



## FEATURES

- Temperature 85°C/85% Humidity
- Long cycle life,maintenance-free
- Ultra low ESR,High reliability
- REACH, RoHS Directive Compliant

## APPLICATIONS

- Instant power outage of equipment to prevent voltage changes, Toys, Auxiliary power supply for solar cells (road signs, indicator lights)

## OPERATING TEMPERATURE RANGE

- -40°C to +85°C @2.5V 85% Humidity 1000 hours

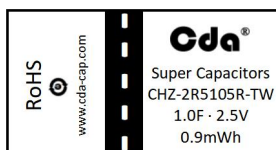
## GENERAL SPECIFICATIONS

| Item  | Performance  |
|---|--|
| Operating temperature   | -40°C to +85°C   |
| Capacitance range   | 0.22F to 110F  |
| Rated voltage   | 2.5 V  |
| Surge voltage   | 2.8 V  |
| Temperature characteristics   | Capacitance change: Within $\pm 30\%$ of initial measured value at +25°C<br>Internal resistance: Within $\pm 200\%$ of initial measured value at +25°C   |
| High temperature load time  | After 85°C 1000 hours&(70°C 1500hours) :<br>Capacitance change: $\pm 30\%$ of initial rated value<br>Internal resistance: Within 2 times of initial specified value  |
| Projected cycle life<br>(From rated voltage to 1/2 rated voltage at 25°C) | After 500,000 cycles:<br>Capacitance change: Within $\pm 30\%$ of initial rated value<br>Internal resistance: Within 2 times of initial specified value  |
| Humidity characteristic   | Relative humidity: 90%~95% /Duration of testing:240 hrs /Temperature:40 $\pm$ 2°C<br>Capacitance change: Within $\pm 30\%$ of initial rated value<br>Internal resistance: Within 2 times of initial specified value    |
| Vibration resistance  | Amplitude:1.5mm /Frequency:10~55Hz /Duration: X,Y,Z(2 hrs)/Duration of testing:6 hrs<br>Capacitance change: Within $\pm 30\%$ of initial rated value<br>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>CHZ</u> | <u>2R5</u>    | <u>105</u>    | <u>R</u>           | <u>TW</u> | <u>*</u><br>— | <u>***</u><br>— |
|------------|---------------|---------------|--------------------|-----------|---------------|-----------------|
| Series     | Rated Voltage | Capacity Code | Environmental Code | MFG Code  | Special Code  | Custom Code     |

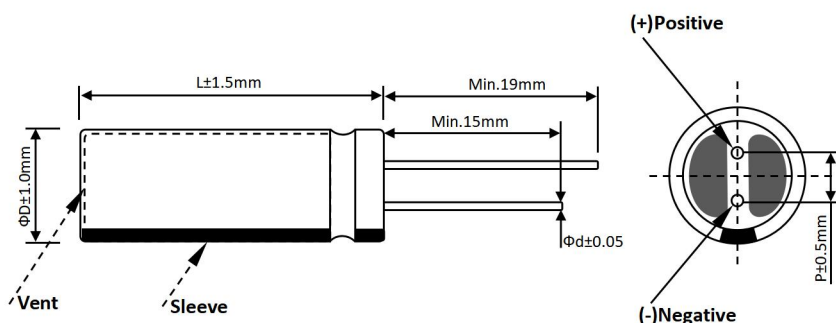
### Casing Display:



## DIMENSIONS

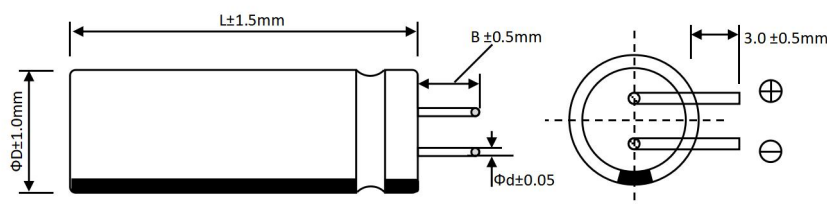


## RADIAL LEAD TYPE



| Size(mm) |     |     |
|----------|-----|-----|
| ΦD       | P   | Φd  |
| 5        | 2.0 | 0.5 |
| 6.3      | 2.5 | 0.6 |
| 8        | 3.5 | 0.6 |
| 10       | 5.0 | 0.6 |
| 12.5     | 5.0 | 0.6 |
| 16       | 7.5 | 0.8 |
| 18       | 7.5 | 0.8 |

