

PCH Chip Type, Higher Capacitance
High Temperature Range



NEW

- 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 compliant. Please contact us for details.



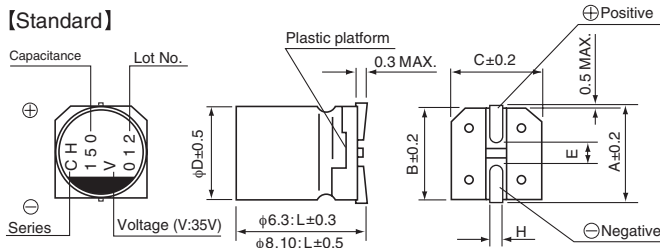
■ Specifications

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 or 3(μA), whichever is greater.								
Temperature Characteristics (Max.Impedance Ratio)	Z-55°C / Z+20°C ≤ 1.25 (100kHz)								
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 135°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
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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)	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. <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
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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
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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								

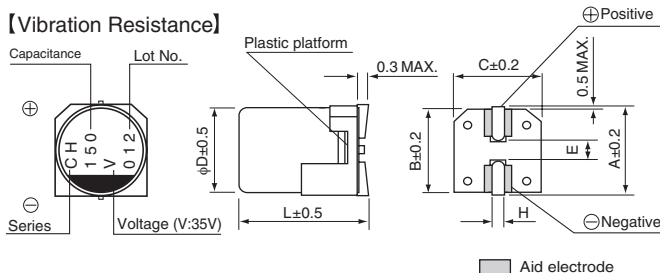
- ※ 1 ESR should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform.
- ※ 2 Conditioning : If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at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

■ Dimensions

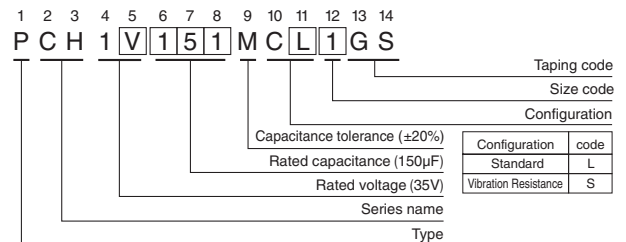
[Standard]



[Vibration Resistance]



Type numbering system (Example : 35V 150μF)



Standard (mm)								Vibration Resistance (mm)					
Size	φ6.3x6L	φ6.3x8L	φ8x7L	φ8x10L	φ8x12L	φ10x8L	φ10x10L	φ10x12.7L	Size	φ6.3x8L	φ8x10.5L	φ10x10.5L	φ10x13.2L
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		Frequency coefficient of rated ripple current			
V	Code	120Hz	1kHz	10kHz	100kHz or more
16	D	0.05	0.30	0.70	1.00
20	E				
25	V				
35	H				
50	J				
63	K				
80					

