# CHQ Series

## New Lower ESR Series

www.cda-cap.com

## FEATURES

- High power,Extremely Lower ESR,high energy density
- Long cycle life
- Maintenance-free
- No Explosion Safety
- RoHS Directive Compliant

## APPLICATIONS

- Power Holdup Modules, Energy Harvesting, UPS/Industrial,Robotic Power,High Pulse Current Applications Emergency car energy storage.

## OPERATING TEMPERATURE RANGE

- -40℃ to +65℃ @2.7V
- -40℃ to +85℃ @2.1V

## GENERAL SPECIFICATIONS

| Item | Performance |
|---|---|
| Operating temperature | -40°C to +65°C |
| Capacitance range | 1.0F to 600F |
| Capacitance tolerance | -0%～+100%;-10%～+30%;-0%～+30% |
| Rated voltage | 2.7 V / 3.0V |
| Surge voltage | 2.85 V / 3.15V |
| Temperature characteristics | Capacitance change: Within ±30% of initial measured value at +25°C<br>Internal resistance: Within ±200% of initial measured value at +25°C |
| High temperature load time | After 65°C 1500 hours (at 2.7V):<br>Capacitance change: ±30% of initial rated value<br>Internal resistance: Within 3 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 ±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±2°C<br>Capacitance change: Within ±30 % of initial rated value<br>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<br>Capacitance change: Within ±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. |


No. 4, Jifeng Road, Wufeng District, Taichung City, Taiwan. TEL:+86-852-51245795 www.cda-cap.com E-MAIL: zfw@cda-cap.tw


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Spec. Date:2023-01-10

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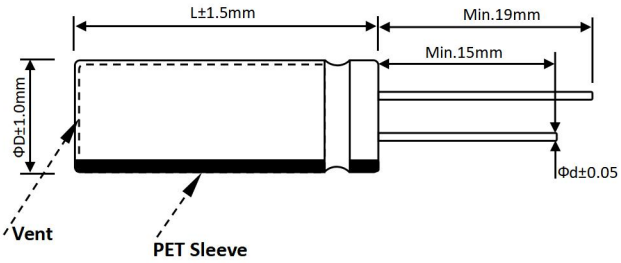
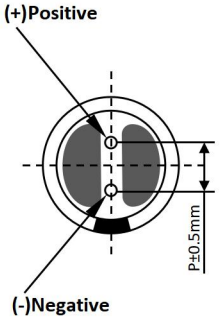
## DIMENSIONS

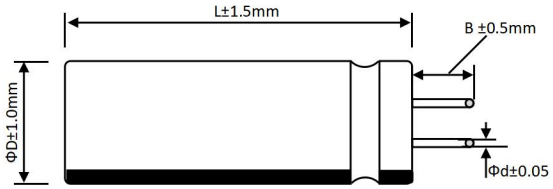
### RADIAL LEAD TYPE

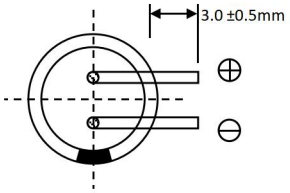



| Size(mm) | | |
|---|---|---|
| ΦD | P | Φd |
| 8 | 3.5 | 0.6 |
| 10 | 5.0 | 0.6 |
| 12.5 | 5.0 | 0.6 |
| 16 | 7.5 | 0.8 |
| 18 | 8.0 | 0.8 |

