

Absorptive Digital Control Attenuator 0.001GHz-43.5GHz



Note: Photo is for illustration purposes only.
Please refer to outline drawing.

Product Description

RFDAT0030G7A is an absorptive digital control attenuator with a frequency range of 0.001 to 43.5GHz.

The power input of this attenuation is 26 dBm typical. The insertion loss is 7dB with a typical attenuation range of 63dB.

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

Features

- Absorptive Digital Control Attenuator
- 0.5dB 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 ($T_A = +25^\circ\text{C}$), $V_{DD} = +5\text{V}$, $V_{CTL} = 0 / +5\text{V}$

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	0.001		1	1		30	30		43.5	GHz
Attenuation Range	60	63		60	63		53	55		dB
Attenuation Flatness (Referenced to Insertion Loss)		± 2.5	± 3.0		± 4.0	± 5.0		± 5.0	± 6.0	dB
Control Bits					7					Bit
Control Step Size		0.5			0.5			0.5		dB
Insertion Loss		7.0	8.5		13	15		16.5	19.5	dB
Insertion Loss Temperature Coefficient		0.03			0.03			0.03		dB/ °C
Input VSWR (All Atten. States)		1.8	3.0		1.8	2.2		1.8	2.2	: 1
Output VSWR (All Atten. States)		2.0	3.0		1.8	2.2		1.8	2.2	: 1
Input 0.1dB Compression Point (P0.1dB)		26			25			23		mA
IP3 Input		42			40			38		dBm
Switching Speed 50% CTRL* to 90% or 10%					200 Typ.					ns
Bias Current (+5V)					20 Max.					mA
Weight					0.08 Max.					lbs.
Impedance					50					Ohms
Input / Output Connectors										2.92mm-Female (Input) – 2.92mm-Female (Output)
Interface and Control Connector										MICRO-D15 (Female)
Package										Epoxy Sealed (Standard) Hermetically Sealed (Optional)

Absolute Maximum Ratings

Parameter	Rating
Biasing Voltage	+5V±10%
RF Input Power	+27dBm

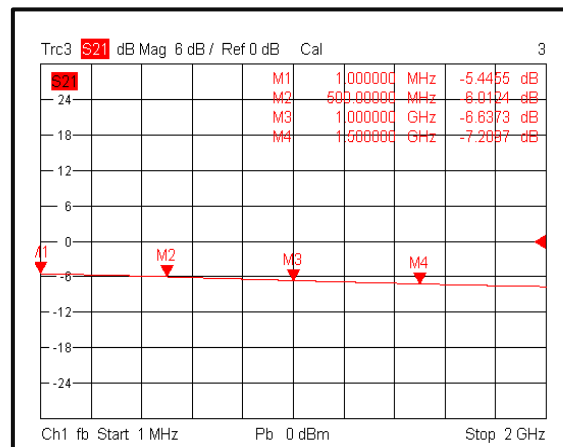
Environmental Specifications and Test Standards

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)

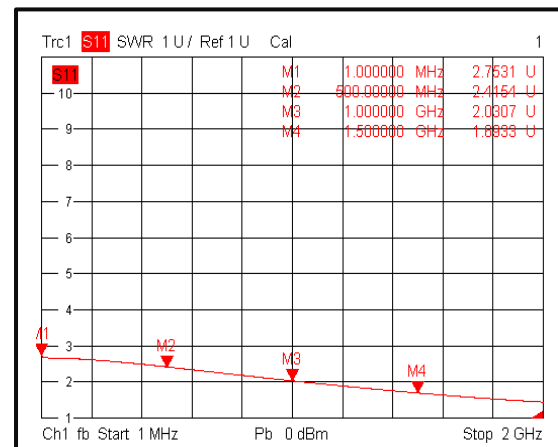
**For vibration testing details please see additional information section.

