样 品 承 认 书

APPROVED SHEET

客户料号(P/O)：OT-007-0052D0-04

品名(MATERIAL)：锂充电电池

规格(SPECIFICATION)：锂充电电池 5200mAh/7.4V/7P2.54 带卡插头/符合 3C 标准

保密文件

密级：秘密

承认说明：

东莞市金赛尔电池科技有限公司

供样签核（CUSTOMER APPROVAL）

初审（ORIGINATED BY）

确认（CHECKED BY）

核准（APPROVED BY）

EDIFIER 漫步者

承认签核（CUSTOMER APPROVAL）

检验（INSPECTED BY）：陈敏

确认（CHECKED BY）：2023.08.18

核准（APPROVED BY）：

CEL SPECIFICATION FOR APPROVAL

CEL 产品规格承认书

Customer Code 客户代码: C254

Customer material number 客户料号:

Product Model 产品型号: INR18650-2S2P

Product Capacity 产品容量: 5200mAh/7.4V

Cell type 电芯类型: 钢壳/圆柱

Part Code 产品编码: LS22111504

Total Page 文件页数: 20

The company acknowledges 公司承认 (Stamp) （盖章）	Registered 编制	Checked by 审核	Approved 批准
	窦国平	刘成	黄健
	2023-12-06	2023-12-06	2023-12-06

Approved by customer 客户承认 (Stamp) （盖章）	Tested by 测试	Checked by 审核	Approved 批准

Add:No.11, jiaoyitang yinhu industrial zone, tangxia town, dongguan city, guangdong province.
地址：广东省东莞市塘厦镇蛟乙塘银湖工业区 11 号
Tel(电话): 86-769-82195308 Fax(传真):86-769-87982226

Product Modified Record List
产品变更履历表

Revision 版本	Description 内容描述	Registered 编制	Approval 审批人	Date 日期
A0	First sample delivery of new design 新设计 首次送样	窦国平	刘成	2022-12-08
A1	变更保护板参数及出线位置	窦国平	刘成	2023-01-09
A2	变更成品内阻，外露线长，放电持续电流	窦国平	刘成	2023-02-03
A3	修改持续充电温度	窦国平	刘成	2023-03-07
A4	更改 3C 标贴	窦国平	刘成	2023-08-08
B0	取消标贴中"3C"字样及完善电池名称	窦国平	刘成	2023-08-17
B1	修改标贴内容	窦国平	刘成	2023-12-06

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1. SCOPE 概述

This product acknowledgement describes the rechargeable lithium-ion battery designed and manufactured by Dong guan Golden CEL Battery Co.LTD., (cel, hereinafter referred to as king cel). It is the basis for product design, production and inspection. Its purpose is to let customers understand the product quality standards and the correct use.

本产品承认书描述东莞市金赛尔电池科技有限公司（CEL，以下简称：金赛尔），设计制造的可充电锂离子电池，它是产品设计、生产和检验的依据。其目的是让客户了解产品的质量标准及正确使用方法。

2. Product basic information 产品基本信息

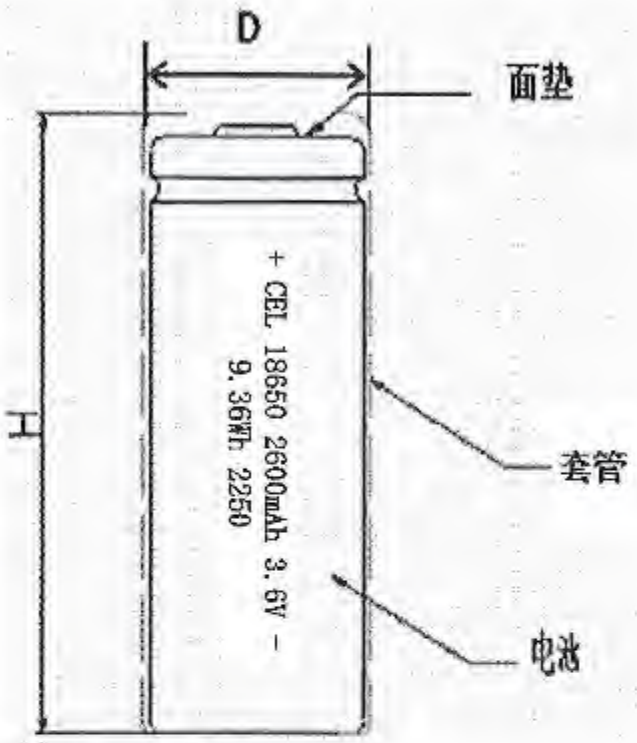
No.序号	Items 项 目			Parameter 参 数	
2.1	Battery model 电池型号			INR 18650-2S2P	
2.2	Shipment voltage 出货电压			≥7.6V	
2.3	Inner Impedance 内阻（交流阻抗 AC 1kHz）			Cell/电芯≤35mΩ	Battery/电池≤200mΩ
2.4	pack weight 成品重量			Approx(约)：200.5g	
2.5	Maximum capacity 最大容量			5300mAh	0.2C Discharge 0.2C 放电
	Nominal capacity 标称容量			5200mAh	
	Minimal capacity 最小容量			5100mAh	
2.6	Nominal voltage 标称电压			7.4V	
	Fully charge voltage(FC)满充电压			8.4V	Defined in this DOC: FC = 8.4V
	Fully discharge voltage(FD)满放电压			5.5V	Defined in this DOC: FD = 5.5V
2.7	Standard charge current 标准充电电流			0.2C	
	Max continuous charge current 最大充电持续电流			0℃~55℃	0.5C(当电池表面温度超过 60℃时，设备停止对电池充电)
2.8	放电电流 Discharge Current	标准放电电流（0.2） Standard Discharge Current		-10℃~60℃	
		持续放电电流 15A Discharge Current 15A			
		最大瞬时放电 21A Max instantaneous discharge 21A		(1-3S)	
2.9	Cycle life 循环寿命			500 次充放电后，电池能恢复 80%的容量 （详见 6.5 项）After 500cycles charge/discharge, battery can recover 80% of its capacity (Detail in 6.5)	
2.10	高温存放要求			低温电压稳定点在 3.0-3.6V，常温稳定电压 3.6-3.8V 左右 电池高温压降：45℃高温堆放 3 天，电芯≤2mV/天，成品<3mV/天	
2.11	Storage temperature 储存温度	-20℃~60℃	≤7 day	The recovery capacity shall not be less than80% of the capacity 恢复容量不低于容量的 80%,Recommended storage temperature is 25±2℃ of half charge state (With electric quantity 30%~70%), humidity 45 to85%。 推荐储存温度 25±2℃，电芯为半电状态 (带电量 30%~70%)储存，湿度 45 ~ 85%。	
		-20℃~40℃	≤3 month		
		-20℃~25℃	≤1 year		

Remarks :2.2,2.5 test results are subject to test within 7 days of receipt of goods ;2.6,2.7,2.8 items are recommended use parameters, different from actual protection parameters.

