

## VTE-7100/CD45 MIPI Compliance Tester



### General Description:

The VTE-7100/CD45 system is a MIPI Compliance Tester capable of testing MIPI devices designed to be compliant with MIPI C-PHY v2.0 and D-PHY v2.1

The tester can be configured for testing CSI Rx/Tx devices, as well as DSI Rx/Tx devices.

An optional embedded MIPI protocol analyzer performs MIPI protocol packet analysis / processing, CRC verification and real-time lane data capture. An internal frame buffer allows for storage of captured data.

### Key PHY Features:

The VTE-7100/CD45 employs Arasan Combo ASIC test chip Apollo-Lite (© 2022 Arasan Chip Systems Inc.) supporting MIPI C-PHY v2.0 @ 4.5Gbps, and MIPI D-PHY v2.1 @ 4.5Gbps. The Apollo-Lite test chip is fabricated via TSMC 12nm / 7nm FINFET process.

Supported features include:

- HS, LP, and ALP modes
- Fast Lane Turnaround mode, Low-Power Escape modes, and Ultra Low-Power State mode
- Up to 4.5 Gbps per data lane in D-PHY<sup>SM</sup> mode with equalization
- Up to 4.5 Gbps (10.26 Gbps) per data trio-lane in C-PHY<sup>SM</sup> mode
- On-board programmable PLL with Spread Spectrum Clocking
- Power saving HS-Tx half swing mode for D-PHY<sup>SM</sup>
- HS-IDLE mode for D-PHY<sup>SM</sup>
- HS deskew
- Alternate calibration sequence
- Preamble sequence

### Key System Features:

- Capable of testing CSI/DSI devices for compliance with MIPI Standards, including data transmission / receive in real-time
- Max Data rate capture / transmission:
  - C-PHY max 4.5 Gbps / trio-lane (3 trio-lane config)
  - D-PHY max 4.5Gbps / lane (4 data lanes)
- Frame Transmit / Capture Modes:
  - On-Demand
  - Continuous
- In On-Demand mode frames are transmitted / captured based on the following parameters:
  - Start Frame Number
  - Frame Count
- In Continuous mode frames are transmitted / captured continuously until the capture process is terminated
- Real-time Frame Transfers from / to the Host PC via the following host interfaces:
  - PCIe X4 Gen3 (max 32Gbps)
  - PCIe X8 Gen3 (max 64 Gbps)
  - Thunderbolt V3 (max 40Gbps)
- Supports Frame Averaging:
  - On-the-fly execution in on-board hardware (FPGA) with zero processing time
  - Averaged frames stored in Frame
- Supports Real-time CRC verification
- On-the-fly Real-time Test Pattern Pixel verification and Pixel Error Counter
- Frame Acquisition Time Stamp and Frame CRC Error Stamp
- Performs Lane Data Rate Measurement
- Data / Frame Buffer: 16 GB (DDR3)
- Support CSI/DSI C-PHY device testing in 1/2/3 trio-lane configurations and D-PHY testing in 1/2/4 lane configurations
- Supports Virtual Channels (Overlap/Non-Overlap modes)
- Supported Formats: RAW RGB 8/10/12/14/16/18/20 (1/2/3 bytes/pixel)
- Supported Pixel Patterns:
  - Bayer RGB
  - 4C Pattern
- Programmable Sensor clock (up to 250MHz)
- Supports lane Auto-Tuning based on CRC
- Lane Auto-Tuning (values stored in XML file or in On-board Flash Memory)
- Sensor Lane Skew Measurement during testing with Pass/Fail Skew window for all C-PHY trio-lanes
- Serial Image Sensor communication: I2C / I3C / SPI
- Single Voltage Power Supply (5V/4A) (110/220V AC Power Supply adapter included)
- Real-time monitoring and alert for all internal power sources
- Status LEDs: PowerIn, HostLink, Streaming, FPGAProg

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## Parametric Measurements:

- Open / Short Test
- Leakage Test
- Vol-Voh Test
- Current Measurements LP / HS

## Power Supplies:

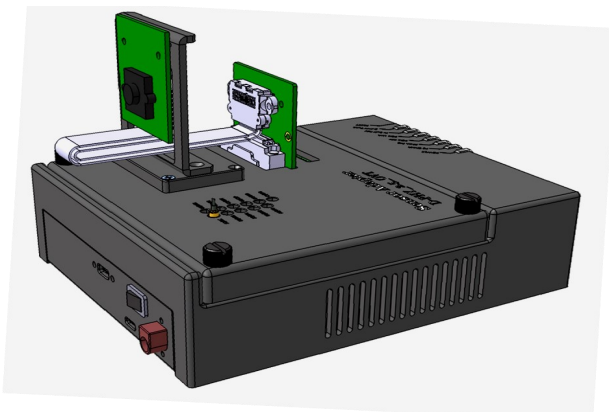
- Programmable DUT Power Supplies  
DUT Core / Analog / IO / VDD / VPP / Aux
- Range / Resolution / Max Current  
0.8-3.3V / 5mV / 1A

## CSI / DSI Test Adapters:

- Accepts CSI / DSI Test Adapters for custom DUT boards
- Configurable for Rx, Tx, or Rx + Tx
- Test Adapters customized for C-PHY, D-PHY or CD-PHY
- Rx / Tx test adapters include C-PHY/ D-PHY terminations and SMA connectors for connecting to oscilloscope for eye measurement
- Tx + Rx Test Adapter include bridge between Tx and Rx with test pads for scope measurements
- Custom Test Adapters can be offered to emulate customer sensor test conditions

## STA-CD45 Sensor Test Adapter:

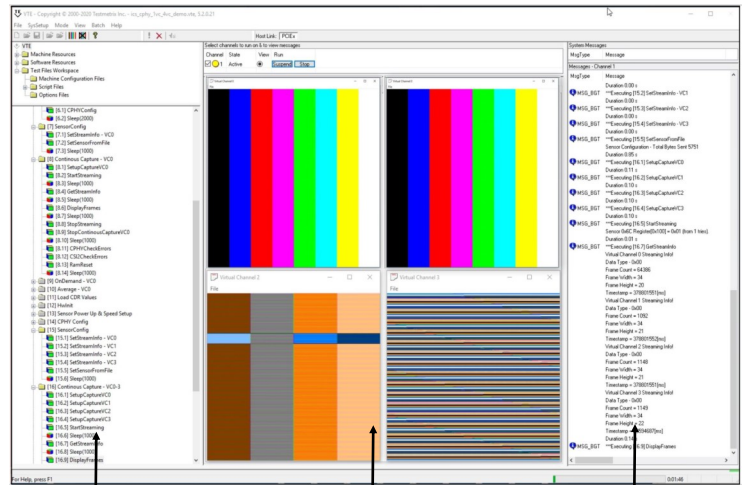
- Routing optimized for C-PHY / D-PHY lanes
- Accepts Sensor Module Adapter board for connecting Sensor Modules (directly or via CD-PHY cables)
- Contains C-PHY / D-PHY Test Pads for scope measurements
- Offered with optional cables of 15cm/25cm/35cm lengths



VTE-7100/CD45 \shown with STA (Sensor Test Adapter)

## VTE Application Program

[ Sample test script setup for checking 4 Virtual Channels ]



Test Script Execution Tree

Frame Data Rendering (4 virtual channels)

Test Script Log Window

## VTE Engineering Software (Win10):

- Comprehensive Engineering Software including Integrated Development Environment (IDE) with C-language Interpreter
- IDE contains powerful debugging features, allowing for efficient development of Test Scripts
- Sample Test Scripts provided for:
  - CSI-Tx and CSI-Rx testing
  - DSI-Tx and DSI-Rx testing
- IDE environment contains comprehensive function libraries,
- DMA driver for fast host communication
- Frame Slide Show for viewing captured frames
- RAW frames conversion to .JPG/.BMP/.PNG

## Recommended Host PC Laptops/Desktops

- Any laptop or host PC with Thunderbolt Ver 3
- Desktop PCs with PCIeX4 / PCIeX8 adapter card

## Physical/Environmental Specifications:

- Dimensions:
  - Width: 9" (22.86cm)
  - Depth : 11" (27.94cm)
  - Height: 2.5" (6.35cm)
- Net Weight: 2.5 lbs.
- Temperature: Operating: +40°F to 100°F  
Storage: +30°F to 122°F

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