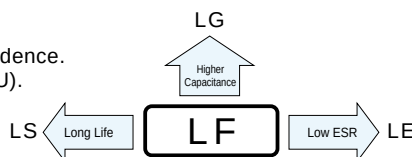


**LF** Radial Lead Type, Standard series



- Low ESR, High ripple current.
- Load life of 2000 hours at 105°C.
- Radial lead type :  
Lead free flow soldering condition correspondence.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

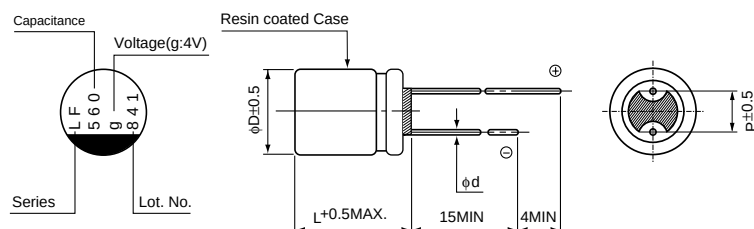
| Item                                              | Performance Characteristics                                                                                                                                                                                                                                                                                                                            |                       |                                                     |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------|
| Category Temperature Range                        | -55 to +105°C                                                                                                                                                                                                                                                                                                                                          |                       |                                                     |
| Rated Voltage Range                               | 2.5 to 25V                                                                                                                                                                                                                                                                                                                                             |                       |                                                     |
| Rated Capacitance Range                           | 6.8 to 1500μF                                                                                                                                                                                                                                                                                                                                          |                       |                                                     |
| Capacitance Tolerance                             | ±20% at 120Hz, 20°C                                                                                                                                                                                                                                                                                                                                    |                       |                                                     |
| Tangent of loss angle (tan δ)                     | Less than or equal to the specified value at 120Hz, 20°C                                                                                                                                                                                                                                                                                               |                       |                                                     |
| ESR (※ 1)                                         | Less than or equal to the specified value at 100kHz, 20°C                                                                                                                                                                                                                                                                                              |                       |                                                     |
| Leakage Current (※ 2)                             | Less than or equal to the specified value. After 2 minutes' application of rated voltage at 20°C                                                                                                                                                                                                                                                       |                       |                                                     |
| Temperature Characteristics (Max.Impedance Ratio) | Z+105°C / Z+20°C ≤ 1.25 (100kHz)<br>Z-55°C / Z+20°C ≤ 1.25                                                                                                                                                                                                                                                                                             |                       |                                                     |
| Endurance                                         | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 105°C.                                                                                                                                                                                                   | Capacitance change    | Within ± 20% of the initial capacitance value (※ 3) |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | tan δ                 | 150% or less than the initial specified value       |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | ESR (※ 1)             | 150% or less than the initial specified value       |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | Leakage current (※ 2) | Less than or equal to the initial specified value   |
| Damp Heat (Steady State)                          | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 1000 hours at 60°C, 90% RH.                                                                                                                                                                                            | Capacitance change    | Within ± 20% of the initial capacitance value (※ 3) |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | tan δ                 | 150% or less than the initial specified value       |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | ESR (※ 1)             | 150% or less than the initial specified value       |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | Leakage current (※ 2) | Less than or equal to the initial specified value   |
| Resistance to Soldering Heat                      | After soldering the capacitor under the soldering conditions prescribed here as preheat at 150 to 200°C for 60 to 180 seconds and peak temperature at 265°C for 10 seconds or less, the capacitor shall meet the specifications listed at right, provided that its temperature profile is measured at both of terminal ends facing the soldering side. | Capacitance change    | Within ± 10% of the initial capacitance value (※ 3) |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | tan δ                 | 130% or less than the initial specified value       |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | ESR (※ 1)             | 130% or less than the initial specified value       |
|                                                   |                                                                                                                                                                                                                                                                                                                                                        | Leakage current (※ 2) | Less than or equal to the initial specified value   |
| Marking                                           | Navy blue print on the case top                                                                                                                                                                                                                                                                                                                        |                       |                                                     |

※ 1 ESR should be measured at both of the terminal ends closest to the capacitor body.

