

GaAs MMIC 5-bit CNC Attenuator Chip, 0.01-12GHz

Performance characteristics

Frequency range: 0.01-12GHz

Insertion loss: 3.2dB typ

Attenuation range: 1-31dB

Bit count: 5

Attenuation step: 1dB

Control voltage: 0/-5V control

50Ohm input/output

Chip size: QFN 5X5

Product Introduction

GDA-0012-5B-CQ5 is a GaAs MMIC 5-bit CNC attenuator chip, with a frequency range of 0.01-12GHz, insertion loss of 3.2dB, switching speed of 50ns, integrated driver inside the chip, and 0/-5V control. The CNC attenuator adopts a 5X5mm surface mount lead-free ceramic tube shell, which can achieve airtight packaging. The surface of the pin pads is treated with gold plating technology, suitable for reflow soldering installation process.

Use restriction parameters

Control voltage range	-8V~+0.5V
Maximum input power	+27dBm
Working temperature	-55 ~ +85°C
Storage temperature	-65 ~ +150°C

Exceeding any of the above maximum limits may result in permanent damage.

Electrical parameters (Ta=+25 ° C, 0/-5V control)

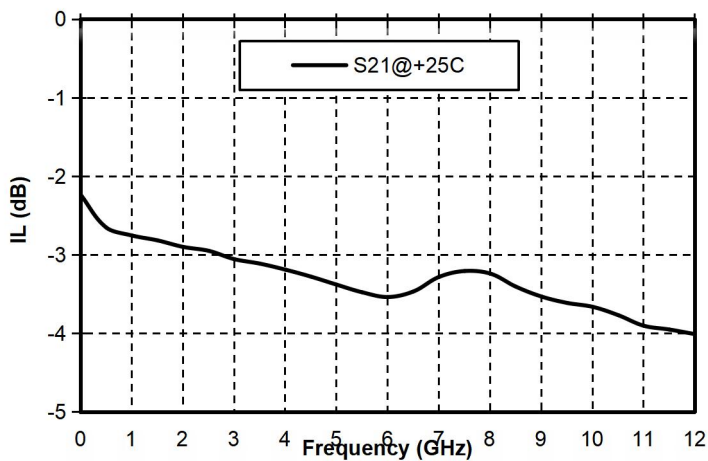
Index	minimum value	Typical value	Maximum value	Unit
Frequency range	0.01-12			GHz
Insertion loss	-	3.2	-	dB
Attenuation range	1~31			dB
Attenuation step	1			dB
Attenuation number	5			bite
Attenuation accuracy (fundamental state)	-	-	±1	dB
Attenuation accuracy (fundamental state) (RMS)	-	0.5	-	dB
Additional phase shift (fundamental state)	-	-	±3.0	degree

Additional phase shift (fundamental state) (RMS)	-	-	0.5	degree
Input return loss	-	17	-	dB
Output Return Loss	-	18	-	dB
Switching speed	-	50	-	ns
P-1dB	-	22	-	dBm
Control voltage		0/-5	-	V

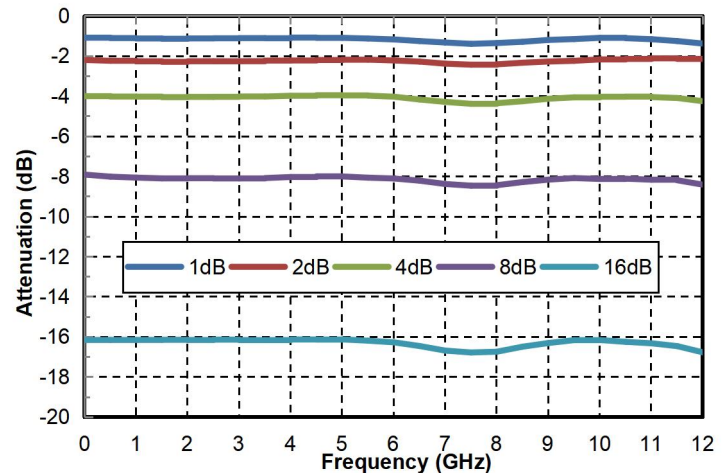
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Main indicator testing curve

