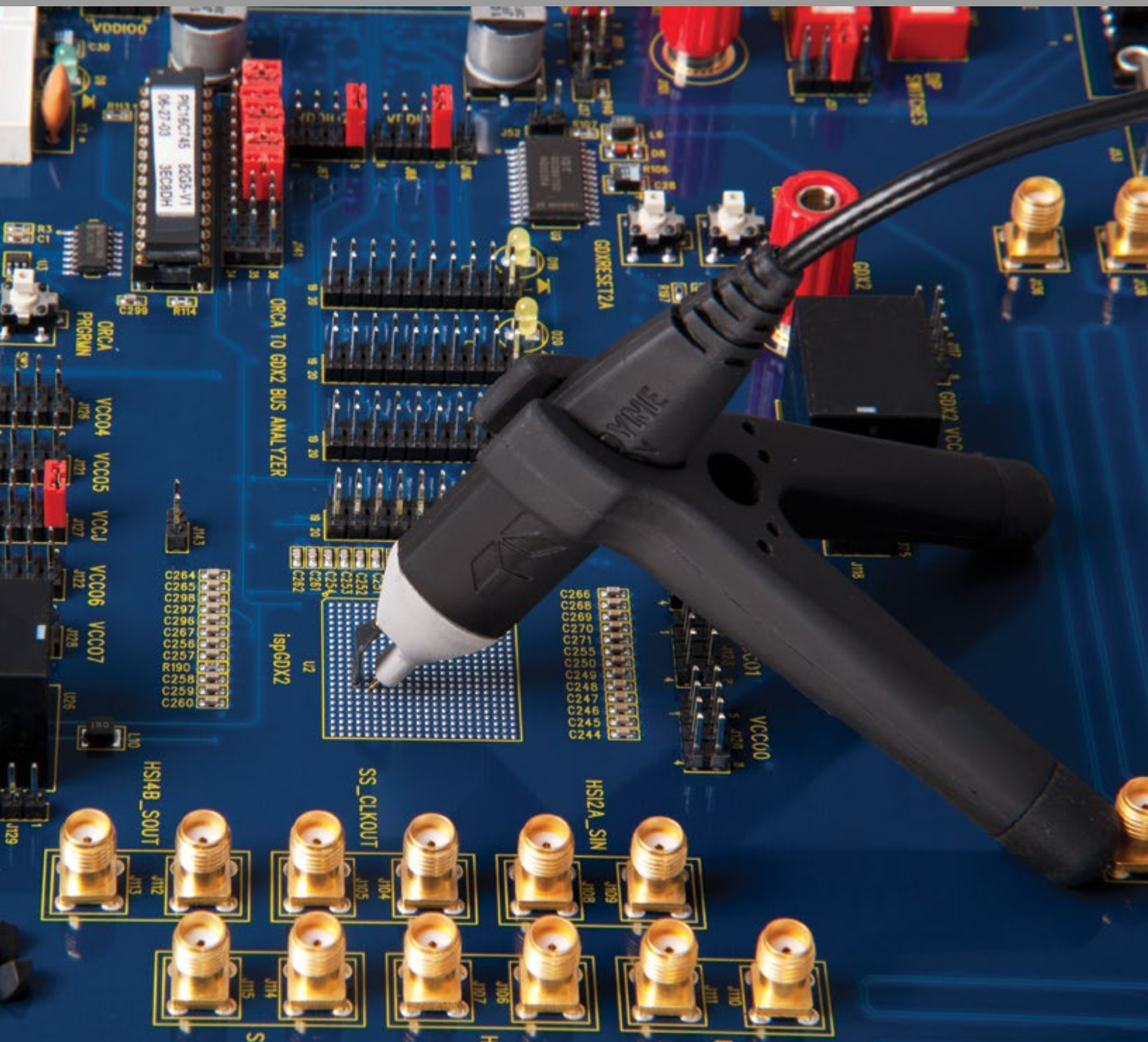




TELEDYNE LECROY
Everywhere you look™

Oscilloscope Probes and Probe Accessories



PROBE SELECTION

Teledyne LeCroy has a wide variety of world class probes and amplifiers to compliment its product line. From the ZS high impedance active probes to the WaveLink differential probing system which offers bandwidths up to 25 GHz, Teledyne LeCroy probes and probe accessories provide optimum mechanical connections for signal measurement.



Front Cover:
ZS Series High Impedance
Active Probes

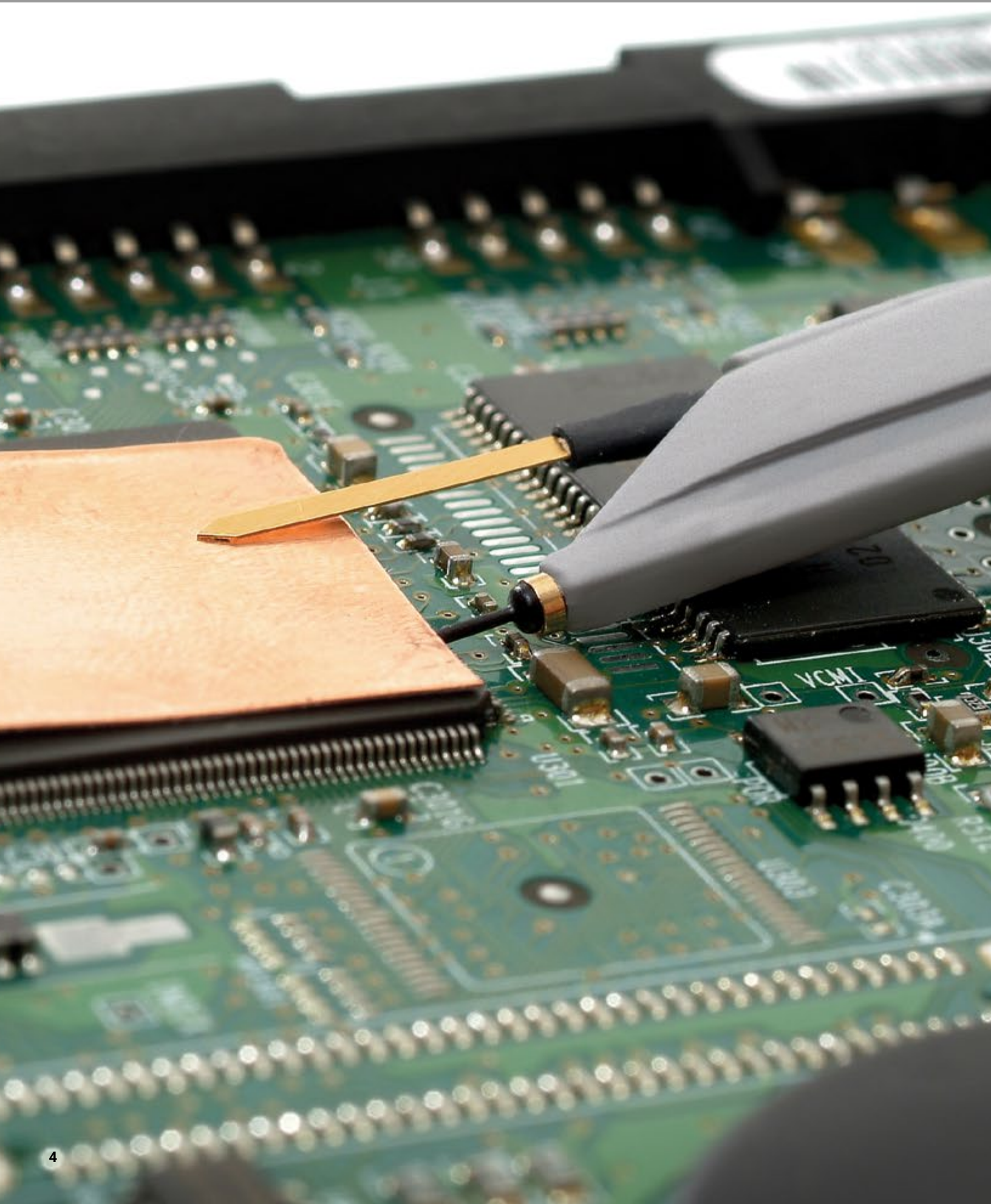
| | WaveAce Oscilloscopes | WaveJet Oscilloscopes | WaveSurfer 3000 Oscilloscopes | WaveSurfer 10 / MXs-B / MSO MXs-B Oscilloscopes | HDO4000 / HDO4000-MS High Definition Oscilloscopes | WaveRunner 8000 Oscilloscopes | HDO6000 / HDO6000-MS High Definition Oscilloscopes | HDO8000 / HDO8000-MS High Definition Oscilloscopes | MDA800 Motor Drive Analyzers | HRO 12-bit Oscilloscopes | WavePro/SDA/DDA7 Zi/7 Zi-A Oscilloscopes | WaveMaster/SDA/DDA8 Zi/Zi-B Oscilloscopes | LabMaster 9 Zi-A Oscilloscopes | LabMaster 10 Zi-A Oscilloscopes |
|---|-----------------------|-----------------------|-------------------------------|--|---|----------------------------------|---|---|------------------------------|--------------------------|---|--|--------------------------------|---------------------------------|
| Active Voltage Probes - p. 4 - 7 | | | | | | | | | | | | | | |
| ZS1000 | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| ZS1500 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| ZS2500 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| ZS4000 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| Current Probes - p. 8 - 11 | | | | | | | | | | | | | | |
| CP030 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CP030A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CP031 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CP031A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CP150 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CP500 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CA10 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Differential Probes - p. 12 - 21 | | | | | | | | | | | | | | |
| ZD200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ZD500 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ZD1000 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ZD1500 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| AP033 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| D410-A-PS | | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D420-A-PS | | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D400A-AT | | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D610-A-PS | | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D620-A-PS | | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D600A-AT | | | | ✓ | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D830-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| D1030-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| D1330-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| D1305-A-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| D1605-A-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| D2005-A-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| D2505-A-PS | | | | | | | | | | | | ✓ | ✓ | ✓ |
| High Voltage Differential Probes - p. 22 - 27 | | | | | | | | | | | | | | |
| HVD3102 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| HVD3106 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| HVD3106-6M | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| HVD3206 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| HVD3605 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ADP300 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| ADP305 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| AP031 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



| | WaveAce Oscilloscopes | WaveJet Oscilloscopes | WaveSurfer 3000 Oscilloscopes | WaveSurfer 10 / MXs-B / MSO | HDO4000 / HDO4000-MS High Definition Oscilloscopes | WaveRunner-8000 Oscilloscopes | HDO6000 / HDO6000-MS High Definition Oscilloscopes | HDO8000 / HDO8000-MS High Definition Oscilloscopes | MDA800 Motor Drive Analyzers | HRO 12-bit Oscilloscopes | WavePro/SDA/DBA/7 Zi/7 Zi-A Oscilloscopes | WaveMaster/SDA/DDA/8 Zi/8 Zi-A Oscilloscopes | LabMaster 9 Zi-A Oscilloscopes | LabMaster 10 Zi-A Oscilloscopes |
|---------------------------------------|-----------------------|-----------------------|-------------------------------|-----------------------------|--|-------------------------------|--|--|------------------------------|--------------------------|---|--|--------------------------------|---------------------------------|
| Differential Amplifiers - p. 28 - 31 | | | | | | | | | | | | | | |
| DXC200 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DA101 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DA1855A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DA1855A-PR2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DA1855A-PR2-RM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DA1855A-RM | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DXC-5100 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| DXC100A | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| High Voltage Probes - p. 32 - 37 | | | | | | | | | | | | | | |
| HVP120 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PPE4KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PPE5KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PPE6KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Optical Probes - p. 38 - 41 | | | | | | | | | | | | | | |
| OE425 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| OE455 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | ✓ |
| OE525 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| OE555 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| OE695G | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| Passive Probes - p. 42 - 45 | | | | | | | | | | | | | | |
| PP006C | | ✓ | | | | | | | | | | | | |
| PP016 | ✓ | | | | | | | | | | | | | |
| PP019 | | | ✓ | | | | | | | | | | | |
| PP020 | | | ✓ | | | | | | | | | | | |
| PP021 | | | | ✓ | | | | | | | ✓ | ✓ | | |
| PP022 | | | | ✓ | | ✓ | | | ✓ | | | | | |
| PP023 | | | | | | | ✓ | ✓ | ✓ | | | | | |
| PP024 | | | | ✓ | | ✓ | | | | ✓ | | | | |
| PP025 | | | | ✓ | | | | | | | ✓ | ✓ | | |
| PP026 | | | | | ✓ | | ✓ | ✓ | ✓ | | | | | |
| Probe Adapters - p. 46 -49 | | | | | | | | | | | | | | |
| CA10 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| TPA10 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Transmission Line Probes - p. 50 - 51 | | | | | | | | | | | | | | |
| PP066 | | | | | | | | | | | ✓ | ✓ | ✓ | ✓ |

Note: Some probes require purchase of the amplifier and platform/cable assembly separately – Reference detailed literature for more information.

ACTIVE VOLTAGE PROBES



Engineers must commonly probe high-frequency signals with high signal fidelity. Typical passive probes with high input R and C provide good response at lower frequencies, but inappropriately load the circuit and distort signals at higher frequencies. Active voltage probes feature both high input R and low input C to reduce circuit loading across the entire probe/oscilloscope bandwidth. With low circuit loading and a form factor that allows probing in confined areas, the active voltage probe becomes the everyday probe for all different types of signals and connection points.

Teledyne LeCroy
Active Voltage Probe
Model Numbers:

ZS1000

ZS1500

ZS2500

ZS4000

*Opposite page:
ZS Series High Impedance Active Probe*

ZS SERIES ACTIVE PROBES



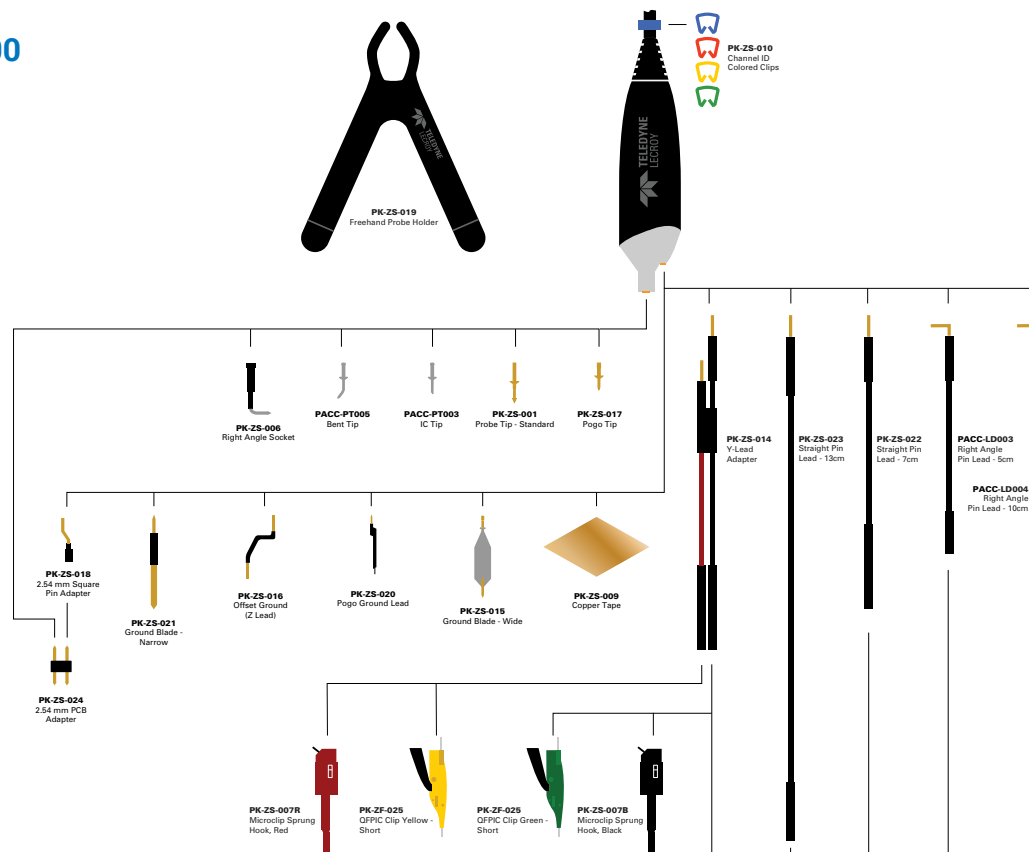
Teledyne LeCroy
Active Voltage Probe
Model Numbers:

ZS1000
ZS1500
ZS2500
ZS4000

The ZS Series probes are high impedance, low capacitance active probes that maintain high signal fidelity through 4 GHz. A small form factor and a wide variety of accessories ensures the ZS probe meets every difficult probing challenge.

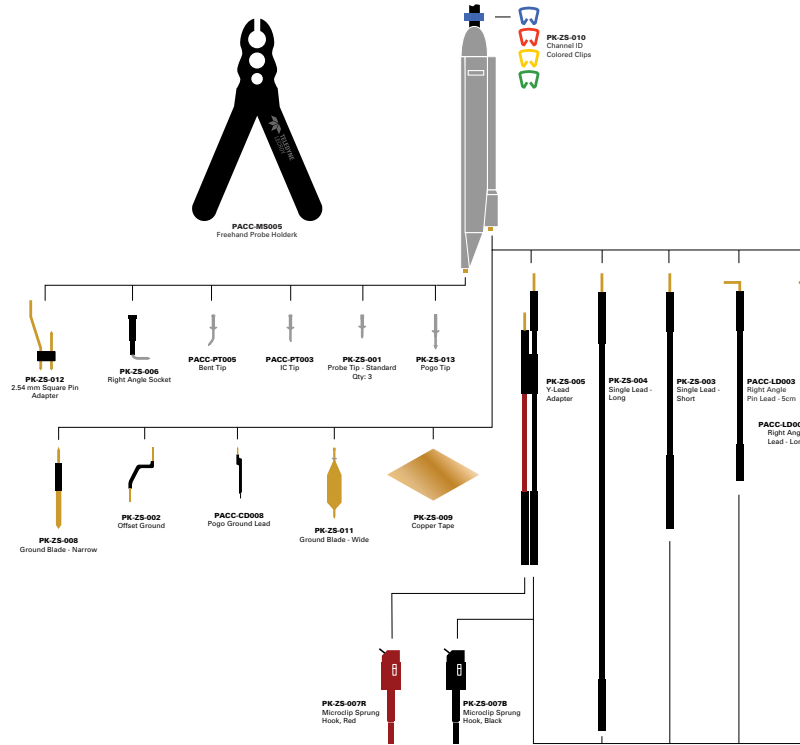
Engineers must commonly probe high frequency signals with high signal fidelity. Typical passive probes with high input R and C provide good response at lower frequencies but inappropriately load the circuit and distort signals at higher frequencies. The ZS Series features both high input R (1 M Ω) and low input C (0.6 pF and 0.9 pF) to reduce circuit loading across the entire probe/oscilloscope bandwidth. The ZS1000 is ideal for 200–600 MHz oscilloscopes. The ZS1500 is ideal for 1 GHz oscilloscopes, the ZS2500 is ideal for 2 GHz oscilloscopes, and the ZS4000 is ideal for 2.5 GHz and 4 GHz oscilloscopes.

