

Absorptive Digital Control Attenuator 0.2GHz-6GHz



Product Description

RFDAT0106G8B-I is an absorptive digital control attenuator with a frequency range of 0.2 to 6GHz.

The maximum power input of this attenuation is 25dBm. The insertion loss is 5.5dB with a typical attenuation range of 63.5dB.

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

Features

- Absorptive Digital Control Attenuator
- Wide Band Operation 0.2-6GHz
- Functional Bandwidth : 0.1GHz to 7GHz
- 0.25dB LSB Steps to 63.5dB
- 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 ($T_A = +25^\circ\text{C}$), $V_{dd} = +5\text{V}$, $V_{CTL} = 0 / +5\text{V}$

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	0.2		1	1		2.5	2.5		6	GHz
Attenuation Range		63.5	68		63.5	68		63.5	68	dB
Attenuation Flatness: (Referenced to Insertion Loss)		± 1.0	± 3.0		± 1.5	± 3.0		± 2.0	± 3.0	dB
Control Bits					8					Bit
Control Step Size		0.25			0.25			0.25		dB
Insertion Loss		2.0	3.0		3.5	4.5		5.5	6.5	dB
Insertion Loss Temperature Coefficient		0.01			0.01			0.01		dB/ °C
Input VSWR (All Atten. States)		1.3	1.8		1.3	1.5		1.5	1.8	: 1
Output VSWR (All Atten. States)		1.3	1.8		1.3	1.5		1.5	1.8	: 1
Input Linearity 0.1dB Compression Point (P0.1dB)		25			25			25		dBm
Input Third-Order Intercept(IP3) @Two-tone input power = 16 dBm/tone, $\Delta f = 1 \text{ MHz}$		50			50			46		dBm
Switching Speed 50% CTRL* to 10% or 90%					220 Max.					ns
Video Leakage (Peak to Peak)					130 Typ. 150 Max.					mV
Bias Current (+5V)					20 Max.					mA
Weight					0.07 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	+5.5V
RF Input Power	+25dBm

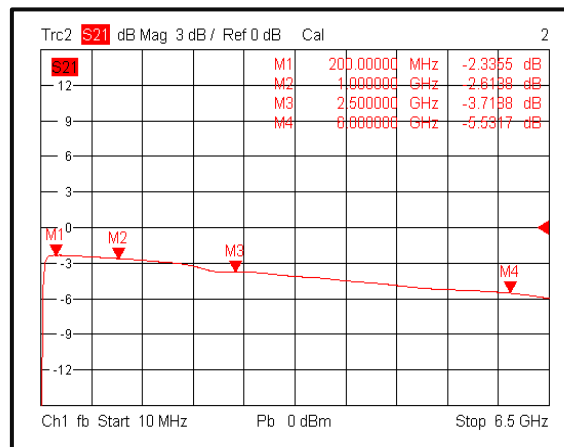
Environmental Specifications and Test Standards

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)

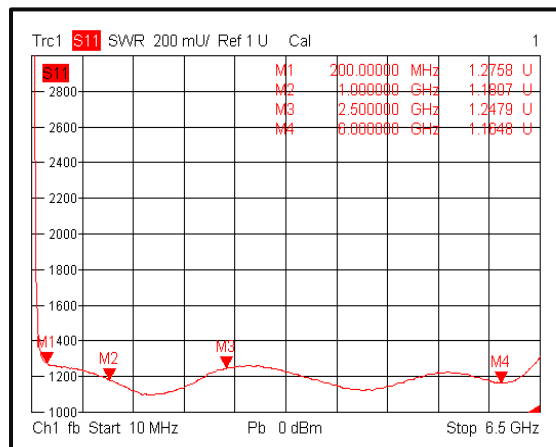
*For vibration testing details please see additional information section.

