

Test Report

Client	:	Lifos Advanced Battery Technology Ltd
Address	:	Lifos Advanced Battery Technology, Stafford Park 5, Telford,TF3 3AS

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client

Sample Name	:	Lithium-ion battery pack
Model/P.O. No.	:	LC48/5000
Manufacturer	:	Guangdong Chuangxin New Energy Technology Co., Ltd
Received Date	:	Sep 09, 2022
Test Period	:	Sep 09, 2022~Sep 23, 2022
Test Requested	:	EU RoHS 2011/65/EU and 2015/863/EU

Conclusion		
-	Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr ⁶⁺)	PASS
-	Polybromobiphenyls (PBBs) & Polybromodiphenyl ethers (PBDEs)	PASS
-	DBP, BBP, DEHP, DIBP	PASS

For Further Details, Please Refer To the Following Page(s)

Approved by: *Jing Liu*

Date: Sep 28, 2022



Test Method

Test Item(s)	Test Method	Equipment	MDL
Pb, Cd, Hg, Cr, Br	IEC 62321-3-1:2013	XRF	5mg/kg
Pb, Cd	IEC 62321-5:2013	ICP-OES	5mg/kg
Hg	IEC 62321-4:2013+AMD1:2017	ICP-OES	5mg/kg
Cr ⁶⁺	IEC 62321-7-2:2017	UV-Vis	5mg/kg
	IEC 62321-7-1:2015		0.10µg/cm ²
PBBs & PBDEs	IEC 62321-6:2015	GC-MS	5mg/kg
DBP, BBP, DEHP, DIBP	IEC 62321-8:2017	GC-MS	30mg/kg

Test Result(s)

- Screening test results

Test items	1	2	3	4	5	6	7	8
Pb	P	P	P	D	D	P	P	P
Cd	P	D	P	D	P	P	P	P
Hg	P	P	P	P	P	P	P	P
Cr	P	D	P	P	D	P	P	P
Br	P	/	/	/	/	/	/	P
Conclusion	P	D	P	D	D	P	P	P

Test items	9	10	11	12	13	14	15	16
Pb	P	D	P	P	P	P	P	P
Cd	D	P	P	P	P	P	P	P
Hg	P	P	P	P	P	P	P	P
Cr	D	D	P	P	P	P	P	P
Br	/	/	P	P	/	/	/	P
Conclusion	D	D	P	P	P	P	P	P

Test items	57	58	59	60	61	62	63	64	65	66
Pb	P	D	P	P	P	P	P	P	P	P
Cd	P	P	P	P	P	P	P	P	P	P
Hg	P	P	P	P	P	P	P	P	P	P
Cr	P	P	P	P	P	P	P	P	P	P
Br	D	/	P	/	P	P	P	P	P	P
Conclusion	D	D	P	P	P	P	P	P	P	P

Test items	67	68	69	70	71	72	73	74	75	76
Pb	P	P	P	P	P	P	P	P	P	P
Cd	P	P	P	P	P	P	P	P	P	P
Hg	P	P	P	P	P	P	P	P	P	P
Cr	P	P	P	P	P	P	P	P	P	P
Br	/	/	/	P	P	P	/	P	P	D
Conclusion	P	P	P	P	P	P	P	P	P	D

Test items	77	78	79	80	81	82	83	84	85	86
Pb	P	P	P	P	P	P	P	P	P	P
Cd	P	P	P	P	P	P	P	P	P	P
Hg	P	P	P	P	P	P	P	P	P	P
Cr	P	P	P	P	P	P	P	P	P	P
Br	/	/	P	P	P	D	D	P	D	D
Conclusion	P	P	P	P	P	D	D	P	D	D

Test items	87	88	89	90	91	92	93	94	95	96
Pb	P	P	P	D	P	D	D	D	P	P
Cd	P	P	P	D	P	D	D	P	P	P
Hg	P	P	P	P	P	P	P	P	P	P
Cr	P	P	P	P	P	P	P	D	P	P
Br	/	D	D	/	P	/	/	/	P	D
Conclusion	P	D	D	D	P	D	D	D	P	D

Note:

- It is the result on total Br while testing PBBs and PBDEs by XRF. It is the result on total Cr while testing Hexavalent Chromium by XRF.
- Results are obtained by XRF for primary screening, and chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GCMS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013 (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
Cd	$P \leq 70-3\sigma < D < 130+3\sigma \leq F$	$P \leq 70-3\sigma < D < 130+3\sigma \leq F$	$P \leq 50-3\sigma < D < 150+3\sigma \leq F$
Pb	$P \leq 700-3\sigma < D < 1300+3\sigma \leq F$	$P \leq 700-3\sigma < D < 1300+3\sigma \leq F$	$P \leq 500-3\sigma < D < 1500+3\sigma \leq F$
Hg	$P \leq 700-3\sigma < D < 1300+3\sigma \leq F$	$P \leq 700-3\sigma < D < 1300+3\sigma \leq F$	$P \leq 500-3\sigma < D < 1500+3\sigma \leq F$
Br	$P \leq 300-3\sigma < D$	----	$P \leq 250-3\sigma < F$
Cr	$P \leq 700-3\sigma < D$	$P \leq 700-3\sigma < D$	$P \leq 500-3\sigma < F$

- P=PASS, F=FAIL, D=DETECTED

- mg/kg = ppm = 0.0001%, * /= Not Available

- Chemical test results:

Test results of Pb, Cd, Hg and Cr⁶⁺

Test Item(s)	MDL	Result(s) (mg/kg)			Limit (mg/kg)
		2	4	5	
Lead(Pb)	5mg/kg	N.D.	N.D.	N.D.	1000
Cadmium(Cd)	5mg/kg	N.D.	N.D.	N.D.	100
Mercury(Hg)	5mg/kg	N.D.	N.D.	91	1000
Hexavalent Chromium(Cr ⁶⁺)#1	5mg/kg	/	/	/	1000
Hexavalent Chromium(Cr ⁶⁺)#2	0.10µg/cm ²	N.D.	N.D.	N.D.	/

Test Item(s)	MDL	Result(s) (mg/kg)			Limit (mg/kg)
		9	10	20	
Lead(Pb)	5mg/kg	N.D.	N.D.	N.D.	1000
Cadmium(Cd)	5mg/kg	N.D.	N.D.	N.D.	100
Mercury(Hg)	5mg/kg	124	26	19	1000
Hexavalent Chromium(Cr ⁶⁺)#1	5mg/kg	/	/	/	1000
Hexavalent Chromium(Cr ⁶⁺)#2	0.10µg/cm ²	N.D.	N.D.	N.D.	/

Test Item(s)	MDL	Result(s) (mg/kg)					Limit (mg/kg)
		38	39	42	58	90	
Lead(Pb)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	1000
Cadmium(Cd)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Mercury(Hg)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	1000
Hexavalent Chromium(Cr ⁶⁺)#1	5mg/kg	/	/	/	/	/	1000
Hexavalent Chromium(Cr ⁶⁺)#2	0.10µg/cm ²	N.D.	N.D.	N.D.	N.D.	N.D.	/

Test Item(s)	MDL	Result(s) (mg/kg)					Limit (mg/kg)
		92	93	94	97	99	
Lead(Pb)	5mg/kg	2691	N.D.	N.D.	N.D.	N.D.	1000
Cadmium(Cd)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Mercury(Hg)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	1000
Hexavalent Chromium(Cr ⁶⁺)#1	5mg/kg	/	/	/	/	/	1000
Hexavalent Chromium(Cr ⁶⁺)#2	0.10µg/cm ²	N.D.	N.D.	N.D.	N.D.	N.D.	/

Test Item(s)	MDL	Result(s) (mg/kg)					Limit (mg/kg)
		109	110	120	127	134	
Lead(Pb)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	1000
Cadmium(Cd)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	100
Mercury(Hg)	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	1000
Hexavalent Chromium(Cr ⁶⁺)#1	5mg/kg	/	/	/	/	/	1000
Hexavalent Chromium(Cr ⁶⁺)#2	0.10µg/cm ²	N.D.	N.D.	N.D.	N.D.	N.D.	/

Note:

- mg/kg=ppm=parts per million;
- N.D.=Not Detected (<MDL); MDL=method detection limit;
- #1: For non-metal materials test.
- #2: For metal materials test:
 “Positive” indicates Cr⁶⁺ in a sample is detected above 0.13µg/cm²;
 “Negative” indicates Cr⁶⁺ in a sample is detected below 0.10µg/cm²;
- According to EU RoHS 2011/65/EU Annex III, the following components were exempt

No.	Exempted substances	Exempted items	Exempted value
92	Copper alloy	Lead(Pb)	4.0%

Test results of PBBs and PBDEs

Test Item(s)	MDL	Result(s) (mg/kg)		Limit (mg/kg)
		25	35	
Monobromobiphenyl	5mg/kg	N.D.	N.D.	/
Dibromobiphenyl	5mg/kg	N.D.	N.D.	/
Tribromobiphenyl	5mg/kg	N.D.	N.D.	/
Tetrabromobiphenyl	5mg/kg	N.D.	N.D.	/
Pentabromobiphenyl	5mg/kg	N.D.	N.D.	/
Hexabromobiphenyl	5mg/kg	N.D.	N.D.	/
Heptabromobiphenyl	5mg/kg	N.D.	N.D.	/
Octabromobiphenyl	5mg/kg	N.D.	N.D.	/
Nonabromobiphenyl	5mg/kg	N.D.	N.D.	/
Decabromodiphenyl	5mg/kg	N.D.	N.D.	/
Polybromobiphenyl(PBBs)	/	N.D.	N.D.	1000
Monobromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Bibromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Tribromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Tetrabromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Pentabromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Hexabromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Heptabromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Octabromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Nonabromobiphenyl ether	5mg/kg	N.D.	N.D.	/
Decabromodiphenyl ether	5mg/kg	N.D.	N.D.	/
Polybromodiphenyl ether(PBDEs)	/	N.D.	N.D.	1000

Test Item(s)	MDL	Result(s) (mg/kg)					Limit (mg/kg)
		103	104	105	106	111	
Monobromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Dibromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Tribromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Tetrabromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Pentabromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Hexabromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Heptabromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Octabromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Nonabromobiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Decabromodiphenyl	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Polybromobiphenyl(PBBs)	/	N.D.	N.D.	N.D.	N.D.	N.D.	1000
Monobromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Bibromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Tribromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Tetrabromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Pentabromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Hexabromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Heptabromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Octabromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Nonabromobiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Decabromodiphenyl ether	5mg/kg	N.D.	N.D.	N.D.	N.D.	N.D.	/
Polybromodiphenyl ether(PBDEs)	/	N.D.	N.D.	N.D.	N.D.	N.D.	1000

Note:

- mg/kg=ppm=parts per million;
- N.D.=Not Detected (<MDL);
- MDL=method detection limit.

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Test components:

1	Silver plastic (label)	2	Silver metal (screw)
3	Silver metal (screw)	4	Silver-white metal (handle)
5	Silver metal (screw)	6	Black coated metal (screws)
7	Black coated metal housing	8	Yellow plastic partition
9	Silver metal (screw)	10	Silver metal (screw)
11	Red plastic	12	Black plastic
13	Silver metal block	14	Silver metal screw (round)
15	Black metal frame	16	Black sponge
17	Blue plastic	18	Off-white plastic shell
19	Blue coated metal	20	Golden metal
21	Silver metal	22	Silver white metal
23	Same color metal core	24	Beige plastic
25	Black plastic	26	Red plastic
27	Red paper	28	Silver metal sheet
29	Metal sheet of the same color	30	Red label paper
31	Black plastic case	32	Silver metal
33	Gold metal (button)	34	Silver metal
35	IC	36	SMD capacitance
37	PCB	38	Silver metal
39	Silver columnar metal	40	White latex
41	White plastic wire slot	42	Silvery-white metal wire
43	White plastic cover	44	Red plastic (wire)
45	Black plastic (wire)	46	Black plastic (wire)
47	Red plastic (wire)	48	White plastic (wire)
49	Yellow plastic (wire)	50	Green plastic (wire)
51	Black plastic (wire)	52	Black plastic cover

