

Envision X14

MIPI C-Phy/D-Phy CSI/DSI Generator and Analyzer

July 2025

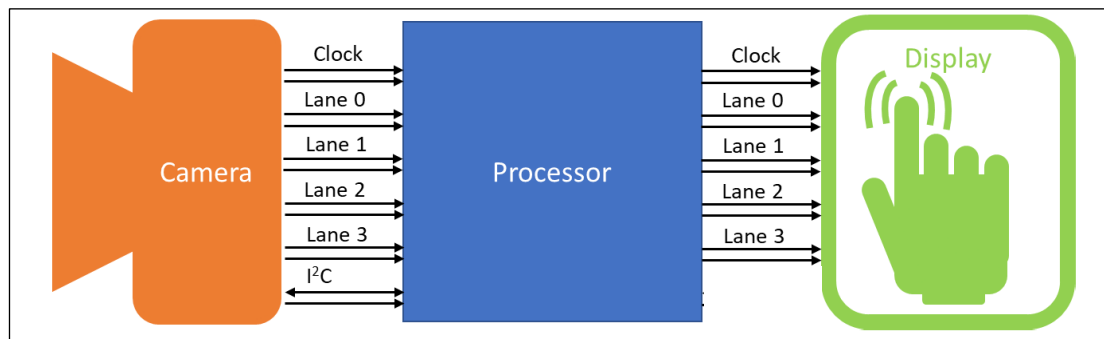


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MIPI (Mobile Industry Processor Interface) D-Phy – Technical Overview

- ◆ D-Phy is the physical layer transport technology:
 - ◆ Provides a Low-cost, High-Speed serial interface solution for communication interconnection between components inside a mobile device.
 - ◆ Support Camera Serial Interface (CSI) for communication from a camera or image sensor to a processor.
 - ◆ Support Display Serial Interface (DSI) for communication from a processor to a Display Controller.



MIPI CSI/DSI Protocol Analysis/Generator – Envision X14 – SKUs

- ◆ The Envision X14 is a D-Phy/ C-Phy, Analyzer & Generator for CSI-2 and DSI-2 protocols.
- ◆ Envision X14 provides a One-Box hardware solution.
- ◆ Ala Carte Licensing:
 - ◆ Choose a Phy - C-Phy & D-Phy licensed separately.
 - ◆ Choose a Protocol: CSI & DSI are licensed separately.
 - ◆ Choose an Application: Generator and Analyzer are licensed separately.
 - ◆ One set of probes for both C-Phy and D-Phy).



SKU	Description
Envision X14 System	
ENV14-CD01-TAA-X	Envision X14 System
Envision X14 Licenses	
ENV14-CD01-ANA-A	Envision X14 Analyzer License
ENV14-CD01-CPHY-A	Envision X14 C-PHY License
ENV14-CD01-CSI-A	Envision X14 CSI Protocol License
ENV14-CD01-DPHY-A	Envision X14 D-PHY License
ENV14-CD01-DSI-A	Envision X14 DSI Protocol License
ENV14-CD01-GEN-A	Envision X14 Generator License
Envision X14 Probes	
ENV14-SDP01-CDPRB-X	Envision X14 Solder Down Probe Amp Assembly for Analyzer
ENV14-SDP01-PRBKT-X	Envision X14 Solder Down Probe Tip Spares/Replacement
Envision X14 Cable Accessories	
ENV14-SMPCAB-AC001-X	Envision X14 SMP Cables (qty 10)
ENV14-SMPCAB-AC002-X	Envision X14 SMP Cables Spares/Replacement (qty 2)

Envision X14 – Hardware System



Envision X14 System



Envision X14 System – Rear View



Envision X14 Probe Amplifier
Probe Tips



- ◆ The Envision X14 system features standard SMP connectors that support C-PHY or D-PHY signals to provide high fidelity capture or transmission of traffic from all active lanes simultaneously.
- ◆ Field upgradeable firmware enables the Envision X14 to evolve and support new features or changes to the MIPI D-Phy and C-Phy and CSI-2 and DSI-2 specifications.
- ◆ Envision X14’s capture analysis functions provide complex event-base triggering and enables detailed analysis of the phy level events, packet types for low power, high speed burst modes, start and end of transmission sequences as well as CRC and ECC error counts.
- ◆ All our captures are portable and can be shared with colleagues at other locations and to Teledyne LeCroy.

Envision X14 Management – Local Administration

- ◆ Administration of the Envision X14. Similar to the M4 series products (M41h, M42de). There are three (3) management options.
- ◆ Connected HDMI Display at the rear HDMI admin port. Use mouse and keyboard for control.



Envision X14 Management – Remote, External Administration with Host PC

- ◆ The Envision X14 can also be controlled from the external Video Protocol Suite (VPS) software application running on a host PC connected to the network.
- ◆ Could also use VNC from a PC to access the embedded VPS software application.
- ◆ This management mode enables you to keep the captures on our local PC for off-line analysis and distribution to other colleagues and subject matter experts at other locations.
- ◆ Used for upgrading the Envision X14 system software.



Envision X14

MIPI C-Phy/D-Phy CSI/DSI Analyzer/Generator Overview of Applications

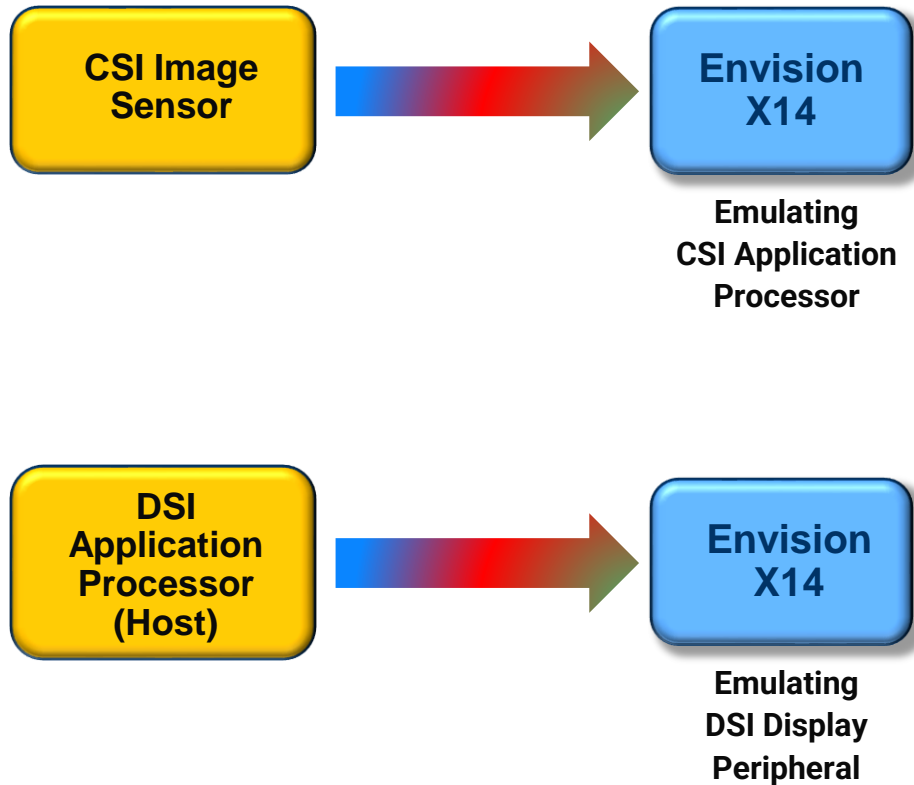
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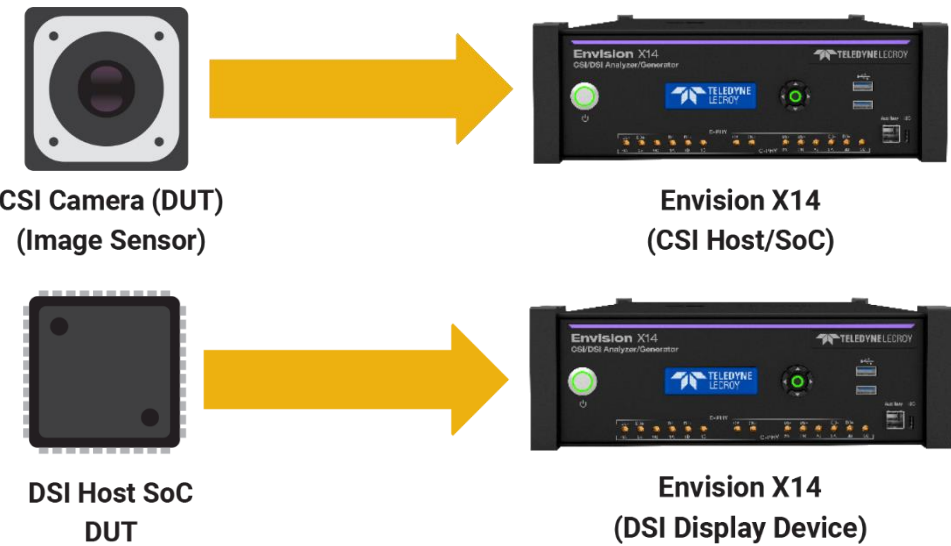
MIPI CSI/DSI Envision X14 Applications – CSI-2 & DSI-2 Emulation Analysis



◆ Emulation Analysis

- ◆ In the emulation analysis mode for either CSI or DSI (and either C-Phy or D-Phy, the Envision X14 is emulating either a CSI Application Processor or a DSI Display Peripheral.
- ◆ **Note:** Solder-down probes are not used. These applications are depicted in the diagrams below for CSI and DSI respectively.

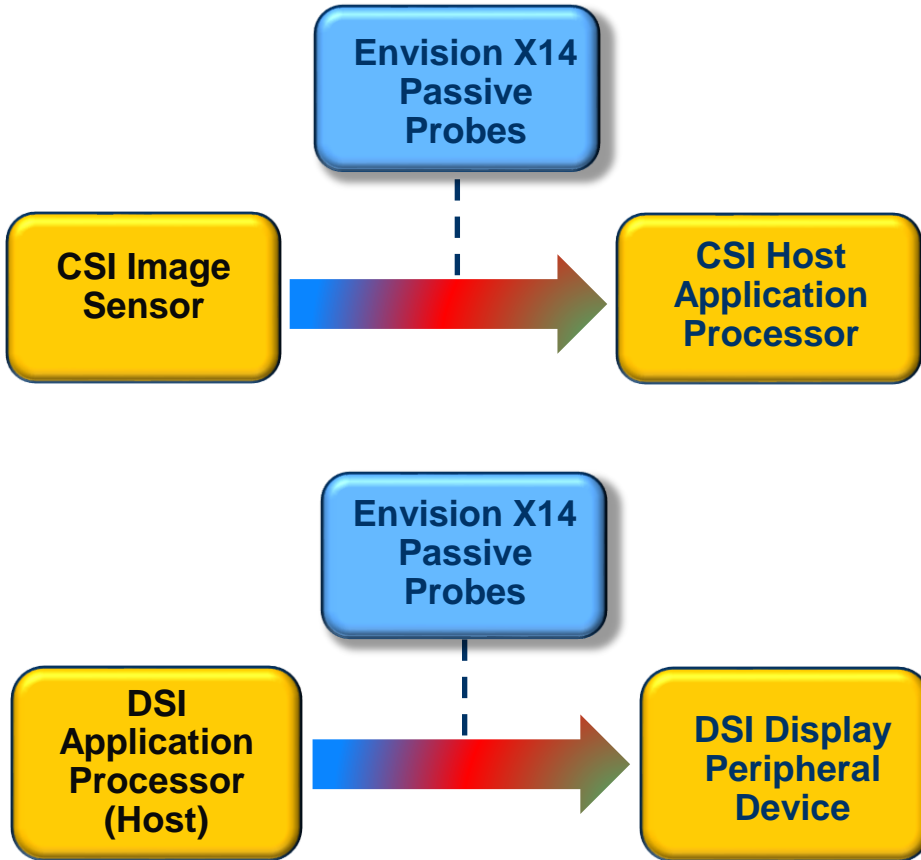
MIPI CSI/DSI Envision X14 Applications – CSI-2 and DSI-2 Emulation Analysis



- ◆ The Envision X14 Analyzer can be positioned as an endpoint for SoC host emulation to test a CSI-2 stream from a camera or image sensor on a test board.
- ◆ The Envision X14 Analyzer can be positioned as an endpoint emulating a display device to test a DSI-2 SoC host on a test board.
- ◆ These configurations are depicted left and the connections are illustrated below.



