



**FEATURES**

- High power,high energy density
- Low leakage current, long life
- Fully sealed, Moisture Resistant Version
- High Reliability
- REACH,RoHS Directive Compliant

**APPLICATIONS**

- Consumer electronics
- GSM/GPRS Pulse Applications
- Back up power
- Stand alone or augment existing
- Energy/power source



**OPERATING TEMPERATURE RANGE**

Operating temperature	5.5V Series		6.0V Series		7.5V Series		8.1V Series		9.0V Series	
	Balanced	Unbalanced	Balanced	Unbalanced	Balanced	Unbalanced	Balanced	Unbalanced	Balanced	Unbalanced
-40°C to +65°C	5.5V	5.1V	6.0V	5.6V	7.5V	7.0V	8.1V	7.5V	9.0V	8.1V
-40°C to +85°C	4.6V	4.2V	5.2V	4.8V	6.4V	5.9V	6.9V	6.4V	/	/

\*With appropriate voltage operating temperature can be extended to 85°C

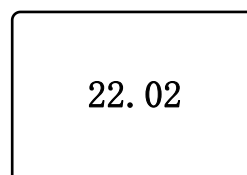
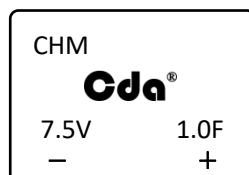
**GENERAL SPECIFICATIONS**

Item	Performance
Operating temperature	-40°C to +65°C
Capacitance range	0.10F to 5.0F
Rated voltage	5.5V/6.0V/7.5V/8.1V/9.0V
Temperature characteristics	Capacitance change: Within ±30% of initial measured value at +25°C Internal resistance: Within ±200% of initial measured value at +25°C
High temperature load time	After 65°C 1500 hours: Capacitance change: ±30% of initial rated value Internal resistance: Within 2 times of initial specified value
Projected cycle life (From rated voltage to 1/2 rated voltage at 25°C)	After 500,000 cycles: Capacitance change: Within ±30 % of initial rated value Internal resistance: Within 2 times of initial specified value
Humidity characteristic	Relative humidity: 90%~95% /Duration of testing:1000 hrs /Temperature:60±2°C(at 5.0V) Capacitance change: Within ±30 % of initial rated value Internal resistance: Within 2 times of initial specified value
Vibration resistance	Amplitude:1.5mm /Frequency:10~55Hz/X,Y,Z(2hrs) /Duration of testing:6 hrs Capacitance change: Within ±30 % of initial rated value Internal resistance: Within 2 times of initial specified value
Shelf life	After 2 years at 25°C without load, the capacitor shall meet the specified endurance limits.

**PART NUMBER SYSTEM**

<u>CHM</u>	<u>9R0</u>	<u>L</u>	<u>105</u>	<u>R</u>	<u>TW</u>	<u>*</u> <u>-</u>	<u>**</u> <u>-</u>
Series	Rated Voltage	Connection Code	Capacity Code	Environmental Code	MFG Code	Special Code	PIN Code

