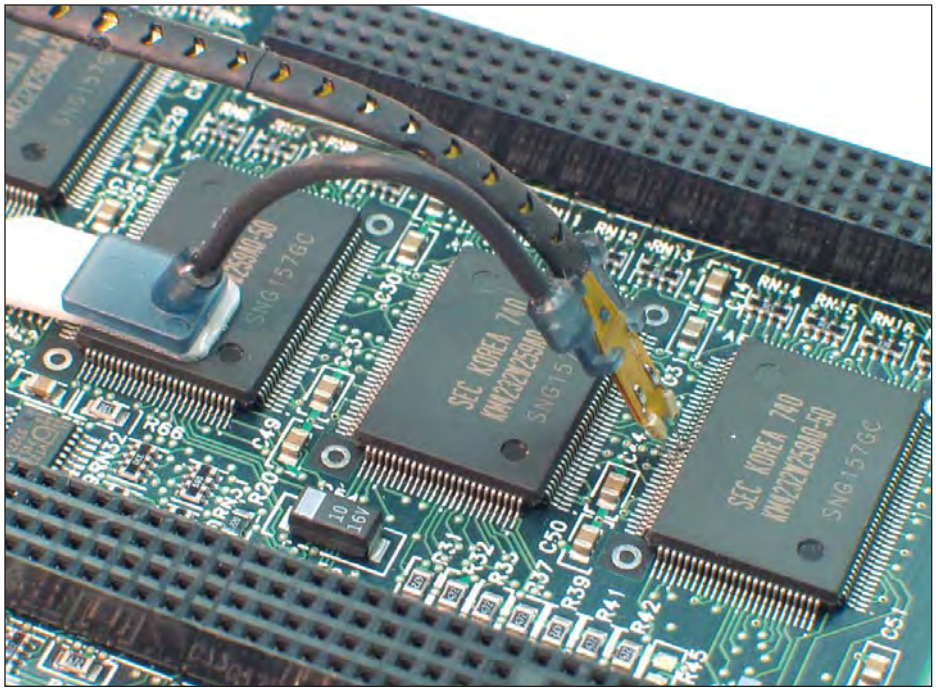
LeCroy

Probes & Accessories Catalog



D11000PS DIFFERENTIAL PROBE SYSTEM



The D11000PS extends the full signal acquisition performance of the SDA 11000 and SDA 9000 to the probe tips. With 11 GHz system bandwidth, the probe enables direct measurement of high-speed serial data streams up to 6.25 Gb/s. The D11000PS also provides 11 GHz system bandwidth when used with the SDA 18000.

Choice of Interconnect Styles Without Compromising Performance

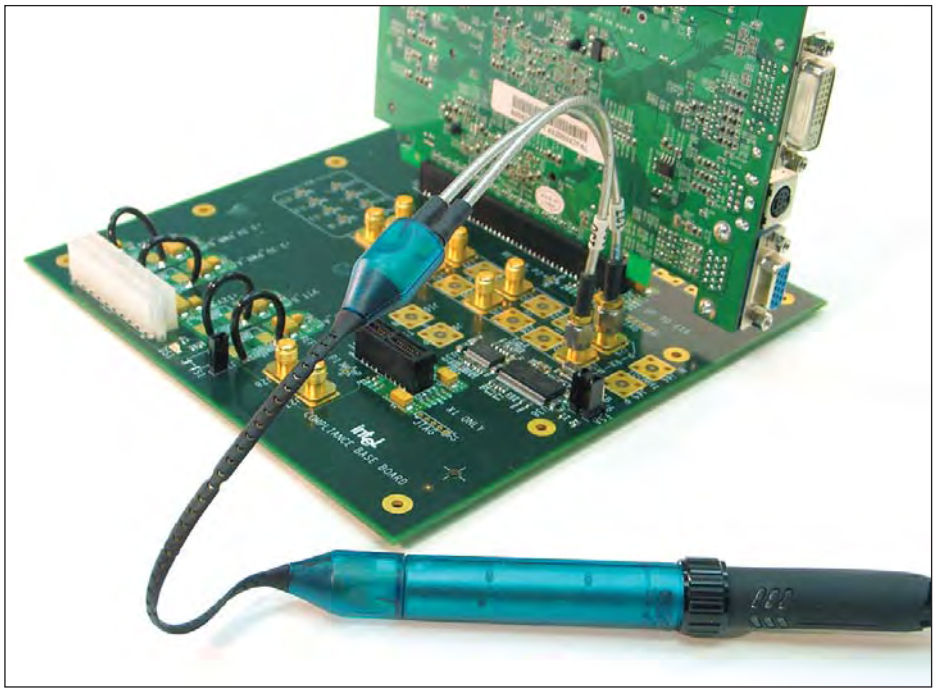
The D11000PS provides both direct Solder-In and cabled SMA interconnect lead assemblies. Each interconnect lead comes with a dedicated probe amplifier module that has calibration data optimized for the respective lead. This eliminates the performance compromise of using a single calibration for multiple lead types. The Solder-In lead provides the highest possible signal integrity with a high loading impedance. The dual SMA interconnect leads provide a true differential 50 Ω input. This is a convenient alternative to direct cabling into the oscilloscope inputs, freeing up the second channel for other signal input, and eliminating the need to set up waveform math and match cable delays.

Unsurpassed Waveform Accuracy

When used to acquire input signals for the SDA 11000, SDA 9000, or SDA 18000, the D11000PS provides unprecedented waveform fidelity, even with signals at higher serial data rates. The D11000PS utilizes third generation compensation calibration, the most advanced in use today, to provide optimal system response.

Each individual probe is characterized with this system. Information on the probe's frequency and time domain responses are stored in non-volatile memory within the probe amplifier module. This information is uploaded to the higher bandwidth SDA's when the probe is connected. The probe calibration data and the SDA oscilloscope's calibration data combine to generate new equalization filters for the composite system. The resulting compensation system corrects for frequency response deviations, as well as group delay correction and reflection cancellation.

D11000PS DIFFERENTIAL PROBE SYSTEM



Reproducing accurate serial data eye patterns requires maintaining precise magnitude and phase relationships between the fundamental and the odd harmonics. The advanced calibration system used in the D11000PS assures the best eye pattern fidelity.

Superior Probe Loading Characteristics
Accurate frequency response is not enough to assure good waveform fidelity. Excessive probe loading can cause waveform distortion. The D11000PS continues the legacy of LeCroy high-performance probe design, placing special emphasis on minimizing loading of the circuit under test.

The Solder-In lead and dedicated probe amplifier module have a high input resistance at DC and low frequencies, allowing the probe to be used in circuits which cannot drive the low resistance of a pure transmission line probe. The direct cabled SMA inputs have 50 Ω input impedance with low VSWR.

Ease of Use
Attention to fine details during the D11000PS design process has resulted in several "ease of use" features. A common mode measure feature allows the user to measure the average common mode component with a single click in the probe control menu. AutoColor ID lights an indicator in the probe body, matching the color of the waveform trace. When multiple channels are used, this feature instantly identifies which waveform corresponds to which probe.

Several connection accessories designed specifically for the D11000PS provide convenient and secure mounting of the probe body and Solder-In tip to the test circuit. DC blocking adapters extend the common mode range of the SMA cabled input for use with higher common mode voltages such as Digital Video Interface (DVI). A finger wrench allows tightening of SMA connectors on dense test fixtures.

D11000PS DIFFERENTIAL PROBE SYSTEM

Compatibility

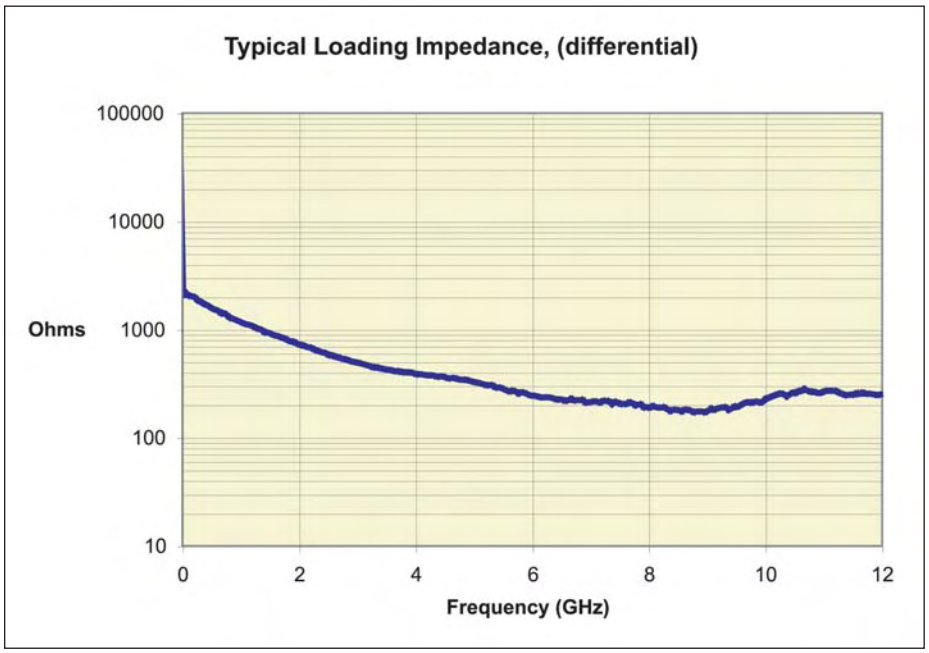
The D11000PS is designed specifically for use with the SDA 11000, SDA 9000, or SDA 18000. However, it does contain additional calibration data for use with all of the lower bandwidth WaveMaster, SDA, and DDA 5005A Series oscilloscopes and analyzers.

SPECIFICATIONS

Bandwidth, System, -3 dB	11 GHz (Typical)*
Rise Time, System	< 50 ps (Typical)*
Rise Time, Probe only	< 40 ps
Attenuation, Nominal	÷3
LF Attenuation Accuracy	2% (20–30 ˚C)
Output Zero	< 15 mV referred to input
Noise, System	5 mV rms (Typical)[1]
Differential Mode Range	±1 V
Common Mode Range	±4 V, Solder-In tip ±2 V, SMA cable input†
Input Resistance at DC, (Solder-In lead)	40 kΩ differential 20 kΩ each side to ground
Minimum Input Impedance, (Solder-In lead, to 11 GHz)	> 175 Ω (Refer to graph)
Input Impedance, (SMA cable input)	50 Ω
Input VSWR, (Typical, each lead to ground)	< 1.5:1 DC–6 GHz < 2.0:1 6 GHz–11 GHz
CMRR, (Typical)	> 40 dB DC–1 GHz > 30 dB 1 GHz–4 GHz > 20 dB 4 GHz–11 GHz

* Measured as a system with SDA 11000, SDA 9000 and SDA 18000.
† Can be extended by using DC Blocking Adapters.

