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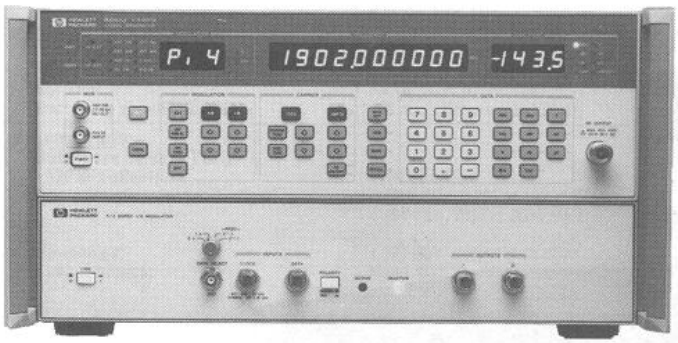
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- 100 kHz to 1030 MHz analog range
- Standard AM and FM modulation
- π/4 DQPSK modulation for NADC, PDC, and PHS
- Digital RF frequency bands for NADC, PDC, and PHS



HP 8657D/J

DESIGNED FOR HP-IB SYSTEMS

HP 8657D/J π/4 DQPSK Signal Generators

The HP 8657D and 8657J signal generators add π/4 DQPSK digital modulation capability to conventional AM, FM, and pulse modulation formats. The HP 8657D/J build on the excellent performance of the HP 8657 signal generator by adding digital modulation capability. The HP 8657D provides the performance to test mobiles for North American Digital Cellular (NADC) and Japanese Digital Cellular (PDC) radio systems. The HP 8657J tests radios for Japanese digital cordless telephone system, called Personal Handiphone System (PHS).

Traditional Source

The HP 8657D/J are ideal for in-channel testing of analog receivers. They offer excellent level accuracy (±1 dB), low radiated emissions, low residual noise, and minimal distortion. The HP 8657D/J make system integration easy by being front panel and HP-IB compatible with the HP 8656B/8657A/8657B family of economy signal generators.

HP 8657D π/4 DQPSK for NADC and PDC

Radios produced for the NADC standard must be capable of operating in the analog AMPS cellular mode as well as in the new digital cellular mode. The HP 8657D fulfills the signal generator requirements for both, making it a single-box solution. When operating in the π/4 DQPSK mode, the frequency range is limited to three bands: 10 to 129.9 MHz, 801 to 965 MHz, and 1420 to 1540 MHz. The attached π/4 DQPSK modulator accepts serial data and a symbol clock from 20 to 25 kHz. Modulator filtering is selectable by either 0.35 or 0.5 root raised cosine filtering. AM and FM modulation are not available in the π/4 DQPSK modulation mode.

HP 8657J π/4 DQPSK for PHS

The HP 8657J provides π/4 DQPSK modulation in the frequency range from 1800 to 2000 MHz to test PHS mobiles and base stations. The attached π/4 DQPSK modulator accepts serial data and symbol clock at 192 kHz ±10 kHz. Modulator filtering is 0.5 root raised cosine. AM and FM modulation are not available in the π/4 DQPSK modulation mode.

Pulse Modulation

A high-performance pulse modulator is included in the HP 8657D/J which can be used in both analog and digital modulation modes. The rise/fall time is <35 ns and on/off ratio is better than 70 dB below 1030 MHz. Pulse modulation combined with π/4 DQPSK modulation capability allows the HP 8657D/J to fully simulate the TDMA properties of these systems.

Data Generation

An internal data generator provides a choice of four patterns: all 0s, all 1s, and PRBS sequences of 2^9-1 and $2^{15}-1$.

Specifications

Analog Modulation Mode: In the analog modulation mode, specifications are the same as the HP 8657B up to 1030 MHz. Please refer to the HP 8657B specifications for complete analog mode performance.

π/4 DQPSK Modulation Mode:

Frequency Range: 10 MHz to 129.9 MHz (HP 8657D); 801 MHz to 965 MHz (HP 8657D); 1420 to 1540 MHz, data inverted (HP 8657D); 1800 to 2000 MHz (HP 8657J)

Output Level Range: –143.5 dBm to +7 dBm in all ranges

Switching Speed: <50 ms within 100 Hz of final frequency

Modulation: π/4 DQPSK

Modulation Data Clock Frequency Range:

Symbol Clock: 20 kHz to 25 kHz (HP 8657D); 192 kHz ±10 kHz (HP 8657J)

Bit Clock: 40 kHz to 50 kHz (HP 8657D); 384 kHz ±20 kHz (HP 8657J)

Pre-modulation Filter: square-root raised cosine

Filter Shape Factor: $\alpha = 0.35$ or $\alpha = 0.50$ (HP 8657D)
$\alpha = 0.50$ (HP 8657J)

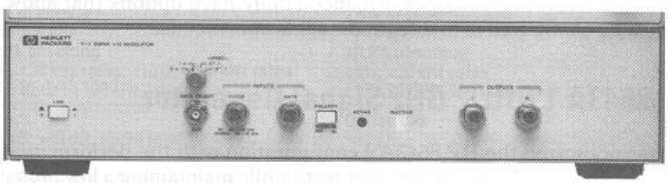
Error Vector Magnitude (15° to 35° C): <4.0%, 10 to 129.9 MHz and 1420 to 1540 MHz, < +7 dBm (HP 8657D); <3.0%, 801 to 965 MHz, < +7 dBm (HP 8657D); <3.2%, 1800 to 2000 MHz, < +3 dBm (HP 8657J)

I/Q Origin Offset (15° to 35° C): –35 dB, RF output only

Pulse Modulation

On/off Ratio: 70 dB, $f_c \leq 1030$ MHz; >50 dB, 1420 MHz $\leq f_c \leq 1540$ MHz, π/4 DQPSK mode (HP 8657D); >50 dB, 1800 MHz $\leq f_c \leq 2000$ MHz, π/4 DQPSK mode (HP 8657J)

Rise/fall Time (10% to 90%): 35 ns (typically 10 ns)



HP 11846B π/4 DQPSK I-Q Generator

The HP 11846B (with Option 001 or 002) is an accessory for use with the HP 8780A or HP 8782B vector signal generators. The HP 11846B with Option 001 is used with a vector signal generator to provide NADC (North American Dual-mode Cellular) and PDC (Personal Digital Cellular) for simulating telephone system transmissions. The HP 11846B with Option 002 is for use with one of the vector signal generators to simulate PHS (Personal Handi-Phone System) system transmissions.

Ordering Information

	Price
HP 8657D πDQPSK Signal Generator	$25,000
Opt 001 High-Stability Reference	+$1,800
Opt 907 Front Handle Kit	Standard
Opt 910 Total of Two Sets of Operating/Calibration (08657-90107) and Two Service Manuals (08657-90131)	+$610
Opt 913 Rack-mount Flange Kit (5062-4073)	+$37
Opt 915 Add Service Manual (does not come standard) (08657-90131)	+$280
Opt W30 Three-Year Repair Service	+$565
Opt W32 Three-Year Calibration Service	+$1,100
HP 8657J π/4 DQPSK Signal Generator	$25,900
Opt 001 High-Stability Reference	+$1,080
Opt 907 Front Handle Kit	Standard
Opt 913 Rack-mount Flange Kit (5062-4073)	+$37
Opt OBX Add Service Manual (does not come standard) (08657-90007, 08657-91011)	+$280
Opt W30 Three-Year Repair Service	+$640
Opt W32 Three-year Calibration Service	+$885
HP 11846B π/4 DQPSK I-Q Generator	$7,365

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