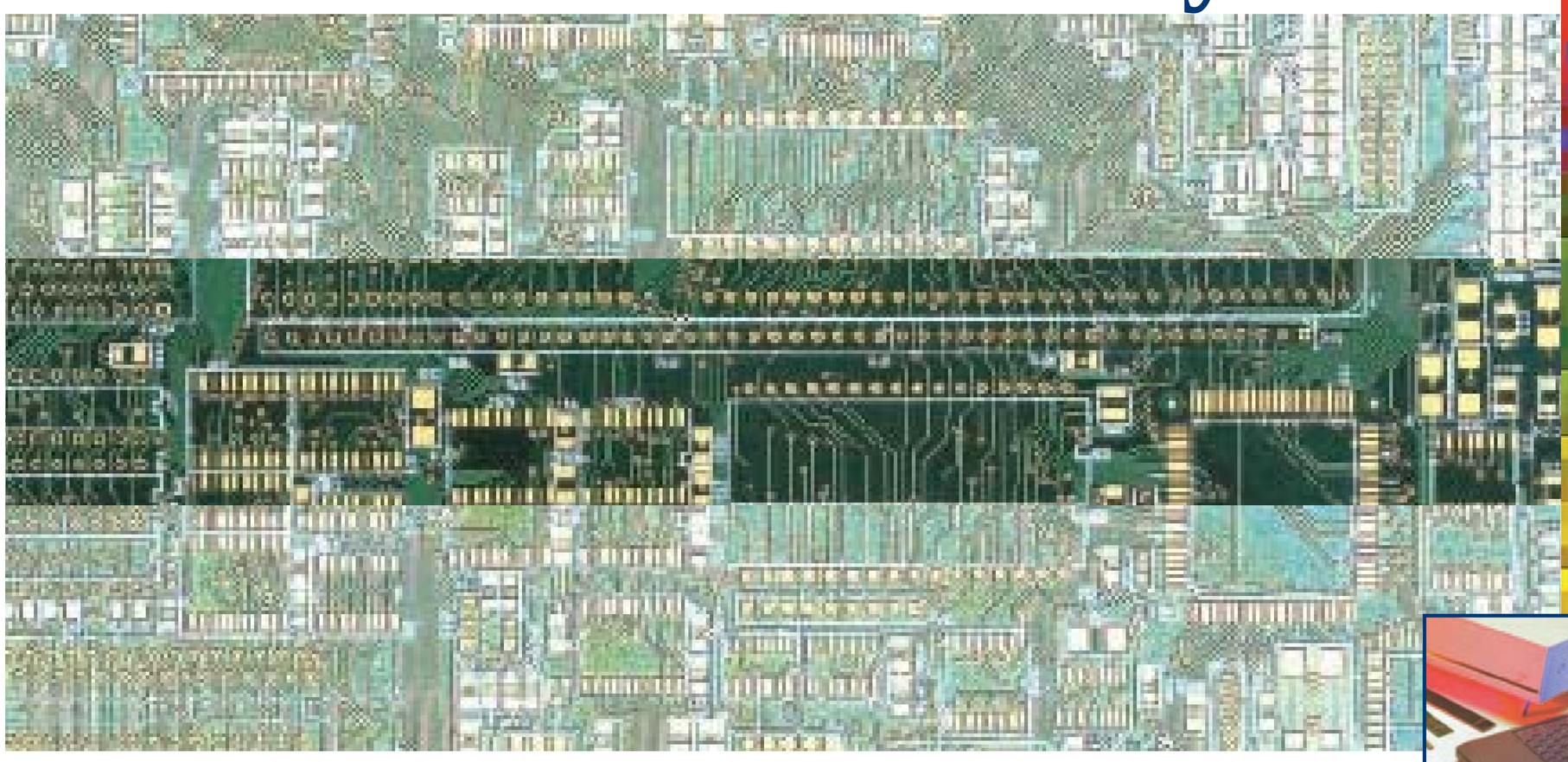
CITS100s
Controlled Impedance Test System