注：2.2、2.5 项测试结果以收到货 7 天内测试为准；2.6、2.7、2.8 项为建议使用参数，与实际保护参数有别。

3. Cell 电芯参数

3.1.Cell outline drawing 电芯外形尺寸(Not In Scale 未按比例)



3.2.Electric core printing code 电芯喷码

+ CEL 18650 2600mAh 3.6V -
9.36Wh 2250

In the inkjet code, 2250 is the date, 22 represents 2022, 50 represents 50 weeks, and the year and week change with time.

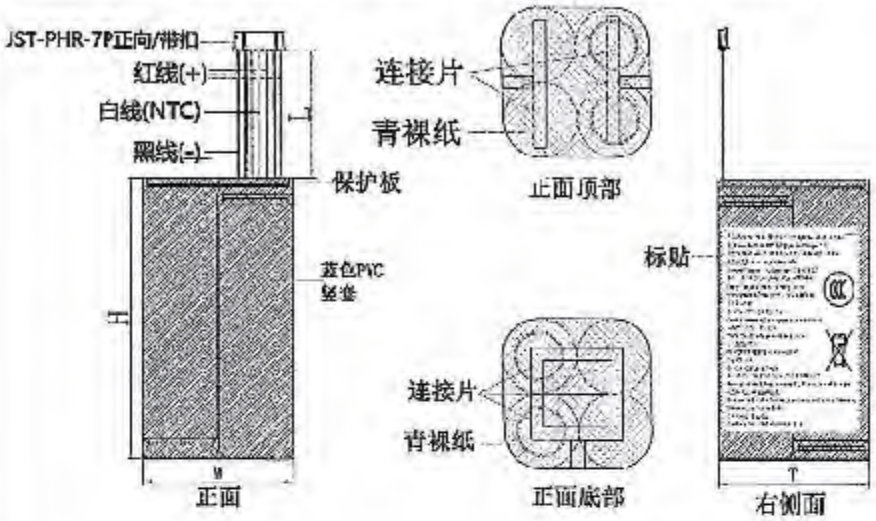
在喷码中 2250 为日期，22 代表 2022 年，50 代表 50 周，年周随时间变化。

3.3.Cell Performance parameters 电芯性能参数

NO. 编号	Item项目		Specification规格	Unit 单位	Remarks备注
1	Dimensions 外形尺寸	D	Max 18.4	mm	Diameter 直径
2		H	Max 65.3	mm	Cell length 电芯长度
3	Sleeve color 套管颜色	蓝色（根据不同批次套管颜色可能会不同，具体以实际为准。）			

4. Battery Outline Drawing 电池组外形尺寸

4.1.Battery Outline Drawing 电池组外形尺寸(Not In Scale 未按比例)



标贴图稿见附页 1

4.2.Spray Content 电池喷码:

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4.3.Battery Performance parameters 电池组性能参数

NO.序号	Item 项目	Specification 规格
1	thickness size Max 厚度 T	38mm
2	width size Max 宽度 W	38mm （含标贴）
3	Height size Max 高度 H	71mm
4	Exposed line length 外露线长 L	110±10mm
5	Wiring method 出线方式	See Figure 见图
6	Remark 备注	测量尺寸时需加 300 克力（gf）

4.4.BOM 1(Bill of materials)电池物料清单

NO.序号	Material Name 零件名称)	Specification(规格型号)	Qty 用量(PCS)
1	Cell 电芯	18650-2600mAh （金赛尔）	4
2	Protection board 保护板（点焊板）	S-8252AAH+PAN2065X4+NTC+均衡 (LP35344-2)	1
3	Red wire 红色导线	UL1007-22#	3
4	Black wire 黑色导线	UL1007-22#	3
5	White wire 白色导线	UL1007-22#	1
6	Connector 连接器	JST-PHR-7P 正向/带扣（红红红黄黑黑黑）	1
7	Connecting pioco 连接片	T 形连接片/口形片	3
8	Label 标贴	见图：	1
9	Barley paper 青稞纸	常规矩形/单面带胶	5
10	Silicone pad 硅胶垫	T=0.12mm/常规矩形/单面带胶	3
11	Blue PVC film 蓝色 PVC 膜	蓝色 PVC 膜	1

