



TRACE LABORATORIES-EAST

Headquarters

5 North Park Drive
Hunt Valley, MD 21030
USA

Telephone: 410/584-9099

Fax: 410/584-9117

Email: tracelab@connext.net

www.tracelabs.com

Western Office

P.O. Box 370736
Denver, CO 80237
USA

Telephone: 303/683-4806

Fax: 303/683-4972

Email: tracelab@connext.net

www.tracelabs.com



Certificate No. TLE01A



Cert No(s) 1251.01, 1251.02,
1251.03

ISO 9001:2000



ISO/IEC 17025



PERRY JOHNSON
REGISTRARS, INC.

Cert No. C2005-01504

TEST REPORT FOR:

PETERS RESEARCH GMBH & CO KG

Hooghe Weg 13

47906 Kempen, Germany

Attn: Geraldine Roskothen

DATE IN:

October 2, 2006

P/O #:

Wire Transfer (PRO6-2909-0657)

SUBMISSION IDENTIFICATION:

Six solder mask coated specimens, identified \$ 24%7 ##, were tested in accordance with IPC-SM-840C, Amendment 1, Class T (Telecommunications) and Class H (High Reliability), for Visual, Hydrolytic Stability, and Dielectric Strength.

SUMMARY:

The solder mask, identified as \$ 24%7 ##, has met the specified requirements of IPC-SM-840C, Amendment 1, Class T (Telecommunications) and Class H (High Reliability), for Visual, Hydrolytic Stability, and Dielectric Strength.

APPROVED:

Renee J. Michalkiewicz
Laboratory Director

SAMPLE DISPOSITION:

Samples returned to the customer



TRACE LABORATORIES-EAST

Headquarters

5 North Park Drive
Hunt Valley, MD 21030
USA

Telephone: 410/584-9099

Fax: 410/584-9117

Email: tracelab@connext.net

www.tracelabs.com

Western Office

P.O. Box 370736
Denver, CO 80237
USA

Telephone: 303/683-4806

Fax: 303/683-4972

Email: tracelab@connext.net

www.tracelabs.com



Certificate No. TLE01A



Cert No(s) 1251.01, 1251.02,
1251.03

ISO 9001:2000



ISO/IEC 17025



PERRY JOHNSON
REGISTRARS, INC.

Cert No. C2005-01504

VISUAL

TEST SPECIMENS:

Fourteen samples coated with solder mask.

REFERENCE:

IPC-SM-840C, Amendment 1, paragraph 3.4.8.

REQUIREMENT:

The solder mask appearance shall be observed visually in all stages of evaluation, qualification, and conformance inspection with the aid of a magnifying lens rated between 1.75 and 10X magnification unless otherwise specified.

The material shall be uniform in appearance and free of foreign materials, cracks, inclusions, peeling, and roughness that would interfere with the assembly or operation of the printed board. Discoloration of metallic surfaces under the cured solder mask shall be acceptable.

METHOD:

The samples were visually examined using a magnification of 10X. Any defects observed were recorded.

RESULTS:

There was no evidence of cracks, inclusions, peeling, or roughness. The solder mask was uniform in appearance and free of foreign materials.

HYDROLYTIC STABILITY/AGING

TEST SPECIMENS:

Three 4" x 4" copper or copper clad laminates, coated with solder mask.

REFERENCE:

IPC-SM-840C, Amendment 1, paragraph 3.6.2.

REQUIREMENT:

The cured solder mask shall be designated as being able to withstand $97 \pm 2^{\circ}\text{C}$, 90-98% RH for a duration of 28 days, without an irreversible change of state. Resistance to reversion shall be determined by examining the appearance and surface tackiness in accordance with TM 2.6.11C of IPC-TM-650.



