

D9360DDRC Keysight Transmitter Compliance Test Software for DDR6

The D9360DDRC Keysight Transmitter Compliance Test Software for DDR6 provides a fast and easy way to test, debug, and characterize DDR6 designs. DDR6 technology offers data rates up to 19.2 GT/s, enabling higher memory bandwidth and improved power efficiency. The software offers full test coverage to enable validation of the transmitter physical layer of DDR6 DRAM devices, DIMM modules, Registering Clock Drivers (RCDs), Data Buffers and host controllers.

Features

The software 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 DDR6 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 DDR6 memory system.
- Full coverage of Offline testing capability with waveform files for completeness of simulation to validation workflow.
- Automatically detects the DDR6 operating data rate, eliminating the need for manual entry and reducing setup time.
- Flexible Burst Separation Methods support DQS-DQ Phase Difference, Read-Only/Write-Only, CA1 + Burst Latency, and CA2 + Burst Latency burst identification algorithms, enabling reliable burst detection.



Burst Separation Methods

The software provides flexible burst separation methods to identify valid read and write bursts across different DDR6 waveform conditions. Users can select the method that best matches the captured signals, enabling reliable burst detection before eye, timing, jitter, and voltage measurements are performed.

Burst Identification Method	Signals Required	Read/Write Support	Notes
DQS-DQ Phase Difference	DQS, DQ	Read and Write	Accuracy depends on clear DQS-DQ phase relationship. Best suited for captures with a clear DQS-DQ phase relationship.
Read or Write Only	DQS, DQ	Read-only or Write-only	Simplest burst detection method. Fast processing and reduced ambiguity when traffic type is known.
CA1 + Burst Latency	DQS, DQ, CA1	Read and Write	Uses Read Latency/Write Latency information to locate bursts accurately. Suitable for mixed traffic captures. Uses the CA1 command address signal together with automatically or manually determined burst latency values to locate DQS bursts.
CA2 + Burst Latency	DQS, DQ, CA2	Read and Write	Uses Read Latency/Write Latency information to locate bursts accurately. Suitable for mixed traffic captures. Uses the CA2 command address signal together with automatically or manually determined burst latency values to locate DQS bursts.

Comprehensive Test Coverage

The software allows you to use the oscilloscope to perform automated testing and margin analysis on your DDR6 design. The software 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 software automates the measurement as specified in the specification, which helps save test time and design cost.

Easy Test Definition

The software enhances the usability of Keysight Infiniium oscilloscopes for testing DDR6 devices which includes the DRAM, register and data buffer. 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.

