



ZHUHAI COSLIGHT BATTERY CO., LTD.

## SPECIFICATION FOR APPROVAL

**PRODUCT:** Lithium Ion Polymer Rechargeable Battery

**MODEL:** C11P1707

**REVISE NO:** VER 0.20

Coslight Battery PACK Part Number:CA456080G

CUSTOMER PACK Part Number: 0B200-02880100

**FOR:** ASUS

**Customer Approval:**

Comment:

Customer's Signature/Data:

**Coslight Approval:**

| Prepared        | R&D Reviewed    | MKT Reviewed    | Approved        |
|-----------------|-----------------|-----------------|-----------------|
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| Date:2017-10-25 | Date:2017-10-25 | Date:2017-10-25 | Date:2017-10-25 |

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ZHUHAI COSLIGHT BATTERY CO., LTD.

|                       |                                                 |      |      |
|-----------------------|-------------------------------------------------|------|------|
| Product               | <b>Lithium Ion Polymer Rechargeable Battery</b> | REV. | 0.20 |
| Model                 | <b>C11P1707/3820mAh</b>                         | Page | 1/36 |
| Spec No: P3-RD-230105 |                                                 |      |      |



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## 1. General

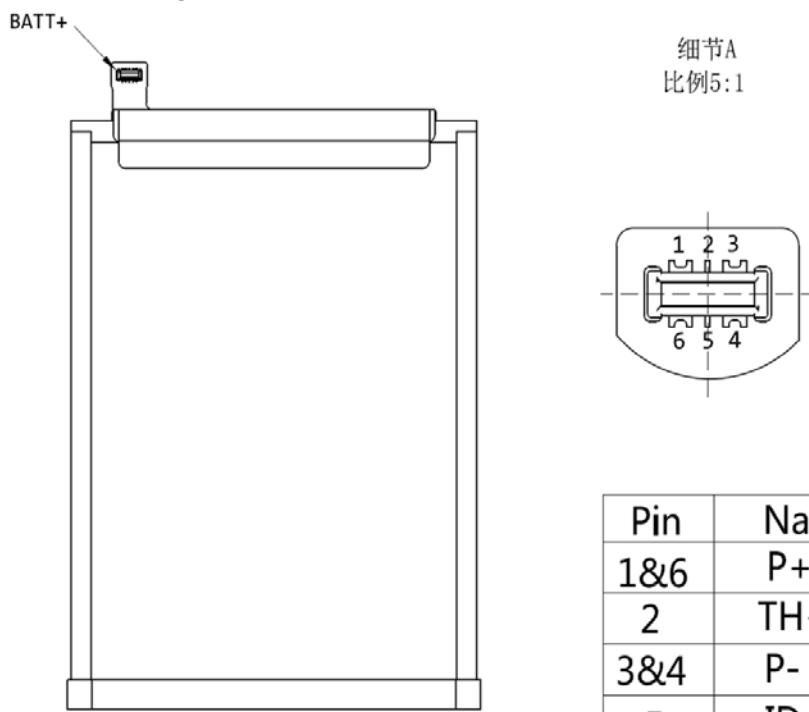
### 1.1 Scope

This specification is made to describe the product, product characteristics and performance, relevant measurement conditions and methods applied to the lithium ion polymer rechargeable battery C11P1707 as specified in following details.

### 1.2 Composition

|                      |                                       |
|----------------------|---------------------------------------|
| Applied Product Name | Rechargeable lithium-ion battery pack |
| Cell Type            | C11P1707                              |
| Cell Capacity        | 4000mAh (Typical)                     |
| Model Name           | C11P1707                              |
| Pack Capacity        | 4000mAh (Typical)                     |
| Pack Configuration   | 1Series 1Parallel(1S1P)               |
| BMU solution         | R5486K519CM                           |
| Asus PN              | 0B200-02880100                        |

### 1.3 Pin Assignment



|                       |                                          |      |      |
|-----------------------|------------------------------------------|------|------|
| Product               | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20 |
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# ZHUHAI COSLIGHT BATTERY CO., LTD.

## 2. Product Specification

### 2.1 Electrical Specification

| No. | Items                                    | Specifications                                                                      | Remark                                                                                            |
|-----|------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1   | Rated Capacity                           | Typical:4000mAh<br>Min:3820mAh                                                      | Charge: Standard charge<br>Discharge: Standard discharge                                          |
| 2   | Nominal Voltage                          | 3.85 V                                                                              |                                                                                                   |
| 3   | Charge Limited Voltage                   | 4.40 <sup>+0.05</sup> <sub>-0.01</sub> V                                            |                                                                                                   |
| 4   | Discharge Cut-off Voltage                | 3.0 V                                                                               |                                                                                                   |
| 5   | Standard Charge                          | 0.3C(1146mA) max to 4.4V, then CV to 0.02C cutoff.                                  | 0~10°C                                                                                            |
|     |                                          | 0.5C(1910mA) max to 4.4V, then CV to 0.02C cutoff.                                  | 10~20°C                                                                                           |
|     |                                          | 0.5C(1910mA) max to 4.4V, then CV to 0.02C cutoff.                                  | 20~50°C                                                                                           |
|     |                                          | 0.5C(1910mA) max to 4.1V, then CV to 0.02C cut off.                                 | 50~60°C                                                                                           |
| 6   | Standard Discharge                       | Using 0.2C( 764mA)constant current discharge to the Discharge Cut-off Voltage       |                                                                                                   |
| 7   | Maximum Continuous Charge Current        | 1.91A                                                                               | 20~50°C                                                                                           |
| 8   | Maximum Continuous Discharge Current     | 3.6A                                                                                | Ambient temperature is 40°C (saftey test condition)                                               |
| 9   | Peak                                     | 6.2A                                                                                | 5S                                                                                                |
| 10  | Operating Temperature and Humidity Range | Charge: 0~60°C<br>Humidity: Less than 85% RH                                        |                                                                                                   |
|     |                                          | Discharge: -20~60°C<br>Humidity: Less than 85% RH                                   |                                                                                                   |
| 11  | Storage Temperature and Humidity Range   | 1 month: -20~60°C<br>3 month: -20~45°C<br>1 year: -20~25°C<br>Humidity: 45%~ 90% RH | The battery should cycle once in three month. Recommended storage temperature is 25°C of SOC 50%. |
| 12  | Battery PACK Weight                      | $\leq$ 58 g                                                                         |                                                                                                   |
| 13  | Shipment Voltage                         | 3.75~3.80V                                                                          |                                                                                                   |
| 14  | Initial Impedance                        | Max120 mΩ                                                                           |                                                                                                   |
| 15  | Thermistor                               | $10K\Omega \pm 1\%$ , $B(25/85)=3435 \pm 1\%$                                       |                                                                                                   |
| 16  | ID Pin                                   | $51K\Omega \pm 1\%$                                                                 |                                                                                                   |
| 17  | Battery PACK Dimension                   | Refer to "Mechanical Characteristics "                                              |                                                                                                   |

|         |                                          |      |      |
|---------|------------------------------------------|------|------|
| Product | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20 |
| Model   | C11P1707/3820mAh                         | Page | 4/36 |



## 2.2 Charge State before Shipment

Shipment of battery voltage 3.75-3.80V, The battery pack shall be charged max of 20~30% \*capacity inactive mode when delivered.

## 2.3 Protection Specification

| PCM Electrical specification                 |                          |                                  |       |      |                            |
|----------------------------------------------|--------------------------|----------------------------------|-------|------|----------------------------|
| Item                                         | Min.                     | Typ.                             | Max.  | Unit | Remarks                    |
| Over charge protection voltage               | 4.455                    | 4.475                            | 4.495 | V    |                            |
| Over charge protection delay time            | 0.7                      | 1                                | 1.3   | Sec  |                            |
| Over discharge protection voltage            | 2.365                    | 2.4                              | 2.435 | V    |                            |
| Over discharge protection delay time         | 14                       | 20                               | 26    | ms   |                            |
| Over discharge current protection current    | 7.2                      | 8                                | 8.8   | A    |                            |
| Over discharge current protection delay time | 8                        | 12                               | 16    | ms   |                            |
| Over charge current protection current       | 4.2                      | 5                                | 5.8   | A    |                            |
| Over charge current protection delay time    | 11                       | 16                               | 21    | ms   |                            |
| Short protection current                     | 27                       | 36                               | 45    | A    |                            |
| Short protection delay time                  | 180                      | 250                              | 425   | us   |                            |
| Operating current consumption                |                          | 4                                | 8     | uA   |                            |
| Current consumption(Power down)              |                          |                                  | 0.1   | uA   |                            |
| PCM breaker impedance(at 25°C)               |                          |                                  |       | mΩ   |                            |
| Thermistor                                   |                          |                                  |       | KΩ   | 10KΩ ±1%, B(25/35)=3435±1% |
| PACK Impedance                               |                          |                                  |       |      |                            |
| Pack Imp                                     | Min.                     | Typ.                             | Max.  | Unit | Remarks                    |
|                                              | MOSFET(Rss)              | 3                                | 5     | 10   | mΩ                         |
|                                              | Rsensor(5mΩ ±1%)         | 4.95                             | 5     | 5.05 | mΩ                         |
|                                              | PTC                      | 1                                | 6     | 14   | mΩ                         |
|                                              | Cell                     |                                  |       |      | mΩ                         |
|                                              | 点焊(Predicted value)      | 0                                | 1     | 3    | mΩ                         |
|                                              | FPC(include connector)   | 10                               | 20    | 30   | mΩ                         |
|                                              | PCB Predicted value      |                                  |       |      | mΩ                         |
| Key-parts spec                               |                          |                                  |       |      |                            |
| Gas-gauge IC                                 |                          | ingore this item if no gas gauge |       |      |                            |
| Protection IC                                | R5486K519CM、MM3722KF6RRE |                                  |       |      |                            |
| MosFet                                       | FC6H21880L、QS1B01R6E     |                                  |       |      |                            |
| PTC                                          | SMD1206P450SLR-Y         |                                  |       |      |                            |
| Cont Type                                    |                          |                                  |       |      |                            |

|                       |                                          |      |      |
|-----------------------|------------------------------------------|------|------|
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| Spec No: P3-RD-230105 |                                          |      |      |



## 2.4 IQC Spec for EMS/ODM Reference

|   |                                                         |                                                                                                                                                    |
|---|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Battery pack output voltage(15-30% SOC)                 | 3.73-3.80V                                                                                                                                         |
| 2 | Thermistor value<br>103T compatible/B value:3435(25/85) | (a)当环境温度为10°C~20°C, TH pin17.817KΩ<br>~12.267KΩ<br>(b)当环境温度为20°C~30°C, TH pin11.977KΩ<br>~8.392KΩ<br>(c)当环境温度为30°C~40°C, TH pin8.195KΩ<br>~5.885KΩ |
| 3 | Battery ID pin value                                    | 51KΩ±2%                                                                                                                                            |
| 4 | Battery pin define                                      | Refer to "5.1 2D drawing" of approval sheet                                                                                                        |
| 5 | Battery Dimension                                       | Refer to "5.1 2D drawing" of approval sheet                                                                                                        |
| 6 | Label drawing                                           | Refer to "5.3 Label Artwork" of approval sheet                                                                                                     |
| 7 | Battery Appearance Spec                                 | Refer to "Battery進料檢驗作業規範"                                                                                                                         |
| 8 | Battery barcode (ASUS P/N & Stage)                      | 0B200-02880100                                                                                                                                     |
| 9 | Gauge Communication Data                                | NA                                                                                                                                                 |

|         |                                          |      |      |
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## 3. Safety and Pack Performance

### 3.1 Pack Performance and Test condition

| Items                                | Conditions and others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Criteria                                                                                               |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Cycle life                           | Carry out 500cycles at $25\pm 3^{\circ}\text{C}$<br>charge: 0.5C charge to 4.4V, cut off 0.02C<br>discharge: 0.5C to 3.0V                                                                                                                                                                                                                                                                                                                                                                                                        | Residual Capacity:<br>$\geq 80\%$ (of $C_{\text{Initial}}$ )                                           |
| Pack impedance                       | ACIR/1KHz at $25 \pm 3^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | $\leq 120 \text{ m}\Omega$                                                                             |
| ESD ability                          | $\pm 12\text{kV}$ by contact, test 10 times                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | No fire, no explode                                                                                    |
|                                      | $\pm 15\text{kV}$ by air                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                        |
| Power consumption                    | $V_{\text{cell}}=3.9\text{V}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4-8uA(BMU)                                                                                             |
| Over charge protection               | The standard charged battery should be charged at 2 C5A constant current with a constant voltage 7.70V for 7 hours.                                                                                                                                                                                                                                                                                                                                                                                                              | The battery shall no leakage, no venting, no rupture, no fire and no explosion.                        |
| Over discharge protection            | After standard discharged, the battery is connected with a $30\Omega$ load to discharge for 7hrs.                                                                                                                                                                                                                                                                                                                                                                                                                                | The battery shall no leakage, no venting, no rupture, no fire and no explosion.                        |
| External short-circuiting Protection | The standard charged battery is to be short-circuited by connecting the positive and negative terminals of the battery with copper wire having a resistance about $80\text{m}\Omega\pm 20 \text{ m}\Omega$ .                                                                                                                                                                                                                                                                                                                     | The battery shall no leakage, no venting, no rupture, no fire and no explosion.                        |
| Drop impact test                     | A battery is to be heated in a circulating air oven. The temperature of the oven is to be raised at a rate of ( $5^{\circ}\text{C}\pm 2^{\circ}\text{C}$ )/min to a temperature of $130^{\circ}\text{C}$ . The oven is to remain for 30 minutes.                                                                                                                                                                                                                                                                                 | No fire, no explode                                                                                    |
| Heating test                         | A battery is to be heated in a circulating air oven. The temperature of the oven is to be raised at a rate of ( $5^{\circ}\text{C}\pm 2^{\circ}\text{C}$ )/min to a temperature of $130^{\circ}\text{C}$ . The oven is to remain for 30 minutes.                                                                                                                                                                                                                                                                                 | No fire, no explode                                                                                    |
| Over charge                          | A fully discharged battery is to be placed in a circulating air oven. Connected with thermocouple. Charged with CV. 4.6V and CC. 3 C5A until the battery voltage up to 4.6V, The test should be finished when the battery meet any of the conditions as below:<br>1) battery has been charged for 7hr.<br>2) the temperature of battery lower than peak temperature about 20%                                                                                                                                                    |                                                                                                        |
| Short Circuit                        | The test should be conducted under $55\pm 5^{\circ}\text{C}$ . A cell is to be placed in a circulating air oven. Connected with thermocouple. The cell is to be short-circuited by connecting the positive and negative terminals of the cell with copper wire having a resistance about $80\text{m}\Omega\pm 20 \text{ m}\Omega$ . The test should be finished when the cell meet any of the conditions as below:<br>1) The cell has been shorted for 24hr.<br>2) The temperature of cell lower than peak temperature about 20% | Without PCM, no fire, no explode, the temperature of cell surface no more than $150^{\circ}\text{C}$ . |
| Thermal Shock                        | Battery (standard charged) is repeatedly tested with 10 times heat cycling, which means maintaining the battery for 6hours at $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and $75^{\circ}\text{C}\pm 2^{\circ}\text{C}$ respectively. The interval of temperature change is kept in 30min.                                                                                                                                                                                                                                        | The battery shall no leakage, no venting, no rupture, no fire and no explosion.                        |
| Product                              | Lithium Ion Polymer Rechargeable Battery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | REV.                                                                                                   |
| Model                                | C11P1707/3820mAh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Page                                                                                                   |
| Spec No:                             | P3-RD-230105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.20                                                                                                   |
|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 7/36                                                                                                   |



## 3.2 Safety Operating Parameters for GB 31241

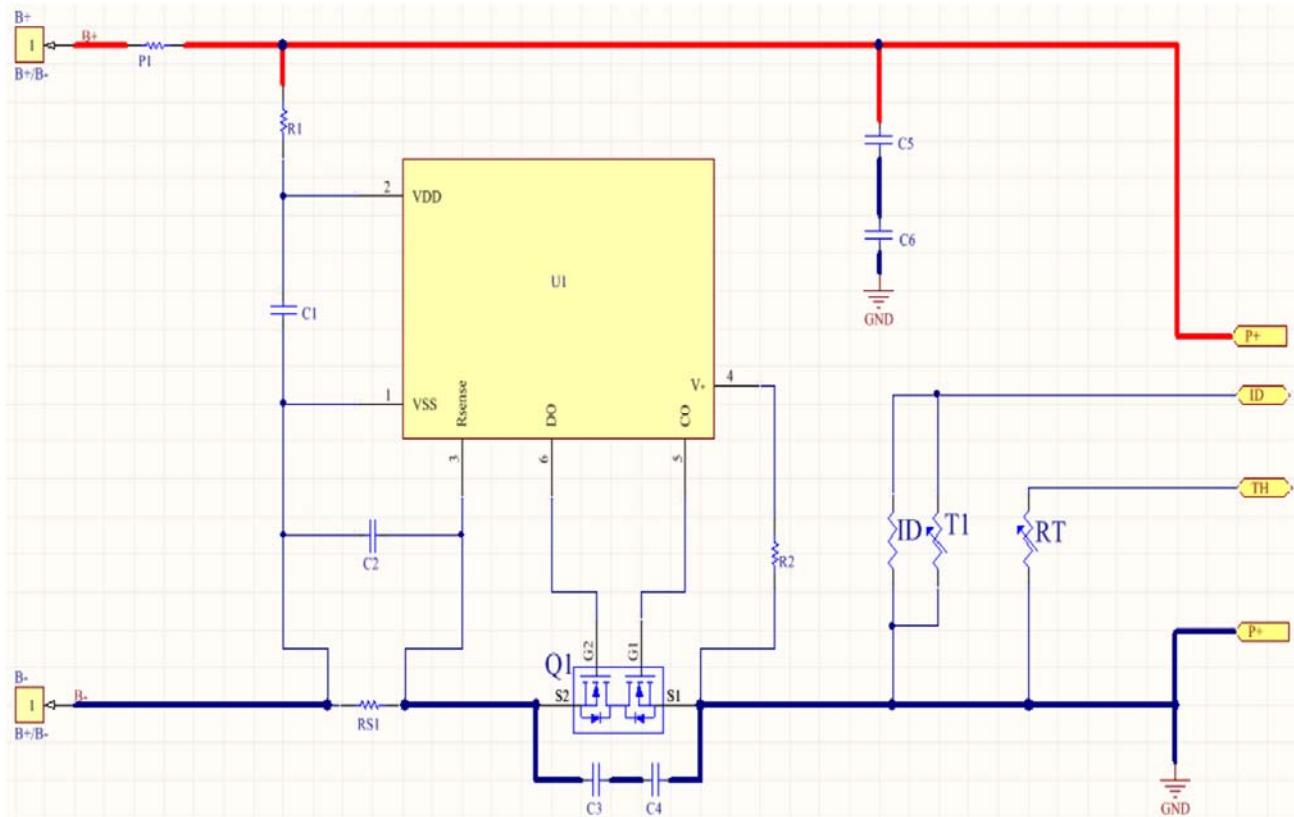
| 安全工作参数<br>Safety Operating Parameter              | 符号<br>Symbol | 电池组<br>Battery Paack |
|---------------------------------------------------|--------------|----------------------|
| 充电限制电压<br>limited charging voltage                | Vcl          | 4.40V                |
| 充电上限电压<br>upper limited charging voltage          | Vup          | 4.40V                |
| 放电截止电压<br>discharge cut-off voltage               | Vdo          | 2.365V               |
| 推荐充电电流<br>recommendation charging current         | Icr          | 1910mA               |
| 最大充电电流<br>maximum charging current                | Icm          | 1.91A                |
| 推荐放电电流<br>recommendation discharging current      | Idr          | 764mA                |
| 最大放电电流<br>maximum discharging current             | Idm          | 3.6A                 |
| 过压充电保护电压<br>over voltage for charge protection    | Vcp          | 4.475V               |
| 过流充电保护电流<br>over current for charge protection    | Icp          | 5.0A                 |
| 欠压放电保护电压<br>low voltage for discharge protection  | Vdp          | 2.40V                |
| 过流放电保护电流<br>over current for discharge protection | Idp          | 8.0A                 |
| 上限充电温度<br>upper limited charging temperature      | Tcm          | 60°C                 |
| 上限放电温度<br>upper limited discharging temperature   | Tdm          | 60°C                 |
| 充电截止电流<br>taper current for charging              | .            | 76.4mA               |

|         |                                          |      |      |
|---------|------------------------------------------|------|------|
| Product | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20 |
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## 4. Circuit Diagram

## 4.1 Schematic

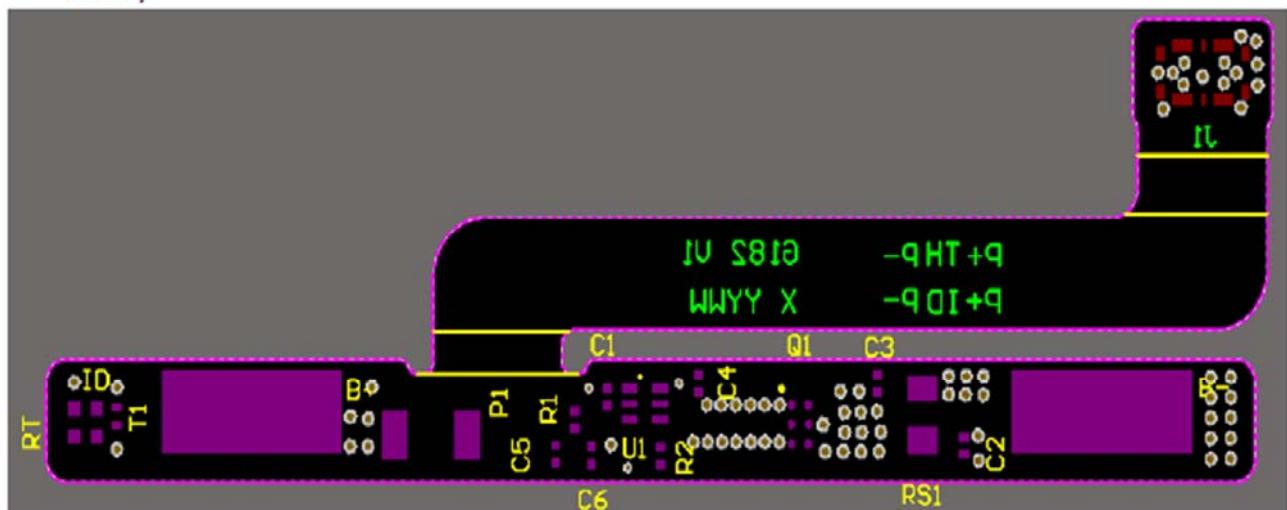


|         |                                          |      |      |
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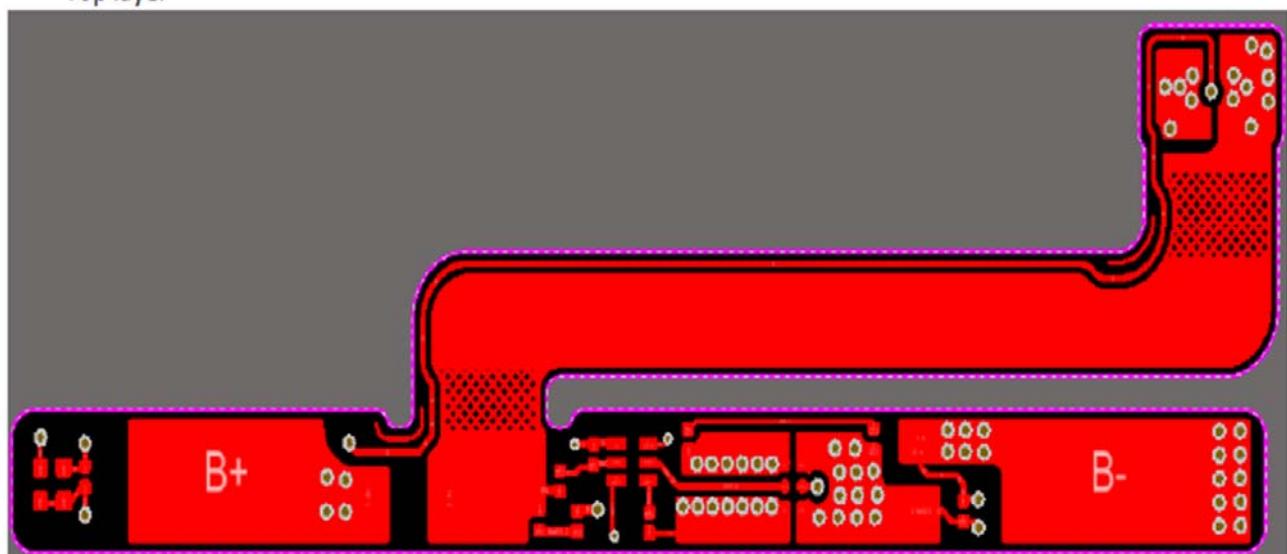


## 4.2 Component Placement

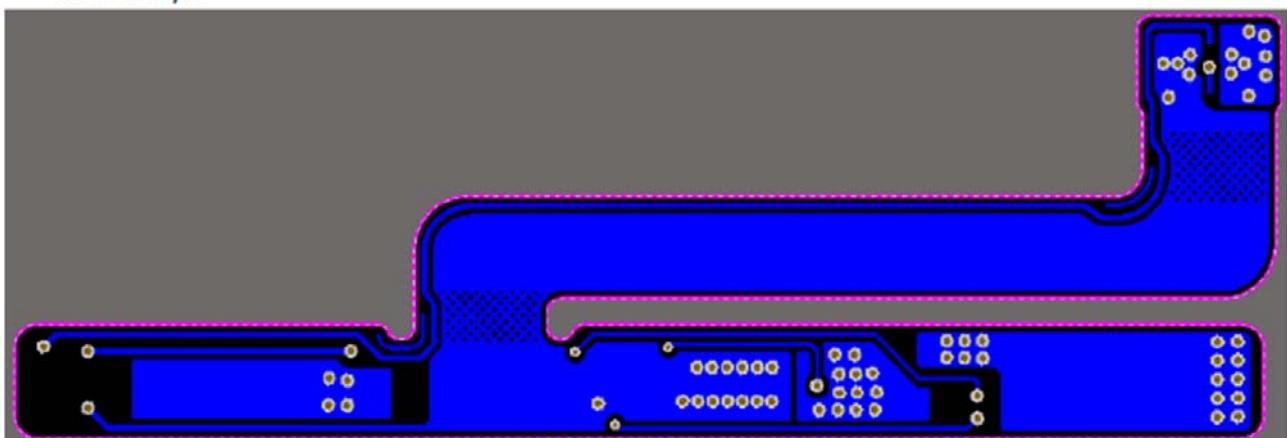
Overlay



Top layer



Bottom layer

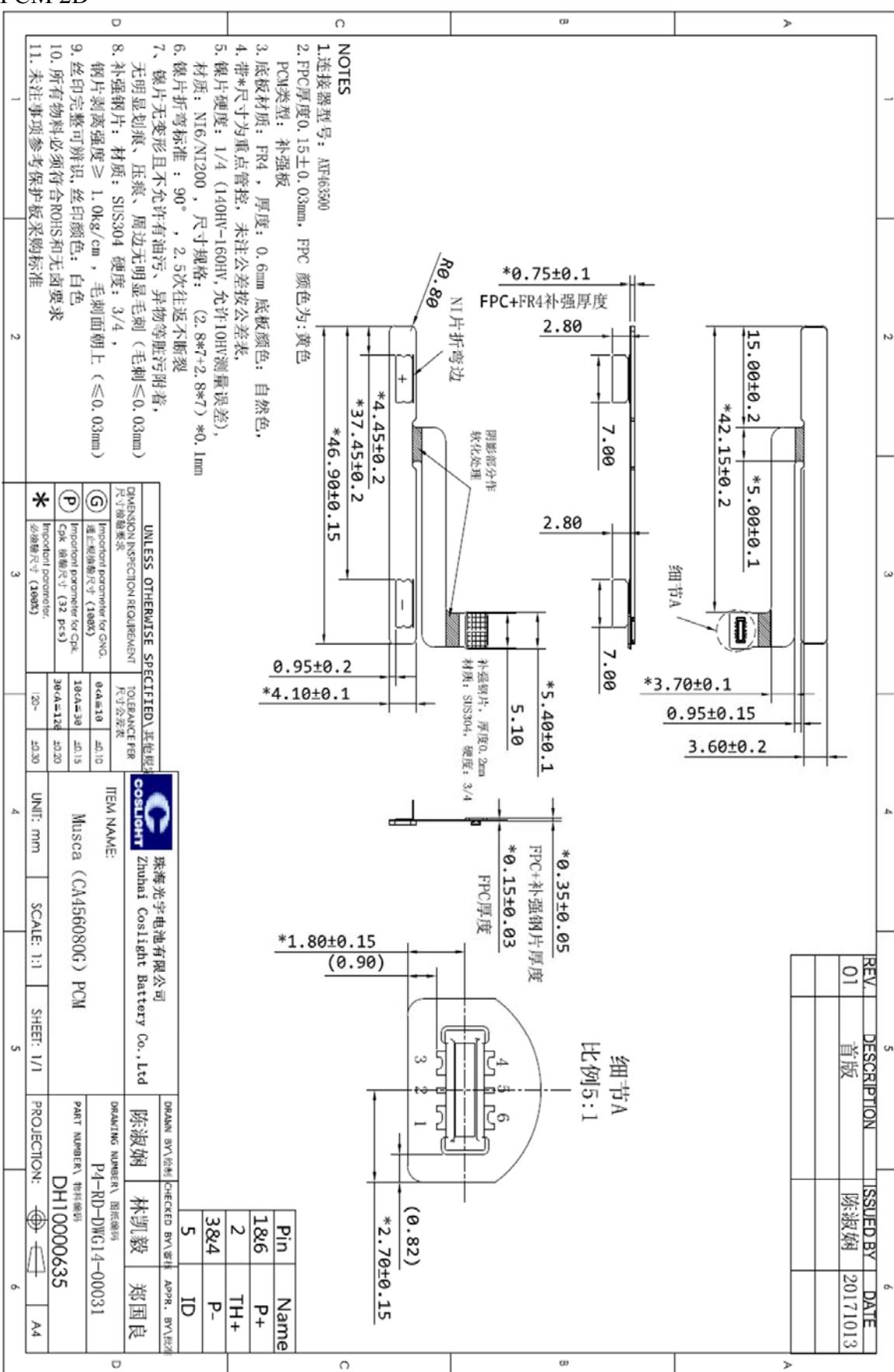


|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
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### 4.3 PCM 2D



|         |                                          |  |  |      |       |
|---------|------------------------------------------|--|--|------|-------|
| Product | Lithium Ion Polymer Rechargeable Battery |  |  | REV. | 0.20  |
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## 4.4 PCM BOM List

| NO. | Description | Symbol | Model/Spec.                                             | brand            | unit | Q'ty |
|-----|-------------|--------|---------------------------------------------------------|------------------|------|------|
| 1   | IC (主选)     | U1     | R5486K519CM-TR_DFN1414                                  | RICOH            | PCS  | 1    |
|     | IC (备选)     |        | MM3722KF6RRE_SSON-6J                                    | MITSUMI          |      |      |
| 2   | MOS (主选)    | Q1     | FC6H21880L_MLGA006                                      | Panasonic        | PCS  | 1    |
|     | MOS (备选)    |        | QS1B01R6E                                               | UBIQ             |      |      |
| 3   | 贴片电容        | C1-C6  | 0.1uF±10%_16V_0201                                      | YAGEO/MURATA/TDK | PCS  | 6    |
| 4   | 压敏电阻        | T1     | EZJPZV080GA                                             | Panasonic        | PCS  | 1    |
| 5   | Sense电阻     | RS1    | 5mΩ±1%_0805_1/2W                                        | SART             | PCS  | 1    |
| 6   | 贴片电阻        | R1     | 100Ω±5%_0201_1/20W                                      | YAGEO/RALEC      | PCS  | 1    |
| 7   | 贴片电阻        | R2     | 1KΩ±5%_0201_1/20W                                       | YAGEO/RALEC      | PCS  | 1    |
| 8   | 贴片电阻        | ID     | 51KΩ±1%_0402_1/16W                                      | YAGEO/RALEC      | PCS  | 1    |
| 9   | NTC (主选)    | RT     | 10KΩ±1% B(25/85)=3435±1%_0402                           | TDK              | PCS  | 1    |
| 10  | NTC (备选)    |        | 10KΩ±1% B(25/85)=3434±1%_0402                           | Murata           |      |      |
| 11  | PTC (主选)    | P1     | SMD1206P450SLR-Y                                        | PTTC             | PCS  | 1    |
| 12  | FPCB        | FPC    | 黄油白字/G182 V1 /2层软板+FR4补强/OSP/<br>0.50Z基铜+0.50Z镀铜，高延展电解铜 | 双赢/骏亚/五株         | PCS  | 1    |
| 13  | 镍片          | B+, B- | 镍片 Ni6或Ni200 7.0*(2.8+H2.8)*0.1mm 1/4H<br>L形 90° 往返2.5次 | 天骏               | PCS  | 2    |
| 14  | 连接器         | J1     | AXF463500FE1                                            | Panasonic        | PCS  | 1    |
| 15  | Under fill胶 | /      | UF3808, 黑色                                              | 汉高/乐泰            | g    | 0.02 |

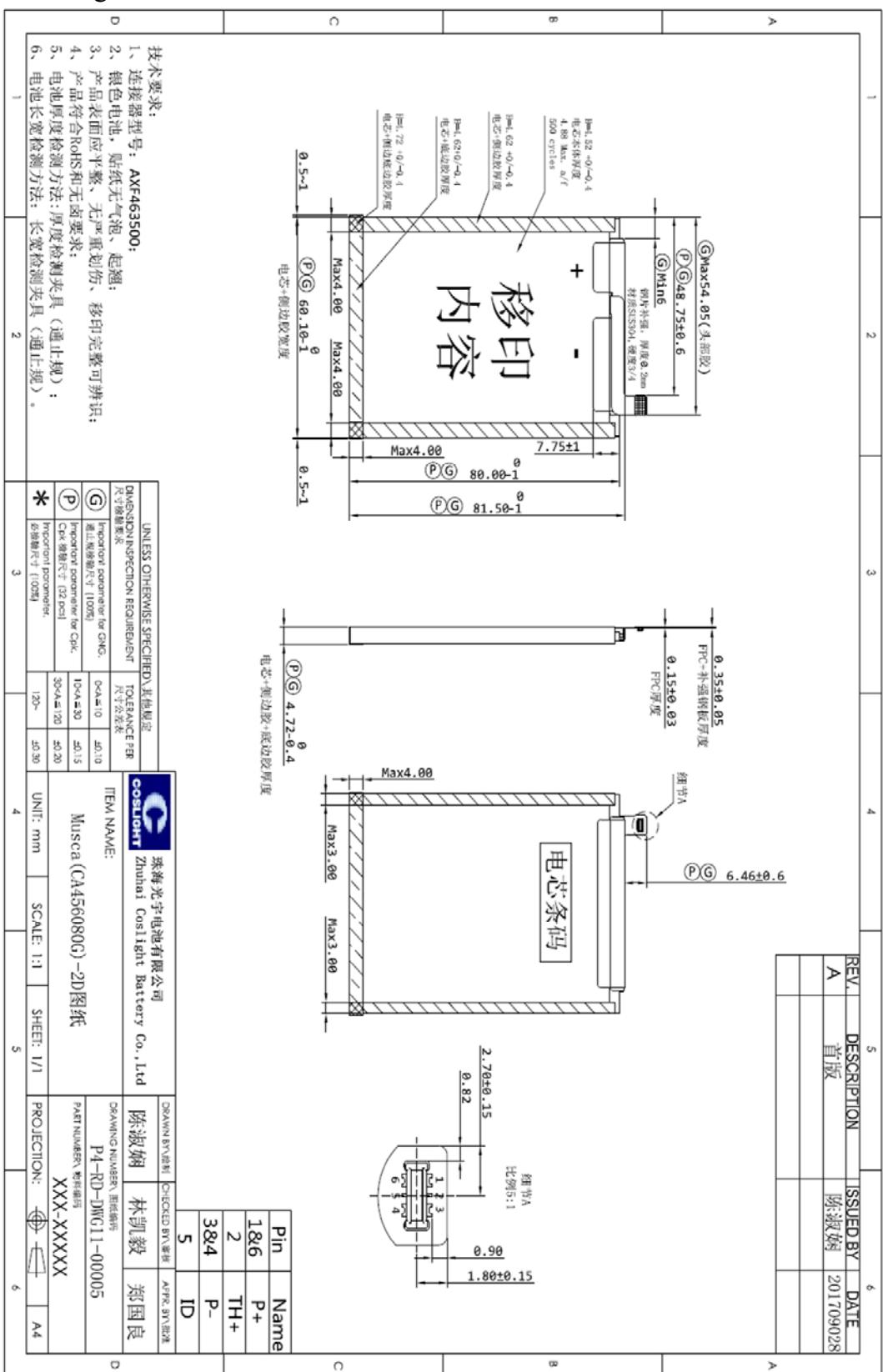
|         |                                          |      |       |
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## 5. Mechanical Specification

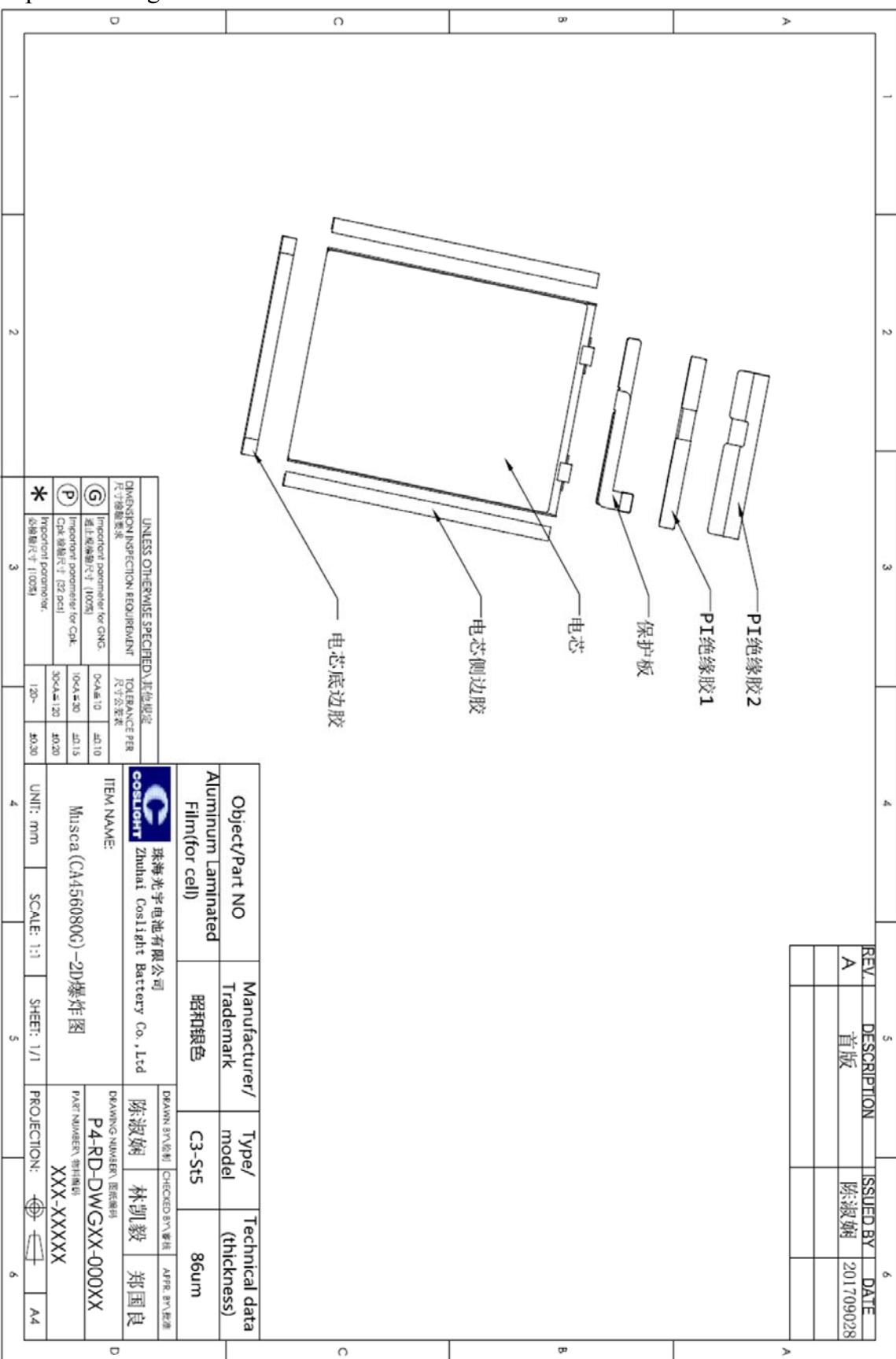
## 5.1 2D Drawing



|                       |                                          |  |  |
|-----------------------|------------------------------------------|--|--|
| Product               | Lithium Ion Polymer Rechargeable Battery |  |  |
| Model                 | C11P1707/3820mAh                         |  |  |
| Spec No: P3-RD-230105 |                                          |  |  |



5.2 Explosion Diagram



| Object/Part NO                                                              | Manufacturer/<br>Trademark          | Type/<br>model | Technical data<br>(thickness)                                                                                                                                                                        |
|-----------------------------------------------------------------------------|-------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aluminum Laminated<br>Film(for cell)                                        | 昭和銀色                                | C3-St5         | 86um                                                                                                                                                                                                 |
| UNLESS OTHERWISE SPECIFIED(其他規定)<br>DIMENSION INSPECTION REQUIREMENT 尺寸檢驗要求 |                                     |                |                                                                                                                                                                                                      |
| TOLERANCE PER 尺寸公差                                                          |                                     |                |                                                                                                                                                                                                      |
| (G) Important parameter for GNG<br>尺寸公差尺寸 [100%]                            | 0.04±10                             | ±0.10          | D<br>DEAILED BY\绘制<br>CHECKED BY\審核<br>APPR. BY\批准                                                                                                                                                   |
| (P) Important parameter for Cpk<br>Cpk 要素尺寸 [30 pieces]                     | 104.4±30                            | ±0.15          | ITEM NAME:<br>珠海外光电池有限公司<br>Zhuhai Coslight Battery Co., Ltd<br>DRAWING NUMBER\圖面編號<br>P4-RD-DWGXX-000XX<br>PART NUMBER\部件編號<br>XXX-XXXXX<br>SCALE: 1:1<br>UNITS: mm<br>SHEET: 1/1<br>PROJECTION: A4 |
| *                                                                           | Important parameter<br>公差量尺寸 [1024] | 120~40.30      |                                                                                                                                                                                                      |

|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
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# ZHUHAI COSLIGHT BATTERY CO., LTD.

## 5.3 Label Artwork

| 1                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                                                                                                                                                                                                                                                                                                                                     | 3                                                               | 4                                                                                                                                                                                                                                                                                                                       | 5                                                                                                                                                                                                                                                                                             | 6                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REV.                                                                                                                                                                                                                                                                                                                                                                                                                             | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                           | ISSUED BY                                                       | DATE                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                | 首版                                                                                                                                                                                                                                                                                                                                                                                                    | 陈淑娴                                                             | 20170927                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
| <p><b>技术要求：</b></p> <ol style="list-style-type: none"> <li>1. 印刷内容在电芯宽度方向居中，采用移印工艺；</li> <li>2. 移印颜色：黑色（具体颜色以签样为准）；</li> <li>3. 本项目 Musca 客户料号为：0B200-02880100</li> <li>4. 二维码尺寸：<math>5.5 \times 5.5 (\pm 0.5\text{mm})</math>，格式QR码，采用喷码工艺；</li> <li>5. 二维码以其右侧的打码非移印内容，由喷码机生成；</li> <li>6. 字体排版比例：1:1；</li> <li>7. 此物料需符合RoHS要求；</li> <li>8. 字体线条粗细0.18mm；</li> <li>9. 线框仅作辅助作用，非丝印内容。</li> <li>10. 移印尺寸 42*59(mm)</li> </ol> |                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                      |
| <p><b>技术要求：</b></p> <ol style="list-style-type: none"> <li>1. 印刷内容在电芯宽度方向居中，采用移印工艺；</li> <li>2. 移印颜色：黑色（具体颜色以签样为准）；</li> <li>3. 本项目 Musca 客户料号为：0B200-02880100</li> <li>4. 二维码尺寸：<math>5.5 \times 5.5 (\pm 0.5\text{mm})</math>，格式QR码，采用喷码工艺；</li> <li>5. 二维码以其右侧的打码非移印内容，由喷码机生成；</li> <li>6. 字体排版比例：1:1；</li> <li>7. 此物料需符合RoHS要求；</li> <li>8. 字体线条粗细0.18mm；</li> <li>9. 线框仅作辅助作用，非丝印内容。</li> <li>10. 移印尺寸 42*59(mm)</li> </ol> | <p><b>二维码内容：</b>0B200-02880100SLKLYWVWNINN<br/>1~14位（0B200-02880100）：客户料号，固定不变(第二位为字母B，第六位为“S”，其余均为数字)；<br/>15位（S）：Stage, S=SR Stage；E=ER Stage；P=PR Stage；M=MVR Stage；<br/>16~17位（U）：为数字00，固定不变；<br/>18~19位（KL）：保留板版本，为A1, A2, A3.....<br/>20位（M）：EEPROM Code，为数字0，固定不变<br/>21位（Y）：年，6为2016年；7为2017年.....<br/>22~23位（WW）：PACK生产周次，14代表第13周，14代表第14周.....<br/>24~27位（NNNN）：32进制流水号，有数字0~9和字母A~V组成</p> | <p><b>二维码明码内容：</b><br/>YYYY/MM/DD<br/>生产日期：<br/>C11P1M HNOP</p> | <p><b>Y</b><br/>第一行1~4位：C11P，固定不变<br/>第一行5位：P 容量區間 40000mAh 為 n (注意：為小寫 "n" )<br/>第一行6位：J，電芯廠，“I”代表光字<br/>第一行7位：M, PACK廠，“M”代表光字<br/>第一行8位：空格<br/>第一行9位：H，隔段號，同二維碼中第15位號“S”<br/>第一行10位：N，年，與二維碼中第21位號應<br/>第一行11~12位：OP，過次，與二維碼中第22~23位對應<br/>第二行：“生產日期：”，固定不变<br/>第三行：“YYYY/MM/DD”，PACK生產日期，如2016年3月10日為2016/03/10</p> | <p><b>D</b><br/><b>DIMENSION INSPECTION REQUIREMENT</b><br/>TOLERANCE PER:<br/>R: 檢驗要求<br/>R: 公差<br/>G: 移印公差 (100%)<br/>G: 0~±10 ±10<br/>P: 喷印公差 (32 pos.)<br/>P: 10~±5 ±5<br/>*: 移印尺寸 (32 pos.)<br/>*: 30~±120 ±20<br/>*: 120~ ±20 UNIT: mm SCALE: 1:1 SHEET: 1/1 PROJECTION: -④- ← → A4</p> | <p><b>C</b><br/><b>珠海光宇电池有限公司</b><br/>Zhuhai Coslight Battery Co.,Ltd<br/>DRAWN BY/繪圖<br/>陳淑娴<br/>CHECKED BY/審核<br/>林凱毅<br/>APPROVED BY/批准<br/>鄭國良<br/>ITEM NAME:<br/>Musca(CA456080G)_<br/>DRAWING NUMBER/圖紙編號<br/>P4-RD-DWG15-00117<br/>PRINT NUMBER/印刷編號<br/>XXXX-XXXXX<br/>D</p> |

|         |                                          |      |       |
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放大图



Rating: +3.85V == 15.4Wh MODEL ( 型號/型号 ) : C11P1707

Questions ? Please visit [www.asus.com](http://www.asus.com)

1ICP5/60/80

Rechargeable Li-Polymer Battery Pack

锂离子电池组 二次鋰電池組

Capacity: 4000mAh(TYP) / 3820mAh (MIN)

制造商: 珠海光宇电池有限公司 制造地: 中国

Manufacturer: ZhuHai Coslight Battery Co.,Ltd.

Battery cell made in China Assembled in China

Please refer to manual before using battery.

Veuillez consulter le manuel d'utilisation avant d'utiliser la batterie

Beziehen Sie sich bitte auf dieses Handbuch,

bevor Sie die Batterie verwenden.

使用電池之前請先參考使用手冊 / 使用电池之前请先参考使用手册

注意事项: 禁止拆解、撞击、挤压或投入火中。若出现严重鼓胀,

请勿继续使用。请勿置于高温环境中。电池浸水后禁止使用。

IS 16046/IEC 62133



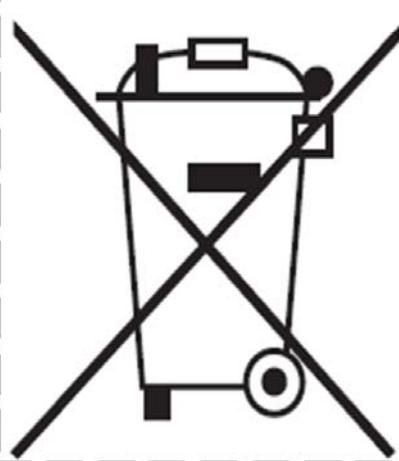
R-41021741



廢電池請回收

执行标准: GB31241-2014  
额定容量: 3820mAh  
充电限制电压: 4.4V ==

ASUS JAPAN 株式会社  
3.85Vdc  
3.82Ah



R35393  
3820mAh



C11P<sub>p</sub>JM HNOP

生产日期:

YYYY/MM/DD

|         |                                          |      |       |
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#### 5.4 Six Side Battery Photograph

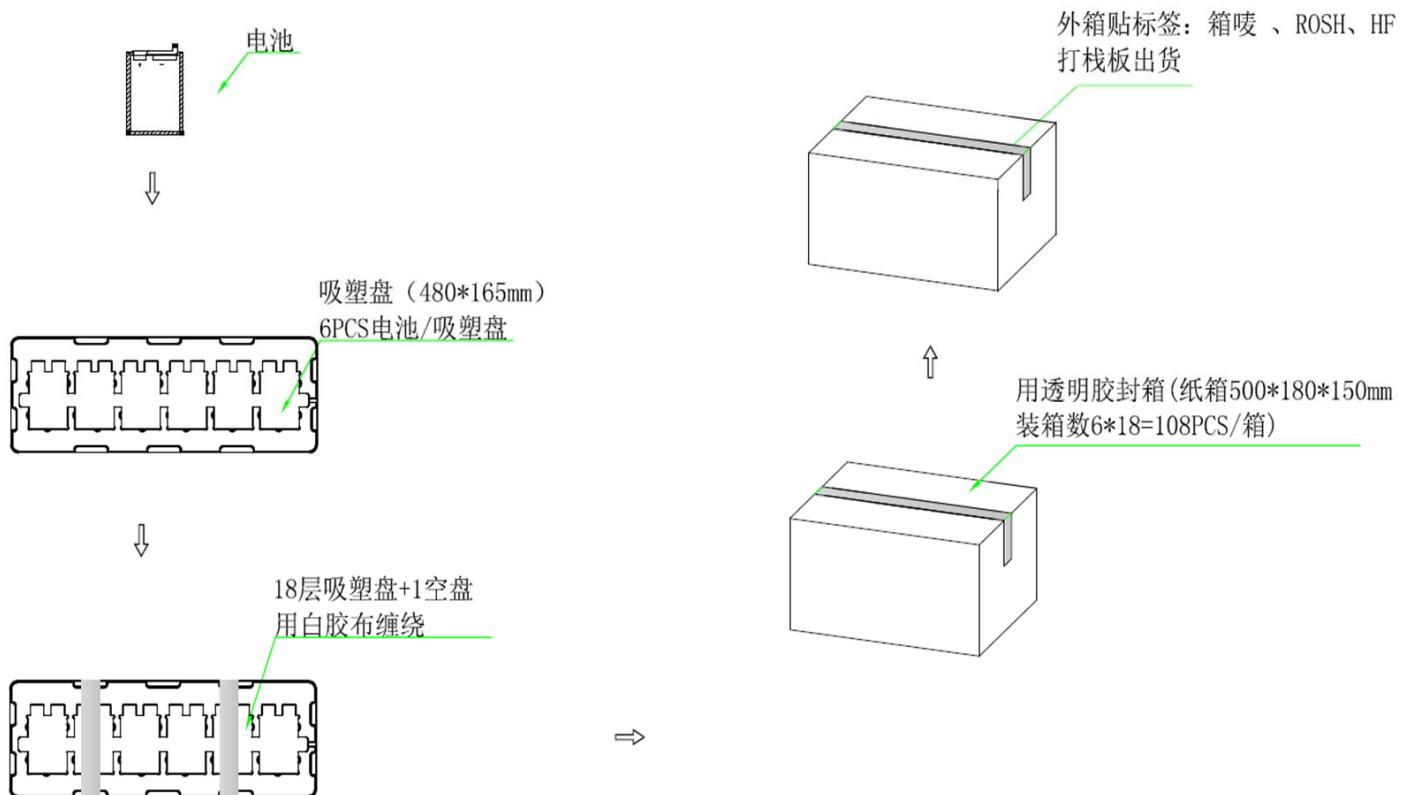
TBD

|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
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## 5.5 Packing Data



|         |                                          |      |       |
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## 6. Appendix

### 6.1 Caution and Prohibition

#### 6.1.1 Others

##### 1.Odor

The battery do not product special smell or harmful odor.

##### 2.Protection for Environment

The material used for packing should meet the criterion to protect environment.

#### 6.1.2 Warning and notice

1. Do not put the battery into a fire, or heat the battery.
  2. Do not store the battery in high temperature environment.
  3. Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment.
  4. Do not let the battery terminals (+ and -) contact a wire or any metal (like a metal necklace or a hairpin) with which it carried or stored together, may cause short-circuit.
  5. Do not drive a nail in, hit with a hammer, or stamp on the battery, do not strike the battery in other ways.
  6. Do not disassemble or alter the batteries' outside structure.
  7. Do not submerge the battery in water, do not wet the battery when store the battery.
1. Battery should be charged and discharged with proper charger, in compliance with correct operation contents
  2. Do not use the battery with other maker's batteries, different types and /or models of batteries such as dry batteries, nickel-metal hydride batteries, or nickel-cadmium batteries, or new and old lithium batteries together.
  3. Do not leave the battery in a charger or equipment if it generates an older and/or heat, changes color and/or shape, leaks electrolyte, or cause any other abnormality.
  4. Do not discharge the battery continuously when it is not charged.
1. Complete instructions as to how to replace the battery including the following or equivalent statement:  
Dispose of used battery promptly. Keep away from children.
  2. Caution – The battery used in this device may present a risk of fire or chemical burn if mistreated. Do not disassemble, heat above (manufacturer's maximum temperature limit), or incinerate. Replace battery with (battery manufacturer's name or end product manufacturer's name and part number) only. Use of another battery may present a risk of fire or explosion."
  3. For long-term storage, please charge at 0.5C for about one hour in advance.
  4. Do not use the battery in other than the following conditions; otherwise, the battery might cause heat generation, damage, or deterioration of its performance.
    - 1) Do not put the battery into a fire, or heat the battery.
    - 2) Do not store the battery in high temperature environment.
    - 3) Do not connect the battery reversed in positive (+) and negative (-) terminals in the charger or equipment.
    - 4) Do not let the battery terminals (+ and -) contact a wire or any metal (like a metal necklace or a hairpin) with which it carried or stored together, may cause short-circuit.
    - 5) Do not drive a nail in, hit with a hammer, or stamp on the battery, do not strike the battery in other ways.
    - 6) Do not disassemble or alter the batteries' outside structure.
    - 7) Do not submerge the battery in water, do not wet the battery when store the battery.

|                       |                                          |      |       |
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## 6.1.3 Protection Function

The electrolyte may be decomposed if a lithium ion secondary cell is subjected to a voltage higher than the allowable voltage or is charged with an excessive current, which may be resulted in safety problems. The performance of the cell may be deteriorated if the cell voltage is below 2.0V. Therefore, Coslight strongly recommended that the cell shall be equipped with “Thermal fuse” or PTC and must be equipped with protection circuit that can prevent overcharge, over-discharge, and over-current. Thermal fuse and PTC should be connected in series with a cell and it should be contacted to the cell top, as close as possible

## 6.1.4 Clarification of pressure release

Li-polymer adopts sides and top sealing as internal pressure vent. The sides and top PE pouch edges are heat-sealed via 130 °C temperature by the measure of melting down the plastic pouches and stick them together. Once the internal pressure reaches 0.2MPa, the conjunction between edges will be broken down and internal pressure would be released promptly.

## 6.1.5 Time of Product Storage

The time of product storage will be 21 days before the product leave factory.

## 6.1.6 Guarantee Period of Quality

Guarantee period of quality is 12 months after sold.

## 6.1.7 Recommendations to equipment manufacturers and battery assemblers

The following represents a typical, but non-exhaustive, list of good advice to be provided by the manufacturer of secondary cells and batteries to equipment manufacturers and battery assemblers.

- a) Do not dismantle, open or shred cells. Batteries should be dismantled only by trained personnel. Multi cell battery cases should be designed so that they can be opened only with the aid of a tool.
- b) Do not short-circuit a cell or battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by conductive materials.
- c) Do not remove a cell or battery from its original packaging until required for use.
- d) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
- e) Do not subject cells or batteries to mechanical shock.
- f) In the event of a cell leaking, do not allow the liquid to come into contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.
- g) Equipment should be designed to prohibit the incorrect insertion of cells or batteries and should have clear polarity marks. Always observe the polarity marks on the cell, battery and equipment and ensure correct use.
- h) Do not mix cells of different manufacture, capacity, size or type within a battery.
- i) Seek medical advice immediately if a cell or battery has been swallowed.
- j) Consult the cell/battery manufacturer on the maximum number of cells, which may be assembled in a battery and on the safest way in which cells may be connected.
- k) A dedicated charger should be provided for each equipment. Complete charging instructions should be provided for all secondary cells and batteries offered for sale.
- l) Keep cells and batteries clean and dry.
- m) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
- n) Secondary cells and batteries need to be charged before use. Always refer to the cell or battery manufacturer's instructions and use the correct charging procedure.

|         |                                                 |      |       |
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- o) Do not maintain secondary cells and batteries on charge when not in use.
- p) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
- q) Secondary cells and batteries give their best performance when they are operated at normal room temperature.
- r) Retain the original cell and battery literature for future reference.
- s) When disposing of secondary cells or batteries, keep cells or batteries of different electrochemical systems separate from each other.

## 6.1.8 Recommendations to the end-users

The following represents a typical, but not exhaustive list of good advice to be provided by the equipment manufacturer to the end-user.

- a) Do not dismantle, open or shred secondary cells or batteries.
- b) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
- c) Do not short-circuit a cell or a battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
- d) Do not remove a cell or battery from its original packaging until required for use.
- e) Do not subject cells or batteries to mechanical shock.
- f) In the event of a cell leaking, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.
- g) Do not use any charger other than that specifically provided for use with the equipment.
- h) Observe the plus (+) and minus (-) marks on the cell, battery and equipment and ensure correct use.
- i) Do not use any cell or battery which is not designed for use with the equipment.
- j) Do not mix cells of different manufacture, capacity, size or type within a device.
- k) Keep cells and batteries out of the reach of children.
- l) Seek medical advice immediately if a cell or a battery has been swallowed.
- m) Always purchase the correct cell or battery for the equipment.
- n) Keep cells and batteries clean and dry.
- o) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
- p) Secondary cells and batteries need to be charged before use. Always use the correct charger and refer to the manufacturer's instructions or equipment manual for proper charging instructions.
- q) Do not leave a battery on prolonged charge when not in use.
- r) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
- s) Secondary cells and batteries give their best performance when they are operated at normal room temperature ( $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ).
- t) Retain the original product literature for future reference.
- u) Use only the cell or battery in the application for which it was intended.
- v) When possible, remove the battery from the equipment when not in use.
- w) Dispose of properly.

|         |                                                 |      |       |
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## 6.1.9. Replaceable battery caution

The battery replacement shall be done only by either cells supplier or device supplier and be done by the user.

## 6.1.A Disposal instructions

Waste disposal must be in accordance with the applicable regulations .Disposal of the lithium ion battery cells should be performed by permitted, professional disposal Page: firms knowledgeable in State or Local requirements of hazardous waste treatment and hazardous waste transportation. Incineration should never be performed by battery but users, eventually by trained professional in authorized facility with proper gas and fume treatment.

## 6.1.B Information of Company

**ZHUHAI COSLIGHT BATTERY CO., LTD**  
**No.209, Zhufeng Way, Xinqing Science & Technology Park, Doumen District,**  
**Zhuhai519180, P.R.China**  
**Tel: 86—756—6199909 Fax: 86—756—6199910**  
**Email:yanming\_xu@cncoslight.com**  
**www.cncoslight.com**

|         |                                                 |      |       |
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## 6.2 ASUS Barcode Rule

|                  | Code                                                                                                                                                                                                                                                                                                                                                                                                         | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Printing                       |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------|----|------|---|------------|---|--------------|---|------------|---|--------------|---|------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|---|--------------|--|--|
| Barcode Sequence |                                                                                                                                                                                                                                                                                                                                                                                                              | <p>ABCDEFH NOP<br/>生产日期: YYYYMMDD00</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|                  | A B C                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Battery Pack Type&amp;Configuration<br/>           A: A=Cylindrical cell<br/>           B=Prismatic cell<br/>           C=Polymer cell<br/>           B&amp;C Battery configuration<br/>           例如: C32表示为Polymer 3S2P机种</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | C11                            |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|                  | D                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Battery Cell Type<br/>           L=Li-ion cell<br/>           P=Polymer cell<br/>           B=Prismatic cell<br/>           N=Ni-MH cell</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | P                              |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|                  | E                                                                                                                                                                                                                                                                                                                                                                                                            | <p>Battery cell normal capacity</p> <table border="1"> <tr><th>代码</th><th>容量区间</th><th>代码</th><th>容量区间</th></tr> <tr><td>a</td><td>100~299mAh</td><td>k</td><td>3100~3399mAh</td></tr> <tr><td>b</td><td>400~699mAh</td><td>l</td><td>3400~3699mAh</td></tr> <tr><td>c</td><td>700~999mAh</td><td>m</td><td>3700~3999mAh</td></tr> <tr><td>d</td><td>1000~1299mAh</td><td>n</td><td>4000~4299mAh</td></tr> <tr><td>e</td><td>1300~1599mAh</td><td>o</td><td>4300~4599mAh</td></tr> <tr><td>f</td><td>1600~1899mAh</td><td>p</td><td>4600~4899mAh</td></tr> <tr><td>g</td><td>1900~2199mAh</td><td>q</td><td>4900~5199mAh</td></tr> <tr><td>h</td><td>2200~2499mAh</td><td>r</td><td>5200~5499mAh</td></tr> <tr><td>i</td><td>2500~2799mAh</td><td>s</td><td>5500~5799mAh</td></tr> <tr><td>j</td><td>2800~3099mAh</td><td></td><td></td></tr> </table> | 代码                             | 容量区间 | 代码 | 容量区间 | a | 100~299mAh | k | 3100~3399mAh | b | 400~699mAh | l | 3400~3699mAh | c | 700~999mAh | m | 3700~3999mAh | d | 1000~1299mAh | n | 4000~4299mAh | e | 1300~1599mAh | o | 4300~4599mAh | f | 1600~1899mAh | p | 4600~4899mAh | g | 1900~2199mAh | q | 4900~5199mAh | h | 2200~2499mAh | r | 5200~5499mAh | i | 2500~2799mAh | s | 5500~5799mAh | j | 2800~3099mAh |  |  |
| 代码               | 容量区间                                                                                                                                                                                                                                                                                                                                                                                                         | 代码                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 容量区间                           |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| a                | 100~299mAh                                                                                                                                                                                                                                                                                                                                                                                                   | k                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3100~3399mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| b                | 400~699mAh                                                                                                                                                                                                                                                                                                                                                                                                   | l                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3400~3699mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| c                | 700~999mAh                                                                                                                                                                                                                                                                                                                                                                                                   | m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3700~3999mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| d                | 1000~1299mAh                                                                                                                                                                                                                                                                                                                                                                                                 | n                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4000~4299mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| e                | 1300~1599mAh                                                                                                                                                                                                                                                                                                                                                                                                 | o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4300~4599mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| f                | 1600~1899mAh                                                                                                                                                                                                                                                                                                                                                                                                 | p                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4600~4899mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| g                | 1900~2199mAh                                                                                                                                                                                                                                                                                                                                                                                                 | q                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4900~5199mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| h                | 2200~2499mAh                                                                                                                                                                                                                                                                                                                                                                                                 | r                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5200~5499mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| i                | 2500~2799mAh                                                                                                                                                                                                                                                                                                                                                                                                 | s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5500~5799mAh                   |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| j                | 2800~3099mAh                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| F                | <p>Cell Vender      Cell Vender<br/>           1=Maxell      A=A0I<br/>           2=Samsung      B=BAK<br/>           3=Toshiba      C=ATL<br/>           4=Panasonic      D=GP<br/>           5=Sanyo      E=BVO<br/>           6=Sony      F=TWS (HLST杭州菱日)<br/>           7=Li-ion      G=Lishen<br/>           8=E-Moli      H=EXA<br/>           9=LG      I=Boston Power<br/>           J=Coslight</p> | J                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| G                | <p>Battery Module Vender<br/>           M=coslight</p>                                                                                                                                                                                                                                                                                                                                                       | M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| H                | <p>Development Stage<br/>           S=ASUS SR Stage<br/>           E=ASUS ER Stage<br/>           P=ASUS PR Stage<br/>           M=ASUS MP Stage</p>                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| N O P            | <p>N=Year Code<br/>           制造年份, 以西元年的末1位数字表示, 如制造西元年2016-&gt;6<br/>           OP=Week Code<br/>           制造的周别, 第01周到第52周, 以数字01-52来表示</p>                                                                                                                                                                                                                                                              | //Year Code//<br>//Week Code//                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| abcde-fghijklm   | <p>ASUS PN Number<br/>           0B*PN 条码面刷出需为27位 (不含有文字的后三个"-")</p>                                                                                                                                                                                                                                                                                                                                         | 0B200-02880100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| H                | <p>Development Stage<br/>           S=ASUS SR Stage<br/>           E=ASUS ER Stage<br/>           P=ASUS PR Stage<br/>           M=ASUS MP Stage</p>                                                                                                                                                                                                                                                         | E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
| 暗码               | I J K L                                                                                                                                                                                                                                                                                                                                                                                                      | <p>PCBA Version<br/>           IJ=Guage board PCBA Verion, 为数字00, 固定不变<br/>           KL=Protection board PCBA Version, A1, A2 ...</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 00<br>A1                       |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|                  | M                                                                                                                                                                                                                                                                                                                                                                                                            | <p>EEPROM code<br/>           为数字0, 固定不变</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0                              |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|                  | N O P                                                                                                                                                                                                                                                                                                                                                                                                        | <p>Y=Year Code<br/>           制造年份, 以西元年的末1位数字表示, 如制造西元年2016-&gt;6<br/>           WW=Week Code<br/>           制造的周别, 第01周到第52周, 以数字01-52来表示</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | //Year Code//<br>//Week Code// |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |
|                  | Q R S T                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Serial Number, 有数字0~9和字母A~V组成</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | //Serial Number (32进位)         |      |    |      |   |            |   |              |   |            |   |              |   |            |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |   |              |  |  |

\*The barcode sequence table need to follow  
ASUS Battery barcode label rule V1.8(VENDOR)

Notes:

- Barcode 印刷为白底黑字, 字型: code 39,  
解析度: 200dpi以上
- 条码及字体印刷须清楚明显, 不可脏污、  
磨损等外观不良之现象。
- 条码必须为可读取。

|                       |                                          |      |       |
|-----------------------|------------------------------------------|------|-------|
| Product               | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20  |
| Model                 | C11P1707/3820mAh                         | Page | 23/36 |
| Spec No: P3-RD-230105 |                                          |      |       |



# ZHUHAI COSLIGHT BATTERY CO., LTD.

## 6.3 UL Key Parts list (TBD)

| No. | COMPONENTS                | MANUFACTURER | MODEL            | RATINGS       | UL FILE NO. |
|-----|---------------------------|--------------|------------------|---------------|-------------|
| 1   | Cell                      | Coslight     | CA456080G        | 3.85V/3820mAh |             |
| 2   | PCB                       |              | G182 V1          | FR4+钢片补强      |             |
| 3   | MOSFET                    | Panasonic    | FC6H21880L       | MLGA006       |             |
| 4   | Control IC                | RICOH        | R5486K519CM-TR   | DFN1414       |             |
| 5   | Current limiting resistor | SART         | SMF08MAFR005     | 5mΩ           |             |
| 6   | PTC                       | PTTC         | SMD1206P450SLR-Y | 4.5A          |             |

## 6.4 Safety Regulation Compliance

| Item | Certification | Standard                                               |
|------|---------------|--------------------------------------------------------|
| 1    | CE            | EMC:EN55032(2012)/AC:2013, EN55024 (2010)              |
| 2    | CB            | IEC62133 REV2(2012)<br>Optional:IEC60950-1 REV2 (2013) |
| 3    | UL            | UL2054 ERV2(2011)<br>Optional:UL60950-1 REV2(2011)     |
| 4    | CTIA          | CRD Rev 2.10 (IEEE1725 2011)                           |
| 5    | BIS(India)    | IS16046 :2015 (IEC62133 REV2)                          |
| 6    | PSE           | Ordinance Article 1,Appendix 9<br>JIS C 8712(2015)     |
| 7    | BSMI          | CNS 15364(102) (IEC62133 REV2)                         |
| 8    | CQC           | GB 31241 2014                                          |
| 9    | UN38.3        | ST/SG/AC.10/11/REV 6/38.3                              |

|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
| Product | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20  |
| Model   | C11P1707/3820mAh                         | Page | 24/36 |

Spec No: P3-RD-230105



# ZHUHAI COSLIGHT BATTERY CO., LTD.

6.5 Cell Specification



## ZHUHAI COSLIGHT BATTERY CO., LTD.

### SPECIFICATION FOR APPROVAL

**PRODUCT:** Lithium Ion Polymer Rechargeable Battery

**MODEL:** CA456080G WITHOUT BREAKER

**REVISE NO:** VER 1.0

**FOR:**

**Customer Approval:**

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

**Coslight Approval:**

| Prepared        | R&D Reviewed    | MKT Reviewed    | Approved        |
|-----------------|-----------------|-----------------|-----------------|
| Yuan Liyun      | Li Junyi        | Liu Houdong     | Xu Yanming      |
| Date: 2017/9/28 | Date: 2017/9/28 | Date: 2017/9/28 | Date: 2017/9/28 |

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Email : yanming\_xu@cncoslight.com  
[www.cncoslight.com](http://www.cncoslight.com)

Spec No. :P3-RD-130454

|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
| Product | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20  |
| Model   | C11P1707/3820mAh                         | Page | 25/36 |

Spec No: P3-RD-230105



ZHUHAI COSLIGHT BATTERY CO., LTD.



ZHUHAI COSLIGHT BATTERY CO., LTD.

## Product Revision History

|         |                                          |      |      |
|---------|------------------------------------------|------|------|
| PRODUCT | Lithium Ion Polymer Rechargeable Battery | REV. | 1.0  |
| MODEL   | CA456080G WITHOUT BREAKER/3820mAh        | Page | 1/11 |

Spec No. :P3-RD-130454

|         |                                                 |      |       |
|---------|-------------------------------------------------|------|-------|
| Product | <b>Lithium Ion Polymer Rechargeable Battery</b> | REV. | 0.20  |
| Model   | <b>C11P1707/3820mAh</b>                         | Page | 26/36 |

Spec No: P3-RD-230105



## ZHUHAI COSLIGHT BATTERY CO., LTD.

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|---------|------------------------------------------|------|------|
| PRODUCT | Lithium Ion Polymer Rechargeable Battery | REV. | 1.0  |
| MODEL   | CA456080G WITHOUT BREAKER/3820mAh        | Page | 2/11 |

Spec No. :P3-RD-180454

|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
| Product | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20  |
| Model   | C11P1707/3820mAh                         | Page | 27/36 |

Spec No: P3-RD-230105



## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 1. Scope

This specification is made to describe the product, product characteristics and performance, relevant measurement conditions and methods applied to the lithium ion polymer rechargeable battery CA456080G WITHOUT BREAKER as specified in following detail.

### 2. Product Name and Product Type

#### 2.1 Product Name

Polymer Lithium Ion Battery

#### 2.2 Product Type

CA456080G WITHOUT BREAKER

### 3. Product Specifications

| No. | Items                                    | Specifications                                                                                                                                                                                                                                         | Remark                                                                                            |
|-----|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1   | Rated Capacity                           | Typical:4000mAh<br>Min:3820mAh                                                                                                                                                                                                                         | Charge: Standard charge<br>Discharge:Standard discharge                                           |
| 2   | Nominal Voltage                          | 3.85V                                                                                                                                                                                                                                                  |                                                                                                   |
| 3   | Charge Limited Voltage                   | $4.40^{+0.05}_{-0.01}$ V                                                                                                                                                                                                                               |                                                                                                   |
| 4   | Discharge Cut-off Voltage                | 3.0V                                                                                                                                                                                                                                                   |                                                                                                   |
| 5   | Maximum Charge Voltage(for safety)       | 4.5V                                                                                                                                                                                                                                                   |                                                                                                   |
| 6   | Standard Charge                          | 0.3C (1146 mA) Max. to 4.4 V, then CV to 0.02C cut off<br>0.5C (1910 mA) Max. to 4.4 V, then CV to 0.02C cut off<br>1.0C (3820 mA) to 4.25V,0.5C(1910mA)Max to 4.4V,then CV to 0.02C cut off<br>0.5C (1910 mA) Max. to 4.1 V, then CV to 0.02C cut off | temperature: 0~10°C<br>temperature: 10~20°C<br>temperature: 20~50°C<br>temperature: 50~60°C       |
| 7   | Standard Discharge                       | Using 0.2C( 764mA)constant current discharge to the Discharge Cut-off Voltage                                                                                                                                                                          |                                                                                                   |
| 8   | Maximum Continuous Charge Current        | 1.2C (4584mA )                                                                                                                                                                                                                                         | temperature: 20~50°C                                                                              |
| 9   | Maximum Continuous Discharge Current     | 1.5C (5730mA )                                                                                                                                                                                                                                         |                                                                                                   |
| 10  | Peak Discharge Current                   | 2C/10s;3C/5s                                                                                                                                                                                                                                           | No fire ;No explosion                                                                             |
| 11  | Operating Temperature and Humidity Range | Charge:0~60°C<br>Humidity: Less than 85% RH<br>Discharge: -20~60°C<br>Humidity: Less than 85% RH                                                                                                                                                       |                                                                                                   |
| 12  | Storage Temperature and Humidity Range   | 1 month: -20~60°C<br>3 month: -20~45°C<br>1 year: -20~20°C<br>Humidity: 45%~ 90% RH                                                                                                                                                                    | The battery should cycle once in three month. Recommended storage temperature is 25°C of SOC 50%. |
| 13  | Weight                                   | $\leq 56g$                                                                                                                                                                                                                                             |                                                                                                   |
| 14  | Pre-charging                             | $\leq 0.1C(382mA)$<br>$\leq 3.0V$                                                                                                                                                                                                                      |                                                                                                   |
| 15  | Charge (Low Voltage)                     | single cell<1.0V<br>multi-cell<2.0V                                                                                                                                                                                                                    | Cells should be forbidden to charge or to use again                                               |

|         |                                          |      |      |
|---------|------------------------------------------|------|------|
| PRODUCT | Lithium Ion Polymer Rechargeable Battery | REV. | 1. 0 |
| MODEL   | CA456080G WITHOUT BREAKER/3820mAh        | Page | 3/11 |

Spec No. :P3-RD-130454

|         |                                          |      |       |
|---------|------------------------------------------|------|-------|
| Product | Lithium Ion Polymer Rechargeable Battery | REV. | 0.20  |
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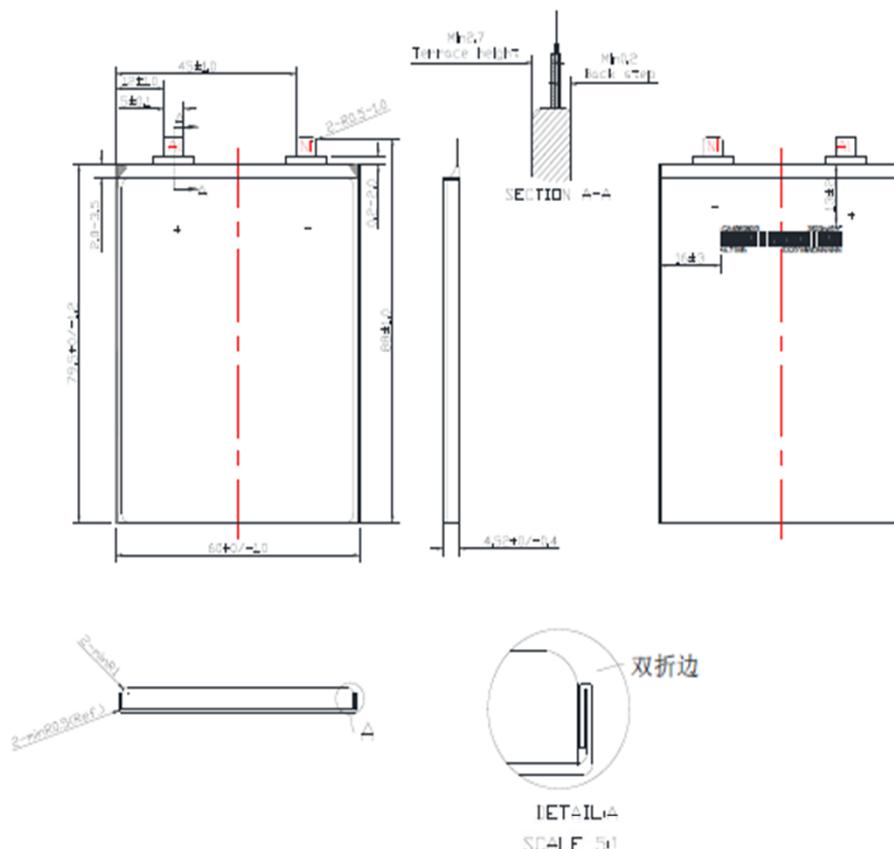
## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 4. Mechanical Characteristics

#### 4.1 External Dimension

| Dimension | Thickness | Width | Height |
|-----------|-----------|-------|--------|
| Maximum   | 4.52mm    | 60mm  | 79.5mm |

External Form Figure (all unit in mm)



备注:1. 银色铝塑膜  
2. 厚度使用1400g PPG测量

#### 4.2 Outside Appearance

The surface is smooth. No mechanical damage. The package membrane has no damage or leakage.

|         |                                          |      |      |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 5. Electrical Characteristics

| No. | Items                                 | Criteria                                                                                                                                                                                 | Test Condition                                                                                                                                                                                                                                                                                    |
|-----|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Open Circuit Voltage                  | 3.75~3.8V                                                                                                                                                                                | Measure cells at $25 \pm 3^\circ\text{C}$ , 20~30% SOC.                                                                                                                                                                                                                                           |
| 2   | Internal Impedance                    | $\leq 60 \text{ m}\Omega$                                                                                                                                                                | Measure cells using an alternate current impedance meter at 1KHz at $25 \pm 3^\circ\text{C}$ after received.                                                                                                                                                                                      |
| 3   | Charge Rate Characteristics           | 0.2C : $\geq 100\%$ (of Cmin)<br>0.5C : $\geq 100\%$ (of Cmin)<br>1.0C : $\geq 97\%$ (of Cmin)<br>1C to 4.25V, $\geq 100\%$ (of Cmin)<br>0.5C to 4.4V:                                   | Discharge capacity is measured with constant current 0.2C and 3.0V cut-off after charged with 0.02C cut off current @ $25 \pm 3^\circ\text{C}$ :                                                                                                                                                  |
| 4   | Discharge Rate Characteristics        | 0.2C: $\geq 100\%$ (of Cmin)<br>0.5C: $\geq 95\%$ (of Cmin)<br>1.0C: $\geq 90\%$ (of Cmin)<br>1.5C: $\geq 80\%$ (of Cmin)                                                                | Discharge capacity is measured with the various currents in under table and 3.0V cut-off after 1C to 4.25V, 0.5C to 4.40V charged with 0.02C cut-off@ $25 \pm 3^\circ\text{C}$                                                                                                                    |
| 5   | Charge Temperature Characteristics    | 0°C: $\geq 80\%$ (of Cmin)<br>25°C: $\geq 100\%$ (of Cmin)<br>45°C: $\geq 98\%$ (of Cmin)                                                                                                | Stored the discharged cells for 3 hrs at $45 \pm 2^\circ\text{C}$ , $25 \pm 2^\circ\text{C}$ , $0 \pm 2^\circ\text{C}$ , and then standard charged at this temperature. Then measured the capacity with discharge constant current 0.2C and 3.0V cut-off @ $25 \pm 3^\circ\text{C}$               |
| 6   | Discharge Temperature Characteristics | -20°C: $\geq 50\%$ (of Cmin)<br>-10°C: $\geq 80\%$ (of Cmin)<br>0°C: $\geq 90\%$ (of Cmin)<br>25°C: $\geq 100\%$ (of Cmin)<br>45°C: $\geq 98\%$ (of Cmin)<br>60°C: $\geq 96\%$ (of Cmin) | Capacity comparison at each temperature, measured with discharge constant current 0.2C and 3.0V cut-off after the 1C to 4.25V, 0.5C to 4.40V charged with 0.02C cut-off@ $25 \pm 3^\circ\text{C}$ .                                                                                               |
| 7   | Storage Characteristics               | Recovered Capacity:<br>$\geq 80\%$ (of Cmin)<br>Impedance increase: $\leq 60 \text{ m}\Omega$<br>Swelling: $\leq 0.46\text{mm}$<br>Appearance: No leakage                                | Measured the high rate capacity as the initial capacity. Stored the recharged cells for 7 days at $60 \pm 2^\circ\text{C}$ and test the thickness at $60 \pm 2^\circ\text{C}$ and then rest for 2 hrs at room temperature, standard discharged after checked the cells' appearance and impedance. |
|     |                                       | Recovered Capacity:<br>$\geq 90\%$ (of Cmin)<br>Impedance: $\leq 60 \text{ m}\Omega$<br>Swelling: $\leq 0.1\text{mm}$<br>Appearance: No leakage, No damage                               | Measured the rate capacity as the initial capacity. Stored the recharged cells for 28days at room temperature. Standard discharged after checked the cells' appearance and impedance. Measured recoverable standard discharge capacity and recoverable impedance.                                 |

|         |                                          |      |      |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 5. Electrical Characteristics

| No. | Items            | Criteria                                                                                                                                                                                        | Test Condition                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8   | Cycle Life(25°C) | For 500 Cycles Residual Capacity:<br>$\geq 80\%$ (of $C_{initial}$ )<br>For 501 Cycles Residual Capacity:<br>$\geq 80\%$ (of $C_{min}$ )<br>Thickness after 501th cycles:<br>$\leq 4.88mm(8\%)$ | Carry out 500cycles at $25\pm 3^\circ C$ .<br>charge: 1C charge to 4.25V, 0.5C charge to 4.4V, cut off 0.02C<br>discharge: 0.5C to 3.0V<br>Cells are to rest 10minutes after charge and 10 minutes after discharge.<br>For 501th cycle<br>charge: 1C charge to 4.25V, 0.5C charge to 4.4V, cut off 0.02C<br>discharge: 0.2C to 3.0V<br>Cells are to rest 10minutes after charge and 10 minutes after discharge. |

|         |                                          |      |      |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 6. Safety Characteristics

| No. | Items    | Condition                                    | Specification                |
|-----|----------|----------------------------------------------|------------------------------|
| 1   | UL       | This cell meet UL1642 safety test criteria   | Follow UL1642 request spec   |
| 2   | IEC62133 | This cell meet IEC62133 safety test criteria | Follow IEC62133 request spec |
| 3   | BSMI     | This cell meet BSMI safety test criteria     | Follow BSMI request spec     |
| 4   | IEEE1725 | This cell meet IEEE1725 safety test criteria | Follow IEEE1725 request spec |
| 5   | KC       | This cell meet KC safety test criteria       | Follow KC request spec       |
| 6   | PSE      | This cell meet PSE safety test criteria      | Follow PSE request spec      |
| 7   | GB       | This cell meet GB safety test criteria       | Follow GB request spec       |
| 8   | BIS      | This cell meet BIS safety test criteria      | Follow BIS request spec      |
| 9   | UN38.3   | This cell meet UN38.3 safety test criteria   | Follow UN38.3 request spec   |

|         |                                          |      |      |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 7. Reliability Characteristics

| No. | Items                                           | Criteria                                                                                                                                            | Test Condition                                                                                                                                                                                                                                                                                                                                   |
|-----|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Static Humidity and Temperature Characteristics | Residual Capacity:<br>≥ 1910 mAh<br>Recovered Capacity:<br>≥ 3056 mAh<br>Swelling: ≤ 0.46mm<br>Impedance: ≤ 100mΩ<br>Appearance: No leakage, damage | Measured the high rate capacity as the initial capacity. Stored the recharged cells for 4 days at 60 ± 2 °C and 95%RH, then rest for 4 hrs at room temperature. Standard discharged after checked the cells' appearance and impedance. Measured recoverable standard discharge capacity and recoverable impedance.                               |
| 2   | Vibration Characteristics                       | OCV Variation: ≤0.02V<br>Impedance: ≤ 60mΩ<br>Appearance: No leakage, damage                                                                        | Measured the initial OCV and impedance after standard charged at 20±5°C. Vibrate the cells for 30minutes on each direction at room temperature in 10min.<br>Amplitude: 1.6mm, (p-p)<br>Vibration: 10-60Hz (sweep 1 oct/min)<br>Direction: X, Y, Z<br>Then measure OCV and impedance.                                                             |
| 3   | 70°C Storage Characteristics                    | Recovered Capacity:<br>≥ 3056 mAh<br>Swelling: ≤ 0.46mm<br>Impedance: ≤ 100mΩ<br>Appearance: No leakage, damage                                     | Measured the high rate capacity as the initial capacity. Stored the recharged cells for 24 hrs at 70 ± 2 °C, and test the thickness at 70 ± 2 °C and then rest for 2 hrs at room temperature. Standard discharged after checked the cells' appearance and impedance. Measured recoverable standard discharge capacity and recoverable impedance. |

Note: the definition and judgment of some terms in the above criteria:

- (1) Initial state: including the initial appearance, OCV, impedance, thickness and weight of the cell.
- (2) End state: including the end appearance, open circuit voltage, impedance, thickness and weight of the cell.
- (3) Residual capacity: the initial discharge capacity of the cell after special measurement.
- (4) Recoverable capacity: the cell is subjected a special measurement, the discharge capacity after several charge-discharge cycles.
- (5) Standard cycle: the cell is charged with standard charge condition, rest for 10 min., then the cell is discharged to the end voltage with 1C5 A current at 25±5°C.

### 8. Protection Function

The electrolyte may be decomposed if a lithium ion secondary cell is subjected to a voltage higher than the allowable voltage or is charged with an excessive current, which may be resulted in safety problems. The performance of the cell may be deteriorated if the cell voltage is below 2.0V(single cell<1.0V multi-cell<2.0V). Therefore, Coslight strongly recommended that the cell shall be equipped with breaker and must be equipped with protection circuit that can prevent overcharge, over-discharge, and over-current. Breaker should be connected in series with a cell and it should be contacted to the cell top, as close as possible.

|         |                                          |      |      |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 9. Guarantee Period of Quality

Guarantee period of quality is 12 months after sold.

### 10. Product Responsibility Agreement

The customers must abide by the Product Specification and remarks in using the cells manufactured by Zhuhai Coslight Battery Co., Ltd. The misuse may cause cell heat, fire or rupture. Coslight will NOT be responsible for any accident occurred by handling outside of the precautions in this specification.

Be attention to the package and structure of the polymer lithium ion cell:

a) The case of the polymer lithium ion cell shall be sustained the mechanical impact (collide, dropping, distortion and curve etc.) to protect the polymer lithium ion cell inside.

- Leakage and short-circuit etc. may be occurred if the cell is suffered strong impact.

- Take care in using the polymer lithium ion cell due to its soft package and is easier to be damaged than metal case cell in suffering from impact.

b) The polymer lithium ion cell shall be fastened inside the package to avoid the motion in suffering from mechanical impact such as dropping.

- The cell, PCB and connection wire may be damaged due to the motion of the cell inside the package is suffered from impact such as dropping etc., if the cell inside the package is not fastness.

- Coslight recommends fastening the wider face of the cell inside the package by adhesive tape.

- Do not make any damage to the bottom of the cell due to the bottom of polymer lithium ion cell is easy to be damaged in suffering from impact such as dropping.

c) Avoid connecting of polymer lithium ion cell with sharp or protruded articles.

- The membrane of polymer lithium ion cell is easy to be damaged by sharp articles, which may be resulted in the leakage of electrolyte.

- Put an isolated membrane between cell and PCB to avoid them connecting directly if the PCB of cell is put on the surface of the polymer lithium ion cell.

- Avoid to put sharp articles, protruded part of PCB (PTC, over-current sheet etc.) or connecting wire on the surface of polymer lithium ion cell directly.

- Avoid concentrating pressure on the cell to fasten the cell during the designing, because the performance of the cell may be decreased if the cell is extruded in a relative small area.

d) Be attention to the variation of the thickness of polymer lithium ion cell during charge-discharge:

- The thickness of polymer lithium ion cell may be increased a little during charge-discharge, if the design do not consider the variation of the thickness, the package may be damaged and the performance of the cell may be decreased due to the cell extrudes the case of cell, connecting wire or cell itself resulted from the thickness increase.

e) Keep the polymer lithium ion cell away from thermal source:

- Some performance of polymer lithium ion cell may be decreased if the cell is working or storage beyond the required temperature range.

f) If the connection of the package case and cap is welded by supersonic, there shall be no gap between case and cap during welding to avoid the energy created by supersonic welding passing to polymer lithium ion cell or PCM.

- Polymer lithium ion cell or PCM may be damaged by the energy created by supersonic welding.

|         |                                          |      |      |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 11. Handling precautions on Lithium ion secondary cell

To assure product safety, there shall be precautions below.

#### ! Danger

- Use dedicated chargers and follow the specified conditions when charging the cell.
- Use the cell only in the specified equipment.
- Do not heat or put the cell into the fire. Also do not wet the cell.
- Do not use, leave cell close to fire or inside of a car where temperature may be above 60°C. Also do not charge / discharge in such conditions.
- Do not put or store cell together with metal articles such as necklaces, hairpins, coins, or screws.
- Do not short circuit the (+) and (-) terminals with metal conductors.
- Do not place cell in a device with the (+) and (-) in a reverse way.
- Do not penetrate cell with a sharp articles such as a needle.
- Do not disassemble the cell.
- Do not weld the cell directly.
- Do not use a cell with serious scar or deformation.
- Thoroughly read the user's manual before use, inaccurate handling of polymer lithium ion cell may results in heat, fire, explosion, damage or the capacity loss of the cell.

#### ! Warning

- Do not put cell into a heating vessel, washing machine or high-pressure container.
- Do not use cell with primary batteries, or batteries of a different package, type, or brand.
- Stop charging the cell if charging is not completed within the specified time.
- If liquid leaking from the cell gets into your eyes, do not rub your eyes. Wash them well with clean water and call physician immediately.
- Keep away from cell immediately when leakage or foul odor is detected.
- Wash well with clean water immediately if liquid leaks onto your skin or clothes.
- If liquid leaking from the cell gets into your eyes, do not rub your eyes. Wash them well with clean water and call physician immediately.

#### ! Caution

- Store batteries out of reach of children so that they are not accidentally swallowed.
- If younger children use the cell, their guardians should explain the proper handling.
- Be sure to read the user's manual and cautions on handling thoroughly before using the cell.
- Batteries have cycle life. Using one new cell the same to the old one to replace it if work time of the equipment using cell as power sources becomes much shorter than the usual.
- Remove it from the equipment and store in a place with low humidity and temperature if the cell is not used for an extended period.
- Keep it far away from articles or materials with static electric charges while the cell is charged, used or stored.
- Wipe with a dry clothe before using the cell if the terminals of the cell become dirty.

|         |                                          |      |       |
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## ZHUHAI COSLIGHT BATTERY CO., LTD.

### 12. Information of Company

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