

Series AP(U)X 85°C 15.000 h

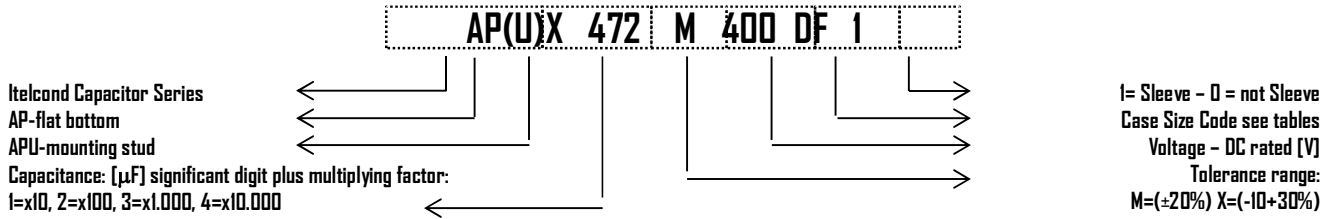
Capacitors screw terminal type –Heavy Transient

- AP- Flat Bottom
- APU- Mounting Stud
- Capacitance Tolerance: -20 + 20% - standard (M)
- Capacitance Tolerance: -10 + 30% - on request (X)
- Climatic category: 40/85/56
- Case: 51x83 - 90x240
- Temperature - 40°C + 85°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



Ripple Current

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

$$I_{\text{Ripple}} = K_t \cdot K_f \cdot I_{\text{Ripple@85C}}$$

Where:

- $I_{\text{Ripple@85°C}}$ is the limit given by tables, @ 85°C/100HZ
- K_t is the Temperature Correlation Factor
- K_f 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
K_t	1.65	1.50	1.40	1.20	1.00

Table 1- K_t Values

V_n /Hz	K_f
	$V_n > 300$ Diameter Code C, D, E
50	0.72
100	1.00
120	1.03
200	1.14
300	1.24
400	1.29
500	1.32
>1000	1.37

Table 2- K_f Values

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:

$$\frac{\Delta C}{C_{t0}} \leq 30\% \quad \text{Equation 1}$$

$$ESR \leq 3 \cdot ESR_{t0} \quad \text{Equation 2}$$

$$I_f \leq I_{ft0} \quad \text{Equation 3}$$

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

$$\frac{\Delta C}{C_{t0}} \leq 10\% \quad \text{Equation 4}$$

$$ESR \leq 1,3 \cdot ESR_{t0} \quad \text{Equation 5}$$

$$I_f \leq I_{ft0} \quad \text{Equation 6}$$

where t_0 is the initial value

Expected Lifetime Vs Temperature and Ripple Current

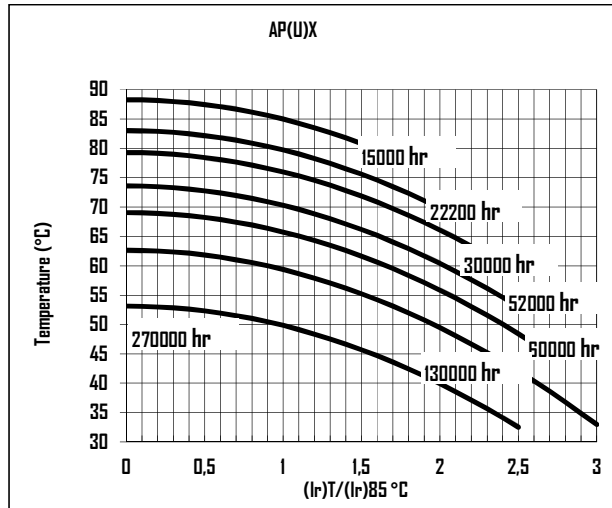


Table 3

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	$I_f \leq 0,001 \times C \times V$
Operating limit	@25°C	$I_f \leq 0,0005 \times C \times V$

