



**AMERICAN MICROWAVE  
CORPORATION**

TYPICAL DATA

ON

OCTAVE BAND

4.0 TO 18.0 GHz

MINIATURE

500nS, HIGH SPEED

60dB DYNAMIC RANGE

DIGITALLY VARIABLE (M-DVAN)

VOLTAGE VARIABLE (M-VVAN)

AND

CURRENT VARIABLE (M-CVAN)

ABSORPTIVE, PIN DIODE ATTENUATORS

WITH

REMOVABLE SMA RF CONNECTORS FOR  
SURFACE MOUNT CAPABILITY

**M-DVAN AND M-VVAN  
SERIES  
MINIATURE ATTENUATORS**

DESIGNED  
BY  
A. K. GORWARA

REPORTED  
BY  
P. D. WOOD

JANUARY 19, 1996



**AMERICAN MICROWAVE CORPORATION**

## M-DVAN & M-VVAN SERIES OCTAVE BAND 4.0 TO 18.0 GHz VARIABLE ATTENUATORS

- 60dB DYNAMIC RANGE
- LATCHING STROBE CAPABILITY
- 500 nSEC., MAXIMUM SWITCHING SPEED
- 8,10,11 & 12-BIT DIGITALLY VARIABLE MODELS(DVAN)
- 5dB & 10dB/VOLT, VOLTAGE VARIABLE MODELS (VVAN)
- REMOVABLE SMA RF CONNECTORS FOR SURFACE MOUNT CAPABILITY

### SPECIFICATIONS:

MODEL # (M-DVAN/ M-VVAN)	FREQUENCY RANGE *	INSERTION LOSS (MAX)	VSWR (MAX)	FLATNESS @ 10dB	FLATNESS @ 20dB	FLATNESS @ 40dB	FLATNESS @ 60dB
4080	4.0 TO 8.0 GHz	2.5 dB	2.0:1	± 0.5 dB	± 0.37 dB	± 1.5 dB	± 1.6 dB
4080E (Extended Bandwidth)	3.0 TO 9.0 GHz	2.7 dB	2.2:1	± 0.75 dB	± 1.5 dB	± 3.0 dB	± 3.5 dB
5010	5.0 TO 10.0 GHz	2.7 dB	2.0:1	± 0.6 dB	± 0.9 dB	± 1.5 dB	± 1.6 dB
5010E (Extended Bandwidth)	3.75 TO 11.25 GHz	2.9 dB	2.2:1	± 0.8 dB	± 1.5 dB	± 3.0 dB	± 3.5 dB
6012	6.0 TO 12.0 GHz	2.8 dB	2.0:1	± 0.7 dB	± 1.0 dB	± 1.5 dB	± 1.6 dB
6012E (Extended Bandwidth)	4.5 TO 13.5 GHz	3.0 dB	2.2:1	± 0.9 dB	± 1.6 dB	± 3.0 dB	± 3.5 dB
8018	8.0 TO 18.0 GHz	2.7 dB **	2.0:1	± 0.8 dB	± 1.1 dB	± 1.5 dB	± 1.6 dB
8018E (Extended Bandwidth)	6.0 TO 18.0 GHz	3.7 dB **	2.2:1	± 0.9 dB	± 1.6 dB	± 3.0 dB	± 3.5 dB

\*\* 2.7 dB Typical Loss to 16 GHz, 3.7 dB MAX. Loss 16.0-18.0 GHz

- DEVIATION FROM LINEARITY : 0 TO 30 dB ± 0.5 dB  
: 30 TO 50 dB ± 1.0 dB  
: 50 TO 60 dB ± 1.5 dB
- MONOTICITY : GUARANTEED
- SWITCHING SPEED : 500 nS MAX.(BETWEEN ATTENUATION SETTINGS)
- TEMPERATURE COEFFICIENT : ± 0.025 dB/°C
- RF POWER RATINGS : + 20 dBm OPERATING, + 30 dBm SURVIVAL

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS

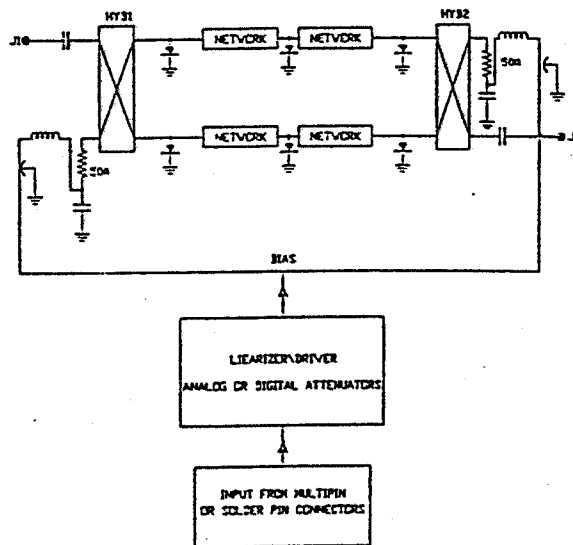


**SPECIFICATIONS:**

(CONTINUED)

- CONTROL : 8-BIT (STANDARD) POSITIVE TRUE BINARY (M-DVAN) (10-BIT, 11-BIT OR 12-BIT ALSO AVAILABLE) -OR- : 10dB/VOLT (STANDARD) ANALOG TRANSFER FUNCTION (M-VVAN) (5dB/VOLT TRANSFER FUNCTION ALSO AVAILABLE)
- DC POWER SUPPLY : ± 12vdc (STANDARD) OR ± 15vdc, @ +150 mA, -75 mA MAX. (8-BIT M-DVAN MODEL) @ +125 mA, -50 mA MAX. (ANALOG M-VVAN MODEL)
- CONNECTORS : REMOVABLE SMA FEMALE (STANDARD) FOR RF : 15-PIN MULTIPIN (STANDARD, OPTION "MP") FOR POWER AND CONTROL (SOLDER PIN CONTROLS, OPTION "SP", AND OTHER OPTIONS AVAILABLE)
- SIZE : 1.34" X 1.34" X 0.5"
- WEIGHT : ≤ 3 oz.

