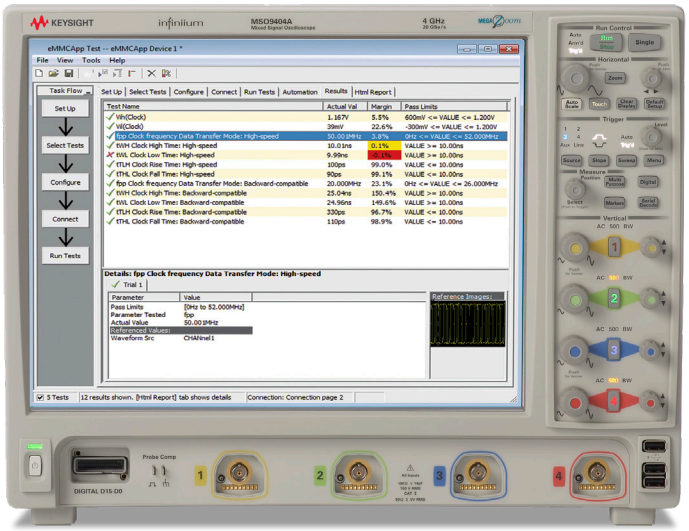
Keysight Technologies

N6465A and N6465B eMMC

Compliance Test Application for Infiniium Series Oscilloscopes

Data Sheet



KEYSIGHT TECHNOLOGIES

Introduction

The Keysight Technologies, Inc. eMMC compliance test application provides a fast and easy way to test, debug and characterize your eMMC designs. The tests performed by the eMMC compliance test software are based on the JEDEC[1] JESD84-B451 specification. The test application offers a user-friendly setup wizard and comprehensive report that includes margin analysis.

The eMMC standard is designed for mobile devices for storing code and data. The eMMC offers the performance and features required by mobile devices while maintaining low power consumption. The eMMC device contains features that support high throughput for large data transfers and performance for small random data in code usage.

The compliance test offers electrical and timing tests as per the JEDEC specification. The eMMC compliance test application is compatible with Keysight 9000 Series Infiniium oscilloscopes.

Features

The eMMC compliance test application offers several features to simplify the validation of your eMMC designs:

- Setup wizard for quick setup, configuration and test
- Execution speed and proven test algorithm for host and device transmitter tests, which minimizes your compliance test time
- User-selected tests and configurations based on JESD84-B451 specification
- Test framework provides powerful characterization through multiple trials that show a full array of statistics for each measurement and returns the worst measurement value
- Offline capability to allow users to run the compliance test with saved waveform files from device

1. The JEDEC (Joint Electronic Device Engineering Council) Solid State Technology Association is a semiconductor engineering standardization body of the Electronic Industries Alliance (EIA), a trade association that represents all areas of the electronic industry.

Comprehensive test coverage

With the eMMC compliance test application, you can use the same oscilloscope you use for everyday debugging to perform automated testing and margin analysis-based physical layer specification. The application automatically configures the oscilloscope for each test and provides informative results. It includes margin analysis indicating how close your device comes to passing or failing the test for each specification. Some of the difficulties in performing the compliance tests are connecting to the target device, configuring the oscilloscope, performing the tests and analyzing the measured results. The eMMC compliance test application does most of this work for you.

