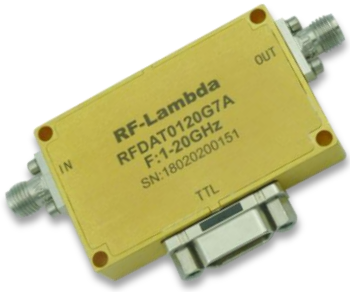
Absorptive Digital Control Attenuator
1 - 20GHz



Features

- Ultra Wide Band Operation 1-20GHz
- 0.5dB LSB Steps to 63.5dB
- Single Positive Control Line Per Bit

Typical Applications

- Wireless Infrastructure
- Military & Aerospace
- Test Instrument

Electrical Specifications, TA = +25 ℃, Vdd = +5V, Vgg = -5V, VCTL = 0 / +5V

Description	PN: RFDAT0120G7A									
	Absorptive Digital Attenuator									
Parameters	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	1		6	6		12	12		20	GHz
Attenuation Range		63.5	70		63.5	69		63.5	70	dB
Attenuation Flatness: (Referenced to Insertion Loss)		±1.5			±1.0			±1.5		dB
Control Bits	7									Bit
Control Step Size	0.5			0.5			0.5			dB
Insertion Loss		4.5	6.5		6.0	8.0		7.0	9.0	dB
Insertion Loss Temperature Coefficient			0.01			0.01		0.01		dB/°C
Input VSWR (All States)		1.8	2.3		1.8	2.0		1.8	2.3	: 1
Output VSWR (All States)		1.8	2.3		1.8	2.0		1.8	2.3	: 1
Input 0.1 dB Compression Point		27			27			27		dBm
IP3 Input		48			48			48		dBm
Switching Speed 50% CTRL* to 90% or 10%	150 Typ.									ns
Weight	1.25 Max.									ounces
Impedance	50									Ω
Bias Current (+5V/-5V)	120/70 Max.									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%
RF Input Power	+27dBm

Ordering Information

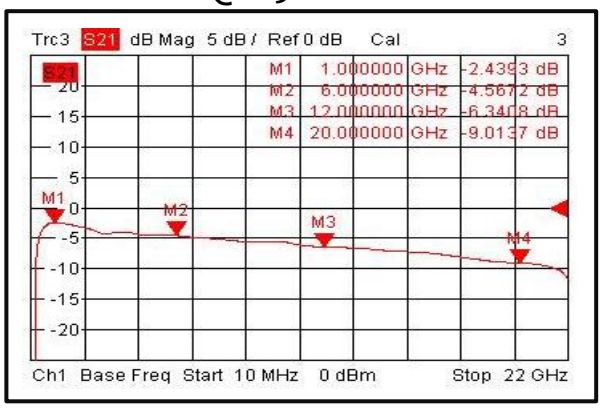
Part No.	ECCN	Description
RFDAT0120G7A	EAR99	1-20GHz Digital Control Attenuator

Environmental Specifications and Test Standards

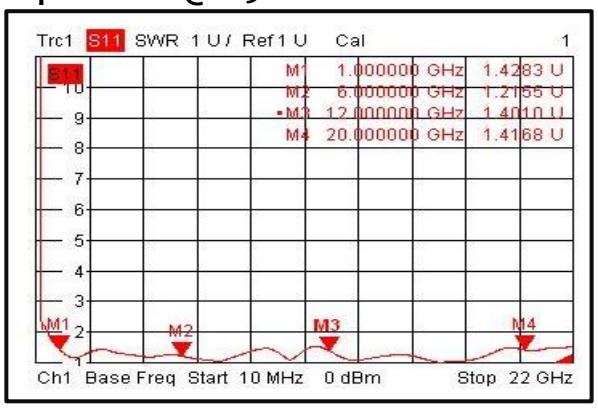
Parameter	Standard	Description
Operational Temperature	MIL-STD-39016	-45℃~+85℃
Storage Temperature		-55℃~+125℃
Thermal Shock		1 Hour@ -45℃ → 1 Hour @ +85℃ (5 Cycles)
Random Vibration		Acceleration Spectral Density 6 (m/s) Total 92.6 RMS
Electrical & Temperature Burn In		Temperature +85℃ for 72 Hours
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	MIL-STD-883 (For Hermetically Sealed Units)

