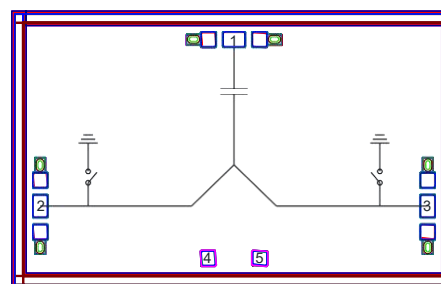


Performance characteristics

- Frequency range: 8.0 GHz ~ 12.0 GHz
- Insertion loss: 0.7 dB
- Switching time: 20ns
- Input 0.3 dB gain compression point power: 47dBm
- Input return loss:-15dB
- Output return loss:-15dB
- Chip size: 3.00 × 1.80 × 1.00 mm³

Functional block diagram



Overview

CWSW0812GaN50 is an X-band GaN high-power SPDT switch. The operating frequency of the chip covers 8.0 GHz ~ 12.0 GHz, and the typical control voltage is 0V/-40V. The chip has excellent isolation (typical value 45dB), insertion loss (typical value 0.7 dB), linearity (input 0.3 dB power compression point typical value 47dBm) and port return loss (typical value -15dB), which can be applied to radar microwave transceiver modules and high-power solid-state transmitters.

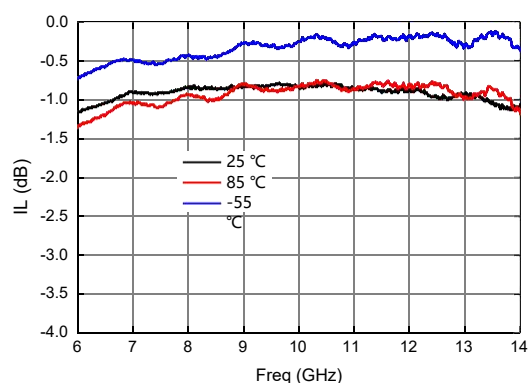
The back of the chip is metallized, which is suitable for eutectic sintering process; The chip adopts on-chip metallized via hole technology to ensure good grounding, which is simple and convenient to use without additional grounding measures.

Electrical Performance Table (TA=+25 °C, CW, 50 Ω system)

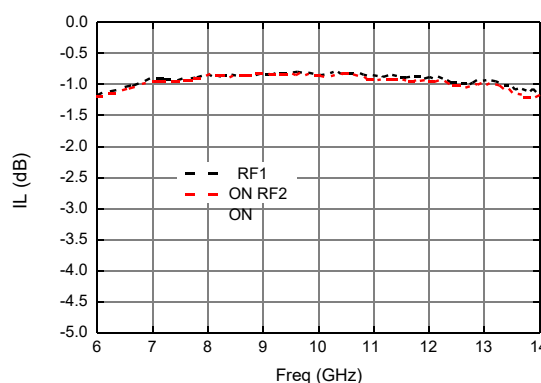
Parameter	Symbol	Minimum value	Typical value	Maximum value	Unit
Operating frequency	Freq	8.0	-	12.0	GHz
Insertion loss	IL	-	0.7	-	dB
Isolation	ISO	-	45	-	dB
Input 0.3 dB power compression point	P-0.3	45	47	-	dBm
Switching time	Ts	-	20	-	ns
Input return loss	RL_in	-	-15	-	dB
Output return loss	RL_out	-	-15	-	dB
Control voltage level	CTL*	-	-40V/0	-	V

* Control levels for typical test curves are -40V, 0V

Typical test curve



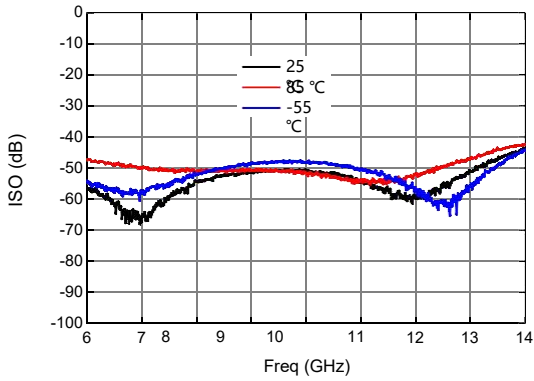
High and low temperature insertion loss vs frequency