### RADIAL BENT LEAD TYPE

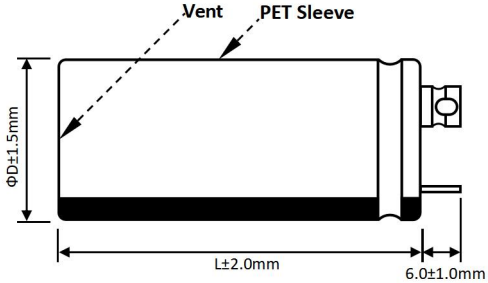


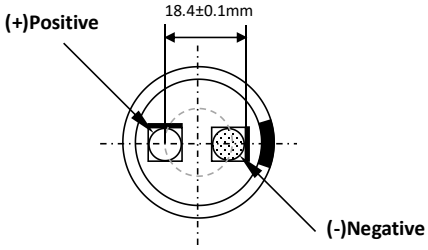




| Style | B(mm) |
|---|---|
| A1 | 4.0 |
| C1 | 2.0 |

### SOLDER PIN TYPE 2-PIN 100~600F PART

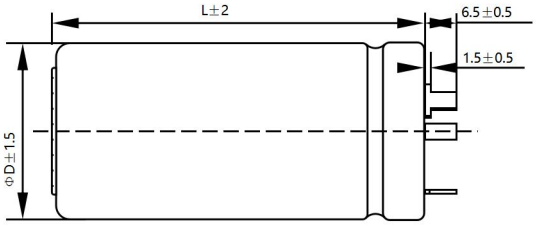
#### Terminal Z2 type

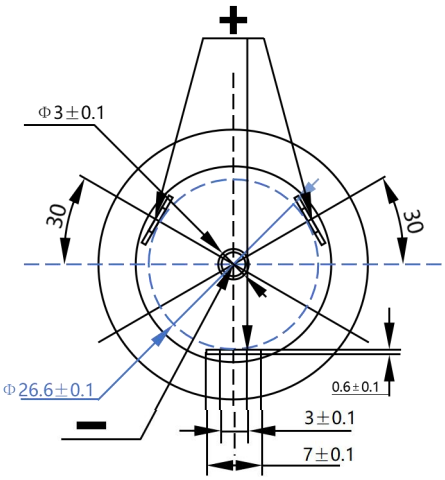



### SOLDER PIN TYPE 4-PIN 300~600F PART

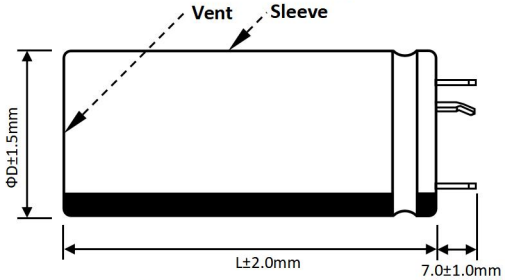
#### Terminal L4 type

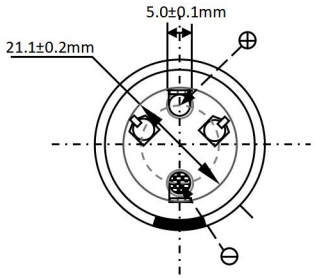


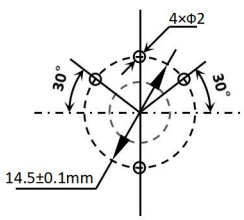




### SOLDER PIN TYPE 4-PIN 400F PART

#### Terminal Z4 type

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## STANDARD PRODUCTS

| Part Number | Working Voltage (V DC) | Rated Cap. (F) | Dimensions (mm) DxL | Max.ESR ESRAC (1kHz/mΩ) | Max.ESR ESRDC (mΩ) | Maximum Leakage (72hrs/mA) | Maximum Peak Current(A) | Maximum Endurance Current(A) | Power Density (W/Kg) | Maximum Energy (W.h) | Energy Density (Wh/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Radial Lead** | | | | | | | | | | | |
| CHQ-2R7105R-TW | 2.7 | 1 | 8x12 | 140 | 325 | 0.006 | 1.16 | 0.57 | 2833 | 0.0010 | 1.07 |
| CHQ-2R7205R-TW | 2.7 | 2 | 8x16 | 90 | 135 | 0.013 | 2.13 | 0.71 | 5945 | 0.0020 | 1.86 |
| CHQ-2R7335R-TW | 2.7 | 3.3 | 8x20 | 60 | 145 | 0.012 | 3.37 | 0.93 | 4161 | 0.0033 | 2.30 |
| CHQ-2R7505R-TWX | 2.7 | 5 | 8x25 | 55 | 83 | 0.020 | 4.78 | 1.11 | 6312 | 0.0051 | 3.01 |
| CHQ-2R7505R-TW | 2.7 | 5 | 10x20 | 27 | 65 | 0.015 | 5.19 | 1.19 | 6943 | 0.0051 | 2.41 |
| CHQ-2R7705R-TW | 2.7 | 7 | 10x25 | 30 | 45 | 0.030 | 7.19 | 1.70 | 7477 | 0.0071 | 2.73 |
| CHQ-2R7106R-TWQ | 2.7 | 10 | 10x30 | 20 | 55 | 0.030 | 8.71 | 2.02 | 5131 | 0.0101 | 3.27 |
| CHQ-2R7106R-TWX | 2.7 | 10 | 12.5x20 | 25 | 38 | 0.035 | 9.82 | 1.91 | 6762 | 0.0101 | 2.94 |
| CHQ-2R7256R-TW | 2.7 | 25 | 16x25 | 15 | 25 | 0.060 | 20.77 | 2.41 | 4793 | 0.0253 | 3.47 |
| CHQ-2R7506R-TW | 2.7 | 50 | 18x40 | 9 | 15 | 0.075 | 38.57 | 3.96 | 4486 | 0.0506 | 3.89 |
| **SOLDER PIN TYPE 2-PIN** | | | | | | | | | | | |