Typical Performance Plots

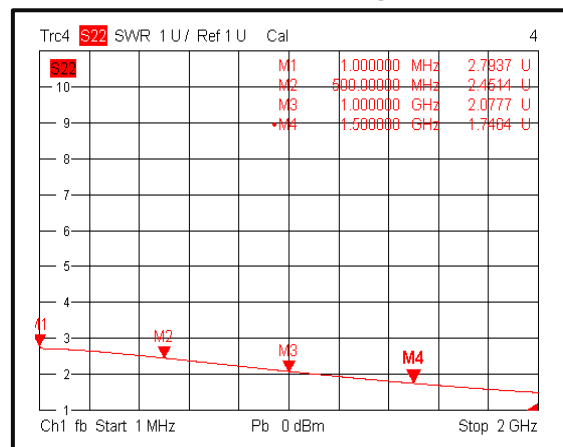
Insertion Loss(1MHz-2GHz)@+25°C



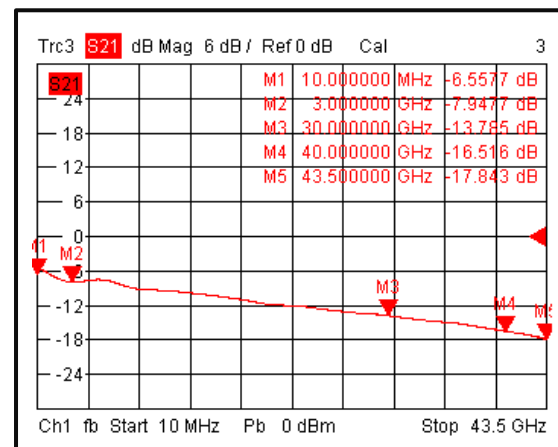
Input VSWR(1MHz-2GHz) @+25°C



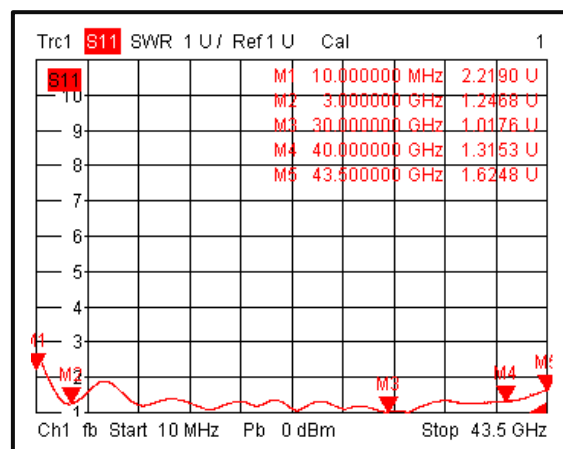
Output VSWR (1MHz-2GHz) @+25°C



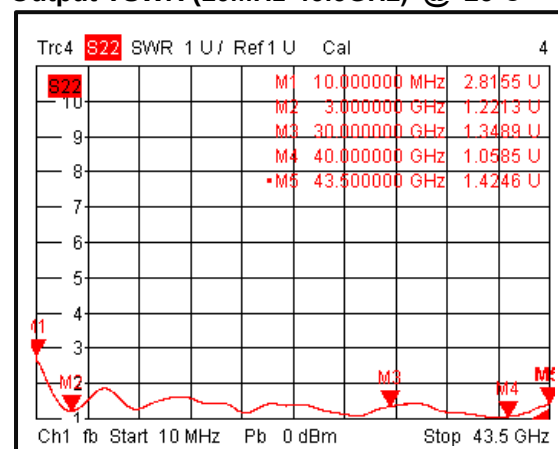
Insertion Loss (10MHz-43.5GHz)@+25°C



Input VSWR (10MHz-43.5GHz) @+25°C

