

Absorptive Digital Control Attenuator 4GHz-8GHz



Product Description

RFDAT0408G6A is an absorptive digital control attenuator with a frequency range of 4 to 8GHz.

The maximum power input of this attenuator is 30dBm. The insertion loss is 5.3dB with a typical attenuation range of 63dB.

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

Features

- Absorptive Digital Control Attenuator
- 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 ($T_A = +25^\circ\text{C}$) , $V_{dd} = +5\text{V}/-5\text{V}$, $V_{CTL} = 0 / +5\text{V}$

Parameter	Min	Typ	Max	Units
Frequency Range		4 - 8		GHz
Attenuation Range		63		dB
Attenuation Flatness: (Referenced to Insertion Loss)		± 0.5	± 1.0	dB
Control Bits		6		Bit
Control Step size		1		dB
Insertion Loss		5.3	6	dB
Insertion Loss Temperature Coefficient		0.005		dB/ °C
Input VSWR(All Atten. States)		1.4	1.5	: 1
Output VSWR (All Atten. States)		1.4	1.5	: 1
Input Power for 0.1 dB Compression		30		dBm
IP3 Input		40		dBm
Switching Speed		100 Max.		ns
Biasing (+5V/-5V)		130/180 Max.		mA
Weight		0.12Max.		lbs.
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±10%/-5V±10%
RF Input Power	+30dBm

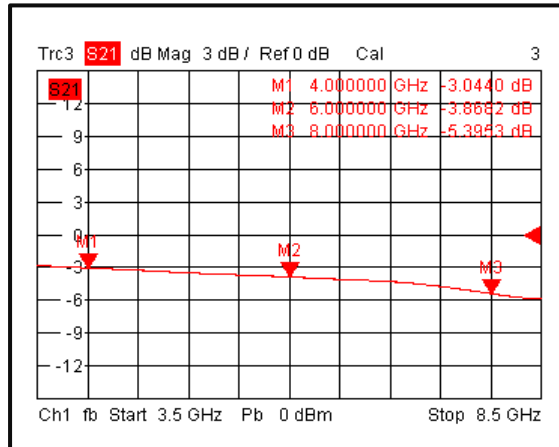
Environmental Specifications and Test Standards

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)

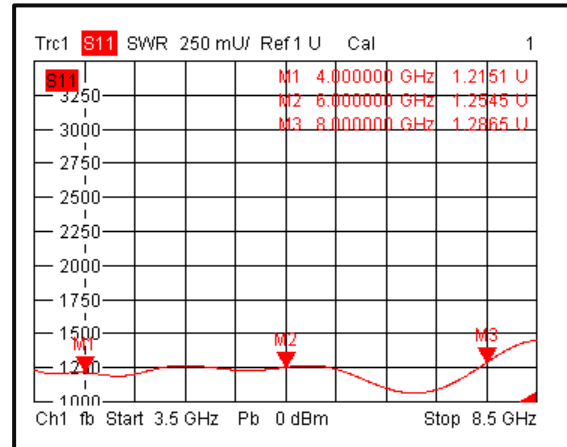
*For vibration testing details please see additional information section.