## RADIAL BENT LEAD TYPE



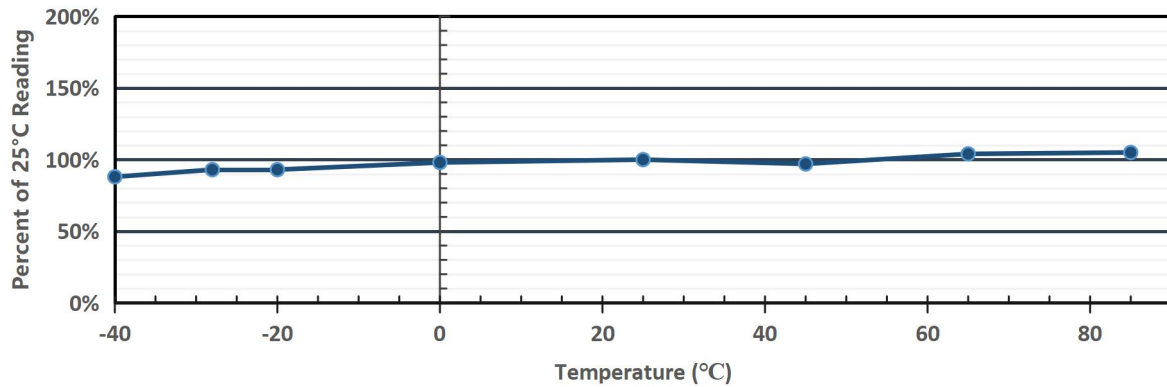
| Style | B(mm) |
|-------|-------|
| A1    | 4.0   |
| C1    | 2.0   |

