tyco Electronics

M/A-COM

Digital Attenuator, 31 dB, 5-Bit, TTL Driver, DC - 2.0 GHz

AT65-0263
V8

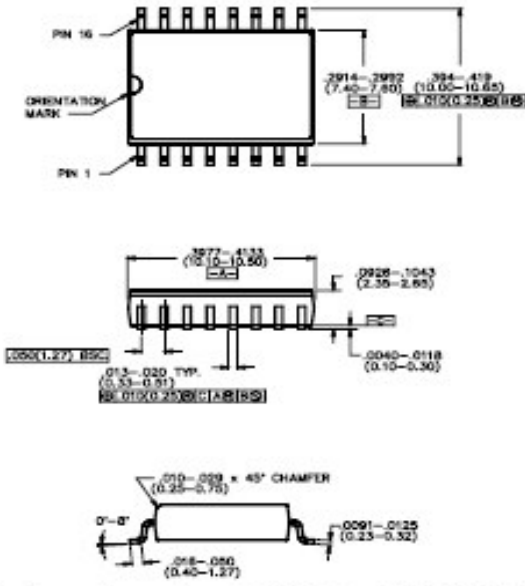
Features

- 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



Package outline conforms to JEDEC standard MS-013AA.

Pin Configuration

Pin No.	Function	Pin No.	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

Absolute Maximum Ratings [1]

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 2.0 GHz	 +27 dBm +34 dBm
+Vcc	+5.5V
-Vee	-8.5V
Control Voltage[2]	-0.5 to Vcc to +0.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

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

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Electrical Specifications: T_A = 25°C

Parameter	Test Conditions	Frequency	Units	Min.	Typ.	Max.
Insertion Loss	—	DC - 2.0 GHz	dB	—	2.8	3.2
Attenuation Accuracy	Individual Bi8ts 1-2-4-8-16 Any Combination of bits 3-29 dB Any Combination of bits 30-31 dB	DC - 2.0 GHz DC - 2.0 GHz DC - 2.0 GHz	dB dB dB	— — —	— — —	±(.5 +5% of atten setting) ±(.5+5% of atten setting) ±(.7+7% of atten setting)
VSWR	Full Range	DC - 2.0 GHz	Ratio	—	1.5:1	1.8:1
Switching Speed[1]	50% Cntl to 90%/10% RF 10% to 90% or 90% to 10%	— —	nS nS	— —	75 20	150 50
1 dB Compression	— —	50 MHz 0.5 - 2.0 GHz	dBm dBm	— —	+21 +24	— —
Input IP3	Two-tone inputs up to +5 dBm	50 MHz 0.5 - 2.0 GHz	dB dB	—	+35 +48	— —
Vcc -Vee	— —	— —	V V	4.75 -8.0	5.0 -5.0	5.5 -4.75
Logic “0”	Sink Current is 20 µA max.	—	V	0.0	—	0.8
Logic “1”	Source Current is 20 µA max.	—	V	2.0	—	5.0
Icc	Vcc min to max, Logic “0” or “1”	—	mA	—	0.2	6
-Iee	-Vee min to max, Logic “0” or “1”	—	mA	—	-0.2	-1
Thermal Resistance θ_{JA}	PCB mount on FR4 material, copper trace, still air at +25°C	—	°C/W	—	90-130	—

1. Decoupling capacitors (.01 µF) are required on power supply lines.

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	1	0	8.0 dB
1	0	1	1	0	16.0 dB
1	1	1	1	1	31.0 dB

0 = TTL Low; 1 = TTL High

Ordering Information

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

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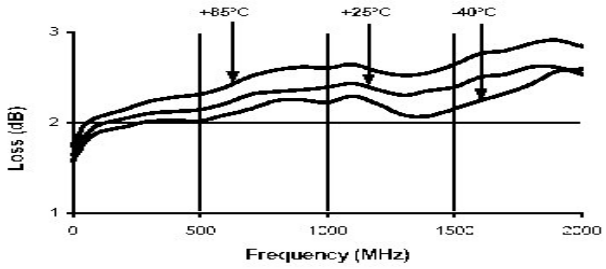
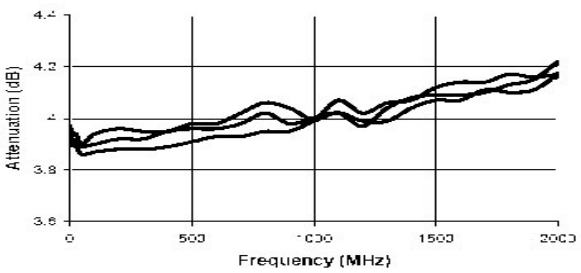
Typical Performance Curves

