D9050DDRC DDR5 Tx Compliance Test Software

The Keysight Technologies, Inc. DDR5 compliance test application software provides a fast and easy way to test, debug and characterize your DDR5 designs. DDR5 technology ofers high data rate of up to 6.5GT/s which enables higher bandwidth for data transfer with lower power. The DDR5 Tx compliance software offers full test coverage to enable testing of transmitter physical layer of the DDR5 DRAM, data buffer and register chips.

Features

The DDR5 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 DDR5 electrical, timing, eye diagram and jitter tests,
- Offline testing capability with waveform files for completeness of simulation to validation workflow.
- Easy interface to export the test result to the KS6800A series Data Analytics repository for quick analysis with the web-based visualization tool.

Comprehensive Test Coverage

The DDR5 compliance test application allows you to use the oscilloscope to perform automated testing and margin analysis on your DDR5 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 DDR5 compliance test automates the measurement as specified in the specification, which helps save test time and design cost.

Easy Test Definition

The test application enhances the usability of Keysight Infiniium oscilloscopes for testing DDR5 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 or the ADS simulation tool on your PC, freeing the oscilloscope for other data acquisition purposes.
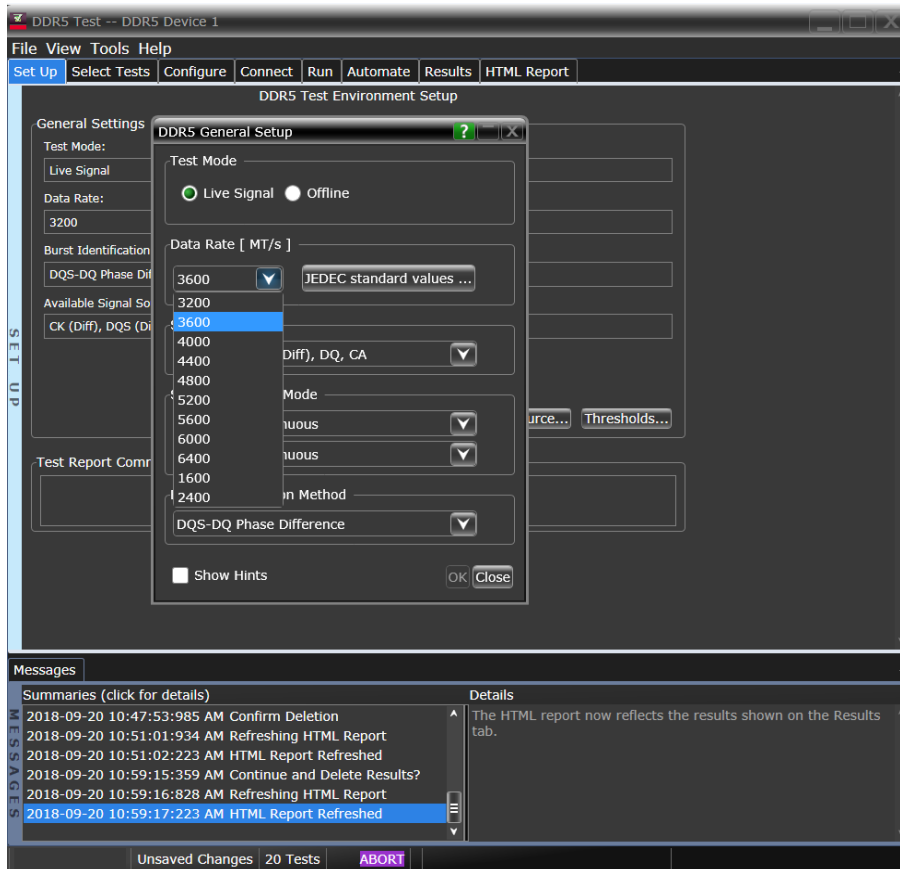

