

GaAs MMIC 3-bit CNC Attenuator Chip, DC-12GHz

Performance characteristics

Frequency range: DC-12GHz

Insertion loss: 3.2dB typ

Attenuation range: 5-35dB

Bit count: 3

Attenuation step: 5dB

Power supply voltage: -5V

Control voltage: 0/+5V

50Ohm input/output

Chip size: QFN 4X4

Product Introduction

GDA-0012-3C-PD-CQ4 is a GaAs MMIC 3-bit CNC attenuator chip, with a frequency range covering DC-12GHz, insertion loss of 3.2dB, switching speed of 50ns, integrated logic inside the chip, powered by -5V and controlled by 0/+5V. 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~+6V
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, VEE=-5V, VC=0/+5V control)

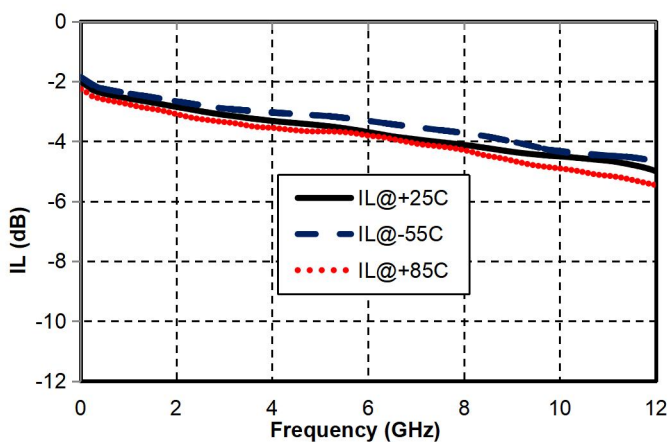
Index	Minimum	Typical value	Maximum value	Unit
Frequency range	DC-12			GHz
Insertion loss	-	3.2	-	dB
Attenuation range	5-35			dB
Attenuation step	5			dB
Attenuation number	3			bite
Attenuation accuracy (fundamental state)	-	-	±0.5	dB
Additional phase shift (fundamental state)	-	-	±2.0	degree
Input/output wave loss	-	20/20	-	dB

Switching speed	-	50	-	ns
P-1dB	-	23	-	dBm
Supply voltage	-	-5	-	V
Power supply current	-	7	-	mA
Power supply voltage	-	-5	-	V
Control voltage	0		+5	V
Control current	-	-	1	mA

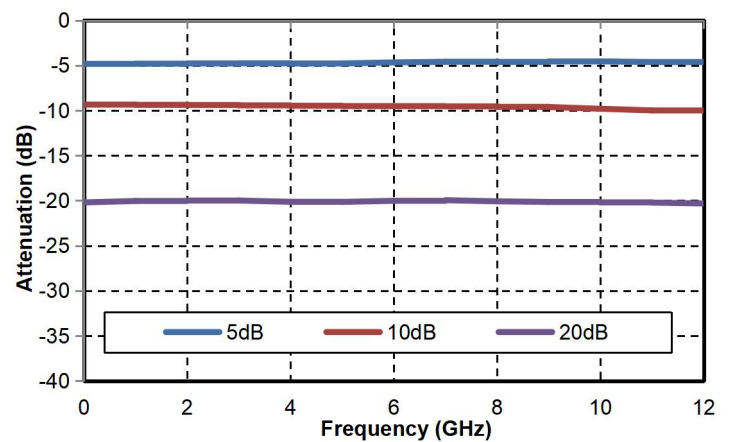
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Main indicator testing curve

