Lithium Polymer Battery
Product Specifications
锂聚合物电池规格书

Customer:

P/N: AS-402025-150-111

Capacity: 150mAh

Voltage: 3.7V

Specification Approved （规格书审批项）	Prepared By(编制)	TANG
	Drawn By(绘图)	TANG
	Checked By(审核)	
	Approved By(批准)	
Customer Approved （客户审批项）	Checked By(审核)	
	Approved By(批准)	
	Please sign and return one copy to us. 请签名盖章确认后回传我司.	Seal the（盖章处）

AMENDMENT RECORDS 修订记录

Revision 修订版本	Description 描述	Date 日期	Approval
1.0	New release 新版发布	2021-10-21	

Contents

1 Scope

This specification is applied to A&S Power Lithium Polymer Battery Provide by Shenzhen A&S Power technology Co., ltd

该规格书仅适用于深圳市安安森电子科技有限公司提供的锂聚合物电池.

2 Product and Model Name 产品和型号

2.1 Product ：Lithium Polymer Battery 产品种类：锂聚合物电池

2.2 Model Name/型号：A&S 402025

3 Ratings 参数

Item 项目		Rating 参数	Note 标注
3.1 Capacity 容量	Typical 标称容量	150mAh	From 4.2V to 3.0V by discharge current 0.2C. 用 0.2C 电流从 4.2V 恒流放电至 3.0V
	Minimum 最小容量	140mAh	
3.2 Nominal Voltage 标称电压		Average 3.7V	
3.3 AC Impedance Resistance 内阻		≤150mΩ	Cell
		≤280mΩ	Battery Pack
3.4 Discharge Cut-off Voltage 放电截止电压		3.00V	
3.5 Charge Current 充电电流		30mA	Standard Charge 标准充电
3.6 Charge voltage 充电限制电压		4.2V	Cut-off current≤5mA
3.7 Charge Time 充电时间		Approx:6 h	Standard Charge 标准充电
3.8 Storage humidity 存储湿度		< 75%RH	
3.9 Max Charge Continuous 最大充电电流		150mA	10~45℃
3.10 Discharge Continuous 持续放电		75mA	0.5CmA
3.11 Max Discharge Continuous 最大连续放电		150mA	1.0CmA
3.12 Weight / 重量		Approx 4.5g	
3.13 Shipping Voltage / 出厂电压		3.85-3.95V	
3.14 Operating Temperature 工作温度	Charge 充电	0~+10℃	0.5C(75mA)
		+10~+45℃	1.0C(150mA)
	Discharge 放电	-20~+60℃	
3.15 Storage Temperature 储存温度	less than 1 month 小于一个月	-20~+45℃	Recommended storage temperature: 25±2℃,at the shipment state 推荐储存温度：25±2℃
	less than 3 months 小于三个月	-20~+35℃	
	less than 6months 小于六个月	-20~+30℃	

4 Outline Dimensions and Appearance 外形尺寸和外观

4.1 Outline Dimensions 外形尺寸

See attached drawing for 402025 (Fig.1).

402025 电池的外形示意图请查看（Fig. 1）.

Thickness：4.0mm.Max(Measured with weighting 300gf at 25±2℃) .

电芯厚度：最大 4.0mm（测量仪器作用于电池上的压力为 300gf,并在 25±2℃温度下测试）.

Width：20.5mm max.(Measured with weighting 300gf at 25±2℃) .

电芯宽度：最大 20.5mm（测量仪器作用于电池上的压力为 300gf,并在 25±2℃温度下测试）.

Length：25.5mm max.(Measured with weighting 300gf at 25±2℃) .

电芯长度：最大 25.5mm（测量仪器作用于电池上的压力为 300gf,并在 25±2℃温度下测试

The battery pack See attached drawing for 402025 Assembly Drawing (Fig.2).

402025 电池外形示意图请查看(Fig. 2).

4.2 Appearance 外观

There shall be no such defect as scratch, flaw, crack, rust, leakage, which may adversely affect commercial value of battery.

