DSA8200

Features & Benefits

State-of-the-Art Sampling Oscilloscope for Communication Signal Analysis, TDR/TDT/Serial Data Network Analysis, Acquisition and Measurements of Repetitive Ultrafast Signals
- Acquisition of Spread Spectrum Clocking (SSC) Signals
- Industry’s Only Mainframe to Support Up to 8 Input Channels for Increased Flexibility and Throughput
- Four-color Graded, Variable Persistence Waveform Databases
- Measurement System with Over 100 Automated Measurements
- Complete Suite of Communications Measurements Includes Both Types of CMA, SSC Profile and Many Others
- Automated ITU/ANSI/IEEE Mask Testing
- Masks and Measurements for SONET/SDH, FC, Ethernet and Other Standards Built-in
- Mask Updates Can Be Loaded from Factory-supplied File
- Mask Margin Testing for Guard Banding Production Testing

Acquisition Modules
- Fully Integrated Multi-rate Optical Modules
- Optical Modules up to 80+GHz 80C10B*1
- High Accuracy “ER Calibrated” Measurement Available in Some Modules
- Electrical Modules to 70+ GHz Bandwidth and 5 ps Measured Rise Time (10 to 90%)
- Flexible Rate Clock Recovery
- Clock Recovery with SSC (Spread Spectrum Clocking) Support Available

Jitter, Noise, BER and Serial Data Link Analysis
- Measures and Separates Deterministic Data Dependent Jitter from Random Jitter
- Measures Vertical Noise Separating Deterministic Data Dependent Noise from Random Noise
- Highly Accurate BER and Eye Contour Estimation
- FFE/DFE Equalization
- Channel Emulation
- Linear Filter for Fixture De-embedding, Linear Filtering

TDR (Time Domain Reflectometry)
- Up to 50 GHz TDR Bandwidth with 15 ps Reflected Rise Time and 12 ps Incident Rise Time
- Lowest Noise for Accurate Repeatable TDR Measurement Results – 600 µVrms at 50 GHz
- Independent Sampler Deskskew Ensures Easy Fixture and Probe De-embedding
- Industry’s Only Mainframe to Accommodate up to Four True Differential TDR or Electrical Channel Pairs for Increased System Versatility

S-parameters Measurements
- Up to 50 GHz Differential, Single-ended, Mixed-mode: Insertion, Return Loss, Frequency Domain Crosstalk
- Intuitive, Easy and Accurate for Serial Data, Gigabit Digital Design and Signal Integrity
- Fast and Accurate Automated Multi-port S-parameter Measurements with Command Line Interface

Industry’s Best Standard Timebase Jitter Performance, 800 fs rms*2

Industry-leading Timebase Jitter Performance, <200 fs rms*2 Available with Phase Reference Mode

Fast Acquisition Rate and High Throughput

True Differential Remote Sampler Enabling Placement Near DUT for Superior Signal Fidelity

FrameScan™ Acquisition Mode with Eye Diagram Averaging:
- Isolate Data Dependent Faults
- Examine Low-power Signals

MS Windows XP Operating System
Advanced Connectivity to Third-party Software

Superior Performance with Extraordinary Versatility

For developing today’s high-speed serial devices, the DSA8200 Digital Serial Analyzer sampling oscilloscope is the most versatile tool for communication, computer and consumer electronics gigabit transmitter and signal path characterization, and compliance verification. With exceptional bandwidth, signal fidelity, and the most extensible modular architecture, the DSA8200 provides the highest performance TDR and interconnect analysis, most accurate analysis of signal impairments, and BER calculations for current and emerging serial data technology.

The DSA8200 provides unmatched measurement system fidelity with ultra-low jitter floor that ensures the most accurate acquisition of high-speed signals. You get advanced analysis benefits from the 200 fs acquisition jitter with the Phase Reference module. And in another step forward for a sampling oscilloscope, with the help of the Phase Reference module the DSA8200 can acquire and measure SSC (Spread Spectrum Clocking) signals.

Applications

Design/Verification of Telecom and Datacom Components and Systems
Manufacturing/Testing for ITU/ANSI/IEEE/SONET/SDH Conformance
High-Performance True Differential TDR Measurements
Advanced Jitter, Noise and BER Analysis
Impedance Characterization and Network Analysis for Serial Data Applications Including S-parameters
Channel and Eye Diagram Simulation and Measurement-based SPICE Modeling

1 80C10B specifications preliminary.
2 Typical, with the Phase Reference Module, some conditions apply. Without the module, the jitter is <800 fs rms, typical.
Digital Serial Analyzer Sampling Oscilloscope

DSA8200

The multi-processor architecture, with dedicated per-slot digital signal processors (DSPs), provides fast waveform acquisition rates, reducing the test times necessary for reliable characterization and compliance verification.

The DSA8200's versatile modular architecture supports a large and growing family of plug-ins enabling you to configure your measurement system with a wide variety of electrical, optical and accessory modules that best suit your application now and in the future. With six module slots, the DSA8200 can simultaneously accommodate a clock recovery module, a precision Phase Reference module and multiple acquisition modules, electrical or optical, so you can match system performance to your evolving needs.

Featuring industry-leading signal fidelity, the family of electrical modules includes bandwidth performance from 12 GHz to 70+ GHz. Two true differential time domain reflectometer (TDR) modules, with remote samplers, offer up to 50 GHz bandwidth and 15 ps reflected rise time and 12 ps incident rise time. The family of low-noise variable bandwidth electrical modules provides the industry's best noise performance with remote samplers, featuring 450 µVRMS noise at 60 GHz, and 300 µVRMS at 30 GHz.

DSA8200 optical modules provide complete optical test solutions with superior system fidelity from 125 Mb/s to 43 Gb/s and beyond. The modules cover a range of wavelengths for both single and multimode fibers. Each module can be optionally configured with a number of selectable data rate filters/optical reference receivers (ORR) and/or a full bandwidth path. The 80C02, 80C07B, 80C08C and 80C11 can be configured with a number of available flexible integrated clock recovery options. The 80C12 multirate module clock recovery support is achieved with an electrical output for use with the 80A05 or 80A07 Electrical Clock Recovery Modules.

The DSA8200's popular FrameScan™ acquisition mode can be used with patterns from DUTs, BERTs, and other sources, to isolate pattern dependent effects in transmitters or show the bit sequence preceding a mask violation. FrameScan automatically sequences the timebase so that each bit of the data stream is acquired in time order. When used in combination with mask testing, the DSA8200's modular flexibility, unmatched performance fully integrated time domain reflectometry (TDR) measurement system. Offering true differential TDR measurements up to 50 GHz bandwidth with 15 ps reflected rise time and 12 ps incident rise time, you are able to keep pace with today's most demanding serial data network analysis (SDNA) requirements.

The new 80E10 and 80E08 TDR modules feature a fully integrated independent dual-channel two-meter remote sampler system to minimize fixturing and assure optimal system fidelity. Independent sampler deskew ensures fast and easy fixture and probe de-embedding. The user can characterize crosstalk by using TDR steps from a differential module to drive one line pair while monitoring a second line pair with a second differential module.

Jitter, Noise, BER and Serial Data Link Analysis

80SJNB Jitter, Noise, BER and Serial Data Link Analysis software package is a comprehensive application for serial data link analysis and for measurements of jitter and noise. Highly accurate BER estimation based on both jitter and noise impairments is also built in, with accuracy higher than simple jitter-based bathtub estimation and with analysis capability unavailable on a BERT.

Available in the package also is a unique, state-of-the-art combination of FFE/DFE equalization, channel emulation, and fixture de-embedding tools. When combined with the DSA8200’s modular flexibility, uncompromised performance and unmatched system fidelity, this Serial Data Link Analysis (SDLA) tool-box provides the ideal solution for next-generation high-speed serial data design validation and compliance testing.

See the 80SJNB Datasheet for more information.
The DSA8200 is the industry’s most versatile TDR measurement system, accommodating up to four dual-channel true differential TDR modules for fast accurate multi-lane impedance characterization.

The P80318 True Differential TDR probe and P8018 Single-ended Passive Handheld TDR probe provide high-performance probing solutions for circuit board impedance and electrical signal characterization. The P80318, an 18 GHz 100 Ω input impedance differential TDR hand probe, enables high-fidelity impedance measurements of differential transmission lines. The adjustable probe pitch enables a wide variety of differential line spacing and impedances. The P8018 is a 20 GHz single-ended passive handheld TDR probe. Both the P80318 and P8018 can be used as stand alone probes but are especially designed to work with the 80A02 for the control of EOS/ESD protection.

Gigabit Signal Path Characterization and Analysis – Serial Data Network Analysis (SDNA)

As clock speeds and rise times of digital circuits increase, interconnect signal integrity dramatically affects digital system performance. Accurate and efficient serial data network analysis (SDNA) of the signal path and interconnects in time and frequency domains is critical to predict signal losses, jitter, crosstalk, terminations and ringing, digital bit errors and eye diagram degradation, ensuring reliable system operation.

Tektronix offers several true differential TDR modules, which in combination with IConnect software, allow S-parameters measurements with up to –70 dB of dynamic range. This performance assures accurate repeatable measurement in serial data analysis, digital design, signal integrity and electrical compliance testing applications.

The table below summarizes the S-parameter measurement bandwidth performance when IConnect and the true differential TDR modules are used in combination.

<table>
<thead>
<tr>
<th>TDR Module</th>
<th>S-parameter Measurement Bandwidth Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E10</td>
<td>50 GHz</td>
</tr>
<tr>
<td>80E08</td>
<td>30 GHz</td>
</tr>
<tr>
<td>80E04</td>
<td>20 GHz</td>
</tr>
</tbody>
</table>

With the long record length acquisitions, IConnect provides great flexibility for obtaining the desired frequency range and frequency step when performing S-parameter measurements. Up to 1,000,000 points can be acquired.13

When you employ IConnect Signal Integrity TDR and S-parameter software with the DSA8200 you have an efficient, easy-to-use, and cost-effective solution for measurement-based performance evaluation of multi-gigabit interconnect links and devices, including signal integrity analysis, impedance, S-parameter and eye diagram tests, and fault isolation.

IConnect can help you complete interconnect analysis tasks in minutes instead of days, resulting in faster system design time and lower design costs. IConnect also enables impedance, S-parameters and eye diagram compliance testing as required by many serial data standards, as well as full channel analysis, Touchstone (SnP) file output and SPICE modeling for gigabit interconnects.

Failure Analysis – Quickly Identify Fault Location

The new 80E10 provides superior resolution enabling the fastest and most efficient fault isolation in package, circuit board and on-chip failure analysis applications.

13 Long record lengths are supported only on DSA8200, CSA8200, TDS8200, CSA8000 and TDS8000 platforms.
Digital Serial Analyzer Sampling Oscilloscope

DSA8200

Advanced Communication Signal Analysis

Specifically designed for ultra-high-performance optical and electrical serial data applications, the DSA8200 is the ideal tool for design characterization and validation, as well as manufacturing test of datacom and telecom components, transceiver subassemblies, and transmission systems. The DSA8200 generates measurement results, not just raw data, with time and amplitude histograms, mask testing, and statistical measurements. It provides a communications-tailored measurement set that includes jitter, noise, duty cycle, overshoot, undershoot, OMA, extinction ratio, Q-factor, mean optical power, and amplitude. In addition, you can do mask testing of SONET/SDH, 10 Gigabit, Gigabit Ethernet, and other electrical and optical standards compliance verification. Color-grading and gray-scale grading of waveform data adds a third dimension, sample density, to your signal acquisitions and analyses to provide visual insight. In addition, the variable persistence database feature enables exact data aging to all of the functions, and facilitates eye measurements on DUTs under adjustment.

