

M80885RCA DDR5 Receiver

Conformance and Characterization Software

The Keysight Technologies, Inc. M80885RCA DDR5 receiver conformance and characterization software provides a fast and easy way to test, debug and characterize your DDR5 designs. DDR5 technology offers high data rate of up to 6.4GT/s which enables higher bandwidth for data transfer with lower power. The M80885RCA offers full test coverage to enable testing of receiver physical layer of the DDR5 DRAM, data buffer and register chips.



Features

- Remote control of the main test instrumentation
- Automatically program your DUT into test mode for each test
- Automated calibration following the procedure recommended in the specification
- Automatic and unattended conformance testing and characterization measurements
- Quick and easy measurement results to assess the performance of your DUT without expertise in BERT and DDR5 standard
- Support for Data Analytics using KS6800A Data Analytics Web Service Software

Comprehensive Test Coverage

The M80885RCA DDR5 receiver test application allows you to use the M8020A J-BERT to perform automated testing and margin analysis on your DDR5 receiver design. The application automatically configures the J-BERT for each test and provides an informative test result. It includes margin analysis indicating how close your device comes to passing or failing each test parameter. The DDR5 receiver test application automates the measurement as specified in the specification, which helps to save test time and design cost.

Easy Test Definition and DUT Control

The test application enhances the usability of the Keysight M8020A J-BERT and 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 and calibrate the test setup, perform the tests and view the test results. In addition to selecting the type of DUT and to put it into test mode, you can select categories of tests or select individual tests. The user interface is designed to minimize unnecessary reconnections, which will help save test time and minimize potential operator errors. You can save the tests results and configurations as project files and recall them for quick testing and review previous results.

