



# ATLAS VNA

PCB INSERTION LOSS  
MEASUREMENT SYSTEM





# The ATLAS VNA Insertion Loss Measurement System

ATLAS VNA Delta-L Insertion Loss Measurement System for Anritsu ShockLine™ MS46524B 4-Port Performance VNA and Anritsu VectorStar™ MS4647B 70GHz VNA – supports Delta-L 4.0 Eigenvalues PCB Insertion Loss Test Methods to 43.5GHz

## The ATLAS VNA Insertion Loss Measurement System

The ATLAS VNA Insertion Loss Measurement System is designed to assist PCB fabricators in the accurate and repeatable measurement of Eigenvalue Delta-L 4.0 PCB transmission line losses in a PCB production environment. The system comprises Atlas VNA software, the performance VNA and all required precision cables and probes.

## ATLAS VNA for Anritsu ShockLine™ and VectorStar™ 4-Port Performance VNA

ATLAS VNA is a precision

insertion loss measurement package designed specifically for PCB fabricators and OEMs. It provides accurate, repeatable measurements of frequency based transmission line losses, allowing fabricators to meet stringent targets that maintain signal integrity within the limits of the latest high-speed chipsets. ATLAS VNA for Anritsu ShockLine™ and VectorStar™ 4-Port Performance VNA insertion loss test supports the Delta-L test method for differential and single ended insertion loss testing.

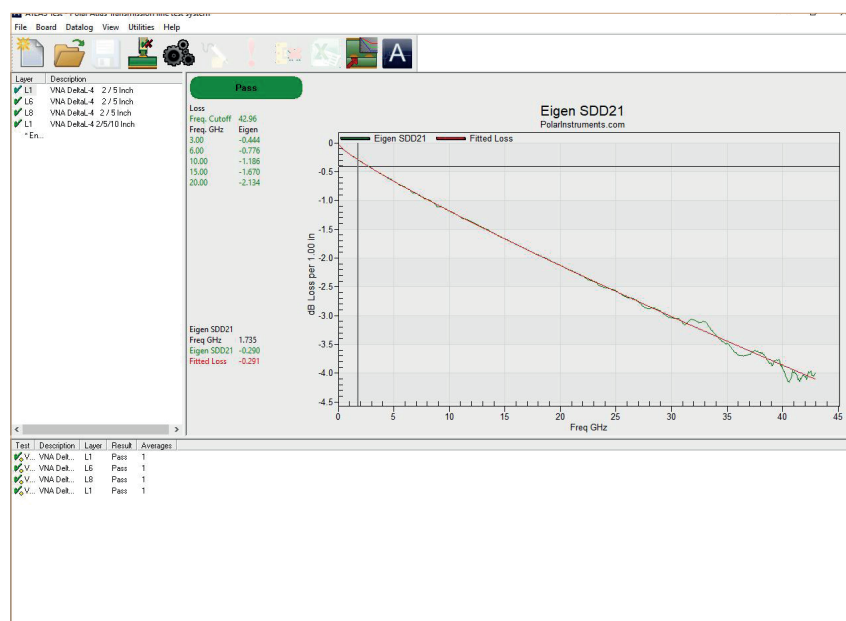
ATLAS VNA interfaces with industry standard Anritsu Sho-

ckLine™ MS46524B 43.5GHz 4-Port Vector Network Analyser. The MS46524B 4-Port VNA covers the broadband frequency range from 50 kHz to 43.5 GHz, measuring single-ended and mixed-mode s-parameters.

The MS46524B series supports SCPI command programming and uses industry standard LAN communications for remote control in test applications.

## Multi-GHz PCB Fabrication

For PCBs operating above 2GHz, signal losses become a major problem for PCBs manufactured in conventional FR4 and other low cost laminate materials. As more OEMs integrate high-speed chipsets onto their boards, the need for PCB fabricators to measure and control frequency-based losses increases. Measuring transmission line losses presents fabricators with a set of challenges with dielectric loss and smoothness of the copper foils, the crucial parameters for controlling frequency-based losses. Fast and accurate measurement of transmission line losses in the production en-



vironment allows you to increase manufacturing yield and reduces the comparatively high cost of multi-gigahertz PCB fabrication.

