Test Report issued under the responsibility of:

TEST REPORT
IEC 62133
Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications

Report Number. ..... :	BATT-4787575770-A-1
Date of issue ..... :	2016-10-10
Total number of pages	25
Applicant's name ..... :	PORTAPOWER (HK) LTD
Address ..... :	FLAT 1003, 10TH FL HOPEFUL FACTORY CTR. 10-16 WO SHING ST. FOTAN N T, HONG KONG
Test specification:	
Standard ..... :	IEC 62133: 2012 (Second Edition)
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC62133B
Test Report Form(s) Originator .... :	UL(Demko)
Master TRF ..... :	Dated 2013-03

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description ..... :	Li-ion Battery
Trade Mark ..... :	N/A
Manufacturer ..... :	Same as Applicant
Model/Type reference ..... :	KLC99HU02GR.809/KLC99UL02GR.809,10ICR19/66-3
Ratings ..... :	36Vdc, 8,7Ah,313Wh

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	Shanghai Truron Testing Technology Co., Ltd.	
Testing location/ address .....:		Floor 1 and 2, Building 1, No. 685, Huishan Road, Shanghai, China	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address .....:			
Tested by (name + signature) .....:		Amy Dong(Project Handler)	
Approved by (name + signature) .....:		Joe Chen(Reviewer)	
☐	**Testing procedure: TMP**		
Testing location/ address .....:			
Tested by (name + signature) .....:			
Approved by (name + signature) .....:			
☐	**Testing procedure: WMT**		
Testing location/ address .....:			
Tested by (name + signature) .....:			
Witnessed by (name + signature) ....:			
Approved by (name + signature) .....:			
☐	**Testing procedure: SMT**		
Testing location/ address .....:			
Tested by (name + signature) .....:			
Approved by (name + signature) .....:			
Supervised by (name + signature) ..:			

List of Attachments (including a total number of pages in each attachment):

National Differences (0 page)
Enclosures (10 pages)

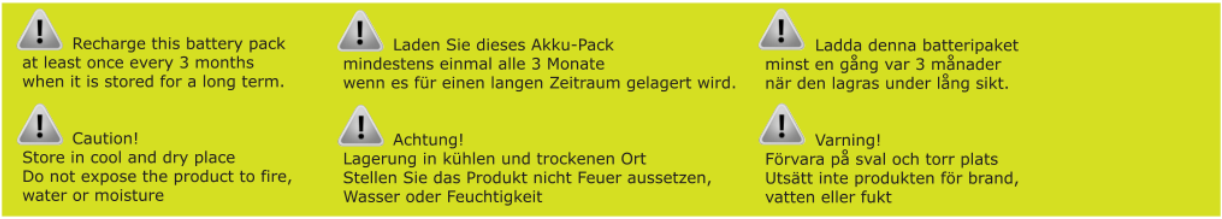
Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
- 5.2 Insulation and wiring - 8.2.2 Moulded case stress at high ambient temperature (battery) - 8.3.2 External short circuit (battery) - 8.3.3 Free fall - 8.3.6 Over-charging of battery	Shanghai Truron Testing Technology Co., Ltd. Floor 1 and 2, Building 1, No. 685, Huishan Road, Shanghai, China

Summary of compliance with National Differences
List of countries addressed: N/A.

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars.....:	See below
Classification of installation and use.....:	For built-in
Supply connection.....:	N/A
Recommend charging method declaired by the manufacturer ..... :	CC/CV 1350mA at 42Vdc.
Discharge current (0,2 I_t A) ..... :	1620mA
Specified final voltage ..... :	27.5Vdc
Chemistry ..... :	☐ nickel systems ..... ☒ lithium systems
Recommend of charging limit for lithium system	
Upper limit charging voltage per cell.....:	4.2Vdc
Maximum charging current.....:	2350mA
Charging temperature upper limit.....:	45°C
Charging temperature lower limit.....:	10°C
Polymer cell electrolyte type ..... :	☐ gel polymer ☐ solid polymer ☒ N/A
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	2016-09-13
Date (s) of performance of tests.....:	2016-09-14 to 2016-09-28

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :

☐ **Yes**
☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) ..... :	Guangzhou Zhanhui Electronics Co., Ltd Shinan Road, Guantan Village,Dongchong Town, Nansha District,Guangzhou, 511453, P. R. China

General product information:

- There is Metal enclosure in the battery pack KLC99HU02GR.809. Electronic components mounted on PWB with 10S3P cells, which approved by IEC62133.

- Maximum charge current/voltage is 2350mA/42V,Maximum discharge current is 10000mA and end of discharge voltage is 27.5V;

- The product was investigated to the following additional Standard for EN 62133: 2013;

- Operating Temperature: Charge: 0~45°C; Discharge: -20~60°C;

- 10ICR19/66-3 is IEC 62133 model designation and identical to model KLC99HU02GR.809 except for model designation.

- KLC99UL02GR.809 was an alternate name, identical to model KLC99HU02GR.809 except for model name.