Typical Performance Plots

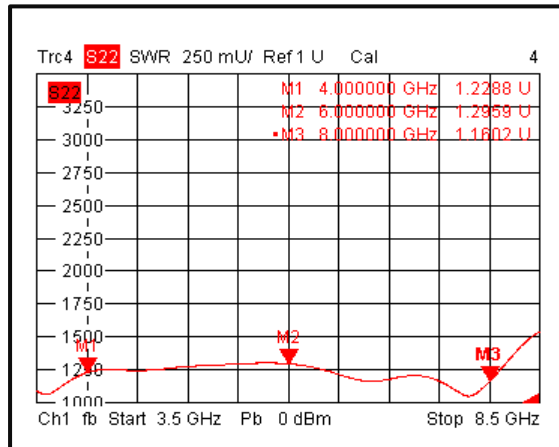
Insertion Loss @+25°C



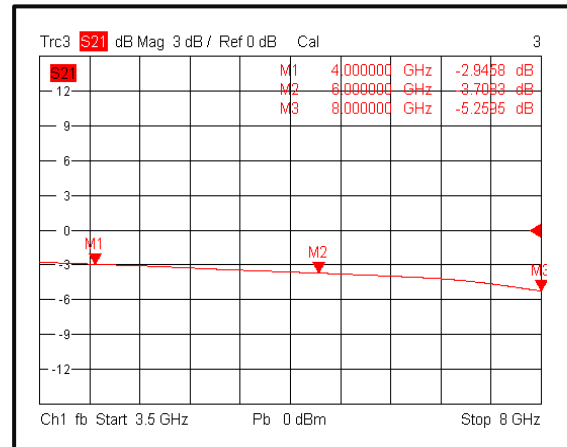
Input VSWR @+25°C



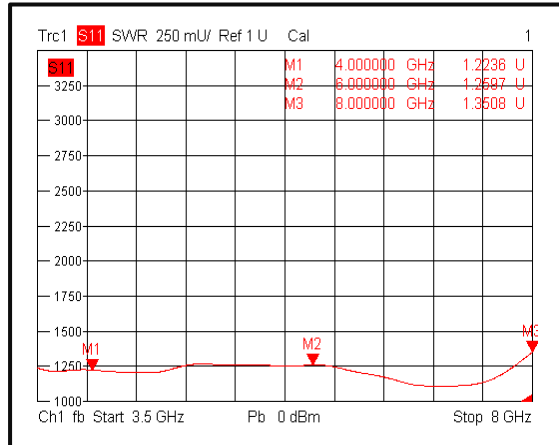
Output VSWR @+25°C



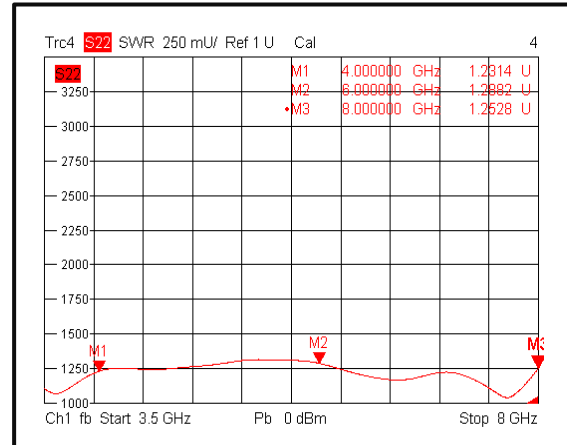
Insertion Loss @-40°C



Input VSWR @-40°C

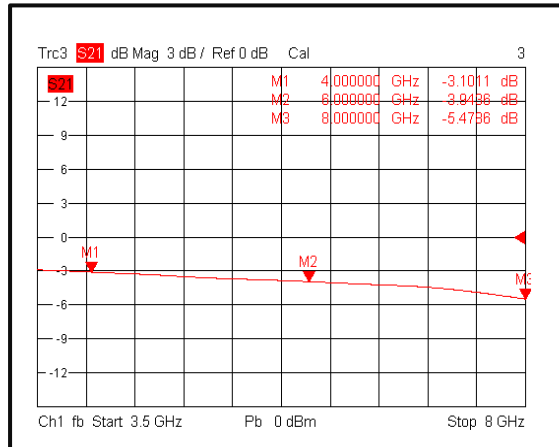


Output VSWR @-40°C

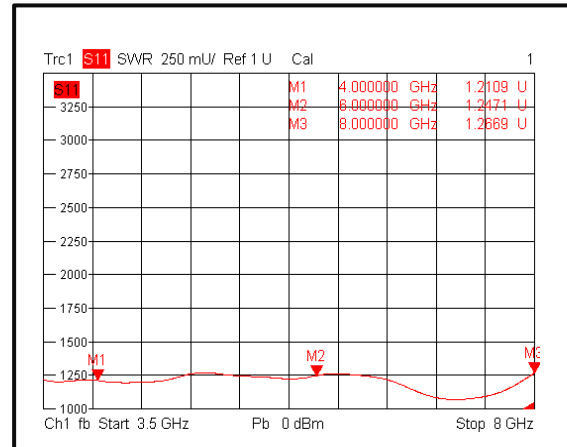