OpenChoice Software Enables Familiar Tools to Extend Your Measurement System

The DSA8200 provides an open Windows environment offering new levels of data analysis on the instrument using your favorite commercially available third party software packages. Additionally, TekVISA™, a standard software accessory, allows the instrument to be placed under the control of software applications (such as LabVIEW, LabWindows, Visual Basic, Microsoft Excel, C, etc.) running on the instrument or on external PC workstations network connected to the instrument without the need of a GPIB hardware interface. Plug and play drivers for LabVIEW and other programs are also supplied. The DSA8200 combines the familiarity of Microsoft’s Windows XP operating system with world-class waveform acquisition technology. This platform provides a wide array of standard instrumentation and communications interfaces, including: GPIB, parallel printer port, RS-232-C, USB serial ports, and an Ethernet LAN connection. In addition, the platform includes a DVD-CD/RW combo drive and removable hard drive for storage of waveforms, setups and analysis results.

155 Mb/s to 12+ Gb/s Optical Test

Tektronix optical modules for DSA8200 offer highest level of integration in the industry, with corresponding higher repeatability and transferability of the result. A particularly method-sensitive measurement, Extinction Ratio (ER) is now also available as ER Calibrated, with additional layer of improvement to the portability of the result (80C02, 80C08C, and 80C11 modules only).

80C08C 10 GHz Broad Wavelength Multi-rate 10 Gb/s Optical Module

The 80C08C is a broad wavelength (700 to 1650 nm) multi-rate optical sampling module providing datacom rate testing for 10GbE applications at 9.95, 10.31, 11.09 Gb/s and 10G Fibre Channel applications at 10.51 Gb/s. The 80C08C also provides telecom rate testing with several filters between 9.95 and 11.3 Gb/s. With its amplified O/E design, this module provides excellent signal to-noise performance and high optical sensitivity, allowing users to examine low power level optical signals. The 80C08C can be optionally configured with clock recovery options that can support any standard or user-defined rate in a continuous range from 9.8 to 12.6 Gb/s.
80C12 Up to 10 GHz Broad Wavelength Multi-rate 1 Gb/s to 10 Gb/s Optical Module

The 80C12 is a broad wavelength (700 to 1650 nm) multi-rate optical sampling module providing 1G, 2G, and 4G telecom and datacom testing. This highly flexible module can be configured to support either lower data rate applications (1 to 4 Gb/s) or a wide variety of 10 Gb/s applications. The low data rate applications include: 1, 2, 4, and 8 Fibre Channel and “by 4” wavelength division multiplex standards such as 10G Base-X4 and 4-Lane 10 Gb/s Fibre Channel. The supported 10 Gb/s applications include both datacom and telecom. The supported 10 Gb/s telecom applications include 10Gbe at 9.95, 10.31, 11.09 Gb/s, 8G fibre Channel, and 10G fibre Channel applications at 8.5 Gb/s, 10.51, and 11.3 Gb/s. The 80C12 also provides telecom rate testing at 9.95, 10.66, and 10.7 Gb/s. With its amplified O/E design, this module provides excellent signal-to-noise performance and high optical sensitivity, allowing users to examine low-power optical signals. Clock recovery for the 80C12 is provided via the 80A05 or 80A07 clock recovery modules (sold separately).

80C11 30 GHz Long Wavelength Multi-rate 10 Gb/s Optical Module

The 80C11 is optimized for testing of long-wavelength signals (1100 to 1650 nm) at a number of rates around 10 Gb/s with a highly flexible multi-rate filter. Additionally, the high optical bandwidth of 30 GHz (typical) and the excellent frequency response of its full bandwidth path make it well suited for general-purpose high-performance optical component testing. The 80C11 can be configured with clock recovery options that supports any standard or user-defined rate from 9.8 to 12.6 Gb/s.

80C07B 2.5 GHz Broad Wavelength Multi-rate 155 Mb/s to 2.5 Gb/s Optical Module

The 80C07B is a broad wavelength (700 to 1650 nm) multi-rate optical sampling module optimized for testing datacom/telecom signals from 155 to 2500 Mb/s. With its amplified O/E design, this module provides excellent signal-to-noise performance, allowing users to examine low-power optical signals. Clock recovery for the 80C12 is provided via the 80A05 or 80A07 clock recovery modules (sold separately).

80C02 30 GHz Long Wavelength 10 Gb/s Optical Module

The 80C02 is optimized for testing of long-wavelength signals (1100 to 1650 nm) at 9,953 Gb/s (SONET OC-192/SDH STM-64). With its high optical bandwidth of 30 GHz (typical), it is also well suited for general purpose, high-performance optical component testing. The 80C02 can be optionally configured with clock recovery that supports 9,953 Gb/s telecom standards. A superset of this module’s functionality has been integrated into the highly flexible 80C11 module.

40 Gb/s Optical Test

80C10B 80+ GHz Long Wavelength 40 Gb/s Optical Module

The 80C10B provides integrated and selectable reference receiver filtering and is the only solution to offer conformance testing at either 1310 nm or 1550 nm at 39.813 Gb/s (OC-768/STM-256) and 43.018 Gb/s (43 Gb/s ITU-T G.709 FEC) rates. In addition to the filter rates, you can choose selectable bandwidths of 30 GHz or 80+ GHz for optimal noise vs. bandwidth performance for accurate signal characterization.
## Optical Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>80C02</th>
<th>80C07B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CR F1</td>
<td>F2 F3</td>
</tr>
<tr>
<td>Bandwidth (GHz)</td>
<td>30</td>
<td>2.5</td>
</tr>
<tr>
<td>Wavelength</td>
<td>1100 to</td>
<td>700 to</td>
</tr>
<tr>
<td>Range (nm)</td>
<td>1650</td>
<td>1650</td>
</tr>
<tr>
<td>Fiber Input (µm)</td>
<td>9</td>
<td>9 &amp; 62.5</td>
</tr>
<tr>
<td>Mask Test</td>
<td>–9</td>
<td>–22</td>
</tr>
</tbody>
</table>

Number of Channels 1

Rates Supported: ■ = Filter, ◆ = Optical Clock Recovery, ⊕ = Electrical Clock Recovery

<table>
<thead>
<tr>
<th>Rates Supported</th>
<th>155 Mb/s</th>
<th>622 Mb/s</th>
<th>1063 Mb/s</th>
<th>1250 Mb/s</th>
<th>2125 Mb/s</th>
<th>2488 Mb/s</th>
<th>2500 Mb/s</th>
<th>3.125 Gb/s</th>
<th>3.188 Gb/s</th>
<th>4.25 Gb/s</th>
<th>9.95 Gb/s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>9.95 Gb/s</td>
<td>■</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

## Optical Modules (Cont.)

<table>
<thead>
<tr>
<th>Module</th>
<th>80C08C</th>
<th>80C10B/80C10</th>
<th>80C11</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CR1 CR2</td>
<td>CR4</td>
<td>CR1 CR2 CR3 CR4</td>
</tr>
<tr>
<td>Bandwidth (GHz)</td>
<td>10</td>
<td>80+</td>
<td>(65) 30</td>
</tr>
<tr>
<td>Wavelength</td>
<td>700 to 1650</td>
<td>1290 to 1330</td>
<td>1100 to 1650</td>
</tr>
<tr>
<td>Range (nm)</td>
<td>1539 to 1570</td>
<td>1539 to 1570</td>
<td></td>
</tr>
<tr>
<td>Fiber Input (µm)</td>
<td>9 &amp; 62.5</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Mask Test</td>
<td>–16</td>
<td>–4</td>
<td>–9</td>
</tr>
<tr>
<td>Sensitivity (dBm)</td>
<td>(–2)</td>
<td>(-2)</td>
<td></td>
</tr>
</tbody>
</table>

Number of Channels 1

Rates Supported: ■ = Filter, ◆ = Optical Clock Recovery, ⊕ = Electrical Clock Recovery

<table>
<thead>
<tr>
<th>Rates Supported</th>
<th>9.95 Gb/s</th>
<th>10.31 Gb/s</th>
<th>10.52 Gb/s</th>
<th>10.66 Gb/s</th>
<th>10.71 Gb/s</th>
<th>11.1 Gb/s</th>
<th>11.3 Gb/s</th>
<th>39.81 Gb/s</th>
<th>43.02 Gb/s</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>■</td>
<td>◆</td>
<td>◆</td>
<td></td>
<td></td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.95 Gb/s</td>
<td>■</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.31 Gb/s</td>
<td>■</td>
<td>◆</td>
<td>◆</td>
<td></td>
<td></td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.52 Gb/s</td>
<td>■</td>
<td>◆</td>
<td>◆</td>
<td></td>
<td></td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.66 Gb/s</td>
<td>■</td>
<td>◆</td>
<td>◆</td>
<td></td>
<td></td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.71 Gb/s</td>
<td>■</td>
<td>◆</td>
<td>◆</td>
<td></td>
<td></td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.1 Gb/s</td>
<td>■</td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.3 Gb/s</td>
<td>■</td>
<td>◆</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39.81 Gb/s</td>
<td>■</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43.02 Gb/s</td>
<td>■</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Module 8OC12</td>
<td>Opt. F1 F2 F3 F4 F5 F6 FC 10G CR^4 CR^5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandwidth (GHz)</td>
<td>4.25 9 4.25 9 10 — —</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength</td>
<td>700 to 1650 — —</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range (nm)</td>
<td>Fiber Input (µm) 9 &amp; 62.5 — —</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mask Test</td>
<td>Sensitivity (dBm) —15 —12 — —</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Channels</td>
<td>1 — —</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Rates Supported:
- ■ = Filter,
- ◆ = Optical Clock Recovery,
- ⊕ = Electrical Clock Recovery

- 155 Mb/s
- 622 Mb/s
- 1063 Mb/s
- 1250 Mb/s
- 2125 Mb/s
- 2488 Mb/s
- 2500 Mb/s
- 3.125 Gb/s
- 3.188 Gb/s
- 3.32 Gb/s
- 4.25 Gb/s
- 9.95 Gb/s
- 8.5 Gb/s
- 10.31 Gb/s
- 10.52 Gb/s
- 10.66 Gb/s
- 10.71 Gb/s
- 11.1 Gb/s
- 11.3 Gb/s

*4 With 80A05 or 80A07.

*5 With 80A05 Option 10G or 80A07.
TDR Module Summary Table

<table>
<thead>
<tr>
<th>Module</th>
<th>Typical TDR Rise Time at Full Bandwidth</th>
<th>Bandwidth Performance</th>
<th>RMS Noise at Remote Sampler</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E10</td>
<td>12 ps Incident, 15 ps Reflected</td>
<td>50 GHz, 40 GHz and 30 GHz (user-selectable)</td>
<td>50 GHz: 600 µV, 40 GHz: 370 µV, 30 GHz: 300 µV</td>
</tr>
<tr>
<td>80E08</td>
<td>18 ps Incident, 20 ps Reflected</td>
<td>30 GHz, 20 GHz (user-selectable)</td>
<td>30 GHz: 300 µV, 20 GHz: 280 µV</td>
</tr>
<tr>
<td>80E04</td>
<td>23 ps Incident, 28 ps Reflected</td>
<td>20 GHz</td>
<td>600 µV</td>
</tr>
</tbody>
</table>

*6 Values shown are warranted unless printed in an italic typeface, which represents a typical value.

