

USB / Ethernet Absorptive Digital Control Attenuator 0.1GHz-8GHz



Features

- Ultra Wide Band Operation 0.1-8GHz
- USB Controlled and Powered
- 0.5dB LSB Steps to 127.5dB

Product Description

RFDAT0106G8AUSB is a USB / Ethernet Absorptive digital control attenuator with a frequency range of 0.1 to 8GHz.

The maximum power input of this attenuation is 23dBm. The insertion loss is 7.5dB with a typical attenuation range of 127.5dB.

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

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, TA = +25°C

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		0.1~0.5			0.5~2.5			2.5~8		GHz
Attenuation Range		120			127.5			127.5		dB
Insertion Loss		5.5	6.5		6.0	7.5		8.5	10	dB
Insertion Loss Temperature Coefficient		0.01			0.01			0.01		dB/ °C
Attenuation Flatness: (Referenced to Insertion Loss)		±5.0			±4.0			±5.0		dB
Control Bits					8					Bit
Control Step Size		0.5			0.5			0.5		dB
Input VSWR (All Atten. States)		1.5	2.0		1.4	1.8		1.5	1.8	: 1
Output VSWR (All Atten. States)		1.5	2.0		1.4	1.8		1.5	1.8	: 1
Input 0.1 dB Compression Point (P0.1dB)		20			21			21		dBm
RF Input Power			23			23			23	dBm
Input IP3		43			45			45		dBm
Weight					0.29 Max.					lbs.
Impedance					50					Ω
Bias Current					210 Max.					mA
Power Supply					USB(+5.0V)					
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)					

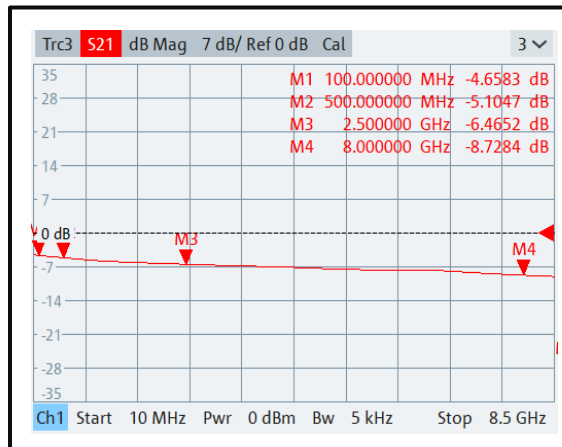
Environmental Specifications and Test Standards

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)

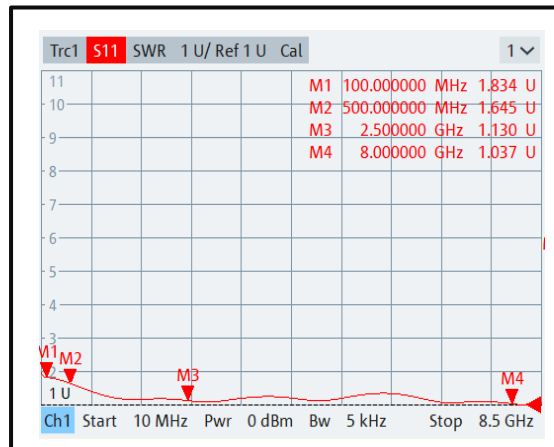
*For vibration testing details please see additional information section.

