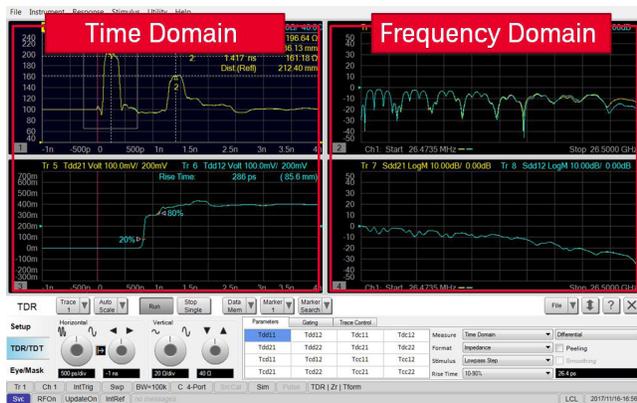# Keysight Technologies

## S93011A Enhanced Time Domain Analysis with TDR
### One-Box Solution For High-Speed Serial Interconnect Analysis

As bit rates of digital systems increase, signal integrity of interconnects drastically affects system performance. Fast and accurate analysis of interconnect performance in both time and frequency domains become critical to ensure reliable system performance. As managing multiple test systems becomes difficult, a single test system that can fully characterize differential high-speed digital devices is a very powerful tool.

The S93011A provides a one-box solution for high-speed interconnect analysis, including impedance, S-parameters, and eye diagrams. The S93011A is an enhancement of the S93010A time domain analysis software. The software, running on the PNA-X/PNA/PNA-L Series B-model vector network analyzers, brings three breakthroughs for signal integrity design and verification: simple and intuitive operation, fast and accurate measurements, and high ESD robustness.

## Key Features

- Up to 67 GHz of bandwidth with 6.66 ps rise time enables measurement to the latest high-speed serial standards
- Unmatched performance
  - Low noise floor for accurate and repeatable measurements: 20 µV rms
  - Wide dynamic range to observe the true performance of your device: > 110 dB
  - Fast measurement speed for real-time analysis: 251 msec (1601 points, 2-port cal)
- State-of-the art calibration techniques reduce measurement errors
  - Automatic deskew ensures easy removal of fixture and probe effects
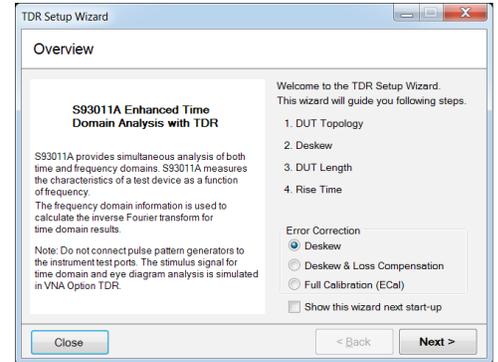  - Full calibration available for the utmost in measurement accuracy





Time Domain

Frequency Domain

Eye Diagram

www.keysight.com/find/pna-tdr

# KEYSIGHT
## TECHNOLOGIES

## Simple and Intuitive Operation

### Wizards guide you through the steps of an operating sequence to reduce operator errors

Complete device characterization is straightforward. The graphical user interface has been designed to provide a similar look-and-feel to traditional TDR oscilloscopes and intuitive for users unfamiliar with vector network analyzers and S-parameter measurements.

The TDR Setup Wizard guides you through all of the required steps, making setup of error correction and measurement intuitive and error-free. Detailed illustrations help you make the correct connections. The instrument then configures itself automatically and provides access to results quickly.

## Fast and Accurate Measurements

### Measure the true performance of your device

As data rates increase, the effects of the test fixture and cables have a more significant impact on measurement results. Many different approaches are available to remove these effects. It is important to understand the accuracy of each method, to ensure that you are measuring the true performance of your device.

- Deskew: only removes delay
- Full calibration (SOLT): one of the most comprehensive calibrations, which removes delay, loss, and mismatch
- Electronic calibration (Ecal): complete solid-state calibration solution which makes full calibration fast and easy
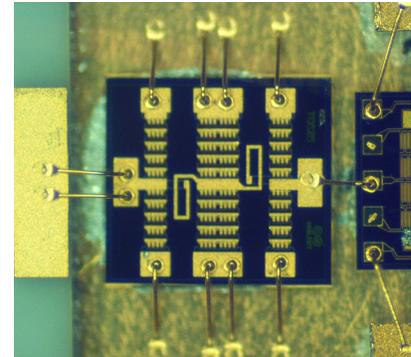
## High ESD Robustness

### Reduce instrument repair fees and downtime

In applications such as electrical TDR circuit board testing and cable testing, large static charges can be stored in the device. Special care is required when using traditional instruments in such situations to make sure the instrument is not damaged by electrostatic discharge (ESD). Vulnerability to ESD can lead to increased maintenance fees and long repair times.

The PNA-X, PNA, and PNA-L Series microwave network analyzers are designed for high robustness against ESD by implementing protection circuits inside the instrument. Leveraging the company's expertise in RF design, Keysight has invested in key technology blocks like our proprietary ESD protection chip to significantly increase ESD robustness, while at the same time maintaining excellent RF performance.

## Ordering Information[1,2,3]

| Model Number | Description |
| --- | --- |
| S93011A | Enhanced Time Domain Analysis with TDR |

1. S93011A is not supported on the following products and options:
   - PNA-X / PNA / PNA-L Series A-model vector network analyzers
   - Low frequency extension: Options 205 and 425
   - Millimeter-wave vector network analyzers: single-sweep solutions (N5290A/N5291A), banded waveguide solutions
2. Supported software license types: fixed-perpetual (1FP), transportable-perpetual (1TP), fixed-1-year (1FY), and transportable-1-year (1TY)
3. The ECal DC option (#0DC) is recommended for higher time domain accuracy.

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