Accurate Impedance Measurement ensures Signal Integrity

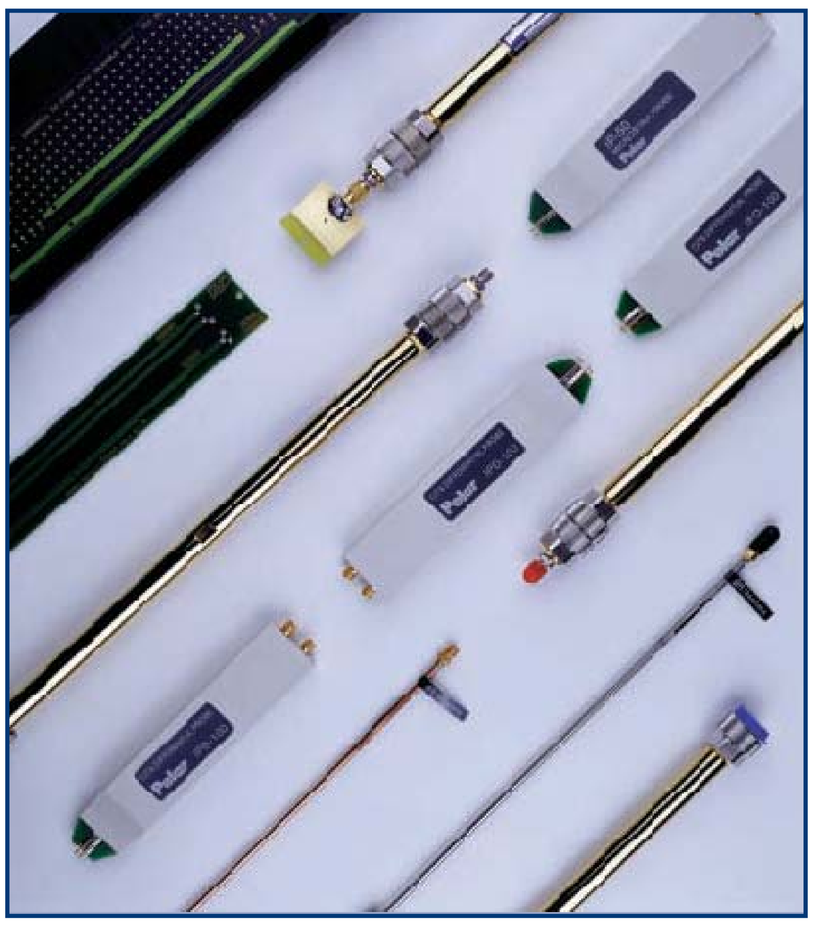
Measures single ended traces

Datalogging and SPC reporting options

CITS100s

Polar

polarinstruments.com



As a PCB manufacturer, you are almost certainly now producing controlled impedance PCBs for your customers – it is estimated that within a few years these types of boards will account for some 70% of the market.

But how do you verify the PCBs' characteristics, control your production process and demonstrate quality conformance to your customers?

Controlled impedance PCBs are used across a broad range of applications to help ensure high frequency signal integrity. Designers invariably specify these types of PCBs whenever the edge speeds of digital signals are faster then 1ns, or analog signals climb above 300MHz.

A wide variety of optional probes are available to ensure repeatable connection with good signal integrity

The dimensions of the trace and the properties of the PCB material – which can vary from batch to batch – determine the characteristic impedance of a PCB trace. To control trace impedance, PCB manufacturers usually vary trace width to compensate for different batches of PCB material. Historically, they were then forced to use specialist laboratory equipment, such as an oscilloscope-based time domain reflectometer (TDR) or a network analyser, to measure the characteristics of a PCB, or a representative trace etched on the board or a test coupon. This approach was complex, expensive, and far from ideal in a production environment.

The CITS100s is a new entry level impedance test system designed to enable fabricators to test impedance controlled boards accurately and repeatably, but at a significantly lower cost. The CITS100s is capable of measuring single ended controlled impedance boards, which comprise the vast majority of controlled impedance build. The CITS100s is an excellent system for smaller PCB shops who are new to controlled impedance, and enables the testing of builds in house where previously impedance test may have been contracted out.

The total test solution

Polar’s CITS100s offers you a total solution for testing your controlled impedance PCBs. This innovative system is designed specifically for use in PCB production environments, and is extremely simple to operate.

The CITS100s uses TDR techniques to measure the reflection of fast rise-time pulses, and provides a graphical view of a conductor’s characteristic impedance along its length. It automatically reports when a measurement is outside the
tolerance you specify.

