tyco Electronics

M/A-COM

Digital Attenuator, 30 dB, 4-Bit, TTL Driver, DC - 3.0 GHz

AT65-0233
V5

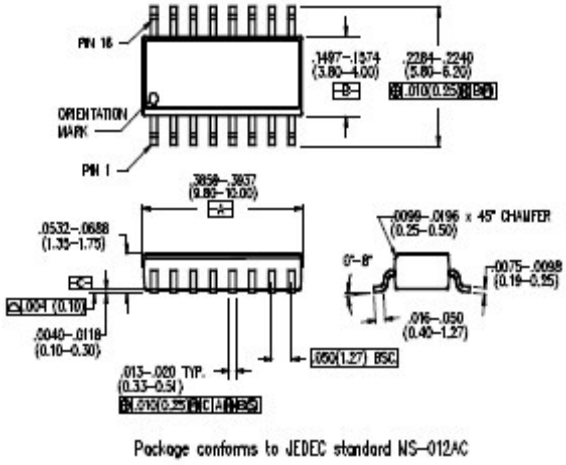
Features

- Attenuation: 2.0 dB steps to 30 dB
- Low DC Power Consumption
- Integral TTL Driver
- 50 Ohm Impedance
- Temperature Stability: ±0.18 dB from -55°C to +85°C Typ.

Description

M/A-COM's AT65-0233 is a GaAs FET 4-bit digital attenuator with a 2.0 dB minimum step size and a 30 dB total attenuation range. This device is in a SOIC-16 plastic surface mount package. The AT65-0233 is ideally suited for use where accuracy, fast speed, very low power consumption and low costs are required. Typical applications include dynamic range setting in precision receiver circuits and other gain/ leveling control circuits.

SO-16



Pin Configuration

Pin No.	Function	Pin No.	Function
1	GND	9	C2
2	RF1	10	C1
3	GND	11	GND
4	N/C	12	GND
5	Vee	13	N/C
6	Vcc	14	GND
7	C4	15	RF2
8	C3	16	GND

N/C = No Connection

Absolute Maximum Ratings [1]

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz 0.5 - 3.0 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.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
- **Asia/Pacific** Tel: 81.44.844.8296 / Fax: 81.44.844.8298

Visit www.macom.com for additional data sheets and product information.

Electrical Specifications: T_A = 25°C

Parameter	Test Conditions	Frequency	Units	Min.	Typ.	Max.
Insertion Loss	—	DC - 0.5 GHz DC - 2.0 GHz DC - 3.0 GHz	dB dB dB	— — —	1.7 2.3 2.6	2.0 2.7 3.1
Attenuation Accuracy	Any Bit or Combination of Bits	DC - 3.0 GHz	dB	+ (0.4 +8% of attenuation setting)		
VSWR	Full Range	DC - 2.0 GHz	Ratio	—	—	1.7:1
Trise, Tfall, Ton, Toff Transients	10% to 90% 50% Cntl to 90%/10% RF In-Band		nS nS mV	— — —	10 30 35	50 150 —
1 dB Compression	Input Power Input Power	0.05 GHz 0.5 - 3.0 GHz	dBm dBm	— —	+20 +28	— —
Input IP3	Two-tone inputs up to +5 dBm	0.05 GHz 0.5 - 3.0 GHz	dBm dBm	—	+40 +50	— —
Input IP2	Two-tone inputs up to +5 dBm	0.05 GHz 0.5 - 3.0 GHz	dBm dBm	— —	+45 +68	— —
Vcc -Vee	— —	— —	V V	4.5 -8.0	5.0 -5.0	5.5 -4.75
Vctl Vctl	Logic (0) TTL Logic (1) TTL	— —	V V	0.0 2.0	— —	0.8 5.0
Input Leakage Current (Low) Input Leakage Current (High)	0 to 0.8 V 2.0 to 5.0 V	— —	µA µA	— —	— —	20 20
Icc	Vcc=4.5 to 5.5V	—	mA	—	—	4.0
-Iee	Vee= -5.0 to –8.0	—	mA	—	—	-1

Ordering Information

Part Number	Package
AT65-0233	SOIC-16 Lead Plastic
AT65-0233TR	Tape and Reel (1K Reel)
AT65-0233-TB	Unit Mounted on Test Board

Truth Table

C1	C2	C3	C4	Attenuation
0	0	0	0	Loss, Reference
1	0	0	0	2.0 dB
0	1	0	0	4.0 dB
0	0	1	0	8.0 dB
0	0	0	1	16.0 dB
1	1	1	1	30.0 dB