| CHQ-2R7107R-TW | 2.7 | 100 | 22x45 | 6.00 | 10.00 | 0.26 | 67.50 | 11.81 | 3803 | 0.1013 | 4.40 |
| CHQ-2R7127R-TW | 2.7 | 120 | 22x50 | 6.00 | 8.00 | 0.30 | 82.65 | 13.05 | 4050 | 0.1215 | 4.50 |
| CHQ-2R7187R-TW | 2.7 | 180 | 25x50 | 7.00 | 10.0 | 0.60 | 86.79 | 15.75 | 2955 | 0.1823 | 6.16 |
| CHQ-2R7227R-TW | 2.7 | 220 | 30x50 | 5.00 | 6.00 | 0.62 | 128.02 | 17.92 | 3038 | 0.2228 | 4.64 |
| CHQ-2R7357R-TW | 2.7 | 350 | 35x60 | 2.50 | 3.00 | 1.00 | 230.40 | 24.20 | 4550 | 0.3545 | 5.53 |
| CHQ-2R7407R-TW | 2.7 | 400 | 35x60 | 2.30 | 2.70 | 1.00 | 259.60 | 25.75 | 4620 | 0.4050 | 5.78 |
| CHQ-2R7507R-TW | 2.7 | 500 | 35x65 | 2.40 | 2.90 | 1.30 | 275.50 | 26.90 | 3770 | 0.5063 | 6.32 |
| CHQ-2R7607R-TW | 2.7 | 600 | 35x70 | 2.50 | 3.00 | 1.50 | 289.20 | 30.77 | 3470 | 0.6075 | 7.20 |
| **SOLDER PIN TYPE L4-PIN** | | | | | | | | | | | |
| CHQ-2R7307R-TW | 2.7 | 300 | 35x60 | 1.60 | 2.20 | 1.00 | 258.10 | 24.44 | 5321 | 0.3038 | 4.05 |
| CHQ-2R7367R-TW | 2.7 | 360 | 35x65 | 1.30 | 2.00 | 1.20 | 299.87 | 24.64 | 5264 | 0.3544 | 4.88 |
| CHQ-2R7407R-TW | 2.7 | 400 | 35x70 | 1.20 | 1.60 | 1.30 | 329.59 | 28.52 | 5957 | 0.4050 | 4.40 |
| CHQ-2R7507R-TW | 2.7 | 500 | 35x85 | 1.10 | 1.40 | 1.50 | 397.41 | 33.26 | 6021 | 0.5063 | 4.87 |
| CHQ-2R7607R-TW | 2.7 | 600 | 35x85 | 1.10 | 1.40 | 1.50 | 440.65 | 34.09 | 5907 | 0.6075 | 5.73 |
| **SOLDER PIN TYPE Z4-PIN** | | | | | | | | | | | |
| CHQ-2R7407R-TWQ | 2.7 | 400 | 35x66 | 2.50 | 2.90 | 1.00 | 270.0 | 22.20 | 4544 | 0.4050 | 5.26 |
| **SOLDER PIN TYPE L4-PIN (3.0V)** | | | | | | | | | | | |
| CHQ-3R0307R-TW | 3.0 | 300 | 35x60 | 1.4 | 2.2 | 1.00 | 271.18 | 22.70 | 6550 | 0.3750 | 5.00 |
| CHQ-3R0367R-TW | 3.0 | 360 | 35x65 | 1.3 | 2.0 | 1.20 | 313.82 | 24.64 | 6578 | 0.4500 | 5.49 |
| CHQ-3R0407R-TW | 3.0 | 400 | 35x70 | 1.2 | 1.6 | 1.30 | 366.21 | 28.52 | 7436 | 0.5000 | 5.49 |
| CHQ-3R0507R-TW | 3.0 | 500 | 35x85 | 1.1 | 1.4 | 1.50 | 441.57 | 33.26 | 7028 | 0.6250 | 5.68 |
| CHQ-3R0607R-TW | 3.0 | 600 | 35x85 | 1.1 | 1.4 | 1.60 | 489.60 | 33.26 | 6841 | 0.7500 | 6.64 |