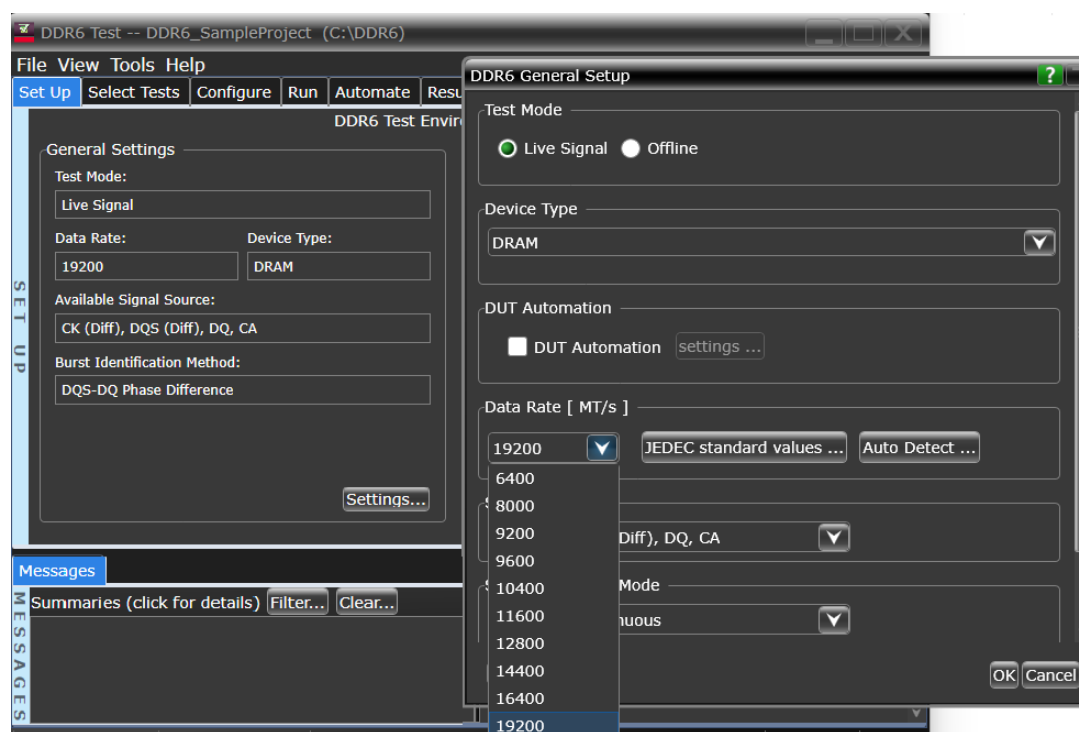


Figure 1. Test setup screen. Select the speed grade of your device.

Full Coverage for Offline Testing

The software supports offline execution of all test cases using waveform files in .wfm and .h5 formats. This enables compliance analysis, debugging, characterization, and validation without requiring a live instrument connection.

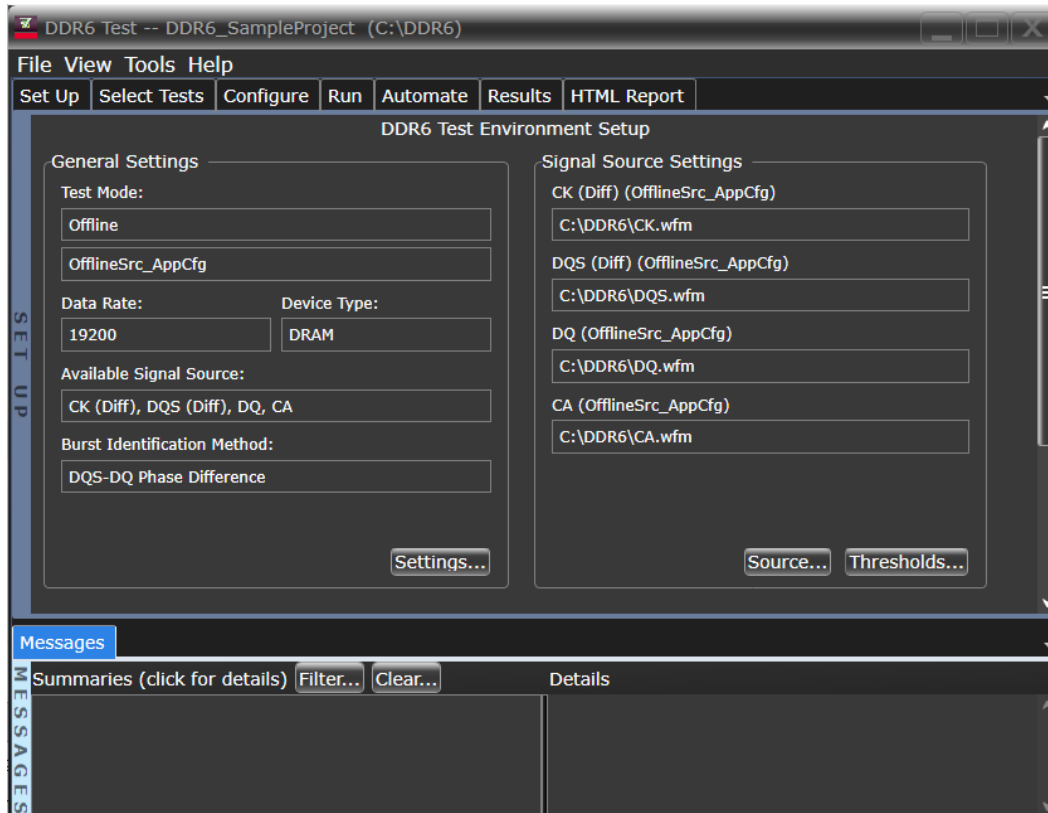


Figure 2. Offline test setup. Supports waveform files in .wfm or .h5 format.