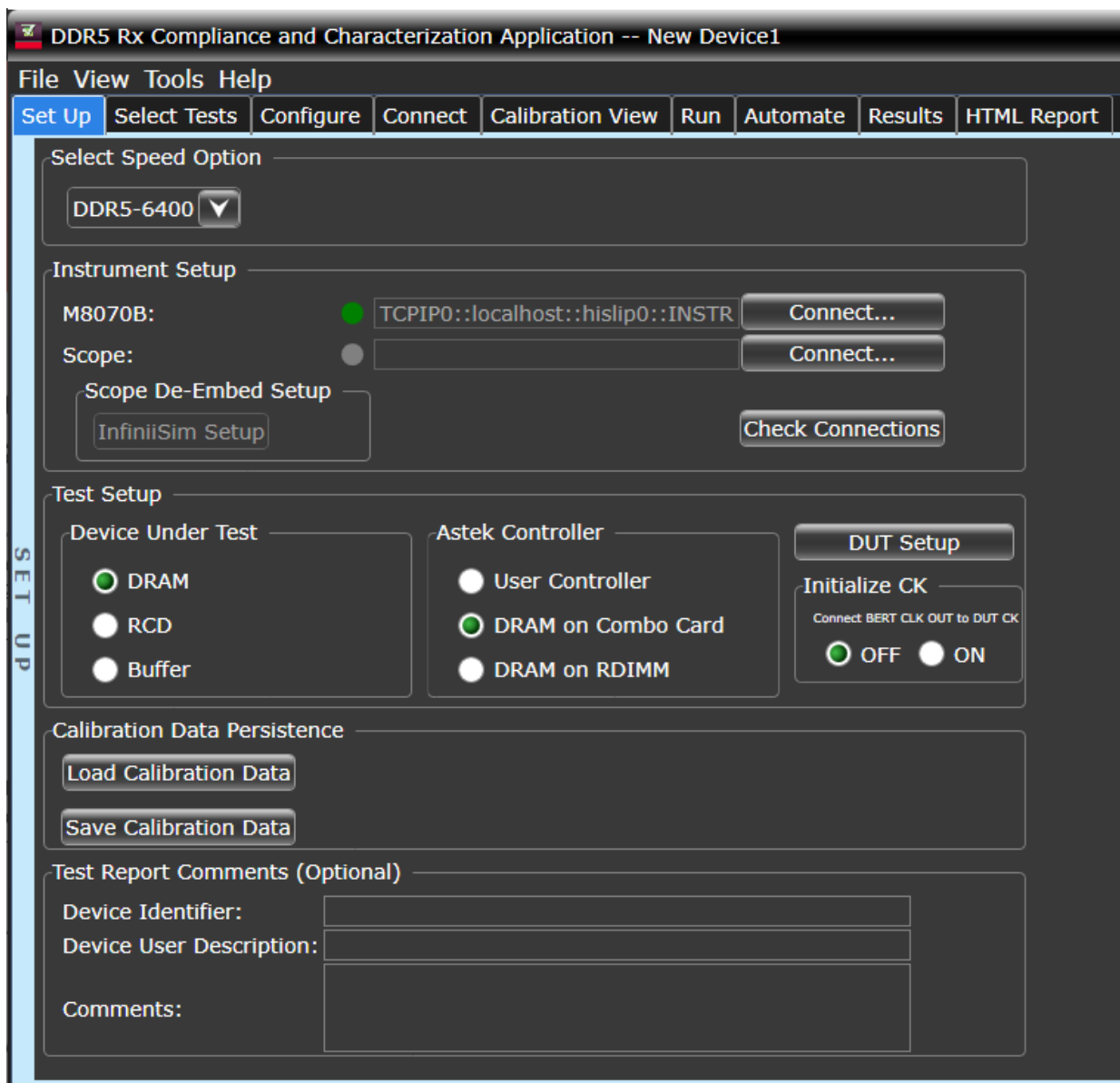


Figure 1. DDR5 application test setup screen. Select the speed grade of your device.

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 termination voltage, amplitude and delay step sizes target BER ratio and target confidence level. 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.