## STANDARD PRODUCTS

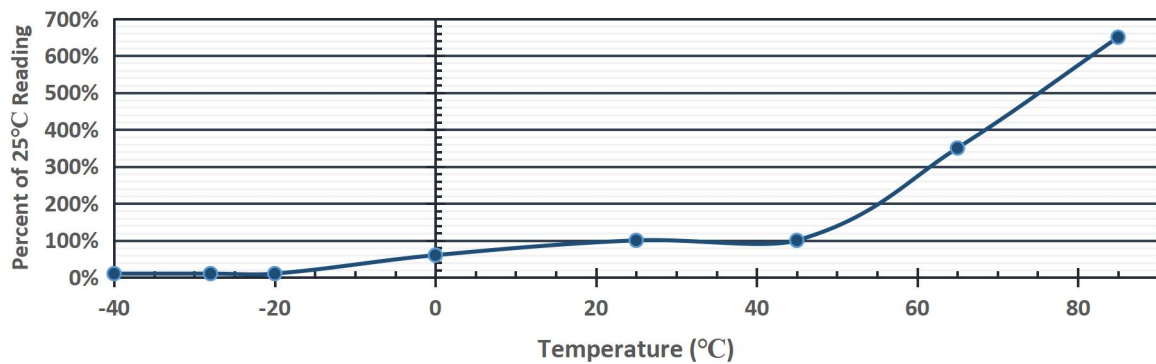
| Part Number     | Working Voltage (V DC) | Rated Cap. (F) | Capacitance Tolerance | Dimensions (mm) |    | Max.ESR         |            | Maximum Leakage (72hrs/mA) | Maximum Peak Current(A) | Maximum Endurance Current(A) | Power Density (W/Kg) | Maximum Energy (W.h) | Energy Density (Wh/kg) |
|-----------------|------------------------|----------------|-----------------------|-----------------|----|-----------------|------------|----------------------------|-------------------------|------------------------------|----------------------|----------------------|------------------------|
|                 |                        |                |                       | D               | L  | ESRAC (1kHz/mΩ) | ESRDC (mΩ) |                            |                         |                              |                      |                      |                        |
| Radial Lead     |                        |                |                       |                 |    |                 |            |                            |                         |                              |                      |                      |                        |
| CHZ-2R5224R-TW  | 2.5                    | 0.22           | -0%~+100%             | 5               | 10 | 700             | 1200       | 0.002                      | 0.19                    | 0.10                         | 1135                 | 0.0002               | 0.34                   |
| CHZ-2R5105R-TWX | 2.5                    | 1              | -0%~+100%             | 6.3             | 12 | 300             | 1500       | 0.006                      | 0.54                    | 0.16                         | 1108                 | 0.0009               | 1.92                   |
| CHZ-2R5105R-TW  | 2.5                    | 1              | -0%~+100%             | 8               | 12 | 160             | 240        | 0.007                      | 1.09                    | 0.47                         | 3314                 | 0.0009               | 0.92                   |
| CHZ-2R5225R-TW  | 2.5                    | 2.2            | -0%~+100%             | 8               | 20 | 100             | 150        | 0.012                      | 2.35                    | 0.54                         | 3645                 | 0.0019               | 2.09                   |
| CHZ-2R5275R-TW  | 2.5                    | 2.7            | -0%~+100%             | 8               | 20 | 100             | 150        | 0.012                      | 2.48                    | 0.59                         | 3645                 | 0.0023               | 2.09                   |
| CHZ-2R5305R-TW  | 2.5                    | 3.0            | -0%~+100%             | 8               | 20 | 100             | 150        | 0.012                      | 2.78                    | 0.62                         | 3645                 | 0.0026               | 2.09                   |
| CHZ-2R5335R-TWX | 2.5                    | 3.3            | -0%~+100%             | 8               | 20 | 100             | 150        | 0.012                      | 2.98                    | 0.74                         | 3645                 | 0.0029               | 2.09                   |
| CHZ-2R5335R-TW  | 2.5                    | 3.3            | -0%~+100%             | 10              | 20 | 75              | 113        | 0.016                      | 4.32                    | 0.97                         | 2957                 | 0.0029               | 1.92                   |
| CHZ-2R5475R-TW  | 2.5                    | 4.7            | -0%~+100%             | 10              | 20 | 75              | 113        | 0.016                      | 4.32                    | 0.97                         | 2957                 | 0.0041               | 1.92                   |
| CHZ-2R5475R-TWV | 2.5                    | 4.7            | -0%~+100%             | 8               | 30 | 60              | 120        | 0.028                      | 6.84                    | 1.43                         | 3600                 | 0.0041               | 4.80                   |
| CHZ-2R5505R-TW  | 2.5                    | 5              | -0%~+100%             | 10              | 20 | 75              | 113        | 0.016                      | 4.32                    | 0.97                         | 2957                 | 0.0043               | 1.92                   |
| CHZ-2R5605R-TWV | 2.5                    | 6              | -0%~+100%             | 8               | 30 | 60              | 120        | 0.028                      | 6.84                    | 1.43                         | 3600                 | 0.0052               | 4.80                   |
| CHZ-2R5605R-TW  | 2.5                    | 6              | -0%~+100%             | 10              | 30 | 45              | 68         | 0.032                      | 8.06                    | 1.51                         | 3482                 | 0.0052               | 2.72                   |
| CHZ-2R5685R-TW  | 2.5                    | 6.8            | -0%~+100%             | 10              | 25 | 60              | 90         | 0.022                      | 5.80                    | 1.20                         | 3135                 | 0.0059               | 2.29                   |
| CHZ-2R5106R-TW  | 2.5                    | 10             | -0%~+100%             | 10              | 30 | 45              | 68         | 0.032                      | 8.06                    | 1.51                         | 3482                 | 0.0087               | 2.72                   |
| CHZ-2R5226R-TW  | 2.5                    | 22             | -0%~+100%             | 12.5            | 35 | 30              | 45         | 0.060                      | 15.88                   | 2.23                         | 3534                 | 0.0191               | 4.60                   |
| CHZ-2R5156R-TWV | 2.5                    | 15             | -0%~+100%             | 12.5            | 35 | 30              | 45         | 0.056                      | 14.21                   | 2.23                         | 3535                 | 0.0130               | 3.68                   |
| CHZ-2R5156R-TW  | 2.5                    | 15             | -0%~+100%             | 12.5            | 25 | 30              | 60         | 0.060                      | 13.50                   | 2.70                         | 2692                 | 0.0130               | 3.10                   |
| CHZ-2R5226R-TW  | 2.5                    | 22             | -0%~+100%             | 16              | 25 | 25              | 38         | 0.078                      | 15.02                   | 2.21                         | 2794                 | 0.0191               | 3.03                   |
| CHZ-2R5256R-TW  | 2.5                    | 25             | -10%~+30%             | 16              | 25 | 25              | 38         | 0.078                      | 17.42                   | 2.41                         | 2794                 | 0.0217               | 3.03                   |
| CHZ-2R5336R-TW  | 2.5                    | 33             | -10%~+30%             | 16              | 35 | 19              | 42         | 0.086                      | 22.60                   | 3.24                         | 3220                 | 0.0286               | 3.65                   |
| CHZ-2R5356R-TW  | 2.5                    | 35             | -10%~+30%             | 16              | 35 | 19              | 42         | 0.086                      | 23.86                   | 3.24                         | 3220                 | 0.0304               | 3.65                   |
| CHZ-2R5476R-TW  | 2.5                    | 47             | -10%~+30%             | 18              | 40 | 16              | 24         | 0.120                      | 28.30                   | 3.55                         | 2526                 | 0.0408               | 3.51                   |
| CHZ-2R5506R-TW  | 2.5                    | 50             | -10%~+30%             | 18              | 40 | 16              | 24         | 0.120                      | 30.68                   | 3.96                         | 2526                 | 0.0434               | 3.51                   |
| CHZ-2R5606R-TW  | 2.5                    | 60             | -10%~+30%             | 18              | 40 | 15              | 23         | 0.150                      | 34.47                   | 4.09                         | 2880                 | 0.0521               | 4.28                   |
| CHZ-2R5107R-TW  | 2.5                    | 100            | -10%~+30%             | 18              | 60 | 13              | 20         | 0.240                      | 45.76                   | 5.30                         | 2136                 | 0.0868               | 4.82                   |
| CHZ-2R5117R-TW  | 2.5                    | 110            | -10%~+30%             | 18              | 60 | 13              | 20         | 0.280                      | 48.50                   | 5.30                         | 2035                 | 0.0955               | 5.52                   |

