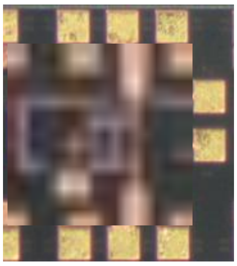
VRFC0009-BD

DC-20 GHz Single Bit GaAs MMIC Attenuators

Preliminary Datasheet v2

Features

- Frequency Range: DC-20 GHz
- Single Bit Attenuators
- 50 Ω Matched RF Ports


1dB Attenuator


2dB Attenuator


4dB Attenuator


16dB Attenuator

Description

The VRFC0009-BD are a set of single bit DC-20GHz digital attenuators offering attenuation levels of 1, 2, 4 and 16dB with a very low phase change. The insertion loss is around 1dB for 1, 2 and 4dB attenuators and 3dB for 16dB attenuator. 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
	Typ. @2GHz	Typ. @10GHz	Typ. @20GHz	
1dB Attenuation	1	0.96	0.8	dB
2dB Attenuation	2.1	2.1	2	dB
4dB Attenuation	4.2	4.2	4.4	dB
16dB Attenuation	15.6	15.2	15.1	dB
I/P Return Loss	-20	-17	-15	dB
O/P Return Loss	-20.5	-19	-17	dB

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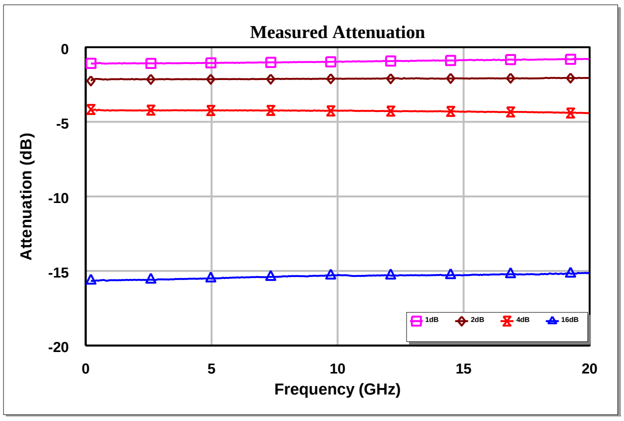
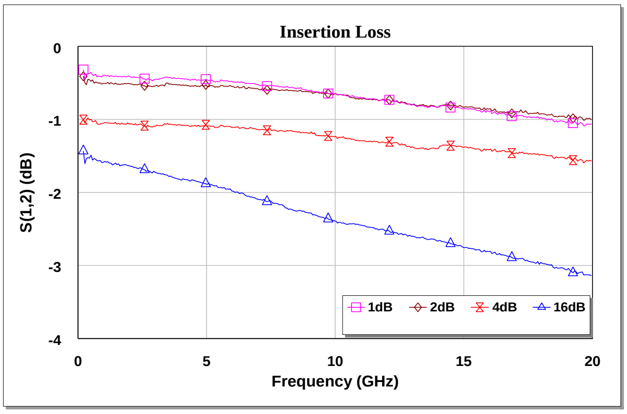
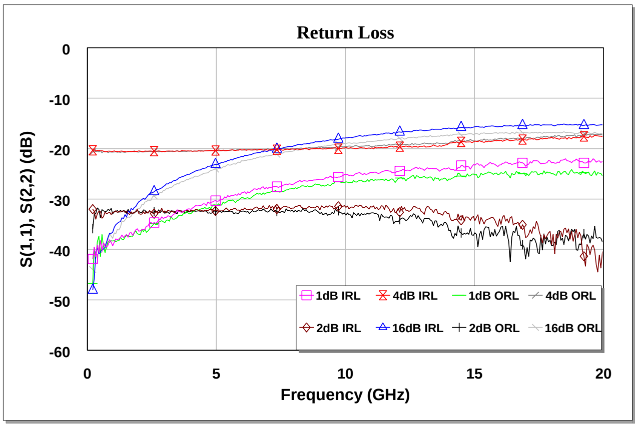
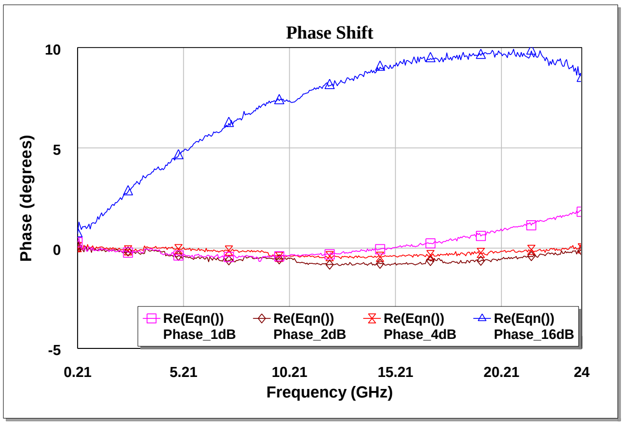
Measured Performance (On-wafer)

T=+25°C baseplate, V_{ctrl} = 0/-5V









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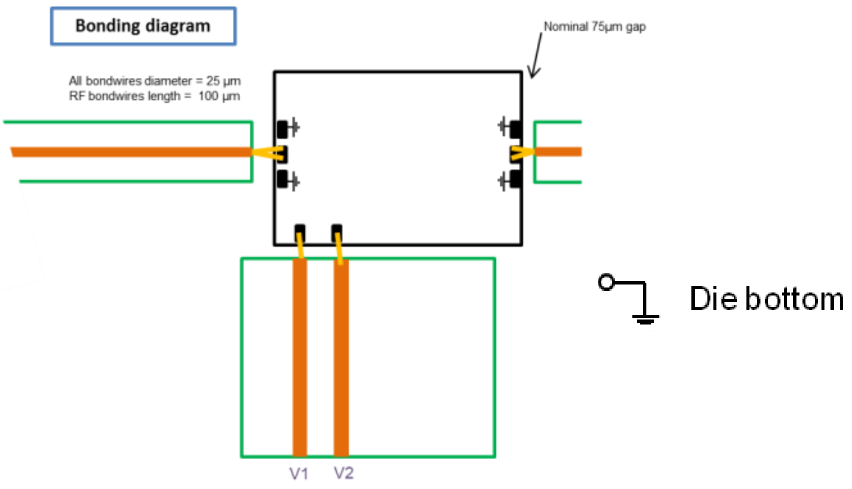
Recommended Absolute Maximum Ratings [1]

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}	TBC	
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



	1 dB	2 dB	4 dB	16 dB
Engineering Die Size	1mm x 3mm	1mm x 3mm	1mm x 3mm	1.5mm x 1mm
Est. Production Die Size	0.9mm x 0.7mm	0.9mm x 0.7mm	0.9mm x 0.7mm	1.5mm x 1mm
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

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