ZS4000



ZS SERIES ACTIVE PROBES

ZS1000
ZS1500
ZS2500



Ordering Information

Product Description

| | |
|--|----------------|
| 4 GHz, 0.6 pF, 1 M Ω High Impedance Active Probe | ZS4000 |
| 2.5 GHz, 0.9 pF, 1 M Ω High Impedance Active Probe | ZS2500 |
| 1.5 GHz, 0.9 pF, 1 M Ω High Impedance Active Probe | ZS1500 |
| 1 GHz, 0.9 pF, 1 M Ω High Impedance Active Probe | ZS1000 |
| Set of 4 ZS2500, 2.5 GHz, 0.9 pF, 1 M Ω High Impedance Active Probes | ZS2500-QUADPAK |
| Set of 4 ZS1500, 1.5 GHz, 0.9 pF, 1 M Ω High Impedance Active Probes | ZS1500-QUADPAK |
| Set of 4 ZS1000, 1 GHz, 0.9 pF, 1 M Ω High Impedance Active Probes | ZS1000-QUADPAK |

Standard Accessory/Quantity

| Accessory Description | Replacement Part Number | ZS1000 ZS1500 ZS2500 | ZS4000 |
|---------------------------------------|------------------------------|----------------------------|--------|
| 2.54 mm PCB Adaptor | PK-ZS-024 | | 5 |
| 2.54mm Square Pin Adapter | PK-ZS-012 | 1 | |
| 2.54mm Square Pin Adaptor | PK-ZS-018 | | 1 |
| IC Tip | PACC-PT003 | 1 | 1 |
| Bent Tip | PACC-PT005 | 1 | 1 |
| Channel ID Clips (Set of 4 colors) | PK-ZS-010 | 4 | 1 |
| Copper Tape Pad | PK-ZS-009 | 2 | 2 |
| Freehand Probe Holder | PK-ZS-019 | | 1 |
| Freehand Probe Holder | PACC-MS005 | 1 | |
| Ground Blade – Narrow | PK-ZS-008 | 1 | |
| Ground Blade – Wide | PK-ZS-011 | 1 | |
| Ground Blade, Narrow | PK-ZS-021 | | 1 |
| Ground Blade, Wide | PK-ZS-015 | | 2 |
| Micro-Grabber Pair | PK-ZS-007R and PK-ZS-007B | 1 | 2 |
| Offset Ground | PK-ZS-016 | | 2 |

Specifications ZS1000 ZS1500 ZS2500 ZS4000

Electrical Characteristics

| | | | | |
|----------------------|-------|---------|--------------|--------|
| Probe Bandwidth | 1 GHz | 1.5 GHz | 2.5 GHz | 4 GHz |
| Input Capacitance | | 0.9 pF | | 0.6 pF |
| DC Input Resistance | | | 1 M Ω | |
| Probe Offset Range | N/A | | ± 12 V | |
| Attenuation | | | $\div 10$ | |
| Input Dynamic Range | | | ± 8 V | |
| Non-destruct Voltage | | | 20 V | |

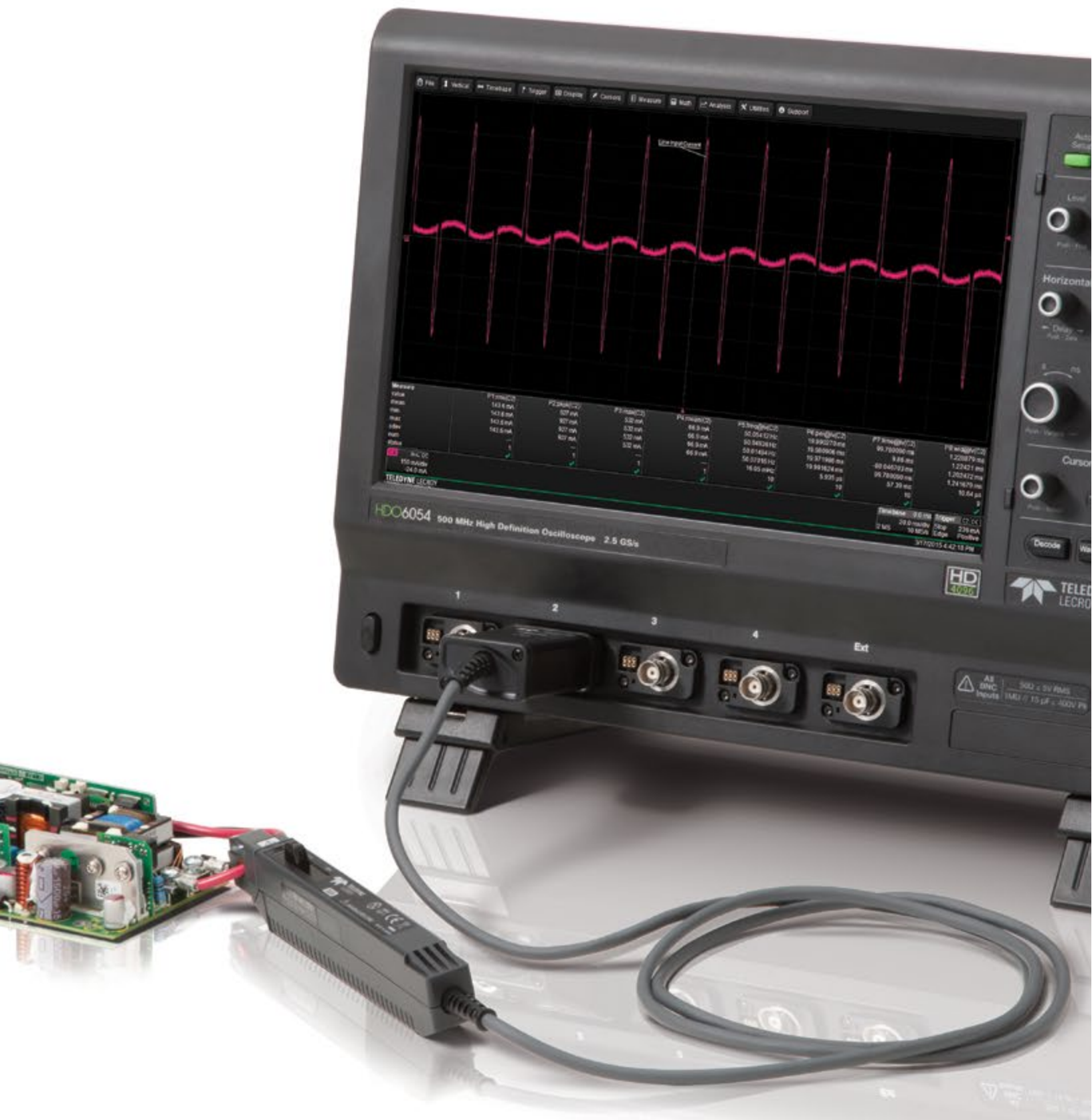
General Characteristics

| | |
|--------------|-------|
| Cable Length | 1.3 m |
|--------------|-------|

Accessory Description

| Accessory Description | Replacement Part Number | ZS1000 ZS1500 ZS2500 | ZS4000 |
|---------------------------|-------------------------|----------------------------|--------|
| Offset Ground – Z Lead | PK-ZS-002 | 1 | |
| Pogo Ground Lead | PK-ZS-020 | | 1 |
| Pogo Ground Lead | PACC-CD008 | 1 | |
| Pogo Tip | PK-ZS-017 | | 3 |
| Pogo Tip | PK-ZS-013 | 1 | |
| Probe Tip – Standard | PK-ZS-001 | 3 | 3 |
| QFPI Clips (set of 2) | PK-ZS-025 | | 1 |
| Right Angle Lead – Long | PACC-LD004 | 1 | 1 |
| Right Angle Lead – Short | PACC-LD003 | 1 | 1 |
| Right Angle Socket | PK-ZS-006 | 1 | 1 |
| Straight Pin Lead – Long | PK-ZS-023 | | 1 |
| Straight Pin Lead – Long | PK-ZS-004 | 1 | |
| Straight Pin Lead – Short | PK-ZS-022 | | 1 |
| Straight Pin Lead – Short | PK-ZS-003 | 1 | |
| Y Lead Adapter | PK-ZS-005 | 1 | |
| Y Lead Adaptor | PK-ZS-014 | | 1 |

CURRENT PROBES



Teledyne LeCroy current probes do not require the breaking of a circuit or the insertion of a shunt to make accurate and reliable current measurements. Based on a combination of Hall effect and transformer technology, Teledyne LeCroy current probes are ideal for making accurate AC, DC, and impulse current measurements.

Wide Range of Applications

Teledyne LeCroy current probes are available in a variety of models for a wide range of applications. The full range of Teledyne LeCroy current probes includes models with bandwidths up to 100 MHz, peak currents up to 700 A and sensitivities to 1 mA/div. Teledyne LeCroy current probes are often used in applications such as the design and test of switching power supplies, motor drives, electric vehicles, and uninterruptible power supplies.

High Sensitivity

The CP030A and CP031A provide a high sensitivity of 1 mA/div. This allows for more precise low current measurements on Teledyne LeCroy oscilloscopes. When used with HDO high definition oscilloscopes with HD4096 technology, users will obtain highly accurate, low current waveforms with unmatched 12-bit resolution for improved debug and analysis.

Fully Integrated

All Teledyne LeCroy current probes are powered through the Teledyne LeCroy ProBus® connection and require no additional hardware. Along with providing power, the ProBus connection allows the current probe and oscilloscope to communicate, resulting in current waveforms automatically displayed on screen in Amps, and calculated power traces scaled correctly in Watts. This full integration also allows for Degauss and Autozero functions to be done directly from the oscilloscope's user interface.

Deskew Calibration Source

The DCS015 deskew calibration source has both voltage and current time-aligned signals, which enables the precise deskew of voltage and current probes. Most voltage probes along with the CP030, CP030A, CP031, and CP031A are compatible with the DCS015.

Teledyne LeCroy
Current Probe
and Adapter
Model Numbers:

CP030
CP030A
CP031
CP031A
CP150
CP500
DCS015
CA10

*Opposite page:
CP031, 30A, 100 MHz Current Probe.*

CURRENT PROBES



Teledyne LeCroy
Current Probe
and Adapter
Model Numbers:

CP030

CP030A

CP031

CP031A

CP150

CP500

DCS015

CA10

Features

- ProBus active probe interface with automatic scaling in A/div
- Autozero and degauss capabilities built into instrument's user interface
- Wide range of input currents and bandwidth capabilities



- **CP030**
 - 30 A_{rms} continuous current
 - 50 A_{peak} current
 - 50 MHz bandwidth



- **CP030A**
 - 30 A_{rms} continuous current
 - 50 A_{peak} current
 - 50 MHz bandwidth
 - 1 mA/div sensitivity



- **CP031**
 - 30 A_{rms} continuous current
 - 50 A_{peak} current
 - 100 MHz bandwidth



- **CP031A**
 - 30 A_{rms} continuous current
 - 50 A_{peak} current
 - 100 MHz bandwidth
 - 1 mA/div sensitivity



- **CP150**
 - 150 A_{rms} continuous current
 - 500 A_{peak} current
 - 10 MHz bandwidth



- **CP500**
 - 500 A_{rms} continuous current
 - 700 A_{peak} current
 - 2 MHz bandwidth



- **DCS015**
 - Precise deskew of voltage and current probes.
 - Compatible with the CP031, CP031A, CP030, and CP030A



● CA10 Current Sensor Adapter

The CA10 enables a third-party current measurement device to operate like a Teledyne LeCroy probe. The CA10 is programmable and customizable to work with third-party current measurement devices that output voltage or current signals proportional to measured current. (See page 48 for more information and specifications).

Specifications

Electrical Characteristics*

| | | | | | | |
|---|---------------------------------------|-----------------|-----------|-----------------|--|--|
| Max. Continuous Input Current | 30 A _{rms} | | | | 150 A _{rms} | 500 A _{rms} |
| Bandwidth | 50 MHz | | 100 MHz | | 10 MHz | 2 MHz |
| Rise Time (typical) | ≤ 7 ns | | ≤ 3.5 ns | | ≤ 35 ns | ≤ 175 ns |
| Max. Peak Current | 50 A _{peak} (non-continuous) | | | | 300 A _{peak} (non-continuous); 500 A _{peak} ≤ 30 μs | 700 A _{peak} (non-continuous) |
| Output Voltage | 0.1 V/A | 0.1 V/A & 1 V/A | 0.1 V/A | 0.1 V/A & 1 V/A | 0.01 V/A | |
| Max Continuous Input Current at 1 V/A (100mA/div or less) | – | 5 A | – | 5 A | – | |
| Offset Range at 1V/A (100mA/div or less) | – | ±5 A | – | ±5 A | – | |
| Minimum Sensitivity | 10 mA/div | 1 mA/div | 10 mA/div | 1 mA/div | 100 mA/div | |
| Low-Frequency Accuracy | 1% | | | | | |
| AC Noise at 20 MHz BWL | ≤ 2.5 mA | ≤ 150 μA | ≤ 2.5 mA | ≤ 150 μA | ≤ 6.0 mA | ≤ 8.0 mA |
| Coupling | AC, DC, GND | | | | | |

General Characteristics

| | | | | | | |
|--------------------------------|-------------------|-------|-------|-------|-----------------------------|-------|
| Cable Length | 1.5 m | | | | 2 m | 6 m |
| Weight | 240 g | 260 g | 240 g | 260 g | 500 g | 630 g |
| Max. Conductor Size (Diameter) | 5 mm | | | | 20 mm | |
| Interface | ProBus, 1 MΩ only | | | | | |
| Usage Environment | Indoor | | | | | |
| Operating Temperature | 0° C to 40° C | | | | | |
| Max. Relative Humidity | 80% | | | | | |
| Max. Altitude | 2000 m | | | | | |
| Maximum Insulated Wire Voltage | 300 V CAT I | | | | 600 V CAT II, 300 V CAT III | |

* Electrical Characteristics Guaranteed at 23 °C ±3 °C

† The CP031 and CP030 require the Teledyne LeCroy oscilloscope to be running firmware version 4.3.1.1 or greater.

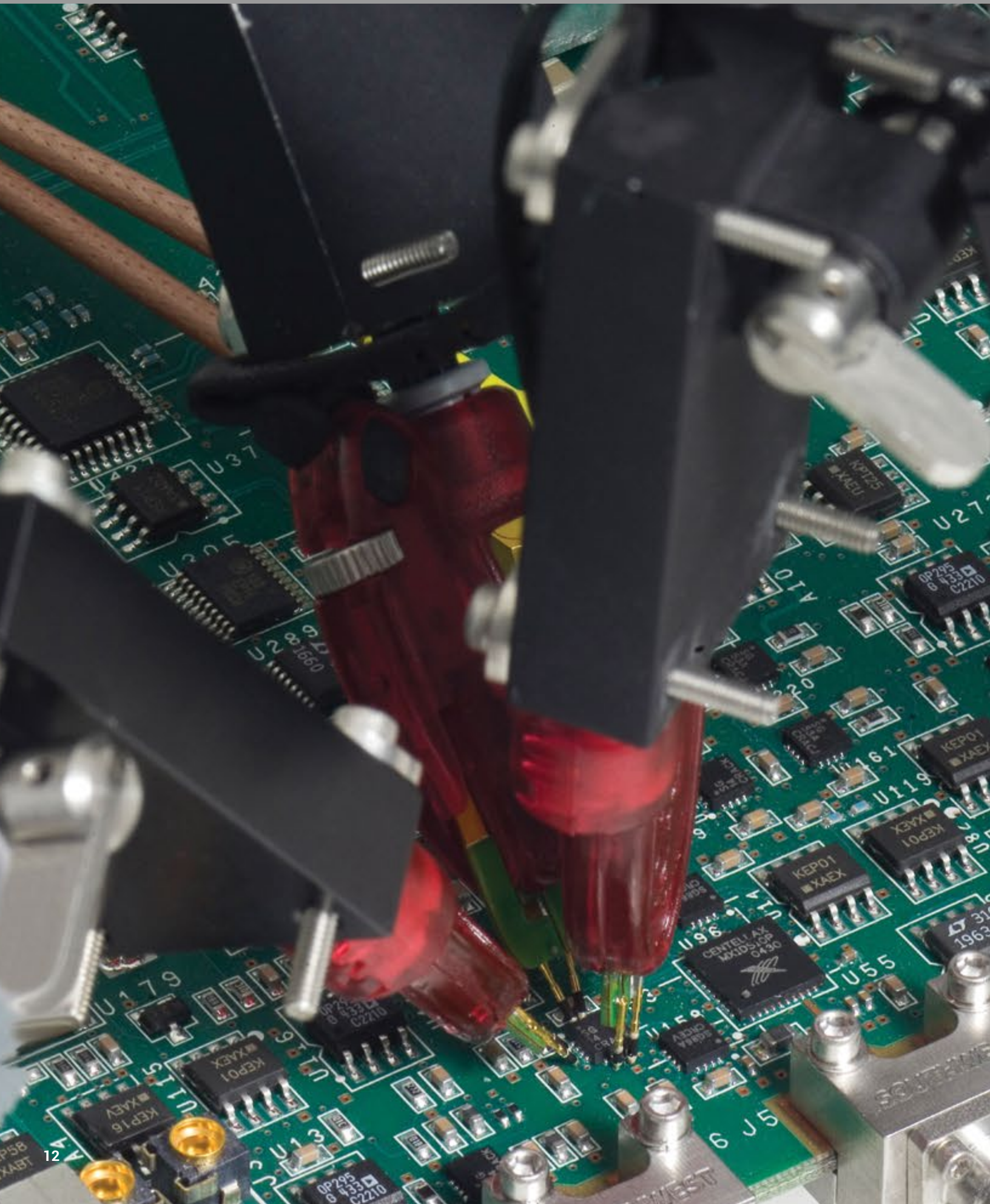
The CP031A and CP030A require firmware version 7.8.x.x or greater.

Ordering Information

Product Description

| | |
|--|--------------|
| ProBus Current Sensor Adapter | CA10 |
| Set of 4 CA10, ProBus Current Sensor Adapters | CA10-QUADPAK |
| 30 A; 50 MHz Current Probe – AC/DC; 30 Arms; 50 A Peak Pulse | CP030 |
| 30 A; 50 MHz High Sensitivity Current Probe – AC/DC; 30 Arms; 50 A Peak Pulse | CP030A |
| 30 A; 100 MHz Current Probe – AC/DC; 30 Arms; 50 A Peak Pulse | CP031 |
| 30 A; 100 MHz High Sensitivity Current Probe – AC/DC; 30 Arms; 50 A Peak Pulse | CP031A |
| 150 A; 10 MHz Current Probe – AC/DC; 150 Arms; 500 A Peak Pulse | CP150 |
| 500 A; 2 MHz Current Probe – AC/DC; 500 Arms; 700 A Peak Pulse | CP500 |
| Deskew Calibration Source for CP031, CP031A, CP030, CP030A and AP015 | DCS015 |

DIFFERENTIAL PROBES



Differential active probes are like two probes in one. Instead of measuring a test point in relation to a ground point (like single-ended active probes), differential probes measure the difference in voltage of a test point in relation to another test point.

