



**DATA SHEET**

# PV2 Universal Active Probe

Probing Solution with 8 GHz Bandwidth

**C SERIES**



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# Introduction

## OVERVIEW

The PV2 Universal Active Probe is a signal measurement solution for high-speed links carrying low voltage, high speed signals with a bandwidth of 8 GHz. By providing a completely non-proprietary instrument interface, it facilitates the attachment of a wide range of instruments to any given device under test (DUT) while minimizing circuit loading and maintaining signal integrity. This means that it can be attached to any oscilloscope brand, and it can also be attached to spectrum analyzers, protocol analyzers, and digital capture systems.

The PV2 consists of a lightweight probe amplifier and a solder-in tip. Both components are optimized for accessing hard to reach signals in live systems and for measuring entire buses such as those found in MIPI, LPDDR5, automotive ethernet, and similar systems.

## KEY FEATURES

- High bandwidth: 8 GHz bandwidth with a high linearity and accuracy
- Non-proprietary interface: output cable of the probe amplifier has a male SMA connector for attachment to any 50 Ohm instrument
- Optimized voltage range: linear performance is guaranteed for low-voltage applications such as MIPI and LPDDR5. Extended linear range is available through different probe tip options
- Miniature and lightweight: probe amplifier is housed in a compact enclosure, enabling attachment in confined spaces

## KEY BENEFITS

- Maintain signal integrity: measure live signal links in their mission modes without custom test fixtures
- Deploy widely: connect the PV2 to Introspect Technology instruments or to oscilloscopes, logic analyzers, spectrum analyzers, and digital capture tools
- Access highly integrated buses: use the solder-in probe tips for optimized signal sniffing in hard-to-reach locations

## ORDERING INFORMATION

TABLE 1: ITEM NUMBERS FOR THE PV2 UNIVERSAL ACTIVE PROBE AND RELATED PRODUCTS

PART NUMBER	NAME	KEY DIFFERENTIATORS
7154	PV2 Universal Active Probe	Universal probe system for 8 GHz applications
7155	PV2PSU Power Supply	Power supply for PV2

## Concepts and Terminology

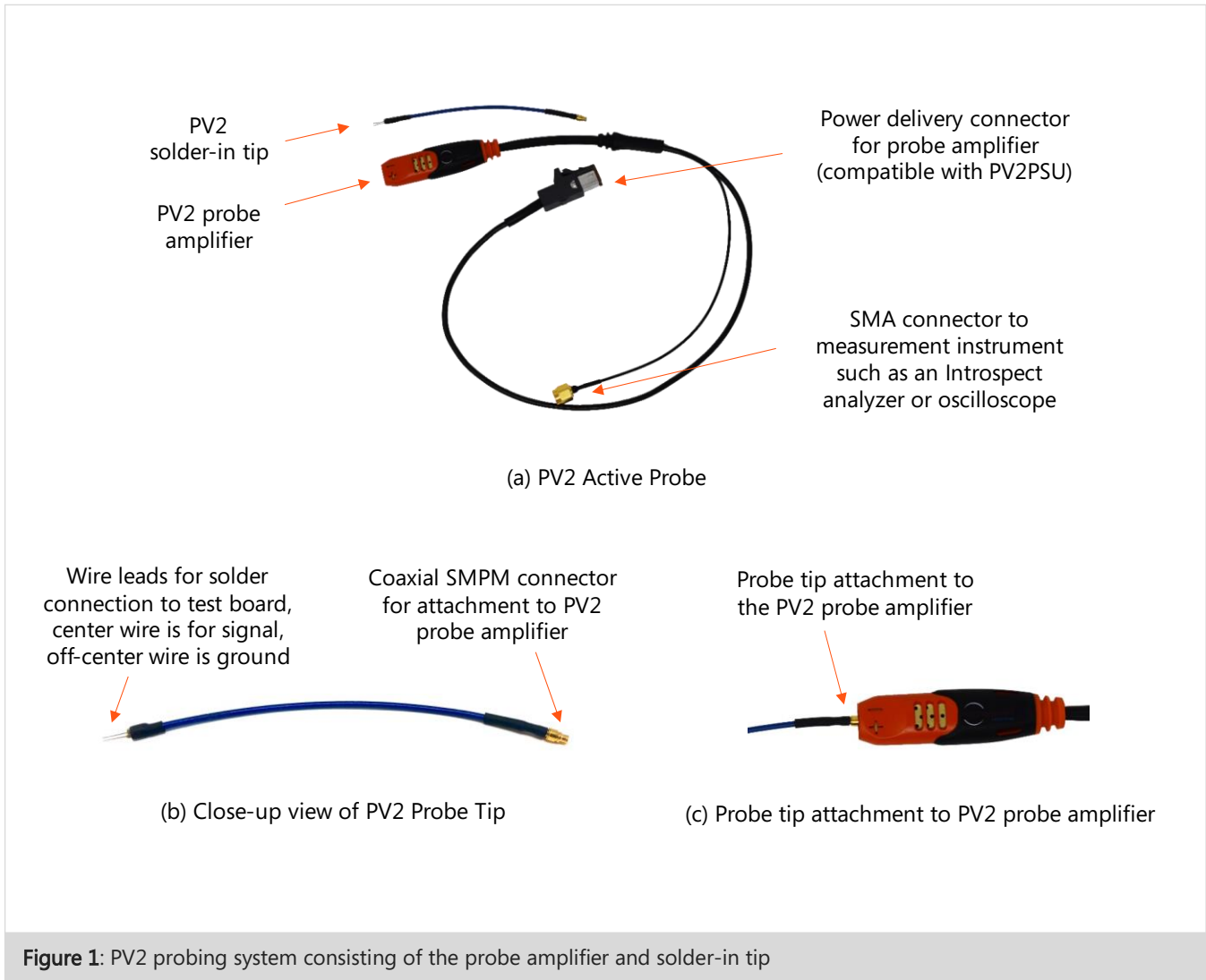
The PV2 probing system consists of the following key components:

- PV2 probe amplifier
- PV2 solder-in tip
- PV2PSU power supply for the probe amplifier
- SMA interface to measurement instrument

Figure 1(a) shows an illustration of the main components of the probing system. Since the PV2 is an active probe, it needs power, and this is provided through the PV2PSU power supply from Introspect Technology (not shown in the figure). Having the PV2PSU as a stand-alone power supply enables the PV2 to be “universal” in that it can attach to any measurement instrument.

Figure 1(b) shows the solder-in tip of the PV2 probing system. This is an integral part of the signal measurement solution and should not be replaced. It consists of short attachment wires on the DUT side and an SMPM coaxial connector on the PV2 amplifier side. The solder-in wires are optimized for impedance matching and bandwidth. Every care should be taken to ensure that the short attachment wires are properly soldered to the DUT board with short leads on both the signal and ground pins.

Figure 1(c) illustrates the attachment of the solder-in tip to the PV2 probe amplifier. The combination of the light weight of the probe amplifier and the retention mechanism in the connector ensures that this solution is practical for many measurement situations.



## Performance Characteristics

Figure 2 shows the step response of the PV2 probing system. This response is obtained by driving the PV2 with an ideal 8-picosecond step input, thus ensuring that the true performance of the PV2 is exposed. As can be seen, a sharp and linear step response is achieved.

Figure 3 on the following page shows an 8.0 Gbps PRBS7 eye diagram measured using the PV2, illustrating high signal fidelity without degradation due to noise or impedance mismatches. Table 2 on the following page shows additional technical specifications.

