



HP 8591E

### HP 8591E, 8593E, 8594E, 8595E, 8596E

#### Specifications

Specifications apply to any of these analyzers unless otherwise noted.

#### Frequency

##### Frequency Range

###### HP 8591E:

50 Ω: 9 kHz to 1.8 GHz

75 Ω: 1 MHz to 1.8 GHz

**HP 8594E:** 9 kHz to 2.9 GHz, dc-coupled; 100 kHz to 2.9 GHz, ac-coupled

**HP 8595E:** 9 kHz to 6.5 GHz, dc-coupled; 100 kHz to 6.5 GHz, ac-coupled

	Band	LO harmonic = N	Center frequency
HP 8596E	0	1	9 kHz to 2.9 GHz (dc-coupled)
	0	1	100 kHz to 2.9 GHz (ac-coupled)
	1	1	2.75 to 6.5 GHz
	2	2	6.0 to 12.8 GHz
HP 8593E	0	1	9 kHz to 2.9 GHz
	1	1	2.75 to 6.5 GHz
	2	2	6.0 to 12.8 GHz
	3	3	12.4 to 19.4 GHz
	4	4	19.1 to 22 GHz
	4	4 (Option 026/027)	19.1 to 26.5 GHz

##### Frequency Reference

**Aging:**  $\pm 2 \times 10^{-9}$ /year;  $\pm 1 \times 10^{-7}$ /year (Option 004)

**Temperature Stability:**  $\pm 5 \times 10^{-6}$ ;  $\pm 1 \times 10^{-8}$  (Option 004)

**Initial Achievable Accuracy:**  $\pm 0.5 \times 10^{-6}$ ;  $\pm 2.2 \times 10^{-8}$  (Option 004)

##### Frequency Readout Accuracy (start, stop, center, marker):

$\pm$  (freq. readout x freq. ref error + span accuracy + 1% of span + 20% of RBW + 100 Hz x N)

##### Marker Count Accuracy

Span  $\leq 10$  MHz x N:  $\pm$  (marker freq. x freq. ref error + counter resolution + 100 Hz x N)

Span  $> 10$  MHz x N:  $\pm$  (marker freq. x freq. ref error + counter resolution + 1 kHz x N)

##### Counter Resolution

Span  $\leq 10$  MHz x N: Selectable from 10 Hz to 100 kHz

Span  $> 10$  MHz x N: Selectable from 100 Hz to 100 kHz

##### Frequency Span

**Range:** 0 Hz (zero span) and

**HP 8591E:** 10 kHz to 1.8 GHz; 1 kHz min (Option 130)

**HP 8594E:** 10 kHz to 2.9 GHz; 1 kHz min (Option 130)

**HP 8595E:** 10 kHz to 6.5 GHz; 1 kHz min (Option 130)

**HP 8596E:**  $[10 \times N]$  kHz to 12.8 GHz;  $[1 \times N]$  kHz min (Option 130)

**HP 8593E:**  $[10 \times N]$  kHz to 19.25 GHz;  $[1 \times N]$  kHz min (Option 130)

**Resolution:** Four digits or 20 Hz x N, whichever is greater

##### Accuracy

Span  $\leq 10$  MHz x N:  $\pm 2\%$  of span

Span  $> 10$  MHz x N:  $\pm 3\%$  of span

##### Sweep Time

###### Range

Span = 0 Hz or  $> 1$  kHz: 20 ms to 100 s

Span = 0 Hz (Option 101): 20  $\mu$ s to 100 s

###### Accuracy

20 ms to 100 s:  $\pm 3\%$

20  $\mu$ s to  $< 20$  ms (Option 101):  $\pm 2\%$

**Sweep Trigger:** Free run, single, line, video, external

**Resolution Bandwidth:** 1 kHz to 3 MHz (3 dB) in 1, 3, 10 sequence; 9 kHz and 120 kHz (6 dB) EMI bandwidths. Option 130 adds 30, 100, and 300 Hz (3 dB) bandwidths and 200 Hz (6 dB) EMI bandwidth.

