Table 1-1. Specifications (1 of 7)*

Electrical Characteristics	Performance Limits	Conditions
FREQUENCY		
Range (8673C)	0.05—18.6 GHz (0.01—18.6 GHz overrange)	
(8673D)	0.05—26.0 GHz (0.01—26.5 GHz overrange)	
Resolution	1 kHz 2 kHz 3 kHz 4 kHz	0.05 to 6.6 GHz 6.6 to 12.3 GHz 12.3 to 18.6 GHz 18.6 to 26.0 GHz (8673D)
Accuracy and Stability	Same as reference oscillator	
Reference Oscillator: Frequency Aging Rate	10 MHz <5 x 10^{-10}/day	After a 10 day warmup (typically 24 hours in a normal operating environment)
Switching Time (for frequency to be within specified resolution and output power to be within 3 dB of set level)	<50 ms	CW and AM modes; AUTO PEAK disabled, NORMAL mode.
SPECTRAL PURITY		
Single-sideband Phase Noise		1 Hz bandwidth; CW mode
0.05—6.6 GHz	< −64 dBc	30 Hz offset from carrier
	<−70 dBc	100 Hz offset from carrier
	<−78 dBc	1 kHz offset from carrier
	<−86 dBc	10 kHz offset from carrier
	<−105 dBc	100 kHz offset from carrier
>6.6—12.3 GHz	<−58 dBc	30 Hz offset from carrier
	<−64 dBc	100 Hz offset from carrier
	<−72 dBc	1 kHz offset from carrier
	<−80 dBc	10 kHz offset from carrier
	<−104 dBc	100 kHz offset from carrier
>12.3—18.6 GHz	<−54 dBc	30 Hz offset from carrier
	<−60 dBc	100 Hz offset from carrier
	<−68 dBc	1 kHz offset from carrier
	<−76 dBc	10 kHz offset from carrier
	<−100 dBc	100 kHz offset from carrier
>18.6—26.0 GHz (8673D)	<−52 dBc	30 Hz offset from carrier
	<−58 dBc	100 Hz offset from carrier
	<−66 dBc	1 kHz offset from carrier
	<−74 dBc	10 kHz offset from carrier
	<−98 dBc	100 kHz offset from carrier

*For temperature specifications, refer to Operating Temperature Range, near the end of this table.

Table 1-1. Specifications (2 of 7)

Electrical Characteristics	Performance Limits	Conditions
SPECTRAL PURITY (cont'd)		
Harmonics	<–40 dBc	0.05 to 1.2 GHz
(up to 26 GHz, normal mode,	<–60 dBc	1.2 to 18.26 GHz (8673C)
power levels ≤ +3 dBm)	<–60 dBc	1.2 to 26 GHz (8673D)
Subharmonics	<–60 dBc*	
Spurious	<–60 dBc**	0.05 to <2.0 GHz
Nonharmonically Related	<–70 dBc	2.0 to 6.6 GHz
	<–64 dBc	>6.6 to 12.3 GHz
	<–60 dBc	>12.3 to 18.6 GHz
	<–58 dBc	>18.6 to 26.0 GHz (8673D)
Power line related and fan rotation related within 5 Hz below line frequencies and multiplies thereof		
0.05—6.6 GHz	<–50 dBc	<300 Hz offset from carrier
	<–60 dBc	300 Hz to 1 kHz offset from carrier
	<–65 dBc	>1 kHz offset from carrier
>6.6—12.3 GHz	<–44 dBc	<300 Hz offset from carrier
	<–54 dBc	300 Hz to 1 kHz offset from carrier
	<–59 dBc	>1 kHz offset from carrier
>12.3—18.6 GHz	<–40 dBc	<300 Hz offset from carrier
	<–50 dBc	300 Hz to 1 kHz offset from carrier
	<–55 dBc	>1 kHz offset from carrier
>18.6—26.0 GHz (8673D)	<–38 dBc	<300 Hz offset from carrier
	<–48 dBc	300 Hz to 1 kHz offset from carrier
	<–53 dBc	>1 kHz offset from carrier
RF OUTPUT		
Output Level:		
Standard Calibrated Output		
Normal Mode	+11 dBm to –100 dBm	0.05 to <2.0 GHz
	+5 dBm to –100 dBm	2.0 to <16.0 GHz
(8673C)	+2 dBm to –100 dBm	16.0 to 18.6 GHz
(8673D)	+6 dBm to –100 dBm	16.0 to 26.0 GHz
Bypass Mode	+8 dBm to –100 dBm	2.0 to <16.0 GHz
(8673C)	+5 dBm to –100 dBm	16.0 to 18.6 GHz
(8673D)	+7 dBm to –100 dBm	16.0 to 26.0 GHz
Option 001 (Delete attenuator)		
Leveled Output		
Normal Mode	+12 dBm to –10 dBm	0.05 to <2.0 GHz
	+7 dBm to –10 dBm	2.0 to <16. GHz
(8673C)	+4 dBm to –10 dBm	16.0 to 18.6 GHz
(8673D)	+9 dBm to –10 dBm	16.0 to 26.0 GHz
Bypass Mode	+10 dBm to –10 dBm	2.0 to <16.0 GHz
(8673C)	+7 dBm to –10 dBm	16.0 to 18.6 GHz
(8673D)	+10 dBm to –10 dBm	16.0 to 26.0 GHz

*In the 21 to 22 GHz frequency range, 3/4 mode subharmonics (15.75 to 16.5 GHz) may exist, –50 dBc.

