



RF-LAMBDA

LEADER OF RF BROADBAND SOLUTIONS

RFDAT0030G8A

Absorptive Digital Control Attenuator 0.1 - 30GHz



Features

- Ultra Wide Band Operation 0.1-30GHz
- 0.5dB LSB Steps to 127.5dB
- Single Positive Control Line Per Bit
- Customization available upon request

Electrical Specifications, $T_A = +25^{\circ}\text{C}$, $V_{dd} = +5\text{V}$, $V_{ss} = -5\text{V}$ & $V_{CTL} = 0 / +5\text{V}$

Description	PN: RFDAT0030G8A									
	Absorptive Digital Attenuator									
Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	0.1~6			6~18			18~30			GHz
Attenuation Range			127.5			127.5			127.5	dB
Insertion Loss		12	13		19.5	21.5		27	29	dB
Insertion Loss Temperature Coefficient		0.01			0.01			0.01		dB/°C
Attenuation Flatness: (Referenced to Insertion Loss)	0.5-60dB $<\pm 3.0$ 60-127.5dB $<\pm 4.0$			0.5-60dB $<\pm 4.0$ 60-127.5dB $<\pm 6.0$			0.5-60dB $<\pm 4.0$ 60-127.5dB $<\pm 10.0$			dB
Control Bits			8			8			8	Bit
Control Step size	0.5			0.5			0.5			dB
Input VSWR(All Atten. States)		1.9	2.5		1.9	2.2		1.9	2.2	: 1
Output VSWR (All Atten. States)		1.9	2.5		1.9	2.2		1.9	2.2	: 1
Input 0.1 dB Compression Point ($P_{0.1\text{dB}}$)		25			25			25		dBm
Input IP3		45			45			45		dBm
Switching Speed	200									ns
Weight	1.06									Ounces
Impedance	50									Ω
Bias Current (+5V / - 5V)	140/140									mA
Input / Output Connectors	2.92mm-Female									
Interface and Control Connector	MICRO-D15(Female)									
Finish	Gold Plated									
Material	Aluminum									
Sealing	Hermetically Sealed (Optional)									

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Absolute Maximum Ratings

Biasing	+5V±10%/-5V±10%
TTL Control Voltage	0~0.8V/2.8~5V

Ordering Information

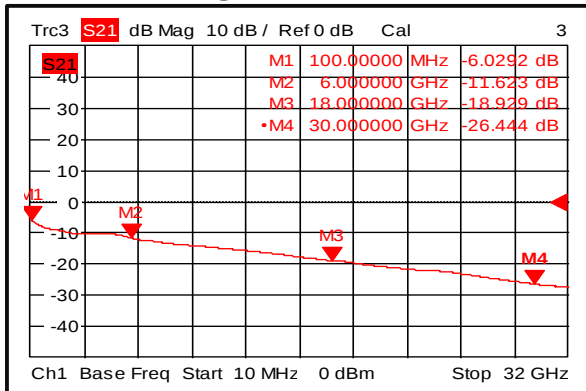
Part No.	ECCN	Description
RFDAT0030G8A	EAR99	0.1-30GHz Digital Control Attenuator

Environmental Specifications and Test Standards

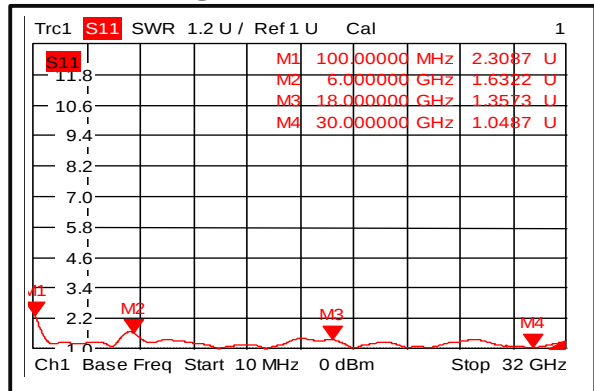
Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-45°C~+85°C
Storage Temperature		-50°C~+125°C
Thermal Shock		1 Hour@ -45°C → 1 Hour @ +85°C (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & Temperature Burn In		Temperature +85°C for 72 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	MIL-STD-883	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)

