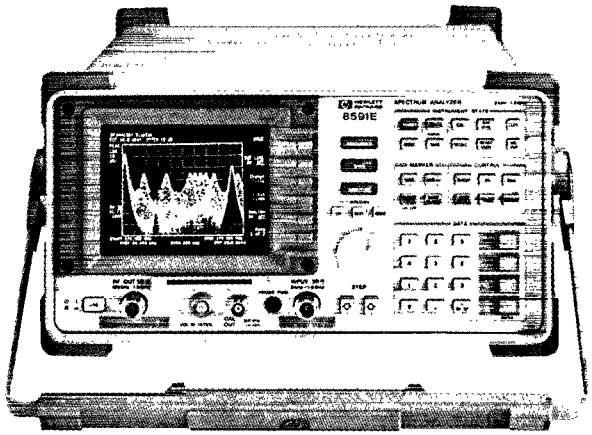

HP 8591E

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

	DC-coupled	AC-coupled
HP 8594E:	9 kHz to 2.9 GHz	100 kHz to 2.9 GHz
HP 8595E:	9 kHz to 6.5 GHz	100 kHz to 6.5 GHz

HP 8596E

Band	LO harmonic=N	Center frequency
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

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 GHz
4	4 (Opt 026)	19.1 to 26.5 GHz

Frequency Reference

Aging: $\pm 2 \times 10^{-6}$/year; $\pm 1 \times 10^{-7}$/year (Opt 004)

Temperature stability: $\pm 5 \times 10^{-6}$; $\pm 1 \times 10^{-8}$ (Opt 004)

Initial achievable accuracy: $\pm 0.5 \times 10^{-6}$; $\pm 2.2 \times 10^{-8}$ (Opt 004)

Frequency Readout Accuracy (start, stop, center, marker): ± (frequency readout × freq ref error + span accuracy + 1% of span + 20% of RBW + 100 Hz × N)

Marker Count Accuracy

Span ≤ 10 MHz × N: ± (marker freq × freq ref error + counter res + 100 Hz × N)

Span > 10 MHz × N: ± (marker freq × freq ref error + counter res + 1 kHz × N)

Counter resolution

Span ≤ 10 MHz × N: Selectable from 10 Hz to 100 kHz

Span > 10 MHz × 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 (Opt 130)

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

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

HP 8596E: [10 × N] kHz to 12.8 GHz; [1 × N] kHz min (Opt 130)

HP 8593E: [10 × N] kHz to 19.25 GHz; [1 × N] kHz min (Opt 130)

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

Accuracy

Span ≤ 10 MHz × N: ±2% of span

Span > 10 MHz × N: ±3% of span

Sweep Time

Range

Span = 0 Hz or > 10 kHz: 20 ms to 100 s

Span = 0 Hz (Opt 101): 20 μs to 100 s

Accuracy

20 ms to 100 s: ±3%

20 μs to < 20 ms (Opt 101): ±2%

Sweep trigger: Free run, single, line, video, external

Resolution Bandwidths: 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: ±20%

Selectivity (characteristic)

−60 dB/−3 dB:	3 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 Opt 130)

Stability

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

>10 kHz offset from CW signal: ≤ −90 dBc/Hz + 20 log N

>20 kHz offset from CW signal: ≤ −100 dBc/Hz + 20 log N

>30 kHz offset from CW signal: ≤ −105 dBc/Hz + 20 log N

Residual FM

HP 8591E

1 kHz RBW, 1 kHz VBW: ≤250 Hz p-p in 100 ms

30 Hz RBW, 30 Hz VBW: ≤30 Hz p-p in 300 ms

HP 8593E, 8594E, 8595E, 8596E

1 kHz, RBW, 1 kHz VBW: ≤ (250 × N) Hz p-p in 100 ms

30 Hz RBW, 30 Hz VBW: ≤ (30 × N) Hz p-p in 300 ms

System Related Sidebands (> 30 kHz offset from CW signal): ≤ −65 dBc + 20 log N

Comb Generator (HP 8593E, 8596E): 100 MHz fundamental frequency; ±0.007% frequency accuracy

Amplitude

Amplitude Range: Displayed average noise level to +30 dBm

HP 8591 Opt 001: Displayed average noise level to +75 dBmV

Maximum Safe Input (input attenuator ≥ 10 dB)

Average continuous power: +30 dBm (1 W)

HP 8591E Opt 001: +75 dBmV (0.4 W)

Peak pulse power

HP 8591E: +30 dBm (1 W)

HP 8591E Opt 001: +75 dBmV (0.4 W)

HP 8593E, 8594E, 8595E, 8596E: +50 dBm (100 W) for < 10 μs pulse width and < 1% duty cycle, input atten ≥ 30 dB

DC

HP 8591E: 25 Vdc

HP 8591E Opt 001: 100 Vdc

HP 8593E: 0 Vdc

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

Gain Compression (> 10 MHz): ≤ 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 Opt 130, sample detector)

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