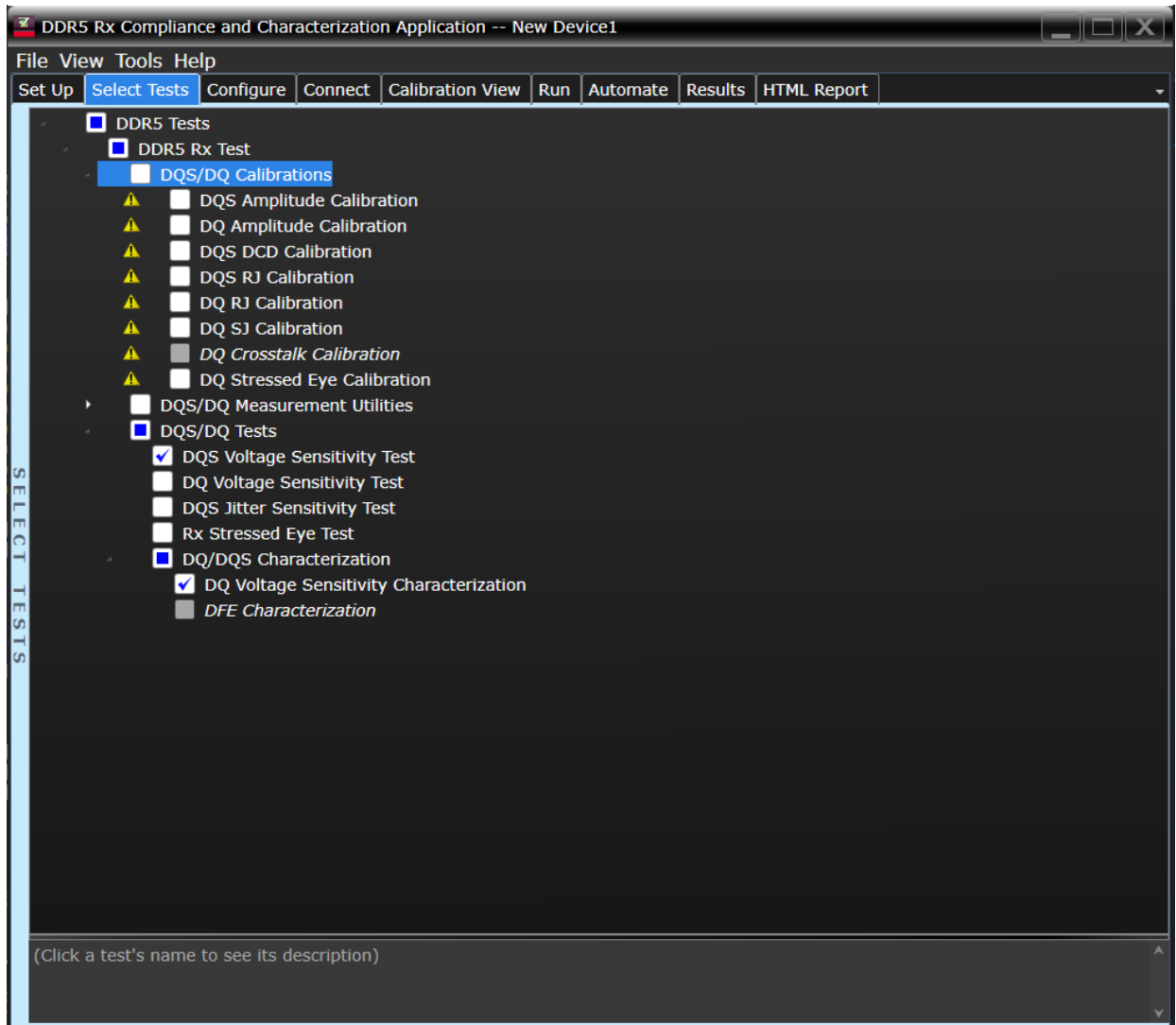


Figure 2. The Select Tests Tab list all calibrations and tests available in your setup. You can easily setup individual tests or groups of tests.

Comprehensive Result Analysis

In addition to providing you with measurement results, the DDR5 conformance 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.

