

Scopes Deliver Faster Measurement Speed And Lower Noise

[Tektronix's](#) 6 Series MSO mixed-signal oscilloscopes extend the performance threshold of midrange oscilloscopes to 8 GHz and deliver a 25-GS/s sample rate simultaneously on all 4 channels—an industry first for this class of oscilloscope, according to the vendor. These performance enhancements are meant to accommodate the needs of designers working on faster, more complex embedded systems designs. With 25-GS/s sampling on all channels, designers can accurately view up to four high-speed signals at one time (Fig. 1.)

The new 6 Series MSOs also boost measurement confidence with their low-noise inputs especially at the highest sensitivity settings where it matters most. For example, modern embedded designs require clean, precisely-controlled dc power supplies to feed ASIC and FPGA devices (Fig. 2). For such applications, the 6 Series MSOs enable designers to measure dc power rails with greater resolution and accuracy, reducing the time it takes to understand high-frequency influencers on power rails.

Based on the same platform as the popular 5 Series MSOs, the 6 Series MSOs provide easy upgradeability for long-term investment protection. Introduced last year, the 5 Series MSOs were the result of a clean sheet design. Their innovations carry over to the 6 Series MSOs including a highly intuitive user interface, a capacitive pinch-zoom-swipe 15.6-inch touchscreen, innovative FlexChannel inputs, a 12-bit ADC that can deliver up to 16 bits of vertical resolution, a completely new industrial design, and an optional Windows 10 operating system.

To meet the need for more insight on faster signals, the 6 Series MSOs incorporate a new low-noise preamplifier ASIC, the TEK061, which dramatically lowers noise, especially on signals that are in the hundreds of millivolts peak-to-peak. With the 25-GS/s sample rate on four channels, the instruments deliver 16-bit resolution at 200 MHz when using the High Res mode. This means that not only can designers see the interfering signals on their power rail, but they can measure them with a level of accuracy, that until now has not been possible on a scope, according to Tektronix.

The 6 Series MSOs are available with a built-in arbitrary/function generator, a free DVM and trigger frequency counter with product registration, protocol options, and a choice of operating system. Adding a TLP058 logic probe turns any of the instruments' four FlexChannel inputs into eight digital inputs, providing flexible MSO configurations. The 6 Series MSOs also have upgradeable bandwidth, starting at 1 GHz and extending up to 8 GHz with a simple license upgrade. Table 1 lists preliminary specs for this series.

For its next-generation platforms, Tektronix is committed to adding capabilities to meet rapidly evolving market requirements. Among the capabilities added since the launch of the 5 Series is an advanced power analysis option with two rounds of free enhancements. This option provides the user with application expertise including algorithms and measurements techniques, and test limits for relevant industry standards. It also automates measurement setup.

For easier connection to fast signals, Tektronix is also launching a series of new higher-performance probes. The TDP7700 is a series of TriMode probes with bandwidths of 4, 6 or 8 GHz. TriMode probes enable engineers to make the single-ended, differential, and common-mode signal measurements required for high-speed bus analysis, without moving or changing probes.

Pricing for the 6 Series MSO instruments, options and accessories is provided in Tables 2 to 6 below. For more information, see the product [page](#).



Fig. 1. The 6 Series MSO mixed-signal oscilloscopes are described as the first midrange scopes with 8-GHz bandwidth and 25-GS/s sample rate simultaneously on all 4 channels

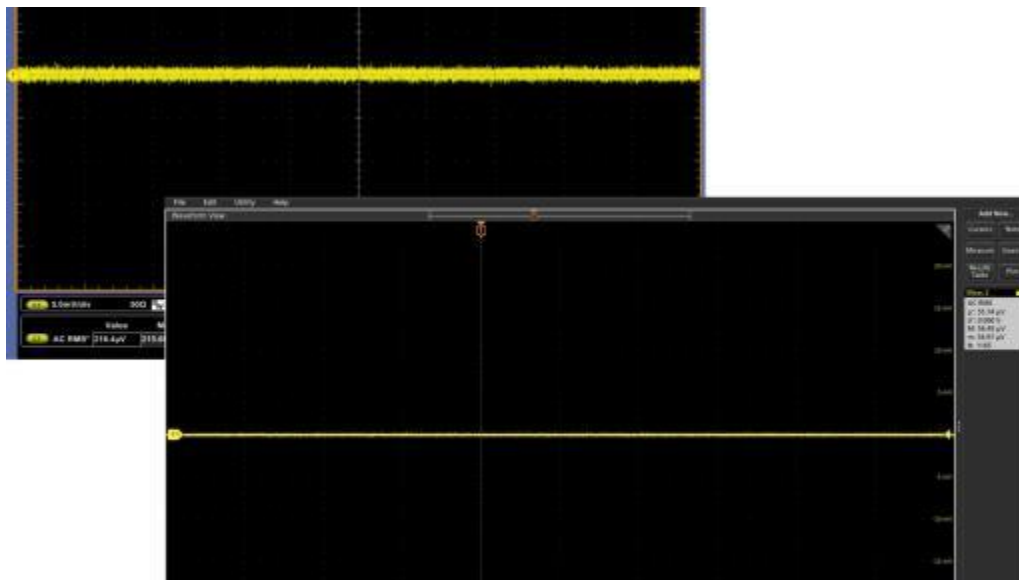


Fig. 2. Tektronix's new TEK061 front-end ASIC is said to enable breakthrough noise performance. According to the company, it achieves >75% noise reduction versus a typical oscilloscope at 1 mV/div. This allows designers to measure dc power rails with greater resolution and accuracy.