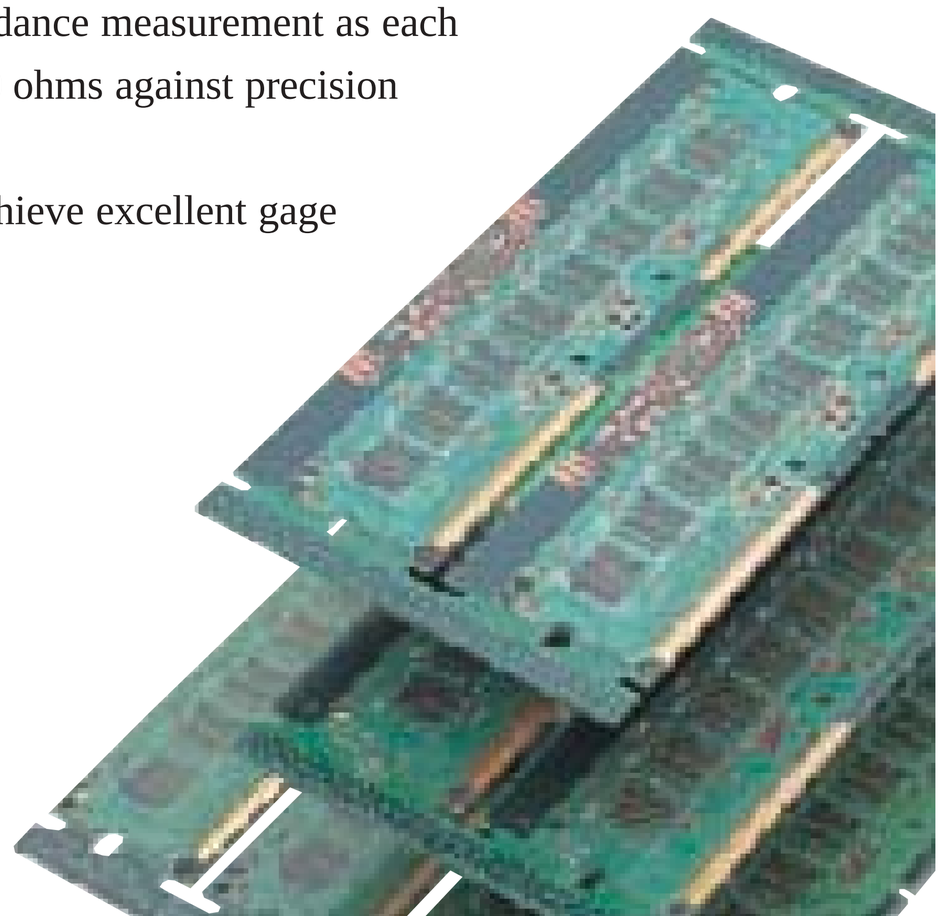
You can share graphical test results by email and view using the CITSView software which is available for download from ***www.polarinstruments.com***

The new CITS100s is based on the same reliable core technology that powers the industry standard CITS500s and CITS500s4. As a single channel system it covers 80% of controlled impedance test capability at a fraction of the price of a differential testing system.

Inbuilt TDR sampling head protection and proven technology mean you can depend on the CITS100s to deliver you reliable accurate impedance test results combined with low lifetime cost of ownership.

High Accuracy

High accuracy is assured over a wide range of impedance measurement as each CITS100s is factory calibrated at 28, 50, 75 and 100 ohms against precision reference airlines, traceable to National Standards.
You obtain accurate and repeatable results. Users achieve excellent gage R&R using non-technical operators.

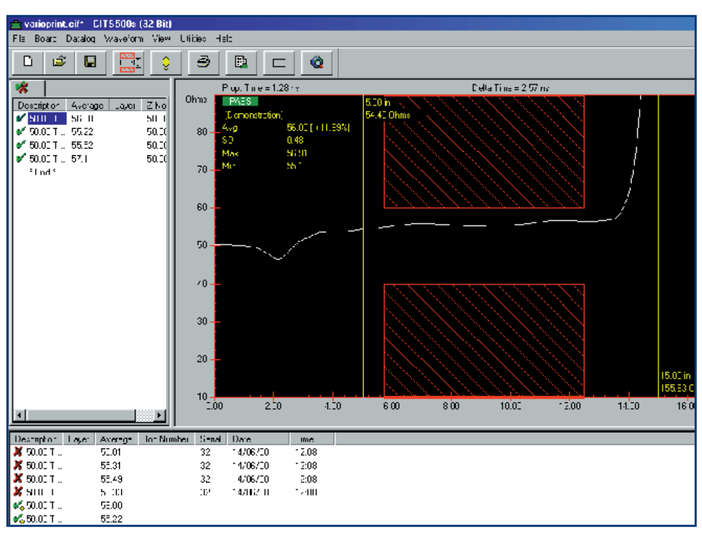


Exceptional ease of use

CITS100s is exceptionally easy to use. Powerful software automates every aspect of testing, enabling the entire process to be controlled by a mouse or footswitch. You simply select a test file containing the PCB test impedances and tolerances, position the probe and press the footswitch. Typical PCBs and coupons have a number of different impedances and the CITS100s can execute a series of impedance tests automatically, prompting you to reposition the probes as appropriate.

The instrument is equipped with an internal static isolation unit to provide maximum protection against accidental damage.

Results



Test results are clear – the CITS100s automatically processes the data to produce a simple display of impedance versus distance, and reports a PASS or FAIL for each test.

