

Reflective Digital Control Attenuator 8GHz-12GHz



Product Description

RFDAT0812G6R is a reflective digital control attenuator with a frequency range of 8 to 12GHz.

The power input of this attenuation is 30dBm typical. The insertion loss is 1.5dB with a typical attenuation range of 63dB.

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

Features

- Reflective 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 ($T_A = +25^\circ\text{C}$), $V_{dd} = +12\text{V}$ & $V_{CTL} = 0 / +5\text{V}$

Parameter	Min	Typ	Max	Units
Frequency Range	8		12	GHz
Attenuation Range			63	dB
Attenuation Flatness (Referenced to Insertion Loss)		± 2		dB
Control Bits			6	Bit
Control Step Size	1			dB
Insertion Loss		1.5	2	dB
Insertion Loss Temperature Coefficient		0.005		dB/ °C
Input VSWR		1.5	2.0	: 1
Output VSWR		1.5	2.0	: 1
Input 0.1dB Compression Point (P0.1dB)		30		dBm
IP3 Input		48		dBm
Switching Speed		800Typ.		us
Bias Current (+12V)		80 Max.		mA
Weight		0.08 Max.		lbs.
Impedance		50		Ohms
Input / Output Connectors	SMA-Female (Input) – SMA-Female (Output)			
Interface and Control Connector	MICRO-D15 (Female)			
Package	Epoxy Sealed (Standard)			
	Hermetically Sealed (Optional)			

Absolute Maximum Ratings

Parameter	Rating
Biasing Voltage	+15V
RF Input Power	+30dBm

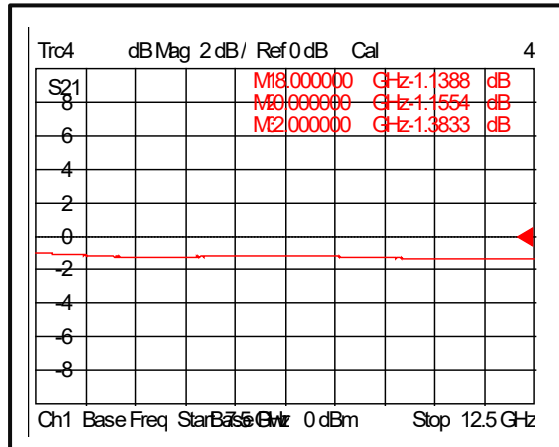
Environmental Specifications and Test Standards

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)

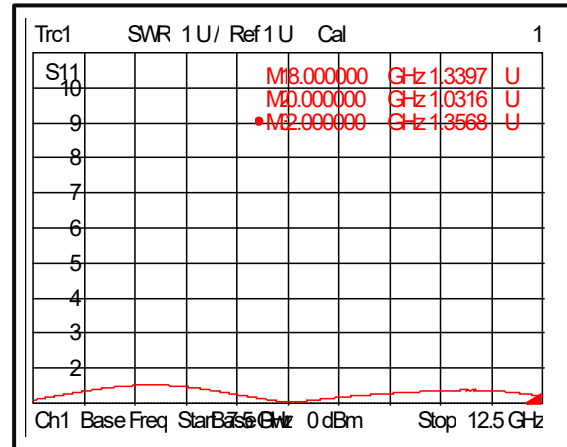
**For vibration testing details please see additional information section.

