Table 1-1. Model 5355A Specifications

INPUT SPECIFICATIONS (PULSE AND CW MODE)

	5356A	5356B*	5356C*	5355A†
Frequency Range	1.5—18 GHz	1.5—26.5 GHz (Option 001: 18—26.5 GHz)	1.5—40 GHz (Option 001: 26.5—40 GHz)	0.4—1.6 GHz
Sensitivity 0.4—1.6 GHz 1.5—12.4 GHz 12.4—18 GHz 18—26.5 GHz 26.5—34 GHz 34—40 GHz	 —— –20 dBm –15 dBm —— —— ——	 —— –20 dBm –15 dBm *–15 dBm* —— ——	 —— –25 dBm –20 dBm –20 dBm *–15 dBm* *–10 dBm*	 –15 dBm —— —— —— —— ——
	NOTE: For pulse widths <200 ns reduce sensitivity by 5 dB			
Maximum Input 0.4—1.6 GHz 1.5—12.4 GHz 12.4—18 GHz 18—26.5 GHz 26.5—40 GHz	 —— +5 dBm –5 dBm —— ——	 —— +5 dBm +5 dBm *+5 dBm* ——	 —— *+5 dBm* +15 dBm *+15 dBm* *+15 dBm*	 +5 dBm —— —— —— ——
Dynamic Range 0.4—1.6 GHz 1.5—12.4 GHz 12.4—18 GHz 18—26.5 GHz 26.5—34 GHz 34—40 GHz	 —— 25 dB 20 dB —— —— ——	 —— 25 dB 20 dB *20 dB* —— ——	 —— 30 dB 35 dB 35 dB *30 dB* *25 dB*	 20 dB —— —— —— —— ——
Damage Level	+25 dBm peak	*+25 dBm peak*	*+25 dBm peak*	+24 dBm peak (fuse in BNC connector)
Impedance	50Ω **NOMINAL**	50Ω **NOMINAL**	50Ω **NOMINAL**	50Ω **NOMINAL**
SWR 0.4—1.6 GHz 1.5—10 GHz 10—18 GHz 18—26.5 GHz 26.5—34 GHz 34—40 GHz	 —— <2:1 **TYPICAL** <3:1 **TYPICAL** —— —— ——	 —— <2:1 **TYPICAL** <3:1 **TYPICAL** <*3:1* **TYPICAL** —— ——	 —— <2:1 **TYPICAL** <3:1 **TYPICAL** <3:1 **TYPICAL** <*3:1* **TYPICAL** <*5:1* **TYPICAL**	 <2.5:1 **TYPICAL** —— —— —— —— ——
Connector	N Male	SMA male with collar (Option 001: 18—26.5 GHz waveguide (WR 42))	APC—3.5 male with collar (Option 001: 26.5—40 GHz waveguide (WR28))	BNC

*Specifications in italics apply to both the standard 5356 Head and Option 001 of the same model.

† 0.4—1.6 GHz Input

OPERATING MODE SPECIFICATIONS (CW MODE)

	5356A/B/C INPUT AUTO MODE	5356A/B/C MAN MODE	5355A 0.4—1.6 GHz INPUT
FM Tolerance	5356A/B: 15 MHz p-p (60 MHz in special FM mode) 5356C: 60 MHz p-p Rate: dc—10 MHz	80 MHz p-p Rate: dc—10 MHz	Instantaneous frequency must not exceed 0.4—1.6 GHz range.
AM Tolerance	Any modulation index provided the minimum signal level is greater than the counter sensitivity.		
Multiple Signal Discrimination **(TYPICAL)**	Automatically measures largest signal provided signal is 8 dB greater than any signal within 500 MHz and 20 dB greater than any signal over 1.5—26.5 GHz range. (5356C only: 15 dB (option 001: 20 dB) greater than any signal over 26.5—40 GHz range)		
Acquisition Time **(TYPICAL)**	5356A/B: 400 ms (1.1s in special FM mode) 5356C: 1.4s (option 001: 1.1s)	15 ms	<1 ms (FREQ ≥ 800 MHz) 5345A GATE TIME + 45 ms (FREQ <800 MHz)

Specifications describe the instrument's warranted performance. Supplemental characteristics are intended to provide information useful in applying the instrument by giving **TYPICAL** or **NOMINAL**, but nonwarranted performance parameters. Definition of terms is provided at the end of the specification section.

