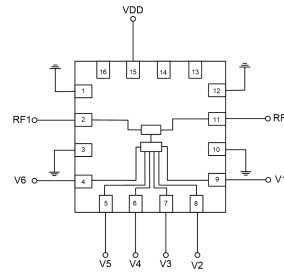


GaAs MMIC 6-bit CNC Attenuator Chip, 0.3-8GHz

Performance characteristics

Frequency range: 0.3-8GHz
 Insertion loss: 3.2dB@8GHz
 Attenuation range: 31.5dB
 Bit count: 6
 Additional Phase Shift (RMS):0.8°
 50Ohm input/output
 Chip size: 3 X 3mm

Principle Block Diagram



Product Introduction

GDA-0008-6C-PD-PQ3 is a GaAs MMIC integrated parallel drive 6-bit CNC attenuator chip, with a frequency range of 0.3-8GHz and insertion loss of 2.4dB. GDA-0008-6C-PD-PQ3 internal integrated driver, powered by +5V, controlled by 0/+5V, with a switching speed of 40ns. The CNC attenuator adopts a 3X3mm surface mount plastic tube shell without leads, and the surface of the pin solder pads is treated with tin plating process, suitable for reflow soldering installation process.

Use restriction parameters¹

| | |
|-----------------------|--------------|
| 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 |

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

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

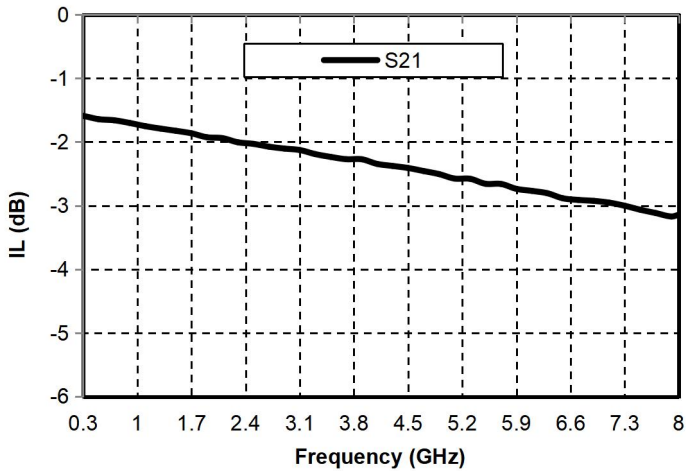
| Index | Minimum value | Typical value | Maximum value | Unit |
|----------------------------|---------------|---------------|---------------|--------|
| Frequency range | 0.3-8 | | | GHz |
| Insertion loss | - | 2.4 | - | dB |
| Attenuation range | 0.5~31.5 | | | dB |
| Attenuation number | 6 | | | bite |
| Attenuation accuracy | -1.0~0.5 | | | dB |
| Attenuation accuracy (RMS) | 0.2 | | | dB |
| Phase fluctuation | -5.5~2.0 | | | degree |
| Phase fluctuation (RMS) | 0.8 | | | degree |
| Input return loss | - | 23 | - | dB |
| Output Return Loss | - | 24 | - | dB |
| Switching speed | - | 30 | - | ns |
| P-1dB | - | 22 | - | dBm |

| | | | | |
|----------------------|--|------|--|----|
| Supply voltage | | +5 | | V |
| Power supply current | | 10 | | mA |
| Control voltage | | 0/+5 | | V |

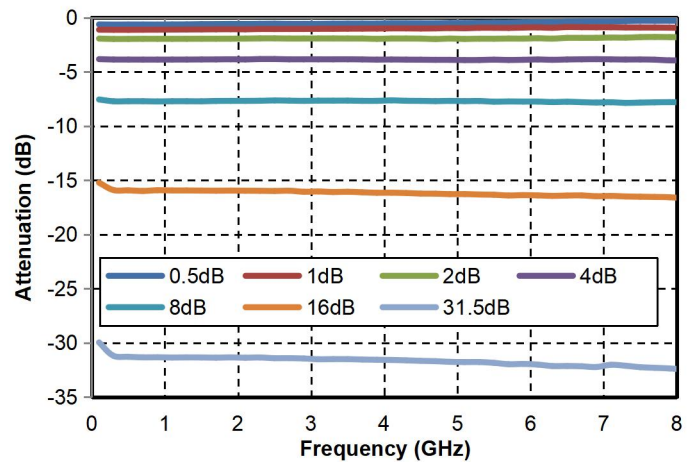
GaAs MMIC 6-bit CNC Attenuator Chip, 0.3-8GHz

