Miniature Axial Aluminum Electrolytics — XAL Series

FEATURES

- Standard low, medium, and high voltage capacitors
- Low impedance characteristics
- Case sizes are smaller than conventional general purpose capacitors, with very high performance

CHARACTERISTICS

Item	Characteristics														
Operating Temperature Range	6.3WV ~ 100WV is -40°C ~ +85°C; 160WV ~ 450WV is -25°C ~ +85°C														
Capacitance Tolerance	±20% at 20°C, 120Hz														
Leakage Current	≤100V	I = 0.02CWV or 3μA whichever is greater after 2 minutes of applied rated DC working voltage at 20°C Where: C = rated capacitance in μF; WV = rated DC working voltage													
	>100V	I = 0.02CWV +25(μA) after 5 minutes of applied rated DC working voltage at 20°C Where: C = rated capacitance in μF; WV = rated DC working voltage													
Dissipation Factor (Tan δ, at 20°C 120Hz)	Working voltage (WV)		6.3	10	16	25	35	50	63	100	160	200	250	350	450
	Tan δ		0.23	0.20	0.17	0.15	0.12	0.10	0.09	0.08	0.12	0.14	0.17	0.20	0.25
	For capacitors whose capacitance exceeds 1,000μF, the specification of tan δ is increased by 0.02 for every addition of 1,000μF														
Surge Voltage	Working voltage (WV)		6.3	10	16	25	35	50	63	100	160	200	250	350	450
	Surge voltage (SV)		8	13	20	32	44	63	79	125	200	250	300	400	500
Low Temperature Characteristics (Imp. ratio @ 120Hz)	Working voltage (WV)		6.3	10	16	25	35	50	63	100	160	200	250	350	450
	Z-25°C/+20°C	øD<16	6	4	3	3	2	2	2	2	3	6	8	12	16
		øD≥16	8	6	4	4	3	3	3	3	3	6	8	12	16
	Z-40°C/+20°C	øD<16	10	8	6	6	4	3	3	3	4	8	10	-	-
		øD≥16	18	16	12	10	8	8	6	6	4	8	10	-	-
Life Test	When returned to +20°C after 2,000 hours application of working voltage at +85°C, the capacitor will meet the following limits: Capacitance change is ≤ ±20% of initial value; tan δ is < 200% of specified value; leakage current is within specified value														
Shelf Life Test	When returned to +20°C after 1,000 hours at +85°C with no voltage applied, the capacitor will meet the following limits: Capacitance change is ≤ ±20% of initial value; tan δ is < 200% of specified value; leakage current is within specified value for 6.3~100V and less than 200% of specified value for 160V~450V														
Standards	Satisfies Characteristic W of JIS C5141														

PART NUMBERING SYSTEM

X A L	5 0 V	1 0 0
Series	Voltage Actual Value	Capacitance (μF) Actual Value

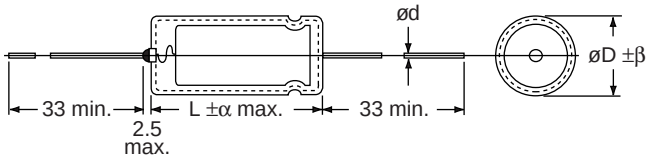
RIPPLE CURRENT AND FREQUENCY MULTIPLIERS

Capacitance (μF)	Frequency (Hz)				
	60 (50)	120	500	1K	≥10K
<100	0.70	1.0	1.3	1.4	1.5
100 ~ 1000	0.75	1.0	1.2	1.3	1.35
>1000	0.80	1.0	1.1	1.12	1.15

RIPPLE CURRENT AND TEMPERATURE MULTIPLIERS

Temperature (°C)	<50	70	85
Multiplier	1.78	1.40	1.0

DIMENSIONS AND PERMISSIBLE RIPPLE CURRENT



Lead Spacing and Diameter (mm)

øD	5	6.3	8	10	13	16	18	22	25
ød	0.6	0.6	0.6	0.6	0.8	0.8	0.8	1.0	1.0
α	1.5	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0
β	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0