**FUNCTIONAL SCHEMATIC**



**ENVIRONMENTAL RATINGS**

- TEMPERATURE ..... : -55°C to +85°C (Operating), -65°C to +125°C (Storage)
- HUMIDITY ..... : MIL-STD-202F, METHOD 103B CONDITION B
- SHOCK ..... : MIL-STD-202F, METHOD 312B CONDITION B
- VIBRATION ..... : MIL-STD-202F, METHOD 204D CONDITION B
- ALTITUDE ..... : MIL-STD-202F, METHOD 105C CONDITION B
- TEMPERATURE CYCLING ..... : MIL-STD-202F, METHOD 107D CONDITION A

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



AVAILABLE M-DVAN DIGITAL CONTROL PINOUTS

PINOUT	8-BIT (STANDARD)	10-BIT	11-BIT	12-BIT
PIN 1	NOT USED	NOT USED	0.06 dB	0.03 dB
PIN 2	LATCHING STROBE * (OPTIONAL)	LATCHING STROBE * (OPTIONAL)	LATCHING STROBE * (OPTIONAL)	0.06 dB
PIN 3	NOT USED	0.13 dB	0.13 dB	0.13 dB
PIN 4	GROUND	GROUND	GROUND	GROUND
PIN 5	0.25 dB (LSB)	0.25 dB	0.25 dB	0.25 dB
PIN 6	0.5 dB	0.5 dB	0.5 dB	0.5 dB
PIN 7	1.0 dB	1.0 dB	1.0 dB	1.0 dB
PIN 8	2.0 dB	2.0 dB	2.0 dB	2.0 dB
PIN 9	4.0 dB	4.0 dB	4.0 dB	4.0 dB
PIN 10	8.0 dB	8.0 dB	8.0 dB	8.0 dB
PIN 11	16.0 dB	16.0 dB	16.0 dB	16.0 dB
PIN 12	32.0 dB (MSB)	32.0 dB (MSB)	32.0 dB (MSB)	32.0 dB (MSB)
PIN 13	+12 OR +15 VDC	+12 OR +15 VDC	+12 OR +15 VDC	+12 OR +15 VDC
PIN 14	-12 OR -15 VDC	-12 OR -15 VDC	-12 OR -15 VDC	-12 OR -15 VDC
PIN 15	NOT USED	0.06 dB (LSB)	0.03 dB (LSB)	0.016 dB (LSB)

\* Order "L" Suffix Models for Latching Strobe Capability, See "HOW TO ORDER" for more details.

STANDARD M-VVAN MULTIPIN ANALOG CONTROL PINOUTS  
(OPTION "MP")

MP-MULTIPIN	CONNECTOR PINOUT FOR VOLTAGE VARIABLE ATTENUATORS (VVAN UNITS)
PIN 3	ANALOG INPUT
PIN 4	GROUND
PIN 13	+12 or +15 VDC
PIN 14	-12 or -15 VDC
ALL OTHER PINS NOT USED	

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



AVAILABLE OPTIONS  
AND  
HOW TO ORDER

EXAMPLE

M-DVAN - 4030 - 60 - 3 - X - GP  
1 2 3 4 5 6

- 1 : M-DVAN : MINIATURE DIGITALLY  
VARIABLE ATTENUATOR NEW
- 2 : FREQUENCY OF OPERATION (e.g. 4.0 to 8.0 GHz)
- 3 : DYNAMIC RANGE IN dB
- 4 : NUMBER OF DIGITAL BITS (e.g. 3, 10, 11 or 12-bits)
- 5 : X=ANY COMBINATION OF THE  
M-DVAN OPTIONS GIVEN BELOW.
- 6 : GOLD PLATED (GP) MOUNTING SURFACE  
All other sides are Painted.  
PAINTED (P) MOUNTING SURFACE  
This is Standard for all products

EXAMPLE

M-VVAN - 6012 - 60 - MP - 3 - GP  
1 2 3 4 5 6

- 1 : VVAN : MINIATURE VOLTAGE  
VARIABLE ATTENUATOR NEW
- 2 : FREQUENCY OF OPERATION (e.g. 6.0 to 12.0 GHz)
- 3 : DYNAMIC RANGE IN dB
- 4 : CONTROL CONNECTOR OPTION
  - MP : Standard Connector for Analog Units  
(ITT Cannon 15-Pin Multipin Connector MDM-15PSP).
  - SP : Solder Pins for both Voltage and Control
  - SMA : Solder Pins for Voltage & SMA Female  
Control Connector
  - SMC : Solder Pins for Voltage & SMC Male  
Control Connector
- 5 : ADDITIONAL OPTIONS AS GIVEN BELOW
- 6 : GOLD PLATED (GP) MOUNTING SURFACE  
All other sides are Painted.  
PAINTED (P) MOUNTING SURFACE  
This is Standard for all products

