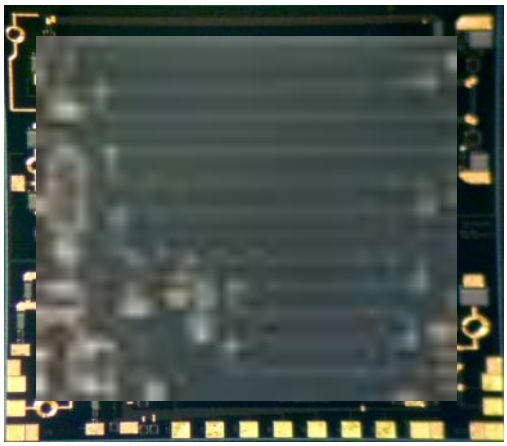
VRFC0008-BD

2-4 GHz 6 Bit GaAs MMIC Phase Shifter

Preliminary Datasheet v2

Features



- Frequency Range: 2-4 GHz
- 6 - bit Resolution (5.625° Phase Step)
- Low RMS Phase Error: 3.3°
- Typical Insertion Loss: 7.5 dB
- High Linearity: > 43 dBm
- 50Ω Matched RF Ports
- Size: 3mm x 3mm x 0.1mm

Description

The VRFC0008-BD is a 2-4 GHz phase shifter with 6 bits resolution providing a 360° phase coverage with 5.625° phase step. The circuit demonstrates a typical insertion loss of 7.5 dB and a low RMS phase error of 3.3° (at 3 GHz). The RF ports are DC blocked and matched to 50 Ω. Typical applications include Defence and Instrumentation markets.

Electrical Specifications

T=+25°C baseplate, V_{ctrl} = 0/-5V

Parameter	Specification			Unit
	Min.	Typ.	Max.	
Resolution		6		bit
Insertion Loss		-7.5		dB
Insertion Loss Modulation		±1		dB
RMS Phase Error		3.3		deg
I/P Return Loss		-12		dB
O/P Return Loss		-11.7		dB
Input Third Order Intercept		>43		dBm

