



RZW Series

Features

- 105°C, 4,000 ~ 10,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHs Compliance

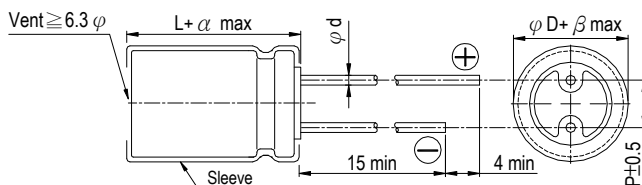


Sleeve & Marking Color: Black & Golden

Specifications

Items	Performance																																
Category Temperature Range	-55°C ~ +105°C																																
Capacitance Tolerance	±20% (at 120Hz, 20°C)																																
Leakage Current (at 20°C)	I = 0.01CV or 3 (µA) whichever is greater (after 2 minutes) Where, C= rated capacitance in µF V = rated DC working voltage in V																																
Tanδ (at 120 Hz, 20°C)	<table border="1"> <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> </tr> <tr> <td>Tanδ (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> </tr> </table> <p>When the capacitance exceeds 1000µF, 0.02 shall be added every 1000µF increase.</p>	Rated Voltage	6.3	10	16	25	35	50	63	Tanδ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																
Rated Voltage	6.3	10	16	25	35	50	63																										
Tanδ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																										
Low Temperature Characteristics (at 120Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <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> </tr> <tr> <td>Impedance Ratio Z(-55°C)/Z(+20°C)</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Rated Voltage	6.3	10	16	25	35	50	63	Impedance Ratio Z(-55°C)/Z(+20°C)	3	3	3	3	3	3	3																
Rated Voltage	6.3	10	16	25	35	50	63																										
Impedance Ratio Z(-55°C)/Z(+20°C)	3	3	3	3	3	3	3																										
Endurance	<table border="1"> <tr> <td rowspan="2">Time</td> <td>6.3 ~ 10V</td> <td>4,000 Hrs for φ D = 5 ~ 6.3 mm; 6,000 Hrs for φ D = 8 ~ 10 mm; 8,000 Hrs for φ D ≥ 12.5 mm</td> </tr> <tr> <td>16 ~ 63V</td> <td>5,000 Hrs for φ D = 5 ~ 6.3 mm; 7,000 Hrs for φ D = 8 ~ 10 mm; 10,000 Hrs for φ D ≥ 12.5 mm</td> </tr> <tr> <td>Capacitance Change</td> <td colspan="2">Within ±25% of initial value</td> </tr> <tr> <td>Tanδ</td> <td colspan="2">Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td colspan="2">Within specified value</td> </tr> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied with rated ripple current for 4,000 ~ 10,000 hours at 105°C.</p>	Time	6.3 ~ 10V	4,000 Hrs for φ D = 5 ~ 6.3 mm; 6,000 Hrs for φ D = 8 ~ 10 mm; 8,000 Hrs for φ D ≥ 12.5 mm	16 ~ 63V	5,000 Hrs for φ D = 5 ~ 6.3 mm; 7,000 Hrs for φ D = 8 ~ 10 mm; 10,000 Hrs for φ D ≥ 12.5 mm	Capacitance Change	Within ±25% of initial value		Tanδ	Less than 200% of specified value		Leakage Current	Within specified value																			
Time	6.3 ~ 10V		4,000 Hrs for φ D = 5 ~ 6.3 mm; 6,000 Hrs for φ D = 8 ~ 10 mm; 8,000 Hrs for φ D ≥ 12.5 mm																														
	16 ~ 63V	5,000 Hrs for φ D = 5 ~ 6.3 mm; 7,000 Hrs for φ D = 8 ~ 10 mm; 10,000 Hrs for φ D ≥ 12.5 mm																															
Capacitance Change	Within ±25% of initial value																																
Tanδ	Less than 200% of specified value																																
Leakage Current	Within specified value																																
Shelf Life Test	<table border="1"> <tr> <td>Test Time</td> <td>1,000 Hrs</td> </tr> <tr> <td>Capacitance Change</td> <td>Within ±25% of initial value</td> </tr> <tr> <td>Tanδ</td> <td>Less than 200% of specified value</td> </tr> <tr> <td>Leakage Current</td> <td>Within specified value</td> </tr> </table> <p>* The above Specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.</p>	Test Time	1,000 Hrs	Capacitance Change	Within ±25% of initial value	Tanδ	Less than 200% of specified value	Leakage Current	Within specified value																								
Test Time	1,000 Hrs																																
Capacitance Change	Within ±25% of initial value																																
Tanδ	Less than 200% of specified value																																
Leakage Current	Within specified value																																
Ripple Current & Frequency Multipliers	<table border="1"> <tr> <td></td> <td>Freq.(Hz)</td> <td>120</td> <td>1k</td> <td>10k</td> <td>100k up</td> </tr> <tr> <td rowspan="5">Cap.(µF)</td> <td>under ~ 33</td> <td>0.42</td> <td>0.70</td> <td>0.90</td> <td>1.0</td> </tr> <tr> <td>39 ~ 270</td> <td>0.50</td> <td>0.73</td> <td>0.92</td> <td>1.0</td> </tr> <tr> <td>330 ~ 680</td> <td>0.55</td> <td>0.77</td> <td>0.94</td> <td>1.0</td> </tr> <tr> <td>820 ~ 1,800</td> <td>0.6</td> <td>0.80</td> <td>0.96</td> <td>1.0</td> </tr> <tr> <td>2,200 ~ 18,000</td> <td>0.7</td> <td>0.85</td> <td>0.98</td> <td>1.0</td> </tr> </table>		Freq.(Hz)	120	1k	10k	100k up	Cap.(µF)	under ~ 33	0.42	0.70	0.90	1.0	39 ~ 270	0.50	0.73	0.92	1.0	330 ~ 680	0.55	0.77	0.94	1.0	820 ~ 1,800	0.6	0.80	0.96	1.0	2,200 ~ 18,000	0.7	0.85	0.98	1.0
	Freq.(Hz)	120	1k	10k	100k up																												
Cap.(µF)	under ~ 33	0.42	0.70	0.90	1.0																												
	39 ~ 270	0.50	0.73	0.92	1.0																												
	330 ~ 680	0.55	0.77	0.94	1.0																												
	820 ~ 1,800	0.6	0.80	0.96	1.0																												
	2,200 ~ 18,000	0.7	0.85	0.98	1.0																												

