

## RXK Series

### Features

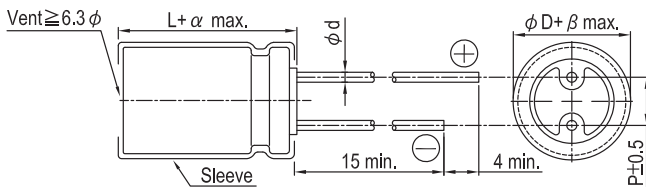
- 105°C, 2,000 ~ 5,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current
- RoHS compliance



### 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 $3 (\mu A)$ whichever is greater (after 2 minutes) Where, C = rated capacitance in $\mu F$ , V = rated DC working voltage in V																																										
Tan $\delta$ (at 120 Hz, 20°C)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Tan<math>\delta</math> (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> </tbody> </table> <p>When the capacitance exceeds 1,000<math>\mu F</math>, 0.02 shall be added every 1,000<math>\mu F</math> increase.</p>	Rated Voltage	6.3	10	16	25	35	50	63	Tan $\delta$ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																										
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Tan $\delta$ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09																																				
Low Temperature Characteristics (at 120 Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Impedance Ratio <math>Z(-55^\circ C)/Z(+20^\circ C)</math></td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated Voltage	6.3	10	16	25	35	50	63	Impedance Ratio $Z(-55^\circ C)/Z(+20^\circ C)$	4	4	3	3	3	3	3																										
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Endurance	<table border="1"> <thead> <tr> <th>Test Time</th> <td>2,000 Hrs for <math>\phi D \leq 6.3</math> mm; 3,000 Hrs for <math>\phi D = 8</math> mm; 4,000 Hrs for <math>\phi D = 10</math> mm; 5,000 Hrs for <math>\phi D \geq 12.5</math> mm</td> </tr> <tr> <th>Capacitance Change</th> <td>Within <math>\pm 20\%</math> of initial value</td> </tr> <tr> <th>Tan<math>\delta</math></th> <td>Less than 200% of specified value</td> </tr> <tr> <th>Leakage Current</th> <td>Within specified value</td> </tr> </thead> </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 2,000 ~ 5,000 hours at 105°C.</p>	Test Time	2,000 Hrs for $\phi D \leq 6.3$ mm; 3,000 Hrs for $\phi D = 8$ mm; 4,000 Hrs for $\phi D = 10$ mm; 5,000 Hrs for $\phi D \geq 12.5$ mm	Capacitance Change	Within $\pm 20\%$ of initial value	Tan $\delta$	Less than 200% of specified value	Leakage Current	Within specified value																																		
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Ripple Current and Frequency Multipliers	<table border="1"> <thead> <tr> <th rowspan="2">Cap. (<math>\mu F</math>)</th> <th colspan="7">Freq. (Hz)</th> </tr> <tr> <th>60 (50)</th> <th>120</th> <th>500</th> <th>1k</th> <th>10k</th> <th>100k</th> </tr> </thead> <tbody> <tr> <td><math>\leq 33</math></td> <td>0.40</td> <td>0.55</td> <td>0.65</td> <td>0.80</td> <td>0.90</td> <td>1.00</td> </tr> <tr> <td>39 ~ 330</td> <td>0.60</td> <td>0.70</td> <td>0.80</td> <td>0.90</td> <td>0.95</td> <td>1.00</td> </tr> <tr> <td>390 ~ 1,000</td> <td>0.65</td> <td>0.80</td> <td>0.85</td> <td>0.98</td> <td>1.00</td> <td>1.00</td> </tr> <tr> <td>1,200 <math>\leq</math></td> <td>0.80</td> <td>0.90</td> <td>0.95</td> <td>0.98</td> <td>1.00</td> <td>1.00</td> </tr> </tbody> </table>	Cap. ( $\mu F$ )	Freq. (Hz)							60 (50)	120	500	1k	10k	100k	$\leq 33$	0.40	0.55	0.65	0.80	0.90	1.00	39 ~ 330	0.60	0.70	0.80	0.90	0.95	1.00	390 ~ 1,000	0.65	0.80	0.85	0.98	1.00	1.00	1,200 $\leq$	0.80	0.90	0.95	0.98	1.00	1.00
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### Diagram of Dimensions

