样 品 承 认 书

APPROVED SHEET

客户料号(P/0)：OT-007-423040-04

品名(MATERIAL)：锂离子电池

规格(SPECIFICATION)：锂离子电池423040/480mAh/3.7V/2C/带NTC/出口/金赛尔

承认说明：此份规格书用于做CB认证使用

东莞市金赛尔电池科技有限公司

供样签核（CUSTOMER APPROVAL）

制作（ORIGINATED BY）：

确认（CHECKED BY）：

核准（APPROVED BY）：

EDIFIER 漫步者

承认签核（CUSTOMER APPROVAL）

检验（INSPECTED BY）：

确认（CHECKED BY）：

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: 423040

Product Capacity 产品容量: 480mAh/3.7V

Cell type 电芯类型： 软包/卷绕

Part Code 产品编码: LS22052802

Total Page 文件页数: 21

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
	2024-04-13	2024-04-13	2024-04-13

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

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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	2024-04-13

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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

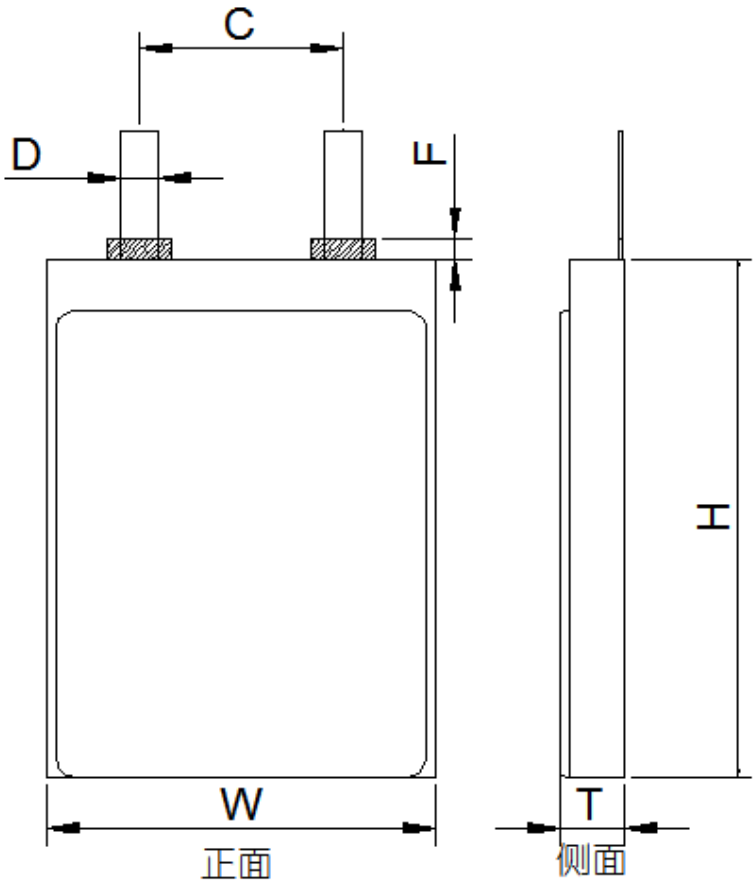
No.序号	Items 项 目			Parameter 参 数	
2.1	Battery model 电池型号			423040	
2.2	Shipment voltage 出货电压			3.80V-4.0V	
2.3	Inner Impedance 内阻（交流阻抗 AC 1kHz）			Cell/电芯≤80mΩ	Battery/电池≤250mΩ
2.4	pack weight 成品重量			Approx(约)：10g	
2.5	Typical capacity 典型容量			500mAh	0.2C Discharge 0.2C 放电
	Nominal capacity 标称容量			480mAh	
	Minimal capacity 最小容量			480mAh	
2.6	Nominal voltage 标称电压			3.7V	
	Charge ending voltage 充电限制电压			4.2V	Defined in this DOC: FC = 4.2V
	Charge Upper Limit Voltage 充电上限电压			4.35V	
	Fully discharge voltage(FD)满放电压			3.0V	Defined in this DOC: FD = 3.0V
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℃	2C（当电池表面温度超过 55℃，设备停止对电池充电）
2.8	Max continuous discharge current 最大放电持续电流			-20℃~60℃	1.5C
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℃~50℃	≤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℃	≤1 month		
		-20℃~30℃	≤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)

