Video Bandwidth
- **010:** Low Insertion Loss Version
- **011:** Higher Isolation Version
- **012:** 0.70" Thick Version
- **013:** 0.85" Thick Version

ENVIROMENTAL RATING:

- Temperature: 
  -55°C to +45°C (Operating)
- Humidity: 85°C to +125°C (Storage)

NOTE: All dimensions are in inches. All tolerances: X, XX ± 0.020, XXX ± 0.010

NOTE: The above specifications are subject to change or revision.
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**SPECIFICATIONS:**

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:**
  - REFLECTIVE: 2.75 dB
  - ABSORPTIVE: 3.75 dB
- **ISOLATION:**
  - 0.5 GHz to 2 GHz: 80 dB
  - 2 GHz to 18 GHz: 70 dB
- **VSWR:**
  - REFLECTIVE IN/OUT: 2.0:1
  - ABSORPTIVE IN/OUT: 2.0:1
  - REFLECTIVE, OUT/OUT: 2.0:1
- **SPEED:**
  - RISE: 10 ns TYPICAL, 15 ns MAX.
  - FALL: 10 ns TYPICAL, 15 ns MAX.
  - DELAY: 75ns TYPICAL, 100ns MAX.
  - DELAY OFFSET: 75ns TYPICAL, 100ns MAX.
- **POWER INPUT:** (CW) +20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 Watt CW, 10 Watts PEAK 1 usec
- **CONTROL:** TTL LOGIC '0' = 'OFF', '1' = 'ON'
- **POWER SUPPLY:**
  - +5V @ 150 mA MAX.
  - -5V @ 75mA MAX. (REFLECTIVE)
  - 100mA MAX. (ABSORPTIVE/ NON-REFLECTIVE)

**OPTIONS:**

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP: 2 BIT DECODER WITH SOLDER PIN
- 1048: 10 MHz to 18 GHz (INSERTION LOSS INCREASES)
  - BY 1.5dB at 10 kHz and 0.5dB at 18 GHz
- 10048: 100 MHz to 18 GHz (INSERTION LOSS INCREASES)
  - BY 1.5dB at 100 kHz and 0.5dB at 18 GHz
- 108: 1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1210: 2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618: 6 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1212: 12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100420: 100 MHz to 20 GHz (INSERTION LOSS INCREASES)
  - BY 1.5dB at 100 MHz and 0.5dB at 20 GHz
- 220: 2 GHz to 20 GHz (INSERTION LOSS INCREASES)
  - BY 1.0dB at 20 GHz
- 120: 10 GHz to 20 GHz (INSERTION LOSS INCREASES)
  - BY 1.0 dB at 20 GHz
- 801: -12V POWER SUPPLIES
- 802: -15V POWER SUPPLIES
- 803: REVERSE LOGIC '0' = 'ON', '1' = 'OFF'
- 804: DRIVERLESS, CURRENT CONTROLLED
- 805: HIGH SPEED, TURNON/TURNOFF 25 nsec MAXIMUM
  - WHEN APPLICABLE
- 806: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH,
  - DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- 807: CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- 808: LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- 809: LOW INSERTION LOSS VERSION
- 810: HIGHER ISOLATION VERSION
- 811: 0.70 THICK VERSION

**ENVIRONMENTAL RATINGS:**

- **TEMPERATURE:**
  - -55°C to +85°C (OPERATING)
  - -65°C to +125°C (STORAGE)
- **HUMIDITY:**
  - MIL-STD-810F, METHOD 103B CONDITION B
- **SHOCK:**
  - MIL-STD-810F, METHOD 213B CONDITION B
- **VIBRATION:**
  - MIL-STD-810F, METHOD 204C CONDITION B
- **ATTITUDE:**
  - MIL-STD-810F, METHOD 163C CONDITION A
- **TEMPERATURE CYCLE:**
  - MIL-STD-810F, METHOD 107C CONDITION A

**NOTE:**

- OR = WITH DRIVER, REFLECTIVE
- DT = WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

---

**OUTLINE DRAWING**

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

MSR-3DR/DT-04-STANDARD
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH
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SPECIFICATIONS:

- FREQUENCY: 0.5 GHz to 18 GHz
- INSERTION LOSS: REFLECTIVE 2.75 db
- ISOLATION: 0.5 GHz to 2 GHz 60 db
- VSWR: 2 GHz to 18 GHz 70 db
- SPEED: RISE: 10 ns TYPICAL 15 ns MAX.
  FALL: 10 ns TYPICAL 15 ns MAX.
- POWER INPUT: (CW)+20 dBm (STANDARD), +10 dBm (HIGH SPEED)
- POWER SUPPLY: +5 V 150 mA MAX.
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC “1”=ON “0”=OFF
- POWER SUPPLY: +5V 75 mA MAX. (REFLECTIVE)
- OPTIONS:
  INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
  DEC-SP 2 BIT DECODER WITH SOLDER PIN
  10M1B 10 MHz TO 18 GHz (INSERTION LOSS INCREASES
  100M1B 100 MHz TO 18 GHz (INSERTION LOSS INCREASES
  110 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  218 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  412 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
  818 8 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  1218 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  100M20 100 MHz TO 20 GHz (INSERTION LOSS INCREASES
  120 1.56 db AT 100 MHz AND 0.56 db AT 18 GHz
  220 2 GHz TO 20 GHz (INSERTION LOSS INCREASES
  1020 10 GHz TO 20 GHz (INSERTION LOSS INCREASES
  801 +12V POWER SUPPLIES
  802 -15V POWER SUPPLIES
  803 REVERSE LOGIC "1"=ON "0"=OFF
  805 DRIVERLESS CURRENT CONTROLLED
  806 HIGH SPEED TURNON/TURNOFF 25 nsec MAXIMUM
  807 CUSTOM DESIGN PRODUCT—SPECIFY INITIALS OF CUSTOMER
  808 LOW VIDEO TRANSIENTS—SPECIFY VIDEO BANDWIDTH
  809 LOW INSERTION LOSS VERSION
  810 HIGHER ISOLATION VERSION
  811 0.4" THICK VERSION

ENVIRONMENTAL RATING:
- TEMPERATURE: -25°C TO +85°C (OPERATING)
- HUMIDITY: 65% TO 125°C (STORAGE)
- SHOCK: MIL-STD-202F, METH 103B COND. B
- VIBRATION: MIL-STD-202F, 16 HZ 204D COND. B
- ALTITUDE: MIL-STD-202F, 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

NOTE: ALL DIMENSIONS ARE IN INCHES.

TOLERANCES:
- X.XX  ±0.020
- X.XXX ±0.010

NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.
SPECSIFICATIONS:
- FREQUENCY: 0.5 GHz to 18 GHz
- INSERTION LOSS: REFLECTIVE 2.75 db, ABSORPTIVE 3.75 db
- ISOLATION: 0.5 GHz to 2 GHz 50 db, 2 GHz to 18 GHz 70 db
- VSWR: REFLECTIVE IN/OUT: 2.0:1, ABSORPTIVE IN/OUT: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.
- POWER INPUT: +CW+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0"-ON "1"-OFF
- POWER SUPPLY: +5V @ 150 mA MAX.
- SIZE @ 75mA MAX, REFLECTIVE 100mA MAX, ABSORPTIVE NON-REFLECTIVE

OPTIONS:
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP: 2 BIT DECODER WITH SOLDER PIN
- 10418: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100418: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 118: 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 418: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618: 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218: 12 GHz TO 18GHz (NO CHANGE IN INSERTION LOSS)
- 100220: 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 1.0db AT 20 GHz)
- 220: 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 1020: 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 801: +12V POWER SUPPLIES
- 802: -12V POWER SUPPLIES
- 803: REVERSE LOGIC "1"-ON "0"-OFF
- 804: DRIVERLESS, CURRENT CONTROLLED
- 805: HIGH SPEED, TURNON TURNOFF 25 nsec MAXIMUM
- 806: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- 807: CUSTOM DESIGNED PRODUCT - SPECIFY INTIALS OF CUSTOMER
- 808: LOW VIDEO TRANSISTORS - SPECIFY VIDEO BANDWIDTH
- 809: LOW INSERTION LOSS VERSION
- 810: HIGHER ISOLATION VERSION
- 811: .40" THICK VERSION

ENVIRONMENTAL RATINGS:
- TEMPERATURE: -55°C TO 48C (OPERATING), 0°C TO 125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 213B COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 1970 COND. A

NOTE:
- DR = DRIVER, REFLECTIVE
- DT = DRIVER, NON-REFLECTIVE/ABSORPTIVE

ALL DIMENSIONS ARE IN INCHES
TOLERANCES:
XX ±.020
XXX ±.010

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSR-3DR/DT-07-DEC-SP
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

PART NO.
A 60483
100-4192-2 A

DATE
REV
SNK N/S
1/11/77
A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECTED TO CHANGE OR REVISE.
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</table>
**SPECIFICATIONS:**
- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:**
  - REFLECTIVE: 3.0 dB
  - ABSORPTIVE: 3.75 dB
- **ISOLATION:**
  - 0.5 GHz to 2 GHz: 50 dB
  - 2 GHz to 18 GHz: 70 dB
- **VSWR:**
  - REFLECTIVE IN/OUT: 2.0:1
  - ABSORPTIVE IN/OUT: 2.0:1
- **SPEED:**
  - RISE: 10 ns TYPICAL, 15 ns MAX.
  - FALL: 10 ns TYPICAL, 15 ns MAX.
  - DELAY IN: 75 ns TYPICAL, 100 ns MAX.
  - DELAY OUT: 75 ns TYPICAL, 100 ns MAX.
- **POWER INPUT:**
  - (CW) 20 dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 WATTS CW, 10 WATTS PEAK 1 usec
- **CONTROL:**
  - TTL LOGIC "0" = ON, "1" = OFF
- **POWER SUPPLY:**
  - +5 V @ 200 mA MAX.
  - -5 V @ 75 mA MAX (REFLECTIVE)
  - 100 mA MAX (ABSORPTIVE/NON-REFLECTIVE)

**OPTIONS:**
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
  - 8018: 10 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 10 MHz and 0.5 dB AT 18 GHz)
  - 100 MHz: 100 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz and 0.5 dB AT 18 GHz)
  - 118: 1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 218: 2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 412: 4 GHz to 12 GHz (NO CHANGE IN INSERTION LOSS)
  - 612: 6 GHz to 12 GHz (NO CHANGE IN INSERTION LOSS)
  - 1218: 12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 100 MHz: 100 MHz to 20 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz and 1.0 dB AT 20 GHz)
  - 220: 2 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)
  - 1020: 10 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)
- **12V POWER SUPPLIES**
- **-15V POWER SUPPLIES**
- **REVERSE LOGIC "1" = ON, "0" = OFF**
- **DRIVERLESS, CURRENT CONTROLLED**
- **HIGH SPEED, TURN-ON/TURN-OFF 25 nsec MAXIMUM WHEN APPLICABLE**
- **HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH**
- **CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER**
- **LOW VIDEO TRANSISTORS - SPECIFY VIDEO BANDWIDTH**
- **LOW INSERTION LOSS VERSION**
- **HIGHER ISOLATION VERSION**
- **0.70" THICK VERSION**

**ENVIRONMENTAL RATINGS:**
- **TEMPERATURE:**
  - -55°C to +85°C (OPERATING)
  - -65°C to +125°C (STORAGE)
- **HUMIDITY:**
  - MIL-STD-883F, METHOD 1033, COND. B
  - MIL-STD-202F, METHOD 105C, COND. B
- **VIBRATION:**
  - MIL-STD-202F, METHOD 213B, COND. B
- **ALTITUDE:**
  - MIL-STD-202F, METHOD 2040, COND. B
- **TEMPERATURE CYCLE:**
  - MIL-STD-202F, METHOD 107D, COND. A

**NOTES:**
- DR= WITH DRIVER, REFLECTIVE
- DT= WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

**AMERICAN MICROWAVE CORPORATION**
FREDERICK, MARYLAND

**OUTLINE DRAWING**
MSR-4DR/DT-04-DEC-SP
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

**ALL DIMENSIONS ARE IN INCHES**

**TOLERANCES:**
- X.XX ±0.020
- X.XX ±0.010

**NOTE:**
- THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

**AMERICAN MICROWAVE CORPORATION**
FREDERICK, MARYLAND

**OUTLINE DRAWING**
MSR-4DR/DT-04-DEC-SP
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

**ALL DIMENSIONS ARE IN INCHES**

**TOLERANCES:**
- X.XX ±0.020
- X.XX ±0.010

**NOTE:**
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SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:** Reflective: 3.25db, Absorptive: 4.0db
- **ISOLATION:** 0.5 GHz to 2 GHz: 60db, 2 GHz to 8 GHz: 70db
- **VSWR:** Reflective IN/OUT: 2.0:1, Absorptive IN/OUT: 2.0:1
- **SPEED:** Rise: 10ns Typical, 15ns Max. Fall: 10ns Typical, 15ns Max. Delay ON: 75ns Typical, 100ns Max. Delay OFF: 75ns Typical, 100ns Max.
- **POWER INPUT:** (CW) +20dBm (Standard), +10 dBm (High Speed)
- **SURVIVAL POWER:** 1 Watt CW, 10 Watts Peak 1 usec
- **CONTROL:** TTL Logic "0" = ON, "1" = OFF
- **POWER SUPPLY:** +5V @ 250mA Max. -5V @ 75mA Max. (Reflective) 100mA Max. (Absorptive/Non-Reflective)

OPTIONS:

- Independent Control with Solder Pin Standard
- Dec-58: 3 Bit Decoder with Solder Pin
- 10M18: 10 MHz to 18 GHz (Insertion Loss Increases By 1.5db at 10 MHz and 0.5db at 18 GHz)
- 100M18: 100 MHz to 18 GHz (Insertion Loss Increases By 1.5db at 100 MHz and 0.5db at 18 GHz)
- 118: 1 GHz to 18 GHz (No Change in Insertion Loss)
- 218: 2 GHz to 18 GHz (No Change in Insertion Loss)
- 412: 4 GHz to 12.4 GHz (No Change in Insertion Loss)
- 618: 6 GHz to 18 GHz (No Change in Insertion Loss)
- 1218: 12 GHz to 18 GHz (No Change in Insertion Loss)
- 10120: 10 GHz to 20 GHz (Insertion Loss Increases By 1.0db at 10 GHz and 0.5db at 20 GHz)
- 1020: 10 GHz to 20 GHz (Power Supply Increases By 1.0db at 10 GHz and 0.5db at 20 GHz)
- B01: -12V Power Supplies
- B02: -15V Power Supplies
- B03: Reverse Logic "1" = On, "0" = Off
- B04: Driverless, Current Controlled
- B05: High Speed, Turn On/Turn Off 250 ns Maximum When Applicable
- B06: High Power -- Specify CW Power, Peak Power, Pulse Width, Duty Cycle, RF Frequency and Bandwidth
- B07: Custom Designed Product -- Specify Initials of Customer
- B08: Low Video Transients -- Specify Video Bandwidth
- B09: Low Insertion Loss Version
- B10: Higher Isolation Version
- B11: 0.40" Thick Version
- B12: 0.88" Thick Version

ENVIRONMENTAL RATINGS:

- **TEMPERATURE:** -25°C to +85°C (Operating), -45°C to +125°C (Storage)
- **HUMIDITY:** MIL-STD-202F, Method 103B Cond. B
- **SHOCK:** MIL-STD-202F, Method 213B Cond. B
- **VIBRATION:** MIL-STD-202F, Method 204B Cond. B
- **ALTIMETRIC:** MIL-STD-202F, Method 105L Cond. B
- **TEMPERATURE CYCLE:** MIL-STD-202F, Method 107D Cond. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR MODIFICATION.

NOTES:

- All dimensions are in inches
- TOLERANCES:
  - XXX ±0.200
  - XXXX ±0.010

NOTE: DR = WITH DRIVER, REFLECTIVE
      DT = WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

OUTLINE DRAWING

SWM-1170-SDR/DT-STANDARD
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
RADIAL SOLID STATE SWITCH
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</table>
SPECIFICATIONS:

- FREQUENCY: 0.5 GHz to 18 GHz
- INSERTION LOSS: REFLECTIVE 3.25 dB, ABSORPTIVE 4.0 dB
- ISOLATION: 0.5 GHz to 2 GHz: 60 dB
- 2 GHz to 16 GHz: 70 dB
- VSWR: REFLECTIVE IN/OUT: 2.0:1, ABSORPTIVE IN/OUT: 2.0:1
- ABSORPTIVE IN/OUT/OFF: 2.0:1
- SPEED: RISE: 10 ns TYPICAL, 15 ns MAX.
- FALL: 10 ns TYPICAL, 15 ns MAX.
- DELAY IN: 75 ns TYPICAL, 100 ns MAX.
- DELAY OFF: 75 ns TYPICAL, 100 ns MAX.
- POWER INPUT: (CW) +20 dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 Watt CW, 10 Watts PEAK 1 usec
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V ± 250 mA MAX.
- -5V ± 75 mA MAX (REFLECTIVE)
- 100 mA MAX (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

INDEPENDENT CONTROL WITH SOLDER PIN STANDARD

DEC-SP
3 BIT DECODER WITH SOLDER PIN
10M18
10 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 10 MHz AND 0.5 dB AT 18 GHz)
100M18
100 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz AND 0.5 dB AT 18 GHz)
118
1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
218
2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
412
4 GHz to 12.4 GHz (NO CHANGE IN INSERTION LOSS)
618
6 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
1218
12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
100M20
100 MHz to 20 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz AND 1.0 dB AT 20 GHz)
220
2 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)
1020
10 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)
B01
-12V POWER SUPPLIES
B02
-15V POWER SUPPLIES
B03
REV LOGIC "1"=ON "0"=OFF
B04
DRIVERLESS, CURRENT CONTROLLED
B05
HIGH SPEED, TURNON/TURNOFF 25 nsec MAXIMUM WHEN APPLICABLE
B06
HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
B07
CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
B08
LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
B09
LOW INSERTION LOSS VERSION
B10
HIGHER ISOLATION VERSION
B11
0.70" THICK VERSION

ENVIRONMENTAL RATINGS:

- TEMPERATURE: -55°C TO +85°C (OPERATING)
- HUMIDITY: MIL-STD-202F, METHOD 101B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107C COND. A

ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

X.XX ± 0.020
X.XXX ± 0.010

NOTE: D with DRIVER, REFLECTIVE
D with DRIVER, NON-REFLECTIVE/ABSORPTIVE

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSR-5DR/DT-04 STANDARD
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

REV. A
PART NO.
60483
100-4188-1

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION
SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:**
  - REFLECTIVE: 3.25dB
  - ABSORPTIVE: 4.0dB
- **ISOLATION:**
  - 0.5 GHz to 2 GHz: 60dB
  - 2 GHz to 18 GHz: 70dB
- **VSWR:**
  - REFLECTIVE IN/OUT: 2.6:1
  - ABSORPTIVE IN/OUT: 2.0:1
  - ABSORPTIVE OUTPUT: 2.0:1
- **SPEED:**
  - RISE: 10ns TYPICAL, 15ns MAX.
  - FALL: 10ns TYPICAL, 15ns MAX.
  - DELAY ON: 75ns TYPICAL, 100ns MAX.
  - DELAY OFF: 75ns TYPICAL, 100ns MAX.
- **POWER INPUT:**
  - (CW): +20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 WATT CW, 10 WATTS PEAK 1 usec
- **CONTROL:**
  - TTL LOGIC "0"-ON "1"-OFF
- **POWER SUPPLY:**
  - +5V @ 220 mA MAX.
  - -5V @ 75mA MAX (REFLECTIVE)
  - 100mA MAX (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
  - DEC-SP: 3 BIT DECODER WITH SOLDER PIN
  - 10M18:
    - 10 MHz TO 18 MHz INSERTION LOSS INCREASES BY 1.5dB AT 10 kHz AND 0.5dB AT 18 GHz
  - 100M18:
    - 100 MHz TO 18 GHz INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 0.5dB AT 18 GHz
  - 118:
    - 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 218:
    - 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 412:
    - 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
  - 618:
    - 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 1218:
    - 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 100M420:
    - 100 MHz TO 20 GHz INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 0.5dB AT 20 GHz
  - 220:
    - 2 GHz TO 20 GHz INSERTION LOSS INCREASES BY 0.5dB AT 20 GHz
  - 1020:
    - 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 0.5dB AT 20 GHz)
- **POWER SUPPLIES:**
  - 12V POWER SUPPLIES
  - 15V POWER SUPPLIES
- **LOGIC:**
  - REVERSE LOGIC "1"=ON "0"=OFF
  - DRIVERLESS, CURRENT CONTROLLED
- **POWER:**
  - HIGH SPEED, TURNOFF TURNON 25 nsec MAXIMUM
  - WHEN APPLICABLE
  - HIGH POWER — SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- **ALLOCATION:**
  - CUSTOM DESIGNED PRODUCT — SPECIFY INITIALS OF CUSTOMER
  - LOW VIDEO TRANSISTORS — SPECIFY VIDEO BANDWIDTH
  - LOW INSERTION LOSS VERSION
  - HIGHER ISOLATION VERSION
  - 0.70" THICK VERSION

ENVIRONMENTAL RATINGS:

- **TEMPERATURE:**
  - -55°C TO +85°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- **HUMIDITY:**
  - MIL-STD-202F, METHOD 103B COND. B
  - MIL-STD-202F, METHOD 213B COND. B
  - MIL-STD-202F, METHOD 103B COND. B
  - MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION:**
  - MIL-STD-202F, METHOD 103B COND. B
  - MIL-STD-202F, METHOD 213B COND. B
  - MIL-STD-202F, METHOD 103B COND. B
  - MIL-STD-202F, METHOD 213B COND. B
  - MIL-STD-202F, METHOD 103B COND. B
  - MIL-STD-202F, METHOD 213B COND. B
  - MIL-STD-202F, METHOD 103B COND. B
  - MIL-STD-202F, METHOD 213B COND. B

NOTE:

DR = WITH DRIVER, REFLECTIVE
DT = WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

- X.XX ± 0.020
- X.XXX ± 0.010

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSR-5DR/DT-04-DEC-SP
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH

PART NO. 60483 100-4188-2

APPROVALS DATE
A 9/8/1977

DRAWING 11/17/77

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SPECIFICATIONS:
- **FREQUENCY**: 0.5 GHz To 18 GHz
- **INSERTION LOSS**: REFLECTIVE: 3.5dB
  ABSORPTIVE: 4.0dB
- **ISOLATION**: 0.5 GHz To 2 GHz: 60dB
  2 GHz To 18 GHz: 70dB
- **VSWR**: REFLECTIVE HIGH/LOW: 2.0:1
  ABSORPTIVE HIGH/LOW: 2.1:1
- **SPEED**: RISE: 10ns TYPICAL, 15ns MAX.
  FALL: 10ns TYPICAL, 15ns MAX.
  DELAY ON: 75ns TYPICAL, 100ns MAX.
  DELAY OFF: 75ns TYPICAL, 100ns MAX.
- **POWER INPUT**: (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER**: 1 WATT CW, 10 WATTS PEAK 1 usec
- **CONTROL**: TTL LOGIC "0"=ON "1"=OFF
- **POWER SUPPLY**: +5V @ 250 mA MAX.
  -5V @ 75mA MAX (REFLECTIVE)
  100mA MAX (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:
- **INDEPENDENT CONTROL WITH SOLDER PIN STANDARD**
  DEC-5R
  10kHz to 18 GHz (INSERTION LOSS INCREASES
  BY 1.5dB at 10 MHz AND 0.5dB at 18 GHz)
  100kHz
  100 MHz to 18 GHz (INSERTION LOSS INCREASES
  BY 1.5dB at 100 MHz AND 0.5dB at 18 GHz)
  1.8GHz
  1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  2.1GHz
  2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  4.1GHz
  4 GHz to 12.4 GHz (NO CHANGE IN INSERTION LOSS)
  8.1GHz
  8 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  12.1GHz
  12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  100MHz to 20 GHz (INSERTION LOSS INCREASES
  BY 1.5dB at 100 MHz AND 1.06dB at 20 GHz)
  220GHz
  2 GHz to 20 GHz (INSERTION LOSS INCREASES
  BY 1.06dB at 20 GHz)
  1020GHz
  10 GHz to 20 GHz (INSERTION LOSS INCREASES
  BY 1.06dB at 20 GHz)
- **B01**: 12V POWER SUPPLIES
- **B02**: 16V POWER SUPPLIES
- **B03**: REVERSE LOGIC "1"=ON "0"=OFF
- **B04**: DRIVERLESS, CURRENT CONTROLLED
- **B05**: HIGH SPEED, TURNON/TURNOFF 25 nsec MAXIMUM
- **D06**: HIGH POWER – SPECIFY CW POWER, PEAK POWER, PULSE WIDTH,
  DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- **D07**: CUSTOM DESIGNED PRODUCT – SPECIFY INITIALS OF CUSTOMER
- **D08**: LOW VIDEO TRANSIENTS – SPECIFY VIDEO BANDWIDTH
- **D09**: LOW INSERTION LOSS VERSION
- **B10**: HIGHER ISOLATION VERSION
- **B11**: 0.40″ THICK VERSION

ENVIRONMENTAL RATINGS:
- **TEMPERATURE**: -55°C TO +85°C (OPERATING)
  -55°C TO +125°C (STORAGE)
- **HUMIDITY**: MIL-STD-202F, METHOD 103B COND. B
- **SHOCK**: MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION**: MIL-STD-202F, METHOD 2041B COND. B
- **ALTITUDE**: MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLES**: MIL-STD-202F, METHOD 107D COND. A

NOTE:
- DR WITH DRIVER, REFLECTIVE
- DT WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

ALL DIMENSIONS ARE IN INCHES

| AMERICAN MICROWAVE CORPORATION |
| FREDERICK, MARYLAND |

OUTLINE DRAWING
MSR-5DR/DT-07-STANDARD
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

ENVIRONMENTAL RATINGS:
- TEMPERATURE: -55°C TO +85°C (OPERATING)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 2041B COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLES: MIL-STD-202F, METHOD 107D COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.
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<td>SWN-1170-6DR/DT-STANDARD with Independent Controls</td>
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<td>18.1</td>
<td>SWN-1182-6DR/DT-STANDARD with Independent Controls</td>
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<td>18.2</td>
<td>SWN-1182-6DR/DT-DEC-SP with 3 Bit Decoder and Solder Pins</td>
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</tbody>
</table>
SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:**
  - REFLECTIVE: 3.5 dB
  - ABSORPTIVE: 4.25 dB
- **ISOLATION:** 0.5 GHz to 2 GHz: 60 dB
  - 2 GHz to 18 GHz: 70 dB
- **VSWR:**
  - REFLECTIVE IN/OUT: 2:1
  - ABSORPTIVE IN/OUT: 2:1
- **SPEED:**
  - RISE: 10 ns TYPICAL, 15 ns MAX.
  - FALL: 10 ns TYPICAL, 12 ns MAX.
  - DELAY ON: 75 ns TYPICAL, 100 ns MAX.
  - DELAY OFF: 75 ns TYPICAL, 100 ns MAX.
- **POWER INPUT:** (CW) +20 dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 WATT CW, 10 WATTS PEAK 1 microsecond
- **CONTROL:** TTL LOGIC "0" - ON "1" - OFF
- **POWER SUPPLY:** 5 V @ 300 mA MAX.
  - 5 V @ 750 mA (SELECTIVE)
  - 100 mA MAX. (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-SP: 3 BIT DECODER WITH SOLDER PIN
- 10M18: 10 MHz to 18 MHz (INSERTION LOSS INCREASES BY 1.6 dB AT 10 MHz AND 0.5 dB AT 18 GHz)
- 100M18: 100 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.6 dB AT 100 MHz AND 0.5 dB AT 18 GHz)
- 118: 1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 210: 2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412: 4 GHz to 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618: 6 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218: 12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100H20: 100 MHz to 20 GHz (INSERTION LOSS INCREASES BY 1.6 dB AT 100 MHz AND 0.05 dB AT 20 GHz)
- 220: 2 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 20 GHz)
- 1020: 10 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 20 GHz)

- B01: -12V POWER SUPPLIES
- B02: +15V POWER SUPPLIES
- B03: REVERSE LOGIC "1" - ON "0" - OFF
- B04: DRIVERLESS, CURRENT CONTROLLED
- B05: HIGH SPEED, TURNON/TURNOFF 25 ns max. WHEN APPLICABLE
- B06: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- B07: CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- B08: LOW VOLTAGE TRANSISTORS - SPECIFY VIDEO BANDWIDTH
- B09: LOW INSERTION LOSS VERSION
- B10: HIGHER INSERTION VERSION
- B11: 0.40" THICK VERSION
- B12: 0.70" THICK VERSION

ENVIRONMENTAL RATINGS:

- **TEMPERATURE:** -55°C to +85°C (OPERATING)
- **HUMIDITY:** -55°C to +125°C (STORAGE)
- **SHOCK:** MIL-STD-202F, METHOD 103B, COND. B
- **VIBRATION:** MIL-STD-202F, METHOD 213B, COND. B
- **ALTITUDE:** MIL-STD-202F, METHOD 2040, COND. B
- **TEMPERATURE CYCLE:** MIL-STD-202F, METHOD 105C, COND. B

NOTE: ALL DIMENSIONS ARE IN INCHES.

TOLERANCES: XXX ±0.020

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.
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SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:** REFLECTIVE: 3.5 dB  
  ABSORPTIVE: 4.25 dB
- **ISOLATION:** 60 dB (at 2 GHz)  
  70 dB (at 18 GHz)
- **VSWR:** REFLECTIVE IN/OUT: 2.0:1  
  ABSORPTIVE IN/OUT: 2.0:1
- **SPEED:** 10 ns TYPICAL, 15 ns MAX.  
  FALL: 15 ns TYPICAL, 15 ns MAX.  
  DELAY: 75 ns TYPICAL, 100 ns MAX.
- **POWER INPUT:** (CW) 20 dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 WATT CW, 10 WATTS PEAK 1 usec
- **CONTROL:** TTL LOGIC "0"=ON "1"=OFF
- **POWER SUPPLY:** +5 V @ 300 mA MAX.  
  -5 V @ 75 mA MAX (REFLECTIVE)  
  100 mA MAX (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-5P: 3 BIT DECODER WITH SOLDER PIN
- 100M18: 10 MHz TO 18 GHz (INSERTION LOSS INCREASES
  BY 1.5 dB AT 18 MHz AND 0.5 dB AT 18 GHz)
- 100M20: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES
  BY 1.5 dB AT 100 MHz AND 0.5 dB AT 18 GHz)
- 118: 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 418: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 818: 8 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218: 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100M20: 100 MHz TO 20 GHz (INSERTION LOSS INCREASES
  BY 1.5 dB AT 100 MHz AND 1.0 dB AT 20 GHz)
- 220: 2 GHz TO 20 GHz (INSERTION LOSS INCREASES
  BY 1.0 dB AT 20 GHz)
- 1020: 10 GHz TO 20 GHz (INSERTION LOSS INCREASES
  BY 1.0 dB AT 20 GHz)
- D01: -12V POWER SUPPLIES
- D02: -15V POWER SUPPLIES
- D03: REVERSE LOGIC "1"=ON "0"=OFF
- D04: DRIVERLESS, CURRENT CONTROLLED
- D05: HIGH SPEED, TURN ON/TURN OFF 25 nsec MAXIMUM
  WHEN APPLICABLE
- D06: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH,
  DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- D07: CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- D08: LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- D09: LOW INSERTION LOSS VERSION
- D10: HIGHER ISOLATION VERSION
- D11: 0.70 THICK VERSION

ENVIRONMENTAL RATING:

- **TEMPERATURE:** -55°C TO +85°C (OPERATING)  
  -65°C TO +125°C (STORAGE)
- **HUMIDITY:** MIL-STD-202F, METHOD 103B COND. B
- **SHOCKS:** MIL-STD-202F, METHOD 211B COND. B
- **VIBRATION:** MIL-STD-202F, METHOD 201B COND. B
- **ALTITUDE:** MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE:** MIL-STD-202F, METHOD 107B COND. A

NOTE:

- DR=WITH DRIVER, REFLECTIVE
- DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

ALL DIMENSIONS ARE IN INCHES.
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SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:** REFLECTIVE 3.75 db, ABSORBING 4.25 db
- **ISOLATION:** 0.5 GHz to 2 GHz 60 db, 2 GHz to 18 GHz 70 db
- **VSWR:** REFLECTIVE IN/OUT: 2.0:1, ABSORBING IN/OUT: 2.0:1
- **SPEED:** RISE: 10 ns TYPICAL, 15 ns MAX., FALL: 10 ns TYPICAL, 15 ns MAX., DELAY: 75 ns TYPICAL, 100 ns MAX.
- **POWER INPUT:** (CW) 0.020 db (STANDARD), +10 dbm (HIGH SPEED)
- **SURVIVAL POWER:** 1 WATT CW, 10 WATTS PEAK 1 usec
- **CONTROL:** TTL LOGIC "0" = ON, "1" = OFF
- **POWER SUPPLY:** +5V @ 300 mA MAX, -5V @ 75 mA MAX (REFLECTIVE), 100 mA MAX (ABSORBING/NON-REFLECTIVE)

OPTIONS:

- **INDEPENDENT CONTROL WITH SOLDER PIN STANDARD**
  - DEC-SP: 3 BIT DECODER WITH SOLDER PIN
- **10MHz**
  - 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5 db AT 10 MHz AND 0.5 db AT 18 GHz)
- **100MHz**
  - 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5 db AT 10 MHz AND 0.5 db AT 18 GHz)
- **118**
  - 118 MHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- **218**
  - 218 MHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- **412**
  - 412 MHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- **612**
  - 612 MHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- **1212**
  - 1212 MHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- **1000**
  - 1000 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5 db AT 10 MHz AND 1.0 db AT 20 GHz)
- **220**
  - 220 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0 db AT 20 GHz)
- **B01**
  - -12V POWER SUPPLIES
- **B02**
  - -15V POWER SUPPLIES
- **B03**
  - REVERSE LOGIC "1" = ON, "0" = OFF
- **B04**
  - DRIVERLESS, CURRENT CONTROLLED
- **B05**
  - HIGH SPEED, TURN ON/TURN OFF 25 nsec MAXIMUM WHEN APPLICABLE
- **B06**
  - HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- **B07**
  - CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- **B08**
  - LOW VIDEO TRANSISTORS - SPECIFY VIDEO BANDWIDTH
- **B09**
  - LOW INSERTION LOSS VERSION
- **B10**
  - HIGHER ISOLATION VERSION
- **B11**
  - 0.70" THICK VERSION
- **B12**
  - 0.85" THICK VERSION

ENVIRONMENTAL RATINGS:

- **TEMPERATURE:** -65°C TO +85°C (OPERATING)
- **HUMIDITY:** MIL-STD-202F, METHOD 103B, COND. B
- **SHOCK:** MIL-STD-202F, METHOD 213B, COND. B
- **VIBRATION:** MIL-STD-202F, METHOD 204D, COND. B
- **ALTITUDE:** MIL-STD-202F, METHOD 105C, COND. B
- **TEMPERATURE CYCLE:** MIL-STD-202F, METHOD 107D, COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

NOTE:

- **DR** = WITH DRIVER, REFLECTIVE
- **DT** = WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE
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<td>SWN-1170-7DR/DT-DEC-SP with 3 Bit Decoder and Solder Pins</td>
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</table>
**SPECIFICATIONS:**
- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:** REFLECTIVE: 3.75dB, ABSORPTIVE: 4.25dB
- **ISOLATION:**
  - 0.5 GHz to 2 GHz: 60dB
  - 2 GHz to 18 GHz: 70dB
- **VSWR:** REFLECTIVE IN/OUT: 2.0:1, ABSORPTIVE IN/OUT: 2.0:1
- **SPEED:**
  - RISE: 10ns TYPICAL, 15ns MAX.
  - FALL: 10ns TYPICAL, 15ns MAX.
  - DELAY ON: 50ns TYPICAL, 100ns MAX.
  - DELAY OFF: 50ns TYPICAL, 100ns MAX.
- **POWER INPUT:** (O) +20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 WATT CW, 100 WATTS PEAK 1 usec
- **CONTROL:** TTL LOGIC "0"=ON, "1"=OFF
- **POWER SUPPLY:** +5V @ 350 mA MAX., -5V @ 75mA MAX. (REFLECTIVE), 100mA MAX. (ABSORPTIVE/NON-REFLECTIVE)

**OPTIONS:**
- **INDEPENDENT CONTROL WITH SOLDER PIN STANDARD**
  - DECODER 3 BIT DECODER WITH SOLDER PIN
  - 10MH = 10MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 10 MHz AND 0.5dB AT 18 GHz)
  - 100MH = 100MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 0.5dB AT 18 GHz)
  - 118 = 1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 218 = 2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 412 = 4 GHz to 12.4 GHz (NO CHANGE IN INSERTION LOSS)
  - 618 = 6 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 1218 = 12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)
  - 100MH2 = 100MHz to 20 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 0.5dB AT 20 GHz)
  - 220 = 2 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0dB AT 20 GHz)
  - 1020 = 10 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0dB AT 20 GHz)
- **POWER SUPPLIES:**
  - -12V POWER SUPPLIES
  - -15V POWER SUPPLIES
  - REVERSE LOGIC "1"=ON, "0"=OFF
  - DRIVERLESS, CURRENT CONTROLLED
  - HIGH SPEED, TURNON/TURNOFF 25 nsec MAXIMUM
  - HIGH POWER — SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
  - CUSTOM DESIGNED PRODUCT — SPECIFY INITIALS OF CUSTOMER
  - LOW VIDEO TRANSISTORS — SPECIFY VIDEO BANDWIDTH
  - LOW INSERTION LOSS VERSION
  - HIGHER ISOLATION VERSION
- **ENVIRONMENTAL RATINGS:**
  - TEMPERATURE: -55°C TO +85°C (OPERATING)
  - HUMIDITY: 5% TO +10% (STORAGE)
  - SHOCK: MIL-STD-202F, METHOD 103C, COND. B
  - VIBRATION: MIL-STD-202F, METHOD 2040, COND. B

**NOTES:**
- DR WITH DRIVER, REFLECTIVE
- DT WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

**OUTLINE DRAWING:**
- SWN-1170-7DR/DT-DEC-SP
- REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE RADIAL SOLID STATE SWITCH

**AMERICAN MICROWAVE CORPORATION**
FREDERICK, MARYLAND

**DRAWING**
- A
- 60483
- 100-4175-2

**SCALE**
- N/S

**APPROVALS**
- 1 of 1

**DATE**
- 8/11/97
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<td>23.2</td>
<td>SWN-1182-7DR/DT-DEC-SP with 3 Bit Decoder and Solder Pins</td>
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</tbody>
</table>
SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz TO 15 GHz
- **INSERTION LOSS:** REFLECTIVE: 3.75db
- **ISOLATION:** 0.5 GHz TO 2 GHz: 50db
- **VSWR:** REFLECTIVE IN/OUT: 2.0:1
- **SPEED:** RISE: 10ns TYPICAL, 15ns MAX.
- **POWER INPUT:** 10W+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** 1 Watt CW, 10 Watts PEAK 1 usec
- **CONTROL:** TTL LOGIC "0"-ON, "1"-OFF
- **POWER SUPPLY:** +5V @ 350 mA MAX.
- **OPTIONS:**
  - INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
  - INDEPENDENT CONTROL WITH SOLDER PIN

OPTIONS:

- **10M19**
  - 10 kHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db at 10 kHz and 0.5db at 18 GHz)
- **10M18**
  - 100 kHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db at 1 kHz and 0.5db at 20 GHz)
- **118**
  - 1 GHz TO 6 GHz (NO CHANGE IN INSERTION LOSS)
- **1218**
  - 2 GHz TO 14 GHz (NO CHANGE IN INSERTION LOSS)
- **1218**
  - 2 GHz TO 14 GHz (NO CHANGE IN INSERTION LOSS)
- **100M20**
  - 100 kHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db at 1 kHz and 1.0db at 20 GHz)
- **1020**
  - 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db at 20 GHz)
- **B01**
  - 12V POWER SUPPLIES
- **B02**
  - -15V POWER SUPPLIES
- **B03**
  - REVERSE LOGIC "1"-ON, "0"-OFF
- **B04**
  - DRIVERLESS, CURRENT CONTROLLED
- **B05**
  - HIGH SPEED, HIGH/LOW TURNON/TURNOFF 5 nanosec MAXIMUM
- **B06**
  - HIGH POWER = SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- **B07**
  - CUSTOM DESIGNED PRODUCT = SPECIFY INITIALS OF CUSTOMER
- **B08**
  - LOW VIDEO TRANSISTORS = SPECIFY VIDEO BANDWIDTH
- **B09**
  - LOW INSERTION LOSS VERSION
- **B10**
  - HIGHER ISOLATION VERSION
- **B11**
  - 0.40" THICK VERSION
- **B12**
  - 0.70" THICK VERSION

ENVIRONMENTAL RATINGS:

- **TEMPERATURE:** -55°C TO +85°C (OPERATING)
  - -55°C TO +70°C (STORAGE)
- **HUMIDITY:** MIL-STD-202F, METHOD 1039 COND. 0
- **SHOCK:** MIL-STD-202F, METHOD 2139 COND. B
- **VIBRATION:** MIL-STD-202F, METHOD 2042 COND. B
- **ALTITUDE:** MIL-STD-202F, METHOD 1052 COND. B
- **TEMPERATURE CYCLE:** MIL-STD-202F, METHOD 1070 COND. A

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

ALL DIMENSIONS ARE IN INCHES

| TOLERANCES | X.XX ±0.020 | X.XXX ±0.010 |

American Microwave Corporation
Frederick, Maryland

OUTLINE DRAWING

DRAWN: 11/1/97
CHECK: 11/1/97

SCALE N/S

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

CONTRACT NO.

TABLE:

| X | 60483 | 100-4185-1 | A |

NOTE: DR = WITH DRIVER, REFLECTIVE
DT = WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE
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<td><strong>SP7T</strong> - (1 1/2&quot; Diameter x 0.7&quot; Thickness) Reflective and Absorptive Switches</td>
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<td>26.2</td>
<td>MSR-8DR-/DT-04-DEC-SP with 3 Bit Decoder and Solder Pins</td>
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</tbody>
</table>

26-0
SPECIFICATIONS:

- FREQUENCY: 0.5 GHz to 18 GHz
- INSERTION LOSS: REFLECTIVE: 4.0dB, ABSORPTIVE: 4.5dB
- ISOLATION: 0.5 GHz to 2 GHz: 60dB, 2 GHz to 18 GHz: 70dB
- VSWR: REFLECTIVE IN/OUT: 2.0:1, ABSORPTIVE IN/OUT: 2.0:1
- SPEED:
  - Rise: 10ns TYPICAL, 15ns MAX.
  - Fall: 15ns TYPICAL, 25ns MAX.
  - Delay: 75ns TYPICAL, 100ns MAX.
- POWER INPUT:
  - CW +20dBm (STANDARD), +10dBm (HIGH SPEED)
- SURVIVAL POWER:
  - 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL:
  - TTL LOGIC "0" = ON, "1" = OFF
- POWER SUPPLY:
  - +5V @ 400mA MAX.
  - -5V @ 75mA MAX. (REFLECTIVE)
  - 100mA MAX. (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

INDEPENDENT CONTROL WITH SOLDER PIN STANDARD

DEC-5P: 3 BIT DECODER WITH SOLDER PIN

10M18: 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 10 MHz AND 0.5dB at 18 GHz)

100M18: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 0.5dB at 18 GHz)

118: 1.18 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)

218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)

412: 4.12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)

819: 8.19 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)

1218: 12.18 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)

100W20: 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 1.0dB at 20 GHz)

220: 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0dB at 20 GHz)

1020: 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0dB at 20 GHz)

D01: -12V POWER SUPPLIES

D02: -15V POWER SUPPLIES

B03: REVERSE LOGIC "1" = ON, "0" = OFF

B04: DRIVERLESS, CURRENT CONTROLLED

B05: HIGH SPEED, TURNON/TURNOFF 25 nsec MAXIMUM

B06: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH

B07: CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER

B08: LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH

B09: LOW INSERTION LOSS VERSION

B10: HIGHER ISOLATION VERSION

B11: 0.70" THICK VERSION

ENVIRONMENTAL RATINGS:

- TEMPERATURE: -55°C TO +85°C (OPERATING)
- HUMIDITY: MIL-STD-202F, METHOD 1035 COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 217A COND. A

NOTE: ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

XXX ±0.020

XXX ±0.010

NOTE: ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

OUTLINE DRAWING

MR-80R/DT-04-DEC-SP

REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE

SOLID STATE SWITCH

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING

MR-80R/DT-04-DEC-SP

REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE

SOLID STATE SWITCH

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

NOTE: OR = WITH DRIVER, REFLECTIVE
DT = WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

DATE: 6/12/87

APPROVED: A

DRAWN: WSP

CHECKED: LMD

6/12/87

PART NO.: 60483

100-4191-2 A

NOTE: ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION
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<td>MSR-8DR/DT-07-DEC-SP with 3 Bit Decoder and Solder Pins</td>
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DATA SHEETS ON

0.5 TO 18 GHZ
(10 MHZ TO 18 GHZ, OPTIONAL)

LOW LOSS

HIGH SPEED

LOW, MEDIUM, & HIGH POWER

RECTANGULAR REFLECTIVE & ABSORPTIVE

MULTI-THROW SOLID-STATE SWITCHES
(SP3T, SP4T, SP5T, SP6T, SP7T, SP8T, SP10T, SP12T, SP16T, & SP32T)
MSN AND MSNC (COMPACT) SERIES

DESIGNED BY
ASH GORWARA, RENE AFABLE, & WAYNE PURDHAM

REPORTS PREPARED BY
EMILY KING

AUGUST 15, 1997

WEB PAGE: HTTP://WWW.AMWAVE.COM
E-MAIL ADDRESS: AMCPMI@AOL.COM

7311 G GROVE ROAD, FREDERICK, MARYLAND 21704 • Tel. (301) 662-4700 • Fax (301) 662-4938
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<td>MSN-7DR/DT-05-MP-IND with MULTIPIN Connector and Independent Controls</td>
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<td>SP8T - (Single Pole Eight Throw), Reflective and Absorptive Switches</td>
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</table>
SPECIFICATIONS:
- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:**
  - REFLECTIVE: 3.0db
  - ABSORPTIVE: 3.75db
- **ISOLATION:**
  - 0.5 GHz to 2 GHz: 60db
  - 2 GHz to 18 GHz: 70db
- **VSWR:**
  - REFLECTIVE IN/OUT: 2.0:1
  - ABSORPTIVE IN/OUT: 2.0:1
  - ABSORPTIVE OUT/OUT: 2.0:1
- **SPEED:**
  - RISE: 10ns TYPICAL, 15ns MAX.
  - FALL: 10ns TYPICAL, 15ns MAX.
  - DELAY IN: 75ns TYPICAL, 100ns MAX.
  - DELAY OUT: 75ns TYPICAL, 100ns MAX.
- **POWER INPUT:** (CW)+20dbm (STANDARD), +10 dbm (HIGH SPEED)
- **SURVIVAL POWER:** 1 Watt CW, 10 Watts PEAK 1 usec
- **CONTROL:** TTL LOGIC "0"=ON "1"=OFF
- **POWER SUPPLY:**
  - +5V @ 200 mA MAX.
  - -5V @ 75mA MAX (REFLECTIVE/ABSORPTIVE)
  - 100mA MAX (ABSORPTIVE/HIGH-REFLECTIVE)

OPTIONS:
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-4P
  - 2 BIT DECODER WITH MULTIPIN
- DEC-SP
  - 2 BIT DECODER WITH SOLDER PIN
- NP-IND
  - INDEPENDENT CONTROL WITH MULTIPIN
- 10K18
  - 10 Mhz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 Mhz AND 0.5db AT 18 GHz)
- 10K418
  - 100 Mhz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 Mhz AND 0.5db AT 18 GHz)
- 2518
  - 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412
  - 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 612
  - 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218
  - 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 10K20
  - 100 Mhz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 Mhz AND 1.0db AT 20 GHz)
- 220
  - 2 GHz TO 20 GHz (INSERTION LOSS INCREASES)
  - BY 1.0db AT 20 GHz
- D01
  - +12V POWER SUPPLIES
- D02
  - +5V POWER SUPPLIES
- D03
  - REVERSE LOGIC "1"=ON "0"=OFF
- D04
  - DRIVERLESS, CURRENT CONTROLLED
- D05
  - HIGH SPEED, TURNOFF/TURNOFF 25 nsec MAXIMUM
  - WHEN APPLICABLE
- D06
  - HIGH SPEED - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, 
    DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- D07
  - CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- D08
  - LOW VIDEO TRANSISTORS - SPECIFY VIDEO BANDWIDTH
- D09
  - LOW INSERTION LOSS VERSION
- D10
  - HIGHER ISOLATION VERSION

ENVIRONMENTAL RATINGS:
- **TEMPERATURE:** -55°C TO +85°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- **HUMIDITY:**
  - MIL-STD-202F, METHOD 1033 COND. C
  - MIL-STD-202F, METHOD 1070 COND. A
- **SHOCKS:**
  - MIL-STD-202F, METHOD 213B COND. C
  - MIL-STD-202F, METHOD 204D COND. C
- **VIBRATION:**
  - MIL-STD-202F, METHOD 105C COND. B
  - MIL-STD-202F, METHOD 106C COND. B
- **ALTITUDE:**
  - MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE:**
  - MIL-STD-202F, METHOD 1070 COND. A

NOTE:
- **DR**=WITH DRIVER, REFLECTIVE
- **DT**=WITH DRIVER, NON-REFLECTIVE/Absorptive

ALL DIMENSIONS ARE IN INCHES
TOLERANCES:
- X.XX ±0.020
- X.XXX ±0.010

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND
SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18 GHz
- INSERTION LOSS: REFLECTIVE 3.0db
- ABSORPTIVE 3.75db
- ISOLATION: 0.5 GHz TO 2 GHz: 60db
- 2 GHz TO 18 GHz: 70db
- VSWR: REFLECTIVE IN/OUT: 2.0:1
- ABSORPTIVE IN/OUT: 2.0:1
- ABSORPTIVE OUT/IN: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX.
- FALL: 10ns TYPICAL, 15ns MAX.
- DELAY OFF: 75ns TYPICAL, 100ns MAX.
- POWER INPUT: (CW) 20dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V 200 mA MAX.
- -5V 75mA MAX. (REFLECTIVE)
- 100mA MAX. (ABSORPTIVE/HAND-REFLECTIVE)

OPTIONS:

INDEPENDENT CONTROL WITH SOLDER PIN STANDARD

DC-5P: 2 BIT DECODER WITH SOLDER PIN
10M1H: 10 MHz TO 1 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
100M1H: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)

412: 4 GHz TO 2.4 GHz (NO CHANGE IN INSERTION LOSS)
618: 6 GHz TO 2.4 GHz (NO CHANGE IN INSERTION LOSS)
1218: 12 GHz TO 2.4 GHz (NO CHANGE IN INSERTION LOSS)
120M2D: 120 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 20 GHz)
220: 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 20 GHz)
1020: 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)

-12V POWER SUPPLIES
-12V POWER "OFF"
-REVERSE LOGIC "1"=ON "0"=OFF
-DRIVERLESS, CURRENT CONTROLLED
-HIGH SPEED, TURNON/TURNOFF 25 nsec MAXIMUM
-WHEN APPLICABLE
-HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH,看望 CYCLE, RF FREQUENCY AND BandWIDTH
-CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
-LOW VIDEO TRANSIENTS - SPECIFY VIDEO TRANSIENTS
-LOW INSERTION LOSS VERSION
-HIGHER ISOLATION VERSION

ENVIRONMENTAL RATINGS:

- TEMPERATURE: -55°C TO +85°C (OPERATING)
- -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. B

NOTE:
- DR-WITH DRIVER, REFLECTIVE
- DT=W/D DRIVER, NON-REFLECTIVE/REFLECTIVE

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSCN-4DR/DT-045
REFLECTIVE OR NON-REFLECTIVE/REFLECTIVE/Absorptive
SOLID STATE SWITCH

ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

- XX 0.020
- XXX 0.011

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSCN-4DR/DT-045
REFLECTIVE OR NON-REFLECTIVE/REFLECTIVE/Absorptive
SOLID STATE SWITCH

PART NO. 100-3989-2

NOTES:
- THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE (1) REV

DATE 7/11/97

DRAWN A 60483

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SPECIFICATIONS:

- FREQUENCY: 0.5 GHz to 18 GHz
- INSERTION LOSS: REFLECTIVE 3.5db, ABSORPTIVE 4.25db
- ISOLATION: 0.5 GHz to 2 GHz: 50db, 2 GHz to 18 GHz: 70db
- VSWR: REFLECTIVE: 2.0:1, ABSORPTIVE IN/OUT: 2.0:1
- SPEED: RISE: 10ns TYPICAL, 15ns MAX, FALL: 10ns TYPICAL, 15ns MAX, DELAY ON: 75ns TYPICAL, 100ns MAX, DELAY OFF: 75ns TYPICAL, 100ns MAX
- POWER INPUT: CW+20dBm (STANDARD), +10 dbm (HIGH SPEED)
- SURVIVAL POWER: 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL: TTL LOGIC "0"=ON "1"=OFF
- POWER SUPPLY: +5V @ 300 mA MAX, -5V @ 75mA MAX (REFLECTIVE), 100mA MAX (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-MP: 3 BIT DECODER WITH MULTIPIN
- DEC-SP: 3 BIT DECODER WITH SOLDER PIN
- HP-MP: INDEPENDENT CONTROL WITH MULTIPIN
- HP-SP: INDEPENDENT CONTROL WITH SOLDER PIN
- 10kHz: 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 10 MHz AND 0.5db AT 18 GHz)
- 100kHz: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 0.5db AT 18 GHz)
- 118: 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618: 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218: 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 10kHz20: 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5db AT 100 MHz AND 1.0db AT 20 GHz)
- 220: 2GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- 1020: 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0db AT 20 GHz)
- D01: +12V POWER SUPPLIES
- D02: -15V POWER SUPPLIES
- B03: REVERSE LOGIC "0"=ON "1"=OFF
- B04: DRIVERLESS, CURRENT CONTROLLED
- B05: HIGH SPEED, TURNOFF/TURNOFF 25 nsec MAXIMUM
- WHEN APPLICABLE
- B08: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- B07: CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- I08: LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- I09: LOW INSERTION LOSS VERSION
- B10: HIGHER ISOLATION VERSION

ENVIRONMENTAL RATINGS:

- TEMPERATURE: -55°C TO 85°C (OPERATING), -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 1038, COND. B
- SHOCK: MIL-STD-202F, METHOD 213B, COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D, COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C, COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 1070, COND. A

NOTE:

- DR=WITH DRIVER, REFLECTIVE
- DT=WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE

ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

X.XX ±0.020
X.XXX ±0.010
SPECIFICATIONS:

- **Frequency:** 0.5 GHz to 18 GHz
- **Insertion Loss:** Reflective: 3.5db, Absorptive: 4.25db
- **Isolation:** 0.5 GHz to 2 GHz: 60db, 2 GHz to 18 GHz: 70db
- **VSWR:** Reflective IN/OUT: 2.0:1, Absorptive HI/OUT: 2.0:1
- **Power Input:** (CW)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **Operating Power:** 1 Watt CW, 10 Watts PEAK 1 usec
- **Control:** TTL LOW 0"=ON, 1"=OFF
- **Power Supply:** +5V @ 300 mA MAX, -5V @ 75mA MAX (Reflective), 100mA MAX (Absorptive/Non-Reflective)

OPTIONS:

- Independent Control with Solder Pin Standard
- DEC-SP: 3 Bit Decoder with Multiple Pin
- DEC-SP: 3 Bit Decoder with Solder Pin
- MP-1/2: Independent Control with Multiple Pin

AMERICAN MICROWAVE CORPORATION
SOLID STATE SWITCH

NOTE:
- DR=With Driver, Reflective
- DT=With Driver, Non-Reflective/Absorptive

ENVIRONMENTAL RATINGS:

- **Temperature:** -55°C to +85°C (Operating), -40°C to +125°C (Storage)
- **Humidity:** MIL-STD-202F, Method 103B, Cond. B
- **Shock:** MIL-STD-202F, Method 213B, Cond. B
- **Vibration:** MIL-STD-202F, Method 204D, Cond. B
- **Altitude:** MIL-STD-202F, Method 105C, Cond. B
- **Temperature Cycle:** MIL-STD-202F, Method 107D, Cond. A

All dimensions are in inches.

