



## FEATURES

- Low leakage current, long life
- High power, high energy density
- Small size and low-resistance
- Long cycle life, maintenance-free
- A safe alternative to lithium-ion batteries (green and environmentally friendly)
- REACH, RoHS Directive Compliant

## APPLICATIONS

- Consumer electronics, Industrial and Automation
- Portable Power Tools, Renewable Energy Storage Systems
- Short Term UPS (Uninterruptible Power Supply),  
Communication module, server equipment.



## GENERAL SPECIFICATIONS

Item	Performance
Rated voltage	10.8 VDC to 12 VDC
Capacitance range	0.22F to 12F
Operating temperature	-40°C to +65°C (10.8V / 11V / 12V)
Extended temperature range	-40°C to +85°C (8.6V / 8.8V / 9.6V)
Volumetric Error	-10% ~ +30% (@25°C)
High temperature load	1000 Hours at rated voltage 65 °C
Projected cycle life	500,000 Annotation Cycles at 25 °C, Vr to 1/2 Vr
Humidity characteristics	Relative humidity: 90%~95% / Testing time: 240 hours / Temperature: 40±2°C Change in capacity: ±30% of initial specified value Change of internal resistance: within 2 times of the 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>CPM</u>	<u>11R0</u>	<u>L</u>	<u>105</u>	<u>R</u>	<u>TW</u>	<u>**</u>	<u>**</u>
Series	Rated Voltage	Connection Code	Capacity Code	Environmental Code	MFG Code	Special Code	PIN Code

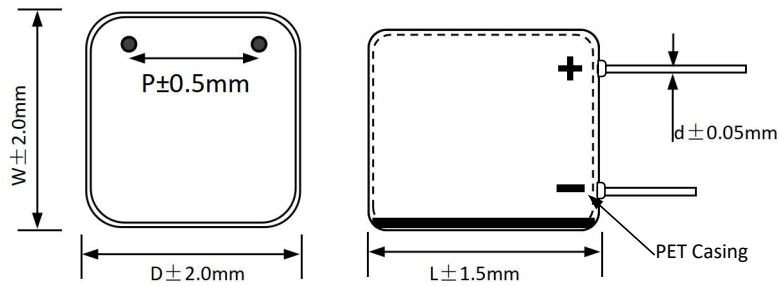
### Casing Display:



## DIMENSIONS

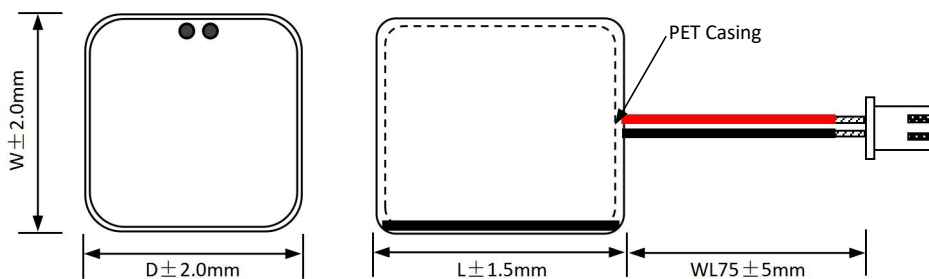


## DA Type



D	P(mm)	Φd
	DA Type	
17	8.5	0.6
21	10.5	0.6
28	15.5	0.6/0.8

## PL Type



\* Connection terminals can be customized

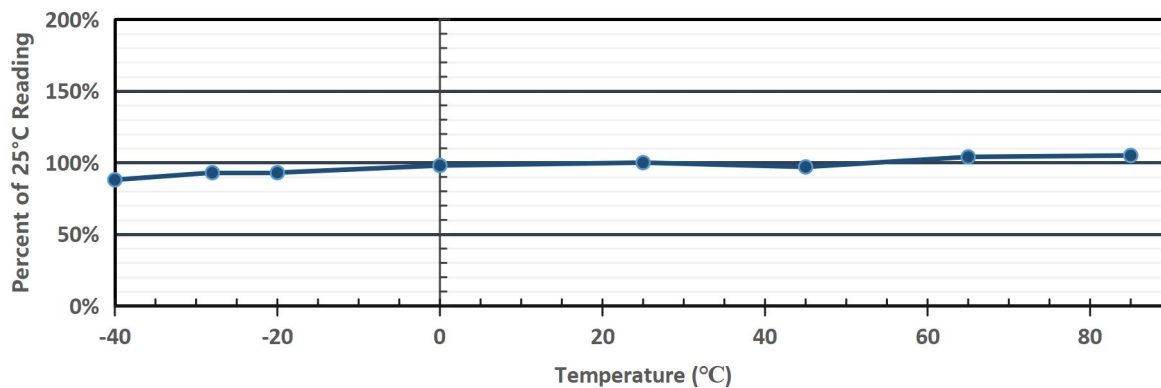
① Module type specification Applicability D: 17mm & 21mm	
Lead	UL3239 AWG20
Terminals	Molex Mini-Lock51163-0200
Terminal block pins	Molex 50752-8200
Male pin socket	Molex 53375-0210
② Module type specification Applicability D: 28mm	
Lead	UL3239 AWG16
Terminals	JST VHR-2N
Terminal block pins	JST SVH-41T-P1.1
Male pin socket	JST B2P-VH