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
4	**Parameter measurement tolerances**		**P**
	Parameter measurement tolerances	Comply with relevant requirements.	P
5	**General safety considerations**		P
5.1	General	See below	P
5.2	Insulation and wiring		P
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ		P
	Insulation resistance (MΩ) ..... :	49.5	—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate creepage and clearance distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	Venting		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition		P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief		P
5.4	Temperature/voltage/current management		P
	Batteries are designed such that abnormal temperature rise conditions are prevented		P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer		P
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the temperature, voltage and current limits specified	The charging limits specified in the manufacturer's specifications.	P
5.5	Terminal contacts		P
	Terminals have a clear polarity marking on the external surface of the battery		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current	Considered	P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P
	Terminal contacts are arranged to minimize the risk of short circuits		P
5.6	Assembly of cells into batteries	See below	P
5.6.1	If there is more than one battery housed in a single battery case, cells used in the assembly of each battery have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		P
	Each battery has an independent control and protection		P
	Manufacturers of cells make recommendations about current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		P
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate separate circuitry to prevent the cell reversal caused by uneven discharges		N/A
	Protective circuit components are added as appropriate and consideration given to the end-device application		P
	When testing a battery, the manufacturer of the battery provides a test report confirming the compliance according to this standard		N/A
5.6.2	Design recommendation for lithium systems only		P
	For the battery consisting of a single cell or a single cellblock: - Charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Clause 8.1.2, Table 4; or		N/A
	- Charging voltage of the cell does not exceed the different upper limit of the charging voltage determined through Clause 8.1.2, NOTE 1.		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - The voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, by monitoring the voltage of every single cell or the single cellblocks; or		N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	- The voltages of any one of the single cells or single cellblocks does not exceed the different upper limit of the charging voltage, determined through Clause 8.1.2, NOTE 1, by monitoring the voltage of every single cell or the single cellblocks		P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks: - Charging is stopped when the upper limit of the charging voltage, specified in Clause 8.1.2, Table 4, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks; or		N/A
	- Charging is stopped when the upper limit of the different charging voltage, determined through Clause 8.1.2, NOTE 1, is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks		P
5.7	Quality plan		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	The manufacture has ISO 9001 certification, see enclosure ID 09.	P
6	**Type test conditions**		**P**
	Tests were made with the number of cells or batteries specified in Table 1 for nickel-cadmium and nickel-metal hydride systems and Table 2 for lithium systems, using cells or batteries that are not more than six months old	Considered.	P
	Unless noted otherwise in the test methods, testing was conducted in an ambient of 20°C ± 5°C.	Considered.	P
7	**Specific requirements and tests (nickel systems)**		N/A
7.1	Charging procedure for test purposes	Not applicable for Lithium system.	N/A
7.2	Intended use		N/A
7.2.1	Continuous low-rate charging (cells)		N/A
	Results: No fire. No explosion		N/A
7.2.2	Vibration		N/A
	Results: No fire. No explosion. No leakage		N/A
7.2.3	Moulded case stress at high ambient temperature		N/A
	Oven temperature (°C) ..... :		—
	Results: No physical distortion of the battery casing resulting in exposure if internal components		N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
7.2.4	Temperature cycling		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3	Reasonably foreseeable misuse		N/A
7.3.1	Incorrect installation cell		N/A
	The test was carried out using: - Four fully charged cells of the same brand, type, size and age connected in series, with one of them reversed; or		N/A
	- A stabilized dc power supply.		N/A
	Results: No fire. No explosion..... :		N/A
7.3.2	External short circuit		N/A
	The cells or batteries were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	Results: No fire. No explosion..... :		N/A
7.3.3	Free fall		N/A
	Results: No fire. No explosion.		N/A
7.3.4	Mechanical shock (crash hazard)		N/A
	Results: No fire. No explosion. No leakage.		N/A
7.3.5	Thermal abuse		N/A
	Oven temperature (°C)..... :		—
	Results: No fire. No explosion.		N/A
7.3.6	Crushing of cells		N/A
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	The cell is prismatic type and a second set of samples was tested, rotated 90° around longitudinal axis compared to the first set		N/A
	Results: No fire. No explosion..... :		N/A
7.3.7	Low pressure		N/A
	Chamber pressure (kPa)..... :		—
	Results: No fire. No explosion. No leakage.		N/A
7.3.8	Overcharge		N/A
	Results: No fire. No explosion..... :		N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
7.3.9	Forced discharge		N/A
	Results: No fire. No explosion..... :		N/A
8	**Specific requirements and tests (lithium systems)**		**P**
8.1	Charging procedures for test purposes	See below	P
8.1.1	First procedure: This charging procedure applied to tests other than those specified in 8.1.2		P
8.1.2	Second procedure: This charging procedure applied to the tests of 8.3.1, 8.3.2, 8.3.4, 8.3.5, and 8.3.9		P
	If a cell's specified upper and/or lower charging temperature exceeds values for the upper and/or lower limit test temperatures of Table 4, the cells were charged at the specified values plus 5 °C for the upper limit and minus 5 °C for the lower limit		N/A
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) ..... :		P
	For a different upper limit charging voltage (i.e. other than for lithium cobalt oxide systems at 4,25 V), the applied upper limit charging voltage and upper limit charging temperatures were adjusted accordingly		N/A
	A valid rationale was provided to ensure the safety of the cell (see Figure A.1) ..... :		P
8.2	Intended use	See below	P
8.2.1	Continuous charging at constant voltage (cells)		N/A
	Results: No fire. No explosion..... :		N/A
8.2.2	Moulded case stress at high ambient temperature (battery)		P
	Oven temperature (°C) ..... :	70°C	—
	Results: No physical distortion of the battery casing resulting in exposure if internal components		P
8.3	Reasonably foreseeable misuse	See below	P
8.3.1	External short circuit (cell)		N/A
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		N/A
	Results: No fire. No explosion..... :		N/A
8.3.2	External short circuit (battery)		P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	The cells were tested until one of the following occurred: - 24 hours elapsed; or		N/A
	- The case temperature declined by 20% of the maximum temperature rise		P
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	Results: No fire. No explosion..... :	(See Table 8.3.2)	P
8.3.3	Free fall		P
	Results: No fire. No explosion.		P
8.3.4	Thermal abuse (cells)		N/A
	The cells were held at 130°C ± 2°C for: - 10 minutes; or		N/A
	- 30 minutes for large cells (gross mass of more than 500 g as defined in IEC 62281)		N/A
	Oven temperature (°C)..... :	--	—
	Gross mass of cell (g) ..... :	--	—
	Results: No fire. No explosion.		N/A
8.3.5	Crush (cells)		N/A
	The crushing force was released upon: - The maximum force of 13 kN ± 1 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained; or		N/A
	- 10% of deformation has occurred compared to the initial dimension		N/A
	Results: No fire. No explosion..... :		N/A
8.3.6	Over-charging of battery		P
	Test was continued until the temperature of the outer casing: - Reached steady state conditions (less than 10°C change in 30-minute period); or		P
	- Returned to ambient		P
	Results: No fire. No explosion..... :	(See Table 8.3.6)	P
8.3.7	Forced discharge (cells)		N/A
	Results: No fire. No explosion..... :		N/A
8.3.8	Transport tests		N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
	Manufacturer's documentation provided to show compliance with UN Recommendations on Transport of Dangerous Goods		N/A
8.3.9	Design evaluation – Forced internal short circuit (cells)		N/A
	The cells complied with national requirement for .....:		—
	The pressing was stopped upon: - A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached		N/A
	Results: No fire ..... :		N/A
9	**Information for safety**		**P**
	The manufacturer of secondary cells ensures that information is provided about current, voltage and temperature limits of their products.		N/A
	The manufacturer of batteries ensures that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards.	Specification provided.	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product	Considered in end product.	N/A
	As appropriate, information relating to hazard avoidance resulting from a system analysis is provided to the end user ..... :	Considered in end product.	N/A
10	**Marking**		**P**
10.1	Cell marking		N/A
	Cells marked as specified in the applicable cell standards: IEC 61951-1, IEC 61951-2 or IEC 61960.		N/A
10.2	Battery marking	See below	P
	Batteries marked in accordance with the requirements for the cells from which they are assembled.		P
	Batteries marked with an appropriate caution statement.	See Marking plate for detailed information.	P
10.3	Other information		P
	Storage and disposal instructions marked on or supplied with the battery.		P
	Recommended charging instructions marked on or supplied with the battery.		P