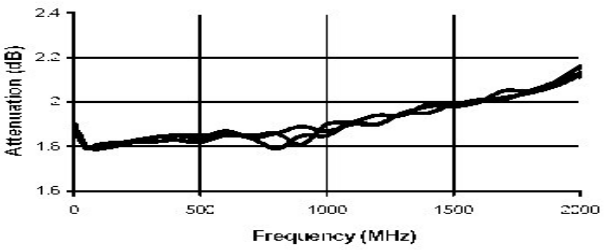
Insertion Loss @ R, H & C



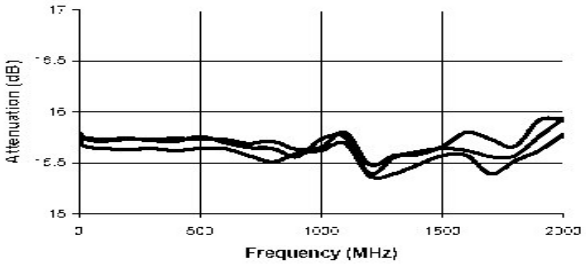
4 dB Bit @ R, H & C



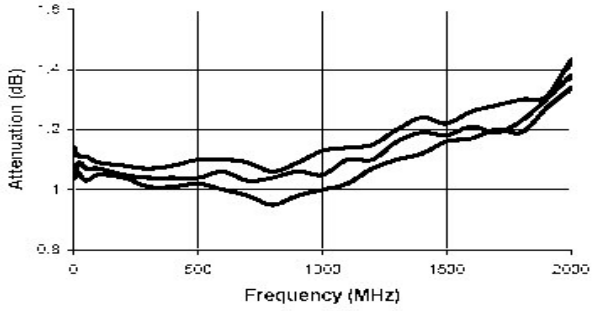
2 dB Bit @ R, H & C



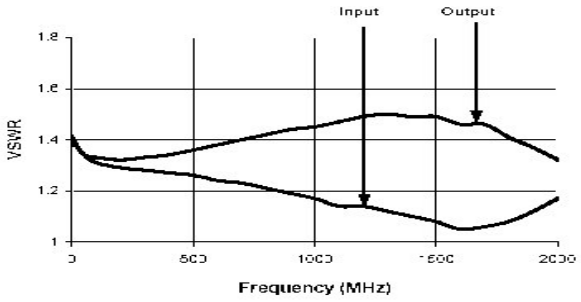
16 dB Bit @ R, H & C



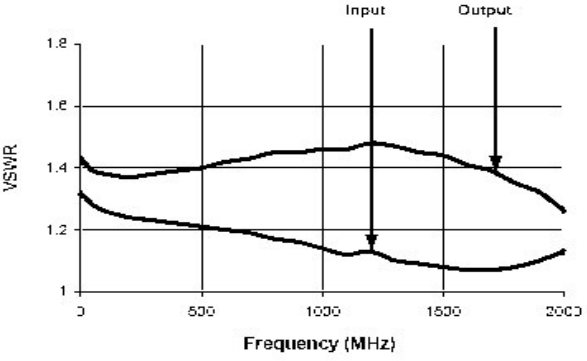
1 dB Bit @ R, H & C



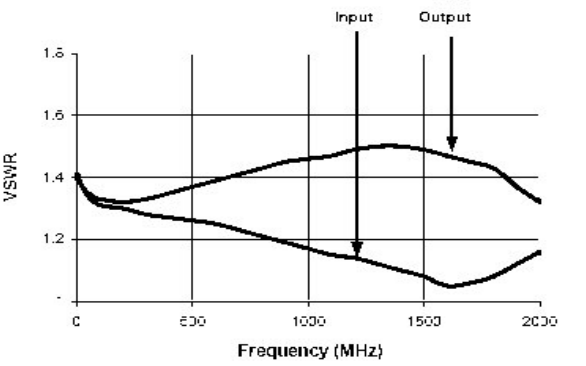
Maximum VSWR over Temp, Loss



Maximum VSWR over Temp, 4 dB Bit



Maximum VSWR over Temp, 16 dB Bit



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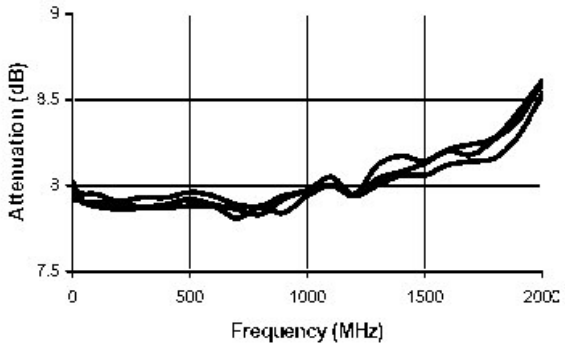
