



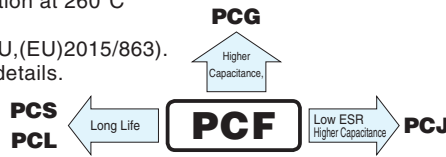
**THE DATASHEET OF  
PCF1E6R8MCL1GS**



# PCF Chip Type, Standard



- Low ESR, High ripple current.
- Load life of 2000 hours at 105°C.
- SMD type : Lead free reflow soldering condition at 260°C peak correspondence.
- Compliant to the RoHS directive (2011/65/EU,(EU)2015/863).
- AEC-Q200 Qualified. Please contact us for details.

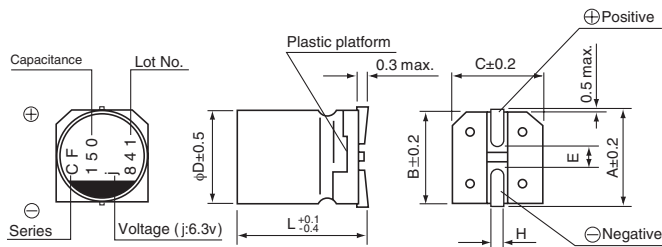


## Specifications

| 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) | $Z(+105^{\circ}\text{C}) / Z(+20^{\circ}\text{C}) \leq 1.25$ (100kHz)<br>$Z(-55^{\circ}\text{C}) / Z(+20^{\circ}\text{C}) \leq 1.25$   |                       |   |
| 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, the capacitor shall meet the specifications listed at right.<br>Pre-heating shall be done at 150 to 200°C and for 60 to 180 sec. The duration for over +230°C temperature at capacitor surface shall not exceed 60 seconds.<br>In case peak temperature is 250°C or less, reflow soldering shall be two times maximum.<br>In case peak temperature is 260°C or less, reflow soldering shall be once.<br>Measurement for solder temperature profile shall be made at the capacitor top. | 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 where the terminals protrude through the plastic platform.  
 ※ 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.

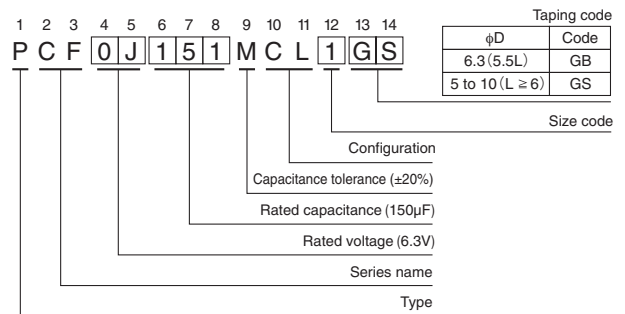
## Dimensions



| Size | φ5 × 6L    | φ6.3 × 5.5L | φ6.3 × 6L  | φ8 × 7L    | φ8 × 12L   | φ10 × 8L   | φ10 × 10L  | φ10 × 12.7L |
|------|------------|-------------|------------|------------|------------|------------|------------|-------------|
| φD   | 5.0        | 6.3         | 6.3        | 8.0        | 8.0        | 10.0       | 10.0       | 10.0        |
| L    | 5.9        | 5.4         | 5.9        | 6.9        | 11.9       | 7.9        | 9.9        | 12.6        |
| A    | 6.0        | 7.3         | 7.3        | 9.0        | 9.0        | 11.0       | 11.0       | 11.0        |
| B    | 5.3        | 6.6         | 6.6        | 8.3        | 8.3        | 10.3       | 10.3       | 10.3        |
| C    | 5.3        | 6.6         | 6.6        | 8.3        | 8.3        | 10.3       | 10.3       | 10.3        |
| E    | 1.6        | 2.1         | 2.1        | 3.2        | 3.2        | 4.6        | 4.6        | 4.6         |
| H    | 0.5 to 0.8 | 0.5 to 0.8  | 0.5 to 0.8 | 0.8 to 1.1 | 0.8 to 1.1 | 0.8 to 1.1 | 0.8 to 1.1 | 0.8 to 1.1  |

● Dimension table in next page.

