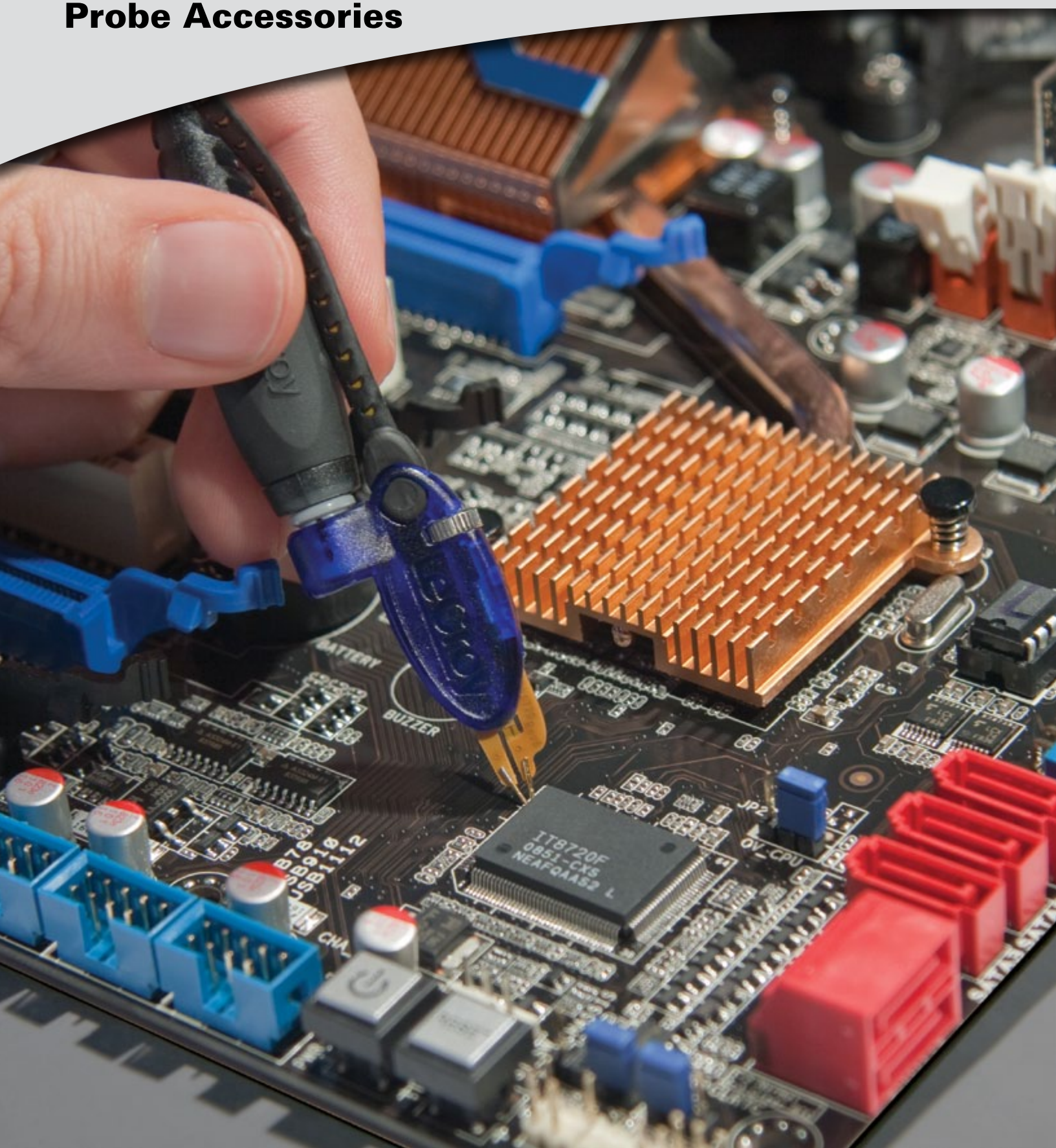
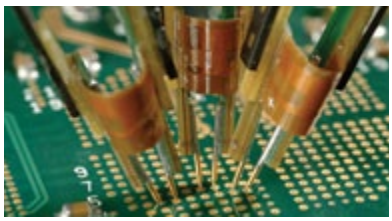
LeCroy

# Oscilloscope Probes and Probe Accessories



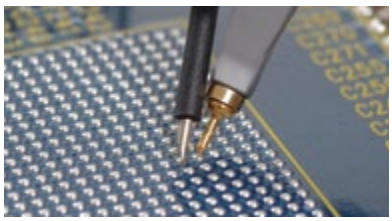
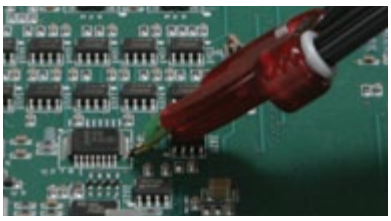
# PROBE SELECTION GUIDE

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, LeCroy probes and probe accessories provide optimum mechanical connections for signal measurement.



*Front Cover:*
*Dxx10-PT Differential Positioner Tip for the WaveLink 4-6 GHz Probes.*

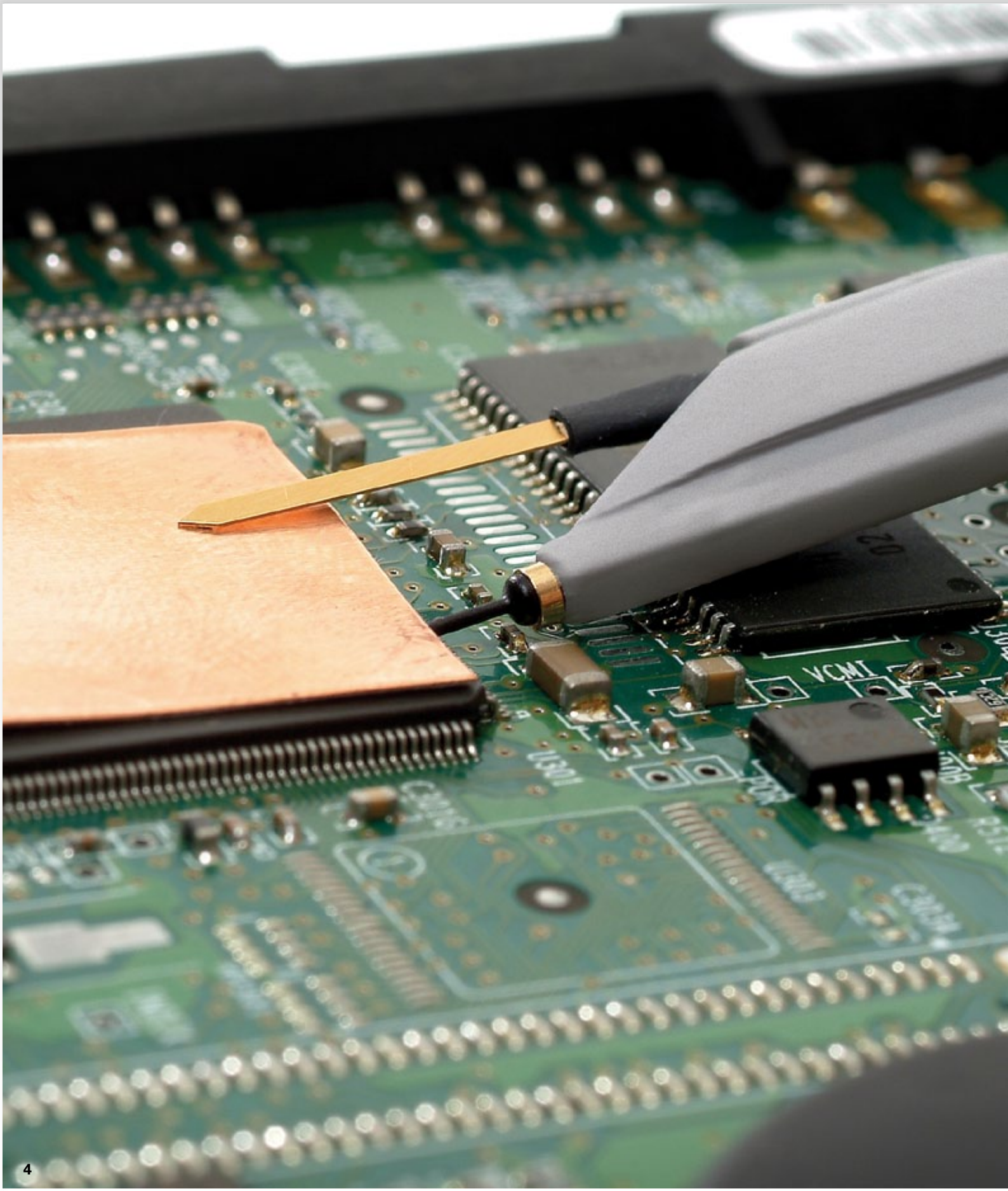
| | WaveAce Oscilloscopes | WaveJet 300A Oscilloscopes | WaveSurfer MXs-B / MSO MXs-B Oscilloscopes | HRO 12-bit Oscilloscopes | WaveRunner 6 Zi Oscilloscopes | WaveRunner Xi-A / MXi-A Oscilloscopes | Vehicle Bus Analyzers | WavePro/SDA/DDA/7 Zi/7 Zi-A Oscilloscopes | WaveMaster/SDA/DDA/8 Zi/Zi-A Oscilloscopes | LabMaster 9 Zi-A Oscilloscopes | LabMaster 10 Zi Oscilloscopes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Active Voltage Probes - p. 4 - 7** | | | | | | | | | | | |
| ZS1000 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ZS1500 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ZS2500 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Current Probes - p. 8 -11** | | | | | | | | | | | |
| AP015 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CP030 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CP031 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CP150 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| CP500 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Differential Probes - p. 12 - 23** | | | | | | | | | | | |
| ZD200 | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ZD500 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ZD1000 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ZD1500 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| AP033 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| AP034 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| D410 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| D410-PT | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| D420 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| D420-PT | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| D500PT | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| D300A-AT | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| D600A-AT | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| D610 | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| D610-PT | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| D620 | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| D620-PT | | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | |
| Dxx05-PT-KIT | | | | | | | | ✓ | ✓ | ✓ | |
| D830 | | | | | | | | ✓ | ✓ | ✓ | |
| D830-PS | | | | | | | | ✓ | ✓ | ✓ | |
| D1030 | | | | | | | | ✓ | ✓ | ✓ | |
| D1030-PS | | | | | | | | ✓ | ✓ | ✓ | |
| D1330 | | | | | | | | ✓ | ✓ | ✓ | |
| D1330-PS | | | | | | | | ✓ | ✓ | ✓ | |
| WL-PLink-A | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| LPA-2.92 | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| WL-2.92MM | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D1305-A | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D1305-A-PS | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D1605-A | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D1605-A-PS | | | | | | | | ✓ | ✓ | ✓ | ✓ |
| D2005-A | | | | | | | | ✓ | ✓ | ✓ | ✓ |

| | WaveAce Oscilloscopes | WaveJet 300A Oscilloscopes | WaveSurfer MXs-B / MSO MXs-B Oscilloscopes | HRO 12-bit Oscilloscopes | WaveRunner 6 Zi Oscilloscopes | WaveRunner Xi-A / MXi-A Oscilloscopes | Vehicle Bus Analyzers | WavePro/SDA/DDA/7 Zi/7 Zi-A Oscilloscopes | WaveMaster/SDA/DDA/8 Zi/Zi-A Oscilloscopes | LabMaster 9 Zi-A Oscilloscopes | LabMaster 10 Zi Oscilloscopes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Differential Probes - p. 12 - 23 (cont'd)** | | | | | | | | | | | |
| D2005-A-PS | | | | | | | | | ✓ | ✓ | ✓ |
| D2505-A | | | | | | | | | ✓ | ✓ | ✓ |
| D2505-A-PS | | | | | | | | | ✓ | ✓ | ✓ |
| **High Voltage Differential Probes - p. 24 - 27** | | | | | | | | | | | |
| ADP300 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| ADP305 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| AP031 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Differential Amplifiers - p. 28 - 31** | | | | | | | | | | | |
| DXC200 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DA101 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DA1855A | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DA1855A-PR2 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DA1855A-PR2-RM | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DA1855A-RM | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DXC-5100 | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| DXC100A | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **High Voltage Probes - p. 32 - 35** | | | | | | | | | | | |
| PPE1.2KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| PPE20KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| PPE2KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| PPE4KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| PPE5KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| PPE6KV | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Optical Probes - p. 36 - 39** | | | | | | | | | | | |
| OE425 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| OE455 | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| OE525 | | | | | | | | ✓ | ✓ | ✓ | |
| OE555 | | | | | | | | ✓ | ✓ | ✓ | |
| OE695G | | | | | | | | | ✓ | ✓ | ✓ |
| **Passive Probes - p. 40 - 43** | | | | | | | | | | | |
| PP005A | | | | | | | | ✓ | | | |
| PP006A | | ✓ | | | | | | | | | |
| PP-007-WR-1 | | | | | | ✓ | | | | | |
| PP008-1 | | | | ✓ | ✓ | | | | | | |
| PP009-1 | | | ✓ | ✓ | ✓ | | | | | | |
| PP010-1 | | ✓ | | | | | | | | | |
| PP011-1 | | | ✓ | | | | | | | | |
| PP016 | ✓ | | | | | | | | | | |
| **Transmission Line Probes - p. 44 - 47** | | | | | | | | | | | |
| PP065 | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| PP066 | | | | | | | | ✓ | ✓ | ✓ | |

