

USB / Ethernet Absorptive Digital Control Attenuator 0.5GHz-6GHz



Product Description

RFDAT0102G9AUSB is an absorptive USB / Ethernet digital control attenuator with a frequency range of 0.5 to 6GHz.

The power input of this attenuator is 30dBm typical. The insertion loss is 2.0 dB with a typical attenuation range of 31.875dB.

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

Features

- USB Controlled and Powered
- 0.125dB LSB Steps to 31.875dB

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 ($T_A=+25^{\circ}\text{C}$)

Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		1-2			0.5-6		GHz
Attenuation Range		31.875			31.875		dB
Insertion Loss		2.0	2.5		4.0	4.5	dB
Insertion Loss Temperature Coefficient		0.01			0.01		dB/ °C
Attenuation Flatness: (Referenced to Insertion Loss)		±1.0			±1.5		dB
Control Bits			8				Bit
Control Step Size		0.125			0.125		dB
Input VSWR (All Atten. States)		1.4	1.8		1.5	2.0	: 1
Output VSWR (All Atten. States)		1.4	1.8		1.5	2.0	: 1
Input 0.1 dB Compression Point (P0.1dB)		27			27		dBm
RF Input Power			30			30	dBm
Input IP3		42			41		dBm
Bias Current			300				mA
Power Supply					USB(+5.0V)		
Weight			0.3 Max.				lbs.
Impedance			50				Ohms
Input / Output Connectors			SMA-Female (Input) – SMA-Female (Output)				
Control Interface			USB2.0 & Ethernet(IPv4) (Control Cable Included)				
Package			Epoxy Sealed (Standard)				
			Hermetically Sealed (Optional)				

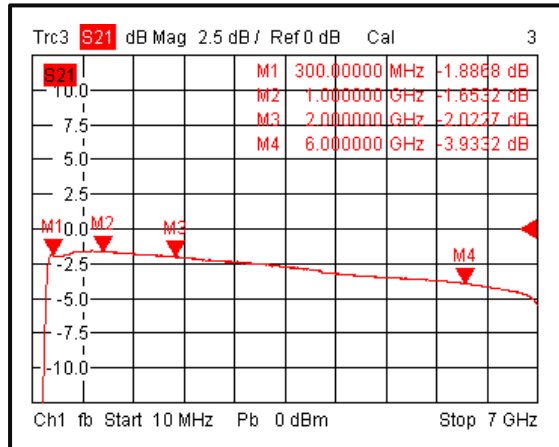
Environmental Specifications and Test Standards

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)

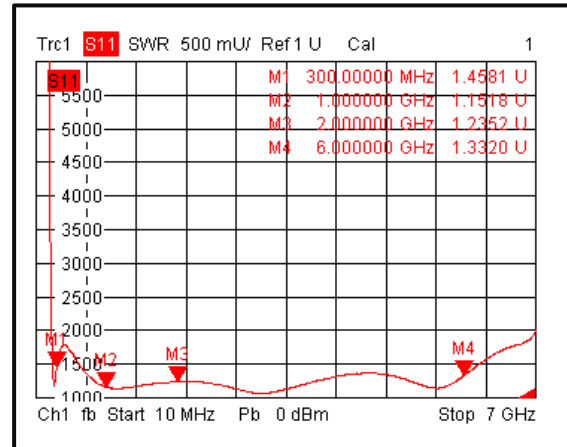
*For vibration testing details please see additional information section.