Where: I_f =leakage current [μ A], C =capacitance [μ F], V =rated voltage [V]

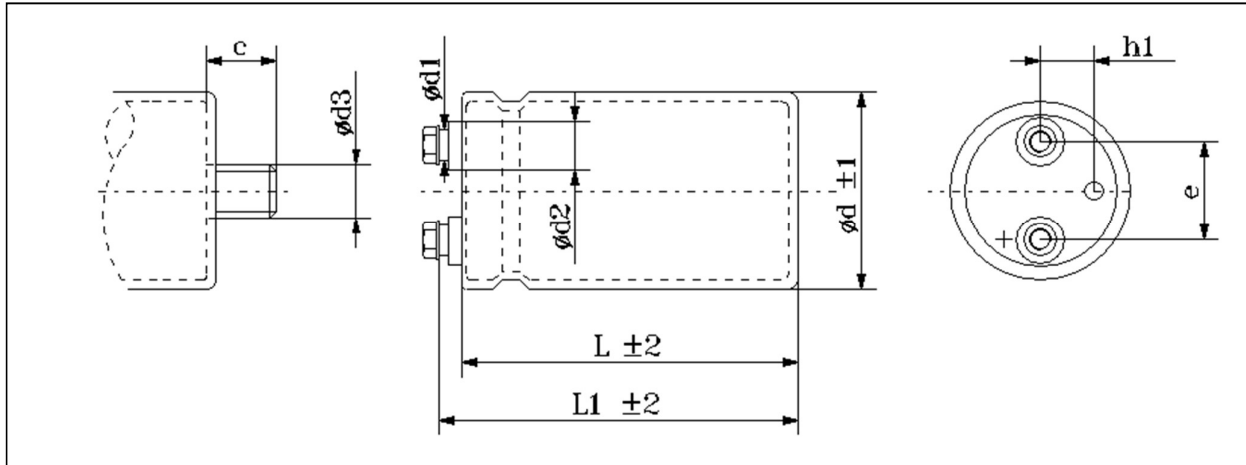
Surge Voltage

Working Voltage	63	75	100	160	200	250	350	400	420	450
Surge Voltage	73	86	115	185	230	290	385	440	460	495