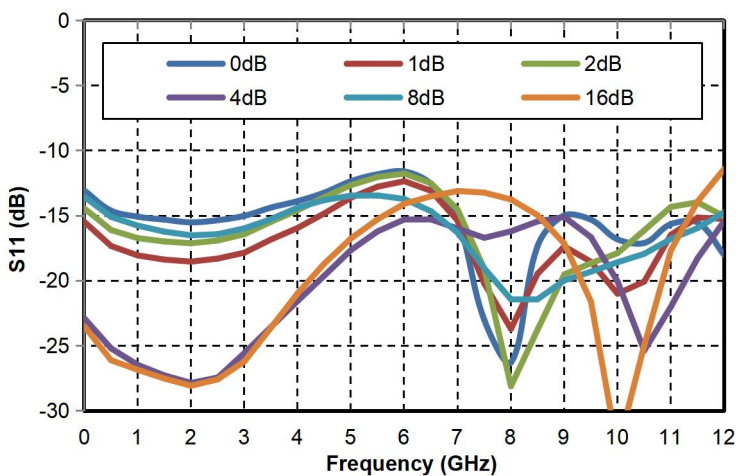
Insertion loss vs. frequency



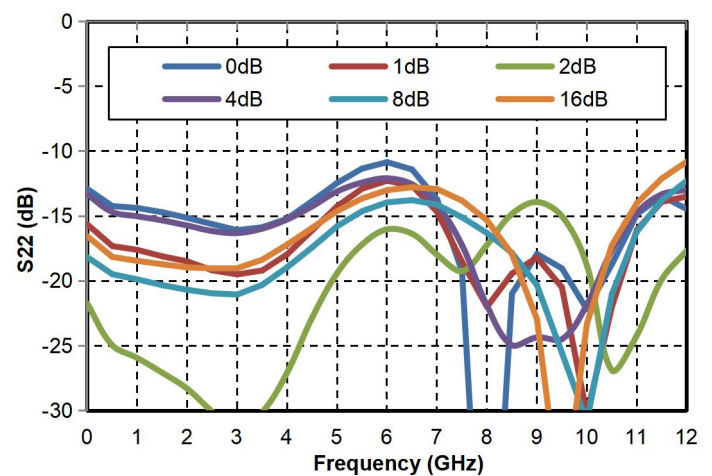
Reference attenuation state vs. frequency



Input Echo vs. Frequency

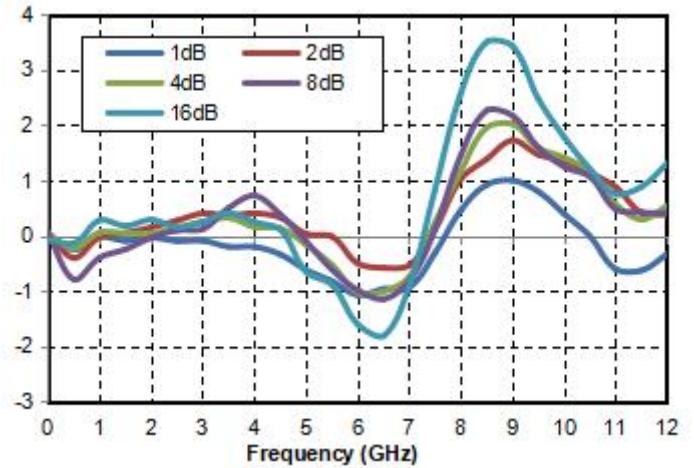
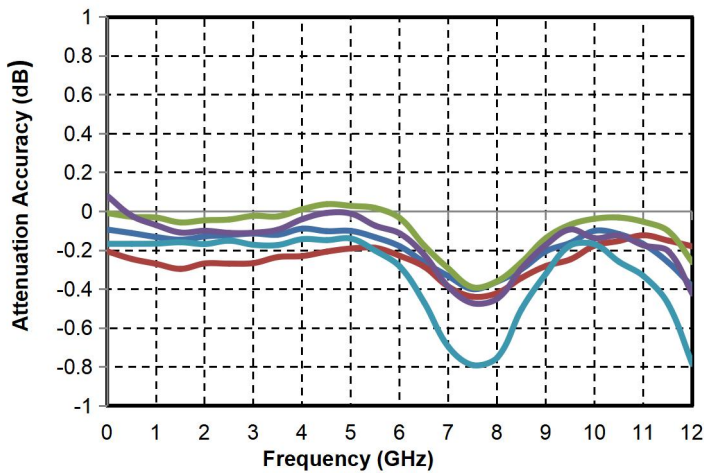


