



SEA Series

Features

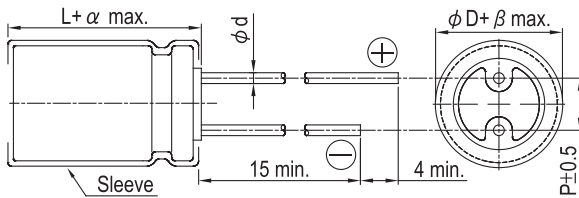
- 85°C, 2,000 hours assured, standard miniature type with 7 ~ 9mm height for compact circuits
- RoHS compliance



Specifications

Items	Performance																													
Category Temperature Range	-40°C ~ +85°C																													
Capacitance Tolerance	±20% (at 120 Hz, 20°C)																													
Leakage Current (at 20°C)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C = rated capacitance in μF, V = rated DC working voltage in V																													
Tanδ (at 120 Hz, 20°C)	<table border="1"> <tr> <td>Rated Voltage</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Tanδ (max)</td> <td>0.35</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>0.10</td> </tr> </table>	Rated Voltage	4	6.3	10	16	25	35	50	63	Tanδ (max)	0.35	0.23	0.20	0.16	0.14	0.12	0.10	0.10											
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Tanδ (max)	0.35	0.23	0.20	0.16	0.14	0.12	0.10	0.10																						
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 colspan="2">Rated Voltage</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td rowspan="2">Impedance Ratio</td> <td>Z(-25°C) / Z(+20°C)</td> <td>7</td> <td>4</td> <td>3</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C) / Z(+20°C)</td> <td>14</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> </table>	Rated Voltage		4	6.3	10	16	25	35	50	63	Impedance Ratio	Z(-25°C) / Z(+20°C)	7	4	3	3	2	2	2	2	Z(-40°C) / Z(+20°C)	14	10	8	6	4	4	4	4
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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 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	Test time: 500 hours; other items are the same as those for the Endurance.																													
Ripple Current and Frequency Multipliers	<table border="1"> <tr> <td rowspan="2">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>≤ 47</td> <td>0.70</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.45</td> </tr> <tr> <td>100 ~ 1,000</td> <td></td> <td>0.80</td> <td>1.00</td> <td>1.10</td> <td>1.15</td> <td>1.20</td> </tr> </table>	Cap.(μF)	Freq.(Hz)	60 (50)	120	500	1k	10k up	≤ 47	0.70	1.00	1.20	1.30	1.45	100 ~ 1,000		0.80	1.00	1.10	1.15	1.20									
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	≤ 47	0.70	1.00	1.20	1.30	1.45																								
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Diagram of Dimensions



Lead Spacing and Diameter

Unit: mm

φD	4	5	6.3	8	10
P	1.5	2.0	2.5	3.5	5.0
φd	0.45	0.5		0.6	
α	1.0			1.5	
β	0.5				

Dimension and Permissible Ripple Current

Dimension: φD × L(mm)

Ripple Current: mA/rms at 120 Hz, 85°C

μF	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA	φD×L	mA
1	010													4×7	10	4×7	11
2.2	2R2													4×7	15	4×7	17
3.3	3R3													4×7	18	4×7	21
4.7	4R7											4×7	22	5×7*	23	5×7*	26
10	100							4×7	25	4×7	26	5×7*	30	6.3×7*	34	6.3×7*	40
22	220			4×7	31	4×7	32	5×7*	39	5×7*	41	6.3×7*	47	6.3×7	53	8×7*	70
33	330	4×7	32	4×7	32	4×7	35	5×7	43	6.3×7	53	8×7*	71	8×7*	76	8×7	80
47	470	4×7	38	4×7	38	5×7*	47	6.3×7*	59	6.3×7	65	8×7*	83	8×7	85	8×7	95
100	101	5×7	61	6.3×7*	75	6.3×7	80	6.3×7	90	8×7	125	8×7	115	8×9	130	10×9	170
220	221	6.3×7	90	6.3×7	99	8×7	140	8×7	146	8×9	190	10×9	215				
330	331	8×7	129	8×7	156	8×7	165	8×9	185	10×9	265						
470	471	8×7	154	8×7	175	8×9	215	10×9	255								
1,000	102	8×9	200	10×9	205												

Note: Case size in mark of "*" is available to product down size.

Part Numbering System

SEA Series	470μF	±20%	6.3V	Bulk Package	Gas Type	8φ×7L	Pb-free and PET sleeve
SEA	471	M	0J	BK	-	0807	
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.

Radial