Figure 1: DDR5 application test setup screen. Select the speed grade of your device.
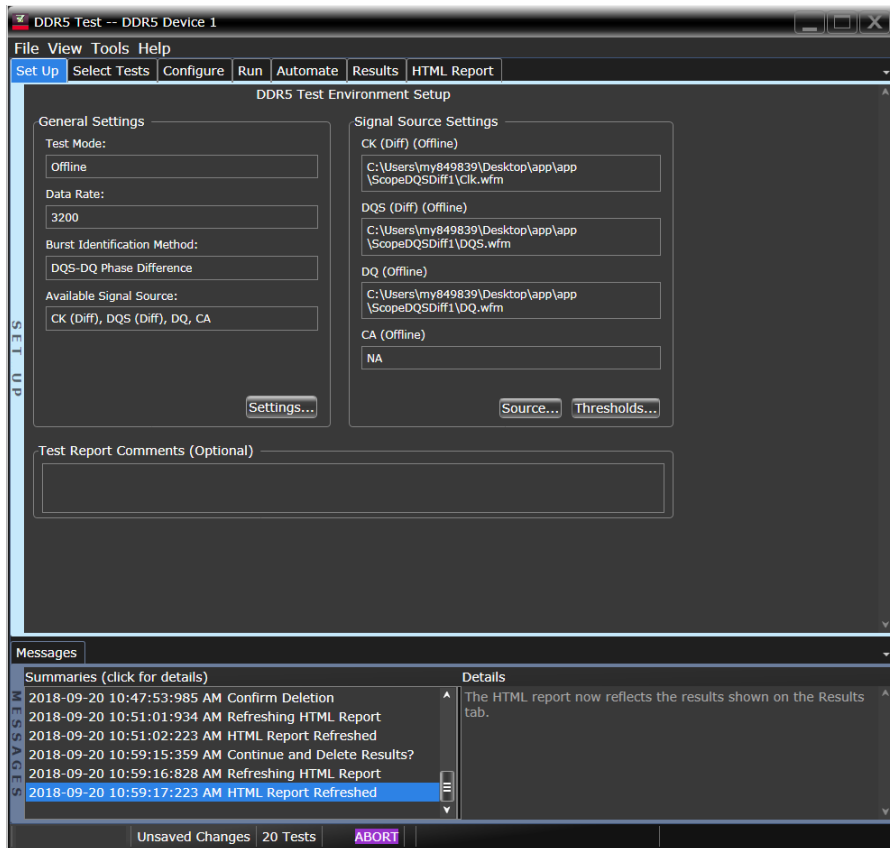
Figure 2: Offline test setup. Supports waveform files in .wfm or .h5 format.

Configurability and Guided Connection

The DDR5 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.
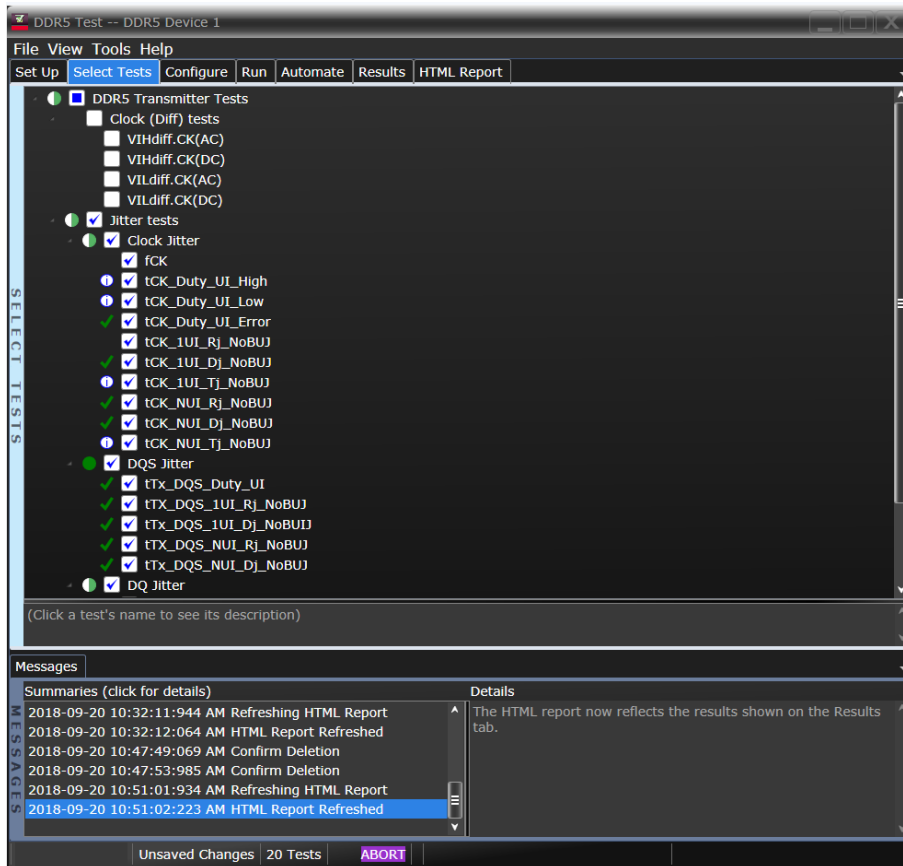
Figure 3: The Select Tab list all the tests available in your setup. You can easily setup the individual test or groups of tests.