D11000PS DIFFERENTIAL PROBE SYSTEM



D11000PS Includes:
Probe amplifier modules (2–1 each for SMA input and Solder-In lead), Solder-In lead assembly (2), SMA interconnect lead, SMA input cables (matched pair), Probe body, SMA DC blocking adapters (2), ground lead and clip, SMA finger wrench (2), tip retaining clip kit for Solder-In lead, probe body mounting clamp set, FreeHand probe stand, ESD dissipating wrist strap, SAC-01 soft accessory case with insert, small accessory case, D11000PS Instruction Manual, certificate of traceable calibration.

ORDERING INFORMATION	PRODUCT CODE
Differential Probe System	D11000PS
Replacement Solder-In Tip Assembly	D11000SI
NIST Traceable Calibration with Test Data (one module)	D11000PS-CCNIST

WAVELINK DIFFERENTIAL PROBES



WaveLink high bandwidth differential probes are designed to provide an optimum mechanical connection for signal measurement. They virtually eliminate distortion when measuring signals, which is particularly useful in eye pattern measurements—now routine for systems using fast serial data bus architecture. 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 LeCroy 6 GHz, 5 GHz, and 3 GHz instruments. They are also the first differential probes to use a unique calibration process to achieve superb waveform fidelity for routine voltage measurements.

D600A-AT
D300A-AT
D600ST
D350ST
D500PT

Features:
- Unique adjustable tips for reliable contact
- Wide assortment of small tips ideal for restricted spaces
- Best-in-class probe loading for accurate signal measurement
- Superior loading characteristics and precise frequency response
- Outstanding fidelity for high-speed signals

D600A-AT and D300A-AT Features:
- Built-in thumbwheel for precise positioning of tip; stays put after adjustment
- Maintains sharp points for good contact
- Tips made of "NiTiNOL," a super-elastic nickel-titanium alloy
- Probe flexes as you apply pressure and consistently returns to original form

D600ST and D350ST Features:
- Best-in-class mechanical design for optimum utility
- Small tip high bandwidth differential probe
- Three interconnect configurations for flexibility
- Very small form factor for accessing tight spaces
- Highly flexible long lead
- Inexpensive and easily replaceable

D500PT Positioner Mounted Tip Features:
- Positioned tip assembly
- Very small tip geometry for accessing physically constrained locations
- Ideal for applications requiring multiple probes on adjacent pads
- Telescoping tips for reliable tip contact—even when probe it tilted
- Mounts in probe positioner or can be hand held
- EZ-Probe positioner available as an accessory

WaveLink D600ST and D350ST

Best-in-class mechanical design for optimum utility:
- Small tip, high bandwidth differential probe
- Three interconnect configurations for flexibility
- Very small form factor for accessing tight spaces

Each of the interchangeable leads is a thin, highly flexible 145 mm (5.7") long lead connecting the tip and the D600ST/D350ST probe tip module.

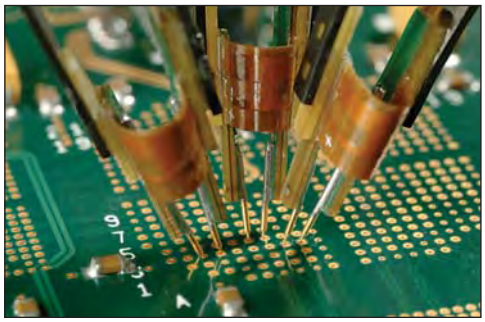


WAVELINK DIFFERENTIAL PROBES

FLEXIBLE INTERCONNECTION OPTIONS —WITHOUT SACRIFICING PERFORMANCE

D500PT Positioner Mounted Probe Tip Module

The probe has a very thin form factor, allowing multiple probes to be used when several channels are required to monitor signals from the same small IC. It has 2 mm of Z-axis compliance through spring-loaded telescoping tips, allowing considerable angular freedom relative to the circuit board while still maintaining reliable contact with both inputs. A ball joint between the tip and mounting arm makes it even easier to adjust for placement when already mounted in a positioner. A small thumbscrew allows precise and secure adjustment of the tip spacing.

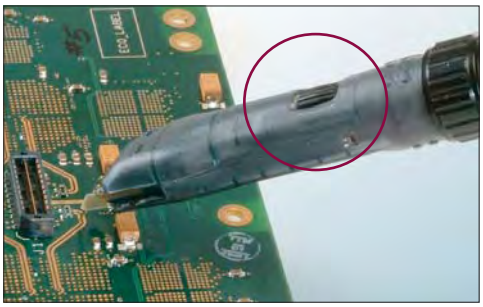


The Probe Tip Modules contain the active amplifier circuitry. Different modules have different electrical and physical interconnect characteristics, allowing the user to select the module appropriate for the application.

D600A-AT and D300A-AT Adjustable Tips

WaveLink adjustable tip probes are designed to provide an optimum mechanical connection for signal measurement.

- Built-in thumbwheel for precise positioning of tip—stays put after adjustment
- Maintains sharp points for good contact
- Tips made of "NiTiNOL," a super-elastic nickel-titanium alloy
- Flexes as you apply pressure
- Consistently returns to original form



EZ-Probe Positioner

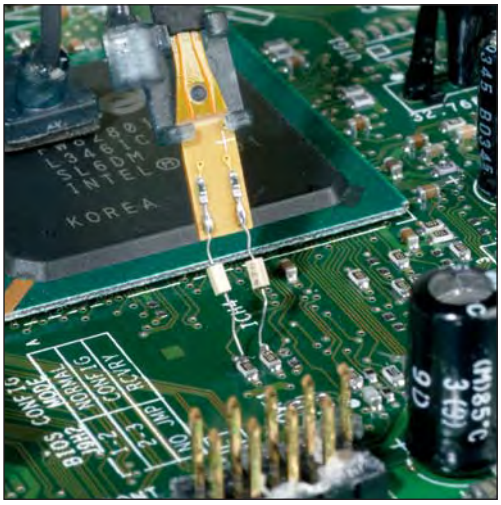
The EZ-Probe positioner provides stable, accurate positioning in the x-y-z axis. Ideal for use with the D500PT and D600A-AT/D300A-AT probe tips. The unique, 3:1 motion reduction joystick allows simple, precise positioning of the attached probe in both the horizontal and vertical measuring plane. The probe has a fully articulating arm, providing 30 cm (12") reach in virtually any direction.



WAVELINK DIFFERENTIAL PROBES

THREE DIFFERENT TIPS FOR INTERCONNECT FLEXIBILITY

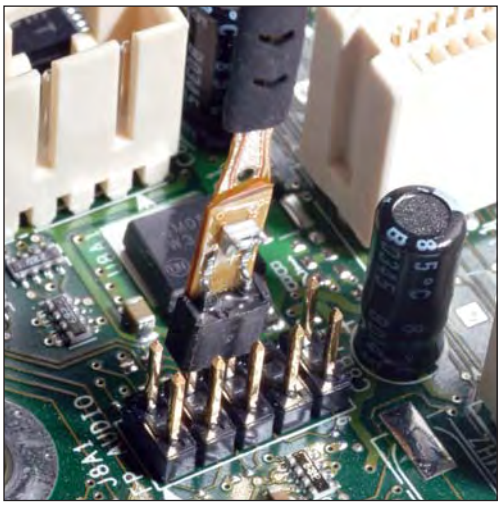
Solder-In Lead
The Solder-In interconnect lead features the smallest physical tip size of any high bandwidth differential probe and the highest level of electrical performance. Two very small damping resistors are directly soldered into the connect points providing a reliable, intermittent free electrical connection. The resistors have highly flexible leads allowing connection to input points with a wide range of input spacing.



Quick Connect (D600ST only)
The Quick Connect interconnect lead enables you to quickly move the probe between multiple test points on the test circuit. Just solder a pair of damping resistors at each location where interconnection is required. A small connector mounted on the probe tip, plugs into the damping resistors, letting you quickly move between sets of test points.



Square Pin
Many applications, such as IC characterization boards, use standard 0.025" square pins for interconnect. The Square Pin interconnect lead directly mates with a pair of 0.025" (0.635 mm) square pins which are mounted on standard 0.100" (2.54 mm) centers.



WAVELINK DIFFERENTIAL PROBES

SPECIFICATIONS

Rise Time, probe only	
D600A-AT	< 70 ps*
D600ST-SI	< 65 ps*
D500PT	< 100 ps†
D300A-AT	< 95 ps‡
D350ST-SP	< 90 ps‡
LF Attenuation Accuracy (with 0 V common mode)	
D600A-AT, D300A-AT, D600ST, and D500PT	2% 0 ±1.2 V 5% ±1.2 V ±2.4 V
D350ST	2% 0 ±2.5 V 5% ±2.5 V ±5 V
Output Zero (within 15 minutes after Autozero)	
D600A-AT, D300A-AT, D600ST, and D500PT	< 10 mV RTI
D350ST	< 20 mV RTI
Bandwidth, System DC to -3 dB (Typical)	
D600ST-SI	6 GHz**
D600ST-QC	4 GHz**
D600ST-SP	3 GHz**
D600A-AT	6 GHz**
D300A-AT	3 GHz††
D350ST-SP	3 GHz††
D350ST-SI	3 GHz††
D500PT	5 GHz†
Input Dynamic Range	
D600A-AT, D300A-AT, D600ST, and D500PT	±2.4 V
D350ST	±5 V
Common Mode Range (Max. peak voltage either input to ground)	
D600A-AT, D300A-AT, D600ST, and D500PT	±2.4 V
D350ST	±5 V
DC Input Resistance	
D600A-AT, D300A-AT, D600ST, and D500PT	4 kΩ differential 2 kΩ either input to ground
D350ST	8 kΩ differential 4 kΩ either input to ground

*Measured with 6 GHz or greater oscilloscope
†Measured with 5 GHz oscilloscope
‡Measured with 3 or 4 GHz oscilloscope
**Typical, with 6 GHz or greater oscilloscope
††Typical, with 3 or 4 GHz oscilloscope

WAVELINK DIFFERENTIAL PROBES

SPECIFICATIONS (CONTINUED)

CMRR

D600A-AT	
DC to 1 GHz	> 40 dB
1 GHz to 3 GHz	> 30 dB
3 GHz to 7 GHz	> 20 dB
D600ST	
DC to 1 GHz	> 30 dB
1 GHz to 3 GHz	> 25 dB
3 GHz to 7 GHz	> 20 dB
D500PT	
DC to 1 GHz	> 25 dB
1 GHz to 3 GHz	> 19 dB
3 GHz to 5 GHz	> 16 dB
D350ST	
DC to 1 GHz	> 30 dB
1 GHz to 3 GHz	> 25 dB
D300A-AT	
DC to 1 GHz	> 40 dB
1 GHz to 3 GHz	> 30 dB

