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Data Sheet

August 14, 2026

AGILENT / KEYSIGHT

Agilent/Keysight 54642D

Agilent 54642D MegaZoom Mixed Signal Oscilloscope The Agilent 54642D is a mixed-signal MegaZoom oscilloscope combining 2 analog channels at 500 MHz with 16 digital logic channels. OEM 54600-series datasheets specify 2 GSa/s interleaved analog acquisition (1 GSa/s per analog channel), 8 MB interleaved analog memory, and 1 GSa/s / 4 MB on the digital pod channels. Mixed analog/digital embedded debug at 500 MHz, correlating high-speed control buses with analog waveforms, and deep-memory fault capture across 18 time-aligned signals. The Agilent 54642D is a mixed-signal MegaZoom oscilloscope combining 2 analog channels at 500 MHz with 16 digital logic channels. OEM 54600-series datasheets specify 2 GSa/s interleaved analog acquisition (1 GSa/s per analog channel), 8 MB interleaved analog memory, and 1 GSa/s / 4 MB on the digital pod channels. Mixed analog/digital embedded debug at 500 MHz, correlating high-speed control buses with analog waveforms, and deep-memory fault capture across 18 time-aligned signals. 500 MHz analog bandwidth with MegaZoom always on

**MODEL****Agilent / Keysight
54642D****CALIBRATION****Available on
request****CONDITION****Used****STATUS****In stock****RFQ / SKU****54642D****LISTING**<https://aumictechlabs.com/products/54642d-2/>

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NAICS 423690 • 811210 • 541380

This unit

The Agilent/Keysight 54642D is a 500 MHz mixed-signal oscilloscope combining analog oscilloscope and logic analyzer functionality in a single instrument. With 2 analog channels and 16

digital logic timing channels, it captures up to 18 simultaneous signals at 2 GSa/s, making it ideal for engineers debugging complex interactions in microcontroller and DSP-based systems. The 8 Mpts record length and 8 MB MegaZoom memory provide deep capture capability with 32 intensity levels for signal visibility across varying signal densities.

Technical Specifications

Bandwidth: 500 MHz Analog Channels: 2 Digital Logic Timing Channels: 16 Sample Rate: 2 GSa/s Record Length: 8 Mpts Memory: 8 MB MegaZoom deep memory mapped to 32 intensity levels Vector Rate: 25 million vectors/sec Display: High-definition CRT with superior horizontal resolution

Key Features

Waveform Math: FFT, subtract, multiply, integrate, and differentiate functions Flexible Triggering: Edge and pulse width triggering; advanced protocol triggers for CAN, I2C, LIN, SPI, and USB CAN Trigger Module: Isolates and triggers on specific frame content for protocol-level debugging Autoscale Function: Automatically configures active channels, trigger modes, vertical sensitivity, and time base Measurement Tools: Quick Meas for automated measurements and manual cursor-based analysis Multi-Language Support: Quick Help available in 11 languages Connectivity: Built-in floppy, RS-232, and parallel ports; GPIB interface with deep memory transfer capability (typical transfer time <70 seconds for 2 MB over GPIB)

Typical Applications

The 54642D is particularly well-suited for systems with clock speeds approaching 100 MHz, including microcontroller debugging, DSP development, and mixed-signal protocol analysis where simultaneous analog and digital observation is essential.

Compatibility & Integration

Standard legacy interface support via RS-232, parallel, and GPIB enables integration into established lab environments and automated test systems.

54642D Characteristics / Specifications

PARAMETER	VALUE
Analog Channels	2 simultaneous
Digital Channels	16
Bandwidth DC Coupled Analog	dc to 500 MHz
Bandwidth AC Coupled Analog	3.5 Hz to 500 MHz
Calculated Risettime Analog	approximately 700 ps
Analog Max Sample Rate Interleaved	2 GSa/s
Analog Max Sample Rate Per Channel	1 GSa/s
Analog Max Memory Interleaved	8 MB
Analog Max Memory Per Channel	4 MB
Digital Max Sample Rate	1 GSa/s
Digital Max Memory Depth	4 MB
Digital Vertical Resolution	1 bit
Digital Glitch Detection Min Pulse	5 ns
Single Shot Bandwidth Analog	500 MHz maximum
Analog Vertical Resolution	8 bits
Analog Peak Detection	1 ns at max sample rate
Analog Vertical Range	2 mV/div to 5 V/div
Analog Input Resistance	1 Mohm +/-1%, 50 ohm selectable
Analog Input Capacitance	approximately 13 pF
BW Limit	approximately 25 MHz selectable
Maximum Input CATIAAnalog	300 Vrms, 400 Vpk
Channel Isolation Analog DC to Max BW	greater than 40 dB
Serial Triggers Standard	CAN, I2C, LIN, SPI, USB
Bandwidth	DC Coupled Analog: dc to 500 MHz

54642D Specifications

PARAMETER	VALUE
Agilent 54642D MegaZoom Mixed Signal Oscilloscope	Overview
Key Features	2 analog + 16 digital MSO channels
Digital glitch detection to 5 ns minimum pulse width	Standard serial triggering including CAN, I2C, LIN, SPI, USB
Technical Specifications	Analog Channels: 2 simultaneous

Full OEM specifications

Complete technical content extracted from the manufacturer datasheet. Sparse OEM tables are reconstructed as tables below; other text is preserved as paragraphs.

Specifications	
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Notes	
Specs from Agilent 54600-Series Oscilloscopes data sheet rows for 54642D. Digital acquisition memory and sample rate follow the MSO table separate from analog MegaZoom depth.	

Available from Aumictech

Used and refurbished unit evaluated in-house. Calibration: Available on request. Used · In stock.

Request a quote: sales@aumictech.com · +1 (484) 841-9341

Aumictech

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Technical content from manufacturer specifications. Unit photo/stock from Aumictech listing when available. Specifications subject to OEM documentation and unit condition.