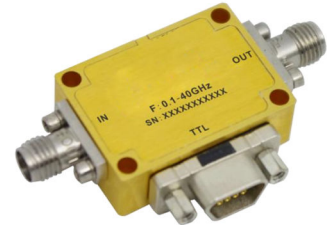




Absorptive Digital Control Attenuator 0.1-40GHz

Features

- Ultra Wide Band Operation 0.1-40GHz
- 1dB LSB Steps to 31dB
- Single Positive Control Line Per Bit



| Parameters | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Units |
|---|--------------------------------|-------|------|-------|-------|------|-------|-------|------|--------|
| Frequency Range | 0.1-18 | | | 18-30 | | | 30-40 | | | GHz |
| Attenuation Range | 30 | 31 | | 28 | 30 | | 28 | 30 | | dB |
| Attenuation Flatness: (Referenced to Insertion Loss) | | ±1.0 | | | ±1.5 | | | ±2.0 | | dB |
| Control Bits | | | 5 | | | 5 | | | 5 | Bit |
| Control Step size | 1 | | | 1 | | | 1 | | | dB |
| Insertion Loss | | 4.5 | 5.0 | | 6.0 | 7.5 | | 7.5 | 8.5 | dB |
| Insertion Loss Temperature Coefficient | | 0.003 | | | 0.003 | | | 0.003 | | dB/ °C |
| Input VSWR(All Atten. States) | | 1.6 | 1.7 | | 1.9 | 2.0 | | 1.9 | 2.2 | : 1 |
| Output VSWR (All Atten. States) | | 1.6 | 1.7 | | 1.9 | 2.0 | | 1.9 | 2.2 | : 1 |
| Input 0.1 dB Compression Point (P0.1dB) | | | 25 | | | 25 | | | 25 | dBm |
| IP3 Input | | 43 | | | 43 | | | 43 | | dBm |
| Switching Speed | | | 200 | | | 200 | | | 200 | ns |
| Weight | 1.06 | | | | | | | | | ounces |
| Impedance | 50 | | | | | | | | | Ω |
| Bias Current (+5V /- 5V) | 25/25 | | | | | | | | | 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±10%/-5V±10% |
| RF Input Power | 25dBm |

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 |

Ordering Information

| Part No. | Description |
|-----------------|--------------------------------------|
| DBDA0500104000A | 0.1-40GHz Digital Control Attenuator |

Outline Drawing:

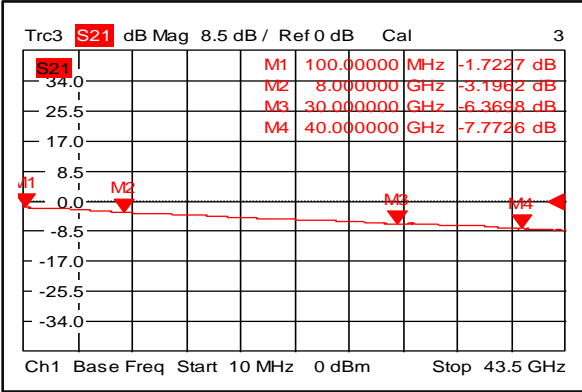
All Dimensions in mm (inches)

The drawing shows the physical dimensions of the attenuator. Key dimensions include: a total length of 5 [0.20] mm, a distance of 14.35 [0.56] mm from the left edge to the center of the DP3.5 connector, a distance of 9.5 [0.37] mm from the DP3.5 connector to the right edge, and a distance of 3 [0.12] mm from the right edge to the center of the DP3.5 connector. The DP3.5 connector is labeled '2-56THREAD DP3.5[0.138]'. The front view shows an IN and OUT port with a frequency range of 'F:0.1-40GHz' and a serial number 'SN:XXXXXXXXXX'. The TTL control pins are labeled 1 through 9. The pin configuration is: 1 (+5V), 2 (-5V), 3 (GND), 4 (C1), 5 (C2), 6 (C3), 7 (C4), 8 (C5), 9 (NC). The distance from the left edge to the center of the IN port is 20 [0.79] mm, and to the center of the OUT port is 16 [0.63] mm. The distance from the left edge to the center of the TTL pins is 14 [0.55] mm. The distance from the center of the TTL pins to the center of the IN port is 28 [1.10] mm, and to the center of the OUT port is 24 [0.94] mm. The distance from the center of the TTL pins to the right edge is 7.35 [0.29] mm. The distance between the center of the IN and OUT ports is 1.27 [0.05] mm. The distance from the center of the TTL pins to the center of the DP3.5 connector is 1.1 [0.04] mm. The distance between the center of the IN and OUT ports is 4-ø2.8 [0.11] THRU. The pin configuration is labeled 'MICRO-D9(Female)'. The truth table is provided below.