Configurability and Guided Connection

The software 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.

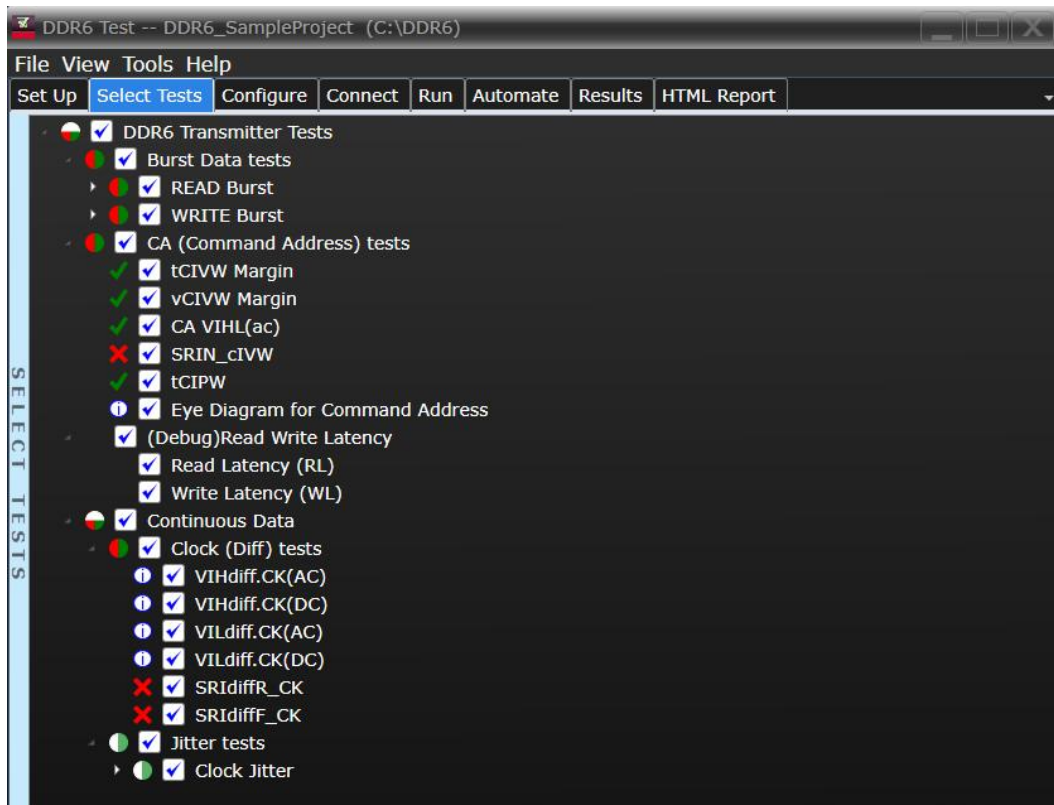
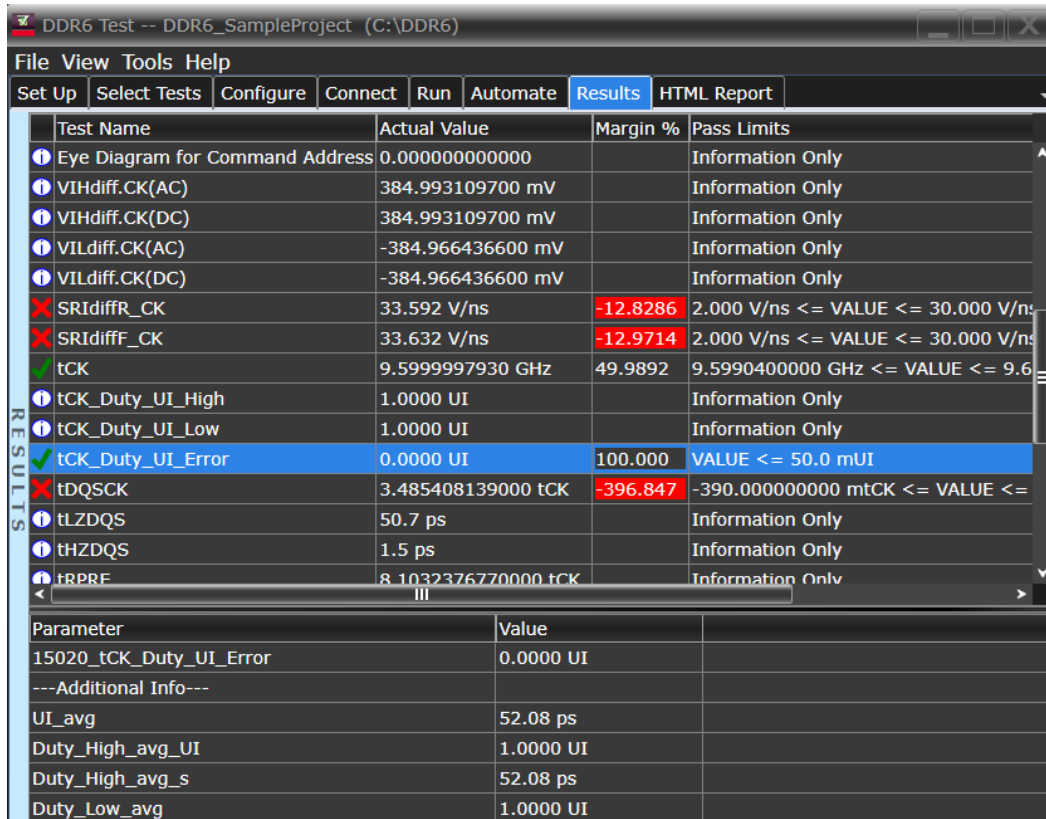


