D9360LDDC LPDDR6 Tx Compliance Test Software

Keysight's D9360LDDC LPDDR6 compliance test application software provides a fast and easy way to test, debug and characterize your LPDDR6 designs. LPDDR6 technology offers higher data rate which enables higher bandwidth for data transfer with lower power. The D9360LDDC offers full test coverage to enable testing of transmitter physical layer of the LPDDR6 DRAM and memory controller silicon. The LPDDR6 test methodology is a prerelease development by Keysight Technologies, facilitating design pathfinding and early adoption.

Features

The D9360LDDC compliance test application offers several key features to simplify the validation of your designs.

- Intuitive setup wizard for quick test setup, configuration, and test.
- Comprehensive test coverage of the LPDDR6 electrical, timing, eye diagram and jitter tests.
- De-embed interposer, cable and even package models to verify the true device performance.
- Cutting-edge equalization emulation using Keysight's built-in equalization analysis, including auto tap setup with multiple optimization algorithms, to accurately determine and simulate ideal DFE settings for a trained LPDDR6 memory system.
- Offline testing capability with waveform files for completeness of simulation to validation workflow.

KEYSIGHT

Comprehensive Test Coverage

The D9360LDDC compliance test application allows you to use the oscilloscope to perform automated testing and margin analysis on your LPDDR6 design. The application automatically configures the oscilloscope for each test and provides informative test result. It includes margin analysis indicating how close your device comes to passing or failing each test parameter. The D9360LDDC compliance test application automates the measurement as specified in the specification, which helps save test time and design cost.

Easy Test Definition

The D9360LDDC compliance test application enhances the usability of Keysight Infiniium oscilloscopes for testing LPDDR6 DRAM. The Keysight automated test framework guides you quickly through the steps required to define the setup, perform the tests and view the test results. You can select a category of tests or select an individual test. The user interface is designed to minimize unnecessary reconnections, which will help save test time and minimize potential operator error. You can save the tests and configurations as project files and recall them for quick testing and review previous results. You can also run the compliance test with saved waveform files from the oscilloscope on your PC, using Offline mode, freeing the oscilloscope for other data acquisition purposes. Offline mode supports waveform files in .wfm or .h5 format.

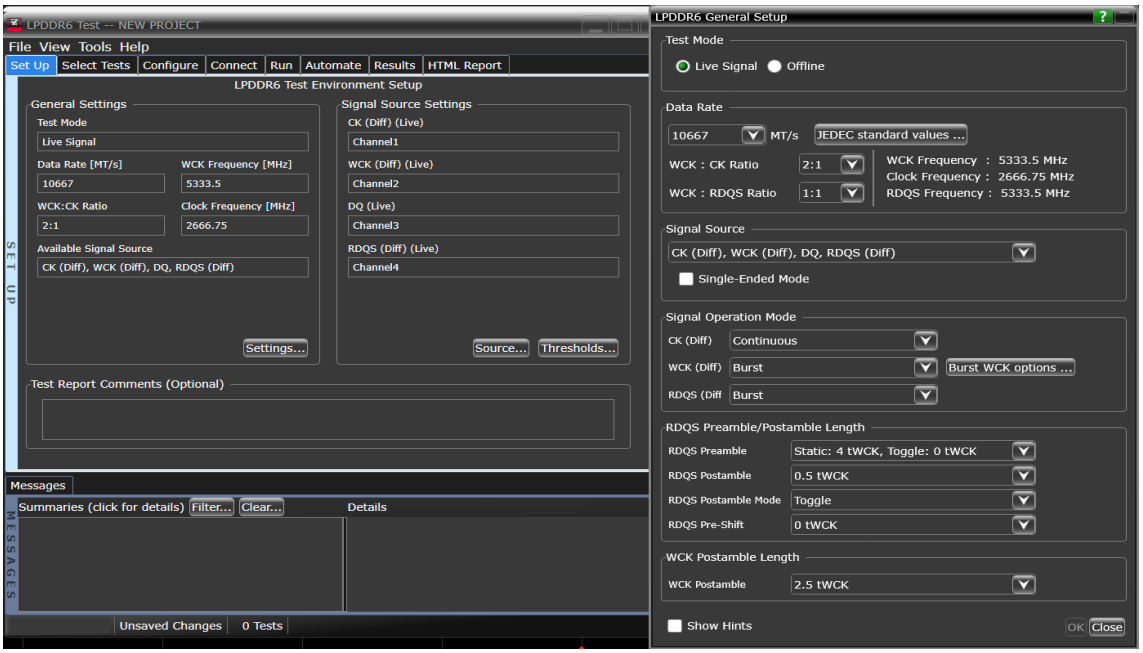

Figure 1. D9360LDDC application test setup screen. Select the speed grade of your device, Live signal or Off-line, and signal sources.