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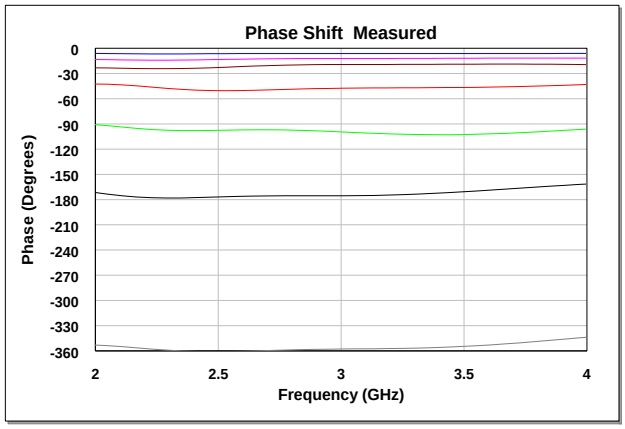
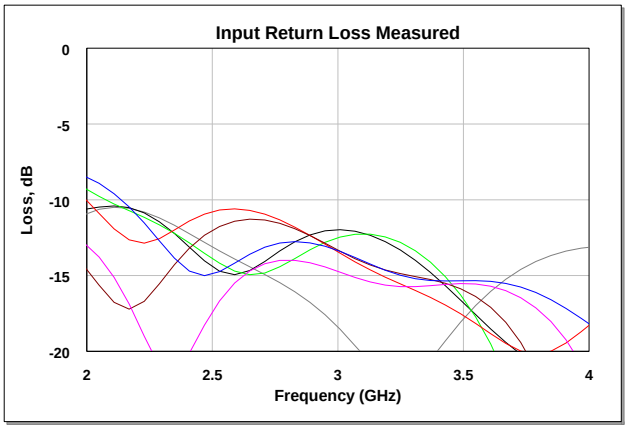
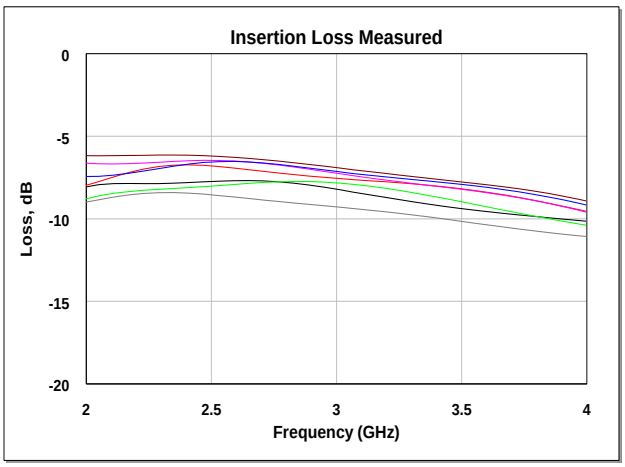
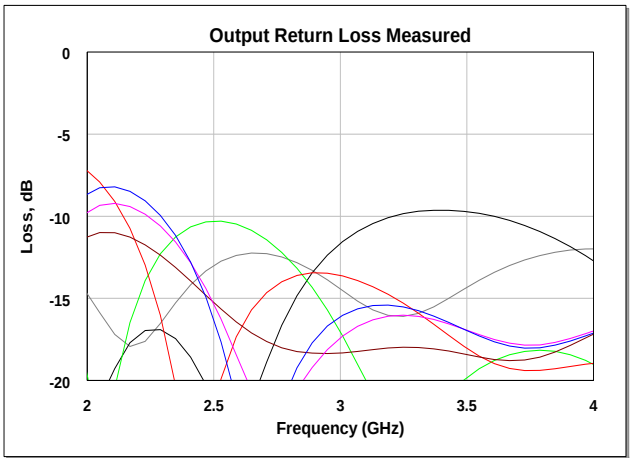
Measured Performance (On-wafer)

T=+25°C baseplate, V_{ctrl} = 0/-5V









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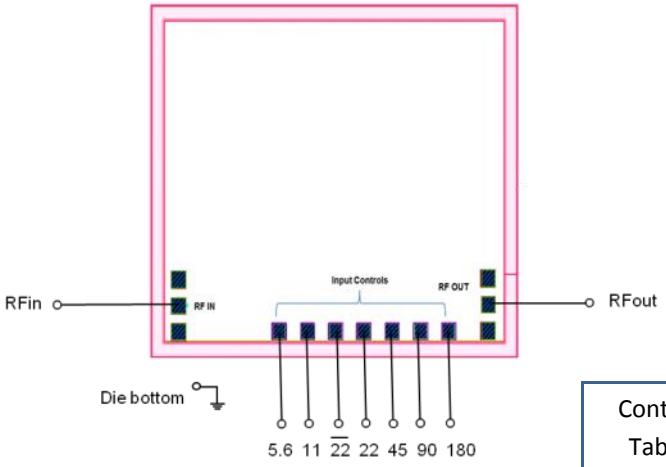
Recommended Absolute Maximum Ratings [1]

Parameter	Symbol	Value	Notes
Control Voltage (+)	V_{ctrl+}	+0.5 V	
Control Voltage (-)	V_{ctrl-}	-7 V	
Control Current	I_{ctrl}	100 µA	
RF Input Power	RF_{in}	27 dBm	
Junction Temperature	T_j	175°C	For maximum median device lifetime, T_j should be minimised
Storage Temperature	$T_{storage}$	-55 to 150°C	

[1] 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



Control Table	5.6	11	$\overline{22}$	22	45	90	180
Reference	-5	-5	0	-5	-5	-5	-5
Max. Phase	0	0	-5	0	0	0	0

Die Size	3.0mm x 3.0mm
Die Thickness	100µm
Minimum Bondpad opening	70µm x 70µm

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.