*7 Calculated from .35 bandwidth rise time product.

DSA8200 Electrical Modules

TDR Modules: 80E10, 80E08 and 80E04

The 80E10, 80E08 and 80E04 are dual-channel time domain reflectometry (TDR) sampling modules, providing up to 12 ps incident and 15 ps reflected rise time. Each channel of these modules is capable of generating a fast impulse for use in TDR mode and the acquisition portion of the sampling module monitors the incident step and any reflected energy. The polarity of each channel’s step can be selected independently. This allows for true differential or common-mode TDR or S-parameters testing of two coupled lines, in addition to the independent testing of isolated lines. The independent step generation for each channel allows true differential measurements, which ensures measurement accuracy of non-linear differential devices.

80E10 and 80E08 feature a small form-factor, fully integrated independent two-meter remote sampler system, enabling the location of the sampler near the DUT for the best system fidelity. The modules characterize crosstalk by using TDR steps to drive one line (or line pair for differential crosstalk) while monitoring a second line (or line pair) with the other channel (or another module for differential crosstalk). The “rise time filter” function on the DSA8200 mainframe can be used with TDR or crosstalk measurements to characterize expected system performance with slower edge speeds. An optional two-meter extender cable for the 80E04 is available, which enables placement of the module near the DUT for the best system fidelity.

All modules have independent incident step and receiver deskew to remove the affect of fixtures and probes, enabling faster and easier deskew. The 80E10 sampling module provides an acquisition rise time of 7 ps, with up to 50 GHz user-selectable equivalent bandwidth (with 50 GHz, 40 GHz and 30 GHz settings). 80E08 sampling bandwidth is 30 GHz (user-selectable with 30 GHz and 20 GHz settings) and 80E04 sampling bandwidth is 20 GHz. The 20 GHz P8018 single-ended and the 18 GHz P80318 differential variable pitch TDR handheld probes provide excellent performance, ensuring easy and accurate backplane and package measurements.
Digital Serial Analyzer Sampling Oscilloscope  
DSA8200

Electrical Module Summary Table

<table>
<thead>
<tr>
<th>Electrical Module</th>
<th>Step Response at Full Bandwidth (10% to 90%)&lt;sup&gt;*&lt;/sup&gt;</th>
<th>Number of Channels</th>
<th>Bandwidth&lt;sup&gt;6&lt;/sup&gt;,&lt;sup&gt;7&lt;/sup&gt;</th>
<th>RMS Noise at Bandwidth&lt;sup&gt;6&lt;/sup&gt;</th>
<th>Remote Sampler</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E09</td>
<td>5.8 ps</td>
<td>2</td>
<td>60 GHz/40 GHz/30 GHz (user-selectable)</td>
<td>60 GHz: 450 µV 40 GHz: 330 µV 30 GHz: 300 µV</td>
<td>Yes, fully integrated 2-meter cable</td>
</tr>
<tr>
<td>80E07</td>
<td>11.7 ps</td>
<td>2</td>
<td>30 GHz/20 GHz (user-selectable)</td>
<td>30 GHz: 300 µV 20 GHz: 280 µV</td>
<td>Yes, fully integrated 2-meter cable</td>
</tr>
<tr>
<td>80E06</td>
<td>5 ps</td>
<td>1</td>
<td>70+ GHz</td>
<td>1.8 mV</td>
<td>No, optional 80N01 – 2-meter extender cable</td>
</tr>
<tr>
<td>80E03</td>
<td>17.5 ps</td>
<td>2</td>
<td>20 GHz</td>
<td>600 µV</td>
<td>No, optional 80N01 – 2-meter extender cable</td>
</tr>
<tr>
<td>80E02</td>
<td>28 ps</td>
<td>2</td>
<td>12.5 GHz</td>
<td>400 µV</td>
<td>No, optional 80N01 – 2-meter extender cable</td>
</tr>
<tr>
<td>80E01</td>
<td>7 ps</td>
<td>1</td>
<td>50 GHz</td>
<td>1.8 mV</td>
<td>No, optional 80N01 – 2-meter extender cable</td>
</tr>
</tbody>
</table>

<sup>6</sup> Values shown are warranted unless printed in an italic typeface, which represents a typical value.

<sup>7</sup> Calculated from .35 bandwidth rise time product.

Electrical Modules: 80E09, 80E07, 80E06, 80E03, 80E02 and 80E01

The 80E09 and 80E07 are dual-channel modules with remote samplers, capable of noise as low as 450 µV<sub>RMS</sub> at 60 GHz bandwidth and 300 µV<sub>RMS</sub> noise at 30 GHz bandwidth. Each small form factor remote sampler is attached to a two-meter cable to minimize the effects of cables, probes and fixtures to ensure the best system fidelity. User-selectable bandwidth settings (60/40/30 on 80E09 and 30/20 on 80E07) offer optimal noise/ bandwidth trade-off.

80E06 and 80E01 are single-channel 70+ and 50 GHz bandwidth sampling modules respectively. 80E06 provides the widest bandwidth and fastest rise time with world-class system fidelity. Both 80E06 and 80E01 provide a superior maximum operating range of ±1.6 V. Both modules can be used with the optional two-meter extender cable, ensuring superior system fidelity and measurement flexibility.

The 80E03 and 80E02 are dual-channel 20 GHz and 12.5 GHz sampling modules respectively. These modules provide an acquisition rise time of 17.5 ps or less for 80E03 and 28 ps for 80E02. An optional two-meter extender cable is available for these modules.

When used with Tektronix 80SJNB Jitter, Noise and BER Analysis software, these modules enable separation of both jitter and noise into their constituent components, for insight into the underlying causes of eye closure and obtain highly accurate calculation of BER and 3-D eye contour. When used with 82A04 phase reference module, timebase accuracy can be improved down to 200 fs<sub>RMS</sub> jitter which, together with the 300 µV<sub>RMS</sub> noise floor and 14 bits of resolution, ensures the highest signal fidelity for your measurements.
Digital Serial Analyzer Sampling Oscilloscope

DSA8200 Accessory Modules

82A04 Phase Reference Module
The 82A04 Phase Reference Module enhances the DSA8200 sampling oscilloscope from the industry’s standard timebase jitter performance of 800 fs RMS to the extremely low timebase jitter of <200 fs RMS. Typical application for the Phase Reference module is the acquisition and analysis of very high-speed optical and electrical signals in communication devices and systems. The 82A04 supports both the Triggere mode of operation, which is similar to usual acquisition, and the un-triggered Free Run mode, where all timing information comes from the customer-supplied clock alone (no trigger signal necessary). When the external clock is not available the module can accept the clock signal from the clock recovery output of the 80Cxx modules, as well as from the 80A05 or 80A07 clock recovery modules. Additionally 82A04 supports SSC (Spread Spectrum Clocking) operation.

80A05 Electrical Clock Recovery Module
The 80A05 Electrical Clock Recovery Module enables clock recovery for electrical signals, as well as internal triggering on the recovered clock. The module recovers clocks from serial data streams for all of the most common electrical standards in the 50 Mb/s to 4.25 Gb/s, around 5 to 6 Gb/s, and from 9.953 Gb/s and 12.5 Gb/s ranges. The module accepts either single-ended or differential signals as its input, providing clock recovery for both. The signal(s) is/are then passed on to the output connectors (at about 50% of the input level) and can be connected to sampling module(s) for differential or single-ended sampling. Option 10G is required for support of standard rates from 9.953 Gb/s to 12.6 Gb/s. The 80A05 and 80A07 can also serve as the clock recovery module for the 80C12 Optical Sampling Module.

80A06 PatternSync Module
The 80A06 PatternSync Trigger Module, when used in combination with 80SJNB software, enables characterizing jitter, noise and BER performance of high-speed serial designs from 1 Gb/s to 60 Gb/s data rates. It extends the capability of the DSA8200 sampling oscilloscope by creating a pattern trigger from any data-related clock – a recovered clock, user-supplied clock, sub-clock or super-clock. The PatternSync Trigger Module is programmable to pattern lengths of up to 2^23 bits and accepts a user-supplied clock signal from 150 MHz to 12.5 GHz. The 80A06 module is required with the DSA8200 when using 80SJNB Advanced Jitter, Noise and BER Analysis software package. This module can be used in combination with the 82A04 Phase Reference module for the best timebase accuracy or for acquisition of signals under SSC (Spread Spectrum Clocking).
80A07 Clock Recovery Module

80A07 recovers clocks from serial data streams for all of the most common electrical standards in the continuous 100 Mb/s to 12.5 Gb/s range. Auto locking capability is selectable from the user interface or programmatic interface, so the design and test engineers can search and lock onto signals of undefined or unknown datarate. The module accepts either single-ended or differential signals as its input, providing clock recovery for both. The signal(s) is/are then passed on to the output connectors and can be connected to sampling module(s) for differential or single-ended sampling. 80A07 offers complete configurability and state-of-the-art specifications, and is the preferred solution for most serial data standards due to excellent stability, superior jitter and slew rate tolerance for recovering clocks from stressed or degraded signals, and unequalled PLL bandwidth and roll-off shape control for either Golden PLL compliance testing or custom PLL response. 80A07 also locks on spread spectrum signals. The 80A07 can also serve as the clock recovery module for the 80C12 Optical Sampling Module.

P80318 Differential Handheld TDR Probe

The P80318 is an 18 GHz 100 Ω input impedance differential TDR hand probe. This probe enables high-fidelity impedance measurements of differential transmission lines. The adjustable probe pitch from 0.5 mm to 4.2 mm enables a wide variety of differential line spacing and impedances. The P80318 probe also includes two precision SMA cables with parallel control lines that provides the 80A02 module the control for EOS/ESD protection.

P8018 Single-ended Handheld TDR Probe

The P8018 Handheld TDR Probe is a 20 GHz, 50 Ω input impedance, single-ended passive probe that provides a high-performance solution for electrical sampling, TDR circuit board impedance characterization and high-speed electrical signal analysis applications. The P8018 probe also includes a precision SMA cable and parallel control line that provides the 80A02 module the control for EOS/ESD protection.

80A02 EOS/ESD Protection Module

The 80A02 EOS/ESD Protection module protects the sampling bridge of Tektronix electrical sampling module inputs from damage by electrostatic charge. The 80A02 is intended for use in applications such as electrical TDR circuit board testing and cable testing where large static charges can be stored in the DUT.

When used with the matching P8018 20 GHz single-ended handheld probe or the P80318 differential handheld probe (both with probe tip pressure actuating feature), the 80A02 provides a superior technique and performance capability for electrical module EOS/ESD protection of acquired electrical signals and TDR measurements (two 80A02 modules required for differential applications).

80A03 TekConnect® Probe Interface Module

The 80A03 provides probe power and control for up to two Tektronix P7000 series probes. The 80A03 is powered through the oscilloscope and requires no user adjustments or external power cords. An electrical sampling module can be plugged directly into the slot on the 80A03 to provide the optimum system fidelity and a short electrical path. Using the 80A03, designers can benefit from Tektronix' industry-leading active and differential probes to measure signals on SMD pins and other challenging circuit features.

SlotSaver Small Module Extender Cable

This cable can be used to power and operate one 80A01, 80A02 or 80A06 accessory modules, eliminating the need to consume a small form factor mainframe slot. The SlotSaver extender cable plugs into the “Trigger Power” connector on the mainframe or (for 80A01 or 80A02) into the “Probe Power” connector on most electrical sampling modules.