ADDITIONAL M-DVAN AND M-VVAN OPTIONS

OPTION No:	M-DVAN AVAILABLE OPTIONS (DIGITALLY VARIABLE)	OPTION No:	M-VVAN AVAILABLE OPTIONS (VOLTAGE VARIABLE)
1	Two SMA Male Removable RF Connectors	1	Two SMA Male Removable RF Connectors
2	One SMA Male & One SMA Female Removable RF Connector	2	One SMA Male & One SMA Female Removable RF Connector
3	Not/Applicable	3	5 dB/Volt Transfer Function
4	0 to 30dB Attenuation Range	4	0 to 30 dB Attenuation Range
5	± 15 vdc Supply Voltage	5	± 15 vdc Supply Voltage
L	Latching Strobe Capability	6	Substitute M-CVAN product code for the M-VVAN product code for Current Controlled (Non-Linearized) Attenuators (AVAILABLE WITH OPTIONS 1, 2, & 4 AND EITHER MP, SP, SMC OR SMA CONTROL CONNECTORS)

ORDERING:

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.

**TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS**



**STANDARD M-DVAN MODELS AVAILABLE**

FREQUENCY	MODEL NUMBER	CONTROL
4.0 TO 8.0 GHz	M-DVAN-4080-60-8	8-Bit Digital Control (Standard) with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP)
5.0 TO 10.0 GHz	M-DVAN-5010-60-8	8-Bit Digital Control (Standard) with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP)
6.0 TO 12.0 GHz	M-DVAN-6012-60-8	8-Bit Digital Control (Standard) with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP)
8.0 TO 18.0 GHz	M-DVAN-8018-60-8	8-Bit Digital Control (Standard) with 15-Pin Multipin Connector (ITT CANNON MDM-15PSP)

**M-DVAN : MINIATURE DIGITALLY VARIABLE ATTENUATOR**

**STANDARD M-VVAN MODELS AVAILABLE**

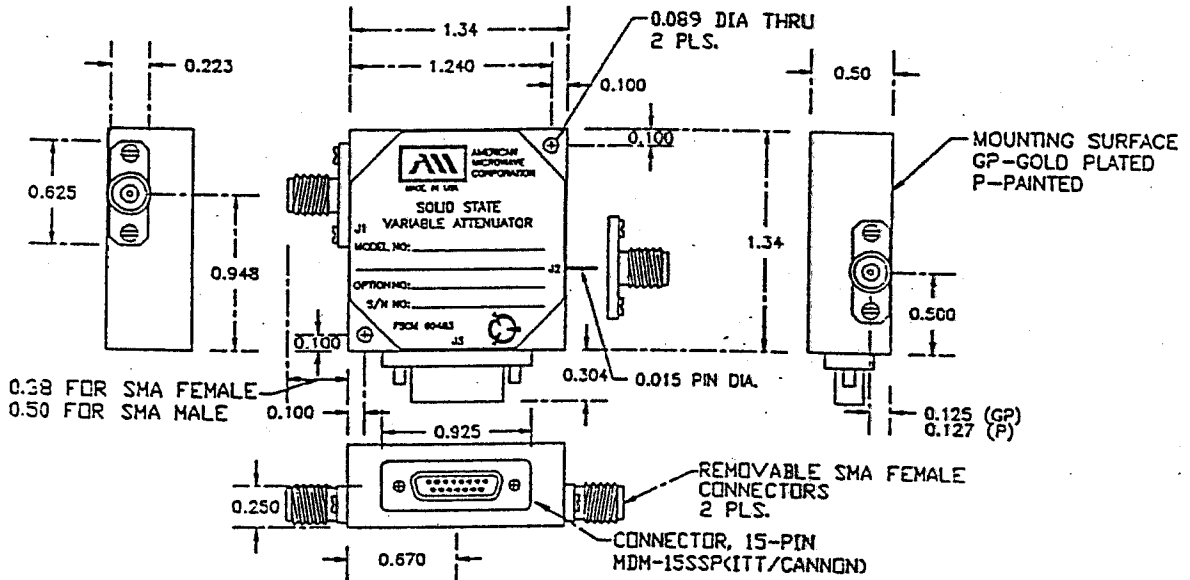
FREQUENCY	MODEL NUMBER	CONTROL
4.0 TO 8.0 GHz	M-VVAN-4080-60-MP	Analog, 10dB/Volt (Standard) with Multipin Connector (ITT CANNON MDM-15PSP)
5.0 TO 10.0 GHz	M-VVAN-5010-60-MP	Analog, 10dB/Volt (Standard) with Multipin Connector (ITT CANNON MDM-15PSP)
6.0 TO 12.0 GHz	M-VVAN-6012-60-MP	Analog, 10dB/Volt (Standard) with Multipin Connector (ITT CANNON MDM-15PSP)
8.0 TO 18.0 GHz	M-VVAN-8018-60-MP	Analog, 10dB/Volt (Standard) with Multipin Connector (ITT CANNON MDM-15PSP)

**M-VVAN : MINIATURE VOLTAGE VARIABLE ATTENUATOR**

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



STANDARD MODEL  
**M-DVAN-4080/5010/6012-60-8**  
MINIATURE DIGITALLY VARIABLE ATTENUATOR  
(4.0 TO 8.0 GHz, 5.0 TO 10.0 GHz & 6.0 TO 12.0 GHz)



