

KEYSIGHT TECHNOLOGIES (AGILENT HP)

MSO7104A

The Keysight Agilent InfiniiVision MSO7104A is a high-performance 1 GHz, 4 analog channel plus 16 digital channel Mixed Signal Oscilloscope. Combining a 12.1-inch XGA display with a compact depth of 6.5 inches and standard MegaZoom III deep memory of 8 Mpts, it achieves an uncompromised update rate of up to 100,000 waveforms per second for capturing elusive signal anomalies.

SPECIFICATIONS

General

Interfaces	USB 2.0 High Speed (2x host ports, 1x device port), LAN (10/100Base-T), XGA video output, GPIB (optional)
Display	12.1-inch color TFT LCD, XGA (1024 x 768), 256 levels of intensity

Physical

Power Supply	100-120 V AC (50/60/400 Hz), 100-240 V AC (50/60 Hz), Max 120 W
Operating Temperature	0 to +55 °C °C
Dimensions (W×H×D)	454 mm × 277 mm × 172 mm mm
Weight	5.9 kg kg

Analog Vertical System

Analog Input Channels	4
Analog Bandwidth (-3 dB)	1 GHz
Calculated Rise Time (10% to 90%)	350 ps
Input Coupling	AC, DC
Input Impedance	1 MΩ ± 1% (14 pF) / 50 Ω ± 1%
Vertical Resolution	8 bits
Input Sensitivity Range (1 MΩ)	2 mV/div to 5 V/div
Input Sensitivity Range (50 Ω)	2 mV/div to 1 V/div
Maximum Input Voltage (1 MΩ)	300 Vrms, 400 Vpk
Maximum Input Voltage (50 Ω)	5 Vrms
DC Gain Accuracy	±2% of full scale
Offset Range	±2 V (2 mV/div to 200 mV/div), ±50 V (200 mV/div to 5 V/div)
Channel-to-Channel Isolation	100:1 from DC to 1 GHz

Digital Vertical System

Digital Channels	16
Threshold Grouping	Pod 1 (D7-D0), Pod 2 (D15-D8)
Threshold Selections	TTL (+1.4 V), 5.0V CMOS (+2.5 V), 3.3V CMOS (+1.65 V), 2.5V CMOS (+1.25 V), ECL (-1.3 V), PECL (+3.7 V), User-defined
Threshold Voltage Range	±8.0 V in 10 mV increments
Threshold Accuracy	±(100 mV + 3% of threshold setting)
Input Impedance (Digital Probe)	100 kΩ ± 2% (~8 pF)
Maximum Input Voltage (Digital Probe)	±40 V peak
Minimum Voltage Swing	500 mV peak-to-peak
Minimum Detectable Pulse Width	2 ns
Maximum Toggle Rate	250 MHz

Horizontal System

Maximum Real-time Sample Rate (Analog)	4 GSa/s (half-channel interleaved), 2 GSa/s (per channel)
Maximum Sample Rate (Digital)	2 GSa/s
Maximum Record Length (Analog Channels)	8 Mpts (half-channel interleaved), 4 Mpts (per channel)
Maximum Record Length (Digital Channels)	8 Mpts (half-channel interleaved), 4 Mpts (per channel)
Time Base Range	500 ps/div to 50 s/div
Time Base Accuracy	±25 ppm
Channel-to-Channel Deskew Range	±100 ns
Dual Window Zoom	Simultaneously displays main and zoomed waveforms

Trigger System

Trigger Modes	Normal, Auto, Single, Force
Trigger Coupling	AC, DC, LF Reject, HF Reject, Noise Reject
Trigger Holdoff Range	60 ns to 10 s
Edge Triggering	Rising, falling, alternating, or either edge on any channel
Pulse Width Triggering	Trigger on pulse width <, >, =, or ≠ a specified period (15 ns to 10 s)
Pattern Triggering	Trigger on a pre-defined logical pattern of inputs
Trigger Level Range	±6 divisions from screen center
Trigger Sensitivity (DC to 100 MHz)	0.6 div or 5 mV
Trigger Sensitivity (100 MHz to 1 GHz)	1.0 div
Video and TV Triggering	NTSC, PAL, SECAM, HDTV (480p, 576p, 720p, 1080i, 1080p)

Acquisition Modes

Sample Mode	Saves sampled values
Peak Detect Mode	Captures glitches as narrow as 250 ps at all sweep speeds
Averaging Mode	Selectable from 2 to 65536
High Resolution Mode	Real-time boxcar averaging reduces random noise and increases vertical resolution (up to 12 bits)
Segmented Memory Mode	Optimizes memory usage for packetized data (up to 2000 segments)

Waveform Analysis & Measurements

Automatic Voltage Measurements	Peak-to-Peak, Maximum, Minimum, Amplitude, Top, Base, Overshoot, Preshoot, Average, RMS
Automatic Time/Frequency Measurements	Period, Frequency, Rise Time, Fall Time, +Width, -Width, Duty Cycle, Delay, Phase, X at Max, X at Min
Math Functions	Addition, subtraction, multiplication, FFT
FFT Window Types	Hanning, Flat Top, Rectangular, Blackman-Harris

Display & User Interface

Waveform Update Rate	Up to 100,000 waveforms/sec
Graticules	8 × 10 grid
Waveform Display Formats	YT, XY

Environmental & Compliance

Non-Operating Temperature Range	-40 °C to +70 °C
Operating Humidity Range	Up to 95% RH at +40 °C

Triggering

External Trigger Bandwidth	DC to 500 MHz
External Trigger Input Impedance	1 M Ω $\pm$ 1% (~14 pF) or 50 Ω $\pm$ 1% (selectable)
External Trigger Range	$\pm$ 1 V or $\pm$ 8 V (selectable)
Trigger Jitter	< 15 ps rms

Digital Channels

Digital Channels Threshold Resolution	10 mV
Digital Channel-to-Channel Skew	2 ns (typical)

Time Base & Clock

Reference Clock Input	10 MHz BNC, 100 mV to 5 V rms, 50 Ω
Reference Clock Output	10 MHz BNC, ~1.2 V pp into 50 Ω
Trigger Output	BNC, 0 to 5 V into high impedance, 0 to 2.5 V into 50 Ω

Rear Panel Connections

External Display Output	XGA, 15-pin D-sub, 1024 x 768
USB Ports	3 x USB 2.0 (2 x Host, 1 x Device)
LAN Interface	10/100Base-T RJ-45
GPIO Port	Optional (via N5421A adapter)

Environmental

Operating Altitude	Up to 4,000 m
Non-Operating Altitude	Up to 15,000 m
Vibration (Non-Operating)	2.41 g rms, 5 to 500 Hz

Standards & Compliance

Safety Standards	IEC 61010-1, EN 61010-1, CAN/CSA-C22.2 No. 61010-1, ANSI/UL 61010-1
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Vertical System

Hardware Bandwidth Limiters	20 MHz (selectable)
Vertical Resolution (High Resolution Mode)	Up to 12 bits of resolution (at >= 10 us/div)

Storage

Internal Waveform/Setup Storage	10 setups and waveforms (non-volatile)
File Export Formats	CSV, ASCII XY, BMP, PNG, Binary (.bin)

Interfaces & Connectivity

LXI Compliance	LXI Class C
Web Server Control	Remote front panel control via standard web browser

TECHNOLOGY

Mixed Signal Oscilloscope (MSO)

APPLICATIONS

Embedded system design, digital circuit debugging, serial bus analysis, and general-purpose electronic test & measurement

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