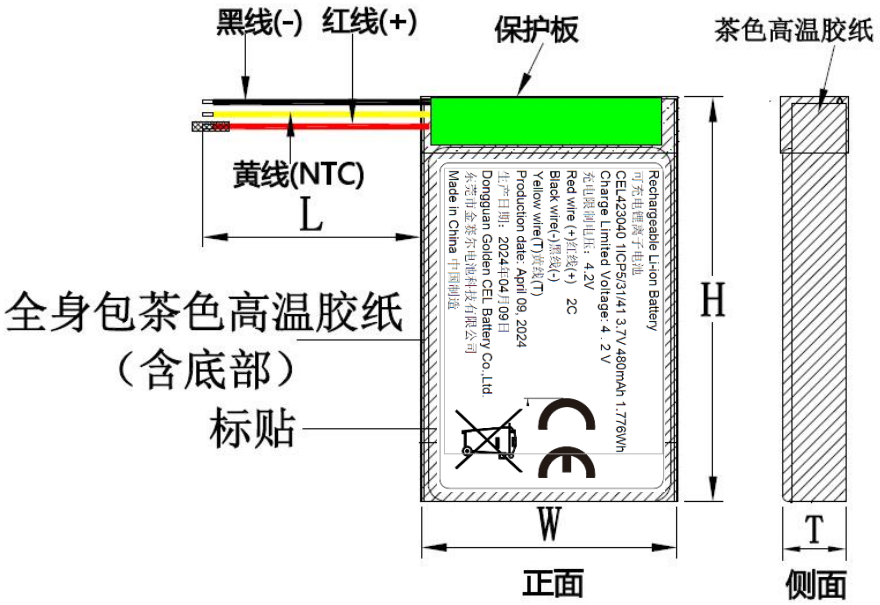


3.2.Cell Performance parameters 电芯性能参数

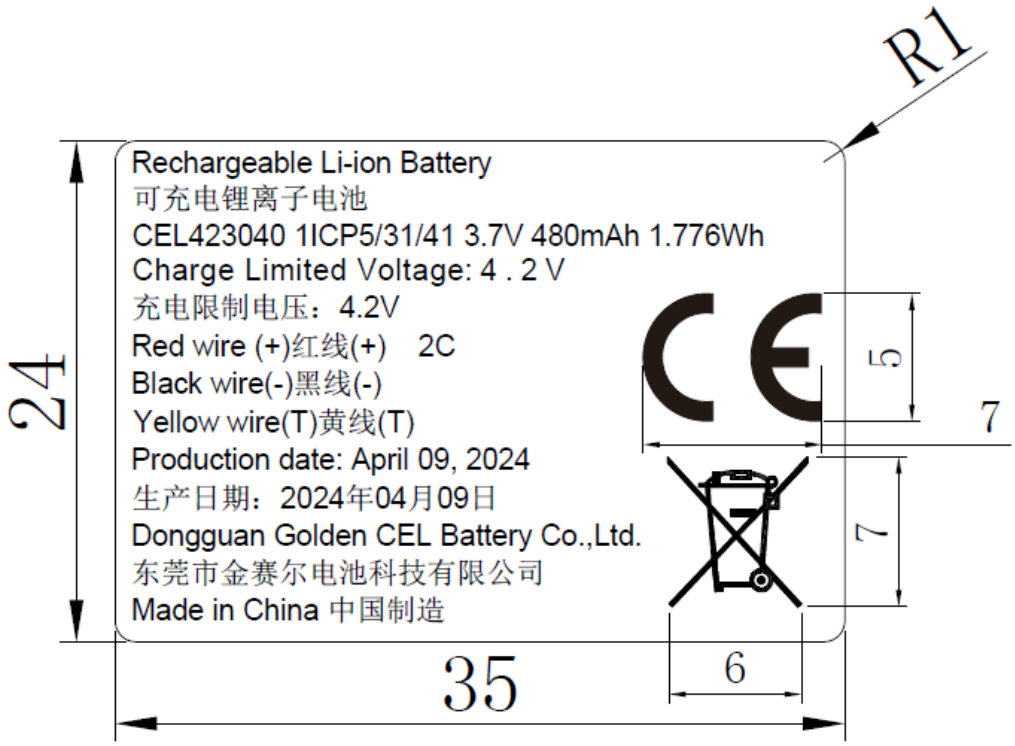
NO. 编号	Item项目		Specification规格	Unit 单位	Remarks备注
1	Edgefold require折边要求		Double folding edge 双折边	-	-
2	Dimensions 外形尺寸	T	Max 4.3	mm	Thickness厚度
3		W	Max 30.5	mm	Width 宽度
4		H	Max 40.5	mm	Cell length（not include Tab sealant） 电芯长度（不含极耳胶）
5		C	19.5±1.5	mm	Tab center distance极耳中心距
6		D	3±0.2	mm	Tab width 极耳宽度
7		F	0.2-2	mm	Tab exposed size极耳胶外露尺寸

