SAC3402A

GaAs MMIC Digital Attenuator
DC~6GHz

Rev 2.1

Features

- Frequency：DC~6GHz
- RMS of Attenuation Accuracy：0.8dB
- Low Insertion Loss：2.5dB
- Positive Voltage Control
- Die Size：1.78mm×1.21mm×0.1mm

Typical Applications

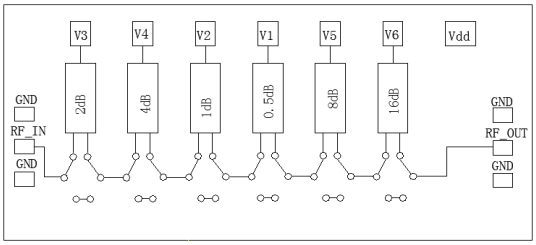
- EW
- Cellular Infrastructure
- SATCOM
- Beamforming Modules
- Test Equipment and Sensors

General Description

SAC3402A is a broadband 6-bit GaAs digital attenuator MMIC chip. Covering DC to 6 GHz, the insertion loss is less than 2.5 dB typically. The attenuator bit values are 0.5dB, 1dB, 2dB, 4dB, 8dB, and 16dB for a total attenuation of 31.5dB. Three LVTTL 0/+5V inputs are used to select each attenuation state.

The chip offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=+25℃, V_{SS}=-5V, Control Voltage=0/+5V, Z_O=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency		DC~6		GHz
Input VSWR	—	1.4	1.8	:1
Output VSWR	—	1.4	1.8	:1
Insertion Loss	—	-2.5	-3.0	dB
A_{TT}-Phase Error	-3	—	2.5	°
Attenuation Accuracy	-0.3	—	0.5	dB
RMS of Attenuation Accuracy	—	0.8	—	dB
Input P-1 dB	—	13(f=0.05GHz)	—	dBm
	—	13(f=0.05GHz)	—	
	—	13(f=0.05GHz)	—	

Truth Table (0：0V，1：+5V)

Attenuation	V1	V2	V3	V4	V5	V6
REF	0	0	0	0	0	0
0.5dB	1	0	0	0	0	0
1dB	0	1	0	0	0	0
2dB	0	0	1	0	0	0
4dB	0	0	0	1	0	0
8dB	0	0	0	0	1	0
16dB	0	0	0	0	0	1
31.5dB	1	1	1	1	1	1

RoHS

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Absolute Maximum Ratings

Maximum Input Power	+22dBm	Operating Temperature	-55℃～+85℃
Maximum Input Voltage	-5.25V (Vs)	Storage Temperature	-65℃～+150℃

