

CR series Chip Type, High Reliability



NEW

- High reliability, High voltage (to 100V).
- Low ESR, High ripple current.
- Long life of 4000 hours at 125°C.
- SMD type : Lead free reflow soldering condition at 260°C peak complete correspondence.
- Adapted to the RoHS directive (2011/65/EU).
- Added ESR specification after the test at -40°C.

CR ← High Capacitance Long Life Assurance → **CX**

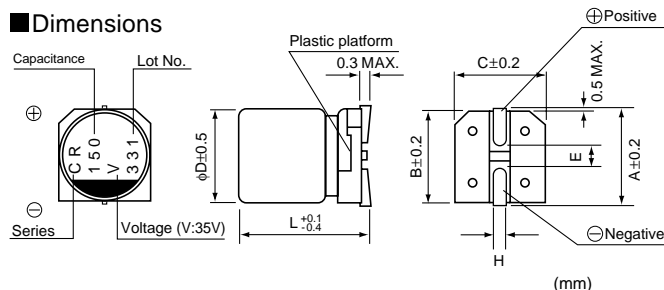


Specifications

| Item | Performance Characteristics | | | | | | | | | |
|---|---|--|--------------------|---|-------|---|-----------|---|-----------------------|---|
| Category Temperature Range | -55 to +125°C | | | | | | | | | |
| Rated Voltage Range | 6.3 to 100V | | | | | | | | | |
| Rated Capacitance Range | 5.6 to 2700µF | | | | | | | | | |
| 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) | After 2 minutes' application of rated voltage, leakage current is not more than 0.03CV or 3(µA), whichever is greater. | | | | | | | | | |
| Temperature Characteristics (Max.Impedance Ratio) | $Z+125^{\circ}\text{C} / Z+20^{\circ}\text{C} \leq 1.25$ (100kHz) $Z-55^{\circ}\text{C} / Z+20^{\circ}\text{C} \leq 1.25$ | | | | | | | | | |
| Endurance | The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 4000 hours at 125°C, the peak voltage shall not exceed the rated voltage. | <table border="1"> <tr><td>Capacitance change</td><td>Within ± 20% of initial capacitance value (※ 3)</td></tr> <tr><td>tan δ</td><td>150% or less of the initial specified value</td></tr> <tr><td>ESR (※ 1)</td><td>150% or less of the initial specified value</td></tr> <tr><td>Leakage current (※ 2)</td><td>Less than or equal to the initial specified value</td></tr> </table> | Capacitance change | Within ± 20% of initial capacitance value (※ 3) | tan δ | 150% or less of the initial specified value | ESR (※ 1) | 150% or less of the initial specified value | Leakage current (※ 2) | Less than or equal to the initial specified value |
| Capacitance change | Within ± 20% of initial capacitance value (※ 3) | | | | | | | | | |
| tan δ | 150% or less of the initial specified value | | | | | | | | | |
| ESR (※ 1) | 150% or less of the initial specified value | | | | | | | | | |
| Leakage current (※ 2) | Less than or equal to the initial specified value | | | | | | | | | |
| Shelf Life | 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 85°C, 85% RH. | | | | | | | | | |
| ESR after Endurance (※ 1) | Less than or equal to the specified value at 100kHz, -40°C | | | | | | | | | |
| 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 85°C, 85% RH. | <table border="1"> <tr><td>Capacitance change</td><td>Within ± 20% of initial capacitance value (※ 3)</td></tr> <tr><td>tan δ</td><td>150% or less of the initial specified value</td></tr> <tr><td>ESR (※ 1)</td><td>150% or less of the initial specified value</td></tr> <tr><td>Leakage current (※ 2)</td><td>Less than or equal to the initial specified value</td></tr> </table> | Capacitance change | Within ± 20% of initial capacitance value (※ 3) | tan δ | 150% or less of the initial specified value | ESR (※ 1) | 150% or less of the initial specified value | Leakage current (※ 2) | Less than or equal to the initial specified value |
| Capacitance change | Within ± 20% of initial capacitance value (※ 3) | | | | | | | | | |
| tan δ | 150% or less of the initial specified value | | | | | | | | | |
| ESR (※ 1) | 150% or less of 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, provided that it's temperature profile is measured at the capacitor top and the terminal. 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. In the case of peak temp, less than 250°C, reflow soldering shall be two times maximum. In the case of peak temp, less than 260°C, reflow soldering shall be once. Measurement for solder temperature profile shall be made at the capacitor top and the terminal. | <table border="1"> <tr><td>Capacitance change</td><td>Within ± 10% of the initial capacitance value (※ 3)</td></tr> <tr><td>tan δ</td><td>130% or less than the initial specified value</td></tr> <tr><td>ESR (※ 1)</td><td>130% or less than the initial specified value</td></tr> <tr><td>Leakage current (※ 2)</td><td>Less than or equal to the initial specified value</td></tr> </table> | 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 |
| 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 | | | | | | | | | |