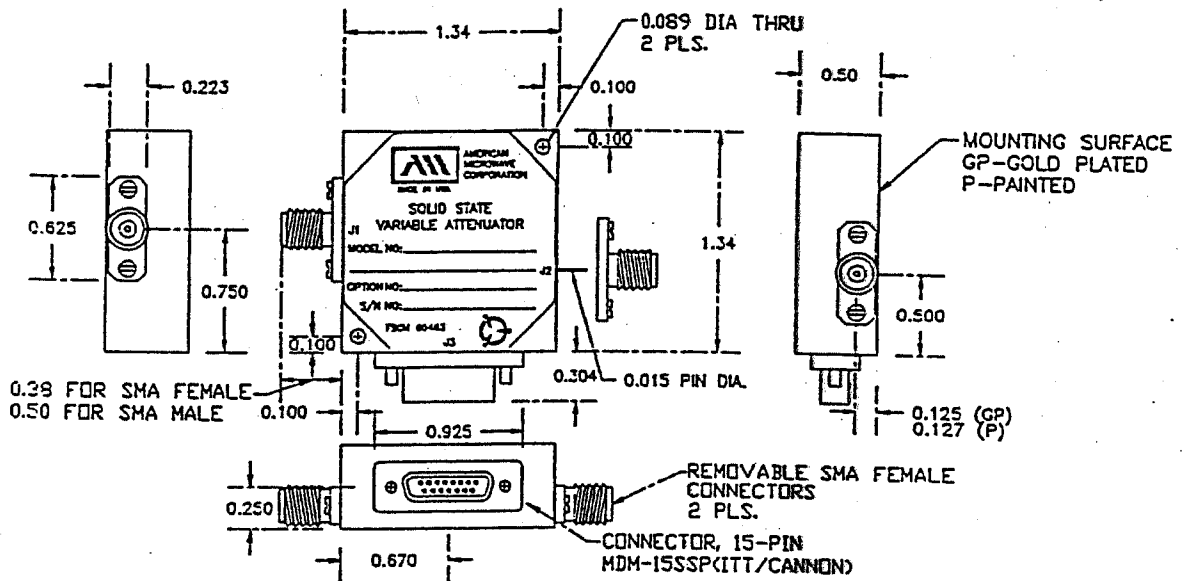
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**M-DVAN-4080/5010/6012-60-8**

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



STANDARD MODEL  
**M-DVAN-8018-60-8**  
MINIATURE DIGITALLY VARIABLE ATTENUATOR  
(8.0 TO 18.0 GHz)



ALL DIMENSIONS ARE IN INCHES, TOLERANCE: X.XXX ±0.020, X.XXXX ±0.010

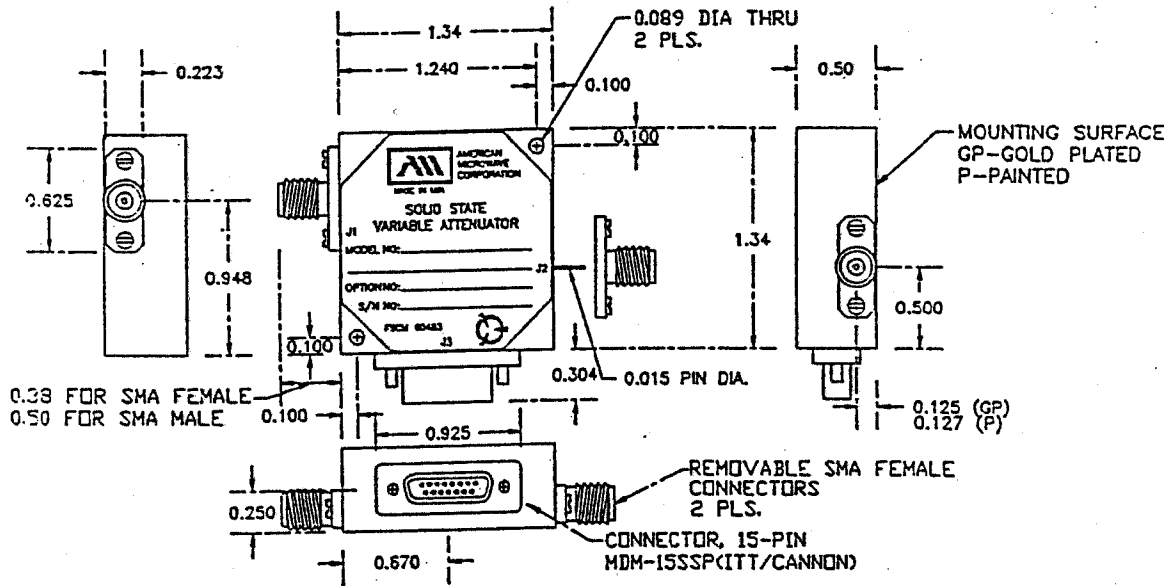
**M-DVAN-8018-60-8**



TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



STANDARD MODEL  
**M-VVAN-4080/5010/6012-60-MP**  
MINATURE VOLTAGE VARIABLE ATTENUATOR  
WITH MULTIPIN CONNECTOR  
(4.0 TO 8.0 GHz, 5.0 TO 10.0 GHz & 6.0 TO 12.0 GHz)



