

DH Series Probes (13 GHz – 25 GHz)



Key Features

Bandwidth models from 13 GHz to 25 GHz

Low loading and high impedance for minimal signal disturbance

Wide variety of tips:

- Standard and high-sensitivity 25 GHz solder-in tips
- High-temperature solder-in tip with 1-meter lead
- QuickLink adapter for mixed-signal probing

Built-in tip identification for simple setup and precise signal reproduction

Ideal for debug and validation of:

- DDR3/LPDDR3
- DDR4/LPDDR4
- DDR5/LPDDR5
- Other high-speed serial interfaces

The DH series of 13 to 25 GHz active differential probes provides high input dynamic range, large offset capability, low loading and excellent signal fidelity with a range of connection options.

General Purpose Probing up to 25 GHz

Teledyne LeCroy's DH series of 13 GHz to 25 GHz differential probes offer the combination of bandwidth, input range and offset to capability to address any high-speed probing requirement - from debugging serial data interfaces to validating DDR memory systems.

Exceptional Signal Fidelity

DH series probes provide superior loading characteristics and are calibrated with a custom "fine-tuned" frequency response. The ultra-low loading and flat frequency response ensure accurate measurements.

Wide Variety of Tips

Two 25 GHz solder-in leads let you choose between a 3.5 Vpp input range for general-purpose applications, or high sensitivity with exceptionally low noise. Also available are a 1-meter long 16 GHz high-temperature tip and a QuickLink adapter for connecting mixed-signal probe tips.

Tip Identification

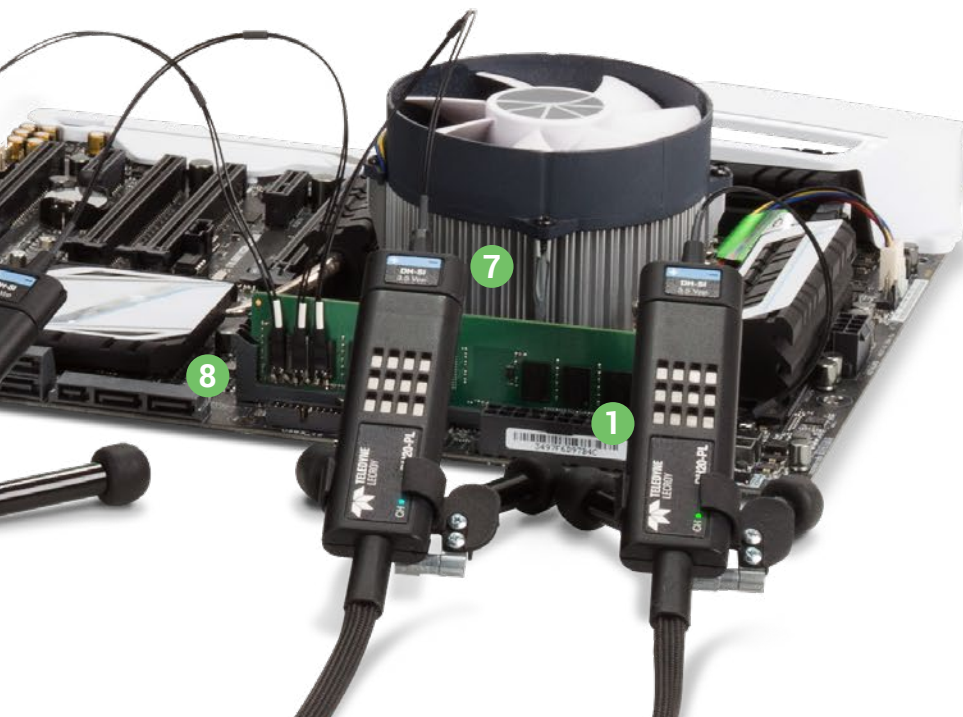
Each DH series tip has its own data onboard - the oscilloscope software automatically selects the correct tip type and precisely corrects for its effects. The result is superior signal fidelity and superior ease-of-use.

SUPERIOR SIGNAL FIDELITY AND EASE OF USE

The DH series of differential voltage probes combine a set of innovative features that make accessing high-speed signals easy with up to 25 GHz bandwidth, exceptionally low noise and superior loading characteristics.