Configurability and Guided Connection

The D9360LDDC compliance test application provides flexibility in your test setup. The application lets you define controls for critical test parameters such as voltage threshold values, number of waveforms used for analysis and customizable violation settings. Once you have configured the tests, the connection page will display the connection diagram for the test you have selected.

You can also specify the number of test trials and only stop running selected tests when the stop condition is met. The application will save the worst-case test result to help you track down the anomalies in your signals.

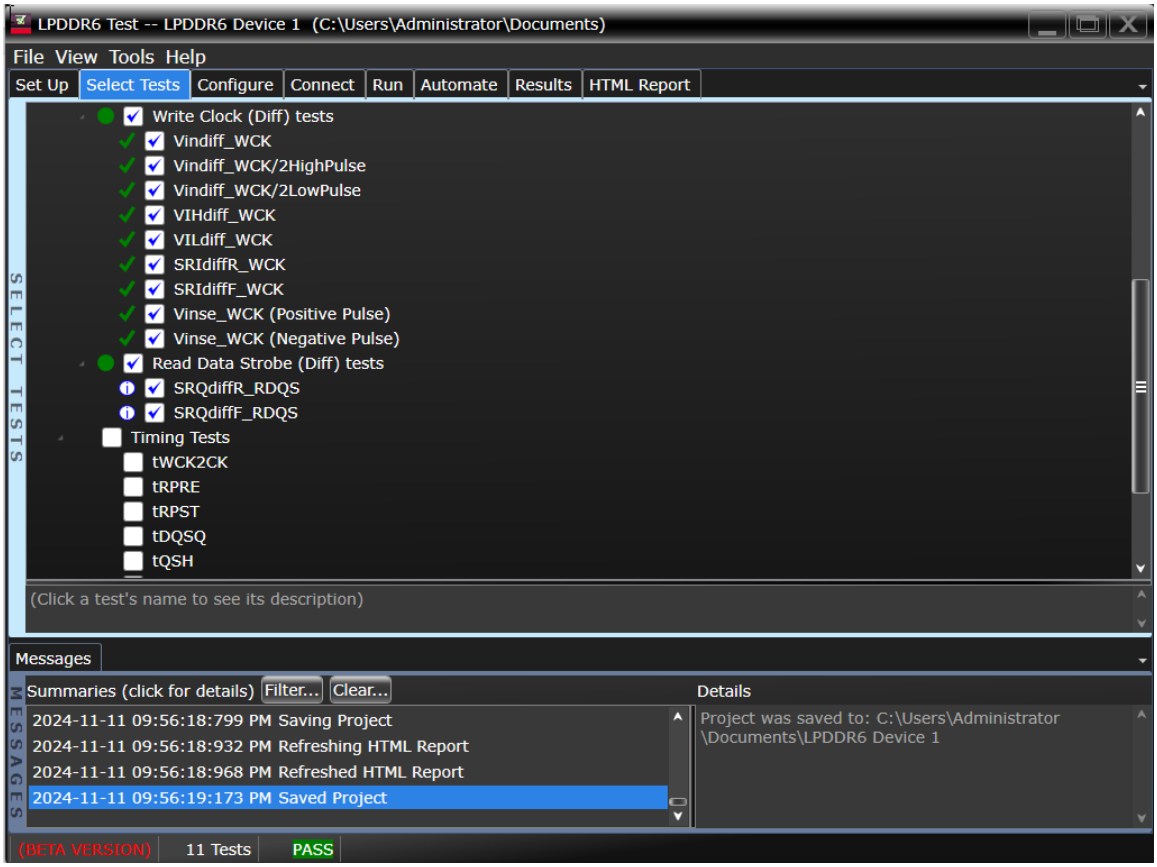

Figure 2. The Select Tests Tab lists all the tests available in your setup. You can easily setup the individual test or groups of tests.

Comprehensive Result Analysis

In addition to providing you with measurement results, the D9360LDDC compliance test application reports how close your test results are to the specified test limit. You can specify the level at which warnings are to be issued. You are provided a full array of statistics for each measurement.