**In the 0.05 to <2.0 GHz band, carrier-frequency independent spurious outputs <–55 dBc may exist in the 10 to 100 MHz frequency range.

Table 1-1. Specifications (3 of 7)

Electrical Characteristics	Performance Limits	Conditions
RF OUTPUT (cont'd)		
Option 004 (Rear panel output)		
Leveled Output		
Normal Mode	+10 dBm to −100 dBm	0.05 to <2.0 GHz
	+4 dBm to −100 dBm	2.0 to <16.0 GHz
(8673C)	+1 dBm to −100 dBm	16.0 to 18.6 GHz
(8673D)	+4 dBm to −100 dBm	16.0 to 26.0 GHz
Bypass Mode	+7 dBm to −100 dBm	2.0 to <16.0 GHz
(8673C)	+4 dBm to −100 dBm	16.0 to 18.6 GHz
(8673D)	+5 dBm to −100 dBm	16.0 to 26.0 GHz
Option 005 (Options 001 & 004)		
Leveled Output		
Normal Mode	+12 dBm to −10 dBm	0.05 to <2.0 GHz
	+6 dBm to −10 dBm	2.0 to <16.0 GHz
(8673C)	+3 dBm to −10 dBm	16.0 to 18.6 GHz
(8673D)	+7 dBm to −10 dBm	16.0 to 26.0 GHz
Bypass Mode	+9 dBm to −10 dBm	2.0 to <16.0 GHz
(8673C)	+6 dBm to −10 dBm	16.0 to 18.6 GHz
(8673D)	+8 dBm to −10 dBm	16.0 to 26.0 GHz
Remote Programming Absolute Level Accuracy		
0.05 — 6.6 GHz	±1.25 dB	+10 dBm output level range
	±1.00 dB	0 dBm output level range
	±1.50 dB	−10 dBm output level range
	±1.70 dB	−20 dBm output level range
	±2.00 dB	−30 dBm output level range
	±2.00 dB & ±0.1 dB per 10 dB step	<−30 dBm output level range
>6.6 — 12.3 GHz	±1.50 dB	+10 dBm output level range
	±1.25 dB	0 dBm output level range
	±1.75 dB	−10 dBm output level range
	±1.95 dB	−20 dBm output level range
	±2.25 dB	−30 dBm output level range
	±2.25 dB & ±0.1 dB per 10 dB step	<−30 dBm output level range
>12.3 — 18.6 GHz	±1.75 dB	+10 dBm output level range
	±1.50 dB	0 dBm output level range
	±2.10 dB	−10 dBm output level range
	±2.30 dB	−20 dBm output level range
	±2.70 dB	−30 dBm output level range
	±2.70 dB & ±0.2 dB per 10 dB step	<−30 dBm output level range
>18.6 — 26.0 GHz	±2.25 dB	+10 dBm output level range
	±2.00 dB	0 dBm output level range
	±2.55 dB	−10 dBm output level range
	±2.85 dB	−20 dBm output level range
	±3.30 dB	−30 dBm output level range
	±3.30 dB & ±0.2 dB per 10 dB step	<−30 dBm output level range

Table 1-1. Specifications (4 of 7)

Electrical Characteristics	Performance Limits	Conditions
RF OUTPUT (cont'd)		
Manual Absolute Level Accuracy	Add ±0.75 dB to remote programming absolute level accuracy	Absolute level accuracy specifications include allowances for detector linearity, temperature, flatness, attenuator accuracy, and measurement uncertainty.
Remote Programming Output Level Resolution	0.1 dB	
Flatness		
	±0.50 dB	0.05 to <2.0 GHz
	±0.75 dB	0.05 to 6.6 GHz
	±1.00 dB	0.05 to 12.3 GHz
	±1.25 dB	0.05 to 18.6 GHz
	±1.75 dB	0.05 to 26.0 GHz
Output Level Switching Time (to be within ±1 dB of final level)	<25 ms	
PULSE MODULATION		
ON/OFF Ratio	>50 dB	50—250 MHz
	>80 dB	.250—26.0 GHz
Rise and Fall Times		AUTO PEAK enabled
	<20 ns	0.05 to <2.0 GHz
	<40 ns	2.0 to 26.0 GHz
Minimum Leveled RF Pulse Width	<100 ns	
Pulse Repetition Frequency	50 Hz to 1 MHz	
Minimum Duty Cycle	<0.0001	When internally leveled; no restriction when unleveled
Minimum Pulse Off-Time	<300 ns	
Maximum Peak Power	Same as in CW mode	
Peak Level Accuracy	±1.5 dB	0.05 to <2.0 GHz
	+1.5/−1.0 dB	2.0 to 26.0 GHz
Overshoot, Ringing	<25%	0.05—6.6, 7.2—26.0 GHz
	<30%	6.6—7.2 GHz
Video Feedthrough	<60 dBc	
AMPLITUDE MODULATION		
Depth	0 to 90%	0 dBm range and below. Output level vernier settings ≤0 dBm (≤ −3 dBm for 8673C, 16.0 to 18.6 GHz).

