



BGA Digital Attenuator, 31.5 dB, 6-Bit, TTL Driver, DC - 2.0 GHz



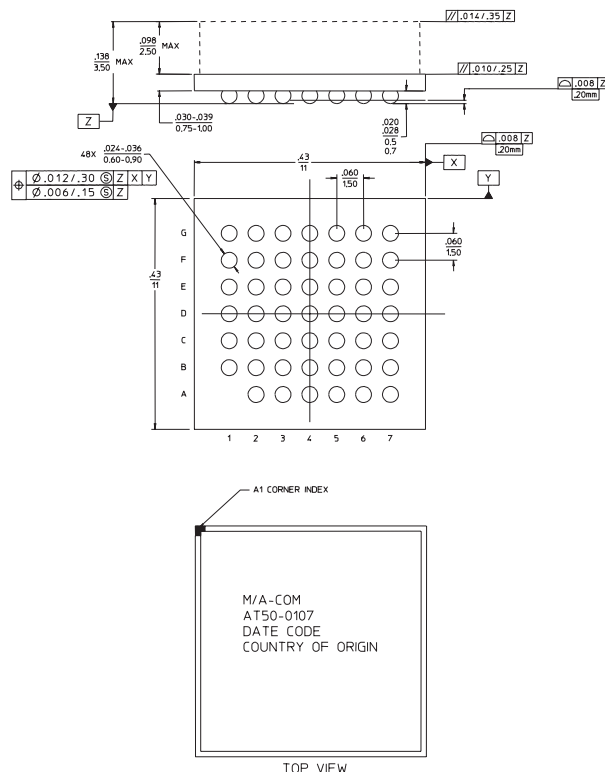
Features

- Attenuation: 0.5 dB Steps to 31.5 dB
- Low DC Power Consumption
- Ball Grid Array Outline
- Integral TTL Driver
- High Intercept Points
- Test Boards are Available
- Tape and Reel Packaging Available

Description

M/A-COM's AT50-0107 is a GaAs FET 6-bit digital attenuator with a 0.5-dB minimum step size and 31.5 dB total attenuation. This attenuator and integral TTL driver is in an 11 mm square, ball grid array, surface mount package. The AT50-0107 is ideally suited for use where accuracy, fast switching, low power consumption and low intermodulation products are required. Typical applications include dynamic range setting in receiver circuits and gain/leveling control in transmitter circuits.

Outline



Electrical Specifications $T_A = +25^\circ\text{C}$, $V_{CC} = +5\text{V}$ and $V_{EE} = -5\text{V}$

Parameter	Test Conditions	Frequency	Units	Min	Typical	Max
Insertion Loss	—	DC - 1.0 GHz	dB	—	3.4	3.6
		DC - 2.0 GHz	dB	—	3.9	4.2
Attenuation Accuracy	Any Bit or Combination of Bits	DC - 2.0 GHz	dB	Maximum .30 $\pm$ (4% of attenuation) or .45 dB, which ever is greater		
VSWR	Full Range	DC - 2.0 GHz	Ratio	—	1.7:1	2.0:1
Trise, Tfall Ton, Toff	10% to 90% to 10% RF 50% Cntl to 90%/10% RF		nS	—	20	50
			nS	—	75	150
1 dB Compression	Input Power Input Power	0.05 GHz	dBm	—	+21	—
		0.5 - 2.0 GHz	dBm	—	+29	—
Input IP_3	Two-tone inputs up to +5 dBm	0.05 GHz	dB	—	+35	—
		0.5 - 2.0 GHz	dB	—	+48	—
Input IP_2	Two-tone inputs up to +5 dBm	0.05 GHz	dB	—	+75	—
		0.5 - 2.0 GHz	dB	—	+79	—
V_{CC}	—	—	V	4.5	5.0	5.5
$-V_{EE}$	—	—	V	-8.0	-	-5.0
I_{CC}	$V_{CC} = 4.5$ to 5.5 V $V_{ctl} = 0$ to 0.8 V , or $V_{CC} - 2.1$ to V_{CC}	—	mA	—	.2	6.0
$-I_{EE}$	$-V_{EE} = -5.0$ to -8.0 V	—	mA	—	.2	1.0

V1.C

Absolute Maximum Ratings¹

Parameter	Absolute Maximum
Max. Input Power	
0.05 GHz	+27 dBm
0.5 - 2.0 GHz	+34 dBm
+Vcc	+5.5V
-Vee	-8.5V
Logic Voltages	-0.5 to Vcc + 0.5V
Control Voltage	-0.5V to Vcc +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 permanent damage.

Truth Table

C16	C8	C4	C2	C1	C0.5	Attenuation
0	0	0	0	0	0	Loss, Reference
0	0	0	0	0	1	0.5 dB
0	0	0	0	1	0	1.0 dB
0	0	0	1	0	0	2.0 dB
0	0	1	0	0	0	4.0 dB
0	1	0	0	0	0	8.0 dB
1	0	0	0	0	0	16.0 dB
1	1	1	1	1	1	31.5 dB

0 = TTL Low; 1 = TTL High

Ordering Information

Part Number	Package
AT50-0107	Bulk Packaging
AT50-0107-TR	Tape and Reel ²
AT50-0107-TB	Unit mounted on test board

2. Check with the factory for available quantities and reel size.

Pin Configuration

Pin #	Function	Pin #	Function
A2	CTL 2 (1)	C1 - C6	N/C
A3	CTL 3 (2)	C7	-5V
A4	CTL 4 (4)	D1 - D7	Ground
A5	+5V	E1 - E7	Ground
A6	CTL 5 (8)	F1	RF Output
A7	CTL 6 (16)	F2 - F6	Ground
B1	CTL 1 (0.5)	F7	RF Input
B2 - B7	Ground	G1 - G7	Ground

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