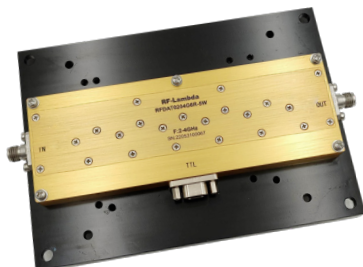


Absorptive Digital Control Attenuator 2GHz-4GHz



Product Description

RFDAT0204G6R-5W is an absorptive digital control attenuator with a frequency range of 2 to 4GHz.

The max power input is 37dBm. The insertion loss is 3.5dB with an attenuation range of 63dB.

The working temperature of this product is between - 40°C and + 85°C.

Features

- Absorptive Digital Control Attenuator
- Wide Band Operation 2-4GHz
- 1dB LSB Steps to 63dB
- Single Positive Control Line Per Bit

Typical Applications

- Wireless Infrastructure
- Military and Aerospace Applications
- Test Instrumentation
- Radar Systems
- 5G Wireless Communications
- Microwave Radio Systems
- TR Modules
- Research and Development
- Cellular Base Stations

Electrical Specifications ($T_A = +25^\circ\text{C}$), $V_{dd} = +5\text{V}/-28\text{V}$, $V_{CTL} = 0 / +5\text{V}$

Parameter	Min	Typ	Max	Units
Frequency Range	2		4	GHz
Attenuation Range		63		dB
Attenuation Flatness (Referenced to Insertion Loss)		± 2.0		dB
Control Bits		6		Bit
Control Step Size		1.0		dB
Insertion Loss		4.0	4.5	dB
Insertion Loss Temperature Coefficient		0.01		dB/ °C
Input VSWR (All States)		1.5		: 1
Output VSWR (All States)		1.5		: 1
Input Linearity 0.1dB Compression Point (P0.1dB)			37	dBm
Input Third-Order Intercept(IP3) @Two-tone input power = 16 dBm/tone, $\Delta f = 1$ MHz		45		dBm
Switching Speed 50% CTRL* to 90% or 10%		800 Typ.		ns
Bias Current (+5V/-28V)		150/300 Typ.		mA
Weight	Net	0.65Max.		lbs.
	Including Heat Sink	1.15Max.		
Impedance		50		Ohms
Input / Output Connectors	SMA-Female (Input) – SMA-Female (Output)			
Interface and Control Connector	MICRO-D9 (Female)			
Package	Epoxy Sealed (Standard)			
	Hermetically Sealed (Optional)			

Absolute Maximum Ratings

Parameter	Rating
Biasing Voltage	(+5V /-28V)±10%
RF Input Power	+37dBm

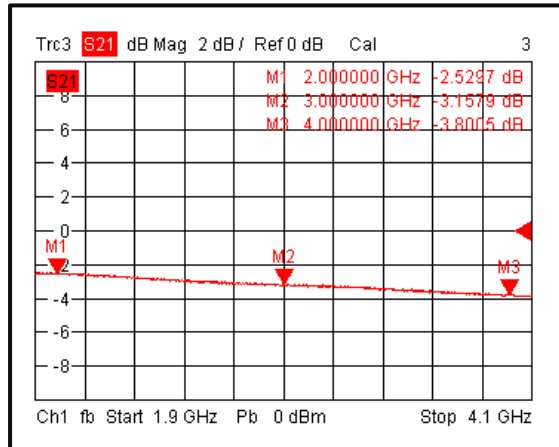
Environmental Specifications and Test Standards

Parameter	Description
Operational Temperature	-40°C to +85°C (Case Temperature)
Storage Temperature	-50°C to +105°C
Thermal Shock	-40°C → +85°C (5 Cycles / 10 hours)
**Random Vibration	MIL-STD-202G Table 214-I, Test Condition Letter C 1.5 Hours Per Axis
High Temperature Burn In	Temperature +85°C for 72 Hours
Shock	1. Weight >20g, 50g half sine wave for 11ms, Speed variation 3.44m/s 2. Weight <=20g, 100g Half sine wave for 6ms, Speed variation 3.75m/s 3. Total 18 times (6 directions, 3 repetitions per direction).
Altitude	Standard: 30,000 Ft (Epoxy Sealed Controlled Environment) Optional: Hermetically Sealed (60,000 ft. 1.0 PSI min)
Hermetically Sealed (Optional)	MIL-STD-883 (For Hermetically Sealed Units)