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)



4.2.Spray Content 电池喷码:



1. 尺寸：35*24*0. 1mm,
2. 银底黑字，附哑膜，边框不印刷，单面带胶,
3. 标贴内容居中，用手触摸，不可掉墨,
4. 标贴内容中：中文日期和英文日期，年月日随时间变化。

4.3.Battery Performance parameters 电池组性能参数

NO.序号	Item 项目	Specification 规格
1	After 500 cycles，thickness size 500 次循环后，Max 厚度 T	4.75mm (含胶纸&标贴)
2	thickness size Max 厚度 T	4.5mm (含胶纸&标贴)
3	width size Max 宽度 W	30.5mm (含胶纸)
4	Height size Max 高度 H	42.5mm
5	Exposed line length 外露线长 L	25±2mm
6	Wire stripping length 剥线长度 L1	-
7	Wiring method 出线方式	Positive pole 正极
8	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	423040-480mAh/金赛尔	1
2	Protection board 保护板（点焊板）	DW01B-G+DP8205+NTC (LP26035NTC)	1
3	Red wire 红色导线	UL3302-28#	1
4	Black wire 黑色导线	UL3302-28#	1
5	Yellow wire 黄色导线	UL3302-28#	1
6	Connector 连接器	-	1
7	Yellow Tape 茶色防火高温胶	胶纸型号：MX-PI(a),厚度 0.05mm,防火等级 UL94-V0,颜色：茶色，证书号：E316507	4
10	Label 标贴:	见图：	1

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

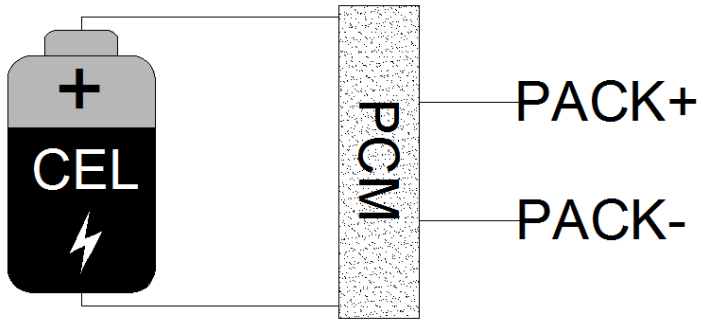
5.1.Performance Parameter 性能参数表

Protection scheme 保护方案		DW01B-G+DP8205+NTC10 K 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	4.25	4.30	4.35	V	※
2		Release voltage/恢复电压	4.05	4.10	4.15	V	◎
3		Detection delay time/保护延迟时间	-	80	200	ms	◎
4	Over discharge 过放电	Detection voltage/保护电压	2.30	2.40	2.50	V	※
5		Release voltage/恢复电压	2.90	3.00	3.10	V	◎
6		Detection delay time/保护延迟时间	-	40	100	ms	◎
7	Discharge overcurrent current 放电过流	Detection overcurrent /保护电流	2	-	6	A	※
8		Detection delay time/保护延迟时间	-	10	20	ms	◎
9	Charge overcurrent 充电过流	Detection overcurrent /保护电流	-	-	-	A	◎
10		Detection delay time/保护延迟时间	-	-	-	ms	◎
11	短路保护 Short protection	Short detection delay time/短路保护延时	-	5	50	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		-	-	6	uA	※
14	IR of PCM/PCM 内阻		-	-	65	mΩ	※
15	suggest working temperature/建议工作温度		-40		+85	℃	
16	0V Charging function/OV 充电功能		Availble 允许				◎
17	NTC Resistor(25℃)/NTC 电阻		9	10	11	KΩ	◎
18	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）					