电池表面干净, 无明显划痕和机械损伤, 无电解液泄漏, 无变形等影响电池价值的外观缺失。

5 Performance 性能

5.1 Standard Test Conditions 标准测试条件

Test should be conducted with new batteries within one month after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 25±2℃ and relative humidity of 45~85%. The test results are not affected evidently by such conditions of temperature 15~30℃ or humidity 25~85%RH.5.2 Measuring Instrument or Apparatus.

测试的电池必须是我司出货时间一个月以内的新电池,且电池未进行超过 5 次充放电循环。除非其他特殊要求，我司产品规格书规定的测试条件为：温度 25±2℃,相对湿度 45~85%。如果已经证明测试结果不受这些测试条件影响，实验也可以在温度 15-30℃，湿度 25~85%RH，按 5.2 条件进行测试，结果不受影响。

5.2 Measuring Instrument or Apparatus 测量设备

5.2.1 Dimension Measuring Instrument 尺寸测量工具

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

尺寸测量应使用精度等于或大于 0. 01 毫米的仪器进行.

5.2.2 Voltmeter 万用表

Standard class specified in the national standard or more sensitive class having inner impedance more than 10 MΩ

应使用国家标准规定的标准级或内部阻抗大于 10㎜Ω的更灵敏级.

5.2.3 Ammeter 安培表

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω.

应使用国家标准中规定的标准级或更灵敏级。总电阻(包括电流表和导线)应小于 0.01Ω。

5.2.4 Impedance Meter 阻抗法

Impedance shall be measured by a sinusoidal alternating current method (1kHz LCR meter).

内阻测试仪测量方法为交流阻抗法（1kHz)

5.3 Standard Charge 标准充电

0.2CmA=30mA

Full charge condition: Constant current 0.2CmA to 4.2V, Constant voltage 4.2V to 0.02C， Approx 6hours, in all at 25±2℃.

满充条件：在 25±2℃温度下,以 0.2CmA 恒流充电到 4.2V,再以 4.2V 恒压充电至截止电流 0.02C,整个过程约 6 小时。

5.4 Rest Period 搁置

Unless otherwise defined, 30min, rest period after charge, 30min, rest period after discharge.

除非另有说明，每次充放电中间需要 30 分钟的间隔。

5.5 Initial Performance Test 初始性能测试

Item 项目	Measuring Procedure 测试条件	Requirements 标准
1.Open-Circuit Voltage 开路电压	The open-circuit voltage shall be measured within 24 hours after standard charge. 标准充电后 24 小时内测试开路电压	≥4.15V
2.AC Impedance Resistance 内阻	The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 25±2℃. 在 25±2℃条件下标准充电后，用交流阻抗法测试内阻	≤280mΩ
3.Minimum Capacity 最小容量	The capacity on 0.2CmA discharge shall be measured after standard charge at 25±2℃(specified C_5). 在 25±2℃条件下标准充电后,0.2CmA 放电测试容量 (该容量定义为 C_5)	C_5≥140mAh

5.6 Electrical Performance 电性能测试

5.6.1 Temperature Dependence of Capacity (Discharge) 不同温度放电容量

Cells shall meet the discharge capacity requirements listed in the below table under respective discharge temperatures. The capacities are to be measured with constant discharge current 0.2CmA (3.0V cut-off) after standard charge at 25±2℃.

电池在 25±2℃标准充电后,然后在 30 分钟内冷却或加热到测试温度,并在此温度下保持 1 小时,再以 0.2CmA 进行放电测试.

Discharge Temperature 放电温度	-20℃	25℃	60℃
Discharge Capacity 放电容量	50%	100%	95%

5.6.2 Cycle Life 循环寿命

10min rest period after standard charge, 0.5CmA discharge to a cut-off voltage of 3.0V, 10min rest period, the capacity shall be measured after 500 cycles of standard charge and discharge at 25±2℃.

在 25±2℃环境温度下,电池标准充电后，搁置 10 分钟,用 0.5CmA 将电池放电至 3.0V,每次充放电间隔 10 分钟,重复上述步骤,进行循环 500 次.

