

PCB insertion loss test system



*Accurate measurement of
transmission line insertion loss for
multi-GHz PCB fabrication*

*Atlas Si - for SET2DIL
Atlas Si - for SPP**

*Ensures accurate insertion
loss measurement*

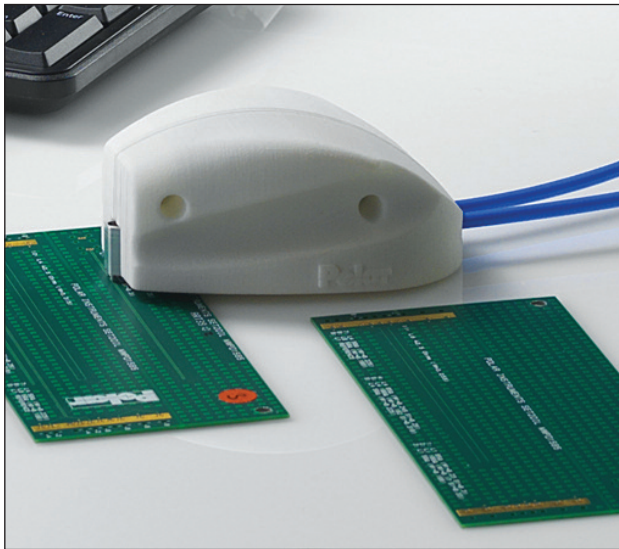
*Incorporates IPC TM 650
compliant: SET2DIL method
Short Pulse Propagation
method**

*Easy to use for non-skilled
operators*

Polar

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Atlas 800 ESD protection
unit has 2 or 4 x 26 GHz
channels for both SPP &
SET2DIL compatibility



Ergonomic ESD safe GGB probe body

New in Atlas for 2013:

Both linear and root fit for
standard and low loss
materials. Snapshot archive
of full or single test data
including both results and
S_{DD21} displays

Atlas Si is a precision insertion loss measurement package designed specifically for PCB fabricators. It provides accurate and 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.

The emergence of a new generation of high-speed busses, such as SuperSpeed USB 3.0, PCI Express® Gen2.0, XAUI and RocketIO™ means that PCB fabricators must be ready to provide tight control over losses from multi-GHz PCB transmission lines.

The differential signalling techniques used by these new busses allow PCBs operating at multi-GHz to be manufactured using conventional and cost-effective PCB base materials. However, while this gives OEM designers the combination of high performance and low PCB costs, it means that PCB fabricators must be able to accurately measure and control transmission line losses.



Using Polar Atlas insertion loss measurement systems in conjunction with the 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.



Use the Atlas DRG Pro to provide professionally presented customer conformance reports. Atlas DRG provides you with off-the-shelf formatted documents – and allows easy customisation with your corporate logo in the printouts.

losses presents fabricators with a set of challenges very different from those for controlling impedance: whereas trace width and dielectric separation are among the most important criteria for impedance control, dielectric loss and smoothness of the copper foils are the crucial parameters for controlling frequency-based losses.

Fast and accurate measurement of transmission line losses in the production environment allows fabricators to increase manufacturing yield and reduces the comparatively high cost of multi-GHz PCB fabrication.

For PCBs 2GHz and below Polar recommends:

- CITS880 controlled impedance test
- CGen PCB coupon generator
- Si8000m controlled impedance design system
- Speedstack PCB

Multi-GHz PCB fabrication

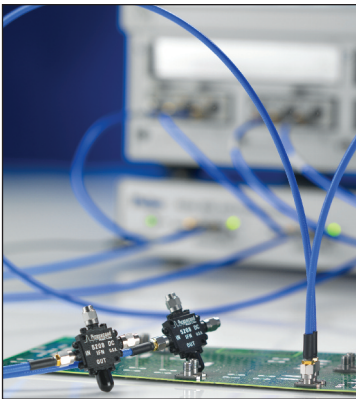
While frequency-based losses are usually negligible on PCBs operating below 2GHz, above this level signal losses become a major problem for PCBs manufactured in conventional FR4 and other low-cost laminate materials.

