



# Digital Attenuator, 31.5 dB, 6-Bit, TTL Driver, DC - 2.0 GHz

V 5.00

AT65-0107

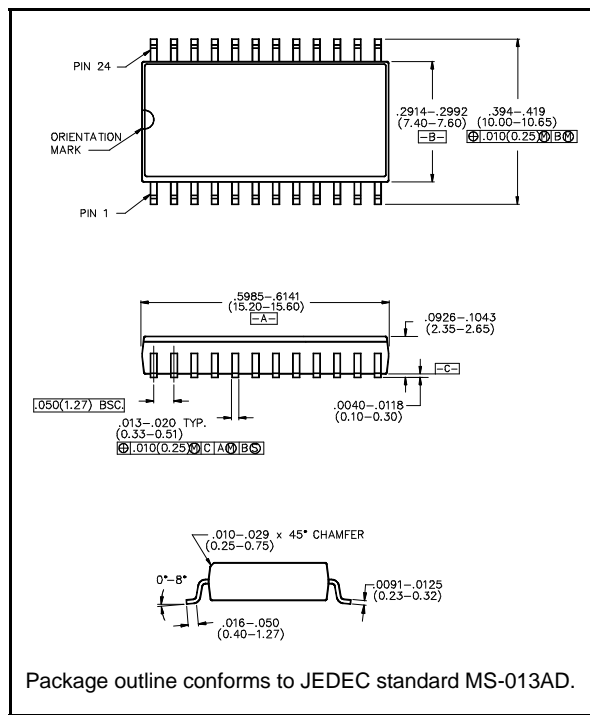
## Features

- Attenuation: 0.5 dB Steps to 31.5 dB
- Low DC Power Consumption
- Plastic SOIC, Wide Body, SMT Package
- Integral TTL Driver
- 50 ohm Impedance
- Test Boards are Available
- Tape and Reel Packaging Available

## Description

M/A-COM's AT65-0107 is a GaAs FET 6-bit digital attenuator with a 0.5 dB minimum step size and a 31.5 dB total attenuation range. This device is in a SOIC-24 wide body, plastic surface mount package. The AT65-0107 is ideally suited for use where accuracy, fast speed, very low power consumption and low costs are required.

## SOW-24



## Electrical Specifications: $T_A = 25^\circ\text{C}$

Parameter	Test Conditions	Frequency	Units	Min	Typ	Max
Insertion Loss	—	DC - 1.0 GHz	dB	—	3.1	3.6
		DC - 2.0 GHz	dB	—	3.6	4.2
Attenuation Accuracy	Any Bit or Combination of Bits	DC - 2.0 GHz	dB	—	—	$\pm(.3 + 4\% \text{ of atten.})$
VSWR	Full Range	DC - 2.0 GHz	Ratio	—	1.8:1	2:1
Switching Speed <sup>1</sup>	50% Cntl to 90%/10% RF 10% to 90% or 90% to 10%	—	nS	—	75	150
		—	nS	—	20	50
1 dB Compression	—	50 MHz	dBm	—	+21	—
		0.5 - 2.0 GHz	dBm	—	+29	—
Input IP <sub>3</sub>	Two-tone inputs up to +5 dBm	50 MHz	dB	—	+35	—
		0.5-2.0 GHz	dB	—	+48	—
V <sub>cc</sub>	—	—	V	4.75	5.0	5.25
-V <sub>ee</sub>	—	—	V	-8.0	-5.0	-4.75
Logic "0"	Sink Current is 20 $\mu\text{A}$ max.	—	V	0.0	—	0.8
Logic "1"	Source Current is 20 $\mu\text{A}$ max.	—	V	2.0	—	5.0
I <sub>cc</sub>	V <sub>cc</sub> min to max, Logic "0" or "1"	—	mA	—	0.2	6
-I <sub>ee</sub>	-V <sub>ee</sub> min to max, Logic "0" or "1"	—	mA	—	-0.2	-1

1. Decoupling capacitors (.01  $\mu\text{F}$ ) are required on Power Supply lines.

### Pin Configuration

Pin #	Function	Pin #	Function
1	GND	13	RF
2	GND	14	GND
3	GND	15	GND
4	C16	16	GND
5	C8	17	GND
6	-Vee	18	GND
7	+Vcc	19	GND
8	C4	20	GND
9	C2	21	GND
10	C1	22	GND
11	C0.5	23	GND
12	GND	24	RF