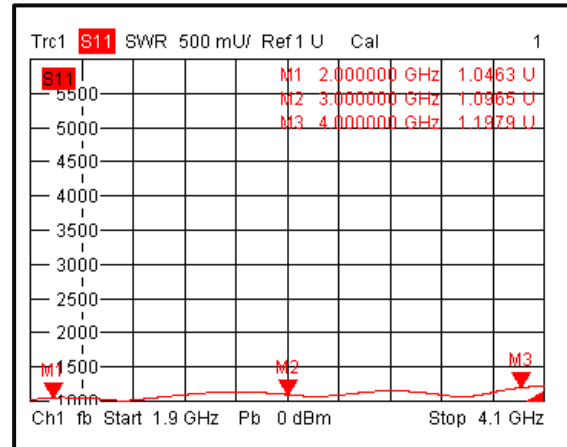
**For vibration testing details please see additional information section.

Typical Performance Plots

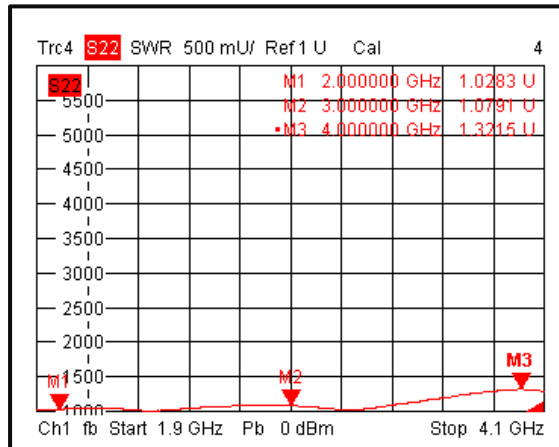
Insertion Loss @+25°C



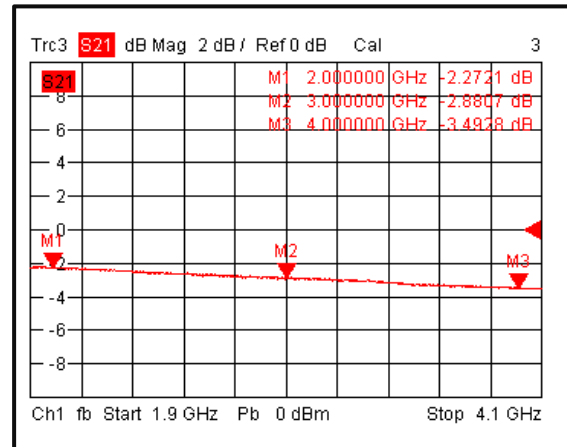
Input VSWR @+25°C



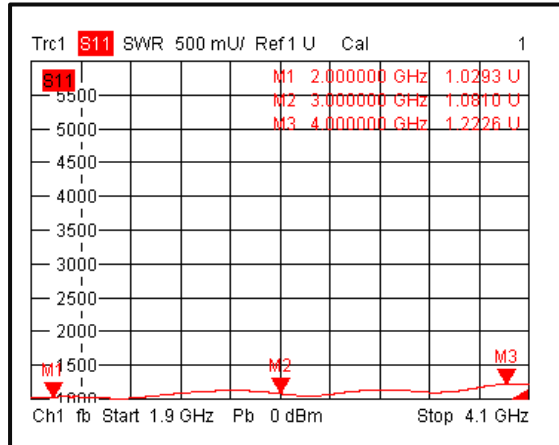