**Accuracy:**  $\pm 20\%$

**Selectivity (characteristic)**

-60 dB/-3 dB: 3 kHz to 10 kHz, 15:1

100 kHz to 3 MHz, 15:1

1 kHz, 30 kHz, 16:1

-40 dB/-3 dB: 30 Hz to 300 Hz, 10:1

**Video Bandwidth Range:** 30 Hz to 1 MHz in 1, 3 sequence

(1 Hz to 1 MHz with Option 130)

##### Stability

**Noise Sidebands** (1 kHz RBW, 30 Hz VBW, sample detector)

$> 10$  kHz offset from CW signal:  $\leq -90$  dBc/Hz + 20 log N

$> 20$  kHz offset from CW signal:  $\leq -100$  dBc/Hz + 20 log N

$> 30$  kHz offset from CW signal:  $\leq -105$  dBc/Hz + 20 log N

##### Residual FM

###### HP 8591E:

1 kHz RBW, 1 kHz VBW:  $\leq 250$  Hz pk-pk in 100 ms

30 Hz RBW, 30 Hz VBW:  $\leq 30$  Hz pk-pk in 300 ms

###### HP 8593E, 8594E, 8595E, 8596E:

1 kHz RBW, 1 kHz VBW:  $\leq (250 \times N)$  Hz pk-pk in 100 ms

30 Hz RBW, 30 Hz VBW:  $\leq (30 \times N)$  Hz pk-pk in 300 ms

**System Related Sidebands** ( $> 30$  kHz offset from CW signal):

$\leq -65$  dBc + 20 log N

**Comb Generator Frequency** (HP 8593E, 8596E): 100 MHz fundamental frequency;  $\pm 0.007\%$  frequency accuracy

#### Amplitude

**Amplitude Range:** Displayed average noise level to + 30 dBm

**HP 8591 Option 001:** Displayed average noise level to + 72 dBmV

**Maximum Safe Input Level** (input attenuator  $\geq 10$  dB)

**Average Continuous Power:** + 30 dBm (1 W)

**HP 8591E Option 001:** + 72 dBmV (0.2 W)

##### Peak Pulse Power

**HP 8591E:**  $\pm 30$  dBm (1 W)

**HP 8591E Option 001:** + 72 dBmV (0.2 W)

**HP 8593E, 8594E, 8595E, 8596E:** +50 dBm (100 W) for  $< 10$   $\mu$ s pulse width and  $< 1\%$  duty cycle, input atten.  $\geq 30$  dB

##### DC

**HP 8591E:** 25 Vdc

**HP 8591E Option 001:** 100 Vdc

**HP 8593E:** 0 Vdc

**HP 8594E, 8595E, 8596E:** 0 V (dc-coupled); 50 V (ac-coupled)

**Gain Compression** ( $> 10$  MHz):  $\leq 0.5$  dB (total power at input mixer = -10 dBm)

**Displayed Average Noise Level** (input terminated, 0 dB atten., 30 Hz VBW or 1 Hz VBW with Option 130, sample detector)