Typical Performance Plots

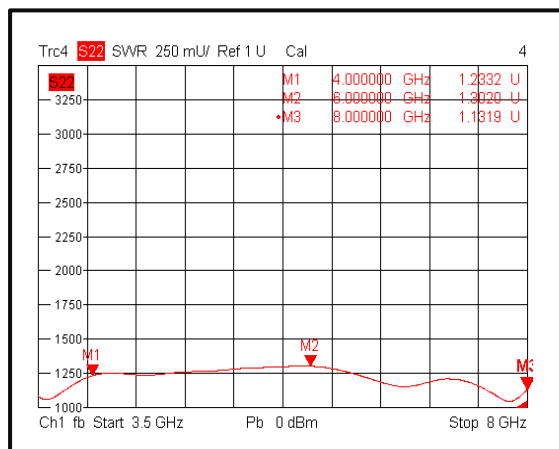
Insertion Loss @+85°C



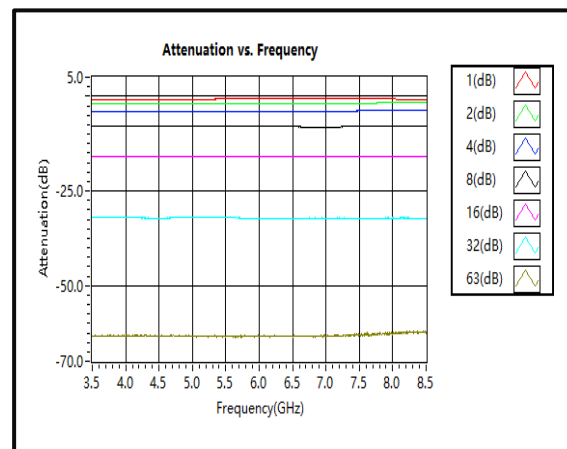
Input VSWR @+85°C



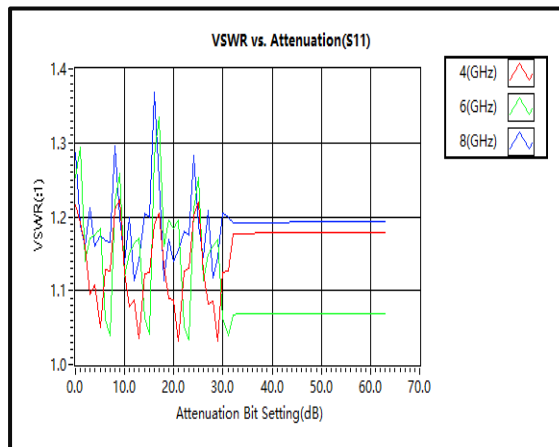
Output VSWR @+85°C



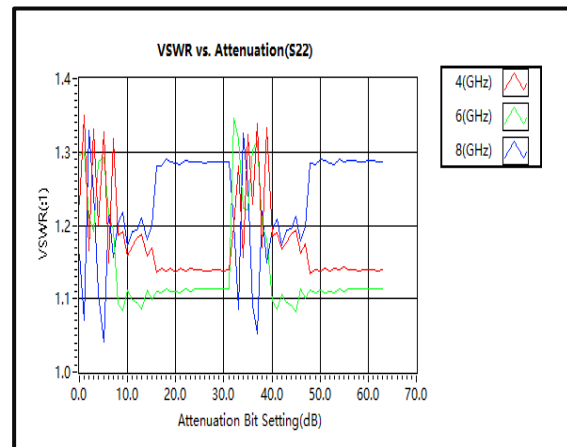
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

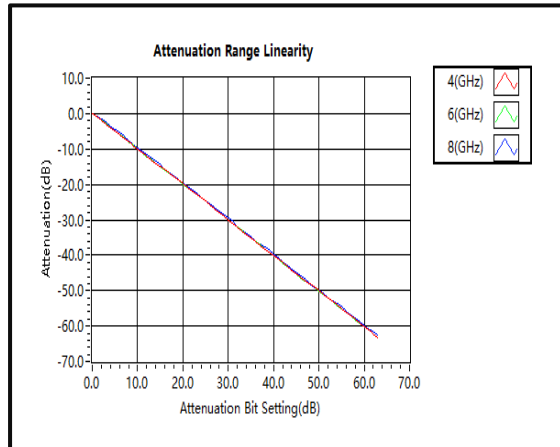


VSWR vs. Attenuation (S22)