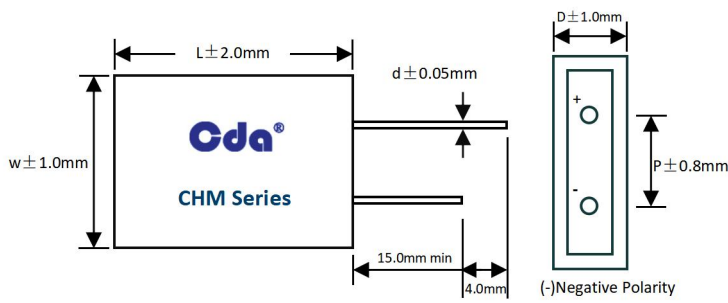
**Casing Display:**



**DIMENSIONS**



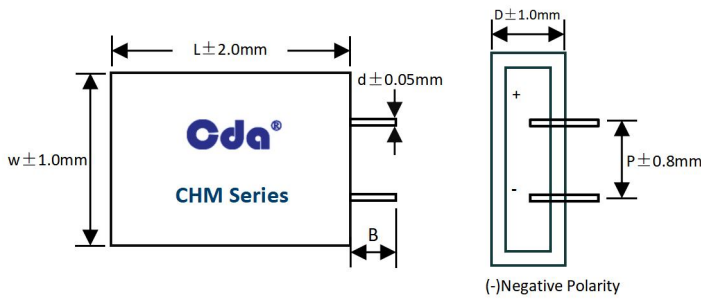
**L Type(Suitable for 5.5V/6.0V)**



D	L Type		Φd
	P(mm)		
5	5.8		0.5
8	9.5		0.6
9	11.5		0.6
12	15.5		0.6

Suitable for 5.5V/6.0V

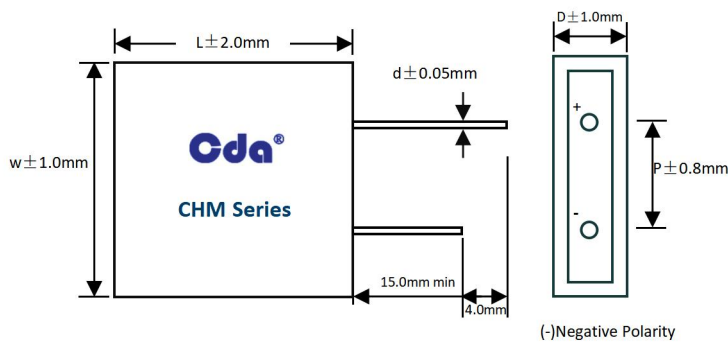
**H Type(Suitable for 5.5V/6.0V)**



D	H Type		Φd
	P(mm)	B(mm)	
5	5.8	2.0	0.5
8	9.5	2.0	0.6
9	11.5	2.0	0.6
12	15.5	2.0	0.6