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NOTE: The above specifications are subject to change or revision.
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**SPECIFICATIONS:**

- **Frequency:** 0.5 GHz to 18 GHz
- **Insertion Loss:**
  - Reflective: 4.0 dB
  - Absorptive: 4.50 dB
- **Isolation:**
  - 0.5 GHz to 2 GHz: 60 dB
  - 2 GHz to 18 GHz: 70 dB
- **VSWR:**
  - Reflective In/Out: 2.0:1
  - Absorptive In/Out: 2.0:1
- **Speed:**
  - Rise: 10 ns typical, 15 ns max.
  - Fall: 10 ns typical, 15 ns max.
  - Delay Off: 75 ns typical, 100 ns max.
  - Delay On: 75 ns typical, 100 ns max.
- **Power Input:** (CW) ±20.8 mW (standard), ±10 dBm (high speed)
- **Survival Power:** 1 watt CW, 10 watts peak 1 usec
- **Control:** TTL logic "0"-on, "1"-off
- **Power Supply:**
  - +5V @ 400 mA max.
  - -5V @ 75 mA max (reflective)
  - 100mA max (absorptive/non-reflective)

**Options:**

- Independent control with solder pin standard
- DEC-SP:
  - 3 bit decoder with multipin
- DEP-HD:
  - Independent control with multipin
- 100K6:
  - 10 MHz to 18 GHz (insertion loss increases by 1.5 dB at 10 MHz and 0.5 dB at 18 GHz)
- 100K6-1:
  - 100 MHz to 18 GHz (insertion loss increases by 1.5 dB at 100 MHz and 0.5 dB at 18 GHz)
- 1216:
  - 12 GHz to 18 GHz (no change in insertion loss)
- 118:
  - 11 GHz to 18 GHz (no change in insertion loss)
- 112:
  - 11 GHz to 18 GHz (no change in insertion loss)
- 1216:
  - 12 GHz to 18 GHz (no change in insertion loss)
- 220:
  - 12 GHz to 20 GHz (insertion loss increases by 1.0 dB at 20 GHz)
- 202:
  - 10 GHz to 20 GHz (insertion loss increases by 1.0 dB at 20 GHz)
- B01:
  - -12V power supplies
- B02:
  - -15V power supplies
- B03:
  - Reverse logic "0"-on, "1"-off
- B04:
  - Driverless, current controlled
- B05:
  - High speed, turnon/turnoff 25 nsec maximum when applicable
- B06:
  - High power - specify CW power, peak power, pulse width, duty cycle, RF frequency and bandwidth
- B07:
  - Custom designed product - specify initials of customer
- B08:
  - Low video transistors - specify video bandwidth
- B09:
  - Low insertion loss version
- B10:
  - Higher isolation version

**Environmental Ratings:**

- Temperature:
  - -55°C to +85°C (Operating)
  - -65°C to +125°C (Storage)
- Humidity:
  - MIL-STD-202F, Method 103A Cond. B
- Shock:
- Vibration:
  - MIL-STD-202F, Method 204D Cond. B
- Altitude:
  - MIL-STD-202F, Method 107D Cond. A
- Temperature Cycle:
  - MIL-STD-202F, Method 107C Cond. A

Note: All specifications are subject to change on review.
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<td>MSN-12DR/DT-05-MP-IND with MULTIPIN Connector and Independent Controls</td>
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</tr>
</tbody>
</table>
**SPECIFICATIONS:**

- **Frequency:**
  - 0.5 GHz to 18 GHz
- **Insertion Loss:**
  - Reflective: 5.0db
  - Absorptive: 5.5db
- **Isolation:**
  - 0.5 GHz to 2 GHz: 60db
  - 2 GHz to 18 GHz: 70db
- **VSWR:**
  - Reflective In/Out: 2.0:1
  - Absorptive In/Out: 2.0:1
- **Speed:**
  - Rise: 10ns Typical, 15ns Max.
  - Fall: 10ns Typical, 15ns Max.
  - Delay on: 75ns Typical, 150ns Max.
  - Delay off: 75ns Typical, 150ns Max.
- **Power Input:**
  - CW+20dBm (Standard), -10 dBm (High Speed)
- **Survival Power:**
  - 1 Watt CW, 10 Watts Peak 1 micro
- **Control:**
  - TTL Logic "0" on "1"-off
- **Power Supply:**
  - +5V @ 600 mA Max.
  - -5V @ 150mA Max. (Reflective)
  - 200mA Max. (Absorptive/Non-Reflective)

**OPTIONS:**

- **Independent Control with Solder Pin Standard**
- **Dec-MP:** 3 Bit Decoder with Multipin
- **Dec-SP:** 3 Bit Decoder with Solder Pin
- **MP-IND:** Independent Control with Multipin
- **10M10:** 10 MHz to 18 GHz (Insertion Loss Increases By 0.5db at 10 MHz and 0.5db at 18 GHz)
- **100M18:** 100 MHz to 18 GHz (Insertion Loss Increases by 1.25db at 100 MHz and 0.5db at 18 GHz)
- **1.18:** 1 GHz to 18 GHz (No Change in Insertion Loss)
- **218:** 2 GHz to 18 GHz (No Change in Insertion Loss)
- **412:** 4 GHz to 12.4 GHz (No Change in Insertion Loss)
- **818:** 8 GHz to 18 GHz (No Change in Insertion Loss)
- **1218:** 12 GHz to 18 GHz (No Change in Insertion Loss)
- **10M20:** 100 MHz to 20 GHz (Insertion Loss Increases by 1.25db at 100 MHz and 0.5db at 20 GHz)
- **220:** 2 GHz to 20 GHz (Insertion Loss Increases by 1.25db at 20 GHz)
- **1020:** 10 GHz to 20 GHz (Insertion Loss Increases by 1.25db at 20 GHz)
- **001:** 12V Power Supplies
- **002:** -12V Power Supplies
- **003:** Reverse Logic "1" on "0"-off
- **004:** Driverless, Current Controlled
- **005:** High Speed, Turnon/ Turnoff 25 nsec Maximum
- **006:** High Power - Specify CW Power, Peak Power, Pulse Width, Duty Cycle, RF Frequency and Bandwidth
- **007:** Custom Designed Product - Specify Initials of Customer
- **008:** Low Video Transients - Specify Video Bandwidth
- **009:** Low Insertion Loss Version
- **010:** Higher Isolation Version

**ENVIRONMENTAL RATINGS:**

- **Temperature:**
  - -55°C to +85°C (Operating)
  - -65°C to +125°C (Storage)
- **Humidity:**
- **Shock:**
- **Vibration:**
- **Altitude:**
- **Temperature Cycle:**
  - MIL-STD-202F, Method 107D Cond. A

**NOTE:**

- DR = With Driver, Reflective
- DT = With Driver, Non-Reflective/Absorptive

**OUTLINE DRAWING**

American Microwave Corporation
FREDERICK, MARYLAND

**OUTLINE DRAWING NO.**

- MSN-12DR/DT-05
  - Reflective or Non-Reflective/Absorptive Solid State Switch

**DIMENSIONS:**

- All dimensions are in inches

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<th>TOLERANCES</th>
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<td>X.XXX ± 0.010</td>
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**PART NO.:**

A 60483

**DRAWN:**

100-4161-2

**APPROVED:**

5/1/93

**REV.:**

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<td>MSNC-12DR/DT-05-MP-IND with MULTIPIN Connector and Independent Controls</td>
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SPECIFICATIONS:
- FREQUENCY:
  - 0.5 GHz to 18 GHz
- INSERTION LOSS:
  - REFLECTIVE: 5.0 dB
  - ABSORBITIVE: 5.5 dB
- ISOLATION:
  - 0.5 GHz to 2 GHz: 60 dB
  - 2 GHz to 18 GHz: 70 dB
- VSWR:
  - REFLECTIVE IN/OUT: 2.0:1
  - ABSORBITIVE IN/OUT: 2.0:1
  - ABSORBITIVE OUT/OUT: 2.0:1
- SPEED:
  - RISE: 10 ns TYPICAL, 15 ns MAX.
  - FALL: 10 ns TYPICAL, 15 ns MAX.
  - DELAY DIFF: 75 ns TYPICAL, 150 ns MAX.
- POWER INPUT:
  - CW: 20 dBm (STANDARD), +10 dBm (HIGH SPEED)
- SURVIVAL POWER:
  - 1 WATT CW, 10 WATTS PEAK 1 usec
- CONTROL:
  - TTL LOGIC '0' = ON, '1' = OFF
- POWER SUPPLY:
  - +5V @ 600 mA MAX.
  - -5V @ 150 mA MAX (REFLECTIVE)
  - 200 mA MAX (ABSORBITIVE/NON-REFLECTIVE)

OPTIONS:
- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- 5 BIT DECODER WITH MULTIPIN
- 5 BIT DECODER WITH SOLDER PIN
- INDEPENDENT CONTROL WITH MULTIPIN

104110
- 10 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 10 MHz AND 0.5 dB AT 18 GHz)

100210
- 100 MHz to 18 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz AND 0.5 dB AT 18 GHz)

118
- 1 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)

218
- 2 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)

412
- 4 GHz to 12.4 GHz (NO CHANGE IN INSERTION LOSS)

618
- 6 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)

1218
- 12 GHz to 18 GHz (NO CHANGE IN INSERTION LOSS)

100420
- 100 MHz to 20 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz AND 1.0 dB AT 20 GHz)

220
- 2 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)

1020
- 10 GHz to 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)

B01
- 12V POWER SUPPLIES

B02
- 15V POWER SUPPLIES

B03
- REVERSE LOGIC "1" = ON, "0" = OFF

B04
- DRIVERS CURRENT CONTROLLED

B05
- HIGH SPEED, TURBO/TURNOFF 25 ns MAXIMUM

B07
- CUSTOM DESIGNED PRODUCTS - SPECIFY INITIALS OF CUSTOMER

B09
- LOW POWER TRANSIENTS - SPECIFY VIDEO BANDWIDTH

B10
- LOW INSERTION LOSS VERSION

ENVIRONMENTAL RATINGS:
- TEMPERATURE:
  - -55°C to +85°C (OPERATING)
  - -55°C to +125°C (STORAGE)

- HUMIDITY:
  - MIL-STD-202F, METHOD 103B COND. B

- SHOCK:
  - MIL-STD-202F, METHOD 212B COND. B

- VIBRATION:
  - MIL-STD-202F, METHOD 212B COND. B

- TEMPERATURE CYCLE:
  - MIL-STD-202F, METHOD 1070 COND. A

NOTE:
- MODEL NO: MSNC-128R/DT-05
- OPTION NO: STANDARD
- SERIAL NO:
- PART NO:
- TIP:
- DRIV: DRIVER, REFLECTIVE
- DT: DRIVER, NON-REFLECTIVE/ABSORPTIVE

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSNC-128R/DT-05 STANDARD
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

DIMENSIONS IN INCHES

TOLERANCES:
X.XX ±0.020
X.XXX ±0.001

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

REV A
DATE 8/97
SHEET 1 OF 1
60483
A 100-4162-1
6/97
SPECIFICATIONS:

- **Frequency**: 0.5 GHz to 18 GHz
- **Insertion Loss**: Reflective: 5.0 dB, Absorptive: 5.5 dB
- **Isolation**: 0.5 GHz to 2 GHz: 90 dB, 2 GHz to 18 GHz: 70 dB
- **VSWR**: Reflective In/Out: 2.0:1 Absorptive In/Out: 2.0:1
- **Slew Rate**: Rise: 10 ns typical, 15 ns max. Fall: 10 ns typical, 15 ns max.
- **Delay**: 0.5 ns typical, 1.5 ns max., Delay for: 7.5 ns typical, 150 ns max.
- **Power Input**: (CW) +20 dBm (standard), +10 dBm (high speed)
- **Survival Power**: 1 watt CW, 10 watts peak 1 usec
- **Control**: TTL Logic "0" = on, "1" = off
- **Power Supply**: +5V, 800 mA max., -5V, 150 mA max. (reflective), 200 mA max. (absorptive/non-reflective)

OPTIONS:

- Independent Control With Solder Pin Standard
- Dec-UP 5 Bit Decoder With Solder Pin
- Dec-SP 5 Bit Decoder With Solder Pin
- HP-HPD Independent Control With Multipin
- HP-HPD 10 MHz to 18 GHz (insertion loss increases by 1.5 dB at 10 MHz and 0.5 dB at 18 GHz)
- HP-HPD 100 MHz to 18 GHz (insertion loss increases by 0.5 dB at 10 MHz and 0.5 dB at 18 GHz)
- 11A 1 GHz to 18 GHz (no change in insertion loss)
- 21A 2 GHz to 18 GHz (no change in insertion loss)
- 41A 4 GHz to 12.4 GHz (no change in insertion loss)
- 61A 6 GHz to 18 GHz (no change in insertion loss)
- 121A 12 GHz to 18 GHz (no change in insertion loss)
- 120A 100 MHz to 20 GHz (insertion loss increases by 1.5 dB at 10 MHz and 0.5 dB at 20 GHz)
- 220A 2 GHz to 20 GHz (insertion loss increases by 1.0 dB at 20 GHz)
- 102A 10 MHz to 20 GHz (insertion loss increases by 1.0 dB at 20 GHz)
- B01: -12V Power Supplies
- B02: -15V Power Supplies
- B03: Reverse Logic "0" = on, "1" = off
- B04: Driven, Current Controlled
- B05: High-Speed, Turn-on/Turn-off 25 nsec Maximum When Applicable
- B08: High Power - Specify CW Power, Peak Power, Pulse Width, Duty Cycle, RF Frequency, Bandwidth
- B07: Custom Designed Product - Specify Initials of Customer
- D08: Low Video Transients - Specify Video Bandwidth
- D09: Low Insertion Loss Version
- D10: Higher Isolation Version

ENVIRONMENTAL RATING:

- Temperature: -5°C to +85°C (operating), -65°C to +125°C (storage)
- Temperature Cycle: MIL-STD-202F, Method 107C Cond. A

ALL DIMENSIONS ARE IN INCHES

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<td>X,XX ±0.020</td>
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<td>X,XXX ±0.010</td>
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</table>

NOTE:
- DR = With Driver, Reflective
- OT = With Driver, Non-Reflective/Absorptive

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSNC-12DR/DT-05-DEC-UP
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH

PART NO. 60483
SOLID STATE SWITCH
100-4162-3
A
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<td>MSN-16DR/DT-05-MP-IND with MULTIPIN Connector and Independent Controls</td>
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</tbody>
</table>
SPECIFICATIONS:

- **FREQUENCY:** 0.5 GHz to 18 GHz
- **INSERTION LOSS:** REFLECTIVE: 6.5dB, ABSORPTIVE: 7.0dB
- **ISOLATION:** 0.5 GHz to 2 GHz: 60dB, 2 GHz to 18 GHz: 70dB
- **VSWR:** REFLECTIVE IN/OUT: 2.0:1, ABSORPTIVE IN/OUT: 2.0:1
- **SPEED:** RISE: 10ns TYPICAL, 15ns MAX, FALL: 10ns TYPICAL, 15ns MAX
- **POWER INPUT:** (CV)+20dBm (STANDARD), +10 dBm (HIGH SPEED)
- **SURVIVAL POWER:** -1 WAIT CW, 10 WATTS PEAK 1 usec
- **CONTROL:** TTL LOGIC "0"=ON, "1"=OFF
- **POWER SUPPLY:** +5V @ 750 mA MAX. -5V @ 150mA MAX. (REFLECTIVE)
  200mA MAX. (ABSORPTIVE/NON-REFLECTIVE)

OPTIONS:

- INDEPENDENT CONTROL WITH SOLDER PIN STANDARD
- DEC-AP: 5 BIT DECODE WITH MULTIPIN
- DEC-AP: 5 BIT DECODER WITH SOLDER PIN
- WP-HD: INDEPENDENT CONTROL WITH MULTIPIN
- 10M18: 10 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 10 MHz AND 0.5dB AT 18 GHz)
- 10M18: 100 MHz TO 18 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 0.5dB AT 18 GHz)
- 118: 1 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 218: 2 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 412: 4 GHz TO 12.4 GHz (NO CHANGE IN INSERTION LOSS)
- 618: 6 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 1218: 12 GHz TO 18 GHz (NO CHANGE IN INSERTION LOSS)
- 100M20: 100 MHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.5dB AT 100 MHz AND 1.02dB AT 20 GHz)
- 220: 2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.06dB AT 20 GHz)
- 1020: 10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.06dB AT 20 GHz)
- B01: -12V POWER SUPPLIES
- B02: -12V POWER SUPPLIES
- B03: REVERSE LOGIC "1"=ON "0"=OFF
- B04: DRIVERLESS, CURRENT CONTROLLED
- B05: HIGH SPEED, TURNON/TURNOFF 25 nanosecond MAXIMUM
- D08: HIGH POWER - SPECIFY CW POWER, PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH
- D07: CUSTOM DESIGNED PRODUCT - SPECIFY INITIALS OF CUSTOMER
- D09: LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH
- D10: LOW INSERTION LOSS VERSION
- D10: HIGHER ISOLATION VERSION

ENVIRONMENTAL RATINGS:

- **TEMPERATURE:** -55°C TO +85°C (OPERATING), -65°C TO +125°C (STORAGE)
- **HUMIDITY:** MIL-STD-202F, METHOD 1038, 95 classes
- **SHOCK:** MIL-STD-202F, METHOD 213B, 95 classes
- **VIBRATION:** MIL-STD-202F, METHOD 294D, 95 classes
- **TEMPERATURE CYCLE:** MIL-STD-202F, METHOD 107D, 95 classes

ALL DIMENSIONS ARE IN INCHES

TOLERANCES:

| XX | ±0.020 |
| 00 | ±0.010 |

AMERICAN MICROWAVE CORPORATION
FREDERICK, MARYLAND

OUTLINE DRAWING
MSN-16DR/DT-05-MP-IND
REFLECTIVE OR NON-REFLECTIVE/ABSORPTIVE
SOLID STATE SWITCH

NOTE:
DR WITH DRIVER, REFLECTIVE
DT WITH DRIVER, NON-REFLECTIVE/ABSORPTIVE
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<td>MSN-32DR/DT-05-STANDARD with Independent Controls</td>
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</tr>
</tbody>
</table>
**SPECIFICATIONS:**

- **Frequency:** 0.5 GHz to 18 GHz
- **Insertion Loss:** Reflective: 7.0 db, Absorptive: 7.5 db
- **Isolation:** 0.5 GHz to 2 GHz: 60 db, 2 GHz to 18 GHz: 70 db
- **VSWR:** Reflective IN/OUT: 2.0:1, Absorptive IN/OUT: 2.1:1
- **Output Power:** Rise: 10 mW typical, 15 mW max. Fall: 10 mW typical, 15 mW max. Delay ON: 75 mV typical, 150 mV max. Delay OFF: 75 mV typical, 150 mV max.
- **Power Input:** (CW) +20 dBm (Standard), +10 dBm (High Speed)
- **Survival Power:** 1 watt CW, 10 watts peak 1 usec
- **Control:** TTL Logic "0"=ON, "1"=OFF
- **Power Supply:** +5V @ 1.75 A max., -5V @ 250mA max. (Reflective/Non-Reflective)

**OPTIONS:**

- **Independent Control with Solder Pin Standard**
  - Dec-MP: 5 bit decoder with multipin
  -Dec-SP: 5 bit decoder with solder pin
  - MP-ND: Independent control with multipin
  - 10M10: 10 MHz to 18 GHz (Insertion Loss Increases by 1.5 db at 10 MHz and 0.5 db at 18 GHz)
  - 100M18: 100 MHz to 18 GHz (Insertion Loss Increases by 1.5 db at 100 MHz and 0.3 db at 18 GHz)
  - 118: 1 GHz to 18 GHz (No Change in Insertion Loss)
  - 218: 2 GHz to 18 GHz (No Change in Insertion Loss)
  - 412: 4 GHz to 12.4 GHz (No Change in Insertion Loss)
  - 618: 6 GHz to 18 GHz (No Change in Insertion Loss)
  - 1218: 12 GHz to 18 GHz (No Change in Insertion Loss)
  - 100M20: 100 MHz to 20 GHz (Insertion Loss Increases by 1.5 db at 100 MHz and 1.0 db at 20 GHz)
  - 220: 2 GHz to 20 GHz (Insertion Loss Increases by 0.4 db at 20 GHz)
  - 1020: 10 GHz to 20 GHz (Insertion Loss Increases by 0.4 db at 20 GHz)
- **-12V Power Supplies**
- **-15V Power Supplies**
- **Reverse Logic "1"=ON, "0"=OFF**
- **Driverless, Current Controlled**
- **High Speed, Turnon/timeout 25 nsec maximum when applicable**
- **High Power - Specify CW Power, Peak Power, Pulse Width, Duty Cycle, RF Frequency and Bandwidth**
- **Custom Designed Product - Specify Initials of Customer**
- **Low Video Transients - Specify Video Bandwidth**
- **Low Insertion Loss Version**
- **Higher Isolation Version**

**ENVIRONMENTAL RATING:**

- **Temperature:** -55°C to +65°C (Operating), -65°C to +125°C (Storage)
- **Humidity:** MIL-STD-202F, Method 103B Cond. B
- **Shock:** MIL-STD-202F, Method 102B Cond. B
- **Vibration:** MIL-STD-202F, Method 204A Cond. B
- **Altitude:** MIL-STD-202F, Method 105B Cond. B
- **Temperature Cycle:** MIL-STD-202F, Method 107B Cond. A

**NOTES:**

- The above specifications are subject to change or revision

---

**PIN OUT TABLE**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
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<tbody>
<tr>
<td>E1</td>
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<tr>
<td>E2</td>
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<td>E25</td>
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**REVISIONS**

- **DATE**
- **APPROVED**

**AMERICAN MICROWAVE CORPORATION**

FREDERICK, MARYLAND

**OUTLINE DRAWING**

MSN-320R/DT-05-REACTIVE OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH

**APPROVED**

- **DATE**
- **REV**

**DRAWN**

- **DATE**

**DESIGNED**

- **DATE**

**CHECKED**

- **DATE**

**ENGINEERED**

- **DATE**

**MANUFACTURED**

- **DATE**

**OUTLINE DRAWING**

MSN-320R/DT-05-REACTIVE OR NON-REFLECTIVE/ABSORPTIVE SOLID STATE SWITCH

**REMARKS**

- **DATE**
- **SIGNATURE**
Introduction to
American Microwave Corporation

Since its founding in 1978, American Microwave Corporation has become a leader in the design and manufacture of solid state control components. At American Microwave, we are dedicated to providing state-of-the-art technology and uniformly high quality microwave components and subsystems that meet or exceed your specifications and are delivered on schedule at fair prices. AMC's vertically integrated manufacturing plant makes it possible to design, machine and manufacture microwave hardware which means total technology, quality and schedule control on all prototype or production orders.

American Microwave's product line has grown steadily since the company's inception. From the line of ferrite products and SW-2000 switches introduced in 1978, to the introduction of microwave switches in 1981, linearized reflectionless attenuators in 1986 to present day work on microwave integrated circuits, the company has produced hundreds of custom and catalog product types. AMC is dedicated to solving customer problems and meeting promised delivery dates with the lowest return rate in the industry.

This catalog contains a sampling of the most popular products in general use today. If you have a requirement that is not listed in the catalog, call us. We may have already made it or something close to it for someone else.

Raymond L. Sicotte
Chairman

Ash K. Gorwara
President and CEO

American Microwave Corporation
General Information

ORDERING INFORMATION
Please order by model or part number and product name with any options clearly specified. Please specify any modifications or special testing requirements on the order.

Telephone orders are acceptable and processed immediately. Shipments can only be made upon receipt of a confirming written order either by mail or facsimile.

Your order may be placed directly to the factory or through your local representative.

AMERICAN MICROWAVE CORPORATION
7311 G Grove Road
Frederick, Maryland 21701
Phone: 301-662-4700      Fax: 301-662-4938

All prices are FOB factory, Frederick, Maryland 21701.

DOMESTIC TERMS
Net 30 days if credit has been established. Otherwise, unless payment is received before shipment, shipment will be made C.O.D.

INTERNATIONAL TERMS
Add 30% for international pricing. Irrevocable sight letter credit engaged and accepted by Maryland National Bank, payable to the account of American Microwave Corporation, Frederick, Maryland.

SPECIFICATION AND PRICE CHANGES
The right to discontinue any item or change specifications and/or prices on any item without notice is reserved.

WARRANTY/SERVICE
American Microwave Corporation warranties all parts of equipment of its manufacture to be free from defects in material and workmanship for one year after the delivery of the equipment to the original purchaser.

Liability under the warranty is limited to repair or replacement of the equipment or parts at the discretion of American Microwave Corporation without charge for any part found to be defective under normal use and service within the warranty time period.

All equipment returned under warranty must have a Return Material Authorization number obtainable from the factory. Original parts or equipment must be returned to American Microwave Corporation, transportation charges prepaid FOB factory. If warranty repair is applicable, the unit will be returned freight prepaid, FOB destination. If warranty is not applicable, the customer will be advised of the repair charges and his authorization to proceed awaited before any costs are incurred. Non-warranty repairs will be returned FOB factory, Frederick, Maryland 21701.
SERIES SWN-218 WIDEBAND SPST PIN DIODE SWITCHES WITH INTEGRAL DRIVERS

FEATURES
- 0.5 to 18 GHz Frequency Range
- Low Insertion Loss
- Up to 85 dB Isolation
- High Speed - 10 nsec
- Small Size
- Light Weight
- Rugged Chip and Microstrip Construction

DESCRIPTION
The series SWN-218 switches are broadband, high speed, low loss SPST switches with integral drivers. They are powered by +5 and -5 volt supplies and are available powered by ±15 volts. They are available in three models that operate over the entire 0.5 to 18 GHz band. Each features rugged integrated circuit assemblies of chip PIN on a microstrip transmission line and proprietary wideband bias decoupling circuitry.

Switching is accomplished by a TTL compatible driver which is controlled by the user.

SPECIFICATIONS
- Control Impedance - TTL Compatible, Two Load. (A Load is 1.6 mA Sink Current and 40 μA Source Current.)
- Control Logic - Logic “0” (-0.3 to +0.7 Volt) for Switch Off.
  Logic “1” (+2.5 to +5.0 Volts) for Switch On.
- Temperature - Operating: -65°C to +85°C
  Non-operating: -65°C to +125°C
- Humidity, Shock, Etc. - Per MIL-STD 202C

FUNCTIONAL SCHEMATIC

07/94

7311 GROVE ROAD, FREDERICK, MARYLAND 21701 (301) 662-4700
### SPECIFICATIONS, Cont’d.

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>CHARACTERISTICS</th>
<th>FREQUENCY (GHz)</th>
<th>RISE/FALL TIME</th>
<th>POWER HANDLING CAPABILITY</th>
<th>POWER SUPPLY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.5 to 1.0</td>
<td>1.0 to 2.0</td>
<td>2.0 to 4.0</td>
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<tr>
<td></td>
<td></td>
<td>4.0 to 8.0</td>
<td>8.0 to 12.4</td>
<td>12.4 to 18.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON-to-OFF and</td>
<td>OFF-to-ON</td>
<td>AVG (WATTS)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 ns</td>
<td>2</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SWN-2182-1A</td>
<td>Min Isolation (dB)</td>
<td>30</td>
<td>40</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max Ins Loss (dB)</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max VSWR (ON Pos)</td>
<td>1.3</td>
<td>1.3</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>SWN-2183-1A</td>
<td>Min Isolation (dB)</td>
<td>40</td>
<td>60</td>
<td>70</td>
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</tr>
<tr>
<td></td>
<td>Max Ins Loss (dB)</td>
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<td>1.1</td>
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<td>Max VSWR (ON Pos)</td>
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<tr>
<td>SWN-2184-1A</td>
<td>Min Isolation (dB)</td>
<td>45</td>
<td>70</td>
<td>85</td>
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<tr>
<td></td>
<td>Max Ins Loss (dB)</td>
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<td></td>
<td>Max VSWR (ON Pos)</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
<td></td>
</tr>
</tbody>
</table>

* Rise/Fall times are 10% to 90% RF and 90% to 10% RF.

*TTL Delay is 60 nsec, Max from 50% TTL to 90% RF for turn-off or 50% TTL to 10% RF for turn-on.

### AVAILABLE OPTIONS

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Two SMA Male RF Connectors</td>
</tr>
<tr>
<td>002</td>
<td>One SMA Male and One SMA Female RF Connector</td>
</tr>
<tr>
<td>003</td>
<td>SMC Control Connector (Solder Type is Standard)</td>
</tr>
<tr>
<td>004</td>
<td>±15 Volt Power Supply Requirement (±5 Volt is Standard)</td>
</tr>
<tr>
<td>005</td>
<td>50 Ohm Control Impedance</td>
</tr>
<tr>
<td>006</td>
<td>Cannon Multipin MDM9SSP</td>
</tr>
<tr>
<td>007</td>
<td>Inverted Logic</td>
</tr>
<tr>
<td>008</td>
<td>Extended Frequency to 100 MHz</td>
</tr>
<tr>
<td>010</td>
<td>50 ns, Maximum Switching Speed (5 watts cw, maximum)</td>
</tr>
<tr>
<td>012</td>
<td>2 ns, Maximum Switching Speed (100 mw, cw maximum)</td>
</tr>
<tr>
<td>013</td>
<td>-12 VDC Power Supply Requirement (+5V, -5V is Standard)</td>
</tr>
<tr>
<td>103</td>
<td>Integral Video Filters (2-18 GHz Frequency Band) Insertion loss Increase of 0.75 Db maximum</td>
</tr>
<tr>
<td>HS</td>
<td>High Speed Version - 20 nsec. Delay</td>
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<tr>
<td>AT</td>
<td>Off Arm Termination</td>
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### ENVIRONMENTAL RATINGS

- **Operating Temperature** - 65° C to 110° C
- **Non-Operating Temperature** - 65° C to 125° C
- **Humidity** - MIL-STD-202F, METHOD 103B
- **Shock** - MIL-STD-202F, METHOD 213B
- **Vibration** - MIL-STD-202F, METHOD 204D
- **Altitude** - MIL-STD-202F, METHOD 105C
- **Temp Cycling** - MIL-STD-202F, METHOD 107D
TYPICAL PERFORMANCE (SWN-2184-1A)

PULSE CHARACTERISTICS

TYPICAL
15 ns Pulse Modulated Signal at 2.3 GHz
(5 ns/Division)

SWN-2184-1A, Option 012, 103, HS

TYPICAL
40 ns Pulse Modulated Signal at 7 GHz with Control Pulse Super-Imposed
(10 ns/Division)

SWN-2184-1A, Option 012, 103, HS

STATIC RESPONSE

TYPICAL ISOLATION

ON/OFF ISOLATION (dB)

FREQUENCY (GHz)

TYPICAL INSERTION LOSS

INSERTION LOSS (dB)

FREQUENCY (GHz)

TYPICAL RETURN LOSS

RETURN LOSS (dB)

FREQUENCY (GHz)
MECHANICAL DATA

LOGIC TABLE

<table>
<thead>
<tr>
<th>LOGIC</th>
<th>RF</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>1</td>
<td>ON</td>
</tr>
</tbody>
</table>
SERIES SW-218 WIDEBAND
SPST PIN DIODE SWITCHES

FEATURES
- 0.3 to 18 GHz
  Frequency Range
- Low Insertion Loss
- Up to 85 dB Isolation
- High Speed - 10 nsec
- Small Size
- Light Weight
- Rugged Chip and
  Microstrip Construction

SPECIFICATIONS
- Temperature -
  Operating: -65°C to +85°C
  Non-operating: -65°C to +125°C
- Humidity, Shock, Etc. -
  Per MIL-STD 202F

DESCRIPTION
The series SW-218 switches are broadband, high speed, low loss SPST switches. They are
available in three models that operate over the 0.3 to 18 GHz band and are usable to 22 GHz. Each
features rugged integrated circuit assemblies of chip PIN diodes on a microstrip transmission line
and proprietary wideband bias decoupling circuitry.
Switching is accomplished by applying positive current to the bias terminal which biases the
diodes to low resistance and the switch OFF. A negative voltage applied to the bias terminal
biases the diodes to a high resistance and the switch ON.

FUNCTIONAL SCHEMATIC

10/89

7311G GROVE ROAD, FREDERICK, MARYLAND 21701 (301) 662-4700
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>CHARACTERISTICS</th>
<th>FREQUENCY (GHz)</th>
<th>SWITCHING SPEED</th>
<th>POWER HANDLING CAPABILITY</th>
<th>BIAS REQUIREMENTS</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>0.3 to 1.0</td>
<td>2.0 to 4.0</td>
<td>4.0 to 8.0</td>
<td>12.4 to 18.0</td>
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<tr>
<td>SW-2182-1</td>
<td>Min Isolation (dB)</td>
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<td>45 to 45</td>
<td>45 to 45</td>
<td>10 ns</td>
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<tr>
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<td>Max Ins Loss (dB)</td>
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<td>1.0 to 1.1</td>
<td>1.0 to 1.6</td>
<td>2.0</td>
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<tr>
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<td>Max VSWR (ON Pos)</td>
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<td>1.3 to 1.4</td>
<td>1.4 to 1.8</td>
<td>1.9</td>
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<tr>
<td>SW-2183-1</td>
<td>Min Isolation (dB)</td>
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<td>70 to 70</td>
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<td>Max Ins Loss (dB)</td>
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<td>1.0 to 1.1</td>
<td>1.4 to 1.8</td>
<td>2.3</td>
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<tr>
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<td>Max VSWR (ON Pos)</td>
<td>1.4</td>
<td>1.4 to 1.4</td>
<td>1.8 to 1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>SW-2184-1</td>
<td>Min Isolation (dB)</td>
<td>45 to 70</td>
<td>85 to 85</td>
<td>85 to 80</td>
<td>10</td>
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<tr>
<td></td>
<td>Max Ins Loss (dB)</td>
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<td>2.5</td>
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<tr>
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<td>Max VSWR (ON Pos)</td>
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<td>1.4 to 1.4</td>
<td>1.8 to 1.9</td>
<td>1.9</td>
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### AVAILABLE OPTIONS

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Two SMA Male RF Connectors</td>
</tr>
<tr>
<td>002</td>
<td>One SMA Male and One SMA Female RF Connector</td>
</tr>
<tr>
<td>003</td>
<td>Solder Type Control Terminals</td>
</tr>
<tr>
<td>008</td>
<td>Extend Frequency to 100 MHz</td>
</tr>
<tr>
<td>010</td>
<td>100 ns, Max Switching Speed (5w, cw, max)</td>
</tr>
<tr>
<td>012</td>
<td>2 ns, Max Switching Speed (100mw, cw, max)</td>
</tr>
<tr>
<td>103</td>
<td>Integral Video Filters (2-18 GHz Frequency Band)</td>
</tr>
</tbody>
</table>

### ENVIRONMENTAL RATINGS

- Operating Temperature: -65° C to 110° C
- Non-Operating Temperature: -65° C to 125° C
- Humidity: MIL-STD-202F, METHOD 103B
- Vibration: MIL-STD-202F, METHOD 204D
- Altitude: MIL-STD-202F, METHOD 105C
- Temp Cycling: MIL-STD-202F, METHOD 107D

## MECHANICAL DATA

![Mechanical Data Diagram](image)
FEATURES
- 0.3 to 18 GHz Frequency Band
- 70 dB, Minimum On/Off Isolation
- 10 ns, Maximum Rise/Fall Time
- Small Size
- Light Weight
- Integral TTL Driver

DESCRIPTION
The SWN-2183-1AT is a broadband, high speed, low loss SPST unit with off arm terminations and integral TTL compatible driver. It is powered by +5V and -5 volt supplies. It features rugged integrated circuit assemblies of chip pin diodes on a microstrip transmission line and TTL driver that is electrically as well as mechanically integral for smooth pulse modulation with no overshoot or ringing.

APPLICATIONS
- Radar Simulators
- Radar Cross Section Transmitters
- Pulse Modulators

07/94
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>0.2 to 0.5</th>
<th>0.5 to 2.0</th>
<th>2.0 to 8.0</th>
<th>8.0 to 12.4</th>
<th>12.4 to 18.0</th>
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<tbody>
<tr>
<td>MIN. ISOLATION (dB)</td>
<td>45</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>MAX. INSERTION LOSS (dB)</td>
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<td>2.0</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
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<tr>
<td>VSWR (On and Off)</td>
<td>1.5</td>
<td>1.5</td>
<td>1.75</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### SWITCHING SPEED

- **RISE TIME (10% - 90% RF)**: 10 ns Max.
- **FALL TIME (90% - 10% RF)**: 10 ns Max.
- **ON TIME (50% COMMAND TO 90% RF)**: 70 ns Max.
- **OFF TIME (50% COMMAND TO 10% RF)**: 70 ns Max.

### POWER HANDLING CAPABILITY

- **NO DEGRADATION**
- **100 MW CW or PEAK**
- **SURVIVAL POWER**
  - **1 W AVERAGE, 10 W PEAK**
  - **(1μ SEC MAX PULSE WIDTH)**

### ENVIRONMENTAL RATINGS

- **OPERATING TEMPERATURE**: -65°C to 110°C
- **NON-OPERATING TEMPERATURE**: -65°C to 125°C
- **HUMIDITY**: MIL-STD-202F, METHOD 103B
- **SHOCK**: MIL-STD-202F, METHOD 213B
- **VIBRATION**: MIL-STD-202F, METHOD 204D
- **ALTITUDE**: MIL-STD-202F, METHOD 105C
- **TEMP CYCLING**: MIL-STD-202F, METHOD 107D

### POWER REQUIREMENTS

- **+5V ± 2%, 90 mA**
- **-5V ± 5%, 75 mA**

### CONTROL CHARACTERISTICS

- **CTL INPUT - 1 UNIT LOAD**
- **LOGIC SENSE**
  - **0**: SWITCH "ON"
  - **1**: SWITCH "OFF"

### AVAILABLE OPTIONS

<table>
<thead>
<tr>
<th>Option No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Two SMA Male RF Connectors</td>
</tr>
<tr>
<td>002</td>
<td>One SMA Male and</td>
</tr>
<tr>
<td>003</td>
<td>One SMA Female RF Connector</td>
</tr>
<tr>
<td>005</td>
<td>SMC Control Connector (Solder Type is Standard)</td>
</tr>
<tr>
<td>013</td>
<td>50 Ohm Control Impedance</td>
</tr>
<tr>
<td>006</td>
<td>Integral Video Filters (2-18 GHz Frequency Band) Insertion Loss Increase of 0.75 Db maximum</td>
</tr>
<tr>
<td>HS</td>
<td>High Speed Version</td>
</tr>
<tr>
<td>R</td>
<td>Reflective</td>
</tr>
<tr>
<td>006</td>
<td>+5V, -15V</td>
</tr>
</tbody>
</table>

### FUNCTIONAL SCHEMATIC

```
+5V

TTL DRIVER

+5V

-5V

GND

J1

50Ω

-5V

J2

50Ω
```

![Schematic Diagram](image-url)
MECHANICAL DATA

LOGIC TABLE

<table>
<thead>
<tr>
<th>LOGIC</th>
<th>RF</th>
</tr>
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<tbody>
<tr>
<td>0</td>
<td>ON</td>
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<tr>
<td>1</td>
<td>OFF</td>
</tr>
</tbody>
</table>
BROADBAND PIN SWITCH SPDT WITH INTEGRAL DRIVER
SWN-218-2A
0.3 To 18 GHz

FEATURES
- 0.3 to 18 GHz Frequency Range
- Low Insertion Loss
- Small Size
- Light Weight
- Rugged Chip and Microstrip Construction
- Integral TTL Compatible Driver

SPECIFICATIONS
- Frequency Range: 0.3 to 18 GHz
- Insertion Loss: 2.5 dB, Max.
- Isolation: 55 dB, Min.
- VSWR: 2.0 to 1
- Rise/Fall Time: 50 ns Max.
- Power Handling: +20 dBm, CW, Max.
- Operating Temp.: -65° C to + 85° C
- DC Power: +5V DC @ 65 mA, Max.
- -5V DC @ 50 mA, Max.

DESCRIPTION
The SWN-218-2A is a SPDT Pin Switch intended for wide band switching applications in commercial and military environments. It has an instantaneous frequency coverage from 0.3 to 18 GHz and features all solid state chip diode and microstrip construction for rugged, reliable operation. Hybrid driver circuitry features reverse voltage and over-voltage protection.
STANDARD UNIT

<table>
<thead>
<tr>
<th>FREQUENCY (GHz)</th>
<th>0.3</th>
<th>2.0</th>
<th>4.0</th>
<th>8.0</th>
<th>12.4</th>
<th>19.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. INSERTION LOSS (dB)</td>
<td>1.2</td>
<td>1.2</td>
<td>1.3</td>
<td>1.3</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>MIN. ISOLATION (dB)</td>
<td>85</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>55</td>
</tr>
<tr>
<td>MAX. VSWR</td>
<td>1.7</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

HUMIDITY, SHOCK, ETC., PER MIL-STD 202C

OPTIONS:
001 35 dB MIN ISOLATION
002 INDEPENDENT CONTROLS
003 SMA MALE CONNECTORS
004 +15 VOLT SUPPLY
005 REVERSE LOGIC
006 –15 VOLT SUPPLY
007 10 NS, MAX SWITCHING SPEED
008 EXTEND FREQUENCY TO 100 MHz
009 30 NS, MAX DELAY
010 –12 VOLT SUPPLY
011 Off ARM TERMINATION
INsertion loss of 3.5 dB maximum
103 INTEGRAL VIDEO FILTERS (FREQUENCY 2-18 GHz)
INsertion loss increase of 0.75 dB maximum

NOTES:
1. Switching Speeds are:
   10%-90% RF and 90%-10% RF

ENVIRONMENTAL RATINGS

Operating Temperature: –65° C to 110° C
Non-Operating Temperature: –65° C to 125° C
Humidity: MIL-STD-202F, METHOD 103B
Vibration: MIL-STD-202F, METHOD 204D
Altitude: MIL-STD-202F, METHOD 105C
Temp Cycling: MIL-STD-202F, METHOD 107D
TYPICAL PERFORMANCE

MECHANICAL DATA

LOGIC TABLE

<table>
<thead>
<tr>
<th>LOGIC</th>
<th>RF ON</th>
<th>RF OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>J1-J2</td>
<td>J1-J3</td>
</tr>
<tr>
<td>1</td>
<td>J1-J3</td>
<td>J1-J2</td>
</tr>
</tbody>
</table>
MINIATURE SP2T SWITCH
0.3 - 18 GHz WITH INTEGRAL DRIVER
SWN-2181-2A

FEATURES
- 0.3 to 18 GHz Frequency Band
- 55 dB, Minimum Isolation
- High Speed - 10 ns Optional
- Integral TTL Driver

SPECIFICATIONS
- Frequency Range: 0.3 to 18 GHz
- Insertion Loss: 3.0 dB, Max.
- Isolation: 55 dB, Min.
- VSWR: 2.0:1, Max.
- Switching Speed: 50 ns, Max.
- Rise/Fall Time
- Power Handling: +23 dBm, CW, Max.
- Operating Temp.: -65°C to +85°C
- DC Power: +5V @ 65 mA, Max.
- -5V @ 50 mA, Max.

DESCRIPTION
The SWN-2181-2A is a SPDT Pin Switch intended for use in commercial and military environments. It features all solid state chip diode and microstrip construction for rugged, reliable operation. Hybrid driver circuitry features reverse voltage and over voltage protection.

07/94

7311G GROVE ROAD, FREDERICK, MARYLAND 21701 (301) 662-4700
SPECIFICATIONS
STANDARD UNIT

<table>
<thead>
<tr>
<th>FREQUENCY (GHz)</th>
<th>0.3</th>
<th>2.0</th>
<th>4.0</th>
<th>8.0</th>
<th>12.0</th>
<th>18.0</th>
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<tbody>
<tr>
<td>MAX. INSERTION LOSS (dB)</td>
<td>1.2</td>
<td>1.2</td>
<td>1.1</td>
<td>1.0</td>
<td>1.8</td>
<td>3.0</td>
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<tr>
<td>MIN. ISOLATION (dB)</td>
<td>85</td>
<td>80</td>
<td>75</td>
<td>70</td>
<td>65</td>
<td>55</td>
</tr>
<tr>
<td>MAX. VSWR</td>
<td>1.7</td>
<td>1.5</td>
<td>1.5</td>
<td>1.9</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

HUMIDITY, SHOCK, ETC. PER MIL-STD 202C

OPTIONS:
001 35 dB MINIMUM ISOLATION
002 INDEPENDANT CONTROLS
003 SMA MALE CONNECTORS
005 REVERSE LOGIC
006 -15 VOLT SUPPLY
007 10 NS, MAXIMUM RISE/FALL TIME
008 EXTENDED FREQUENCY TO 100 MHz
009 30 NS, MAXIMUM DELAY
010 OFF ARM TERMINATION
103 INSERTION LOSS OF 3.5 dB MAXIMUM
     INTEGRAL VIDEO FILTERS (2 - 18 GHz)
     INSERTION LOSS INCREASE OF 0.75 dB MAXIMUM

TYPICAL PERFORMANCE

![Graph of insertion loss vs frequency]

![Graph of isolation vs frequency]
MECHANICAL DATA

LOGIC TABLE

<table>
<thead>
<tr>
<th>LOGIC</th>
<th>RF ON</th>
<th>RF OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>J1-J2</td>
<td>J1-J3</td>
</tr>
<tr>
<td>1</td>
<td>J1-J3</td>
<td>J1-J2</td>
</tr>
</tbody>
</table>
FEATURES

- 10 MHz to 18 GHz
- Low Insertion Loss
- High Isolation
- Small Size

DESCRIPTION

SP3T PIN diode switches that cover the frequency range from 2 to 18 GHz are available in octave to multi-decade bandwidths.

All feature rugged, bonded diode chip and micro-strip construction that meet MIL-STD-202C environmental requirements. TTL drivers feature ultra reliable discrete component construction. Drivers, in addition, will withstand up to 300% overload and reverse polarity connection for up to 30 seconds without damage.

Optional control port connectors, power supply voltages, male RF connectors and truth tables are available.
SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>SWITCH TYPE</th>
<th>FREQUENCY RANGE (GHz)</th>
<th>MAXIMUM INSERTION LOSS (dB)</th>
<th>MINIMUM ISOLATION (dB)</th>
<th>MAXIMUM VSWR</th>
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<tbody>
<tr>
<td>SW-2040-3A</td>
<td>SP3T</td>
<td>2-4</td>
<td>1.6</td>
<td>45</td>
<td>1.5</td>
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<td>SW-4080-3A</td>
<td>SP3T</td>
<td>4-8</td>
<td>1.7</td>
<td>40</td>
<td>1.6</td>
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<tr>
<td>SW-9012-3A</td>
<td>SP3T</td>
<td>8-12</td>
<td>1.8</td>
<td>35</td>
<td>1.7</td>
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<tr>
<td>SW-1218-3A</td>
<td>SP3T</td>
<td>12-18</td>
<td>2.6</td>
<td>30</td>
<td>1.9</td>
</tr>
<tr>
<td>SW-218-3A</td>
<td>SP3T</td>
<td>2-18</td>
<td>2.8</td>
<td>30</td>
<td>2.5</td>
</tr>
</tbody>
</table>

RISE/FALL TIME: (10% RF to 90% RF) 50 ns, Max
(90% RF to 10% RF) 50 ns, Max

POWER HANDLING: +23 dBm, Max

TTL DELAY: 50 ns, typical

POWER SUPPLY: +5V DC @ 100 mA, Max
-5V DC @ 50 mA, Max

OPTIONS:
001 -55 dB, Min Isolation
002 Independent Controls (SPDT)
003 SMA Male Connectors
004 Solder Pin Control Terminal
005 Reverse Logic
006 -15V Supply
007 -12V Supply

ENVIRONMENTAL RATINGS
- Operating Temperature: -65°C to 110°C
- Non-Operating Temperature: -65°C to 125°C
- Humidity: MIL-STD-202F, METHOD 103B
- Vibration: MIL-STD-202F, METHOD 204D
- Altitude: MIL-STD-202F, METHOD 105C
- Temp Cycling: MIL-STD-202F, METHOD 107D

MECHANICAL DATA

STANDARD LOGIC TABLE

<table>
<thead>
<tr>
<th>LOGIC-H</th>
<th>RF-ON</th>
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</thead>
<tbody>
<tr>
<td>E2</td>
<td>J1-J2</td>
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<tr>
<td>E3</td>
<td>J1-J3</td>
</tr>
<tr>
<td>E4</td>
<td>J1-J4</td>
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</table>

INVERTED LOGIC

<table>
<thead>
<tr>
<th>LOGIC-L</th>
<th>RF-ON</th>
</tr>
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<tbody>
<tr>
<td>E2</td>
<td>J1-J2</td>
</tr>
<tr>
<td>E3</td>
<td>J1-J3</td>
</tr>
<tr>
<td>E4</td>
<td>J1-J4</td>
</tr>
</tbody>
</table>

DIMENSIONS: INCHES (MILLIMETERS)
PIN DIODE SWITCH SP4T
MODEL SW-2181-4AT
NON-REFLECTIVE
2-18 GHz

FEATURES
- Integral TTL Driver
- Rugged Microstrip Construction
- Reverse Polarity Protection on +5V and -5V Lines
- Off-Arm Terminations

FUNCTIONAL SCHEMATIC

(Typical Arm)

DESCRIPTION
Model SW-2181-4AT is a broadband SP4T switch covering the 2-18 GHz band. It features Off-Arm terminations that provide reflectionless performance when arm is switched "on" or "off". Integral TTL Driver is "unit load" TTL compatible, one control per arm.
SPECIFICATIONS

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>2-4</th>
<th>4-8</th>
<th>8-12.4</th>
<th>12.4-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX. INS LOSS (dB)</td>
<td>2.0</td>
<td>2.2</td>
<td>2.7</td>
<td>3.5</td>
</tr>
<tr>
<td>MIN. ISOLATION (dB)</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>MAX. VSWR (on)</td>
<td>1.8</td>
<td>1.8</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>MAX. VSWR (off)</td>
<td>1.8</td>
<td>1.8</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Switching Speed: (10% to 90% RF) 50 ns, Max.
(90% to 10% RF) 50 ns, Max.

RF Power: +20 dBm, Max.

Control: TTL compatible, one "unit load"
4 individual controls. Logic "1" - RF On;
Logic "0" - RF Off

Power Requirements: +5V @ 200 mA, Max.

Connectors: RF: SMA Female
            Power: RFI Solder Pin
            Control: Solder Pin

Options: 001 RF Male SMA Connectors
         002 35 dB, Min. Isolation
         003 -12V Supply
         004 +15 Volt Supply
         005 Reverse Logic
         006 -15 Volt Supply
         007 Decoder
         008 SMC Male CTL Connector
         009 10 ns, Max Rise/Fall Time
         010 Extend Frequency Range to 500 MHz

MECHANICAL DATA

ENVIRONMENTAL RATINGS

Operating Temperature: -65° C to 110° C
Non-Operating Temperature: -65° C to 125° C
Humidity MIL-STD-202F, METHOD 103B
Shock MIL-STD-202F, METHOD 213B
Vibration MIL-STD-202F, METHOD 204D
Altitude MIL-STD-202F, METHOD 105C
Temp Cycling MIL-STD-202F, METHOD 107D

DIMENSIONS: INCHES (MILLIMETERS)
PIN DIODE SWITCH SP5T
WITH TTL DRIVER
MODEL SW-2181-5A
2-18 GHz

FEATURES
- Integral TTL Driver
- Rugged Microstrip Construction
- Reverse Polarity Protection on
  +5V and −15V Lines
- Available with Off-Arm Terminations

DESCRIPTION
Model SW-2181-5A is a Broadband SP5T Switch covering the 2-18 GHz Band. Integral TTL Driver is "unit load" TTL compatible, one control per arm.

FUNCTIONAL SCHEMATIC
(Typical Arm)
SPECIFICATIONS

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>5-2 (Option 010)</th>
<th>2-4</th>
<th>4-8</th>
<th>8-12.4</th>
<th>12.4-18</th>
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<tbody>
<tr>
<td>MAX. INS. LOSS (dB)</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
<td>3.3</td>
<td>3.6</td>
</tr>
<tr>
<td>MIN. ISOLATION (dB)</td>
<td>75</td>
<td>65</td>
<td>65</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>MAX. VSWR (On)</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>MAX. VSWR (Off) (Option 011)</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Switching Speed: (10% to 90% RF) 50 ns, Max.
(90% to 10% RF) 50 ns, Max.
RF Power: +20 dBm, Max.
Control: TTL compatible, one "unit load"
5 individual controls.
Control Logic: Logic "1" (−0.3 to +0.7V) Port On
Logic "0" (+2.0 to +5.0V) Port Off
Power Requirements: +5 VDC @ 250 mA, Max.
−15 VDC @ 100 mA, Max.
Connectors: RF: SMA Female
Power: RFI Solder Pin
Control: Solder Pin
Options: 001 RF SMA Male Connectors
002 35 dB, Min. Isolation
003 −12 VDC Power Supply
004 +15 VDC Power Supply
005 Reverse Logic
006 −5 VDC Power Supply
007 Decoder
008 SMC − Male Control Connector
009 10 ns, Max. Rise/Fall Time
010 Extend Frequency Range to 500 MHz
011 Off-Arm Terminations
103 Video Filters

ENVIRONMENTAL RATINGS
Operating Temperature −50° C to 85° C
Non-Operating Temperature −65° C to 125° C
Humidity MIL-STD-202F, METHOD 103B
Shock MIL-STD-202F, METHOD 213B
Vibration MIL-STD-202F, METHOD 204D
Altitude MIL-STD-202F, METHOD 105C
Temp Cycling MIL-STD-202F, METHOD 107D
MECHANICAL DATA

1.25 (31.75)

.104 DIA. THRU ON A 1.000 BOLT CIRCLE 2 HOLES

.63 (16.00)

MARKING SURFACE

.88 (22.35)

CONTROL TERMINAL

DIMENSIONS: INCHES (MILLIMETERS)
PIN DIODE SWITCH SP8T
NON-REFLECTIVE
WITH TTL DRIVER
SW-2000-8AT .01-2.0 GHz
SW-2181-8AT 2-18 GHz

FEATURES
- Integral TTL Driver
- Rugged Microstrip Construction
- Reverse Polarity Protection
- 300% Overload for up to 2 Minutes
- Off-Arm Terminations

DESCRIPTION
SP8T switch is available in two models, SW-2000-8AT covers .01-2.0 GHz and SW-2181-8AT covers 2-18 GHz. Both models feature Off-Arm terminations that provide reflectionless performance when the arm is switched “on” or “off”. Integral TTL Driver is one “unit load” compatible, one control per arm.

FUNCTIONAL SCHEMATIC
(Typical Arm)
## SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CHARACTERISTICS</th>
<th>FREQUENCY (GHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>.01-2</td>
</tr>
<tr>
<td>SW-2000-8AT</td>
<td>MAX. INS LOSS (dB)</td>
<td>2.0</td>
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<tr>
<td></td>
<td>MIN. ISOLATION (dB)</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>MAX. VSWR (on)</td>
<td>1.5:1</td>
</tr>
<tr>
<td></td>
<td>MAX. VSWR (off)</td>
<td>1.45:1</td>
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<tr>
<td>SW-2181-8AT</td>
<td>MAX. INS LOSS (dB)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>MIN. ISOLATION (dB)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>MAX. VSWR (on)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>MAX. VSWR (off)</td>
<td>—</td>
</tr>
</tbody>
</table>

Switching Speed: (10% to 90% RF) 50 ns, Max. (90% to 10% RF) 50 ns, Max.

RF Power: +20 dBm, Max.
Control: TTL compatible, one "unit load"
8 individual controls
TTL "Hi" = RF on
TTL "Lo" = RF off
Power Requirements: +5VDC @ 350 mA, Max.
−15VDC @ 100 mA, Max.

Connectors: RF: SMA Female
Power: RFI Solder Pin
Control: Solder Pin
Options: 001 RF Male Connectors
002 Inverted Logic
003 +15VDC Supply
004 Decoder
005 10 ns, Max. Rise/Fall Time (not available on SW-2000-8AT)
103 Video Filters (not available on SW-2000-8AT)

## ENVIRONMENTAL RATINGS

- Operating Temperature: −65° C to 110° C
- Non-Operating Temperature: −65° C to 125° C
- Humidity: MIL-STD-202F, METHOD 103B
- Vibration: MIL-STD-202F, METHOD 204D
- Altitude: MIL-STD-202F, METHOD 105C
- Temp Cycling: MIL-STD-202F, METHOD 107D

## MECHANICAL DATA

![Mechanical Drawing]
How to Specify PIN Diode Switches

I. INTRODUCTION

When purchasing PIN diode switches, it is important that they are completely specified to assure system performance. It is also important that the specifications be achievable. This paper is designed to help a systems designer specify realizable PIN diode switches.

There are six key parameters essential to specify PIN diode switches. These are:

1) Type, i.e., SPST, SPDT, SP3T, DPDT, etc.
2) Operating frequency band
3) Insertion loss
4) Isolation
5) Switching speed
6) Power handling

There are five secondary parameters that may require specification. These are:

1) Logic compatible driver type and speed
2) Phase tracking arm to arm and/or unit to unit
3) Off arm terminations
4) Intercept point or compression point
5) Video transients

II. SWITCH TYPE

Most PIN diode switches are of the single pole multiple throw type. They range from single throw up through 8-12 throws. The most popular type is the SPST or pulse modulator type. In general, the greater the number of throws, the less popular the switch, and, hence, the less readily available it is. American Microwave has standard switch designs up through 5 throws in the three popular bands of interest: HF, UHF/VHF, and Microwave. We also have designs for 8 and 10 throws at HF and Microwave.

The most popular multi-pole switch is the DPDT type, commonly known as the Transfer Switch. These units are available in UHF/VHF and Microwave bands. High order multi-pole switches are generally referred to as switch matrices, which is a whole subject matter by itself.

III. OPERATING FREQUENCY BANDS

American Microwave classifies PIN switches into five operating frequency bands. They are:

a) Video, which covers from 10MHz to 2MHz, not manufactured at AMC.
b) HF, which covers 2MHz to 32MHz, AMC series SW-0230 switches.
c) UHF/VHF, covering 10MHz to 2000MHz, AMC series SW-2000 switches.
d) Microwave, covering 10MHz to 20GHz and above, AMC series SW-218 switches.
e) Millimeter wave switches, 20GHz and up

The above bands have loosely defined boundaries which overlap. They are more indicative of the five different technologies available to the switch manufacturer as well as distinct application areas of switch requirements.

There are some special application bands and technologies such as the high speed, low transient IF switching technology which is reflected in the SWB-0070 series of switches in the AMC catalog.

IV. THE PIN DIODE

A simplified equivalent circuit of the PIN diode is shown in figure 1. The forward biased diode is a current controlled resistor. The resistance vs current behavior of a typical PIN diode is shown in figure 2. The reversed biased diode is a voltage-controlled capacitor. The capacitance vs voltage of a typical PIN diode is shown in figure 3.

Figure 1. The forward biased PIN diode.
V. INSERTION LOSS

Simple, most basic switches have the lowest loss for any given operating band. For a given technology or operating band, insertion loss increases with increasing frequency proportionally to the square root of frequency in a well-designed PIN switch. Insertion loss originates in four basic areas.

a) Conductor or transmission line loss within the switch itself due to the presence of microstrip, coaxial line, or waveguide interconnecting lines.

b) Resistance losses due to finite resistance of series connected components such as PIN diodes and/or finite "Q" capacitors.

c) VSWR losses due to mismatch of components within the switch or at the terminals of the switch. VSWR losses at the terminals of the switch can be tuned out externally to improve losses; those within the switch must be minimized in design. These actually are the cause for ripples in the insertion loss vs frequency characteristic.

Assuming a switch is well designed, i.e., lowest loss transmission media, lowest resistance diodes and other series components are employed and all internal VSWR's are minimized, the loss of the switch is then dependent on the complexity of the design. In general, multi-throw units are more lossy as the number of throws increases. The addition of off-arm terminations and video filters increases the loss of the switch for a given technology. Also, increased on/off isolation will contribute slightly to the loss. The insertion loss is lowest in the least complex switch configurations. For low loss switches, keep the specification simple.

VI. ISOLATION

PIN diodes are connected to the transmission line in series or in shunt. Isolation is achieved by reverse biasing series connected diodes for forward biasing shunt connected diodes. The shunt mounted diode provides the most effective means for achieving broadband, relatively frequency independent isolation. It is ideally frequency independent, but, practically, small parasitic reactances generally affect broadband performance. Isolation is also achieved by reverse biasing series mounted diodes. Isolation for the series mounted diode decreases with increasing frequency.

Series-shunt diode configurations are frequently employed in multi-throw broadband switches to achieve relatively high isolation in a simple structure. An example of the performance of a series-shunt connection is shown in figure 4 for the AMC model SW-218-2 switch. Note how the isolation decreases with increasing frequency. Multiple diodes connected in series or in shunt are frequently employed in PIN switches to achieve relatively high isolation over a broad band of frequencies. The isolation vs frequency characteristic of a shunt connected array of forward biased diodes is shown in figure 5. An example of a shunt mounted switch is the AMC model SW-2184-1A SPST unit, shown in figure 6, which achieves 85 dB isolation over the 2-18 GHz band by judiciously spacing four shunt connected diodes. An example of a switch employing an array of reverse biased series connected diodes is the AMC model SW-2000-1, shown in figure 7, which achieves 70 dB minimum isolation over the 10-2000 MHz band. It is interesting to note that the SW-2000-1 unit has more insertion loss at the low end of the band than that of the SW-218-1A unit. This, of course, is due to the finite resistance of the forward biased series diodes in the SW-2000-1 unit.

For narrowband applications, the possibilities are endless for combining and tuning diodes for excellent trade-offs between insertion loss and isolation. Many designers have employed series and shunt inductors to resonate the capacitance of reverse biased PIN diodes to achieve excellent isolation-insertion loss performance over limited frequency bands. (See reference 1.)
VII. SWITCHING SPEED

Switching speed of a PIN diode switch is generally defined as the time for the RF to traverse 10% to 90% levels. Other definitions, such as the time from 1 dB to 60 dB levels, are occasionally employed for high isolation requirements. The switching speed is generally controlled by two factors, the time required to remove the stored charge from the diode junction and the theoretical maximum speed at which the charge can be removed from the junction. The time required to remove the stored charge from the junction is limited by the transit time of the PIN diode. The transit time given by

\[ t = \frac{\lambda}{V_s} \phi t_o \]

where \( W1 \) = the device I-region thickness (cm)
\( V_s \) = maximum saturated velocity = 10^7 cm/sec

The I-region thickness is related to the breakdown voltage \( Vb \) by

\[ W1 = Vb/20 \]

Additionally, the stored charge in the forward biased diode junction is related to the minority carrier lifetime of the junction by

\[ Q_s = W1 V_b T \]

Where \( Q_s \) = stored charge (coulombs)
\( I \) = forward current (amperes)
\( T \) = minority carrier lifetime (seconds)
As a minimum for operation as a PIN switch, the diode lifetime is shown vs the lowest operating frequency in figure 8. Further, the transit time as a function of breakdown voltage is shown in figure 9. (see reference 2.) For minority carrier lifetimes shorter than 10 ns, state-of-the-art PIN drivers can switch in approximately the transition time of the device. Longer lifetimes require higher currents and larger, slower switching transistors causing switching times to be longer than the transition time.

Low intermodulation and harmonic distortion PIN switches require diodes with longer than minimum minority carrier lifetimes and hence switch more slowly.

High power PIN switches require higher Vb diodes which results in slower transition times and slower switching times.

VIII. POWER HANDLING

The power handling capability of PIN diode switches is controlled by three parameters. First is the upper operating temperature of the device. Second is the breakdown voltage and third the charge storage capability of the device. For silicon PIN diodes, best reliability is achieved by keeping junction operating temperatures below 200 degrees centigrade. Since series mounted diodes are more dissipative and have poorer heat sinking capabilities than shunt mounted configurations, switch designers tend to avoid series configurations in high power applications. Since series configurations are essential to wideband multi-throw switches, these units tend to be the lowest power handling configurations. Hence, high power broadband switches are difficult to realize. One usually ends up trading power for bandwidth.

It is necessary that the breakdown voltage be at least twice the peak RF voltage that the diode will see and that the forward charge stored in the junction be greater than the charge moved on one-half cycle of the RF current waveform. The former requirement will assure that the diode not exceed its voltage breakdown and the latter that the forward biased junction will not be depleted in operation. The elements are essential to linear non-destructive operation of the diode under high power operation.

IX. LOGIC COMPATIBLE DRIVERS

The three most popular logic families are Transistor-Transistor-Logic (TTL), Emitter Coupled Logic (ECL) and Metal Oxide Semiconductor (MOS/CMOS).

Of the three, TTL logic is by far the most popular, ECL and CMOS are a distant second. Four of the most popular forms of TTL driver circuits are shown in figure 10. We will confine this discussion to TTL compatible drivers. For best performance, switch drivers must be electrically as well as mechanically integrated in the switch unit. It is possible to achieve clean, transient free switching by designing electrically compatible drivers.

Figure 8. Minimum lifetime vs. frequency.

Figure 9. Transit time vs. bulk breakdown voltage.

Figure 10. TTL driver circuits.
"Unit load" drivers are highly desirable because they are compatible with the widest range of TTL product line I.C.s. A "unit load" is defined as 40 microamperes maximum source current and 1.6 milliamperes maximum sink current. Drivers are available in multiples of "unit load." True TTL compatibility also requires a logic "low" to be 0–8 volts and a logic "high" to be 2.0–5.0 volts at the input (0.8–2.0 volts is an undefined region.)

All TTL compatible drivers have delay. Generally the driver delay is defined as the time from 50% TTL level to where the RF signal changes by 10%, i.e., 0–10% for turn-on or 100–90% for turn-off. It is caused by energy storage in the driver and/or RF circuitry. The delay is a result of the time required to remove the stored energy before the switch state can be changed. The stored energy can be stored charge in the base region of a switching transistor or stored in various capacitors and inductors in the driver circuit or the bias decoupling circuit. Often this delay is different for turn-on or turn-off. This phenomenon can lead to pulse shrinkage or pulse expansion when the PIN switch is operated in a pulse mode. Since driver delay is consistent from unit to unit in a well designed PIN switch, a systems designer can often pre-trigger the switch and essentially "program-out" the driver delay. When it is not possible to anticipate the delay, it is necessary to specify delay equalization. An example of a PIN switch with equalized delay is the AMC model SW-218-1A series pulse modulator with modulation characteristics shown in figure 11. This unit has on/off delay equalization to 5 ns, maximum.

**X. PHASE TRACKING**

Often systems require switches that are "phase tracked". A phase tracking requirement is best achieved by first equalizing the time delay between arms of a multi-throw switch (if a multi-throw is indicated) and equalizing the time delay from unit to unit within a production run or product line, if required.

Since the PIN switch is made up internally of many elements, i.e., diodes, capacitors, and chokes with their accompanying mounting parasitic reactances and losses, it is necessary to control the uniformity of parts and assembly techniques to achieve best phase tracking.

For unit-to-unit phase tracking on a lot-to-lot basis, it is necessary to build a phase standard unit that is maintained at the switch vendor's facility which has an impact on the price of the initial lot of switches.

Typical state-of-the-art phase tracking is as follows:

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<tr>
<th>BAND</th>
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<tr>
<td>HF</td>
<td>1 Degree</td>
</tr>
<tr>
<td>UHF/VHF</td>
<td>2 Degrees</td>
</tr>
<tr>
<td>Microwave</td>
<td>10 Degrees</td>
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**XI. OFF ARM TERMINATIONS**

Often PIN switches are employed to commutate or switch VSWR sensitive components such as antenna elements in an array, oscillators or amplifiers. Normally, switches have an infinite VSWR in the OFF position. Figure 12 shows a switch with off arm terminations having an extra switching section that switch the terminal in question into a matched load when that arm is turned off. This, in effect, controls and stabilizes the VSWR in both the ON and OFF condition of the switch. You must specify off arm terminations when it is necessary to control OFF VSWR.

**Figure 11. Driver delay equalized.**

Another phenomenon of driver delay is minimum pulse width. Since delay involves charging and discharging of components within the driver circuit, it is necessary to "charge" or "discharge" the driver before any RF changes in signal level are observed. This results in minimum pulse width for any switch with integral logic drivers. The minimum pulse width is approximately equal to the delay in the driver.

**Figure 12. Off arm terminations.**

Be aware that when the specified arm is commutated or switched there is a period of time when the VSWR is unspecified. This is particularly important in high power switching where momentary high reflected power levels can be troublesome.
The addition to off arm terminations adds complexity to the switch which results in additional insertion loss and poorer phase tracking.

XII. INTERCEPT POINT OR COMPRESSION POINT

Compression in a PIN switch is a less well defined parameter than in, say, an amplifier. So, we will limit our remarks in this section to intercept point. The concept of intercept point is well documented in the literature and we will not go into it here. Rather, we will examine the elements that control intercept point of PIN diode switches and their tradeoff on overall switch performance.

Intermodulation is a result of nonlinear mechanisms within the PIN diode primarily and occasionally caused by other elements such as nonlinear capacitors, resistors, and/or ferrite cores in the bias decoupling chokes. We will confine this discussion to the PIN diode only.

The primary intermod generator in a PIN switch is the forward biased series PIN diode. Intermod is generated in the diode when the stored charge becomes close to being swept out (or depleted) from the I layer region. Hence, low intermod switches employ diodes with longer than minimum minority carrier lifetimes and are biased at relatively high forward currents to store a lot of charge in the junction. The degree of linearity is controlled by the percentage of charge depleted from the junction by the RF cycle. Highly linear switches have small percentage of charge depletion. See reference 9 for a more complete discussion of Intermodulation Distortion Mechanisms.

A secondary intermod generator is the non-linear capacitance vs voltage characteristic of the reversed biased PIN diode. This phenomenon is relatively easily controlled by selecting diodes with flat capacitance vs voltage characteristics and biasing the device into that region of the curve.

XIII. VIDEO TRANSIENTS

Refer to figure 13, the equivalent circuit of a typical PIN switch. When the diodes are switched between biasing conditions, a change of voltage or current occurs at the bias decoupling element adjacent to the output terminals. This element acts to differentiate the waveform (current for the shunt inductor and voltage for the series capacitor) and cause a pulse, spike, or video transient at the output terminal. This transient occurs in all PIN switches but is controlled by various means.

The most effective means of controlling video transients are:

1) Slowing the switching waveform
2) Filtering the video spectrum
3) Balancing or cancelling two equal video transients

The first is very effective when switching speed is not important. Slowing the switching waveform will slow switching speed. The second is effective when the switch operating band is above the frequency band where the video spectrum is concentrated. The addition of high pass filters at the input and output terminals of PIN switches at frequencies above 500 MHz has proven very effective in reducing transients. Typically, the highest speed switches have at least 90% of the video spectrum below 1 GHz. Filtering has its accompanying side effects. It will often introduce unwanted "ringing" in the switching waveform. Balancing has been employed very effectively as a means of reducing video transients without affecting switching speed or introducing "ringing". Unfortunately, present state-of-the-art technology has limited balancing technique to UHF/VHF band. An example of the balancing technique is the AMC SWB-070 series of IF switches shown in figure 14.

XIV. CONCLUSION

Six essential and five supplementary parameters have been presented to aid in the specification of PIN diode switches. Tradeoffs between the various parameters have also been explored. It is hoped that this will help bridge the gap between switch users and switch designers.

A sample specification is presented in figure 15 to serve as a prototype switch specification to aid in bridging the gap.
SWITCH SPECIFICATIONS DATA SHEET

CUSTOMER: ___________________________ MODEL: ___________ OPT.: ___________

1.0 CONFIGURATION: ____________________

2.0 FREQUENCY BAND (GHZ): ___________

3.0 INSERTION LOSS:
   3.1) MAXIMUM: ___________
   3.2) VARIATION: ___________

4.0 ISOLATION:
   4.1) MINIMUM: ___________
   4.2) TYPICAL: ___________

5.0 SWITCHING SPEED:
   5.1) 50% TTL TO 90% RF ___________
   5.2) 50% TTL TO 10% RF ___________
   5.3) 10% RF TO 90% RF ___________
   5.4) 90% RF TO 10% RF ___________

6.0 VSWR:
   6.1) INPUT ___________
   6.2) OUTPUT (ON) ___________
   6.3) OUTPUT (OFF) ___________

7.0 RF POWER:
   7.1) CW ___________
   7.2) PEAK POWER ___________
   7.3) PULSE DUTY RATIO ___________

8.0 CONTROL: NO DRIVER □
   TTL DRIVER □
   TTL DECODER □

9.0 POWER SUPPLY: VOLTAGE CURRENT (mA)
   + 5
   + 15
   - 5
   - 15

Figure 15.

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References:
SWITCH SPECIFICATIONS DATA SHEET

CUSTOMER: ___________________________ MODEL: ____________ OPT.: __________

1.0 CONFIGURATION: ___________________________ 10.0 CONNECTORS: ___________________________

2.0 FREQUENCY BAND (GHz): ___________________________

3.0 INSERTION LOSS:

3.1) MAXIMUM: __________________________________
3.2) VARIATION: __________________

4.0 ISOLATION:

4.1) MINIMUM: ___________________________
4.2) TYPICAL: ___________________________

5.0 SWITCHING SPEED:

5.1) 50% TTL TO 90% RF
5.2) 50% TTL TO 10% RF
5.3) 10% RF TO 90% RF
5.4) 90% RF TO 10% RF

6.0 VSWR:

6.1) INPUT
6.2) OUTPUT (ON)
6.3) OUTPUT (OFF)

7.0 RF POWER:

7.1) CW
7.2) PEAK POWER
7.3) PULSE DUTY RATIO

8.0 CONTROL: NO DRIVER □
TTL DRIVER □
TTL DECODER □

9.0 POWER SUPPLY: VOLTAGE CURRENT (mA)

+5
+15
-5
-15

Figure 15.

7311-G GROVE ROAD, FREDERICK, MARYLAND 21701 (301) 662-4700
References:

PIN-DIODE SWITCHES

NEW PRODUCT DEVELOPMENTS AT

AMERICAN MICROWAVE CORPORATION

AUGUST 10, 1993
PIN-DIODE
SWITCHES

NEW
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<td>2-18 GHz 10 nsec, CURRENT/VOLTAGE CONTROLLED PULSE MODULATOR SWITCH, AMC MODEL NO: SW-2184-1-30</td>
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<td>8-18 GHz 10 WATT SWITCH MODULE AMC MODEL NO: SW-2182-1A-230</td>
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DESCRIPTION
AMC MODEL SWM-DC20-1D IS A REFLECTIVE GaAs MMIC SPST SWITCH/MODULATOR WITH INTEGRAL TTL DRIVER, DESIGNED FOR ULTRA BROAD-BAND, FAST SWITCHING TIME, AND LOW DC POWER CONSUMPTION, PACKAGED IN A LOW PROFILE HOUSING.

SPECIFICATIONS
- FREQUENCY RANGE: DC-20 GHz
- INSERTION LOSS:
  - DC-10 GHz: 2.2 dB MAXIMUM
  - 10-18 GHz: 2.5 dB MAXIMUM
  - 18-20 GHz: 3.2 dB MAXIMUM
- ISOLATION:
  - DC-10 GHz: 40 dB MINIMUM
  - 10-18 GHz: 35 dB MINIMUM
  - 18-20 GHz: 30 dB MINIMUM
- VSWR (ON): 2.1 MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 10 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 20 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 20 ns MAXIMUM
- RF POWER RATINGS (0 dB COMP.)
  - 0.5-20 GHz: +25 dBm TYPICAL
  - 0.05 GHz: +18 dBm TYPICAL
- CONTROL:
  - TTL COMPATIBLE, UNITY LOAD
  - LOGIC "0" ISOLATION
  - LOGIC "1" INSERTION LOSS
- POWER SUPPLY:
  - +7VDC TO +18VDC ±5% @ 25 mA MAXIMUM
  - -7VDC TO -18VDC ±5% @ 25 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT: FIELD REPLACEABLE SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
  - NOTE: RF CONNECTORS CAN BE PLACED SIDE BY SIDE OR IN ANGLE. (CONSULT FACTORY FOR AVAILABLE MECHANICAL OPTIONS)
- SIZE: 1.50" x 1.50" x 0.40"

AVAILABLE OPTIONS
- A01: 50 Ω CONTROL IMPEDANCE
- A02: 100 Ω CONTROL IMPEDANCE
- A03: HERMETIC SEALING (MIL-STD-883)
- A04: ±5VDC POWER SUPPLY
- A05: INVERSE CONTROL LOGIC (LOGIC "0" = INSERTION LOSS)
- A06: SINGLE ENDED ECL CONTROL LOGIC
- A07: BALANCED ECL CONTROL LOGIC
- A08: DIFFERENTIAL TTL CONTROL LOGIC (R=422 LOGIC FAMILY)
- A09: HIGH ISOLATION (CONSULT FACTORY)
- A10: SMC MALE CONTROL CONNECTOR
- A11: SMC FEMALE CONTROL CONNECTOR
- A12: OTHER POWER SUPPLIES (CONSULT FACTORY)

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE: -55°C TO +85°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- HUMIDITY:
  - MIL-STD-202F, METHOD 103B COND. B
- SHOCK:
  - MIL-STD-202F, METHOD 213B COND. B
- VIBRATION:
  - MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE:
  - MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE:
  - MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SWM-DC20-1D
DC-20 GHz, GaAs MMIC, REFLECTIVE, ULTRA BROAD-BAND SPST SWITCH/MODULATOR
SIZE A SHEET 1 OF 2 DWG. #101-2914
AMC Model SW-2184-1A-225 is a reflective broadband pulse modulator/switch with integral TTL driver and built-in input/output video filter. Designed for wideband, high-speed and low-distortion RF-linked, data communications.

**Specifications**

- **Frequency Range**: 0.5–18 GHz minimum
- **Insertion Loss**:
  - 0.5–1 GHz: 1.0 dB maximum
  - 1–2 GHz: 1.2 dB maximum
  - 2–4 GHz: 1.5 dB maximum
  - 4–8 GHz: 2.0 dB maximum
  - 8–18 GHz: 2.8 dB maximum
- **Isolation**:
  - 0.5–1 GHz: 60 dB minimum
  - 1–2 GHz: 70 dB minimum
  - 2–4 GHz: 85 dB minimum
  - 4–8 GHz: 91 dB minimum
  - 8–18 GHz: 96 dB minimum
- **VSWR (ON)**:
  - 0.5–4 GHz: 1.5:1 maximum
  - 4–8 GHz: 1.8:1 maximum
  - 8–18 GHz: 1.9:1 maximum
- **RF Power Ratings**:
  - 2W CW maximum, 10W peak (1 μs, PW)
- **Switching Time**
  - Rise (10% RF to 90% RF): 10 ns maximum
  - Fall (90% RF to 10% RF): 10 ns maximum
  - On (50% TTL to 90% RF): 20 ns maximum
  - Off (50% TTL to 10% RF): 20 ns maximum
- **In-Band Video Transients**: 50mV p-p across 50 Ω impedance in 20 MHz bandwidth.
- **Control**
  - TTL compatible, unity load
  - Logic "0" = insertion loss
  - Logic "1" = isolation
- **Power Supply**:
  - +5VDC ±5% @ 50 mA maximum
  - -12VDC ±5% @ 5 mA maximum
- **Connectors**
  - RF Input/Output: SMA (female)
  - Power: solder pin
  - Control: solder pin
- **Size**: 1.10" x 0.87" x 0.37"

**Available Options**

- A01: 50 Ω control impedance
- A02: 100 Ω control impedance
- A03: Inverse control logic (logic "0" isolation)
- A04: Extended frequency to 100 MHz
- A05: 5 watts CW maximum
- A06: 2ns rise/fall time
- A07: Single ended ECL driver (10ns on/off time)
- A09: Balanced ECL driver (10ns on/off time)
- A10: 15 volt power supply

**Environmental Ratings**

- **Temperature**: -55°C to +95°C (operating)
  - -65°C to +125°C (storage)
- **Humidity**: MIL-STD-202F, Method 103B, Cond. B
- **Vibration**: MIL-STD-202F, Method 204D, Cond. B
- **Altitude**: MIL-STD-202F, Method 105C, Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D, Cond. A

**Mechanical Outline**

**Notes**:

1. Dimensions are in inches [millimeters]
2. Tolerances: ±0.020
3. Weight: approx. 1.0 oz

**American Microwave Corporation**

7311 Grove Rd., Frederick, MD. 21701

Tel: (301) 662-4700 Fax: (301) 662-4938

**Product Feature**

SW-2184-1A-225

0.5–18 GHz, reflective SPST Switch/Modulator

**Size**: A

**Sheet**: 1 of 2

**Dwg.**: #100-2863
DESCRIPTION
AMC MODEL SW-2187-1DS IS A REFLECTIVE SPST SWITCH/MODULATOR WITH INTEGRAL ECL DRIVER, DESIGNED TO MAINTAIN A VERY HIGH ISOLATION, LOW IN BAND VIDEO TRANSIENT SIGNALS AND FAST SWITCHING RESPONSE TIME.

SPECIFICATIONS
- **FREQUENCY RANGE**: 0.7–18 GHz MINIMUM
- **INSERTION LOSS**: 0.7–18 GHz, 4.0 dB MAXIMUM
- **ISOLATION**: 0.7–1.0 GHz, 95 dB MINIMUM
  1.0–18.0 GHz, 110 dB MINIMUM
- **VSWR (ON)**: 1.9:1 MAXIMUM
- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF): 10 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 50 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 50 ns MAXIMUM
- **RF POWER RATINGS**: 2W CW, 10 W PEAK (1 μS, PW)
- **CONTROL**: SINGLE ENDED ECL LOGIC
  - LOGIC "0" (~1.75V) = ISOLATION
  - LOGIC "1" (~0.9V) = INSERTION LOSS
- **IN BAND VIDEO POWER/TRANSIENTS**: ≤ –70 dBm @ 0.5 GHz TO 18 GHz OR
  20 mV (P-P) IN 100 MHz BANDWIDTH
- **POWER SUPPLY**: +5VDC ±5% @ 50 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SMC (MALE)
- **SIZE**: 0.792" x 1.97" x 0.56"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A05: 5 WATTS CW MAXIMUM
- A06: BALANCED ECL LOGIC
- A07: ±9VDC TO ±18VDC SUPPLY POWER
- A08: J1 SMA MALE, J2 SMA FEMALE
- A10: TWO SMA MALE Connectors
- A12: SOLDER PIN CONTROL TERMINAL
- A13: SMA FEMALE CONTROL TERMINAL
- A14: CANNON MULTIPIN MDMSSP
- A16: STANDARD TTL CONTROL LOGIC
  - (LOGIC"0" = INSERTION LOSS)

ENVIRONMENTAL RATINGS
- **TEMPERATURE**: –55°C TO +95°C (OPERATING)
  - –65°C TO +125°C (STORAGE)
- **HUMIDITY**: MIL-STD-202F, METHOD 103B COND. B
- **SHOCK**: MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION**: MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE**: MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE**: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
73116 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2187-1DS
0.7–18 GHz, REFLECTIVE, LOW VIDEO TRANSIENT, HIGH ISOLATION AND FAST SPST PULSE MODULATOR/SWITCH

SIZE A
SHEET 1 OF 2
DWC. # 100-2556
DESCRIPTION
AMC MODEL SWS-2184-1D IS A REFLECTIVE BROAD BAND SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER PACKAGED IN A LOW PROFILE, HERMETICALLY SEALED HOUSING.

SPECIFICATIONS
- **FREQUENCY RANGE**: 1-18 GHz MINIMUM
- **INSERTION LOSS**: 1 - 2 GHz 1.0 dB MAXIMUM
  2 - 4 GHz 1.2 dB MAXIMUM
  4 - 8 GHz 1.4 dB MAXIMUM
  8 - 12 GHz 1.6 dB MAXIMUM
  12 - 18 GHz 2.4 dB MAXIMUM
- **ISOLATION**: 1 - 2 GHz 60 dB MINIMUM
  2 - 18 GHz 80 dB MINIMUM
- **VSWR (ON)**: 2:1 MAXIMUM
- **RF POWER RATING**: 2W CW, 10W PEAK (1 μS PN)
- **SWITCHING TIME**
  - RISE (10% RF. TO 90% RF.) 10 ns MAXIMUM
  - FALL (90% RF. TO 10% RF.) 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF.) 20 ns MAXIMUM
  - OFF (50% TTL TO 10% RF.) 20 ns MAXIMUM
- **CONTROL**: TTL COMPATIBLE, UNITY LOAD
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
- **POWER SUPPLY**: + 5VDC ±5% @ 50 mA MAXIMUM
  - -12VDC ±5% @ 5 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT: FIELD REPLACEABLE SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- **SIZE**: 1.00" x 0.65" x 0.112"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04: EXTENDED FREQUENCY RANGE TO 100 MHz
- A05: 5 WATTS CW MAXIMUM
- A06: 2 ns RISE/FALL TIME
- A07: INPUT/OUTPUT VIDEO FILTER (ADDITIONAL 0.5 dB EXCESS LOSS, 2-18 GHz)
- A08: SINGLE ENDED ECL (10 ns ON/OFF TIME)
- A09: BALANCED ECL DRIVER (10 ns ON/OFF TIME)
- A10: -15 VOLT POWER SUPPLY

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- **TEMPERATURE**: 
  - -55°C TO +85°C (OPERATING)
  - 65°C TO +125°C (STORAGE)
- **HUMIDITY**: MIL-STD-202F, METHOD 103B COND. B
- **SHOCK**: MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION**: MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE**: MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE**: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE
SWS-2184-1D
SLIM LINE 1 TO 18 GHz, REFLECTIVE, PULSE MODULATOR SWITCH

SIZE A SHEET 1 OF 2 DWG. #100-2534
DESCRIPTION

AMC MODEL SW-2187-1DU IS A REFLECTIVE SPST SWITCH/MODULATOR WITH INTEGRAL ECL DRIVER, DESIGNED TO MAINTAIN A VERY HIGH ISOLATION, LOW IN-BAND VIDEO TRANSIENT SIGNALS, AND ULTRA FAST SWITCHING RESPONSE TIME.

SPECIFICATIONS

- **FREQUENCY RANGE**: 2–18 GHz MINIMUM
- **INSERTION LOSS**: 2–4 GHz, 2.5 dB MAXIMUM
- 4–8 GHz, 3.5 dB MAXIMUM
- 8–18 GHz, 4.5 dB MAXIMUM
- **ISOLATION**: 100 dB MINIMUM
- **VSWR (ON)**: 2–4 GHz, 1.8:1 MAXIMUM
- 4–8 GHz, 1.9:1 MAXIMUM
- 8–18 GHz, 2.0:1 MAXIMUM
- **SWITCHING TIME**
  - **Rise (10% RF TO 90% RF)**: 1 nS MAXIMUM
  - **Fall (90% RF TO 10% RF)**: 2 nS MAXIMUM
  - **On (50% TTL TO 90% RF)**: 9 nS MAXIMUM
  - **Off (50% TTL TO 10% RF)**: 20 nS MAXIMUM
- **RF POWER RATINGS**: 100mW CW MAXIMUM
- **CONTROL**: SINGLE ENDED ECL LOGIC
  - **Logic "0"** (-1.75V) = ISOLATION
  - **Logic "1"** (-0.9V) = INSERTION LOSS
- **IN-BAND VIDEO POWER/TRANSIENTS**: ≤ -70 dBm @ 2 GHz TO 18 GHz, OR
  50mV P-P IN 100 MHz BANDWIDTH
- **POWER SUPPLY**: +5VDC ±5% @ 50 mA MAXIMUM
  -5VDC ±5% @ 50 mA MAXIMUM
- **CONNECTORS**
  - **RF INPUT/OUTPUT**: SMA (FEMALE)
  - **POWER**: SOLDER PIN
  - **CONTROL**: SMC (MALE)
- **SIZE**: 0.792” x 1.97” x 0.56”

AVAILABLE OPTIONS

A01: 50Ω CONTROL IMPEDANCE
A02: 100Ω CONTROL IMPEDANCE
A03: INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
A09: BALANCED ECL LOGIC (SOLDER PINS)
A10: ±9VDC TO ±18VDC SUPPLY POWER
A14: J1 SMA MALE, J2 SMA FEMALE
A15: TWO SMA MALE CONNECTORS
A16: SOLDER PIN CONTROL TERMINAL
A17: SMA FEMALE CONTROL TERMINAL
A18: CANNON MULTIPIN MOD99SSP

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: XXX ±0.020 XXX ±0.010
3) WEIGHT: APPROX. 1.3 OZ

ENVIRONMENTAL RATINGS

- **TEMPERATURE**: -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- **HUMIDITY**: MIL-STD-202F, METHOD 103B COND. B
- **SHOCK**: MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION**: MIL-STD-202F, METHOD 2040 COND. B
- **ALTITUDE**: MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE**: MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-2187-1DU
2–18 GHz, REFLECTIVE, LOW VIDEO TRANSIENT, HIGH ISOLATION AND ULTRA FAST SPST PULSE MODULATOR/SWITCH

SIZE A SHEET 1 OF 2 DWG. # 100-2657
DESCRIPTION

AMC MODEL SW-2184-1A-243 IS A REFLECTIVE SPST SWITCH/MODULATOR WITH INTEGRAL TTL DRIVER, DESIGNED TO MAINTAIN VERY LOW IN-BAND VIDEO TRANSIENT SIGNALS, AND ULTRA FAST SWITCHING RESPONSE TIME.

SPECIFICATIONS

- **FREQUENCY RANGE**: 2–18 GHz MINIMUM
- **INSERTION LOSS**: 2–12 GHz, 2.5 dB MAXIMUM
- **12–18 GHz, 3.1 dB MAXIMUM**
- **ISOLATION**: 80 dB MINIMUM
- **VSWR (ON)**: 1.9:1 MAXIMUM
- **SWITCHING TIME**
  - **RISE (10% RF TO 90% RF)**: 2 ns MAXIMUM
  - **FALL (90% RF TO 10% RF)**: 2 ns MAXIMUM
  - **ON (50% TTL TO 90% RF)**: 10 ns MAXIMUM
  - **OFF (50% TTO TO 10% RF)**: 10 ns MAXIMUM
- **RF POWER RATINGS**: 2W CW MAXIMUM,
  10W PEAK (1 μs pw) MAXIMUM
- **CONTROL**: STANDARD TTL
  - LOGIC "0"= INSERTION LOSS
  - LOGIC "1"= ISOLATION
- **IN-BAND VIDEO POWER/TRANSIENTS**: 50mV P–P IN 20 MHz BANDWIDTH
- **POWER SUPPLY**: +5VDC ±5% @ 100 mA MAXIMUM
  - −15VDC ±5% @ 45 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SMC (MALE)
- **SIZE**: 0.792" x 1.97" x 0.56"

AVAILABLE OPTIONS

A01: 50 Ω CONTROL IMPEDANCE
A02: 100Ω CONTROL IMPEDANCE
A03: INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
A09: BALANCED ECL LOGIC (SOLDER PIN CONTROLS)
A10: ±9VDC TO ±18VDC SUPPLY POWER
A14: J1 SMA MALE, J2 SMA FEMALE
A15: TWO SMA MALE CONNECTORS
A16: SOLDER PIN CONTROL TERMINAL
A17: SMA MALE CONTROL TERMINAL
A18: SMA FEMALE CONTROL TERMINAL
A19: CANNON MULTIPIN MDM9SSP
240: 2 ns RISE/FALL TIME

ENVIRONMENTAL RATING

- **TEMPERATURE**: −55°C TO +95°C (OPERATING)
  - −65°C TO +125°C (STORAGE)
- **HUMIDITY**: MIL-STD-202F, METHOD 103B COND. B
- **SHOCK**: MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION**: MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE**: MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE**: MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE

SW-2184-1A-243
2-18 GHz, REFLECTIVE, LOW VIZED TRANSIENT, ULTRA FAST SPST PULSE MODULATOR/SWITCH

SIZE: A
SHEET 1 OF 2

REV 10-93

AMERICAN MICROWAVE CORP.
FREDERICK, MD. MADE IN USA

NOTES:
1. DIMENSIONS ARE IN INCHES [MILLIMETERS]
2. TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3. WEIGHT: APPROX. 1.3 OZ
AMC MODEL SW-2184-1A-113 IS A REFLECTIVE SPST SWITCH/MODULATOR WITH INTEGRAL ECL DRIVER, DESIGNED TO MAINTAIN VERY LOW IN-BAND VIDEO TRANSIENT SIGNALS, AND ULTRA FAST SWITCHING RESPONSE TIME.

SPECIFICATIONS
- **FREQUENCY RANGE** ............................................. 2–18 GHz MINIMUM
- **INSERTION LOSS** .................................................. 2–12 GHz, 2.5 dB MAXIMUM
  12–18 GHz, 3.1 dB MAXIMUM
- **ISOLATION** .......................................................... 80 dB MINIMUM
- **VSWR (ON)** ......................................................... 1.9:1 MAXIMUM
- **SWITCHING TIME**
  - **RISE** (10% RF TO 90% RF) .................................. 10 ns MAXIMUM
  - **FALL** (90% RF TO 10% RF) .................................. 10 ns MAXIMUM
  - **ON** (50% TTL TO 90% RF) .................................. 15 ns MAXIMUM
  - **OFF** (50% TTL TO 10% RF) .................................. 15 ns MAXIMUM
- **RF POWER RATINGS** ............................................. 2W CW MAXIMUM,
  10W PEAK (1 μs pw) MAXIMUM
- **CONTROL** .......................................................... SINGLE ENDED ECL LOGIC,
  50Ω CONTROL IMPEDANCE
  LOGIC "0" (-1.75V) = ISOLATION
  LOGIC "1" (-0.9V) = INSERTION LOSS
- **IN–BAND VIDEO POWER/TRANSIENTS** ....................... 50mV P-P IN 20 MHz BANDWIDTH
- **POWER SUPPLY** .................................................. +5VDC ±5% @ 100 mA MAXIMUM
  -5VDC ±5% @ 80 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT .................................................. SMA (FEMALE)
  - POWER .............................................................. SOLDER PIN CONTROL .......................................................... SMA (FEMALE)
- **SIZE** .............................................................. 0.792" x 1.97" x 0.56"

AVAILABLE OPTIONS
- A02 ................................................................. 100Ω CONTROL IMPEDANCE
- A03 ................................................................. INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A05 ................................................................. BALANCED ECL LOGIC (SOLDER PIN CONTROLS)
- A10 ................................................................. ±9VDC TO ±18VDC SUPPLY POWER
- A14 ................................................................. J1 SMA MALE, J2 SMA FEMALE
- A15 ................................................................. TWO SMA MALE CONNECTORS
- A16 ................................................................. SOLDER PIN CONTROL TERMINAL
- A17 ................................................................. SMA MALE CONTROL TERMINAL
- A18 ................................................................. SMC MALE CONTROL TERMINAL
- A19 ................................................................. CANNON Multipart MDM9SSP
- 240 ................................................................. 2ns RISE/FALL TIME

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: X.XXX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 1.3 OZ

ENVIRONMENTAL RATINGS
- **TEMPERATURE** ................................................. -55°C TO +85°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- **HUMIDITY** ...................................................... MIL-STD-202F, METHOD 103B COND. B
- **SHOCK** ........................................................ MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION** ..................................................... MIL-STD-202F, METHOD 204D COND. B
- **ALTIMITUDE** .................................................... MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE** ....................................... MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-2184-1A-113
2–18 GHz, REFLECTIVE, LOW VIDEO TRANSIENT, ULTRA FAST SPST PULSE MODULATOR/SWITCH

SIZE A SHEET 1 OF 2 DWG. # 100–2660
DESCRIPTION
AMC Model SW-2184-1-30 is a reflective broad-band SPST switch module without driver circuitry, packaged in a miniature connectorized housing.

SPECIFICATIONS
- **Frequency Range**: 2–18 GHz minimum
- **Insertion Loss**: 2 dB maximum
- **Isolation**: 60 dB minimum
- **VSWR (ON)**: 1.9:1 maximum
- **RF Power Ratings**: +30 dBm CW maximum, or +40 dBm peak @1μsec PW maximum
- **Switching Time**
  - Rise (10% RF to 90% RF): 10 ns maximum
  - Fall (90% RF to 10% RF): 10 ns maximum
  - ON (50% TTL to 90% RF): 20 ns maximum
  - OFF (50% TTL to 10% RF): 20 ns maximum
- **Controls**: Current/voltage driven, single control
  - -10 VDC = insertion loss
  - +30 mA = isolation
- **Connectors**
  - RF input/output: SMA female
  - Control: SMC male
- **Size**: 0.80" x 0.80" x 0.42"

AVAILABLE OPTIONS
- A04: Input/output video filter (0.5 dB excess loss)
- A05: Extended frequency range to 100 MHz
- A06: 5 watts CW maximum
- A07: 2 ns rise/fall time
- A13: J1 SMA male, J2 SMA female
- A14: Two SMA male connectors
- A15: Removable connectors (drop-in applications)
- A16: Solder pin control connector
- A17: SMA female control connector

ENVIRONMENTAL RATINGS
- **Temperature**: -55°C to +85°C (operating)
  - -65°C to +125°C (storage)
- **Humidity**: MIL-STD-202F, Method 103B cond. B
- **Vibration**: MIL-STD-202F, Method 204D cond. B
- **Altitude**: MIL-STD-202F, Method 105C cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D cond. A

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PRODUCT FEATURE
SW-2184-1-30
2–18 GHz, reflective SPST pulse modulator switch

SIZE A
SHEET 1 OF 2
Dwg. #: 100-2904
DESCRIPTION

AMC Model SW-2182-1A-230 is a reflective SPST switch module with integral driver, capable of handling 10 W CW RF power over 8 to 18 GHz band width.

SPECIFICATIONS

- **Frequency Range**: 8–18 GHz minimum
- **Insertion Loss**: 1.9 dB maximum
- **Isolation**: 45 dB minimum
- **VSWR (ON)**: 1.7:1 maximum
- **RF Power Ratings**: 10 W CW maximum (cold switching)
- **Switching Time**
  - Rise (10% RF to 90% RF): 150 ns maximum
  - Fall (90% RF to 10% RF): 150 ns maximum
  - On (50% TTL to 90% RF): 200 ns maximum
  - Off (50% TTL to 10% RF): 200 ns maximum
- **Control**: TTL compatible, unity load
  - Logic "0" = Insertion Loss
  - Logic "1" = Isolation
- **Power Supply**: +15VDC ±5% @ 55 mA maximum
  - -30VDC ±5% @ 35 mA maximum
- **Connectors**
  - RF Input/Output: SMA Female
  - Power: Solder Pin
  - Control: SMC Male
- **Size**: 0.792" x 1.97" x 0.56"

AVAILABLE OPTIONS

- A01: 50Ω Control Impedance
- A02: 100Ω Control Impedance
- A03: Inverse Control Logic (Logic "0" Isolation)
- A04: Video Filter (0.5 dB Excess Loss)
- A08: Single Ended ECL Logic
- A09: Balanced ECL Logic (Solder Pins)
- A14: J1 SMA Male, J2 SMA Female
- A15: Two SMA Male Connectors
- A16: Solder Pin Control Terminal
- A17: SMA Female Control Terminal
- A18: Cannon Multipin MDMSSP

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS

- **Temperature**: -55°C to +85°C (operating)
  - -65°C to +125°C (storage)
- **Humidity**: MIL-STD-202F, Method 103B Cond. B
- **Shock**: MIL-STD-202F, Method 213B Cond. B
- **Vibration**: MIL-STD-202F, Method 2040 Cond. B
- **Altitude**: MIL-STD-202F, Method 105C Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D Cond. A

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PRODUCT FEATURE

SW-2182-1A-230
8–18 GHz, Reflective, 10W SPST Switch Module

SIZE A SHEET 1 OF 2 DWG # 100-2690
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DESCRIPTION

AMC MODEL SW-0405-1DT IS A REFLECTIVE SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR HIGH RELIABILITY APPLICATIONS SUCH AS SHIPBOARD RADARS WHERE SWITCHING SPEED, ISOLATION AND SPECTRAL PURITY ARE OF EXTREME IMPORTANCE.

SPECIFICATIONS

- FREQUENCY RANGE: 400-500 MHz MINIMUM
- INSERTION LOSS: 1.0 dB MAXIMUM
- INSERTION LOSS VARIATION: ±0.3 dB MAXIMUM OVER ALL OPERATING CONDITIONS OF INPUT POWER, FREQUENCY, AND ENVIRONMENTAL EXTREMES
- ISOLATION: 70 dB MINIMUM
- VSWR (ON/OFF): 1.3:1 MAXIMUM
- RF POWER: +16 dBm CW MAXIMUM
- SWITCHING TIME
  - RISE (10% RF TO 90% RF): 40 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 40 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 300 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 300 ns MAXIMUM
- SETTLING TIME
  - ON (90% TO WITHIN ±0.25 dB OF INSERTION LOSS) 0.7 μs MAXIMUM
  - OFF (10% TO MINIMUM ISOLATION REQUIREMENT) 1.0 μs MAXIMUM
- VOLTAGE TRANSIENTS: 1 Vpp MAXIMUM ACROSS 50Ω LOAD
- CONTROLS: STANDARD TTL COMPATIBLE
  - SINGLE CONTROL
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
- HARMONIC DISTORTION PRODUCTS: 50 dBc MINIMUM
- SPURIOUS SIGNALS/SPECTRAL PURITY (AM/PM SIDEBANDS IN OPERATING BAND): 100 dB BELOW THE OUTPUT SIGNAL LEVEL
- RF LEAKAGE
  - RADIATIVE: -90 dBm/SQUARE FOOT
  - 1 FOOT DISTANCE APPROXIMATELY 90 dBm ON SUPPLY AND CONTROL LINES.
  - CONDUCTIVE:
  - RADIATION SUSCEPTIBILITY: ≥-76 dBm FOR RF INTERFERENCE FIELD OF -20 dBm/SQUARE FOOT
  - CONDUCTED SUSCEPTIBILITY: ≥-76 dBm FOR RF INTERFERENCE LEVEL OF -20 dBm ON DC POWER LINES
  - CONDUCTED SUSCEPTIBILITY (INTERMODULATION): ≥-85 dBm FOR -20 dBm RF INTERFERENCE LEVEL ON DC POWER LINES
  - POWER SUPPLY: +5VDC ±5% @ 90 mA MAXIMUM
  - +15VDC ±5% @ 80 mA MAXIMUM (OVER VOLTAGE PROTECTED)
- CONNECTORS
  - RF INPUT/OUTPUT: SMA FEMALE
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- SIZE: 1.69" x 1.19" x 0.675"

ENVIRONMENTAL RATINGS

- TEMPERATURE: 0°C TO +65°C (OPERATING)
- HUMIDITY: -55°C TO +70°C (STORAGE)
- SHOCK: MIL-STD-202, METHOD 103, CONDITION B
- VIBRATION: MIL-8-167, TYPE 1 VIBRATION, 0.3G SINUSODAL 20 Hz TO 2000 Hz
- MTBF: 1 X 10⁶ HOURS, @-50°C OPERATION

ENVIRONMENTAL STRESS SCREENING (ESS)

- TEMPERATURE CYCLES: 10 CYCLES, 1/2 HOUR SOAK MINUTE, -55°C TO +65°C
- TEMPERATURE SHOCK: 4 CYCLES, -55°C TO +65°C
- VIBRATION: 10 G@60 Hz FOR 1 MINUTE, 3 AXIS
- BURN IN (OPERATIONAL): MIL-STD-883 METHOD 1014.4 TEST CONDITION B, 160 HOURS @125°C JUNCTION TEMPERATURE (105°C AMBIENT)
- ESS (NEXT HIGHER ASSEMBLY)
  - THERMAL: 5 CYCLES, 5°C PER MINUTE, -55°C TO +65°C
  - RANDOM VIBRATION: 20 TO 2000 Hz AND 6 G RMS, 10 MINUTES PER AXIS AT +65°C/-55°C

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE

SW-0405-1DT
(B-BAND)

400-500 MHz, NON-REFLECTIVE SOLID STATE SPST SWITCH MODULE

- SIZE A
- SHEET 1 OF 2
- DWG #: 100-2907
FUNCTIONAL SCHEMATIC

TTL DRIVER

REFERENCE VOLTAGE

+5VDC

+15VDC

E1

GND

BIAS A

BIAS B

RF SECTION

R

BIAS A

J1

R

BIAS B

BIAS B

J2
DESCRIPTION
AMC MODEL SWM-6000-1DT IS AN ABSORPTIVE GaAs MMIC SPST SWITCH/MODULATOR WITH INTEGRAL TTL DRIVER, PACKAGED IN A LOW PROFILE HOUSING.

SPECIFICATIONS
- FREQUENCY RANGE: DC–6.0 GHz
- INSERTION LOSS:
  - DC–1 GHz: 1.2 dB MAXIMUM
  - 1–2 GHz: 1.4 dB MAXIMUM
  - 2–4 GHz: 1.9 dB MAXIMUM
  - 4–6 GHz: 2.5 dB MAXIMUM
- ISOLATION:
  - DC–1 GHz: 50 dB MINIMUM
  - 1–4 GHz: 45 dB MINIMUM
  - 4–6 GHz: 40 dB MINIMUM
- VSWR (ON/OFF):
  - DC–1 GHz: 1.5:1 MAXIMUM
  - 1–2 GHz: 1.8:1 MAXIMUM
  - 2–6 GHz: 2.0:1 MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 10 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 20 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 20 ns MAXIMUM
- VIDEO TRANSIENTS:
  - 30 mV (P–P) MAXIMUM, 300 MHz BW
- RF POWER RATINGS (dB COMP.):
  - 0.5–6 GHz: +20 dBm TYPICAL
  - 0.001 GHz: +12 dBm TYPICAL
- CONTROL:
  - TTL COMPATIBLE, UNIANT LOAD LOGIC "0" ISOLATION
  - LOGIC "1" INSERTION LOSS.
- POWER SUPPLY:
  - +5VDC ±5% @ 5 mA MAXIMUM
  - –5VDC ±5% @ 5 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: FIELD REPLACEABLE SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
  - NOTE: RF CONNECTORS CAN BE PLACED SIDE BY SIDE OR IN ANGLE.
  - (CONSULT FACTORY FOR AVAILABLE MECHANICAL OPTIONS)
- SIZE: 1.50" x 1.50" x 0.40"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: HERMETIC SEALING (MIL-STD-883)
- A04: INVERSE CONTROL LOGIC (LOGIC "0" = INSERTION LOSS)
- A05: SINGLE ENDED ECL CONTROL LOGIC
- A06: DIFFERENTIAL TTL CONTROL LOGIC (R2=422 LOGIC FAMILY)
- A07: BALANCED ECL CONTROL LOGIC
- A08: HIGH ISOLATION (CONSULT FACTORY)
- A09: SMC MALE CONTROL CONNECTOR
- A10: SMA FEMALE CONTROL CONNECTOR

MECHANICAL OUTLINE

ENVIROMENTAL RATINGS
- TEMPERATURE: –55°C TO +95°C (OPERATING)
  - –65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B, COND. B
- SHOCK: MIL-STD-202F, METHOD 213B, COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D, COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C, COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D, COND. A

AMERICAN MICROWAVE CORPORATION
7311 G ROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SWM-6000-1DT
DC–6 GHz, GaAs MMIC, NON-REFLECTIVE, LOW INSERTION LOSS AND FAST SPST SWITCH/MODULATOR

SIZE A SHEET 1 OF 2 DWG. # 100-2854
DESCRIPTION
AMC MODEL SWM-6000-1DTU IS AN ABSORPTIVE GaAs MMIC SPST SWITCH/MODULATOR WITH INTEGRAL TTL DRIVER, DESIGNED TO MAINTAIN HIGH ISOLATION AND VERY FAST SWITCHING TIME, PACKAGED IN A SMALL RUGGED HOUSING.

SPECIFICATIONS
- FREQUENCY RANGE: DC–6.0 GHz
- INSERTION LOSS:
  - DC–500 MHz: 2.0 dB MAXIMUM
  - 0.5–3.0 GHz: 2.5 dB MAXIMUM
  - 3.0–5.0 GHz: 3.0 dB MAXIMUM
  - 5.0–6.0 GHz: 3.5 dB MAXIMUM
- ISOLATION:
  - DC–3.0 GHz: 80 dB MAXIMUM
  - 3.0–4.0 GHz: 60 dB MINIMUM
  - 4.0–6.0 GHz: 50 dB MINIMUM
- VSWR (ON/OFF): 1.5:1 MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 5 nS MAXIMUM
  - FALL (90% RF TO 10% RF): 5 nS MAXIMUM
  - ON (50% TTL TO 90% RF): 15 nS MAXIMUM
  - OFF (50% TTL TO 10% RF): 15 nS MAXIMUM
- RF POWER RATINGS:
  - DC–2.0 GHz: +22 dBm MAXIMUM
  - 2.0–6.0 GHz: +26 dBm MAXIMUM
- CONTROL:
  - TTL COMPATIBLE, UNITY LOAD,
  - LOGIC "0" ISOLATION
  - LOGIC "1" INSERTION LOSS.
- VOLTAGE TRANSIENTS: 50 mV P-P, 100 MHz BANDWIDTH
- POWER SUPPLY:
  - +5VDC ±5% @ 40 mA MAXIMUM
  - -5VDC ±5% @ 40 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: FIELD REPLACEABLE SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- SIZE: 1.40" x 0.80" x 0.40"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A10: ±9VDC TO ±18VDC SUPPLY
- A11: SMC MALE CONTROL CONNECTOR
- A12: SMA FEMALE CONTROL CONNECTOR
- A13: DIFFERENTIAL TTL LOGIC CONTROLS
- A14: J1 SMA MALE, J2 SMA FEMALE
- A15: TWO SMA MALE CONNECTORS

ENVIRONMENTAL RATINGS
- TEMPERATURE: −55°C TO +95°C (OPERATING)
- −65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD–202F, METHOD 103B Cond. B
- VIBRATION: MIL-STD–202F, METHOD 204D Cond. B
- TEMPERATURE CYCLE: MIL-STD–202F, METHOD 107D Cond. A

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TEL: (301) 662–4700  FAX: (301) 662–4938

PRODUCT FEATURE
SWM–6000–1DTU
DC TO 6 GHz, NON-REFLECTIVE, GaAs MMIC SPST SWITCH/MODULATOR

SIZE A  SHEET 1 OF 2  DWG. # 100–2626
DESCRIPTION
AMC MODEL SW-2183-1AT-250 IS AN ABSORPTIVE ULTRA BROAD BAND (10 MHz–18 GHz) SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
- FREQUENCY RANGE ................. 0.01–18 GHz MINIMUM
- INSERTION LOSS .................. 3.5 dB MAXIMUM
- ISOLATION
  0.01–0.02 GHz 60 dB MINIMUM
  0.02–1.0 GHz 70 dB MINIMUM
  1.0–12.4 GHz 80 dB MINIMUM
  12.4–18.0 GHz 70 dB MINIMUM
- VSWR (ON/OFF) .................. 2:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) .......... 15 nS MAXIMUM
  FALL (90% RF TO 10% RF) .......... 15 nS MAXIMUM
  ON (50% CTL TO 80% RF) .......... 80 nS MAXIMUM
  OFF (50% CTL TO 10% RF) .......... 40 nS MAXIMUM
- CONTROL
  TTL COMPATIBLE. UNITY LOAD
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
- RF POWER RATINGS:
  OPERATING ....................... +20dBm CW MAXIMUM
  SURVIVAL ....................... +27dBm CW OR 10 W (1μS, PW)
- POWER SUPPLY ................... +5VDC ±5% @ 90 mA MAXIMUM
  -12VDC ±5% @ 75 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ................. SMA FEMALE
  POWER ......................... SOLDER PIN
  CONTROL ....................... SMC MALE
- SIZE ............................. 1.00" x 1.00" x 0.53"

AVAILABLE OPTIONS
A01 .................. 50Ω CONTROL IMPEDANCE
A02 .................. 100Ω CONTROL IMPEDANCE
A03 .................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A13 .................. +12 TO +15 VOLTS SUPPLY
A14 .................. J1 SMA MALE, J2 SMA FEMALE
A15 .................. J1, J2 SMA MALE
A17 .................. -15 VOLTS SUPPLY
A18 .................. SOLDER TYPE CONTROL TERMINAL

ENVIRONMENTAL RATINGS
- TEMPERATURE .................... -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY ....................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK ......................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ...................... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ....................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 107D COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2183-1AT-250
HIGH SPEED, 0.01–18 GHz, NON-REFLECTIVE, SPST MODULATOR/SWITCH

SIZE A SHEET 1 OF 2 Dwg. # 100-2007
DESCRIPTION
AMC MODEL SW-2183-1AT-107 IS AN ABSORPTIVE BROAD BAND
SPST SWITCH MODULE WITH INTEGRAL DRIVER AND DIFFERENTIAL
LINE RECEIVER INTERFACE CAPABILITY FOR APPLICATIONS WHERE
CONTROL SIGNALS ARE CARRIED BY LONG AND NOISY TRANSMISSION
LINES.

SPECIFICATIONS
- FREQUENCY RANGE: 0.3-18 GHz MINIMUM
- INSERTION LOSS: 3.5 dB MAXIMUM
- ISOLATION:
  - 0.3-1.0 GHz: 70 dB MINIMUM
  - 1.0-12.4 GHz: 80 dB MINIMUM
  - 12.4-18.0 GHz: 70 dB MINIMUM
- VSWR (ON/OFF): 2:1 MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 10 nS MAXIMUM
  - FALL (90% RF TO 10% RF): 10 nS MAXIMUM
  - ON (50% CTL TO 90% RF): 50 nS MAXIMUM
  - OFF (50% CTL TO 10% RF): 50 nS MAXIMUM
- CONTROL: DIFFERENTIAL LINE RECEIVER, PAIRS
  (RI+, RI-), COMPATIBLE TO ST506, ST412,
  ESI, AND RS-422 LOGIC FAMILIES.
  (100Ω INPUT IMPEDANCE).
- RF POWER RATINGS:
  OPERATING: +27 dBm CW, MAXIMUM
  SURVIVAL: +30 dBm CW, OR 10 W (1µ S, PW)
- POWER SUPPLY:
  +5VDC ±5% AT 90 mA MAXIMUM
  -5VDC ±5% AT 75 mA MAXIMUM
- CONNECTORS:
  RF INPUT/OUTPUT: SMA FEMALE
  POWER: SOLDERED PIN
  CONTROL: SOLDERED PIN
- SIZE: 1.00" x 1.00" x 0.53"

AVAILABLE OPTIONS
A03: INVERSE LOGIC
A07: INPUT/OUTPUT VIDEO FILTER
  (0.5 dB EXCESS LOSS, 2-18 GHz)
A13: +12 TO +15 VOLTS SUPPLY
A14: J1 SMA MALE, J2 SMA FEMALE
A15: J1, J2 SMA MALE
A16: 85 dB ISOLATION (2-18 GHz,
  0.3 dB EXCESS LOSS)
A17: -12 TO -15 VOLTS SUPPLY

MECHANICAL OUTLINE

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</tr>
<tr>
<td>L</td>
<td>H</td>
<td>OFF</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 1.5 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE:
  -55°C TO +85°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY
  MIL-STD-202F, METHOD 103B COND. B
- SHOCK
  MIL-STD-202F, METHOD 213B COND. B
- VIBRATION
  MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE
  MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE
  MIL-STD-202F, METHOD 107D COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2183-1AT-107
HIGH SPEED, 0.3-18 GHz, NON-REFLECTIVE, SPST MODULATOR/SWITCH

SIZE A SHEET 1 OF 2 Dwg. # 100-2754
DESCRIPTION
AMC MODEL SW-2183-1AT-210 IS AN ABSORPTIVE BROAD BAND SPST SWITCH MODULE WITH INTEGRAL DRIVER AND BALANCED ECL CONTROL CAPABILITY FOR HIGH SPEED APPLICATIONS.

SPECIFICATIONS
- FREQUENCY RANGE: 0.3–18 GHz MINIMUM
- INSERTION LOSS: 3.5 dB MAXIMUM
- ISOLATION: 0.3–1.0 GHz 70 dB MINIMUM
  1.0–12.4 GHz 80 dB MINIMUM
  12.4–18.0 GHz 70 dB MINIMUM
- VSWR (ON/OFF): 2:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF): 10 nS MAXIMUM
  FALL (90% RF TO 10% RF): 10 nS MAXIMUM
  ON (50% CTRL TO 90% RF): 35 nS MAXIMUM
  OFF (50% CTRL TO 10% RF): 20 nS MAXIMUM
- CONTROL: BALANCED ECL PAIRS (–C, +C),
  (100Ω INPUT IMPEDANCE).
- RF POWER RATINGS
  OPERATING: +27 dBm CW, MAXIMUM
  SURVIVAL: +30 dBm CW, OR 10 W (1 μS, PW)
- POWER SUPPLY: +5VDC ±5% @ 90 mA MAXIMUM
  −5VDC ±5% @ 75 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT: SMA FEMALE
  POWER: SOLDER PIN
  CONTROL: SOLDER PIN
- SIZE: 1.00" x 1.00" x 0.53"

AVAILABLE OPTIONS
- A03: INVERSE LOGIC
- A07: INPUT/OUTPUT VIDEO FILTER
  (5.0 dB EXCESS LOSS, 2–18 GHz)
- A13: +12 TO +15 VOLTS SUPPLY
- A14: J1 SMA MALE, J2 SMA FEMALE
- A15: J1, J2 SMA MALE
- A16: 85 dB ISOLATION (2–18 GHz,
  0.3 dB EXCESS LOSS)
- A17: −12 TO −15 VOLTS SUPPLY
- A18: EXTENDED FREQUENCY TO 10 MHz

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
X.XXX ±0.010
3) WEIGHT: APPROX. 1.5 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE: −55°C TO +95°C (OPERATING)
  −65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311C GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2183-1AT-210
HIGH SPEED, 0.3 TO 18 GHz, NON-REFLECTIVE, SPST MODULATOR/SWITCH
SIZE: A
SHEET 1 OF 2
DRAWING # 100-2755
DESCRIPTION

AMC MODEL SW-2184-1AT IS AN ABSORPTIVE SPST SWITCH WITH INTEGRAL TTL DRIVER DESIGNED FOR HIGH ISOLATION, HIGH SPEED, AND LOW VIDEO TRANSIENT APPLICATIONS.

SPECIFICATIONS

- **FREQUENCY RANGE** ..................... 2–18 GHz MINIMUM
- **INSERTION LOSS** ....................... 3.5 dB MAXIMUM
- **ISOLATION** .................... 80 dB MINIMUM
- **VSWR (ON/OFF)** ...................... 2.0:1 MAXIMUM
- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF) ............. 10 nsec MAXIMUM
  - FALL (90% RF TO 10% RF) ............. 10 nsec MAXIMUM
  - ON (50% TTL TO 90% RF) ............. 50 nsec MAXIMUM
  - OFF (50% TTL TO 10% RF) ............. 50 nsec MAXIMUM
- **RF POWER RATINGS** ................ +23 dBm CW MAXIMUM
- **IN–BAND VIDEO POWER/TRANSIENTS**
  - –60 dBm MAXIMUM, OR
  - 10 mV (P–P) IN 100 MHz BW
- **CONTROLS** ......................... TTL COMPATIBLE, UNITY LOAD
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
- **POWER SUPPLY** ..................... +5VDC ±5% @70 mA MAXIMUM
  - –5VDC ±5% @70 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT .................. SMA FEMALE
  - POWER ......................... SOLDER PIN (EMI)
  - CONTROL ....................... SMC (MALE)
- **SIZE** ............................. 1.10" x 1.16" x 0.85"

AVAILABLE OPTIONS

- A01 .................. 50Ω CONTROL IMPEDANCE
- A02 .................. 100Ω CONTROL IMPEDANCE
- A03 .................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A13 .................. ±9 TO ±15 VOLTS SUPPLY
- A14 .................. J1 SMA MALE, J2 SMA FEMALE CONNECTORS
- A15 .................. TWO SMA MALE CONNECTORS
- A18 .................. SOLDER TYPE CONTROL TERMINAL
- 240 .................. 6.0–18.5 GHz, 1 WATT CW RF POWER

MECHANICAL OUTLINE

MARKINGS THIS SURFACE
DRIVER SIDE COVER

ENVIRONMENTAL RATINGS

- **TEMPERATURE** ..................... –55°C TO +95°C (OPERATING)
  - –65°C TO +125°C (STORAGE)
- **HUMIDITY** ........................ MIL-STD-202F, METHOD 103B COND. B
- **SHOCK** ............................. MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION** ......................... MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE** ........................ MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE** ............... MIL-STD-202F, METHOD 107D COND. A

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7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE

SW-2184-1AT-230
2–18 GHz, NON-REFLECTIVE SPST SWITCH/MODULATOR

SIZE A SHEET 1 OF 2 DWG. # 100-2980
DESCRIPTION
AMC MODEL SW-2184-1AT IS AN ABSORPTIVE SPST SWITCH WITH INTEGRAL TTL DRIVER DESIGNED FOR HIGH ISOLATION, HIGH SPEED, AND LOW VIDEO TRANSIENT APPLICATIONS.

SPECIFICATIONS
- FREQUENCY RANGE: 2-18 GHz MINIMUM
- INSERTION LOSS: 3.5 dB MAXIMUM
- ISOLATION: 80 dB MINIMUM
- VSWR (ON/OFF): 2.0:1 MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 10 nsec MAXIMUM
  - FALL (90% RF TO 10% RF): 10 nsec MAXIMUM
  - ON (50% TTL TO 90% RF): 30 nsec MAXIMUM
  - OFF (50% TTL TO 10% RF): 30 nsec MAXIMUM
- RF POWER RATINGS: +27 dBm CW MAXIMUM
- IN-BAND VIDEO POWER/TRANSIENTS: -60 dBm MAXIMUM, OR 10 mV (P-P) IN 100 MHz BW
- CONTROLS:
  - TTL COMPATIBLE, UNITY LOAD
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
- POWER SUPPLY:
  - +5VDC ±5% @ 70 mA MAXIMUM
  - -5VDC ±5% @ 70 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: SMA FEMALE
  - POWER: SOLDER PIN (EMI)
  - CONTROL: SMC (MALE)
- SIZE: 1.0" x 1.0" x 0.53"

AVAILABLE OPTIONS
- AO1: 50 ohm CONTROL IMPEDANCE
- AO2: 100 ohm CONTROL IMPEDANCE
- AO3: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A13: ±9 TO ±15 VOLTS SUPPLY
- A14: J1 SMA MALE, J2 SMA FEMALE CONNECTORS
- A15: TWO SMA MALE CONNECTORS
- A18: SOLDER TYPE CONTROL TERMINAL

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: XXX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 1.5 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE:
  - -55°C TO +85°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- HUMIDITY:
  - MIL-STD-202F, METHOD 103B COND. B
- SHOCK:
  - MIL-STD-202F, METHOD 213B COND. B
- VIBRATION:
  - MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE:
  - MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE:
  - MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-2184-1AT-231
2-18 GHz, NON-REFLECTIVE SPST SWITCH/MODULATOR

SIZE: A
SHEET: 1 OF 2
DRAWING: 100-2871
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<td>5 nsec, 70 dB ISOLATION, MINIATURE SWITCH MODULE, AMC MODEL NO: SW-2181-2A-171</td>
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<td>50 nsec, SLIM LINE SWITCH MODULE, AMC MODEL NO: SW-2181-2A-305</td>
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</table>
DESCRIPTION

AMC MODEL SWM-DC20-2D IS A REFLECTIVE GaAs MMIC SPDT SWITCH/MODULATOR WITH INTEGRAL TTL DRIVER, DESIGNED FOR ULTRA BROAD-BAND, FAST SWITCHING TIME, AND LOW DC POWER CONSUMPTION, PACKAGED IN A LOW PROFILE HOUSING.

SPECIFICATIONS

- FREQUENCY RANGE: DC-20 GHz
- INSERTION LOSS:
  - DC-10 GHz: 2.2 dB MAXIMUM
  - 10-18 GHz: 2.6 dB MAXIMUM
  - 18-20 GHz: 3.5 dB MAXIMUM
- ISOLATION:
  - DC-10 GHz: 50 dB MINIMUM
  - 10-18 GHz: 42 dB MINIMUM
  - 18-20 GHz: 40 dB MINIMUM
- VSWR (ON): 2:1 MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 10 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 20 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 20 ns MAXIMUM
- RF POWER RATINGS (1dB COMP.)
  - 0.5-20 GHz: +25 dBm TYPICAL
  - 0.05 GHz: +18 dBm TYPICAL
- CONTROL:
  - TTL COMPATIBLE, UNITY LOAD
  - SINGLE CONTROL (TOGGLE)
  - (SEE LOGIC TABLE)
- POWER SUPPLY:
  - +7VDC TO +18VDC ±5% @ 40 mA MAXIMUM
  - -7VDC TO -18VDC ±5% @ 40 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT:
  - FIELD REPLACEABLE SMA (FEMALE)
  - POWER:
  - SOLDER PIN
  - CONTROL:
  - SOLDER PIN
  - NOTE: RF CONNECTORS CAN BE PLACED SIDE BY SIDE OR IN ANGLE.
    (CONSULT FACTORY FOR AVAILABLE MECHANICAL OPTIONS)
- SIZE: 1.50" x 1.50" x 0.40"

AVAILABLE OPTIONS

- A01: 50Q CONTROL IMPEDANCE
- A02: 100Q CONTROL IMPEDANCE
- A03: HERMETIC SEALING (MIL-STD-883)
- A04: ±5VDC POWER SUPPLY
- A05: INVERSE CONTROL LOGIC (LOGIC "0" = J1-J2 PATH ON)
- A06: SINGLE ENDED ECL CONTROL LOGIC
- A07: BALANCED ECL CONTROL LOGIC
- A08: DIFFERENTIAL TTL CONTROL LOGIC (RS-422 LOGIC FAMILY)
- A09: HIGH ISOLATION (CONSULT FACTORY)
- A10: SMA MALE CONTROL CONNECTOR
- A11: SMA FEMALE CONTROL CONNECTOR
- A12: OTHER POWER SUPPLIES (CONSULT FACTORY)

MECHANICAL OUTLINE

LOGIC TABLE

<table>
<thead>
<tr>
<th>E1</th>
<th>J1-J2</th>
<th>J1-J3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>0</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

NOTES:

1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: 
   - X.XX ± 0.020
   - X.XXX ± 0.010
3) WEIGHT: APPROX. 1.5 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE:
  - -55°C TO +95°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- HUMIDITY:
  - MIL-STD-202F, METHOD 103B COND. B
- SHOCK:
  - MIL-STD-202F, METHOD 213B COND. B
- VIBRATION:
  - MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE:
  - MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE:
  - MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE

SWM-DC20-2D

DC-20 GHz, GaAs MMIC, REFLECTIVE, ULTRA BROAD-BAND SPDT SWITCH/MODULATOR

SIZE A

SHEET 1 OF 2

Dwg. # 100-2915
DESCRIPTION

AMC MODEL SW-0105-2A IS A REFLECTIVE SPDT SWITCH MODULE WITH INTEGRAL DRIVER, DESIGNED TO MAINTAIN LOW LOSS/VSWR AND VIDEO TRANSIENT RESPONSES. APPLICATIONS ARE FOR HIGHLY SENSITIVE LOW-NOISE RADARS, RECEIVERS, AND MISSILE SYSTEMS.

SPECIFICATIONS

- FREQUENCY RANGE .............. 100-500 MHz MINIMUM
- INSERTION LOSS ................. 0.8 dB MAXIMUM
- AMPLITUDE BALANCE .............. ±0.1 dB MAXIMUM
- PHASE BALANCE ................. ±0.5° MAXIMUM
- ISOLATION ..................... 60 dB MINIMUM
- VSWR ......................... 1.3:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ....... 300 ns MAXIMUM
  FALL (90% RF TO 10% RF) ...... 300 ns MAXIMUM
  ON (50% TTL TO 90% RF) ...... 500 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ..... 500 ns MAXIMUM
- RF POWER RATINGS .......... +30 dBm CW MAXIMUM
- RF LEAKAGE (CONDUCTIVE/RADIATED) .... 60 dBc MINIMUM
- IN-BAND VIDEO POWER/TRANSIENTS ........................................... -60 dBm MAXIMUM
- CONTROLS .................. TTL COMPATIBLE, UNITY LOAD
  2 INDIVIDUAL CONTROLS
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
  (SEE TRUTH TABLE)

- POWER SUPPLY ..................... +5VDC ±5% @ 130 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ....... SMA FEMALE
  POWER .................... SOLDER PIN
  CONTROL ................. SOLDER PIN
- SIZE ......................... 1.5" x 1.5" x 0.88"

AVAILABLE OPTIONS

A01 .................. 50Ω CONTROL IMPEDANCE
A02 .................. 100Ω CONTROL IMPEDANCE
A03 .................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A08 .................. SINGLE CONTROL LOGIC (LOGIC "0" = J1-J2 PATH ON)
A16 .................. +9 TO +18 VDC POWER SUPPLY
A17 .................. EXTENDED FREQUENCY BAND
                    (FROM 10 MHz TO 18 GHz, CONSULT FACTORY)

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>E3</th>
<th>E2</th>
<th>RF PATH ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>J1-J2</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>J1-J3</td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 5 OZ

ENVIRONMENTAL RATING

- TEMPERATURE .......... -55°C TO +55°C (OPERATING)
                        -65°C TO +125°C (STORAGE)
- HUMIDITY .......... MIL-STD-202F, METHOD 103B COND. B
- SHOCK .......... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION .......... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE .......... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE

SW-0105-2A
100-500 MHz, LOW NOISE, REFLECTIVE SPDT SWITCH MODULE

SIZE A SHEET 1 OF 2 DWG. # 100-2870
DESCRIPTION

AMC MODEL SW-0205-2D IS A REFLECTIVE SPOT SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR HIGH RELIABILITY APPLICATIONS SUCH AS SHIPBOARD RADARS WHERE SWITCHING SPEED, ISOLATION AND SPECTRAL PURITY ARE OF EXTREME IMPORTANCE.

SPECIFICATIONS

- FREQUENCY RANGE: 200–500 MHz MINIMUM
- INSERTION LOSS: 0.6 ±0.2 dB
- INSERTION LOSS BALANCE: 0.2 dB MAXIMUM
- INSERTION LOSS VARIATION OVER TEMPERATURE: ±0.1 dB MAXIMUM OVER OPERATING TEMPERATURE RANGE
- INSERTION LOSS VARIATION OVER FREQUENCY: ±0.1 dB MAXIMUM
- ISOLATION: 45 dB MINIMUM
- VSWR (ON): 1.3:1 MAXIMUM
- RF POWER: +16 dBm CW MAXIMUM
- SWITCHING TIME
  - RISE (10% RF TO 90% RF): 40 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 40 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 300 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 300 ns MAXIMUM
- SETTLING TIME
  - ON (90% TO WITHIN ±0.25 dB OF INSERTION LOSS): 0.7 μs MAXIMUM
  - OFF (10% TO MINIMUM ISOLATION REQUIREMENT): 1.0 μs MAXIMUM
- VOLTAGE TRANSIENTS: 1 V pp MAXIMUM ACROSS 50 Ω LOAD
- CONTROLS: STANDARD TTL COMPATIBLE
  - 2 INDIVIDUAL CONTROLS
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
  - (SEE TRUTH TABLE)
- HARMONIC DISTORTION PRODUCTS: 50 dBc MINIMUM
- SPURIOUS SIGNALS/SPECTRAL PURITY (AM/PM SIDEBANDS IN OPERATING BAND): 90 dB BELOW THE OUTPUT SIGNAL LEVEL
- RF LEAKAGE
  - RADIOACTIVE: −90 dBm/SQUARE FOOT, 1 FOOT DISTANCE APPROXIMATELY
  - CONDUCTIVE: −80 dBm ON SUPPLY AND CONTROL LINES.
- RADIATION SUSCEPTIBILITY: ≥−76 dBm FOR RF INTERFERENCE FIELD OF −20 dBm/SQUARE FOOT
- CONDUCTED SUSCEPTIBILITY: ≥−76 dBm FOR RF INTERFERENCE LEVEL OF −85 dBm ON DC POWER LINES
- CONDUCTED SUSCEPTIBILITY (INTERMODULATION): ≥−85 dBm FOR −20 dBm RF INTERFERENCE LEVEL ON DC POWER LINES
- POWER SUPPLY: +5 VDC ±5% @ 90 mA MAXIMUM
  - +15 VDC ±5% @ 40 mA MAXIMUM (OVER VOLTAGE PROTECTED)
- CONNECTORS
  - RF INPUT/OUTPUT: SMA FEMALE
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- SIZE: 1.69" x 1.19" x 0.675"

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
3) WEIGHT: APPROX. 3 DZ
4) MATERIALS PROCESS AND PARTS TO MIL-21500, MIL-DE 38510
5) CALIBRATION, MIL-STD-454
6) MOUNTING, MIL-STD-18701

ENVIRONMENTAL RATINGS

- TEMPERATURE: 0°C TO +65°C (OPERATING)
- −55°C TO +70°C (STORAGE)
- HUMIDITY: MIL-STD-202, METHOD 103, CONDITION B
- SHOCK: MIL-S-901 GRADE A, CLASS I AND II
- VIBRATION: MIL-S-167, TYPE 1 VIBRATION, 0.1 G RMS, SINE, 25 HZ TO 2000 HZ
- MTBF: 1 x 10⁶ HOURS, @ +50°C OPERATION

ENVIRONMENTAL STRESS SCREENING (ESS)

- TEMPERATURE CYCLES: 10 CYCLES, 1/2 HOUR DUR MINIMUM, −55°C TO +85°C
- TEMPERATURE SHOCK: 4 CYCLES, −55°C TO +85°C
- VIBRATION: 10 G @ 60 Hz FOR 1 MINUTE, 3 AXES
- BURN IN (OPERATING): MIL-STD-883 METHOD 1014.0 TEST CONDITION B
- 160 HOURS @ 125°C JUNCTION TEMPERATURE (105°C AMBIENT)
- ESS (NEXT HIGHER ASSEMBLY):
  - THERMAL: 5 CYCLES, 5°C PER MINUTE, −55°C TO +55°C
  - RANDOM VIBRATION: 20 TO 2000 Hz AND 0.3 RMS, 10 MINUTES PER AXES AT +55°C/−55°C

AMERICAN MICROWAVE CORPORATION
7316 GROVE RD, FREDERICK, MD 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE SW-0205-2D
(B-BAND)
200–500 MHz, REFLECTIVE SOLID STATE SPDT SWITCH MODULE

SIZE: A
SHEET: 1 OF 2
Dwg. #: 100-290B
**DESCRIPTION**

AMC MODEL SW-2181-2A-202 IS A REFLECTIVE SPDT BAND-SELECT SWITCH WITH INTEGRAL TTL DRIVER, PACKAGED IN A MINIATURE POSTAGE STAMP SIZE HOUSING, DESIGNED FOR ULTRA BROAD-BAND APPLICATIONS SUCH AS WIDE-BAND SWEEP GENERATORS.

**SPECIFICATIONS**

- **FREQUENCY**
  - LOW-BAND (J1-J2): 0.01–3 GHz MINIMUM
  - HIGH-BAND (J1–J3): 1.0–20 GHz MINIMUM

- **INSERTION LOSS**
  - LOW-BAND: 1.3 dB MAXIMUM
  - HIGH-BAND: 2.4 dB MAXIMUM

- **ISOLATION**
  - LOW-BAND: 0.01–3 GHz, 70 dB MINIMUM
  - HIGH-BAND: 1–12 GHz, 65 dB MINIMUM
  - 12–18 GHz, 60 dB MINIMUM
  - 18–20 GHz, 55 dB MINIMUM

- **VSWR (ON)**
  - LOW-BAND: 1.6:1 MAXIMUM
  - HIGH-BAND: 1.8:1 MAXIMUM

- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF): 50 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 50 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 100 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 100 ns MAXIMUM

- **CONTROL**
  - TTL COMPATIBLE, UNITY LOAD
  - SINGLE CONTROL (TOGGLE)
  - LOGIC "0" = J1–J2 PATH ON (LOW BAND)
  - LOGIC "1" = J1–J3 PATH ON (HIGH BAND)

- **RF POWER RATINGS**
  - +27 dBm CW MAXIMUM

- **POWER SUPPLY**
  - +5VDC ±5% @ 65 mA MAXIMUM
  - -15VDC ±5% @ 65 mA MAXIMUM

- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN

- **SIZE**
  - 0.80" x 0.62" x 0.38"

**AVAILABLE OPTIONS**

- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC
- A08: TWO INDIVIDUAL CONTROLS
- A14: J1 SMA MALE, J2 AND J3 SMA FEMALE
- A15: J1 SMA FEMALE, J2 AND J3 SMA MALE

**ENVIRONMENTAL RATINGS**

- **TEMPERATURE**
  - -55°C TO +85°C (OPERATING)
  - -65°C TO +125°C (STORAGE)

- **HUMIDITY**
  - MIL-STD-202F, METHOD 103B COND. B

- **SHOCK**
  - MIL-STD-202F, METHOD 213B COND. B

- **VIBRATION**
  - MIL-STD-202F, METHOD 204D COND. B

- **ALTITUDE**
  - MIL-STD-202F, METHOD 105C COND. B

- **TEMPERATURE CYCLE**
  - MIL-STD-202F, METHOD 107D COND. A

**PRODUCT FEATURE**

SW-2181-2A-202

0.01–3 GHz, REFLECTIVE SPDT SWITCH MODULE

**AMERICAN MICROWAVE CORPORATION**

7311G GROVE RD., FREDERICK, MD. 21701

TEL: (301) 662-4700 FAX: (301) 662-4938

**PRODUCT FEATURE**

SW-2181-2A-202

0.01–3 GHz, REFLECTIVE SPDT SWITCH MODULE

**SIZE** A

**SHEET** 1 OF 2

**DWG.** 100-2867
DESCRIPTION

AMC MODEL SW-0540-2A IS A REFLECTIVE SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR ULTRA HIGH SPEED SWITCHING APPLICATIONS.

SPECIFICATIONS

- FREQUENCY RANGE: 0.5–4.0 GHz MINIMUM
- INSERTION LOSS: 0.8 dB MAXIMUM
- ISOLATION: 70 dB MINIMUM
- VSWR (ON): 1.5:1 MAXIMUM
- RF POWER RATINGS: 1 WATT CW MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 8 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 8 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 15 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 15 ns MAXIMUM
- CONTROL: TTL COMPATIBLE, UNITY LOAD
  - 1 SINGLE CONTROL (TOGGLE)
  - LOGIC "0" = J1–J2 PATH ON
  - LOGIC "1" = J1–J3 PATH ON
- POWER SUPPLY:
  - +5VDC ±5% @ 50 mA MAXIMUM
  - −15VDC ±5% @ 50 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SMC MALE
- SIZE: 1.20" x 1.00" x 0.42"

AVAILABLE OPTIONS

- AO1: 50Ω CONTROL IMPEDANCE
- AO2: 100Ω CONTROL IMPEDANCE
- AO3: INVERSE CONTROL LOGIC
- AO4: EXTENDED FREQUENCY, FROM 100 MHz TO 18 GHz (CONSULT FACTORY)
- AO6: SOLDER PIN CONTROL TERMINAL
- AO7: INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
- A10: +12 VDC TO +18 VDC SUPPLY
- A11: −5 VDC SUPPLY

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XXX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 1.5 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE: −55°C TO +95°C (OPERATING)
  −65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-0540-2A
0.5–4.0 GHz, REFLECTIVE SPDT SWITCH MODULE

SIZE A  SHEET 1 OF 2  DWG. # 100-2883
DESCRIPTION

AMC MODEL SW-4080-2D IS A REFLECTIVE, OCTAVE BAND SPDT SWITCH MODULE WITH HIGH SPEED AND HIGH POWER CAPABILITIES.

SPECIFICATIONS

- FREQUENCY RANGE.................. 3-9 GHz
- INSERTION LOSS.................... 4-8 GHz 1.4 dB MAXIMUM
- 3-9 GHz 2.3 dB MAXIMUM
- ISOLATION......................... 4-8 GHz 50 dB MAXIMUM
- 3-9 GHz 45 dB MAXIMUM
- VSWR (ON)......................... 4-8 GHz 1.5:1 MAXIMUM
- 3-9 GHz 2.1:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF)........... 10 nS MAXIMUM
  FALL (90% RF TO 10% RF).......... 10 nS MAXIMUM
  ON (50% TTL TO 90% RF).......... 25 nS MAXIMUM
  OFF (50% TTL TO 10% RF)......... 20 nS MAXIMUM
- RF POWER RATINGS.................. 2W CW, 10W PEAK (1μS, PW)
- CONTROL.......................... TTL COMPATIBLE, UNITY LOAD
- 2 INDEPENDENT CONTROLS
- LOGIC "0" = INSERTION LOSS
- LOGIC "1" = ISOLATION
- POWER SUPPLY...................... +5VDC ± 5% @ 85 mA
- -12 TO -15VDC ± 5%@ 2 mA
- CONNECTORS
  RF INPUT/OUTPUT................... SMA FEMALE
  POWER............................. SOLDER PIN
  CONTROL......................... SOLDER PIN
- SIZE.............................. 1.84" x 0.85" x 0.38"

AVAILABLE OPTIONS

A01.................. 5Ω CONTROL IMPEDANCE
A02.................. 10Ω CONTROL IMPEDANCE
A03.................. INVERSE LOGIC (LOGIC "0" ISOLATION)
A05.................. 5 WATTS CW MAXIMUM (100 nS RISE/FALL)
A07.................. INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
A13.................. +12 TO +15 VOLTS SUPPLY
A14.................. J1 SMA MALE, J2 SMA FEMALE
A15.................. J1, J2 SMA MALE
A16.................. 70 dB ISOLATION (0.5 dB EXCESS LOSS)

ENVIRONMENTAL RATINGS

- TEMPERATURE...................... -55°C TO +95°C (OPERATING)
- -65°C TO +125°C (STORAGE)
- HUMIDITY......................... MIL-STD-202F, METHOD 103B COND.
- SHOCK........................... MIL-STD-202F, METHOD 213B COND.
- VIBRATION......................... MIL-STD-202F, METHOD 204D COND.
- ALTITUDE......................... MIL-STD-202F, METHOD 105C COND.
- TEMPERATURE CYCLE............... MIL-STD-202F, METHOD 1020 COND.

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7311G GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE

SW-4080-2D
HIGH SPEED, REFLECTIVE, HIGH POWER, 3-9 GHz SPDT SWITCH MODULE

SIZE A SHEET 1 OF 2 SWG. # 100-252D

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ± 0.020
   X.XXX ± 0.010
3) WEIGHT: APPROX. 1.2 OZ
DESCRIPTION
AMC MODEL SW-0910-2D IS A REFLECTIVE SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR HIGH RELIABILITY APPLICATIONS SUCH AS SHIPBOARD RADAR WHERE SWITCHING SPEED, ISOLATION AND SPECTRAL PURITY ARE OF EXTREME IMPORTANCE.

SPECIFICATIONS
- FREQUENCY RANGE: 9–10 GHz MINIMUM
- INSERTION LOSS: 1.1 ± 0.3 dB @ +25°C ± 5°C
- INSERTION LOSS BALANCE: 0.2 dB MAXIMUM
- INSERTION LOSS VARIATION OVER TEMPERATURE: ±0.1 dB MAXIMUM OVER OPERATING TEMPERATURE RANGE
- INSERTION LOSS VARIATION OVER FREQUENCY: ±0.1 dB MAXIMUM
- ISOLATION: 40 dB MINIMUM
- VSWR (ON): 1.4:1 MAXIMUM
- RF POWER: +20 dBm CW MAXIMUM
- SWITCHING TIME: 40 ns MAXIMUM
- SETTLING: 0.7 μs MAXIMUM
- VOLTAGE TRANSIENTS: 1 Vpp MAXIMUM ACROSS 50Ω LOAD
- CONTROLS: STANDARD TTL COMPATIBLE
- HARMONIC DISTORTION PRODUCTS: 50 dBc MINIMUM
- SPURIOUS SIGNALS/RESPONSES (AM/FM SIDEBANDS IN OPERATING RANGE): 80 dB BELOW THE OUTPUT SIGNAL LEVEL
- RF LEAKAGE: 
  - RADIATIVE: -90 dBm/SQUARE FOOT, 1 FOOT DISTANCE APPROXIMATELY
  - CONDUCTIVE: -50 dBm ON SUPPLY AND CONTROL LINES
- RADIATION SUSCEPTIBILITY: ≥76 dBm/FEET RF INTERFERENCE FIELD OF ≥20 dBm/SQUARE FOOT
- CONDUCTED SUSCEPTIBILITY: ≥65 dBm FOR DC POWER LINES OF 0–20 dBm ON DC POWER LINES
- CONDUCTED SUSCEPTIBILITY (INTERMODULATION): ≥65 dBm FOR RF INTERFERENCE LEVEL ON DC POWER LINES
- POWER SUPPLY: +5VDC ±5% @ 90 mA MAXIMUM
- CONNECTORS: RF INPUT/OUTPUT: SMA FEMALE
- SIZE: 1.85” x 1.41” x 0.50”

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>L3</th>
<th>L2</th>
<th>RF PATH</th>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>J1–J2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>J1–J3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ± 0.020
   X.XXX ± 0.010
3) WEIGHT: APPROX. 3 OZ
4) MATERIALS PROCESS AND PARTS:
   TLD: MIL-F-19330, MIL-F-38510
   CLASS B, MIL-F-19330, MIL-F-38510
   TYPE B, MIL-F-18970
   3-PAK
5) REQUIREMENTS:
   MIL-STD-454 (5 AND 9)

ENVIRONMENTAL RATINGS
- TEMPERATURE: 0°C TO +65°C (OPERATING)
- HUMIDITY: MIL-STD-202, METHOD 103, CONDITION B
- SHOCK: MIL-S-901 GRADE A, CLASS I OR II
- VIBRATION: MIL-S-167, TYPE 1 VIBRATION, 0.1 G SINE SPECTRAL 25 Hz TO 2000 Hz
- MTBF: 1 x 10⁸ HOURS, @ +50°C OPERATION

ENVIRONMENTAL STRESS TESTING (ESS)
- TEMPERATURE CYCLES: 10 CYCLES, 1/2 HOUR SUDDEN MINUTE, −55°C TO +85°C
- TEMPERATURE SHOCK: 4 CYCLES, −55°C TO +85°C
- VIBRATION: 10 G @ 60Hz FOR 1 MINUTE, 3 AXES
- BURN IN (OPERATING): MIL-STD-883 METHOD 1015.4 TEST CONDITION B;
  160 HOURS @ 125°C JUNCTION TEMPERATURE (105°C AMBIENT)
- ESS (NEXT HIGHER ASSEMBLY)
  THERMAL: 5 CYCLES, 5°C PER MINUTE, −55°C TO +55°C
  RANDOM VIBRATION: 20 TO 2000 Hz AND 6 G RMS, 10 MINUTES PER AXIS AT +55°C/−55°C

AMERICAN MICROWAVE CORPORATION
7310 GROVE RD., FREDERICK, MD 21701
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PRODUCT FEATURE
SW-0910-2D
1-BAND
9-10 GHz, REFLECTIVE SOLID STATE SPOT SWITCH MODULE

SIZE: A
SHEET 1 OF 2
DWG. # 103-2910
DESCRIPTION
AMC MODEL SW-2181-2A-CS01 IS A REFLECTIVE BROAD-BAND SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A MINIATURE HOUSING, DESIGNED TO MAINTAIN A VERY LOW SWITCHING TRANSIENT DISTORTION ON RF PORTS. APPLICATIONS ARE FOR HIGHLY SENSITIVE MULTICHANNEL RECEIVERS AND SIGNAL DETECTING DEVICES.

SPECIFICATIONS
- FREQUENCY RANGE .................. 0.25-18.25 GHz MINIMUM
- INSERTION LOSS .................... 2.5 dB MAXIMUM
- ISOLATION ......................... 60 dB MINIMUM
- VSWR (ON) ......................... 1.9:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ......... 5 µs MINIMUM, 25 µs MAXIMUM
  FALL (90% RF TO 10% RF) ......... 5 µs MINIMUM, 25 µs MAXIMUM
  ON (50% TTL TO 90% RF) ........ 30 µs MAXIMUM
  OFF (50% TTL TO 10% RF) ....... 30 µs MAXIMUM
- CONTROL
  TTL COMPATIBLE, UNITY LOAD
  2 INDIVIDUAL CONTROLS
  LOGIC "0" = ISOLATION
  LOGIC "1" = INSERTION LOSS
  (SEE LOGIC TABLE)
- RF POWER RATINGS .................. +20 dBm CW MAXIMUM
- POWER SUPPLY
  +5VDC ±5% @ 65 mA MAXIMUM
  -12VDC ±5% @ 65 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT .................. SMA (FEMALE)
  POWER .................................. SOLDER PIN
  CONTROL ............................ SOLDER PIN
- SIZE ............................... 0.80" x 0.62" x 0.38"

AVAILABLE OPTIONS
AO1 .................................. 50Ω CONTROL IMPEDANCE
AO2 .................................. 100Ω CONTROL IMPEDANCE
AG3 .................................. INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
AO8 .................................. SINGLE CONTROL (LOGIC "0", J1-J2 PATH ON)
A14 .................................. J1 SMA MALE, J2 AND J3 SMA FEMALE
A15 .................................. J1 SMA FEMALE, J2 AND J3 SMA MALE
A17 .................................. -15 VDC SUPPLY
A18 .................................. -5 VDC SUPPLY

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE ....................... -55°C TO +65°C (OPERATING)
                             -65°C TO +125°C (STORAGE)
- HUMIDITY ......................... MIL-STD-202F, METHOD 1039 COND. B
- SHOCK ............................ MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ......................... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ......................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE ............. MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-2181-2A-CS01
0.25-18.25 GHz, REFLECTIVE, SPDT SWITCH MODULE

AMERICAN MICROWAVE CORPORATION
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TEL: (301) 662-4700 FAX: (301) 662-4938
DESCRIPTION
AMC MODEL SW-2181-2A-ST02 IS A REFLECTIVE BROAD BAND SPDT SWITCH MODULE WITH AN INTEGRAL BALANCED ECL DRIVER, DESIGNED FOR ULTRA FAST SWITCHING APPLICATIONS.

SPECIFICATIONS
- FREQUENCY RANGE ................. 0.3–18 GHz MINIMUM
- INSERTION LOSS .................. 1–2 GHz 1.2 dB MAXIMUM
- 2–4 GHz 1.6 dB MAXIMUM
- 4–8 GHz 2.1 dB MAXIMUM
- 8–12 GHz 2.6 dB MAXIMUM
- 12–18 GHz 3.0 dB MAXIMUM
- ISOLATION .................... 50 dB MINIMUM
- VSWR (ON) .................. 2.1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) .......... 5 nS MAXIMUM
  FALL (90% RF TO 10% RF) .......... 5 nS MAXIMUM
  ON (50% CTL TO 90% RF) .......... 10 nS MAXIMUM
  OFF (50% CTL TO 10% RF) .......... 10 nS MAXIMUM
- CONTROL .................. BALANCED ECL PAIRS (–C,+C)
  (100Ω INPUT IMPEDANCE).
- RF POWER RATINGS :
  OPERATING .................. +27 dBm CW MAXIMUM
  SURVIVAL .................. +30 dBm CW OR 10 W (1 μS, PW)
- POWER SUPPLY .................. +5VDC ±5% @ 50 mA MAXIMUM
  −5VDC ±5% @ 50 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT .......... SMA FEMALE
  POWER .................. SOLDER PIN
  CONTROL .................. SOLDER PIN
- SIZE .......................... 1.2" x 1.0" x 0.5"

AVAILABLE OPTIONS
A03 .................. INVERTED LOGIC
A04 .................. EXTENDED FREQUENCY TO 100 MHz
A07 .................. INPUT/OUTPUT VIDEO FILTER
  (0.5 dB EXCESS LOSS, 2–18 GHz)
A14 .................. J1 SMA MALE, J2 AND J3 SMA FEMALE
A15 .................. J1 SMA FEMALE, J2 AND J3 SMA MALE
A16 .................. 65 dB ISOLATION
  (0.3 dB EXCESS LOSS, 1–18 GHz)
A17 .................. −12 TO −15 VOLTS SUPPLY

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE ............... −55°C TO +85°C (OPERATING)
  −65°C TO +125°C (STORAGE)
- HUMIDITY ................ MIL-STD-202F, METHOD 103B COND. B
- SHOCK .................. MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ................ MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ................ MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 107D COND. A
DESCRIPTION
AMC Model SW-218-2A-112 is a reflective broadband SPDT switch module with integral TTL driver, designed to operate at +33 dBm CW signal.

SPECIFICATIONS
- **Frequency Range**: 0.3–18 GHz Minimum
- **Insertion Loss**: 0.3–4.0 GHz, 1.2 dB Maximum
  4.0–8.0 GHz, 1.3 dB Maximum
  8.0–12.0 GHz, 2.0 dB Maximum
  12.0–18.0 GHz, 2.5 dB Maximum
- **Isolation**: 0.3–4.0 GHz, 75 dB Minimum
  4.0–8.0 GHz, 70 dB Minimum
  8.0–12.0 GHz, 65 dB Minimum
  12.0–18.0 GHz, 55 dB Minimum
- **VSWR (ON)**: 2:1 Maximum
- **Switching Time**
  Rise (10% RF to 90% RF): 50 ns Maximum
  Fall (90% RF to 10% RF): 50 ns Maximum
  On (50% TTL to 90% RF): 100 ns Maximum
  Off (50% TTL to 10% RF): 100 ns Maximum
- **RF Power Ratings**: +33 dBm CW, Maximum
- **Control**: TTL Compatible, Unity Load
  1 Dependant Control (Toggle)
  Logic "0" J1–J2 Path On
  Logic "1" J1–J3 Path On
- **Power Supply**: +5VDC ±5% @ 65 mA Maximum
  -5VDC ±5% @ 50 mA Maximum
- **Connectors**
  RF Input/Output: SMA (Female)
  Power: Solder Pin (EMI)
  Control: Solder Pin
- **Size**: 1.20" x 1.0" x 0.50"

AVAILABLE OPTIONS
A01: 50 Ohm Control Impedance
A02: 100 Ohm Control Impedance
A03: Inverse Control Logic (Logic "0", J1–J3 Path On)
A04: 2 Independent Controls (Logic "0" Insertion Loss)
A05: Input/Output Video Filter (0.5 dB Excess Loss)
A14: J1 SMA Male, J2 and J3 SMA Female
A15: J1 SMA Female, J2 and J3 SMA Male
A17: ±9 VDC to ±18 VDC Supply

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- **Temperature**: −55°C to +85°C (Operating)
  −65°C to +125°C (Storage)
- **Humidity**: MIL-STD-202F, Method 103B Cond. B
- **Shock**: MIL-STD-202F, Method 213B Cond. B
- **Vibration**: MIL-STD-202F, Method 2040 Cond. B
- **Altitude**: MIL-STD-202F, Method 105C Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D Cond. A

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PRODUCT FEATURE
SW-218-2A-112
0.3–18 GHz, Reflective, High Power, SPDT Switch Module
Size A, Sheet 1 of 2, DWG. # 100-2878
DESCRIPTION
AMC MODEL SW-218-2 (2L) is a reflective broad-band switch module without driver circuitry.

SPECIFICATIONS
- FREQUENCY RANGE: 0.3–18 GHz MINIMUM
- INSERTION LOSS:
  (-2) 2.5 dB MAXIMUM
  (-2L) 2.0 dB MAXIMUM
- ISOLATION: 55 dB MINIMUM
- VSWR (ON): 2.3:1 MAXIMUM
- RF POWER RATINGS: +27 dBm CW MAXIMUM
- SWITCHING TIME:
  RISE (10% RF TO 90% RF): 100 ns MAXIMUM
  FALL (90% RF TO 10% RF): 100 ns MAXIMUM
  ON (50% TTL TO 90% RF): 200 ns MAXIMUM
  OFF (50% TTL TO 10% RF): 200 ns MAXIMUM
- CONTROLS: CURRENT CONTROLLED
  2 INDEPENDENT CONTROLS
  +30 mA ISOLATION
  −30 mA INSERTION LOSS
  (SEE TRUTH TABLE)
- CONNECTORS:
  RF INPUT/OUTPUT: SMA FEMALE
  CONTROL: SOLDER PIN
- SIZE: 1.25” x 1.00” x 0.325”

AVAILABLE OPTIONS
AO4: INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
A05: EXTENDED FREQUENCY RANGE TO 100 MHz
A13: J1 SMA MALE, J2 AND J3 SMA FEMALE
A14: J1 SMA FEMALE, J2 AND J3 SMA MALE

MECHANICAL OUTLINE

ENVIROMENTAL RATINGS
- TEMPERATURE: −55°C TO +95°C (OPERATING)
  −65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 1070 COND. A

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PRODUCT FEATURE
SW-218-2 (2L)
0.3–18 GHz, REFLECTIVE SPDT SWITCH MODULE

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PRODUCT FEATURE
SW-218-2 (2L)
0.3–18 GHz, REFLECTIVE SPDT SWITCH MODULE
DESCRIPTION
AMC MODEL SW-2181-2A-309 IS A REFLECTIVE BROAD BAND SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A MINIATURE HOUSING, CAPABLE OF HANDLING 2 WATTS OF CW POWER.

SPECIFICATIONS
- FREQUENCY RANGE .......................... 0.3–18 GHz MINIMUM
- INSERTION LOSS ......................... 2–4 GHz 1.2 dB MAXIMUM
- ......................... 4–8 GHz 1.6 dB MAXIMUM
- ......................... 8–12 GHz 2.1 dB MAXIMUM
- ......................... 12–18 GHz 2.5 dB MAXIMUM
- ISOLATION ................................. 55 dB MINIMUM
- VSWR (ON) .................................. 2:1 MAXIMUM
- SWITCHING TIME ............................
  RISE (10% RF TO 90% RF) .................. 50 nS MAXIMUM
  FALL (90% RF TO 10% RF) ................. 50 nS MAXIMUM
  ON (50% TTL TO 90% RF) .................. 200 nS MAXIMUM
  OFF (50% TTL TO 10% RF) .................. 200 nS MAXIMUM
- CONTROL ...................................
  TTL COMPATIBLE, UNITY LOAD
  1 DEPENDANT CONTROL (TOGGLE)
  LOGIC "0" J1–J2 PATH ON
  LOGIC "1" J1–J3 PATH ON
- RF POWER RATINGS ........................ 2 WATTS CW, MAXIMUM, 75 WATT PEAK (1ms PW)
- POWER SUPPLY ............................
  +15VDC ±5% @ 70 mA MAXIMUM
  −15VDC ±5% @ 65 mA MAXIMUM
- CONNECTORS ................................
  RF INPUT/OUTPUT ..........................
  FIELD REPLACEABLE SMA (FEMALE)
  POWER ....................................
  SOLDER PIN
  CONTROL ...................................
  SOLDER PIN
- SIZE ......................................
  0.80" x 0.62" x 0.38"

AVAILABLE OPTIONS
A01 ........................................ 50Ω CONTROL IMPEDANCE
A02 ........................................ 100Ω CONTROL IMPEDANCE
A03 ........................................ INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A04 ........................................ INPUT/OUTPUT VIDEO FILTER
  (0.5 dB EXCESS LOSS 2–18 GHz)
A08 ........................................ TWO INDIVIDUAL CONTROLS
A14 ........................................ J1 SMA MALE, J2 AND J3 SMA FEMALE
A15 ........................................ J1 SMA FEMALE, J2 AND J3 SMA MALE
A16 ........................................ −5 VDC SUPPLY
A17 ........................................ +5 VDC SUPPLY
A18 ........................................ ±12 VDC SUPPLY

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PRODUCT FEATURE
SW-2181-2A-309
0.3–18 GHz, REFLECTIVE, 2 WATT SPDT SWITCH

SIZE A SHEET 1 OF 2 DWG. # 100-2954
**DESCRIPTION**

AMC MODEL SW-2181-2A-171 IS A REFLECTIVE SPDT SWITCH MODULE WITH INTEGRTL TTL DRIVER, PACKAGED IN A MINIATURE POSTAGE STAMP SIZE HOUSING, DESIGNED FOR HIGH ISOLATION AND FAST SWITCHING APPLICATIONS.

**SPECIFICATIONS**

- **FREQUENCY**.............. 1–18 GHz MINIMUM
- **INSERTION LOSS**........ 3.5 dB MAXIMUM
- **ISOLATION**................ 70 dB MINIMUM
- **VSWR (ON)**.............. 1.4:1 MAXIMUM
- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF) .. 5 ns MAXIMUM
  - FALL (90% RF TO 10% RF) .. 5 ns MAXIMUM
  - ON (50% TTL TO 90% RF) .. 25 ns MAXIMUM
  - OFF (50% TTL TO 10% RF) .. 25 ns MAXIMUM
- **CONTROL**.................. TTL COMPATIBLE, UNITY LOAD
  - SINGLE CONTROL (TOGGLE)
  - LOGIC "0" = J1–J3 PATH ON
  - LOGIC "1" = J1–J2 PATH ON
- **RF POWER RATINGS**...... +27 dBm CW MAXIMUM
- **POWER SUPPLY**........... +5VDC ±5% @ 80 mA MAXIMUM
  - 6VDC ±5% @ 50 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- **SIZE**..................... 0.80" x 0.62" x 0.38"

**AVAILABLE OPTIONS**

- A01 .................. 50Ω CONTROL IMPEDANCE
- A02 .................. 100Ω CONTROL IMPEDANCE
- A03 .................. INVERSE CONTROL LOGIC
- A08 .................. TWO INDIVIDUAL CONTROLS
- A09 .................. INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
- A14 .................. J1 SMA MALE, J2 AND J3 SMA FEMALE
- A15 .................. J1 SMA FEMALE, J2 AND J3 SMA MALE
- A16 .................. -12 VDC
- A17 .................. -15 VDC
- A18 .................. -5 VDC

**MECHANICAL OUTLINE**

- PIN FUNCTIONS
  - Ø0.104 THRU 4 PLACES
  - PIN FUNCTIONS
  - SMA FEMALE 3 PLACES

**ENVIRONMENTAL RATINGS**

- **TEMPERATURE**........... -55°C TO +95°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- **HUMIDITY** .............. MIL-STD-202F, METHOD 103B COND. B
- **SHOCK** .................. MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION** ............... MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE** ............... MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE** .... MIL-STD-202F, METHOD 107D COND. A

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**PRODUCT FEATURE**

SW-2181-2A-171

1-18 GHz, REFLECTIVE SPDT SWITCH MODULE

SIZE A  SHEET 1 OF 2  DWG. 100-3197
**DESCRIPTION**

AMC Model SW-2181-2A-113 is a reflective broad band SPDT switch module with integral TTL driver, packaged in a miniature housing, capable of handling 2 watts of CW power.