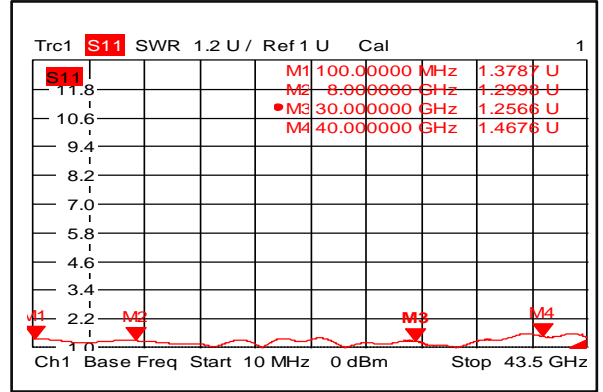
| Truth Table | | | | | |
|-------------------------------|----|----|----|----|---------------------------------|
| TTL Control Voltage THRESHOLD | | | | | Low(0)=0~0.8V High(1)=2.8~5V |
| Control Voltage Input | | | | | Attenuation State |
| C5 | C4 | C3 | C2 | C1 | |
| 1 | 1 | 1 | 1 | 1 | Reference IL |
| 1 | 1 | 1 | 1 | 0 | 1dB |
| 1 | 1 | 1 | 0 | 1 | 2dB |
| 1 | 1 | 0 | 1 | 1 | 4dB |
| 1 | 0 | 1 | 1 | 1 | 8dB |
| 0 | 1 | 1 | 1 | 1 | 16dB |
| 0 | 0 | 0 | 0 | 0 | 31dB |