Value (µF)	Working Voltage; Dimensions: øD x L (mm); Ripple Current: mA/RMS @ 120Hz, 85°C															
	6.3		10		16		25		35		50		63		100	
	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA
0.1											5 x 12	1.5	5 x 12	3.0	5 x 12	3.0
0.22											5 x 12	3.5	5 x 12	4.5	5 x 12	4.5
0.33											5 x 12	5.0	5 x 12	7.5	5 x 12	7.5
0.47											5 x 12	6.0	5 x 12	9.0	5 x 12	9.0
1											5 x 12	10	5 x 12	15	5 x 12	15
2.2											5 x 12	20	5 x 12	30	5 x 12	30
3.3											5 x 12	30	5 x 12	36	6.3 x 12	41
4.7											5 x 12	42	5 x 12	44	6.3 x 12	50
6.8											5 x 12	50	5 x 13	55		
10									5 x 12	55	6.3 x 12	65	6.3 x 12	68	6.3 x 12	72
22					5 x 12	71	5 x 12	76	6.3 x 12	88	6.3 x 12	96	6.3 x 14	109	8 x 16	133
33			5 x 12	78	5 x 12	88	6.3 x 12	100	6.3 x 14	115	6.3 x 14	126	8 x 16	154	10 x 17	190
47	5 x 12	87	5 x 12	94	6.3 x 12	111	6.3 x 12	119	6.3 x 14	138	8 x 16	174	10 x 17	214	10 x 21	237
100	6.3 x 12	136	6.3 x 12	145	6.3 x 16	174	8 x 16	215	8 x 16	232	10 x 17	298	10 x 21	326	13 x 22	377
220	6.3 x 14	215	6.3 x 16	231	8 x 16	298	8 x 16	319	10 x 17	401	10 x 21	459	13 x 22	527	16 x 28	625
330	8 x 16	305	8 x 16	327	8 x 16	365	10 x 17	454	10 x 21	514	13 x 22	613	13 x 27	675	16 x 33	793
470	8 x 16	364	8 x 16	390	8 x 20	460	10 x 17	542	10 x 21	613	13 x 22	731	13 x 27	780	16 x 37	942
1000	10 x 17	617	10 x 17	662	10 x 21	775	13 x 22	873	13 x 27	955	16 x 33	1111	18 x 38	1249	22 x 43	1359
2200	13 x 26	929	13 x 22	1051	13 x 22	1125	16 x 28	1344	16 x 33	1421	18 x 42	1699	22 x 43	1744		
3300	13 x 22	1150	13 x 27	1288	16 x 28	1454	16 x 33	1611	16 x 37	1640	22 x 43	2027	25 x 52	2309		
4700	13 x 27	1354	16 x 28	1552	16 x 33	1650	18 x 38	1811	22 x 43	2206	25 x 52	2347				
10000	16 x 37	2062	18 x 42	2122	22 x 43	2503	22 x 52	2893								
22000	22 x 43	3097														

Value (µF)	Working Voltage; Dimensions: øD x L (mm); Ripple Current: mA/RMS @ 120Hz, 85°C									
	160		200		250		350		450	
	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA	øD x L	mA
1	6.3 x 12	7	6.3 x 16	9	6.3 x 16	12	8 x 16	13	8 x 16	15
2.2	6.3 x 12	15	8 x 16	16	8 x 16	17	8 x 20	19	10 x 21	23
3.3	8 x 16	21	8 x 16	26	8 x 20	31	8 x 20	33	10 x 21	36
4.7	8 x 16	31	8 x 16	33	10 x 17	38	10 x 21	44	13 x 22	46
10	10 x 17	60	10 x 21	66	10 x 21	72	13 x 22	77	13 x 27	82
22	13 x 22	121	13 x 22	121	13 x 27	126	13 x 27	132	16 x 37	143
33	13 x 22	154	13 x 27	167	16 x 28	178	16 x 33	186	16 x 42	201
47	13 x 27	198	16 x 32	214	16 x 33	241	18 x 42	253	22 x 43	402
100	16 x 33	345	16 x 37	368	18 x 43	391	18 x 40	402	25 x 52	448
220	18 x 42	586	22 x 43	609	22 x 43	632				
330	22 x 43	632								