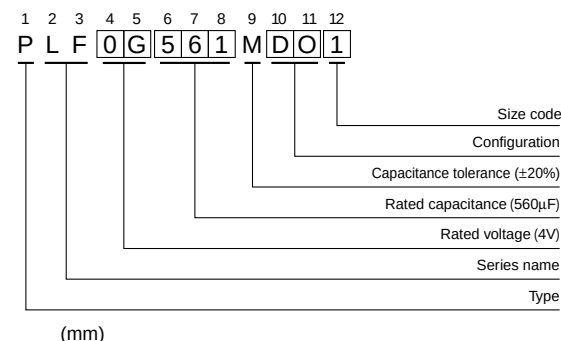
※ 2 Conditioning : If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105°C.

※ 3 Initial value : The value before test of examination of resistance to soldering.

## Dimensions



## Type numbering system (Example : 4V 560μF)



| Size | φ6.3 × 6L | φ6.3 × 9L | φ6.3 × 10.5L | φ8 × 7L | φ8 × 9L | φ8 × 12L | φ10 × 8L | φ10 × 10L | φ10 × 13L |
|------|-----------|-----------|--------------|---------|---------|----------|----------|-----------|-----------|
| φD   | 6.3       | 6.3       | 6.3          | 8.0     | 8.0     | 8.0      | 10.0     | 10.0      | 10.0      |
| L    | 5.5       | 8.5       | 10.0         | 6.5     | 8.5     | 11.5     | 7.5      | 9.5       | 12.5      |
| P    | 2.5       | 2.5       | 2.5          | 3.5     | 3.5     | 3.5      | 5.0      | 5.0       | 5.0       |
| φd   | 0.45      | 0.6       | 0.5          | 0.6     | 0.6     | 0.6      | 0.6      | 0.6       | 0.6       |

## Voltage

| V    | 2.5 | 4 | 6.3 | 10 | 16 | 20 | 25 |
|------|-----|---|-----|----|----|----|----|
| Code | e   | g | j   | A  | C  | D  | E  |

Please refer to page 20 about the end seal configuration.

● Dimension table in next page.

