

T3SPxx Fact Sheet

Time Domain Reflectometer (TDR)

Calibrated True-Differential TDR

Rapid and Accurate Single-ended and Differential Impedance Profile Measurements

Three different mainframes available: **T3SP15D**, High-Resolution TDR
T3SP15D-XR, High-Resolution, Extended-Range model optimized for cable manufacturing
T3SP01D, Ultra-Long-Range TDR with higher Dynamic Range



Key Specifications

Model	T3SP15D	T3SP15D-XR	T3SP01D
Rise Time (20 % to 80 %)	35 ps	35 ps	280 ps
Step Amplitude	150 mV @ 50 Ω		360 mV @ 50 Ω
Pulse Repetition Rate	1 MHz to 10 MHz	500 KHz to 10 MHz	50 KHz to 400 KHz
Battery Operated	Yes (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 Rise Time** – Less than 3 mm impedance measurement spatial resolution (T3SP15D and T3SP15D-XR).
 - Precisely locate and detect geometry dimensions and dielectric variation of cables and transmission lines.
- 50 KHz Repetition Rate and 360 mV @ 50 Ω Step Amplitude** – Measure long cables (T3SP01D).
 - Detect any imperfection on Mil-Spec and In Vehicle long cables up to 1,000 m.
- 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.
- Inter-pair and intra-pair skew Measurements** – Automatically calculated from Impedance profile traces.
 - Automatic Inter-Pair skew measurements (SE-SE and Diff-Diff) and Intra-Pair skew (+/- conductors of the same differential pair)
- Up to 50,000 points long memory** – Long TDR response capture with high resolution.
 - Characterize up to 30 m (15D), 50 m (15D-XR), and 1 km (01D) cables with higher-detail measurements
- Rapid MDI S-Parameter Return Loss and Mode-Conversion** – Measurements for Automotive Ethernet Compliance.
 - Easy and fast compliance Testing for 10BASE-T1, 100BASE-T1 and 1000BASE-T1.

For more information, please contact:



T3SPxx Fact Sheet

Time Domain Reflectometer (TDR)

Ordering information

Product Description	Product Code
Mainframes (T3SP15D)	
Differential High-Resolution TDR, 35 ps Rise Time, ESD protection, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Aluminum Case, S _{dd11} and S ₁₁ , S ₂₁ , S ₁₂ and S ₂₂	T3SP15D-BUNDLE
Differential High-Resolution TDR, 35 ps Rise Time, ESD protection, Internal Battery, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Aluminum Case, S _{dd11} and S ₁₁ , S ₂₁ , S ₁₂ and S ₂₂	T3SP15D-B-BUNDLE
Mainframes (T3SP15D-XR)	
Differential Extended Range, High-Resolution TDR, 35 ps Rise Time, ESD protection, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Aluminum Case, S _{dd11} and S ₁₁ , S ₂₁ , S ₁₂ and S ₂₂	T3SP15D-XR-BUNDLE
Differential Extended Range, High-Resolution TDR, 35 ps Rise Time, ESD protection, Internal Battery, 2 phase matched 3.5 mm cables, 3.5 mm Cal. Kit, Aluminum Case, S _{dd11} and S ₁₁ , S ₂₁ , S ₁₂ and S ₂₂	T3SP15D-B-XR-BUNDLE
Mainframe (T3SP01D)	
Differential TDR Long Range ≤1 km, ESD protection, Internal Battery, 2 phase-matched SMA cables, OSLT SMA Cal Kit, Aluminum Case, S ₁₁ , S ₂₁ , S ₁₂ , S ₂₂ and Mixed-Mode S _{dd11} , S _{dc11} , S _{cd11} , S _{cc11}	T3SP01D-B-BUNDLE
TDR probes (all mainframes)	
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
Accessories	
OSLT Calibration Kit RPC-3.50 (Jack) with torque wrench, female*	T3SP-CALKIT-3.5MM
Phase Matched 3.5 mm cables (50 ± 1 Ohm, <1 ps skew)*	T3SP-CABLE-3.5MM
Storage and Travel Case (aluminum suitcase for TDRs and accessories)**	T3SP-CASE
Demo and Verification Board	T3SP-BOARD

* included with T3SP15D and T3SP15D-XR BUNDLE configurations, 3.5 mm connectors (or higher-quality compatible connectors, subject to availability)

** included with all BUNDLE configurations

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

Platform selection guide

Product Code	Max Cables Length	Main-frame and Phase Matched Cables	Calibration Kit and Torque wrench	Internal Battery	PCBs line impedance	MDI Automotive Ethernet	Inter-pair and intra-pair Skew	S-par (S _{dd11} and S ₁₁ , S ₂₁ , S ₁₂ and S ₂₂)
T3SP15D-BUNDLE	30 m	Yes, 3.5 mm cables	Yes, 3.5 mm OSLT	No	Yes	Yes	Yes	Yes
T3SP15D-B-BUNDLE	30 m	Yes, 3.5 mm cables	Yes, 3.5 mm OSLT	Yes	Yes	Yes	Yes	Yes
T3SP15D-XR-BUNDLE	50 m	Yes, 3.5 mm cables	Yes, 3.5 mm OSLT	No	Yes	Yes	Yes	Yes
T3SP15D-B-XR-BUNDLE	50 m	Yes, 3.5 mm cables	Yes, 3.5 mm OSLT	Yes	Yes	Yes	Yes	Yes
T3SP01D-B-BUNDLE	1 km	Yes, SMA cables	Yes, SMA OSTL	Yes	No	Yes	Yes	Yes*

* Included Mixed-Mode Reflection: (S_{DD11}, S_{DC11}, S_{CD11}, S_{CC11})

T3SP15D-XR includes new time bases optimized for cable manufacturing

Pulse Repetition Rate	Sampling Interval	Acquisition Time (s)	Comments	T3SP15D	T3SP15D-XR
10 MHz	10 ps			Yes	Yes
5 MHz	10 ps			Yes	Yes
2 MHz	10 ps			Yes	Yes
1 MHz	10 ps	6.4 s		Yes	Yes
1 MHz	20 ps	0.8 s	optimized for manufacturing	No	Yes
1 MHz	40 ps	0.4 s	optimized for manufacturing	No	Yes
500 KHz	20 ps	3.2 s	extended range (50 m) optimized for manufacturing	No	Yes
500 KHz	40 ps	1.6 s	extended range (50 m) optimized for manufacturing	No	Yes