

RN Series

Features

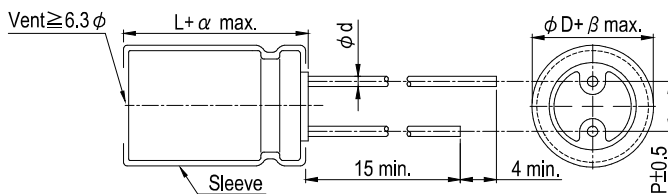
- 85°C, 2,000 hours assured, standard bi-polarized series
- Suitable for use in circuits which has a reversed or unknown polarity
- RoHS compliance



Specifications

Items	Performance																																			
Category Temperature Range	-40°C ~ +85°C																																			
Capacitance Tolerance	±20% (at 120 Hz, 20°C)																																			
Leakage Current (at 20°C)	<table border="1"> <tr> <td>Rated voltage</td> <td>≤ 100V</td> <td colspan="2">> 100V</td> </tr> <tr> <td>Time</td> <td>after 2 minutes</td> <td colspan="2">after 5 minutes</td> </tr> <tr> <td>Leakage Current</td> <td>I = 0.03CV or 4 (μA) whichever is greater</td> <td>CV ≤ 1,000 I = 0.03CV+15(μA)</td> <td>CV > 1,000 I = 0.02CV+25(μA)</td> </tr> </table> <p>Where, C = rated capacitance in μF, V = rated DC working voltage in V</p>	Rated voltage	≤ 100V	> 100V		Time	after 2 minutes	after 5 minutes		Leakage Current	I = 0.03CV or 4 (μA) whichever is greater	CV ≤ 1,000 I = 0.03CV+15(μA)	CV > 1,000 I = 0.02CV+25(μA)																							
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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> <td>100</td> <td>160</td> <td>200</td> <td>250</td> </tr> <tr> <td>Tanδ (max)</td> <td>0.23</td> <td>0.20</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> <td>0.12</td> <td>0.14</td> <td>0.17</td> </tr> </table> <p>When the capacitance exceeds 1,000μF, 0.02 shall be added every 1,000μF increase.</p>	Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	Tanδ (max)	0.23	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.12	0.14	0.17											
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Tanδ (max)	0.23	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.12	0.14	0.17																									
Low Temperature Characteristics (at 120 Hz)	<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> <td>100</td> <td>160</td> <td>200</td> <td>250</td> </tr> <tr> <td rowspan="2">Impedance Ratio</td> <td>Z(-25°C)/Z(+20°C)</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C)/Z(+20°C)</td> <td>8</td> <td>6</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> </tr> </table>	Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	Impedance Ratio	Z(-25°C)/Z(+20°C)	4	3	3	2	2	2	2	2	2	2	Z(-40°C)/Z(+20°C)	8	6	6	4	4	3	3	3	4	4
Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250																									
Impedance Ratio	Z(-25°C)/Z(+20°C)	4	3	3	2	2	2	2	2	2	2																									
	Z(-40°C)/Z(+20°C)	8	6	6	4	4	3	3	3	4	4																									
Endurance (After application of the rated voltage at 85°C, the polarity inverted every 250 Hrs.)	<table border="1"> <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>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 the rated voltage applied with rated ripple current for 2,000 hours at 85°C.</p>	Test Time	2,000 Hrs	Capacitance Change	Within ±20% of initial value	Tanδ	Less than 200% of specified value	Leakage Current	Within specified value																											
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Shelf Life Test	<table border="1"> <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>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 85°C without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 250V (Refer to JIS C 5101-4 4.1).</p>	Test Time	1,000 Hrs	Capacitance Change	Within ±20% of initial value	Tanδ	Less than 200% of specified value	Leakage Current	Within specified value																											
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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 ≥ 20: 2.0						
β	0.5						



Dimension: $\phi D \times L(\text{mm})$
 Ripple Current: mA/rms at 120 Hz, 85°C

Dimension and Permissible Ripple Current

Cap. (μF)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
1	010											5×11	15	5×11	18	5×11	23
2.2	2R2											5×11	23	5×11	25	6.3×11	26
3.3	3R3											5×11	28	5×11	31	6.3×11	32
4.7	4R7									5×11	32	5×11	34	6.3×11	37	6.3×11	40
10	100					5×11	40	5×11	42	5×11	46	6.3×11	55	6.3×11	60	8×11.5	66
22	220	5×11	50	5×11	56	5×11	59	6.3×11	63	6.3×11	76	8×11.5	82	8×11.5	90	10×16	120
33	330	5×11	62	5×11	69	5×11	73	6.3×11	78	8×11.5	94	8×11.5	104	10×12.5	135	10×20	175
47	470	5×11	74	5×11	82	6.3×11	88	6.3×11	95	8×11.5	115	10×12.5	135	10×16	175	12.5×20	200
100	101	6.3×11	115	6.3×11	120	8×11.5	149	8×11.5	155	10×16	202	10×20	235	12.5×20	270	16×25	350
220	221	8×11.5	181	8×11.5	200	10×12.5	240	10×16	294	12.5×20	335	12.5×25	378	16×25	443	16×35.5	590
330	331	8×11.5	250	10×16	308	10×16	330	12.5×20	384	12.5×20	429	16×25	496	16×31.5	653		
470	471	10×12.5	329	10×16	365	10×20	435	12.5×25	479	16×25	548	16×25	590	18×35.5	815		
1,000	102	10×20	505	12.5×20	598	12.5×25	659	16×25	700	16×31.5	880	16×31.5	920				
2,200	222	12.5×25	840	16×25	992	16×31.5	1,150	18×35.5	1,347								

Cap. (μF)	Contents	160V (2C)		200V (2D)		250V (2E)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
0.47	R47	5×11	10	5×11	10	6.3×11	12
1	010	6.3×11	14	8×11.5	16	8×11.5	16
2.2	2R2	8×11.5	23	8×11.5	28	10×12.5	32
3.3	3R3	8×11.5	33	10×12.5	33	10×16	46
4.7	4R7	10×12.5	39	10×16	46	10×20	62
10	100	10×16	75	10×20	83	10×20	99
22	220	12.5×20	146	12.5×20	146	12.5×25	172
33	330	12.5×20	179	12.5×25	197	16×25	211
47	470	12.5×25	235				

Part Numbering System

RN Series 470 μF $\pm 20\%$ 6.3V Bulk Package Gas Type 10 $\phi \times 12.5L$ Pb-free and PET sleeve
RN- **471** **M** **0J** **BK** - **1012**
 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.

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