As more OEMs integrate high-speed chipsets onto their boards, the need for PCB fabricators to measure and control frequency-based losses will also increase. Measuring transmission line



Atlas software

Atlas uses powerful mathematical processing techniques to allow non-skilled operators to measure 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 compared to traditional techniques.



Atlas uses either SET2DIL (Single ended TDR to Differential Insertion Loss) to extract S_{DD21} or SPP (Short Pulse Propagation.) Customers may license either or both techniques.

Atlas is compatible with the Tektronix DSA8300 oscilloscope and 80E04 Time Domain Reflectometer (TDR) head which provides the raw data from which Atlas can calculate insertion loss results.

*Customer or Polar supplied

ESD protection designed for SET2DIL & SPP applications – Atlas 800

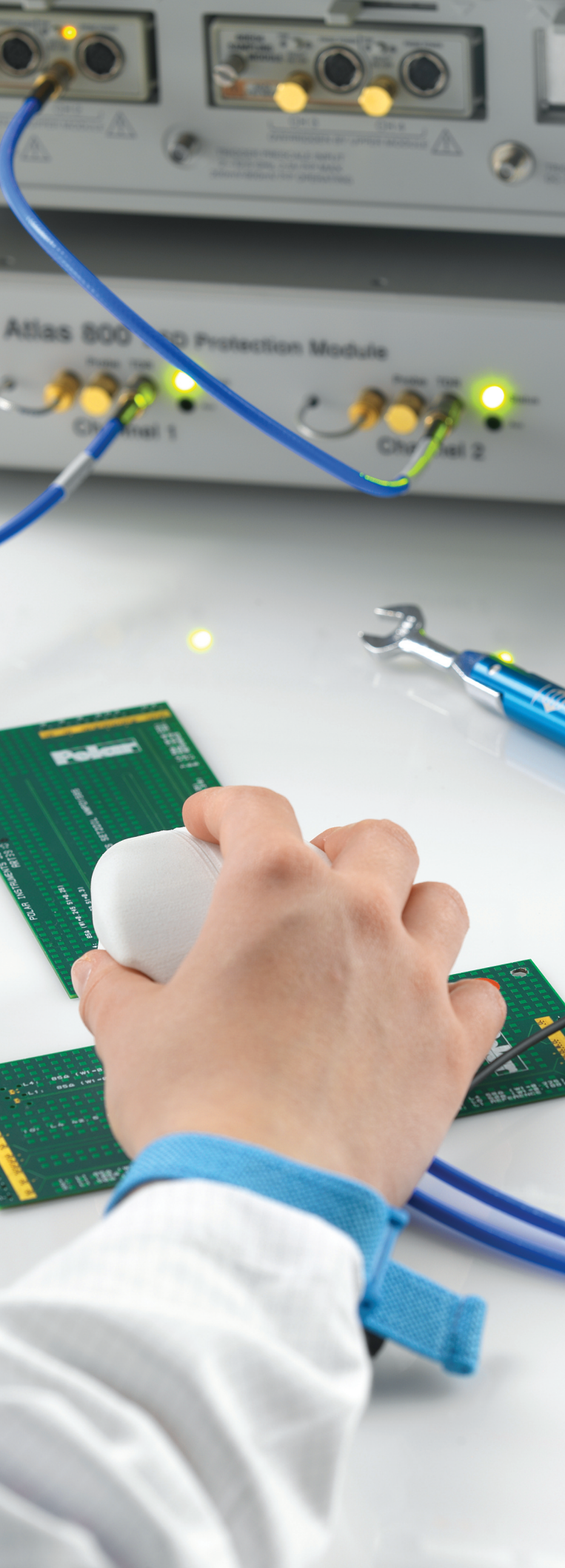
As high bandwidth systems are inherently sensitive to electrostatic discharge (ESD) they must be implemented with the highest level of ESD control that is practical in the test environment. Atlas software is fully integrated with the Atlas 800 ESD protection unit which provides both 26GHz bandwidth switching and active coupon pre-discharge. Atlas 800 ESD protection unit should be used in an environment with good ESD practice in order to minimise your running costs.

