

Features

- 105°C, for general purpose, standard series
- RoHS Compliance
- If there is any requirement on ESR, it's suggested to use low ESR series instead of RGA. Please consult our contact window for any inquiry.

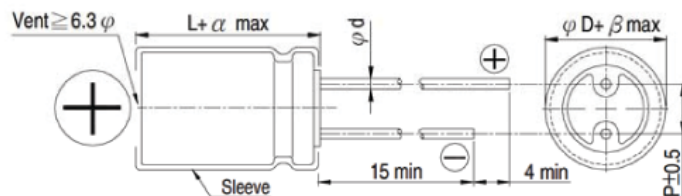


Sleeve & Marking Color: Green & Black
Black & White

SPECIFICATIONS

Items	Performance																																																																																										
Category Temperature Range	-40℃ ~ +105℃																																																																																										
Capacitance Tolerance	±20% (at 120Hz, 20℃)																																																																																										
Leakage Current (at 20℃)	<table><tr><td>Rated voltage</td><td colspan="7">≤ 100V</td><td colspan="7">> 100V</td></tr><tr><td>Time</td><td colspan="7">after 2 minutes</td><td colspan="7">after 5 minutes</td></tr><tr><td>Leakage Current</td><td colspan="7">I = 0.01CV or 3 (μA) whichever is greater</td><td colspan="7">CV ≤ 1,000 I = 0.03CV+15(μA) CV > 1,000 I = 0.02CV+25(μA)</td></tr></table> Where, C = rated capacitance in μF V = rated DC working voltage in V														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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Dissipation Factor (Tan δ at 120 Hz, 20℃)	<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><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td>Tan δ (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> When the capacitance exceeds 1,000 μF, 0.02 shall be added every 1,000 μF increase.														Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	Tan δ (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)	Impedance ratio shall not exceed the values given in the table below. <table><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℃)</td><td>φD < 16</td><td>4</td><td>3</td><td>3</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℃)</td><td>φD ≥ 16</td><td>6</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Z(-40℃)</td><td>φD < 16</td><td>8</td><td>6</td><td>6</td><td>4</td><td>4</td><td>3</td><td>3</td><td>4</td><td>8</td><td>10</td><td>16</td><td>18</td><td>20</td></tr><tr><td>/Z(+20℃)</td><td>φD ≥ 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></td><td></td><td></td><td></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℃)	φD < 16	4	3	3	2	2	2	2	3	6	8	12	14	16	/Z(+20℃)	φD ≥ 16	6	4	4	3	3	3	3							Z(-40℃)	φD < 16	8	6	6	4	4	3	3	4	8	10	16	18	20	/Z(+20℃)	φD ≥ 16	12	10	8	8	8	8	6	6					
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	Z(-40℃)	φD < 16	8	6	6	4	4	3	3	4	8	10	16	18	20																																																																												
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Endurance	<table><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>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000 hours at 105℃.														Test Time	2,000 Hrs	Capacitance Change	Within ±20% of initial value	Dissipation Factor	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>1,000 Hrs</td></tr><tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ 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).														Test Time	1,000 Hrs	Capacitance Change	Within ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																																																					
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Ripple Current & Frequency Multipliers	<table><tr><td>Freq.(Hz)</td><td>60(50)</td><td>120</td><td>500</td><td>1k</td><td>10k up</td></tr><tr><td>Cap.(μF)</td><td></td><td></td><td></td><td></td><td></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>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>														Freq.(Hz)	60(50)	120	500	1k	10k up	Cap.(μF)						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

ϕD	5	6.3	8	10	12.5	16	18	20	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	10	12.5
ϕd	0.5		0.6		0.8		1.0			
α	1.0			1.5			2.0			
β	0.5									

Dimension: φ D × L (mm)

Ripple Current: mA/rms at 120 Hz, 105°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