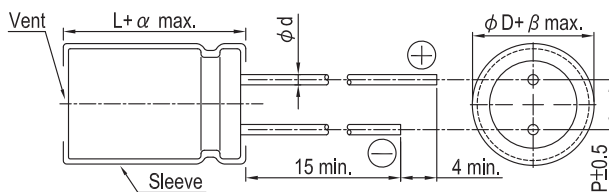


### Lead Spacing and Diameter

Unit: mm

$\phi D$	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
$\phi d$	0.5		0.6			0.8	
$\alpha$	L < 20: 1.5, L $\geq$ 20: 2.0						
$\beta$	0.5						

The case size of 16x20 is suitable for below diagram:



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

### Dimension and Permissible Ripple Current

Rated Volt. (Vdc) Contents Cap. ( $\mu$ F)	6.3V (0J)					10V (1A)					16V (1C)					
	$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)		$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)		$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)		
		20°C	-10°C	120 Hz	100k Hz		20°C	-10°C	120 Hz	100k Hz		20°C	-10°C	120 Hz	100k Hz	
56												5×11	0.72	1.8	116	165
68												5×11	0.72	1.8	126	180
82						5×11	0.72	1.8	116	165						
100						5×11	0.72	1.8	126	180						
120	5×11	0.72	1.8	116	165						6.3×11	0.38	0.95	179	255	
180						6.3×11	0.38	0.95	179	255	6.3×15	0.27	0.68	231	330	
220	6.3×11	0.38	0.95	179	255	6.3×11	0.38	0.95	196	280						
270	6.3×11	0.38	0.95	196	280	6.3×15	0.27	0.68	231	330	8×11.5 10×12.5	0.20 0.12	0.50 0.30	291 438	415 625	
330	6.3×15	0.27	0.68	231	330	8×11.5	0.20	0.50	291	415	8×11.5 8×15 10×12.5	0.20 0.16 0.12	0.50 0.40 0.30	315 347 540	450 495 675	
390	8×11.5	0.20	0.50	332	415	8×11.5 10×12.5	0.20 0.12	0.50 0.30	360 500	450 625						
470	8×11.5 10×12.5	0.20 0.12	0.50 0.30	360 500	450 625	8×15 10×12.5	0.16 0.12	0.40 0.30	396 540	495 675	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	472 512 660	590 640 825	
560	8×15 10×12.5	0.16 0.12	0.40 0.30	396 540	495 675	8×15	0.16	0.40	472	590	8×20 10×16	0.11 0.084	0.28 0.21	560 728	700 910	
680	10×16	0.084	0.21	660	825	8×20 10×16	0.11 0.084	0.28 0.21	512 660	640 825	10×20	0.062	0.16	832	1,040	
820	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	472 512 728	590 640 910	8×20 10×16	0.11 0.084	0.28 0.21	560 728	700 910	10×20 10×25	0.062 0.052	0.16 0.13	904 1,008	1,130 1,260	
1,000	8×20	0.11	0.28	560	700	10×20	0.062	0.16	832	1,040	10×25	0.052	0.13	1,112	1,390	
1,200	10×20	0.062	0.16	936	1,040	10×20 10×25	0.062 0.052	0.16 0.13	1,017 1,134	1,130 1,260	10×30 12.5×20	0.044 0.046	0.11 0.12	1,296 1,206	1,440 1,340	
1,500	10×20 10×25	0.062 0.052	0.16 0.13	1,017 1,134	1,130 1,260	10×25 10×30	0.052 0.044	0.13 0.11	1,251 1,296	1,390 1,440	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,413 1,305 1,521	1,570 1,450 1,690	
1,800	10×25	0.052	0.13	1,251	1,390	10×30 12.5×20	0.044 0.046	0.11 0.12	1,413 1,206	1,570 1,340	12.5×25	0.034	0.085	1,629	1,810	
2,200	10×30 12.5×20	0.044 0.046	0.11 0.12	1,296 1,206	1,440 1,340	12.5×20 12.5×25	0.046 0.034	0.12 0.085	1,305 1,521	1,450 1,690	12.5×30 16×20	0.030 0.035	0.075 0.087	1,755 1,485	1,950 1,650	
2,700	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,413 1,305 1,521	1,570 1,450 1,690	12.5×25 12.5×30	0.034 0.030	0.085 0.075	1,629 1,755	1,810 1,950	12.5×30 12.5×35 16×25	0.030 0.027 0.028	0.075 0.068 0.070	1,917 1,980 1,863	2,130 2,200 2,070	
3,300	12.5×25	0.034	0.085	1,629	1,810	12.5×30 12.5×35	0.030 0.027	0.075 0.068	1,917 1,980	2,130 2,200	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 2,025	2,390 2,440 2,250	
3,900	12.5×30	0.030	0.075	1,755	1,950	12.5×35 12.5×40 16×20 16×25	0.027 0.024 0.035 0.028	0.068 0.060 0.087 0.070	2,196 2,151 1,692 1,863	2,390 2,440 1,880 2,070	16×31.5	0.025	0.063	2,115	2,350	
4,700	12.5×30 12.5×35 16×20	0.030 0.027 0.035	0.075 0.068 0.087	1,917 1,980 1,440	2,130 2,200 1,600	12.5×40 16×25	0.024 0.028	0.060 0.070	2,358 2,025	2,620 2,250	16×31.5 16×35.5	0.025 0.022	0.055 0.055	2,295 2,295	2,550 2,550	
5,600	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 1,863	2,390 2,440 2,070	16×31.5	0.025	0.063	2,115	2,350	16×35.5 16×40	0.022 0.018	0.055 0.045	2,394 2,610	2,660 2,900	
6,800	12.5×40 16×25 16×31.5	0.024 0.028 0.025	0.060 0.070 0.063	2,358 2,025 2,115	2,620 2,250 2,350	16×31.5 16×35.5	0.025 0.022	0.063 0.055	2,295 2,295	2,550 2,550	16×40 18×35.5	0.018 0.021	0.045 0.053	2,844 2,448	3,160 2,720	
8,200	16×31.5	0.025	0.063	2,295	2,550	16×35.5	0.022	0.055	2,448	2,720	18×35.5	0.021	0.053	2,601	2,890	
10,000	16×35.5	0.022	0.055	2,691	2,990											