Typical Performance Plots

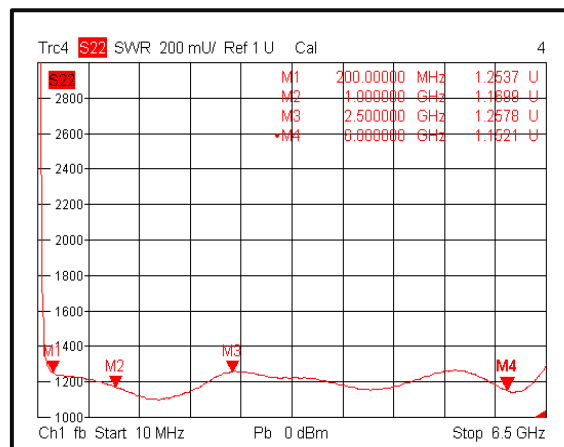
Insertion Loss @+25°C



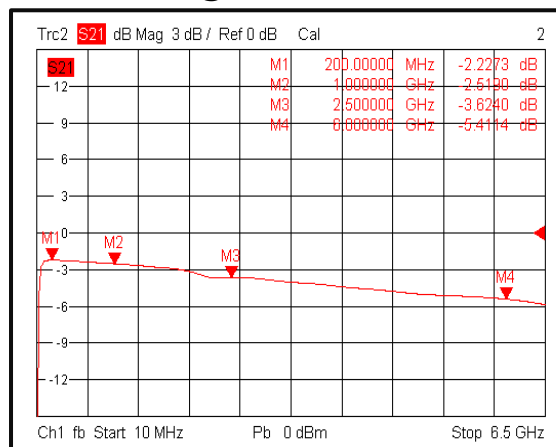
Input VSWR @+25°C



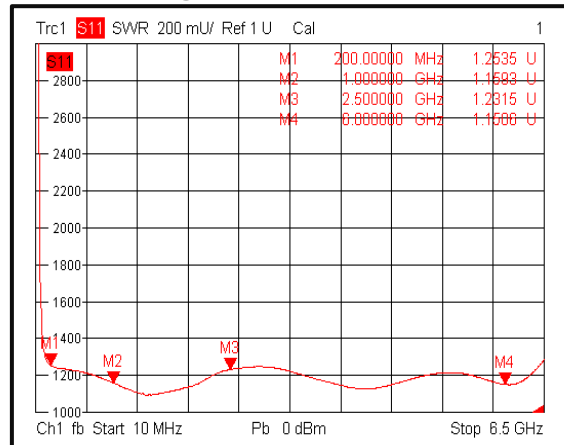
Output VSWR @+25°C



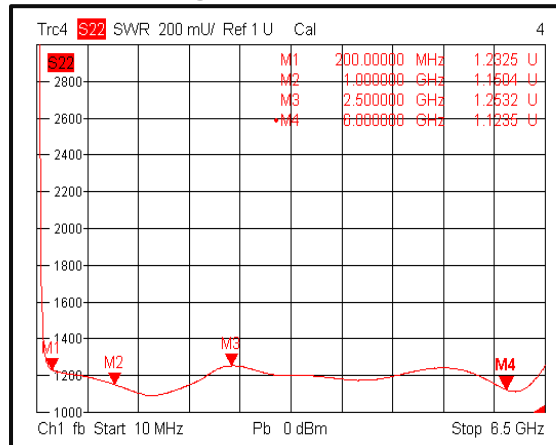
Insertion Loss @-40°C



Input VSWR @-40°C

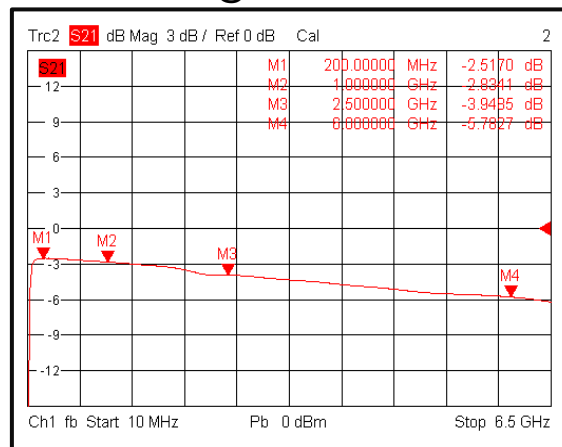


Output VSWR @-40°C

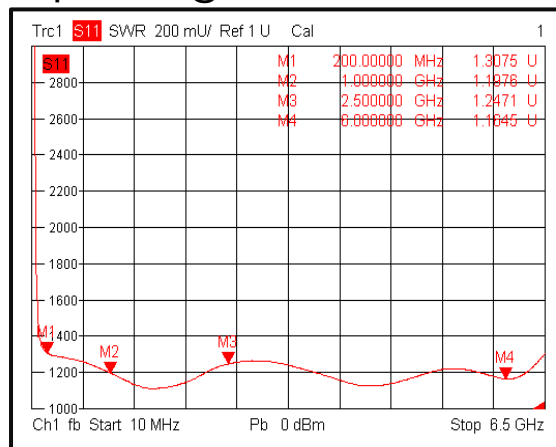


