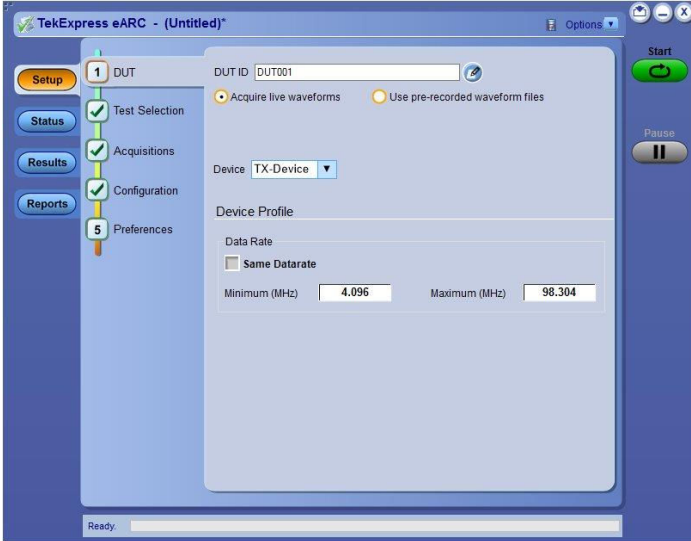


HDMI 2.1 eARC Compliance Test Solution

Option EARC21TX/EARC21RX Datasheet



The Tektronix TekExpress® HDMI 2.1 eARC Solution is a fully automated compliance test software application for the HDMI 2.1 eARC standard. The application lets you take full advantage of validation and debug capabilities, in addition to compliance testing. The complete testing solution enables you to pass strict compliance tests with greater confidence in the design margins under real-world conditions. Option EARC21TX and EARC21RX HDMI 2.1 eARC compliance test software automates a comprehensive range of tests according to the CTS, enabling unprecedented, efficient reliable test results.

Key features

- **Test time:** Fully automated with a setup wizard, to perform compliance testing in accordance with the HDMI 2.1 eARC standards. The software provides equipment connection diagrams, and automatically configures the test equipment for each test.
- **Test coverage:** HDMI 2.1 eARC solution is designed to comply with the HDMI forum CTS 2.1b specifications.
- **Signal qualification:** In addition to compliance testing, automated tests and advanced jitter analysis tools are provided for testing the DUT under different environmental conditions.
- **Comprehensive report:** Automated reporting with Pass/Fail notification that include limit margins.
- **Measurement accuracy:** Accurate source tests use precise measurement techniques. Dependable sink tests with closed-loop measurements that eliminate non linearities in the test equipment setup.
- **Solution setup:** The HDMI 2.1 eARC Rx solution setup does not require any additional equipment to generate common mode

information and is a fast and efficient direct synthesis solution. The solution uses an AWG for tolerance tests and all eARC Rx tests.

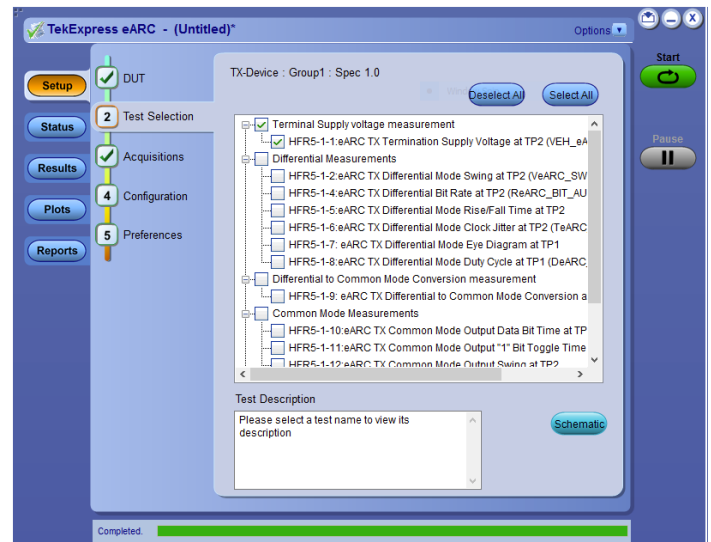
- **Performance verification:** The HDMI 2.1 eARC application allows you to run the selected test for multiple times and includes pass/fail results for each run.