## Type numbering system (Example : 6.3V 150μF)



## Voltage

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

## Frequency coefficient of rated ripple current

|             |       |      |       |                |
|-------------|-------|------|-------|----------------|
| Frequency   | 120Hz | 1kHz | 10kHz | 100kHz or more |
| Coefficient | 0.05  | 0.30 | 0.70  | 1.00           |

# PCF

■ Dimensions

| Rated Voltage (V) (code) | Surge Voltage (V) | Rated Capacitance (μF) | Case Size φD × L (mm) | tan δ | Leakage Current (μA) (at 20°C after 2 minutes) | ESR (mΩ) (20°C/100kHz) | Rated Ripple (mArms) (105°C/100kHz) | Part Number    |
|--------------------------|-------------------|------------------------|-----------------------|-------|--|------------------------|-------------------------------------|----------------|
| 2.5 (0E)                 | 2.8               | 100                    | 6.3 × 6               | 0.12  | 100  | 22                     | 2600                                | PCF0E101MCL1GS |
|                          |                   | 220                    | ■ 6.3 × 5.5           | 0.12  | 110  | 20                     | 2800                                | PCF0E221MCL4GB |
|                          |                   | 220                    | 6.3 × 6               | 0.12  | 110  | 20                     | 2800                                | PCF0E221MCL1GS |
|                          |                   | 470                    | 8 × 7                 | 0.12  | 235  | 20                     | 3300                                | PCF0E471MCL1GS |
|                          |                   | 820                    | 10 × 8                | 0.12  | 410  | 17                     | 4400                                | PCF0E821MCL1GS |
|                          |                   | 1500                   | 10 × 10               | 0.12  | 750  | 13                     | 4700                                | PCF0E152MCL1GS |
| 4 (0G)                   | 4.6               | 100                    | ■ 6.3 × 5.5           | 0.12  | 100  | 22                     | 2600                                | PCF0G101MCL4GB |
|                          |                   | 100                    | 6.3 × 6               | 0.12  | 80   | 22                     | 2600                                | PCF0G101MCL1GS |
|                          |                   | 150                    | ■ 6.3 × 5.5           | 0.12  | 120  | 22                     | 2800                                | PCF0G151MCL4GB |
|                          |                   | 150                    | ▲ 5 × 6               | 0.12  | 300  | 30                     | 2000                                | PCF0G151MCL6GS |
|                          |                   | 150                    | 6.3 × 6               | 0.12  | 120  | 22                     | 2800                                | PCF0G151MCL1GS |
|                          |                   | 220                    | 8 × 7                 | 0.12  | 176  | 21                     | 3200                                | PCF0G221MCL1GS |
|                          |                   | 330                    | 8 × 7                 | 0.12  | 264  | 21                     | 3400                                | PCF0G331MCL1GS |
|                          |                   | 470                    | 10 × 8                | 0.12  | 376  | 17                     | 4200                                | PCF0G471MCL1GS |
|                          |                   | 560                    | ■ 8 × 12              | 0.12  | 448  | 13                     | 4520                                | PCF0G561MCL4GS |
|                          |                   | 680                    | 10 × 8                | 0.12  | 544  | 17                     | 4400                                | PCF0G681MCL1GS |
| 6.3 (0J)                 | 7.2               | 820                    | 10 × 10               | 0.12  | 656  | 13                     | 4800                                | PCF0G821MCL1GS |
|                          |                   | 1200                   | 10 × 12.7             | 0.12  | 960  | 10                     | 5500                                | PCF0G122MCL1GS |
|                          |                   | 47                     | 5 × 6                 | 0.12  | 148  | 35                     | 1600                                | PCF0J470MCL1GS |
|                          |                   | 82                     | ■ 6.3 × 5.5           | 0.12  | 103  | 23                     | 2600                                | PCF0J820MCL4GB |
|                          |                   | 82                     | 6.3 × 6               | 0.12  | 103  | 23                     | 2600                                | PCF0J820MCL1GS |
|                          |                   | 100                    | ■ 6.3 × 5.5           | 0.12  | 126  | 23                     | 2800                                | PCF0J101MCL4GB |
|                          |                   | 100                    | ▲ 5 × 6               | 0.12  | 315  | 25                     | 2200                                | PCF0J101MCL6GS |
