DC-40GHz 2.4mm115dB Programmable Step Attenuator P/N: YX-PSADC-40G-115-5P1

Overview:

The 2.4mm 115dB programmable step attenuator provides 0-115dB attenuation across a wide frequency range of DC-40GHz, with a minimum step size of 5dB. It offers high accuracy, good repeatability, low insertion loss, and long service life. This device is primarily used to control the signal amplitude entering the system, manage output power, adjust matching between the signal source and load, and simulate transmission path losses in communication systems. It is widely utilized in various broadband spectrum analyzers, vector network analyzers, synthetic signal sources, noise figure testers, and microwave automatic test systems for wireless communications.

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-40GHz		
Attenuation	115dB		
Step amount	5dB		
Connector	2.4mm		
Electrical connector	Pitch: 2.54mm x 2.54mm; Straight needle section: 0.64mm x 0.64mm; Number of cores: 14		
Frequency range:	DC to 7GHz	7 to 20GHz	20 to 40GHz
VSWR:	≤1.6	≤1.8	≤2.0
Insertion loss (dB) :	≤2dB	≤3dB	≤5dB
Attenuation accuracy	5±1dB	5±1dB	5±1.5 dB
	10±1dB	10±1dB	10±1.5 dB
	20±1dB	20±1dB	20±1.5 dB
Repeatability	≤0.05dB (typical value)		
Maximum input power	1W (continuous wave)		

Minimum service life	1 million times (per stage)
Working temperature	-20 ºC to+75 ºC
Storage temperature	-55 ºC to+85 ºC
Impact (working state)	10g, 6ms, three axes and six directions
Vibration (working state)	acceleration 5g, 50-2000Hz
Humidity resistance	240h@40 ºC, 95%RH

Mechanical Characteristics	
Weight	Maximum 0.42kg
Switching speed	Max. 20ms
Relay drive voltage, curren Relay drive voltage	20V ~ 28V, rated voltage: 24VRelay driving current: 126mA (rated voltage at room temperature, per stage)

Attenuation Quantity Composition:

The programmed attenuator contains five parts inside, each part can be switched between the direct and different attenuators to achieve the switch of direct and attenuator.

Such as the first part contains straight-through and 10dB attenuator, the second part contains straight-through and 40dB attenuator, the third part contains straight-through and 20dB attenuator, the fourth part contains straight-through and 40dB attenuator, the fifth part contains straight-through and 5dB attenuator, straight-through and attenuator can be combined to achieve 0dB ~ 115dB attenuation. The specific combination method is as follows:

Attenuation	First Stage	Second Stage	Third Stage	Fourth Stage	Fifth Stage
0dB	○	○	○	○	○
5dB	○	○	○	○	×
10dB	×	○	○	○	○
15dB	×	○	○	○	×
20dB	○	○	×	○	○
40dB	○	×	○	○	○
80dB	○	×	○	×	○
115dB	×	×	×	×	×

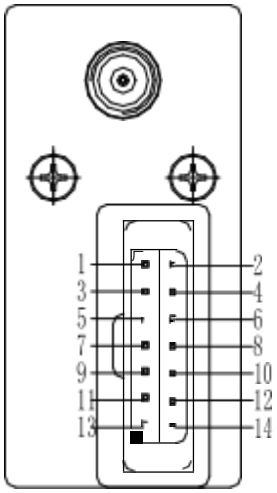
Note: ○ for the transmission signal through the transmission piece, × for the transmission signal through the attenuation piece transmission.

Control Mode:

The relay in the drive program-controlled stepping attenuator requires a DC voltage of 20V to 28V and a drive current of 126mA (at room temperature with a 24V supply for each stage). It features a latch that automatically cuts off power after activation, ensuring low power consumption. The relay switching time is ≤20ms.

The control relay needs TTL level input at the corresponding connector to select either pass-through or attenuation. Triggering occurs on the falling edge (transition from high to low), with the low level lasting more than 20ms. The specific control relationships are as follows:

Power supply: Pin 4 is the positive terminal (+20V to +28Vdc), rated at +24Vdc, while pin 9 is the negative terminal (ground). Control: When any pin changes from TTL high level to low level (0V to +1.0Vdc) for over 20ms, other pins (except pins 1, 2, 4, and 9) should be at TTL high level (+4.2V to +5Vdc) to function properly.



Pin 1	Unused
Pin 2	Unused
Pin 3	Second stage 40dB attenuation
Pin 4	+24Vdc
Pin 5	Fourth stage 40dB attenuation
Pin 6	Third stage 20dB attenuation
Pin 7	Third stage pass-through
Pin 8	Fourth stage pass-through
Pin 9	Ground
Pin 10	Second stage pass-through
Pin 11	First stage pass-through
Pin 12	First stage 10dB attenuation
Pin 13	Fifth stage pass-through
Pin 14	5th level 5dB attenuation

For example: to achieve 50dB attenuation, power the connector as follows:

Pin 3	TTL high level to low level and low level duration greater than 20ms
Pin 4	+24Vdc
Pin 5	TTL high level
Pin 6	TTL high level
Pin 7	TTL high level to low level and low-level duration greater than 20ms
Pin 8	TTL high level to low level and low-level duration greater than 20ms
Pin 9	Ground
Pin 10	TTL high level
Pin 11	TTL high level
Pin 12	TTL high level to low level and low-level duration greater than 20ms
Pin 13	TTL high level
Pin 14	TTL high level

Cautions:

1.When powering the programmed stepping attenuator, pin 9 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.