1. **Up to 25 GHz bandwidth** with wide input voltage range and offset capabilities
2. **Tip identification** eliminates setup errors by automatically detecting tip type
3. **Onboard tip calibration data** optimizes signal fidelity and accuracy
4. **Exceptional noise performance** for cleaner signals and better measurements
5. **Superior loading characteristics** mean probe does not impact device performance
6. **Compact one-piece design** with a low-profile amplifier reduces clutter
7. **Robust mechanical design** for excellent tip retention and long-term reliability
8. **Small tip geometry and long leads** for embedded systems with DDR memory and other high-density components



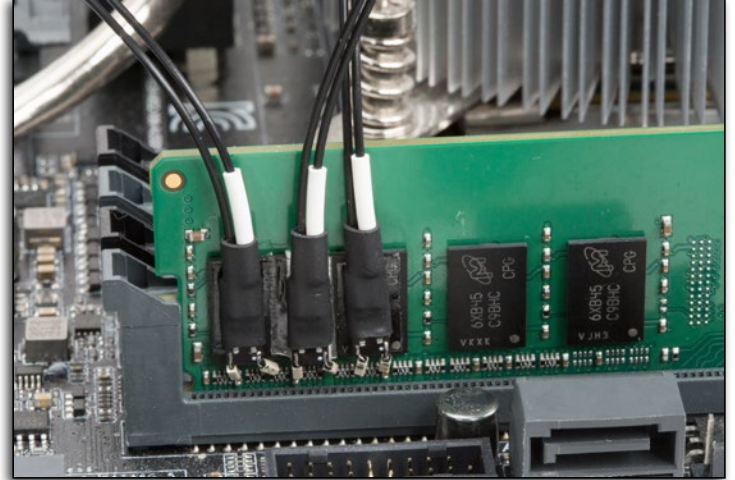
WIDE VARIETY OF TIPS

The same solder-in, high-temperature and QuickLink tips are compatible with all DH series probes and can be interchanged between any probes in the series for ultimate flexibility in the lab. Each tip contains its own identification and calibration data for accurate signal reproduction and superior ease of use.

Solder-In Tips (DH-SI and DH-SI-HS)

The 25 GHz DH series solder-in tips are extremely small to facilitate access to signals on tightly-packed boards, with a 9-inch lead length to help reach difficult probing points.

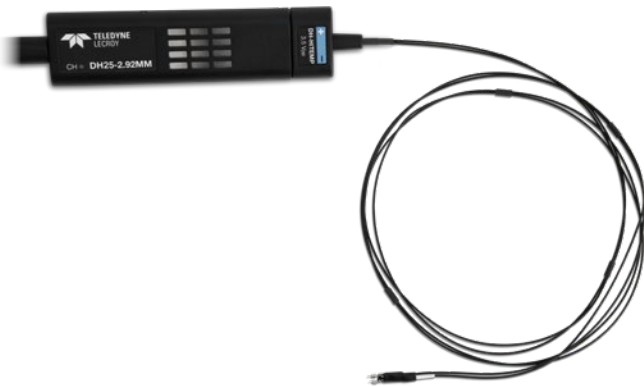
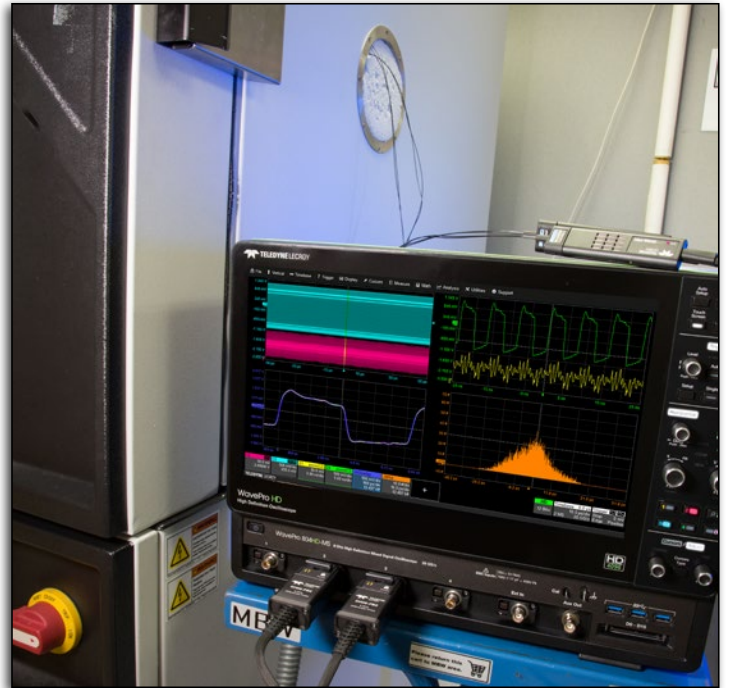
The standard DH-SI tip has a 3.5 Vpp input range, perfect for DDR memory and other general-purpose, high-speed serial signal applications. For smaller signals where low noise is critical, the DH-SI-HS high-sensitivity tip has a 2.0 Vpp input range and exceptional noise performance.



