

Features

- Attenuation: 1 dB Steps to 50 dB
- Single Positive Supply
- Contains Internal DC to DC Converter
- Low DC Power Consumption
- Small Footprint, JEDEC Package
- Integral TTL Driver
- 50 ohm Impedance
- Lead-Free CSP-1 Package
- 100% Matte Tin Plating over Copper
- Halogen-Free "Green" Mold Compound
- 260°C Reflow Compatible
- RoHS* Compliant Version of AT90-1106

Description

M/A-COM's MAAD-007080-000100 is a GaAs FET 6-bit digital attenuator with integral TTL driver. Step size is 1 dB providing a 50 dB total attenuation range. This device is in a PQFN plastic surface mount package. MAAD-007080-000100 is ideally suited for use where accuracy, fast speed, very low power consumption and low costs are required. For dual supply designs without switching noise, use MAAD-007082-000100.

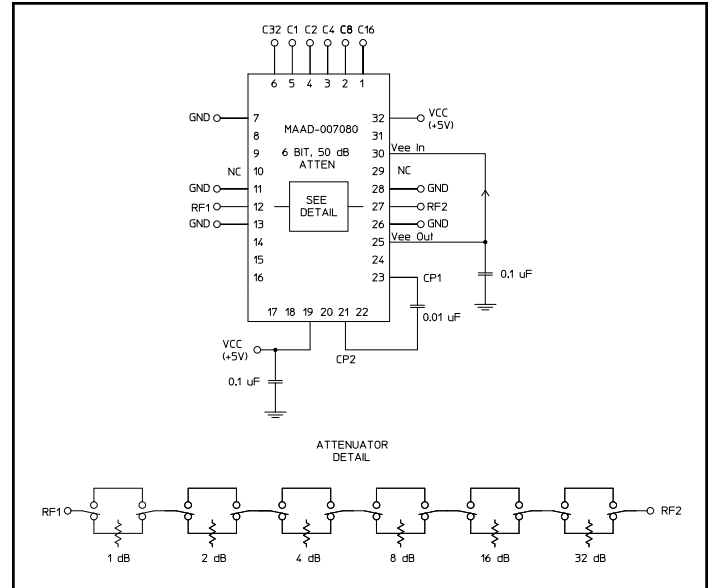
Ordering Information

Part Number	Package
MAAD-007080-00100	Bulk Packaging
MAAD-007080-001TR	1000 piece reel
MAAD-0007080-001TB	Sample Test Board

Note: Reference Application Note M513 for reel size information.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

Functional Schematic



Pin Configuration¹

Pin No.	Function	Pin No.	Function
1	C16	17	NC
2	C8	18	NC
3	C4	19	+Vcc
4	C2	20	NC
5	C1	21	Cp
6	C32	22	NC
7	GND	23	Cp
8	NC	24	NC
9	NC	25	-Vee ³
10	NC ²	26	GND
11	GND	27	RF2
12	RF1	28	GND
13	GND	29	NC ²
14	NC	30	-Vee ³
15	NC	31	NC
16	NC	32	+Vcc

1. The exposed pad centered on the package bottom must be connected to RF and DC ground. (For PQFN Packages)
2. Pins 10 & 29 must be isolated
3. -Vee is produced internally and requires a .1µF cap to GND. Generated noise is typical of switching DC-DC Converters.

Digital Attenuator 50.0 dB, 6-Bit, TTL Driver, DC-2.4 GHz

Rev. V4

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.

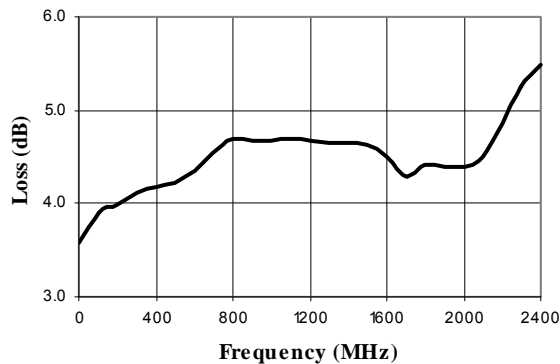
Truth Table (Digital Attenuator)

C32	C16	C8	C4	C2	C1	Attenuation
0	0	0	0	0	0	Loss, Reference
0	0	0	0	0	1	1.0 dB
0	0	0	0	1	0	2.0 dB
0	0	0	1	0	0	4.0 dB
0	0	1	0	0	0	8.0 dB
0	1	0	0	0	0	16.0 dB
1	0	0	0	0	0	32.0 dB
1	1	0	0	1	0	50.0 dB

