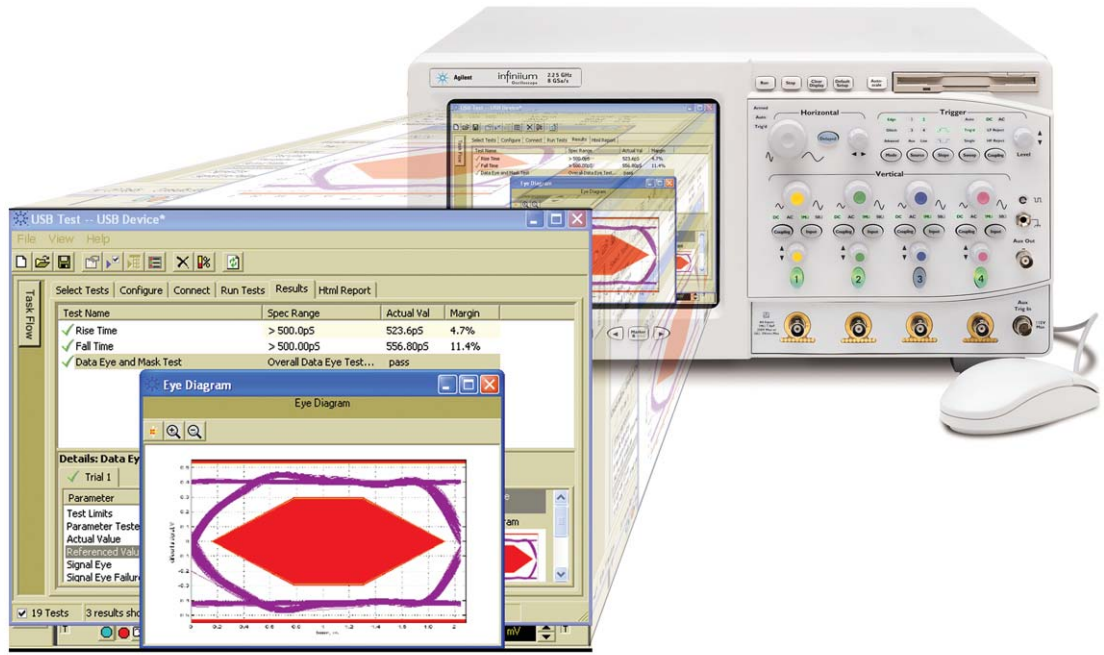


Infiniium USB Test Option N5416A

Data Sheet



- **New setup wizard for fast setup, configuration, and test**
- **Recognized by the USB-IF for official compliance testing**
- **Fast electrical compliance testing**
- **USB-IF MATLAB® script execution inside the Infiniium oscilloscope**
- **Award-winning Infiniium ease-of-use**
- **Test fixtures for low, full, and hi-speed compliance**

The Infiniium USB Test Option provides a fast and reliable way to verify USB electrical specification compliance for USB 2.0 devices, hosts, and hubs. The Infiniium USB test option executes the official USB-IF MATLAB scripts with MATLAB's runtime engine embedded in the oscilloscope.

Features

With the Infiniium USB Test Option, you can take the Infiniium oscilloscope you use for everyday debugging and use it to verify USB electrical parameters with the same testing scripts the USB-IF created for official compliance testing at designated workshops. The Infiniium USB Test Option with the new setup wizard allows you to quickly and easily test all facets of electrical compliance of your device, host, or hub. Low, full, and hi-speed tests require compliance with signal quality, inrush current, droop, drop, and backdrive voltage tests. Hi-speed USB requires compliance with an additional suite of tests. Tests can be executed directly from the scope interface under the Analyze menu. The setup wizard menu structure of the N5416A Infiniium USB Test Option provides a level of simplicity not found with other vendors' multi-tiered menu structures for executing tests and documenting results.

No fixtures are supplied with the N5416A. One SQiDD test fixture must be ordered separately as part number E2646A (for low and full speed testing). A set of six hi-speed test fixtures for signal quality, receiver sensitivity, TDR, and host disconnect must be ordered separately as part number E2649A.

