

SIGNAL SOURCES

High-Performance RF

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

- 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



These signal generators offer RF designers and manufacturers a selection of frequency range and high performance. The HP 8643A, 8644B, and 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.

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 two-tone capability with the selection of sine, square, sawtooth, and white Gaussian noise waveforms.

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

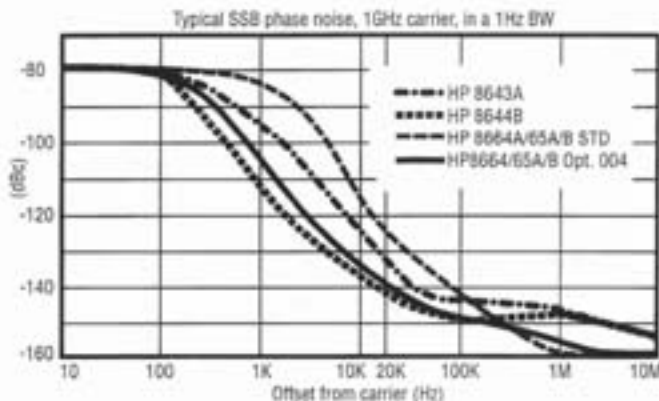
The HP 8644B represents the highest overall performance in HP's line of 1 GHz and 2 GHz signal generators. The HP 8644B builds on the HP 8643A's performance by lowering SSB phase noise (-136 dBc/Hz versus -130 dBc/Hz) and lowering spurious (-105 dBc versus -100 dBc). The HP 8644B can be used either for specific tests that require the lowest SSB phase noise or for applications with diversified performance requirements.

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

These three signal generators offer identical 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 are suitable for many applications such as 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, in a 1 Hz BW

Specifications	HP 8643A	HP 8644B	HP 8664A HP 8665A/B
Frequency Range: Resolution: Stability: Switching speed (typical):	0.252 to 1030 MHz 0.252 to 2060 MHz (Option 002) 0.01 Hz 3×10^{-11} /day (Option 001) <90 ms; <200 ms with FM on	0.252 to 1030 MHz 0.252 to 2060 MHz (Option 002) 0.01 Hz 3×10^{-11} /day (Option 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 3×10^{-11} /day (Option 001) <100 ms (Option 004)
Spectral Purity SSB phase noise @ 1 GHz (20 kHz offset): Nonharmonics: (>10 kHz offset) Harmonics: Subharmonics: Residual FM @ 1 GHz: 0.3 to 3 kHz post det. BW	-130 dBc/Hz < -100 dBc, 0.252 to 1030 MHz < -94 dBc, 1030 to 2060 MHz < -27 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, 0.252 to 1030 MHz < -100 dBc, 1030 to 2060 MHz < -27 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 (Option 004) < -100 dBc, 187.5 to 2060 MHz < -90 dBc, 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 < 7.5 Hz rms; < 1.2 Hz rms (Option 004)
Output Level Range: Resolution: Absolute accuracy: Reverse power protection:	+13 to -137 dBm 0.1 dB ± 1 dB, output \geq -127 dBm 50 W	+16 to -137 dBm, +13 dBm (Option 002, 005) 0.1 dB ± 1 dB, output \geq -127 dBm 50 W	+13 to -128.9 dBm, +9 dBm (Option 008) 0.1 dB ± 1 dB, output \geq -119.9 dBm, 1 to 1000 MHz ± 1.5 dB, output \geq -119.9 dBm, 1000 to 3000 MHz ± 2 dB, output \geq -119.9 dBm, >3000 MHz, < 1 MHz 25 W ¹ , 0.1 to 2060 MHz; 1 W, >2060 MHz
Amplitude Modulation Depth: (@ \leq +7 dBm) Resolution: Bandwidth (3 dB) \leq +7 dBm: Accuracy: 1 kHz rate Distortion: 30% depth, 1 kHz rate	0 to 100% 0.1% dc to >100 kHz, >128 MHz \pm (7% of setting + 1%) up to 80% depth <2%; <4% (Option 002)	0 to 100% 0.1% dc to >100 kHz, >128 MHz \pm (7% of setting + 1%) up to 80% depth <2%; <4% (Option 002)	0 to 100% 0.1% dc to >10 kHz, >10 MHz \pm (8% of setting + 1%) up to 90% depth <4%
Frequency Modulation Maximum peak deviation: (Deviation halves per lower octave) Resolution: Bandwidth (3 dB): Carrier accuracy in FM: Indicator accuracy: Distortion:	2 MHz, 1030 to 2060 MHz; 1 MHz, 515 to 1030 MHz 2.5% of setting dc to 100 kHz \pm 0.5% of setting <5%, <30 kHz rates; <10%, <100 kHz rates <5%, 20 Hz to 100 kHz rates	20 MHz/200 kHz ² , >1030 MHz; 10 MHz/100 kHz ² , >515 MHz 2.5% of setting dc to 100 kHz \pm 0.5% of setting <5%, <30 kHz rates; <10%, <100 kHz rates <5%, 20 Hz to 100 kHz rates	20 MHz, 3000 to 6000 MHz; 10 MHz, 1500 to 3000 MHz 2.5% of setting dc to 800 kHz \pm 0.6% of setting <8%, <20 kHz rates <1%, 20 Hz to 20 kHz rates
Pulse Modulation On/off ratio: Rise/fall time, 10 to 90%: Repetition rate: Internal width/delay:	>50 dB; >80 dB, >1030 MHz <100 ns dc to 1 MHz N/A	>50 dB; >80 dB, >1030 MHz <100 ns dc to 1 MHz N/A	Option 008 >80 dB <5 ns dc to 10 MHz Variable, 50 ns to 1 s
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 V pk for HP 8643A and 8644B 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 at maximum 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, T8, TE0, LA, LE0, SR1, RL1, PP0, DC1, DT0, CO, E2		
General Power requirements: Operation temperature: Leakage: Calibration interval: Weight: Size:	\pm 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 RED-None-2 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 x 426 mm W x 524 mm D (7 in x 16.8 in x 24.6 in). Option 010 adds 35 mm (1.4 in) to D.		

