



Absorptive Digital Control Attenuator 0.1-40GHz

Features

- Ultra Wide Band Operation 0.1-31GHz
- Functional Bandwidth : 0.1GHz to 40GHz
- 0.5dB LSB Steps to 15.5dB
- Single Positive Control Line Per Bit
- Customization available upon request



Parameter0	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	0.1-18			15-31			31-40			40-43.5			GHz
Attenuation Range		15.5	16.5		15.5	16		15.5	16.5		15.5	16.5	dB
Attenuation Flatness: (Referenced to Insertion Loss)		±0.6			±0.6			±1.0			±1.0		dB
Control Bits			5			5			5			5	Bit
Control Step Size		0.5			0.5			0.5			0.5		dB
Insertion Loss		3.5	4.0		5.0	6.0		6.5	7.5		8.5	9.0	dB
Insertion Loss Temperature Coefficient		0.03			0.03			0.03			0.03		dB/ °C
Input VSWR (All Atten. States)		1.4	2.0		1.7	2.0		2	2.3		3.0		: 1
Output VSWR (All Atten. States)		1.4	2.0		1.7	2.0		2	2.3		3.0		: 1
Input 0.1 dB Compression Point (P0.1dB)		27			27			27			27		dBm
IP3 Input(0dBm)		43			42			38			38		dBm
Switching Speed 50% CTRL* to 90% or 10%	100 Typ.												ns
Weight	1.3 Max.												ounces
Impedance	50												Ω
Bias Current (+5V /- 5V)	10/10 Max.												mA
Input / Output Connectors	2.92mm-Female												
Interface and Control Connector	MICRO-D9 (Female)												
Finish	Gold Plated												
Material	Aluminum												
Sealing	Hermetically Sealed (Optional)												



Absolute Maximum Ratings

Biasing	+5V / -5V ± 10%
RF Input power	+27dBm

Ordering Information

Part No.	Description
DBDA0500103100A	0.1-40GHz Digital Control Attenuator

Environmental Specifications

Operational Temperature	-40°C~+85°C
Storage Temperature	-50°C~+105°C
Altitude	30,000 ft. (Epoxy Sealed Controlled environment)
	60,000 ft. 1.0psi min (Hermetically Sealed Un-controlled environment) (Optional)
Vibration	25g RMS (15 degrees 2KHz) endurance, 1 hour per axis
Humidity	100% RH at 35°C, 95%RH at 40°C
Shock	20G for 11msec half sine wave, 3 axis both directions

Outline Drawing:

All Dimensions in mm (inches)
Housing Tolerances ± 0.1(0.004)

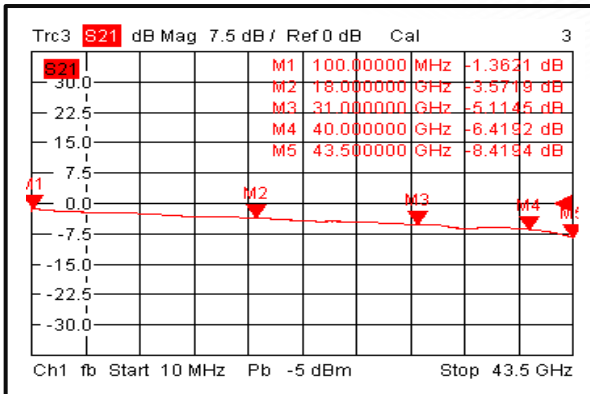
The drawing shows a side view and a top view of the attenuator. Key dimensions include: 9.5 [0.37] mm height, 6.5 [0.26] mm offset, 14.35 [0.56] mm length, 28 [1.10] mm total width, 24 [0.94] mm width, 8 [0.31] mm offset, 16 [0.63] mm offset, 20 [0.79] mm height, and 4-Ø2.8 [0.11] THRU holes. Pin configurations are labeled: PIN1 (5 4 3 2) and PIN6 (9 8 7). A MICRO-D9(Female) connector is shown with pins 1-9 labeled: +5V, -5V, GND, C1, C2, C3, C4, C5, NC.

