

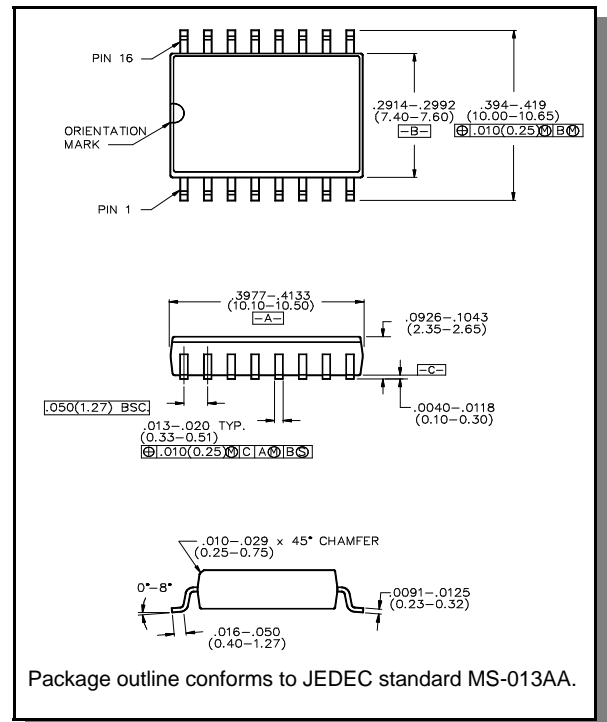
## Features

- Attenuation: 1.0 dB Steps to 31 dB
- Low DC Power Consumption
- Plastic SOW, Wide Body, SMT Package
- Integral TTL Driver
- 50 ohm Impedance
- Test Boards are Available
- Tape and Reel Packaging Available

## Description

M/A-COM's AT65-0263 is a GaAs FET 5-bit digital attenuator with integral TTL driver. Step size is 1.0 dB providing 31 dB total attenuation range. This device is in a SOW-16 plastic surface mount package. The AT65-0263 is ideally suited for use where accuracy, fast speed, very low power consumption and low costs are required.

## SOW-16



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

Parameter	Test Conditions	Frequency	Units	Min	Typical	Max
Insertion Loss	—	DC-1.0 GHz	dB	—	2.6	2.9
		DC-2.0 GHz	dB	—	2.8	3.2
Attenuation Accuracy	Individual Bits 1-2-4-8-16	DC-2.0 GHz	dB	—	—	$\pm(.5 + 5\% \text{ of atten setting})$
	Any Combination of bits 3 - 29 dB	DC-2.0 GHz	dB	—	—	$\pm(.5 + 5\% \text{ of atten setting})$
	Any Combination of bits 30 - 31 dB	DC-2.0 GHz	dB	—	—	$\pm(.7 + 7\% \text{ of atten setting})$
VSWR	Full Range	DC-2.0 GHz	Ratio	—	1.5:1	1.8:1
Switching Speed <sup>1</sup>	50% Cntl to 90%/10% RF	—	nS	—	75	150
	10% to 90% or 90% to 10%	—	nS	—	20	50
1 dB Compression	—	50 MHz	dBm	—	+21	—
		0.5-2.0 GHz	dBm	—	+29	—
Input $IP_3$	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	RF	9	C16
2	GND	10	Vcc
3	GND	11	Vee
4	GND	12	C8
5	GND	13	C4
6	GND	14	C2
7	GND	15	C1
8	RF	16	GND

**Truth Table**

C16	C8	C4	C2	C1	Attenuation
0	0	0	0	0	Loss, Reference
0	0	0	0	1	1.0 dB
0	0	0	1	0	2.0 dB
0	0	1	0	0	4.0 dB
0	1	0	0	0	8.0 dB
1	0	0	0	0	16.0 dB
1	1	1	1	1	31.0 dB

