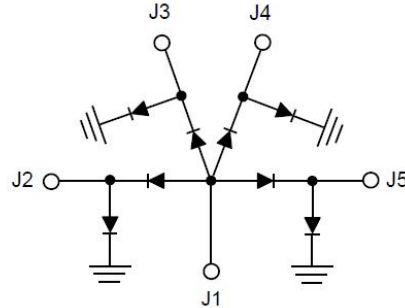


## GaAs PIN Reflective SP4T Switch Chip, 0.05-20GHz

### Performance characteristics

- Frequency range: 0.05-20GHz
- Insertion loss : 0.7dB typ.
- Isolation: 54 dB typ.
- P-1dB: 30dBm @17GHz
- 50Ohm input / output
- 100% on-wafer testing
- Chip size: 2.02 x 1.47 x 0.1mm
- Silicon nitride passivation, scratch protection

### Functional Block Diagram



### Product Introduction

GSW4H is a GaAs PIN reflective single-pole four-throw switch chip, input/output end 50Ω matching, frequency range covers 0.05~20 GHz, and adopts -5V/+5V control. 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 process to ensure good grounding, no additional grounding measures are required, and it is simple and convenient to use. The back of the chip is metallized, which is suitable for eutectic sintering or conductive adhesive bonding process.

#### Use restriction parameter <sup>1</sup>

Maximum input voltage	2.5V
Maximum input power	+36dBm CW
Operating temperature	-55 ~ +85°C
storage temperature	-65 ~ +150°C

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

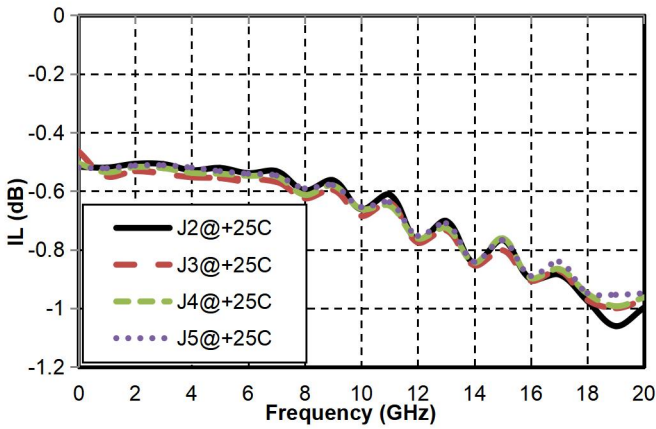
#### Electrical performance parameters ( TA = +25°C)

index	Minimum	Typical Value	Maximum	unit
Frequency Range	0.05-20			G Hz
Insertion loss	-	0.7	1.1	dB
Isolation	41	54	-	dB
Input return loss	10	16	-	dB
Output return loss	11	17	-	dB
P-1dB @17GHz	-	28.5	-	dBm
Switching speed	-	20	-	ns

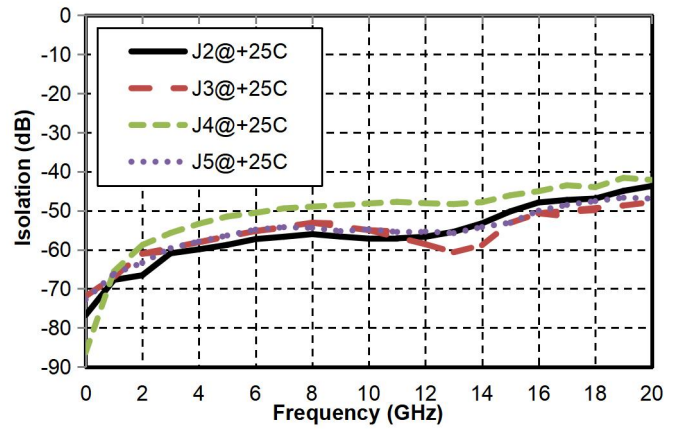
## GaAs PIN Reflective SP4T Switch Chip, 0.05-20GHz

