GaAs IC 3 Bit Digital Attenuator
4 dB LSB DC–1 GHz

SKYWORKS

AT001D3-24

Features

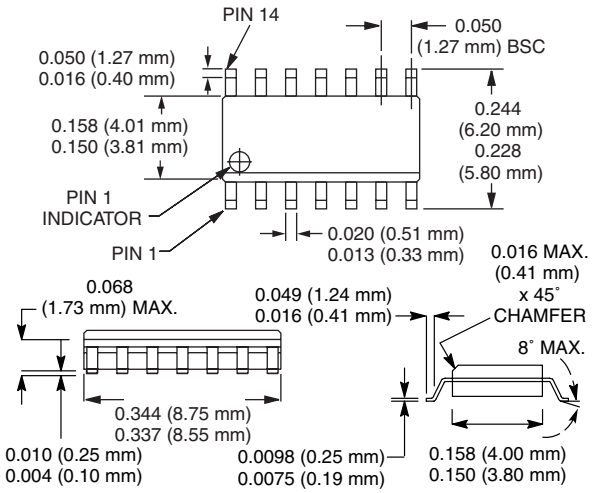
- Attenuation in 4 dB Steps to 28 dB
- Low Cost SOIC-14 Plastic Package
- Low DC Power Consumption

Description

The AT001D3-24 is an IC FET digital attenuator consisting of three monolithic attenuators with LSB of 4 dB and a total attenuation of 28 dB with all attenuators connected. Attenuator bits are switched with -5 and 0 V.

The attenuator is packaged in the plastic 14 lead surface mount package for low cost commercial cellular radio applications.

SOIC-14



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

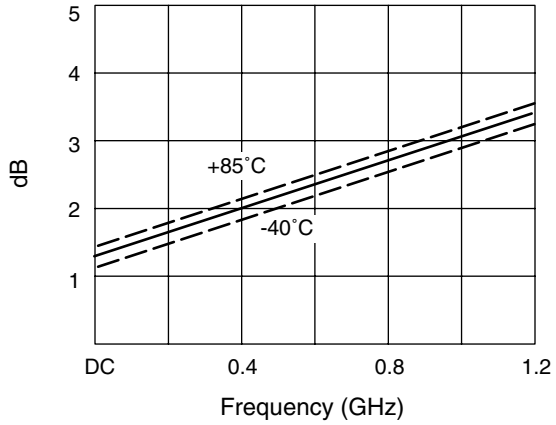
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz DC–1.0 GHz		2.2 3.0	2.5 3.2	dB dB
Attenuation Range	DC–1.0 GHz		28		dB
Attenuation Accuracy Per Bit[4]	DC–1.0 GHz	±5%, 16 dB Bit ±10%, 4, 8 dB Bits			dB dB
VSWR (I/O)	DC–1.0 GHz		1.4:1	1.6:1	

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

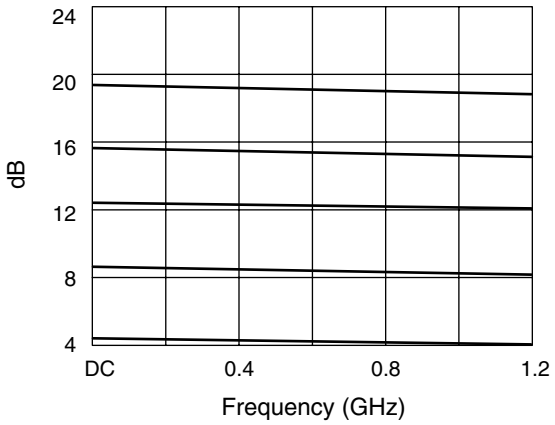
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru			10 20 20		ns ns mV
Input Power for 1 dB Compression		0.50–1.0 GHz 0.05 GHz		+24 +14		dBm dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.50–1.0 GHz 0.05 GHz		+43 +32		dBm 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.

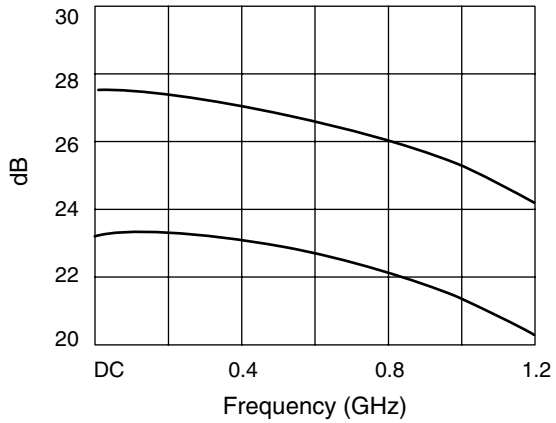
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



4, 8, 12, 16, 20 dB States vs. Frequency



24, 28 dB States vs. Frequency

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.

Truth Table

V_1	V_2	V_3	V_4	V_5	V_6	Attenuation
4 dB		8 dB		16 dB		J_1–J_2
-5	0	0	-5	-5	0	Reference I.L.
0	-5	0	-5	-5	0	4 dB
-5	0	-5	0	-5	0	8 dB
-5	0	0	-5	0	-5	16 dB
0	-5	-5	0	0	-5	28 dB

Pin Out