Noise

D600A-AT, D600ST, D500PT	5.8 mV_{rms} with 6 GHz oscilloscope
D300A-AT	5.0 mV_{rms} with 3 GHz oscilloscope
D350ST	9.5 mV_{rms} with 3 GHz oscilloscope

ORDERING INFORMATION

	PRODUCT CODE
PROBE TIP MODULES	
WaveLink 7.5 GHz, Differential Probe Adjustable Tip Module	D600A-AT*
WaveLink 4 GHz, Differential Probe Adjustable Tip Module	D300A-AT*
WaveLink 7 GHz, Differential Probe Small Tip Module	D600ST*
WaveLink 4 GHz, 5 V Differential Probe Small Tip Module	D350ST*
WaveLink 6 GHz, Differential Positioner Mounted Tip Module	D500PT*
PROBE BODIES	
WaveLink ProLink Probe Body	WL600
WaveLink ProBus Probe Body	WL300
POSITIONER	
Cascade Microtech EZ-Probe Positioner	EZ PROBE
SERVICE OPTIONS	
NIST Traceable Calibration with Test Data† (one module)	D600A-AT-CCNIST D300A-AT-CCNIST D600ST-CCNIST D350ST-CCNIST D500PT-CCNIST

* For a complete probe, order a WL300 or WL600 Probe Body with Probe Tip Module.
†-CCNIST NIST traceable calibration with test data is an available option for D600ST, D350ST, D500PT, D600A-AT, or D300A-AT probe tip module only when ordered with either a WL600 or WL300 probe body.

WAVELINK DIFFERENTIAL PROBES

ORDERING INFORMATION (CONTINUED)	PRODUCT CODE
CONSUMABLES AND REPLACEMENT PARTS	
Replacement Quick Connect Lead Set for D600ST	D600ST-QC
Replacement Solder-In Lead Set for D600ST	D600ST-SI
Replacement Square Pin Lead Set for D600ST	D600ST-SP
Extra Solder-In Lead for D350ST	D350ST-SI
Extra Square Pin Lead for D350ST	D350ST-SP
Replacement Tip Assembly for D500PT	D500PT-TIP
Replacement Resistor Kit for D600ST-SI (10)	PK600ST-1
Replacement Resistor Kit for D600ST-QC (20)	PK600ST-2
Replacement Probe Tip Holder Kit	PK600ST-3
Replacement Probe Body Mounting Kit	PK600ST-4
Replacement Probe Tips for D500PT (pkg. of 4)	PK500PT-1
Replacement Resistor Kit for D350ST-SI (10)	PK350ST-1
Probe Characterization Fixture	PCF-200
WaveLink Probe Series Instruction Manual	WL-OM-E

D600A-AT, D300A-AT Adjustable Tip Modules Include:
Protective storage case, ground wire and clip, WaveLink Series instruction manual, Quick Start guide, calibration certificate.

D600ST Small Tip Module Includes:
Solder-In interconnect lead set with replacement damping resistors (10), Quick Connect interconnect lead set with additional damping resistors (20), Square Pin interconnect lead set, ground wire and clip, probe tip mounting kit, WaveLink Series instruction manual, Quick Start guide, calibration certificate.

D350ST Small Tip Module Includes:
Solder-In interconnect lead set with replacement damping resistors (10), Square Pin interconnect lead set, ground wire and clip, probe tip mounting kit, WaveLink Series instruction manual, Quick Start guide, calibration certificate.

D500PT Positioner Mounted Tip Includes:
Positioned tip assembly, Probe tip module, Module mounting clamp, Ground lead and clip, WaveLink Series instruction manual, Quick Start guide, Calibration certificate, FreeHand probe stand, Tip repair tool, Replacement tips (2)

WL600, WL300 Probe Bodies Include:
SAC-01 Soft accessory case with WaveLink Series insert, probe characterization fixture, probe body mounting clip, probe cable clamp (2), and small probe accessory case.

WaveLink Probe Calibration
When ordered with WL600 or WL300 also substitute: Certificate of NIST traceable calibration in place of calibration certificate.



PASSIVE PROBES

Passive probes are the standard probe provided with most oscilloscopes. Typical passive probes provide a 10:1 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.

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

Model	Bandwidth	Input R	Input C	Attenuation	Maximum Voltage	Diameter	Recommended Oscilloscope
PP005A	500 MHz	10 MΩ	11 pF	10:1	500 V	5 mm	1, 2, 12, 13
PP006A	500 MHz	10 MΩ	12 pF	10:1	600 V	5 mm	3, 11
PP007-WS	500 MHz	10 MΩ	9.5 pF	10:1	400 V	2.5 mm	4
PP007-WR	500 MHz	10 MΩ	9.5 pF	10:1	400 V	2.5 mm	5, 7, 9
PP008	500 MHz	10 MΩ	9.5 pF	10:1	400 V	2.5 mm	4, 6, 8
PP009	500 MHz	10 MΩ	9.5 pF	10:1	400 V	5 mm	4, 6, 8
PP010	200 MHz	10 MΩ	12.5 pF	10:1	600 V	5 mm	10
PP011	500 MHz	10 MΩ	9.5 pF	10:1	400 V	5 mm	5, 7, 9

Recommended Oscilloscope

1 9300 Series
2 LC Series
3 LT Series
4 WaveSurfer 400 Series
5 WaveRunner 6000 Series
6 WaveRunner Xi Series (≤ 600 MHz)
7 WaveRunner Xi (1 GHz–2 GHz)
8 WaveSurfer Xs Series (≤ 600 MHz)
9 WaveSurfer Xs Series (1 GHz)
10 WaveJet Series (≤ 200 MHz)
11 WaveJet Series (≥ 350 MHz)
12 WavePro 900 Series
13 WavePro 7000 Series

ORDERING INFORMATION	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-WS-1
÷10, 500 MHz 10 MΩ Passive Probe	PP007-WR-1
÷10, 500 MHz 10 MΩ Passive Probe	PP008
÷10, 500 MHz 10 MΩ Passive Probe	PP009
÷10, 200 MHz 10 MΩ Passive Probe	PP010
÷10, 500 MHz 10 MΩ Passive Probe	PP011

WAVELINK DIFFERENTIAL PROBES

WAVELINK PROBE COMPATIBILITY CHART

						WR 204Xi		
	SDA 18000*					WR 104Xi		
	SDA 11000*					WR 64Xi		
	SDA 9000*				WP7300A	WR 62Xi		
	SDA 6020	WM8620A			WP7200A	WR 44Xi		
	SDA 4020	WM8420A	DDA 5005A	DDA 3000	WP7100A	WR 6KA	WL300	WL600
D600A-AT	•	•	•				RP	FP
D300A-AT				•	•	•	FP	FP
D600ST	•	•	•				RP	FP
D350ST	•	•	•	•	•	•	FP	FP
D500 PT	•	•	•	•	•	•	RP	FP
WL600	•	•	•	NC	NC	NC		
WL300	RP[1]	RP[1]	RP[1]	•	•	•		

•	Recommended
NC	Not Compatible
FP	Operates at Full Performance
RP	Operates with Reduced Performance with LPA adapters. Frequency response > 3 GHz may be altered
RP[1]	Operates with Reduced Performance with LPA adapters. Frequency response > 3 GHz may be altered

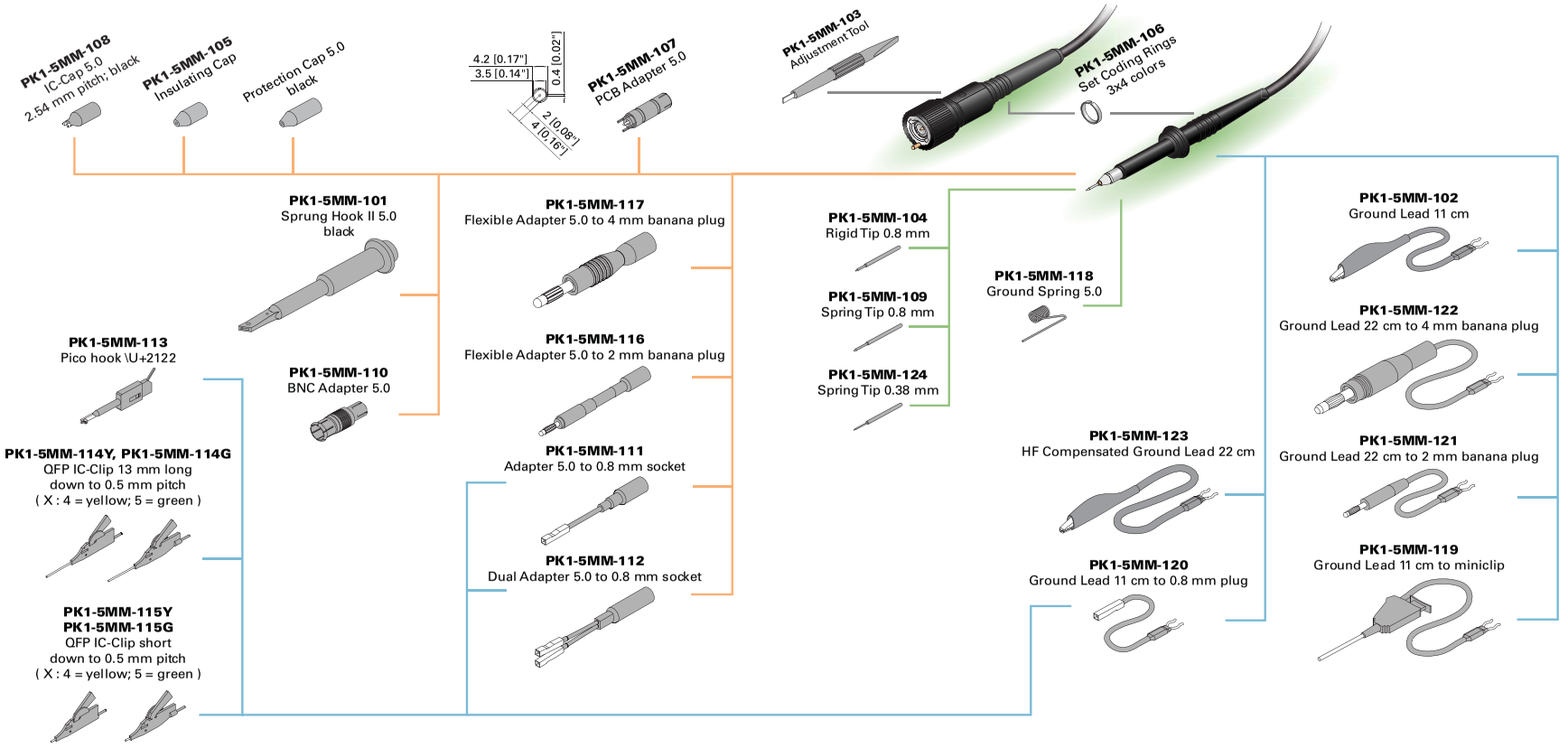
**Operates on channels in 6 GHz mode only*