High Temperature Tip (DH-HITEMP)

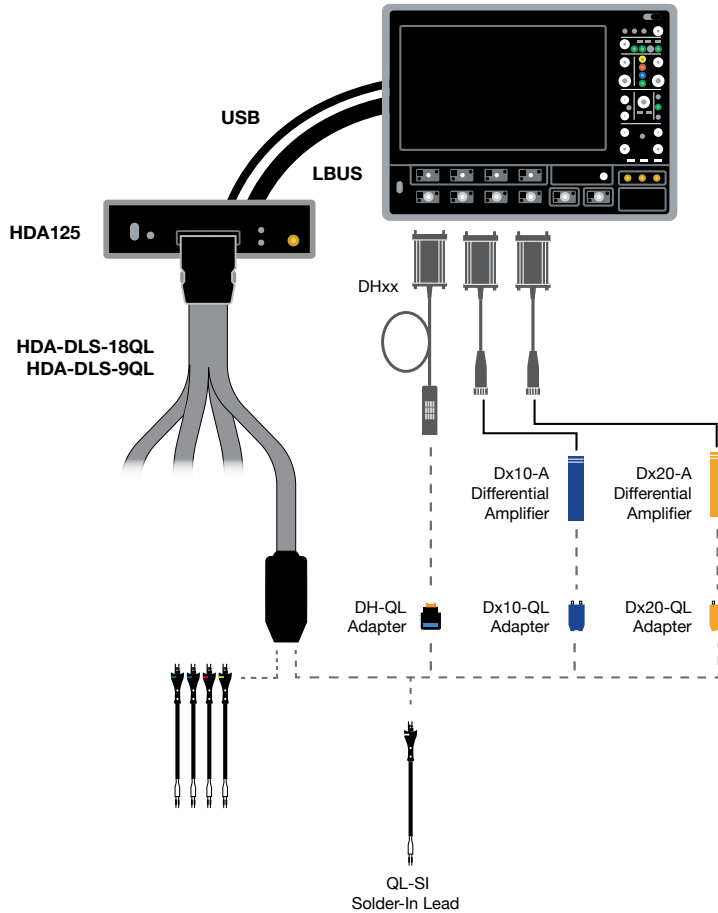
For tests where the device must be placed in an environmental chamber, the DH-HITEMP tip allows the solder-in probe tip to be separated from the probe amplifier by up to 1 meter.

The tip offers 16 GHz bandwidth, 3.5 Vpp input range, and an operating temperature range of -40 °C to +125 °C, making it ideal for environmental testing of a wide variety of high-speed devices.



QUICKLINK MIXED-SIGNAL PROBING

The QuickLink probe tip system was designed to be compatible with both the HDA125 High-speed Digital Analyzer system and with Teledyne LeCroy's selection of differential analog probes. Equip your system under test with QuickLink tips at all desired test points, and swap connections between digital and analog acquisition systems as needed.



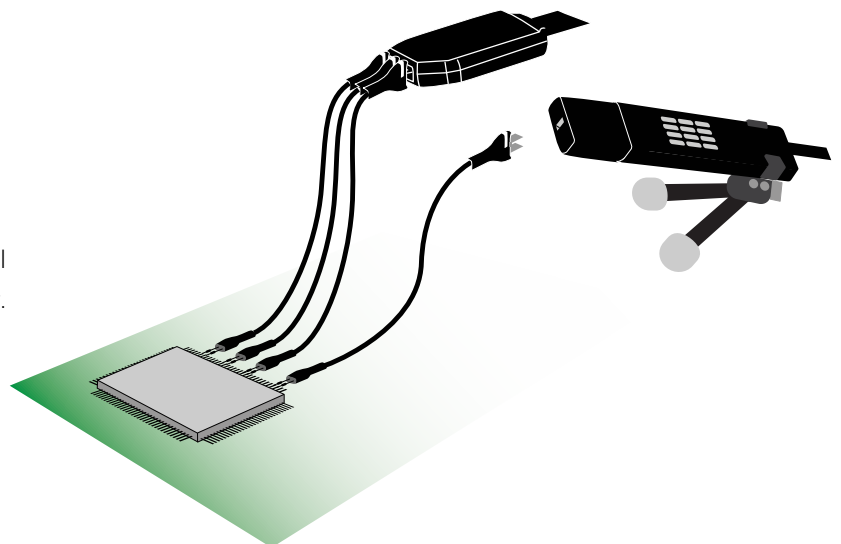
Mixed-signal Flexibility

When connected to a Teledyne LeCroy analog differential probe, QuickLink tips provide 8 GHz of bandwidth and a flat, well-controlled frequency response. When used with the HDA125 for digital acquisitions, they support 3 GHz bandwidth with industry-leading sensitivity.

