

Absorptive Digital Control Attenuator 2GHz-12GHz



Product Description

RFDAT0212G6A is an absorptive digital control attenuator with a frequency range of 2 to 12GHz.

The power input of this attenuation is 27dBm. The insertion loss is 4.5dB with a typical attenuation range of 65dB.

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

Features

- Absorptive Digital Control Attenuator
- 1dB LSB Steps to 65dB
- 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	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	2		4	4		8	8		12	GHz
Attenuation Range	63	65		63	65		63	65		dB
Attenuation Flatness: (Referenced to Insertion Loss)		± 2.0			± 3.0			± 4.0		dB
Control Bits		6			6			6		Bit
Control Step Size		1			1			1		dB
Insertion Loss		4.5	5		4.5	5.8		5.5	7	dB
Insertion Loss Temperature Coefficient		0.005			0.005			0.005		dB/ °C
Input VSWR (All States)		1.7	2.2		1.6	2.2		1.5	1.8	: 1
Output VSWR (All States)		1.7	2.2		1.6	2.2		1.5	1.8	: 1
Input 0.1 dB Compression Point (P0.1dB)		27			27			27		dBm
Input IP3		38			38			38		dBm
Switching Speed					1.0 Typ.					us
Bias Current (+5V/-5V)					50/50 Max.					mA
Weight					0.05 Max.					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	+27dBm

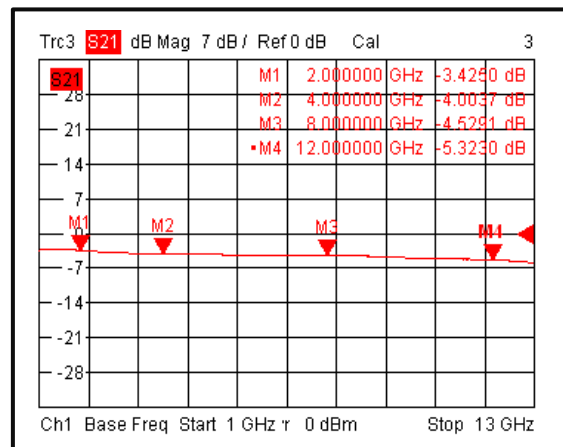
Environmental Specifications and Test Standards

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)

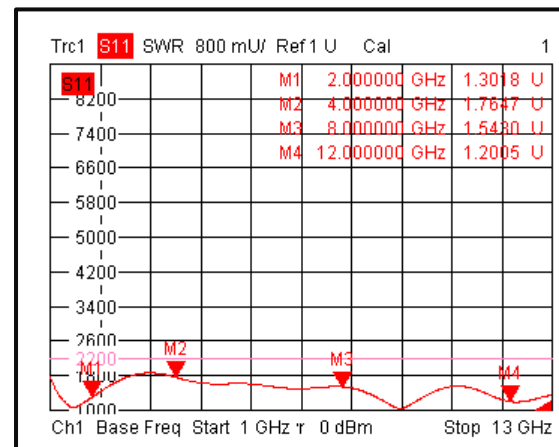
*For vibration testing details please see additional information section.

