Standard Circuit

GaAs MMIC 6-bit CNC Attenuator Chip, 1-8GHz

Performance characteristics

Frequency range: 1-8GHz

Insertion loss: 2.3dB typ

Attenuation range: 0.5~31.5dB

Control digit: 6

Attenuation step: 0.5dB

Full positive:+5V power supply, 0/+5V control
(compatible with+3.3V)

50Ohm input/output

Chip size: QFN 4X4

Product Introduction

GDA-0108-6E-PD-CQ4 is a GaAs MMIC 6-bit CNC attenuator chip, with a frequency range of 1-8GHz, insertion loss of 2.3dB, switching speed of 30ns, integrated driver inside the chip, powered by+5V, 0/+5V control (compatible with+3.3V). This CNC attenuator adopts a 4X4mm 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

Power supply voltage range	+6V
Control voltage range	-0.5V~+5.5V
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, VDD=+5V, 0/+5V control)

Index	Minimum value	Typical value	Maximum value	Unit
Frequency range	1-8			GHz
Insertion loss	-	2.3	-	dB
Attenuation range	0.5~31.5			dB
Attenuation step	0.5			dB
Attenuation number	6			bite
Attenuation accuracy (fundamental state)	-	-	±0.6	dB
Additional phase shift (fundamental state)	-	-	8	degree
Input/output wave loss	-	20/18	-	dB

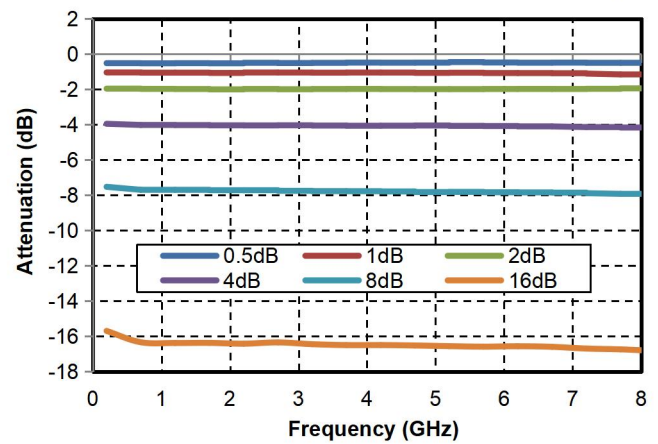| Switching speed	-	30	-	ns
P-1dB	-	23	-	dBm
Supply voltage	+3	+5	-	V
Power supply current		8	-	mA
Control high voltage	2.5	3.3	5	V
Control low voltage	0		0.8	V
Control current	-	-	1	mA

GaAs MMIC 6-bit CNC Attenuator Chip, 1-8GHz
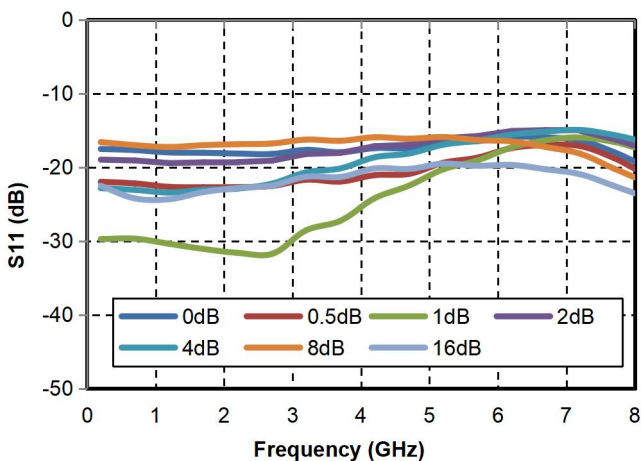
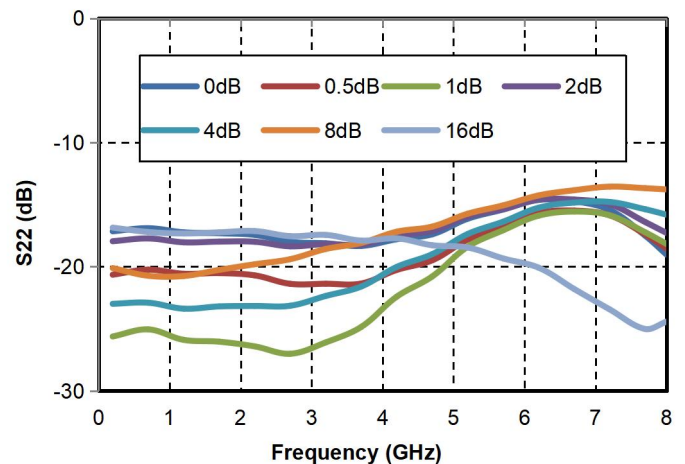## Main indicator testing curve

