

# Power Meters

290

## Power Peak Analyzers, Peak Power Sensors

HP 8990A  
HP 8991A  
HP 8992A  
HP 84812A  
HP 84813A  
HP 84814A  
HP 84815A



HP 8991A

### HP 8990A and HP 8991A Peak Power Analyzers HP 8992A Digital Video Power Analyzer

#### Complete Pulse Power Characterization

The HP 8990A and HP 8991A peak power analyzers provide complete and accurate characterization of today's complex pulsed signals. They are capable of performing seven automatic timing measurements (rise time, fall time, pulse width, PRI, PRF, duty cycle, and delay) and five automatic power measurements (peak power, average power, pulse top/base amplitude, and overshoot) with push-button ease. Front-panel operation is intuitive and straightforward. Data entries can be typed in or made with the front-panel knob; automatic measurements are made with simple keystrokes.

The HP 8990A and 8991A offer two sensor channels plus two external triggering/oscilloscope channels, allowing the simultaneous measurement of modulating signals and detected power envelopes. Powerful measurement and display routines put you in control of your most demanding pulse applications. Measurement statistics, high-speed/high-sensitivity triggering, amplitude and time markers, dual-timebase windowing, measurement limit test, waveform storage, and waveform math are some of the new capabilities featured in the HP 8990A and 8991A.

The HP 8990A is optimized for linear display applications, and better rise/fall times than the HP 8991A. The HP 8991A is optimized for log display applications, providing higher resolution power measurements and improved power accuracy (when used with the HP 84815A sensor) than the HP 8990A. In addition, the HP 8991A is priced significantly less than the HP 8990A.

The peak power analyzers are compatible with the HP 84812/13A/14A/15A peak power sensors. These sensors give you outstanding measurement accuracy in demanding situations and include automatic temperature sensing and correction. The HP 8992 digital video power analyzer is very important for digital transmission applications. The HP 8992A's ability to characterize random peak power events make it possible to monitor receiver headroom and digital modulation quality.

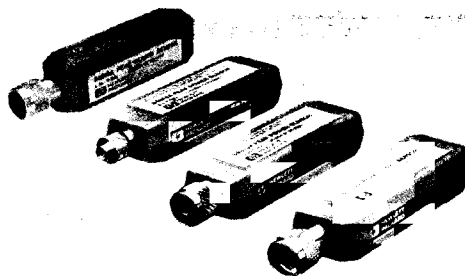
#### HP 8990A, 8991A, and 8992A Specifications

**Sensor Inputs** (Channels 1 and 4)

**Frequency Range:** 20 MHz to 40 GHz, sensor dependent

	HP 8990A			HP 8991A/92A		
<b>Power measurement range</b>	-32 to +20 dBm			-33 to +20 dBm		
<b>Rise/fall time</b>	<b>Power dBm</b>	<b>Video BW</b>	<b>Tr/Tf</b>	<b>Video BW</b>	<b>Tr/Tf</b>	
	0 to +20	150 MHz	<5 ns	High	<10 ns	
	-16 to 0	150 MHz	<6 ns	Low	<1 μs	
	-26 to -16	500 kHz	<1 μs	CW	<100 μs	
	-32 to -26	8 kHz	<80 μs			
<b>Instrumentation uncertainty (including noise and offset)</b>	±(3.5% + (0.07 μV/signal power) × 100%)			±(0.07 + 1/(signal power in dBm + 26)) dB (high bandwidth) ±(0.07 + 1.3/(signal power in dBm + 33)) dB (low, CW bandwidth) ±0.07 dB, -15 to +20 dBm (using HP 84815A sensor and 50 MHz, 0 dBm reference source)		

Note: Rise/fall times limited to <45 ns with HP 84815 sensor



HP 84815A, HP 81814A, HP 84813A, HP 84812A (left to right)

**Max. Pulse Repetition Rate:** 100 MHz externally triggered, 1 MHz internally triggered

**Video Inputs** (Channels 2 and 3)

**Bandwidth:** dc-coupled: dc to 100 MHz (repetitive); dc to 1 MHz (single shot). ac-coupled: 10 Hz to 100 MHz (repetitive); 10 Hz to 1 MHz (single shot).

**Rise Time:** <5 ns (HP 8990A) <10 ns (HP 8991A)

**Vertical Sensitivity:** 100 mV/div to 500 mV/div

**Vertical Gain Accuracy:** ±1.5%

**Available Offset Range:** ±20 Vdc, ±10 Vac

**Time Base**

**Range:** 2 ns/div to 5 s/div in 1-2-5 sequence

**Resolution:** 100 ps

**Accuracy:** 0.005%

**General Characteristics**

**Power Requirements:** Voltage: 90 to 132 or 198 to 264 Vac;

48 to 66 Hz. Power: 250 VA max

**HP-IB Codes:** SH1, AH1, T5, L4, SR1, RL1, PP1, DC1, DT1, C0, E2

**Size:** 422 mm W x 194 mm H x 366 mm D (16.62 in x 7.65 in x 14.4 in)

**Weight:** Net, 12.8 kg (28 lb); shipping, 20.1 kg (44 lb)

#### HP 84812A/13A/14A/15A Specifications

**Frequency Range:** HP 84812A: 500 MHz to 18 GHz

HP 84813A: 500 MHz to 26.5 GHz

HP 84814A: 500 MHz to 40 GHz

HP 84815A: 20 MHz to 18 GHz

**Power Range:** Dependent upon analyzer used. See specifications table for HP 8990A/91A/92A.

**Sensor Input SWR** (reflection coefficient):

50 MHz to 18 GHz: 1.25 (0.11)

6 to 18 GHz: 1.30 (0.13) (HP 84815A only)

18 GHz to 26.5 GHz: 1.35 (0.15)

26.5 GHz to 40 GHz: 1.60 (0.23)

**Sensor Calibration Uncertainty:**

Frequency RSS uncertainty

< 4 GHz ±3.6%

< 12 GHz ±3.8%

< 18 GHz ±4.3%

< 26.5 GHz ±5.5%

< 40 GHz ±6.5%

**Connector Type:** HP 84812A, HP 84815A: Type-N (m);

HP 84813A: APC-3.5 mm (m); HP 84814A: 2.4 mm (m)

**General Characteristics**

**Size:** HP 84812A, HP 84815A: 37 mm W x 27 mm H x 137 mm D

(1.45 in x 1.05 in x 5.4 in)

HP 84813A, HP 84814A: 37 mm W x 27 mm H x 127 mm D

(1.45 in x 1.05 in x 5.0 in)

**Weight:** Net, 0.29 kg (0.64 lb); shipping, 0.64 kg (1.4 lb)

#### Ordering Information

	Price
<b>HP 8990A Peak Power Analyzer</b>	\$17,460
Opt 001 Deletes Channel 4	-\$3,120
Opt W30 Extended Repair Service (see page 584)	+\$390
<b>HP 8991A Peak Power Analyzer</b>	\$14,555
<b>HP 8992A Digital Video Power Analyzer</b>	\$14,840
Opt 001 Deletes Channel 4	-\$4,590
Opt W30 Extended Repair Service	+\$355
<b>HP 84812A Peak Power Sensor</b>	\$1,755
<b>HP 84813A Peak Power Sensor</b>	\$2,015
<b>HP 84814A Peak Power Sensor</b>	\$2,710
<b>HP 84815A Peak Power Sensor</b>	\$1,855
Opt W30 Extended Repair Service (see page 584)	+\$45