Typical Performance Plots

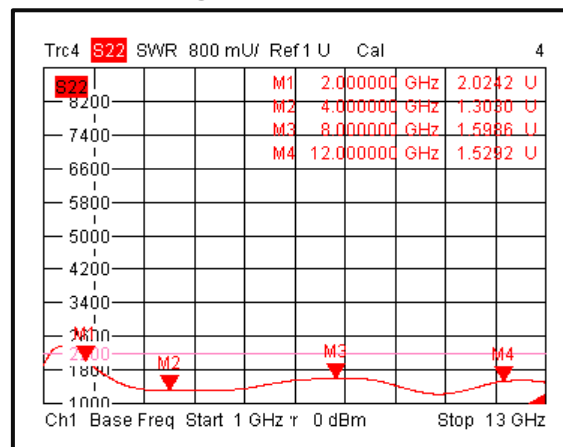
Insertion Loss @+25°C



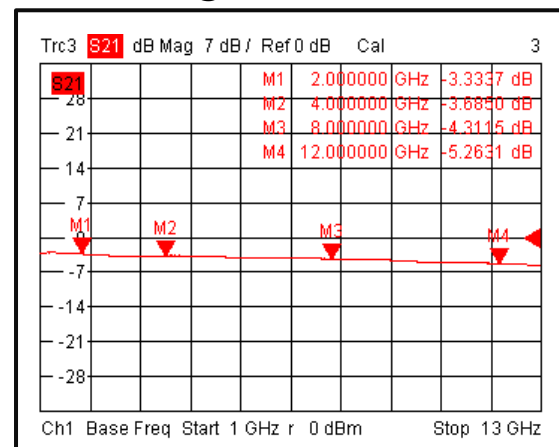
Input VSWR @+25°C



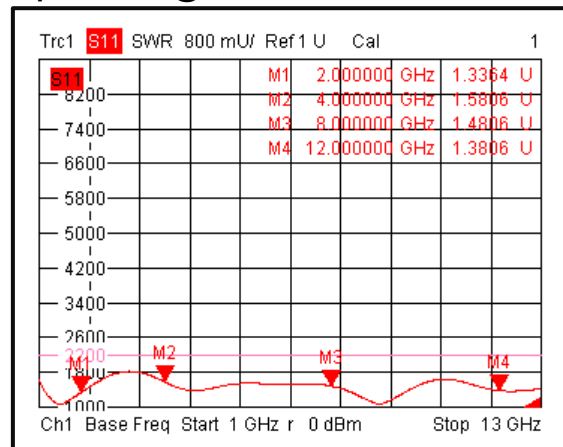
Output VSWR @+25°C



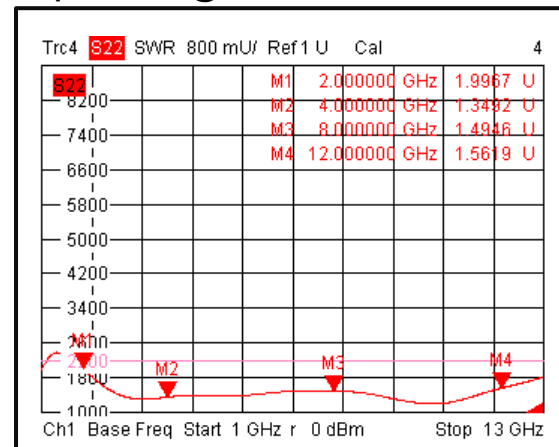
Insertion Loss @-40°C



Input VSWR @-40°C

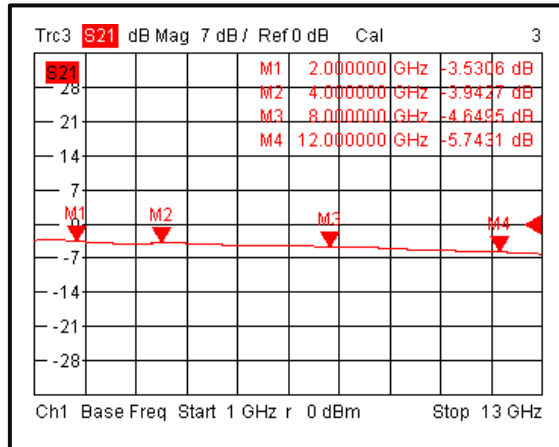


Output VSWR @-40°C

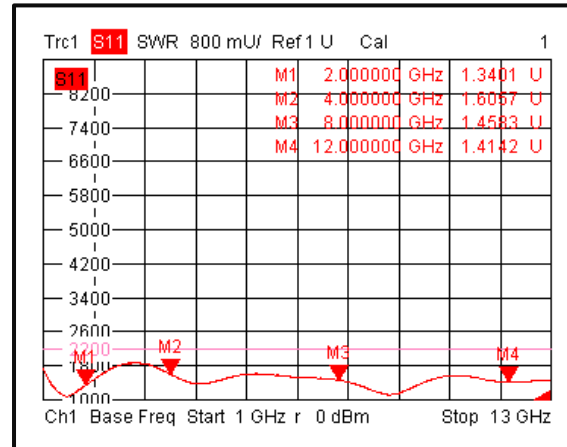