Truth Table

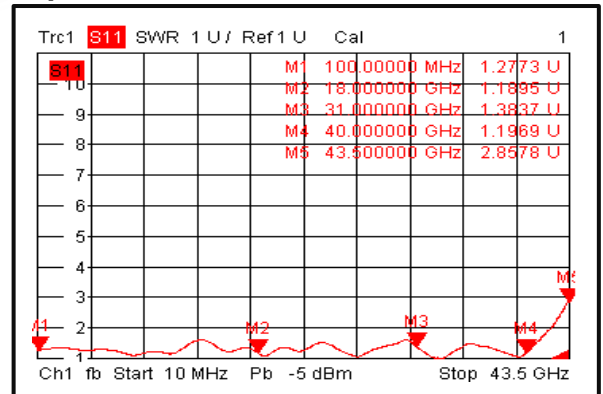
TTL Control Voltage					Low(0)=0~0.8V
					High(1)=2.8~5V
TTL Control Input					Attenuation State
C5	C4	C3	C2	C1	
1	1	1	1	1	Reference IL
1	1	1	1	0	0.5dB
1	1	1	0	1	1dB
1	1	0	1	1	2dB
1	0	1	1	1	4dB
0	1	1	1	1	8dB
0	0	0	0	0	15.5dB



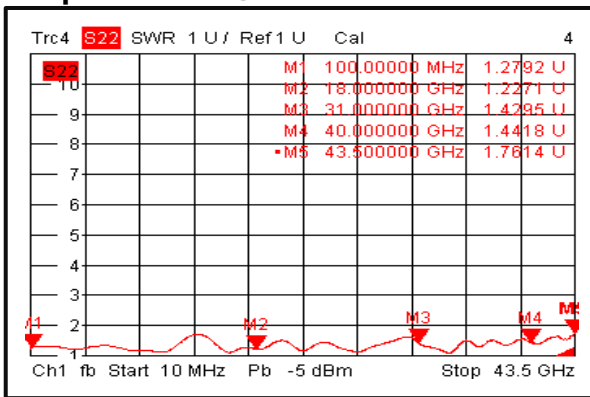
Insertion Loss @+25°C



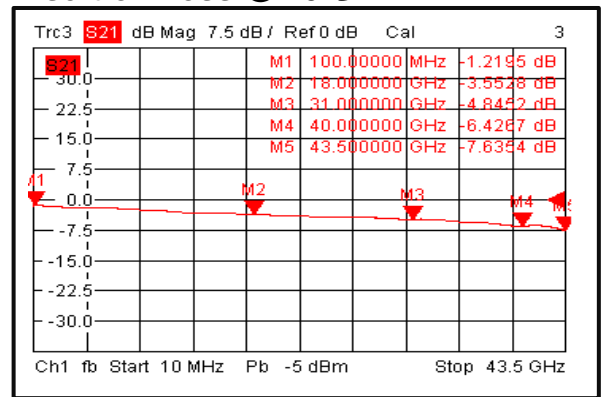
Input VSWR @+25°C



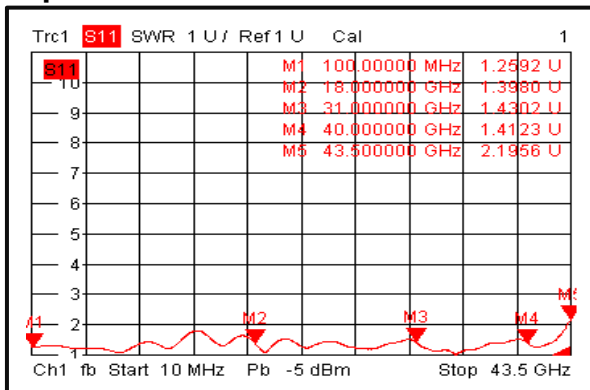
Output VSWR @+25°C



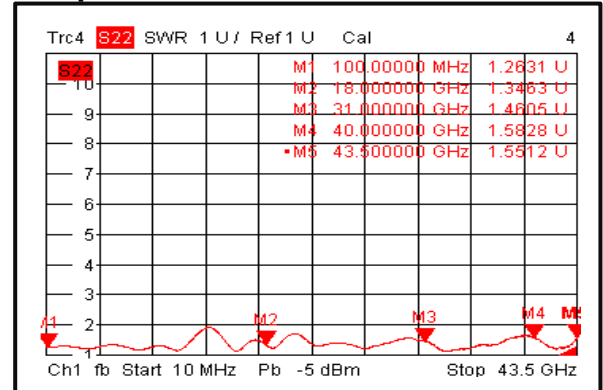
