

HP 5350B/5351B/5352B Specifications

Input 1

Frequency range: HP 5350B: 10 Hz to 20 GHz
 HP 5351B: 10 Hz to 26.5 GHz
 HP 5352B: 10 Hz to 40 GHz

Sensitivity, in dBm (specification/typical performance @ 25°C)
HP 5350B/5351B: 500 MHz to 12.4 GHz: -32/-40; Option 002: -31/-39; Option 006: -29/-37.
HP 5350B/5351B: 12.4 GHz to 20 GHz: -27/-35; Option 002: -25/-33; Option 006: -23/-31.
HP 5351B: 20 GHz to 26.5 GHz: -16/-28; Option 002: -13/-25; Option 006: -11/-23.
HP 5352B: 500 MHz to 26.5 GHz: -25/-30; 26.5 GHz to 40 GHz, linear decrease to -15/-20.

Maximum input: +7 dBm.
Damage level: +25 dBm; HP 5350B/5351B Option 006: 500 MHz to 6 GHz + 39 dBm; 6 GHz to 18 GHz + 36 dBm; 18 GHz to 26.5 GHz + 34.8 dBm.
SWR (typical): 500 MHz to 10 GHz 2:1; Option 002/006 2.5:1. 10 GHz to 26.5 GHz 3:1; Option 002/006 3.5:1. 26.5 GHz to 40 GHz 3.5:1.

Coupling: dc to 50Ω termination, ac to instrument.
Accuracy: ± 1 LSD ± time-base error × frequency. (See Graphs 3 & 5).

Residual stability: when counter and source use common 10 MHz time base or counter uses external higher stability time base, .3 LSD rms typical for resolution 1 Hz - 1 kHz at 25°C; HP 5352B .7 LSD typical 26.5 - 40 GHz; LSD = least significant digit.

Resolution: selectable 1 Hz to 1 MHz.
FM Tolerance (see Graph 2: FM Rate Tolerance)
Maximum deviation: Auto: 20 MHz p-p (12 MHz 5350B). Manual: 60 MHz p-p (55 MHz 5352B).

Maximum FM rate: 10 MHz.

Tracking Speed
Fast-acquisition track: 1 GHz/s.
Normal FM rate: 1 MHz/s.
Low FM rate: 80 kHz/s.

AM tolerance: any modulation index provided the minimum signal level is not less than the sensitivity specification.

Modes of Operation
Automatic: counter automatically acquires and displays highest level signal within sensitivity range.

Manual: center frequency must be entered to within ± 20 MHz or input frequency; ± 3 MHz worst case below 1 GHz; increases measurement and data output rate.

Automatic amplitude discrimination: automatically measures the largest of all signals present, providing that signal is >6 dB (typical) above any signal within 500 MHz; >20 dB (typical) above any signal within 500 MHz to 20 (40) GHz.

Acquisition time
Automatic mode: fast-acquisition track: <60 ms.
 normal FM rate: <125 ms.
 low RM rate: <1.25 s

Manual mode: <20 ms.

	TCX0	Option 001	Option 010
Aging Rate	1 X 10 ⁻⁷ per month	5 X 10 ⁻¹⁰ per day	2 X 10 ⁻⁸ per year
Short Term	1 X 10 ⁻⁹ per s	1 X 10 ⁻¹⁰ per s	1 X 10 ⁻¹⁰ per s
Temperature 0 - 50	1 X 10 ⁻⁶	1 X 10 ⁻⁹	1 X 10 ⁻⁹
Line 10% change	1 X 10 ⁻⁷	1 X 10 ⁻¹⁰	1 X 10 ⁻¹⁰
Warm up to <5 X 10 ⁻⁹ @ 25°C		10 minutes	10 minutes

Figure 1. Time Base (10 MHz).

