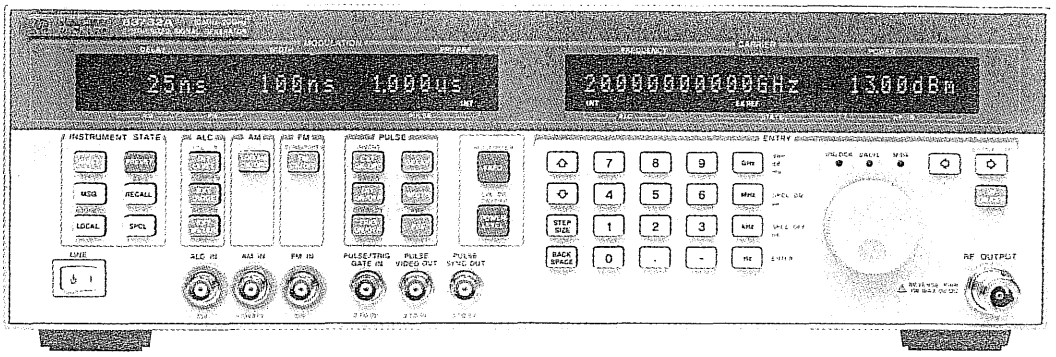


HP 83732A

DESIGNED FOR HP-IB SYSTEMS

HP Instrument Drivers

HP 83731A Synthesized Signal Generator
HP 83732A Synthesized Signal Generator

The HP 83731/32A Synthesized Signal Generators set new standards for performance at prices that are surprisingly affordable. No longer will you have to give up frequency coverage, modulation, or reliability to meet your budget. The HP 83731/32A will perform beyond your expectations at a price within your reach.

Test radar, electronic warfare (EW), and communication receivers with confidence from 10 MHz through 20 GHz. Excellent spectral purity, high output power, and sophisticated modulation are combined in an affordable, lightweight, easy-to-use signal generator.

Clean Signals with Plenty of Power

Choose the HP 83731A, 1 to 20 GHz, or the HP 83732A, 10 MHz to 20 GHz, for your receiver and system test applications. You can count on the HP 83731/32A for excellent spectral purity. Fundamental oscillators and switched low pass filters deliver < -55 dBc harmonics, eliminate subharmonics, and supress spurious to < -60 dBc. Not only does the HP 83731/32A provide plenty of output power (typically $> +14$ dBm), but spectral purity is maintained even at these high power levels. Typical output power at frequencies below 1 GHz is $+20$ dBm. Level resolution is 0.01 dB with typical accuracy of ± 1.0 dB at any frequency or power level. User Level Correction simplifies generating accurate, leveled power at distant test ports.

Unmatched Modulation Performance

Sophisticated modulation lets you simulate real-world signals. Test state-of-the-art radar and EW receivers with high-fidelity pulse modulation. <10 ns pulse rise/fall times, <25 ns pulse width, and >80 dB pulse on/off ratio give you the performance you need to verify modern receivers. A built-in multimode pulse generator adds the flexibility to generate triggered, doublet, and gated burst pulse modes.

In addition, logarithmic AM is a standard feature in the HP 83731/32A. Use the >60 dB depth log AM and the fast pulse modulation simultaneously (scan modulation) for accurate simulation of antenna scanning patterns, or sweep power linearly and accurately to test power-sensitive devices.

The HP 83731/32A offer unmatched performance for testing satellite communications and telemetry receivers. 10 MHz peak FM deviations, combined with the highest modulation index available (>300), simplify simulation of these difficult-to-generate signals. The HP 83731/32A remain fully synthesized even at high modulation indices, eliminating the troublesome frequency drift of other signal sources.

Real-world signals often combine two or more modulations. The HP 83731/32A let you use all three modulations simultaneously without any degradation in performance. When your applications require high performance modulation, excellent spectral purity, and high output power, the HP 83731/32A offer unparalleled capability.

Powerful Versatility

For applications at frequencies below 1 GHz, the HP 83732A offers several unique advantages. Digital dividers and switched filters minimize harmonics (< -55 dBc) and spurious signals even at power levels approaching $+20$ dBm. Now you can test receivers at their IF with the same high performance modulation you need at microwave. Phase noise and spurious supression improves by 6 dB/octave as the frequency is reduced, making the HP 83732A a versatile solution for both microwave and in-channel RF receiver tests. Broadband noise is improved greatly compared to older designs.

The HP 83731/32A are recommended local oscillators for the HP 8970B noise figure meter. Low broadband noise minimizes errors in measurements of low gain devices. Use the HP 83731/2A with the HP 83550 Series millimeter wave modules to generate signals to 110 GHz.

All front panel functions are completely HP-IB programmable and SCPI compatible.

Reliable by Design

The HP 83731/32A are designed to remain within factory specifications for the entire life of the instrument. The recommended two-year performance verification cycle minimizes downtime and ownership cost. If a unit ever drifts toward the edge of a performance specification, automated adjustment routines supplied with each unit can be run to return the unit to factory performance. A complete adjustment sequence requires <6 hours. Extensive use of surface mount technology and a minimum number of adjustments combine to deliver an estimated MTBF of $>20{,}000$ hours. If ever needed, built-in functional verification routines speed servicing.Tedious manual adjustments have been designed out while performance and reliability have been designed in.