Fully automated HDMI 2.1 eARC compliance testing

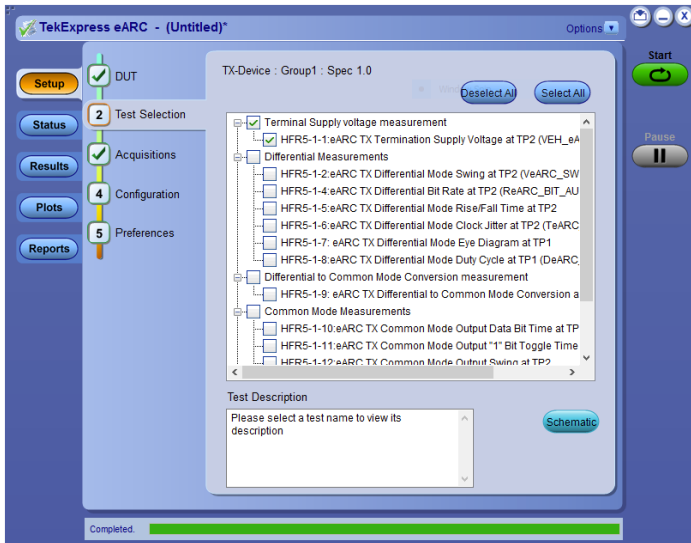
The Tektronix HDMI 2.1 eARC solution is supported on DPO/DSA/MSO7000/70000/C/D/DX/SX Series real-time oscilloscopes with bandwidth ≥ 2.5 GHz. The solution also uses a Tektronix AWG 5202/04/08 for tolerance tests and other transceiver/ receiver tests.

The HDMI 2.1 eARC compliance application consists of eARC TX and RX measurements.

The TekExpress eARC compliance software allows for complete or selective testing of any of the transmitter electrical specifications, with automated complete oscilloscope control of the required setups. Software setup flexibility allows you to perform design validation, margin analysis, and repeatable compliance testing by reducing instrument setup difficulties. In addition, the software can generate a comprehensive date-stamped test report with pass/fail results, waveform plots, oscilloscope display screen shots, and margin analysis to provide more insights into your design.

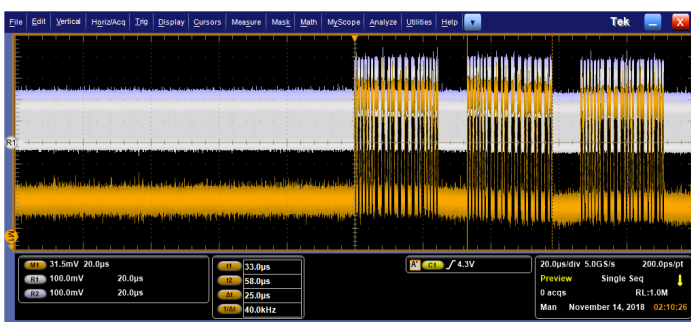
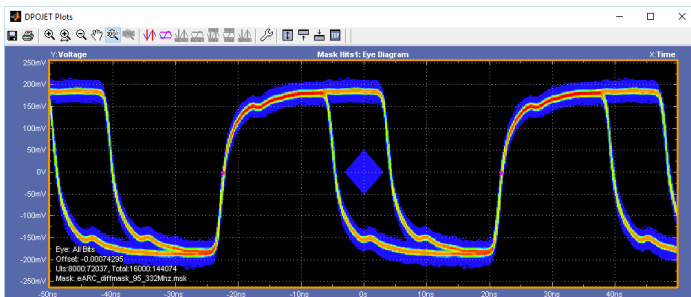


TekExpress HDMI 2.1 eARC Test Selection tab – eARC Tx



TekExpress HDMI 2.1 eARC Test Selection tab – eARC Rx

The HDMI 2.1 eARC compliance software allows you to select all or any specific tests through a simple Setup menu. Software navigation follows a logical workflow for quick test setups, changes, and review of test results.



HDMI 2.1 eARC Tx measurements are grouped as:

- Terminal supply voltage measurements
- Differential measurements
- Common mode measurements
- Differential to common mode conversion measurement
- Input swing tolerance measurement

HDMI 2.1 eARC Rx measurements are grouped as:

- Common mode output measurements
- Tolerance measurements

Test setup connections vary for the measurements. To help testers correctly setup the connections for the measurement, the HDMI 2.1 eARC software provides instructions for each test, with images and reference illustrations.