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

# ACTIVE VOLTAGE PROBES



# 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.**

LeCroy Active Voltage Probes Model Numbers:

**ZS1000**
**ZS1500**
**ZS2500**

*Opposite page:*
*ZS Series High Impedance Active Probe*

# ZS SERIES ACTIVE PROBES

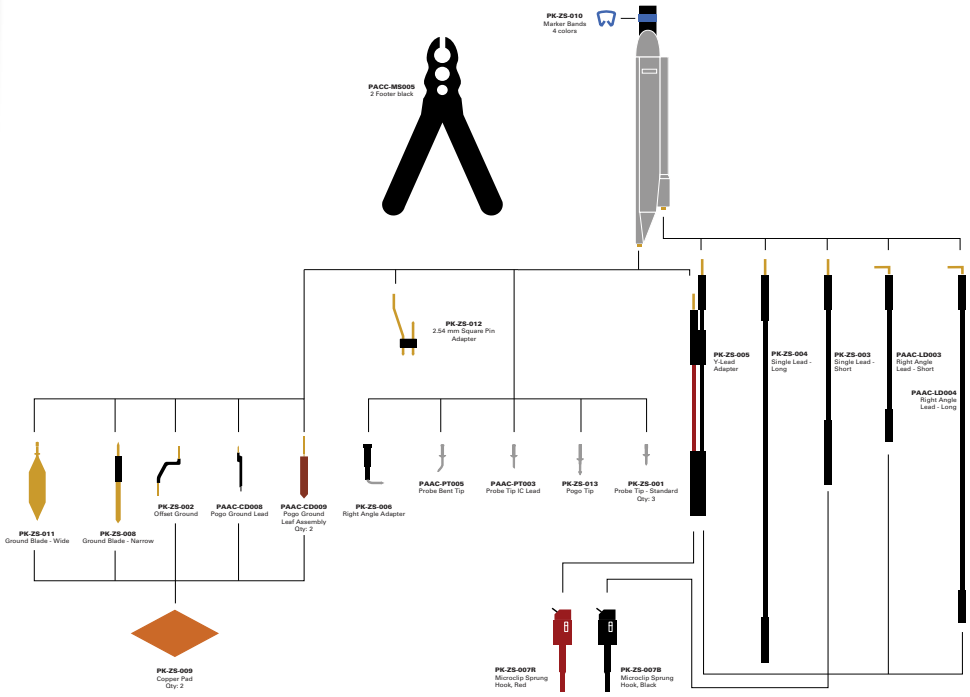
LeCroy
Active Voltage Probe
Model Numbers:

**ZS1000**
**ZS1500**
**ZS2500**

The ZS Series probes provide high impedance and an extensive set of probe tips and ground accessories to handle a wide range of probing scenarios. The high 1 MΩ input resistance and low 0.9 pF input capacitance mean this probe is ideal for all frequencies. The ZS Series probes provide full system bandwidth for all LeCroy oscilloscopes having bandwidths of 2 GHz and lower.

## High Impedance Reduces Circuit Loading Across Full Oscilloscope Bandwidth

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 MΩ and low input C (0.9 pF) 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 ZS Series becomes the everyday probe for all different types of signals and connection points. The ZS1000 is ideal for 200–600 MHz oscilloscopes. The ZS1500 is ideal for 1 GHz oscilloscopes and the ZS2500 is ideal for 2 GHz oscilloscopes.



## Specifications

### Electrical Characteristics

| | ZS1000 | ZS1500 | ZS2500 |
|---|---|---|---|
| Bandwidth (Probe Only) | 1 GHz | 1.5 GHz | 2.5 GHz |
| Bandwidth (System) | 600 MHz at probe tip with 600 MHz oscilloscope | 1 GHz at probe tip with 1 GHz oscilloscope | 2 GHz at probe tip with 2 GHz oscilloscope |
| Input Capacitance | 0.9 pF | | |
| DC Input Resistance | 1 MΩ | | |
| Probe Offset Range | N/A | ±12 V | |
| Attenuation | ÷10 | | |
| Input Dynamic Range | ±8 V | | |
| Non-destruct Voltage | 20 V | | |

### General Characteristics

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

## Ordering Information

| Product Description | Product Code |
|---|---|
| Set of 4 ZS2500, 2.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probes | ZS2500-QUADPAK |
| Set of 4 ZS1500, 1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probes | ZS1500-QUADPAK |
| Set of 4 ZS1000, 1 GHz, 0.9 pF, 1 MΩ High Impedance Active Probes | ZS1000-QUADPAK |
| 2.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe | ZS2500 |
| 1.5 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe | ZS1500 |
| 1 GHz, 0.9 pF, 1 MΩ High Impedance Active Probe | ZS1000 |

### Included with Standard Configuration

| | |
|---|---|
| Instruction Manual, English | |
| Certificate of Calibration | |
| 1-Year Warranty | |
| Straight Pin Lead – Short (Qty 1) | PK-ZS-003 |
| Straight Pin Lead – Long (Qty 1) | PACC-LD004 |
| Right Angle Pin Lead – Short (Qty 1) | PACC-LD003 |
| Right Angle Pin Lead – Long (Qty 1) | PACC-LD004 |
| Y Lead Adapter (Qty 1) | PK-ZS-005 |
| Micro-Grabber Pair | PK-ZS-007R and PK-ZS-007B |
| Ground Blade – Wide | PK-ZS-011 |
| Probe Tip – Standard (Qty 3) | PK-ZS-001 |
| Right Angle Socket (Qty 1) | PK-ZS-006 |
| Offset Ground – Z lead (Qty 1) | PK-ZS-002 |
| Ground Blade – Narrow (Qty 1) | PK-ZS-008 |

| Product Description | Product Code |
|---|---|

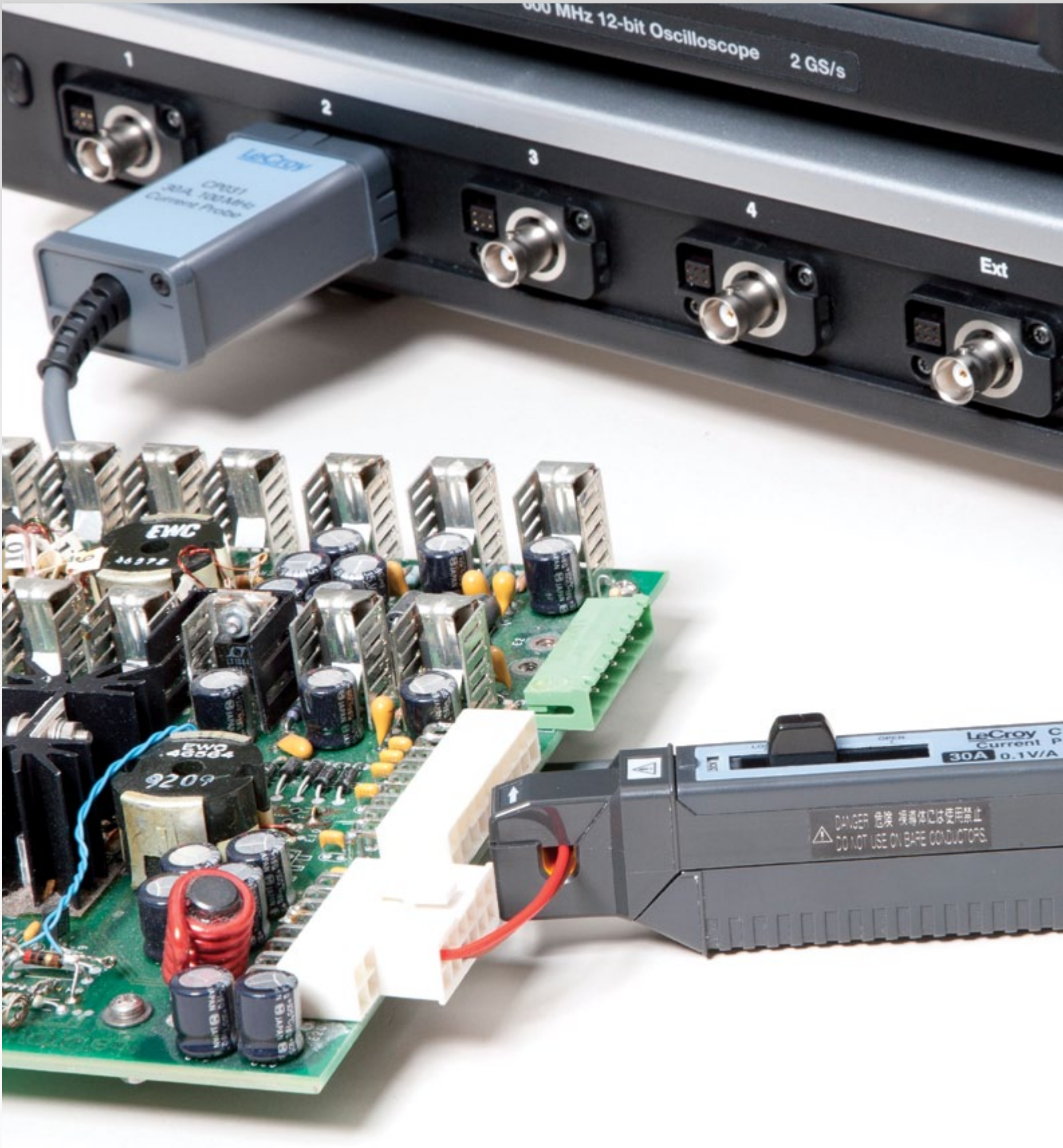
### Included with Standard Configuration (cont'd)

| | |
|---|---|
| Copper Tape (Qty 2) | PK-ZS-009 |
| Pogo Tip (Qty 1) | PK-ZS-013 |
| 2.54mm Square Pin Adapter | PK-ZS-012 |
| Channel ID Clips (Set of 4 Colors) | PK-ZS-010 |
| Freehand Probe Holder | PACC-MS005 |
| Bent Tip (Qty 1) | PACC-PT005 |
| IC Tip (Qty 1) | PACC-PT003 |
| Pogo Ground Lead (Qty 1) | PACC-CD008 |
| Pogo Leaf Ground Assembly (Qty 2) | PACC-CD009 |

### Available Accessories

| | |
|---|---|
| Discrete SMD Tip | PACC-PT004 |
| Solder-In Ground | PACC-CD007 |
| Ground Spring Hook | PACC-LD001 |
| Square Pin Ground Spring | PACC-LD002 |

# CURRENT PROBES



## Measuring AC and DC Currents

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, LeCroy current probes are ideal for making accurate AC, DC, and impulse current measurements.

## Fully Integrated with Oscilloscope

Many current probes require external power supplies or amplifiers to display a waveform on the oscilloscope screen. All LeCroy current probes are powered through the 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 with a single button press.

## Applications

LeCroy current probes are available in a wide range of models for a wide range of applications. The full range of LeCroy current probes includes models with bandwidths up to 100 MHz, peak currents up to 700 A and sensitivities to 10 mA/div. Multiple current probes can be used together to make measurements on three-phase systems, or a single current probe can be used with a voltage probe to make accurate instantaneous power measurements. 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.

LeCroy
Current Probes
Model Numbers:

**AP015**
**CP030**
**CP031**
**CP150**
**CP500**

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

# CURRENT PROBES

LeCroy Current Probes
Model Numbers:

**CP031**
**CP030**
**AP015 / DCS015**
**CP150**
**CP500**

## CP031 – 30A, 100 MHz

The CP031 is LeCroy's highest bandwidth current probe. Along with the high 100 MHz bandwidth the CP031can probe continuous currents of 30 $A_{rms}$ and peak currents up up to 50 A. The CP031 features a small form factor making it easier to probe on a crowded, compact board.

## CP030 – 30 A, 50 MHz

The CP030 was designed with a small form factor for today's crowded boards. The small jaw can probe currents in tight spaces and still clamp onto conductors up to 5 mm in diameter. Continuous currents of 30 $A_{rms}$ and peak currents of 50 A can be measured by the CP030, which also features a 50 MHz bandwidth.

## AP015 – 30 A, 50 MHz

The AP015 current probe can measure continuous current of 30 $A_{rms}$ and peak pulses of up to 50 A for durations up to 10 seconds. This probe also features an over-heating protection circuit, which will display an on-screen warning to the user to prevent damage. A probe unlock detection feature is also built in to the AP015 to ensure accurate measurements.

## DCS015 – Deskew Calibration Source for AP015

The DCS015 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 CP031, CP030 and AP015 are compatible with the DCS015.