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
11	**Packaging**		**P**
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants.	See enclosure ID08	P

Annex A	**Charging range of secondary lithium ion cells for safe use**		**N/A**
A.1	General		N/A
A.2	Safety of lithium-ion secondary battery		N/A
A.3	Consideration on charging voltage		N/A
A.3.1	General		N/A
A.3.2	Upper limit charging voltage		N/A
A.3.2.1	General		N/A
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied		N/A
A.4	Consideration of temperature and charging current		N/A
A.4.1	General		N/A
A.4.2	Recommended temperature range		N/A
A.4.2.1	General		N/A
A.4.2.2	Safety consideration when a different recommended temperature range is applied		N/A
A.4.3	High temperature range		N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in high temperature range		N/A
A.4.3.4	Safety consideration when specifying new upper limit in high temperature range		N/A
A.4.4	Low temperature range		N/A
A.4.4.1	General		N/A
A.4.4.2	Explanation of safety viewpoint		N/A
A.4.4.3	Safety considerations, when specifying charging conditions in low temperature range		N/A
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		N/A
A.4.5	Scope of the application of charging current		N/A
A.5	Sample preparation		N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict
A.5.1	General		N/A
A.5.2	Insertion procedure for nickel particle to generate internal short		N/A
	The insertion procedure carried out at 20°C±5°C and under -25 °C of dew point		N/A
A.5.3	Disassembly of charged cell		N/A
A.5.4	Shape of nickel particle		N/A
A.5.5	Insertion of nickel particle to cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle to winding core		N/A
A.5.5.2	Mark the position of nickel particle on the both end of winding core of the separator		N/A
A.5.6	Insertion of nickel particle to prismatic cell		N/A

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Critical components information				P
Object/part no.	**Manufacturer/ trademark**	**Type/model**	**Technical data**	**Standard**	**Mark(s) of conformity [1)]**
1. Cells	PSI	NCR18650PF	3.6V/2900mAh	IEC 62133:2012	NL-32025
1.1 Cell Case	--	--	Al foil	--	--
1.2 Positive Electrode	--	--	Positive material LiNiCoAlO2 , coated on Al film	--	--
1.3 Negative Electrode	--	--	Negative material C coated on Cu film	--	--
1.4 Separator	--	--	PP/PE/PP.	--	--
1.5 Electrolyte	--	--	LiFP6 dissolved in organic solvent (EC+ DMC)	--	--
2. PCB	ChengTai	REV-1	259.0*135.0*1.2mm	-	-
3. Control IC	Seiko	S-8204BBN	Vds=-0.3V~+24V Vcu=4.3V+/-0.025V Vcl=4.2V+/-0.05V Vdl=2.5V+/-0.08V Vdu=3.2V+/-0.1V	--	--
4. MOSFET	NCEPOWER	NCE75H21D	N-CH Vds=75V Vgs=±20V Rds 4.5mohm@Vgs10V d=150A PD=310W TO-263	--	--
5.Enclosure	Interchangeable	Interchangeable	V-1 Min	UL746 UL94	UL
6.PTC	SHANGHAI KETER NEW MATERIALS CO LTD(E230676)	KT16-1750DL 1.75A 16V	Ih 1.75A， It 3.6A, rated 16V,moa 85 ℃	--	--
7.Connector	Interchangeable	Interchangeable	V-1 Min	UL1007	UL
8. Label	Interchangeable	Interchangeable	V-1 Min	UL246 UL94 UL1694	UL
9.Fuse	NEC	SFH117E	250V 15A 121℃ φ 11mm*4.2mm	--	--

Supplementary information: N/A

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: Continuous low rate charge (cells)				N/A
Model	**Recommended charging method, (CC, CV, or CC/CV)**	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.2.2	TABLE: Vibration		N/A
Model	**OCV at start of test, (Vdc)**	**Results**	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.1	TABLE: Incorrect installation (cells)		N/A
Model		**OCV of reversed cell, (Vdc)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.3.2	TABLE: External short circuit				N/A
Model	**Ambient (at 20°C ± 5°C or 55°C ± 5°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature rise ΔT, (°C)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.6	TABLE: Crush			N/A
Model	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Results**	