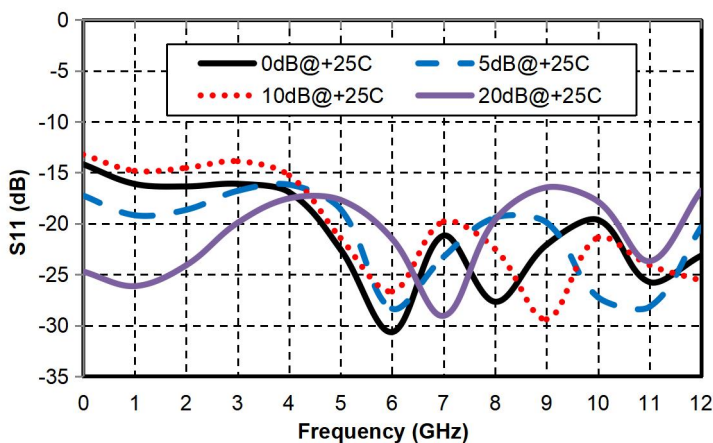
Insertion loss vs. frequency



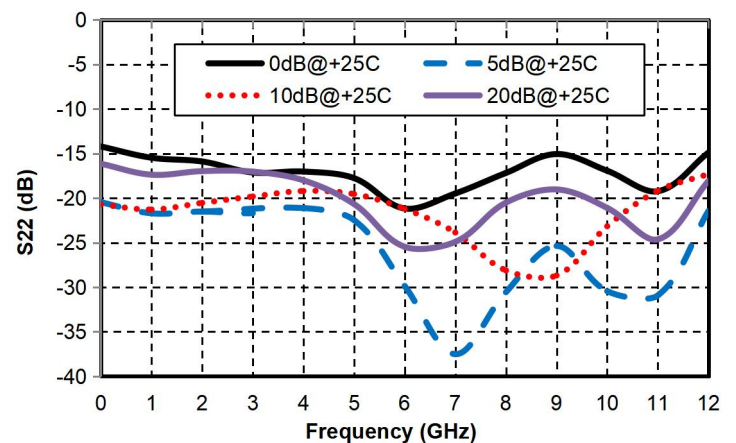
Reference attenuation state vs. frequency



Basic state input echo vs. frequency

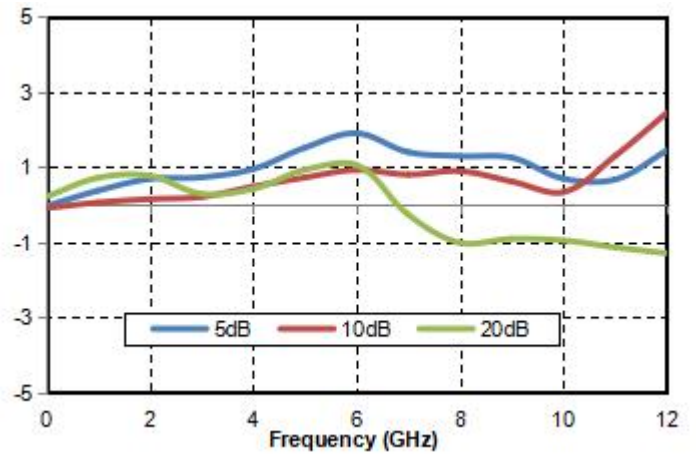
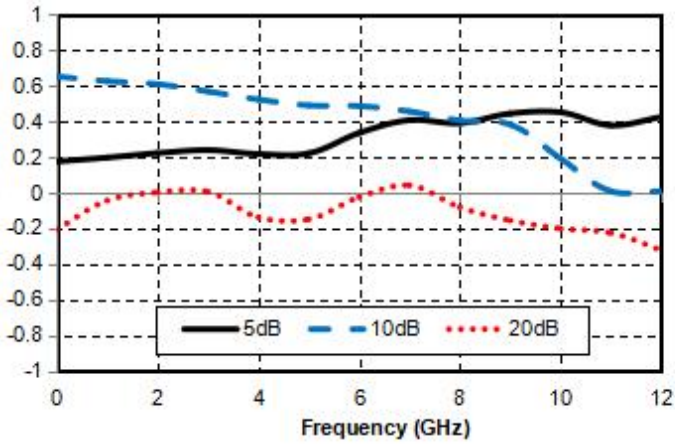