Output Echo vs. Frequency



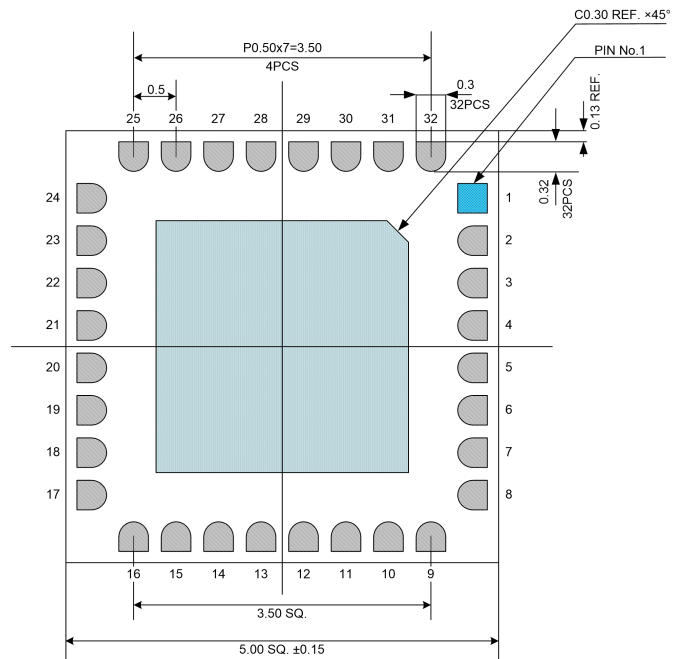
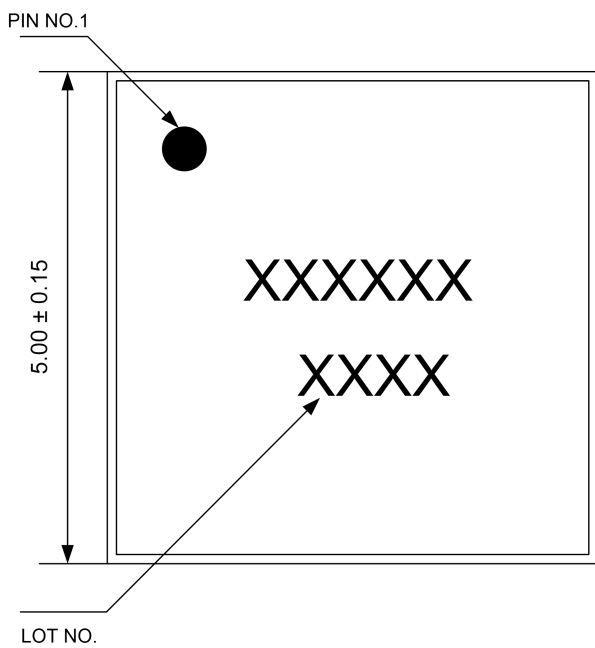
Attenuation accuracy (fundamental state) vs. frequency

Additional phase shift (fundamental state) vs. frequency



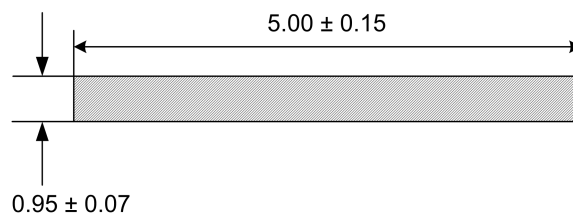
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External structure



vertical view

Top view



Side view

The units in the figure are all millimeters, with an unspecified tolerance of $\pm 0.15\text{mm}$

