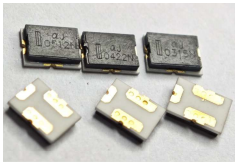


**Features**

- ■Surface mount
- ■Halogen free / Sb free
- ■RoHS compliance
- ■Fast response time
- ■Protect Li-ion battery from overcurrent

**Applications**

- ■Vacuum cleaner
- ■Powertools
- ■Lawn mower
- ■Energy storage batteries
- ■Battery Management System

# TEPJ Series

Alpha-Top (Sea & Land Alliance)

## Specifications

| Model | $I_{rated}$ (A) | Cells in seires | $V_{max}$ (V) | $I_{break}$ (A) | $V_{op}$ (V) | Resistance $R_{heater}$ (Ω) | Resistance $R_{fuse}$ (mΩ) | Agency Approval UL | Agency Approval TUV |
|---|---|---|---|---|---|---|---|---|---|
| TEPJ0112N | 12 | 1 | 48 | 200 | 3.0-4.5 | 0.6-1.5 | 1.5-3.5 | √ | |
| TEPJ0212N | 12 | 2 | 48 | 200 | 4.0-9.0 | 2.0-3.2 | 1.5-3.5 | √ | |
| TEPJ0312N | 12 | 3 | 48 | 200 | 7.4-13.8 | 5.7-9.9 | 1.5-3.5 | √ | |
| TEPJ0412N | 12 | 4 | 48 | 200 | 10.5-19.6 | 11.2-20.0 | 1.5-3.5 | √ | |
| TEPJ0512N | 12 | 5 | 48 | 200 | 14.4-23.5 | 18.0-32.0 | 1.5-3.5 | √ | |
| TEPJ0612N | 12 | 5-6 | 48 | 200 | 14.4-28.0 | 19.6-34.5 | 1.5-3.5 | √ | |
| TEPJ0812N | 12 | 7-8 | 48 | 200 | 24.5-36.0 | 32.4-85.7 | 1.5-3.5 | √ | |
| TEPJ1412N | 12 | 9-14 | 62 | 50 | 31.5-62.0 | 96.1-141.7 | 1.5-3.5 | √ | |
| TEPJ1712N | 12 | 15-17 | 80 | 50 | 15.0-80.0 | 182.0-337.0 | 1.5-3.5 | √ | |
| TEPJ0115N | 15 | 1 | 48 | 200 | 3.0-4.5 | 0.6-1.5 | 1.0-3.0 | √ | |
| TEPJ0215N | 15 | 2 | 48 | 200 | 5.0-9.0 | 2.2-3.3 | 1.0-3.0 | √ | |
| TEPJ0315N | 15 | 3 | 48 | 200 | 7.4-13.8 | 5.5-8.4 | 1.0-3.0 | √ | |
| TEPJ0415N | 15 | 4 | 48 | 200 | 10.5-19.6 | 10.4-15.8 | 1.0-3.0 | √ | |
| TEPJ0515N | 15 | 5 | 48 | 200 | 14.4-23.5 | 17.9-29.1 | 1.0-3.0 | √ | |
| TEPJ0615N | 15 | 5-6 | 48 | 200 | 14.4-28.0 | 19.6-34.5 | 1.0-3.0 | √ | |
| TEPJ0815N | 15 | 7-8 | 48 | 200 | 24.5-36.0 | 32.4-85.7 | 1.0-3.0 | √ | |
| TEPJ1415N | 15 | 9-14 | 62 | 50 | 31.5-62.0 | 96.1-141.7 | 1.0-3.0 | √ | |
| TEPJ1715N | 15 | 15-17 | 80 | 50 | 45.0-80.0 | 182.0-337.0 | 1.0-3.0 | √ | |
| TEPJ0122N | 22 | 1 | 48 | 200 | 3.5-4.7 | 0.68-1.00 | 0.5-2.0 | √ | |
| TEPJ0222N | 22 | 2 | 48 | 200 | 6.0-9.2 | 2.29-3.30 | 0.5-2.0 | √ | |
| TEPJ0322N | 22 | 3 | 48 | 200 | 9.0-13.8 | 5.3-7.5 | 0.5-2.0 | √ | |
| TEPJ0422N | 22 | 4 | 48 | 200 | 12.0-18.5 | 9.8-13.2 | 0.5-2.0 | √ | |
| TEPJ0522N | 22 | 5 | 48 | 200 | 15.9-23.1 | 16.1-23.1 | 0.5-2.0 | √ | |
| TEPJ0622N | 22 | 6 | 48 | 200 | 18.0-27.0 | 22.1-32.4 | 0.5-2.0 | √ | |
| TEPJ0722N | 22 | 7 | 48 | 200 | 21.0-31.5 | 30.1-44.1 | 0.5-2.0 | √ | |
| TEPJ0822N | 22 | 8 | 48 | 200 | 24.0-36.0 | 39.3-57.6 | 0.5-2.0 | √ | |
| TEPJ0922N | 22 | 9 | 48 | 200 | 27.0-40.5 | 49.7-72.9 | 0.5-2.0 | √ | |
| TEPJ1022N | 22 | 10 | 48 | 200 | 30.0-45.0 | 61.4-90.0 | 0.5-2.0 | √ | |
| TEPJ1422N | 22 | 11-14 | 80 | 50 | 33.0-63.0 | 113.4-181.5 | 0.5-2.0 | √ | |
| TEPJ1722N | 22 | 15-17 | 80 | 50 | 45.0-80.0 | 182.8-337.5 | 0.5-2.0 | √ | |