P 83731/32A Specifications

(For complete specifications see HP 83731/32A technical data eet, HP p/n 5091-4318E)

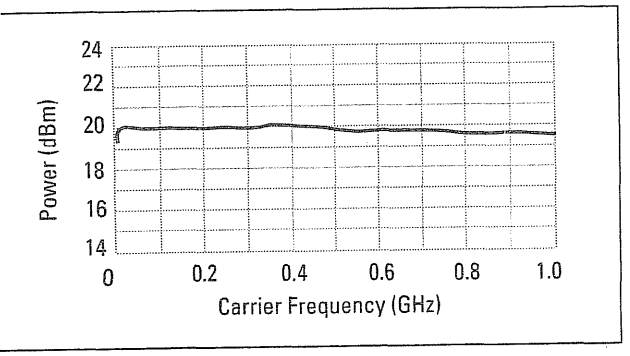
equency Characteristics

Frequency range: HP 83731A 1 to 20 GHz
HP 83732A 0.01 to 20 GHz

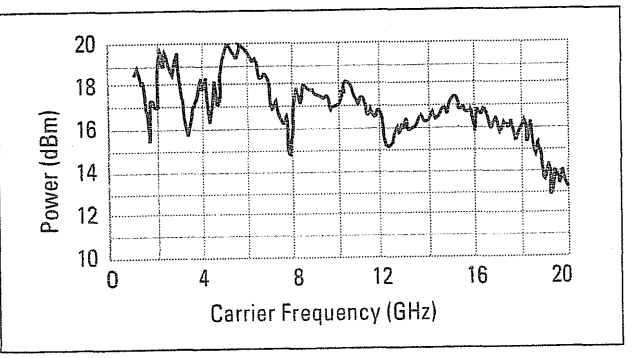
equency Resolution: 1 kHz, 1 Hz with Opt 1E8

utput Characteristics

Output power (with Opt 1E1): 0.01 to 1 GHz +13 dBm
1 to 18 GHz +10 dBm
18 to 20 GHz + 8 dBm



ypical maximum available output power from 0.01 to 1 GHz at 25° C.



ypical maximum available output power from 1 to 20 GHz, at 25° C ith output step attenuator (Option 1E1) installed.

Resolution: 0.01 dB
Accuracy: ±2.3 dB 10 MHz to 50 MHz ±2 dB 50 MHz to 20 GHz for all power levels and temperatures
Flatness: ±0.5 dB

Spectral Purity

Harmonics: < −55 dBc
Sub-harmonics: None
Non-harmonic spurious (> 3 kHz): −60 dBc
Phase noise (@ 10 kHz offset): 500 MHz −103 dBc/Hz
2 GHz −91 dBc/Hz
18 GHz −73 dBc/Hz

(Phase noise decreases 6 dB/octave below 500 MHz and reaches a floor of < −140 dBc/Hz.) For typical phase noise plot, see page 417.

Pulse Modulation

On/off ratio: >80 dB
Rise/fall times: <10 ns
Minimum pulse width: <25 ns, 1 to 20 GHz

Internal Multimode Pulse Modulation Source

Modes: Internal free-run, triggered, doublet, and gated burst modes
Pulse repetition frequency: 3 Hz to >3 MHz
Pulse width: 25 ns to 419 ms
Pulse delay: −419 ms to +419 ms, free-run mode
225 ns to 419 ms, triggered mode
Minimum pulse parameter resolution: 25 ns

Frequency Modulation

Rates: 1 kHz to >1 MHz
Maximum deviation: 10 MHz pk, 2 to 20 GHz
5 MHz pk, 1 to 2 GHz
Decreases by a factor of 2 for each octave below 1 GHz
Maximum modulation index: >300

Logarithmic Amplitude Modulation

Depth: >60 dB
Sensitivity: −10 dB/V
Step response: <5 us for 50 dB step

General Specifications

Operating temperature: 0° to +55° C
EMC: Meets or exceeds EN55011/CISPR 11/1990, Class A, and Mil-Std-461C Part2 RE02, CS02, CE03, RS03
Power: 90 to 132 V, 48 to 440 Hz; 198 to 264 V, 48 to 66 Hz; 400 VA maximum.
Net weight: <16 kg (35 lb)
Size: 426 mm W × 133 mm H × 498 mm D (16.8 in × 5.2 in × 19.6 in)

Ordering Information	Price
HP 83731A Synthesized Signal Generator	$28,500
HP 83732A Synthesized Signal Generator	$32,500
Opt 1E1 Add 90 dB Output Step Attenuator	+$2,000
Opt 1E5 Add High-Stability Timebase	+$1,500
Opt 1E8 Add 1 Hz Frequency Resolution	+$2,000
Opt 1E9 3.5 mm RF Output Connector	+$500
Opt 0B2 Extra Operating Manual	+$100
Opt 0B3 Service Manuals	+$100
Opt 1CM Rack Mount Kit (HP p/n 5062-3977)	+$65
Opt 1CP Rack Mount and Handle Kit (HP p/n 5062-3983)	+$100
Opt 1CR Rack Slide Kit (HP p/n 1494-0059)	+$35
Opt W30 Two Additional Years Return-to-HP Service	
HP 83731A	$765
HP 83732A	$815