PASSIVE PROBES ACCESSORIES

ORDERING INFORMATION	PRODUCT CODE
PK001 – Standard Probe Accessory for PP002	
Ground Lead PP002	PP001/002-1
Probe Tip to BNC adapter	PP001/002-2
Sprung Hook PP002	PP001/002-3
M/F Lead – Long (4")	
M/F Lead – Short (2")	
PK102 – Standard Probe Accessory Kit for PP005/PP005	
Sprung Hook (Black)	PP005-HOOK
Spring Tip (0.38 mm)	PP005-ST38
Spring Tip (0.8 mm)	PP005-ST8
Rigid Tip (0.8 mm)	PP005-RT
Probe Tip to BNC Adapter	PP005-BNC
Ground Lead (11 cm)	PP005-GL11
Ground Lead (22 cm)	PP005-GL22
Ground Lead (Spring)	PP005-GLPT
IC Insulating Tip	
Probe Tip to BNC Adapter	
Adjustment Screw Driver	
PPK106 – SMT Accessories for PP005/PP005A, PPExkV	
Dual Lead Adapter	PK106-1
Single Lead Adapter	PK106-2
0.5 mm Clip (Orange)	PK106-3
Probe Tip to PCB Adapter	PK106-4
M/F Lead – Long (4")	PK106-5
M/F Lead – Short (2")	PK106-6
0.5 mm Clip (Yellow)	PK106-8
PK101 – Microclip Accessory Kit for PP005/PP005A	
Single Lead Adapter	PK106-2
QFPIC Clip (0.5 mm Pitch)	PACC-CL001
PK116 – Standard Probe Accessory Kit for PP006/PP006A	
Sprung Hook	PK116-1
Ground Lead	PK116-2
Ground Pin	PK116-3
Insulating Tip	
Screw Driver	
PK006 – SMT Accessories for PP006/PP006A	
Dual Lead Adapter PK006	PK006-1
Single Lead Adapter PK006	PK006-2
0.5 mm Clip (Black and Red)	PK006-3
0.8 mm Clip (Black and Red)	PK006-4
M/F Lead – Long (4")	
M/F Lead – Short (2")	

PASSIVE PROBES ACCESSORIES

ORDERING INFORMATION	PRODUCT CODE
PKIT1-5MM-102 – Basic Adapter Kit for PP009	
Sprung Hook	PK1-5MM-101
Standard Ground Lead	PK1-5MM-102
Adjustment Tool	PK1-5MM-103
Rigid Tip, 0.8 mm	PK1-5MM-104
IC Cap, 2.54 mm pitch	PK1-5MM-108
Spring Tip 0.8 mm (Qty. 6)	PK1-5MM-109
BNC Adapter	PK1-5MM-110
Adapter, 4 mm plug	PK1-5MM-117
Ground Spring	PK1-5MM-118
High Frequency Compensated Ground Lead	PK1-5MM-123
Spring Tip 0.38 mm (Qty. 5)	PK1-5MM-124
PKIT1-5MM-101 – Micro Clip Kit for PP009	
Single Lead Adapter	PK1-5MM-111
Microclip Long, Green	PK1-5MM-114G
Microclip Long, Yellow	PK1-5MM-114Y
Microclip Short, Green	PK1-5MM-115G
Microclip Short, Yellow	PK1-5MM-115Y
PKIT2-5MM-101 – Standard Accessory Kit for PP010	
Sprung Hook	PK2-5MM-101
Standard Ground Lead	PK2-5MM-102
Adjustment Tool	
Ground Attachment	
IC Test Tip	
Color Coding Rings (set)	



Passive Probe Accessories PP005, PP009, and PP011 Series



PP007-WR-1

PP007-WS-1

PP008-1

PASSIVE PROBES

The PP007 and PP008 embody leading edge technology in passive probe design. A rugged, general-purpose probe, its small size is optimized for maximum waveform fidelity. The small 2.5 mm ground sleeve provides superior visibility, as well as a greater ability to probe dense circuits than traditional 3.5 mm and 5 mm probes. Its sharp probe tip* is spring loaded, allowing it to retract into the narrow probe head. Low input capacitance and low inductance optimize functionality in high frequency applications. For best performance, the PP007-WR-1 version is designed to be used with the WaveRunner 6000A Series, while the PP007-WS-1 version is designed for the WaveSurfer 400 Series. The PP008-1 is designed for use with the WaveRunner Xi Series.

Features:

- Compact probe head
- Fine pitch SMD probing support
- Rugged, sharp tip
- HF optimized connection accessories
- Over 30 accessories
- Low input capacitance

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

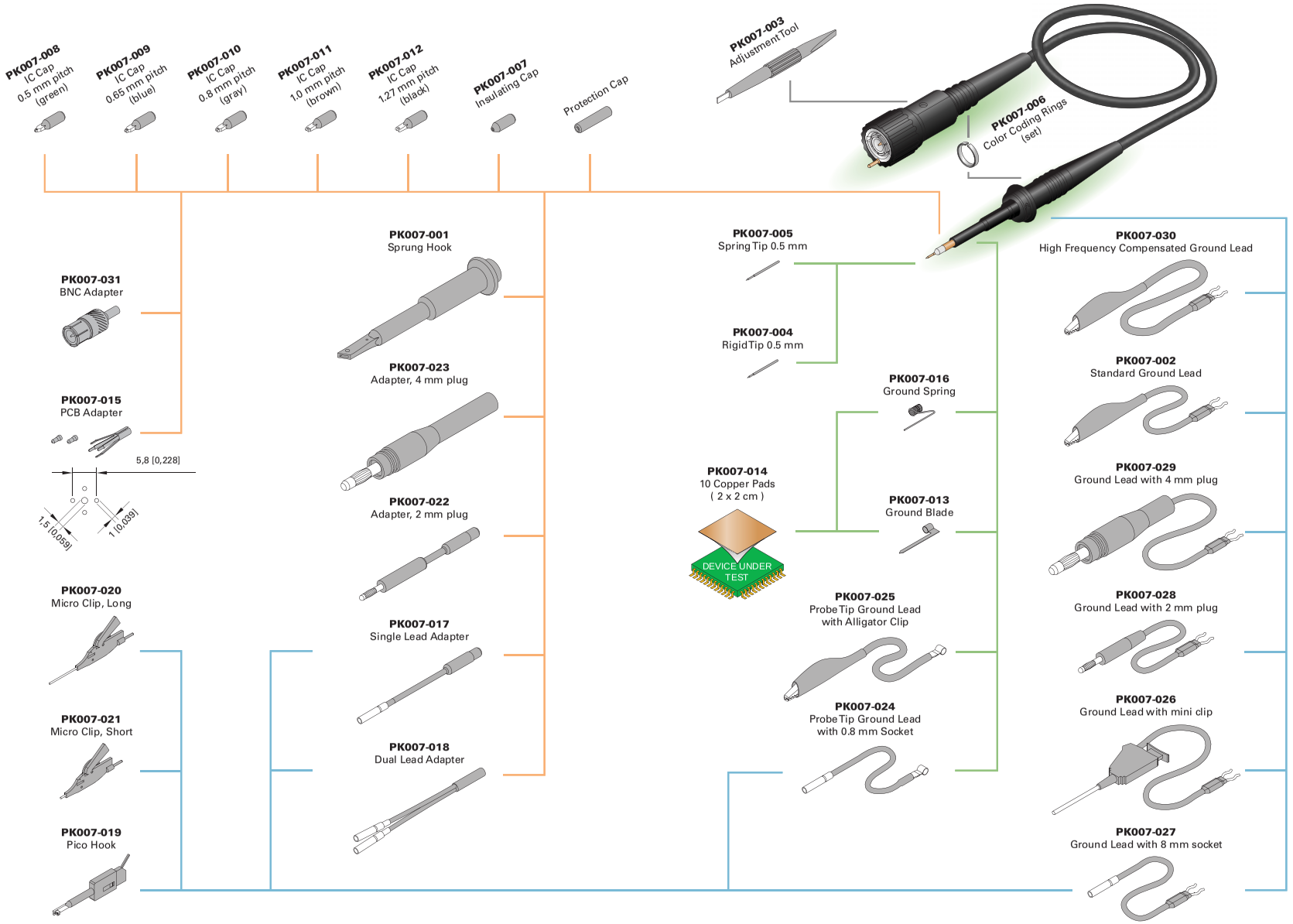
Attenuation	÷ 10
Bandwidth	> 500 MHz
Input R	10 MΩ
Input C	9.5 pF
Max. Input Voltage	400 V CAT I (1250 V surge) 300 V CAT II

GENERAL CHARACTERISTICS

Ground Sleeve Diameter	2.5 mm
Input Pin Diameter	0.5 mm
Cable Length	1.3 m

ORDERING INFORMATION	PRODUCT CODE
Basic Adapter Kit	PK701
Advanced Adapter Kit	PK702
SMD Adapter Kit	PK703
Microclip Kit	PK704
÷10 HiZ 500 MHz Passive Probe for WaveRunner Xi Series Oscilloscopes	PP008-1
÷10 HiZ 500 MHz Passive Probe for WaveRunner 6000A Series Oscilloscopes	PP007-WR-1
÷10 HiZ 500 MHz Passive Probe for WaveSurfer 400 Series Oscilloscopes	PP007-WS-1
Instruction Manual	PP007-OM-E

* A rigid tip is included



Passive Probe Accessories for PP007 and PP008 Series

PASSIVE PROBE ACCESSORIES

ORDERING INFORMATION PP007 AND PP008					PRODUCT CODE
PROBE ACCESSORIES	PK701	PK702	PK703	PK704	
Sprung Hook	2	1			PK007-001
Standard Ground Lead	2	1			PK007-002
Adjustment Tool	1	1			PK007-003
Rigid Tip	2	2			PK007-004
Spring Tip	2	1	2		PK007-005
Color Coding Rings (3 Red, 3 Yellow, 3 Blue, 3 Green)		2			PK007-006
Insulating Cap		2	2		PK007-007
IC-cap for 0.5 mm Pitch		1	2		PK007-008
IC-cap for 0.65 mm Pitch		1	2		PK007-009
IC-cap for 0.8 mm Pitch		1	2		PK007-010
IC-cap for 1.0 mm Pitch		1	2		PK007-011
IC-cap for 1.27 mm Pitch		1	2		PK007-012
Ground Blade		1	2		PK007-013
Copper Pad		1	2		PK007-014
PCB-adapter		5		1	PK007-015
Ground Spring	2	1	1		PK007-016
Single Adapter Lead			1	1	PK007-017
Dual Adapter Lead		1	1	1	PK007-018
Pico Hook		2			PK007-019
Microclip Long 0.5 mm		2	1	2	PK007-020
Microclip Short 0.5 mm		2	1	2	PK007-021
Adapter 2 mm Plug					PK007-022
Adapter 4 mm Plug					PK007-023
Probe Tip Ground Lead w/0.8 mm Socket		1	1		PK007-024
Probe Tip Ground Lead w/Alligator-clip					PK007-025
Ground Lead with Miniclip		1			PK007-026
Ground Lead with 0.8 mm Socket		1	1		PK007-027
Ground Lead with 2 mm Plug					PK007-028
Ground Lead with 4 mm Plug					PK007-029
HF-compensated Ground Lead		1	1		PK007-030
BNC-adapter		2			PK007-031
Product Description Brochure	1	1	1	1	PK007-032

ACTIVE VOLTAGE PROBES

ZS SERIES HIGH IMPEDANCE ACTIVE PROBES

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 1 GHz and lower.