**Irated** = Current carrying capacity that is measured at 25°C thermal equilibrium condition

**Cells in seires** = Number of battery cells connected in series in the circuit.

$V_{max}$ = The maximum voltage that can be cut off by fuse

**Ibreak** = The current that the fuse element is able to interrupt

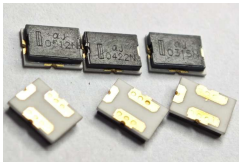
**Vop** = Range of operation voltage

**Rheater** = The resistance of the heating element

**Rfuse** = The resistance of the fuse element

**Cells in series** = Number of battery cells connected in series in the circuit.

**• Specifications are subject to change without notice.**



# TEPJ Series

Alpha-Top (Sea & Land Alliance)

## Electrical Characteristics

| Items | Conditions | Specifications |
|---|---|---|
| Current carrying capacity | 100% x $I_{rated}$ | No melting. |
| Fusing time | 200% x $I_{rated}$ | The fuse shall be melt within 1min. |
| | In operation voltage range | |
| Operating temperature range | The following examinations are executed respectively within the range from -10 to 65°C.<br>●Fusing time test<br>●Current carrying capacity test | The fuse shall be passed each test. |

## Environmental Specifications

| Test | Conditions | pecifications |
|---|---|---|
| **Dry heat** | The fuse shall be stored at a temperature of 100±5℃ for 250h. And then it shall be subjected to standard atmospheric conditions for 24h, after which its measurement shall be made. | ● Without damage such as deformation or disconnection of fuse element.<br>● Internal resistance shall be relative to the value before test 110% or less. |
| **Cold** | The fuse shall be stored at a temperature of -20±3℃ for 500h. And then it shall be subjected to standard atmospheric conditions for 24h, after which its measurement shall be made. | |
| **Damp heat** | The fuse shall be stored at a temperature of 60±2℃ with relative humidity of 90~95%RH for 250h. And then it shall be subjected to standard atmospheric condition for 24h, after which its measurement shall be made. | |
| **Endurance test** | 300% x Iratedshall be carried for a period of 5ms. The current is there switched off for a period of 995ms. This cycle is repeated 10000 times. | |

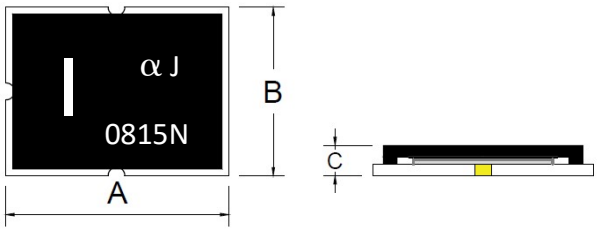
*[Electrical Characteristics] is influenced by thermal capacity of PCB, parts, pattern width, and so on. Therefore you should check it on your PCB.