Automatic datalogging enables test results – together with system setup data and measurement criteria – to be easily exported to a wide variety of third-party database or spreadsheet packages for real-time statistical process control.

You can print test results to provide conformance reports for your customers, store the data on disk for archive purposes or future analysis, or export it for real-time SPC purposes.

An optional SPC datalog report generator (DRG) accommodates a wide variety of standard forms, for simplicity of reporting.

Test Parameters

Despite the CITS100s' simplicity of operation, test accuracy and flexibility have not been sacrificed. The instrument has traceable measurement accuracy, with all calibration constants stored in EEROM. Furthermore, QA specialists still have the freedom to specify complex setup parameters such as propagation velocity and loss compensation, as well as standard test functions like pass/fail limits, result handling and data logging.

Applications

CITS100s has capability of writing professional reports using the optional DRG Datalog report generator, in addition the CITS100s is also compatible with Prolink QC Calc real time SPC reporting systems.

www.prolinksoftware.com

Accessories

There are a wide number of accessories to support your specific application including:

Probes

There is a wide range of 50 ohm probes with footprints to suit your coupon layout. These have been designed to ensure maximum repeatability and accuracy of measurement.
A comprehensive range of standard and specialist probes are available to suit over 90% of typical applications, in addition we can supply bespoke probing solutions for your customer requirements, there is a setup cost associated with this, and wherever possible we suggest you talk with your customer to generate a coupon design to suit one of our standard probes.

Verification kit and airlines

We offer a range of airlines (28, 50, 75 and 100 ohms) and semi-rigid references (25, 50, 75 and 100 ohms) with Certificates of Accuracy traceable to National Standards (NIST and NPL). These allow you to verify the accuracy of your CITS.

Data Report Generator

This is an optional software module that imports data from the CITS datalog and produces customer reports including calculation of Cp and Cpk.

Coupon Holder

This will adjust to hold most sizes of coupon and ensures maximum accuracy of measurement.

Bar code Reader

This reader allows you to scan PCB barcodes prior to testing and avoids manual entry of a PCB serial number.

USA / CANADA
Polar Instruments Inc
T: (800) 328 0817
F: (650) 344 7964
E: richard.smith@polarinstruments.com

ASIA / PACIFIC
Polar Instruments (Asia Pacific) Pte Ltd
T: +65 6873 7470
F: +65 6873 7471
E: amit.bhardwaj@polarinstruments.com

GERMANY, AUSTRIA, SWITZERLAND
Polar Instruments
T: +43 1 98 54 680-0
F: +43 1 98 54 680-20
E: hermann.reischer@polarinstruments.com

KOREA
Polar Instruments Korea Corp
T: +82 2 2644 2493/4
F: +82 2 2644 2495
E: jsbae@polarinstruments.com

UNITED KINGDOM / EUROPE
Polar Instruments UK Ltd.
T: +44 23 9226 9113
F: +44 23 9226 9114
E: neil.chamberlain@polarinstruments.com

REST OF WORLD
Polar Instruments Ltd.
(Head office)
Garenne Park, Guernsey
UK. GY2 4AF
United Kingdom
T: +44 1481 253081
F: +44 1481 252476
E: martyn.gaudion@polarinstruments.com

LIT:195

CITS100s

Measurement Capability	
Range	0 – 150 ohm
Accuracy	1% at 50 ohm (Calibrated against traceable standards at 28, 50, 75 and 100 ohms)
Testable length	15m maximum
Horizontal display resolution	0.2mm (0.008")
Vertical display resolution	0.03 ohm

System Inputs & Outputs	
Test probe channel	Single channel
Bar code reader interface	Industry standard PC keyboard wedge
Pass/Fail outputs	Opto-isolated, open collector
Socket for anti-static wrist strap	4mm
Computer communication port	RS232C
Power input	IEC, 100v±10%, 115V±10% or 230V±10%@50/60Hz, 15VA

Standard Accessories	Description	Part Number
	Probe cable	WMA326
	50 ohm probe	IP50
	Sample coupon	MPCD1325
	Footswitch	ACC124
	RS232 cable	ACC142
	Anti-static wrist strap & cable	ACC185
	Operators Manual	MAN192
	Power cord	

Optional Accessories		
	50 ohm probe,variable pitch	IP50V
	Short trace matching probes	Consult factory for advice
	Barcode reader	ACC186
	Datalog Report Generator software	ACC230
	Service Manual	
	CITS Coupon Holder	ACC153

PC Requirements		
	Pentium running WIN2000 or NT, monitor, RS232 port	128Mb RAM, SVGA

For differential testing please refer to the CITS500s and CITS500s4 literature (LIT157) or visit **www.polarinstruments.com**

polarinstruments.com