Comprehensive Result Analysis

In addition to providing you with measurement results, the DDR5 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.
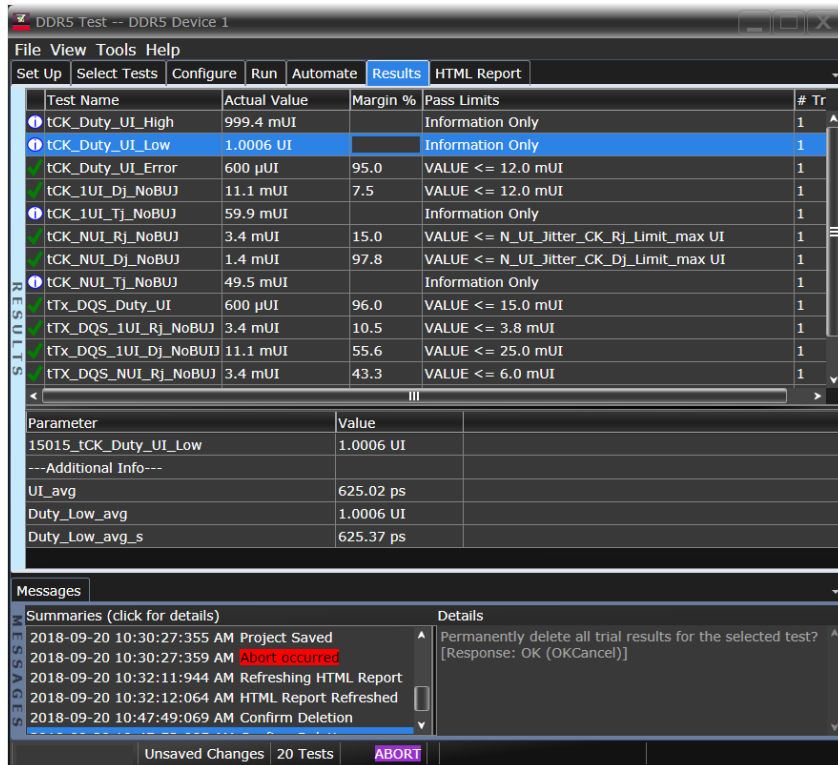
Test Name	Actual Value	Margin %	Pass Limits	# Tr
ⓘ tCK_Duty_UI_High	999.4 mUI		Information Only	1
ⓘ tCK_Duty_UI_Low	1.0006 UI		Information Only	1
✓ tCK_Duty_UI_Error	600 µUI	95.0	VALUE <= 12.0 mUI	1
✓ tCK_1UI_Dj_NoBUJ	11.1 mUI	7.5	VALUE <= 12.0 mUI	1
ⓘ tCK_1UI_Tj_NoBUJ	59.9 mUI		Information Only	1
✓ tCK_NUI_Rj_NoBUJ	3.4 mUI	15.0	VALUE <= N_UI_Jitter_CK_Rj_Limit_max UI	1
✓ tCK_NUI_Dj_NoBUJ	1.4 mUI	97.8	VALUE <= N_UI_Jitter_CK_Dj_Limit_max UI	1
ⓘ tCK_NUI_Tj_NoBUJ	49.5 mUI		Information Only	1
✓ tTX_DQS_Duty_UI	600 µUI	96.0	VALUE <= 15.0 mUI	1
✓ tTX_DQS_1UI_Rj_NoBUJ	3.4 mUI	10.5	VALUE <= 3.8 mUI	1
✓ tTX_DQS_1UI_Dj_NoBUJ	11.1 mUI	55.6	VALUE <= 25.0 mUI	1
✓ tTX_DQS_NUI_Rj_NoBUJ	3.4 mUI	43.3	VALUE <= 6.0 mUI	1

Parameter	Value
15015_tCK_Duty_UI_Low	1.0006 UI
---Additional Info---	
UI_avg	625.02 ps
Duty_Low_avg	1.0006 UI
Duty_Low_avg_s	625.37 ps

Messages

Summaries (click for details)
2018-09-20 10:30:27:355 AM Project Saved
2018-09-20 10:30:27:359 AM Abort occurred
2018-09-20 10:32:11:944 AM Refreshing HTML Report
2018-09-20 10:32:12:064 AM HTML Report Refreshed
2018-09-20 10:47:49:069 AM Confirm Deletion

Details
Permanently delete all trial results for the selected test?
[Response: OK (OKCancel)]

Unsaved Changes | 20 Tests | ABORT

Figure 4: The DDR5 test application documents your test parameters, pass or fail status, test limits, measured values and margin.

