



Digital Attenuator, 31 dB, 5-Bit, TTL Driver, DC-4.0 GHz

V 6.00

AT90-1263

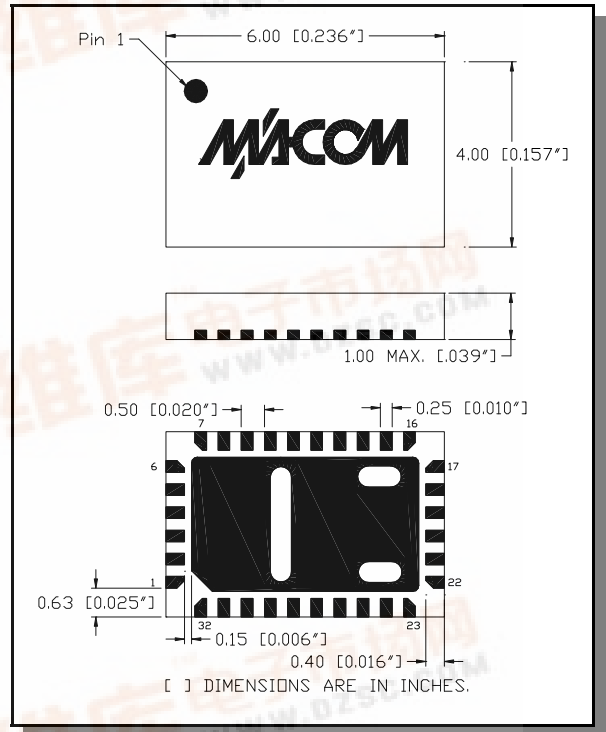
Features

- Attenuation: 1.0dB Steps to 31dB
- Single Positive Supply
- Contains internal DC to DC converter
- Low DC Power Consumption
- Small Footprint, JEDEC Package
- Integral TTL Driver
- 50 ohm Impedance

Description

M/A-COM's AT90-1263 is a GaAs FET 5-bit digital attenuator with integral TTL driver. Step size is 1.0 dB providing 31dB total attenuation range. This device is in an FQFP-N plastic surface mount package. The AT90-1263 is ideally suited for use where accuracy, fast speed, very low power consumption and low costs are required.

CSP-1



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

Parameter	Test Conditions	Frequency	Units	Min	Typical	Max
Insertion Loss	—	DC - 4.0 GHz	dB	—	3.5	3.8
Attenuation Accuracy	Individual Bits 1-2-4-8-16 dB	DC - 3.0 GHz	dB	—	—	$\pm(3 + 5\%$ of atten setting)
	Any Combination of Bits 1 to 31 dB	DC - 4.0 GHz	dB	—	—	$\pm(4 + 6\%$ of atten setting)
		DC - 4.0 GHz	dB	—	—	$\pm(5 + 7\%$ of atten setting)
VSWR	Full Range	DC - 4.0 GHz	Ratio	—	2.0:1	2.2:1
Switching Speed	50% Cntl to 90%/10% RF	—	nS	—	75	150
	10% to 90% or 90% to 10%	—	nS	—	20	50
1 dB Compression	—	50 MHz	dBm	—	+21	—
	—	0.5 - 4.0 GHz	dBm	—	+29	—
Input IP_3	Two-tone inputs up to +5 dBm	50 MHz	dB	—	+35	—
		0.5-4.0 GHz	dB	—	+48	—
+Vcc	—	—	V	4.75	5.0	5.25
Logic "0"	Sink Current is 20 μA max.	—	V	0.0	—	0.8
Logic "1"	Source Current is 20 μA max.	—	V	2.0	—	5.0
Icc	Vcc min to max, Logic "0" or "1"	—	mA	—	6	10



Pin Configuration

Pin #	Function	Pin #	Function
1	GND	17	NC
2	C16	18	NC
3	C8	19	+Vcc ²
4	C4	20	NC
5	C2	21	Cp ⁴
6	C1	22	NC
7	GND	23	Cp ⁴
8	NC	24	NC
9	NC	25	-Vee ³
10	NC ¹	26	GND
11	GND	27	RF2
12	RF1	28	GND
13	GND	29	NC ¹
14	NC	30	-Vee ^{3,5}
15	NC	31	NC
16	NC	32	+Vcc ^{2,6}

