

SIGNAL GENERATORS

High-Performance RF

HP 8643A, 8644B, 8664A, 8665A, 8665B

437

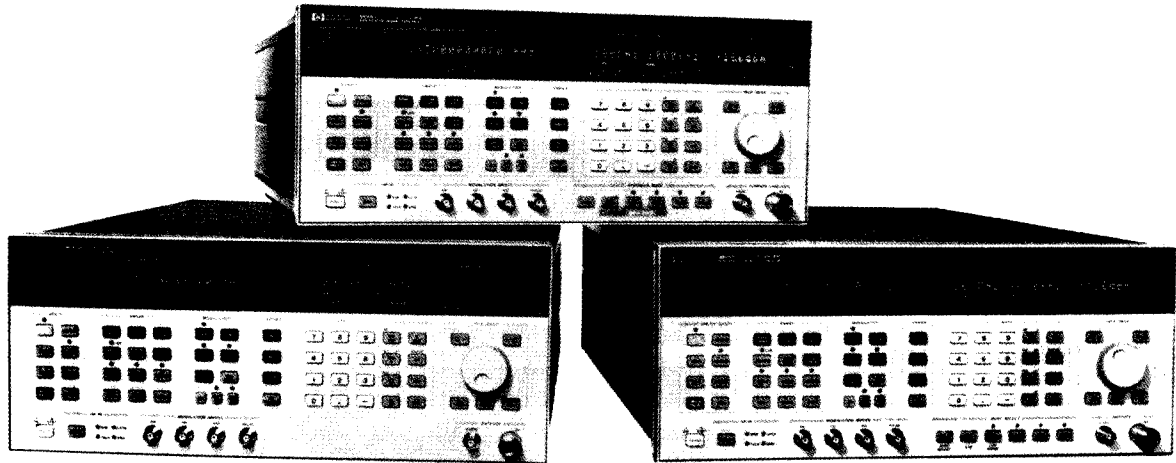
- Frequency ranges of 1 GHz, 2 GHz, 3 GHz, 4.2 GHz, or 6 GHz
- Lowest overall noise and spurious
- AM, FM, and pulse modulation

- Lowest specified leakage (optional)
- Internal modulation source for complex waveforms
- Onsite repair and calibration



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These signal generators offer the RF designer/manufacturer a selection of frequency range and high performance. The HP 8643A, HP 8644B and HP 8664A are for traditional out-of channel receiver test applications. The HP 8665A/B are for high performance applications up to 6 GHz, particularly radar, telemetry and spurious testing of UHF receivers. All signal generators within this performance family have options that allow them to be configured to meet specific application needs.

HP 8643A 1 GHz/2 GHz Signal Generator

HP has optimized the HP 8643A's configuration with the performance necessary for out-of-channel receiver tests while maintaining a low price. Options have been limited on the HP 8643A, but many performance/feature capabilities have been included as standard. The HP 8643A combines the most common options that have been purchased with the cost savings of consolidation.

Standard Electronic Attenuator and Advanced Modulation Source

Reliability is enhanced by the use of an electronic attenuator on the 1 GHz version. Instead of using mechanical relays for setting levels, the HP 8643A uses solid-state components accurate to within ± 1.0 dB. The HP 8643A comes standard with an advanced internal modulation synthesizer that provides coverage to 400 kHz and 2-tone capability with the selection of sine, square, sawtooth, and white Gaussian noise waveforms.

HP 8644B 1 GHz/2 GHz High-Performance Signal Generator

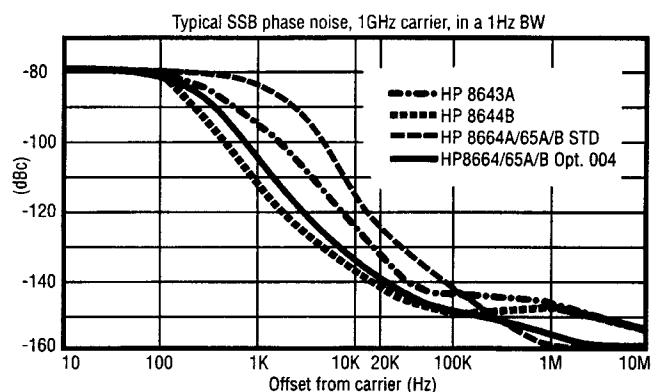
The HP 8644B represents the highest overall performance in HP's line of 1 GHz and 2 GHz signal generators. The HP 8644B builds on the HP 8643A's performance by lowering SSB phase noise (-136 dBc/Hz vs. -130 dBc/Hz) and lowering spurious (-105 dBc vs. -100 dBc). The HP 8644B should be used either for a specific test that requires the lowest SSB phase noise or an application with diversified requirements in which it is hard to identify what signal-generator performance is required.