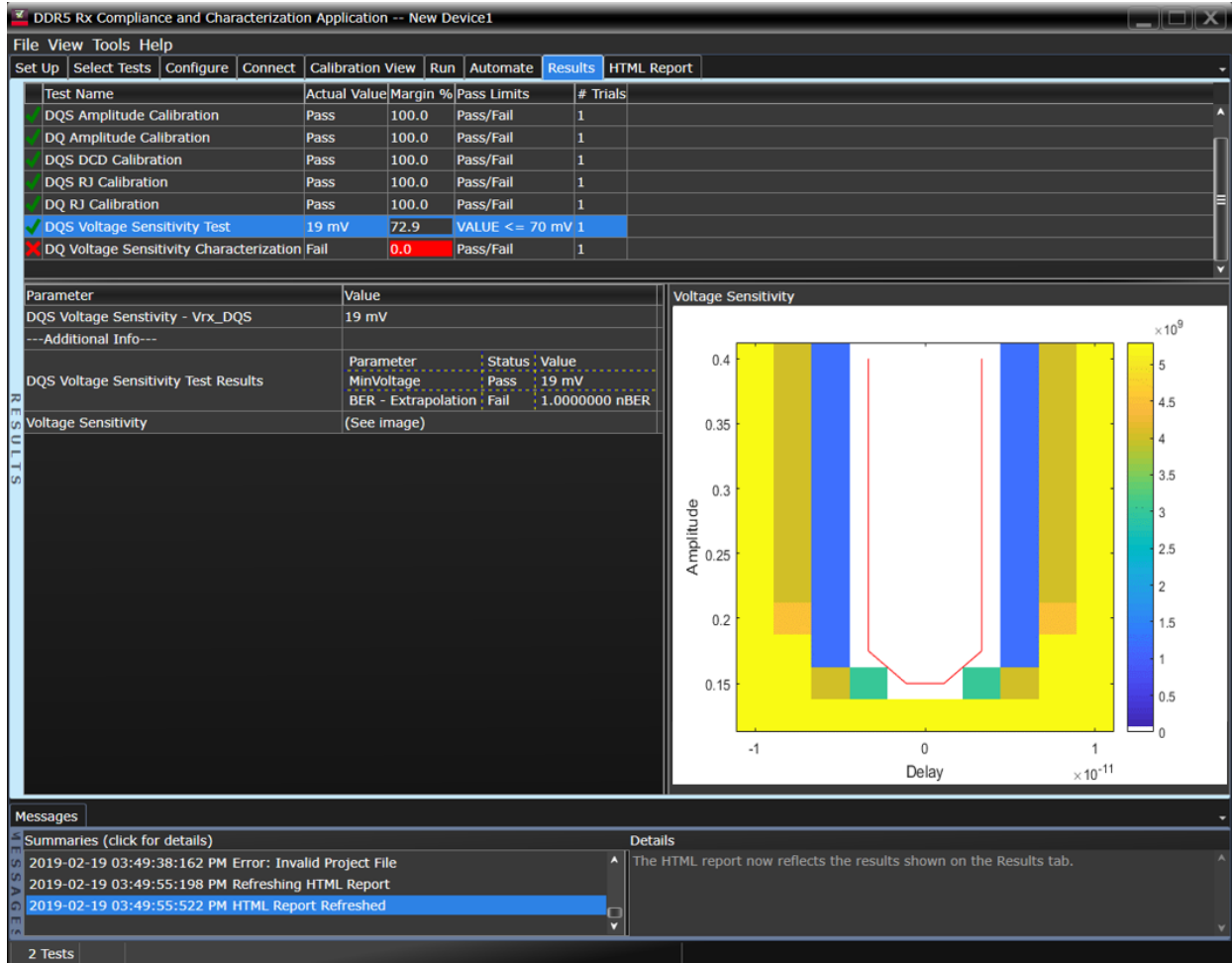


Figure 3. The DDR5 test application documents your test parameters, pass or fail status, test limits, measured values and margin.

Test Setup Calibration

The DDR5 Rx test application supports automatic calibration of the test setup. All calibration steps are automated. The test application prompts the user when user interaction is required for connecting the test setup. Detailed connection diagrams and instructions are provided by the test application. Calibration results are visualized in the Calibration View Tab.