Basic state output echo vs. frequency



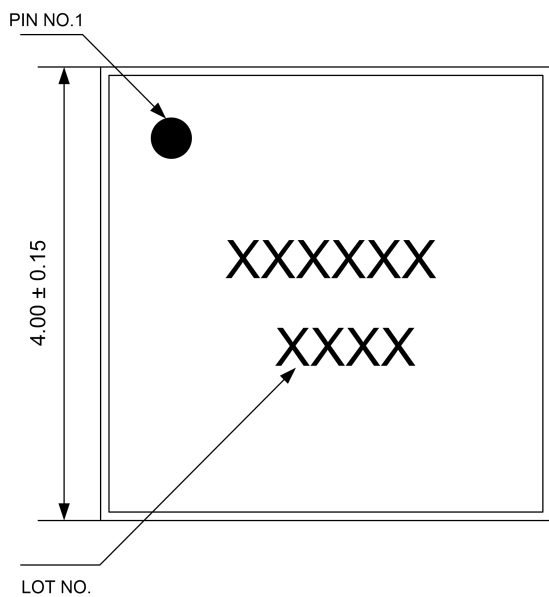
Attenuation accuracy (fundamental state) vs. frequency

Additional phase shift (fundamental state) vs. frequency

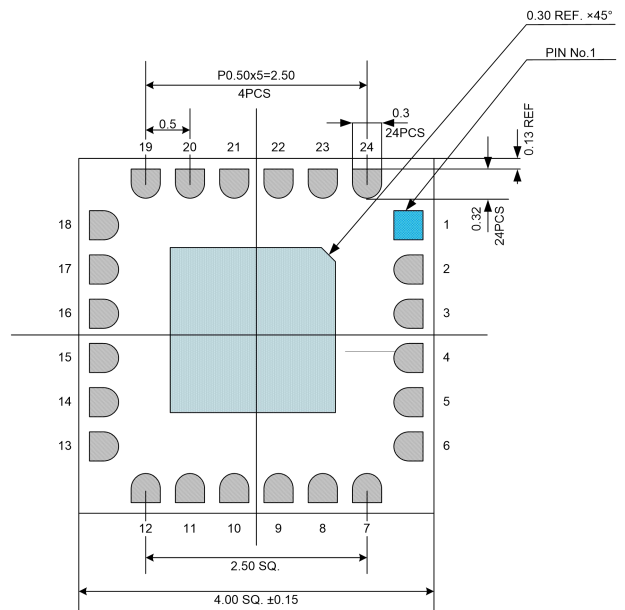


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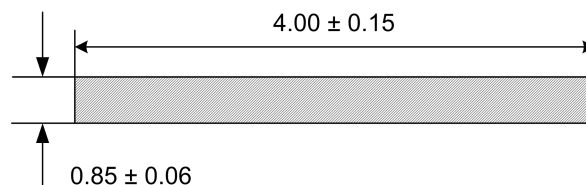
External structure



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

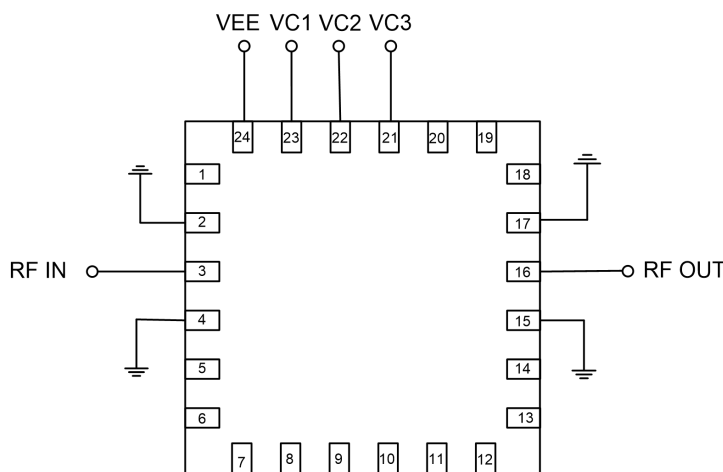
Supply voltage	Control input			
VEE	VC1	VC2	VC3	Attenuated state
-5V	0V	0V	0V	0dB
-5V	0V	+5V	0V	5dB
-5V	0V	0V	+5V	10dB
-5V	+5V	0V	0V	20dB

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Pin Definition

Bond point 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
24	VEE	Power supply terminal
21、22、23	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 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