Radial

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

### Dimension and Permissible Ripple Current

Rated Volt. (V <sub>DC</sub> ) Cap. (μF) Contents	25V (1E)					35V (1V)					50V (1H)				
	$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)		$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)		$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)	
		20°C	-10°C	120 Hz	100k Hz		20°C	-10°C	120 Hz	100k Hz		20°C	-10°C	120 Hz	100k Hz
18											5×11	1.1	3.3	72	130
22											5×11	1.1	3.3	83	150
27						5×11	0.72	1.8	91	165					
33						5×11	0.72	1.8	99	180					
39	5×11	0.72	1.8	116	165						6.3×11	0.56	1.6	154	220
47	5×11	0.72	1.8	126	180						6.3×11	0.56	1.6	161	230
56						6.3×11	0.38	0.95	179	255	6.3×15	0.41	1.2	217	310
68						6.3×11	0.38	0.95	196	280	8×11.5	0.29	0.84	238	340
82	6.3×11	0.38	0.95	179	255	6.3×15	0.27	0.68	231	330	8×11.5 8×15 10×12.5	0.29 0.25 0.16	0.84 0.75 0.40	249 329 336	355 470 480
100	6.3×11	0.38	0.95	196	280						10×12.5	0.16	0.40	371	530
120	6.3×15	0.27	0.68	231	330	8×11.5 10×12.5	0.20 0.12	0.50 0.30	291 438	415 625	8×15 8×20 10×16	0.25 0.18 0.12	0.75 0.52 0.30	392 427 529	560 610 755
150	8×11.5	0.20	0.50	291	415	8×11.5 10×12.5	0.20 0.12	0.50 0.30	315 473	450 675	10×16	0.12	0.30	588	840
180	8×11.5 10×12.5	0.20 0.12	0.50 0.30	315 438	450 625	8×15	0.16	0.40	347	495	8×20 10×20	0.18 0.088	0.52 0.22	525 662	750 945
220	8×15 10×12.5	0.16 0.12	0.40 0.30	347 473	495 675	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	413 448 578	590 640 825	10×20 10×25	0.088 0.068	0.22 0.17	728 805	1,040 1,150
270						8×20 10×16	0.11 0.084	0.28 0.21	490 637	700 910	10×25	0.068	0.17	896	1,280
330	8×15 8×20 10×16	0.16 0.11 0.084	0.40 0.28 0.21	413 448 578	590 640 825	10×20	0.062	0.16	728	1,040	10×30 12.5×20	0.059 0.059	0.15 0.15	882 833	1,260 1,190
390	8×20 10×16	0.11 0.084	0.28 0.21	560 728	700 910	10×20 10×25	0.062 0.052	0.16 0.13	904 1,008	1,130 1,260	12.5×20	0.059	0.15	952	1,190
470	10×20	0.062	0.16	832	1,040	10×25	0.052	0.13	1,112	1,390	10×30 12.5×25	0.059 0.045	0.15 0.11	1,176 1,192	1,470 1,490
