

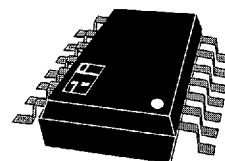
GaAs MMIC FET 2 Bit Digital Attenuator With Driver 16 and 32 dB Bit Values DC–2 GHz



AK002D2–24

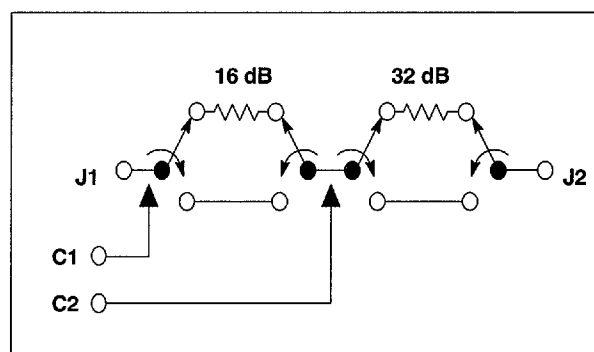
Features

- Designed for Commercial Applications
- Surface Mount 14 Lead SOIC
- Low DC Power Consumption ~ 20 mW Per Bit
- Integral Driver +5V, –5V; CMOS and TTL Compatible
- Use in Conjunction with AK002D4–24 to Achieve 63 dB Total Attenuation



Description

The AK002D2–24 is a MMIC FET Digital Attenuator with integral driver consisting of a 2 bit monolithic attenuator with a total attenuation of 48 dB with both attenuators connected. Bias required is +5 and –5V.



Electrical Specifications at 25°C⁶

Insertion Loss ¹	DC–0.5 GHz	1.5			dB	Max
	DC–1 GHz	2.0			dB	Max
	DC–2 GHz	2.5			dB	Max
Attenuation Accuracy ²	Bits	16	32	48	dB	
	DC–1 GHz	±6%	±6%	±8%	Max	
	DC–2 GHz	±6%	±8%	±10%	Max	
VSWR (I/O)	DC–1 GHz	1.4:1				Max
	DC–2 GHz	1.6:1				Max

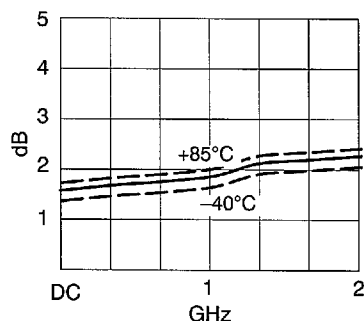
1. Insertion loss changes by 0.003 dB/°C.
2. Attenuation value referenced above insertion loss.
3. Measured with 1 ns risetime pulse and 500 MHz bandwidth.
4. Bias voltage and ground must be connected before TTL voltage is applied. Use of toggle switches or other similar components may produce voltage spikes which can cause irreversible damage to the device.
5. Current increases from 8 mA to 10 mA at +85°C.
6. DC = 300 kHz.

Operating Characteristics at 25°C

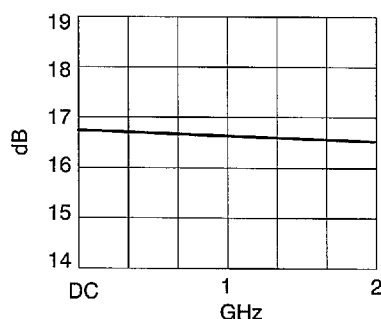
Impedance	50 Ohms Nominal			
Switching Characteristics				
RISE, FALL (10/90% or 90/10% RF)	10	ns	Typ	
ON, OFF (50% CTL to 90/10% RF)	20	ns	Typ	
Video Feedthru ³	30	mV	Typ	
Input Power for 1 dB Compression				
0.5–2 GHz	+20	dBm	Typ	
0.001 GHz	+12	dBm	Typ	
Intermodulation Intercept Point for two–tone input power up to +13 dBm				
Intercept Points	IP2	IP3		
0.5–2 GHz	+59	37	dBm	Typ
0.001 GHz	+48	26	dBm	Typ
Logic Drives (Volts)	Min	Max		
Low (0)	0	0.5	Volts	
High (1)	4	5		
Bias Voltage ⁴ +5V ± 0.5V at 3 mA Typ				
–5V ± 0.25V at 8 mA Typ ⁵				

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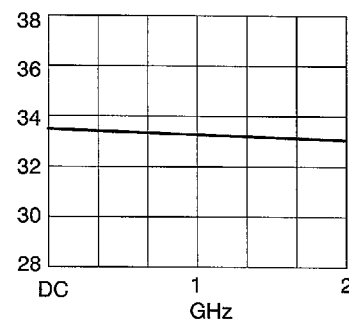
Typical Performance Data



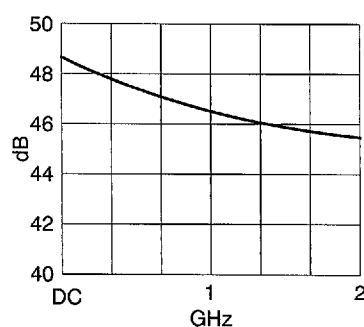
Insertion Loss vs. Frequency



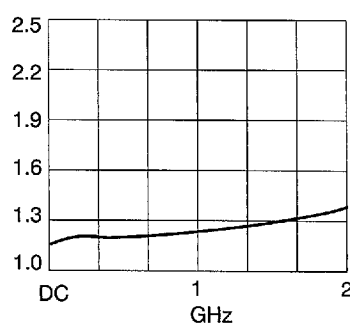
16 dB State vs. Frequency



32 dB State vs. Frequency



48 dB State vs. Frequency

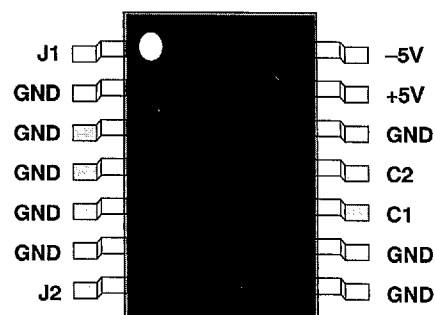


VSWR vs. Frequency (All States)

Truth Table

C1 (16 dB)	C2 (32 dB)	Condition
0	0	Insertion Loss
1	0	16 dB State
0	1	32 dB State
1	1	48 dB State

Pin Out



Absolute Maximum Ratings

RF Input Power:	0.8W > 500 MHz 0.2W @ 50 MHz
Bias Voltages:	+7V, -7V
Control Voltage:	+7V
Operating Temperature:	-40 to +85°C
Storage Temperature:	-65 to 150°C
Θ_{JC} :	30°C/W

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RF GaAs MMIC Products in Metal Packages

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