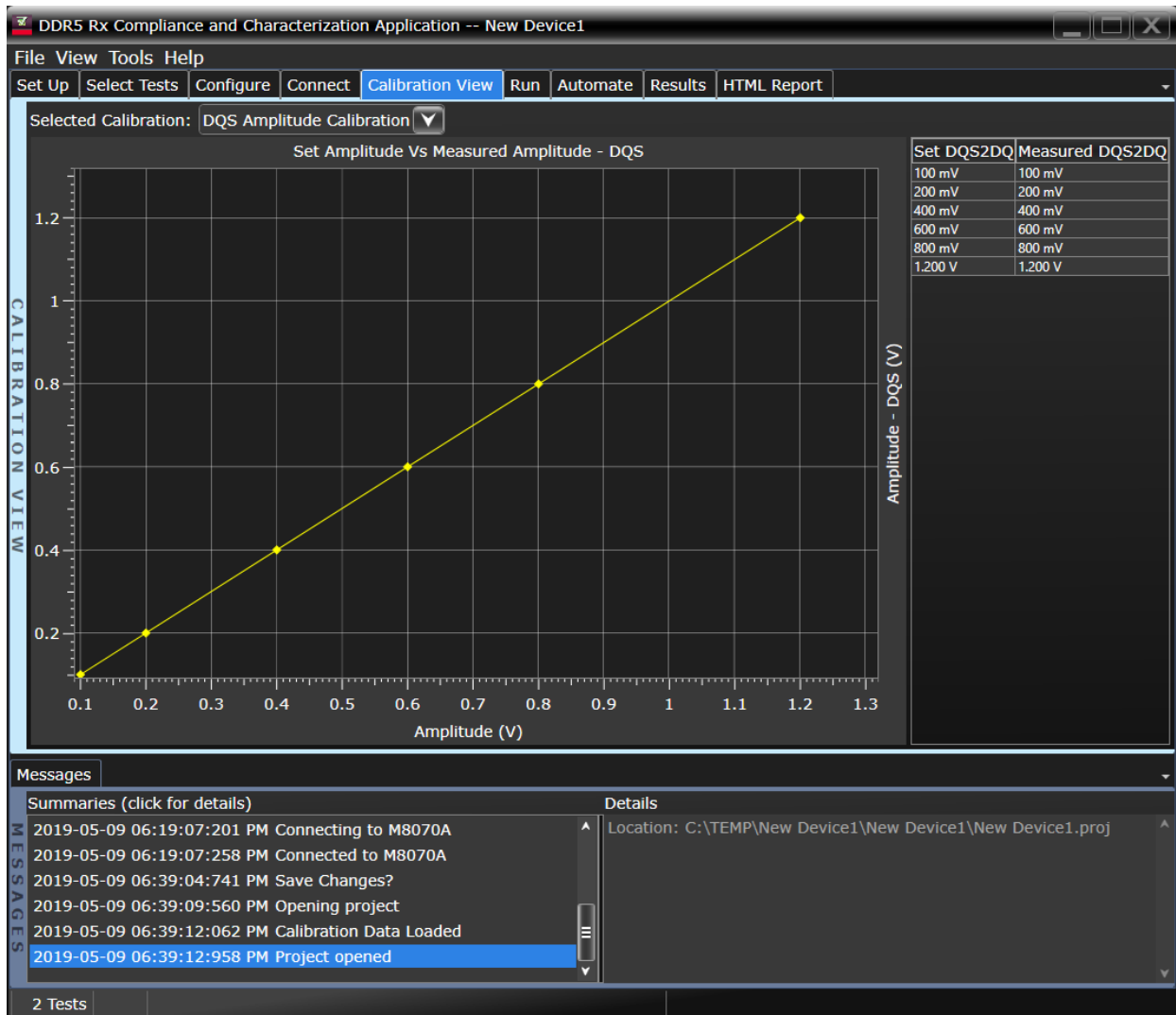


Figure 4. Individual calibration results can be visualized in the Calibration View Tab.

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.

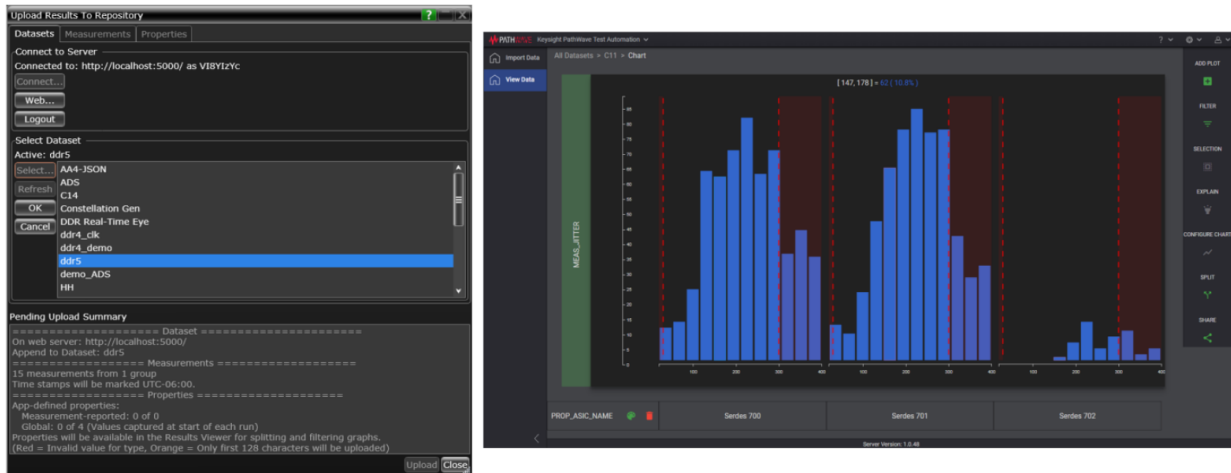


Figure 5. Users can import test results to the KS6810A software from the M80885RCA Rx Conformance and Characterization software and view test results with the visualization tool.

Thorough Test Reporting

The DDR5 compliance test application generates HTML reports that captures the performance, status and margins of your device under test. It also visualizes number of bit errors over amplitude and skew and extrapolation to the target BER. This report is suitable for printing and sharing with your test vendors, customers and suppliers.

