# **Getting Started with TDSHT3**

You can use this side of the quick reference card to get started with the Source Clock-Data Tests Select All test procedure. The other side contains a complete menu tree for the TDSHT3 HDMI Compliance Test Software.

NOTE. For additional procedures, refer to the TDSHT3 Quick Start User Manual. For complete operating instructions, refer to the online help.

TDSHT3 HDMI Compliance Test Software enables unprecedented efficiency by providing a comprehensive range of tests, including Jitter Tolerance. Start the application by using Analyze > HDMI Compliance Test Software(1.3) or App > HDMI Compliance Test Software(1.3).

## Source Clock-Data Tests Select All

This option enables you to run the Eye Diagram, Duty Cycle, Rise Time, Fall Time, and Clock Jitter simultaneously.

You will need one supported oscilloscope, two differential probes, one DC power supply 3.3 V, one EDID emulator, and one HDMI EFF-TPA-P fixture.

Follow these steps:

1. On the menu bar, click Tests > Select > Source.

## 2. In the clock-data tests pane, click Select All.



3. To change the configuration settings, click Tests > Configure. For most tests, you can use the factory default configuration. However, you can change the values by using the virtual keyboard or the general purpose knob on the oscilloscope front panel. You can also restore the factory defaults or save and recall your own configuration settings.

File Tests Results Utilities Help

		Configure -	Source		
Select Configure Connect	Input Clock Ch1 Data Ch2	Horiz/Acq # of Acqs M Rec Length	Referen Units Per(%) ¥ Hysteresis	50% C	Run Test Result Roport Summary
View Waveform		CRU PLL 🔽		Low 6	Detail

For up-to-date information on Tektronix oscilloscope solutions for HDMI Compliance Test Software, access the <u>www.tektronix.com</u> Web page.

## **TDSHT3 Ordering Information**

This software supports the TDS6000B, TDS6000C, TDS7254/TDS7254B, TDS7404/TDS7404B, CSA7404/ CSA7404B, TDS7704B, and DPO70000 series of oscilloscopes. Refer to the *Optional Applications Software on Windows-Based Oscilloscopes Installation Manual* for a list of specific models. The applications CD includes a PDF file of the online help.

To order along with oscilloscope:

• Opt. HT3 - HDMI Compliance Test Software

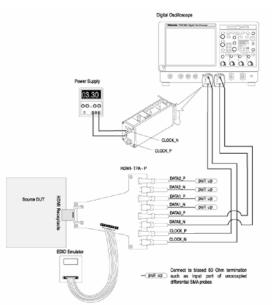
To order an upgrade for an existing oscilloscope:

- TDS6000B Order TDS6BUP Opt. HT3
- TDS7000/B Order TDS7UP/7BUP Opt. HT3
- CSA7000/B Order TDS7UP/7BUP Opt. HT3
- DPO70000 Order DPO7UP Opt. HT3
  To order an upgrade from HDMI 1.2a to HDMI 1.3a
- compliance test software:
- TDS6000B Order TDS6BUP Opt. HT23

## 4. To connect the DUT, click **Tests** > **Connect**.

File Tests	Results Utilities Help	TDSHT3 V1-3	M X
Select Configure Connect Vierv W/aveform	Connect Follow these instructions to set up the connections. Citch More for details <u>More</u> 1. Set up the DUT. 2. Connect the test thoures and probes 3. To view the signal, click View Waveform.		Result Result Report Summary Detail
Source -> Multi	ple Tests Clook -> Ch1: Data -> Ch2: Reo Length -> 10M; CRU -> PLL	: High -> 80%; Low -> 20%	

5. Make the connections as follows:



6. Ensure that your signal in the oscilloscope display is similar to the sample signal. Click **View Waveform** to display a sample of the expected signal. If the displays are not similar, go back and check your configuration and connections.



7. Click **Run Test** to perform the test. The TDSHT3 HDMI Compliance Test Software sets up the oscilloscope and the test runs displaying a progress indicator.

## **Recommended Accessories**

## Oscilloscopes

 16 M Record Length/Ch: Opt. 4 M or more (Eye Diagram and Jitter tests)

#### **HDMI Pattern Sources**

- Jitter Generation: AWG7102/AWG710/AWG710B/ AFG3000 (minimum two channel AFG) for Sink tests
- Test Pattern Generation: DTG5274/DTG5334, DTGM30 (three required), and DTGM32 (one required for AFG3000/AWG710/AWG710B) for sink tests

## **TDR Tests**

 Oscilloscope: TDS8200B/DSA8200 with 80E03 and 80E04 modules

## Probes

- Differential Probes: P7313SMA for both single-ended and differential measurements. P7350SMA can be used for differential tests of limited resolutions.
- Active Probes: P7240 (two probes) for single ended measurements using old fixtures.
- Probe Positioner: PPM100 Flexible Arm Probe Positioner.

## Test Fixture

8. If you have run the tests successfully, the software makes **Result** available automatically and displays the eye diagram plot and the clock jitter plot. You can also view both the result summary of the test and the report configuration in the result pane.