Capacity ≥80%

容量 ≥初始容量的80%

5.6.3 Shelf Life 荷电保持能力

Item 项目		Measuring Procedure 测试条件	Requirements 备注
Storage Characteristics 1 储存性能1	1	The capacity on 1.0CmA discharge shall be measured after standard charge and then storage at 25±2℃ for 30 days. 采用标准充电，在 25±2℃下储存 30 天后以 1.0CmA 放电对电池进行容量测试。	Remaining Capacity 容量保持≥85% C_5
	2	After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge. 以上测量后剩余容量,采用标准充电，并对标准放电下的电池进行容量测试。	Recovery capacity 恢复容量≥90% C_5
Storage Characteristics 2 储存性能2	1	The capacity on 1.0CmA discharge shall be measured after standard charge and then storage at 60±2℃ for 7 days. 采用标准充电，在 60±2℃下储存 7 天后以 1.0CmA 放电对电池进行容量测试。	Remaining Capacity 容量保持≥60% C_5

	2	After above measured Remaining capacity, the capacity on standard discharge shall be measured after standard charge. 以上测试后剩余容量,采用标准充电，并对标准放电下的电池进行容量测试。	Recovery capacity 恢复容量≥80% C_5

5.6.4 Long Time Storage Characteristics 长期储存性能

After about half charge after a period of storage at 25 ±2℃ for one year(365 days). The remaining available capacity is ≥85% C_5. The capacity is determined with the capacity of the by the most of preceding three cycles.

取新生产 3 个月内的新电池,注入 50%容量,在 25 ±2℃环境温度条件下,开路搁置 365 天。储存完成后，在 25 ±2℃环境温度条件下，以 0.2CmA 进行 3 次充放电,测试恢复容量(取 3 次循环的最大容量):

容量恢复≥85% C_5

5.7 Mechanical Performance 机械性能

Item 项目	Measuring Procedure 测试条件	Requirements 标准
Vibration test 振动测试	After standard charge, the battery is to be tested as following conditions: Amplitude:0.38mm Frequency:10~55Hz(sweep:1Hz/min) Direction: X/Y/Z axis for 90~100min. The battery is to be tested in three mutually perpendicular to each axis. 电池标准充电后,将电池固定在振动台上,按 X、Y、Z 三个垂直方向进行实验，震动频率在 10HZ~55HZ 以 1Hz/min 的速度变化,振幅位移 0.38mm,往复震动 90-100min.	No fire, no explosion, no smoking is obtained. 不起火,不爆炸,不冒烟
Drop Test 自由跌落测试	Drop the battery in the shipment condition(full-charge)from 1m height onto 18-20cm or thicker concrete with p-tile on it 1 times each of X, Y, and Z directions at 25±2℃. 在 25±2℃下环境温度下,电池充满电后从 1000mm 高度由 X，Y，Z 方向自由跌落到 18-20cm 的厚木板上,每个方向跌落 1 次.	No fire, no explosion, no smoking is obtained. 不起火,不爆炸,不冒烟

5.8 Safety Performance 安全性能

Item 项目	Measuring Procedure 测试条件	Requirements 标准
Short-Circuit Test 短路测试	After standard charge, the battery is to be short-circuited by connecting the positive and negative terminals of the battery with copper wire having a maximum resistance load of 0.1Ω. 电池标准充电后,用 0.1Ω的导线连接电池的正负极来短路电池。	No explosion, no fire. 不爆炸，不起火。
Heating Test 热冲击测试	A battery is to be heated in a gravity convection or circulating air oven. The temperature of the oven is to be raised at a rate of 5±2℃/min to a temperature of 130±2℃ at which temperature the oven is to remain for 30 minutes before the test is discontinued. 将标准充电后的电池放在重力对流或循环空气的烘箱中进行加热，烘箱的温度以 5±2℃/min 的速率上升到 130±2℃后恒温 30 分钟。	No explosion, no fire. 不爆炸，不起火。
Over Charging Test 过充电测试	After standard charge, the battery is subjected to a charging current by connecting it to a dc-power supply. The beginning current is 1.0C,which is to be obtained by connecting a resistor of specified size and rating in series with the battery, the voltage of the dc-power supply is 4.8V. The test time is 8.0 hours. This does not require that the initial be maintained for 8.0 hours. 电池标准充电后,将电池连接一个恒流恒压直流电源,电压调节为 4.8V,然后以用 1.0CmA 的电流给电池充电。测试时间为 8.0H.	No explosion, no fire. 不爆炸，不起火。
Low Pressure Test 高空模拟测试	After standard charge ,store for 6h at a absolute pressure of 11.2KPa, next rest for 2hrs at 25±5℃. 按标准方式满充电池后，在绝对压强为 11.2KPa 下放置 6h，然后在 25±5℃环境中搁置观察 2hrs。	No leakage, no fire and no explosion 不漏液， 不起火， 不爆炸