Typical Performance Plots

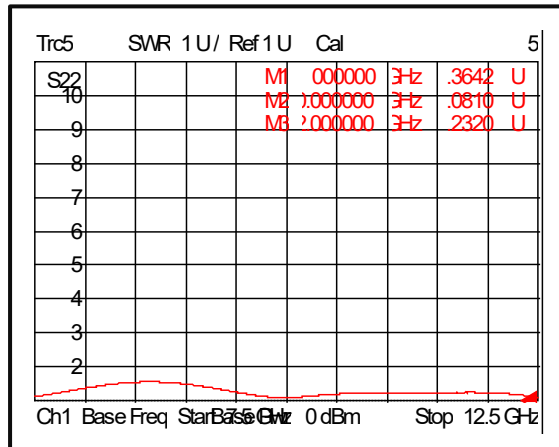
Insertion Loss @+25°C



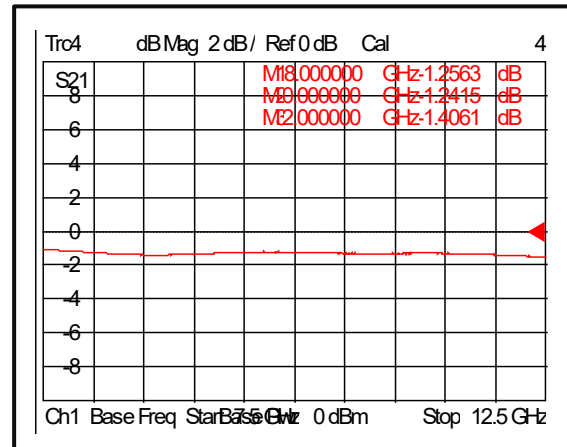
Input VSWR @+25°C



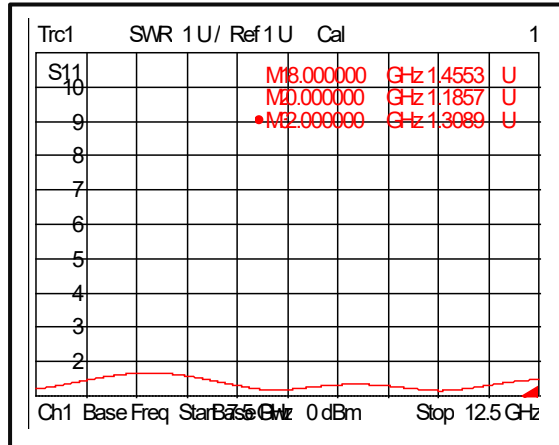
Output VSWR @+25°C



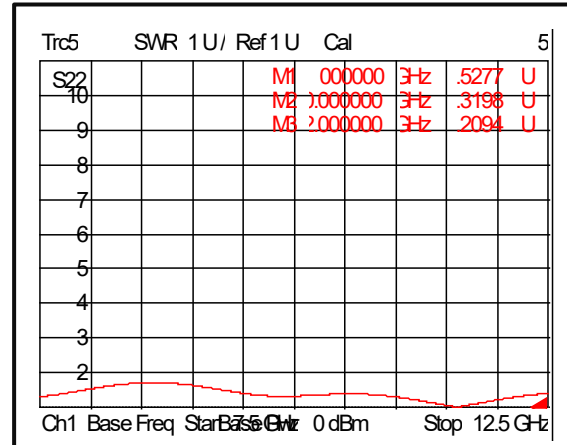
Insertion Loss @-40°C



Input VSWR @-40°C

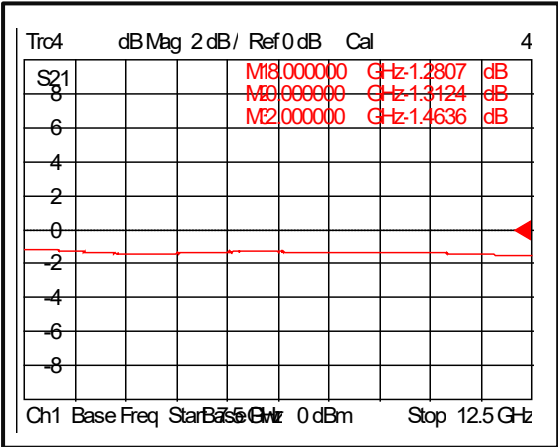


Output VSWR @-40°C