Table 1-1. Model 5355A Specifications (Continued)

OPERATING MODE SPECIFICATIONS (CW MODE) (Continued)

	5356A/B/C INPUT AUTO MODE	5356A/B/C MAN MODE	5355A 0.4—1.6 GHz INPUT
Measurement Time	Gate Time ≤ 100 ms: Acquisition time + 4 X 5345A GATE TIME + 5345A Sample Rate + 125 ms. Gate Time > 100 ms: Acquisition time + 5345A GATE TIME +5345A Sample Rate + 35 ms		Acquisition time +5345A GATE TIME + 5345A SAMPLE RATE + 35 ms
LSD Displayed	$\frac{1\text{ Hz}}{\text{5345A GATE TIME}}$		
Resolution	± 2 X LSD ± 1 X 10^{-10} rms X FREQ		± 5 X LSD
Accuracy †	Resolution ± (time base error X FREQ)		Resolution ± (time base error X FREQ)

PULSE MODE

	5356A/B/C INPUT AUTO MODE	5356A/B/C INPUT MAN MODE	5355A* 0.4—1.6 GHz INPUT
FM Tolerance **(TYPICAL)**	50 MHz p-p chirp	80 MHz p-p chirp	Instantaneous frequency must not exceed 0.4—1.6 GHz range
Acquisition Time **(TYPICAL)**	5356A/B/C MAN MODE: 0 5356A/B AUTO MODE: 100 μs/(EXT. GATE WIDTH X PRF) + 650 ms for EXT GATE ≤ 100 μs. (2/PRF) + 650 ms for EXT GATE > 100 μs. 5356C AUTO MODE: 100 μs/(EXT GATE WIDTH X PRF) + 1.55s (Option 001: 1.25s) + 8 (Option 001: 7)/PRF for EXT GATE ≤ 100 μs. 10 (Option 001: 9)/PRF + 1.55s (Option 001: 1.25s) for EXT GATE > 100 μs.		0 (FREQ ≥ 800 MHz) $\frac{\text{5345A GATE TIME}}{\text{EXT GATE WIDTH X PRF}}$ + 45 ms (FREQ < 800 MHz)
Calibration Time	$\frac{\text{5345A GATE TIME}}{\text{EXT GATE WIDTH X PRF}}$ + 75 ms Performed during 10 consecutive measurements when PULSE Mode is selected, after any front panel change, or when the EXTERNAL GATE width changes by more than 12%. Only calibrates if External Gate is < 100 μs.		
Measurement Time **(TYPICAL)**	$\frac{\text{Acquisition Time + Calibration Time + 5345A SAMPLE RATE + 5345A GATE TIME or 100 μs (whichever is greater)}}{\text{EXT GATE WIDTH X PRF}}$ + 100ms	Acquisition Time + Calibration Time + 5345A SAMPLE RATE + 60 ms + $\frac{\text{(1 μs + 5345A GATE TIME)}}{\text{EXT GATE WIDTH X PRF}}$	
Pulse Width: Min: Max:	100 ns 20 ms	60 ns 20 ms	100 ns 1 s
Pulse Repetition Frequency Min: Max:	NOTE: Minimum off time is 400 ns (i.e., 2 MHz PRF with 100 ns pulses) 50 Hz 2 MHz	50 Hz 2 MHz	100 Hz 2 MHz
Minimum ON/OFF RATIO	25 dB **(TYPICAL)**		
Maximum Video Feedthrough	15 mV p-p **(TYPICAL)** for rf burst rise and fall times ≥ 10 ns		
LSD Displayed	1 Hz/5345A GATE TIME		
Resolution	± 2 X LSD ± rms jitter**		± 10 X LSD ± 5 X rms jitter**
Accuracy†	Resolution ± $\frac{.04}{\text{EXT GATE WIDTH}}$ ± 3 KHz ± (Time base error X FREQ)		(± 16 X LSD) ± (5 X rms jitter**) ± (.08/EXT GATE WIDTH) ± 24 KHz ± (Time base error X FREQ)