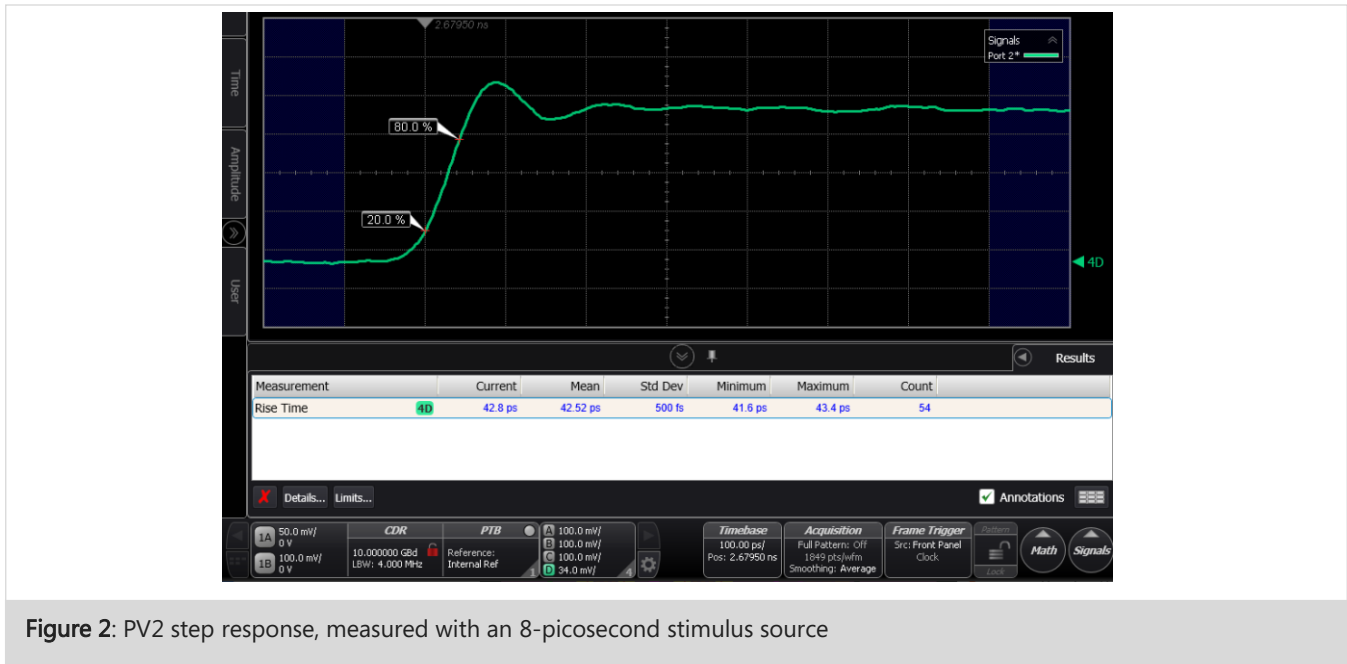


Figure 2: PV2 step response, measured with an 8-picosecond stimulus source

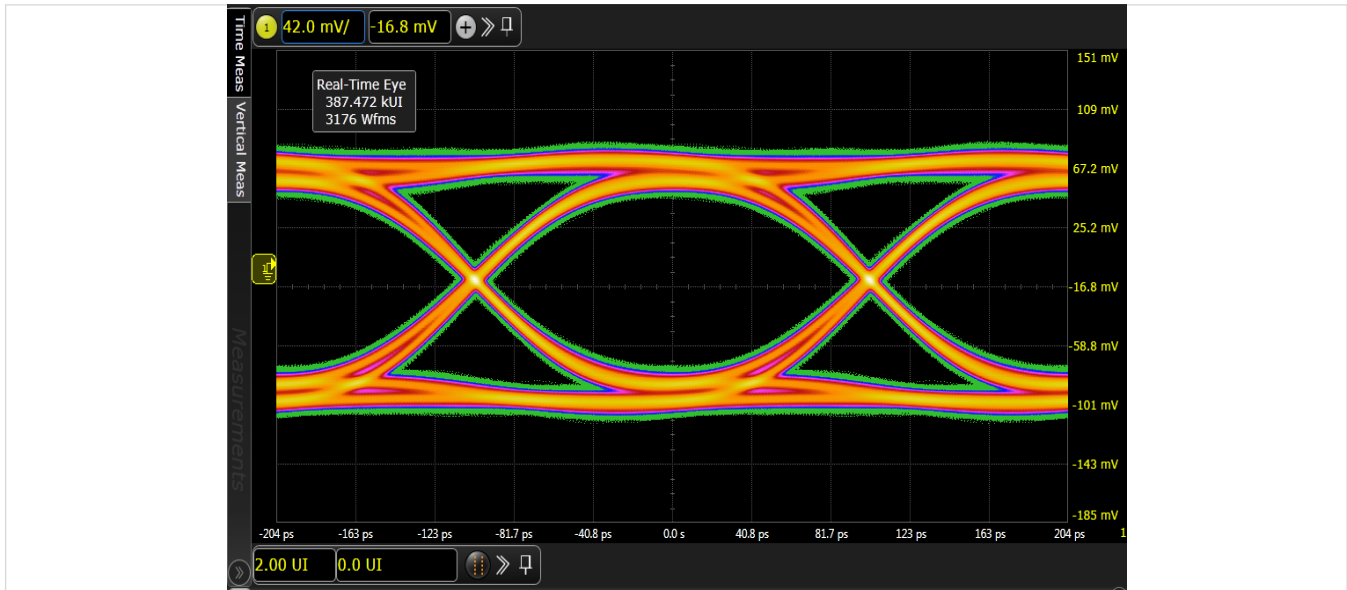


Figure 3: Eye diagram of a PRBS7 pattern running at 8 Gbps as measured by PV2

TABLE 2: KEY PERFORMANCE SPECIFICATIONS

PARAMETER	VALUE	DESCRIPTION
Rise Time	42 ps	20%-80% value
Linearity	50 dB	Spurious free dynamic range measured at 5 MHz and across entire voltage range
Power Dissipation	0.8 W	Operating at room temperature without cooling
<b>Standard Solder-In Tip (1 V/V)</b>		
Input Impedance	1200 Ω	
Linear Range	-0.8 V to 1.0 V	
Maximum Voltage Range	-0.9 V to 1.2 V	



REVISION NUMBER	HISTORY	DATE
1.0	Document Release	September 28, 2021
1.1	Updated photo of the PV2 and ordering part numbers	June 12, 2023

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