

# VRFS0008-BD



## DC-20GHz GaAs SPST MMIC Switch

Datasheet v3

### Features

- Frequency Range: DC-20GHz
- Non-reflective SPST architecture
- Low Insertion Loss: 0.6dB @ 10GHz
- High Isolation: 48dB @ 10GHz
- 50Ω matched RF ports
- Size: 1.91mm x 0.7mm x 0.1mm
- Available as known good die



### Description

The VRFS0008-BD is a DC – 20GHz non-reflective output single-pole single-throw switch for Defence and Instrumentation markets. The device demonstrates over 40dB isolation across the band with a low insertion loss of 0.6dB at 10GHz. The RF ports are DC blocked and matched to 50Ω.

### Electrical Specifications

$T=+25^{\circ}\text{C}$  baseplate,  $V_{ctrl}=0/-5\text{V}$

Parameter	Specification			Unit	Condition
	Typ.@1GHz	Typ. @ 10GHz	Typ. @20GHz		
Insertion Loss	-0.4	-0.6	-1.1	dB	$f_0=$ DC - 20GHz
Isolation	-58	-48	-39	dB	$f_0=$ DC - 20GHz
I/P Return Loss	-33	-19	-26	dB	$f_0=$ DC - 20GHz ON state
O/P Return Loss	-33	-17.3	-33	dB	$f_0=$ DC - 20GHz RF1, RF2, ON state
	-9.6	-12.2	-5	dB	$f_0=$ DC - 20GHz RF1, RF2, OFF state
Input power for 1dB compression		23		dBm	$f_0=$ 0.5 - 20GHz
$T_r/T_f$		<30		ns	$f_0=$ DC - 20GHz

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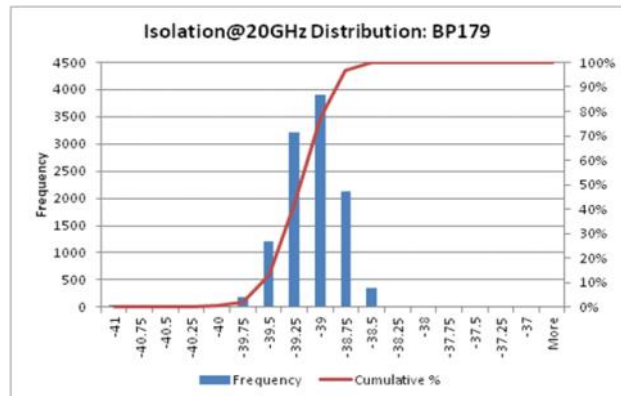
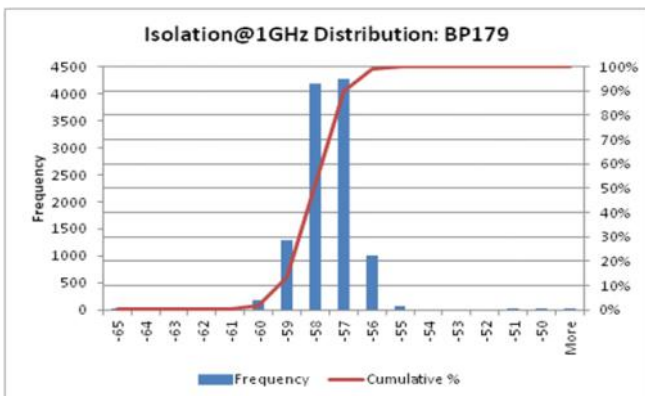
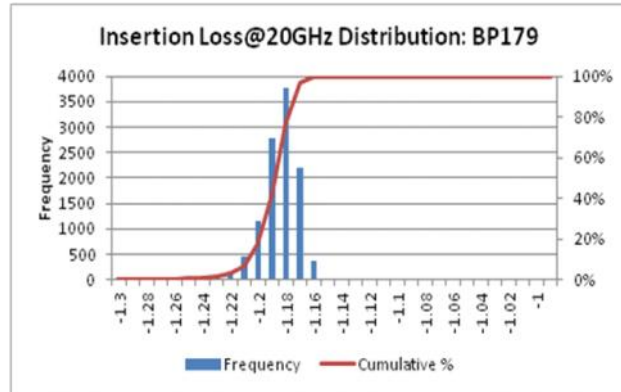
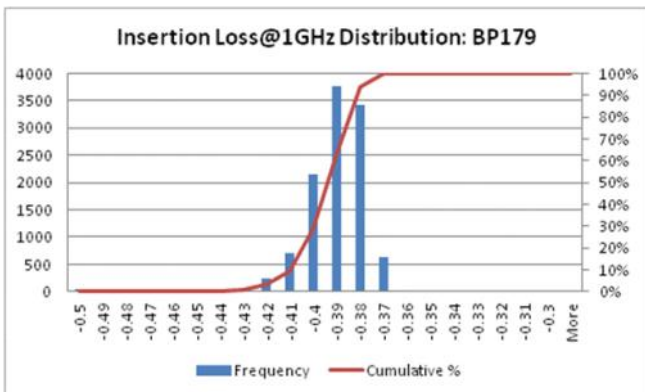
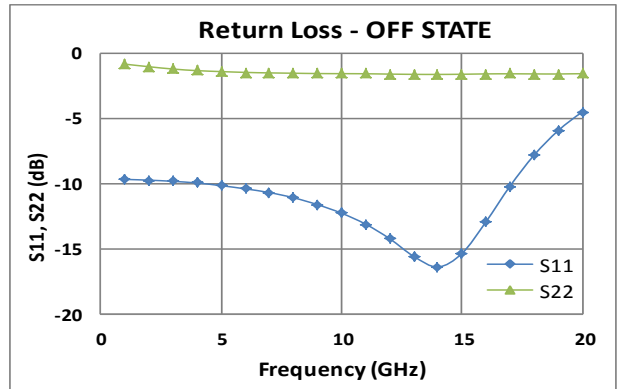
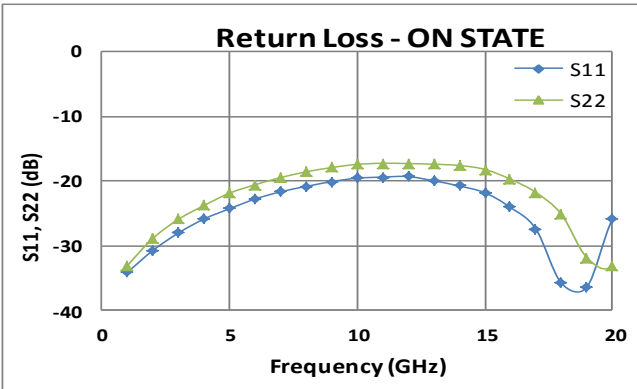
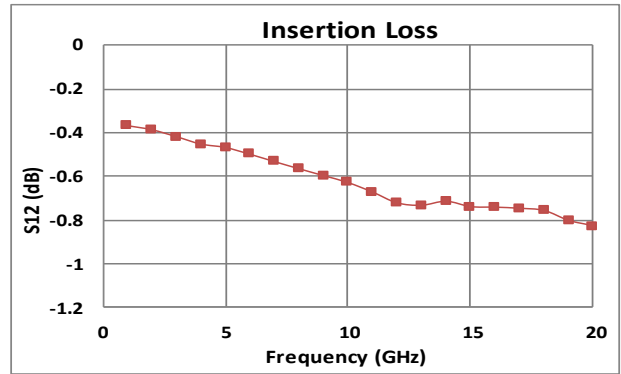
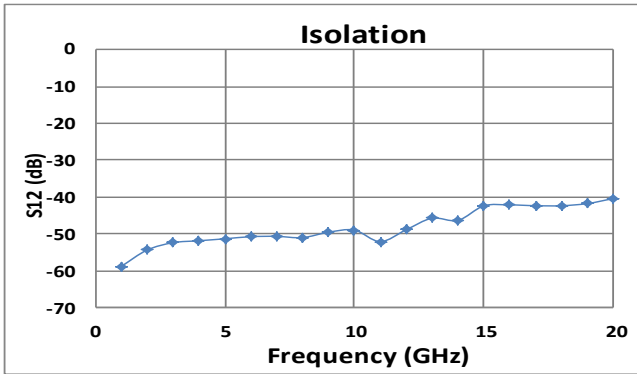