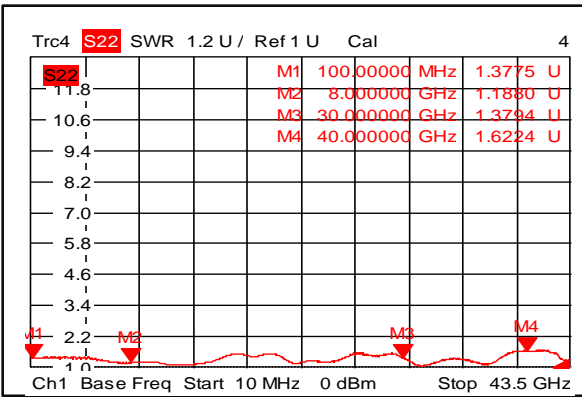
Insertion Loss @+25°C



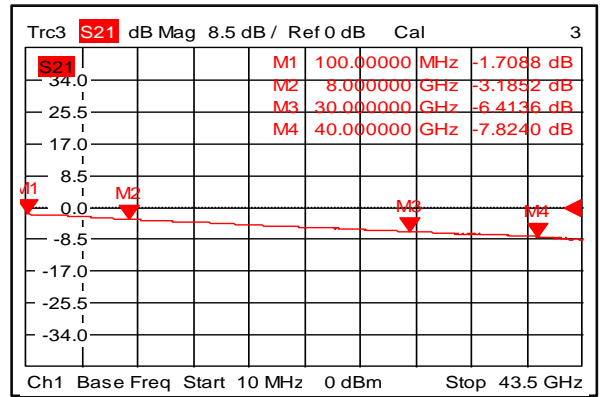
Input VSWR @+25°C



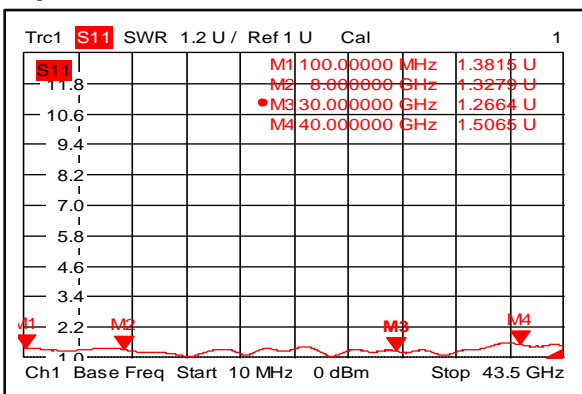
Output VSWR @+25°C



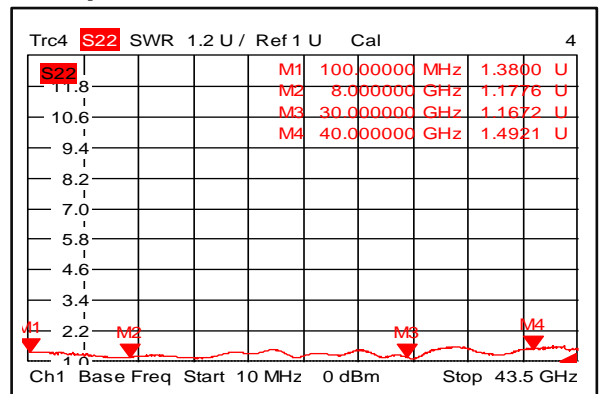
Insertion Loss @-40°C



Input VSWR @-40°C

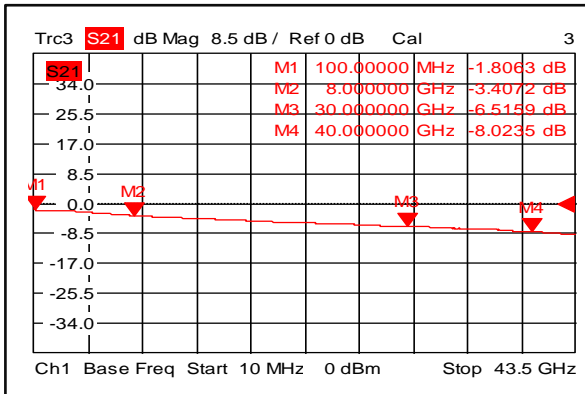


Output VSWR @-40°C

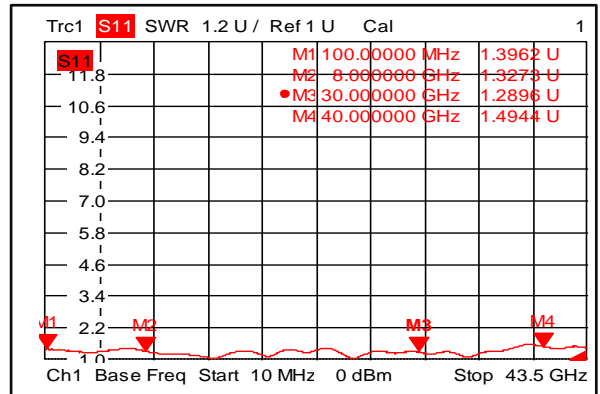




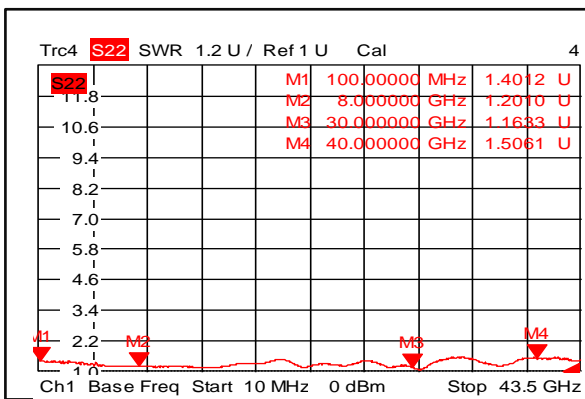
Insertion Loss @+85°C



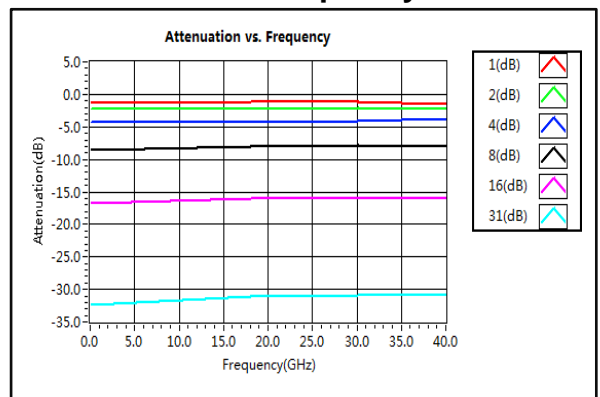
Input VSWR @+85°C