Table 1-1. Specifications (5 of 7)

Electrical Characteristics	Performance Limits	Conditions
AMPLITUDE MODULATION (cont'd)		
Rates	20 Hz to 100 kHz (dc to 100 kHz, Option H41)	3 dB bandwidth, 30% depth
Sensitivity	(See also indicated Meter Accuracy and Accuracy Relative to External AM Input Level.)	Maximum input 1 Vpk into 600Ω nominal; AM depth is linearly controlled by varying input level between 0 and 1V peak.
30% Range	30%/Vpk	
100% Range	100%/Vpk	
Indicated Meter Accuracy	±11% of reading ±3% of range	100 Hz to 10 kHz rates
Accuracy Relative to External AM Input Level	±9% of reading ±2% of range	100 Hz to 10 kHz rates
Incidental Phase Modulation		(100 Hz to 10 kHz rates; 30% depth)
	<0.4 radians	0.05 to 6.6 GHz
	<0.8 radians	>6.6 to 12.3 GHz
	<1.2 radians	>12.3 to 18.6 GHz
	<1.6 radians	>18.6 to 24.0 GHz
	<2.5 radians	>24.0 to 26.0 GHz
Incidental FM	Incidental phase modulation x modulation frequency	
FREQUENCY MODULATION		
Frequency Response Relative to a 100 kHz Rate	±2 dB, 100 Hz to 3 MHz, ±2 dB, 3 kHz to 3 MHz	30 and 100 kHz/V ranges; .03, 1, 3, and 10 MHz/V ranges
Maximum Peak Deviation	The smaller of 10 MHz or f_{mod} x 5	0.05 to 6.6 GHz
	The smaller of 10 MHz or f_{mod} x 10	>6.6 to 12.3 GHz
	The smaller of 10 MHz f_{mod} x 15	>12.3 to 18.6 GHz
	The smaller of 10 MHz f_{mod} x 20	>18.6 to 26.0 GHz
Sensitivity (peak deviation) Maximum input 1 Vpk into 50Ω nominal	1 Vpk = range maximum deviation.	All ranges; peak deviation is linearly controlled by varying input level between 0 and 1 Vpk
Indicated Meter Accuracy	±12% of reading ±3% of range	100 kHz rate
Accuracy Relative to External FM Input Level	±7% of reading ±3% of range	100 kHz rate
Incidental AM	<5%	Rates <100 kHz; peak deviations ≤1 MHz

Table 1-1. Specifications (6 of 7)

Electrical Characteristics	Performance Limits	Conditions
DIGITAL SWEEP		
Sweep Function	Start/Stop or ΔF (Span) Sweep	
Sweep Modes	Manual, Auto, Single	
Step Size	Maximum equals the maximum width; minimum is equal to the greater of the frequency resolution or span divided by 9999.	Maximum of 9999 frequency points per sweep.
Dwell Time	Set from 1 to 255 ms per step	
Maximum Width:	Restricted to amplifier/filter bands shown.	Filter/amplifier bands NORMAL 0.01 to <2.0 GHz 2.0 to <3.5 GHz 3.5 to <6.0 GHz 6.0 to 18.6 GHz (8673C) 6.0 to <16.0 GHz (8673D) 16.0 to <22.0 GHz (8673D) 22.0 to 26.5 GHz (8673D) BYPASS 2.0 to 18.6 GHz (8673C) 2.0 to <16.0 GHz (8673D) 16.0 to 26.5 GHz (8673D) MANUAL mode, Single Sweep 0.01 to 18.6 GHz (8673C) 0.01 to 26.5 GHz (8673D)
Markers	5 independent, fixed frequency markers set from front panel	Resolution and accuracy are identical to RF output.
REAR PANEL AUXILIARY CONTROL CONNECTOR		
14-Pin Connector	Inputs: Stop Sweep (HP 8410B/C Compatible) Trigger Output Service Function Frequency Increment Frequency Decrement Blank Frequency Display Recall Register 1 Sequential Register Recall Outputs: Trigger HP 8410B/C Compatible) End Sweep Negative Z-axis Blanking Ground	
Input Required	Contact closure to ground or 5 μs, negative true TTL pulse	
Outputs	5 μs negative true TTL pulse	

Table 1-1. Specifications (7 of 7)

Electrical Characteristics	Performance Limits	Conditions
REMOTE PROGRAMMING	All functions HP-IB programmable, except LINE switches	
GENERAL		
Operating Temperature Range	0 to +55°C (except specifications for harmonically related spurious signals, RF output, pulse peak level accuracy, and amplitude modulation, which apply +15 to +35°C).	
Power Requirements:		
Line Voltage (100, 120, 220, or 240V)	+5, −10%	48—66 Hz
Power Dissipation	500 V·A maximum	
Conducted and Radiated Electromagnetic Interference	MIL-STD 461A-1968	Conducted and radiated interference is within the requirements of methods CE03 and RE02 of MIL-STD 461A, VDE 0871, and CISPR publication 11.
Net Weight	42.3 kg (94 lb)	
Dimensions:		For ordering HP cabinet accessories, module sizes are 8-3/4H, 1 MW, 23D (composed of two parts, 3.50 in. high and 5.25 in. high)
Height	234 mm (9.2 in.)	
Width	425 mm (16.8 in.)	
Depth	620 mm (24.4 in.)	

