

## SEA Series

### Features

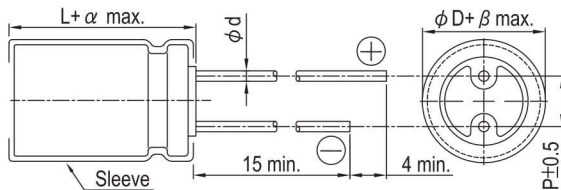
- 85°C, 2,000 hours assured, standard miniature type with 7 ~ 9mm height for compact circuits
- RoHS compliance
- AEC-Q200 Parts Available: Replace "S" Suffix with "KS" or "LS" Suffix



### 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 $3 (\mu A)$ whichever is greater (after 2 minutes) Where, C = rated capacitance in $\mu F$ , V = rated DC working voltage in V																											
Tan $\delta$ (at 120 Hz, 20°C)	<table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Tan<math>\delta</math> (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> </tbody> </table>	Rated Voltage	4	6.3	10	16	25	35	50	63	Tan $\delta$ (max)	0.35	0.23	0.20	0.16	0.14	0.12	0.10	0.10									
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Low Temperature Characteristics (at 120 Hz)	<p>Impedance ratio shall not exceed the values given in the table below.</p> <table border="1"> <thead> <tr> <th>Rated Voltage</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Impedance Ratio <math>Z(-25^\circ C) / Z(+20^\circ C)</math></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>Impedance Ratio <math>Z(-40^\circ C) / Z(+20^\circ C)</math></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> </tbody> </table>	Rated Voltage	4	6.3	10	16	25	35	50	63	Impedance Ratio $Z(-25^\circ C) / Z(+20^\circ C)$	7	4	3	3	2	2	2	2	Impedance Ratio $Z(-40^\circ C) / Z(+20^\circ C)$	14	10	8	6	4	4	4	4
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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"> <thead> <tr> <th rowspan="2">Cap. (<math>\mu F</math>)</th> <th colspan="6">Freq. (Hz)</th> </tr> <tr> <th>60 (50)</th> <th>120</th> <th>500</th> <th>1k</th> <th>10k up</th> <th></th> </tr> </thead> <tbody> <tr> <td>≤ 47</td> <td>0.70</td> <td>1.00</td> <td>1.20</td> <td>1.30</td> <td>1.45</td> <td></td> </tr> <tr> <td>100 ~ 1,000</td> <td>0.80</td> <td>1.00</td> <td>1.10</td> <td>1.15</td> <td>1.20</td> <td></td> </tr> </tbody> </table>	Cap. ( $\mu F$ )	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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### Diagram of Dimensions



Lead Spacing and Diameter Unit: mm

	4	5	6.3	8	10
$\phi D$	4	5	6.3	8	10
P	1.5	2.0	2.5	3.5	5.0
$\phi d$	0.45	0.5			0.6
$\alpha$	1.0				1.5
$\beta$	0.5				

### Dimension and Permissible Ripple Current

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

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

$\mu F$	Contents	4V (0G)		6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)		63V (1J)	
		$\phi D \times L$	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													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	470 $\mu F$	±20%	6.3V	Bulk Package	Gas Type	8 $\phi$ ×7L	
<b>SEA</b>	<b>471</b>	<b>M</b>	<b>0J</b>	<b>BK</b>	-	<b>0807</b>	<b>S</b>
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Regional Code

Note: For more details, please refer to "Part Numbering System (Radial Type)" on page 13.