**Agency Approvals :** **E550184**

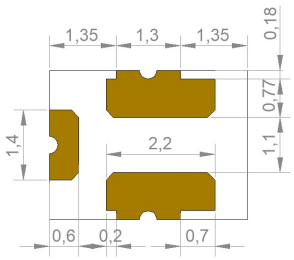
**Regulation/Standard:** **2011/65/EU & (EU)2015/863**

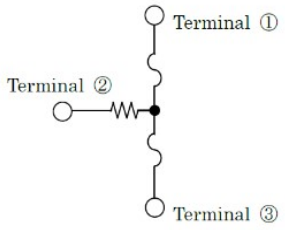
**EN14582:2016**

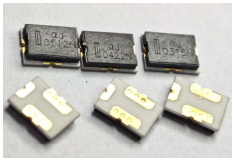
## Construction And Dimension (Unit:mm)




| Code | A | B | C |
|---|---|---|---|
| Spec.(mm) | 4 ±0.3 | 3 ±0.3 | 1.0max |
| * Without extra notification the tolerance is ± 0.20 mm<br>除非特殊注明，否则默认公差为 ±0.20 mm | | | |



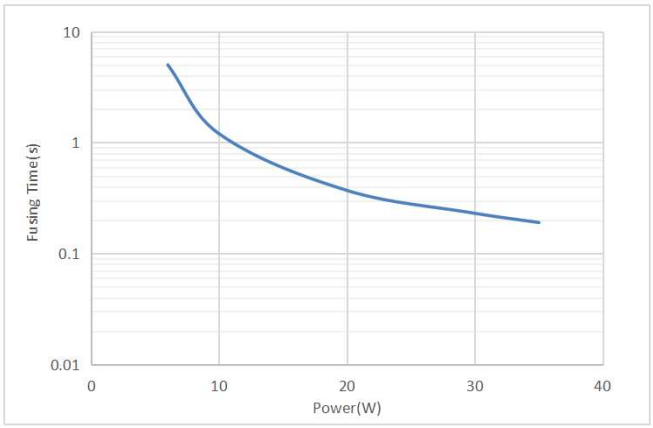




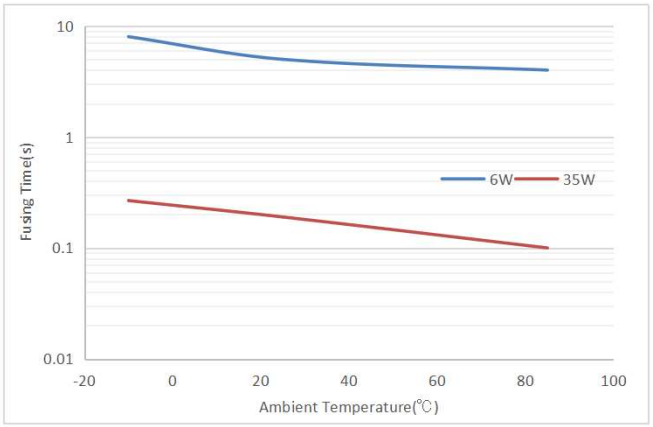
**Typical Performance Data**

**Cut Time by Heater Operation (TEPJ 12A series)**

Various heater wattage at 25℃ ambient temperature