5. Battery protection characteristics 电池保护特性(n=1)

5.1.Performance Parameter 性能参数表

以下检测项目中,※表示批量生产必测项；◎表示品质管控项； ○表示该产品无此项功能或不管控

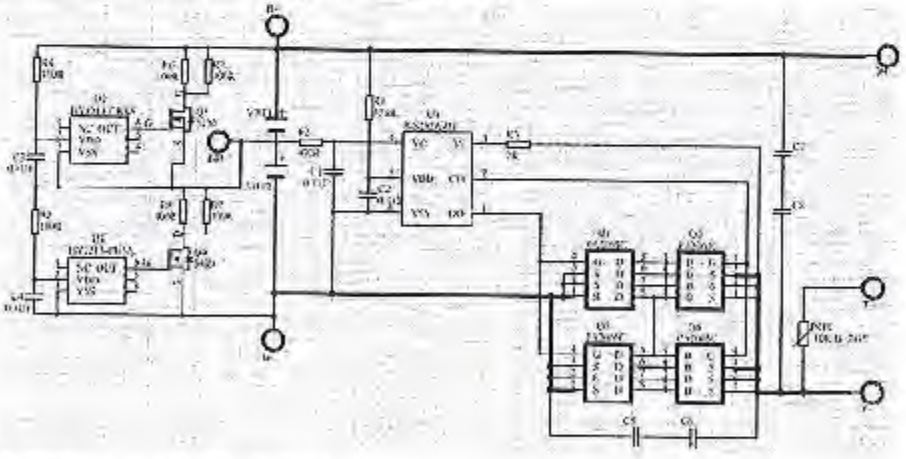
Protection scheme 保护方案		S-8252AAH+PAN2065Cx4+加均衡 HY2213-CB3A +NTC10K B=3435	Parameter Values/参数 Normal temperature 25 ℃ 常温 25℃				
No. 序号	Item 项目		Min 最小值	Type 典型值	Max 最大值	Unit 单位	检测度
1	Overcharge 过充电	Detection voltage/保护电压	4.230	4.250	4.270	V	※
2		Release voltage/恢复电压	4.070	4.100	4.130	V	◎
3		Detection delay time/保护延迟时间	0.8	1.0	1.2	s	◎
4	Over discharge 过放电	Detection voltage/保护电压	2.950	3.000	3.050	V	※
5		Release voltage/恢复电压	2.950	3.000	3.050	V	◎
6		Detection delay time/保护延迟时间	102.4	128	153.6	ms	◎
7	Discharge overcurrent current 放电过流	Detection overcurrent /保护电流	22	-	42	A	※
8		Detection delay time/保护延迟时间	6.4	8	9.6	ms	◎
9	Charge overcurrent 充电过流	Detection overcurrent /保护电流	22	-	42	A	◎
10		Detection delay time/保护延迟时间	6.4	8	9.6	ms	◎
11	短路保护 Short protection	Short detection delay time/短路保护延时	224	280	336	us	◎
12		Release Conditions/恢复条件	Cut off load/断开负载				◎
13	Consume electricity while working/工作时自耗电		-	-	8	uA	※
14	IR of PCM/PCM 内阻		-	-	40	mΩ	※
15	Balanced starting voltage 均衡启动电压		4.155	4.18	4.205	V	※
16	Balanced starting current 均衡启动电流		70	-	100	mA	※
17	suggest working temperature/建议工作温度		-40		+85	℃	
18	0V Charging function/0V 充电功能		Availble 允许				◎
19	NTC Resistor(25℃)/NTC 电阻		9	10	11	KΩ	◎
20	ESD 测试	No protection/damage KV contact/-4(test condition: contact 500Ω resistive load) 接触+/-4KV 不得有保护/损坏等现象（测试条件：接触 500Ω 电阻负载）					

5.2.PCB Bom PCB 物料清单

NO. 序号	Name of material 物料名称	Symbol 代号	Spec./Model 规格型号	Size 尺寸/封装	Q'ty 数量	Unit 单位	供应商 Vendor	Remarks 备注
1	Protection IC	U1	S-8252AAH 丝印：CGH，“*”代表可变化丝印	SOT-23-6	1	PCS	ABLIC 艾普凌科	
2	MOS Tube	Q1.Q2. Q5.Q6	PAN2065C 丝印： PAN2065C*，“*”代表可变化丝印	DFN5*6	4	PCS	派朋迪	
3	PCB	PCB	35*34.4*1.2mm	/	1	PCS	精维顶	
4	Protection IC	U2.U3	HY2213-CB3A 丝印：BC3A，“*”代表可变化丝印	SOT-23-6	2	PCS	宏晟	
5	MOS Tube	Q3.Q4	CJ3400	SOT-23	2	PCS	长电	
6	SMD Resistance 贴片电阻	R1.R2	470Ω±5%	0603	2	PCS	国巨	
7	SMD Resistance 贴片电阻	R4.R5	100Ω±1%	0603	2	PCS	国巨	
8	SMD Resistance 贴片电阻	R3	2K±5%	0603	1	PCS	国巨	
9	SMD Capacitance 贴片电容	C1.C2. C3.C4	0.1uF±30-20% 16-25V	0603	4	PCS	国巨	
10	SMD Resistance 贴片电阻	R6.R7. R8.R9	100Ω±1%	1206	4	PCS	国巨	
11	SMD Resistance 贴片电阻	NTC	10K ±1% B=3435	0603	1	PCS	仙桥	

5.3.Battery structure diagram 电池架构图(Sketch map 示意图)

