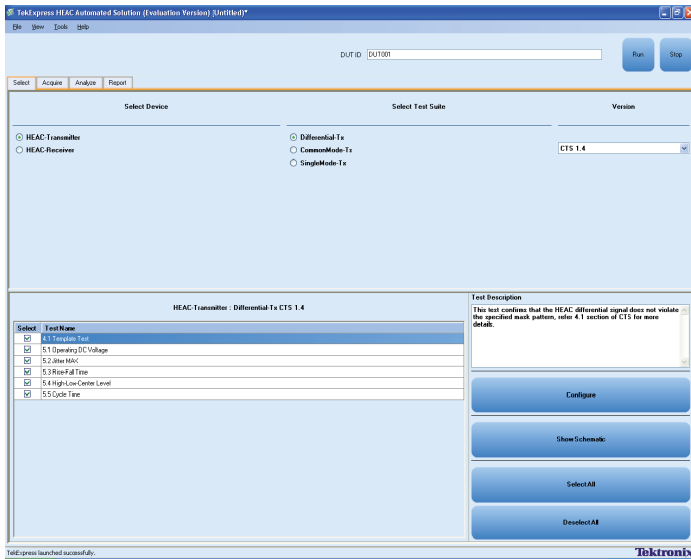


TekExpress HEAC Automated Compliance Software



Features & Benefits

- Conformance to HDMI 1.4a Standards and Compliance Test Specification 1.4a (CTS)
- Complete Validation to Standards with Wide Range of Tests for Source, Sink, and Cable Devices
- Sink Tests with Closed-loop Measurements that Eliminate Nonlinearities in Test Setup
- Fast, Efficient Direct Synthesis Method for Receiver Testing
 - Leverages the Software Method to Replace the Need to Use Different Hardware Elements to Meet ISI/Jitter Needs
 - No Dependency on Hardware Elements
- Reduce Test Times by Automating Complex Transmitter and Receiver Tests with Remote Control of Signal Sources
- Get Quick Results with Automatic Mask-Fit, Measurements and Pass/Fail Notification, and In-depth Reporting with Statistical Analysis and Mask Margins
- Ensure Faster Testing with One-button Selection of Multiple Tests
- Save Time with One-button CSV-format Summary and Reports
- Comprehensive HDMI 1.4a HEAC Solution including Test Fixtures, DPO/DSA/MSO70000 Series Real-time Oscilloscopes, P7300 or TDP1000 Series Differential Probes, P6245 or TAP1500 Series Active Probes, AWG5000/7000 Series Arbitrary Waveform Generators, and DSA8200 Sampling Oscilloscope

Applications

- Design and Validation of HEAC Physical Layer

HDMI Ethernet and Audio Return Channel (HEAC) Physical Layer Compliance Testing

Engineers designing and validating the HEAC physical layer of their devices face constant pressure to improve efficiency. Engineers need to perform a wide range of compliance tests quickly and reliably right on their bench.

HDMI 1.4a specification and HDMI Ethernet Audio Back Channel enables networking of HDMI devices, speeds up signaling between transmitter and receiver devices, and also provides a faster path for the audio return channel. Option HEAC Compliance Test Software, which meets the HDMI 1.4a HEAC specification, automates a comprehensive range of tests enabling unprecedented efficiency for performing HDMI 1.4a electrical validation.

