

SAC3408B



GaAs MMIC Digital Attenuator
DC~20GHz

Rev 1.0

Features

- Frequency: DC~20GHz
- RMS of Attenuation Accuracy: 0.8dB
- Insertion Loss: 3.8dB@20GHz
- Positive Voltage Control
- Chip Size: 1.75mm×1.25mm×0.1mm

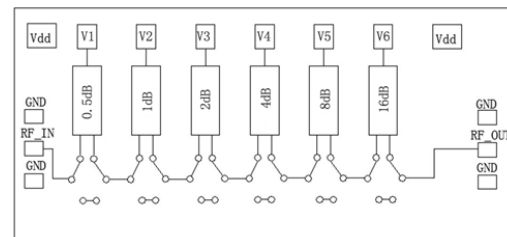
Typical Applications

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

General Description

SAC3408B is a broadband 6-bit GaAs digital attenuator MMIC chip. Covering DC to 20GHz, the insertion loss is less than 3.8 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.

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~20			GHz
Input VSWR	-	-15	-	dB
Output VSWR	-	-15	-	dB
Insertion Loss	-	3.8	4.5	dB
A_{TT} -Phase Error	-	± 5	± 10	$^\circ$
Attenuation Accuracy	-	± 2	-	dB
RMS of Attenuation Accuracy	-	0.8	1.5	dB

Truth Table (0: 0V, 1: +5V)

Attenuation	V1	V2	V3	V4	V5	V6
REF	0	0	0	0	0	0
0.5dB	5	0	0	0	0	0
1dB	0	5	0	0	0	0
2dB	0	0	5	0	0	0
4dB	0	0	0	5	0	0
8dB	0	0	0	0	5	0
16dB	0	0	0	0	0	5
31.5dB	5	5	5	5	5	5

SuperApex, LLC

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Control Voltage

State	Bias
Low	0~0.25V
High	3.3~5.0V

Absolute Maximum Ratings

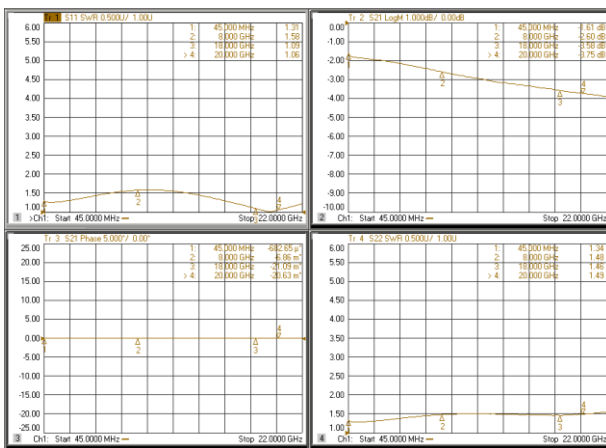
Maximum Input Power	Maximum Input Voltage
+23dBm (≥500MHz)	-6V
Operating Temperature	Storage Temperature
-55°C~+85°C	-65°C~+150°C

