

KEYSIGHT TECHNOLOGIES (AGILENT HP)

53132A 030

The Keysight (Agilent/HP) 53132A Option 030 is a high-performance Universal Frequency Counter/Timer. This specific configuration features a 225 MHz two-channel base unit enhanced with the Option 030 3 GHz Channel 3 input, delivering 12-digit-per-second frequency resolution and 150 ps single-shot time interval resolution.

SPECIFICATIONS

General

Interfaces	GPIO (IEEE-488.2, SCPI compatible), RS-232 (Talk-Only)
Display	12-digit Vacuum Fluorescent Display (VFD)
Save/Recall Instrument Setups	20 setups

Physical

Power Supply	100-120 VAC $\pm 10\%$ (50/60/400 Hz), 220-240 VAC $\pm 10\%$ (50/60 Hz), 100 VA maximum
Operating Temperature	0 °C to 55 °C °C
Dimensions (W×H×D)	212.6 mm × 88.5 mm × 348.3 mm mm
Weight	3.5 kg kg

Input Channels 1 & 2 Characteristics

Frequency Range (DC Coupled) - Ch 1 & 2	0.1 Hz to 225 MHz
Frequency Range (AC Coupled) - Ch 1 & 2	30 Hz to 225 MHz (1 M Ω), 1 MHz to 225 MHz (50 Ω)
Input Impedance - Ch 1 & 2	1 M Ω (parallel with 30 pF) or 50 Ω
Input Coupling - Ch 1 & 2	AC or DC
Input Attenuation - Ch 1 & 2	x1 or x10
Low-Pass Filter Selectability - Ch 1 & 2	100 kHz cutoff, switchable
Trigger Level Range - Ch 1 & 2	-5.125 V to +5.125 V (x1), -51.25 V to +51.25 V (x10)
Trigger Level Resolution - Ch 1 & 2	2.5 mV (x1), 25 mV (x10)
Input Sensitivity (DC - 100 MHz) - Ch 1 & 2	20 mVrms
Input Sensitivity (100 MHz - 225 MHz) - Ch 1 & 2	40 mVrms
Maximum Input Damage Level (1 M Ω) - Ch 1 & 2	350 V (DC + AC peak) to 10 kHz, derating to 5 Vrms at 100 kHz
Maximum Input Damage Level (50 Ω) - Ch 1 & 2	5 Vrms

Optional Channel 3 (High-Frequency) Characteristics

Frequency Range - Ch 3 (Option 030)	100 MHz to 3 GHz
Input Impedance - Ch 3 (Option 030)	50 Ω nominal
Input Coupling - Ch 3 (Option 030)	AC
Connector Type - Ch 3 (Option 030)	BNC female (front panel)
Input Sensitivity (100 MHz - 2.7 GHz) - Ch 3	40 mVrms
Input Sensitivity (2.7 GHz - 3.0 GHz) - Ch 3	75 mVrms
Maximum Input Damage Level - Ch 3 (Option 030)	5 Vrms (+27 dBm)

Measurement Capabilities & Modes

Frequency Resolution	12 digits/second
Single-Shot Time Interval Resolution	150 ps
Time Interval Range	-1 ns to 10^5 s
Time Interval Delay Range	100 ns to 10 s
Rise/Fall Time Measurement Range	5 ns to 10 μ s
Pulse Width Measurement Range	5 ns to 10^5 s
Duty Cycle Measurement Range	0% to 100% (5 ns minimum pulse width)
Phase Measurement Range	-180° to +360°
Frequency Ratio Measurement Channels	Ch 1/Ch 2, Ch 1/Ch 3, Ch 2/Ch 1, Ch 3/Ch 1
Voltage Peak-to-Peak Measurement Range	100 Hz to 20 MHz, 20 mV to 10 Vp-p (Ch 1 & 2)