Typical Performance Plots

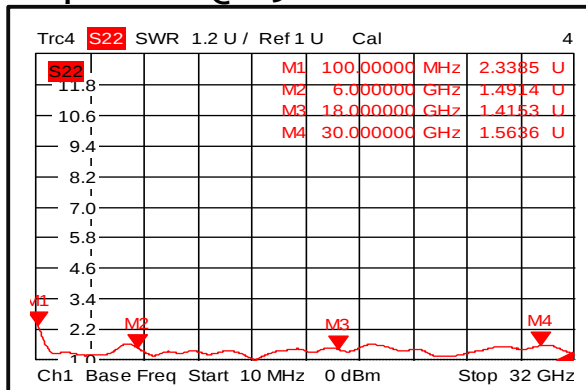
Insertion Loss @+25°C



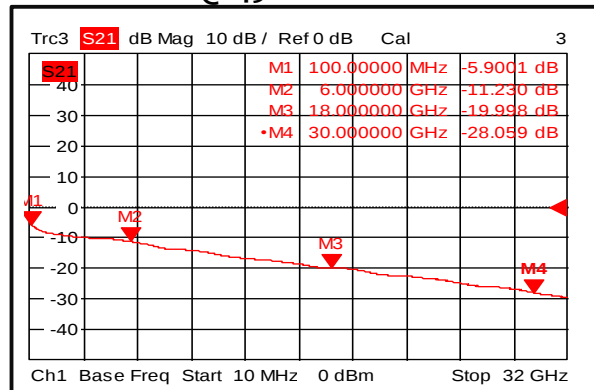
Input VSWR @+25°C



Output VSWR @+25°C



Insertion Loss @-45°C



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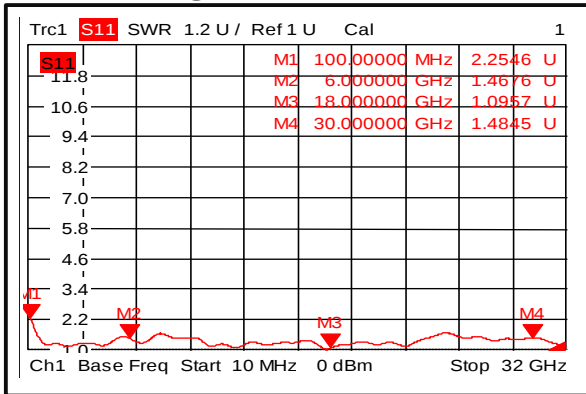


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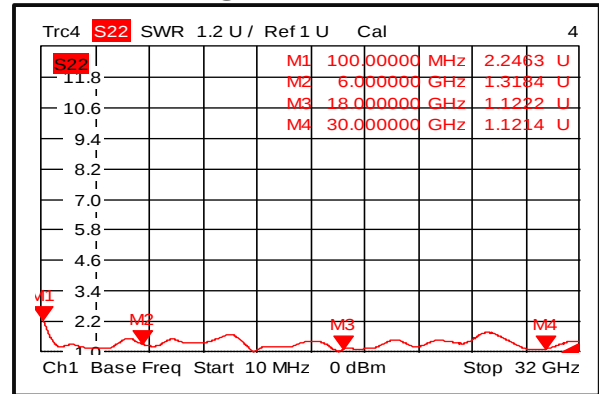
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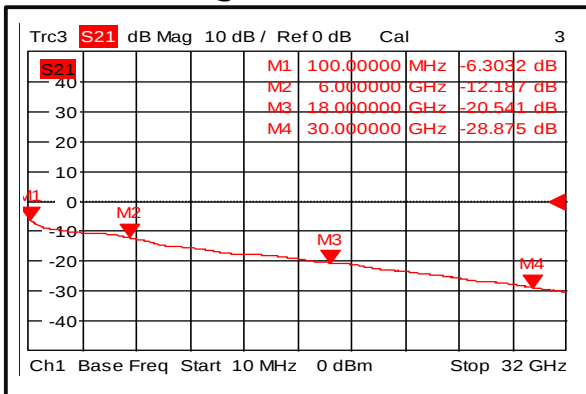
Input VSWR @-45°C