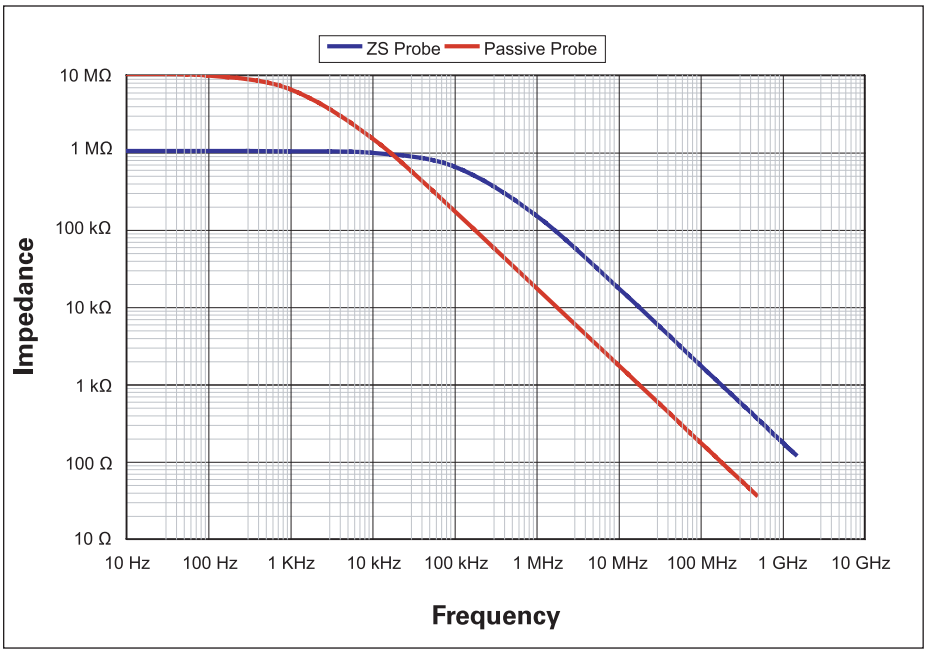
HIGH IMPEDANCE REDUCES CIRCUIT LOADING ACROSS FULL OSCILLOSCOPE BANDWIDTH

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.



ZS1500

ZS1000



Passive probes are great for low frequency measurements; however, the input capacitance reduces impedance above 1 kHz. The 1 MΩ input resistance and 0.9 pF capacitance of the ZS probe provide high impedance across the entire probe bandwidth making it the ideal tool for all your probing needs.

ACTIVE VOLTAGE PROBES

A VARIETY OF PROBE TIPS FOR VARIED TASKS

Engineers often need to probe a variety of different test points in confined spaces. The extensive range of standard and optional tip accessories for the ZS Series of probes ensures that this probe can meet any difficult probing challenge. Various flexible leads and clips, such as right-angle leads, Y-adapters, and pico hooks, are also available for probing test points that are spaced farther apart.

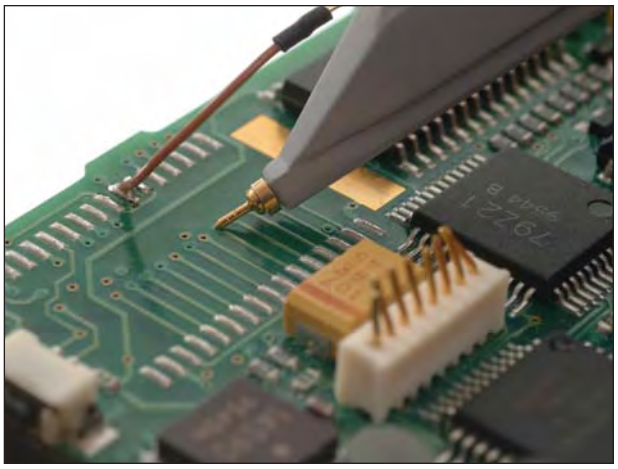
INNOVATIVE GROUNDING SOLUTIONS PROVIDE THE HIGHEST SIGNAL FIDELITY AND EASIEST CONNECTIONS

Making a good ground connection is just as Keeping the ground loop short is critical to eliminating the effect of high inductance on the signal. The ZS Series of probes provides several grounding capabilities to offer the highest signal fidelity by shortening the ground loop and eliminating the effect of that loop on the signal. The standard Offset ground lead is a "twisted-Z" shape for probing signal and ground points that are extremely close together. The standard ground blade and copper pad provide the shortest ground loop possible, and provide a pulse response that cannot be achieved with traditional long ground leads. A variety of other ground connections are available for nearly any type of probing requirement.

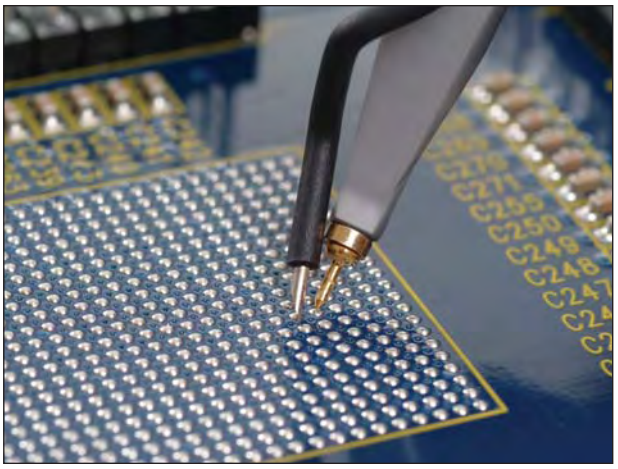
SPECIFICATIONS	ZS1000	ZS1500
ELECTRICAL CHARACTERISTICS		
Bandwidth (probe only)	1 GHz	1.5 GHz
Bandwidth (system)	600 MHz at probe tip with 600 MHz oscilloscope	1 GHz at probe tip with 1 GHz oscilloscope
Input Capacitance	0.9 pF	0.9 pF
DC Input Resistance	1 MΩ	1 MΩ
Probe Offset Range	NA	±12 V
Attenuation	÷10	÷10
Input Dynamic Range	±8 V	±8 V
Non-Destruct Voltage	20 V	20 V
GENERAL CHARACTERISTICS		
Cable Length	1.3 m	1.3 m
INCLUDED WITH STANDARD CONFIGURATION		
Instruction Manual, English		
Color Coding Clips (set of 4 colors)		
Certificate of Calibration		
1-Year Warranty		
Straight Probe Tip (PK-ZS-001)	4	4
Offset Ground (PK-ZS-002)	2	2
Short Lead (PK-ZS-003)	1	1
Long Lead (PK-ZS-004)	1	1
Y Lead Adapter (PK-ZS-005)	1	1
Right Angle Connector (PK-ZS-006)	1	1
Sprung Hook Red (PK-ZS-007R)	1	1
Sprung Hook Black (PK-ZS-007B)	1	1
Ground Blade (PK-ZS-008)	1	1
Copper Pad (PK-ZS-009)	2	2
Color Coding Rings (PK-ZS-010)	4 (sets)	4 (sets)

ACTIVE VOLTAGE PROBES

EXTENSIVE SET OF PROBE TIPS AND GROUND LEADS FOR A WIDE RANGE OF PROBING SCENARIOS



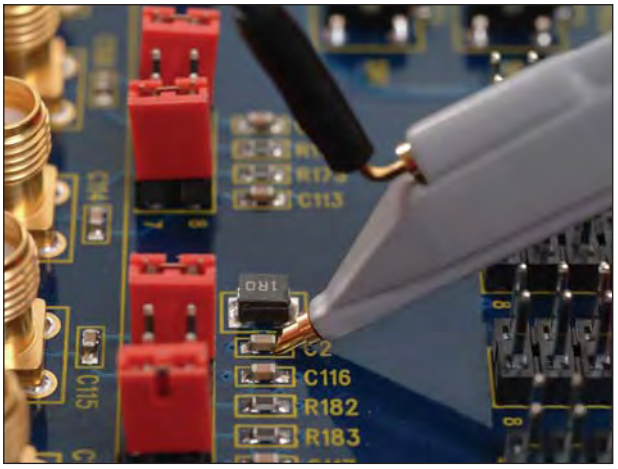
Use the Solder-In Ground with Straight Tip for general purpose browsing.



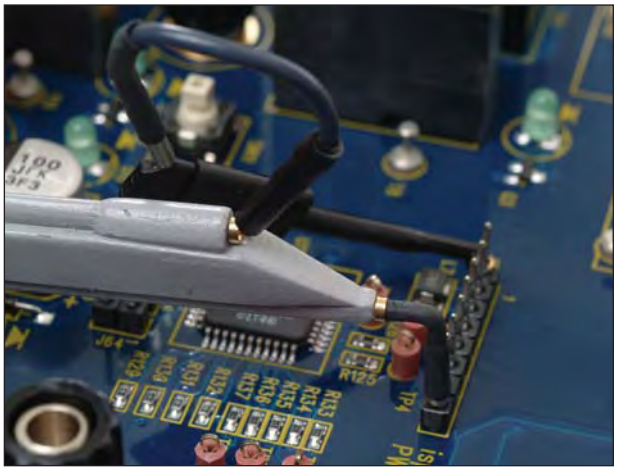
The Straight Tip and Offset Ground Lead can be used together for probing signal and ground points extremely close together.