5.4.Schematic circuit diagram 电路原理图



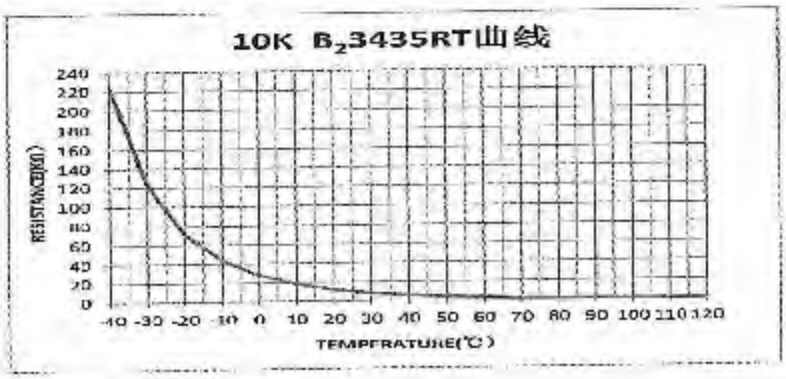
5.5.PCB Layout PCB 布线图

电阻—温度特性表

R_{25}=10KΩ±1% $B_{25/85}$=3435K±1%

T(℃)	R_{Min}(KΩ)	R_{Nor}(KΩ)	R_{Max}(KΩ)	T(℃)	R_{Min}(KΩ)	R_{Nor}(KΩ)	R_{Max}(KΩ)
-40	212.0153	220.8889	230.1108	1	26.2226	26.7494	27.2840
-39	199.8448	208.0846	216.6426	2	25.1013	25.5943	26.0943
-38	188.4623	196.1166	204.0614	3	24.0350	24.4962	24.9639
-37	177.8114	184.9244	192.3028	4	23.0206	23.4522	23.8895
-36	167.8401	174.4525	181.3073	5	22.0554	22.4591	22.8680
-35	158.5003	164.6495	171.0202	6	21.1366	21.5143	21.8965
-34	149.7478	155.4682	161.3910	7	20.2617	20.6150	20.9723
-33	141.5416	146.8649	152.3732	8	19.4285	19.7588	20.0928
-32	133.8440	138.7994	143.9239	9	18.6346	18.9435	19.2555
-31	126.6200	131.2344	136.0033	10	17.8780	18.1667	18.4583
-30	119.8373	124.1355	128.5749	11	17.1567	17.4266	17.6989
-29	113.4661	117.4708	121.6048	12	16.4689	16.7210	16.9753
-28	107.4785	111.2110	115.0617	13	15.8129	16.0483	16.2857
-27	101.8490	105.3288	108.9166	14	15.1869	15.4067	15.6282
-26	96.5538	99.7989	103.1426	15	14.5894	14.7946	15.0012
-25	91.5709	94.5978	97.7150	16	14.0191	14.2105	14.4031
-24	86.8797	89.7039	92.6106	17	13.4744	13.6529	13.8325
-23	82.4614	85.0971	87.8082	18	12.9541	13.1205	13.2878
-22	78.2982	80.7585	83.2879	19	12.4570	12.6120	12.7677
-21	74.3738	76.6710	79.0312	20	11.9818	12.1262	12.2711
-20	70.6729	72.8183	75.0212	21	11.5276	11.6620	11.7967
-19	67.1815	69.1854	71.2420	22	11.0933	11.2182	11.3435
-18	63.8862	65.7584	67.6787	23	10.6779	10.7940	10.9102
-17	60.7748	62.5243	64.3177	24	10.2804	10.3882	10.4961
-16	57.8359	59.4711	61.1463	25	9.9000	10.0000	10.1000
-15	55.0589	56.5874	58.1525	26	9.5287	9.6286	9.7285
-14	52.4338	53.8628	55.3252	27	9.1734	9.2731	9.3729
-13	49.9513	51.2875	52.6542	28	8.8334	8.9327	9.0322
-12	47.6028	48.8524	50.1299	29	8.5079	8.6068	8.7059
-11	45.3803	46.5491	47.7432	30	8.1963	8.2946	8.3932
-10	43.2761	44.3694	45.4858	31	7.8979	7.9955	8.0936
-9	41.2833	42.3062	43.3500	32	7.6120	7.7089	7.8063
-8	39.3953	40.3523	41.3284	33	7.3380	7.4342	7.5308
-7	37.6060	38.5014	39.4142	34	7.0755	7.1708	7.2666
-6	35.9095	36.7474	37.6010	35	6.8238	6.9182	7.0131
-5	34.3005	35.0846	35.8830	36	6.5824	6.6759	6.7699
-4	32.7739	33.5077	34.2545	37	6.3510	6.4434	6.5365
-3	31.3251	32.0118	32.7103	38	6.1289	6.2203	6.3124
-2	29.9496	30.5923	31.2456	39	5.9158	6.0061	6.0972
-1	28.6432	29.2447	29.8558	40	5.7114	5.8005	5.8905
0	27.4021	27.9650	28.5366	41	5.5150	5.6031	5.6920

T(℃)	R_{Min}(KΩ)	R_{Nor}(KΩ)	R_{Max}(KΩ)	T(℃)	R_{Min}(KΩ)	R_{Nor}(KΩ)	R_{Max}(KΩ)
42	5.3265	5.4135	5.5013	84	1.4489	1.4917	1.5355
43	5.1455	5.2313	5.3179	85	1.4094	1.4513	1.4944
44	4.9716	5.0562	5.1417	86	1.3711	1.4123	1.4546
45	4.8045	4.8879	4.9723	87	1.3340	1.3745	1.4161
46	4.6439	4.7261	4.8093	88	1.2981	1.3379	1.3787
47	4.4896	4.5706	4.6526	89	1.2633	1.3024	1.3425
48	4.3412	4.4210	4.5018	90	1.2297	1.2680	1.3074
49	4.1985	4.2771	4.3567	91	1.1970	1.2347	1.2734
50	4.0612	4.1386	4.2170	92	1.1654	1.2024	1.2404
51	3.9292	4.0054	4.0826	93	1.1348	1.1711	1.2085
52	3.8021	3.8771	3.9531	94	1.1051	1.1408	1.1775
53	3.6798	3.7536	3.8285	95	1.0764	1.1114	1.1474
54	3.5621	3.6347	3.7084	96	1.0485	1.0829	1.1183
55	3.4488	3.5202	3.5927	97	1.0214	1.0552	1.0900
56	3.3396	3.4099	3.4812	98	0.9952	1.0284	1.0626
57	3.2345	3.3036	3.3738	99	0.9698	1.0024	1.0359
58	3.1332	3.2011	3.2702	100	0.9451	0.9771	1.0101
59	3.0356	3.1024	3.1703	101	0.9212	0.9526	0.9850
60	2.9416	3.0072	3.0740	102	0.8979	0.9288	0.9607
61	2.8509	2.9155	2.9811	103	0.8754	0.9058	0.9370
62	2.7635	2.8269	2.8915	104	0.8536	0.8834	0.9141
63	2.6793	2.7416	2.8051	105	0.8323	0.8616	0.8918
64	2.5980	2.6592	2.7216	106	0.8117	0.8405	0.8702
65	2.5196	2.5797	2.6411	107	0.7917	0.8200	0.8492
66	2.4439	2.5030	2.5633	108	0.7723	0.8001	0.8287
67	2.3709	2.4290	2.4883	109	0.7535	0.7807	0.8089
68	2.3005	2.3575	2.4158	110	0.7351	0.7619	0.7896
69	2.2324	2.2885	2.3457	111	0.7173	0.7437	0.7709
70	2.1668	2.2218	2.2781	112	0.7001	0.7259	0.7527
71	2.1034	2.1575	2.2127	113	0.6833	0.7087	0.7350
72	2.0421	2.0952	2.1495	114	0.6669	0.6919	0.7178
73	1.9830	2.0351	2.0885	115	0.6511	0.6756	0.7010
74	1.9258	1.9770	2.0294	116	0.6357	0.6598	0.6847
75	1.8706	1.9209	1.9724	117	0.6207	0.6444	0.6689
76	1.8172	1.8666	1.9172	118	0.6061	0.6294	0.6535
77	1.7656	1.8141	1.8638	119	0.5919	0.6148	0.6386
78	1.7157	1.7634	1.8122	120	0.5782	0.6007	0.6240
79	1.6675	1.7143	1.7622	121	0.5648	0.5869	0.6098
80	1.6208	1.6668	1.7139	122	0.5518	0.5735	0.5960
81	1.5757	1.6208	1.6671	123	0.5391	0.5604	0.5826
82	1.5320	1.5764	1.6218	124	0.5267	0.5477	0.5695
83	1.4898	1.5333	1.5780	125	0.5147	0.5354	0.5568



