

## ORE Series

### Features

- 105°C, 5,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS compliant



Marking color: Blue

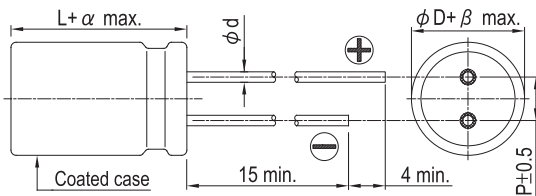
### Specifications

Items	Performance										
Category Temperature Range	-55°C ~ +105°C										
Capacitance Tolerance	±20% (at 120 Hz, 20°C)										
Leakage Current (at 20°C)*	Rated voltage applied, after 2 minutes at 20°C. See Standard Ratings										
Tanδ (at 120 Hz, 20°C)	See Standard Ratings										
ESR (at 100k ~ 300k Hz, 20°C)	See Standard Ratings										
Endurance	<table border="1"> <tr><td>Test Time</td><td>5,000 Hrs</td></tr> <tr><td>Capacitance Change</td><td>Within ±20% of initial value</td></tr> <tr><td>Tanδ</td><td>Less than 150% of specified value</td></tr> <tr><td>ESR</td><td>Less than 150% of specified value</td></tr> <tr><td>Leakage Current</td><td>Within specified value</td></tr> </table>	Test Time	5,000 Hrs	Capacitance Change	Within ±20% of initial value	Tanδ	Less than 150% of specified value	ESR	Less than 150% of specified value	Leakage Current	Within specified value
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	Capacitance Change	Within ±20% of initial value									
	Tanδ	Less than 150% of specified value									
	ESR	Less than 150% of specified value									
Leakage Current	Within specified value										
* The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied for 5,000 hours at 105°C.											
Moisture Resistance	<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 150% of specified value</td></tr> <tr><td>ESR</td><td>Less than 150% of specified value</td></tr> <tr><td>Leakage Current</td><td>Within specified value</td></tr> </table>	Test Time	1,000 Hrs	Capacitance Change	Within ±20% of initial value	Tanδ	Less than 150% of specified value	ESR	Less than 150% of specified value	Leakage Current	Within specified value
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	Capacitance Change	Within ±20% of initial value									
	Tanδ	Less than 150% of specified value									
	ESR	Less than 150% of specified value									
Leakage Current	Within specified value										
* The above specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them at 60°C, 90 ~ 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*.											
Resistance to Soldering Heat * (Please refer to page 18 for soldering conditions)	<table border="1"> <tr><td>Capacitance Change</td><td>Within ±10% of initial value</td></tr> <tr><td>Tanδ</td><td>Within specified value</td></tr> <tr><td>ESR</td><td>Within specified value</td></tr> <tr><td>Leakage Current</td><td>Within specified value</td></tr> </table>	Capacitance Change	Within ±10% of initial value	Tanδ	Within specified value	ESR	Within specified value	Leakage Current	Within specified value		
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	Tanδ	Within specified value									
	ESR	Within specified value									
Leakage Current	Within specified value										
Ripple Current and Frequency Multipliers											
<table border="1"> <thead> <tr> <th>Frequency (Hz)</th> <th>120 ≤ f &lt; 1k</th> <th>1k ≤ f &lt; 10k</th> <th>10k ≤ f &lt; 100k</th> <th>100k ≤ f &lt; 500k</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>0.05</td> <td>0.3</td> <td>0.7</td> <td>1.0</td> </tr> </tbody> </table>		Frequency (Hz)	120 ≤ f < 1k	1k ≤ f < 10k	10k ≤ f < 100k	100k ≤ f < 500k	Multiplier	0.05	0.3	0.7	1.0
Frequency (Hz)	120 ≤ f < 1k	1k ≤ f < 10k	10k ≤ f < 100k	100k ≤ f < 500k							
Multiplier	0.05	0.3	0.7	1.0							

\* For any doubt about measured values, measure the leakage current again after the following voltage treatment.  
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105 °C.

### Diagram of Dimensions

5 φ, 6.3 φ and 8 φ × 6.5 ~ 8L

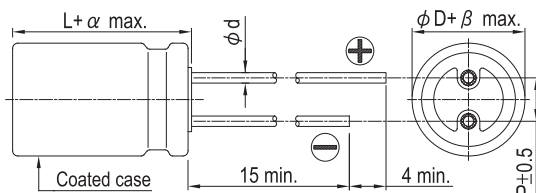


### Lead Spacing and Diameter

Unit: mm

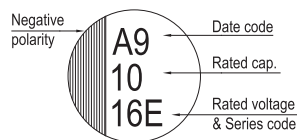
φ D	5	6.3	6.3	8	8	8	10
L	8	5.5	8	6.5	8	12	12
P	2.0	2.5		3.5		5.0	
φ d	0.5	0.45	0.6				
α	1.0	0.5	1.0	0.5	1.0		
β	0.5						