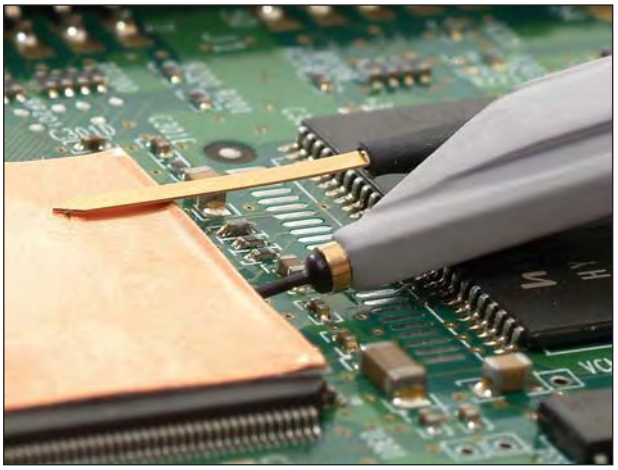
Hard-to-reach spaces can be be probed with the Bent Sharp Tip and can be used with a range of ground leads like the flexible Short Right-angle Lead shown here.



Probe directly on surface mount components, like resistors or capacitors, with the Discrete SMD Tip. Use this tip with any of the ground leads, like the flexible Long Right-angle Lead shown here.



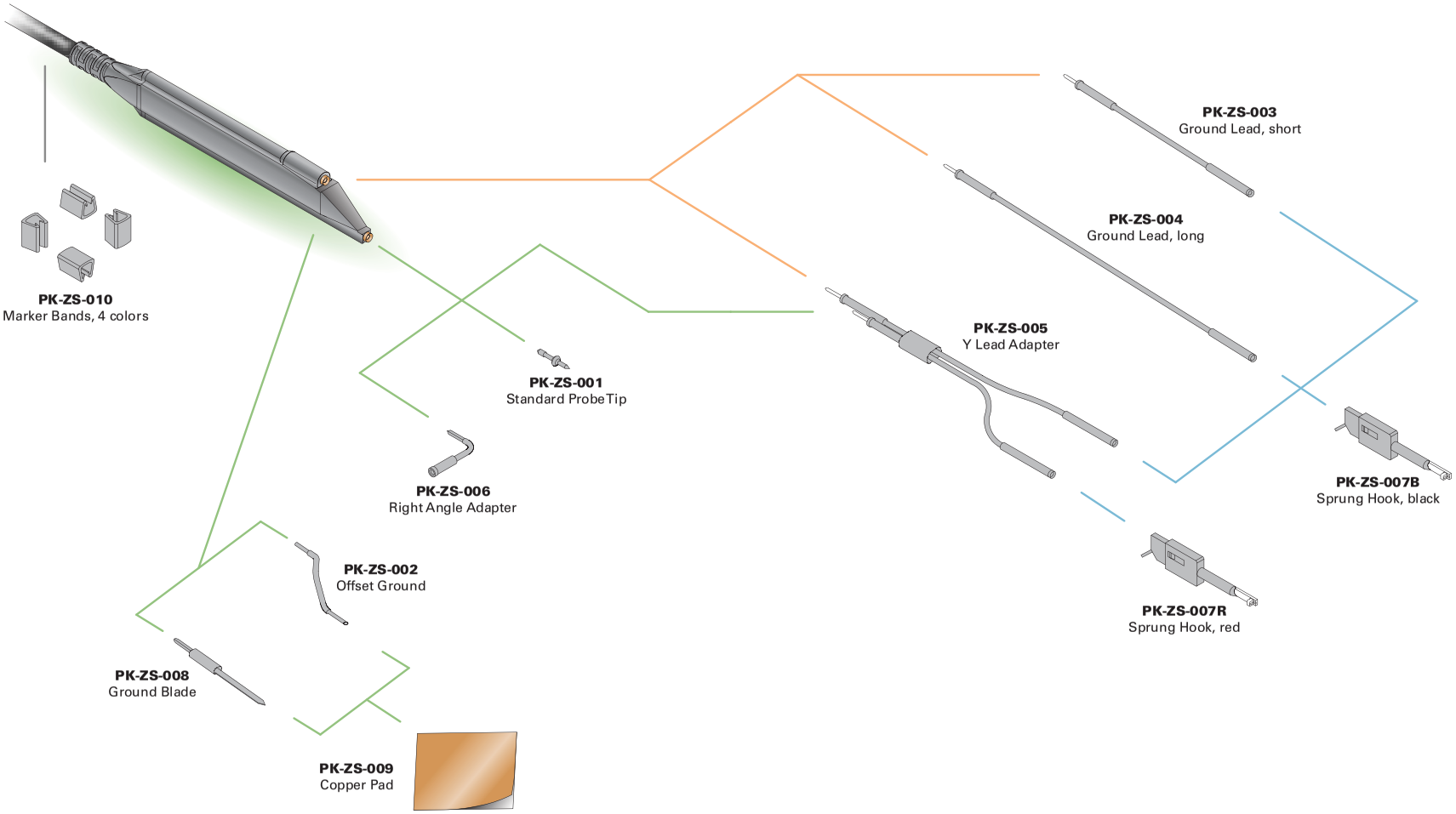
Use the Right-angle Connector and the Sprung Hook to probe square pins spaced far apart from each other.



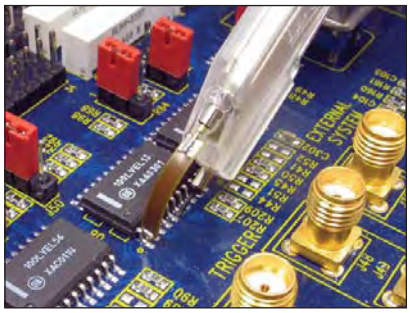
The Ground Blade and Copper Pad provide the shortest ground loop for excellent signal fidelity when probing an IC. Use them with the insulated IC Lead Tip to prevent shorting between test points.

ACTIVE VOLTAGE PROBES

ORDERING INFORMATION	PRODUCT CODE
(Set of 4) ZS1500 Active Probes	ZS1500-QUADPAK
(Set of 4) ZS1000 Active Probes	ZS1000-QUADPAK
1.5 GHz, 1 MΩ, 0.9 pF Active Probe	ZS1500
1 GHz, 1 MΩ, 0.9 pF Active Probe	ZS1000
REPLACEMENT ACCESSORIES	
Replacement Accessory Kit for ZS Series Probes	PK-ZS
Straight Probe Tip	PK-ZS-001
Offset Ground	PK-ZS-002
Short Lead	PK-ZS-003
Long Lead	PK-ZS-004
Y Lead Adapter	PK-ZS-005
Right-Angle Connector	PK-ZS-006
Sprung Hook – Red	PK-ZS-007R
Sprung Hook – Black	PK-ZS-007B
Ground Blade	PK-ZS-008
Copper Pad	PK-ZS-009
Color Coding Rings	PK-ZS-010
AVAILABLE ACCESSORIES	
IC Lead Tip	PACC-PT003
Discrete SMD Tip	PACC-PT004
Bent Sharp Tip	PACC-PT005
Solder-In Ground	PACC-CD007
Bendable Pogo Ground	PACC-CD008
Ground Spring Hook	PACC-LD001
Square Pin Ground Spring	PACC-LD002
Short Right-angle Lead	PACC-LD003
Long Right-angle Lead	PACC-LD004



Accessories for ZS Series High Impedance Active Probes



HFP2500

HFP1500

HFP1000

ACTIVE VOLTAGE PROBES

HFP ACTIVE PROBES

LeCroy's series of HFP active probes are versatile, small and lightweight, yet still maintain the high bandwidth needed for accurate measurement. Five interchangeable tips facilitate access regardless of tight fits and difficult locations. The FreeHand probe holder brings added versatility, allowing several probes to be used at the same time on a variety of test points while maintaining the short paths needed to preserve signal fidelity. The HFP probes also offer AutoColor ID, which automatically illuminates the probe head in a connected oscilloscope's trace color. This unique capability eliminates the need to manually apply plastic rings or colored tape to determine which channel the probe is connected to.

Features:

- 1 GHz to 3.5 GHz bandwidth
- 0.7 pF input capacitance
- ±8 V dynamic range
- ±12 V offset range (except HFP1000)
- 5 interchangeable tips for probing a variety of test points
- Replaceable probe tip socket
- Hands-free probing with FreeHand probe holder
- AutoColor ID feature matches the channel trace color

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

BANDWIDTH (PROBE ONLY)

HFP1000	1 GHz
HFP1500	1.5 GHz
HFP2500	2.5 GHz
Input Capacitance	0.7 pF at 1 GHz
DC Input Resistance	100 kΩ
Input Dynamic Range	±8 V
Probe Offset Range	N/A **(HFP1000)** ±12 V **(HFP1500, HFP2500)**
Attenuation	÷10
Attenuation Accuracy	±1%
Output Zero	< 4 mV, referred to input
Offset Accuracy **(n/a for HFP1000)**	±(1% of offset value +4 mV)

GENERAL CHARACTERISTICS

Cable Length	1.3 m
Probe Head Size (LWH)	61 mm x 7.3 mm x 13.1 mm
Input Sockets	Signal and ground sockets compatible with 0.635 mm (0.025") square pins, 0.91 mm (0.036") maximum diameter (for round pins)

INCLUDED WITH STANDARD CONFIGURATION

Instruction Manual, English

Certificate of Calibration

1-year Warranty

ACTIVE VOLTAGE PROBES ACCESS.