※ φ6.3x8L(φ6.3x8L),φ8x10L(φ8x10.5L),φ10x10L(φ10x10.5L),φ10x12.7L(φ10x13.2L) : 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 (mArms) (135°C / 100kHz)	Part Number
16 (1C)	20	120	6.3 × 6	0.08	36	72	900	PCH1C121MCL1GS
		220	■ 6.3 × 8	0.08	23	46	1500	PCH1C221MCL4GS
		220	8 × 7	0.08	30	60	1100	PCH1C221MCL1GS
		470	▲ 8 × 10	0.08	17	34	2400	PCH1C471MCL6GS
		470	10 × 8	0.08	22	44	1900	PCH1C471MCL1GS
		560	8 × 12	0.08	16	32	2700	PCH1C561MCL1GS
		680	10 × 10	0.08	19	38	2300	PCH1C681MCL1GS
20 (1D)	25	100	6.3 × 6	0.08	41	82	900	PCH1D101MCL1GS
		150	■ 6.3 × 8	0.08	25	50	1200	PCH1D151MCL4GS
		150	8 × 7	0.08	39	78	800	PCH1D151MCL1GS
		330	▲ 8 × 10	0.08	19	38	2300	PCH1D331MCL6GS
		330	10 × 8	0.08	23	46	1800	PCH1D331MCL1GS
		470	8 × 12	0.08	18	36	2500	PCH1D471MCL1GS
		560	10 × 10	0.08	20	40	2200	PCH1D561MCL1GS
25 (1E)	31	680	10 × 12.7	0.08	14	28	3000	PCH1D681MCL1GS
		56	6.3 × 6	0.08	43	86	900	PCH1E560MCL1GS
		100	■ 6.3 × 8	0.08	27	54	1100	PCH1E101MCL4GS
		100	8 × 7	0.08	41	82	800	PCH1E101MCL1GS
		220	▲ 8 × 10	0.08	20	40	2300	PCH1E221MCL6GS
		220	10 × 8	0.08	24	48	1800	PCH1E221MCL1GS
		270	8 × 12	0.08	19	38	2300	PCH1E271MCL1GS
35 (1V)	43	330	10 × 10	0.08	20	40	2200	PCH1E331MCL1GS
		470	10 × 12.7	0.08	15	30	2900	PCH1E471MCL1GS
		47	6.3 × 6	0.08	48	96	800	PCH1V470MCL1GS
		68	■ 6.3 × 8	0.08	31	62	1100	PCH1V680MCL4GS
		68	8 × 7	0.08	44	88	800	PCH1V680MCL1GS
		150	▲ 8 × 10	0.08	22	44	2200	PCH1V151MCL6GS
		150	10 × 8	0.08	25	50	1800	PCH1V151MCL1GS
50 (1H)	63	220	8 × 12	0.08	21	42	2300	PCH1V221MCL1GS
		270	10 × 10	0.08	20	40	2200	PCH1V271MCL1GS
		330	10 × 12.7	0.08	16	32	2800	PCH1V331MCL1GS
		22	6.3 × 6	0.08	50	100	700	PCH1H220MCL1GS
		39	■ 6.3 × 8	0.08	36	72	900	PCH1H390MCL4GS
		39	8 × 7	0.08	45	90	900	PCH1H390MCL1GS
		82	▲ 8 × 10	0.08	26	52	2100	PCH1H820MCL6GS
63 (1J)	79	82	10 × 8	0.08	34	68	1600	PCH1H820MCL1GS
		120	△ 8 × 12	0.08	25	50	2100	PCH1H121MCL2GS
		120	10 × 10	0.08	25	50	2100	PCH1H121MCL1GS
		180	10 × 12.7	0.08	19	38	2500	PCH1H181MCL1GS
		12	6.3 × 6	0.08	51	102	700	PCH1J120MCL1GS
		22	■ 6.3 × 8	0.08	45	90	800	PCH1J220MCL4GS
		22	8 × 7	0.08	48	96	800	PCH1J220MCL1GS
80 (1K)	100	39	8 × 10	0.08	28	56	1900	PCH1J390MCL1GS
		47	10 × 8	0.08	35	70	1500	PCH1J470MCL1GS
		56	8 × 12	0.08	27	54	2100	PCH1J560MCL1GS
		68	10 × 10	0.08	28	56	2000	PCH1J680MCL1GS
		100	10 × 12.7	0.08	24	48	2100	PCH1J101MCL1GS
		12	6.3 × 8	0.08	50	100	800	PCH1K120MCL1GS
		27	8 × 10	0.08	38	76	1000	PCH1K270MCL1GS
80 (1K)	100	39	8 × 12	0.08	35	70	1100	PCH1K390MCL1GS
		47	10 × 10	0.08	33	66	1200	PCH1K470MCL1GS
		68	10 × 12.7	0.08	28	56	1500	PCH1K680MCL1GS

- 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.

Rated ripple current (mArms) at 135°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.