Teledyne LeCroy
Differential Probe
Model Numbers:

≤ 1.5 GHz

ZD200

ZD500

ZD1000

ZD1500

AP033

4 GHz - 6 GHz

D410-A-PS

D420-A-PS

D400A-AT

D610-A-PS

D620-A-PS

D600A-AT

8 GHz - 13 GHz

D830-PS

D1030-PS

D1330-PS

13 GHz - 25 GHz

D1305-PS

D1605-PS

D2005-PS

D2505-PS

Opposite page:
WaveLink® High Bandwidth Differential Probing System
(13 GHz – 25 GHz)

≤ 1.5 GHz DIFFERENTIAL PROBES



Teledyne LeCroy
≤1.5 GHz
Differential Probe
Model Numbers:

ZD200
ZD500
ZD1000
ZD1500
AP033

The ZD Series probes provide wide dynamic range, excellent noise and loading performance and an extensive set of probe tips, leads, and ground accessories to handle a wide range of probing scenarios. The low 1 pF capacitance means this probe is ideal for all frequencies. The ZD Series differential probes provide full system bandwidth for all Teledyne LeCroy Oscilloscopes 1.5 GHz and lower.

Fully Integrated

With the ProBus interface, the ZD500, 1000, and 1500 become an integral part of the oscilloscope. All probe gain and offset controls are transparent to the user, making it easier to probe the circuit without concern for which gain setting to choose. When used with a Teledyne LeCroy digital oscilloscope, no external power supply is required.

Wide Dynamic Range

The ZD500, 1000, 1500 probes provide transparent probe attenuation so signals are always optimized for the display. The differential range is 18 V_{p-p} with a differential offset of ±8V and common mode range of ±10 V, making these probes versatile for every probing application.

Wide Applications

The wide dynamic range of 16 V_{p-p} and offset range of ±8V suit this probe to a wide range of applications and signal types. The ZD differential probes are ideally suited for Automotive, Serial Data, power, and general purpose use.

Specifications

Electrical Characteristics

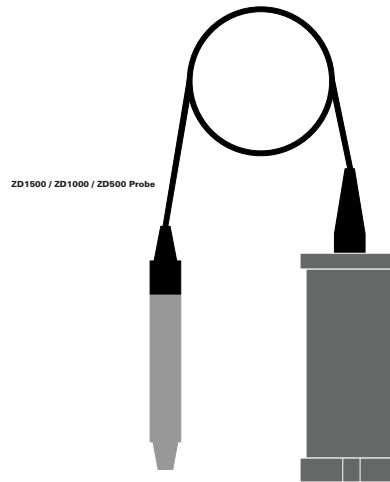
| Specifications Electrical Characteristics | ZD200 | ZD500 | ZD1000 | ZD1500 |
|---|--|---|--|--|
| Bandwidth (Warranted) | 200 MHz | 500 MHz | 1000 MHz | 1500 MHz |
| Bandwidth (Typical) | - | 650 MHz | 1200 MHz | 1700 MHz |
| Risetime 10–90% (Typical) | 1.75 ns | 650 ps | 375 ps | 270 ps |
| Risetime 20–80% (Typical) | - | 500 ps | 280 ps | 200 ps |
| LF Attenuation Accuracy (Warranted) | 1% | 2% | | |
| Zero Offset (Typical) (within 15 minutes after autozero) | - | 5 mV | | |
| System Noise (Typical) | - | 1.3 mV _{rms} | 1.75 mV _{rms} | |
| Probe Noise Density (Typical) | 3 mV _{rms} | 38 nV/rt (Hz) | | |
| Input Differential Range (Nominal) | ± 20 V | ±8 V (16 V _{p-p}) | | |
| Differential Offset Range (Nominal) | - | ±18 V | | |
| Offset Gain Accuracy (Typical) | - | 2% | | |
| Common Mode Range (Nominal) | ± 60 V | ±10 V | | |
| Maximum Non-destruct Voltage (Nominal) | - | 30 V | | |
| CMRR (Typical) | 80 dB @ 60 Hz 50 dB@10 MHz | 60 dB 50/60 Hz 30 dB 20 MHz 25 dB 500 MHz | 60 dB 50/60 Hz 30 dB 20 MHz 25 dB @ 1000 MHz | 60 dB 50/60 Hz 30 dB 20 MHz 25 dB @ 1500 MHz |
| DC Input Resistance (Nominal) | 250 kΩ (Common Mode) 1 MΩ (Differential Mode) | 50 kΩ (Common Mode) 120 kΩ (Differential Mode) | | |
| Differential Input Capacitance (Typical) | 3.5 pF | < 1.0 pF | | |

Ordering Information

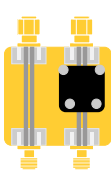
Product Description

| | |
|---|--------|
| 200 MHz, 3.5 pF, 1 MΩ Active Differential Probe | ZD200 |
| 500 MHz, 1.0 pF Active Differential Probe, ±8 V | ZD500 |
| 1 GHz, 1.0 pF Active Differential Probe, ±8 V | ZD1000 |
| 1.5 GHz, 1.0 pF Active Differential Probe, ±8 V | ZD1500 |

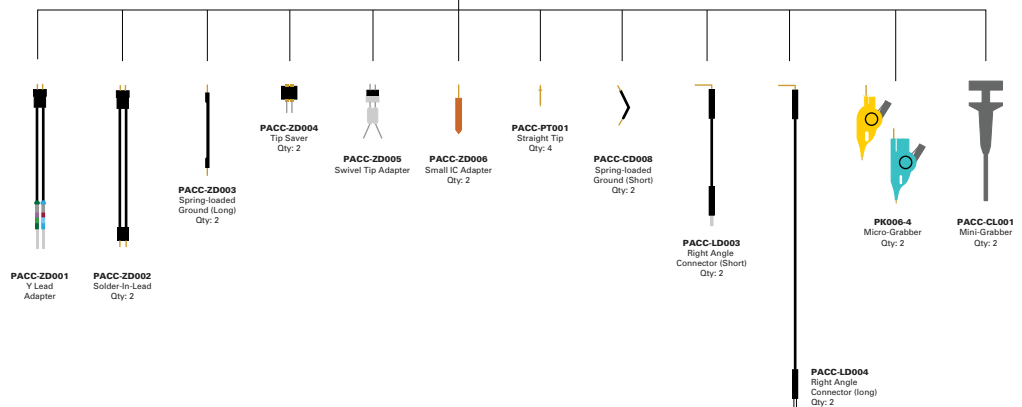
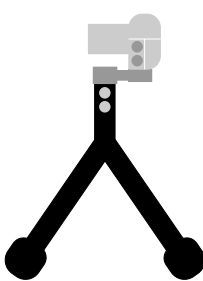
Product Code



PCF200
Probe Calibration Fixture



PACC-MS001
Hands Free Probe Holder



AP033

High bandwidth, excellent common-mode rejection ratio (CMRR) and low noise make these active differential probes ideal for applications such as disk drive design and failure analysis, as well as wireless and data communication design.



Specifications

| | |
|-------------------------|---|
| Bandwidth | 500 MHz |
| Gain | x10, x1, ÷10 (÷100 with plug-on ÷10 attenuator) |
| DC Accuracy | 1% in x1 without external attenuator |
| Input Resistance | 1 MΩ each input to ground 2 MΩ differential between inputs |
| Differential Mode Range | ±400 mV (x1) ±40 mV (x10) ±4 V (÷10) ±40 V (÷100) |
| Offset Range | ±400 mV (x1, x10) ±4 V (±10) ±40 V (±100) |
| Common-Mode Range | ±42 V peak (±10) ±4.2 V peak (±100) |
| CMRR | 70 Hz 10,000:1 (80 dB) 100 kHz 10,000:1 (80 dB) 1 MHz 1000:1 (60 dB) 10 MHz 100:1 (40 dB) 250 MHz 5:1 (14 dB) |

Ordering Information

Product Description

500 MHz Differential Probe

Product Code

AP033

4 GHz - 6 GHz DIFFERENTIAL PROBES



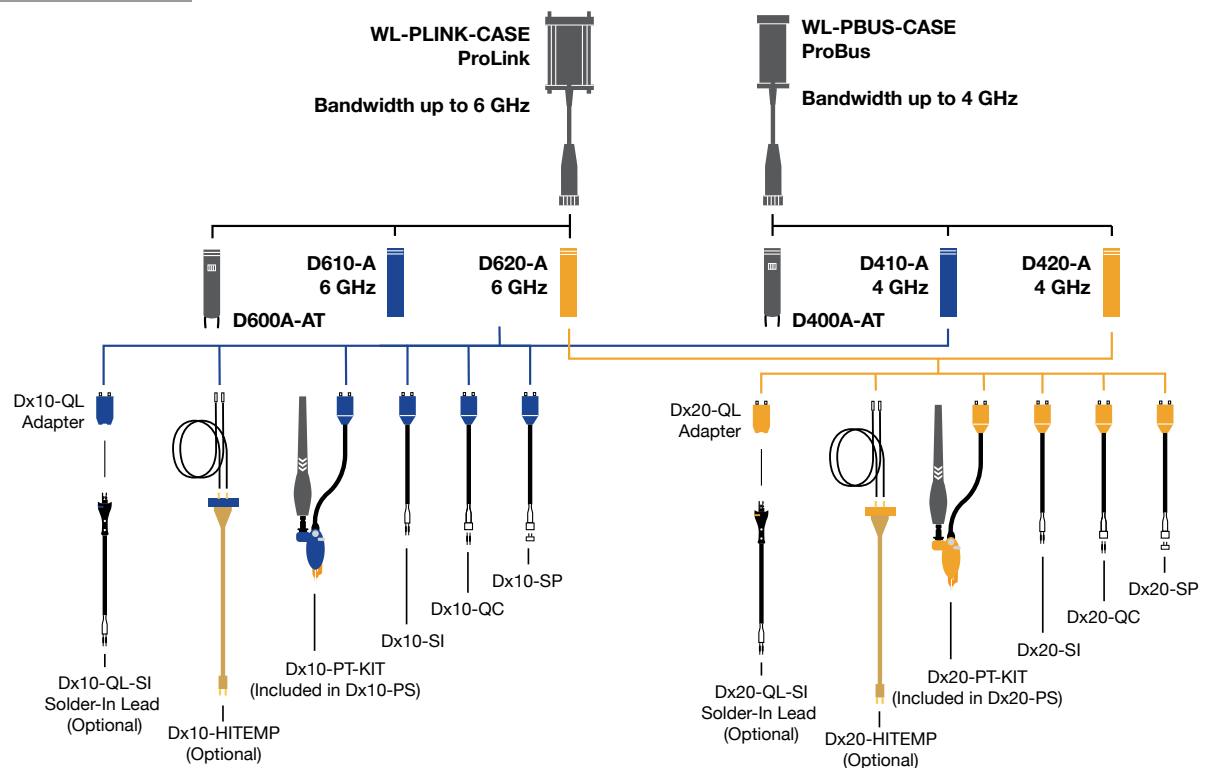
Teledyne LeCroy
4 GHz - 6 GHz
Differential Probe
Model Numbers:

D410-A-PS
D420-A-PS
D400A-AT
D610-A-PS
D620-A-PS
D600A-AT

Teledyne LeCroy's WaveLink 4-6 GHz Differential Probes are a general purpose probing solution with high-input dynamic range and offset range capability. The range of capabilities is ideal for a variety of high-speed DDR signals where high dynamic range and large offset requirements are common.

Key Features

- **4 GHz or 6 GHz models**
- **Up to 5 Vpk-pk dynamic range with low noise**
- **±3 V offset range**
- **Ideal for DDR2, LPDDR2, DDR3**
- **Innovative QuickLink architecture**
- **Wide variety of tips and leads**
 - Solder-In Lead
 - QuickLink Solder-In Lead
 - Positioner (Browser) Tip
 - Adjustable (Browser) Tip
 - Quick Connect Lead
 - Square Pin Lead
 - Hi-Temp Solder-In Lead
- **Low loading and high impedance for minimal signal disturbance**
- **Deluxe soft carrying case**



4 GHz - 6 GHz DIFFERENTIAL PROBES

| | D610-A, D610-A-PS | D620-A, D620-A-PS | D410-A, D410-A-PS | D420-A, D420-A-PS | D600A-AT | D400A-AT |
|--|---|---|--|--|--|--|
| Bandwidth* (Probe only, guaranteed) (System bandwidth, typical) | Dx10-SI, Dx10-QL-SI and Dx10-PT Tips 6 GHz Dx10-HiTemp 5 GHz Dx10-QC Tip 4 GHz Dx10-SP Tip 3 GHz | Dx20-SI, Dx20-QL-SI and Dx20-PT Tips 6 GHz Dx20-HiTemp 5 GHz Dx20-QC Tip 4 GHz Dx20-SP Tip 3 GHz | Dx10-SI, Dx10-QL-SI, Dx10-HiTemp, Dx10-QC and Dx10-PT Tips 4 GHz Dx10-SP Tip 3 GHz | Dx20-SI, Dx20-QL-SI, Dx20-HiTemp, Dx20-QC and Dx20-PT Tips 4 GHz Dx20-SP Tip 3 GHz | 6 GHz | 4 GHz |
| Rise Time* (10–90%) | Dx10-SI, Dx10-QL-SI and Dx10-PT Tips 75 ps (typical) Dx10-HiTemp 90 ps (typical) Dx10-QC Tip 122.5 ps (typical) Dx10-SP Tip 150 ps (typical) | Dx20-SI, Dx20-QL-SI and Dx20-PT Tips 75 ps (typical) Dx20-HiTemp 90 ps (typical) Dx20-QC Tip 122.5 ps (typical) Dx20-SP Tip 150 ps (typical) | Dx10-SI, Dx10-QL-SI, Dx10-HiTemp, Dx10-QC and Dx10-PT Tips 112 ps (typical) Dx10-QC Tip 122.5 ps (typical) Dx10-SP Tip 150 ps (typical) | Dx20-SI, Dx20-QL-SI, Dx20-HiTemp, Dx20-QC and Dx20-PT Tips 112 ps (typical) Dx20-QC Tip 122.5 ps (typical) Dx20-SP Tip 150 ps (typical) | <75 ps (typical) | <112 ps (typical) |
| Rise Time* (20–80%) | Dx10-SI, Dx10-QL-SI and Dx10-PT Tips 56 ps (typical) Dx10-HiTemp 67.5 ps (typical) Dx10-QC Tip 92 ps (typical) Dx10-SP Tip 113 ps (typical) | Dx20-SI, Dx20-QL-SI and Dx20-PT Tips 56 ps (typical) Dx20-HiTemp 67.5 ps (typical) Dx20-QC Tip 92 ps (typical) Dx20-SP Tip 113 ps (typical) | Dx10-SI, Dx10-QL-SI, Dx10-HiTemp, Dx10-QC and Dx10-PT Tips 84 ps (typical) Dx10-QC Tip 92 ps (typical) Dx10-SP Tip 113 ps (typical) | Dx20-SI, Dx20-QL-SI, Dx20-HiTemp, Dx20-QC and Dx20-PT Tips 84 ps (typical) Dx20-QC Tip 92 ps (typical) Dx20-SP Tip 113 ps (typical) | 56 ps (typical) | 84 ps (typical) |
| Noise (System) | <36 nV/√Hz (2.8 mVrms) (typical) Referred to input, 6 GHz bandwidth | <61 nV/√Hz (4.8 mVrms) (typical) Referred to input, 6 GHz bandwidth | <36 nV/√Hz (2.3 mVrms) (typical) Referred to input, 4 GHz bandwidth | <67 nV/√Hz (4.3 mVrms) (typical) Referred to input, 4 GHz bandwidth | <74 nV/√Hz (5.8 mVrms) (typical) Referred to input, 6 GHz bandwidth | <74 nV/√Hz (4.7 mVrms) (typical) Referred to input, 4 GHz bandwidth |
| Input | | | | | | |
| Input Dynamic Range (Nominal) | 2.5Vpk-pk, ±1.25V | 5Vpk-pk, ±2.5V | 2.5Vpk-pk, ±1.25V | 5Vpk-pk, ±2.5V | 4.8Vpk-pk, ±2.4V | |
| Input Common Mode Voltage Range (Nominal) | ±4 V | | | | ±2.4 Vmax | |
| Input Offset Voltage Range | ±3 V Differential (nominal) | | | | n/a | |
| Non-destructive Input Range (Nominal) | ±20 V | | | | ±18 V | |
| Attenuation | 1.7X / 1.0X (nominal) | 3.2X / 1.9X (nominal) | 1.7X / 1.0X (nominal) | 3.2X / 1.9X (nominal) | 2.5X | |
| DC Input Resistance (Nominal) | 200 kΩ Differential 50 kΩ Common Mode | | | | 4 kΩ Differential 2 kΩ Common Mode | |

* All bandwidth and rise time measurements are made with an oscilloscope bandwidth greater or equal to the probe bandwidth

† Through entire frequency range

Product Description

Complete Probe Systems

| | |
|---|-----------|
| 4 GHz Complete Probe System with Dx10-SI Solder-In Tip (Qty. 1), Dx10-SP Square Pin (Qty. 1), Dx10-QC Quick Connect (Qty. 1), and Dx10-PT-KIT Positioner Tip Browser (Qty. 1) | D410-A-PS |
| 4 GHz Complete Probe System with Dx20-SI Solder-In Tip (Qty. 1), Dx20-SP Square Pin (Qty. 1), Dx20-QC Quick Connect (Qty. 1), and Dx20-PT-KIT Positioner Tip Browser (Qty. 1) | D420-A-PS |
| 6 GHz Complete Probe System with Dx10-SI Solder-In Tip (Qty. 1), Dx10-SP Square Pin (Qty. 1), Dx10-QC Quick Connect (Qty. 1), and Dx10-PT-KIT Positioner Tip Browser (Qty. 1) | D610-A-PS |
| 6 GHz Complete Probe System with Dx20-SI Solder-In Tip (Qty. 1), Dx20-SP Square Pin (Qty. 1), Dx20-QC Quick Connect (Qty. 1), and Dx20-PT-KIT Positioner Tip Browser (Qty. 1) | D620-A-PS |

