

Features

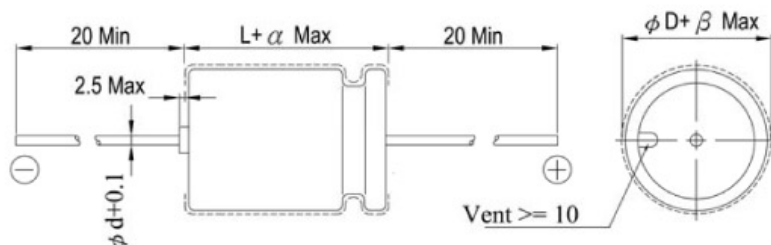
- 85°C, 2,000 hours assured
- For general purpose application
- RoHS Compliance



SPECIFICATIONS

Items	Performance																																																																																														
Operating Temperature Range	-40℃ ~ +85℃																																																																																														
Capacitance Tolerance	±20% (at 120Hz, 20℃)																																																																																														
Leakage Current (at 20℃)	<table><tr><td>Rated voltage</td><td colspan="4">≤ 100V</td><td colspan="6">> 100V</td></tr><tr><td>Time</td><td colspan="4">after 2 minutes</td><td colspan="6">after 5 minutes</td></tr><tr><td>Leakage Current</td><td colspan="4">I = 0.02CV or 3 (μ A) whichever is greater</td><td colspan="4">CV ≤ 1000 I = 0.03CV+15(μ A)</td><td colspan="4">CV > 1000 I = 0.02CV+25(μ A)</td></tr></table> Where, C= rated capacitance in μ F. V = rated DC working voltage in V.														Rated voltage	≤ 100V				> 100V						Time	after 2 minutes				after 5 minutes						Leakage Current	I = 0.02CV or 3 (μ A) whichever is greater				CV ≤ 1000 I = 0.03CV+15(μ A)				CV > 1000 I = 0.02CV+25(μ A)																																																	
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Dissipation Factor (Tan δ at 120 Hz, 20℃)	<table><tr><td>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td>Tan δ (max)</td><td>0.23</td><td>0.20</td><td>0.17</td><td>0.15</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td><td>0.12</td><td>0.14</td><td>0.17</td><td>0.20</td><td>0.24</td><td>0.24</td></tr></table> When the capacitance exceeds 1,000 μ F, 0.02 shall be added every 1,000 μ F increase.														Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	Tan δ (max)	0.23	0.20	0.17	0.15	0.12	0.10	0.09	0.08	0.12	0.14	0.17	0.20	0.24	0.24																																																			
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Low Temperature Characteristics (at 120Hz)	Impedance ratio shall not exceed the values given in the table below. <table><tr><td colspan="2">Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td rowspan="4">Impedance Ratio</td><td>Z(-25℃) /Z(+20℃)</td><td>φ D < 16</td><td>6</td><td>4</td><td>3</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>6</td><td>8</td><td>12</td><td>14</td><td>16</td></tr><tr><td></td><td>φ D ≥ 16</td><td>8</td><td>6</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Z(-40℃) /Z(+20℃)</td><td>φ D < 16</td><td>10</td><td>8</td><td>6</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>4</td><td>8</td><td>10</td><td>-</td><td>-</td><td>-</td></tr><tr><td></td><td>φ D ≥ 16</td><td>18</td><td>16</td><td>12</td><td>10</td><td>8</td><td>8</td><td>6</td><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>														Rated Voltage		6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	Impedance Ratio	Z(-25℃) /Z(+20℃)	φ D < 16	6	4	3	3	2	2	2	2	3	6	8	12	14	16		φ D ≥ 16	8	6	4	4	3	3	3	3							Z(-40℃) /Z(+20℃)	φ D < 16	10	8	6	6	4	3	3	3	4	8	10	-	-	-		φ D ≥ 16	18	16	12	10	8	8	6	6						
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Load Life Test	<table><tr><td>Test Time</td><td>2,000 hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied for 2,000 hrs at 85℃														Test Time	2,000 hrs	Capacitance Change	Within ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																																																									
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Shelf Life Test	<table><tr><td>Test Time</td><td>1,000 hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hrs at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V (Refer to JIS C 5101-4 4.1).														Test Time	1,000 hrs	Capacitance Change	Within ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																																																									
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Ripple Current & Frequency Multipliers	<table><tr><td colspan="2">Freq.(Hz)</td><td>60 (50)</td><td>120</td><td>500</td><td>1K</td><td>10K up</td></tr><tr><td rowspan="4">Cap.(μ F)</td><td>Under 100</td><td>0.70</td><td>1.00</td><td>1.30</td><td>1.40</td><td>1.50</td></tr><tr><td>100 < C ≤ 1,000</td><td>0.75</td><td>1.00</td><td>1.20</td><td>1.30</td><td>1.35</td></tr><tr><td>1,000 up above</td><td>0.80</td><td>1.00</td><td>1.10</td><td>1.12</td><td>1.15</td></tr></table>														Freq.(Hz)		60 (50)	120	500	1K	10K up	Cap.(μ F)	Under 100	0.70	1.00	1.30	1.40	1.50	100 < C ≤ 1,000	0.75	1.00	1.20	1.30	1.35	1,000 up above	0.80	1.00	1.10	1.12	1.15																																																							
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DIAGRAM OF DIMENSIONS