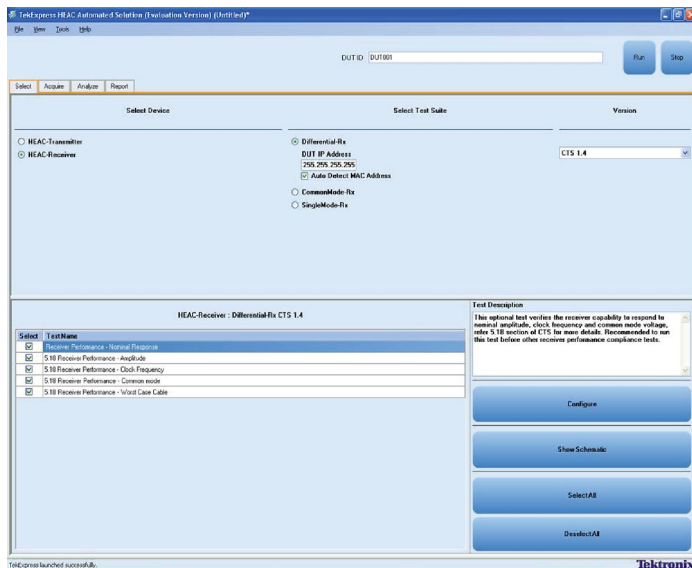
Repeatable Results

Option HEAC software embeds the HEAC CTS 1.4a compliance test procedures, ensuring dependable results. Accurate jitter testing and precise violation testing delivers repeatable results. Perform accurate transmitter and receiver tests with closed-loop measurements that eliminate nonlinearities of the test setup. Authentic measurement techniques and automation eliminate errors to provide accurate results.

Option HEAC leverages the TekExpress software to handle multiple equipment interactions enabling an automated solution for HEAC transmitter and receiver testing. The Direct Synthesis method ensures greater repeatability as it eliminates the need for hardware PCB traces to insert jitter components and combining of audio and Ethernet signals using hardware combiners.

Faster Validation Cycles

The unparalleled automation offered on the HEAC leveraging Direct Synthesis capability enables faster validation. Shrink test times for HEAC testing with HEAC remotely controlling the DPO/DSA/MSO real-time



HEAC Receiver Testing.

oscilloscope and AWG to automate the complex test process. Demonstrate efficiency by using the "Select All" feature to perform multiple tests. Instantaneously generate CSV-format summaries or detailed reports at a press of a button.

Complete Solution for Validation

Option HEAC offers a wide range of tests enabling thorough verification for transmitter and receiver devices. Perform accurate validation using a comprehensive solution that includes test fixtures, DPO/DSA/MSO70000 Series real-time oscilloscopes, P7300 and TDP1000 Series differential probes, P6245 and TAP1500 Series active probes, AWG5000/7000 Series arbitrary waveform generators, and DSA8200 sampling oscilloscope.

Characteristics

HEAC Transmitter Tests

Test ID	Description
HEAC Differential Signal Characteristics Tests	
HEACT 5-1	Operating DC Voltage Test
HEACT 5-2	Jitter Max Test
HEACT 5-3	Rise/Fall Time Test
HEACT 5-4	High/Low/Center Level Voltage Test
HEACT 5-5	Cycle Time Test
HEAC Common Mode Signal Characteristics Tests	
HEACT 5-6	Operating DC Voltage Test
HEACT 5-7	High/Low Level Voltage Test
HEACT 5-8	Rise/Fall Time Test
HEACT 5-9	Jitter Max/Clock Frequency Test
HEACT 5-10	IEC 60958-1 Stream Verification Test
HEAC Single Mode Signal Characteristics Tests	
HEACT 5-11	Operating DC Voltage Test
HEACT 5-12	Signal Amplitude Test
HEACT 5-13	Rise/Fall Time Test
HEACT 5-14	Jitter Max/Clock Frequency Test
HEACT 5-15	IEC 60958-1 Stream Verification Test

HEAC Receiver Tests

Test ID	Description
HEACT 5-16	Differential Signal Receiver Performance Test
HEACT 5-17	Common Mode Signal Receiver Performance Test
HEACT 5-18	Single Mode Signal Receiver Performance Test
HEACT 5-19	Common Mode Operating DC Voltage Test
HEACT 5-20	Single Mode Operating DC Voltage Test

HEAC Cable Assembly Tests

Test ID	Description
HEACT 6-1	Intra-pair Skew Test
HEACT 6-2	Differential Attenuation Test
HEACT 6-3	Differential / Common Mode Impedance Test