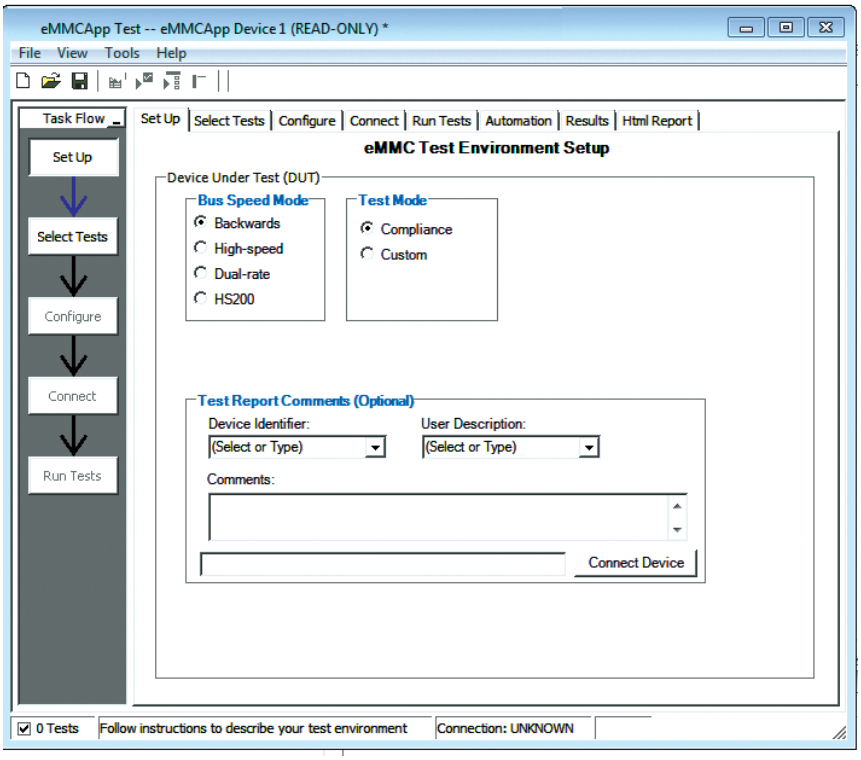


Figure 1: N6465A eMMC compliance test software application provides electrical and timing tests as per JESD84-B451 specifications.

Easy test definition

The test application enhances the usability of Keysight's Infiniium oscilloscopes for testing eMMC devices. The Keysight automated test framework quickly guides you through the steps required to define the setup, perform the tests and view the test results. You can select a category of tests or specify individual tests. The user interface is designed to minimize unnecessary reconnections, which saves time and minimizes potential operator error. You can save the tests and configurations as project files and recall them later for quick testing and review of previous results. Clear menus let you perform tests with minimum mouse clicks.

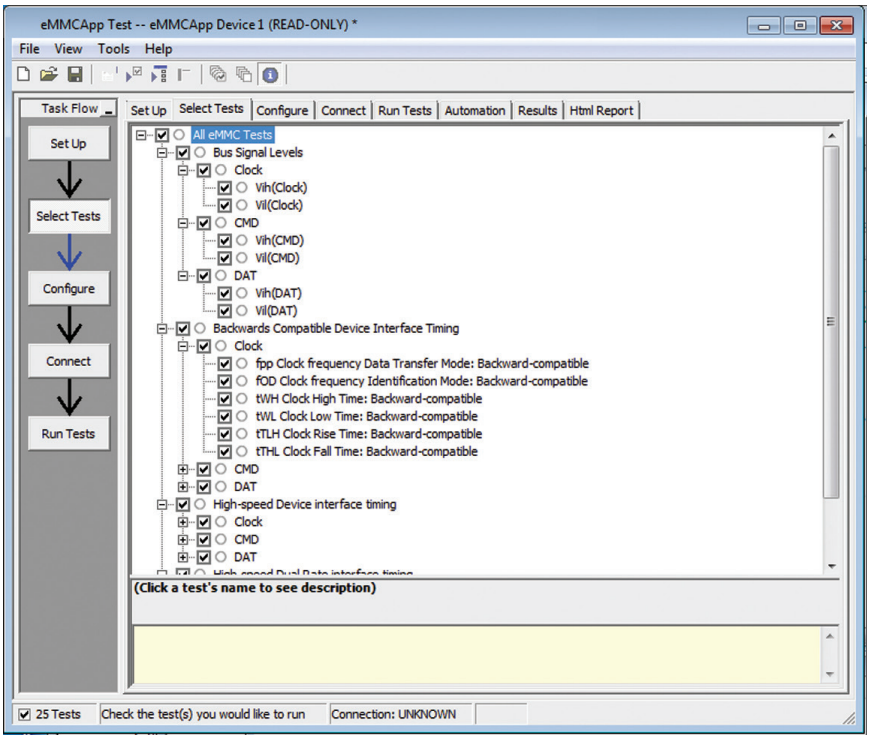


Figure 2: The Keysight automated test engine filters the test selection based on your test setup. You can easily select individual tests or groups of tests with a mouse-click.

