



**AMERICAN MICROWAVE  
CORPORATION**

**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**



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COMPARISON CHARTS  
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# COMPARISON CHARTS OF SEVEN NEW REFLECTIVE SPST PIN DIODE SWITCH/MODULATORS

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### NEW AMC MODEL NUMBERS:

- SWN-AGRA-1DR-ECL-GAK0-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENT(L/C)  
5ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH
- SWN-AGRA-1DR-TTL-GAK1-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENT(L/C)  
7ns-ULTRA HIGH SPEED, TTL LOGIC SPST PIN DIODE SWITCH
- SWN-AGRA-1DR-PTTL-GAK2-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, SINGLE SUPPLY, LOW LOSS, LOW VIDEO  
TRANSIENT(L/C), 10ns-ULTRA HIGH SPEED, TTL LOGIC, SPST PIN DIODE  
SWITCH
- SWN-AGRA-1DR-ECL-GAK3-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENT(L/C)  
5ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH
- SWN-AGRA-1DR-ECL-GAK3P-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, LOW LOSS, LOW VIDEO TRANSIENT(L/C)  
9ns-ULTRA HIGH SPEED, ECL LOGIC SPST PIN DIODE SWITCH
- SWN-AGRA-1DR-TTL-GAX-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, LOW LOSS, 10ns-ULTRA HIGH SPEED, LOW  
VIDEO TRANSIENTS(L/C) SPST PIN DIODE SWITCH
- SWN-AGRA-1DR-PTTL-GAX-LVT  
REFLECTIVE, 2.0 TO 18.0 GHz, SINGLE SUPPLY, LOW LOSS, LOW VIDEO  
TRANSIENTS(L/C), 10ns-ULTRA HIGH SPEED SPST PIN DIODE SWITCH

NOTE: Contact Factory for Available Options.

NEW DESIGNS BY A. K. GORWARA  
AUGUST 29, 1995



INSERTION LOSS vs FREQUENCY

INSERTION LOSS vs FREQUENCY  
 A COMPARISON OF SEVEN NEW SPST SWITCHES

FREQUENCY IN GHZ	0.5	0.8	1	2	4	6	8	10	12	14	16	18
SWN-AGRA-1DR-ECL-GAK0				0.56	0.51	0.53	0.56	0.88	0.69	0.99	1.03	1.26
SWN-AGRA-1DR-TTL-GAK1				0.62	0.56	0.61	0.91	0.67	0.92	1.09	1.23	1.43
SWN-AGRA-1DR-PTTL-GAK2				0.54	0.45	0.43	0.68	0.83	0.81	0.97	1.15	1.5
SWN-AGRA-1DR-ECL-GAK3				0.5	0.64	0.55	0.66	0.76	1.17	1.33	1.26	1.56
SWN-AGRA-1DR-ECL-GAK3P				0.53	0.54	0.52	0.92	0.93	0.9	1.08	1.38	1.47
SWN-AGRA-1DR-TTL-GAX				0.84	0.6	0.66	1.04	1.09	1.15	1.04	1.26	1.36
SWN-AGRA-1DR-PTTL-GAX				0.57	0.61	0.68	1.07	1.13	1.27	1.31	1.44	1.79

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

FREQUENCY IS SHOWN-GHZ  
 INSERTION LOSS MEASURED IN dB



ISOLATION vs FREQUENCY

ISOLATION vs FREQUENCY  
 A COMPARISON OF SEVEN NEW SPST SWITCHES

FREQUENCY IN GHz	0.5	0.8	1	2	4	6	8	10	12	14	16	18
SWN-AGRA-1DR-ECL-GAK0	50	54	63	88	95	94	92	92	90	86	84	82
SWN-AGRA-1DR-TTL-GAK1	40	38	44	72	92	96	82	90	90	86	84	82
SWN-AGRA-1DR-PTTL-GAK2	50	52	60	86	94	94	92	90	90	88	84	82
SWN-AGRA-1DR-ECL-GAK3	50	51	58	86	94	94	92	90	90	86	80	82
SWN-AGRA-1DR-ECL-GAK3P	50	52	62	88	94	94	94	92	88	86	82	80
SWN-AGRA-1DR-TTL-GAX			64	94	90	90	88	78	80	78	72	64
SWN-AGRA-1DR-PTTL-GAX			76	92	88	90	86	76	72	78	72	64

