



# MIPI Solutions Guide



## Selection Guide

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## Introduction

Introspect Technology offers the broadest range of test and measurement solutions for applications containing [MIPI® Alliance](#) (MIPI) interfaces. Whether the test requirement is for basic functionality or for full-featured analog characterization, each solution offers best-in-class performance, enabling the development and volume-screening of components, modules, and entire systems. Indeed, all Introspect Technology products feature excellent signal integrity, robust reliability, and exceptional software tools. This has led to widespread adoption in the design and test of applications such as image sensors and display drivers, 77 GHz radar ICs and modules, camera and vision sub-systems, and entire mobility solutions.

This selection guide provides an overview of all Introspect Technology MIPI offerings as well as specifications comparisons to help you determine the best tool for your needs. Further information is available at <https://introspect.ca>.

## Application Coverage

### Product Categories

This guide presents the Introspect Technology products according to their corresponding category. Complete specifications comparison tables are provided later, and this section presents an overview of the categories and the corresponding application and deployment activity areas.

#### C Series

The most flexible amongst all Introspect Technology product classes, this category is ideal for applications requiring deep characterization capability. Featuring a full suite of analog impairment capability, it is routinely used for high-volume characterization, pre- and post-silicon design validation, and production testing.

#### D Series

The D Series line of products is optimized for mass production. Its products are characterized by extreme compactness, coupled with unprecedented lane and port coverage.

#### E Series

The E Series line of products is ideal for performing device emulation functionality while still offering world-class signal integrity, professional instrument-grade programmability, and powerful software tools. The E Series is ideal for system-level test applications.