V. DC	Contents	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
		φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA
4.7	4R7													5×11	26		
10	100									5×11	35			5×11	43		
22	220					5×11	49			5×11	58			5×11	62		
33	330	5×11	54			5×11	60			5×11	71			5×11	76		
47	470	5×11	65			5×11	76			5×11	85			5×11	97		
100	101	5×11	95			5×11	105			6.3×11	133	5×11	110	6.3×11	142		
220	221	6.3×11	160	5×11	140	6.3×11	175			8×11.5	215	6.3×11	190	8×11.5	236		
330	331	8×11.5	195	6.3×11	190	8×11.5	245	6.3×11	200	8×11.5	270			10×12.5	335	8×11.5	310
470	471	8×11.5	270	6.3×11	230	8×11.5	290			10×12.5	370	8×11.5	310	10×16	440	10×12.5	380
1,000	102	10×12.5	460	8×11.5	380	10×16	550	10×12.5	460	10×20	640	10×16	560	10×20	680	12.5×16	590
2,200	222	10×16	690	12.5×16	700	10×20	760	12.5×16	690	12.5×20	920	16×16	830	12.5×25	1,110	16×20	970
3,300	332	12.5×20	960	10×20	840	12.5×20	1,100	16×16	940	12.5×25	1,170	16×16	950	16×25	1,440	18×20	1,220
4,700	472	12.5×20	1,090	16×16	1,010	12.5×25	1,260	16×16	1,060	16×25	1,300	16×20	1,050	16×31.5	1,460	18×25	1,470
6,800	682	12.5×25	1,460	16×20	1,190	16×25	1,690	16×20	1,270	16×31.5	1,480	18×20	1,185	18×35.5	1,710	18×35.5	2,160
10,000	103	16×25	1,990	16×20	1,340	16×31.5	2,220	18×20	1,330	18×35.5	1,930	18×25	1,650	22×40	2,720		
15,000	153	18×35.5	2,780	16×35.5	2,500	18×35.5	2,780	16×35.5	2,500	18×40	2,950						
22,000	223	18×40	3,100	18×35.5	2,930	18×40	3,100			22×40	3,460						

V. DC	Contents	35V (1V)				50V (1H)				63V (1J)				100V (2A)			
		φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA
0.1	0R1					5×11	3.2			5×11	3.5			5×11	4		
0.22	R22					5×11	4.9			5×11	5.1			5×11	6		
0.33	R33					5×11	6			5×11	7.5			5×11	8		
0.47	R47					5×11	7.1			5×11	9			5×11	9		
1	010					5×11	13			5×11	15			5×11	15		
2.2	2R2					5×11	20			5×11	30			5×11	30		
3.3	3R3					5×11	30			5×11	31			5×11	31		
4.7	4R7	5×11	30			5×11	33			5×11	36			6.3×11	40		
10	100	5×11	46			5×11	50			5×11	54			8×11.5	66	6.3×11	54
22	220	5×11	71			5×11	78			6.3×11	86			8×11.5	99	6.3×11	93
33	330	6.3×11	90	5×11	75	6.3×11	96	5×11	90	8×11.5	114	6.3×11	100	10×12.5	148	8×11.5	130
47	470	6.3×11	110	5×11	90	6.3×11	120			8×11.5	141	6.3×11	130	10×16	180	10×12.5	165
100	101	8×11.5	180	6.3×11	150	8×11.5	188			10×12.5	235			12.5×20	320	10×20	265
220	221	10×12.5	300	8×11.5	270	10×16	300	10×12.5	240	10×20	450	10×16	335	16×25	570	12.5×25	440
330	331	10×16	400	10×12.5	350	10×20	460	10×16	410	12.5×20	540	10×20	510	16×31.5	700	16×25	540
470	471	10×20	520	10×16	460	10×20	530	12.5×16	425	12.5×25	720	12.5×20	640	18×35.5	880	16×31.5	715
1,000	102	12.5×20	810	12.5×16	600	12.5×25	950	16×20	830	16×31.5	1,210	16×25	930	22×40	1,760	18×40	985
2,200	222	16×25	1,260	18×20	1,110	18×35.5	1,600	16×35.5	1,470	18×40	2,340						
3,300	332	16×31.5	1,420	18×25	1,570	22×40	2,290	18×35.5	1,770	22×40	2,510						
4,700	472	18×40	1,910	18×35.5	1,900	25×40	2,610	22×40	2,340	25×40	3,000						

Remark: The Case size 12.5×16, 16×16, 16×20, 18×20 and 18×25 are used flat type rubber bung. Case size in mark of "*" is downsize.