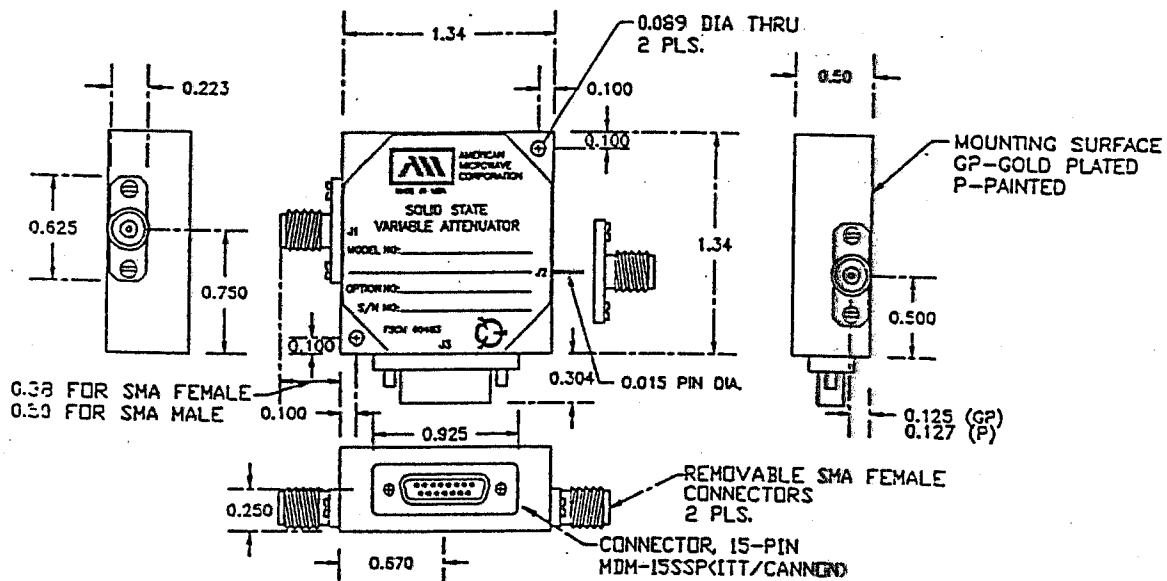
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**M-VVAN-4080/5010/6012-60-MP**

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



STANDARD MODEL  
**M-VVAN-8018-60-MP**  
MINIATURE VOLTAGE VARIABLE ATTENUATOR  
WITH MULTIPIN CONNECTOR  
(8.0 TO 18.0 GHz)



ALL DIMENSIONS ARE IN INCHES. TOLERANCE: X.XX ±0.020, X.XXX ±0.010

**M-VVAN-8018-60-MP**

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



AVAILABLE OPTIONS ON M-VVAN ATTENUATORS

FREQUENCY	MODEL NUMBER	CONTROL
4.0 TO 8.0 GHz	M-VVAN-4080-60-SP	10dB/Volt Analog Control with Solder Pin Voltage & Control
4.0 TO 8.0 GHz	M-VVAN-4080-60-SMA	10dB/Volt Analog Control with Solder Pin Voltage & SMA Female Control Connector
4.0 TO 8.0 GHz	M-VVAN-4080-60-SMC	10dB/Volt Analog Control with Solder Pin Voltage & SMC Male Control Connector
5.0 TO 10.0 GHz	M-VVAN-5010-60-SP	10dB/Volt Analog Control with Solder Pin Voltage & Control
5.0 TO 10.0 GHz	M-VVAN-5010-60-SMA	10dB/Volt Analog Control with Solder Pin Voltage & SMA Female Control Connector
5.0 TO 10.0 GHz	M-VVAN-5010-60-SMC	10dB/Volt Analog Control with Solder Pin Voltage & SMC Male Control Connector
6.0 TO 12.0 GHz	M-VVAN-6012-60-SP	10dB/Volt Analog Control with Solder Pin Voltage & Control
6.0 TO 12.0 GHz	M-VVAN-6012-60-SMA	10dB/Volt Analog Control with Solder Pin Voltage & SMA Female Control Connector
6.0 TO 12.0 GHz	M-VVAN-6012-60-SMC	10dB/Volt Analog Control with Solder Pin Voltage & SMC Male Control Connector
8.0 TO 18.0 GHz	M-VVAN-8018-60-SP	10dB/Volt Analog Control with Solder Pin Voltage & Control
8.0 TO 18.0 GHz	M-VVAN-8018-60-SMA	10dB/Volt Analog Control with Solder Pin Voltage & SMA Female Control Connector
8.0 TO 18.0 GHz	M-VVAN-8018-60-SMC	10dB/Volt Analog Control with Solder Pin Voltage & SMC Male Control Connector

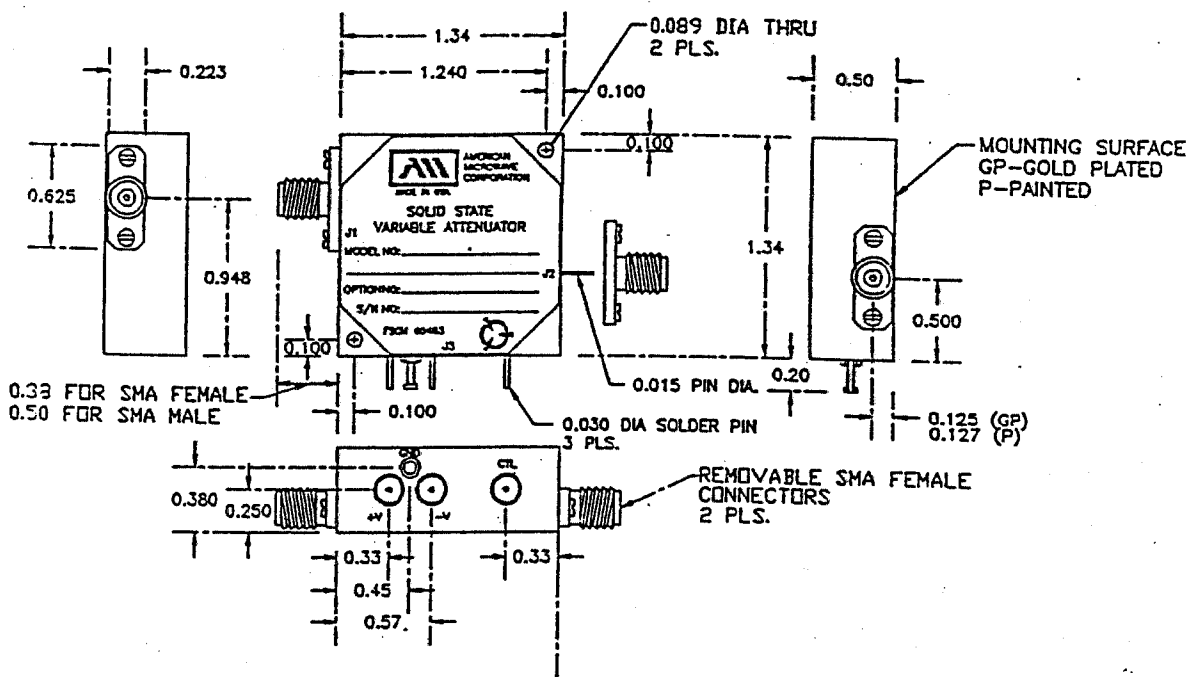
M-VVAN : MINIATURE VOLTAGE VARIABLE ATTENUATOR