Test Report

Overall Result: **FAIL**

Test Configuration Details

Device Description	
Speed Option	DDR5-4800
Loopback Phase Option	Full DataRate

Test Session Details

BERT SW Version	6.0.100.2
BERT Model Number	M80708
BERT Serial Number	MY57700006
Application SW Version	1.0.1.0
Debug Mode Used	No
Compliance Limits	DDR5 4800 Rx Test Limit (official)
Last Test Date	2019-02-19 15:40:19 UTC +01:00

Summary of Results

Test Statistics

Failed	1
Passed	7
Total	8

Margin Thresholds

Warning	< 5 %
Critical	< 0 %

Pass	Failed	# Trials	Test Name	Actual Value	Margin	Pass Limits
✓	0	1	DQS2DQ Stew Calibration	Pass	100.0 %	Pass/Fail
✓	0	1	DQS Amplitude Calibration	Pass	100.0 %	Pass/Fail
✓	0	1	DQ Amplitude Calibration	Pass	100.0 %	Pass/Fail
✓	0	1	DQS DCD Calibration	Pass	100.0 %	Pass/Fail
✓	0	1	DQS RJ Calibration	Pass	100.0 %	Pass/Fail
✓	0	1	DQ RJ Calibration	Pass	100.0 %	Pass/Fail
✓	0	1	DQS Voltage Sensitivity Test	19 mV	72.9 %	VALUE <= 70 mV
✗	1	1	DQ Voltage Sensitivity Characterization	Fail	0.0 %	Pass/Fail

Report Detail

Messages

Summaries (click for details)

- 2019-02-19 03:49:38:162 PM Error: Invalid Project File
- 2019-02-19 03:49:55:198 PM Refreshing HTML Report
- 2019-02-19 03:49:55:522 PM HTML Report Refreshed

Details

The HTML report now reflects the results shown on the Results tab.

Unsaved Changes | 2 Tests

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 Instrument Configurations

Accessories are not listed.

BERT Stimulus and Error Detector (Base Victim)	
M8020A-BU2	Bundle consisting of one M9505A 5-slot AXIe Chassis with USB option
M8041A-C08	BERT one Channel Data Rate up to 8.5 Gb/s
M8041A-0A3	Analyzer Equalization, Module-wide License
M8041A-0G2	Second Channel for Pattern Generator, License
M8041A-0G3	Advanced Jitter Sources for Receiver Characterization, Module-wide License
M8041A-0G4	Multi-tap De-emphasis, Module-wide License
M8041A-0G5	Adjustable Intersymbol Interference (ISI), Module-wide License
M8041A-0G6	Reference Clock Input with Multiplying PLL, Clockgroup-wide License
M8041A-0G7	Advanced Interference Sources for Receiver Characterization, Module-wide License
M8041A-0A2	Second Channel for Analyzer, License
BERT Stimulus and Error Detector (Narrow Aggressor Extension)	
M8051A-G08	Pattern Generator one Channel Data Rate up to 8.5 Gb/s
M8051A-0G2	Second Channel for Pattern Generator, License
M8051A-0G3	Advanced Jitter Sources for Receiver characterization, Module-wide License
M8051A-0G4	Multi-tap De-emphasis, Module-wide License
M8051A-0G5	Adjustable Intersymbol Interference (ISI), Module-wide License
M8051A-0G7	Advanced Interference Sources for Receiver characterization, Module-wide License
Scope for Calibration (16 or 20 GHz scope – V or the new UXR series)	
UXR0204A	20 GHz Infiniium oscilloscope
D9020ASIA	Advanced Signal Integrity Software (EQ, InfiiniSimAdv, Crosstalk)
D9020JITA	Jitter, Vertical and Phase Noise Analysis Software
Test Automation Software	
M80885RCA	DDR5 RX Compliance and Characterization Tests
M8070ADVB	Advanced Measurement Package for M8000 Series BER Test Solutions
M8070B	System Software for M8000 Series of BER Test Solutions

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