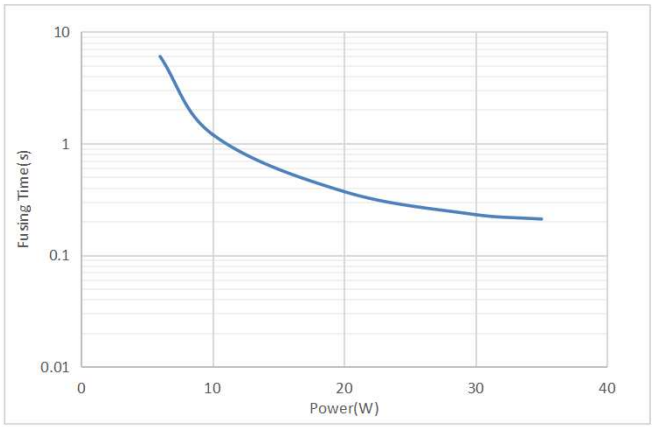



Constant heater wattage at various ambient temperature

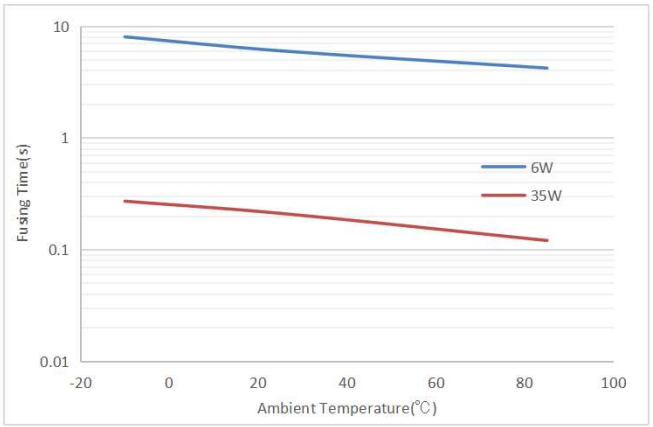



**Cut Time by Heater Operation (TEPJ 15A series)**

Various heater wattage at 25℃ ambient temperature

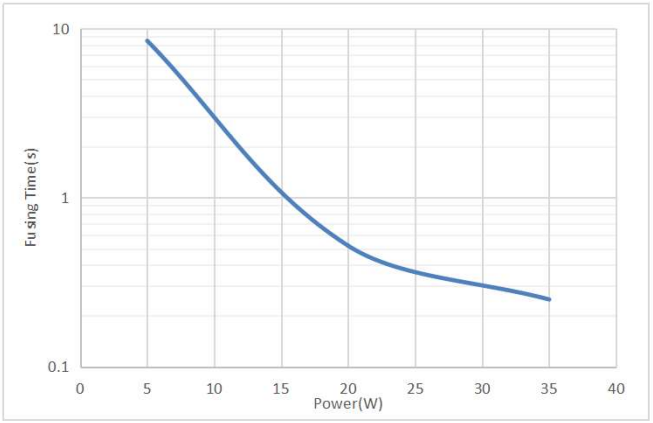



Constant heater wattage at various ambient tempera

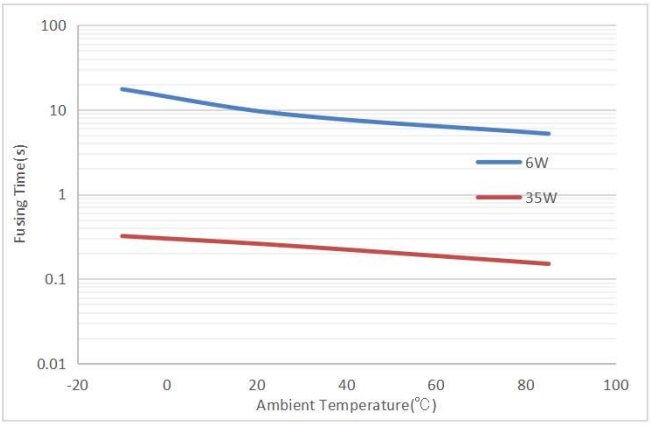


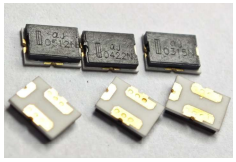

**Cut Time by Heater Operation (TEPJ 22A series)**

Various heater wattage at 25℃ ambient temperature




Constant heater wattage at various ambient temperature

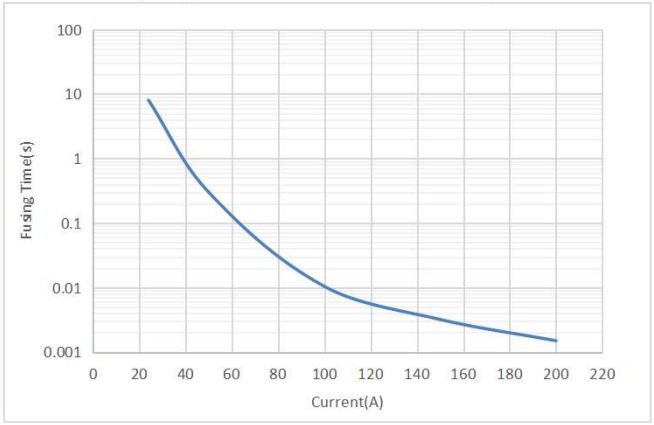




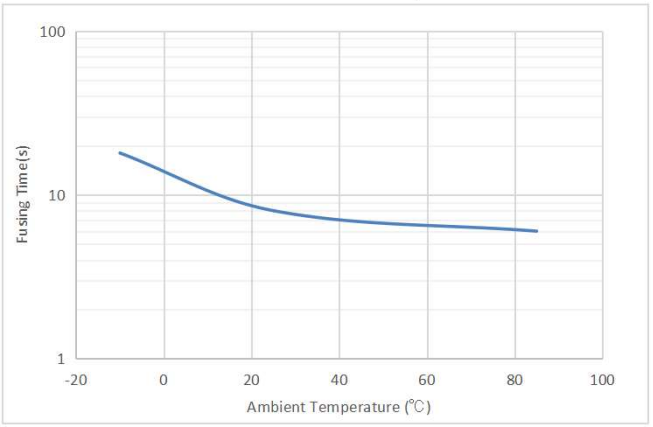


