

PCR

Chip Type, High Reliability



- High reliability, High voltage (to 80V).
- 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.
- Compliant to the RoHS directive (2011/65/EU,(EU)2015/863).
- ESR after Endurance at -40°C.
- AEC-Q200 compliant. Please contact us for details.

■ Specifications

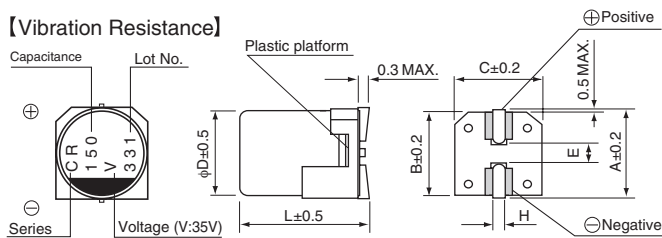
| Item | Performance Characteristics | | | | | | | | |
|---|--|--------------------|--|-------|---|----------|---|----------------------|---|
| Category Temperature Range | -55 to +125°C | | | | | | | | |
| Rated Voltage Range | 16 to 80V | | | | | | | | |
| Rated Capacitance Range | 22 to 1000μF | | | | | | | | |
| 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°C / Z+20°C ≤ 1.25 (100kHz) 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 4000 hours at 125°C. <table border="1" style="float: right;"> <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>200% 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) | 200% 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) | 200% or less of the initial specified value | | | | | | | | |
| Leakage current (*2) | Less than or equal to the initial specified value | | | | | | | | |
| Shelf Life | After storing the capacitors under no load at 125°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above. | | | | | | | | |
| 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" style="float: right;"> <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>200% 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) | 200% 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) | 200% 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. 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 case peak temperature is 260°C or less, reflow soldering shall be two times maximum. Measurement for solder temperature profile shall be made at the capacitor top. <table border="1" style="float: right;"> <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 [Standard]



■ Dimensions [Vibration Resistance]



Type numbering system (Example : 35V 150μF)



| Standard (mm) | | | | | | Vibration Resistance (mm) | | | | |
|---------------|------------|------------|------------|------------|------------|---------------------------|------|------------|------------|------------|
| Size | φ8×7L | φ8×10L | φ8×12L | φ10×8L | φ10×10L | φ10×12.7L | Size | φ8×10.5L | φ10×10.5L | φ10×13.2L |
| φD | 8.0 | 8.0 | 8.0 | 10.0 | 10.0 | 10.0 | φD | 8.0 | 10.0 | 10.0 |
| L | 6.9 | 9.9 | 11.9 | 7.9 | 9.9 | 12.6 | L | 10.0 | 10.0 | 12.7 |
| A | 9.0 | 9.0 | 9.0 | 11.0 | 11.0 | 11.0 | A | 9.0 | 11.0 | 11.0 |
| B | 8.3 | 8.3 | 8.3 | 10.3 | 10.3 | 10.3 | B | 8.3 | 10.3 | 10.3 |
| C | 8.3 | 8.3 | 8.3 | 10.3 | 10.3 | 10.3 | C | 8.3 | 10.3 | 10.3 |
| E | 3.2 | 3.2 | 3.2 | 4.6 | 4.6 | 4.6 | E | 3.1 | 4.6 | 4.6 |
| H | 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 | H | 1.1 to 1.5 | 1.1 to 1.5 | 1.1 to 1.5 |

| Voltage | | | | | | | Frequency coefficient of rated ripple current | | | | | |
|---------|----|----|----|----|----|----|---|-------------|-------|------|-------|----------------|
| V | 16 | 20 | 25 | 35 | 50 | 63 | 80 | Frequency | 120Hz | 1kHz | 10kHz | 100kHz or more |
| Code | C | D | E | V | H | J | K | Coefficient | 0.05 | 0.30 | 0.70 | 1.00 |

※ φ8×10L(φ8×10.5L), φ10×10L(φ10×10.5L), φ10×12.7L(φ10×13.2L) : The vibration structure-resistant product is also available upon request, please ask for details.
() : Size of the vibration structure-resistant product.

● Dimension table in next page.



