Overview：

The 1.85mm 70dB Programmable Step Attenuator can achieve step attenuation from 0 to 70dB 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~67GHz			
Attenuation	10	20	20	20
Attenuation Accuracy	±1.5	±2.0	±2.0	±2.0
Attenuation	70dB			
Step Amount	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	≤4.5dB(at 0dB)			
VSWR	≤2.0			
Repeatability	≤0.05dB(typical value)			
Maximum Input Power	1W(CW)			
Minimum Service Life	3 million cycles (per level)			

Performance Characteristics

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

Mechanical Characteristics

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

Attenuation Composition：

The programmed attenuator contains four parts inside,each part can be switched between the

pass-through and different attenuators to achieve the switch of pass-through and attenuation.

Such as the first part contains straight-through film and 10dB attenuator, the second part contains straight-through film and 20dB attenuator, the third part contains straight-through film and 20dB attenuator, the fourth part contains straight-through film and 20dB attenuator, straight-through film and attenuator combination can achieve 0dB ~ 70dB attenuation. The specific combination method is as follows:

Attenuation	First Stage	Second Stage	Third Stage	Fourth Stage
0dB	○	○	○	○
10dB	×	○	○	○
20dB	○	×	○	○
30dB	×	×	○	○
40dB	○	×	×	○
50dB	×	×	×	○
60dB	○	×	×	×
70dB	×	×	×	×

Note: ○ indicates that the transmission signal is transmitted through the straight-through piece, × indicates that the transmission signal is transmitted through the attenuation piece.

Control Mode：

The relay inside the drive program controlled stepping attenuator needs to provide 20V ~ 28Vdc DC voltage, and the drive current is 126mA (at room temperature, 24V drive voltage, each stage). Relay with latch device, relay action after the internal drive circuit automatically cut off the power supply, low power consumption. Relay switching time ≤20ms.

The control relay needs to input TTL level to the corresponding connector to select the through piece or the attenuation piece. The driving mode is triggered by the falling edge (the falling edge from high level to low level works, and the low level duration needs to be greater than 20ms). The specific control relationship is as follows:

Power : Pin 10 of the connector is the positive terminal of the power supply (+20~+28Vdc), rated voltage +24Vdc, pin 3 is the negative terminal (ground).

Control:If the pin changes from TTL high level to low level (0V~+1.0Vdc) and the low level duration is greater than 20ms, the other pins (except pin 3 and 10) are TTL high level (+4.2V~+5Vdc) to achieve their respective functions.
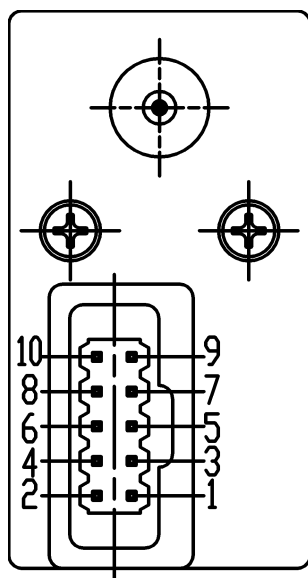
Pin 1	The first stage pass-through
Pin 2	First level 10dB attenuation
Pin 4	Second level straight through
Pin 5	Third level straight through
Pin 6	Fourth level straight through
Pin 7	Fourth level 20dB attenuation
Pin 8	Third level 20dB attenuation
Pin 9	Second level 20dB attenuation

For example: To achieve 30dB attenuation, the connector should be powered as follows:

Pin 1	TTL high
Pin 2	TTL high level to low level and low level duration greater than 20ms
Pin 3	Ground
Pin 4	TTL high level
Pin 5	TTL high level to low level and low level duration greater than 20ms
Pin 6	TTL high level to low level and low level duration greater than 20ms
Pin 7	TTL high level
Pin 8	TTL high
Pin 9	TTL high converts to low and low duration is greater than 20ms
Pin 10	+24Vdc

Cautions:

1. When powering the programmed stepping attenuator, pin 3 must be well grounded, otherwise it may cause permanent damage to the internal components of the programmed stepping attenuator.

2. When the attenuator is installed, in order to make it have better seismic performance, place the attenuator horizontally (that is, the mounting screw of the attenuator is perpendicular to the horizontal plane).

3. The attenuator can only withstand a maximum of 1W (CW) of power, so do not input more than 1W (CW) of power into this attenuator port at this time.

4. The programmable stepping attenuator port is a precision female connector, which can only be connected with its matching connector. At the same time, when connecting, attention should be paid to whether the port size to be connected meets the national standard requirements to avoid damage to the connector, affecting the indicators and service life of the device. In addition, when the connector is connected and disconnected, it is best to use a torque wrench. When not in use, the connector will be covered with a dust-proof cap to avoid excess into the attenuator internal impact indicators.

5. The programmed stepping attenuator is a non-sealed attenuator, please store in a dry and dust-free environment.