LF series

## ■ Standard Ratings

| Rated Voltage<br>(V)(code) | Surge Voltage<br>(V) | Rated Capacitance<br>(μF) | Case Size<br>φD × L (mm) | tan δ | Leakage Current<br>(μA) | ESR (mΩ)<br>(at 100kHz 20°C) | Rated Ripple<br>(mArms) | Part Number  |
|----------------------------|----------------------|---------------------------|--------------------------|-------|-------------------------|------------------------------|-------------------------|--------------|
| 2.5<br>(0E)                | 2.8                  | 330                       | ○ 6.3 × 9                | 0.08  | 500                     | 7                            | 5600                    | PLF0E331MCO8 |
|                            |                      | 390                       | ■ 6.3 × 10.5             | 0.08  | 195                     | 20                           | 3200                    | PLF0E391MDL4 |
|                            |                      | 560                       | ○ 6.3 × 9                | 0.08  | 500                     | 7                            | 5600                    | PLF0E561MCO8 |
|                            |                      | 560                       | 8 × 9                    | 0.08  | 280                     | 6                            | 4800                    | PLF0E561MCO1 |
|                            |                      | 680                       | ▲ 8 × 9                  | 0.08  | 340                     | 7                            | 4800                    | PLF0E681MCO6 |
|                            |                      | 680                       | 8 × 12                   | 0.08  | 340                     | 6                            | 5700                    | PLF0E681MDO1 |
|                            |                      | 820                       | ○ 6.3 × 9                | 0.08  | 500                     | 7                            | 5600                    | PLF0E821MCO8 |
|                            |                      | 820                       | ▲ 8 × 9                  | 0.08  | 410                     | 7                            | 5200                    | PLF0E821MCO6 |
|                            |                      | 820                       | 8 × 12                   | 0.08  | 410                     | 6                            | 6200                    | PLF0E821MDO1 |
|                            |                      | 1000                      | 10 × 13                  | 0.08  | 500                     | 6                            | 6500                    | PLF0E102MDO1 |
|                            |                      | 1200                      | 10 × 13                  | 0.08  | 600                     | 8                            | 5300                    | PLF0E122MDO1 |
|                            |                      | 1500                      | ▲ 8 × 12                 | 0.08  | 750                     | 7                            | 6100                    | PLF0E152MDO6 |
|                            |                      | 1500                      | 10 × 13                  | 0.08  | 750                     | 8                            | 5500                    | PLF0E152MDO1 |
| 4<br>(0G)                  | 4.6                  | 270                       | ○ 6.3 × 9                | 0.08  | 500                     | 7                            | 5600                    | PLF0G271MCO8 |
|                            |                      | 270                       | ■ 6.3 × 10.5             | 0.08  | 216                     | 20                           | 3200                    | PLF0G271MDL4 |
|                            |                      | 390                       | ■ 6.3 × 10.5             | 0.08  | 312                     | 24                           | 3300                    | PLF0G391MDL4 |
|                            |                      | 560                       | ▲ 8 × 9                  | 0.08  | 448                     | 7                            | 5200                    | PLF0G561MCO6 |
|                            |                      | 560                       | 8 × 12                   | 0.08  | 448                     | 7                            | 5500                    | PLF0G561MDO1 |
|                            |                      | 680                       | 8 × 12                   | 0.08  | 544                     | 6                            | 6200                    | PLF0G681MDO1 |
|                            |                      | 820                       | 10 × 13                  | 0.08  | 656                     | 6                            | 6500                    | PLF0G821MDO1 |
|                            |                      | 1000                      | 10 × 13                  | 0.08  | 800                     | 6                            | 6640                    | PLF0G102MDO1 |
|                            |                      | 1200                      | 10 × 13                  | 0.08  | 960                     | 8                            | 5600                    | PLF0G122MDO1 |
|                            |                      | 1200                      | 10 × 13                  | 0.08  | 960                     | 8                            | 5600                    | PLF0G122MDO1 |
| 6.3<br>(0J)                | 7.2                  | 220                       | ■ 6.3 × 10.5             | 0.08  | 277                     | 20                           | 3200                    | PLF0J221MDL4 |
|                            |                      | 330                       | ■ 6.3 × 10.5             | 0.08  | 416                     | 24                           | 3300                    | PLF0J331MDL4 |
|                            |                      | 470                       | ▲ 8 × 9                  | 0.08  | 592                     | 7                            | 5200                    | PLF0J471MCO6 |
|                            |                      | 470                       | 8 × 12                   | 0.08  | 592                     | 7                            | 5500                    | PLF0J471MDO1 |
|                            |                      | 680                       | 10 × 13                  | 0.08  | 857                     | 6                            | 6300                    | PLF0J681MDO1 |
| 10<br>(1A)                 | 11.5                 | 47                        | ■ 6.3 × 10.5             | 0.08  | 94                      | 25                           | 2900                    | PLF1A470MDL4 |