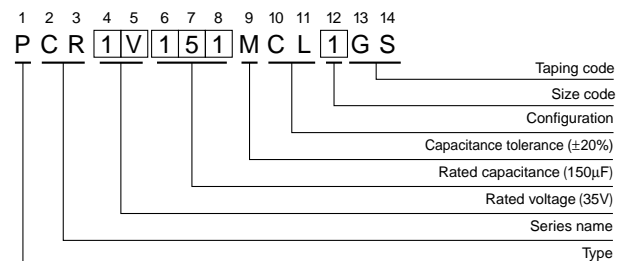
- ※ 1 ESR should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform.
- ※ 2 Conditioning : If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105°C.
- ※ 3 Initial value : The value before test of examination of resistance to soldering.

Dimensions



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

Type numbering system (Example : 35V 150µF)



※φ6.3×8L, φ8×7L, φ8×10L, φ10×10L : The vibration structure-resistant product is also available upon request, please ask for detail.

Voltage

| | | | | | | | | | | |
|------|-----|----|----|----|----|----|----|----|----|-----|
| V | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 | 63 | 80 | 100 |
| Code | j | A | C | D | E | V | H | J | K | 2A |

● Dimension table in next page.



■ Standard Ratings

| Rated Voltage (V)(code) | Surge Voltage (V) | Rated Capacitance (μF) | Case Size φD × L (mm) | tan δ | Initial ESR (mΩ) (20°C / 100kHz) | Low temp. ESR after Endurance (mΩ) (-40°C / 100kHz) | Rated Ripple (mArms) (125°C / 100kHz) | Part Number |
|-------------------------|-------------------|------------------------|-----------------------|-------|----------------------------------|---|---------------------------------------|----------------|
| 6.3 (0J) | 8 | 180 | 5 × 6 | 0.10 | 55 | 83 | 900 | PCR0J181MCL1GS |
| | | 330 | 6.3 × 6 | 0.10 | 32 | 48 | 1500 | PCR0J331MCL1GS |
| | | 560 | ■ 6.3 × 8 | 0.10 | 20 | 30 | 1800 | PCR0J561MCL4GS |
| | | 560 | 8 × 7 | 0.10 | 25 | 38 | 1600 | PCR0J561MCL1GS |
| | | 1000 | 8 × 10 | 0.10 | 15 | 23 | 3700 | PCR0J102MCL1GS |
| | | 1200 | 10 × 8 | 0.10 | 18 | 27 | 3000 | PCR0J122MCL1GS |
| | | 1500 | 8 × 12 | 0.10 | 14 | 21 | 4000 | PCR0J152MCL1GS |
| | | 1800 | 10 × 10 | 0.10 | 15 | 23 | 3600 | PCR0J182MCL1GS |
| | 13 | 2700 | 10 × 12.7 | 0.10 | 11 | 17 | 4700 | PCR0J272MCL1GS |
| | | 120 | 5 × 6 | 0.10 | 60 | 90 | 800 | PCR1A121MCL1GS |
| | | 180 | 6.3 × 6 | 0.10 | 34 | 51 | 1400 | PCR1A181MCL1GS |
| | | 330 | ■ 6.3 × 8 | 0.10 | 22 | 33 | 1700 | PCR1A331MCL4GS |
| | | 330 | 8 × 7 | 0.10 | 28 | 42 | 1600 | PCR1A331MCL1GS |
| | | 680 | ▲ 8 × 10 | 0.10 | 16 | 24 | 3500 | PCR1A681MCL6GS |
| | | 680 | 10 × 8 | 0.10 | 20 | 30 | 2900 | PCR1A681MCL1GS |
| | | 1000 | 8 × 12 | 0.10 | 15 | 23 | 3800 | PCR1A102MCL1GS |
| | 20 | 1200 | 10 × 10 | 0.10 | 17 | 26 | 3400 | PCR1A122MCL1GS |