8 φ × 12L and 10 φ × 12L

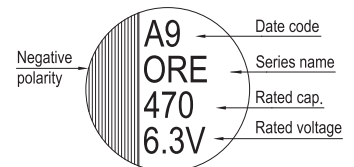


### Marking

φ D = 5 ~ 6.3



φ D = 8 ~ 10





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

Ripple Current: mA/rms at 100k Hz, 105°C

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance ( $\mu F$ )	Size $\phi D \times L$ (mm)	Tan $\delta$ (120 Hz, 20°C)	L C ( $\mu A$ )	E S R (m $\Omega$ /at 100k ~ 300k Hz, 20°C max.)	Rated R. C. (mA/rms at 100k Hz, 105°C)
2.5V (0E)	2.9	100	5 × 8	0.10	500	7	4,180
		330	5 × 8			7	4,180
			6.3 × 8			5	5,900
		390	6.3 × 5.5	0.12		10	3,900
		470	5 × 8	0.10		7	4,180
			6.3 × 8			5	5,900
		560	5 × 8		0.10	7	4,180
			6.3 × 5.5	10		3,900	
			6.3 × 8	5		5,900	
		820	8 × 8	0.10		8	4,700
			6.3 × 8			5	5,900
			8 × 8			7	6,100
1,000	8 × 8	0.10	1,350	10	5,560		
2,700	10 × 12						
4V(0G)	4.6	560	6.3 × 8	0.10	500	7	5,600
			8 × 8				6,100
			8 × 12				
		680	8 × 12		544		
820	10 × 12	656	6,640				
6.3V (0J)	7.2	470	6.3 × 8	0.10	592	7	5,600
			8 × 8			8	5,700
			8 × 12			8	5,700
		560	6.3 × 8		706	7	5,600
			8 × 8		706		6,100
		680	10 × 12		857	6,640	
1,500	10 × 12	1,890	10	5,560			
10V(1A)	12.0	270	8 × 6.5	0.12	500	22	3,220
16V (1C)	18.0	100	6.3 × 5.5	0.10	320	24	2,490
			6.3 × 8		480	10	4,680
		150	6.3 × 5.5		500	24	2,490
			8 × 6.5	500	22	3,220	
		180	8 × 8	0.12	576	10	5,000
			8 × 12		576	16	4,360
		220	8 × 6.5	500	13	4,150	
		270	6.3 × 8	0.10	864	10	5,080
			8 × 6.5			13	4,150
			8 × 8			10	5,000
			8 × 12			11	5,000
		470	8 × 8	0.12	1,504	8	5,400
			10 × 12	0.10	1,504	10	6,100
		560	8 × 12	0.12	1,792	14	4,950
1,000	10 × 12	0.12	3,200	12	5,400		

OP-CAP



Dimension:  $\phi D \times L$ (mm)  
Ripple Current: mA/rms at 100k Hz, 105°C

Standard Ratings

Rated Volt. (V)	Surge Voltage (V)	Capacitance ( $\mu F$ )	Size $\phi D \times L$ (mm)	Tan $\delta$ (120 Hz, 20°C)	L C ( $\mu A$ )	E S R (m $\Omega$ /at 100k ~ 300k Hz, 20°C max.)	Rated R. C. (mA/rms at 100k Hz, 105°C)
20V(1D)	23.0	120	6.3 × 5.5	0.12	480	25	3,200
		180	8 × 6.5		720	25	3,200
		390	8 × 12		1,560	14	4,970
		560	10 × 12		2,240	12	5,600
25V(1E)	29.0	56	6.3 × 5.5	0.12	280	30	2,800
		82	8 × 6.5		410	28	3,000
		180	8 × 12		900	16	4,650
		220	8 × 12		1,100	16	4,650
		330	10 × 12		1,650	14	5,000
		390	10 × 12		1,950	14	5,000
35V(1V)	40.0	22	6.3 × 5.5	0.12	154	35	2,600
		39	8 × 6.5		273	30	2,800
		82	8 × 12		574	20	4,000
		120	10 × 12		840	18	4,400

OP-CAP

Part Numbering System

ORE Series	470 $\mu F$	$\pm 20\%$	2.5V	Bulk Package	Gas Type	6.3 $\phi \times 8L$	General Purpose
<b>ORE</b>	<b>471</b>	<b>M</b>	<b>0E</b>	<b>BK</b>	-	<b>0608</b>	
Series Name	Capacitance	Capacitance Tolerance	Rated Voltage	Lead Configuration and Package	Rubber Type	Case Size	Application

Note: For more details, please refer to "Part Numbering System" on page 20.