The HDA125 provides the ability to acquire and analyze DDR command bus signals and other high-speed digital buses directly alongside time-correlated analog signals on the standard oscilloscope channels.

QuickLink Adapter (DH-QL)

The DH-QL adapter enables QuickLink solder-in probe tips to be used with any DH series probe. For embedded systems validation and debug, these tips can be used for both analog probing with the DH series probes and digital acquisitions with the HDA125 high-speed digital analyzer.



SPECIFICATIONS

	DH13	DH16	DH20	DH25
Bandwidth*				
Bandwidth (probe only)	13 GHz	16 GHz	20 GHz	25 GHz
Bandwidth with DH-SI or DH-SI-HS tip	13 GHz	16 GHz	20 GHz	25 GHz
Bandwidth with DH-HITEMP tip	13 GHz	16 GHz	16 GHz	16 GHz
Bandwidth with DH-QL adapter and QL-SI tip	8 GHz	8 GHz	8 GHz	8 GHz
Rise Time*				
Rise Time (10-90%)	34.5 ps	28 ps	22.5 ps	18 ps
Rise Time (20-80%)	23 ps	19 ps	15 ps	12 ps
Probe noise (referred to input)				
With DH-SI-HS tip	1.7 mV _{rms}	1.9 mV _{rms}	2.1 mV _{rms}	2.4 mV _{rms}
With all other tips	3.6 mV _{rms}	3.8 mV _{rms}	4.2 mV _{rms}	4.8 mV _{rms}
Probe noise density (referred to input)				
With DH-SI-HS tip	15 nV/rt(Hz)			
With all other tips	30 nV/rt(Hz)			
Input				
Input Dynamic Range				
With DH-SI-HS tip	2.0 V _{pp} (±1.0 V)			
With all other tips	3.5 V _{pp} (±1.75 V)			
Input Common Mode Voltage Range				
±5.0 V				
Input Offset Voltage Range				
±4.0 V				
Non-destructive Input Range				
±16 V				
Attenuation				
With DH-SI-HS tip	1.8x / 3.2x (selected automatically by oscilloscope software)			
With all other tips	3.2x / 5.8x (selected automatically by oscilloscope software)			
Attenuation Accuracy				
±2%				
DC Input Resistance (nominal)				
Differential	200 kΩ differential			
Common mode	50 kΩ differential			
Input Resistance > 10 kHz (typical)				
With DH-SI-HS tip	1100 Ω differential			
With all other tips	2100 Ω differential			
Environmental				
Temperature				
Non-operating	-40 °C to 70 °C			
Operating (DH-HITEMP tip)	-40 °C to 125 °C			
Operating (Probe and all other tips)	0 °C to 40 °C			
Humidity				
Operating	5% to 80% RH (Non-Condensing) 50% RH above 30 °C			
Non-operating	5% to 95% RH (Non-Condensing), 75% RH above 30 °C and 45% RH above 40 °C			
Dimensions				
DH-SI and DH-SI-HS tips	0 to 9 mm (0 to 0.35") tip spread at circuit connection 10" overall length			
DH-HITEMP tip	0 to 9 mm (0 to 0.35") tip spread at circuit connection 1 m overall length			
Cable length	1.2 m			

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

ORDERING INFORMATION

Product Description

Complete Differential Probes

Product Description	Product Code
13 GHz differential probe with ProLink interface	DH13-PL
16 GHz differential probe with ProLink interface	DH16-PL
20 GHz differential probe with ProLink interface	DH20-PL
25 GHz differential probe with 2.92 mm interface	DH25-2.92MM

Solder-in Tips

Product Description	Product Code
DH series solder-in tip, 25 GHz BW, 3.5 Vpp range	DH-SI
DH series high-sensitivity solder-in tip, 25 GHz BW, 2.0 Vpp range	DH-SI-HS

High-temperature Tips

Product Description	Product Code
DH series high-temperature solder-in tip, 16 GHz BW, 3.5 Vpp range	DH-HITEMP