**SPECIFICATIONS**

- **Frequency Range**: 2–18 GHz minimum
- **Insertion Loss**:
  - 2–4 GHz: 1.2 dB maximum
  - 4–8 GHz: 1.6 dB maximum
  - 8–12 GHz: 2.1 dB maximum
  - 12–18 GHz: 2.5 dB maximum
- **Isolation**: 60 dB minimum
- **VSWR (ON)**: 2:1 maximum
- **Switching Time**:
  - Rise (10% RF to 90% RF): 50 nS maximum
  - Fall (90% RF to 10% RF): 50 nS maximum
  - On (50% TTL to 90% RF): 200 nS maximum
  - Off (50% TTL to 10% RF): 200 nS maximum
- **Control**:
  - TTL compatible, unity load
  - 1 dependant control (toggle)
  - Logic "0" J1–J2 path on
  - Logic "1" J1–J3 path on
- **RF Power Ratings**: 2 watts CW, maximum
- **Power Supply**:
  - +5VDC ±5% @ 65 mA maximum
  - -15VDC ±5% @ 65 mA maximum
- **Connectors**:
  - RF Input/Output: field replaceable SMA (female)
  - Power: solder pin
  - Control: solder pin
- **Size**: 0.80" x 0.62" x 0.38"

**AVAILABLE OPTIONS**

- A01: 50Ω control impedance
- A02: 100Ω control impedance
- A03: Inverse control logic (logic "0" isolation)
- A04: Input/output video filter (0.5 dB excess loss 2–18 GHz)
- A05: Two individual controls
- A14: J1 SMA male, J2 and J3 SMA female
- A15: J1 SMA female, J2 and J3 SMA male
- A16: -5 VDC supply
- A17: +15 VDC supply
- A18: ±12 VDC supply

**MECHANICAL OUTLINE**

- Field replaceable SMA female 3 places
- Pin functions
  - +V GND -4V CTL
- Mounting surface

**ENVIRONMENTAL RATING**

- **Temperature**: -55°C to +95°C (operating)
  - -65°C to +125°C (storage)
- **Humidity**: MIL-STD-202F, Method 103B Cond. B
- **Shock**: MIL-STD-202F, Method 213B Cond. B
- **Vibration**: MIL-STD-202F, Method 204D Cond. B
- **Altitude**: MIL-STD-202F, Method 105C Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D Cond. A

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**PRODUCT FEATURE**

**SW-2181-2A-113**
2–18 GHz, reflective, 2 watt SPDT switch

**SIZE A** SHEET 1 OF 2 DWG. #: 100-2757
DESCRIPTION

AMC MODEL SW-2181-2 IS A REFLECTIVE BROAD-BAND SPDT SWITCH MODULE WITHOUT DRIVER CIRCUITRY, PACKAGED IN A MINIATURE CONNECTORIZED HOUSING.

SPECIFICATIONS

- FREQUENCY RANGE .......... 0.3–20 GHz MINIMUM
- INSERTION LOSS .......... 3.0 dB MAXIMUM
- ISOLATION .......... 0.3–18 GHz, 60 dB MINIMUM
                        18–20 GHz, 55 dB MINIMUM
- VSWR (ON) .......... 2.0:1 MAXIMUM
- RF POWER RATINGS .......... +27 dBm CW MAXIMUM

SWITCHING TIME

RISE (10% RF TO 90% RF) .......... 10 ns MAXIMUM
FALL (90% RF TO 10% RF) .......... 10 ns MAXIMUM
ON (50% TTL TO 90% RF) .......... 20 ns MAXIMUM
OFF (50% TTL TO 10% RF) .......... 20 ns MAXIMUM

CONTROLS

CURRENT CONTROLLED
2 INDEPENDENT CONTROLS
+20 mA = ISOLATION
-20 mA = INSERTION LOSS
(SEE TRUTH TABLE)

CONNECTORS

RF INPUT/OUTPUT .......... SMA (FEMALE)
CONTROL .......... SOLDER PIN

SIZE .......... 0.80" x 0.62" x 0.24"

AVAILABLE OPTIONS

A04 .......... INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
A05 .......... EXTENDED FREQUENCY RANGE TO 100 MHz
A06 .......... 2 WATTS CW MAXIMUM (2–20 GHz)
A13 .......... J1 SMA MALE, J2 AND J3 SMA FEMALE
A14 .......... J1 SMA FEMALE, J2 AND J3 SMA MALE
A15 .......... REMOVABLE CONNECTORS (DROP IN APPLICATIONS)

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS

- TEMPERATURE .......... −55°C TO +95°C (OPERATING)
                        −65°C TO +125°C (STORAGE)
- HUMIDITY .......... MIL-STD-202F, METHOD 103B COND. B
- SHOCK .......... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION .......... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE .......... MIL-STD-202F, METHOD 205C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 206D COND. A

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PRODUCT FEATURE

SW-2181-2
0.3–20 GHz, REFLECTIVE SPDT SWITCH MODULE

SIZE A
SHEET 1 OF 2
DWG. # 100-2903
**DESCRIPTION**

AMC MODEL SW-2181-2A-305 IS A REFLECTIVE SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A LOW PROFILE HOUSING.

**SPECIFICATIONS**

- **FREQUENCY RANGE** .......... 0.5 - 20 GHz MINIMUM
- **INSERTION LOSS** ........... 2.5 dB MAXIMUM
- **ISOLATION** ................. 0.5 - 2 GHz, 85 dB MINIMUM
- ................................ 2 - 4 GHz, 80 dB MINIMUM
- ................................ 4 - 8 GHz, 75 dB MINIMUM
- ................................ 8 - 12 GHz, 65 dB MINIMUM
- ................................ 12 - 18 GHz, 55 dB MINIMUM
- ................................ 18 - 20 GHz, 50 dB MINIMUM
- **VSWR (ON)** ............... 0.5 - 18 GHz, 1.9:1 MAXIMUM
- ................................ 18 - 20 GHz, 2.0:1 MAXIMUM
- **SWITCHING TIME**
  - **RISE** (10% RF TO 90% RF) ....... 50 ns MAXIMUM
  - **FALL** (50% RF TO 10% RF) ...... 50 ns MAXIMUM
  - **ON** (50% TTL TO 90% RF) ...... 150 ns MAXIMUM
  - **OFF** (50% TTL TO 10% RF) ...... 150 ns MAXIMUM
- **CONTROL** .................. TTL COMPATIBLE, UNITY LOAD
  - 2 INDEPENDENT CONTROLS
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
  - (SEE TRUTH TABLE)
- **RF POWER RATINGS** .......... 1W CW MAXIMUM
- **POWER SUPPLY** ............ +5VDC ±5% @ 75 mA MAXIMUM
- ................................ -15VDC ±5% @ 50 mA MAXIMUM
- **CONNECTORS**
  - **RF INPUT/OUTPUT** ...... SMA (FEMALE)
  - **POWER** ................. SOLDER PIN
  - **CONTROL** ............... SOLDER PIN
- **SIZE** ....................... 1.0" x 1.5" x 0.3"

**AVAILABLE OPTIONS**

- A01 .................. 50Ω CONTROL IMPEDANCE
- A02 .................. 100Ω CONTROL IMPEDANCE
- A03 .................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04 .................. INPUT/OUTPUT VIDE FILTER (0.5 dB EXCESS LOSS)
- A05 .................. SINGLE CONTROL (LOGIC "0" = J1-J2 PATH ON)
- A14 .................. J1 SMA MALE, J2 AND J3 SMA FEMALE
- A15 .................. J1 SMA FEMALE, J2 AND J3 SMA MALE
- A16 .................. +15VDC SUPPLY

**MECHANICAL OUTLINE**

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>TTL 3</th>
<th>TTL 2</th>
<th>RF PATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>J1-J2</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>J1-J3</td>
</tr>
</tbody>
</table>

**NOTES:**
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: XXX ±0.020
3) WEIGHT: APPROX. 1.2 OZ

**ENVIRONMENTAL RATINGS**

- **TEMPERATURE** .......... -55°C TO +55°C (OPERATING)
- ................................ -65°C TO +125°C (STORAGE)
- **HUMIDITY** ............. MIL-STD-202F, METHOD 103B COND. B
- **SHOCK** ................. MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION** ............. MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE** ............. MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE** .... MIL-STD-202F, METHOD 107D COND. A

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**PRODUCT FEATURE**

SW-2181-2A-305
0.5-20 GHz, SPDT REFLECTIVE SWITCH MODULE

**SIZE** A  **SHEET 1 OF 2**  **Dwg. # 100-2864**
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|         | • DC-2.0 GHz  
GaAs MMIC, SWITCH MODULE,  
AMC MODEL NO: SWM-2000-2DT  | 4-3   |
|         | • DC-6 GHz  
GaAs MMIC, LOW INSERTION LOSS,  
AND FAST SWITCH/MODULE,  
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|         | • 1-2 GHz  
50 nsec SWITCH MODULE,  
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DESCRIPTION
AMC MODEL SWM-2000-2DT IS AN ABSORPTIVE GaAs SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR HIGH SPEED, LOW POWER CONSUMPTION, AND BROAD-BAND SWITCHING APPLICATIONS.

SPECIFICATIONS
- FREQUENCY RANGE ................. DC−2.0 GHz MINIMUM
- INSERTION LOSS .................. DC−1.0 GHz, 1.0 dB MAXIMUM 1.0−2.0 GHz, 1.5 dB MAXIMUM
- ISOLATION ...................... DC−1.0 GHz, 50 dB MINIMUM 1.0−2.0 GHz, 45 dB MINIMUM
- VSWR (ON/OFF) .................. DC−1.0 GHz, 1.5:1 MAXIMUM 1.0−2.0 GHz, 1.7:1 MAXIMUM
- RF POWER RATINGS ............... 1 MHz @ +12 dBm TYPICAL (1 dB COMPRESSION) 0.5−2.0 GHz @ +20 dBm TYPICAL
- SWITCHING TIME ................. RISE (10% RF TO 90% RF) .......... 10 ns MAXIMUM FALL (90% RF TO 10% RF) .......... 10 ns MAXIMUM ON (50% TTL TO 90% RF) .......... 15 ns MAXIMUM OFF (50% TTL TO 10% RF) .......... 15 ns MAXIMUM
- CONTROL ......................... TTL COMPATIBLE, UNITY LOAD 1 INDIVIDUAL CONTROL (TOGGLE) LOGIC "0" = J1−J3 PATH ON LOGIC "1" = J1−J2 PATH ON
- POWER SUPPLY .................. +5VDC ±5% @ 5 mA MAXIMUM −5VDC ±5% @ 10 mA MAXIMUM
- CONNECTORS ..................... RF INPUT/OUTPUT ........ SMA (FEMALE) POWER .................. SOLDER PIN (EMI) CONTROL ............... SOLDER PIN
- SIZE ........................... 1.20" x 1.00" x 0.50"

AVAILABLE OPTIONS
A01 ............... 50Ω CONTROL IMPEDANCE
A02 ............... 100Ω CONTROL IMPEDANCE
A14 .............. J1 SMA MALE, J2 AND J3 SMA FEMALE
A15 .............. J1 SMA FEMALE, J2 AND J3 SMA MALE
A17 .............. ±9 VDC TO ±18 VDC SUPPLY

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: ±X.XX ±0.020
±X.XXX ±0.010
3) WEIGHT: APPROX. 1.4 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE .................. −55°C TO +95°C (OPERATING) −65°C TO +125°C (STORAGE)
- HUMIDITY ....................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK ......................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ..................... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ...................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 1070 COND. A

AMERICAN MICROWAVE CORPORATION
73116 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662−4700 FAX: (301) 662−4938

PRODUCT FEATURE
SWM−2000−2DT
(SPTG−0110)
DC−2.0 GHz, NON-REFLECTIVE, GaAs SPDT SWITCH MODULE
SIZE A SHEET 1 OF 2 DWG. # 20489
DESCRIPTION
AMC MODEL SWM-6000-2DT IS AN ABSORPTIVE GaAs MMIC SPDT SWITCH/MODULATOR WITH INTEGRAL TTL DRIVER, PACKAGED IN A LOW PROFILE HOUSING.

SPECIFICATIONS
- FREQUENCY RANGE DC–6.0 GHz
- INSERTION LOSS
  - DC–0.5 GHz, 1.0 dB MAXIMUM
  - 0.5–1.0 GHz, 1.1 dB MAXIMUM
  - 1.0–2.0 GHz, 1.4 dB MAXIMUM
  - 2.0–4.0 GHz, 1.7 dB MAXIMUM
  - 4.0–6.0 GHz, 2.2 dB MAXIMUM
- ISOLATION
  - DC–1.0 GHz, 50 dB MINIMUM
  - 1.0–2.0 GHz, 45 dB MINIMUM
  - 2.0–4.0 GHz, 30 dB MINIMUM
  - 4.0–6.0 GHz, 20 dB MINIMUM
- VSWR (ON/OFF)
  - DC–1.0 GHz, 1.5:1 MAXIMUM
  - 1.0–2.0 GHz, 1.7:1 MAXIMUM
  - 2.0–6.0 GHz, 2.0:1 MAXIMUM
- SWITCHING TIME
  - RISE (10% RF TO 90% RF)
    - 10 ns MAXIMUM
  - FALL (90% RF TO 10% RF)
    - 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF)
    - 20 ns MAXIMUM
  - OFF (50% TTL TO 10% RF)
    - 20 ns MAXIMUM
- VIDEO TRANSIENTS
  - 30 mV (P–P) MAXIMUM, 300 MHz BANDWIDTH.
- RF POWER RATINGS (dBm COMP.)
  - 0.5–6 GHz
    - +20 dBm TYPICAL
    - +12 dBm TYPICAL
  - 0.001 GHz
    - +20 dBm TYPICAL
- CONTROL
  - TTL COMPATIBLE, UNITY LOAD
  - SINGLE CONTROL (TOGGLE)
  - SEE LOGIC TABLE
- POWER SUPPLY
  - +7VDC TO +18VDC ±5% @ 5 mA MAXIMUM
  - -7VDC TO -18VDC ±5% @ 5 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT
    - FIELD REPLACEABLE SMA (FEMALE)
  - POWER
    - SOLDER PIN
  - CONTROL
    - SOLDER PIN
  - NOTE: RF CONNECTORS CAN BE PLACED SIDE BY SIDE OR IN ANGLE.
    - CONSULT FACTORY FOR AVAILABLE MECHANICAL OPTIONS
- SIZE
  - 1.50" x 1.50" x 0.40"

AVAILABLE OPTIONS
- AO1: 50Ω CONTROL IMPEDANCE
- AO2: 100Ω CONTROL IMPEDANCE
- AO3: HERMETIC SEALING (MIL–STD–883)
- AO4: ±5VDC POWER SUPPLY
- AO5: INVERSE CONTROL LOGIC (LOGIC "0" = J1–J2 PATH ON)
- AO6: SINGLE ENDED ECL CONTROL LOGIC
- AO7: BALANCED ECL CONTROL LOGIC
- AO8: DIFFERENTIAL TTL CONTROL LOGIC (RS–422 LOGIC FAMILY)
- AO9: HIGH ISOLATION (CONSULT FACTORY)
- A10: SMC MALE CONTROL CONNECTOR
- A11: SMA FEMALE CONTROL CONNECTOR
- A12: OTHER POWER SUPPLIES (CONSULT FACTORY)

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE
  - -55°C TO +85°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- HUMIDITY
  - MIL–STD–202F, METHOD 103B, COND. B
- SHOCK
  - MIL–STD–202F, METHOD 213B, COND. B
- VIBRATION
  - MIL–STD–202F, METHOD 204D, COND. B
- ALTITUDE
  - MIL–STD–202F, METHOD 105C, COND. B
- TEMPERATURE CYCLE
  - MIL–STD–202F, METHOD 107D, COND. A

AMERICAN MICROWAVE CORPORATION
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PRODUCT FEATURE
SWM–6000–2DT
DC–6 GHZ, GaAs MMIC, NON-REFLECTIVE, LOW INSERTION LOSS AND FAST SPDT SWITCH/MODULATOR

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XXX ± 0.020
    X.XXX ± 0.010
3) WEIGHT: APPROX. 1.5 OZ
DESCRIPTION
AMC MODEL SW-2181-2AT-10 IS AN ABSORPTIVE SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
- FREQUENCY RANGE ..................... 1–2 GHz MINIMUM
- INSERTION LOSS ...................... 1.5 dB MAXIMUM
- ISOLATION ......................... 80 dB MINIMUM
- VSWR (ON/OFF) ...................... 1.4:1 MAXIMUM
- RF POWER RATINGS .................. 1 WATT CW MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) .......... 50 ns MAXIMUM
  FALL (90% RF TO 10% RF) .......... 50 ns MAXIMUM
  ON (50% TTL TO 90% RF) .......... 150 ns MAXIMUM
  OFF (50% TTL TO 10% RF) .......... 150 ns MAXIMUM
- CONTROL
  TTL COMPATIBLE, UNITY LOAD
  2 INDIVIDUAL CONTROLS
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
  (SEE TRUTH TABLE)
- POWER SUPPLY ....................... +5VDC ±5% @ 130 mA MAXIMUM
  -15VDC ±5% @ 60 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ................... SMA (FEMALE)
  POWER ................................ SOLDER PIN
  CONTROL ............................... SOLDER PIN
- SIZE ................................. 1.0" x 1.50" x 0.38"

AVAILABLE OPTIONS
A01 .................................. 50Ω CONTROL IMPEDANCE
A02 .................................. 100Ω CONTROL IMPEDANCE
A03 .................................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A14 .................................. J1 SMA MALE, J2 AND J3 SMA FEMALE
A15 .................................. -5 VDC SUPPLY
A17 .................................. +12 VDC TO +15 VDC SUPPLY
A18 .................................. SINGLE CONTROL (LOGIC "0", J1-J2 PATH ON)
A19 .................................. EXTENDED FREQUENCY BAND (CONSULT FACTORY)

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE ...................... -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY ......................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK .............................. MIL-STD-202F, METHOD 213B COND. B
- VIBRATION .......................... MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE ......................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .............. MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-2181-2AT-10
1–2 GHz, NON-REFLECTIVE, SPDT SWITCH MODULE

SIZE A SHEET 1 OF 2 Dwg. # 100-2892
DESCRIPTION
AMC MODEL SW-2181-2AT-B1072 & B2072 IS AN ABSORPTIVE SPDT SWITCH MODULE WITH INTEGRAL DRIVER, DESIGNED TO OPERATE WITH A SINGLE POSITIVE SUPPLY VOLTAGE.

SPECIFICATIONS
- FREQUENCY RANGE: 1-2 GHz MINIMUM
- INSERTION LOSS
  - B1072: 1.3 dB MAXIMUM
  - B2072: 1.1 dB MAXIMUM
- ISOLATION
  - B1072: 70 dB MINIMUM
  - B2072: 50 dB MINIMUM
- VSWR (ON/OFF): 1.5:1 MAXIMUM
- RF POWER RATINGS: +20 dBm CW MAXIMUM
- SWITCHING TIME
  - RISE (10% RF TO 90% RF): 500 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 500 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 1 μS MAXIMUM
  - OFF (50% TTL TO 10% RF): 1 μS MAXIMUM
- CONTROLS: TTL COMPATIBLE, UNITY LOAD 2 INDIVIDUAL CONTROLS
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
    (SEE TRUTH TABLE)
- SUPPLY POWER: +5VDC ±5% @ 100 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT: SMA FEMALE
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- SIZE: 1.63" x 1.25" x 0.50"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04: VIDEO FILTER (0.5 dB EXCESS LOSS)
- A05: SINGLE CONTROL (LOGIC "0" J1-J2)
- A06: EXTENDED FREQUENCY RANGE (CONSULT FACTORY)
- A13: J1 SMA MALE, J2-J3 SMA FEMALE
- A14: J1 SMA FEMALE, J2-J3 SMA MALE
- A16: +9 VDC TO +18 VDC SUPPLY

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>B1</th>
<th>B0</th>
<th>RF PATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>JT-J2</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>J1-J3</td>
</tr>
</tbody>
</table>

NOTES:
1. DIMENSIONS ARE IN INCHES
2. TOLERANCES: XXX ±0.020
   X.XXX ±0.010
3. WEIGHT: APPROX. 2 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE: -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204B COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE
SW-2181-2AT-B1072 & B2072
1-2 GHz, NON-REFLECTIVE SPDT SWITCH MODULE

SIZE A SHEET 1 OF 2

APPROVALS

CHANGEOVER
6/22/99

DRAWING
6/21/99
DESCRIPTION
AMC Model SW-2181-2AT-A1072 & A2072 is an absorptive SPDT switch module with integral driver, designed to operate with a single positive supply voltage.

SPECIFICATIONS
- Frequency Range: 2–4 GHz minimum
- Insertion Loss:
  - A1072: 1.3 dB maximum
  - A2072: 1.1 dB maximum
- Isolation:
  - A1072: 70 dB minimum
  - A2072: 50 dB minimum
- VSWR (ON/OFF): 1.5:1 maximum
- RF Power Ratings: +20 dBm CW maximum
- Switching Time:
  - Rise (10% RF to 90% RF): 500 ns maximum
  - Fall (90% RF to 10% RF): 500 ns maximum
  - ON (50% TTL to 90% RF): 1 µs maximum
  - OFF (50% TTL to 10% RF): 1 µs maximum
- Controls: TTL compatible, unity load
  - 2 individual controls
  - Logic "0" = insertion loss
  - Logic "1" = isolation
  - (See truth table)
- Supply Power: +5VDC ±5% @ 100 mA maximum
- Connectors:
  - RF Input/Output: SMA female
  - Power: Solder pin
  - Control: Solder pin
- Size: 1.63" x 1.25" x 0.50"

AVAILABLE OPTIONS
- A01: 50Ω control impedance
- A02: 100Ω control impedance
- A03: Inverse control logic (logic "0" isolation)
- A04: Video filter (0.5 dB excess loss)
- A05: Single control (logic "0" J1–J2)
- A06: Extended frequency range (consult factory)
- A13: J1 SMA male, J2–J3 SMA female
- A14: J1 SMA female, J2–J3 SMA male
- A16: +9 VDC to +18 VDC supply

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>B1</th>
<th>B0</th>
<th>RF Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>J1–J2</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>J1–J3</td>
</tr>
</tbody>
</table>

ENVIROMENTAL RATINGS
- Temperature: -55°C to +95°C (operating)
  -65°C to +125°C (storage)

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2181-2AT-A1072 & A2072
2–4 GHz, non-reflective SPDT switch module

SIZE: A
SHEET: 1 of 2
Dwg. #: 100–2956
SPECIFICATIONS

AMC MODEL SW-2181-2AT-011 IS AN ABSORPTIVE SPDT BAND
SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS

- FREQUENCY RANGE: 0.01-18 GHz MINIMUM
- INSERTION LOSS:
  J1-J2 (LOW BAND): 0.01-2.0 GHz 2.0 dB MAXIMUM
  J1-J3 (HIGH BAND): 2.0-18.0 GHz 3.0 dB MAXIMUM
- ISOLATION:
  J1-J2 (LOW BAND): 0.01-2.0 GHz 80 dB MINIMUM
  J1-J3 (HIGH BAND): 2.0-18.0 GHz 60 dB MINIMUM
- VSWR (ON/OFF):
  J1-J2 (LOW BAND): 0.01-2.0 GHz 1.3:1 MAXIMUM
  J1-J3 (HIGH BAND): 2.0-18.0 GHz 2:1 MAXIMUM
- SWITCHING TIME:
  RISE (10% RF TO 90% RF): 35 ns MAXIMUM
  FALL (90% RF TO 10% RF): 35 ns MAXIMUM
  OFF (50% TTL TO 90% RF): 350 ns MAXIMUM
  ON (50% TTL TO 10% RF): 100 ns MAXIMUM
- CONTROL: TTL COMPATIBLE, UNITY LOAD
  2 INDIVIDUAL CONTROLS
  LOGIC "Q" = ISOLATION
  LOGIC "Q" = INSERTION LOSS
- POWER SUPPLY: +5VDC ±5% @ 50 mA MAXIMUM
  -12VDC ±5% @ 90 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT: SMA FEMALE
  POWER: SOLDER PIN
  CONTROL: SOLDER PIN
- SIZE: 1.00" x 1.50" x 0.38"

AVAILABLE OPTIONS

A01: 50Ω CONTROL IMPEDANCE
A02: 100Ω CONTROL IMPEDANCE
A03: INVERSE CONTROL LOGIC (LOGIC "Q" INSERTION LOSS)
A14: J1 SMA MALE, J2 AND J3 SMA FEMALE
A15: J1 SMA FEMALE, J2 AND J3 SMA MALE
A16: -5VDC SUPPLY
A17: +12VDC TO +15VDC SUPPLY
A18: SINGLE CONTROL (TOGGLE)
       (LOGIC "Q" = J1-J3 PATH ON)

MECHANICAL OUTLINE

FEMALE SMA
CONNECTOR 3 PCS

LOGIC TABLE

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<th>E2</th>
<th>RF PATH</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>J1-J2</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>J1-J3</td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ± 0.020
   X.XXX ± 0.010
3) WEIGHT: APPROX. 1.3 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE: -55°C TO +55°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE

SW-2181-2AT-011
0.01 TO 18 GHz, NON-REFLECTIVE SPDT BAND SWITCH MODULE

SIZE A
SHEET 1 OF 2
Dwg. 190-2758
DESCRIPTION

AMC MODEL SW-2182-2AT IS AN ABSORPTIVE SPDT SWITCH MODULE WITH INTEGRAL TTL DRIVER AND BUILT IN VIDEO FILTER.

SPECIFICATIONS

- FREQUENCY RANGE ................. 2–18 GHz MINIMUM
- INSERTION LOSS ................. 1–12 GHz, 3.5 dB MAXIMUM
- ......................... 12–18 GHz, 4.5 dB MAXIMUM
- ISOLATION ................. 1–12 GHz, 70 dB MINIMUM
- ......................... 12–18 GHz, 55 dB MINIMUM
- VSWR (ON/OFF) ................. 2.0:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ................. 100 ns MAXIMUM
  FALL (90% RF TO 10% RF) ................. 100 ns MAXIMUM
  ON (50% TTL TO 90% RF) ................. 150 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ................. 150 ns MAXIMUM
- CONTROL ................. TTL COMPATIBLE, UNITY LOAD
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
  (SEE TRUTH TABLE)
- RF POWER RATINGS ................. +27 dBm CW MAXIMUM
- POWER SUPPLY ................. +5VDC ±5% @ 80 mA MAXIMUM
  −5VDC ±5% @ 80 mA MAXIMUM
- RF LEAKAGE (CONDUCTIVE/RADIATED) ................. −50 dbc MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ................. SMA (FEMALE)
  POWER ................. SOLDER PIN
  CONTROL ................. SOLDER PIN
- SIZE ................. 1.55" x 0.85" x 0.78"

AVAILABLE OPTIONS

A01 ................. 50Ω CONTROL IMPEDANCE
A02 ................. 100Ω CONTROL IMPEDANCE
A03 ................. INVERSE CONTROL LOGIC (LOGIC "0" = ISOLATION)
A08 ................. SINGLE CONTROL (LOGIC "0" = J1–J2, PATH "ON")
A14 ................. J1 SMA MALE, J2 AND J3 SMA FEMALE
A15 ................. J1 SMA FEMALE, J2 AND J3 SMA MALE
A16 ................. ±9V TO ±18V DC SUPPLY

ENVIRONMENTAL RATINGS

- TEMPERATURE ................. −55°C TO +95°C (OPERATING)
  −65°C TO +125°C (STORAGE)
- HUMIDITY ................. MIL-STD-202F, METHOD 103B, COND. B
- SHOCK ................. MIL-STD-202F, METHOD 213B, COND. B
- VIBRATION ................. MIL-STD-202F, METHOD 204D, COND. B
- ALTITUDE ................. MIL-STD-202F, METHOD 105C, COND. B
- TEMPERATURE CYCLE ................. MIL-STD-202F, METHOD 107D, COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE

SW-2182-2AT
2–18 GHz, NON-REFLECTIVE, SPDT SWITCH MODULE

SIZE A SHEET 1 OF 2 Dwg. # 100-2886
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<th>PAGES</th>
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<td>SP3T, REFLECTIVE</td>
<td></td>
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<tr>
<td></td>
<td>1-18 GHz</td>
<td>5-1</td>
</tr>
<tr>
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<td>SLIM-LINE SWITCH MODULE,</td>
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<td>AMC MODEL NO: SWS-2183-3D</td>
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<td>1.75-18 GHz</td>
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<td>SWITCH MODULE,</td>
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<tr>
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<td>AMC MODEL NO: SW-2181-3 (3S)</td>
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<tr>
<td></td>
<td>0.3-20 GHz</td>
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<tr>
<td></td>
<td>SWITCH MODULE,</td>
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<tr>
<td></td>
<td>AMC MODEL NO: SW-2182-3</td>
<td>5-7</td>
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</table>
AMC MODEL SWS-2183-3D IS A REFLECTIVE BROAD BAND SP3T SWITCH MODULE WITH INTEGRAL TTL DRIVER IN A LOW PROFILE HERMETICALLY SEALED HOUSING.

**SPECIFICATIONS**

- **FREQUENCY RANGE**
  - 1 – 18 GHz MINIMUM

- **INSERTION LOSS**
  - 1 – 2 GHz 1.2 dB MAXIMUM
  - 2 – 4 GHz 1.5 dB MAXIMUM
  - 4 – 8 GHz 2.0 dB MAXIMUM
  - 8 – 12 GHz 2.5 dB MAXIMUM
  - 12 – 18 GHz 3.0 dB MAXIMUM

- **ISOLATION**
  - 65 dB MINIMUM

- **VSWR (ON)**
  - 2 : 1 MAXIMUM

- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF) 10 nS MAXIMUM
  - FALL (90% RF TO 10% RF) 10 nS MAXIMUM
  - ON (50% TTL TO 90% RF) 20 nS MAXIMUM
  - OFF (50% TTL TO 10% RF) 20 nS MAXIMUM

- **CONTROL**
  - TTL COMPATIBLE, UNITY LOAD
  - 3 INDIVIDUAL CONTROLS
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION

- **RF POWER RATING**
  - 1W CW, MAXIMUM

- **POWER SUPPLY**
  - +5VDC ±5% @ 110 mA MAXIMUM
  - -12VDC ±5% @ 60 mA MAXIMUM

- **CONNECTORS**
  - RF INPUT/OUTPUT FIELD REPLACEABLE SMA (FEMALE)
  - POWER SOLDER PIN
  - CONTROL SOLDER PIN

- **SIZE**
  - 1.20” x 1.00” x 0.24”

**AVAILABLE OPTIONS**

- **A01**
  - 50Ω CONTROL IMPEDANCE

- **A02**
  - 100Ω CONTROL IMPEDANCE

- **A03**
  - INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)

- **A04**
  - EXTENDED FREQUENCY RANGE TO 100 MHz

- **A07**
  - INPUT/OUTPUT VIDEO FILTER
  - (ADDITIONAL 0.5 dB LOSS, 2–18 GHz)

- **A10**
  - -15VDC SUPPLY

- **A12**
  - 2 BIT DECODER OPTION (30 nS EXCESS DELAY)

**MECHANICAL OUTLINE**

**LOGIC TABLE**

<table>
<thead>
<tr>
<th>C3</th>
<th>C2</th>
<th>C1</th>
<th>RF_PATH</th>
<th>NOTES</th>
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<td>0</td>
<td>J4-J1</td>
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<td>0</td>
<td>1</td>
<td>J4-J2</td>
<td>2) TOLERANCES: X.XX ±0.020</td>
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<td>0</td>
<td>1</td>
<td>1</td>
<td>J4-J3</td>
<td>X.XXX ±0.010</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL RATINGS**

- **TEMPERATURE**
  - -55°C TO +95°C (OPERATING)
  - -65°C TO +125°C (STORAGE)

- **HUMIDITY**
  - MIL-STD-202F, METHOD 103B COND. B

- **SHOCK**
  - MIL-STD-202F, METHOD 213B COND. B

- **VIBRATION**
  - MIL-STD-202F, METHOD 204D COND. B

- **ALTITUDE**
  - MIL-STD-202F, METHOD 105C COND. B

- **TEMPERATURE CYCLE**
  - MIL-STD-202F, METHOD 107D COND. A

**AMERICAN MICROWAVE CORPORATION**

73116 GROVE RD., FREDERICK, MD. 21701

TEL: (301) 662-4700 FAX: (301) 682-4938

**PRODUCT FEATURE**

SWS-2183-3D

SLIM LINE 1 TO 18 GHz, REFLECTIVE, SP3T SWITCH MODULE

**SHEET 1 OF 2**

REV: A

DATE: 11/17/92
DESCRIPTION
AMC Model SW-2181-3 (3S) is a reflective broad-band switch module without driver circuitry.

SPECIFICATIONS
- FREQUENCY RANGE
  (-3) 1.75-18 GHz minimum
  (-3S) 0.3-20 GHz minimum
- INSERTION LOSS
  (-3) 2.5 dB maximum
  (-3S) 3.0 dB maximum
- ISOLATION
  (-3) 30 dB minimum
  (-3S) 55 dB minimum
- VSWR (ON)
  1.9:1 maximum
- RF POWER RATINGS
  +27 dBm CW maximum
- SWITCHING TIME
  RISE (10% RF TO 90% RF) 300 ns maximum
  FALL (90% RF TO 10% RF) 300 ns maximum
  ON (50% TTL TO 90% RF) 500 ns maximum
  OFF (50% TTL TO 10% RF) 500 ns maximum
- CONTROLS
  CURRENT CONTROLLED
  3 INDIVIDUAL CONTROLS
  +30 mA = ISOLATION
  -30 mA = INSERTION LOSS
  (SEE TRUTH TABLE)
- CONNECTORS
  RF INPUT/OUTPUT
  SMA FEMALE
  CONTROL
  SOLDER PIN
- SIZE
  1.25" x 1.11" x 0.32"

AVAILABLE OPTIONS
A04: INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
A05: EXTENDED FREQUENCY TO 100 MHz
A13: J1 SMA MALE, J2 AND J3 SMA FEMALE
A14: J1 SMA FEMALE, J2 AND J3 SMA MALE

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>E4</th>
<th>E3</th>
<th>E2</th>
<th>RF PATH</th>
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<tr>
<td>+30mA</td>
<td>+30mA</td>
<td>-30mA</td>
<td>J1-J2</td>
</tr>
<tr>
<td>+30mA</td>
<td>-30mA</td>
<td>+30mA</td>
<td>J1-J3</td>
</tr>
<tr>
<td>-30mA</td>
<td>+30mA</td>
<td>+30mA</td>
<td>J1-J4</td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 2.0 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE
  -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY
  MIL-STD-202F, METHOD 103B COND. B
- SHOCK
  MIL-STD-202F, METHOD 213B COND. B
- VIBRATION
  MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE
  MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE
  MIL-STD-202F, METHOD 1070 COND. A

AMERICAN MICROWAVE CORPORATION
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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2181-3 (3S)
1.75-18 GHz, REFLECTIVE SPST SWITCH MODULE
SIZE A  SHEET 1 OF 2  Dwg. # 100-2900
**DESCRIPTION**

ANC MODEL SW-2182-3 IS A REFLECTIVE BROAD-BAND SWITCH MODULE WITHOUT DRIVER CIRCUITRY, PACKAGED IN A MINIATURE CONNECTORIZED HOUSING.

**SPECIFICATIONS**

- **FREQUENCY RANGE**
  0.3-20 GHz MINIMUM

- **INSERTION LOSS**
  3.2 dB MAXIMUM

- **ISOLATION**
  18-20 GHz, 55 dB MINIMUM

- **VSWR (ON)**
  2.0:1 MAXIMUM

- **RF POWER RATINGS**
  +27 dBm CW MAXIMUM

- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF): 10 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 10 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 20 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 20 ns MAXIMUM

- **CURRENT CONTROLLED**
  +20 mA = ISOLATION
  -20 mA = ISOLATION
  (SEE TRUTH TABLE)

- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - CONTROL: SOLDER PIN

- **SIZE**
  0.80" x 0.72" x 0.24"

**AVAILABLE OPTIONS**

- **A04**: INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
- **A06**: 2 WATTS CW MAXIMUM (2-20 GHz)
- **A13**: J1 SMA MALE, J2-J4 SMA FEMALE
- **A14**: J1 SMA FEMALE, J2-J4 SMA MALE
- **A15**: REMOVABLE CONNECTORS (DROP IN APPLICATIONS)

**MECHANICAL OUTLINE**

![Mechanical Outline Diagram]

**ENVIRONMENTAL RATINGS**

- **TEMPERATURE**
  -55°C TO +55°C (OPERATING)
  -65°C TO +125°C (STORAGE)

- **HUMIDITY**
  MIL-STD-202F, METHOD 103B COND. B

- **SHOCK**
  MIL-STD-202F, METHOD 213B COND. B

- **VIBRATION**
  MIL-STD-202F, METHOD 204D COND. B

- **ALTITUDE**
  MIL-STD-202F, METHOD 165C COND. B

- **TEMPERATURE CYCLE**
  MIL-STD-202F, METHOD 107D COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938

**PRODUCT FEATURE**

**SW-2182-3**

0.3-20 GHz, REFLECTIVE SPST SWITCH MODULE
DESCRIPTION

AMC MODEL SW-1182-3D IS A REFLECTIVE BROAD BAND SP4T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS

- **FREQUENCY RANGE** ................. 1–18 GHz MINIMUM
- **INSERTION LOSS** ................. 1–4 GHz, 1.4 dB MAXIMUM
  4–8 GHz, 1.5 dB MAXIMUM
  8–12.4 GHz, 2.0 dB MAXIMUM
  12.4–18 GHz, 2.6 dB MAXIMUM
- **ISOLATION** ......................... 1–12.4 GHz, 65 dB MINIMUM
  12.4–18 GHz, 55 dB MINIMUM
- **VSWR (ON)** ......................... 1.8:1 MAXIMUM
- **RF POWER RATING** ................. 1W CW, 75W PEAK (1µS, PW MAXIMUM)
- **SWITCHING TIME** .................
  RISE (10% RF TO 90% RF) ............... 20 ns MAXIMUM
  FALL (90% RF TO 10% RF) ............... 20 ns MAXIMUM
  ON (50% TTL TO 90% RF) ............... 50 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ............... 50 ns MAXIMUM
- **CONTROL**......................... TTL LOW POWER SCHOTTKY, (UNITY LOAD)
  (SEE TRUTH TABLE)
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
- **POWER SUPPLY** ................. +5VDC ±5% @ 150 mA MAXIMUM
  −12 TO −15VDC @ 50 mA MAXIMUM
- **CONNECTORS** ..................
  RF INPUT/OUTPUT .................. SMA (FEMALE)
  POWER .................. SOLDER PIN
  CONTROL .................. SOLDER PIN
- **SIZE** .................. 1.25" x 1.25" x 0.88"

AVAILABLE OPTIONS

- **A01** .................. 50Ω CONTROL IMPEDANCE
- **A02** .................. 100Ω CONTROL IMPEDANCE
- **A03** .................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- **A04** .................. EXTENDED FREQUENCY RANGE TO 100 MHz
- **A07** .................. VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
- **A08** .................. VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
- **A09** .................. VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
- **A10** .................. SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
- **A11** .................. SMC MALE CONTROL TERMINALS
- **A13** .................. +12 TO +18 VDC POWER SUPPLY
- **A14** .................. −5 VDC POWER SUPPLY

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 2.0 OZ

ENVIRONMENTAL RATINGS

- **TEMPERATURE:**
  OPERATING ............... −65°C TO +110°C
  NON-OPERATING ............ −65°C TO +125°C
- **HUMIDITY:** .......... MIL-STD-202F, METHOD 103B, COND. B
- **SHOCK:** ............... MIL-STD-202F, METHOD 213B, COND. B
- **VIBRATION:** .......... MIL-STD-202F, METHOD 2040, COND. B
- **ALTITUDE:** .......... MIL-STD-202F, METHOD 105C, COND. B
- **TEMPERATURE CYCLE:** .. MIL-STD-202F, METHOD 107D, COND. A

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PRODUCT FEATURE
SW-1182-3D
1.0–18 GHz, SP4T SWITCH MODULE

SIZE A

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PRODUCT FEATURE
SW-1182-3D
1.0–18 GHz, SP4T SWITCH MODULE

SIZE A
**SPECIFICATIONS**

- **FREQUENCY RANGE**
  - 1–18 GHz MINIMUM
  - 1–4 GHz, 1.4 dB MAXIMUM
  - 4–8 GHz, 1.5 dB MAXIMUM
  - 8–12.4 GHz, 2.0 dB MAXIMUM
  - 12.4–18 GHz, 2.6 dB MAXIMUM

- **INSERTION LOSS**
  - 1–12.4 GHz, 65 dB MINIMUM
  - 12.4–18 GHz, 55 dB MINIMUM

- **ISOLATION**
  - 1–12.4 GHz, 65 dB MINIMUM
  - 12.4–18 GHz, 55 dB MINIMUM

- **VSWR (ON)**
  - 1.8:1 MAXIMUM

- **RF POWER RATING**
  - 1W CW, 75W PEAK (1μS, PW MAXIMUM)

- **SWITCHING TIME**
  - **RISE** (10% RF TO 90% RF)
    - 20 ns MAXIMUM
  - **FALL** (90% RF TO 10% RF)
    - 20 ns MAXIMUM
  - **ON** (50% TTL TO 90% RF)
    - 50 ns MAXIMUM
  - **OFF** (50% TTL TO 10% RF)
    - 50 ns MAXIMUM

- **CONTROL**
  - TTL LOW POWER SCHOTTKY, (UNITY LOAD)
    - (SEE TRUTH TABLE)
    - LOGIC "0" = INSERTION LOSS
    - LOGIC "1" = ISOLATION

- **POWER SUPPLY**
  - +5VDC ±5% @ 150 mA MAXIMUM
  - -12 TO -15VDC @50 mA MAXIMUM

- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN

- **SIZE**
  - 1.25" x 1.25" x 0.70"

**AVAILABLE OPTIONS**

- A01 50Ω CONTROL IMPEDANCE
- A02 100Ω CONTROL IMPEDANCE
- A03 INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04 EXTENDED FREQUENCY RANGE TO 100 MHz
- A07 VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
- A09 VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
- A07 VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
- A10 SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
- A11 SMC MALE CONTROL TERMINALS
- A13 +12 TO +18 VDC POWER SUPPLY
- A14 -5 VDC POWER SUPPLY

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**ENVIRONMENTAL RATING**

- **TEMPERATURE:**
  - OPERATING: -65°C TO +110°C
  - NON-OPERATING: -65°C TO +125°C

- **HUMIDITY:** MIL-STD-202F, METHOD 103B COND. B
- **SHOCK:** MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION:** MIL-STD-202F, METHOD 204D COND. B
- **ALTITUDE:** MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE:** MIL-STD-202F, METHOD 107D COND. A
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<td>1-2 GHz 500 nsec SWITCH MODULE</td>
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<td>0.1-18 GHz 50 nsec SWITCH MODULE</td>
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DESCRIPTION
AMC MODEL SW-2000-3AH IS A REFLECTIVE SP3T SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR LOW LOSS AND LOW VSWR RF APPLICATIONS.

SPECIFICATIONS
- FREQUENCY RANGE: 50–1500 MHz MINIMUM
- INSERTION LOSS: 1.5 dB MAXIMUM
- ISOLATION: 65 dB MINIMUM
- VSWR (ON): 1.3:1 MAXIMUM
- RF POWER RATINGS: +20 dBm CW MAXIMUM
- SWITCHING TIME
  - Rise (10% RF TO 90% RF): 250 ns MAXIMUM
  - Fall (90% RF TO 10% RF): 250 ns MAXIMUM
  - On (50% TTL TO 90% RF): 500 ns MAXIMUM
  - Off (50% TTL TO 10% RF): 500 ns MAXIMUM
- CONTROLS: TTL COMPATIBLE, UNITY LOAD
  - Logic "0" = INSERTION LOSS
  - Logic "1" = ISOLATION
  (SEE TRUTH TABLE)
- POWER SUPPLY: +5VDC ±5% @ 150 mA MAXIMUM
  - −5VDC ±5% @ 50 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN (EMI)
  - CONTROL: SOLDER PIN
- SIZE: 1.40" × 1.00" × 0.75"

AVAILABLE OPTIONS
- AO1: 50Ω CONTROL IMPEDANCE
- AO2: 100Ω CONTROL IMPEDANCE
- AO3: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A13: −9VDC TO ±18VDC SUPPLY
- A14: J1 SMA MALE, J2–J4 SMA FEMALE
- A15: J1 SMA FEMALE, J2–J4 SMA MALE

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE: −55°C TO +95°C (OPERATING)
  - −65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
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PRODUCT FEATURE
SW-2000-3AH
50–1500 MHz, REFLECTIVE SP3T SWITCH MODULE
SIZE A SHEET 1 OF 2 Dwg. # 100-289
DESCRIPTION

AMC MODEL SW-2250-3AT IS AN ABSORPTIVE SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER DESIGNED FOR LOW LOSS, LOW VSWR, AMPLITUDE AND PHASE BALANCED APPLICATIONS.

SPECIFICATIONS

- **Frequency Range**: 500 MHz - 2.25 GHz Minimum
- **Insertion Loss**: 1.3 dB Maximum
- **Amplitude Balance**: ±0.1 dB Maximum
- **Phase Balance**: ±1° Maximum
- **Isolation**: 65 dB Minimum
- **VSWR (ON/OFF)**: 1.4:1 Maximum
- **Switching Time**: 3 MHz PRF Maximum
  - Rise (10% RF to 90% RF): 50 ns Maximum
  - Fall (90% RF to 10% RF): 50 ns Maximum
  - On (50% TTL to 90% RF): 150 ns Maximum
  - Off (50% TTL to 10% RF): 150 ns Maximum
- **RF Power Ratings**: +23 dBm CW Maximum
- **RF Leakage (Conductive/Radiated)**: 60 dBc Minimum
- **In-Band Video Leakage**: −65 dBm Maximum @ 500 MHz
- **Controls**: TTL Compatible, Unity Load
  - 3 Individual Controls
  - Logic "0" = Insertion Loss
  - Logic "1" = Isolation
- **Power Supply**: +5VDC ±5% @ 70 mA Maximum
  - −5VDC ±5% @ 50 mA Maximum
- **Connectors**
  - RF Input/Output: SMA (Female)
  - Power: Solder Pin (EMI)
  - Control: Solder Pin
- **Size**: 1.40" x 1.40" x 0.75"

AVAILABLE OPTIONS

A01 ............................................. 50Ω CONTROL IMPEDANCE
A02 ............................................. 100Ω CONTROL IMPEDANCE
A03 ............................................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A14 ............................................. J1 SMA MALE, J2-J4 SMA FEMALE
A15 ............................................. J1 SMA FEMALE, J2-J4 SMA MALE
A16 ............................................. ±9 TO ±18VDC POWER SUPPLY

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: +0.020
3) WEIGHT: APPROX. 5 OZ

ENVIRONMENTAL RATINGS

- **Temperature**: −55°C TO +95°C (OPERATING)
  - −65°C TO +125°C (STORAGE)
- **Humidity**: MIL-STD-202F, METHOD 103B COND. B
- **Shock**: MIL-STD-202F, METHOD 213B COND. B
- **Vibration**: MIL-STD-202F, METHOD 204D COND. B
- **Altitude**: MIL-STD-202F, METHOD 105C COND. B
- **Temperature Cycle**: MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE

SW-2250-3AT

0.5-2.25 GH, AMPLITUDE AND PHASE BALANCED, NON-REFLECTIVE, SPST SWITCH MODULE

SIZE A SHEET 1 OF 2 DMC # 100-285B
FUNCTIONAL SCHEMATIC

TTL DRIVER

RF SECTION
**DESCRIPTION**

AMC MODEL SW-2181-3AT-10 IS AN ABSORPTIVE SP3T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

**SPECIFICATIONS**

- **Frequency Range**: 1–2 GHz Minimum
- **Insertion Loss**: 1.5 dB Maximum
- **Isolation**: 60 dB Minimum
- **VSWR (ON/OFF)**: 1.4:1 Maximum
- **RF Power Ratings**: 1 Watt CW Maximum
- **Switching Time**:
  - Rise (10% RF to 90% RF): 100 ns Maximum
  - Fall (90% RF to 10% RF): 100 ns Maximum
  - On (50% TTL to 90% RF): 150 ns Maximum
  - Off (50% TTL to 10% RF): 150 ns Maximum
- **Control**: TTL compatible, Unity load
  - 3 Individual Controls
  - Logic "0" = Insertion Loss
  - Logic "1" = Isolation
  - (See Truth Table)
- **Power Supply**: +5VDC ± 5% @ 130 mA Maximum
  - −15VDC ± 5% @ 60 mA Maximum
- **Connectors**
  - RF input/output: SMA female
  - Power: solder pin
  - Control: solder pin
- **Size**: 1.00” x 1.00” x 0.63”

**AVAILABLE OPTIONS**

- A01: 50Ω Control Impedance
- A02: 100Ω Control Impedance
- A03: Inverse Control Logic (Logic "0" Isolation)
- A14: J1 SMA Male, J2–J4 SMA Female
- A15: J1 SMA Female, J2–J4 SMA Male
- A16: −5 VDC Supply
- A17: +12 VDC or +15 Supply
- A18: Extended Frequency Band (Consult Factory)

**MECHANICAL OUTLINE**

![Mechanical Diagram](image-url)

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>E4</th>
<th>E3</th>
<th>E2</th>
<th>RF Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>J1-J2</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>J1-J3</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>J1-J4</td>
</tr>
</tbody>
</table>

**NOTES:**
1) Dimensions are in inches [millimeters]
2) Tolerances: ± 0.020
3) Weight: Approx. 4 oz

**ENVIRONMENTAL RATINGS**

- **Temperature**: −55°C to +95°C (Operating)
  - −65°C to +125°C (Storage)
- **Humidity**: MIL-STD-202F, Method 103B Cond. B
- **Shock**: MIL-STD-202F, Method 213B Cond. B
- **Vibration**: MIL-STD-202F, Method 2040 Cond. B
- **Altitude**: MIL-STD-202F, Method 105C Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D Cond. A

**AMERICAN MICROWAVE CORPORATION**
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662–4700 FAX: (301) 662–4938

**PRODUCT FEATURE**

**SW-2181-3AT-10**
1–2 GHz, Non-Reflective, SP3T Switch Module

**SIZE A**
SHEET 1 OF 2
Dwg. # 100-2005
**DESCRIPTION**

AMC MODEL SW-2181-3AT-B3072 IS AN ABSORPTIVE SP3T SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED TO OPERATE WITH A SINGLE POSITIVE SUPPLY VOLTAGE.

**SPECIFICATIONS**

- **Frequency Range**: 1–2 GHz minimum
- **Insertion Loss**: 2.0 dB maximum
- **Isolation**: 80 dB minimum
- **VSWR (ON/OFF)**: 1.5:1 maximum
- **RF Power Handling**: 1 watt CW maximum
- **Switching Time**
  - Rise (10% RF to 90% RF): 500 ns maximum
  - Fall (90% RF to 10% RF): 500 ns maximum
  - ON (50% TTL to 90% RF): 1 μs maximum
  - OFF (50% TTL to 10% RF): 1 μs maximum
- **Controls**: TTL compatible, unity load
  - 3 individual controls
  - Logic "0" = insertion loss
  - Logic "1" = isolation
  - (See truth table)
- **Supply Power**: +5VDC ±5% @ 200 mA maximum
- **Connectors**
  - RF input/output: SMA female
  - Power: solder pin
  - Control: solder pin
- **Size**: 1.63" x 1.50" x 0.50"

**AVAILABLE OPTIONS**

- A01: 50Ω control impedance
- A02: 100Ω control impedance
- A03: Inverse control logic (logic "0" isolation)
- A04: Video filter (0.5 dB excess loss)
- A05: 2-bit binary decoder
- A06: Extended frequency range (consult factory)
- A13: J4 SMA male, J1–J3 SMA female
- A14: J4 SMA female, J1–J3 SMA male
- A16: +9 VDC to +18 VDC supply

**MECHANICAL OUTLINE**

![Mechanical Outline Diagram]

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>B2</th>
<th>B1</th>
<th>B0</th>
<th>RF Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>0</td>
<td>J4–J1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>J4–J2</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>J4–J3</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL RATINGS**

- **Temperature**: -55°C to +95°C (operating)  
  -65°C to +125°C (storage)
- **Humidity**: MIL-STD-202F, METHOD 103B COND. B
- **Shock**: MIL-STD-202F, METHOD 213B COND. B
- **Vibration**: MIL-STD-202F, METHOD 204D COND. B
- **Altitude**: MIL-STD-202F, METHOD 105C COND. B
- **Temperature Cycle**: MIL-STD-202F, METHOD 107D COND. A

**AMERICAN MICROWAVE CORPORATION**

73116 GROVE RD., FREDERICK, MD. 21701

TEL: (301) 662-4700 FAX: (301) 662-493B

**PRODUCT FEATURE**

SW-2181-3AT-B3072

1–2 GHz, Non-Reflective SP3T Switch Module

Size: A  
Sheet: 1 of 2  
DWC. #: 100-3185
DESCRIPTION
AMC Model SW-2181-3AT-A3072 is an absorptive SP3T switch module with integral TTL driver, designed to operate with a single positive supply voltage.