	30 Hz RBW	1 kHz RBW
<b>HP 8591E</b>		
400 kHz to 1 MHz	$\leq -130$ dBm	$\leq -115$ dBm
1 MHz to 1.5 GHz	$\leq -130$ dBm	$\leq -115$ dBm
1.5 GHz to 1.8 GHz	$\leq -128$ dBm	$\leq -113$ dBm
<b>HP 8591E Option 001</b>		
1 MHz to 1.5 GHz	$\leq -78$ dBmV	$\leq -63$ dBmV
1.5 GHz to 1.8 GHz	$\leq -76$ dBmV	$\leq -61$ dBmV
<b>HP 8594E</b>		
400 kHz to 5 MHz	$\leq -122$ dBm	$\leq -107$ dBm
5 MHz to 2.9 GHz	$\leq -127$ dBm	$\leq -112$ dBm
<b>HP 8595E</b>		
400 kHz to 2.9 GHz	$\leq -125$ dBm	$\leq -110$ dBm
2.75 to 6.5 GHz	$\leq -127$ dBm	$\leq -112$ dBm
<b>HP 8596E</b>		
400 kHz to 2.9 GHz	$\leq -125$ dBm	$\leq -110$ dBm
2.75 to 6.5 GHz	$\leq -127$ dBm	$\leq -112$ dBm
6.0 to 12.8 GHz	$\leq -115$ dBm	$\leq -100$ dBm
<b>HP 8593E</b>		
400 kHz to 2.9 GHz	$\leq -127$ dBm	$\leq -112$ dBm
2.75 to 6.5 GHz	$\leq -129$ dBm	$\leq -114$ dBm
6.0 to 12.8 GHz	$\leq -117$ dBm	$\leq -102$ dBm
12.4 to 19.4 GHz	$\leq -113$ dBm	$\leq -98$ dBm
19.1 to 22 GHz	$\leq -107$ dBm	$\leq -92$ dBm
<b>HP 8593E Option 026/027</b>		
19.1 to 26.5 GHz	$\leq -102$ dBm	$\leq -87$ dBm

HP 8590  
E-Series  
HP 8591E  
HP 8593E  
HP 8594E  
HP 8595E  
HP 8596E

## Specifications (cont'd)

## Spurious Responses

## Second Harmonic Distortion

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

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

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

**HP 8593E, 8595E, 8596E** ( $> 2.75$  GHz):  $< -100$  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** ( $\geq 30$  kHz offset,  $-20$  dBm tone at input mixer)

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

**HP 8593E**:  $< -65$  dBc (applied frequency  $\leq 18$  GHz);  $< -60$  dBc (applied frequency  $\leq 22$  GHz)

## Residual Responses (input terminated, 0 dB attenuation)

**1 MHz to 1.8 GHz** (HP 8591E Option 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 $\mu$ V, V, W

## Marker Readout Resolution

**Log Scale**: 0.05 dB

**Linear Scale**: 0.05% of ref level

**Fast Time Sweep for Zero Span** (Option 101 or 301, 20  $\mu$ s to 20 ms)

$\leq 1$  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**:  $\pm 0.01$  dB for log scale;  $\pm 0.12\%$  of ref level for linear scale

**Accuracy**:  $\pm 0.3$  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**:  $\pm 1.5$  dB

**HP 8595E**:  $\pm 1.5$  to  $\pm 2.0$  dB

**HP 8596E**:  $\pm 1.5$  to  $\pm 2.5$  dB

**HP 8593E**:  $\pm 1.5$  to  $\pm 5.0$  dB (preselector peaked)

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

**HP 8591E, 8594E**:  $\pm 1.0$  dB

**HP 8595E**:  $\pm 1.0$  to  $\pm 1.5$  dB

**HP 8596E**:  $\pm 1.0$  to  $\pm 2.0$  dB

**HP 8593E**:  $\pm 1.0$  to  $\pm 2.0$  dB (preselector peaked)

**Calibrator Output Amplitude**:  $-20$  dBm  $\pm 0.4$  dB;  $+28.75$  dBmV  $\pm 0.4$  dB, HP 8591 Option 001

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

**3 kHz to 3 MHz RBW**:  $\pm 0.4$  dB

**1 kHz RBW**:  $\pm 0.5$  dB

**30 Hz to 300 Hz RBW**:  $\pm 0.6$  dB

**Log to Linear Switching**:  $\pm 0.25$  dB at ref level

## Display Scale Fidelity

**Log Incremental Accuracy** (0 to  $-60$  dB from ref level):  $\pm 0.4$  dB/4 dB

**Log Maximum Cumulative** (0 to  $-70$  dB from ref level)

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

**30 Hz to 1 kHz 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**:  $0^\circ$  to  $+55^\circ$  C

**Storage**:  $-40^\circ$  to  $+75^\circ$  C

**EMI Compatibility**: Conducted and radiated interference CISPR Pub. 11 and Messempefaenger 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): 238 KB nonvolatile RAM