Suitable for 5.5V/6.0V

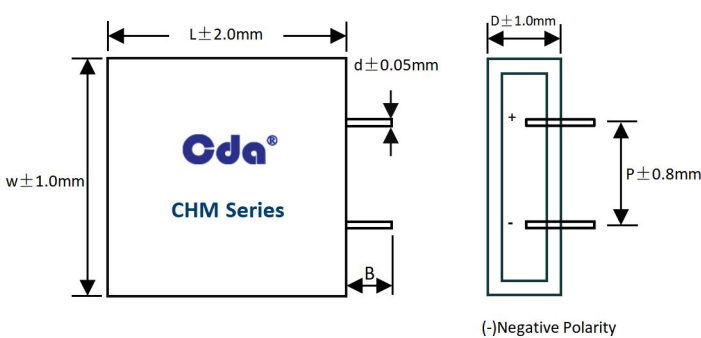
**L Type(Suitable for 7.5V/8.1V/9.0V)**



D	L Type		Φd
	P(mm)		
9	13.5		0.6

Suitable for 7.5V/8.1V/9.0V

**H Type(Suitable for 7.5V/8.1V/9.0V)**



D	H Type		Φd
	P(mm)	B(mm)	
9	13.5	2.0	0.6

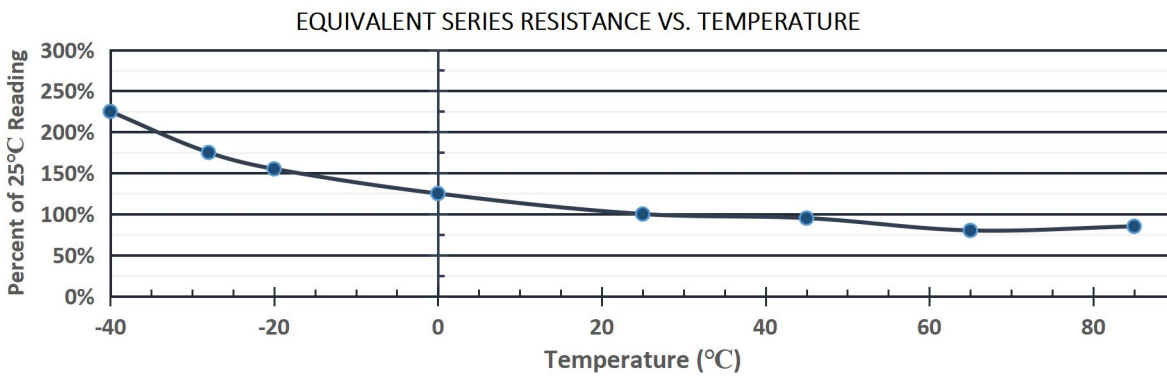
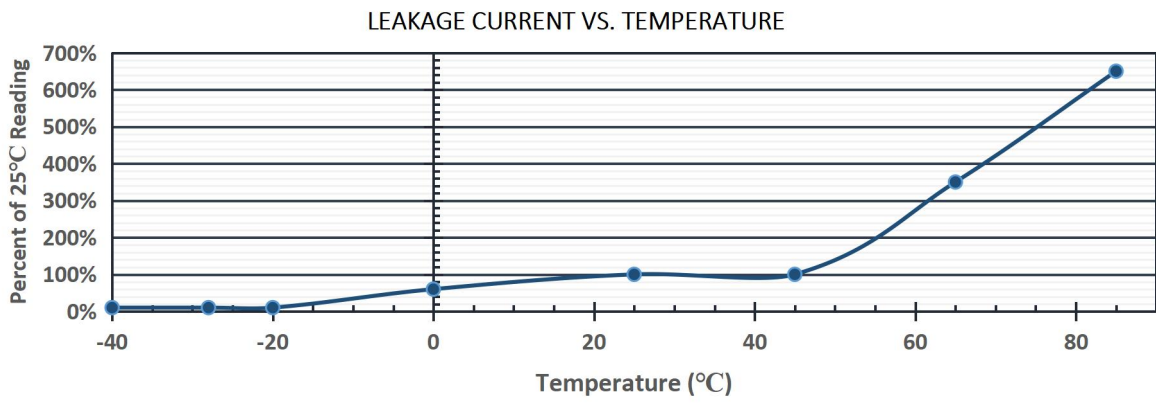
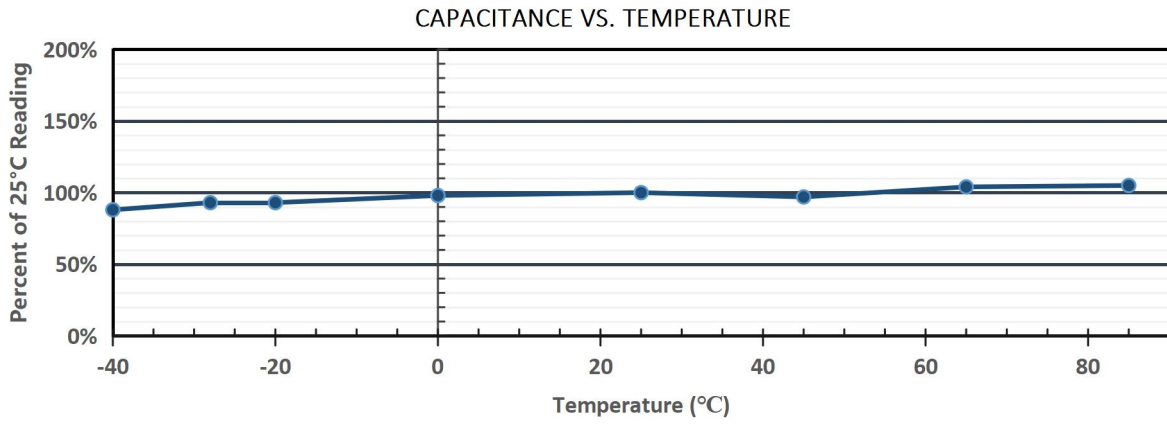
Suitable for 7.5V/8.1V/9.0V

