



**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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SUMMARY TEST DATA
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



SUMMARY TEST DATA
COMPARISON CHARTS
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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



SUMMARY TEST DATA
COMPARISON CHARTS
PAGE : 4

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



SUMMARY TEST DATA
 COMPARISON CHARTS
 PAGE : 5

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



SUMMARY TEST DATA
COMPARISON CHARTS
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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 |

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SWITCHING SPEED AS MEASURED IN NANoseconds



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 COMPARISON CHARTS
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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



SUMMARY TEST DATA
COMPARISON CHARTS
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MECHANICAL OUTLINES

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

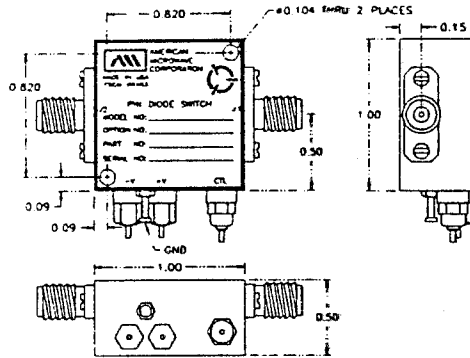


Figure 1. SWN-AGRA-1DR-TTL-GAK1-LVT
SWN-AGRA-1DR-TTL-GAX-LVT

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

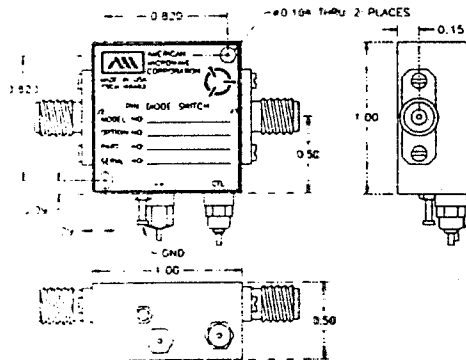


Figure 2. SWN-AGRA-1DR-PTTL-GAK2-LVT
SWN-AGRA-1DR-PTTL-GAX-LVT

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

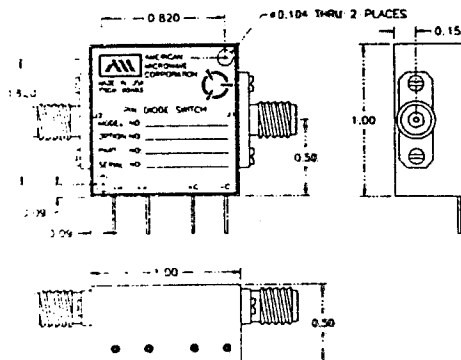


Figure 3. SWN-AGRA-1DR-ECL-GAK0-LVT
SWN-AGRA-1DR-ECL-GAK3-LVT
SWN-AGRA-1DR-ECL-GAK3P-LVT

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