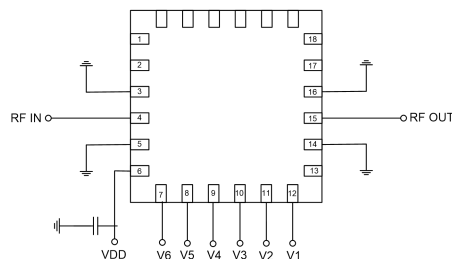


## GaAs MMIC 6-bit CNC Attenuator Chip, 0.1-8GHz

### Performance Characteristics

Frequency range: 0.1-8GHz  
 Insertion loss: 3.0dB@8GHz  
 Attenuation range: 0.5~31.5dB  
 Bit count: 6  
 Additional phase shift (RMS): 1.0°  
 50Ohm input/output  
 Chip size: 4 X 4mm QFN

### Principle Block Diagram



### Product Introduction

GDA-0008-6C-PD-CQ4 is a GaAs MMIC integrated parallel drive 6-bit CNC attenuator chip, with a frequency range of 0.1-8GHz and insertion loss of 2.4dB. GDA-0008-6C-PD-CQ4 internal integrated driver, powered by +5V, controlled by 0/+5V, with a switching speed of 30ns. The CNC attenuator adopts a 4X4mm surface mount lead-free ceramic tube shell, and the surface of the pin solder pads is treated with a gold plating process, suitable for reflow soldering installation process.

Exceeding any of the above maximum limits may result in permanent damage.	
Control voltage range	-0.5V~+5.5V
Power supply voltage	+6V
Maximum input power	+27dBm
Working temperature	-55 ~ +85°C
Storage temperature	-65 ~ +150°C

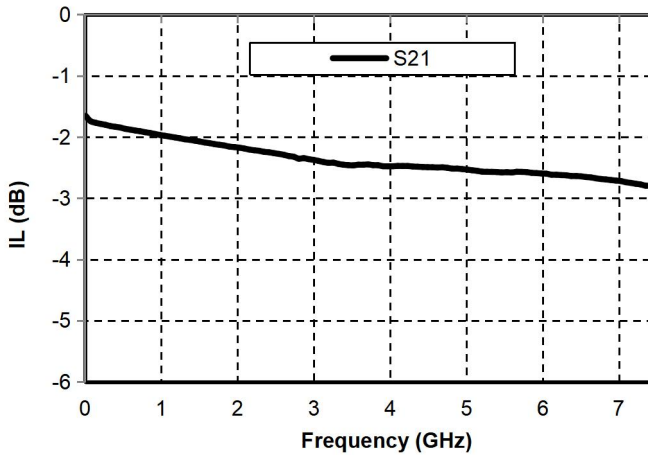
### Electrical parameters (Ta=+25 ° C, VDD=+5V, 0/+5V control)

Index	Minimum value	Typical value	Maximum value	Unit
Frequency range	0.1-8			GHz
Insertion loss	-	2.4	-	dB
Attenuation range	0.5~31.5			dB
Attenuation number	6			bite
Attenuation accuracy	-1.0~+1.0			dB
Attenuation accuracy (RMS)	0.1			dB
Phase fluctuation	-3.0~+3.0			degree
Phase fluctuation (RMS)	1.0			degree
input return loss	-	20	-	dB
Output Return Loss	-	20	-	dB
Switching speed	-	30	-	ns
P-1dB	-	22	-	dBm
supply voltage	+5			V
Power supply current	8			mA
Control voltage	0/+5			V

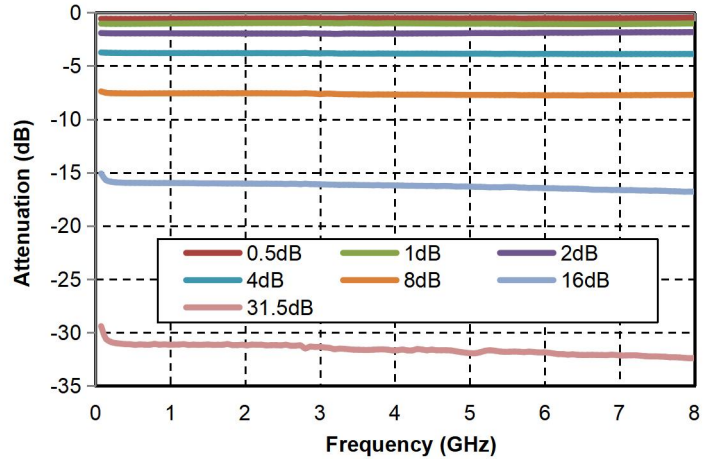
## GaAs MMIC 6-bit CNC Attenuator Chip, 0.1-8GHz