Typical Performance Plots

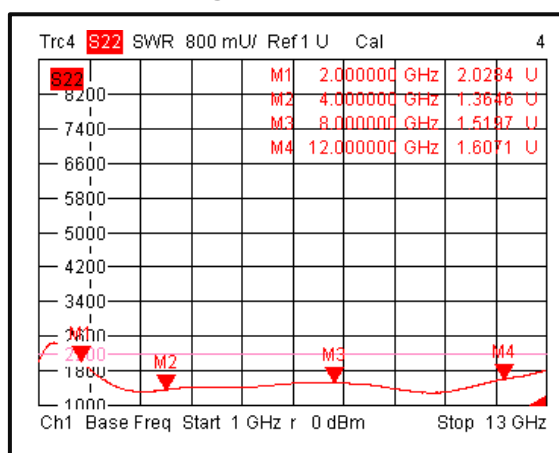
Insertion Loss @+85°C



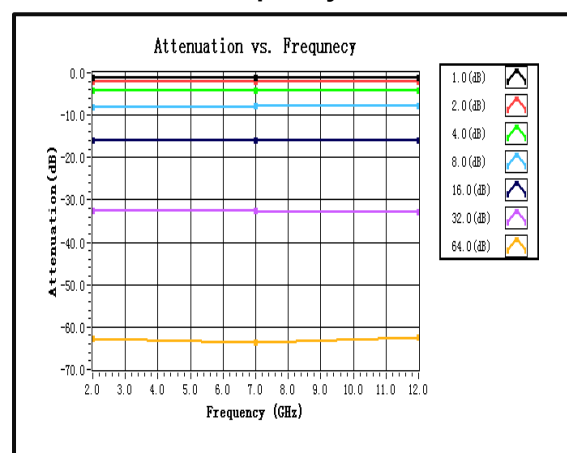
Input VSWR @+85°C



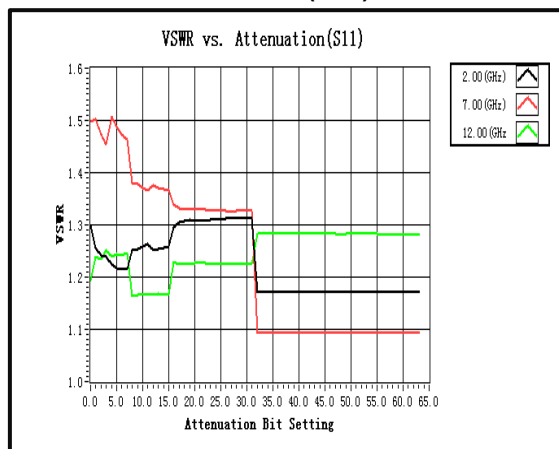
Output VSWR @+85°C



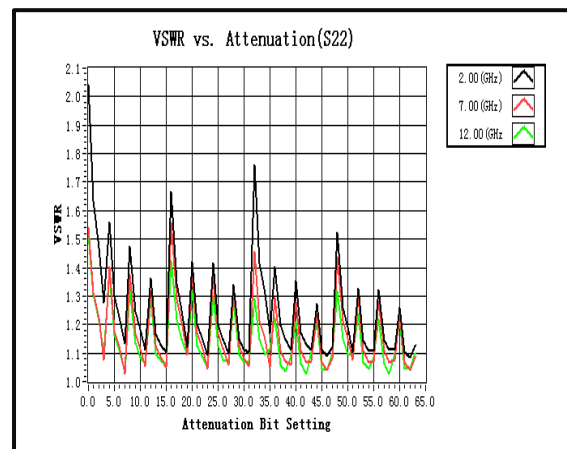
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

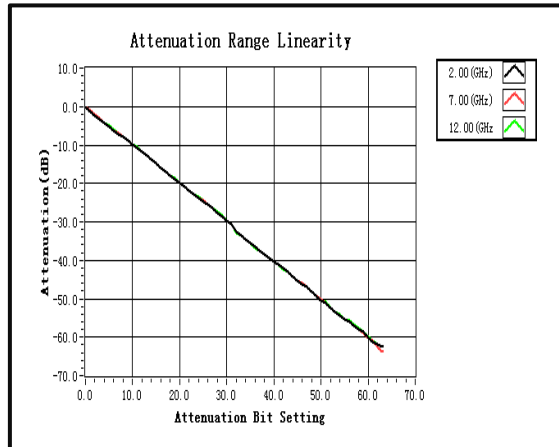


VSWR vs. Attenuation (S22)