0 = TTL Low; 1 = TTL High

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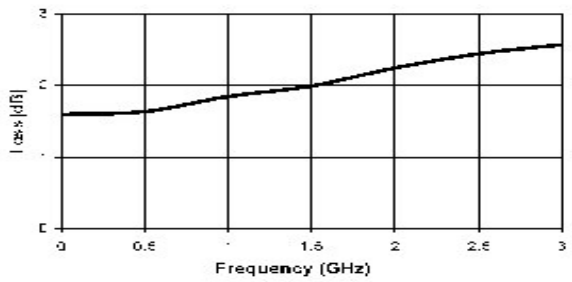
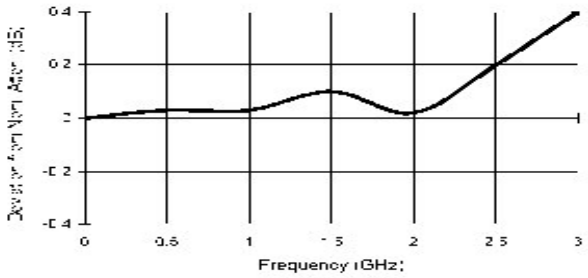
Typical Performance Curves

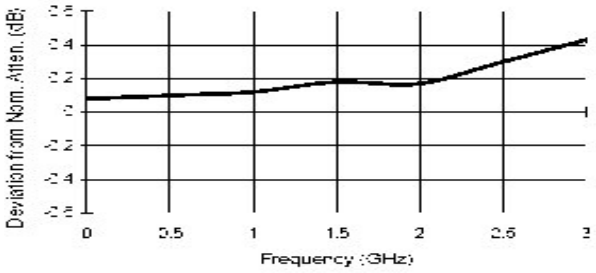
Typical Insertion Loss (dB)



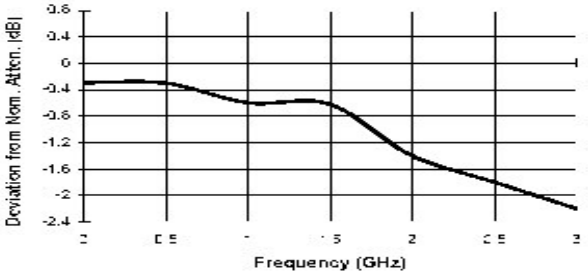
Attenuation Accuracy, 8 dB



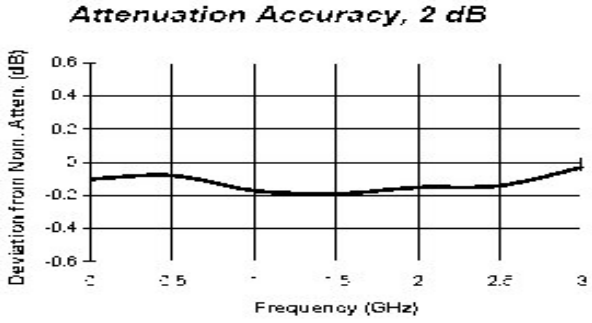
Attenuation Accuracy, 4 dB



Attenuation Accuracy, 30 dB

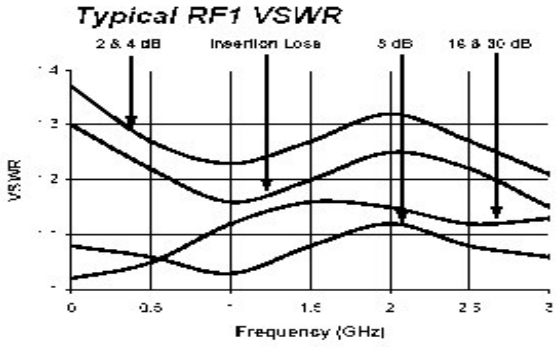


Attenuation Accuracy, 2 dB

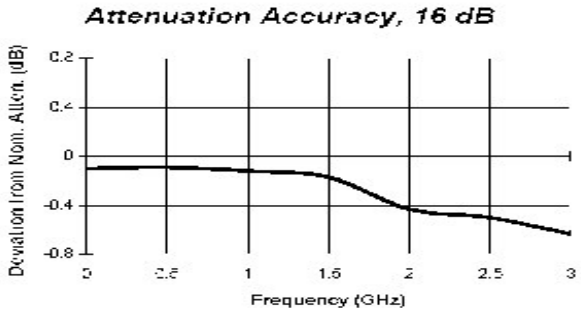


Typical RF2 VSWR

Typical RF1 VSWR



Attenuation Accuracy, 16 dB



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