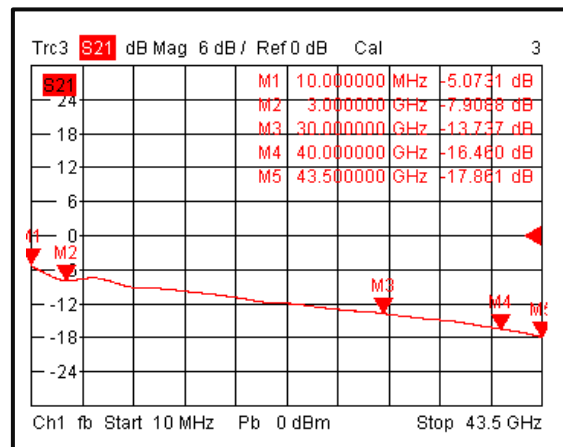


Output VSWR (10MHz-43.5GHz) @+25°C

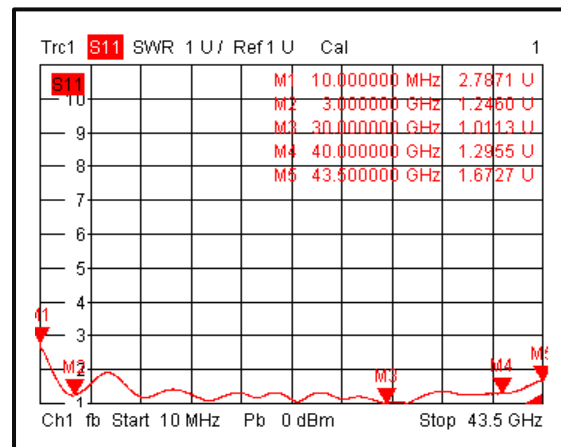


Typical Performance Plots

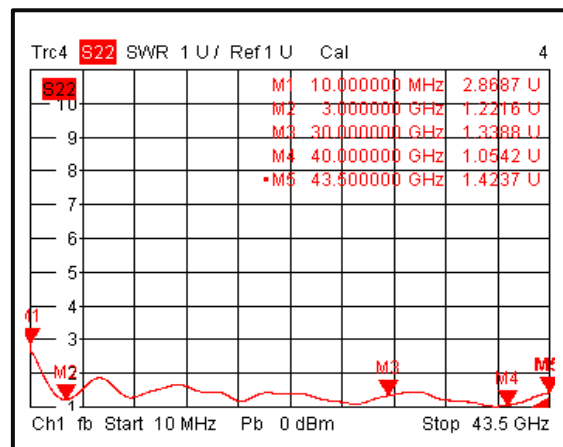
Insertion Loss @-40°C



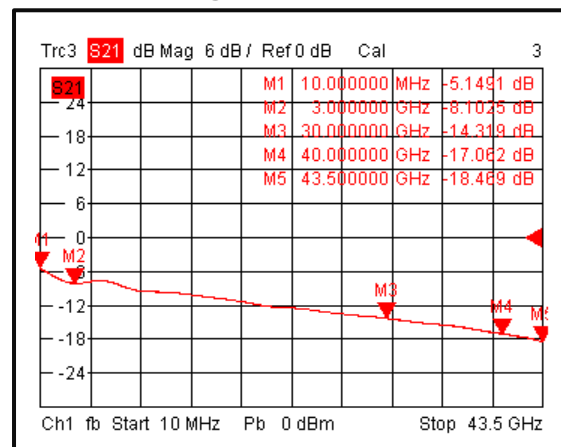
Input VSWR @-40°C



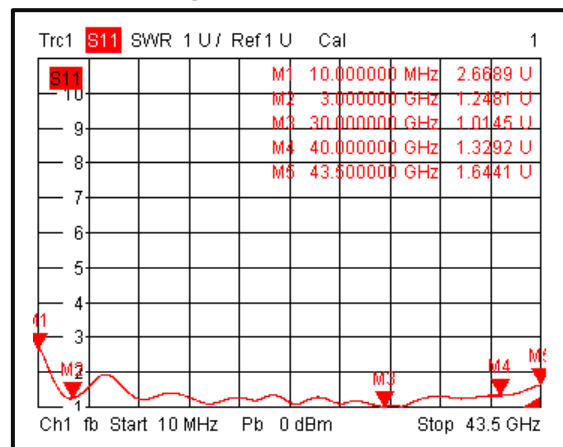
Output VSWR @-40°C



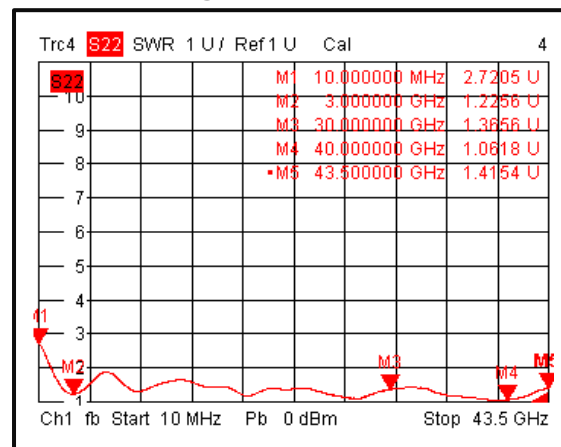
