GSW - 00188T-N-PDM

GaAs MMIC Absorptive SP8T Switch Chip, 0.5-18GHz

Performance characteristics

- Frequency range: 0.5 - 18GHz
- Positive control, full shutdown, integrated TTL
- Insertion loss : 4.0 dB @ 18GHz typ.
- Isolation: 50dB
- On/off state standing wave ratio : 1.5 :1
- Chip size: 2.15 x1.9 x 0.1mm

Product Introduction

GSW-00188T-N-PDM is an absorptive single-pole eight-throw switch chip with 50Ω matching at the input/output end and a frequency range of 0.5~18 GHz .Speed 35 ns, 1dB compression input power +2 5 dBm. The chip adopts -5V power supply, + 5V /0V positive level control (compatible with +3.3V), the product has full off ISW-000188T-N-PDM and ISW-000188T-N-PD are mirror versions of each other.

Use limit parameters	
Control voltage range	-0.5V ~ + 6V
Supply voltage range	-6V
Maximum input power	+27dBm
Operating temperature	-55 ~ +85°C
storage temperature	-65 ~ +150°C

Exceeding any of these maximum limits may cause permanent damage.

Electrical performance parameters (TA = +25°C, VEE = -5V)				
index	Minimum	Typical Value	Maximum	unit
Frequency Range		0.5-18		GHz
Insertion loss @18GHz	-	4.0	-	dB
Isolation	-	50	-	dB
On-state input return loss	-	15	-	dB
On-state output return loss	-	14	-	dB
Off-state output return loss	-	16	-	dB
P-1@0.5~18GHz	-	25	-	dBm
Switching speed	-	35	-	ns
Control current	-	500	-	uA
Input high level voltage	+3.0	+3.3	+5	V
Input low level voltage	0	-	+ 0.8	V
voltage	-	-5	-	V
Quiescent Current	-	20	-	mA

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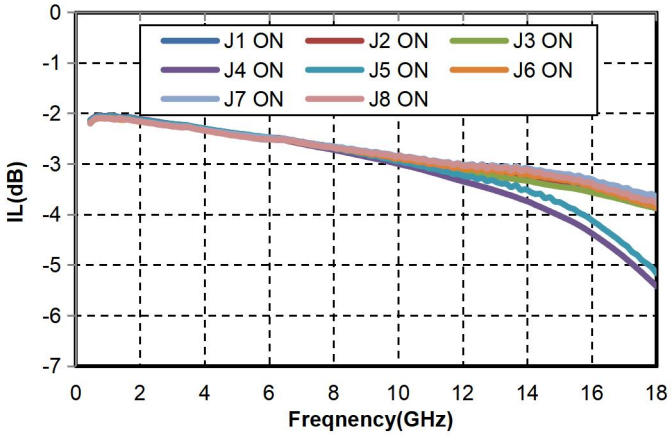
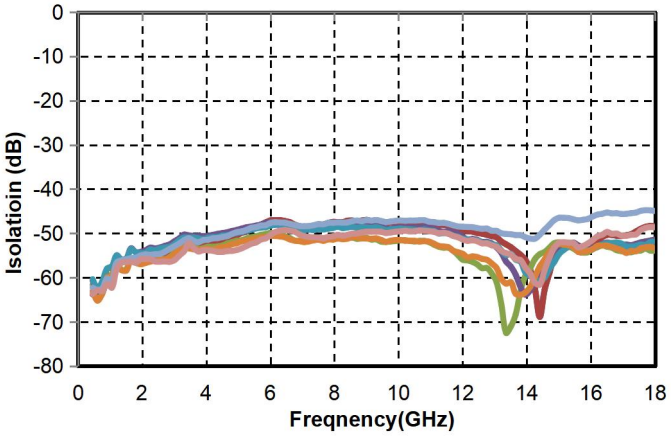
Main index test curve

