

ED

**Feature: Miniaturized, Low E.S.R. and impedance.
Capacitors for use in high ripple current capability.**

SPECIFICATIONS

Item	Performance Characteristics																		
Category Temperature Range	-40 to +105°C																		
Working Voltage Range	6.3 to 100Vdc																		
Capacitance Range	10 to 10,000 μ F																		
Capacitance Tolerance	$\pm 20\%$ (at 25°C 120Hz)																		
Dissipation Factor (tan δ) (at 25°C 120Hz)	<table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>tan δ (Max)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.08</td> </tr> </tbody> </table> <p>The above values should be increased by 0.02 for every additional 1000 μ F</p>	Rated Voltage (V)	6.3	10	16	25	35	50	63	100	tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
Rated Voltage (V)	6.3	10	16	25	35	50	63	100											
tan δ (Max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08											
Leakage Current	<p>$I=0.01CV$ or $3\mu A$, whichever is greater</p> <p>I: Leakage current. (μA) C:Rated capacitance. (μF) V: Rated voltage. (V) The rated voltage is impressed for two minutes.</p>																		
Endurance	<p>After applying rated voltage to the capacitor for 2,000 to 5,000 hours at 105°C, the following characteristics shall be satisfied when the capacitor has been restored to 25°C.</p> <table border="1"> <thead> <tr> <th>Case Size</th> <th>Life time</th> </tr> </thead> <tbody> <tr> <td>5 ϕ ~ 8x12</td> <td>2,000 hours</td> </tr> <tr> <td>8x16~10 ϕ</td> <td>3,000 hours</td> </tr> <tr> <td>13 ϕ ~18 ϕ</td> <td>5,000 hours</td> </tr> </tbody> </table> <p>Capacitance change $\leq \pm 25\%$ of the initial value Dissipation factor (tan δ) $\leq 200\%$ of the specified value Leakage current \leq specified value</p>	Case Size	Life time	5 ϕ ~ 8x12	2,000 hours	8x16~10 ϕ	3,000 hours	13 ϕ ~18 ϕ	5,000 hours										
Case Size	Life time																		
5 ϕ ~ 8x12	2,000 hours																		
8x16~10 ϕ	3,000 hours																		
13 ϕ ~18 ϕ	5,000 hours																		
Shelf Life	<p>After exposing the capacitor for 500 hours at 105°C, without applying voltage, the following characteristics shall be satisfied when the capacitor has been restored to 25°C.</p> <p>Capacitance change $\leq \pm 25\%$ of the initial value Dissipation factor (tan δ) $\leq 200\%$ of the specified value Leakage current $\leq 200\%$ of the specified value</p>																		
Others	Conforms to JIS C-5141 (1991), characteristic W																		

RIPPLE CURRENT MULTIPLIERS

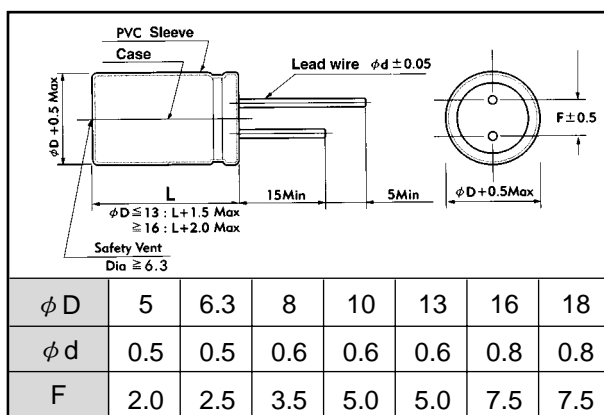
Temperature Multipliers

Temp (°C)	60	85	105
Factor	1.90	1.40	1.00

Frequency Multipliers

Freq.(Hz) Cap. (μ F)	120	1K	10K	100K
10 to 68	0.30	0.65	0.85	1.00
82 to 220	0.50	0.70	0.90	1.00
330 to 820	0.60	0.75	0.95	1.00
1000 to 10000	0.70	0.80	0.98	1.00

DIMENSIONS(mm)



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Case size & Permissible Ripple Current:

Nominal Capacitance (μ F)	Case Size ϕ DxL (mm)	6.3V			10 V			
		Max. Impedance @100kHz (Ω)		Max. Ripple Current @105°C 100kHz (mA rms)	Max. Impedance @100kHz (Ω)		Max. Ripple Current @105°C 100kHz (mA rms)	
		25°C	-10°C		25°C	-10°C		
100	5x11	0.65	3.6	155	5x11	0.58	2.3	210
220	6.3x11	0.40	1.6	255	6.3x11	0.22	0.87	340
330	6.3x11	0.22	0.87	340	8x12	0.21	0.85	410
470	8x12	0.18	0.80	400	8x12	0.13	0.52	640
560	8x12	0.17	0.75	460	8x16	0.12	0.48	675
680	8x12	0.13	0.52	640	8x16	0.087	0.35	840
820	8x16	0.095	0.48	730	8x20	0.085	0.33	875
1000	8x16	0.087	0.35	840	10x16	0.060	0.24	1210
1200	8x20	0.069	0.27	1050	10x20	0.046	0.18	1400
1500	10x20	0.046	0.18	1400	10x20	0.045	0.18	1440
2200	10x20	0.045	0.18	1440	13x20	0.035	0.12	1900
2700	10x25	0.042	0.17	1700	13x20	0.034	0.11	1945
3300	13x20	0.035	0.12	1900	13x25	0.027	0.089	2230
3900	13x25	0.027	0.089	2230	13x30	0.024	0.078	2650
4700	13x30	0.024	0.078	2650	13x35	0.020	0.065	2880
5600	13x35	0.020	0.065	2880	13x35	0.019	0.060	2930
6800	13x35	0.019	0.060	2930	16x32	0.017	0.050	3450
8200	16x32	0.017	0.050	3450	16x36	0.015	0.044	3610
10000	16x36	0.015	0.044	3610	16x40	0.013	0.038	4080