| | | 1500 | 10 × 12.7 | 0.10 | 12 | 18 | 4500 | PCR1A152MCL1GS |
| | | 68 | 5 × 6 | 0.08 | 65 | 98 | 800 | PCR1C680MCL1GS |
| | | 120 | 6.3 × 6 | 0.08 | 36 | 54 | 1300 | PCR1C121MCL1GS |
| | | 220 | ■ 6.3 × 8 | 0.08 | 23 | 35 | 1700 | PCR1C221MCL4GS |
| | | 220 | 8 × 7 | 0.08 | 30 | 45 | 1500 | PCR1C221MCL1GS |
| | | 470 | ▲ 8 × 10 | 0.08 | 17 | 26 | 3400 | PCR1C471MCL6GS |
| | | 470 | 10 × 8 | 0.08 | 22 | 33 | 2700 | PCR1C471MCL1GS |
| | 25 | 560 | 8 × 12 | 0.08 | 16 | 24 | 3800 | PCR1C561MCL1GS |
| | | 680 | 10 × 10 | 0.08 | 19 | 29 | 3200 | PCR1C681MCL1GS |
| | | 1000 | 10 × 12.7 | 0.08 | 13 | 20 | 4300 | PCR1C102MCL1GS |
| | | 56 | 5 × 6 | 0.08 | 70 | 105 | 700 | PCR1D560MCL1GS |
| | | 100 | 6.3 × 6 | 0.08 | 41 | 62 | 1300 | PCR1D101MCL1GS |
| | | 150 | ■ 6.3 × 8 | 0.08 | 25 | 38 | 1700 | PCR1D151MCL4GS |
| | | 150 | 8 × 7 | 0.08 | 39 | 59 | 1200 | PCR1D151MCL1GS |
| | | 330 | ▲ 8 × 10 | 0.08 | 19 | 29 | 3300 | PCR1D331MCL6GS |
| | 31 | 330 | 10 × 8 | 0.08 | 23 | 35 | 2600 | PCR1D331MCL1GS |
| | | 470 | 8 × 12 | 0.08 | 18 | 27 | 3500 | PCR1D471MCL1GS |
| | | 560 | 10 × 10 | 0.08 | 20 | 30 | 3100 | PCR1D561MCL1GS |
| | | 680 | 10 × 12.7 | 0.08 | 14 | 21 | 4200 | PCR1D681MCL1GS |
| | | 33 | 5 × 6 | 0.08 | 75 | 113 | 700 | PCR1E330MCL1GS |
| | | 56 | 6.3 × 6 | 0.08 | 43 | 65 | 1300 | PCR1E560MCL1GS |
| | | 100 | ■ 6.3 × 8 | 0.08 | 27 | 41 | 1600 | PCR1E101MCL4GS |
| | | 100 | 8 × 7 | 0.08 | 41 | 62 | 1200 | PCR1E101MCL1GS |
| | 43 | 220 | ▲ 8 × 10 | 0.08 | 20 | 30 | 3200 | PCR1E221MCL6GS |
| | | 220 | 10 × 8 | 0.08 | 24 | 36 | 2500 | PCR1E221MCL1GS |
| | | 270 | 8 × 12 | 0.08 | 19 | 29 | 3300 | PCR1E271MCL1GS |
| | | 330 | 10 × 10 | 0.08 | 20 | 30 | 3100 | PCR1E331MCL1GS |
| | | 470 | 10 × 12.7 | 0.08 | 15 | 23 | 4100 | PCR1E471MCL1GS |
| | | 27 | 5 × 6 | 0.08 | 80 | 120 | 600 | PCR1V270MCL1GS |
| | | 47 | 6.3 × 6 | 0.08 | 48 | 72 | 1100 | PCR1V470MCL1GS |
| | | 68 | ■ 6.3 × 8 | 0.08 | 31 | 47 | 1500 | PCR1V680MCL4GS |
| | 43 | 68 | 8 × 7 | 0.08 | 44 | 66 | 1200 | PCR1V680MCL1GS |
| | | 150 | ▲ 8 × 10 | 0.08 | 22 | 33 | 3100 | PCR1V151MCL6GS |
| | | 150 | 10 × 8 | 0.08 | 25 | 38 | 2500 | PCR1V151MCL1GS |
| | | 220 | 8 × 12 | 0.08 | 21 | 32 | 3300 | PCR1V221MCL1GS |
| | | 270 | 10 × 10 | 0.08 | 20 | 30 | 3100 | PCR1V271MCL1GS |
| | | 330 | 10 × 12.7 | 0.08 | 16 | 24 | 3900 | PCR1V331MCL1GS |



■ Standard Ratings

| Rated Voltage (V)(code) | Surge Voltage (V) | Rated Capacitance (μF) | Case Size φD × L (mm) | tan δ | Initial ESR (mΩ) (20°C / 100kHz) | Low temp. ESR after Endurance (mΩ) (-40°C / 100kHz) | Rated Ripple (mArms) | Part Number |
|-------------------------|-------------------|------------------------|-----------------------|-------|----------------------------------|---|----------------------|----------------|
| 50 (1H) | 63 | 12 | 5 × 6 | 0.08 | 88 | 132 | 600 | PCR1H120MCL1GS |
| | | 22 | 6.3 × 6 | 0.08 | 50 | 75 | 1000 | PCR1H220MCL1GS |
| | | 39 | ■ 6.3 × 8 | 0.08 | 36 | 54 | 1300 | PCR1H390MCL4GS |
| | | 39 | 8 × 7 | 0.08 | 45 | 68 | 1300 | PCR1H390MCL1GS |
| | | 82 | ▲ 8 × 10 | 0.08 | 26 | 39 | 2900 | PCR1H820MCL6GS |
| | | 82 | 10 × 8 | 0.08 | 34 | 51 | 2200 | PCR1H820MCL1GS |
| | | 120 | △ 8 × 12 | 0.08 | 25 | 38 | 2900 | PCR1H121MCL2GS |
| | | 120 | 10 × 10 | 0.08 | 25 | 38 | 3000 | PCR1H121MCL1GS |
| 63 (1J) | 79 | 6.8 | 5 × 6 | 0.08 | 92 | 138 | 600 | PCR1J68MCL1GS |
| | | 12 | 6.3 × 6 | 0.08 | 51 | 77 | 1000 | PCR1J120MCL1GS |
| | | 22 | ■ 6.3 × 8 | 0.08 | 45 | 68 | 1200 | PCR1J220MCL4GS |
| | | 22 | 8 × 7 | 0.08 | 48 | 72 | 1100 | PCR1J220MCL1GS |
| | | 39 | 8 × 10 | 0.08 | 28 | 42 | 2700 | PCR1J390MCL1GS |
| | | 47 | 10 × 8 | 0.08 | 35 | 53 | 2100 | PCR1J470MCL1GS |
| | | 56 | 8 × 12 | 0.08 | 27 | 41 | 2900 | PCR1J560MCL1GS |
| | | 68 | 10 × 10 | 0.08 | 28 | 42 | 2800 | PCR1J680MCL1GS |
| 80 (1K) | 100 | 12 | 6.3 × 8 | 0.08 | 50 | 75 | 1200 | PCR1K120MCL1GS |
| | | 27 | 8 × 10 | 0.08 | 38 | 57 | 1400 | PCR1K270MCL1GS |
| | | 39 | 8 × 12 | 0.08 | 35 | 53 | 1600 | PCR1K390MCL1GS |
| | | 47 | 10 × 10 | 0.08 | 33 | 50 | 1700 | PCR1K470MCL1GS |
| | | 68 | 10 × 12.7 | 0.08 | 28 | 42 | 2100 | PCR1K680MCL1GS |
| 100 (2A) | 125 | 5.6 | 6.3 × 8 | 0.08 | 55 | 83 | 1100 | PCR2A5R6MCL1GS |
| | | 12 | 8 × 10 | 0.08 | 45 | 68 | 1200 | PCR2A120MCL1GS |
| | | 18 | 8 × 12 | 0.08 | 42 | 63 | 1500 | PCR2A180MCL1GS |
| | | 22 | 10 × 10 | 0.08 | 39 | 59 | 1600 | PCR2A220MCL1GS |
| | | 33 | 10 × 12.7 | 0.08 | 28 | 42 | 2100 | PCR2A330MCL1GS |

Rated ripple current (mArms) at 125°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.

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.

Mouser Electronics

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