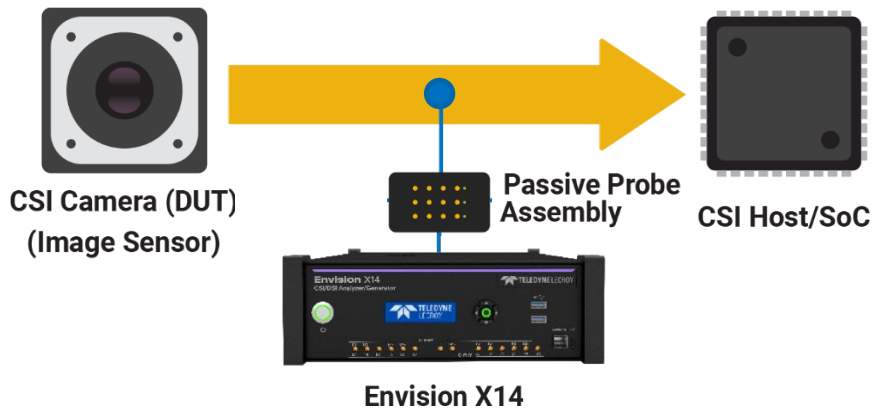
MIPI CSI/DSI Envision X14 Applications – Passive Analysis



◆ Passive Monitoring Analysis

- ◆ In the passive monitoring analysis mode the solder-down probe amplifier and probe tips are used. This application involves soldering the passive probes down between a CSI Image Sensor and the CSI Application processor or soldering the passive probes down between a DSI Application Processor and the DSI Display Peripheral.
- ◆ **Note:** Solder-down probes are required. These applications are depicted in the diagrams below for CSI and DSI respectively.

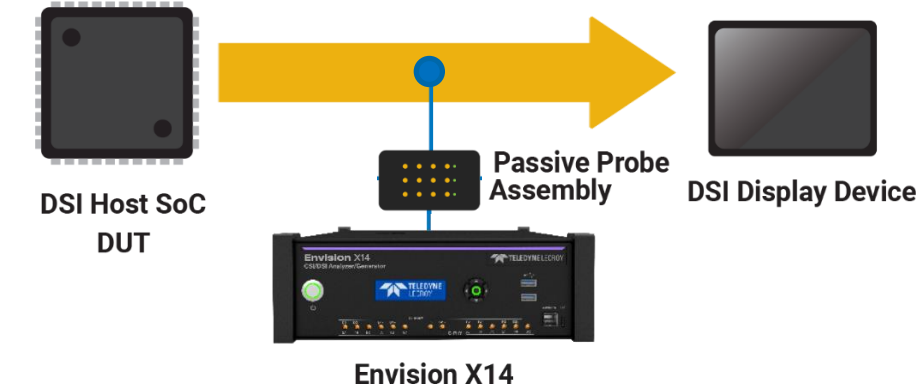
MIPI CSI-2 Envision X14 Applications – Passive Analysis



- ◆ The Envision X14 analyzer can be positioned as a passive tap between a CSI-2 host SoC and a CSI-2 camera or image sensor to passively sniff the traffic.
- ◆ Passive probing is invaluable where the transmission path undergoes a format conversion or traverses a transport facility.
- ◆ By positioning the Envision X14 passive probe elements at various points along the transport facility, you can segment and isolate the point of failure.



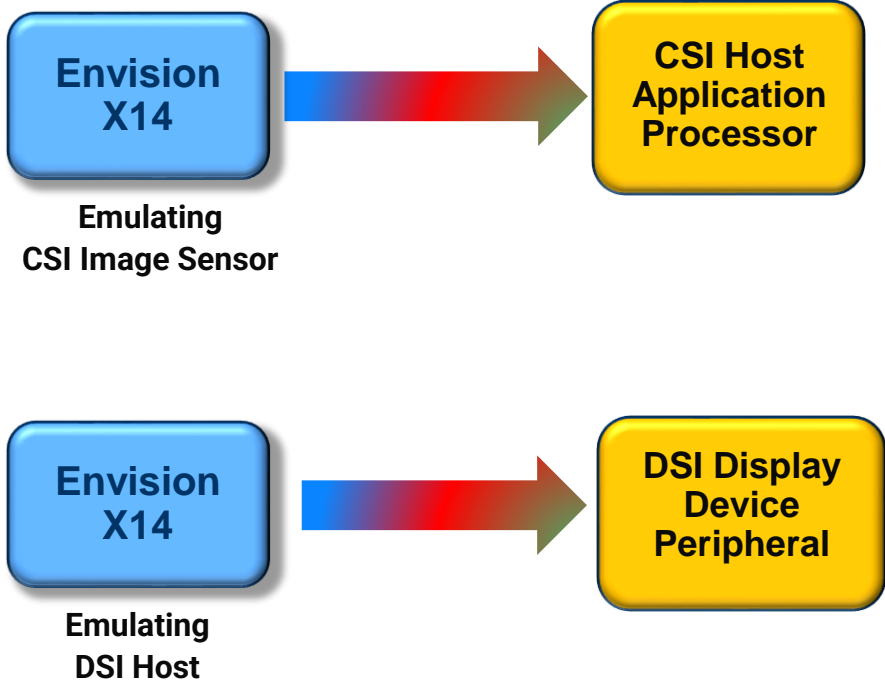
MIPI CSI-2 Envision X14 Applications – Passive Analysis



- ◆ The Envision X14 analyzer can be positioned as a passive tap between a DSI-2 host SoC and a DSI-2 display device to passively sniff the traffic.
- ◆ Passive probing is invaluable where the transmission path undergoes a format conversion or traverses a transport facility.
- ◆ By positioning the Envision X14 passive probe elements at various points along the transport facility, you can segment and isolate the point of failure.



MIPI CSI-2/DSI-2 Envision X14 Applications – Image/Video Generation



- ◆ Image or Video Generation
 - ◆ In the generator mode, the Envision X14 is transmitting CSI image sensor data or DSI video pixel data.
 - ◆ **Note:** Solder-down probes are not used. These applications are depicted in the diagrams below for CSI and DSI respectively.

MIPI CSI-2/DSI-2 Envision X14 Applications – Image/Video Generation



Envision X14
Emulating a CSI-2 Image Sensor



CSI Host/SoC



Envision X14
Emulating a DSI-2 Host



DSI Display Device

- ◆ The Envision X14 generator can be emulate an CSI-2 to transmit image data to a CSI-2 host application processor.
- ◆ The Envision X14 generator can be emulate a DSI-2 application processor to transmit video data to a DSI-2 Display Device.
- ◆ These configurations are depicted left and the connections are illustrated below left.
- ◆ **Note:** The solder-down probes are not used in this application.



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MIPI C-Phy/D-Phy CSI/DSI – Status Update Solder-Down Probes

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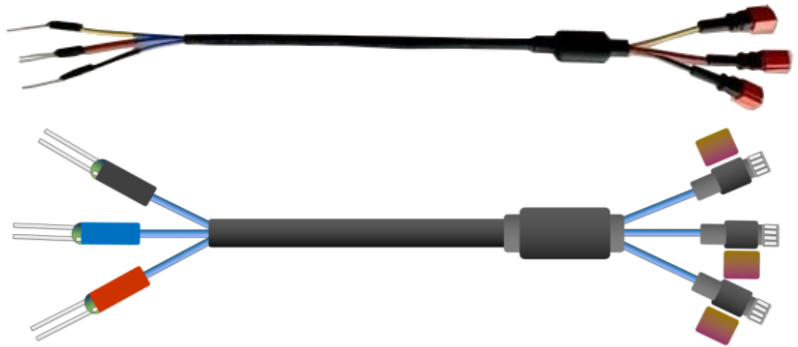


MIPI CSI/DSI Protocol Analysis – Envision X14 – Solder-Down Probes

- ◆ Envision X14 Solder-down probes Probe Amp Assembly SKU:

ENV14-SDP01-CDPRB-X

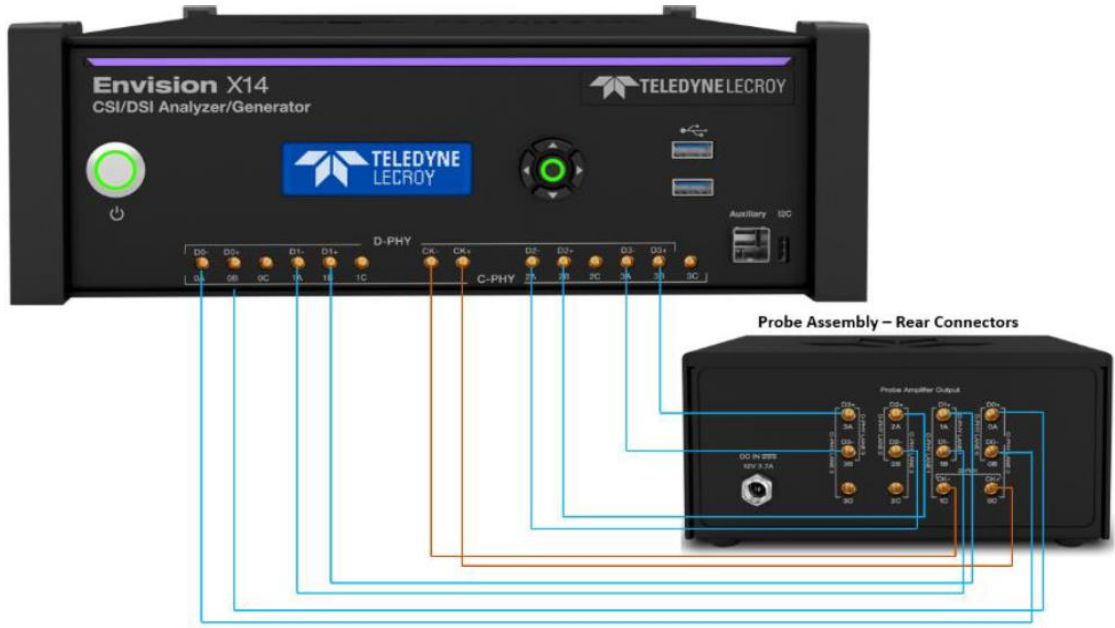
Includes support for both C-Phy and D-Phy five (5) probe tips with three (3) Twinax connectors on one end and the three (3) solder-down probe tips on the other end. There will be one spare probe tip in a four (4) lane configuration for D-Phy.



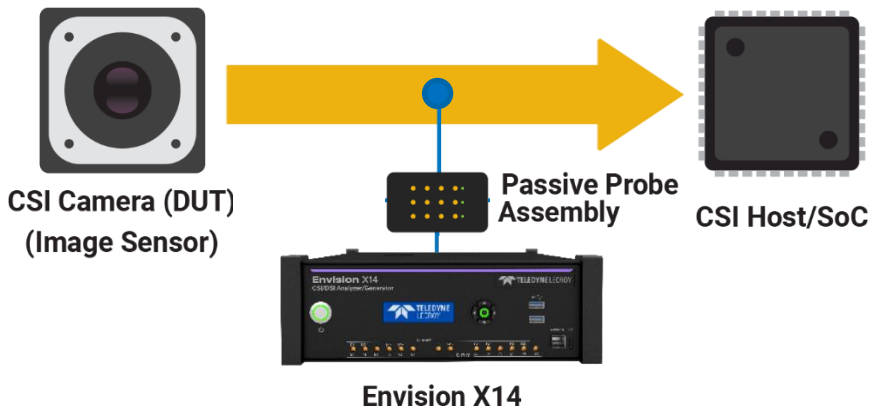
Envision X14 – Connections from Envision X14 System to Probe Amp Assembly.

To connect your source DUT to the Envision X14:

1. Connect the SMP cables provided with the Envision X14 and the Probe Assembly to the rear of the Envision X14 Probe Assembly using the illustration below.