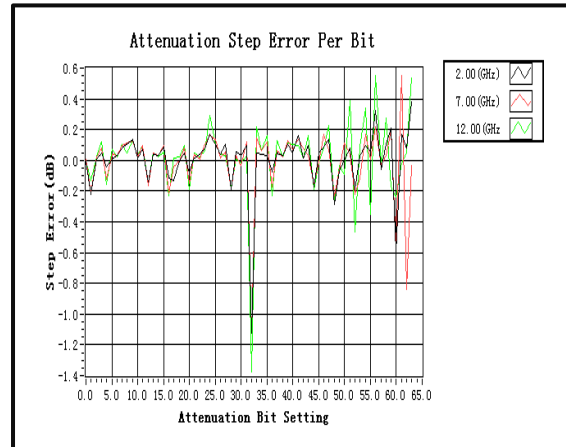


Typical Performance Plots

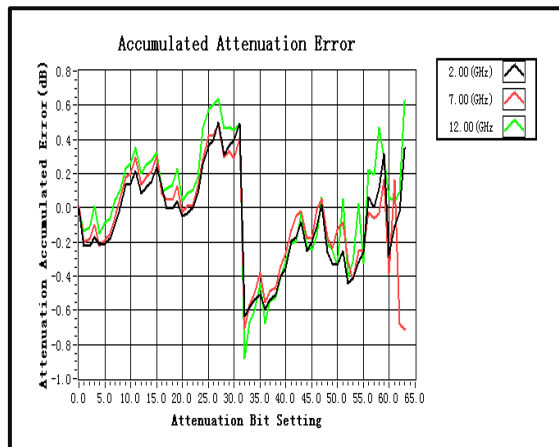
Attenuation Range Linearity



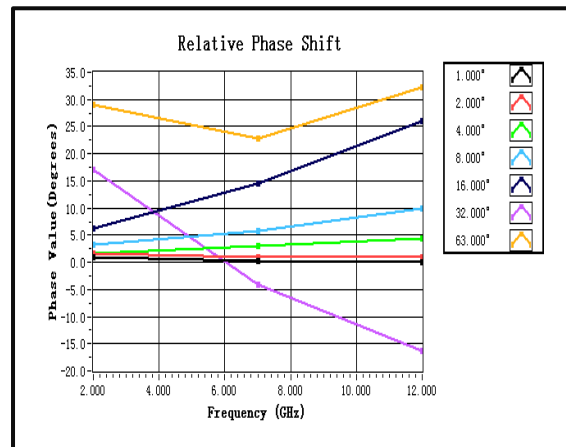
Attenuation Step Error Per Bit (dB)



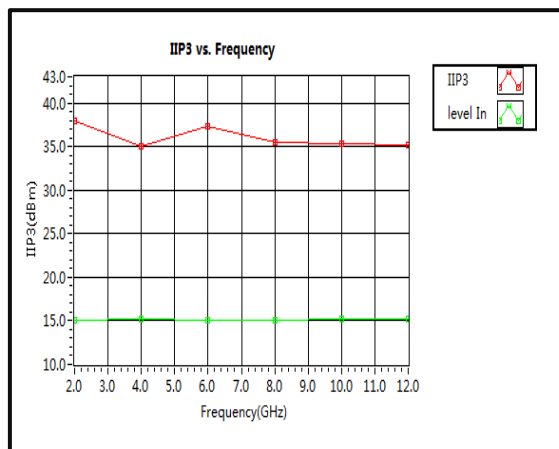
Accumulated Attenuation Error (dB)