Table 1-2. Supplemental Characteristics (1 of 3)

Supplemental characteristics are intended to provide information useful in applying the instrument by giving typical, but non-warranted, performance parameters. They apply to the 8673C/D in "Normal" mode, CW operation, and with AUTO PEAK on, except where noted.

FREQUENCY

Internal Reference: The internal reference oscillator accuracy is a function of time base calibration ± aging rate, ± temperature effects, and ± line voltage effects. Typical temperature and line voltage effects are $<1 \times 10^{-10}$/°C and $<5 \times 10^{-10}$/+5% to −10% line voltage change. Reference oscillator is kept at operating temperature in STANDBY mode with the instrument connected to mains power. For instruments disconnected from mains power less than 24 hours, the aging rate is $<5 \times 10^{-10}$/day after a 24 hour warmup.

Switching time for frequency to be within specified resolution and output to be within 3 dB of set level (CW and AM modes, AUTO PEAK disabled) is typically <20 ms for frequency changes that do not cross internal filter or amplifier switching points. Filter switching points are 2, 3.5, 6, and 22 GHz. The 8673D has an amplifier switching point at 16 GHz.

External Reference Input: 5 or 10 MHz at a level of 0.1 to 1 Vrms into 50Ω. Stability and spectral purity of the microwave output will be partially determined by characteristics of the external reference frequency.

Reference Outputs: 10 MHz at a level of 0.2 Vrms into 50Ω.

SPECTRAL PURITY

Residual FM in CW and FM Modes, 0.05 to 6.6 GHz* (noise and power line related):

Mode/FM Range	Post-Detection Bandwidth	
	300 Hz—3 kHz	50 Hz—15 kHz
CW, 30, 100, 300 kHz/V and 1, 3 MHz/V	12 Hz rms	60 Hz rms
10 MHz/V	15 Hz rms	75 Hz rms

*Residual FM doubles for 6.6—12.3 GHz, triples for 12.3—18.6 GHz, and quadruples for 18.6—26.0 GHz.

Spurious Signals (CW and AM modes), Option 003 instruments (400 Hz line operation): Power line related and fan rotation related within 5 Hz below line frequency and multiples thereof:

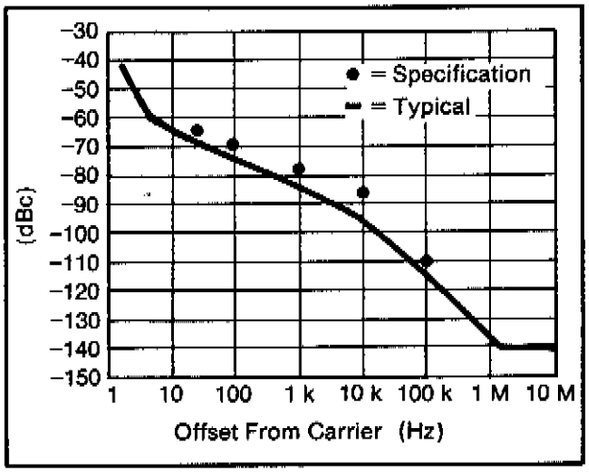
Frequency Range (GHz)	Offset from Carrier		
	<2 kHz	2 to 8 kHz	>8 kHz
2.0–6.6	−40 dBc	−50 dBc	−65 dBc
>6.6–12.3	−34 dBc	−44 dBc	−59 dBc
>12.3–18.6	−30 dBc	−40 dBc	−55 dBc
>18.6–26.0	−28 dBc	−38 dBc	−53 dBc

Harmonics (up to 26 GHz, NORMAL mode, −10 dBm vernier setting on 0 dBm range and below):
<−55 dBc, 0.05 to <1.2 GHz
<−60 dBc, 1.2 to 26.0 GHz

Harmonics (up to 26 GHz, BYPASS mode, output level vernier settings ≤ 0 dBm on 0 dBm range and below): <−45 dBc.

Subharmonics and Multiples Thereof (BYPASS mode):
<−30 dBc, 0.05 to <18.6 GHz
<−20 dBc, >18.6 to 26.0 GHz

Single-sideband Phase Noise (1 Hz BW, CW mode, 0.05 to 6.6 GHz*):



*Add 6 dB for 6.6 to 12.3 GHz, 10 dB for 12.3 to 18.6 GHz, and 12 dB for 18.6 to 26.0 GHz.

