



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

**Report No.**..... : WTF22F05099979C  
**Applicant**..... : Mid Ocean Brands B.V.  
**Address**..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong  
**Manufacturer** ..... : 111590  
**Sample Name** ..... : Weatherstation  
**Sample Model**..... : MO6664  
**Date of Receipt sample** ..... : 2022-05-20  
**Testing period** ..... : 2022-05-20 to 2022-06-06  
**Date of Issue**..... : 2022-06-07  
**Test Result**..... : Refer to next page (s)

**Prepared By:**

**Waltek Testing Group (Foshan) Co., Ltd.**

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Signed for and on behalf of  
Waltek Testing Group (Foshan) Co., Ltd.

Swing.Liang



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**Test Requested** ..... : In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863.

**Test Method**..... : 1) With reference to IEC 62321-2:2021, disassembly, disjunction and mechanical sample preparation  
2) With reference to IEC 62321-3-1:2013, screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry  
3) With reference to IEC 62321-4:2013+AMD1:2017 CSV, determination of Mercury by ICP-OES  
4) With reference to IEC 62321-5:2013, determination of Lead and Cadmium by ICP-OES  
5) With reference to IEC 62321-7-2: 2017 and IEC 62321-7-1: 2015, determination of Hexavalent Chromium by UV-Vis  
6) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS  
7) With reference to IEC 62321-8:2017, determination of Phthalates content by GC-MS.

**Test Conclusion** ..... : **Pass** (Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863)

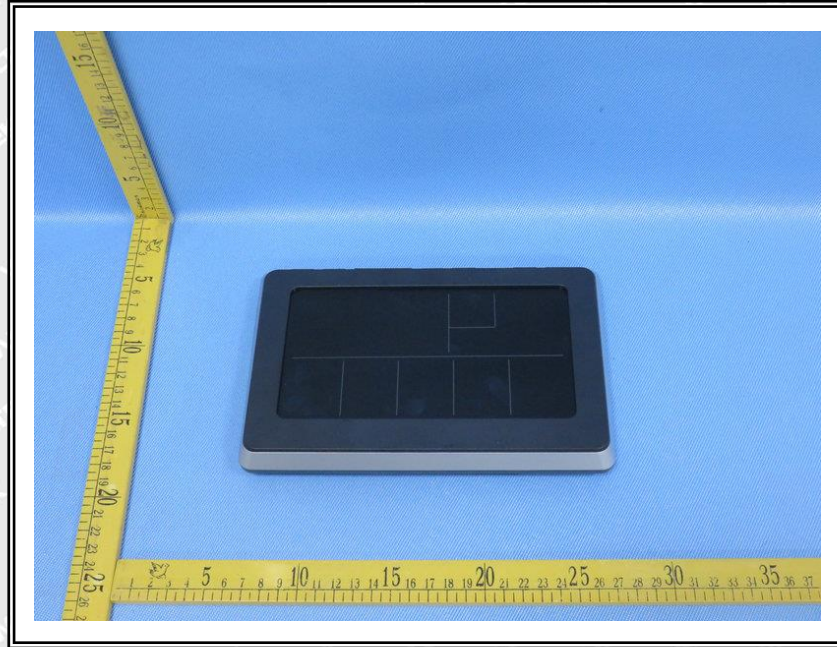
**WALTEK**





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Sample Photo(s):







**Test Results:****1. Lead, Mercury, Cadmium, Hexavalent Chromium, PBBs and PBDEs**

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
1	Black plastic shell	BL	BL	BL	BL	BL	NA
2	Black plastic shell without silvery coating	BL	BL	BL	BL	BL	NA
3	Silvery coating	BL	BL	BL	BL	BL	NA
4	Transparent plastic film with grey coating	BL	BL	BL	BL	BL	NA
5	White plastic shell	BL	BL	BL	BL	BL	NA
6	Black transparent plastic film	BL	BL	BL	BL	BL	NA
7	Transparent glass sheet	BL	BL	BL	BL	BL	NA
8	Pink soft plastic sheet	BL	BL	BL	BL	BL	NA
9	Black soft plastic sheet	BL	BL	BL	BL	BL	NA
10	White-silvery plastic film	BL	BL	BL	BL	BL	NA
11	Transparent plastic adhesive tape	BL	BL	BL	BL	BL	NA
12	White plastic film	BL	BL	BL	BL	BL	NA
13	Transparent plastic sheet	BL	BL	BL	BL	BL	NA
14	White-black plastic film	BL	BL	BL	BL	BL	NA
15	White-black plastic adhesive tape	BL	BL	BL	BL	BL	NA
16	Transparent plastic film with multicolour coating	BL	BL	BL	BL	BL	NA
17	Silvery metal spring	BL	BL	BL	BL	BL	NA
18	Solder	BL	BL	BL	BL	BL	NA
19	Black plastic wire covering	BL	BL	BL	BL	BL	NA





Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
20	Silvery metal sheet	BL	BL	BL	BL	BL	NA
21	Red plastic wire covering	BL	BL	BL	BL	BL	NA
22	Coppery metal wire	BL	BL	BL	BL	BL	NA
23	Chip LED	BL	BL	BL	BL	BL	NA
24	Red plastic wire covering	BL	BL	BL	BL	BL	NA
25	White-black PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
26	Black plastic wire covering	BL	BL	BL	BL	BL	NA
27	Silvery metal wire	BL	BL	BL	BL	BL	NA
28	Solder	BL	BL	BL	BL	BL	NA
29	Solder	BL	BL	BL	BL	BL	NA
30	Red plastic wire covering	BL	BL	BL	BL	BL	NA
31	Grey plastic wire covering	BL	BL	BL	BL	BL	NA
32	Silvery metal wire	BL	BL	BL	BL	BL	NA
33	Chip IC	BL	BL	BL	BL	BL	NA
34	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
35	Black plastic base	BL	BL	BL	BL	BL	NA
36	Chip capacitor	BL	BL	BL	BL	BL	NA
37	Blue PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
38	Chip resistor	BL	BL	BL	BL	BL	NA
39	White sponge adhesive sheet	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
40	Silvery metal screw	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : Negative
41	Silvery metal screw	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : Negative
42	Coppery metal winding	BL	BL	BL	BL	BL	NA
43	Chip IC	BL	BL	BL	BL	BL	NA
44	Black body of EC	BL	BL	BL	BL	BL	NA
45	Chip IC	BL	BL	BL	BL	BL	NA
46	Silvery metal shell of switch	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : Negative
47	Silvery metal sheet of switch	BL	BL	BL	BL	BL	NA
48	Black plastic slide knob of switch	BL	BL	BL	BL	BL	NA
49	Blue plastic shell	BL	BL	BL	BL	BL	NA
50	White-black ceramic sheet	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
51	Chip resistor	BL	BL	BL	BL	BL	NA
52	Solder	BL	BL	BL	BL	BL	NA
53	Green PCB	BL	BL	BL	BL	BL	NA
54	Chip capacitor	BL	BL	BL	BL	BL	NA
55	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
56	Silvery body of EC	BL	BL	BL	BL	BL	NA
57	Black plastic shell of buzzer	BL	BL	BL	BL	BL	NA
58	Silvery metal sheet of buzzer	BL	BL	BL	BL	BL	NA
59	Silvery metal axle of buzzer	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
60	Green PCB of buzzer	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
61	Black magnetic core of buzzer	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : ND
62	Coppery metal winding of buzzer	BL	BL	BL	BL	BL	NA
63	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
64	Silvery metal shell of socket	BL	BL	BL	BL	BL	NA
65	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
66	White plastic core of socket	BL	BL	BL	BL	BL	NA
67	Black plastic shell of socket	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
68	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
69	Silvery metal sheet of socket	BL	BL	BL	BL	BL	NA
70	Solder	BL	BL	BL	BL	BL	NA
71	Black plastic film of electrolytic capacitor	BL	BL	BL	BL	BL	NA
72	Black rubber stopper of electrolytic capacitor	BL	BL	BL	BL	BL	NA
73	Brown paper of electrolytic capacitor	BL	BL	BL	BL	BL	NA
74	Silvery metal shell of electrolytic capacitor	BL	BL	BL	BL	BL	NA
75	Silvery metal foil of electrolytic capacitor	BL	BL	BL	BL	BL	NA
76	Grey metal foil of electrolytic capacitor	BL	BL	BL	BL	BL	NA
77	Chip IC	BL	BL	BL	BL	BL	NA
78	Chip IC	BL	BL	BL	BL	BL	NA
79	Chip audion	BL	BL	BL	BL	BL	NA





Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
80	Black plastic key of switch	BL	BL	BL	BL	BL	NA
81	White plastic base of switch	BL	BL	BL	BL	BL	NA
82	Silvery metal shell of switch	BL	BL	BL	BL	BL	NA
83	Silvery metal sheet of switch	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : Negative
84	Chip capacitor	BL	BL	BL	BL	BL	NA
85	Chip diode	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
86	Chip inductor	BL	BL	BL	BL	BL	NA
87	Chip IC	BL	BL	BL	BL	BL	NA
88	Chip IC	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
89	Chip resistor	BL	BL	BL	BL	BL	NA
90	Chip capacitor	BL	BL	BL	BL	BL	NA
91	White PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
92	Solder	BL	BL	BL	BL	BL	NA
93	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
94	White plastic adhesive label	BL	BL	BL	BL	BL	NA
95	Silvery metal sheet	BL	BL	BL	BL	BL	NA
96	Black plastic shell of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
97	Silvery metal sheet of plug	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : Negative
98	Silvery metal pin of plug	BL	IN	BL	BL	BL	Pb :ND
99	Black plastic film	BL	BL	BL	BL	BL	NA



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
100	Black plastic film of electrolytic capacitor	BL	BL	BL	BL	BL	NA
101	Black rubber stopper of electrolytic capacitor	BL	BL	BL	BL	BL	NA
102	Brown paper of electrolytic capacitor	BL	BL	BL	BL	BL	NA
103	Silvery metal shell of electrolytic capacitor	BL	BL	BL	BL	BL	NA
104	Silvery metal foil of electrolytic capacitor	BL	BL	BL	BL	BL	NA
105	Grey metal foil of electrolytic capacitor	BL	BL	BL	BL	BL	NA
106	Blue body of capacitor	BL	BL	BL	BL	BL	NA
107	Silvery metal shell of socket	BL	BL	BL	BL	BL	NA
108	Black plastic core of socket	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
109	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
110	Yellow plastic adhesive tape of transformer	BL	BL	BL	BL	BL	NA
111	Black plastic bobbin of transformer	BL	BL	BL	BL	BL	NA
112	Black magnetic core of transformer	BL	BL	BL	BL	BL	NA
113	Coppery metal winding of transformer	BL	BL	BL	BL	BL	NA
114	Yellow insulation wire of transformer	BL	BL	BL	BL	BL	NA
115	White glue	BL	BL	BL	BL	BL	NA
116	Green plastic film of electrolytic capacitor	BL	BL	BL	BL	BL	NA
117	Pink body of fuse	BL	BL	BL	BL	BL	NA
118	Green body of inductor	BL	BL	BL	BL	BL	NA
119	Yellow-green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND





Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
120	Solder	BL	BL	BL	BL	BL	NA
121	Chip diode	BL	BL	BL	BL	BL	NA
122	Chip IC	BL	BL	BL	BL	BL	NA
123	Chip diode	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
124	Chip rectifier	BL	BL	BL	BL	BL	NA
125	Chip capacitor	BL	BL	BL	BL	BL	NA
126	Chip resistor	BL	BL	BL	IN	BL	Cr <sup>6+</sup> : ND
127	Black plastic jacket of plug	BL	BL	BL	BL	BL	NA
128	Silvery metal shell of plug	BL	BL	BL	BL	BL	NA
129	Black plastic wire covering	BL	BL	BL	BL	BL	NA
130	Coppery metal wire	BL	BL	BL	BL	BL	NA
131	Solder of plug	BL	BL	BL	BL	BL	NA
132	Silvery metal pin of plug	BL	BL	BL	BL	BL	NA
133	White plastic core of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
134	Black plastic jacket of plug	BL	BL	BL	BL	BL	NA
135	Silvery metal shell of plug	BL	BL	BL	BL	BL	NA
136	Silvery metal pin of plug	BL	BL	BL	BL	BL	NA
137	Black plastic core of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
138	Solder of plug	BL	BL	BL	BL	BL	NA

**Remark:**

- (1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr<sup>6+</sup>) and GC-MS (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	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$LOD < IN < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < IN < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < IN < (1500+3\sigma) \leq OL$
Cr	$BL \leq (700-3\sigma) < IN$	$BL \leq (700-3\sigma) < IN$	$BL \leq (500-3\sigma) < IN$
Br	$BL \leq (300-3\sigma) < IN$	--	$BL \leq (250-3\sigma) < IN$

BL= Below Limit      OL= Over Limit      LOD = Limit of Detection      -- = Not Regulated

- (2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.
- (3) The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample be of non-uniformity composition.
- (4) mg / kg =milligram per kilogram=ppm,  $\mu\text{g}/\text{cm}^2$  = Micrograms per square centimetre.
- (5) ND = Not Detected or lower than limit of quantitation.
- (6) NA = Not Applicable, as the XRF screening test result was below the limit or as the XRF screening directly determine that test result was over the limit, it was not need to conduct the wet chemical testing.
- (7) LOQ = Limit of quantitation.

Test Items	Pb	Cd	Hg	Cr <sup>6+</sup>		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	$\mu\text{g}/\text{cm}^2$	mg/kg	mg/kg
LOQ	2	2	2	8	0.1	5	5

The LOQ for single compound of PBBs and PBDEs is 5mg/kg, LOQ of Cr<sup>6+</sup> for polymer and composite sample is 8mg/kg and LOQ of Cr<sup>6+</sup> for metal sample is 0.1 $\mu\text{g}/\text{cm}^2$ .

- (8) RoHS Requirement

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr <sup>6+</sup> )	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)

- (9) According to IEC 62321-7-1:2015, determined of Cr<sup>6+</sup> on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.

Boiling water extraction:

Negative = Absence of Cr<sup>6+</sup> coating, the detected concentration in boiling water extraction solution is less than 0.10 $\mu\text{g}/\text{cm}^2$ .

Positive = Presence of Cr<sup>6+</sup> coating, the detected concentration in boiling water extraction solution is greater than 0.13 $\mu\text{g}/\text{cm}^2$ .





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Information on storage conditions and production date of the tested sample is unavailable and thus Cr<sup>6+</sup> results represent status of the sample at the time of testing.

(10) Abbreviation:

“Pb” denotes Lead, “Cd” denotes Cadmium, “Hg” denotes Mercury, “Cr” denotes Chromium, “Cr (VI)” denotes Hexavalent Chromium, “Br” denotes Bromine, “PBBs” denotes Total Polybrominated Biphenyls, “PBDEs” denotes Total Polybrominated Diphenyl Ethers.

# WALTEK



## 2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1+2+4+5+6 <sup>△</sup>	<50	<50	<50	<50
T02	3	<50	<50	<50	<50
T03	7+23+33+34+36 <sup>△</sup>	<50	<50	<50	<50
T04	8	<50	<50	<50	<50
T05	9	<50	<50	<50	<50
T06	10+12+13+14 <sup>△</sup>	<50	<50	<50	<50
T07	11	<50	<50	<50	<50
T08	15	<50	<50	91	<50
T09	16+35+48+49 <sup>△</sup>	<50	<50	<50	<50
T10	19	<50	<50	<50	<50
T11	21	<50	<50	<50	<50
T12	24	<50	<50	<50	<50
T13	25+125+126+37+53 <sup>△</sup>	<50	<50	<50	<50
T14	26	<50	<50	<50	<50
T15	30	<50	<50	<50	<50
T16	31	<50	<50	<50	<50
T17	38+43+44+45+50 <sup>△</sup>	<50	<50	<50	<50
T18	39	<50	<50	<50	<50
T19	51+54+55+56+61 <sup>△</sup>	<50	<50	<50	<50
T20	57+66+67	<50	<50	<50	<50
T21	60+63+91+119 <sup>△</sup>	<50	<50	<50	<50
T22	71	<50	<50	<50	<50
T23	72	<50	<50	<50	<50
T24	73	<50	<50	<50	<50
T25	77+78+79+84+85 <sup>△</sup>	<50	<50	<50	<50
T26	80	<50	<50	<50	<50
T27	81+96+99+100 <sup>△</sup>	<50	<50	<50	<50
T28	86+87+88+89+90 <sup>△</sup>	<50	<50	<50	<50
T29	93+106+112+114+117 <sup>△</sup>	<50	<50	<50	<50
T30	94	<50	<50	<50	<50
T31	101	<50	<50	<50	<50
T32	102	<50	<50	<50	<50
T33	108+111+133 <sup>△</sup>	<50	<50	<50	<50
T34	110	<50	<50	96	<50
T35	115	<50	<50	<50	<50
T36	116	<50	<50	<50	<50
T37	118+121+122+123+124 <sup>△</sup>	<50	<50	<50	<50
T38	127	<50	<50	<50	<50
T39	129	166	<50	<50	<50
T40	134	109	<50	<50	<50
T41	137	<50	<50	<50	<50





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**Note:**

- (1) “<” = less than
- (2) mg/kg = milligram per kilogram= ppm
- (3) Abbreviation:

“DBP” denotes Dibutyl phthalate, “BBP” denotes Benzyl butyl phthalate (BBP), “DEHP” denotes Bis(2-ethylhexyl)-phthalate, “DIBP” denotes Diisobutyl phthalate, “PHT” denotes Phthalates.

