

HE3 Wet Tantalum Capacitors: Frequently Asked Questions (FAQs)

- Q. The HE3 specs indicate that the capacitors passed a 1000 hours life test at + 85 °C. Can it be assumed that this is the standard test duration and the actual life is longer?
- Q. Can you provide some idea of the projected life of these capacitors at - 55 °C, 0 °C, + 20 °C, + 55 °C, and + 85 °C, at a specified working voltage?
- Q. How does HE3 life relate to de-rated voltage and what voltage de-rating do you recommend?
- Q. How much does capacitance decrease at - 55 °C, - 20 °C, and 0 °C?
- Q. Can you supply a small quantity (100 pieces) budgetary pricing and delivery times?
- Q. Several HE3 ratings are indicated as preliminary on the datasheet. What would be the lead time of the parts?
- Q. How do we fixture, mount, connect to the HE3 capacitor?
- Q. How does the HE3 perform at high altitude?

Q. THE HE3 SPECS INDICATE THAT THE CAPACITORS PASSED A 1000 HOURS LIFE TEST AT + 85 °C. CAN IT BE ASSUMED THAT THIS IS THE STANDARD TEST DURATION AND THE ACTUAL LIFE IS LONGER?

- A. The 1000 hours is a standard test duration, and often used as referee number for new products. Actual life expectancy is much longer, but to say how much will come with experience. While the HE3 is a relatively new product, wet tantalums as a whole has a history of long life capability. Product which has been built and test supported to 10 000 hours (per MIL Specification) has seen useable life well beyond twenty years. Some of the tantalum products were the space probes launched in the 1970's which are still going.

Q. CAN YOU PROVIDE SOME IDEA OF THE PROJECTED LIFE OF THESE CAPACITORS AT - 55 °C, 0 °C, + 20 °C, + 55 °C, AND + 85 °C, AT A SPECIFIED WORKING VOLTAGE?

- A. As far as projected life, the acceptable life test condition for tantalum has been found to be at the highest temperature (+ 85 °C) and at rated voltage. De-rating the voltage and/or the temperature is known to extend the expected life.

Q. HOW DOES HE3 LIFE RELATE TO DE-RATED VOLTAGE AND WHAT VOLTAGE DE-RATING DO YOU RECOMMEND?

- A. Once again, derating the voltage and/or the temperature is known to extend the expected life. There are some acceptable-equations found in the space application literature that talk about increases in life (i.e. MTBF) numbers. In military and space applications, derating for wet tantalum capacitors is typically recommended to be around 60 % of rated voltage. The final decision must be made by the customer based upon specific application needs, and required life.

Q. HOW MUCH DOES CAPACITANCE DECREASE AT - 55 °C, - 20 °C, AND 0 °C?

- A. The idea of the capacitance decrease at low temperatures has to be viewed carefully. The change in capacitance should not to be viewed as a loss by means of losing charge, but should be viewed as the lack of the ability of getting the charge out quickly.

We have 120 Hz capacitance measurements that indicate a capacitance change at - 55 °C of around - 70 to - 80 % from room ambient. However in an application of lower frequency, this change will be less. How much? We don't know. It will vary by rating, and of course by the specific application parameters. This is true with all the wet tantalums as can be seen from any of the historical literature or bulletins.

While there is no data presently available for - 20 °C, the real steep capacitance change occurs in the - 40 °C to - 55 °C region.



Q. CAN YOU SUPPLY A SMALL QUANTITY (100 PIECES) BUDGETARY PRICING AND DELIVERY TIMES?

A. In order to maintain records for quoting, all RFQs must be done through our normal quote system. Please contact our Regional Marketing locations if there are any questions.

Q. SEVERAL HE3 RATINGS ARE INDICATED AS PRELIMINARY ON THE DATASHEET. WHAT WOULD BE THE LEAD TIME OF THE PARTS?

A. We presently have several ratings under development. We list these as preliminary values to make everyone aware of our product roadmap. Each rating however may have a unique timetable. If there is a question concerning a specific preliminary rating, please contact Vishay. We will review the development program and expected release date with our engineering group. We can then give you a more precise and detailed answer on the lead-time of a specific rating.

Q. HOW DO WE FIXTURE, MOUNT, CONNECT TO THE HE3 CAPACITOR?

A. The HE3 capacitor series is provided as a standard package with two terminations or leads. These terminations are nickel wire, with either a tin/lead or 100 % tin (RoHS compliant) plating. While the capacitor may be mounting through-hole as a radial leaded capacitor, the user must make allowance for the tantalum tube which extends from the center of the glass-to-metal seal. This tube has a larger diameter, cannot be bent, and should not be soldered. In the majority of applications, these capacitors are used for bulk high energy storage or pulse power. They therefore may well be used in multiple quantities. These multiple capacitors are assembled in a plastic or metal case, with flying or loose wires leads, with or without a connector. The actual capacitors may be potted or rigidly fixed within the assembly case.

Q. HOW DOES THE HE3 PERFORM AT HIGH ALTITUDE?

A. The HE3 is designed to meet the operational requirements at 100 000 feet per MIL-STD-202, Method 105C, Condition D.