Main indicator testing curve

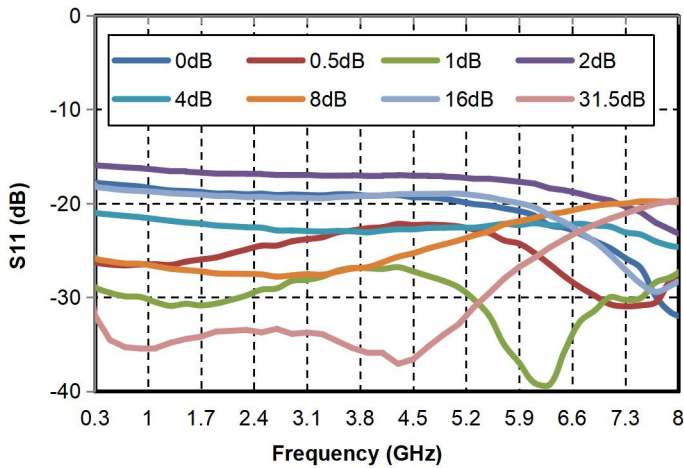
Insertion loss vs. frequency



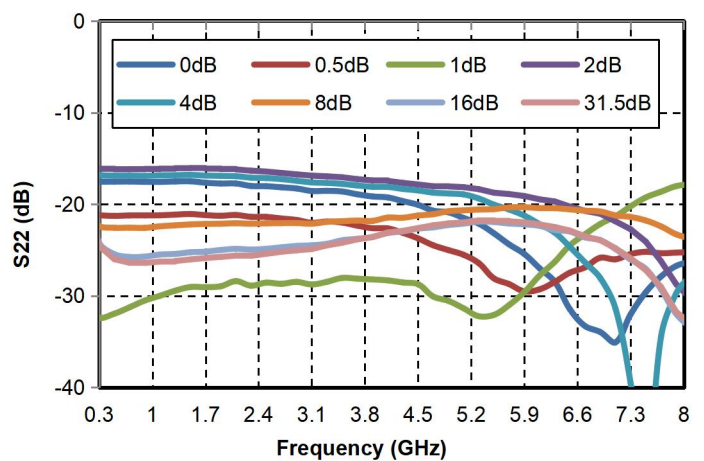
Reference attenuation state vs. frequency



Input Echo vs. Frequency

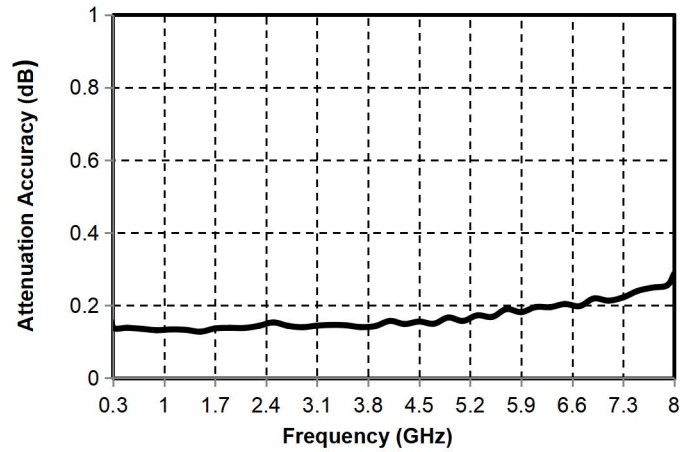
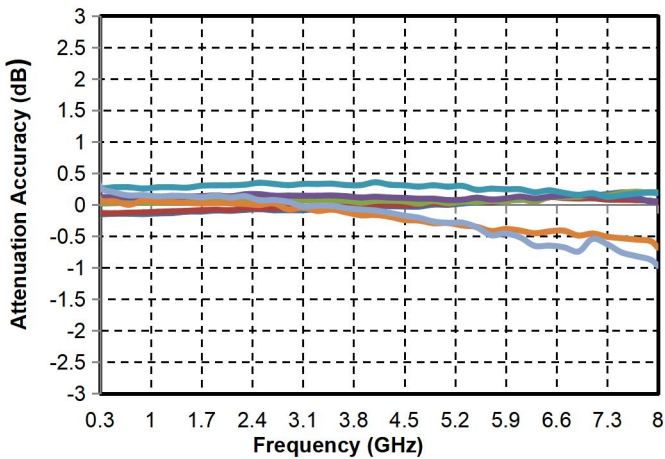


