

## Mixers

### HP 11970, 11974 Series



#### HP 11974 Series Preselected Millimeter Mixers

Eliminate the need for signal identification at millimeter frequencies. The HP 11974 series mixers are preselected from 26.5 to 75 GHz for faster, easier testing of millimeter devices and systems. Pre-selection reduces mixer overload from broadband signals and reduces radiation of local oscillator harmonics back to the device under test. Equipment operators can quickly locate true signals. Also, software development for automated measurements is greatly simplified.

These mixers feature advanced barium-ferrite technology and come with a standalone power supply. They are particularly useful for broadband millimeter signal analysis, millimeter electromagnetic-interference (EMI) measurements, and unattended monitoring of millimeter signals.

#### Compatibility

All HP 8560E series analyzers and HP 70907B external mixer interface modules are fully compatible with the HP 11974 series.

#### HP 11970 Series Harmonic Mixers

These waveguide mixers are general purpose harmonic mixers. They employ a dual-diode design to achieve flat frequency response and low conversion loss. This is achieved without external dc bias or tuning stubs. Manual operation and computer controlled hardware operation are simplified because mixer bias and tuning adjustment are not required.

#### Specifications

HP Model <sup>1</sup>	Frequency Range (GHz)	Sensitivity (Displayed Avg. Noise Level/10 Hz) (dBm)	Calibration Accuracy (dB)	Image Rejection (dBc)	1 dB Gain <sup>2</sup> Compression (dBm)
11974A	26.5 to 40	-111	<±2.3	-54	+6
11974Q	33 to 50	-106	<±2.3	-50	0
11974U	40 to 60	-109	<±2.6	-50	0
11974V	50 to 75	-100	<±4.5	-50 (to 67 GHz) -40 (67 to 75 GHz)	+3

<sup>1</sup> Specifications apply when connected to the HP 8566B or 70000 series spectrum analyzers.

<sup>2</sup> Typical characteristic.

## Mixers

### Specifications

HP Model	Frequency Range (GHz)	LO Harmonic Number	Maximum Conversion Loss (dB)	Noise Level (dB) 1 kHz RBW	Freq. <sup>1</sup> Response (dB)	1 dB Gain <sup>2</sup> Compression (dBm)
11970K	18 to 26.5	6+	24	-105	±1.9	-3
11970A	26.5 to 40	8+	26	-102	±1.9	-5
11970Q	33 to 50	10+	28	-101	±1.9	-7
11970U	40 to 60	10+	28	-101	±1.9	-7
11970V	50 to 75	14+	40	-92	±2.1	-3
11970W	75 to 110	18+	47	-85	±3.0	-1

<sup>1</sup> Frequency of the mixers is reduced by 1 dB with LO input power of 14.5 to 16.0 dBm.

<sup>2</sup> Typical characteristic.

- Preselected mixers to eliminate signal identification
- State-of-the-art technology
- Easier automated measurements
- Low conversion loss
- Individually amplitude calibrated
- No bias or tuning adjustments
- High 100 mW safe input level

### Compatibility

The HP 11970 series mixers extend the frequency range of the HP 8560E, 8561E, 8562E, and 8563A,E portable spectrum analyzers; except the HP 8560A,E with built-in tracking generator (Option 002). The HP 11970 series mixers are also compatible with the HP 8566B spectrum analyzer (used with the HP 11975A amplifier); and the HP 70000 modular measurement system (used with the HP 70907A,B external mixer interface module, or the HP 70909A and 70910A RF sections).

### HP 11970 and 11974 Series Specifications

**IF Range:** dc to 1.3 GHz

**LO Amplitude Range:** +14 to +16 dB; +16 optimum

**Calibration Accuracy:** ±2.0 dB for HP 11970 series with optimum LO amplitude

**Typical RF Input SWR:** <2.2:1, <3.0:1 for HP 11974 series

**Bias Requirements:** none

**Typical Odd-Order Harmonic Suppression:** >20 dB (does not apply to HP 11974 series)

**Maximum CW RF Input Level:** +20 dBm (100 mW), +25 dBm for HP 11974 series

**Maximum Peak Pulse Power:** 24 dBm (250 mW) with <1 μs pulse (avg. power = +20 dBm)

**Bandwidth:** 100 MHz minimum (HP 11974 series only)

**Environmental:** Meets MIL-T-28800C, Type III, Class 3, Style C

**IF/LO Connectors:** SMA female

**Tune IN Connector:** BNC

**LO Range:** 3.0 to 6.1 GHz

### Ordering Information

**HP 11974A:** 26.5 to 40 GHz preselected mixer

**HP 11974Q:** 33 to 50 GHz preselected mixer

**HP 11974U:** 40 to 60 GHz preselected mixer

**HP 11974V:** 50 to 75 GHz preselected mixer

**Option 003:** Delete power supply (HP 11974 series only)

**HP 11970K:** 18 to 26.5 GHz mixer

**HP 11970A:** 26.5 to 40 GHz mixer

**HP 11970Q:** 33 to 50 GHz mixer

**HP 11970U:** 40 to 60 GHz mixers

**HP 11970V:** 50 to 75 GHz mixers

**HP 11970W:** 75 to 110 GHz mixers

**HP 11970**

**Option 009:** Mixer connection set adds three-1 meter low-loss SMA cables, wrench, allen driver for any HP 11970 series mixer.

Carrying case with storage space for cables and tools included.

**HP 11969A:** Carrying case for one to five HP 11970 series mixers, SMA cables, and tools

**HP 11975A:** 2 to 8 GHz amplifier

**HP 281A,B:** Coaxial to waveguide adapters

**R281A:** 26.5 to 40 GHz, 2.4 mm (f)

**R281B:** 26.5 to 40 GHz, 2.4 mm (m)

**Q281A:** 33 to 50 GHz, 2.4 mm (f)

**Q281B:** 33 to 50 GHz, 2.4 mm (m)

**U281A:** 40 to 60 GHz, 1.85 mm (f)

**U281B:** 40 to 60 GHz, 1.85 mm (m)

**V281A:** 50 to 64 GHz, 1.85 mm (f)

**V281B:** 50 to 64 GHz, 1.85 mm (m)