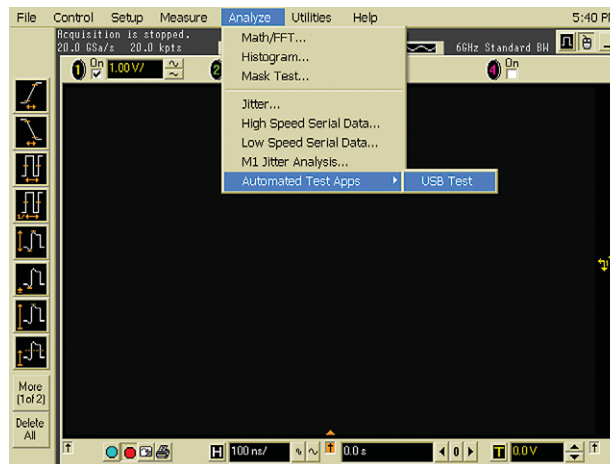


Figure 1. The Infiniium USB Test Option is incorporated directly into the oscilloscope's menu structure as a submenu under the Analyze menu.

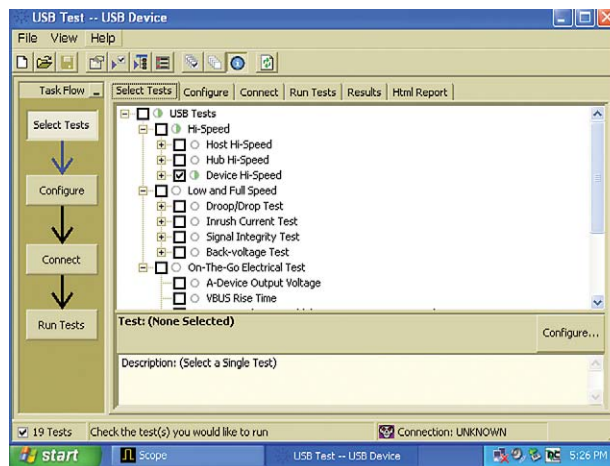


Figure 2. The Infiniium USB Test Option is configured and launched through a single window.

Benefits

In the past, pre-compliance testing in a lab environment involved capturing the data with an oscilloscope, transferring it to a PC, and post-processing it with a software program of choice. The Infiniium USB Test Option has simplified the process by installing a run-time version of MATLAB in the scope and integrating the USB Test Option into the Infiniium oscilloscope's menu structure. Test results are just one mouse-click away.

Once the test is executed, the test results appear on the Infiniium display in an .html window. Each test also automatically saves the .png, .html, and .tsv files required by the USB-IF.

The higher data rates associated with hi-speed USB 2.0 demand a measurement system that will not interfere with your device/host/hub operation by loading the system. The award-winning InfiniiMax probing system, which is compatible with Infiniium oscilloscopes, provides unmatched signal fidelity—ensuring your measurement system does not load the signals under test, thus not compromising the specification margins for passing the electrical signal quality tests. The InfiniiMax probing system has been approved by the USB-IF for compliance testing.

The set of six hi-speed test fixtures are highly manageable in a test environment due to their smaller size. The six fixtures allow you the flexibility to run different tests concurrently when you have more than one host, hub, or device to verify for compliance.

Compatibility

The N5416A Infiniium USB test option requires an Infiniium 4-channel or 4+16 channel oscilloscope.

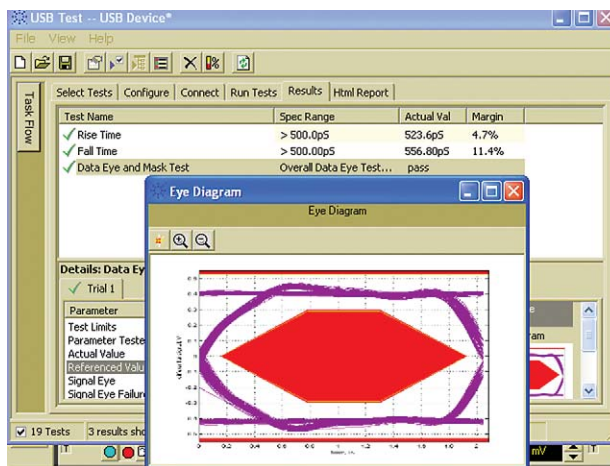


Figure 3. Infiniium automatically displays test results in an .html window immediately after test execution.

Recommended Test Equipment

Hi-Speed Recommended Test Equipment [5]

Recommended 2 GHz bandwidth or higher: Using Agilent Infiniium 80000B Series, 80000A Series and 54850 Series)

