Standard Circuit

GVA-0060
Voltage Variable Attenuator Chip

Performance Characteristics

- Frequency range：DC~60GHz
- Insertion loss：3dB（Typical values）
- Attenuation：0dB~15dB
- On/Off state Standing Wave：1.5/2.5（Typical values）
- Control voltage：V1=-1V~0V; V2=-1V~0V
- Chip size：1.40 mmx0.70 mmx0.07 mm

Product Introduction

Broadband Voltage Variable attenuator chip, with a frequency range of DC~60GHz, a typical insertion loss of 3.0 dB, and an attenuation range of 0dB~15dB.

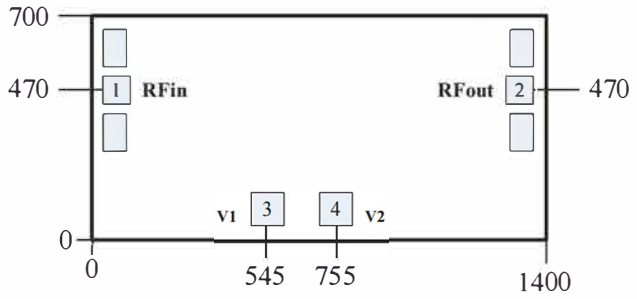
Electrical Performance Table(TA=+25°c)

Parameter	Min	Typ	Max	Unit
Frequency Range	DC		60	GHz
Insertion Loss	1.2	3.0	3.0	dB
Attenuation	0		15	dB
On State Input Standing Wave		1.5		-
On State Output Standing Wave		1.5		-
Attenuated Input Standing Wave		2.5		-
Attenuation State Output Standing Wave		2.5		-
Input P1dB		5		dBm

Use Restriction Parameters

Control Voltage Range	-4V~0V
Input Power	15dBm
Storage Temperature	-65℃~150℃
Usage Temperature	-55℃~85℃

External Dimensions



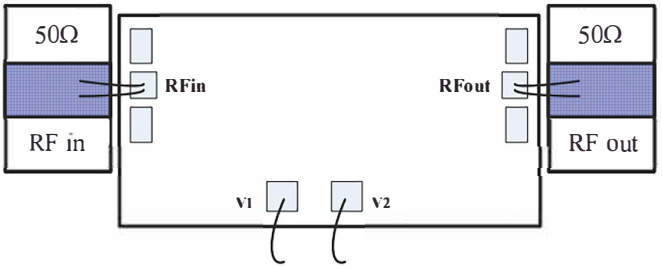
Notes：

1) All dimensions marked are in micrometers (μm);
2) Dimensional tolerance for external dimensions: ±50μm;
3) The chip thickness is 70μm.

Definition Of Bonding Pressure Point

Number	Symbol	Function Description	Size(μm^2)
1	RFin	RF signal input terminal, connected to an external 50 ohm system, requires an external DC blocking capacitor.	80×80
2	RFout	RF signal output terminal, connected to an external 50 ohm system, requires an external DC blocking capacitor.	80×80
3	V1	Control the voltage feeding end without the need for external bypass capacitors.	100×100
4	V2	Control the voltage feeding end without the need for external bypass capacitors.	100×100