Table 1. Key specifications for the 6 series MSOs.

MSO64	
Bandwidth	1 GHz, 2.5 GHz, 4 GHz, 6 GHz, 8 GHz
Maximum Analog Channels	4
Maximum Digital Channels	32 (optional)
Sample Rate (all ch)	25 GS/s
Standard Record Length (all ch)	62.5 M
Optional Record Length (all ch)	125 M or 250 M
Waveform Capture Rate	500,000 <u>wfm/s</u> (Peak Detect) 30,000 <u>wfm/s</u>
ADC Resolution	12 bits
Vertical Resolution	8 bits @ 25 GS/s 12 bits @ 12.5 GS/s Up 16 bits @ 200 MHz (High Res)
Random Noise	165 μ V (1.66% of FS) at 8 GHz, 1 mV/div 60 μ V (0.60% of FS) at 1 GHz, 1 mV/div
Open Operating System	Windows 10 (optional)
Display	15.6 inch HD (1920 x 1080) with capacitive touch
Arbitrary / Function Generator	50 MHz (optional)
DVM & Trigger Frequency Counter	Free with product registration
Price Range	\$23,500 to \$75,000

Table 2. Pricing for base products with bandwidth options.

Model	Description	Master Price (\$)
MSO64	Mixed Signal Oscilloscope; (4) FlexChannels with 62.5M record length, 3-year warranty, Certificate of Traceable Calibration Standard	N/A
Opt. 6-BW-1000	Installed Option; 1 GHz Bandwidth	\$23,500
Opt. 6-BW-2500	Installed Option; 2.5 GHz Bandwidth	\$31,000
Opt. 6-BW-4000	Installed Option; 4 GHz Bandwidth	\$40,500
Opt. 6-BW-6000	Installed Option; 6 GHz Bandwidth	\$56,500
Opt. 6-BW-8000	Installed Option; 8 GHz Bandwidth	\$75,000
TLP058	8 channel general purpose logic probe for 5 & 6 Series oscilloscopes. Includes accessory kit.	\$1,800

Table 3. Pricing for instrument options.

Option	Description	Master Price (\$)
6-WIN	Installed Option; Removable SSD with Windows license	\$990
6-AFG	License; Installed Option; Arbitrary function generator	\$1,250
6-RL-1	License; Installed Option; Extend record length to 125 M/ch maximum	\$4,990
6-RL-2	License; Installed Option; Extend record length to 250 M/ch maximum	\$9,990
6-PS2	Installed Option; Power Solution Bundle (PWR, THDP0200, TCP0030A, deskew fixture)	\$4,760
6-SEC	Installed Option; Enhanced security for instrument declassification and password protected enabling and disabling of all communication ports and firmware upgrades	\$550

Table 4. Pricing for advanced analysis options.

Option	Description	Master Price (\$)
6-DJA	License; Installed Option; Advanced jitter and eye analysis	\$7,490
6-PWR	License; Installed Option; Power measurement and analysis	\$2,300

Table 5. Pricing for serial trigger and decode options.

Option	Description	Master Price (\$)
6-SRAERO	License; Installed Option; Aerospace serial triggering and analysis (MIL-STD-1553, ARINC429)	\$1,850
6-SRAUDIO	License; Installed Option; Audio serial triggering and analysis (I2S, LJ, RJ, TDM)	\$1,850
6-SRAUTO	License; Installed Option; Automotive serial triggering and analysis (CAN, CAN-FD, LIN, FlexRay)	\$1,850
6-SRCOMP	License; Installed Option; Computer serial triggering and analysis (RS-232/422/485/UART)	\$1,850
6-SRAUTOSEN	License; Installed Option; Automotive sensor serial triggering and analysis (SENT)	\$1,850
6-SREMBD	License; Installed Option; Embedded serial triggering and analysis (I2C, SPI)	\$1,850
6-SRENET	License; Installed Option; Ethernet serial triggering and analysis (10BASE-T, 100BASE-TX)	\$1,850
6-SRPM	License; Installed Option; Power management serial triggering and analysis (SPMI)	\$1,850
6-SRUSB2	License; Installed Option; USB serial triggering and analysis (USB 2.0 LS, FS, HS)	\$1,850

Table 6. Pricing for serial bus standard compliance test options.

Option	Description	Master Price (\$)
6-CMAUTOEN	License; Installed Option; Automotive Ethernet (100Base-T1, 1000Base-T1) automated compliance test application	\$5,500
6-CMUSB2	License; Installed Option; USB2.0 automated compliance test application (Requires TDSUSBF USB test fixture). ≥2.5 GHz bandwidth required for high-speed USB	\$3,300