Product Release – High Grade T497 (COTS)

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The T497 product was developed using conservative design characteristics resulting in a very robust capacitor demonstrating low leakage current capabilities. It fits a demand for extended safety considerations in different case dimensions. The case dimensions listed in Table 1 compare the metric code of length and width, in millimeters times ten. These parts are built with long proven capabilities using tantalum as the anode or base metal, Ta_2O_5 as the dielectric, and MnO_2 as the cathode system. Unlike the commercial versions of this device, we will not push the envelopes of safe designs for the considerations of higher capacitance at specific voltages. The capacitance and voltage requirements have been long established and are safe, easy designs, and use processes established in the industry for the past 20 years of building surface mount tantalum capacitors. Introducing designs that are more aggressive could extend the capacitance capability for each case at each voltage, but at what cost to reliability? The most important consideration for using this product should be in its primary consideration for safety and low leakage current making it suitable for use in devices having self-contained, depleting power sources such as batteries.

Alpha Case Code	T497	Standard
A	1005	3216
B	1505	3528
C	2005	6032
D	1510	7343
E	2010	7360
F	2213	NA
G	2610	NA
H	2815	NA
X	2824	7343

Table 1. Differences between T497 and standard cases.

The size difference between this product type and the standard or commercial offerings are considerable. Consider the 'A' case device of 1005 metric code listed under the "T497" column heading: this part is a nominal 1.0 mm in length and 0.5 mm in width. This differs drastically from the standard 'A' case rating of 3216 as listed under the "Standard" heading. This product's largest offering is the 'X' case at 2824, and this represents a footprint of 6.72 sq. mm. This is significantly smaller that the standard's D, E, and X cases, all of the same 7343 footprint, and 31.39 sq. mm.

These size considerations, making this part type totally different from the standard's case dimensions, allows an absolute separation of this product type from the standard. This separation is desired for the high-grade applications for these devices. This part type is a drop-in replacement for the AVX "TAZ" series of capacitors. These sizes also form the basis for the military capacitor family of CWR09 and these military offerings will follow after the long term reliability testing has been completed at the end of this year.

Like the standard designs using these materials, the temperature range for these components will be from -55°C to +85°C, with no voltage derating, and from +85°C to +125°C, with a linear, graduated temperature-voltage derating from 0% at +85°C to -33% at +125°C. These devices are manufactured with capabilities of surviving lead-free as well as tin-lead solder profiles. A recommended application voltage derating of -50% will assure that the parts failure rates will conform to the low, single-digit FIT rates shown in continuous monitoring of parts for this construction.

Emphasis on reliability is also apparent in the part number options for this part type with listed options down to 0.01%/1000-hours failure rates. This product will be available with 100% tin, or gold, or tin-lead coatings on the leadframe. The T497 COTS capacitors range from 0.10 to 150µF and 4 to 25 volts.

Figure 1. T497 surface-mount capacitor.

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