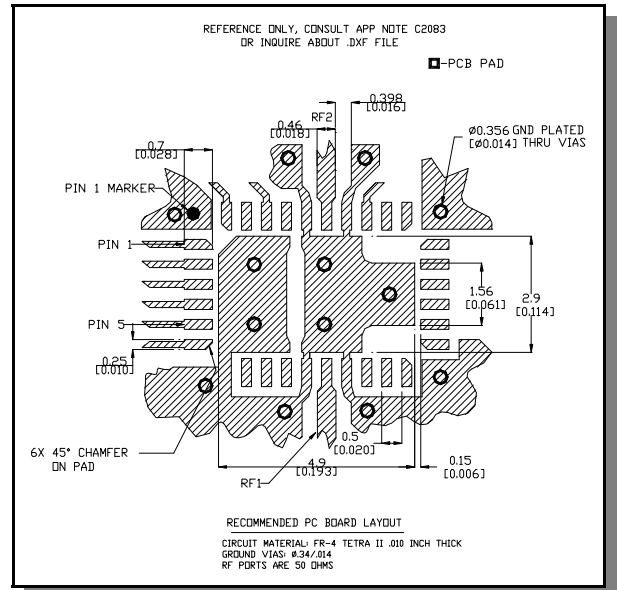
1. Pins 10 & 29 must be isolated
2. Pin 19 must be connected to Pin 32
3. Pin 25 must be connected to Pin 30
4. .01µF cap must be connected between Pins 21 and 23
5. -Vee is produced internally and requires a .1µF cap to GND
6. +Vcc requires a .1µF cap to GND

Absolute Maximum Ratings ⁸

Parameter	Absolute Maximum
Max. Input Power 0.05 GHz	+27 dBm
0.5 - 4.0 GHz	+34 dBm
+Vcc	+5.5V
Logic Voltages ⁹	-0.5 to +Vcc + 0.5V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +125°C

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

Recommended PCB Layout ⁷



7. Application Note C2083 is available on line at www.macom.com

Truth Table

C16	C8	C4	C2	C1	Attenuation
0	0	0	0	0	Loss, Reference
0	0	0	0	1	1.0 dB
0	0	0	1	0	2.0 dB
0	0	1	0	0	4.0 dB
0	1	0	0	0	8.0 dB
1	0	0	0	0	16.0 dB
1	1	1	1	1	31.0 dB

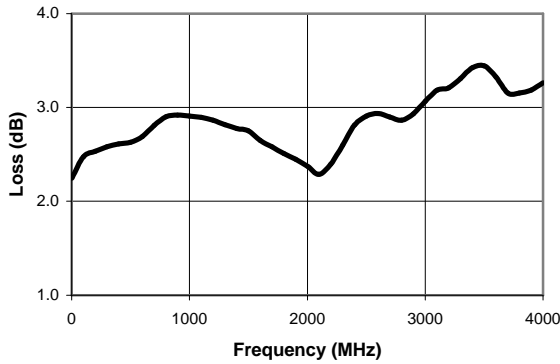
0 = TTL Low; 1 = TTL High

Specifications subject to change without notice.

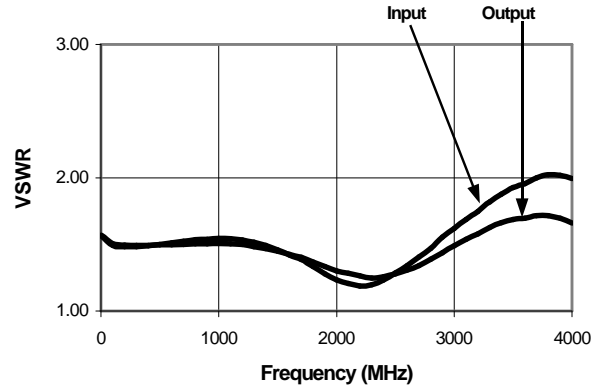
North America: Tel. (800) 366-2266
Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

