



RF-LAMBDA

LEADER OF RF BROADBAND SOLUTIONS

RFDAT0120G8A

Absorptive Digital Control Attenuator 1 - 20GHz



Features

- Ultra Wide Band Operation 1-20GHz
- 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: RFDAT0120G8A						
	Absorptive Digital Attenuator						
Parameters	Min	Typ.	Max	Min	Typ.	Max	Units
Frequency Range	1~10			10~20			GHz
Attenuation Range			127.5			127.5	dB
Attenuation Flatness: (Referenced to Insertion Loss)			± 3.0			± 5.0	dB
Control Bits			8			8	Bit
Control Step size		0.5			0.5		dB
Insertion Loss		9.0	10		13.5	15	dB
Insertion Loss Temperature Coefficient		0.01			0.01		dB/ $^{\circ}\text{C}$
Input VSWR (All Atten. States)		1.7	2		1.7	2	:1
Output VSWR (All Atten. States)		1.7	2		1.7	2	:1
Input 0.1 dB Compression Point ($P_{0.1\text{dB}}$)		25			25		dBm
Input IP ₃	45						dBm
Switching Speed	200						ns
Weight	1.06						ounces
Impedance	50						Ω
Bias Current (+5V/-5V)	250/130						mA
Input / Output Connectors	SMA-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

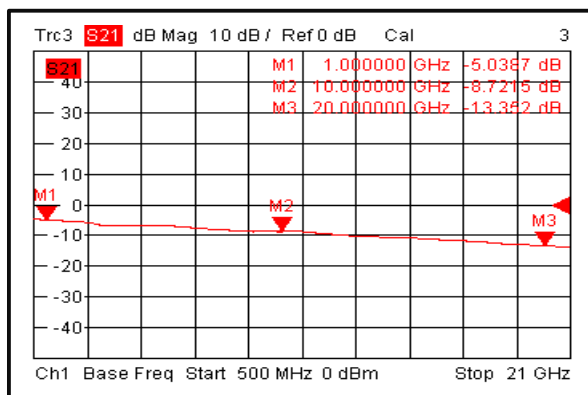
Part No.	ECCN	Description
RFDAT0120G8A	EAR99	1-20GHz Digital Control Attenuator

Environmental Specifications and Test Standards

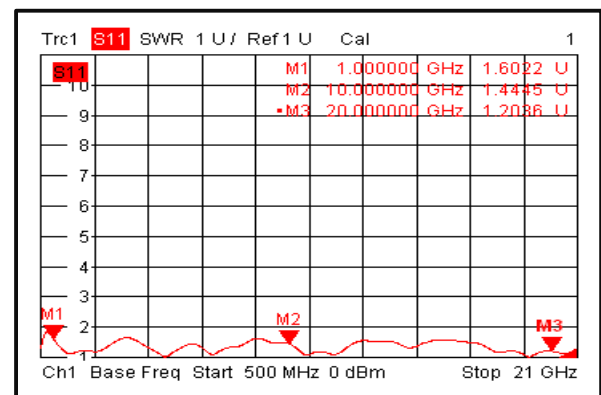
Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-40°C~+85°C
Storage Temperature		-55°C~+125°C
Thermal Shock		1 Hour@ -45°C → 1 Hour @ +85°C (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & Temperature Burn In		Temperature +85°C for 72 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



