

# AMPLIFIERS

## Microwave Amplifier

### Model 8349B

- Continuous 2 to 20 GHz coverage
- 15 dB gain to 18.6GHz:



HP 8349B

The HP 8349B Microwave Amplifier delivers increased microwave power performance across a 2 to 20 GHz frequency range. This general-purpose broadband power amplifier is designed for maximum reliability and configured for the greatest convenience in interfacing with Hewlett-Packard's microwave sources, the HP 8350B Sweep Oscillator, HP 8340B/8341B/8360 Series Synthesized Sweepers, and HP 8671B, 8672A, or 8673 series Synthesized Signal Generators.

Providing 100 mW (+20 dBm) of unlevelled output power from 2 to 18.6 GHz, 63 mW (+18 dBm) from 18.6 to 20 GHz, the HP 8349B offers one of the broadest operating bandwidths available from a solid-state power amplifier. This performance is achieved using a multiple stage GaAs FET design, resulting in > 15 dB of gain from 2 to 18.6 GHz, and > 12 dB of gain from 18.6 to 20 GHz.

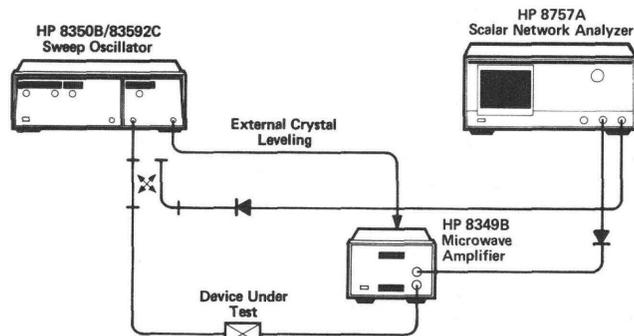
The HP 8349B can also provide externally-leveled output power without using an external coupler and detector, since these components are built-in and are compatible with Hewlett-Packard microwave sources. The HP 8349B is also equipped with an output power display, minimizing the need for an external power meter and enhancing the amplifier's utility. For example, the HP 8349B can be placed at the end of a long RF cable where the microwave output needs to be amplified, leveled and monitored.

Naturally, the versatile power control features of the microwave source (e.g., calibrated power, power sweep, power slope and remote power control via the Hewlett-Packard Interface Bus) can be accurately transmitted through the HP 8349B during external leveling operations.

The HP 8349B also has a built-in source module interface, enabling it to properly bias and control the HP 83550 series millimeter-wave source modules. Using the HP 8349B and a millimeter source module extends the capabilities of any 11 to 20 GHz HP microwave source to millimeter-wave frequencies.

### Applications

The broadband high power of the HP 8349B is ideal, whether in a versatile bench-top arrangement or a dedicated rack-mount system. In antenna testing, the HP 8349B can be placed at the end of long RF cables, delivering high power right to the device under test. In EW/ECM systems, the HP 8349B can be combined with the HP 8340B/8341B/8360 Series, or the HP 8673 series Synthesized Signal Generators to provide high power pulses with little degradation in pulse performance. The HP 8349B is also an excellent choice as a microwave driver for TWTs, high power amplifiers, or mixers. And with a typical noise figure < 13 dB, the HP 8349B is often used as a pre-amplifier for spectrum analyzers and frequency counters.



Extended Dynamic Range Configuration

- 100 milliwatts across 2 to 18,6 GHz
- <13 dB typical noise figure

The dynamic range of a scalar network analyzer measurement system is limited by the maximum output power of the microwave source and the sensitivity of the detectors. Using the illustrated configuration, up to 100 dB of dynamic range can be achieved by combining the calibrated dynamic range of the reference detector (R) with that of the transmission detector (B) in a ratio measurement (B/R). The HP 8349B makes this possible by extending the external crystal leveling power control of the microwave source. Hewlett-Packard Application Note 327-1 discusses this application in detail.

RFI susceptibility tests can also greatly benefit from the high quality amplifying characteristics of the HP 8349B.

### Frequency Specifications

Range: 2-20 GHz

### Output and Input Specifications (25°C ±5°C)

Minimum Output Power (at +5dBm input):

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

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: 15dB

18.6 to 20.0 GHz: 13dB

Noise Figure: <13 dB, typical

Impedance (Input and Output): 50 ohms, nominal

VSWR:

Frequency Range (GHz)	Input	Output	
		Leveled	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), ±10V (DC)

### 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/Output Connectors: Type N Female

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

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 with Front Panel RF Output

Opt W30 Two Years Extended Service

Price HP8349B 2 to 20

\$8,000

add \$100

add \$100

add \$140