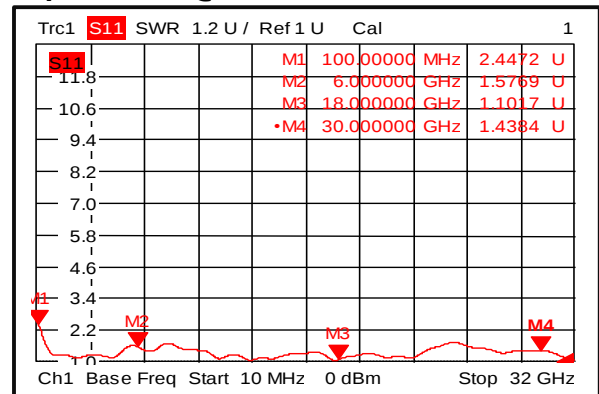
Output VSWR @-45°C



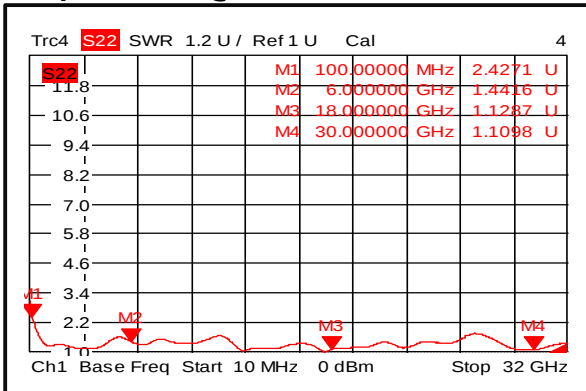
Insertion Loss @+85°C



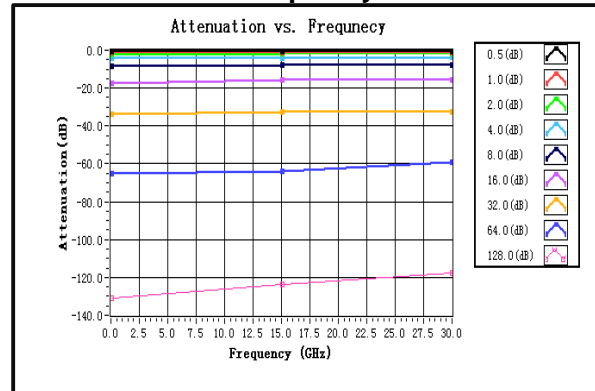
Input VSWR @+85°C



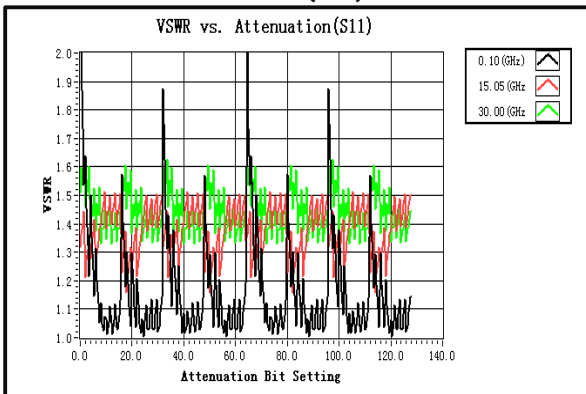
Output VSWR @+85°C



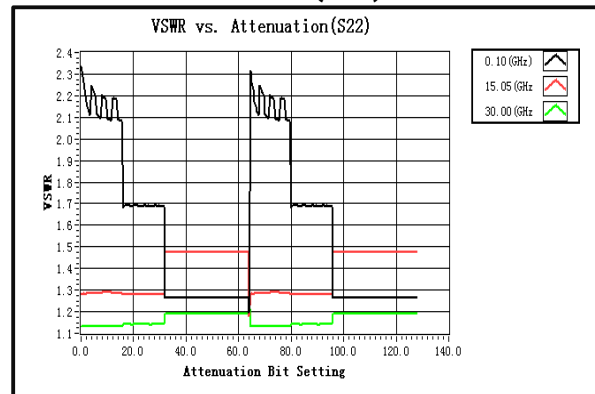
Attenuation vs. Frequency



