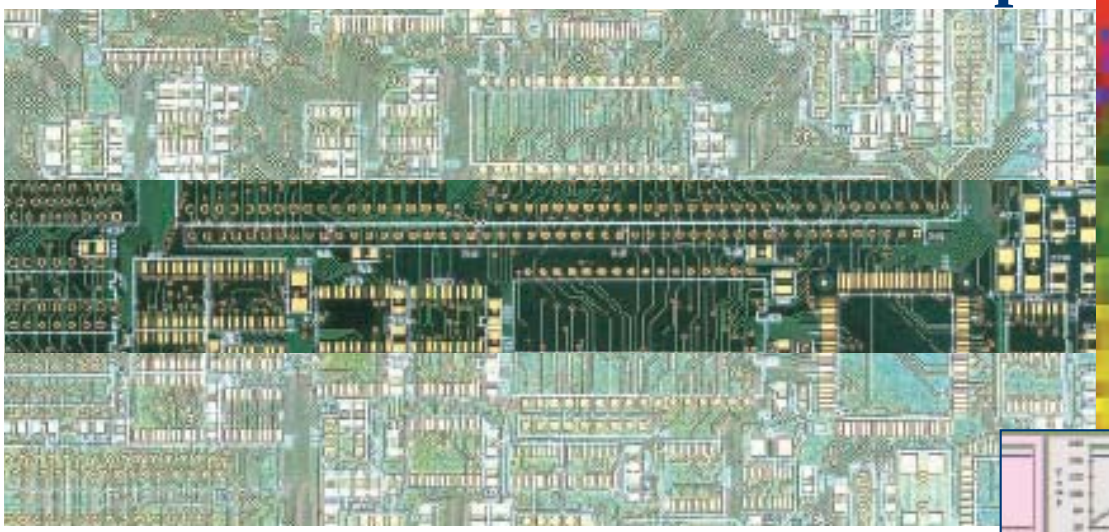
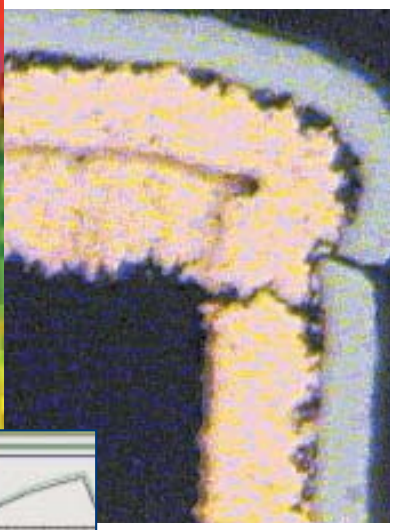
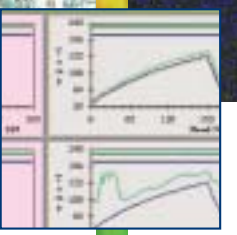
Interconnect Stress Test
PWB Corp







