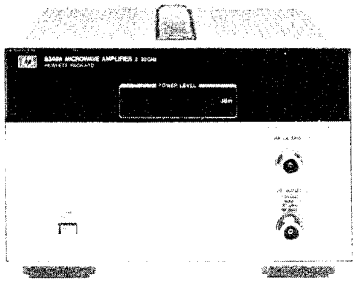
- Continuous 2 to 20 GHz coverage
- 15 dB gain



HP 8349A

The HP 8349A 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, namely, the HP 8350 or HP 8620C sweep oscillators, the HP 8340A/8341A synthesized sweepers, and the HP 8672A or 8673 synthesized signal generators.

Providing 100 mW (+20 dBm) of unleveled output power and 80 mW (+19 dBm) of leveled power from 2 to 18.6 GHz (typically to 20 GHz), the HP 8349A is one of the most broadband solid-state power amplifiers available today. This general-purpose, broadband power performance is achieved using a GaAs FET design of multiple stages. This multiple stage design provides more than 15 dB of gain over the full 2 to 20 GHz range.

Externally leveled output power can also be provided by the HP 8349A without using an external coupler and detector, since these external leveling components are built-in and are compatible with Hewlett-Packard microwave sources. The HP 8349A is also equipped with an output power display. This display minimizes the need for an external power meter and enhances the amplifier's utility; for example, at the end of a long cable, where the microwave output needs to be amplified, leveled and measured.

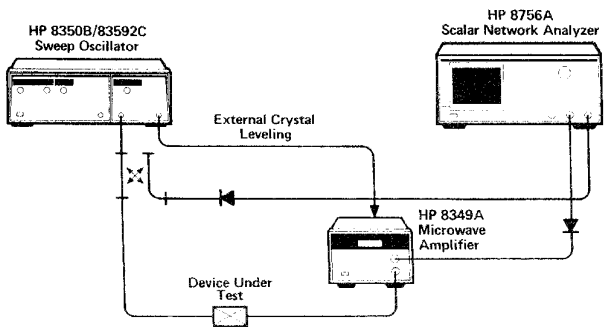
Naturally, the versatile power control features of the microwave source (e.g., calibrated power, power sweep, power slope and remote power control via the Hewlett-Packard Interface Bus) can be accurately transmitted through the HP 8349A during external leveling operations.

Applications

The HP 8349A is an excellent power amplifier for microwave measurements in a versatile bench-top arrangement or in a dedicated rack-mount system.

The broadband power of the HP 8349A is also ideal for making antenna efficiency and antenna pattern measurements.

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 receiver. In the following configuration the effective dynamic range is typically extended by >20 dB 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 8349A makes this possible by extending the external crystal leveling power control of the microwave source.



- 100 milliwatts across 2 to 20 GHz
- <13 dB typical noise figure

Hewlett-Packard Application Note 327-1 discusses this application in detail, and shows how typically >80 dB of dynamic range can be achieved from 2.0 to 20 GHz using the HP 8349A amplifier, the HP 8350B/83592C sweep oscillator and the HP 8755C, 8756A, or the HP 8757A scalar network analyzer.

High power pulse measurements (20 dBm output power, 80 dB on/off ratio, 25 ns rise and fall times) from 2 to 20 GHz can be achieved using the HP 8349A amplifier and the HP 8340A or HP 8341A Opt. 006 synthesized sweeper or the HP 8673A synthesized signal generator.

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

Frequency Specifications

Range: 2.0-20 GHz

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

Minimum Output Power (25°C ±5°C):

Frequency Range (GHz)	Input	Output	
		Leveled	Unleveled
2.0 to 18.6	5 dBm (3.2mW)	19 dBm (80mW)	20 dBm (100mW)
18.6 to 20.0 (typical)	6 dBm (4.0mW)	19 dBm (80mW)	20 dBm (100mW)

Power Flatness (Leveled): ±1.25 dB
1 dB Compression Point: +21 dBm, nominal
Minimum Small Signal Gain (at −5 dBm input): 15 dB
Noise Figure: <13 dB, typical
Impedance (Input and Output): 50 ohms, nominal
SWR

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

*SWR from 18.0 to 20.0 GHz is typical

Maximum Continuous Input, to the input or output ports:
+27 dBm (RF), ±10V

Spectral Purity

Harmonics: <−20 dBc, 2.0 to <11.0 GHz (at + 20 dBm output).
<−30 dBc, 11.0 to 20.0 GHz (at + 20 dBm output).

Non-Harmonic Spurious: ≤−55 dBc.
Third Order Intercept: + 33 dBm, nominal.

Pulse Transmission Capability

Rise/Fall Time: Typically <10 ns.
Delay Time (input to output): Typically <8 ns.

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

	Price
HP 8349A 2 to 20 GHz Microwave Amplifier	$7,000
Opt 001 Rear Panel RF Input/Output	add $100
Opt 002 Rear Panel RF Input with Front Panel RF Output	add $100