

GaAs IC 35 dB Voltage Variable Attenuator Single Positive Control 0.4–2.5 GHz

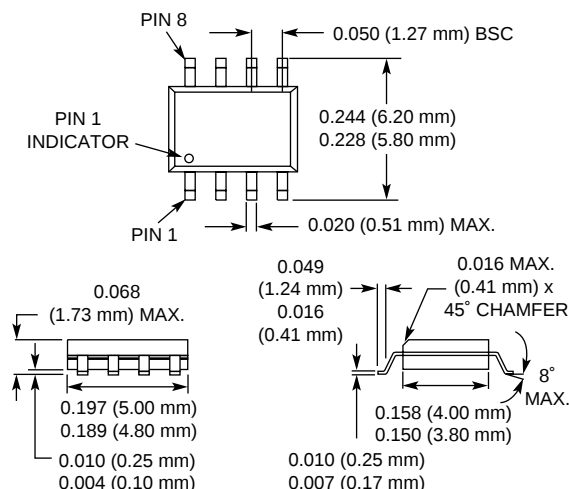


AT002S3-12

Features

- +5 V Operation
- Single Positive Voltage Control
- 35 dB Attenuation Range
- Low Insertion Loss (1.7 dB @ 0.9 GHz)

SOIC-8



Description

The AT002S3-12 GaAs IC FET bridge “T” attenuator provides 35 dB minimum absolute attenuation at 900 MHz. The key feature of this attenuator is the requirement of only one “positive” control voltage. Blocking capacitors are required on the RF ports.

Electrical Specifications at 25°C ($V_S = 5\text{ V}$)

Parameter ¹	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ($V_1 = 5\text{ V}$) ²	0.4–1.0 GHz		1.5	1.7	dB
	1.0–2.0 GHz		2.0	2.4	dB
	2.0–2.5 GHz		2.5	2.9	dB
Absolute Attenuation ($V_1 = 0\text{ V}$)	0.4–0.6 GHz	30	32		dB
	0.6–1.0 GHz	35	37		dB
	1.0–1.5 GHz	30	33		dB
	1.5–2.0 GHz	27	30		dB
	2.0–2.5 GHz	25	27		dB
VSWR (I/O) ³	0.4–2.5 GHz		2.5:1		

Operating Characteristics at 25°C ($V_S = 5\text{ V}$)

Parameter ¹	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁴	Rise, Fall (10/90% or 90/10% RF)			1.0		μs
	On, Off (50% CTL to 90/10% RF)			1.5		μs
	Video Feedthru			20		mV
Attenuation Flatness	0–10 dB	0.8–2.0 GHz		±1.0		dB
	11–20 dB	0.8–2.0 GHz		±1.5		dB
	21–30 dB	0.8–2.0 GHz		±3.5		dB
	31–Max.	0.8–2.0 GHz		±4.5		dB
Input Power for 1 dB Compression	Worst Case For All Attenuation States	0.9 GHz		-3		dBm
Control Voltages	$V_{\text{Low}} = 0\text{ to }0.2\text{ V @ }50\text{ }\mu\text{A Max.}$ $V_{\text{High}} = +5\text{ V @ }100\text{ }\mu\text{A Max.}$					
Supply Voltages (V_S)	+5 V @ 100 μA Max.					

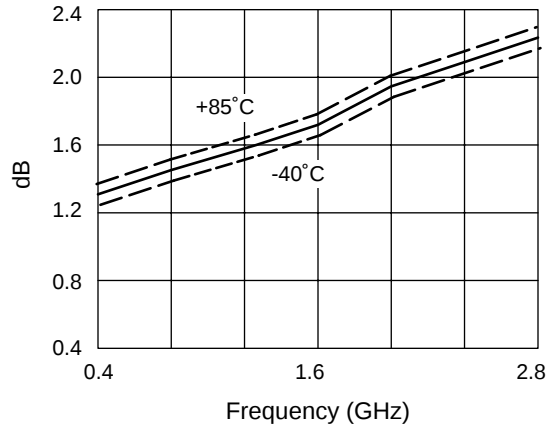
1. All measurements made in a 50 Ω system, unless otherwise specified.