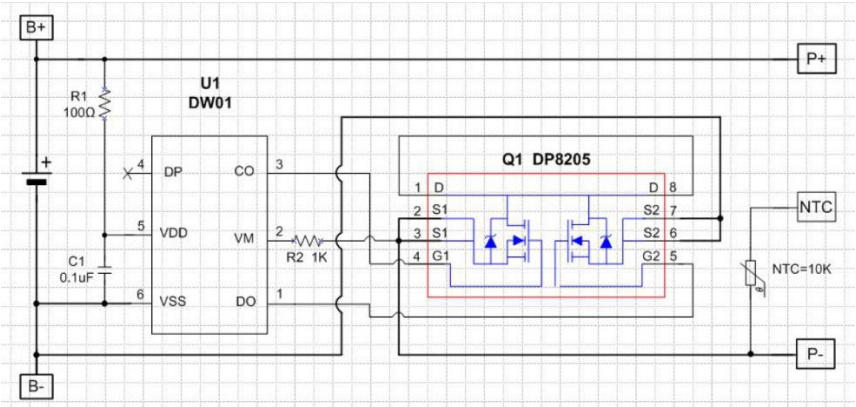
5.2.PCB Bom PCB 物料清单

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	DW01B-G 丝印：DW01**，“**”代表可变化丝印	SOT-23-6	1	PCS	富晶	
2	MOS Tube	Q1.	DP8205 丝印：8205**，“**”代表可变化丝印	TSSOP-8	1	PCS	德普微	
3	PCB	PCB	26*3.5*0.6mm	/	1	PCS	精维进	
4	SMD Resistance 贴片电阻	R1	100Ω±5%	0603	1	PCS	国巨	
5	SMD Resistance 贴片电阻	R2	1K±5%	0603	1	PCS	国巨	
6	SMD Capacitance 贴片电容	C1	0.1uF+80-20% 16-25V	0603	1	PCS	国巨	
7	SMD Resistance 贴片电阻	NTC	10K ±1% B=3435	0603	1	PCS	卓英社	备选仙桥

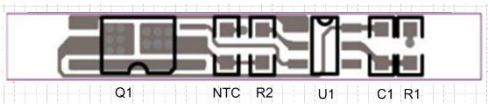
5.3.Battery structure diagram 电池架构图(Sketch map 示意图）



