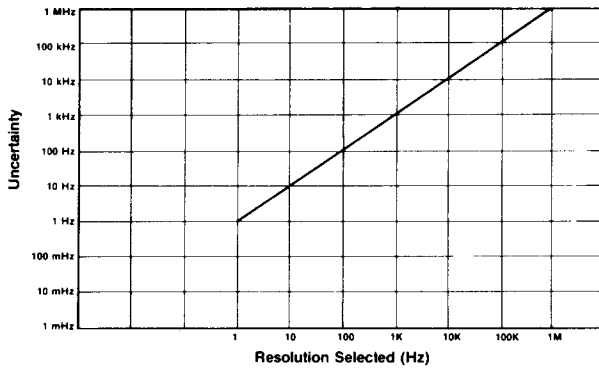
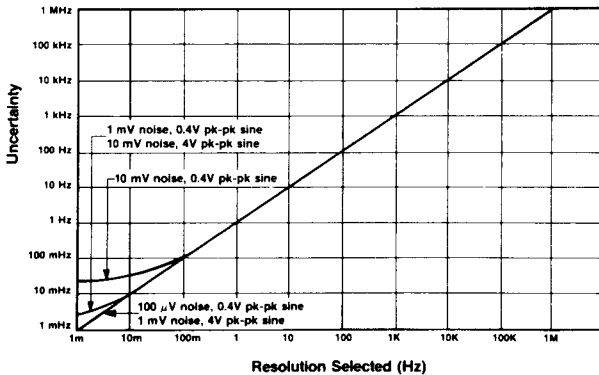


Table 1-1. Model 5350B/5351B/5352B Specifications

INPUT CHARACTERISTICS			
INPUT 1:	HP 5350B	HP 5351B	HP 5352B
Frequency Range:	500 MHz – 20.0 GHz	500 MHz – 26.5 GHz	500 MHz – 46 GHz
Sensitivity: Full Operating Environment 500 MHz to 12.4 GHz 12.4 GHz to 20.0 GHz 20.0 GHz to 26.5 GHz 26.5 GHz to 40 GHz @ 25°C (typical) 500 MHz to 12.4 GHz 12.4 GHz to 20.0 GHz 20.0 GHz to 26.5 GHz 26.5 GHz to 40 GHz	-32 dBm -27 dBm N/A -40 dBm -35 dBm N/A	-32 dBm -27 dBm -16 dBm -40 dBm -35 dBm -28 dBm N/A	-25 dBm -25 dBm -25 dBm dBm = 0.741 f(GHz) – 44.6 -30 dBm -30 dBm -30 dBm dBm = 0.741 f(GHz) – 49.6
Maximum Input:	+7 dBm	+7 dBm	+7 dBm
Damage Level:	+25 dBm, peak	+25 dBm, peak	+25 dBm, peak
Impedance:	50Ω nominal	50Ω nominal	50Ω nominal
Connector:	Precision Type N female	APC –3.5 male with collar, SMA compatible	
SWR: 500 MHz – 10 GHz 10 GHz – 20 GHz 20 GHz – 26.5 GHz 26.5 GHz – 40 GHz	<2:1 typical <3>1 typical N/A N/A	<2:1 typical <3:1 typical <3:1 typical N/A	<2:1 typical <3:1 typical <3:1 typical <3.5:1 typical
Coupling:	dc to 50Ω termination, ac to instrument		
Accuracy:	±1 LSD ± time base error × frequency (See Graphs 1, 2, 3)		
Residual Stability:	When counter and source use common 10 MHz time base or counter uses external higher stability time base, 1 LSD rms typical for resolution 1 Hz – 1 kHz at 25°C; LSD = least significant digit.		
Resolution:	Selectable 1 Hz to 1 MHz		

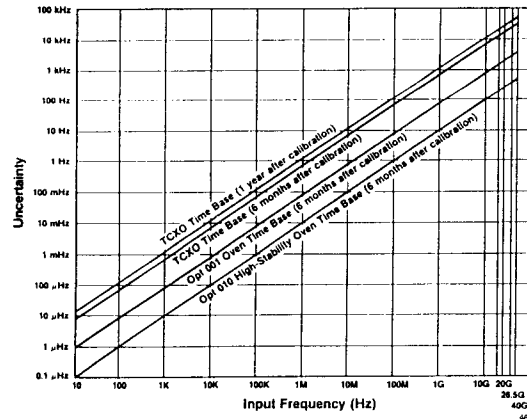


GRAPH 1. Input 1 Uncertainty Due to Resolution Selected



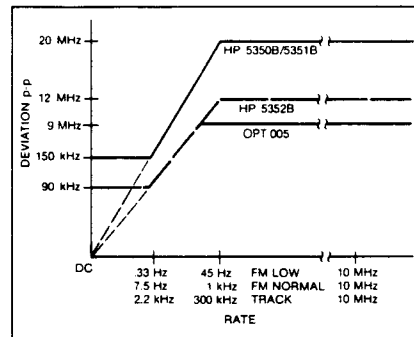
GRAPH 2. Input 2 Uncertainty Due to Trigger Error and Resolution Selected.