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

7.3.8	TABLE: Overcharge			N/A
Model	**OCV prior to charging, (Vdc)**	**Maximum charge current, (A)**	**Time for charging, (hours)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.9	TABLE: Forced discharge (cells)			N/A
Model	**OCV before application of reverse charge, (Vdc)**	**Measured reverse charge I_t, (A)**	**Time for reversed charge, (minutes)**	**Results**

Supplementary information:

- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

8.2.1	TABLE: Continuous charging at constant voltage (cells)			N/A
Model	**Recommended charging voltage V_c, (Vdc)**	**Recommended charging current I_{rec}, (A)**	**OCV at start of test, (Vdc)**	**Results**

Supplementary information:

A – No fire or explosion
B – No Leakage
C – Leakage
D – Fire
E – Explosion

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.1	TABLE: External short circuit (cell)				N/A
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature rise ΔT, (°C)**	**Results**
Samples charged at charging temperature upper limit					
Samples charged at charging temperature lower limit					

Supplementary information:

A – No fire or Explosion

B – Fire

C – Explosion

D – The test was completed after 24 h

E – The test was completed after the cell casing cooled to 20% of the maximum temperature rise.

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.2	TABLE: External short circuit (battery)				P
Model	**Ambient, (°C)**	**OCV at start of test, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum case temperature rise ΔT, (°C)**	**Results**
Samples charged at charging temperature upper limit					
KLC99HU02GR.809	55.6	41.73	0.083	0.0	A,E
KLC99HU02GR.809	55.7	41.77	0.085	0.0	A,E
KLC99HU02GR.809	55.7	41.71	0.079	0.0	A,E
KLC99HU02GR.809	55.7	41.74	0.088	0.0	A,E
KLC99HU02GR.809	55.7	41.73	0.083	0.0	A,E
KLC99HU02GR.809	55.7	41.80	0.087	0.2	A,E
KLC99HU02GR.809	55.7	41.77	0.084	0.1	A,E
KLC99HU02GR.809	55.7	41.79	0.091	0.4	A,E
KLC99HU02GR.809	55.7	41.72	0.093	0.0	A,E
KLC99HU02GR.809	55.7	41.80	0.084	0.1	A,E

Supplementary information:
A – No fire or Explosion
B – Fire
C – Explosion
D – The test was completed after 24 h
E – The test was completed after the pack casing cooled to 20% of the maximum temperature rise

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5	TABLE: Crush				N/A
Model	**OCV at start of test, (Vdc)**	**OCV at removal of crushing force, (Vdc)**	**Width/ diameter of cell before crush, (mm)**	**Required deformation for crush, (mm)**	**Results**
Samples charged at charging temperature upper limit					
Samples charged at charging temperature lower limit					

Supplementary information:

A – No fire or explosion

B – Fire

C – Explosion

D – Force released after maximum level reached

E – Force released after abrupt voltage drop of one-third the original

F - Force released after 10 % of deformation has occurred

G – Crush Direction: Longitudinal axis was parallel to the flat surface

H – Crush Direction: 90° from the longitudinal axis (nickel prismatic only)

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.6	TABLE: Over-charging of battery			P
Constant charging current (A)..... :		17.4		—
Supply voltage (Vdc)..... :		50.0		—
Model	**OCV before charging, (Vdc)**	**Resistance of circuit, (Ω)**	**Maximum outer casing temperature, (°C)**	**Results**
KLC99HU02GR.809	35.9	--	23.0	A
KLC99HU02GR.809	35.3	--	23.4	A
KLC99HU02GR.809	36.0	--	22.5	A
KLC99HU02GR.809	35.6	--	23.4	A
KLC99HU02GR.809	35.7	--	23.2	A

Supplementary information:

A- No fire or explosion
B- Fire
C- Explosion

8.3.7	TABLE: Forced discharge (cells)			N/A
Model	**OCV before application of reverse charge, (Vdc)**	**Measured Reverse charge I_t, (A)**	**Time for reversed charge, (minutes)**	**Results**

Supplementary information:

A – No fire or explosion
B – Fire
C – Explosion

IEC 62133			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.9	TABLE: Forced internal short circuit (cells)				N/A
Model	**Chamber ambient, (°C)**	**OCV at start of test, (Vdc)**	**Particle location [1)]**	**Maximum applied pressure, (N)**	**Results**

Supplementary information:

[1)] Identify one of the following**:**

1: Nickel particle inserted between positive and negative (active material) coated area.

2: Nickel particle inserted between positive aluminium foil and negative active material coated area.

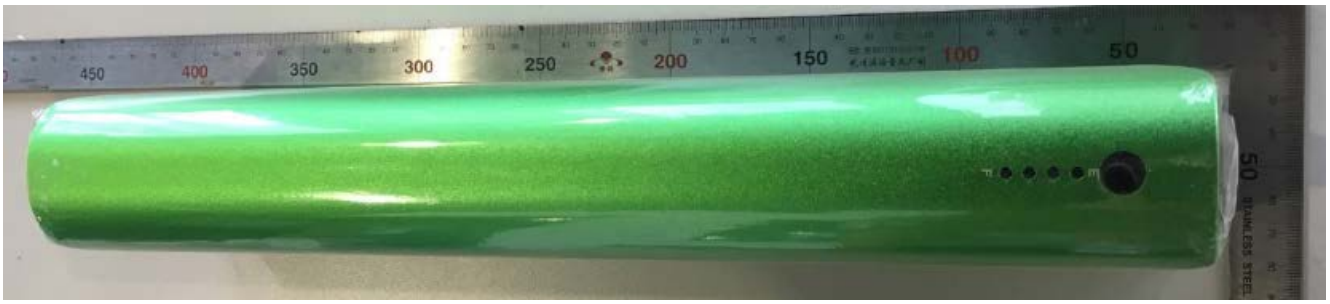
- No fire or explosion
- No leakage
- Leakage
- Fire
- Explosion
- Bulge
- Others (please explain)