INCLUDED WITH STANDARD CONFIGURATION

	HFP1000	HFP1500	HFP25000
Straight Tip	4	4	4
Sharp Tip	4	4	4
Bent Tip		4	4
Discrete SMD Tip		4	4
IC Lead Tip		4	4
Square Pin Ground Spring	1	1	1
Flexible IC Ground	1	1	1
Bendable Pogo Ground	1	1	2
Solder-In Ground	1	1	2
Short Single Lead		1	1
Long Single Lead		1	
Right-angle Short Single Lead	1	2	1
Right-angle Long Single Lead	1	2	1
Clips (0.8 mm)	2	2	2
FreeHand Probe Holder		1	1
Replaceable Cartridge	1	1	1
Microclips (0.5 mm)			2
Low C Tip Cartridge			1
Soft Accessory Case		1	1

ORDERING INFORMATION	PRODUCT CODE
1 GHz, 0.7 pF Active Probe (÷10), Small Form Factor	HFP1000
1.5 GHz, 0.7 pF Active Probe (÷10), Small Form Factor	HFP1500
2.5 GHz, 0.7 pF Active Probe (÷10), Small Form Factor	HFP2500
Standard Accessory Kit for HFP2500	PK108
Standard Accessory Kit for HFP1500	PK109
Standard Accessory Kit for HFP1000	PK110
Soft Accessory Case	SAC-01
Straight Tip	PACC-PT001
Sharp Tip	PACC-PT002
IC Lead Tip	PACC-PT003
SMD Discrete Tip	PACC-PT004
Bent Sharp Tip	PACC-PT005
Freehand Probe Holder	PACC-MS001
Replaceable Cartridge	PACC-MS002
Low C Cartridge	PACC-MS003
Solder-In Ground	PACC-CD007
Bendable Pogo Ground	PACC-CD008
Flexible IC Ground	PACC-CD009
Ground Spring Hook	PACC-LD001
Square Pin Ground Spring	PACC-LD002
Short Right-angle Lead	PACC-LD003
Long Right-angle Lead	PACC-LD004
Short Single Lead	PACC-LD005
Long Single Lead	PACC-LD006
0.8 mm Clips	PK006-4
Microclip	PACC-CL001
HFP1000 Instruction Manual, English	HFP1000-OM-E
HFP1500 Instruction Manual, English	HFP1500-OM-E
HFP2500 Instruction Manual, English	HFP2500-OM-E

HIGH-BANDWIDTH TRANSMISSION LINE



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

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS	
Bandwidth	DC to 7.5 GHz
Risetime	< 47 ps
Input C	< 0.20 pF
Input R	500 Ω (÷10 cartridge) 1000 Ω (÷20 cartridge)
Maximum Voltage	15 V rms
Cable Length	1 m



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

SPECIFICATIONS

Input R Ohm	500 Ω
Maximum Voltage	22 V
Compatibility	LCXXX, 93XX, LA314, LA354, WaveRunner, and WavePro Scopes
Bandwidth	1 GHz
Attenuation	100:1
Input Capacitance	1.5 pF

ORDERING INFORMATION	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

INCLUDED WITH PP066 PROBE	
PACC-AD001	SMA to BNC Adapter

DIFFERENTIAL PROBES

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.



AP034

AP033

Features for both probes:

- 500 MHz **(AP033)** and 1 GHz **(AP034)** bandwidths
- 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 2 MΩ II 0.85 pF between inputs	1 MΩ each input to ground 2 MΩ differential between inputs
Differential Mode Range	±400 mV (x1) ±4 V (÷10) ±8 V (÷20)	±400 mV (x1) ±40 mV (x10) ±4 V (÷10) ±40 V (÷100)
Offset Range	±1.6 V (x1) ±16 V (±10) ±32 V (±20)	±400 mV (x1, x10) ±4 V (±10) ±40 V (±100)
Common-Mode Range	±16 V (x1) ±42 V (±10) +42 V (±20)	±42 V peak (±10) +4.2 V peak (±100)
CMRR	70 Hz 10,000:1 (80 dB) 1 MHz 100:1 (40 dB) 100 MHz 18.1 (25 dB) 500 MHz 9:1 (19 dB)	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)

DIFFERENTIAL PROBES

SPECIFICATIONS (CONTINUED)

	AP034/AP033
Max. Nondestruct Voltage	±200 VDC continuous
Cable Length	1.2 m
Operating Temperature	0 °C to 50 °C
Standard Accessories	÷10 Plug-on Attenuator ÷20 Plug-on Attenuator **(AP034 only)** Plug-on AC Coupler
Probe Connection Accessory Kit	Flex Lead Set (1) Input 'Y' Lead (1) Mini Clip, 0.8 mm (3) Mini Clip, 0.5 mm (2) Ground Lead (1) Offset Pins, Round (4) Square Pin Header Strip (1)
Warranty	1 year

PK033 – Standard Probe Accessory Kit for AP033/AP034

Dual Lead	AP03X-FLEX-LEAD
Single Lead	NA
Offset Pin (package of 10)	AP03X-OFFSET-PIN
0.5 mm Clip (red and black)	PK006-3
0.8 mm Clip (red and black)	PK006-4
1x6 Square Pin Header	NA

Other Accessories for AP033/AP034

AC Coupler	AP03X-AC-COUPLER
÷10 Attenuator for AP033	AP033-ATTN
÷10 Attenuator for AP034	AP034-DA10
÷20 Attenuator for AP034	AP034-DA20

ORDERING INFORMATION

	PRODUCT CODE
1 GHz Active Differential Probe (÷1, ÷10, ÷20)	AP034
500 MHz Active Differential Probe (x10, ÷1, ÷10 or ÷100)	AP033

HIGH VOLTAGE PASSIVE 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



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 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 2 kV max. Voltage DC and Peak AC	PPE2KV
÷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
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. 4mm safety ground lead, and green/yellow crocodile clip.
† Probe Kit: trimming tool, and ground lead with a crocodile clip.

HIGH VOLTAGE DIFFERENTIAL PROBES



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 MΩ input oscilloscope

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
Power Source (four AA batteries)	56 dB @ 200 kHz

ORDERING INFORMATION	PRODUCT CODE
700 V, 15 MHz Differential Probe (÷10, ÷100)	AP031



ADP305

ADP300

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

HIGH VOLTAGE DIFFERENTIAL PROBES

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

STANDARD ACCESSORIES

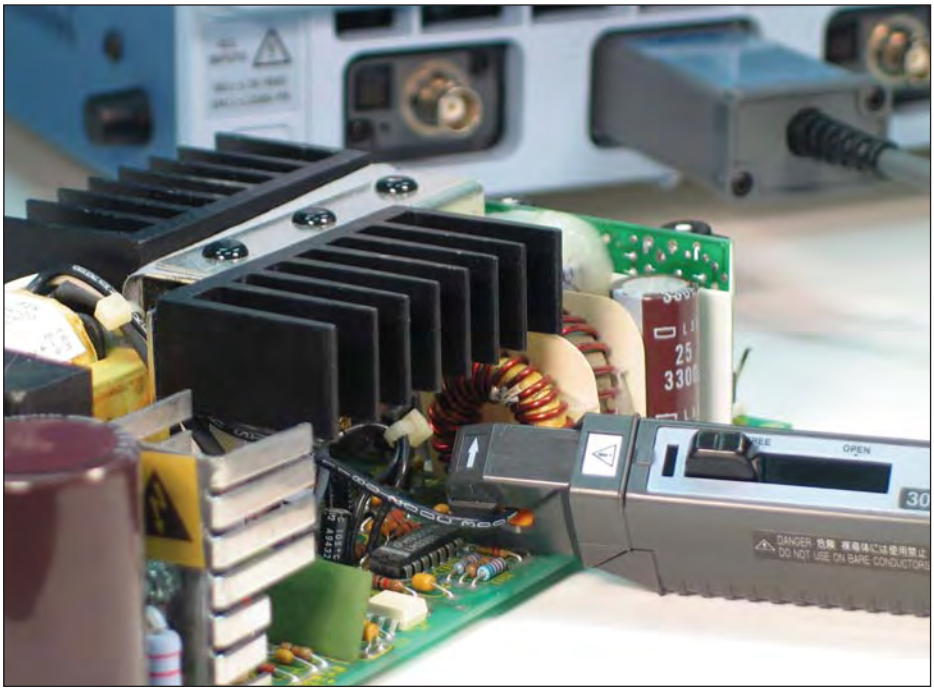
ADP305	
	All ADP300 Accessories
	Safety Spade (1 Red, 1 Blue)
	Plunger Clamp Clip (1 Red, 1 Blue)
	Plunger Jaw Clip (1 Red, 1 Blue)
	Safe Alligator Clip (1 Red, 1 Blue)
	Soft Accessory Case
ADP300	
	Instruction Manual
	Certification of Calibration
	Plunger Hook Clip (1 Red, 1 Blue)
	Straps for Holding Probe

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

ORDERING INFORMATION

	PRODUCT CODE
1,400 V, 100 MHz High-Voltage Differential Probe	ADP305
1,400 V, 20 MHz High-Voltage Differential Probe	ADP300

CURRENT PROBES



Accurately measure AC, DC, and impulse currents.

MEASURE CURRENTS IN A WIDE RANGE OF APPLICATIONS

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.

CURRENT PROBES

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 to 50 A. The CP031 features a small form factor making it easier to probe on a crowded, compact board.

Features:

- 100 MHz bandwidth
- Small form factor accommodates large conductors with small jaw size
- 30 A_{rms} continuous current, 50 A_{peak} current



CP031

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.

Features:

- Small form factor accommodates large conductors with small jaw size
- 30 A_{rms} continuous current, 50 MHz bandwidth
- 50 A_{peak} current



CP030

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 overheating 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.

Features:

- 30 A_{rms} continuous current, 50 MHz bandwidth
- 50 A_{peak} current for up to 10 seconds
- Overheating and Probe Unlock Detection



AP015

CP150 – 150 A, 10 MHz

Features:

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



CP150

CP500 – 500 A, 2 MHz

Features:

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



CP500

CURRENT PROBES

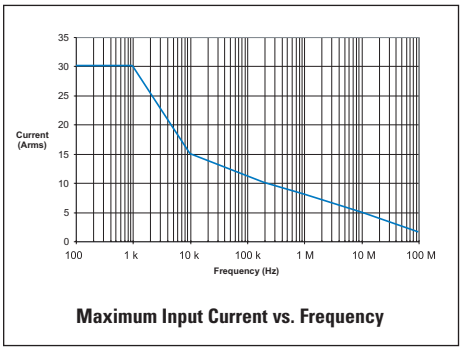
SPECIFICATIONS	CP031*†	CP030*†
ELECTRICAL CHARACTERISTICS		
Max. Continuous Input Current	30 A	30 A
Bandwidth	100 MHz	50 MHz
Max. Peak Current at Pulse Width	50 A ≤ 10 µs	50 A ≤ 10 µs
Rise Time (typical)	≤ 3.5 ns	≤ 7 ns
Minimum Sensitivity	20 mA/div	20 mA/div
Max. In-Phase Current	–	–
Low-Frequency Accuracy	1%	1%
AC Noise	≤ 2.5 mA	≤ 2.5 mA
Coupling	AC, DC, GND	AC, DC, GND
GENERAL CHARACTERISTICS		
Cable Length	1.5 m	1.5 m
Weight	240 g	240 g
Max. Conductor Size (diameter)	5 mm	5 mm
Interface	ProBus, 1 MΩ only‡	ProBus, 1 MΩ only‡
Usage Environment	Indoor	Indoor
Operating Temperature	0 °C to 40 °C	0 °C to 40 °C
Max. Relative Humidity	80%	80%
Max. Altitude	2000 m	2000 m
Maximum Insulated Wire Voltage	300 V CAT I, 150 V CAT II	300 V CAT I

* 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.