- (4) RoHS requirement

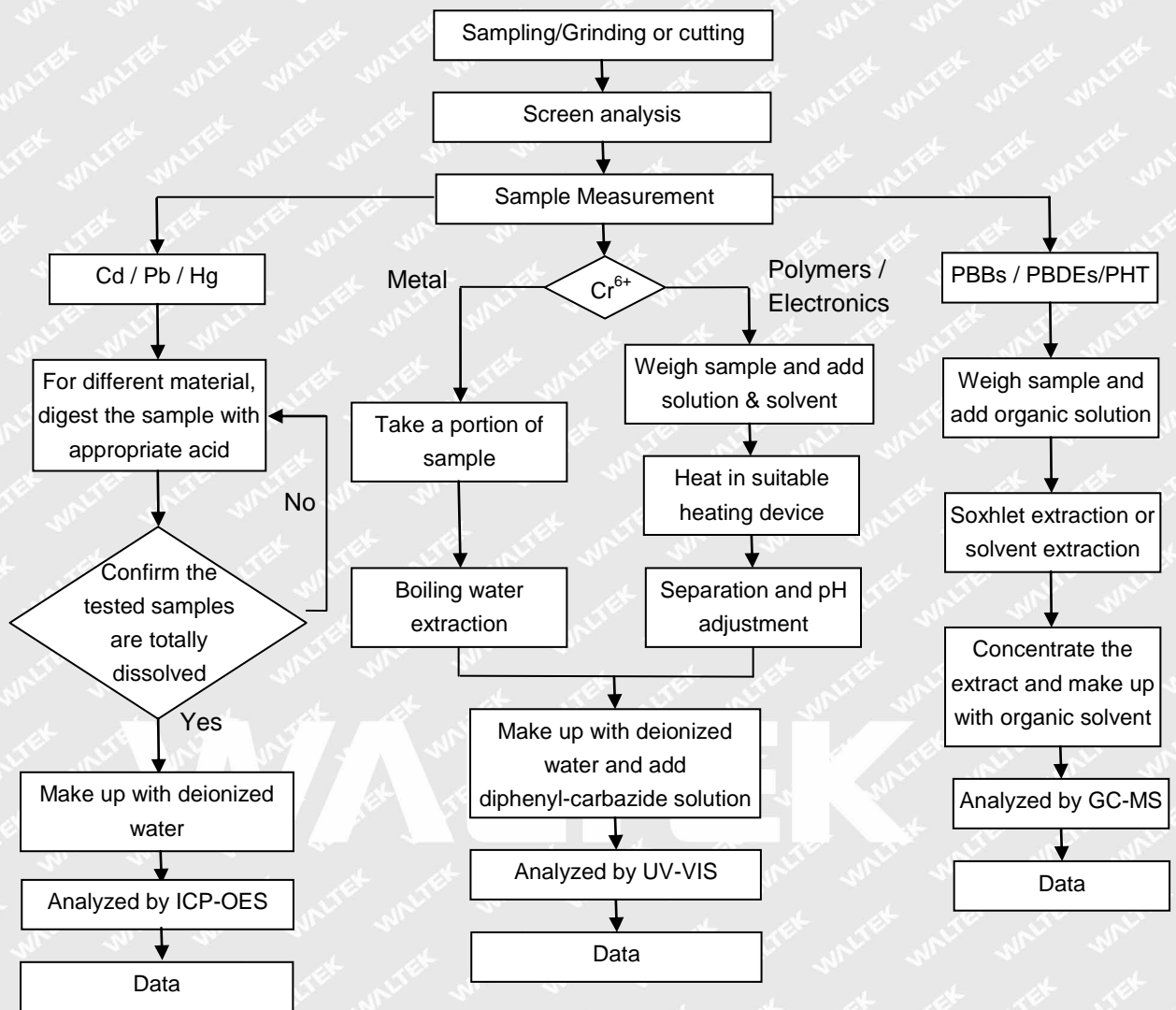
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

- (5) “△”= As client’s requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

# WALTEK



**Measurement Flowchart:**

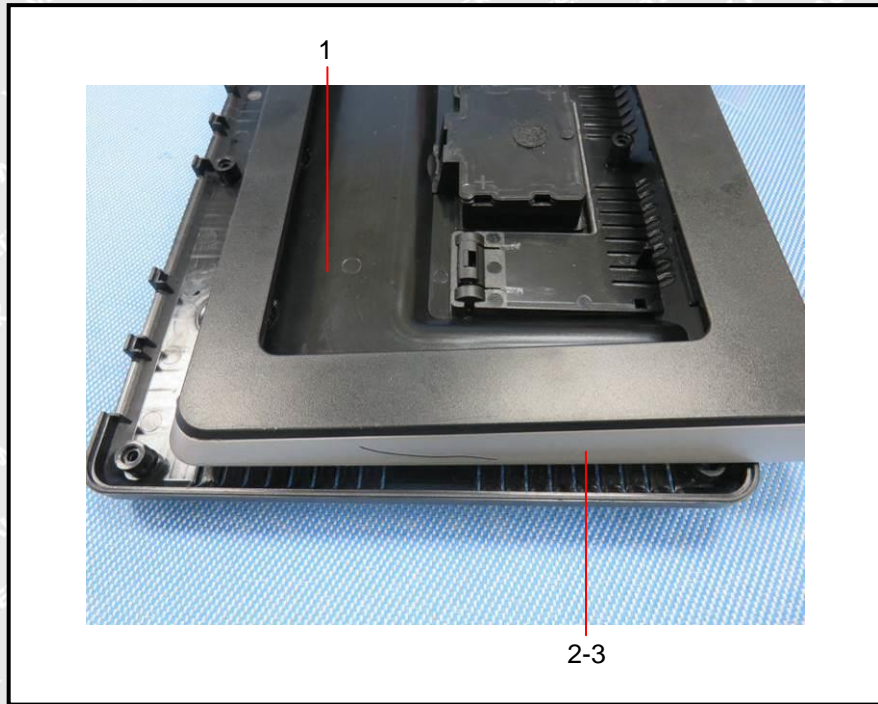


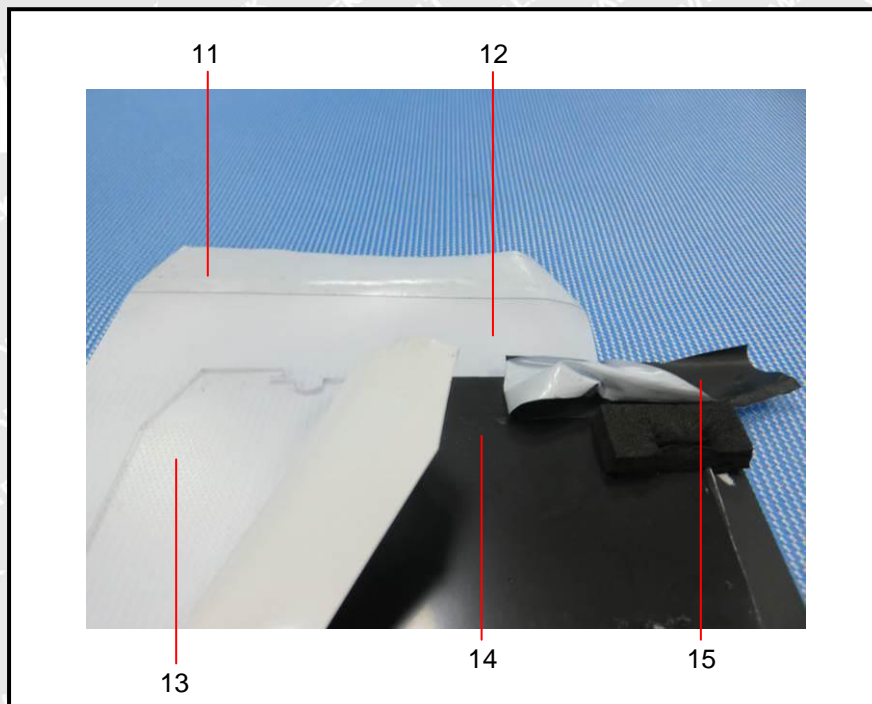
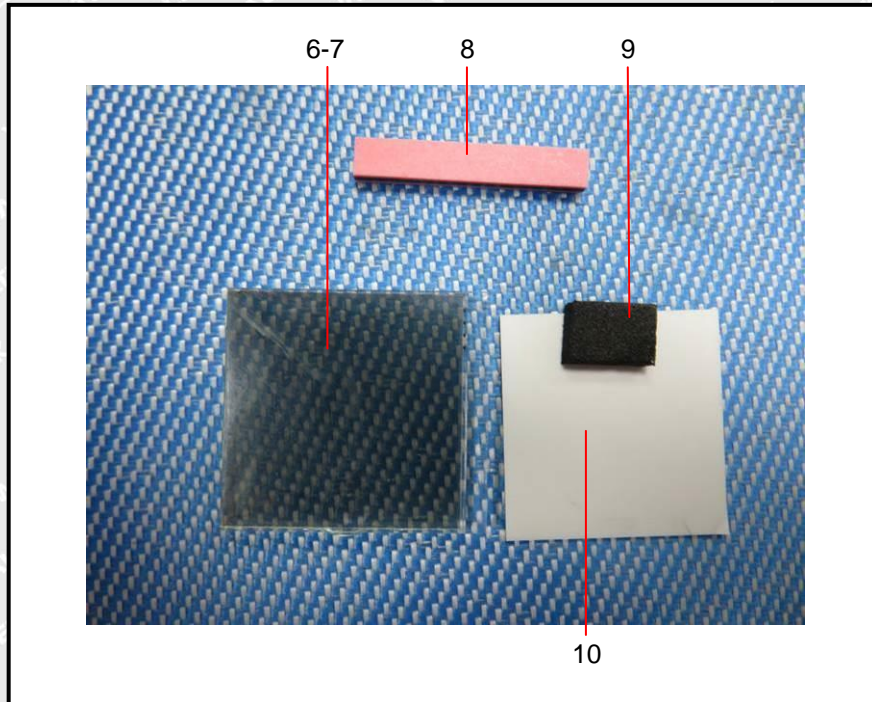