**Cut Time by Current Operation (TEPJ 12A series)**

Various interrupting current at 25℃ ambient temperature Constant

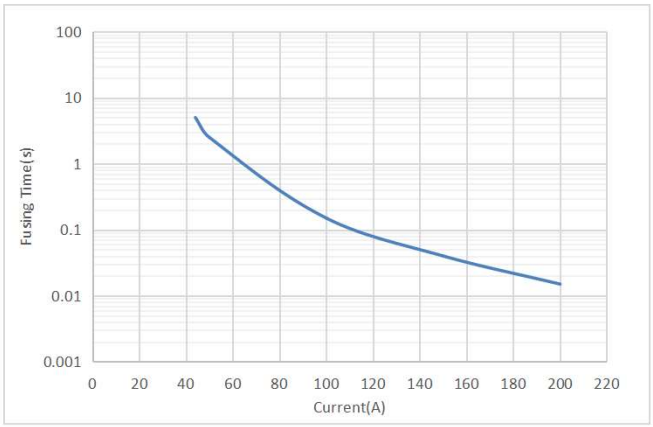



2x rated current at various ambient temperature

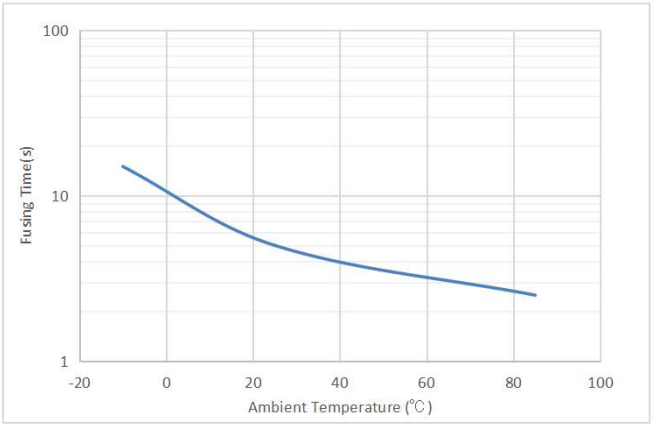



**Cut Time by Current Operation (TEPJ 22A series)**

Various interrupting current at 25℃ ambient temperature Constant

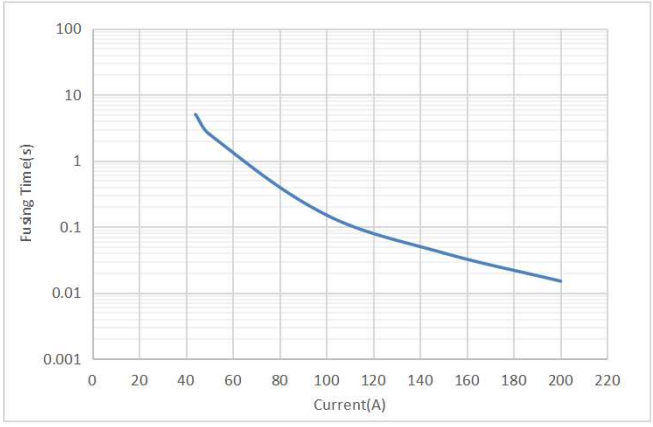



2x rated current at various ambient temperature

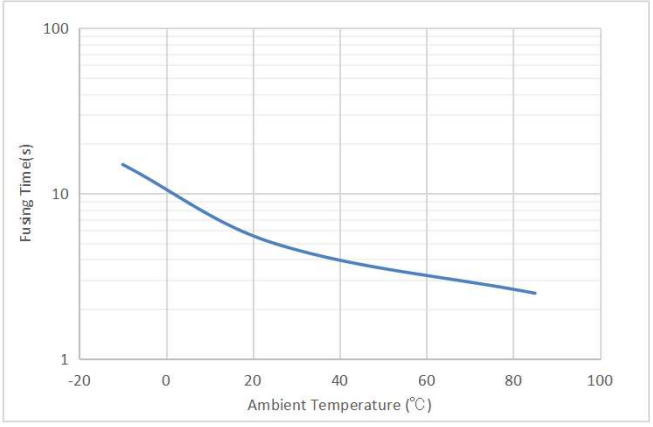


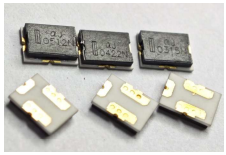

**Cut Time by Current Operation (TEPJ 22A series)**

Various interrupting current at 25℃ ambient temperature Constant