Atlas test system for SET2DIL testing of frequency-based insertion losses – S_{DD21} and S_{21}

Compatible with Tektronix DSA8300 Time Domain Reflectometer (TDR) with 80E04 TDR sampler heads

Compatible with GGB Picoprobe type TLP-1 450 micron GSSG (for SET2DIL testing)

Compatible with other Polar GHz PCB design and fabrication tools – Si9000e / Speedstack Si and CGen Si – (Beta) Insertion Loss Coupon Generator.



Atlas is compatible with both commonly specified test techniques for TDR based insertion loss: (S_{DD21}) measurement, SET2DIL & SPP*

Atlas can be used for standalone testing of insertion loss at the point of fabrication or as part of a suite of GHz PCB fabrication tools with other Polar products, including the Si9000e Transmission Line Field Solver, Speedstack Si Layer Stack-up Design System and the CGen Si (beta) Insertion Loss Coupon Generator. The combination of these powerful tools can help to improve manufacturing yields as well as reduce the cost of multi-GHz PCB fabrication.

Using the Si9000e to analyse and predict losses during the design stage, the fabricator can quickly model a range of scenarios, dramatically reducing both material costs and engineering time, to improve manufacturing yields. The data on the modeled stack geometries can then be imported into the CGen coupon generator to create accurate coupons for Atlas SET2DIL test coupons. Finally, the Atlas software ensures that transmission line losses are measured and controlled during the fabrication process.

- Lossy-line testing uses criteria different from impedance control
- Allows PCBs over 2GHz to be manufactured with the most cost-effective laminates
- PCB fabricators face a growing need to test lossy lines
- Reduces the high cost of multi-GHz PCB fabrication
- Lossy-line testing is not a substitute for impedance control



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Specifications

Insertion Loss measurement	S _{DD} 21 magnitude vs frequency over the widest range practical for a coupon of defined characteristics
Impedance measurement	Single ended and differential impedance Accuracy specifications: as defined by the TDR manufacturer
SET2DIL	S _{DD} 21 measured using the IPC-TM-650 defined SET2DIL technique. Order Atlas Si – for SET2DIL
SPP	S _{DD} 21 measured using the IPC-TM-650 defined SPP – Short Pulse Propagation technique *
Impedance	Controlled (characteristic) lossless impedance – included as standard with SPP and SET2DIL
ESD protection	Included as standard – Atlas 800 SPP & SET2DIL ESD protection system
SET2DIL & SPP	Atlas for SET2DIL & SPP bundles all of the above
Datalogging and output	All tests data logged and output as pipe delimited text files for customer processing Printable test lists and waveforms
Probe	GGB Picoprobe type TLP-1 450 micron GSSG for SET2DIL
Bandwidth monitoring	Real time monitoring of system bandwidth
Acquisition system	Tektronix DSA8300 with 80E04 plug-in (Polar or customer supplied)
Accessories	ACC383: USB footswitch
PC requirements	PC running Windows 7 or later TCP/IP Ethernet connection for communication with compatible measurement system (static IP address required for compatible measurement system)
Applicable standards	IPC TM-650 2.5.5.12

*From Fall 2013

Ordering Information

Atlas for SET2DIL insertion loss measurement:	Atlas SET2DIL
Atlas for SPP insertion loss measurement:	Atlas SPP
Atlas for both SET2DIL and SPP techniques:	Atlas SET2DIL & SPP
Atlas 2 channel impedance test & ESD isolation:	Atlas PCB 2CH
Atlas 4 channel impedance test & ESD isolation:	Atlas PCB 4CH
Datalogging:	Atlas DRG Pro

Included in all of the above Atlas 800 ESD protection unit compatible with SPP & SET2DIL testing.

About Polar Instruments

Polar Instruments is a market leader in designing and manufacturing tools to simplify and enhance the design, fabrication and testing of printed circuit boards (PCBs). Their innovative tools include the industry-standard Controlled Impedance Test System (CITS) which provides the global PCB industry with an easy-to-use test system for high-speed digital and RF boards, as well as class-leading tools for fast and accurate design and testing of controlled impedance in PCBs. Polar also leads the industry in tools for automated PCB layer stackup design and documentation. Polar Instruments was established in 1976 and now has operations and channel partners in the US, UK, Europe and Asia Pacific.

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