Typical Performance Plots

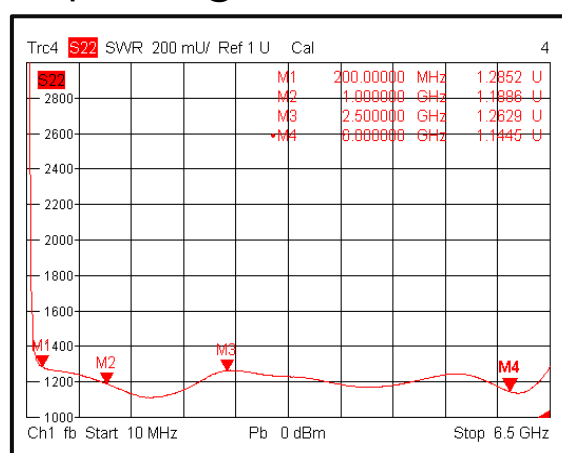
Insertion Loss @+85°C



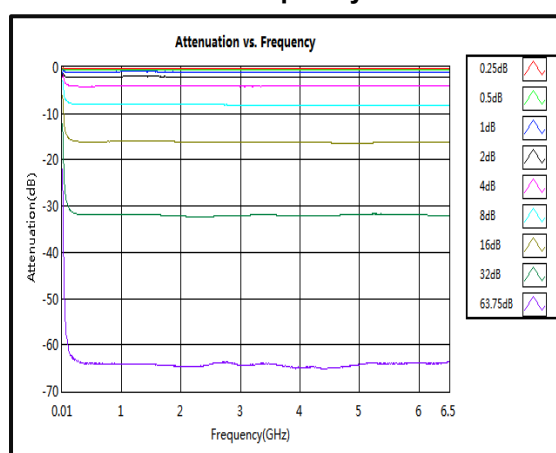
Input VSWR @+85°C



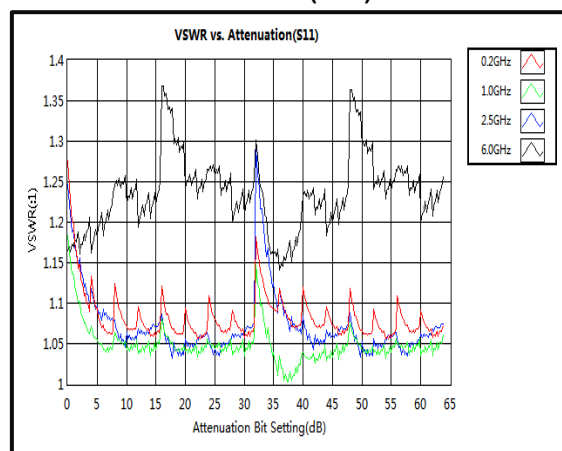
Output VSWR @+85°C



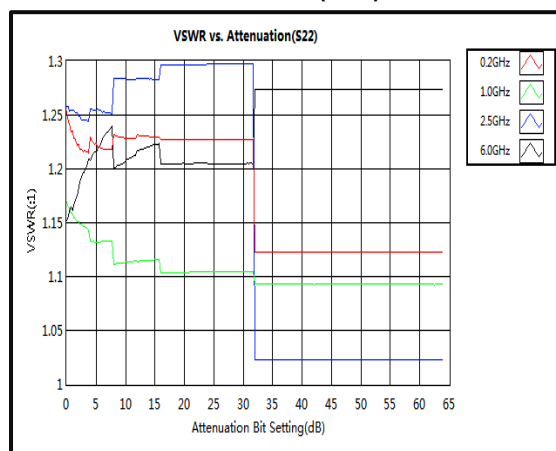
Attenuation vs. Frequency



VSWR vs. Attenuation (S11)

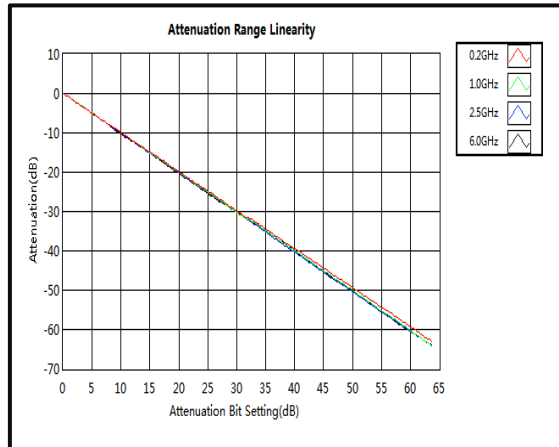


VSWR vs. Attenuation (S22)

