

ENGINEERING PRACTICE STUDY

TITLE: ADDITION OF ESTABLISHED RELIABILITY TO MIL-PRF-49470

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FINAL REPORT

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I. OBJECTIVE

This engineering practices study was conducted to determine industry interest in revising [MIL-PRF-49470](#) to include established reliability. If interest existed, this study hoped to gather information and recommendations regarding specification changes needed to complete the revision.

II. BACKGROUND

A QPL manufacturer states that they have enough life test data to substantiate an “R” failure rate level (at 60% confidence level) and believes that the customer will benefit from the addition of failure rate verification.

[MIL-PRF-49470](#) covers the general requirements for general purpose and temperature stable ceramic capacitors for use in switch mode power supplies. Two product levels are presently offered: B level (standard reliability) and T level (high reliability). An acceleration factor of 8:1 is used to relate life test data obtained at 200 percent of rated voltage at maximum rated temperature to rated voltage at rated temperature.

Qualification of B level product requires a life test of 1000 hours minimum. Qualification of T level product requires a life test of 4000 hours minimum. 24 samples are to be tested for both levels with 1 defective permitted.

Group B life test is 1000 hours minimum on 12 samples with 1 defective permitted for both B and T level product. Life test samples are taken every three months for B level product. T level product life test samples are taken from each T level production lot.

III. RESULTS

A survey was distributed to QPL manufacturers and users of [MIL-PRF-49470](#). Participation in the survey was disappointing as there were only a few comments. Some users feel that, if there are manufacturers that can supply to established reliability levels, the QPL should reflect it; however, a need for the change was not established. Other users feel that [MIL-PRF-49470](#) parts are very expensive and don't feel that the cost to maintain established reliability levels and the effort to change part numbers to get the proper failure rate level (that could change at any time) is justified by the increased reliability afforded.

There were no comments from the space community.

Addition of established reliability to [MIL-PRF-49470](#) was originally proposed by a QPL manufacturer; however, other qualified manufacturers are not interested in the change due to a low volume of sales. They feel that they would have to produce parts for the sole purpose of maintaining failure rate levels.

IV. CONCLUSIONS

There is not sufficient industry interest in adding established reliability to [MIL-PRF-49470](#) at this time. “T” level [MIL-PRF-49470](#) product is filling the needs of high reliability parts users.

V. RECOMMENDATIONS

Recommend that DSCC continue to monitor the needs of the users of [MIL-PRF-49470](#). Should there be more demand for established reliability parts, the information gathered by this engineering practices study will be used to revise [MIL-PRF-49470](#).