Insertion Loss @+85°C



Input VSWR @+85°C

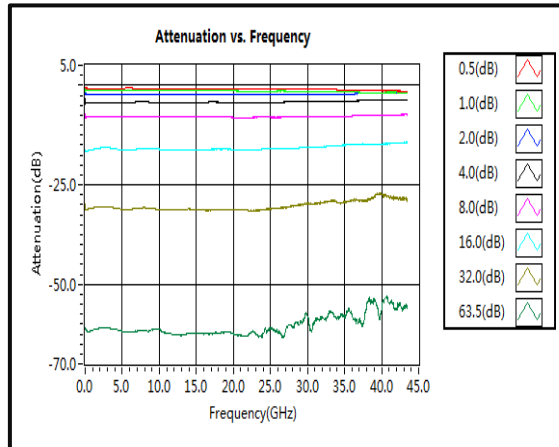


Output VSWR @+85°C

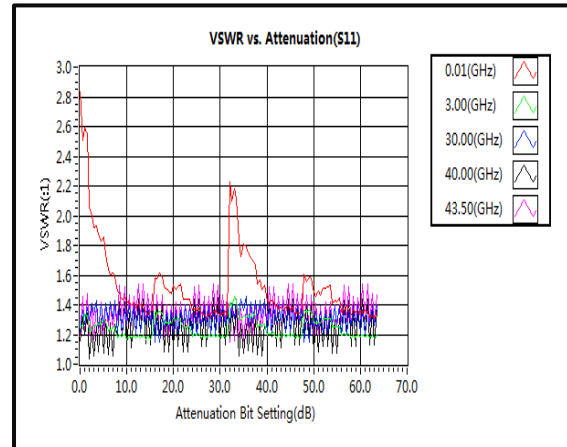


Typical Performance Plots

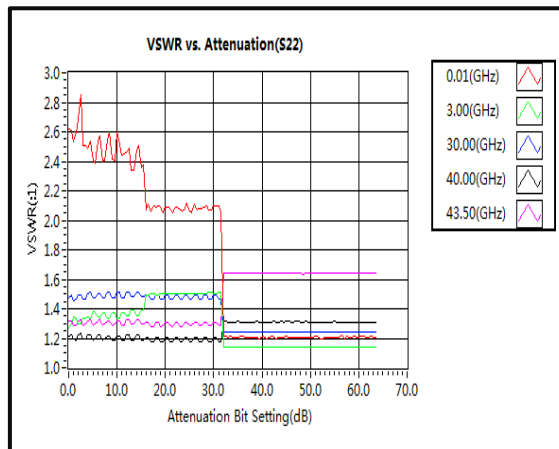
Attenuation vs. Frequency



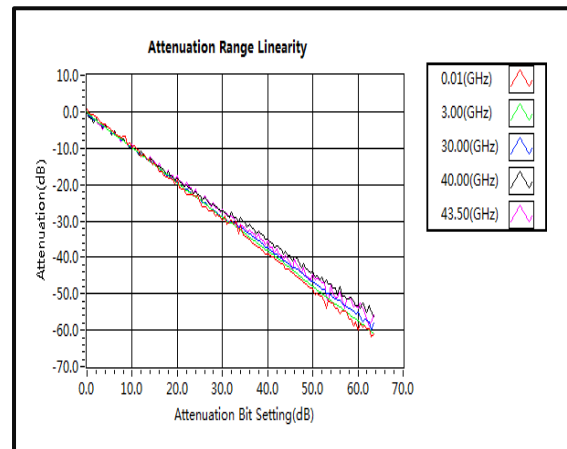
VSWR vs. Attenuation (S11)



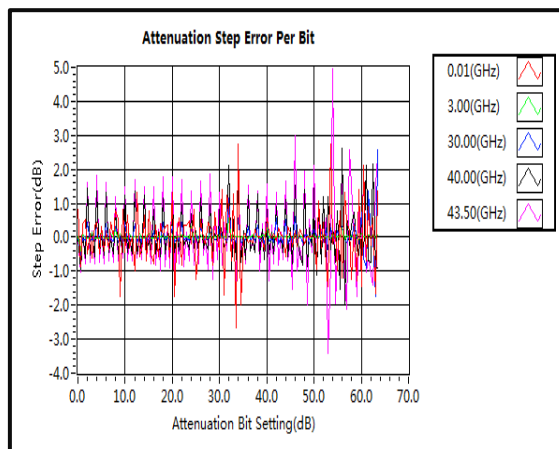
VSWR vs. Attenuation (S22)