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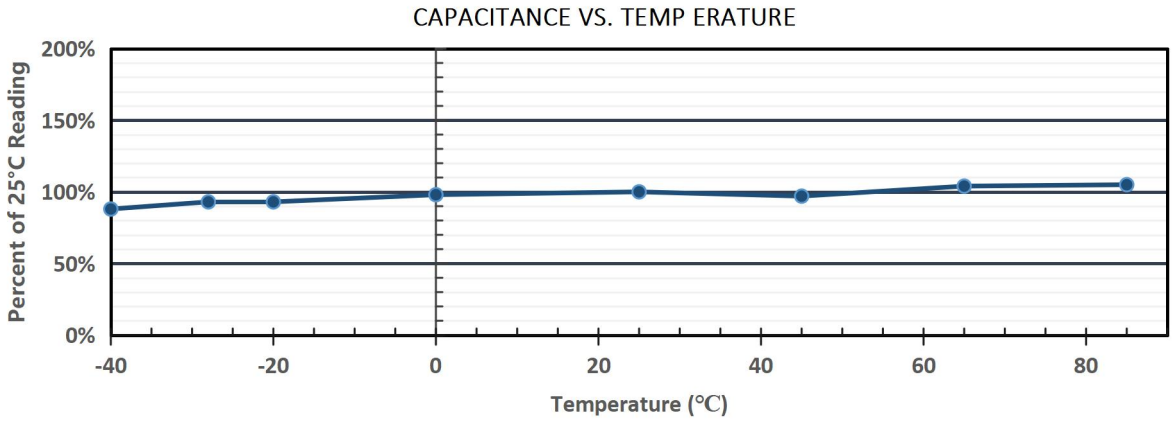
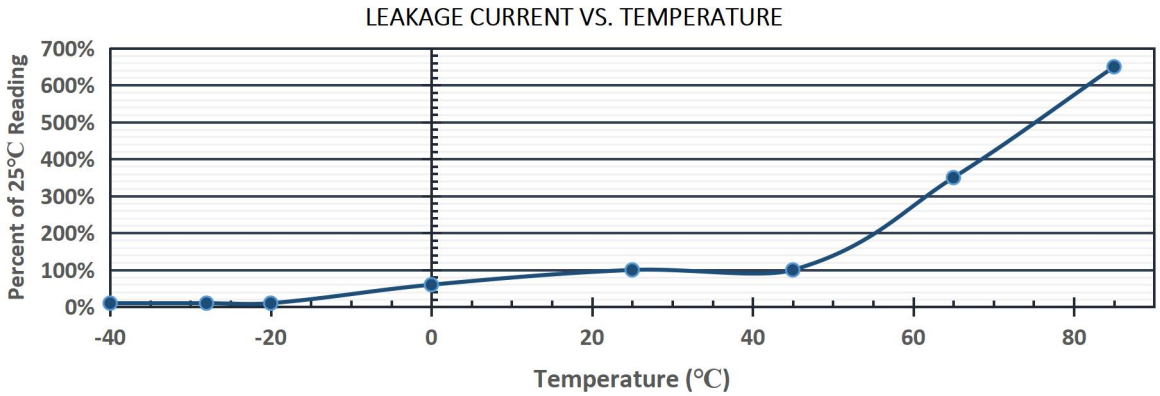
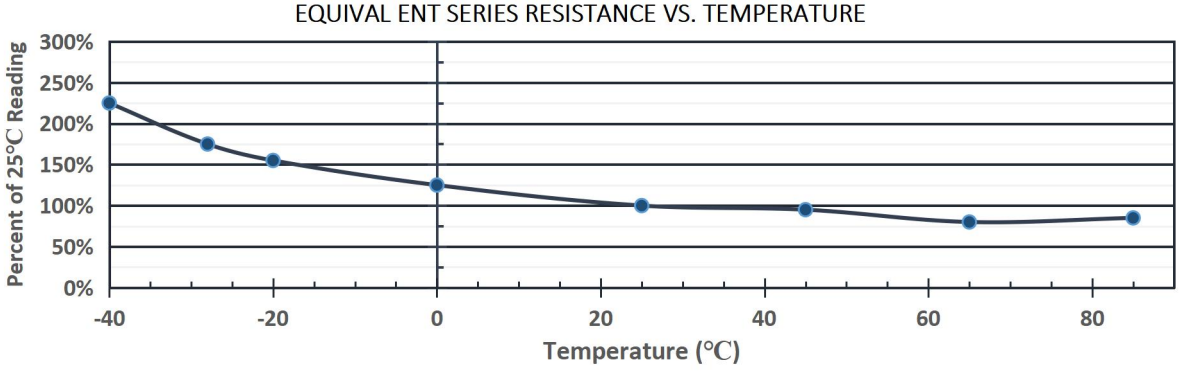
## QUALITY AND RELIABILITY



