

SIGNAL ANALYZERS

Spectrum Analyzers, Portable (cont'd)

HP 8590 E-Series

HP 8591E, 8593E, 8594E, 8595E, 8596E Specifications (cont'd)

Spurious Responses

Second harmonic distortion

5 MHz to 1.8 GHz (HP 8591E): < -70 dBc for -45 dBm tone at input mixer

10 MHz to 2.9 GHz (HP 8593E): < -70 dBc for -40 dBm tone at input mixer

> 10 MHz (HP 8594E, 8595E, 8596E): < -70 dBc for -40 dBm tone at input mixer

> 2.75 GHz (HP 8593E, 8595E, 8596E): < -100 dBc for -10 dBm tone at input mixer (or below DANL)

Third-order intermodulation

HP 8591E (5 MHz to 1.8 GHz): < -70 dBc for two -30 dBm tones at input and > 50 kHz separation

HP 8593E, 8594E, 8595E, 8596E (> 10 MHz): < -70 dBc for two -30 dBm tones at input and > 50 kHz separation

Other input-related spurious (≥ 30 kHz offset, -20 dBm tone at input mixer)

HP 8591E, 8594E, 8595E, 8596E: < -65 dBc

HP 8593E: < -65 dBc (applied freq ≤ 18 GHz); < -60 dBc (applied freq ≤ 22 GHz)

Residual Responses (input terminated, 0 dB attenuation)

1 MHz to 1.8 GHz (HP 8591E Opt 001): < -38 dBmV

150 kHz to 1.8 GHz (HP 8591E): < -90 dBm

150 kHz to 2.9 GHz (HP 8594E): < -90 dBm

150 kHz to 6.5 GHz (HP 8593E, 8595E, 8596E): < -90 dBm

Display Range

Log scale: 0 to -70 dB from ref level is calibrated; 0.1, 0.2, 0.5 dB/div and 1 to 20 dB/div in 1 dB steps; 8 div displayed

Linear scale: 8 divisions

Scale units: dBm, dBmV, dB μ V, V, W

Marker Readout Resolution

Log scale: 0.05 dB

Linear scale: 0.05% of ref level

Fast time sweep for zero span (Opt 101 or 301, 20 μ s to 20 ms)

≤ 1 GHz: 0.7% of ref level for linear scale

> 1 GHz: 1.0% of ref level for linear scale

Reference Level

Range: Same as amplitude range

Resolution: ± 0.01 dB for log scale; $\pm 0.12\%$ of ref level for linear scale

Accuracy: ± 0.3 dB at -20 dBm

0 to -59.9 dBm: $\pm (0.3 \text{ dB} + 0.01 \times \text{dB from } -20 \text{ dBm})$

Frequency Response (10 dB input attenuation)

Absolute (referenced to 300 MHz CAL OUT)

HP 8591E, 8594E: ± 1.5 dB

HP 8595E: ± 1.5 to ± 2.0 dB

HP 8596E: ± 1.5 to ± 2.5 dB

HP 8593E: ± 1.5 to ± 5.0 dB (preselector peaked)

Relative flatness (referenced to midpoint between highest and lowest frequency response deviations)

HP 8591E, 8594E: ± 1.0 dB

HP 8595E: ± 1.0 to ± 1.5 dB

HP 8596E: ± 1.0 to ± 2.0 dB

HP 8593E: ± 1.0 to ± 2.0 dB (preselector peaked)

Calibrator Output Amplitude: -20 dBm ± 0.4 dB; +28.75 dBmV ± 0.4 dB, HP 8591 Opt 001

Resolution Bandwidth Switching Uncertainty (ref to 3 kHz RBW, at ref level)

3 kHz to 3 MHz RBW: ± 0.4 dB

1 kHz RBW: ± 0.5 dB

30 Hz to 300 Hz RBW: ± 0.6 dB

Log to Linear Switching: ± 0.25 dB at ref level

Display Scale Fidelity

Log incremental accuracy (0 to -60 dB from ref level): ± 0.4 dB/4 dB

Log maximum cumulative (0 to -70 dB from ref level)