Typical Performance Plots

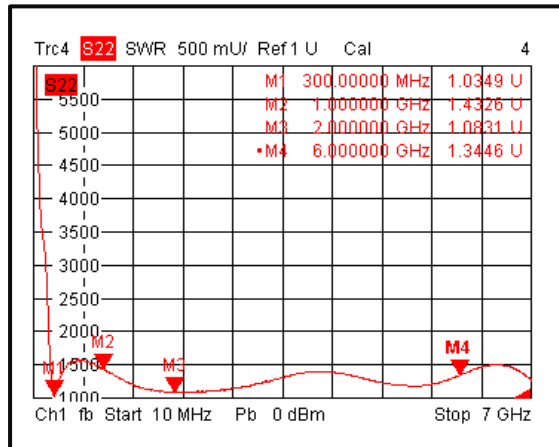
Insertion Loss @+25°C



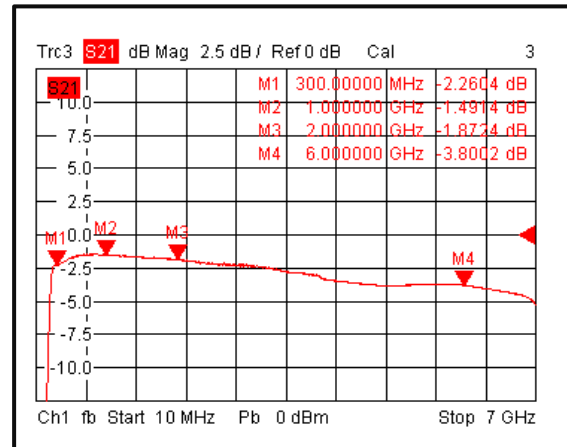
Input VSWR @+25°C



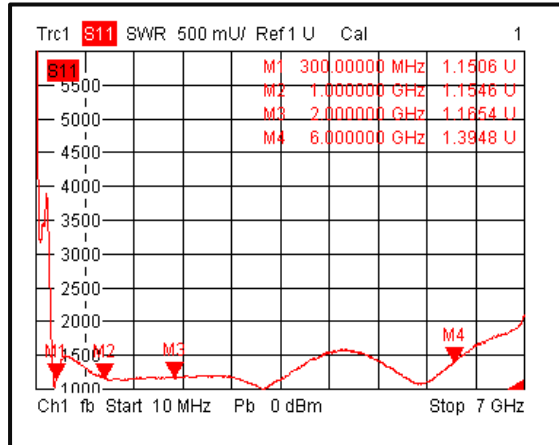
Output VSWR @+25°C



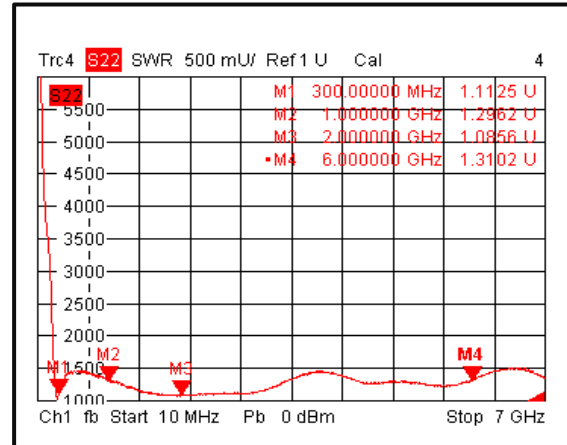
Insertion Loss @-40°C



Input VSWR @-40°C

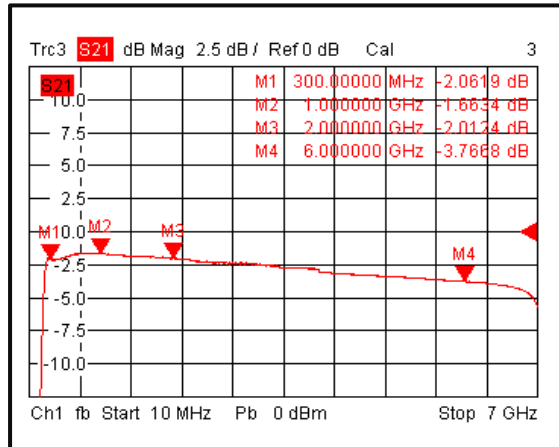


Output VSWR @-40°C