Main index test curve

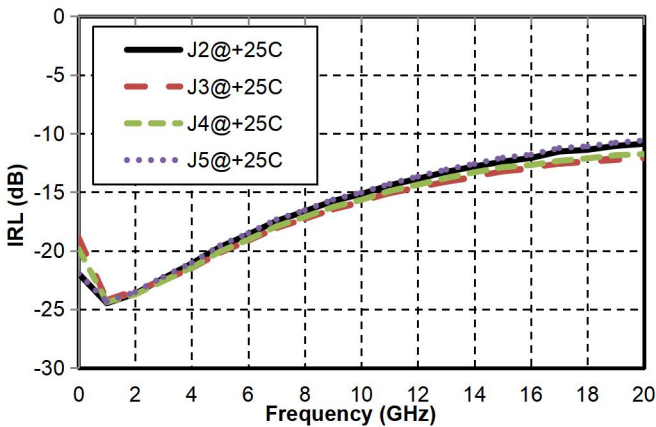
Insertion Loss vs. Operating Frequency



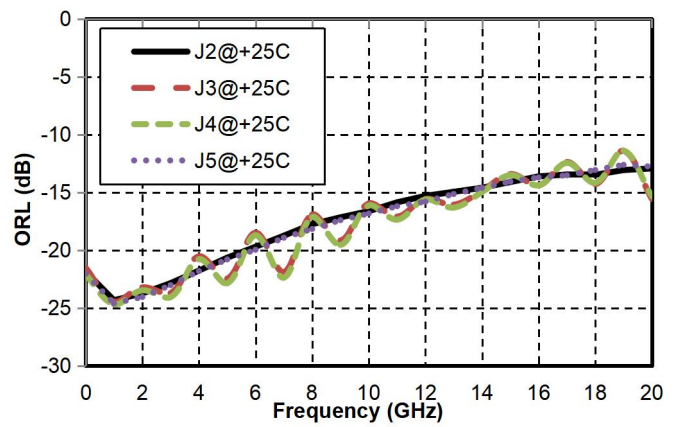
Isolation vs. Operating Frequency



Input Return Loss vs. Frequency



Output Return Loss vs. Frequency



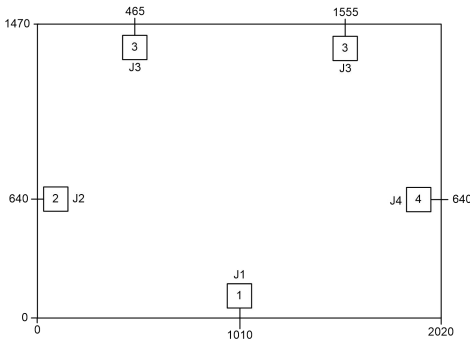
Typical Driver Connections

CONTROL LEVEL (DC CURRENT)				RF OUTPUT STATE			
J2	J3	J4	J5	J2-J1	J3-J1	J4-J1	J5-J1
-10mA	+ 20mA	+ 20mA	+ 20mA	Low Loss	Isolation	Isolation	Isolation
+20mA	-10mA	+20mA	+20mA	Isolation	Low Loss	Isolation	Isolation
+20mA	+20mA	-10mA	+20mA	Isolation	Isolation	Low Loss	Isolation
+20mA	+ 20mA	+ 20mA	-10mA	Isolation	Isolation	Isolation	Low Loss

Note:  $V \approx +1.35V$ ,  $I \approx +20mA$ ;  $V \approx -3.20V$ ,  $I \approx -10mA$  (including J1 end  $R_{IN} = 50\ \Omega$  resistor voltage divider), +5V/-5V series  $R \approx 180\ \Omega$  resistor

**GaAs PIN Reflective SP4T Switch Chip, 0.05-20GHz**

## Appearance structure

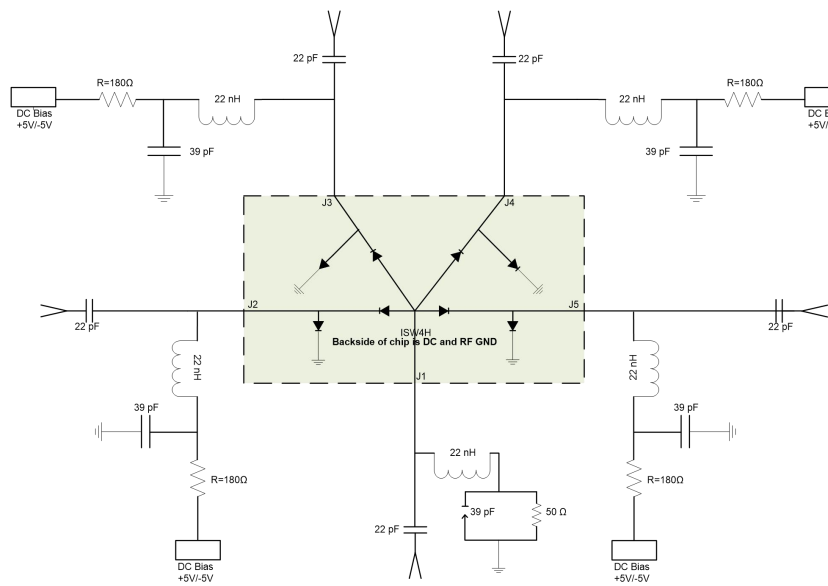


All units in the figure are micrometers

## Bonding point definition

Bonding point number	Function Symbol	Functional Description
1, 2, 3, 4, 5	J1, J2, J3, J4, J5	RF signal terminal
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC

## Recommended circuit diagram



If you need to reduce power consumption, you need to connect +5V/-5V in series with resistors of different resistance values. +5V series  $R \approx 370$  ohm resistor,  $V=+1.3V$ ,  $I=+10mA$ ; -5V series  $R \approx 180$  ohm resistor,  $V=-3.2V$ ,  $I=-10mA$ . Users can change the resistance value according to their own situation. If you have any questions, please contact the manufacturer.