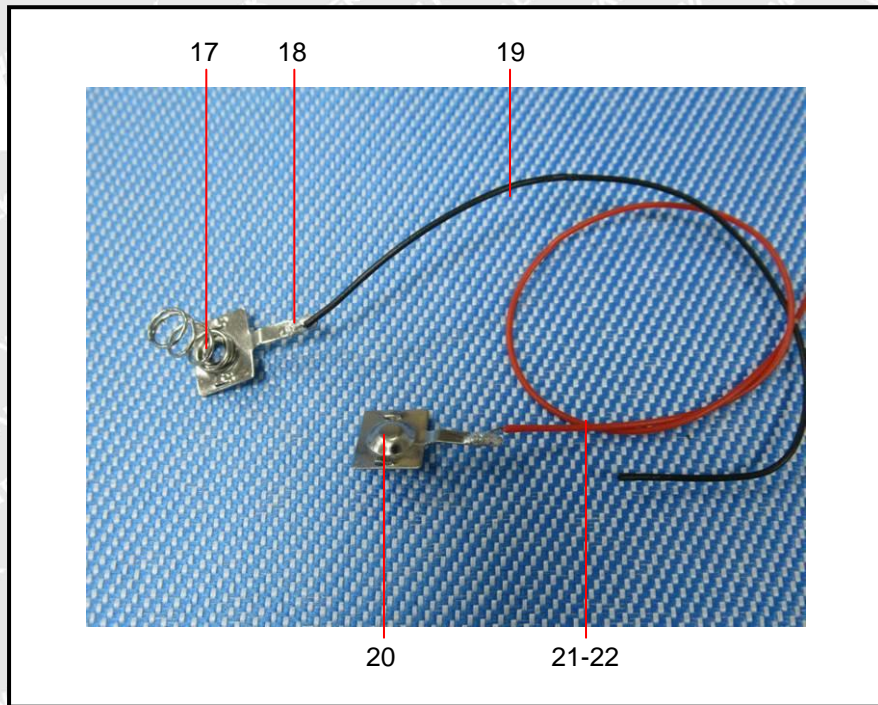
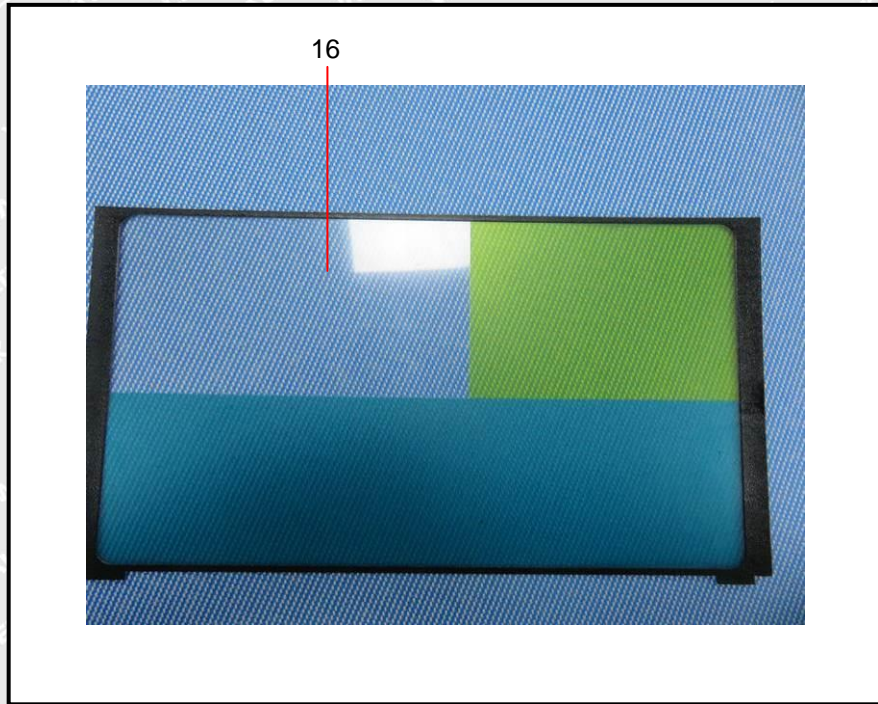
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**Photograph(s) of parts tested:**

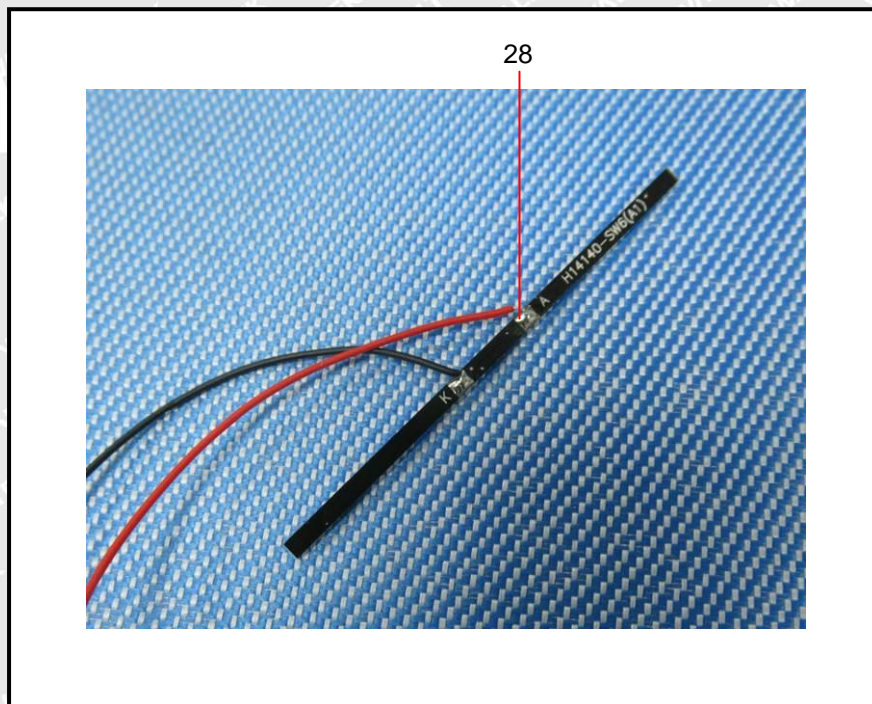
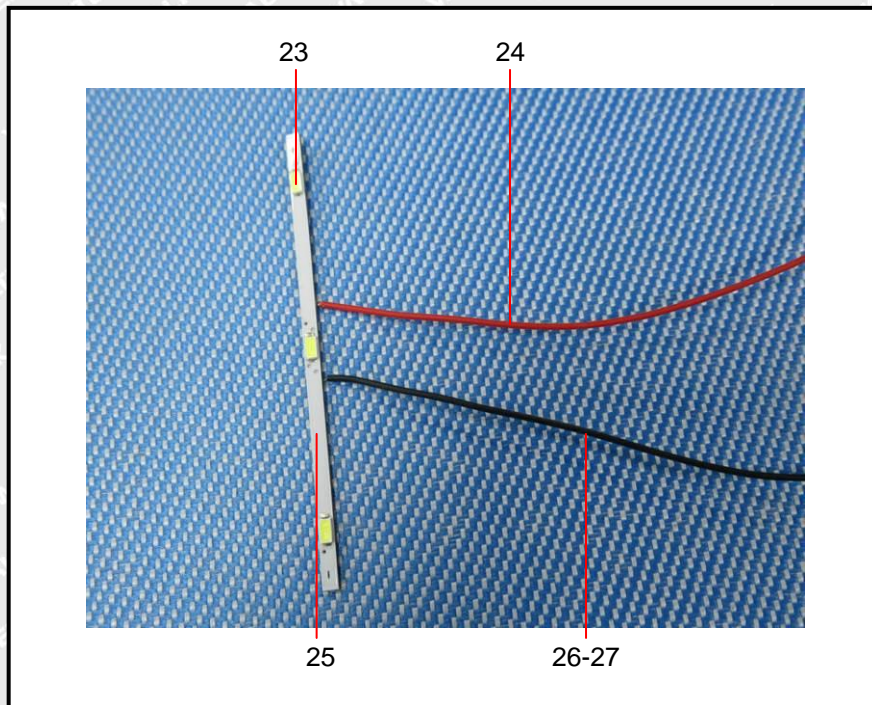