Typical Performance Plots

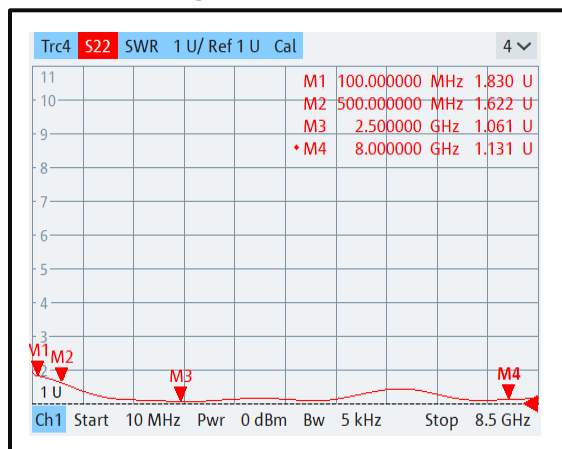
Insertion Loss @+25°C



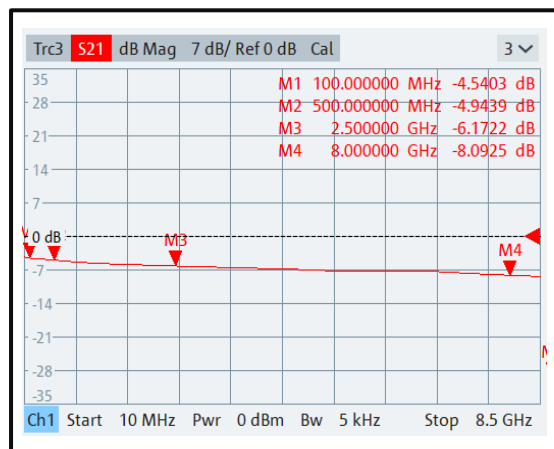
Input VSWR @+25°C



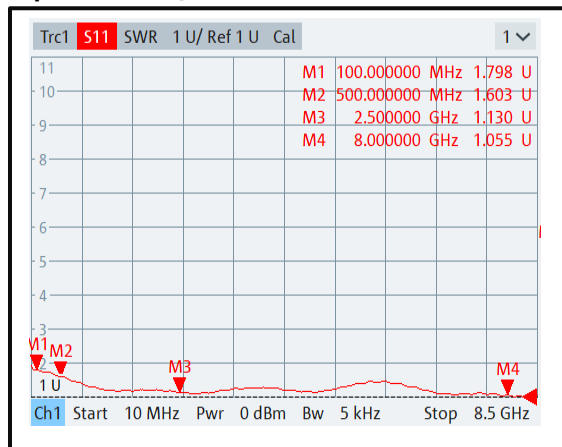
Output VSWR @+25°C



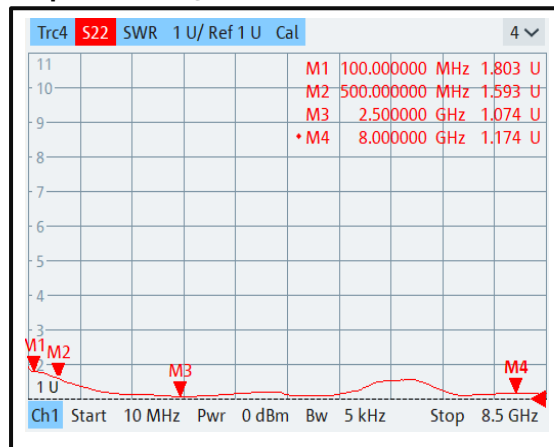
Insertion Loss @-40°C



Input VSWR @-40°C

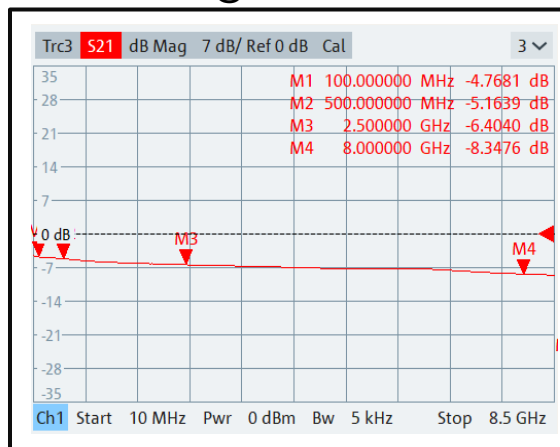


Output VSWR @-40°C

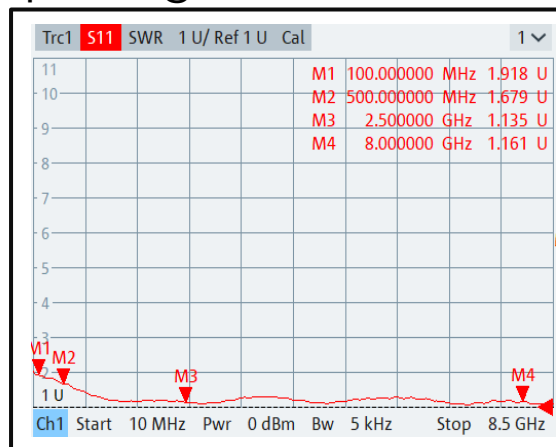


