

PCH Chip Type, Higher Capacitance
High Temperature Range



- High reliability, High voltage (to 80V).
- Low ESR, High ripple current.
- Long life of 4000 hours at 135°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 Qualified. Please contact us for details.

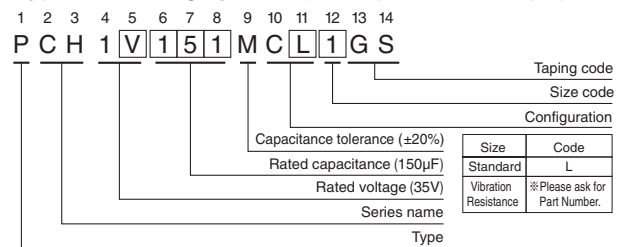
Specifications

Item	Performance Characteristics								
Category Temperature Range	-55 to +135°C								
Rated Voltage Range	16 to 80V								
Rated Capacitance Range	12 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. ※								
Temperature Characteristics (Max.Impedance Ratio)	$Z(-55^{\circ}\text{C}) / Z(+20^{\circ}\text{C}) \leq 1.25$ (100kHz)								
Endurance	<p>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 135°C.</p> <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>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 135°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)	<p>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 85°C, 85% RH.</p> <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>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	<p>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.</p> <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.

※ I : Leakage Current (μA), C : Rated Capacitance (μF), V : Rated Voltage (V)

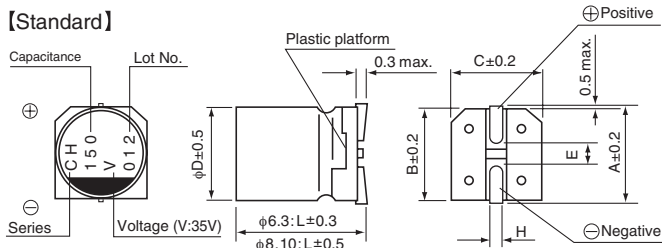
Type numbering system (Example : 35V 150μF)



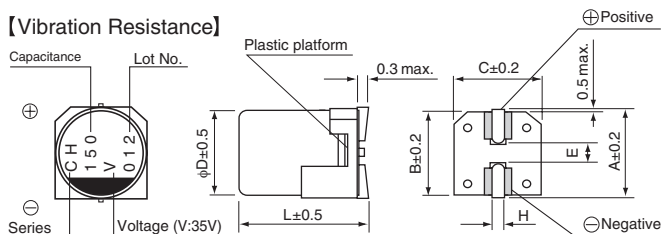
※ φ6.3×8L(φ6.3×8L), φ8×10L(φ8×10.5L), φ10×10L(φ10×10.5L), φ10×12.7L(φ10×13.2L) : The vibration structure-resistant product is also available upon request, please ask for details. () : Size of the vibration structure-resistant product.

Dimensions

[Standard]



[Vibration Resistance]



● Dimension table in next page.

Standard	(mm)							Vibration Resistance (mm)					
Size	φ6.3×6L	φ6.3×8L	φ8×7L	φ8×10L	φ8×12L	φ10×8L	φ10×10L	φ10×12.7L	Size	φ6.3×8L	φ8×10.5L	φ10×10.5L	φ10×13.2L
φD	6.3	6.3	8.0	8.0	8.0	10.0	10.0	10.0	φD	6.3	8.0	10.0	10.0
L	5.9	7.9	6.9	9.9	11.9	7.9	9.9	12.6	L	7.5	10.0	10.0	12.7
A	7.3	7.3	9.0	9.0	9.0	11.0	11.0	11.0	A	7.3	9.0	11.0	11.0
B	6.6	6.6	8.3	8.3	8.3	10.3	10.3	10.3	B	6.6	8.3	10.3	10.3
C	6.6	6.6	8.3	8.3	8.3	10.3	10.3	10.3	C	6.6	8.3	10.3	10.3
E	2.1	2.1	3.2	3.2	3.2	4.6	4.6	4.6	E	2.5	3.1	4.6	4.6
H	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	H	0.5 to 0.8	1.1 to 1.5	1.1 to 1.5	1.1 to 1.5