File Tests	Results Utilities Help		TDSHT3 v1-3	M X
	Result Summary: Source		onfiguration	Run
Select	7-9: Clock Jitter: CK	Pair (CK, D)	-	Test
Configure	7-10: Source Eye Diagram: CK, D 7-4: RiseTime: CK	Resolution 1921	0*1000i	Result
	V 7-4: RiseTime: D V 7-4: FallTime: CK	Refresh Rate	z 💻	Report
	V 7-4: FallTime: D V 7-8: Max Duty Dysle: CK	Report File CAT	w/applications/TDSHT	Summary
View Waveform	View View Result Jitter Plot Eye Plot Details	🔽 Enable Preview	Clear Report Advanced	Detail

# **9.** In the result summary pane, click **Result Details** to display the results of the tests.

7-4 RiseTime D	75.00ps < TRISE < 179.605;	143 2961	Pata			
		145.23ps		Tot = 449 90pt, Vs = 169 80mV, Upper Margin = 90. Lower Margin = 74 39ps.		
7-4 FaiTime CK	75 D0ps < 1FALL < 179 Eps,	143 Filps		Tall = 440 SOpr, Vs = 995 D0mV, Upper Margin = 55 57ps, Lower Margin = 66 90ps,		
7-4: FailTime: D	75.00ps < 1FALL < 179.6ps;	127.72p1		Tat = 448 93pc, Vs = 759 80eV, Upper Marger = 41.85p Lower Morgon = 62.72pc,		
7-8: Max Duty Cycle: CK	Max Duty Cycle < 60.0%;	50.54%	Pass .	Tott = 448 Stort, Margin = 9 66%;		
7-8: Min Duty Cycle: CK	40.0% < Min Duty Cycle;	1001%	Pats	Tat = 448 93pt; Margn = 9.81%;		

**10.** In the **Result Details** dialog box, click **Result Statistics** to display statistics based on the tests.

Test Name	Population			Mear	Std Dev	Pk-Pk
7-9: Clock Jitter Tx Clock TIE: CK		-41.975ps	45.357ps			87.331ps
7-9: Clock Jitter Recovered Clock TIE: CK	7.4250k	-35.814ps	38.433ps	10.352ps	20.300ps	74.247ps
7-10: Source Eye Diagram Tx Clock TIE	7.4250k	-41.975ps	45.357ps	0.00s	23.166ps	87.331ps
7-10: Source Eye Diagram Recovered	7.4250k	-35.814ps	38.433ps	10.352ps	20.300ps	74.247ps
7-4: Rise Time: CK	778.07k	159.41ps	160.24ps	159.60ps	188.431:	831.20fs
7-4: Rise Time: D	731.22k	159.67ps	161.45ps	161.06ps	488.61f:	1.7810ps
7-4: Fall Time: CK	777.38k	130.22ps	182.92ps	181.46ps	474.9715	2.7088ps
7-4: Fall Time: D	742.26k	152.34ps	153.36ps	153.03ps	190.41fs	1.0250ps

The software calculates statistics for each selected test, and logs the statistics on a cycle-by-cycle basis in a fairly large waveform. The standard statistics are for the Maximum, Minimum, Mean, Standard Deviation, and Population.

## TDSHT3 HDMI Compliance Test Software Reference Source Test

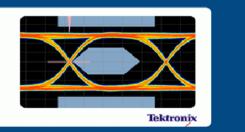
- TDS7000/B Order TDS7UP/7BUP Opt. HT23
- CSA7000/B Order TDS7UP/7BUP Opt. HT23
- DPO70000 Order DPO7UP Opt. HT23

**NOTE.** You will be provided with two TDSHT3 applications, one supporting CTS 1.2a specification, displayed as TDSHT3, and the other for CTS 1.3a specification, displayed as TDSHT3v1.3. Both applications can be loaded onto the oscilloscope, but you can run only one application at a time.

- Plug type: EFF-HDMI-TPA-P, available from Efficere Technologies
- Receptacle type: EFF-HDMI-TPA-R, available from Efficere Technologies
- Receptacle type: HDMI TPA-R adapter set -013-A012-50 (can be used for limited resolution)
- Plug type: HDMI TPA-P adapter set 013-A013-50 (can be used for limited resolution)

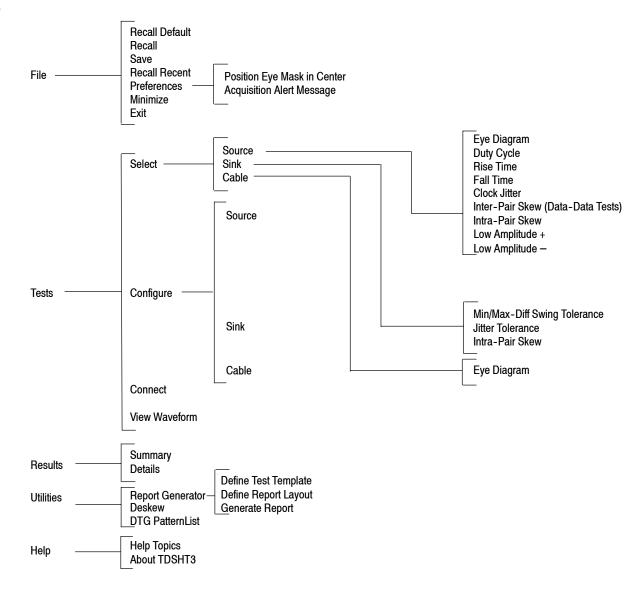


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