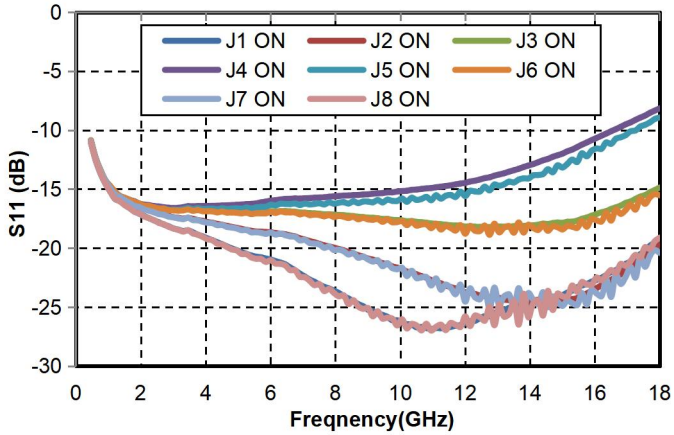
Insertion Loss vs. Operating Frequency



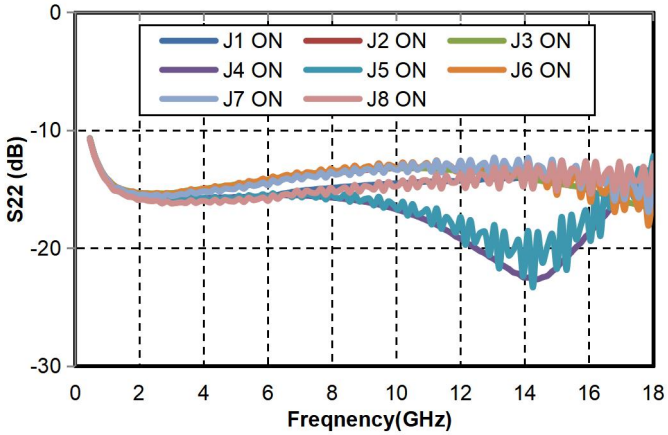
Isolation vs. Operating Frequency



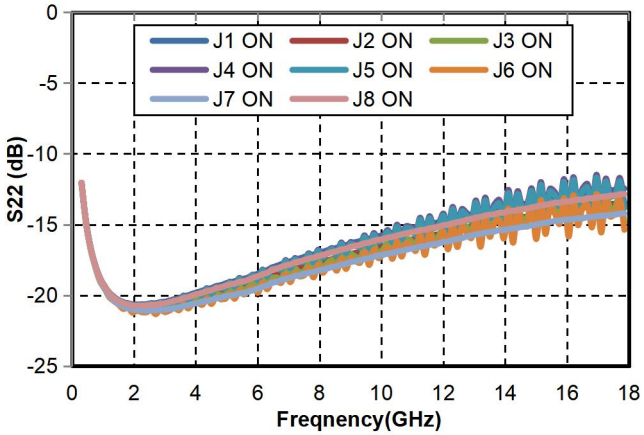
Input Return Loss vs. Operating Frequency
(On State)



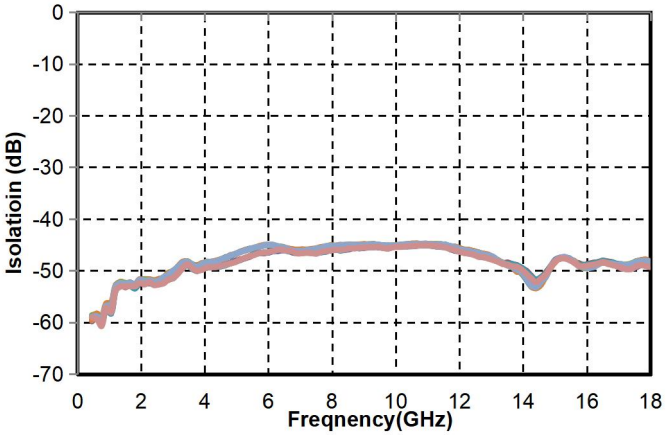
Output Return Loss vs. Operating Frequency
(On State)



Output Return Loss vs. Operating Frequency
(Off State)



Full off isolation



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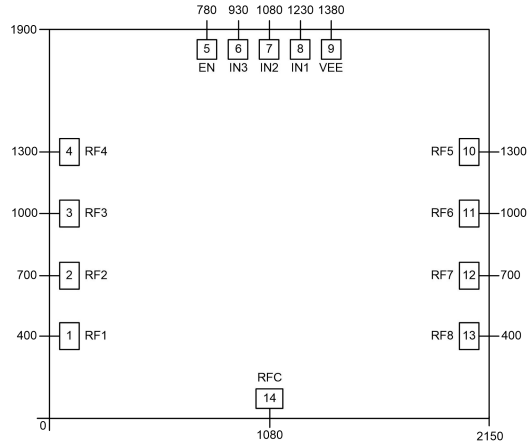
Appearance and structure (units in the figure are all microns)



Bonding point definition		
Bonding point number	Function Symbol	Functional Description
14	RF COMM	RF common terminal , internal integrated DC blocking capacitor
1, 2, 3, 4, 10, 11, 12, 13	RF1~RF8	RF input/output terminal , internal integrated DC blocking capacitor
8, 7, 6	IN1~IN3	Signal control port, on/off control
5	EN	Enable end
9	VEE	Power supply terminal
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC

Truth table :