VSWR vs. Attenuation(S11)



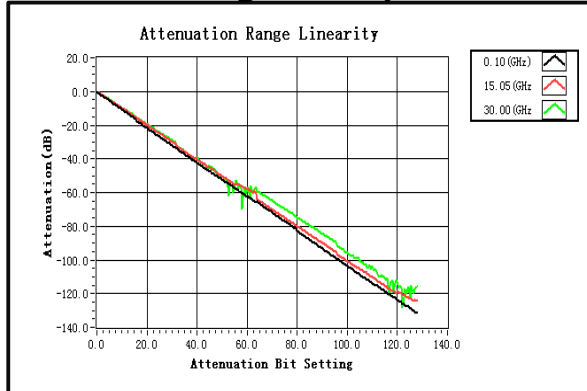
VSWR vs. Attenuation(S22)



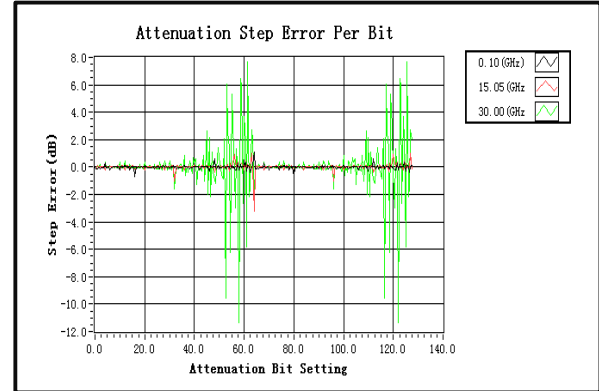
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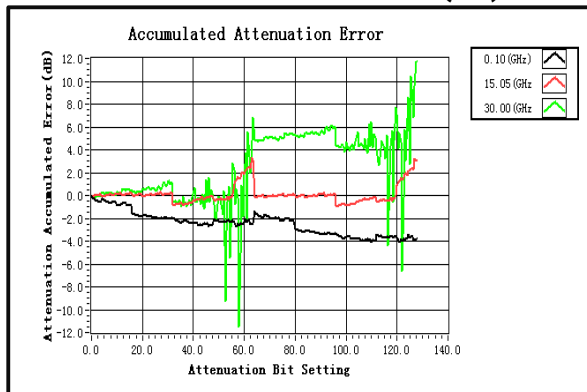
Attenuation Range Linearity



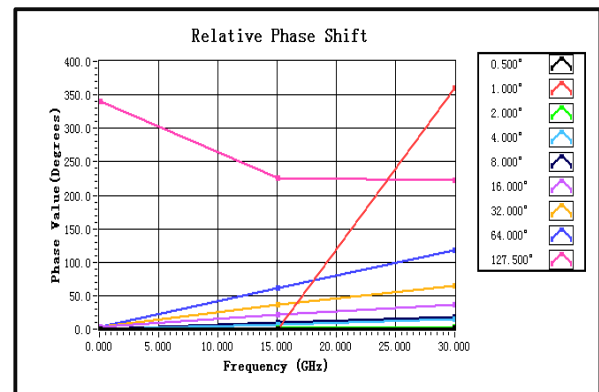
Attenuation Step Error Per Bit (dB)