Part #	Description	Quantity
N5416A	USB 2.0 test option for Infiniium 80000B, 80000A, and 54850 Series [3],	1
E2649A	Hi-speed USB 2.0 test fixture set consists of: E2645-66501 Device Signal Quality test fixture E2645-66505 Host TDR test fixture E2645-66502 Host Signal Quality test fixture E2645-66506 Host Disconnect test fixture E2645-66503 Receiver Sensitivity test fixture 0950-2546 Power supply E2645-66504 Device TDR test fixture	1
1131A/32A/34A	InfiniiMax probe amplifier (qty 2 required for hub testing)	1
E2678A	Differential socketed probe head for InfiniiMax probe amplifiers (qty 2 required for hub testing)	1
01131-68703	Additional kit of 10 damped adapters for use with InfiniiMax probes (Note that four damped adapters are included with the E2649A) (The damped adapter part number is 01130-63201)	1
Digital Signal Generator [1]	81130A Pulse/Pattern Generator 1 MB SRAM Memory Card (#UFH) 81132A 660 MHz option 8493C #006 6 dB attenuator male SMA cable OR 81134A Pulse Generator	1 1 2 2 2
15433B	Transition time converter (for use with the 81134A)	2
82357A	USB to GPIB interface converter	1
TDR [2]	86100A/B 54745A male SMA cable	1 1 2
Multimeter	34401A	1
Hi-Speed USB Test Bed Computer	Hardware configuration: 815EEA2 motherboard, Pentium III 700 MHz, 256 MB ram, 40 GB HD, CD (CD-RW), FD, IOGear (or ATEN) USB 2.0 PCI card (5-port) Software configuration: Windows® 2000 or Windows XP	1
USB Cable	1.5 meter cable [4] 1 meter cable	1 1
USB-IF Tool on Host System	HS Electrical Test Tool available from www.usb.org (USBHSET.exe)	1

[1] Digital Signal Generator is required when testing receiver sensitivity test for device/hub.

[2] TDR test was deleted from Hi-speed Test Procedure (Rev. 1.0), but it is still recommended to test when at development stage.

[3] Option 8, enhanced bandwidth, is recommended for the 54855A. Option 5, noise reduction, is recommend for the DSO80000 Series oscilloscopes.

[4] Not available from Agilent. Refer to www.usb.org for lists of qualified vendors.

[5] Hi-speed devices must support the full speed mode. Consult the Low/Full Speed Recommended Test Equipment table for the required test equipment.

Recommended Test Equipment (continued)

Low/Full Speed Recommended Test Equipment

Using Agilent Infiniium 8000 Series, 80000A Series, 80000B Series or 54830B/D, 54832A/D

Part #	Description	Quantity
N5416A	USB 2.0 test option for 54830B/D Series, and 54850A Series with software A.04.21 or higher[1]	1
E2646A	One SQiDD (Signal Quality Inrush, Drop/Droop) test fixture for low/full speed USB 2.0 testing	1
1165A or 10073C	Miniature passive probe for the 5483x Series oscilloscopes Passive probe for the 8000 Series oscilloscopes	3
E2697A	High-impedance adapter with one 10073C passive probe (for the 5485x and DSO80000 Series oscilloscopes)	3
10075A	Clip adapter (for each E2697A)	3
1147A	50 MHz current probe (for 54831B/D or 32B/D only)	1
N2774A & N2775A	50 MHz current probe and power supply (for the 5485x and DSO80000 Series oscilloscopes)	1
HUB	Intel Customer HUB (CHUB) [2]	5
Adjacent Device	Intel Deluxe PC Camera (for full-speed), USB mouse (for low-speed)[2]	1
Multimeter	34401A	1
USB Host System	Hardware Configuration: 815EEA2 motherboard, Pentium III 700 MHz, 256 MB ram, 40 GB HD, CD (CD-RW), FD, IOGear (or ATEN) USB 2.0 PCI card (5-port) Software Configuration: Windows 2000 or Windows XP	1
USB Cable	5 meter cable [2] 1 meter cable	6 1
USB-IF Tool on Host System	HS Electrical Test Tool available from www.usb.org (USBHSET.exe)	1

[1] Option 8, enhanced bandwidth, is recommended for the 54855A. Option 5, noise reduction, is recommend for the DSO80000 Series oscilloscopes.

[2] Not available from Agilent. Refer to www.usb.org for lists of qualified vendors.

Ordering Information

Infiniium Oscilloscope	Operating System	Software Revision	USB Test Option	Tests
8000 Series	Windows XP Pro	A.04.90 or higher	N5416A	Low/Full Speed
80000B Series	Windows XP Pro	A.04.91 or higher	N5416A	Low/Full/Hi Speed
5483xB/D	Windows XP Pro	A.04.21 or higher	N5416A	Low/Full Speed
5485xA	Windows XP Pro	A.04.21 or higher	N5416A	Low/Full/Hi Speed
80000A Series	Windows XP Pro	A.04.21 or higher	N5416A	Low/Full/Hi Speed

Note that free upgrade media for Infiniium oscilloscopes is available for order online at http://www.agilent.com/find/infiniium_software.

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