Table 1-2. Supplemental Characteristics (2 of 3)

RF OUTPUT

Output Level Switching Time (to be within ±1 dB of final level with no range change):

Operating Mode	Output Level Switching Time
CW	<15 ms
AM and Sweep	<5 ms

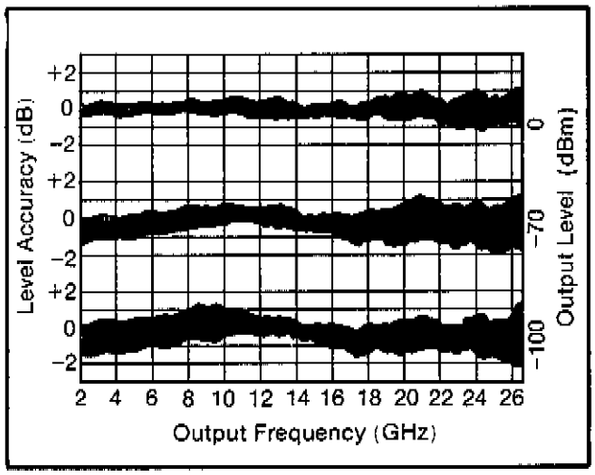
For power settings >0 dBm, changes in frequency of several GHz in one step may require additional AUTO PEAK enabling to stabilize power at the desired level. Spurious output oscillations may occur for settings above +8 dBm.

External leveling device characteristics will determine output flatness, absolute level accuracy, and switching time in external leveling modes.

Impedance: 50 ohms.

Source SWR: <2.0.

Output Level Accuracy:



Typical 8673C/D output level accuracy at 0, –70, and –100 dBm level settings.

PULSE MODULATION

ON/OFF Ratio: >90 dB, 6.6 to 26.0 GHz.

Pulse Width: Pulse widths from 100 ns down to 25 ns are possible with degraded peak power level accuracy relative to CW.

Pulse Input:

Normal Mode: >3V on, <0.5V off
Complement Mode: <0.5V on, >3V off
Impedance: 50Ω nominal
Damage Level:
For source >50Ω it is > +6V.
For source <50Ω it is > +6V or more negative than –0.5V.

Pulse Width Compression: <35 ns.

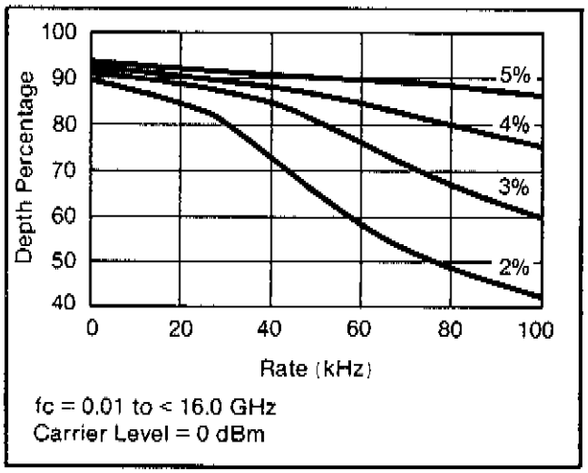
Maximum Delay Time: 150 ns.

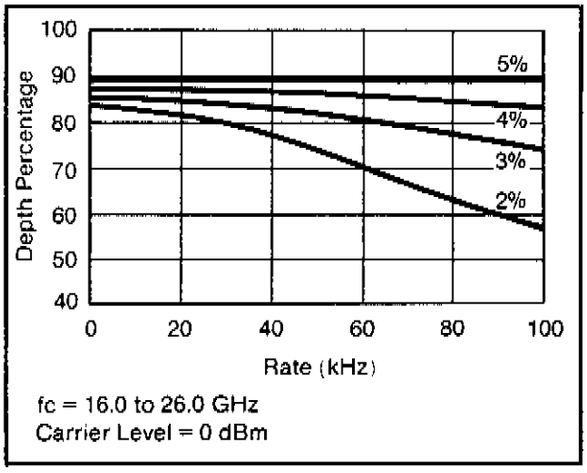
Table 1-2. Supplemental Characteristics (3 of 3)

AMPLITUDE MODULATION

Frequency Response Relative to a 1 kHz Rate: ±0.25 dB, 100 Hz—10 kHz.

Distortion:

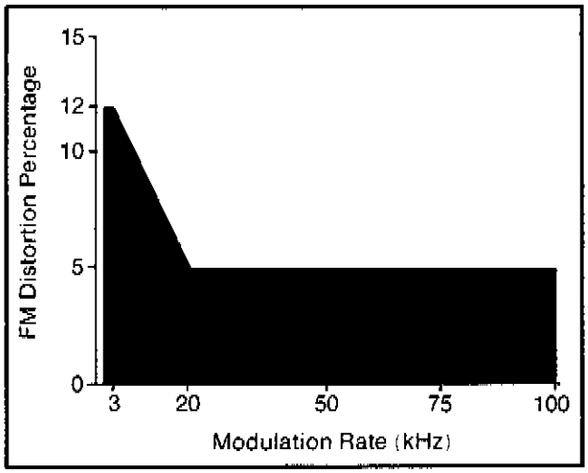




Typical 8673C/D AM distortion versus modulation rate and depth.

FREQUENCY MODULATION

Rates (3 dB bandwidth): 100 Hz to 10 MHz, 30 and 100 kHz/V ranges; 1 kHz to 10 MHz, 300 kHz/V, and 1, 3, and 10 MHz/V ranges.



Typical 8673C/D FM Distortion versus modulation rate.