## STANDARD PRODUCTS



Part Number	Rated Voltage (V)	Rated Cap. (F)	Capacitance Tolerance	Size (mm)			Max.ESR (1kHz/mΩ)	Maximum Endurance Current (A)	Maximum Peak Current (A)	Maximum Leakage Current (72hrs/mA)	Power Density (W/Kg)	Maximum Energy (W.h)	Energy Density (Wh/kg)
				W	D	L							
<b>5.5V series - Glue filled Supercapacitor</b>													
CHM-5R5L104R-TW	5.5	0.1	-0%~+100%	10	5	13	2100	0.08	0.18	0.001	349	0.0004	0.32
CHM-5R5L224R-TW	5.5	0.22	-0%~+100%	15	8	16	700	0.16	0.37	0.003	403	0.0009	0.31
CHM-5R5L334R-TW	5.5	0.33	-0%~+100%	18	9	16	600	0.21	0.51	0.003	398	0.0014	0.36
CHM-5R5L474R-TW	5.5	0.47	-0%~+100%	18	9	16	380	0.26	0.75	0.003	541	0.0020	0.51
CHM-5R5L474R-TWX	5.5	0.47	-0%~+100%	15	8	14	500	0.16	0.59	0.003	720	0.0020	0.82
CHM-5R5L105R-TW	5.5	1.0	-0%~+100%	18	9	20	250	0.44	1.59	0.007	1096	0.0042	0.98
CHM-5R5L155R-TW	5.5	1.5	-0%~+100%	18	9	24	200	0.54	2.24	0.012	1179	0.0063	1.15
CHM-5R5L255R-TW	5.5	2.5	-10%~+30%	23	12	25	180	0.75	3.45	0.020	1114	0.0105	1.16
CHM-5R5L355R-TW	5.5	3.5	-10%~+30%	23	12	25	160	0.79	3.65	0.023	1078	0.0147	1.57
CHM-5R5L505R-TW	5.5	5.0	-10%~+30%	23	12	25	150	1.17	5.35	0.028	2063	0.0147	2.70
<b>6.0V series - Glue filled Supercapacitor</b>													
CHM-6R0L104R-TW	6.0	0.1	-0%~+100%	10	5	13	2100	0.08	0.20	0.001	415	0.0005	0.38
CHM-6R0L224R-TW	6.0	0.22	-0%~+100%	15	8	16	700	0.18	0.42	0.003	502	0.0013	0.42
CHM-6R0L334R-TW	6.0	0.33	-0%~+100%	18	9	16	600	0.26	0.58	0.003	614	0.0017	0.46
CHM-6R0L474R-TW	6.0	0.47	-0%~+100%	18	9	16	380	0.32	0.78	0.007	1029	0.0024	0.60
CHM-6R0L474R-TWX	6.0	0.47	-0%~+100%	15	8	14	500	0.16	0.65	0.003	857	0.0024	0.98
CHM-6R0L105R-TW	6.0	1.0	-0%~+100%	18	9	20	250	0.51	1.74	0.012	1304	0.0050	1.09
CHM-6R0L155R-TW	6.0	1.5	-0%~+100%	18	9	24	200	0.59	2.45	0.018	1403	0.0075	1.36
CHM-6R0L255R-TW	6.0	2.5	-10%~+30%	23	12	25	180	0.81	3.59	0.020	2488	0.0125	2.42
<b>7.5V series - Glue filled Supercapacitor</b>													
CHM-7R5L334R-TW	7.5	0.33	-10%~+30%	26	9	16	600	0.26	0.75	0.006	511	0.0026	0.47
CHM-7R5L604R-TWX	7.5	0.6	-10%~+30%	26	9	16	460	0.26	1.04	0.008	544	0.0047	0.79
CHM-7R5L604R-TW	7.5	0.6	-10%~+30%	26	9	20	350	0.44	1.59	0.008	698	0.0047	0.68
CHM-7R5L105R-TW	7.5	1	-10%~+30%	26	9	24	285	0.54	2.32	0.012	1058	0.0078	0.92
<b>8.1V series - Glue filled Supercapacitor</b>													
CHM-8R1L334R-TW	8.1	0.33	-10%~+30%	26	9	16	500	0.26	0.69	0.003	498	0.0030	0.54
CHM-8R1L604R-TW	8.1	0.6	-10%~+30%	26	9	20	400	0.43	1.47	0.070	1063	0.0055	0.80
CHM-8R1L105R-TW	8.1	1.0	-10%~+30%	26	9	24	350	0.53	2.20	0.012	1129	0.0091	1.11
<b>9.0V series - Glue filled Supercapacitor</b>													
CHM-9R0L334R-TW	9.0	0.33	-10%~+30%	26	9	16	500	0.26	0.77	0.007	598	0.0037	0.65
CHM-9R0L604R-TW	9.0	0.6	-10%~+30%	26	9	20	400	0.43	1.64	0.012	1286	0.0068	0.96
CHM-9R0L105R-TW	9.0	1.0	-10%~+30%	26	9	24	350	0.53	2.53	0.018	1361	0.0113	1.32
CHM-9R0L155R-TW	9.0	1.5	-10%~+30%	26	9	24	300	0.54	3.13	0.014	1227	0.0169	1.92