5.4.Schematic circuit diagram 电路原理图



5.5.PCB Layout PCB 布线图



TEMP(C)	MIN	MEAN	MAX	R-TOL(MIN)	R-TOL(MAX)	T-TOL(MIN)	T-TOL(MAX)
-40	**195.369**	**203.378**	**211.694**	**3.94**	**4.09**	**0.70**	**0.73**
-39	184.817	192.285	200.035	3.88	4.03	0.69	0.72
-38	174.896	181.862	189.087	3.83	3.97	0.69	0.71
-37	165.565	172.064	178.801	3.78	3.92	0.68	0.71
-36	156.786	162.851	169.134	3.72	3.86	0.68	0.70
-35	**148.524**	**154.185**	**160.046**	**3.67**	**3.80**	**0.67**	**0.70**
-34	140.745	146.030	151.499	3.62	3.74	0.67	0.69
-33	133.419	138.354	143.458	3.57	3.69	0.66	0.68
-32	126.516	131.126	135.890	3.52	3.63	0.66	0.68
-31	120.011	124.317	128.765	3.46	3.58	0.65	0.67
-30	**113.878**	**117.901**	**122.055**	**3.41**	**3.52**	**0.65**	**0.67**
-29	108.093	111.854	115.733	3.36	3.47	0.64	0.66
-28	102.636	106.151	109.776	3.31	3.41	0.63	0.65
-27	97.486	100.772	104.159	3.26	3.36	0.63	0.65
-26	92.624	95.697	98.862	3.21	3.31	0.62	0.64
-25	**88.033**	**90.907**	**93.865**	**3.16**	**3.25**	**0.62**	**0.64**
-24	83.695	86.383	89.149	3.11	3.20	0.61	0.63
-23	79.597	82.111	84.697	3.06	3.15	0.61	0.62
-22	75.722	78.075	80.493	3.01	3.10	0.60	0.62
-21	72.059	74.260	76.522	2.97	3.05	0.59	0.61
-20	**68.593**	**70.654**	**72.770**	**2.92**	**2.99**	**0.59**	**0.60**
-19	65.314	67.243	69.222	2.87	2.94	0.58	0.60
-18	62.211	64.017	65.869	2.82	2.89	0.58	0.59
-17	59.273	60.964	62.696	2.77	2.84	0.57	0.58
-16	56.490	58.073	59.695	2.73	2.79	0.56	0.58
-15	**53.854**	**55.337**	**56.854**	**2.68**	**2.74**	**0.56**	**0.57**
-14	51.356	52.745	54.165	2.63	2.69	0.55	0.56
-13	48.988	50.289	51.618	2.59	2.64	0.54	0.56
-12	46.743	47.961	49.206	2.54	2.60	0.54	0.55
-11	44.613	45.754	46.920	2.49	2.55	0.53	0.54
-10	**42.592**	**43.662**	**44.753**	**2.45**	**2.50**	**0.52**	**0.54**
-9	40.675	41.676	42.698	2.40	2.45	0.52	0.53
-8	38.855	39.793	40.750	2.36	2.40	0.51	0.52
-7	37.126	38.005	38.901	2.31	2.36	0.50	0.51
-6	35.484	36.308	37.147	2.27	2.31	0.50	0.51
-5	**33.924**	**34.696**	**35.481**	**2.22**	**2.26**	**0.49**	**0.50**
-4	32.441	33.164	33.900	2.18	2.22	0.48	0.49
-3	31.032	31.709	32.398	2.14	2.17	0.48	0.49
-2	29.691	30.326	30.971	2.09	2.13	0.47	0.48
-1	28.416	29.011	29.615	2.05	2.08	0.46	0.47
0	**27.203**	**27.760**	**28.325**	**2.01**	**2.04**	**0.46**	**0.46**
1	26.049	26.570	27.100	1.96	1.99	0.45	0.46
2	24.950	25.438	25.934	1.92	1.95	0.44	0.45
3	23.903	24.361	24.824	1.88	1.90	0.43	0.44
4	22.907	23.335	23.769	1.84	1.86	0.43	0.43
5	**21.957**	**22.358**	**22.764**	**1.79**	**1.82**	**0.42**	**0.43**