Typical Performance Curves

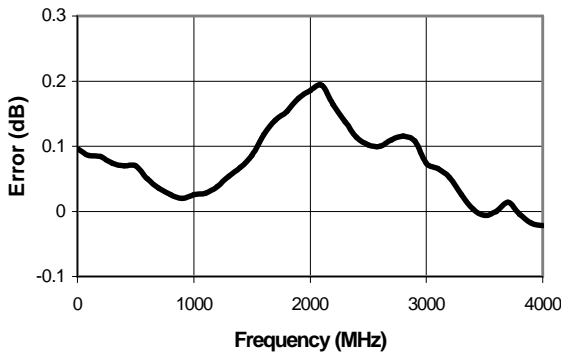
Insertion Loss



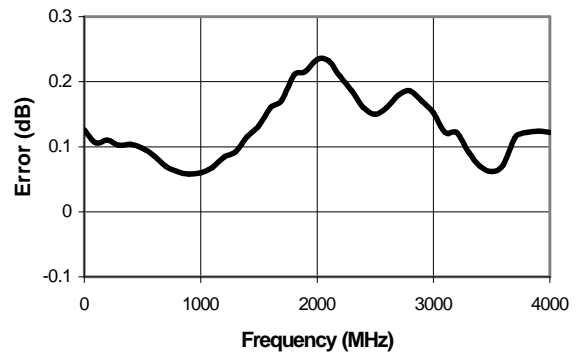
VSWR @ Insertion Loss



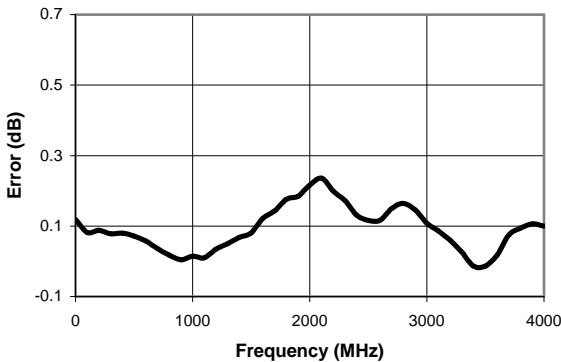
Attenuation Error, 1 dB Bit



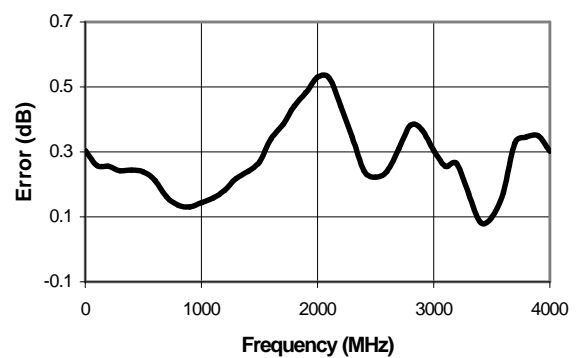
Attenuation Error, 2 dB Bit



Attenuation Error, 4 dB Bit



Attenuation Error, 8 dB Bit

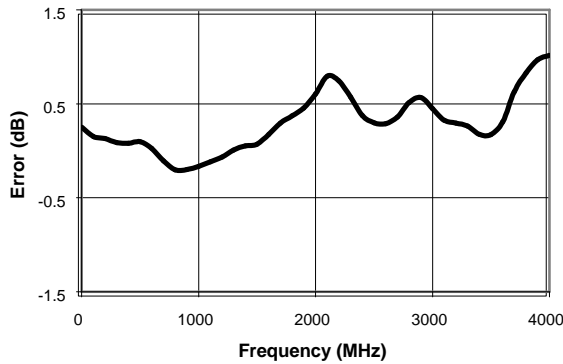


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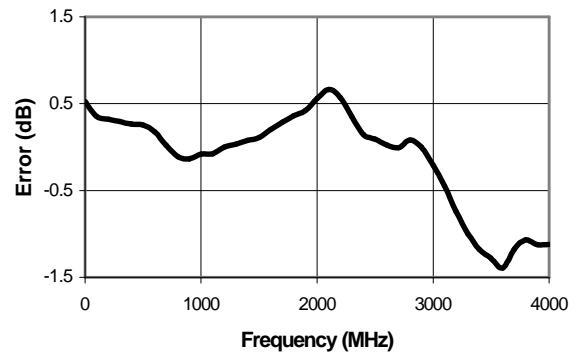
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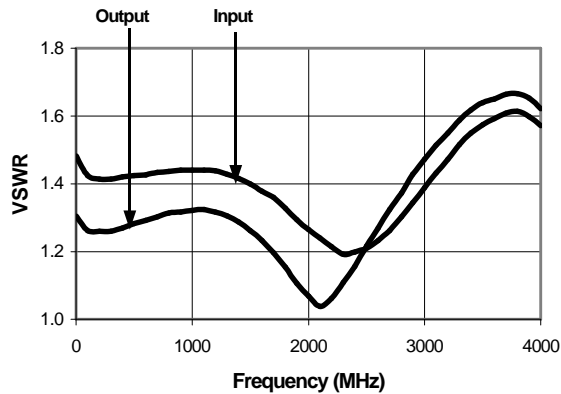
Attenuation Error, 16 dB Bit