## CP150 – 150 A, 10 MHz

Features:

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

## CP500 – 500 A, 2 MHz

Features:

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

## Specifications

### Electrical Characteristics

| | CP031*† | CP030*† | AP015 | CP150 | CP500 |
|---|---|---|---|---|---|
| Max. Continuous Input Current | 30 A | | | 150A | 500 A |
| Bandwidth | 100 MHz | 50 MHz | 50 MHz | 10 MHz | 2 MHz |
| Max. Peak Current at Pulse Width | 50 A ≤ 10 µs | | 50 A ≤ 10 s | 500 A ≤ 30 µs | 700 A |
| Rise Time (typical) | ≤ 3.5 ns | ≤ 7 ns | | < 35 ns | < 175 ns |
| Minimum Sensitivity | 20 mA/div | | 10 mA/div | 20 0mA/div | |
| Max. In-Phase Current | - | | | 500 A | 1150 A |
| Low-Frequency Accuracy | 1% | | | | |
| AC Noise | ≤ 2.5 mA | | - | ≤ 25 mA | 25 mA |
| Coupling | AC, DC, GND | | | | |

### General Characteristics

| | | | | | |
|---|---|---|---|---|---|
| Cable Length | 1.5 m | | 2 m | | 6 m |
| Weight | 240 g | | 300 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 VCAT I, 150 V CAT II | 300 VCAT I | | 600 VCAT I, 300 V CAT II | |

* Guaranteed at 23 °C ±3 °C

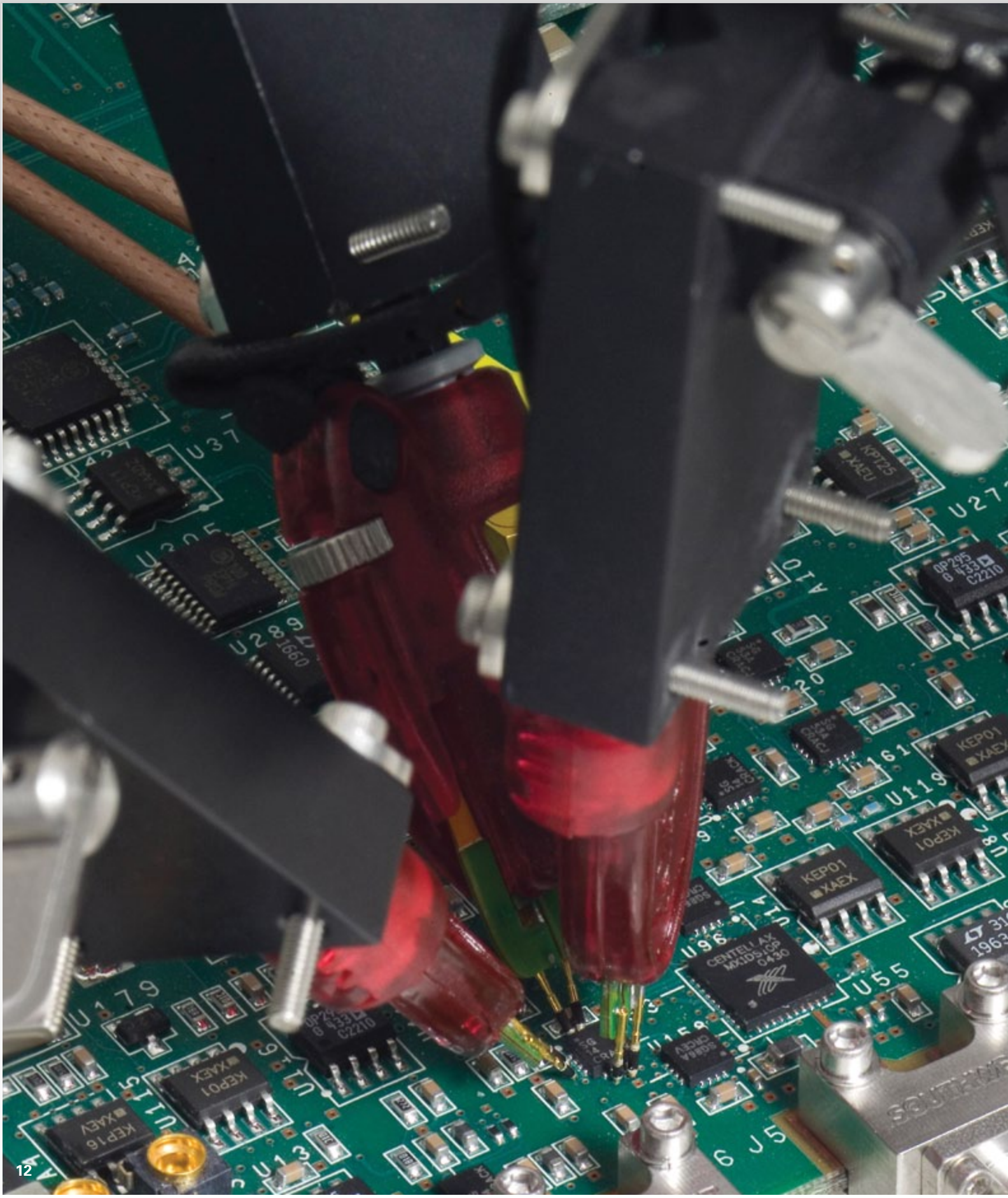
† The CP031 and CP030 are compatible with LeCroy X-Stream oscilloscopes running firmware version 4.3.1.1 or greater.

‡ Requires AP-1M for use with 50 Ω input only oscilloscopes

## Ordering Information

| Product Description | Product Code |
|---|---|
| 30 A; 100 MHz Current Probe - AC/DC; 30 $A_{rms}$; 50 $A_{peak}$ Pulse | CP031 |
| 30 A; 50 MHz Current Probe - AC/DC; 30 $A_{rms}$; 50 $A_{peak}$ Pulse | CP030 |
| 30 A; 50 MHz Current Probe - AC/DC; 30 $A_{rms}$; 50 $A_{peak}$ Pulse | AP015 |
| 150 A; 10 MHz Current Probe - AC/DC; 150 $A_{rms}$; 500 $A_{peak}$ Pulse | CP150 |
| 500 A; 2 MHz Current Probe - AC/DC; 500 $A_{rms}$; 700 $A_{peak}$ Pulse | CP500 |
| Deskew Calibration Source for AP015 | DCS015 |

# DIFFERENTIAL PROBES



# 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.**

LeCroy
Differential Probes
Model Numbers:

**200 MHz - 1.5 GHz**
**ZD200**
**ZD500**
**ZD1000**
**ZD1500**
**AP033**
**AP034**

**3 GHz - 6 GHz**
**D300A-AT**
**D410**
**D420**
**D500PT**
**D600A-AT**
**D610**
**D620**

**8 GHz - 13 GHz**
**D830**
**D1030**
**D1330**

**11 GHz - 25 GHz**
**D1305-A**
**D1605-A**
**D2005-A**
**D2505-A**

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

# ZD SERIES DIFFERENTIAL PROBES

LeCroy
Differential Probe
Model Numbers:

**ZD200**
**ZD500**
**ZD1000**
**ZD1500**

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 LeCroy Oscilloscopes 1.5 GHz and lower.

## Fully Integrated

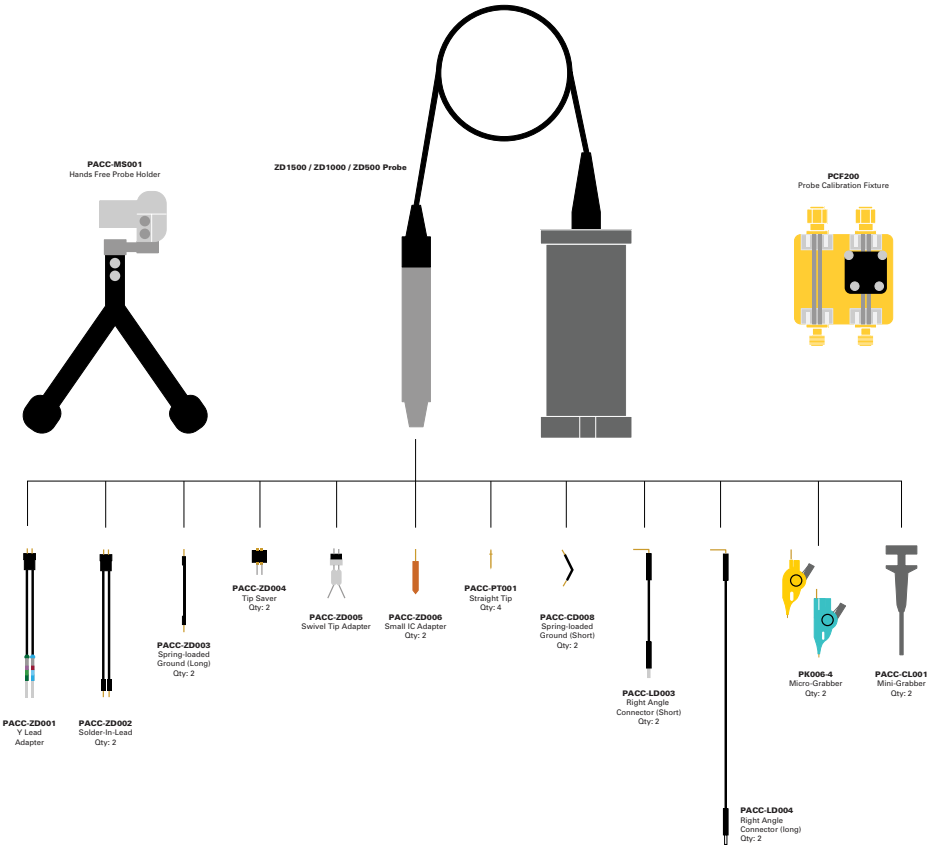
With the ProBus interface, the ZD500, 1000, and 1500 becomes an integral part of the oscilloscope. All probe gain and offset controls are transparent to the user, making it easier to probe the circuit without concern for which gain setting to choose. When used with a LeCroy digital oscilloscope, no external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

## Wide Dynamic Range

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

## Wide Applications

The wide dynamic range of 16 $V_{p-p}$ and offset range of ±8 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

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

## Ordering Information

| Product Description | Product Code |
|---|---|
| 200 MHz, 3.5 pF, 1 MΩ Active Differential Probe | ZD200 |
| 500 MHz, 1.0 pF, 1 MΩ Active Differential Probe | ZD500 |
| 1 GHz, 1.0 pF, 1 MΩ Active Differential Probe | ZD1000 |
| 1.5 GHz, 1.0 pF, 1 MΩ Active Differential Probe | ZD1500 |

### Standard Accessories

| | |
|---|---|
| Y Lead Adapter, Qty 1 | PACC-ZD001 |
| Solder-In Lead, Qty 2 | PACC-ZD002 |
| Long Spring Loaded Bendable Ground, Qty 2 | PACC-ZD003 |
| Tip Saver, Qty 2 | PACC-ZD004 |
| Swivel Tip Adapter | PACC-ZD005 |
| Small IC Adapter, Qty 2 | PACC-ZD006 |
| Replacement Accessory Kit for ZD200 | PACC-ZD007 |
| Replacement Leadset for ZD200 | PACC-ZD008 |
| Straight Tip, Qty 4 | PACC-PT001 |
| Right Angle Connector Short, Qty 2 | PACC-LD003 |

| Product Description | Product Code |
|---|---|
| Right Angle Connector Long, Qty 2 | PACC-LD004 |
| Micrograbber, Qty 2 | PK006-4 |
| Minigrabber, Qty 2 | PACC-CL001 |
| Short Spring Loaded Bendable Ground, Qty 2 | PACC-CD008 |
| Probe Calibration Fixture, Qty 1 | PCF200 |
| ZD Replacement Kit | PK111 |
| Hands Free Probe Holder, Qty1 | PACC-MS001 |

# WAVELINK LOW BANDWIDTH DIFFERENTIAL PROBES

LeCroy WaveLink
Low Bandwidth Differential
Probe and Accessory
Model Numbers:

**D410**
**D410-PT**
**D420**
**D420-PT**
**D500PT**
**D300A-AT**
**D600A-AT**
**D610**
**D610-PT**
**D620**
**D620-PT**
**WL-PBus**
**WL-PLink**

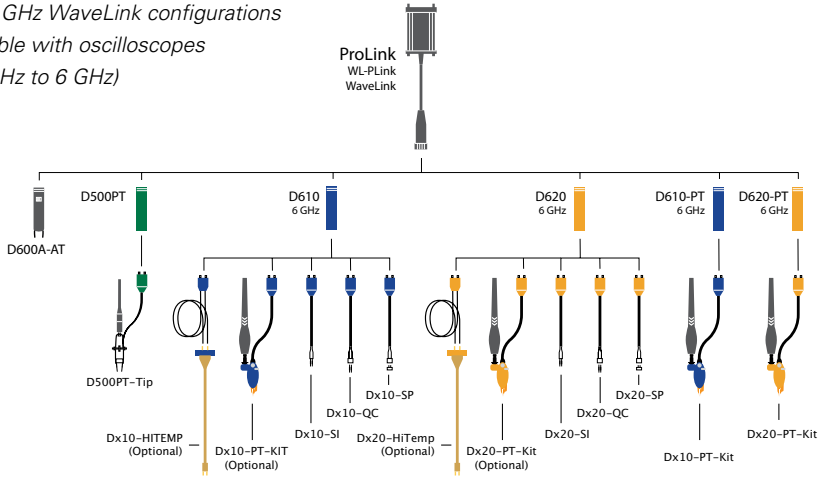
WaveLink® probes provide industry leading technology for wideband signal connection to test instruments. The first differential probes to employ SiGe technology, they deliver full system bandwidth when used with WaveRunner,® WavePro,® WaveMaster,® DDA and SDA oscilloscopes up to 6 GHz.