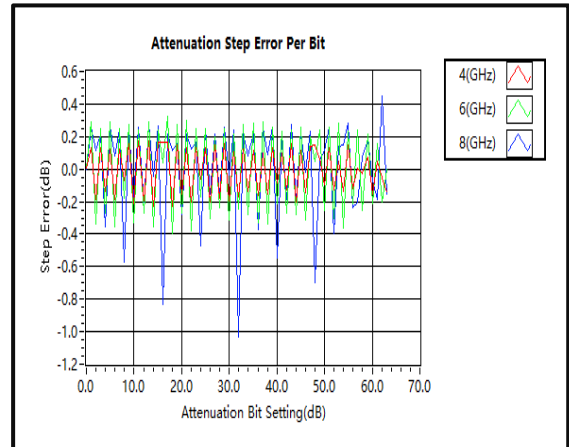


Typical Performance Plots

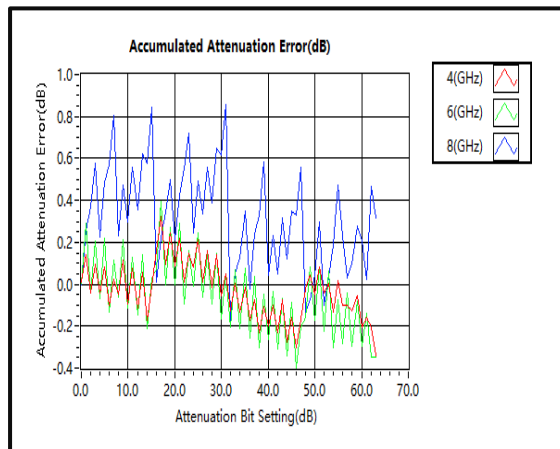
Attenuation Range Linearity



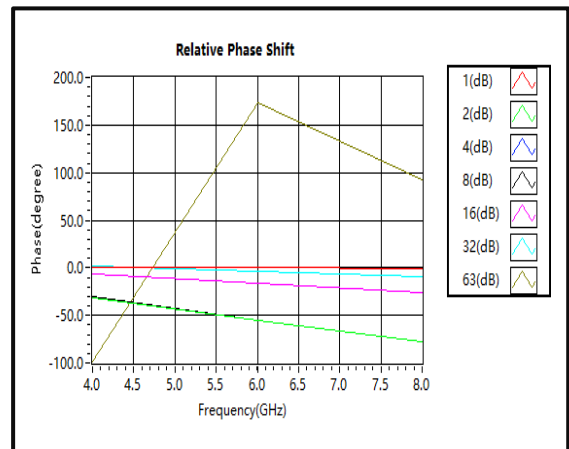
Attenuation Step Error Per Bit (dB)



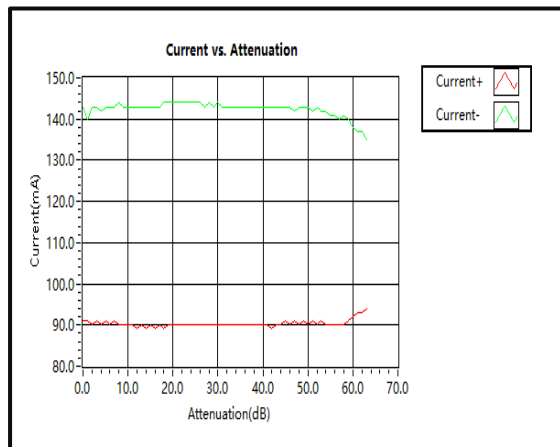
Accumulated Attenuation Error (dB)