Typical Performance Plots

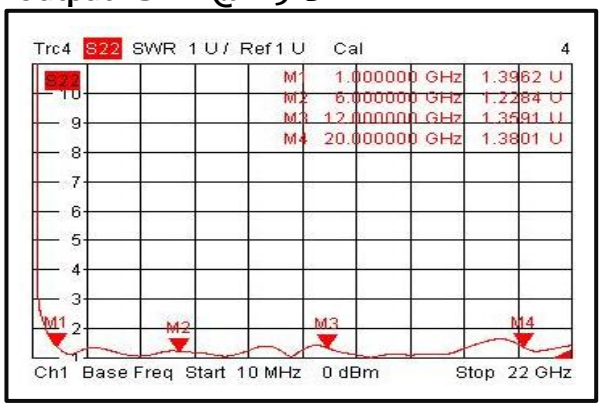
Insertion Loss @+25℃



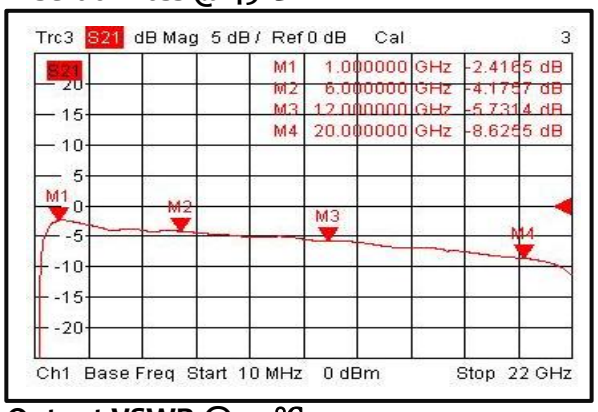
Input VSWR @+25℃



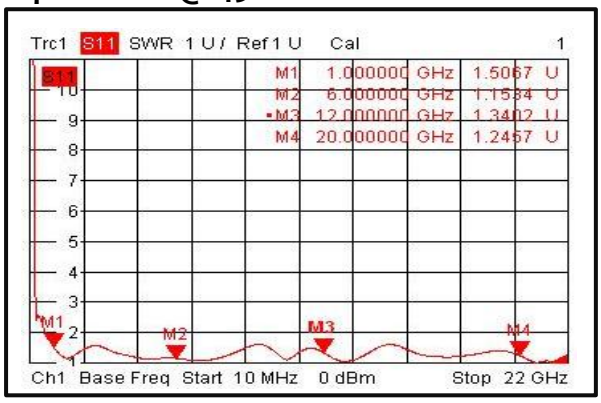
Output VSWR @+25℃



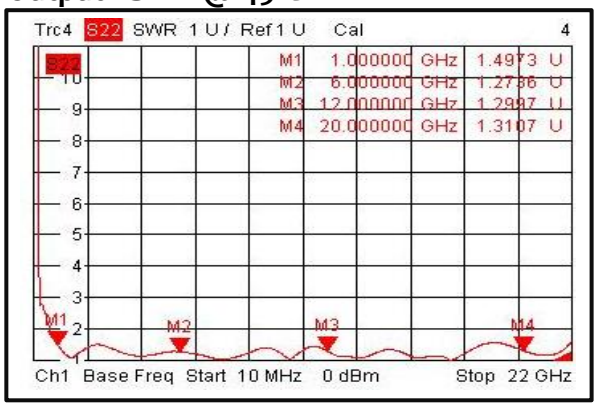
Insertion Loss @-45℃



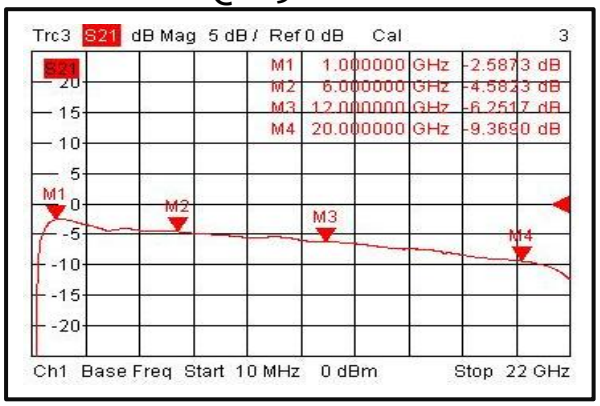
Input VSWR @-45℃