6 Handling Instructions 使用指南

Read and observe the following warnings and precautions to ensure correct and safe use of Lithium battery.
认真阅读下面的注意事项，确保正确使用锂电池。

Danger! 危险！

Failure to observe the following precautions may result in battery leakage, overheating, explosion and/ or fire.
不仔细阅读下述事项,可能导致电池泄漏,发热,爆炸或起火。

— Do not immerse the battery in water or allow it to get wet.
—严禁将电池浸入水中。
— Do not use or store the battery near sources of heat such as a fire or heater.
— 禁止在热源(如火和加热器)附近使用或储存电池.
— Do not use any chargers other than those recommended by A&S Power.
— 请使用安安森推荐的充电器.
— Do not reverse the positive(+) and negative(-) terminals.
— 禁止将电池正负极接反。
— Do not connect the battery directly to wall outlets or car cigarette-lighter sockets.
— 禁止将电池直接连接到墙上插座或车载点烟式插座.
— Do not put the battery into a fire or apply direct heat to it.
— 禁止将电池放入火中或给电池加热.
— Do not short-circuit the battery by connecting wires or other metal objects to the positive(+) and negative(-) terminals.
— 禁止用导线或其他金属将电池的正负极短路.
— Do not carry or put the battery together with necklaces, hairpins or other metal objects.
— 禁止将电池和项链,发夹或其他金属物品放在一起.
— Do not strike, throw or subject the battery to sever physical shock.
— 禁止将电池投入到较热的容器中.
— Do not pierce the battery casing with a nail or other sharp object, break it open with a hammer, or step on it.
— 禁止用钉子或其他尖锐物品或刺破电池外壳,也不要用锤子或其他方法击打电池.
— Do not directly solder the battery terminals.
— 禁止将电池端子焊接在一起.
— Do not attempt to disassemble or modify the battery in any way.
— 在任何情况下不得拆卸电池。
— Do not recharge the battery near a fire or in extremely hot conditions.
— 不要在靠近火源或极热的条件下给电池充电.

Warning! 警告!

Failure to observe the following precautions may result in battery leakage, overheating, explosion and/ or fire.
不仔细阅读下述事项,可能导致电池泄漏,发热,爆炸或起火。

— Do not place the battery in a microwave oven or pressurized container.
— 禁止将电池放在微波炉或压力容器里。
— Do not use the battery in combination with primary batteries (such as dry-cell batteries) or batteries of different capacity, type or brand.
— 禁止将电池与其他一次性电池(如干电池)或不同容量、型号、品种电池合使用。
— Do not use the battery if it gives off an odor, generates heat, becomes discolored or deformed, or appears abnormal in any way.
— 当电池散发出异味、发热、变形、变色或出现其他任何异常现象时，请不要使用。
— Keep the batteries out of the reach of children. If a child somehow swallows a battery, seek medical attention immediately.
— 请将电池放置于小孩接触不到的地方,如果小孩不小心吞咽电池,应立即寻求医生治疗.
— If the battery leaks or emits an odor, immediately remove it from the proximity of any exposed flame. The leaking electrolyte can ignite and cause a fire or explosion.
— 如果电池泄漏或发出异味，请立即将其远离明火，以免燃烧或爆炸。
— If the battery leaks and electrolyte gets in your eyes, do not rub them. Instead, rinse them with clean running water and immediately seek medical attention. If left as is, electrolyte can cause eye injury.
— 如果电解液接触到眼睛, 请立刻用清水冲洗并寻求医生的治疗！

Caution! 注意!