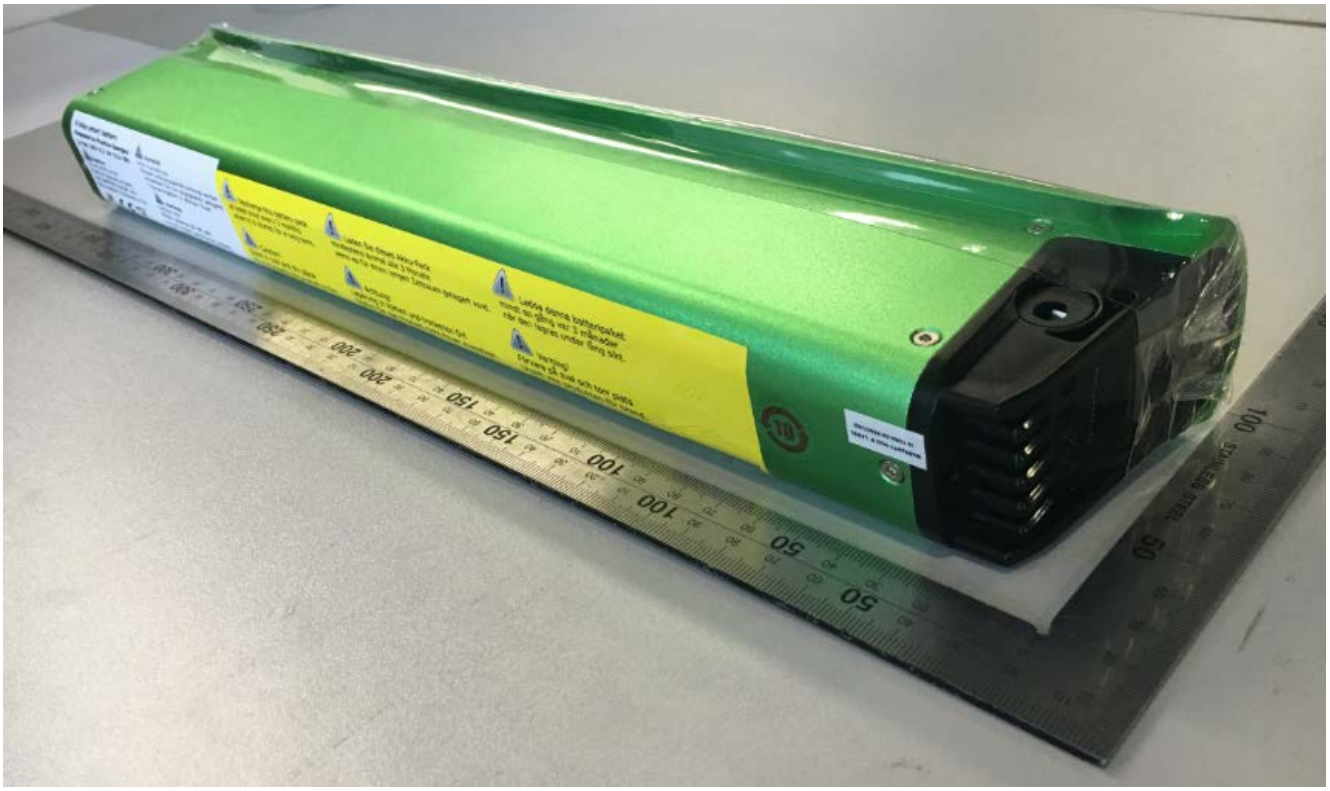
Enclosure

Supplement ID	Description
01-01	Front view of Battery
01-02	Back view of Battery
02	Internal PCB of battery pack
03	PCB Layout of battery pack
04	Protection board principle diagram
05	Specification of Battery
06	Outline Dimension of battery pack
07	Manufacturer date code of Battery
08	Packaging Illustration of Battery
09	ISO 9001 Certification for manufacturer