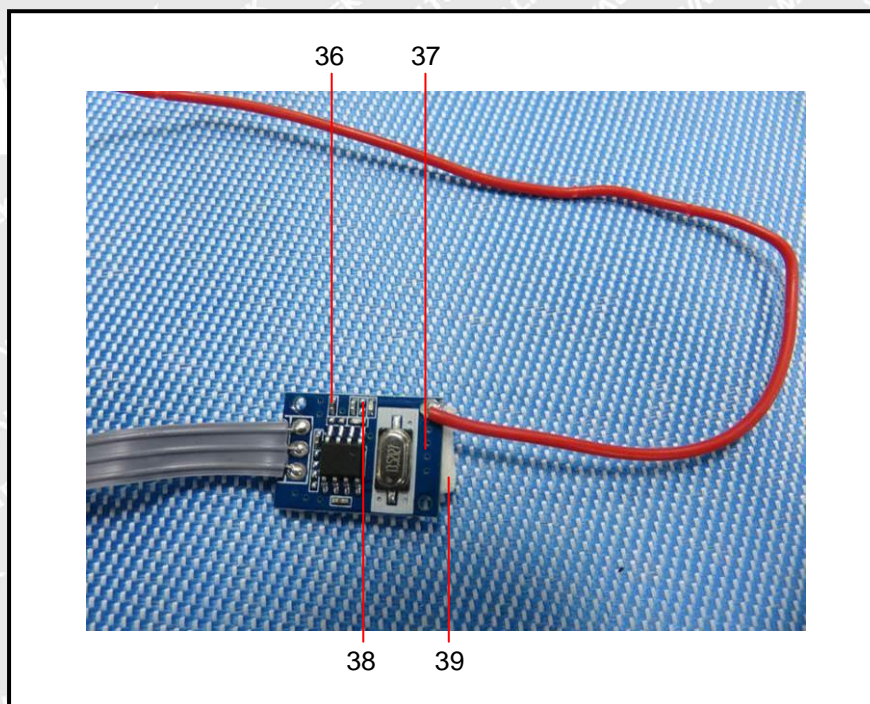
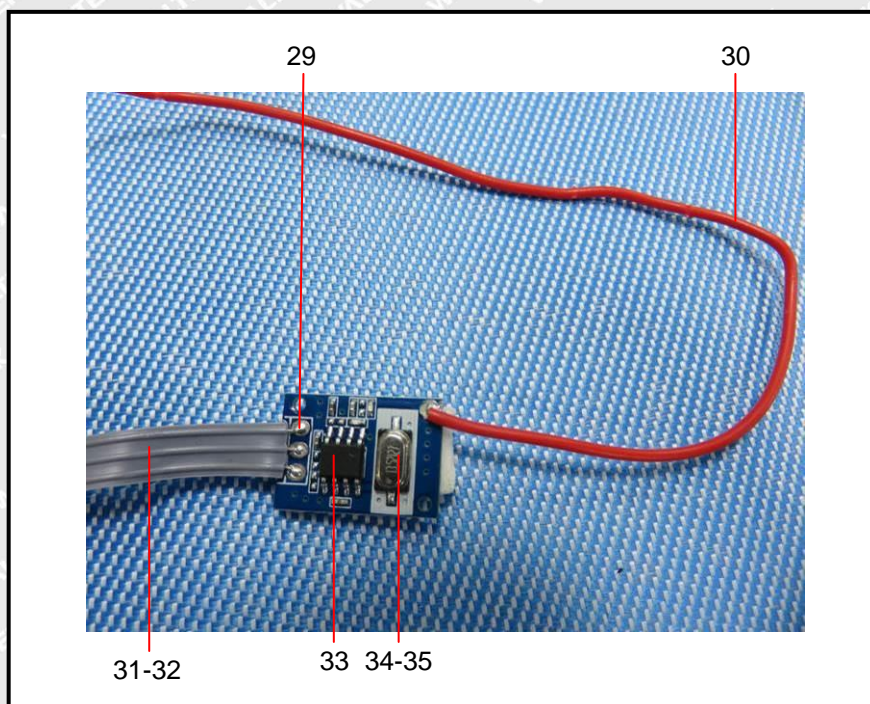




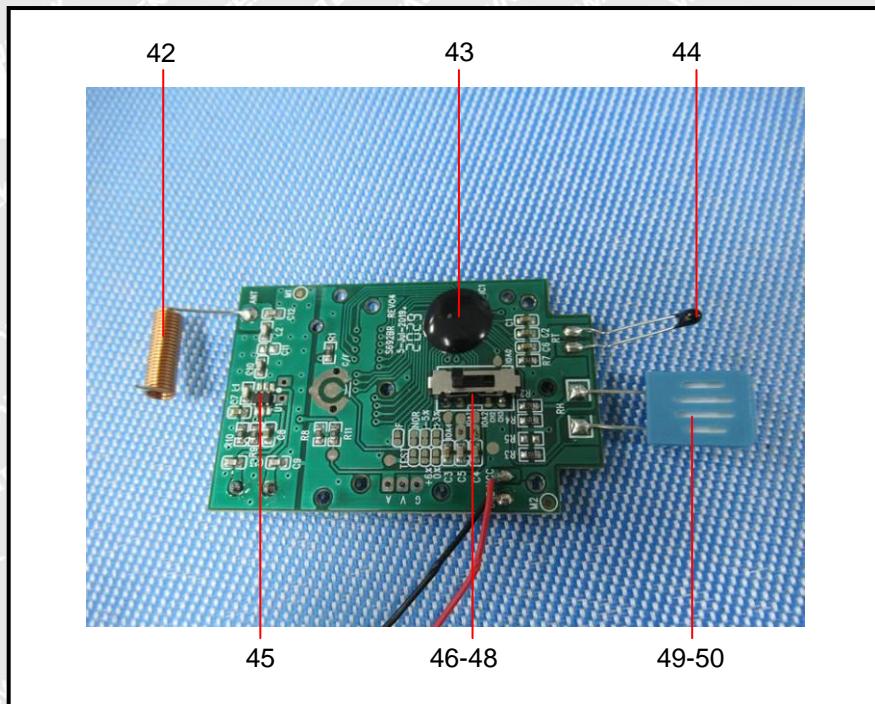
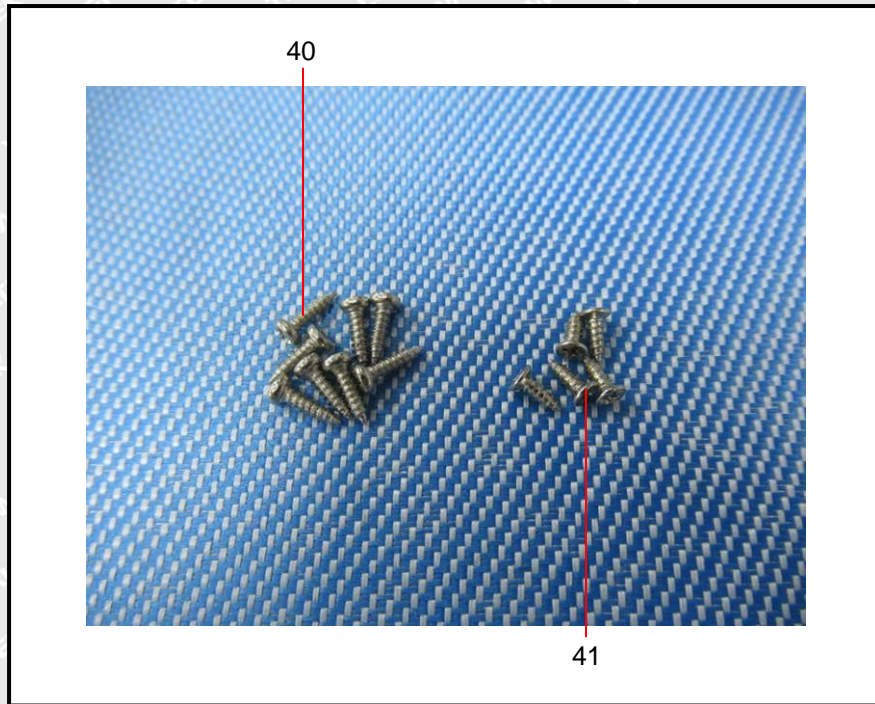