### Delta-L 4.0 Test Method

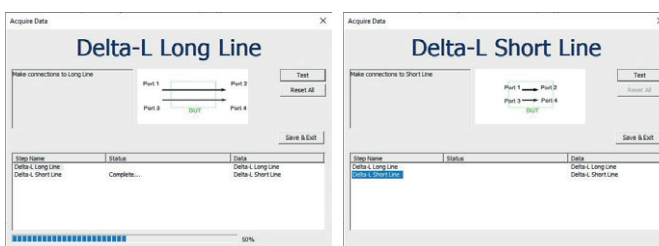
Atlas for Anritsu VNA is compliant with IPC TM650 2.5.5.12 (Test Methods to Determine the Amount of Signal Loss on Printed Boards) and supports the Delta-L 4.0 test method for extraction of differential insertion loss and effective  $E_r$  from a suitably designed coupon.

The Delta-L technique uses long-line and short-line measurement combined with innovative via de-embedding techniques. ATLAS fully incorporates Delta-L with the current settings and parameters. Delta-L provides a sound method for removing the via effects from differential (mixed mode) s-parameters when characterising raw PCBs for insertion loss.

### Delta-L 4.0 Eigenvalue Test Method

Is fully supported on both Shockline and VectorStar VNAs Delta L 4.0 with Eigenvalue method.

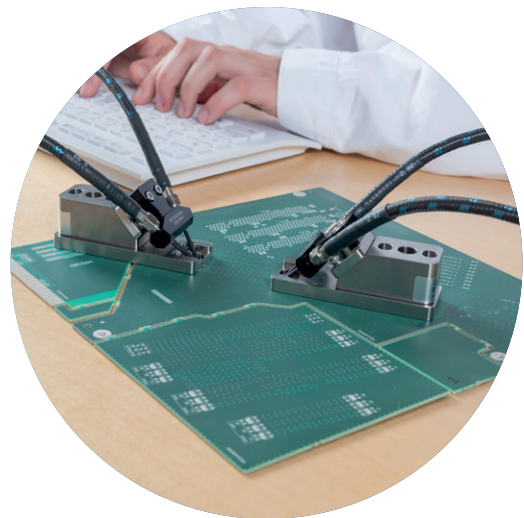
ATLAS VNA uses powerful mathematical processing techniques to allow measurement of differential frequency-dependent losses from a test coupon quickly and easily. The system is easy to set up, easy to use and delivers fast results without the need for extensive operator training. A single insertion loss test can be performed in a fraction of the time needed for traditional techniques.



The Delta-L Test Method uses two or three test traces of different lengths.



ATLAS VNA is a turnkey rackmount system and comprises all required probes and cables.



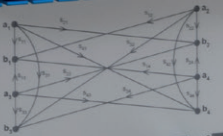
The Delta-L 4.0 De-Embedding Technique eliminates the effect of the probes, extracting the signal loss of the traces

