

# High Resolution Calibrated True Differential TDR Fact Sheet

## Time Domain Reflectometers

## Signal Integrity Analyzer

### Accurate Impedance Profile Measurements



### Key Specifications

Model	T3SP15D
Impedance Profile	Yes, True Differential TDR and Single-ended TDR
Rise Time	35 ps
Spatial Resolution (FR4)	≤ 3 mm
S <sub>11</sub> , Reflection	Yes, Differential (S <sub>dd11</sub> ) and Single-ended (S <sub>11</sub> )
Frequency	15 GHz
Full 2-port Single-ended	Yes (S <sub>11</sub> , S <sub>21</sub> , S <sub>12</sub> , S <sub>22</sub> )
Impedance Profile Memory Trace	up to 50,000 points
Battery Operated (B-Models)	Yes
Dimensions	220 x 210 x 82.5 mm

### Affordable Tools for Precision Debugging

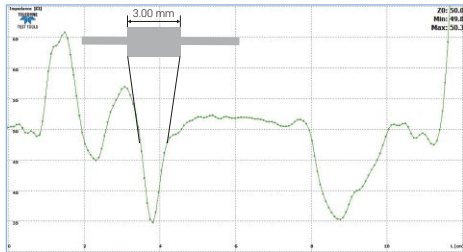
- True Differential TDR and Single-ended TDR** – Best for cables, differential design and twisted pair.
  - ✓ Accurate Impedance measurements, no ground connection required for differential.
- 30 ps typ. Rise Time** – Less than 3 mm impedance measurement spatial resolution.
  - ✓ Precisely locate and detect impedance mismatches for signal integrity.
- Instant Cable and Connector Testing** – Verify the quality of your cables and connectors.
  - ✓ Detect even on your premium cables any imperfection that might be the root cause of measurement artifacts.
- Small Form Factor and Battery Powered** – Measure and analyze in the lab, factory floor or in the field.
  - ✓ Measure and analyze everywhere you go without an AC requirement.
- S-parameter: Differential S<sub>11</sub> and Full 2-port Single-ended Measurements** – Analyze transmission lines, cable, connectors and adaptors in the frequency domain.
  - ✓ Precisely and rapidly identify any frequency related signal integrity impairments.
- Up to 50,000 points long memory** – Long TDR response capture with high resolution.
  - ✓ Characterize up to 40 m long cables with more detailed measurement data.
- Pre-Compliance for Emerging Serial Data Standards** – USB, BroadR-Reach and Automotive Ethernet.
  - ✓ Debug serial data standards easily.

For more information, please contact:



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## Time Domain Reflectometers



*OSL calibration in time domain avoid aberrations effects in impedance plots and let the user identify impedance anomalies with less than 3 mm resolution.*



*Based on the true differential design, there is no need for a physical ground connection if differential lanes are measured.*



*The T3SP15D series offer full calibrated S-parameters measurements from DC up to 15 GHz.*

T3SP15D offers great value being affordable, small, simple to use, portable and lightweight with unique specifications for differential lines and high accuracy in detecting and locating with high spatial resolution any signal integrity issue.

### Ultra-portable and Battery operated

T3SP10D and T3SP15D are designed to be used wherever measurements have to be performed. The battery pack option allows up to 3 hours of operation.

### Fully calibrated

Using three calibration standards (open, short, load) in the time domain instead of using a simple normalization which is common in TDR-instruments offers the highest accuracy both in the impedance profile measurements as well as in the S-11 Return Loss frequency response.

### ESD protected

The T3SP-Series is protected against electrostatic discharge (ESD) isolating the high-frequency front-end when connecting and during the set-up.

### TDR-Probes: Differential and Single-ended

The variable and fixed pitch TDR-Probe provides an ideal solution for TDR circuit board impedance characterization.

## Ordering information

Product Description	Product Code
Differential TDR, 35 ps Rise Time, ESD protection, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Differential S <sub>11</sub> and Single-ended S <sub>11</sub> , S <sub>21</sub> , S <sub>12</sub> , S <sub>22</sub>	T3SP15D-BUNDLE
Differential TDR, 35 ps Rise Time, ESD protection, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Internal Battery, Differential S <sub>11</sub> and Single-ended S <sub>11</sub> , S <sub>21</sub> , S <sub>12</sub> , S <sub>22</sub>	T3SP15D-B-BUNDLE
Phase Matched 3.5 mm cables (50 ± 1 Ohm, <1 ps skew)	T3SP-CABLE-3.5MM
Differential TDR-Probe (high precision, 18 GHz, 0.5 – 5.0 mm variable pitch)	T3SP-DPROBE
Differential TDR-Probe (economic, 5 GHz, 2.5 or 5 mm fixed pitch)	T3SP-DPROBE-F
Single-ended TDR-Probe (fixed pitch 2.54 mm)	T3SP-SEPROBE-F
Single-ended TDR-Probe (high precision, 10 GHz, variable pitch)	T3SP-SEP
OSLT Calibration Kit 3.5MM with torque wrench, female	T3SP-CALKIT-3.5MM
Storage and Travel Case (aluminum suitcase for TDRs and accessories)	T3SP-CASE
Demo and Verification Board	T3SP-BOARD

Standard warranty is one year (for warranty extension please contact Teledyne LeCroy Service)