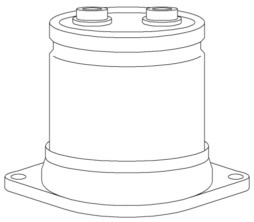


AVX

Itelcond

Series AVX- – 105°C 8000h

Capacitors screw terminal type – High Ripple – High Reliability – Extra Useful Life

- AV- Flat Bottom
- Capacitance Tolerance: -20 + 20% – standard (M)
- Capacitance Tolerance: -10 + 30% - on request (X)
- Climatic category: 40/105/56
- Case: 76x105 – 90x147
- Temperature – 40°C + 105°C
- Storage: – 55°C + 105°C
- All welded construction reliable electrical contact

Mechanical Outlines

- Case: aluminium made
- Terminals: screw
- Sealing: hermetic by EPR gasket, on a resin cover
- Pressure Release Vent: silicone-rubber
- Sleeve: self-extinguishing thermo shrinkable
- Size: see enclosed drawings
- Mounting Hardware: see hardware section
- External Material UL94-V0

Ordering Code: Example

AVX	472	M	400	DF	1

- AVX: Itelcond Capacitor Series; AV-flat bottom
- 472: Capacitance: [µF] significant digit plus multiplying factor: 1=x10, 2=x100, 3=x1.000, 4=x10.
- M: Tolerance range: M=(±20%) X=(-10+30%)
- 400: Voltage – DC rated [V]
- DF: Case Size Code see tables
- 1: 1= Sleeve – 0 = not Sleeve

Ripple Current

The allowable values of ripple current in Ampères, are related to the temperature and frequency by following equation:

$$I_{Ripple} = K_t \bullet K_f \bullet I_{Ripple@105°C}$$

Where:

- IRipple@105°C is the limit given by tables, @ 105°C/100HZ
- Kt is the Temperature Correlation Factor
- Kf is the Frequency Correlation Factor

Note .Superimposed alternating voltage summed to DC volage must not exceed rated voltage, rated ripple current must not be exceeded and no reverse polarity is allowed

°C	40	55	65	75	85	95	105
Kt	2.50	2.40	2.20	2.00	1.80	1.30	1.00

Table 1-Kt Values

Hz	Kf
50	0.78
100	1.00
120	1.02
200	1.06
300	1.08
400	1.09
500	1.32
>1000	1.37

Table 2-Kf Values

Itelcond

Expected Lifetime End of Life Criteria

During useful life typical electrical parameters of electrolytic capacitor are subject to change.

End of Life criteria, when rated temperature, voltage and ripple are applied, are:

$\Delta C / C_{t0} \leq 30\%$ *Equation 1*

$ESR \leq 3 \bullet ESR_{t0}$ *Equation 2*

$I_f \leq I_{ft0}$ *Equation 3*

where t_0 is the initial value

Voltage Endurance Test Requirements

On Voltage Endurance Test are based Expected Lifetime Curves.

End of Life criteria, when rated temperature, and voltage are applied for 2'000hrs, are

$\Delta C / C_{t0} \leq 20\%$ *Equation 4*

$ESR \leq 1{,}3 \bullet ESR_{t0}$ *Equation 5*

$I_f \leq I_{ft0}$ *Equation 6*

where t_0 is the initial value

Expected Lifetime Vs Temperature and Ripple Current

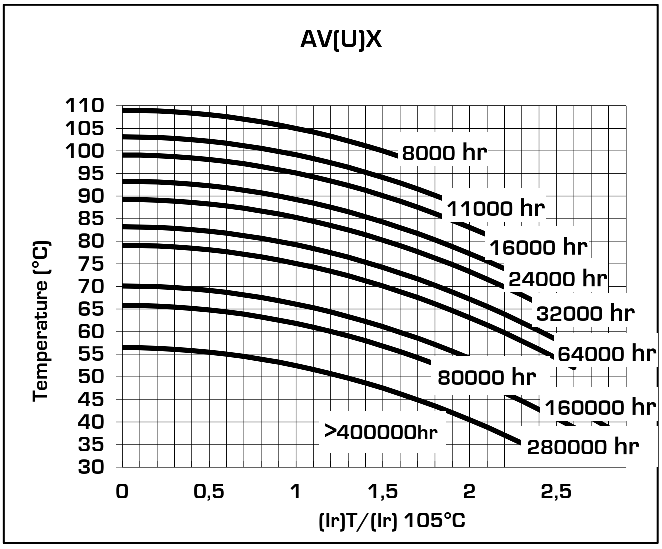


Table 3

Leakage Current

After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be within those limits.

