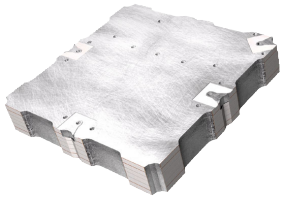
VMD-1Q-2.0G (2.14 GHz)
VECTOR MODULATOR

REV: 004, 09/21/01

- 2.04 - 2.24 GHz
- 30 dB ATTENUATION RANGE
- 360 DEGREE PHASE RANGE
- SURFACE MOUNT
- TAPE & REEL



TECHNICAL DESCRIPTION / APPLICATION

MULTI-MIX® Q-SERIES VECTOR MODULATORS

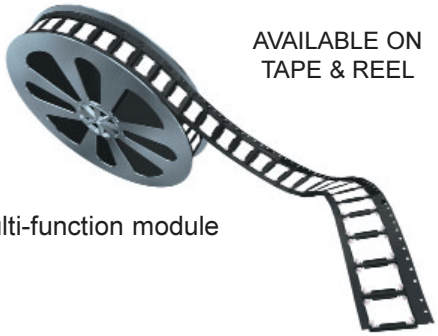
The Multi-Mix® VMD-Q series provides a vector modulator with variable IQ control of phase and amplitude in a surface mount outline. Accurate phase and amplitude control through a 360 degree range make them ideal for feed forward and signal processing applications.

VMD-Q vector modulators are fusion bonded multilayer stripline assemblies. The fusion bonding process yields a homogeneous monolithic dielectric structure with reliability, ruggedness, and electrical performance that is superior to conventional adhesive bonding techniques.

The VMD-Q series is an easy to install SMD designed specifically for the full spectrum of wireless applications. The high stability ceramic filled PTFE dielectrics utilized in these components are compatible with common substrates such as FR-4, G-10, and polyamide. The wrap around ground plane provides excellent EM shielding.

Additional benefits include:

- Available on tape and reel
- Cost effective for commercial wireless applications
- Surface mount outline
- Operating temperature range –55°C to +85°C.
- Can be integrated with other Multi-Mix® components in a multi-function module



AVAILABLE ON TAPE & REEL

RELIABILITY

The product family has passed environmental screening including Thermal shock, Burn-in, Acceleration, Vibration, Mechanical Shock, Moisture Resistance, Resistance to Solder Heat, and Thermal Cycling Life Test (>1000 cycles).

THE MULTI-MIX® PROCESS

Multi-Mix® is a manufacturing process based on fluoropolymer composite substrates that are fusion bonded together into a multilayer structure. The fusion bonding process yields a homogeneous monolithic structure with superior performance at microwave and millimeter wave frequencies. The bonded layers can contain embedded semiconductors, MMICs, etched resistors, circuit patterns, and plated-through vias to form a SMD module that requires no additional packaging and is suitable for automated assembly.

THE MULTI-MIX MICROTECHNOLOGY® GROUP IS ISO-9001 REGISTERED

Merrimac Industries / 41 Fairfield Place, West Caldwell, NJ 07006
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GENERAL SPECIFICATIONS

ELECTRICAL

FREQUENCY	2.04 TO 2.24 GHz
IQ CONTROL CURRENT	0 TO +45 mA
INSERTION LOSS	10 dB (MAX)
VSWR	1.4:1 (MAX)
AMPLITUDE BALANCE	± 0.3 dB
PHASE BALANCE	± 3 Deg
ATTENUATION RANGE	30 dB
PHASE RANGE	360 Deg
INPUT COMPRESSION POINT (1 dB)	+18 dBm

MECHANICAL

SIZE / OUTLINE	0.80 x 0.80 x 0.20 inches
WEIGHT	0.160 oz.
RF INTERFACE	Surface Mount

ENVIRONMENTAL

OPERATING TEMPERATURE RANGE	-55° To + 85°, C

Typical control current for test conditions:
Fc = 2.14 GHz, and RF input power = 0 dBm

State #	Phase	VI	VQ	I-current	Q-current
1	Ref, 0	0.065	0.810	0.196	2.484
2	45	0.178	0.234	0.540	0.716
3	90	0.615	0.133	1.863	0.409
4	135	2.167	0.343	6.566	1.051
5	180	4.010	1.253	12.151	3.843
6	-135	1.610	5.442	4.879	16.692
7	-90	0.454	12.336	1.375	37.842
8	-45	0.127	3.337	0.384	10.237
	Degrees	V	V	mA	mA