Main indicator testing curve

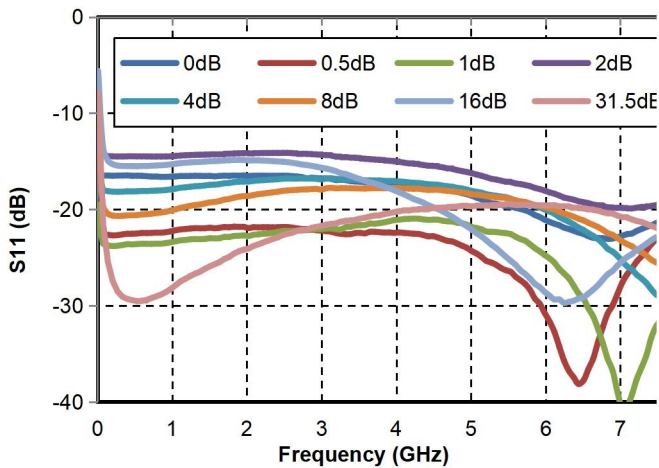
Insertion loss vs. frequency



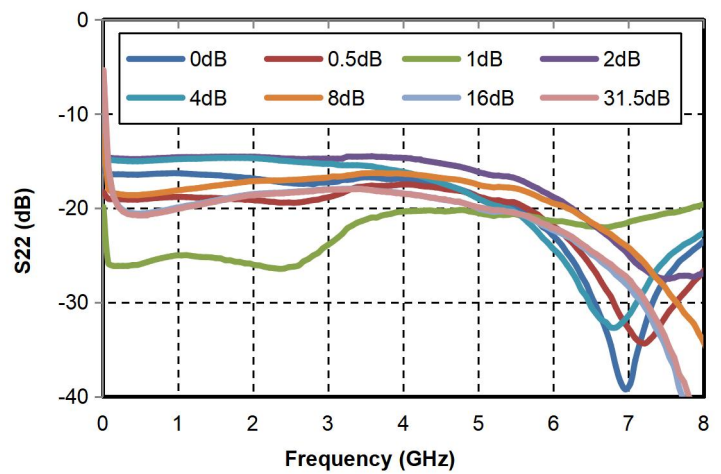
Reference attenuation state vs. frequency



Input Echo vs. Frequency

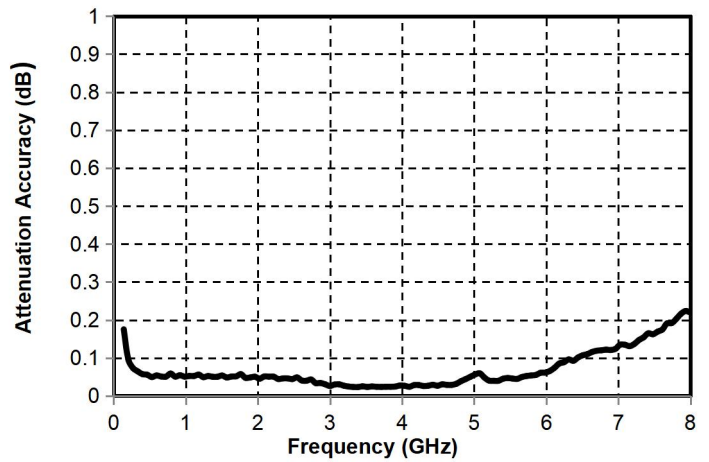
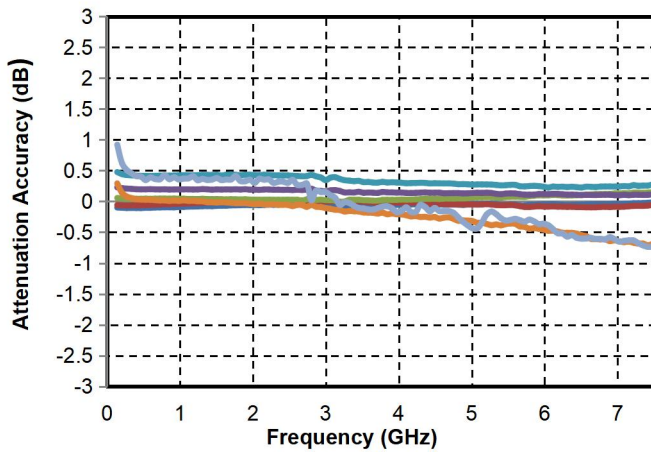