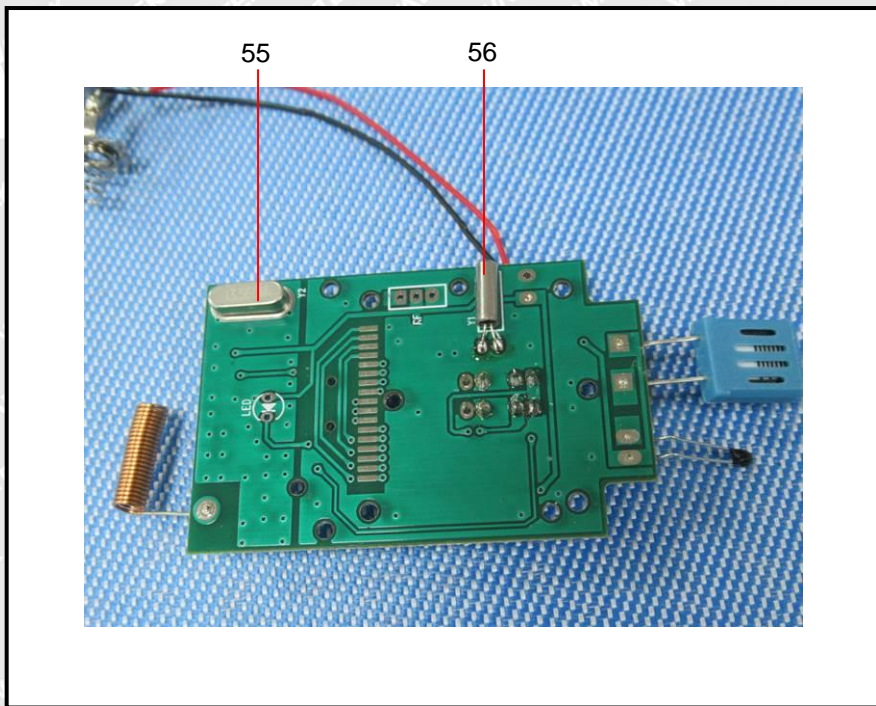
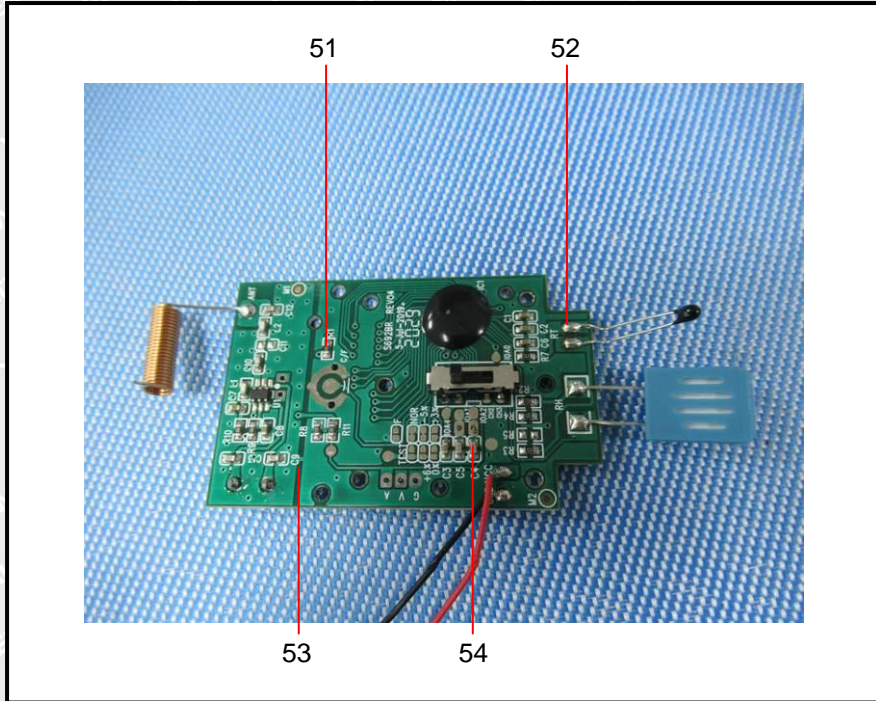




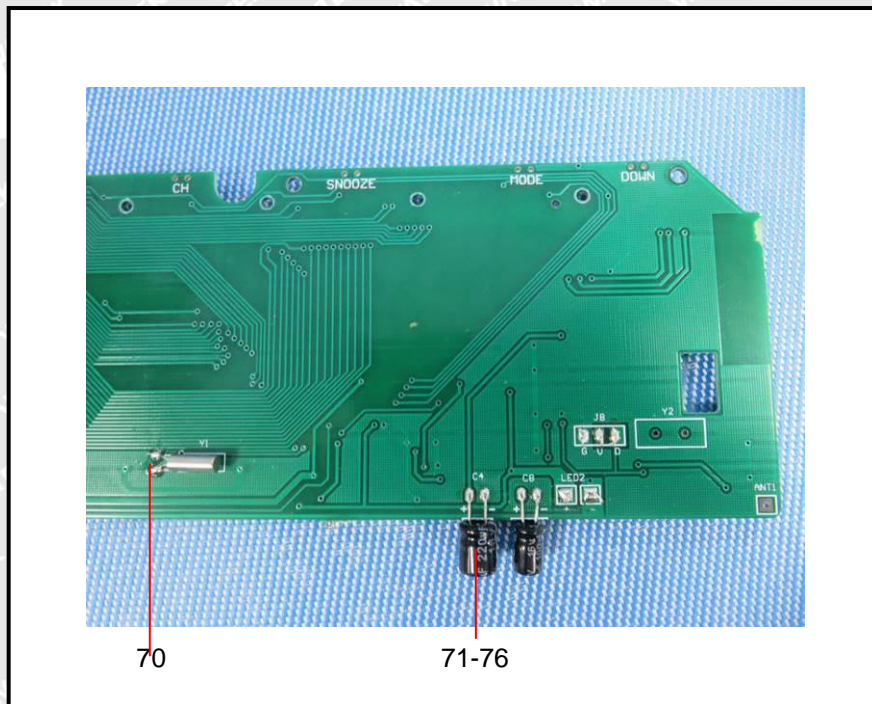
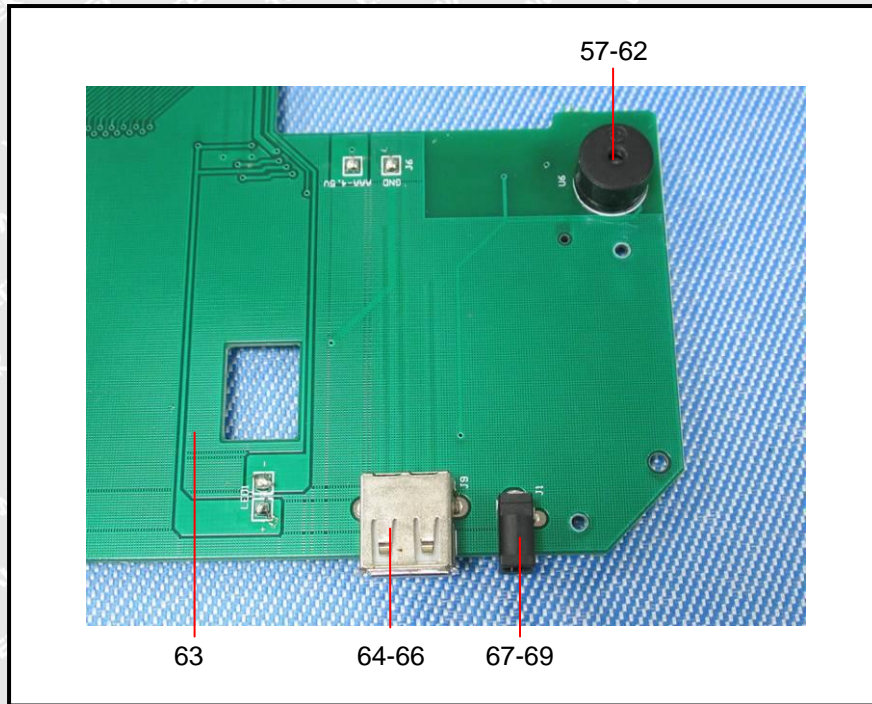