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

FREQUENCY IS SHOWN-GHz  
 ISOLATION AS MEASURED IN dB



RETURN LOSS vs FREQUENCY

RETURN LOSS vs FREQUENCY  
 A COMPARISON OF SEVEN NEW SPST SWITCHES

FREQUENCY IN GHZ	0.5	0.8	1	2	4	6	8	10	12	14	16	18
SWN-AGRA-1DR-ECL-GAK0				15.71	18.05	18.5	23.18	13.21	29.76	13.97	31.29	30.95
SWN-AGRA-1DR-TTL-GAK1				14.93	19.34	24.02	17.55	22.31	12.7	11.9	16.79	17.6
SWN-AGRA-1DR-PTTL-GAK2				15.84	19.43	28.69	16.86	14.89	17.81	18.98	14.96	23.79
SWN-AGRA-1DR-ECL-GAK3				20.41	15.46	20.47	22.37	23.57	10.77	11.78	18.6	20.73
SWN-AGRA-1DR-ECL-GAK3P				18.75	16.89	24.44	12.32	13.84	17.38	15.56	14.6	29.52
SWN-AGRA-1DR-TTL-GAX				14.53	19.06	19.48	12.59	11.98	11.8	16.65	16.54	36.86
SWN-AGRA-1DR-PTTL-GAX				15.09	17.51	19.83	12.8	12.85	12.24	14.14	18.22	20.24

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

FREQUENCY IS SHOWN-GHZ  
 RETURN LOSS MEASURED IN dB



SWITCHING SPEED

SWITCHING SPEED  
 A COMPARISON OF SEVEN NEW SPST SWITCHES

SWITCHING SPEED IN nS	RISE	FALL	ON	OFF
SWN-AGRA-1DR-ECL-GAK0	1	1	5	5
SWN-AGRA-1DR-TTL-GAK1	1	1	7	7
SWN-AGRA-1DR-PTTL-GAK2	1	1	10	5
SWN-AGRA-1DR-ECL-GAK3	1	1	5	5
SWN-AGRA-1DR-ECL-GAK3P	1	1	9	3
SWN-AGRA-1DR-TTL-GAX	2	2	10	10
SWN-AGRA-1DR-PTTL-GAX	2	2	15	8

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

SWITCHING SPEED AS MEASURED IN NANoseconds



VIDEO TRANSIENTS

**VIDEO TRANSIENTS**  
 A COMPARISON OF SEVEN NEW SPST SWITCHES

BANDWIDTH IN MHZ	20	100	300
SWN-AGRA-1DR-ECL-GAK0	15		350
SWN-AGRA-1DR-TTL-GAK1	15		235
SWN-AGRA-1DR-PTTL-GAK2	5		175
SWN-AGRA-1DR-ECL-GAK3	10		175
SWN-AGRA-1DR-ECL-GAK3P	5		130
SWN-AGRA-1DR-TTL-GAX	20	275	
SWN-AGRA-1DR-PTTL-GAX	10	135	

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

VIDEO TRANSIENTS MEASURED IN MILLIVOLTS PEAK-PEAK



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### MECHANICAL OUTLINES

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

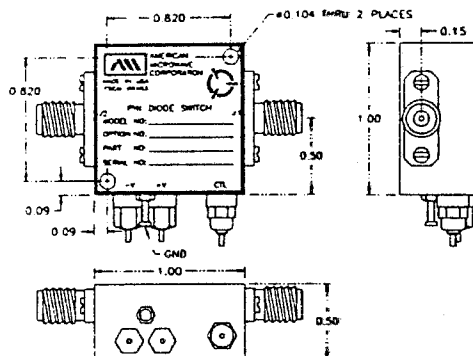


Figure 1. SWN-AGRA-1DR-TTL-GAK1-LVT  
SWN-AGRA-1DR-TTL-GAX-LVT

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

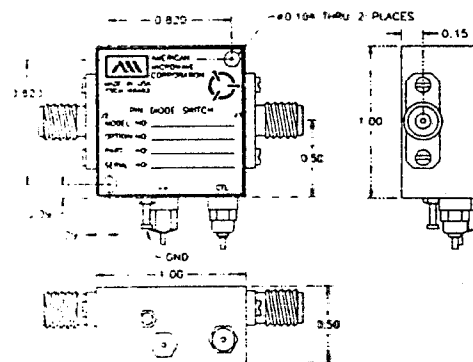


Figure 2. SWN-AGRA-1DR-PTTL-GAK2-LVT  
SWN-AGRA-1DR-PTTL-GAX-LVT

DC Power Supply:  
 $\pm 5\text{vdc} @ \pm 80\text{mA Max.}$

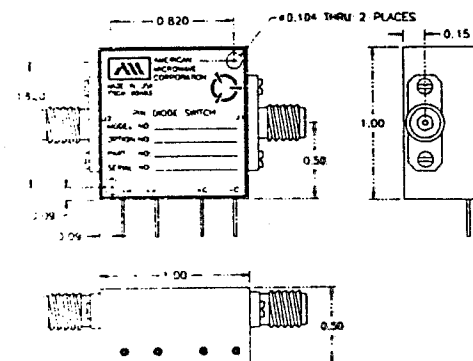


Figure 3. SWN-AGRA-1DR-ECL-GAK0-LVT  
SWN-AGRA-1DR-ECL-GAK3-LVT  
SWN-AGRA-1DR-ECL-GAK3P-LVT