Figure 3. The Select Tab list all the tests available in your setup. You can easily setup the individual test or groups of tests.

Comprehensive Result Analysis

In addition to providing you with measurement results, the software 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.



Test Name	Actual Value	Margin %	Pass Limits
Eye Diagram for Command Address	0.000000000000		Information Only
VIHdiff.CK(AC)	384.993109700 mV		Information Only
VIHdiff.CK(DC)	384.993109700 mV		Information Only
VILdiff.CK(AC)	-384.966436600 mV		Information Only
VILdiff.CK(DC)	-384.966436600 mV		Information Only
SRIdiffR_CK	33.592 V/ns	-12.8286	2.000 V/ns <= VALUE <= 30.000 V/ns
SRIdiffF_CK	33.632 V/ns	-12.9714	2.000 V/ns <= VALUE <= 30.000 V/ns
tCK	9.5999997930 GHz	49.9892	9.5990400000 GHz <= VALUE <= 9.6
tCK_Duty_UI_High	1.0000 UI		Information Only
tCK_Duty_UI_Low	1.0000 UI		Information Only
tCK_Duty_UI_Error	0.0000 UI	100.000	VALUE <= 50.0 mUI
tDQSCK	3.485408139000 tCK	-396.847	-390.0000000000 mtCK <= VALUE <=
tLZDQS	50.7 ps		Information Only
tHZDQS	1.5 ps		Information Only
tRPRF	8.1032376770000 tCK		Information Only

Parameter	Value
15020_tCK_Duty_UI_Error	0.0000 UI
---Additional Info---	
UI_avg	52.08 ps
Duty_High_avg_UI	1.0000 UI
Duty_High_avg_s	52.08 ps
Duty_Low_avg	1.0000 UI

Figure 4. The software documents your test parameters, pass or fail status, test limits, measured values and margin.

Thorough Performance Reporting

The software 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.