Fast repeatable PWB reliability testing

IST - VBP

Fast

Excellent R&R

Easy to characterize

Cost effective

Simulates environmental conditions

Reduces the need for microsectioning

Effective data analysis

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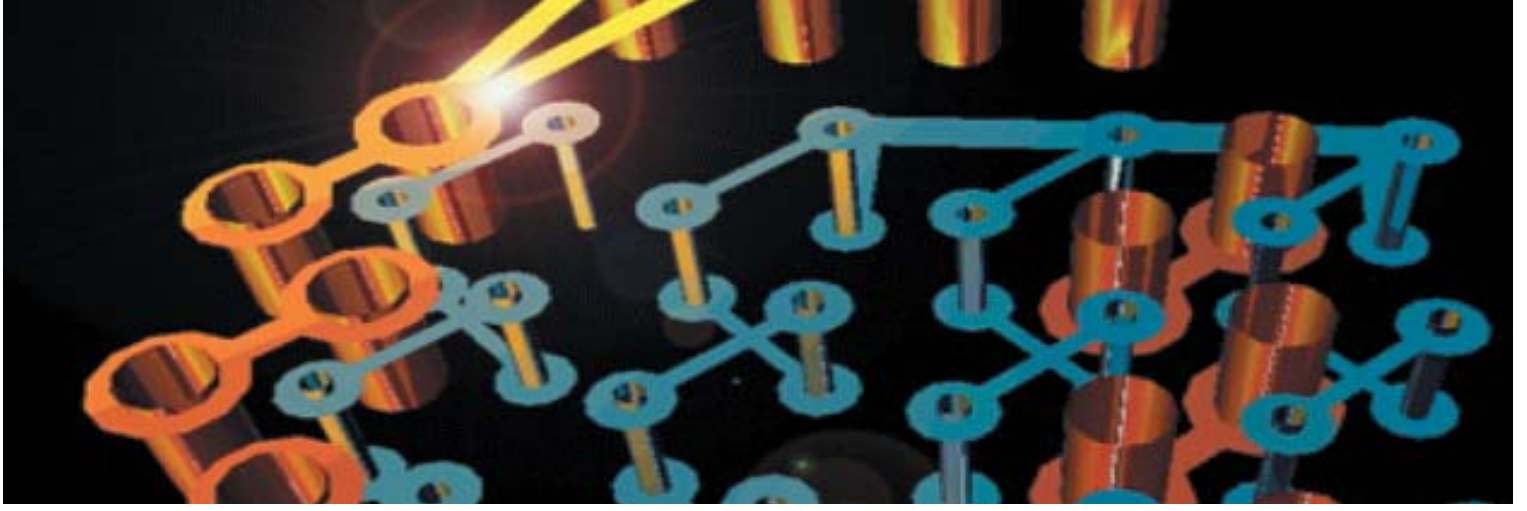

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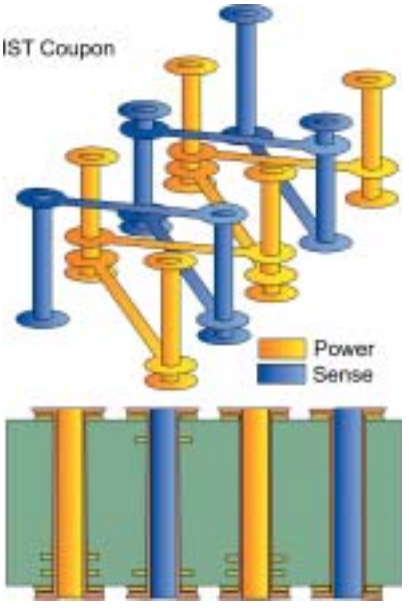


By integrating heating elements and sense traces into a custom coupon design, IST is able to extract reliability information without the need to resort to traditional oven/ Liquid to Liquid methods. Both power and sense elements are embedded into the test coupon structure.

Interconnect Stress Test (IST)is rapidly emerging as the future test methodology for the assessment of Printing Wiring Board interconnect. Because PCB industry wide studies over the last ten years have concluded that compared to traditional methods, (thermal oven/liquid to liquid/sand bath/solder float), IST methods are:

- *Faster*
- *Repeatable & reproducible*
- *Easy to characterize*
- *Simulate the products expected assembly/environmental conditions*
- *Cost effective*
- *Reduces the need for micro sectioning*
- *Simplify data analysis & interpretation*

IST is an accelerated stress test method that overcomes the limitations of thermal oven or liquid/liquid methods, IST has the capability of effective/rapidly quantifying the integrity of both the Plated Through Hole (PTH)and the unique ability to identify the presence and levels of post separations within the multilayer board. IST creates a uniform strain from within the substrate, the interconnects ability to distribute and redistribute this strain provides an indication of integrity. The plated barrels and inner layer junctions are “exercised” until the initial failure mode/mechanism is uncovered.

Following several years of intense evaluation, the IPC have approved the IST technology as the first electrical test methodology for assessing plate through hole integrity and for the detection of post separation.
The IST methodology is issued in the IPC-TM-650 Test Methods Manual.

IST is able to interrupt testing just prior to the failure occuring thus allowing more detailed analysis of the fault mechanism than with traditional methods.