|                            |                      | 68                        | ■ 6.3 × 10.5             | 0.08  | 136                     | 25                           | 2900                    | PLF1A680MDL4 |
|                            |                      | 100                       | ■ 6.3 × 10.5             | 0.08  | 200                     | 25                           | 2900                    | PLF1A101MDL4 |
|                            |                      | 150                       | ■ 6.3 × 10.5             | 0.08  | 300                     | 25                           | 2900                    | PLF1A151MDL4 |
|                            |                      | 270                       | 8 × 12                   | 0.08  | 540                     | 8                            | 4900                    | PLF1A271MDO1 |
|                            |                      | 470                       | 10 × 13                  | 0.08  | 940                     | 7                            | 5700                    | PLF1A471MDO1 |
|                            |                      | 560                       | 10 × 13                  | 0.08  | 1120                    | 7                            | 5900                    | PLF1A561MDO1 |
|                            |                      | 680                       | 10 × 13                  | 0.08  | 1360                    | 7                            | 6100                    | PLF1A681MDO1 |
| 16<br>(1C)                 | 18.4                 | 100                       | ■ 6.3 × 10.5             | 0.08  | 320                     | 24                           | 2900                    | PLF1C101MDL4 |
|                            |                      | 180                       | 8 × 12                   | 0.08  | 576                     | 9                            | 5000                    | PLF1C181MDO1 |
|                            |                      | 270                       | 8 × 12                   | 0.08  | 864                     | 9                            | 5100                    | PLF1C271MDO1 |
|                            |                      | 330                       | 10 × 13                  | 0.08  | 1056                    | 9                            | 6100                    | PLF1C331MDO1 |
|                            |                      | 470                       | 10 × 13                  | 0.08  | 1504                    | 9                            | 6100                    | PLF1C471MDO1 |
| 20<br>(1D)                 | 23                   | 22                        | △ 6.3 × 6                | 0.12  | 88                      | 50                           | 1700                    | PLF1D220MCL2 |
|                            |                      | 39                        | △ 8 × 7                  | 0.12  | 156                     | 45                           | 2000                    | PLF1D390MCL2 |
|                            |                      | 47                        | △ 8 × 7                  | 0.12  | 188                     | 45                           | 2000                    | PLF1D470MCL2 |
|                            |                      | 56                        | △ 10 × 8                 | 0.12  | 224                     | 40                           | 2400                    | PLF1D560MCL2 |
|                            |                      | 68                        | △ 10 × 8                 | 0.12  | 272                     | 40                           | 2600                    | PLF1D680MCL2 |
|                            |                      | 82                        | △ 10 × 8                 | 0.12  | 328                     | 40                           | 2600                    | PLF1D820MCL2 |
|                            |                      | 100                       | △ 8 × 12                 | 0.12  | 400                     | 22                           | 3320                    | PLF1D101MDO2 |
|                            |                      | 120                       | △ 10 × 10                | 0.12  | 480                     | 35                           | 2800                    | PLF1D121MCL2 |
|                            |                      | 150                       | △ 10 × 13                | 0.12  | 600                     | 20                           | 4320                    | PLF1D151MDO2 |
| 25<br>(1E)                 | 28.7                 | 6.8                       | △ 6.3 × 6                | 0.12  | 85                      | 80                           | 1200                    | PLF1E6.8MCL2 |
|                            |                      | 10                        | □ 6.3 × 6                | 0.12  | 125                     | 65                           | 1500                    | PLF1E100MCL7 |
|                            |                      | 10                        | △ 8 × 7                  | 0.12  | 125                     | 60                           | 1500                    | PLF1E100MCL2 |
|                            |                      | 22                        | □ 8 × 7                  | 0.12  | 275                     | 50                           | 1800                    | PLF1E220MCL7 |
|                            |                      | 47                        | △ 10 × 13                | 0.12  | 588                     | 30                           | 3000                    | PLF1E470MDO2 |
|                            |                      | 56                        | △ 10 × 13                | 0.12  | 700                     | 28                           | 3800                    | PLF1E560MDO2 |

\* Parts with 5000h guaranteed life are also available upon request.

Rated ripple current (mArms) at 105°C 100kHz

No marked, [1] will be put at 12th digit of type numbering system.  
 △ : In this case, [2] will be put at 12th digit of type numbering system.  
 ■ : In this case, [4] will be put at 12th digit of type numbering system.  
 ▲ : In this case, [6] will be put at 12th digit of type numbering system.  
 □ : In this case, [7] will be put at 12th digit of type numbering system.  
 ○ : In this case, [8] will be put at 12th digit of type numbering system.

- Please refer to page 20, 21, 22 about the formed or taped product spec.
- Please refer to page 3 for the minimum order quantity.

CAT.8100C-1