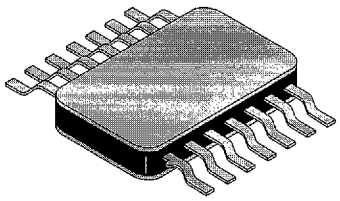
GaAs MMIC FET 4 Bit Digital Attenuator
3, 6, 12, 24 dB Bits DC–1 GHz

Alpha

AT001D6–31

Features

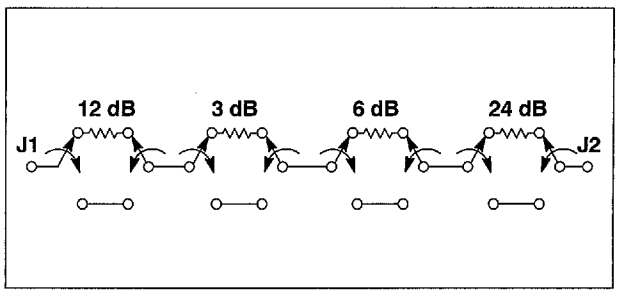


- 3, 6, 12, 24 dB Bits
- Designed for Military Applications
- 14 Lead Metal Surface Mount Package
- Low DC Power Consumption
- Meets MIL–STD–883 Screening Requirements

Description

The AT001D6–31 is a MMIC FET digital attenuator consisting of four monolithic attenuators with LSB of 3 dB and a total attenuation of 45 dB with all attenuators connected. Bias required is –5 and 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	3.0	dB	Max
	DC–1 GHz	3.7	dB	Max
Attenuation Range[2]	DC–1 GHz 10% or ± 0.5 dB whichever is greater			
VSWR (I/O)	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 with 1 ns risetime pulse and 500 MHz bandwidth.

Operating Characteristics at 25°C

Impedance		50 Ohms Nominal		
Switching Characteristics				
RISE, FALL (10/90% or 90/10% RF)		10	ns	Typ
ON, OFF (50% CTL to 90/10% RF)		20	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
0.001 GHz	+14	+17	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_O (Low)	0 to –0.2V at 20 μA Max			
V_O (High)	–5V at 50 μA to –9V at 200 μA Max			

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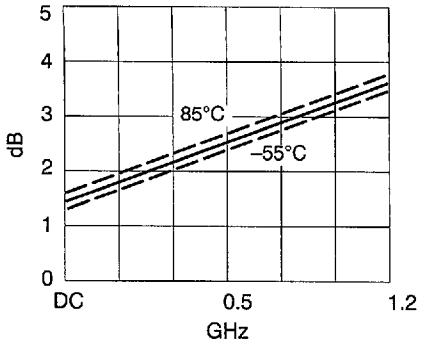
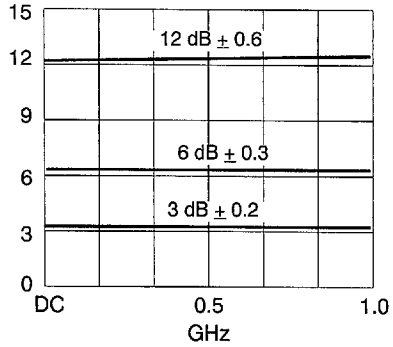
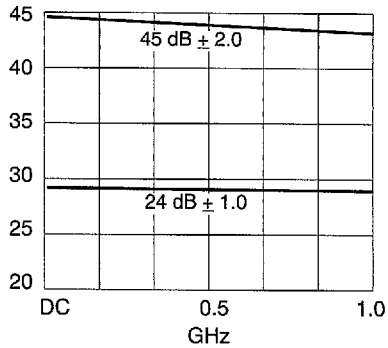
Typical Performance Data



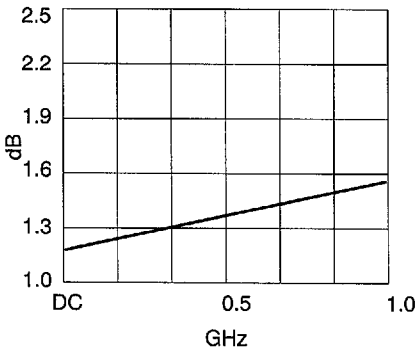
Insertion Loss vs. Frequency



3, 6, 12 dB Bits



24, 45 dB Bits

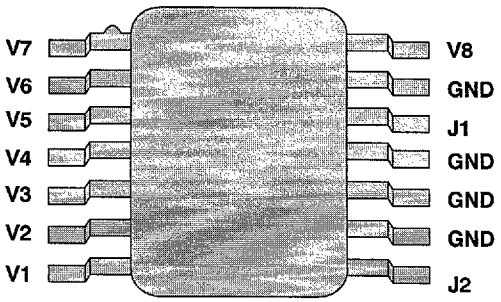


VSWR vs. Frequency
All States

Truth Table

V1	V2	V3	V4	V5	V6	V7	V8	Condition
12 dB		3 dB		6 dB		24 dB		J1–J2
–5	0	–5	0	0	–5	0	–5	Insertion Loss
–5	0	0	–5	0	–5	0	–5	3 dB State
–5	0	–5	0	–5	0	0	–5	6 dB State
0	–5	–5	0	0	–5	0	–5	12 dB State
–5	0	–5	0	0	–5	–5	0	24 dB State
0	–5	0	–5	–5	0	–5	0	45 dB Max Atten.

Pin Out



Absolute Maximum Ratings

RF Input Power: 2W > 500 MHz 0/–8V
0.5W @ 50 MHz 0/–8V

Control Voltage: +0.2V, –10V

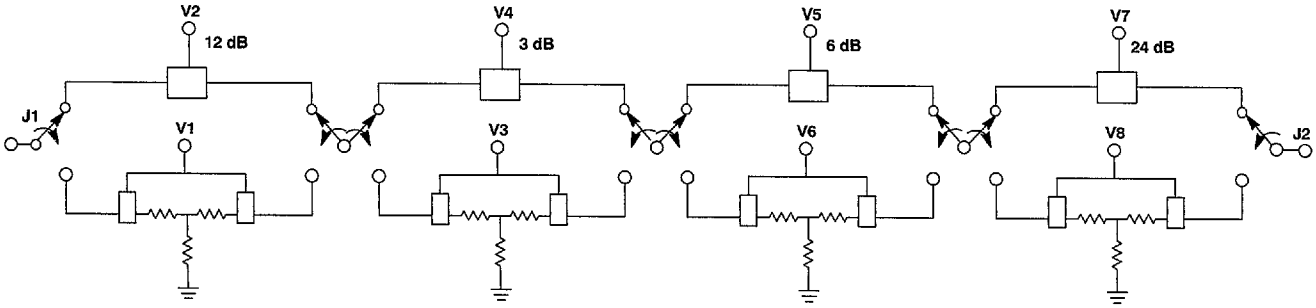
Operating Temperature: –55°C to 125°C

Storage Temperature: –65°C to 150°C

Θ_{JC}: 25°C/W

Note: Exceeding these parameters may cause irreversible damage.

Functional Schematic



RF GaAs MMIC Products in Metal Packages

Numerical Index