

Features

- Operates 1.94 to 2.24 GHz
- Low Amplitude Ripple
- Linear Phase
- 50 Ohm nominal impedance
- Continuously Variable Across a Full 360 degree range
- Test Boards Available
- 4x6 mm PQFN Package

Description

M/A-COM's SA90-0001 is a Vector Modulator that significantly reduces the required board space compared to hybrid solutions. The monolithic passive elements will lead to greater repeatability lot-to-lot. Low amplitude ripple will provide superior performance. High intercept and compression points will contribute to more linear system performance. SA90-0001 is ideally suited for wireless infrastructure applications.

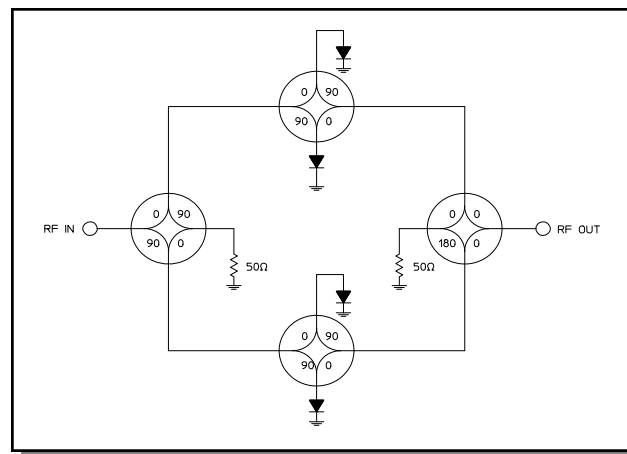
M/A-COM's MADRCC0002 Dual Linearizer is designed to simplify the control of Vector Modulators. See Figure 1 and App Note AN3001.

Ordering Information

Part Number	Package
SA90-0001	Bulk Packaging
SA90-0001TR	1000 piece reel
SA90-0001--DC000	Sample Test Board

Note: Reference Application Note M513 for reel size information.

Functional Schematic



Pin Configuration

Pin No.	Function	Pin No.	Function
1	NC	17	NC
2	NC	18	NC
3	NC	19	NC
4	NC	20	NC
5	NC	21	NC
6	NC	22	NC
7	NC	23	NC
8	NC	24	BIAS 2B
9	BIAS 1A	25	NC
10	NC	26	GND
11	GND	27	RF OUT
12	RF IN	28	GND
13	GND	29	NC
14	NC	30	BIAS 1B
15	BIAS 2A	31	NC
16	NC	32	NC

The exposed pad centered on the package bottom must be connected to RF and DC ground. (For PQFN Packages)