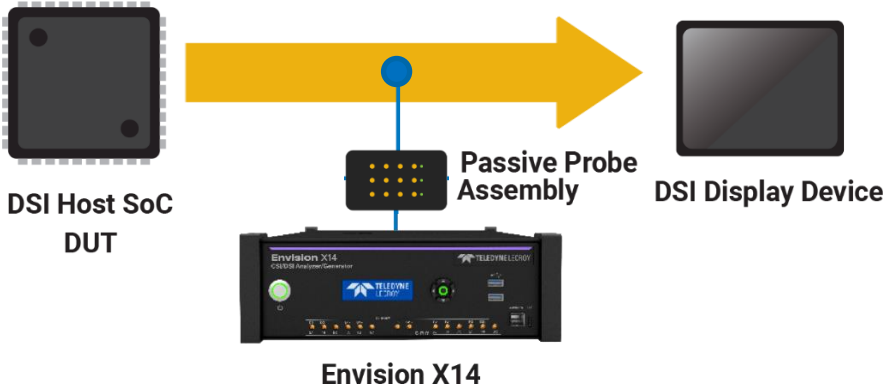
Envision X14 – MIPI C-Phy/D-Phy CSI-2 Analyzer Passive Probing



- ◆ The Envision X14 analyzer can be positioned as a passive tap between a CSI-2 host SoC and a CSI-2 camera or image sensor to passively sniff the traffic.
- ◆ Passive probing is invaluable where the transmission path undergoes a format conversion or traverses a transport facility.
- ◆ By positioning the Envision X14 passive probe elements at various points along the transport facility, you can segment and isolate the point of failure.



Envision X14 – MIPI C-Phy/D-Phy DSI-2 Analyzer Configurations



- ◆ In the DSI passive probing mode, the Envision X14 Analyzer is positioned as a passive tap between a DSI host SoC and a DSI display device to sniff traffic.
- ◆ This application is invaluable where the transmission path undergoes a format conversion or traverses a transport facility.
- ◆ By positioning the Envision X14 passive probe elements at various points along the transport facility, the Envision X14 can segment and isolate the point of failure.



Envision X14

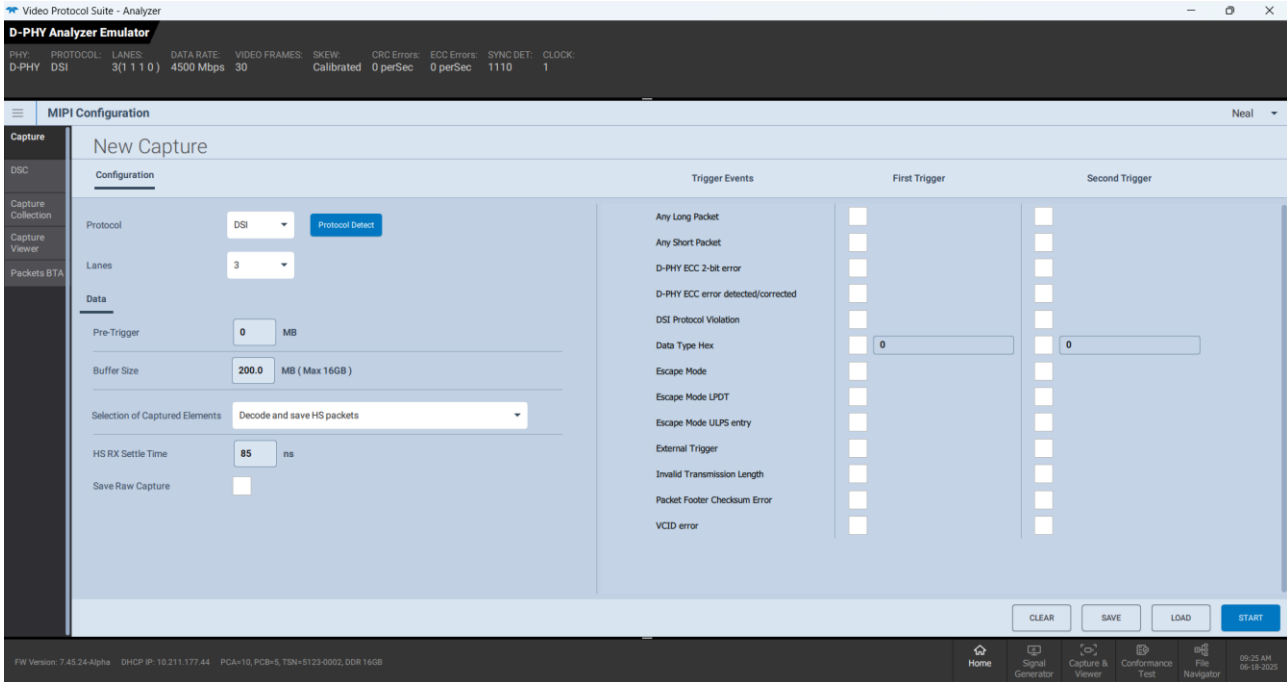
MIPI C-Phy/D-Phy CSI/DSI Analyzer

Examples of Analyzer operation

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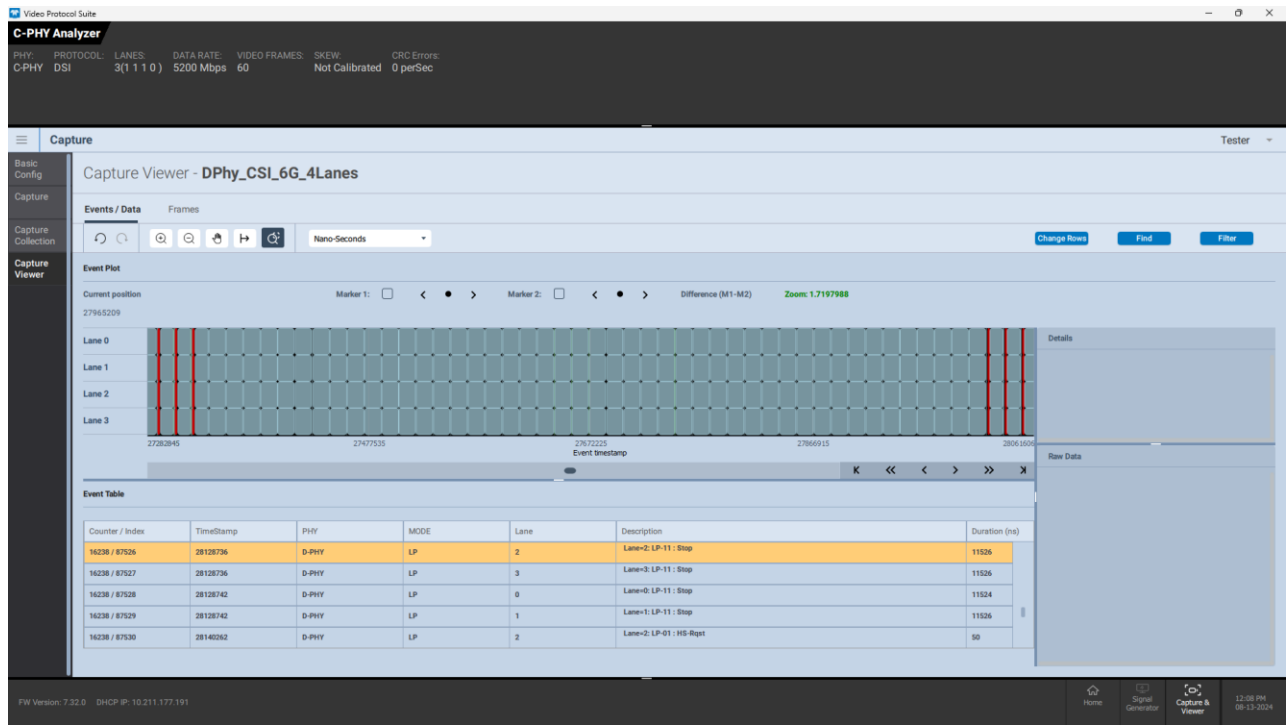


Envision X14 Analysis Software – Capture Triggering - New Triggers



- ◆ Set up complex capture triggering to ensure that you capture the data of interest.
- ◆ Specify the event and the incident of an event to begin the capture.
- ◆ Specify multiple capture criteria as a logical OR and/or a logical AND function.
- ◆ The capture triggering feature also enables you to specify an external trigger condition through a connection from the SMA connector.
- ◆ Configure the capture trigger to capture data before and/or after the trigger condition(s) are met.

Envision X14 – Analysis Software – Showing D-Phy CSI Frame Blanking Region



- ◆ The Envision X14 analysis software depicts the blanking area of a D-Phy CSI frame. You can see a few lines of the previous frame and a few lines of the next frame with the blanking in Low Power between.

Envision X14 – Analysis Software – Showing D-Phy CSI Burst

C-PHY Analyzer

PHY: C-PHY, PROTOCOL: DSI, LANES: 3(1 1 1 0), DATA RATE: 5199 Mbps, VIDEO FRAMES: 60, SKEW: Not Calibrated, CRC Errors: 0 perSec

Capture Viewer - DPhy_CSI_6G_4Lanes

Events / Data | Frames

Event Plot

Current position: 27327954

Marker 1: [] | Marker 2: [] | Difference (M1-M2): Zoom: 0.0374143

Counter / Index	Timestamp	PHY	MODE	Lane	Description	Duration (ns)
15987 / 85730	27322728	D-PHY	HS	0	Data Rate 6.00Gbps, CSI: RGB Data: RGB888	1921
15987 / 85731	27322728	D-PHY	HS	1	Data Rate 6.00Gbps, CSI: RGB Data: RGB888	1921
15987 / 85732	27322728	D-PHY	HS	2	Data Rate 6.00Gbps, CSI: RGB Data: RGB888	1921
15987 / 85733	27322728	D-PHY	HS	3	Data Rate 6.00Gbps, CSI: RGB Data: RGB888	1921
15990 / 85734	27324786	D-PHY	LP	2	Lane=2: LP-11 : Stop	11536

Raw Data

Lane0	Lane1	Lane2	Lane3
HS-Sync	HS-Sync	HS-Sync	HS-Sync
0x24	0x00	0x16	0x2d
0xeb	0xeb	0x10	0xeb
0xeb	0x10	0xeb	0xeb
0xeb	0xeb	0xeb	0x18
0xeb	0xeb	0x10	0xeb
0xeb	0x10	0xeb	0xeb
0xeb	0xeb	0xeb	0x18
0xeb	0xeb	0x10	0xeb
0xeb	0x10	0xeb	0xeb
0xeb	0xeb	0xeb	0x18
0xeb	0xeb	0x10	0xeb
0xeb	0x10	0xeb	0xeb
0xeb	0xeb	0xeb	0x18

FW Version: 7.22.0 | DHCP IP: 10.211.177.191

◆ The Envision X14 analysis software depicts the RGB high speed burst a D-Phy CSI frame. Details of the high speed image burst are shown on right panel.

Envision X14 – Analysis Software – Showing D-Phy CSI Start of New Frame

The screenshot displays the 'C-PHY Analyzer' window within the 'Video Protocol Suite'. The main view is the 'Capture Viewer - DPhy_CSI_6G_4Lanes'. It features an 'Event Plot' showing four lanes (Lane 0, Lane 1, Lane 2, Lane 3) over time. The plot shows a transition from a black state to a green state, indicating the start of a new frame. The 'Event Table' below the plot lists the following events:

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
19987 / 85733	27322728	D-PHY	HS	3	Data Rate 6.000Gbps, CSI: RGB Data: RGB888	1921
19990 / 85734	27324786	D-PHY	LP	2	Lane=2, LP-11: Stop	11536
19990 / 85735	27324786	D-PHY	LP	3	Lane=3, LP-11: Stop	11536
19990 / 85736	27324802	D-PHY	LP	0	Lane=0, LP-11: Stop	11524
19990 / 85737	27324802	D-PHY	LP	1	Lane=1, LP-11: Stop	11526

The interface also includes a 'Details' panel on the right showing 'VC=0, DT=8x24' and 'Word Count=5760 bytes, ECC=8x2d'. The bottom status bar shows 'FW Version: 7.32.0', 'DHCP IP: 10.211.177.191', and the time '12:09 PM 08-15-2024'.

- ◆ The Envision X14 analysis software depicts the start of a new D-Phy CSI frame.

Envision X14 – Analysis Software – Showing D-Phy DSI Burst

- ◆ The Envision X14 analysis software depicts a D-Phy DSI high speed burst.