*C Series*

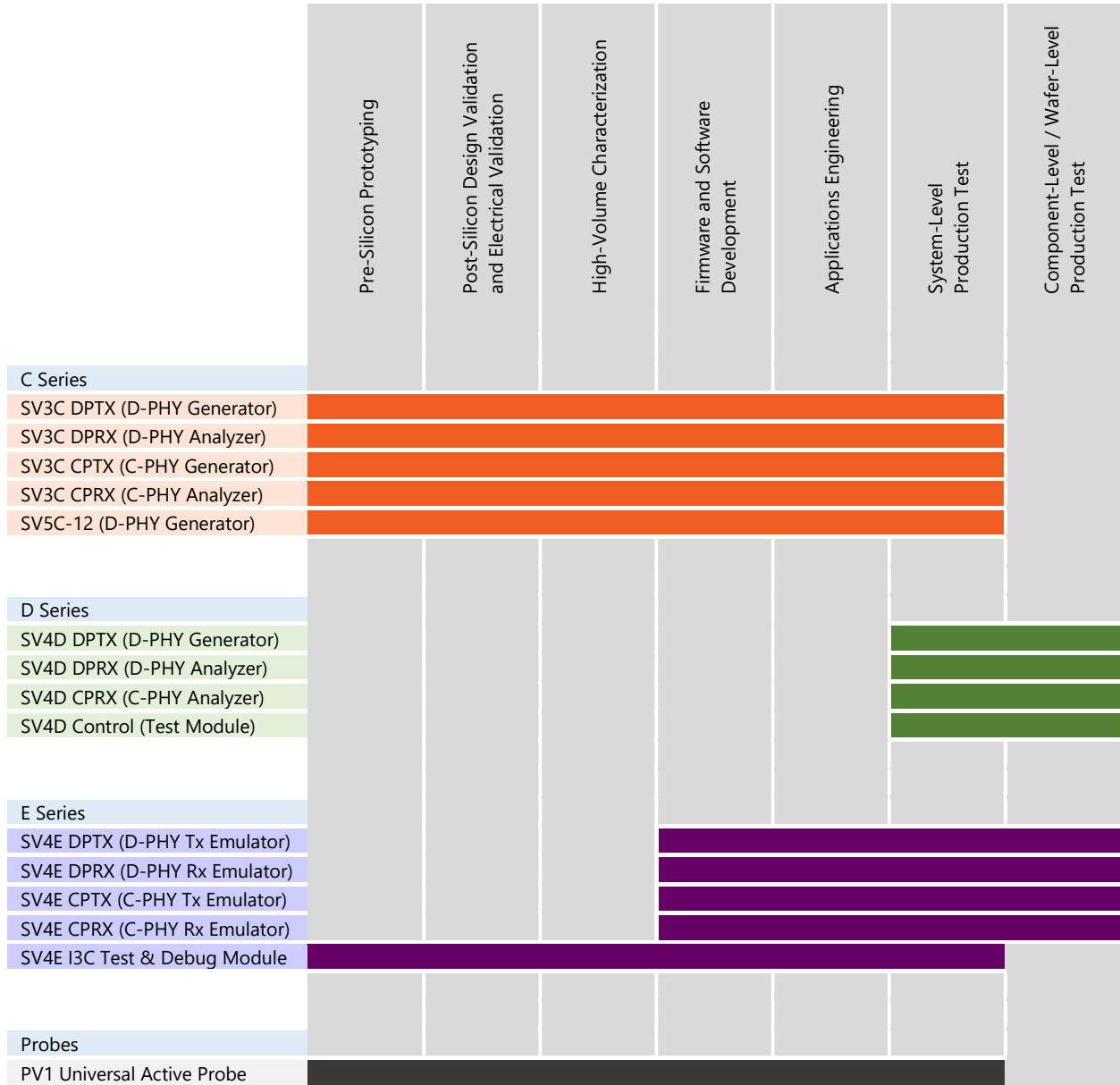


*D Series*



*E Series*

## Solution Map Based on Deployment Activity



## Generator and Transmit Emulator Protocol Coverage

	Physical Layers						Protocol Layers					
	D-PHY v 1.1	D-PHY v 1.2	D-PHY v 2.1	D-PHY v 3.0	C-PHY v 1.0	C-PHY v 1.1	C-PHY v 1.2	CSI-2 v 1.3	CSI-2 v 2.0	DSI <sup>1</sup> v 1.3	DSI-2 v 1.0	DSI-2 v 1.1
<b>C Series</b>												
SV3C DPTX	•	•	•					•	•	•	•	•
SV3C CPTX					•	•	•	•	•		•	•
SV5C-12				•					•		•	•
<b>D Series</b>												
SV4D DPTX	•	•	•					•	•	•	•	•
<b>E Series</b>												
SV4E DPTX	•	•						•	•	•	•	•
SV4E CPTX					•	•		•	•		•	•

<sup>1</sup> This specification supports D-PHY only

## Analyzer and Receive Emulator Protocol Coverage

	Physical Layers						Protocol Layers					
	D-PHY v 1.1	D-PHY v 1.2	D-PHY v 2.1	D-PHY v 3.0	C-PHY v 1.0	C-PHY v 1.1	C-PHY v 1.2	CSI-2 v 1.3	CSI-2 v 2.0	DSI <sup>1</sup> v 1.3	DSI-2 v 1.0	DSI-2 v 1.1
<b>C Series</b>												
SV3C DPRX	•	•	•					•	•	•	•	•
SV3C CPRX					•	•	•	•	•		•	•
<b>D Series</b>												
SV4D DPRX	•	•	•					•	•	•	•	•
SV4D CPRX					•	•	•	•	•		•	•
<b>E Series</b>												
SV4E DPRX	•	•						•	•	•	•	•
SV4E CPRX					•	•	•	•	•		•	•
<b>Probes</b>												
PV1	•	•	•		•	•	•					

<sup>1</sup> This specification supports D-PHY only

## Specifications Comparison Tables

### D-PHY Generator Specifications Comparison Table

	SV3C <i>Pattern Generator</i>	SV3C <i>Protocol Generator</i>	SV4E <i>Device Emulator</i>	SV4E <i>Production Tester</i>
<b>System Parameters</b>				
Number of Lanes	4	4	4	4
Maximum per Lane Data Rate	6.5 Gbps	2.5 Gbps	2.5 Gbps	2.5 Gbps
On-Board Memory	4 GB	4 GB	1 GB	1 GB
Control Link to PC	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Automated Conformance Test Suites	•			
<b>Protocol Parameters</b>				
Arbitrary Video Frame Generation (Moving Pictures)	•	•	•	•
Color Bar and Fixed Frame Generation	•	•	•	•
Virtual Channel Control	•	•	•	•
LP and HS Packet Commands	•	•	•	•
Bus Turnaround (BTA)	•	•	•	•
Display Stream Compression (DSI-2) and Scrambling (CSI-2 / DSI-2)	•	•	•	•
Virtual Channel Interleaving	•	•		
Error Insertion	•	•		
<b>Voltage Parameters</b>				
Individual per Lane HS Amplitude Control	•	•	•	
Individual per Lane HS Common-Mode Control	•	•		
Individual per Lane LP Voltage Control	•	•		
Individual per Lane Pre-Emphasis Control	•			
<b>Timing and Jitter Parameters</b>				
Global Timing Parameters	•	•	•	
Individual per Lane Skew Control with Picosecond Resolution	•			
Individual per Lane Jitter Injection with Picosecond Resolution	•			
Spread Spectrum Clocking	•			