**Phase and Attenuation of SA90-0001, Vector Modulator Linearized with
MADRCC0002 Dual Linearizer^{5,6,7,8}**

Figure 1A

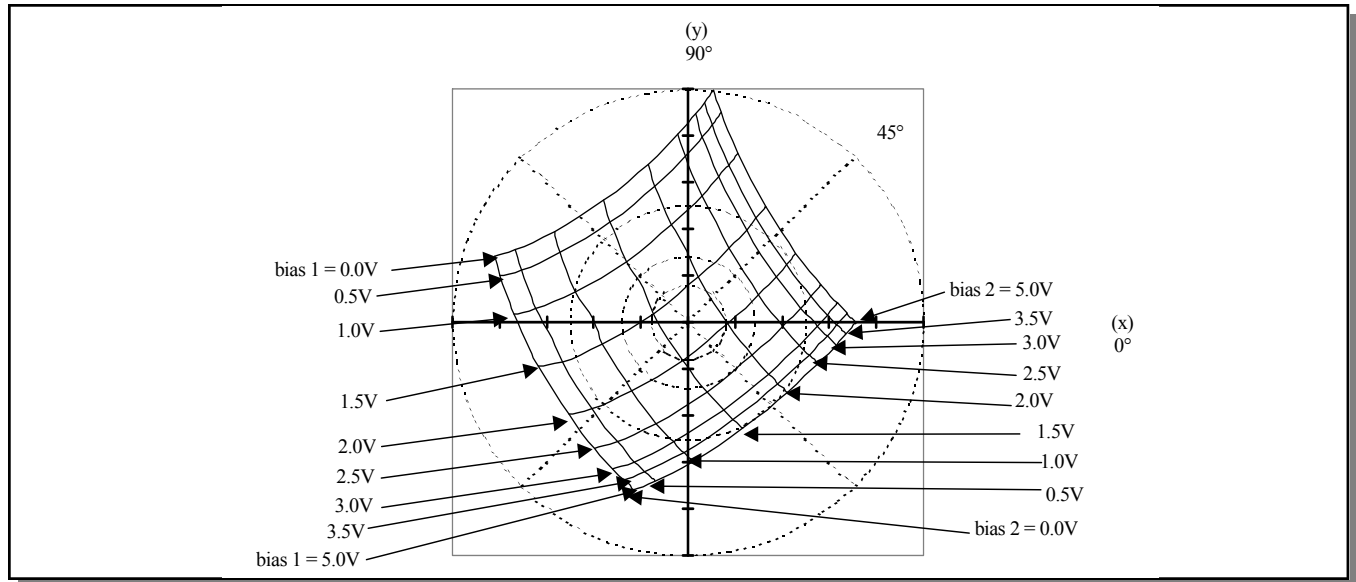
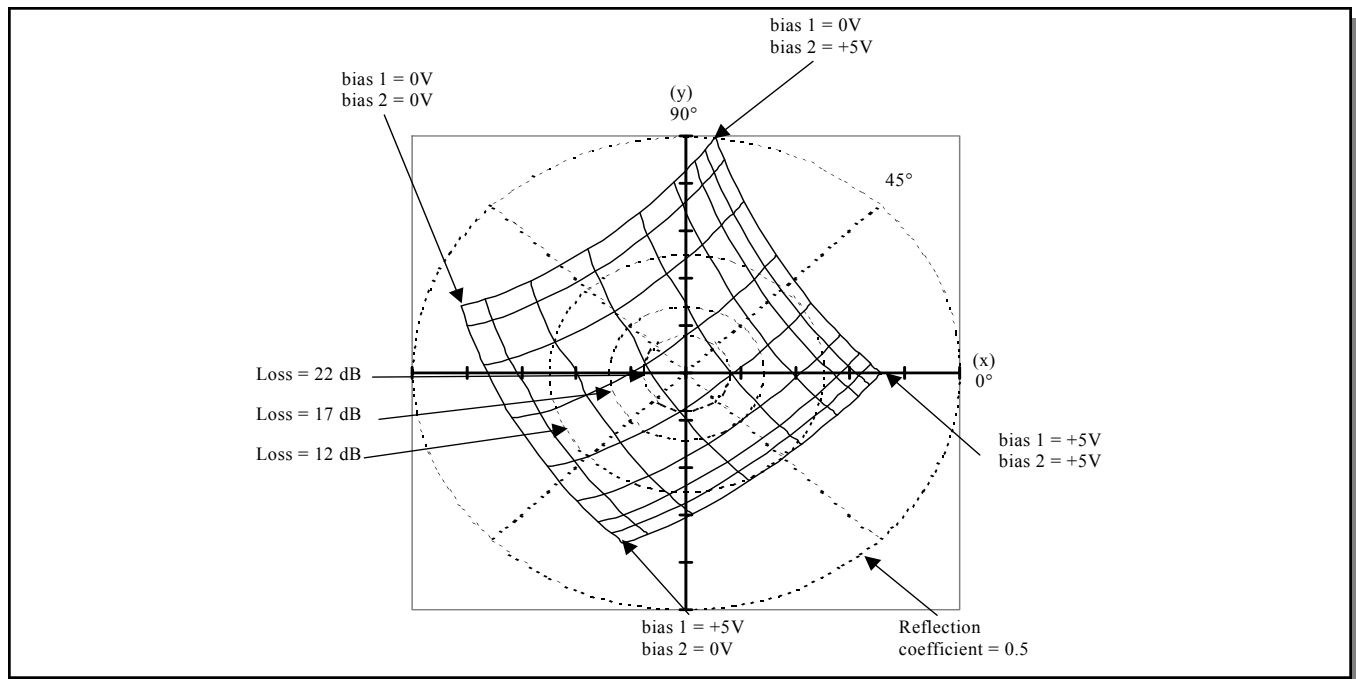