Note: Adds passive balance. Balance options can be provided upon request. Customers can choose according to the application.





**LIFE TIME AND TEMPERATURE PERFORMANCE**

The life of a Super Capacitor is impacted by a combination of operating voltage and the operating temperature according to the following equation :

$$L = L_0 \times 3.25^{\frac{T_0 - T}{10}} \times 1.52^{\frac{V_0 - V}{0.1}}$$

**L** : is the theoretical lifetime at T temperature;

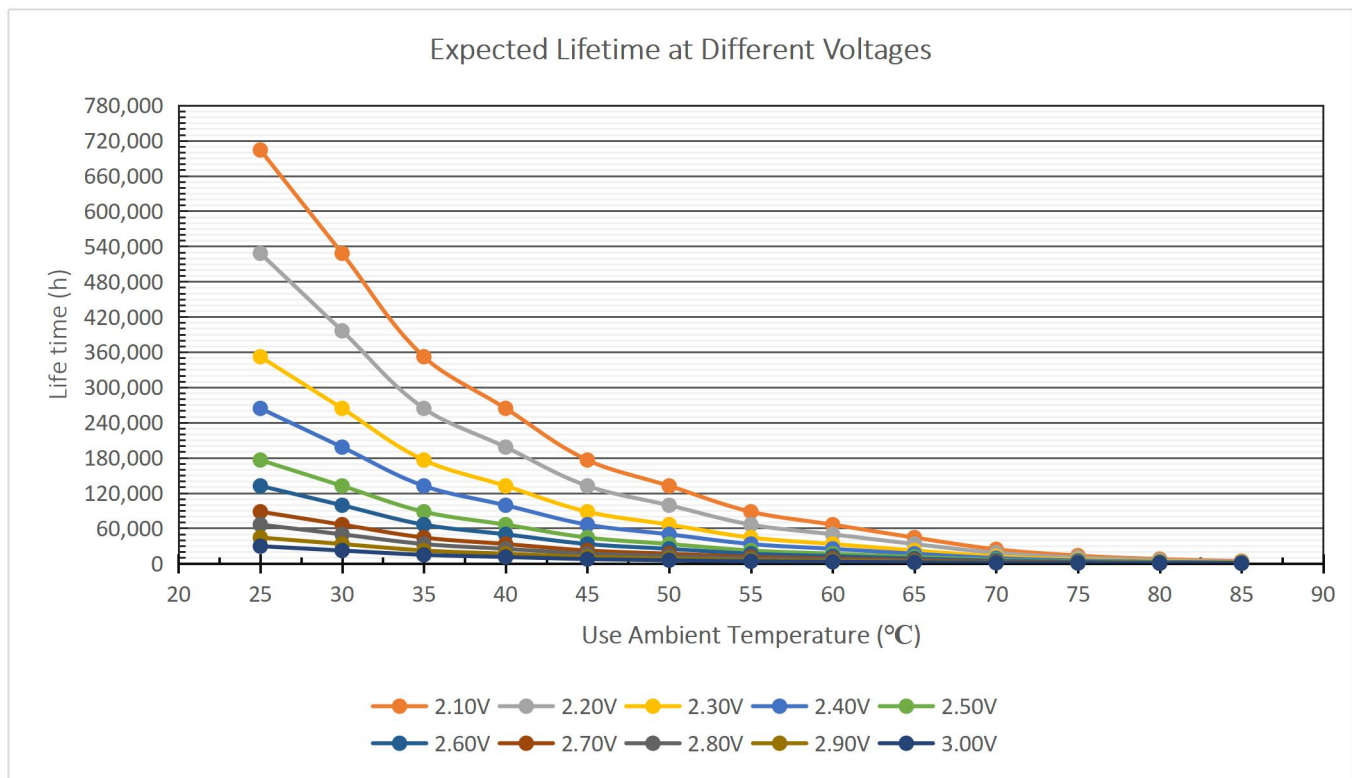
**L<sub>0</sub>** : is the working life of the highest rated working temperature;