Insertion Loss @-40°C



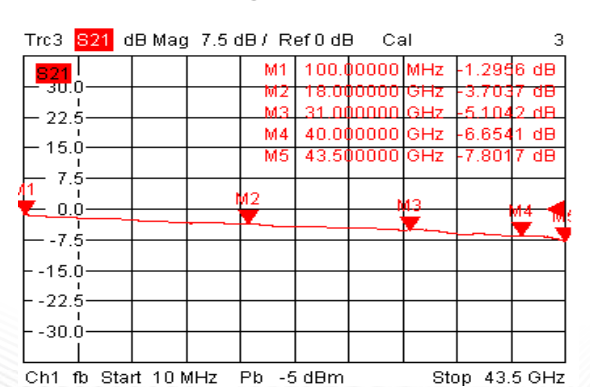
Input VSWR @-40°C



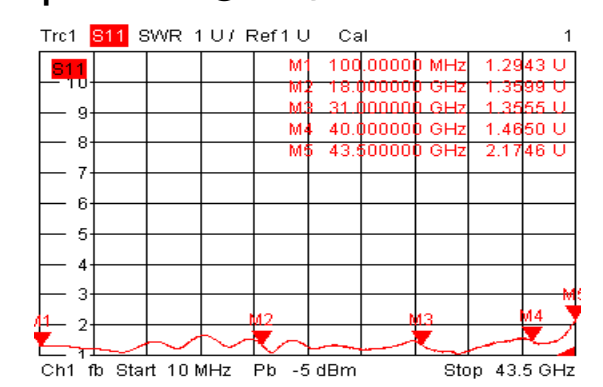
Output VSWR @-40°C



Insertion Loss @+85°C

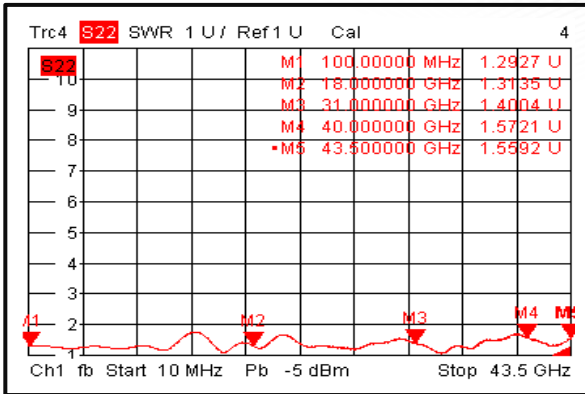


Input VSWR @+85°C

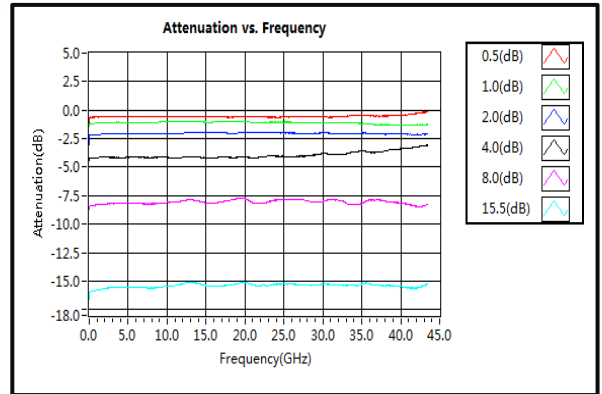




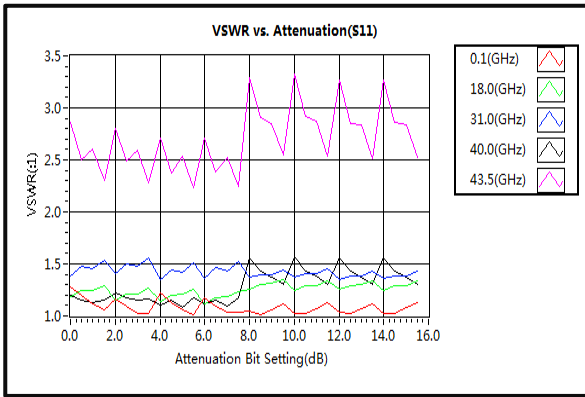
Output VSWR @+85°C



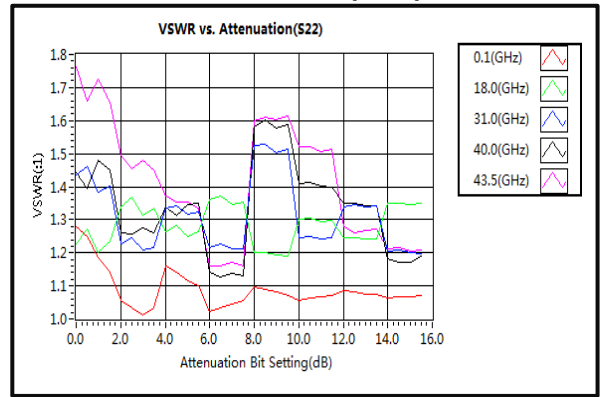
Attenuation vs. Frequency



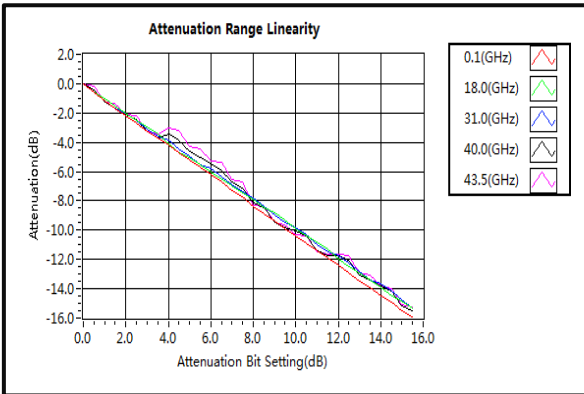
VSWR vs. Attenuation(S11)



