

## System-Level Tester for Validating MIPI Transmitters



**Figure 1.** Introspect's SV4E-DPRXCPRX system-level tester (140 mm x 89 mm)

The SV4E is a highly-integrated system-level tester that facilitates the rapid screening, calibration, and optimization of MIPI® Alliance enabled devices. Such devices include high-resolution image sensors, camera modules, and advanced image signal processors used in mobile or IoT applications. The SV4E-DPRXCPRX features a unique dual-mode D-PHY<sup>SM</sup>/C-PHY<sup>SM</sup> analog front-end. It also integrates reconfigurable protocol stacks for the CSI-2<sup>SM</sup> standards. These features make it incredibly easy to create a realistic test setup for tuning and calibrating system parameters such as camera colour settings or noise performance.

### FEATURES

- **Integrated PHY:** truly compact design that can act as a D-PHY or a C-PHY receiver
- **High bandwidth:** up to 2.5 Gbps D-PHY signaling and 2.5 Gbps C-PHY signaling per lane; up to 4 lanes per port
- **Native protocol implementation:** true CSI-2 controller instantiation with support for version 2.1 specifications
- **Easy to use:** Introspect ESP Software enables interactive operation or full automation

### BENEFITS

- **Future proof:** protect your investment by adopting a high-performance tool for multiple product applications and across a large span of data rates
- **Self-contained:** an all-in-one system enables true protocol capture and helps create a system-oriented testing methodology
- **Automated:** scripting capability is ideal for debug tasks and full-fledged production screening of devices and system modules

## Typical Application: Image Sensor Testing at 2.5 Gbps



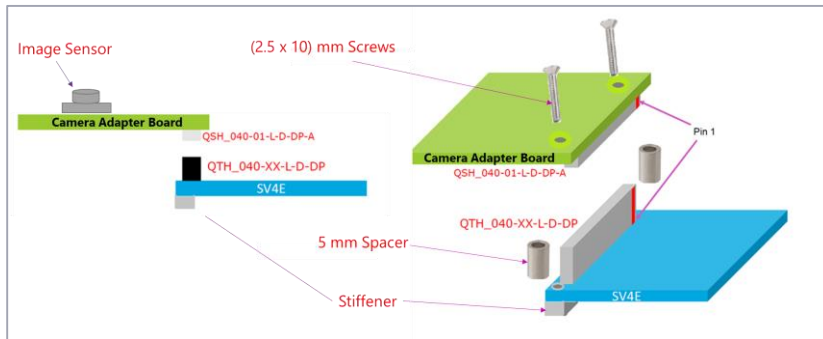
**Figure 2.** SV4E-DPRXCPRX testing a C-PHY camera module

### Protocol and Signal Parameters

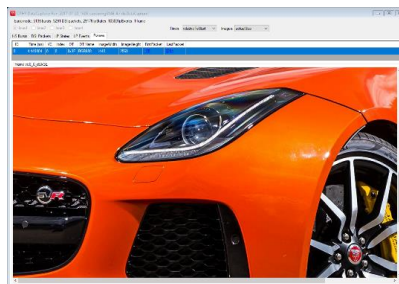
Feature	Description	Benefit
<b>Application / Protocol Support</b>	D-PHY version 1.1, 1.2, 2.0 (including BTA) C-PHY version 1.0, 1.1 (including BTA) CSI-2 version 1.3, 2.0, 2.1	Able to capture device transmissions from varied application contexts including ADAS sensors and bridge devices.
<b>Receive Payload Support</b>	PRBS packet loop patterns HS-only and LP-only patterns Arbitrary video patterns at any frame rate	Detects a wide spectrum of data conditions for the purposes of debug or colour calibration during production

### Key Performance Parameters

Parameter	Value	Description
<b>Lane Count</b>	4 lanes of D-PHY; 3 lanes of C-PHY	Allows for deployment into multiple generations of products or multiple product families
<b>Data Rates</b>	80 Mbps to 2.5 Gbps in D-PHY mode; 80 Msps to 2.5 Gsps in C-PHY mode	Allows for supporting high-performance applications
<b>GPIO</b>	DUT reset control pin 15 user programmable IO pins	Provides full control over devices under test
<b>Auxiliary Power</b>	Up to 6 DC outputs with CMU capability	Enables complete module test and DC measurement capability



**Figure 3.** Mechanical connection to camera adapter board



**Figure 4.** Software interface for confirming received image frames