About PWB Interconnect Solutions

PWB Interconnect Solutions Inc. is an advanced technology company which offers a revolutionary method for assessing the quality of printed circuit boards (PCB). Their patented interconnect stress test (IST) technology has the unique ability to identify the presence and severity of post separation of both the plated through hole (PTH) and vias within multilayer PCBs. IST technology offers significant advantages over traditional test methods while providing microsection analysis with precise fault locations

COMPETITIVE ANALYSIS

ELEMENT	IST	Thermal Cycling	LIQ/LIQ
Test Type/Temp	Stress (25-150C)	Stress (65/+125C	Shock (-35/+125C)
Characterization	Easiest	Difficult	Easier
Failure Detection	Early detection	Not applicable	Not applicable
Cost of Ownership	Low	High	Medium
Cost of Test (/500cyc)	Low	High	Medium
Data Collection	Integrated	optional	A @10K
Capabilities	PTH + Post	PTH	PTH
Time to Results (hrs)	24	288	120
Installation	Portable AC Outlet	Hard wired Drainage, Compressed Air	Hard wired Drainage, Compressed Air
Mass-Microsectioning	No	Yes	Yes
Environmental	Friendly	Nitrogen/CFC's	CFC's

Precision microsection of delam fracture after extensive testing.

Revolutionary reliability test method.

IST Technology is now capable of providing to the Printed Wiring Board Industry a new revolutionary method of testing which has the following characteristics

- *IST removes the ambiguity*
- *IST accelerates throughput*
- *IST reduces overall cost, and*
- *IST improves customer satisfaction*

IST technology is the first test system capable of quantifying various types of post separation and PTH degradation that occur simultaneously or independently

How often do I need to IST test?

The answer is very much related to who's asking the question. There are typically three levels of customers that require IST test data;
1 PWB Manufacturers
2 Component Assembly/Contract Manufacturers
3 OEM's or End Use Customers.
The activities requiring IST data for each customer level is as follows:

1

Activity	Frequency
New Technology Introduction	During development & Pre-production phase
Product Baselining	During initial introduction phase
Process Monitoring	Ongoing following baselining activities
Chemical/Material Characterization	As Required
Process Troubleshooting	As Required
Correlation Studies	During initial development phase
Customer Assurance	As Required
Product Prescreening	Prior to long term (air to air) testing

2

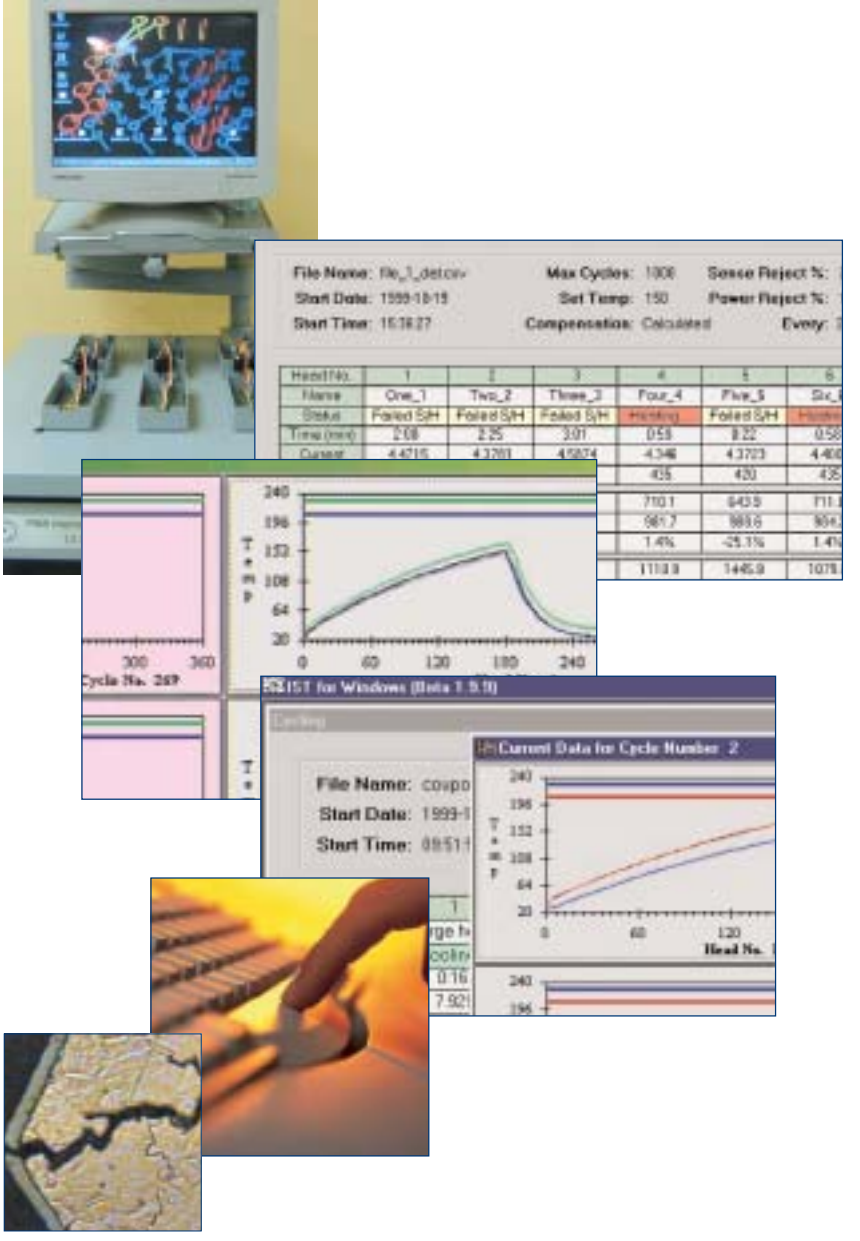
Activity	Frequency
Impact of assembly/ rework stresses	Ongoing following baselining activities
PWB vendor base capability studies	During initial pre-production phase
Process/Product Troubleshooting	As Required
New Technology/Process Introduction	During development & Pre-production phase