QuickLink Adapters and Kits

Product Description	Product Code
DH series QuickLink adapter, 8 GHz BW	DH-QL
DH series QuickLink adapter kit with 3 x QL-SI tips	DH-QL-3SI

Accessories

Product Description	Product Code
ProLink to 2.92 mm adapter with probe power and communication pass through	LPA-2.92
2.92 mm to ProLink adapter with probe power and communication pass through	L2.92A-PLINK

Product Code

Product Description

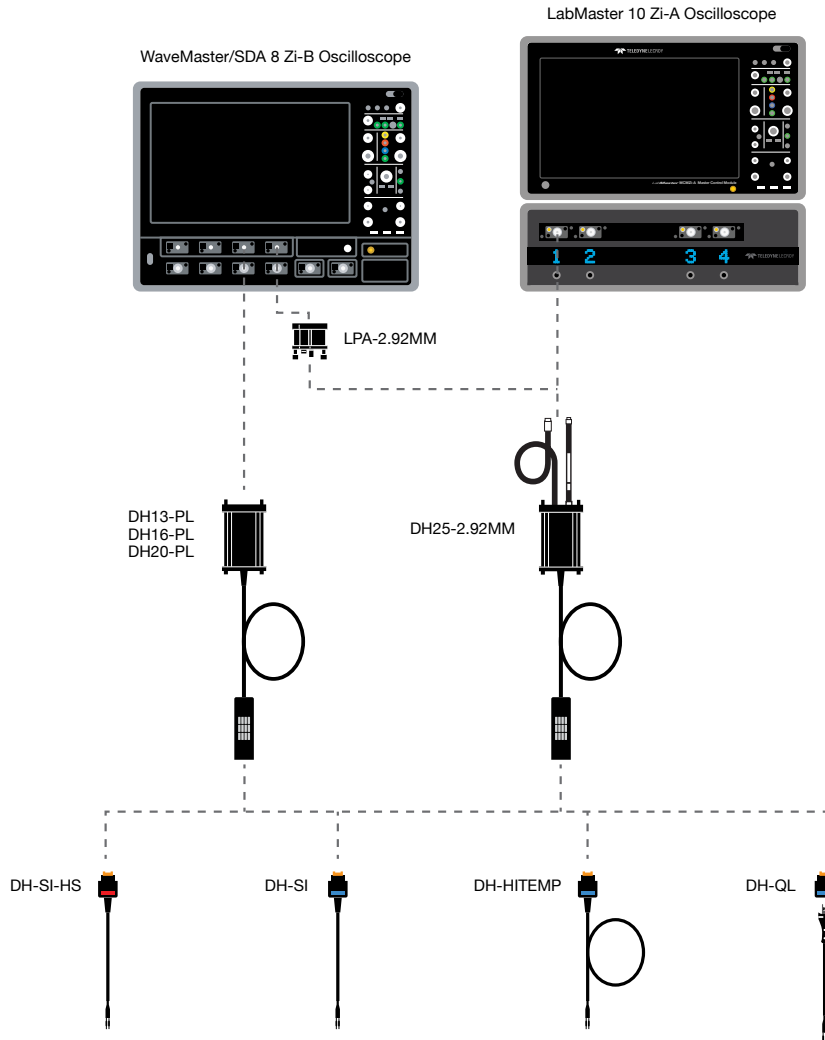
Calibration Options

Product Description	Product Code
3-year warranty	DH13-W3, DH16-W3, DH20-W3, DH25-W3
5-year warranty	DH13-W5, DH16-W5, DH20-W5, DH25-W5
3-year annual NIST calibration	DH13-C3, DH16-C3, DH20-C3, DH25-C3
5-year annual NIST calibration	DH13-C5, DH16-C5, DH20-C5, DH25-C5
3-year warranty with annual NIST calibration	DH13-T3, DH16-T3, DH20-T3, DH25-T3
5-year warranty with annual NIST calibration	DH13-T5, DH16-T5, DH20-T5, DH25-T5
NIST traceable calibration with test data	DH13-CCNIST, DH16-CCNIST, DH20-CCNIST, DH25-CCNIST

Replacement Parts

Product Description	Product Code
Replacement SI resistor kit for DH-SI and DH-SI-HS solder-in tips	DH-SI-RESISTORS

Compatibility Chart



Customer Service

Teledyne LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge



1-800-5-LeCroy
teledynelecroy.com

Local sales offices are located throughout the world.
Visit our website to find the most convenient location.