NOTE:
Input 1 accuracy = resolution uncertainty (Graph 1) + time base uncertainty (Graph 3).
Input 2 accuracy = resolution and trigger uncertainty (Graph 2) + time base uncertainty (Graph 3).



GRAPH 3. Uncertainty Due to Time Base Error.

Time Base Error can be reduced by calibrating the time base more frequently, or by using a time base with a better aging rate.



GRAPH 4. FM Rate Tolerance.

Table 1-1. Model 5350B/5351B/5352B Specifications (Continued)

INPUT 1: HP 5350B/5351B/5352B	TCXO TIME BASE	OPTIONAL HIGH STABILITY TIME BASE OPTION 010 [Ⓟ]						
<p>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 of input frequency; ± 3 MHz worst case below 1 GHz; increases measurement and data output rate.</p> <p>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.</p> <p>FM Tolerance (See Graph 4):</p> <table border="1" data-bbox="154 625 571 756"> <tr> <td>Automatic Mode:</td> <td>20 MHz p-p 12 MHz p-p 9 MHz p-p</td> <td>HP 5350B/51B HP 5352B HP 5352B, Opt 005</td> </tr> <tr> <td>Manual Mode:</td> <td>60 MHz p-p 55 MHz p-p 55 MHz p-p</td> <td>HP 5350B/51B HP 5352B HP 5352B, Opt 005</td> </tr> </table> <p>Tracking Speed: Fast-Acquisition Track; 1 GHz/s. Normal FM Rate: 1 MHz/s. Low FM Rate: 80 kHz/s.</p> <p>Acquisition Time: Automatic Mode: Fast-Acquisition Track: <60 ms. Normal FM Rate: <125 ms Low FM Rate: <1.25s. Manual Mode: <20 ms</p> <p>AM Tolerance: Any modulation index provided the minimum signal level is not less than the sensitivity specification.</p> <p>Gate time: For 1 Hz resolution 500 MHz - 5.7 GHz 200 ms 5.7 - 11.3 GHz 400 ms 11.3 - 16.9 GHz 600 ms 16.9 - 22.5 GHz 800 ms >22.5 GHz 1000 ms</p>	Automatic Mode:	20 MHz p-p 12 MHz p-p 9 MHz p-p	HP 5350B/51B HP 5352B HP 5352B, Opt 005	Manual Mode:	60 MHz p-p 55 MHz p-p 55 MHz p-p	HP 5350B/51B HP 5352B HP 5352B, Opt 005	<p>Crystal Frequency: 10 MHz Stability: Aging Rate: $<1 \times 10^{-7}$ per month. Short Term: $<1 \times 10^{-9}$ for 1 s averaging time. Temperature: $<1 \times 10^{-6}$, 0-50°C, if referenced to +25°C and set to the offset frequency. Line Variation: $<1 \times 10^{-7}$ for 10% change from nominal. Time Base Output: 10 MHz and 1 MHz, >2.4V square wave ac coupled into 1 kΩ; >1.5V p-p into 50Ω; available from rear panel BNC connectors whenever the instrument has ac power connected. External Time Base: 1, 2, 5 or 10 MHz, 0.7V min. to 8V max p-p; sine wave or square wave into >1kΩ shunted by <30pF, via rear panel BNC connector. External reference automatically selected when signal is present, an indicator (∇) appears in the display. TCXO power turned off, oven heater on, oscillator signal disconnected.</p>	<p>Crystal Frequency: 10 MHz Stability: Long Term (Aging Rate): A. $<5 \times 10^{-10}$ per day after 24-hour warm-up when: 1. oscillator off-time was less than 24 hours. 2. oscillator aging rate was $<5 \times 10^{-10}$ per day prior to turn off. B. $<5 \times 10^{-10}$ per day in less than 30 days of continuous operation for off-time greater than 24 hours. C. $<1 \times 10^{-7}$ per year for continuous operation. Temperature: $<7 \times 10^{-9}$, 0-50°C Line Variation: $<1 \times 10^{-10}$ for 10% change from nominal Warmup: Same as Warmup for Opt 001</p>
Automatic Mode:	20 MHz p-p 12 MHz p-p 9 MHz p-p	HP 5350B/51B HP 5352B HP 5352B, Opt 005						
Manual Mode:	60 MHz p-p 55 MHz p-p 55 MHz p-p	HP 5350B/51B HP 5352B HP 5352B, Opt 005						
	<p>OPTIONAL OVEN TIME BASE OPTION 001[Ⓟ]</p>	<p>GENERAL</p>						