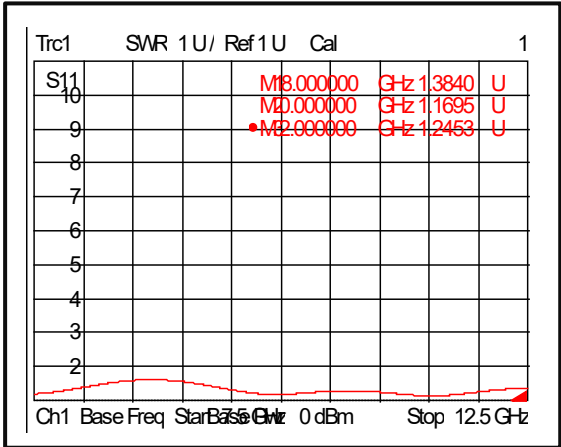


Typical Performance Plots

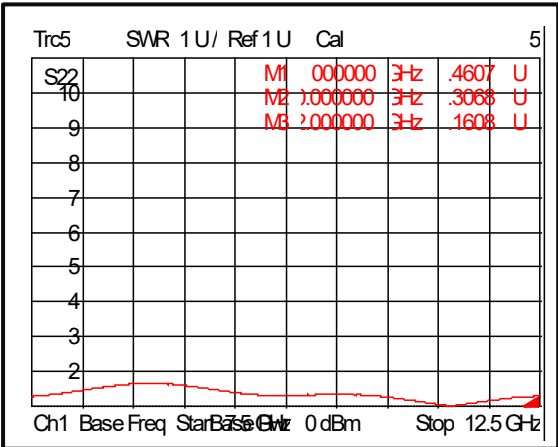
Insertion Loss @+85°C



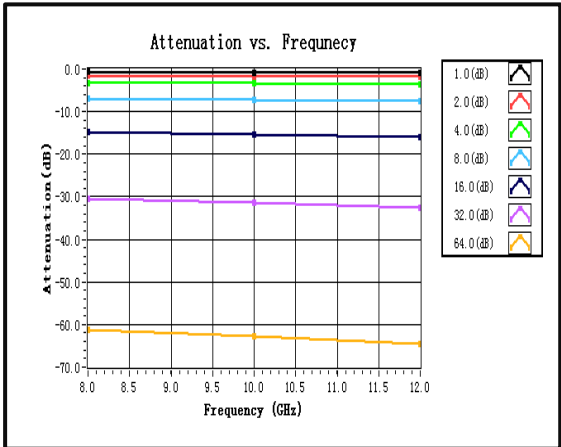
Input VSWR @+85°C



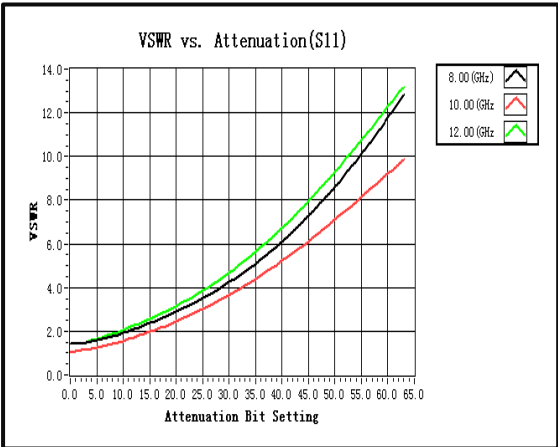
Output VSWR @+85°C



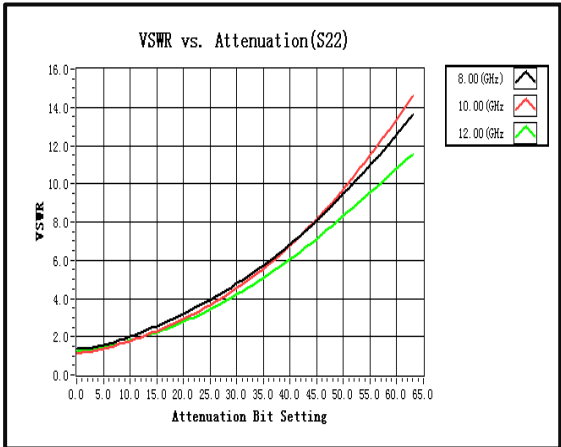
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