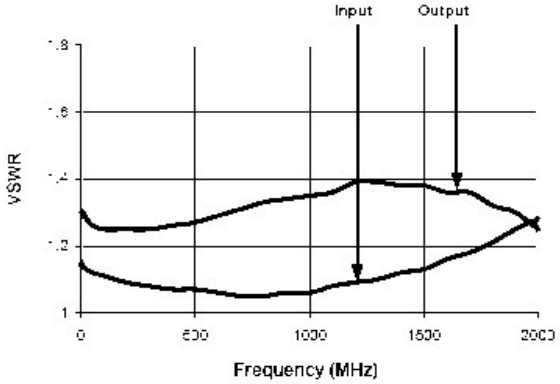
Typical Performance Curves

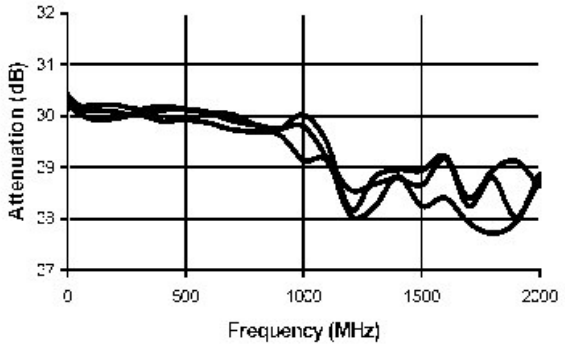
8 dB Bit @ R, H & C



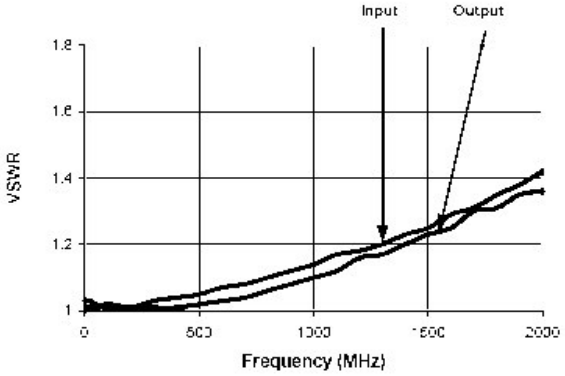
Maximum VSWR over Temp, 2 dB Bit



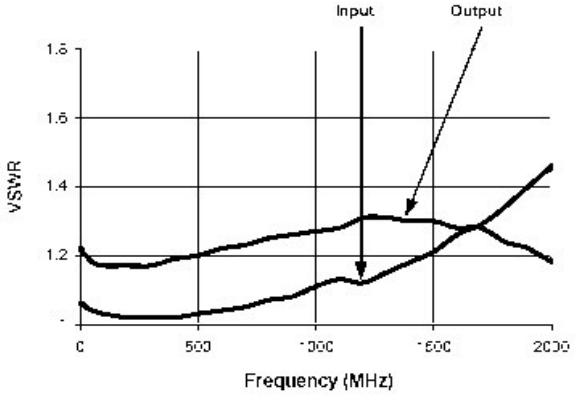
Max. Attenuation @ R, H & C



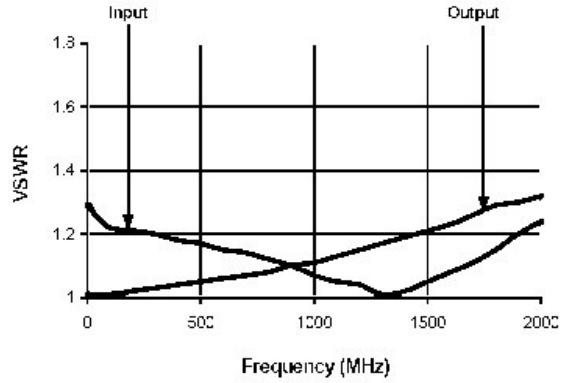
Maximum VSWR over Temp, 8 dB Bit



Maximum VSWR over Temp, 1 dB Bit



Maximum VSWR over Temp, Max Attenuation



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