

Multi-Layer Ceramic Capacitors for Space Level Applications Utilizing Base Metal Electrodes

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This presentation covers the latest status on Space BME MLCC with Nickel electrode and Copper termination Capacitors available under the ESCC and NASA specification system and the qualification of an extended range of components under the MIL-PRF-32535 specification for the X7R dielectric material BaTiO₂ with added minors to achieve high reliability performance. These products have the advantage of having a "flexible" termination layer as a fundamental design feature to reduce any risk of PCB flexure damage and data from the Board bend tests up to 7mm plus extended thermal cycling will be reviewed.

This enhanced range will include 0402 sizes smaller sized components and the larger 2220 size making a 22uF 25V product available in an SMD chip for the first time at Space T level.

Representative data from the Mil qualification official testing program and datapacks will be shared with related links to the material Selection, product Design, cross sectional analysis and processes utilised in the manufacturing process.

A review of the primary flow chart for MIL-PRF - 32535 discrete SMD products and typical data sheet examples will be discussed with the impact on process cycle time and leadtime.

Future development of BME parts with potential range extensions will be proposed in the lower voltage ranges example 10V to 16V.