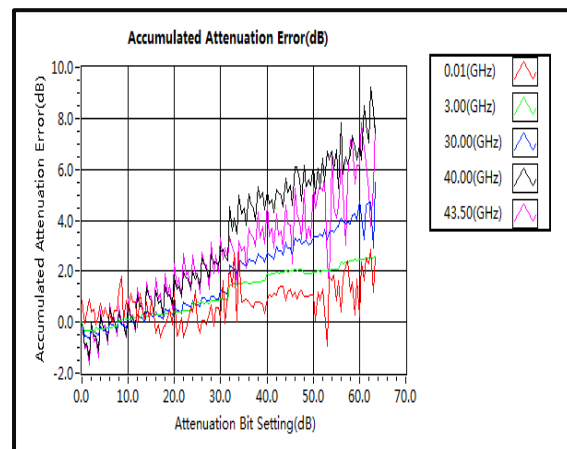
Attenuation Range Linearity



Attenuation Step Error Per Bit (dB)

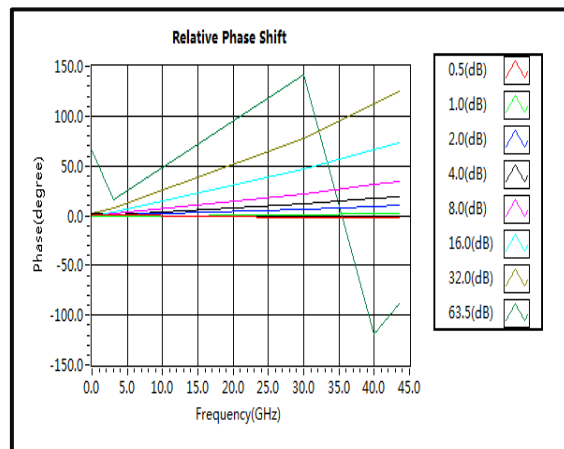


Accumulated Attenuation Error (dB)

