GaAs IC 4 Bit Digital Attenuator
2 dB LSB DC–1 GHz

Alpha

AT001D4-25

Features

- 2, 4, 8, 16 dB Bits
- Designed for Cellular Radio Applications
- Low Cost Plastic Package
- For Extended Frequency Performance to 2 GHz Use the AD320-25
- Low DC Power Consumption

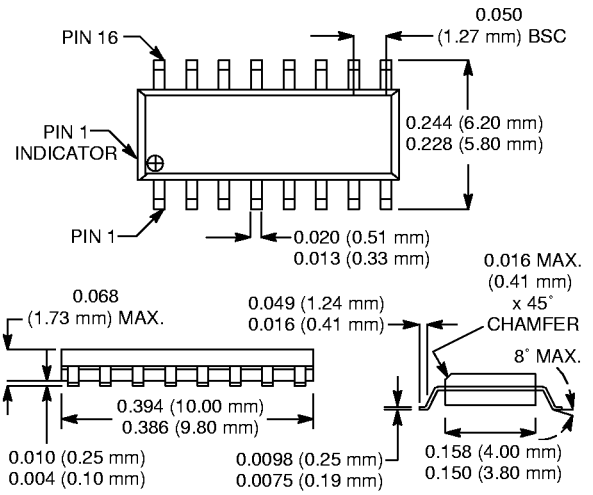
Description

The AT001D4-25 is an IC FET digital attenuator consisting of four monolithic attenuators with LSB of 2 dB and a total attenuation of 30 dB with all attenuators connected.

The attenuator is packaged in the plastic 16 lead surface mount package for low cost commercial cellular radio applications.

Bias required is -5, 0 V. By "floating" the device, a bias of + 5 and 0 is required. Refer to the application note, "Switch and Attenuator Mounting for Positive Voltage Operation," in the Application Notes section.

SOIC-16



Electrical Specifications at 25°C (0, -5 V)

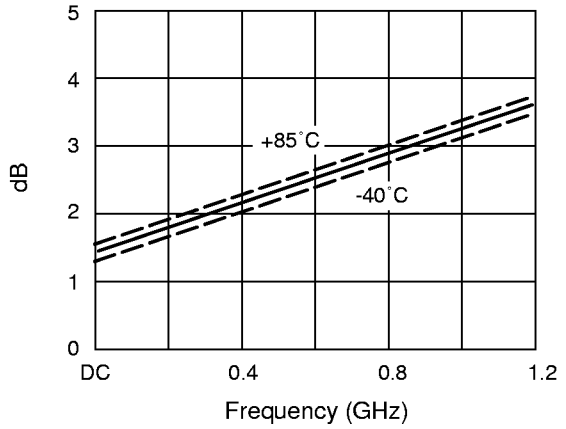
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz DC–1.0 GHz		1.3 1.5	1.8 1.9	dB dB
Attenuation Range[4]	DC–1.0 GHz	± 0.25 + 3% of Attenuation Setting in dB or ± 0.5 dB, Whichever is Greater			dB
VSWR (I/O)	DC–0.5 GHz DC–1.0 GHz		1.45 1.5	1.8:1 1.6:1	

Operating Characteristics at 25°C (0, -5 V)

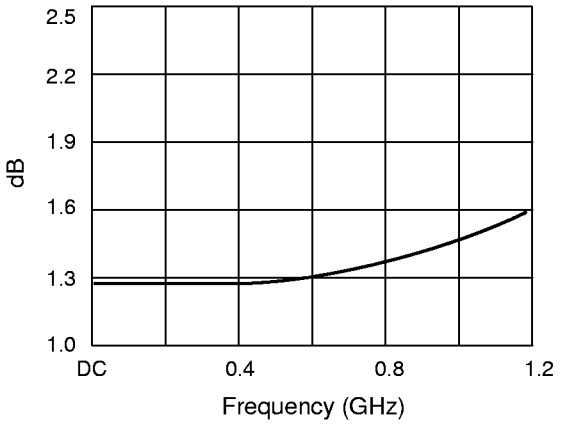
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru			10 20 20		ns ns mV
Input Power for 1 dB Compression		0.5–1.0 GHz 0.001 GHz		+24 +14		dBm dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.5–1.0 GHz 0.001 GHz		+43 +32		dBm dBm
Control Voltages	V_{Low} = 0 to -0.2 V @ 20 µA Max. V_{High} = -5 @ 50 µA to -8 V @ 200 µA Max.					

1. All measurements made in a 50 ohm system, unless otherwise specified.
2. DC = 300 kHz.
3. Insertion loss changes by 0.003 dB/°C.
4. Attenuation referenced to insertion loss.
5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

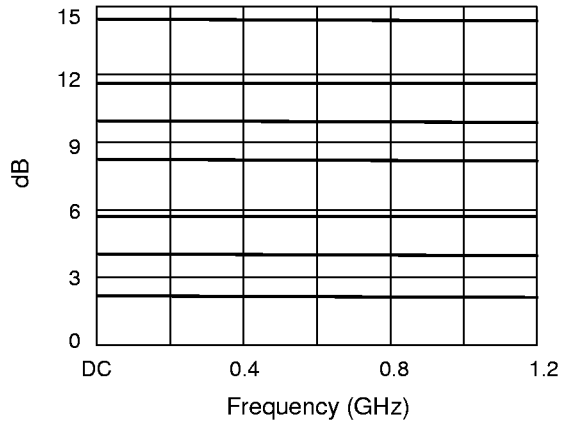
Typical Performance Data (0, -5 V)



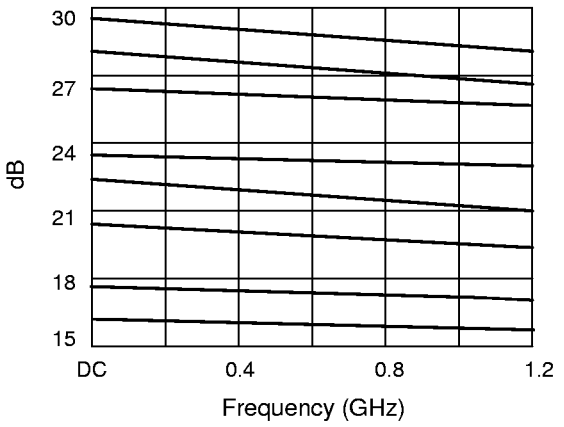
Insertion Loss vs. Frequency



VSWR vs. Frequency (All States)



2 Through 14 dB States vs. Frequency



16 Through 30 dB States vs. Frequency

Truth Table

2 dB		4 dB		8 dB		16 dB		J_1–J_2
V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	Attenuation
-5	0	-5	0	0	-5	-5	0	Reference I.L.
0	-5	-5	0	0	-5	-5	0	2 dB
-5	0	0	-5	0	-5	-5	0	4 dB
-5	0	-5	0	-5	0	-5	0	8 dB
-5	0	-5	0	0	-5	0	-5	16 dB
0	-5	0	-5	-5	0	0	-5	30 dB Max.

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	2 W > 500 MHz 0/-8 V 0.5 W @ 50 MHz 0/-8 V
Control Voltage	+0.2 V, -8 V
Operating Temperature	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Θ_{JC}	25°C/W

Note: Exceeding these parameters may cause irreversible damage.

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