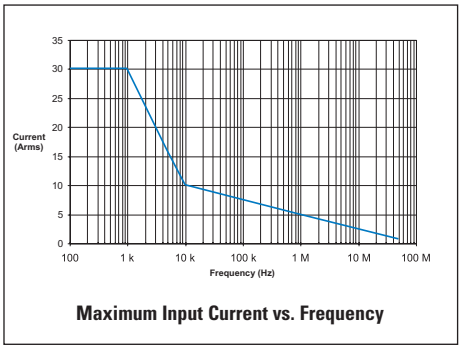
ORDERING INFORMATION	PRODUCT CODE
30 A; 100 MHz Current Probe – AC/DC; 30 A_{rms}; 50 A_{peak} Pulse	CP031
30 A; 50 MHz Current Probe – AC/DC; 30 A_{rms}; 50 A_{peak} Pulse	CP030
30 A; 50 MHz Current Probe – AC/DC; 30 A_{rms}; 50 A_{peak} Pulse	AP015
150 A; 10 MHz Current Probe – AC/DC; 150 A_{rms}; 500 A_{peak} Pulse	CP150
500 A; 2 MHz Current Probe – AC/DC; 500 A_{rms}; 700 A_{peak} Pulse	CP500

CP031 – 30 A, 100 MHz



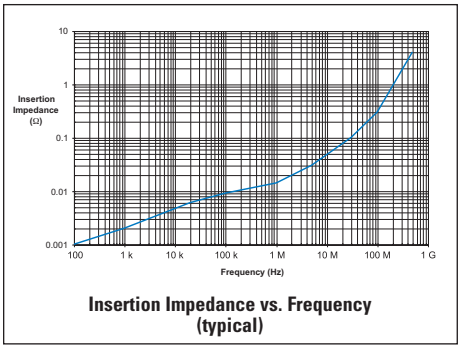
Maximum Input Current vs. Frequency

CP030 – 30 A, 50 MHz



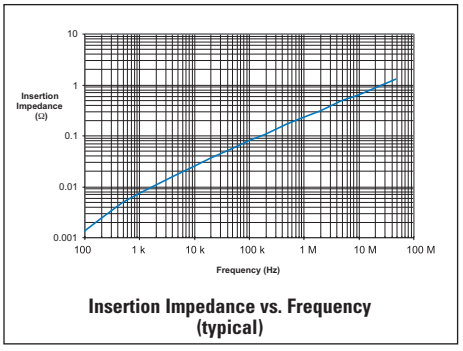
Maximum Input Current vs. Frequency

CP031 – 30 A, 100 MHz



Insertion Impedance vs. Frequency (typical)

CP030 – 30 A, 50 MHz



Insertion Impedance vs. Frequency (typical)

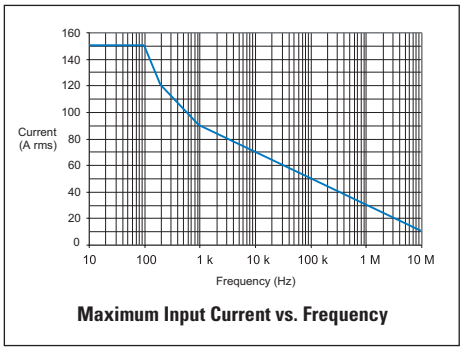
CURRENT PROBES

AP015	CP150	CP500
30 A	150 A	500 A
50 MHz	10 MHz	2 MHz
50 A ≤ 10 s	500 A ≤ 30 µs	700 A
≤ 7 ns	< 35 ns	< 175 ns
10 mA/div	200 mA/div	200 mA/div
–	500 A	1150 A
1%	1%	1%
	≤ 25 mA	25 mA
AC, DC, GND	AC, DC, GND	AC, DC, GND
2 m	2 m	6 m
300 g	500 g	630 g
5 mm	20 mm	20 mm
ProBus, 1 MΩ only‡	ProBus, 1 MΩ only‡	ProBus, 1 MΩ only‡
Indoor	Indoor	Indoor
0 °C to 40 °C	0 °C to 40 °C	0 °C to 40 °C
80%	80%	80%
2000 m	2000 m	2000 m
300 V CAT I	600 V CAT II, 300 V CAT III	600 V CAT II, 300 V CAT III

* Guaranteed at 23 °C ±3 °C

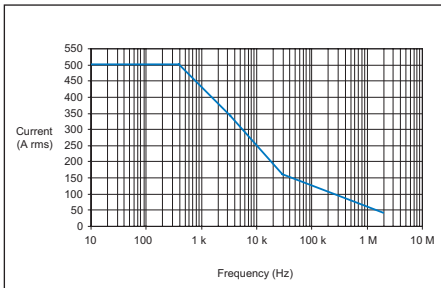
† The CP031 and CP030 are compatible with LeCroy X-Stream oscilloscopes running firmware version 4.3.1.1 or greater.
‡ Requires AP-1M for use with 50 Ω input only oscilloscopes.

CP150 – 150 A, 10 MHz



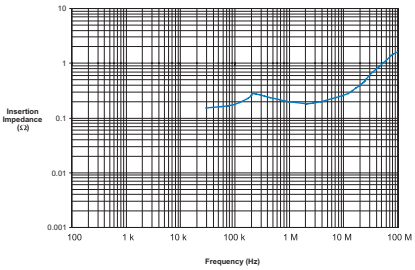
Maximum Input Current vs. Frequency

CP500 – 500 A, 2 MHz



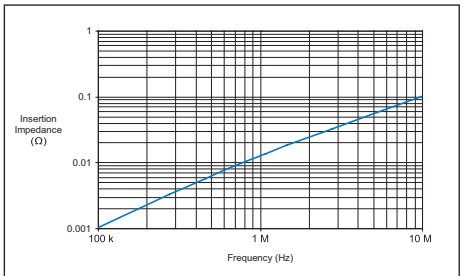
Maximum Input Current vs. Frequency

AP015 – 30 A, 50 MHz



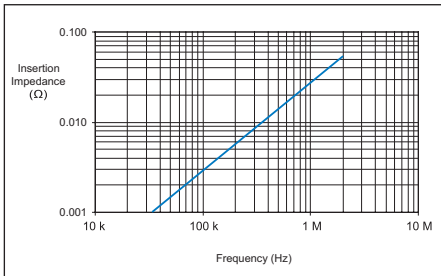
Insertion Impedance vs. Frequency (typical)

CP150 – 150 A, 10 MHz



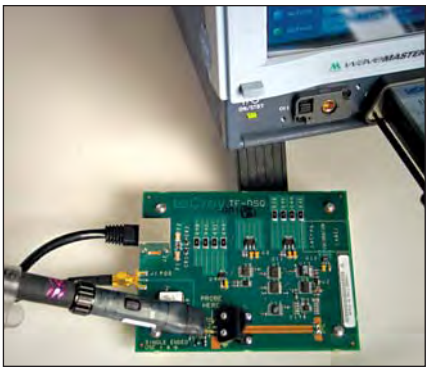
Insertion Impedance vs. Frequency (typical)

CP500 – 500 A, 2 MHz



Insertion Impedance vs. Frequency (typical)

PROBE DESKEW AND CALIBRATION



TF-DSQ

The TF-DSQ fixture facilitates calibration of timing measurements in single-ended and differential probes—a unique concern in high-speed measurements. By requiring only one connection of a probe to the fixture and one button press, the TF-DSQ ensures probe calibration results that are valid for the duration that the probe is connected to the circuit. An extremely fast edge with 75 ps risetime combines with probe gain and offset calibration capabilities for added accuracy.

Features:

- Deskews to ±20 ps typical accuracy
- Differential and single-ended drive
- 75 ps edge for precise deskewing
- Calibrates gain, offset and skew at the same probing point
- Accounts for risetime variations
- Accounts for common-mode voltage variations
- DC gain calibration accounts for probe loading effects
- Integrated operation with scope for fully automatic calibration

SPECIFICATIONS

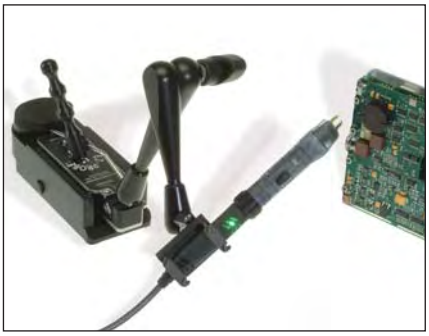
SCOPE COMPATIBILITY	SCOPES
(requires software version 3.6.0 or later)	WaveMaster **(WM8420A and WM8620A including all WaveMaster XXL models)**
	Serial Data Analyzers **(SDA 18000, SDA 11000, SDA 9000, SDA 4020, and SDA 6020 including all SDA XXL models)** Disk Drive Analyzers **(DDA 5005A and 5005A XXL)**
Scope Connection	ProLink
Probes Supported	WL600 and WL300 with all Probing Accessories PP **AP033, AP034, PP066 HFP1000, HFP1500, HFP2500, ZS1500, ZS1000, D11000PS, DA18000**
DC Range	±5 V Single-ended, ±10 V Differential
DC Accuracy	±(1% + 600 µV)
Edge Risetime	75 ps (typical) < 95 ps (guaranteed)
Edge Amplitude and Rep Rate	Approximately 800 mV @ 10 MHz
Deskew Accuracy	±20 ps (typical)

ORDERING INFORMATION	PRODUCT CODE
Probe Deskew and Calibration Fixture	TF-DSQ
Included: ProLink Extender 48" 50 ohm Cable with Male SMA Connectors Calibration Certificate Operator's Manual Soft Accessory Case	

EZ PROBE POSITIONER

The EZ-Probe Positioner provides stable, accurate X, Y and Z positioning in one fluid motion. Its unique 3-D joystick, with 3:1 motion reduction and single-clutch, fully-articulating arm, allow simple, precise positioning in anything from card cages to MCMs. Any current handheld probes can be easily attached, facilitating the measurement process and ensuring more precise connectivity.

ORDERING INFORMATION	PRODUCT CODE
Cascade Microtech EZ-Probe Positioner	EZ PROBE



EZ PROBE

ADPPS

Power Adapter for AP033, AP034 and HFP1000 Active Probes; allows the probe's output to be connected to other non-ProBus test equipment, including spectrum and network analyzers.

ORDERING INFORMATION	PRODUCT CODE
ProBus-to-BNC and Power Adapter for AP033, AP034, and HFP Series (BW limited to 1 GHz)	ADPPS



ADPPS

TRANSIT CASE

Soft Accessory Case for probes—features inside flap for storing manuals, plus roomy interior for a probe and its many accessories.

ORDERING INFORMATION	PRODUCT CODE
Soft Accessory Case for Probes	SAC-01



SAC-01