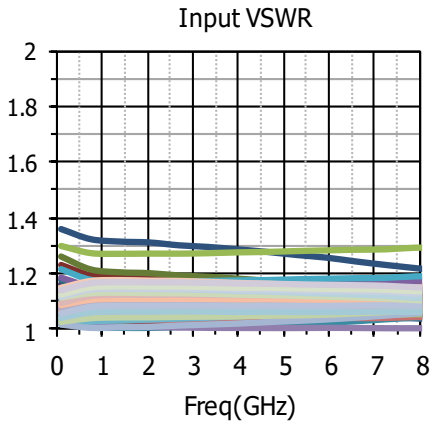
Control Voltage

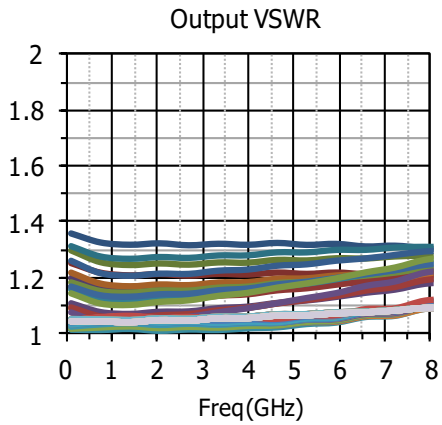
State	Bias
Low	0~ 0.25V
High	3.3~ 5.25V

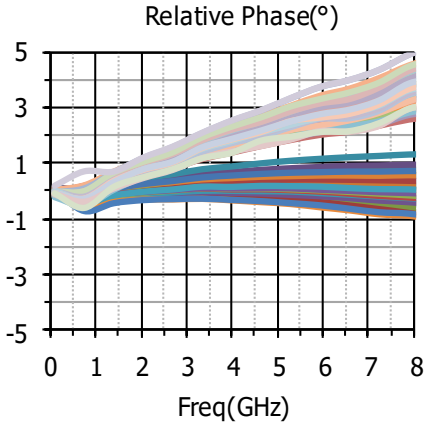
Power Supply

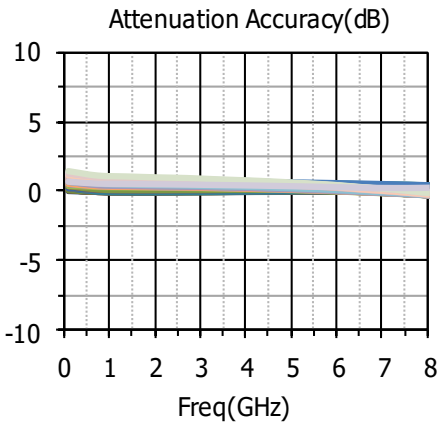
V_{ss}	I_{ss}
-5V	8mA (typ)

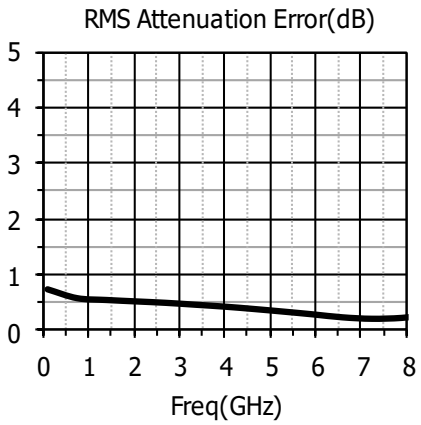
Typical Performance Curve



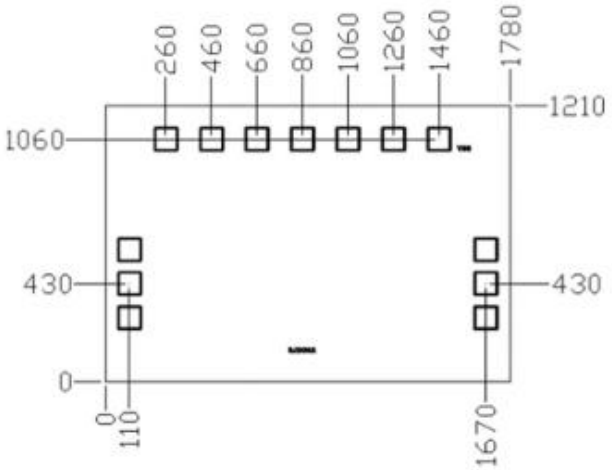




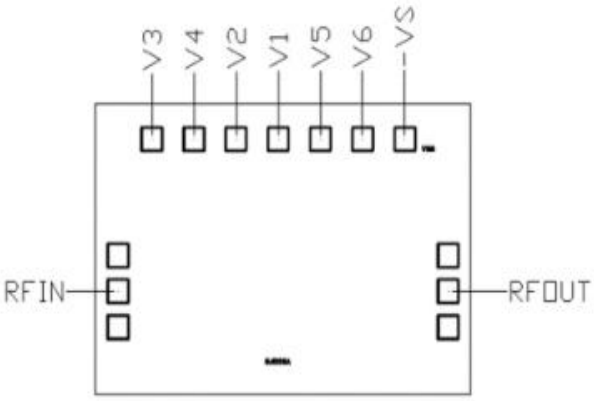




Die Outline
(All dimensions in mm)



Assembly Diagram



Attention:

1. The chip is stored in dry and nitrogen environment and used in ultra clean environment;
2. The GaAs material is brittle and cannot touch the surface of the chip, so care must be taken when using it;
3. The chip is sintered with conductive adhesive or alloy (the alloy temperature shall not exceed 300 ° C and the time shall not exceed 30 seconds) to make it fully grounded;
4 The gap between the chip microwave port and the substrate is not more than 0.05mm, and the gold wire length is recommended to be 250-400μm;
5. The chip is sensitive to ESD, so pay attention to anti-static during storage and use.

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