### Absolute Maximum Ratings <sup>2</sup>

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz	+27 dBm
0.5 - 2.0 GHz	+34 dBm
+Vcc	+5.5V
-Vee	-8.5V
Logic Voltages <sup>3</sup>	-0.5 to Vcc + 0.5V
Control Voltage	-0.5V to Vcc +0.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

2. Operation of this device above any one of these parameters may cause permanent damage.
3. Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

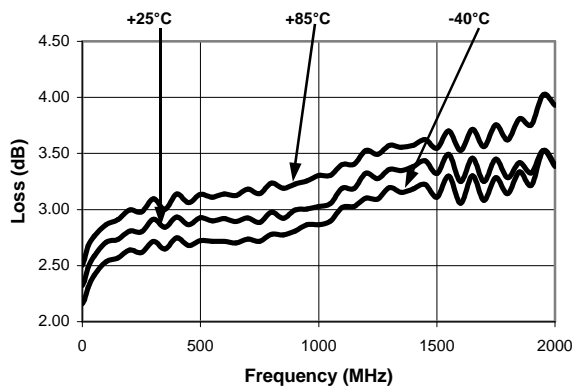
### Truth Table

C16	C8	C4	C2	C1	C0.5	Attenuation
0	0	0	0	0	0	Loss, Reference
0	0	0	0	0	1	0.5 dB
0	0	0	0	1	0	1.0 dB
0	0	0	1	0	0	2.0 dB
0	0	1	0	0	0	4.0 dB
0	1	0	0	0	0	8.0 dB
1	0	0	0	0	0	16.0 dB
1	1	1	1	1	1	31.5 dB

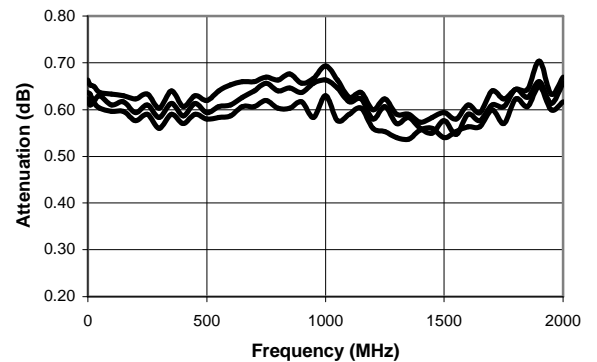
0 = TTL Low; 1 = TTL High

### Typical Performance Curves

Loss vs. Temperature



0.5 dB Bit vs. Temperature



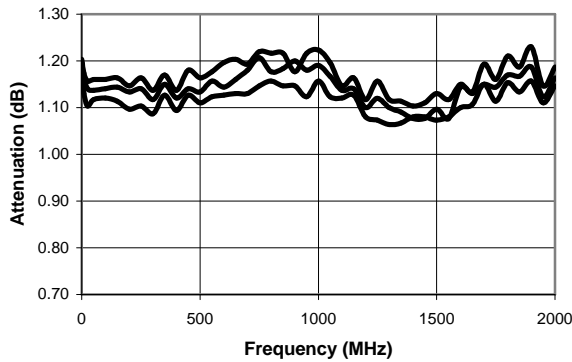
Specifications subject to change without notice.

- North America: Tel. (800) 366-2266
- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
- Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

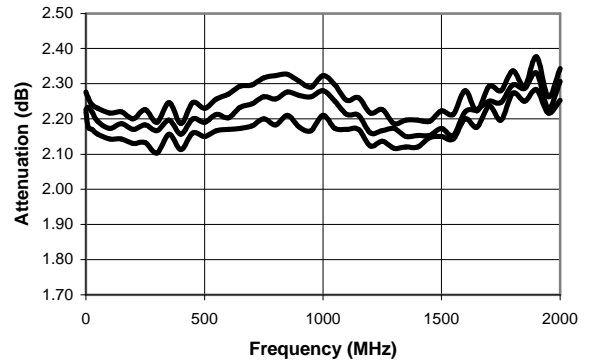
Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

