



5 North Park Drive
Hunt Valley, MD 21030

TRACE LABORATORIES-EAST

Military Spotlight

UPDATE ON MILITARY QUALIFICATION AND CONFORMANCE of PRINTED CIRCUIT BOARD AND CONFORMAL COATING PRODUCTS

Rev. February 2006

To receive this information via email, please email mopperhauser@tracelabs.com, subject line: MILSPOT boards produced within the production month being tested.

Important DSCC News

Changes in QPL and QML and Testing Certification

Trace Laboratories, a leader in Qualification and Conformance testing of Military PCB's and materials, is pleased to provide our customers with the latest official qualification and testing update notification from DSCC. We realize that this information was covered in the previous MILSPOTS but wanted to provide the official notification as issued by DSCC.

FREQUENTLY ASKED QUESTIONS

Question: How many coupons do I need to submit for Group B testing?

Answer:

Two sets of quality conformance test circuitry or two test coupons each for Rework Simulation or Bond Strength, Moisture and Insulation Resistance and Dielectric Withstanding Voltage tests. These test coupons shall be from the most complex design produced that month and shall have passed Group A and In Process inspections.

Three test samples containing marking ink or legend for Resistance to Solvents test (Marking Ink test) if required. These samples can either be test coupons or

Eight peel strength test specimens shall be selected from two different production lots; four from each lot or 100 percent if the number of coupons available is less than four for a production lot. Plated tin-lead, solder coating or other plated metallic resist shall be chemically removed prior to test or shall be masked during plating. The test specimen shall not be coated with any organic coating for test.

Question: What happens if my test coupons fail a test listed in the Group B Inspection?

Answer: The production lot is considered to have failed. Trace Laboratories-East will then notify DSCC within 3 business days of notifying the customer. The customer and DSCC shall then discuss what corrective action to take.

Meanwhile, if the lot or lots directly represented by the Group B failure have been shipped, the manufacturer must notify their customer of the failure and shall recall the affected lot or lots for re-inspection, if possible. All other lots represented by extension of qualification by the failed group B sample are considered noncompliant until the failure has been resolved.

Question: What corrective actions shall I take if my test samples fail Group B Inspection?



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Answer: Your corrective actions shall be agreed upon between yourself and DSCC. You may be required to re-inspect all of your Group A data affected by the failed lot. DSCC may also ask for a submission of another set of test coupons from the same lot or from the next most complex design for retest.

Question: How long do I need to keep my coupons which have been subjected to Group B testing?

Answer: Traceability shall be available for review for a minimum of 3 years after delivery of the printed wiring boards.

For more information concerning these topics or any other testing needs, please contact Renee Michalkiewicz at (410) 584-9099 or rmichalkiewicz@tracelabs.com. Visit us on the web at www.tracelabs.com/east.aspx.

DSCC Letter Included, Below



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This DSCC letter highlights some of the recent changes in both the QPL and QML programs for printed boards. DSCC would also like to clarify its position on some related subjects.

DSCC CONTACTS

DSCC-VQE has made some changes to the companies and labs that each of our associates is assigned as main points-of-contact. A list can be found at the DSCC website.

QPL-55110 and QPL-50884:

<http://www.dscc.dla.mil/downloads/VQGeneral/IE55110POCcurrent.doc>

QML-31032: <http://www.dscc.dla.mil/downloads/VQGeneral/IE31032POCcurrent.doc>

NEW DOCUMENT REVISIONS/AMENDMENTS

MIL-PRF-55110 Revision G, (*released 11 December 2005*)

<http://www.dscc.dla.mil/Downloads/MilSpec/Docs/MIL-PRF-55110/prf55110.pdf>

MIL-PRF-55110 Revision G has been released. Authorizations issued prior to 13 January 2006 are valid until 30 June 2006. Qualification testing must be completed in accordance with the revision level stated on the approved DSCC Form 19W.

MIL-P-50884 Revision D, Amendment 2, (*draft proposal released 6 January 2006*)

<http://www.dscc.dla.mil/Programs/MilSpec/listdocs.asp?BasicDoc=MIL-P-50884>

The draft proposal for Amendment 2 to MIL-P-50884 Revision D will be available for review and comment. The comment period ends 7 March 2006. The link above references you to the MIL-P-50884 general page and the document should be up shortly. Comments should be submitted to 5998.Documents@dscc.dla.mil.

DSCC Form 19W [Jan 2006] (attached as *19W [Jan 2006]*)

The Application/ Authorization for Qualification Testing form has been revised. Effort has been made to clarify the instructions for manufacturers. The updated 19W form is also more attuned to the changes in MIL-PRF-55110G and the next version of MIL-P-50884.

After 13 January 2006, DSCC will no longer accept previous versions of DSCC Form 19W. The latest version of the DSCC Form 19W is attached to this letter. It is also available on the DSCC website at <http://www.dscc.dla.mil/downloads/VQGeneral/FE19Wcurrent.pdf>



QUALIFICATION TESTING ISSUES

IPC-100043 Design Issues:

Qualification test specimens are required to comply with the requirements of the MIL-PRF-55110 or MIL-P-50884. These two specifications make reference to the various IPC master drawings for the majority of the design, construction, and material details of the resulting printed boards. Some of the notes on the IPC drawing have been modified by MIL-PRF-55110 and MIL-P-50884. Tables 1 and 2 of the master drawing have been superseded by DSCC Form 19W.

