

REA Series

Features

- 85°C, 2,000 ~ 3,000 hours assured
- Standard series for general purposes
- RoHS Compliance

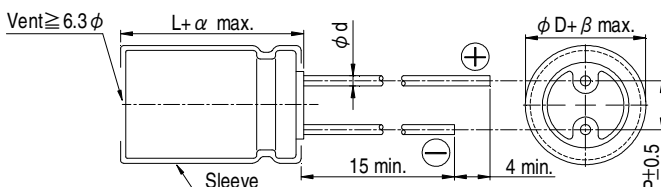


Sleeve & Marking Color: Blue & Black

Specifications

Items	Performance																																																																		
Category Temperature Range	-40°C ~ +85°C																																																																		
Capacitance Tolerance	±20% (at 120Hz, 20°C)																																																																		
Leakage Current (at 20°C)	<table border="1"> <tr> <td>Rated voltage</td> <td>≤ 100V</td> <td>> 100V</td> </tr> <tr> <td>Time</td> <td>after 2 minutes</td> <td>after 5 minutes</td> </tr> <tr> <td>Leakage Current</td> <td>I = 0.01CV or 3 (μA) whichever is greater</td> <td>CV ≤ 1,000 I = 0.03CV + 15(μA) 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 = 0.01CV or 3 (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> <td>350</td> <td>400</td> <td>450</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> <td>0.20</td> <td>0.25</td> <td>0.25</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	350	400	450	Tanδ (max)	0.23	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.12	0.14	0.17	0.20	0.25	0.25																																				
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Low Temperature Characteristics (at 120Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <tr> <td colspan="2">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> <td>350</td> <td>400</td> <td>450</td> </tr> <tr> <td rowspan="4">Impedance Ratio</td> <td>Z(-25°C)</td> <td>φ D < 16</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td rowspan="2">3</td> <td rowspan="2">6</td> <td rowspan="2">8</td> <td rowspan="2">12</td> <td rowspan="2">14</td> <td rowspan="2">16</td> </tr> <tr> <td>/Z(+20°C)</td> <td>φ D ≥ 16</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> <tr> <td>Z(-40°C)</td> <td>φ D < 16</td> <td>10</td> <td>8</td> <td>6</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td rowspan="2">4</td> <td rowspan="2">8</td> <td rowspan="2">10</td> <td rowspan="2">16</td> <td rowspan="2">18</td> <td rowspan="2">20</td> </tr> <tr> <td>/Z(+20°C)</td> <td>φ D ≥ 16</td> <td>18</td> <td>16</td> <td>12</td> <td>10</td> <td>8</td> <td>8</td> <td>6</td> <td>6</td> </tr> </table>	Rated Voltage		6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	Impedance Ratio	Z(-25°C)	φ D < 16	6	4	3	3	2	2	2	3	6	8	12	14	16	/Z(+20°C)	φ D ≥ 16	8	6	4	4	3	3	3	Z(-40°C)	φ D < 16	10	8	6	6	4	3	3	4	8	10	16	18	20	/Z(+20°C)	φ D ≥ 16	18	16	12	10	8	8	6	6
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Endurance	<table border="1"> <tr> <td>Test Time</td> <td>2,000 Hrs for φ D ≤ 8mm 3,000 Hrs for φ D ≥ 10mm</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 / 3,000 hours at 85°C.</p>	Test Time	2,000 Hrs for φ D ≤ 8mm 3,000 Hrs for φ D ≥ 10mm	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 ~ 450V (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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Ripple Current and Frequency Multipliers	<table border="1"> <tr> <td rowspan="3">Cap. (μF)</td> <td>Freq. (Hz)</td> <td>60 (50)</td> <td>120</td> <td>500</td> <td>1k</td> <td>10k up</td> </tr> <tr> <td>Under 100</td> <td>0.70</td> <td>1.00</td> <td>1.30</td> <td>1.40</td> <td>1.50</td> </tr> <tr> <td>100 < C ≤ 1,000</td> <td>0.75</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.35</td> </tr> <tr> <td></td> <td>1,000 up above</td> <td>0.80</td> <td>1.00</td> <td>1.10</td> <td>1.12</td> <td>1.15</td> </tr> </table>	Cap. (μF)	Freq. (Hz)	60 (50)	120	500	1k	10k up	Under 100	0.70	1.00	1.30	1.40	1.50	100 < C ≤ 1,000	0.75	1.00	1.20	1.30	1.35		1,000 up above	0.80	1.00	1.10	1.12	1.15																																								
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Diagram of Dimensions

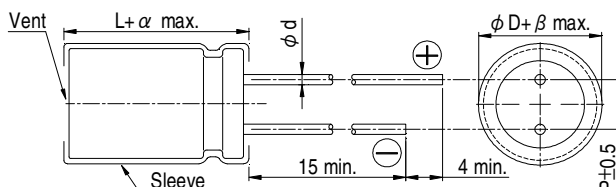


Lead Spacing and Diameter

Unit: mm

φ D	5	6.3	8	10	12.5	16	18	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	12.5
φ d	0.5		0.6			0.8		1.0	
α	L < 20: 1.5, L ≥ 20: 2.0								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 120 Hz, 85°C