|                          |                   | 100                    | 6.3 × 6               | 0.12  | 126  | 23                     | 2800                                | PCF0J101MCL1GS |
|                          |                   | 120                    | 6.3 × 6               | 0.12  | 151  | 23                     | 3000                                | PCF0J121MCL1GS |
|                          |                   | 150                    | 8 × 7                 | 0.12  | 189  | 22                     | 3200                                | PCF0J151MCL1GS |
|                          |                   | 220                    | 8 × 7                 | 0.12  | 277  | 22                     | 3400                                | PCF0J221MCL1GS |
|                          |                   | 330                    | 10 × 8                | 0.12  | 416  | 18                     | 4200                                | PCF0J331MCL1GS |
|                          |                   | 470                    | ■ 8 × 12              | 0.12  | 592  | 12                     | 5300                                | PCF0J471MCL4GS |
|                          |                   | 470                    | ▲ 10 × 8              | 0.12  | 592  | 18                     | 4300                                | PCF0J471MCL6GS |
| 10 (1A)                  | 11.5              | 470                    | 10 × 10               | 0.12  | 592  | 16                     | 4600                                | PCF0J471MCL1GS |
|                          |                   | 680                    | 10 × 10               | 0.12  | 857  | 14                     | 5000                                | PCF0J681MCL1GS |
|                          |                   | 680                    | ● 10 × 12.7           | 0.12  | 857  | 10                     | 5500                                | PCF0J681MCL9GS |
|                          |                   | 820                    | 10 × 12.7             | 0.12  | 1033   | 10                     | 5800                                | PCF0J821MCL1GS |
|                          |                   | 33                     | 5 × 6                 | 0.12  | 165  | 35                     | 1500                                | PCF1A330MCL1GS |
|                          |                   | 47                     | ▲ 5 × 6               | 0.12  | 235  | 26                     | 2600                                | PCF1A470MCL6GS |
|                          |                   | 47                     | 6.3 × 6               | 0.12  | 94   | 26                     | 2600                                | PCF1A470MCL1GS |
|                          |                   | 56                     | ■ 6.3 × 5.5           | 0.12  | 112  | 25                     | 2500                                | PCF1A560MCL4GB |
|                          |                   | 56                     | 6.3 × 6               | 0.12  | 112  | 25                     | 2500                                | PCF1A560MCL1GS |
|                          |                   | 120                    | 8 × 7                 | 0.12  | 240  | 23                     | 3000                                | PCF1A121MCL1GS |
|                          |                   | 150                    | ▲ 8 × 7               | 0.12  | 300  | 23                     | 3200                                | PCF1A151MCL6GS |
|                          |                   | 150                    | 10 × 8                | 0.12  | 300  | 21                     | 3300                                | PCF1A151MCL1GS |
|                          |                   | 270                    | ■ 8 × 12              | 0.12  | 540  | 13                     | 4500                                | PCF1A271MCL4GS |
|                          |                   | 270                    | 10 × 8                | 0.12  | 540  | 20                     | 3600                                | PCF1A271MCL1GS |
| 330                      | ■ 8 × 12          | 0.12                   | 660                   | 14    | 4000   | PCF1A331MCL4GS         |                                     |                |
| 330                      | 10 × 8            | 0.12                   | 660                   | 20    | 3700   | PCF1A331MCL1GS         |                                     |                |
| 470                      | 10 × 10           | 0.12                   | 940                   | 16    | 4600   | PCF1A471MCL1GS         |                                     |                |
| 470                      | ● 10 × 12.7       | 0.12                   | 940                   | 12    | 5300   | PCF1A471MCL9GS         |                                     |                |
| 560                      | 10 × 10           | 0.12                   | 1120                  | 15    | 4800   | PCF1A561MCL1GS         |                                     |                |
| 560                      | ● 10 × 12.7       | 0.12                   | 1120                  | 13    | 5230   | PCF1A561MCL9GS         |                                     |                |