Configurability and guided connection

The compliance test application provides flexibility in your test setup. The eMMC compliance test application provides you with user-defined controls for critical test parameters such as sampling rate and setting for single-ended or differential connection types. Once you have configured the tests, the connection page will display the connection diagram for the test you have selected. With the multiple test trial capability, you can extensively characterize the performance of your eMMC devices. You can run the selected tests until the stop condition is met. The application will then save the worst-case conditions and help you track down the anomalies in your signals. In addition to providing you with measurement results, the eMMC compliance test application reports how close you are to the specified limit. You can specify the level at which warnings are to be issued. You are provided with a full array of statistics for each measurement, and you can save worst-case conditions to extensively test the performance of your device.

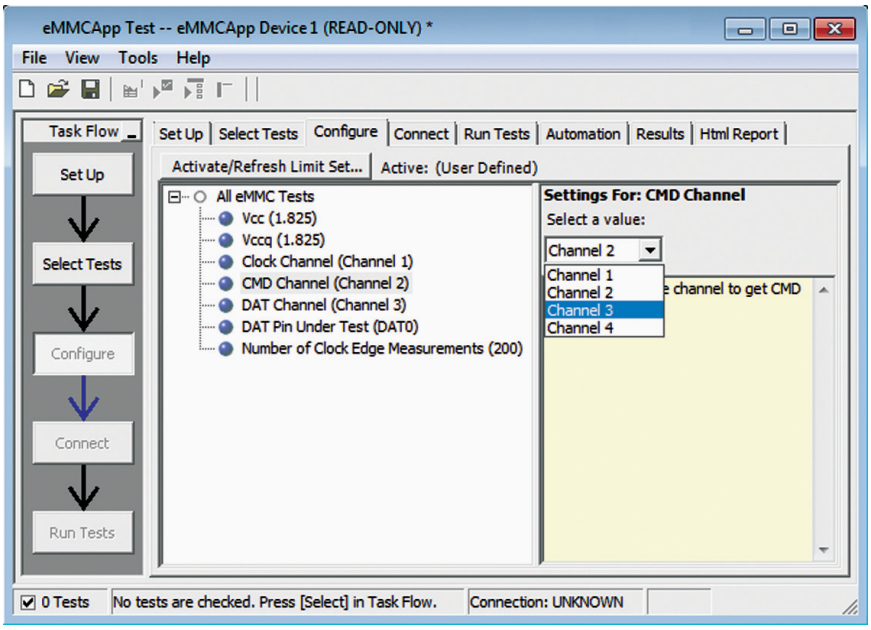


Figure 3: The software provides user-defined controls for test parameters such as number of measurements and channel assignments.

Thorough performance reporting

The eMMC compliance test application generates thorough HTML reports that capture the performance, status and margins of your device. It also captures screen shots of critical measurements for your reference and documentation. This report is suitable for printing and sharing with your vendors, customers or colleagues.