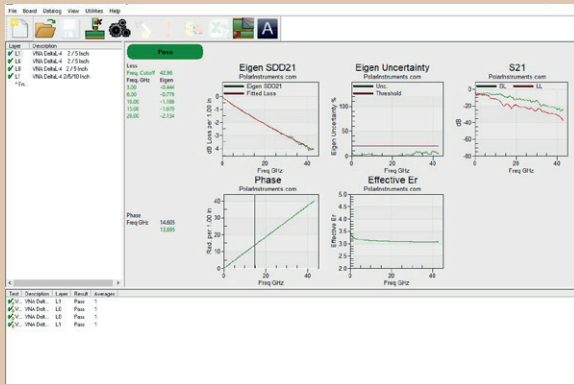




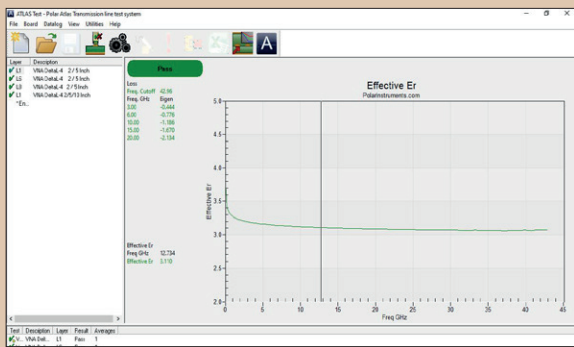


Anritsu  
MS46524B  
43.5 GHz Vector Network Analyzer

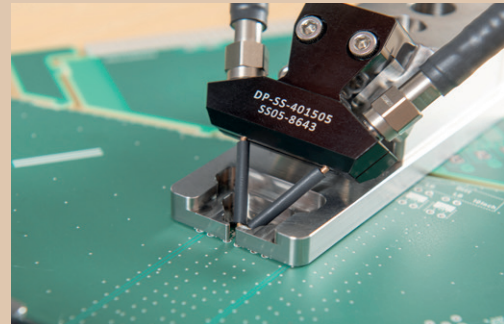




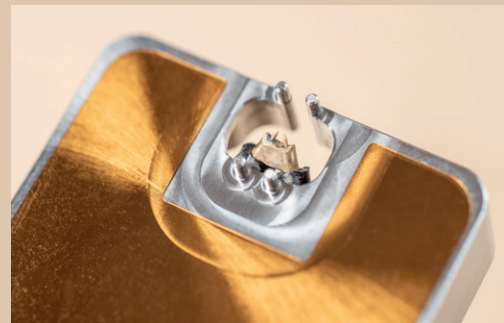
ATLAS VNA displays additional parameters such as Eigen Uncertainty, S21 of the short and long line, Phase and Er



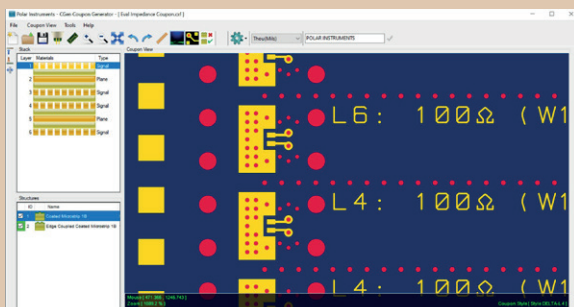
In addition to PCB Trace Loss, ATLAS VNA extracts the Effective Permittivity (ER)



A pair of precision Delta-L 4.0 probes ensures optimum signal launch



Delta-L 4.0 Probe Footprint with guidance pins

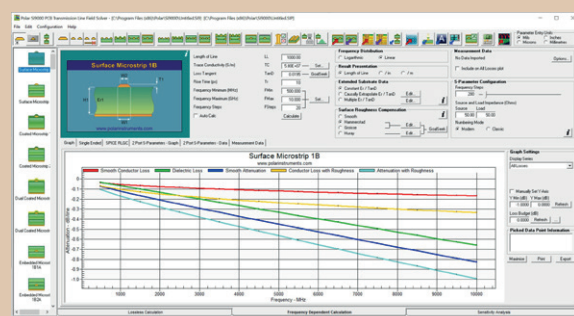


CGen with Delta-L 4.0 Footprint

## Controlled impedance test

Use the optional Polar CGen Si coupon generator to design test coupons with Delta-L 4.0 Probe Footprints for PCB Loss Tests

ATLAS VNA Software also includes traditional lossless controlled impedance test. Using Polar ATLAS VNA Insertion Loss Measurement Systems in conjunction with the Polar Industry Standard Si9000e Field Solver enables PCB fabricators to predict and measure the characteristics of ultra high speed differential signal lines and reduce the number of prototype turns before committing to production.



PCB Loss Simulation with Si9000e



# Specification

Measurement Functions Insertion Loss Measurement	Insertion Loss SDD 21 vs. Frequency according to Delta-L 4.0, Phase, Effective Er
Impedance measurement	Single ended and differential impedance accuracy specifications: as defined by the Anritsu Shockline product specification
Datalogging and output	CSV file export, printable test lists and waveforms. All tests data logged and output as pipe delimited test files for customer processing
Standard Accessories	ATLAS VNA is a fully integrated industry grade rackmount solution and comprises the following: Anritsu ShockLine TM MS46524B 4-Port Vector Network Analyser with Option MS46524B-043 (50 kHz to 43.5 GHz) Option MS46524B-002 Time Domain with Time Gating Option MS46524B-001 Rack Mount Kit Calibration Kit Type K(f) DC to 43.5 GHz, 50 $\Omega$ 2 pc Delta-L 4.0 Probes 4 pc Precision Cables: 40 GHz, 1000 mm, 2.92 (m) - 2.92 (m), with Armor. 4 pc Precision Adapter, DC to 40 GHz, K(f)-K(f), 50 Ohm 19" Rackmount PC with ATLAS VNA Software preinstalled 19" Rackmount Touch Screen Monitor KVM Switch Uninterruptible Power Supply Network Switch Foot Switch
Optional Accessories	Polar IPS Series Probes for impedance test
PC requirements	Integrated Rackmount PC with Touchscreen Monitor, Mouse, keyboard, KVM switch, UPS, network switch
Dimensions	56 cm x 60 cm x 60 cm (w x h x d)
Weight:	65 kg



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