

## GaAs PIN reflective single-pole five-throw switch chip, 10-40GHz

### Performance characteristics

- Frequency range: 10-40 GHz
- Insertion loss : 1.5dB typ.
- Isolation: 46 dB typ.
- P-1dB: 25dBm @17GHz
- 50Ohm input / output
- 100% on-wafer testing
- Chip size: 2.12 x 1.52 x 0.1mm
- Silicon nitride passivation, scratch protection

### Product Introduction

GSW5B2 is a GaAs PIN reflective single-pole five-throw switch chip with 50Ω matching at the input/output end, a frequency range of 10 to 40GHz , and -5/+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 <sup>1</sup>	
Maximum input voltage	2.5V
Maximum input power	+31dBm CW
Operating temperature	-55 ~ +85°C
storage temperature	-65 ~ +150°C

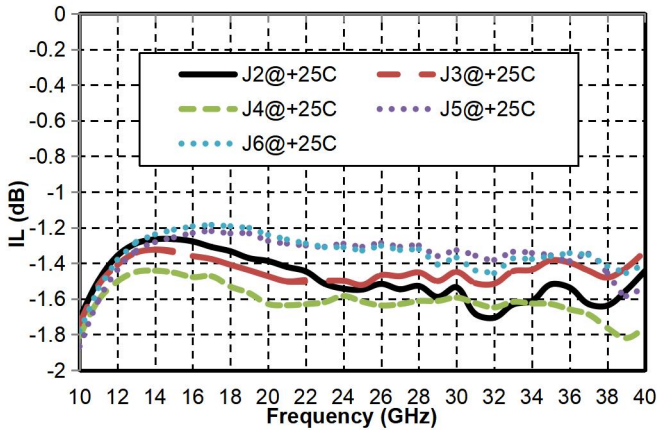
【1】 Exceeding any of these maximum limits may cause permanent damage.

Electrical performance parameters ( TA = +25°C)				
index	Minimum	Typical Value	Maximum	unit
Frequency Range	10-40			G Hz
Insertion loss	-	1.5	1.7	dB
Isolation	36	46	-	dB
Input return loss	11	18	-	dB
Output return loss	11	18	-	dB
P-1dB @17GHz	-	25	-	dBm
Switching speed	-	30	-	ns

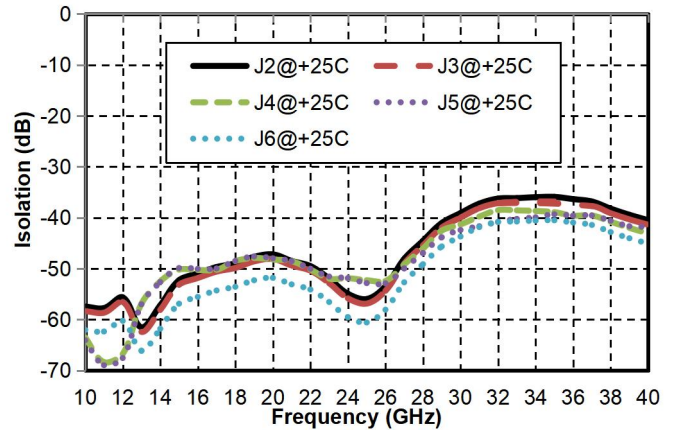
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### Main index test curve