Output VSWR @+25°C



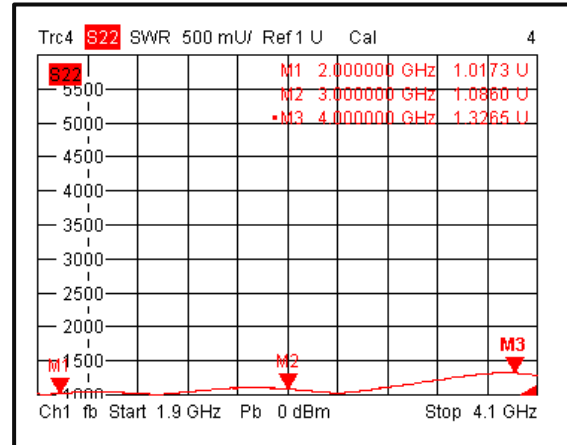
Insertion Loss @-40°C



Input VSWR @-40°C

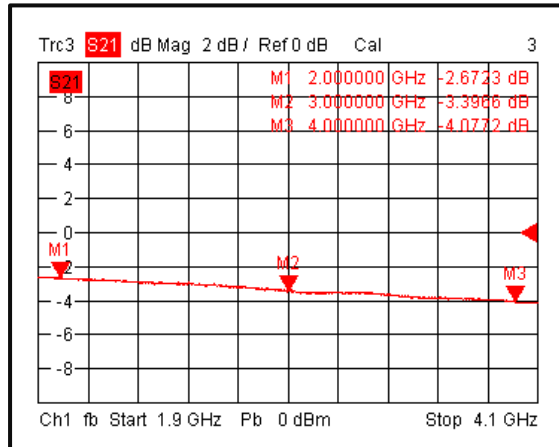


Output VSWR @-40°C

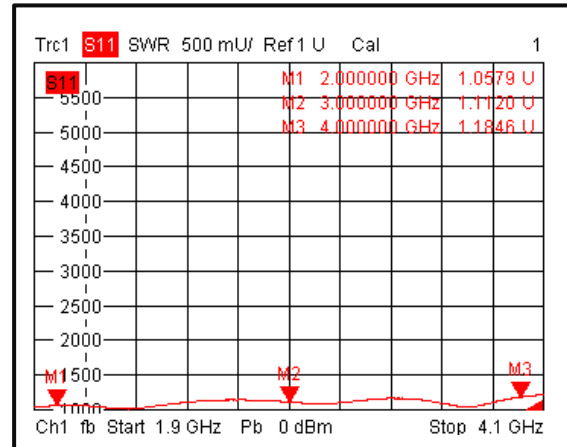


Typical Performance Plots

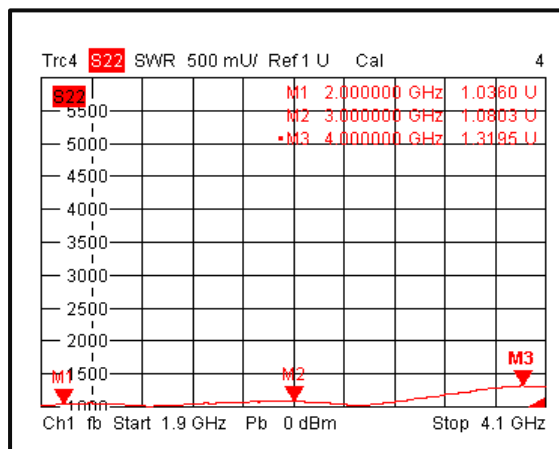
Insertion Loss @+85°C