Amplifier and Probe Tip Modules

| | |
|---|----------|
| WaveLink D410-A 4 GHz/2.5Vp-p Differential Probe Amplifier with Dx10-SI Solder-In Tip (Qty. 1), Dx10-SP Square Pin (Qty. 1), and Dx10-QC Quick Connect (Qty. 1) | D410-A |
| WaveLink D420-A 4 GHz/5Vp-p Differential Probe Amplifier with Dx20-SI Solder-In Tip (Qty. 1), Dx20-SP Square Pin (Qty. 1), and Dx20-QC Quick Connect (Qty. 1) | D420-A |
| WaveLink D610-A 6 GHz/2.5Vp-p Differential Probe Amplifier with Dx10-SI Solder-In Tip (Qty. 1), Dx10-SP Square Pin (Qty. 1), and Dx10-QC Quick Connect (Qty. 1) | D610-A |
| WaveLink D620-A 6 GHz/5Vp-p Differential Probe Amplifier with Dx20-SI Solder-In Tip (Qty. 1), Dx20-SP Square Pin (Qty. 1), Dx20-QC Quick Connect (Qty. 1) | D620-A |
| WaveLink D400A-AT 4 GHz/4.8Vp-p Differential Amplifier Module with Adjustable Tip | D400A-AT |
| WaveLink D600A-AT 6 GHz/4.8Vp-p Differential Amplifier Module with Adjustable Tip | D600A-AT |

-PS COMPONENTS

Product Description

Positioner Tip (Browser) Kits

| | |
|--|-------------|
| WaveLink Dx10-PT Adjustable Positioner Tip Kit. For use with Dx10 amplifiers. | Dx10-PT-KIT |
| WaveLink Dx20-PT Adjustable Positioner Tip Kit. For use with Dx20 amplifiers. | Dx20-PT-KIT |

Probe Platform/Cable Assemblies and Adapters

| | |
|--|---------------|
| WaveLink ProLink Platform/Cable Assembly Kit with complete soft carrying case for all probe items. | WL-PLINK-CASE |
| WaveLink ProBus Platform/Cable Assembly Kit with complete soft carrying case for all probe items. | WL-PBUS-CASE |

QuickLink Solder-In Tip Set

| | |
|---|-------------|
| QuickLink Solder-In starter pack for use with Dx10 amplifier. Includes one QuickLink adapter and three QL-SI tips. | Dx10-QL-3SI |
| QuickLink Solder-In starter pack for use with Dx20 amplifier. Includes one QuickLink adapter and three QL-SI tips. | Dx20-QL-3SI |

Hi-Temp Leads

| | |
|---|-------------|
| WaveLink Temperature Extension Cables for Dx10. Includes set of Matched 30" High Temperature Cables (Qty. 1) and solder-in lead set (Qty. 1) | Dx10-HiTemp |
| WaveLink Temperature Extension Cables for Dx20. Includes set of Matched 30" High Temperature Cables (Qty. 1) and solder-in lead set (Qty. 1) | Dx20-HiTemp |

8 GHz - 13 GHz DIFFERENTIAL PROBES



Teledyne LeCroy
8 GHz - 13 GHz
Differential Probe
Model Numbers:

D830-PS

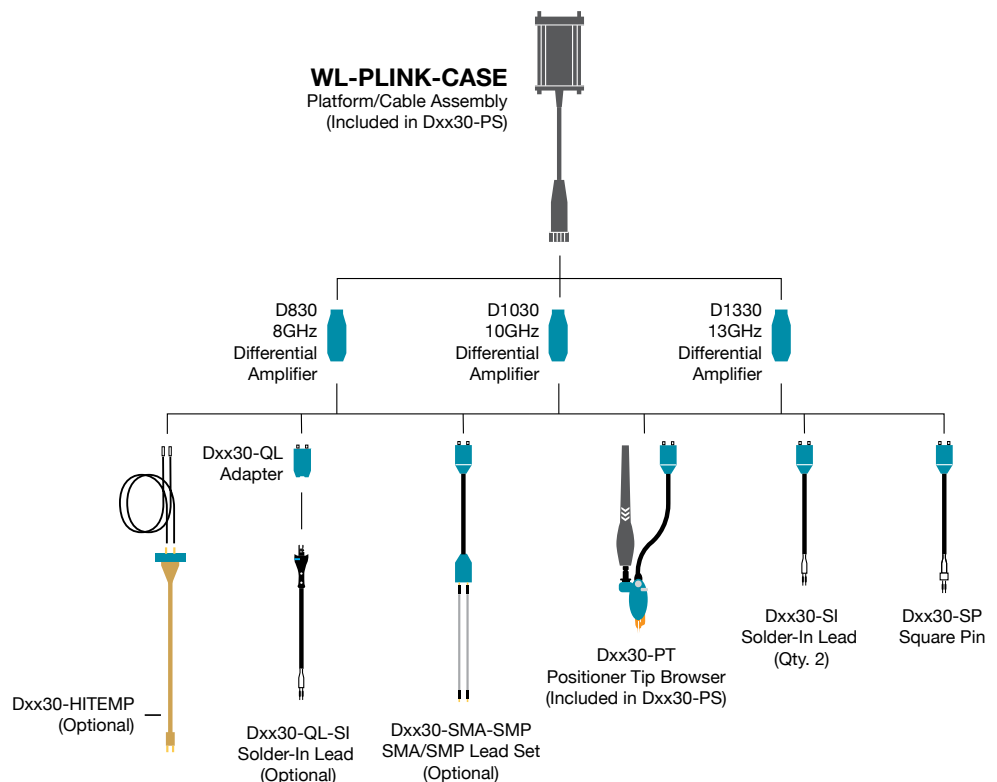
D1030-PS

D1330-PS

The WaveLink Differential Probe Series is a 8-13 GHz bandwidth active differential probe series with high input dynamic range, a large offset capability, and a wide variety of tips and leads available for different applications.

Features and Benefits

- Choice of 8, 10, or 13 GHz bandwidth models
- 3.5 Vpk-pk dynamic range
- ± 4 V offset range
- Ideal for DDR3, DDR4, LPDDR3
- Innovative QuickLink architecture
- Wide variety of tips and leads
 - Solder-In Lead
 - QuickLink Solder-In Lead
 - Positioner (Browser) Tip
 - SMA/SMP Lead
 - Square Pin Lead
 - Hi-Temp Solder-In Lead
- Low loading and high impedance for minimal signal disturbance
- Deluxe soft carrying case
- SMA/SMP lead set accessory does not require purchase of a different amplifier



8 GHz - 13 GHz DIFFERENTIAL PROBES

| | D830, D830-PS | D1030, D1030-PS | D1330, D1330-PS |
|--|---|--|---|
| Bandwidth* (Probe only, guaranteed) (System bandwidth, typical) | Dxx30-SI, Dxx30-QL-SI, Dxx30-SMA-SMP, Dxx30-HiTemp, and Dxx30-PT Tips 8 GHz Dxx30-SP Tip 3 GHz | Dxx30-SI, Dxx30-SMA-SMP, Dxx30-HiTemp, and Dxx30-PT Tips 10 GHz Dxx30-QL-SI Tip 8 GHz Dxx30-SP Tip 3 GHz | Dxx30-SI and Dxx30-SMA-SMP Tips 13 GHz Dxx30-PT and Dxx30-HiTemp Tips 10 GHz Dxx30-QL-SI Tip 8 GHz Dxx30-SP Tip 3 GHz |
| Rise Time* (10–90%) | Dxx30-SI, Dxx30-QL-SI, Dxx30-SMA-SMP, Dxx30-HiTemp, and Dxx30-PT Tips 50 ps (typical) Dxx30-SP Tip 132 ps (typical) | Dxx30-SI, Dxx30-SMA-SMP, Dxx30-HiTemp, and Dxx30-PT Tips 40 ps (typical) Dxx30-QL-SI Tip 50 ps (typical) Dxx30-SP Tip 132 ps (typical) | Dxx30-SI and Dxx30-SMA-SMP Tips 35 ps (typical) Dxx30-PT and Dxx30-HiTemp Tips 40 ps (typical) Dxx30-QL-SI Tip 50 ps (typical) Dxx30-SP Tip 132 ps (typical) |
| Rise Time* (20–80%) | Dxx30-SI, Dxx30-QL-SI, Dxx30-SMA-SMP, Dxx30-HiTemp, and Dxx30-PT Tips 37.5 ps (typical) Dxx30-SP Tip 100 ps (typical) | Dxx30-SI, Dxx30-SMA-SMP, Dxx30-HiTemp, and Dxx30-PT Tips 30 ps (typical) Dxx30-QL-SI Tip 37.5 ps (typical) Dxx30-SP Tip 100 ps (typical) | Dxx30-SI and Dxx30-SMA-SMP Tips 26 ps (typical) Dxx30-PT and Dxx30-HiTemp Tips 30 ps (typical) Dxx30-QL-SI Tip 37.5 ps (typical) Dxx30-SP Tip 100 ps (typical) |
| Noise (Probe) | <48 nV/√Hz (4.3 mVrms) (typical) Referred to input, 8 GHz bandwidth. | <48 nV/√Hz (4.8 mVrms) (typical) Referred to input, 10 GHz bandwidth. | <48 nV/√Hz (5.5 mVrms) (typical) Referred to input, 13 GHz bandwidth. |
| Noise (System) | <52 nV/√Hz (4.6 mVrms) (typical) Referred to input, 8 GHz bandwidth. | <52 nV/√Hz (5.2 mVrms) (typical) Referred to input, 10 GHz bandwidth. | <52 nV/√Hz (5.9 mVrms) (typical) Referred to input, 13 GHz bandwidth. |

| | |
|--|---|
| Input | |
| Input Dynamic Range | 3.5Vpk-pk, ±1.75V (nominal) |
| Input Common Mode Voltage Range | ±5 V (nominal) |
| Input Offset Voltage Range | ±4 V Differential (nominal) |
| Non-destructive Input Range | ±15 V (nominal) |
| Attenuation | 3.75x (nominal) |
| DC Input Resistance (nominal) | 200 kΩ Differential 50 kΩ Common mode |
| Impedance (Zmin, typical) | >250 Ω Differential through entire frequency range using SI tip |
| Impedance (mid-band, typical) | Dxx30-SI, Dxx30-QL-SI, and Dxx30-HiTemp Tips 470 Ω at 4 GHz, 320 Ω at 6 GHz, 260 Ω at 8 GHz, 250 Ω at 9 GHz, 260 Ω at 10 GHz, 350 Ω at 13 GHz Dxx30-PT Tip 155 Ω at 4 GHz, 210 Ω at 6 GHz, 140 Ω at 8 GHz, 80 Ω at 9 GHz, 40 Ω at 10 GHz |
| CMRR | 58 dB DC / 100 Hz 38 dB to 10 MHz 30 dB to 3 GHz 20 dB to 8 GHz (typical) |

*All Bandwidth and Rise Time measurements are made with an oscilloscope bandwidth greater or equal to the probe bandwidth

| | Product Description | Product Code | Product Description | Product Code |
|-----------------------|---|---------------|--|---------------------|
| -PS COMPONENTS | Complete Probe Systems | | QuickLink Solder-In Tip Set | |
| | 8 GHz Complete Probe System with Dxx30-SI Solder-In Tip (Qty. 2), Dxx30-SP Square Pin (Qty. 1), and Dxx30-PT-KIT Positioner Tip Browser (Qty. 1) | D830-PS | QuickLink Solder-In starter pack for use with Dxx30 amplifier. Includes one QuickLink adapter and three QL-SI tips. | Dxx30-QL-3SI |
| | 10 GHz Complete Probe System with Dxx30-SI Solder-In Tip (Qty. 2), Dxx30-SP Square Pin (Qty. 1), and Dxx30-PT-KIT Positioner Tip Browser (Qty. 1) | D1030-PS | Hi-Temp Lead Set | |
| | 13 GHz Complete Probe System with Dxx30-SI Solder-In Tip (Qty. 2), Dxx30-SP Square Pin (Qty. 1), and Dxx30-PT-KIT Positioner Tip Browser (Qty. 1) | D1330-PS | WaveLink Temperature Extension Cables for Dxx30. Includes set of Matched 30" High Temperature Cables (Qty. 1) and solder-in lead set (Qty. 1). | Dxx30-HiTemp |
| | Amplifier and Probe Tip Modules | | SMA/SMP Lead Set | |
| | WaveLink D830 8 GHz/3.5V _{p-p} Differential Probe Amplifier with Dxx30-SI Solder-In Tip (Qty. 2) and Dxx30-SP Square Pin (Qty. 1) | D830 | SMA/SMP lead set for use with Dxx30 amplifiers. Includes a set of SMA leads, SMP leads, pair of DC blocks and SMA finger wrenches. | Dxx30-SMA-SMP-LEADS |
| | WaveLink D1030 10 GHz/3.5V _{p-p} Differential Probe Amplifier with Dxx30-SI Solder-In Tip (Qty. 2) and Dxx30-SP Square Pin (Qty. 1) | D1030 | Accessories | |
| | WaveLink D1330 13 GHz/3.5V _{p-p} Differential Probe Amplifier with Dxx30-SI Solder-In Tip (Qty. 2) and Dxx30-SP Square Pin (Qty. 1) | D1330 | Cascade Microtech EZ-Probe Positioner | EZ PROBE |
| | Positioner Tip (Browser) Kits | | Probe Deskew and Calibration Test Fixture | TF-DSQ |
| | WaveLink Dxx30-PT (up to 10 GHz rating) Adjustable Positioner Tip Kit. For use with Dxx30 amplifiers. | Dxx30-PT-KIT | Calibration Options | |
| | Probe Platform/Cable Assemblies and Adapters | | NIST Calibration for D830. Includes test data. | D830-CCNIST |
| | WaveLink ProLink Platform/Cable Assembly Kit with complete soft carrying case for all probe items. | WL-PLINK-CASE | NIST Calibration for D1030. Includes test data. | D1030-CCNIST |
| | | | NIST Calibration for D1330. Includes test data. | D1330-CCNIST |

13 GHz - 25 GHz DIFFERENTIAL PROBES



Teledyne LeCroy
13 GHz - 25 GHz
Differential Probe
Model Numbers:

D1305-A-PS

D1605-A-PS

D2005-A-PS

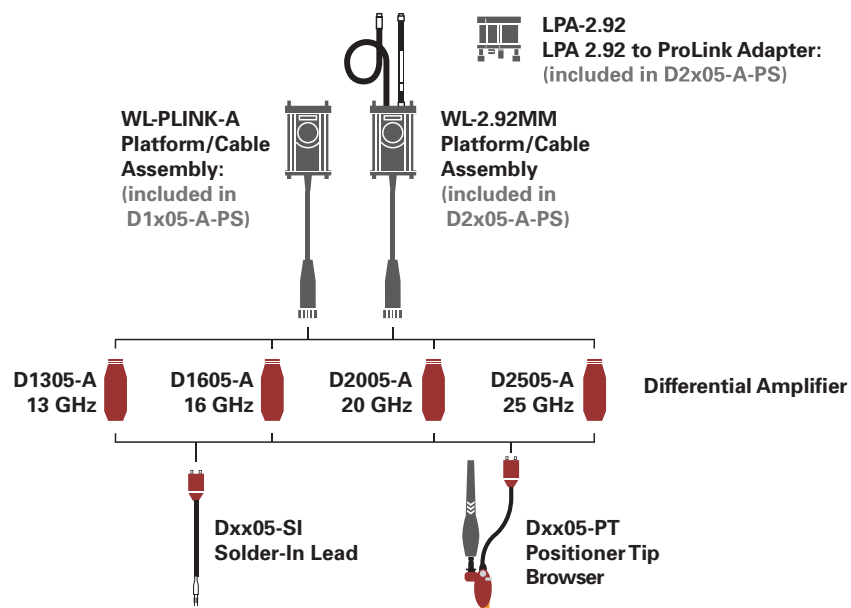
D2505-A-PS

Ultra-wideband Architecture for Superior Signal Fidelity

Teledyne LeCroy's WaveLink® high bandwidth differential probes utilize advanced differential traveling wave (distributed) amplifier architecture to achieve superior high frequency true analog broadband performance. Traveling wave (distributed) amplifiers are commonly used in ultra high frequency broadband amplifiers. This multi-stage amplifier architecture maximizes gain per stage and minimizes probe attenuation, which provides very low probe noise and fast rise times.

Features & Benefits

- Up to 25 GHz bandwidth (probe + oscilloscope)
- System rise time as fast as 13 ps (20–80%)
- 25 GHz Solder-in solution
- 22 GHz ultra-compact browser tip
- Superior probe impedance minimizes AC loading on device under test (DUT)
- Carbon-composite browser tips optimize signal fidelity and minimize loading
- Probe noise as low as 14 nV/√Hz (1.6 mV_{rms})
- Low probe attenuation
- Large operating voltage range
 - ±4 V common mode range
 - ±2.5 V offset range
 - 2.0 V_{pk-pk} dynamic range
- Long length Solder-In tip with field replaceable resistors