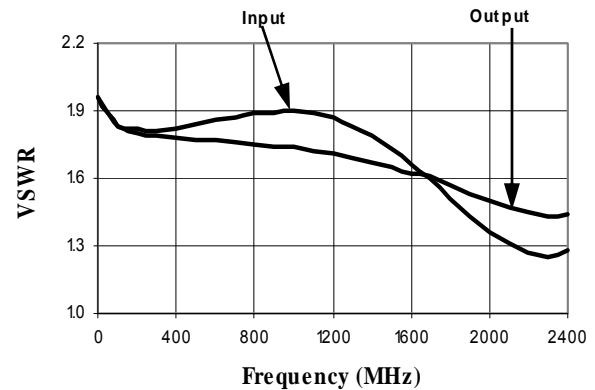
0 = TTL Low; 1 = TTL High

Typical Performance Curves

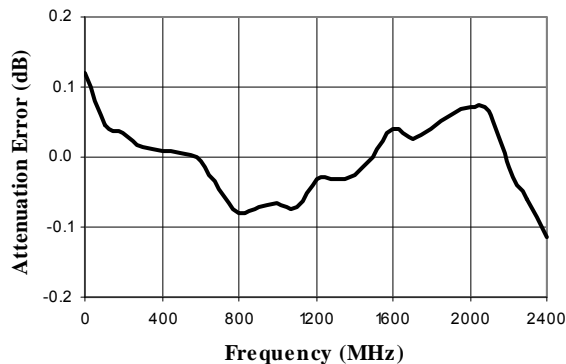
Insertion Loss



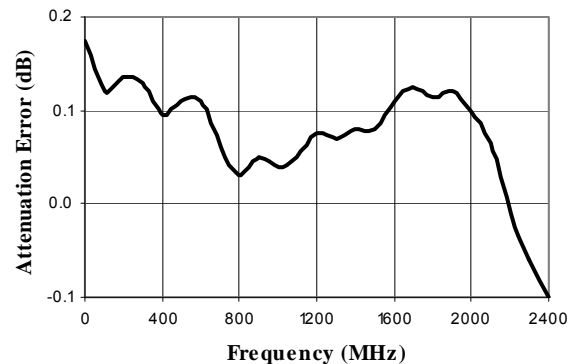
VSWR @ Insertion Loss



Attenuation Error, 1 dB Bit

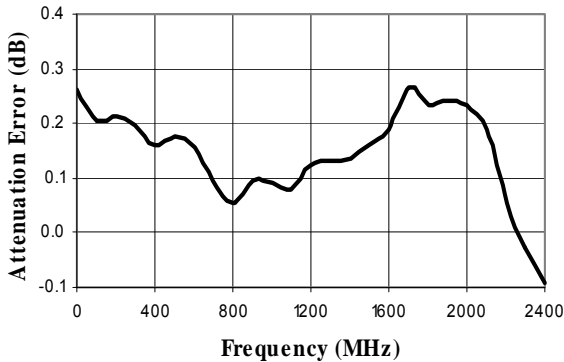


Attenuation Error, 2 dB Bit

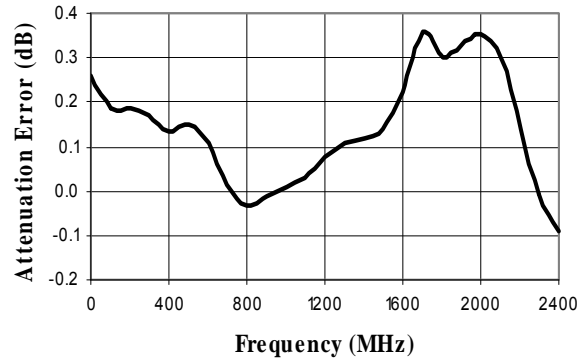


Typical Performance Curves

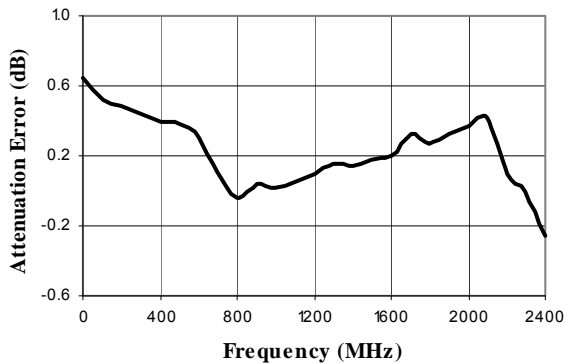
Attenuation Error, 4 dB Bit



