



Digital Attenuator, 31 dB, 5-Bit, TTL Driver, DC - 2 GHz

V 3.00

AT20-0263

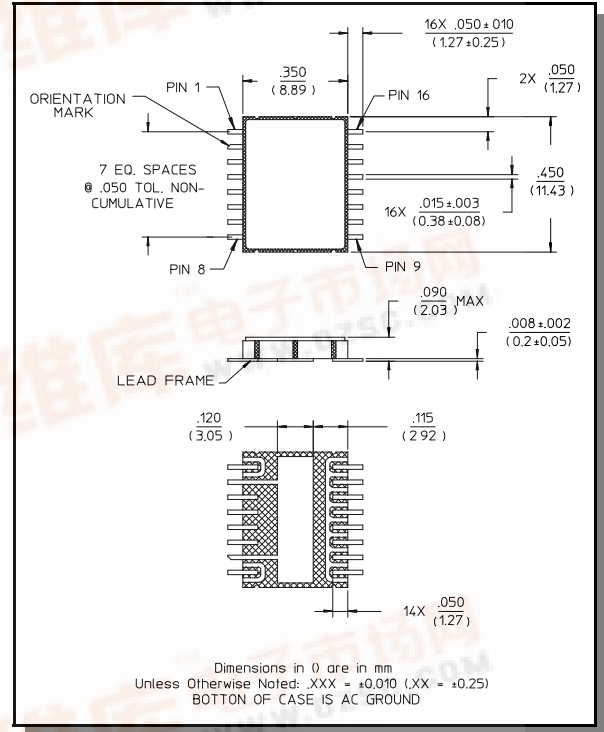
Features

- Attenuation: 1 dB steps to 31 dB
- Temperature Stability: ± 0.18 dB from -40°C to $+85^{\circ}\text{C}$ Typical
- Low DC Power Consumption
- Surface Mount Package
- Integral TTL Driver
- Low Cost/High Performance
- 50 Ohm Nominal Impedance

Description

M/A-COM's AT20-0263 is a GaAs FET 5-bit digital attenuator with a 1 dB minimum step size and 31 dB total attenuation. This attenuator and integral TTL driver is in a ceramic 16-lead surface mount package. The AT20-0263 is ideally suited for use where accuracy, fast switching, very low power consumption and low intermodulation products are required. Typical applications include dynamic range setting in precision receiver circuits and other gain/leveling control circuits. Available with enhanced performance as fully hermetic version. Environmentally screenable as P/N AT-263.

CR-12



Electrical Specifications: $T_A = 25^{\circ}\text{C}^1$

Parameter	Test Conditions	Frequency	Units	Min	Typ	Max
Reference Insertion Loss	—	DC - 0.5 GHz DC - 1.0 GHz DC - 2.0 GHz	dB dB dB	— — —	2.0 2.2 2.5	2.4 2.8 3.0
Attenuation Accuracy ²	Any Single Bit Any Combination of Bits	DC - 1.0 GHz DC - 2.0 GHz	dB dB	$\pm (0.25 + 3\%$ of atten setting in dB) dB or ± 0.4 dB, whichever is greater		
VSWR	—	DC - 2.0 GHz	Ratio	—	—	1.6:1
Trise, Tfall	10% to 90%	—	ns	—	50	—
Ton, Toff	50% Control to 90/10% RF	—	ns	—	150	—
Transients	In-Band (peak-peak)	—	mV	—	50	—
1 dB Compression	Input Power Input Power	0.05 GHz 0.5 - 2.0 GHz	dBm dBm	— —	+20 +28	— —
Input IP3	For two-tone Input Power Up to +5 dBm	0.05 GHz 0.5 - 2.0 GHz	dBm dBm	— —	+40 +48	— —
Input IP2	For two-tone Input Power Up to +5 dBm	0.05 GHz 0.5 - 2.0 GHz	dBm dBm	— —	+45 +68	— —
Vcc	—	—	V	4.5	5.0	5.5
Vee	—	—	V	-8.0	—	-5.0

1. All specifications apply when operated with bias voltages of +5V for Vcc and -5.0V for Vee.
2. This attenuator is guaranteed monotonic.