## Data Storage (nominal)

**Internal**: 24 traces or 32 states

**External**: 50 traces, 8 states

**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 x 163 mm H x 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

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

## Frequency Range

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

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

## Output Level

## Range

**Option 010**: 0 to  $-15$  dBm (HP 8590L); 0 to  $-70$  dBm (HP 8591E);

$-1$  to  $-66$  dBm (HP 8593E, 8594E, 8595E, 8596E)

**Option 011**:  $+42.8$  to  $+27.8$  dBmV (HP 8590L);

$+42.8$  to  $-27.2$  dBmV (HP 8591E)

**Resolution**: 0.1 dB

**Absolute Accuracy**:  $\pm 1.5$  dB (HP 8590L);  $\pm 1.0$  dB (HP 8591E);

$\pm 0.75$  dB (HP 8593E, 8594E, 8595E, 8596E)

## Vernier

**Range**: 15 dB (HP 8590L); 10 dB (HP 8591E);

9 dB (HP 8593E, 8594E, 8595E, 8596E)

**Accuracy**:  $\pm 1.0$  dB (HP 8590L);  $\pm 0.75$  dB (HP 8591E);

$\pm 0.5$  dB (HP 8593E, 8594E, 8595E, 8596E)

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

## Spurious Output

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

**Nonharmonic Spurs**:  $< -30$  dBc (HP 8590L, 8591E);  $\leq -27$  dBc, 300 kHz to 2.0 GHz,  $\leq -23$  dBc, 2.0 GHz to 2.9 GHz (HP 8593E, 8594E, 8595E, 8596E)

Dynamic Range (characteristic; max. output level  $-TG$  feedthrough)

**Option 010**: 106 dB (HP 8590L, 8591E); 106 dB (HP 8594E,  $> 400$  kHz);

109 dB (HP 8595E, 8596E,  $> 400$  kHz); 111 dB (HP 8593E,  $> 400$  kHz)

**Option 011**: 100 dB

## Power Sweep

## Range

**Option 010**:  $-15$  dBm to 0 dBm (HP 8590L);  $-75$  dBm to 0 dBm

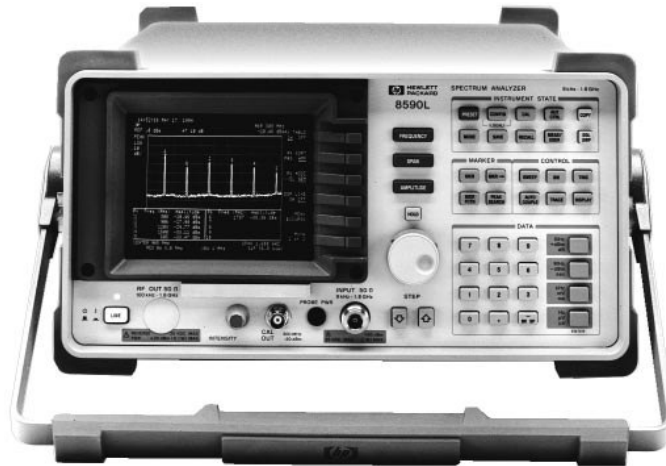
(HP 8591E);  $-66$  dBm to  $-1$  dBm in 8 dB increments (HP 8593E, 8594E, 8595E, 8596E)

**Option 011**:  $+27.8$  dBmV to  $+42.8$  dBmV (HP 8590L);

$-32.2$  to  $+42.8$  dBmV (HP 8591E)

**Resolution**: 0.1 dB

- Low-cost general purpose spectrum analysis with frequency accuracy



### HP 8590L and 8592L Specifications

Specifications apply to either analyzer unless otherwise noted.