DIGITAL SWEEP

Rear Panel BNC Sweep Connections:

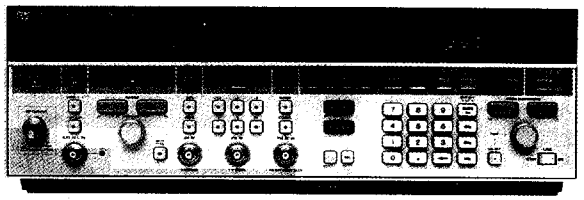
Sweep Out: 0 to +10V ramp start to stop (maximum adjustable from +4 to +12V)
Sweep Reference: 1V/GHz ramp (+18V maximum)
Z-Axis Blanking/Markers
Tone Marker Output
Penlift

SIGNAL GENERATORS

High-Performance Microwave

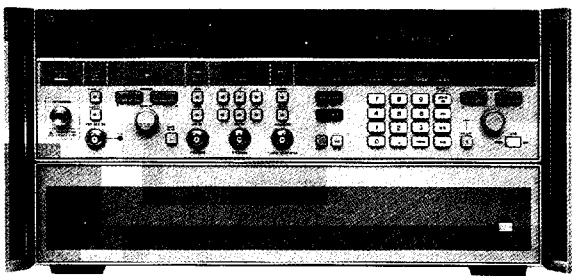
HP 8673B, 8673C, 8673D, 8673E

- 10 MHz to 26.5 GHz frequency range
- < −60 dBc harmonics/subharmonics
- Low spurious and phase noise
- +8 to −100 dBm calibrated output
- Internally leveled AM/FM/pulse modulation
- Frequency extension capability to 110 GHz



HP 8673B

DESIGNED FOR HP-IB SYSTEMS



HP 8673D

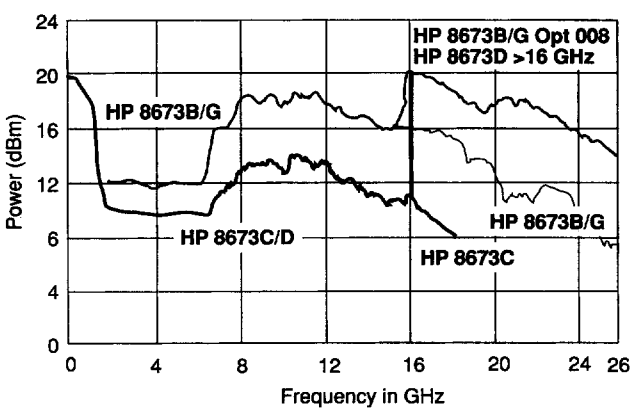
DESIGNED FOR HP-IB SYSTEMS

HP 8673B, 8673C, 8673D, and 8673E Synthesized Signal Generators

The HP 8673B/C/D/E Synthesized Signal Generators are full-performance synthesizers designed to generate precise microwave signals over the 50 MHz to 26.5 GHz frequency range. These generators offer calibrated and leveled power, AM, FM, pulse modulation, digital sweep, programmability, and frequency extension capability to 110 GHz. The HP 8673B covers 2.0 to 26.5 GHz. The HP 8673C/D pair cover 50 MHz to 18.6 GHz and 26.5 GHz respectively and the HP 8673E covers 2.0 to 18.6 GHz.

Excellent Spectral Purity

A variety of applications ranging from microwave radar to communications systems require the frequency stability available from the HP 8673B/C/D/E. The broadband frequency coverage is derived from multiplying a fundamental 2.0 to 6.6 GHz YIG-tuned oscillator. This technique provides the wide frequency coverage in a single instrument. Indirect synthesis phase-locks the YIG-tuned oscillator to a 10 MHz quartz crystal reference to provide excellent long term and short term stability (frequency drift $< 5 \times 10^{-10}$ per day), (HP 8673B/C/D). Phase locked loops are optimized for lowest possible single-sideband phase noise. The HP 8673C and HP 8673D include an internal tracking YIG-filter to further reduce unwanted harmonic, subharmonic, and nonharmonic spurious signals above 1.2 GHz to < −60dBc.



Maximum power typically available from HP 8673B/C/D/G and HP 8673B/G Option 008 at 25° C. HP 8673E and HP 8673H Option 212 and Option 618 typical maximum power is the same as HP 8673B/G over 2.0 to 18.0 GHz.

Wide Dynamic Output Range

For broadband component and receiver testing applications, the HP 8673B/C/D/E deliver exceptionally flat power output across the full frequency ranges. For receiver sensitivity measurements, power is internally (or externally) leveled to −100 dBm (−120 dBm for the HP 8673E). Maximum available power varies with frequency as shown in the figure below.

Internally Leveled Pulse Modulation

The HP 8673B/C/D/E features an internal pulse modulator that provides high-quality pulse modulation over the entire 50 MHz to 26.5 GHz range. Since the modulation is done before the frequency multiplication, the peak pulsed power can be leveled and calibrated to within typically +1.5/−1.0 dBm of the set level referenced to CW. External TTL level pulse rates up to 1 MHz and pulse widths as narrow as 100 ns can be easily accommodated by the HP 8673B/C/D/E to provide ON/OFF ratios in excess of 80 dB.