The screenshot shows the C-PHY Analyzer software interface. At the top, the status bar displays: PHY: C-PHY, PROTOCOL: DSI, LANES: 3(1 1 1 0), DATA RATE: 5200 Mbps, VIDEO FRAMES: 60, SKEW: Not Calibrated, and CRC Errors: 0 perSec. The main window is titled 'Capture Viewer - DPhy_DSI-4.5G_4Lanes'. It features a 'Capture' sidebar on the left and a 'Tester' dropdown on the right. The central area is divided into 'Events / Data' and 'Frames' tabs. Below these are navigation controls, a search bar set to 'Nano-Seconds', and buttons for 'Change Rows', 'Find', and 'Filter'. The 'Event Plot' section shows a timeline with four lanes (Lane 0, Lane 1, Lane 2, Lane 3) and a zoom level of 0.0003174. A red burst is visible in the plot, corresponding to the event table below. The 'Event Table' contains the following data:

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
2101 / 13478	29574428	D-PHY	LP	2	Lane-2: LP-11: Stop	66164
2101 / 13479	29574428	D-PHY	LP	3	Lane-3: LP-11: Stop	66164
2101 / 13480	29574430	D-PHY	LP	0	Lane-0: LP-11: Stop	66162
2101 / 13481	29574430	D-PHY	LP	1	Lane-1: LP-11: Stop	66162
2101 / 13482	29640592	D-PHY	LP	0	Lane-0: LP-01: HS-Rpt	80

At the bottom of the interface, there are navigation buttons for 'Home', 'Signal Generator', and 'Capture & Viewer', along with the system information: 'FW Version: 7.32.0 DHCP IP: 10.211.177.191' and the date/time '12:18 PM 08-13-2024'.

Envision X14 – Analysis Software – Showing D-Phy DSI H Sync Start

C-PHY Analyzer

PHY: C-PHY, PROTOCOL: DSI, LANES: 3(1 1 1 0), DATA RATE: 5199 Mbps, VIDEO FRAMES: 60, SKEW: Not Calibrated, CRC Errors: 0 perSec

Capture Viewer - DPhy_DSI-4.5G_4Lanes

Events / Data: Nano-Seconds

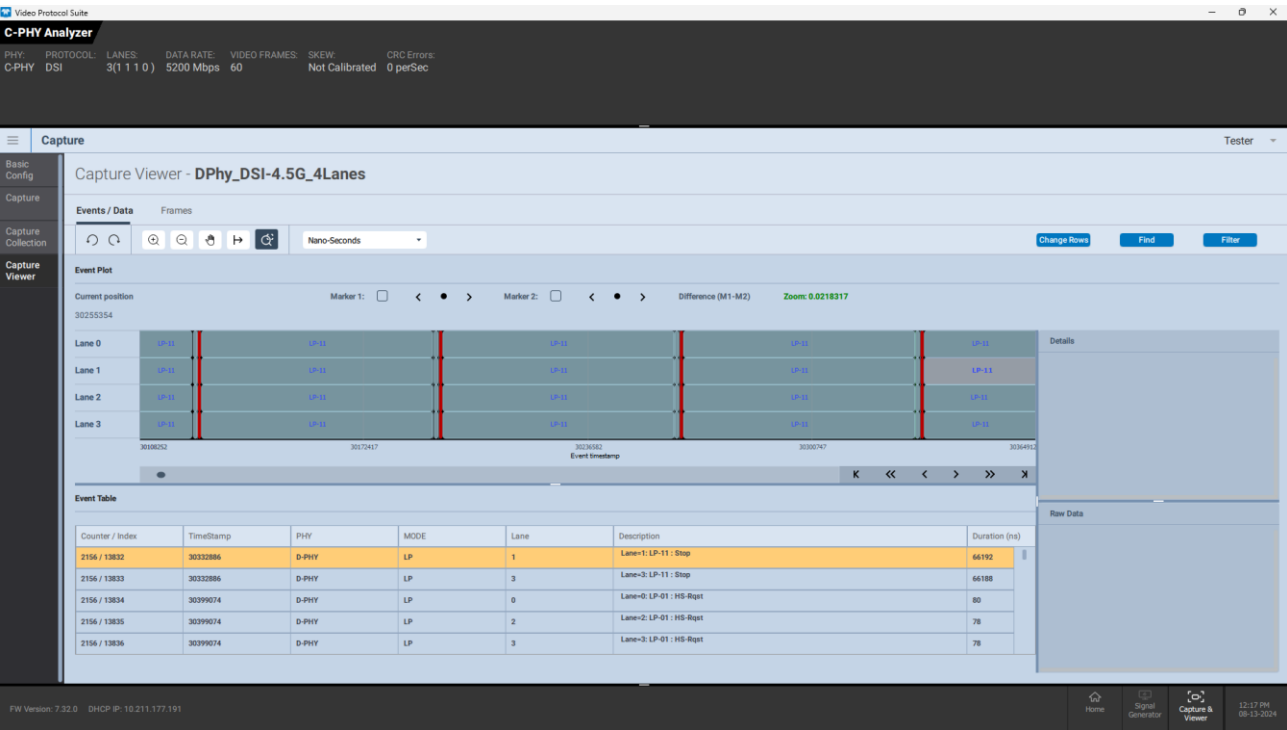
Event Plot: Lane 0, Lane 1, Lane 2, Lane 3

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
2101 / 13487	29640672	D-PHY	LP	1	Lane=1: LP-00 : Bridge	220
2101 / 13488	29640670	D-PHY	LP	2	Lane=2: LP-00 : Bridge	222
2101 / 13489	29640670	D-PHY	LP	3	Lane=3: LP-00 : Bridge	222
2102 / 13490	29640892	D-PHY	HS	0	Data Rate 4.500Gbps, DSI Short : Sync Event, H Sync Start	2
2102 / 13491	29640892	D-PHY	HS	1	Data Rate 4.500Gbps, DSI Short : Sync Event, H Sync Start	2

Raw Data: Lane0 HS-Sync 0x21, Lane1 HS-Sync 0x00, Lane2 HS-Sync 0x00, Lane3 HS-Sync 0x12

- ◆ The Envision X14 analysis software depicts a D-Phy DSI high speed Line Sync event. Details of the packet is shown on right panel.

Envision X14 – Analysis Software – Showing D-Phy DSI Burst Lines



◆ The Envision X14 analysis software depicts a set of D-Phy DSI burst lines of a frame.

Envision X14 – Analysis Software – Showing C-Phy CSI Burst Lines

The screenshot displays the 'C-PHY Analyzer' interface. At the top, it shows system metrics: PHY: C-PHY, PROTOCOL: DSI, LANES: 3(1 1 0), DATA RATE: 5200 Mbps, VIDEO FRAMES: 60, SKEW: Not Calibrated, and CRC Errors: 0 perSec. The main window is titled 'Capture Viewer - CPhy_CSI_3L_1.5G'. It features an 'Event Plot' showing four lanes (Lane 0 to Lane 3) over time. Lane 0 and Lane 1 show vertical red bars representing CSI bursts. Below the plot is an 'Event Table' with the following data:

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
11531 / 47125	17611814223786	C-Phy	HS	0	Data Rate 1.50Gbps, CSI: RGB Data: RGB888	1554.25
11531 / 47126	17611814223786	C-Phy	HS	1	Data Rate 1.50Gbps, CSI: RGB Data: RGB888	1554.25
11531 / 47127	17611814223786	C-Phy	HS	2	Data Rate 1.50Gbps, CSI: RGB Data: RGB888	1554.25
11534 / 47128	17611814225482	C-Phy	LP	0	Lane=0: LP-111 : Stop	294
11534 / 47129	17611814225482	C-Phy	LP	1	Lane=1: LP-111 : Stop	294

On the right side, there is a 'Details' panel showing 'VC=2, DT=8x24, WordCount=1928, CheckSum=8x97e4' and a 'Raw Data' panel showing hex values for Lane0, Lane1, and Lane2.

- ◆ The Envision X14 analysis software depicts a set of C-Phy CSI high speed burst lines of a frame. Details of the burst are shown on right panel.

Envision X14 – Analysis Software – Showing C-Phy CSI Frame End

- ◆ The Envision X14 analysis software depicts a C-Phy CSI high speed frame end packet.

The screenshot displays the 'C-PHY Analyzer' interface within the 'Video Protocol Suite'. The main window is titled 'Capture Viewer - CPhy_CSI_3L_1.5G'. It features a top status bar with parameters: PHY: C-PHY, PROTOCOL: DSI, LANES: 3(1 1 1 0), DATA RATE: 5199 Mbps, VIDEO FRAMES: 60, SKEW: Not Calibrated, and CRC Errors: 0 perSec. The interface is divided into several sections:

- Events / Data:** Includes navigation icons and a 'Nano-Seconds' dropdown menu.
- Event Plot:** A timeline view showing signal activity across four lanes (Lane 0 to Lane 3). A zoom level of 0.0012762 is indicated. The plot shows a red block for 'HS-RxS' and several grey blocks for 'LP-111' and 'HS-RxS'.
- Event Table:** A table listing captured events with columns for Counter / Index, Time@stamp, PHY, MODE, Lane, Description, and Duration (ns).
- Raw Data:** A section for viewing the underlying data of the selected event.

Counter / Index	Time@stamp	PHY	MODE	Lane	Description	Duration (ns)
11536 / 47143	17611814226214	C-PHY	LP	1	Lane=1: LP-111 : Stop	27296
11536 / 47142	17611814226216	C-PHY	LP	2	Lane=2: LP-111 : Stop	27294
11536 / 47143	17611814253510	C-PHY	LP	0	Lane=0: LP-001 : HS-RxS	116
11536 / 47144	17611814253510	C-PHY	LP	1	Lane=1: LP-001 : HS-RxS	116
11536 / 47145	17611814253510	C-PHY	LP	2	Lane=2: LP-001 : HS-RxS	116

Envision X14 – Analysis Software – Showing C-Phy CSI Frame Blanking Region

- ◆ The Envision X14 analysis software depicts a C-Phy CSI frame blanking region.

C-PHY Analyzer

PHY: C-PHY PROTOCOL: DSI LANES: 3(1 1 1 0) DATA RATE: 5199 Mbps VIDEO FRAMES: 60 SKEW: Not Calibrated CRC Errors: 0 perSec

Capture Viewer - CPhy_CSI_3L_1.5G

Events / Data Frames

Event Plot

Current position: 17611829925449 Marker 1: Marker 2: Difference (M1-M2): Zoom: 13.4518815

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
12038 / 49399	17611835521198	C-Phy	LP	2	Lane-2 LP-T11: Stop	27294
12038 / 49400	17611835548488	C-Phy	LP	0	Lane-0 LP-001: HS-Rqst	96
12038 / 49401	17611835548492	C-Phy	LP	1	Lane-1 LP-001: HS-Rqst	92
12038 / 49402	17611835548492	C-Phy	LP	2	Lane-2 LP-001: HS-Rqst	92
12038 / 49403	17611835548584	C-Phy	LP	0	Lane-0 LP-000: Bridge	208

FW Version: 7.22.0 DHCP IP: 10.211.177.191 Home Signal Generator Capture & Viewer 12:03 PM 08-13-2024

Envision X14 – Analysis Software – Showing C-Phy DSI Multiple Burst Lines

- ◆ The Envision X14 analysis software depicts a set of C-Phy DSI high speed video burst with the details of the burst data shown in the panel on the right.

The screenshot displays the 'C-PHY Analyzer' interface. At the top, it shows 'Capture Viewer - CPHY_DSI_3L_1.5G'. Below this, there are controls for 'Events / Data' and 'Frames', including a search bar and a 'Nano-Seconds' unit selector. The main area features an 'Event Plot' with a timeline showing four lanes (Lane 0 to Lane 3) and their respective data bursts. An 'Event Table' is visible at the bottom, listing events with columns for Counter/Index, TimeStamp, PHY, MODE, Lane, Description, and Duration (ns).