#### Frequency

##### Frequency Range

###### HP 8590L:

50  $\Omega$ : 9 kHz to 1.8 GHz

75  $\Omega$  (Option 001): 1 MHz to 1.8 GHz

HP 8592L: 9 kHz to 22 GHz

HP 8592L (Option 026/027): 9 kHz to 26.5 GHz

Band	LO harmonic=N	Center frequency
0	1	9 kHz to 2.9 GHz
1	1	2.75 to 6.5 GHz
2	2	6.0 to 12.8 GHz
3	3	12.4 to 19.4 GHz
4	4	19.1 to 22.0 GHz
4	4 (Option 026/027)	19.1 to 26.5 GHz

##### Frequency Reference

**Aging:**  $\pm 2 \times 10^{-6}$ /year

**Temperature Stability:**  $\pm 5 \times 10^{-6}$

**Initial Achievable Accuracy:**  $\pm 0.5 \times 10^{-6}$

##### Frequency Readout Accuracy (start, stop, center, marker):

$\pm$  (freq. readout x freq. ref. error + span accuracy + 1% of span + 20% of RBW + 100 Hz x N)

##### Marker Count Accuracy

Span  $\leq 10$  MHz x N:  $\pm$  (marker freq. x freq. ref. error + counter resolution + 100 Hz x N)

Span  $> 10$  MHz x N:  $\pm$  (marker freq. x freq. ref. error + counter resolution + 1 kHz x N)

Counter Resolution

Span  $\leq 10$  MHz x N, selectable from 10 Hz to 100 kHz

Span  $> 10$  MHz x N, selectable from 100 Hz to 100 kHz

##### Frequency Span

###### Range

HP 8590L: 0 Hz (zero span), 10 kHz to 1.8 GHz

HP 8592L: 0 Hz (zero span), [50 kHz x N] to 19.25 GHz

**Resolution:** Four digits

###### Accuracy:

HP 8590L:  $\pm 3\%$  of span

HP 8592L: Span  $\leq 10$  MHz x N:  $\pm 2\%$  of span; span  $> 10$  MHz x N:  $\pm 3\%$  of span

##### Sweep Time

**Range:** 20 ms to 100 s

**Accuracy:**  $\pm 3\%$

**Sweep Trigger:** Free run, single, line, video, external

##### Resolution Bandwidth (characteristic): 1 kHz to 3 MHz (3 dB) in

1, 3, 10 sequence, 9 kHz and 120 kHz (6 dB) EMI bandwidths

**Accuracy:**  $\pm 20\%$

##### Video Bandwidth Range: 30 Hz to 1 MHz in 1, 3, 10 sequence

**Stability** (same as for HP 8590E series)

**Noise Sidebands** (1 kHz RBW, 30 Hz VBW and sample detector):

$\leq -105$  dBc/Hz + 20 log N at  $> 30$  kHz offset from CW signal

**System-Related Sidebands:**  $\leq -65$  dBc + 20 log N at  $> 30$  kHz offset from CW signal

**Comb Generator Frequency** (HP 8592L): 100 MHz fundamental frequency  
**Accuracy:**  $\pm 0.007\%$

HP 8590  
L-Series

#### Amplitude

##### Amplitude Range

HP 8590L, 8592L: Displayed average noise level to +30 dBm

HP 8590L Option 001: Displayed average noise level to +75 dBmV

**Maximum Safe Input Level** (input attenuator  $\geq 10$  dB)

##### Average Continuous Power

HP 8590L, 8592L: +30 dBm (1 W)

HP 8590L Option 001: +75 dBmV (0.4 W)

##### Peak Pulse Power

HP 8590L: +30 dBm (1 W); +75 dBmV (0.4 W) (Option 001)

HP 8592L: +50 dBm (100 W) for  $< 10$   $\mu$ s pulse width and  $< 1\%$  duty cycle, input atten.  $\geq 30$  dB

##### DC

HP 8590L: 25 Vdc; 100 Vdc (Option 001)