WaveLink probes:

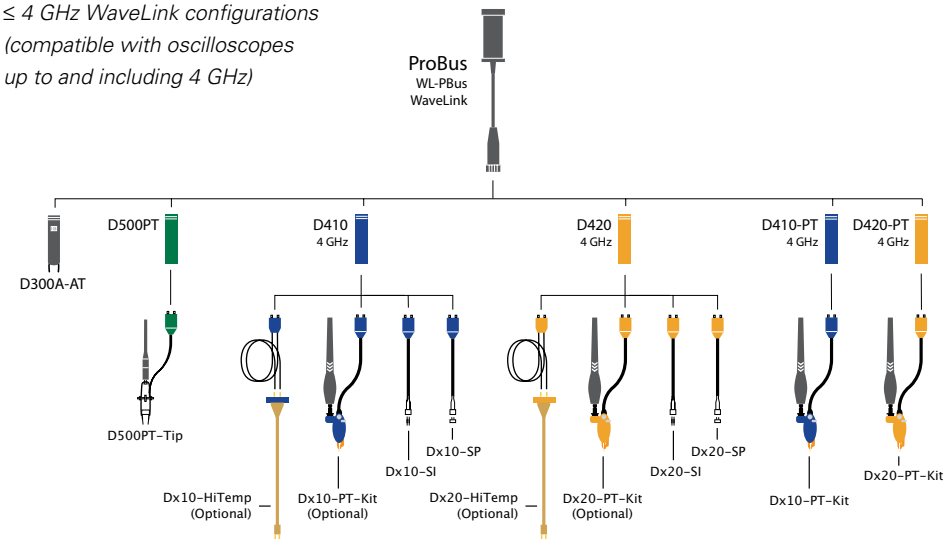
- Maintain good loading characteristics across the frequency span
- Optimized for gain, noise and bandwidth for optimal performance
- Offer broad range of dynamic range and noise over gain settings by incorporating automatic probe attenuation changes

WaveLink is the first differential probe to use a unique calibration process to achieve superb waveform fidelity for routine voltage measurements. Calibration coefficients "fine tune" the frequency response of each WaveLink probe and are individually determined during factory calibration and programmed into the probe. The SDA, DDA, WaveMaster, WaveRunner, or WavePro Series oscilloscopes read this data and use it to digitally compensate the entire system response for superior fidelity.

*4 GHz–6 GHz WaveLink configurations (compatible with oscilloscopes from 4 GHz to 6 GHz)*




*≤ 4 GHz WaveLink configurations (compatible with oscilloscopes up to and including 4 GHz)*



# WAVELINK LOW BANDWIDTH DIFFERENTIAL PROBES

| Specifications | D610 | D620 | D410 | D420 | D600A-AT | D300A-AT | D500PT |
|---|---|---|---|---|---|---|---|
| Bandwidth, System DC to -3 dB | | | | | | | |
| PT Positioner Lead | 6 GHz[1] | | 4 GHz[1] | | 6 GHz | 3 GHz | 5 GHz |
| SI Solder-In Lead | 6 GHz[1] | | 4 GHz[1] | | | N/A | |
| QC Interconnect Lead | 4 GHz | | | | N/A | | |
| SP Interconnect Lead | 3 GHz | | | | | N/A | |
| HiTemp Solder-In Lead | 6 GHz | | 4 GHz | | N/A | N/A | N/A |
| Rise Time (10–90) | | | | | | | |
| PT Positioner Lead | < 75 ps | | < 112 ps | | < 75 ps[1] | < 130 ps[1] | < 90 ps[1] |
| SI Solder-In Lead | < 75 ps | | < 112 ps | | | N/A | |
| QC Interconnect Lead | < 122.5 ps | | | | N/A | | |
| SP Interconnect Lead | < 150 ps | | | | | N/A | |
| HiTemp Solder-In Lead | < 75 ps | | < 112 ps | | N/A | N/A | N/A |
| LF Attenuation Accuracy[1] | 2% < 1.25 $V_{pp}$<br>5% 1.25 $V_{pp}$ to 2.5 $V_{pp}$ | 2% < 2.25 $V_{pp}$<br>5% 2.5 $V_{pp}$ to 5 $V_{pp}$ | 2% < 1.25 $V_{pp}$<br>5% 1.25 $V_{pp}$ to 2.5 $V_{pp}$ | 2% < 2.25 $V_{pp}$<br>5% 2.5 $V_{pp}$ to 5 $V_{pp}$ | 2% 0±1.2 V (with 0 V common mode)<br>5% ±1.2 V ±2.4 V (with 0 V common mode) | | |
| Zero Offset<br>(within 15 minutes after autozero) | < 2.5 mV[1] | < 5 mV[1] | < 2.5 mV[1] | < 5 mV[1] | < 10 mV[1] | | |
| Offset Gain Accuracy | 1% of offset value[1] | | | | N/A | | |
| Input Differential Range | 2.5 $V_{pp}$ | 5 $V_{pp}$ | 2.5 $V_{pp}$ | 5 $V_{pp}$ | 4.8 $V_{pp}$ | | |
| Differential Offset Range | ±3 V | | | | 0 V | | |
| Common Mode Range<br>(max. peak voltage either input to ground) | ±4 V | | | | ±2.4 V | | |
| DC Input Resistance | 100 kΩ differential<br>50 kΩ single-ended | | | | 4 kΩ differential<br>2 kΩ single-ended | | |
| AC Loading (differential Zmin) | 200 Ω | 200 Ω | 200 Ω | 200 Ω | 120 Ω | 600 Ω | 200 Ω |
| CMRR | > 30 dB@10 MHz<br>> 26 dB@ 6 GHz | | > 30 dB@10 MHz<br>> 26 dB@ 3.5 GHz | | > 40 dB@1 MHz<br>> 30 dB@3 GHz<br>> 20 dB@ 6 GHz (D600A-AT only) | | > 25 dB@ 1 GHz<br>> 19 dB@ 3 GHz<br>> 16 dB@ 5 GHz |
| Differential Input Capacitance@1 GHz | | | | | | | |
| SI Solder-In Lead | 210 fF | 120 fF | 210 fF | 120 fF | N/A | | |
| PT Positioner Lead | 290 fF | 290 fF | 290 fF | 290 fF | 170 fF | | |
| QC Interconnect Lead | 550 fF | 530 fF | 550 fF | 530 fF | N/A | | |
| SP Interconnect Lead | 980 fF | 980 fF | 980 fF | 980 fF | N/A | | |
| HiTemp Solder-In Lead | 210 fF | 120 fF | 210 fF | 120 fF | N/A | | |
| Noise<br>(System referred to probe input) | 2.8 $mV_{rms}$ | 4.8 $mV_{rms}$ | 2.3 $mV_{rms}$ | 4.3 $mV_{rms}$ | 5.8 $mV_{rms}$ | 5.0 $mV_{rms}$ | 5.8 $mV_{rms}$ |

[1] Warranted specification.

## Ordering Information

### Probe Tip Modules

| Product Description | Product Code |
|---|---|
| WaveLink 6 GHz 2.5 $V_{p-p}$ Differential Amplifier Small Tip Module | D610* |
| WaveLink 4 GHz 2.5 $V_{p-p}$ Differential Amplifier Small Tip Module | D410* |
| WaveLink 6 GHz 5 $V_{p-p}$ Differential Amplifier Small Tip Module | D620* |
| WaveLink 4 GHz 5 $V_{p-p}$ Differential Amplifier Small Tip Module | D420* |
| WaveLink 6 GHz Differential Amplifier Module with Adjustable Tip | D600A-AT* |
| WaveLink 3 GHz Differential Amplifier Module with Adjustable Tip | D300A-AT* |
| WaveLink 5 GHz Differential Amplifier Module with Positioner Tip | D500PT* |
| WaveLink 6 GHz, 2.5 $V_{p-p}$ Differential Positioner Tip | D610-PT* |
| WaveLink 6 GHz, 5 $V_{p-p}$ Differential Positioner Tip | D620-PT* |
| WaveLink 4 GHz, 2.5 $V_{p-p}$ Differential Positioner Tip | D410-PT* |
| WaveLink 4 GHz, 5 $V_{p-p}$ Differential Positioner Tip | D420-PT* |

* For a complete probe, order a WL-PLink, or WL-PBus Platform/Cable Assembly with the probe tip module.

### Probe Bodies

| | |
|---|---|
| WaveLink ProLink Platform/Cable Assembly (4 – 6 GHz) | WL-PLink |
| WaveLink ProBus Platform/Cable Assembly (4 GHz) | WL-PBus |

### Probe Leads and Accessories

| Product Description | Product Code |
|---|---|
| Differential Positioner Tip with Accessories (for use with D610 or D410) | Dx10-PT-Kit |
| Differential Positioner Tip with Accessories (for use with D620 or D420) | Dx20-PT-Kit |
| WaveLink Temperature Extension Cables for Dx10. Includes (1) Set of Matched 30" High Temperature Cables, (1) Solder-In Lead Set | Dx10-HiTemp |
| WaveLink Temperature extension cables for Dx20. Includes (1) Set of Matched 30" High Temperature Cables, (1) Solder-In Lead Set | Dx20-HiTemp |

### Service Options

| | |
|---|---|
| NIST Traceable Calibration with Test Data† (one module) | D600A-AT-CCNIST<br>D300A-AT-CCNIST<br>D500PT-CCNIST<br>D610-CCNIST<br>D620-CCNIST<br>D410-CCNIST<br>D420-CCNIST |

† CCNIST NIST traceable calibration with test data is an available option for D610, D620, D410, D420, D500PT, D600A-AT, or D300A-AT only when ordered with either a WL-PLink or WL-PBus.

# WAVELINK MEDIUM BANDWIDTH DIFFERENTIAL PROBES

LeCroy WaveLink
Medium Bandwidth Differential
Probe and Accessory
Model Numbers:

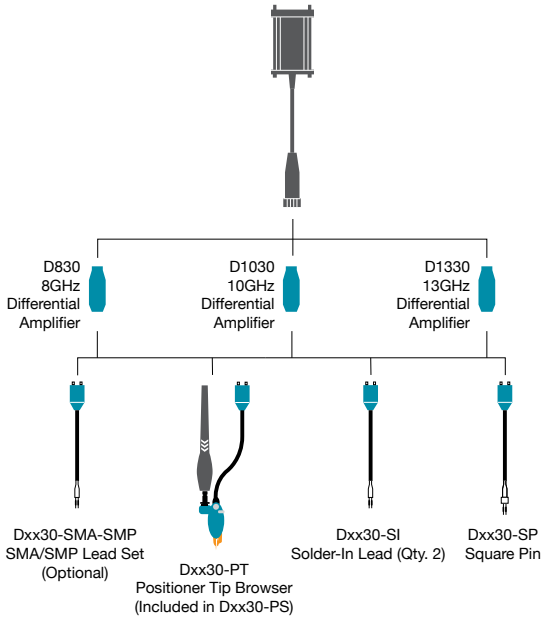
**D830**
**D1030**
**D1330**
**Dxx30-PT-KIT**
**Dxx30-SMA-SMP-LEADS**
**WL-PLINK-CASE**

## General Purpose Probe with Range of Capabilities

LeCroy's WaveLink 8-13 GHz Differential Probes are a medium bandwidth, general purpose probing solution with high input dynamic range and offset range capability. These probes support solder-in, positioner (browser), square pin and SMA/SMP cabled tip/lead connections. The range of capabilities is ideal for a variety of high speed DDR signals where high dynamic range and large offset requirements are common.