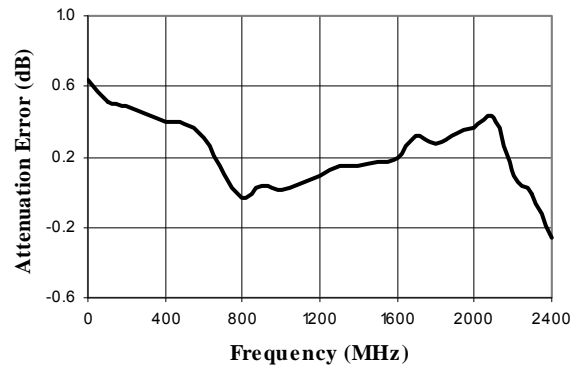
Attenuation Error, 8 dB Bit



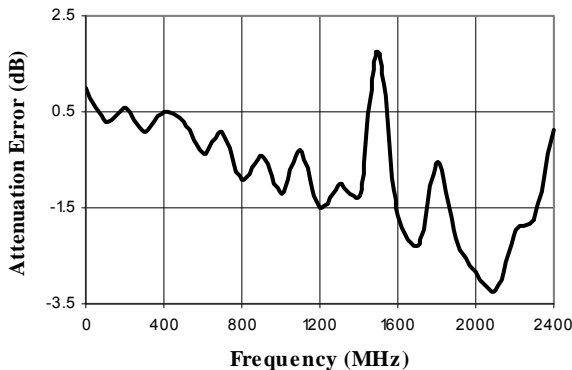
Attenuation Error, 16 dB Bit



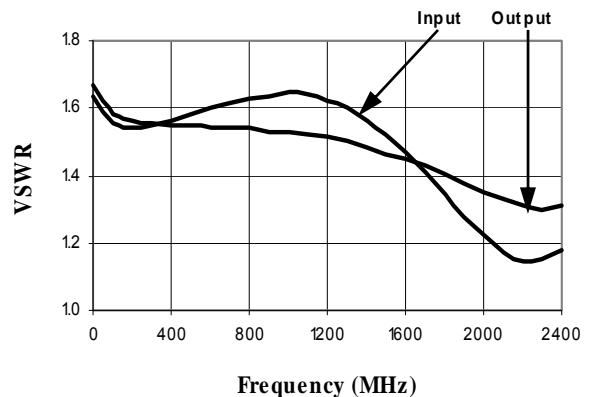
Attenuation Error, 32 dB Bit



Attenuation Error, Max. Attenuation

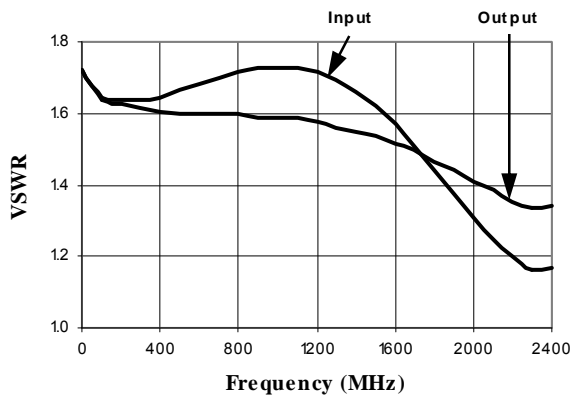


VSWR, 1 dB Bit

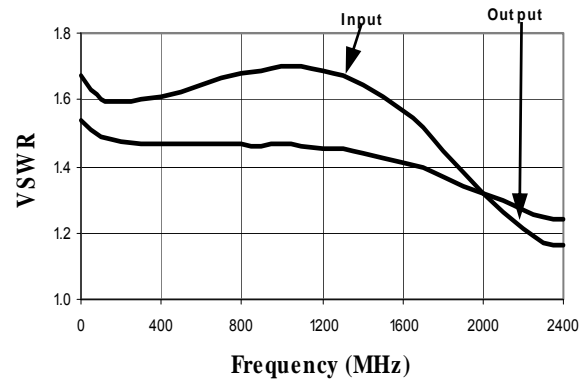


Typical Performance Curves

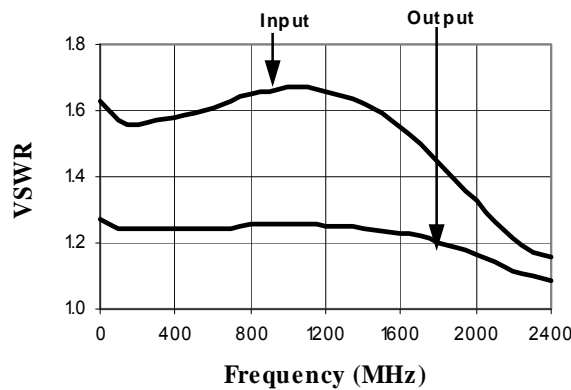