HP 8592L: 0 Vdc

**Gain Compression** ( $> 10$  MHz):  $\leq 0.5$  dB (total power at input mixer =  $-10$  dBm)

**Displayed Average Noise Level** (input terminated, 0 dB atten., 1 kHz RBW, 30 Hz VBW, sample detector)

HP 8590L:  $\leq -115$  to  $\leq -113$  dBm;  $\leq -63$  to  $\leq -61$  dBmV (Option 001)

HP 8592L:  $\leq -112$  to  $\leq -92$  dBm;  $\leq -112$  to  $\leq -87$  dBm (Option 026)

##### Spurious Responses

###### Second Harmonic Distortion

HP 8590L: ( $> 5$  MHz)  $< -70$  dBc for  $-45$  dBm tone at input mixer

HP 8592L (10 MHz to 2.9 GHz):  $< -70$  dBc for  $-40$  dBm tone at input mixer;  $> 2.75$  GHz:  $< -100$  dBc for  $-10$  dBm tone at input mixer (or below DANL)

###### Third-Order Intermodulation Distortion

###### HP 8590L

Distortion  $> 5$  MHz:  $< -70$  dBc for two  $-30$  dBm tones at input mixer and  $> 50$  kHz separation  
Other Input-Related:  $< -65$  dBc at  $\geq 30$  kHz offset, for  $-20$  dBm tone at input mixer

###### HP 8592L

Distortion  $> 10$  MHz:  $< -70$  dBc for two  $-30$  dBm tones at input mixer and  $> 50$  kHz separation  
Other Input-Related:  $< -65$  dBc at  $\geq 30$  kHz offset, for  $-20$  dBm tone at input mixer,  $\leq 18$  GHz;  $< -60$  dBc for  $-20$  dBm tone at input mixer,  $\leq 22$  GHz

##### 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 $\mu$ V, V, W

**Marker Readout Resolution:** 0.05 dB for log scale; 0.05% of reference level for linear

##### Reference Level

**Range:** Same as amplitude range

**Resolution:** 0.01 dB for log scale; 0.12% of ref. level for linear

**Accuracy:**  $\pm 0.3$  dB @  $-20$  dBm; 0 dBm to  $-59.9$  dBm:  $\pm (0.3$  dB +  $0.01 \times$  dB from  $-20$  dBm)

##### Frequency Response (10 dB input attenuation)

**Absolute** (referenced to 300 MHz CAL OUT)

HP 8590L:  $\pm 1.5$  dB

HP 8592L (preselector peaked in band  $> 0$ ):  $\pm 1.5$  to  $\pm 5.0$  dB

**Relative:** Referred to midpoint between highest and lowest frequency response deviations

HP 8590L:  $\pm 1.0$  dB

HP 8592L (preselector peaked in band  $> 0$ ):  $\pm 1.0$  to  $\pm 2.0$  dB

##### Calibrator Output Amplitude: $-20$ dBm $\pm 0.4$ dB;

HP 8590L Option 001: +28.75 dBmV  $\pm 0.4$  dB

##### Resolution Bandwidth Switching Uncertainty (ref. to 3 kHz RBW, at ref. level): $\pm 0.4$ dB for 3 kHz to 3 MHz RBW; $\pm 0.5$ dB for 1 kHz

**Log to Linear Switching:**  $\pm 0.25$  dB at ref. level

##### Display Scale Fidelity

**Log Incremental Accuracy:**  $\pm 0.4$  dB/4 dB, 0 to  $-60$  dB from ref. level

**Log Maximum Cumulative:**  $\pm (0.4$  dB +  $0.01 \times$  dB from ref. level), 0 to  $-70$  dB from ref. level

**Linear Accuracy:**  $\pm 3\%$  of ref. level

#### General

Same as for HP 8590 E-series

Built-in tracking generator (see page 238)