Do not use or store the battery where is exposed to extremely hot, such as under window of a car in direct sunlight in a hot day. Otherwise, the battery may be overheated. This can also reduce battery performance and/or shorten service life.
不要在极热的环境中使用电池，如阳光直射的或热天的车内。否则电池会过热，可能着火；同时也会影响电池的性能，缩短电池的使用寿命。

Use the battery only under the following environmental conditions. Failure to do so can result in reduced performance or a shorten service life. Recharging the battery outside of these temperatures can cause the battery to overheat, explode or catch fire.
只能在下述条件下使用电池,否则将会降低电池的性能或缩短电池的使用寿命.在此温度范围外使用电池可能引起过热、爆炸或起火。

Operating environment:工作环境
When charging the battery 电池充电温度: 0℃～45℃
When discharging the battery 电池放电温度: -20℃～60℃
When stored up to 30 days 存储 30 天: -20℃～45℃
When stored up to 90 days 存储 90 天: -20℃～35℃
When stored up to 150 days 存储 150 天: -20℃～30℃

In cases where children use the battery, instruct them on the contents of the user's guide and keep an eye on them to ensure that the battery is being used correctly.
当小孩使用电池时，需要按照说明书的内容教导他们，并密切注意他们，确保正确使用电池。

If the battery leaks and electrolyte gets your skin or clothing, immediately rinse the affected area with clean running water. If left as is, skin inflammation can occur.
如果电池漏液，电解液弄到皮肤或衣服上，立即用流动的清水冲洗受影响区域，否则可能导致皮肤发炎。

For directions on battery installation and removal, read the instruction manual that accompanies the equipment in which the battery will be used.
阅读电池的装置说明书，正确进行电池的安装和拆除。

If a device is not used for an extended period, the battery should be removed and stored in a cool, dry place. Otherwise, resting or reduced performance may occur.
如果长期不使用设备，请将电池卸下并放置在阴凉、干燥的地方，否则可能导致电池性能降低。

If the terminals of the battery are dirty, wipe them clean with dry cloth before use. Otherwise, solid electrical contact may not be charged with the equipment, and this can cause power outages or charging to fail.
如果电池的端子变脏，使用前用干布擦拭干净。否则电池会接触不良，从而引起能量损耗或无法充电。

7 Period of Warranty 质保期

Guarantee period of quality is one year from the date of shipment. A&S Power guarantees to give a replacement in case of cell with defects proven due to manufacturing process instead of the customer's abuse.
电池的保质期从出货之日算起为一年。如果证明电池的缺陷是在我们公司制造过程中造成的而不是客户错误使用造成，本公司负责退换电池

During long term storage, battery should be charged and discharged once every half a year
在长期储存期间，电池应每半年充放电一次。

8 Delivery Condition 交货条件

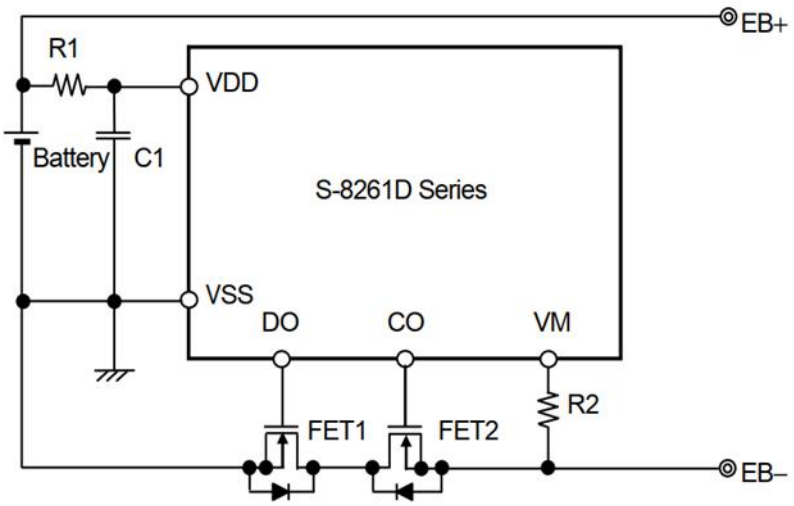
Partial charged condition. Battery voltage: 3.85-3.95V.
电池出厂时已带部分电量,电池电压约为 3.85-3.95V.

