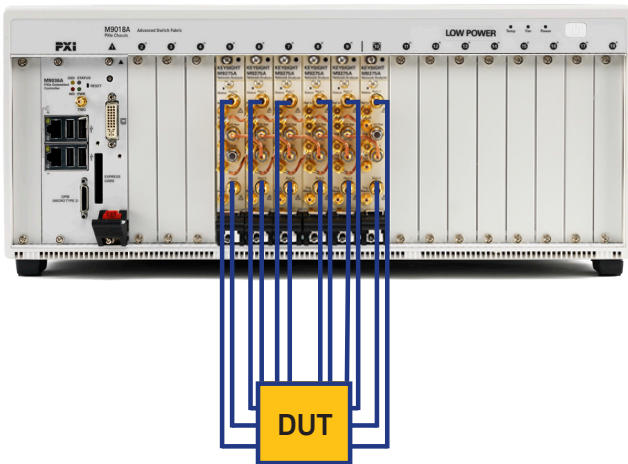


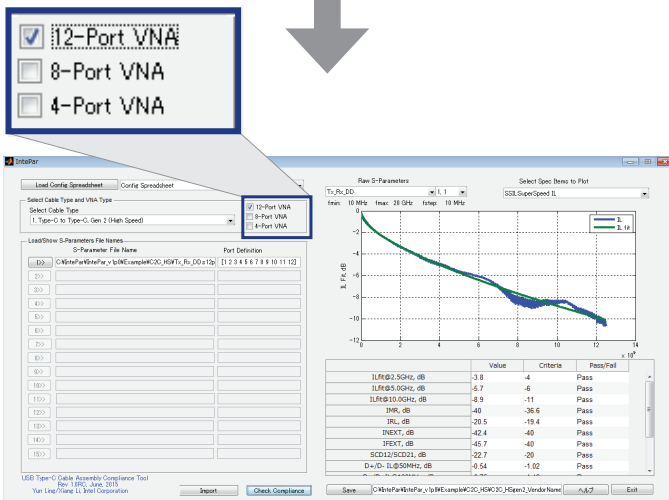
# Keysight Technologies

## Cable Assembly Compliance Test Solution Using M937xA PXIe Multiport VNA

### Multiport Measurement Solution for Interconnect Analysis



1x s12p  
Touchstone File



## True Multiport Measurements for USB Type-C™ Cable Assembly

Driven by the demand for more bandwidth, high-speed digital standards continues to evolve to higher data rates. The 10 Gbps USB 3.1 specification delivers more than double the practical data rate compared to the current 5 Gbps USB 3.0. This increase in data rate results in even tougher requirements for the physical layer to ensure interoperability.

One of the measurement challenges for such high-speed digital cable assemblies is to perform the multiport measurements. Keysight M937xA PXI Multiport Vector Network Analyzer provides the true multiport measurements with full n-port calibration and its inherent frequency domain measurement capability. For the USB Type-C™ cable assembly tests, M937xA can be configured to support 12-port measurements from 300 kHz to 15 GHz to generate an s12p touchstone file analyzed by the USB-IF compliance tool.

## M937xA PXI Multiport VNA Features

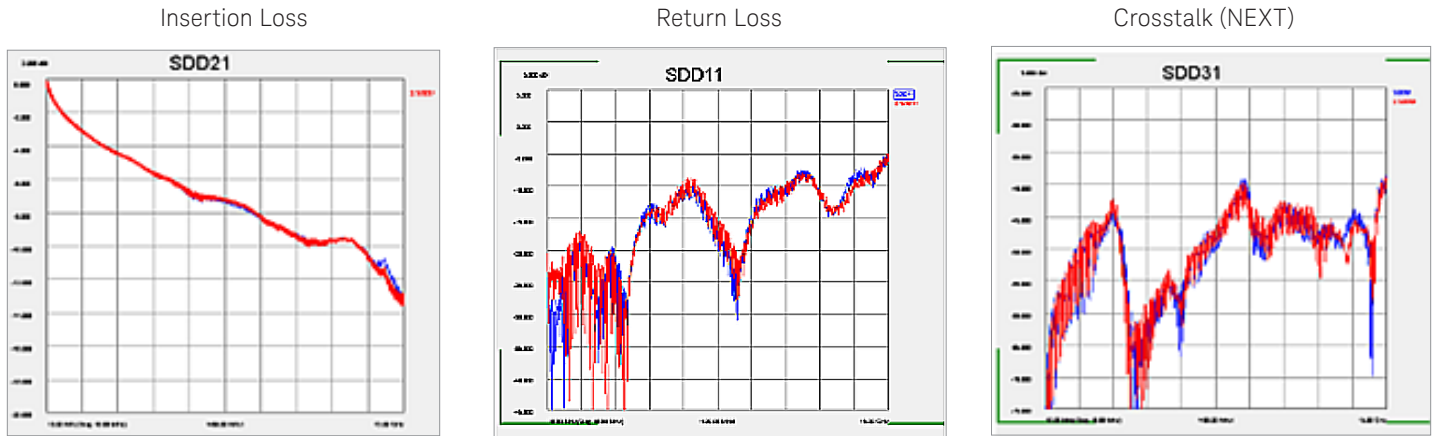
Features	Advantages
Accurate measurements	Comparable to box VNA (e.g. >114 dB dynamic range, <0.003 dB trace noise, 0.005 dB/degree stability)
Six frequency models (300 kHz to 4, 6.5, 9, 14, 20, 26.5 GHz)	Meet frequency requirement of major high-speed digital standards (e.g. 300 kHz to 15 GHz for USB Type-C cable)
True multiport meas. with full n-port calibration	Enable simple and quick measurement to generate one touch stone file (e.g. s12p for USB Type-C cable)
Up to 32-ports measurements	Expandable for future multiport measurement needs
Simultaneous multi-site measurement with independent VNAs	Faster measurement time



Unlocking Measurement Insights

## Measurement Correlations between M937xA and E5071C

For the cable assembly compliance tests, Keysight E5071C ENA Option TDR has been certified for various high-speed digital standards such as USB, HDMI, DisplayPort. As shown below, the measurement results are well correlated between M937xA PXI Multiport Vector Network Analyzer and E5071C ENA Option TDR when comparing the USB Type-C cable assembly measurement results.



Blue: M937xA (Full 12-port calibration), Red: E5071C ENA Option TDR (Full 4-port calibration)  
 10 MHz to 15 GHz, 1,500 pts, 1 kHz IFBW, -5 dBm source power, port Z conversion ON (42.5 ohm for all ports),  
 De-embedding ON (test fixture compensation), 50 ohm terminations attached for unused ports

## Ordering Information

Model/ Option	Description	Each
M9374A	300 k to 20 GHz, 2-port, PXIe Vector Network Analyzer	2 (for 4-port VNA) 4 (for 8-port VNA) 6 (for 12-port VNA)
M9374A-010	Time domain analysis	1 <sup>(*)</sup>
M9374A-551	Full N-port calibrated measurement	1 <sup>(*)</sup>
N4433A	ECal module, 300 k to 20 GHz, 4-port.	1
M9018A	18-slot PXIe chassis	1
M9037A	High-performance embedded controller	1

\* At least one PXI VNA module must have option 010 and 551 to enable the capabilities in a multiport configuration

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 © Keysight Technologies, 2017  
 Published in USA, December 1, 2017  
 5992-1371EN  
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