TEMP(C)	MIN	MEAN	MAX	R-TOL(MIN)	R-TOL(MAX)	T-TOL(MIN)	T-TOL(MAX)
6	21.052	21.427	21.807	1.75	1.77	0.41	0.42
7	20.189	20.540	20.896	1.71	1.73	0.41	0.41
8	19.367	19.695	20.028	1.67	1.69	0.40	0.40
9	18.582	18.890	19.200	1.63	1.64	0.39	0.39
10	**17.834**	**18.121**	**18.412**	**1.59**	**1.60**	**0.38**	**0.39**
11	17.120	17.389	17.660	1.55	1.56	0.38	0.38
12	16.438	16.690	16.943	1.51	1.52	0.37	0.37
13	15.788	16.022	16.259	1.47	1.48	0.36	0.36
14	15.166	15.386	15.607	1.43	1.44	0.35	0.35
15	**14.573**	**14.778**	**14.984**	**1.39**	**1.40**	**0.34**	**0.35**
16	14.006	14.197	14.389	1.35	1.35	0.34	0.34
17	13.464	13.642	13.822	1.31	1.31	0.33	0.33
18	12.946	13.113	13.280	1.27	1.27	0.32	0.32
19	12.451	12.606	12.762	1.23	1.23	0.31	0.31
20	**11.978**	**12.122**	**12.267**	**1.19**	**1.19**	**0.30**	**0.31**
21	11.525	11.659	11.794	1.15	1.16	0.30	0.30
22	11.092	11.216	11.342	1.11	1.12	0.29	0.29
23	10.677	10.793	10.909	1.08	1.08	0.28	0.28
24	10.280	10.388	10.496	1.04	1.04	0.27	0.27
25	**9.900**	**10.000**	**10.100**	**1.00**	**1.00**	**0.26**	**0.26**
26	9.529	9.629	9.729	1.04	1.04	0.27	0.28
27	9.174	9.273	9.373	1.07	1.08	0.29	0.29
28	8.834	8.933	9.033	1.11	1.11	0.30	0.30
29	8.508	8.607	8.706	1.15	1.15	0.31	0.31
30	**8.196**	**8.295**	**8.393**	**1.18**	**1.19**	**0.32**	**0.32**
31	7.898	7.995	8.093	1.22	1.23	0.33	0.33
32	7.611	7.708	7.806	1.26	1.26	0.34	0.35
33	7.337	7.433	7.530	1.29	1.30	0.36	0.36
34	7.074	7.169	7.265	1.33	1.34	0.37	0.37
35	**6.822**	**6.916**	**7.011**	**1.36**	**1.37**	**0.38**	**0.38**
36	6.580	6.673	6.767	1.40	1.41	0.39	0.40
37	6.348	6.440	6.534	1.43	1.45	0.40	0.41
38	6.125	6.217	6.309	1.47	1.48	0.42	0.42
39	5.912	6.002	6.093	1.50	1.52	0.43	0.43
40	**5.707**	**5.796**	**5.886**	**1.54**	**1.55**	**0.44**	**0.45**
41	5.510	5.598	5.687	1.57	1.59	0.45	0.46
42	5.321	5.408	5.496	1.61	1.62	0.47	0.47
43	5.140	5.225	5.312	1.64	1.66	0.48	0.48
44	4.965	5.050	5.135	1.67	1.69	0.49	0.50
45	**4.798**	**4.881**	**4.965**	**1.71**	**1.73**	**0.50**	**0.51**
46	4.637	4.719	4.802	1.74	1.76	0.52	0.52
47	4.482	4.563	4.645	1.77	1.80	0.53	0.54
48	4.333	4.413	4.494	1.81	1.83	0.54	0.55
49	4.190	4.269	4.348	1.84	1.86	0.55	0.56
50	**4.053**	**4.130**	**4.208**	**1.87**	**1.90**	**0.57**	**0.58**

51	3.920	3.996	4.074	1.90	1.93	0.58	0.59
52	3.793	3.868	3.944	1.94	1.96	0.59	0.60
53	3.670	3.744	3.819	1.97	2.00	0.61	0.62
54	3.553	3.625	3.699	2.00	2.03	0.62	0.63
55	**3.439**	**3.510**	**3.583**	**2.03**	**2.06**	**0.63**	**0.64**
56	3.330	3.400	3.471	2.06	2.10	0.65	0.66
57	3.224	3.293	3.363	2.09	2.13	0.66	0.67
58	3.123	3.191	3.260	2.12	2.16	0.67	0.68
59	3.025	3.092	3.160	2.16	2.19	0.69	0.70
60	**2.931**	**2.997**	**3.063**	**2.19**	**2.22**	**0.70**	**0.71**
61	2.840	2.905	2.970	2.22	2.26	0.71	0.73
62	2.753	2.816	2.881	2.25	2.29	0.73	0.74
63	2.669	2.731	2.794	2.28	2.32	0.74	0.75
64	2.587	2.648	2.711	2.31	2.35	0.75	0.77
65	**2.509**	**2.569**	**2.630**	**2.34**	**2.38**	**0.77**	**0.78**
66	2.433	2.492	2.552	2.37	2.41	0.78	0.80
67	2.360	2.418	2.477	2.40	2.44	0.80	0.81
68	2.290	2.347	2.405	2.42	2.47	0.81	0.83
69	2.222	2.278	2.335	2.45	2.51	0.82	0.84
70	**2.156**	**2.211**	**2.267**	**2.48**	**2.54**	**0.84**	**0.86**
71	2.093	2.147	2.202	2.51	2.57	0.85	0.87
72	2.032	2.085	2.139	2.54	2.60	0.87	0.89
73	1.973	2.025	2.078	2.57	2.63	0.88	0.90
74	1.916	1.967	2.019	2.60	2.66	0.90	0.92
75	**1.861**	**1.911**	**1.962**	**2.63**	**2.69**	**0.91**	**0.93**