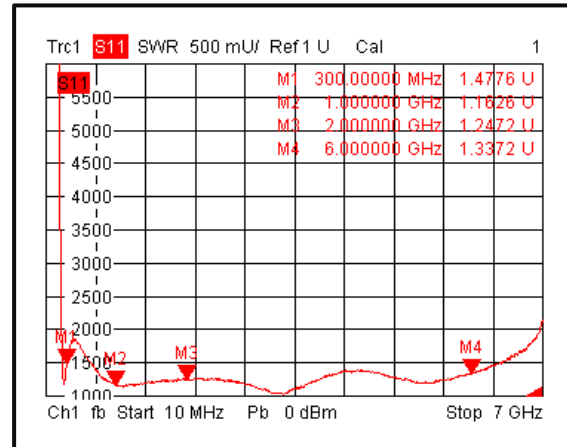


Typical Performance Plots

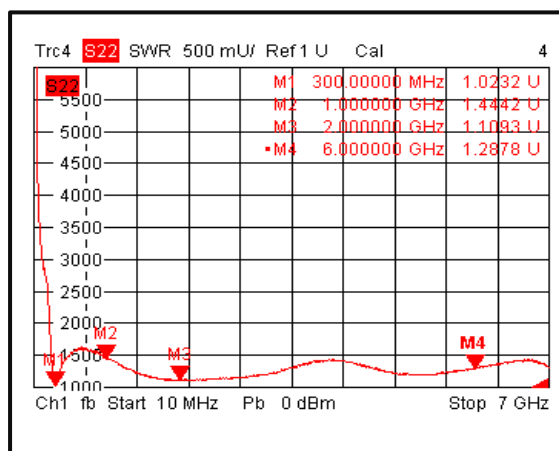
Insertion Loss @+85°C



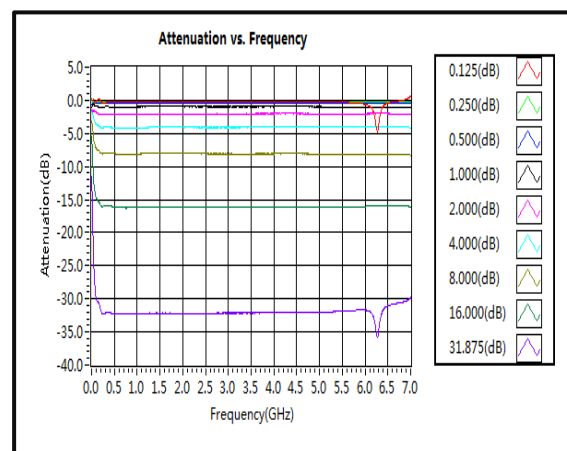
Input VSWR @+85°C



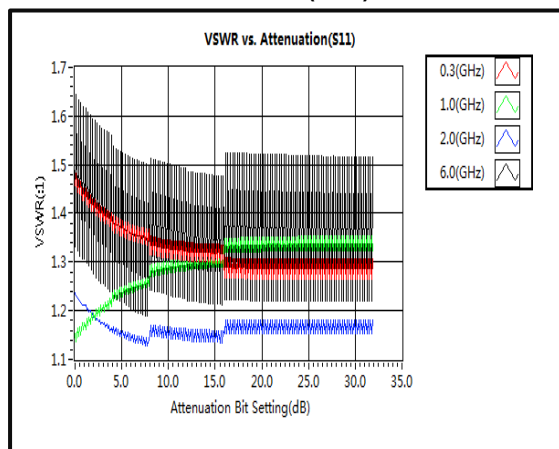
Output VSWR @+85°C



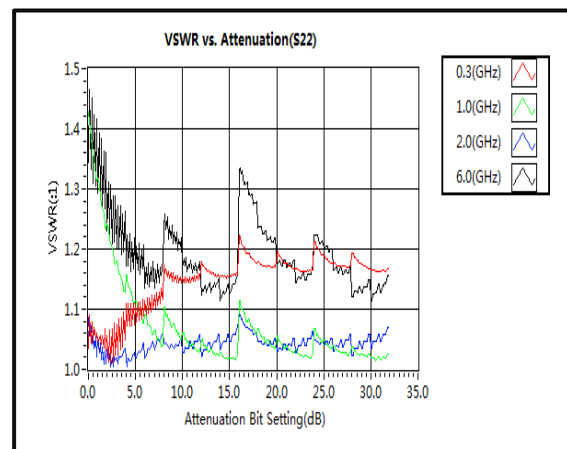
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