HP 8590  
L-Series

## Ordering Information

**HP 8590L** Spectrum Analyzer (9 kHz to 1.8 GHz)**HP 8592L** Spectrum Analyzer (9 kHz to 22 GHz)Options<sup>1</sup>

- Opt 001** 75  $\Omega$  Input (HP 8590L only)
- Opt 003** Memory Card Reader
- Opt 010** Tracking Generator (100 kHz to 1.8 GHz, HP 8590L only)
- Opt 011** Tracking Generator (75  $\Omega$ , HP 8590L only)
- Opt 015** Soft Tan Carrying/Operating Case
- Opt 016** Soft Yellow Carrying/Operating Case
- Opt 041** HP-IB and Parallel Printer Interfaces
- Opt 043** RS-232 and Parallel Printer Interfaces
- Opt 026** 26.5 GHz Frequency Extension, APC-3.5 mm Connector (HP 8592L only)
- Opt 027** 26.5 GHz Frequency Extension, Type-N Connector (HP 8592L only)
- Opt 040** Front Panel Protective Cover With Storage
- Opt 042** Protective Soft Carrying Case/Backpack
- Opt 711** 50/75  $\Omega$  Matching Pad/100 Vdc Block
- Opt 008** Factory Service Training
- Opt UK6** Commercial Calibration Certificate with Test Data
- Opt ABX** Quick Reference Guide in Local Languages
- Opt 908** Rackmount Without Handles
- Opt 909** Rackmount With Handles
- Opt 910** Additional Manual Set
- Opt 915** Component Level Information and Service Guide
- Opt W30** Two Additional Years Return-to-HP Service
- Opt W32** Two Additional Years Return-to-HP Calibration

**HP 8591E** Spectrum Analyzer, 9 kHz to 1.8 GHz**HP 8594E** Spectrum Analyzer, 9 kHz to 2.9 GHz**HP 8595E** Spectrum Analyzer, 9 kHz to 6.5 GHz**HP 8596E** Spectrum Analyzer, 9 kHz to 12.8 GHz**HP 8593E** Spectrum Analyzer, 9 kHz to 22 GHzOptions<sup>1</sup>

- Opt 001** 75  $\Omega$  Input (HP 8591E only)
- Opt 004** Precision Frequency Reference
- Opt 009** LO and Sweep + Tune
- Opt 010** Tracking Generator (100 kHz to 1.8 GHz, HP 8591E only)
- Opt 010** Tracking Generator (9 kHz to 2.9 GHz)
- Opt 011** Tracking Generator (75  $\Omega$ , HP 8591E only)
- Opt 012** Source for DECT Receiver Test
- Opt 015** Soft Tan Carrying/Operating Case
- Opt 016** Soft Yellow Carrying/Operating Case
- Opt 026** 26.5 GHz Frequency Extension, APC-3.5 mm Connector (HP 8593E only)
- Opt 027** 26.5 GHz Frequency Extension, Type-N Connector (HP 8593E only)
- Opt 040** Front Panel Protective Cover With Storage
- Opt 041** HP-IB and Parallel Printer Interfaces
- Opt 042** Protective Soft Carrying Case/Backpack
- Opt 043** RS-232 and Parallel Printer Interfaces
- Opt 050** Improved Amplitude Accuracy (NADC-TDMA bands)
- Opt 051** Improved Amplitude Accuracy for PDC Bands
- Opt 052** Improved Amplitude Accuracy for PHS Band
- Opt 053** Improved Amplitude Accuracy for CDMA Bands
- Opt 101** Fast Time-Domain Sweeps and Analog+ Display
- Opt 102** AM/FM Demodulator and TV Sync Trigger (TV Sync requires Option 101)
- Opt 103** Quasi-Peak Detector, AM/FM Demodulator
- Opt 105** Time-Gated Spectrum Analysis
- Opt 107** TV Receiver Video Tester
- Opt 110** CT2 Demodulator

**Opt 111** Group Delay and Amplitude Flatness

(HP 8593/4/5/6E only)