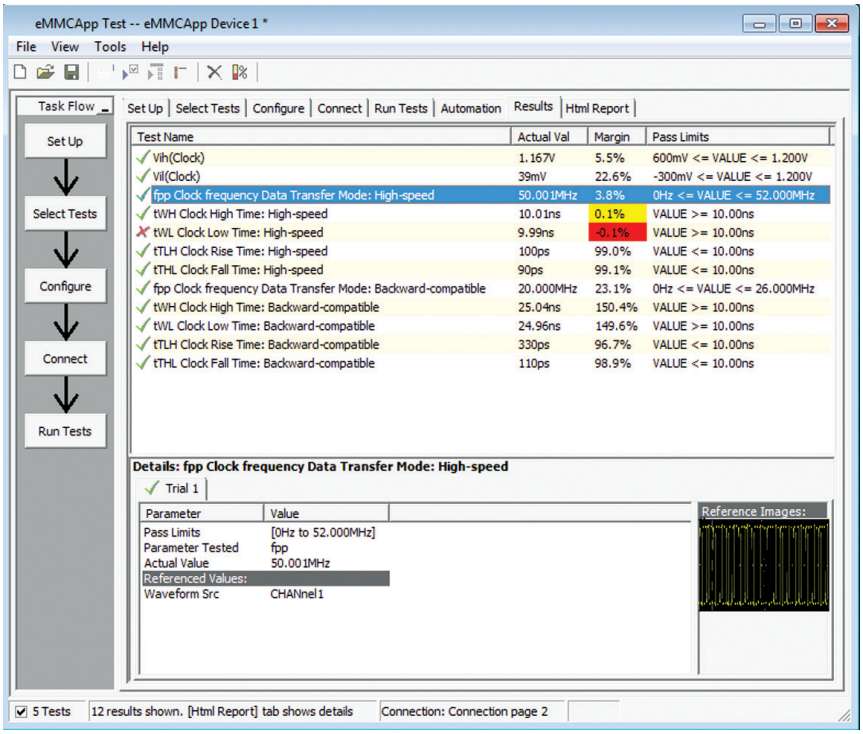


Figure 4: The eMMC test application documents your test parameters, pass or fail status, test specification range, measured values and pass/fail margin.

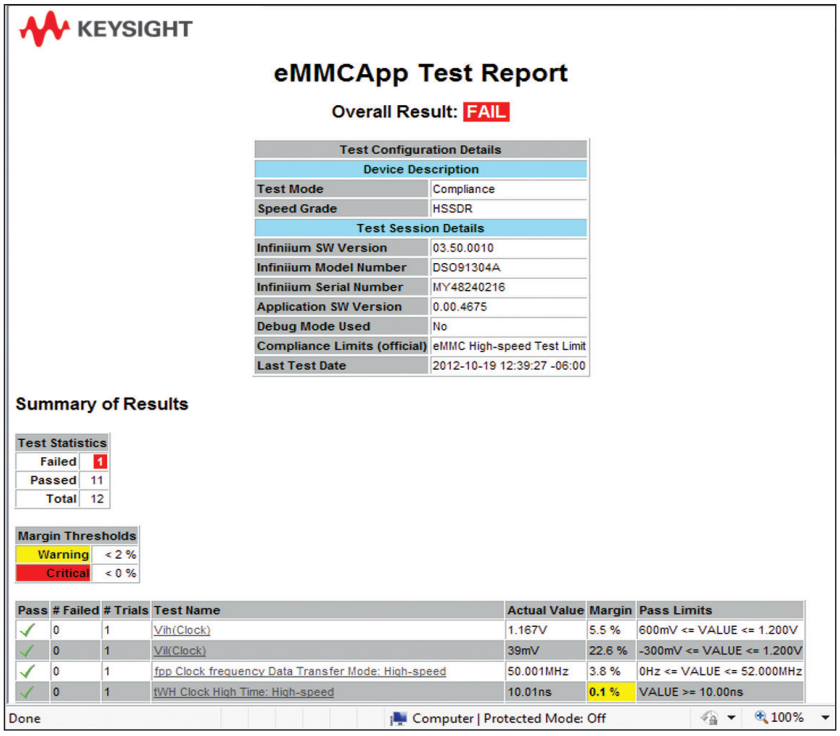


Figure 5: The test application generates a summary report where you can see your device's test results quickly and clearly. Details are available for each test including the test limits, test description and test results. In addition, the pass/fail margin is indicated to give you further insight.

Extensibility

You may add additional custom tests or steps to your application using the User Defined Application (UDA) development tool (www.keysight.com/find/uda). Use UDA to develop functional "Add-ins" that you can plug into your application.

