

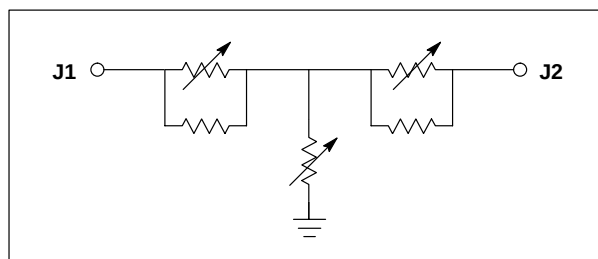
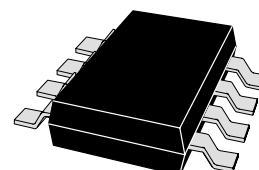
GaAs 35 dB MMIC FET Voltage Variable Single Positive Control Attenuator 0.4–2.5 GHz



AT002S3–12

Features

- 35 dB Range
- SOIC 8 Package
- Single Positive DC Bias Control
- Low Insertion Loss (< 1.7 dB @ 900 MHz)
- Low Cost
- Requires Single Fixed Positive 5 Volt Bias



Description

The AT002S3–12 GaAs FET MMIC 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. On the RF terminals, blocking capacitors greater than 0.001 μ f are necessary.

Electrical Specifications at 25°C

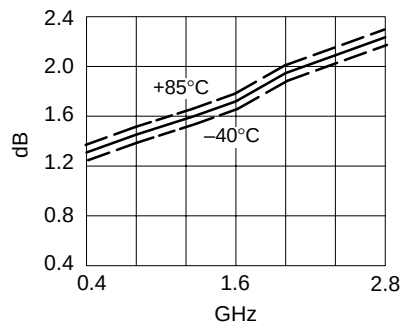
Insertion Loss	0.4 – 1.0 GHz	1.7	dB	Max
	1.0 – 2.0 GHz	2.4	dB	Max
	2.0 – 2.5 GHz	2.9	dB	Max
Absolute Attenuation ($V_1=0V$, $V_{DD}=5V$)	0.4–0.6	30	dB	Min
	0.6–1.0	35	dB	Min
	1.0–1.5	30	dB	Min
	1.5–2.0	27	dB	Min
	2.0–2.5	25	dB	Min
VSWR (I/O) ^{1,2}	0.4 – 2.5 GHz	2.5:1		Max

1. For Insertion Loss and Absolute Attenuation States.
2. Better VSWR may be obtained by raising the +5V bias to +6V. Set control V1 to operate from 0 to 6V.

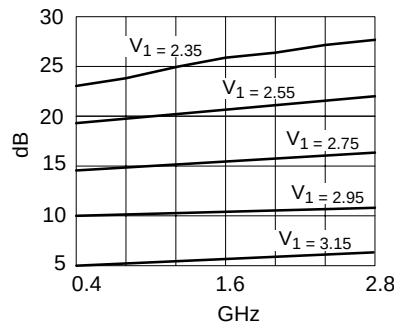
Operating Characteristics at 25°C

Impedance		50 Ohms Nominal		
Switching Characteristics				
RISE, FALL (10/90% or 90/10% RF)		1.0	μs	Typ
ON, OFF (50% CTL to 90/10% RF)		1.5	μs	Typ
Video Feedthru		20	mV	Typ
Attenuation Flatness				
0.8–2.0 GHz	0–10 dB	± 1.0 dB		Typ
	11–20 dB	± 1.5 dB		Typ
	21–30 dB	± 3.5 dB		Typ
	31–Max	± 4.5 dB		Typ
Compression Point (900 MHz) Worst Case for all Attenuation States				
0.1 dB		–10	dBm	Typ
1.0 dB		–3	dBm	Typ
Control Voltages				
V1 (Low)	0 to 0.2V @ 35 μA Max			
V1 (High)	+5V @ 30 μA Max			
Bias Voltage, V _{DD}		+5V @ 50 μA Max		

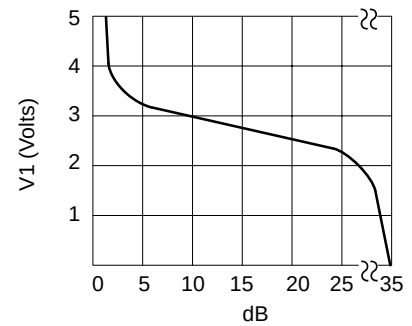
Typical Performance Data



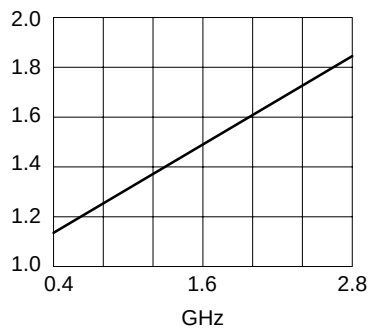
Insertion Loss vs. Frequency



Attenuation for a Given Vcontrol (by State) vs. Frequency

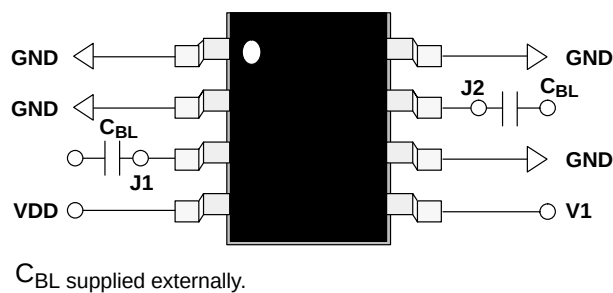


Relative Attenuation vs. Control Voltage at 1.0 GHz



VSWR vs. Frequency (Insertion Loss)

Pin Out and Functional Schematic



Absolute Maximum Ratings

RF Input Power:	5 mW > 500 MHz
Bias Voltage:	+8V
Control Voltage:	≤ +8V (Do not allow control voltage to exceed V _{DD} voltage.)
Operating Temperature:	–55°C to +125°C
Storage Temperature:	–65°C to +150°C
Thermal Resistance:	25°C/W