0 = TTL Low; 1 = TTL High

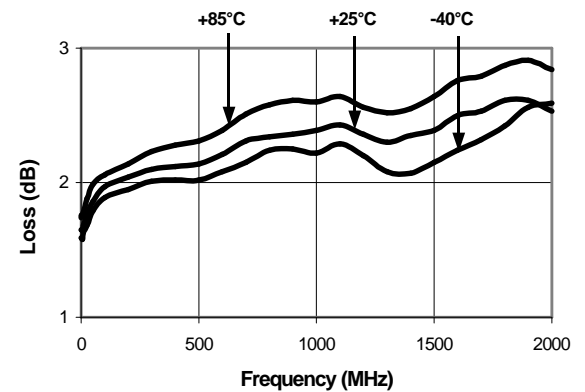
**Absolute Maximum Ratings <sup>2</sup>**

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

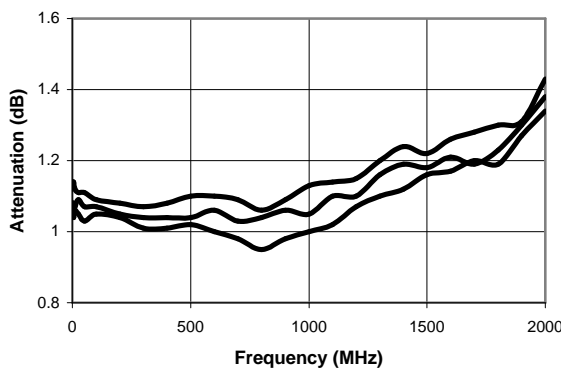
- Operation of this device above any one of these parameters may cause permanent damage.
- Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

**Typical Performance Curves**

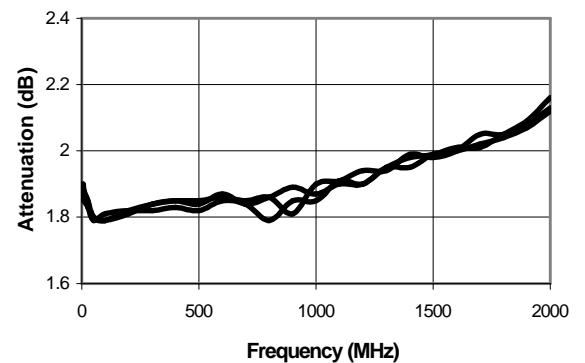
*Insertion Loss @ R, H & C*



**1 dB Bit @ R, H & C**



**2 dB Bit @ R, H & C**



Specifications subject to change without notice.

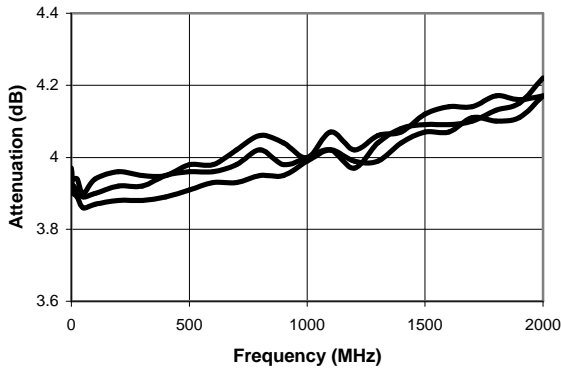
- North America: Tel. (800) 366-2266
- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
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Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