Insertion loss vs. frequency
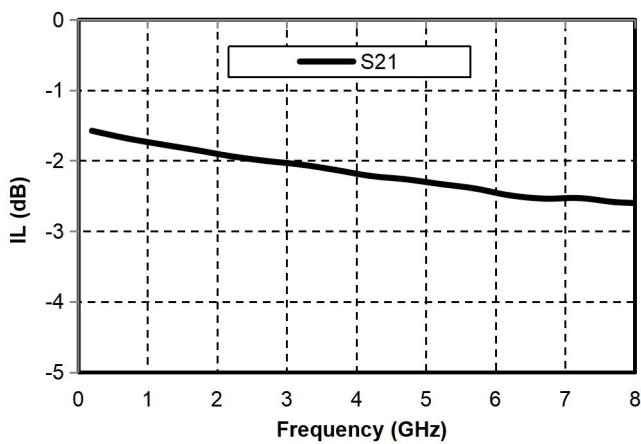
Reference attenuation state vs. frequency
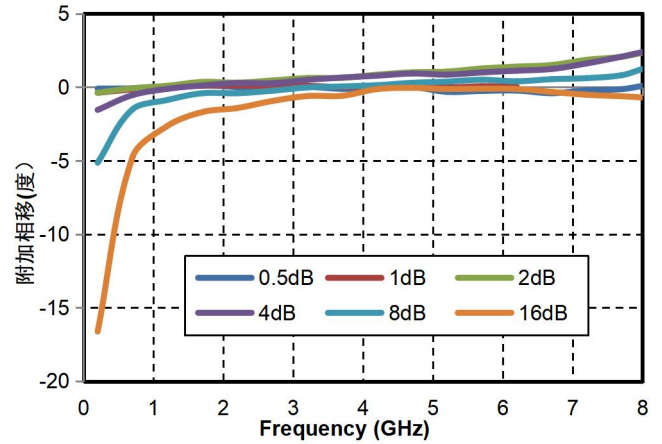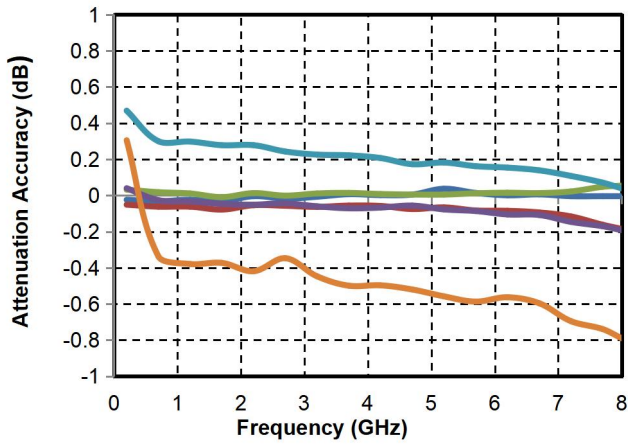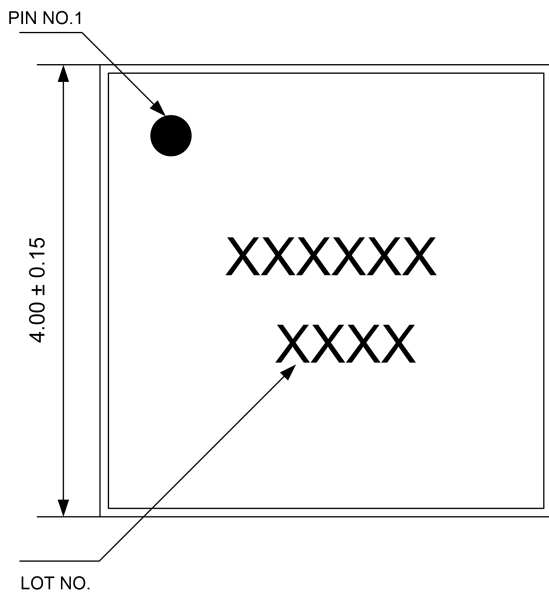

Input Echo vs. Frequency

Output Echo vs. Frequency

Attenuation accuracy (fundamental state) vs. frequency
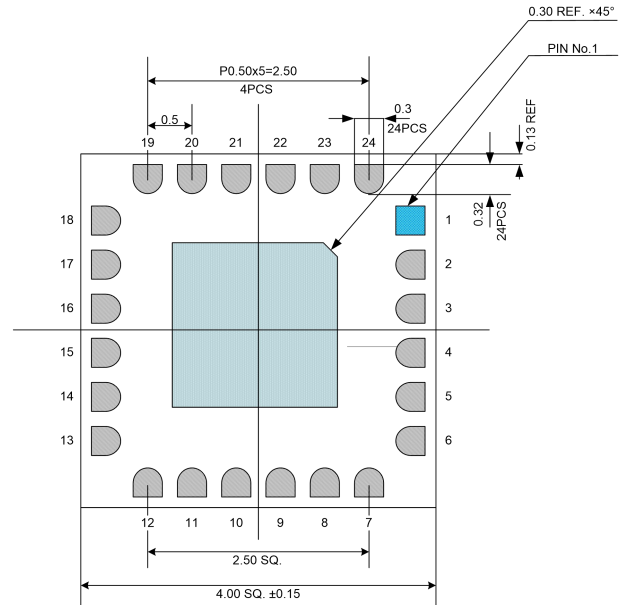
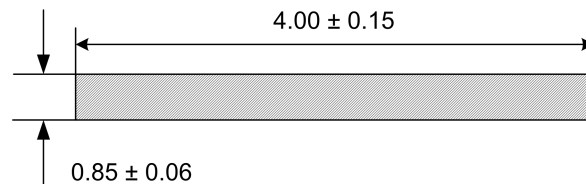Additional phase shift (fundamental state) vs. frequency