Data Analytics

The KS6810A data analytics web service software provides an interface that allows the user to export the test result directly to the data repository server via a URL. The user can retrieve the aggregated measurement to be viewed using the visualization tool included in the KS6810A software. The visualization tool provides graphical plots in histogram or line mode that describes the measurement in different test conditions or properties.
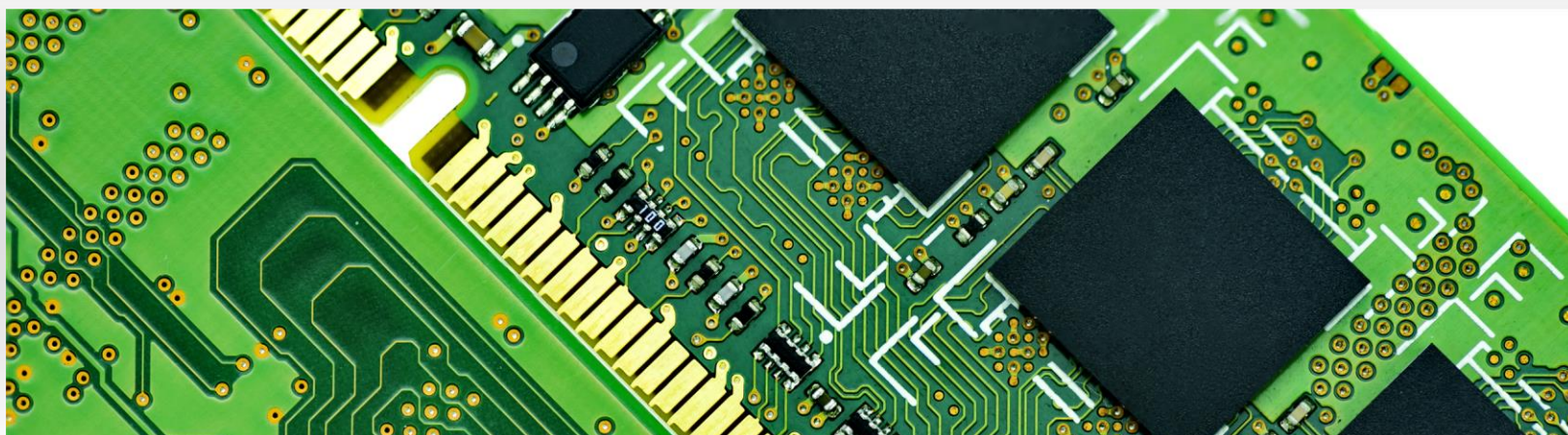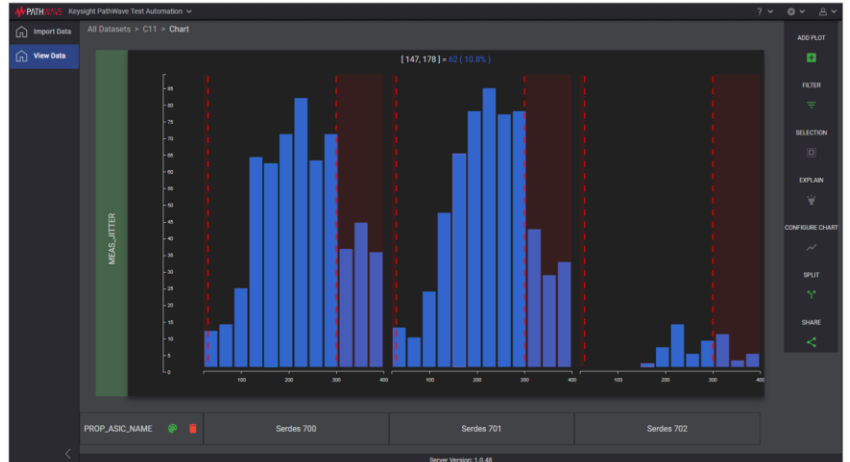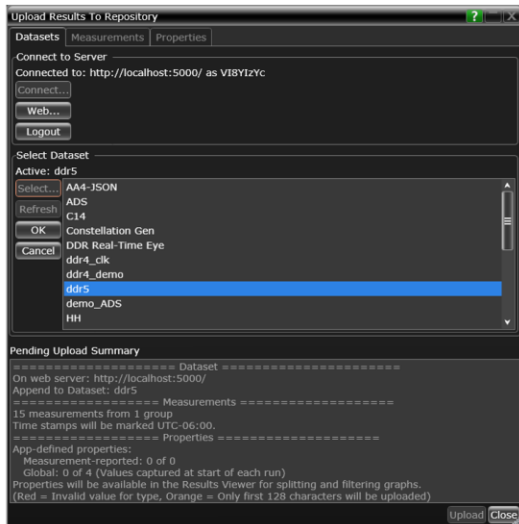
Figure 5: User can import test results to the KS6810A software from the DDR5 Tx Compliance Test software and view the test results with the visualization tool.