560	10×20 10×25	0.062 0.052	0.16 0.13	904 1,008	1,130 1,260	10×30 12.5×20	0.044 0.046	0.11 0.12	1,152 1,072	1,440 1,340	12.5×25 12.5×30	0.045 0.039	0.11 0.098	1,304 1,376	1,630 1,720
680	10×25	0.052	0.13	1,112	1,390	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,256 1,160 1,352	1,570 1,450 1,690	12.5×30 12.5×35 16×20	0.039 0.033 0.048	0.098 0.083 0.120	1,520 1,512 1,248	1,800 1,900 1,560
820	10×30 12.5×20	0.044 0.046	0.11 0.12	1,152 1,072	1,440 1,340	12.5×25	0.034	0.085	1,448	1,810	12.5×35 12.5×40 16×25	0.033 0.029 0.033	0.083 0.073 0.083	1,624 1,656 1,504	2,030 2,070 1,880
1,000	10×30 12.5×20 12.5×25	0.044 0.046 0.034	0.11 0.12 0.085	1,256 1,160 1,352	1,570 1,450 1,690	12.5×30 16×20	0.030 0.035	0.075 0.087	1,560 1,376	1,950 1,720	12.5×40 16×25 16×31.5	0.029 0.033 0.029	0.073 0.083 0.073	1,800 1,664 1,720	2,250 2,080 2,150
1,200	12.5×25	0.034	0.085	1,629	1,810	12.5×30 12.5×35 16×25	0.030 0.027 0.028	0.075 0.068 0.070	1,917 1,980 1,863	2,130 2,200 2,070	16×31.5 16×35.5	0.029 0.025	0.073 0.063	2,088 2,115	2,320 2,350
1,500	12.5×30 16×20	0.030 0.035	0.075 0.087	1,755 1,539	1,950 1,710	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 2,025	2,390 2,440 2,250	16×35.5 16×40	0.025 0.021	0.063 0.063	2,160 2,336	2,400 2,595
1,800	12.5×30 12.5×35 16×25	0.030 0.027 0.028	0.075 0.068 0.070	1,917 1,980 1,863	2,130 2,200 2,070	12.5×40 16×31.5	0.024 0.025	0.060 0.063	2,358 2,115	2,620 2,350	16×40 18×35.5	0.021 0.023	0.063 0.058	2,466 2,286	2,740 2,540
2,200	12.5×35 12.5×40 16×25	0.027 0.024 0.028	0.068 0.060 0.070	2,151 2,196 2,025	2,390 2,440 2,250	16×31.5 16×35.5	0.025 0.022	0.063 0.055	2,295 2,295	2,550 2,550	18×35.5 18×40	0.023 0.020	0.058 0.050	2,349 2,385	2,610 2,650
2,700	16×31.5	0.025	0.063	2,115	2,350	16×35.5 16×40 18×35.5	0.022 0.018 0.021	0.055 0.045 0.053	2,394 2,610 2,448	2,660 2,900 2,720					
3,300	16×31.5 16×35.5	0.025 0.022	0.063 0.055	2,295 2,295	2,550 2,550	18×35.5 18×40	0.021 0.017	0.053 0.043	2,601 2,709	2,890 3,010					
3,900	16×35.5 16×40 18×35.5	0.022 0.018 0.021	0.055 0.045 0.053	2,394 2,610 2,448	2,660 2,900 2,720	18×40	0.017	0.043	2,934	3,260					
4,700	18×35.5 18×40	0.021 0.017	0.053 0.043	2,601 2,709	2,890 3,010										
5,600	18×40	0.017	0.043	2,934	3,260										