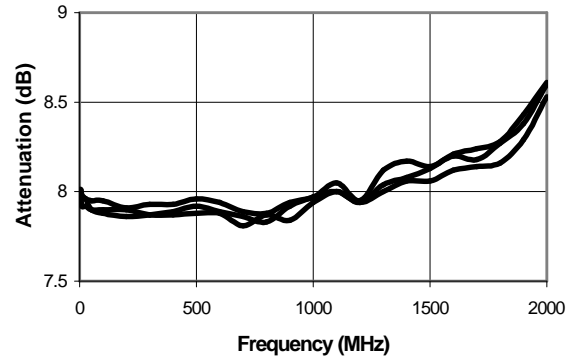


Typical Performance Curves

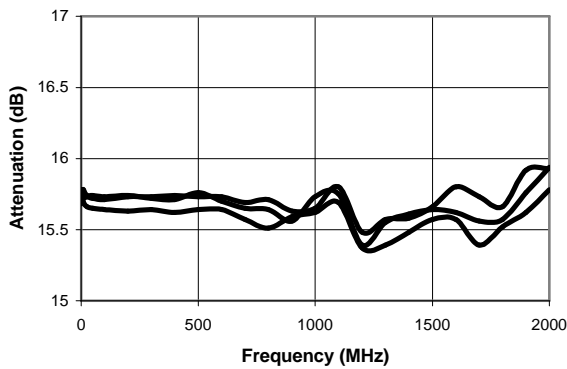
4 dB Bit @ R, H & C



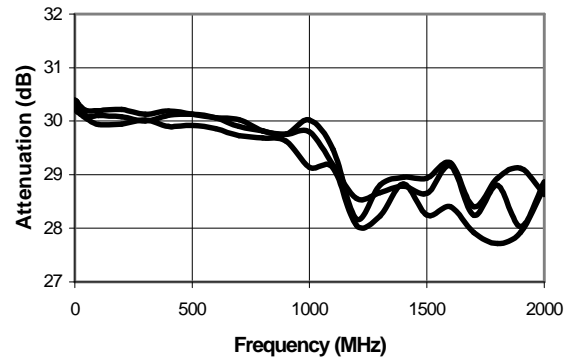
8 dB Bit @ R, H & C



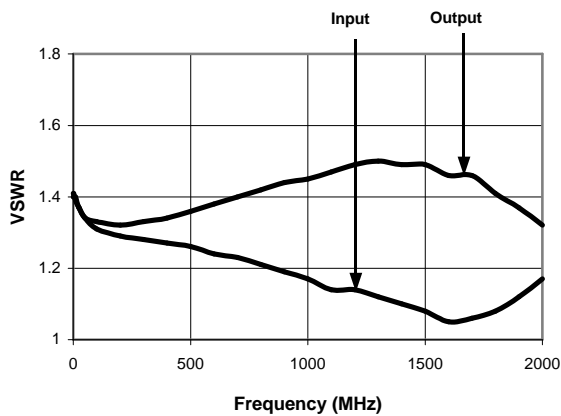
16 dB Bit @ R, H & C



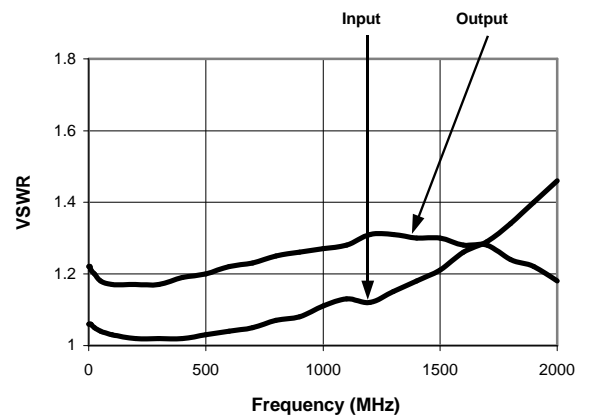
Max. Attenuation @ R, H & C



Maximum VSWR over Temp, Loss



Maximum VSWR over Temp, 1 dB Bit



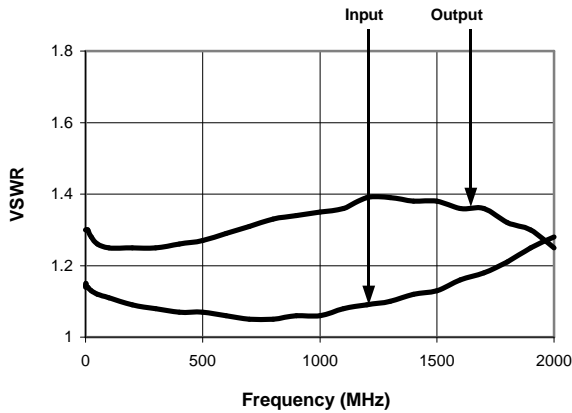
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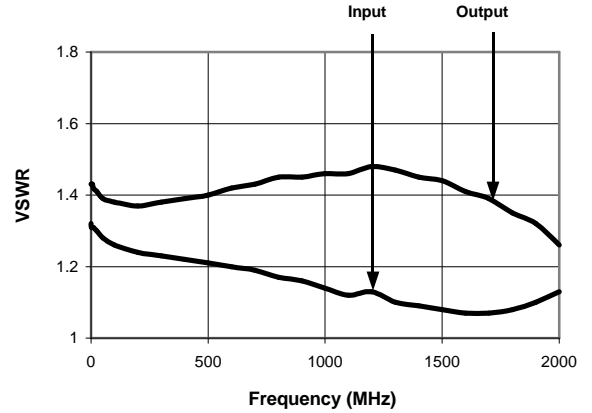