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
GHz ABSORPTIVE ATTENUATORS



OPTIONAL MODEL  
**M-VVAN-4080/5010/6012-60-SP**

MINIATURE VOLTAGE VARIABLE ATTENUATOR  
WITH SOLDER PIN CONTROL CONNECTORS  
(4.0 TO 8.0 GHz, 5.0 TO 10.0 GHz & 6.0 TO 12.0 GHz)



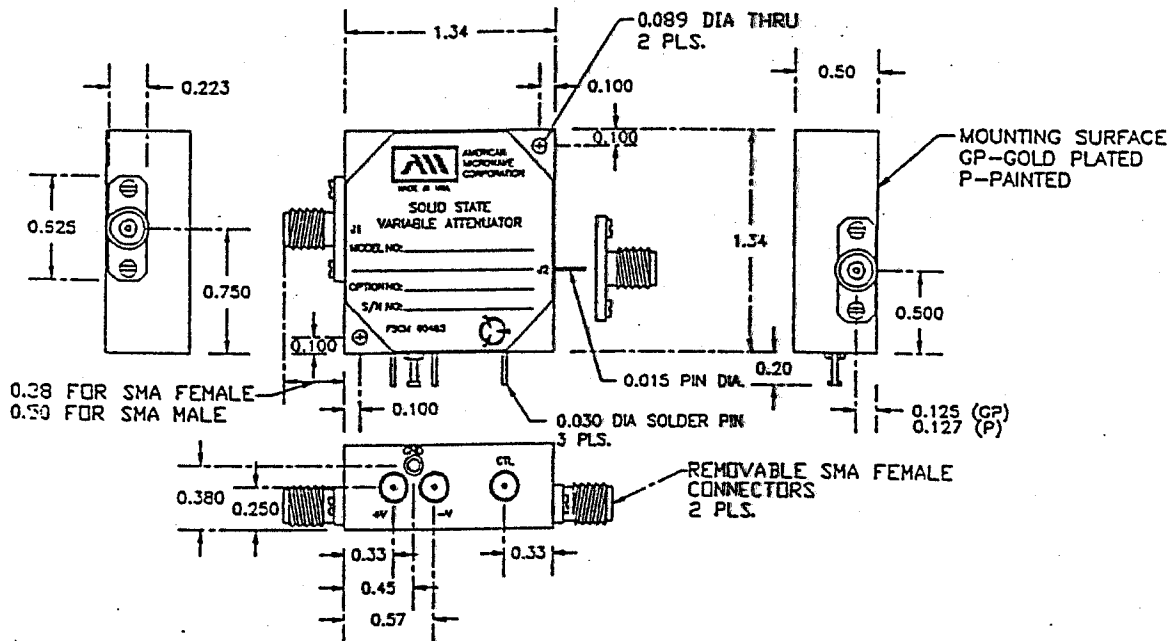
ALL DIMENSIONS ARE IN INCHES, TOLERANCE: X.XX ±0.020, X.XXX ±0.010

**M-VVAN-4080/5010/6012-60-SP**

TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



OPTIONAL MODEL  
**M-VVAN-8018-60-SP**  
MINIATURE VOLTAGE VARIABLE ATTENUATOR  
WITH SOLDER PIN CONTROL CONNECTOR  
(8.0 TO 18.0 GHz)



