

GaAs PIN Reflective SP4T Switch Chip, 2-20GHz

Performance characteristics

- Frequency Range: 2-20GHz
- Insertion loss : 0.9dB typ.
- Isolation: 49 dB typ.
- P-1dB: 25dBm @17GHz
- 50Ohm input / output
- 100% on-wafer testing
- Chip size: 2.17 x 1.62 x 0.1mm
- Silicon nitride passivation, scratch protection

Product Introduction

GSW4B1 is a GaAs PIN reflective single-pole four-throw switch chip with 50Ω matching at the input/output end, a frequency range of 2 to 20GHz , and -5V/+5V control. It has a built-in bias network and DC blocking capacitors, which is easy to use. It has excellent switching characteristics and port standing wave characteristics in the entire operating frequency range, and is very suitable for microwave hybrid integrated circuits, multi-chip modules, and low-power systems. The switch chip uses on-chip through-hole metallization technology to ensure good grounding, does not require additional grounding measures, and is simple and convenient to use. The back of the chip is metallized, which is suitable for eutectic sintering or conductive adhesive bonding processes.

Use restriction parameter ¹	
Maximum input voltage	2.5V
Maximum input power	+31dBm CW
Operating temperature	-55 ~ +85°C
storage temperature	-65 ~ +150°C

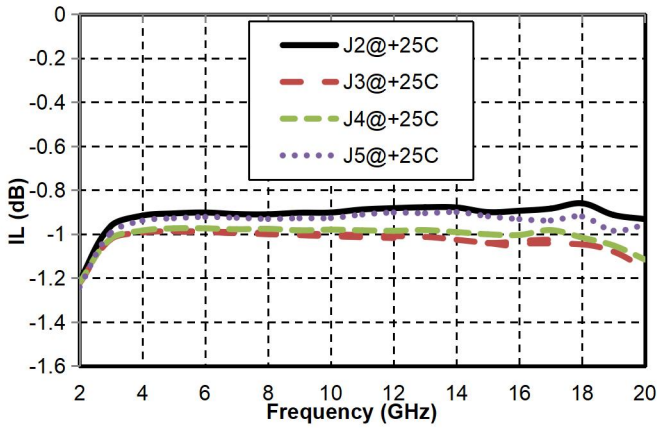
【1】 Exceeding any of these maximum limits may cause permanent damage.

Electrical performance parameters (TA = +25°C)				
index	Minimum	Typical Value	Maximum	unit
Frequency Range	2-20			G Hz
Insertion loss	-	0.9	1.2	dB
Isolation	42	49	-	dB
Input return loss	15	17	-	dB
Output return loss	18	26	-	dB
P-1dB @17GHz	-	25	-	dBm
Switching speed	-	20	-	ns

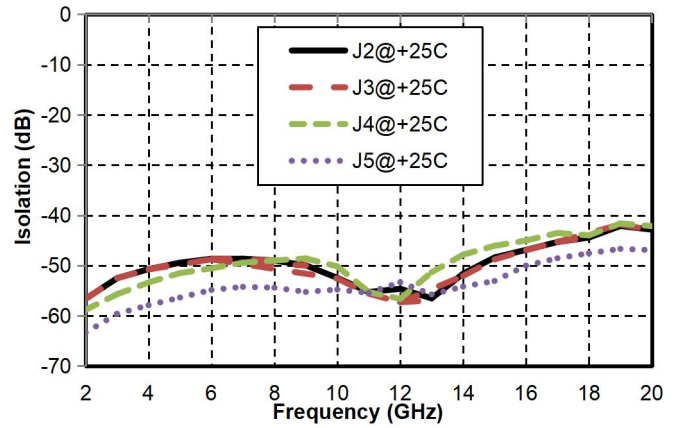
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Main index test curve