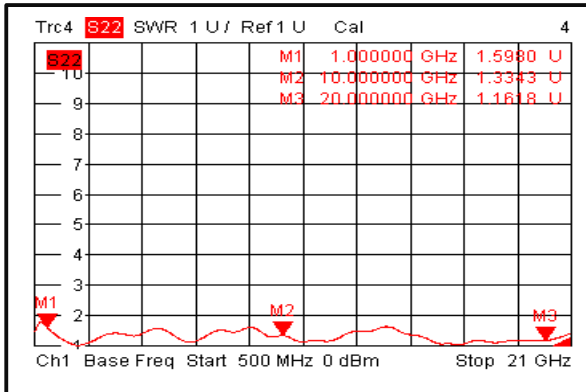


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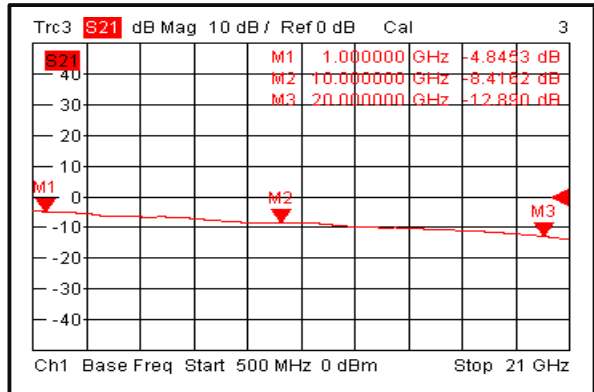
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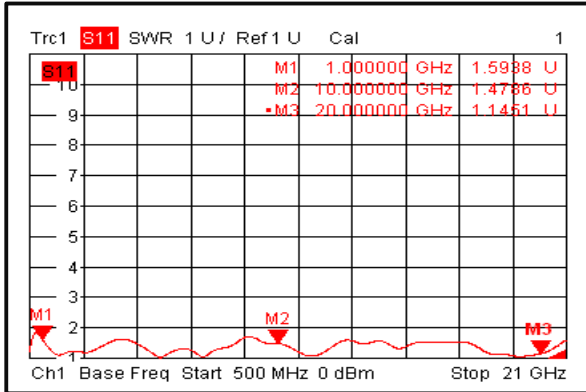
Output VSWR @+25°C