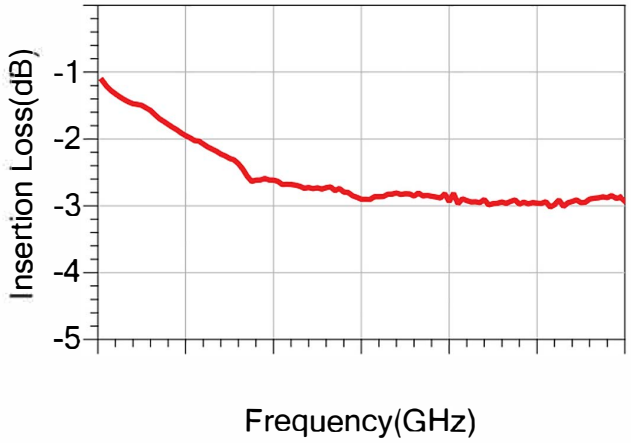
Suggested Assembly Diagram



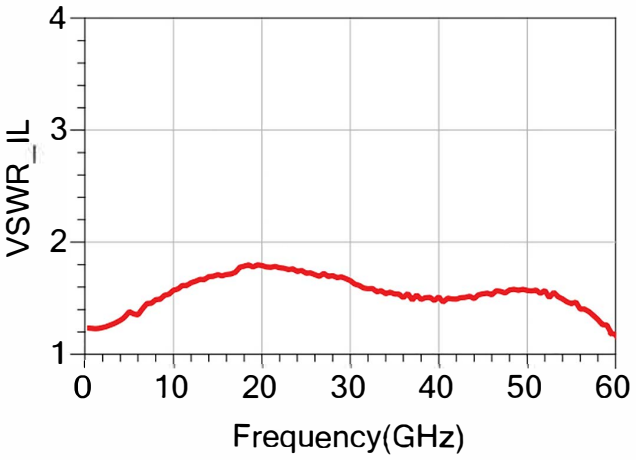
Note: There is no DC blocking capacitor for input and output.

On Chip Testing Curve(TA=+25°c)

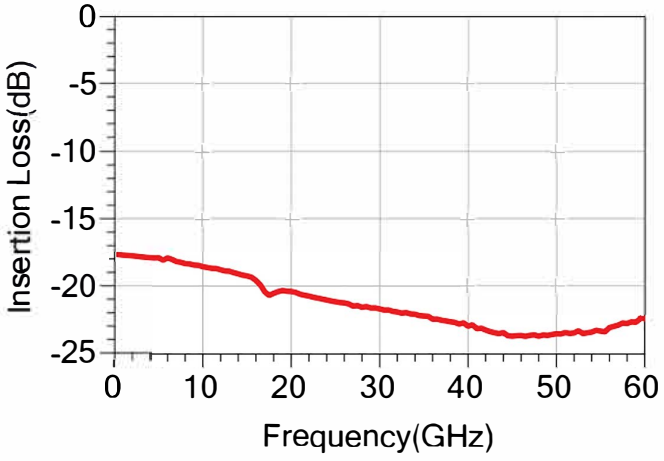
On State Insertion Loss vs. Frequency@V1=0V; V2=-1V



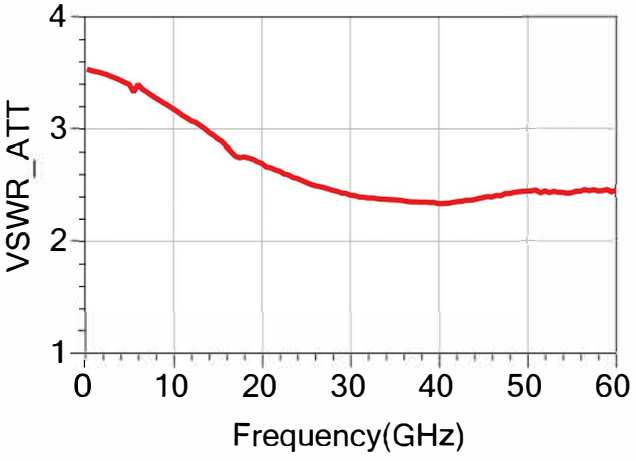
On State Input/Output Standing Wave vs. Frequency@V1=0V; V2=-1V



