KEYSIGHT TECHNOLOGIES (AGILENT HP)

8971B

The Keysight (Agilent/HP) 8971B Noise Figure Test Set is a dedicated downconverter designed to extend the frequency range of the HP 8970B Noise Figure Meter. It enables automatic, high-performance single-sideband (SSB) and double-sideband (DSB) noise figure measurements up to 18 GHz (or 26.5 GHz with Option 002) by utilizing internal preamplifiers, switches, filters, and mixers to downconvert high-frequency signals to the 10 to 1600 MHz intermediate frequency (IF) range of the meter.

SPECIFICATIONS

General

Interfaces	HP-IB (System Interface, Hewlett-Packard Interface)

Physical

Power Supply	100 / 120 / 220 / 240 VAC (+5%, -10%), 48 to 66 Hz (48 to 440 Hz for 100/120 VAC), 100 VA max
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	425.5 mm × 132.6 mm × 503.2 mm mm
Weight	16.0 kg

Frequency Specifications

Standard Frequency Range	10 MHz to 18 GHz
Option 002 Frequency Range	10 MHz to 26.5 GHz

RF Input and Port Characteristics

RF Input Impedance	50 ohms nominal
Maximum RF Input Power	+20 dBm (100 mW) continuous wave
Maximum DC Input Voltage	0 V
RF Input Damage Level	+20 dBm (100 mW)
Standard RF Input Connector Type	Type-N female
Option 002 RF Input Connector Type	APC-3.5 male

Local Oscillator Input

LO Input Frequency Range	2.4 to 18.0 GHz (up to 26.5 GHz with Option 002)
LO Input Power Range	1 to 3 mW (0 to 5 dBm)
LO Input Impedance	50 ohms nominal
LO Input Connector Type	Type-N female (Option 002: APC-3.5 male)

IF Output Characteristics

IF Output Frequency Range	10 to 1600 MHz
IF Output Connector Type	Type-N female

RF Input VSWR

SWR (Bypass Mode, 10 MHz to 1.6 GHz)	< 1.35
SWR (SSB Mode, 1.6 to 12.4 GHz)	< 2.2
SWR (SSB Mode, 12.4 to 18 GHz)	< 2.5
SWR (SSB Mode, 18 to 26.5 GHz, Option 002)	< 3.2
SWR (DSB Mode, 1.6 to 18 GHz)	< 2.0
SWR (DSB Mode, 18 to 26.5 GHz, Option 002)	< 3.0

Noise Figure and Gain Performance

Image and Out-of-Band Rejection	> 20 dB (SSB Mode)

Environmental and Compliance

Storage Temperature Range	-55 to +75 °C

Power and Physical Characteristics

Cooling Type	Internal forced-air fan

Noise Source Drive and Calibration

Noise Source Drive Front Port	BNC female (loop-through from rear input)
Noise Source Drive Rear Input Port	BNC female (connection from HP 8970B)

Measurement Configuration and Processing

Measurement Modes	SSB (Single Sideband), DSB (Double Sideband), Bypass

Configuration Options

Option 001 Description	Rear panel RF Input, LO Input, and IF Output connectors
Option 002 Description	Extends operating frequency range up to 26.5 GHz

System Noise Figure

System Noise Figure (Bypass Mode, 10 to 1600 MHz)	< 8 dB (includes HP 8970B)
System Noise Figure (SSB Mode, 1.6 to 12.4 GHz)	< 18 dB (includes HP 8970B)
System Noise Figure (SSB Mode, 12.4 to 18.0 GHz)	< 20 dB (includes HP 8970B)
System Noise Figure (SSB Mode, 18.0 to 26.5 GHz)	< 23 dB (Option 002, includes HP 8970B)
System Noise Figure (DSB Mode, 1.6 to 18.0 GHz)	< 14 dB (includes HP 8970B)
System Noise Figure (DSB Mode, 18.0 to 26.5 GHz)	< 17 dB (Option 002, includes HP 8970B)

RF Performance

Bypass Mode Insertion Loss (10 to 1600 MHz)	< 3.0 dB
Gain (SSB Mode, 1.6 to 12.4 GHz)	> 23 dB
Gain (SSB Mode, 12.4 to 18.0 GHz)	> 21 dB
Gain (SSB Mode, 18.0 to 26.5 GHz)	> 16 dB (Option 002)
Gain (DSB Mode, 1.6 to 18.0 GHz)	> 23 dB
Gain (DSB Mode, 18.0 to 26.5 GHz)	> 18 dB (Option 002)

LO Input

LO Input SWR (2.4 to 18.0 GHz)	< 2.0
LO Input SWR (18.0 to 26.5 GHz)	< 2.5 (Option 002)

Control & Interfaces

HP-IB Interface Capabilities	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT0, C0, E1

Frequency

YIG-Tuned Filter Frequency Range	1.6 to 18.0 GHz (standard) / 1.6 to 26.5 GHz (Option 002)

Environmental

Operating Altitude	Up to 4,570 m (15,000 ft)
Storage Altitude	Up to 15,240 m (50,000 ft)
Operating Humidity	Up to 95% relative humidity at 40 °C

APPLICATIONS

Noise Figure Measurement Downconversion

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