Typical Performance Plots

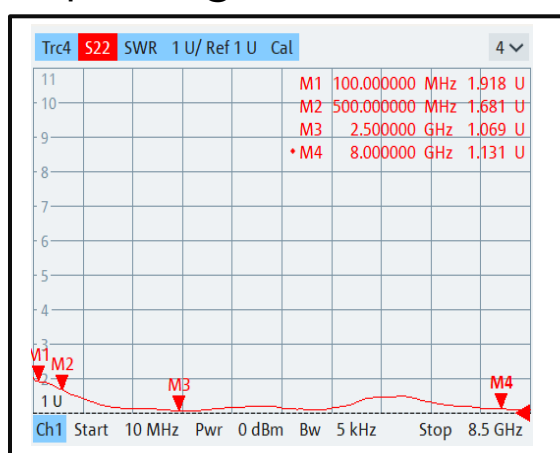
Insertion Loss @+85°C



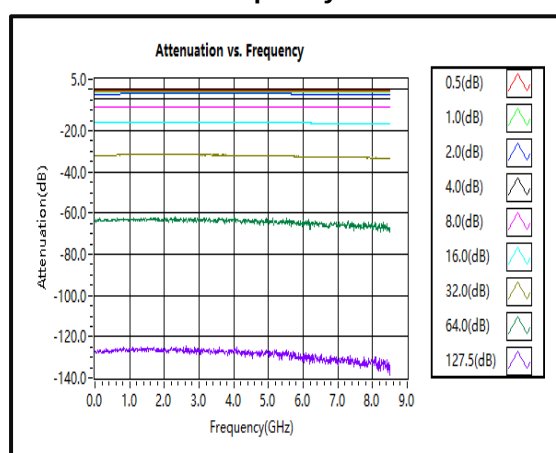
Input VSWR @+85°C



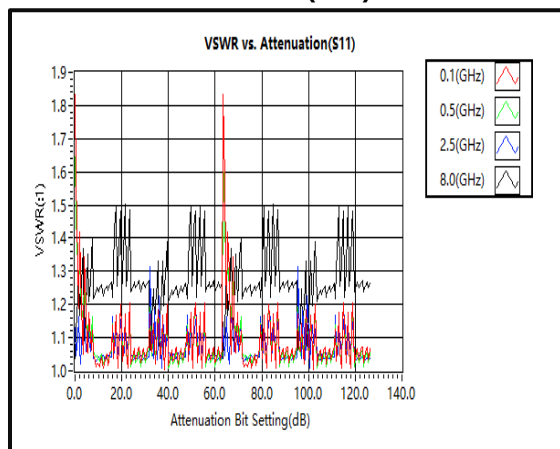
Output VSWR @+85°C



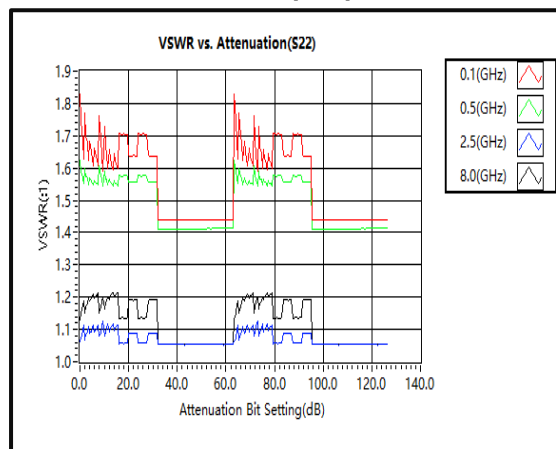
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

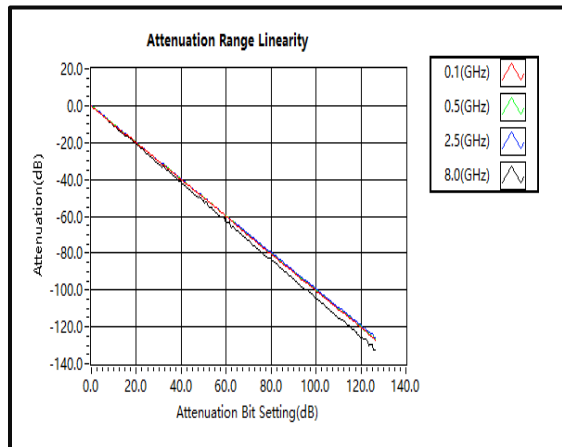


VSWR vs. Attenuation (S22)