TEMP(C)	MIN	MEAN	MAX	R-TOL(MIN)	R-TOL(MAX)	T-TOL(MIN)	T-TOL(MAX)
76	1.807	1.857	1.907	2.65	2.72	0.93	0.95
77	1.756	1.804	1.854	2.68	2.74	0.94	0.96
78	1.706	1.754	1.802	2.71	2.77	0.95	0.98
79	1.658	1.705	1.753	2.74	2.80	0.97	0.99
80	**1.612**	**1.657**	**1.704**	**2.76**	**2.83**	**0.98**	**1.01**
81	1.567	1.612	1.658	2.79	2.86	1.00	1.02
82	1.523	1.567	1.613	2.82	2.89	1.01	1.04
83	1.481	1.524	1.569	2.84	2.92	1.03	1.06
84	1.440	1.483	1.527	2.87	2.95	1.04	1.07
85	**1.401**	**1.443**	**1.486**	**2.90**	**2.97**	**1.06**	**1.09**
86	1.363	1.404	1.446	2.92	3.00	1.07	1.10
87	1.326	1.366	1.408	2.95	3.03	1.09	1.12
88	1.290	1.330	1.371	2.98	3.06	1.10	1.13
89	1.256	1.295	1.335	3.00	3.09	1.12	1.15
90	**1.222**	**1.261**	**1.300**	**3.03**	**3.11**	**1.14**	**1.17**
91	1.190	1.227	1.266	3.06	3.14	1.15	1.18
92	1.159	1.195	1.233	3.08	3.17	1.17	1.20
93	1.128	1.164	1.202	3.11	3.20	1.18	1.22
94	1.099	1.134	1.171	3.13	3.22	1.20	1.23
95	**1.070**	**1.105**	**1.141**	**3.16**	**3.25**	**1.21**	**1.25**
96	1.042	1.077	1.112	3.18	3.28	1.23	1.27
97	1.016	1.049	1.084	3.21	3.30	1.25	1.28
98	0.990	1.023	1.057	3.23	3.33	1.26	1.30
99	0.964	0.997	1.030	3.26	3.36	1.28	1.32
100	**0.940**	**0.972**	**1.005**	**3.28**	**3.38**	**1.29**	**1.33**
101	0.916	0.948	0.980	3.31	3.41	1.31	1.35
102	0.893	0.924	0.956	3.33	3.43	1.33	1.37
103	0.871	0.901	0.932	3.35	3.46	1.34	1.38
104	0.849	0.879	0.910	3.38	3.49	1.36	1.40
105	**0.828**	**0.858**	**0.888**	**3.40**	**3.51**	**1.38**	**1.42**
106	0.808	0.837	0.866	3.43	3.54	1.39	1.44
107	0.788	0.816	0.845	3.45	3.56	1.41	1.45
108	0.769	0.797	0.825	3.47	3.59	1.42	1.47
109	0.750	0.777	0.806	3.50	3.61	1.44	1.49
110	**0.732**	**0.759**	**0.787**	**3.52**	**3.64**	**1.46**	**1.51**
111	0.715	0.741	0.768	3.54	3.66	1.48	1.53
112	0.698	0.723	0.750	3.57	3.69	1.49	1.54
113	0.681	0.706	0.732	3.59	3.71	1.51	1.56
114	0.665	0.690	0.715	3.61	3.74	1.53	1.58
115	**0.649**	**0.674**	**0.699**	**3.64**	**3.76**	**1.54**	**1.60**
116	0.634	0.658	0.683	3.66	3.79	1.56	1.62
117	0.619	0.643	0.667	3.68	3.81	1.58	1.63
118	0.605	0.628	0.652	3.70	3.83	1.59	1.65
119	0.591	0.614	0.637	3.72	3.86	1.61	1.67
120	**0.577**	**0.600**	**0.623**	**3.75**	**3.88**	**1.63**	**1.69**
121	0.564	0.586	0.609	3.77	3.91	1.65	1.71
122	0.551	0.573	0.595	3.79	3.93	1.66	1.73
123	0.539	0.560	0.582	3.81	3.95	1.68	1.74
124	0.526	0.547	0.569	3.83	3.98	1.70	1.76
125	**0.515**	**0.535**	**0.557**	**3.86**	**4.00**	**1.72**	**1.78**

