

SIGNAL SOURCES

Economy RF Signal Generators (cont'd)

HP 8647A, 8648A/B/C

Display Resolution: 0.1 dB

Accuracy (specified power <13 dBm to -127 dBm)

HP 8647A: ± 1.5 dB

HP 8648A/B/C (applies at $25^\circ \pm 5^\circ\text{C}$): ± 1.0 dB

HP 8648C at $f_c > 2.5$ GHz: ± 1.5 dB (≥ -100 dBm)
 ± 3 dB (< -100 dBm)

Reverse power protection (watts into 50Ω)

HP 8647A and 8648A: 50 watts

HP 8648B/C: 25 watts <1001 MHz; 1 watt \geq 1001 MHz

SWR: (output < -6 dBm, typical)

HP 8647A: 2.0:1

HP 8648A/B/C

<249 MHz: <2.5:1

≤ 2500 MHz: <1.5:1

≤ 3200 MHz: <2.0:1

Output Impedance: Nominally 50Ω

Frequency Modulation

Peak Deviation (rates >25 Hz ac FM)

<249 MHz: 0 to 100 kHz

<501 MHz: 0 to 50 kHz

<1001 MHz: 0 to 100 kHz

<2001 MHz: 0 to 200 kHz

≤ 3200 MHz: 0 to 400 kHz

Resolution

For $\leq 10\%$ peak deviation

<2001 MHz: 10 Hz

≥ 2001 MHz: 20 Hz

For > 10% to maximum peak deviation

<2001 MHz: 100 Hz

≥ 2001 MHz: 200 Hz

Deviation Accuracy (internal 1 kHz rate)

HP 8647A: $\pm 7.5\%$ of FM deviation ± 30 Hz

HP 8648A/B/C

<1001 MHz: $\pm 3\%$ of deviation ± 30 Hz

<2001 MHz: $\pm 3\%$ of deviation ± 60 Hz

≤ 3200 MHz: $\pm 3\%$ of deviation ± 120 Hz

Rates

HP 8647A

Internal: 400 Hz or 1 kHz

External dc: DC to 75 kHz (typical, 3 dB BW)

External ac: 20 Hz to 75 kHz (typical, 3 dB BW)

HP 8648A/B/C

Internal: 400 Hz to 1 kHz

External dc: DC to 150 kHz (typical, 3 dB BW)

External ac: 20 Hz to 150 kHz (typical, 3 dB BW)

Distortion (1 kHz rate, THD + N, 0.3 to 3 kHz BW)

<1001 MHz: <1% at deviations >4 kHz

<2001 MHz: <1% at deviations >8 kHz

≤ 3200 MHz: <1% at deviations >16 kHz

HP 8648A/B/C 88 to 108 MHz: <0.5% at deviations ≥ 75 kHz

Carrier Frequency Accuracy (relative to CW in dcFM, at $25^\circ \pm 5^\circ\text{C}$)

<1001 MHz: ± 500 (typ. 200) Hz, deviations <10 kHz

<2001 MHz: ± 1000 (typ. 400) Hz, deviations <20 kHz

≤ 3200 MHz: ± 2000 (typ. 800) Hz, deviations <40 kHz

FM + FM: Internal 1 kHz to 400 Hz source plus external. In internal plus external FM mode, the internal source produces the set level of deviation. The external input should be set to $\leq \pm 0.5$ V peak or 0.5 Vdc (one-half the set deviation).

Phase Modulation

Peak deviation

<249 MHz: 0 to 10 radians

<501 MHz: 0 to 5 radians

<1001 MHz: 0 to 10 radians

<2001 MHz: 0 to 20 radians

≤ 3200 MHz: 0 to 40 radians

Resolution

<2001 MHz: 0.01 radian

≥ 2001 MHz: 0.02 radian

Deviation accuracy (internal 1 kHz rate, typical)

HP 8647A: $\pm 7.5\%$ of deviation ± 0.05 radians

HP 8648A/B/C

<1001 MHz: $\pm 3\%$ of deviation ± 0.05 radians

<2001 MHz: $\pm 3\%$ of deviation ± 0.1 radians

≤ 3200 MHz: $\pm 3\%$ of deviation ± 0.2 radians

Rates

Internal: 400 Hz or 1 kHz

External: 20 Hz to 10 kHz (typical, 3 dB BW)

Distortion (1 kHz rate)

HP 8647A <2% at deviations ≥ 3 radians

HP 8648A/B/C

<1001 MHz: <1% at deviations ≥ 3 radians

<2001 MHz: <1% at deviations ≥ 6 radians

≤ 3200 MHz: <1% at deviations ≥ 12 radians

Amplitude Modulation

(AM is not specified below 1.5 MHz and is typical above 1001 MHz)

Range: 0 to 100%; output $\leq +4$ dBm

Resolution: 0.1%

Accuracy (1 kHz rate): $\pm 5\%$ of setting $\pm 1.5\%$ (for HP 8648B/C, specification is applicable at $25^\circ \pm 5^\circ\text{C}$ and <70% depth)

Rates

Internal: 400 Hz or 1 kHz

External: 20 Hz to 25 kHz (typ., 3 dB BW)

Distortion (1 kHz rate, THD + N, 0.3 to 3 kHz BW)

HP 8647A and 8648A:

@ 30% AM: <2%

@ 90% AM: <3%

HP 8648B/C:

@ 30% AM: <2%

@ 70% AM: <3%

Pulse Option 1E6 (HP 8648B/C only)

On/Off Ratio: > 80 dB ≤ 2000 MHz; > 70dB > 2000 MHz

Rise/Fall Times: <10 ns

Modulation Source

Internal: 400 Hz or 1 kHz, front panel BNC connector provided at nominally 1 V (p-p) into 600Ω

External: 1 V peak into 600Ω (nominal) required for full scale modulation. (High/Low indicator provided for external signals ≤ 10 kHz.)

Remote Programming

Interface: HP-IB (IEEE-488.2-1987) with Listen and Talk

Control Languages: SCPI version 1992.0. The HP 8648A/B/C are code compatible with the HP 8656B and 8657.

Functions Controlled: All front panel functions except power switch and knobs.

IEEE-488: SH1, AH1, T6, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT0, C0, E2

ISO Compliant

The HP 8647A and 8648A/B/C signal generators are manufactured in an ISO 9002 registered facility in concurrence with Hewlett-Packard's commitment to quality.

General

Power Requirements: 90 to 264 V, 48 to 440 Hz; 150 VA max.

Operating Temperature: 0° to 50°C

Leakage: Conducted and radiated interference meets MIL-STD 461B RE02 and FTZ 1046. Typically <1 μV .

Key Literature

HP 8647A and 8648A/B/C Data Sheet, p/n 5062-6190 E.

Signal Generator Selection Guide, p/n 5091-7274 E.

HP 8647A and 8648A/B/C Brochure, p/n 5962-6191 E.

Ordering Information

HP 8647A Synthesized Signal Generator

HP 8648A Synthesized Signal Generator

HP 8648B Synthesized Signal Generator

HP 8648C Synthesized Signal Generator

Opt 1EA High Power

Opt 1E6 Pulse (HP 8648B/C only)

Opt 1E5 High Stability Timebase

Opt 1CM Rack Kit, p/n 08647-61020 (HP 8647A)

Opt 1CM Rack Kit, p/n 08648-60001 (HP 8648)

HP 83300A Remote Interface

HP 83301A Memory Interface