Calibrated AM/FM Modulation

AM and FM capability is included in the HP 8673B/C/D/E to expand the versatility in receiver testing applications. AM depth at rates up to 100 kHz can be accurately set using the front panel meter. Six ranges of metered FM are available at rates and peak deviations up to 10 MHz. The HP 8673E features unlocked mode which allows up to 10 MHz deviation at rates as low as 50 Hz. Both AM depth and FM deviation are linearly controlled by varying the externally supplied modulating input voltage up to 1V peak. Simultaneous modulation of AM, FM, and pulse is possible to simulate complex environments.

Frequency Extension to 110 GHz

The HP 8673B/C/D can be used as microwave drivers for the HP 83550-series millimeter-wave source modules. This combination (with the addition of the HP 8349B Microwave Amplifier) can provide leveled output signals up to 110 GHz with the "System Leveling" mode. The resultant output frequency can be displayed on the HP 8673B/C/D front panel by entering the multiplication factor of the source module.

Full Programmability and Digital Sweep

The HP 8673B/C/D/E provide full programmability of all front panel functions for automatic test applications. Output level can be controlled in steps as fine as 0.1 dB. An internal microprocessor is used to simplify HP-IB program code generation and follow front-panel keystroke sequences. This design allows the implementation of digital sweep. Sweep spans can be set over the entire frequency range with variable rates, step sizes, and selectable markers available.

HP 8673B/C/D/E Specifications

Frequency Characteristics

Frequency Range:
HP 8673B: 2.0 to 26.0 GHz (1.95 to 26.5 GHz in overrange).
HP 8673C: 0.05 to 18.6 GHz (0.01 to 18.6 GHz in overrange).
HP 8673D: 0.05 to 26.0 GHz (0.01 to 26.5 GHz in overrange).
HP 8673E: 2.0 to 18.0 GHz (1.95 to 18.6 GHz in overrange).
Frequency Bands: Band 0: 0.05 to 2.0 GHz. Band 1: 2.0 to 6.6 GHz. Band 2: 6.6 to 12.3 GHz. Band 3: 12.3 to 18.6 GHz. Band 4: 18.6 to 26.0 GHz.
Frequency Resolution: 1 kHz Band 0 and 1 — 3 kHz Band 3; 2 kHz Band 2 — 4 kHz Band 4
Timebase: Internal 10 MHz ($<5 \times 10^{-10}$/day aging rate for HP 8673 B/C/D, $<1.5\times10^{-9}$/day aging rate for HP 8673E) or ext. 5 or 10 MHz.

Spectral Purity

Single-sideband phase noise (HP 8673B/C/D) (1 Hz BW, CW mode):

F_c	Offset from F_c				
	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz
Band 0	−64 dBc	−70 dBc	−78 dBc	−86 dBc	−105 dBc
Band 1	−58 dBc	−70 dBc	−78 dBc	−86 dBc	−110 dBc
Band 2	−52 dBc	−64 dBc	−72 dBc	−80 dBc	−104 dBc
Band 3	−48 dBc	−60 dBc	−68 dBc	−76 dBc	−100 dBc
Band 4	−46 dBc	−58 dBc	−66 dBc	−74 dBc	−98 dBc

Single-sideband phase noise (HP 8673E) (1 Hz BW, 1 kHz offset, CW mode): < −60 dBc

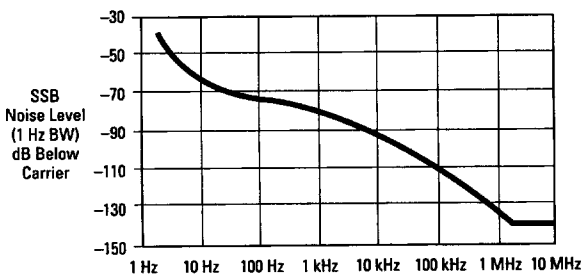


Figure 2. Typical HP 8673B/C/D/E single-sideband phase noise performance using the internal standard, Band 1.

Harmonics (up to maximum frequency, output level meter readings <0 dB on 0 dBm range and below): < −40 dBc (HP 8673B/E). < −35 dBc, 50MHz to 1.2GHz; < −60 dBc, 1.2 to 26.0 GHz (HP 8673C/D).
Sub-harmonics and multiples thereof: < −60 dBc (HP 8673C/D). < −25 dBc, Bands 1 to 3; < −20 dBc, Band 4 (HP 8673B); < −35 dBc, (HP 8673E).
Spurious (CW and AM modes)
Non-harmonically related: < −60 dBc, Band 0; < −70 dBc, Band 1; < −64 dBc, Band 2; < −60 dBc, Band 3; < −58 dBc, Band 4 (HP 8673B/C/D); < −60 dBc (HP 8673E)

Output Characteristics

Output level (+15° C to +35° C):

8673B		8673C		8673D	
Level (dBm)	Freq. (GHz)	Level (dBm)	Freq. (GHz)	Level (dBm)	Freq.(GHz)
+8 to −100	2 to 18	+11 to −100	.05 to 2.0	+11 to −100	.05 to 2.0
+4 to −100	18 to 22	+5 to −100	2 to 16	+5 to −100	2 to 16
0 to −100	22 to 26	+2 to −100	16 to 18.6	+10 to −100	16 to 26

Output level (+15° C to +35° C): +8 dBm to −120 dBm (HP 8673E)
Remote programming output level resolution: 0.1 dB.