Typical Performance Curves

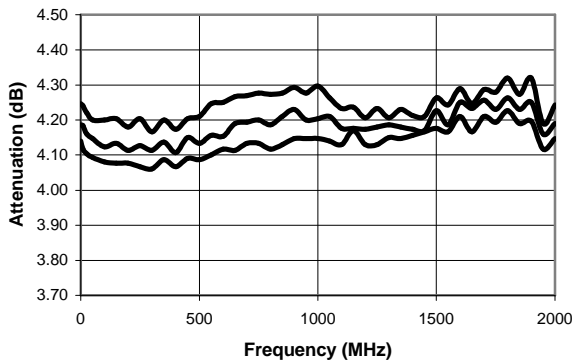
1 dB Bit vs. Temperature



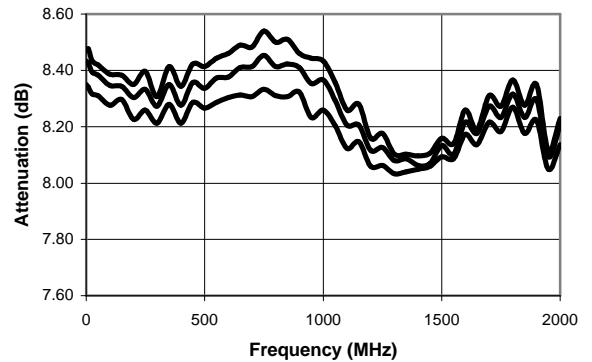
2 dB Bit vs. Temperature



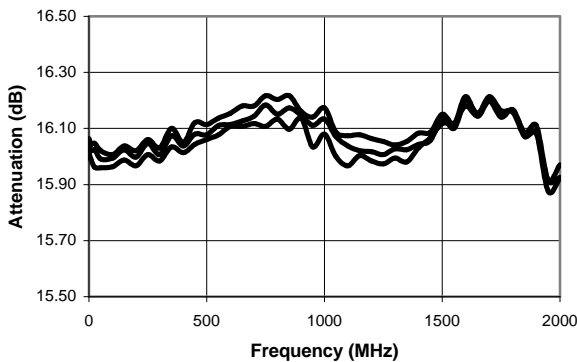
4 dB Bit vs. Temperature



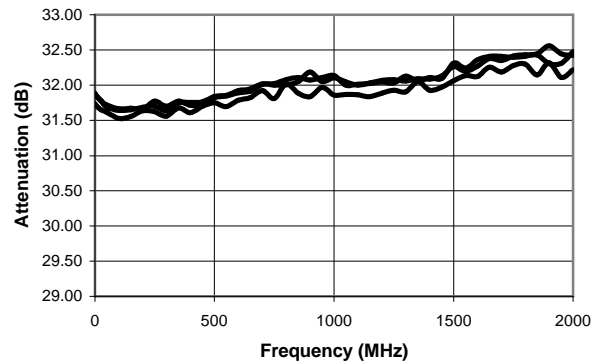
8 dB Bit vs. Temperature



16 dB Bit vs. Temperature



Max Attenuation vs. Temperature



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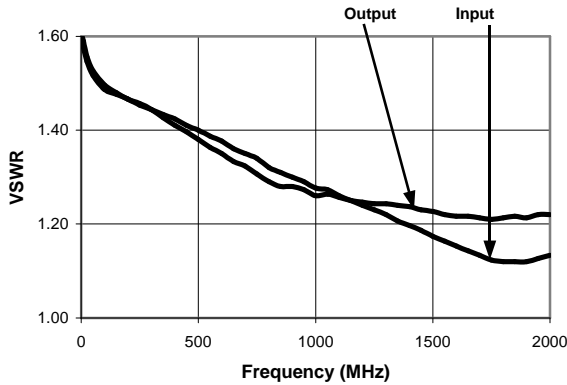
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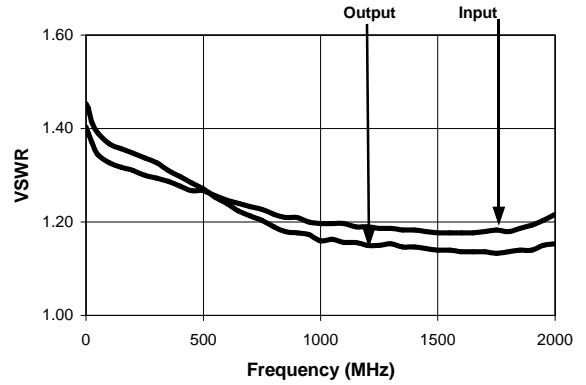


