

Amplifiers

Microwave Amplifiers

HP 8348A Microwave Amplifier

Specifications

Frequency Range: 2.0 to 26.5 GHz

Maximum Output Power (at 0 dBm input):

1.0 to 2.0 GHz: $\geq +20$ dBm (typical)

2.0 to 20.0 GHz: $\geq +25$ dBm

20.0 to 26.5 GHz: $\geq +23$ dBm

Power Flatness (at 0 dBm input): ± 4 dB (typical)

Minimum Small Signal Gain (at -15 dBm input):

1.0 to 2.0 GHz: ≥ 20 dB (typical)

2.0 to 20.0 GHz: ≥ 25 dB

20.0 to 26.5 GHz: ≥ 23 dB

Spectral Purity

Harmonics (typical, at maximum specified output power):

1.0 to 2.0 GHz: < -20 dBc

2.0 to 26.5 GHz: < -15 dBc

Third-Order Intercept

2.0 to 20.0 GHz: $+36$ dBm, nominal

20.0 to 26.5 GHz: $+31$ dBm, nominal

Maximum Continuous Input

Microwave power: $+22$ dBm

DC voltage: ± 10 V

Input and Output Impedance: 50Ω , nominal

Input SWR: 3:1 (typical)

Output SWR (typical):

1.0 to 2.0 GHz: 6:1

2.0 to 20.0 GHz: 4.5:1

20.0 to 26.5 GHz: 2:1

Reverse Isolation: > 50 dB (typical)

Noise Figure (typical):

1.0 to 20 GHz: < 10 dB

20 to 26.5 GHz: < 13 dB

Pulse Transmission Capability

Rise/Fall Time: < 5 ns (typical)

Delay Time: < 5 ns (typical)

General

Input and Output Connectors: 3.5 mm male

Power Requirement: 50 to 400 Hz, 100, 120, 200, or 240 volts ac ($\pm 10\%$); 85 VA maximum

Size: 133 mm H x 214 mm W x 366 mm D (5.2 in x 8.4 in x 14.4 in)

Weight: Net, 7 kg (15 lb); shipping, 14 kg (31 lb)

Ordering Information

HP 8348A 2 to 26.5 GHz Microwave Preamplifier

HP 8349B Microwave Amplifier

Frequency Specifications

Frequency Range: 2 to 20 GHz

Output and Input Specifications (25° C \pm 5° C)

Minimum Output Power (at $+5$ dBm input)

Frequency Range (HGz)	Output Leveled	Output Unleveled
2.0 to 18.6	19 dBm (80 mW)	20 dBm (100 mW)
18.6 to 20.0	17 dBm (50 mW)	18 dBm (63 mW)

1 dB Compression Point: $+21$ dBm, nominal

Power Flatness (leveled): ± 1.25 dB

Minimum Small Signal Gain (at -5 dBm input):

2.0 to 18.6 GHz: 15 dB

18.6 to 20.0 GHz: 13 dB

Noise Figure: < 13 dB, typical

Input and Output Impedance: 50Ω , nominal

VSWR

Frequency Range (GHz)	Input	Output Leveled	Output Unleveled (typical)
2.0 to 5.0	≤ 2.8	≤ 2.5	≤ 4.8
5.0 to 11.0	≤ 2.8	≤ 2.5	≤ 3.8
11.0 to 18.0	≤ 2.8	≤ 2.5	≤ 3.2
18.0 to 20.0*	≤ 2.8	≤ 2.5	≤ 3.2

*VSWR from 18.0 to 20.0 GHz is typical

Maximum Continuous Input, to the Input or Output Ports:

$+27$ dBm (RF), ± 10 Vdc

Spectral Purity

Harmonics (at $+20$ dBm output): 2.0 to 11.0 GHz: < -20 dBc;

11.0 to 20.0 GHz: < -30 dBc typical

Non-Harmonic Spurious: ≤ -55 dBc

Third-Order Intercept: $+33$ dBm, nominal

Pulse Transmission Capability

Rise/Fall Time: < 10 ns typical

General

Reverse Isolation: > 50 dB, typical

RF Input and Output Connectors: Type-N female

Size: 214 mm W x 133 mm H x 366 mm D (8.36 in x 5.2 x 13.6 in)

Weight: Net, 7 kg (15 lb); shipping, 14 kg (31 lb)

Ordering Information

HP 8349B 2 to 20 GHz Microwave Amplifier

Opt 001 Rear Panel RF Input/Output

Opt 002 Rear Panel RF Input w/Front Panel RF Output

Opt W30 Extended Repair Service (see page 70)

HP 8449B Preamplifier

Specifications

Frequency range	1.0 to 26.5 GHz		
Gain (mean, per channel)	≥ 26 dB (20° to 30° C)		
Gain flatness across full freq. range	1 to 26.5 GHz ± 4.5 dB (0° to 55° C); 2 to 22 GHz ± 2.4 dB (20° to 30° C)		
Noise figure	Band	Typical	
	1.0 to 12.7 GHz	≤ 8.5 dB	7 dB
	12.7 to 22.0 GHz	12.5 dB	9 dB
	22.0 to 26.5 GHz	≤ 14.5 dB	12 dB

Output power for 1 dB gain compression $\leq +7$ dBm (characteristic)

Harmonic distortion -30 dB for 0 dBm output (characteristic)

Output for < -60 dB harmonic distortion -30 dBm (characteristic)

VSWR	Input	1.0 to 2.0 GHz	2.0:1
		2.0 to 12.5 GHz	1.5:1
		12.5 to 26.5 GHz	2.0:1
	Output	1.0 to 26.5 GHz	2.0:1

Reverse isolation > 75 dB

Maximum dc voltage ± 20 V

Displayed average noise level, 0 dB atten. (characteristic)

HP 8563E (1 Hz RBW)	HP 8566B (10 Hz RBW)
1.0 to 6.46 GHz, -165 dBm	1.0 to 2.5 GHz, -55 dBm
5.86 to 13.0 GHz, -163 dBm	2.0 to 5.8 GHz, -154 dBm
12.4 to 26.5 GHz, -160 dBm	5.8 to 12.5 GHz, -150 dBm
	12.5 to 18.6 GHz, -144 dBm
	18.6 to 22 GHz, -140 dBm

Size: 213 mm W x 102 mm H x 297 mm D (8.4 in x 4.0 in x 11.7 in)

Weight: Net, 4 kg (8.8 lb) nominal

Power: 100, 120, 220, or 240 V, $\pm 10\%$; 47 to 63 Hz

Ordering Information

HP 8449B 1 to 26.5 GHz Preamplifier

Opt 907 Front Handle Kit

Opt 908 Rackmount Kit (half-rack width)

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