13 GHz - 25 GHz DIFFERENTIAL PROBES

| | D1305-A, D1305-A-PS | D1605-A, D1605-A-PS | D2005-A, D2005-A-PS | D2505-A, D2505-A-PS |
|---------------------------|--|--|--|---|
| Bandwidth | Dxx05-SI and Dxx05-PT Tips 13 GHz (probe only, guaranteed) 13 GHz (system bandwidth, when used with 813Zi, typical) | Dxx05-SI and Dxx05-PT Tips 16 GHz (probe only, guaranteed) 16 GHz (system bandwidth, when used with 816Zi, typical) | Dxx05-SI and Dxx05-PT Tips 20 GHz (probe only, guaranteed) 20 GHz (system bandwidth, when used with 820Zi, typical) | Dxx05-SI Lead 25 GHz (probe only, guaranteed) 25 GHz (system bandwidth, when used with 825Zi, typical) Dxx05-PT Tip 22 GHz (system bandwidth, when used with 825Zi, typical) 20 GHz (probe only, guaranteed) |
| Rise Time (10–90%) | Dxx05-SI and Dxx05-PT Tips 32.5 ps (typical) System rise time measured with ≥ 13 GHz oscilloscope | Dxx05-SI and Dxx05-PT Tips 28 ps (typical) System rise time measured with ≥ 16 GHz oscilloscope | Dxx05-SI and Dxx05-PT Tips 20 ps (typical) System rise time measured with ≥ 20 GHz oscilloscope | Dxx05-SI Lead 17.5 ps (typical) System rise time measured with ≥ 25 GHz oscilloscope Dxx05-PT Tip 19 ps (typical) System rise time measured with ≥ 25 GHz oscilloscope |
| Rise Time (20–80%) | Dxx05-SI and Dxx05-PT Tips 24.5 ps (typical) System rise time measured with ≥ 13 GHz oscilloscope | Dxx05-SI and Dxx05-PT Tips 21 ps (typical) System rise time measured with ≥ 16 GHz oscilloscope | Dxx05-SI and Dxx05-PT Tips 15 ps (typical) System rise time measured with ≥ 20 GHz oscilloscope | Dxx05-SI Lead 13 ps (typical) System rise time measured with ≥ 25 GHz oscilloscope Dxx05-PT Tip 14 ps (typical) System rise time measured with ≥ 25 GHz oscilloscope |
| Noise (Probe) | < 14 nV/ $\sqrt{\text{Hz}}$ (1.6 mV _{rms}) (typical) Referred to input, 13 GHz bandwidth | < 14 nV/ $\sqrt{\text{Hz}}$ (1.8 mV _{rms}) (typical) Referred to input, 16 GHz bandwidth | < 18 nV/ $\sqrt{\text{Hz}}$ (2.5 mV _{rms}) (typical) Referred to input, 20 GHz bandwidth | < 18 nV/ $\sqrt{\text{Hz}}$ (2.8 mV _{rms}) (typical) Referred to input, 25 GHz bandwidth |
| Noise (System) | < 23 nV/ $\sqrt{\text{Hz}}$ (2.7 mV _{rms}) (typical) Referred to input, 13 GHz bandwidth | < 23 nV/ $\sqrt{\text{Hz}}$ (2.9 mV _{rms}) (typical) Referred to input, 16 GHz bandwidth | < 28 nV/ $\sqrt{\text{Hz}}$ (4.0 mV _{rms}) (typical) Referred to input, 20 GHz bandwidth | < 28 nV/ $\sqrt{\text{Hz}}$ (4.5 mV _{rms}) (typical) Referred to input, 25 GHz bandwidth |

| Input | | | | |
|---------------------------------|---|--|---|---|
| Input Dynamic Range | | 2.0 V _{pk-pk} , (±1.0 V) (nominal) | | |
| Input Common Mode Voltage Range | | ±4 V (nominal) | | |
| Input Offset Voltage Range | | ±2.5 V Differential (nominal) | | |
| Non-destructive Input Range | | ±10 V (nominal) | | |
| Attenuation | 3.5x (nominal) | | 4.5x (nominal) | |
| DC Input Resistance (Nominal) | | 1.1 kΩ Differential 100 kΩ Common mode | | |
| Impedance (Zmin, typical) | Dxx05-SI Lead | Dxx05-SI Lead | Dxx05-SI Lead | Dxx05-SI Lead |
| | > 300 Ω Differential through entire frequency range | > 300 Ω Differential through entire frequency range | > 230 Ω Differential through entire frequency range | > 120 Ω Differential through entire frequency range |
| | Dxx05-PT Tip | Dxx05-PT Tip | Dxx05-PT Tip | Dxx05-PT Tip |
| | >160 Ω Differential through entire frequency range | >160 Ω Differential through entire frequency range | >160 Ω Differential through entire frequency range | >160 Ω Differential through entire frequency range |
| Impedance (mid-band, typical) | | Dxx05-SI Lead: 300 Ω at 6 GHz, 525 Ω at 13 GHz, 600 Ω at 16 GHz, 300 Ω at 20 GHz, 120 Ω at 25 GHz Dxx05-PT Tip: 160 Ω at 6 GHz, 450 Ω at 13 GHz, 240 Ω at 16 GHz, 210 Ω at 20 GHz | | |

| Product Description | Product Code |
|--|-----------------|
| Complete Probe Systems | |
| 13 GHz Complete Probe System with Solder-In Tip (13 GHz) and Positioner Tip Browser (13 GHz) | D1305-A-PS |
| 16 GHz Complete Probe System with Solder-In Tip (16 GHz) and Positioner Tip Browser (16 GHz) | D1605-A-PS |
| 20 GHz Complete Probe System with Solder-In Tip (20 GHz) and Positioner Tip Browser (20 GHz) | D2005-A-PS |
| 25 GHz Complete Probe System with Solder-In Tip (25 GHz) and Positioner Tip Browser (22 GHz) | D2505-A-PS |
| Amplifier and Probe Tip Modules | |
| WaveLink D1305 13 GHz/1.6 V _{pk-pk} Differential Probe Amplifier with Dxx05-SI Solder-In Tip (Qty. 2) | D1305-A |
| WaveLink D1605 16 GHz/1.6 V _{pk-pk} Differential Probe Amplifier with Dxx05-SI Solder-In Tip (Qty. 2) | D1605-A |
| WaveLink D2005 20 GHz/1.6 V _{pk-pk} Differential Probe Amplifier with Dxx05-SI Solder-In Tip (Qty. 2) | D2005-A |
| WaveLink D2505 25 GHz/1.6 V _{pk-p} Differential Probe Amplifier with Dxx05-SI Solder-In Tip (Qty. 2) | D2505-A |
| Positioner Tip (Browser) Kits | |
| WaveLink Dxx05-PT (Up to 22 GHz Rating) Adjustable Positioner Tip Kit. For use with Dxx05 Amplifiers | Dxx05-PT-KIT |
| Probe Platform/Cable Assemblies and Adapters | |
| WaveLink ProLink Platform/Cable Assembly Kit for ≥ 13 GHz WaveLink Probes | WL-PLINK-A-CASE |
| WaveLink 2.92 mm Platform/Cable Assembly Kit for ≥ 20 GHz WaveLink Probes | WL-2.92MM-CASE |
| ProLink to 2.92 mm Adapter with Probe Power and Communication Pass Through | LPA-2.92 |

| Product Description | Product Code |
|---|--------------------|
| Accessories | |
| Cascade Microtech EZ-Probe Positioner | EZ PROBE |
| Probe Deskew and Calibration Test Fixture | TF-DSQ |
| Calibration Options | |
| NIST Calibration for D1305. Includes Test Data | D1305-A-CCNIST |
| NIST Calibration for D1605. Includes Test Data | D1605-A-CCNIST |
| NIST Calibration for D2005. Includes Test Data | D2005-A-CCNIST |
| NIST Calibration for D2505. Includes Test Data | D2505-A-CCNIST |
| Replacement Parts | |
| Replacement Dxx05-SI 13–25 GHz Solder-In Lead with Qty. 5 Spare Resistors | Dxx05-SI |
| Replacement SI Resistor Kit for Dxx05-SI Solder-In Tip | Dxx05-SI-RESISTORS |
| Replacement Dxx05-PT Positioner Tip | Dxx05-PT |
| Qty. 4 Replacement Carbon Composite Pogo-pin Tips | Dxx05-PT-TIPS |
| Replacement Probe Tip Holder Kit | PK600ST-3 |
| Replacement Platform/Cable Assembly Mounting Kit | PK600ST-4 |
| Qty. 1 Package of Black Adhesive Pads (10/pkg.) and Qty. 1 Package of White Adhesive Pads (10/pkg.) | Dxx05-PT-TAPE |
| Qty. 1 Package of Adhesive Probe Connection Guides (200 individual guides/package) | Dxx05-PT-GUIDES |

HIGH VOLTAGE DIFFERENTIAL PROBES



Differential active probes are like two probes in one. Instead of measuring a test point in relation to a ground point (like single-ended active probes), differential probes measure the difference in voltage of a test point in relation to another test point.

Teledyne LeCroy
High Voltage
Differential Probe
Model Numbers:

HVD3102

HVD3106

HVD3106-6M

HVD3206

HVD3605

AP031

ADP300

ADP305

*Opposite page:
HVD3000 Series High Voltage Differential Probes
working with an HDO8000*

HIGH VOLTAGE DIFFERENTIAL PROBES

Teledyne LeCroy
High Voltage
Differential Probe
Model Numbers:

HVD3102
HVD3106
HVD3106-6M
HVD3206
HVD3605



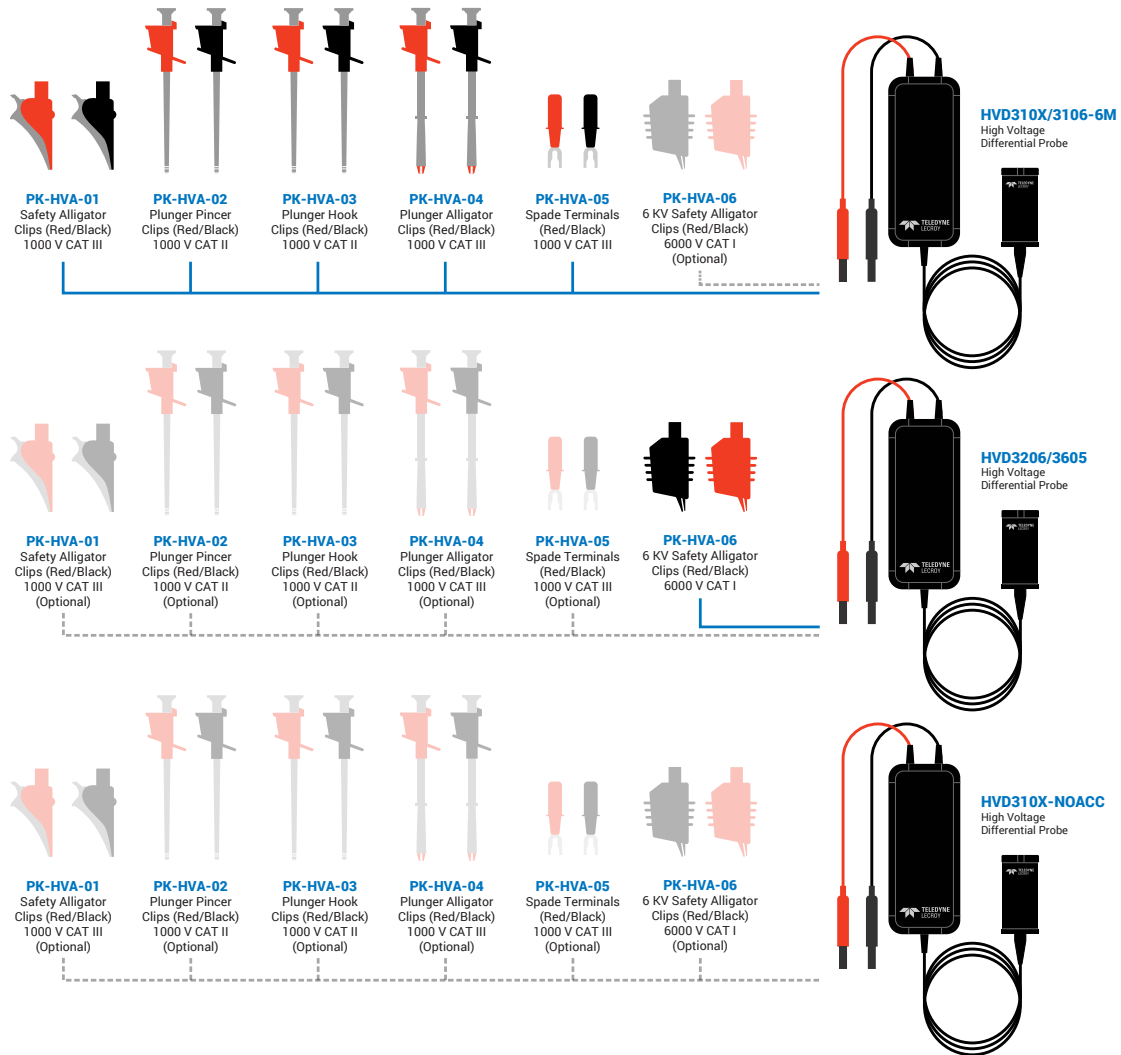
The HVD3000 series high voltage differential probes provide high CMRR over a broad frequency range to simplify the measurement challenges found in noisy, high common-mode power electronics environments. The probe's design is easy-to-use and enables safe, precise high voltage floating measurements.

Key Features

- 1 kV, 2 kV, 6 kV CAT safety rated models
- World's only 1500 V_{dc} safety rated probe per IEC/EN 61010-031:2015
- Widest differential voltage ranges available
- Exceptional common-mode rejection ratio (CMRR) across a broad frequency range
- 1% gain accuracy
- High offset capability at both high and low attenuation
- AC and DC coupling
- ProBus active probe interface with automatic scaling
- Auto-zero capabilities
- Wide oscilloscope compatibility

HIGH VOLTAGE DIFFERENTIAL PROBES

| | HVD3102 | HVD3102-NOACC | HVD3106 | HVD3106-NOACC | HVD3106-6M | HVD3206 | HVD3605 |
|-----------------------------------|--|--|--|--|--|--|---|
| Bandwidth | 25 MHz | 25 MHz | 120 MHz | 120 MHz | 80 MHz | 120 MHz | 100 MHz |
| Differential Voltage Range | 1500 V (DC + peak AC) (2000V maximum typical measurable before saturation) | 1500 V (DC + peak AC) (2000V maximum typical measurable before saturation) | 1500 V (DC + peak AC) (2000V maximum typical measurable before saturation) | 1500 V (DC + peak AC) (2000V maximum typical measurable before saturation) | 1500 V (DC + peak AC) (2000V maximum typical measurable before saturation) | 2000 V (DC + peak AC) | 7000 V (DC + peak AC) (7600 V maximum typical measurable before saturation) |
| Max Safe Input Voltage | 1000 Vrms CAT III | 1000 Vrms CAT III | 1000 Vrms CAT III | 1000 Vrms CAT III | 1000 Vrms CAT III | 1000 Vrms CAT III 1500 V _{dc} CAT III 2000 V (DC + peak AC) CAT I | 8485 V (DC + peak AC) CAT I 6000 Vrms CAT I 1000 Vrms CAT III 1500 V _{dc} CAT III |
| Gain Accuracy | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Cable Length | 2 meters | 2 meters | 2 meters | 2 meters | 6 meters | 2 meters | 6 meters |
| Included Tip Accessories | Yes | No | Yes | No | Yes | Yes | Yes |



Ordering Information

Product Description

1 kV, 25 MHz High Voltage Differential Probe with 2 m cable
 1 kV, 120 MHz High Voltage Differential Probe with 2 m cable
 1 kV, 80 MHz High Voltage Differential Probe with 6m cable
 1 kV, 25 MHz High Voltage Differential Probe with 2 m cable without tip Accessories
 1 kV, 120 MHz High Voltage Differential Probe with 2 m cable without tip Accessories
 2 kV, 120 MHz High Voltage Differential Probe with 2 m cable
 6 kV, 100 MHz High Voltage Differential Probe with 6 m cable
 High Voltage Replacement Accessories Kit (Includes 2 each, 1 Black, 1 Red):
 Safety Alligator Clips, Plunger Pincer Clips, Plunger Hook Clips, Plunger Alligator Clips, Spade Terminals

Product Code

HVD3102
 HVD3106
 HVD3106-6M
 HVD3102-NOACC
 HVD3106-NOACC
 HVD3206
 HVD3605
 PK-HV-001

HIGH VOLTAGE DIFFERENTIAL PROBES

Teledyne LeCroy
High Voltage
Differential Probe
Model Numbers:

AP031
ADP300
ADP305



AP031

The AP031 is a low cost, battery operated active differential probe intended for measuring higher voltages. The differential techniques employed permit measurements to be taken at two points in a circuit without reference to the ground, allowing the oscilloscope to be safely grounded without the use of opto-isolators or isolating transformers.

Features

- Safe floating measurements
- 15 MHz bandwidth
- 700 V maximum input voltage
- Works with any 1 M Ω input oscilloscope

Specifications

| | |
|-------------------------|--|
| Attenuation | $\div 10 / \div 100$ |
| Bandwidth | 15 MHz |
| Input R | 4 M Ω |
| Differential Mode Range | $\pm 70 \text{ V} / \pm 700 \text{ V DC} + \text{Peak AC}$ |
| Common Mode Range | $\pm 700 \text{ V DC} + \text{Peak AC}$ |
| CMRR | 86 dB @ 50 Hz 56 dB @ 200 kHz |

Power Requirements: four AA batteries

Ordering Information

| Product Description | Product Code |
|--|--------------|
| 700 V, 15 MHz Differential Probe ($\div 10, \div 100$) | AP031 |
| 1,400 V, 20 MHz High-Voltage Differential Probe | AP300 |
| 1,400 V, 100 MHz High-Voltage Differential Probe | AP305 |

HIGH VOLTAGE DIFFERENTIAL PROBES

ADP30X

ADP30X high-voltage active probes are safe, easy-to-use, and ideally suited for measuring power electronics. The ADP300 is designed for troubleshooting low-frequency power devices and other circuits where the reference potential is elevated from the ground or the location of the ground is unknown. The ADP305 is designed for measuring the high-speed floating voltages found in today's power electronics.



Features

- 20 MHz and 100 MHz bandwidth
- 1,000 V_{rms} common mode voltage
- 1,400 V_{peak} differential voltage
- EN 61010 CAT III
- 80 dB CMRR at 50/60 Hz
- ProBus system
- Full remote control

Specifications

Electrical Characteristics

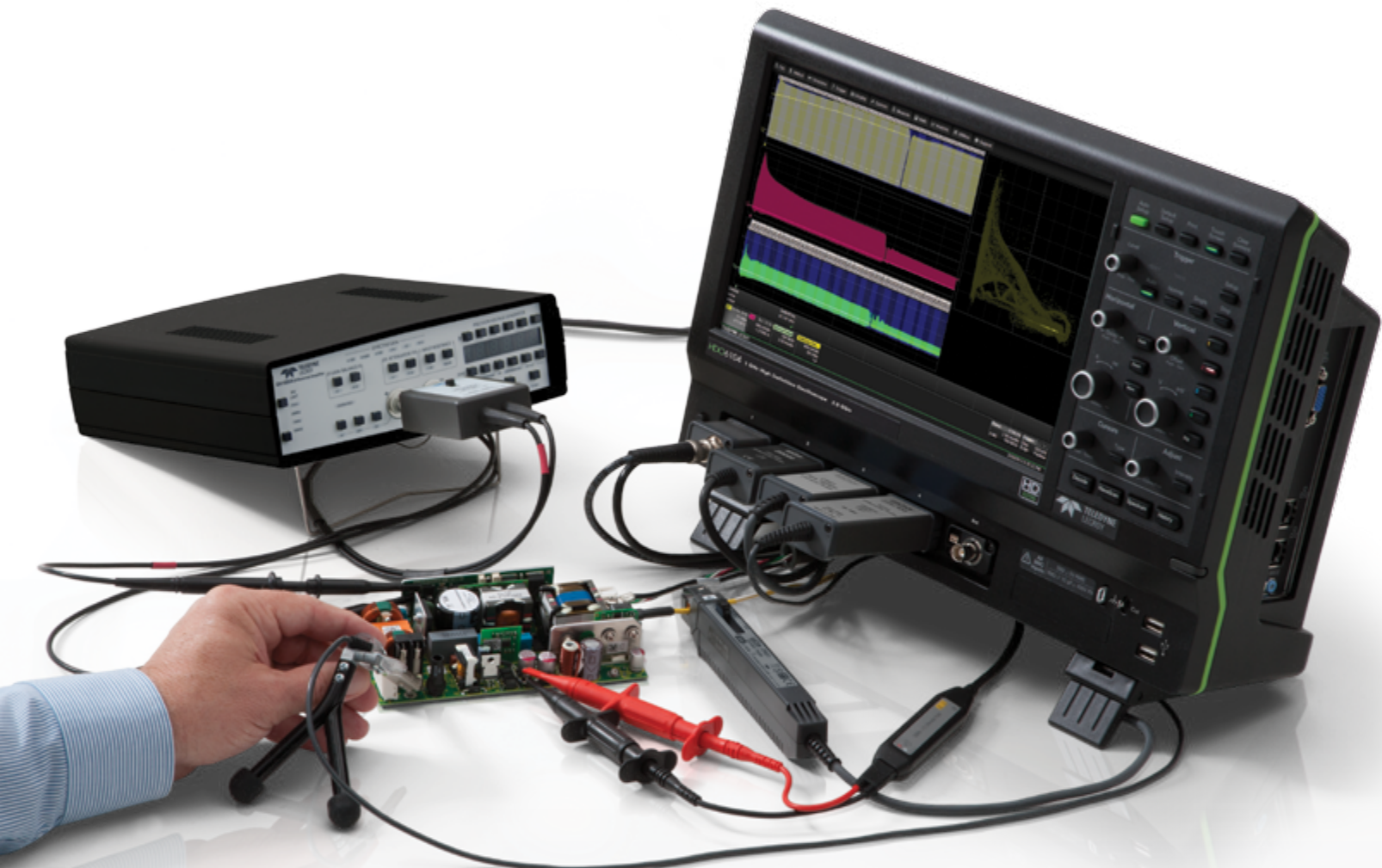
| | |
|--------------------------------------|---|
| Bandwidth | 20 MHz (ADP300) 100 MHz (ADP305) |
| Differential Voltage | 1,400 V peak |
| Common Mode Voltage | 1,000 V rms CAT III |
| Low-Frequency Accuracy (Probe Only) | 1% of Reading |
| CMRR | 50/60 Hz 80 dB (10,000:1) 100 kHz 50 dB (300:1) |
| Max. Slew Rate (Referenced to Input) | 60,000 V/μs (ADP300) 300,000 V/μs (ADP305) |
| AC Noise (Referenced to Input) | 50 mV rms |
| Attenuation | ÷100/÷1000 (automatically selected by scope) |
| Input Impedance | Between inputs 8 MΩ, 6 pF Each input to ground 4 MΩ, 1 pF |
| Sensitivity | 1 V/div to 350 V/div (ADP300) 200 mV/div to 350 V/div (ADP305) |
| Interface | ProBus, 1 MΩ* |

General Characteristics

| | |
|-----------------------|---------------------------|
| Overall Length | 2 m |
| Input Connectors | 4 mm Shrouded Banana Plug |
| Operating Temperature | 0 °C to 50 °C |
| Warranty | 1 year |

*Requires AP-1M for oscilloscopes with 50 Ω only inputs

DIFFERENTIAL AMPLIFIERS



Differential amplifiers are intended to act as signal conditioning preamplifiers for oscilloscopes and network and spectrum analyzers, providing differential measurement capability to instruments having only a single-ended input. The “-PR2” version of each amplifier is a dual channel unit. The DXC series differential input cables are matched to the characteristics of the amplifier.