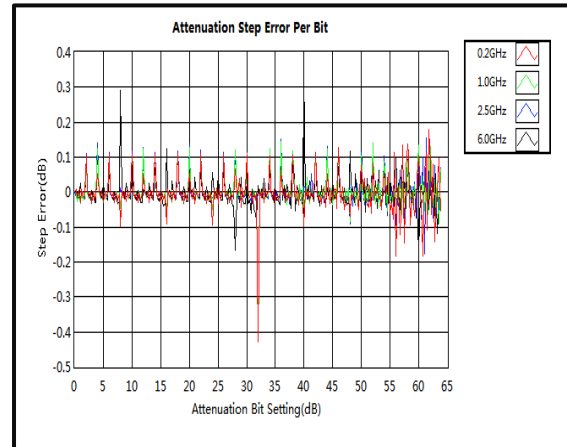


Typical Performance Plots

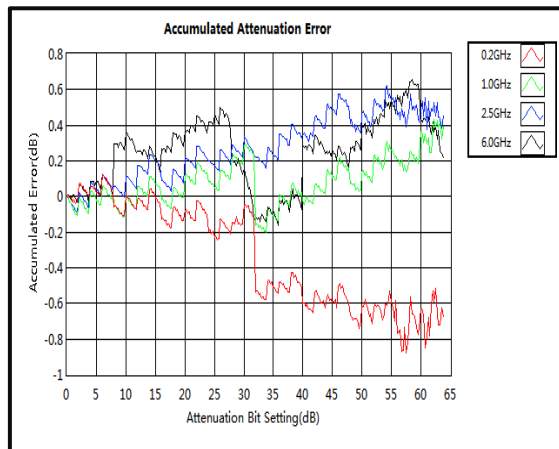
Attenuation Range Linearity



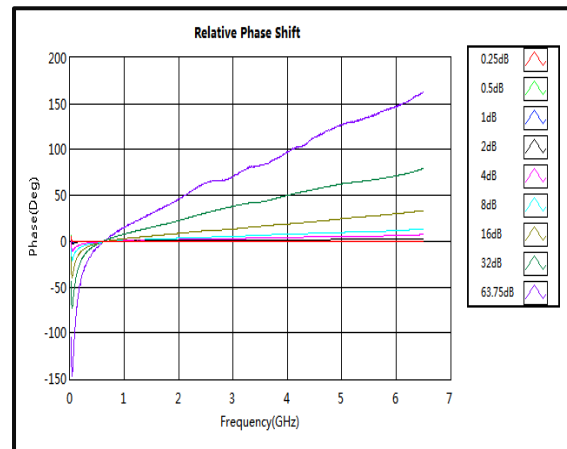
Attenuation Step Error Per Bit (dB)



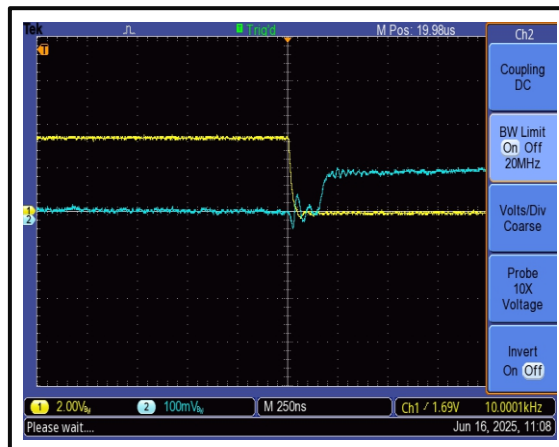
Accumulated Attenuation Error (dB)