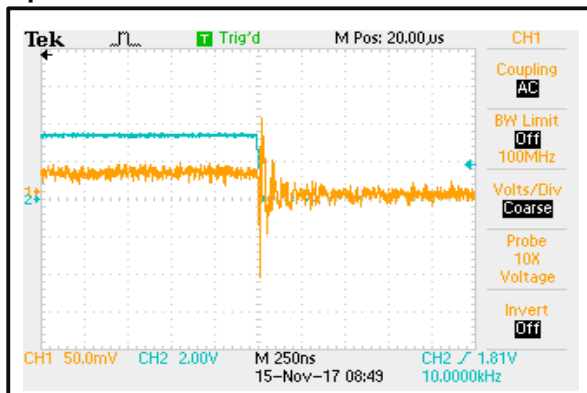
Accumulated Attenuation Error (dB)



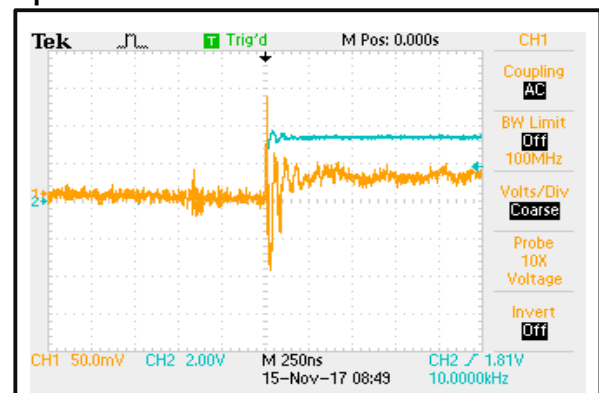
Relative Phase Shift



Speed



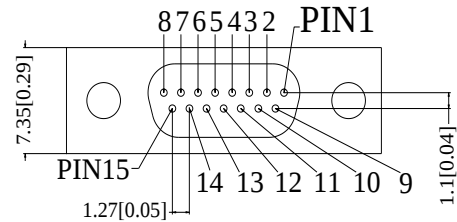
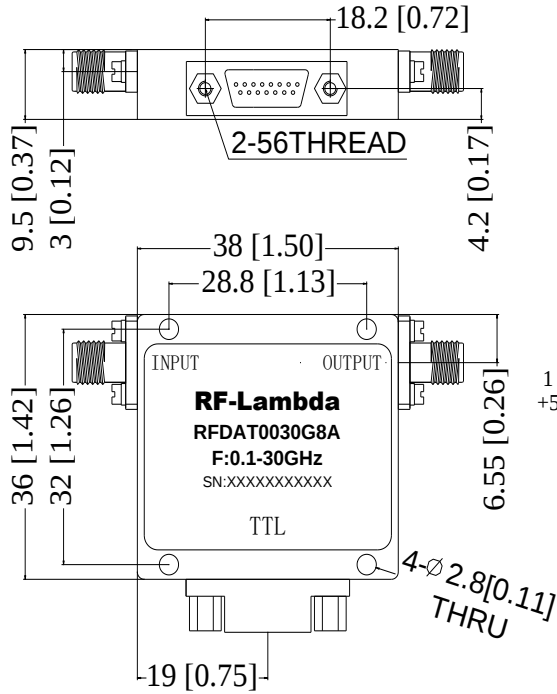
Speed





Outline Drawing:

All Dimensions in mm [inches]



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
+5V GND -5V C1 C2 C3 C4 C5 C6 C7 C8 GND GND GND GND

MICRO-D15(Female)

Truth Table

Control Voltage Input								Attenuation state
C8	C7	C6	C5	C4	C3	C2	C1	
1	1	1	1	1	1	1	1	Reference IL
1	1	1	1	1	1	1	0	0.5dB
1	1	1	1	1	1	0	1	1dB
1	1	1	1	1	0	1	1	2dB
1	1	1	1	0	1	1	1	4dB
1	1	1	0	1	1	1	1	8dB
1	1	0	1	1	1	1	1	16dB
1	0	1	1	1	1	1	1	32dB
0	1	1	1	1	1	1	1	64dB
0	0	0	0	0	0	0	0	127.5dB



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