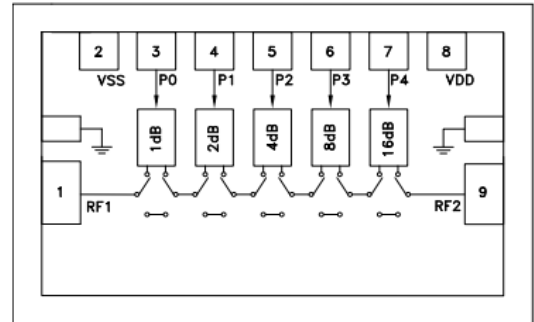


Functional Diagram



Performance features :

- Operating frequency: 0.1GHz~40GHz
- Insertion loss: 4.5dB
- Attenuation range: 1~31dB
- Input return loss: 10dB
- Output return loss: 12dB
- Chip size: 2.34mmx1.00mmx0.10mm

Product Description :

The CW939b is a GaAs MMIC wideband 5-bit CNC attenuator with operating frequency coverage from 0.1 to 40 GHz, insertion loss typical value of 4.5 dB, its basic attenuation bits are 1 dB, 2 dB, 4 dB, 8 dB, 16 dB and total attenuation is 31 dB. This CNC attenuator is controlled by 0/+5V logic and has no power consumption. With excellent attenuation characteristics and port standing wave characteristics over the entire operating frequency range, it is ideally suited for applications in microwave hybrid ICs and multi-chip modules as well as low-power systems.

Electrical parameters : ($T_A=25^\circ\text{C}$, 0V/+5V Control)

Indicators	Minimum value	Typical values	Maximum value	Unit
Frequency range	0.1~40			GHz
Attenuation range	1~31			dB
Insertion loss	-	4.5	5	dB
Switching times	-	30	-	ns
Input return loss	10			dB
Output return loss	12			dB

Control truth table : (VSS=-5V , Control bit voltage 0/+5V)

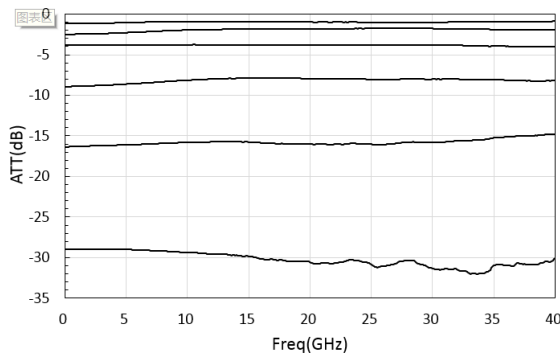
Control status					Decay state
P4 16dB	P3 8dB	P2 4dB	P1 2dB	P0 1dB	
+5	+5	+5	+5	+5	Reference state
+5	+5	+5	+5	0	1dB
+5	+5	+5	0	+5	2dB
+5	+5	0	+5	+5	4dB
+5	0	+5	+5	+5	8dB
0	+5	+5	+5	+5	16dB
0	0	0	0	0	31dB

Use of restriction parameters :

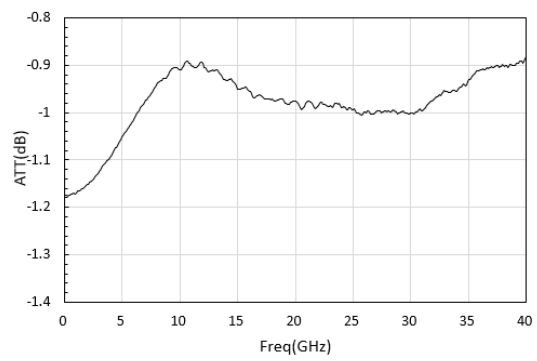
Maximum power	27dBm
Storage temperature	-65°C~150°C
Operating temperature	-55°C~85°C

Typical curves : (TA=+25°C)

