



RGA Series

Features

- 105°C, 2,000 hours assured
- 105°C standard series for general purposes
- RoHS Compliance
- If there is any requirement on ESR, it's suggested to use low ESR series instead of RGA. Please consult us for any inquiry.

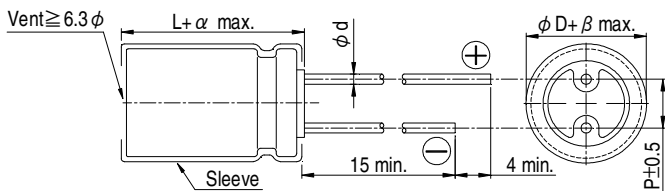


Sleeve & Marking Color: Black & White

Specifications

Items	Performance																																																																																	
Category Temperature Range	6.3~400V -40°C ~ +105°C																																																																																	
Capacitance Tolerance	450V -25°C ~ +105°C																																																																																	
Leakage Current (at 20°C)	±20% (at 120Hz, 20°C)																																																																																	
	<table border="1"> <tr> <td>Rated voltage</td> <td>≤ 100V</td> <td>&gt; 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 &gt; 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 &lt; 16</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>3</td> <td>6</td> <td>8</td> <td>12</td> <td>14</td> <td>16</td> </tr> <tr> <td>/Z(+20°C)</td> <td>φ D ≥ 16</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>6</td> <td>8</td> <td>12</td> <td>14</td> <td>16</td> </tr> <tr> <td>Z(-40°C)</td> <td>φ D &lt; 16</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>8</td> <td>10</td> <td>16</td> <td>18</td> <td>-</td> </tr> <tr> <td>/Z(+20°C)</td> <td>φ D ≥ 16</td> <td>12</td> <td>10</td> <td>8</td> <td>8</td> <td>8</td> <td>8</td> <td>6</td> <td>6</td> <td>4</td> <td>8</td> <td>10</td> <td>16</td> <td>18</td> <td>-</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	4	3	3	2	2	2	2	2	3	6	8	12	14	16	/Z(+20°C)	φ D ≥ 16	6	4	4	3	3	3	3	3	3	6	8	12	14	16	Z(-40°C)	φ D < 16	8	6	6	4	4	3	3	3	4	8	10	16	18	-	/Z(+20°C)	φ D ≥ 16	12	10	8	8	8	8	6	6	4	8	10	16	18	-
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	/Z(+20°C)	φ D ≥ 16	6	4	4	3	3	3	3	3	3	6	8	12	14	16																																																																		
	Z(-40°C)	φ D < 16	8	6	6	4	4	3	3	3	4	8	10	16	18	-																																																																		
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Endurance	<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 105°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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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 &lt; 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>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

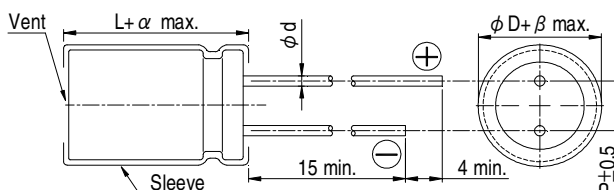


Lead Spacing and Diameter

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 12.5x16, 16x16, 16x20, 18x16, 18x20 and 18x25 are suitable for below diagram:





Dimension:  $\phi D \times L$ (mm)  
Ripple Current: mA/rms at 120 Hz, 105°C

Dimension and Permissible Ripple Current

Cap. (μF)	Rated Volt. (V <sub>DC</sub> ) 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
2.2	2R2											5x11	20			5x11	30
3.3	3R3											5x11	30			5x11	31
4.7	4R7											5x11	33			5x11	36
10	100											5x11	50			6.3x11	54
22	220											5x11	78	6.3x11	86	6.3x11	93
33	330									5x11	75	5x11	90	6.3x11	100	8x11.5	130
47	470							5x11	97	5x11	90	6.3x11	120	6.3x11	130	10x12.5	165
100	101					5x11	110	6.3x11	142	6.3x11	150	8x11.5	188	10x12.5	235	10x20	265
220	221	5x11	140	6.3x11	175	6.3x11	190	8x11.5	236	8x11.5	270	10x12.5	300	10x16	335	12.5x25	440
330	331			6.3x11	200	8x11.5	270	8x11.5	310	10x12.5	350	10x16	410	10x20	510	16x25	620
470	471	6.3x11	230	8x11.5	290	8x11.5	310	10x12.5	380	10x16	460	10x20	530	12.5x20	640	16x31.5	715
1,000	102	8x11.5	380	10x12.5	460	10x16	560	10x20	680	12.5x20	810	12.5x25	950	16x25	930	18x40	1,275
2,200	222	10x16	690	10x20	760	12.5x16	780	12.5x25	1,110	16x25	1,260	16x35.5	1,470	18x40	2,280	25x45	2,400
3,300	332	10x20	840	12.5x20	1,100	12.5x25	1,170	16x25	1,440	16x31.5	1,420	18x35.5	1,770	22x40	2,510		
4,700	472	12.5x20	1,090	12.5x25	1,260	16x20	1,185	16x31.5	1,650	18x20	1,220	18x25	1,570	22x40	2,340	25x40	3,000
6,800	682	12.5x25	1,460	16x20	1,270	16x31.5	1,930	16x40	2,000	18x20	2,160	18x35.5	2,160	25x40	2,530		
10,000	103	16x20	1,340	16x31.5	2,220	18x25	1,800	18x31.5	2,330	22x40	2,720	18x45	2,410				
15,000	153	16x31.5	2,365	18x25	2,290	18x31.5	2,620	18x40	2,950	25x40	3,200						
22,000	223	16x40	2,800	18x35.5	2,930	18x40	3,230	22x40	3,460								
33,000	333	18x45	3,080	22x40	4,090	25x45	4,500										

Cap. (μF)	Rated Volt. (V <sub>DC</sub> ) Contents	160V (2C)		200V (2D)		250V (2E)		350V (2V)		400V (2G)		450V (2W)	
		$\phi D \times L$	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									6.3x11	21	8x11.5	27
2.2	2R2			6.3x11	30	6.3x11	35	6.3x11	35	8x11.5	39	8x11.5	39
3.3	3R3			6.3x11	39	6.3x11	40	8x11.5	43	8x11.5	45	8x11.5	45
4.7	4R7			6.3x11	43	8x11.5	45	8x11.5	45	8x11.5	50	8x11.5	50
10	100	8x11.5	65	8x11.5	65	10x12.5	92	10x16	95	10x16	95	10x20	105
22	220	10x12.5	110	10x16	140	10x16	140	12.5x20	220	12.5x20	160	12.5x20	160
33	330	10x16	150	10x20	170	12.5x16	175	12.5x25	215	16x20	225	16x20	225
47	470	10x20	195	12.5x16	215	12.5x20	230	16x16	245	16x20	255	16x25	295
68	680	12.5x20	275	12.5x20	265	16x20	320	18x25	360	18x25	360	16x35.5	400
100	101	12.5x25	355	16x20	365	16x25	425	16x31.5	370	16x31.5	375	18x31.5	420
150	151	16x25	470	18x20	510	16x31.5	550	18x20	415	16x35.5	430	18x35.5	540
220	221	16x31.5	660	18x31.5	750	18x25	535	18x40	600	22x40	730	22x40	770
330	331	18x35.5	820	18x40	965	25x40	865	25x45	850	22x45	930		
470	471	22x40	1,130	22x40	1,130	25x40	1,325		1,070				

Part Numbering System

RGA Series    470μF    ±20%    6.3V    Bulk Package    Gas Type    6.3  $\phi$  x11L    Pb-free and PET sleeve

**RGA**    **471**    **M**    **0J**    **BK**    -    **0611**

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.

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