# 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 :

$$LS = L_R \times 2_X \times 2_Y$$

Which is X=（Tm-Ta)/10 Y= (Vr-Va)/0.2

Ls = Expected life of the super capacitor in the application

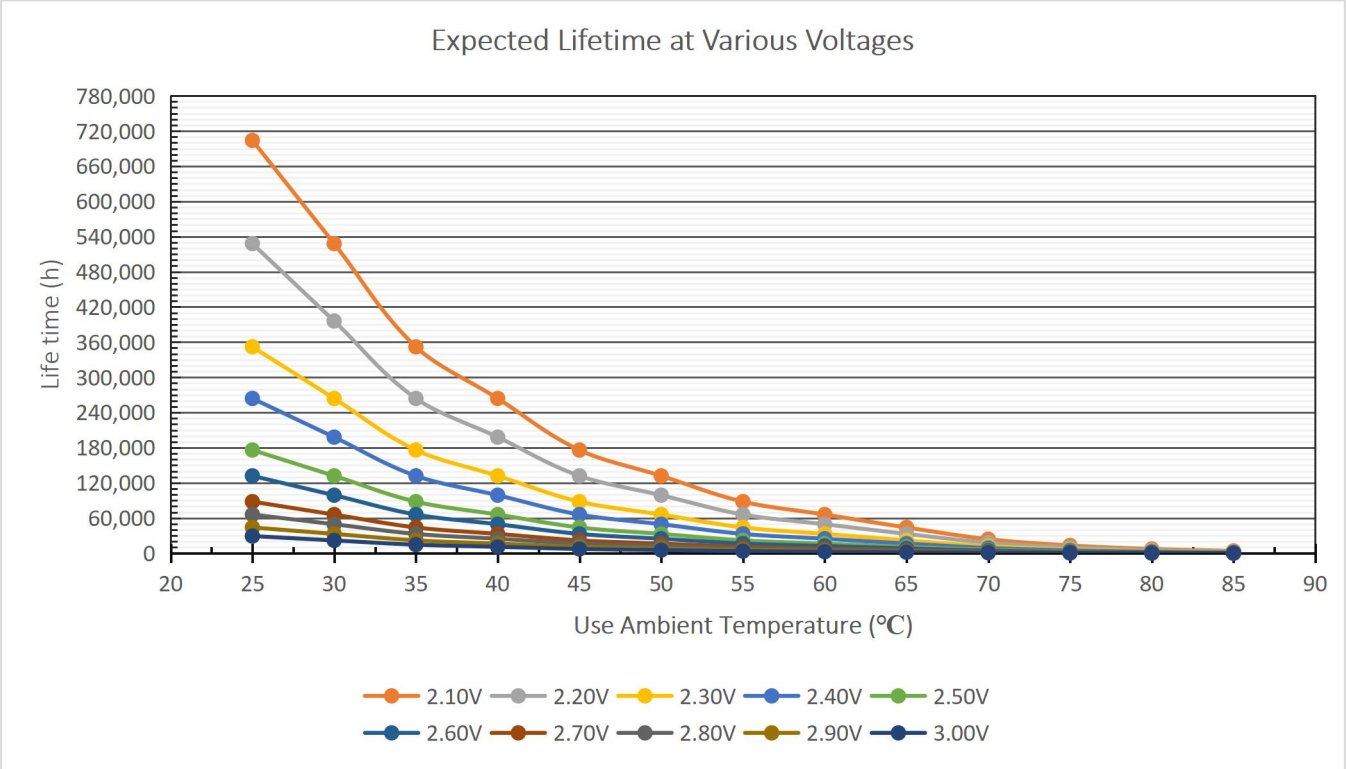
LR = Load life rating of the super capacitor

Tm = Max temperature rating of the super capacitor

Ta = Ambient temperature of the application

Vr = Rated voltage of the super capacitor

Va = Maximum applied voltage on the super capacitor in the application



# SAFETY RECOMMENDATIONS

### WARNINGS

• To Avoid Short Circuit, after usage or test, SuperCapacitors voltage needs to discharge to ≤ 0.1V
• Do not Apply Overvoltage, Reverse Charge, Burn or Heat Higher than 150°C, explosion-proof valve may break open
• Do not Press, Damage or disassemble the SuperCapacitors, 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 com-ponents, 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 ca-pacitor. 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°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°C on the top side of the board for PCBs equal to or greater than 0.8 mm thick.

| Solder Temperature (ºC) | 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 with-out clear rated reflow temperature for supercapacitors.