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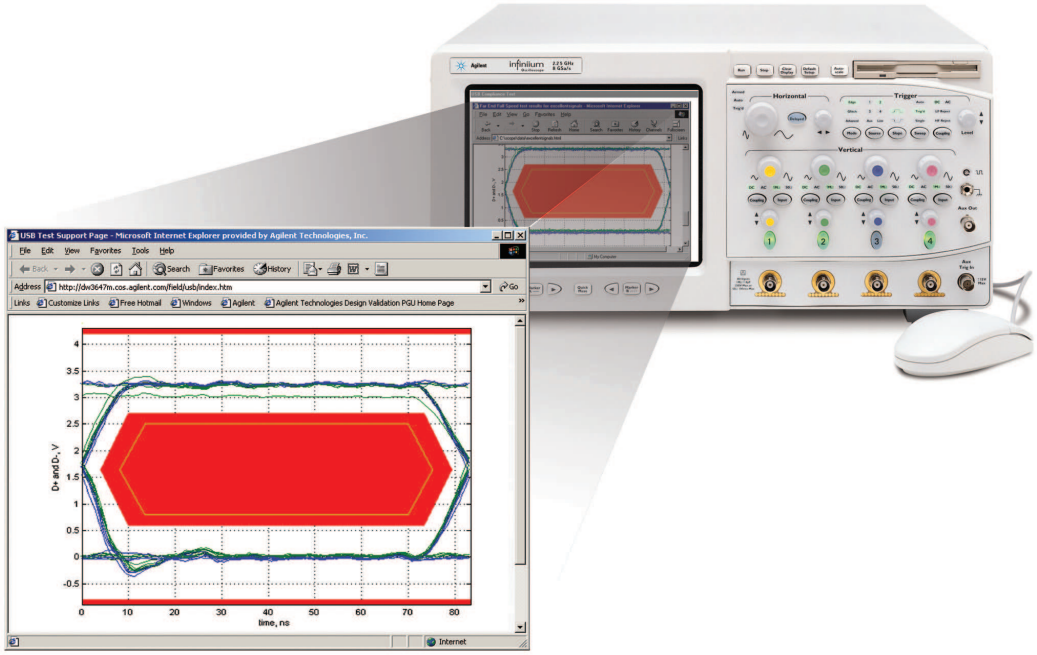
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Infiniium USB Test Option
E2645A, N2854A, N2855A, E2683A

Data Sheet



- **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. Test procedures for Agilent equipment can be found on the USB-IF website: **www.usb.org/developers/docs**

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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 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 single menu structure of the Infiniium USB Test Option provides a level of simplicity not found with other vendors' multi-tiered menu structures for executing tests and documenting results.

One SQiDD (signal quality, inrush, droop/drop) test fixture is included with the software in the test option package. A set of six hi-speed test fixtures for signal quality, receiver sensitivity, TDR, and host disconnect can be ordered separately as part number E2649A.

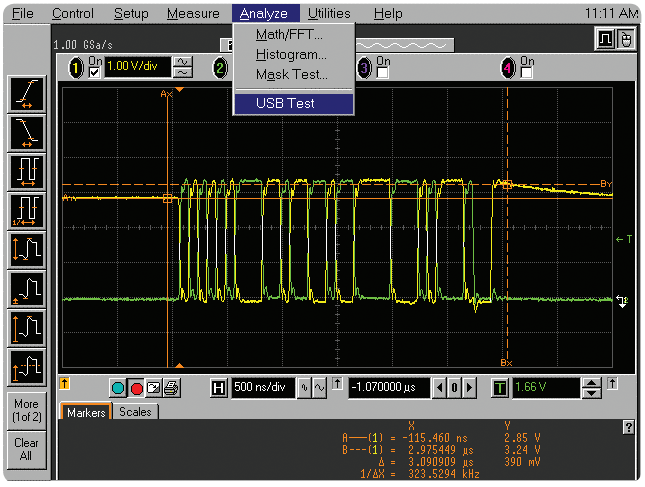


Figure 1. The Infiniium USB Test Option is incorporated directly into the oscilloscope's menu structure as a submenu under the Analyze menu.