Supported HDMI 2.1 eARC Tx tests

Test items	Test name
HFR5-1-1	eARC TX Termination Supply Voltage at TP2 (VEH_eARC)
HFR5-1-2	eARC TX Differential Mode Swing at TP2 (VeARC_SWING_DM2)
HFR5-1-4	eARC TX Differential Bit Rate at TP2 (ReARC_BIT_AUDIO)
HFR5-1-5	eARC TX Differential Mode Rise/Fall Time at TP2 (TeARC_DM2_RISE_FALL)
HFR5-1-6	eARC TX Differential Mode Clock Jitter at TP2 (TeARC_DM2_CLK_JITTER)
HFR5-1-7	eARC TX Differential Mode Eye Diagram at TP1
HFR5-1-8	eARC TX Differential Mode Duty Cycle at TP1 (DeARC_DM1)
HFR5-1-9	eARC TX Differential to Common Mode Conversion at TP2 (VeARC_DM2_CM_CONV) Not needed to test for eARC Compliance as per the CTS
HFR5-1-10	eARC TX Common Mode Output Data Bit Time at TP2 (TeARC_BIT_CM)
HFR5-1-11	eARC TX Common Mode Output "1" Bit Toggle Time at TP2 (TeARC_TGL_CM)
HFR5-1-12	eARC TX Common Mode Output Swing at TP2 (UeARC_MASTER_SWING_CM2)
HFR5-1-13	eARC TX Common Mode Input Swing Tolerance at TP2 (UeARC_SLAVE_SWING_CM2)
HFR5-1-15	eARC TX Common Mode Output Rise/Fall Time (10%-90%) at TP2 (TeARC_RISE_FALL_CM)

Supported HDMI 2.1 eARC Rx tests

Test items	Test name
HFR5-2-1	eARC RX Termination Supply Voltage Tolerance at TP2 (VEH_eARC)
HFR5-2-2	eARC RX Differential Mode Swing Tolerance at TP2 (VeARC_SWING_DM2)
HFR5-2-4	eARC RX Differential Bit Rate Tolerance at TP1 (ReARC_BIT_AUDIO)
HFR5-2-5	eARC RX Differential Mode Eye Diagram Tolerance at TP1
HFR5-2-6	eARC RX Differential Mode Duty Cycle Tolerance at TP1 (DeARC_DM1)
HFR5-2-7	eARC RX Common Mode Output Data Bit Time at TP1 (TeARC_BIT_CM)
HFR5-2-8	eARC RX Common Mode Output "1" Bit Toggle Time at TP1 (TeARC_TGL_CM)
HFR5-2-9	eARC RX Common Mode Input Swing Tolerance at TP1 (UeARC_MASTER_SWING_CM1)
HFR5-2-10	eARC RX Common Mode Output Swing at TP1 (UeARC_SLAVE_SWING_CM1)
HFR5-2-12	eARC RX Common Mode Output Rise/Fall Time (10%-90%) at TP1 (TeARC_RISE_FALL_CM)

Ordering information

Required software	EARC21TX (TekExpress Advanced Analysis and Compliance Software for eARC TX tests) EARC21RX (TekExpress Advanced Analysis and Compliance Software for eARC RX tests) DJA (Advanced Jitter Analysis for use with TekScope Anywhere; DPO/DSA/MSO70000C/D/DX; DPO7000C or DPO/MSO5000 Oscilloscopes)
Required hardware	DPO/DSA/MSO7000/70000/C/D/DX/SX Series Real time Oscilloscopes with bandwidth \geq to 2.5 GHz.
Probing	Two, P6245 or TAP1500 (requires TCA-VPI adapters for 70K Oscilloscope) One, P6248 or TDP1500 (requires TCA-VPI adapters for 70K Oscilloscope)
Signal sources (AWG)	Tektronix AWG5202, AWG5204, AWG5208 Options for AWG: 250 - 10 GS/s Sample Rate (Interpolated from 5 GS/s); Node Locked Options for AWG: SEQ - Sequencing; Node Locked
Test fixtures	HDA2.1-PRB-TEAK (contains eARC main board, probe test adapter boards, and eARC 18-inch coaxial cables)
Power supply	24xx Series (SMU) or PWS4721/PWS4602/PWS4323/PWS4305/PWS4205
Analyzer	SL870 – for eARC Tx only (order from Simplay Labs)



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.

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9 Jun 2022 61W-61602-0
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