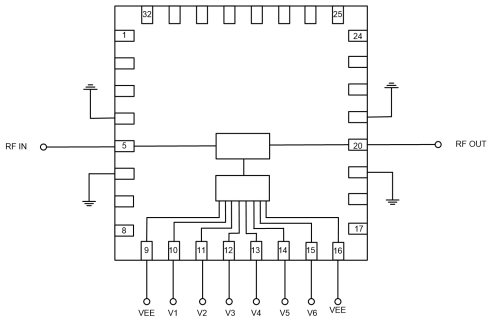
GDA-0012-6C-PD-CQ5

GaAs MMIC CNC Attenuator Chip, DC-12GHz

Performance Characteristics

Frequency range: DC-12GHz
Insertion loss: 3.5dB typ
Attenuation range: 0.5~31.5dB
Bit count: 6
Attenuation accuracy (RMS): 0.3dB
Additional phase shift (RMS): 2.3°
Standing wave: 1.3:1
50Ohm input/output
Chip size: QFN 5X5

Principle Block Diagram



Product Introduction

GDA-0012-6C-PD-CQ5 is a GaAs MMIC 6-bit CNC attenuator chip, with a frequency range of DC~12GHz, insertion loss of 3.5dB, switching speed of 50ns, integrated driver inside the chip, and 0/+5V control. The amplifier 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[1]	
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

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

Electrical parameters (Ta=+25 ° C, VEE=-5V, 0/+5V control)				
Index	minimum value	Typical value	Maximum value	Unit
Frequency range	DC~12			GHz
Insertion loss	-	3.5	-	dB
Attenuation range	0.5~31.5			dB
Attenuation step	0.5			dB
Attenuation number	6			bite
Attenuation accuracy (all frequency bands)	-	-0.3 ~ +1.1	-	dB
Attenuation accuracy RMS	-	0.3	-	dB
Additional phase shift RMS	-	2.3		degree
Input return loss	-	19	-	dB

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Output Return Loss	-	19	-	dB
Switching speed	-	50	-	ns
P-1dB	-	22	-	dBm
Current	-	10	-	mA

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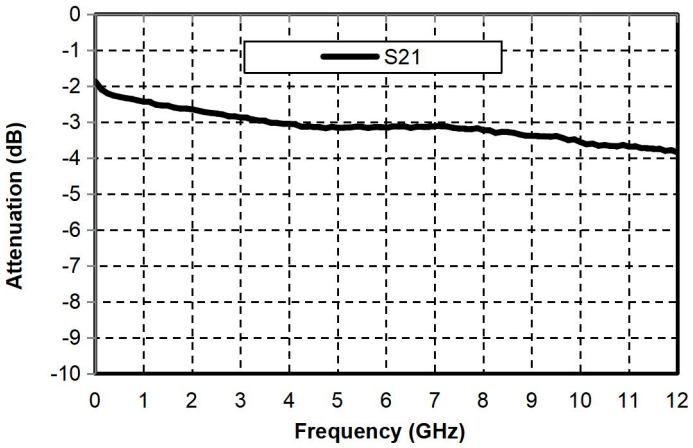
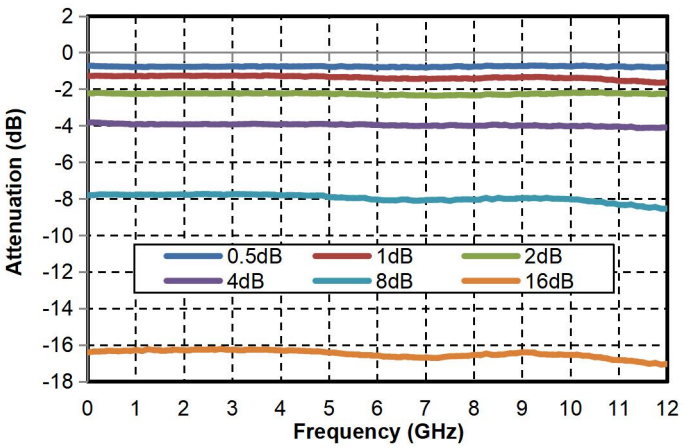
Main indicator testing curve