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
4054 / 16274	39138577374292	C-Phy	HS	0	Data Rate 1.500Gbps, DSI Long : Packed Pixel Stream, 24-bit RGB 8:8:8 4 -orange	1179.73
4054 / 16275	39138577374292	C-Phy	HS	1	Data Rate 1.500Gbps, DSI Long : Packed Pixel Stream, 24-bit RGB 8:8:8 4 -orange	1179.73
4054 / 16276	39138577374292	C-Phy	HS	2	Data Rate 1.500Gbps, DSI Long : Packed Pixel Stream, 24-bit RGB 8:8:8 4 -orange	1179.73
4057 / 16277	39138577375944	C-Phy	LP	0	Lane=0-LP-111 : Stop	65466
4057 / 16278	39138577375944	C-Phy	LP	1	Lane=1-LP-111 : Stop	65466

Envision X14 – Analysis Software – Showing C-Phy DSI H-Sync Event

C-PHY Analyzer

PHY: C-PHY, PROTOCOL: DSI, LANES: 3(1 1 1 0), DATA RATE: 5199 Mbps, VIDEO FRAMES: 60, SKEW: Not Calibrated, CRC Error: 0 perSec

Capture | Tester

Basic Config | Capture | Capture Collection | Capture Viewer

Capture Viewer - CPHY_DSI_3L_1.5G

Events / Data | Frames

Search: Nano-Seconds | Change Rows | Find | Filter

Event Plot

Current position: 39138577373394 | Marker 1: < • > | Marker 2: < • > | Difference (M1-M2): | Zoom: 0.0028340

Lane 0, Lane 1, Lane 2, Lane 3

Event Table

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
4052 / 16262	39138577372732	C-Phy	HS	0	Data Rate 1.500Gbps, DSI Short : Sync Event, H Sync Start	23.41
4052 / 16263	39138577372732	C-Phy	HS	1	Data Rate 1.500Gbps, DSI Short : Sync Event, H Sync Start	23.41
4052 / 16264	39138577372732	C-Phy	HS	2	Data Rate 1.500Gbps, DSI Short : Sync Event, H Sync Start	23.41
4053 / 16265	39138577372846	C-Phy	LP	0	Lane=0-LP-111 : Stop	1142
4053 / 16266	39138577372846	C-Phy	LP	1	Lane=1-LP-111 : Stop	1142

Raw Data

Lane0 Lane1 Lane2
VC=0, DT=0x21
Data=0x0800, S2DC=0x888, Pli-Checksum=0x0afd ...
SYNC3 SYNC3 SYNC3
8021 8000 8afd
SYNC3 SYNC3 SYNC3
8021 8000 8afd
EOB EOB EOB

FW Version: 7.32.0 DHCP IP: 10.211.177.191 | Home | Signal Generator | Capture & View | 12:58 PM 09-13-2024

- ◆ The Envision X14 analysis software depicts a set of C-Phy DSI high speed line start packet with the packet details shown in the panel on the right.

Envision X14 – Analysis Software – Showing C-Phy DSI Data Burst

The screenshot displays the 'C-PHY Analyzer' interface. At the top, it shows 'Video Protocol Suite' and 'C-PHY Analyzer' with various status indicators like 'PHY: DS1', 'DATA RATE: 5199 Mbps', and 'VIDEO FRAMES: 60'. The main area is titled 'Capture Viewer - CPHY_DSI_3L_1.5G'. It features an 'Event Plot' showing four lanes (Lane 0, Lane 1, Lane 2, Lane 3) over time. Below the plot is an 'Event Table' with the following data:

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
4054 / 16274	3913857374292	C-Phy	HS	0	Data Rate 1.500Gbps, DSI Long : Packed Pixel Stream, 24-bit RGB 8:8:4 - orange	1179.73
4054 / 16275	3913857374292	C-Phy	HS	1	Data Rate 1.500Gbps, DSI Long : Packed Pixel Stream, 24-bit RGB 8:8:4 - orange	1179.73
4054 / 16276	3913857374292	C-Phy	HS	2	Data Rate 1.500Gbps, DSI Long : Packed Pixel Stream, 24-bit RGB 8:8:4 - orange	1179.73
4057 / 16277	3913857375944	C-Phy	LP	0	Lane=0: LP-111 : Stop	65466
4057 / 16278	3913857375944	C-Phy	LP	1	Lane=1: LP-111 : Stop	65466

On the right side of the interface, there are 'Details' and 'Raw Data' panels. The 'Details' panel shows 'VC=0, DT=0x3e' and 'Word Count=1928 bytes, SSDC=0x888, PH-Checksum=E...'. The 'Raw Data' panel shows hex values for Lane0, Lane1, and Lane2.

◆ The Envision X14 analysis software depicts a set of C-Phy DSI high speed line start packet with the packet details shown in the panel on the right.

Envision X14 – Analysis with DSI-2 Display Stream Compression (DSC)

- ◆ DSI Display Stream Compression (DSC) for both C-Phy and D-Phy.
- ◆ DSC Parameters can be entered on DSC tab.

Video Protocol Suite - Analyzer

C-PHY Analyzer

PHY: C-PHY PROTOCOL: DSI LANES: 2(1 1 0) DATA RATE: 0 Msps VIDEO FRAMES: 0 SKEW: Configured CRC Errors: 0 perSec PACKET HEADER CRC Errors: 0 perSec SYNC DET: 000

Capture Viewer - D-Phy_DSI_3G_4L_DSC

Event Plot

Current position: 33240097

Marker 1: [] Marker 2: [] Difference (M1-M2): Zoom: 100.0000000

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
3624 / 28966	20248440	D-PHY	HS	0	Data Rate 3.000Gbps, DSI Long: Picture Parameter Set	88
3624 / 28966	20248440	D-PHY	HS	1	Data Rate 3.000Gbps, DSI Long: Picture Parameter Set	88
3624 / 28967	20248440	D-PHY	HS	2	Data Rate 3.000Gbps, DSI Long: Picture Parameter Set	88
3624 / 28968	20248440	D-PHY	HS	3	Data Rate 3.000Gbps, DSI Long: Picture Parameter Set	88
3625 / 28969	20276942	D-PHY	HS	0	Data Rate 3.000Gbps, DSI Short: Sync Event, H Sync Start	3
3625 / 28970	20276942	D-PHY	HS	1	Data Rate 3.000Gbps, DSI Short: Sync Event, H Sync Start	3
3625 / 28971	20276942	D-PHY	HS	2	Data Rate 3.000Gbps, DSI Short: Sync Event, H Sync Start	3
3625 / 28972	20276942	D-PHY	HS	3	Data Rate 3.000Gbps, DSI Short: Sync Event, H Sync Start	3

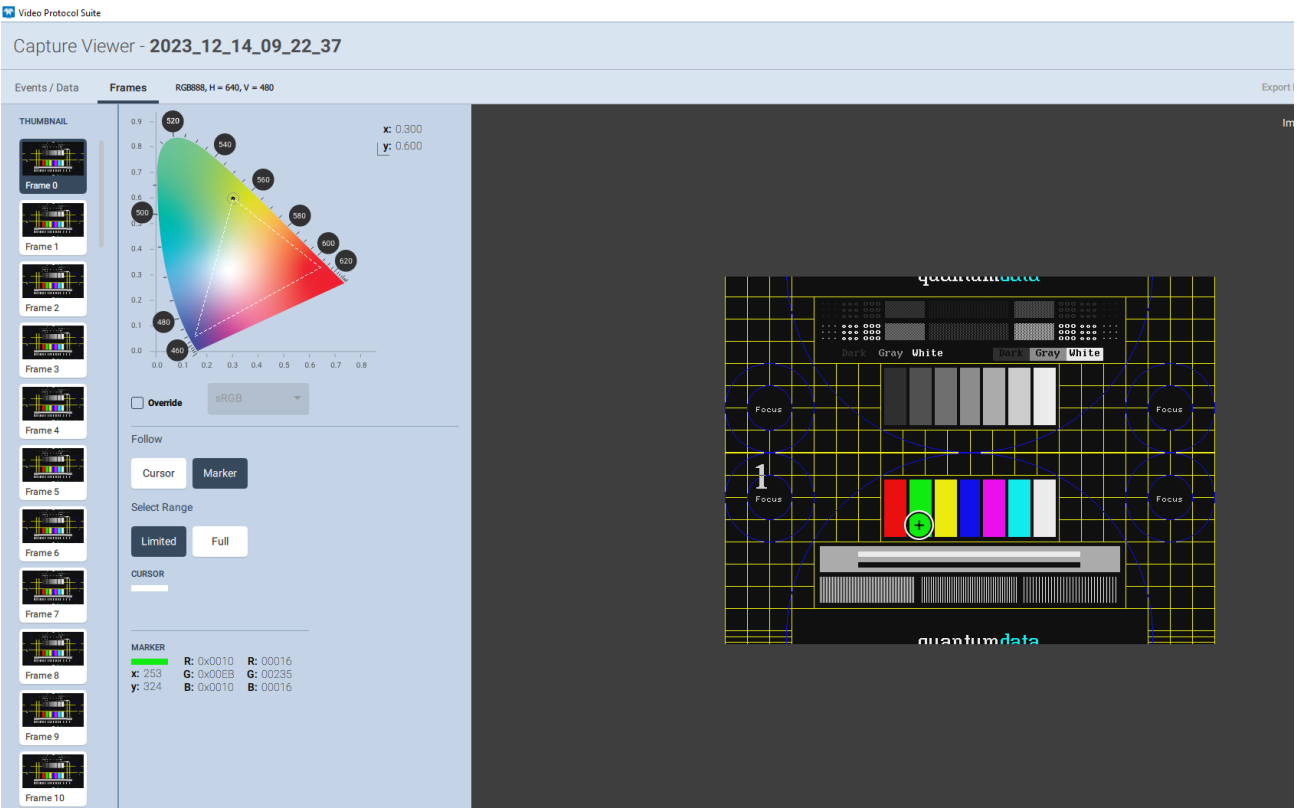
Raw Data

Lane0	Lane1	Lane2	Lane3
HS-Sync	HS-Sync	HS-Sync	HS-Sync
0x0a	0x08	0x08	0x08
0x12	0x08	0x08	0x08
0x30	0x08	0x01	0xe0
0x02	0x08	0x01	0xe0
0x01	0x08	0x01	0xe0
0x02	0x08	0x01	0xc9
0x00	0x20	0x17	0x90
0x00	0x04	0x08	0x0f
0x00	0x41	0x08	0x5c
0x18	0x08	0x10	0xf9
0x03	0x0c	0x20	0x08
0x06	0x0b	0x0b	0x33
0x0e	0x1c	0x2a	0x38
0x46	0x54	0x02	0x59
0x78	0x77	0x79	0x7c
0x7d	0x7e	0x01	0x82
0x01	0x08	0x09	0x48
0x09	0x0e	0x19	0xfc
0x19	0xfa	0x19	0xf8
0x1a	0x38	0x1a	0x78
0x22	0x06	0x2a	0x06
0x2a	0xf6	0x2a	0xf4
0x43	0x34	0x53	0x74
0x00	0x08	0x08	0x08
0x08	0x08	0x08	0x08
0x00	0x08	0x08	0x08

FW Version: 7.42.01 Beta Static IP: 10.211.176.7 PCA=10, PCB=6, TSN=2024-0007, DDR 16Gb

Home Signal Generator Capture & Viewer 01:46 PM 03-22-2025

Envision X14 Analysis Software – Frame Viewer



- ◆ The Envision X14 provides a view of the captured frames.
- ◆ You can view the image element or pixel values by selecting or mousing over an element.
- ◆ The Envision X14 Frame capture feature also enables you to view each image element on a CIE color chart.