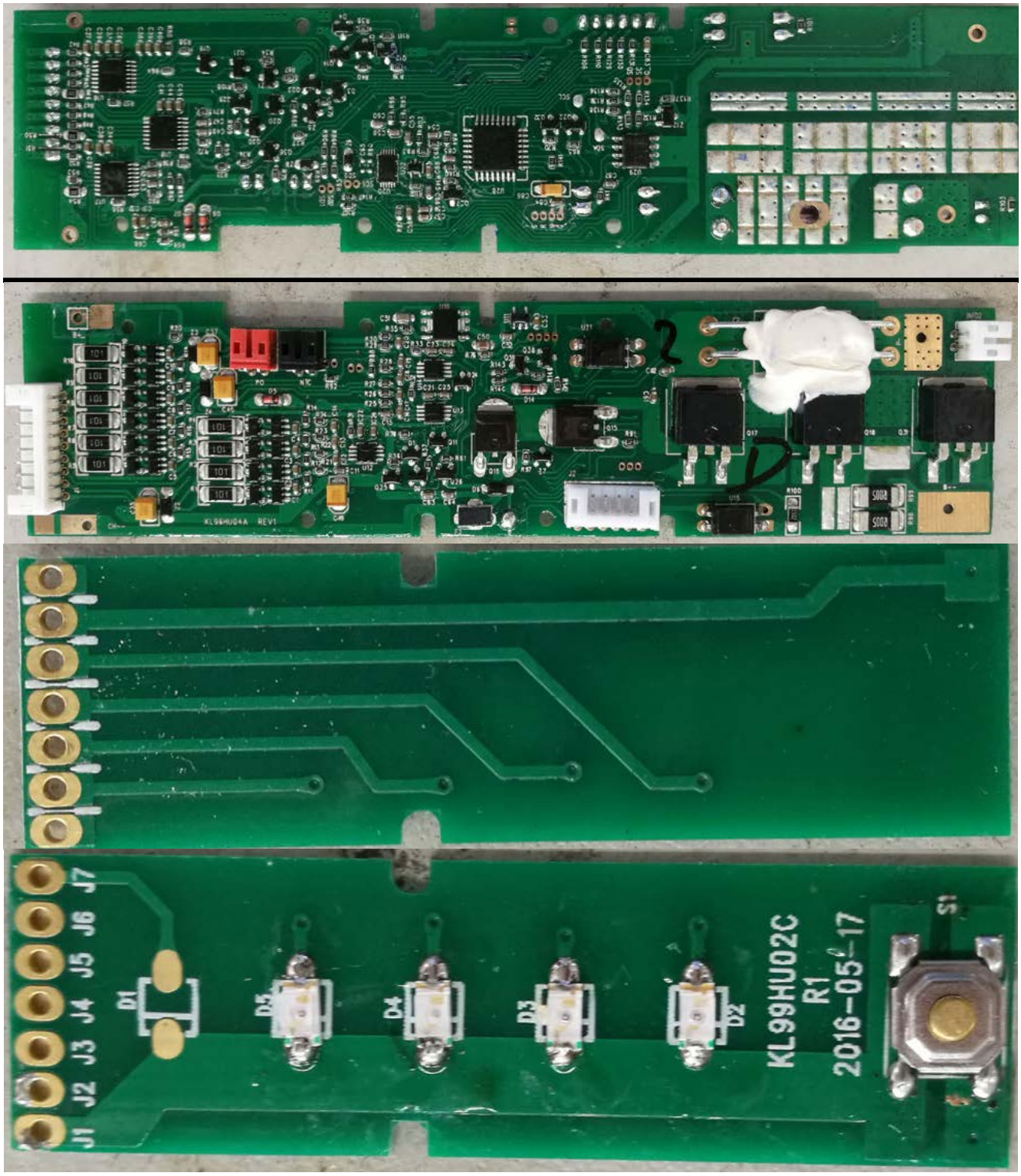
ID 01-01

ID 01-02

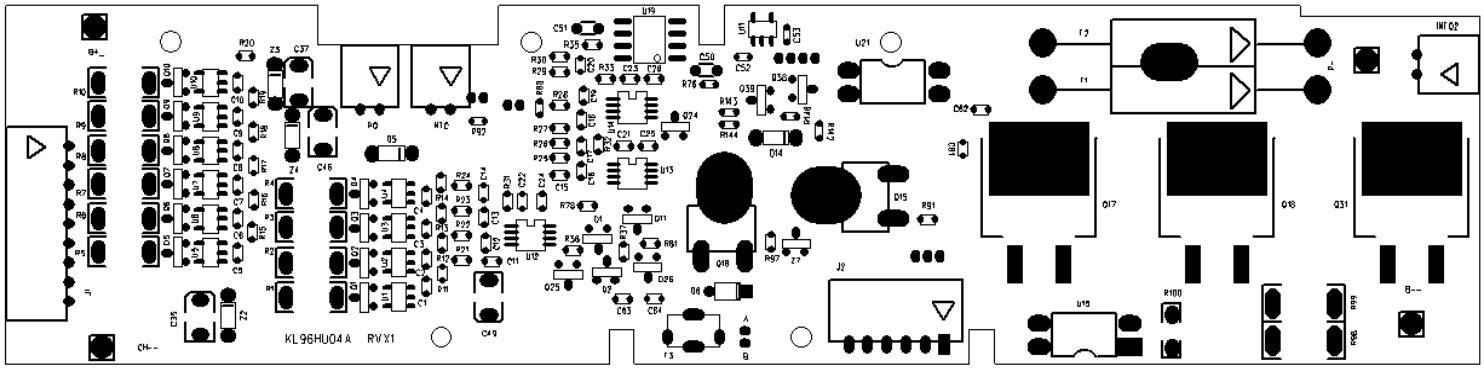


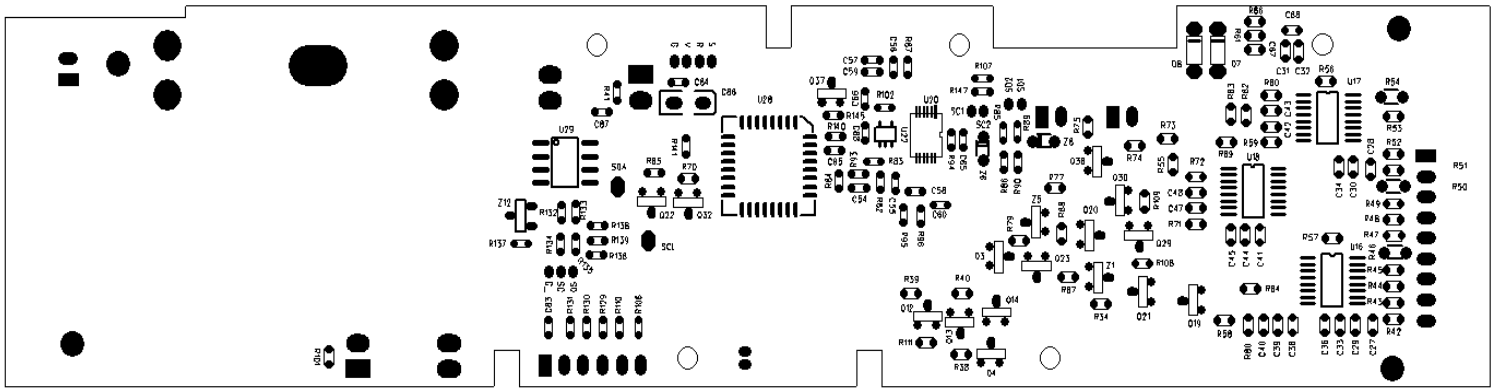


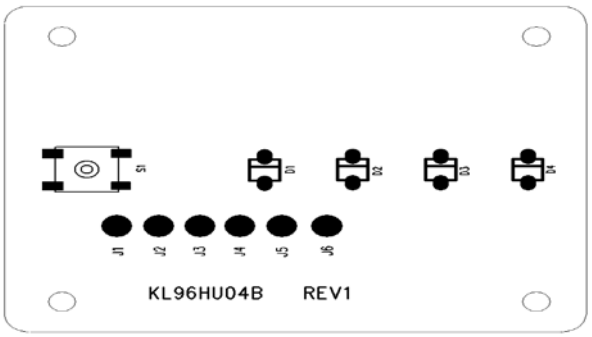
ID 02



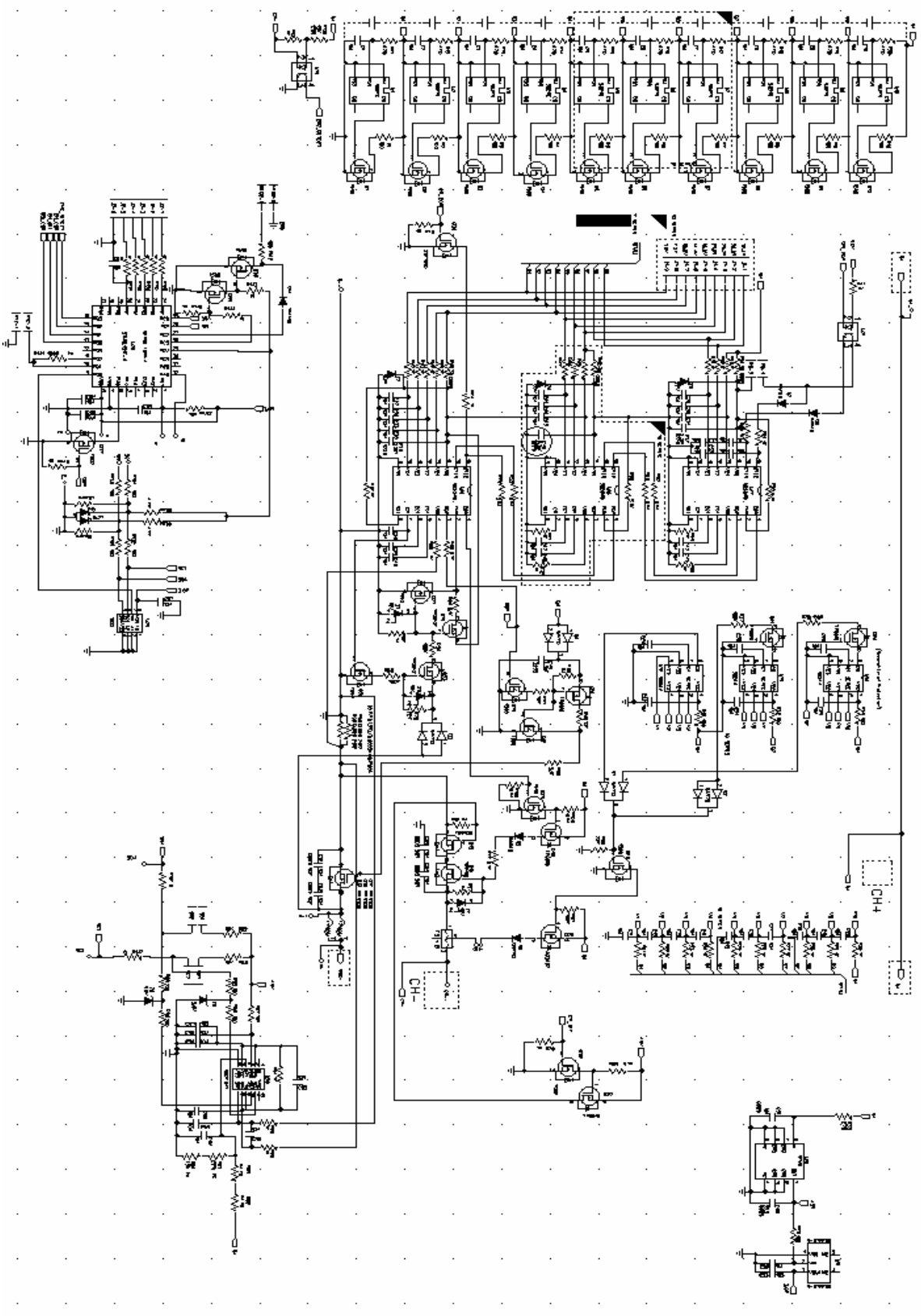
ID 03







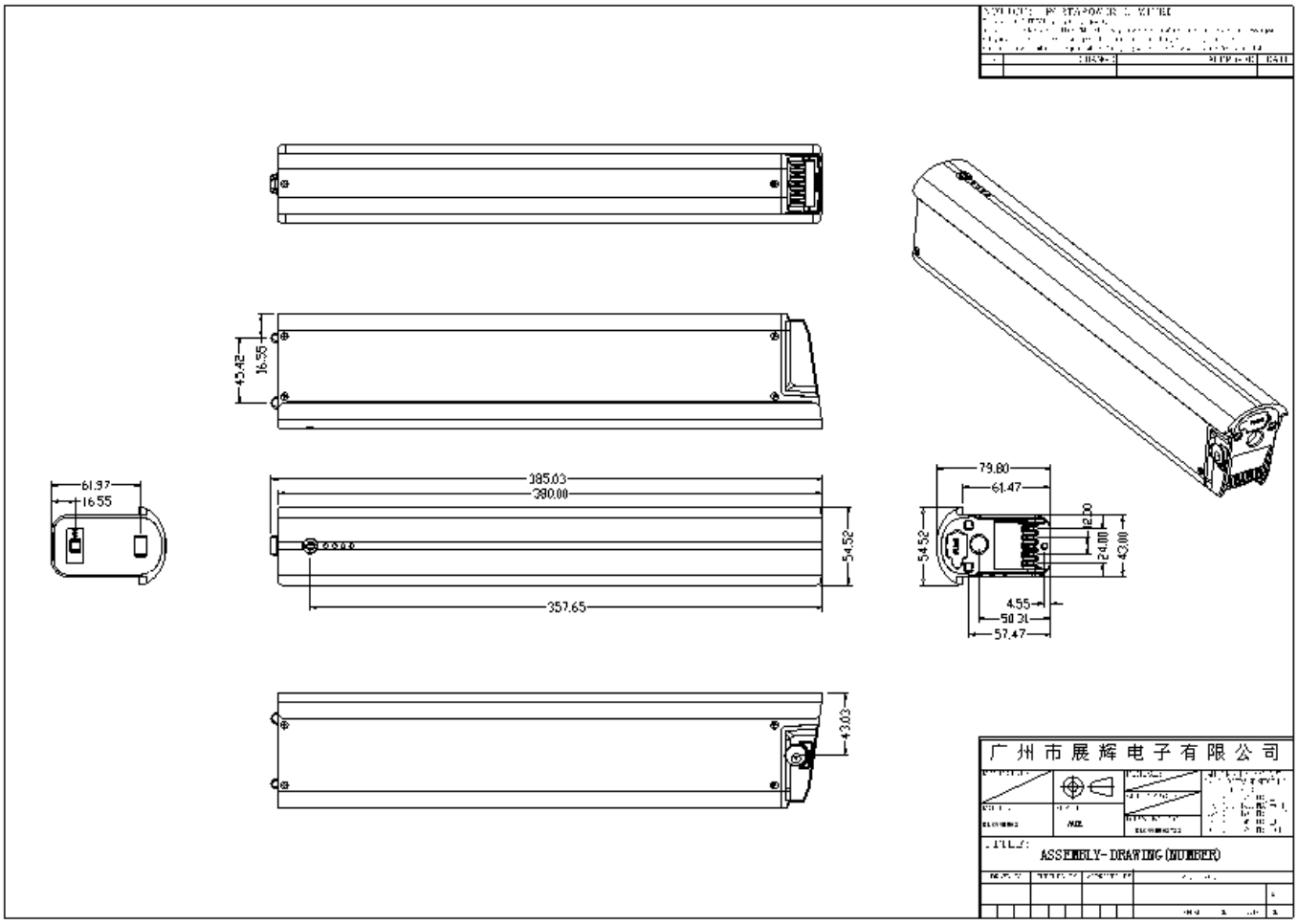
ID 04



ID 05

Secondary battery pack	
Battery Pack Model	KLC99HU02GR.809
Nominal Capacity	8700mAh
Standard Charging Current	1350mA
Standard Full Charging Voltage	42V
End of Charging Current	435mA
Maximum Charging Current	2350mA
Maximum Charging Voltage	42V
Standard Discharging Current/Load	1620mA
End Point Voltage	27.5V
Maximum Discharge Current/Load	10A
Upper Limit Charging Voltage	42V
Upper charging Temp limit(T3)	+45℃
Lower charging Temp limit(T2)	+10℃

ID 06


61.37
16.55
45.42
16.55
385.03
380.00
54.52
357.65
43.03
79.80
61.47
54.52
12.00
24.00
43.00
4.55
50.31
57.47
广州市展辉电子有限公司
ASSEMBLY-DRAWING(NUMBER)

Date Code information:

Notes to Battery Label Text:

Customer Art. No.: "PEN"

Factory Art. No.: "KLC99HU02GR.809" (is not mentioned on battery label text)