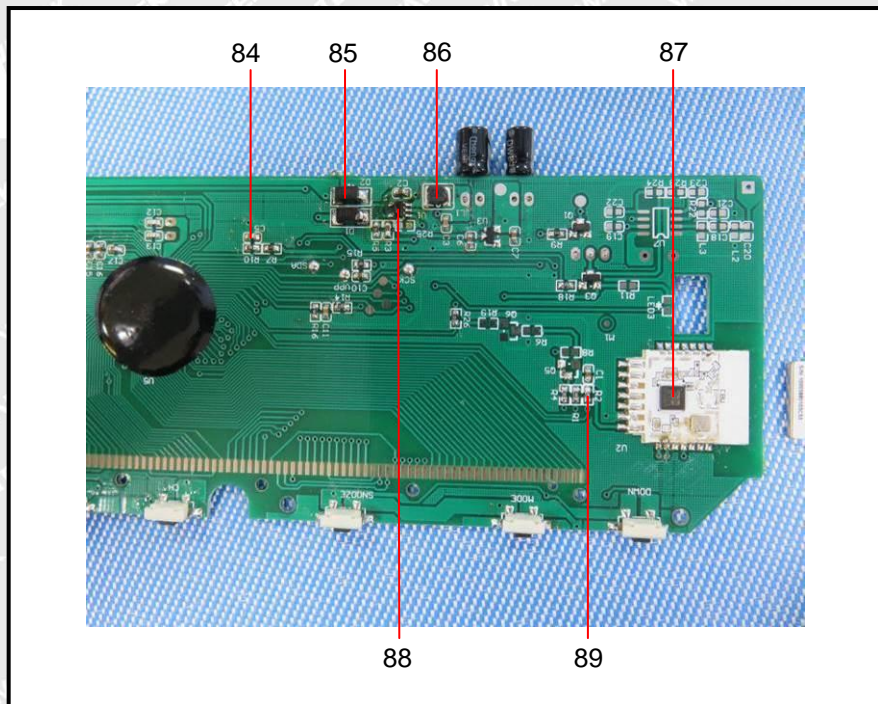
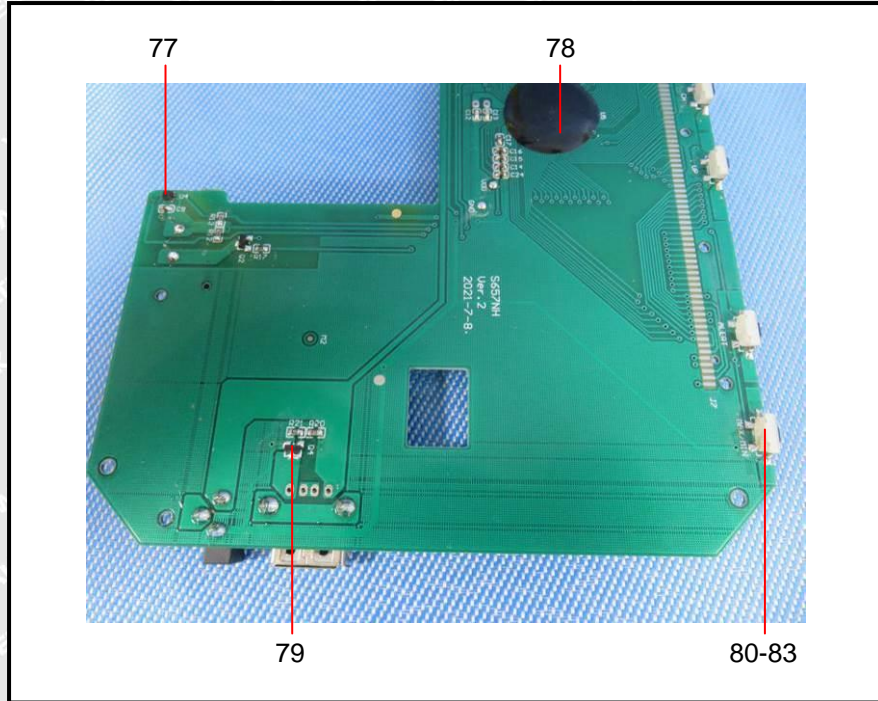


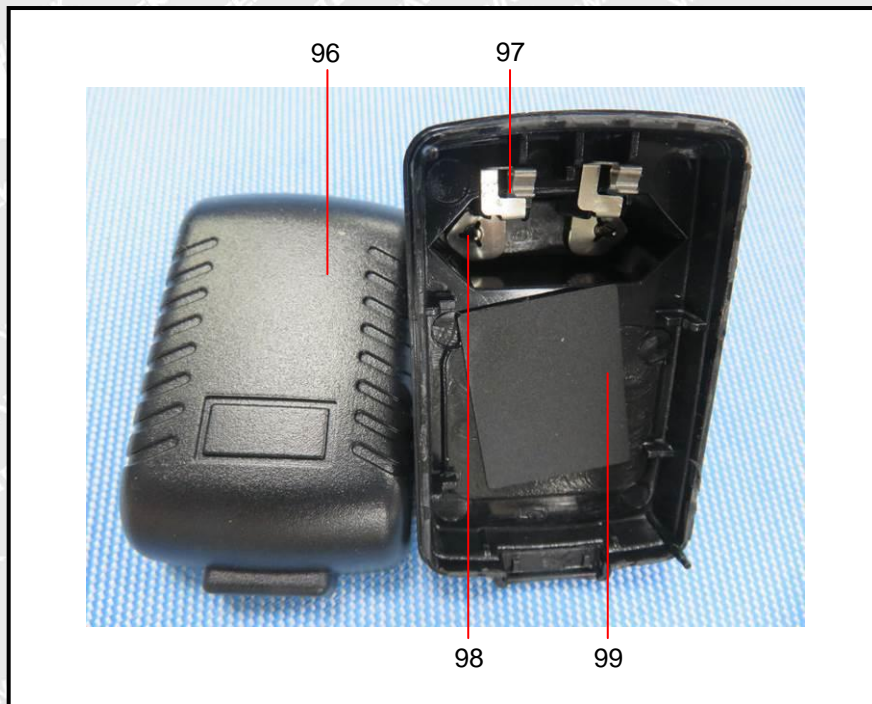
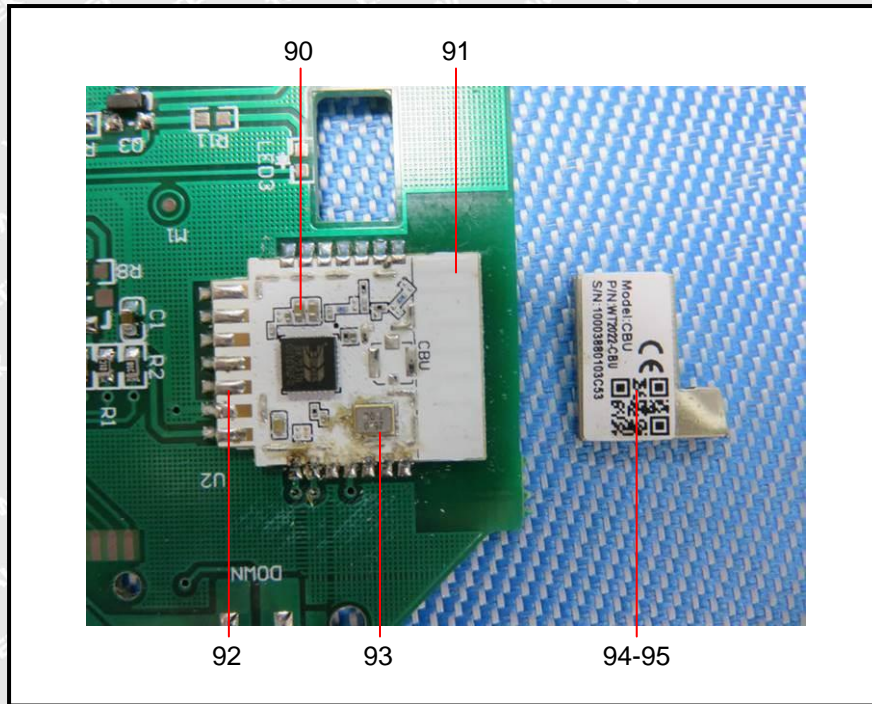