Output Echo vs. Frequency



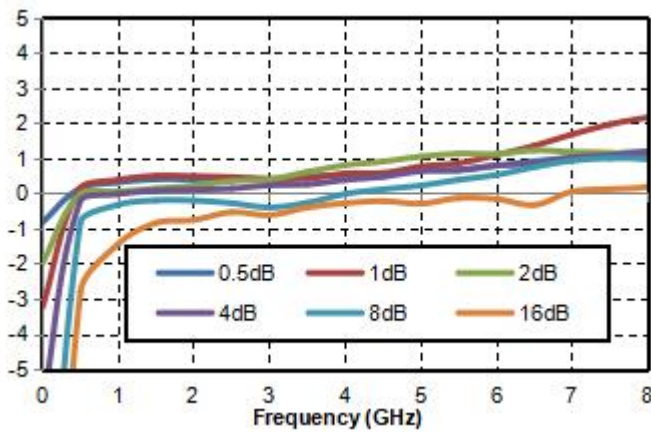
Attenuation accuracy (fundamental state) vs. frequency

Additional phase shift (fundamental state) vs. frequency

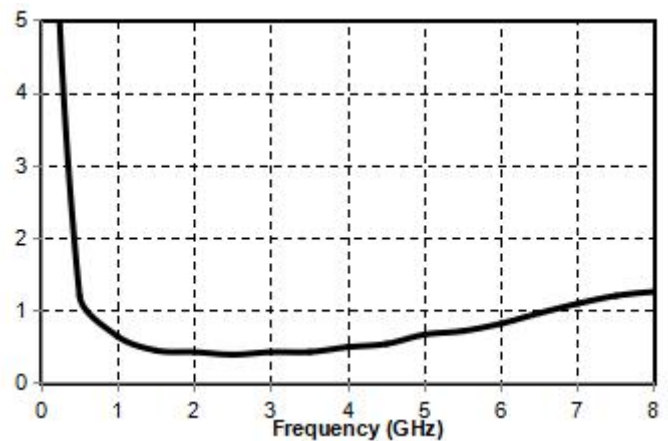


## GaAs MMIC 6-bit CNC Attenuator Chip, 0.1-8GHz

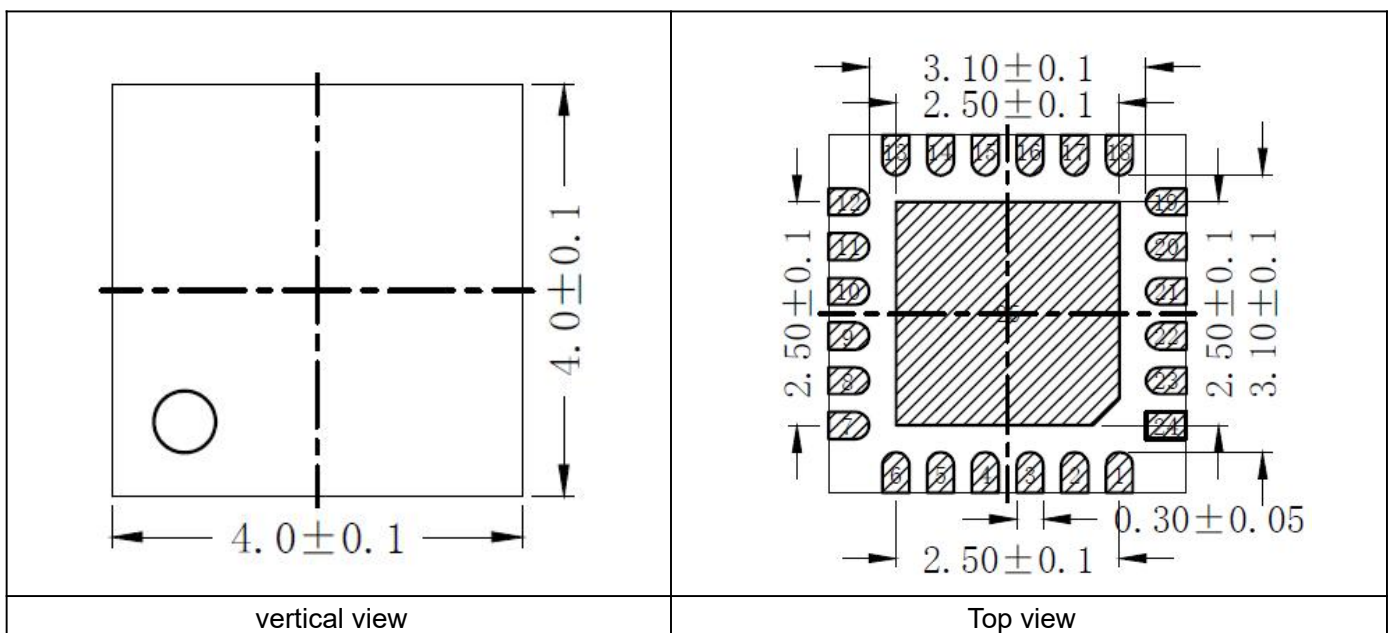
Reference state additional phase shift (absolute value) vs. frequency

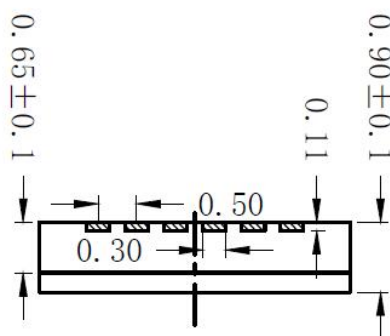


Additional Phase Shift (RMS) vs. Frequency (not consistent with actual measurement)



External structure





SIDE VIEW

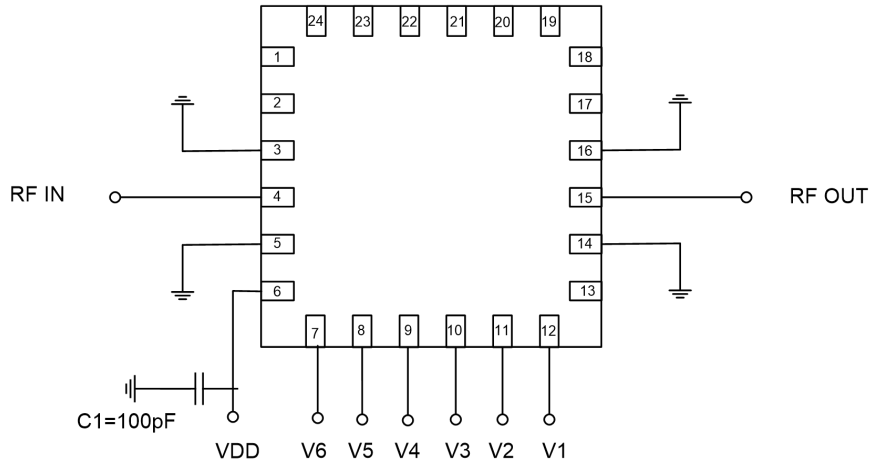
## GaAs MMIC 6-bit CNC Attenuator Chip, 0.1-8GHz

Solder joint serial number	Functional symbols	Function Description
4	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
15	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	V6-V1	Attenuation control pads, see truth table for attenuation control details
3, 5, 14, 16, Chip bottom	GND	The pins and the bottom of the chip need to be well grounded to RF and DC
other	NC	No welding required

### Truth table

V1	V2	V3	V4	V5	V6	VDD	Conduction pathway
+5V	+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		Attenuation state N=8: Attenuation amount is 4
+5V	0V	+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

## Recommended circuit



## Precautions for use

- Sealing material: Low pressure injection molding plastic that meets ROHS specifications
- Lead surface coating: 100% matte tin
- Maximum reflow soldering peak temperature: 260C