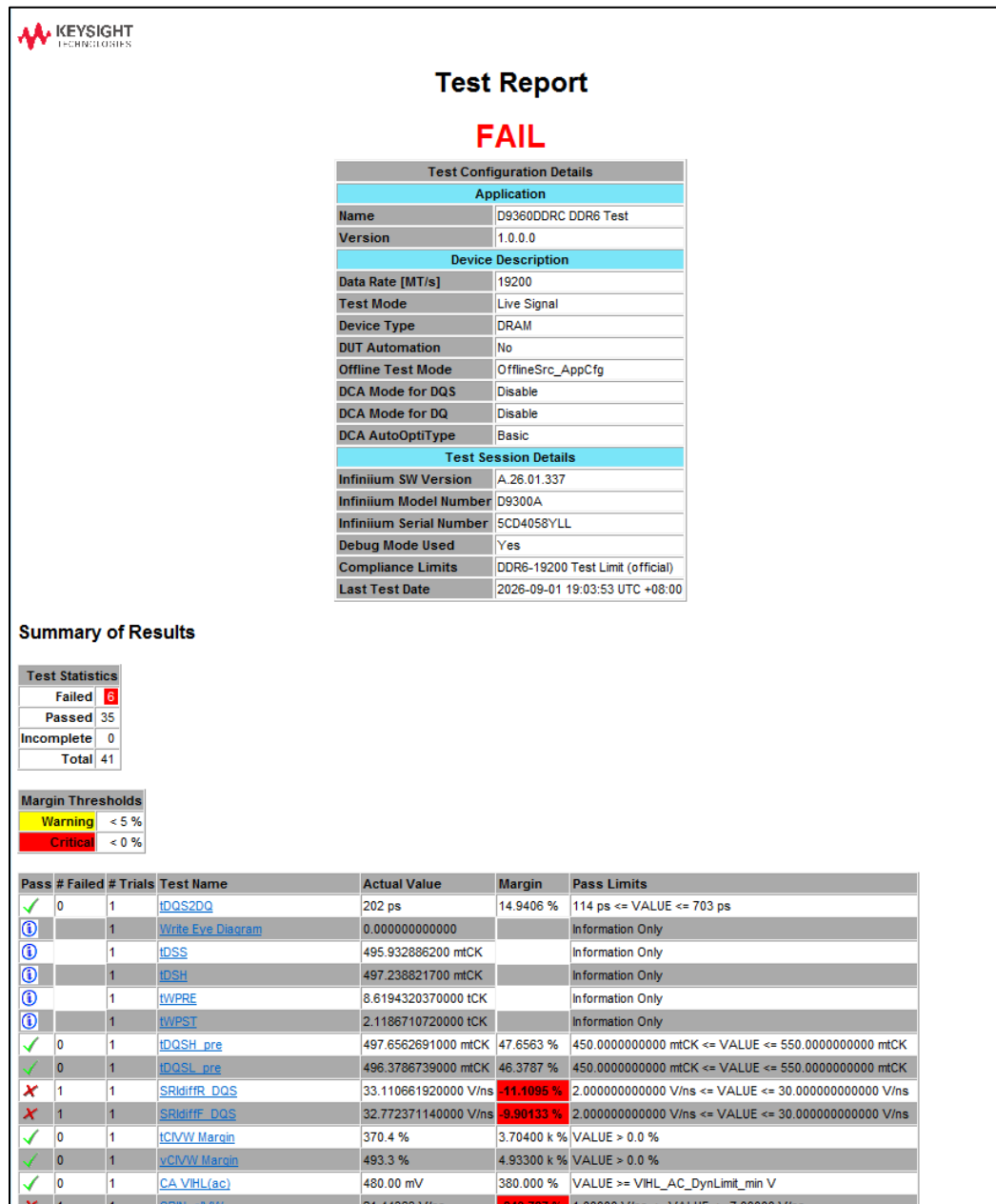


Figure 5. The software generates a summary report for quick results viewing. The report includes details such as test limits, test description and test results.

Automation

The Remote Programming Interface feature enables full automation of application tests and AddIns 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:

