

Specifications

Electrical

Attenuation Accuracy ($\pm$ dB Referenced from 0-dB Setting):

Models 33320A/B/G/H (11 dB max)											
Frequency Range	Attenuator Setting (dB)										
	1	2	3	4	5	6	7	8	9	10	11
dc - 4 GHz (A, G only)	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
dc - 12.4 GHz (B, H only)	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.7
12.4 - 18.0 GHz (B, H only)	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9

* Typical step-to-step accuracy is ± 0.2 dB to 18 GHz.

Model Number	33321A/B/G/H (70 dB max)*										
	33322A/B/G/H (110 dB max)*										
Frequency Range	Attenuator Setting (dB)										
	10	20	30	40	50	60	70	80	90	100	110
dc - 4 GHz (A, G only)	0.2	0.4	0.5	0.7	0.8	1.0	1.2	1.3	1.5	1.6	1.8
dc - 12.4 GHz (B, H only)	0.5	0.7	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3
12.4 - 18 GHz (B, H only)	0.6	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4

* Typical step-to-step accuracy is ± 1 dB to 18 GHz.

Models 33321D/K (70 dB max)*							
Frequency Range	Attenuator Setting (dB)						
	10	20	30	40	50	60	70
dc - 12.4 GHz	0.6	0.7	0.9	1.8	2.0	2.2	2.3
12.4 - 18.0 GHz	0.7	0.9	1.2	2.0	2.3	2.5	2.8
18.0 - 24.0 GHz	0.9	1.5	2.5	3.0	3.2	3.3	3.5
24.0 - 26.5 GHz	1.0	2.5	3.0	4.2	4.4	4.6	4.8

* Typical step-to-step accuracy is ± 1 dB to 18 GHz
 ± 2 dB to 26.5 GHz

To insure guaranteed specifications for the 33321K, use the following combination of sections:

Attenuation (dB)	10	20	30	40	50	60	70
Recommended Sections to use	1	4	1,4	2,4	1,2,4	2,3,4	1,2,3,4

SWR (Characteristic Impedance: 50 ohms)

Model	Frequency (GHz)				
	dc - 4	4 - 8	8 - 12.4	12.4 - 18	18 - 26.5
33320A/G 33322A/G	1.5	—	—	—	—
33320B/H 33322B/H	1.5	1.5	1.6	1.9	—
33321A/G	1.35	—	—	—	—
33321B/H	1.35	1.35	1.5	1.7	—
33321D/K	1.6	1.6	1.6	1.9	2.2

Attenuation Temperature Coefficient: Less than 0.0001 dB/dB/°C.

Power Sensitivity: 0.001 dB/watt.

RF Input Power (max.): 1 watt average, 100 watts peak (10 μ s pulse width).

Life, Minimum: 1 million switchings per section.
Repeatability: 0.03 dB, typical after 1 million steps to 18 GHz, 0.05 dB, typical after 1 million steps to 26.5 GHz.

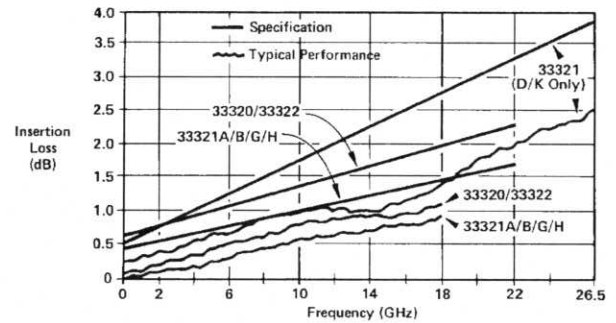
Insertion Loss (0 dB position, f is frequency in GHz):

33320A/B/G/H: $(0.6 + 0.09 f)$ dB

33321A/B/G/H: $(0.4 + 0.07 f)$ dB

33321D/K: $(0.5 + 0.13 f)$ dB

33322A/B/G/H: $(0.6 + 0.09 f)$ dB



Environmental Capabilities*

Temperature, Non-Operating: -55° to $+85^{\circ}$ C.

Temperature, Operating: -20° C to $+75^{\circ}$ C.

Altitude, Non-operating: 50,000 ft.

Altitude, Operating: 15,000 ft.

Humidity: Cycling 5 days, 40° C at 95% RH with condensation.

Shock, Operating: 10 g's, 6 ms, on six sides, three blows.

Vibration, Operating: 5 g's, 34-2000 Hz (for all models except the 33321D/K; 0.015 inches DA, 5 - 55 Hz (for the 33321D/K only).

*Additional environmental data provided on request.

Mechanical

Mounting Position: Any.

Net Weight:

33321 A/B: 198 grams (7 oz); G/H: 227 grams (8 oz); D: 255 grams (9 oz); K: 284 grams (10 oz).

33320 A/B: 255 grams (9 oz); G/H 284 grams (10 oz).

RF Connectors: SMA female for 33320,1,2A/B/G/H; APC-3.5 female (SMA compatible) for 33321D/K only.

Programmable Models (G, H, K)

Switching Speed: Max. 20 milliseconds including settling time.

Solenoids	Coil Voltage	Switching Current*	Nominal Coil Impedance
Standard (G, H, and K models)	24 V (20 - 30 V)	110 mA (@ 24 V)	220 Ω (70 mH)
Option 011 (G and H models only)	5 V (4 - 7 V)	300 mA (@ 5 V)	17 Ω (5.5 mH)

* Current per section; approximately 8 milliseconds duration before internal contacts open the coil circuit.

Accessory Provided:

Solenoid drive plug on 5-foot cable included with programmable models. (Replacement plug and cable assembly available as HP Part Number 8120-2178.)