

GaAs IC 1 Bit Digital Attenuator

15 dB LSB DC–2 GHz



AA116-72

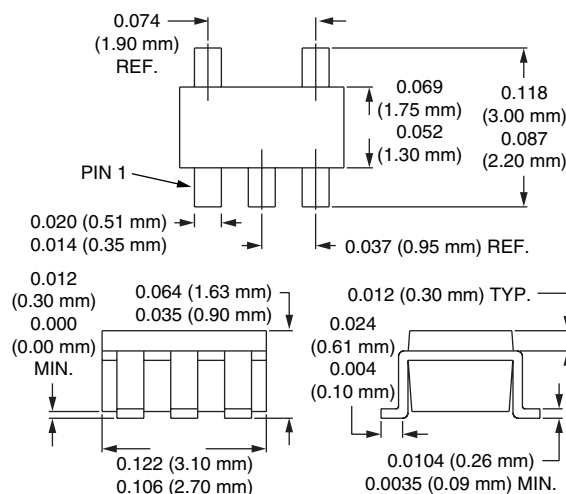
Features

- +3 V Control
- Low Loss
- Low Cost SOT-5 Plastic Package

Description

The AA116-72 is a 1 bit GaAs IC FET digital attenuator in a low cost package. This attenuator has an LSB of 15 dB. The AA116-72 is particularly suited where high attenuation accuracy, low insertion loss and low intermodulation products are required. Typical applications include cellular radio, wireless data, and wireless local loop gain level control circuits.

SOT-5



Electrical Specifications at 25°C (0, +3 V)

Parameter ¹	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ²	0.50–1.00 GHz		0.35	0.45	dB
	0.85–0.94 GHz		0.30	0.38	dB
	1.00–2.00 GHz		0.40	0.50	dB
Attenuation Range			15.0		dB
Attenuation Accuracy ³	0.50–2.00 GHz	14.0	15.0	16.0	dB
	0.85–0.94 GHz	14.5	15.0	15.5	dB
Return Loss	0.50–1.00 GHz		24		

Operating Characteristics at 25°C (0, +3 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ^{4, 5}	Rise, Fall (10/90% or 90/10% RF)			150		ns
	On, Off (50% CTL to 90/10% RF)			300		ns
	Video Feedthru			70		mV
Input Power for 1 dB Compression	V _S = +3 V	0.5–2.5 GHz		+20		dBm
	V _S = +5 V	0.5–2.5 GHz		+26		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm V _S = +3 V V _S = +5 V	0.5–2.5 GHz		+41		dBm
		0.5–2.5 GHz		+45		dBm
Control Voltages	V _{Low} = 0 to 0.2 V V _{High} = +3 V @ 25 μA Typ. to +5 V @ 50 μA Typ.					

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

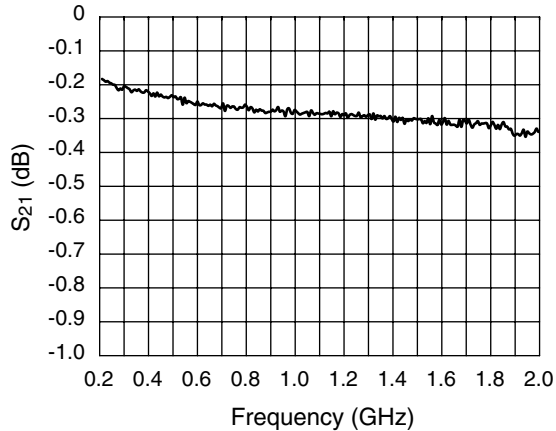
2. Insertion loss changes by 0.003 dB/°C.

3. Maximum attenuation includes insertion loss.

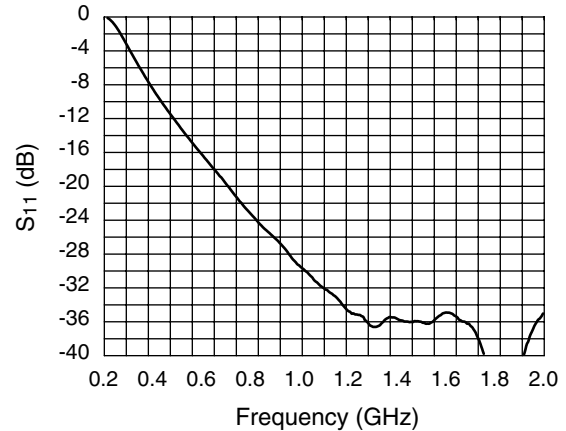
4. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

5. Switching characteristics will vary with value chosen for C_{BP}.

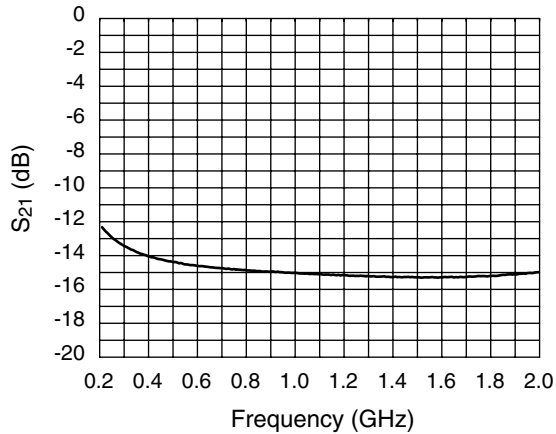
Typical Performance Data (0, +3 V)



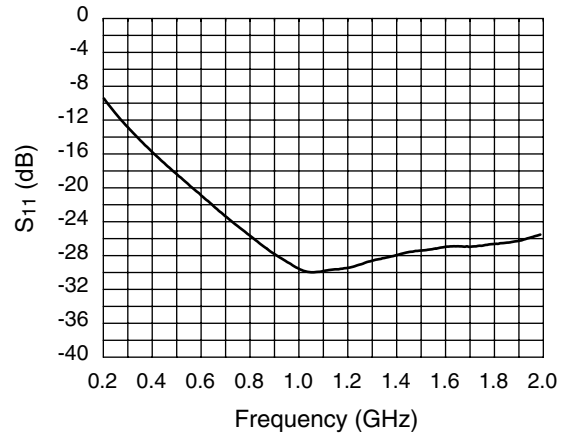
Insertion Loss



Return Loss in Insertion Loss State



Attenuation



Return Loss in Attenuation State

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	1 W > 500 MHz 0/8 V 0.5 W @ 50 MHz 0/8 V
Supply Voltage	+8 V
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

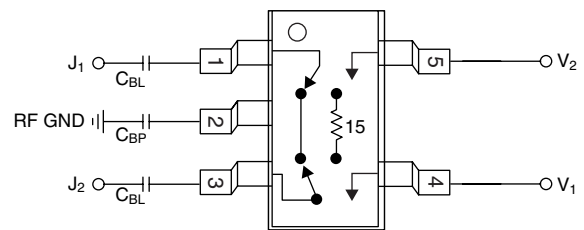
Note: Exceeding these parameters may cause irreversible damage.

Truth Table

V_1	V_2	J_1-J_2
V_{High}	0	Insertion Loss
0	V_{High}	Attenuation

V_{High} = +3 to +5 V.

Pin Out



DC blocking capacitors (C_{BL}), bypass capacitor (C_{BP}), and biasing resistor must be supplied externally for positive voltage operation.
 C_{BL} = 33, C_{BP} = 39 pF for operation @ 900 MHz.