HEAC Recommended Test Equipment List

Equipment	Description
CTS 1.4a Recommended Real-time Oscilloscopes for HEAC Testing	<p>Tektronix DPO/DSA/MSO70000 Series Oscilloscope (4 GHz or higher) with Option 2XL, DJA, MTH, PTH</p> <p>OR</p> <p>Tektronix DPO7254 or DPO7354 with Option 2XL DJA, MTM, PTM</p>
CTS 1.4a Recommended Arbitrary Waveform Generators for HEAC Testing	<p>Tektronix AWG5000 Series with Option 01, 09</p> <p>OR</p> <p>AWG7000 Series with Option 01, 09</p>
CTS 1.4a Recommended Differential Probes for HEAC Testing	<p>Tektronix P7330 for Tektronix DPO/DSA70000 Series Digital Oscilloscope</p> <ul style="list-style-type: none"> - Tektronix 016-1884-xx Square Pin Adapter <p>OR</p> <p>Tektronix P6247/P6248/P6330 for Tektronix DPO/DSA/MSO70000 or DPO7000 Series</p> <ul style="list-style-type: none"> - Tektronix 016-1884-xx Square Pin Adapter for P6330 - Tektronix TCA-BNC Interface Adapter for DPO/DSA/MSO70000 Series - Tektronix TPA-BNC Interface Adapter for DPO7000 Series <p>OR</p> <p>TDP1000/1500/3500 for Tektronix DPO7000 Series Digital Oscilloscope</p>
CTS 1.4a Recommended Single-ended Probes for HEAC Testing	<p>Tektronix P6245 for Tektronix DPO/DSA/MSO70000 or DPO7000 Series (Qty: 2)</p> <ul style="list-style-type: none"> - Tektronix TCA-BNC Interface Adapter for DPO/DSA/MSO70000 Series - Tektronix 196-3463-xx Y-lead Adapter - Tektronix TPA-BNC Interface Adapter for DPO7000 Series <p>OR</p> <p>Tektronix TAP1500 for Tektronix DPO7000 Series Digital Oscilloscope (Qty: 2)</p> <ul style="list-style-type: none"> - Tektronix 196-3463-xx Y-lead Adapter
CTS 1.4a Recommended HEAC Fixtures for HEAC Testing	<p>Tektronix HEAC Fixture Kit – TF-HEAC-TPA-KIT consisting of:</p> <ul style="list-style-type: none"> - Tektronix Test Fixture TF-HEAC-TPA-MAIN - Tektronix Test Fixture TF-HEAC-TPA-AP - Tektronix Test Fixture TF-HEAC-TPA-CP - Tektronix Test Fixture TF-HEAC-TDR-AR (Qty: 2) - Tektronix Test Fixture TF-HEAC-TDR-CR (Qty: 2) <p>Tektronix Fixture TF-HDMI-TPA-CE consisting of:</p> <ul style="list-style-type: none"> - EDID Fixture PCBA - EEPROM with HDMI 1.4a Software - Ribbon Cable (174-5746-xx) - Customer Documentation <p>Tektronix HDMI Fixture Kit (for Type D and Type D HEAC Testing) – TF-HDMID-TPA-KIT consisting of:</p> <ul style="list-style-type: none"> Tektronix Test Fixture TF-HDMID-TPA-P Tektronix Test Fixture TF-HDMID-TPA-R <p>Tektronix Fixture TF-HDMI-TPA-CE consisting of:</p> <ul style="list-style-type: none"> - EDID Fixture PCBA - EEPROM with HDMI 1.4 Software - Ribbon Cable (174-5746-xx) - Customer Documentation
CTS 1.4a Recommended Sampling Oscilloscope for HEAC Testing	<p>DSA8200 Sampling Oscilloscope</p> <ul style="list-style-type: none"> 80E04 TDR module 80E03 Sampling module 80SSPAR S-parameter Software

HEAC Test Automation

- NI GPIB-USB-A/B/HS
- GPIB-HS cables when using DPO/DSA/MSO oscilloscopes
- Ethernet LAN cable

Ordering Information

Test Software

Includes: Application CD and electronic documentation.