Teledyne LeCroy
Differential Amplifier
and Accessory
Model Numbers:

DA1855A
DA1855-PR2
DA1855A-RM
DA1855A-PR2-RM
DXC5100
DXC100A
DXC200
DA101

*Opposite page:
DA1855A Differential Amplifier working with the
HDO6000 oscilloscope for power measurement.*

DIFFERENTIAL AMPLIFIERS

Teledyne LeCroy
Differential Amplifier
and Accessory
Model Numbers:

DA1855A
DA1855-PR2
DA1855A-RM
DA1855A-PR2-RM
DXC5100
DXC100A
DXC200
DA101



DA1855A

The DA1855A is a stand-alone, high-performance 100 MHz differential amplifier. It is intended to act as a signal conditioning preamplifier for oscilloscopes, digitizers and spectrum analyzers, providing differential measurement capability to instruments having only a single-ended input. When used with a DA1855A, oscilloscopes can obtain Common Mode Rejection Ratio (CMRR) and overdrive recovery performance levels previously unobtainable.

Amplifier gain can be set to 1 or 10. A built-in input attenuator can be separately set to attenuate signals by a factor of 10, providing gains of 10, 1, or 0.1 and common mode dynamic range of $\pm 15.5 \text{ V} (\div 1)$ or $\pm 155 \text{ V} (\div 10)$. Optional probes increase the maximum input signal and common mode ranges

in proportion to their attenuation ratio but do not exceed their maximum input voltage rating. Effective gain of the DA1855A, including probe attenuation, amplifier gain and attenuator settings, is automatically displayed.

The DA1855A features a built-in Precision Voltage Generator (PVG) that can be set to any voltage between $\pm 15.5 \text{ V}$ ($\pm 10 \text{ V}$ in Differential Offset) with up to $100 \mu\text{V}$ resolution. The PVG's output can be selected as an input to the inverting (-) input of the amplifier for operation as a differential comparator, or applied internally as a true differential offset voltage independent of oscilloscope offset. The differential amplifier is also available in a 2 channel model. In addition, a rackmount is available for each model for easy installation with other instruments.



DXC100A

÷100 or ÷10 Selectable, 250 MHz Passive Differential Probe Pair

- DC to 100 MHz Bandwidth with DA1855A
DC to 10 MHz Bandwidth with DA1822
- Max Input Voltage 500 V
- Selectable 10 or 100 Attenuation Factor
- 1.2 m Cable Length



DXC200

÷1, 50 MHz, Passive Differential Probe Pair

- DC to 50 MHz with DA1855A
DC to 10 MHz with DA1822A
- Max Input Voltage 500 V (Limited to Amplifier Max Input Voltage)
- x1 Differential Probe Pair
- 0.7 m Cable Length



DXC5100

÷100, 2.5KV Passive High Voltage Probe Pair. Requires DA101 for full performance



DA101

÷10, 1M Ω Passive Attenuator for DXC series probes

Ordering Information

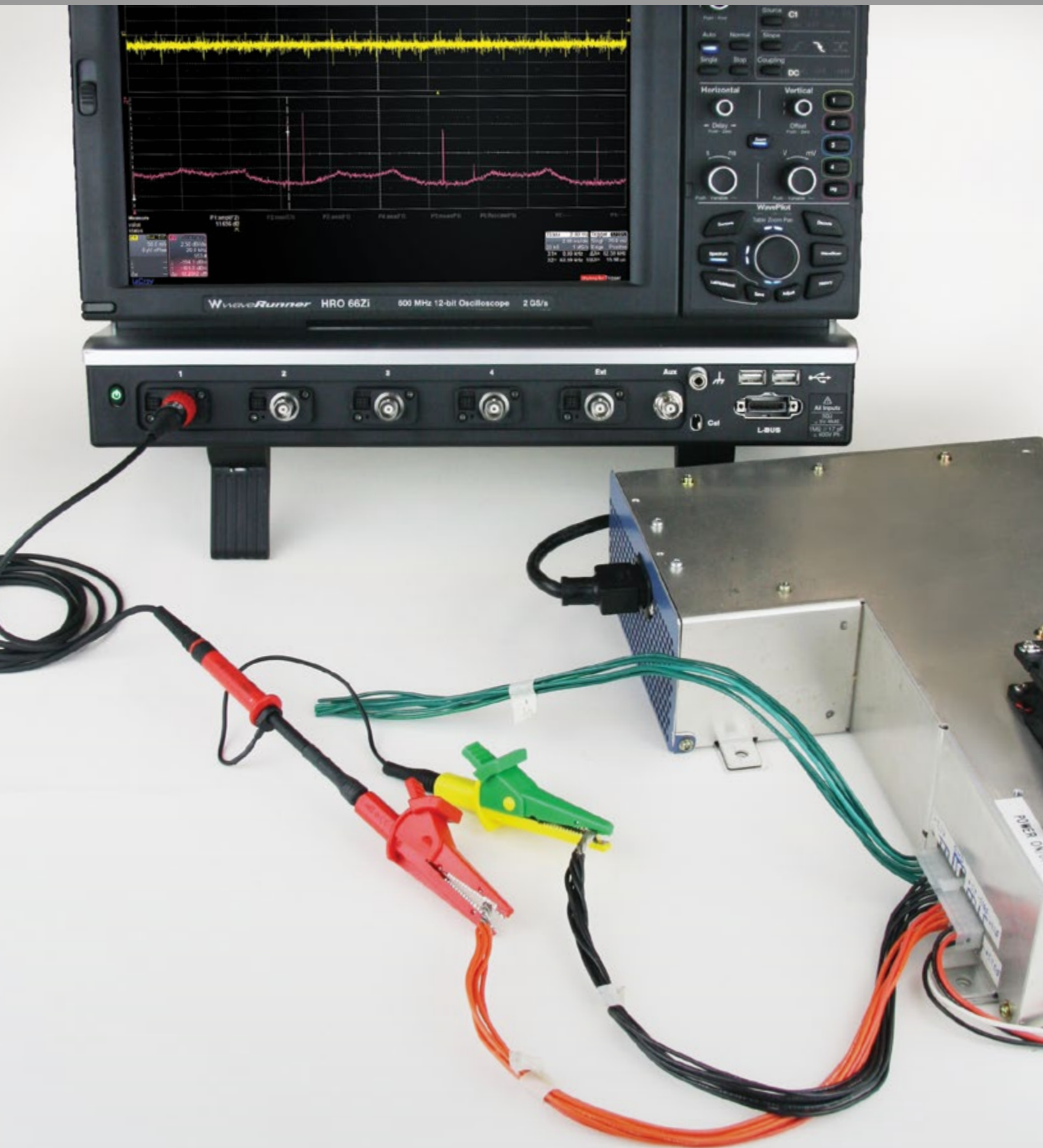
Product Description

Product Code

| | |
|---|----------------|
| 1 Ch, 100 MHz Differential Amplifier with Precision Voltage Source | DA1855A |
| 2 Ch, 100 MHz Differential Amplifier with Precision Voltage Source | DA1855A-PR2 |
| DA1855A with Rackmount | DA1855A-RM |
| DA1855A with Rackmount (must be ordered at time of purchase, no retrofit) | DA1855A-PR2-RM |
| ÷100 or ÷10 Selectable, 250 MHz Passive Differential Probe Pair | DXC100A* |
| ÷1, 50 MHz Passive Differential Probe Pair | DXC200* |
| ÷100, 250 MHz 2.5 kV, High Voltage Probe Pair (requires DA101 for full performance) | DXC-5100* |
| ÷10 1 M Ω Passive Attenuator for DXC Series Probes | DA101* |

*Must be used with DA Series Differential Amplifiers

HIGH VOLTAGE PROBES

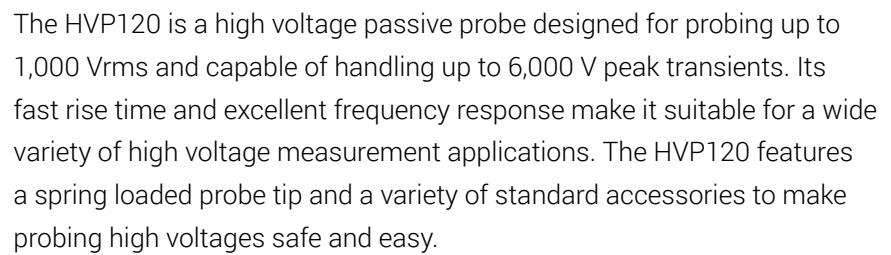


High voltage probes are suitable for a wide range of applications where high-voltage measurements must be made safely and accurately. There are several fixed attenuation probes covering a range from 1 kV to 6 kV and varying transient overvoltage ratings. All of these high voltage probes feature a spring loaded probe tip and a variety of standard accessories to make probing high voltages safe and easy. Additionally, all of the high voltage probe have a probe sense pin to automatically configure the oscilloscope for use with the probe.

Teledyne LeCroy
High Voltage Probe
Model Numbers:

HVP120
PPE4KV
PPE5KV
PPE6KV

Opposite page:
PPE Series High Voltage Probe



- 400 MHz probe bandwidth
- 900 ps rise time
- 1000 Vrms maximum input
- Up to 6 kV transient overvoltage

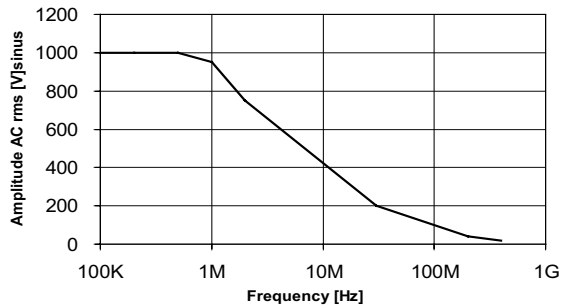
| | |
|-------------------------|---|
| Bandwidth | 400 MHz |
| Risetime (10% - 90%) | 900 ps (typical) |
| Maximum Input Voltage* | |
| Measurement Category II | 1000 Vrms |
| Measurement Category I | 4000V Transient Overvoltage at 1000 Vrms 6000V Transient Overvoltage at 0 Vrms |
| Pollution Degree* | 2 |
| Input Capacitance | 7.5 pF (typical) |
| Compensation Range | 10 pF - 50 pF (typical) |
| Attenuation Ratio | 100:1 \pm 2% |

| | |
|-----------------------------|--|
| Temperature (Operating) | 0°C to 50°C |
| Temperature (Non-Operating) | -40°C to 71°C |
| Humidity (Operating) | 80% RH (Non-Condensing) up to 31°C, decreasing linearly to 40% RH at 50°C |
| Altitude (Operating) | up to 2,000 m |
| Altitude (Non-Operating) | up to 15,000 m |

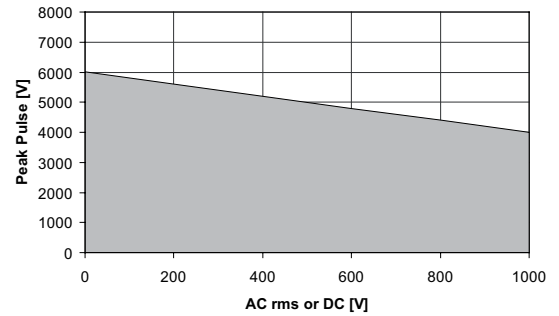
| | |
|--------------------|--------------------|
| Weight (probe) | 67 g (0.15 lbs) |
| Cable Length | 2 m (6.56 ft) |
| Probe Tip Diameter | 5 mm (0.20 inches) |

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**Typical Voltage Derating HVP120
Measurement Category I**



**HVP120 RMS vs. Peak Pulse Voltage
Measurement Category I**



Product Description

400 MHz, High Voltage Passive Probe
High Voltage Replacement Accessories Kit

Product Code

HVP120
PK-HV-002

Replacement Accessories

One of each of the following accessories are included with the HVP120. Replacement quantities are listed below.

| | |
|--|-------------|
| Coding Rings (set) 4 Colors (Qty 3 also included standard) | PK1-5MM-106 |
| Ground Lead 22 cm to 4 mm Banana plug (Qty 1) | PK1-5MM-122 |
| Solid Tip 0.8 mm (Qty 5) | PK1-5MM-125 |
| Spring Tip 0.8 mm (Qty 5) | PK1-5MM-126 |
| BNC Adapter 5.0-L (Qty 1) | PK1-5MM-127 |
| Insulating Cap 5.0-L (Qty 1) | PK1-5MM-128 |
| Protection Cap 5.0-L (Qty 1) | PK1-5MM-129 |
| Sprung Hook 5.0-L (Qty 1) | PK1-5MM-130 |
| Adjustment Tool T (Qty 1) | PK1-5MM-131 |
| Flexible Adapter 5.0-L (Qty 1) | PK1-5MM-132 |
| Safety Alligator Clip red (Qty 1) | PK1-5MM-133 |
| Ground Lead 22 cm (Qty 1) | PK1-5MM-134 |

HIGH VOLTAGE PROBES

Teledyne LeCroy
High Voltage Probe
Model Numbers:

PPE4KV
PPE5KV
PPE6KV



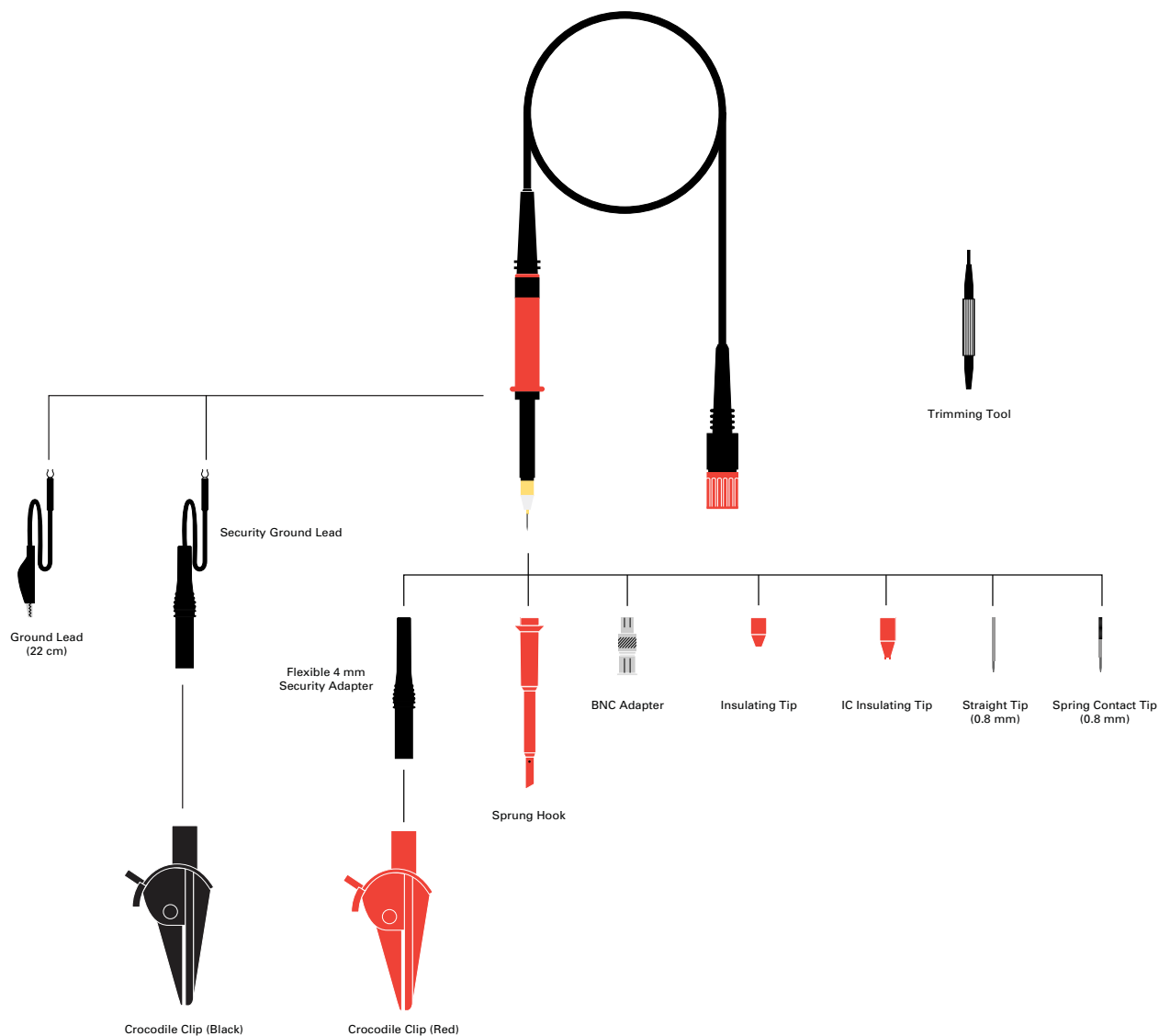
The PPE series includes four fixed-attenuation probes covering a range from 2 kV to 6 kV, and one switchable probe providing $\div 10/\div 100$ attenuation for voltage inputs up to 1.2 kV. All fixed-attenuation, standard probes automatically rescale compatible Teledyne LeCroy oscilloscopes for the appropriate attenuation of the probe.