* Now obsolete model useful with older versions of the mainframe, but not needed with the 8200 Series mainframes.
Digital Serial Analyzer Sampling Oscilloscope
DSA8200

Application Software

80SJNB Jitter, Noise, BER and Serial Data Analysis (SDLA) Software

80SJNB speeds the identification of the underlying causes of both horizontal and vertical eye closure through separation of jitter and noise. With its unique insight into the constituent components of both jitter and noise, 80SJNB provides a highly accurate and complete BER calculation and eye contour analysis.

Additionally available in the software package is the first-ever set of features addressing the design issues of modern Serial Data Links: equalization with either FFE or DFE, channel emulation, support for fixture de-embedding, as well as full support for SSC – Spread Spectrum Clocking. When you combine Jitter, Noise and BER analysis with the DSA8200 modular flexibility, uncompromised performance and unmatched signal fidelity, you get the ideal solution for next-generation high-speed serial data design validation and compliance testing. 80SJNB requires the 80A06 PatternSync module, which creates a trigger pulse on each complete pattern. 80SJNB may be used with the 80A04 phase reference module for enhanced accuracy, or for SSC signals, or without it depending on your requirements. SSC max. amplitude 5000 ppm (6000 ppm) at 30 ±3 kHz.

New: 80SJNB Advanced Supports:

- FFE (Feed-Forward Equalization) to 100 Taps
- DFE (Decision Feedback Equalization) to 40 Taps
- Filter for Support of Linear Filters from Fixture De-embed to Transmitter Equalization

80SJNB Advanced Jitter and Noise Analysis Measurements

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TJBBER</td>
<td>Total jitter at specified BER</td>
</tr>
<tr>
<td>RJ</td>
<td>Random jitter</td>
</tr>
<tr>
<td>RJ(h)</td>
<td>Horizontal component of random jitter</td>
</tr>
<tr>
<td>RJ(v)</td>
<td>Vertical component of random jitter</td>
</tr>
<tr>
<td>RJ(d-d)</td>
<td>Random jitter according to the dual Dirac model</td>
</tr>
<tr>
<td>DJ</td>
<td>Deterministic jitter</td>
</tr>
<tr>
<td>DDJ</td>
<td>Data dependent jitter</td>
</tr>
<tr>
<td>DCD</td>
<td>Duty cycle distortion</td>
</tr>
<tr>
<td>DJ(d-d)</td>
<td>Deterministic jitter computed in the dual-Dirac model</td>
</tr>
<tr>
<td>PJ</td>
<td>Periodic jitter</td>
</tr>
<tr>
<td>PJ(h)</td>
<td>Horizontal component of periodic jitter</td>
</tr>
<tr>
<td>PJ(v)</td>
<td>Vertical component of periodic jitter</td>
</tr>
<tr>
<td>EOBBER</td>
<td>Horizontal eye opening at BER</td>
</tr>
<tr>
<td>SSC Magnitude</td>
<td>Magnitude of SSC modulation in ppm</td>
</tr>
<tr>
<td>SSC Frequency</td>
<td>Frequency of SSC modulation in ppm</td>
</tr>
</tbody>
</table>

(Profiles: see 80SJNB for information)

Advanced Noise Analysis

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN</td>
<td>Random noise</td>
</tr>
<tr>
<td>RN(v)</td>
<td>Vertical component of random noise</td>
</tr>
<tr>
<td>RN(h)</td>
<td>Horizontal component of random noise</td>
</tr>
<tr>
<td>DN</td>
<td>Deterministic noise</td>
</tr>
<tr>
<td>DDN1</td>
<td>Data dependent noise on logical level 1</td>
</tr>
<tr>
<td>DDN0</td>
<td>Data dependent noise on logical level 0</td>
</tr>
<tr>
<td>PN</td>
<td>Periodic noise</td>
</tr>
<tr>
<td>PN(v)</td>
<td>Vertical component of periodic noise</td>
</tr>
<tr>
<td>PN(h)</td>
<td>Horizontal component of periodic noise</td>
</tr>
<tr>
<td>EOBBER</td>
<td>Vertical eye opening at specified BER</td>
</tr>
</tbody>
</table>
IConnect® Signal Integrity TDR and S-parameter Software

Operating on the DSA8200 TDR platform, IConnect S-parameters is the most cost-effective and highest throughput approach for S-parameter measurements in digital design, signal integrity analysis and interconnect compliance testing, providing as much as 50 percent cost savings compared to similar bandwidth VNAAs, and dramatically speeding up measurements. You can also take advantage of IConnect S-parameters command line interface, which automates the S-parameter measurements, to the overall suite of manufacturing tests you perform using your TDR instrument significantly reducing test time while increasing measurement repeatability.

The simplicity of S-parameter calibration using a reference (open, short or through), and an optional 50 Ω load makes the measurement, fixture de-embedding and moving the reference plane a snap. Touchstone file format output enables easy S-parameter file sharing for further data analysis and simulations.

Tektronix offers several true differential TDR modules, which in combination with IConnect, offer S-parameter measurements to 50 GHz with up to ~70 dB of dynamic range. This performance exceeds requirements for serial data analysis, digital design and signal integrity applications, resolving down to 1 percent (~40 dB) accuracy of crosstalk, whereas electrical compliance testing masks typically call for the measurements in the ~10 to ~30 dB range.

IConnect software allows you to quickly and easily generate SPICE and IBIS models for your PCBs, flex-boards, connectors, cables, packages, sockets and I/O buffer inputs directly from TDR/T or VNA S-parameter measurements. IConnect allows you to display eye-diagram degradation, jitter, loss, crosstalk, reflections and ringing in your digital system. IConnect Linear Simulator allows the designer to link several interconnect channels together to evaluate the total time, frequency domain performance and eye diagram of the overall channel. IConnect substantially simplifies the signal integrity analysis of the interconnect link, equalization and emphasis component design and analysis of the interconnect link with transmitter and receiver.

**Characteristics**

**Signal Acquisition**

**Acquisition Modes** – Sample (normal), Envelope and Average.

**Number of Sampling Modules Accommodated** – Up to four dual-channel electrical; up to two optical sampling modules. Both single- and dual-channel modules are appropriate for the two channels associated with the slot.

Population of the Ch 1/Ch 2 large slot with any module other than one requiring power only displaces functionality of the Ch 1/Ch 2 small slot; population of the Ch 3/Ch 4 large slot with any module other than one requiring power only displaces functionality of the Ch 3/Ch 4 small slot.

**Number of Simultaneously Acquired Inputs** – Eight channels maximum.

**Vertical Systems**

**Rise Time/Bandwidth** – Determined by the sampling modules used.

**Vertical Resolution** – Determined by the sampling modules used.

**Horizontal System**

Four timescale modules are available:

- **Triggered Phase Reference** Timebase Mode – Timing information extracted from a user-supplied or from clock recovery signal significantly improves timescale accuracy and jitter performance of the triggered acquisition. Horizontal position is referenced to the trigger signal as with a traditional timescale. 
- **Free Run Phase Reference** Timebase Mode – All timing is based on a phase reference signal; accuracy and jitter as above; no trigger is needed and correspondingly there is no timing relation to trigger signal.

**Locked to 10 MHz Reference Sequential Timebase** – Provides the best long-delay performance for acquisitions without the external reference signal. The Lock is selectable between Lock to Internal 10 MHz and Lock to External 10 MHz for highest frequency accuracy.

**Main and Magnification View Timebases** – 100 fs/div to 5 μs/div in 1-2-5 sequence or 100 fs increments.

**Maximum Trigger Rate** – 200 kHz. In Phase Reference mode: 50 kHz.

**Typical Acquisition Rate** – 150 ks/s per channel (standard sequential timebase); 50 ks/s (Phase Reference modes).

**Time Interval Accuracy (Standard Timebase) and Timing Deviation**

**Phase Reference Timebase** –

- **Free Run**: Maximum timing deviation relative to phase reference signal:
  - Horizontal position >40 ns after trigger event: 0.2% of phase reference signal period (typical).
  - Horizontal position >40 ns after trigger event: 0.4% of phase reference signal period (typical).

**Triggered**: maximum timing deviation relative to phase reference signal:

- Horizontal position >40 ns after trigger event: 0.1% or better of phase reference signal period (typical).

**Sequential Timebase**

**Time Interval Accuracy**:

- **Horizontal scale**: 25 ps/div:
  - ≤21 ps/div: +0.01% of interval
  - ≤21 ps/div: +0.01% of interval

- **Horizontal scale**: 21 ps/div:
  - ≤21 ps/div: +0.01% of interval (short-term optimized mode)
  - ≤21 ps/div: +0.01% of interval (locked to 10 MHz mode)

**Horizontal Deskew Range Available**

- **Sequential Timebase Only** – 0 to +100 ns on any individual channel in 100 fs increments.
- **IConnect** – 3,200,000 points.

**DS8200 Record Length** – 20, 50, 100, 250, 500, 1000, 2000 or 4000 samples. Longer records available as follows:

- **DS8200 Record Length with IConnect** – 1,000,000 points.

**Waveform Databases** – Four independently accumulated waveform records of up to 4 waveform points. Variable waveform database mode with true first-in first-out of 2000 waveforms available on each of four waveform databases.

**Magnification Views** – In addition to the main timescale, the DS8200 supports two magnification views. These magnifications are independently acquired under separate timescale settings which allow same or faster time/div than that of the main timescale.

Note:

- **Traditional mode** – not using the IConnect Phase Reference module.
Communications Signal Analysis

- 10 GbE manufacturing compliance testing and design verification.
- The INQ10, the only solution for 40 Gb/s optical reference oscillators (ORR) at 39.81 Gb/s and 43.02 Gb/s, and full bandwidth at 65 Gb/s.
- Large and growing family of optical modules.

TDR and Serial Data Network Analysis

- Keep pace with ultra-fast serial data rates; up to four True Differential 50 GHz TDR channels with 15 ps reflected rise time.
- Interconnect characterization and compliance test with 5-parameter measurements to 50 GHz.
- Advanced analysis and modeling speeds product development and time to market.

Jitter, Noise and BER Analysis

- 10 GbE compliance test. Tektronix optical modules provide the industry’s widest dynamic range and lowest noise floor for accurate measurements.
- Phase Reference module provides extremely low 200 fs RMS timebase jitter for signal analysis applications.
- With six slots, the DSA8200 is the industry’s most extensible mainframe; it accommodates four true differential TDR or electrical modules.
- Electrical and optical clock recovery for data communication and telecom standards to 10 Gb/s and beyond.
- USB port on the front panel for storage and transport of data. Four additional ports on the rear panel.

- Highly accurate BER and Eye contour analysis with separation of jitter and noise.
- Large and growing family of electrical and TDR modules.
Jitter: System jitter of 280 fsRMS typical on a 10 GHz ≤ 800 fsRMS +5 ppm of position (typical).

Short-term Jitter Optimized Sequential Mode – to 100 mV (typical) with increased jitter.

The Phase Reference timebase remains operational

Reference Signal.

fasteracquisition module, with f gate, maximum non-destruct input level ±5 V.

TTL logic 1 enables gate, a TTL logic 0 disables

External Trigger Gate (optional) – Adjustable 5 µs to 100 ms in 0.5 ns increments.

Trigger Holdoff –

Trigger Input Range –

Trigger Level Range –

clock output and calibrator).

Internal Clock –

800 fsRMS +5 ppm of position (typical).

1.2 psRMS +0.01 ppm of position (max).

Locked to 10 MHz Reference Sequential Mode – 1.6 psRMS +0.04 ppm of position (typical).

2.5 psRMS +0.01 ppm of position (max).