Thorough Performance Reporting

The DDR5 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.
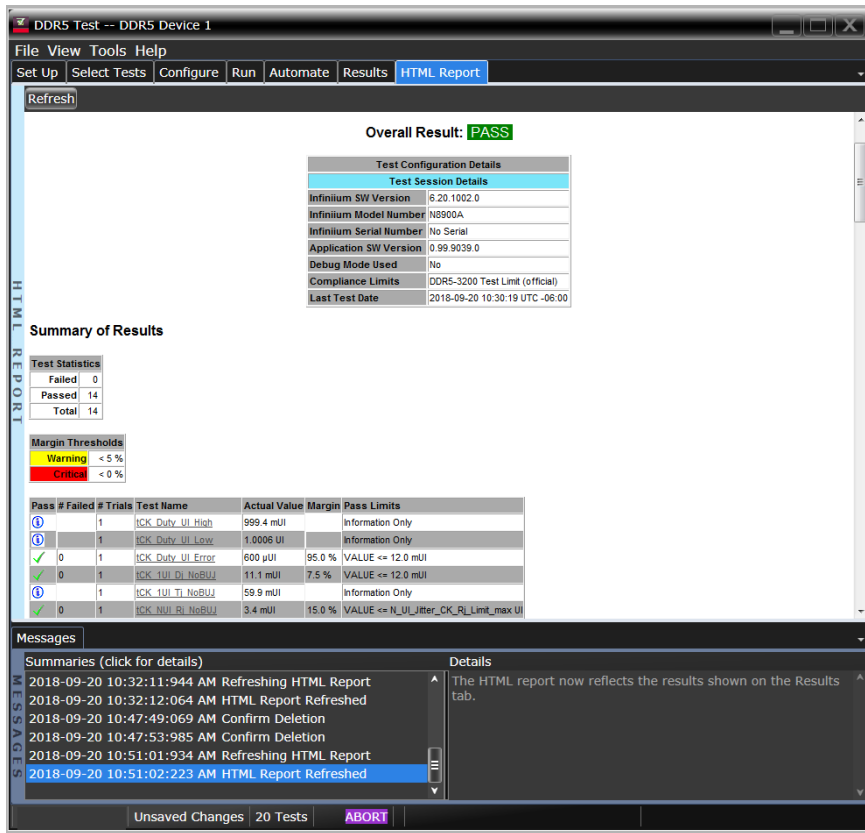
Figure 6: The DDR5 test application generates a summary report for quick results viewing. The report includes details such as test limits, test description and test results.

Recommended oscilloscope

The DDR5 software is compatible with the Infiniium series oscilloscopes with operating software revision of 6.30 or higher.

Data rate	Minimum Bandwidth	Minimum Channels	Description
Up to 6500 MT/s	16 GHz	2	Infiniium V-series, Z-series, UXR oscilloscopes

Ordering Information

Software

Model number	Description	Note
D9050DDRC	DDR5 Compliance Test Software	Required
D9020JITA	Jitter, Vertical and Phase Noise Analysis Software	Required
D9020ASIA	Advanced Signal Integrity Software (EQ, InfiniiSim Advanced)	Optional
D9020SCNA	InfiniiScan Event Identification Software	Optional
KS6810A	Data Analytics software (1 license)	Optional

Example of Hardware Configuration

Model number	Description	Quantity
UXR0164A	16 GHz Infiniium oscilloscope	1
1169B	12GHz InfiniiMax II probe amplifiers	Minimum 2
N5442A	Precision BNC adapter	2
MX0100A	Micro probe head	1 (includes 5 probe heads, 1 bullet adapter)
MX0103A	Bullet adapter	1

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.

Time-based – Time-based 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.

Time-based licenses include a software support subscription through the term of the license.

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.

Selecting your license:

Step 1. Choose your software product (eg. S1234567A).
Step 2. Choose your license term: perpetual or time-based.
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.

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