Figure 1B



5. Tic marks on x,y axes refer to reflection coefficient in increments of 0.1V. Reflection coefficients vary from -0.5 to +0.5 on both the x and y axes.
6. Data is for vector modulators driven by linearizers per attached schematic.
7. Inputs to the linearizers vary from 0 to 5V.
8. The phase with the inputs to both linearizers set to +5V is arbitrarily called zero degrees.

Phase and Attenuation of SA90-0001 vs. Bias Current^{9,10}

Figure 2A

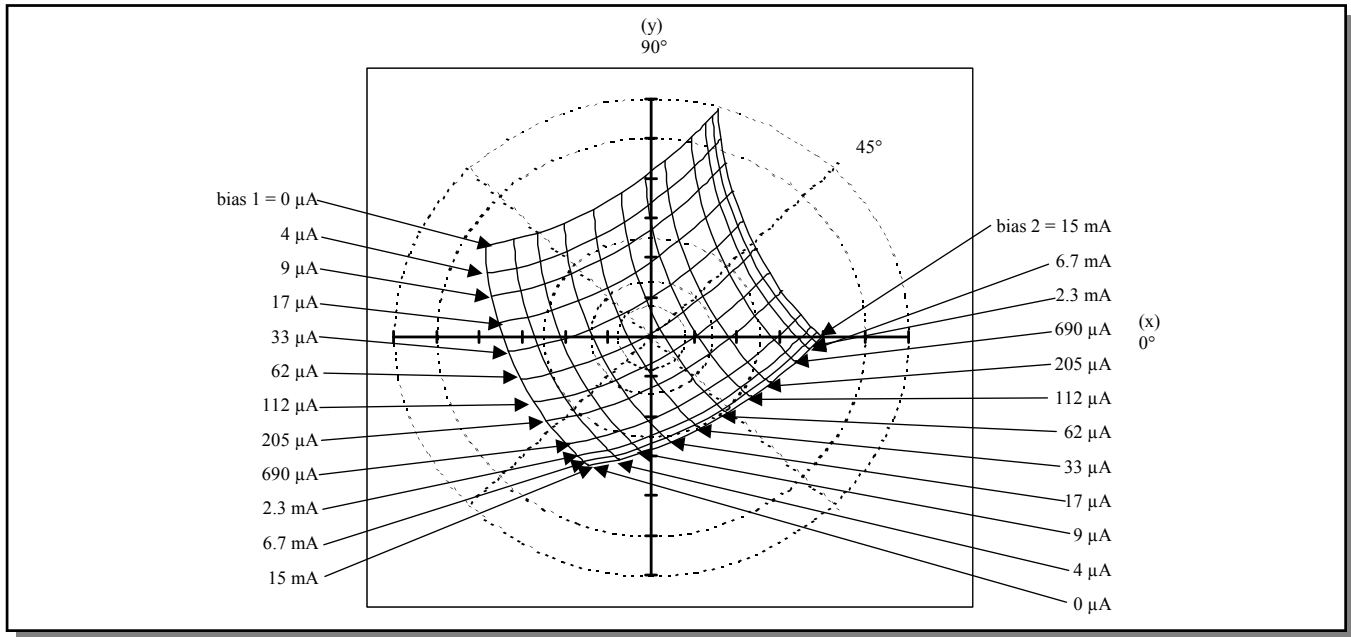
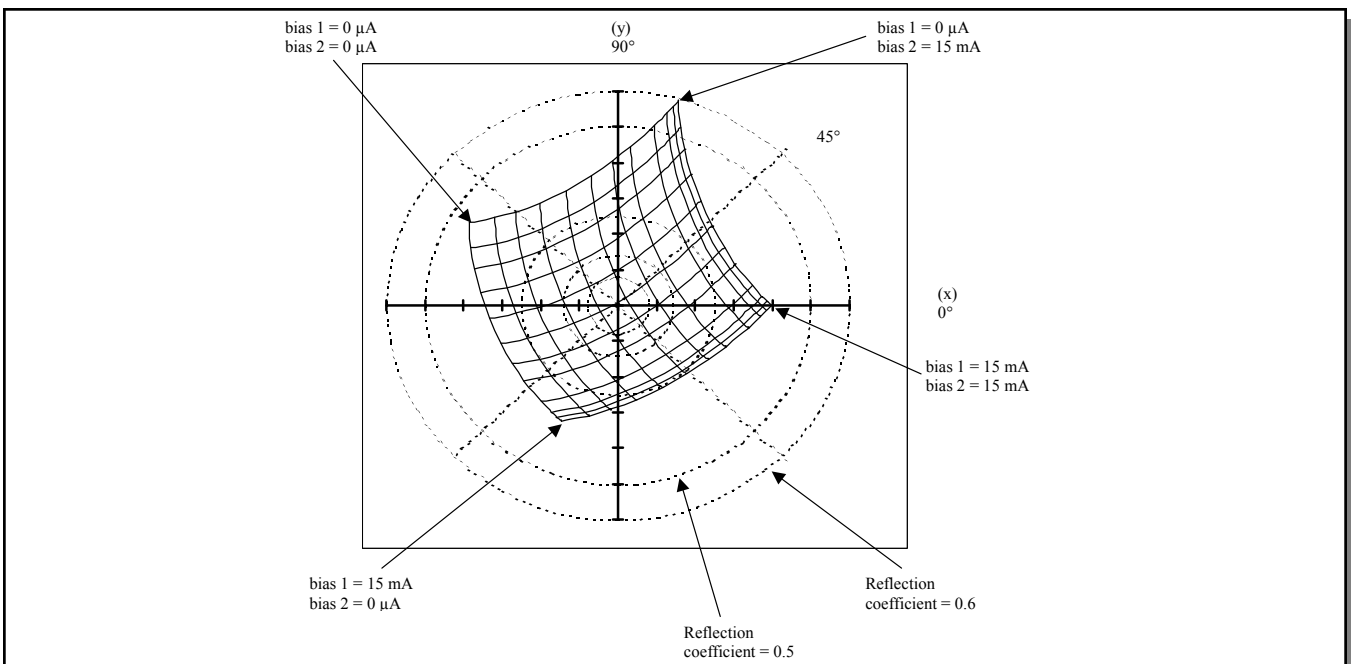