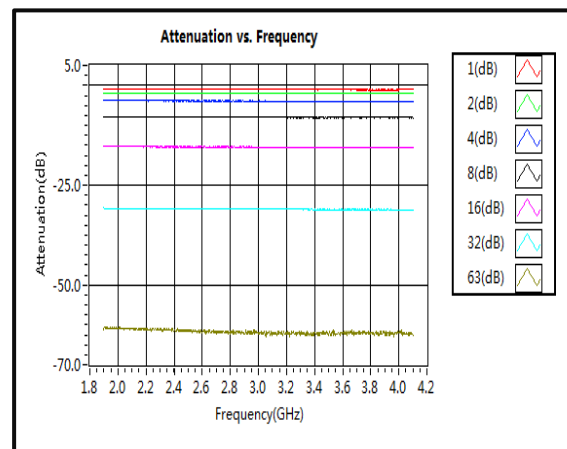
Input VSWR @+85°C



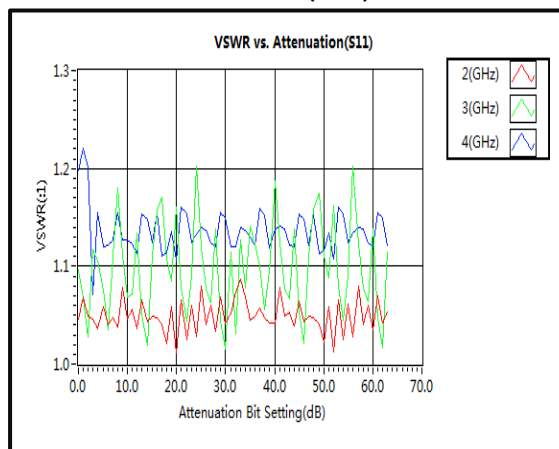
Output VSWR @+85°C



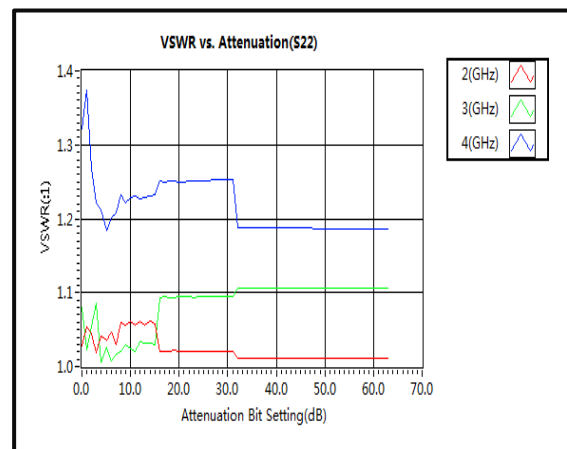
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

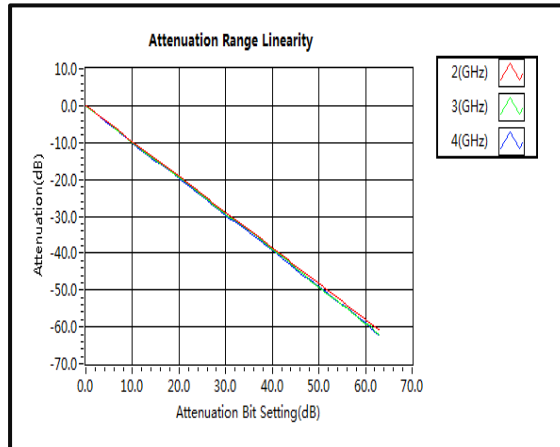


VSWR vs. Attenuation (S22)