# PCF

## ■ Dimensions



| Rated Voltage (V) (code) | Surge Voltage (V) | Rated Capacitance (μF) | Case Size φD × L (mm) | tan δ | Leakage Current (μA) (at 20°C after 2 minutes) | ESR (mΩ) (20°C/100kHz) | Rated Ripple (mArms) (105°C/100kHz) | Part Number    |
|--------------------------|-------------------|------------------------|-----------------------|-------|--|------------------------|-------------------------------------|----------------|
| 16 (1C)                  | 18.4              | 22                     | 5 × 6                 | 0.12  | 176  | 45                     | 1210                                | PCF1C220MCL1GS |
|                          |                   | 33                     | 6.3 × 6               | 0.12  | 106  | 31                     | 2400                                | PCF1C330MCL1GS |
|                          |                   | 39                     | ■ 6.3 × 5.5           | 0.12  | 125  | 31                     | 2400                                | PCF1C390MCL4GB |
|                          |                   | 39                     | 6.3 × 6               | 0.12  | 125  | 31                     | 2400                                | PCF1C390MCL1GS |
|                          |                   | 56                     | 8 × 7                 | 0.12  | 179  | 30                     | 2900                                | PCF1C560MCL1GS |
|                          |                   | 82                     | 8 × 7                 | 0.12  | 262  | 28                     | 3200                                | PCF1C820MCL1GS |
|                          |                   | 100                    | 10 × 8                | 0.12  | 320  | 27                     | 3300                                | PCF1C101MCL1GS |
|                          |                   | 150                    | 10 × 8                | 0.12  | 480  | 25                     | 3500                                | PCF1C151MCL1GS |
|                          |                   | 180                    | ■ 8 × 12              | 0.12  | 576  | 16                     | 4400                                | PCF1C181MCL4GS |
|                          |                   | 180                    | 10 × 8                | 0.12  | 576  | 25                     | 3600                                | PCF1C181MCL1GS |
|                          |                   | 220                    | 10 × 10               | 0.12  | 704  | 20                     | 3900                                | PCF1C221MCL1GS |
| 220                      | ● 10 × 12.7       | 0.12                   | 704                   | 14    | 5050   | PCF1C221MCL9GS         |                                     |                |
| 330                      | 10 × 12.7         | 0.12                   | 1056                  | 14    | 5000   | PCF1C331MCL1GS         |                                     |                |
| 20 (1D)                  | 23                | 10                     | 5 × 6                 | 0.12  | 100  | 120                    | 900                                 | PCF1D100MCL1GS |
|                          |                   | 22                     | ■ 6.3 × 5.5           | 0.12  | 100  | 50                     | 1700                                | PCF1D220MCL4GB |
|                          |                   | 22                     | 6.3 × 6               | 0.12  | 88   | 50                     | 1700                                | PCF1D220MCL1GS |
|                          |                   | 39                     | 8 × 7                 | 0.12  | 156  | 45                     | 2000                                | PCF1D390MCL1GS |
|                          |                   | 47                     | 8 × 7                 | 0.12  | 188  | 45                     | 2000                                | PCF1D470MCL1GS |
|                          |                   | 56                     | 10 × 8                | 0.12  | 224  | 40                     | 2400                                | PCF1D560MCL1GS |
|                          |                   | 68                     | 10 × 8                | 0.12  | 272  | 40                     | 2600                                | PCF1D680MCL1GS |
|                          |                   | 82                     | 10 × 8                | 0.12  | 328  | 40                     | 2600                                | PCF1D820MCL1GS |
|                          |                   | 100                    | 8 × 12                | 0.12  | 400  | 22                     | 3200                                | PCF1D101MCL1GS |
|                          |                   | 120                    | 10 × 10               | 0.12  | 480  | 35                     | 2800                                | PCF1D121MCL1GS |
| 150                      | 10 × 12.7         | 0.12                   | 600                   | 20    | 4320   | PCF1D151MCL1GS         |                                     |                |
| 25 (1E)                  | 28.7              | 6.8                    | 6.3 × 6               | 0.12  | 85   | 80                     | 1200                                | PCF1E6R8MCL1GS |
|                          |                   | 10                     | 8 × 7                 | 0.12  | 125  | 60                     | 1600                                | PCF1E100MCL1GS |
|                          |                   | 22                     | 10 × 8                | 0.12  | 275  | 50                     | 2200                                | PCF1E220MCL1GS |
|                          |                   | 33                     | 8 × 12                | 0.12  | 413  | 30                     | 2800                                | PCF1E330MCL1GS |
|                          |                   | 47                     | ■ 8 × 12              | 0.12  | 588  | 30                     | 3000                                | PCF1E470MCL4GS |
|                          |                   | 47                     | 10 × 10               | 0.12  | 588  | 45                     | 2400                                | PCF1E470MCL1GS |
| 56                       | 10 × 12.7         | 0.12                   | 700                   | 28    | 3800   | PCF1E560MCL1GS         |                                     |                |

No marked, [1] 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, [9] will be put at 12th digit of type numbering system.







• For taping specifications, recommended land size/soldering by reflow and minimum order quantity, please refer to the Guidelines for Aluminum Electrolytic Capacitors.

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