Add-ins may be designed as:

- Complete custom tests (with configuration variables and connection prompts)
- Any custom steps such as pre-or post-processing scripts, external instrument control and your own device control

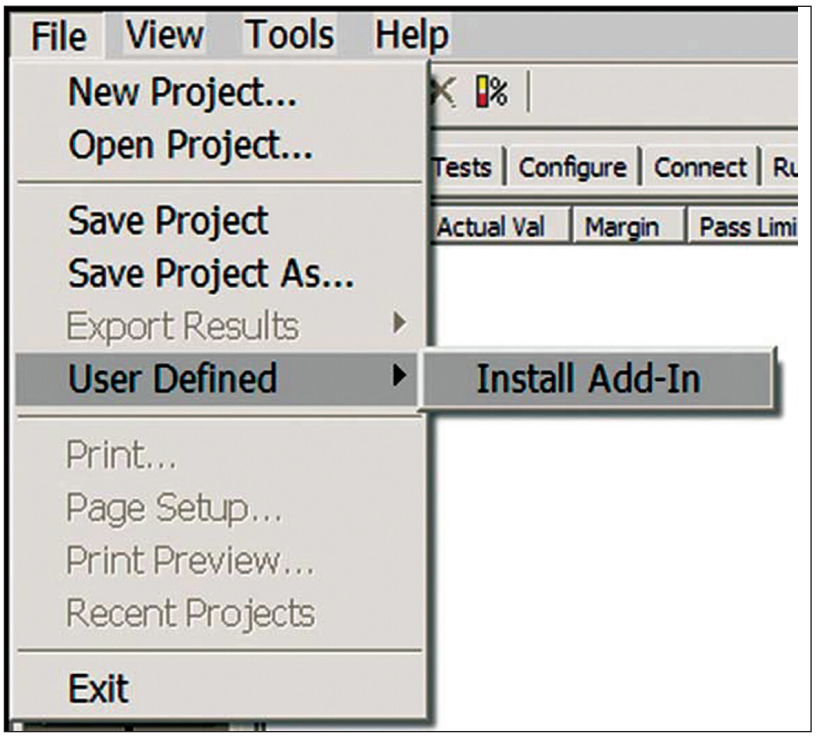


Figure 6: Importing a UDA Add-in into your test application.

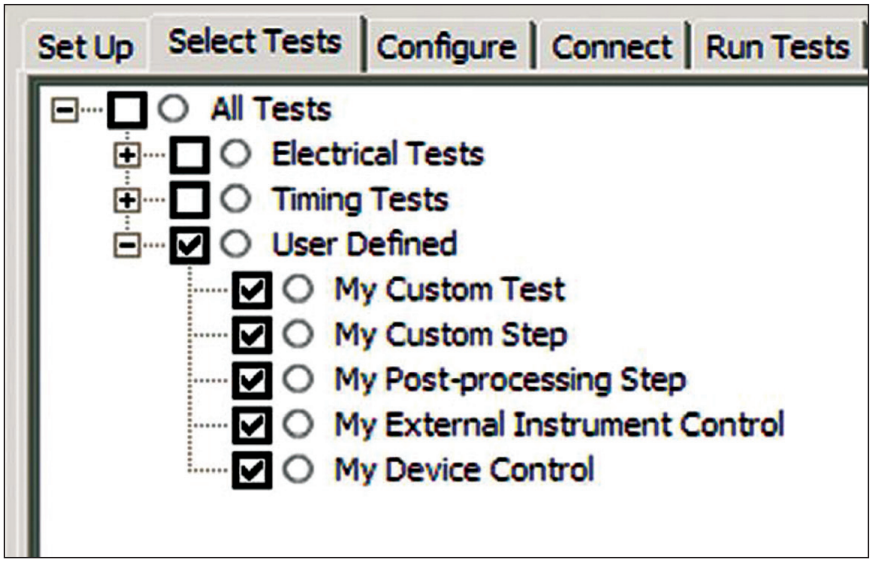


Figure 7: UDA Add-in tests and utilities in your test application.

Automation

You can completely automate execution of your application's tests and Add-ins from a separate PC using the included N5452A Remote Interface feature (download free toolkit from www.keysight.com/find/scope-apps-sw). You can even create and execute automation scripts right inside the application using a convenient built-in client.