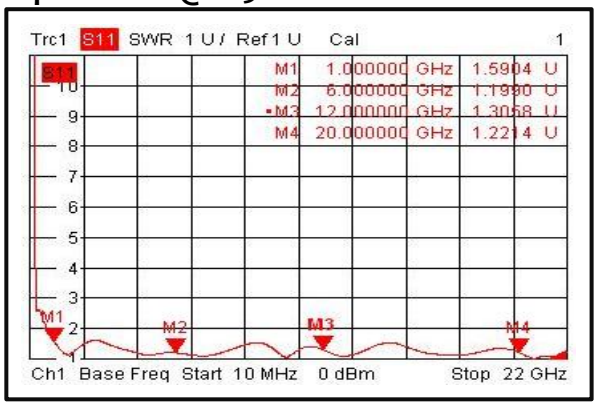
Output VSWR @-45℃



Insertion Loss @+85℃

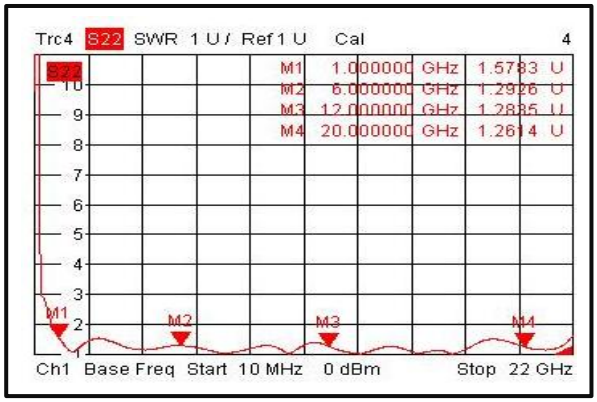


Input VSWR @+85℃

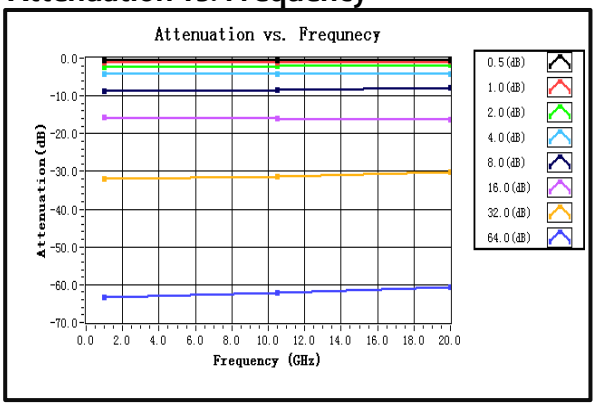


Absorptive Digital Control Attenuator 1-20GHz

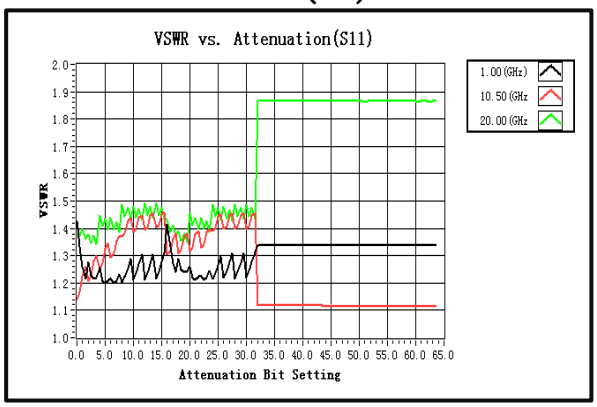
Output VSWR @+85℃



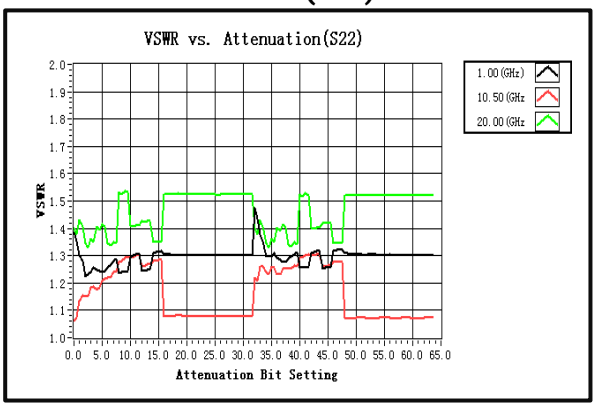