## 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
- Deluxe soft carrying case
- Wide variety of tips and leads
  – Solder-In Lead
  – Positioner (Browser) Tip
  – SMA/SMP Lead
  – Square Pin Lead
- SMA/SMP lead set accessory does not require purchase of a different amplifier
- Deluxe Soft Carrying Case



# WAVELINK MEDIUM BANDWIDTH DIFFERENTIAL PROBES

| Specifications | D830, D830-PS | D1030, D1030-PS | D1330, D1330-PS |
|---|---|---|---|
| **Bandwidth** | **Dxx30-SI, Dxx30-SMA-SMP, and Dxx30-PT Tips**<br>8 GHz (probe only, guaranteed)<br>8 GHz (system bandwidth, when used with 808Zi/Zi-A, typical)<br><br>**Dxx30-SP Tip**<br>3 GHz (probe only, guaranteed)<br>3 GHz (system bandwidth, when used with 808Zi/Zi-A, typical) | **Dxx30-SI, Dxx30-SMA-SMP, and Dxx30-PT Tips**<br>10 GHz (probe only, guaranteed)<br>10 GHz (system bandwidth, when used with 813Zi/Zi-A, typical)<br><br>**Dxx30-SP Tip**<br>3 GHz (probe only, guaranteed)<br>3 GHz (system bandwidth, when used with 813Zi/Zi-A, typical) | **Dxx30-SI and Dxx30-SMA-SMP Tips**<br>13 GHz (probe only, guaranteed)<br>13 GHz (system bandwidth, when used with 813Zi/Zi-A, typical)<br><br>**Dxx30-PT Tip**<br>10 GHz (probe only, guaranteed)<br>10 GHz (system bandwidth, when used with 813Zi/Zi-A, typical)<br><br>**Dxx30-SP Tip**<br>3 GHz (probe only, guaranteed)<br>3 GHz (system bandwidth, when used with 813Zi/Zi-A, typical) |
| **Rise Time (10–90%)** | **Dxx30-SI, Dxx30-SMA-SMP, and Dxx30-PT Tips**<br>50 ps (typical)<br>System rise time measured with ≥8 GHz oscilloscope<br><br>**Dxx30-SP Tip**<br>132 ps (typical) System rise time measured with ≥8 GHz oscilloscope | **Dxx30-SI, Dxx30-SMA-SMP, and Dxx30-PT Tips**<br>40 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope<br><br>**Dxx30-SP Tip**<br>132 ps (typical) System rise time measured with ≥13 GHz oscilloscope | **Dxx30-SI and Dxx30-SMA-SMP Tips**<br>35 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope<br><br>**Dxx30-PT Tip**<br>40 ps (typical) System rise time measured with ≥13 GHz oscilloscope<br><br>**Dxx30-SP Tip**<br>132 ps (typical) System rise time measured with ≥13 GHz oscilloscope |
| **Rise Time (20–80%)** | **Dxx30-SI, Dxx30-SMA-SMP, and Dxx30-PT Tips**<br>37.5 ps (typical)<br>System rise time measured with ≥8 GHz oscilloscope<br><br>**Dxx30-SP Tip**<br>100 ps (typical)<br>System rise time measured with ≥8 GHz oscilloscope | **Dxx30-SI, Dxx30-SMA-SMP, and Dxx30-PT Tips**<br>30 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope<br><br>**Dxx30-SP Tip**<br>100 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope | **Dxx30-SI and Dxx30-SMA-SMP Tips**<br>26 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope<br><br>**Dxx30-PT Tip**<br>30 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope<br><br>**Dxx30-SP Tip**<br>100 ps (typical)<br>System rise time measured with ≥13 GHz oscilloscope |
| **Noise (Probe)** | <48 nV/√Hz (4.3 mVrms) (typical)<br>Referred to input, 8 GHz bandwidth. | <48 nV/√Hz (4.8 mVrms) (typical)<br>Referred to input, 10 GHz bandwidth. | <48 nV/√Hz (5.5 mVrms) (typical)<br>Referred to input, 13 GHz bandwidth. |
| **Noise (System)** | <52 nV/√Hz (4.6 mVrms) (typical)<br>Referred to input, 8 GHz bandwidth. | <52 nV/√Hz (5.2 mVrms) (typical)<br>Referred to input, 10 GHz bandwidth. | <52nV/√Hz (5.9 mVrms) (typical)<br>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 |

| Product Description | Product Code |
|---|---|
| **Complete Probe Systems** | |
| 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 |
| 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 |
| 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 |
| **Amplifier and Probe Tip Modules** | |
| WaveLink D830 8 GHz/3.5$V_{p-p}$ Differential Probe Amplifier with Dxx30-SI Solder-In Tip (Qty. 2) and Dxx30-SP Square Pin (Qty. 1) | D830 |
| WaveLink D1030 10 GHz/3.5$V_{p-p}$ Differential Probe Amplifier with Dxx30-SI Solder-In Tip (Qty. 2) and Dxx30-SP Square Pin (Qty. 1) | D1030 |
| WaveLink D1330 13 GHz/3.5$V_{p-p}$ Differential Probe Amplifier with Dxx30-SI Solder-In Tip (Qty. 2) and Dxx30-SP Square Pin (Qty. 1) | D1330 |
| **Positioner Tip (Browser) Kits** | |
| WaveLink Dxx30-PT (up to 10 GHz rating) Adjustable Positioner Tip Kit. For use with Dxx30 amplifiers. | Dxx30-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 |

| Product Description | Product Code |
|---|---|
| **SMA/SMP Lead Set** | |
| Lead set for use with Dxx30 amplifiers. | Dxx30-SMA-SMP-LEADS |
| **Accessories** | |
| Cascade Microtech EZ-Probe Positioner | EZ PROBE |
| Probe Deskew and Calibration Test Fixture | TF-DSQ |
| **Calibration Options** | |
| NIST Calibration for D830. Includes test data. | D830-CCNIST |
| NIST Calibration for D1030. Includes test data. | D1030-CCNIST |
| NIST Calibration for D1330. Includes test data. | D1330-CCNIST |
| **Replacement Parts** | |
| Replacement Dxx30-SI 8-13 GHz Solder-In Lead with Qty. 5 Spare Resistors. | Dxx30-SI |
| Replacement SI Resistor Kit for Dxx05-SI and Dxx30-SI Solder-In Tip - Kit of 5 | Dxx05-SI-RESISTORS |
| Quantity 4 Replacement Pogo Pin Tips and Qty. 2 Replacement Sockets for Dx10-PT, Dx20-PT, and Dxx30-PT Adjustable Positioner Tips. | Dxx0-PT-TIPS |
| Replacement Probe Tip Holder Kit | PK600ST-3 |
| Replacement Platform/Cable Assembly Mounting Kit | PK600ST-4 |
| Quantity 1 Package of Black Adhesive Pads (10/pkg) and Quantity 1 Package of White Adhesive Pads (10/pkg) | Dxx0-PT-TAPE |
| Quantity 1 Package of Adhesive Probe Connection Guides (200 individual guides/package) | Dxx05-PT-GUIDES |

# WAVELINK HIGH BANDWIDTH DIFFERENTIAL PROBES

LeCroy WaveLink
High Bandwidth Differential
Probe and Accessory
Model Numbers:

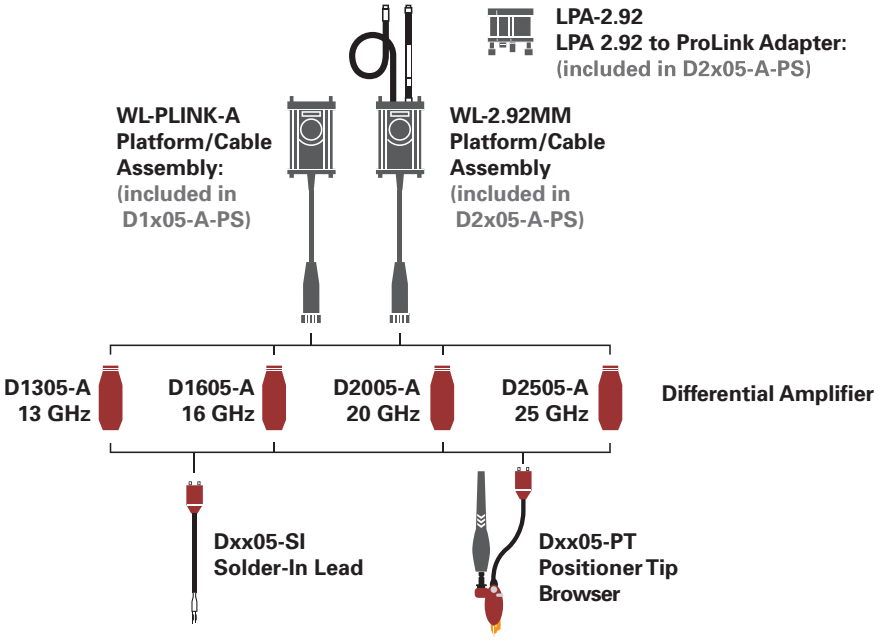
**D1305-A**
**D1605-A**
**D2005-A**
**D2505-A**
**LPA-2.92**
**WL-2.92MM**
**WL-PLINK-A**

## Ultra-wideband Architecture for Superior Signal Fidelity

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%)
- Highest bandwidth Solder-In solution (25 GHz)
- Ultra-compact browsertip (22 GHz)
- Superior probe impedance minimizes AC loading on device under test (DUT)
- Carbon-composite browser tips optimize signal fidelity and loading
- Probe noise as low as 14 nV/√Hz (1.6 Vrms)
- Low probe attenuation
- Large operating voltage range
  ±4 V common mode range
  ±2.5 V offset range
  2.0 $V_{pk\text{-}pk}$ dynamic range
- Long length Solder-In tip with field replaceable resistors



# WAVELINK HIGH BANDWIDTH DIFFERENTIAL PROBES

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

## Input

| | | |
|---|---|---|
| **Input Dynamic Range** | 2.0 $V_{pk-pk}$, ±1 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<br>100 kΩ Common mode | |

| 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 |
| **Probe Platform/Cable Assemblies and Adapters** | |
| WaveLink ProLink Platform/Cable Assembly Kit for ≥ 13 GHz WaveLink Probes | WL-PLINK-A |
| WaveLink 2.92 mm Platform/Cable Assembly Kit for ≥ 20 GHz WaveLink Probes | WL-2.92MM |
| ProLink to 2.92 mm Adapter with Probe Power and Communication Pass Through | LPA-2.92 |

| Product Description | Product Code |
|---|---|
| **Positioner Tip (Browser) Kits** | |
| WaveLink Dxx05-PT (Up to 22 GHz Rating) Adjustable Positioner Tip Kit. For use with Dxx05 Amplifiers | Dxx05-PT-KIT |
| **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.) | Dxx0-PT-TAPE |
| Qty. 1 Package of Adhesive Probe Connection Guides (200 individual guides/package) | Dxx05-PT-GUIDES |

# DIFFERENTIAL PROBES

LeCroy
Differential Probes
Model Numbers:

**AP033**
**AP034**

**AP033**

**AP034**

## AP033 and AP034

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. With the ProBus interface, the AP034 and AP033 become an integral part of the oscilloscope, allowing sensitivity, offset and common-mode range to be displayed on the scope screen. Common mode sensing and input protection capabilities of the AP033 add additional functionality.

## Features for both probes:

- 500 MHz bandwidth (AP033)
- 1 GHz bandwidth (AP034)
- x10 gain to ÷ 10 attenuation range (AP033)
- 10,000:1 DC CMRR
- Low 9 nV/√Hz noise (AP033)
- 1.5 pF/side input C (AP034)
- 200 µV/div (AP033)
- Input ESD protection
- Autozero feature

## Specifications

| | AP034 | AP033 |
|---|---|---|
| Bandwidth | 1 GHz | 500 MHz |
| Gain | x1 (÷10 and ÷20 with plug-on attenuators) | x10, x1, ÷10 (÷100 with plug-on ÷10 attenuator) |
| DC Accuracy | 2% typical (probe only) | 1% in x1 without external attenuator |
| Input Resistance | 1 MΩ II 1.5 pF each input to ground<br>2 MΩ II 0.85 pF between inputs | 1 MΩ each input to ground<br>2 MΩ differential between inputs |
| Differential Mode Range | ±400 mV (x1)<br>±4 V (÷10)<br>±8 V (÷20) | ±400 mV (x1)<br>±40 mV (x10)<br>±4 V (÷10)<br>±40 V (÷100) |
| Offset Range | ±1.6 V (x1)<br>±16 V (±10)<br>±32 V (±20) | ±400 mV (x1, x10)<br>±4 V (±10)<br>±40 V (±100) |
| Common-Mode Range | ±16 V (x1)<br>±42 V (±10)<br>+42 V (±20) | ±42 V peak (±10)<br>+4.2 V peak (±100) |
| CMRR | 70 Hz 10,000:1 (80 dB)<br>1 MHz 100:1 (40 dB)<br>100 MHz 18.1 (25 dB)<br>500 MHz 9:1 (19 dB) | 70 Hz 10,000:1 (80 dB)<br>100 kHz 10,000:1 (80 dB)<br>1 MHz 1000:1 (60 dB)<br>10 MHz 100:1 (40 dB)<br>250 MHz 5:1 (14 dB) |

## Ordering Information

| Product Description | Product Code |
|---|---|
| 500 MHz Differential Probe | AP033 |
| 1 GHz Differential Probe | AP034 |

# HIGH VOLTAGE DIFFERENTIAL PROBES

# HIGH VOLTAGE DIFFERENTIAL PROBES

LeCroy
High Voltage
Differential Probe
Model Numbers:
**AP031**
**ADP300**
**ADP305**

**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.**

*Opposite page:*
*ADP305 High Voltage Differential Probe*

# HIGH VOLTAGE DIFFERENTIAL PROBES

LeCroy
High Voltage
Differential Probes
Model Numbers:

**AP031**
**ADP300**
**ADP305**

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 MΩ input oscilloscope

## AP031 Specifications

| | |
|---|---|
| Attenuation | ÷10 / ÷100 |
| Bandwidth | 15 MHz |
| Input R | 4 MΩ |
| Differential Mode Range | ±70 V / ±700 V DC + Peak AC |
| Common Mode Range | ±700 V DC + Peak AC |
| CMRR | 86 dB @ 50 Hz<br>56 dB @ 200 kHz |

Power Requirements: four AA batteries

# HIGH VOLTAGE DIFFERENTIAL PROBES

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

## ADP30X 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

## Ordering Information

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

# DIFFERENTIAL AMPLIFIERS

# 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.**

LeCroy
Differential Amplifier
and Accessory
Model Numbers:

**DA1855A**
**DA1855-PR2**
**DA1855A-PR2-RM**
**DA1855A-RM**
**DSC5100**
**DXC100A**
**DXC200**
**DA101**

*Opposite page:*
*The DA1855A Differential Amplifier can be used for a complete PowerMeasure System.*

# DIFFERENTIAL AMPLIFIERS

LeCroy
Differential Amplifier
and Accessory
Model Numbers:

**DA1855A**
**DA1855-PR2**
**DA1855A-PR2-RM**
**DA1855A-RM**
**DSC5100**
**DXC100A**
**DXC200**
**DA101**

## DXC-5100

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

## DXC100A

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

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

## DXC200

÷1, 50 MHz, Passive Differential Probe Pair

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

## DA101

÷10, 1MOhm Passive Attenuator for DXC series probes

## 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 ±15.5 V (÷1) or ±155 V (÷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.