53	Silver metal ring	54	Wire core (copper)
55	Blue plastic (wire cover)	56	Yellow plastic
57	Black plastic cover	58	Golden metal
59	Black plastic (wire cover)	60	Silver metal ring
61	Black plastic cover	62	Blue plastic (wire)
63	Black plastic (wire)	64	Silver metal (wire)
65	Green paper (with adhesive)	66	Grey rubber mud
67	Silver-white metal (Type C)	68	Black metal screw
69	Black metal screw (long)	70	Gray rubber
71	Black plastic frame	72	Black plastic case
73	Silver white metal shell	74	Black plastic pad
75	Light yellow adhesive paper	76	Yellow tape
77	Gold metal needle	78	Magnetic coil (wire core)
79	ceramic	80	Black plastic block
81	Green plastic case (capacitor)	82	Yellow tape
83	IC	84	SMD capacitance
85	SMD resistance	86	Diode
87	Solder	88	PCB
89	Red coated metal	90	Black coated metal
91	Green tape	92	Red coated metal
93	Black coated metal	94	Black coated metal
95	Black plastic	96	White plastic slot
97	Silvery-white metal pin	98	IC
99	IC pin	100	SMD resistance
101	SMD capacitance	102	SMD resistance (small)
103	Diode	104	Triode
105	IC	106	PCB
107	Golden metal	108	MOS tube
109	MOS tube base	110	MOS tube pin
111	PCB	112	Silver metal ring
113	Red plastic (thin thread leather)	114	Black metal frame
115	Silver white metal screw	116	Grey plastic frame

117	Silver metal ring	118	Copper metal
119	Blue plastic case	120	Silver white metal shell
121	White scotch tape	122	Blue plastic
123	Yellow tape	124	Blue tape
125	White plastic (diaphragm)	126	Anode carbon powder
127	Cathode carbon powder	128	Gray rubber
129	White transparent diaphragm	130	Black rubber
131	Silver-white columnar metal	132	Black plastic frame
133	Silver white metal	134	Aluminum foil
135	Copper metal	136	Copper foil