## STANDARD PRODUCTS

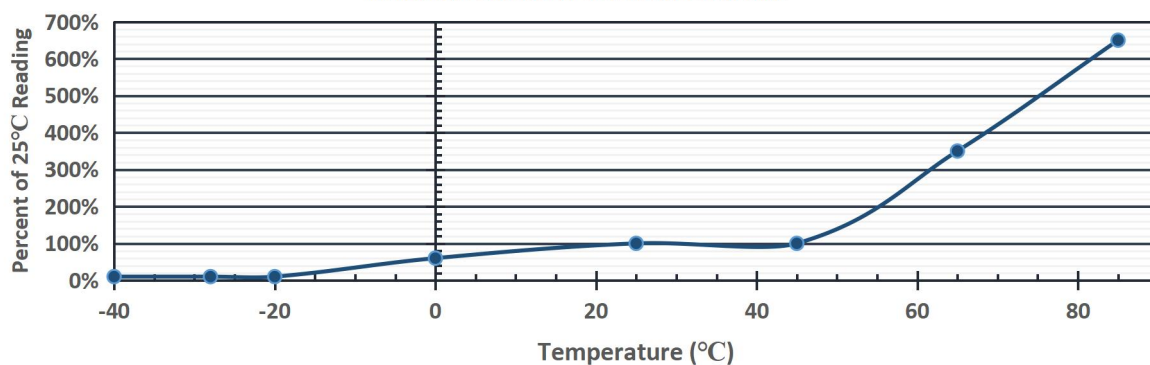
Part Number	Working Voltage (V DC)	Rated Cap. (F)	Dimensions (mm)			Max.ESR		Maximum Leakage (72hrs/mA)	Maximum Peak Current 1s (A)	Rated Current 5s (A)	Maximum Energy (W.h)	Weights (g)
			W	D	L	ESRAC (1kHz/mΩ)	ESRDC (mΩ)					
CPM-10R8L224R-TW	10.8	0.22	17	17	15	640	960	0.015	0.98	0.23	0.0036	4.8
CPM-10R8L504R-TW	10.8	0.5	17	17	18	400	1440	0.020	1.50	0.47	0.0081	5.2
CPM-10R8L804R-TW	10.8	0.8	17	17	22	340	1120	0.022	2.28	0.73	0.0130	6.5
CPM-10R8L125R-TW	10.8	1.2	17	17	27	360	540	0.035	4.32	1.15	0.0194	8.6
CPM-10R8L125R-TWX	10.8	1.2	21	21	22	240	640	0.035	3.67	1.12	0.0194	10.0
CPM-10R8L175R-TW	10.8	1.7	17	17	27	360	540	0.032	4.78	1.55	0.0275	9.0
CPM-10R8L175R-TWX	10.8	1.7	21	21	22	300	460	0.042	5.16	1.59	0.0275	10.5
CPM-10R8L255R-TW	10.8	2.5	17	17	31	240	480	0.058	6.14	2.18	0.0405	9.8
CPM-10R8L255R-TWX	10.8	2.5	21	21	27	160	320	0.040	7.5	2.33	0.0405	12.3
CPM-10R8L355R-TW	10.8	3.5	28	28	28	140	280	0.050	9.55	3.16	0.0567	16.0
CPM-10R8L505R-TW	10.8	5	28	28	28	120	240	0.120	12.27	4.35	0.0810	18.0
CPM-10R8L106R-TW	10.8	10	28	28	49	80	160	0.140	20.77	8.18	0.1620	33.2
CPM-10R8L126R-TW	10.8	12	52	27	27	72	140	0.210	24.18	9.70	0.1944	41.5
CPM-11R0L105R-TW	11	1	21	21	22	280	720	0.030	3.2	0.96	0.0168	10.0
CPM-12R0L224R-TW	12	0.22	17	17	15	720	960	0.015	1.09	0.25	0.0044	4.8
CPM-12R0L504R-TW	12	0.5	17	17	18	400	1440	0.016	1.74	0.52	0.0100	5.2
CPM-12R0L804R-TW	12	0.8	17	17	22	400	1120	0.028	2.53	0.81	0.0160	6.5
CPM-12R0L105R-TW	12	1	21	21	22	280	720	0.030	3.49	1.05	0.0200	10.0
CPM-12R0L125R-TW	12	1.2	17	17	27	360	540	0.036	4.36	1.27	0.024	8.6
CPM-12R0L175R-TW	12	1.7	17	17	27	320	640	0.040	4.88	1.68	0.034	9.0
CPM-12R0L255R-TW	12	2.5	21	21	32	160	320	0.050	8.33	2.59	0.050	12.8
CPM-12R0L355R-TW	12	3.5	28	28	28	140	280	0.050	10.61	3.51	0.070	16.0
CPM-12R0L505R-TW	12	5	28	28	32	120	200	0.090	15.00	5.00	0.100	22.0
CPM-12R0L605R-TW	12	6	28	28	37	104	170	0.135	16.36	5.81	0.120	28.0