TRACE LABORATORIES-EAST

Headquarters

5 North Park Drive
Hunt Valley, MD 21030
USA

Telephone: 410/584-9099

Fax: 410/584-9117

Email: tracelab@connext.net

www.tracelabs.com

Western Office

P.O. Box 370736
Denver, CO 80237
USA

Telephone: 303/683-4806

Fax: 303/683-4972

Email: tracelab@connext.net

www.tracelabs.com



Certificate No. TLE01A



Cert No(s) 1251.01, 1251.02,
1251.03

ISO 9001:2000



ISO/IEC 17025



PERRY JOHNSON
REGISTRARS, INC.

Cert No. C2005-01504

METHOD:

A saturated solution of distilled water and potassium sulfate (35 grams per 100 cc) was prepared and heated to 97 ±2°C. The solution was poured into a desiccator to a level just below the ceramic plate. Crystals of potassium sulfate remained visible in the saturated solution. The ceramic plate was placed in the desiccator and a rack was placed in the center of the plate. The specimens were placed in the rack, vertically (the samples did not touch one another). The desiccator lid was sealed with a high temperature silicone grease. The desiccator, containing the samples, was placed in a Blue-M oven which had been preset to 97 ±2°C. The test was run for twenty-eight (28) days. After the required time exposure, the specimens were removed from the desiccator. The appearance of each sample was visually examined and any defects were recorded. The surface tackiness was performed by touching the solder mask with a swab of absorbent cotton. The solder mask was then examined for cotton particles adhering to the coating.

RESULTS:

There was no evidence of reversion. There was no evidence of cotton particles adhering to the solder mask surface.

(Meets the specified requirement)

DIELECTRIC STRENGTH

TEST SPECIMENS:

Three 4" x 4" copper or copper clad (one side) laminates containing a 3" x 3" square of the solder mask in the center of each sample.

REFERENCE:

IPC-SM-840C, Amendment 1, paragraph 3.8.1.

REQUIREMENT:

When tested in accordance with TM 2.5.6.1A of IPC-TM-650, the solder mask material shall meet or exceed the minimum value of 500 VDC per 0.025 mm (0.001") of thickness. Thickness of solder mask less than 0.025 mm (0.001") shall meet an absolute minimum breakdown voltage of 500 volts DC.

METHOD:

A ground terminal of a Hi-Pot Tester was clipped over the thickness of the copper cladding and substrate, being careful not to let the clip extend inward to the polymer coating. A positive electrode was placed on top of the test panel at the center making certain the electrode and clip were electrically isolated by the test polymer film. A



TRACE LABORATORIES-EAST

Headquarters

5 North Park Drive
Hunt Valley, MD 21030
USA

Telephone: 410/584-9099

Fax: 410/584-9117

Email: tracelab@connext.net

www.tracelabs.com

Western Office

P.O. Box 370736
Denver, CO 80237
USA

Telephone: 303/683-4806

Fax: 303/683-4972

Email: tracelab@connext.net

www.tracelabs.com



Certificate No. TLE01A



Cert No(s) 1251.01, 1251.02,
1251.03

ISO 9001:2000



ISO/IEC 17025



PERRY JOHNSON
REGISTRARS, INC.

Cert No. C2005-01504

voltage of direct current was applied in 500 volt increments per second until failure occurred.

RESULTS:

Specimens	Solder Mask Thickness (mils)	Voltage Breakdown (VDC)	Volts/Mil
1	1.8	4,000	2,222
2	1.9	3,500	1,842
3	1.9	4,500	2,368

Trace Laboratories-East certifies that the test equipment used complies with the calibration test purposes of ISO 10012-1, ANSI/NCSL Z540-1-1994, and MIL-STD-45662A and that the data contained in this report is accurate within the tolerance limitation of this equipment.

All test procedures detailed within this report are complete. The results in this report relate only to those items tested. If any additional information or clarification of this report is required, please contact us. This test report shall not be reproduced except in full, without the written approval of Trace Laboratories-East.

See attached certificates to determine if testing performed within this report is covered under our A2LA Scope of Accreditation.

Thank you for selecting Trace Laboratories-East for your testing requirements.

Debora L. Obitz
Senior Engineer