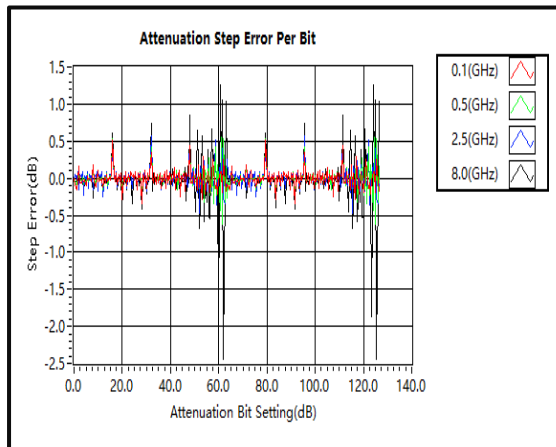


Typical Performance Plots

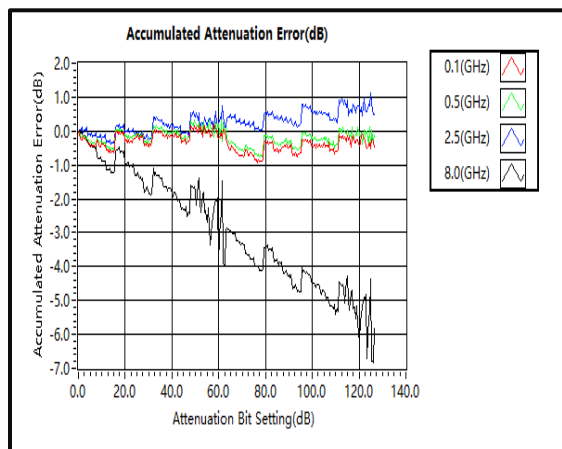
Attenuation Range Linearity



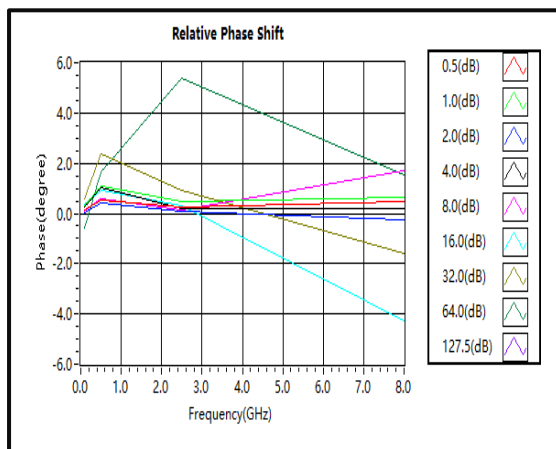
Attenuation Step Error Per Bit (dB)



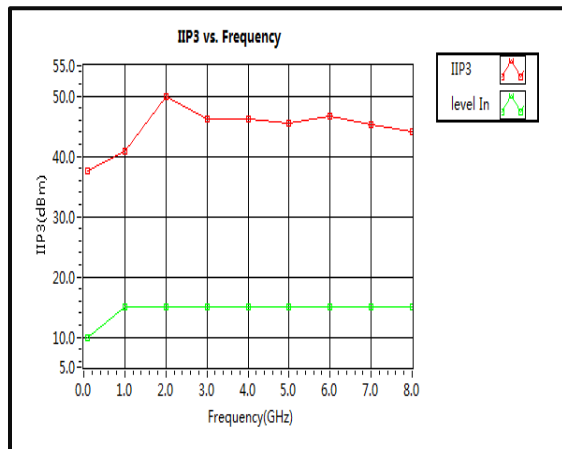
Accumulated Attenuation Error (dB)