Test setup series resistor values for measuring control current

RI =	330	**ohms**
RQ =	326	**ohms**

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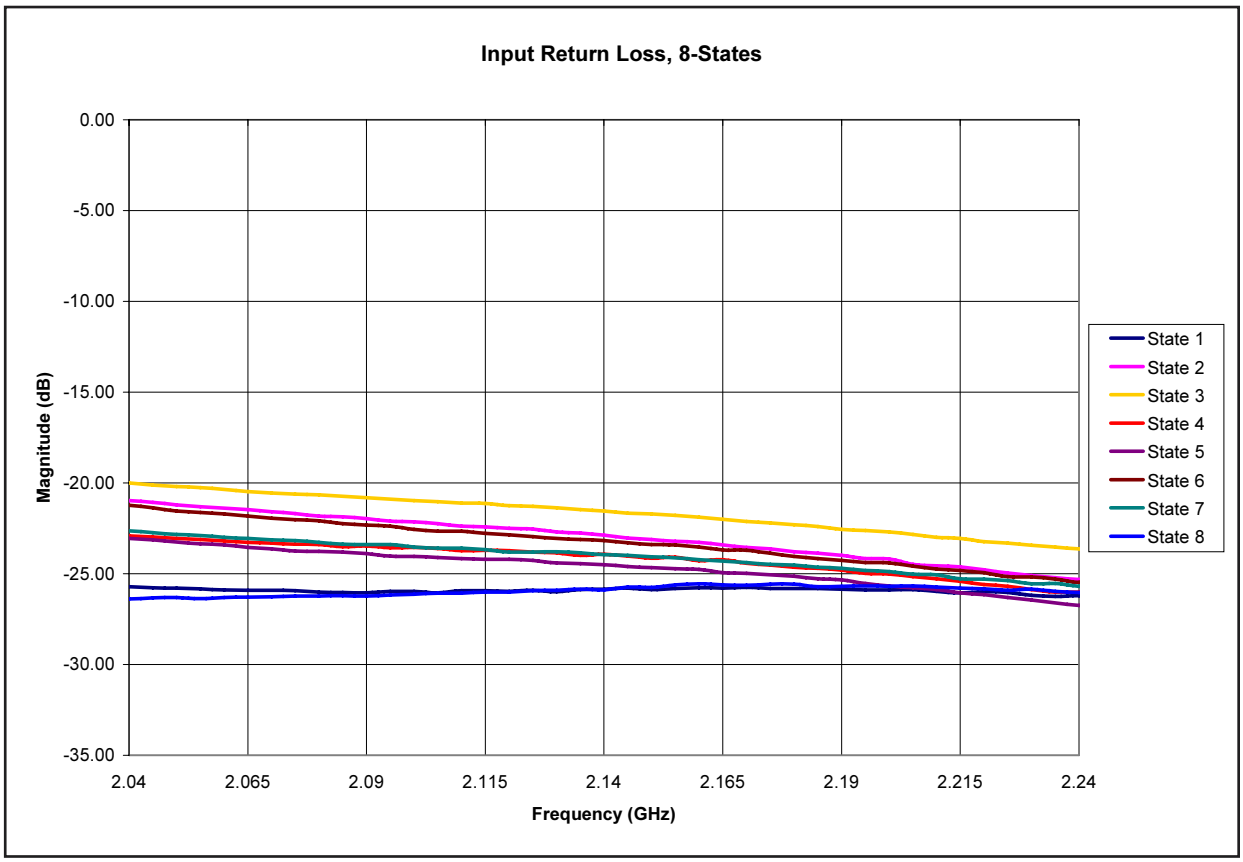
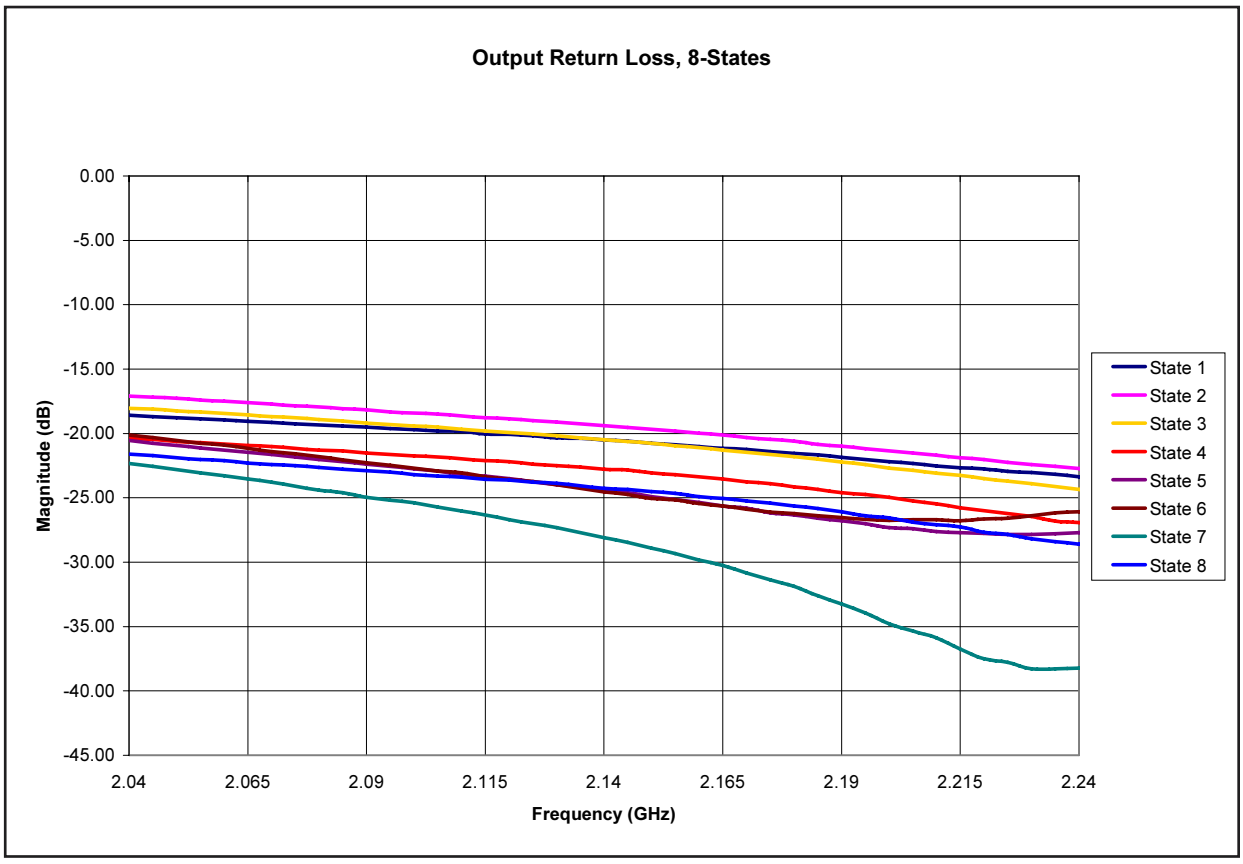
TYPICAL PERFORMANCE