Timebase & Reference Oscillator Options

Standard Timebase Aging Rate	$< 3.7 \times 10^{-7}$ per day
Standard Timebase Temperature Stability	$< 5 \times 10^{-6}$ (0 °C to 50 °C)
External Reference Input Frequencies	1, 5, or 10 MHz
External Reference Input Amplitude Range	100 mVrms to 5 Vrms
External Reference Output Frequency	10 MHz
External Reference Output Amplitude	> 1 Vp-p into 50 Ω

Gating, Triggering & Math Functions

Gate Time Range	1 ms to 10.00 s
Gate Time Resolution	1 ms
Statistics Functions	Mean, Min, Max, Standard Deviation
Allan Deviation Measurement	Calculated from statistical measurements
Math Functions	Scale and Offset: (Measure - Offset) / Scale
Limit Testing Capabilities	High/Low limits with visual fail/pass indication

Connectivity & System Interfaces

SCPI Command Compatibility Mode	SCPI-1992 compliant
Backward Compatibility Emulation Modes	HP 5335A

Power & Environmental Specifications

Storage Temperature Range	-40 °C to +70 °C
Calibration Interval	1 year

Physical Characteristics & Compliance

Safety Compliance Certifications	EN 61010-1, CSA C22.2 No. 1010.1
EMC/EMI Compliance Standard	EN 55011, EN 50082-1

Optional Timebases

Option 001 Medium Stability Oven Timebase Aging Rate	$< 2 \times 10^{-7}$ per month
Option 001 Medium Stability Oven Timebase Temperature Stability (0 to 50 °C)	$< 1 \times 10^{-6}$
Option 010 High Stability Oven Timebase Aging Rate	$< 5 \times 10^{-10}$ per day, $< 1.5 \times 10^{-8}$ per month
Option 010 High Stability Oven Timebase Temperature Stability (0 to 50 °C)	$< 2.5 \times 10^{-9}$
Option 012 Ultra-High Stability Oven Timebase Aging Rate	$< 1 \times 10^{-10}$ per day, $< 3 \times 10^{-9}$ per month
Option 012 Ultra-High Stability Oven Timebase Temperature Stability (0 to 50 °C)	$< 2.5 \times 10^{-9}$

Channel 3 (Option 030)

Channel 3 VSWR (Option 030)	$< 2.5:1$ (typical)
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Measurement Speed

GPIO Measurement Transfer Rate	Up to 200 measurements/s
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Triggering

Auto Trigger Frequency Range (Ch 1 & 2)	100 Hz to 225 MHz
Auto Trigger Minimum Amplitude (Ch 1 & 2)	> 100 mVpp
Trigger Holdoff Range	Not supported

Power Requirements

AC Voltage Input Range	90 VAC to 265 VAC
AC Frequency Input Range	47 Hz to 63 Hz (for 90-265 VAC), 360 Hz to 440 Hz (for 90-132 VAC)
Power Consumption	170 VA max (30 W typical)

Physical Specifications

Rackmount Form Factor	2U, half-rack width
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Interfaces & Connectivity

GPIO Interface Function Codes	SH1, AH1, T5, TE0, L4, LE0, SR1, RL1, PP0, DC1, DT1, C0, E2
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Input Characteristics - Ch 1 & 2

Low-Pass Filter Cutoff Frequency	100 kHz (nominal)
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Timebase

Internal Timebase Frequency	10 MHz
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Inputs & Outputs

External Gate Input Impedance	1 kΩ (nominal)
External Gate Input Threshold	TTL compatible
External Gate Minimum Pulse Width	50 ns

Environmental

Maximum Operating Altitude	4,600 m
Operating Humidity	Up to 95% RH at 40 °C (non-condensing)

Interfaces

RS-232 Baud Rates	300, 1200, 2400, 4800, 9600, 19200 bps
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TECHNOLOGY

Universal Frequency Counter/Timer

APPLICATIONS

Precision time and frequency measurement

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