**Opt 112** DECT Demodulator**Opt 119** Noise Figure**Opt 130** Narrow Resolution Bandwidths

(30 to 300 Hz and 200 Hz EMI)

**Opt 140** Narrow Bandwidths and Precision Frequency Reference**Opt 151** DSP, FAST ADC, and Digital Demodulator**Opt 160** PDC, PHS, NADC, and CDMA Firmware

for Option 151

**Opt 163** GSM900/DCS1800 Firmware for Option 151**Opt 180** TV Picture NTSC/PAL/SECAM**Opt 301** TV Sync Trigger, Fast Time-Domain Sweeps, AM/FM Demodulator, Analog+ Display**Opt 711** 50/75  $\Omega$  Matching Pad/100 Vdc Block**Opt 008** Factory Service Training**Opt UK6** Commercial Calibration Certificate with Test Data**Opt ABX** Quick Reference Guide in Local Languages**Opt W30** Two Additional Years Return-to-HP Service**Opt W32** Two Additional Years Return-to-HP CalibrationApplication Measurement Cards/Personalities<sup>2,3</sup>**HP 11770A** Link Measurement Personality**HP 85700A** Blank 32-KB Memory Card**HP 85702A** Blank 128-KB Memory Card**HP 85704A** Blank 256-KB Memory Card**HP 85705A** Blank 512-KB Memory Card**HP 85712D** EMC Measurement Personality**HP 85713A** Digital Radio Measurement Personality**HP 85714A** Scalar Measurement Personality**HP 85715B** GSM900 Measurement Personality**HP 85717A** CT2-CAI Measurement Personality**HP 85718B** NADC-TDMA Measurement Personality**HP 85719A** Noise-Figure Measurement Personality**HP 85720C** PDC Measurement Personality**HP 85721A** Cable TV Measurement Personality**HP 85722B** DCS1800 Measurement Personality**HP 85723A** DECT Measurement Personality**HP 85724A** Broadcast Measurement Personality**HP 85725C** CDMA Measurement Personality**HP 85726B** PHS Measurement Personality

## Printers and Accessories

**HP DeskJet 340** (C2655A) portable monochrome/color printer**HP DeskJet 400** (C2642A) monochrome/color printer**HP DeskJet 680C** (C4549A) color printer**HP DeskJet 690C** (C4562A) color printer**HP DeskJet 693C** (C4589A) color printer**HP DeskJet 870C** (C4565A, C4555A) color printer**HP C1405B** Keyboard (requires C1405-60015 Adapter)**HP 10833A** HP-IB Cable (1 m)**HP 24542U** RS-232 Cable 3 Meter (9 Pin F to 9 Pin F)

Option 043 Only (for RS-232 9 Pin PC Connection to Analyzer)

**HP 24542G** RS-232 Cable 3 Meter (25 Pin M to 9 Pin F)

Option 043 Only (for RS-232 25 Pin PC or Printer

Connection to Analyzer)

**HP C2932A** RS-232 Cable 3 Meter (9 Pin M to 9 Pin F)

Option 043 Only (for Serial 9 Pin LaserJet 4P/4Plus

Connection to Analyzer)

**HP C2950A** HP IEEE-1284 A-B Parallel Cable (2 m)**HP ITEL-45CHVUB** HP-IB/Parallel Converter (U.S./Canada)**HP ITEL-45CHVEB** HP-IB/Parallel Converter

(International) (requires HP F1011A ac adapter)

## Key Literature

HP 8590 Series Configuration Guide, p/n 5963-6858E

HP 8590 E-Series Data Sheet, p/n 5963-6909E

HP 8590 L-Series Product Overview, p/n 5962-7575E

HP 8590 Series Brochure, p/n 5963-6908E

<sup>1</sup> Most options can be retrofitted. Please contact your local HP sales representative.<sup>2</sup> Some measurement personalities are not supported by all HP 8590 series models.

For complete information, please contact your local HP sales representative.

<sup>3</sup> HP 8590L series requires Option 003 memory card reader.