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Typical Performance Curves

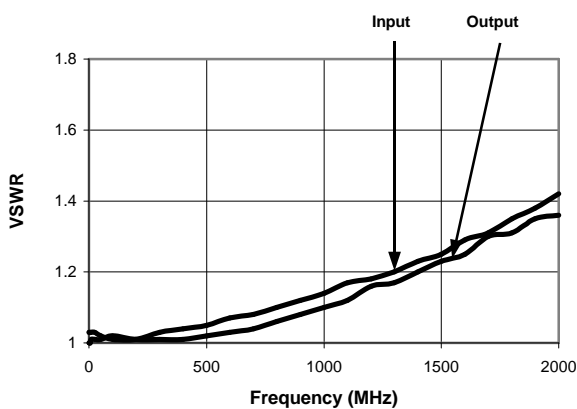
Maximum VSWR over Temp, 2 dB Bit



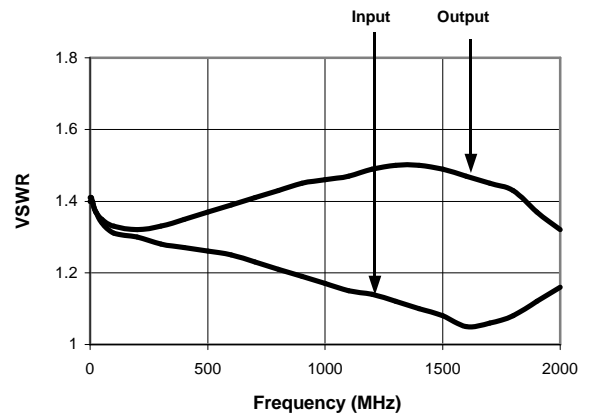
Maximum VSWR over Temp, 4 dB Bit



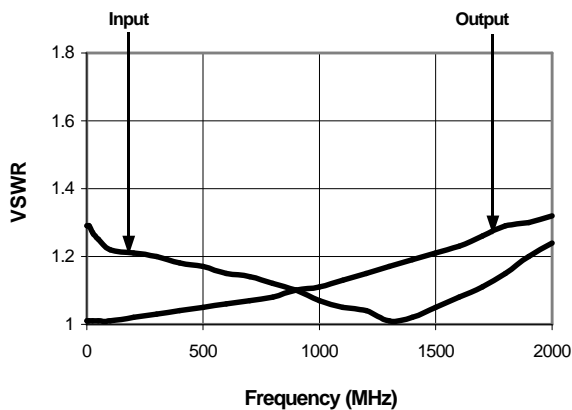
Maximum VSWR over Temp, 8 dB Bit



Maximum VSWR over Temp, 16 dB Bit



Maximum VSWR over Temp, Max Attenuation



Ordering Information

Part Number	Package
AT65-0263	Bulk Packaging
AT65-0263TR	Tape and Reel (1K Reel)
AT65-0263-TB	Units Mounted on Test Board

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