	Capacitance	Case	Diam	Height	Tanδ	ESRmax typ		Zmax	Iripple @100Hz		Ordering Code
	[μF]@100Hz		[mm]	[mm]	[%]@100Hz	[mΩ]@100Hz	[mΩ]@10KHz	[mΩ]@10KHz	[A]@55°C	[A]@85°C	(U) for mounting stud
40	10000	AA	35	50	0,27	43	34	32	7,8	5,2	AP(U)X103M040AAI
	15000	AB	35	83	0,35	37	30	28	10,5	7,0	AP(U)X153M040ABI
	22000	AC	35	105	0,42	30	24	23	13,0	8,7	AP(U)X223M040ACI
	33000	BB	51	83	0,45	22	17	16	17,0	11,3	AP(U)X333M040BBI
	47000	BB	51	83	0,48	16	13	12	19,7	13,1	AP(U)X473M040BBI
		BC	51	105	0,51	17	14	13	21,1	14,1	AP(U)X473M040BCI
	100000	CC	63	107	0,70	11	9	8	29,9	19,9	AP(U)X104M040CCI
	150000	DC	76	107	0,90	10	8	7	35,9	23,9	AP(U)X154M040DCI
220000	DF	76	147	1,30	9	8	7	41,5	27,7	AP(U)X224M040DFI	
63	22000	BB	51	83	0,26	19	15	14	18,8	12,5	AP(U)X223M063BBI
		BC	51	105	0,24	17	14	13	21,7	14,5	AP(U)X223M063BCI
	33000	BC	51	105	0,28	14	11	10	24,6	16,4	AP(U)X333M063BCI
		CC	63	107	0,27	13	10	10	28,5	19,0	AP(U)X333M063CCI
	47000	CC	63	107	0,30	10	8	8	32,2	21,5	AP(U)X473M063CCI
	68000	DC	76	105	0,36	8	7	6	39,0	26,0	AP(U)X683M063DCI
100000	DF	76	147	0,40	6	5	5	52,0	34,6	AP(U)X103M063DFI	
100	10000	BB	51	83	0,12	19	15	14	18,7	12,4	AP(U)X103M100BBI
		BC	51	105	0,1	16	13	12	22,7	15,1	AP(U)X103M100BCI
	15000	BC	51	105	0,11	12	9	9	26,5	17,7	AP(U)X153M100BCI
	22000	CC	63	107	0,15	11	9	8	31,2	20,8	AP(U)X223M100CCI
		DC	76	107	0,14	10	8	8	35,9	23,9	AP(U)X223M100DCI
	33000	DC	76	107	0,18	9	7	7	38,8	25,8	AP(U)X333M100DCI
		DF	76	147	0,16	8	6	6	47,2	31,5	AP(U)X333M100DFI
47000	DF	76	147	0,18	6	5	5	53,1	35,4	AP(U)X473M100DFI	
160	4700	BC	51	105	0,1	34	27	25	15,5	10,4	AP(U)X472M160BCI
		CC	63	107	0,09	30	24	23	18,6	12,4	AP(U)X472M160CCI
	6800	DC	76	107	0,1	23	19	18	23,6	15,7	AP(U)X682M160DCI
	10000	DC	76	107	0,11	18	14	13	27,3	18,2	AP(U)X103M160DCI
	15000	DF	76	147	0,12	13	10	10	36,7	24,5	AP(U)X153M160DFI
	22000	DF	76	147	0,15	11	9	8	39,8	26,5	AP(U)X223M160DFI
EF		90	220	0,14	10	8	8	54,2	36,1	AP(U)X223M160EFI	
200	3300	BC	51	105	0,10	48	39	36	13,0	8,7	AP(U)X332M200BCI
	4700	CC	63	107	0,10	34	27	25	17,6	11,8	AP(U)X472M200CCI
		DC	76	107	0,09	30	24	23	20,7	13,8	AP(U)X472M200DCI
	6800	DC	76	107	0,10	23	19	18	23,6	15,7	AP(U)X682M200DCI
	10000	DF	76	147	0,11	18	14	13	31,3	20,9	AP(U)X103M200DFI
	15000	DF	76	147	0,12	13	10	10	36,7	24,5	AP(U)X153M200DFI
	22000	DF	76	147	0,12	9	7	7	44,5	29,7	AP(U)X223M200DFI
DK		76	167	0,12	9	7	7	47,1	31,4	AP(U)X223M200DKI	
33000	DK	76	167	0,12	6	5	4	57,7	38,5	AP(U)X333M200DKI	

	Capacitance	Case	Diam	Height	Tanδ	ESRmax typ		Zmax	Iripple @100Hz		Ordering Code
	[μF]@100Hz		[mm]	[mm]	[%]@100Hz	[mΩ]@100Hz	[mΩ]@10KHz	[mΩ]@10KHz	[A]@55°C	[A]@85°C	(U) for mounting stud
250	2200	BB	51	83	0,09	65	52	49	10,1	6,7	AP(U)X222M250BB1
	3300	BC	51	105	0,10	48	39	36	13,0	8,7	AP(U)X332M250BC1
	3300	CC	63	107	0,09	43	35	33	15,6	10,4	AP(U)X332M250CC1
	4700	DC	76	107	0,10	34	27	25	19,6	13,1	AP(U)X472M250DC1
	6800	DC	76	107	0,10	23	19	18	23,6	15,7	AP(U)X682M250DC1
	10000	DF	76	147	0,10	16	13	12	32,9	21,9	AP(U)X103M250DF1
	10000	EC	90	107	0,10	16	13	12	31,6	21,1	AP(U)X103M250EC1
	15000	DF	76	147	0,10	11	8	8	40,3	26,8	AP(U)X153M250DF1
	15000	EJ	90	222	0,10	11	8	8	53,2	35,4	AP(U)X153M250EJ1
350	2200	BC	51	105	0,09	65	52	49	11,2	7,5	AP(U)X222M350BC1
	3300	CC	63	107	0,09	43	35	33	15,6	10,4	AP(U)X332M350CC1
		DC	76	107	0,08	39	31	29	18,4	12,3	AP(U)X332M350DC1
	4700	DC	76	107	0,09	30	24	23	20,7	13,8	AP(U)X472M350DC1
		DF	76	147	0,08	27	22	20	25,2	16,8	AP(U)X472M350DF1
	6800	DF	76	147	0,08	19	15	14	30,3	20,2	AP(U)X682M350DF1
		DJ	76	222	0,09	21	17	16	34,4	23,0	AP(U)X682M350DJ1
		EC	90	107	0,11	26	21	19	24,8	16,6	AP(U)X682M350EC1
	10000	DF	76	147	0,11	18	14	13	31,3	20,9	AP(U)X103M350DF1
		DJ	76	222	0,10	16	13	12	39,6	26,4	AP(U)X103M350DJ1
		EC	90	107	0,10	16	13	12	31,6	21,1	AP(U)X103M350EC1
	15000	DF	76	147	0,10	11	8	8	40,3	26,8	AP(U)X153M350DF1
		DJ	76	222	0,10	11	8	8	48,5	32,3	AP(U)X153M350DJ1
		EF	90	147	0,12	13	10	10	40,4	26,9	AP(U)X153M350EF1
		EJ	90	222	0,12	13	10	10	48,5	32,4	AP(U)X153M350EJ1
18000	EF	90	147	0,12	11	8	8	44,3	29,5	AP(U)X183M350EF1	
22000	EJ	90	222	0,12	9	7	7	58,8	39,2	AP(U)X223M350EJ1	
27000	EJ	90	222	0,12	7	6	5	65,1	43,4	AP(U)X273M350EJ1	
25000	EL	90	240	0,12	8	6	6	54,9	43,3	AP(U)X253M350EL1	
400	1500	BB	51	83	0,10	106	85	80	7,9	5,3	AP(U)X152M400BB1
		BC	51	105	0,10	106	85	80	8,8	5,9	AP(U)X152M400BC1
	2200	BC	51	105	0,10	72	58	54	10,6	7,1	AP(U)X222M400BC1
		CC	63	107	0,09	65	52	49	12,7	8,5	AP(U)X222M400CC1
		DC	76	107	0,08	58	46	43	15,0	10,0	AP(U)X222M400DC1
	3300	CC	63	107	0,09	43	35	33	15,6	10,4	AP(U)X332M400CC1
		DC	76	107	0,09	43	35	33	17,3	11,6	AP(U)X332M400DC1
		DF	76	147	0,09	43	35	33	19,9	13,3	AP(U)X332M400DF1
	4700	DC	76	107	0,10	34	27	25	19,6	13,1	AP(U)X472M400DC1
		DF	76	147	0,09	30	24	23	23,8	15,8	AP(U)X472M400DF1
	6800	DF	76	147	0,08	19	15	14	30,3	20,2	AP(U)X682M400DF1
	10000	DJ	76	222	0,11	18	14	13	37,8	25,2	AP(U)X103M400DJ1
		EF	90	147	0,11	18	14	13	34,5	23,0	AP(U)X103M400EF1
15000	EJ	90	222	0,08	8	7	6	59,4	39,6	AP(U)X153M400EJ1	

	Capacitance	Case	Diam	Height	Tanδ	ESRmax typ		Zmax	Iripple @100Hz		Ordering Code
	[μF]@100Hz		[mm]	[mm]	[%]@100Hz	[mΩ]@100Hz	[mΩ]@10KHz	[mΩ]@10KHz	[A]@55°C	[A]@85°C	(U) for mounting stud
400	15000	EJ	90	222	0,08	8	7	6	59,4	39,6	AP(U)X153M400EJ1
	18000	EJ	90	222	0,08	7	6	5	65,1	43,4	AP(U)X183M400EJ1
	20000	EL	90	240	0,08	6	5	5	71,4	47,4	AP(U)X203M400EL1
450	1000	BB	51	83	0,12	191	153	143	5,9	3,9	AP(U)X102M450BB1
	1500	BB	51	83	0,11	117	93	88	7,6	5,0	AP(U)X152M450BB1
		BC	51	105	0,10	106	85	80	8,8	5,9	AP(U)X152M450BC1
	2200	CC	63	107	0,12	87	69	65	11,0	7,3	AP(U)X222M450CC1
		DC	76	107	0,11	80	64	60	12,8	8,5	AP(U)X222M450DC1
	3300	DC	76	107	0,12	58	46	43	15,0	10,0	AP(U)X332M450DC1
		DF	76	147	0,1	48	39	36	18,9	12,6	AP(U)X332M450DF1
	4700	DF	76	147	0,12	41	33	30	20,6	13,7	AP(U)X472M450DF1
		EC	90	107	0,11	37	30	28	20,7	13,8	AP(U)X472M450EC1
	6800	DF	76	147	0,13	30	24	23	23,8	15,8	AP(U)X682M450DF1
		DJ	76	222	0,12	28	22	21	29,8	19,9	AP(U)X682M450DJ1
	10000	DJ	76	222	0,12	19	15	14	36,2	24,1	AP(U)X103M450DJ1
		EJ	90	222	0,12	19	15	14	39,6	26,4	AP(U)X103M450EJ1
	15000	EJ	90	222	0,13	14	11	10	46,6	31,1	AP(U)X153M450EJ1
	18000	EL	90	240	0,13	12	9	9	52,9	35,3	AP(U)X183M450EL1

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		
BB	51x83	85	13	8	13	22.2	X	M5	2,0	10	M12	16	10Nm	30	6-9
BB	51x83	85	13	13	18	22.2	X	M5	2,0	10	M12	16	10Nm	30	6-9
BC	51x105	109	13	8	13	22.2	X	M5	2,0	10	M12	16	10Nm	30	6-9
BC	51x105	109	13	13	18	22.2	X	M5	2,0	10	M12	16	10Nm	30	6-9
CC	63x105	111	16	8	13	28.6	X	M5	2,0	10	M12	16	10Nm	20	6-8
CC	63x105	111	16	13	18	28.6	X	M5	2,0	10	M12	16	10Nm	20	6-8
DC	76x105	111	19	13	18	31.8	X	M5	2,0	10	M12	16	10Nm	12	5-7
DF	76x145	151	19	13	18	31.8	X	M5	2,0	10	M12	16	10Nm	12	6-14
				18	23		G	M6	2,5						
DK	76x165	173	19	13	18	31.8	X	M5	2,0	10	M12	16	10Nm	12	6-14
				18	23		G	M6	2,5						
DJ	76x222	222	19	13	18	31.8	X	M5	2,0	10	M12	16	10Nm	8	9-11
				18	23		G	M6	2,5						
EC	90x105	112	19	18	23	31.8	G	M6	2,5	10	M12	16	10Nm	6	7-9
EF	90x145	153	19	18	23	31.8	G	M6	2,5	10	M12	16	10Nm	6	9-11
EJ	90x222	227	19	18	23	31.8	G	M6	2,5	10	M12	16	10Nm	6	8-12
EL	90x240	245	19	18	23	31.8	G	M6	2,5	10	M12	16	10Nm	6	9-13

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