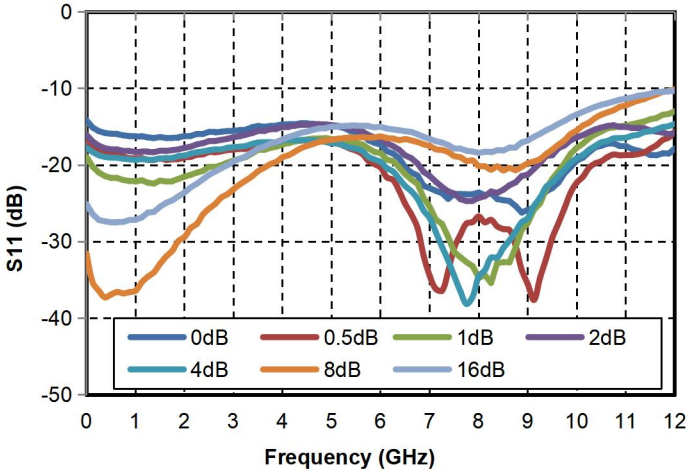
Insertion loss vs. frequency



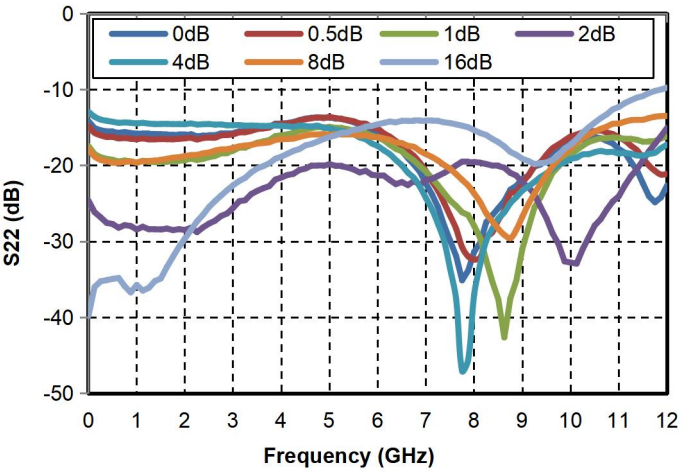
Reference attenuation state vs. frequency