HP 8664A 3 GHz, HP 8665A 4.2 GHz and HP 8665B 6 GHz High-Performance Signal Generators

These three signal generators are virtually identical in performance, except for frequency coverage and price. Your application will dictate which instrument is required. The HP 8664A and HP 8665A/B are suited for out-of-channel receiver measurements through the use of Option 004 (low-noise enhancement) and for such applications as radar testing through the use of Option 008 (pulse modulation).

Wideband FM and Optional Pulse Modulation

FM rates of up to 2 MHz and deviations to 20 MHz peak allow use in many applications such as the new higher-rate digital communications. An optional pulse modulator with on/off ratio of > 80 dB and rise/fall times of < 5 ns is available. Pulse width and delay can be internally adjusted between 50 ns and 999 ms, eliminating the need for an external pulse generator.



TYPICAL SSB PHASE NOISE
AT 1 GHz CARRIER

SIGNAL GENERATORS

High-Performance RF (cont'd)

HP 8643A, 8644B, 8664A, 8665A, 8665B

Specifications	HP 8643A	HP 8644B	HP 8664A HP 8665A/B
Frequency Range: Resolution: Stability: Switching Speed (typ.):	0.252 to 1030 MHz 0.252 to 2060 MHz (Opt 002) 0.01 Hz 5×10^{-10} /day (Opt 001) <90 ms <200 ms with FM on	0.252 to 1030 MHz 0.252 to 2060 MHz (Opt 002) 0.01 Hz 5×10^{-10} /day (Opt 001) <350 ms	0.1 to 3000 MHz (HP 8664A) 0.1 to 4200 MHz (HP 8665A) 0.1 to 6000 MHz (HP 8665B) 0.01 Hz 5×10^{-10} /day (Opt. 001) <100 ms
Spectral Purity SSB Phase Noise @ 1 GHz (20 kHz offset): Nonharmonics: Harmonics: Subharmonics: Residual FM @ 1 GHz: 0.3 to 3 kHz Post Det. BW	-130 dBc/Hz < -100 dBc, > 10 kHz offset, 0.252 to 1030 MHz < -84 dBc, > 10 kHz offset, 1030 to 2060 MHz < -25 dBc, output \leq +8 dBm None, 0.252 to 515 MHz < -60 dBc, 515 to 1030 MHz < -40 dBc, 1030 to 2060 MHz <2 Hz rms	-136 dBc/Hz < -105 dBc, > 10 kHz offset, 0.252 to 1030 MHz < -100 dBc, > 10 kHz offset, 1030 to 2060 MHz < -30 dBc, output \leq +10 dBm None, 0.252 to 515 MHz < -60 dBc, 515 to 1030 MHz < -40 dBc, 1030 to 2060 MHz <1 Hz rms	-117 dBc/Hz -134 dBc/Hz (Opt 004) < -100 dBc, > 10 kHz offset, 187.5 to 2060 MHz < -90 dBc, > 10 kHz offset, 2060 to 6000' MHz, 0.1 to 187.5 MHz < -30 dBc, output \leq +10 dBm < -75 dBc, 0.1 to 1500 MHz < -40 dBc, 1500 to 3000 MHz < -50 dBc, 3000 to 6000' MHz <15 Hz rms <2.5 Hz rms (Opt 004)
Output Level Range: Resolution: Absolute Accuracy: Reverse Power Protection:	+13 to -137 dBm 0.01 Hz ± 1 dB, output \geq -127 dBm 50 W	+16 to -137 dBm, +13 dBm (Opt 002) 0.01 Hz \pm dB, output \geq -127 dBm 50 W	+13 to -139.9 dBm +9 dBm (Opt 008) 0.01 Hz ± 1 dB, output \leq -119.9 dBm, 1 to 3000 MHz ± 1.5 dB, output \leq -119.9 dBm, >3000' MHz, <1 MHz 25 W, 0.1 to 2060 MHz 1 W, >2060' MHz
Amplitude Modulation Depth: Resolution: Bandwidth (3 dB): Accuracy: 1 kHz rate Distortion: 30% depth, 1 kHz rate	0 to 100%, output \leq +7 dBm 0.1% dc to > 100 kHz, \leq 128 MHz \pm (7% of setting + 1%) up to 80% depth <3%; <4% (Opt 002)	0 to 100%, output \leq +7 dBm 0.1% dc to > 100 kHz, > 128 MHz \pm (7% of setting + 1%) up to 80% depth <3%; <4% (Opt 002)	0 to 100%, output \leq +7 dBm 0.1% > 10 kHz for > 10 MHz \pm (6% of setting + 1%) up to 90% depth <4%
Frequency Modulation Maximum Peak Deviation: Resolution: Bandwidth (3 dB): Carrier Accuracy in FM: Indicator Accuracy: Distortion:	2 MHz, 1030 to 2060 MHz 1 MHz, 515 to 1030 MHz Deviation halves per lower octave 2.5% of setting dc to 100 kHz ± 0.5 % of setting <5%, <30 kHz rate <10%, <100 kHz rates <5%	20 MHz/200 kHz ² , > 1030 MHz 10 MHz/100 kHz ² , > 515 MHz Deviation halves per lower octave 2.5% of setting dc to 100 kHz ± 0.5 % of setting <5%, <30 kHz rates <10%, <100 kHz rates <5%	20 MHz, 3000 to 6000' MHz 10 MHz, 1500 to 3000 MHz Deviation halves per lower octave 2.5% of setting dc to 800 kHz ± 0.4 % of setting ± 9 %, <20 kHz rates <1%

Specifications	HP 8643A ¹	HP 8644B ¹	HP 8664A ¹ HP 8665A/B ¹
Pulse Modulation On/Off Ratio: Rise/Fall Time, 10 to 90%: Repetition Rate: Internal Width/Delay:	> 35 dB > 80 dB, > 1030 MHz < 100 ns dc to 1 MHz N/A	> 35 dB > 80 dB, > 1030 MHz < 100 ns dc to 1 MHz N/A	Opt 008 > 80 dB < 5 ns dc to 10 MHz Yes
Internal Modulation Source Waveforms and Rates: Frequency Accuracy: Output Level (into 600 Ω): Output Resolution:		Sine, white Gaussian noise: 0.1 Hz to 400 kHz Triangle, sawtooth, square: 0.1 Hz to 50 kHz Same as timebase 1 V pk 2 mV pk	
Frequency Sweep Digital Sweep: Markers/Z-Axis Output: Phase Continuous Sweep:	Digitally stepped sweep over entire frequency range. Linear/log selection. 0.5 to 1000 s sweeps. 3 markers available/Z-axis output nominally +5 V/X-axis output nominally 0 to 10 V. 40 MHz of span available depending on carrier frequency. 20 ms to 10 s sweep times.		
Remote Programming Interface: Control Language: IEEE-488 Functions:	HP-IB (IEEE 488.2-1987) Hewlett-Packard Systems Language (HP-SL). All functions controlled except power. SH1, AH1, T6 TEO, L4, LEO, SR1, PPO, DC1, DTO, CO, E2		
General Power Requirements: Operation Temperature: Leakage: Calibration Interval: Weight: Dimensions:	± 10% of 100 V, 120 V, 220 V, or 240 V; 48 to 440 Hz; 500 VA (except HP 8643A/44B: 400 VA) 0° to 55° C Conducted and radiated interference meets MIL STD 461B REO2 and FTZ 1046. Recommended 3 years (MTBC) HP 8643A: 23 kg (50 lb). HP 8644B: 30 kg (67 lb). HP 8664A/65A/B: 35 kg (78 lb). 177 mm H × 426 mm W × 624 mm D (7 in × 16.8 in × 24.6 in). (Opt 010 adds 35 mm (1.4 in) to D.)		
¹ 3000 MHz for HP 8664A, 4200 MHz for HP 8665A, 6000 MHz for HP 8665B. ² N/A to HP 8665B. ³ Low-noise mode 3.			

Ordering Information

Base Price	HP 8643A	\$15,000	HP 8644B	\$22,655	HP 8664A	\$28,890
					HP 8665A	\$38,315
					HP 8665B	\$39,200
Options:						
001 High-Stability Timebase		\$1,650		\$1,650		\$1,650
002 2 GHz Doubled Output		\$5,000		\$7,625		N/A
003 Rear-Panel Input/Output		\$430		\$430		\$430
004 Low-noise Option		N/A		Standard		\$4,375
005 Electronic Attenuator (N/A with Opt 002)		Standard		\$535		N/A
008 Pulse Modulation		N/A		N/A		\$3,835
009 Specified VOR/ILS		\$1,600		\$1,600		N/A
010 Reduced-Leakage Configuration		\$1,600		\$1,600		\$1,600
011 2 GHz Internal Frequency Counter		\$1,065		\$1,065		N/A
907 Front-Handle Kit (5061-9690)		\$65		\$65		\$65
908 Rack Flange Kit (5061-9678)		\$35		\$35		\$35
909 Combined Front/Rack Flange Kit (5061-9684)		\$90		\$90		\$90
910 Extra Manual Set (includes service manual)		\$190		\$190		\$190
915 Add Service Manual		\$65		\$65		\$65
Service Kit	(08645-61116)	\$650	(08645-61116)	\$650	(08665-61116)	\$1,250
W30 Add 3 Years to Return Warranty.		\$425		\$425		\$875

HP-IB Cables

For off-the-shelf shipment, call 800-452-4844.