Best-in-Test 2014: Signal Integrity/High-Speed

Martin Rowe - November 27, 2013

Here are the finalists for EDN's Best-in-Test awards in the Signal Integrity/High-Speed Test category. Please give them a review, then follow the links to vote or to return to the name Best-in-Test page to see finalists in other categories.

MP1800A Signal Quality Analyzer, Anritsu

The MP1800A BERT now has a high-sensitivity error detector (ED) that features an Auto Adjust function, as well as 4PAM/8PAM converters and MP1825B 32 Gbit/s 4Tap Emphasis. The enhanced MP1800A meets complex signal integrity measurement requirements associated with physical layer devices and modules with transmission speeds up to 32Gbps.

The ED delivers a wideband bit rate from 2.4Gbps to 32.1Gbps and offers Rx sensitivity of typically 10mV to enable BER measurement for the closed eye of high bit-rate data transmission. An Auto Adjust function detects the optimum BER voltage threshold and phase level in less than one second for up to eight channels. The MP1800A supports simultaneous multi-channel BER measurements of low-amplitude, low eye-opening DUTs such as high-speed backplanes and Active Optical Cables.

Combining the 4PAM/8PAM converters with the MP1800A supports generation of both 4PAM and 8PAM signals for R&D high-speed backplane and 400 GbE R&D. The combination of the high-quality NRZ waveform from the MP1800A and wideband passive PAM converter generate best-in-class PAM signals with assured SNR.

The MP1825B 4Tap Emphasis supports easy changes to the pre-emphasis waveform amplitude, offset, and amplitude of each tap, for effective evaluation of high-speed interface characteristics. Each tap can be changed independently. This allows the effect of pre-emphasis to be confirmed with higher precision. Designed with a compact remote head, a shorter cable can be used to connect the MP1825B to the DUT to ensure high signal quality by minimizing cable effects.
The PicoScope 9312 evolved from the PicoScope 9200 series. It features 20GHz bandwidth, two channels, clock recovery up to 11.3Gb/S, built-in pattern generator with extensive automated measurements, statistics, histograms, and mask testing. All of this is in a compact, portable, PC connected device. The PicoScope 9312 allows the user to plot voltage, impedance or reflection coefficient against time or distance as well as characterize transmission lines, PCB traces, connectors & cables. It provides support for popular industry standards: PCIe, SATA, SONET/SDH, Ethernet, RapidIO, and InfiniBand plus user-defined masks. With the PicoScope 9312, you would be able to measure: Clock distribution, Signal path design, Stubs, Noise margin, Impedances and loading, Transmission line effects, Signal path return currents, Termination, Decoupling, Power distribution and more.

The NI PXIe-5162, 1.5 GHz digitizer uses updates to the LabVIEW Jitter Analysis Toolkit to enhance the PXI platform for traditional oscilloscope applications. The NI PXIe-5162 digitizer’s PXI platform and flexibility make it an ideal general-purpose instrument for test and measurement applications. The high-speed, high-channel, and high-resolution measurements offered by the NI PXIe-5162 digitizer lets traditional oscilloscope users move beyond traditional box instruments. Pairing the four-channel NI PXIe-5162 digitizer with the PXI platform, engineers can build an oscilloscope with up to 68 channels in a single chassis with tight synchronization.

With 1.5 GHz of bandwidth and four channels in a single slot, the NI PXIe-5162 is suited for high-
channel-count digitizer systems in manufacturing test, research, and device characterization. The digitizer features 10 bits of vertical resolution and a 5GSample/s sample rate. They provide high-speed measurements at four times the vertical resolution of a traditional 8-bit oscilloscope. To manage the large data sets, the NI PXIe-5162 is equipped with deep onboard memory and a PCI Express x4 Gen 1 link to the PXI Express backplane.

The digitizer is compatible with the newly updated LabVIEW Jitter Analysis Toolkit that helps engineers accelerate their measurement systems using the processing power of modern PCs instead of the legacy embedded processors on box oscilloscopes. The LabVIEW Jitter Analysis Toolkit provides a library of functions optimized for performing the jitter, eye diagram, and phase noise measurements.

**MSO/DPO70000DX Series**

**Performance Oscilloscopes, Tektronix**

The MSO/DPO70000DX Series offers 23, 25 & 33GHz models that enable complete system visibility of high speed serial bus system designs. With 16 digital channels on all Tektronix MSO's, engineers can observe a greater amount of their design’s electrical behavior at one time, shortening debug cycles and system validation. The MSO70000DX instruments provide 80ps timing resolution on its 16 digital channels. This enables engineers evaluate logic or protocol performance for serial buses like USB, I²C, and SPI in real-time while performing analog validation of high speed DDR memory on the 4 analog channels.

Tektronix Performance MSO’s iCapture, which enables muxing to be implemented internal to the oscilloscope. Engineers can evaluate the signal characteristics of a signal with either analog or digital probes on up to 20 oscilloscope inputs and, based on their debug needs, determine the appropriate level of trigger resolution to apply. Low resolution digital trigger needs (EG - setup and hold on I²C low speed bus) can be performed with the digital channels. With iCapture, the same digital channel can be "routed" to an analog channel and triggered using analog methods at 2.5GHz bandwidth.

Both the MSO and DPO models feature a dynamic range of 600mV/div (6V full scale) at maximum voltage setting. Record length is now four times as long at 1Gsamples/channel on two channels. Processor speed enables faster decode on longer records. In addition, the instruments support a more than 300,000 wfms/s acquisition rate.
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Vote now

Voting closes December 31, 2013