1 kHz to 3 MHz RBW: $\pm (0.3 + 0.01 \times \text{dB from ref level})$

30 to 300 Hz RBW: $\pm (0.4 + 0.01 \times \text{dB from ref level})$

Linear accuracy: $\pm 3\%$ of ref level

General Specifications

MIL-T-28800: Has been type-tested to the environmental specifications of MIL-T-28800 Class 5

Temperature

Operating: 0° to +55° C

Storage: -40° to +75° C

EMI Compatibility: Conducted and radiated interference CISPR Pub. 11 and Messemphaenger Postverfuegung 526/527/79

Audible Noise: < 37.5 dBA pressure and < 5.0 Bels power (ISODP7779)

Power Requirements

On (line 1): 90 to 132 V rms, 47 to 440 Hz

195 to 250 V rms, 47 to 66 Hz

Power consumption < 500 VA; < 180 W

Standby (line 0): Power consumption < 7 W

User Program Memory (nominal): 121 KB nonvolatile RAM

Data Storage (nominal)

Internal: 50 traces; 8 states

External

Memory cards: HP 85700A (32 KB), 24 traces or 32 states

HP 85702A (128 KB), 99 traces or 128 states

Video cassette recorder (VCR): Continuous video recording of display supported through composite video output

Size (nominal, without handle, feet, or cover): 325 mm W \times 163 mm H \times 427 mm D

Weight: 14.5 kg (HP 8591E); 16.4 kg (HP 8593E, 8594E, 8595E, 8596E)

Option 010 and 011 Built-In Tracking Generators

Opt 010 (50 Ω) is available for all HP 8590 series spectrum analyzers except the HP 8592L. Opt 011 (75 Ω) is available for the HP 8590L and 8591E only.

Frequency Range

Opt 010: 100 kHz to 1.8 GHz (HP 8590L, 8591E); 9 kHz to 2.9 GHz (HP 8593E, 8594E, 8595E, 8596E)

Opt 011: 1 MHz to 1.8 GHz (HP 8590L, 8591E)

Output Level

Range

Opt 010: 0 to -15 dBm (HP 8590L); 0 to -70 dBm (HP 8591E); -1 to -66 dBm (HP 8593E, 8594E, 8595E, 8596E)

Opt 011: +42.8 to +27.8 dBmV (HP 8590L); +42.8 to -27.2 dBmV (HP 8591E)

Resolution: 0.1 dB

Absolute accuracy: ± 1.5 dB (HP 8590L); ± 1.0 dB (HP 8591E); ± 0.75 dB (HP 8593E, 8594E, 8595E, 8596E)

Vernier

Range: 15 dB (HP 8590L); 10 dB (HP 8591E); 8 dB (HP 8593E, 8594E, 8595E, 8596E)

Accuracy: ± 1.0 dB (HP 8590L); ± 0.25 dB (HP 8591E); ± 0.8 dB (HP 8593E, 8594E, 8595E, 8596E)

Output Flatness: ± 1.75 dB (HP 8590L, 8591E); ± 2.0 dB, > 10 MHz (HP 8593E, 8594E, 8595E, 8596E)

Spurious Output

Harmonic spurs: 0 dBm + 42.8 dBmV output, < -20 dBc (HP 8590L); < -25 dBc (HP 8591E); -1 dBm output, < -25 dBc (HP 8593E, 8594E, 8595E, 8596E)

Nonharmonic spurs: < -30 dBc

Dynamic Range (characteristic; max output level -TG feed-through)

Opt 010: 106 dB (HP 8590L, 8591E); 108 dB (HP 8594E, > 400 kHz); 111 dB (HP 8595E, 8596E, > 400 kHz); 113 dB (HP 8593E, > 400 kHz)

Opt 011: 100 dB

Power Sweep

Range

Opt 010: -15 dBm to 0 dBm (HP 8590L); -75 dBm to 0 dBm (HP 8591E); -66 dBm to -1 dBm in 8 dB increments (HP 8593E, 8594E, 8595E, 8596E)

Opt 011: -27.8 dBmV to +42.8 dBmV (HP 8590L); -32.2 to +42.8 dBmV (HP 8591E)

Resolution: 0.1 dB