\*Note that D:Ø18 products cannot support humidity of 85%

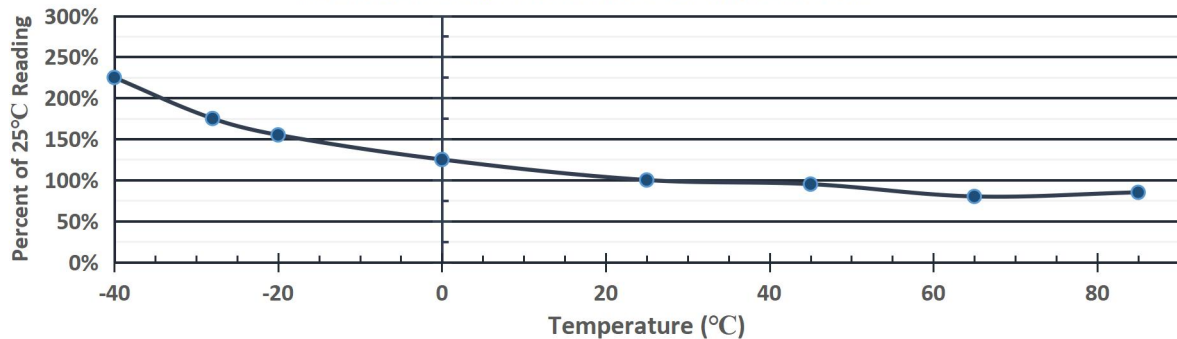
CAPACITANCE VS. TEMPERATURE



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;