6.Electrical Characteristics and reliability requirements 电气特性和可靠性要求

No.	Items 项目	Test Method 测试方法	Criteria 标准
1	standard charge 标准充电	0.2C CC（constant current）charge to FC, then CV(constant voltage FC)charge till charge current decline to ≤ 0.01C 0.2C CC（恒流）充电至 FC，再 CV（恒压 FC）充电直至充电电流≤0.01C。	约 300min(分钟)
2	0.2C Capacity 0.2C 容量	At standard testing condition，after standard charging, rest battery for 10min, then discharging at 0.2C to voltage FD, recording the discharging time. 在标准测试环境下，标准充饱电后,搁置 10 分钟,然后用 0.2C 电流放电至 FD，所记录放电时间	≥300min(分钟)
3	0.5C Capacity 0.5C 容量	At standard testing condition，after standard charging, rest battery for 10min, then discharging at 0.5C to voltage FD, recording the discharging time. 在标准测试环境下，标准充饱电后,搁置 10 分钟,然后用 0.5C 电流放电至 FD，所记录放电时间	≥114min(分钟)
4	1C Capacity 1C 容量	At standard testing condition，after standard charging, rest battery for 10min, then discharging at 1C to voltage FD, recording the discharging Capacity 在标准测试环境下，标准充饱电后,搁置 10 分钟,然后用 1C 电流放电至 FD,记录容量	≥56min（分钟）
5	Cycle Life 循环寿命	At standard testing condition，constant current 0.2C charge to FC, then constant voltage charge to current declines to 0.01C, rest 10min，constant current 0.2C discharge to FD，rest 10min. Repeat above steps till continuously discharging capacity Higher than 80% of the Initial Capacities of the Cells 在标准测试环境下，先用 0.2 C 恒流充电至 FC，再恒压 FC 充电直至充电电流≤0.01C,搁置 10 分钟,再用 0.2C 电流放电至 FD;又搁置 10 分钟,重复以上步骤,直到放电容量是初始容量的 80%。	≥500 times(次)
6	Capability of keeping electricity 荷电保持能力	After the battery is fully charged according to the charging method specified in 6.1, without external load line, the battery combination is out aside for 28 days, and then discharged to FD with 0.2C, and the discharge time is recorded。 将电池按照 6.1 规定的充电方法充满电后，无外接负载线路，电池组合搁置 28 天,然后用 0.2C 放电至 FD,所记录放电时间。	≥270min（分钟）
7	low Temperature 低温性能	After the battery is fully charged according to the charging method specified in 6.1, measure the discharge capacity of the battery discharged to FD with 0.2 C5a current at different temperatures (compared with the initial capacity). 将电池按照 6.1 规定的充电方法充满电后，测量电池在不同	在-10℃时 ≥70% At -10℃is ≥70%

		温度下用 0.2 C5A 电流放电至 FD 所放出的容量（与初始容量作为较）。	
8	High Temperature 高温性能	After the battery is fully charged according to the charging method specified in 6.1, measure the discharge capacity of the battery discharged to FD with 0.2 C5a current at different temperatures (compared with the initial capacity). 将电池按照6.1规定的充电方法充满电后，测量电池在不同温度下用0.2 C5A 电流放电至FD所放出的容量（与初始容量作为较）。	在 55°C时 ≥95% At 55°Cis ≥95%
9	Constant temperature and Humidity 恒定湿热	Put the battery at 40 ℃ ± After 48 hours in a constant temperature and humidity box with 2 ℃ and 90-95% relative humidity, discharge to FD with 0.2C current.将电池放入40℃±2℃及相对湿度为90--95%的恒温恒湿箱中48 小时后，再以0.2C 电流放电至FD。	No visible distortion, fire or explosion, the discharging time ≥3h. 无泄漏、冒烟、起火或爆炸； 放电时间≥3h。
10	Drop test 跌落测试	After the battery pack is fully charged according to the standard, the drop height: 1000mAh 1.5m, >1000mAh, 1.0m. The sample with the power supply capacity of portable electronic products higher than 1.0m is scheduled to be used on the handheld device, and the drop height should be 1.5m将电池组按标准充满电后，跌落高度：容量≤1000mAh 1.5米，容量>1000mAh，1.0米，手持设备预定使用高度高于1.0米的便携式电子产品供电的容量超过1000mAh的样品，起跌落高度应为1.5米。自由落体跌落于混凝土板上。每个面各跌落一次，共进行6次试验。	No fire, no explosion, no liquid leakage. 不起火、不爆炸、不漏液。
11	Low pressure 低气压测试	Each fully charged cell is placed in a vacuum chamber, in an ambient temperature of 20~25℃.Once the chamber has been sealed, its internal pressure is gradually reduced to a pressure equal to or less than 11.6 kPa (this simulates an altitude of 15240 m) held at that value for 6 h. 电池放在一个模拟真空的空间放置6 小时，环境温度为20~25℃，真空环境压力≤11.6kpa，模拟15240m 高空低压环境	No leakage, No fire, No explosion 无泄漏，不起火，不爆炸
12	Temperature 温度循环	In the standard test environment, after standard charging, the battery pack is placed in a controlled temperature box with a temperature of 20±5℃ drop the temperature of the test box to -40±2℃ and keep it for 6 hours;The temperature conversion time shall not exceed 30 min.C) raise the temperature of the test box to 72±2℃ again, and the temperature conversion time shall not exceed 30 min;D) repeat steps a)--c). After a total of 10 test cycles, continue one discharge charging cycle according to the standard charging and discharging method 在标准测试环境下，标准充饱电后，将电池组在温度为20 ℃±5 ℃的可控温的箱体中进行如下步骤：	No fire, no explosion, no liquid leakage. 不起火、不爆炸、不漏液。

		a）将样品放入温度为 72 ℃±2 ℃的试验箱中保持 6h； b）后将试验箱温度降为-40 ℃±2 ℃，并保持 6h；温度转换时间不大于 30 min； c）再次将试验箱温度升为 72 ℃+2 ℃，温度转换时间不大于 30 min； d）重复步骤 a）～c），共循环 10 次。试验后按标准充放电方法继续进行一次放电充电循环。	

