GaAs IC 15 dB Voltage Variable Attenuator Single Control DC–2 GHz

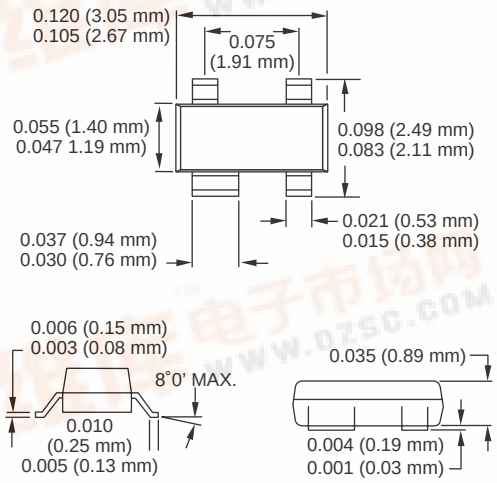
Alpha

AF002N2-32

Features

- Single Voltage Control, Positive or Negative Voltage
- Low Cost SOT-143 Package
- 15 dB Dynamic Range
- Non-Reflective

SOT-143



Description

The AF002N2-32 is a single control non-reflective IC FET VVA ideal for AGC applications. Its low DC drain characteristic and size make it suitable for PCS and portable cellular markets. A positive control voltage may be used by adding 2 DC blocking capacitors (C_{BL}) and 1 bypass capacitor (C_{BP}).

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

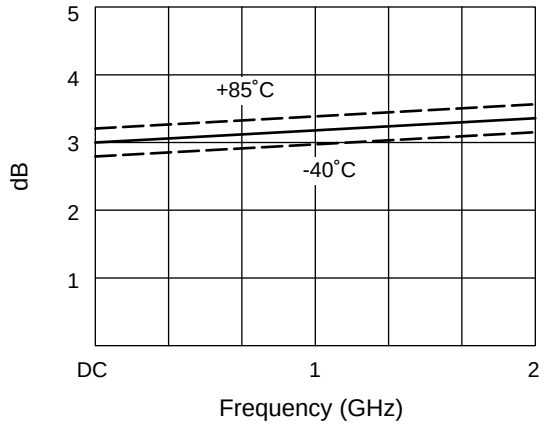
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss (V_1 = -5 V)[3]	DC–0.5 GHz DC–1.0 GHz DC–2.0 GHz		3.1 3.3 3.5	3.3 3.5 3.8	dB dB dB
Attenuation (V_1 = 0 V)	DC–0.5 GHz DC–1.0 GHz DC–2.0 GHz	18 14 10	20 16 12		dB dB dB
VSWR (V_1 = 0 to -5 V)	DC–2.0 GHz		2.0:1	2.2:1	

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

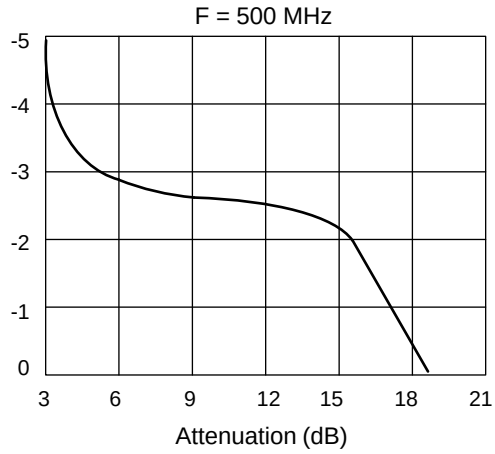
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[4]	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru			7 10 20		ns ns mV
Input Power for 1 dB Compression	For All Attenuation Levels	0.05 GHz 0.90 GHz		-3 0		dBm dBm
Control Voltages	V_{Low} = 0 to -0.2 V @ 20 µA Max. V_{High} = -5 V @ 50 µA Max. to -8 V @ 200 µA Max. V_S = V_{High} ± 0.2 V					

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

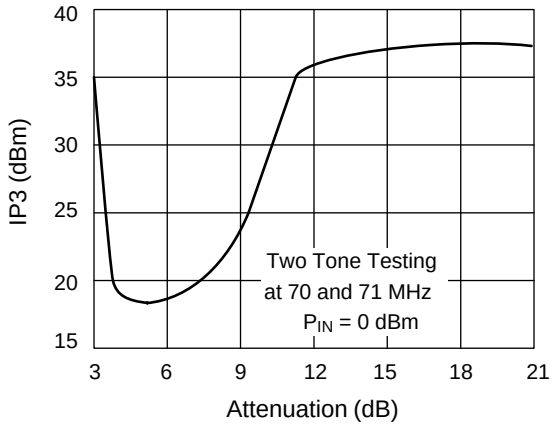
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Attenuation vs. Control Voltage



Attenuation vs. IP3

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	10 mW > 500 MHz 0/-8 V 4 mW @ 50 MHz 0/-8 V
Control Voltage	+0.2 V, -10 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	25°C/W

Note: Operating this device above any of these parameters may cause irreversible damage.

Truth Table

Negative Voltage Operation

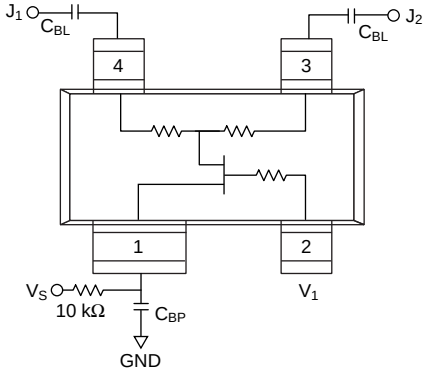
V_1	Attenuation J_1–J_2
-5	Insertion Loss
0	Full Attenuation

Positive Voltage Operation

V_1	Attenuation J_1–J_2
V_{High}	Full Attenuation
0	Insertion Loss

V_{High} = +5 V to +8 V (V_S = V_{High} ± 0.2 V).

Pin Out



External components for positive voltage operation only.
C_{BL} = 100 pF.

Optimum Tuning for Maximum Attenuation

F (MHz)	C_{BP}	Typical Maximum Attenuation
130	220 pF	21
730	15 pF	21
1925	1.6 pF	21