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Plant Closings and Relocations – Minimizing Impact

A working group will convene to formulate requirements military and space part manufacturers must follow when closing or relocating a plant. The rules would ideally minimize critical parts shortages recently experienced with diodes. Contact: Shri Agarwal 818-394-5598.

A Look at Failure: Electro-Migration



Mass transport of metal-ions in the direction of current flow is a mechanism for interconnection failure. Failure results from the flux divergence of the migrating ions and is accelerated by current density and temperature.

Surge Current Testing: Tantalum Capacitors

Test methods in MIL-PRF specifications, such as MIL-PRF-55365 and 39003, for tantalum capacitors do not specifically state whether capacitors can be surge current tested in parallel or individually. Some manufacturer technical reports show testing the capacitors in parallel can result in much

higher stresses to parts closest to the power supply or capacitor bank. For more details, contact Ray Smith 818-393-7547.

Using Non-Mil Capacitors in Critical Applications

It is tempting to choose non-MIL capacitors for applications requiring small package size, higher capacitance or higher voltage, cautions Mike Sampson, GSFC. Caution is urged as these parameters can compromise part performance. Any non-MIL capacitor should be thoroughly qualified, including life testing, DPA, voltage temperature coefficient testing, and full electrical including hot insulation resistance. Only a small number of factors in the basic capacitor equation: $C = KA/t$ can be varied. Increasing the dielectric constant K , is an obvious way to increase C , but high K dielectrics can be less reliable over time and less stable over temperature. Increasing active area A , without increasing the chip footprint means reducing edge margins, which increases the risk of voltage breakdown failures. Reducing dielectric thickness t , risks dielectric breakdown. The result is usually a compromise, using the highest K that meets the temperature coefficient (temperature, voltage coefficient for MIL parts) with the narrowest margins that can withstand the voltage breakdown requirements and the thinnest dielectric that can pass life test. Commercial manufacturers are not constrained to follow MIL type testing. The MIL life test is for 2,000 hrs at 2X rated voltage. The commercial manufacturer can do 1000 hrs at 1.5X once a year or less if they choose. Life test indicates the robust nature of the parts, but it does not provide reliability or failure rate information. For details contact Mike Sampson 301-614-6233.

Test Data on JANS Parts

Thermal impedance data for JANS diodes may not be included in data packs unless specifically requested on the purchase order to the manufacturer. For details contact Ed Powell 818-354-3188.

Counterfeit Parts – New Blacktopping Material in Use

A semiconductor distributor recently found two instances of suspect counterfeit parts that use a new blacktopping material designed to evade detection. The substance passes visual inspection and is immune to acetone—so many quality control technicians might not suspect the part is counterfeit. Parts were bought from brokers. A GIDEP advisory will be issued. Contact Phil Zulueta 818-354-1566.

Remarking of Parts

A recent procurement of a commercial microcircuit by a broker from an authorized distributor revealed the parts were remarked by the manufacturer to a lower grade part number. The manufacturer acknowledged that this is their practice when a part fails a higher specification but still meets a lower level spec. Notification would be helpful when parts are remarked. Military/Aerospace QML microcircuits may be remarked when properly documented and MIL-PRF-38535, para. A.3.6.13, requirements are met. Remarking semiconductors is also permitted and must meet MIL-PRF-19500 requirements when a higher-product-assurance-level part is substituted for a lower-assurance-level part (see para. 1.3.8). There are no regulations for remarking commercial microcircuits. Contact Lori Risse 818-354-5131.

Recent DSCC Audits supported for NASA by JPL Specialists

BAE Systems; Pacific Aerospace & Electronics; International Rectifier (Santa Clara); and Kyocera America Inc.

GIDEP 6E-P-09-01 Suspect Counterfeit: Leaded Small Signal Transistor

Parts marked JANTX2N2920 with date code 0309 purchased from an unauthorized source are suspected to be counterfeit. Contact: Ed Powell 818-354-3188.

GIDEP C7E-A-09-01 Suspect Counterfeit: Microcircuit, 32Kx8 nvSRAM

Parts marked STK14C88-N351 date code 0307 purchased from an unauthorized source are suspected to be counterfeit. Contact: Ramin Roosta 818-354-7385.

Upcoming Meetings:

- Military and Aerospace Programmable Logic Devices Aug. 31-Sept. 3
http://nepp.nasa.gov/mapld_2009
- JEDEC Joint Electron Devices Engineering Council JC-13 Meeting, Columbus, OH Sept. 21 - 24
<http://www.jedec.org/default.cfm>

Contacts

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

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