VSWR, 2 dB Bit



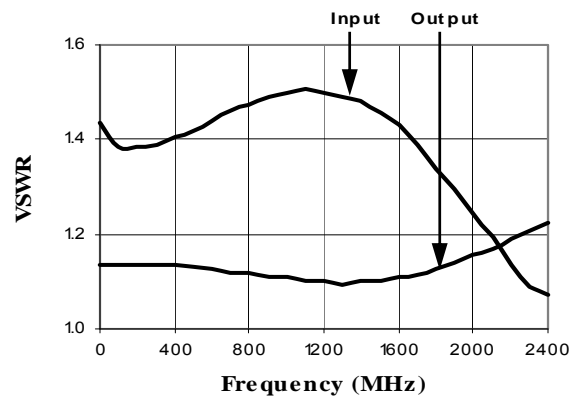
VSWR, 4 dB Bit



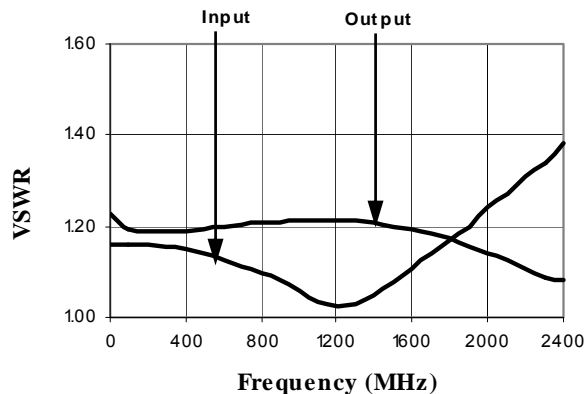
VSWR, 8 dB Bit



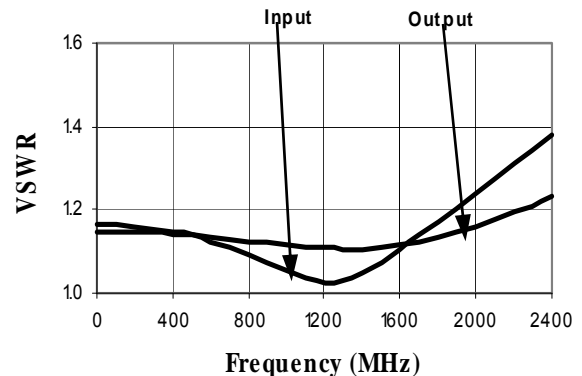
VSWR, 16 dB Bit



VSWR, 32 dB Bit

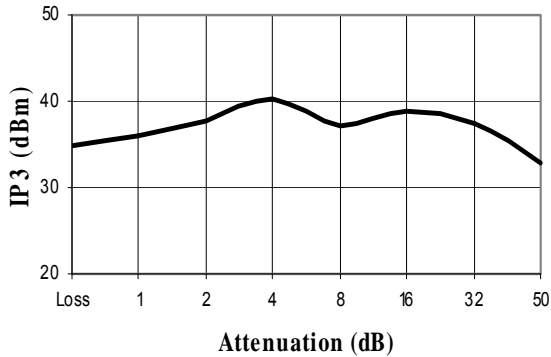


VSWR, Maximum attenuation

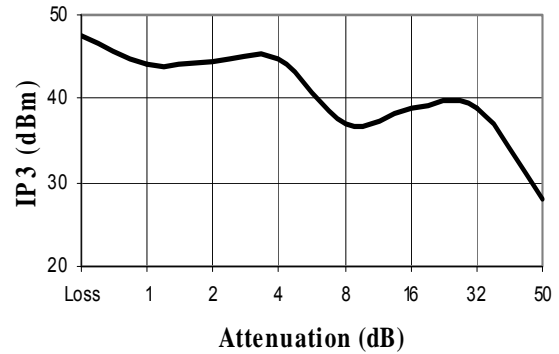


Typical Performance Curves

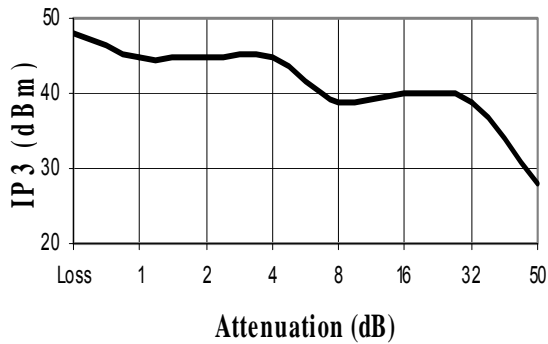
Maximum IP3 over Temperature Range and Attenuation @ 50 MHz