**T** : is the actual working temperature;

**T<sub>0</sub>** : is the highest rated working temperature;

**V** : is the actual working voltage;

**V<sub>0</sub>** : is the highest rated working voltage.



\*Note : Estimated lifespan: The estimated lifespan under different operating voltages and operating temperatures in a theoretical environment. For the actual service life, please contact us to discuss the working conditions.



## SAFETY RECOMMENDATIONS

### WARNINGS

- To Avoid Short Circuit, after usage or test, SuperCapacitors voltage needs to discharge to  $\leq 0.1V$ .
- Do not Apply Over-voltage, Reverse Charge, Burn or Heat Higher than  $150^{\circ}C$ , explosion-proof valve may break open.
- Do not Press, Damage or disassemble the SuperCapacitor, housing could heat to high temperature causing Burns.
- If you observe Overheating or Burning Smell from the capacitor disconnect Power immediately, and do not touch.

## PRECAUTIONS FOR WELDING

When soldering supercapacitors to a PCB, the temperature & time that the body of the supercapacitor sees during soldering can have a negative effect on performance. We advise following these guidelines:

- Do not immerse the supercapacitors in solder. Only the leads should come in contact with the solder.
- Ensure that the body of the supercapacitor is never in contact with the molten solder, the PCB or other components during soldering.
- Excessive temperatures or excessive temperature cycling during soldering may cause the safety vent to burst or the case to shrink or crack, potentially damaging the PCB or other components, and significantly reduce the life of the capacitor.

### HAND SOLDERING

Keep distance between the supercapacitor body and the tip of the soldering iron and the tip should never touch the body of the capacitor. Contact between supercapacitor body and soldering iron will cause extensive damage to the supercapacitor, and change its electrical properties. It is recommended that the soldering iron temperature should be less than  $350^{\circ}C$ , and contact time should be limited to less than 4 seconds. Too much exposure to terminal heat during soldering can cause heat to transfer to the body of the supercapacitor, potentially damaging the electrical properties of the supercapacitor.

### REGULATORY

- MSDS
- RoHS Compliant
- Reach Compliant

### TRANSPORTATION

Not subjected to US DOT or IATA regulations  
 UN3499, <10Wh, Non-Hazardous Goods  
 International shipping description –  
 “Electronic Products – Capacitor”

### WAVE SOLDERING

Only use wave soldering on Radial type supercapacitors. The PCB should be preheated only from the bottom and for less than 60 seconds, with temperature at, or below,  $100^{\circ}C$  on the top side of the board for PCBs equal to or greater than 0.8 mm thick.

Solder Temperature ( $^{\circ}C$ )	Suggested Solder Time (s)	Maximum Solder Time (s)
220	7	9
240	7	9
250	5	7
260	3	5

### REFLOW SOLDERING

Infrared or conveyor over reflow techniques can be used on these supercapacitors. Do not use a traditional reflow oven without clear rated reflow temperature for supercapacitors.