The commands required for each task may be created using a command wizard or the "remote hints" accessible throughout the user interface. Using automation, you can accelerate complex testing scenarios and even automate manual tasks such as:

- Opening projects, executing tests and saving results
- Executing tests repeatedly while changing configurations
- Sending commands to external instruments
- Executing tests out of order

Combine the power of built-in automation and extensibility to transform your application into a complete test suite executive:

- Interact with your device controller to place it into desired states or test modes before test execution
- Configure additional instruments used in your test suite such as a pattern generator and probe switch matrix
- Export data generated by your tests and post-process it using your favorite environment, such as MATLAB, Python, LabVIEW, C, C++, Visual Basic, etc.
- Sequence or repeat the tests and "Add-in" custom steps execution in any order for complete test coverage of the test plan

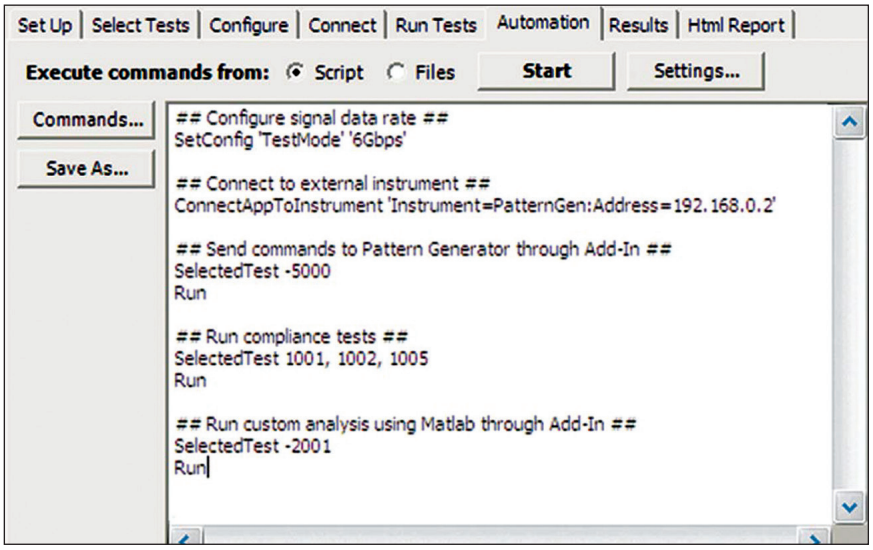


Figure 8: Remote Programming script in the Automation tab.

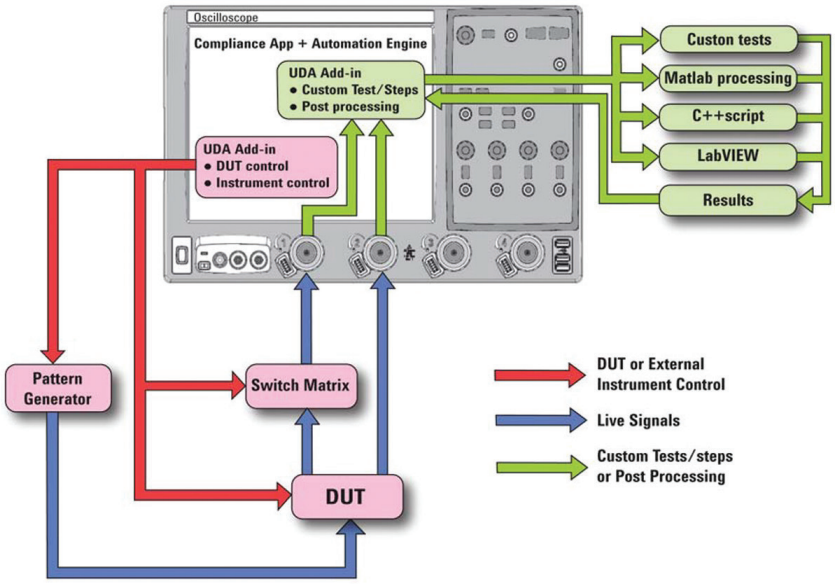


Figure 9: Combine the power of built-in automation and extensibility to transform your application into a complete test suite executive.

