

SIGNAL SOURCES

Economy RF

HP 8656B, 8657A/B

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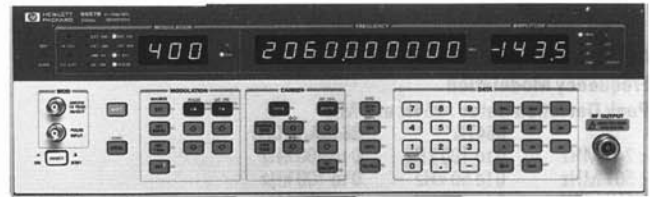
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- 100 kHz up to 2060 MHz
- Electronic attenuator on HP 8657A
- ± 1.0 dB level accuracy (typically ± 0.5 dB on HP 8657A)

- 50W reverse power protection on HP 8657A/B
- AM, FM, and optional pulse modulation



HP 8657A



HP 8657B



HP 8656B Synthesized Signal Generator

The HP 8656B is a programmable synthesized signal generator that combines performance, quality, and economy, covering the 0.1 to 990 MHz frequency range.

Precise Output Control

The HP 8656B provides ± 1.0 dB absolute level accuracy and 0.1 dB resolution with calibrated power levels over +13 to -127 dBm. The output level can be offset to compensate for losses external to the generator. RF leakage is well-shielded at $< 1.0 \mu\text{V}$ and 25 W reverse power protection guards against accidental damage.

Versatile Modulation

The HP 8656B is capable of simultaneous AM and FM modulation. The instrument provides internal 1 kHz and 400 Hz sources and also accepts external sources. AM is ac-coupled, while FM can be either ac- or dc-coupled. The dc-coupling is exceptionally stable (< 10 Hz/hour drift) and accurate (± 500 Hz center frequency accuracy).

HP 8657A/B Synthesized Signal Generators

The HP 8657A and 8657B offer excellent performance at an affordable price. The HP 8657A covers a 100 kHz to 1040 MHz frequency range while the L-Band HP 8657B covers 100 kHz to 2060 MHz.

High-Performance Spectral Purity and Output Power

The low residual FM (< 4 Hz at frequencies < 1040 MHz) and the excellent phase noise performance of these signal generators make them ideal for almost all measurements requiring test signals at adjacent or out-of-channel offsets. Features such as carrier phase adjust allow you to characterize phase-sensitive devices such as phase detectors or phase interferometers, using precise 1-degree phase offsets with respect to another signal source. Display blanking and nonvolatile memory-clear are also available for operation in secure environments.

HP 8656B, 8657A/B Specification Summary

Specifications	HP 8656B	HP 8657A	HP 8657B
Frequency			
Range:	100 kHz to 990 MHz	100 kHz to 1040 MHz	100 kHz to 2060 MHz
Resolution:	10 Hz	10 Hz	1 Hz
Timebase aging rate:	± 2 ppm/year (typ.)	± 2 ppm/year (typ.)	± 2 ppm/year (typ.)
Option 001:	1.5×10^{-3} parts/day after 10 days (typ.)	1.5×10^{-3} parts/day after 10 days (typ.)	1×10^{-3} parts/day after 45 days (typ.)
Switching speed (w/i 100 Hz):	< 35 ms (25 ms typ. at 25° C)	< 35 ms (30 ms typ. at 25° C)	< 35 ms (30 ms typ. at 25° C)
Spectral Purity			
SSB phase noise ($f_c = 500$ MHz, 20 kHz offset):	< -114 dBc/Hz	< -130 dBc/Hz	< -130 dBc/Hz
Nonharmonics (> 5 kHz offset, CW):	< -60 dBc	< -60 dBc	< -60 dBc, < 1030 MHz < -54 dBc, ≥ 1030 MHz
Harmonics (at levels $\leq +7$ dBm):	< -30 dBc	< -30 dBc	< -30 dBc, < 1030 MHz < -25 dBc, ≥ 1030 MHz
Subharmonics	None	None	None, 100 kHz to 1030 MHz
Residual FM (0.3 to 3 kHz $f_c = 500$ MHz, CW)	< 7 Hz rms	< 4 Hz rms	< -35 dBc, 1030 to 2060 MHz < 2 Hz rms (< 6 Hz > 1040 MHz)