7. Battery Pack Safe Characteristic 电池组安全性能

1	Forced Discharge test 强制放电	A discharged cell is subjected to a reverse charge at 1C for 90 min. 电池先以0.2C 放电至终止电压，再以1C 电流，对电池进行反向充电，90min 以上	No fire, No explosion 无起火，无爆炸
2	Acceleration shock加速度冲击	In the standard test environment, the acceleration impact test was conducted in accordance with three vertical directions after standard charging. Fixed in the sample of the impact on the stage, half sine pulse impact test, within the first 3 ms, minimum average acceleration is designed. the gn 75, peak acceleration is designed. the 150±25 designed. The gn, pulse duration for 6 ms 1ms sample three times in each direction acceleration shock test after test shall be carried out in accordance with the standard charge and discharge method to charge a discharge cycle 在标准测试环境下，标准充饱电后，按照3个相互垂直的方向依次进行加速度冲击试验；将样品固定在冲击台上，进行半正弦脉冲冲击试验，在最初的3ms内，最小平均加速度为75 gn，峰值加速度为150 gn±25 gn，脉冲持续时间为6 ms±1ms。样品每个方向进行三次加速度冲击试验。试验后按照标准充放电方法继续进行一次放电充电循环。	No fire, no explosion, no liquid leakage. 不起火、不爆炸、不漏液。
3	Vibration measurement振动测试	In the standard test environment, vibration tests were conducted in three vertical directions after standard charging.Tighten the sample on the vibration test bench, and the scanning frequency is oscillated from 10hz-55hz in each direction in three directions of X, Y and Z for 30 min, and the scanning frequency rate is 1oct/min.10hz-30hz, displacement amplitude (single amplitude):0.38mm;30 hz - 55 hz, displacement amplitude (single amplitude) : 0.19 mm, sine vibration test for 12 cycles in each direction, the cycle time of each direction of a total of 3 h after vibration test shall be carried out in accordance with the standard charge and discharge method to charge a discharge cycle 在标准测试环境下，标准充饱电后，按照 3 个相互垂直的方向依次进行振动试验；将样品紧固在振动试验台上，X、Y、Z 三个方向上每个方向上从 10Hz-55Hz 循环扫频振动 30 min,扫频速率为 1oct/min； 10Hz-30Hz，位移幅值（单振幅）：0.38mm；30Hz-55Hz，位移幅值（单振幅）：0.19mm，正弦振动	No fire, no explosion, no liquid leakage. 不起火、不爆炸、不漏液。

		测试。每个方向进行 12 个循环，每个方向循环时间共计 3h 的振动。试验后按照标准充放电方法继续进行一次放电充电循环。	
4	高温外部短路 55℃short-circuit Characteristics	电芯充满电后，放置在环境温度 55℃±5℃的条件下，在电池表面温度达到设定温度后，再放置 30min，在防爆箱内用电阻 80±20mΩ的导线将电池正负极短接。 A fully charged cell is to be short circuited by connecting the positive and negative terminals with a electric resistance (80±20 mΩ) at temperature 55℃± 5℃ will cells kept in the temperature for	不着火、不爆炸； 电池外表面温度不超过 150℃。No fire; No explosion ; Temperature on the cells' surface should no more than 150 'C
5	常温外部短路 (Room temperature) Short -circuit Characteristics	电芯充满电后，放置在环境温度 20℃±5℃的条件下，在电池表面温度达到要求温度后，再放置 30min 在防爆箱内用电阻 80±20mΩ的导线将电池正负极短接。 A fully charged cell is to be short circuited by connecting the positive and negative terminals with a electric resistance (80±20mΩ) at room temperature 20℃±5℃will cells kept in the temperature for 30min .	不着火； 不爆炸； 电池的外部表面温度不超过 150 "C No fire; No explosion; Temperature on the cells' surface should no more than 15CJ 'C
6	热滥用 Hot Oven Characteristics	将满电电池用绝缘线悬挂在温度冲击箱（远红外鼓风烘箱或真空烤箱）中，冲击箱温度以 5℃±2℃/ min 的速率上升到 130℃+2℃ 保持 30min， 观察电池状态。 The standard fully charged cell is to be heated in a circulating air oven, the temperature of the oven is, to be raised at a rate of 5℃±2℃/ min to 130℃±2℃ and remain for 30 minutes at that temperature. Then check the cells' appearance .	不着火不爆炸 ND fire No explosion
7	过充电 Overcharge Characteristics	在环境温度 20 ±5℃的条件下，以 0.2 CsA 恒流放电至 3.0V,以指定 3 CsA 恒流充电到指定电压 4.6V,转为恒压充电， 当出现以下情况时终止测试，①电芯失效（如起火、爆炸）；②电芯温度下降到比峰值低 20%；③总的测试时间达到 7h。 The cells firstly 0.2 CsA discharged to 3.0V at 20±5℃, then charged at a 3 CsA current with a voltage limit of 4.6V, then turn to charge at constant voltage. The test can be terminated after 7 hours or perform fire and explosion, alternatively when the cells tempelature is reduced to top 20%.	不着火不燥炸 No fire No explosion
8	Extrusion test 挤压测试	In the test environment, the standard charge, the battery in two plane, perpendicular to the direction of the plate by extruding, applied between the two tablet 13.0 kN 0.78 kN extrusion Once the pressure reaches the maximum value can stop pressing test, test battery cannot occur in the process of external short circuit 1 as a sample only do an extrusion test 在标准测试环境下，标准充饱电后，将电池置于两个平面内，	No fire, no explosion, no liquid leakage. 不起火、不爆炸。