Input Echo vs. Frequency

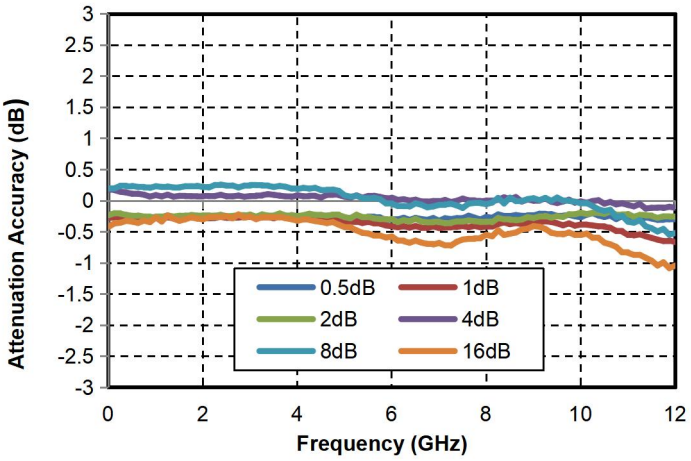


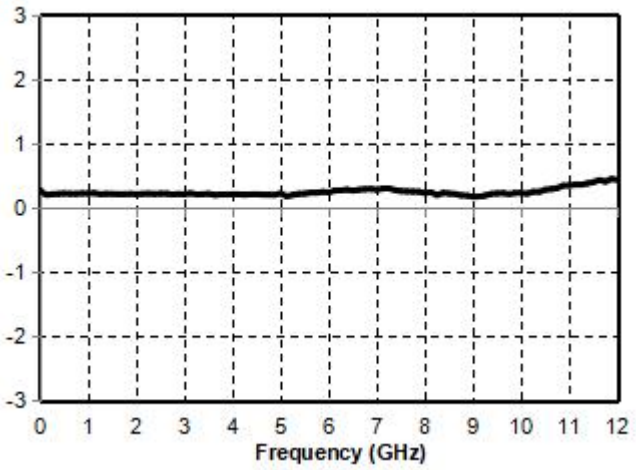
Output Echo vs. Frequency



Attenuation accuracy vs. frequency

Attenuation accuracy vs. frequency





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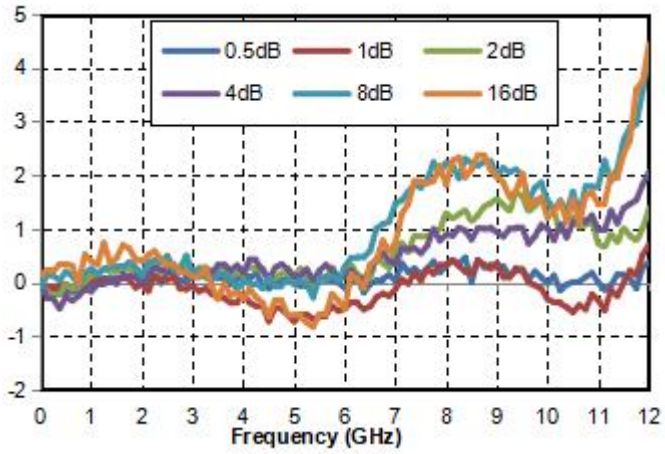
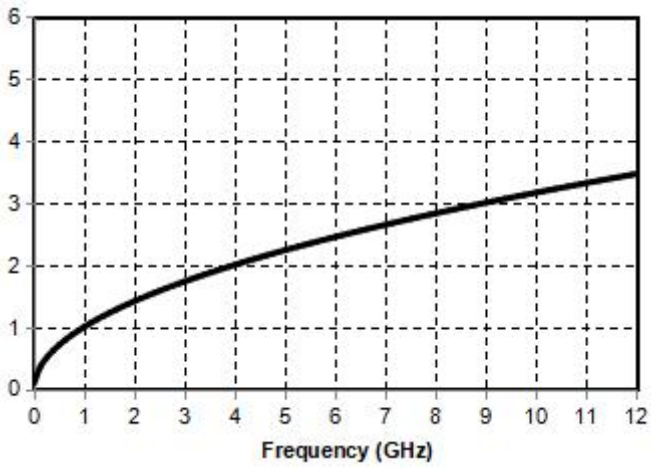
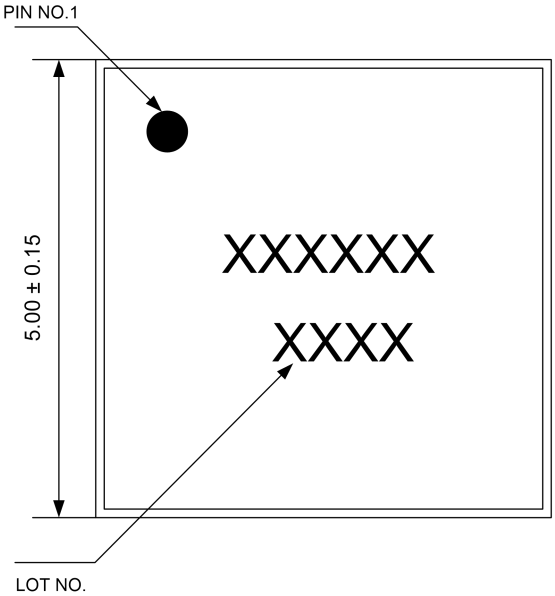
Additional phase shift vs. frequency