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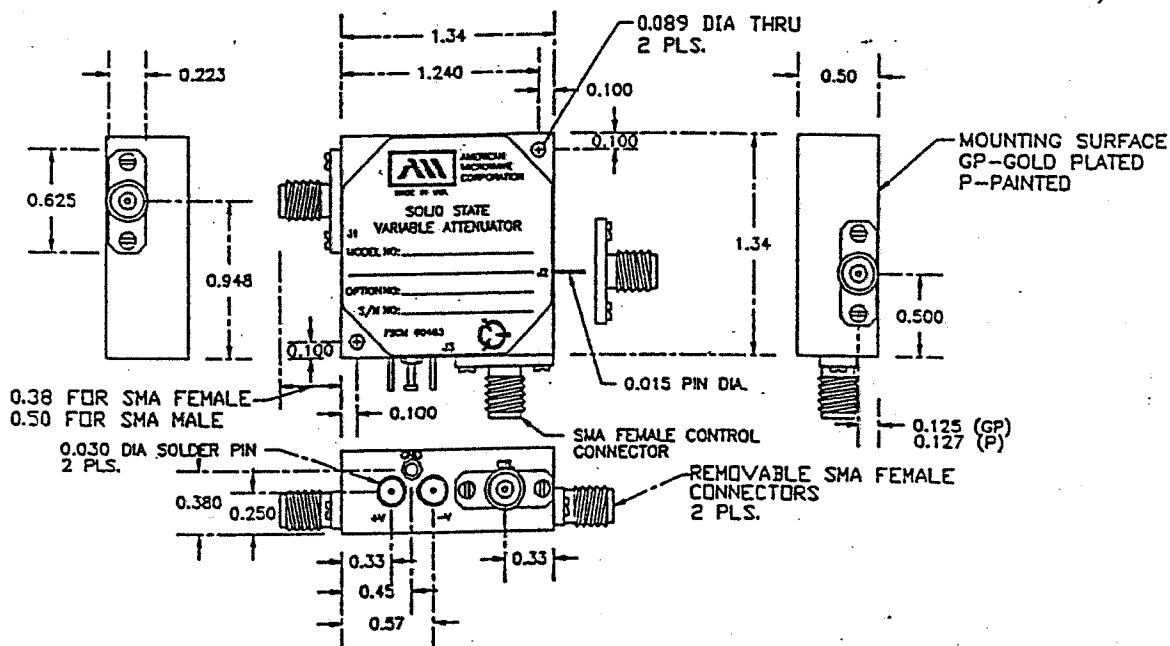
**M-VVAN-8018-60-SP**

TYPICAL DATA  
 M-DVAN & M-VVAN SERIES  
 60dB ABSORPTIVE ATTENUATORS



OPTIONAL MODEL  
**M-VVAN-4080/5010/6012-60-SMA**

MINIATURE VOLTAGE VARIABLE ATTENUATOR  
 WITH SMA FEMALE CONTROL CONNECTOR  
 (4.0 TO 8.0 GHz, 5.0 TO 10.0 GHz & 6.0 TO 12.0 GHz)



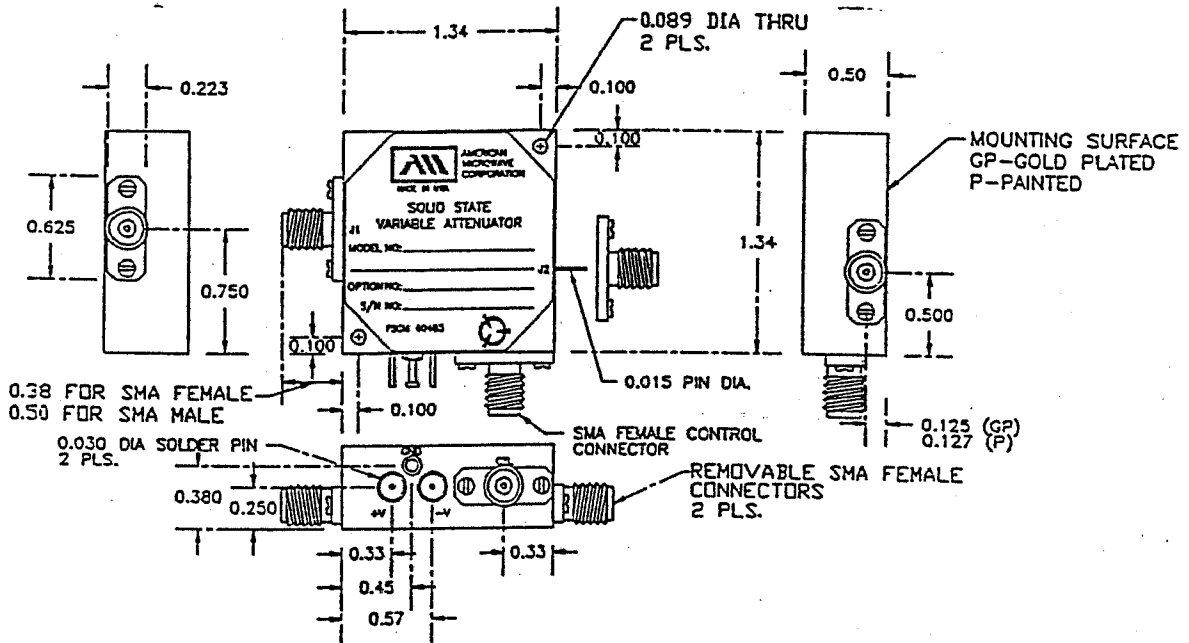
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**M-VVAN-4080/5010/6012-SMA**

TYPICAL DATA  
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 60dB ABSORPTIVE ATTENUATORS



OPTIONAL MODEL  
**M-VVAN-8018-60-SMA**  
 MINIATURE VOLTAGE VARIABLE ATTENUATOR  
 WITH SMA FEMALE CONTROL CONNECTOR  
 (8.0 TO 18.0 GHz)