¹3000 MHz for HP 8664A, 4200 MHz for HP 8665A, 6000 MHz for HP 8665B

²N/A to HP 8665B

³Low-noise mode

Ordering Information

	HP 8643A	HP 8644B	HP 8664A	HP 8665A	HP 8665B
Base Price	\$16,850	\$23,450	\$29,950	\$29,700	\$40,600
Options					
001 High-Stability Timebase	+\$1,710	+\$1,710	+\$1,710	+\$1,710	+\$1,710
002 2 GHz Doubled Output	+\$5,700	+\$7,890	N/A	N/A	N/A
004 Low-noise Option	N/A	Standard	+\$4,535	+\$4,535	+\$4,535
005 Electronic Attenuator (N/A with Option 002)	Standard	+\$555	N/A	N/A	N/A
008 Pulse Modulation	Standard ¹	Standard ¹	+\$3,975	+\$3,975	+\$3,975
009 Specified VOR/ILS ¹	+\$1,660	+\$1,660	N/A	N/A	N/A
011 2 GHz Internal Frequency Counter	+\$1,105	+\$1,105	N/A	N/A	N/A
Service Kit	\$950 (88645-61116)	\$950 (88645-61116)	\$1,250 (88665-61116)	\$1,250 (88665-61116)	\$1,250 (88665-61116)
003 Rear-Panel Input/Output	\$435	\$450	\$450	\$450	\$450
010 Reduced-Leakage Configuration	\$1,660	\$1,660	\$1,660	\$1,660	\$1,660
W30 Add 3 Years to Return Warranty	\$375	\$565	\$700	\$835	\$950
907 Front-Handle Kit (5063-3990)	\$66	\$66	\$66	\$66	\$66
908 Rack Flange Kit (5062-3978)	\$36	\$36	\$36	\$36	\$36
909 Combined Front/Rack Flange Kit (5061-3684)	\$92	\$92	\$92	\$92	\$92

¹See Specifications ²Not compatible with Options 002 or 005

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