Adjustable from 25 to 200 kHz (drives TDR, internal clock output and calibrator).

Trigger Level Range – ±1.0 V

Trigger Input Range – ±1.5 V

Trigger Holdoff – Adjustable 5 µs to 100 ms in 0.5 ns increments.

External Trigger Gate (optional) – TTL logic 1 enables gate, a TTL logic 0 disables gate, maximum non-destruct input level ±5 V.

*11 When using the 82A04 Phase Reference module perform-

*9 When using the 82A04 Phase Reference module.

Phase Reference*11 Timebase –

200 mVpk-pk to 800 mVpk-pk, 2 to 12.5 GHz (guaranteed).

Pre-scaled Trigger Input –

100 mV, DC to 3 GHz (guaranteed).

50 mV, DC to 4 GHz (typical).

External Direct Trigger Output –

Trigger Sensitivity

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –

Trigger Sources

External direct trigger.

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External pre-scaled trigger.

Internal clock trigger: Internally connected to

External Direct Trigger Output –
### Optical Sampling Module Characteristics

**Refer to Optical Sampling Modules User Manual for more detailed information.**

<table>
<thead>
<tr>
<th>Application Type</th>
<th>Standards and Supported Filtering Rates<em>1</em>2</th>
<th>Number of Input Channels</th>
<th>Effective Wavelength Range</th>
<th>Calibrated Wavelengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>80C02 10 Gb/s Telecom</td>
<td>OC-192/STM-64 (9.953 Gb/s), 10GBase-W (9.953 Gb/s)</td>
<td>1</td>
<td>1100 nm to 1650 nm</td>
<td>1310 nm and 1550 nm (±20 nm)</td>
</tr>
<tr>
<td>80C10 40 Gb/s Telecom</td>
<td>OC-788/STM-256 (59.813 Gb/s), ITU-T G.979 FEC (43.018 Gb/s)</td>
<td>1</td>
<td>1310 nm and 1550 nm</td>
<td>1310 nm and 1550 nm (±20 nm)</td>
</tr>
<tr>
<td>80C12 1 to 8.5 Gb/s Datacom/Telecom</td>
<td>Fibre Channel (1.063 Gb/s), 2G Fibre Channel (2.125 Gb/s), 4G Fibre Channel (4.25 Gb/s), 10GBase-X4 (3.125 Gb/s), 6G Fibre Channel (8.5 Gb/s), 10GFC-X4 (3.1875 Gb/s), VSR5-3318 (3.318 Gb/s)</td>
<td>1</td>
<td>700 nm to 1650 nm</td>
<td>850 nm, 1310 nm and 1550 nm (±20 nm)</td>
</tr>
</tbody>
</table>

---

*1* 80C10B specifications preliminary.

*2* Bandwidths shown are warranted unless printed in an italic typeface, which represents a typical value.

80C08C, 80C12: Bandwidths and optical filters valid for OMA ≤ 500 mW (1550/1310 nm), OMA ≤ 860 (850 nm), OMA ≤ 1020 (780 nm).
Digital Serial Analyzer Sampling Oscilloscope

DSA8200

Optical Sampling Module Characteristics (continued)

<table>
<thead>
<tr>
<th></th>
<th>Clock Recovery Outputs</th>
<th>Unfiltered Nondestructive Optical Input</th>
<th>Absolute Maximum Internal Fiber Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>80C02</td>
<td>Option CR: 9.953 Gb/s</td>
<td>28 GHz</td>
<td>5 mW average; 10 mW peak power at wavelength of highest relative responsivity</td>
</tr>
<tr>
<td></td>
<td>Clock, Clock/16, Data</td>
<td></td>
<td>9 µm/125 µm single-mode</td>
</tr>
<tr>
<td>80C07B</td>
<td>Option CR1: 155 Mb/s, 622 Mb/s, 1.063 Gb/s, 1.25 Gb/s, 2.125 Gb/s, 2.486 Gb/s, 2.5 Gb/s, 2.666 Gb/s</td>
<td>±Clock, ±Data</td>
<td>2.5 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 mW average; 10 mW peak power at wavelength of highest relative responsivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>62.5 µm/125 µm multi-mode</td>
</tr>
<tr>
<td>80C08C</td>
<td>Option CR1: 9.953 Gb/s, 10.31 Gb/s, Option CR2: 10.31 Gb/s, 10.52 Gb/s, Option CR4: Continuous from 9.8 Gb/s to 12.6 Gb/s</td>
<td>Clock, Clock/16</td>
<td>10 GHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 mW average; 10 mW peak power at wavelength of highest relative responsivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>62.5 µm/125 µm multi-mode</td>
</tr>
<tr>
<td>80C10B*1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80C10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 mW average; 10 mW peak power at wavelength of highest relative responsivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9 µm/125 µm single-mode</td>
</tr>
<tr>
<td>80C12</td>
<td>Provided by 80A05 or 80A07 (sold separately)</td>
<td>ELECTRICAL SIGNAL OUT</td>
<td>9 GHz (for all options except 10G)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 GHz (with Opt. 10G)</td>
</tr>
</tbody>
</table>

*1 80C10B specifications preliminary.

*12 Bandwidths shown are warranted unless printed in an italic typeface, which represents a typical value.

80C08C, 80C12: Bandwidths and optical filters valid for OMA ≤ 500mW (1550/1310 nm), OMA ≤ 860 (850 nm), OMA ≤ 1020 (780 nm).

Optical Sampling Module Characteristics (continued)

<table>
<thead>
<tr>
<th>Optical Return Loss</th>
<th>Fiber Input Accepted</th>
<th>RMS Optical Noise (typical)</th>
<th>RMS Optical Noise (maximum)</th>
<th>Independent Channel Deskew</th>
</tr>
</thead>
<tbody>
<tr>
<td>80C02</td>
<td>&gt;30 dB</td>
<td>6 µW at 9.953 Gb/s, 12.5 Gb/s</td>
<td>10 µW at 9.953 Gb/s, 12.5 Gb/s, 15 µW at 20 GHz, 30 µW at 30 GHz</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 µW at 9.953 Gb/s, 12.5 Gb/s, 15 µW at 20 GHz, 30 µW at 30 GHz</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>80C07B</td>
<td>&gt;14 dB (multi-mode)</td>
<td>0.5 µW at 155 Mb/s, 622 Mb/s, 1063 Mb/s, 1250 Mb/s, 0.7 µW at 2.488/2.5 Gb/s</td>
<td>1 µW at 155 Mb/s, 622 Mb/s, 1063 Mb/s, 1250 Mb/s, 1.5 µW at 2.488/2.5 Gb/s</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td>&gt;24 dB (single-mode)</td>
<td></td>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>80C08C</td>
<td>&gt;14 dB (multi-mode)</td>
<td>1.7 µW at all filter rates (1550/1310 nm)</td>
<td>3 µW at all filter rates (1550/1310 nm)</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td>&gt;24 dB (single-mode)</td>
<td></td>
<td></td>
<td>Standard</td>
</tr>
<tr>
<td>80C10B*1</td>
<td>&gt;30 dB</td>
<td>25 µW at 39.813 Gb/s, 43.018 Gb/s (1550 nm); 45 µW at 39.813 Gb/s, 43.018 Gb/s (1310 nm); 20 µW at 30 GHz mode (1550 nm); 40 µW at 30 GHz mode (1310 nm); 40 µW at 65 GHz mode (1550 nm); 75 µW at 65 GHz mode (1310 nm); 65 µW at 80+ GHz mode (1550 nm); 150 µW at 80+ GHz mode (1310 nm)</td>
<td>60 µW at 39.813 Gb/s, 43.018 Gb/s (1550 nm); 75 µW at 39.813 Gb/s, 43.018 Gb/s (1310 nm); 35 µW at 30 GHz (1550 nm); 65 µW at 30 GHz (1310 nm); 60 µW at 65 GHz (1550 nm); 110 µW at 65 GHz (1310 nm); 120 µW at 80+ GHz (1550 nm); 220 µW at 80+ GHz (1310 nm)</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 µW at 39.813 Gb/s, 43.018 Gb/s (1550 nm); 75 µW at 39.813 Gb/s, 43.018 Gb/s (1310 nm); 35 µW at 30 GHz (1550 nm); 65 µW at 30 GHz (1310 nm); 60 µW at 65 GHz (1550 nm); 110 µW at 65 GHz (1310 nm); 120 µW at 80+ GHz (1550 nm); 220 µW at 80+ GHz (1310 nm)</td>
<td>Standard</td>
<td></td>
</tr>
</tbody>
</table>
### Optical Sampling Module Characteristics (continued)

<table>
<thead>
<tr>
<th>Module</th>
<th>Return Loss</th>
<th>Fiber Type</th>
<th>RMS Optical Noise (typical)</th>
<th>RMS Optical Noise (maximum)</th>
<th>Channel Deskew</th>
</tr>
</thead>
<tbody>
<tr>
<td>80C10</td>
<td>&gt;30 dB</td>
<td>Single-mode</td>
<td>40 µW at 39.813 Gb/s, 43.018 Gb/s (1550 nm); 75 µW at 39.813 Gb/s, 43.018 Gb/s (1310 nm);</td>
<td>60 µW at 39.813 Gb/s, 43.018 Gb/s (1550 nm); 110 µW at 39.813 Gb/s, 43.018 Gb/s (1310 nm);</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 µW at 30 GHz mode (1550 nm); 55 µW at 30 GHz mode (1310 nm); 85 µW at 65 GHz mode (1550 nm); 150 µW at 65 GHz mode (1310 nm);</td>
<td>90 µW at 30 GHz (1550 nm); 120 µW at 65 GHz (1550 nm); 220 µW at 65 GHz (1310 nm);</td>
<td></td>
</tr>
<tr>
<td>80C11</td>
<td>&gt;30 dB</td>
<td>Single-mode</td>
<td>5.5 µW at all filter rates; 10 µW at 20 GHz</td>
<td>8 µW at all filter rates; 14 µW at 20 GHz</td>
<td>Standard</td>
</tr>
<tr>
<td>80C12</td>
<td>&gt;14 dB (multi-mode)</td>
<td>Single- or multi-mode</td>
<td>1.7 µW (all filters except Option 10G); 3.4 µW (“Full BW” and Option 10G filters)</td>
<td>6 µW (all filters except Option 10G)</td>
<td>Standard</td>
</tr>
</tbody>
</table>

### Optical Sampling Module Characteristics (continued)

<table>
<thead>
<tr>
<th>Module</th>
<th>Power Meter</th>
<th>Power Meter Range</th>
<th>Power Meter Accuracy</th>
<th>Mask Test Optical Sensitivity$^{13}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>80C02</td>
<td>Standard</td>
<td>+4 dBm to -30 dBm</td>
<td>5% of reading</td>
<td>-9 dBm at 9.953 Gb/s; -7 dBm at 20 GHz; -4 dBm at 30 GHz</td>
</tr>
<tr>
<td>80C07B</td>
<td>Standard</td>
<td>+4 dBm to -30 dBm</td>
<td>5% of reading</td>
<td>-22 dBm at 155 Mb/s, 622 Mb/s; -20 dBm at 2488/2500 Mb/s</td>
</tr>
<tr>
<td>80C08C</td>
<td>Standard</td>
<td>0 dBm to -30 dBm</td>
<td>5% of reading</td>
<td>-16 dBm at all filter rates</td>
</tr>
<tr>
<td>80C10B</td>
<td>Standard</td>
<td>+13 dBm to -21 dBm</td>
<td>5% of reading</td>
<td>-4 dBm at 39.813 Gb/s, 43.018 Gb/s (1550 nm); -1 dBm (1310 nm)</td>
</tr>
<tr>
<td>80C10</td>
<td>Standard</td>
<td>+13 dBm to -21 dBm</td>
<td>5% of reading</td>
<td>-2 dBm at 39.813 Gb/s, 43.018 Gb/s (1550 nm); +1 dBm (1310 nm)</td>
</tr>
<tr>
<td>80C11</td>
<td>Standard</td>
<td>+4 dBm to -30 dBm</td>
<td>5% of reading</td>
<td>-10 dBm at all filter rates; -7 dBm at 20 GHz; -4 dBm at 30 GHz</td>
</tr>
<tr>
<td>80C12</td>
<td>Standard</td>
<td>0 dBm to -30 dBm</td>
<td>5% of reading</td>
<td>-15 dBm (for all options except Option 10G); -12 dBm (for Option 10G)</td>
</tr>
</tbody>
</table>

$^{13}$ Smallest power level for mask test. Values represent theoretical typical sensitivity of NRZ eyes for competitive comparison purposes. Assumes instrument peak-peak noise consumes most of the mask margin.