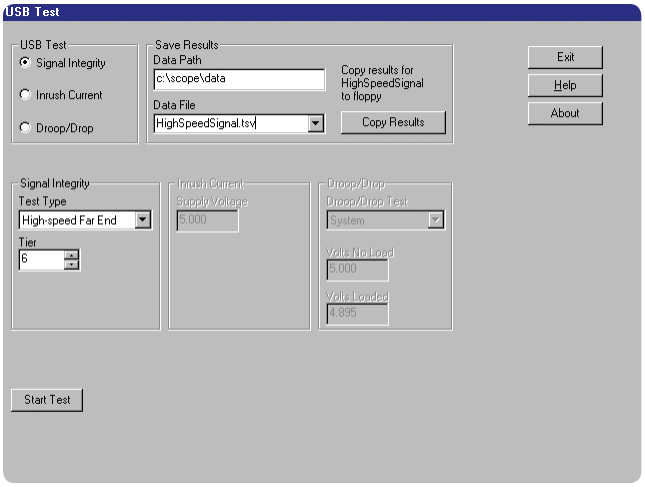


Figure 2. The Infiniium USB Test Option is configured and launched through a single window.

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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 Infiniium USB test option is compatible with Infiniium 4-channel and 4+16 channel oscilloscopes.

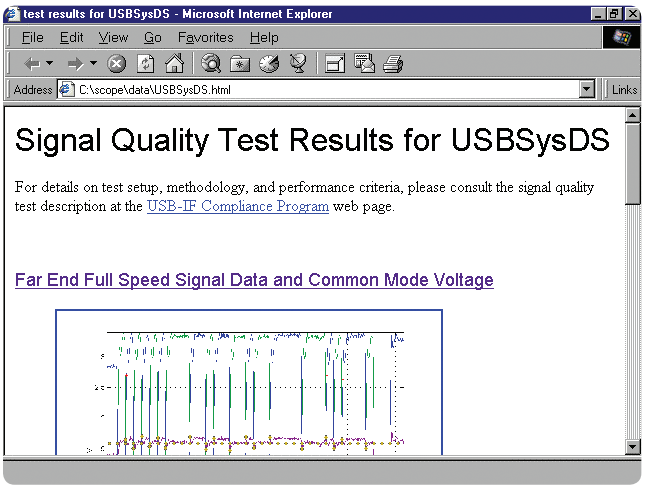


Figure 3. Infiniium automatically displays test results in an .html window immediately after test execution

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Hi-Speed Recommended Equipment

(Using Agilent 54846A/B, 53A, 54A, 55A)

Part #	Description	Quantity
E2645A [1] N2854A E2683A	USB 2.0 test option. Includes one SQiDD test fixture for low/full speed USB 2.0 testing for 54846A for 54846B for 54853A/54A/55A	1
E2646A	Additional SQiDD (Signal Quality Inrush, Drop/Droop) test fixture for low/full speed USB 2.0 testing (Note that one E2646A is included in the USB test option)	–
E2649A	Hi-speed USB 2.0 test fixture set consists of: E2645-66501 Device Signal Quality test fixture E2645-66502 Host Signal Quality test fixture E2645-66503 Receiver Sensitivity test fixture E2645-66504 Device TDR test fixture E2645-66505 Host TDR test fixture E2645-66506 Host Disconnect test fixture 0950-2546 Power supply	1
54846B Option 004	Adds (four) 1161A passive probes to the 54846B oscilloscope	1
E2697A	High-impedance adapter with one 10073C passive probe for 54853A/54A/55A only (1156A can be used in lieu of E2697A)	3
1131A/32A/34A	InfiniiMax probe amplifier (qty 2 required for hub testing)	1
E2669A	Differential connectivity kit for InfiniiMax probes	1
01131-68703	Additional set of 10 damped adapters for use with InfiniiMax probes (Note that four damped adapters are included with the E2649A and the E2699A)	–
Digital Signal Generator [2]	81130A Pulse/Pattern Generator 1 MB SRAM Memory Card (#UFH) 81132A 660 MHz option 8493C #006 6 dB attenuator male SMA cable	1 1 2 2 2
TDR [3]	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 1 meter cable	1 1
USB-IF Tool on Host System	USB Hi-speed Electrical Test Tool from USB-IF, Inc.	1

[1] To use the E2645A option, you must have the following minimum Infiniium configuration: 300 MHz CPU, 64 MB RAM, Windows 98, Version A.04.20 or greater of the system software, LS-120 120 MB SuperDisk. To determine if your Infiniium meets these configuration criteria, look at the back of your unit. If the serial number of your unit starts with US3919 or higher, you meet these requirements. Or if there is a product tag with "E2633A," "E2633-68703," or "E2633-68701," you meet the requirements. If you do not meet the minimum requirements, you must order an Infiniium oscilloscope performance upgrade in addition to the E2645A. Please contact your Agilent representative for selecting the right performance upgrade for your Infiniium oscilloscope.