Maximum limit	@25°C	$If \leq 1.3 \bullet \sqrt{C \bullet V}$
Operating limit	@25°C	$If \leq 1.2 \bullet \sqrt{C \bullet V}$

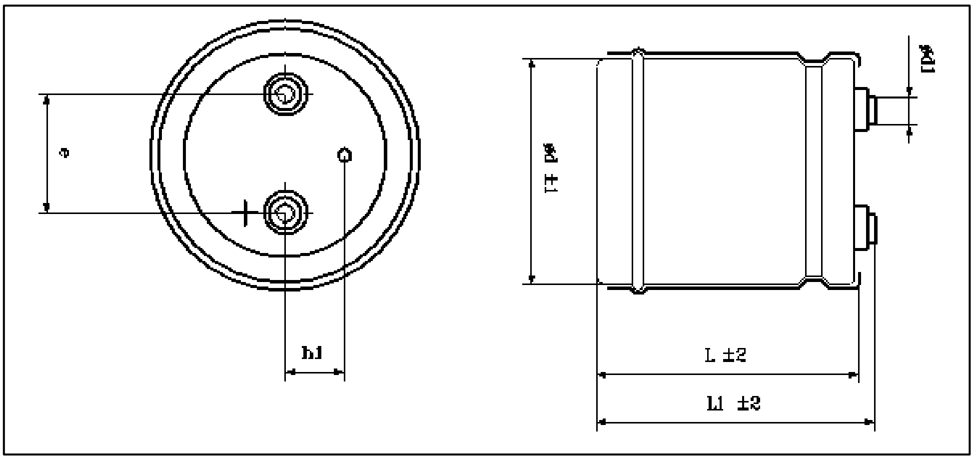
Where: If=leakage current [μA], C=capacitance [μF], V=rated voltage [V]

Surge Voltage

Working Voltage	350	400	450
Surge Voltage	385	440	495

	Capacitance	Case	Diam	Height	Tanδ	ESRmax	typ	Zmax	Iripple @100Hz		Ordering Code
	[µF]@100Hz		[mm]	[mm]	[%]@100Hz	[mΩ]@100Hz		[mΩ]@10KHz	[A]@55°C	[A]@105°C	(U) for mounting stud
350	3300	DC	76	107	0,07	34	27	25	26,9	10,8	AV(U)X332M350DC1
	4700	DC	76	107	0,07	24	19	18	32,1	12,8	AV(U)X472M350DC1
		DF	76	147	0,07	24	19	18	36,8	14,7	AV(U)X472M350DF1
		EC	90	107	0,07	24	19	18	35,4	14,2	AV(U)X472M350EC1
	6800	DF	76	147	0,07	16	13	12	44,3	17,7	AV(U)X682M350DF1
		EC	90	107	0,07	16	13	12	42,6	17,0	AV(U)X682M350EC1
		EF	90	147	0,07	16	13	12	48,7	19,5	AV(U)X682M350EF1
	10000	EF	90	147	0,07	11	9	8	59,1	23,6	AV(U)X103M350EF1
400	3300	DC	76	107	0,07	34	27	25	26,9	10,8	AV(U)X332M400DC1
	4700	DC	76	107	0,07	24	19	18	32,1	12,8	AV(U)X472M400DC1
		DF	76	147	0,07	24	19	18	36,8	14,7	AV(U)X472M400DF1
		EC	90	107	0,07	24	19	18	35,4	14,2	AV(U)X472M400EC1
	6800	DF	76	147	0,07	16	13	12	44,3	17,7	AV(U)X682M400DF1
		EC	90	107	0,07	16	13	12	42,6	17,0	AV(U)X682M400EC1
		EF	90	147	0,07	16	13	12	48,7	19,5	AV(U)X682M400EF1
	10000	EF	90	147	0,07	11	9	8	59,1	23,6	AV(U)X103M400EF1
450	3300	DC	76	107	0,09	43	35	33	23,7	9,5	AV(U)X332M450DC1
	4700	DF	76	147	0,09	EC	90	107	32,5	13,0	AV(U)X472M450DF1
	4700	EC	90	107	0,09	30	24	23	31,2	12,5	AV(U)X472M450EC1
	6800	EF	90	147	0,09	21	17	16	43,0	17,2	AV(U)X682M450EF1