## DA1855A-PR2

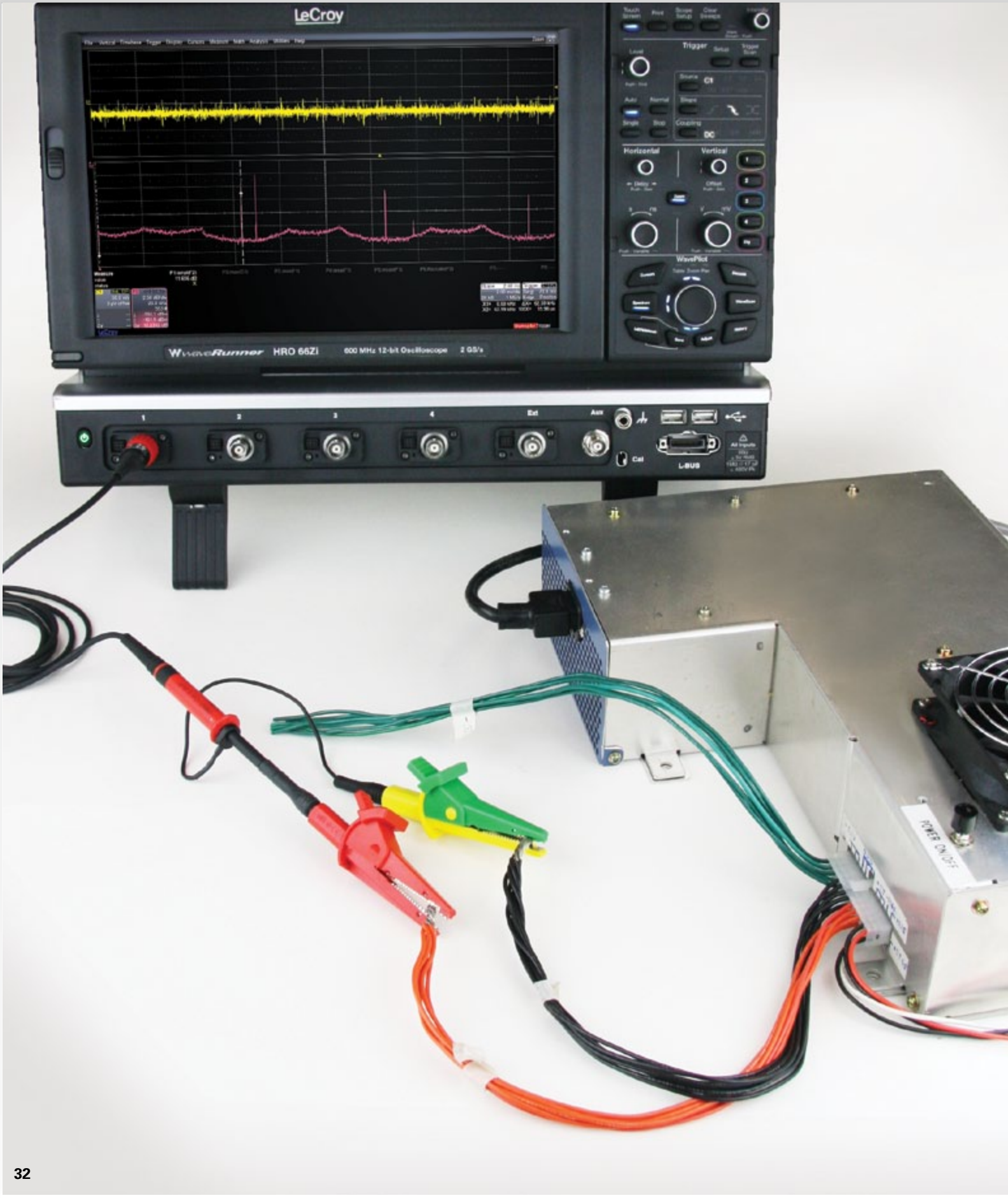
2 Ch, 100 MHz Differential Amplifier with fast over drive recovery, calibrated offset, and selectable LP filters.

## Ordering Information

| Product Description | Product Code |
|---|---|
| 1 Ch, 100 MHz Differential Amplifier with Precision Voltage Source | DA1855A |
| ÷100 or ÷10 Selectable, 250 MHz Passive Differential Probe Pair | DXC100A* |
| ÷1, 50 MHz Passive Differential Probe Pair | DXC200* |
| ÷100, 250 MHz 2.5kv, High Voltage Probe Pair (requires DA101 for full performance) | DXC-5100* |
| ÷10 1 MΩ Passive Attenuator for DXC Series Probes | DA101* |
| 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 |

**Must be used with DA Series Differential Amplifiers*

# HIGH VOLTAGE PROBES



# HIGH VOLTAGE PROBES

LeCroy
High Voltage Probe
Model Numbers:

**PPE1.2KV**
**PPE2KV**
**PPE4KV**
**PPE5KV**
**PPE6KV**
**PPE20KV**

**The PPE series of probes are suitable for a wide range of applications where high-voltage measurements must be made safely and accurately. There are five fixed-attenuation probes covering a range from 2 kV to 20 kV, and one switchable probe providing ÷10/÷100 attenuation for voltage inputs up to 1.2 kV.**

**New technology which utilizes hybrid circuitry (and switch reading for probes with switchable gain/attenuation) minimizes ringing and overshoot to provide a precise response.**

*Opposite page:*
*PPE Series High Voltage Probe*

# HIGH VOLTAGE PROBES

The PPE series includes five fixed-attenuation probes covering a range from 2 kV to 20 kV, and one switchable probe providing ÷10/÷100 attenuation for voltage inputs up to 1.2 kV. All fixed-attenuation, standard probes automatically rescale compatible LeCroy oscilloscopes for the appropriate attenuation of the probe.

## Features

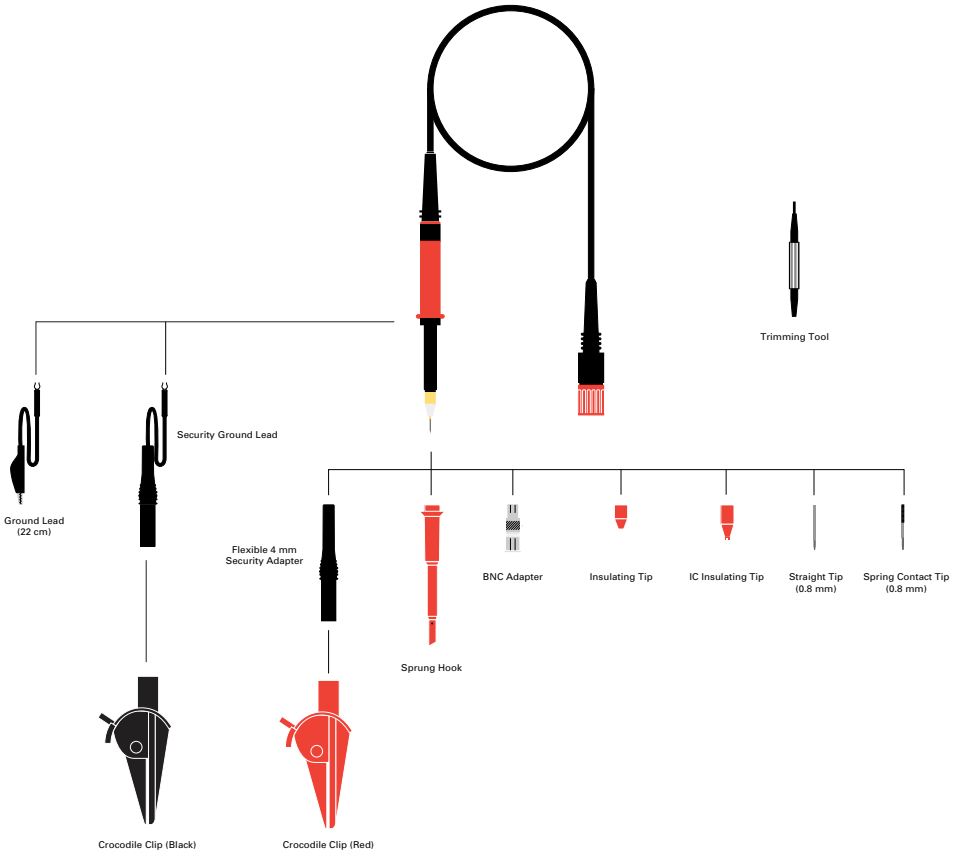
- Safe, accurate high-voltage measurement
- 1.2 kV to 20 kV

LeCroy
High Voltage Probe
Model Numbers:

**PPE1.2KV**
**PPE2KV**
**PPE4KV**
**PPE5KV**
**PPE6KV**
**PPE20KV**

## High-Voltage Probes Selection Guide Specifications

| Types | Bandwidth (MHz) | Input R (Ω) | Input C (pF) | Attenuation | Maximum Voltage | Probe Encoding | Cable |
|---|---|---|---|---|---|---|---|
| PPE1.2kV* | 400 | 50 M | < 6 | ÷10 / ÷100 | 600 V/1.2 kV | No | 2 m |
| PPE2kV* | 400 | 50 M | < 6 | ÷100 | 2 kV | Yes | 2 m |
| PPE4kV* | 400 | 50 M | < 6 | ÷100 | 4 kV | Yes | 2 m |
| PPE5kV* | 400 | 50 M | < 6 | ÷100 | 5 kV | Yes | 2 m |
| PPE6kV* | 400 | 50 M | < 6 | ÷1000 | 6 kV | Yes | 2 m |
| PPE20kV† | 100 | 50 M | < 2 | ÷1000 | 20 kV (40 KV peak) | Yes | 3 m |