9 Amendment of this Specification 规格书的修订

This specification is subject to change with prior notice.
我司有权对规格书进行修订,在对产品规格书进行修订后将通知客户。

10 Protection Circuit 保护电路

10.1 Circuit Diagram 电路原理图



10.2 PCM BOM

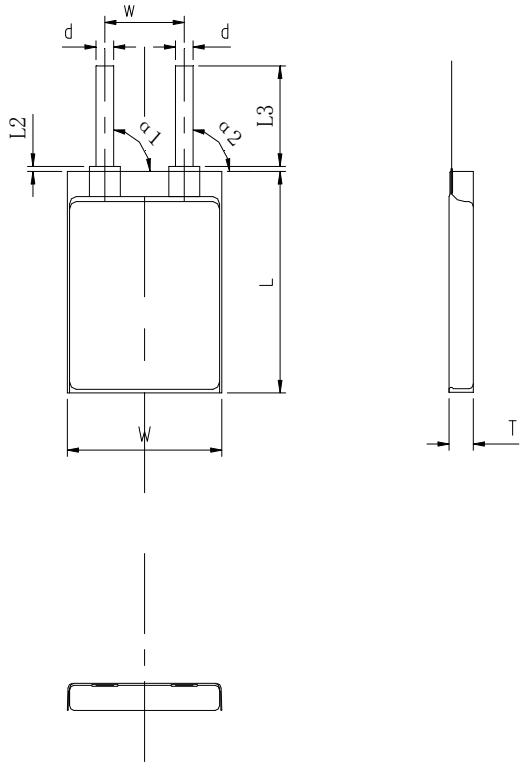
元件名称	规格描述	封装描述	位置	用量	品牌
PCB	FR-4	0.6mm	PCB	1	-
IC	S8261DAA	SOT23-6	U1	1	ABLiC
MOS	8205A	TSSOP-6	Q1	1	德普或同规格
贴片电阻	330Ω ±5%	0402	R1	1	风华或同规格
	1KΩ±5%	0402	R2	1	风华或同规格
贴片电容	0.1uF (104) 16V	0402	C1	1	国巨或同规格

10.3 PCM Parameter PCM 保护参数

项目	符号	最小值	典型值	最大值	单位
常态自耗	IDD	1	5.0	7.0	uA
过充保护电压(单节)	VCU	4.255	4.28	4.305	V
过充恢复电压(单节)	VOCR	4.03	4.08	4.13	V
过放保护电压(单节)	VODP	2.95	3.00	3.05	V
过放恢复电压(单节)	VODR	2.90	3.00	3.10	V
开通内阻	$R_{DS(ON)}$	30	45	65	mΩ
过流保护电流	COIP(VOI1)	1.0	-	3.0	A

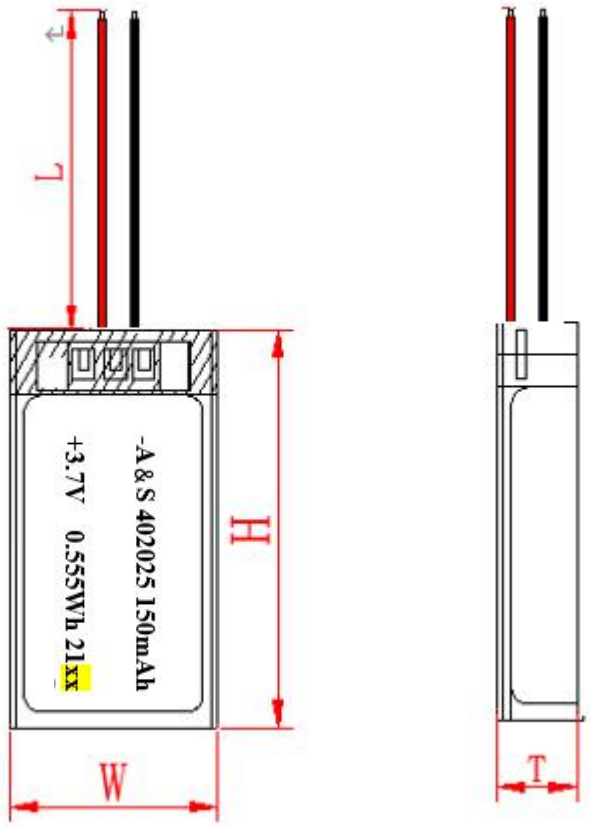
11.Structural figure 产品结构示意图

Fig.1 Dimensional Drawing of 402025 外形尺寸



Item 项目	Cell-Specifications 电芯规格
T/厚度	4.0 mm max.
W/宽度	20.5 mm max.
L/长度	25.5 mm max.

Fig.2 Dimensional Drawing of **402025** 电池尺寸示意图



Item 项目	Pack Dimension 电池规格
T/厚度	4.15mm.max（Max 4.2mm after 500 cycles life）
W/宽度	20.5mm.max
H/高度	27.0mm.max
L/线材	20.0±3.0 mm (UL3302 28# AWG)

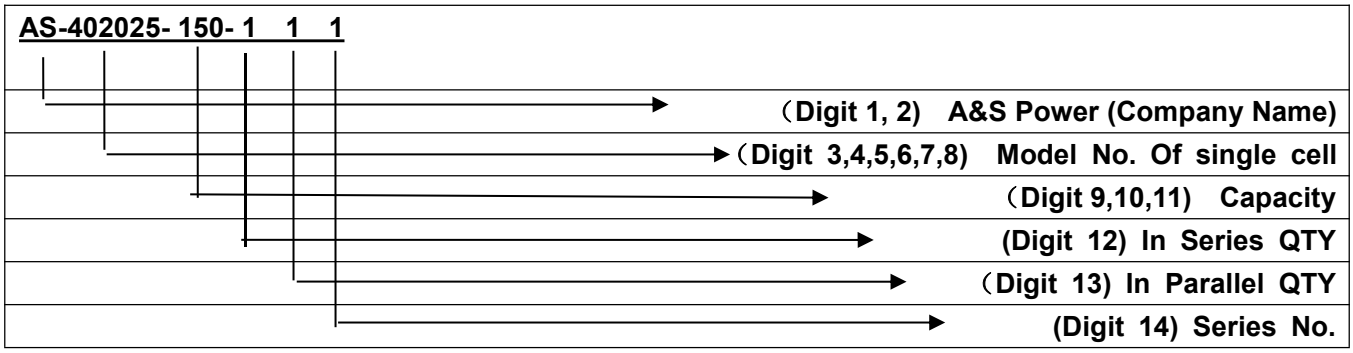
12.Marking

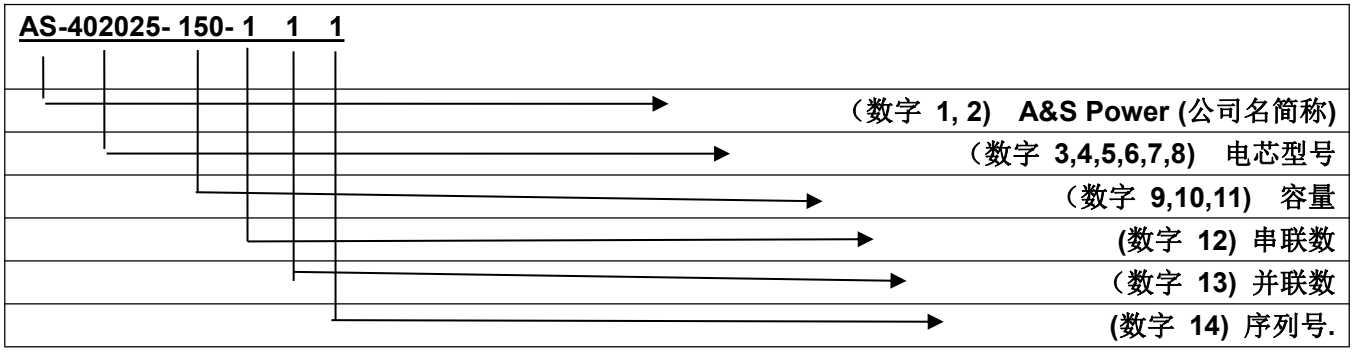
A&S 402025 3.7V 150mAh 0.555Wh 21xx

(21means 2021, xx means week of year)

13.Part Number Description

编号说明





End-