Typical Performance Curves

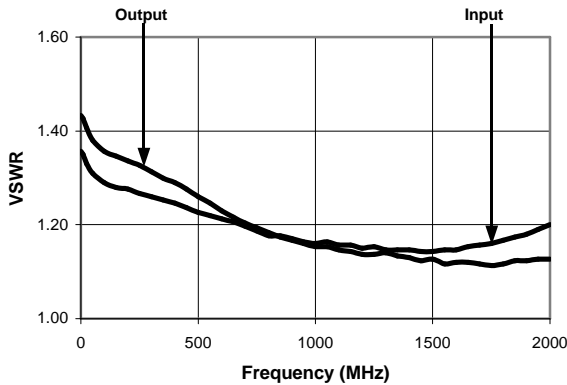
VSWR @ Insertion Loss



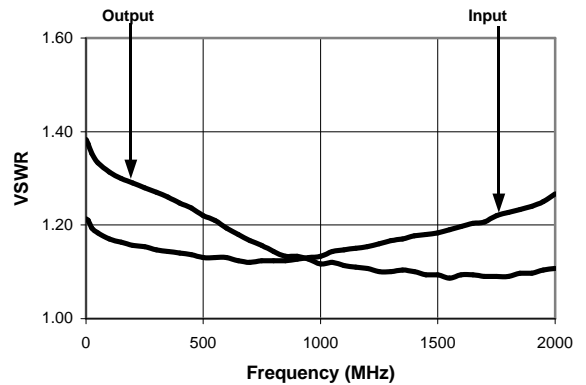
VSWR, 0.5 dB Bit



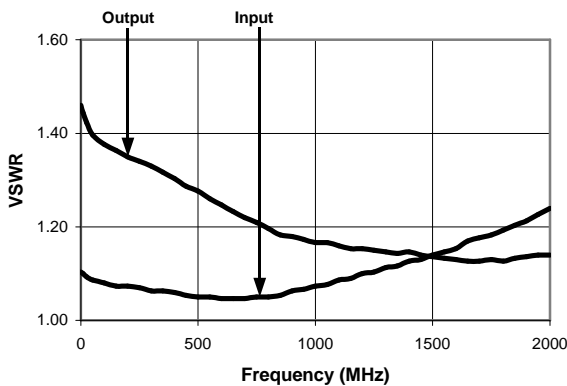
VSWR, 1 dB Bit



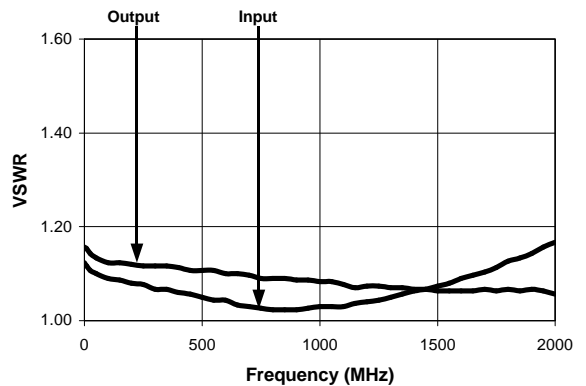
VSWR, 2 dB Bit



VSWR, 4 dB Bit



VSWR, 8 dB Bit



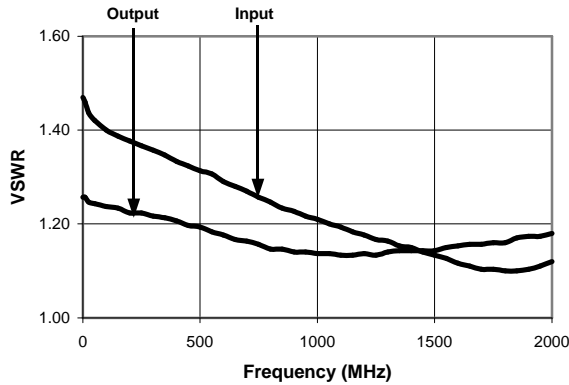
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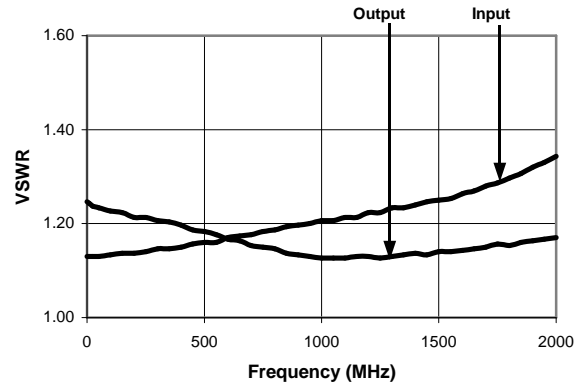
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### Typical Performance Curves

*VSWR, 16 dB Bit*



*VSWR, Maximum Attenuation*



### Ordering Information

Part Number	Package
AT65-0107	Bulk Packaging
AT65-0107TR	Tape and Reel (1K Reel)
AT65-0107-TB	Units Mounted on Test Board

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