## Ordering Information

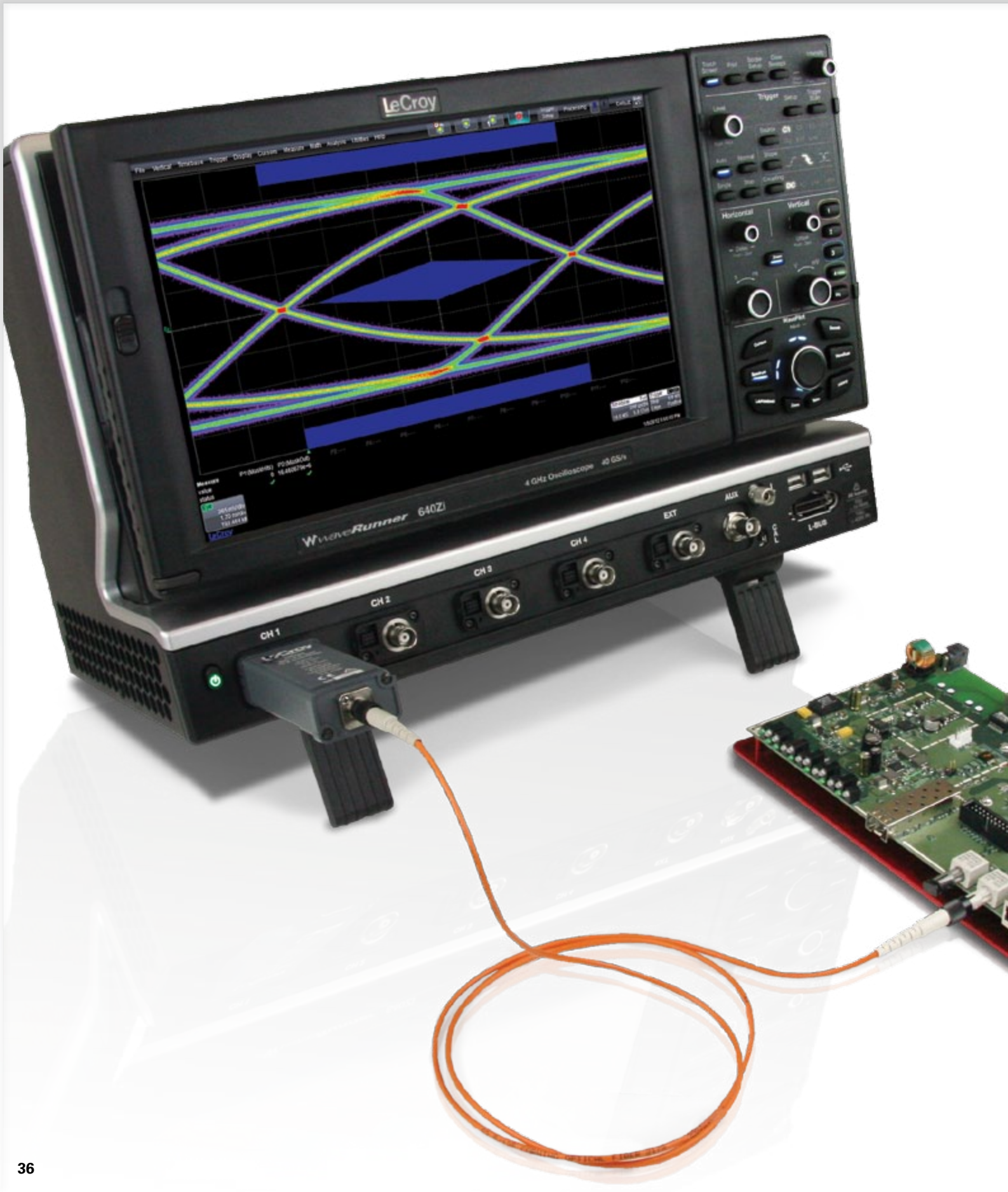
| Product Description | Product Code |
|---|---|
| ÷10/÷100; 200/300 MHz; 5 MΩ/50 MΩ High-Voltage Probe 600 V/1.2 kV max. Voltage DC | PPE1.2KV |
| ÷1000; 100 MHz; 50 MΩ High-Voltage Probe 20 kV (40 kV Peak) max. Voltage DC and Peak AC | PPE20KV |
| ÷100; 400 MHz; 50 MΩ High-Voltage Probe | PPE2KV |
| 2 kV max. Voltage DC and Peak AC | |
| ÷100; 400 MHz; 50 MΩ High-Voltage Probe | PPE4KV |
| 4 kV max. Voltage DC and Peak AC | |
| ÷100; 400 MHz; 50 MΩ High-Voltage Probe | PPE5KV |
| 5 kV max. Voltage DC and Peak AC | |
| ÷1000; 400 MHz; 50 MΩ High-Voltage Probe | PPE6KV |
| 6 kV max. Voltage DC and Peak AC | |
| Accessory Kit for PPE1.2kV, 2kV, 4kV, 5kV, and 6kV | PK103 |
| Standard Probe Accessory Kit for PPE20kV | PK104 |
| Ground Lead (15 cm) | PK104-1 |
| Hook | PK104-2 |
| Standard Probe Accessory Kit for PPE1.2kV, PPE2kV | PK103 |
| Sprung Hook (red) | PK103-1 |
| Ground Lead (22 cm) | PP005-G22 |
| Crocodile Clip | PK30x-2 |
| Probe Tip to BNC Adapter | PP005-BNC |
| IC Insulating Tip | |
| Screw Driver | |
| Probe Tip to Banana Plug Adapter | |
| Ground Lead with Banana Plug | |
| Spring Tip (0.8 mm) | PP005-ST8 |
| Rigid Tip V2A | PP005-RT |

### Standard Accessory Kit for PPE20KV

| | |
|---|---|
| Ground Lead (15 cm) | PK104-1 |
| Hook | PK104-2 |

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

# OPTICAL PROBES



# OPTICAL PROBES

LeCroy
Optical Probe
Model Numbers:

**OE695G**
**OE425**
**OE455**
**OE525**
**OE555**

**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 Gigabit Ethernet, Fibre Channel, and ITU telecom standards.**

**The OE695G is compatible with WaveMaster 8 Zi/Zi-A, LabMaster 9 Zi-A, and LabMaster 10 Zi oscilloscopes. Connection to a real-time LeCroy oscilloscope is through the 2.92mm interface, with a provided adapter to connect to ProLink interfaces.**

**The OE425 and OE455 are ProBus modules compatible with WaveRunner Xi/Xi-A, WaveRunner 6 Zi, WavePro 7 Zi/Zi-A oscilloscopes, as well as WaveMaster 8 Zi/Zi-A and LabMaster 9 Zi-A when used with an LPA-BNC adapter. The OE525 and OE555 are ProLink modules compatible with WavePro 7 Zi/Zi-A, WaveMaster 8 Zi/Zi-A, and LabMaster 9 Zi-A oscilloscopes.**

*Opposite page:*
*OE455 Optical Probe.*

# OPTICAL PROBES

LeCroy
Optical Probe
Model Numbers:

**OE695G**
**OE425**
**OE455**
**OE525**
**OE555**

## OE695G

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 LeCroy oscilloscope is through the 2.92mm interface, with a provided adapter to connect to ProLink interfaces.

## Features

- Compatible with LeCroy 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 µm multi-mode or single-mode fiber input
- +7 dBm (5 mW) max peak optical power
- Low noise (as low as 25 pW/√Hz)
- Ideal for Eye Mask, Extinction Ratio, and Optical Modulation Amplitude (OMA) testing

## Specifications

| | |
|---|---|
| Optical Wavelength Range | 780 to 1550 nm (calibrated range)<br>750 to 1650 nm (usable range) |
| Maximum Modulation Bandwidth | DC to 8.625 GHz (-3 dBe, electrical)<br>DC to 11.64 GHz (-3 dBo, optical)<br>(Reference Receiver Applied)<br>DC to 9.5 GHz (-3 dBe)<br>DC to 12 GHz (-6 dBe)<br>DC to 17 GHz (-14 dBe)<br>(+/-1 dBe passband variations typical, no Reference Receiver Applied) |
| Reference Receiver Uncertainty | ±1.6 dBe up to Fref =0.75*bit rate<br>±4 dBe 2*bit rate setting (typical)<br>±0.85 dBe up to Fref =0.75*bit rate<br>±4 dBe 2*bit rate setting<br>(on matched oscilloscope input channel 4 with 11, 17, 20, 30, 39, 50, 75, 90, or<br>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/√Hz @ 1310 nm (typical)<br>50 pW/√Hz @ 850 nm (typical)<br>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 µm Multi-Mode fiber, or mechanically compatible Single-Mode fiber |
| Maximum Optical Linear Input<br>(1 dB compression point) | -2 dBm (typical), -3 dBm (minimum) at 1550/1310 nm<br>+4 dBm (typical), +3 dBm (minimum) at 850 nm |
| Maximum Optical Power | +7 dBm (5 mW) Peak |

## 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

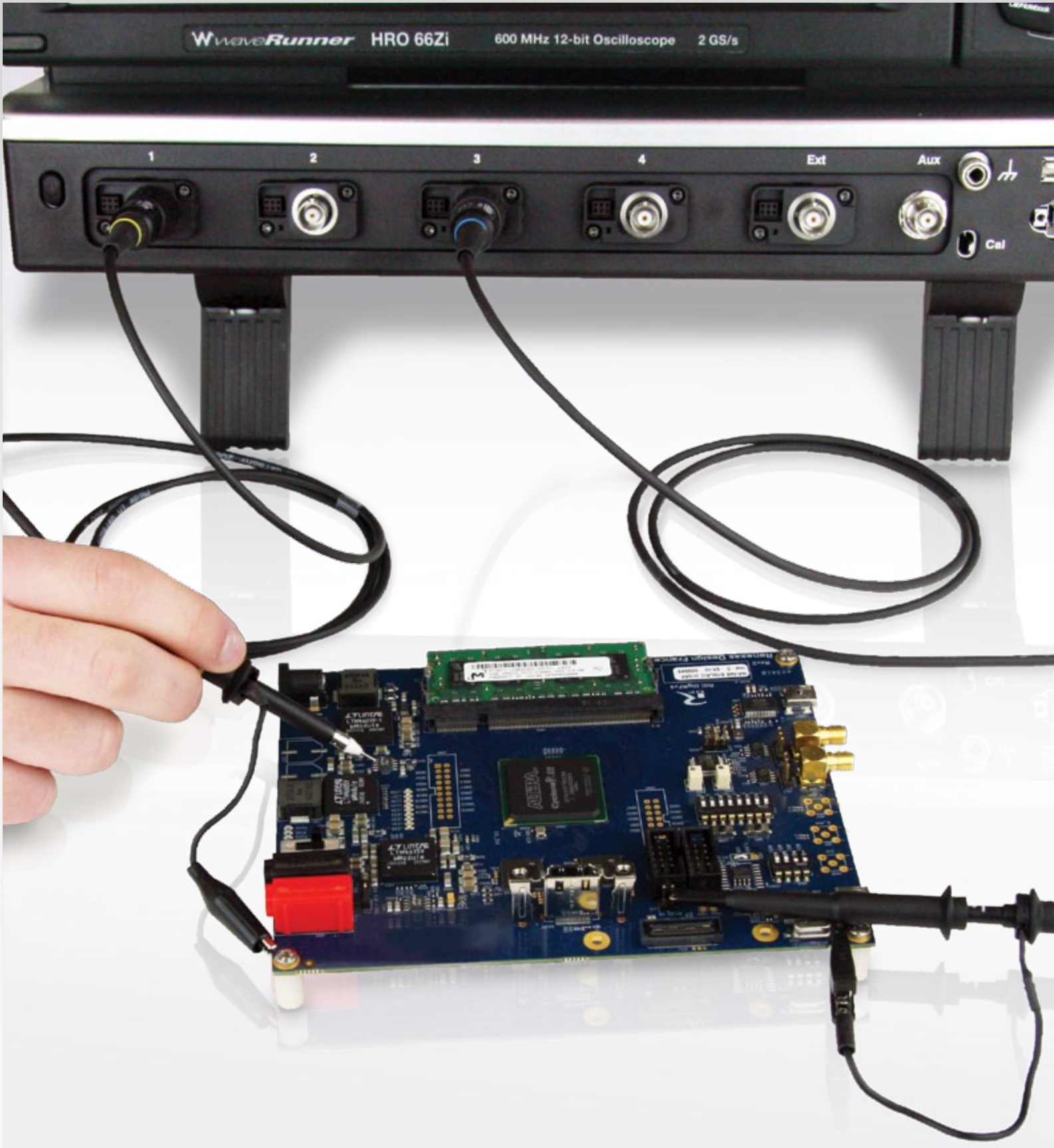
## Specifications

| Specifications | OE425/OE525 | OE455/OE555 |
|---|---|---|
| Wavelength Range | 500 – 870 nm<br>460 – 870 nm<br>(0.1 V/mW) | 950 – 1630 nm<br>800 – 1630 nm<br>(0.1 V/mW) |
| Conversion Gain | 0.5 V/mW | 1.1 V/mW |
| Bandwidth | 5 GHz<br>(6 GHz optical) | 3.5 GHz<br>(4.5 GHz optical) |
| Equivalent Noise | 2.2 µW rms | 1.0 µW rms |
| Maximum Optical Power<br>(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

**Passive probes are the standard probe provided with most oscilloscopes. Typical passive probes provide a ÷10 attenuation and feature a high input resistance of 10 MΩ. 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. LeCroy passive probes feature an attenuation sense pin which tells the oscilloscope to scale the waveforms automatically requiring no user input.**

LeCroy
Passive Probe
Model Numbers:

**PP005A**
**PP006A**
**PP007-WR-1**
**PP008-1**
**PP009-1**
**PP010-1**
**PP011-1**
**PP016**

# PASSIVE PROBES

LeCroy
Passive Probe
Model Numbers:

**PP005A**
**PP006A**
**PP007-WR-1**
**PP008-1**
**PP009-1**
**PP010-1**
**PP011-1**
**PP016**

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.