### Physical Characteristics for Optical Sampling Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Dimensions (mm/inches)</th>
<th>Weight (kg/lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>Height</td>
<td>Depth</td>
</tr>
<tr>
<td>80C02</td>
<td>165/6.5</td>
<td>25/1.0</td>
</tr>
<tr>
<td>80C07B</td>
<td>165/6.5</td>
<td>25/1.0</td>
</tr>
<tr>
<td>80C08C</td>
<td>165/6.5</td>
<td>25/1.0</td>
</tr>
<tr>
<td>80C10, 80C10B</td>
<td>165/6.5</td>
<td>25/1.0</td>
</tr>
<tr>
<td>80C11</td>
<td>165/6.5</td>
<td>25/1.0</td>
</tr>
<tr>
<td>80C12</td>
<td>165/6.5</td>
<td>25/1.0</td>
</tr>
</tbody>
</table>
### Electrical Sampling Module Characteristics

<table>
<thead>
<tr>
<th>Application Type</th>
<th>Channels</th>
<th>Input Impedance</th>
<th>Channel Input Connector</th>
<th>Bandwidth*14</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E10 True Differential TDR, S-parameters and fault isolation</td>
<td>2</td>
<td>50 ±1.0 Ω</td>
<td>1.85 mm female, precision adapter to 2.92 mm included with 50 Ω SMA termination</td>
<td>50/40/30 GHz<em>7</em>15</td>
</tr>
<tr>
<td>80E09 High frequency, low noise signal acquisition and jitter characterization</td>
<td>2</td>
<td>50 ±1.0 Ω</td>
<td>1.85 mm female, precision adapter to 2.92 mm included with 50 Ω SMA termination</td>
<td>60/40/30 GHz<em>7</em>15</td>
</tr>
<tr>
<td>80E08 True Differential TDR and S-parameters</td>
<td>2</td>
<td>50 ±1.0 Ω</td>
<td>2.92 mm female</td>
<td>30/20 GHz<em>7</em>15</td>
</tr>
<tr>
<td>80E07 Optimal noise/performance trade off for jitter characterization</td>
<td>2</td>
<td>50 ±1.0 Ω</td>
<td>2.92 mm female</td>
<td>30/20 GHz<em>7</em>15</td>
</tr>
<tr>
<td>80E06 High-speed Electrical Device Characterization</td>
<td>1</td>
<td>50 ±0.5 Ω</td>
<td>1.85 mm female, precision adapter to 2.92 mm included with 50 Ω SMA termination</td>
<td>70+ GHz</td>
</tr>
<tr>
<td>80E04 TDR Impedance and Crosstalk Characterization</td>
<td>2</td>
<td>50 ±0.5 Ω</td>
<td>3.5 mm female</td>
<td>20 GHz*7</td>
</tr>
<tr>
<td>80E03 Device Characterization</td>
<td>2</td>
<td>50 ±0.5 Ω</td>
<td>3.5 mm female</td>
<td>20 GHz*7</td>
</tr>
<tr>
<td>80E02 Low-level Signals</td>
<td>2</td>
<td>50 ±0.5 Ω</td>
<td>3.5 mm female</td>
<td>12.5 GHz*7</td>
</tr>
<tr>
<td>80E01 High frequency, high maximum operating range signal acquisition</td>
<td>1</td>
<td>50 ±0.5 Ω</td>
<td>2.4 mm female, precision adapter to 2.92 mm included with 50 Ω SMA termination</td>
<td>50 GHz</td>
</tr>
</tbody>
</table>

*7 Calculated from 0.35 bandwidth rise time product.

*14 Values shown are warranted unless printed in an italic typeface, which represents a non-warranted characteristic value that the instrument will typically perform to.

*15 User selectable.

### Electrical Sampling Module Characteristics (continued)

<table>
<thead>
<tr>
<th>Rise Time (10 to 90%)</th>
<th>Dynamic Range</th>
<th>Offset Range</th>
<th>Maximum Operating Voltage</th>
<th>Maximum Non-destruct Voltage, DC+ACpk-pk</th>
<th>Vertical Number of Digitized Bits</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E10 7 ps*7</td>
<td>1.0 Vpk-pk</td>
<td>±1.1 V</td>
<td>±1.1 V</td>
<td>2.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E09 5.8 ps*7</td>
<td>1.0 Vpk-pk</td>
<td>±1.1 V</td>
<td>±1.1 V</td>
<td>2.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E08 11.7 ps*7</td>
<td>1.0 Vpk-pk</td>
<td>±1.1 V</td>
<td>±1.1 V</td>
<td>2.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E07 11.7 ps*7</td>
<td>1.0 Vpk-pk</td>
<td>±1.1 V</td>
<td>±1.1 V</td>
<td>2.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E06 ≤17.5 ps*76</td>
<td>1.0 Vpk-pk</td>
<td>±1.6 V</td>
<td>±1.6 V</td>
<td>2.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E04 ≤17.5 ps</td>
<td>1.0 Vpk-pk</td>
<td>±1.6 V</td>
<td>±1.6 V</td>
<td>3.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E03 ≤28 ps</td>
<td>1.0 Vpk-pk</td>
<td>±1.6 V</td>
<td>±1.6 V</td>
<td>3.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E02 ≤28 ps</td>
<td>1.0 Vpk-pk</td>
<td>±1.6 V</td>
<td>±1.6 V</td>
<td>3.0 V</td>
<td>14 bits full scale</td>
</tr>
<tr>
<td>80E01 11.7 ps*7</td>
<td>1.0 Vpk-pk</td>
<td>±1.6 V</td>
<td>±1.6 V</td>
<td>2.0 V</td>
<td>14 bits full scale</td>
</tr>
</tbody>
</table>

*7 Calculated from 0.35 bandwidth rise time product.

*76 Calculated from formula rise time = 0.35/(typical bandwidth).
# Electrical Sampling Module Characteristics (continued)

<table>
<thead>
<tr>
<th>Vertical Sensitivity Range</th>
<th>DC Vertical Voltage Accuracy, Single Point, within ±2 °C of Compensated Temperature</th>
<th>Typical Step Response Aberrations</th>
<th>RMS Noise*</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E10 10 mV to 1.0 V full scale</td>
<td>±(2 mV + 0.002 (Offset)) + 0.02 (Vertical Value – Offset)</td>
<td>±1% or less over the zone 10 ns to 20 ps before step transition; +6%, –10% or less for the first 400 ps following step transition; +0%, –4% or less over the zone 400 ps to 3 ns following step transition; +1%, –2% or less over the zone 3 ns to 100 ns following step transition; ±1% after 100 ns following step transition</td>
<td>50 GHz: 600 µV, ±700 µV, 40 GHz: 370 µV, ±480 µV, 30 GHz: 300 µV, ±410 µV</td>
</tr>
<tr>
<td>80E09 10 mV to 1.0 V full scale</td>
<td>±(2 mV + 0.002 (Offset)) + 0.02 (Vertical Value – Offset)</td>
<td>±1% or less over the zone 10 ns to 20 ps before step transition; +6%, –10% or less for the first 400 ps following step transition; +0%, –4% or less over the zone 400 ps to 3 ns following step transition; +1%, –2% or less over the zone 3 ns to 100 ns following step transition; ±1% after 100 ns following step transition</td>
<td>60 GHz: 450 µV, ±600 µV, 40 GHz: 330 µV, ±480 µV, 30 GHz: 300 µV, ±410 µV</td>
</tr>
<tr>
<td>80E08 10 mV to 1.0 V full scale</td>
<td>±(2 mV + 0.002 (Offset)) + 0.02 (Vertical Value – Offset)</td>
<td>±1% or less over the zone 10 ns to 20 ps before step transition; +6%, –10% or less for the first 400 ps following step transition; +0%, –4% or less over the zone 400 ps to 3 ns following step transition; +1%, –2% or less over the zone 3 ns to 100 ns following step transition; ±1% after 100 ns following step transition</td>
<td>30 GHz: 300 µV, ±410 µV, 20 GHz: 280 µV, ±380 µV</td>
</tr>
<tr>
<td>80E07 10 mV to 1.0 V full scale</td>
<td>±(2 mV + 0.002 (Offset)) + 0.02 (Vertical Value – Offset)</td>
<td>±1% or less over the zone 10 ns to 20 ps before step transition; +6%, –10% or less for the first 400 ps following step transition; +0%, –4% or less over the zone 400 ps to 3 ns following step transition; +1%, –2% or less over the zone 3 ns to 100 ns following step transition; ±1% after 100 ns following step transition</td>
<td>30 GHz: 300 µV, ±410 µV, 20 GHz: 280 µV, ±380 µV</td>
</tr>
<tr>
<td>80E06<strong>16</strong> 10 mV to 1.0 V full scale</td>
<td>±(2 mV + 0.002 (Offset)) + 0.02 (Vertical Value – Offset)</td>
<td>±5% or less for first 300 ps following step transition</td>
<td>1.8 mV ±2.4 mV (maximum)</td>
</tr>
</tbody>
</table>

* Values shown are warranted unless printed in an italic typeface, which represents a typical value.

