

**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.
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.
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.
Marking	Navy blue print on the case top

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

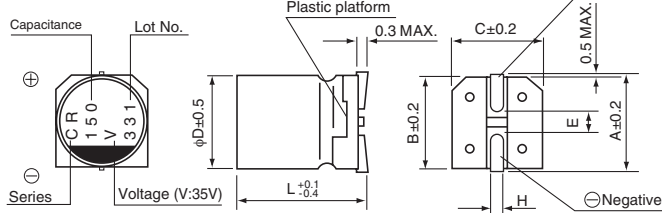
Capacitance change	Within ± 20% of initial capacitance value (*3)
tan δ	150% or less of the initial specified value
ESR (*1)	200% or less of the initial specified value
Leakage current (*2)	Less than or equal to the initial specified value

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

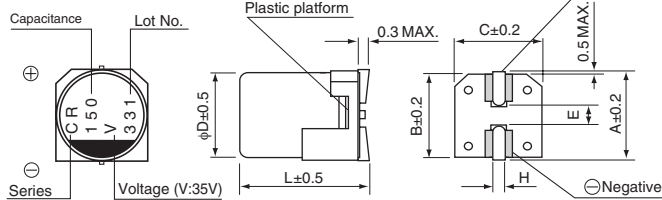
- \*1 ESR should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform.
- \*2 Conditioning : If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at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

■ Dimensions

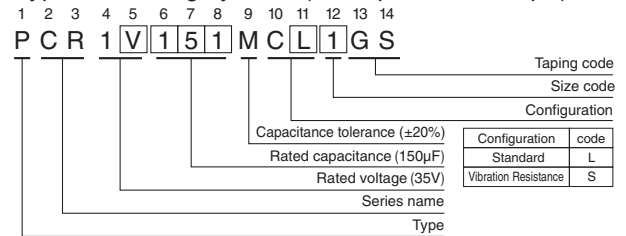
[Standard]



[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.

□ Aid electrode



■ 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.