\*Operating temperature can be extended to 85°C with appropriate voltage.

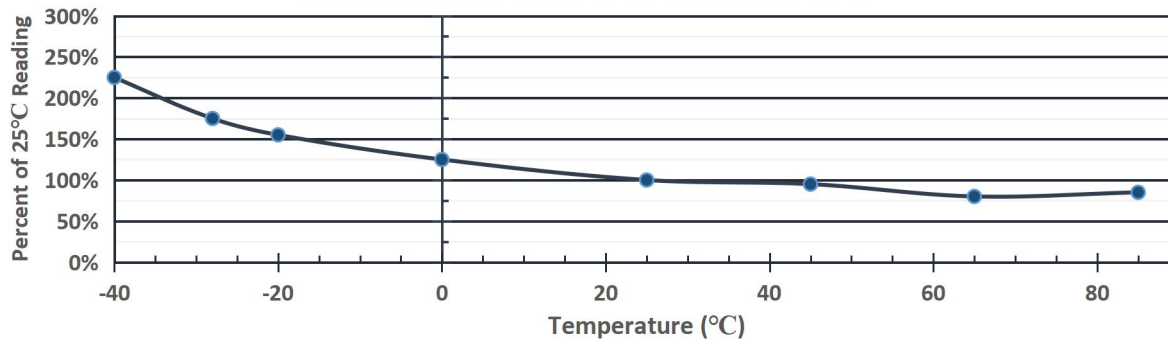
CAPACITANCE VS. TEMPERATURE



LEAKAGE CURRENT VS. TEMPERATURE



EQUIVALENT SERIES RESISTANCE VS. TEMPERATURE





## 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;

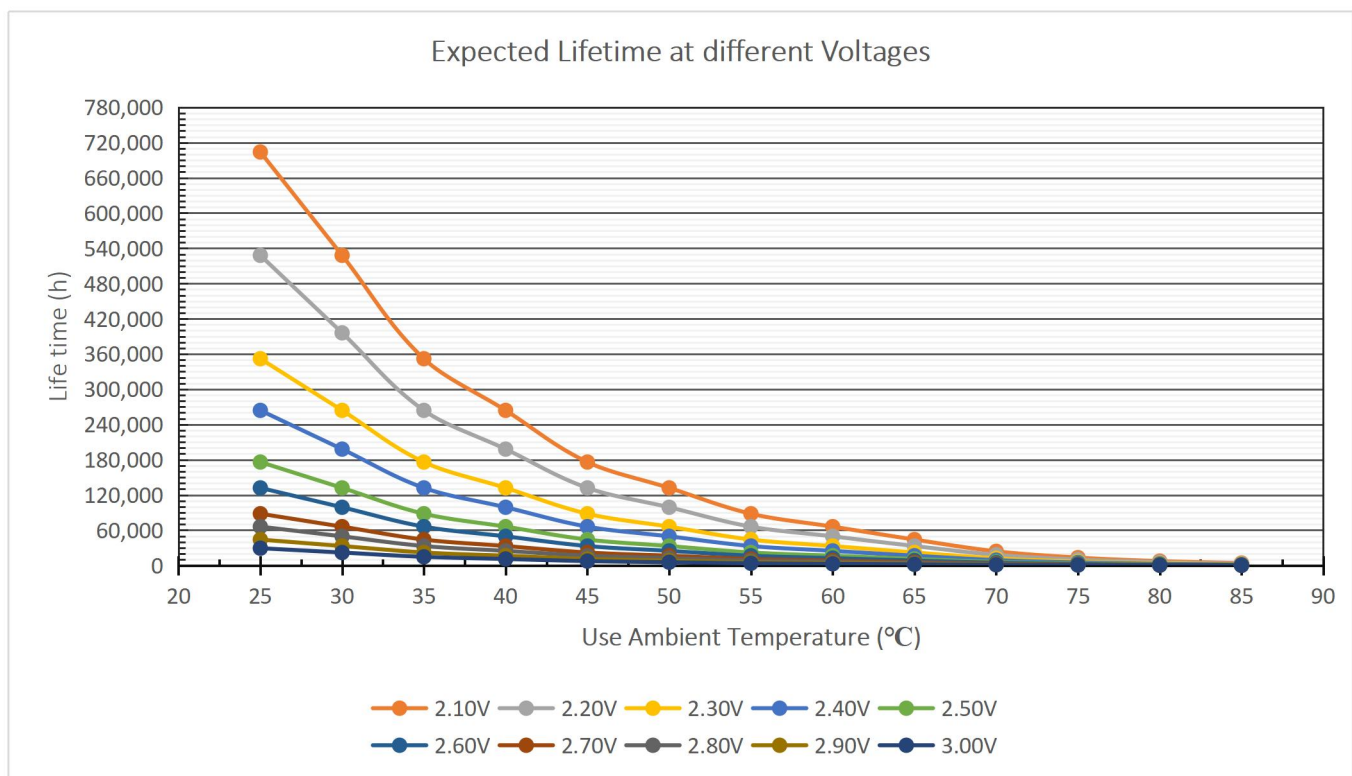
$L_0$  : is the working life of the highest rated working temperature;

$T$  : is the actual working temperature;

$T_0$  : is the highest rated working temperature;

$V$  : is the actual working voltage;

$V_0$  : 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.

### Emergency Handling

In case of leakage from the housing:

- Skin contact: Immediately clean the contacted area thoroughly with soap and water.
- Eye contact: Rinse with running water or normal saline, and seek medical attention immediately.
- Ingestion: Immediately rinse the contacted areas (such as the mouth) with water, and seek medical attention.

### Precautions for Polarity and Reverse Voltage Usage

To ensure product consistency and optimal performance, it is recommended to use the capacitor in accordance with the marked polarity. Reverse polarity may cause permanent damage to the circuit, including a significant increase in leakage current within a short period of time, and will shorten the service life of the supercapacitor.

In practical applications, it is necessary to strictly confirm the connection in accordance with the circuit design and the polarity markings on the capacitor body (such as "+" and "-" symbols, differences in pin length, etc.) to avoid the application of reverse voltage.