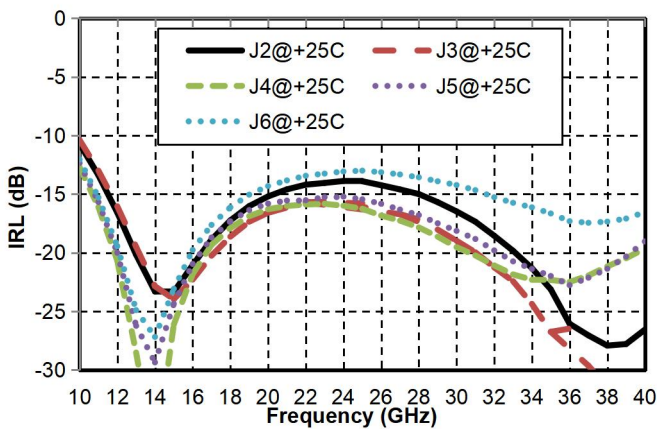
Insertion Loss vs. Operating Frequency



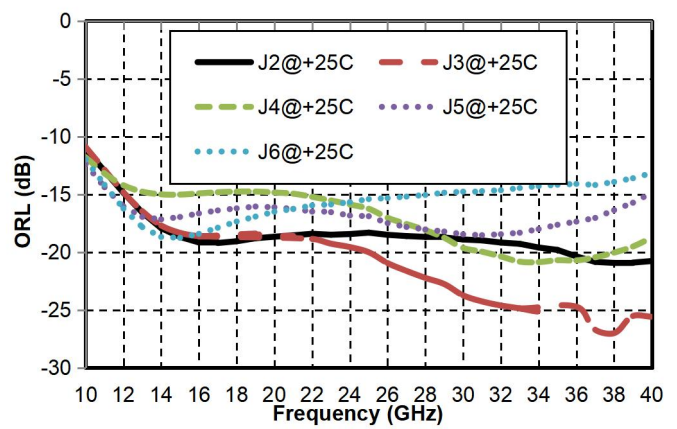
Isolation vs. Operating Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



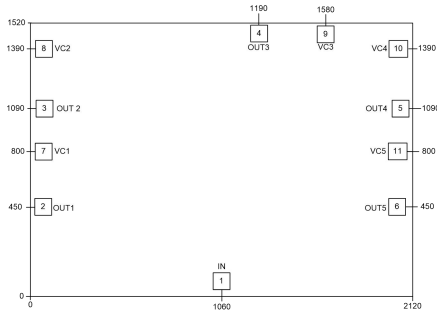
### Typical Driver Connections

Control Port					Output conduction condition				
VC1	VC2	VC3	VC4	VC5	J2-J1	J3-J1	J4-J1	J5-J1	J6-J1
-10 mA	20 mA	20 mA	20 mA	20 mA	Continuity	isolation	isolation	isolation	isolation
20 mA	-10 mA	20 mA	20 mA	20 mA	isolation	Continuity	isolation	isolation	isolation
20 mA	20 mA	-10 mA	20 mA	20 mA	isolation	isolation	Continuity	isolation	isolation
20 mA	20 mA	20 mA	-10 mA	20 mA	isolation	isolation	isolation	Continuity	isolation
20 mA	20 mA	20 mA	20 mA	-10 mA	isolation	isolation	isolation	isolation	Continuity

Note: V = +1.35 V , I = +20mA; V = -3.2V, I = -10mA (including J1 on-chip resistor RIN = 50 ohm voltage divider)

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**Appearance structure**

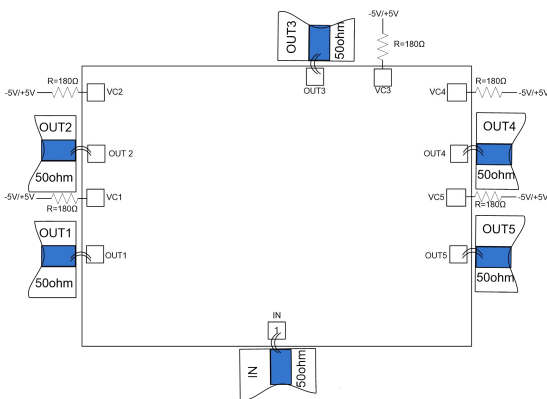


All units in the figure are micrometers

**Bonding point definition**

Bonding point number	Function Symbol	Functional Description
1	IN(J1)	RF input signal terminal
2, 3, 4, 5, 6	OUT2(J2), OUT3(J3), OUT4(J4), OUT5(J5), OUT6(J6)	RF output signal terminal
7, 8, 9, 10, 11	VC1, VC2, VC3, VC4, VC5	Control Port
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC

**Recommended circuit diagram**



+5V is connected in series with R=180 ohm resistor , V =+ 1.35V , I=+20mA . -5V is connected in series with R=180 ohm resistor , V=-3.2V, I=-10mA .

Note: If you need to reduce power consumption, you need to connect +5V /-5V in series with resistors of different resistance values. For example: +5V in series with R=370 ohm resistor : V=+1.3V, I=+10mA; -5V in series with R=180 ohm resistor V=-3.2V, I=-10mA . (Including the internal resistor R<sub>IN</sub>=50 ohm voltage divider at J1 end ). Please contact the manufacturer for specific usage.