■ Dimensions

| 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 (mAmps) (125°C / 100kHz) | Part Number |
|-------------------------|-------------------|------------------------|-----------------------|-------|----------------------------------|---|---------------------------------------|----------------|
| 16 (1C) | 20 | 220 | 8 × 7 | 0.08 | 30 | 60 | 1500 | PCR1C221MCL1GS |
| | | 470 | ▲ 8 × 10 | 0.08 | 17 | 34 | 3400 | PCR1C471MCL6GS |
| | | 470 | 10 × 8 | 0.08 | 32 | 64 | 2200 | PCR1C471MCL1GS |
| | | 560 | 8 × 12 | 0.08 | 16 | 32 | 3800 | PCR1C561MCL1GS |
| | | 680 | 10 × 10 | 0.08 | 19 | 38 | 3200 | PCR1C681MCL1GS |
| | | 1000 | 10 × 12.7 | 0.08 | 13 | 26 | 4300 | PCR1C102MCL1GS |
| 20 (1D) | 25 | 150 | 8 × 7 | 0.08 | 39 | 78 | 1200 | PCR1D151MCL1GS |
| | | 330 | ▲ 8 × 10 | 0.08 | 19 | 38 | 3300 | PCR1D331MCL6GS |
| | | 330 | 10 × 8 | 0.08 | 33 | 66 | 2100 | PCR1D331MCL1GS |
| | | 470 | 8 × 12 | 0.08 | 18 | 36 | 3500 | PCR1D471MCL1GS |
| | | 560 | 10 × 10 | 0.08 | 20 | 40 | 3100 | PCR1D561MCL1GS |
| | | 680 | 10 × 12.7 | 0.08 | 14 | 28 | 4200 | PCR1D681MCL1GS |
| 25 (1E) | 31 | 100 | 8 × 7 | 0.08 | 41 | 82 | 1200 | PCR1E101MCL1GS |
| | | 220 | ▲ 8 × 10 | 0.08 | 20 | 40 | 3200 | PCR1E221MCL6GS |
| | | 220 | 10 × 8 | 0.08 | 33 | 66 | 2100 | PCR1E221MCL1GS |
| | | 270 | 8 × 12 | 0.08 | 19 | 38 | 3300 | PCR1E271MCL1GS |
| | | 330 | 10 × 10 | 0.08 | 20 | 40 | 3100 | PCR1E331MCL1GS |
| | | 470 | 10 × 12.7 | 0.08 | 15 | 30 | 4100 | PCR1E471MCL1GS |
| 35 (1V) | 43 | 68 | 8 × 7 | 0.08 | 44 | 88 | 1200 | PCR1V680MCL1GS |
| | | 150 | ▲ 8 × 10 | 0.08 | 22 | 44 | 3100 | PCR1V151MCL6GS |
| | | 150 | 10 × 8 | 0.08 | 33 | 66 | 2100 | PCR1V151MCL1GS |
| | | 220 | 8 × 12 | 0.08 | 21 | 42 | 3300 | PCR1V221MCL1GS |
| | | 270 | 10 × 10 | 0.08 | 20 | 40 | 3100 | PCR1V271MCL1GS |
| | | 330 | 10 × 12.7 | 0.08 | 16 | 32 | 3900 | PCR1V331MCL1GS |
| 50 (1H) | 63 | 39 | 8 × 7 | 0.08 | 45 | 90 | 1300 | PCR1H390MCL1GS |
| | | 82 | ▲ 8 × 10 | 0.08 | 26 | 52 | 2900 | PCR1H820MCL6GS |
| | | 82 | 10 × 8 | 0.08 | 42 | 84 | 1900 | PCR1H820MCL1GS |
| | | 120 | △ 8 × 12 | 0.08 | 25 | 50 | 2900 | PCR1H121MCL2GS |
| | | 120 | 10 × 10 | 0.08 | 25 | 50 | 3000 | PCR1H121MCL1GS |
| | | 180 | 10 × 12.7 | 0.08 | 19 | 38 | 3500 | PCR1H181MCL1GS |
| 63 (1J) | 79 | 22 | 8 × 7 | 0.08 | 48 | 96 | 1100 | PCR1J220MCL1GS |
| | | 39 | 8 × 10 | 0.08 | 28 | 56 | 2700 | PCR1J390MCL1GS |
| | | 47 | 10 × 8 | 0.08 | 47 | 94 | 1800 | PCR1J470MCL1GS |
| | | 56 | 8 × 12 | 0.08 | 27 | 54 | 2900 | PCR1J560MCL1GS |
| | | 68 | 10 × 10 | 0.08 | 28 | 56 | 2800 | PCR1J680MCL1GS |
| | | 100 | 10 × 12.7 | 0.08 | 24 | 48 | 3000 | PCR1J101MCL1GS |
| 80 (1K) | 100 | 27 | 8 × 10 | 0.08 | 38 | 76 | 1400 | PCR1K270MCL1GS |
| | | 39 | 8 × 12 | 0.08 | 35 | 70 | 1600 | PCR1K390MCL1GS |
| | | 47 | 10 × 10 | 0.08 | 33 | 66 | 1700 | PCR1K470MCL1GS |
| | | 68 | 10 × 12.7 | 0.08 | 28 | 56 | 2100 | PCR1K680MCL1GS |

Rated ripple current (mAmps) 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, [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.