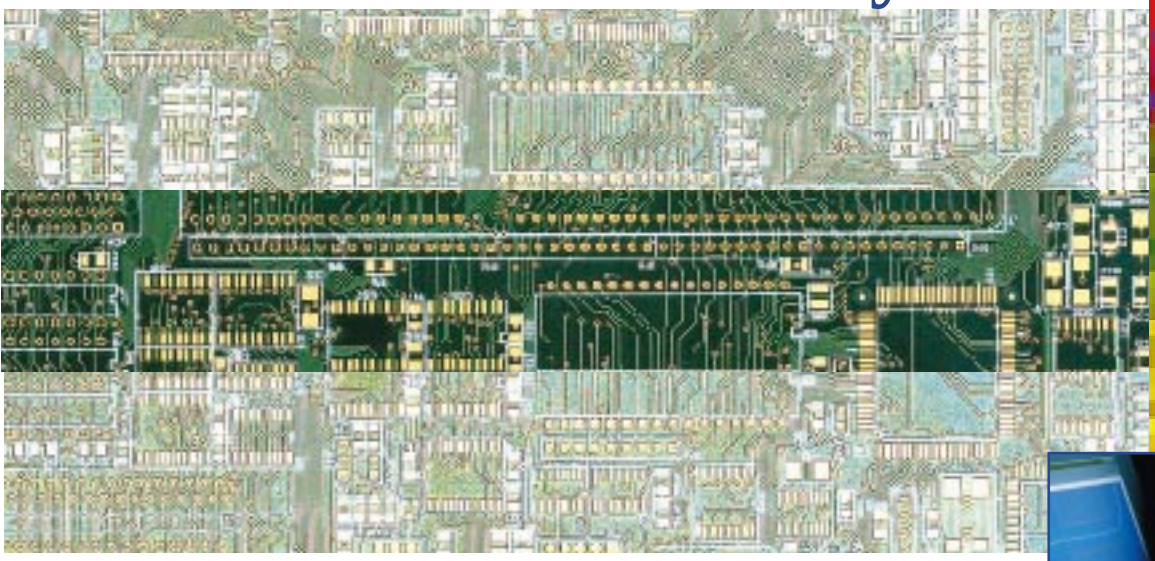
CITS500s
Controlled Impedance Test System

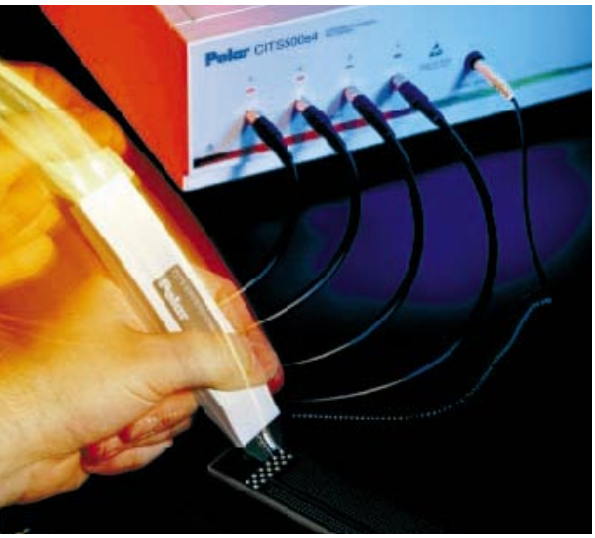


Accurate Impedance Measurement ensures Signal Integrity

- *High Accuracy*
- *Excellent R&R*
- *Measures Single and Differential Traces*
- *CITS500s - 2 channels*
- *CITS500s4 - 4 channels*

Polar

polarinstruments.com



CITS500s4 has 4 channels to test single and differential traces on the same coupon

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.

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.

Many electronics designers – especially those pushing performance boundaries in the defence/aerospace, communications and IT industries – are now taking controlled impedance PCBs a stage further, by using differential signals and balanced traces to improve noise immunity and reduce timing errors on very high speed interconnects. For PCB manufacturers serving these rapidly growing electronics sectors, verifying the differential impedance of these balanced traces has proved difficult until now.

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

The total test solution

Polar's CITS500s 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.

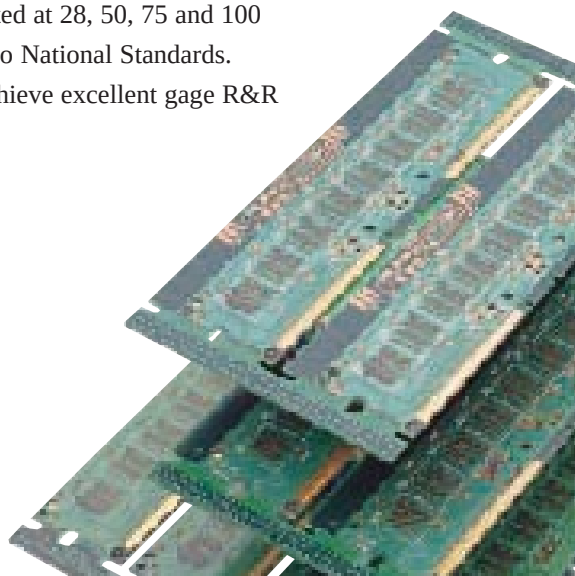
The CITS500s uses TDR techniques to measure the reflection of fast rise-time pulses, and provides a graphical view of a conductor's characteristic impedance along its length. It automatically reports when a measurement is outside the tolerance you specify.

CITS500s4 has 4 channels that allow you to permanently connect two or more test probes making it ideal when your coupons have both single and differential traces. The CITS500s4 software automatically prompts the user to select the correct probe.

CITS500s and CITS500s4 provide you with the ideal solution for easily and accurately verifying the impedance of PCBs – both single-ended trace impedance and the differential impedance of balanced traces.

High Accuracy

High accuracy is assured over a wide range of impedance measurement as each CITS500s running 32-bit software 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.



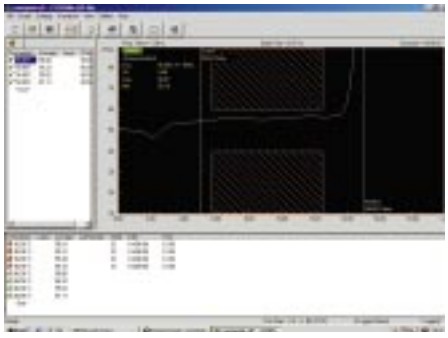
Exceptional ease of use

CITS500s 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 CITS500s 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 CITS500s 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 set-up 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 CITS500s' 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

CITS500s is a robust instrument suitable for use in production environments by non-technical operators. It is also widely used by contract manufacturers to verify conformance from PCB suppliers.

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. Differential and variable pitch probes are also available together with other impedance probes when you need to measure short traces. Contact us for more information about your application so that we may advise you on the best solution.

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.

CITS500s & CITS500s4

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

System Inputs & Outputs	
Test probe channels	CITS500s - 2channel, CITS500s4 - 4 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 x2	WMA258 (per pair)
	100 ohm differential probe	IPD100
	50 ohm probe	IP50 (per pair)
	Sample coupon	MPCD950
	Footswitch	ACC124
	RS232 cable	ACC142
	Anti-static wrist strap & cable	ACC185
	Operators Manual	MAN174
	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	

PC Requirements	
	Pentium running WIN95, 98 or NT, 64Mb RAM, SVGA monitor, RS232 port

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