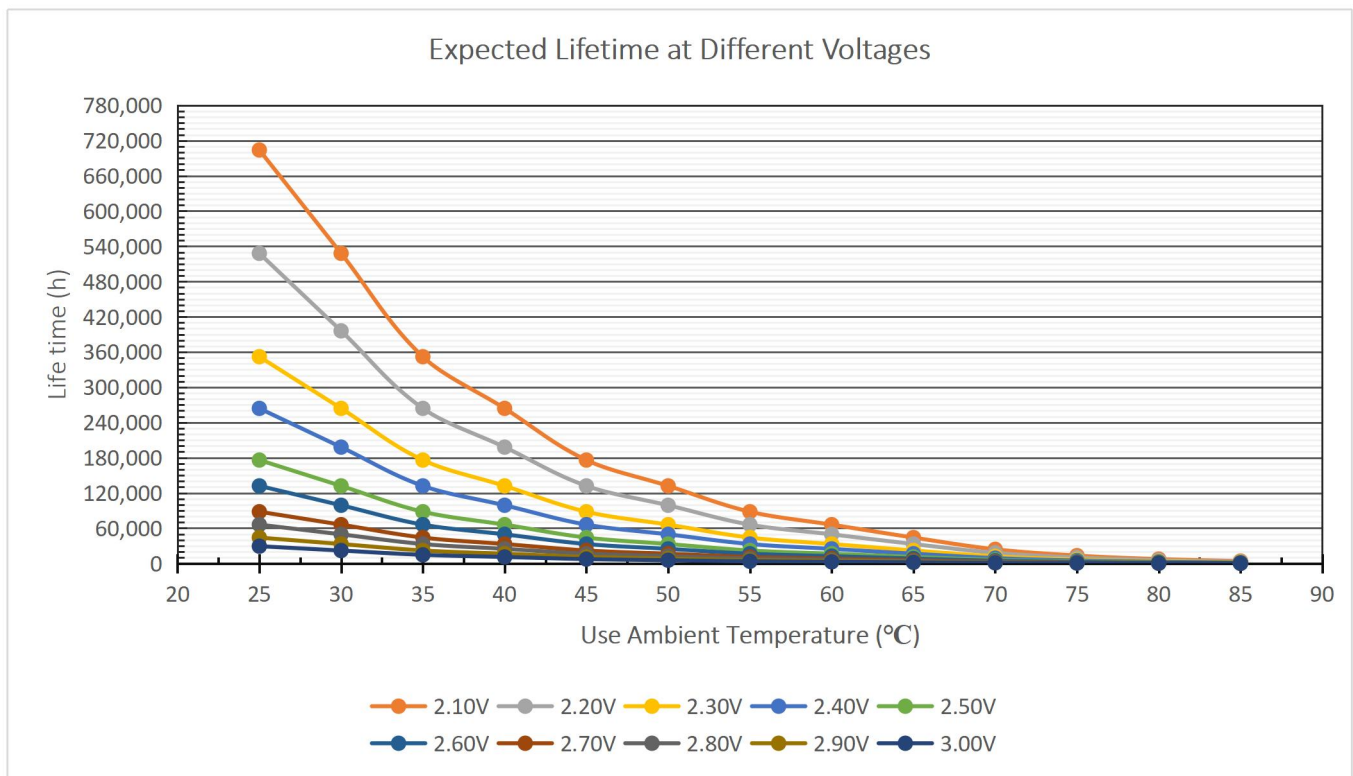
**L<sub>0</sub>** : is the working life of the highest rated working temperature;

**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.

### 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”

## 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.

### 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<br>( $^{\circ}C$ ) | Suggested Solder<br>Time (s) | Maximum Solder<br>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.