

RZW Series

Features

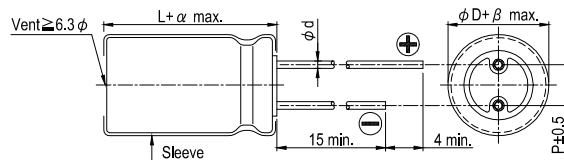
- 105°C, 4,000 ~ 10,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHs compliant
- AEC-Q200 compliant parts available (replace "S" Suffix with "KS")



Specifications

Items	Performance																																														
Category Temperature Range	-55°C ~ +105°C																																														
Capacitance Tolerance	± 20% (at 120 Hz, 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><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> When the capacitance exceeds 1000μF, 0.02 shall be added every 1000μF increase.								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																							
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Low Temperature Characteristics (at 120 Hz)	Impedance ratio shall not exceed the values given in the table below. <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></tr><tr><td>Impedance Ratio</td><td>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></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																							
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Endurance	<table><tr><td rowspan="2">Time</td><td>6.3 ~ 10V</td><td colspan="6">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 colspan="6">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 colspan="2">Capacitance Change</td><td colspan="6">Within ± 25% of initial value</td></tr><tr><td colspan="2">Tanδ</td><td colspan="6">Less than 200% of specified value</td></tr><tr><td colspan="2">Leakage Current</td><td colspan="6">Within specified value</td></tr></table> * 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.								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					
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Shelf Life Test	<table><tr><td>Test Time</td><td colspan="7">1,000 Hrs</td></tr><tr><td>Capacitance Change</td><td colspan="7">Within ± 25% of initial value</td></tr><tr><td>Tanδ</td><td colspan="7">Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td colspan="7">Within specified value</td></tr></table> * 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.								Test Time	1,000 Hrs							Capacitance Change	Within ± 25% of initial value							Tanδ	Less than 200% of specified value							Leakage Current	Within specified value													
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Ripple Current and Frequency Multipliers	<table><tr><th>Cap.(μF) \ Freq.(Hz)</th><th>120</th><th>1k</th><th>10k</th><th>100k up</th></tr><tr><td>≤ ~ 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>								Cap.(μF) \ Freq.(Hz)	120	1k	10k	100k up	≤ ~ 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									
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Diagram of Dimensions

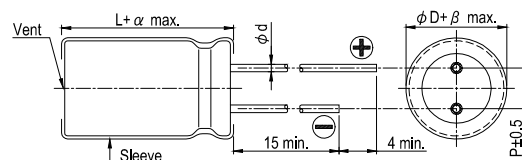


Lead Spacing and Diameter

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	$L < 20: 1.5, L \geq 20: 2.0$						
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:



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Dimension: $\phi D \times L$ (mm)
 Impedance: Ω / at 100k Hz
 Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Cap. (μF)	Contents	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
		$\phi D \times L$		Impedance (Ω , max./100kHz)	Ripple Current (mA/rms, 105°C)	$\phi D \times L$		Impedance (Ω , max./100kHz)	Ripple Current (mA/rms, 105°C)	$\phi D \times L$		Impedance (Ω , max./100kHz)	Ripple Current (mA/rms, 105°C)	$\phi D \times L$		Impedance (Ω , max./100kHz)	Ripple Current (mA/rms, 105°C)
		20°C	-10°C	100k Hz		20°C	-10°C	100k Hz		20°C	-10°C	100k Hz		20°C	-10°C	100k Hz	
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
1,500		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												

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

Impedance: Ω / at 100k Hz

Ripple Current: mA/rms at 105°C

Dimension and Permissible Ripple Current

Rated Volt. (Vdc) Contents Cap. (μF)	35V (1V)				50V (1H)				63V (1J)			
	$\phi D \times L$	Impedance (Ω , max./100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance (Ω , max./100kHz)		Ripple Current (mA/rms, 105°C) 100k Hz	$\phi D \times L$	Impedance (Ω , 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	0.190	0.38	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	0.17	0.34	880	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	10×20	0.078	0.156	1,220	10×25	0.064	0.128	1,350
390	12.5×16	0.079	0.158	1,260	12.5×16	0.079	0.158	1,260	12.5×20	0.057	0.114	1,500
470	10×16	0.060	0.120	1,210	10×25	0.072	0.144	1,440				
560									12.5×25	0.043	0.086	1,900
680	10×20	0.046	0.092	1,400	10×30	0.056	0.112	1,690	12.5×30	0.039	0.078	2,300
820	12.5×16	0.049	0.098	1,450	12.5×20	0.059	0.118	1,660	16×20	0.045	0.090	2,000
1,000	10×25	0.042	0.084	1,650	16×16	0.072	0.144	1,690				
1,200	12.5×20	0.031	0.062	1,910	12.5×25	0.044	0.088	1,950	12.5×35	0.034	0.068	2,500
1,500	16×16	0.035	0.070	1,900	18×16	0.070	0.140	1,930	16×25	0.029	0.058	2,800
1,800		0.042	0.084	1,940	12.5×30	0.039	0.078	2,310	18×20	0.042	0.084	2,500
2,200					12.5×35	0.033	0.066	2,510	16×31.5	0.029	0.058	2,850
2,700	12.5×25	0.027	0.054	2,230	16×20	0.044	0.088	2,210	18×25	0.034	0.068	2,800
3,300	18×16	0.043	0.086	2,210	12.5×40	0.027	0.054	2,920	16×35.5	0.027	0.054	2,900
3,900					16×25	0.033	0.066	2,555				
					18×20	0.047	0.094	2,490				
	12.5×30	0.024	0.048	2,650	16×31.5	0.027	0.054	3,010	16×40	0.025	0.050	3,400
	16×20	0.027	0.054	2,530	18×25	0.028	0.056	2,740	18×31.5	0.028	0.056	3,300
	12.5×35	0.020	0.040	2,880	16×35.5	0.024	0.048	3,150	18×35.5	0.025	0.050	3,400
	12.5×40	0.017	0.034	3,350	16×40	0.021	0.042	3,710				
	16×25	0.021	0.042	2,930	18×31.5	0.024	0.048	3,635	18×40	0.024	0.048	3,500
	18×20	0.026	0.052	2,860								
	16×31.5	0.017	0.034	3,450	18×35.5	0.022	0.044	3,680				
	18×25	0.019	0.038	3,140								
	16×35.5	0.015	0.030	3,610	18×40	0.018	0.036	3,800				
	18×31.5	0.015	0.030	4,170								
	16×40	0.013	0.026	4,080								
	18×35.5	0.014	0.028	4,220								
	18×40	0.012	0.024	4,280								

Part Numbering System

RZW Series	470μF	± 20%	16V	Bulk Package	Gas Type	8 ϕ × 15L	Regional Tracking Purpose
RZW	471	M	1C	BK	-	0815	S
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	

Note: For more details, please refer to "Part Numbering System - Radial Type" on page 139.

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