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# General Information

The HP 8447D, 8447E and 8447F are general purpose, wideband amplifiers. Each instrument consists of a power supply and one or two thin film, hybrid, integrated circuit amplifiers. The thin film amplifiers are hermetically sealed and feature low noise, low distortion, flat frequency response, and long term stability and reliability.

The HP 8447D Amplifier is a pre-amplifier that provides 25 dB of gain to signals from 100 kHz to 1.3 GHz. It can be used to increase the sensitivity of any lab, shop or field device operating within its frequency range.

The HP 8447E Amplifier is a power amplifier that provides 22 dB of gain to signals from 100 kHz to 1.3 GHz. It can be used to increase the output power of signal generators, swept sources and similar devices operating within its frequency range.

The HP 8447F Amplifier contains a preamplifier and a power amplifier. They are the same thin film amplifiers used in the HP 8447D and HP 8447E. The input and output ports of both amplifiers are available on the front panel. They can be used separately or cascaded to provide 47 dB of gain.

The HP 8447F Option H64 Amplifier is a general purpose wide band amplifier with Type-N connectors. It contains two preamplifiers. One provides 26 dB minimum gain to signals from 9 kHz to 50 MHz. The other provides 25 dB minimum gain to signals from 100 kHz to 1300 MHz.

**Table 1** **HP 8447D and HP 8447E Specifications**

| Specifications | HP 8447D Preamp | HP 8447E Power Amp |
|---|---|---|
| Frequency range | 0.1 to 1300 MHz | 0.1 to 1300 MHz |
| Typical 3 dB bandwidth (Std, Opt 001 and Opt 011) | .075 to 1700 MHz | .075 to 1400 MHz |
| Mean Gain (20° to 30°C) | 25 dB minimum | 22 dB ± 2.0dB |
| Gain flatness across frequency range | ± 1.5 dB | ± 1.5 dB |
| Noise Figure | <8.5 dB | <11 dB (typical) |
| Output power for 1 dB gain compression | >+7 dBm (typical) | ≥+12.5 dBm (0.1 to 1000 MHz) |



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**Table 1 HP 8447D and HP 8447E Specifications**

| Specifications | HP 8447D Preamp | HP 8447E Power Amp |
|---|---|---|
| Harmonic distortion | −30 dB for 0 dBm output (typical) | −30 dB for +8 dBm output |
| Typical output for <−60 dB harmonic distortion | −30 dBm | −20 dBm |
| VSWR, 1 to 1300 MHz | <2.0:1 Input<br><2.2:1 Output | — |
| VSWR, 1 to 1400 MHz | — | <2.2:1 Input<br><2.5:1 Output |
| Impedance | 50 Ω | 50 Ω |
| Reverse isolation | >40 dB | >40 dB |
| Maximum DC input voltage | ±10 V | ±10 V |
| Typical risetime | 400 ps | 420 ps |
| Typical group delay | 1.1 ns[a] | 1.5 ns[b] |
| Net weight | 3 lbs 8 oz (1.59 kg) | 3 lbs 8 oz (1.59 kg) |
| Option 001 | 3 lbs 14 oz (1.75 kg) | — |
| Option 010 | 3 lbs 1 oz (1.84 kg) | 3 lbs 10 oz (1.64 kg) |
| Option 011 | 4 lbs 10 oz (1.64 kg) | — |
| Dimensions | 8 1/2 in (216 mm) by 5-1/2 in (130 mm) by 3-3/8 in (85.8 mm) | |
| Power Requirements | 115 or 230 Vac ±10%, 48 to 440 Hz, 15 Watts, 27 VAmax | |
| Environmental | Operation: 0°C to +55°C<br>Storage: −40°C to +75°C | |

a. Variation over any 50 MHz band from 0.1-1300 MHz is typically <0.15 ns.
b. Variation over any 50 MHz band from 0.1-1300 MHz is typically <0.25 ns.



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**Table 2 HP 8447F Specifications**

| Specifications | HP 8447F | | HP 8447F H64 | |
|---|---|---|---|---|
| | Preamp | Power Amp | Preamp | Low Freq. Preamp |
| Frequency range | 0.1 to 1300 MHz | 0.1 to 1300 MHz | 0.1 to 1300 MHz | 9 kHz to 50 MHz |
| Typical 3 dB bandwidth (Std, Opt 001 and Opt 011) | .075 to 1700 MHz | .075 to 1400 MHz | .075 to 1700 MHz | 6 kHz to 400 MHz |
| Mean Gain (20° to 30°C) | 25 dB minimum | 22 dB ± 2.0dB | 25 dB minimum | 26 dB minimum |
| Gain flatness across frequency range | ± 1.5 dB | ± 1.5 dB | ± 1.5 dB | ± 2 dB |
| Noise Figure | <8.5 dB | <11 dB (typical) | <8.5 dB | —— |
| Output power for 1 dB gain compression | >+7 dBm (typical) | ≥+12.5 dBm (0.1 to 1000 MHz) | >+7 dBm (typical) | >+15 dBm (0.1 to 1000 MHz) |
| Harmonic distortion | −30 dB for 0 dBm output (typical) | −30 dB for +8 dBm output | −30 dB for 0 dBm output (typical) | −35 dBc for +10 dBm output |
| Typical output for <−60 dB harmonic distortion | −30 dBm | −20 dBm | −30 dBm | −2 dBm |
| VSWR, 9 kHz to 50 MHz | —— | —— | —— | <2.0:1 |
| VSWR, 1 to 1300 MHz | <2.0:1 Input<br><2.2:1 Output | —— | <2.0:1 Input<br><2.2:1 Output | |
| VSWR, 1 to 1400 MHz | —— | <2.2:1 Input<br><2.5:1 Output | —— | |
| Impedance | 50 Ω | 50 Ω | 50 Ω | 50 Ω |
| Reverse isolation | >40 dB | >40 dB | >40 dB | —— |
| Maximum DC input voltage | ±10 V | ±10 V | ±10 V | ±10 V |
| Typical risetime | 400 ps | 420 ps | 400 ps | —— |
| Typical group delay | 1.1 ns[a] | 1.5 ns[b] | 1.1 ns[a] | —— |
| Net weight | 3 lbs 14 oz (1.75 kg) | | 3 lbs 14 oz (1.75 kg) | |
| Option 001 | —— | | —— | |



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**Table 2 HP 8447F Specifications**

| Specifications | HP 8447F<br>Preamp Power Amp | HP 8447F H64<br>Preamp Low Freq. Preamp |
|---|---|---|
| Option 010 | 4 lbs 1 oz (1.84 kg) | 4 lbs 1 oz (1.84 kg) |
| Dimensions | 8 1/2 in (216 mm) by 5-1/2 in (130 mm) by 3-3/8 in (85.8 mm) | |
| Power Requirements | 115 or 230 Vac ±10%, 48 to 440 Hz, 15 Watts, 27 VAmax | |
| Environmental | Operation: 0°C to +55°C<br>Storage: −40°C to +75°C | |

a. Variation over any 50 MHz band from 0.1-1300 MHz is typically <0.15 ns.
b. Variation over any 50 MHz band from 0.1-1300 MHz is typically <0.25 ns.

**Table 3 HP 8447F H64 Characteristics**

| Characteristics | HP 8447F H64<br>Preamp Low Freq. Preamp | |
|---|---|---|
| Noise figure<br>9 kHz to 20 kHz<br>20 kHz to 100 kHz<br>100 kHz to 50 MHz | — | <br><12.0 dB<br><9.0 dB<br><7.0 dB |
| Typical mean gain (20° to 30°C) | — | 28 dB |



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