

KEMET Aluminum Electrolytic Life Calculator

User Guide

Introduction

The life calculator is designed to provide the user with useful information regarding the expected life of the selected component under defined operation conditions, as such it is intended for guidance only, please refer to disclaimer.

Search & Selection

To search for a suitable capacitor, use the filters at the top of the screen. Values can be selected from the Range, Rated temp, Voltage, Capacitance, Case diameter and Case length fields. The filters are additive, so each additional filter applied will reduce the options available.

Alternatively, if the part number of the capacitor is already known, then this can be selected directly from Part number field by selecting it from the list or by entering the part number in the search box.

Calculation Method

There are two basic calculation methods. Ripple current method – use this method if you know the operating conditions including the ripple currents and their frequencies. Temperature method – use this if you know the core temperature of the capacitor during operation, e.g. by direct measurement.

Starting a New calculation

When first accessing the calculator, the fields will be blank and ready to accept new data. If you have already performed some calculations and wish to begin again then click the New Calculation button, this will clear all fields and data.

Entering Operating Conditions

Operating conditions can be entered into the calculator in the appropriate fields. The frequencies and magnitudes of ripple currents should be entered into the table for each condition, click the “+” below the table to add additional currents up to a maximum of fifty. Initially enter the data for Condition 1, if there are multiple sets of conditions then use the column of fields for condition 2, 3 etc., to add additional conditions click the “+” above the scroll bar, a maximum of twenty sets of conditions can be entered. When working with multiple sets of conditions enter the split of time in the Time fraction % field, the sum of these values must equal 100% and a status bar to the left indicates the total.

Data validation will be performed to ensure all entered data is within allowed limits, any field with invalid data will be highlighted by a red outline around the field. Hovering over the “!” symbol in a field will give details of acceptable values for that field. The operating voltage should be entered as the dc voltage plus the peak of the ac ripple voltage. The minimum voltage must ensure no reverse polarity is caused by ripple voltage. For natural convection, i.e. no forced air cooling, enter the air speed as 0.

Importing Operating Conditions

Using the import template, it is possible to populate the calculator with pre-defined data. This is particularly useful when dealing with large numbers of frequencies and ripple currents. Multiple template files can be created to cover different products and scenarios. An import template can be created by clicking the Export to Spreadsheet button, this will save the file in the Downloads folder. If this is created before any calculations have been performed then it will be blank, otherwise it will contain data from the calculation on screen, this data can then be deleted or modified. Templates can be stored in any location, to import a spreadsheet click Import from Spreadsheet and select the appropriate file.

Calculate Results

When the calculate button is clicked some final validation checks are performed and then the results will be displayed for each condition together with a total aggregate life for all conditions combined. End of life criteria will be displayed at the bottom of the screen.

Calculation History

This feature allows recently performed calculations to be recalled without re-entering or re-importing the data. The last ten calculations will be displayed, click Populate to re-load the selected calculation. An option at the top of the list controls whether new calculations are added to this list or not.

Export Results

The export function allows the data to be exported to a MS Excel spreadsheet to act as a record of the calculation performed. A check box next to the button enables the calculation results to be included in the export file. Files are exported to the Downloads folder with a unique name. Once downloaded, the file name can be changed and the file stored in an alternative location for future reference or import into the calculator.