Attenuation Accuracy (dB) vs **Frequency (GHz)**

附加相移(度) vs **Frequency (GHz)**

Legend: 0.5dB, 1dB, 2dB, 4dB, 8dB, 16dB

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External structure

PIN NO.1

XXXXXX

XXXX

4.00 ± 0.15

LOT NO.

vertical view

0.30 REF. ×45°

PIN No.1

P0.50x5=2.50
4PCS

0.5

0.3
24PCS

0.13 REF

0.32
24PCS

19 20 21 22 23 24

18   1
17   2
16   3
15   4
14   5
13   6

12 11 10 9 8 7

2.50 SQ.

4.00 SQ. ±0.15

Top view

4.00 ± 0.15

0.85 ± 0.06

Side view

The units in the figure are all millimeters, with an unspecified tolerance of ± 0.15mm

Truth table

Truth table							
VC1	VC2	VC3	VC4	VC5	VC6	VDD	Conduction pathway
+5V	+5V	+5V	+5V	+5V	+5V		Initial state N=0: attenuation amount is 0
+5V	+5V	+5V	+5V	+5V	0V		Attenuation state N=1: Attenuation amount is 0.5
+5V	+5V	+5V	+5V	0V	+5V		Attenuation state N=2: Attenuation amount is 1
+5V	+5V	+5V	0V	+5V	+5V		Attenuation state N=4: Attenuation amount is 2
+5V	+5V	0V	+5V	+5V	+5V	+5V	Attenuation state N=8: Attenuation amount is 4
+5V	0	+5V	+5V	+5V	+5V		Attenuation state N=16: Attenuation amount is 8
0V	+5V	+5V	+5V	+5V	+5V		Attenuation state N=32: Attenuation amount is 16
0V	0V	0V	0V	0V	0V		Attenuation state N=63: attenuation amount is 31.5

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Solder joint serial number	Functional symbols	Function Description
3	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
16	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
6	VDD	Power on port, requires an external 100pF capacitor
7、8、9、10、11、12	VC	Attenuation control pads, see truth table for attenuation control details
2、4、15、17	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
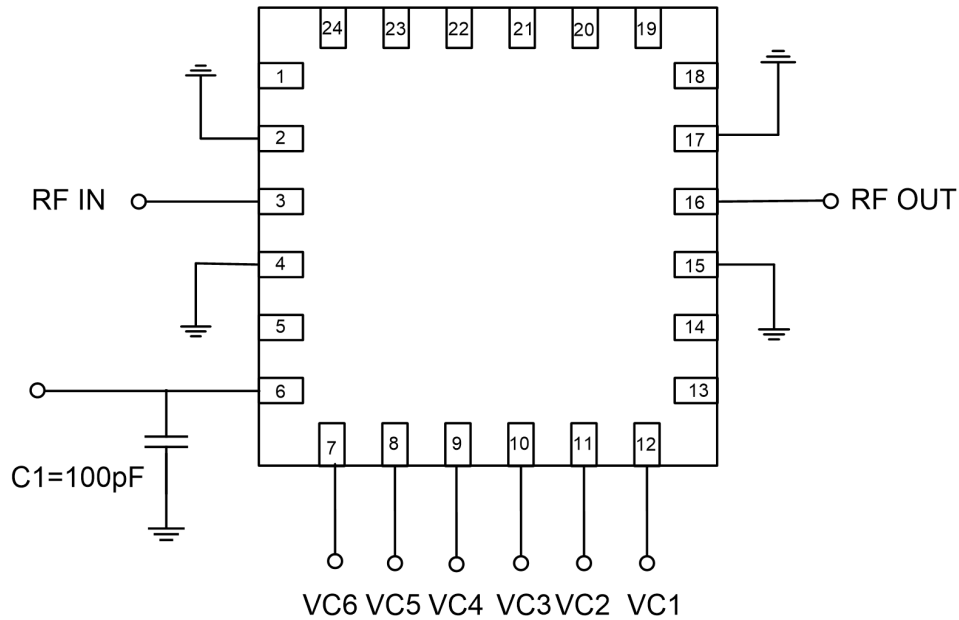
Precautions for use

- Sealing material: Ceramic material that meets ROSH 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 ℃