2x rated current at various ambient temperature



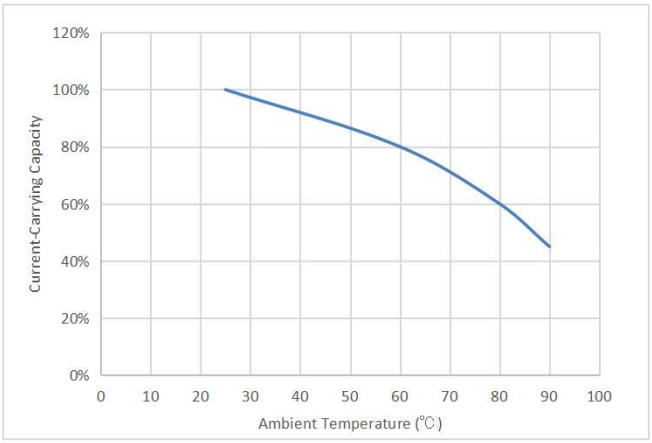


# TEPJ Series

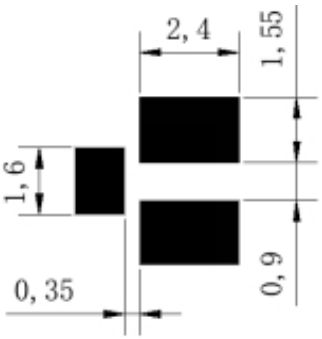


## Current CarryingCapacity (TEPJ12A series / TEPJ15A series / TEPJ15A series)

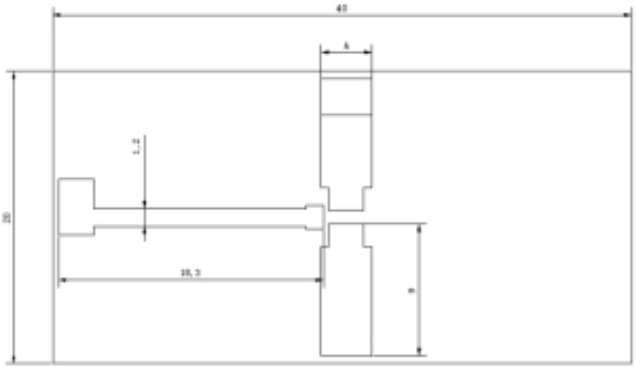
Current Carrying Capacity at various ambient temperature




## Dimensions & Marking




## Recommended Pad Layout (mm)



Unit：mm

| Type<br>规格 | Materials<br>材质 | Width of copper coating<br>覆铜宽度 | Thickness<br>厚度 | Copper thickness<br>铜厚 | Wires<br>引出线 |
|---|---|---|---|---|---|
| 12A | FR-4 | 2mm | 0.6 mm | 2.0OZ | AWG18 |
| 15A | FR-4 | 3.5mm | 0.6 mm | 2.0OZ | AWG10 |
| 22A | FR-4 | 6mm | 0.6 mm | 2.0OZ | AWG10 |