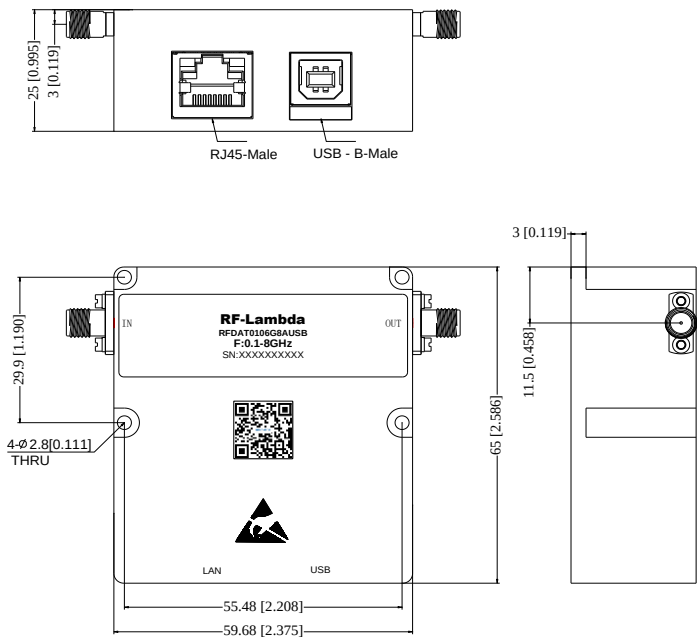
Relative Phase Shift



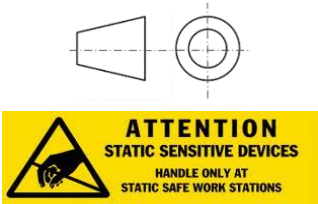
IIP3



Outline Drawing



- Notes:
- 1. Package Material: Aluminum
 - 2. Finish: Nickel Plated
 - 3. All dimensions are in millimeters [inches].
 - 4. Housing Tolerances ± 0.2 [0.008] 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

RF-LAMBDA
THE LEADER OF RF BROADBAND SOLUTIONS

Download Quit Continue >>

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

RF-LAMBDA
THE LEADER OF RF BROADBAND SOLUTIONS

<< Goback

Control Bits 6 Attenuation Step(dB) 1

Select the Attenuation Value(dB) 63

OFF

Device Name: Digital Control Attenuator

Part Number: RFDAT0102G6AUSB

Serial Number: 20032600365

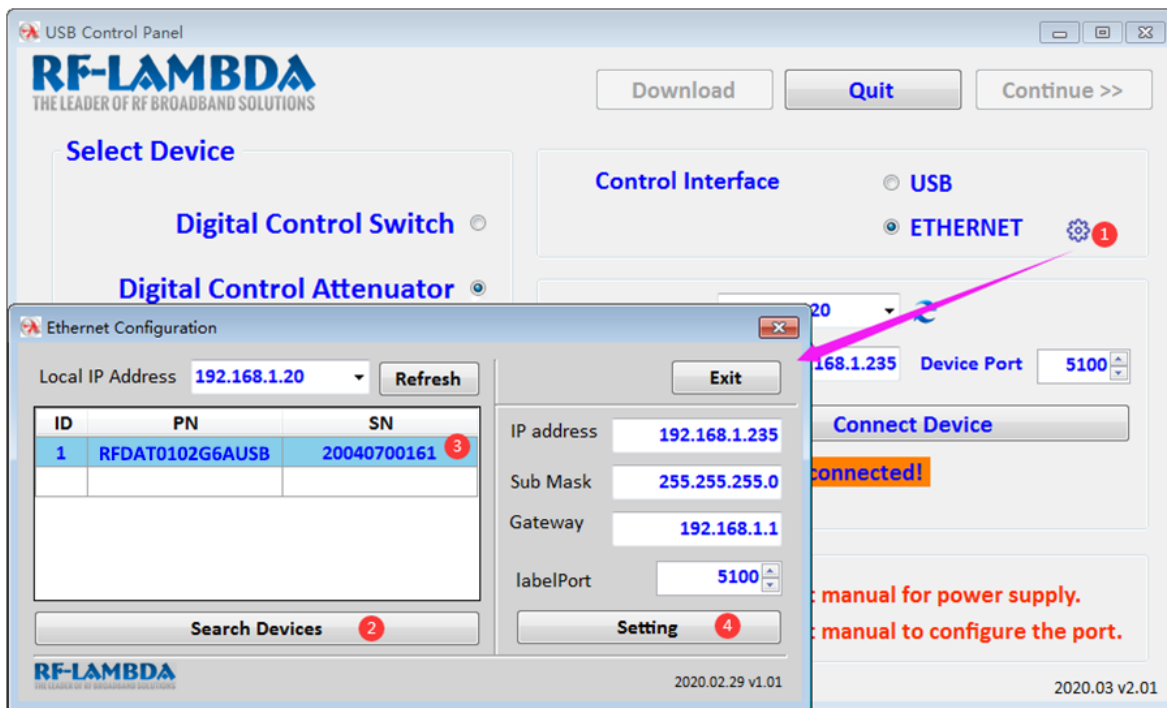
Control Model: USB

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
RFDAT0106G8AUSB	Connectors SMA-Female	0.1-8GHz Digital Control Attenuator

Important Notice

The information contained herein is believed to be reliable. RF-Lambda makes no warranties regarding the information contained herein. RF-Lambda assumes no responsibility or liability whatsoever for any of the information contained herein. RF-Lambda assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for RF-Lambda products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

RF-Lambda products are not warranted or authorized for use as critical components in medical, life-saving, or life sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.