**16** Calculated from formula rise time = 0.35/(typical bandwidth).
| Electrical Sampling Module Characteristics (continued) |
|-----------------|-----------------|-----------------|-----------------|
| Vertical Sensitivity Range | DC Vertical Voltage Accuracy, Single Point, within ±2 °C of Compensated Temperature | Typical Step Response Aberrations | RMS Noise$^6$ |
| 80E04 10 mV to 1.0 V full scale | ± [2 mV + 0.007 (Offset) + 0.02 (Vertical Value – Offset)] | ±3% or less over the zone 10 ns to 20 ps before step transition; ±10%, –5% or less for the first 300 ps following step transition; ±3% or less over the zone 300 ps to 5 ns following step transition; ±1% or less over the zone 5 ns to 100 ns following step transition; 0.5% after 100 ns following step transition | 600 µV, ±1.2 mV (maximum) |
| 80E03 10 mV to 1.0 V full scale | ± [2 mV + 0.007 (Offset) + 0.02 (Vertical Value – Offset)] | ±3% or less over the zone 10 ns to 20 ps before step transition; ±10%, –5% or less for the first 300 ps following step transition; ±3% or less over the zone 300 ps to 5 ns following step transition; ±1% or less over the zone 5 ns to 100 ns following step transition; 0.5% after 100 ns following step transition | 600 µV, ±1.2 mV (maximum) |
| 80E02 10 mV to 1.0 V full scale | ± [2 mV + 0.007 (Offset) + 0.02 (Vertical Value – Offset)] | ±3% or less over the zone 10 ns to 20 ps before step transition; ±10%, –5% or less for the first 300 ps following step transition; ±3% or less over the zone 300 ps to 5 ns following step transition; ±1% or less over the zone 5 ns to 100 ns following step transition; 0.5% after 100 ns following step transition | 400 µV, ±800 µV (maximum) |
| 80E01 10 mV to 1.0 V full scale | ± [2 mV + 0.007 (Offset) + 0.02 (Vertical Value – Offset)] | ±3% or less over the zone 10 ns to 20 ps before step transition; ±12%, –5% or less for the first 300 ps following step transition; ±5.5%, –3% or less over the zone 300 ps to 3 ns following step transition; ±1% or less over the zone 3 ns to 100 ns following step transition; 0.5% after 100 ns following step transition | 1.8 mV, ±2.3 mV (maximum) |

$^6$ Values shown are warranted unless printed in an italic typeface, which represents a typical value.
Digital Serial Analyzer Sampling Oscilloscope

DSA8200

TDR System (80E10, 80E08, 80E04 only)

<table>
<thead>
<tr>
<th></th>
<th>80E10</th>
<th>80E08</th>
<th>80E04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>50 Ω nominal</td>
<td>50 Ω nominal</td>
<td>50 Ω nominal</td>
</tr>
<tr>
<td>Channel Input Connector</td>
<td>1.85 mm</td>
<td>2.92 mm</td>
<td>3.5 mm</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>50 GHz</td>
<td>30 GHz</td>
<td>20 GHz</td>
</tr>
<tr>
<td>TDR Step Amplitude</td>
<td>250 mV (polarity of either step may be inverted)</td>
<td>250 mV (polarity of either step may be inverted)</td>
<td>250 mV (polarity of either step may be inverted)</td>
</tr>
<tr>
<td>TDR System Reflected Rise Time</td>
<td>15 ps</td>
<td>20 ps</td>
<td>28 ps</td>
</tr>
<tr>
<td>TDR System Incident Rise Time</td>
<td>12 ps</td>
<td>18 ps</td>
<td>23 ps</td>
</tr>
<tr>
<td>TDR Step Deskew Range</td>
<td>±250 ps</td>
<td>±250 ps</td>
<td>±50 ps</td>
</tr>
<tr>
<td>TDR Sampler Deskew Range</td>
<td>±250 ps</td>
<td>±250 ps</td>
<td>+100 ns –500 ps (slot deskew only)</td>
</tr>
<tr>
<td>TDR Step Maximum Repetition Rate</td>
<td>200 kHz</td>
<td>200 kHz</td>
<td>200 kHz</td>
</tr>
</tbody>
</table>

S-parameter Performance Characteristics (80E10)

Dynamic Range

Uncertainty

Measurement Conditions

- All measurements were performed after proper warm-up, as specified in the DSA8200 manual
- Standard S-parameter dynamic range measurement practices were used to determine the dynamic range of the module
- Uncertainty results were derived from a wide range of devices, with 250 averages
- Better dynamic range can be achieved by selecting lower bandwidth settings on the 80E10 module due to lower RMS noise floor
- Results apply to single-ended or differential measurements
Digital Serial Analyzer Sampling Oscilloscope

DSA8200

Physical Characteristics for Electrical Sampling Modules

<table>
<thead>
<tr>
<th>Dimensions (mm/in.)</th>
<th>Width</th>
<th>Height</th>
<th>Depth</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td>80E10*17</td>
<td>55/2.2</td>
<td>25/1.0</td>
<td>75/3.0</td>
<td>0.175/0.37</td>
</tr>
<tr>
<td>80E09*17</td>
<td>55/2.2</td>
<td>25/1.0</td>
<td>75/3.0</td>
<td>0.175/0.37</td>
</tr>
<tr>
<td>80E08*17</td>
<td>55/2.2</td>
<td>25/1.0</td>
<td>75/3.0</td>
<td>0.175/0.37</td>
</tr>
<tr>
<td>80E07*17</td>
<td>55/2.2</td>
<td>25/1.0</td>
<td>75/3.0</td>
<td>0.175/0.37</td>
</tr>
<tr>
<td>80E06</td>
<td>79/3.1</td>
<td>25/1.0</td>
<td>135/5.3</td>
<td>0.4/0.87</td>
</tr>
<tr>
<td>80E04</td>
<td>79/3.1</td>
<td>25/1.0</td>
<td>135/5.3</td>
<td>0.4/0.87</td>
</tr>
<tr>
<td>80E03</td>
<td>79/3.1</td>
<td>25/1.0</td>
<td>135/5.3</td>
<td>0.4/0.87</td>
</tr>
<tr>
<td>80E02</td>
<td>79/3.1</td>
<td>25/1.0</td>
<td>135/5.3</td>
<td>0.4/0.87</td>
</tr>
<tr>
<td>80E01</td>
<td>79/3.1</td>
<td>25/1.0</td>
<td>135/5.3</td>
<td>0.4/0.87</td>
</tr>
</tbody>
</table>

*17 Remote module characteristics.

80A05 and 80A07 Electrical Clock Recovery Module

<table>
<thead>
<tr>
<th>Supported Specifications</th>
<th>80A05</th>
<th>80A07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enumerated Standards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC3/STM1</td>
<td>155.52 Mb/s</td>
<td>■</td>
</tr>
<tr>
<td>OC12/STM4</td>
<td>622.08 Mb/s</td>
<td>■</td>
</tr>
<tr>
<td>FibreChannel</td>
<td>1.063 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>Gigabit Ethernet</td>
<td>1.25 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>SAS Gen I</td>
<td>1.50 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>2 GB FibreChannel</td>
<td>2.125 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>OC48/STM16</td>
<td>2.488 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>2 GB Ethernet</td>
<td>2.50 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>PCI Express I</td>
<td>2.50 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>Infiniband*19</td>
<td>2.50 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>2.5G G.709 FEC</td>
<td>2.666 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>SAS Gen II</td>
<td>3.0 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>XAUI, 10GBase-X</td>
<td>3.125 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>10GB FibreChannel x4</td>
<td>3.188 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>4 GB FibreChannel</td>
<td>4.25 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>FB-DIMM1</td>
<td>3.2, 4.0, 4.8 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>PCI Express II</td>
<td>5.0 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>FB-DIMM2</td>
<td>4.8, 6.4, 8.0, 9.6 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>OIF CEI</td>
<td>6+ Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>2x XAUI</td>
<td>6.25 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>8 GB FibreChannel</td>
<td>8.50 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>OC192/STM64</td>
<td>9.953 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>XFP/XFI</td>
<td>9.95 to 11.2 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>10GBase-W</td>
<td>9.953 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>10GBase-R</td>
<td>10.31 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>10GB FibreChannel</td>
<td>10.51 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>G.975 FEC</td>
<td>10.66 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>G.709 FEC</td>
<td>10.71 Gb/s</td>
<td>■</td>
</tr>
<tr>
<td>OIF CEI</td>
<td>11+ Gb/s</td>
<td>■</td>
</tr>
</tbody>
</table>

*18 The standard is not enumerated but is supported as a custom rate.

*19 No spread spectrum clocking support.

24 Sampling Oscilloscope • www.tektronix.com/sampling
Digital Serial Analyzer Sampling Oscilloscope  ▶ DSA2000

**80A05 and 80A07 Electrical Clock Recovery Module (continued)**

<table>
<thead>
<tr>
<th>Product Feature/Characteristic</th>
<th>80A05</th>
<th>80A07</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supported Specifications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enumerated Standards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 GbE w/FEC</td>
<td>11.10 Gb/s</td>
<td></td>
</tr>
<tr>
<td>Super FEC</td>
<td>12.50 Gb/s</td>
<td></td>
</tr>
</tbody>
</table>

Additional enumerated standard rates are supported with 8000 series Firmware Releases higher than 2.4.x

Clock Recovery Ranges for custom (user specified) rates (in addition to enumerated lists above)

<table>
<thead>
<tr>
<th></th>
<th>50 Mb/s to 3.188 Gb/s</th>
<th>50 Mb/s to 3.188 Gb/s</th>
<th>100 Mb/s to 12.5 Gb/s continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.25 Gb/s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.267 to 4.25 Gb/s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.900 to 6.375 Gb/s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.800 to 12.60 Gb/s</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sensitivity (clock recovery will lock, differential data is given for each input)

<table>
<thead>
<tr>
<th></th>
<th>Differential ≤ 8 mV_{pk-pk}</th>
<th>Differential ≤ 12 mV_{pk-pk}</th>
<th>Differential ≤ 15 mV_{pk-pk}</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.70 to 11.19 Gb/s</td>
<td>Single-ended 10 mV_{pk-pk}</td>
<td>Single-ended 15 mV_{pk-pk}</td>
<td>Single-ended 20 mV_{pk-pk}</td>
</tr>
<tr>
<td>11.19 to 12.60 Gb/s</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DSA2000 Mainframe Physical Characteristics**

<table>
<thead>
<tr>
<th>Dimensions (mm/in)</th>
<th>Weight (kg./lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>H</td>
</tr>
<tr>
<td>457 mm (18 in.)</td>
<td>343 mm (13.5 in.)</td>
</tr>
</tbody>
</table>

**Computer System and Peripherals**

Operating System – Windows XP.
CPU – Intel Celeron 2.93 GHz processor.
PC System Memory – 512 MB.
Hard Disk Drive – Rear-panel, removable hard disk drive, 40 GB capacity.
DVD-ROM/CD-RW Drive – Front-panel DVD-Read/Write drive with CD creation software application.

**Input/Output Ports Front Panel**

USB 2.0 Port – One USB2.0 connector.
Anti-static Connection – Banana-jack connector, 1 MΩ.

**Power Requirements**

Line Voltage and Frequency – 100 to 240 V_{ac}, ±10% 50/60 Hz.
115 V_{ac}, ±10% 400 Hz.

**Environmental Characteristics**

Temperature – Operating: +10 ºC to +40 ºC.
Non-operating: –22 ºC to +60 ºC.
Relative Humidity – Operating (Floppy disk and CD-ROM not installed): 20% to 80% at or below 40 ºC (upper limit de-rates to 45% relative humidity at 40 ºC).
Non-operating: 5% to 90% at or below 60 ºC (upper limit de-rates to 20% relative humidity at +60 ºC).
Altitude – Operating: 3,048 m (10,000 ft.).
Non-operating: 12,190 m (40,000 ft.).
Electromagnetic Compatibility – 89/336/EEC.
Safety – UL3111-1, CSA1010.1, EN61010-1, IEC61010-1.
Digital Serial Analyzer Sampling Oscilloscope

DS8200

Ordering Information

DS8200 Digital Serial Analyzer Sampling Oscilloscope
Includes: User manual, quick reference card, MS Windows XP-compatible keyboard and mouse, touch-screen stylus, online help, programmer online-guide, power cord.

With OpenChoice software, Tektronix provides enhanced test and measurement analysis with the capability of full integration of third-party software on the open Windows oscilloscopes. By working with the industry leaders, National Instruments and The MathWorks, examples of software programs from these companies are featured on all Tektronix open Windows oscilloscopes.

Options


Service Options

Opt. C5 – Calibration Service 5 years.

International Power Plug Options

Opt. A0 – North America power.
Opt. A2 – United Kingdom power.
Opt. A3 – Australia power.
Opt. A5 – Switzerland power.

