

# Derating Tantalum Capacitors Depends on the Cathode System

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Military standards tend to drive design engineers. Guidelines, rules of thumb, and the like are established and sometimes we lose touch with where they came from and why they are there. Do they still apply? Has technology improved so that the rule is no longer valid?

With the release of MIL-STD-32700 (polymer tantalums), we should revisit tantalum capacitor derating. The purpose of derating is to lower the probability of failure. Today, there are several different cathode systems in use, each with their own failure modes and derating guidelines. This presentation will explore the three major cathodes systems, their benefits, history of derating, and the validity of that derating. There are levels of derating, and the presentation will provide the listener with various guidelines, from commercial use to space applications. With data, we will show the derating percentage guidelines, based on cathode system.

We will compare and contrast the various derating schemes for MnO<sub>2</sub>, wets, and polymer, including application voltage and temperature, which will play into this derating.