Control Input					Signal Path State
VEE (V)	EN(V)	IN3(V)	IN2(V)	IN1(V)	
-5	0	Low（0）	Low（0）	Low（0）	RFC-RF1
		Low（0）	Low（0）	High（1）	RFC-RF2
		Low（0）	High（1）	Low（0）	RFC-RF3
		Low（0）	High（1）	High（1）	RFC-RF4
		High（1）	Low（0）	Low（0）	RFC-RF5
		High（1）	Low（0）	High (1)	RFC- RF6
		Low (0)	High (1)	High (1)	RFC- RF7
		High (1)	High (1)	High (1)	RFC- RF8
	+5	-	-	-	All Off

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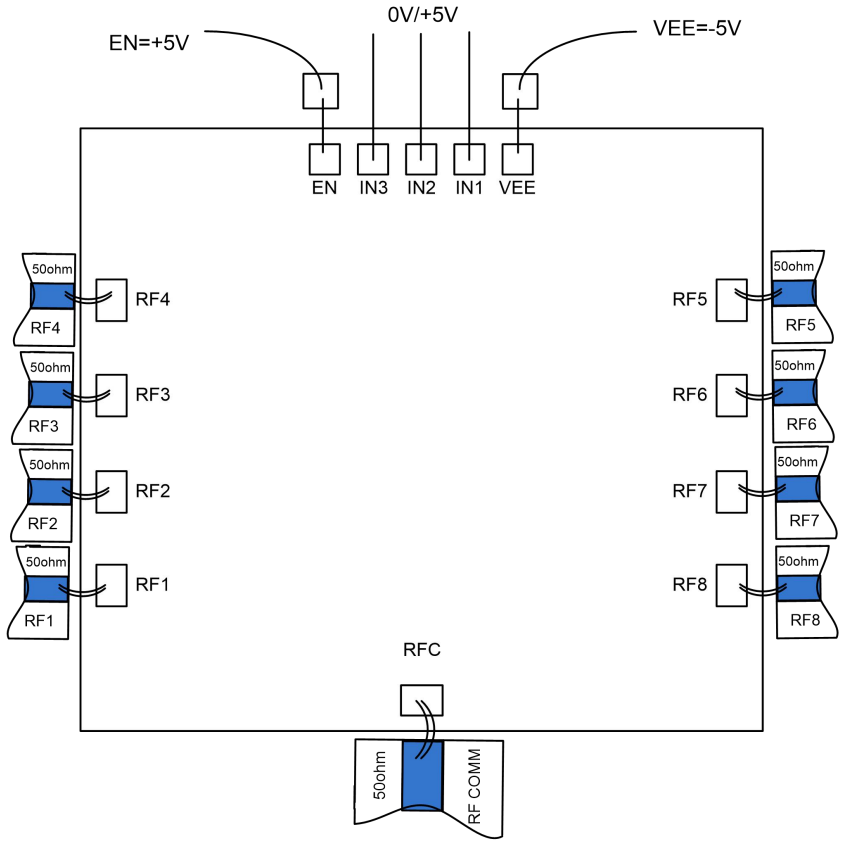
Recommended assembly drawing



Note: The VEE port can be connected in parallel with a bypass capacitor > 100nF .

Precautions for use

- The chip needs to be stored in an anti-static container and kept in a nitrogen environment.
- bare die surface using wet chemical methods .
- Please strictly comply with ESD protection requirements to avoid electrostatic damage to bare chips.
- General operation: Please use precision pointed tweezers to pick up bare chips. Avoid touching the chip surface with tools or fingers during operation.
- Rack mounting operation suggestions: Bare chip mounting can be done by AuSn solder eutectic sintering or conductive adhesive bonding. The mounting surface must be clean and flat.
- Sintering process: It is recommended to use AuSn solder sheets with a gold-tin ratio of 80/20 . The working surface temperature reaches 255 ℃ and the tool (vacuum chuck) temperature reaches 265 ℃. When the high-temperature mixed gas (nitrogen-hydrogen ratio of 90/10) is blown to the chip, the temperature at the top of the tool should be raised to 290 ℃. Do not let the chip exceed 320 ℃ for more than 20 seconds. The friction time should not exceed 3 seconds.
- Bonding process: The amount of conductive glue dispensed should be as small as possible. After the chip is placed in the installation position , the conductive glue should be vaguely visible

around it . For curing conditions, please follow the information provided by the conductive glue manufacturer.

- Bonding operation suggestions: Use Φ0.025mm (1mil) gold wire for both ball and wedge bonding . Thermo-ultrasonic bonding temperature is 150 °C. The pressure of the wedge for ball bonding is 40~50gf , and the pressure of the wedge bonding is 18~22gf . Use the smallest possible ultrasonic energy. The bonding starts at the pressure point on the chip and ends at the package (or substrate) .