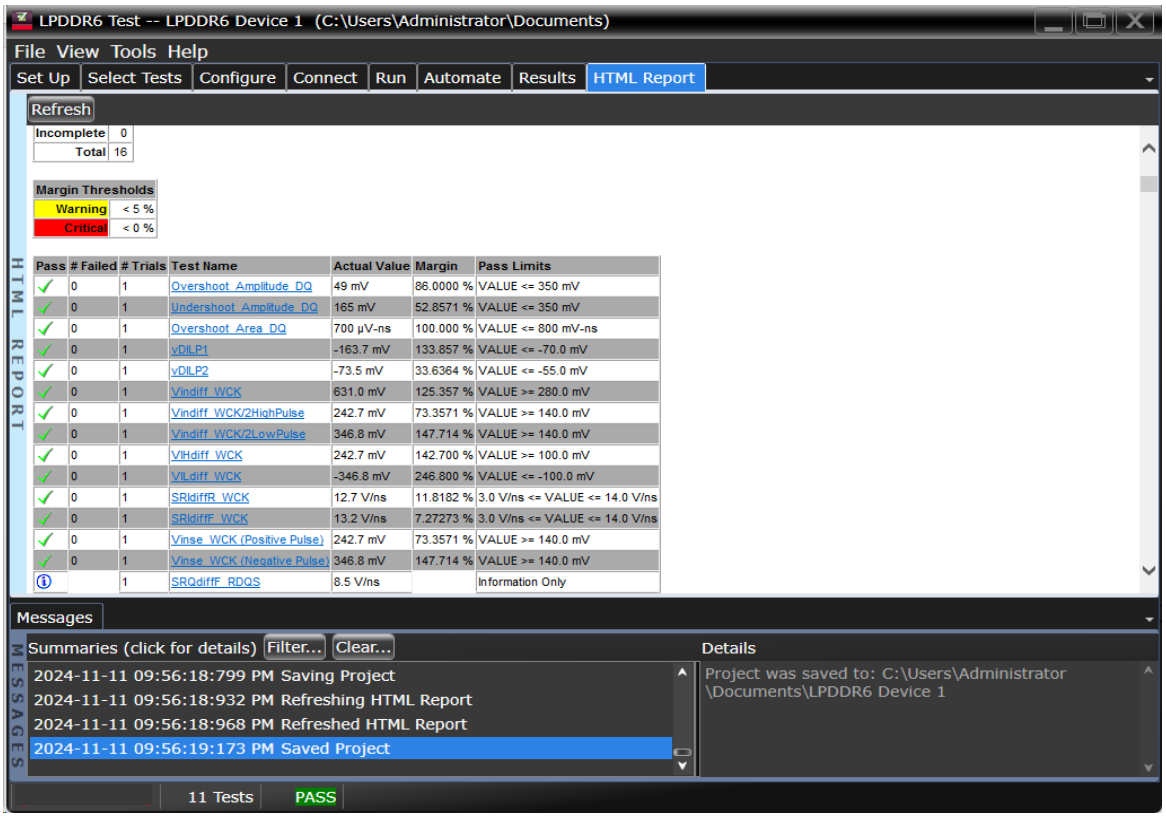

Figure 3. The D9360LDDC test application documents your test parameters, pass or fail status, test limits, measured values, and margin.

Thorough Performance Reporting

The D9360LDDC compliance test application generates HTML reports that captures the performance, status and margins of your device under test. It also captures screenshots of critical measurements of your reference and documentation. This report is suitable for printing and sharing with your test vendors, customers, and suppliers.

KEYSIGHT TECHNOLOGIES

Test Report

Pass

Test Configuration Details	
Application	
Name	D9060LDDC LPDDR6 Test
Version	0.99.9018.0
Device Description	
Single-Ended Mode	No
Test Mode	Live Signal
Data Rate [MT/s]	10667
WCK:CK ratio	2:1
WCK:RDQS ratio	1:1
Offline Test Mode	OfflineSrc_AppCfg
Burst Identification Method	RDQS Detect
Test Session Details	
Infiniium SW Version	11.61.00002
Infiniium Model Number	UXR0334B
Infiniium Serial Number	MY63040107
Debug Mode Used	No
Compliance Limits	LPDDR5-4266.5MHz Test Limit (official)
Last Test Date	2024-11-11 20:21:38 UTC +08:00