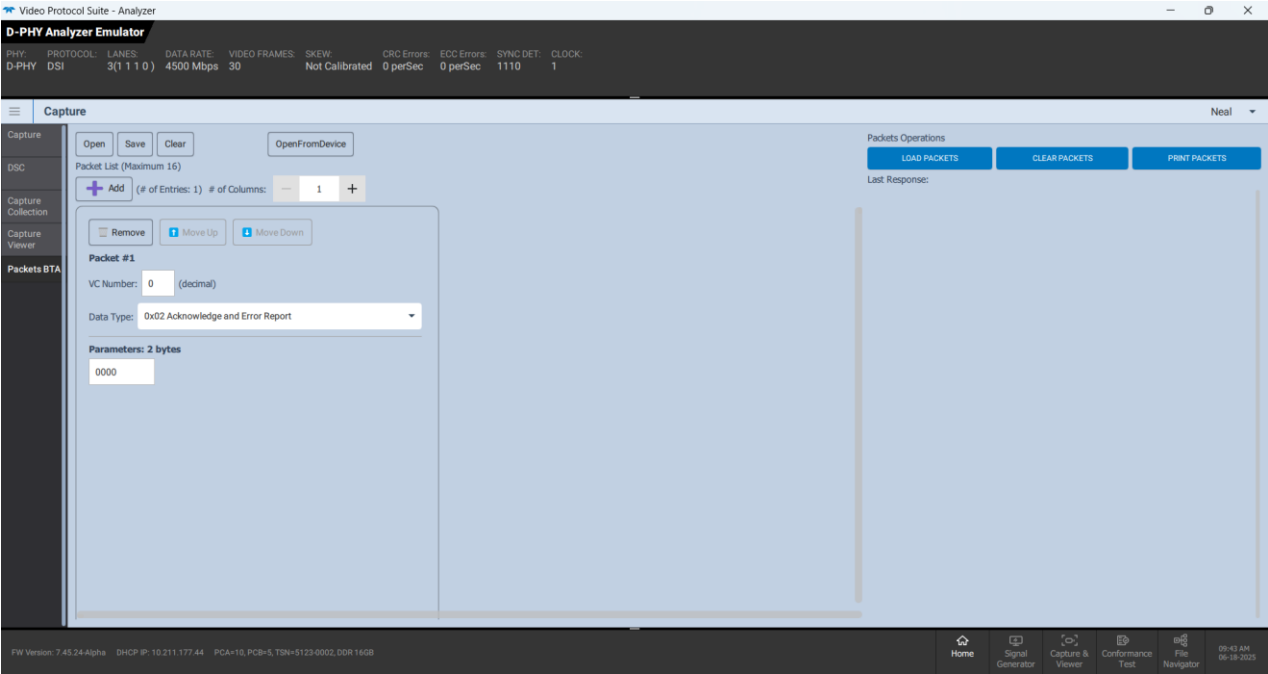
Envision X14 Analysis Software – Viewing Virtual Channel Frames

The screenshot displays the Envision X14 Analysis Software interface. At the top, it shows 'Events / Data' and 'Frames' tabs, with the current frame information: 'RGB888, H = 1920, V = 1080, VC = 1'. The interface is divided into several sections:

- THUMBNAIL:** A vertical list of five frame thumbnails. Frame 0 (VC=2) is highlighted in purple. Frame 1 (VC=1) shows a grayscale image with a color calibration bar. Frame 2 (VC=2) shows a rainbow color bar. Frame 3 (VC=1) shows a grayscale image with a color calibration bar. Frame 4 (VC=2) shows a rainbow color bar.
- CURSOR:** A panel on the right side of the thumbnail area showing the current cursor position and pixel values. It displays:
 - x: 7
 - y: 18
 - R: 0x0010
 - G: 0x0010
 - B: 0x0010
 - R: 00016
 - G: 00016
 - B: 00016
- MARKER:** A panel at the bottom of the cursor area, currently empty.
- Main View:** A large central area showing a grid of the captured frame. A red dashed oval highlights a specific region of interest. The grid contains a grayscale image with a color calibration bar and a barcode-like pattern.

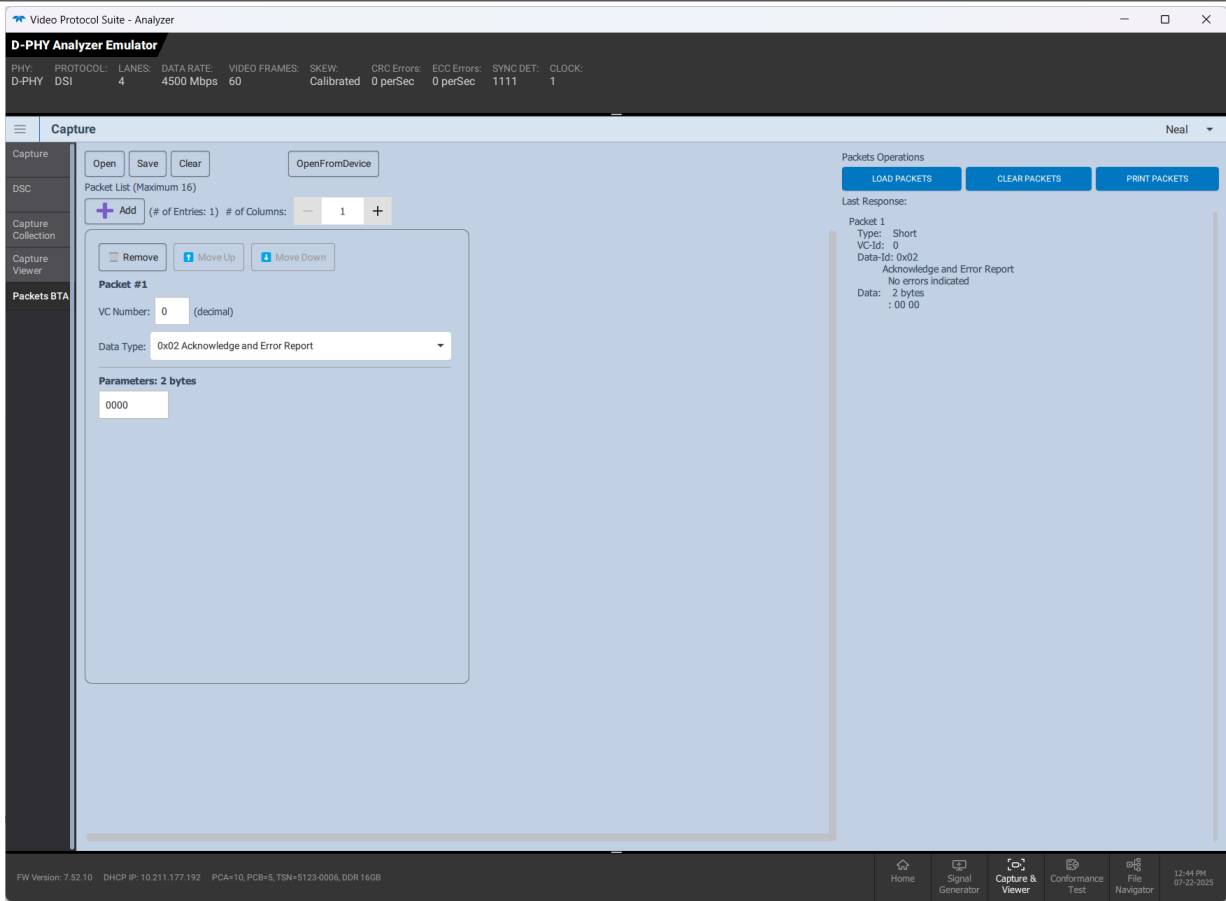
- ◆ The Envision X14 provides a view of the captured frames.
- ◆ You can view the image element or pixel values by selecting or mousing over an element.
- ◆ Example shows viewing the frames of different Virtual Channels.

Envision X14 Analysis Software – Packets Bus Turnaround for DSI DCS



- ◆ The Envision X14 Analyzer (emulating a DSI display device) can be configured to product the desired response to a DSI DCS Command Mode command from the DSI Host.

Envision X14 Analysis Software – Packets Bus Turnaround for DSI DCS



- ◆ The Envision X14 Analyzer (emulating a DSI display device) can be configured to product the desired response to a DSI DCS Command Mode command from the DSI Host.
- ◆ Example show last response sent via the bus turnaround.

Envision X14 Analysis Software – Packets Bus Turnaround for DSI DCS

Video Protocol Suite - Analyzer

C-PHY Analyzer Emulator

PHY: C-PHY PROTOCOL: CSI LANES: 1 DATA RATE: 2200 Msps VIDEO FRAMES: 60 SKEW: Configured CRC Errors: 0 perSec PACKET HEADER CRC Errors: 0 perSec SYNC DET: 100

Capture Viewer - 2025_07_24_16_57_05

Events / Data Frames

Event Plot

Current position: 7227820515 Marker 1: Marker 2: Difference (M2-M1): Zoom: 0.0001431

Event Table

Counter / Index	TimeStamp	PHY	MODE	Lane	Description	Duration (ns)
3224506 / 742880	7227819916	D-PHY	EVM	M	Lane=0 LPDPT BTA REQUEST	100
3224506 / 742881	7227820376	D-PHY	LP	0	Lane=0 LP-11 : Stop	160
3224506 / 742882	7227820536	D-PHY	LP	0	Lane=0 LP-10 : LP-Rqst	50
3224506 / 742883	7227820586	D-PHY	LP	0	Lane=0 LP-00 : Bridge	60
3224506 / 742884	7227820646	D-PHY	LP	0	Lane=0 LP-01 : HS-Rqst	42
3224506 / 742885	7227820688	D-PHY	LP	0	Lane=0 LPDPT RESPONSE: Short: Reserved (0x00)	908
3224506 / 742886	7227821596	D-PHY	LP	0	Lane=0 LP-11 : Stop	108
3224506 / 742887	7227821704	D-PHY	LP	0	Lane=0 LP-10 : LP-Rqst	52
3224506 / 742888	7227821756	D-PHY	LP	0	Lane=0 LP-00 : Bridge	60

- ◆ The Envision X14 Analyzer (emulating a DSI display device) can be configured to product the desired response to a DSI DCS Command Mode command from the DSI Host.
- ◆ Example shows capture indicating a trigger on the bus turnaround in response to a DCS command and shows the Low Power Data Transmission (LPDPT) command response.

Envision X14

MIPI C-Phy/D-Phy CSI/DSI Analyzer

Examples of Generator operation

July 2025



Envision X14 Generator Software – Link Tab

The screenshot displays the 'D-PHY Generator' window within the 'Video Protocol Suite - Generator' application. The top status bar shows various system parameters: PHY: D-PHY, Protocol: DSI, Lanes: 3, Rate: 4.500 Gbps, Video: Enabled, Format: 1080p30, Total: 2200 x 1125, Active: 1920 x 1080, Refresh: 30.000 Hz, Pixel Mode: RGB 8-8-8, DSI Syncs: pulses, Blanking DSI: NONE, EOTF Enabled: DSI: No, CSI: No, Numbering: both, LRTE: Enabled, LRTE S-Count: 0, LRTE L-Count: 0, Inj Errors: None, Pattern: ColorBar.

The main interface is titled 'MIPI Generator View' and shows the 'Basic Link Configuration' section. It includes three input fields: 'Lanes' set to 3, 'Protocol' set to DSI, and 'Rate(Mbps)' set to 4500. An 'APPLY' button is located below these fields. A sidebar on the left contains navigation options for 'Link', 'Video', 'Errors', and 'Packets'. The bottom status bar shows 'FW Version: 7.43.24-Alpha', 'DHCP IP: 10.211.177.46', 'PCA=na, PCB=na, TSN=na, DDR 16GB', and navigation icons for Home, Signal Generator, Capture & Viewer, Conformance Test, and File Navigator, along with the date and time '09:25 AM 06-18-2025'.

- ◆ Select Format, color mode and chroma sampling, test patterns and blanking options.

Envision X14 Generator Software – Format Selection

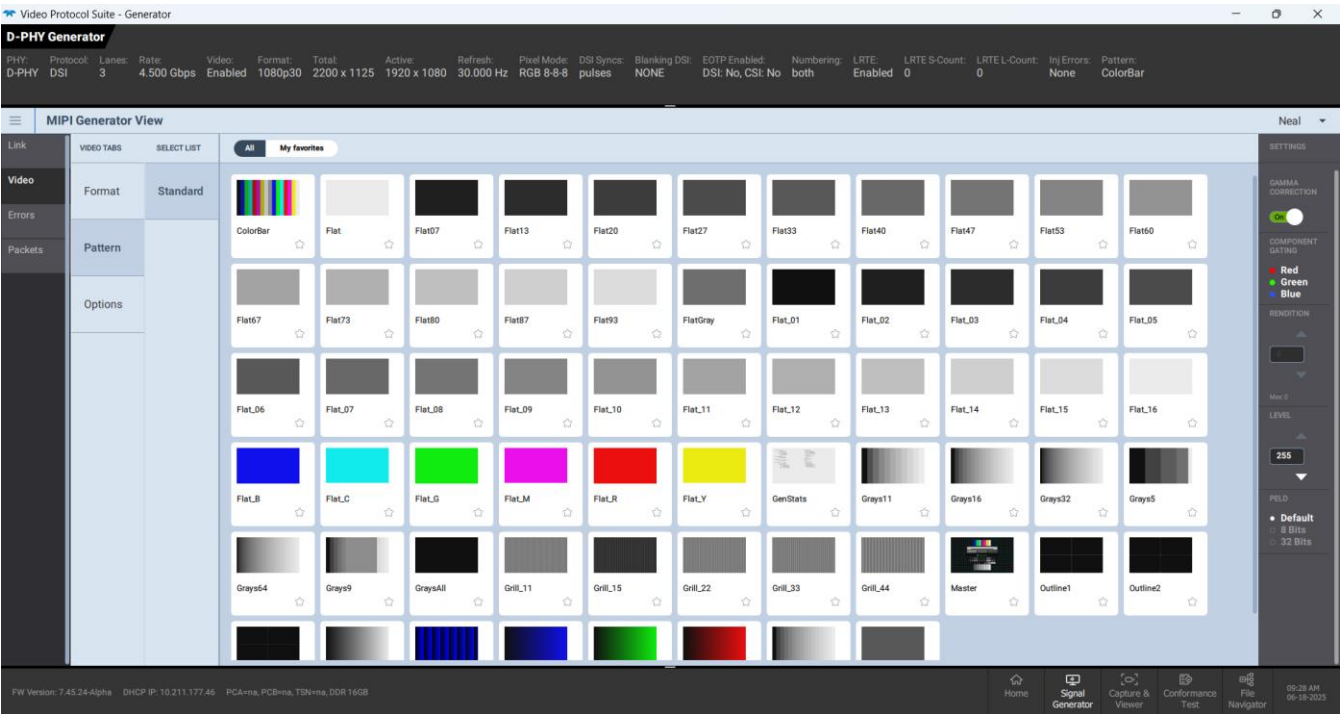
The screenshot displays the 'D-PHY Generator' window within the 'Video Protocol Suite - Generator' application. The top status bar shows various configuration parameters: PHY: D-PHY, Protocol: DSI, Lanes: 3, Rate: 4.500 Gbps, Video: Enabled, Format: 1080p30, Total: 2200 x 1125, Active: 1920 x 1080, Refresh: 30.000 Hz, Pixel Mode: RGB 8-8-8, DSI Syncs: pulses, Blanking DSI: NONE, EOTP Enabled: DSI: No, CSI: No, Numbering: both, LRTE: Enabled, LRTE S-Count: 0, LRTE L-Count: 0, Inj Errors: None, Pattern: ColorBar.

