

GaAs IC 4 Bit Digital Attenuator

3 dB LSB DC–1 GHz



AT001D6-25

Features

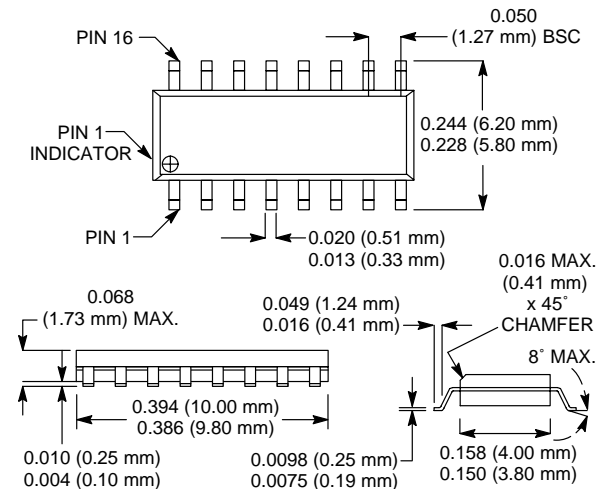
- Attenuation in 3 dB Steps to 45 dB
- Low DC Power Consumption
- Low Cost SOIC-16 Plastic Package

Description

The AT001D6-25 is an IC FET digital attenuator consisting of four monolithic attenuators with LSB of 3 dB and a total attenuation of 45 dB with all attenuators connected.

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

SOIC-16



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

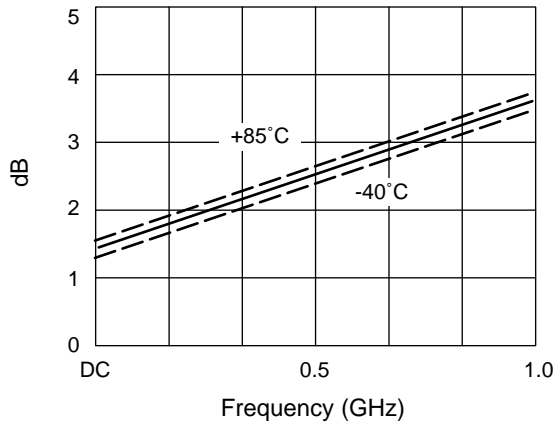
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.5 GHz		2.5	3.2	dB
	DC–1.0 GHz		3.5	4.0	dB
Attenuation Range ⁴	DC–1.0 GHz	10% or ± 0.5 dB Whichever is Greater 12% for 45 dB Attenuation			
VSWR (I/O)	DC–0.5 GHz		1.4:1	1.6:1	
	DC–1.0 GHz		1.6:1	1.8:1	

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

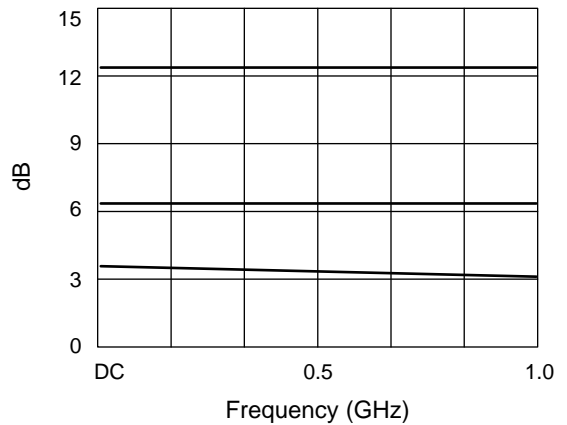
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru			10		ns
				20		ns
				20		mV
Input Power for 1 dB Compression		0.50–1.0 GHz		+24		dBm
		0.05 GHz		+14		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.50–1.0 GHz		+43		dBm
		0.05 GHz		+32		dBm
Control Voltages	V _{Low} = 0 to -0.2 V @ 20 μA Max. V _{High} = -5 V @ 50 μA to -8 V at 200 μA Max.					

1. All measurements made in a 50 Ω 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.

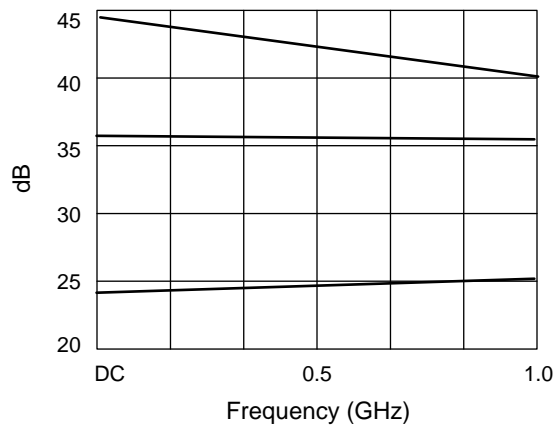
Typical Performance Data (0, -5 V)



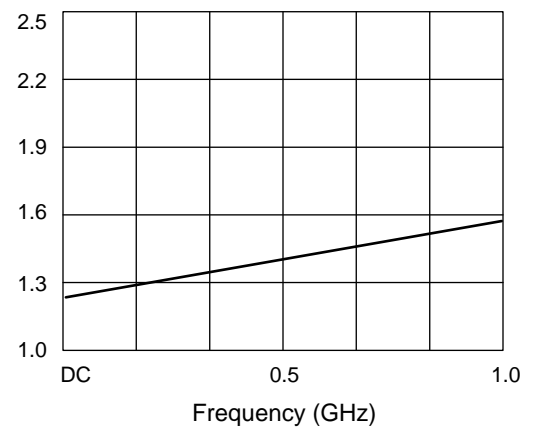
Insertion Loss vs. Frequency



3, 6, 12 dB States



24, 36, 45 dB States



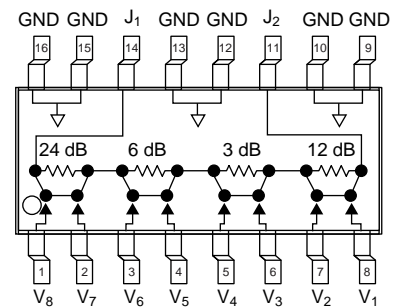
VSWR vs. Frequency (All States)

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.

Pin Out



Truth Table

V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Attenuation
12 dB	3 dB	6 dB	24 dB	Reference I.L.				
-5	0	-5	0	0	-5	0	-5	3 dB
-5	0	-5	0	-5	0	0	-5	6 dB
0	-5	-5	0	0	-5	0	-5	12 dB
-5	0	-5	0	0	-5	-5	0	24 dB
0	-5	0	-5	-5	0	-5	0	45 dB