Recommended Oscilloscopes

The eMMC compliance software is compatible with Keysight Infiniium Series oscilloscopes with operating software revision 4.20 or higher. For oscilloscopes with earlier revisions, free upgrade software is available here: www.keysight.com/find/scope-apps-sw.

Data rate	Minimum bandwidth	Minimum channels	Compatible oscilloscopes
Up to 200 MHz	1 GHz	3	Infiniium 9000, 90000, S-Series and Z-Series

Ordering Information

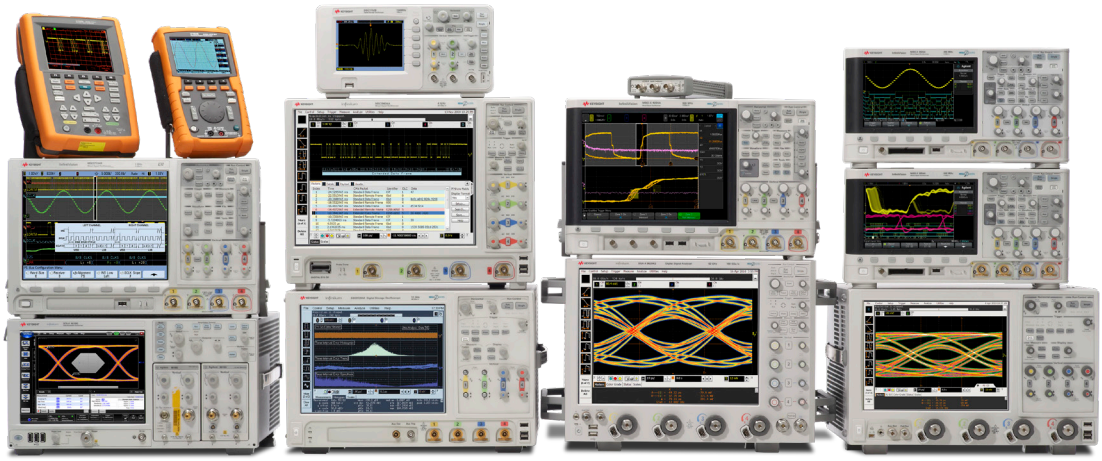
Software options

Application	License type		Infiniium Z-Series	Infiniium S- Series	Infiniium 90000 Series	Infiniium 9000 Series
eMMC compliance	Fixed	Factory-installed	N6465A-1FP	N6465B-1FP	Option 064	Option 064
		User-installed	N6465A-1FP	N6465B-1FP	N6465A-1NL	N6465B-1NL
	Floating	Transportable	N6465A-1TP	N6465B-1TP	N6465A-1TP[1,2]	N6465B-1TP[1,2]
		Server-based			N5435A-061	

1. Requires software 5.00 and above.
2. Software 4.30 or above requires Windows 7. N2753A Infiniium Windows XP to 7 OS upgrade kit (oscilloscope already has M890 motherboard). N2754A Infiniium Windows XP to 7 OS and M890 motherboard upgrade kit (oscilloscope without M890 motherboard). Verify the M890 motherboard using the procedure found in the Windows 7 upgrade kit data sheet, publication number 5990-8569EN.

Related Literature

Publication title	Publication type	Publication number
Keysight Technologies Infiniium 9000 Series Oscilloscopes	Data Sheet	5990-3746EN
Keysight Oscilloscope Probes and Accessories	Data Sheet	5989-6162EN

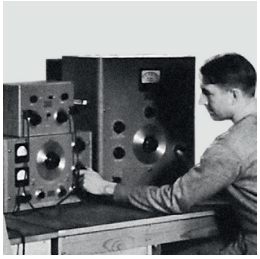


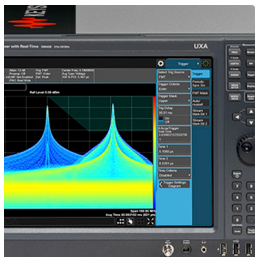
Keysight Technologies Oscilloscopes

Multiple form factors from 20 MHz to > 90 GHz | Industry leading specs | Powerful applications

Evolving Since 1939

Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology.
From Hewlett-Packard to Agilent to Keysight.





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