Features

- Safe, accurate high-voltage measurement
- 1.2 kV to 6 kV

High-Voltage Probes Selection Guide Specifications

| Types | Bandwidth (MHz) | Input R (Ω) | Input C (pF) | Attenuation | Maximum Voltage | Probe Encoding | Cable |
|---------|--------------------|-------------------------|-----------------|-------------|--------------------|-------------------|-------|
| PPE4kV* | 400 | 50 M | < 6 | $\div 100$ | 4 kV | Yes | 2 m |
| PPE5kV* | 400 | 50 M | < 6 | $\div 100$ | 5 kV | Yes | 2 m |
| PPE6kV* | 400 | 50 M | < 6 | $\div 1000$ | 6 kV | Yes | 2 m |

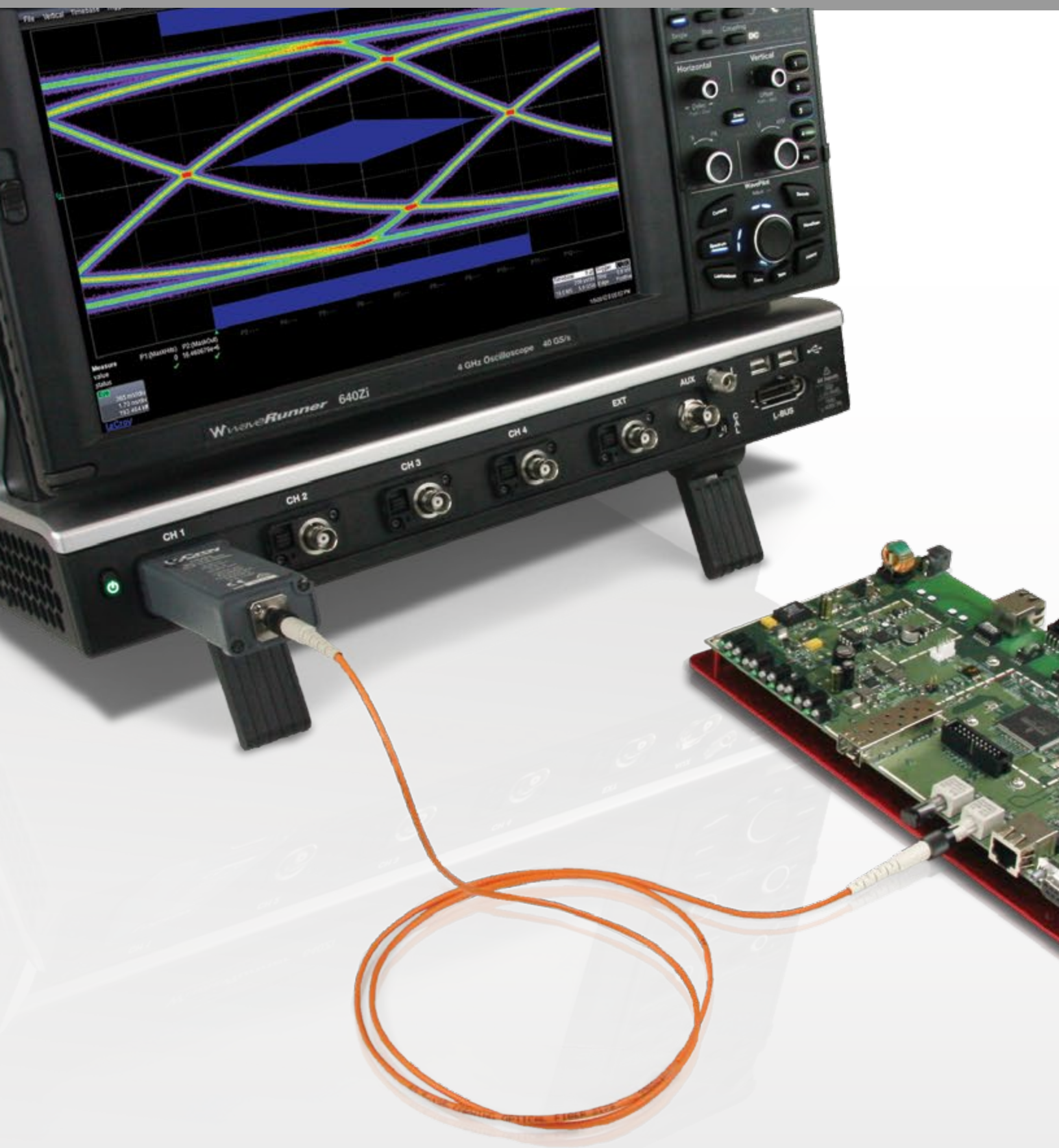


Ordering Information

| Product Description | Product Code |
|--|--------------|
| ÷100; 400 MHz; 50 MΩ High-Voltage Probe, 4 kV max. Voltage DC and Peak AC | PPE4KV |
| ÷100; 400 MHz; 50 MΩ High-Voltage Probe, 5 kV max. Voltage DC and Peak AC | PPE5KV |
| ÷1000; 400 MHz; 50 MΩ High-Voltage Probe, 6 kV max. Voltage DC and Peak AC | PPE6KV |
| Accessory Kit for PPE1.2kV, 2kV, 4kV, 5kV, and 6kV | PK103 |
| Sprung Hook (red) | PK103-1 |
| Ground Lead (22 cm) | PP005-GL22 |
| Crocodile Clip | PK30x-2 |
| Probe Tip to BNC Adapter | PP005-BNC |
| Spring Tip (0.8 mm) | PP005-ST8 |
| Rigid Tip V2A | PP005-RT |

Supplied with probe:
* Probe Kit: Trimming tool, ground lead, rigid tip, IC insulator, BNC adapter, tip insulator, sprung hook, red crocodile clip.
4 mm safety ground lead, and green/yellow crocodile clip.

OPTICAL PROBES



Teledyne LeCroy's wide-band multi-mode optical-to-electrical converters are designed for measuring optical communications signals. Their broad wavelength range and multi-mode input optics make these devices ideal for applications including Ethernet, Fibre Channel, and ITU telecom standards. Available to support optical data rates up to 11.3 Gb/s with reference receivers, or slightly higher without reference receivers.

These wide-band multi-mode optical-to-electrical converters are designed for measuring optical communications signals. They connect to Teledyne LeCroy real-time oscilloscopes and provide capability for physical layer signal assessment using a variety of oscilloscope tools, such as SDAIII-CompleteLinQ Serial Data Eye, Jitter, Noise and Crosstalk Analysis, mask testing, serial triggering and decoding, and other compliance and debug tools. Maximum data rate test capability is >11.317 Gb/s with reference receiver, or 12.5 Gb/s without.

Teledyne LeCroy
Optical Probe
Model Numbers:

OE695G

OE425

OE455

OE525

OE555

*Opposite page:
OE455 Optical Probe working with a WaveRunner 640 Zi oscilloscope.*



Teledyne LeCroy
Optical Probe
Model Numbers:

OE695G
OE425
OE455
OE525
OE555

OE695G

Teledyne LeCroy's OE695G wide-band optical-to-electrical converter is ideal for measuring optical datacom and telecom signals with data rates from 622 Mb/s to 12.5+ Gb/s. Connection to a real-time Teledyne LeCroy oscilloscope is through the 2.92mm interface, with a provided adapter to connect to ProLink interfaces.

Features

- Compatible with Teledyne LeCroy WavePro 7 Zi/Zi-A, WaveMaster 8 Zi/Zi-A, LabMaster 9 Zi-A, and LabMaster 10 Zi oscilloscopes
- Frequency range DC to 9.5 GHz (electrical, -3 dB)
- Reference receiver support from 8GFC to 10GFC FEC, or Custom (<12.5Gb/s)
- Full bandwidth mode (no reference receiver applied)
- 62.5/125 μ m multi-mode or single-mode fiber input
- +7 dBm (5 mW) max peak optical power
- Low noise (as low as 25 pW/ $\sqrt{\text{Hz}}$)
- Ideal for Eye Mask, Extinction Ratio, and Optical Modulation Amplitude (OMA) testing

Specifications

| | |
|---|---|
| Optical Wavelength Range | 780 to 1550 nm (calibrated range) 750 to 1650 nm (usable range) |
| Maximum Modulation Bandwidth | DC to 8.625 GHz (-3 dBe, electrical) DC to 11.64 GHz (-3 dBo, optical) (Reference Receiver Applied) DC to 9.5 GHz (-3 dBe) DC to 12 GHz (-6 dBe) DC to 17 GHz (-14 dBe) (+/-1 dBe passband variations typical, no Reference Receiver Applied) |
| Reference Receiver Uncertainty | ± 1.6 dBe up to $F_{\text{ref}} = 0.75 \times \text{bit rate}$ ± 4 dBe $2 \times F_{\text{ref}}$ setting (typical) ± 0.85 dBe up to $F_{\text{ref}} = 0.75 \times \text{bit rate}$ ± 4 dBe $2 \times F_{\text{ref}}$ setting (on matched oscilloscope input channel 4 with 11, 17, 20, 30, 39, 50, 75, 90, or 100 mV/div gain ranges) with purchase of OE695G-REFCAL) |
| Reference Receiver Settings | 8GFC, OC192/STM64, 10GBASE-W, 10GBASE-R, 10GFC, ITU-T G.975 FEC, ITU-T G.709 FEC, 10GbE FEC, 10GFC FEC, Custom (622 Mb/s to 12.5 Gb/s), None (Maximum Bandwidth) |
| Noise Equivalent Power | 25 pW/ $\sqrt{\text{Hz}}$ @ 1310 nm (typical) 50 pW/ $\sqrt{\text{Hz}}$ @ 850 nm (typical) Average noise spectral density 0-10 GHz using most sensitive vertical scale |
| Rise Time (10-90%) | 33 ps (typical, no reference receiver applied) |
| Connector Type | FC/PC, compatible with 62.5/125 μ m Multi-Mode fiber, or mechanically compatible Single-Mode fiber |
| Maximum Optical Linear Input (1 dB Compression Point) | -2 dBm (typical), -3 dBm (minimum) at 1550/1310 nm +4 dBm (typical), +3 dBm (minimum) at 850 nm |
| Maximum Optical Power | +7 dBm (5 mW) Peak |
| Conversion Gain (typical) | 0.17 V/mW (785 nm) 0.21 V/mW (850 nm) 0.33 V/mW (1310 nm) 0.33 V/mW (1550 nm) |

OE425/OE455/OE525/OE555

The O/E converters contain calibration data that can be used to create optical reference receivers for SONET/SDH (up to OC48/STM16), Fibre Channel, Gigabit Ethernet, and other optical standards. This feature is available when the O/E is used on a supported oscilloscope. The universal reference receiver supports any data rate up to 3 GHz and remains calibrated on any channel of the oscilloscope.

Features

- Frequency range to 5 GHz (6 GHz optical)
- 62.5 μm or narrower multi-mode or single-mode fiber input
- Broad wavelength range:
 - 500–870 nm (OE425, OE525)
 - 950–1630 nm (OE455, OE555)
- High responsivity
- Low noise
- Included Accessories:
 - Multi-mode optical fiber jumper FC-FC
 - FC to ST adapter
 - FC to SC adapter



Specifications

| | OE425/OE525 | OE455/OE555 |
|---|--|--|
| Wavelength Range | 500 – 870 nm 460 – 870 nm (0.1 V/mW) | 950 – 1630 nm 800 – 1630 nm (0.1 V/mW) |
| Conversion Gain | 0.5 V/mW | 1.1 V/mW |
| Bandwidth | 5 GHz (6 GHz optical) | 3.5 GHz (4.5 GHz optical) |
| Equivalent Noise | 2.2 μW rms | 1.0 μW rms |
| Maximum Optical Power (at 5% Saturation) | 2.2 mW | 1.0 mW |
| Rise Time | 90 ps | 108 ps |
| Maximum Safe Input | 5.5 mW | 2.5 mW |
| Temperature Drift | 0.00275 dB / °C | 0.00275 dB / °C |
| Frequency Response Ripple | 1.1 dB | 1.1 dB |
| Connector Type | FC/PC | FC/PC |

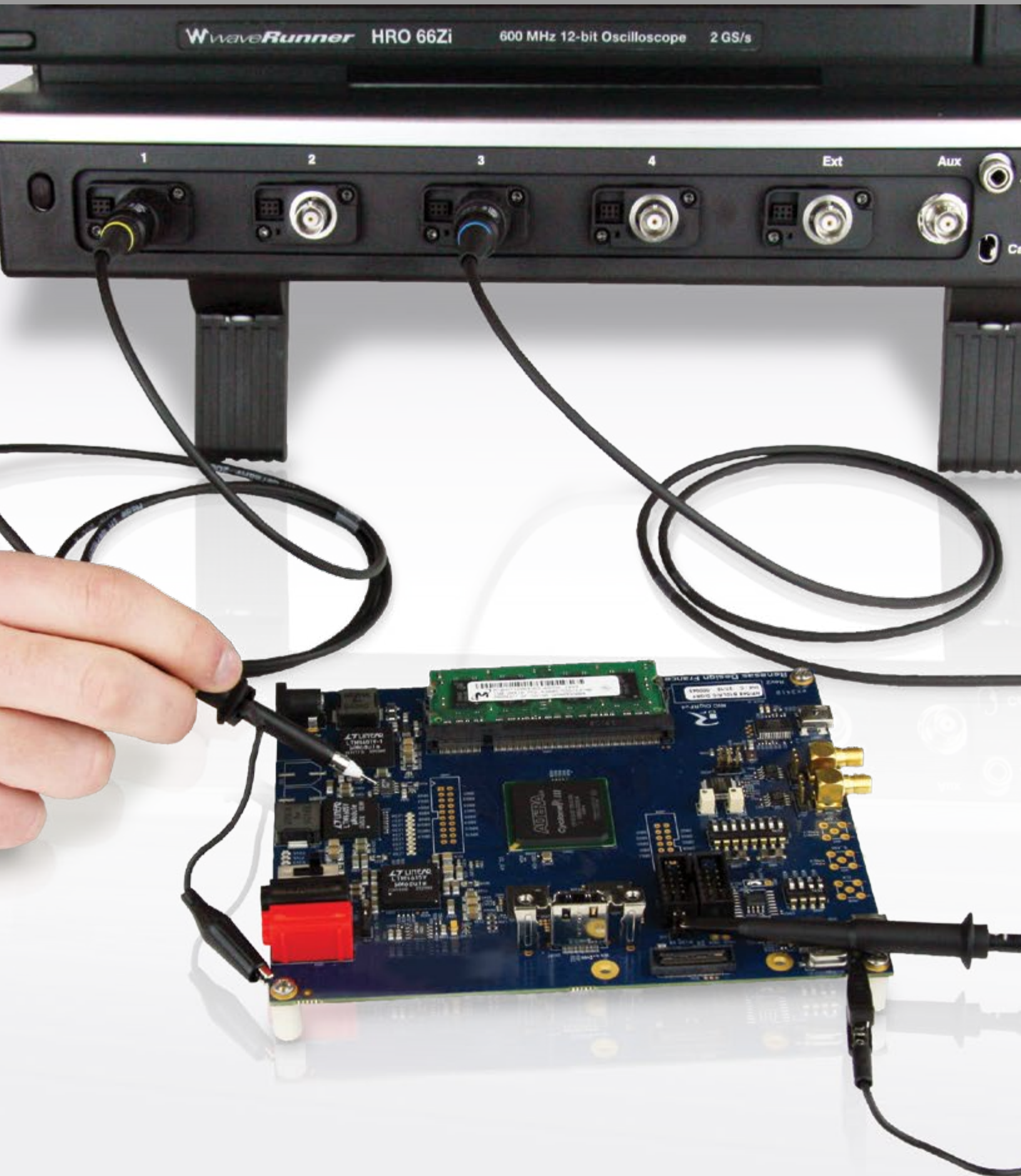
Ordering Information

Product Description

Product Code

| | |
|---|--------|
| Optical-to-Electrical Converter, 785 to 1550 nm, 2.92 mm connector with ProLink adapter | OE695G |
| Optical-to-Electrical Converter, 500–870 nm ProBus BNC Connector | OE425 |
| Optical-to-Electrical Converter, 950–1630 nm ProBus BNC Connector | OE455 |
| Optical-to-Electrical Converter, 500–870 nm ProLink BMA Connector | OE525 |
| Optical-to-Electrical Converter, 950–1630 nm ProLink BMA Connector | OE555 |

PASSIVE PROBES



Passive probes are the standard probe provided with most oscilloscopes. Typical passive probes provide a $\div 10$ attenuation and feature a high input resistance of 10 M Ω . This high input resistance means that passive probes are the ideal tool for low frequency signals since circuit loading at these frequencies is minimized. Passive probes are designed to handle voltages of at least 400 V, some as high as 600 V. Teledyne LeCroy passive probes feature an attenuation sense pin which tells the oscilloscope to scale the waveforms automatically requiring no user input.

Teledyne LeCroy
Passive Probe
Model Numbers:

PP006C
PP016
PP019
PP020
PP021
PP022
PP023
PP024
PP025
PP026

PASSIVE PROBES

Each passive probe is recommended for a certain oscilloscope, using the right passive probe with the right oscilloscope means that the probe can be properly compensated across the entire bandwidth. Using probes with a different oscilloscope will only let you compensate for low frequencies.