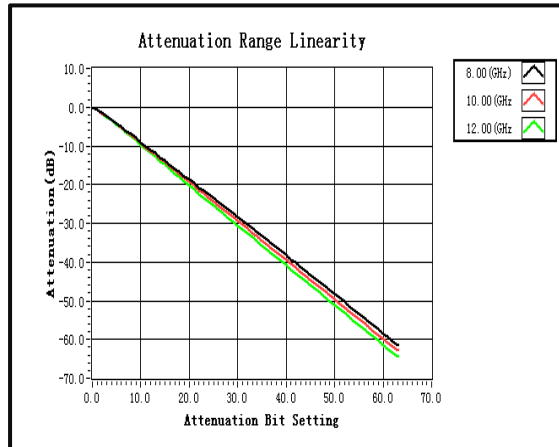


VSWR vs. Attenuation (S22)

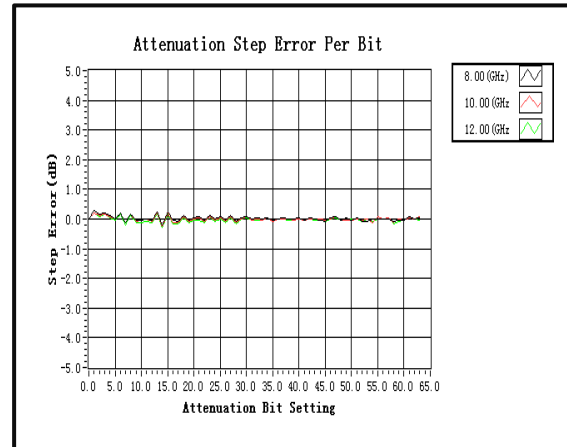


Typical Performance Plots

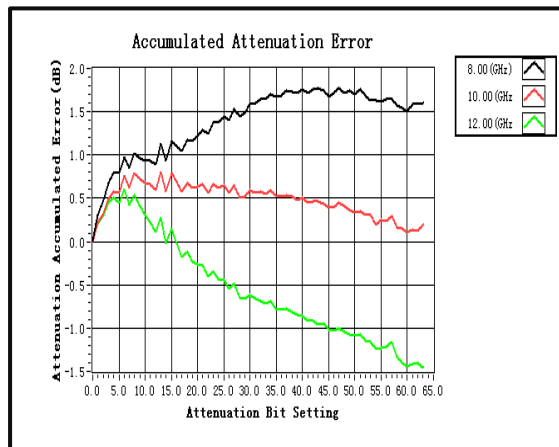
Attenuation Range Linearity



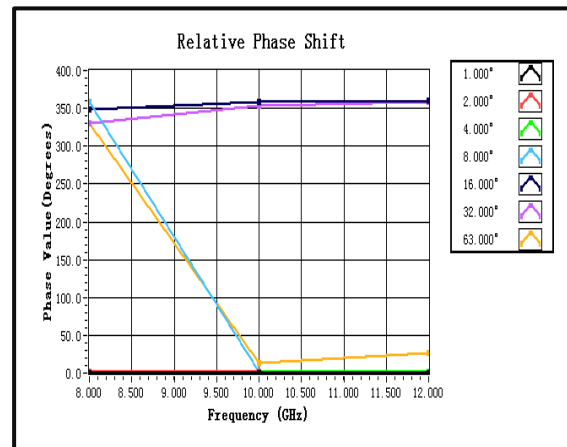
Attenuation Step Error Per Bit (dB)