## 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"

### Storage Requirements

The storage temperature range of the capacitor is  $-40^{\circ}C$  to  $+70^{\circ}C$ , with a relative humidity of < 60%. Lower storage temperatures are preferable, as they can extend the capacitor's shelf life. For products where the production date code indicates storage duration of more than 1 year but less than 2 years, it is recommended to perform recharge activation for at least 24 hours before initial use.

### Optimal Storage Conditions

- Temperature:  $25^{\circ}C$ , relative humidity:  $\leq 60\%$ , with no voltage applied.
- Avoid direct exposure to sunlight.
- Prevent direct contact with water, salt, oil, or other chemicals.
- Prevent direct contact with corrosive substances, acids, alkalis, or toxic gases.
- Avoid storage in dusty environments.
- Avoid storage in environments with shock and vibration.

### 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

Selective wave soldering		
Solder Temperature ( $^{\circ}C$ )	Suggested Solder Time (s)	Maximum Solder Time (s)
290	2	4

**\*Caution:** For all products with PET sleeves, the use of any type of cleaning agent is prohibited for cleaning.

During all welding processes, it is recommended to protect the shrink film from contact with any liquids (including but not limited to: water, strong acids, strong alkalis, strong oxidizing solutions, and strong solvents), so as to avoid the risk of damage, cracking, and discoloration of the outer shrink film.