DIMENSION & PERMISSIBLE RIPPLE CURRENT

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

Ripple Current: mA/rms at 120 Hz, 105°C

μF	V. DC Contents	160V (2C)				200V (2D)				250V (2E)				350V (2V)			
		$\phi D \times L$	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
0.47	R47	6.3x11	13	5x11	11	6.3x11	14	5x11	12	8x11.5	18	5x11	11	8x11.5	18	6.3x11	16
1	010	6.3x11	20	5x11	17	6.3x11	21	5x11	18	8x11.5	27	5x11	16	8x11.5	27	6.3x11	23
2.2	2R2	6.3x11	29	5x11	25	8x11.5	37	6.3x11	30	8x11.5	41	6.3x11	35	10x16	53	8x11.5	41
3.3	3R3	8x11.5	42	6.3x11	36	8x11.5	45	6.3x11	39	8x11.5	50	6.3x11	40	10x12.5	59	8x11.5	50
4.7	4R7	8x11.5	50	6.3x11	43	8x11.5	54	6.3x11	43	10x16	93	8x11.5	60	10x16	93	10x12.5	65
10	100	10x12.5	87	8x11.5	73	10x20	115	10x12.5	94	10x16	115	10x12.5	92	10x20	125	10x16	115
22	220	10x20	158	10x16	135	10x20	170	10x16	142	10x20 12.5x20	200 220	12.5x16	200	12.5x25	235	12.5x20	220
33	330	12.5x20	225	10x20	190	12.5x20 12.5x25	240 265	12.5x16 16x16	215 250	12.5x20 12.5x25	315 348	16x16	250	16x31.5	365	16x25	325
47	470	12.5x20 12.5x25	265 295	12.5x16 16x16	230 275	12.5x20 12.5x25	270 315	16x16 16x20	275 300	12.5x25 16x25	350 365	16x20	320	16x31.5	395	16x25	365
68	680			16x20	330	18x20	350	16x20	330			18x20	350				
100	101	12.5x25 16x25	425 485	16x20 18x20	395 420	16x25 16x35.5	485 565	18x25	420	16x35.5	610			18x40	530	16x31.5	450
150	151			18x25	510												
220	221	18x35.5	750	16x31.5	660	18x40	885	18x35.5	835	18x40	885	18x35.5	835				
330	331	18x40	865	18x35.5	820												

μF	V. DC Contents	400V (2G)				450V (2W)			
		$\phi D \times L$	mA	* $\phi D \times L$	mA	$\phi D \times L$	mA	* $\phi D \times L$	mA
0.47	R47	8x11.5	18	6.3x11	15	10x12.5	22	8x11.5	18
1	010	8x11.5	27	6.3x11	21	10x12.5	32	8x11.5	27
2.2	2R2	10x12.5	48	8x11.5	39	10x12.5	48	8x11.5	39
3.3	3R3	10x16	65	8x11.5	47	10x16	65	10x12.5	55
4.7	4R7	10x20	86	10x12.5 8x11.5	70 50	10x20	86	10x16 8x11.5	75 50
10	100	10x20 12.5x20	125 145	12.5x16 16x16	120 150	12.5x25	160	12.5x20	145
22	220	10x25 16x25	205 265	16x20	220	16x25	265	12.5x20	200
27	270	16x25	310			16x31.5	340	12.5x25	235
33	330	16x25 16x31.5	325 360	18x20	270	16x31.5	360	16x25	325
39	390	16x31.5	375	16x25	340	16x35.5	400		
47	470	16x25 16x35.5	370 420	18x25	350	18x31.5	430		
56	560	18x25	460	16x25	400	18x40	480		
68	680	16x25	440						
82	820	18x31.5	500	16x31.5	475	22x40	600	18x31.5	500
100	101	20x40	600	18x35.5	540	20x45	690	18x35.5	540
120	121	20x40	720			20x50	780		
150	151	22x40	850			22x50	930	20x40	850
180	181	20x50	960						
220	221	22x50	1,130	20x45	950				

Remark: The Case size 12.5x16, 16x16, 16x20, 18x20 and 18x25 are used flat type rubber bung.
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