

# 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

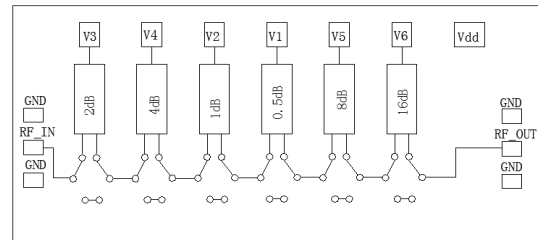
- EW
- Cellular Infrastructure
- SATCOM
- Beamforming Modules
- Test Equipment and Sensors

## 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 LVTTTL 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 ( $T_A = +25^\circ\text{C}$ , $V_{SS} = -5\text{V}$ , Control Voltage=0/+5V, $Z_0 = 50\Omega$ )

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

### SuperApex, LLC

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## Absolute Maximum Ratings

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

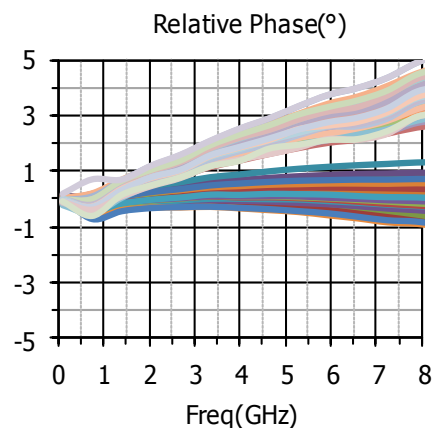
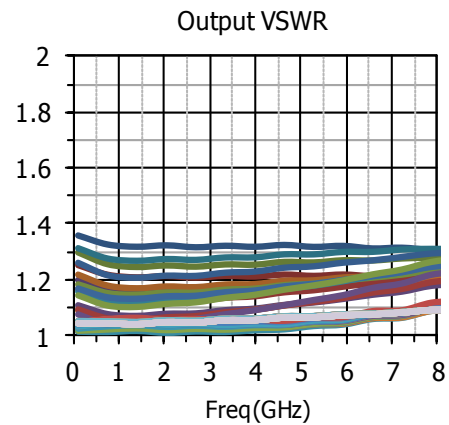
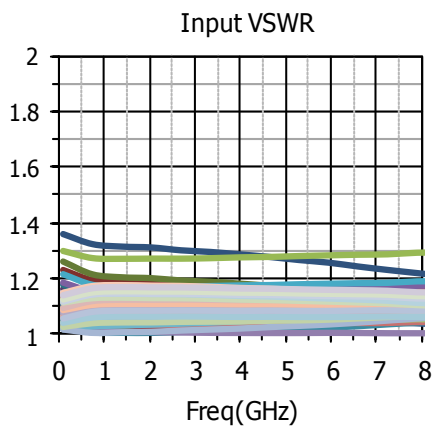
### Control Voltage

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

### Power Supply

V <sub>ss</sub>	I <sub>ss</sub>
-5V	8mA (typ)

## Typical Performance Curve



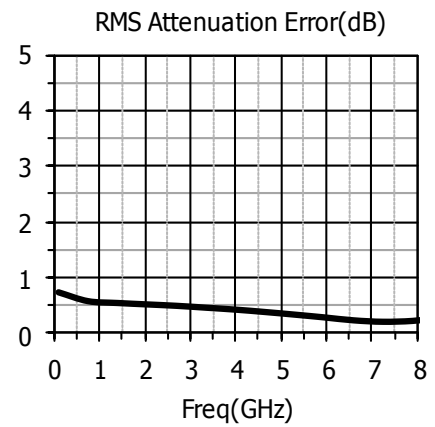
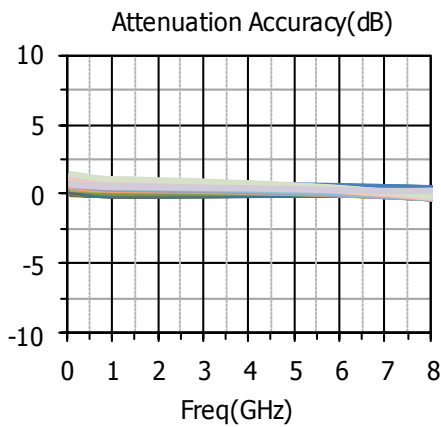
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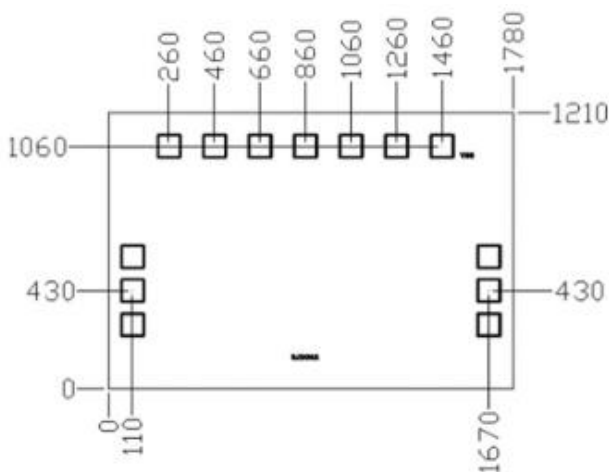
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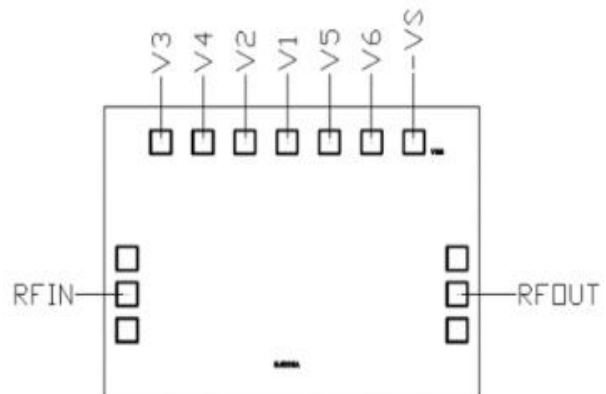
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**Die Outline**  
(All dimensions in mm)



**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.