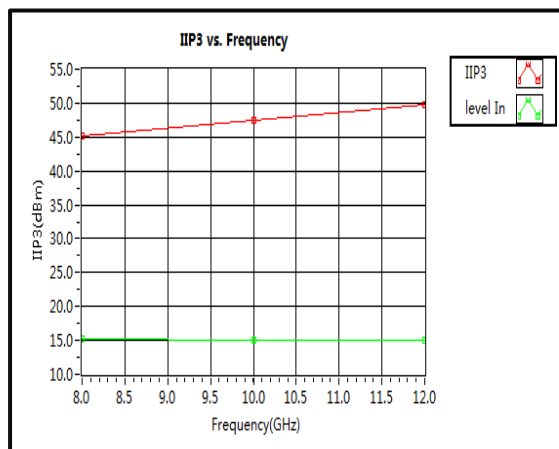
Accumulated Attenuation Error (dB)



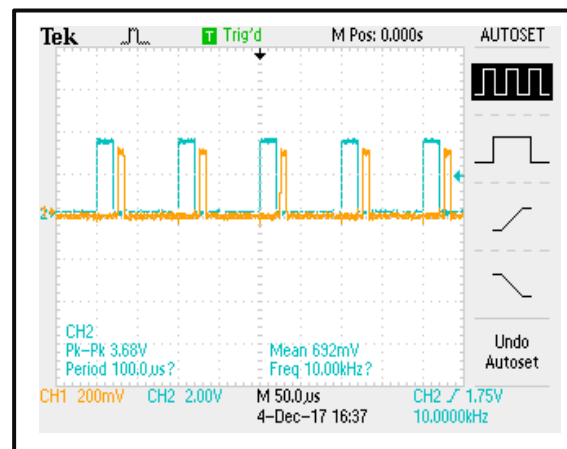
Relative Phase Shift



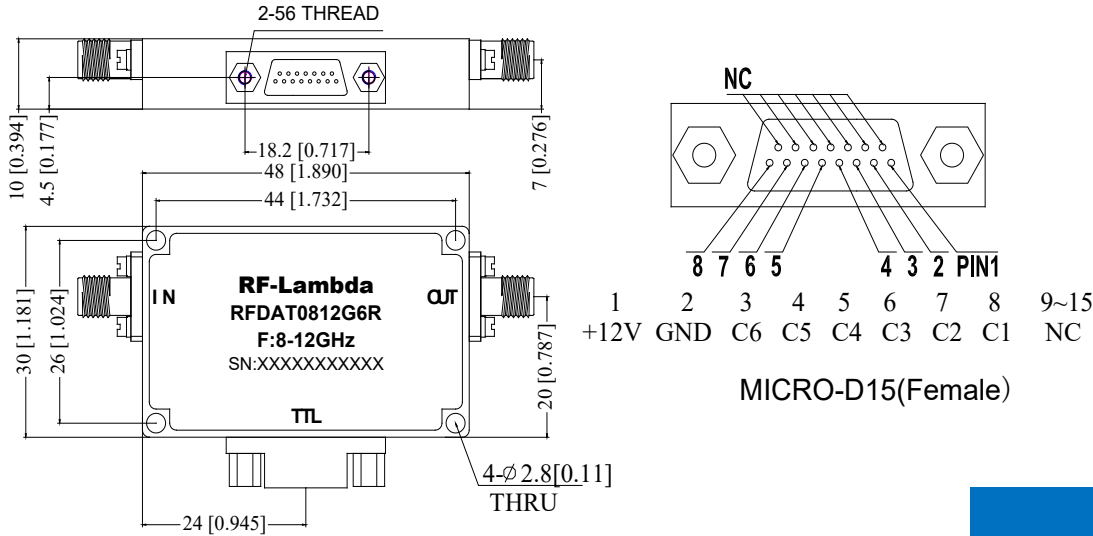
IIP3



Speed



Outline Drawing

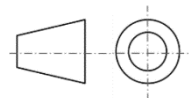


Truth Table

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		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
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
RFDAT0812G6R	Standard	8-12GHz Digital Control Attenuator

Important Notice

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