

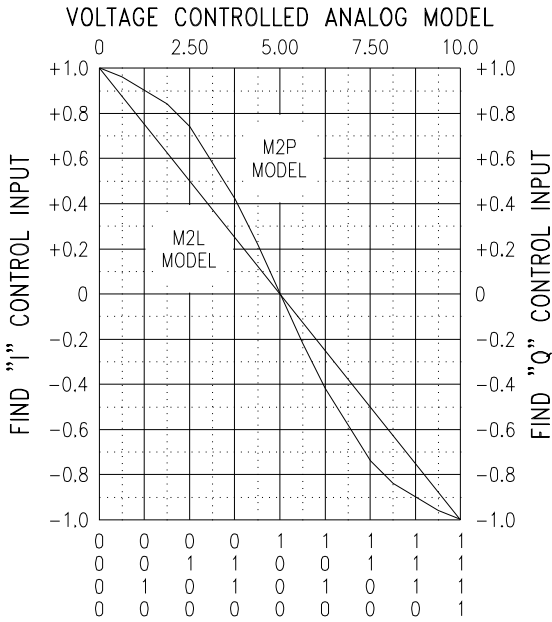
20 dB/360° I & Q VECTOR MODULATORS

G.T. Microwave Features:

*** Monotonic Performance Guaranteed ***

Frequency Ranges: From 500 MHz to 20 GHz any optimized bandwidth is available.

Optional Control Models: G.T.M.I.'s I & Q vector modulators simultaneously control attenuation (dB) and phase shift (θ) by finding their $I = 10^{-(dB/20)} \cos \theta$ & $Q = 10^{-(dB/20)} \sin \theta$ on the chart below and submitting the results to the POWER/LOGIC connections.



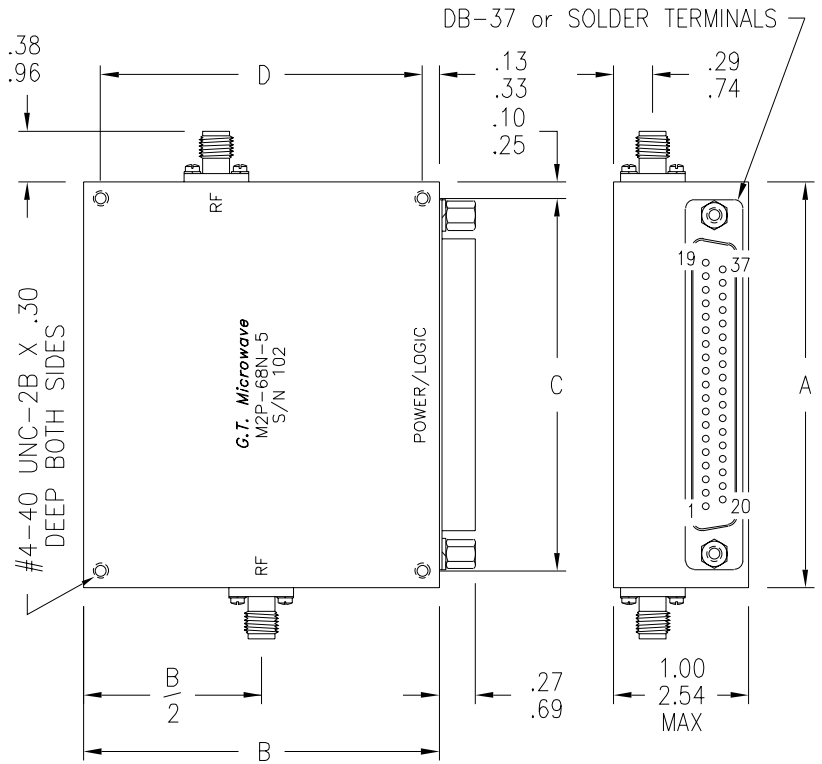
12 BIT-TTL CONTROLLED DIGITAL MODEL

Optional Types of Modulators: Bi-Phase & QPSK Modulators are also available, please consult factory.

Low DC Power Consumption: I & Q Vector Modulators require $\pm 15VDC$, $\pm 1\%$ @ $+100/-75mA$.

Stable Performance: Operating Temperature range is from -55° to $85^\circ C$.

Standard Interfaces: RF port connectors are 'SMA', female per MIL-C-39012. Voltage controlled models have solder terminals.



DIMENSIONS ARE EXPRESSED IN CM TOLERANCES ? .02 ? .010
? .05 ? .025

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

Microwave Products Available

Switches BP/QPSK & Vector Modulators Couplers
Attenuators Gain Equalizers D.C. Blocks
Hybrids Power Dividers/Combiners Bias Tees
Phase Shifters Custom Sub-Assemblies Detectors

Passive, Linearized Voltage or Current Controlled Analog, Digital, Programmable and Temperature Compensated

Electrical Specifications for 20 dB/360° I & Q vector modulators

G.T.M.I.'s MODEL NUMBER	FREQUENCY RANGE GHz	PHASE ERROR MAX	ATTENUATION ERROR MAX	INSERTION LOSS MAX	V.S.W.R. MAX	SWITCHING SPEED nSEC MAX	RF INPUT POWER dBm CW MAX	OUTLINE SIZE
M2L*P-39N-5	0.5-2.0	±10.0°	±1.50 dB	13.0 dB	1.70:1	500	+15 +20	1
M2L*P-48N-5	2.0-6.0			12.0 dB	1.80:1			2
M2L*P-68N-5	6.0-18.0			12.0 dB	1.90:1			3

For substantial improvement in performance; ask for OPTIMIZED NARROWBAND models