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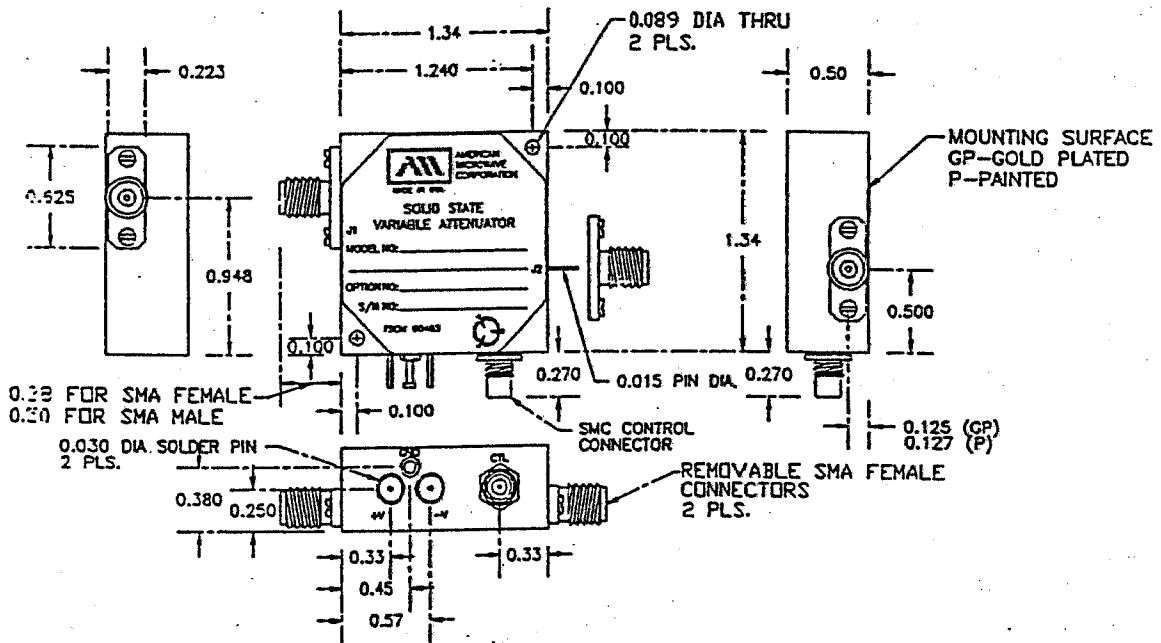
**M-VVAN-8018-60-SMA**

TYPICAL DATA  
 M-DVAN & M-VVAN SERIES  
 60dB ABSORPTIVE ATTENUATORS



OPTIONAL MODEL  
**M-VVAN-4080/5010/6012-60-SMC**

MINIATURE VOLTAGE VARIABLE ATTENUATOR  
 WITH SMC MALE CONTROL CONNECTOR  
 (4.0 TO 3.0 GHz, 5.0 TO 18.0 GHz & 6.0 TO 12.0 GHz)



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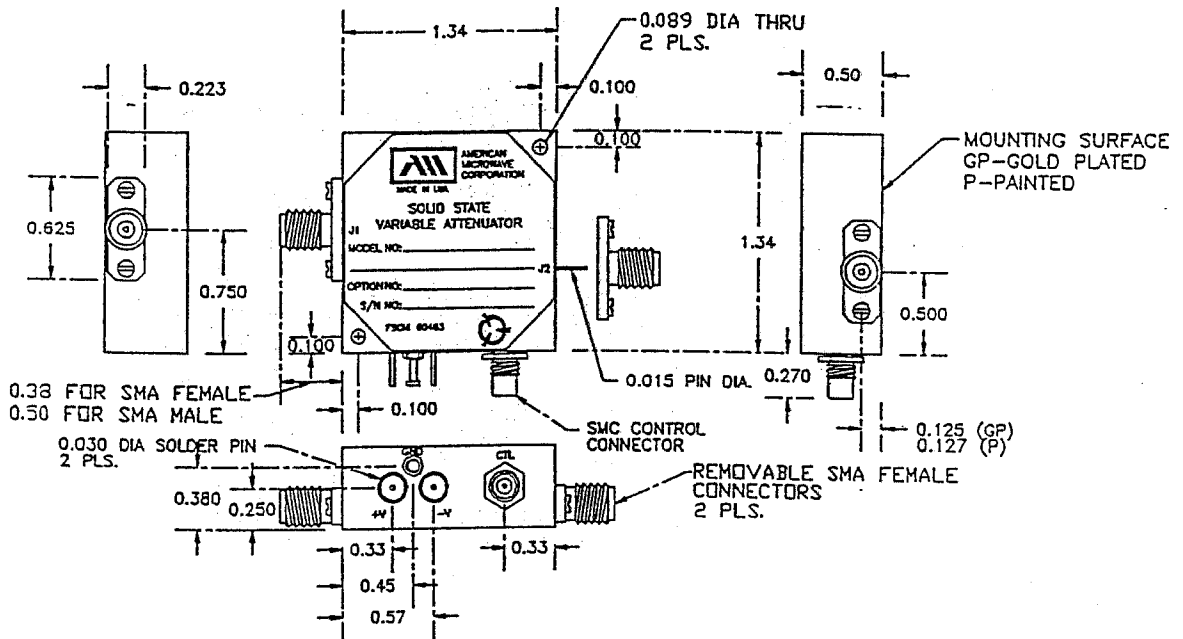
**M-VVAN-4080/5010/6012-60-SMC**



TYPICAL DATA  
M-DVAN & M-VVAN SERIES  
60dB ABSORPTIVE ATTENUATORS



OPTIONAL MODEL  
**M-VVAN-8018-60-SMC**  
MINIATURE VOLTAGE VARIABLE ATTENUATOR  
WITH SMC MALE CONTROL CONNECTOR  
(8.0 TO 18.0 GHz)



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**M-VVAN-8018-60-SMC**

AMERICAN MICROWAVE CORPORATION

