

Rev. V7

Features

- Positive Single Control
- 2-dB Attenuation Steps to 30 dB
- Low DC Power Consumption
- TSSOP-16 Plastic Package

Description

M/A-COM's AT-264 is a 4-bit, 2-dB step GaAs MMIC digital attenuator in a low cost TSSOP-16 surface mount plastic package. The AT-264 is ideally suited for use where high accuracy, very low power consumption and low intermodulation products are required. Typical applications include radio, cellular, wireless LANs, GPS equipment and other gain/level control circuits.

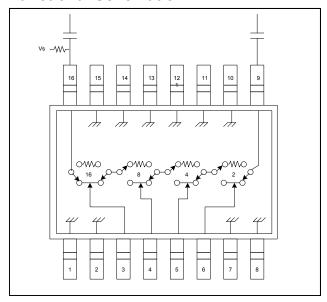
The AT-264 is fabricated using a mature 1 micron GaAs MESFET process. The process features full chip passivation for increased performance and reliability.

Ordering Information¹

Part Number	Package
AT-264-PIN	Bulk Packaging
AT-264TR	1000 piece reel

1. Reference Application Note M513 for reel size information.

Functional Schematic ^{2,3}



- Blocking caps are required on all RF ports (39 pF used for data measurements).
- 3. Vs = $+5 \pm 0.2$ VDC must be applied at RF1 or RF2 using a 10 K Ω or greater pull-up resistor.

Pin Configuration

Pin No.	Function	Pin No.	Function	
1	Ground	9	RF2	
2	Ground	10	Ground	
3	VC1	11	Ground	
4	VC2	12	Ground	
5	VC3 13 Grou		Ground	
6	VC4 14 Grour		Ground	
7	Ground 15 Ground		Ground	
8	Ground 16 RF1			

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PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

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Electrical Specifications⁴: $T_A = 25^{\circ}C$, $Z_0 = 50 \Omega$, $V_S = 5 V$

Parameter	Test Conditions	Units	Min.	Тур.	Max.
Reference Insertion Loss	0.5 - 1.0 GHz 0.5 - 2.0 GHz	dB dB		2.0 2.2	2.4 2.6
Attenuation Accuracy	0.5 - 1.0 GHz 0.5 - 2.0 GHz	± (0.15 dB + 5% of attenuation setting in dB) dB ± (0.3 dB + 5% of attenuation setting in dB) dB			
VSWR	1.0 - 1.5 GHz 0.5 - 2.0 GHz	Ratio Ratio	_	1.5:1 1.9:1	
Trise, Tfall	10% to 90% RF, 90% to 10% RF	ns	_	200	_
Ton, Toff	50% Control to 90% RF,50% Control to 10% RF	ns	_	200	_
Transients	In Band	mV	_	75	_
1 dB Compression	Input Power, 0.5 GHz Input Power, 0.9 GHz	dBm dBm		25 25	
IP ₂	0.5 GHz 0.5 - 2.0 GHz Measured Relative to Input (for two-tone Input Power up to +5 dBm)	dBm dBm		65 71	_
IP ₃	0.5 GHz 0.5 - 2.0 GHz Measured Relative to Input (for two-tone Input Power up to +5 dBm)	dBm dBm	_	43 47	_
Ic	Vc = 5 V	μA	_	_	10
I _{VS}	_	μΑ	_	_	20

^{4.} External DC blocking capacitors are required on all RF ports. Loss varies at 0.003 dB/°C.

Absolute Maximum Ratings 5,6

Parameter	Absolute Maximum
Input Power 50 MHz 500 - 2000 MHz	+27 dBm +34 dBm
Control Voltage	-0.5 V <u><</u> V _C <u><</u> 8.5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

^{5.} Exceeding any one or combination of these limits may cause permanent damage to this device.

Truth Table⁷

VC1	VC2	VC3	VC4	Attenuation (dB)
1	1	1	1	Reference Insertion Loss
1	1	1	0	2
1	1	0	1	4
1	0	1	1	8
0	1	1	1	16
0	0	0	0	30

7. $0 = 0 \pm 0.2 \text{ V}, 1 = +5 \text{ V}$

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M/A-COM does not recommend sustained operation near these survivability limits.

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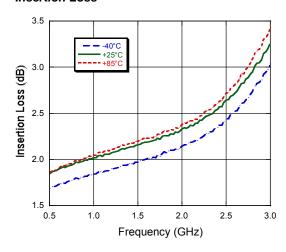
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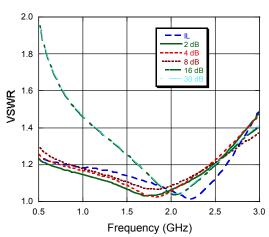
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Typical Performance Curves

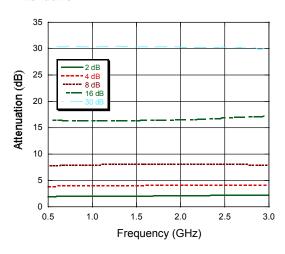
Insertion Loss



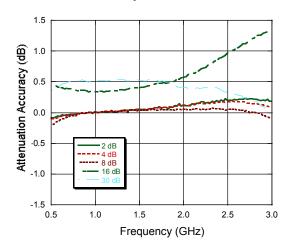
VSWR



Attenuation



Attenuation Accuracy

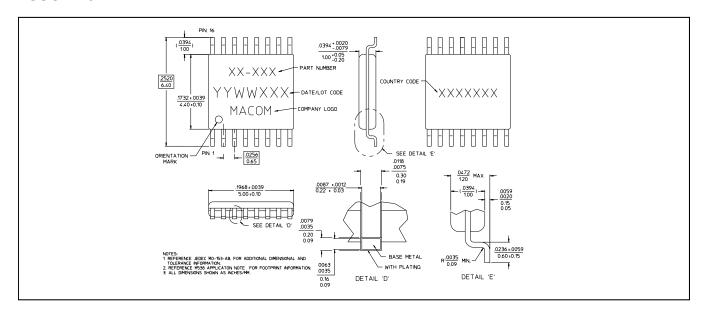


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Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

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