

KEYSIGHT TECHNOLOGIES (AGILENT HP)

84904L

The Keysight Technologies (formerly Agilent HP) 84904L is a high-performance coaxial programmable step attenuator operating from DC to 40 GHz. Designed for high reliability and integration in automated test equipment (ATE) systems, it offers an attenuation range of 0 to 11 dB in precise 1 dB steps. The unit utilizes miniature thin-film tantalum nitride attenuation cards on sapphire substrates to achieve exceptional accuracy, repeatability, and low SWR across its ultra-wide operating frequency.

SPECIFICATIONS

Physical

Power Supply	24 VDC / 15 VDC / 5 VDC solenoid actuation (option dependent)
Operating Temperature	0 to +55 °C °C
Weight	0.29 kg kg

RF Performance

Frequency Range	DC to 40 GHz
Attenuation Range	0 to 11 dB
Attenuation Step Size	1 dB
Nominal Impedance	50 Ω
Insertion Loss at 0 dB	0.8 dB + 0.04 dB/GHz
Maximum Insertion Loss (at 40 GHz)	2.4 dB
Maximum SWR (DC to 12.4 GHz)	1.3
Maximum SWR (12.4 to 34 GHz)	1.7
Maximum SWR (34 to 40 GHz)	1.8
Attenuation Repeatability	0.03 dB maximum
Maximum Continuous RF Input Power (Average)	1 W
Maximum Peak RF Input Power	100 W
Attenuation Card Material	Thin-film tantalum nitride
Attenuation Card Substrate	Sapphire

Mechanical & Connector

RF Connector Type (Standard)	2.4 mm female
RF Connector Options	2.4 mm (male/female) or 2.92 mm (male/female)
Operating Life	5 million switching cycles per section

Electrical & Actuation

Solenoid Nominal Voltage Options	24 V, 15 V, 5 V
Switching Speed (Actuation Time)	20 ms maximum

Performance

Number of Attenuator Sections	4
Attenuator Section Values	1 dB, 2 dB, 4 dB, 4 dB
Attenuation Accuracy (DC to 12.4 GHz)	±0.35 dB (1 to 4 dB), ±0.55 dB (5 to 8 dB), ±0.70 dB (9 to 11 dB)
Attenuation Accuracy (12.4 to 34 GHz)	±0.45 dB (1 to 4 dB), ±0.65 dB (5 to 8 dB), ±0.85 dB (9 to 11 dB)
Attenuation Accuracy (34 to 40 GHz)	±0.55 dB (1 to 4 dB), ±0.85 dB (5 to 8 dB), ±1.05 dB (9 to 11 dB)

Power & Solenoid

Solenoid Switching Current (Standard 24 V)	125 mA (nominal per section)
Solenoid Switching Current (Option 011 5 V)	300 mA (nominal per section)
Solenoid Switching Current (Option 015 15 V)	188 mA (nominal per section)
Solenoid Coil Resistance (Standard 24 V)	190 Ω
Solenoid Coil Resistance (Option 011 5 V)	17 Ω
Solenoid Coil Resistance (Option 015 15 V)	80 Ω

Environmental

Storage Temperature	-55 to +85 °C
Operating Altitude	Up to 4,600 m (15,000 ft)
Storage Altitude	Up to 15,200 m (50,000 ft)

TECHNOLOGY

Thin-film tantalum nitride on sapphire

APPLICATIONS

Coaxial programmable step attenuation for RF and microwave test systems

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