		垂直于极板方向进行挤压，两平板间施加 13.0 kN±0.78 kN 的挤压力。一旦压力达到最大值即可停止挤压试验，试验过 程中电池不能发生外部短路。1 个样品只做一次挤压试验。	
9	Free fall 自由跌落	The cell free falls from a height of 1m into the cement floor from X,Y,Z front and opposite direction of each direction. Then discharge the cell to 3.0*n(V) cut- off voltage with 1.0C current. 电池将从 1 米高处自由跌落到水泥地板上，从 X、Y、Z 正反方向每个方向自由跌落一次,再以 1.0C 放电至 3.0 (V)	No leakage, no fire, no explosion. 电池无漏液,无冒烟，无起火，无爆炸
10	Combustion injection 燃烧喷射	After the battery is fully charged The battery is placed on the wire mesh of the test tooling. If the test process In case of battery slipping, a single metal wire can be used The pool sample is fixed on the wire mesh; If this does not happen, Do not bundle the battery. Heat the battery with a flame when Stop heating in the following three cases: a) Battery explosion; b) The battery burns completely; c) Keep heating for 30 min, but the battery does not catch fire or explode. After the test, the components that make up the battery (except for dust products) or The whole battery shall not penetrate the aluminum mesh. 满电后，再将 电池放置在试验工装的钢丝网上。如果试验过程 中出现电池滑落的情况时，可用单根金属丝把电 池样品固定在钢丝网上；如果无此类情况发生， 则不可以捆绑电池。用火焰加热电池，当出现以 下三种情况时停止加热： a）电池爆炸； b）电池完全燃烧； c）持续加热 30 min，但电池未起火、未爆炸。 试验后，组成电池的部件（粉尘状产物除外）或 电池整体不得穿透铝网。	test Rear battery components (dust Except for products) and battery Aluminum mesh. 试验 后组成电池的部件（粉尘状 产物除外）和电池整体未穿 透铝网。

8. AReference standard 参考标标准

金赛尔电池安全性能是根据 UL1642、GB31241、IEC62133要求定制，电池符合 GB31241、IEC62133、UL1642、UN38.3、1.2米跌落标准的相关要求。

在出大货前提供 GB31241 过压充电、过流充电、外部短路 3 项测试报告，盖 CNAS 章。

9. Testing requirements 测试要求（无特别注明时，试验环境应符合此项要求）

9.1 Cell test environment 电池试验环境

Temperature 温度：25±2℃

Relative humidity 相对湿度：40~80% RH

Atmospheric pressure 大气压力：86~106 KPa

9.2 Measuring instrumentation requirements 测量仪表要求

Dimension instrumentation requirements: Measuring the dimension meter accuracy no less than 0.01mm scale

尺寸仪表要求：测量尺寸的仪表的精确度在 0.01mm 内

Voltage Instrumentation requirements: Measuring the voltage meter accuracy class no less than class 0.5

电压仪表要求：测量电压的仪表的精确度不低于 0.5 级

Current instrumentation requirements: Measuring the current meter accuracy class no less than class 0.5

电流仪表要求：测量电源的仪表精确度不低于 0.5 级

Time instrumentation requirements: Measuring the time meter accuracy no less than 0.1%

时间仪表要求：测量时间的仪表精确度不低于 0.1%

Temperature Instrumentation requirements: Measuring the temperature meter accuracy no less than 0.5 ℃

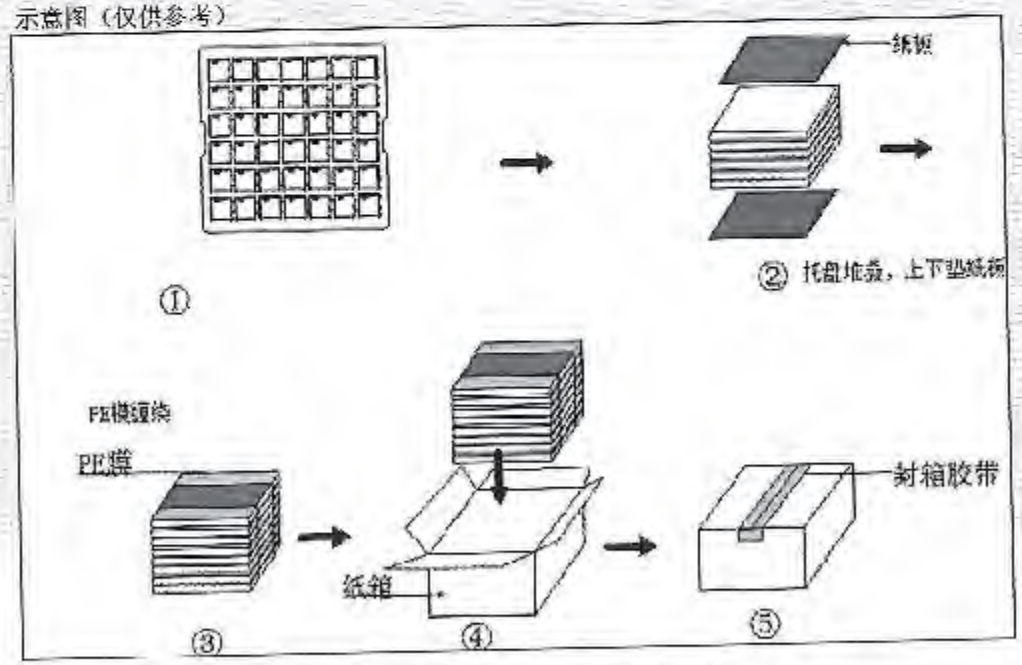
温度仪表要求：测量温度的仪表准确度不低于 0.5℃

Impedance instrumentation requirements: Measuring impedance should by sinusoidal alternating (1 KHZ) test

内阻仪表要求：测量内阻应由正弦交变(1KHZ)进行测试。

10. Packaging 包装

示意图（仅供参考）



The sketch, sizes, color of marking should match GB/T191-2016 requests.

标志的图形、尺寸、颜色应符合 GB/T 191－2016 的要求.

The manner of packing should match 2019 IATA DGR 60th Edition requests.

包装方式符合 2019 IATA DGR 60 的要求。

11.Warnings 警告

To prevent the possibility of the pack from leaking, heating, fire .please observe the following precautions:

☆为防止电池组合可能发生的泄漏,发热,起火,请注意以下预防措施:

The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs, pins and needles .Do not strike at pack with any sharp edge parts.

☆电池组合外包装膜易被镍片,尖针等尖锐部件损伤,禁止用尖锐部件碰伤电池.

Do not immerse the battery in liquid such as water, beverages, or other fluids.

☆严禁将电池组合浸入水或饮料或其它液体中。.

Do not use and leave the pack near a heat source as fire or heater

☆禁止将电池组合放在热高温源旁,如火,加热器等使用设备.