Output Echo vs. Frequency



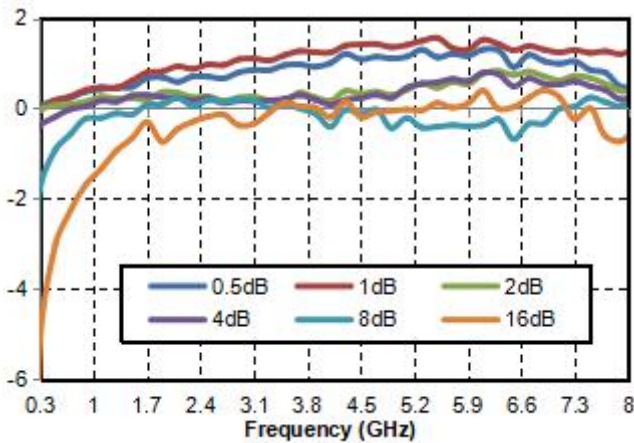
Attenuation accuracy (absolute value) vs. frequency

Attenuation accuracy (RMS) vs. frequency

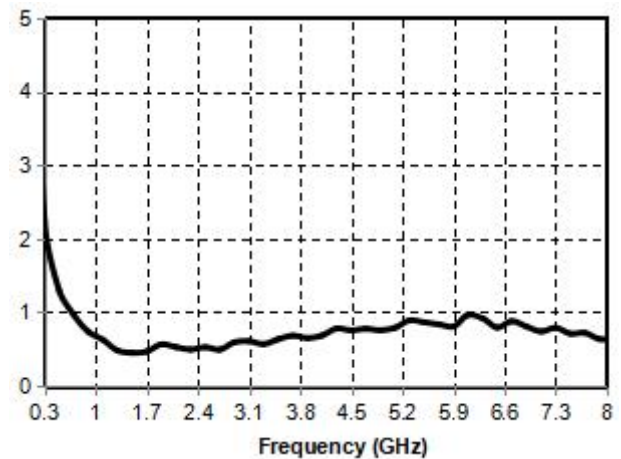


GaAs MMIC 6-bit CNC Attenuator Chip, 0.3-8GHz

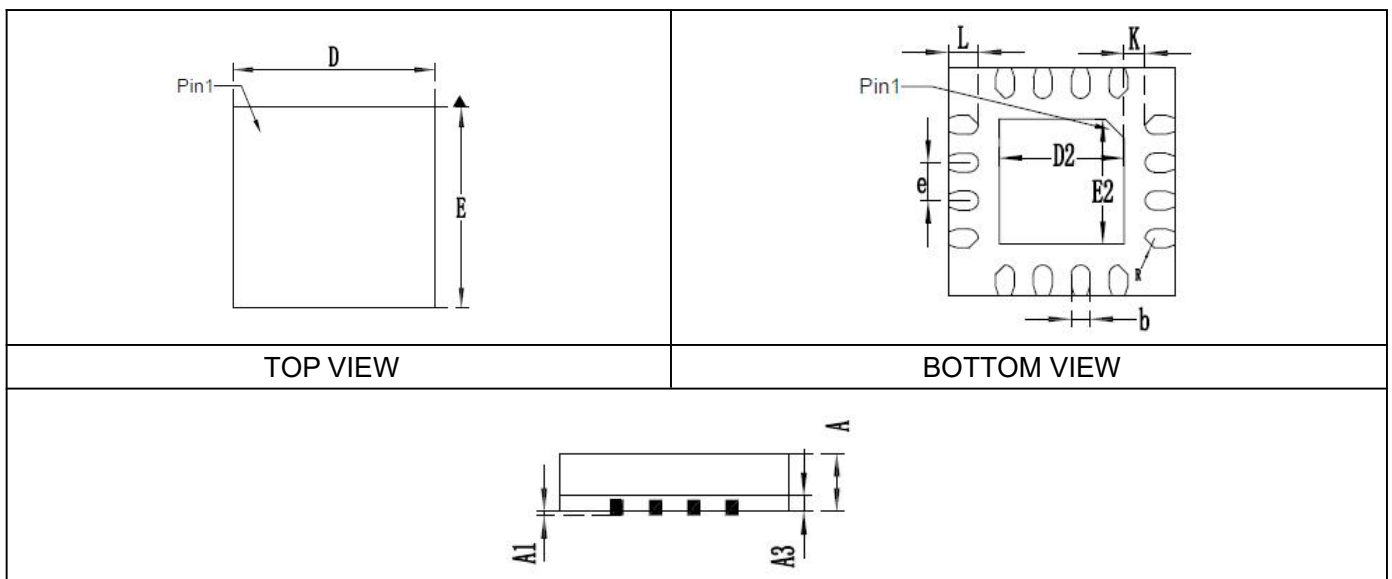
Additional phase shift (absolute value) vs. frequency



Additional Phase Shift (RMS) vs. Frequency



External structure



SIDE VIEW

| Pin Definition | | |
|----------------|--------------------|---|
| Pin number | Functional symbols | Function Description |
| 2 | RF1 | The signal input terminal is externally connected to a 50 ohm circuit, and there is no integrated DC isolation capacitor inside the device |
| 11 | RF2 | The signal output terminal is externally connected to a 50 ohm circuit, and there is no integrated DC isolation capacitor inside the device |
| 1、3、10、12 | GND | The pins should have sufficient and good contact with the RF and DC ground |
| 15 | VDD | Power on port |