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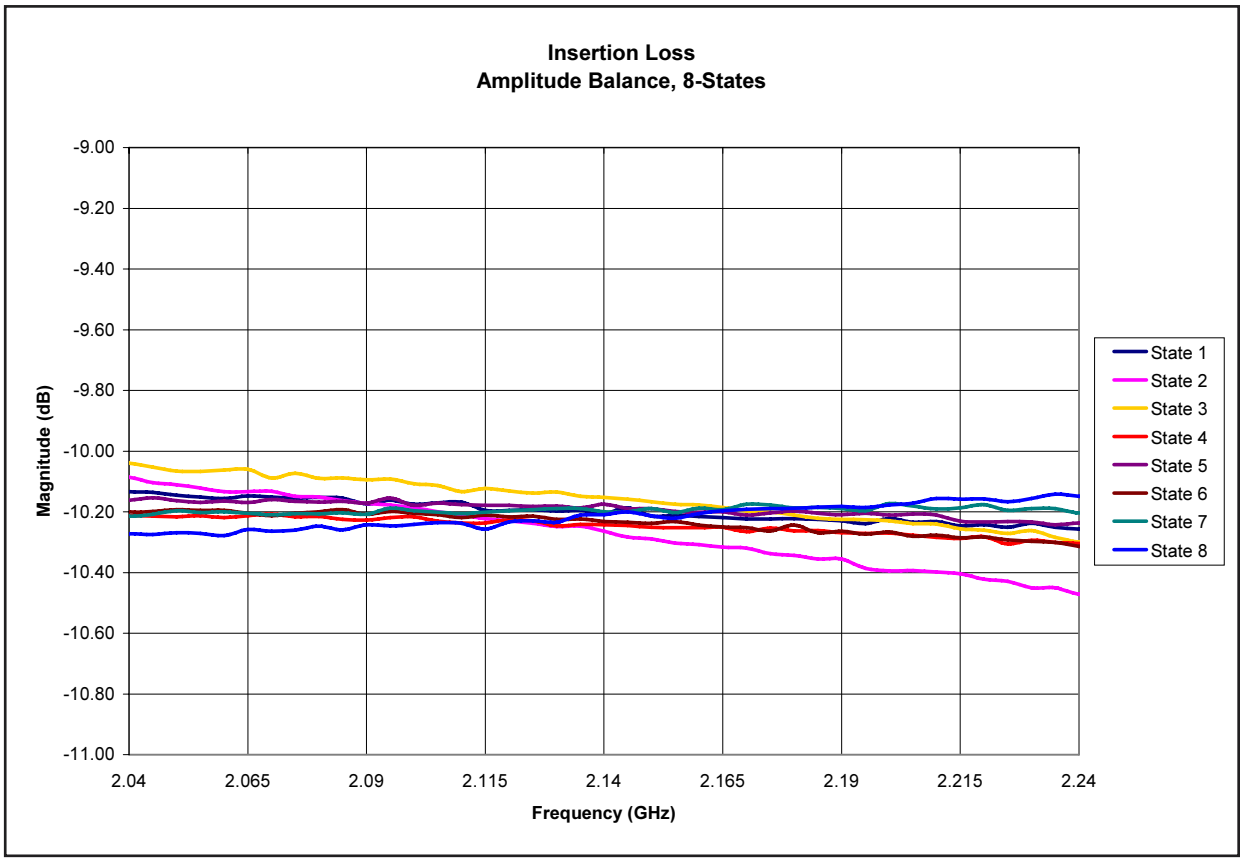