Power Supply

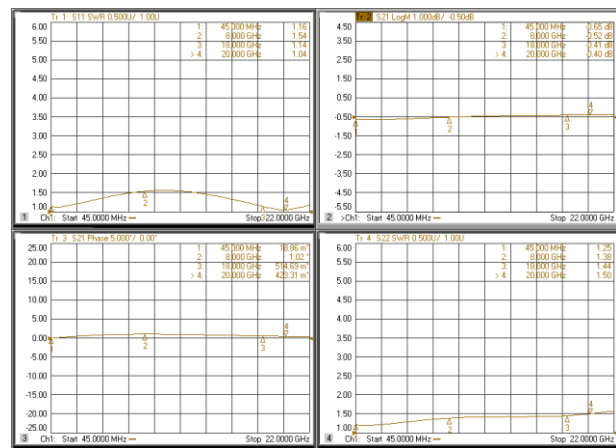
V _{SS}	I _{SS}
-5V	14mA max

Typical Performance Curve

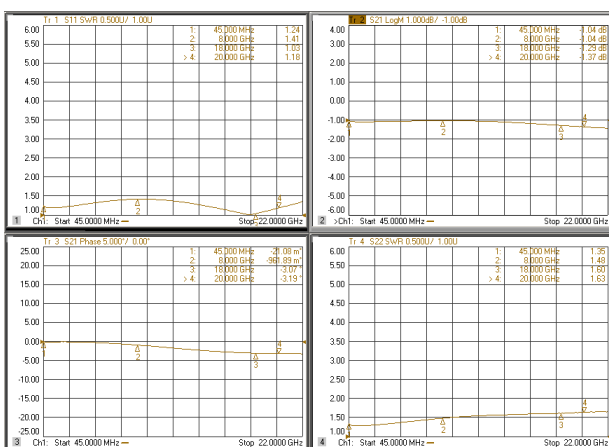
REF bit



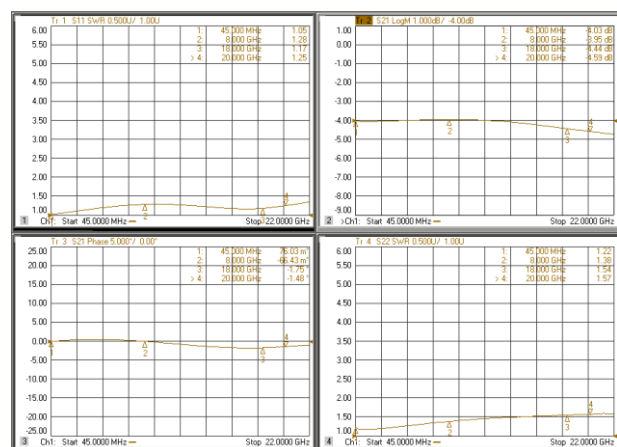
0.5dB bit



1dB bit



2dB bit



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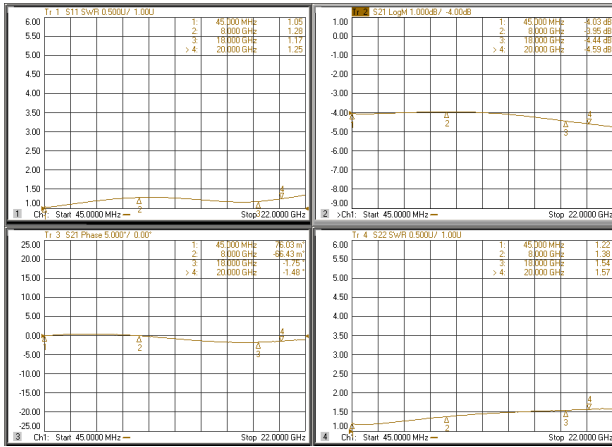
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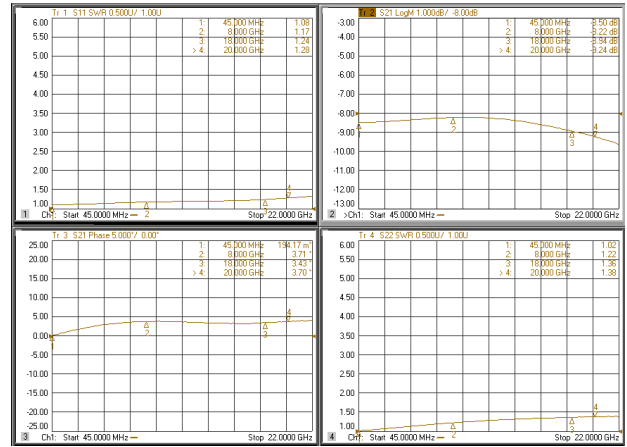
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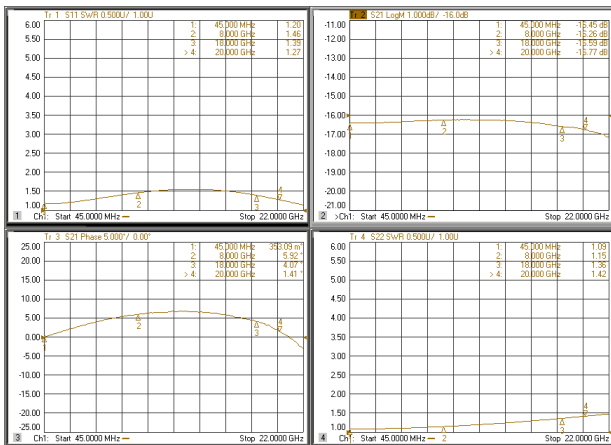
4dB bit



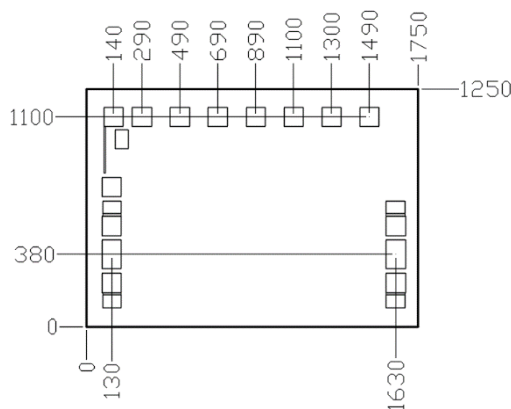
8dB bit



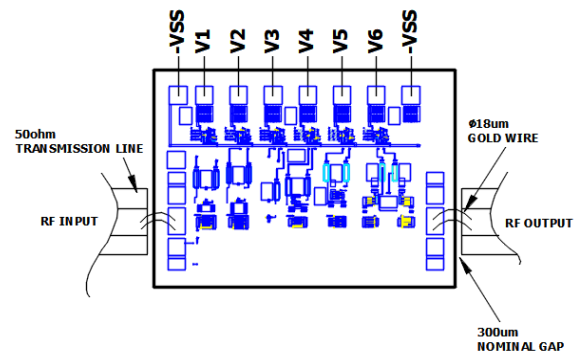
16dB bit



Die Outline (All dimensions in mm)



Assembly Diagram



Pad size for RF input and output bonding: 135x100um²
size of other bonding pads: 100x100um²

Select any pad to use : Vss
The RF port is not integrated with DC blocking capacitor

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Attention:

GaAs MMIC devices are susceptible to damage from electrostatic discharge. Proper precautions should be observed during handling, assembly and test

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