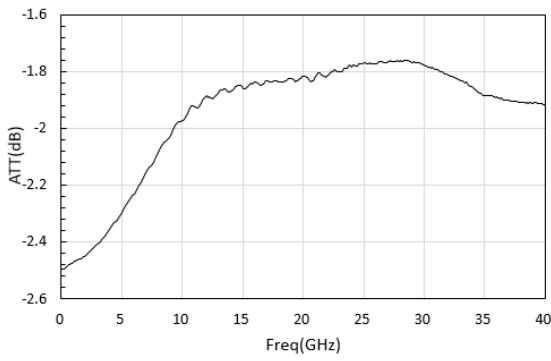
Basic decay state



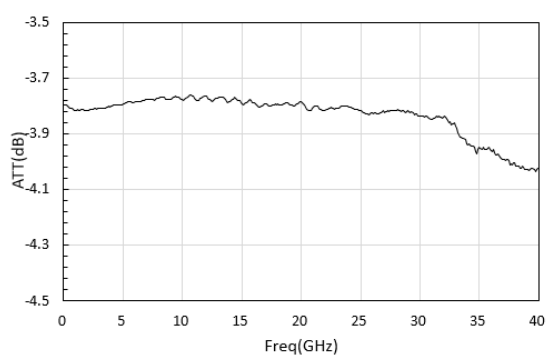
1dB attenuation state



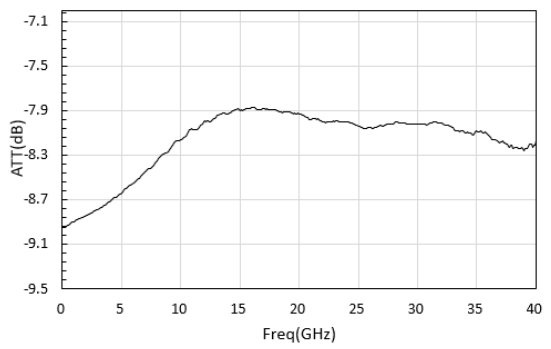
2dB attenuation state



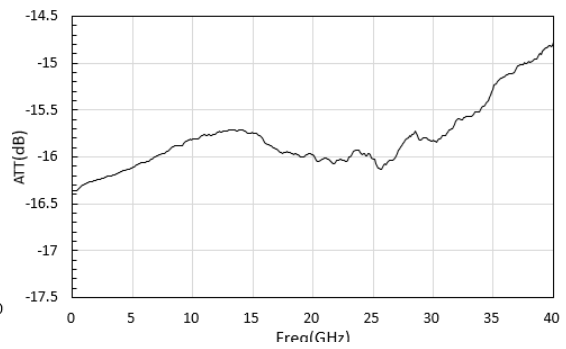
4dB attenuation state



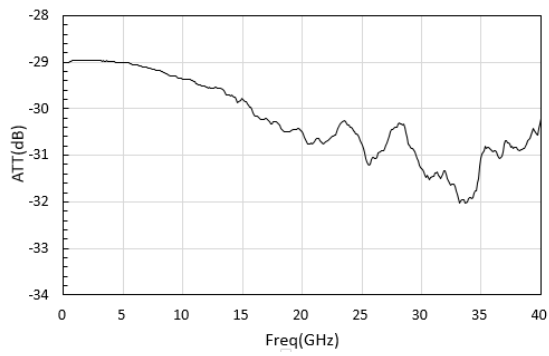
8dB attenuation state



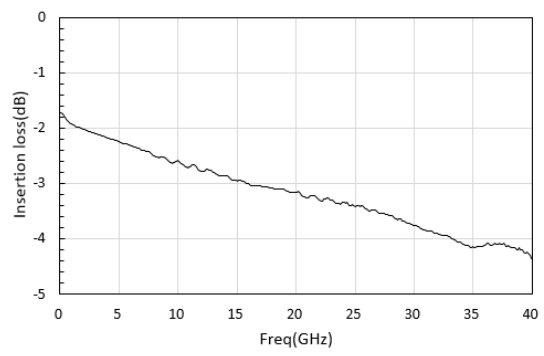
16dB attenuation state



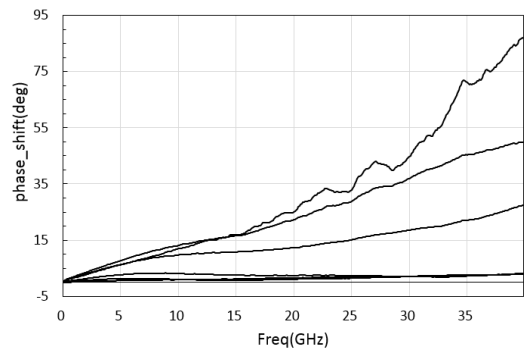
31dB attenuation state



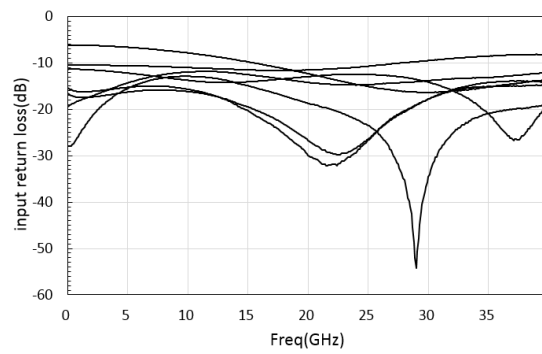
Insertion loss



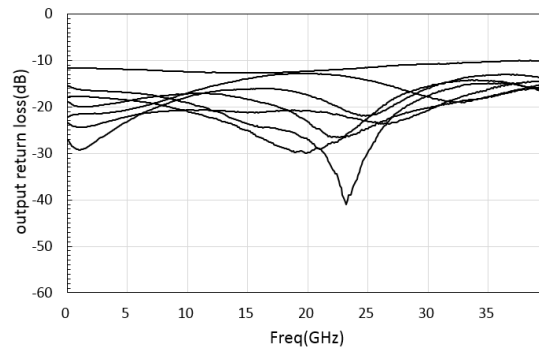
Attenuation of additional phase shift



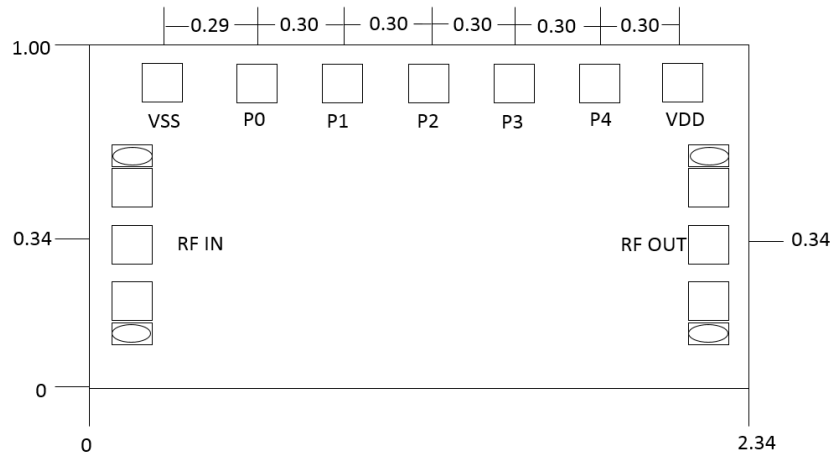
Input return loss



Output return loss



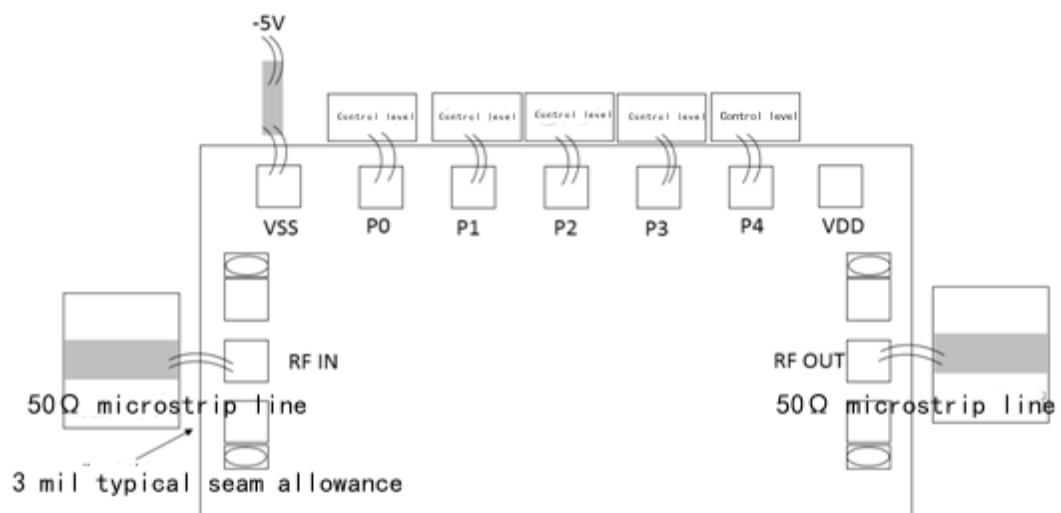
Dimensional drawings : (Unit mm)



Definition of bonding pressure points :

Functional symbols	Function description
RF IN	RF signal input/output, external 50 Ω system
RF OUT	RF signal input/output, external 50 Ω system
VSS	Bias voltage terminal, external -5V
P0, P1, P2, P3, P4	DC control signal, external 0V/+5V

Suggested assembly drawing :



Instructions for use:

Storage: The chips must be stored in a static-proof container and under nitrogen.

Cleaning treatment: Bare chips must be operated and used in a purified environment. It is forbidden to use liquid cleaning agents to clean the chips.

ESD protection: Please strictly comply with ESD protection requirements to avoid electrostatic damage to the device.

Routine handling: Please use vacuum grips or precision pointed tweezers to pick up the chips. Avoid touching the chip surface with tools or fingers during operation.

Mounting operation: Chip mounting can be done by eutectic soldering with AuSn solder or by bonding with conductive adhesive. The mounting surface must be clean and flat.

Bonding operation: 2 (25um diameter gold wire recommended) bonding wires are used for each input and output, with a bonding wire length of less than 250um being optimal. It is recommended to use the lowest possible ultrasonic energy. Bonding starts at the pressure point on the chip and ends at the package (or substrate).