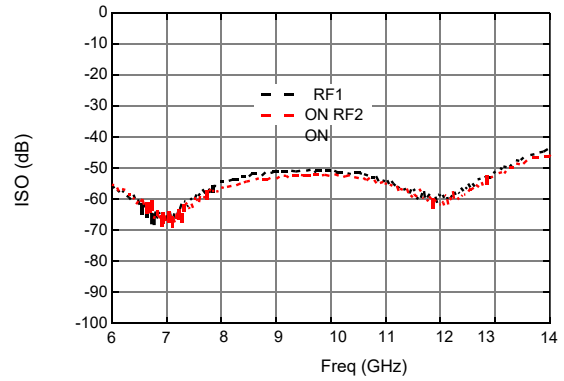
Insertion loss channel consistency vs frequency

CWSW0812GaN50

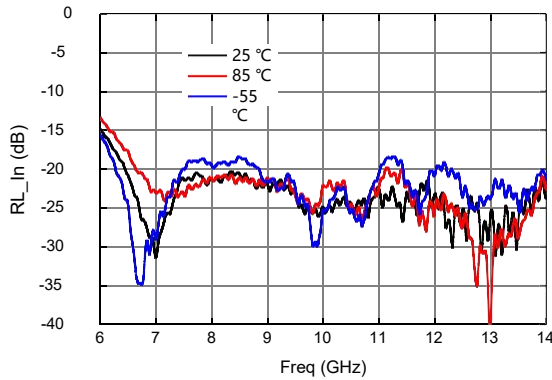
8 GHz ~ 12 GHz Reflective GaN SPDT Switch



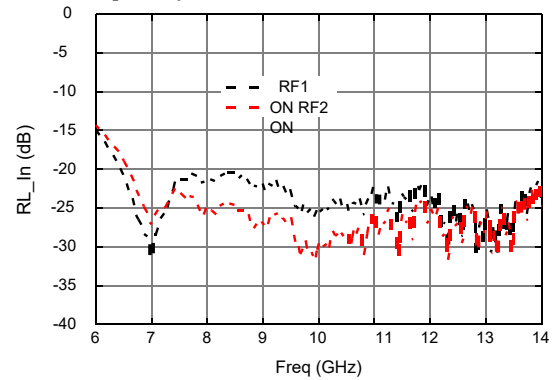
Three-temperature isolation vs frequency



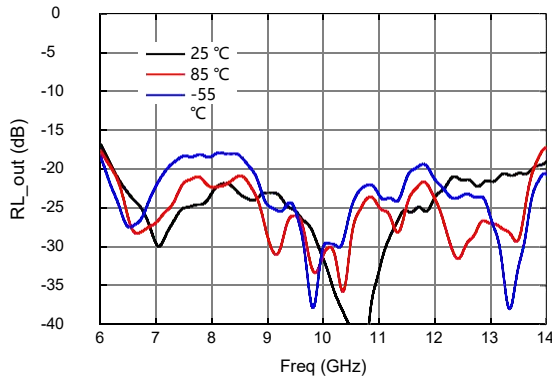
Isolation Channel Consistency vs Frequency



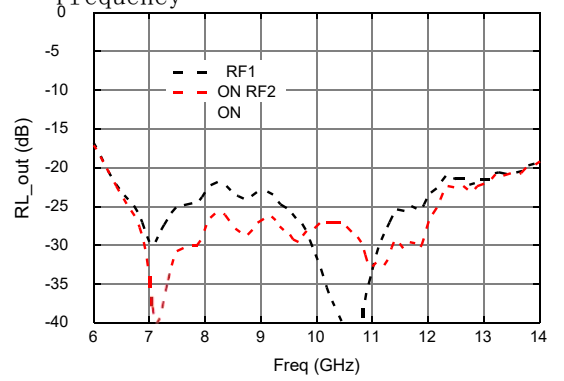
Input return loss vs frequency



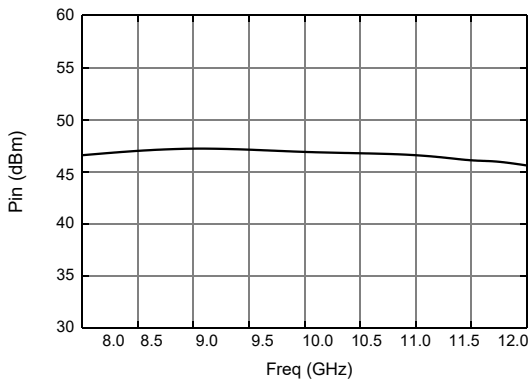
Input Return Loss Channel Consistency vs Frequency