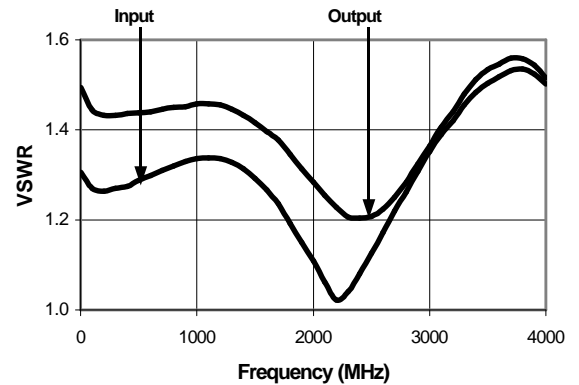
Attenuation Error, Max. Attenuation



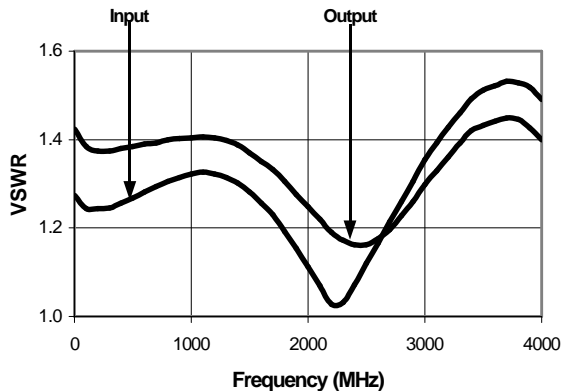
VSWR, 1 dB Bit



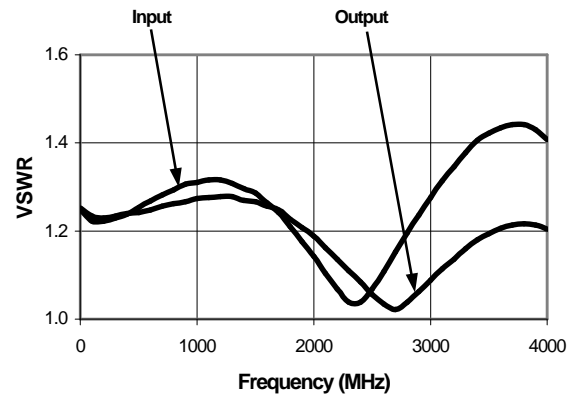
VSWR, 2 dB Bit



VSWR, 4 dB Bit



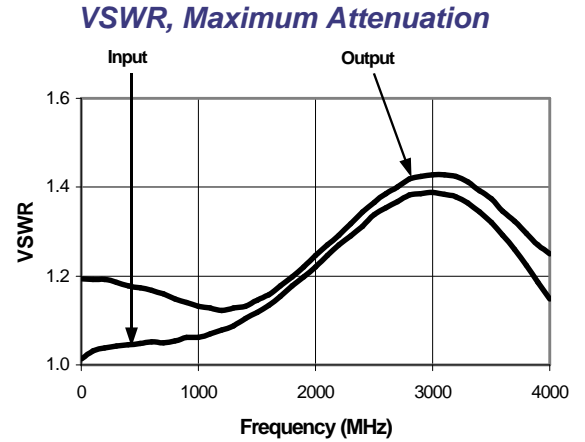
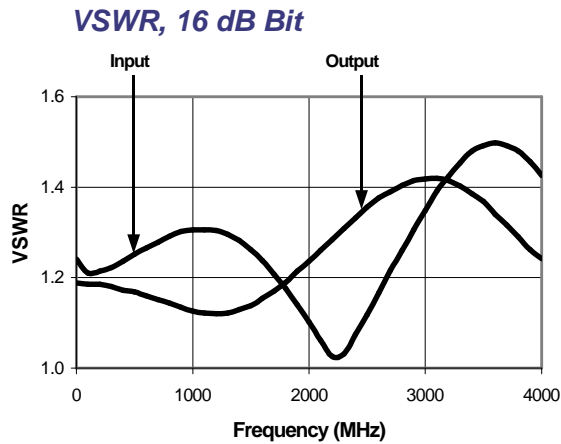
VSWR, 8 dB Bit



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Typical Performance Curves



Ordering Information

Part Number	Package
AT90-1263	Bulk Packaging
AT90-1263TR	Tape and Reel (1K Reel)
AT90-1263-TB	Units Mounted on Test Board

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