| 4~9 | VC | Attenuation control pins, refer to the truth table for attenuation control |
| Chip bottom | GND | The bottom of the chip needs to have sufficient and good contact with RF and DC ground |
| other | NC | Pin suspended, can be grounded |

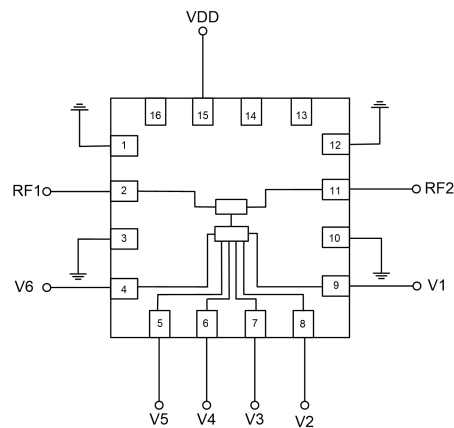
| Numbe | size (mm) | | |
|-------|-----------|-------|-------|
| | Min | TYP | Max |
| A | 0.650 | 0.750 | 0.850 |
| A1 | 0.000 | 0.020 | 0.050 |
| A3 | -- | 0.203 | -- |
| b | 0.225 | 0.250 | 0.275 |
| D | 2.900 | 3.000 | 3.100 |
| E | 2.900 | 3.000 | 3.100 |
| e | -- | 0.500 | -- |
| D2 | -- | 1.650 | -- |
| E2 | -- | 1.650 | -- |
| L | -- | 0.400 | -- |
| K | 0.200 | 0.275 | -- |
| R | 0.090 | 0.125 | -- |

GaAs MMIC 6-bit CNC Attenuator Chip, 0.3-8GHz

| 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 | 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 |

Recommended circuit



Precautions for use

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