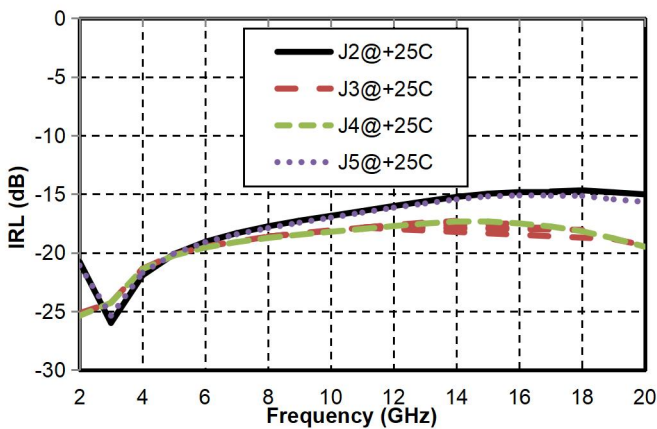
Insertion Loss vs. Operating Frequency



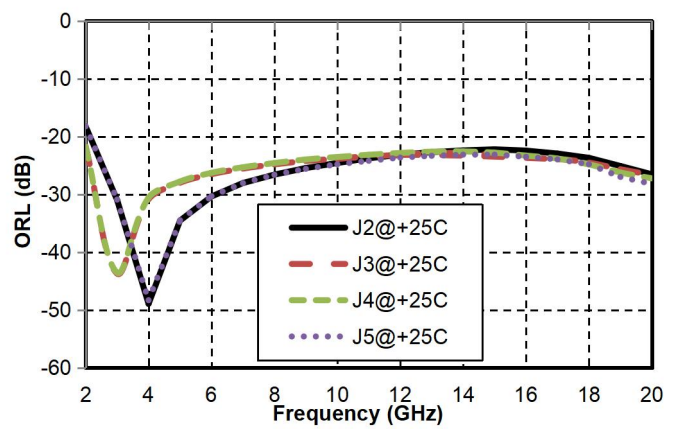
Isolation vs. Operating Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



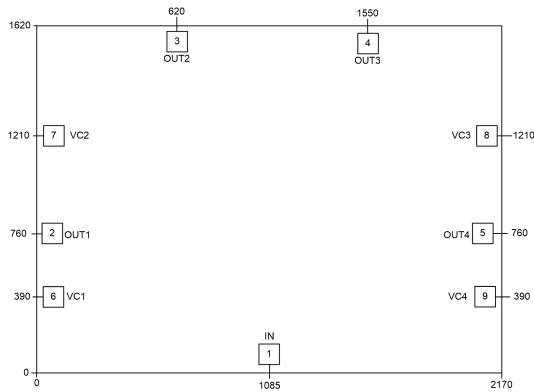
Typical Driver Connections

CONTROL LEVEL (DC CURRENT)				RF OUTPUT STATE			
VC1	VC2	VC3	VC4	J2-J1	J3-J1	J4-J1	J5-J1
-10mA	+12mA	+12mA	+12mA	Low Loss	Isolation	Isolation	Isolation
+12mA	-10mA	+12mA	+12mA	Isolation	Low Loss	Isolation	Isolation
+12mA	+12mA	-10mA	+12mA	Isolation	Isolation	Low Loss	Isolation
+12mA	+12mA	+12mA	-10mA	Isolation	Isolation	Isolation	Low Loss

Note: $V \approx +1.32V$, $I \approx +12mA$; $V \approx -1.90V$, $I \approx -10mA$ (including J1 end RIN ≈ 50 ohm resistor voltage divider)

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Appearance structure

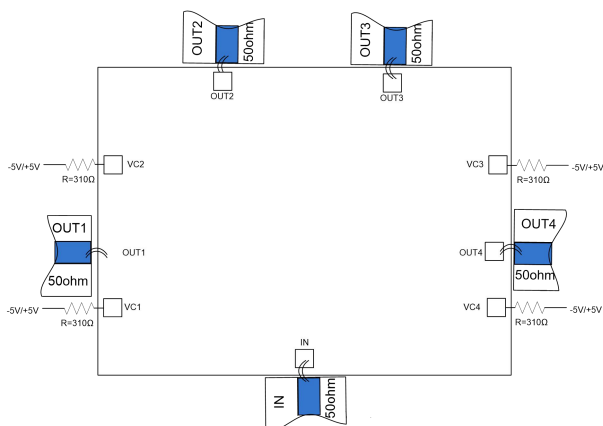


All units in the figure are micrometers

Bonding point definition

Bonding point number	Function Symbol	Functional Description
1 ,	IN(J1)	RF input signal terminal
2, 3, 4, 5	OUT1(J2), OUT2(J3), OUT3(J4), OUT4(J5)	RF output signal terminal
6, 7, 8, 9	VC1, VC2, VC3, VC4	Signal control terminal
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC

Recommended circuit diagram



+5V series $R \approx 310$ ohm resistor, $V \approx +1.32V$, $I \approx +12mA$; -5V series $R \approx 310$ ohm resistor, $V \approx -1.90V$, $I \approx -10mA$.

Users can change the resistance value according to their own situation. If you have any questions, please contact the manufacturer.