

# SIGNAL SOURCES

## Synthesized Sweepers, 10 MHz to 50 GHz (or 110 GHz)

### HP 8360 Series

- 1 Hz frequency resolution (Option 008)
- Low spurious and phase noise
- +20 dBm to -110 dBm calibrated output



### HP 8360 Series Synthesized Sweepers

The HP 8360 Series synthesized sweepers are the standard of excellence for applications requiring the high performance and accuracy of a synthesized source and the speed and versatility of a sweep oscillator.

Synthesized broadband frequency coverage and precise 1 Hz frequency resolution (Option 008) are generated by indirect synthesis, enabling the HP 8360 to achieve low single-sideband phase noise performance.

The HP 8360 delivers excellent harmonic performance with harmonics at least 50 dB below the carrier from 2.2 to 20 GHz, and at least 35 dB below the carrier above 20 GHz.

#### Pulse, Scan, Amplitude, and Frequency Modulation

High-performance pulse modulators with > 80 dB on/off ratio, and rise/fall times < 10 ns (Option 006), make the HP 8360 suitable for the most demanding pulse modulation applications.

In addition to its linear AM mode (100%/V), the HP 8360 offers a scan modulation mode (10 dB/V). Both modes have dc-coupled amplitude modulation capability with a 3 dB bandwidth of 100 kHz, and 99.7% (50 dB) of modulation depth. Pulse and amplitude modulation capabilities can be used independently and simultaneously.

The HP 8360 also offers dc-coupled frequency modulation capabilities with rates up to 8 MHz.

#### Millimeter Signals

When the HP 8360 Series is used to drive the HP 83550 Series millimeter-wave modules, they provide millimeter test signals from 26.5 to 110 GHz. The source modules offer leveled high output power, full waveguide band coverage, and frequency accuracy and resolution proportional to the HP 8360 used.

The HP 83550 source modules can be driven directly by the HP 83623 and 83626 synthesized sweepers. Other HP 8360 models can drive the source modules through the HP 8349B amplifier.

#### Specification Summary

##### Frequency

Range (by model): **HP 83620A** 10 MHz to 20 GHz  
**HP 83622A** 2 to 20 GHz  
**HP 83623A** 10 MHz to 20 GHz (high power)  
**HP 83624A** 2 to 20 GHz (high power)  
**HP 83630A** 10 MHz to 26.5 GHz  
**HP 83640A** 10 MHz to 40 GHz  
**HP 83650A** 10 MHz to 50 GHz

Resolution: 1 kHz standard, 1 Hz optional

Time base: Internal 10 MHz time base. Aging rate: less than  $5 \times 10^{-10}$ /day,  $1 \times 10^{-7}$ /year after 30-day warm-up.

##### RF Output

Range: +20 to -110 dBm Resolution: 0.02 dB

##### Maximum Leveled Power (by model):

**HP 83620A** +13 dBm **HP 83630A** +10 dBm  
**HP 83622A** +13 dBm **HP 83640A** +6 dBm  
**HP 83623A** +17 dBm **HP 83650A** +2.5 dBm  
**HP 83624A** +20 dBm

RF Output Connector: 3.5 mm on 20 GHz models, 2.4 mm on 40 and 50 GHz models; nominal 50  $\Omega$  output impedance

- Pulse, amplitude, and frequency modulation
- Complete analog sweeper
- < -50 dBc harmonics 2.2 to 20 GHz

#### Spectral Purity

##### Harmonics and subharmonics:

- < -50 dBc at output frequencies < 20 GHz
- < -40 dBc at output frequencies > 40 GHz
- < -35 dBc at output frequencies > 40 GHz

##### Non-harmonically related spurious:

- < -60 dBc at output frequencies < 20 GHz
- < -52 dBc at output frequencies > 20 GHz

##### Single-sideband phase noise (dBc/1 Hz BW, CW mode):

Frequency range (GHz)	100 Hz	1 kHz	10 kHz	100 kHz
0.01 to 7.0	-70	-78	-86	-107
7.0 to 13.5	-64	-72	-80	-101
13.5 to 20.0	-60	-68	-76	-97
20.0 to 26.5	-58	-66	-74	-95
26.5 to 38.0	-54	-62	-70	-91
38.0 to 40.0	-54	-62	-70	-91
40.0 to 50.0	-52	-60	-68	-89

#### Modulation

##### Pulse modulation

On/off ratio: > 80 dB

Rise and fall times: < 25 ns (< 10 ns optional)

Minimum internally leveled RF pulse width: < 1  $\mu$ s

Minimum RF pulse width: < 50 ns (15 ns with Opt 006)

##### Scan and amplitude modulation

Rates (3dB BW): dc to 100 kHz

Depth: 0 to 90% (20 dB) and 0 to 99.7% (50 dB) above 10 Hz

Sensitivity: 100%/V and 10 dB/V

##### Frequency modulation

##### Locked mode

Modulation rate (3 dB BW, 500 kHz deviation): 100 kHz to 8 MHz

Maximum deviations: 8 MHz

##### Unlocked mode

Modulation rate (3 dB BW, 500 kHz deviation): dc to 8 MHz

Maximum deviations: At rates  $\leq$  100 Hz:  $\pm$  75 MHz

At rates > 100 Hz:  $\pm$  8 MHz

Sensitivity: 1 MHz/V or 10 MHz/V, user-selectable

#### Internal Modulation Generator (Opt 002)

##### AM, FM

Waveforms: Sine, square, triangle, ramp, noise

Rate range: Sine: 1 Hz to 1 MHz

Square, triangle, ramp: 1 Hz to 100 kHz

Rate resolution: 1 Hz

Depth, deviation

Range and accuracy: Same as base instrument

Resolution: 0.1%

##### Pulse

Modes: Free-run, gated, triggered, delayed

Period range: 300 ns to 400 ms

Width range: 25 ns to 400 ms

Video delay

Internal sync pulse: 0 to 400 ms

Externally supplied sync pulse: 225 ns to 400 ms

#### Ordering Information

**HP 83620A** Synthesized Sweeper

**HP 83622A** Synthesized Sweeper

**HP 83623A** Synthesized Sweeper

**HP 83624A** Synthesized Sweeper

**HP 83630A** Synthesized Sweeper

**HP 83640A** Synthesized Sweeper

**HP 83650A** Synthesized Sweeper

Opt 001 Add Step Attenuator

Opt 002 Internal Modulation Generator

Opt 003 Delete Front Panel Keyboard/Display

Opt 004 Rear Panel RF Output

Opt 006 Fast Pulse Modulation

Opt 008 1 Hz Frequency Resolution

Opt 700 Mate System Compatibility

Opt W30 Extended Repair Service (see page 624)

#### Dedicated HP 8510 Synthesized Sweepers

**HP 83621A** Synthesized Source

**HP 83631A** Synthesized Source

**HP 83651A** Synthesized Source

Opt W30 Extended Repair Service (see page 624)

#### Price

\$37,600

\$33,600

\$45,000

\$41,000

\$46,000

\$53,000

\$56,000

\$2,500/\$4,500

\$3,500

-\$1,500

\$200

\$4,000

\$3,000

\$4,000

\$34,600

\$45,000

\$51,000