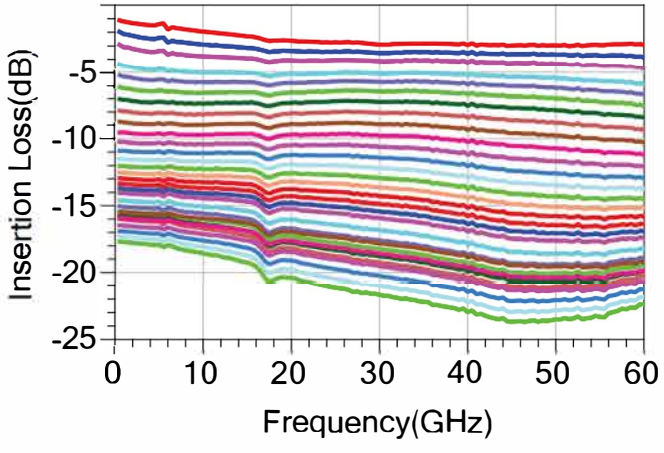
Attenuation State Insertion Loss vs. Frequency@V1=-1V; V2=0V



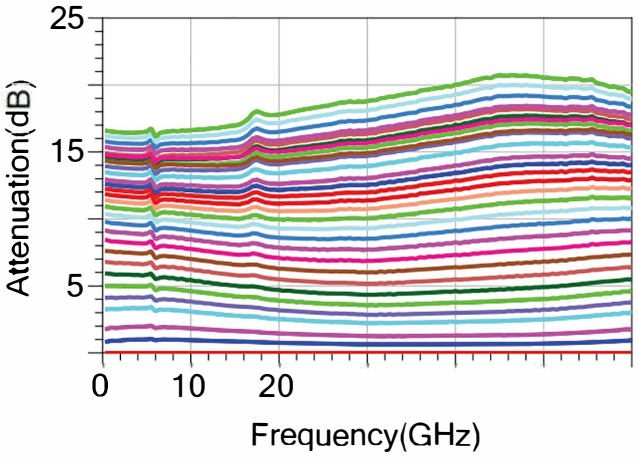
Attenuation State Input/Output Standing Wave vs. Frequency@V1=-1V; V2=0V



Insertion Loss vs. Frequency (power on conditions from top to bottom are:
V1=0V/V2=-0.8V~0V/V2_Step=0.04V;
V1=-1V/V2=-0.34V~-0.06V/V2_Step=0.04V)



The Attenuation Amount vs. Frequency (from bottom to top under the charging conditions:
V1=0V/V2=-0.8V-0V/V2_Step=0.04V;
V1=-1V/V2=-0.34V~-0.06V/V2_Step=0.04V)



Note:

1)Storage: The chip must be placed in a container with electrostatic protection and stored in a nitrogen environment.

2)Cleaning treatment: Bare chips must be operated and used in a purified environment, and it is prohibited to use liquid cleaning agents to clean the chips.

3)Electrostatic protection: Please strictly comply with ESD protection requirements to avoid electrostatic damage.

4)Conventional operation: To retrieve the chip, please use a vacuum chuck or a precision pointed camera. During the operation, avoid touching the chip surface with tools or fingers.

5)Power on sequence: When powering on, apply gate voltage first, then drain voltage; When powering off, first remove the leakage voltage, then remove the gate voltage.

6)Mounting operation: Chip installation can use AuSn solder eutectic sintering or conductive adhesive bonding process. The mounting surface must be clean and flat, and the gap between the chip and the input/output RF connection substrate should be minimized as much as possible.
Sintering process: Use 80/20 AuSn for sintering, with a sintering temperature not exceeding 300 °C, a sintering time as short as possible, not exceeding 20 seconds, and a friction time not exceeding 3 seconds.
Adhesive process: When bonding conductive adhesive, try to minimize the amount of glue applied, and refer to the information provided by the conductive adhesive manufacturer for curing conditions.

7)Bonding operation:
Unless otherwise specified, use 2 bonding wires (25 μ m diameter gold wire) for RF input and output, and keep the bonding wires as short as possible.
Hot ultrasonic bonding temperature is 150 °C, using the smallest possible ultrasonic energy.

8)Please contact the supplier if you have any questions.