Nominal Capacitance (μ F)	Case Size ϕ DxL (mm)	16 V			25 V			
		Max. Impedance @100kHz (Ω)		Max. Ripple Current @105°C 100kHz (mA rms)	Max. Impedance @100kHz (Ω)		Max. Ripple Current @105°C 100kHz (mA rms)	
		25°C	-10°C		25°C	-10°C		
47	5x11	0.80	2.8	120	5x11	0.58	2.3	210
68	6.3x11	0.56	2.2	220	6.3x11	0.36	1.8	230
100	6.3x11	0.52	1.5	255	6.3x11	0.22	0.87	340
150	8x12	0.21	0.86	350	8x12	0.20	0.69	405
220	8x12	0.20	0.79	405	8x12	0.13	0.52	640
330	8x12	0.13	0.52	640	8x16	0.087	0.35	840
470	8x16	0.087	0.35	840	10x16	0.060	0.24	1210
560	8x20	0.085	0.34	865	10x20	0.058	0.23	1220
680	8x20	0.069	0.27	1050	10x20	0.046	0.18	1400
820	10x20	0.058	0.23	1220	10x20	0.042	0.17	1450
1000	10x20	0.046	0.18	1400	13x20	0.035	0.12	1900
1200	10x25	0.042	0.17	1650	13x25	0.034	0.11	1936
1500	13x20	0.035	0.12	1900	13x25	0.027	0.089	2230
2200	13x25	0.027	0.089	2230	13x35	0.020	0.065	2880
2700	13x30	0.024	0.078	2650	13x35	0.019	0.060	2930
3300	13x35	0.020	0.065	2880	16x32	0.017	0.050	3450
3900	13x40	0.017	0.056	3350	16x36	0.015	0.044	3610
4700	16x32	0.017	0.050	3450	16x40	0.013	0.038	4080
5600	16x36	0.015	0.044	3610				
6800	16x40	0.013	0.038	4080				



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Case size & Permissible Ripple Current:

Nominal Capacitance (μ F)	Case Size ϕ DxL (mm)	35 V		Max. Ripple Current @105°C 100kHz (mA rms)	Case Size ϕ DxL (mm)	50 V		Max. Ripple Current @105°C 100kHz (mA rms)
		Max. Impedance @100kHz (Ω)				Max. Impedance @100kHz (Ω)		
		25°C	-10°C			25°C	-10°C	
10	5x11	1.5	3.8	100	5x11	1.45	3.5	105
22	5x11	0.75	3.2	160	5x11	0.7	2.8	180
33	5x11	0.58	2.3	210	6.3x11	0.48	1.70	215
47	6.3x11	0.49	1.8	215	6.3x11	0.40	1.60	220
68	8x12	0.21	0.87	350	8x12	0.28	1.10	355
100	8x12	0.20	0.85	405	8x12	0.17	0.68	555
150	8x12	0.13	0.52	640	8x16	0.12	0.48	730
220	8x16	0.087	0.35	840	10x16	0.084	0.34	1050
330	10x16	0.060	0.24	1210	10x25	0.055	0.22	1440
470	10x20	0.046	0.18	1400	13x20	0.045	0.15	1660
560	10x25	0.042	0.17	1650	13x25	0.034	0.11	1950
680	10x30	0.031	0.12	1910	13x30	0.030	0.10	2310
820	13x25	0.030	0.11	1938	13x35	0.025	0.083	2510
1000	13x25	0.027	0.089	2230	16x25	0.025	0.075	2555
1200	13x30	0.024	0.078	2650	16x32	0.022	0.066	3010
1500	13x35	0.020	0.065	2880	16x36	0.019	0.057	3150
2200	16x32	0.017	0.050	3450	18x36	0.017	0.046	3680
2700	16x36	0.015	0.044	3610	18x40	0.014	0.038	3800
3300	16x40	0.013	0.038	4080				
3900	18x40	0.012	0.032	4280				

Nominal Capacitance (μ F)	Case Size ϕ DxL (mm)	63 V		Max. Ripple Current @105°C 100kHz (mA rms)	Case Size ϕ DxL (mm)	100 V		Max. Ripple Current @105°C 100kHz (mA rms)
		Max. Impedance @100kHz (Ω)				Max. Impedance @100kHz (Ω)		
		25°C	-10°C			25°C	-10°C	
10	5x11	2.85	9.3	30	6.3x11	2.2	9.3	60
22	6.3x11	1.85	7.2	60	8x12	1.1	5.0	120
33	6.3x11	1.20	5.0	115	8x16	0.62	2.8	242
47	8x12	1.0	4.5	170	10x12	0.43	1.8	288
68	8x12	0.61	2.5	245	10x16	0.31	1.5	357
100	8x16	0.43	1.90	305	10x25	0.20	0.84	531
220	10x20	0.21	0.92	470	13x30	0.10	0.42	905
330	13x25	0.12	0.45	784	13x40	0.071	0.30	1180
470	13x30	0.10	0.42	905	16x36	0.045	0.17	1790
560	13x35	0.083	0.35	1050	16x40	0.04	0.15	2020
680	13x40	0.071	0.30	1180	18x36	0.04	0.15	1790
820	16x32	0.054	0.20	1570	18x40	0.036	0.13	2330
1000	16x36	0.045	0.17	1790				
1200	16x40	0.040	0.15	2020				
1500	18x40	0.036	0.13	2330				