Summary of Results

Test Statistics	
Failed	0
Passed	16
Incomplete	0
Total	16

Margin Thresholds	
Warning	< 5 %
Critical	< 0 %

Pass	# Failed	# Trials	Test Name (click to jump)	Actual Value	Margin	Pass Limits
✓	0	1	Overshoot_Amplitude_DQ	49 mV	86.0000 %	VALUE <= 350 mV
✓	0	1	Undershoot_Amplitude_DQ	165 mV	52.8571 %	VALUE <= 350 mV
✓	0	1	Overshoot_Area_DQ	700 µV-ns	100.000 %	VALUE <= 800 mV-ns
✓	0	1	vDILP1	-163.7 mV	133.857 %	VALUE <= -70.0 mV
✓	0	1	vDILP2	-73.5 mV	33.6364 %	VALUE <= -55.0 mV
✓	0	1	Vindiff_WCK	631.0 mV	125.357 %	VALUE >= 280.0 mV
✓	0	1	Vindiff_WCK/2HighPulse	242.7 mV	73.3571 %	VALUE >= 140.0 mV
✓	0	1	Vindiff_WCK/2LowPulse	346.8 mV	147.714 %	VALUE >= 140.0 mV
✓	0	1	VIHdiff_WCK	242.7 mV	142.700 %	VALUE >= 100.0 mV
✓	0	1	VILdiff_WCK	-346.8 mV	246.800 %	VALUE <= -100.0 mV
✓	0	1	SRIdiffR_WCK	12.7 V/ns	11.8182 %	3.0 V/ns <= VALUE <= 14.0 V/ns

Figure 4. The D9360LDDC test application generates a summary report for quick results viewing. The report includes details such as test limits, test description and test results.

vDIVW Margin — JEDEC Standard No. 209-6, Figure 257

Pass

DQ Rx mask height margin
Actual Value Measurement Name: 141002_vDIVW_Margin_Compliance
Pass Limits: VALUE >= 0.0 %

Actual Value	Margin	vCENTDQ	vDIVW_min	vDIVW_Worst_Top	vDIVW_Worst_Top_Margin	vDIVW_Worst_Bottom	vDIVW_Worst_Bottom_Margin
101.0 %	1.01000 k %	160.480 mV	271.80 mV	40.39 mV	100.98 %	40.39 mV	100.98 %

vDIVW_Best_Top	vDIVW_Best_Top_Margin	vDIVW_Best_Bottom	vDIVW_Best_Bottom_Margin	tDIVW_Mask_Width	vDIVW_Mask_Height	DFE_Tap1
50.85 mV	127.13 %	50.85 mV	127.13 %	28.125 ps	80.000 mV	-99.000000

vDIVW Worst(Left) tDIVW Worst(Top) Margin
(See image)