2. Insertion loss changes by 0.003 dB/°C.

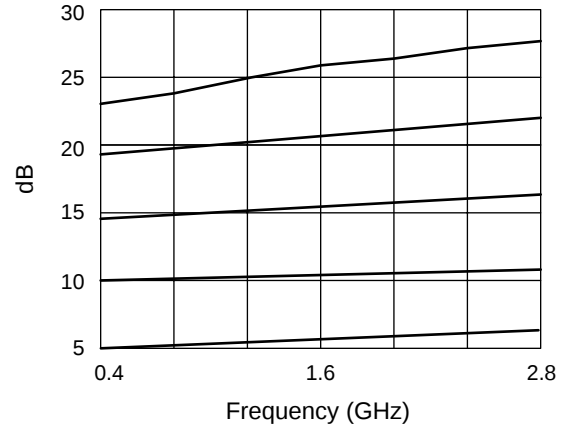
3. For all states.

4. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

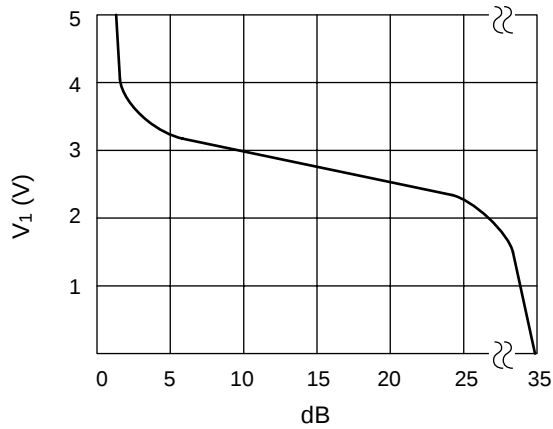
Typical Performance Data



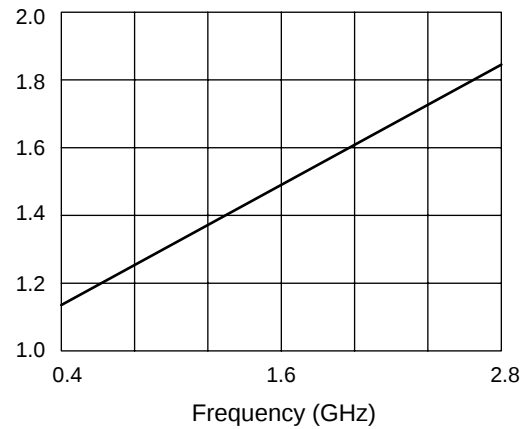
Insertion Loss vs. Frequency



Attenuation Flatness vs. Frequency



Attenuation vs. Control Voltage at 1.0 GHz



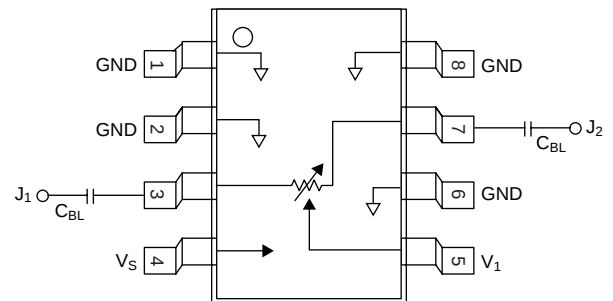
VSWR vs. Frequency
(Insertion Loss)

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	5 mW > 500 MHz
Supply Voltage	+8 V
Control Voltage	-0.2 V, +8 V (Do not allow control voltage to exceed V_S voltage.)
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.

Pin Out



DC blocking capacitors (C_{BL}) supplied externally.
 $C_{BL} = 100$ pF for operation >500 MHz.