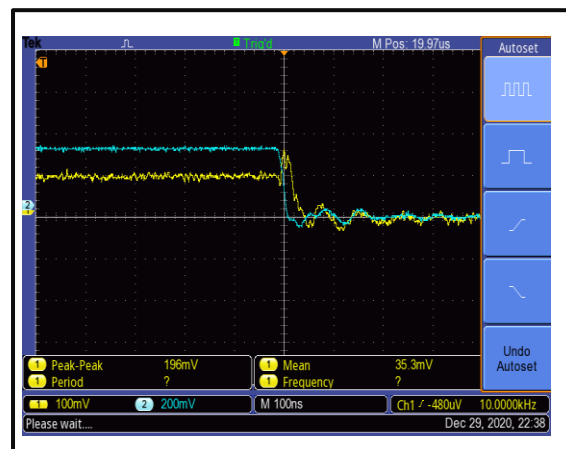
Relative Phase Shift



IIP3

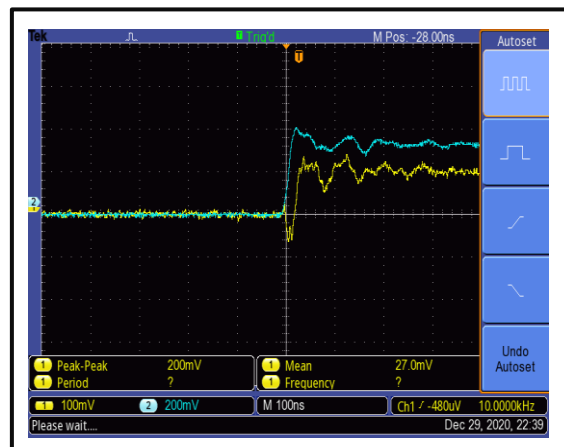


Speed

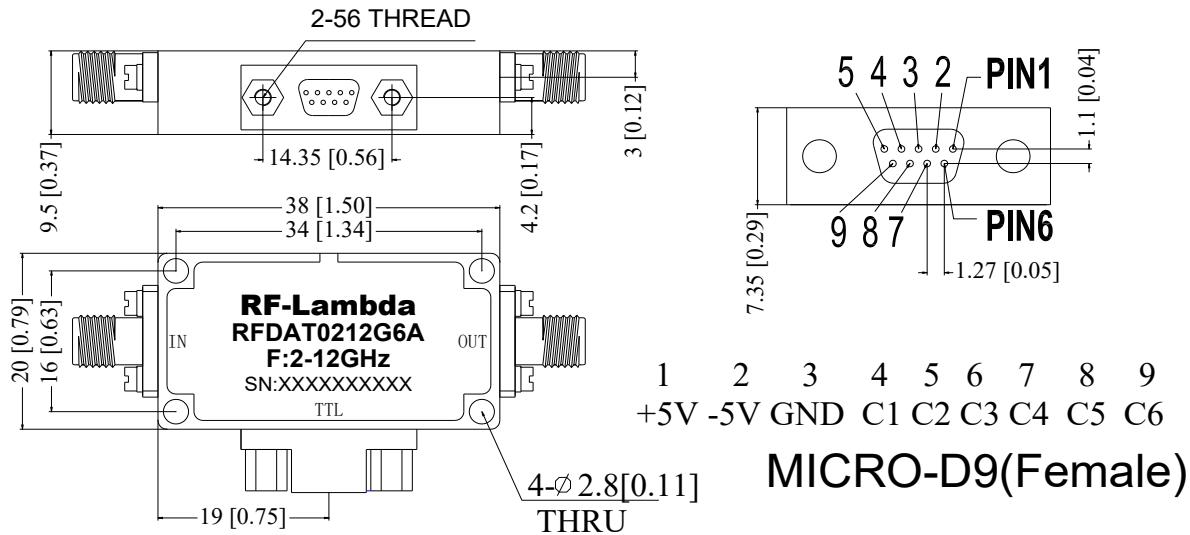


Typical Performance Plots

Speed



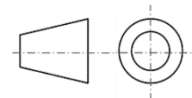
Outline Drawing



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
1	1	1	1	1	1	Reference IL
1	1	1	1	1	0	1dB
1	1	1	1	0	1	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.



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
RFDAT0212G6A	Standard	2GHz-12GHz Digital Control Attenuator

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