The master drawing reference must be listed on the DSCC Form 19W. In order for the test specimens to comply with the master drawing, some manufacturers may be required to make adjustments to their electronic data or phototools used for qualification. If qualification test specimens do not meet the master drawing specified in Section I of the 19W form and the Attachment A notes of the 19W form, then these qualification test specimens fail (unless exceptions to the drawing had previously been authorized by DSCC on the 19W form). Should a laboratory come across a discrepancy during qualification review, DSCC should be notified, and the qualification should be considered a failure.

MTR testing:

MIL-PRF-55110 Revision G and the new 19W form clarify a manufacturer's test routine (MTR) for the portion of qualification testing that the manufacturer performs in-house. Please note that DSCC expects a manufacturer to follow the proper test methods and sampling plans stated on the 19W form and the applicable specification.

Qualification Reports:

Qualification reports completed after 13 January 2006 are now required to contain the following photographs or images:

- a.) As received (as-is) microsection
- b.) Thermal stress microsection
- c.) Thermal shock microsection
- d.) Rework simulation microsection
- e.) Any failures

Qualification Report Delivery:

An option of electronic delivery for qualification reports is available to laboratories. Reports can be sent to 5998.qualifications@dla.mil and will be forwarded to the correct DSCC contact. Please keep in mind that the entire report needs to be delivered to DSCC, including the manufacturer's information and data, material information, etc. Also, any specimens will still need to be delivered to DSCC for examination regardless of report delivery method.

GROUP B AND PCI TESTING ISSUES

Rework Simulation Testing:

The intent of both MIL-PRF-55110 and MIL-P-50884 group B testing is that all tests be performed (except resistance to solvents if it is covered during group A). This might require that samples for the group B test come from different designs or part numbers. When the term 'most complex' is used, it is not referring to just one design used for all group B tests.

Manufacturers are required to submit samples for rework simulation testing from the most complex through hole component mounting design produced during the month where the rework simulation test can be performed (i.e. from the most complex design that has component holes).



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If only SMT printed boards are produced during the month, then the rework simulation test does not need to be performed. However, the manufacturer should supply a statement to that effect.

Example: Samples from four or more part numbers might be supplied for group B testing as follows:

- Part number 1 for MIR/DWV (from the most complex design, SMT only)
- Part number 2 for rework simulation (from a design that is less complex than part 1, but that has component holes)
- Part number 3 for surface peel strength
- Part numbers 4 for resistance to solvents (if resistance to marking is not being performed during group A)

Please clearly state in the report the part numbers and serial number of the coupons used for each test.

Peel Strength Testing:

Peel strength testing uses the after thermal-stress acceptance value listed on the material slash-sheet. Some of the materials in the same grouping (e.g. IPC-4101 /40 and /41) can have a difference in the acceptable peel strength value. Laboratories must receive information concerning the material certifications from QPL customers so that the test results can be evaluated correctly. For IPC-4101, the "≥0.50 mm [0.0197 in]" column in the material specification sheet should be used, unless otherwise specified.

Dielectric Withstanding Voltage Testing:

It has been noted that IPC-TM-650, test method 2.5.7 has a drying step for specimen preparation. The drying step is not needed for QPL PWB testing for the following reasons:

- (a) the test specimen has already been wired and cleaned
- (b) the test specimen, in most cases, has been conformally coated with insulating compound
- (c) the test specimen has just undergone an environmental exposure to moisture and this test (DWV) is meant to detect any short in the moisture resistance of the test specimen

Group B & PCI Reporting:

Some non-qualified printed board manufacturers are having Group B and/or PCI testing performed on their products. While a lab is at liberty to do this testing to the DoD specification, DSCC does not want it to be implied that passing these tests equates to certified product. To remedy this, DSCC is now requiring all labs to put the Qualification Reference Number (QRN) for each company on the coversheets of group B test reports. This information should be submitted by the manufacturer when requesting group B testing. If a company requesting the periodic testing is not qualified, it is recommended to use the statement "**Not Qualified to QPL-55110**" (or QML-31032 or QPL-50884 as applicable) in place of the QRN.

QRN's are on the qualified list for the QPL specifications. The QPL's & QML can be viewed or downloaded from the DSCC website. Note that if a company is qualified to QML-31032, they may have either 50884-31032! or 55110-31032! as their QRN.

QPL-50884: <http://www.dsccl.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=50884>

QPL-55110: <http://www.dsccl.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=55110>

QML-31032: <http://www.dsccl.dla.mil/Programs/QmlQpl/QPLdetail.asp?qpl=31032>

If you require further information or have any questions, please contact Mr. Jeffrey Ciesla, 614-692-0624 or via email at vqe.jc@dla.mil.