Radial

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

### Dimension and Permissible Ripple Current

Cap. ( $\mu$ F)	Contents	63V(1J)				
		$\phi D \times L$	Impedance ( $\Omega$ , max./100k Hz)		Ripple Current (mA/rms, 105°C)	
			20°C	-10°C	120 Hz	100k Hz
12	5×11	1.90	4.78	55	100	
27	6.3×11	1.10	2.78	88	160	
33	6.3×11	1.10	2.75	96	175	
39	6.3×15	0.62	1.55	161	230	
47	8×11.5	0.49	1.23	193	275	
56	8×11.5	0.49	1.23	203	290	
	10×12.5	0.27	0.675	294	420	
68	8×15	0.34	0.850	252	360	
	10×12.5	0.27	0.675	354	505	
	10×16	0.21	0.525	366	523	
82	8×20	0.21	0.525	350	500	
100	8×15	0.34	0.850	308	440	
120	10×16	0.210	0.525	455	650	
	10×20	0.160	0.400	490	700	
150	8×20	0.210	0.525	476	680	
	10×25	0.130	0.325	546	780	
180	10×20	0.160	0.400	553	790	
	10×30	0.100	0.250	672	960	
220	10×25	0.130	0.325	648	925	
	12.5×20	0.110	0.275	609	870	
270	10×30	0.100	0.250	812	1,160	
	12.5×25	0.074	0.185	805	1,150	
330	12.5×20	0.110	0.275	746	1,065	
390	12.5×25	0.074	0.185	1,088	1,280	
	12.5×30	0.068	0.170	1,024	1,360	
470	12.5×30	0.068	0.170	1,120	1,360	
	12.5×35	0.063	0.158	1,112	1,400	
	16×20	0.059	0.148	1,080	1,350	
	16×25	0.055	0.138	1,184	1,480	
560	12.5×40	0.051	0.128	1,224	1,530	
	16×25	0.055	0.138	1,296	1,620	
680	12.5×40	0.051	0.128	1,336	1,670	
	16×31.5	0.046	0.115	1,376	1,720	
820	12.5×40	0.051	0.128	1,480	1,850	
	16×31.5	0.046	0.115	1,512	1,890	
	16×35.5	0.040	0.100	1,528	1,910	
1,000	16×35.5	0.040	0.100	1,576	1,970	
	18×35.5	0.040	0.100	1,688	2,110	
1,500	18×35.5	0.040	0.100	2,169	2,410	

Radial

### Part Numbering System

RXK Series    470 $\mu$ F     $\pm$ 20%    6.3V    Bulk Package    Gas Type    8 $\phi$  × 11.5L    Pb-free and PET sleeve

**RXK**    **471**    **M**    **0J**    **BK**    -    **0811**

Series Name    Capacitance    Capacitance Tolerance    Rated Voltage    Lead Configuration and Package    Rubber Type    Case Size    Lead Wire and Sleeve type

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.