

GaAs IC 5 Bit Digital Attenuator

0.5 dB LSB DC–2 GHz



AD280-25

Features

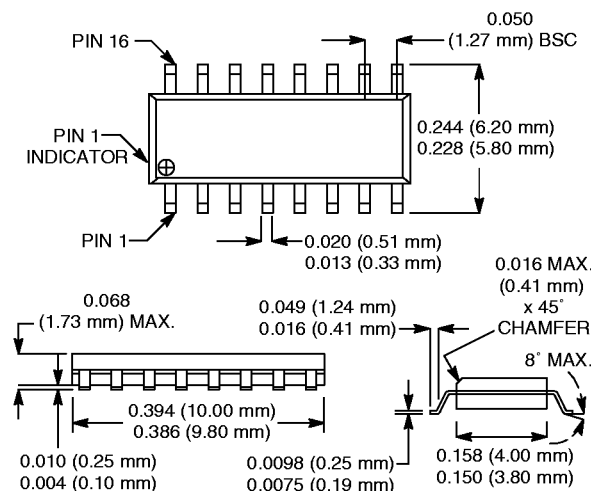
- Attenuation 0.5 dB Steps to 15.5 dB with High Accuracy
- Low DC Power Consumption
- Low Cost SOIC-16 Plastic Package

Description

The AD280-25 is a 5 bit, GaAs IC FET digital attenuator in a low cost SOIC-16 package. This attenuator has an LSB of 0.5 dB and a total attenuation of 15.5 dB.

The AD280-25 is particularly suited where high attenuation accuracy, low insertion loss and low intermodulation products are required. Typical applications include cellular radio, wireless data, wireless local loop and other gain level control circuits.

SOIC-16



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

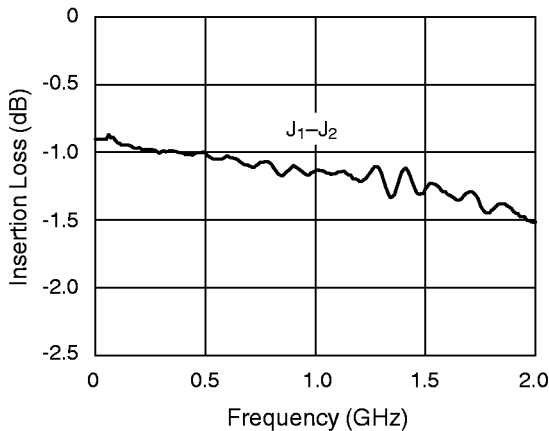
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.5 GHz		1.1	1.3	dB
	DC–1.0 GHz		1.4	1.7	dB
	DC–2.0 GHz		1.7	2.0	dB
Attenuation Range			15.5		dB
Attenuation Accuracy ⁴	DC–1.0 GHz	± (0.2 + 3% of Attenuation Setting in dB)			dB
	DC–2.0 GHz	± (0.4 + 3% of Attenuation Setting in dB)			dB
VSWR (I/O)	DC–2.0 GHz		1.4:1	1.8:1	

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

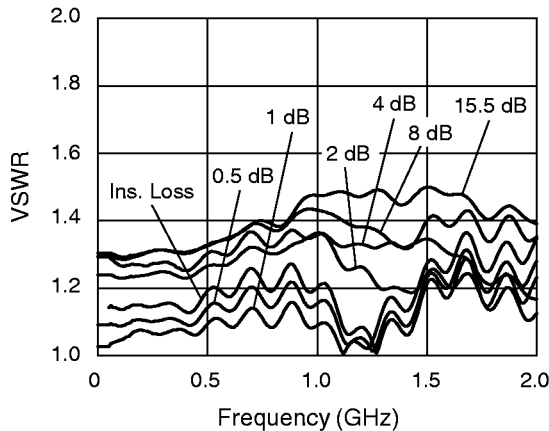
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90%/10% RF)			15		nS
	On, Off (50% CTL to 90%/10% RF)			25		nS
	Video Feedthru			25		mV
Input Power for 1 dB Compression		0.5–2.0 GHz 0.05 GHz		+27 +20		dBm dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +5 dBm	0.5–2.0 GHz 0.05 GHz		+45 +33		dBm dBm
Control Voltages	V _{Low} = 0 to 0.2 V @ 20 µA Max. V _{High} = -5 V @ 300 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.

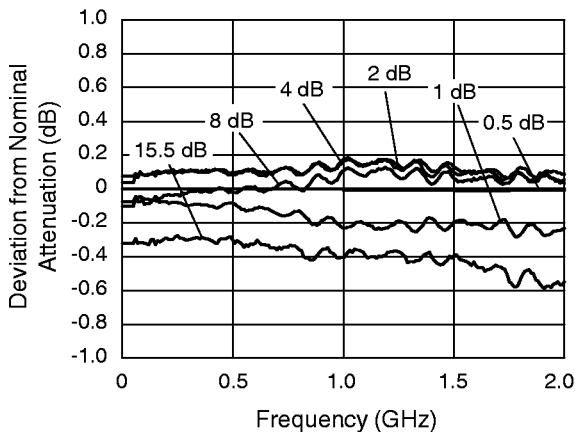
Typical Performance Data



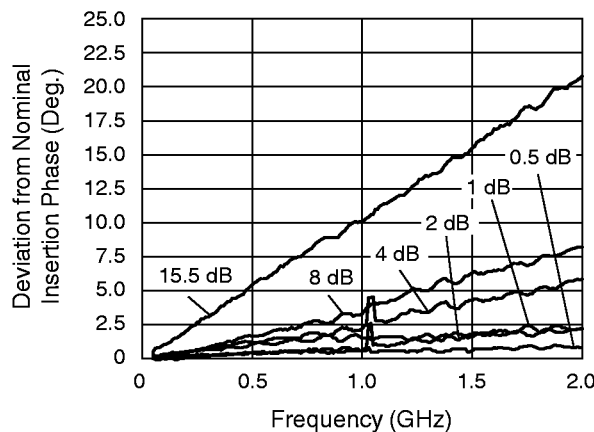
Insertion Loss vs. Frequency



VSWR vs. Frequency



Attenuation Accuracy vs. Frequency



Attenuation Phase Accuracy vs. Frequency

Truth Table

V ₁	V ₂	V ₃	V ₄	V ₅	V ₆	V ₇	V ₈	Attenuation J ₁ –J ₂
0.5 dB Bit	1 dB Bit	2 dB Bit	4 dB Bit	8 dB Bit				
-5	-5	-5	0	-5	0	-5	0	Reference I.L.
0	-5	-5	0	-5	0	-5	0	0.5 dB
-5	0	-5	0	-5	0	-5	0	1 dB
-5	-5	0	-5	-5	0	-5	0	2 dB
-5	-5	-5	0	0	-5	-5	0	4 dB
-5	-5	-5	0	-5	0	0	-5	8 dB
0	0	0	-5	0	-5	0	-5	15.5 dB Max. Atten.

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	2.0 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}	85°C/W

Note: Exceeding these ratings may cause irreversible damage.

Pin Out