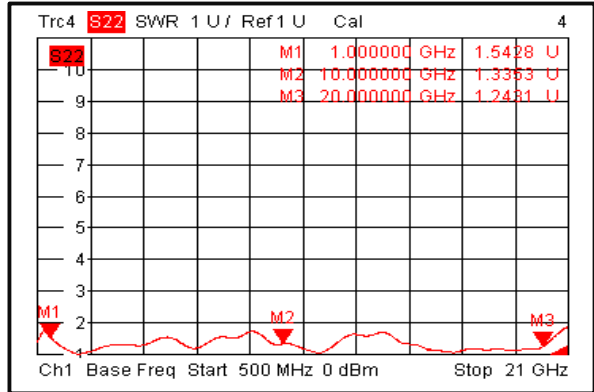
Insertion Loss @-45°C



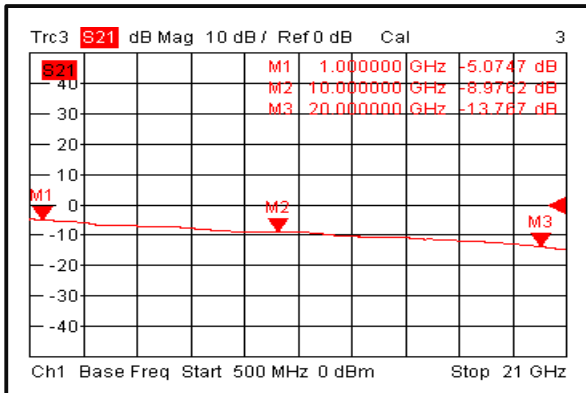
Input VSWR @-45°C



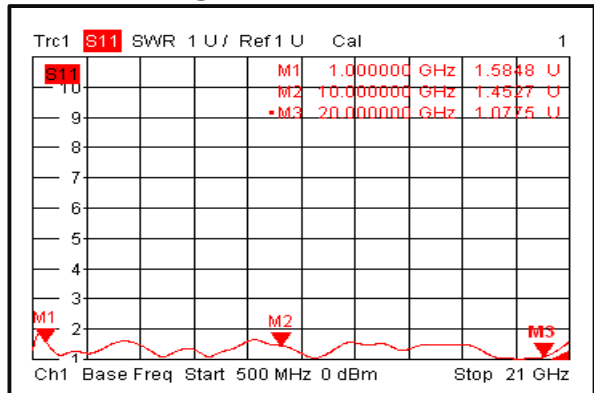
Output VSWR @-45°C



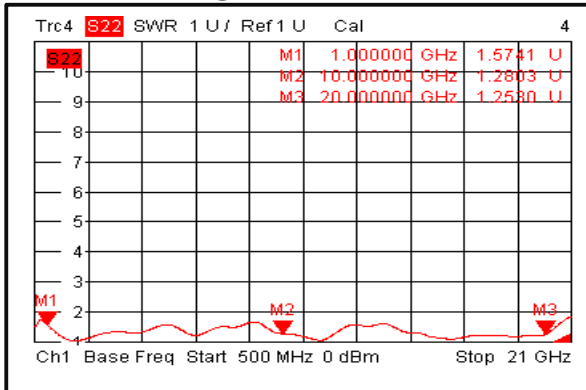
Insertion Loss @+85°C



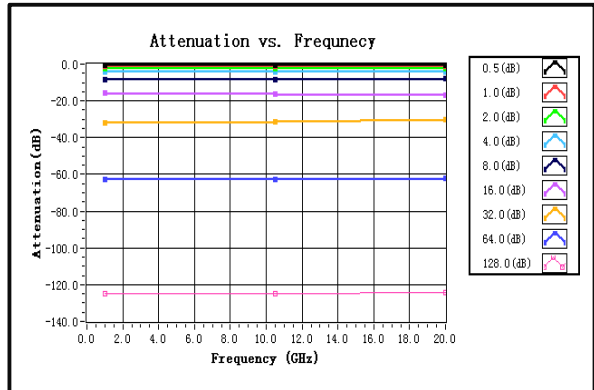
Input VSWR @+85°C



Output VSWR @+85°C



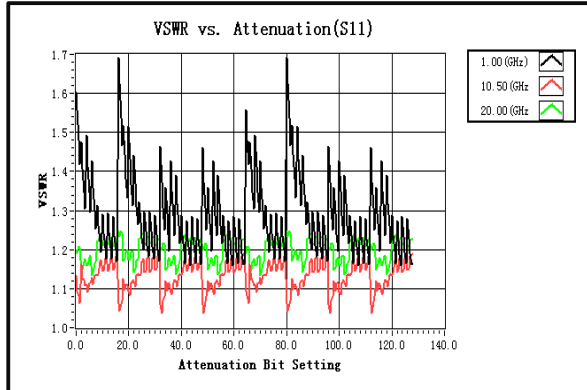
Attenuation vs. Frequency



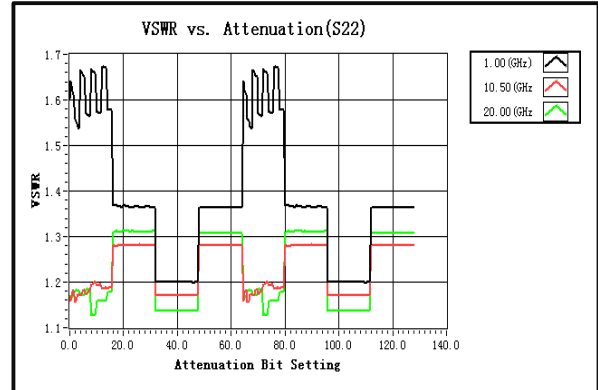
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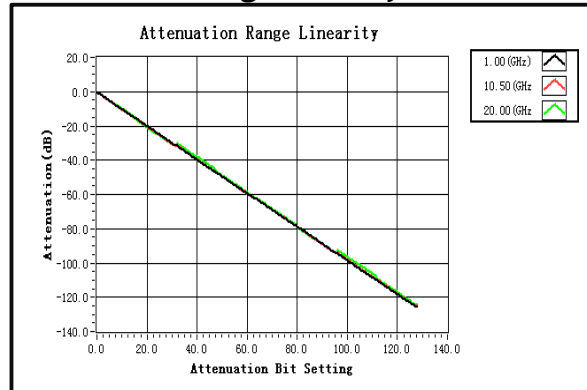
VSWR vs. Attenuation(S11)



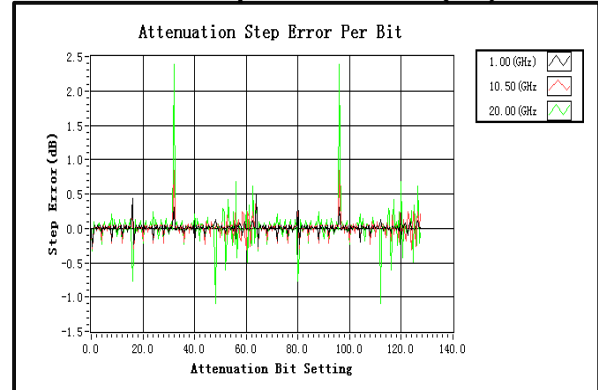
VSWR vs. Attenuation(S22)



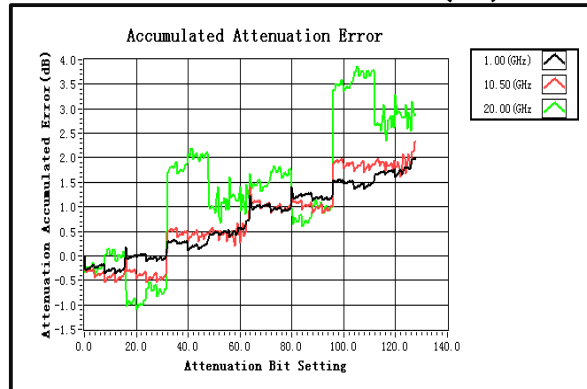
Attenuation Range Linearity



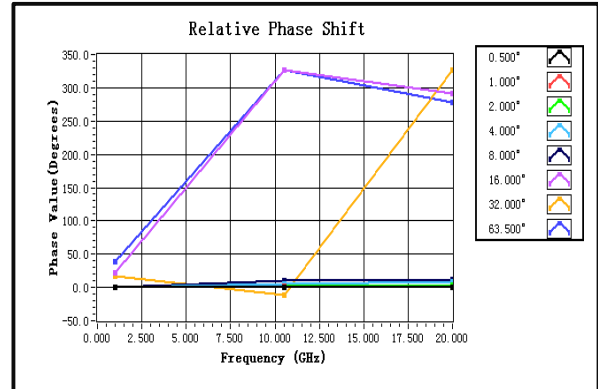
Attenuation Step Error Per Bit (dB)



