



DEFENSE LOGISTICS AGENCY
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REPLY
REFER TO

DSCC-VQH-00-35 (Miss Schneider/614-692-0585/jms)

February 8, 2000

SUBJECT: Survey of Capacitor Issues, MIL-PRF-38534, FSC 5962

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Dear Sir or Madame:

Some concerns about how hybrid manufacturers select and evaluate capacitors have come up at recent meetings with customers and manufacturers of hybrid microcircuits. One manufacturer shared their experience with capacitors that pushed the design envelope (i.e., high capacitance in a small component). The capacitors contained microcracks that, after burn-in, resulted in leakage. Following the presentation, the following concepts were expressed.

- Stacking capacitors can degrade the capacitors.
- Dielectric layer integrity cannot be determined through a visual inspection. Process control on the slurry during construction, and/or burn-in can reveal this information. However, in some cases microcracks may not result in leakage until the capacitor has experienced environmental preconditioning and electrical stress.
- When capacitors push the design envelope (i.e., high capacitance in a small component) more potential for problems exists.

As a result of these discussions, DSCC is attempting to determine the extent of the issues, find any other issues, and look for ways to minimize risk. One approach may include modifying the element evaluation guidelines in Appendix C of MIL-PRF-38534. Another approach may be to increase the availability of Established Reliability (ER) capacitors.

ER components are those listed on a Qualified Products List. These lists are established based on a manufacturer's meeting the capacitor specification and quality requirements of MIL-STD-790. DSCC-VQ technical staff, through on-site audits and review of qualification data, determines what products and manufacturers can be listed on the QPLs. Many of the very small surface mount capacitors, used in hybrid microcircuits, are not QPL. In some cases, the suppliers have primarily covered those products that will be used directly on printed circuit boards. However, as an interest from the hybrid community to buy this type of capacitor is seen, more suppliers will see the value in pursuing QPL listing for these device types. The ER program allows for reduced vendor evaluation, reduced incoming inspection, and greater reliability.

Please respond to the survey by December 15, 1999. Contact Miss Schneider 614-692-0585 with any questions.

Sincerely,

JOSEPH GEMPERLINE
Chief
Hybrid Devices Team

Capacitor Issues Survey

Please complete and return:

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What failures have you found through the current MIL-PRF-38534, Appendix C Passive Element Evaluation or your current practice (define)?

What failures did you find through production or from your customer? What conditions brought out the failures?

Approximately what percent of your capacitors are purchased using ER QPLs?

For those capacitors not purchased using the ER QPLs, why not?

What capacitor types and values (or ranges) do you purchase that are not on an ER QPL?

For which capacitor types and values do you have difficulty locating any source ?

What changes would you need to see in the ER QPL program to purchase more of your capacitors in that manner?