## Features

- Bandwidth from 200 MHz to 500 MHz
- Probe encoding ring for automatic scale factor readout on LeCroy oscilloscopes

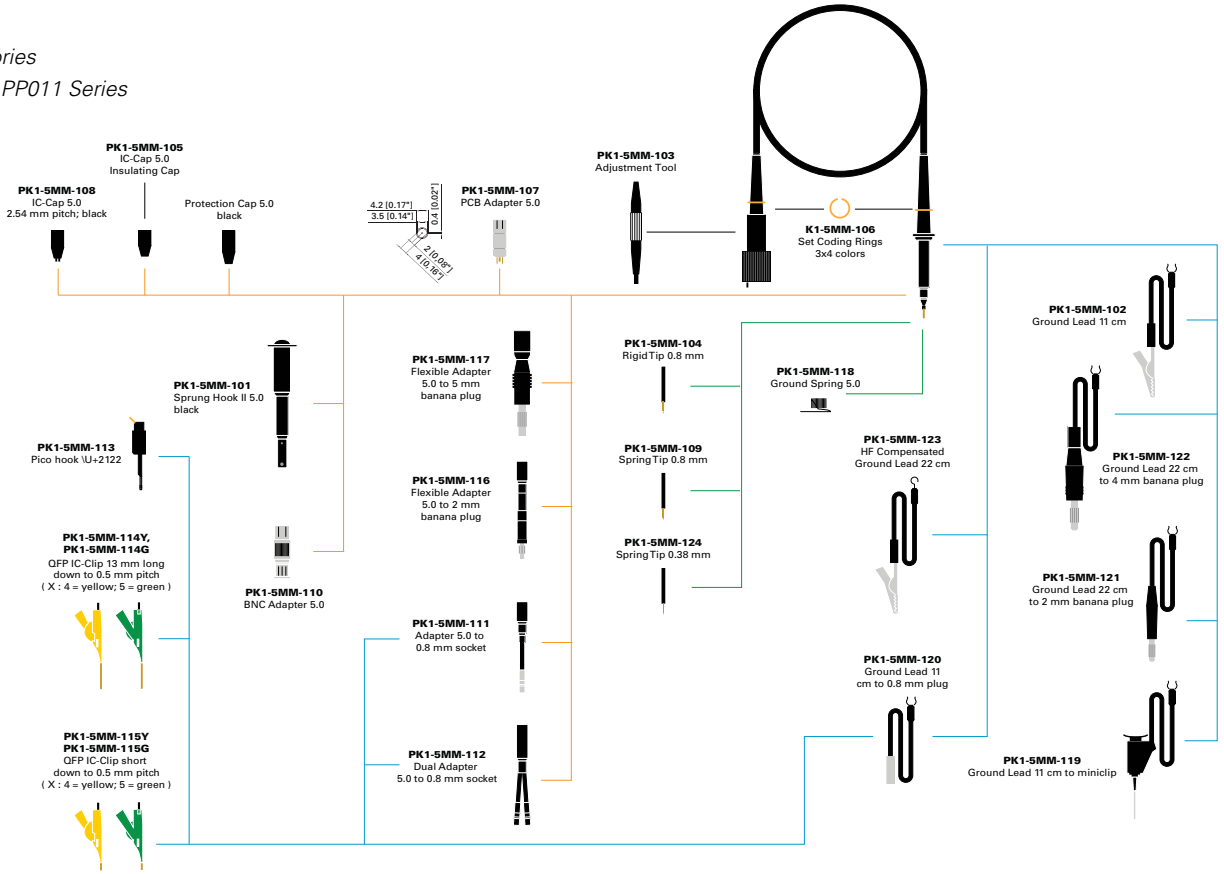
## Passive Probes Selection Guide Specifications

| Types | Bandwidth (MHz) | Input R (Ω) | Input C (pF) | Attenuation | Maximum Voltage | Diameter (mm) |
|---|---|---|---|---|---|---|
| PP005A | 500 | 10 M | 11 | ÷10 | 500 V | 5 |
| PP006A | 500 | 10 M | 12 | ÷10 | 600 V | 5 |
| PP007-WR-1 | 500 | 10 M | 9.5 | ÷10 | 400 V | 2.5 |
| PP008-1 | 500 | 10 M | 9.5 | ÷10 | 400 V | 2.5 |
| PP009-1 | 500 | 10 M | 9.5 | ÷10 | 400 V | 2.5 |
| PP010-1 | 500 | 10 M | 9.5 | ÷10 | 400 V | 2.5 |
| PP011-1 | 50 | 10 M | 9.5 | ÷10 | 400 V | 5 |
| PP016 | 300 MHz/ 10 MHz | 10 MΩ/ 1 MΩ | 12 pF/ 46 pF | ÷10/ ÷1 | 600 V | 5 mm |

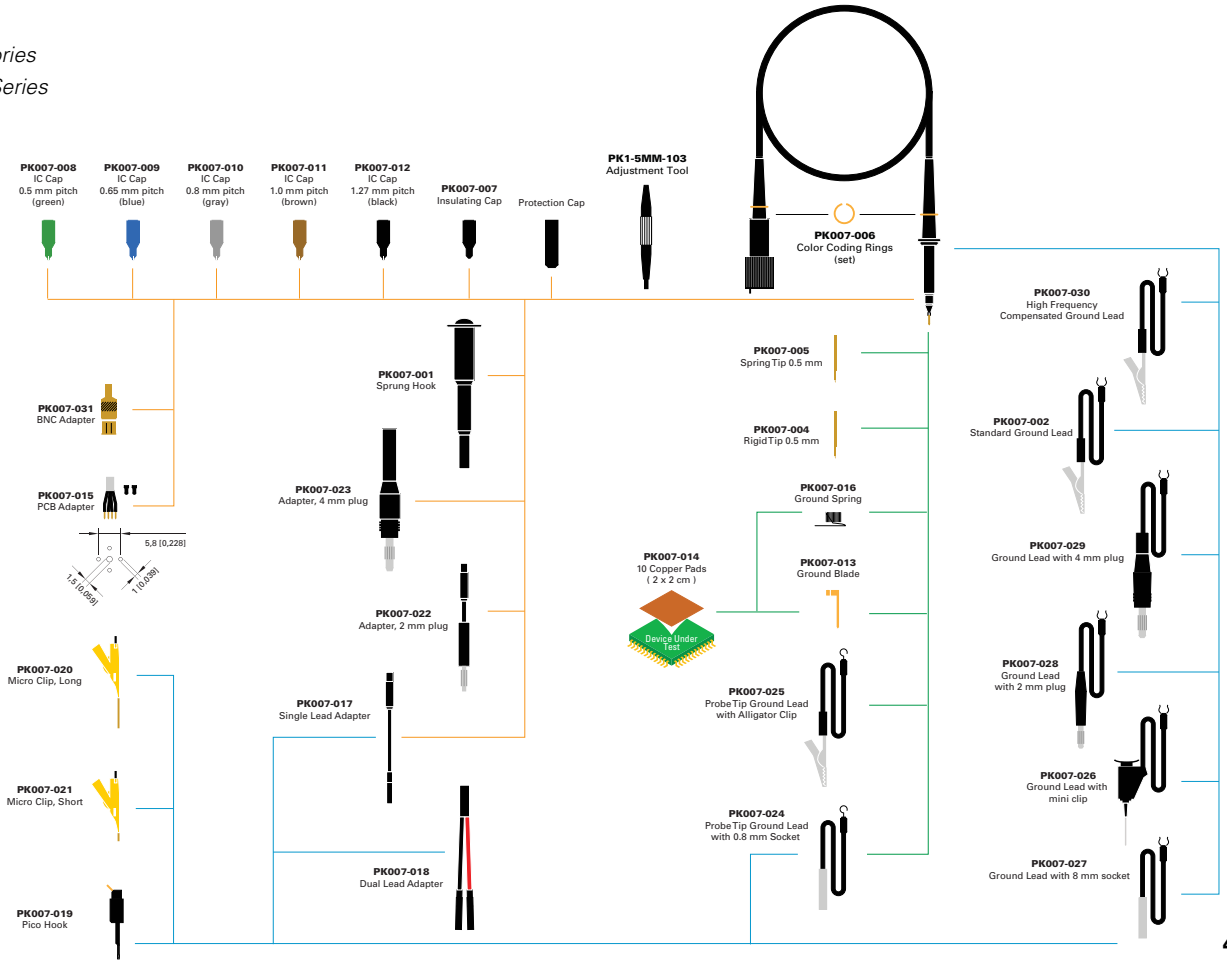
## Ordering Information

| Product Description | Product Code |
|---|---|
| ÷10, 500 MHz 10 MΩ Passive Probe | PP005A |
| ÷10, 500 MHz 10 MΩ Passive Probe | PP006A |
| ÷10, 500 MHz 10 MΩ Passive Probe | PP007-WR-1 |
| ÷10, 500 MHz 10 MΩ Passive Probe | PP008-1 |
| ÷10, 500 MHz 10 MΩ Passive Probe | PP009-1 |
| ÷10, 200 MHz 10 MΩ Passive Probe | PP010-1 |
| ÷10, 500 MHz 10 MΩ Passive Probe | PP011-1 |
| ÷10, 300 MHz 10 MΩ Passive Probe | PP016 |

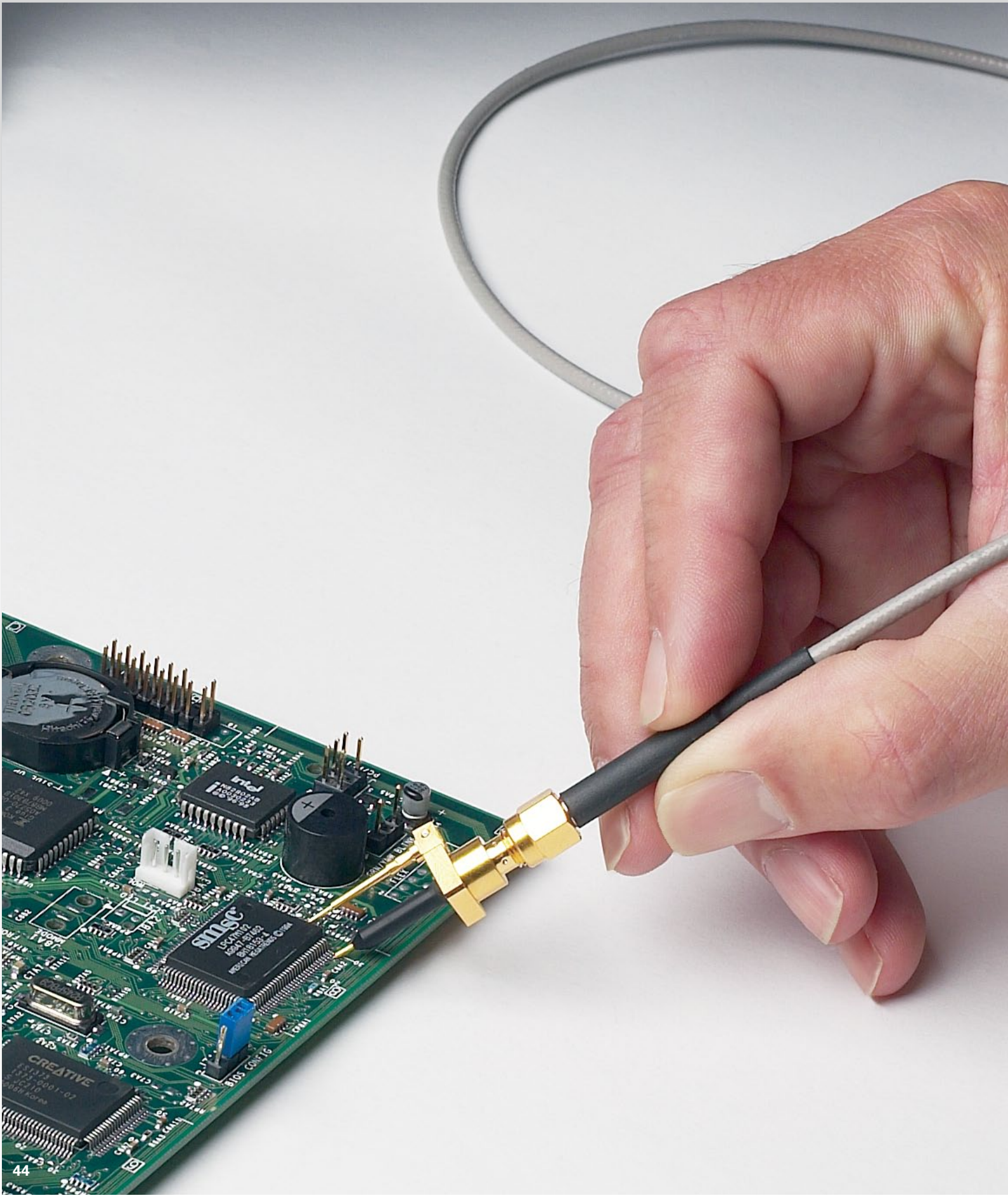
*Passive Probe Accessories*
*for PP005, PP009, and PP011 Series*




*Passive Probe Accessories*
*for PP007 and PP008 Series*



# TRANSMISSION LINE PROBES



# TRANSMISSION LINE PROBES

LeCroy
Transmission Line Probe
Model Numbers:

**PP066**
**PP065**

**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 Ω). 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 Ω) to 5 kΩ), the input impedance of these probes remains nearly constant over their entire frequency range. A traditional ÷10 passive probe will have a 10 MΩ) 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. A high BW transmission line probe driving a sampling oscilloscope can be used as a "golden standard" in situations when the response of an active probe measurement is questioned.**

*Opposite page:*
*PP066 Transmission Line Probe*

# TRANSMISSION LINE PROBES

LeCroy
Transmission Line Probe
Model Numbers:

**PP066**
**PP065**

## 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 (÷10 cartridge)<br>1000 Ω (÷20 cartridge) |
| Maximum Voltage | 15 V rms |
| Cable Length | 1 m |

## Included with PP0066

| |
|---|
| PACC-AD001 |
| SMA to BNC Adapter |

## PP065

The PP065 is a transmission line probe designed for use at very high frequencies. The probe's input impedance remains nearly constant over its entire frequency range. Robust to over voltage and ESD exposure, it is particularly useful in applications producing fast rising, narrow pulses with amplitudes, which exceed the dynamic range of active probes.

## Features:

- 1 GHz
- Low capacitance
- ÷100 1 GHz 5 k passive probe

## PP065 Specifications

| | |
|---|---|
| Bandwidth | 1 GHz |
| Input Capacitance | 1.5 pF |
| Input Resistance | 500 Ω |
| Maximum Voltage | 22 V |
| Attenuation | ÷100 |

## Ordering Information

| Product Description | Product Code |
|---|---|
| 7.5 GHz Low Capacitance Passive Probe (÷10, 1 kΩ; ÷20, 500 Ω) | PP066 |
| 1 GHz Low Capacitance Passive Probe (÷10, 5 kΩ) | PP065 |

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1-800-5-LeCroy
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**Local sales offices are located throughout the world.**
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ProbeCatalog-13july12
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Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

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