SPECIFICATIONS
- FREQUENCY RANGE: 2-4 GHz minimum
- INSERTION LOSS: 2.0 dB maximum
- ISOLATION: 80 dB minimum
- VSWR (ON/OFF): 1.5:1 maximum
- RF POWER HANDLING: 1 WATT CW maximum
- SWITCHING TIME
  RISE (10% RF TO 90% RF): 500 ns maximum
  FALL (90% RF TO 10% RF): 500 ns maximum
  ON (50% TTL TO 90% RF): 1 μs maximum
  OFF (50% TTL TO 10% RF): 1 μs maximum
- CONTROLS
  TTL compatible, unity load
  3 individual controls
  Logic "0" = insertion loss
  Logic "1" = isolation
  (See truth table)
- SUPPLY POWER: +5VDC ±5% @ 200 mA maximum
- CONNECTORS
  RF INPUT/OUTPUT: SMA female
  POWER: solder pin
  CONTROL: solder pin
- SIZE: 1.63" x 1.50" x 0.50"

AVAILABLE OPTIONS
A01: 50Ω CONTROL IMPEDANCE
A02: 100Ω CONTROL IMPEDANCE
A03: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A04: VIDEO FILTER (0.5 dB EXCESS LOSS)
A05: 2-BIT BINARY DECODER
A06: EXTENDED FREQUENCY RANGE (CONSULT FACTORY)
A13: J4 SMA MALE, J1-J3 SMA FEMALE
A14: J4 SMA FEMALE, J1-J3 SMA MALE
A16: +9 VDC TO +18 VDC SUPPLY

ENVIRONMENTAL RATINGS
- TEMPERATURE: -55°C to +95°C (OPERATING)
- -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2181-3AT-A3072
2-4 GHz, NON-REFLECTIVE SP3T SWITCH MODULE

SIZE: A
SHEET 1 OF 2
DWC: 100-2905
DESCRIPTION

AMC MODEL SW-2181-3AT IS AN ABSORPTIVE SP3T SWITCH MODULE WITH INTEGRAL TTL DRIVER DESIGNED FOR BROAD BAND AND LOW IN-BAND VIDEO TRANSIENT SIGNAL APPLICATIONS.

SPECIFICATIONS

- FREQUENCY RANGE ................. 0.1–18 GHz MINIMUM
- INSERTION LOSS .................. 4.0 dB MAXIMUM
- ISOLATION ....................... 60 dB MINIMUM
- VSWR (ON/OFF) .................. 2.0:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ........... 50 ns MAXIMUM
  FALL (90% RF TO 10% RF) ........... 50 ns MAXIMUM
  ON (50% TTL TO 90% RF) ........... 150 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ........... 150 ns MAXIMUM
- RF POWER RATINGS ............... +27 dBm CW MAXIMUM
- IN BAND VIDEO POWER/TRANSIENTS ........... -60 dBm MAXIMUM
- CONTROLS ...................... TTL COMPATIBLE, UNITY LOAD
  3 INDIVIDUAL CONTROLS
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
  (SEE TRUTH TABLE)
- POWER SUPPLY ................... +5VDC ±5% @ 120 mA MAXIMUM
  -5VDC ±5% @ 60 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ................. SMA (FEMALE)
  POWER ......................... SOLDER PIN (EMI)
  CONTROL ....................... SOLDER PIN
- SIZE ............................ 1.0" x 1.0" x 0.63"

AVAILABLE OPTIONS

- AO1 .......................... 50Ω CONTROL IMPEDANCE
- AO2 .......................... 100Ω CONTROL IMPEDANCE
- AO3 .......................... INVERSE CONTROL LOGIC (LOGIC "0", ISOLATION)
- A13 .......................... ±9VDC TO ±18VDC SUPPLY
- A14 .......................... J1 SMA MALE, J2–J4 SMA FEMALE CONNECTORS
- A14 .......................... J1 SMA FEMALE, J2–J4 SMA MALE CONNECTORS

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>E4</th>
<th>E3</th>
<th>E2</th>
<th>RF PATH ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>0</td>
<td>J1–J2</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>J1–J3</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>J1–J4</td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES (MILLIMETERS)
2) TOLERANCES: X.XX ± 0.020 X.XXX ± 0.010
3) WEIGHT: APPROX. 4.0 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE .................. -55°C TO +85°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY ..................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK ......................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION .................... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ..................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE

SW-2181-3AT-230
0.1–18 GHz, NON-REFLECTIVE SP3T SWITCH MODULE

SIZE A  SHEET 1 OF 2  DWG. # 100-2009
<table>
<thead>
<tr>
<th>SECTION</th>
<th>PRODUCT DESCRIPTION</th>
<th>PAGES</th>
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<tbody>
<tr>
<td>7</td>
<td>SP4T, REFLECTIVE</td>
<td>7-1</td>
</tr>
<tr>
<td></td>
<td>• 8.5-10.5 GHz 2KW PEAK/2W AVERAGE POWER SWITCH MODULE,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMC MODEL NO: SWH-0811-4</td>
<td>7-3</td>
</tr>
<tr>
<td></td>
<td>• 8-18 GHz SWITCH MODULE,</td>
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<tr>
<td></td>
<td>AMC MODEL NO: SW-8018-4A</td>
<td>7-5</td>
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<tr>
<td></td>
<td>• 2-18 GHz BAND-SWITCH MODULE,</td>
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<tr>
<td></td>
<td>AMC MODEL NO: SW-218-4S</td>
<td>7-7</td>
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<tr>
<td></td>
<td>• 1-18GHz RADIAL SWITCH MODULE,</td>
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<tr>
<td></td>
<td>AMC MODEL NO: SW-1182-4D</td>
<td>7-9</td>
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<tr>
<td></td>
<td>• 1-18 GHz SLIM-LINE SWITCH MODULE,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMC MODEL NO: SWS-2183-4D</td>
<td>7-11</td>
</tr>
</tbody>
</table>
**DESCRIPTION**

AMC MODEL SWH-0811-4 IS A REFLECTIVE, ALL SHUNT SP4T SWITCH MODULE WITH INTEGRAL TTL DRIVER, CAPABLE OF HANDLING 2KW PEAK POWER.

**SPECIFICATIONS**

- **Frequency Range**: 8.5-10.5 GHz minimum
- **Insertion Loss**: 9.0-10.0 GHz 1.8 dB maximum
- **Isolation**: 8.5-10.5 GHz 20.0 dB maximum
- **VSWR (On/Off)**: 50 dB minimum
- **Switching Time**
  - Rise (10% RF to 90% RF): 500 ns maximum
  - Fall (90% RF to 10% RF): 100 ns maximum
  - ON (50% TTL to 90% RF): 150 ns maximum
  - OFF (50% TTL to 10% RF): 250 ns maximum
- **Control**: TTL compatible, unity load
- **RF Power Ratings**: 2kW peak/2W average
  - 0.2 to 1.5 μs pulse width
  - 800 to 4000 Hz PRF rate
  - OR
  - 100W peak/5W average
  - 0.2 to 65 μs pulse width
  - Up to 150 kHz PRF rate
- **Power Supply**: +5 VDC ±5% @ 100 mA maximum
  - −15 VDC ±5% @ 40 mA maximum
- **Connectors**
  - RF Input/Output: SMA Female
  - Power Control: Solder Pin
- **Size**: 2.25" x 2.25" x .75"

**AVAILABLE OPTIONS**

- A01: 50Ω Control Impedance
- A02: 100Ω Control Impedance
- A03: Inverse Control Logic (Logic "0" Isolation)
- A14: J1 SMA Male, J2 to J5 SMA Female
- A15: J1 SMA Female, J2 to J5 SMA Male
- A16: +15VDC Power Supply

**ENVIRONMENTAL RATINGS**

- **Temperature**: -55°C to +95°C (Operating)
  - -65°C to +125°C (Storage)
- **Humidity**: MIL-STD-202F, METHOD 103B COND. B
- **Shock**: MIL-STD-202F, METHOD 213B COND. B
- **Vibration**: MIL-STD-202F, METHOD 2040 COND. B
- **Altitude**: MIL-STD-202F, METHOD 105C COND. B
- **Temperature Cycle**: MIL-STD-202F, METHOD 107D COND. A

**MECHANICAL OUTLINE**

**LOGIC TABLE**

<table>
<thead>
<tr>
<th>E5</th>
<th>E4</th>
<th>E3</th>
<th>E2</th>
<th>RF PATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>J1-J2</td>
</tr>
<tr>
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<td>1</td>
<td>J1-J3</td>
</tr>
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<td>J1-J4</td>
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<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>J1-J5</td>
</tr>
</tbody>
</table>

**NOTES:**

1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: XXX ± 0.002
   XXX ± 0.010
3) WEIGHT: APPROX. 2.5 OZ

**AMERICAN MICROWAVE CORPORATION**
7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

**PRODUCT FEATURE**

**SWH-0811-4**

8.5-10.5 GHz, Reflective, 2kW Peak Power SP4T Switch
FUNCTIONAL SCHEMATIC

 DRIVER CIRCUIT

+V
-V
E2
E3
E4
E5
GND

BIAS 2
BIAS 3
BIAS 4
BIAS 5

RF SECTION

J1

BIAS 2
BIAS 3
BIAS 4
BIAS 5

J2
J3
J4
J5

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SWH-0811-4
8.5-10.5 GHz, REFLECTIVE, 2KW PEAK POWER SP4T SWITCH

SIZE A SHEET 2 OF 2 DWG: #100-2801
DESCRIPTION
AMC MODEL SW-8018-4A IS A REFLECTIVE SP4T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
- FREQUENCY RANGE .................................. 8–18 GHz MINIMUM
- INSERTION LOSS ..................................... 3.0 dB MAXIMUM
- ISOLATION ............................................ 50 dB MINIMUM
- VSWR (ON) ........................................... 2:1 MAXIMUM
- RF POWER RATINGS ................................ 1 WATT CW MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) .......................... 100 ns MAXIMUM
  FALL (90% RF TO 10% RF) ......................... 100 ns MAXIMUM
  ON (50% TTL TO 90% RF) ......................... 200 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ......................... 200 ns MAXIMUM
- CONTROLS
  TTL COMPATIBLE, UNITY LOAD
  4 INDIVIDUAL CONTROLS
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
  (SEE TRUTH TABLE)
- POWER SUPPLY .................................... +5VDC ±5% @175 mA MAXIMUM
  -15VDC ±5% @175 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT .................................. SMA (FEMALE)
  POWER ............................................... SOLDER PIN (EMI)
  CONTROL ............................................ SOLDER PIN
- SIZE .............................................. 1.50" x 1.50" x 0.75"

AVAILABLE OPTIONS
- A01 .............................................. 50Ω CONTROL IMPEDANCE
- A02 .............................................. 100Ω CONTROL IMPEDANCE
- A03 .............................................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04 .............................................. VIDEO FILTER (0.5 dB EXCESS LOSS)
- A13 .............................................. +15 VDC SUPPLY

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE ..................................... -55°C TO +85°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY .......................................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK .............................................. MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ........................................... MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE .......................................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .............................. MIL-STD-202F, METHOD 1070 COND. A

AMERICAN MICROWAVE CORPORATION
7311 G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-8018-4A
8–18 GHz, REFLECTIVE SP4T SWITCH MODULE

SIZE A SHEET 1 OF 2 DWG. # 100-2857
DESCRIPTION
AMC MODEL SW-218-4S IS A REFLECTIVE SP4T BAND-SWITCH MODULE WITHOUT DRIVER CIRCUITRY.

SPECIFICATIONS
- FREQUENCY
  J5-J1: 2-4 GHz MINIMUM
  J5-J2: 4-8 GHz MINIMUM
  J5-J4: 8-12.4 GHz MINIMUM
  J5-J3: 12.4-18 GHz MINIMUM

- INSERTION LOSS
  J5-J1: 1.1 dB MAXIMUM
  J5-J2: 1.2 dB MAXIMUM
  J5-J4: 1.8 dB MAXIMUM
  J5-J3: 2.3 dB MAXIMUM

- ISOLATION
  J5-J1: 45 dB MINIMUM
  J5-J2: 40 dB MINIMUM
  J5-J4: 35 dB MINIMUM
  J5-J3: 30 dB MINIMUM

- VSWR (ON)
  J5-J1: 1.8:1 MAXIMUM
  J5-J2: 2.0:1 MAXIMUM
  J5-J4: 2.2:1 MAXIMUM
  J5-J3: 2.5:1 MAXIMUM

- RF POWER RATINGS
  +27 dBm CW MAXIMUM

- SWITCHING TIME
  RISE (10% RF TO 90% RF): 300 ns MAXIMUM
  FALL (90% RF TO 10% RF): 300 ns MAXIMUM
  ON (50% TTL TO 95% RF): 500 ns MAXIMUM
  OFF (50% TTL TO 10% RF): 500 ns MAXIMUM

- CONTROLS
  CURRENT CONTROLLED
  4 INDIVIDUAL CONTROLS
  +20 mA = ISOLATION
  -20 mA = INSERTION LOSS
  (SEE TRUTH TABLE)

- CONNECTORS
  RF INPUT/OUTPUT: SMA (FEMALE)
  CONTROL: SOLDER PIN

- SIZE
  1.25" x 1.53" x 0.52"

AVAILABLE OPTIONS
- A13: J5 SMA MALE, J1-J4 SMA FEMALE
- A14: J5 SMA FEMALE, J1-J4 SMA MALE
- A15: -60 dB ISOLATION (CONSULT FACTORY)

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE
  -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)

- HUMIDITY
  MIL-STD-202F, METHOD 103B COND. B

- SHOCK
  MIL-STD-202F, METHOD 213B COND. B

- VIBRATION
  MIL-STD-202F, METHOD 204D COND. B

- ALTITUDE
  MIL-STD-202F, METHOD 105C COND. B

- TEMPERATURE CYCLE
  MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-218-4S
2-18 GHz, REFLECTIVE SP4T BAND-SWITCH MODULE

SIZE A SHEET 1 OF 2 DWG. #100-2698
**DESCRIPTION**

AMC Model SW-1182-4D is a reflective broadband SP4T switch module with integral TTL driver.

**SPECIFICATIONS**

- **Frequency Range** ............... 1–18 GHz minimum
- **Insertion Loss** ............... 1–4 GHz, 1.4 dB maximum
  ........................................ 4–8 GHz, 1.5 dB maximum
  ........................................ 8–12.4 GHz, 2.0 dB maximum
  ........................................ 12.4–18 GHz, 2.6 dB maximum
- **Isolation** ...................... 1–12.4 GHz, 65 dB minimum
  ........................................ 12.4–18 GHz, 55 dB minimum
- **VSWR (ON)** ..................... 1.8:1 maximum
- **RF Power Rating** .......... 1W CW, 75W peak (1μs, PW maximum)
- **Switching Time** .............. Rise (10% RF to 90% RF) 20 ns maximum
  ........................................ Fall (90% RF to 10% RF) 20 ns maximum
  ........................................ On (50% TTL to 90% RF) 50 ns maximum
  ........................................ Off (50% TTL to 10% RF) 50 ns maximum
- **Control** ...................... TTL LOW POWER SCHOTTKY, (UNITY LOAD)
  (see truth table)
- **Power Supply** .............. +5VDC ±5% @ 150 mA maximum
  ........................................ 12 to −15VDC @ 50 mA maximum
- **Connectors** ................. RF INPUT/OUTPUT
  ........................................ SMA (female)
  ........................................ POWER
  ........................................ SOLDER PIN
  ........................................ CONTROL
  ........................................ SMC (male)
- **Size** ......................... 1.25” x 1.25” x 0.88”

**AVAILABLE OPTIONS**

- A01 ............... 50Ω CONTROL IMPEDANCE
- A02 ............... 100Ω CONTROL IMPEDANCE
- A03 ............... INVERSE CONTROL LOGIC (LOGIC “0” ISOLATION)
- A04 ............... EXTENDED FREQUENCY RANGE TO 100 MHz
- A07 ............... VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
- A08 ............... VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
- A09 ............... VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
- A10 ............... SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
- A11 ............... SOLDER PIN CONTROL TERMINALS
- A13 ............... +12 TO +18 VDC POWER SUPPLY
- A14 ............... −5 VDC POWER SUPPLY

**MECHANICAL OUTLINE**

**TRUTH TABLE**

<table>
<thead>
<tr>
<th>C7</th>
<th>C6</th>
<th>C4</th>
<th>C3</th>
<th>RF Path On</th>
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<td>1</td>
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<td>1</td>
<td>0</td>
<td>J1−J3</td>
</tr>
<tr>
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<td>1</td>
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<tr>
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<td>1</td>
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<td>J1−J7</td>
</tr>
</tbody>
</table>

**NOTES**

1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: ±0.020
3) WEIGHT: APPROX. 2.0 OZ

**ENVIRONMENTAL RATINGS**

- **Temperature** .............. Operating: −65°C to +110°C
  ........................................ Non-Operating: −65°C to +125°C
- **Humidity** .............. MIL-STD-202F, METHOD 103B COND. B
- **Shock** .............. MIL-STD-202F, METHOD 213B COND. B
- **Vibration** .............. MIL-STD-202F, METHOD 204D COND. B
- **Altitude** .............. MIL-STD-202F, METHOD 105C COND. B
- **Temperature Cycle** ....... MIL-STD-202F, METHOD 107D COND. A

**AMERICAN MICROWAVE CORPORATION**

7311 GROVE RD., FREDERICK, MD. 21701

TEL: (301) 662-4700 FAX: (301) 682-4938

**PRODUCT FEATURE**

SW-1182-4D

1.0–18 GHz, SP4T Switch Module

**SIZE** A

**SHEET 1 OF 2**

**DRAWN** WBF 6/10/93

**APPROVED** WBF 6/10/93

**REV.** A

**DESCRIPTION**
**DESCRIPTION**

AMC MODEL SW-1182-4D IS A REFLECTIVE BROAD BAND SP4T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

**SPECIFICATIONS**

- **Frequency Range:** 1-18 GHz MINIMUM
- **Insertion Loss:**
  - 1-4 GHz, 1.4 dB MAXIMUM
  - 4-8 GHz, 1.5 dB MAXIMUM
  - 8-12.4 GHz, 2.0 dB MAXIMUM
  - 12.4-18 GHz, 2.6 dB MAXIMUM
- **Isolation:**
  - 1-12.4 GHz, 65 dB MINIMUM
  - 12.4-18 GHz, 55 dB MINIMUM
- **VSWR (ON):** 1.8:1 MAXIMUM
- **RF Power Rating:** 1W CW, 75W PEAK (1μS, PW MAXIMUM)
- **Switching Time:**
  - RISE (10% RF TO 90% RF): 20 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 20 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 50 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 50 ns MAXIMUM
- **Control:** TTL, LOW POWER SCHOTTKY. (UNITY LOAD)
  (SEE TRUTH TABLE)
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
- **Power Supply:**
  +5VDC ±5% @ 150 mA MAXIMUM
  -12 to -15VDC @ 50 mA MAXIMUM
- **Connectors:**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- **Size:** 1.25" x 1.25" x 0.88"

**Available Options**

- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04: EXTENDED FREQUENCY RANGE TO 100 MHz
- A07: VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
- A08: VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
- A09: VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
- A10: SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
- A11: SMA MALE CONTROL TERMINALS
- A13: +12 TO +18 VDC POWER SUPPLY
- A14: -5 VDC POWER SUPPLY

**MECHANICAL OUTLINE**

**Environmental Ratings**

- **Temperature:**
  - Operating: −65°C to +110°C
  - Non-operating: −65°C to +125°C
- **Humidity:** MIL-STD-202F, METHOD 103B, COND. B
- **Shock:** MIL-STD-202F, METHOD 213B, COND. B
- **Vibration:** MIL-STD-202F, METHOD 204D, COND. B
- **Altitude:** MIL-STD-202F, METHOD 105C, COND. B
- **Temperature Cycle:** MIL-STD-202F, METHOD 107D, COND. A

**AMERICAN MICROWAVE CORPORATION**

7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

**PRODUCT FEATURE**

SW-1182-4D
1.0-18 GHz, SP4T Switch Module

**SIZE:** A
**SHEET:** 1 OF 2
**DRAWING:** 100-2954
DESCRIPTION

AMC model SW-1170-4D is a reflective broad band SP4T switch module with integral TTL driver.

SPECIFICATIONS

- FREQUENCY RANGE ............... 1-18 GHz MINIMUM
- INSERTION LOSS ................. 1-4 GHz, 1.4 dB MAXIMUM
  4-8 GHz, 1.5 dB MAXIMUM
  8-12.4 GHz, 2.0 dB MAXIMUM
  12.4-18 GHz, 2.6 dB MAXIMUM
- ISOLATION ......................... 1-12.4 GHz, 65 dB MINIMUM
  12.4-18 GHz, 55 dB MINIMUM
- VSWR (ON) .......................... 1.8:1 MAXIMUM
- RF POWER RATING ................. 1W CW, 75W PEAK (1μS, PW MAXIMUM)
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ........... 20 ns MAXIMUM
  FALL (90% RF TO 10% RF) .......... 20 ns MAXIMUM
  ON (50% TTL TO 90% RF) ........... 50 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ......... 50 ns MAXIMUM
- CONTROL
  TTL LOW POWER SCHOTTKY, (UNITY LOAD)
  (SEE TRUTH TABLE)
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
- POWER SUPPLY ..................... +5VDC ±5% @ 150 mA MAXIMUM
  −12 to −15VDC @ 50 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ................. SMA (FEMALE)
  POWER ................................ SOLDER PIN
  CONTROL ............................. SOLDER PIN
- SIZE ................................. 1.25" x 1.25" x 0.70"

AVAILABLE OPTIONS

A01 50Ω CONTROL IMPEDANCE
A02 100Ω CONTROL IMPEDANCE
A03 INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A04 EXTENDED FREQUENCY RANGE TO 100 MHz
A07 VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
A08 VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
A09 VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
A10 SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
A11 SMC MALE CONTROL TERMINALS
A13 +12 TO +18 VDC POWER SUPPLY
A14 −5 VDC POWER SUPPLY

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>C7</th>
<th>C6</th>
<th>C4</th>
<th>C3</th>
<th>RF/PATH ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>0</td>
<td>J1-J2</td>
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<tr>
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<td>J1-J4</td>
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<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>J1-J7</td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 2.0 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE:
  OPERATING ......................... −65°C TO +110°C
  NON-OPERATING ..................... −65°C TO +125°C
- HUMIDITY ........................ MIL-STD-202F, METHOD 103B COND. B
- SHOCK ............................. MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ........................ MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ........................ MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE ............... MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-1170-4D
1.0-18 GHz, SP4T SWITCH MODULE

SIZE A  SHEET 1 OF 2  DVC. # 100-3670
DESCRIPTION

AMC MODEL SWS-2183-4D IS A REFLECTIVE BROAD BAND SP4T SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A LOW PROFILE, HERMETICALLY SEALED HOUSING.

SPECIFICATIONS

- **FREQUENCY RANGE**: 1–18 GHz MINIMUM
- **INSERTION LOSS**: 1–2 GHz 1.2 dB MAXIMUM
  2–4 GHz 1.6 dB MAXIMUM
  4–8 GHz 2.1 dB MAXIMUM
  8–12 GHz 2.6 dB MAXIMUM
  12–18 GHz 3.0 dB MAXIMUM
- **ISOLATION**: 65 dB MINIMUM
- **VSWR (ON)**: 2:1 MAXIMUM
- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF): 10 nS MAXIMUM
  - FALL (90% RF TO 10% RF): 10 nS MAXIMUM
  - ON (50% TTL TO 90% RF): 20 nS MAXIMUM
  - OFF (50% TTL TO 10% RF): 20 nS MAXIMUM
- **RF POWER RATINGS**: 1W CW MAXIMUM
- **CONTROL**
  - TTL COMPATIBLE, UNIT LOAD
  - 4 INDIVIDUAL CONTROLS
  - LOGIC "0" = INSERTION LOSS
  - LOGIC "1" = ISOLATION
- **POWER SUPPLY**: +5VDC ±5% @ 130 mA MAXIMUM
  - -12VDC ±5% @ 70 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT: FIELD REPLACEABLE SMA (FEMALE)
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- **SIZE**: 1.20" x 1.00" x 0.24"

AVAILABLE OPTIONS

- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04: EXTENDED FREQUENCY TO 100 MHz
- A07: INPUT/OUTPUT VIDEO CTRL
  - (0.5 dB EXCESS LOSS, 2–18 GHz)
- A08: SINGLE ENDED ECL (15 nS ON/OFF TIME)
- A10: 15VDC SUPPLY
- A12: 2 BIT DECODER

MECHANICAL OUTLINE

LOGIC TABLE

<table>
<thead>
<tr>
<th>C4</th>
<th>C3</th>
<th>C2</th>
<th>C1</th>
<th>RF PATH</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>J5–J1</td>
</tr>
<tr>
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<td>J5–J2</td>
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<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>J5–J4</td>
</tr>
</tbody>
</table>

NOTES:

1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: ±0.020
3) WEIGHT: APPROX. 1.2OZ.

ENVIRONMENTAL RATINGS

- **TEMPERATURE**
  - -55°C TO +95°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- **HUMIDITY**
  - MIL-STD-202F, METHOD 103B, COND. D
- **SHOCK**
  - MIL-STD-202F, METHOD 213B, COND. D
- **VIBRATION**
  - MIL-STD-202F, METHOD 204D, COND. D
- **ALTITUDE**
  - MIL-STD-202F, METHOD 101C, COND. D
- **TEMPERATURE CYCLE**
  - MIL-STD-202F, METHOD 107D, COND. A

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE

SWS-2183-4D
1 TO 18 GHz, SLIM LINE, REFLECTIVE, SP4T SWITCH MODULE

SIZE: A
SPACK: 1 OF 2
ENG. #: 200-2035-4
<table>
<thead>
<tr>
<th>SECTION</th>
<th>PRODUCT DESCRIPTION</th>
<th>PAGES</th>
</tr>
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<tbody>
<tr>
<td>8</td>
<td>SP4T, NON-REFLECTIVE/ABSORPTIVE</td>
<td>8-1</td>
</tr>
<tr>
<td></td>
<td>• 0.01-2.0 GHz SWITCH MODULE, AMC MODEL NO: SW-2000-4AT</td>
<td>8-3</td>
</tr>
<tr>
<td></td>
<td>• 0.1-20 GHz HIGH ISOLATION SWITCH MODULE, AMC MODEL NO: SW-2185-4AT</td>
<td>8-5</td>
</tr>
</tbody>
</table>
DESCRIPTION

AMC Model SW-2000-4AT is an absorptive SP4T switch module with integral TTL driver, designed for low loss and low VSWR broad band applications.

SPECIFICATIONS

- Frequency Range .............. 0.1-2 GHz minimum
- Insertion Loss .............. 1 dB maximum
- Isolation ......................... 85 dB minimum
- VSWR (On/Off) .............. 1.2:1 maximum
- Switching Time
  Rise (10% RF to 90% RF) .............. 50 ns maximum
  Fall (90% RF to 10% RF) .............. 50 ns maximum
  On (50% TTL to 90% RF) .............. 150 ns maximum
  Off (50% TTL to 10% RF) .............. 150 ns maximum
- RF Power Ratings .............. +27 dBm CW maximum
- Control ...................... TTL compatible, unity load
  Logic "0" = isolation
  Logic "1" = insertion loss
- Power Supply .............. +5VDC ±5% @ 200 mA maximum
  -5VDC ±5% @ 50 mA maximum
- Connectors
  RF Input/Output .............. SMA (female)
  Power ...................... Solder pin (EMI)
  Control .............. Solder pin
- Size ...................... 1.19" x 1.22" x 0.90"

AVAILABLE OPTIONS

A01 ............... 50Ω control impedance
A02 ............... 100Ω control impedance
A03 .............. Inverse control logic (logic "0" insertion loss)
A08 .............. SMA male connectors
A10 .............. ±12VDC to ±18VDC supply power
A11 .............. SMC male CTL connector

ENVIRONMENTAL RATINGS

- Temperature .............. -55°C to +95°C (operating)
  -65°C to +125°C (storage)
- Humidity .............. MIL-STD-202F, Method 103B Cond. B
- Vibration .............. MIL-STD-202F, Method 204D Cond. B
- Temperature Cycle .............. MIL-STD-202F, Method 107D Cond. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 682-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2000-4AT
(SW-2181-4AT-A2052)

0.01-2.0 GHz, non-reflective SP4T switch module

SIZE A
SHEET 1 OF 2
DRAWN: 11/22/92
APPROVED: 11/22/92

CONC. SW-2000-4AT
0.01-2.0 GHz, non-reflective SP4T switch module

SIZE A
SHEET 1 OF 2
DRAWN: 11/22/92
APPROVED: 11/22/92
DESCRIPTION
AMC Model SW-2000-4AT is an absorptive SP4T switch module with integral TTL driver, designed for low loss and low VSWR broad band applications.

SPECIFICATIONS
- FREQUENCY RANGE: 0.1–2 GHz MINIMUM
- INSERTION LOSS: 1 dB MAXIMUM
- ISOLATION: 65 dB MINIMUM
- VSWR (ON/OFF): 1.2:1 MAXIMUM
- SWITCHING TIME
  - RISE (10% RF TO 90% RF): 50 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 50 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 150 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 150 ns MAXIMUM
- RF POWER RATINGS: +27 dBm CW MAXIMUM
- CONTROL: TTL COMPATIBLE, UNITY LOAD
- LOGIC "0" = ISOLATION
- LOGIC "1" = INSERTION LOSS
- POWER SUPPLY: +5VDC ±5% @ 200 mA MAXIMUM
- -5VDC ±5% @ 50 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER: SOLDER PIN (EMI)
  - CONTROL: SOLDER PIN
- SIZE: 1.19" x 1.22" x 0.90"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A08: SMA MALE CONNECTORS
- A10: ±12VDC TO ±18VDC SUPPLY POWER
- A11: SMC MALE CTL CONNECTOR

ENVIRONMENTAL RATINGS
- TEMPERATURE: -55°C TO +95°C (OPERATING)
- -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2000-4AT
(SW-2181-4AT-A3052)
0.01–2.0 GHz, NON-REFLECTIVE SP4T SWITCH MODULE

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: ±0.020
3) WEIGHT: APPROX. 6 OZ
TTL DRIVER

+V

-V

E1

E2

E3

E4

BIAS A

BIAS B

BIAS C

BIAS D

GND

RF SECTION

BIAS A

50Ω

J1

BIAS B

50Ω

J2

BIAS C

50Ω

J3

BIAS D

50Ω

J4

J5
DESCRIPTION
AMC model SW-2185-4AT is an absorptive SP4T switch module with
integral TTL driver, designed for broad-band, very high isolation,
and phase matched applications.

SPECIFICATIONS
- Frequency range: 0.1-20 GHz minimum
- Insertion loss: 5.0 dB maximum
- Isolation: 110 dB minimum
- VSWR (ON/OFF): 2:1 maximum
- RF power ratings: 1 watt CW maximum
- Switching time
  - Rise (10% RF to 90% RF): 50 ns maximum
  - Fall (90% RF to 10% RF): 50 ns maximum
  - Off (50% TTL to 90% RF): 150 ns maximum
- Control
  - TTL compatible, unity load
  - 4 individual controls
  - Logic "0" = insertion loss
  - Logic "1" = isolation
  - (See truth table)
- Power supply
  - +5VDC ±5% @ 250 mA maximum
  - -12VDC ±5% @ 150 mA maximum
- Connectors
  - RF input/output: SMA (female)
  - Power: solder pin EMI
  - Control: solder pin
- Size: 2.75" x 2.00" x 0.68"

AVAILABLE OPTIONS
- A01: 50Ω control impedance
- A02: 100Ω control impedance
- A03: inverse control logic (logic "0" isolation)
- A07: input/output video filter (0.5 dB excess loss)
- A14: +12 VDC to +15 VDC supply
- A15: -15 VDC supply
- A16: 9-pin miniature multipin

MECHANICAL OUTLINE

TRUTH TABLE

<table>
<thead>
<tr>
<th>E5</th>
<th>E4</th>
<th>E3</th>
<th>E2</th>
<th>RF Path</th>
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<td>1</td>
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<td>J1-J5</td>
</tr>
</tbody>
</table>

NOTES:
1) Dimensions are in inches
2) Tolerances: X.XX ±0.020
   X.XXX ±0.010
3) Weight: Approx. 10 oz

ENVIRONMENTAL RATINGS
- Temperature: -55°C to +95°C (operating)
  -65°C to +125°C (storage)
- Humidity: MIL-STD-202F, METHOD 103B, COND. B
- Vibration: MIL-STD-202F, METHOD 204D, COND. B
- Altitude: MIL-STD-202F, METHOD 105C, COND. B
- Temperature cycle: MIL-STD-202F, METHOD 107D, COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2185-4AT
0.1-20 GHz, non-reflective, high isolation SP4T switch module.

SIZE A SHEET 1 OF 2 DWG. # 103-2894
<table>
<thead>
<tr>
<th>SECTION</th>
<th>PRODUCT DESCRIPTION</th>
<th>PAGES</th>
</tr>
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<tbody>
<tr>
<td><strong>9</strong></td>
<td><strong>SPST, REFLECTIVE</strong></td>
<td>9-1</td>
</tr>
<tr>
<td>- 0.01-18 GHz</td>
<td>BAND-SWITCH MODULE, AMC MODEL NO: SW-218-5</td>
<td>9-3</td>
</tr>
<tr>
<td>- 1.0-18 GHz</td>
<td>RADIAL SWITCH MODULE, AMC MODEL NO: SW-1182-5D</td>
<td>9-5</td>
</tr>
<tr>
<td>- 0.3-20 GHz</td>
<td>SWITCH MODULE, AMC MODEL NO: SW-2181-5A-171</td>
<td>9-7</td>
</tr>
</tbody>
</table>
DESCRIPTION
AMC MODEL SW-218-5 IS A REFLECTIVE SPST BAND-SWITCH MODULE WITHOUT DRIVER CIRCUITRY.

SPECIFICATIONS
- FREQUENCY
  JD-J1 ........................................ 0.01-2 GHz MINIMUM
  JD-J2 ........................................ 2-4 GHz MINIMUM
  JD-J3 ........................................ 4-8 GHz MINIMUM
  JD-J4 ........................................ 8-12.4 GHz MINIMUM
  JD-J5 ........................................ 12.4-18 GHz MINIMUM

- INSERTION LOSS
  JD-J1 ........................................ 1.7 dB MAXIMUM
  JD-J2 ........................................ 2.0 dB MAXIMUM
  JD-J3 ........................................ 2.3 dB MAXIMUM
  JD-J4 ........................................ 2.8 dB MAXIMUM
  JD-J5 ........................................ 3.5 dB MAXIMUM

- ISOLATION
  JD-J1 ........................................ 45 dB MINIMUM
  JD-J2 ........................................ 45 dB MINIMUM
  JD-J3 ........................................ 40 dB MINIMUM
  JD-J4 ........................................ 35 dB MINIMUM
  JD-J5 ........................................ 30 dB MINIMUM

- VSWR (ON)
  JD-J1 ........................................ 1.35:1 MAXIMUM
  JD-J2 ........................................ 1.8:1 MAXIMUM
  JD-J3 ........................................ 2.0:1 MAXIMUM
  JD-J4 ........................................ 2.2:1 MAXIMUM
  JD-J5 ........................................ 2.5:1 MAXIMUM

- RF POWER RATINGS ................................ +27 dBm CW MAXIMUM

- SWITCHING TIME
  RISE (10% RF TO 90% RF) ................. 300 ns MAXIMUM
  FALL (90% RF TO 10% RF) ................. 300 ns MAXIMUM
  ON (50% TTL TO 50% RF) ................. 500 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ................. 500 ns MAXIMUM

- CONTROLS
  CURRENT CONTROLLED
  5 INDIVIDUAL CONTROLS
  +20 mA = ISOLATION
  -20 mA = INSERTION LOSS

- CONNECTORS
  RF INPUT/OUTPUT: SMA (FEMALE)
  CONTROL: SOLDER PIN

- SIZE ........................................ 1.25" x 1.53" x 0.52"

AVAILABLE OPTIONS
A13 ........................................ JD SMA MALE, JD-J5 SMA FEMALE
A14 ........................................ JD SMA FEMALE, JD-J5 SMA MALE
A15 ........................................ 60 dB ISOLATION (CONSULT FACTORY)

ENVIRONMENTAL RATINGS
- TEMPERATURE .......................... -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY ................................. MIL-STD-202F, METHOD 103B COND. B
- SHOCK ..................................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ................................ MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ................................ MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE ................... MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
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PRODUCT FEATURE
SW-218-5
0.01-18 GHz, REFLECTIVE SPST BAND-SWITCH MODULE

SIZE A  SHEET 1 OF 2  DWG. # 100-2699
DESCRIPTION
AMC MODEL SW-1182-5D IS A REFLECTIVE BROAD BAND SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
* FREQUENCY RANGE .............. 1–18 GHz MINIMUM
  1–4 GHz, 1.4 dB MAXIMUM
  4–8 GHz, 1.5 dB MAXIMUM
  8–12.4 GHz, 2.0 dB MAXIMUM
  12.4–18 GHz, 2.8 dB MAXIMUM
* INSERTION LOSS .............. 1–12.4 GHz, 65 dB MINIMUM
  12.4–18 GHz, 55 dB MINIMUM
* ISOLATION .................. 1–12.4 GHz, 21 dB MINIMUM
  12.4–18 GHz, 21 dB MINIMUM
* VSWR (ON) .................. 1.9:1 MAXIMUM
* RF POWER RATING .......... 1W CW, 75W PEAK (1µS, PW MAXIMUM)
* SWITCHING TIME .............
  RISE (10% RF TO 90% RF) .... 20 ns MAXIMUM
  FALL (90% RF TO 10% RF) .... 20 ns MAXIMUM
  ON (50% TTL TO 90% RF) .... 50 ns MAXIMUM
  OFF (50% TTL TO 10% RF) .... 50 ns MAXIMUM
* CONTROL .................... TTL LOW POWER SCHOTTKY, (UNITY LOAD)
  (SEE TRUTH TABLE)
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
* POWER SUPPLY ................
  +5V DC ±5% @ 200 mA MAXIMUM
  -12 TO -15V DC @ 55 mA MAXIMUM
* CONNECTORS .................
  RF INPUT/OUTPUT ............ SMA (FEMALE)
  POWER ........................ SOLDER PIN
  CONTROL ..................... SMC (MALE)
* SIZE ......................... 1.25" x 1.25" x 0.88"

AVAILABLE OPTIONS
A01 .................. 50Ω CONTROL IMPEDANCE
A02 .................. 100Ω CONTROL IMPEDANCE
A03 .................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A04 .................. EXTENDED FREQUENCY RANGE TO 100 MHz
A07 .................. VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
A08 .................. VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
A09 .................. VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
A10 .................. SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
A11 .................. SOLDER PIN CONTROL TERMINALS
A12 .................. +12 TO +18 VDC POWER SUPPLY
A14 .................. -5 VDC POWER SUPPLY

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
* TEMPERATURE ................
  OPERATING .................. -85°C TO +110°C
  NON-OPERATING ............. -85°C TO +125°C
* HUMIDITY ..................
  MIL-STD-202F, METHOD 103B COND. B
* SHOCK ........................
  MIL-STD-202F, METHOD 213B COND. B
* VIBRATION ...................
  MIL-STD-202F, METHOD 204D COND. B
* ALTITUDE ...................
  MIL-STD-202F, METHOD 105C COND. B
* TEMPERATURE CYCLE ..........
  MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-1182-5D
1.0–18 GHz, SPST SWITCH MODULE

ENVIRONMENTAL RATING
DESCRIPTION
AMC MODEL SW-2181-5A-171 IS A REFLECTIVE BROAD BAND SP5T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
- FREQUENCY RANGE: 0.3–20 GHz MINIMUM
- INSERTION LOSS:
  - 0.3–4 GHz: 1.4 dB MAXIMUM
  - 4–8 GHz: 1.5 dB MAXIMUM
  - 8–12.4 GHz: 2.0 dB MAXIMUM
  - 12.4–20 GHz: 3.0 dB MAXIMUM
- ISOLATION:
  - 0.3–12.4 GHz: 60 dB MINIMUM
  - 12.4–20 GHz: 50 dB MINIMUM
- VSWR (ON):
  - 1:8:1 MAXIMUM
- RF POWER RATING:
  - 1W CW, 75W PEAK (1uS, PW MAXIMUM)
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 15 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 15 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 45 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 45 ns MAXIMUM
- CONTROL:
  - TTL LOW POWER SCHOTTKY, (UNITY LOAD)
    (SEE TRUTH TABLE)
    LOGIC "1" = INSERTION LOSS
    LOGIC "0" = ISOLATION
- POWER SUPPLY:
  - +5VDC ±5% @ 250 mA MAXIMUM
  - -6VDC ±5% @ 100 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER/CONTROL: SOLDER PIN
- SIZE: 1.25" x 1.25" x 0.68"

AVAILABLE OPTIONS
- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- A04: EXTENDED FREQUENCY RANGE TO 100 MHz
- A07: VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
- A08: VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
- A09: VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
- A10: SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
- A11: SMC CONTROL TERMINALS
- A13: +12 TO +18 VDC POWER SUPPLY
- A14: -12 TO -18 VDC POWER SUPPLY

ENVIRONMENTAL RATINGS
- TEMPERATURE:
  - OPERATING: -55°C TO +110°C
  - NON-OPERATING: -65°C TO +125°C
- HUMIDITY: MIL-STD-202F, METHOD 103B, COND. B
- SHOCK: MIL-STD-202F, METHOD 213B, COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D, COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C, COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D, COND. A

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PRODUCT FEATURE
SW-2181-5A-171
0.3–20 GHz, SP5T SWITCH MODULE

SIZE A
SHEET 1 OF 2
DWG. # 100-3184
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<td>• 400-450 MHz SOLID STATE, B BAND, SWITCH MODULE, AMC MODEL NO: SW-4045-5DT</td>
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DESCRIPTION
AMC MODEL SW-4045-5DT IS AN ABSORPTIVE SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR HIGH RELIABILITY APPLICATIONS SUCH AS SHIPBOARD RADARS WHERE SWITCHING SPEED, ISOLATION AND SPECTRAL PURITY ARE OF EXTREME IMPORTANCE.

SPECIFICATIONS
- FREQUENCY RANGE: 400-450 MHz MINIMUM
- INSERTION LOSS: -1.4 dB MAXIMUM
- INSERTION LOSS BALANCE: 0.2 dB MAXIMUM
- INSERTION LOSS VARIATION OVER TEMPERATURE: ±0.1 dB MAXIMUM OVER OPERATING TEMPERATURE RANGE
- INSERTION LOSS VARIATION OVER FREQUENCY: ±0.1 dB MAXIMUM
- ISOLATION: 90 dB MINIMUM
- VSWR (ON/OFF): 1.3:1 MAXIMUM
- RF POWER: ±16 dBm CW MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 40 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 40 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 300 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 300 ns MAXIMUM
- SETTLING TIME:
  - ON (90% TO WITHIN ±0.25 dB OF INSERTION LOSS): 0.7 µS MAXIMUM
  - OFF (10% TO MINIMUM ISOLATION REQUIREMENT): 1.0 µS MAXIMUM
- VOLTAGE TRANSIENTS: 1 Vpp MAXIMUM ACROSS 50Ω LOAD
- CONTROLS: STANDARD TTL COMPATIBLE
- HARMONIC DISTORTION PRODUCTS: 50 dBc MINIMUM
- SPURIOUS SIGNALS/SPECTRAL RUBIES (AM/PM SIDEBANDS IN OPERATING BAND): 100 dB BELOW THE OUTPUT SIGNAL LEVEL
- RF LEAKAGE:
  - RADIATIVE: -90 dBm/SQUARE FOOT
  - CONDUCTIVE: -90 dBm ON SUPPLY AND CONTROL LINES.
- RADIATION SUSCEPTIBILITY: ≥-76 dBm FOR RF INTERFERENCE FIELD OF -20 dBm/SQUARE FOOT
- CONDUCTED SUSCEPTIBILITY: ≥-76 dBm FOR RF INTERFERENCE LEVEL OF -20 dBm ON DC POWER LINES
- CONDUCTED SUSCEPTIBILITY (INTERMODULATION): ≥-85 dBm FOR -20 dBm RF INTERFERENCE LEVEL ON DC POWER LINES
- POWER SUPPLY: +5VDC ±5% @ 90 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: SMA FEMALE
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- SIZE: 2.69" x 1.69" x 0.68"

MECHANICAL OUTLINE

TRUTH TABLE

| E0 | E1 | E2 | E3 | E4 | E5 | RF | PATH | ON
|----|----|----|----|----|----|----|------|----
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |
| 1  | 1  | 0  | 1  | 1  | 0  | 0  | 01   | 1  |

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XXX ±0.020
3) WEIGHT: APPROX. 4 OZ
4) MATERIALS PROCESS AND PARTS TO MIL-R-17500, MIL-M-38510 CLASS B, MIL-F-19570 JANTX TYPE, ER COMPONENTS
5) REQUIREMENT: MIL-STD-810

ENVIRONMENTAL RATING
- TEMPERATURE: 0°C TO +65°C (OPERATING)
- HUMIDITY: 5% TO 95% (OPERATING)
- SHOCK: MIL-S-901 GRADE A, CLASS I OR II
- VIBRATION: MIL-S-167, TYPE 1 VIBRATION, 0.1G SINEWAVE 25 Hz TO 2000 Hz
- MTBF: 1 x 10^6 HOURS, @+70°C OPERATION

ENVIRONMENTAL STRESS SCREENING (ESS)
- TEMPERATURE CYCLES: 10 CYCLES, 1/2 HOUR SDAK, WARM SIDE TO +85°C
- TEMPERATURE SHOCK: 4 CYCLES, -55°C TO +85°C
- VIBRATION: 10 G@60 Hz FOR 1 MINUTE, 1 AXES
- BURN IN (OPERATING): MIL-STD-883 METHOD 1015.4 TEST CONDITION B, 160 HOURS @125°C JUNCTION TEMPERATURE (105°C AMBIENT)

ESS (NEXT HIGHER ASSEMBLY)
- THERMAL: 5 CYCLES, 5°C PER MINUTE, -55°C TO +55°C
- RANDOM VIBRATION: 20 TO 2000 Hz AND 5 G, RMS, 10 MINUTES PER AXES AT ±55°C/55°C

AMERICAN MICROWAVE CORPORATION
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PRODUCT FEATURE
SW-4045-5DT
(B-BAND)
300-450 MHz, NON-REFLECTIVE SOLID STATE SPST SWITCH MODULE
SIZE A SHEET 1 OF 2 ENG. #100-2911
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<td>• 400-450 MHz SOLID STATE, B BAND SWITCH MODULE, AMC MODEL NO: SW-4045-6D</td>
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<td>• 2.0-2.5 GHz SOLID STATE, E BAND, SWITCH MODULE, AMC MODEL NO: SW-2025-6D</td>
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<td>• 1-18 GHz RADIAL SWITCH MODULE, AMC MODEL NO: SW-1182-6D</td>
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DESCRIPTION

AMC MODEL SW-4045-BD IS A REFLECTIVE SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR HIGH RELIABILITY APPLICATIONS SUCH AS SHIPBOARD RADARS WHERE SWITCHING SPEED, ISOLATION AND SPECTRAL PURITY ARE OF EXTREME IMPORTANCE.

SPECIFICATIONS

- **Frequency Range**: 400-450 MHz Minimum
- **Insertion Loss**: 0.9 dB Maximum
- **Insertion Loss Balance**: 0.2 dB Maximum
- **Insertion Loss Variation Over Temperature**: ±0.1 dB Maximum Over Operating Temperature Range
- **Insertion Loss Variation Over Frequency**: ±0.1 dB Maximum
- **Isolation**: 45 dB Minimum
- **VSWR (ON)**: 1.3:1 Maximum
- **RF Power**: +16 dBm CW Maximum
- **Switching Time**
  - Rise (10% RF to 90% RF): 40 ns Maximum
  - Fall (90% RF to 10% RF): 40 ns Maximum
  - On (50% TTL to 90% RF): 300 ns Maximum
  - Off (50% TTL to 10% RF): 300 ns Maximum
- **Settling Time**
  - On (90% TO within ±0.25 dB of insertion loss): 0.7 µs Maximum
  - Off (10% TO minimum isolation required): 1.0 µs Maximum
- **Voltage Transients**: 1 Vpp Maximum Across 50Q Load
- **Controls**: Standard TTL Compatible
- **Harmonic Distortion Products**: 50 dBc Minimum
- **Spurious Signals/Spectral Purity**: 100 dB Below the Output Signal Level
- **RF Leakage**: -90 dBm/SQUARE FOOT
  - Conductive: 90 dBm on Supply and Control Lines.
- **Radiation Susceptibility**: ≥-76 dBm for RF Interference Field of 20 dBm/SQUARE FOOT
- **Conducted Susceptibility**: ≥-76 dBm for RF Interference Level of 20 dBm on DC Power Lines
- **Conducted Susceptibility (Intermodulation)**: ≥-85 dBm for -20 dBm RF Interference Level on DC Power Lines
- **Power Supply**: +5VDC ±5% @ 90 mA Maximum
  - +15VDC ±5% @ 40 mA Maximum (Over Voltage Protected)
- **Connectors**
  - RF Input/Output: SMA Female
  - Power: Solder Pin
  - Control: Solder Pin
- **Size**: 3.19” x 1.69” x 0.68”

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS

- **Temperature**: 0°C to +65°C (Operating)
  - -55°C to +70°C (Storage)
- **Humidity**: MIL-STD-202, Method 103, Condition B
- **Shock**: MIL-S-901 Grade A, Class I or II
- **Vibration**: MIL-S-208, Type 1, Minimum Amplitude 0.16 g. 25 Hz to 200 Hz
- **MTBF**: 1 x 10^8 Hours, @ +40°C Operation

ENVIRONMENTAL STRESS TESTING (EST)

- **Temperature Cycles**: 10 Cycles, 1/2 Hour Storage at 0°C to +75°C
- **Temperature Shock**: 4 Cycles, -55°C to +85°C
- **Vibration**: 10 G @ 50 Hz for 1 Minute, 3 Axes
- **Burn In (Operating)**: MIL-STD-883, Method 1015.4 Test Condition B, 160 Hours @ 125°C Junction Temperature (105°C Ambient)
- **ESS (Next Higher Assembly)**
  - **Thermal**: 5 Cycles, 5°C Per Minute, -55°C to +75°C
  - **Random Vibration**: 20 to 2000 Hz and 6 G RMS, 10 Minutes Per Axis at ±25°C/55°C

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PRODUCT FEATURE
SW-4045-BD
(9-BAND)
400-450 MHz, REFLECTIVE SOLID STATE SPST SWITCH MODULE

SIZE A
SHEET 1 OF 2
OWG # 100-2912
AMC MODEL SW-2025-6D IS A REFLECTIVE SP6T SWITCH MODULE WITH INTEGRAL TTL DRIVER. DESIGNED FOR HIGH RELIABILITY APPLICATIONS SUCH AS SHIPBOARD RADARS WHERE SWITCHING SPEED, ISOLATION AND SPECTRAL PURITY ARE OF EXTREME IMPORTANCE.

SPECIFICATIONS

- **FREQUENCY RANGE**: 2.0–2.5 GHz MINIMUM
- **INSERTION LOSS**: -1.5 dB MAXIMUM
- **INSERTION LOSS BALANCE**: 0.4 dB MAXIMUM
- **INSERTION LOSS VARIATION OVER TEMPERATURE**: ±0.1 dB MAXIMUM OVER OPERATING TEMPERATURE RANGE
- **INSERTION LOSS VARIATION OVER FREQUENCY**: ±0.1 dB MAXIMUM
- **ISOLATION**: 40 dB MINIMUM
- **VSWR (ON)**: 1.4:1 MAXIMUM
- **RF POWER**: +30 dBm CW MAXIMUM
- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF): 40 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 40 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 400 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 400 ns MAXIMUM
- **SETTLING TIME**
  - ON (90% TO WITHIN ±0.25 dB OF INSERTION LOSS): 0.7 μS MAXIMUM
  - OFF (10% TO MINIMUM ISOLATION REQUIREMENT): 1.0 μS MAXIMUM
- **VOLTAGE TRANSIENTS**: 1 Vpp MAXIMUM ACROSS 50Ω LOAD
- **CONTROLS**: STANDARD TTL COMPATIBLE
- **HARMONIC DISTORTION PRODUCTS**: -65 dBc MINIMUM
- **SPURIOUS SIGNALS/SPECTRAL PURITY** (AM/PM SIDEBANDS IN OPERATING BAND 2–2.5 GHz): 100 dB BELOW THE OUTPUT SIGNAL LEVEL IN NO OPERATING BAND (100 MHz–2 GHz & 2.5 TO 10 GHz): 55 dB BELOW THE OUTPUT SIGNAL LEVEL
- **RF LEAKAGE**
  - RADIATIVE: –90 dBm/SQUARE FOOT, 1 FOOT DISTANCE APPROXIMATELY
  - CONDUCTIVE: –80 dBm ON SUPPLY AND CONTROL LINES.
- **RADIATION SUSCEPTIBILITY**: ≥–76 dBm FOR RF INTERFERENCE FIELD OF –20 dBm/SQUARE FOOT
- **CONDUCTED SUSCEPTIBILITY**: ≥–76 dBm FOR RF INTERFERENCE FIELD OF –20 dBm ON DC POWER LINES
- **CONDUCTED SUSCEPTIBILITY (INTERMODULATION)**: ≥–85 dBm FOR –20 dBm RF INTERFERENCE LEVEL ON DC POWER LINES
- **POWER SUPPLY**: +5VDC ±5% @ 120 mA MAXIMUM
  - +15VDC ±5% @ 40 mA MAXIMUM
  - (OVER VOLTAGE PROTECTED)
- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA FEMALE
  - POWER: SOLDER PIN
  - CONTROL: SOLDER PIN
- **SIZE**: 2” DIAMETER x 0.75” THICK

ENVIRONMENTAL RATINGS

- **TEMPERATURE**: 0°C TO +65°C (OPERATING)
- **HUMIDITY**: MIL-STD-202, METHOD 103, CONDITION B
- **SHOCK**: MIL-901 GRADE A, CLASS I OR II
- **VIBRATION**: MIL-167, TYPE I VIBRATION, 0.1G SINUSOIDAL 25 Hz TO 2000 Hz
- **MTBF**: 1 x 10⁶ HOURS, @ +50°C OPERATION

ENVIRONMENTAL STRESS SCREENING (ESS)

- **TEMPERATURE CYCLES**: 10 CYCLES, 1/2 HOUR SOAK MINIMUM, –55°C TO +85°C
- **TEMPERATURE SHOCK**: 4 CYCLES, –55°C TO +85°C
- **VIBRATION**: 10 G@60 Hz FOR 1 MINUTE, 3 AXES
- **BURN IN (OPERATING)**: MIL-STD-883 METHOD 1015.4 TEST CONDITION B, 160 HOURS @ 125°C JUNCTION TEMPERATURE (105°C AMBIENT)
- **ESS (NEXT HIGHER ASSEMBLY)**
  - THERMAL: 5 CYCLES, 5°C PER MINUTE, –55°C TO +65°C, RANDOM VIBRATION: 20 TO 2000 Hz AND 6 RMS, 10 MINUTES PER AXES AT +55°C/–55°C

AMEERICAN MICROWAVE CORPORATION
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PRODUCT FEATURE

SW-2025-6D
(E-BAND)

2.0–2.5 GHz, REFLECTIVE SOLID STATE SP6T SWITCH MODULE

SIZE A

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
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PRODUCT FEATURE

SW-2025-6D
(E-BAND)

2.0–2.5 GHz, REFLECTIVE SOLID STATE SP6T SWITCH MODULE

SIZE A
DESCRIPTION
AMC MODEL SW-1182-6D IS A REFLECTIVE BROAD BAND SP6T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
- FREQUENCY RANGE ........................................... 1-18 GHz MINIMUM
- INSERTION LOSS ............................................. 1-4 GHz, 1.6 dB MAXIMUM
- ............................................. 4-8 GHz, 1.8 dB MAXIMUM
- ............................................. 8-12.4 GHz, 2.2 dB MAXIMUM
- ............................................. 12.4-18 GHz, 3.2 dB MAXIMUM
- ISOLATION ................................................. 1-12.4 GHz, 60 dB MINIMUM
- ............................................. 12.4-18 GHz, 50 dB MINIMUM
- VSWR (ON) .................................................. 2.0:1 MAXIMUM
- RF POWER RATING ........................................... 1W CW, 75W PEAK (1μS, PW MAXIMUM)
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ................................ 20 ns MAXIMUM
  FALL (90% RF TO 10% RF) ................................ 20 ns MAXIMUM
  ON (50% TTL TO 90% RF) ................................ 50 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ................................ 50 ns MAXIMUM
- CONTROL
  TTL LOW POWER SCHOTTKY, (UNITY LOAD)
  (SEE TRUTH TABLE)
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION
- POWER SUPPLY ............................................. +5VDC ± 5% @ 250 mA MAXIMUM
  -12 TO -15VDC @60 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ........................................ SMA (FEMALE)
  POWER .................................................. SOLDER PIN
  CONTROL ............................................. SMC (MALE)
- SIZE .................................................. 1.25" x 1.25" x 0.88"

AVAILABLE OPTIONS
A01 ............................................. 50Ω CONTROL IMPEDANCE
A02 ............................................. 100Ω CONTROL IMPEDANCE
A03 ............................................. INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A04 ............................................. EXTENDED FREQUENCY RANGE TO 100 MHz
A07 ............................................. VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESSLOSS)
A08 ............................................. VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
A09 ............................................. VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
A10 ............................................. SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
A11 ............................................. SOLDER PIN CONTROL TERMINALS
A13 ............................................. +12 TO +18 VDC POWER SUPPLY
A14 ............................................. -5 VDC POWER SUPPLY

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE:
  OPERATING: ........................................... -65°C TO +110°C
  NON-OPERATING: ........................................ -65°C TO +125°C
- HUMIDITY:
  MIL-STD-202F, METHOD 103B COND. B
- SHOCK:
  MIL-STD-202F, METHOD 213B COND. B
- VIBRATION:
  MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE:
  MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE:
  MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE
SW-1182-6D
1.0-18 GHz, SP6T SWITCH MODULE
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<td>• 0.2-0.4 GHz SWITCH MODULE</td>
<td>12-3</td>
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<td>AMC MODEL NO: SW-0204-6DT</td>
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<tr>
<td></td>
<td>• 1-20 GHz RADIAL, SWITCH MODULE,</td>
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<tr>
<td></td>
<td>AMC MODEL NO: SW-2181-6AT</td>
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</tbody>
</table>
DESCRIPTION

AMC MODEL SW-0204-6DT IS AN ABSORPTIVE SPST SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR LOW NOISE, LOW LOSS, LOW VSWR, AND HIGH ISOLATION SWITCHING APPLICATIONS.