Dimension and Permissible Ripple Current

Cap.(μ F)	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)		100V (2A)	
		ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA
2.2	2R2											5x11	29			5x11	33
3.3	3R3											5x11	35			5x11	40
4.7	4R7											5x11	42			5x11	48
10	100											5x11	65	5x11	70	5x11	59
22	220											5x11	95	6.3x11	115	6.3x11 8x11.5	115 135
33	330									5x11	108	6.3x11 5x11	136 125	6.3x11	140	8x11.5	145
47	470							5x11	115	5x11	130	6.3x11	165	6.3x11	170	10x12.5	235
100	101					5x11	160	6.3x11	190	6.3x11	210	8x11.5	260	8x11.5 10x12.5	245 320	10x16	325
220	221			5x11	220	6.3x11	260	8x11.5	320	8x11.5	385	10x12.5	455	10x16	490	12.5x20 16x16	640 625
330	331			6.3x11	290	6.3x11	290	8x11.5	440	10x12.5	490	10x16	585	10x20 12.5x16	710 675	16x20 18x16	695 685
470	471			6.3x11	350	8x11.5	440	10x12.5	545	10x16	740	10x20 12.5x16	755 610	16x16 12.5x20	910 900	16x25	910
1,000	102	8x11.5	540	10x12.5 8x11.5	650 550	10x12.5	635	10x20 12.5x16	955 830	12.5x20 16x16	1,145 1,010	12.5x25 16x20	1,340 1,160	16x20	1,260	18x40	1,820
2,200	222	10x16	845	10x20 12.5x16	1,070 970	12.5x16 16x16	930 1,160	12.5x25 16x16	1,540 1,150	16x20	1,390	16x35.5	1,960	18x31.5	2,040		
3,300	332	10x20 12.5x16	1,185 960	12.5x20	1,420	12.5x20 16x16	1,450 1,240	16x20	1,490	16x31.5 18x25	2,070 1,970	18x35.5	2,500	18x40	2,575		
4,700	472	12.5x20	1,545	12.5x25 16x16	1,780 1,420	16x20 18x16	1,600 1,820	16x25 18x25	2,100 2,170	18x35.5	2,700	22x40	3,040				
6,800	682	12.5x25	1,880	16x20 18x20	1,700 1,870	16x25 18x20	2,280 1,890	16x35.5 18x31.5	2,475 2,550	22x40	2,900	22x45	3,185				
10,000	103	16x20 18x20	2,000 2,020	16x25 18x25	2,150 2,370	18x31.5 16x35.5	2,590 2,450	18x40	3,080	22x45	3,400						
15,000	153	16x31.5 18x25	2,460 2,375	16x40 18x31.5	2,730 2,620	18x40	3,100	22x45 25x40	3,780 3,850								
22,000	223	18x31.5	2,780	18x40	3,370	22x40	3,900	25x45	4,290								
33,000	333	22x40	3,700														

Cap.(μ F)	Contents	160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA	ϕ DxL	mA
1	010					5x11	18	5x11	18	5x11	22	6.3x11	25
2.2	2R2			5x11	29	6.3x11	33	6.3x11	33	6.3x11	33	8x11.5	45
3.3	3R3			6.3x11	46	6.3x11	46	8x11.5	50	8x11.5	50	10x12.5	65
4.7	4R7			6.3x11	50	8x11.5	55	8x11.5	60	8x11.5 10x12.5	55 80	8x11.5 10x12.5	55 80
10	100	8x11.5	75	8x11.5	81	10x12.5	100	10x16	110	10x16	110	10x20	140
22	220	10x12.5	130	10x12.5	135	10x16	150	12.5x16	185	12.5x20	200	12.5x20	200
33	330	10x16	175	10x16	180	10x20 12.5x16	215 220	12.5x20 16x16	245 260	16x16	260	16x20	270
47	470	10x20 12.5x16	230 250	10x20 12.5x16	240 250	12.5x20	290	16x20 18x16	340 310	16x20	340	16x31.5	390
68	680	12.5x20	330	12.5x20 16x16	330 370	12.5x25	370	16x25 18x20	420 410	16x31.5	435	16x35.5	460
100	101	12.5x25	440	16x20 18x16	460 450	16x25	510	16x31.5 18x25	540 520	16x40 18x35.5	560 570	18x35.5	570
150	151	16x25	620	16x25 18x20	620 605	16x31.5 18x25	625 630	18x35.5	640	18x40	670	22x45	800
220	221	16x31.5 18x25	790 760	16x35.5	830	16x40 18x35.5	840 890	22x40	920	22x45 25x40	960 980	25x45	1,030
330	331	18x35.5	985	18x40	1,150	22x40	1,200	25x45	1,270				
470	471	18x40	1,150	22x40	1,400	22x45	1,470						

Part Numbering System

REA Series 470 μ F \pm 20% 16V Bulk Package Gas Type 8 ϕ x11.5L Pb-free and PET sleeve

REA **471** **M** **1C** **BK** - **0811**

Series Name Capacitance Capacitance Tolerance Rated Voltage Lead Configuration & 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.