

## ORF Series

### Features

- 105°C, 20,000 hours assured
- Ultra low ESR with large permissible ripple current
- RoHS Compliance



Marking color: Blue

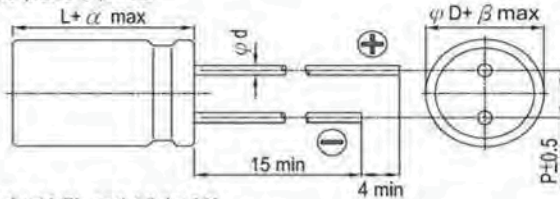
### Specifications

| Items  | Performance  |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
|--|--|-----------------------------------|------------------------------|--------------------|-----------------------------------|-----------------|-----------------------------------|-----------------|-----------------------------------|-----------------|------------------------|
| Category Temperature Range   | -55°C ~ +105°C   |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| Capacitance Tolerance  | ±20% (at 120Hz, 20°C)  |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| Leakage Current (at 20°C)*   | Rated voltage applied, after 2 minutes at 20°C.<br>See Standard Ratings  |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| Tanδ (at 120Hz, 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>20,000 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                         | 20,000 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 |
|  | Test Time  | 20,000 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   |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| * The above specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage applied for 20,000 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 |
|  | 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   |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| * The above specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them at 60°C, 90 to 95% RH for 1,000 hours. Leakage current should be tested after voltage treatment*. |  |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| Resistance to Soldering Heat *<br>(Please refer to page 11 for soldering conditions)   | <table border="1"> <tr><td>Capacitance Change</td><td>Within ±10% of initial value</td></tr> <tr><td>Tanδ</td><td>Less than 130% of specified value</td></tr> <tr><td>ESR</td><td>Less than 130% of specified value</td></tr> <tr><td>Leakage Current</td><td>Within specified value</td></tr> </table>  | Capacitance Change                | Within ±10% of initial value | Tanδ               | Less than 130% of specified value | ESR             | Less than 130% of specified value | Leakage Current | Within specified value            |                 |                        |
|  | Capacitance Change   | Within ±10% of initial value      |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
|  | Tanδ   | Less than 130% of specified value |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
|  | ESR  | Less than 130% of specified value |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| Leakage Current  | Within specified value   |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| * For any doubt about measured values, measure the leakage current again after the following voltage treatment.<br>Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105°C.      |  |                                   |                              |                    |                                   |                 |                                   |                 |                                   |                 |                        |
| Ripple Current and Frequency Multipliers   | <table border="1"> <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> <tr> <td>Multiplier</td> <td>0.05</td> <td>0.3</td> <td>0.7</td> <td>1.0</td> </tr> </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                |                                   |                 |                                   |                 |                                   |                 |                        |

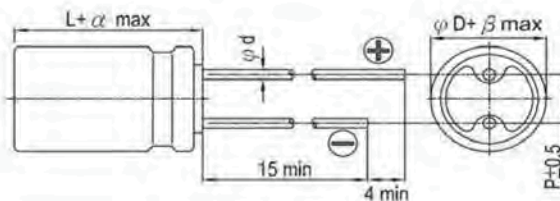
\* For any doubt about measured values, measure the leakage current again after the following voltage treatment.  
Voltage treatment: DC rated voltage is applied to the capacitors for 2 hours at 105°C.

### Diagram of Dimensions

6.3 φ and 8 φ × 8L



8 φ × 11.5L and 10 φ × 12L



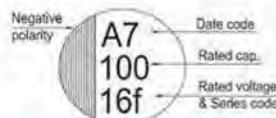
### Lead Spacing and Diameter

Unit: mm

| φD | 6.3  |     |     | 8   |      |    | 10  |  |  |
|----|------|-----|-----|-----|------|----|-----|--|--|
| L  | 5.5  | 8   | 11  | 8   | 11.5 | 12 |     |  |  |
| P  | 2.5  |     |     | 3.5 |      |    | 5.0 |  |  |
| φd | 0.45 | 0.6 | 0.5 | 0.6 |      |    |     |  |  |
| α  | 0.5  |     |     | 1.0 |      |    |     |  |  |
| β  |      |     |     | 0.5 |      |    |     |  |  |

### Marking

φD = 5 - 6.3



φD = 8 - 10



All product specifications in the catalog are subject to change without notice. (CAT. 2017E1)

Dimension:  $\phi$  D×L(mm)  
Ripple Current: mA/rms at 100k Hz

### Standard Ratings

| W. V. (V) | Surge Voltage (V) | Capacitance (μF) | Size $\phi$ D×L(mm) | Tanδ (120Hz, 20°C) | L C (μA) | E S R (mΩ/at 100k – 300k Hz, 20°C Max) | Rated R. C. (mA/rms-at 100k Hz, 105°C) |
|-----------|-------------------|------------------|---------------------|--------------------|----------|--|--|
| 2.5V(0E)  | 2.9               | 330              | 6.3 × 8             | 0.10               | 500      | 5                                      | 5,900                                  |
|           |                   | 470              | 6.3 × 8             | 0.10               | 500      | 5                                      | 5,900                                  |
|           |                   | 560              | 6.3 × 8             | 0.10               | 500      | 5                                      | 5,900                                  |
|           |                   | 820              | 6.3 × 8             | 0.10               | 500      | 5                                      | 5,900                                  |
| 4V(0G)    | 4.6               | 470              | 6.3 × 8             | 0.10               | 500      | 7                                      | 5,600                                  |
|           |                   | 560              | 6.3 × 8             | 0.10               | 500      | 7                                      | 5,600                                  |
| 6.3V(0J)  | 7.2               | 820              | 6.3 × 8             | 0.10               | 1,030    | 8                                      | 4,700                                  |
| 16V (1C)  | 18.0              | 100              | 6.3 × 5.5           | 0.10               | 500      | 24                                     | 2,490                                  |
|           |                   |                  | 6.3 × 11            | 0.10               | 500      | 25                                     | 2,890                                  |
|           |                   | 270              | 8 × 8               | 0.10               | 864      | 10                                     | 5,000                                  |
|           |                   | 270              | 8 × 11.5            | 0.10               | 864      | 11                                     | 5,080                                  |
|           |                   | 330              | 8 × 8               | 0.10               | 1,050    | 13                                     | 4,700                                  |
|           |                   | 470              | 8 × 11.5            | 0.10               | 1,500    | 11                                     | 5,400                                  |
|           |                   |                  | 10 × 12             | 0.10               | 1,500    | 10                                     | 6,100                                  |

OP-CAP

### Part Numbering System

|   |             |                       |               |                              |             |                  |                              |
|---|-------------|-----------------------|---------------|------------------------------|-------------|------------------|------------------------------|
| ORF Series  | 270μF       | ±20%                  | 16V           | Bulk Package                 | Gas Type    | 8 $\phi$ × 11.5L | Pb-free and PET coating case |
| <b>ORF</b>  | <b>271</b>  | <b>M</b>              | <b>1C</b>     | <b>BK</b>                    | -           | <b>0811</b>      | <b>S</b>                     |
| Series Name   | Capacitance | Capacitance Tolerance | Rated Voltage | Lead Configuration & Package | Rubber Type | Case size        | Lead Wire and Coating Type   |
| <p>Note: For more details, please refer to "Part Numbering System (Radial Type)".</p> |             |                       |               |                              |             |                  |                              |