LEAD SPACING AND DIAMETER Unit: mm

ϕD	5	6.3	8	10	12.5	16	18	22	25
ϕd	0.6					0.8			
α	1.5			2.0					
β	0.5								

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: φ D × L(mm)

Ripple Current: mA/rms at 120 Hz, 85°C

μF	V. DC Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA
0.10	0R1											5×12	1.5	5×12	3	5×12	3
0.22	R22											5×12	3.5	5×12	4.5	5×12	5
0.33	R33											5×12	5	5×12	7.5	5×12	8
0.47	R47											5×12	6	5×12	9	5×12	9
1.0	010											5×12	10	5×12	15	5×12	15
2.2	2R2											5×12	20	5×12	30	5×12	30
3.3	3R3											5×12	30	5×12	36	5×12	40
4.7	4R7											5×12	42	5×12	44	6.3×13	41
10	100							5×12	40	5×12	55	5×12	50	6.3×13	55	6.3×13	72
22	220					5×12	71	5×12	76	6.3×13	70	6.3×13	85	6.3×13	109	8×16	133
33	330					5×12	85	5×12	80	6.3×13	115	6.3×13	126	8×13	154	10×17	190
47	470	5×12	87	5×12	94	6.3×13	88	6.3×13	100	6.3×13	138	8×13	174	8×16	214	10×21	237
100	101	6.3×13	121	6.3×13	145	6.3×13	160	8×13	215	8×16	232	10×17	296	10×17	326	13×22	377
220	221	6.3×13	215	8×13	231	8×13	298	8×16	319	10×17	401	10×21	459	13×22	527	16×28	625
330	331	8×16	305	8×16	327	8×16	365	10×17	454	10×21	514	13×22	613	13×22	675	16×33	793
470	471	8×16	364	8×16	390	8×16	460	10×21	524	13×22	613	13×22	731	13×27	780	16×36	942
1,000	102	10×17	662	10×17	671	10×21	775	13×22	873	13×27	955	16×33	1,111	16×36	1,249	18×42	1,359
2,200	222	13×22	929	13×22	1,051	13×24	1,125	16×28	1,344	16×33	1,421	18×36	1,699	22×43	1,744	25×52	2,430
3,300	332	13×27	1,150	13×27	1,288	16×28	1,454	16×33	1,611	18×36	1,640	22×43	2,027	25×52	2,309		
4,700	472	13×27	1,354	16×28	1,552	16×33	1,650	18×36	1,881	22×43	2,280	25×43	2,347	25×52	2,710		
6,800	682	16×28	1,762	16×33	1,930	18×36	2,040	18×42	2,170	22×43	2,470	25×52	2,650				
10,000	103	16×36	2,062	18×36	2,122	18×42	2,503	22×43	2,893	25×52	3,180						

μF	V. DC Contents	160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA	φ D×L	mA
1.0	010	6.3 × 13	7	6.3 × 13	9	6.3 × 13	12	8 × 16	13	8 × 16	14	8 × 16	15
2.2	2R2	6.3 × 13	15	8 × 13	16	8 × 16	17	8 × 20	19	10 × 17	21	10 × 21	23
3.3	3R3	8 × 13	21	8 × 16	26	8 × 21	31	8 × 21	33	10 × 17	34	10 × 21	36
4.7	4R7	8 × 16	31	10 × 17	33	10 × 17	38	10 × 21	44	10 × 26	45	10 × 26	46
10	100	10 × 17	60	10 × 21	66	10 × 21	72	13 × 22	72	13 × 22	80	13 × 27	82
22	220	10 × 21	121	13 × 22	121	13 × 27	126	13 × 27	132	16 × 33	137	16 × 36	143
33	330	13 × 22	154	13 × 27	167	16 × 28	178	16 × 33	186	16 × 36	192	16 × 42	201
47	470	13 × 27	198	16 × 33	214	16 × 33	241	16 × 42	253	18 × 42	339	18 × 42	339
100	101	16 × 33	345	16 × 36	368	16 × 42	391	22 × 43	402	25 × 43	424	25 × 52	448
220	221	18 × 42	586	22 × 43	609	22 × 43	632						
330	331	22 × 43	632										