Dimension, Quantity and Weight for box

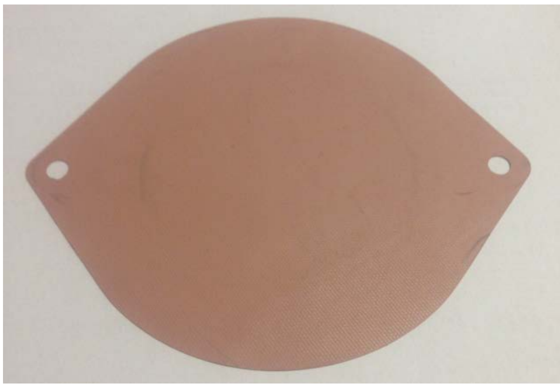


Case				Connections							Mounting Stud			Packaging	
Code	DxL	L1	h1	d1	d2	e	Terminal	Screw			Screw			Pcs/Box	Weight/box
							Code	Thread	Torque	Lenght	d3	c	Torque		
DC	76x107	111	19	13	18	31.8	X	M5	2,0	10	M12	16	10Nm	12	5-7
DF	76x147	151	19	13	18	31.8	X	M5	2,0	10	M12	16	10Nm	12	6-14
				17	23		G	M6	2,5						
EC	90x107	112	19	17	23	31,8	G	M6	2,5	10	M12	16	10Nm	6	7-9
EF	90x147	153	19	17	23	31,8	G	M6	2,5	10	M12	16	10Nm	6	9-11

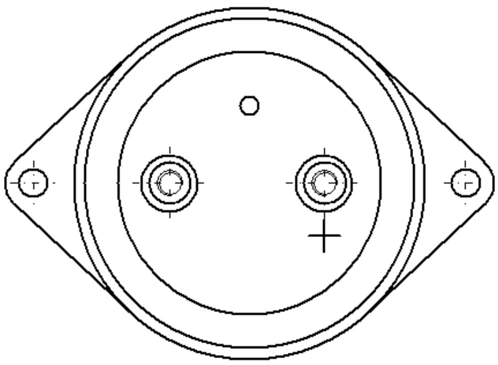
All dimensions in mm, torque in Nm, weight in kg

Thermal data

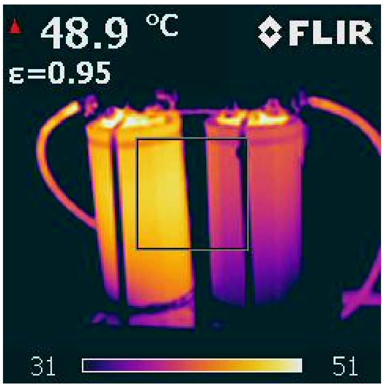
The Ripple Current I flowing though the capacitor winding causes power losses P, following the formula $P_{heat} = ESR * I^2$, where ESR is the capacitor's Equivalent Series Resistance. This leads to a temperature increase ΔT_{heat} into this section, while the ability of the surface of the capacitor tends to decrease it following the formula $P_{dissip} = \Delta T_{dissip} * A * \beta$ where A is the surface and β is the Thermal Resistance. When $P_{heat} = P_{dissip}$ a temperature balance between the core and the ambient is given. This leads to a last equation showing how the temperature is depending on A and β: $\Delta T = {(ERS * I^2)}/{A * \beta}$. It's now clear that mastering those A and β, as it is done on this series, will lead to a more favourable balance in terms of allowed ripple current and expected lifetime. This design with a higher bottom surface of the capacitor (see dimensions), coupled with a dissipating pad (see Picture 1) and a new design clamp (see Picture 2) is the answer to the highest demanding conditions on the market, leading up to 40% decrease in temperature increase due to ripple current (see Picture 3).



Picture 1



Picture2



Picture 3