Attenuation vs. Frequency



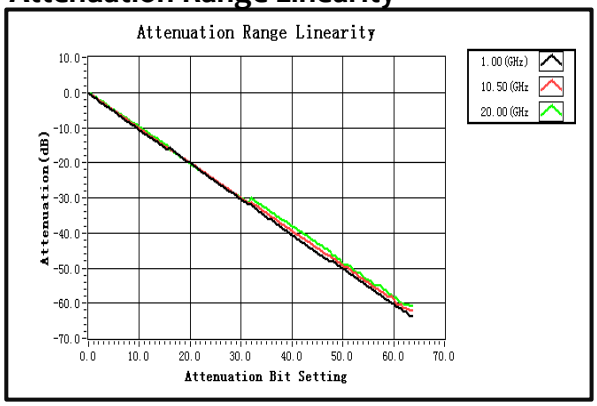
VSWR vs. Attenuation(S11)



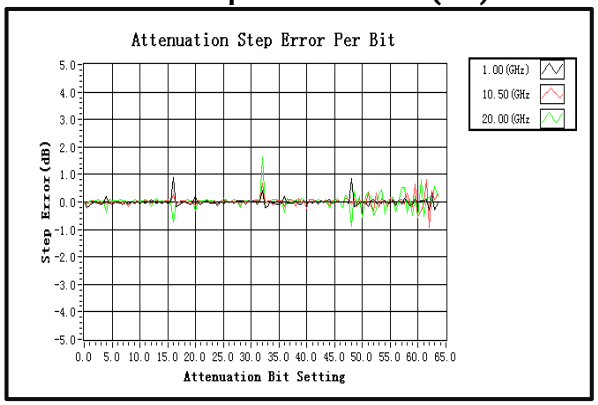
VSWR vs. Attenuation(S22)



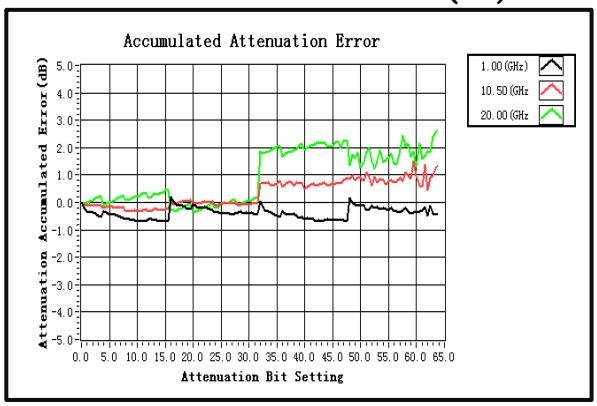
Attenuation Range Linearity



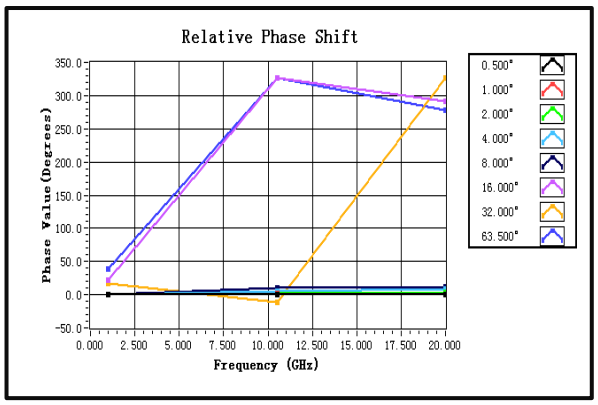
Attenuation Step Error Per Bit (dB)



Accumulated Attenuation Error (dB)

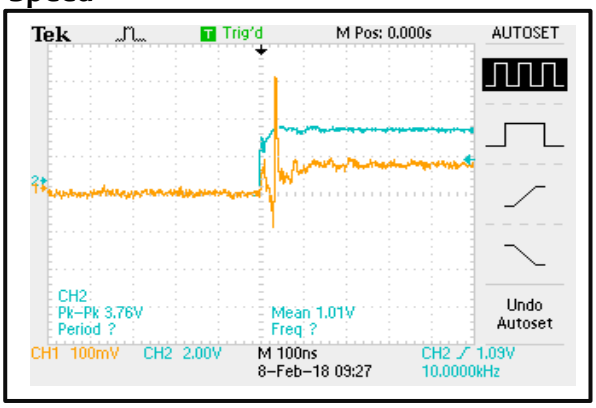


Relative Phase Shift

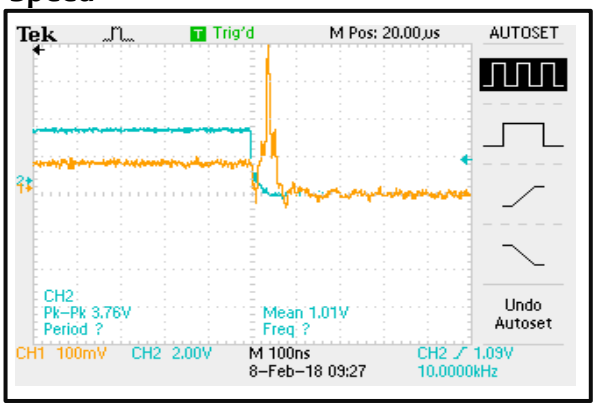


Absorptive Digital Control Attenuator 1-20GHz

Speed

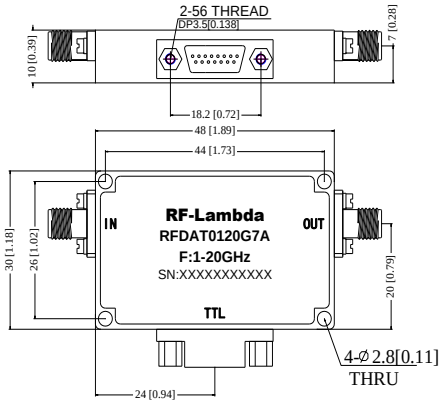


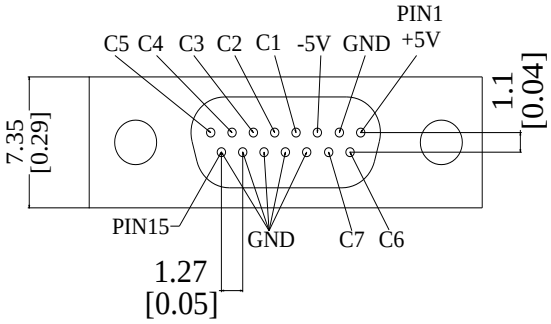
Speed



Outline Drawing:

All Dimensions in mm [inches]





MICRO-D15(Female)

Truth Table

TTL Control Voltage THRESHOLD							Low(0)=0~0.8V High(1)=2~5V
Control Voltage Input							Attenuation State
C7	C6	C5	C4	C3	C2	C1	
1	1	1	1	1	1	1	Reference IL
1	1	1	1	1	1	0	0.5dB
1	1	1	1	1	0	1	1dB
1	1	1	1	0	1	1	2dB
1	1	1	0	1	1	1	4dB
1	1	0	1	1	1	1	8dB
1	0	1	1	1	1	1	16dB
0	1	1	1	1	1	1	32dB
0	0	0	0	0	0	0	63.5db

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