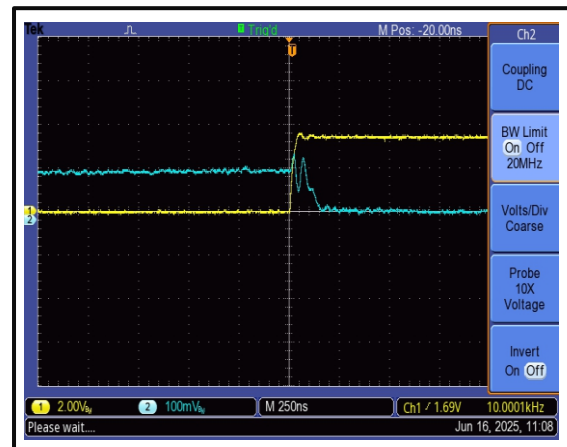
Relative Phase Shift



Speed

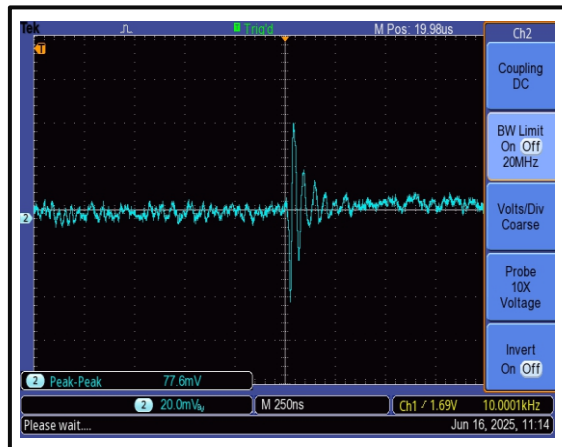


Speed

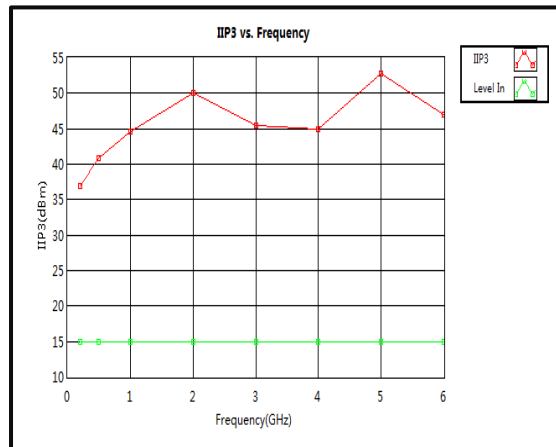


Typical Performance Plots

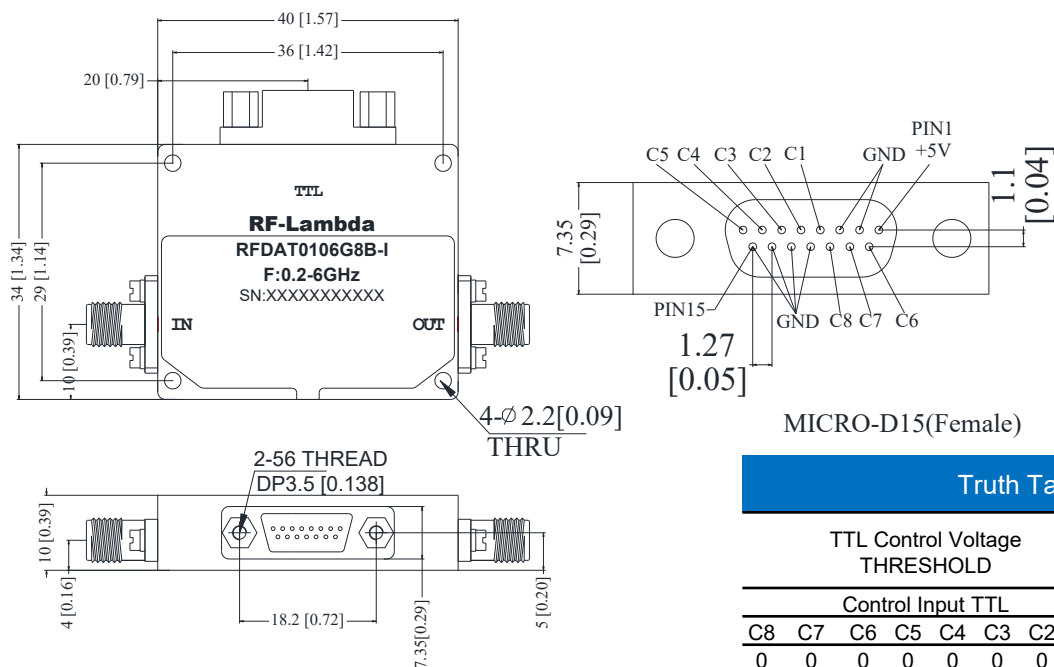
Video Leakage (Peak to Peak)



IIP3



Outline Drawing



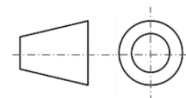
MICRO-D15(Female)

Truth Table

TTL Control Voltage THRESHOLD								Low(0)=0~0.8V
Control Input TTL								High(1)=4~5V
C8	C7	C6	C5	C4	C3	C2	C1	Attenuation State
0	0	0	0	0	0	0	0	Reference IL
0	0	0	0	0	0	0	1	0.25dB
0	0	0	0	0	0	1	0	0.5dB
0	0	0	0	0	1	0	0	1dB
0	0	0	0	1	0	0	0	2dB
0	0	0	1	0	0	0	0	4dB
0	0	1	0	0	0	0	0	8dB
0	1	0	0	0	0	0	0	16dB
1	0	0	0	0	0	0	0	31.75dB
1	1	1	1	1	1	1	1	63.5dB

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.
6. Note: A lower TTL High Voltage (+3.3V) can be used, but Vcc must also be +3.3V instead of +5V



Additional Information

Documentation

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

Webpage

Ordering Information

Part Number	Modification	Description
RFDAT0106G8B-I	Standard	0.2GHz-6GHz 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.