

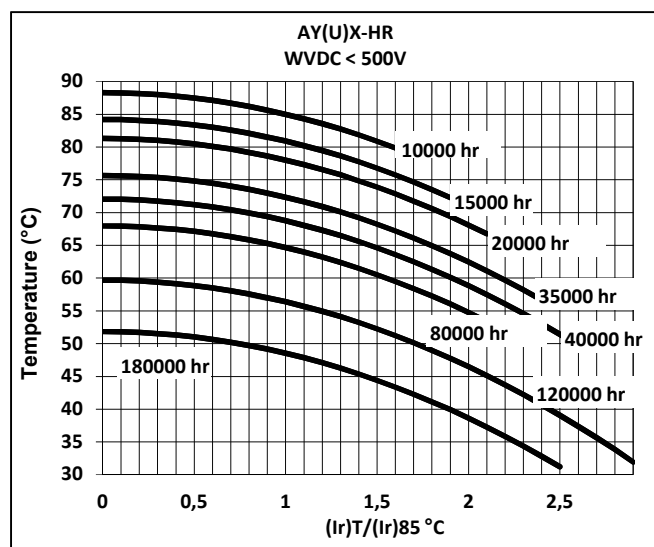
Useful Life Calculation

The useful life of a capacitor is calculated in accordance with the tables of expected life per each series. The rated ripple current at upper category is listed in the data sheets, while the ripple current at different temperature can be calculated using the tables shown on each series.

To know the useful life proceed as follows:

- calculate the ratio $(I_R) / (I_{R@85^\circ C})$ or $(I_R) / (I_{R@105^\circ C})$
- find on to the table the crossing between the working temperature and the calculated ratio
- on top of the table it appears the useful life in hours

The example does not consider the frequency dependence of ripple current: the corresponding factor listed on each type must be used as an additional factor.



Example 1:

- Capacitor AY(U)X-HR472M350DF1
- Working conditions: $I_{Ripple} = 25A@100Hz$
- Ambient temperature = $70^\circ C$

VN=350V

Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Ordering Code
[μF]@100Hz		[%]@100Hz	[mΩ]@100Hz		[mΩ]@10KHz	[A]@100Hz	[A]@100Hz	(U) for mounting stud
4700	DF	0,08	27	22	20	22,8	16,3	AF(U)X-HR472M350DF1

$$1. \quad \frac{I_{Ripple}}{I_{Ripple@85^\circ C}} = \frac{25}{16,3} = 1,53$$

- a. Crossing 1,53 and $T=70^\circ C$ expected life is about 30.000 hours

Example 2:

- Capacitor AY(U)X-HR472M350DF1
- Working conditions: $I_{Ripple} = 25A@500Hz$
- Ambient temperature = $70^\circ C$

VN=350V



Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Ordering Code
[μF]@100Hz		[%]@100Hz	[mΩ]@100Hz		[mΩ]@10KHz	[A]@100Hz	[A]@100Hz	(U) for mounting stud
4700	DF	0,08	27	22	20	24,5	16,3	AF(U)X-HR472M350DF1

$$1. I_{Ripple} = \frac{25}{1,32} = 18,9$$

$$2. \frac{I_{Ripple}}{I_{Ripple@85^{\circ}C}} = \frac{18,9}{16,3} = 1,16$$

a. Crossing 1,16 and T = 70 °C expected life is about 36000 hours

Example 3:

- Capacitor AY(U)X-HR472M350DF1
- Working conditions: IRipple=25A@500Hz
- Ambient temperature =60°C

VN=350V

Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Ordering Code
[μF]@100Hz		[%]@100Hz	[mΩ]@100Hz		[mΩ]@10KHz	[A]@100Hz	[A]@100Hz	(U) for mounting stud
4700	DF	0,08	27	20	17	23,9	17,1	AY(U)X-HR472M350DF1

$$3. I_{Ripple} = \frac{25}{1,32} = 18,9$$

$$4. \frac{I_{Ripple}}{I_{Ripple@85^{\circ}C}} = \frac{18,9}{16,3} = 1,16$$

a. Crossing 1,10 and T =60 °C expected life is about 120000 hours