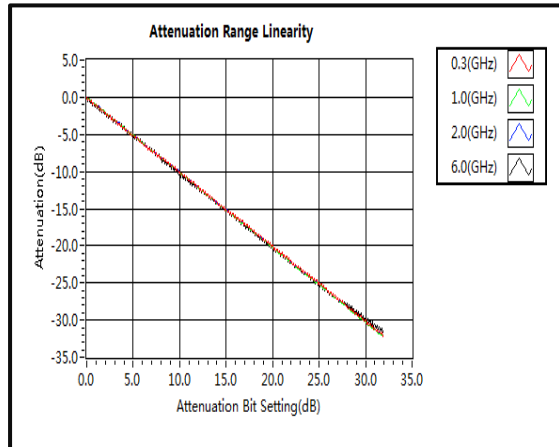


VSWR vs. Attenuation (S22)

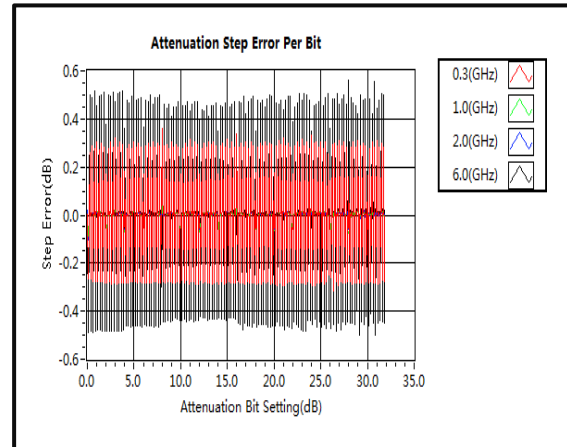


Typical Performance Plots

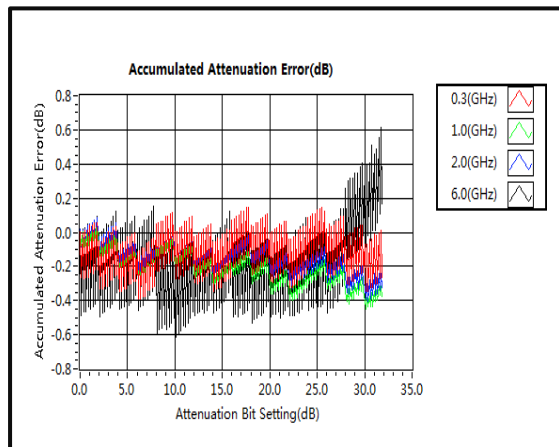
Attenuation Range Linearity



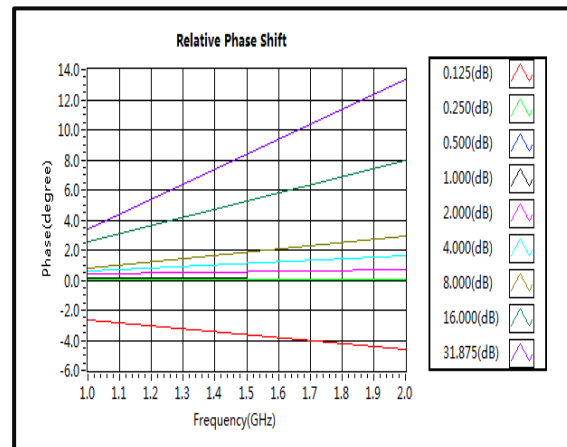
Attenuation Step Error Per Bit (dB)



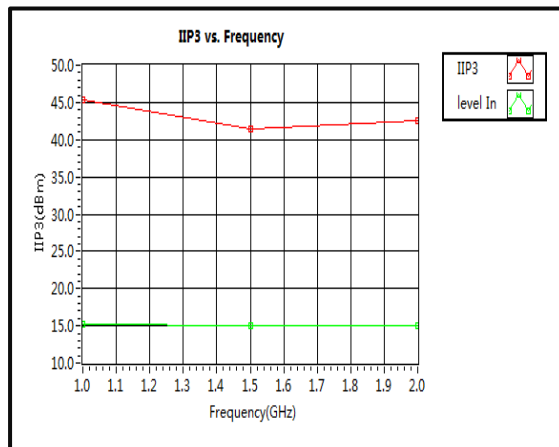
Accumulated Attenuation Error (dB)



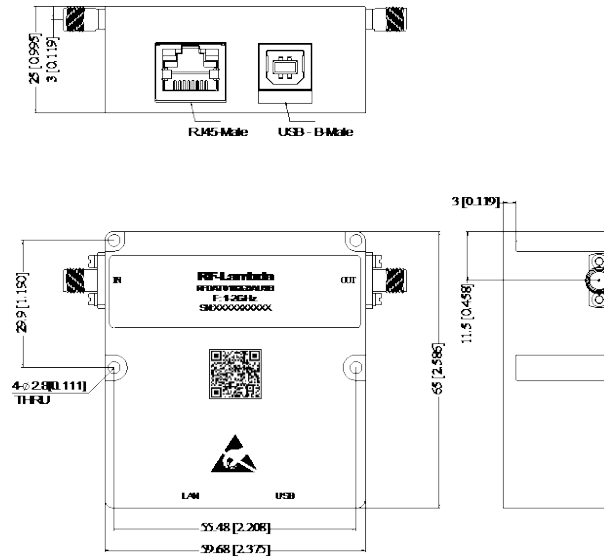
Relative Phase Shift



IIP3

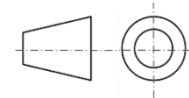


Outline Drawing



Notes:

1. Package Material: Aluminum
2. Plating: Nickel
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.



Packing List

ID	Description	QTY
1	Fig a. USB/Ethernet Control RF Attenuator	1
2	Fig b. USB2.0 Cable (5 feet / 1.5 meter)	1
3	Fig c. Network Cable (6 feet / 2 meter)	1



Fig b.



Fig c.

Control Content Description

Format Requirement	USB (virtual serial port) Configuration	LAN Interface	Range of Parameters
a.All commands must end with a semicolon. b.All commands are case insensitive. c.Comma is used to separate multiple parameters in commands. d.All commands are suitable for USB(virtual serial port) and LAN interface.	Baud Rate :115200 Data bits : 8 Parity : None Stop bits : 1 Flow Type :None	IP address and Port. Default:192.168.1.225:5100; use 'USB Control panel.exe' to update.	x(Step): 1~2^n ,n is control bits.

Command Specification

ID	Order	Description	Return	Example
1	*IDN?;	Query product information	Product PN ,SN, Manufacturer ,version	*IDN?;
2	Reset;	Reset the product	/	Reset;
3	AT:ATT x;	Set attenuation step	Attenuation value	AT:ATT 2; Return : 2*step size
4	AT:ATT?;	Query current attenuation value	Attenuation step, attenuation value	AT:ATT? Return :2, 2*step size
5	AT:ATTS?	Query attenuation step size	Attenuation step size	AT:ATTS? Return : step size

Error Code Query

ID	Return	Description
1	E1	Missing semicolon
2	E2	Incorrect command
3	E3	Missing space character
4	E4	Out of range parameters