Chemical Test Process

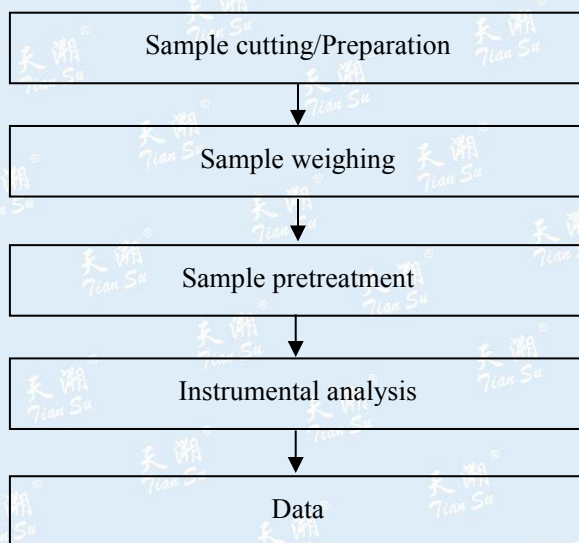
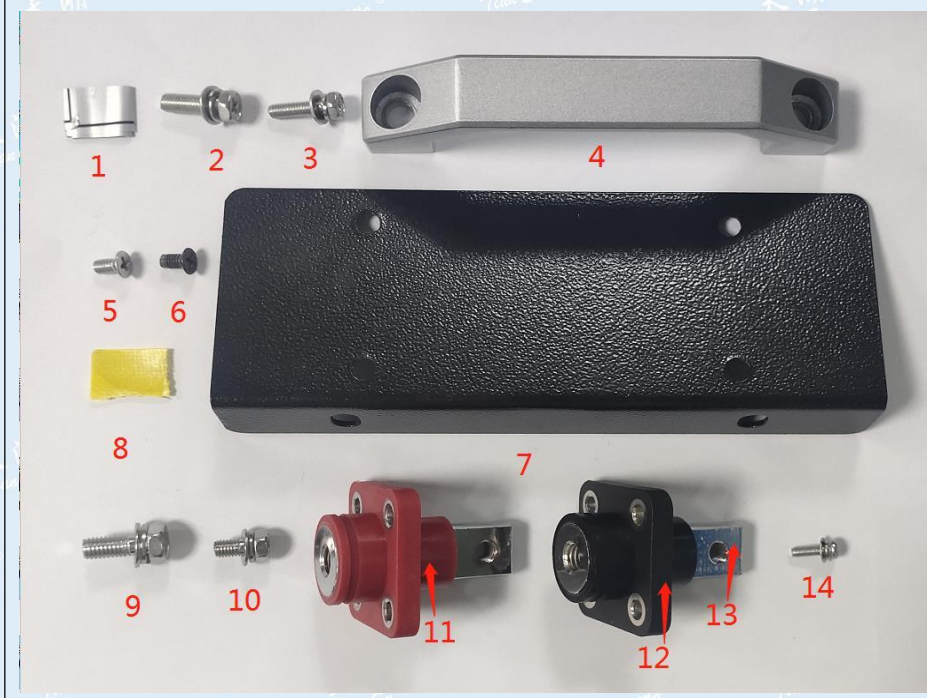
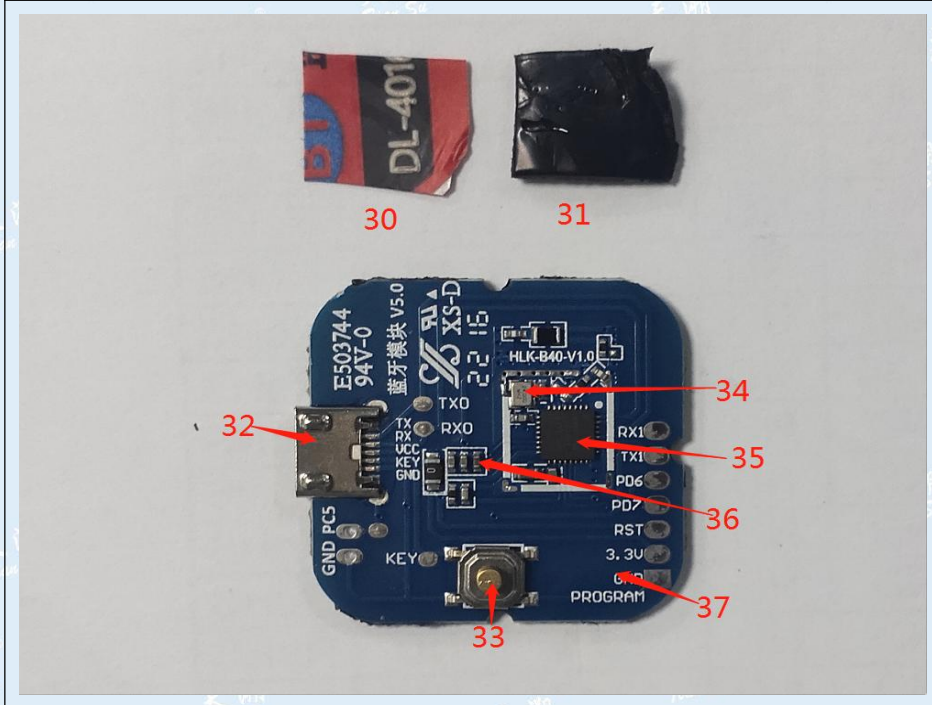