SPECIFICATIONS

- FREQUENCY RANGE: 0.2-0.4 GHz MINIMUM
- INSERTION LOSS: 1.0 dB MAXIMUM
- ISOLATION: 80 dB MINIMUM
- VSWR (ON/OFF): 1.25:1 MAXIMUM
- RF POWER RATINGS: +27 dBm CW MAXIMUM
- SWITCHING TIME:
  - RISE (10% RF TO 90% RF): 30 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 30 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 100 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 100 ns MAXIMUM
- CONTROLS: TTL COMPATIBLE, UNITY LOAD
  - 6 INDIVIDUAL CONTROLS
  - LOGIC "0" = ISOLATION
  - LOGIC "1" = INSERTION LOSS
  - (SEE TRUTH TABLE ON SHEET 2 OF 2)
- POWER SUPPLY: +5VDC ±5% @ 200 mA MAXIMUM
  - -15VDC ±5% @ 80 mA MAXIMUM
- CONNECTORS:
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER PIN: SOLDER PIN
  - CONTROL PIN: SOLDER PIN
- SIZE: 5.10" x 2.00" x 0.75"

AVAILABLE OPTIONS

- A01: 50Ω CONTROL IMPEDANCE
- A02: 100Ω CONTROL IMPEDANCE
- A03: INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A13: +15 VDC SUPPLY
- A14: SMA MALE CONNECTORS
- A15: CANNON MULTIPIN MD95SSP
- A16: 3 BIT BINARY TTL CONTROL LOGIC

MECHANICAL OUTLINE

- SMA FEMALE
  - 9 PLACES
- MOUNTING HOLES
  - 4-40 HELI-COIL
  - X 0.40 DEEP
  - 4 PLACES
  - FAR SIDE

ENVIRONMENTAL RATINGS

- TEMPERATURE:
  - -55°C TO +95°C (OPERATING)
  - -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND. B
- SHOCK: MIL-STD-202F, METHOD 213B COND. B
- VIBRATION: MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D COND. A

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PRODUCT FEATURE

SW-0204-6DT

0.2-0.4 GHz, NON-REFLECTIVE SPST SWITCH MODULE

SIZE A

SHEET 1 OF 2

Dwg. #: 100-2889
DESCRIPTION
AMC MODEL SW-2181-6AT IS AN ABSORPTIVE BROAD BAND SP6T SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A RADIAL HOUSING.

SPECIFICATIONS
- FREQUENCY RANGE ........................ 1-20 GHz MINIMUM
- INSERTION LOSS ............................ 1-8 GHz 2.5 dB MAXIMUM
8-18 GHz 3.5 dB MAXIMUM
18-20 GHz 4.5 dB MAXIMUM
- ISOLATION .................................. 1-18 GHz, 65 dB MINIMUM
18-20 GHz, 60 dB MINIMUM
- VSWR (ON/OFF) ............................. 2:1 MAXIMUM
- SWITCHING TIME ............................
  RISE (10% RF TO 90% RF) .............. 200 nS MAXIMUM
  FALL (90% RF TO 10% RF) .............. 10 nS MAXIMUM
  ON (50% TTL TO 90% RF) .............. 800 nS MAXIMUM
  OFF (50% TTL TO 10% RF) .............. 20 nS MAXIMUM
- RF POWER RATINGS ....................... +27 dBm, MAXIMUM
- CONTROL ...................................
  TTL COMPATIBLE, UNITY LOAD
  6 INDIVIDUAL CONTROLS
  LOGIC "0" = ISOLATION
  LOGIC "1" = INSERTION LOSS
- POWER SUPPLY .............................
  +5VDC ±5% @ 260 mA MAXIMUM
  -15VDC ±5% @ 70 mA MAXIMUM
- CONNECTORS ...............................
  RF INPUT/OUTPUT ......................... SMA FEMALE
  POWER ..................................... SOLDER PIN
  CONTROL ................................... SOLDER PIN
- SIZE ....................................... 2.13" DIAMETER x 0.75" THICK

AVAILABLE OPTIONS
A01 ........................................ 50Ω CONTROL IMPEDANCE
A02 ........................................ 100Ω CONTROL IMPEDANCE
A03 ........................................ INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
A04 ........................................ EXTENDED FREQUENCY RANGE TO 100 MHz
A07 ........................................ SMA MALE CONNECTORS
A08 ........................................ +12 TO +15VDC SUPPLY
A10 ........................................ 3 BIT BINARY TTL LOGIC DECODER

ENVIRONMENTAL RATINGS
- TEMPERATURE ............................. -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY .................................. MIL-STD-202F, METHOD 103B COND. B
- SHOCK ..................................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ................................. MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE .................................. MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE ..................... MIL-STD-202F, METHOD 107D COND. A

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7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2181-6AT
RADIAL 1 TO 20 GHz, NON-REFLECTIVE, SP6T SWITCH MODULE

SIZE AQ SHEET 1 OF 2 DWG. # 100-2824
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<td>0.02-2.6GHz RADIAL SWITCH MODULE, AMC MODEL NO: SW-2560-7D</td>
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<td>1.0-18 GHz RADIAL SWITCH MODULE, AMC MODEL NO: SW-1182-7D</td>
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DESCRIPTION
AMC Model SW-2560-7D (or -7DT) is a reflective (or an absorptive) SP7T switch module with integral TTL driver, designed to maintain low harmonic RF contents, good phase and amplitude balance, and high isolation. Applications are for highly sensitive low-noise radars and missile systems.

SPECIFICATIONS
- FREQUENCY RANGE ................. 20 MHz to 2.56 GHz
- INSERTION LOSS
  (-7D) REFLECTIVE ................. 2.0 dB MAXIMUM
  (-7DT) ABSORPTIVE ................. 2.5 dB MAXIMUM
- AMPLITUDE BALANCE ............... ±0.1 dB MAXIMUM
- PHASE BALANCE .................. ±0.1 dB MAXIMUM
- ISOLATION
  (-7D) REFLECTIVE ................. 65 dB MINIMUM
  (-7DT) ABSORPTIVE ................. 70 dB MINIMUM
- VSWR ................................ 1.7:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) .......... 200 nsec MAXIMUM
  FALL (90% RF TO 10% RF) .......... 200 nsec MAXIMUM
  ON (50% TTL TO 90% RF) .......... 800 nsec MAXIMUM
  OFF (50% TTL TO 10% RF) .......... 800 nsec MAXIMUM
- RF POWER RATINGS ................. +27 dBm CW MAXIMUM
- HARMONIC CONTENTS
  2nd ORDER Two-TONE INTERCEPT .... +56 dBm MINIMUM
  2nd ORDER Two-TONE INTERCEPT .... +50 dBm MINIMUM
  @ 0 dBm INPUT RF POWER
  3rd ORDER Two-TONE INTERCEPT .... +40 dBm MINIMUM
  @ 0 dBm INPUT RF POWER
- RF LEAKAGE (CONDUCTIVE/RADIATED) .... > 70 dBC @ 2.56 GHz
- CONTROL .......................... 3 BIT BINARY TTL LOGIC
  (SEE TRUTH TABLE ON SHEET 2 OF 2)
- POWER SUPPLY .................... +12VDC TO +18VDC @ 250 mA MAXIMUM
  -12VDC TO -18VDC @ 250 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ................. SMA (FEMALE)
  POWER AND CONTROLS .............. 15 PIN D TYPE CONNECTOR
- SIZE .............................. 3.0" x 2.0" x 1.5"

AVAILABLE OPTIONS
A01 ................................... SMA MALE CONNECTORS
A02 ................................... 7 INDIVIDUAL CONTROLS
A03 ................................... DIFFERENTIAL TTL LINE RECEIVER/DECODER (RS-422-A)
A04 ................................... INVERSE CONTROL LOGIC

MECHANICAL OUTLINE

DETAIL A

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
X.XXX ±0.010
3) WEIGHT: APPROX. 12 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE ..................... -55°C TO +95°C (OPERATING)
  -55°C TO +125°C (STORAGE)
- HUMIDITY ......................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK ........................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ......................... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ......................... MIL-STD-202F, METHOD 205C COND. B
- TEMPERATURE CYCLE .............. MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
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PRODUCT FEATURE
SW-2560-7D (OR 7DT)
20 MHz to 2.56 GHz, REFLECTIVE OR NON-REFLECTIVE, SP7T SWITCH MODULE

SIZE A SHEET 1 OF 2 DWG: #100-2865
AMC MODEL SW-1170-7D IS A REFLECTIVE BROAD BAND SP7T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS

- **FREQUENCY RANGE**
  - 1–18 GHz MINIMUM
- **INSERTION LOSS**
  - 1–4 GHz, 1.7 dB MAXIMUM
  - 4–8 GHz, 2.0 dB MAXIMUM
  - 8–12.4 GHz, 2.5 dB MAXIMUM
  - 12.4–18 GHz, 3.5 dB MAXIMUM
- **ISOLATION**
  - 12.4–18 GHz, 60 dB MINIMUM
- **VSWR (ON)**
  - 2.2:1 MAXIMUM
- **RF POWER RATING**
  - 1W CW, 75W PEAK (1μS, PW MAXIMUM)
- **SWITCHING TIME**
  - RISE (10% RF TO 90% RF): 20 ns MAXIMUM
  - FALL (90% RF TO 10% RF): 20 ns MAXIMUM
  - ON (50% TTL TO 90% RF): 50 ns MAXIMUM
  - OFF (50% TTL TO 10% RF): 50 ns MAXIMUM
- **CONTROL**
  - TTL, LOW POWER SCHOTTKY, (UNITY LOAD) (SEE TRUTH TABLE)
    - LOGIC "0" = INSERTION LOSS
    - LOGIC "1" = ISOLATION
- **POWER SUPPLY**
  - +5VDC ±5% @ 300 mA MAXIMUM
  - −12 TO −15VDC @ 60 mA MAXIMUM
- **CONNECTORS**
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER CONTROL: SOLDER PIN
  - SIZE: 1.25" x 1.25" x 0.70"

AVAILABLE OPTIONS

- **A01**
  - 50Ω CONTROL IMPEDANCE
- **A02**
  - 100Ω CONTROL IMPEDANCE
- **A03**
  - INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
- **A04**
  - EXTENDED FREQUENCY RANGE TO 100 MHz
- **A07**
  - VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
- **A08**
  - VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
- **A09**
  - VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
- **A10**
  - SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
- **A11**
  - SMC MALE CONTROL TERMINALS
- **A13**
  - +12 TO +18 VDC POWER SUPPLY
- **A14**
  - −5 VDC POWER SUPPLY

ENVIRONMENTAL RATINGS

- **TEMPERATURE:**
  - OPERATING: −65°C TO +110°C
  - NON-OPERATING: −65°C TO +125°C
- **HUMIDITY**
  - MIL-STD-202F, METHOD 103B, COND. B
- **SHOCK**
  - MIL-STD-202F, METHOD 213B, COND. B
- **VIBRATION**
  - MIL-STD-202F, METHOD 204D, COND. B
- **ALTITUDE**
  - MIL-STD-202F, METHOD 105C, COND. B
- **TEMPERATURE CYCLE**
  - MIL-STD-202F, METHOD 107D, COND. A

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PRODUCT FEATURE

SW-1170-7D
1.0–18 GHz, SP7T SWITCH MODULE

SIZE A SHEET 1 OF 2
AMC MODEL SW-1182-7D IS A REFLECTIVE BROAD BAND SP7T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS

- **Frequency Range**
  - 1–18 GHz Minimum

- **Insertion Loss**
  - 1–4 GHz: 1.7 dB Maximum
  - 4–8 GHz: 2.0 dB Maximum
  - 8–12.4 GHz: 2.5 dB Maximum
  - 12.4–18 GHz: 3.5 dB Maximum

- **Isolation**
  - 1–12.4 GHz: 60 dB Minimum
  - 12.4–18 GHz: 50 dB Minimum

- **VSWR (On)**
  - 2.2:1 Maximum

- **RF Power Rating**
  - 1W CW, 75W Peak (1µs, PW Maximum)

- **Switching Time**
  - Rise (10% RF to 90% RF): 20 ns Maximum
  - Fall (90% RF to 10% RF): 20 ns Maximum
  - On (50% TTL to 90% RF): 50 ns Maximum
  - Off (50% TTL to 10% RF): 50 ns Maximum

- **Control**
  - TTL Low Power Schottky (Unity Load)
  - (See Truth Table)
  - Logic "0" = Insertion Loss
  - Logic "1" = Isolation

- **Power Supply**
  - +5VDC ±5% @ 300 mA Maximum
  - -12 to -15VDC @ 60 mA Maximum

- **Connectors**
  - RF Input/Output: SMA (Female)
  - Power: Solder Pin
  - Control: SMC (Male)

- **Size**
  - 1.25" x 1.25" x 0.88"

AVAILABLE OPTIONS

- A01: 50Ω Control Impedance
- A02: 100Ω Control Impedance
- A03: Inverse Control Logic (Logic "0" Isolation)
- A04: Extended Frequency Range to 100 MHz
- A07: Video Filter on Common Port Only (0.25 dB Excess Loss)
- A08: Video Filter on Output Ports Only (0.25 dB Excess Loss)
- A09: Video Filter on All Ports (0.5 dB Excess Loss)
- A10: SMA Male RF Connectors (0.4 dB Excess Loss)
- A11: Solder Pin Control Terminals
- A13: +12 to +18 VDC Power Supply
- A14: -5 VDC Power Supply

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS

- **Temperature**
  - Operating: -65°C to +110°C
  - Non-Operating: -65°C to +125°C

- **Humidity**
  - MIL-STD-202F, METHOD 103B, COND. B

- **Shock**
  - MIL-STD-202F, METHOD 213B, COND. B

- **Vibration**
  - MIL-STD-202F, METHOD 2040, COND. B

- **Altitude**
  - MIL-STD-202F, METHOD 105C, COND. B

- **Temperature Cycle**
  - MIL-STD-202F, METHOD 107D, COND. A

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PRODUCT FEATURE

SW-1182-7D
1.0–18 GHz, SP7T Switch Module
DESCRIPTION

AMC MODEL SW-1182-7D IS A REFLECTIVE BROAD BAND SP7T SWITCH MODULE WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS

• FREQUENCY RANGE ........................................... 1-18 GHz MINIMUM
  1-4 GHz, 1.7 dB MAXIMUM
  4-8 GHz, 2.0 dB MAXIMUM
  8-12.4 GHz, 2.5 dB MAXIMUM
  12.4-18 GHz, 3.5 dB MAXIMUM

• INSERTION LOSS ............................................. 1-4 GHz, 1.7 dB MAXIMUM
  4-8 GHz, 2.0 dB MAXIMUM
  8-12.4 GHz, 2.5 dB MAXIMUM
  12.4-18 GHz, 3.5 dB MAXIMUM

• ISOLATION .................................................. 1-12.4 GHz, 60 dB MINIMUM
  12.4-18 GHz, 50 dB MINIMUM

• VSWR (ON) ................................................... 2.2:1 MAXIMUM

• RF POWER RATING .......................................... 1W CW, 75W PEAK (1μS, PW MAXIMUM)

• SWITCHING TIME ............................................
  RISE (10% RF TO 90% RF) 20 ns MAXIMUM
  FALL (90% RF TO 10% RF) 20 ns MAXIMUM
  ON (50% TTL TO 90% RF) 50 ns MAXIMUM
  OFF (50% TTL TO 10% RF) 50 ns MAXIMUM

• CONTROL ..................................................... TTL, LOW POWER SCHOTTKY, (UNITY LOAD)
  (SEE TRUTH TABLE)
  LOGIC "0" = INSERTION LOSS
  LOGIC "1" = ISOLATION

• POWER SUPPLY .............................................
  +5VDC ±5% @ 300 mA MAXIMUM
  −12 TO −15VDC @ 60 mA MAXIMUM

• CONNECTORS .................................................. RF INPUT/OUTPUT: SMA (FEMALE)
  POWER: SOLDER PIN
  CONTROL: SOLDER PIN

• SIZE ........................................................... 1.25" x 1.25" x 0.86"

AVAILABLE OPTIONS

A01 ....................................................... 50Ω CONTROL IMPEDANCE
A02 ....................................................... 100Ω CONTROL IMPEDANCE
A03 ....................................................... INVERSE CONTROL LOGIC (LOGIC "0" ISOLATION)
A04 ....................................................... EXTENDED FREQUENCY RANGE TO 100 MHz
A07 ....................................................... VIDEO FILTER ON COMMON PORT ONLY (0.25 dB EXCESS LOSS)
A08 ....................................................... VIDEO FILTER ON OUTPUT PORTS ONLY (0.25 dB EXCESS LOSS)
A09 ....................................................... VIDEO FILTER ON ALL PORTS (0.5 dB EXCESS LOSS)
A10 ....................................................... SMA MALE RF CONNECTORS (0.4 dB EXCESS LOSS)
A11 ....................................................... SMC MALE CONTROL TERMINALS
A13 ....................................................... +12 TO +18 VDC POWER SUPPLY
A14 ....................................................... −5 VDC POWER SUPPLY

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PRODUCT FEATURE

SW-1182-7D
1.0-18 GHz, SP7T SWITCH MODULE
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<td>• 0.02-2.6 GHz RADIAL SWITCH MODULE, AMC MODEL NO: SW-2560-7DT</td>
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</table>
DESCRIPTION

AMC MODEL SW-2000-7AT IS AN ABSORPTIVE BROAD BAND SP7T SWITCH MODULE WITH INTEGRAL TIL DRIVER, DESIGNED TO MAINTAIN LOW HARMONIC RF CONTENTS, AND HIGH ISOLATION. APPLICATIONS ARE FOR HIGHLY SENSITIVE LOW-NOISE RADARS AND MISSILE SYSTEMS.

SPECIFICATIONS

- FREQUENCY RANGE: 20 MHz to 2.0 GHz minimum
- INSERTION LOSS: 2.0 dB maximum
- AMPLITUDE BALANCE: ±0.25 dB maximum
- ISOLATION: 80 dB minimum
- VSWR (ON/OFF): 1.5:1 maximum
- SWITCHING TIME
  - RISE (10% RF TO 90% RF): 200 nsec maximum
  - FALL (90% RF TO 10% RF): 200 nsec maximum
  - ON (50% TTL TO 90% RF): 700 nsec maximum
  - OFF (50% TTL TO 10% RF): 700 nsec maximum
- RF POWER RATINGS: +20 dBm CW maximum
- HARMONIC CONTENTS
  - 2nd HARMONIC INTERCEPT: +56 dBm minimum
  - 2nd ORDER TWO-TONE INTERCEPT: +50 dBm minimum
  - 3rd ORDER TWO-TONE INTERCEPT: +40 dBm minimum
- RF LEAKAGE (CONDUCTIVE/RADIATED): > 80 dBc @ 2.0 GHz
- CONTROL: 3 BIT BINARY TTL LOGIC
- POWER SUPPLY: +5VDC ±5% @ 200 mA maximum
  - -15VDC ±5% @ 120 mA maximum
- CONNECTORS
  - RF INPUT/OUTPUT: SMA (FEMALE)
  - POWER AND CONTROLS: 9 PIN MALE MINIATURE MULTIPIN CONNECTOR (MDH-9SSP)
- SIZE: 3.94" x 2.00" x 0.83"

AVAILABLE OPTIONS

A01: SMA MALE CONNECTORS
A02: ±12 to ±18 VDC SUPPLIES
A03: 7 INDIVIDUAL CONTROLS
A04: INVERSE CONTROL LOGIC

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: APPROX. 12 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE: -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B, COND. B
- SHOCK: MIL-STD-202F, METHOD 213B, COND. B
- VIBRATION: MIL-STD-202F, METHOD 204D, COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C, COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D, COND. A

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PRODUCT FEATURE
SW-2000-7AT
20 MHz TO 2 GHz, NON-REFLECTIVE, SP7T SWITCH MODULE
SIZE A SHEET 1 OF 2 Dwg: 100-2859
DESCRIPTION

AMC MODEL SW-2560-7D (OR -7DT) IS A REFLECTIVE (OR AN ABSORPTIVE) SP7T SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED TO MAINTAIN LOW HARMONIC RF CONTENTS, GOOD PHASE AND AMPLITUDE BALANCE, AND HIGH ISOLATION. APPLICATIONS ARE FOR HIGHLY SENSITIVE LOW-NOISE RADARS AND MISSILE SYSTEMS.

SPECIFICATIONS

- FREQUENCY RANGE ................. 20 MHz–2.56 GHz
- INSERTION LOSS .................. 2.0 dB MAXIMUM
  (-7D) REFLECTIVE ................. 2.5 dB MAXIMUM
- PHASE BALANCE .................. ±0.1 dB MAXIMUM
- ISOLATION ....................... 65 dB MINIMUM
  (-7D) REFLECTIVE ................. 70 dB MINIMUM
- VSIR ................................ 1.7:1 MAXIMUM
- SWITCHING TIME .................
  RISE (10% RF TO 90% RF) ......... 200 nsec MAXIMUM
  FALL (90% RF TO 10% RF) ........ 200 nsec MAXIMUM
  ON (50% TTL TO 90% RF) ........ 800 nsec MAXIMUM
  OFF (50% TTL TO 10% RF) ......... 800 nsec MAXIMUM
- RF POWER RATINGS ............... +27 dBm CW MAXIMUM
- HARMONIC CONTENTS ..............
  2nd HARMONIC INTERCEPT .......... +56 dBm MINIMUM
  2nd ORDER TWO-TONE INTERCEPT ... +50 dBm MINIMUM
  @ 0 dBm INPUT RF POWER
  3rd ORDER TWO-TONE INTERCEPT ... +40 dBm MINIMUM
  @ 0 dBm INPUT RF POWER
- RF LEAKAGE (CONDUCTIVE/RADIATED) ........ > 70 dBc @ 2.56 GHz
- CONTROL ....................... 3 BIT BINARY TTL LOGIC
  (SEE TRUTH TABLE ON SHEET 2 OF 2)
- POWER SUPPLY ...................
  +12 VDC TO +18 VDC @ 250 mA MAXIMUM
  −12 VDC TO −18 VDC @ 250 mA MAXIMUM
- CONNECTORS .................
  RF INPUT/OUTPUT ............. SMA (FEMALE)
  POWER AND CONTROLS .......... 15 PIN D TYPE CONNECTOR
- SIZE ...................... 3.0" x 2.0" x 1.5"

AVAILABLE OPTIONS

A01 .................. SMA MALE CONNECTORS
A02 .................. 7 INDIVIDUAL CONTROLS
A03 .................. DIFFERENTIAL TTL LINE RECEIVER/DECODER (RS-422-A)
A04 .................. INVERSE CONTROL LOGIC

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PRODUCT FEATURE

SW-2560-7D (OR 7DT)
20 MHz–2.56 GHz, REFLECTIVE OR NON-REFLECTIVE, SP7T SWITCH MODULE

SIZE A
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DWG. # 100-2865
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<td>AMC MODEL NO: SW-2040-8AT</td>
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<td>AMC MODEL NO: SW-2181-8AT</td>
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</table>
DESCRIPTION

MWC MODEL SW–2000–8AT–A1052 IS AN ABSORPTIVE SP8T SWITCH MODULE WITH INTEGRAL TTL DRIVER, DESIGNED FOR LOW LOSS AND LOW VSWR BROAD BAND APPLICATIONS.

SPECIFICATIONS

- FREQUENCY RANGE .... 0.01–2.0 GHz MINIMUM
- INSERTION LOSS .... 1.0 dB MAXIMUM
- ISOLATION .... 65 dB MINIMUM
- VSWR (ON/OFF) .... 1.3:1 MAXIMUM
- SWITCHING TIME
  - RISE (10% RF TO 90% RF) .... 400 ns MAXIMUM
  - FALL (90% RF TO 10% RF) .... 400 ns MAXIMUM
  - ON (50% TTL TO 90% RF) .... 800 ns MAXIMUM
  - OFF (50% TTL TO 10% RF) .... 800 ns MAXIMUM
- CONTROL .... TTL COMPATIBLE, UNITY LOAD
  - LOGIC "0" = ISOLATION
  - LOGIC "1" = INSERTION LOSS
  (SEE TRUTH TABLE ON SHEET 2 OF 2)
- RF POWER RATINGS .... +27 dBm CW MAXIMUM
- POWER SUPPLY .... +5VDC ±5% @ 350 mA MAXIMUM
  - 15VDC ±5% @ 100 mA MAXIMUM
- CONNECTORS
  - RF INPUT/OUTPUT .... SMA (FEMALE)
  - POWER .... SOLDER PIN
  - CONTROL .... SOLDER PIN
- SIZE .... 5.1" x 2.0" x 0.75"

AVAILABLE OPTIONS

- A01 .... 50Ω CONTROL IMPEDANCE
- A02 .... 100Ω CONTROL IMPEDANCE
- A03 .... INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A08 .... SMA MALE CONNECTORS
- A10 .... ±12VDC TO ±15VDC SUPPLY POWER
- A12 .... 3 BIT BINARY TTL LOGIC

MECHANICAL OUTLINE

NOTES:
1) DIMENSIONS ARE IN INCHES [MILLIMETERS]
2) TOLERANCES: X.XX ±0.020
    XXX ±0.010
3) WEIGHT: APPROX. 10 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE .... −55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY .... MIL–STD–202F, METHOD 103B COND. B
- SHOCK .... MIL–STD–202F, METHOD 213B COND. B
- VIBRATION .... MIL–STD–202F, METHOD 204D COND. B
- ALTITUDE .... MIL–STD–202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .... MIL–STD–202F, METHOD 107D COND. A

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PRODUCT FEATURE

SW–2000–8AT–A1052
0.01–2.0 GHz, NON-REFLECTIVE, SP8T SWITCH MODULE

SIZE A SHEET 1 OF 2 DWG # 100–2877
FUNCTIONAL SCHEMATIC

TTL DRIVER

RF SECTION

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<td>J9-J8</td>
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AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2000-8AT-A1052
0.01-2.0 GHz, NON-REFLECTIVE, SPST SWITCH MODULE

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2000-8AT-A1052
0.01-2.0 GHz, NON-REFLECTIVE, SPST SWITCH MODULE

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2000-8AT-A1052
0.01-2.0 GHz, NON-REFLECTIVE, SPST SWITCH MODULE

AMERICAN MICROWAVE CORPORATION
7311 GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2000-8AT-A1052
0.01-2.0 GHz, NON-REFLECTIVE, SPST SWITCH MODULE
DESCRIPTION
AMC MODEL SW-2000-8AT-200 IS AN ABSORPTIVE SP8T SWITCH MODULE DESIGNED TO MAINTAIN LOW HARMONIC RF CONTENTS, AND HIGH ISOLATION FROM EXTENSIVE NOISY ENVIRONMENTS BY APPLYING OPTO-ISOLATORS ON CONTROL SIGNAL PORTS AND VOLTAGE TRANSIENT SUPPRESSORS. APPLICATIONS ARE FOR HIGHLY SENSITIVE LOW-NOISE RADARS, MISSILE SYSTEMS, EW SYSTEMS, ETC.

SPECIFICATIONS
- FREQUENCY RANGE .................. 250-500 MHz MINIMUM
- INSERTION LOSS ................... 0.5 dB MAXIMUM
- ISOLATION ......................... 80 dB MINIMUM
- VSWR (ON/OFF) ..................... 1.5:1 MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ............ 150 nS MAXIMUM
  FALL (90% RF TO 10% RF) ............ 250 nS MAXIMUM
  ON (50% TTL TO 90% RF) ............. 200 nS MAXIMUM
  OFF (50% TTL TO 10% RF) ............ 500 nS MAXIMUM
- RF POWER RATINGS ................. 1W CW, MAXIMUM
- HARMONIC CONTENT
  2nd HARMONIC ...................... -80 dBC MAXIMUM @ +10dBm INPUT RF POWER
  3rd HARMONIC ...................... -110 dBC MAXIMUM @ +10dBm INPUT RF POWER
- RF LEAKAGE (CONDUCTIVE/RADIATED) > 80 dBC @ 500 MHz
- CONTROLS .......... DIFFERENTIAL TTL WITH OPTO COUPLERS;
  8 INDIVIDUAL CONTROL PAIRS;
  LOGIC "1" INSERTION LOSS
  LOGIC "0" ISOLATION
- POWER SUPPLY ..................... +5 ±0.25VDC @ 380 mA MAXIMUM
- -5.2 ±0.25VDC @ 440 mA MAXIMUM
- DC LINES ARE FILTERED TO PREVENT RF LEAKAGE AND PROVIDE TRUE POWER SUPPLY DECOUPLING.
- CONNECTIONS
  RF INPUT/OUTPUT .................. SMA FEMALE
  CONTROL ..................... 26 PIN TYPE DD
  SUPPLY .................. 9 PIN SUB MINIATURE TYPE D
- SIZE ...................... 4.50" x 3.00" x 0.75"

AVAILABLE OPTIONS
A01 .................. ±12 TO ±18VDC SUPPLIES
A02 .................. EXTENDED FREQUENCY BAND FROM 10 MHz TO 2000 MHz (RF PERFORMANCE IS SUBJECT TO CHANGE, CONSULT FACTORY)
A03 .................. INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
A04 .................. SMA MALE CONNECTORS

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS
- TEMPERATURE ............... -55°C TO +95°C (OPERATING)
                        -65°C TO +125°C (STORAGE)
- HUMIDITY .................. MIL-STD-202F, METHOD 103B COND. B
- SHOCK ..................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION .................. MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE .................. MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE ........... MIL-STD-202F, METHOD 107D COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938
PRODUCT FEATURE
SW-2000-8AT-200
250-500 MHz, NON-REFLECTIVE, LOW-NOISE ABSORPTIVE SP8T SWITCH MODULE WITH TTL COMPATIBLE OPTO-COUPLER

SIZE A SHEET 1 OF 2 DWG. # 100-2814
AMC MODEL SW-1020-8AT IS AN ABSORPTIVE SP8T SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A RADIAL HOUSING, DESIGNED FOR LOW LOSS, LOW VSWR, AMPLITUDE AND PHASE BALANCED APPLICATIONS.

SPECIFICATIONS

- FREQUENCY RANGE .............. 1-2 GHz MINIMUM
- INSERTION LOSS .............. 1.5 dB MAXIMUM
- AMPLITUDE BALANCE .......... ±0.3 dB MAXIMUM
- PHASE BALANCE ............... ±3° MAXIMUM
- ISOLATION ..................... 70 dB MINIMUM
- VSWR (ON/OFF) .............. 1.3:1 MAXIMUM
- RF POWER RATINGS .......... +27 dBm, MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) ..... 100 ns MAXIMUM
  FALL (90% RF TO 10% RF) ..... 100 ns MAXIMUM
  ON (50% TTL TO 90% RF) ..... 800 ns MAXIMUM
  OFF (50% TTL TO 10% RF) ..... 800 ns MAXIMUM
- CONTROL .......................... TTL COMPATIBLE, UNITY LOAD
  8 INDIVIDUAL CONTROLS
  LOGIC "0" = ISOLATION
  LOGIC "1" = INSERTION LOSS
  (SEE TRUTH TABLE ON SHEET 2 OF 2)
- POWER SUPPLY ................. +5VDC ±5% @ 280 mA MAXIMUM
  -15VDC ±5% @ 75 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT .............. SMA FEMALE
  POWER .......................... SOLDER PIN
  CONTROL ....................... SOLDER PIN
- SIZE .......................... 2.13" DIAMETER x 0.75"

AVAILABLE OPTIONS

- A01 .................................. 50Ω CONTROL IMPEDANCE
- A02 .................................. 100Ω CONTROL IMPEDANCE
- A03 .................................. INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A04 .................................. EXTENDED FREQUENCY RANGE (CONSULT FACTORY)
- A07 .................................. INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
- A08 .................................. SMA MALE CONNECTORS
- A10 .................................. +12 TO +15VDC SUPPLY
- A12 .................................. 3 BIT BINARY TTL LOGIC DECODER

MECHANICAL OUTLINE

ENVIRONMENTAL RATINGS

- TEMPERATURE .................... -55°C TO +95°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY ........................ MIL-STD-202F, METHOD 103B COND. B
- SHOCK .............................. MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ....................... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE ......................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE ............. MIL-STD-202F, METHOD 107D COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-1020-8AT
1 TO 2 GHz, NON-REFLECTIVE, RADIAL, SP8T SWITCH MODULE

AM \ IT IS
APPROVALS \ DATE
\ DRAFTER: 3/23/92
\ REVISIONS: 1/12/92
\ DATE: 11/22/92
\ APPROVED: 1/12/92

SIZE A \ SHEET 1 OF 2
Dwg. # 100-2895
DESCRIPTION

AMC MODEL SW-2040-8AT IS AN ABSORPTIVE SP8T SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A RADIAL HOUSING, DESIGNED FOR LOW LOSS, LOW VSWR, AMPLITUDE AND PHASE BALANCED APPLICATIONS.

SPECIFICATIONS

- FREQUENCY RANGE ............. 2-4 GHz MINIMUM
- INSERTION LOSS .............. 2.0 dB MAXIMUM
- AMPLITUDE BALANCE .......... ±0.3 dB MAXIMUM
- PHASE BALANCE ............... ±5° MAXIMUM
- ISOLATION .................. 60 dB MINIMUM
- VSWR (ON/OFF) .............. 1.3:1 MAXIMUM
- RF POWER RATINGS .......... +27 dBm, MAXIMUM
- SWITCHING TIME
  RISE (10% RF TO 90% RF) .... 100 ns MAXIMUM
  FALL (90% RF TO 10% RF) .... 100 ns MAXIMUM
  ON (50% TTL TO 90% RF) .... 800 ns MAXIMUM
  OFF (50% TTL TO 10% RF) .... 800 ns MAXIMUM
- CONTROL
  TTL COMPATIBLE, UNITY LOAD
  8 INDIVIDUAL CONTROLS
  LOGIC "1" = ISOLATION
  LOGIC "0" = INSERTION LOSS
  (SEE TRUTH TABLE ON SHEET 2 OF 2)
- POWER SUPPLY ............... +5VDC ±5% @ 280 mA MAXIMUM
  -15VDC ±5% @ 75 mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT ............. SMA FEMALE
  POWER CONTROL ............... SOLDER PIN
  POWER CONTROL ............... SOLDER PIN
- SIZE ....................... 2.13" DIAMETER x 0.75"

AVAILABLE OPTIONS

A01 .................................. 50Ω CONTROL IMPEDANCE
A02 .................................. 100Ω CONTROL IMPEDANCE
A03 .................................. INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
A04 .................................. EXTENDED FREQUENCY RANGE (CONSULT FACTORY)
A07 .................................. INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
A08 .................................. SMA MALE Connectors
A10 .................................. +12 TO +15VDC SUPPLY
A12 .................................. 3 BIT BINARY TTL LOGIC DECODER

MECHANICAL OUTLINE

- CONTROL TYPICAL 8 PLACES
  TYPICAL 8 PLACES
- GND TERMINAL
- COMMON PORT
- LABELING SURFACE
- Ø0.154 THRU 9 HOLES ON Ø2.000 CIRCLE

ENVIRONMENTAL RATINGS

- TEMPERATURE ................. -55°C TO +85°C (OPERATING)
  -65°C TO +125°C (STORAGE)
- HUMIDITY ..................... MIL-STD-202F, METHOD 103B COND. B
- SHOCK ......................... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION ..................... MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE ...................... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 1070 COND. A

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TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SW-2040-8AT
2 TO 4 GHz, NON-REFLECTIVE, RADIAL, SP8T SWITCH MODULE

SIZE A | SHEET 1 OF 2 | DWG. # 100-2696
**DESCRIPTION**
AMC MODEL SW-2181-8AT IS AN ABSORPTIVE BROAD BAND SP8T SWITCH MODULE WITH INTEGRAL TTL DRIVER, PACKAGED IN A RADIAL HOUSING.

**SPECIFICATIONS**
- **FREQUENCY RANGE** .......... 1-20 GHz MINIMUM
- **INSERTION LOSS** .......... 1-8 GHz 2.5 dB MAXIMUM  
  8-18 GHz 3.5 dB MAXIMUM  
  18-20 GHz 4.5 dB MAXIMUM
- **ISOLATION** .......... 1-18 GHz, 65 dB MINIMUM  
  18-20 GHz, 60 dB MINIMUM
- **VSWR (ON/OFF)** .......... 2:1 MAXIMUM
- **SWITCHING TIME**
  RISE (10% RF TO 90% RF) .......... 200 nS MAXIMUM
  FALL (90% RF TO 10% RF) .......... 10 nS MAXIMUM
  ON (50% TTL TO 90% RF) .......... 80 nS MAXIMUM
  OFF (50% TTL TO 10% RF) .......... 20 nS MAXIMUM
- **RF POWER RATINGS** .......... +27 dBm, MAXIMUM
- **CONTROL** .......... TTL COMPATIBLE, UNITY LOAD  
  8 INDIVIDUAL CONTROLS  
  LOGIC "0" = ISOLATION  
  LOGIC "1" = INSERTION LOSS
- **POWER SUPPLY** .......... +5VDC ±5% @ 280 mA MAXIMUM  
  -15VDC ±5% @ 75 mA MAXIMUM
- **CONNECTORS**
  RF INPUT/OUTPUT .......... SMA FEMALE  
  POWER .......... SOLDER PIN  
  CONTROL .......... SOLDER PIN
- **SIZE** .......... 2.13" DIAMETER x 0.75" THICK

**AVAILABLE OPTIONS**
- A01 .......... 50Ω CONTROL IMPEDANCE
- A02 .......... 100Ω CONTROL IMPEDANCE
- A03 .......... INVERSE CONTROL LOGIC (LOGIC "0" INSERTION LOSS)
- A04 .......... EXTENDED FREQUENCY RANGE TO 100 MHz
- A07 .......... INPUT/OUTPUT VIDEO FILTER (0.5 dB EXCESS LOSS)
- A08 .......... SMA MALE CONNECTORS
- A10 .......... +12 TO +15VDC SUPPLY
- A12 .......... 3 BIT BINARY TTL LOGIC DECODER

**MECHANICAL OUTLINE**

**ENVIRONMENTAL RATING**
- **TEMPERATURE** .......... -55°C TO +85°C (OPERATING)  
  -65°C TO +125°C (STORAGE)
- **HUMIDITY** .......... MIL-STD-202F, METHOD 103B COND. B
- **SHOCK** .......... MIL-STD-202F, METHOD 213B COND. B
- **VIBRATION** .......... MIL-STD-202F, METHOD 204C COND. B
- **ALTITUDE** .......... MIL-STD-202F, METHOD 105C COND. B
- **TEMPERATURE CYCLE** .......... MIL-STD-202F, METHOD 107D COND. A

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**PRODUCT FEATURE**
SW-2181-8AT
RADIAL 1 TO 20 GHz, NON-REFLECTIVE, SP8T SWITCH MODULE

**SIZE** A  SHEET 1 OF 2  Dwg. # 100-2825
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<td>TRANSFER SWITCH.</td>
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<td>• 0.4-0.6 GHz 1 WATT SWITCH MODULE</td>
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<td>AMC MODEL NO: SW-0406-TR</td>
<td>16-3</td>
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DESCRIPTION
AMC Model SW-0406-TR is a transfer switch module capable of handling 1 watt CW RF power.

SPECIFICATIONS
- **Frequency Range**: 0.4–0.6 GHz minimum
- **Insertion Loss**: 0.8 dB maximum
- **Isolation**: 80 dB minimum
- **VSWR**: 1.3:1 maximum
- **RF Power Ratings**: +30 dBm CW maximum
- **Switching Time**
  - RISE (10% RF to 90% RF): 500 ns maximum
  - FALL (90% RF to 10% RF): 500 ns maximum
  - ON (50% TTL to 90% RF): 1 μs maximum
  - OFF (50% TTL to 10% RF): 1 μs maximum
- **Control**: Voltage controlled
  - 2 Dependent controls (toggle)
  - \(-1V \pm 80\) mA typical
  - \(+1V \pm 40\) mA typical
(See Truth Table)

- **Connectors**
  - RF Ports: SMA female
  - Controls: Solder pin
- **Size**: 1.20" x 1.20" x 0.60"

AVAILABLE OPTIONS
- A01: Integral TTL driver
- A02: Extended frequency band (consult factory)
- A03: SMC male control terminals

MECHANICAL OUTLINE

ENIRONMENTAL RATINGS
- **Temperature**: 
  - Operating: \(-55^\circ C \) to \(+95^\circ C\)
  - Storage: \(-65^\circ C \) to \(+125^\circ C\)
- **Humidity**: MIL-STD-202F, Method 103B Cond. B
- **Shock**: MIL-STD-202F, Method 213B Cond. B
- **Vibration**: MIL-STD-202F, Method 204D Cond. B
- **Altitude**: MIL-STD-202F, Method 105C Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D Cond. A

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PRODUCT FEATURE
SW-0406-TR
0.4–0.6 GHz Transfer Switch Module

SIZE: A
SHEET 1 OF 2
Dwg. # 100-2897
SWITCHED FILTER BANKS

NEW PRODUCT DEVELOPMENTS

AT

AMERICAN MICROWAVE CORPORATION

NOVEMBER 22, 1992
TABLE OF CONTENTS

1.0 SP6T, 0.01-8 GHz SWITCHED FILTER BANK ..................... 1-2
DESCRIPTION
AMC MODEL SFB-0108-6P IS A 6 CHANNEL SWITCHED FILTER BANK WITH INTEGRAL TTL DRIVER.

SPECIFICATIONS
- FREQUENCY RANGE .......... 0.01–8 GHz
- INSERTION LOSS
  CHANNEL 1 .......... 0.01–0.5 GHz, 3.0dB MAXIMUM
  CHANNEL 2 .......... 0.45–0.9 GHz, 3.3dB MAXIMUM
  CHANNEL 3 .......... 0.8–1.5 GHz, 3.6dB MAXIMUM
  CHANNEL 4 .......... 1.4–2.7 GHz, 3.8dB MAXIMUM
  CHANNEL 5 .......... 2.2–4.3 GHz, 4.0dB MAXIMUM
  CHANNEL 6 .......... 3.8–7.5 GHz, 5.0dB MAXIMUM
- NOTE: (DIFFERENT FREQUENCY BANDS AVAILABLE; CONSULT FACTORY)
- ISOLATION .......... 60 dB MINIMUM
- VSWR (ON) .......... 2:1 MAXIMUM
- SWITCHING TIME
  DELAY ON (50% TTL TO 90% RF) .......... 500ns MAXIMUM
  DELAY OFF (50% TTL TO 10% RF) .......... 500ns MAXIMUM
- CONTROL
  TTL COMPATIBLE, UNITY LOAD
  6 INDIVIDUAL CONTROLS
  LOGIC "0" INSERTION LOSS
  LOGIC "1" ISOLATION
- RF POWER RATINGS .......... +27dBm CW MAXIMUM
- POWER SUPPLY
  +12VDC @ 100mA MAXIMUM
  -12VDC @ 250mA MAXIMUM
- CONNECTORS
  RF INPUT/OUTPUT .......... SMA FEMALE
  POWER .......... SOLDER PIN
  CONTROL .......... SOLDER PIN
- SIZE .......... 4.0" x 3.5" x 1.0"

AVAILABLE OPTIONS
A13 .......... +15 VOLT DC SUPPLY
A14 .......... J1 SMA MALE, J2 & J3 SMA FEMALE
A15 .......... J1 SMA FEMALE, J2 & J3 SMA MALE
A19 .......... SMC CONTROL TERMINALS
A20 .......... MULTIPIN OPTION
A21 .......... 3 BIT DECODER OPTION

MECHANICAL OUTLINE

SWITCHED FILTER BANK
SFB-0108-6P
S/N
P/N

LOGIC TABLE
| E1 = 0 | J1-J2 | 0.01–0.5 GHz |
| E2 = 0 | J1-J2 | 0.45–0.9 GHz |
| E3 = 0 | J1-J2 | 0.8–1.5 GHz |
| E4 = 0 | J1-J2 | 1.4–2.7 GHz |
| E5 = 0 | J1-J2 | 2.2–4.3 GHz |
| E6 = 0 | J1-J3 | 3.8–7.5 GHz |

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: XXX ± 0.020
XXX ± 0.010
3) WEIGHT: APPROX. 16 OZ

ENVIRONMENTAL RATINGS
- TEMPERATURE .......... -55°C TO +95°C (OPERATING)
                      -65°C TO +125°C (STORAGE)
- HUMIDITY .......... MIL-STD-202F, METHOD 103B COND. B
- SHOCK .......... MIL-STD-202F, METHOD 213B COND. B
- VIBRATION .......... MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE .......... MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE .......... MIL-STD-202F, METHOD 107D COND. A

AMERICAN MICROWAVE CORPORATION
7311G GROVE RD., FREDERICK, MD. 21701
TEL: (301) 662-4700 FAX: (301) 662-4938

PRODUCT FEATURE
SFB-0108-6P
0.01–8 GHz, SWITCHED FILTER

SIZE A
SHEET 1 OF 2
DRAWING 100-2808
TEST DATA

ON

10 MHz TO 2 Ghz
(10 MHz GHz TO 18 GHz ALSO AVAILABLE)

LOW LOSS

HIGH ISOLATION

ABSORPTIVE & REFLECTIVE

SP8T PIN DIODE SWITCH

AMC MODEL Nos:
SWN-2000-8DT-0012 (ABSORPTIVE)
SWN-2000-8DR-0012 (REFLECTIVE)
Serial No: 8MS60475

AND
MSN-8DR/DT-05-10M2 (REFLECTIVE or ABSORPTIVE)
MSN-8DR/DT-06-10M2 (REFLECTIVE or ABSORPTIVE)
MSNC-8DR/DT-06-10M2 (REFLECTIVE or ABSORPTIVE)

DESIGNED
BY
A. K. GORWARA

REPORTED
BY
P. D. WOOD

MAY 29, 1998
10 MHz TO 2 GHz
ABSORPTIVE
LOW LOSS, HIGH ISOLATION
SP8T PIN DIODE SWITCH

• LOW LOSS
• ABSORPTIVE
• HIGH ISOLATION

AMC MODEL Nos:
SWN-2000-8DR/DT-0012 (ABSORPTIVE or REFLECTIVE)
MSN-8DR/DT-05-10M2 (ABSORPTIVE or REFLECTIVE)
MSN-8DR/DT-06-10M2 (ABSORPTIVE or REFLECTIVE)
MSNC-8DR/DT-06-10M2 (ABSORPTIVE or REFLECTIVE)

SPECIFICATIONS:

• FREQUENCY RANGE : 10 MHz GHz TO 2 GHz
• INSERTION LOSS : 2.50 dB MAX.
  (For Absorptive, Non-Absorptive or Reflective reduces Loss by about 0.5 dB)
  : 1.50 dB TYP. @ 0.01 GHz
  : 1.30 dB TYP. @ 0.5 GHz
  : 1.50 dB TYP. @ 1.0 GHz
  : 2.00 dB TYP. @ 2.0 GHz
• ISOLATION : 75 dB MIN.
  : 90 dB TYP. @ 0.05 GHz
  : 95 dB TYP. @ 0.1 GHz
  : 95 dB TYP. @ 0.5 GHz
  : 90 dB TYP. @ 1.0 GHz
  : 80 dB TYP. @ 2.0 GHz
• VSWR : 2.0:1
• SWITCHING SPEED :

  ALL SERIES DESIGN    SERIES/SHUNT DESIGN
RISE          50 nS Maximum        25 nS Maximum
FALL          50 nS Maximum        25 nS Maximum
ON            250 nS Maximum       100 nS Maximum
OFF           350 nS Maximum       100 nS Maximum

• CONTROL : TTL Compatible (Independent Control, Standard; 3-bit Binary Decoder Available)
• VIDEO TRANSIENTS : 2.5 V Peak to Peak in a 20 MHz BW (Without Video Filters)
  : 3.0 V Peak to Peak in a 300 MHz BW (Without Video Filters)
• RF INPUT POWER : +20 dBm Operating, 1 Watt Survival
• DC POWER SUPPLY : +5Vdc @ 250 mA MAX., <200 mA TYP. (+5/-5Vdc Standard,
  : -5Vdc @ 75 mA MAX., <50 mA TYP. Other Voltage Options Also Available)
• SIZE & WEIGHT :
  : SWN : 5.1" X 2.0" X 0.56" @ <7.0 oz. (5.10" X 2.0" X 0.75" Also Available)
  : MSN-05: 4.0" X 1.5" X 0.40", MSN-06: 4.75" X 1.5" X 0.5" Both <6.0oz.
  : MSNC-06: 4.76" X 1.5" X 0.40" <6.0oz.

