Evaluation of Polymer Tantalum Feed-Through Capacitors for Space Applications

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New technology tantalum feed-through capacitors developed by Kyocera AVX can be used for high frequency (GHz range) signal filtering in space systems for FPGA, microswitches or micro-DC-DC converters as a replacement for the currently used MLCCs. The part employs conductive polymer cathodes and has low inductance, ESR, and insertion losses. The purpose of this work is to evaluate the design and performance of the parts using engineering samples of the low-inductance bulk capacitors (LIBC), address potential reliability issues, and assess the possibility of using these parts in space projects. Performance evaluation included temperature dependence of insertion losses, leakage and anomalous charging currents (ACC), breakdown voltages, and self-heating caused by direct currents. Highly accelerated life testing was used to assess voltage acceleration factor and useful life of the parts at operating conditions.