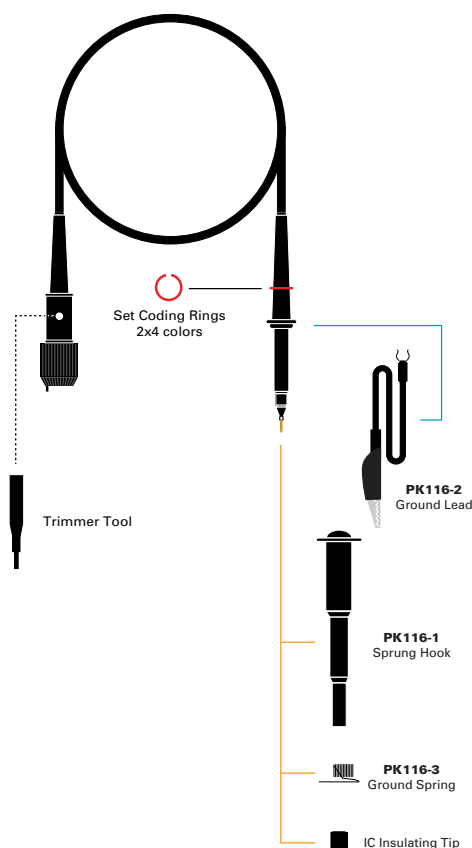
Specifications

| Types | Bandwidth | Input R | Input C | Attenuation | Maximum Voltage | Diameter |
|--------|--------------------|---------------------------------|-----------------|-------------------------|-----------------|----------|
| PP006C | 500 MHz | 10 M Ω | 12 pF | $\div 10$ | 500 V | 5 mm |
| PP016 | 300 MHz/ 10 MHz | 10 M Ω / 1 M Ω | 12 pF/ 46 pF | $\div 10$ / $\div 1$ | 600 V | 5 mm |
| PP019 | 200 MHz | 10 M Ω | 12 pF | $\div 10$ | 500 V | 5 mm |
| PP020 | 500 MHz | 10 M Ω | 11 pF | $\div 10$ | 500 V | 5 mm |
| PP021 | 500 MHz | 10 M Ω | 11 pF | $\div 10$ | 500 V | 2.5 mm |
| PP022 | 500 MHz | 10 M Ω | 10 pF | $\div 10$ | 500 V | 2.5 mm |
| PP023 | 500 MHz | 10 M Ω | 10 pF | $\div 10$ | 500 V | 2.5 mm |
| PP024 | 500 MHz | 10 M Ω | 10 pF | $\div 10$ | 500 V | 5 mm |
| PP025 | 500 MHz | 10 M Ω | 10 pF | $\div 10$ | 500 V | 5 mm |
| PP026 | 500 MHz | 10 M Ω | 10 pF | $\div 10$ | 500 V | 5 mm |

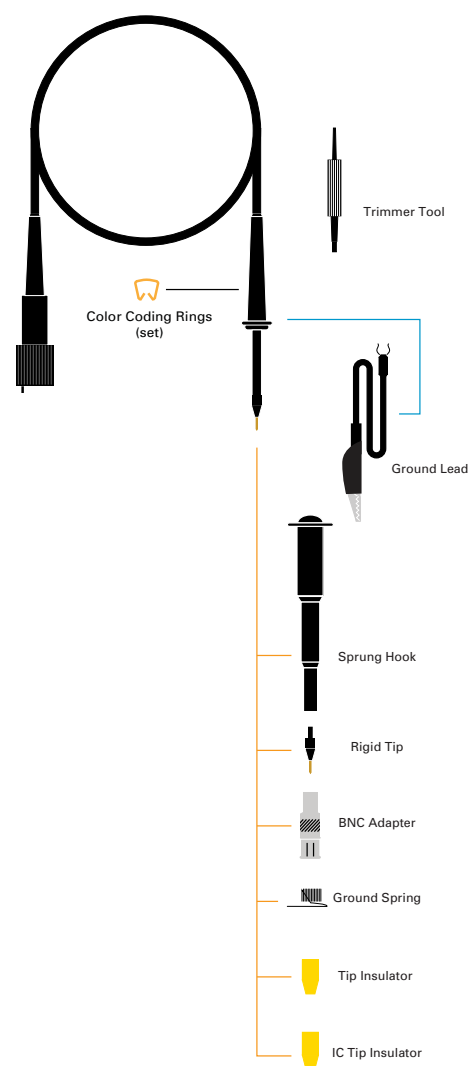
Teledyne LeCroy
Passive Probe
Model Numbers:

PP006C
PP016
PP019
PP020
PP021
PP022
PP023
PP024
PP026

Passive Probe Accessories for PP006C
Replacement Part Kit: PK116



Passive Probe Accessories for PP016
Replacement Part Kit: PKIT3-5MM-101



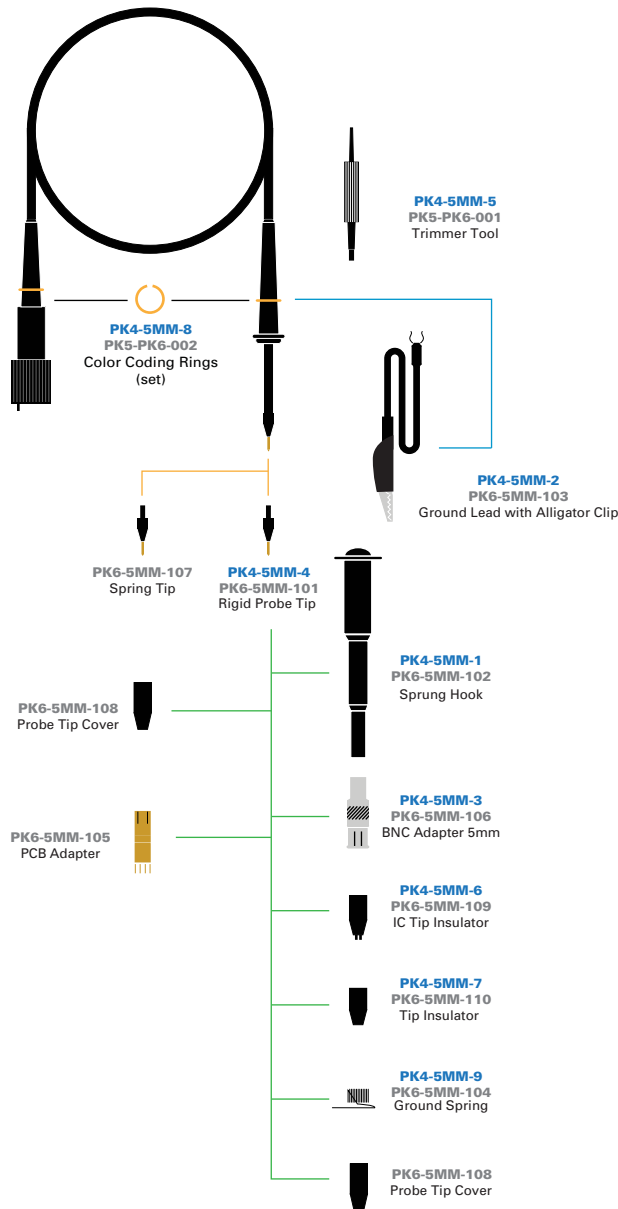
Passive Probe Accessories for

PP019 and PP020 – Part numbers in blue

Replacement Part Kit: PKIT4-5MM-101

PP024, PP025, and PP026 – Part numbers in gray

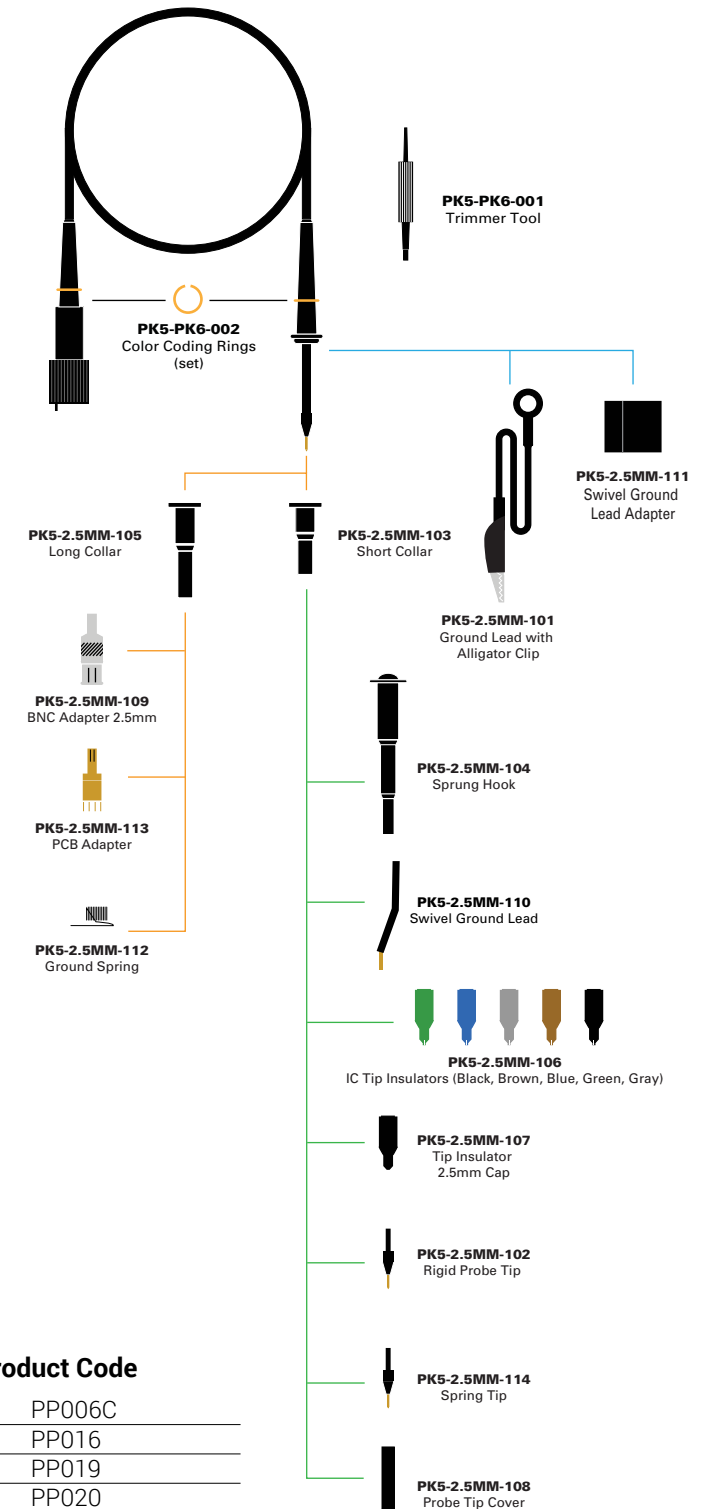
Replacement Part Kit: PKIT6-5MM-101



Passive Probe Accessories for

PP021, PP022, and PP023

Replacement Part Kit: PKIT5-2.5MM-101



Ordering Information

Product Description

500 MHz Passive Probe for WaveJet Touch, 10:1, 10 MΩ

10:1, 10 MΩ, 300 MHz Passive Probe

250 MHz Passive Probe for WaveSurfer 3000, 10:1, 10 MΩ

500 MHz Passive Probe for WaveSurfer 3000, 10:1, 10 MΩ

500 MHz Passive Probe, 2.5mm, 10:1, 10 MΩ

500 MHz Passive Probe, 2.5mm, 10:1, 10 MΩ

500 MHz Passive Probe, 2.5mm, 10:1, 10 MΩ

500 MHz Passive Probe, 5mm, 10:1, 10 MΩ

500 MHz Passive Probe, 5mm, 10:1, 10 MΩ

500 MHz Passive Probe, 5mm, 10:1, 10 MΩ

Product Code

PP006C

PP016

PP019

PP020

PP021

PP022

PP023

PP024

PP025

PP026

PROBE ADAPTERS



PROBE ADAPTERS

Probe adapters provide simple and easy interface of third-party probes as well as change between the different Teledyne LeCroy Oscilloscope input and cable types (ProBus, ProLink, K/2.92 mm, BNC and SMA). Depending on the adapters, changing between the Teledyne LeCroy Oscilloscope's input type may have an effect on the overall performance of the channel.

Teledyne LeCroy
Probe Adapter
Model Numbers:

CA10
TPA10

*Opposite page:
TPA10 Probe Adapter with an HDO Oscilloscope*

PROBE ADAPTERS



Teledyne LeCroy
Probe Adapter
Model Numbers:

CA10
TPA10



CA10 Key Features

- Provides ability for third party current sensor to operate like a Teledyne LeCroy probe
- Programmable EEPROM for saving third party current sensor parameters
- Allows for addition of shunt resistor and RLC filter components
- ProBus Active interface with automatic scaling in A/div
- Easy to use, saves time and possible errors

CA10

The CA10 is a programmable and customizable interface device that seamlessly incorporates third party current transducers/transformers with Teledyne LeCroy oscilloscopes or motor drive analyzers. The easy to use interface provides the ability for the CA10 to be programmed to contain the specifications of the current sensor allowing it to automatically correct for the gain or attenuation and display results in Ampere units. This allows the third party device to be recognized and operate as if it were a Teledyne LeCroy probe.

Specifications

| | |
|-------------------------------------|--|
| Input Coupling | DC, AC, Both |
| Input Termination | 1M Ω or 50 Ω |
| Programmable Bandwidth Filters | Full, 200 MHz, 20 MHz |
| Transformer/Transducer Interface | BNC |
| Scaling Factors | Programmable |
| Resistive Termination (if required) | Customizable (See Operator's Manual for details) |
| Oscilloscope Interface | Teledyne LeCroy ProBus |

Note: Some third party devices will require a separate power supply or batteries. The CA10 does not have the ability to supply the power to these devices.

Ordering Information

| Product Description | Product Code |
|--|--------------|
| ProBus Current Sensor Adapter | CA10 |
| Set of 4 CA10, ProBus Current Sensor Adapter | CA10-QUADPAK |

Included with Standard Configuration CA10

| Description | Qty |
|--------------------------------|-----|
| CA10 ProBus Current Adapter | 1 |
| Heat-Shrink tubing (6" length) | 1 |
| Removable Labels (sheet of 20) | 1 |

Included with Standard Configuration CA10-QUADPAK

| Description | Qty |
|---------------------------------|-----|
| CA10 ProBus Current Adapter | 4 |
| Carrying Case | 1 |
| Heat-Shrink tubing (24" length) | 1 |
| Removable Labels (sheet of 20) | 4 |

PROBE ADAPTERS



TPA10

The TPA10 ProBus™ Probe Adapter enables you to connect select TekProbe interface level II probes to any ProBus-equipped Teledyne LeCroy instrument. The TPA10 supplies all necessary power and offset control to the probe and automatically detects which probe is attached.

Specifications

Electrical Characteristics

| | |
|--------------------|--|
| Bandwidth | 4 GHz (adapter only) |
| Power Supplies | +15V, -15V, +5V, -5V (each 2%) |
| Offset Voltage | ±1V (1%) |
| Max. Input Voltage | 47 V _{pk} , 33 V _{rms} |

Environmental

| | |
|---------------------------------|--|
| Operating Temperature Range | 0 to 50 °C |
| Non-operating Temperature Range | -40 to +70 °C |
| Humidity | 5% to 95% RH (10 to 40 °C); 5% to 75% (above 40 °C); RH not controlled below 10 °C |
| Operating Altitude | 3000 meters maximum |

Physical

| | |
|--------------------|--|
| Dimensions (WxHxD) | 39 mm x 31.1 mm x 88.6 mm (1.54" x 1.22" x 3.49") |
| Weight | 119 g (0.26 lb) |

The TPA10 requires the Teledyne LeCroy oscilloscope to be running firmware version 7.8.0.0 or greater.

TPA10 Key Features

- Allows TekProbe™ interface level II probes to work with any ProBus-equipped Teledyne LeCroy oscilloscope
- Automatic probe detection
- Provides all necessary power and offset control to the attached probe
- Supports probes up to 4 GHz
- Easy firmware updates
- Wide variety of probes supported including:
 - Preamplifiers
 - Current Probes
 - Single-Ended Active Probes
 - Differential Active Probes

Ordering Information

| Product Description | Product Code |
|---------------------------------------|---------------|
| TPA10 ProBus Adapter | TPA10 |
| Set of 4 TPA10, TPA10 ProBus Adapters | TPA10-QUADPAK |

Supported Probes

The following TekProbe devices are supported for use with TPA10:

Preamplifiers

| | |
|---------------------------------|---------|
| 1 MHz Differential Preamplifier | ADA400A |
|---------------------------------|---------|

Current Probes

| | |
|----------------------------|----------------|
| 50 MHz AC/DC Current Probe | TCP202/TCP202A |
|----------------------------|----------------|

Single-ended Active Probes

| | |
|-----------------------------------|-------|
| 750 MHz Single-ended Active Probe | P6205 |
| 1 GHz Single-ended Active Probe | P6243 |
| 1.5 GHz Single-ended Active Probe | P6245 |
| 4 GHz Single-ended Active Probe | P6241 |
| 4 GHz Single-ended Active Probe | P6249 |

Differential Active Probes

| | |
|----------------------------|--------------|
| 100 MHz Differential Probe | P5205/P5205A |
| 50 MHz Differential Probe | P5210/P5210A |
| 400 MHz Differential Probe | P6246 |
| 1 GHz Differential Probe | P6247 |
| 1.5 GHz Differential Probe | P6248 |
| 500 MHz Differential Probe | P6250 |
| 1 GHz Differential Probe | P6251 |

TRANSMISSION LINE PROBES



Teledyne LeCroy
Transmission Line Probe
Model Number:
PP066

Transmission line probes are a special type of passive probe designed for use at very high frequencies. They replace the high impedance probe cable found in a traditional passive probe with a precision transmission line, with a characteristic impedance that matches the oscilloscope input ($50\ \Omega$). This greatly reduces the input capacitance to a fraction of a picofarad, minimizing the loading of high frequency signals. A matching network at the tip increases the DC input resistance. While they have lower DC input resistance than a traditional passive probe (usually $500\ \Omega$ to $5\ \text{k}\Omega$), the input impedance of these probes remains nearly constant over their entire frequency range. A traditional $\div 10$ passive probe will have a $10\ \text{M}\Omega$ input impedance at DC, however this impedance drops rapidly with frequency, passing below the input impedance of a transmission line probe at less than 100 MHz.

In some applications, transmission line probes offer advantages over active probes. In addition to being less expensive, their passive design is more robust to over voltage and ESD exposure. They are useful in applications producing fast rising, narrow pulses with amplitudes which exceed the dynamic range of active probes. They also tend to have less parasitic effects on frequency response.

PP066

The PP066 is a high-bandwidth passive probe designed for use with the WaveMaster and other high-bandwidth oscilloscopes with 50 Ω input termination. This very low capacitance probe provides an excellent solution for higher frequency applications, especially the probing of transmission lines with 20–100 Ω impedance. The PP066 accommodates a wide range of applications, including probing of analog and digital ICs commonly found in computer, communications, data storage, and other high-speed designs.

Features:

- Interchangeable attenuator tips
- Signal integrity at high bandwidth
- Standard SMA cable connection
- Ultra low capacitance

PP066 Specifications

Electrical Characteristics

| | |
|-------------------|---|
| Bandwidth | DC to 7.5 GHz |
| Risetime | < 47 ps |
| Input Capacitance | < 0.20 pF |
| Input Resistance | 500 Ω ($\div 10$ cartridge) 1000 Ω ($\div 20$ cartridge) |
| Maximum Voltage | 15 V rms |
| Cable Length | 1 m |

Ordering Information

Product Description

7.5 GHz Low Capacitance Passive Probe
($\div 10$, 1 k Ω ; $\div 20$, 500 Ω)

Product Code

PP066

Included with PP0066

PACC-AD001, SMA to BNC Adapter





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[PK5-2.5MM-113](#)