When recharging, use the battery charger specifically for that purpose

☆充电时请选用锂电池专用充电器.

Do not reverse the positive and negative terminals

☆禁止颠倒正负极使用电池组合

Do not connect the pack to an electrical outlet

☆禁止将电池组合直接接入电源插座

Do not discard the pack in fire or heat it

☆禁止将电池组合丢入火或加热器中

Do not short-circuit the pack by directly connecting the positive and negative terminal with metal object such as wire

☆禁止用金属直接将电池组合的正负极进行短路连接.

Do not transport and store the battery together with metal objects such as necklaces, hairpins etc.

☆禁止将电池组合与金属,如发夹,项链等一起运输或贮存.

Do not strike or throw the pack.

☆禁止敲击或抛掷,踩踏电池组合等.

Do not directly solder the pack or battery and pierce the battery with a nail or other sharp object.

☆禁止直接焊接电池组合或电芯，禁止用钉子或其它利器刺穿电池组合或电芯.

12. Cautions 注意

It is prohibited to use or place the battery combination at high temperature (beyond the range of 2.7,2.8,2.10), or it may cause the battery to overheat, catch fire or function failure, which may result in the short battery life.

△禁止在高温下(超出 2.7,2.8,2.10 范围)使用或放置电池组合,否则可能会引起电池过热,起火或功能失效,从而导致电池组合寿命减短。

The battery can only be charged within the scope of clause 2.7. Exceeding this temperature range may lead to battery leakage, heating, or serious damage. It can also lead to deterioration of battery performance and life.

△电池只能在条款 2.7 范围充电。超出此温度范围可能导致电池漏液、发热，或导致电池严重的损坏。它也可能导致电池的性能和寿命的恶化。

It is forbidden to use in the place with strong static electricity and strong magnetic field, otherwise it is easy to damage the safety protection device of battery combination and bring unsafe hidden danger。

△禁止在强静电和强磁场的地方使用,否则易破坏电池组合的安全保护装置,带来不安全隐患。

If the pack leaks and the electrolyte get into the eyes, do not rub eyes, instead, rinse the eyes, with clean running water, and immediately seek medical attention. Otherwise, eye injury can result.

△如果电池发生泄漏,电解液进入眼睛,请不要揉擦,应用清水冲洗眼睛,并立即送医院治疗,否则会伤害眼睛。

If the pack takes off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.

△如果电池组合在使用或贮存中发出异味,发热,变色,变形,或者是在充电过程中出现任何异常现象,立即将电池从充电器或装置中移开,并停止使用。

In case the pack terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.

△如果电池组合的连接点弄脏,使用前应用干布抹净,否则可能会因接触不良而影响性能失效。

Be aware discharged battery may cause fire or smoke, tape the terminals to insulate them.

△废弃之电池应用绝缘纸包住电极,以防起火,冒烟.

The battery combination shall be stored in accordance with Clause 2.10. In order to prevent over discharge of the battery, it is recommended to charge every 6 months. If the storage time is more than one year, it is recommended to charge and discharge once a year to activate the battery.

△电池组合应按 2.10 条款存放。为防止电池过放，建议每 6 个月进行一次充电，如储存时间超过一年，建议每年进行一次充、放电以激活。

13. Handling of Cells 电池操作注意事项

△Don't strike battery with any sharp edge parts 勿用尖锐处撞击电池。

△Trim your nail or wear glove before taking battery 剪掉指甲，或者戴手套。

△Clean worktable to make sure no any sharp particle 清理工作台，避免尖锐零部件。

△Prohibition short circuit（禁止电池短路）

Never make short pack circuit. It generates very high current which causes heating of the cells and may cause electrolyte leakage, gassing or explosion that are very dangerous. The LIP tabs may be easily short-circuited by putting them on conductive surface.Such outershort circuit may lead to heat generation and damage of the cell.

避免电池短路电。短路会产生很高的电流而使电池发热以及电解液泄漏，产生气体或爆炸是非常危险的。极片连接在导电物体表面很容易短路，外部短路会导致发热及损害电池。

△Falling, hitting, bending, etc. may cause degradation of LIP characteristics.

跌落、碰撞、弯曲等等都可能会降低聚合物电池的性能。

14.Period of Warranty 保质期

The shelf life of the battery is one year from the date of delivery. Other problems caused by customer's equipment failure or improper use of battery are not included in the warranty. In addition, defects unrelated to battery

manufacturing are not included.The minimum capacity shall be maintained within 3 months, and the annual capacity attenuation shall not exceed 5% (the battery shall be stored under the condition of electrification ≤ 50%; long-term storage temperature: 20 ± 5 ℃, high and low temperature storage will occur in normal use, and the actual recovery rate will be slightly lower than the laboratory test.

电池的保质期从出货之日算起为一年。客户设备故障或电池使用不当引起的其他问题不在质保之列。另外也不包括与电池制造无关的缺陷情况。3个月内保持最小容量，每年容量衰减不超5%（电池应在带电≤50%的状态下储存；长期贮存温度：20±5℃，正常使用会存在高低温存储的情况，实际恢复率会比实验室测试略低。

15. Others 其它事项

1. If the customer needs to use the battery for applications beyond the specified conditions, or use the battery under conditions beyond the specified conditions, he should contact Kinsell in advance, because specific experimental tests are required to verify the performance and safety of the battery under the specified conditions.
客户若需要将电池用于超出文件规定以外的应用，或在文件规定以外的使用条件下使用电池，应事先联系金赛尔，因为需要进行特定的实验测试以核实电池在该使用条件下的性能及安全性。
2. Kinsell will not be responsible for any accident caused by using the battery beyond the conditions specified in the document.
对于在超出文件规定以外的条件下使用电池而造成的任何意外事故，金赛尔概不负责。
3. If necessary, Kinsell will inform the customer in writing of the improvement measures for the correct operation and use of the battery.
如有必要，金赛尔会以书面形式告之客户有关正确操作使用电池的改进措施。
4. Any matters that this specification does not cover should be conferred between the customer and CEL Battery
任何本说明书中未提及的事项，须经双方协商确定。

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备注：每批电池出货前，电芯及成品高温堆放检测需全检，按照规格书标准来执行，客户定期来访申请每批电池出货报表全检数据。

附页 1

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