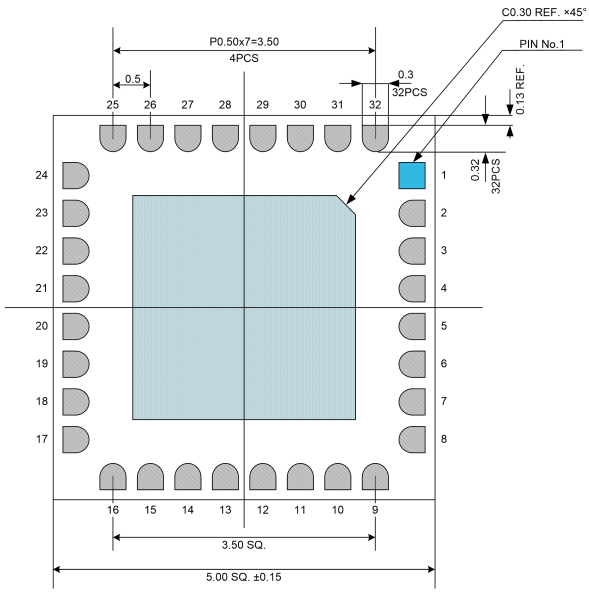


Additional phase shift RMS vs. frequency



External structure





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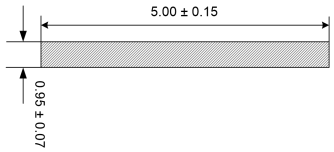
vertical view

Top view



Side view

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

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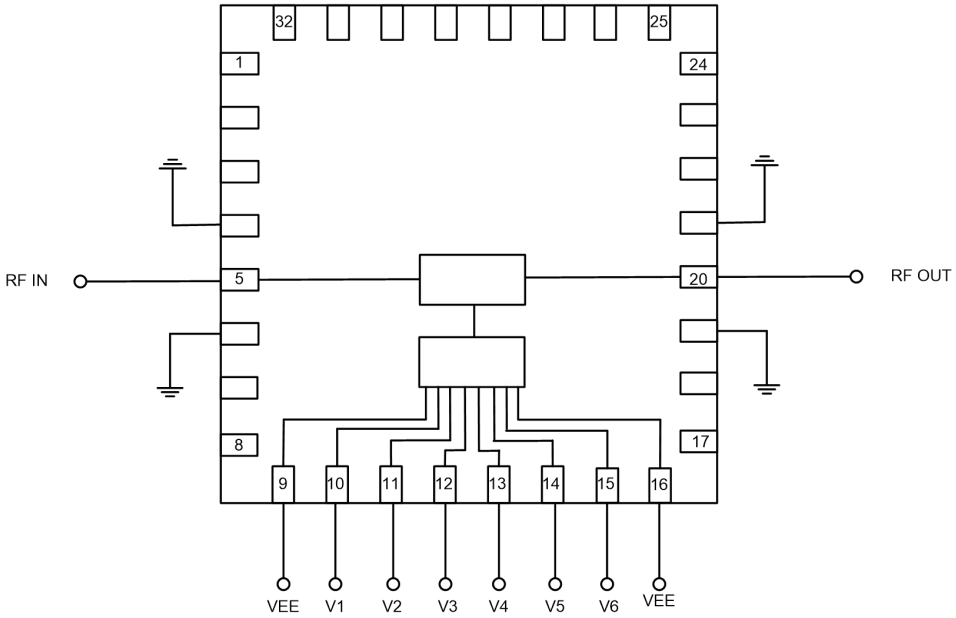
Truth table

V1	V2	V3	V4	V5	V6	VEE	Conduction pathway
0	0	0	0	0	0	-5V	Initial state N=0: attenuation amount is 0
+5V	0	0	0	0	0	-5V	Attenuation state N=1: Attenuation amount is 0.5
0	+5V	0	0	0	0	-5V	Attenuation state N=2: Attenuation amount is 1
0	0	+5V	0	0	0	-5V	Attenuation state N=4: Attenuation amount is 2
0	0	0	+5V	0	0	-5V	Attenuation state N=8: Attenuation amount is 4
0	0	0	0	+5V	0	-5V	Attenuation state N=16: Attenuation amount is 8
0	0	0	0	0	+5V	-5V	Attenuation state N=32: Attenuation amount is 16

Pin Definition

Pin number	Functional symbols	Function Description
5	IN	The signal input terminal is externally connected to a 50 ohm circuit, and there is no integrated DC isolation capacitor inside the chip
20	OUT	The signal output terminal is externally connected to a 50 ohm circuit, and there is no integrated DC isolation capacitor inside the chip
9、16	VEE	The chip power port can be connected to the VEE on one side
10、11、12、13、14、15	VC	Attenuation control pads, refer to the truth table for attenuation control
4、6、19、21	GND	The pins should have sufficient and good contact with the RF and DC ground
Chip bottom	GND	The bottom of the chip needs to have sufficient and good contact with RF and DC ground

Recommended circuit



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