Specifications	HP 8656B	HP 8657A	HP 8657B
Output Level Range: Resolution: Absolute accuracy: Reverse power protection:	+13 to -127 dBm into 50 Ω 0.1 dB < ±1 dB, ≥123 MHz, +7 to -124 dBm < ±1.5 dB, <123.5 MHz and < -124 dBm or > +7 dBm 25 W	+12 to -143.5 dBm into 50 Ω, +10 dBm, 100 kHz to 1 MHz 0.1 dB < ±1 dB, ≥ -127 dBm < ±1.5 dB, > +7 dBm 50 W	+13 to -143.5 dBm into 50 Ω, +10 dBm, <1030 MHz w/Option 003 0.1 dB < ±1 dB, ≥ -127 dBm < ±1.5 dB, ≥ +3.5 dBm 50 W
Amplitude Modulation Depth (output at ≤ +7 dBm): Resolution: Bandwidth (1 dB): Accuracy (internal rates): (<90% AM < +7 dBm) Distortion (internal rates): (0 to 30% AM, < +7 dBm)	0 to 99% 1% 20 Hz to 40 kHz < ±(2% ± 4% of setting) <1.5% THD + noise	0 to 99% f _c ≥400 kHz 1% 20 Hz to 40 kHz < ±(2% + 6% of setting) <1.5% THD + noise	0 to 100% f _c ≥400 kHz 1% 20 Hz to 40 kHz < ±(2% + 6% of setting) <1.5%, <1030 MHz <4%, >1030 MHz
Frequency Modulation Maximum peak deviation ¹ : Resolution: Bandwidth (1 dB): Indicator accuracy: Distortion (internal rates, deviation 3 kHz):	99 kHz, f _c <123.5 and >247 MHz 50 kHz, f _c 123.5 to 247 MHz 100 Hz, deviations <10 kHz, 1 kHz, deviations ≥10 kHz dc/20 Hz to 50 kHz < ±5% of setting <0.5% THD + noise	99 kHz, f _c <130 and >260 MHz 50 kHz, f _c 130 to 260 MHz 100 Hz, deviations <10 kHz, 1 kHz, deviations ≥10 kHz dc/20 Hz to 50 kHz < ±5% of setting <0.5% THD + noise	50 kHz to 200 kHz, f _c <1040 MHz 400 kHz, f _c 1040 to 2060 MHz 100 Hz, <1040 MHz, dev. <20 kHz 200 Hz, >1040 MHz, dev. <20 kHz dc/20 Hz to 50 kHz < ±5% of setting <0.5% THD + noise, (≥6 kHz dev. for f _c ≥1040 MHz)
Pulse Modulation On/off ratio: Rise/fall time, 10% to 90%: Repetition rate: Duty cycle:	Not applicable	Not applicable	Option 003 >70 dB (>95 dB, f _c ≥1030 MHz) <35 ns (<50 ns, f _c ≥1030 MHz) dc to 30 MHz, typical 0% to 100%
Remote Programming Interface: IEEE-488 functions:	HP-IB (HP's implementation of IEEE-488) SH0, AH1, T0, L2, SR0, RL1, PP0, DC1, DT0, C0, E1		
General Save/recall/sequence registers: Operating temperature: Power requirements: Size: Weight:	100 nonvolatile registers to save front-panel settings 0° to 55° C 100 V, 120 V, 220 V or 240 V (+5, -10%) from 48 to 440 Hz HP 8656B: 125 VA maximum; HP 8657A: 175 VA maximum; HP 8657B: 200 VA maximum HP 8656B, 8657A: 133 mm H x 425 mm W x 520 mm D (5.25 in x 16.75 in x 20.5 in) HP 8657B: 133 mm H x 425 mm W x 574 mm D (5.25 in x 16.75 in x 22.6 in) HP 8656B: 18.1 kg (40 lb); HP 8657A: 18.2 kg (40 lb); HP 8657B: 20.5 kg (45 lb)		

¹Deviations reduced for low-rate modulation; not specified for f_c - (f_m) < 100 kHz.

Key Literature

HP 8656/57 Series Economy Synthesized Signal Generators Technical Data, p/n 5091-1556E
HP 8656/57 Series Economy Synthesized Signal Generators Brochure, p/n 5091-1555E

Ordering Information

Base Price	HP 8656B	\$7,490	HP 8657A	\$9,760	HP 8657B	\$14,200
Options						
001 High-Stability Timebase		+\$1,110		+\$1,080		+\$1,080
002 RF Connectors on Rear Panel Only		+\$285		+\$280		+\$280
003 Pulse Modulation		N/A		N/A		+\$925
022 0.3 GMSK Modulation (Includes Option 909, N/A w/Option 002)		N/A		+\$4,080		+\$4,360
H46 0.5 GMSK Modulation		N/A		+\$7,000		+\$7,000
H60 Pulse Modulation, Frequencies to 1040 MHz		N/A		N/A		-\$1,800
907 Front Handle Kit (5061-9689)		+\$59		+\$58		+\$58
908 Rack Flange Kit (5061-9677)		+\$34		+\$35		+\$35
909 Combined Front/Rack Flange Kit (5061-9683)		+\$85		+\$84		+\$84
910 Extra Operation/Calibration and Two Service Manuals		+\$375		+\$365		+\$365
915 Add Service Manual	(08656-90205)	+\$160	(08657-90004)	+\$157	(08657-90007)	+\$157
W30 Three-year Repair Service		+\$155		+\$190		+\$310
W32 Three-year Calibration Service		+\$810		+\$810		+\$1,485
W34 Three-year Standard Compliant Cal. Service		+\$980		+\$980		+\$1,770
W50 Five-year Repair Service		+\$310		+\$380		+\$620

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