## DIGITALLY CONTROLLED PHASE SHIFTERS

G.T. Microwave Features:

**Frequency Ranges:** From 500 MHz to 24 GHz up to 9:1 bandwidths are available.

**TTL Compatible Logic:** G.T.M.I's binary logic Digital to Analog Converter with 8 inputs;

Logic '1' / BIT = 256 discrete phase shifts with a 1.4' Resolution (L.S.B) or all Logic 'O' = O' Reference State. Any resolution up to 12 BITs is available.

**Optional Models:** Analog Voltage controlled or Switched Line Digital phase shifters are available, please consult factory.

**Operating Temperature Range:** 500 nSec models have a temperature range from -10 to +65 Degrees C with a temperature coefficient of +/- 0.035 dB & +/- 0.17 Deg/Deg C. 1.0 uSec models have an improved temperature coefficient. For severe environments, consult factory.

**High Speed Switching:** Phase Shifters listed are measured from any set value to any value.

**Low DC power Consumption:** Phase Shifters require +/-12 to +/-15VDC@ +/-100mA.

**Stable Phase Shifts:** Variation vs. Temperature is typically +/- 0.17 degrees & +/- 0.035 dB/degrees C from –10 to +65 degrees C for 500 nSec models. Slower models have better temperature coefficients, please consult factory.

**High RF Power Handling:** For power levels greater than listed, please consult factory.

**Standard Interfaces:** RF Port connectors are 'SMA', female per MIL-C-39012.

**Life Time Integrity:** G.T.M.I.'s Phase Shifters can be designed to meet MIL–E–16400, Range 1 and MIL – E – 5400, Class 2 environments operating within the -55° to +85° C temperature range.

| G.T.M.I Part Number | FREQUENCY RANGE GHz | Dynamic Range | Phase Error MAX | Amplitude MAX | INSERTION LOSS MAX | V.S.W.R. MAX | RF INPUT POWER CW | SWITCHING SPEED nSEC MAX | RF INPUT POWER dBm MAX | Outline Size |
|---|---|---|---|---|---|---|---|---|---|---|
| P*P-18A-5 | 0.2-0.4 | 360° | +/-10° | +/-1.0 dB | 11.0 dB | 1.6:1 | 0 dBm | 500 | +30 | 5 |
| P*P-28A-5 | 0.3-0.6 | 360° | +/-10° | +/-1.0 dB | 11.0 dB | 1.6:1 | 0 dBm | | | 1 |
| P*P-39A-5 | 0.5-2.0 | 360° | +/-10° | +/-1.0 dB | 13.0 dB | 1.7:1 | +5 dBm | | | 1 |
| P*P-38A-5 | 1.0-3.0 | 360° | +/-10° | +/-1.0 dB | 13.0 dB | 1.7:1 | +5 dBm | | | 1 |
| P*P-49A-5 | 1.0-4.0 | 360° | +/-15° | +/-1.0 dB | 13.0 dB | 1.8:1 | +5 dBm | | | 6 |
| P*P-48A-5 | 2.0-6.0 | 360° | +/-10° | +/-1.0 dB | 11.0 dB | 1.8:1 | +10 dBm | | | 2 |
| P*P-58A-5 | 4.0-12.0 | 360° | +/-10° | +/-1.0 dB | 12.0 dB | 1.8:1 | +10 dBm | | | 2 |
| P*P-68A-5 | 6.0-18.0 | 360° | +/-10° | +/-1.0 dB | 12.0 dB | 1.9:1 | +15 dBm | | | 3 |
| P*P-84A-5 | 16.0-24.0 | 360° | +/-15° | +/-2.0 dB | 16.0 dB | 2.0:1 | +15 dBm | | | 3 |
| P*P-69A-5 | 2.0-18.0 | 360° | +/-20° | +/-3.0 dB | 16.0 dB | 2.2:1 | +10 dBm | | | 4 |

## POWER / LOGIC CONNECTIONS

| No. of Bits | Login Pin Assignments | +15V Pin | -15v Pin | GND Pin |
|---|---|---|---|---|
| 8 | L.S.B. @ 1 TO M.S.B. @ 8 | 13 | 14 | 15 |
| 10 | L.S.B. @ 1 TO M.S.B. @ 10 | 13 | 14 | 15 |
| 12 | L.S.B. @ 1 TO M.S.B. @ 12 | 13 | 14 | 15 |

ALL UN-USED PINS HAVE NO INTERNAL CONNECTIONS.

| SIZE | 'A'DIM. IN/CM | 'B' DIM. IN/CM | 'C'DIM. IN/CM | 'D' DIM. IN/CM |
|---|---|---|---|---|
| 1 | 4.95/12.57 | 3.38/8.58 | 4.750/12.065 | 3.125/7.938 |
| 2 | 3.25/8.26 | 3.25/8.26 | 3.050/7.747 | 3.000/7.620 |
| 3 | 3.00/7.62 | 3.00/7.62 | 2.800/7.112 | 2.750/6.985 |
| 4 | 4.25/10.80 | 3.50/8.89 | 3.250/8.255 | 3.250/8.255 |
| 5 | 5.00/12.70 | 5.00/12.70 | 4.800/12.192 | 4.750/12.065 |
| 6 | 5.38/13.65 | 4.50/11.43 | 5.175/13.145 | 4.250/10.795 |