Photo of the sample

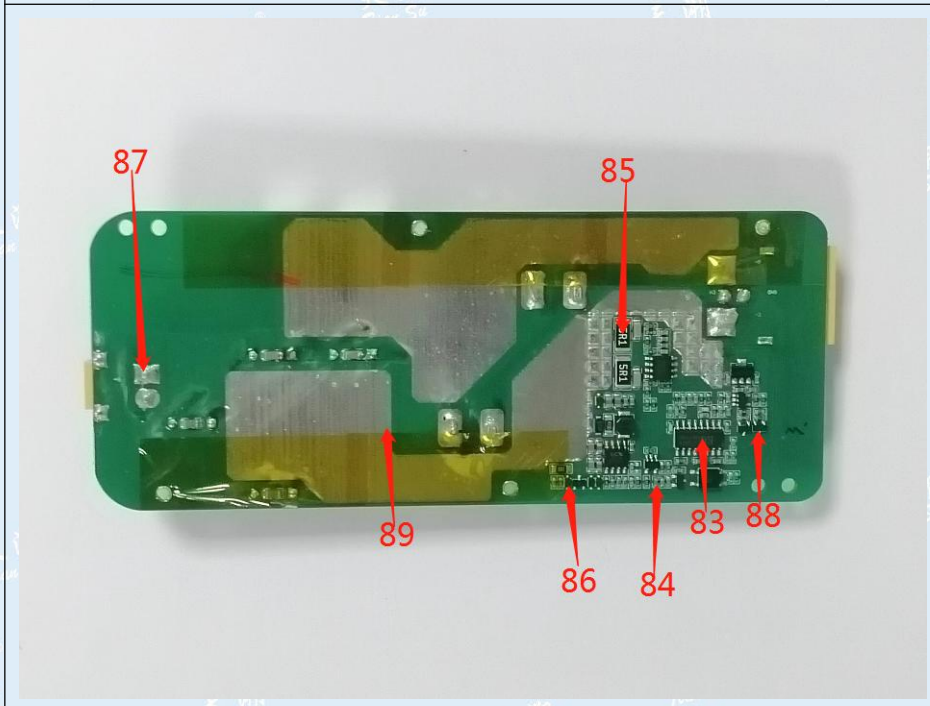
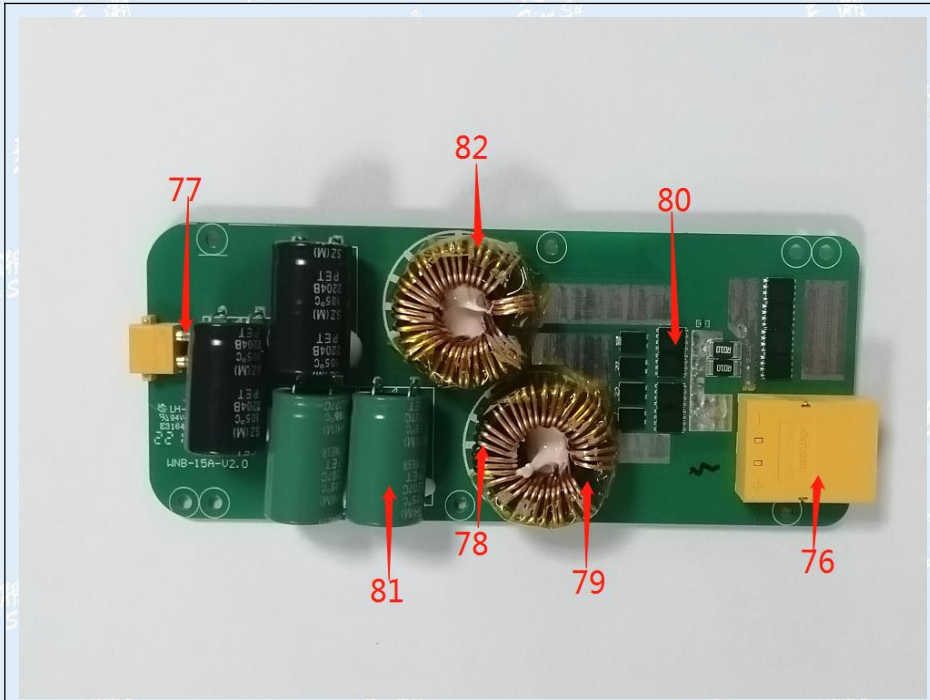