Maximum IP3 over Temperature Range and Attenuation @ 950 MHz



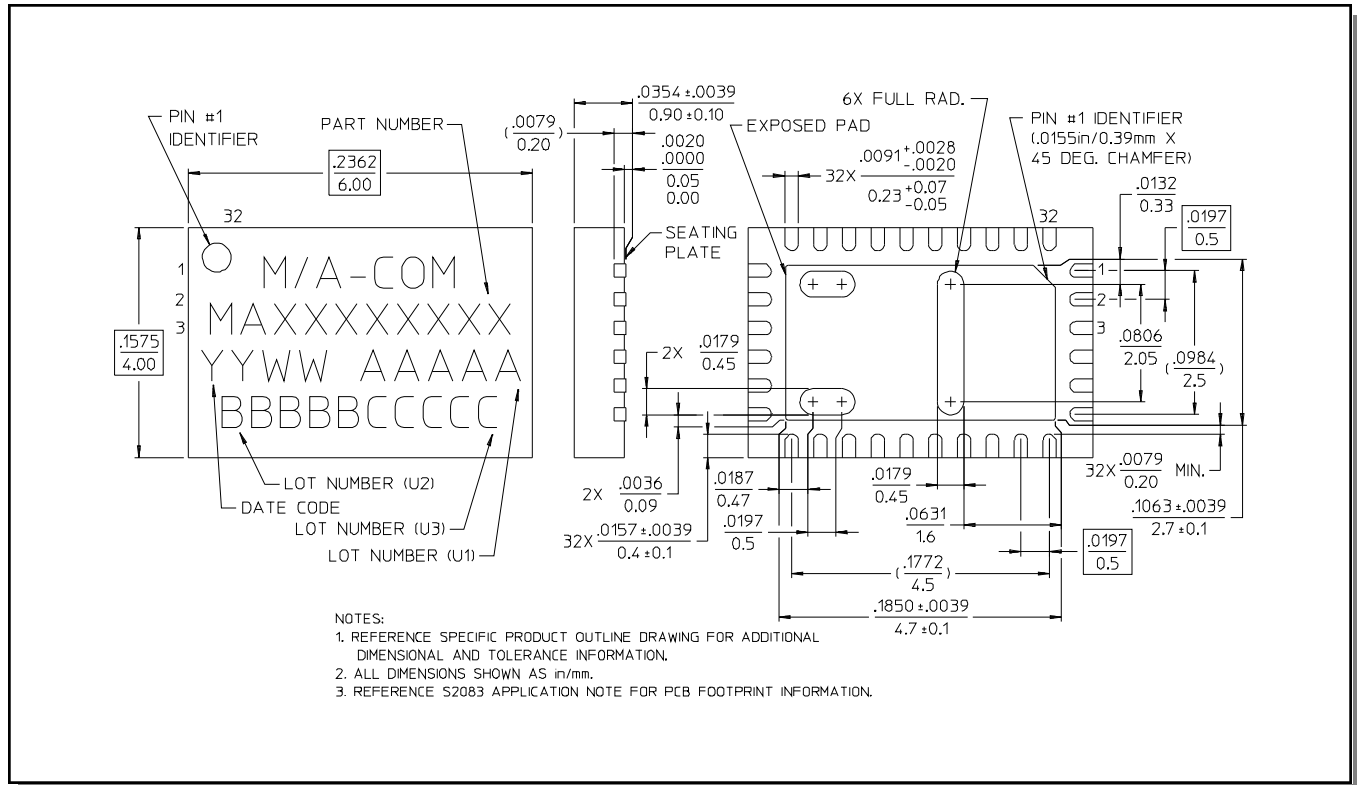
Maximum IP3 over Temperature Range and Attenuation @ 1900 MHz



Digital Attenuator 50.0 dB, 6-Bit, TTL Driver, DC-2.4 GHz

Rev. V4

CSP-1, Lead-Free 4 x 6 mm, 32-lead PQFN†



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