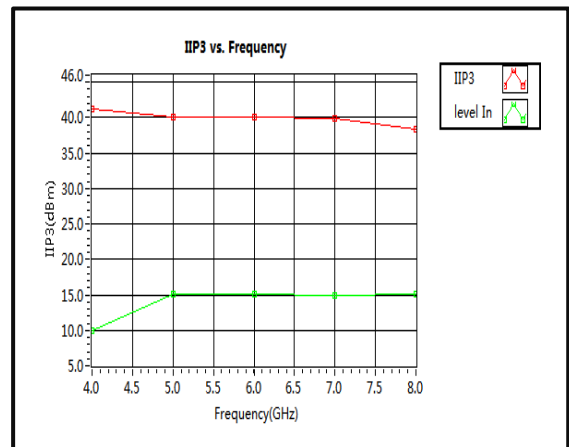
Relative Phase Shift



Current vs. Attenuation

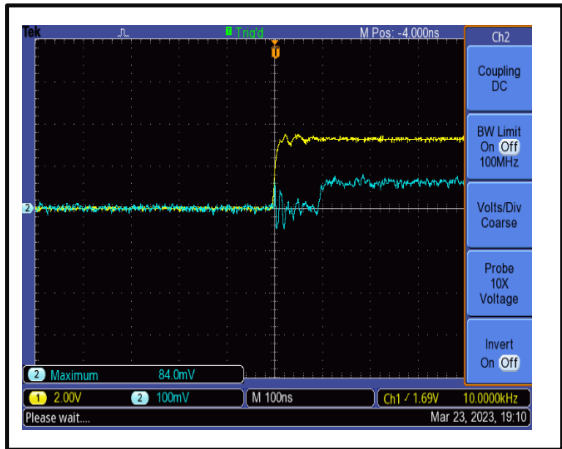


IIP3

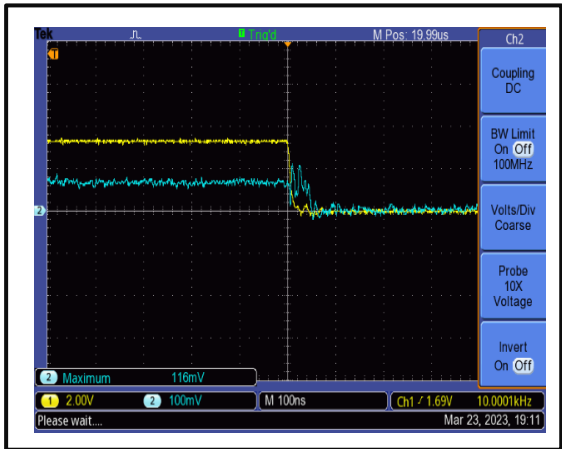


Typical Performance Plots

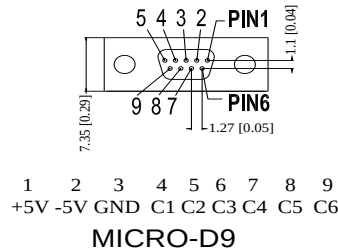
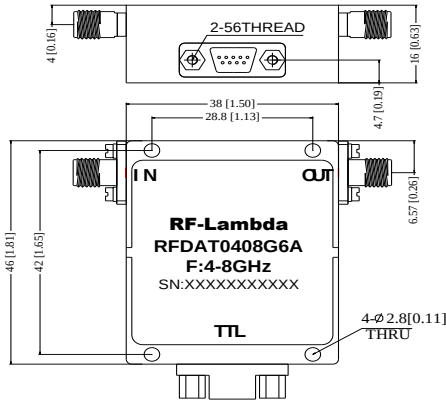
Speed



Speed



Outline Drawing

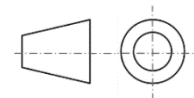


Truth Table

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
1	1	1	1	1	1		1dB
1	1	1	1	1	0		2dB
1	1	1	0	1	1		4dB
1	1	0	1	1	1		8dB
1	0	1	1	1	1		16dB
0	1	1	1	1	1		32dB
0	0	0	0	0	0		63dB

Notes:

1. Package Material: Aluminum
2. Finish: Gold Plated
3. All dimensions are in millimeters [inches].
4. Housing Tolerances ± 0.1 [0.004] unless otherwise specified.
5. Standard torque wrench must be used to secure RF connectors.



Additional Information

Documentation

Webpage

ESD Policy

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

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
RFDAT0408G6A	Standard	4GHz-8GHz Digital Control Attenuator

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