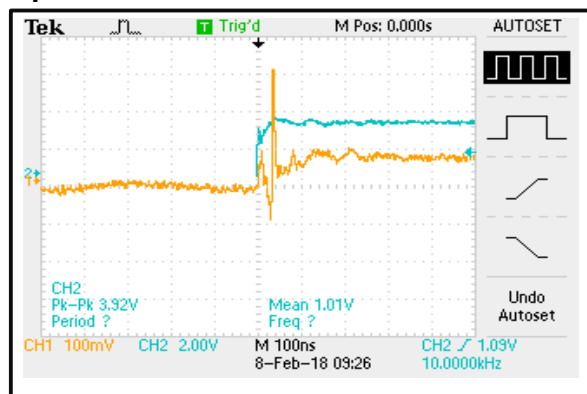
Accumulated Attenuation Error(dB)



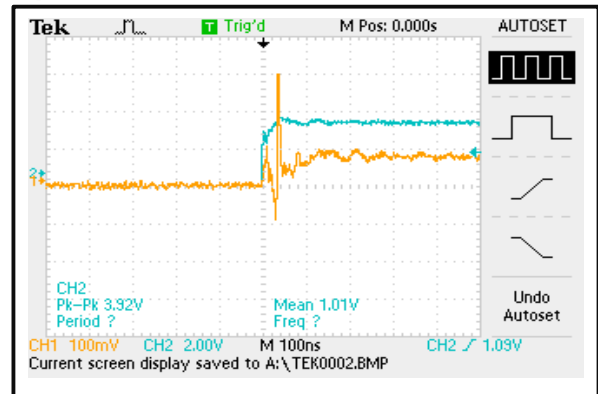
Relative Phase Shift



Speed



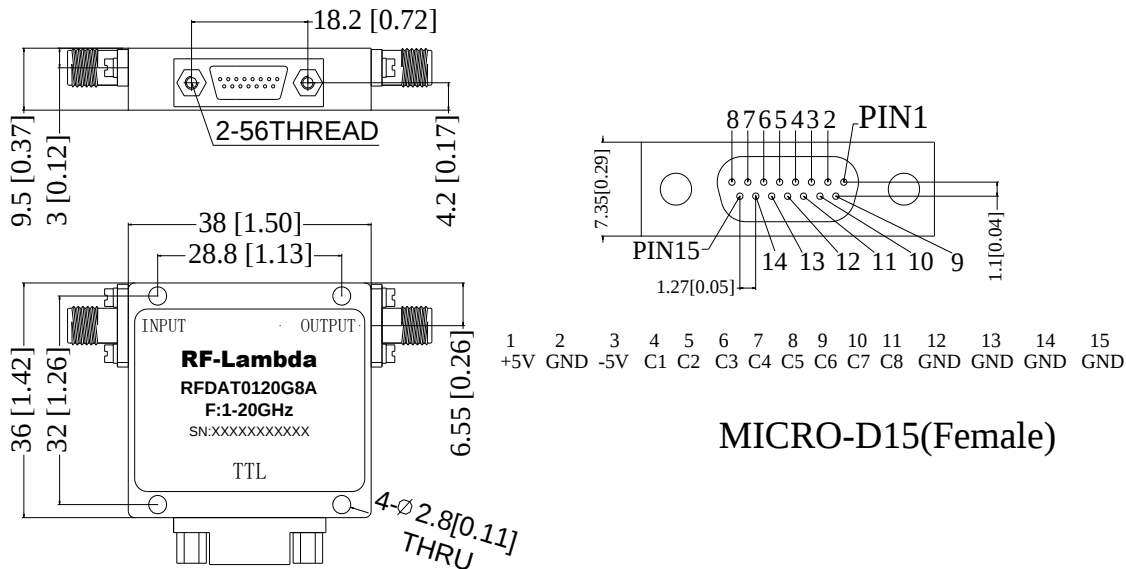
Speed





Outline Drawing:

All Dimensions in mm [inches]



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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