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

Parameter	Test Conditions	Frequency	Units	Min	Typ	Max
icc	$V_{cc} = 4.5$ to 5.5V $V_{ctl} = 0$ to 0.8V , or $V_{cc} - 2.1\text{V}$ to V_{cc}	—	mA	—	—	5.0
lee	$V_{ee} = -5.0$ to -8.0V	—	mA	—	—	1.0

Absolute Maximum Ratings ³

Parameter	Absolute Maximum
Max Input Power 0.5 GHz 0.5 - 2.0 GHz	+27 dBm +34 dBm
Supply Voltages V_{cc} V_{ee}	+5.5V -8.5V
Control Voltage ⁴	-0.5V to $V_{cc} + 0.5\text{V}$
Operating Temperature	-40°C to +125°C
Storage Temperature	-65°C to +150°C

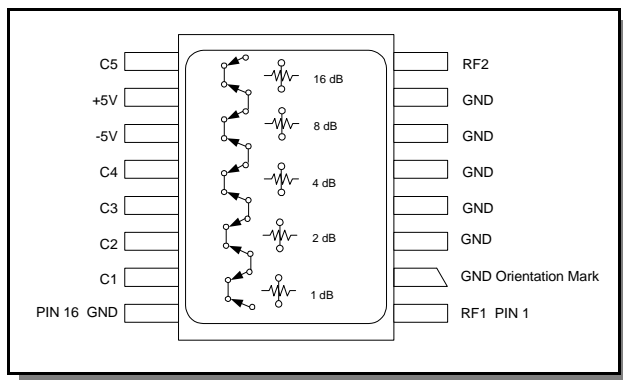
3. Operation of this device above any one of these parameters may cause permanent damage.
4. Standard CMOS TTL interface, latch-up will occur if logic signal is applied prior to power supply.

Truth Table

Control Inputs					
C5	C4	C3	C2	C1	Attenuation
0	0	0	0	0	Reference
0	0	0	0	1	1 dB
0	0	0	1	0	2 dB
0	0	1	0	0	4 dB
0	1	0	0	0	8 dB
1	0	0	0	0	16 dB
1	1	1	1	1	31 dB

0 = TTL Low 1 = TTL High

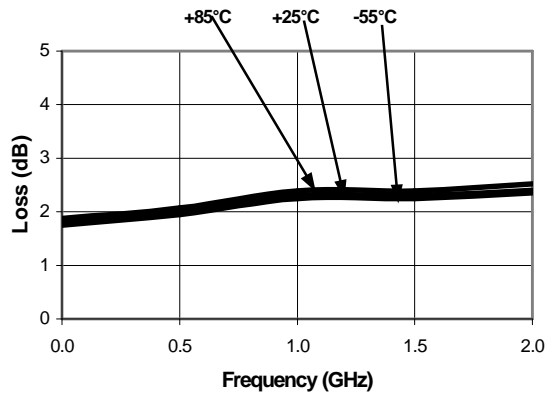
Functional Schematic (Top View)



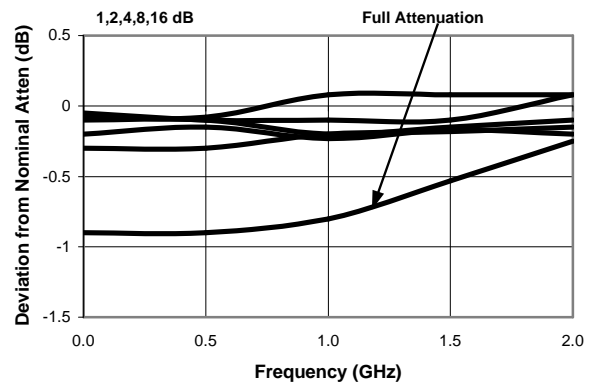
Specifications subject to change without notice.

Typical Performance Curves

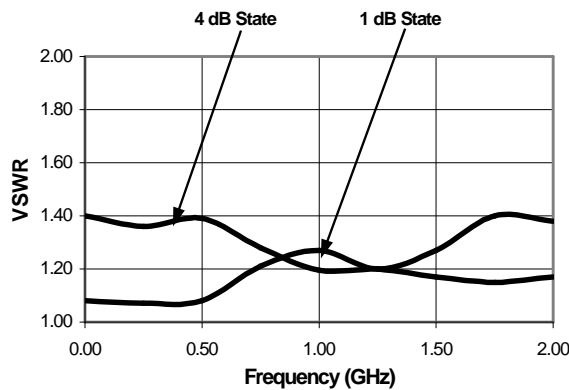
Ref. Insertion Loss vs. Frequency



Attenuation Accuracy vs. Frequency



VSWR vs. Frequency



Ordering Information

Part Number	Package
AT20-0263	CR-12

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