The main area is titled 'MIPI Generator View' and features a 'Select path' button and 'Current path: Standard'. It is divided into 'VIDEO TABS' and 'FORMAT TABS'. Under 'FORMAT TABS', there are 'TIMINGS' and 'Pattern' sections. The 'TIMINGS' section contains a grid of format options: 1280x800p60, 1080p60, 640x480p60, 720p120, 1080p120, 1080p30 (highlighted), and 720p60. The 'Pattern' section includes 1024x600p60, 1440x1080p60, and 720p30. An 'Options' section is also present but currently empty.

The bottom status bar shows: FW Version: 7.45.24-Alpha, DHCP IP: 10.211.177.46, PCA=na, PCB=na, TSN=na, DDR 16GB. Navigation icons for Home, Signal Generator, Capture & Viewer, Conformance Test, and File Navigator are visible, along with the date and time: 09:27 AM 06-18-2025.

◆ Select Format, color mode and chroma sampling, test patterns and blanking options.

Envision X14 Generator Software – Test Pattern Selection



- ◆ Select Format, color mode and chroma sampling, test patterns and blanking options.

Envision X14 Generator Software – Blanking Configuration

The screenshot shows the 'D-PHY Generator' window in the 'Video Protocol Suite - Generator' application. The 'MIPI Generator View' is active, displaying various configuration options. At the top, a status bar shows parameters like PHY: D-PHY, Protocol: DSI, Lanes: 3, Rate: 4.500 Gbps, Video: Enabled, Format: 1080p30, Total: 2200 x 1125, Active: 1920 x 1080, Refresh: 30.000 Hz, Pixel Mode: RGB 8-8-8, DSI Syncs: pulses, Blanking DSI: NONE, EOTP Enabled: DSI: No, CSI: No, Numbering: both, LRTE: Enabled, LRTE S-Count: 0, LRTE L-Count: 0, Inj Errors: None, and Pattern: ColorBar.

The 'MIPI Generator View' is divided into several sections:

- Virtual Channel:** Value: 0
- Encoding:** Buttons for YCbCr 4:2:2 16bit, RGB 10-10-10, RGB 8-8-8 (selected), and RGB 5-6-5.
- Blanking Options - DSI:** Radio buttons for Packet and LP (selected) for Horiz. Front Porch, Horiz. Sync Active, and Horiz. Back Porch. Packet Type: Blanking and NULL (selected).
- DSI Sync Options:** Radio buttons for Pulses (selected) and Events.
- Use EoTp:** Checkboxes for CSI and DSI.

An 'APPLY' button is located at the bottom left of the configuration area. The bottom status bar shows 'FW Version: 7.45.24-Alpha', 'DHCP IP: 10.211.177.46', 'PCA=na, PCB=na, TSN=na, DDR 16GB', and navigation icons for Home, Signal Generator, Capture & Viewer, Conformance Test, and File Navigator, along with the date and time '09:25 AM 06-15-2025'.

◆ Select Format, color mode and chroma sampling, test patterns and blanking options.

Envision X14 – Generator CSI/DSI Error Injection

Video Protocol Suite - Generator

D-PHY Generator

PHY: D-PHY Protocol: DSI Lanes: 4 Rate: 6.000 Gbps Video: Enabled Format: 1440x1080p60 Total: 1936 x 1118 Active: 1440 x 1080 Refresh: 60.000 Hz Pixel Mode: RGB 8-8-8 DSI Syncs: pulses Blanking DSI: NONE EOTP Enabled: DSI: No, CSI: No Numbering: none LRTE: Disabled LRTE S-Count: 0 LRTE L-Count: 0 Inj Errors: dt Pattern: Master

MIPI Generator View Neal

Link

Video

Errors

Packets

Injected Error Type

- None [None] [Description](#); There are no active Injected Errors.
- Ecc 1bit Error [ecc_1b] [Description](#); This type of error introduces 1 bit error in calculated Ecc.
- Ecc 2bit Error [ecc_2b] [Description](#); This type of error introduces 2 bit error in calculated Ecc.
- Data Type Error [dt] [Description](#); This type of error will send wrong data type from protocol layer.
- Invalid Transmission Length Error [txlen] [Description](#); This type of error will send wrong Word count in the case of long packets.
- DSI Protocol Violation [dsp] [Description](#); This type of error won't send the EoTp at the end of transmission or in the case of read request, BTA request won't be send after the read request.
- Virtual Channel ID Error [vcid] [Description](#); This type of error will send the wrong VC ID.
- Packet Footer Error [pfi] [Description](#); This type of error will send wrong Packet Footer in the case of Long Packets.
- SoT Error [sot] [Description](#); This type of error will introduce error in SoT leader sequence (Single bit errors), so that synchronization can be done, but confidence in payload may be lower.
- SoT Sync Error [sots] [Description](#); This type of error will introduce the error in SoT leader sequence, so that proper synchronization cannot be expected.
- EoT Sync Error [eots] [Description](#); This type of error will send the data in such a way that the end of the transmission doesn't match the byte boundary.
- Escape Mode Entry Command Error [escm] [Description](#); This type of error will introduce the error in the Entry Command of Escape Mode.
- LP Transmission Sync Error [psync] [Description](#); This type of error will send the data in such a way that the end of Low Power Data Transmission isn't synchronized to a byte boundary.
- False Control Error [falsec] [Description](#); This type of error can generate two scenarios: 1.) The valid Escape or Turnaround sequence which isn't followed by LP_Rqst state. 2.) A HS_Rqst which isn't correctly followed by a Bridge state.

FW Version: 7.52.12 DHCP IP: 10.211.177.55 PCA=10, PCB=6, TSN=5123-0007, DDR 16GB

Home Signal Generator Capture & Viewer Conformance Test File Navigator 03:14 PM 07-24-2025

- ◆ C-Phy and D-Phy CSI Error Generation.
- ◆ Inject both Phy and Protocol errors.

Envision X14 – DSI DCS Command Mode Control

- ◆ C-Phy and D-Phy DSI DCS Command Mode.
- ◆ Select commands from a pull-down menu to send to a DSI display device under test.

Envision X14 – DSI DCS Command Mode Control

Video Protocol Suite - Generator

D-PHY Generator

PHY	Protocol	Lanes	Rate	Video	Format	Total	Active	Refresh	Pixel Mode	DSI Syncs	Blanking DSI	EOTP Enabled	Numbering	LRTE	LRTE S-Count	LRTE L-Count	Inj Errors	Pattern
D-PHY	DSI	3	4.500 Gbps	Enabled	1080p30	2200 x 1125	1920 x 1080	30.000 Hz	RGB 8-8-8	pulses	NONE	DSI: No, CSI: No	both	Enabled	0	0	None	ColorBar

MIPI Generator View

Link: Open Save Clear

Video: Packet List (Maximum 16)

Errors: Add (# of Entries: 1) # of Columns: 1

Packets: Remove Move Up Move Down

Packet #1

VC Number: 0 (decimal)

Data Type: DCS Command

Command: 70h: get_DSI_mode

No parameters

Send Packets

Mode: HS LP

Perform BTA and get response

SEND PACKETS

Last Response:

FW Version: 7.45.24-Alpha DHCP IP: 10.211.177.46 PCAnms_PCBnms_TSNnms_DDR 16GB

Home Signal Generator Capture & Viewer Conformance Test File Navigator 09:20 AM 06-18-2025

- ◆ C-Phy and D-Phy DSI DCS Command Mode.
- ◆ Select commands from a pull-down menu to send to a DSI display device under test.

Envision X14 – DSI DCS Command Mode Control

The screenshot displays the 'D-PHY Generator' window within the 'Video Protocol Suite - Generator' application. The top status bar shows configuration details: PHY: D-PHY, Protocol: DSI, Lanes: 3, Rate: 4.500 Gbps, Video: Enabled, Format: T080p30, Total: 2200 x 1125, Active: 1920 x 1080, Refresh: 30.000 Hz, Pixel Mode: RGB 8-8-8, DSI Syncs: pulses, Blanking DSI: NONE, EOTP Enabled: DSI, No, CSI, No, Numbering: both, LRTE: Enabled, LRTE S-Count: 0, LRTE L-Count: 0, Inj Errors: None, Pattern: ColorBar.

The main area is titled 'MIPI Generator View' and contains a 'Packet List (Maximum 16)' with 3 entries. Two packets are visible:

- Packet #1:** VC Number: 0 (decimal), Data Type: DCS Command, Command: 70h: get_DSI_mode, No parameters.
- Packet #2:** VC Number: 0 (decimal), Data Type: DCS Command, Command: 2Ah: set_column_address, Parameters: 4 bytes (00000000).

On the right, the 'Send Packets' section shows 'Mode: HS LP' selected and a 'SEND PACKETS' button. The 'Last Response:' field is currently empty.

At the bottom, the status bar includes: FW Version: 7.45.24-Alpha, DHCP IP: 10.211.177.46, PCA=na, PCB=rns, TSN=na, DDR 16GB, and navigation icons for Home, Signal Generator, Capture & Viewer, Conformance Test, File Navigator, and a timestamp of 09:32 AM 06-18-2025.

- ◆ C-Phy and D-Phy DSI DCS Command Mode.
 - ◆ Select commands from a pull-down menu to send to a DSI display device under test.
 - ◆ Configure multiple commands in a sequence.

Envision X14

MIPI C-Phy/D-Phy CSI/DSI – Status Update Conformance Testing

July 2025



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Envision X14 – Conformance Testing

The screenshot shows the 'Test Configuration' window of the 'D-PHY Analyzer Emulator'. The window title is 'D-PHY Analyzer Emulator' and the subtitle is 'Test Configuration'. Below the subtitle, it reads 'MIPI D-PHY TX CSI-2 v4.1 CT v1.0'. The window has a menu bar with 'Export', 'Save CDF As', 'Save Configuration As', 'Load CDF', and 'Load Configuration'. The main area is divided into 'CDF Entry', 'Test Selection', and 'Preview & Run' tabs. The 'CDF Entry' tab is active, showing a 'General' category with the following fields: 'Manufacturer' (text input), 'Model' (text input), 'Port Tested' (text input with value '1'), 'CSLLRTE_SUPPORTED' (radio buttons for 'Yes' and 'No'), and 'CSL_LINE_SYNC_START_END_SUPPORTED' (radio buttons for 'Yes' and 'No'). At the bottom right, there are 'CLEAR ALL' and 'NEXT' buttons.

- ◆ C-Phy and D-Phy CSI and DSI Conformance Testing.

Envision X14 – Conformance Testing

◆ C-Phy and D-Phy CSI and DSI Conformance Testing.

