EXPECTED LIFETIME CALCULATION
OF ALUMINUM CAPACITORS

The expected lifetime of a specific capacitor can be calculated based on the given endurance, maximum temperature and temperature of the application:

Aluminum Polymer Capacitors Radial THT & V-Chip SMT:

$$L_X = L_{Nom} * 10^{\frac{T_{MAX} - T_A}{20}}$$

Aluminum Electrolytic Capacitors & Aluminum Hybrid Polymer Capacitors & Aluminum Polymer Capacitors H-Chip SMT:

$$L_X = L_{Nom} * 2^{\frac{T_{MAX} - T_A}{10}}$$

L_x = Expected lifetime of component

L_{Nom} = Endurance of component (see datasheet)
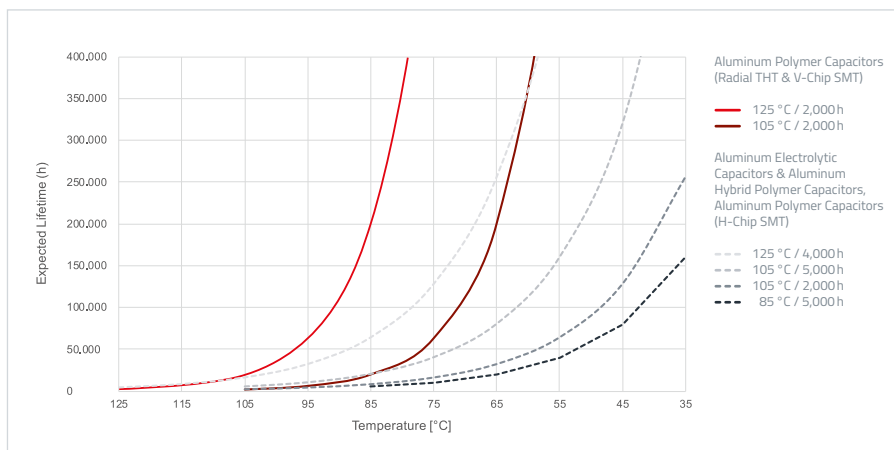
T_{max} = Maximum allowed temperature of component

T_A = Component ambient temperature within application

Temperature (°C)	Aluminum Polymer Capacitors Radial THT & V-Chip SMT Expected Lifetime (h)		Aluminum Electrolytic Capacitors & Aluminum Hybrid Polymer Capacitors & Aluminum Polymer Capcitors H-Chip SMT Expected Lifetime (h)			
125	2,000	–	4,000	–	–	–
115	6,325	–	8,000	–	–	–
105	20,000	2,000	16,000	5,000	2,000	–
95	63,246	6,325	32,000	10,000	4,000	–
85	200,000	20,000	64,000	20,000	8,000	5,000
75	632,455	63,246	128,000	40,000	16,000	10,000
65	2,000,000	200,000	256,000	80,000	32,000	20,000
55	6,324,555	632,455	512,000	160,000	64,000	40,000
45	20,000,000	2,000,000	1,024,000	320,000	128,000	80,000
35	63,245,553	6,324,555	2,048,000	640,000	256,000	160,000

Expected Lifetime vs. Temperature

Aluminum Polymer Capacitors (Radial THT & V-Chip SMT)
— 125 °C / 2,000 h
— 105 °C / 2,000 h

Aluminum Electrolytic Capacitors & Aluminum Hybrid Polymer Capacitors, Aluminum Polymer Capacitors (H-Chip SMT)
--- 125 °C / 4,000 h
--- 105 °C / 5,000 h
--- 105 °C / 2,000 h
--- 85 °C / 5,000 h

Calculate the expected lifetime of your capacitor with REDEXPERT:

Lifetime Calculator

www.we-online.com/lifetimecalculator

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT