



ARX Series

ARX Flat Bottom

ARUX Mounting Stud

Series	Voltage	Temperature	Case Φ x H [mm]	Applications
AR(U)X	40-450V	-25°C,+85°C	35x59/76x147	High CV Long Life Industrial Applications

Table 1-General

Mechanical Outlines:

- **Case:** aluminium made
- **Terminals:** screw
- **Sealing:** hermetic by beading on an EPR gasket, housed on a resin cover
- **Pressure Release Vent:** made in silicone-rubber
- **Sleeve:** self-extinguishing thermoshrinkable sleeve
- **Size:** see enclosed drawings
- **Mounting Hardware:** see hardware section

Specifications	Temperature Range	Capacitance
CECC 30300 IEC 384-4 ("long life grade") MIL C62D DIN 41240/DIN45910	Operating: -25°C/+85°C ¹ Climatic category : 25/85/56	Standard tolerance X=10%+30% Upon request M=±20%

Table 2-General Specifications

¹ Capacitors can be operated @-40°C, but impedance should be considered

Leakage Current

After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be within limits given in Table 3-Leakage Current limits:

Maximum limit	@25°C	$I_f \leq 0,004 \times C \times V$
Operating limit	@25°C	$I_f \leq 0,001 \times C \times V$

Table 3-Leakage Current limits

Where:

- I_f =leakage current [μ A]
- C=capacitance [μ F]
- V=rated voltage [V]

Important

When using high-capacitance and high-voltage electrolytic capacitors it is important to remember that the inner part (the rolled section) is not insulated from can: between the negative pole and the aluminium can there is a variable and not defined resistance essentially due to the electrolyte used in capacitor manufacture.

Surge Voltage

Surge Voltage is the maximum voltage which may be applied for short periods, limit for each working voltage is shown in Table 4-Surge Voltage values.

Working Voltage	40	50	63	75	100	160	200	250	350	400	420	450
Surge Voltage	46	58	73	86	115	185	230	290	385	440	460	495

Table 4-Surge Voltage values

Ripple Current

The allowable values of ripple current in Ampères, are related to the temperature and frequency by Equation 1:

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

Equation 1

Where:

- $I_{\text{Ripple@85}^\circ\text{C}}$ is the limit given by tables, @ 85°C/100HZ
- K_t is the Temperature Correlation Factor, tabulated in Table 5-Kt Values
- K_f is the Frequency Correlation Factor, tabulated in Table 6-Kf Values

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

°C	40	55	65	75	85
Kt	2.10	1.80	1.60	1.30	1.0

Table 5-Kt Values

Vn/Hz	Kf			
	50<V=300		V>300	
	Diameter Code A,B		Diameter Code C,D,E	
50	0.79	0.76	0.78	0.72
100	1.00	1.00	1.00	1.00
120	1.04	1.04	1.02	1.03
200	1.12	1.17	1.06	1.14
300	1.16	1.28	1.08	1.24
400	1.20	1.35	1.09	1.29
500	1.22	1.39	1.09	1.32
>1000	1.25	1.45	1.09	1.37

Table 6-Kf Values

Dimensions

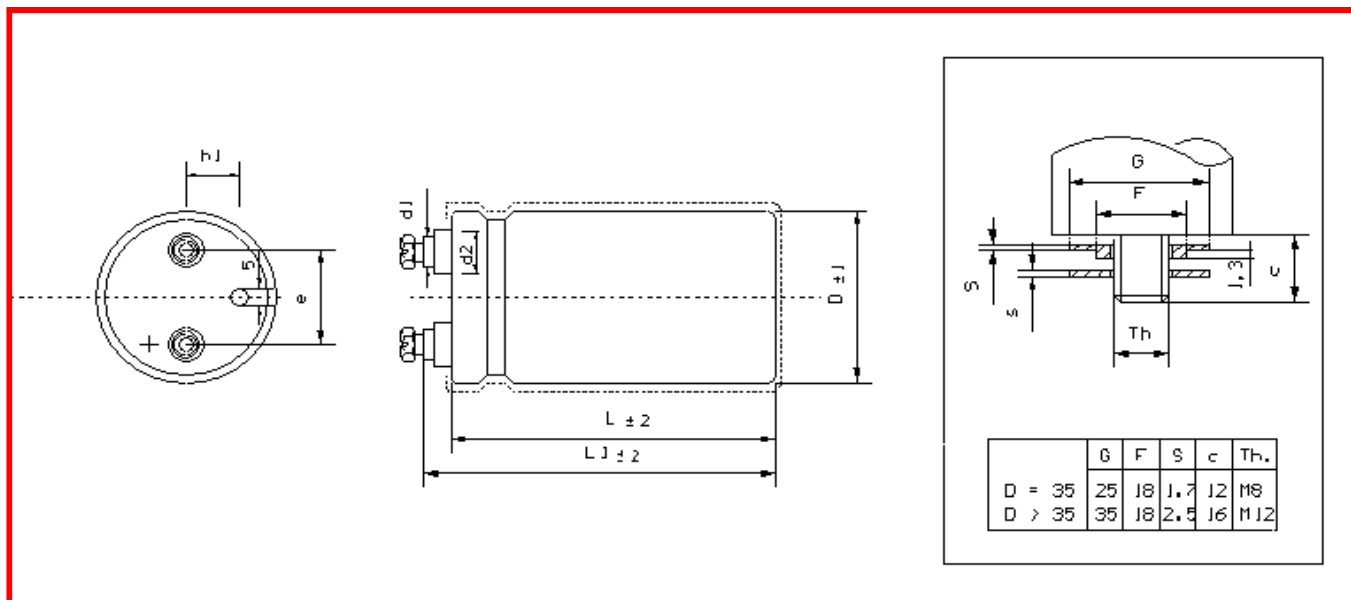


Table 7-General View

Case Code	$\Phi \times L$	l1	d1	d2	h1	e	Case Code	$\Phi \times L$	l1	d1	d2	h1	e
All dimensions in [mm] general tolerance $\pm 0,5$ mm													
AA	35x59	64	8	12	8	12.7	BC	51x105	109	13	18	13	22.2
AB	35x83	89	8	12	8	12.7	CC	63x107	111	13	18	16	28.6
AC	35x105	109	8	12	8	12.7	DC	76x107	111	13	18	19	31.8
BB	51x83	89	13	18	13	22.2	DF	76x147	151	13	18	19	31.8

Table 8-Dimensions

Insert screw thread (diam 51,63 and 76mm)= M5	Insert screw thread (diam 90mm)= M6
Insert screw torque max. (M5) = 2,0Nm	Insert screw torque max. (M6) = 2,5Nm
Insert screw length =10mm	Screw torque for hex nuts M12 =10Nm

Table 9-Connections

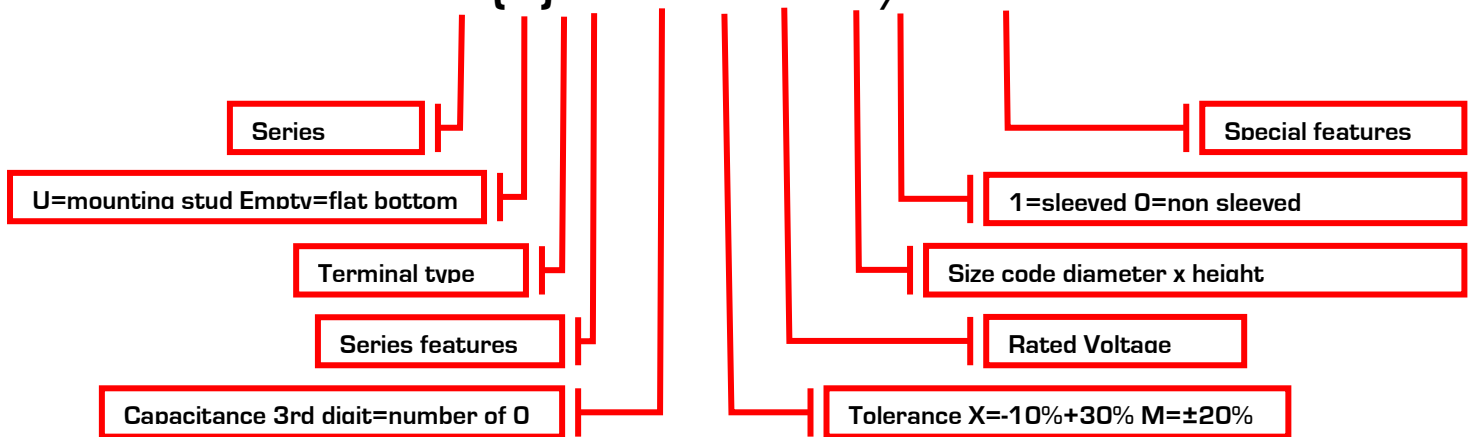
Diam ² Height ³	A pcs/box	B pcs/box	C pcs/box	D pcs/box
A	50/100	/	/	
B	50	30	/	
C	50	30	20	12
F	/	/	20	12
K	/	/	/	
G	/	/	/	
J	/	/	/	
L	/	/	/	
thread		M5	M5	M5

Table 10-Quantity per box

Standard Mounting Stud Hardware: Insulating Plastic Washer And Metallic Nut

Ordering code

AR(U)X472X350DF1/XXXX



² All dimensions in [mm] general tolerance $\pm 0,5\text{mm}$

³ All dimensions in [mm] general tolerance $\pm 0,5\text{mm}$



Expected Lifetime Vs Temperature and Ripple Current

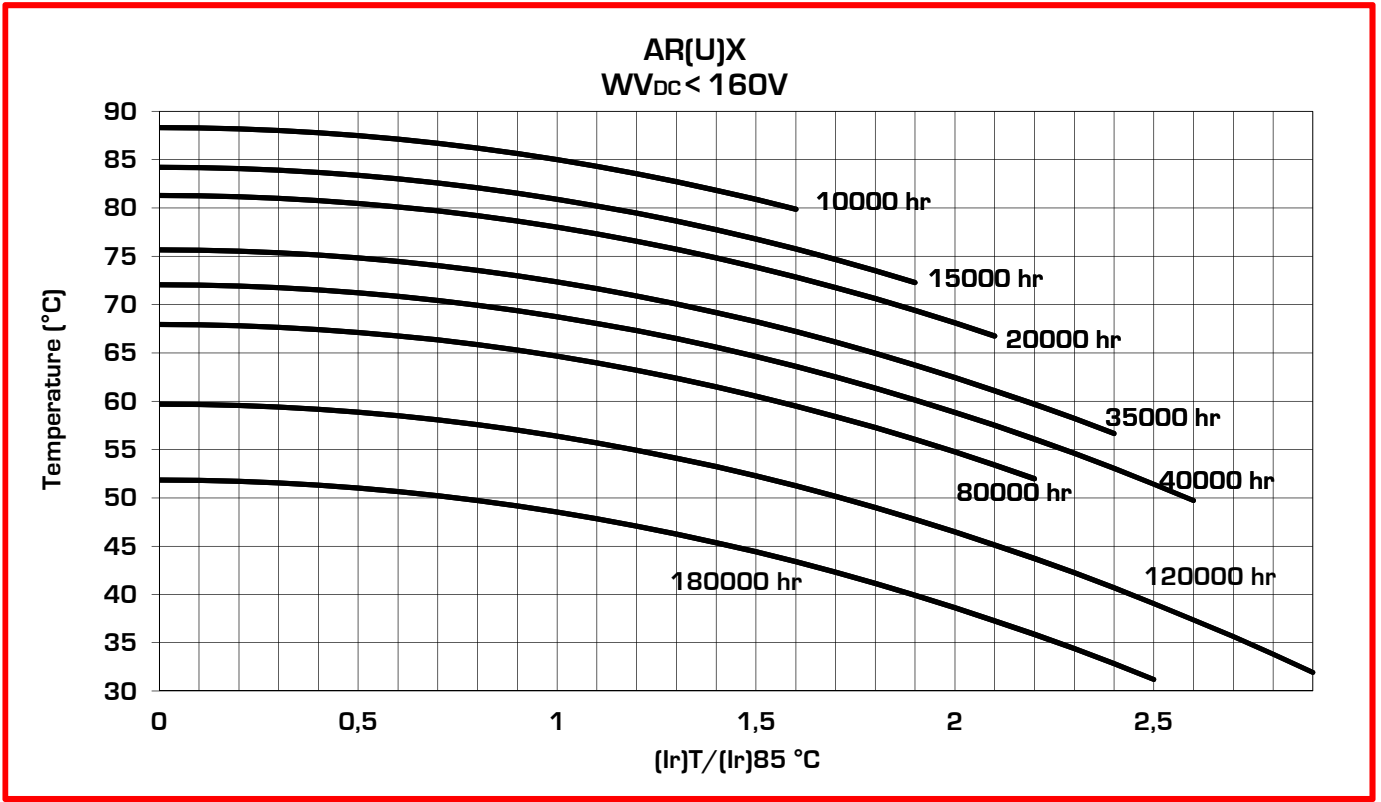


Table 11

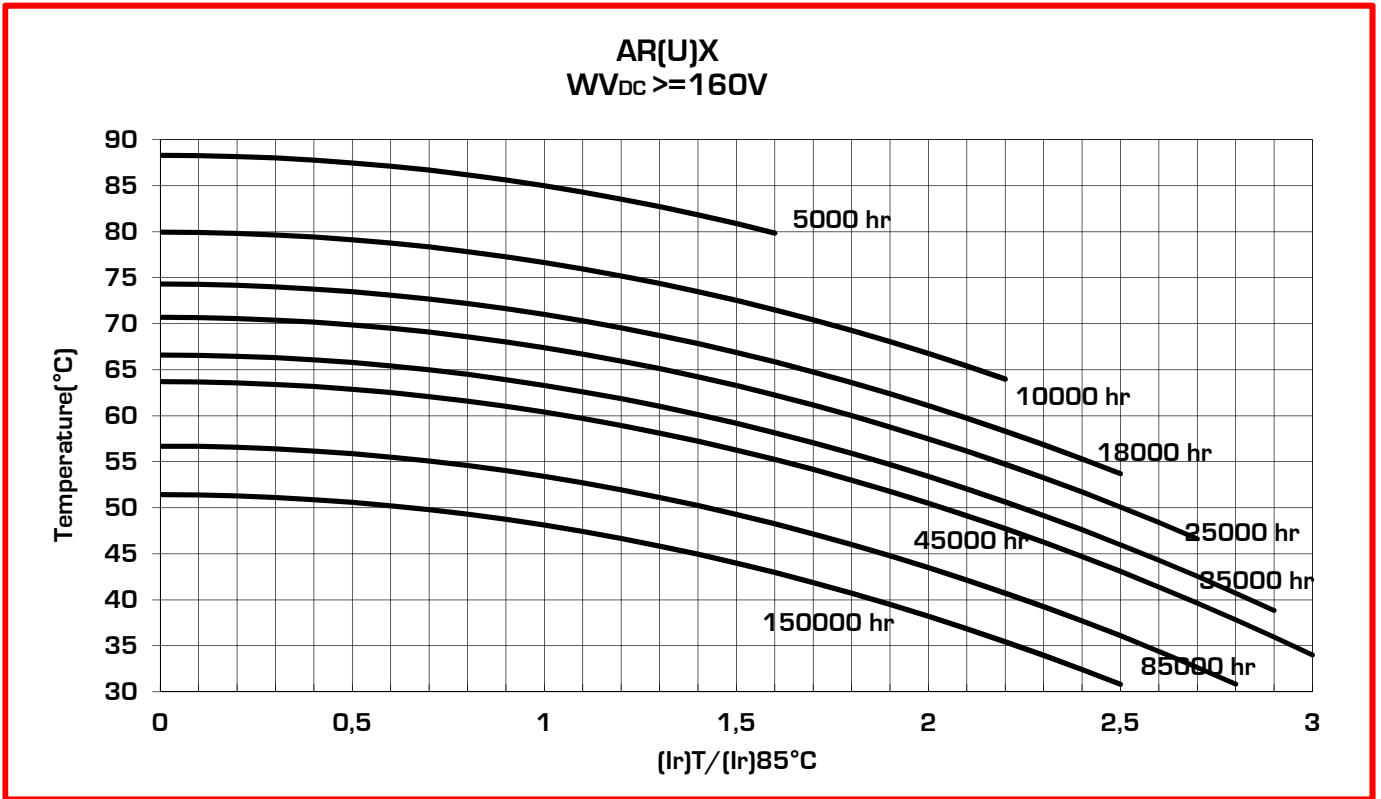


Table 12

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:

- $\frac{\Delta C}{C_{t0}} \leq 30\%$ *Equation 2*
- $ESR \leq 3 \cdot ESR_{t0}$ *Equation 3*
- $I_f \leq I_{ft0}$ *Equation 4*

where t_0 is the initial value

Voltage Endurance Test Requirements

Voltage Endurance Test are one of the basys for Expected Lifetime Curves.

For AY(U)X series, End of Life criteria, when rated temperature, and voltage are applied for 2'000hrs, are:

- $\frac{\Delta C}{C_{t0}} \leq 15\%$ *Equation 5*
- $ESR \leq 1,3 \cdot ESR_{t0}$ *Equation 6*
- $I_f \leq I_{ft0}$ *Equation 7*

where t_0 is the initial value

VN=40V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
10000	AA	35	59	0,27	39	31	30	8,0	4,6	AR(U)X103X40AA1
15000	AB	35	83	0,35	33	27	25	10,5	6,1	AR(U)X153X40AB1
22000	AC	35	105	0,42	27	22	18	13,2	7,7	AR(U)X223X40AC1
33000	BB	51	83	0,45	20	16	18	16,9	9,8	AR(U)X333X40BB1
47000	BB	51	83	0,48	15	12	18	16,9	11,4	AR(U)X473X40BB1
47000	BC	51	105	0,51	16	12	14	21,4	13,3	AR(U)X473X40BC1
100000	CC	63	107	0,70	10	8	9	30,0	17,5	AR(U)X104X40CC1
150000	DC	76	107	0,90	9	7	8	36,1	21,1	AR(U)X154X40DC1
220000	DF	76	147	1,30	8	7	7	41,6	24,3	AR(U)X224X40DF1

VN=63V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°Cz	
4700	AA	35	59	0,15	46	37	30	7,4	4,1	AR(U)X472X63AA1
6800	AB	35	83	0,20	42	34	27	9,3	5,2	AR(U)X682X63AB1
10000	AB	35	83	0,22	32	25	21	10,8	6,0	AR(U)X103X63AB1
15000	AC	35	105	0,25	24	19	18	14,1	7,8	AR(U)X153X63AC1
22000	BB	51	83	0,33	21	17	17	16,1	8,9	AR(U)X223X63BB1
33000	BC	51	105	0,38	17	13	14	20,8	11,6	AR(U)X333X63BC1
47000	CC	63	105	0,33	10	8	9	30,0	16,7	AR(U)X473X63CC1
68000	DC	76	107	0,39	8	7	7	36,9	20,5	AR(U)X683X63DC1
100000	DF	76	147	0,45	6	5	6	47,7	26,5	AR(U)X104X63DF1

Notes:

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VN=100V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
2200	AA	35	59	0,12	78	63	47	5,6	3,1	AR(U)X222X100AA1
3300	AB	35	83	0,12	52	42	34	8,4	4,7	AR(U)X332X100AB1
4700	AB	35	83	0,12	37	29	27	9,7	5,4	AR(U)X472X100AB1
6800	AC	35	105	0,12	25	20	20	13,2	7,3	AR(U)X682X100AC1
10000	BB	51	83	0,12	17	14	17	15,6	8,7	AR(U)X103X100BB1
15000	BC	51	105	0,12	11	9	13	21,6	12	AR(U)X153X100BC1
22000	CC	63	107	0,12	8	6	9	27,8	15,4	AR(U)X223X100CC1
33000	DC	76	107	0,12	5	4	8	35,9	20	AR(U)X333X100DC1
47000	DF	76	147	0,12	4	3	7	46,7	26	AR(U)X473X100DF1

VN=160V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
1000	AA	35	59	0,12	172	138	94	4,2	2,3	AR(U)X102X160AA1
1500	AB	35	83	0,12	115	92	62	6,2	3,4	AR(U)X152X160AB1
2200	AC	35	105	0,12	78	63	41	8,5	4,7	AR(U)X222X160AC1
3300	BB	51	83	0,12	52	42	29	11,3	6,3	AR(U)X332X160BB1
4700	BC	51	105	0,12	37	29	25	14,0	7,8	AR(U)X472X160BC1
6800	CC	63	105	0,12	25	20	20	18,9	10,5	AR(U)X682X160CC1
10000	CC	63	105	0,12	17	14	18	20,5	11,4	AR(U)X103X160CC1
12000	DC	76	105	0,12	14	11	15	25,0	13,9	AR(U)X123X160DC1
22000	DF	76	147	0,12	8	6	8	36,4	20,2	AR(U)X223X160DF1

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VN=200V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
680	AA	35	59	0,12	253	202	111	3,8	2,1	AR(U)X681X200AA1
1000	AB	35	83	0,12	172	138	78	5,6	3,1	AR(U)X102X200AB1
1500	AC	35	105	0,12	115	92	51	7,9	4,4	AR(U)X152X200AC1
2200	BB	51	83	0,12	78	63	36	10,3	5,7	AR(U)X222X200BB1
3300	BC	51	105	0,12	52	42	30	12,8	7,1	AR(U)X332X200BC1
4700	CC	63	107	0,12	37	29	21	17,2	9,6	AR(U)X472X200CC1
10000	DC	76	107	0,12	17	14	14	25,5	14,2	AR(U)X103X200DC1
15000	DF	76	147	0,12	11	9	12	32,0	17,8	AR(U)X153X200DF1