Pulse Modulation

ON/OFF ratio: >80 dB (HP 8673B/C/D.) >70dB (HP 8673E)
Rise/fall times: <30 ns, Band 0; <40 ns, Bands 1 to 4 (HP 8673 B/C/D); <50 ns (HP 8673E)
Minimum leveled pulse width: <100 ns
Pulse repetition frequency: 50 Hz to 1 MHz
Minimum Duty Cycle: <0.001 for leveled performance

Amplitude Modulation

Rates (3 dB BW, 30% depth): 20 Hz to 100 kHz. (HP 8673 B/C/D); 10 Hz to 50 kHz (HP 8673E).
Sensitivity: 30%/V, 100%/V ranges. Max. input 1 V peak into 600 Ω

Frequency Modulation (8673B/C/D)

Deviation Range	Rate (±3dB BW, typical)	Maximum Peak Deviation
		The smaller of 10 MHz or:
30, 100 kHz/V	100 Hz to 10 MHz	fmod x 5. Band 0 and Band 1
.3, 1, 3 MHz/V	1 kHz to 10 MHz	fmod x 10, Band 2
10 MHz/V	1 kHz to 10 MHz	fmod x 15, Band 3
		fmod x 20, Band 4

Frequency Modulation (8673E)

Deviation Range	Rate (±3dB BW, typical)	Maximum Peak Deviation
		The smaller of 3 MHz or:
30, 100 kHz/V	100 Hz to 2 MHz	fmod x 5. Band 1
.3, 1, 3 MHz/V	3 kHz to 2 MHz	fmod x 10, Band 2
		fmod x 15, Band 3
10 MHz/V (unlocked)	50 Hz to 2 MHz, typical	10 MHz

Digital Sweep Characteristics

Sweep function: Start/stop or ΔF (span) sweep.
Sweep modes: Manual, auto, or single sweep.
Step size: Maximum of 9999 frequency points per sweep; minimum step size equals frequency resolution.
Dwell time: Set from 1 to 255 ms per frequency.
Markers: 5 independent, settable frequency markers.
Sweep outputs: 0 to +10 V ramp start to stop; 0.5 V/GHz ramp; Z-axis blanking/markers; tone marker; penlift.

Remote Programming

All functions HP-IB programmable except line switch.

General

Operating temperature range: 0° C to +55° C.
Power: 100, 120, 220, 240 V, +5%, −10%, 48 to 66 Hz; 400 VA max. (HP 8673B/E), 500 VA max. (HP 8673C/D)
Weight: HP 8673B/E: net 29 kg (64 lb); shipping 34.5 kg (76 lb). HP 8673C/D: net 42.4 kg (94 lb.); shipping 46.5 kg (103 lb).
Size: HP 8673B/E: 146 mm H × 425 mm W × 620 mm D (5.7in × 16.8 in × 24.4 in). HP 8673C/D: 234 mm H × 425 mm W × 620 mm D (9.2 in × 16.8 in × 24.4 in).

Ordering Information

	Price
HP 8673B Synthesized Signal Generator	$44,000
Opt 001 Delete RF Output Attenuator	−$600
Opt 002 Delete Reference Oscillator	−$735
Opt 004 Rear-panel RF Output	+$75
Opt 006 Chassis Slide Kit	+$75
Opt 008 +10 dBm Output Level	+$5,000
Opt 907 Front-panel Handle Kit (5062-3989)	+$55 ☎
Opt 908 Rack Mounting Flange Kit (5062-3977)	+$33 ☎
Opt 909 Front-panel and Rack Mounting Kits (5062-3983)	+$80
Opt 910 Extra Operating and Service Manual (08673-90114) (08673-90116) (08673-60097)	+$65 ☎
Opt W30 Two Additional Years of Return-to-HP Warranty. See page 671.	+$1,050
HP 8673C Synthesized Signal Generator	$55,500
Opts 001, 002, 004, and 006 Same as HP 8673B	
Opt 908 Rack Mounting Flange Kit (5062-3974) (5062-3977)	+$55
Opt 910 Service and Extra Operating Manual (08673-90070) (08673-90138) (08673-60097)	+$85
Opt 913 Rack Flanges for Standard Front Handles (5062-4073)	+$45
Opt 915 Service Manual (08673-90138) (08673-60097)	+$20
Opt 916 Extra Operating Manual (08673-90070)	+$65
Opt W30 Two Additional Years of Return-to-HP Warranty. See page 671.	+$1,170
HP 8673D Synthesized Signal Generator	$59,000
Opts 001, 002, 004, 006, 908, 913, 910, 915, and 916 Same as HP 8673C	
Opt W30 Two Additional Years of Return-to-HP Warranty. See page 671.	+$1,250
HP 8673E Synthesized Signal Generator	$41,000
Opts 001, 002, 004, 006, 907, 908, 909 and 910 Same as HP 8673B	
Opt W30 Two Additional Years of Return-to-HP Warranty. See page 671.	$915
HP 11726A Support Kit (for HP 8673B)	$2,400

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