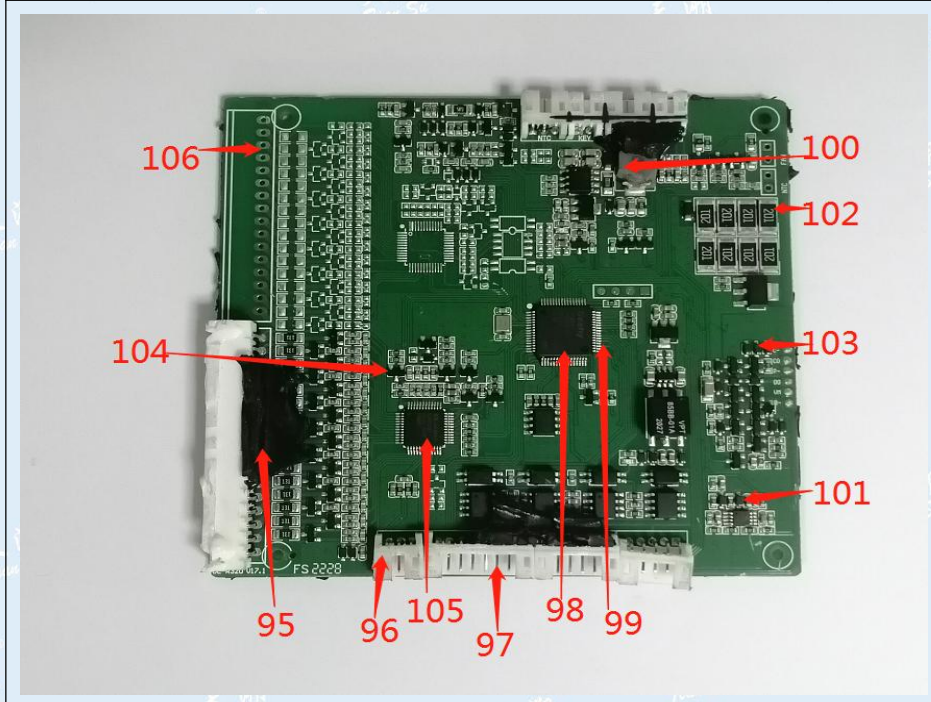
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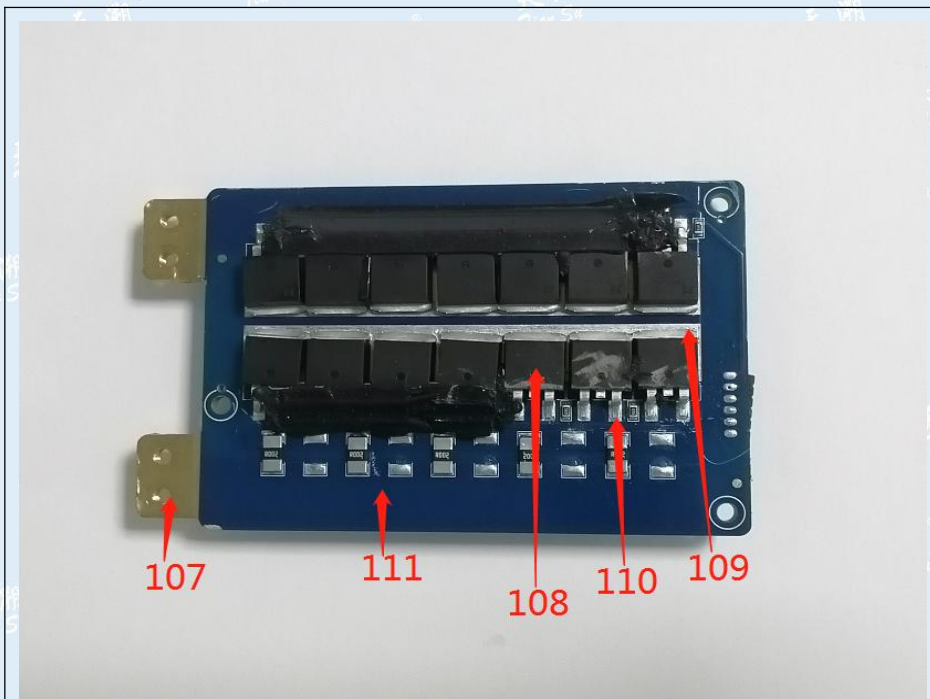


