

GaAs MMIC FET 4 Bit Digital Attenuator

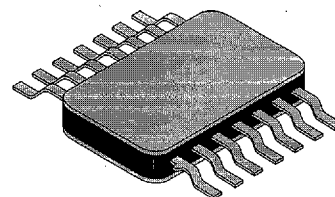
2, 4, 8, 16 dB Bits DC–1 GHz



AT001D4–31

Features

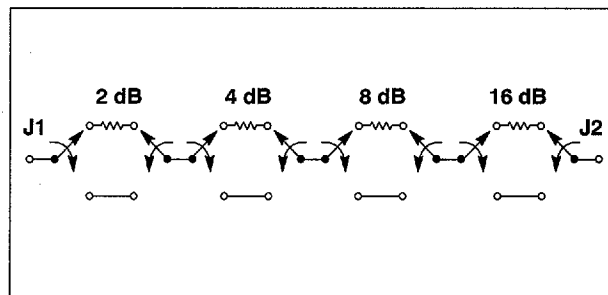
- Designed for Military Applications
- Low DC Power Consumption
- 14 Lead Metal Surface Mount Package
- Meets MIL–STD–883 Screening Requirements



Description

The AT001D4–31 is a MMIC FET digital attenuator consisting of four monolithic attenuators with a LSB of 2 dB and a total attenuation of 30 dB with all attenuators connected. Bias required is –5 or 0 volts on V1 through V8 control leads.

The attenuator is packaged in the glass to metal seal 14 lead package for military applications. This attenuator is recommended for fast response, low power consumption AGC circuits. Typical applications include AGC circuits for radar processing, instrumentation and levelers in RF equipment.



Electrical Specifications at 25°C

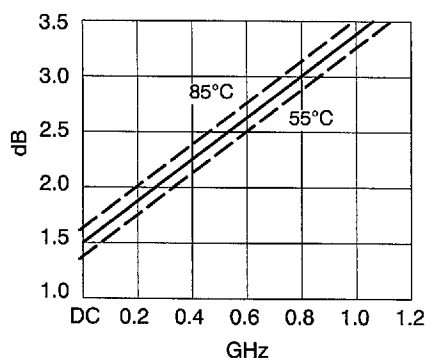
Insertion Loss ¹	DC–0.5 GHz	2.7	dB	Max
	DC–1 GHz	3.7	dB	Max
Attenuation Accuracy Per Bit ²	DC–1 GHz	±5 % 8 – 30 dB Bits Max ± 10%, 2 – 6 dB Bits Max or ±0.5 dB whichever is greater		
VSWR	DC–0.5 GHz	1.5:1		Max
	DC–1 GHz	1.8:1		Max

1. Insertion Loss changes by 0.003 dB/°C.
2. Attenuation value referenced above insertion loss.
3. Measured in 500 MHz bandwidth with 1 ns risetime pulse.

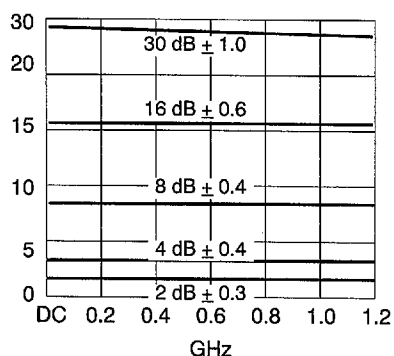
Operating Characteristics at 25°C

Impedance	50Ω Nominal		
Switching Characteristics			
RISE, FALL (10/90% or 90/10% RF)	7	ns	Typ
ON, OFF (50% CTL to 90/10% RF)	14	ns	Typ
Video Feedthru ³	20	mV	Typ
Input Power for 1 dB Compression			
Control Voltages (Vdc)	0/–5	0/–8	
0.5–1 GHz	+24	+27	dBm Typ
Intermodulation Intercept Point (for Two–Tone Input Power up to +13 dBm)			
Intercept Points	IP2	IP3	
0.5–1 GHz	+62	+43	dBm Typ
0.001 GHz	+51	+32	dBm Typ
Control Voltages			
V ₀ (Low)	0 to –0.2V @ 20 μA Max		
V ₀ (High)	–5V @ 50 μA to –9V @ 200 μA Max		

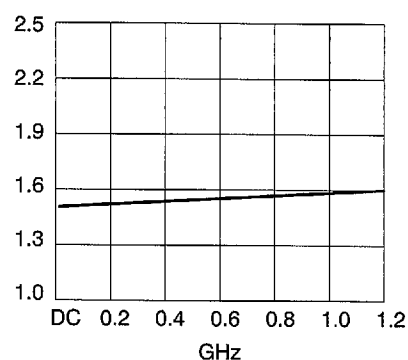
Typical Performance Data



Insertion Loss vs. Frequency

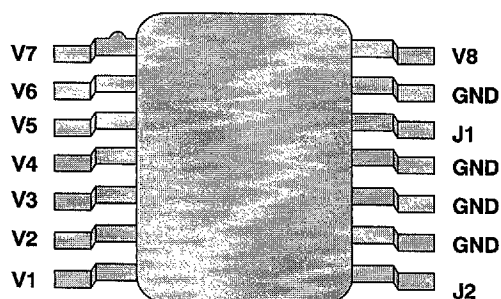


Attenuation vs. Frequency by BIT



VSWR vs. Frequency
(All States)

Pin Out



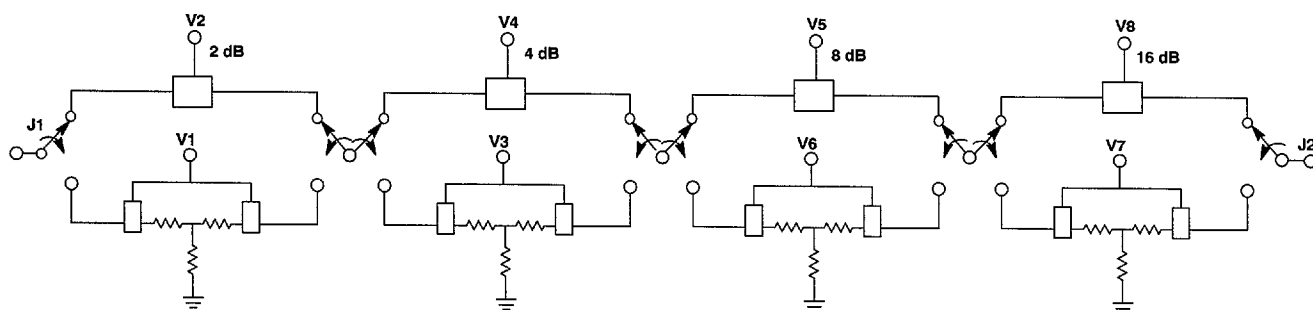
Truth Table

V1	V2	V3	V4	V5	V6	V7	V8	Condition
								J1–J2
	2 dB							Insertion Loss
–5	0	–5	0	0	–5	–5	0	2 dB State
0	–5	–5	0	0	–5	–5	0	4 dB State
–5	0	0	–5	0	–5	–5	0	8 dB State
–5	0	–5	0	–5	0	–5	0	16 dB State
0	–5	0	–5	–5	0	0	–5	30 dB Max Atten.

Absolute Maximum Ratings

RF Input Power:	2W > 500 MHz 0/–8V
	0.5W @ 50 MHz 0/–8V
Control Voltage:	+0.2V, –10V
Operating Temperature:	–55°C to 125°C
Storage Temperature:	–65°C to 150°C
Thermal Resistance:	25°C/W

Functional Schematic



RF GaAs MMIC Products in Metal Packages

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