Input 2:

Frequency range: 10 Hz to 525 MHz.
Mode of Operation
50 Ω: 10 MHz to 525 MHz.
1M Ω: 10 Hz to 80 MHz.
Sensitivity: full operating environment:
50 Ω: 10 MHz to 525 MHz, 25 mV rms: 15 mV typical @ 25°C;
1M Ω: 10 Hz to 80 MHz, 25 mV rms: 15 mV typical @ 25°C;
 Gate Time = 1/resolution: 1 ms minimum.
Resolution: selectable 1 Hz to 1 MHz.
High resolution: 1M Ω mode: 0.001 Hz for <100 kHz input; 0.01 Hz for <1 MHz input; 0.1 Hz for <10 MHz input; 1 Hz for >10MHz input: 1 second gate.
Accuracy: (See Graphs 4 & 5). ±1 LSD

$$\left(\frac{\pm 1.4 \times \text{Trigger Error}^{(1)} \pm \text{Time Base}}{\text{Gate Time}} \right) \times \text{Frequency}$$

Impedance: selectable 1M Ω nominal shunted by <70 pF or 50 Ω nominal.

Coupling: ac.
Connector: replaceable fuse, type BNC female.
Maximum input: 50 Ω: +10 dBm; 1M Ω: 1V rms.
Damage level: 50 Ω: 1.5V p-p into 50 Ω; available from rear panel BNC connectors whenever the instrument has AC power connected. >5 kHz: 5.5 V rms (+ 28 dBm) + 1.25 X 10⁶ V rms/FREQ.
Panel label: 5.5 V rms (+ 28 dBm).

Time base output: 10 MHz and 1 MHz, 2.4 V square wave AC coupled into 1k Ω: 1.5V p-p into 50 Ω; available from rear panel BNC connectors whenever the instrument has AC power connected.

External time base: 1, 2, 5 or 10 MHz, 0.7 V min to 8 V max. p-p sine wave or square wave into > 1K Ω shunted by < 30 pF, via rear-panel BNC connector. External reference automatically selected when signal is present.

General

Display: segmented 24-character alphanumeric LCD (backlighted).
Keyboard: set-up stored in STBY mode.
Self-check: tests for correct circuit operation.
Diagnostics: front-panel or HP-IB selectable, Display and Keyboard Lockout, Service Diagnostics and User Information.
Data output: over HP-IB bus; varies with Frequency and Resolution.
Auto mode: >100 readings/s, 10 kHz resolution, no math functions, "DUMP" mode.
Manual mode: >120 readings per second formatted at 10 kHz resolution, no math functions "DUMP MODE".

Math functions: result = measurement x scale + offset.
Offset: measurement is offset by entered value.
Scale: measurement is multiplied by entered value.
Smooth: displayed resolution is determined using exponential averaging; displays only stable digits.

Sample rate: variable from less than 50 ms between measurements to HOLD, which holds the display indefinitely or until trigger occurs.
Display rate: 5/s, variable over HP-IB.

Overload indication: "OVRLOAD" A user message.
Sleep mode: input 1 emissions reduced to <-70 dBm typical when sleep mode or input 2 is selected.

IF output: rear panel BNC provides 30 - 110 MHz down-converted microwave signal at >-20 dBm into 50 Ω, ac coupled.

HP-IB interface functions: functions and diagnostics are programmable; address-set at front panel, default switches on rear panel; teach/learn programming; IEEE 728 compatible command structure; function subset SH1, AH1, T5, RF1, RL1, PP0, DC1, DT1, C0, E1 (see page 542).

Reset/local: returns to local control.
Operation temperature: 0° C to 50° C.
Power requirements: 100 VA max.

Line select: 100 V (90-105 VAC rms; 47.5 - 440 Hz).
 115/120 V (104/126 VAC rms; 47.5 - 440 Hz).
 220 V (198-231 VAC rms; 47.5 - 66 Hz).
 230/240 V (207-252 VAC rms; 47.5 - 66 Hz).

Accessories furnished: power cord, manual.
Size: 33mmH × 407 mmW × 358 mmD (5¼ in. H × 16 in. W × 14 in. D)
Weight: 11 kg (24 lb).

(1) Trigger Error $\sqrt{e_1^2 + e_n^2}$ s rms
 Input Slew Rate in V/s at Trigger Point
 Where e₁ = effective rms noise of counter's input channel (100 μV typical)
 e_n = rms noise of the input signal for a 500 MHz bandwidth