## Part Number and Marking System

| TEP | J | 08 | 15 | N | |
|---|---|---|---|---|---|
| 1~3 | 4 | 5~6 | 7~8 | 9 | 10~12 |

1~3 : **Product series**
TEP: Sea&Land battery fuses

4 : **Device Size**
J: 4030 Size

5~6 : **Cells in series**
08:8 Cells in series

7~8 : **Rated Current**
15: $I_{rated}$ 15A

9 : **Battery category / 应用电池类别**
N: NCM/NCA / 三元锂电池
L: LFP / 磷酸铁锂电池

10~12 : **Special suffix / 其他备注**

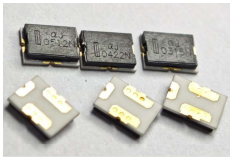

α:Sea&Land battery fuses

J: 4030 series

xx: Cells in series

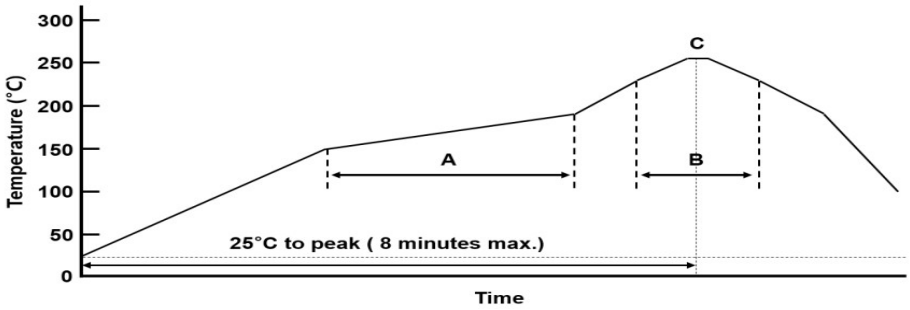
15: Rated Current 15A

N: Applied to NCM / NCA（L: Applied to LFP）





## Recommended Solder Reflow Conditions

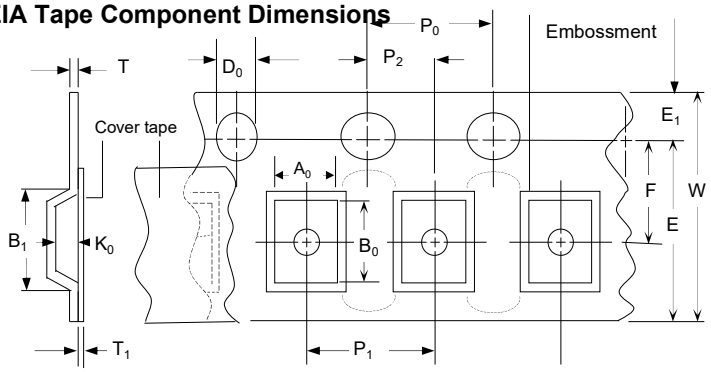



| | A (Pre-Heating) | B | C (Peak) |
|---|---|---|---|
| **Temperature(℃)** | 150~190℃ | 230±5℃ | 255±5℃ |
| **Time(s)** | 90±30s | Max.30s | Max.5s |

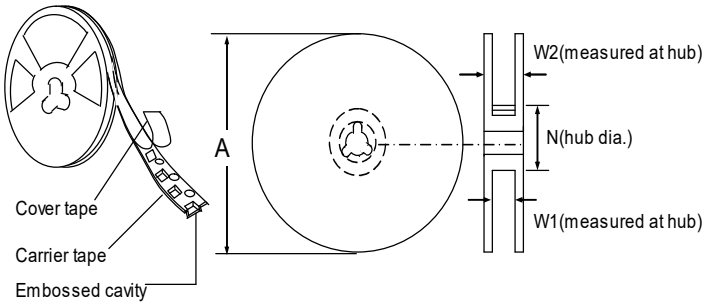
## Tape And Reel Specifications (mm)

| | |
|---|---|
| **Governing Specifications** | **EIA 481-1** |
| W | 12.0 ± 0.2 |
| P0 | 4.0 ± 0.10 |
| P1 | 8.0 ± 0.10 |
| P2 | 2.0 ± 0.30 |
| A0 | 3.50 ± 0.10 |
| B0 | 4.50 ± 0.10 |
| D0 | 1.55 ± 0.05 |
| F | 5.5 ± 0.05 |
| E1 | 1.75 ± 0.10 |
| T | 0.30 |
| T1max. | 0.1 |
| K0 | 1.25 ± 0.1 |
| Leader min. | 400 |
| Trailer min. | 110 |
| **Reel Dimensions** | |
| A max. | 330 ± 2 |
| N min. | 80 |
| W1 | 13.5 + 1, -0.5 |
| W2 min. | 19.7 |

### EIA Tape Component Dimensions




### EIA Reel Dimensions




## Storage

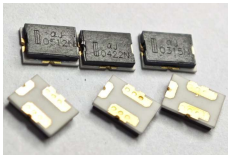
This product must be stored in shaded area where it is not too dusty, under 40℃ or less with no sudden temperature change, with relative humidity of 60% or less, and no corrosive gas in the air. The maximum storage period under above condition is 12 months.