	<p>Crystal Frequency: 10 MHz Stability: Aging Rate: Same as Long Term Aging Rate - Opt 010 Short Term: $<1 \times 10^{-10}$ for 1 s average. Temperature: $<7 \times 10^{-9}$, 0° - 50°C Line Variation: $<1 \times 10^{-10}$ for 10% change from nominal. Warmup: Within 5×10^{-9} of final value (see below) 10 min. after turn-on when: 1. oscillator is operated in a 25°C environment with 20 Vdc Oven Supply voltage applied. 2. oscillator off-time was less than 24 hours. 3. oscillator aging rate was $<5 \times 10^{-10}$ per day prior to turn-off. Final value is defined as oscillator frequency 24 hours after turn-on.</p>	<p>Display: Segmented 24-character alpha-numeric LCD with 24 annunciators (backlighted); lockout (see Diagnostics) Keyboard: Set up stored in STBY mode; lockout (See Diagnostics). Self-Check: Tests for correct circuit operation using LO frequency divided by ten. 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. Automatic Mode: 100 readings per second. Manual Mode: 120 readings per second. (10 kHz resolution, no math functions "DUMP MODE"). Math Functions: Result = measurement \times 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, 1 kHz resolution. Overload Indication: "OVERLOAD" A user message; external pad or signal attenuation should be used to avoid damage. 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 50Ω, ac coupled. HP-IB: Functions and diagnostics are programmable; address settable from front panel. Default switches on rear panel; Teach/Learn programming; IEEE 728 compatible command structure; Function subset SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT1, C0, E1. Reset/Local: returns to local control. Operating Temperature: 0°C to 50°C. Power Requirements: 100 VA max. Line Select: 100V (90-105 VAC rms; 47.5-440 Hz) 115/120V (104-126 VAC rms; 47.5-440 Hz). 220V (198 - 231 VAC rms; 47.5 - 66 Hz) 230/240V (207-252 VAC rms; 47.5-66 Hz). Accessories Furnished: Power cord, manual. Size: D/133 mmH \times 425.5 mmW \times 358 mmD (5 1/4 in. H \times 16.75 in. W \times 14 in. D) Weight: 11 kg (24 lb)</p>						
	<p>OPTIONAL REAR PANEL INPUTS OPTION 002[Ⓟ]</p>							
	<p>All specifications are the same except Input 1:</p>							
	<p>Sensitivity: Sensitivity is reduced by: 1 dBm, 500 MHz to 12.4 GHz 2 dBm, 12.4 GHz to 20.0 GHz 3 dBm, 20.0 GHz to 26.5 GHz SWR: 500 MHz - 10 GHz ($<2.5:1$ typical) 10 GHz - 20 GHz ($<3.5:1$ typical) 20 GHz - 26.5 GHz ($<3.5:1$ typical, 5351B)</p>							
	<p>OPTIONAL FREQUENCY RANGE EXTENSION, 5352B OPTION 005</p>							
	<p>Sensitivity: 41 GHz to 46 GHz 0.741 \times Frequency in GHz -44.6 dBm for frequencies greater than 26.5 GHz (-10dBm at 46 Hz)</p>							
	<p>OPTIONAL INCREASED DAMAGE LEVEL OPTION 006[Ⓟ]</p>							
	<p>Protects Input 1 from damage by limiting high level signals. All specifications are the same except Input 1:</p>							
	<p>Damage Level 500 MHz to 6 GHz +39 dBm (8 Watts) 6 GHz to 18 GHz +36 dBm (4 Watts) 18 GHz to 26.5 GHz +34.8 dBm (3 Watts)</p>							
	<p>Sensitivity: Sensitivity is reduced by: 3 dBm, 500 MHz to 12.4 GHz 4 dBm, 12.4 GHz to 20.0 GHz 5 dBm, 20.0 GHz to 26.5 GHz</p>							
	<p>SWR: 500 MHz - 10 GHz ($<2.5:1$ typical) 10 GHz - 20 GHz ($<3.5:1$ typical) 20 GHz - 26.5 GHz ($<3.5:1$ typical, 5351B)</p>							
		<p>Footnotes: ⁽¹⁾ Trigger Error: $\frac{\sqrt{e_1^2 + e_n^2}}{\text{Input Slew Rate in } V/s \text{ at Trigger point}} \text{ s rms}$ Where e_1 = Effective rms noise of counter's input channel (100 μV typical) e_n = rms noise of the input signal for a 500 MHz bandwidth</p>						
		<p>⁽²⁾ Available with HP5350B/5351B only.</p>						
		<p>⁽³⁾ Options 001 and 010 are mutually exclusive.</p>						