

Overview:

The 1.85mm 50dB Programmable Step Attenuator can achieve step attenuation from 0 to 50dB in the wide frequency range of DC to 67GHz, with a minimum step size of 10dB. It is mainly used to control the signal level entering the system, control the system's output signal power, adjust the matching between the signal source and the load, and can also be used to simulate signal transmission losses in communication systems.



Features:

- High attenuation accuracy
- Good repeatability
- Low insertion loss
- Long service life

Typical Applications:

- Broadband spectrum analyzers
- Broadband vector network analyzers
- Broadband synthesized signal sources
- Noise figure test instruments
- Microwave automatic test systems
- Wireless communication systems



Performance Characteristics

Frequency Range	DC~60GHz		
Attenuation	10dB	20dB	20dB
Attenuation Accuracy	$\pm 1.5\text{dB}$	$\pm 2.0\text{dB}$	$\pm 2.0\text{dB}$
Attenuation	50dB		
Step Size	10dB		
Connector Type	1.85mm		
	Electrical Connector Type: Spacing: 2.54mm x 2.54mm; Straight pin cross-section: 0.64mm x 0.64mm; Number of cores: 10		
Insertion Loss	$\leq 4\text{dB}$ (at 0dB)		
VSWR	≤ 2.0		
Repeatability	$\leq 0.05\text{dB}$ (typical value)		
Maximum Input Power	1W(CW)		
Minimum Service Life	1 million cycles (per level)		

Performance Characteristics

Operational Temperature	-20°C~+70°C
Storage Temperature	-55°C~+85°C
Shock(Operating Condition)	10g,6ms,three-axis six-direction
Vibration (Operating Condition)	Acceleration 5g,50~2000Hz
Humidity Resistance	240h@40°C,95%RH

Mechanical Characteristics

Weight	Maximum 0.35kg
Switching Speed	Maximum20ms
Relay Drive Voltage	20V~28V
	Rated Voltage:24V
Relay Drive Current	126mA(at ambient temperature, rated voltage, per level)

Attenuation Composition:

The programmable attenuator internally includes four sections, each of which can switch between a direct path and different attenuation pads to achieve switching between direct and attenuation.

For example, the first section includes a direct pad and a 10dB attenuation pad, the second section includes a direct pad and a 20dB attenuation pad, the third section includes a direct pad and a 20dB attenuation pad. The direct pad and attenuation pads can be combined to achieve attenuation from 0dB to 50dB. The specific combination method is as follows:

Attenuation	First Stage	Second Stage	Third Stage
0dB	○	○	○
10dB	×	○	○
20dB	○	×	○
30dB	×	×	○
40dB	○	×	×
50dB	×	×	×

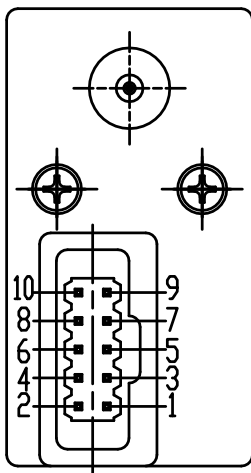
Note: ○ indicates that the transmission signal passes through the direct pad, × indicates that the transmission signal passes through the attenuation pad.

Control Mode:

To drive the relays inside the programmable step attenuator, a DC voltage of 20V to 28Vdc is required, with a driving current of 126mA (at ambient temperature, 24V driving voltage, per level). The relay has a latching device, and after the relay action, the internal driving circuit automatically cuts off the power supply, resulting in low power consumption. The relay switching time is $\leq 20\text{ms}$. To control the relay to choose between the direct pad or the attenuation pad, a TTL level input is required on the corresponding connector to achieve the function. The driving method is triggered by a falling edge (the falling edge from a high level to a low level is effective, and the low level must last more than 20ms). The specific control relationship is as follows:

Power: Connector pin 10 is the positive pole of the power supply (+20 to +28Vdc), rated voltage +24Vdc, pin 3 is the negative pole (ground).

Control: If this pin transitions from a TTL high level to a low level (0V to +1.0Vdc) and the low level lasts more than 20ms, and other pins (except pins 3 and 10) are at a TTL high level (+4.2V to +5Vdc), then each function is realized.



Pin 1	The first level pass-through
Pin 2	First level 10dB attenuation
Pin 4	second level straight through
Pin 5	Third level straight through
Pin 6	Not used
Pin 7	Not used
Pin 8	Third level 20dB attenuation
Pin 9	Second level 20dB attenuation

For example: To achieve 40dB attenuation, the connector should be powered as follows:

Pin 1	TTL high level transitions to low level and the low level lasts more than 20ms
Pin 2	TTL high level
Pin 3	Ground
Pin 4	TTL high level
Pin 5	TTL high level
Pin 8	TTL high level transitions to low level and the low level lasts more than 20ms
Pin 9	TTL high level transitions to low level and the low level lasts more than 20ms
Pin 10	+24Vdc

Cautions:

1. When powering the programmable step attenuator, pin 3 must be well grounded; otherwise, it may cause permanent damage to the internal components of the programmable step attenuator.
2. When installing the attenuator, to provide better shock resistance, please place the attenuator horizontally (i.e., the installation screws of the attenuator are perpendicular to the horizontal plane).
3. The attenuation pad can only withstand a maximum of 1W (CW) of power, so do not input more than 1W (CW) of power into the attenuator port at this time.
4. The programmable step attenuator port is a precision male connector and can only be connected with matching connectors. When connecting, pay attention to whether the port size meets the national standard requirements to avoid damaging the connector, affecting the device's specifications and service life. In addition, it is best to use a torque wrench when connecting and disconnecting the connectors. When not in use, cover the connectors with dust caps to prevent foreign objects from entering the attenuator and affecting the specifications.
5. The programmable step attenuator is a non-sealed attenuator, please store it in a dry and dust-free environment.