Product/Feature	Description
To Order Along with Oscilloscope	
Opt. HEAC	HEAC Compliance Test Software

Recommended Test Fixtures

TF-HEAC-TPA-KIT includes:

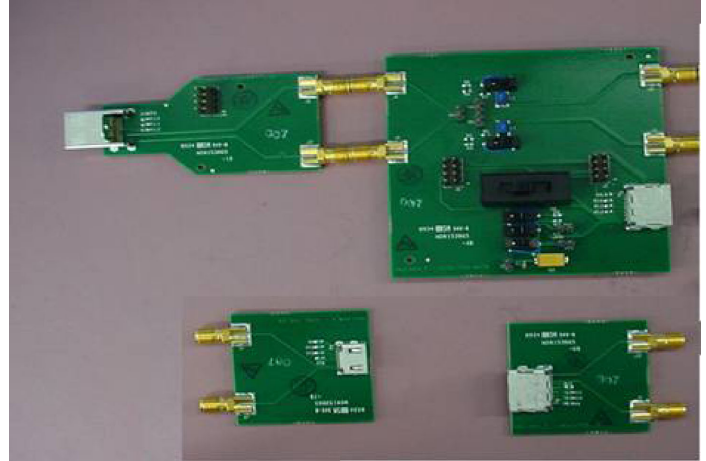
- Tektronix Test Fixture TF-HEAC-TPA-MAIN
- Tektronix Test Fixture TF-HEAC-TPA-AP
- Tektronix Test Fixture TF-HEAC-TPA-CP
- Tektronix Test Fixture TF-HEAC-TDR-AR (Qty: 2)
- Tektronix Test Fixture TF-HEAC-TDR-CR (Qty: 2)

Tektronix Fixture TF-HDMI-TPA-CE includes:

- EDID Fixture PCBA
- EEPROM with HDMI 1.4a Software
- Ribbon Cable (174-5746-xx)
- Customer Documentation

TF-HDMID-TPA-KIT (Type D and Type D with HEAC test capability for Type D i.e. mobile phone connections) includes:

- Tektronix Test Fixture TF-HDMID-TPA-P
- Tektronix Test Fixture TF-HDMID-TPA-R



TF-HEAC-TPA-KIT.

Tektronix Fixture TF-HDMI-TPA-CE includes:

- EDID Fixture PCBA
- EEPROM with HDMI 1.4a Software
- Ribbon Cable (174-5746-xx)
- Customer Documentation

Test fixtures are available individually from Tektronix.

Contact Tektronix:

ASEAN / Australasia (65) 6356 3900
Austria 00800 2255 4835*
Balkans, Israel, South Africa and other ISE Countries +41 52 675 3777
Belgium 00800 2255 4835*
Brazil +55 (11) 3759 7600
Canada 1 800 833 9200
Central East Europe, Ukraine, and the Baltics +41 52 675 3777
Central Europe & Greece +41 52 675 3777
Denmark +45 80 88 1401
Finland +41 52 675 3777
France 00800 2255 4835*
Germany 00800 2255 4835*
Hong Kong 400 820 5835
India 000 800 650 1835
Italy 00800 2255 4835*
Japan 81 (3) 6714 3010
Luxembourg +41 52 675 3777
Mexico, Central/South America & Caribbean (52) 56 04 50 90
Middle East, Asia, and North Africa +41 52 675 3777
The Netherlands 00800 2255 4835*
Norway 800 16098
People's Republic of China 400 820 5835
Poland +41 52 675 3777
Portugal 80 08 12370
Republic of Korea 001 800 8255 2835
Russia & CIS +7 (495) 7484900
South Africa +41 52 675 3777
Spain 00800 2255 4835*
Sweden 00800 2255 4835*
Switzerland 00800 2255 4835*
Taiwan 886 (2) 2722 9622
United Kingdom & Ireland 00800 2255 4835*
USA 1 800 833 9200

* European toll-free number. If not accessible, call: +41 52 675 3777

Updated 25 May 2010

For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com



Copyright © Tektronix, Inc. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and TEK are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks, or registered trademarks of their respective companies.

14 Oct 2010

61W-24786-2