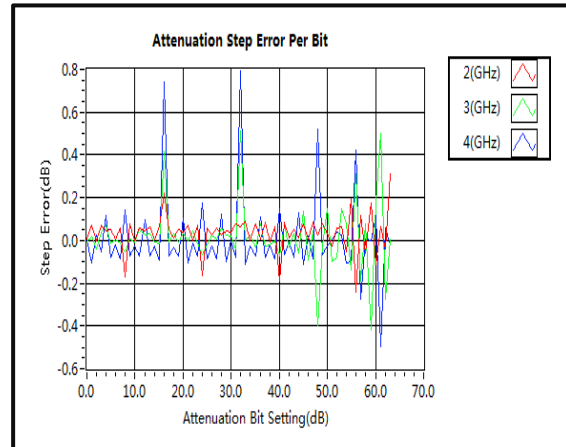


Typical Performance Plots

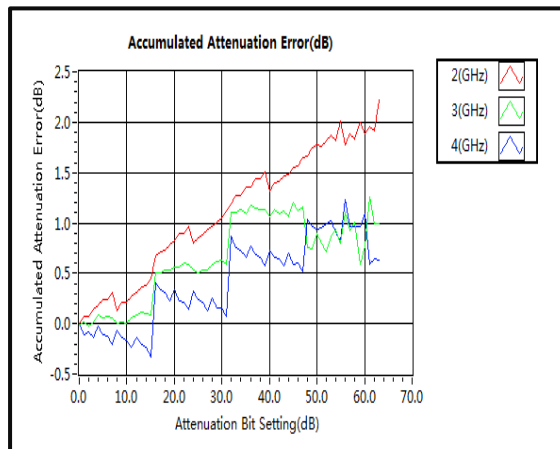
Attenuation Range Linearity



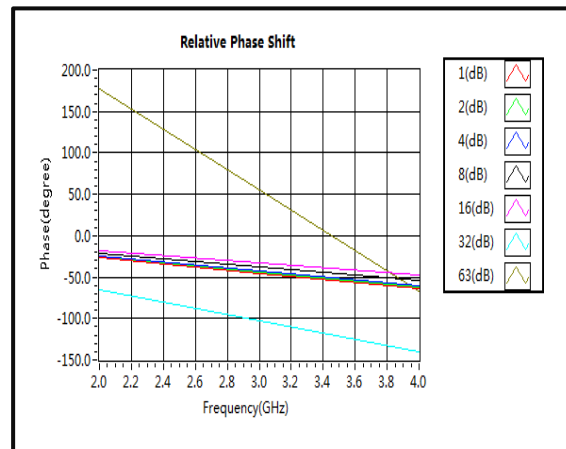
Attenuation Step Error Per Bit (dB)



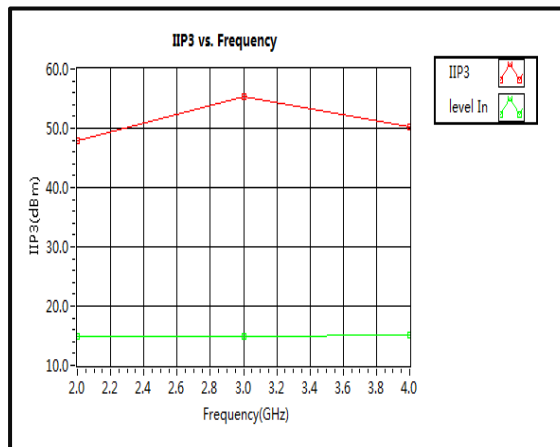
Accumulated Attenuation Error (dB)



