



MICROWAVE TEST EQUIPMENT
Waveguide Crystal Detectors, Mixers

Models 422A/C, 424A, 11970/11971 Series, 10514/34A



HP K422C



HP X424A



HP 10514A



HP 11970/11971 Series

HP 422 Series, 424 Series Crystal Detectors

The HP 422A/C and 424A families of Crystal Detectors combine high sensitivity with flat frequency response and low SWR to provide waveguide band coverage from 8.2 to 60 GHz. They deliver between 0.2 and 0.5 mV/μW output at low level and handle 100 mW peak input. SWR ranges from 1.35 at X-band to 3 at R-band.

The HP K422C detector uses a planar doped barrier (PDB) diode. This superior diode technology results in a frequency response 5 times better than the former HP K422A (± 0.4 dB vs. ± 2.0 dB).

HP Q/U422 Series millimetre-wave detectors use Low-Barrier Schottky diodes for low video impedance and low junction capacitance. Their SWR is below 2.0, low-level sensitivity is 0.2 mV/μW.

For reflectometer applications in which both flat frequency response and square-law characteristics are important, these models can be supplied as matched pairs (Option 001) and with optimum square-law loads (Option 002). Due to its exceptionally flat frequency response, and any two standard HP K422Cs become a matched pair, and therefore the matched pair option, Option 001, is not needed.

HP 422 Series, 424 Series Waveguide Crystal Detector Specifications

HP Model	Frequency Range (GHz)	Frequency Response (dB)	Option 001 Matched Response (dB)	LowLevel Sensitivity mV/μW	SWR	Waveguide & Equivalent Flange	Price
X424A	8.2-12.4	±0.3	±0.3 dB	>0.4	1.35	WR90 UG-135/U	\$300
P424A	12.4-18.0	±0.5	±0.5 dB	>0.3	1.5	WR62 UG-419/U	\$340
K422C	18.0-26.5	±0.4	N/A	>0.5	1.36	WR42 UG-595/U	\$800
R422A	26.5-40.0	±2	±1 dB	>0.3	3.0	WR28 UG-599/U	\$800
Q422A	33.0-50.0	±1.5	N/A	>0.25	2.0	WR-22 UG-383/U	\$1150
U422A	40.0-60.0	±1.5	N/A	>0.20	2.0	WR-19 UG-383/U (mod)	\$1350

Option 001: Matched response. Must order two (2) option 001's for a pair of detectors with matched frequency response.
 Option 002: optimum square-law load.
 Option 003: positive polarity output. (available with X/P424A and Q/U422A)

Option Prices			
HP Model	Opt. 001	Opt. 002	Opt. 003
K422C	N/A	add \$20	N/A
P424A	add \$20	add \$20	N/C
R422A	add \$45	add \$20	N/A
X424A	add \$20	add \$20	N/C
Q422A	N/A	N/A	N/C
U422A	N/A	N/A	N/C

HP 10514A, 10534A Double Balanced Mixers

These mixers are excellent in a variety of mixing applications as well as AM, pulse, and square-wave modulation applications. The careful balancing of the hot carrier diodes in the HP 10514A and 10534A provides excellent output suppression of the local oscillator and input frequencies. Frequency ranges are 0.2-500 MHz for the HP 10514A and 0.05-150 MHz for the HP 10534A. Connectors are BNC.

HP 11970 and 11971 Series Harmonic Mixers

Although designed for operation with HP spectrum analyzers, these broadband mixers also serve a wide variety of general-purpose uses for the frequency bands from 18 to 110 GHz. Such uses include down-conversion for noise figure and network analysis measurements.

As down-conversion mixers for test receivers, the HP 11970 and 11971 offer flat response, low SWR, and low conversion loss without requiring bias. These mixers can also serve as harmonic generators with input signals from 2 to 6.1 GHz (depending on the model). Outputs are at the band specified, and each mixer is individually calibrated for conversion loss over its complete band. See page 693 for more technical performance information.

Ordering Information

HP 10514A Double Balanced Mixer (0.2-500 MHz)
 HP 10534A Double Balanced Mixer (0.05-150 MHz)

Price
 \$185
 \$133

HP 11970/11971 Series Specifications

HP Models	Frequency Range (GHz)	Freq. Response (dB)	Waveguide and Equivalent Flange	Price
11970K 11971K	18 - 26.5	±1.9 ±2.1	WR-42 UG-595/U	\$1500 \$1350
11970A 11971A	26.5 - 40	±1.9 ±2.1	WR-28 UG-599/U	\$1550 \$1400
11970Q 11971Q	33 - 50	±1.9 ±2/3	WR-22 UG-383/U	\$1700 \$1600
11970U 11971U	40 - 60	±1.9 ±2.3	WR-19 UG-383/U (mod)	\$1850 \$1800
11970V 11971V	50 - 75	±2.1 ±2.5	WR-15 UG-385/U	\$2250 \$2000
11970W	75 - 110	±3.0	WR-10 UG-385/U (mod)	\$2550