

KEYSIGHT TECHNOLOGIES (AGILENT HP)

53181A

The Keysight (formerly Agilent/HP) 53181A is a high-performance RF frequency counter offering 10 digits/second frequency resolution. It features a standard 225 MHz input channel, with an option to add a second high-frequency channel ranging up to 12.4 GHz. The 53181A is tailored for precise RF measurements and includes built-in automated limit tests, statistics processing (average, min/max, standard deviation), and peak voltage measurement capabilities.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2) standard; RS-232 talk-only
Display	Vacuum Fluorescent Display (VFD)

Physical

Power Supply	100-120 VAC / 220-240 VAC, 50/60/400 Hz, 170 VA max
Operating Temperature	0 to 55 °C
Dimensions (W×H×D)	212.6 × 88.5 × 348.3 mm

Basic Characteristics

Number of Channels	1 standard (Channel 1), 1 optional (Channel 2)
Frequency Range (Base)	dc to 225 MHz
Frequency Range (With Options)	Up to 1.5 GHz, 3.0 GHz, 5.0 GHz, or 12.4 GHz (option dependent)
Measurement Resolution	10 digits/second

Input Characteristics (Standard Channel)

Frequency Range	dc to 225 MHz
Coupling	ac or dc (switchable)
Impedance	1 MΩ or 50 Ω (switchable)
Low Pass Filter	100 kHz (switchable)

Time Base Specifications

Standard Time Base Type	10 MHz crystal oscillator
External Reference Input Frequency	1 MHz, 5 MHz, or 10 MHz

Measurement Functions

Primary Measurements	Frequency, Frequency Ratio (with optional Ch 2), Period, Peak Voltage
Math Functions	Scale and Offset
Statistics	Average, Min/Max, Standard Deviation
Limit Testing	Automated upper and lower limits

Measurement Performance

Gate Time Range	1 ms to 1000 s
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Trigger Specifications

Trigger Level Range	$\pm 5.125\text{ V}$ (1 M Ω), $\pm 5\text{ V}$ (50 Ω)
Trigger Level Resolution	5 mV

Physical Specifications

Rack Unit Size	2U (half-rack width)
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Timebase & Reference

Timebase Output Frequency	10 MHz
Timebase Output Amplitude	> 1 V _{pp} into 50 Ω
External Reference Input Frequencies	1 MHz, 5 MHz, 10 MHz

Performance

Resolution (Digits per Second)	10 digits/s
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System & Connectivity

Programming Language	SCPI
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Environmental

Storage Temperature	-40 °C to +71 °C
Operating Humidity	Up to 95% relative humidity at 40 °C

Options

Timebase Options	Medium Stability Oven (Opt 001), High Stability Oven (Opt 010), Ultra-High Stability Oven (Opt 012)
RF Input Options (Channel 2)	1.5 GHz (Opt 015), 3.0 GHz (Opt 030), 5.0 GHz (Opt 050), 12.4 GHz (Opt 124)

Input 1 Characteristics

Damage Level (50 Ω)	5 V _{rms}
Damage Level (1 M Ω)	350 V _{dc} + AC peak (DC to 2.7 kHz)
Input Attenuation	x1 or x10
Trigger Slope	Selectable Positive or Negative

Timebase Characteristics

Standard Timebase Aging Rate	$< 3 \times 10^{-7}$ / month
Timebase Aging (Option 010)	$< 1.5 \times 10^{-8}$ / month
Timebase Aging (Option 012)	$< 3 \times 10^{-9}$ / month

System Performance

Maximum Measurement Speed (GPIB)	Up to 200 measurements / second
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Power

Maximum Power Consumption	170 VA
AC Line Voltage Requirements	100-120 VAC ±10% (50/60/400 Hz) or 220-240 VAC ±10% (50/60 Hz)

Compliance

EMI / RFI Compliance	CISPR-11, EN55011 Group 1 Class A
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TECHNOLOGY

RF Frequency Counter

APPLICATIONS

RF and Microwave Frequency Measurement

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