USB Control Panel

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Select Device

Digital Control Switch ☐

Digital Control Attenuator ☒

Digital Control Phase Shifter ☐

Control Interface ☒ USB 1
☐ ETHERNET

Please select a COM port COM60 2

Connect Device 3

The device number is: 20040700161
Device IP: 192.168.1.235:5100

Note

1. Please refer to the product manual for power supply.
2. Please refer to the product manual to configure the port.

2020.03 v2.01

USB Control Panel

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<< Goback

Control Bits 6 Attenuation Step(dB) 1

Select the Attenuation Value(dB) 63

OFF

Device Name: Digital Control Attenuator

Part Number: RFDAT0102G6AUSB

Serials Number: 20032600365

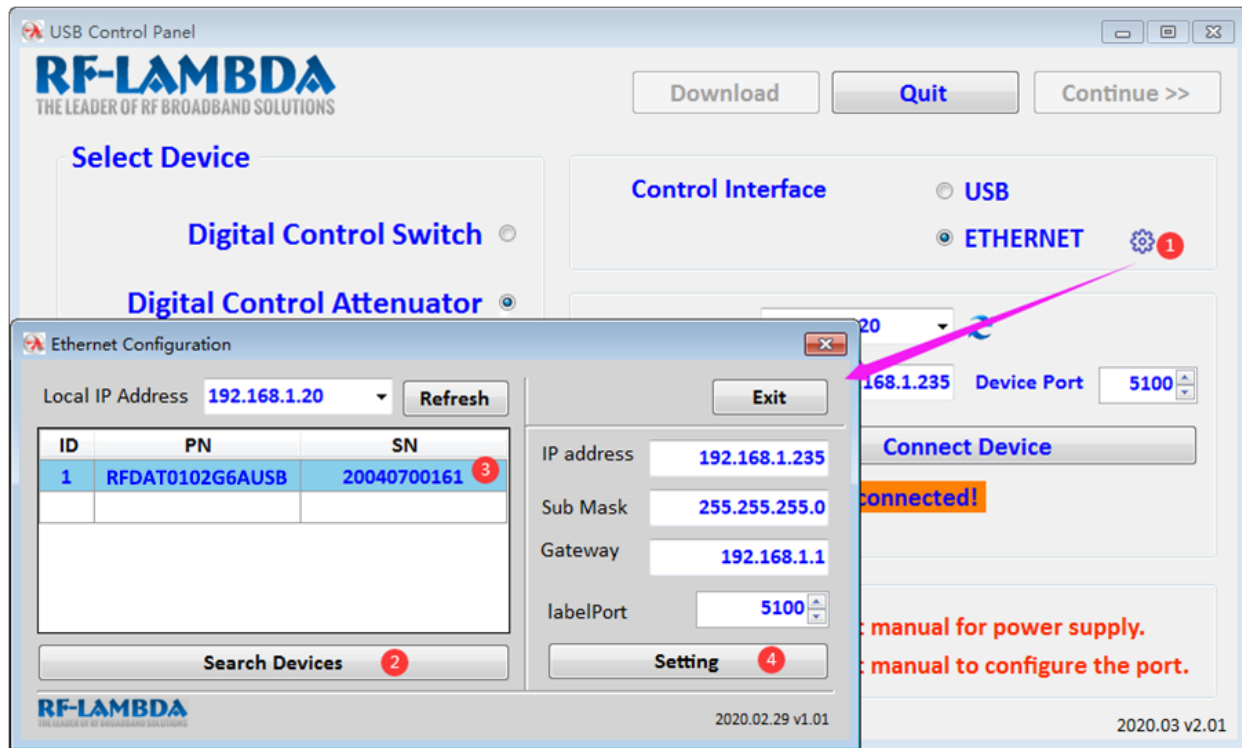
Control Model: USB

Control Port: COM6

Send String AT:ATT 63;

Recevie String 63.000

2020.03.02 v1.01



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
RFDAT0102G9AUSB	Standard	1-2GHz Digital Control Attenuator

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