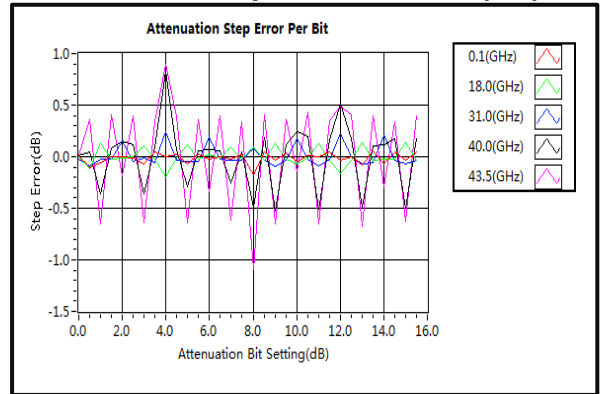
VSWR vs. Attenuation(S22)



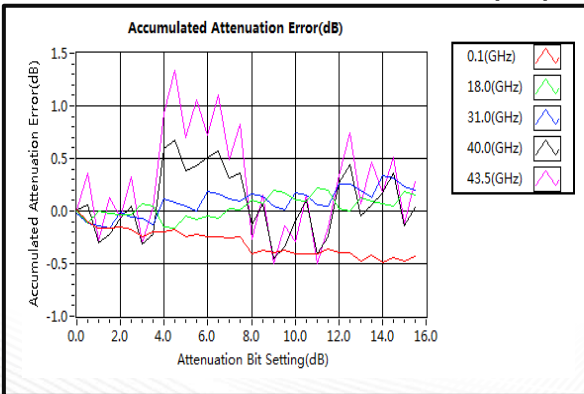
Attenuation Range Linearity



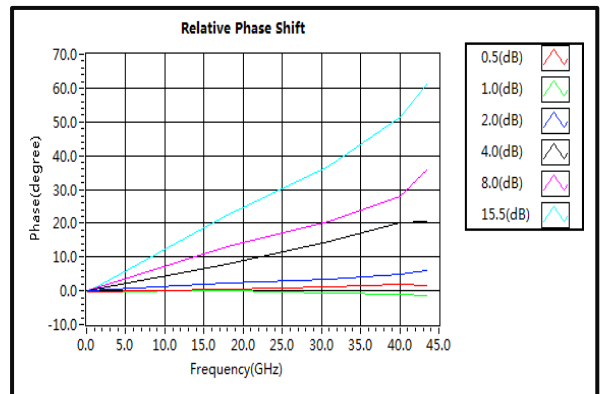
Attenuation Step Error Per Bit (dB)



Accumulated Attenuation Error (dB)

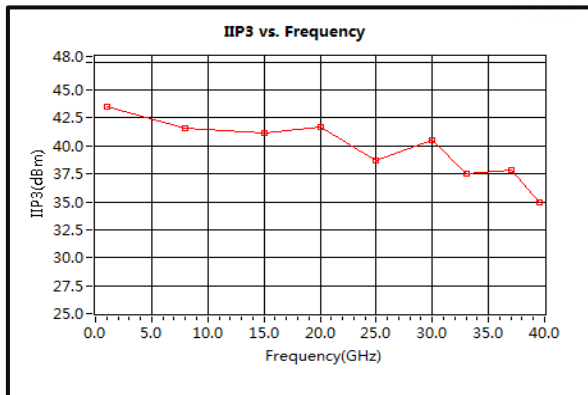


Relative Phase Shift

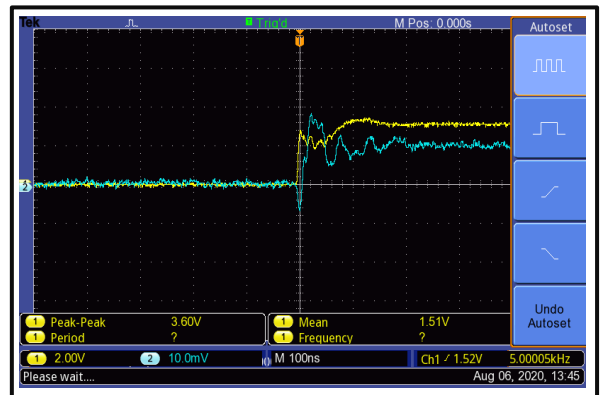




IIP3



Speed



Speed