Voltage

V	16	20	25	35	50	63	80
Code	C	D	E	V	H	J	K

Frequency coefficient of rated ripple current

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



■ 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)	Initial ESR (mΩ) (20°C/100kHz)	Low temp. ESR after Endurance (mΩ) (-40°C /100kHz)	Rated Ripple (mArms) (135°C /100kHz)	Part Number
16 (1C)	20	120	6.3×6	0.08	57	36	72	900	PCH1C121MCL1GS
		220	■ 6.3×8	0.08	105	23	46	1500	PCH1C221MCL4GS
		220	8×7	0.08	105	30	60	1100	PCH1C221MCL1GS
		470	▲ 8×10	0.08	225	17	34	2400	PCH1C471MCL6GS
		470	10×8	0.08	225	22	44	1900	PCH1C471MCL1GS
		560	8×12	0.08	268	16	32	2700	PCH1C561MCL1GS
		680	10×10	0.08	326	19	38	2300	PCH1C681MCL1GS
		1000	10×12.7	0.08	480	13	26	2500	PCH1C102MCL1GS
20 (1D)	25	100	6.3×6	0.08	60	41	82	900	PCH1D101MCL1GS
		150	■ 6.3×8	0.08	90	25	50	1200	PCH1D151MCL4GS
		150	8×7	0.08	90	39	78	800	PCH1D151MCL1GS
		330	▲ 8×10	0.08	198	19	38	2300	PCH1D331MCL6GS
		330	10×8	0.08	198	23	46	1800	PCH1D331MCL1GS
		470	8×12	0.08	282	18	36	2500	PCH1D471MCL1GS
		560	10×10	0.08	336	20	40	2200	PCH1D561MCL1GS
		680	10×12.7	0.08	408	14	28	3000	PCH1D681MCL1GS
25 (1E)	31	56	6.3×6	0.08	42	43	86	900	PCH1E560MCL1GS
		100	■ 6.3×8	0.08	75	27	54	1100	PCH1E101MCL4GS
		100	8×7	0.08	75	41	82	800	PCH1E101MCL1GS
		220	▲ 8×10	0.08	165	20	40	2300	PCH1E221MCL6GS
		220	10×8	0.08	165	24	48	1800	PCH1E221MCL1GS
		270	8×12	0.08	202	19	38	2300	PCH1E271MCL1GS
		330	10×10	0.08	247	20	40	2200	PCH1E331MCL1GS
		470	10×12.7	0.08	352	15	30	2900	PCH1E471MCL1GS
35 (1V)	43	47	6.3×6	0.08	49	48	96	800	PCH1V470MCL1GS
		68	■ 6.3×8	0.08	71	31	62	1100	PCH1V680MCL4GS
		68	8×7	0.08	71	44	88	800	PCH1V680MCL1GS
		150	▲ 8×10	0.08	157	22	44	2200	PCH1V151MCL6GS
		150	10×8	0.08	157	25	50	1800	PCH1V151MCL1GS
		220	8×12	0.08	231	21	42	2300	PCH1V221MCL1GS
		270	10×10	0.08	283	20	40	2200	PCH1V271MCL1GS
		330	10×12.7	0.08	346	16	32	2800	PCH1V331MCL1GS
50 (1H)	63	22	6.3×6	0.08	33	50	100	700	PCH1H220MCL1GS
		39	■ 6.3×8	0.08	58	36	72	900	PCH1H390MCL4GS
		39	8×7	0.08	58	45	90	900	PCH1H390MCL1GS
		82	▲ 8×10	0.08	123	26	52	2100	PCH1H820MCL6GS
		82	10×8	0.08	123	34	68	1600	PCH1H820MCL1GS
		120	△ 8×12	0.08	180	25	50	2100	PCH1H121MCL2GS
		120	10×10	0.08	180	25	50	2100	PCH1H121MCL1GS
		180	10×12.7	0.08	270	19	38	2500	PCH1H181MCL1GS
63 (1J)	79	12	6.3×6	0.08	22	51	102	700	PCH1J120MCL1GS
		22	■ 6.3×8	0.08	41	45	90	800	PCH1J220MCL4GS
		22	8×7	0.08	41	48	96	800	PCH1J220MCL1GS
		39	8×10	0.08	73	28	56	1900	PCH1J390MCL1GS
		47	10×8	0.08	88	35	70	1500	PCH1J470MCL1GS
		56	8×12	0.08	105	27	54	2100	PCH1J560MCL1GS
		68	10×10	0.08	128	28	56	2000	PCH1J680MCL1GS
		100	10×12.7	0.08	189	24	48	2100	PCH1J101MCL1GS
80 (1K)	100	12	6.3×8	0.08	28	50	100	800	PCH1K120MCL1GS
		27	8×10	0.08	64	38	76	1000	PCH1K270MCL1GS
		39	8×12	0.08	93	35	70	1100	PCH1K390MCL1GS
		47	10×10	0.08	112	33	66	1200	PCH1K470MCL1GS
		68	10×12.7	0.08	163	28	56	1500	PCH1K680MCL1GS

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

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.