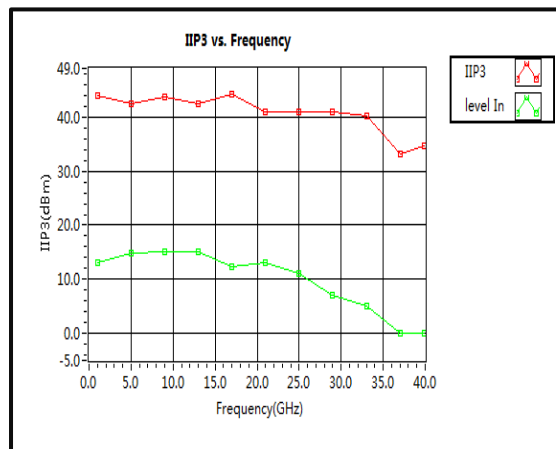


Typical Performance Plots

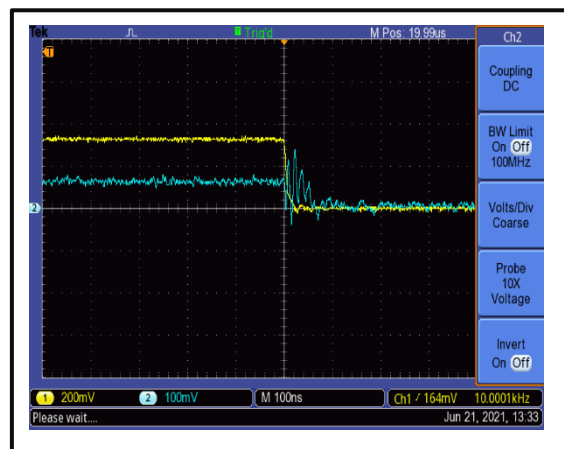
Relative Phase Shift



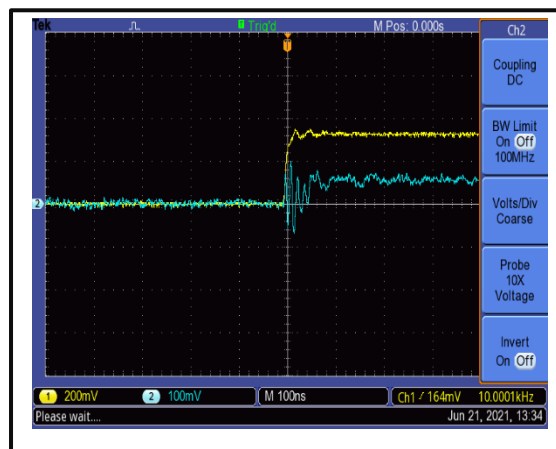
IIP3



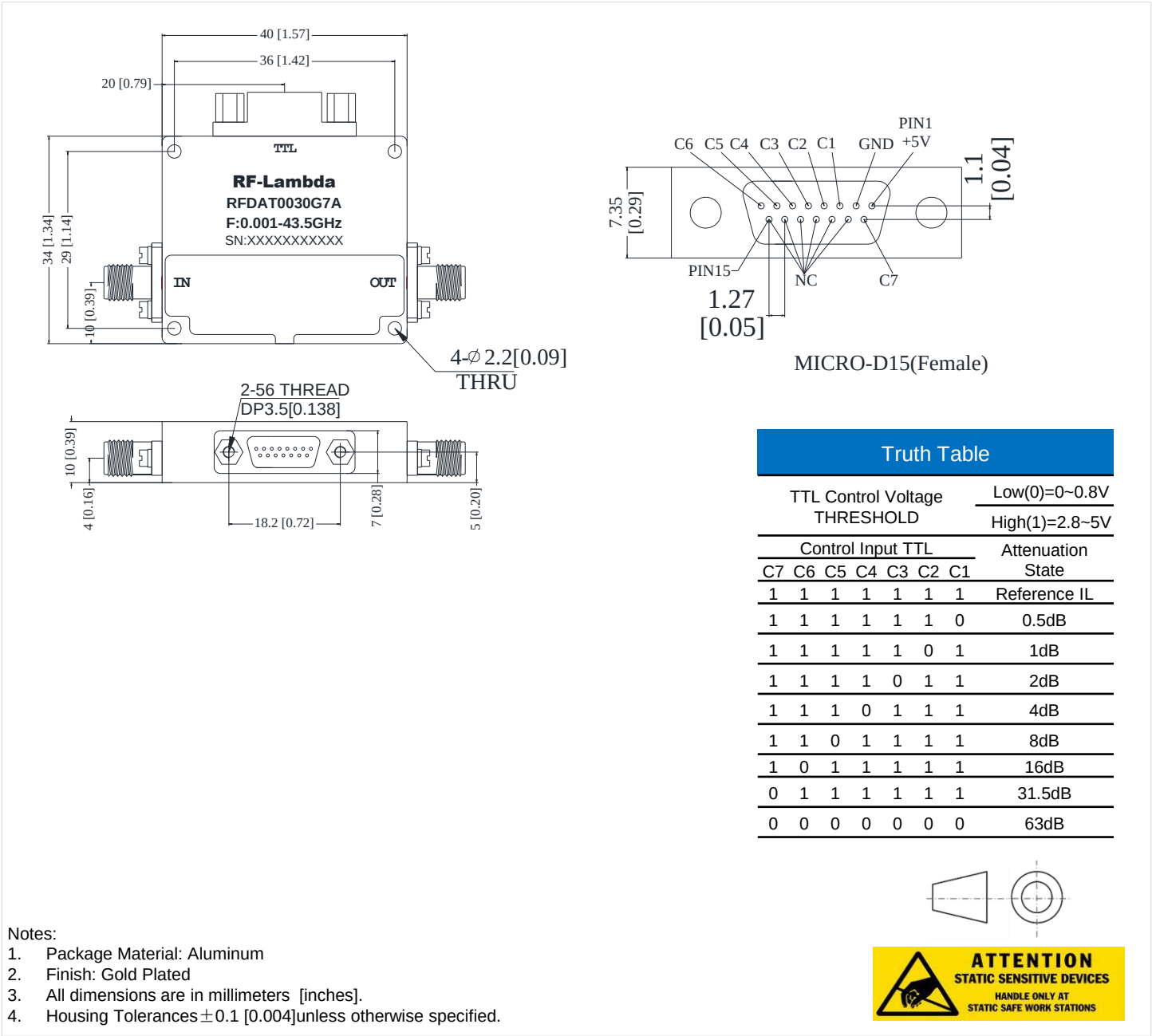
Speed



Speed



Outline Drawing



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
RFDAT0030G7A	connectors 2.92mm-Female	0.001GHz-43.5GHz Digital Control Attenuator

Important Notice

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