## Order Information

**Packaging**

| TEPJ Series | 08 | 15 | N | |
|---|---|---|---|---|
| Product name<br>Size 4030mm<br>SMD：surface mount device | Cells in Series<br>08: 8 cells in series | Rated<br>15: Irated 15A | Battery catagory<br>N: NCM/NCA<br>L: LFP | 5,000 pcs/reel<br>or 1200 pcs/reel |

Devices taped with reference to EIA481 standard.





## Cautions

(1) It is necessary to foresee there are possibilities that “Current-Carrying Capacity” and “Heater Operation Characteristic” may be varied along with the condition change in the substrate thermal capacity, etc.Therefore you should check it on your PCB. Generally, when thermal capacity of PCB increases, Current-carrying capacity will increase accordingly and Clearing-time will be longer.

“载流能力”和“加热电阻动作特性”应根据基板热容量等条件的变化来预测，因此，需根据实际使用的PCB板的状态确认其特性，一般来说，由于基板多层化、双面覆铜、基材厚度增加等热容量增加原因，可通电的极限电流值（允许通电电流）较大，切断时间较长。

(2) The data on this specification is measured with UL standard PCB (0.6t Glass Epoxy single-sided copper laminated). The characteristics are influenced by thermal capacity of PCB, so it is recommended checking it on actual PCB.

本规范中的数据是用UL标准PCB测量的。特性受PCB热容量的影响，因此建议在实际PCB上进行检查。

(3) Ultrasonic-cleaning or immersion-cleaning and so on must not be done to product before and after mounted. When cleaning is done, flux on element would flow, and it would not be satisfied its specification. Moreover, a similar influence happens when the product comes in contact with cleaning-solution. These products after cleaning will not be guaranteed.

安装前后不得进行超声波清洗或浸泡清洗等。因为清洗完成时，元件上的焊剂会流动，并且不符合其规格。此外，当产品与清洁溶液接触时，也会产生类似的影响。清洁后的这些产品将无法得到保证。

(4) Please avoid contacting fuse and resin-mold. The resin might infiltrate into the product, and it doesn’t meet the specification when the resin-mold is done to this product. These products after resin-mold will not be guaranteed.

请避免接触保险丝和树脂模具。树脂可能渗透到产品中，当对该产品进行树脂成型时，树脂不符合规格。树脂成型后的这些产品将无法得到保证

(5) Please do not re-use of the fuse removed by the solder correction.

请不要使用二次拆除的保险丝。

(6) Make sure that the terminals of this product are connected property on the land of circuit board, and the value falls in the rated heater resistance between Terminal 1-2 and 3-2.

确保本产品的端子在电路板的焊盘上具有连接特性，并且该值在端子1-2和3-2之间的额定加热器电阻范围内。

(7) This product’s terminals use Ag or Au plating.Especially with Ag terminals, as they tend to easily get sulfurized or tarnished, please be cautious about their storage environment as follows.Unopen packages also must be stored under the storage condition.After opening packages, products shall be sealed in a bag with high gas barrier property (e.g. aluminum laminated bag), and must be stored under the storage condition.

该产品的端子使用Ag或Au镀层。尤其是Ag端子，因为它们很容易硫化或失去光泽，请注意以下存储环境。

未开封的包装也必须在储存条件下储存。

打开包装后，产品应密封在具有高气体阻隔性能的袋子（如铝层压袋）中，并且必须在储存条件下储存。

(8) This product is designed and produced for only general-use of electronics devices.Therefore, we do not suppose that it is used for the applications [Military, Medical and so on] which may cause direct damages on life, bodies or properties of third party.

本产品的设计和生产仅适用于电子设备的一般用途。

因此，我们不认为它用于[军事、医疗等]可能对第三方的生命、身体或财产造成直接损害的应用。

(9) It is amended in conference with the supplier and the customer when the necessity of the change or doubt occurs in this specification.

当本规范中出现变更或疑问的必要性时，在与供应商和客户的会议上对其进行修订。