GaAs 30 dB IC Voltage Variable Dual Control Attenuator DC–8 GHz

Alpha

AT006N3-93

Features

- Dual Control Voltages
- Low Insertion Loss
- Broadband DC–8 GHz
- Small Low Cost “Chip on Board” Package

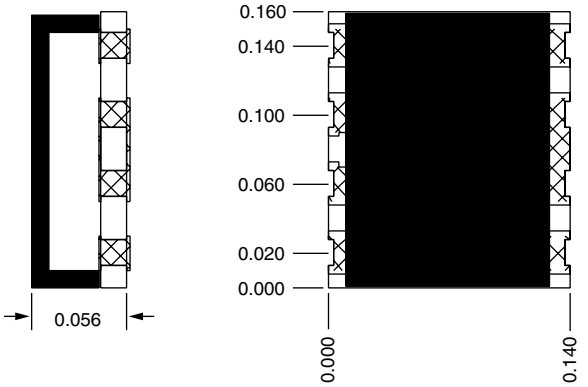
Description

The AT006N3-93 GHz GaAs FET IC non-reflective bridged “T” attenuator provides up to 30 dB of “non-reflective” attenuation. The control voltage requirements are 0 to -5 V.

This attenuator has two independent voltage controls, which must be adjusted in a prescribed manner to obtain the desired attenuation under non-reflective conditions. Refer to the Application Notes section, “Dual Voltage Controlled VVA.”

Applications for these fast attenuators are AGC circuits and variable level control in various military and telecommunications systems.

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Electrical Specifications at 25°C

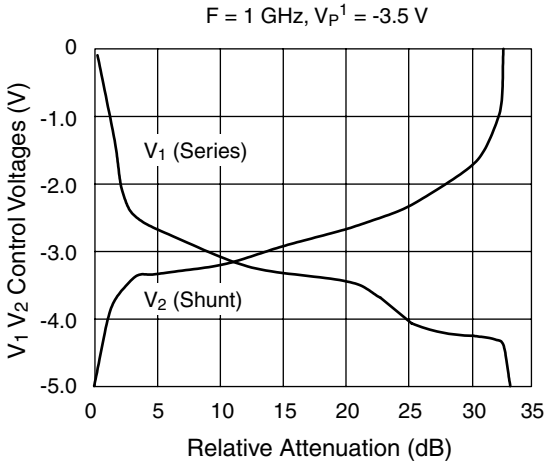
Parameter[1]	Frequency[4]	Min.	Typ.	Max.	Unit
Insertion Loss[2]	DC–2.0 GHz		0.8	1.0	dB
	DC–4.0 GHz		1.0	1.2	dB
	DC–6.0 GHz		1.2	1.4	dB
	DC–8.0 GHz		1.9	2.0	dB
Attenuation Range	DC–2.0 GHz	30	35		dB
	DC–4.0 GHz	29	33		dB
	DC–6.0 GHz	26	30		dB
	DC–8.0 GHz	24	28		dB
VSWR (I/O)	DC–2.0 GHz		1.25:1	1.3:1	
	DC–4.0 GHz		1.40:1	1.5:1	
	DC–8.0 GHz		1.50:1	1.6:1	

Operating Characteristics at 25°C

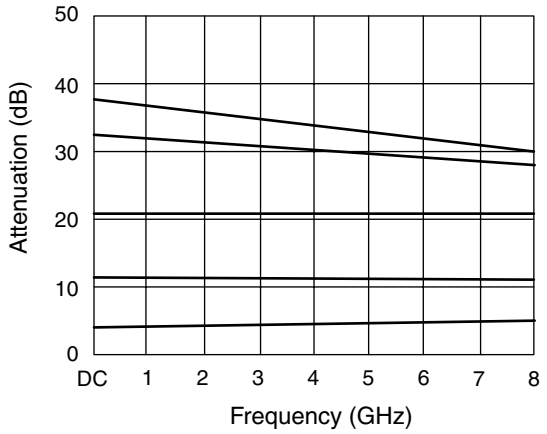
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF)			7		ns
	On, Off (50% CTL to 90/10% RF)			10		ns
	Video Feedthru[3]			20		mV
Input Power for 1 dB Compression	For All Attenuation Levels	0.5–6 GHz		0		dBm
		0.05 GHz		-3		dBm
Control Voltages	V_{Low} = 0 to -0.2 V @ 20 µA Max.					
	V_{High} = -5 V @ 50 µA Max.					

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C.
3. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.
4. DC = 300 kHz.

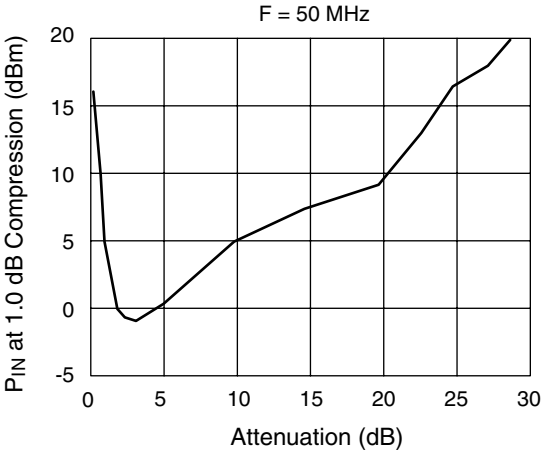
Typical Transfer Curve



Relative Attenuation vs. Control Voltages



Attenuation (By State) vs. Frequency

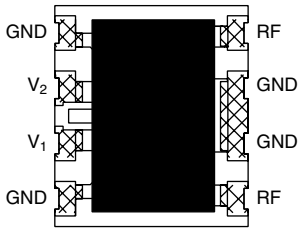


Attenuation vs. 1.0 dB Compression Point

Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	10 mW > 500 MHz 4 mW @ 50 MHz
Control Voltage (V_C)	+0.2 V, -10 V
Operating Temperature (T_{OP})	-40°C to +90°C
Storage Temperature (T_{ST})	-65°C to +150°C
Thermal Resistance (Θ_{JC})	25°C/W

Pin Out



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