## C-PHY Generator Specifications Comparison Table

	SV3C	SV3C	SV4E	SV4E
	<i>Pattern Generator</i>	<i>Protocol Generator</i>	<i>Device Emulator</i>	<i>Production Tester</i>
<b>System Parameters</b>				
Number of Trios	4	4	4	4
Maximum per Trio Data Rate	4.5 Gbps	2.5 Gbps	2.5 Gbps	2.5 Gbps
On-Board Memory	4 GB	4 GB	1 GB	1 GB
Control Link to PC	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Automated Conformance Test Suites	•			
<b>Protocol Parameters</b>				
Arbitrary Video Frame Generation (Moving Pictures)	•	•	•	•
Color Bar and Fixed Frame Generation	•	•	•	•
Virtual Channel Control	•	•	•	•
LP and HS Packet Commands	•	•	•	•
Bus Turnaround (BTA)	•	•	•	•
Display Stream Compression (DSI-2) and Scrambling (CSI-2 / DSI-2)	•	•	•	•
Virtual Channel Interleaving	•	•		
Error Insertion	•	•		
<b>Voltage Parameters</b>				
Individual per Wire HS Amplitude Control	•	•	•	
Individual per Wire HS Common-Mode Control	•	•		
Individual per Wire LP Voltage Control	•	•		
Individual per Wire Pre-Emphasis Control	•			
<b>Timing and Jitter Parameters</b>				
Global Timing Parameters	•	•	•	
Individual per Wire Skew Control with Picosecond Resolution	•			
Individual per Trio Jitter Injection with Picosecond Resolution	•			



## D-PHY Analyzer Specifications Comparison Table

	SV3C	SV4E	SV4E
	<i>Analyzer</i>	<i>Device Emulator</i>	<i>Production Tester</i>
<b>System Parameters</b>			
Number of Lanes	4	4	4
Maximum per Lane Data Rate	3.25 Gbps	2.5 Gbps	2.5 Gbps
On-Board Memory	4 GB	1 GB	1 GB
Control Link to PC	USB 3.0	USB 3.0	USB 3.0
Compatibility with PV1 Active Probe	•	•	•
Automated Conformance Test Suites	•		
<b>Protocol Parameters</b>			
Arbitrary Image and Video Sequence Extraction (Frame Grabber Feature)	•	•	•
Virtual Channel Extraction	•	•	•
Automatic Interpretation of LP and HS Commands	•	•	•
Automatic Handling of Compression Picture Parameter Sets (PPS)	•	•	•
Acquisition Trigger Based on Frame Start or Video Start	•	•	•
Bus Turnaround (BTA) with Configurable Host or Endpoint Response Values	•	•	
Acquisition Trigger Based on Protocol Error	•		
Hardware-Based Packet Error Testing	•		
<b>Physical Layer Parameters</b>			
Dynamic Termination Receiver	•	•	•
Automatic Data Rate Measurement	•	•	•
Individual per Lane Receiver Equalization and Gain Control	•	•	
Adjustable HS Detection Threshold	•	•	
Adjustable LP Detection Threshold	•		
Burst-mode Analog Capture	•		
<b>Timing and Sampling Parameters</b>			
Global Timing Parameter Measurement	•		
Adjustable per Lane Receiver Sampling Phase	•		
Automatic Spread Spectrum Tracking	•		

## C-PHY Analyzer Specifications Comparison Table

	SV3C	SV4E	SV4E
	<i>Analyzer</i>	<i>Device Emulator</i>	<i>Production Tester</i>
<b>System Parameters</b>			
Number of Trios	4	3	3
Maximum per Trio Data Rate	3.5 Gsps	2.5 Gsps	2.5 Gsps
On-Board Memory	4 GB	1 GB	1 GB
Control Link to PC	USB 3.0	USB 3.0	USB 3.0
Compatibility with PV1 Active Probe	•	•	•
Automated Conformance Test Suites	•		
<b>Protocol Parameters</b>			
Arbitrary Image and Video Sequence Extraction (Frame Grabber Feature)	•	•	•
Virtual Channel Extraction	•	•	•
Automatic Interpretation of LP and HS Commands	•	•	•
Automatic Handling of Compression Picture Parameter Sets (PPS)	•	•	•
Acquisition Trigger Based on Frame Start or Video Start	•	•	•
Bus Turnaround (BTA) with Configurable Host or Endpoint Response Values	•	•	
Acquisition Trigger Based on Protocol Error	•		
Hardware-Based Packet Error Testing	•		
<b>Physical Layer Parameters</b>			
Dynamic Termination Receiver	•	•	•
Automatic Data Rate Measurement	•	•	•
Individual per Lane Receiver Equalization and Gain Control	•	•	
Adjustable HS Detection Threshold	•	•	
Adjustable LP Detection Threshold	•		
Burst-mode Analog Capture	•		
<b>Timing and Sampling Parameters</b>			
Global Timing Parameter Measurement	•		
Adjustable per Lane Receiver Sampling Phase	•		

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