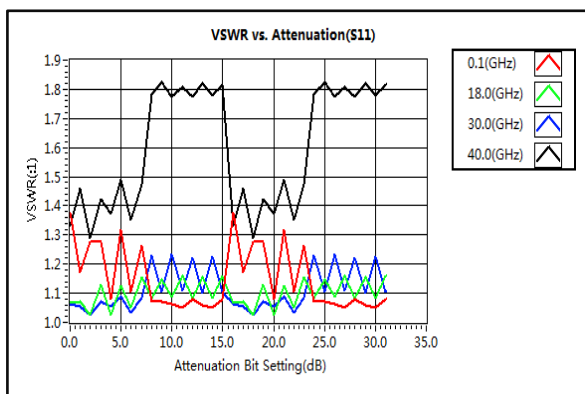
Output VSWR @+85°C



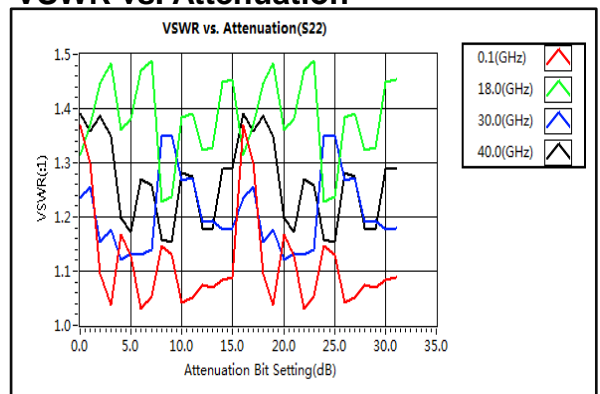
Attenuation vs. Frequency



VSWR vs. Attenuation

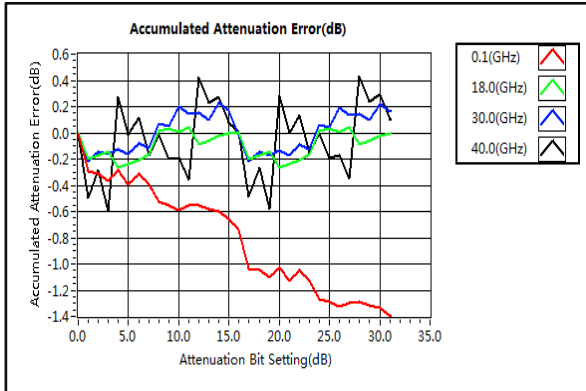


VSWR vs. Attenuation

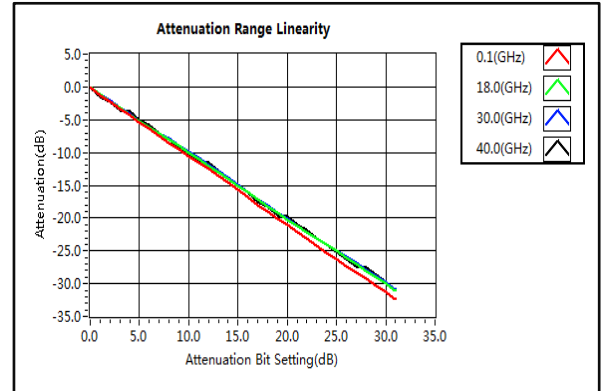




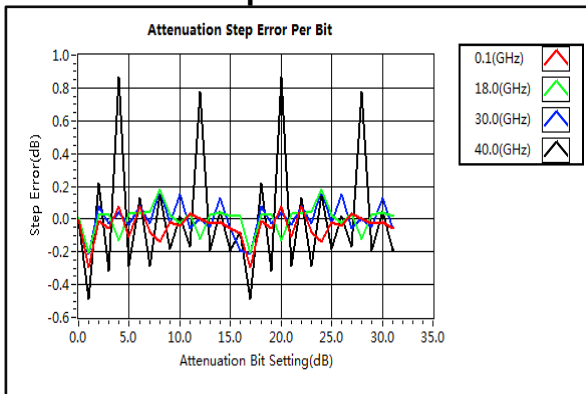
Accumulated Attenuation Error



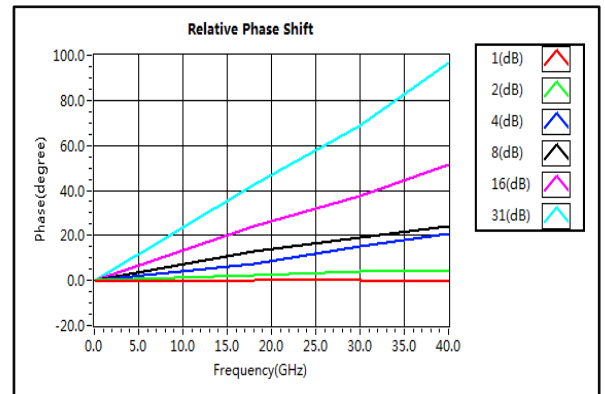
Attenuation Range Linearity



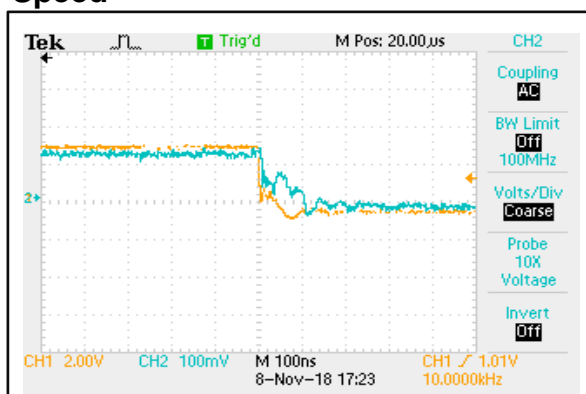
Attenuation Step Error Per Bit



Relative Phase Shift



Speed



Speed