Figure 2B



9. Tic marks on x,y axes refer to reflection coefficient in increments of 0.1. Reflection coefficients vary from -0.6 to +0.6 on both the x and y axes.
10. The phase with the inputs to both linearizers set to +15mA is arbitrarily called zero degrees.

Handling Procedures

Please observe the following precautions to avoid damage:

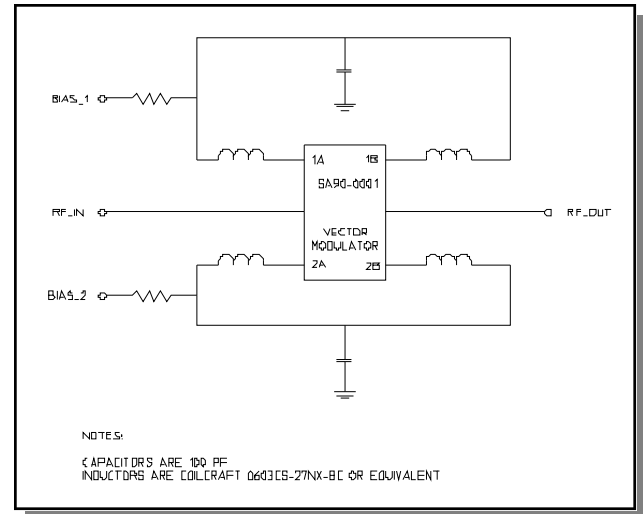
Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