vDIVW Worst(Left) tDIVW Worst(Top) Margin

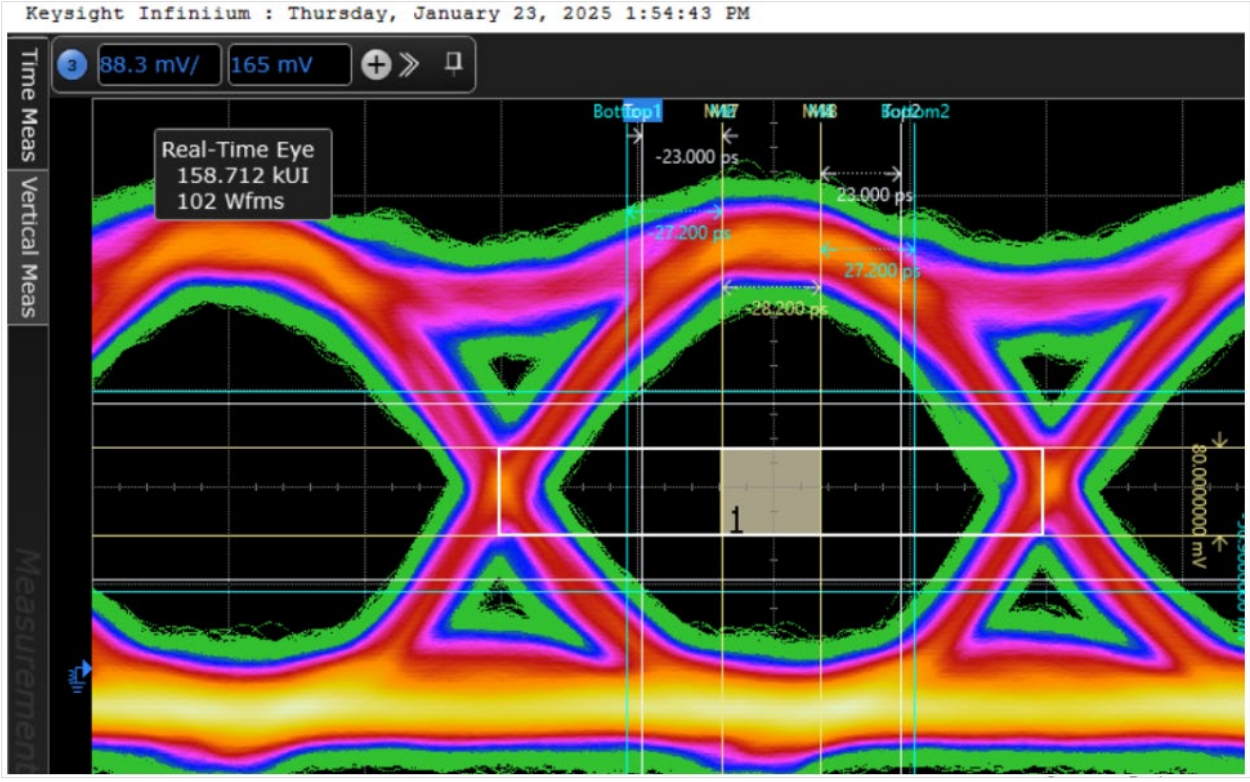

Figure 5. Images of worst-case failures are included in the LPDDR6 summary report for appropriate tests.

Automation

The Remote Programming Interface feature enables full automation of application tests and Add-Ins from a separate PC. Users can easily create and run automation scripts directly within the application through a built-in client.

Commands for each task can be generated using the Command Wizard or by accessing "Remote Interface hints" throughout the user interface. This automation capability accelerates complex testing scenarios and enables automation of tasks, such as:

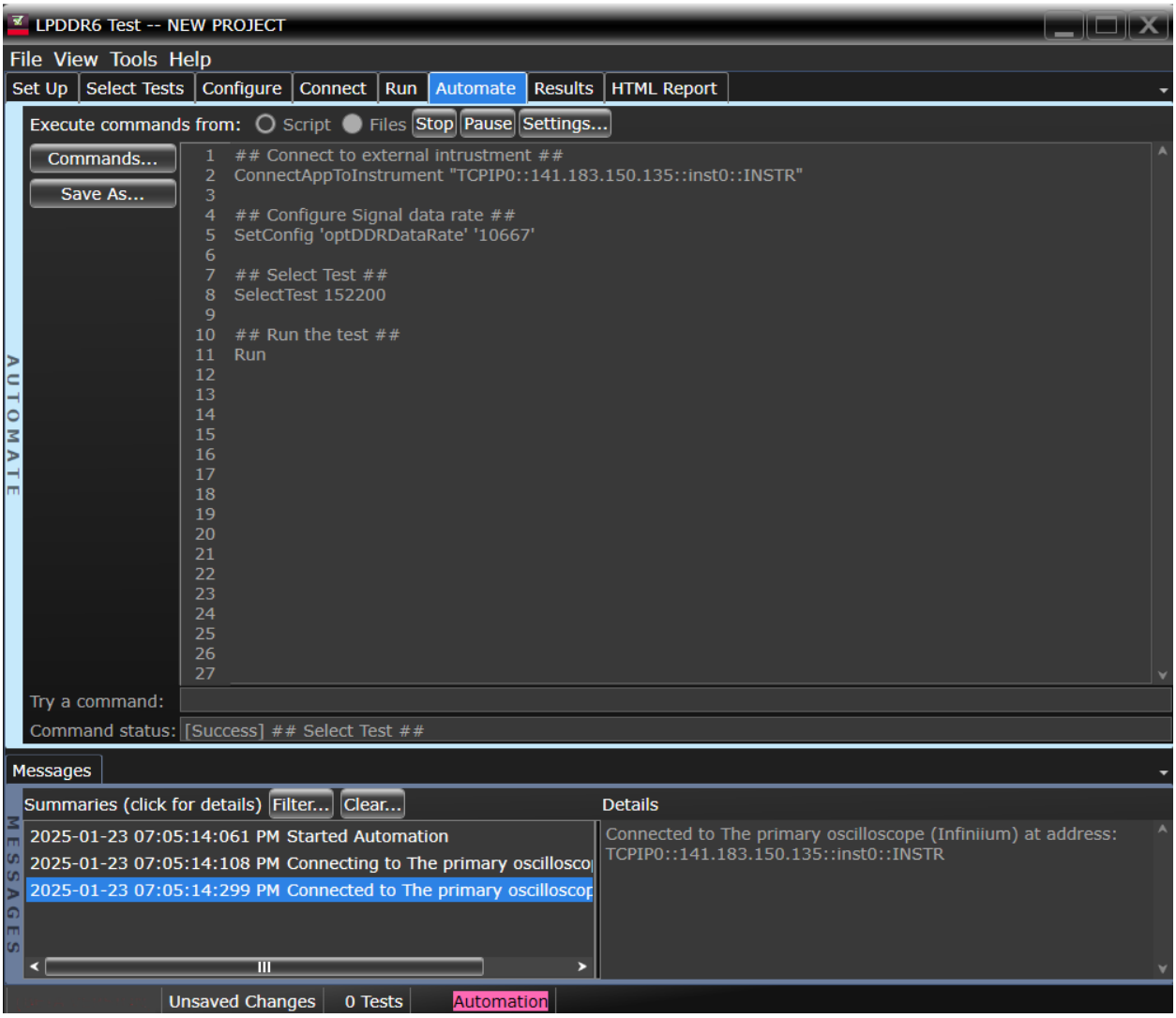

Figure 6. Remote Programming script in the Automation tab.

- Opening projects, running tests, and saving results
- Repeating tests with varying configurations
- Sending commands to external instruments
- Running tests in non-sequential order

Recommended Oscilloscope

The D9360LDDC LPDDR6 software is compatible with various series of oscilloscopes. Please refer to the release notes for the recommended oscilloscope software version.

Memory Type	Data Rate	Minimum Bandwidth	Channels	Description
LPDDR6	Up to 14.4 GT/s	25 GHz	4 Channels	Infiniium XR8, UXR series oscilloscope

Ordering Information

Software

Model Number	Description	Note
D9360LDDC	LPDDR6 Compliance Test Software	Required
D9320JITA	Jitter, vertical and phase noise analysis software	Required
D9320ASIA	Advanced Signal Integrity Software (EQ, InfiniiSim Advanced)	Optional

Example of LPDDR6 Hardware Configuration

Model Number	Description	Quantity
XR804KA-254	25 GHz Infiniium XR8 oscilloscope	1
MX0025A	25 GHz InfiniiMax Ultra probe amplifiers	4

Keysightcare Software Support Subscription Provides Peace of Mind Amid Evolving Technologies

Ensure your software is always current with the latest enhancements and measurement standards.

Gain additional insight into your problems with live access to our team of technical experts.

Stay on schedule with fast turnaround times and priority escalations when you need support.

Flexible Software Licensing and KeysightCare Software Support Subscriptions

Keysight offers a variety of flexible licensing options to fit your needs and budget. Choose your license term, license type, and KeysightCare software support subscription.

License Terms

Perpetual – Perpetual licenses can be used indefinitely.

Subscription – Subscription licenses can be used through the term of the license only (6, 12, 24, or 36 months).

License Types

Node-locked – License can be used on one specified instrument/computer.

Transportable – License can be used on one instrument/computer at a time but may be transferred to another using Keysight Software Manager (internet connection required).

USB Portable – License can be used on one instrument/computer at a time but may be transferred to another using a certified USB dongle (available for additional purchase with Keysight part number
E8900-D10).

Floating (single site) – Networked instruments/computers can access a license from a server one at a time. Multiple licenses can be purchased for concurrent usage.

Keysightcare Software Support Subscriptions

Perpetual licenses are sold with a 12 (default), 24, 36, or 60-month software support subscription. Support subscriptions can be renewed for a fee after that.

Subscription licenses include a software support subscription through the term of the license.

Selecting Your License

Step 1. Choose your software product (eg. S1234567A).

Step 2. Choose your license term: perpetual or subscription.

Step 3. Choose your license type: node-locked, transportable, USB portable, or floating.

Step 4. Depending on the license term, choose your support subscription duration.

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.

KEYSIGHT

This information is subject to change without notice. © Keysight Technologies, 2025, Published in USA, November 28, 2025, 3125-1400.EN