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

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

Table 1. Recommended test equipment.

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Low/Full Speed Recommended Equipment

(Using Agilent 54815A, 25A, 31B/D, 32B/D, 35A, 45A/B, 46A/B, 52A, 53A, 54A, 55A, DSO80804A/1004A/1204A/1304A Scopes)

Part #	Description	Quantity
	USB 2.0 test option. Includes one SQiDD test fixture for low/full speed USB 2.0 testing	1
E2645A [1]	for 54815A, 54825A, 54835A, 54845A, 54846A	
N2854A	for 54845B, 54846B	
N2855A	for 54830B/D Series with software rev. A.02.30 or below	
E2683A	for 54830B/D Series, 54833A and 54850A Series with software A.03.10 or higher	
E2646A	Additional SQiDD (Signal Quality Inrush, Drop/Droop) test fixture for low/full speed USB 2.0 testing (Note that one E2646A is included in the USB test option)	–
54832B/32D Option 004	Adds (four) 1165A passive probes for new purchase of 54832B/32D scopes only	1
54846B Option 004	Adds (four) 1161A passive probes for new purchase of 54846B scopes only	1
E2697A	High-impedance adapter with one 10073C passive probe for 54852A/53A/54A/55A only	3
1147B	50 MHz current probe (for 54831B/D, 32B/D, 45B, 46B only)	1
N2774A & N2775A	50 MHz current probe and power supply (for 54852A/53A/54A/55A)	1
HUB	Intel Customer HUB (CHUB)	5
Adjacent Device	Intel Deluxe PC Camera (for full-speed), USB mouse (for low-speed)	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	6
	1 meter cable	1
USB-IF Tool on Host System [2]	USBCheck or USBCV program from USB-IF, Inc.	1

[1] To use the E2645A option, you must have the following minimum Infiniium configuration: 300 MHz CPU, 64 MB RAM, Windows 98, Version A.04.20 or greater of the system software, LS-120 120 MB SuperDisk. To determine if your Infiniium meets these configuration criteria, look at the back of your unit. If the serial number of your unit starts with US3919 or higher, you meet these requirements. Or if there is a product tag with "E2633A," "E2633-68703," or "E2633-68701," you meet the requirements. If you do not meet the minimum requirements, you must order an Infiniium oscilloscope performance upgrade in addition to the E2645A. Please contact your Agilent representative for selecting the right performance upgrade for your Infiniium oscilloscope.

[2] USB Check is supported on Windows 2000 only and is being made obsolete by USBCV. When performing USBCV to test full/low device, USB 2.0 hi-speed HUB is also needed.

Table 2. Recommended test equipment.

Ordering Information

Infiniium Oscilloscope	Operating System	Software Revision	USB Test Option	Tests
5481xA, 5482xA	Windows® 98	A.04.20 or higher	E2645A	Low/Full Speed
5483xB/D	Windows 98	A.01.10 or higher	N2855A	Low/Full Speed
5483xB/D	Windows XP Pro	A.03.10 or higher	E2683A	Low/Full Speed
54835A, 54845A	Windows 98	A.04.50 or higher	E2645A	Low/Full Speed
54846A	Windows 98	A.04.50 or higher	E2645A	Low/Full/Hi Speed
54845B	Windows 98	A.04.50 or higher	N2854A	Low/Full Speed
54846B	Windows 98	A.04.50 or higher	N2854A	Low/Full/Hi Speed
5485xA	Windows XP Pro	A.03.10 or higher	E2683A	Low/Full/Hi Speed
80000 Series	Windows XP Pro	A.03.90 or higher	E2683A	Low/Full/Hi Speed

Additional SQiDD fixtures may be ordered as part number E2646A.

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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