UL File No.: "AWBxxxxx" TBD

Serial No. Format: "AWBYYMM0001"

Serial No. Example: "AWB16200001"

"AWB" is factory Identification No.

"01" is the battery Version No.

"16" is Year (2016 = 16)

"20" is Calendar week (01~52)

"0001" is a hexadecimal sequential forth running number (0001~FFFF). The number shall always consist of 4 characters, numbers may not be re-used, number shall be reset to 0001 with each new shipment calendar date code.

ID 08

ID 09

CERTIFICATE OF QUALITY MANAGEMENT SYSTEM CERTIFICATION

Certificate No.016SZ15Q22489R1M
Organization code:74756254-6

This is to Certify that the Quality Management System of

GUANGZHOU ZHANHUI ELECTRONICS CO.,LTD

is in conformity with
GB/T19001-2008/ISO9001:2008 Standard
This certificate is valid to the following product(s)/service(s)

RESEARCH AND DEVELOPMENT, PRODUCTION AND SALES (ONLY FOR EXPORT) OF RECHARGEABLE BATTERIES, CHARGERS, BATTERY INFORMATION INDICATOR, ELECTRIC MOTOR, POWER SUPPLY SYSTEM CONTROLLER

REGISTERED ADDRESS:SHINAN ROAD, GUANTAN VILLAGE, DONGCHONG TOWN, NANSHA DISTRICT, GUANGZHOU, 511453, P. R. CHINA
GEOGRAPHIC ADDRESS:SHINAN ROAD, GUANTAN VILLAGE, DONGCHONG TOWN, NANSHA DISTRICT, GUANGZHOU, 511453, P. R. CHINA

Issue Date:Dec. 13, 2012
Reissue Date:Oct. 26, 2015
Valid Until:Oct. 25, 2018

Beijing New Century Inspection & Certification Co., Ltd.
General Manager:

BCC Address:11/F,Building,1 Guoying,Nanxiaojie,Xizhimennei,Xicheng District,Beijing,P.R.China
The certificate is valid within the term of validity of all administrative and qualification license subject to the regulation of P.R.China
It shall be maintained by regular surveillance assessments and shall be valid when used in conjunction with the Notice of Surveillance Decision
The query website of certificate valid state:www.bcc.com.cn 2-dimensional bar code seach:v.bcc.com.cn
The certificate information is available in the CNCA website:www.cnca.gov.cn
This certificate will remain effective on condition that the transition certification has been completed and new certificate issued before September 14, 2018 in accordance with the new standard.

中国认可
国际互认
管理体系
MANAGEMENT SYSTEM
CNAS C016-M