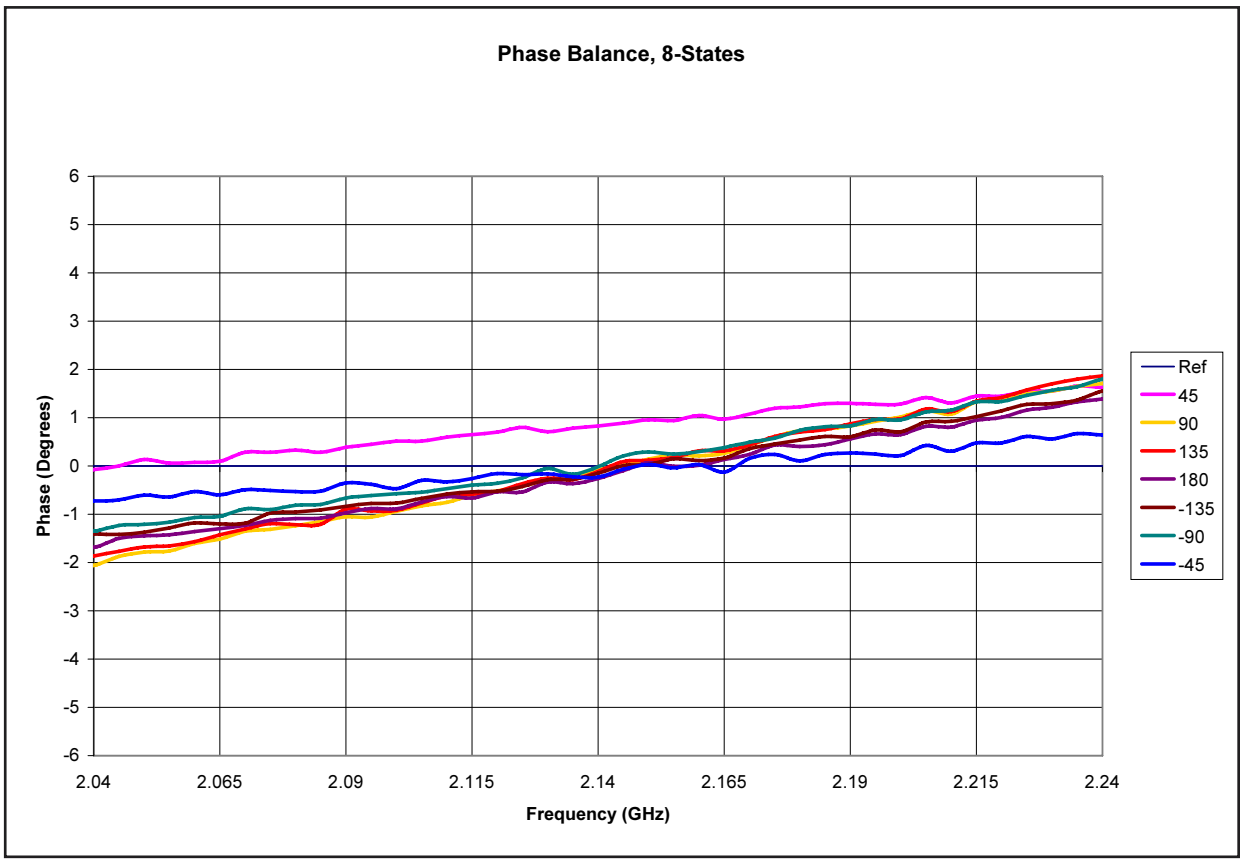

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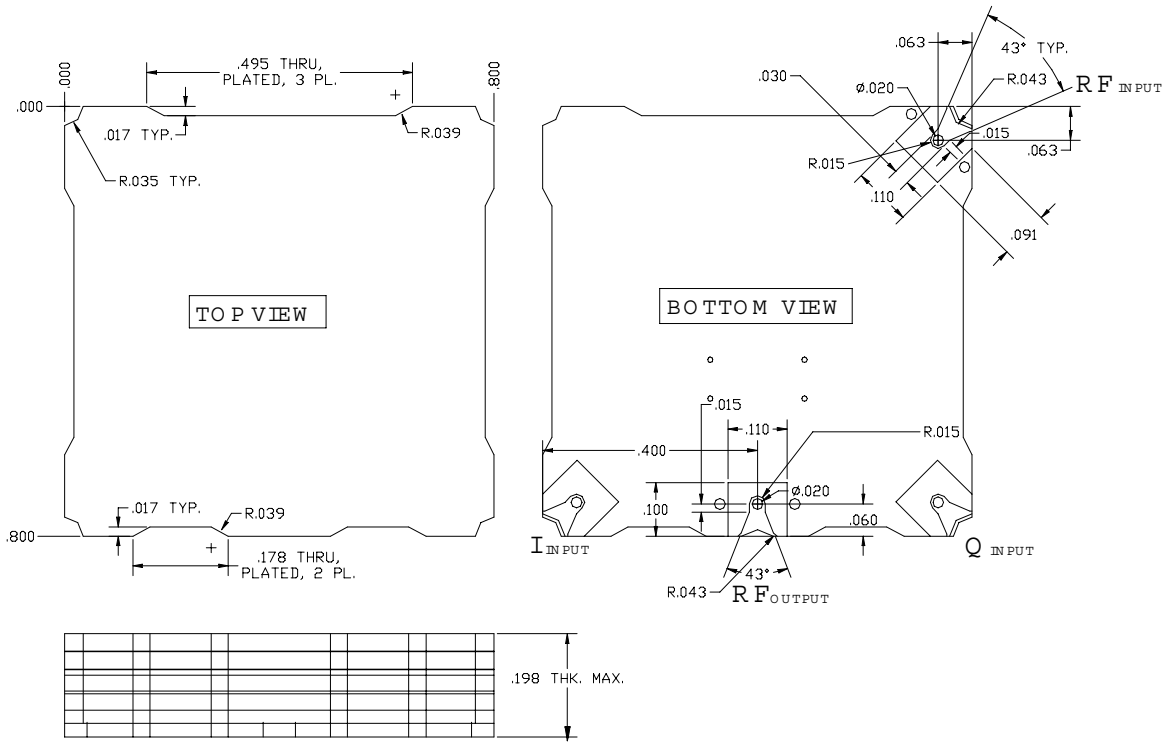
PACKAGE OUTLINE



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