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 put 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℃时 ≥95% At 55℃is ≥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 6 h；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℃士 5℃的条件下，在电池表面温度达到设定温度后，再放置 30min, 在防瀑箱内用电阻 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℃士 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'C。No fire; No explosion ; Temperature on the cells' surf ace should no more than 150 'C
5	常温外部短路 (Room temperature) Short -circuit Characteristics	电芯充满屯后，放置在环境温度 20℃士 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℃士 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' surf ace 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℃士 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 r ate of 5℃士 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 fir e No explosion
7	过充电 Overcharge Characteristics	在环境温度 20 士 5℃的条件下，以 0.2 C5A 恒流放电至 3.0V,以指定 3 C5A 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、燥炸）;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 C5A discharged to 3.0V at 20±5℃, then charged at a 3 C5A 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 fi re and explosion, alternatively when the cells tempe1ature is reduced to top 20%.	不着火不燥炸 No fire No explosion
8	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	No fire, no explosion, no liquid leakage. 不起火、不爆炸、不漏液。

		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。	
9	Crush 挤压	The pressure on the surface of the fully charged cell do not stop being raised until 17.2Mpa when the cell is crushed by two flat surfaces(Max 13kN) 充满电电池被两平板挤压。挤压的最大压强为 17.2Mpa，最大作用力为 13kN。当达到最大值即停止	No fire No explosion 不着火 不爆炸

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、CCC、IEC62133、UL1642、UN38.3、1.2 米跌落标准的相关要求。

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：测量电流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 ℃

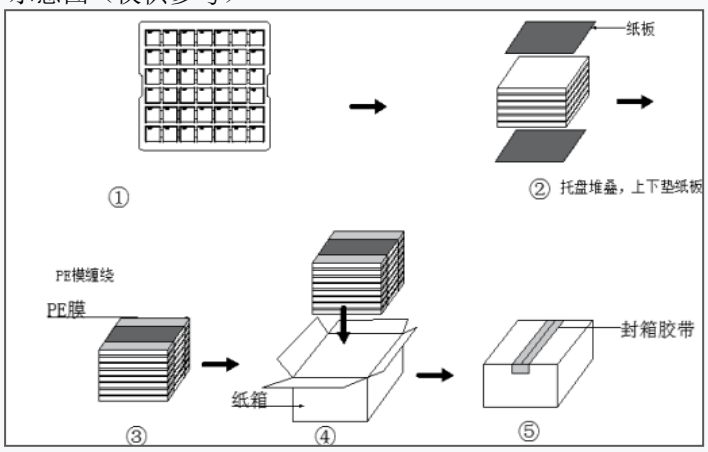
温度仪表要求：测量温度的仪表准确度不低于 0.5℃

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 warranty period is 12 months from the date of delivery, which belongs to improper use rather than quality problems. Even within the warranty period, our company will not replace new batteries for free. The battery shall maintain the minimum capacity within 3 months, and the annual capacity decline shall not exceed 5% (long-term storage temperature: 20 ± 3 ℃, battery power shall be stored below 50%, if not stored under this condition, the actual capacity decline of the battery will be>5%)保质期是自出厂之日起 12 个月内，属于使用不当而非质量问题的，即使在保质期内，我司也不会无偿更换新电池。3 个月内电池保持最小容量，每年容量衰减不超 5%（长期存储温度：20±3℃，电池电量在 50%以下存放，若不在此条件存放，电池实际容量衰减会＞5%）。

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。

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，客户定期来访审查每批电池出货报表全检数据。

东莞金赛尔电池有限公司

物料采购提前期

	物料编码	规格描述	采购提前期 L/T	最小采购量 MOQ	最小包装量 MPQ
1	OT-007-423040-04	锂离子电池423040/480mAh/ 3.7V/2C/带NTC/出口/金赛尔	FCS 60天 L/T 21天	10000pcs	/
2					
3					
4					
5					

申请人：

东莞金赛尔电池科技有限公司 销售专用章

备注：