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### Measured Performance (On-wafer)

$T=+25^{\circ}\text{C}$  baseplate,  $V_{ctrl}=0/-5\text{V}$



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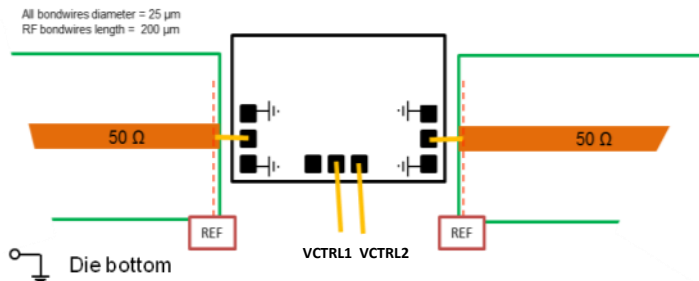
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### Recommended Absolute Maximum Ratings <sup>[1]</sup>

Parameter	Symbol	Value	Notes
Control Voltage (+)	$V_{ctrl+}$	+0.5V	
Control Voltage (-)	$V_{ctrl-}$	-7V	
Control Current	$I_{ctrl}$	10uA	
RF input power	$RF_{in}$	+21dBm	
Junction Temperature	$T_j$	175°C	For maximum median device lifetime, $T_j$ should be minimised
Storage temperature	$T_{storage}$	-55 to 150°C	

<sup>[1]</sup> Operation outside these conditions may cause permanent damage to the device. Combination of maximum rating conditions may reduce the values. Device performance at these ratings is not implied.

### Assembly & Bonding Diagram



STATE	VCTRL1(V)	VCTRL2(V)
ON	-5	0
OFF	0	-5

Die Size	1.91mm x 0.7mm
Die Thickness	100 $\mu$ m
Minimum Bondpad opening	70 $\mu$ m x 70 $\mu$ m

Minimal length (0.15nH) are recommended for RF bondwires. The RF input and output ports are DC blocked.

GaAs devices are ESD sensitive and precautions should be observed during storage, handling, assembly and testing.