ABOVE DATA IS TYPICAL FOR ABSORPTIVE OR REFLECTIVE VERSIONS.
OTHER MULTI-THROW (SP2T, SP3T, SP4T, SP5T, SP6T & SP7T) DESIGNS AVAILABLE.
SUMMARY TEST DATA

MODEL NUMBER
- SWN-2000-8DR/DT-0012
- MSN-8DR/DT-05-10M2
- MSN-9DR/DT-06-10M2
- R. Afable

TECHNICIAN

MECHANICAL OUTLINES

SMA FEMALE
9 PLACES
0.35 [8.9]

0.60 [15.2]
0.45 [11.4]
TYPICAL

0.25 [6.3]

1.490 [37.8]

0.16 [4.1]

0.16 [4.1]

0.030 PINS

5.10 [129.5]

4.78 [121.4]

5 [10.1]

2.00 [50.8]

0.56 [14.2]

MOUNTING HOLES
4-40 HELI-COILS
x.40 DEEP, 4 PLACES
FAR SIDE

SWN-2000-8DT-0012
TOLERANCE: X.XX ±0.05 INCHES, X.XXX ±0.002 INCHES

ENVIRONMENTAL RATINGS

- TEMPERATURE
  -54°C TO +85°C (OPERATING)
  -65°C TO +100°C (STORAGE)
- HUMIDITY
  MIL-STD-202F, METHOD 103B COND. B
- SHOCK
  MIL-STD-202F, METHOD 213B COND. B
- VIBRATION
  MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE
  MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE
  MIL-STD-202F, METHOD 107D COND. A

MAY 25, 1998

PAGE 4
SUMMARY TEST DATA

MODEL NUMBER
: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2

TECHNICIAN
: R. AFABLE

MECHANICAL OUTLINES
(CONTINUED)

AMERICAN
MICROWAVE
CORPORATION

SOLID STATE SWITCH

MODEL NO: MSN-8DR-05
OPTION NO: STANDARD

SERIAL NO:

PART NO:

E1 E2 E3 E4 GND -V J9 +V GND E5 E6 E7 E8

0.025 TYP.

0.17 TYP.

0.40

0.127 (G)

0.125 (GP)

0.25 TYP.

0.39

0.38

0.750 150

0.030 SOLDER PIN 10 PLACES

0.005 DIA THRU V/4-48 THD 0.250 DEEP MINIMUM ON MOUNTING SURFACE, 4 PLACES

0.005 x 0.100" RF PIN 9 PLACES

REMOVABLE SMA (F) 9 PLACES

MOUNTING SURFACE GP-GOLD PLATED P-PAINTED

MSN-8DR/DT-05-STANDARD WITH INDEPENDENT CONTROLS

MAY 25, 1998

PAGE 5
SUMMARY TEST DATA

MODEL NUMBER
: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2
: R. AFABLE

TECHNICIAN

MECHANICAL OUTLINES
(CONTINUED)

MSN-8DR/DT-06-STANDARD
WITH INDEPENDENT CONTROLS

MAY 25, 1998

PAGE 6
SUMMARY TEST DATA

MODEL NUMBER

: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2
: R. AFALE

TECHNICIAN

MECHANICAL OUTLINES

(Continued)

MSNC-8DR/DT-06-STANDARD

WITH INDEPENDENT CONTROLS

MAY 25, 1998

PAGE 7
AVAILABLE OPTIONS AND HOW TO ORDER
SWN-2000 SERIES OF SWITCHES

EXAMPLE:

\[
\text{SWN - 2000 - 8 D T - XXXX - ###}
\]

1. : SWN : Switch Designator (SW = Older Models, SWN = Newer Models)
2. : 2000 : Series Designator (2181 = Older Models, 218 or 1170 = Newer Models)
3. : 8 : Number of Throws, i.e.: 3 (3P3T), 4 (3P4T), 5 (5P5T), 6 (6P6T), 7 (7P7T), 8 (8P8T)
4. : D : Indicates Integral Driver
5. : T : T = Terminated (Absorptive), R = Reflective (Non-Absorptive)
6. : XXXX : Frequency Range of Switch as Illustrated Below
7. : ### : Available Options as Noted Below

<table>
<thead>
<tr>
<th>OPTION:</th>
<th>MULTI-THROW SWITCH OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>SMA Male RF Connectors (Increases Insertion Loss by 0.25dB per Arm)</td>
</tr>
<tr>
<td>002</td>
<td>Inverted Logic, &quot;0&quot; = ON (Standard TTL Logic is &quot;1&quot; = ON)</td>
</tr>
<tr>
<td>003</td>
<td>+12vdc DC Power Supply (Standard is ±5vdc)</td>
</tr>
<tr>
<td>004</td>
<td>+15vdc DC Power Supply (Standard is ±5vdc)</td>
</tr>
<tr>
<td>005</td>
<td>3-bit Binary Decoder</td>
</tr>
<tr>
<td>006</td>
<td>-12vdc DC Power Supply (Standard is ±5vdc)</td>
</tr>
<tr>
<td>007</td>
<td>-15vdc DC Power Supply (Standard is ±5vdc)</td>
</tr>
<tr>
<td>008</td>
<td>MULTIPIN CONNECTOR</td>
</tr>
<tr>
<td>009</td>
<td>0.4&quot; THICK OPTION AVAILABLE (Consult Factory For Details)</td>
</tr>
<tr>
<td>XXXX</td>
<td>Indicates the Frequency for which the Switch has been Adjusted</td>
</tr>
</tbody>
</table>

For Example:
- 10M2 = 10 MHz to 2.0 GHz
- 40M2 = 40 MHz to 2.0 GHz
- 12 = 1.0 GHz to 2.0 GHz
- 1052 = 1.5 GHz to 2.0 GHz

AMERICAN MICROWAVE CORPORATION
7311-G GROVE ROAD, FREDERICK, MARYLAND 21704
TELEPHONE NUMBER : 301-662-4700
FACSIMILE NUMBER : 301-662-4938

PLEASE CALL OR FAX FOR CATALOGS, TEST REPORTS AND ORDERING INFORMATION ON ANY OF OUR PRODUCTS

MAY 25, 1998
AVAILBLE OPTIONS AND HOW TO ORDER
MSN SERIES OF SWITCHES

EXAMPLE:
MSN - 8 DR/DT - 05 - XXX - ###
1 2 3 4 5 6

1. MSN : Switch Designator Microwave Switch New
2. 8 : Number of Throws, i.e.: 3 (SP3T), 4 (SP4T), 5 (SP5T), 6 (SP6T), 7 (SP7T), 8 (SP8T)
3. DT/DR : D = Integral Driver, T = Terminated (Absorptive), R = Reflective (Non-Absorptive)
4. 05 : 05 = 0.5" between SMA connectors center to center, 06 = 0.6" between SMA connectors center to center
5. XXX : Available Options as Noted Below
6. ### : Frequency Range of Switch as Illustrated Below

<table>
<thead>
<tr>
<th>OPTION:</th>
<th>MSN MULTI-THROW SWITCH OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NOTE)</td>
<td>INDEPENDENT CONTROL WITH SOLDER PINS IN STANDARD</td>
</tr>
<tr>
<td>DEC-MP</td>
<td>3-BIT BINARY DECODER WITH MULTIPIN CONNECTOR</td>
</tr>
<tr>
<td>DEC-SP</td>
<td>3-BIT BINARY DECODER WITH SOLDER PINS</td>
</tr>
<tr>
<td>MP-IND</td>
<td>INDEPENDENT CONTROL WITH MULTIPIN CONNECTOR</td>
</tr>
<tr>
<td>10M2</td>
<td>10 MHz TO 2.0 GHZ FREQUENCY RANGE</td>
</tr>
<tr>
<td>10M18</td>
<td>10 MHz TO 18.0 GHZ FREQUENCY RANGE</td>
</tr>
<tr>
<td>100M18</td>
<td>100 MHz TO 18.0 Ghz</td>
</tr>
<tr>
<td>118</td>
<td>1 Gz TO 18 Gz</td>
</tr>
<tr>
<td>218</td>
<td>2 Gz TO 18 Gz</td>
</tr>
<tr>
<td>412</td>
<td>4 Gz TO 12 Gz</td>
</tr>
<tr>
<td>618</td>
<td>6 Gz TO 18 Gz</td>
</tr>
<tr>
<td>1218</td>
<td>12 Gz TO 18 Gz</td>
</tr>
<tr>
<td>100M20</td>
<td>100 MHz TO 20.0 Ghz</td>
</tr>
<tr>
<td>220</td>
<td>2 Gz TO 20 Gz</td>
</tr>
<tr>
<td>1020</td>
<td>10 Gz TO 20 Gz</td>
</tr>
<tr>
<td>B01</td>
<td>-12 VOLT POWER SUPPLIES</td>
</tr>
<tr>
<td>B02</td>
<td>-15 VOLT POWER SUPPLIES</td>
</tr>
<tr>
<td>B03</td>
<td>REVERSE LOGIC &quot;1&quot; = ON, &quot;0&quot; = OFF</td>
</tr>
<tr>
<td>B04</td>
<td>DRIVERLESS CONFIGURATION (CURRENT CONTROLLED)</td>
</tr>
<tr>
<td>B05</td>
<td>HIGH SPEED, TURNON/TURNOFF 20 nS MAXIMUM WHEN APPLICABLE</td>
</tr>
<tr>
<td>B06</td>
<td>HIGH POWER - SPECIFY CW &amp; PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH</td>
</tr>
<tr>
<td>B07</td>
<td>CUSTOM DESIGNED PRODUCT - SPECIFY WITH INITIALS OF CUSTOMER</td>
</tr>
<tr>
<td>B08</td>
<td>LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH</td>
</tr>
<tr>
<td>B09</td>
<td>LOW INSERTION LOSS VERSION</td>
</tr>
<tr>
<td>B10</td>
<td>HIGHER ISOLATION VERSION</td>
</tr>
</tbody>
</table>

AMERICAN MICROWAVE CORPORATION
7311-G GROVE ROAD, FREDERICK, MARYLAND 21704
TELEPHONE NUMBER : 301-662-4700
FACSIMILE NUMBER : 301-662-4938
PLEASE CALL OR FAX FOR CATALOGS, TEST REPORTS AND ORDERING INFORMATION ON ANY OF OUR PRODUCTS
MAY 25, 1998
SUMMARY TEST DATA

MODEL NUMBER: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2

TECHNICIAN: R. AFABLE

SERIAL NUMBER: 8MS60475

INSERTION LOSS & RETURN LOSS

J9 TO J1

CH1: A - M - 1.94 dB
1.0 dB/ REF - 2.00 dB
CH2: B - M - 10.41 dB
5.0 dB/ REF - 9.54 dB

---

MARKERS

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-1.382</td>
<td>-20.949</td>
</tr>
<tr>
<td>2</td>
<td>4.955501E+08</td>
<td>-1.288</td>
<td>-19.256</td>
</tr>
<tr>
<td>3</td>
<td>9.997751E+08</td>
<td>-1.484</td>
<td>-23.756</td>
</tr>
<tr>
<td>4</td>
<td>1.497775E+09</td>
<td>-1.503</td>
<td>-18.730</td>
</tr>
<tr>
<td>act</td>
<td>1.997775E+09</td>
<td>-1.673</td>
<td>-16.131</td>
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</tbody>
</table>

CURSORS

<table>
<thead>
<tr>
<th>Z-5 Ref</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5E+09</td>
<td>-1.936</td>
<td>-19.416</td>
</tr>
</tbody>
</table>

MAY 25, 1998
SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
 : MSN-8DR/DT-05-10M2
 : MSN-9DR/DT-06-10M2
 : R. AFABLE

TECHNICIAN

SERIAL NUMBER : 8MS60475

INSERTION LOSS & RETURN LOSS
J9 TO J2

<table>
<thead>
<tr>
<th>Channel</th>
<th>Start</th>
<th>Stop</th>
<th>Frequency</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH1</td>
<td>1.0</td>
<td>5.0</td>
<td>1E+07</td>
<td>1.89</td>
<td>1.71</td>
</tr>
<tr>
<td>CH2</td>
<td>1.0</td>
<td>5.0</td>
<td>1.955501E+09</td>
<td>1.339</td>
<td>21.141</td>
</tr>
<tr>
<td></td>
<td>9.997751E+08</td>
<td>1.321</td>
<td>20.418</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.497775E+09</td>
<td>1.569</td>
<td>26.998</td>
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<tr>
<td></td>
<td>1.995775E+09</td>
<td>1.557</td>
<td>18.159</td>
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</tr>
</tbody>
</table>

Markers

May 25, 1998
SUMMARY TEST DATA

MODEL NUMBER : SNW-2000-8DR/DT-0012
              : MSN-8DR/DT-05-10M2
              : MSN-9DR/DT-06-10M2
TECHNICIAN : R. AFABLE
SERIAL NUMBER : 8MS60475

INSERTION LOSS & RETURN LOSS
J9 TO J3

<table>
<thead>
<tr>
<th>CH1: A  -n</th>
<th>1.06 dB</th>
<th>CH2: B  -n</th>
<th>20.25 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 dB/ REF</td>
<td>2.00 dB</td>
<td>5.0 dB/ REF</td>
<td>3.54 dB</td>
</tr>
</tbody>
</table>

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-1.293</td>
<td>-21.418</td>
</tr>
<tr>
<td>2</td>
<td>4.955501E+08</td>
<td>-1.134</td>
<td>-21.306</td>
</tr>
<tr>
<td>3</td>
<td>3.977751E+08</td>
<td>-1.233</td>
<td>-22.317</td>
</tr>
<tr>
<td>4</td>
<td>1.497775E+09</td>
<td>-1.492</td>
<td>-20.460</td>
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<tr>
<td>set</td>
<td>1.995775E+09</td>
<td>-1.629</td>
<td>-31.304</td>
</tr>
</tbody>
</table>

Curves

| 1   | 2.5E+09       | -1.860       | -26.229      |

MAY 25, 1998

PAGE 12
SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
   : MSN-8DR/DT-05-10M2
   : MSN-9DR/DT-06-10M2

TECHNICIAN : R. AFABLE

SERIAL NUMBER : 8MS60475

INSERTION LOSS & RETURN LOSS

J9 TO J4

CH1: A -M - 1.95 dB  CH2: B -M - 21.64 dB
1.0 dB/ REF - 1.00 dB  5.0 dB/ REF - 9.54 dB

Makers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-1.365</td>
<td>-21.831</td>
</tr>
<tr>
<td>2</td>
<td>4.995501E+08</td>
<td>-1.178</td>
<td>-21.139</td>
</tr>
<tr>
<td>3</td>
<td>9.997751E+08</td>
<td>-1.316</td>
<td>-20.530</td>
</tr>
<tr>
<td>4</td>
<td>1.497775E+09</td>
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<td>-20.828</td>
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<tr>
<td>act</td>
<td>1.995775E+09</td>
<td>-1.733</td>
<td>-32.545</td>
</tr>
</tbody>
</table>

Cursors

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5E+09</td>
<td>-1.942</td>
</tr>
</tbody>
</table>

MAY 25, 1998

PAGE 13
SUMMARY TEST DATA

MODEL NUMBER
: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2

TECHNICIAN
: R. AFABLE

SERIAL NUMBER
: 8MS60475

INSERTION LOSS & RETURN LOSS
J9 TO J5

CH1: A - M - 2.01 dB
1.0 dB/ REF - 2.00 dB
CH2: B - M - 19.71 dB
5.0 dB/ REF - 9.54 dB

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>1.404</td>
<td>-20.570</td>
</tr>
<tr>
<td>2</td>
<td>4.355501E+08</td>
<td>1.228</td>
<td>-19.999</td>
</tr>
<tr>
<td>3</td>
<td>9.957751E+08</td>
<td>1.345</td>
<td>-13.257</td>
</tr>
<tr>
<td>4</td>
<td>1.4957775E+09</td>
<td>1.540</td>
<td>-20.224</td>
</tr>
<tr>
<td>acl</td>
<td>1.9557775E+09</td>
<td>1.728</td>
<td>-30.573</td>
</tr>
</tbody>
</table>

Comments

1.2E+09
2.019 - 13.790

MAY 25, 1998

PAGE 14
SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
               : MSN-8DR/DT-05-10M2
               : MSN-9DR/DT-06-10M2
               : R. AFABLE

TECHNICIAN

SERIAL NUMBER : 8MS6047S

INSERTION LOSS & RETURN LOSS

J9 TO J6

CH1: A - M - 1.96 dB
     1.0 dB/ REF - 2.00 dB
CH2: B - M - 19.21 dB
     5.0 dB/ REF - 9.54 dB

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-1.415</td>
<td>-20.521</td>
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<tr>
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Cursors

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<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5E+09</td>
<td>-1.969</td>
<td>-19.208</td>
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</tbody>
</table>

MAY 25, 1998
SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2
TECHNICIAN : R. AFABLE
SERIAL NUMBER : 8MS60475

INSERTION LOSS & RETURN LOSS
J9 TO J7

CH1: A - M - 1.34 dB  CH2: B - M - 14.99 dB
1.0 dB/ REF - 2.00 dB  5.0 dB/ REF - .954 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency</th>
<th>Chan. 1</th>
<th>Chan. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+97</td>
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<td>9.99775E+08</td>
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<tr>
<td>acc</td>
<td>1.995775E+09</td>
<td>-1.687</td>
<td>-17.851</td>
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<tr>
<th>Cursors</th>
<th>Frequency</th>
<th>Chan. 1</th>
<th>Chan. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>-1.953</td>
<td>-14.862</td>
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MAY 25, 1998
### SUMMARY TEST DATA

**MODEL NUMBER**: SWN-2000-8DR/DT-0012  
MSN-8DR/DT-05-10M2  
MSN-9DR/DT-06-10M2  
**TECHNICIAN**: R. AFABLE  
**SERIAL NUMBER**: 8MS60475

### INSERTION LOSS & RETURN LOSS

**J9 TO J8**

<table>
<thead>
<tr>
<th>Channel</th>
<th>Frequency</th>
<th>Loss (dB)</th>
<th>Return Loss (dB)</th>
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<tbody>
<tr>
<td>CH1: A-M</td>
<td>2.05</td>
<td>10.0 dB</td>
<td>2.00 dB</td>
</tr>
<tr>
<td>CH2: B-M</td>
<td>17.71</td>
<td>5.0 dB</td>
<td>5.54 dB</td>
</tr>
</tbody>
</table>

**Markers**

- **STR**: +.01000GHz  
- **CRSR**: +2.5000GHz  
- **STOP**: +2.5000GHz

**Curves**

- **1E+07**: 1.401  
- **4.555501E+09**: 1.288  
- **9.997751E+09**: 1.470  
- **1.457775E+09**: 1.612  
- **1.995775E+09**: 1.772

**Notes**

- **Curves**: 2.5E+09  
- **Loss**: 2.05  
- **Return Loss**: 17.664

**MAY 25, 1998**

**PAGE 17**
SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
               : MSN-8DR/DT-05-10M2
               : MSN-9DR/DT-06-10M2
TECHNICIAN    : R. AFABLE
SERIAL NUMBER : 8MS60475

OFF-ARM TERMINATION
J1-J9

CH1: n - M   = 47.22 dB
     1.0 dB/ REF = 2.00 dB
CH2: 0 - M   = 20.38 dB
     10.0 dB/ REF = 9.54 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>- 50.596</td>
<td>- 25.529</td>
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<td>2</td>
<td>3.9555E+08</td>
<td>- 48.053</td>
<td>- 37.028</td>
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<td>3</td>
<td>5.9977E+08</td>
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<td>act</td>
<td>1.99577E+09</td>
<td>- 49.789</td>
<td>- 28.678</td>
</tr>
</tbody>
</table>

Curves
1 2.5E+09     - 48.102     - 28.369

MAY 25, 1998

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SUMMARY TEST DATA

MODEL NUMBER: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2
: R. AFABLE

TECHNICIAN

SERIAL NUMBER: 8MS60475

OFF-ARM TERMINATION

J2-J9

CH1: A -m = 48.71 dB
1.0 dB/ REF = 2.00 dB
10.0 dB/ REF = 9.54 dB

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<td>2</td>
<td>1.955501E+08</td>
<td>47.074</td>
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<td>3</td>
<td>9.997751E+08</td>
<td>52.573</td>
<td>27.206</td>
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<td>4</td>
<td>1.457775E+09</td>
<td>45.317</td>
<td>23.119</td>
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<td>act</td>
<td>1.995775E+09</td>
<td>46.042</td>
<td>24.922</td>
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</tbody>
</table>

Cursors

| 1  | 2.5E+09       | -49.056      | -43.114      |

MAY 25, 1998

PAGE 19
SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
               : MSN-8DR/DT-05-10M2
               : MSN-9DR/DT-06-10M2
               : R. AFABLE

TECHNICIAN

SERIAL NUMBER : SMS60475

OFF-ARM TERMINATION
J3-39

CH1: M -n -47.35 dB
1.0 dB/ REF = 2.00 dB
CH2: U -M -15.68 dB
10.0 dB/ REF = 9.54 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
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<tbody>
<tr>
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<td>3</td>
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</table>

<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.5E+09</td>
<td>-48.218</td>
<td>-15.697</td>
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</table>

MAY 25, 1998

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SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/D2-0012
: MSN-8DR/D0-05-10M2
: MSN-9DR/D0-06-10M2

TECHNICIAN : R. AFABLE

SERIAL NUMBER : 8MS60475

OFF-ARM TERMINATION
J4-J9

CH1: A - M - 52.48 dB
CH2: U - M - 17.13 dB
1.0 dB/ REF - 2.00 dB
10.0 dB/ REF - 3.54 dB

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
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<tbody>
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<td>1</td>
<td>1E+07</td>
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<td>act</td>
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<td>-19.839</td>
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Cursora

<table>
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<th>No.</th>
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<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
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<td>-44.872</td>
<td>-17.126</td>
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</tbody>
</table>

MAY 25, 1998

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SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
               : MSN-8DR/DT-05-10M2
               : MSN-9DR/DT-06-10M2
TECHNICIAN : R. AFABLE
SERIAL NUMBER : 8MS60475

OFF-ARM TERMINATION
J5-J9

CH1: A, -N - 47.19 dB
CH2: B, -N - 15.58 dB
1.0 dB/REF - 2.00 dB
10.0 dB/REF - 9.54 dB

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
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<th>Chan: 2</th>
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<td>-32.639</td>
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<td>-24.866</td>
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<td>4</td>
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<td>-49.853</td>
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Cursors

<p>| | | | |</p>
<table>
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<tbody>
<tr>
<td>1</td>
<td>2.5E+08</td>
<td>51.891</td>
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</table>

MAY 25, 1998

PAGE 22
SUMMARY TEST DATA

MODEL NUMBER: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2

TECHNICIAN: R. AFFABLE

SERIAL NUMBER: 8MS60475

OFF-ARM TERMINATION

CH1: A - N = 45.11 dB
1.0 dB/ REF = 2.00 dB

CH2: B - N = 17.40 dB
10.0 dB/ REF = 3.54 dB

MARKERS

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency</th>
<th>Chan. 1</th>
<th>Chan. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-53.824</td>
<td>-35.300</td>
</tr>
<tr>
<td>2</td>
<td>4.9555E+08</td>
<td>-45.652</td>
<td>-35.924</td>
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<td>9.9975E+08</td>
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<td>4</td>
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<td>-23.100</td>
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<tr>
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<td>1.9557775E+09</td>
<td>-45.670</td>
<td>-19.872</td>
</tr>
</tbody>
</table>

CUTOFF:

1. 2.5E+09 = 47.586 dB = 17.395 dB

MAY 25, 1998

PAGE 23
SUMMARY TEST DATA

MODEL NUMBER
: SNW-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2

TECHNICIAN
: R. AFABLE

SERIAL NUMBER
: 8MS60475

OFF-ARM TERMINATION
J7-J9

CH1: A - M - 53.00 dB
1.0 dB/ REF - 2.00 dB
CH2: B - M - 44.97 dB
10.0 dB/ REF - 9.54 dB

MARKERS
- Frequency (Hz) | Channel 1 (dB) | Channel 2 (dB)
--- | --- | ---
1 | 1E+07 | -45.508 | -37.121
2 | 4.955501E+08 | -46.503 | -44.993
3 | 9.997751E+08 | -45.911 | -25.953
4 | 1.497775E+09 | -49.119 | -23.652
5 | 1.995775E+09 | -52.711 | -26.025

CURSORS
1 | 2.5E+09 | -47.295 | -47.388

MAY 25, 1998

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SUMMARY TEST DATA

MODEL NUMBER: SWN-2000-8DR/DT-0012
               MSN-8DR/DT-05-10M2
               MSN-9DR/DT-06-10M2
TECHNICIAN: R. AFABLE
SERIAL NUMBER: 8MS60475

OFF-ARM TERMINATION

J8-J9

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1</th>
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<tbody>
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<td>1E+07</td>
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<td>-44.719</td>
<td>-26.404</td>
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</table>

MAY 25, 1998

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SUMMARY TEST DATA

MODEL NUMBER : SWN-2000-8DR/DT-0012
 : MSN-8DR/DT-05-10M2
 : MSN-9DR/DT-06-10M2

TECHNICIAN : R. AFABLE

SERIAL NUMBER : 8MS60475

ISOLATION
AS MEASURED ON A SCALAR NETWORK ANALYZER

MAY 25, 1998
### SUMMARY TEST DATA

**MODEL NUMBER**: SWN-2000-8DR/DT-0012  
: MSN-8DR/DT-05-10M2  
: MSN-9DR/DT-06-10M2  
: R. AFABLE

**SERIAL NUMBER**: 8MS60475

### ISOLATION

Isolation as measured on a spectrum analyser.

#### J9 (COMMON ARM) TO:

<table>
<thead>
<tr>
<th>Frequency</th>
<th>J1</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J5</th>
<th>J6</th>
<th>J7</th>
<th>J8</th>
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<tbody>
<tr>
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<td>96</td>
<td>100</td>
<td>96</td>
<td>98</td>
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<td>100 MHz</td>
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<td>500 GHz</td>
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<td>98</td>
<td>98</td>
<td>96</td>
<td>99</td>
<td>99</td>
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<tr>
<td>1.0 GHz</td>
<td>98</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<td>2.0 GHz</td>
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<td>81</td>
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<td>2.5 GHz</td>
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<td>84</td>
<td>89</td>
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<td>91</td>
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<td>3.0 GHz</td>
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<td>94</td>
<td>96</td>
<td>84</td>
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<tr>
<td>3.5 GHz</td>
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<td>80</td>
<td>80</td>
<td>79</td>
<td>82</td>
<td>79</td>
<td>72</td>
<td>70</td>
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<tr>
<td>4.0 GHz</td>
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<td>81</td>
<td>78</td>
<td>79</td>
<td>80</td>
<td>84</td>
<td>86</td>
<td>72</td>
</tr>
</tbody>
</table>

**MAY 25, 1998**

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SUMMARY TEST DATA

MODEL NUMBER: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2
: R. AFABLE

TECHNICIAN

SERIAL NUMBER: 8MS60475

SWITCHING SPEED
TYPICAL FOR ALL ARMS
"RISE/FALL" TIME: 10%RF TO 90%RF & 90%RF TO 10%RF
"ON/OFF" TIME: 50% TTL TO 90%RF OR 10%RF

"ON" 180nS, "RISE" 50nS

HORIZONTAL SCALE: 50ns/DIVISION

VERTICAL SCALE: 5mV/DIVISION

"OFF" 150nS, "FALL" 20nS

HORIZONTAL SCALE: 50ns/DIVISION

VERTICAL SCALE: 5mV/DIVISION

MAY 25, 1998

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SUMMARY TEST DATA

MODEL NUMBER
: SWN-2000-8DR/DT-0012
: MSN-8DR/DT-05-10M2
: MSN-9DR/DT-06-10M2

TECHNICIAN
: R. AFABLE

SERIAL NUMBER
: 8MS60475

VIDEO TRANSIENTS
TYPICAL FOR ALL ARMS

AS MEASURED IN A
300MHz BANDWIDTH

HORIZONTAL SCALE:
0.2μS/DIVISION

VERTICAL SCALE:
1.0 V/DIVISION

AS MEASURED IN A
20MHz BANDWIDTH

HORIZONTAL SCALE:
0.2μS/DIVISION

VERTICAL SCALE:
1.0 V/DIVISION

MAY 25, 1998

PAGE 29
TEST DATA
ON
10 MHz TO 18 GHz
LOW LOSS
HIGH SPEED
HIGH ISOLATION

ABSORPTIVE AND REFLECTIVE

SP7T & SP8T PIN DIODE SWITCHES

AMC MODEL Nos:
SWN-1170-7DT-00418 (1.25" dia. RADIAL DESIGN)
Serial No: 7MS60525
AND
SW-2181-8AT-00118 (RECTANGULAR DESIGN)
SWNR-218-8DT-00118 (2.0" dia. RADIAL DESIGN)
SLIMLINE MODELS:
SWN-218-8DT-00118 (RECTANGULAR DESIGN)
MSN-8DR/DT-05-10M18 (RECTANGULAR DESIGN)
MSN-8DR/DT-06-10M18 (RECTANGULAR DESIGN)
MSNC-8DR/DT-06-10M18 (RECTANGULAR DESIGN)

DESIGNED
BY
A. K. GORWARA

REPORTED
BY
P. D. WOOD

JUNE 1, 1998
10 MHz TO 18 GHz
ABSORPTIVE & REFLECTIVE
LOW LOSS, HIGH ISOLATION
SP7T & SP8T PIN DIODE SWITCHES

- LOW LOSS
- ABSORPTIVE
- HIGH ISOLATION
- ULTRA-BROADBAND

AMC MODEL Nos:
SWN-1170-7DT-00418 (RADIAL), SW-2181-8AT-00118 (RECTANGULAR)
SWNR-218-8DT-00118 (RADIAL), SWN-218-8DT-00118 (RECTANGULAR)
MSN-8DR/DT-05-10M18 (RECTANGULAR), MSN-8DR/DT-06-10M18 (RECTANGULAR)
MSCN-8DR/DT-06-10M18 (RECTANGULAR)

SPECIFICATIONS:

- FREQUENCY RANGE : 10 MHz GHz TO 18 GHz
- INSERTION LOSS : 3.75 dB MAX. (For Absorptive, Non-Absorptive or Reflective reduces Loss by about 0.5 dB)
  - 3.50 dB TYP. @ 6.01 GHz
  - 3.00 dB TYP. @ 2.0 GHz
  - 2.20 dB TYP. @ 10.0 GHz
  - 3.50 dB TYP. @ 18.0 GHz
- ISOLATION : 60 dB MIN.
  - 70 dB TYP. @ 0.05 GHz
  - 90 dB TYP. @ 2.0 GHz
  - 75 dB TYP. @ 12.0 GHz
  - 75 dB TYP. @ 18.0 GHz
- VSWR : 2.0:1
- SWITCHING SPEED : "RISE" : 10 nS MAX., 5 nS TYP.
  "FALL" : 10 nS MAX., 5 nS TYP.
  "ON" : 15 nS MAX., 80 nS TYP.
  "OFF" : 50 nS MAX., 25 nS TYP.
- CONTROL : TTL Compatible (Independent Control, Standard; 3-bit Binary Decoder Available)
- VIDEO TRANSIENTS : 2.0 V Peak to Peak in a 20 MHz BW (Without Video Filter)
- RF INPUT POWER : 3.0 V Peak to Peak in a 300 MHz BW (Without Video Filter)
- DC POWER SUPPLY : +20 dBm Operating, 1 Watt Survival
- SIZE & WEIGHT :
  - SWN-1170-7DT (Radial) : 1.25" dia. X 0.75" @ < 3.0 oz.
  - SWN-218-8DT (Rectangular) : 5.10" X 2.0" X 0.55" @ < 7.0 oz.
  - SW-2181-8AT (Rectangular) : 5.10" X 2.0" X 0.75" @ < 7.0 oz.
  - SWNR-218-8DT (Radial) : 2.0" dia. X 0.75" @ < 4.5 oz.
  - MSN-8DR/DT-05-10M18 (Rectangular) : 4.00" X 1.5" X 0.40" @ < 4.5 oz.
  - MSN-8DR/DT-06-10M18 (Rectangular) : 4.75" X 1.5" X 0.50" @ < 4.5 oz.
  - MSNC-8DR/DT-06-10M18 (Rectangular) : 4.75" X 1.5" X 0.40" @ < 4.5 oz.

ABOVE DATA IS TYPICAL FOR ABSORPTIVE OR REFLECTIVE VERSIONS
OTHER MULTI-THROW (SP2T, SP3T, SP4T, SP5T, SP6T & SP7T) DESIGNS AVAILABLE

WEBSITE: HTTP://WWW.AMWAVE.COM
E-MAIL: AMCPMI@AOL.COM

7311 G GROVE ROAD, FREDERICK, MARYLAND:21704 • Tel. (301) 662-4700 • Fax (301) 662-4938
MECHANICAL OUTLINES

SWN-1170-7DT
0.4" Thick Option Available, Inquire with Factory for Details

SWNR-218-8DT (RADIAL)
0.4" Thick Option Available, Inquire with Factory for Details
TOLERANCES: X.XX ± 0.02 INCHES, X.XXX ± 0.005 INCHES

JUNE 1, 1998

PAGE 3
MECHANICAL OUTLINES

SW-2181-8AT

SMA FEMALE
9 PLACES
0.35 [8.9]

0.60 [15.2]
TYPICAL

0.45 [11.4]
TYPICAL

0.50 [12.7]

1.490 [37.8]

0.16 [4.1]

0.16 [4.1]

4.78 [121.4]

5.10 [129.5]

MOUNTING HOLES
4-40 Heli-Coils
x.40 Deep, 4 Places
Far Side

2.55 [64.8]

0.40 [10.2]
TYPICAL

0.40 [10.2]

SW-218-8DT

5.4" Thick Option Available. Inquire with Factory for Details
TOLERANCES: XXX ± 0.02 INCHES, XXX ± 0.005 INCHES

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PAGE 4
AVAILABLE OPTIONS
AND
HOW TO ORDER

EXAMPLE:

```
SWN - 218 - 8 D T - XXXX - ###
1 2 3 4 5 6 7
```

1. : SWN : Switch Designator (SW = Older Models, SWN = Newer Models)
2. : 218 : Series Designator (2181 = Older Models, 218 or 1170 = Newer Models)
3. : 8 : Number of Throws, i.e. 3 (SP3T), 4 (SP4T), 5 (SP5T), 6 (SP6T), 7 (SP7T), 8 (SP8T)
4. : D : Indicates Integral Driver
5. : T : T = Terminated (Absorptive), R = Reflective (Non-Absorptive)
6. : XXXX : Frequency Range of Switch
7. : ### : Available Options as Noted Below

<table>
<thead>
<tr>
<th>OPTION NO:</th>
<th>MULTI-THROW SWITCH OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>SMA Male RF Connectors</td>
</tr>
<tr>
<td></td>
<td>(Increases Insertion Loss by 0.25dB per Arm)</td>
</tr>
<tr>
<td>002</td>
<td>Inverted Logic, &quot;0&quot; = ON</td>
</tr>
<tr>
<td></td>
<td>@Standard TTL Logic is &quot;1&quot; = ON</td>
</tr>
<tr>
<td>003</td>
<td>+ 12vdc DC Power Supply</td>
</tr>
<tr>
<td></td>
<td>(Standard h = ± 5vdc)</td>
</tr>
<tr>
<td>004</td>
<td>+ 15vdc DC Power Supply</td>
</tr>
<tr>
<td></td>
<td>(Standard h = ± 5vdc)</td>
</tr>
<tr>
<td>005</td>
<td>3-bit Binary Decoder</td>
</tr>
<tr>
<td></td>
<td>(Available with Solid Pin Connectors only on Radial designs and other Solid Pins or Multiple Connectors on Rectangular designs)</td>
</tr>
<tr>
<td>006</td>
<td>- 12vdc DC Power Supply</td>
</tr>
<tr>
<td></td>
<td>(Standard h = ± 5vdc)</td>
</tr>
<tr>
<td>007</td>
<td>- 15vdc DC Power Supply</td>
</tr>
<tr>
<td></td>
<td>(Standard h = ± 5vdc)</td>
</tr>
<tr>
<td>008</td>
<td>MULTIPIN CONNECTOR</td>
</tr>
<tr>
<td></td>
<td>(Available on Rectangular models only)</td>
</tr>
<tr>
<td>009</td>
<td>0.4&quot; THICK OPTION (WHERE AVAILABLE)</td>
</tr>
<tr>
<td>103</td>
<td>Integral Band Pass Video Filters</td>
</tr>
<tr>
<td></td>
<td>(Only available on units with Frequency Ranges starting above 2.0 GHz)</td>
</tr>
<tr>
<td></td>
<td>(Increases Insertion Loss by 0.75dB, overall)</td>
</tr>
<tr>
<td>XXXX</td>
<td>Indicates the Frequency for which the Switch has been Adjusted</td>
</tr>
<tr>
<td></td>
<td>For Example: 00425 = 40 MHz to 10.0 GHz</td>
</tr>
<tr>
<td></td>
<td>00115 = 10 MHz to 10.0 GHz</td>
</tr>
<tr>
<td></td>
<td>0012 = 10 MHz to 2.0 GHz</td>
</tr>
<tr>
<td></td>
<td>35 = 4.0 to 5.0 GHz</td>
</tr>
</tbody>
</table>

AMERICAN MICROWAVE CORPORATION
7311-G GROVE ROAD, FREDERICK, MARYLAND 21704
TELEPHONE NUMBER : 301-662-4700
FACSIMILE NUMBER : 301-662-4938

PLEASE CALL OR FAX FOR CATALOGS, TEST REPORTS AND ORDERING INFORMATION ON ANY OF OUR PRODUCTS

JUNE 1, 1998

PAGE 7
AVAILABLE OPTIONS AND HOW TO ORDER
MSN SERIES OF SWITCHES

EXAMPLE :

<table>
<thead>
<tr>
<th>OPTION</th>
<th>MSN MULTI-Throw SWITCH OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NOTE)</td>
<td>INDEPENDENT CONTROL WITH SOLDER PINS IN STANDARD</td>
</tr>
<tr>
<td>DEC-MP</td>
<td>3-BIT BINARY DECODER WITH MULTIPIN CONNECTOR</td>
</tr>
<tr>
<td>DEC-SP</td>
<td>3-BIT BINARY DECODER WITH SOLDER PINS</td>
</tr>
<tr>
<td>MP-IND</td>
<td>INDEPENDENT CONTROL WITH MULTIPIN CONNECTOR</td>
</tr>
<tr>
<td>10M2</td>
<td>10 MHz TO 2.0 GHZ FREQUENCY RANGE</td>
</tr>
<tr>
<td>10M18</td>
<td>10 MHz TO 18.0 GHZ FREQUENCY RANGE (INSERTION LOSS INCREASES BY 1.5 dB AT 10 MHz AND 0.5 dB AT 18 GHz)</td>
</tr>
<tr>
<td>100M18</td>
<td>100 MHz TO 18.0 Ghz (INSERTION LOSS INCREASES BY 1.5 dB AT 100 MHz AND 0.5 dB AT 18 GHz)</td>
</tr>
<tr>
<td>118</td>
<td>1 Ghz TO 18 Ghz (NO CHANGE IN INSERTION LOSS)</td>
</tr>
<tr>
<td>218</td>
<td>2 Ghz TO 18 Ghz (NO CHANGE IN INSERTION LOSS)</td>
</tr>
<tr>
<td>412</td>
<td>4 Ghz TO 12 Ghz (NO CHANGE IN INSERTION LOSS)</td>
</tr>
<tr>
<td>618</td>
<td>6 Ghz TO 18 Ghz (NO CHANGE IN INSERTION LOSS)</td>
</tr>
<tr>
<td>1218</td>
<td>12 Ghz TO 18 Ghz (NO CHANGE IN INSERTION LOSS)</td>
</tr>
<tr>
<td>100M20</td>
<td>100 MHz TO 20.0 GHz (INSERTION LOSS INCREASES BY 1.5 dB AT 10 MHz AND 1.0 dB AT 20 GHz)</td>
</tr>
<tr>
<td>220</td>
<td>2 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)</td>
</tr>
<tr>
<td>1020</td>
<td>10 GHz TO 20 GHz (INSERTION LOSS INCREASES BY 1.0 dB AT 20 GHz)</td>
</tr>
<tr>
<td>B01</td>
<td>-12 VOLT POWER SUPPLIES</td>
</tr>
<tr>
<td>B02</td>
<td>-15 VOLT POWER SUPPLIES</td>
</tr>
<tr>
<td>B03</td>
<td>REVERSE LOGIC &quot;1&quot;= ON, &quot;0&quot;= OFF</td>
</tr>
<tr>
<td>B04</td>
<td>DRIVERLESS CONFIGURATION (CURRENT CONTROLLED)</td>
</tr>
<tr>
<td>B05</td>
<td>HIGH SPEED, TURNON/TURNOFF 20 nS MAXIMUM WHEN APPLICABLE</td>
</tr>
<tr>
<td>B06</td>
<td>HIGH POWER - SPECIFY CW &amp; PEAK POWER, PULSE WIDTH, DUTY CYCLE, RF FREQUENCY AND BANDWIDTH</td>
</tr>
<tr>
<td>B07</td>
<td>CUSTOM DESIGNED PRODUCT - SPECIFY WITH INITIALS OF CUSTOMER</td>
</tr>
<tr>
<td>B08</td>
<td>LOW VIDEO TRANSIENTS - SPECIFY VIDEO BANDWIDTH</td>
</tr>
<tr>
<td>B09</td>
<td>LOW INSERTION LOSS VERSION</td>
</tr>
<tr>
<td>B10</td>
<td>HIGHER ISOLATION VERSION</td>
</tr>
</tbody>
</table>

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7311-G GROVE ROAD, FREDERICK, MARYLAND 21704
TELEPHONE NUMBER : 301-662-4700
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PAGE 8
ACTUAL
TEST DATA
ON
ABSORPTIVE
SP7T

PIN DIODE SWITCH

AMC MODEL No: SWN-1170-7DT-00418
SERIAL No: 7MS60525

APPLICABLE
FOR ALL TYPES
10 MHz TO 18 GHz OR 40 MHz TO 18 GHz

ABSORPTIVE OR REFLECTIVE
(REFLECTIVE SWITCHES OFFER APPROXIMATELY 0.5 dB LESS INSERTION LOSS)

SP7T OR SP8T

PIN DIODE SWITCHES
INSERTION LOSS & RETURN LOSS
J1 TO J2

Channel 1 - Channel 2

<table>
<thead>
<tr>
<th>Band (GHz)</th>
<th>Frequency (Hz)</th>
<th>Channel 1 Loss (dB)</th>
<th>Channel 2 Loss (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 MHz-1</td>
<td>1.8E+07</td>
<td>2.534</td>
<td>7.292</td>
</tr>
<tr>
<td>2 GHz</td>
<td>1.39999E+09</td>
<td>1.091</td>
<td>18.653</td>
</tr>
<tr>
<td>6 GHz</td>
<td>5.991674E+09</td>
<td>1.535</td>
<td>21.333</td>
</tr>
<tr>
<td>10 GHz</td>
<td>9.934452E+09</td>
<td>2.255</td>
<td>13.418</td>
</tr>
<tr>
<td>14 GHz</td>
<td>1.599723E+10</td>
<td>2.904</td>
<td>13.703</td>
</tr>
</tbody>
</table>

Currents:

19 GHz: 1.8E+10, 3.400, 20.740

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SUMMARY TEST DATA
SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES

SERIAL NUMBER: 7MS60525
TECHNICIAN: R. AFABLE

INSERTION LOSS & RETURN LOSS
J1 TO J3

CH1: M = 3.45 dB
CH2: M = 25.57 dB
1.0 dB/ REF = 3.50 dB
5.0 dB/ REF = 9.54 dB

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>Channel 1</th>
<th>Channel 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 E+07</td>
<td>5.749</td>
<td>7.282</td>
</tr>
<tr>
<td>1.999E+09</td>
<td>1.295</td>
<td>19.548</td>
</tr>
<tr>
<td>5.391E+09</td>
<td>1.521</td>
<td>20.592</td>
</tr>
<tr>
<td>9.954E+09</td>
<td>2.155</td>
<td>16.170</td>
</tr>
<tr>
<td>Act 1.399E+01</td>
<td>2.529</td>
<td>17.698</td>
</tr>
</tbody>
</table>

MARKERS
1.8E+10 - 3.49 - 25.453

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SUMMARY TEST DATA
SPTT & SP8T ABSORPTIVE & REFLECTIVE SWITCHES.

SERIAL NUMBER: 7MS60525
TECHNICIAN: R. AFABLE

INSERTION LOSS & RETURN LOSS
J1 TO J4

CH1: A - R = 3.27 dB
1.0 dB/REF = 3.50 dB

CH2: B - R = 19.47 dB
5.0 dB/REF = 9.54 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (GHz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0E+07</td>
<td>-3.595</td>
<td>-7.397</td>
</tr>
<tr>
<td>2</td>
<td>1.9869E+09</td>
<td>-1.154</td>
<td>-16.136</td>
</tr>
<tr>
<td>3</td>
<td>5.991674E+09</td>
<td>-1.038</td>
<td>-15.120</td>
</tr>
<tr>
<td>4</td>
<td>9.99452E+09</td>
<td>-2.365</td>
<td>-18.505</td>
</tr>
<tr>
<td>act</td>
<td>1.359723E+10</td>
<td>-2.496</td>
<td>-17.027</td>
</tr>
</tbody>
</table>

CURSOR:
1. 1.8E+10
2. 3.238
3. 19.510

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**SUMMARY TEST DATA**
**SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES**

**SERIAL NUMBER**
7MS60525

**TECHNICIAN**
R. AFABLE

**INSERTION LOSS & RETURN LOSS**
**J1 TO J5**

<table>
<thead>
<tr>
<th>CH1: A -M</th>
<th>3.30 dB</th>
<th>CH2: B -M</th>
<th>22.68 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 dB/REF</td>
<td>3.50 dB</td>
<td>5.0 dB/REF</td>
<td>9.54 dB</td>
</tr>
</tbody>
</table>

---

**Frequencies**

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (GHz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-3.703</td>
<td>-7.545</td>
</tr>
<tr>
<td>2</td>
<td>1.9888E+09</td>
<td>-1.244</td>
<td>-19.164</td>
</tr>
<tr>
<td>3</td>
<td>5.991674E+09</td>
<td>-1.799</td>
<td>-17.609</td>
</tr>
<tr>
<td>4</td>
<td>3.994452E+09</td>
<td>-2.332</td>
<td>-13.418</td>
</tr>
<tr>
<td>act</td>
<td>1.399723E+10</td>
<td>-2.645</td>
<td>-21.191</td>
</tr>
</tbody>
</table>

**Cursor**

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (GHz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.8E+10</td>
<td>-3.315</td>
<td>-22.778</td>
</tr>
</tbody>
</table>

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**PAGE 13**
INSERTION LOSS & RETURN LOSS
J1 TO J6

CH1: A -M - 3.35 dB
1.0 dB/ REF - 3.50 dB
CH2: B -M - 22.08 dB
5.0 dB/ REF - 9.54 dB

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>3.799</td>
<td>7.482</td>
</tr>
<tr>
<td>2</td>
<td>1.8889E+09</td>
<td>1.134</td>
<td>19.790</td>
</tr>
<tr>
<td>5</td>
<td>5.951674E+09</td>
<td>1.788</td>
<td>18.416</td>
</tr>
<tr>
<td>4</td>
<td>9.994452E+09</td>
<td>2.316</td>
<td>12.126</td>
</tr>
<tr>
<td>act</td>
<td>1.399723E+10</td>
<td>2.623</td>
<td>15.373</td>
</tr>
</tbody>
</table>

Cursors

| 1   | 1.6E+10       | 3.332        | 22.059       |

JUNE 1, 1998
INSERTION LOSS & RETURN LOSS
J1 TO J7

CH1: A -M - 3.28 dB CH2: B -M - 22.88 dB
1.0 dB/ REF - 1.50 dB 5.0 dB/ REF - 9.54 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 (dB)</th>
<th>Chan. 2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+87</td>
<td>-3.617</td>
<td>-7.375</td>
</tr>
<tr>
<td>2</td>
<td>1.9999E+09</td>
<td>-1.014</td>
<td>20.444</td>
</tr>
<tr>
<td>3</td>
<td>5.931674E+09</td>
<td>-1.503</td>
<td>22.553</td>
</tr>
<tr>
<td>4</td>
<td>9.934452E+09</td>
<td>-2.085</td>
<td>13.731</td>
</tr>
<tr>
<td>act</td>
<td>1.999723E+10</td>
<td>-2.045</td>
<td>11.527</td>
</tr>
</tbody>
</table>

| Curvesrc | 1.8E+10 | -3.250 | 22.037 |

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SUMMARY TEST DATA
SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES

SERIAL NUMBER: 7MS60525
TECHNICIAN: R. AFABLE

INSERTION LOSS & RETURN LOSS
J1 TO J8

<table>
<thead>
<tr>
<th>CH1: A -M</th>
<th>3.61 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH2: B -M</td>
<td>25.02 dB</td>
</tr>
</tbody>
</table>

1.0 dB/ REF - 3.50 dB
5.0 dB/ REF - 9.54 dB

START +0.0100GHz  CRSR +10.000GHz  STOP +18.000GHz

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 1 dB</th>
<th>Chan. 2 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>3.995</td>
<td>7.622</td>
</tr>
<tr>
<td>2</td>
<td>9.889E+09</td>
<td>1.853</td>
<td>18.872</td>
</tr>
<tr>
<td>3</td>
<td>5.991674E+09</td>
<td>1.595</td>
<td>18.581</td>
</tr>
<tr>
<td>4</td>
<td>9.99452E+09</td>
<td>2.277</td>
<td>14.044</td>
</tr>
<tr>
<td>act</td>
<td>1.399723E+10</td>
<td>2.700</td>
<td>15.340</td>
</tr>
</tbody>
</table>

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PAGE 16
OFF-ARM TERMINATION
J1-J2

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>CH1 (dB)</th>
<th>CH2 (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>-43.169</td>
<td>-7.853</td>
</tr>
<tr>
<td>2</td>
<td>1.9609E+09</td>
<td>-45.273</td>
<td>-26.525</td>
</tr>
<tr>
<td>3</td>
<td>5.991674E+09</td>
<td>-44.158</td>
<td>-19.651</td>
</tr>
<tr>
<td>5</td>
<td>1.3997223E+10</td>
<td>-43.499</td>
<td>-25.362</td>
</tr>
</tbody>
</table>

CURSOR

| 1   | 1.8E+10       | -45.240  | -31.815  |

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OFF-ARM TERMINATION
J1-J3

Markers

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (MHz)</th>
<th>Channel 2 (dB)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>7.886</td>
</tr>
<tr>
<td>2</td>
<td>1.9889E+09</td>
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<tr>
<td>3</td>
<td>5.991674E+09</td>
<td>19.262</td>
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<td>4</td>
<td>5.994512E+09</td>
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</tr>
<tr>
<td>act</td>
<td>1.353773E+10</td>
<td>20.460</td>
</tr>
</tbody>
</table>

Start + .01000GHz  Crs  +18.000GHz  Stop  +18.000GHz

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SUMMARY TEST DATA
SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES

SERIAL NUMBER : 7MS60525
TECHNICIAN : R. AFABLE

OFF-ARM TERMINATION
J1-J4

CHZ: B - M - 14.95 dB
5.0 dB/ REF - 3.54 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1E+07</td>
<td>- 8.226</td>
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<tr>
<td>2</td>
<td>1.9899E+09</td>
<td>- 24.954</td>
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<tr>
<td>3</td>
<td>5.991574E+09</td>
<td>- 28.257</td>
</tr>
<tr>
<td>4</td>
<td>9.934452E+09</td>
<td>- 20.751</td>
</tr>
<tr>
<td>act</td>
<td>1.399723E+10</td>
<td>- 31.595</td>
</tr>
</tbody>
</table>

CURSOR:
1 1.8E+10 - 14.967

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SUMMARY TEST DATA
SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES

SERIAL NUMBER : 7MS60525
TECHNICIAN : R. AFABLE

OFF-ARM TERMINATION
J1-J6

CH2: 0 H -M - 23.38 dB
5.0 dB/ REF - 9.54 dB

Markers
No. Frequency Chan. 2
1 1E+07 - 7.292 (fHz) (dB)
2 1.9985E+09 - 28.738
3 9.99E+09 - 20.614
4 9.99E+09 - 22.509
act 1.39972E+10 - 23.822

Cursors
1 1.8E+10 - 23.349

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OFF-ARM TERMINATION
J1-J7

Channel: 0 -h - 22.29 dB
5.0 dB/ REF - 9.54 dB

<table>
<thead>
<tr>
<th>No.</th>
<th>Frequency (Hz)</th>
<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>1.9889E+09</td>
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<td>3</td>
<td>5.991G74E+09</td>
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<tr>
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<td>9.994452E+09</td>
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Currents

<p>| | |</p>
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</thead>
<tbody>
<tr>
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</tbody>
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OFF-ARM TERMINATION
J1-J8

Markers

<table>
<thead>
<tr>
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<th>Frequency (Hz)</th>
<th>Chan. 2 (dB)</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>2</td>
<td>1.9869E+09</td>
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<tr>
<td>3</td>
<td>5.991674E+09</td>
<td>-19.048</td>
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<tr>
<td>4</td>
<td>9.994462E+09</td>
<td>-16.972</td>
</tr>
<tr>
<td>act</td>
<td>1.399723E+10</td>
<td>-17.433</td>
</tr>
</tbody>
</table>

Cursor 1 | 1.8E+10       | -14.527     

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ISOLATION
AS MEASURED ON A NETWORK ANALYSER
ISOLATION

ISOLATION AS MEASURED ON A SPECTRUM ANALYSES

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J5</th>
<th>J6</th>
<th>J7</th>
<th>J8</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 MHz</td>
<td>78 dB</td>
<td>71 dB</td>
<td>98 dB</td>
<td>98 dB</td>
<td>96 dB</td>
<td>98 dB</td>
<td>82 dB</td>
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<tr>
<td>50 MHz</td>
<td>68 dB</td>
<td>68 dB</td>
<td>83 dB</td>
<td>78 dB</td>
<td>87 dB</td>
<td>98 dB</td>
<td>74 dB</td>
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<tr>
<td>500 MHz</td>
<td>64 dB</td>
<td>63 dB</td>
<td>66 dB</td>
<td>66 dB</td>
<td>76 dB</td>
<td>78 dB</td>
<td>66 dB</td>
</tr>
<tr>
<td>2.0 GHz</td>
<td>91 dB</td>
<td>94 dB</td>
<td>98 dB</td>
<td>98 dB</td>
<td>98 dB</td>
<td>98 dB</td>
<td>94 dB</td>
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<tr>
<td>4.0 GHz</td>
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<td>92 dB</td>
<td>94 dB</td>
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<td>94 dB</td>
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<td>90 dB</td>
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<td>6.0 GHz</td>
<td>80 dB</td>
<td>88 dB</td>
<td>90 dB</td>
<td>95 dB</td>
<td>94 dB</td>
<td>96 dB</td>
<td>95 dB</td>
</tr>
<tr>
<td>8.0 GHz</td>
<td>74 dB</td>
<td>88 dB</td>
<td>88 dB</td>
<td>86 dB</td>
<td>84 dB</td>
<td>88 dB</td>
<td>88 dB</td>
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<tr>
<td>10.0 GHz</td>
<td>79 dB</td>
<td>87 dB</td>
<td>84 dB</td>
<td>89 dB</td>
<td>89 dB</td>
<td>88 dB</td>
<td>84 dB</td>
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<tr>
<td>12.0 GHz</td>
<td>74 dB</td>
<td>76 dB</td>
<td>83 dB</td>
<td>86 dB</td>
<td>85 dB</td>
<td>81 dB</td>
<td>82 dB</td>
</tr>
<tr>
<td>14.0 GHz</td>
<td>80 dB</td>
<td>80 dB</td>
<td>80 dB</td>
<td>84 dB</td>
<td>80 dB</td>
<td>85 dB</td>
<td>76 dB</td>
</tr>
<tr>
<td>16.0 GHz</td>
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<td>72 dB</td>
<td>76 dB</td>
<td>72 dB</td>
<td>78 dB</td>
<td>75 dB</td>
<td>76 dB</td>
</tr>
<tr>
<td>18.0 GHz</td>
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<td>76 dB</td>
<td>76 dB</td>
<td>76 dB</td>
<td>76 dB</td>
<td>76 dB</td>
<td>78 dB</td>
</tr>
</tbody>
</table>
SUMMARY TEST DATA
SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES

SERIAL NUMBER: 7MS60525
TECHNICIAN: R. AFABLE

SWITCHING SPEED
TYPICAL FOR ALL ARMS
"RISE/FALL" TIME: 10% RF TO 90% RF & 90% RF TO 10% RF
"ON/OFF" TIME: 50% TTL TO 90% RF OR 10% RF

"ON" 80nS, "RISE" 5nS

HORIZONTAL SCALE: 20nS/DIVISION
VERTICAL SCALE: 5mV/DIVISION

"OFF" 25nS, "FALL" 10nS

HORIZONTAL SCALE: 20nS/DIVISION
VERTICAL SCALE: 5mV/DIVISION

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SUMMARY TEST DATA
SP7T & SP8T ABSORPTIVE & REFLECTIVE SWITCHES

SERIAL NUMBER: 7MS60525
TECHNICIAN: R. AFABLE

VIDEO TRANSIENTS
TYPICAL FOR ALL ARMS

AS MEASURED IN A 300MHz BANDWIDTH

HORIZONTAL SCALE: 0.1μS/DIVISION

VERTICAL SCALE: 1.0 V/DIVISION

AS MEASURED IN A 20MHz BANDWIDTH

HORIZONTAL SCALE: 0.1μS/DIVISION

VERTICAL SCALE: 1.0 V/DIVISION

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