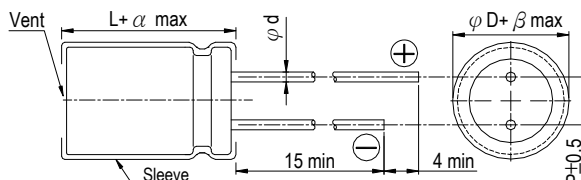
Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6		0.8		
α	L<20: 1.5, L≥20: 2.0						
β	0.5						

The case size of 12.5×16, 16×16, 16×20, 18×16, 18×20 and 18×25 are suitable for below diagram:



Dimension:  $\phi D \times L$ (mm)

Ripple Current: mA/rms at 100k Hz, 105°C

### Dimension & Permissible Ripple Current

V. DC Contents $\mu F$	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz
		20°C	-10°C			20°C	-10°C			20°C	-10°C			20°C	-10°C	
47													5×11	0.58	1.16	210
56									5×11	0.58	1.16	210				
100					5×11	0.58	1.16	210					6.3×11	0.22	0.44	340
120									6.3×11	0.22	0.44	340				
150	5×11	0.58	1.16	210												
220					6.3×11	0.22	0.44	340	8×11.5	0.11	0.22	640	8×11.5	0.11	0.22	640
330	6.3×11	0.22	0.44	340					8×11.5	0.11	0.22	640	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865
470					8×11.5	0.11	0.22	640	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865	8×20 10×16	0.064 0.060	0.128 0.120	1,050 1,210
680	8×11.5	0.11	0.22	640	8×15 10×12.5	0.083 0.080	0.166 0.160	840 865	8×20 10×16	0.064 0.060	0.128 0.120	1,050 1,210	10×20 12.5×16	0.046 0.049	0.092 0.098	1,400 1,450
820	10×12.5	0.080	0.16	865									10×25	0.042	0.084	1,650
1,000	8×15	0.087	0.174	840	8×20 10×16	0.064 0.060	0.128 0.120	1,050 1,210	10×20 12.5×16	0.046 0.049	0.092 0.098	1,400 1,450	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940
1,200	8×20 10×16	0.069 0.060	0.128 0.120	1,050 1,210	10×20	0.046	0.092	1,400	10×25	0.042	0.084	1,650	18×16	0.043	0.086	2,210
1500	10×20	0.046	0.092	1,400	10×25 12.5×16	0.042 0.049	0.084 0.090	1,650 1,450	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940	12.5×25	0.027	0.054	2,230
1,800	12.5×16	0.045	0.090	1,450									12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530
2,200	10×25	0.042	0.084	1,650	10×30 12.5×20 16×16	0.031 0.035 0.042	0.062 0.070 0.084	1,910 1,900 1,940	12.5×25 18×16	0.027 0.043	0.054 0.086	2,230 2,210	12.5×35 18×20	0.020 0.026	0.040 0.052	2,880 2,860
2,700	10×30 16×16	0.031 0.042	0.062 0.084	1,910 1,940	18×16	0.043	0.086	2,210	12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530	12.5×40 16×25	0.017 0.021	0.034 0.042	3,350 2,930
3,300	12.5×20	0.035	0.070	1,900	12.5×25	0.027	0.054	2,230	12.5×35	0.020	0.040	2,880	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140
3,900	12.5×25 18×16	0.027 0.043	0.054 0.086	2,230 2,210	12.5×30 16×20	0.024 0.027	0.048 0.054	2,650 2,530	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×35.5 18×31.5	0.015 0.015	0.030 0.030	3,610 4,170
4,700	12.5×30	0.024	0.048	2,650	12.5×35	0.020	0.040	2,880	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140	16×40 18×35.5	0.013 0.014	0.026 0.028	4,080 4,220
5,600	12.5×35 16×20	0.020 0.027	0.040 0.054	2,880 2,530	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×35.5 18×31.5	0.015 0.015	0.030 0.03	3,610 4,170	18×40	0.012	0.024	4,280
6,800	12.5×40 16×25 18×20	0.017 0.021 0.026	0.034 0.042 0.052	3,350 2,930 2,860	16×31.5 18×25	0.017 0.019	0.034 0.038	3,450 3,140	16×40	0.013	0.026	4,080				
8,200	16×31.5	0.017	0.034	3,450	16×35.5 18×31.5	0.015 0.015	0.030 0.030	3,610 4,170	18×35.5	0.014	0.02	4,220				
10,000	16×35.5 18×25	0.015 0.019	0.030 0.038	3,610 3,140	16×40 18×35.5	0.013 0.014	0.026 0.028	4,080 4,220	18×40	0.012	0.024	4,280				
12,000	16×40 18×31.5	0.013 0.015	0.026 0.030	4,080 4,170	18×40	0.012	0.024	4,280								
15,000	18×35.5	0.014	0.028	4,220												
18,000	18×40	0.012	0.024	4,280												