Output return loss vs frequency

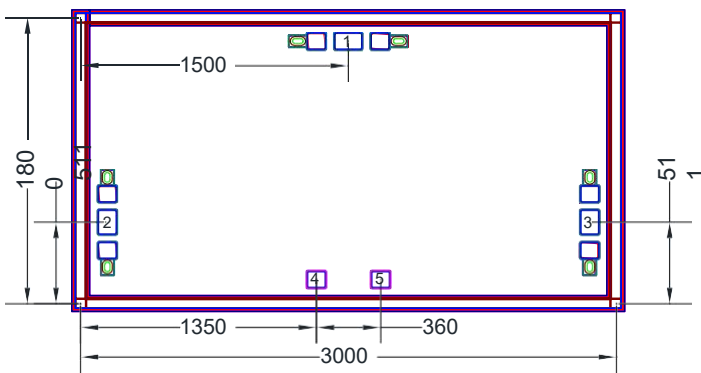


Output Return Loss Channel Consistency vs Frequency



Compress 0.3 dB input power vs frequency

Overall dimensions



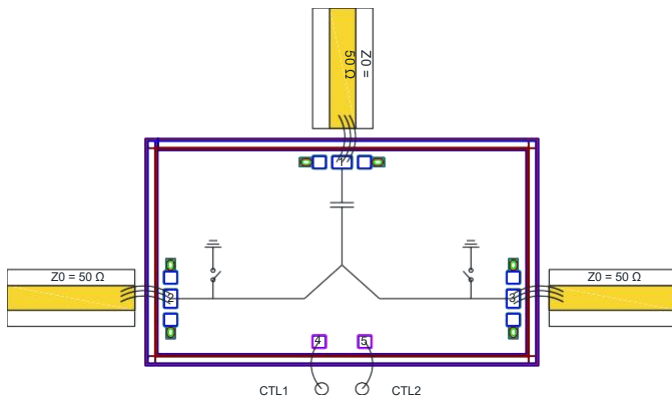
Description: 1. Unit: μm

2. Gold-plated grounding on the back of the chip
3. RF pressing point size: $150\ \mu\text{m} \times 100\ \mu\text{m}$
4. Other pressing point dimensions: $100\ \mu\text{m} \times 100\ \mu\text{m}$
5. Tolerance of overall dimensions: $50\ \mu\text{m}$

Definition of bonding pressure point

Pressing point Numbering	Function Definition	Functional description
1	RF1	RF signal input terminal
2	RF1	RF Signal Output Terminal 1
3	RF2	RF Signal Output Terminal 2
4	CTL1	Control Terminal 1, -40V, 0V active
5	CTL2	Control Terminal 2, -40V, 0V active

Reference circuit



Instructions for use:

1. Three RF output ports with a diameter of $25\ \mu\text{m}$ are bonded, and the span distance should not exceed $300\ \mu\text{m}$.
2. The DC control port adopts a single gold wire with a diameter of $25\ \mu\text{m}$.

Truth table

Control input		On-off state	
CTL1	CTL2	RF1	RF2
-40V	0V	ON	OFF
0V	-40V	OFF	ON

Matters needing attention

Limit parameter	Numerical value
Input power P_{in} , $50\ \Omega$	51dBm
Maximum control voltage level	-50V
Storage temperature	$-65\ ^\circ\text{C} \sim +150\ ^\circ\text{C}$
Operating temperature	$-55 \sim +85\ ^\circ\text{C}$
Sintering temperature (30s, N ₂ protection)	300 $^\circ\text{C}$

Exceeding the above conditions may cause permanent damage to the chip.



This product is sensitive to static electricity. Please pay attention to anti-static in use