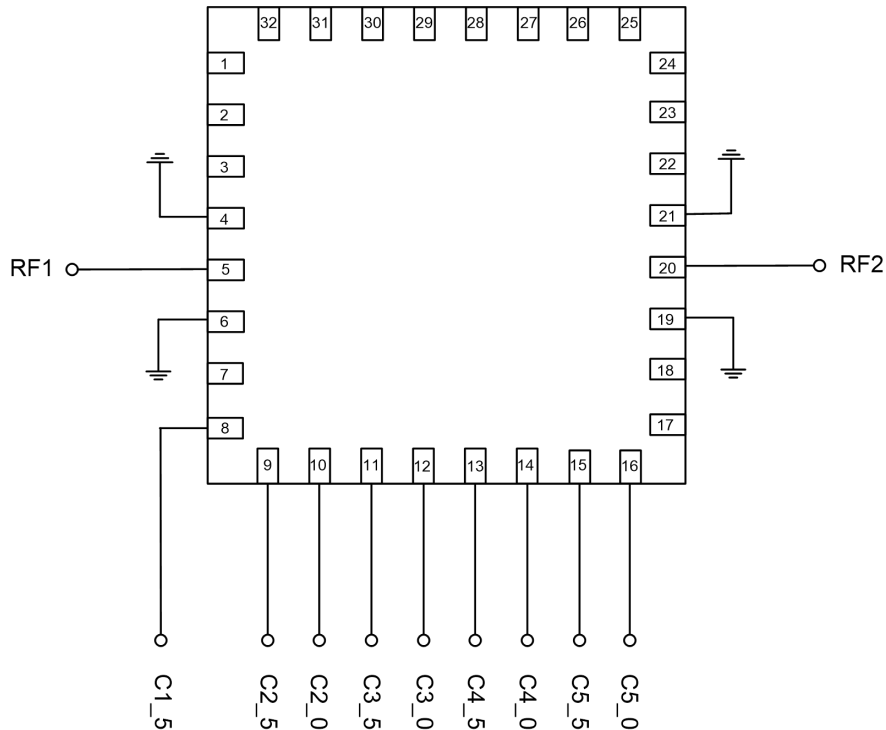
Truth table

Truth table									
C1_5	C2_5	C2_0	C3_5	C3_0	C4_5	C4_0	C5_5	C5_0	Conduction pathway
-5V	-5V	0V	-5V	0V	-5V	0V	-5V	0V	Initial state N=0: attenuation amount is 0
0V	-5V	0V	-5V	0V	-5V	0V	-5V	0V	Attenuation state N=1: Attenuation amount is 1
-5V	0V	-5V	-5V	0V	-5V	0V	-5V	0V	Attenuation state N=2: Attenuation amount is 2
-5V	-5V	0V	0V	-5V	-5V	0V	-5V	0V	Attenuation state N=4: Attenuation amount is 4
-5V	-5V	0V	-5V	0V	0V	-5V	-5V	0V	Attenuation state N=8: Attenuation amount is 8
-5V	-5V	0V	-5V	0V	-5V	0V	0V	-5V	Attenuation state N=16: Attenuation amount is 16

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Solder joint serial number	Functional symbols	Function Description
5	RFIN	The RF signal input terminal is externally connected to a 50 ohm circuit, and there is no integrated DC isolation capacitor inside the chip
20	RFOUT	The RF signal output terminal is externally connected to a 50 ohm circuit, and there is no integrated DC isolation capacitor inside the chip
8、9、10、11、12、13、14、15、16	VC	Attenuation control pads, see truth table for attenuation control details
4、6、19、21	GND	The pins need to be well grounded with RF and DC
Chip bottom	GND	The bottom of the chip needs to be well grounded with RF and DC
other	NC	No welding required

Recommended circuit



Precautions for use

- Sealing material: Ceramic material that meets ROHS specifications
- Lead frame material: copper alloy
- Lead surface coating: gold, with a gold layer thickness greater than 0.3um MIN
- Maximum reflow soldering peak temperature: 260 °C