Dimension:  $\phi D \times L(\text{mm})$   
 Ripple Current: mA/rms at 100k Hz, 105°C

Dimension & Permissible Ripple Current

V. DC Contents $\mu\text{F}$	35V (1V)				50V (1H)				63V (1J)			
	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance ( $\Omega$ , Max/100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz
		20°C	-10°C			20°C	-10°C			20°C	-10°C	
3.3					5×11	2.9	5.8	53				
4.7					5×11	2.5	5.0	95				
10					5×11	2.0	4.0	130				
15									5×11	1.2	2.4	165
22					5×11	0.91	1.82	180				
33	5×11	0.58	1.16	210					6.3×11	0.49	0.98	265
56	6.3×11	0.22	0.44	340	6.3×11	0.39	0.78	295	8×11.5	0.31	0.62	500
82									8×15	0.22	0.44	665
100									10×12.5	0.15	0.30	690
120					8×11.5	0.22	0.44	555				
150					8×15	0.150	0.30	730	8×20	0.17	0.34	820
180					10×12.5	0.160	0.32	760	10×16	0.11	0.22	950
220	8×15	0.083	0.166	840	8×20	0.118	0.236	910	10×20	0.078	0.156	1,150
270	10×12.5	0.080	0.160	865	10×16	0.110	0.22	1,050	12.5×16	0.101	0.202	1,150
330	8×20	0.064	0.128	1,050	10×25	0.072	0.144	1,440	10×25	0.064	0.128	1,350
390	10×16	0.060	0.120	1,210	12.5×20	0.079	0.158	1,260	12.5×20	0.057	0.114	1,500
470	10×25	0.042	0.084	1,650	10×25	0.072	0.144	1,440	10×25	0.064	0.128	1,350
560	10×30	0.031	0.062	1,910	12.5×25	0.044	0.088	1,950	12.5×25	0.043	0.086	1,900
680	12.5×20	0.035	0.070	1,900	18×16	0.070	0.140	1,930	12.5×30	0.039	0.078	2,300
820	16×16	0.042	0.084	1,940	12.5×30	0.039	0.078	2,310	16×20	0.045	0.090	2,000
1,000	12.5×25	0.027	0.054	2,230	16×25	0.033	0.066	2,510	12.5×40	0.029	0.058	2,800
1,200	16×16	0.043	0.086	2,210	18×20	0.044	0.088	2,210	16×25	0.035	0.070	2,600
1,500	12.5×30	0.024	0.048	2,650	12.5×40	0.027	0.054	2,920	18×20	0.042	0.084	2,500
1,800	16×20	0.027	0.054	2,530	16×25	0.033	0.066	2,555	16×31.5	0.029	0.058	2,850
2,200	18×20	0.026	0.052	2,860	18×20	0.047	0.094	2,490	18×25	0.034	0.068	2,800
2,700	16×31.5	0.017	0.034	3,450	16×31.5	0.027	0.054	3,010	16×31.5	0.025	0.050	3,400
3,300	18×25	0.019	0.038	3,140	18×25	0.033	0.066	2,555	18×31.5	0.028	0.056	3,300
3,900	18×35.5	0.015	0.030	3,610	18×35.5	0.024	0.048	3,150	18×35.5	0.025	0.050	3,400
	18×31.5	0.015	0.030	4,170	16×40	0.021	0.042	3,710				
	18×40	0.013	0.026	4,080	18×31.5	0.024	0.048	3,635	18×40	0.024	0.048	3,500
		0.014	0.028	4,220								
		0.012	0.024	4,280								

Part Numbering System

RZW series    470 $\mu\text{F}$      $\pm 20\%$     16V    Bulk Package    Gas Type    8  $\phi \times 15\text{L}$     Pb-free and PET coating case

**RZW**    **471**    **M**    **1C**    **BK**    -    **0815**

Series    Capacitance    Capacitance Tolerance    Rated Voltage    Lead Configuration & Package    Rubber Type    Case Size    Lead Wire and Coating Type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 10.