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

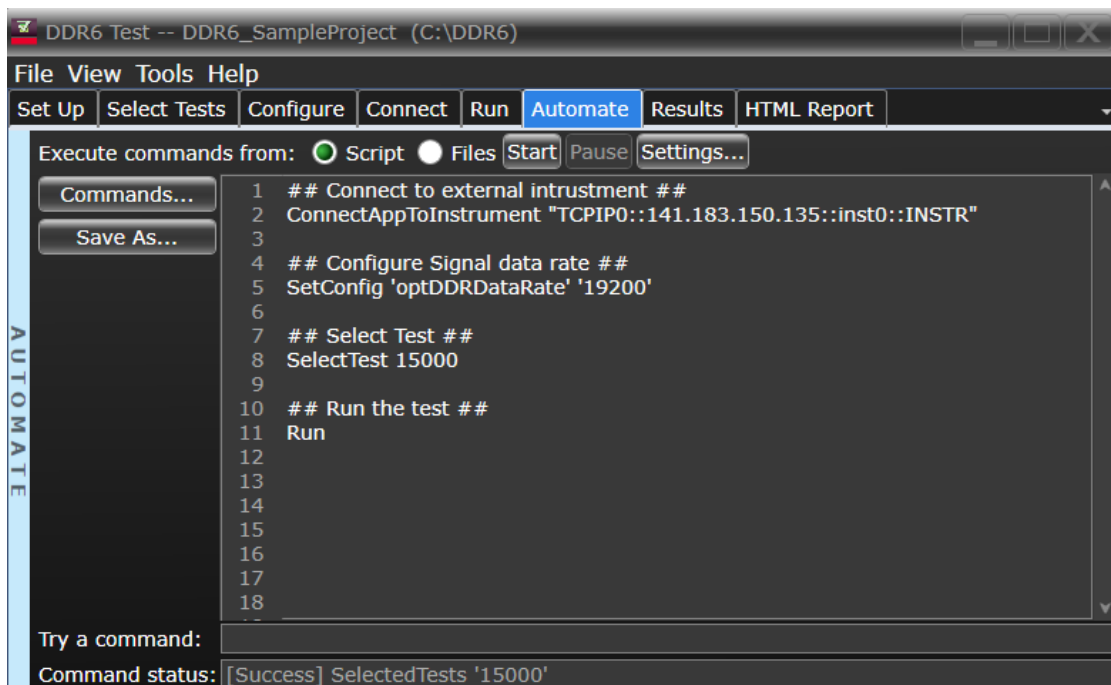


Figure 6. Remote Programming script in the Automation tab.

Recommended Oscilloscope

The D9360DDRC Keysight Transmitter Compliance Test Software for DDR6 is compatible with various series of oscilloscopes. Please refer to the release notes for the recommended oscilloscope software version.

Data Rate	Minimum Bandwidth	Recommended Bandwidth	Minimum Channels	Description
Silicon Characterization				
Up to 19200 MT/s	33 GHz	50 GHz	4	Infiniium UXR / XR8 / XR9 series oscilloscopes
System Validation				
Up to 19200 MT/s	20 GHz	33 GHz	4	Infiniium UXR / XR8 / XR9 series oscilloscopes

Ordering Information

Software on Oscilloscope

Model Number	Description	Note
D9360DDRC	Keysight Transmitter Compliance Test Software for DDR6	Required
D9320JITA	Jitter, vertical and phase noise analysis software	Required
D9320ASIA	Advanced signal integrity software (EQ, InfiniiSim Advanced)	Optional
D9020SCNA	InfiniiScan event identification software	Optional

Example Of Hardware Configuration

Model Number	Description	Quantity
XR804KA-254	25 GHz Infiniium XR8 oscilloscope	1
MX0025A	25 GHz InfiniiMax Ultra probe amplifiers	4
MX0100A	Micro probe head	1 (includes 5 probe heads, 1 bullet adapter)
MX0103A	Bullet adapter	3

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.

Subscription-Based Compliance Test Software Suites

A new ownership model of multiple Compliance Test Software Applications is now available.

With this new subscription-based model, the DDR software suites bundle the Compliance Test Software Applications under a model number. Using a subscription-based ownership, you can enjoy all the test software features covered under DDR across multiple generations and variants.

Software Support and Continuity

Under the subscription plan, software support is made available with no extra support cost. Ensuring your software always stays up to date with the latest enhancements and measurement standards while having access to our team of technical experts when you need support.

On top of that all upgrades are made available to you as the DDR standards progresses with no additional costs.

Subscription-Based Compliance Test Software Suites

Each suite comes with a 12, 24, or 36-month software suite subscription.

Model Number	Options Available
SW00DDRV DDR Validation License	DDR4 TX Validation (D9040DDRC) DDR5 TX Validation (D9350DDRC) or (D9050DDRC) DDR6 TX Validation (D9360DDRC)



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