The screenshot shows the 'D-PHY Analyzer Emulator' software interface. At the top, there is a status bar with the following information: PHY: D-PHY, PROTOCOL: DSI, LANES: 4(1 1 1 1), DATA RATE: 4000 Mbps, VIDEO FRAMES: 30, SKEW: Not Calibrated, CRC Errors: 0 perSec, ECC Errors: 0 perSec, SYNC DET: 1111, CLOCK: 1. Below this is a 'Conformance Test' section with a search bar and a dropdown menu set to 'Neal'. The main area is divided into two panes. The left pane, titled 'MIPI Conformance', shows a list of test configurations under the 'DSI' tab, including 'C-PHY HOST DSI-2 v1.1 CTS v1.0', 'C-PHY PERI DSI-2 v1.1 CTS v1.0', 'D-PHY HOST DSI-2 v1.1 CTS v1.0', and 'D-PHY PERI DSI-2 v1.1 CTS v1.0'. The right pane, titled 'Conformance Test(0)', contains a table with columns for 'Test name', 'TestSuite', 'Test Completed/ Stopped', and 'Test Status'. A yellow tooltip titled 'What is a Template?' is overlaid on the right pane, explaining that templates save time by saving configurations and can be created from scratch or saved. A 'GOT IT' button is at the bottom of the tooltip. At the bottom of the interface, there is a footer with version information: 'FW Version: 7.45.24-Alpha', 'DHCP IP: 10.211.177.44', 'PCA+10, PCB+5, TSN=5123-0002, DDR 16GB', and navigation icons for Home, Signal Generator, Capture & Viewer, Conformance Test, and File Navigator. The system clock shows 11:35 AM on 05-15-2025.

Envision X14 – Conformance Testing – Test Selection

◆ C-Phy and D-Phy CSI and DSI Conformance Testing.

Video Protocol Suite - Analyzer
D-PHY Analyzer Emulator

Test Configuration
MIPI D-PHY TX CSI-2 v4.1 CT v1.0

Save TestList As Save Configuration As Load TestList Load Configuration

CDF Entry Test Selection Preview & Run

Select All Clear All

TEST CATEGORIES 0/1

Section3 0/18

- T.3.1.1: [Ready] Long Packet Data Types
- T.3.1.2: [Ready] Long Packet Format D-PHY
- T.3.1.4: [Ready] Byte Ordering D-PHY
- T.3.1.6: [Ready] Short Packet Data Types
- T.3.1.7: [Ready] Short Packet Format D-PHY
- T.3.1.9: [Under Development] Frame and Line Synchronization Data Types
- T.3.2.1: [Under Development] Virtual Channel Interleaving
- T.3.2.2: [Under Development] VCX Support
- T.3.3.1: [Under Development] ECC Calculation D-PHY
- T.3.4.1: [Under Development] CRC Calculation D-PHY FCM Long Packet
- T.3.5.1: [Under Development] Packet Spacing
- T.3.6.1: [Under Development] Sync Short Packet Data Type Codes
- T.3.6.2: [Under Development] Frame Synchronization Packets
- T.3.6.3: [Under Development] Line Synchronization Packets
- T.3.7.1: [Under Development] Generic Short Packet Data Type Codes
- T.3.8.1: [Under Development] Service Extension Packet (SEP) Data Type Code
- T.3.11.1: [Under Development] Write and Read USL Transaction

PREVIOUS NEXT

Envision X14 – Conformance Testing – Test Review

Video Protocol Suite - Analyzer
D-PHY Analyzer Emulator

Test Configuration
MIPI D-PHY TX CSI-2 v4.1 CT v1.0

Save Configuration As Load Configuration

CDF Entry Test Selection **Preview & Run**

Select Multiple Select All Deselect All Expand All Collapse All

Disable Selected Items Enable Selected Items

CATEGORY / TEST NAME / ITERATIONS	ON/OFF	REPEAT COUNT
18/18 Section3	<input checked="" type="checkbox"/>	1
1/1 T.3.1.1: [Ready] Long Packet Data Types	<input checked="" type="checkbox"/>	1
1/1 T.3.1.2: [Ready] Long Packet Format D-PHY	<input checked="" type="checkbox"/>	1
1/1 T.3.1.4: [Ready] Byte Ordering D-PHY	<input checked="" type="checkbox"/>	1
1/1 T.3.1.6: [Ready] Short Packet Data Types	<input checked="" type="checkbox"/>	1
1/1 T.3.1.7: [Ready] Short Packet Format D-PHY	<input checked="" type="checkbox"/>	1
1/1 T.3.1.9: [Under Development] Frame and Line Synchronization Data Types	<input checked="" type="checkbox"/>	1
1/1 T.3.2.1: [Under Development] Virtual Channel Interleaving	<input checked="" type="checkbox"/>	1
1/1 T.3.2.2: [Under Development] VCX Support	<input checked="" type="checkbox"/>	1
1/1 T.3.3.1: [Under Development] ECC Calculation D-PHY	<input checked="" type="checkbox"/>	1
1/1 T.3.4.1: [Under Development] CRC Calculation D-PHY FCM Long Packet	<input checked="" type="checkbox"/>	1
1/1 T.3.5.1: [Under Development] Packet Spacing	<input checked="" type="checkbox"/>	1
1/1 T.3.6.1: [Under Development] Sync Short Packet Data Type Codes	<input checked="" type="checkbox"/>	1
1/1 T.3.6.2: [Under Development] Frame Synchronization Packets	<input checked="" type="checkbox"/>	1
1/1 T.3.6.3: [Under Development] Line Synchronization Packets	<input checked="" type="checkbox"/>	1
1/1 T.3.7.1: [Under Development] Generic Short Packet Data Type Codes	<input checked="" type="checkbox"/>	1

TEST SETTINGS

PREVIOUS RUN

- ◆ C-Phy and D-Phy CSI and DSI Conformance Testing.
- ◆ Note that you can disable at test and set the number of iterations of each test.

Envision X14 – Conformance Testing

- ◆ C-Phy and D-Phy CSI and DSI Conformance Testing.
- ◆ Shows test suite in progress.

The screenshot shows the 'D-PHY Analyzer Emulator' window with a 'Test Configuration' section. The test suite is 'MIPI D-PHY TX CSI-2 v4.1 CT v1.0'. The table below lists the test items and their current status.

CATEGORY / TEST NAME / ITERATIONS	ON/OFF	REPEAT COUNT	STATUS
> Iter 01:	On	1	Pass
▼ T.3.1.7: Short Packet Format D-PHY	On	1	1/1 Pass
> Iter 01:	On	1	Pass
▼ T.3.1.9: Frame and Line Synchronization Data Types	On	1	1/1 Pass
> Iter 01:	On	1	Pass
▼ T.3.2.1: Virtual Channel Interleaving	On	1	1/1 Pass
> Iter 01:	On	1	Pass
▼ T.3.2.2: VCX Support	On	1	0/1 In Progress
Iter 01:	On	1	Not Tested
> T.3.3.1: ECC Calculation D-PHY	On	1	0/1 Not Tested
> T.3.4.1: CRC Calculation D-PHY FCM Long Packet	On	1	0/1 Not Tested
> T.3.5.1: Packet Spacing	On	1	0/1 Not Tested
> T.3.6.1: Sync Short Packet Data Type Codes	On	1	0/1 Not Tested

At the bottom, the 'TEST LOGS' section shows 'TEST IN PROGRESS' for 'T.3.2.2: Iteration 01' with an elapsed time of 00:04:17. There are 'CANCEL THE TEST' and 'PAUSE' buttons.

Envision X14 – Conformance Testing

The screenshot shows the 'D-PHY Analyzer Emulator' interface. At the top, it displays 'Test Configuration' for 'MIPI D-PHY TX CSI-2 v4.1 CT v1.0'. Below this is a table of test items with columns for 'ON/OFF', 'REPEAT COUNT', and 'STATUS'. The tests listed include T.3.2.1: Virtual Channel Interleaving, T.3.2.2: VCX Support, T.3.3.1: ECC Calculation D-PHY, and T.3.4.1: CRC Calculation D-PHY FCM Long Packet. Each test item has a 'Pass' status and a '1' repeat count. Below the table is a 'TEST LOGS' section with a legend for log types (HEADER/INFORMATION, SUB-HEADER, WARNING, CONTINUE, COMMAND, RESPONSE) and a list of log entries. The logs show the execution of the test, including removing logs, loading json files, and starting the test. At the bottom, there is an 'Elapsed Time' of 00:07:32 and a 'TEST IN PROGRESS' indicator for 'T.3.6.2: Iteration 01'. There are also 'CANCEL THE TEST' and 'PAUSE' buttons.

CATEGORY / TEST NAME / ITERATIONS	ON/OFF	REPEAT COUNT	STATUS
▼ T.3.2.1: Virtual Channel Interleaving	On	1	1/1 Pass
> Iter 01:	On	1	Pass
▼ T.3.2.2: VCX Support	On	1	1/1 Pass
> Iter 01:	On	1	Pass
▼ T.3.3.1: ECC Calculation D-PHY	On	1	1/1 Pass
> Iter 01:	On	1	Pass
▼ T.3.4.1: CRC Calculation D-PHY FCM Long Packet	On	1	1/1 Pass
> Iter 01:	On	1	Pass
> 1: verify that the DUT using the D-PHY FCM physical layer properly calculates the CRC field.	On		Pass

TEST LOGS

- 0286 Executing the test.
- 0287 Removing logs at C:/Users/nkendall/Documents/VPSWorkspace/Neal/MipiDPhyTxct/results/2025_07_22_11_32_57/T_3_6_2_01
- 0288 Removing logs at /home/qd/mipict_results.log
- 0289 Removing logs at /home/qd/mipl_cts_steps.log
- 0290 Removing logs at /home/qd/mipict_debug.log
- 0291 Removing capture logs at /home/qd/mipidecode.log
- 0292 Removing capture logs at /home/qd/mipiframepixels.bin
- 0293 mipi-scope >> log truncate
- 0294 mipixct T.3.6.2.1
- 0295 load json file.MIPI RX PHY set to D-PHY
- 0296 Cap started . CSI LRTE: = DISABLED
- 0297 Cap completed .START CAPTURE DECODE

Elapsed Time: 00:07:32 TEST IN PROGRESS: T.3.6.2: Iteration 01

CANCEL THE TEST PAUSE

- ◆ C-Phy and D-Phy CSI and DSI Conformance Testing.
- ◆ Shows test suite in progress.
- ◆ Shows viewing the detailed logs.

Envision X14 – Conformance Testing

CATEGORY / TEST NAME / ITERATIONS	REPEAT COUNT	STATUS
> T.3.1.9: Frame and Line Synchronization Data Types	1	1/1 Pass
> T.3.2.1: Virtual Channel Interleaving	1	1/1 Pass
> T.3.2.2: VCX Support	1	1/1 Pass
> T.3.3.1: ECC Calculation D-PHY	1	1/1 Pass
> T.3.4.1: CRC Calculation D-PHY FCM Long Packet	1	1/1 Pass
> T.3.5.1: Packet Spacing	1	1/1 Pass
> T.3.6.1: Sync Short Packet Data Type Codes	1	1/1 Pass
> T.3.6.2: Frame Synchronization Packets	1	1/1 Pass
> T.3.6.3: Line Synchronization Packets	1	1/1 Pass
▼ T.3.7.1: Generic Short Packet Data Type Codes	1	1/1 Fail
Iter 01:		Fail
> 1: verify that the DUT uses the Synchronization Short Packet Data Type 0x8 only for Generic Short Packet Code 1		Fail
▼ 2: verify that the DUT uses the Synchronization Short Packet Data Type 0x9 only for Generic Short Packet Code 2		Fail
Data Type 0x09 (Not detected) for Generic Short Packet Code 2. Total short Packet processed 4868.		
> 3: verify that the DUT uses the Synchronization Short Packet Data Type 0xA only for Generic Short Packet Code 3		Fail
> 4: verify that the DUT uses the Synchronization Short Packet Data Type 0xB only for Generic Short Packet Code 4		Fail
> 5: verify that the DUT uses the Synchronization Short Packet Data Type 0xC only for Generic Short Packet Code 5		Fail
> 6: verify that the DUT uses the Synchronization Short Packet Data Type 0xD only for Generic Short Packet Code 6		Fail
> 7: verify that the DUT uses the Synchronization Short Packet Data Type 0xE only for Generic Short Packet Code 7		Fail
> 8: verify that the DUT uses the Synchronization Short Packet Data Type 0xF only for Generic Short Packet Code 8		Fail

Test Count: 16/16 (Failed: 1, Passed Fully: 15)

Buttons: CONTINUE TESTING, HTML REPORT

- ◆ C-Phy and D-Phy CSI and DSI Conformance Testing.
- ◆ Shows test results.
- ◆ Note that you can link to the capture from the test results.