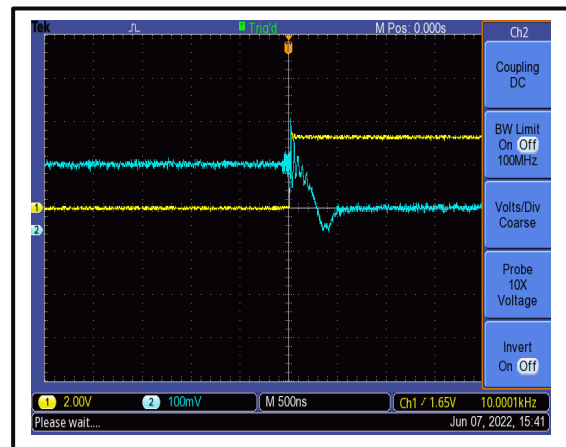
Relative Phase Shift



IIP3

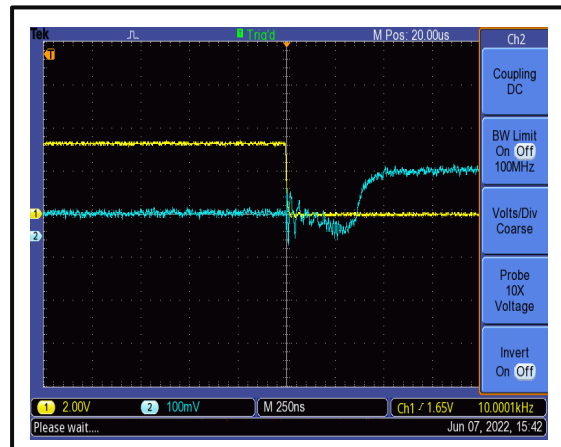


Speed

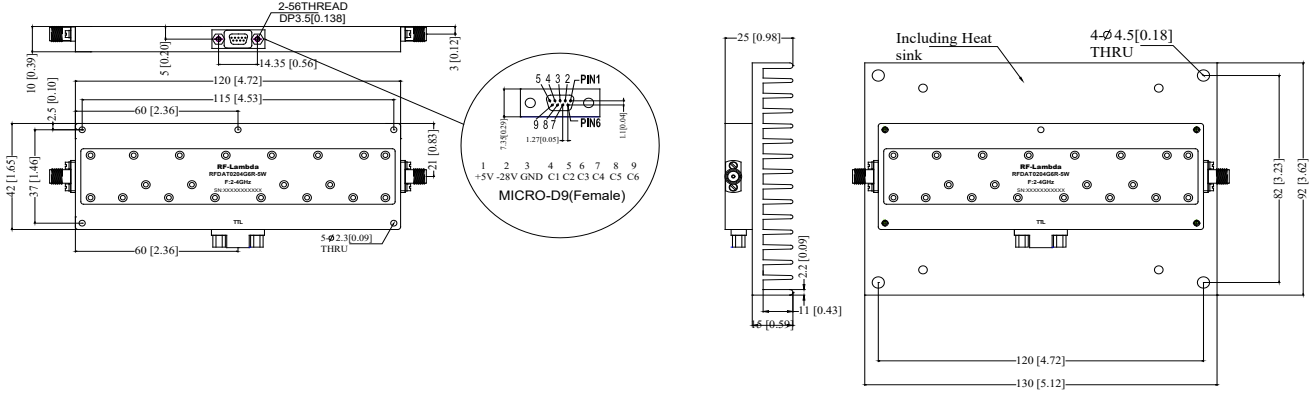


Typical Performance Plots

Speed



Outline Drawing

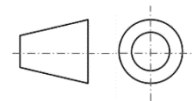


Truth Table

TTL Control Voltage THRESHOLD		Low(0)=0~0.8V				
		High(1)=2.8~5V				
Control Input TTL		Attenuation State				
C6	C5	C4	C3	C2	C1	Reference IL
0	0	0	0	0	0	0dB
0	0	0	0	0	1	1dB
0	0	0	0	1	0	2dB
0	0	0	1	0	0	4dB
0	0	1	0	0	0	8dB
0	1	0	0	0	0	16dB
1	0	0	0	0	0	32dB
1	1	1	1	1	1	63dB

Notes:

1. Package Material: Aluminum
2. Plating: Gold plated
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ± 0.2 [0.008] unless otherwise specified (Excl Heat Sink).
5. Heatsink Included - Mandatory for Operation. Matching heatsink is listed on our website. If customer would like to use their own cooling method, please make sure the amplifier will operate under the specs that listed in page 2 of this datasheet.
6. Standard torque wrench must be used to secure RF connectors.



Additional Information

Documentation

Webpage

ESD Policy

https://rflambda.com/pdf/rflambda_esd_control.pdf

Heatsink Lookup Specifications

https://rflambda.com/search_heatsink.jsp

Connector Torque Specifications

https://www.rflambda.com/pdf/Torque_Specifications.pdf

Random Vibration Test Standard

https://www.rflambda.com/pdf/rflambda_random_vibration_MIL-STD-202G.pdf

Ordering Information

Part Number	Modification	Description
RFDAT0204G6R-5W	Standard	2-4GHz Digital Control Attenuator

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