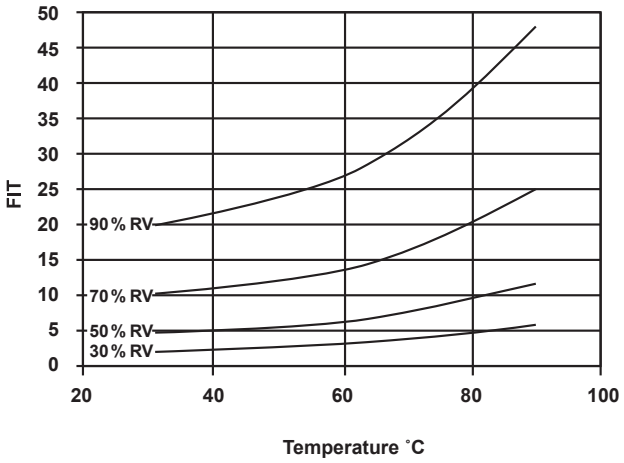
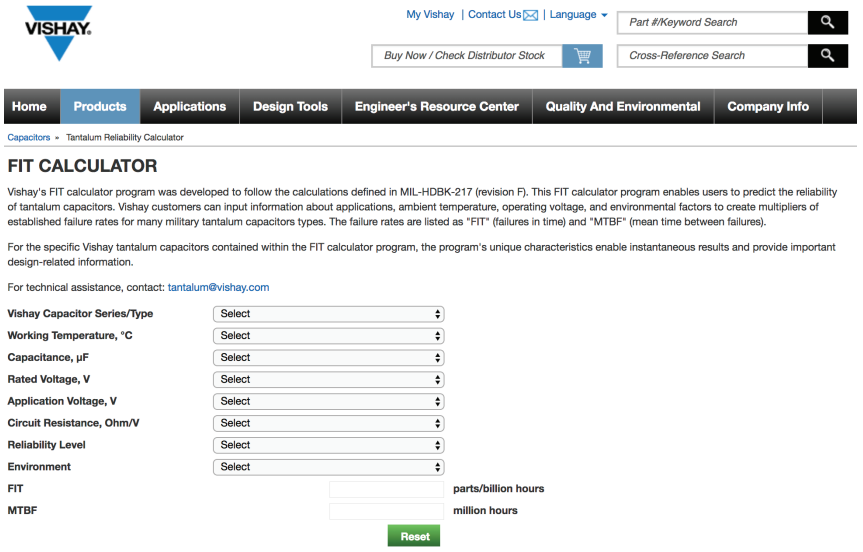
DID YOU KNOW?

TANTALUM AUTOMOTIVE GRADE SMD CAPACITORS

Calculation of Failure in Time Rate

Critical Selection Parameters





Vishay's FIT Calculator: www.vishay.com/capacitors/tantalum-reliability-calculator-list/

Tantalum capacitors require proper derating in order to operate properly, a fact that was established when the military began using the devices in the late 1950. This led to the establishment of a standard life test procedure: operation at rated voltage for 1000 h at +85 °C using a current limiting resistor of < 3 Ω in series. This “steady-state” test procedure is still the industry standard today. “M” level exponential failure rates were 1 % per 1000 h, and standard military and commercial products were designed to meet this failure rate requirement. Now, low impedance circuitry (minimal current limiting resistance) requires failure rates better than “M.” Thus, voltage derating greatly enhances reliability. As field failure rate data became available, mostly through military studies, actual reliability calculations became possible. Hence, MIL-STD-217 was developed for capacitors of all types. Derating of the applied voltage from the full rated voltage down to 50 % dropped field failure rates to approximately a FIT of 5.