3

Activity	Frequency
Technology/Design change impact studies	During initial pre-production phase
Product Troubleshooting	As Required
PWB vendor base capability studies	During development & Pre-production phase
PWB vendor base qualification	As per the supplier procurement specification

Clients and customers include:

Company	Business
Alcatel	OEM
Atotech (Germany/China)	Chemical
Celestica	CEM
Chin Poon	PWB
Cisco	OEM
Compeq (Taiwan)	PWB
Coretec	PWB
Cray Research	OEM
D.D.I. (2 divisions)	PWB
Delco/Delphi Electronics	OEM
Dell Computers	OEM
Dupont	OEM
Electrochemicals	Chemical
Elec & Eltek (Hong Kong)	PWB
E.M.C. Corp.	OEM
Gold Circuits (Taiwan/China)	PWB
GUL Technology	PWB
Harris Corp.	OEM
Hewlett Packard	OEM (3 Divs)
Hitachi (Japan/Singapore)	OEM
Honeywell (Air & Space Divs)	OEM (2 Divs)
Ibiden (Japan)	PWB
IBM	OEM
ISUPetasys Co., Ltd.	PWB
Isola	Materials
LG Electronics (Korea)	PWB
Lockheed Martin	OEM (3 Divs)
Macdermid	Chemical
Maxedge (Taiwan)	PWB
Merix Corp	PWB
Motorola	OEM (3 Divs)
Multek (Flextronics)	PWB (3 Divs)
Nan Ya	PWB
Nelco	Materials
Northrop Grumman (Litton)	PWB
Oriental Printed Circuits	PWB
Plato	PWB
Plexus	CEM
Polyclad	Materials
Raytheon	OEM
Research In Motion (RIM)	OEM
Sanmina	PWB (5 Divs)
Samsung	PWB
Shipley-Ronal	Chemical
Siemens	OEM
Silicon Graphics	OEM
Sun Microsystems	OEM
Teradyne	PWB
The EPC (Wong Circuits)	PWB
Toppan (Japan)	PWB
Tripod (Taiwan)	PWB
Topsearch	PWB
T.T.M	PWB (2 Divs)
Tyco	PWB (5 Divs)
Unisys	OEM
U.S Navy	Government
Viasystems (Cdn , Hol'd & UK)	PWB (5 Divs)
WUS	PWB (3 Divs)
Yamamoto (Japan)	PWB



Combining an innovative coupon design incorporating both heating and resistive sense elements. PWB IST-VBP delivers cost effective reliability testing in a much more cost effective and time effective package. Backed by extensive IPC studies, the PWB IST is a revolutionary alternative to traditional oven / liquid thermal shock techniques. Of special interest is the ability to stop testing just at or before the point of failure.

Polar Instruments (Asia Pacific Pte Limited) provides both sales and after sales support to PWB clients in the Asia pacific region. If you need more information on reliability test please contact us at the address below.

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