

# POWER METERS

## Power Meters

HP 437B, 70100A, E146A



HP437B



### HP 437B Power Meter

The HP 437B is a low-cost, high-performance, single-channel, programmable, average power meter compatible with the HP 8480 family of thermocouple and diode power sensors. Depending on which power sensor is used, the HP 437B can measure from  $-70$  dBm (100pW) to  $+44$  dBm (25 W) at frequencies from 100 kHz to 110 GHz.

Designed for ATE systems and demanding benchtop measurements, the HP 437B power meter makes fast, accurate, and reliable average power measurements. Only three inches high and half rack wide, the HP 437B minimizes the use of critical rack space in ATE systems. The advanced plastics technology used in the HP 437B cabinet combines the light weight of plastic with the shielding effectiveness of metal, making the HP 437B the only power meter to meet MIL-STD-461C EMI specifications.

A modern and flexible feature set makes this meter easy to use in any application:

- Automatic calibration and zeroing
- Frequency entry instead of cal. factor
- Ten pre-loaded sensor cal. factor versus frequency tables
- Selectable resolution to 0.001 dB
- Offset entry in dB
- Duty-cycle entry for a convenient peak power representation of the measured average power
- Ten store/recall registers
- HP-IB is standard
- Analog meter is a standard feature

With a measurement speed twice as fast as that of the industry-standard HP 436A, powerful programming capability, state-of-the-art accuracy, and exceptional reliability, the HP 437B lets you measure your test signal with speed, precision, and confidence.

### HP 70100A and E1416A MMS and VXI Power Meters

The HP 70100A is a full-featured single-channel power meter module for the modular measurement system (see page 66). It has all the capability of the HP 437B power meter in an  $\frac{1}{8}$ th rack-width module. The HP 70100A features the same modern and flexible feature set as the HP 437B, the same state-of-the-art accuracy, and is also fully compatible with the HP 8480 series of power sensors. The HP E1416A power meter is a VXI version of the HP 70100A. For information on the HP E1416A, refer to page 294.

### HP 437B, 70100A, and E1416A Specifications

**Frequency Range:** 100 kHz to 110 GHz, sensor dependent  
**Power Range:**  $-70$  to  $+44$  dBm (100 WP to 25 W), sensor dependent  
**Power Sensors:** Compatible with all HP 8480 series power sensors  
**Dynamic Range:** 50 dB in 10 dB steps  
**Display Units:** Absolute: watts, dBm; relative: percent, dB  
**Resolution:** Selectable resolution of 0.1, 0.01, and 0.001 dB in logarithmic mode; or 1% and 0.01% of full scale in linear mode

#### Accuracy

**Instrumentation:**  $\pm 0.02$  dB or  $\pm 0.5\%$   
**In REL Mode:**  $\pm 0.02$  dB or  $\pm 0.5\%$  within measurement range;  $\pm 0.04$  dB or 1% outside measurement range  
**Zero Set:**  $\pm 0.5\%$  of full scale on most sensitive range



HP 70100A



HP E1416A

### Power Reference

**Power Output:** 100mW, factory-set to  $\pm 0.7\%$  traceable to US National Institute of Standards and Technology  
**Accuracy:**  $\pm 1.2\%$  worst case ( $\pm 0.9\%$  RSS) for 1 year

### General (HP 437B only)

**EMI:** Radiated and conducted emissions and radiated and conducted susceptibility are within the requirements of RE02, CE03, RS01/03 and CS01/03 called out in MIL-STD-461C, and within the requirements of VDE 0871 and CISPR Publication 11

**Rear-Panel Output:** Analog 0-1 volt without digital filtering or cal. factor correction,  $1k\Omega$  output impedance BNC connector

**Line Voltage:** 100 and 120 Vac,  $+5\%$  to  $10\%$ , 48-66 Hz, 360-440 Hz; 220 and 240 Vac,  $+5\%$  to  $10\%$ , 48 to 66 Hz

**Power Requirement:** 8 watts maximum (10 VA max.)

**HP-IB Codes:** SH1, AH1, T5, TE0, L4, LE0, SR1, RL1, PP1, DC1, DT1, C0

**Size:** 212mm W x 88 mm H x 273 mm D (8.35 in x 3.46 in x 10.75 in)

**Weight:** Net 2.6 kg (5.9 lb); shipping 4.5 kg (10 lb)

### Accessories

**Furnished:** HP 11730A, 1.5 m (5 ft) cable for power sensors; 2.4 m (7.5 ft) power cable. Mains plug shipped to match destination requirements.

**Available:** To select or substitute nonstandard lengths for power sensor cable, see page 298. To rackmount one HP 437B, order HP p/n 5062-4080. To rackmount two HP 437B power meters, order HP p/n 5062-4081.

### Key Literature

HP 437A Technical Data and Compatible Power Sensor, p/n 5091-3826E

### Ordering Information

#### HP 437B Power Meter

**Opt 002** Supplies a Parallel Rear-panel Sensor Input

**Opt 003** Supplies a Parallel Rear-panel Sensor Input and Moves Reference Oscillator to Rear Panel

**Opt 004** Deletes the HP 11730A Sensor Cable

**Opt 401** Provides Side-carrying Handle and Standoff Feet

**Opt 915** Service Manual

**Opt 916** Extra Operating Manual (00437-90015)

**Opt W30** Two Additional Years of Return-to-HP Warranty

#### HP 70100A Power Meter Module

**Opt 003** Moves Reference Oscillator from Front to Rear Panel

**Opt 004** Deletes the HP 11730A Power Sensor Cable

**Opt 005** Deletes Reference Oscillator

**Opt W30** Extended Repair Service (see page 592)