

Digital Attenuator, 32 dB, 2-Bit, TTL Driver DC - 2 GHz

AT-273

V3.00

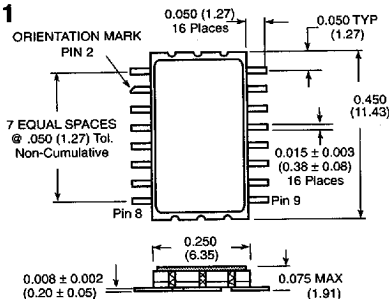
Features

- Attenuation: 16-dB Steps to 32 dB^{1,6}
- Temperature Stability: ± 0.18 dB from -55°C to $+85^{\circ}\text{C}$ Typical
- Low DC Power Consumption
- Hermetic Surface Mount Package
- Integral TTL Driver
- 50 Ω Nominal Impedance

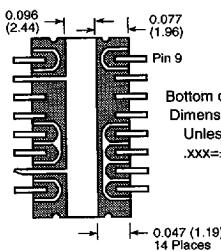
Description

M/A-COM's AT-273 is a GaAs FET digital attenuator with a 16-dB minimum step size and 32 dB total attenuation. This attenuator and integral TTL driver is in a hermetically sealed ceramic 24-lead surface mount package. The AT-273 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. Environmental screening is available. Contact the factory for information.

CR-11



Bottom View



Bottom of case is AC ground.
Dimensions in () are in mm.
Unless otherwise noted:
.xxx = ± 0.010 (.xx = ± 0.25)

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

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Reference Insertion Loss	DC - 0.5 GHz DC - 1.0 GHz DC - 2.0 GHz	dB dB dB			1.6 1.7 1.9
Attenuation Accuracy ^{3,4}	C1 Bit Full Attenuation (32dB) DC - 2.0 GHz DC - 0.5 GHz DC - 1.0 GHz DC - 2.0 GHz		$\pm 3\%$ of attenuation setting in dB $\pm 3\%$ of attenuation setting in dB $\pm 3\%$ of attenuation setting in dB, -1dB $\pm 3\%$ of attenuation setting in dB, -3dB		
VSWR	DC - 2.0 GHz				1.4:1
Trise, Tfall	10% to 90%	nS		7	
Ton, Toff	50% Control to 90/10% RF	nS		28	
Transients	In-band (peak-peak)	mV		20	
1 dB Compression ⁵	Input Power Input Power	dBm dBm		+20 +28	
Input IP ₃ ⁵	For two-tone input power up to +5 dBm	dBm		+38 +48	
Input IP ₂ ⁵	For two-tone input power up to +5 dBm	dBm		+44 +68	
V _{CC} V _{EE}	V _{CC} = 4.5 to 5.5 V V _{EE} = 0 to 0.8 V, or V _{CC} - 2.1 V to V _{CC}	V	4.5 -8.0	5.0	5.5 -5.0
I _{CC}	V _{CC} = 4.5 to 5.5 V V _{EE} = -5.0 to -8.0 V	mA			2.0
I _{EE}	V _{CC} = 4.5 to 5.5 V V _{EE} = -5.0 to -8.0 V	mA			1.0
V _{ctl} V _{cti}	Logic 0 (TTL) Logic 1 (TTL)	V	0.0 2.0		0.8 5.0
Input Leakage Current (Low)	0 to 0.8 V	μA			1.0
Input Leakage Current (High)	2.0 to 5.0 V	μA			1.0

1. All specifications apply when operated with bias voltages of +5 V for V_{CC} and -5.0 V to -8.0 V for V_{EE}, and 50 Ω impedance at all ports unless otherwise specified.
2. Above reference insertion loss.
3. This attenuator is guaranteed monotonic.

4. For the attenuator to meet the guaranteed specifications, it is necessary to have a DC return on either RF1 or RF2. The DC return can be either a 10 K Ω resistor, or an RF choke.
5. V_{EE} = -5 V for the typical numbers given.
6. Use the C1 control for a single 16-dB bit.

Specifications Subject to Change Without Notice.

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5642205 0003709 1T2

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Input Power	
0.5 GHz	+27 dBm
0.5 - 2.0 GHz	+34 dBm
Supply Voltages	
V _{CC}	+5.5 V
V _{EE}	-8.5 V
Control Voltage	-0.5 V to V _{CC} + 0.5 V
Operating Temperature	-55°C to +125°C
Storage Temperature	

Note: Operation of this device above any one of these parameters may cause permanent damage.

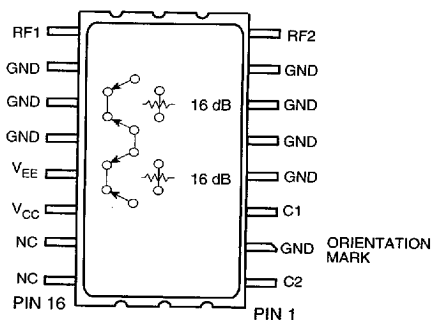
Truth Table

Control Inputs		
C2	C1	Attenuation
0	0	Reference
0	1	16 dB
1	1	32 dB

0 = TTL Low

1 = TTL High

Functional Schematic (Top View)

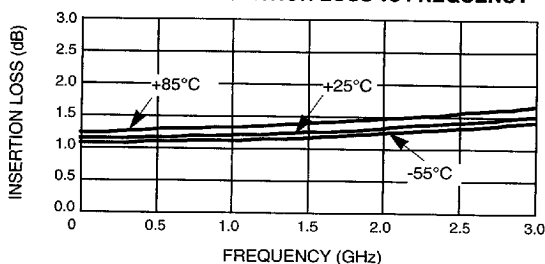
Ordering Information⁷

Part Number	Package
AT-273 PIN	Ceramic

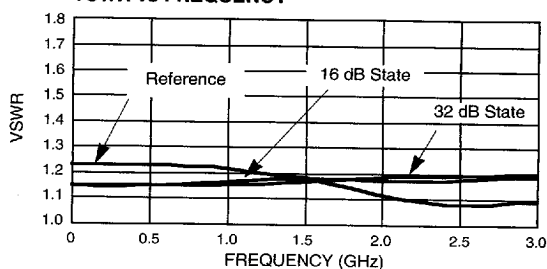
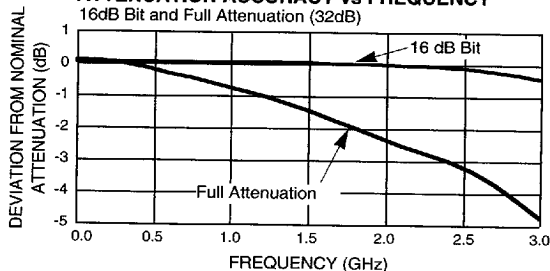
7. Contact the factory for standard or custom screening requirements.

Typical Performance @ +25°C

REFERENCE INSERTION LOSS vs FREQUENCY



VSWR vs FREQUENCY

ATTENUATION ACCURACY vs FREQUENCY
16dB Bit and Full Attenuation (32dB)

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