Other Accessories

Sampling Module Extender Cable (two meter) – Order 80N01 (not compatible with 80E10, 80E09, 80E08 or 80E07 modules).
SlotSaver Adapter Extender Cable – Brings power and control to the 80A06 when operated externally from the mainframe, saving slot space (compatible with 80A06 and 80A02). Order 174-5230-00.
82A04 Filter 2 GHz – Filter kit for non-sinusoidal phase reference clock signal with frequency between 2 GHz and 4 GHz. Order 82A04-2-1000-02.
82A04 Filter 4 GHz – Filter kit for non-sinusoidal phase reference clock signal with frequency between 4 GHz and 6 GHz. Order 82A04-4-1000-02.
82A04 Filter 6 GHz – Filter kit for non-sinusoidal phase reference clock signal with frequency between 6 GHz and 8 GHz. Order 82A04-6-1000-02.
2X Attenuator (SMA male-to-female) – DC to 18 GHz. Order 80A02-2-1000-01.
5X Attenuator (SMA male-to-female) – DC to 18 GHz. Order 80A02-5-1000-01.
Connector Adapter – (2.4 mm or 1.85 mm male to 2.92 mm female) DC to 40 GHz. Order 011-0157-00.

Power Divider – 50 Ω, impedance matching power divider. SMA male to two SMA females. Order 015-0705-00.

Rackmount Kit – Order 016-1791-01.

Wrist Strap (antistatic) – Order 016-3415-04.
P7513/P7516 – 13 GHz and 16 GHz TriMode™ Differential probes. Requires 80A03 interface module.
P7260 – 6 GHz Active FET Probe. Requires 80A03 interface module.
P7350 – 5 GHz Active FET Probe. Requires 80A03 interface module.
P7305SMA – 5 GHz 50 Ω Differential-to-Single-ended Active Probe. Requires 80A03 interface module. Note that the P7380 probes are recommended over the P7350 probes for sampling purposes due to their higher bandwidth and signal fidelity.
P7380SMA – 8 GHz 50 Ω Differential-to-Single-ended Active Probe. Requires 80A03 interface module.
P8018 – 20 GHz Single-ended TDR Probe. 80A02 module recommended for static protection of the sampling or TDR module.
P80318 – 18 GHz 100 Ω Differential Impedance TDR Hand Probe.
P801318 – 18 GHz 100 Ω Differential Impedance TDR Hand Probe.
P6150 – 9 GHz Passive Probe; the probe consists of a very high quality 20 GHz probe tip, plus an extremely flexible SMA cable. For higher frequency performance the 015-0590-00, or some of the accessory cables listed can be used.
P6018 – 20 GHz Single-ended TDR Probe. 80A02 module recommended for static protection of the sampling or TDR module.
P60318 – 18 GHz 100 Ω Differential Impedance TDR Hand Probe.

Other Accessories

Sampling Module Extender Cable (two meter) – Order 80N01 (not compatible with 80E10, 80E09, 80E08 or 80E07 modules).
SlotSaver Adapter Extender Cable – Brings power and control to the 80A06 when operated externally from the mainframe, saving slot space (compatible with 80A06 and 80A02). Order 174-5230-00.
82A04 Filter 2 GHz – Filter kit for non-sinusoidal phase reference clock signal with frequency between 2 GHz and 4 GHz. Order 82A04-2-1000-02.
82A04 Filter 4 GHz – Filter kit for non-sinusoidal phase reference clock signal with frequency between 4 GHz and 6 GHz. Order 82A04-4-1000-02.
82A04 Filter 6 GHz – Filter kit for non-sinusoidal phase reference clock signal with frequency between 6 GHz and 8 GHz. Order 82A04-6-1000-02.
2X Attenuator (SMA male-to-female) – DC to 18 GHz. Order 80A02-2-1000-01.
5X Attenuator (SMA male-to-female) – DC to 18 GHz. Order 80A02-5-1000-01.
Connector Adapter – (2.4 mm or 1.85 mm male to 2.92 mm female) DC to 40 GHz. Order 011-0157-00.

Power Divider – 50 Ω, impedance matching power divider. SMA male to two SMA females. Order 015-0705-00.

Rackmount Kit – Order 016-1791-01.

Wrist Strap (antistatic) – Order 016-3415-04.
P7513/P7516 – 13 GHz and 16 GHz TriMode™ Differential probes. Requires 80A03 interface module.
P7260 – 6 GHz Active FET Probe. Requires 80A03 interface module.
P7350 – 5 GHz Active FET Probe. Requires 80A03 interface module.
P7305SMA – 5 GHz 50 Ω Differential-to-Single-ended Active Probe. Requires 80A03 interface module. Note that the P7380 probes are recommended over the P7350 probes for sampling purposes due to their higher bandwidth and signal fidelity.
P7380SMA – 8 GHz 50 Ω Differential-to-Single-ended Active Probe. Requires 80A03 interface module.
P8018 – 20 GHz Single-ended TDR Probe. 80A02 module recommended for static protection of the sampling or TDR module.
P80318 – 18 GHz 100 Ω Differential Impedance TDR Hand Probe.
P801318 – 18 GHz 100 Ω Differential Impedance TDR Hand Probe.
P6150 – 9 GHz Passive Probe; the probe consists of a very high quality 20 GHz probe tip, plus an extremely flexible SMA cable. For higher frequency performance the 015-0590-00, or some of the accessory cables listed can be used.
P6018 – 20 GHz Single-ended TDR Probe. 80A02 module recommended for static protection of the sampling or TDR module.
Digital Serial Analyzer Sampling Oscilloscope

80A02 – DSA8200 EOS/ESD Protection Module
(1 channel). P8B18 TDR probe recommended.
80A03 – Enables the use of two Tektronix P7000 Series TekConnect™ probes on the DSA8200 or 8000 Series sampling oscilloscopes.
82A04 – Phase Reference Module for low jitter acquisition (with or without trigger). Accepts signals from 2 GHz to 25 GHz (external filter might be required below 8 GHz) or to 60 GHz with Option 60G.
80A05 – Electrical clock recovery module/clock recovery. Applicable to electrical signals and for the 80C12. The standard version of 80A05 supports signals in the following ranges: 50 Mb/s to 2,700 Mb/s, 2,700 Mb/s to 3,188 Mb/s and the rate of 4 Gigabit Fibre Channel 4.250 Gb/s. The Option 10G adds the ranges of 3,267 Gb/s to 4,250 Gb/s, 4,000 Gb/s to 6,375 Gb/s and 9,800 Gb/s to 12.60 Gb/s.
80A06 – PatternSync module for 80SJNB jitter analysis package. Programmable divider for creating a trigger pulse from patterns up to 223 in length.
80A07 – Electrical clock recovery module. 80A07 recovers clocks from serial data streams for all of the most common electrical standards in the continuous 100 Mb/s to 12.5 Gb/s range. Applicable to electrical signals and for 80C12.
80SJNB Essentials – 80SJNB Essentials with Jitter, Noise and BER Analysis software. Provides separation of jitter and noise into their constituent components and provides highly accurate eye-opening and BER calculations. Also see Opt. JNB/JNB01.
80SJNB Advanced – 80SJNB Advanced adds Equalization, Channel emulation, Fixture de-embedding. Also see Opt. JNB/JNB01.

Interconnect Cables
015-0560-00 (450 mm/18 inch; 1 dB loss at 20 GHz) cable is a high-quality cable recommended for work to 20 GHz.

Interconnect Cables (Third Party)
Tektronix recommends using quality high-performance interconnect cables with these high-bandwidth products in order to minimize measurement degradation and variations. The W.L. Gore & Associates’ cable assemblies listed below are compatible with the 2.92 mm, 2.4 mm and 1.85 mm connector interface of the 80Exx modules. Assemblies can be ordered by contacting Gore by phone at (800) 356-4622 or on the Web at www.gore.com/tektronix.

Calibration Kits and Accessories (third party)
To facilitate S-parameter measurements with the new 80E10, 80E08 and 80E04 electrical TDR modules and IConnect® software, we recommend precision calibration kits, adapter kits, connector savers, airlines, torque wrenches and connector gauges from Maury Microwave. These components, accessible at www.maurymw.com/tektronix.htm, are compatible with the 2.92 mm, 2.4 mm and 1.85 mm connector interface of the 80Exx modules. Cal kits and other components can be ordered by contacting Maury Microwave.

Bench Top Test Cable Assemblies
TEK40PF18PP – Frequency: 40 GHz; Connectors: 2.92 mm male; Length: 18 inches.
TEK50PF18PP – Frequency: 50 GHz; Connectors: 2.4 mm male; Length: 18 inches.
TEK65PF18PP – Frequency: 65 Gb/s; Connectors: 1.85 mm male; Length: 18 inches.

High-frequency Interconnect Cables for Electrical Sampling Modules
TEK40HF06PP – Frequency: 40 GHz; Connectors: 2.92 mm male; Length: 6 inches.
TEK40HF06PS – Frequency: 40 GHz; Connectors: 2.92 mm male; 2.92 mm female; Length: 6 inches.
TEK50HF06PP – Frequency: 50 Gb/s; Connectors: 2.4 mm male; Length: 6 inches.
TEK50HF06PS – Frequency: 50 Gb/s; Connectors: 2.4 mm male; 2.4 mm female; Length: 6 inches.
TEK65HF06PP – Frequency: 65 Gb/s; Connectors: 1.85 mm male; Length: 6 inches.
TEK65HF06PS – Frequency: 65 Gb/s; Connectors: 1.85 mm male, 1.85 mm female; Length: 6 inches.
Digital Serial Analyzer Sampling Oscilloscope

DSA8200

Our most up-to-date product information is available at:

www.tektronix.com

Copyright © 2007, Tektronix. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and TEK are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks or registered trademarks of their respective companies.

Updated 01 June 2007

Our most up-to-date product information is available at:

www.tektronix.com

Contact Tektronix:

ASAAN / Australia
(61) 03 6366 3000

Austria +43 1 265 3777

Balkan, Israel, South Africa and other ISE Countries +43 1 265 3777

Belgium 07 81 05166

Brazil & South America (11) 40893400

Canada 1 (800) 661-5625

Central East Europe, Ukraine and the Baltics +41 52 675 3777

Central Europe & Greece +41 52 675 3777

Denmark +45 80 88 1401

Finland +41 52 675 3777

France (+33) 1 69 86 81 81

Germany +49 (0211) 94 77 420

Hong Kong +852 2989 6988

India (91) 80 2277 5777

Italy +39 02 22086 1

Japan 81 (03) 7740 3101

Luxembourg +44 (2) 1344 392400

Middle East, Asia and North Africa +41 52 675 3777

The Netherlands 0900 02 027197

Norway 800 16098

People's Republic of China 86 (10) 6335 1200

Poland +43 2675 3777

Portugal 80 08 12370

Republic of Korea 82 (2) 6917 5000

Russia & CIS +7 (495) 7939500

South Africa +27 11 206 8260

Spain +34 901 988 054

Sweden 070 89 98371

Switzerland +41 52 675 3777

Taiwan 886 (2) 2722 9822

United Kingdom & Eire +44 (2) 1344 392400

USA 1 (800) 436-2200

For other areas contact Tektronix, Inc. at: 1 (503) 627-7111

Updated 01 June 2007

Products are manufactured in ISO registered facilities.

Copyright © 2007, Tektronix. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and DSA are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks or registered trademarks of their respective companies.

907  HEV00W  BWV 1/654-8

Enabling Innovation