



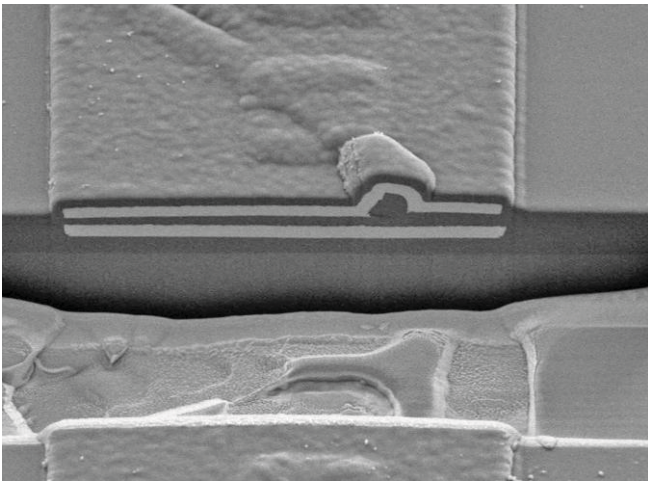

EEE Parts Bulletin

Electrical, Electronic, and Electromechanical

A periodic newsletter of the JPL/OSMS Assurance Technology Program Office (ATPO), NASA EEE Parts Assurance Group (NEPAG), and Section 514, of the Jet Propulsion Laboratory.

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A Look at Failure: Dielectric Defect



A SEM (scanning electron microscope) focused ion beam reveals a defect in a dielectric layer between two metallization layers. [Credit: JPL Failure Analysis Lab.]

GIDEP Alerts/Advisories

Contact your GIDEP Representative for a copy of:

| | |
|---------------------|--|
| Suspect Counterfeit | KD4-P-10-02 Suspect counterfeit, microcircuit |
| | AP2-A-10-01 Suspect Counterfeit, SG1635R-883B, Half Bridge Driver, inverting diode |
| | AAN-U-10-484 Florida corp. owner- employee indicted for selling counterfeit high tech devices destined for the US military and industry |
| | QF4-A-11-01 Suspect counterfeit, microcircuit, linear voltage regulator |
| Misc. | SC7-P-10-03 Libero software fix on static timing analysis for minimum delay for RTAX-S/SL |
| | J5-A-10-01 Intermittent and out-of-specification capacitance (CDR32 Capacitors) |

Virtex 5Q Xilinx announces a new high-performance, rad-hard reconfigurable FPGA. According to Xilinx, the part is made on their V-grade production line, but the product is not officially QML Class V. The package is ruggedized, non-hermetic ceramic.

Hybrid Derating

Hybrid de-rating is a complicated subject. The issue is whether users should derate hybrids in space-related applications or have confidence that the hybrid designers' margins are adequate in the final application?

One example in which one would not want to derate involves DC/DC converters. Derating much below their 'sweet spot' may come too close to their maximum rating, developing a lot of heat when the device isn't operating smoothly.

MIL-PRF-38534 product analysis and derating doesn't specify any amount or even criteria. Users require manufacturers to derate, but to what level is primarily up to the manufacturer. DLA Land and Maritime (formerly known as DSCC) audits check for documentation of derating and analysis on a sample basis since there are no published criteria.

MIL-PRF-38534 requires Class K have all its components de-rated to MIL-STD-975 requirements. Hybrid manufacturers use either 975 or the JPL criteria as a starting point because they do not have better criteria.

In attempting to add derating criteria to the specification, it becomes difficult to apply to various products and designs and can unnecessarily disqualify products that have a desired performance capability.

Space users could design a criteria set and require any exceptions be signed off by at least the design-engineering manager. If a manufacturer's derating process is in accordance with 975 or the JPL approach, ensure they have a sensible process by which exceptions are evaluated and approved.

NASA's DC-to-DC converter guidelines strongly recommend no derating at the hybrid level because the user may be derating components already derated internally and this might cause the DC/DC converter to over- or under-load. Precedent for the no-derating rule lies with relays for which derating the coil voltage could cause non-operation. Contact Mike Sampson 301-614-6233.

Supplier News:

- Solitron Devices no longer QML for MIL-PRF-38535
- Microsemi buys Actel – link to press release: <http://investor.microsemi.com/ReleaseDetail.cfm?ReleaseID=513524>

Unsealed Microcircuits and Hybrids – How Long is too Long Sitting on the Shelf?

During final source inspection of a popular manufacturer of hybrid microelectronic devices, JPL discovered the manufacturer had begun initial assembly of a standard hybrid device five years prior to final seal.

This violated various mission assurance requirements commonly applied to many JPL missions and generated discussion regarding the appropriate time interval between initial manufacturing and final seal.

JPL parts specialists suggest a six-week standard (similar to single-chip microcircuit requirements) for hybrids. The manufacturer being inspected felt a 1-year limit was reasonable. This issue will be discussed within the NE-PAG community to determine further action. Contact Chandra Pardiwala 818-393-7250.

NEPP Workshop Presentations Online

Use the below link to see presentations including 'Counterfeit Electronics – All the World's a Fake', 'Lead-free Electronics – Impact for Space Electronics', 'Packaging and Embedded Electronics for the Next Generation' and 'Workmanship Issues for Modern Packaged Electronics': <http://nepp.nasa.gov/workshops/etw2010/talks/>.

Upcoming Meetings

- ReSpace / MAPLD 2010 Conference, Nov. 1-4, 2010 Albuquerque, NM <http://www.cosmiac.org/ReSpace2010>
- Microelectronics Reliability & Qualification Workshop Dec. 7-8, 2010, Manhattan Beach, CA <http://www.aero.org/conferences/mrqw/index.html>

NASA parts specialists recently supported DSCC Audits of:

Microsemi Corp., Bourns, Ltd., National Semiconductor, M.S. Kennedy Corp. and DPA Laboratories.

Task Group Update: G-12 TG10-01 Class Y for MIL-PRF-38535)

NASA led the second meeting of G12 Task Group #10-01, meant to define screening and qualification require-

ments for non-hermetic parts for space. About 75 people representing government agencies, manufacturers and defense contractors attended. A summary of inputs received from all respondents was presented.

Some fundamental issues were raised, i.e., Is the Virtex V-4 after column attach considered a component? Some users are buying LGA (Land Grid Array) versions and having companies like Six Sigma do the column attach. Moving forward, the team will work on a 3-4 page document showing the exceptions for Class Y. Contact Shri Agarwal at 818-354-5598.

Non-hermetic QMLQ 32-bit RISC Processor

The user community should be aware that the 5962-97608 SMD (standard microcircuit drawing) for a 32-bit RISC processor has both a hermetic (Package X) and a non-hermetic (Package Y) package option. Both are being sold as QMLQ. The QMLQ and V products are supposed to be hermetic.

NASA is leading an effort to develop a new class of non-hermetic parts (Class Y) for space. According to DLA Land and Maritime (formerly DSCC), this is the only situation where a non-hermetic part exists as QMLQ.

NASA has recommended the word "hermetic" be added to the definitions of Classes Q and V in MIL-PRF-38535 for microcircuits. Contact Shri Agarwal 818-354-5598.

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<http://atpo.jpl.nasa.gov/nepag/index.html>

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Previous Issues:

JPL : <http://atpo/nepag/index.html>

Other NASA centers:

<http://nepp.nasa.gov/index.cfm/12753>

Public Link (best with Internet Explorer):

<http://trs-new.jpl.nasa.gov/dspace/handle/2014/41402>

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