› For more information contact
evans@evans-group.com

STORAGE LIFE of HYBRID CAPACITORS

Evans Tantalum Hybrid Capacitors have unlimited storage life due to the following factors. Evans Hybrid Capacitors use Tantalum Pentoxide anodes and Ruthenium Oxide cathodes. These electrodes are chemically and physical stable and do not degrade over time. Evans Hybrid Capacitors utilize hermetic tantalum case design and do not dry out over time.

To demonstrate extremely long storage life capability, the following analysis and testing was performed:

Accelerated Storage Life Test

Method:
The Arrhenius rule characterizes the change of thermic reaction speed resulting in a halfing of the evaporation rate with every 10˚C lower temperature. The rule further suggests that for every 10˚C lower temperature the lifetime of a capacitor doubles.
To provide test data, we stored three (3) discharged THQ3050243 50V 24,000µF Tantalum Hybrid capacitors at elevated temperature. The capacitors were periodically removed and AC characteristics were checked. The test lasted 2,000 hours at 85C followed by 16,400 hours at 125C.
The results of this testing are presented below:

THQ3050243 AC Spec Limits
Voltage: 50V
Capacitance: 24,000µF +/- 20%
ESR Max: 35mΩ

Initial Characteristics:

Serial Number	Cap (µF)	ESR (mΩ)
172758	24,340	20.2
172759	24,170	18.7
172760	24,510	19.9

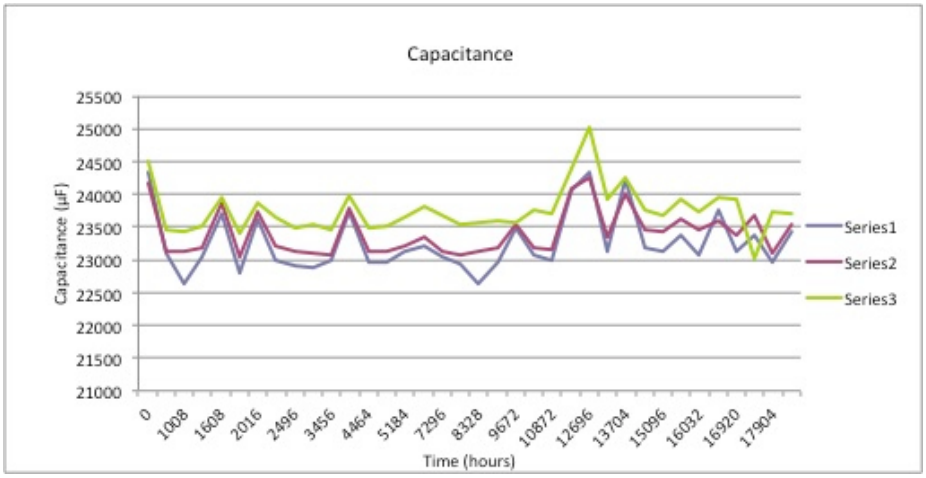
Post Test Characteristics

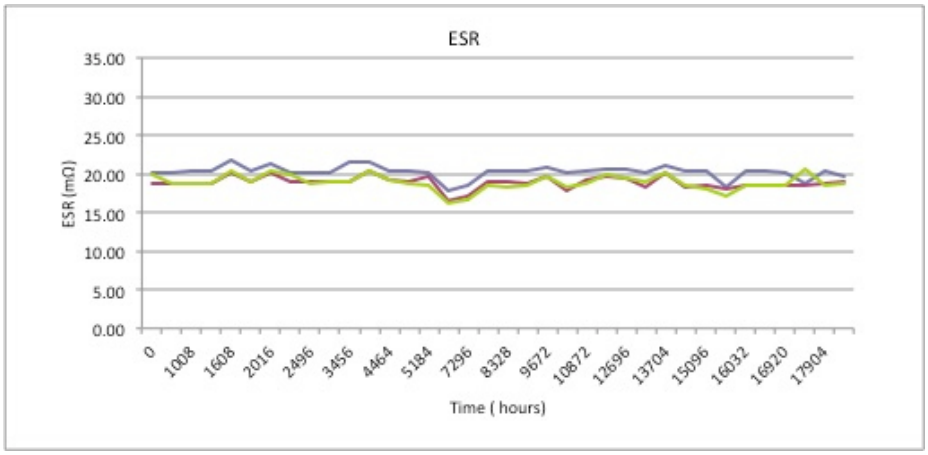
Serial Number	Cap (µF)	ESR (mΩ)
172758	23,436	19.5
172759	23,548	18.9
172760	23,691	18.8

Test Data

The following two graphs present the periodic AC Characteristic (Capacitance and ESR) measurements performed during the test

› For more information contact
evans@evans-group.com





Conclusion

The capacitors experienced no significant degradation in measured characteristics over the test period, as the characteristics remained well within the specification limits.
When the factors based on the Arrhenius rule are applied, an extremely long storage life is determined, as presented below:

TEMP SOAK	25˚C Factor	40˚C Factor	25˚C equivalent Soak Time (yrs)	40˚C equivalent Soak Time (yrs)
2,000 hr @85˚C	64	23	15	5
16,400 hr @125˚C	1,024	362	1,917	678
		Total	1,932	683

From the above test data and the application of the Arrhenius rule, the storage life is calculated at 1,932 years at 25C or 683 years at 40C.

Evans
72 Boyd Avenue E. Providence, RI 02914

T +1 401.435.3555
E evans@evans-group.com
URL www.evans-group.com/evans