KEYSIGHT TECHNOLOGIES (AGILENT HP)

11970U

The Keysight Agilent 11970U is a high-performance waveguide harmonic mixer designed to extend the frequency range of spectrum analyzers to the U-band (40 to 60 GHz). It employs a dual-diode design that achieves exceptionally flat frequency response and low conversion loss without requiring external DC bias or tuning stubs. This makes both manual and automated millimeter-wave measurements simple, precise, and highly reliable.

SPECIFICATIONS

Physical

Power Supply	None (passive device, no external DC bias required)
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	70 mm × 47 mm × 103 mm mm
Weight	0.14 kg kg
Shipping Weight	0.9 kg

Frequency & Band Specifications

Waveguide Band Designation	U Band
RF Input Frequency Range	40 to 60 GHz
LO Input Frequency Range	3.0 to 6.1 GHz
IF Output Frequency Range	DC to 1300 MHz
Harmonic Number (N)	10-
Waveguide Designation	WR-19

Electrical & Performance Parameters

Conversion Loss (Maximum)	28 dB
Conversion Loss Flatness Across Band	±1.9 dB
Maximum RF Input Power (CW Damage Level)	+20 dBm (100 mW)
Maximum Peak Pulse Power	+24 dBm (250 mW) with pulse width <1 µs
Optimum LO Drive Level	+14 to +18 dBm

Port Impedance & VSWR

Typical RF Input SWR	<2.2:1
Nominal Port Impedance	50 Ω (LO and IF ports)

Physical Interfaces & Connectors

RF Input Connector Type	WR-19 Waveguide
Waveguide Flange Type	UG-383/U-M circular flange
LO Input Connector Type	SMA female
IF Output Connector Type	SMA female

DC Bias & Control Requirements

External DC Bias Requirements	None (unbiased dual-diode design)
Tuning Adjustments	None required (no tuning stubs)

Environmental & Reliability

Storage Temperature Range	-40 to +75 °C

Compliance & Quality Standards

Calibration Traceability	Individually calibrated conversion loss chart attached to housing

General & Compatibility

Compatible Spectrum Analyzers	Keysight E4440A/46A/48A PSA, E4407B ESA-E, 8560 E-series, 8566B (with 11975A amplifier), 70000 MMS (with 70907A/B interface)

Performance

Typical Calibration Uncertainty	±2.0 dB
Calibration Step Size	1 GHz
Maximum LO Input Power	+20 dBm

Environmental

Environmental Standards	MIL-T-28800C, Type III, Class 3, Style C (except operating temperature)

Compliance

MIL-T-28800C Compliance	Type III, Class 3, Style C

Calibration

Recommended Calibration Cycle	1 year

TECHNOLOGY

Harmonic Mixer

APPLICATIONS

Millimeter-wave spectrum analysis and frequency extension

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.