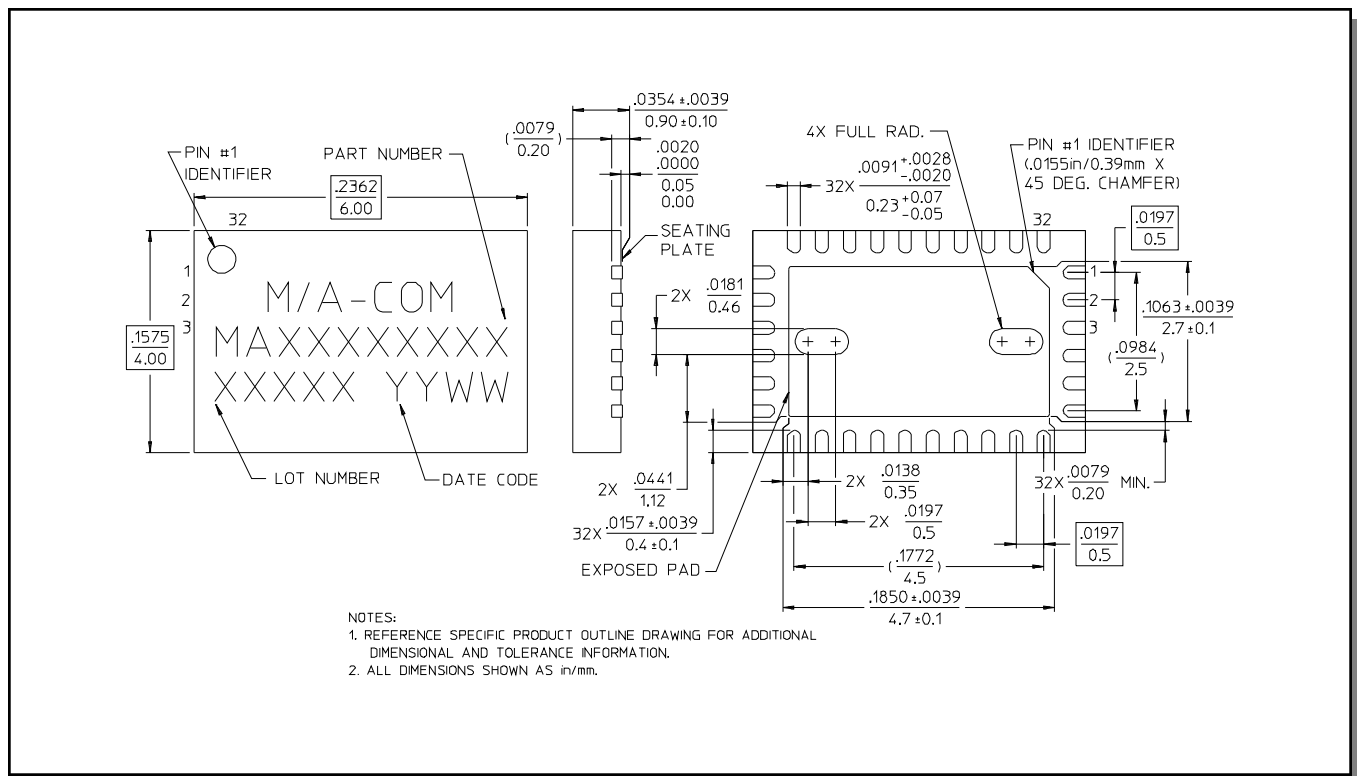
Moisture Sensitivity

The MSL rating for this part is defined as Level 2 per IPC/JEDEC J-STD-020. Parts shall be stored and/or baked as required for MSL Level 2 parts.

Schematic with Off-Chip Components



CSP-6, 4 x 6 mm, 32-lead, PQFN[†]



[†] Reference Application Note M538 for lead-free solder reflow recommendations.