VN=250V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
470	AA	35	59	0,12	366	293	155	3,2	1,8	AR(U)X471X250AA1
680	AB	35	83	0,12	253	202	107	4,7	2,6	AR(U)X681X250AB1
1000	AC	35	105	0,12	172	138	86	6,1	3,4	AR(U)X102X250AC1
1500	BB	51	83	0,12	115	92	59	8,0	4,5	AR(U)X152X250BB1
2200	BC	51	105	0,12	78	63	44	10,5	5,8	AR(U)X222X250BC1
3300	BC	51	105	0,12	52	42	30	12,8	7,1	AR(U)X332X250BC1
4700	CC	63	107	0,12	37	29	23	17,2	9,6	AR(U)X472X250CC1
6800	DC	76	107	0,12	25	20	20	21,1	11,7	AR(U)X682X250DC1
10000	DF	76	147	0,12	17	14	17	26,1	14,5	AR(U)X103X250DF1

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VN=350V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
330	AA	35	59	0,12	521	417	217	2,7	1,5	AR(U)X331X350AA1
470	AB	35	83	0,12	366	293	155	3,9	2,2	AR(U)X471X350AB1
680	AC	35	105	0,12	253	202	107	5,3	2,9	AR(U)X681X350AC1
1000	AC	35	105	0,12	172	138	78	6,4	3,6	AR(U)X102X350AC1
1500	BB	51	83	0,12	115	92	51	8,6	4,8	AR(U)X152X350BB1
2200	BC	51	105	0,12	78	63	35	11,7	6,5	AR(U)X222X350BC1
3300	CC	63	107	0,12	52	42	25	16,1	9	AR(U)X332X350CC1
4700	DC	76	107	0,12	37	29	22	19,2	10,7	AR(U)X472X350DC1
6800	DF	76	147	0,12	25	20	18	26,4	14,6	AR(U)X682X350DF1

VN=400V

Capacitance [μF]@100Hz	Case	Diam [mm]	Height [mm]	Tanδ [%]@100Hz	ESRmax typ		Zmax [mΩ]@10KHz	Iripple @100Hz		Part Number (U) for mounting stud
					[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	
330	AA	35	59	0,12	521	417	221	2,7	1,5	AR(U)X331X400AA1
470	AB	35	83	0,12	366	293	155	3,9	2,2	AR(U)X471X400AB1
680	AC	35	105	0,12	253	202	111	5,3	2,9	AR(U)X681X400AC1
1000	BB	51	83	0,12	172	138	78	7,0	3,9	AR(U)X102X400BB1
1500	BB	51	83	0,12	115	92	78	8,0	4,5	AR(U)X152X400BB1
1500	BC	51	105	0,12	115	92	50	9,7	5,4	AR(U)X152X400BC1
2200	CC	51	107	0,12	78	63	40	12,4	6,9	AR(U)X222X400CC1
3300	DC	76	107	0,12	52	42	29	16,5	9,2	AR(U)X332X400DC1
4700	DF	76	147	0,12	37	29	21	22,5	12,5	AR(U)X472X400DF1

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VN=450V

Capacitance	Case	Diam	Height	Tanδ	ESRmax typ		Zmax	Iripple @100Hz		Part Number
[μF]@100Hz		[mm]	[mm]	[%]@100Hz	[mΩ]@100Hz	[mΩ]@10KHz		[A]@55°C	[A]@85°C	(U) for mounting stud
220	AA	35	59	0,12	782	625	480	1,8	1,0	AR(U)X221X450AA1
330	AB	35	83	0,12	521	417	323	2,6	1,5	AR(U)X331X450AB1
470	AC	35	105	0,12	366	293	237	4,6	2,5	AR(U)X471X450AC1
680	BB	51	83	0,12	253	202	166	4,7	2,6	AR(U)X681X450BB1
1000	BC	51	105	0,12	172	138	112	6,4	3,6	AR(U)X102X450BC1
1500	CC	63	107	0,12	115	92	75	8,9	4,9	AR(U)X152X450CC1
2200	DC	76	107	0,12	78	63	56	12,0	6,7	AR(U)X222X450DC1
3300	DF	76	107	0,12	52	39	32	16,0	8,9	AR(U)X332X450DC1
4700	DF	76	147	0,12	37	29	28	20,0	11,1	AR(U)X472X450DF1

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