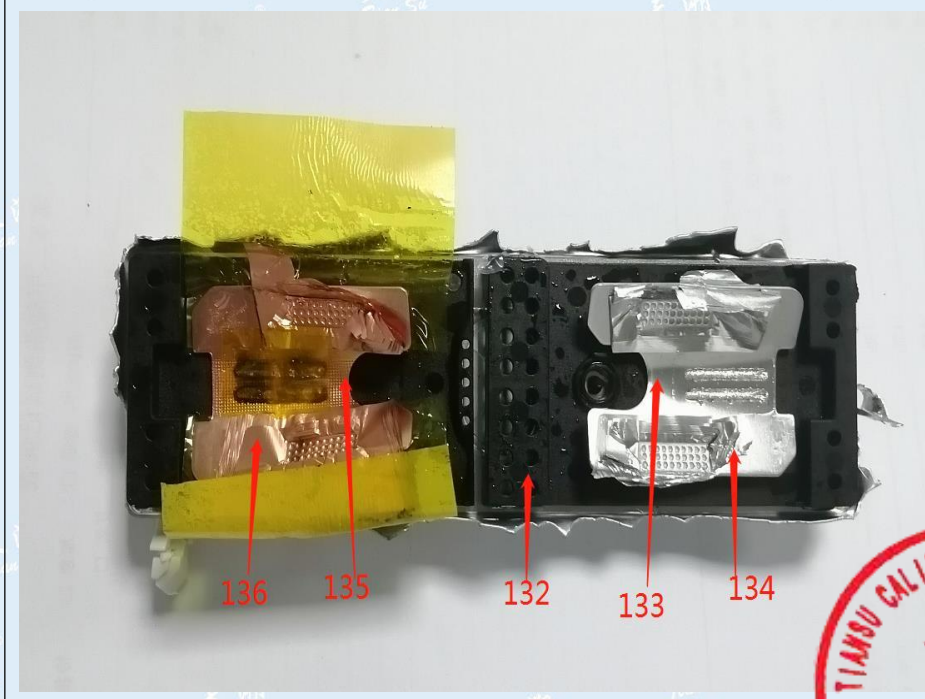
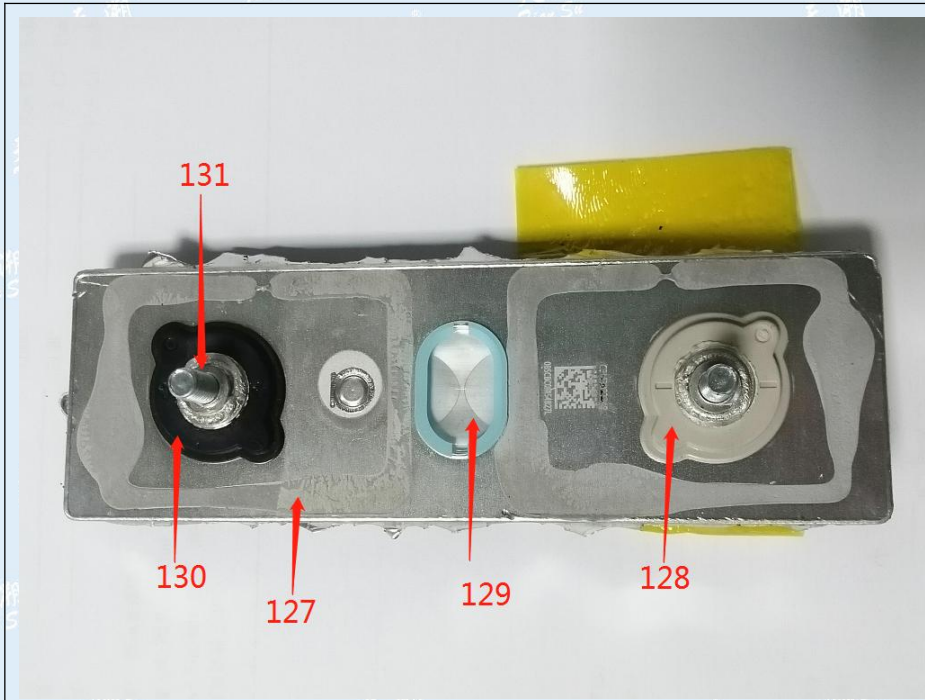












***** End of report *****

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