Specifications apply only to external gating of 5345/5355 ** See jitter specification on following page. † After one minute warm-up.

Table 1-1. Model 5355A Specifications (Continued)

5356A OPTION 001 HIGH PASS FILTER SPECIFICATIONS

Insertion Loss: <1 dB from 1.5—18 GHz

Insertion Loss below 100 MHz: >35 dB

GENERAL

IF OUT: Down converted signal in range of 80—375 MHz available at 5355 rear panel IF OUT connector. Ø dBm **NOMINAL** level.

GATE OUT: Ø to -1 volt detected IF signal used to drive 5345A EXTERNAL GATE CONTROL INPUT. Width of GATE OUT is approximately 30 ns less than rf burst width.

PULSE OUT: Detected IF signal: TTL levels; TTL low indicates signal present; +1 to ØV **TYPICAL** into 50Ω.

Operating Temperature: Ø° to 55°C

Weight: 5355A: 3.75 kg (8 lb., 4 oz.) net
5356A/B/C: 0.54 kg (1 lb., 3 oz.) net

5356A/B/C Dimensions: 27.4 mm, 138 mm, 56.6 mm (1.08", 5.43", 2.23")
Cable length: 1.68 metres (66")

DEFINITIONS

LSD Displayed: Unit value of least significant digit.

Resolution: Maximum deviation (or rms deviation) between successive measurements under constant environmental and constant input conditions.

Accuracy: Deviation from the true value as fixed by universally accepted standards for frequency and time.

Minimum ON/OFF Ratio: For a pulsed rf input, the required minimum difference, in dB, between the pulse ON signal level and pulse OFF signal level which will enable the 5355 to distinguish a pulse input.

Maximum Video Feedthrough: For a pulse rf input, the maximum peak-to-peak voltage caused by the superposition of video components above 75 MHz, which the 5355/56 can tolerate in the burst.

rms jitter = $\frac{1}{\sqrt{(\text{5345A GATE TIME})\ (\text{EXT GATE WIDTH})}} + X$

X = 100 Hz rms

For EXT GATE signals generated by the 5355A, the EXT GATE WIDTH equals the input PULSE WIDTH minus 30 ns **(TYPICAL)** for the 5356A/B/C input and equals input PULSE width minus 40 ns **(TYPICAL)** for the 5355 0.4—1.6 GHz input.

1-13. SAFETY CONSIDERATIONS

1-14. This product is used as part of a Safety Class I instrument (provided with a protective earth terminal). Safety information pertinent to the operation and servicing of this instrument is included in appropriate sections of this manual.

1-15. EQUIPMENT SUPPLIED

1-16. The only equipment supplied with the 5355A plug-in unit is the BNC Cable (HP Part No. 05355-60101) shown in *Figure 1-1*.

1-17. ACCESSORIES

1-18. Accessories available for use with the 5355A are as follows (connector and filter options listed in *Table 1-2*):

5356A Frequency Converter Head (1.5—18 GHz)
5356B Frequency Converter Head (1.5—26.5 GHz)
5356C Frequency Converter Head (1.5—40 GHz)
Extender Board Service Kit, HP Part No. 05355-60100 (See paragraph 1-19)
APC 7 to N(f) Adapter, HP 11524A