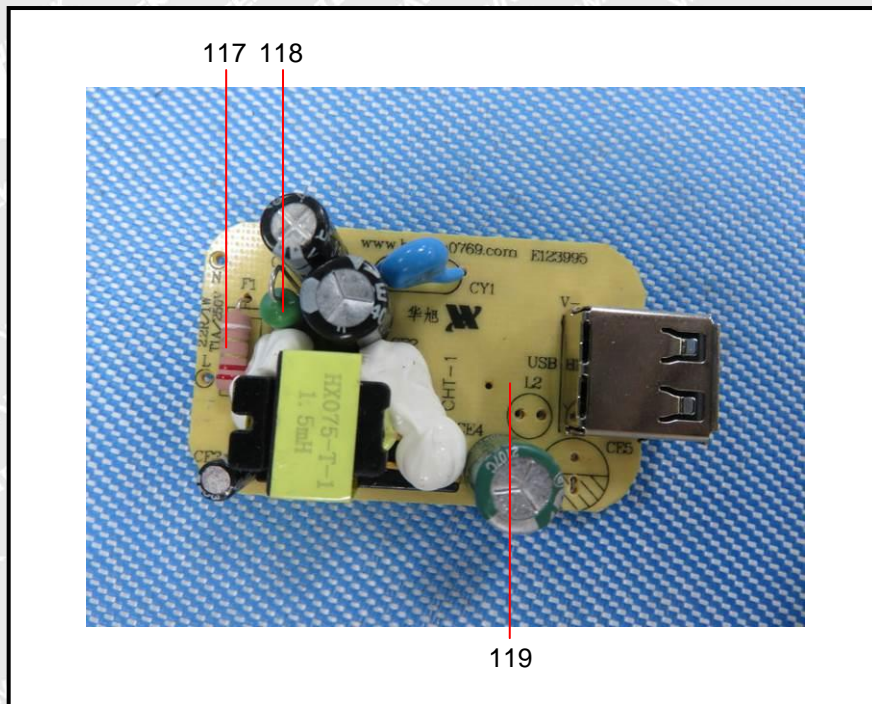
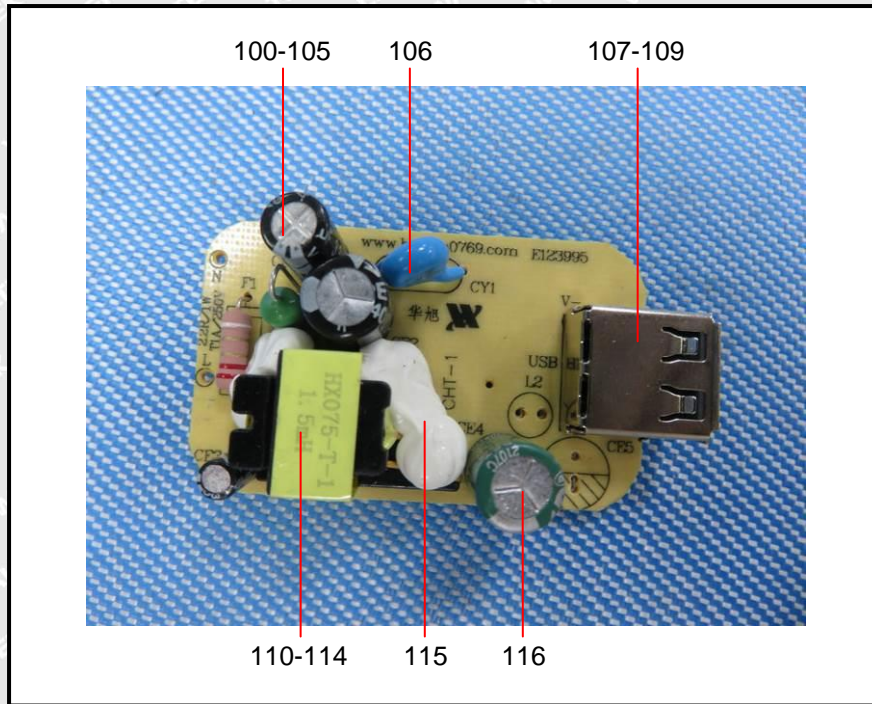




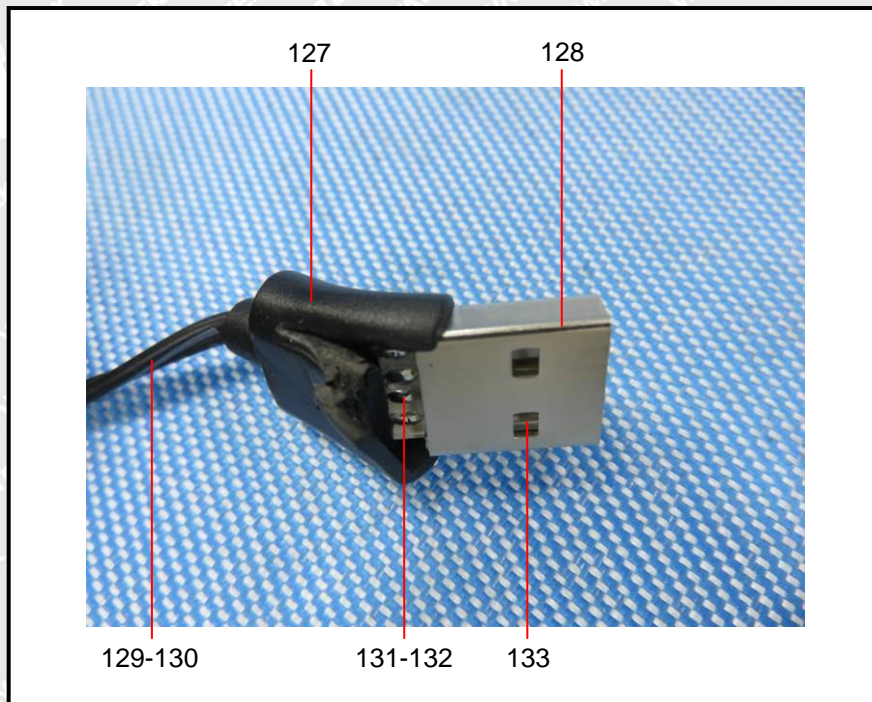
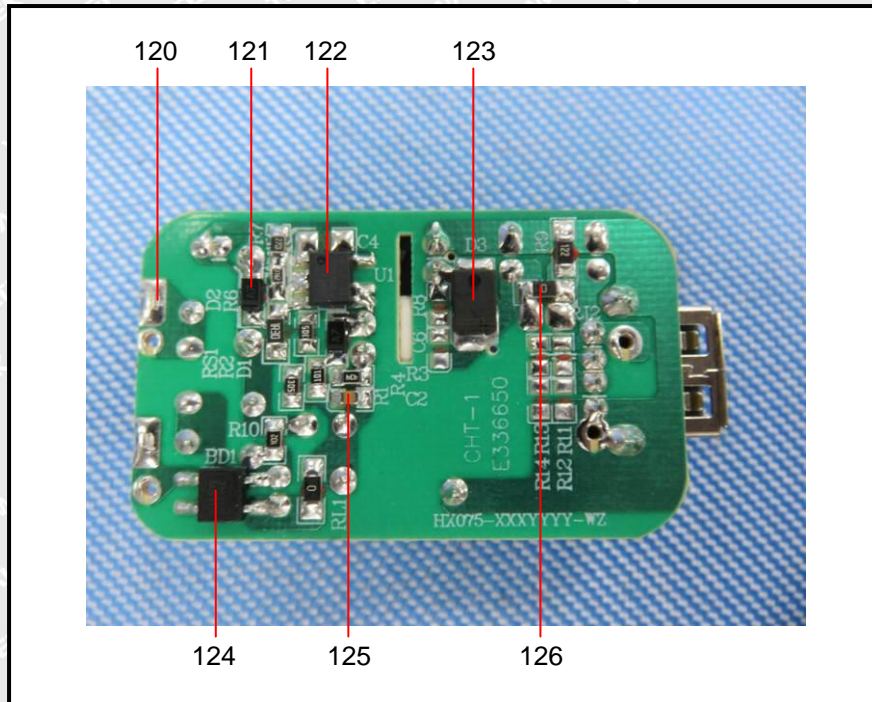




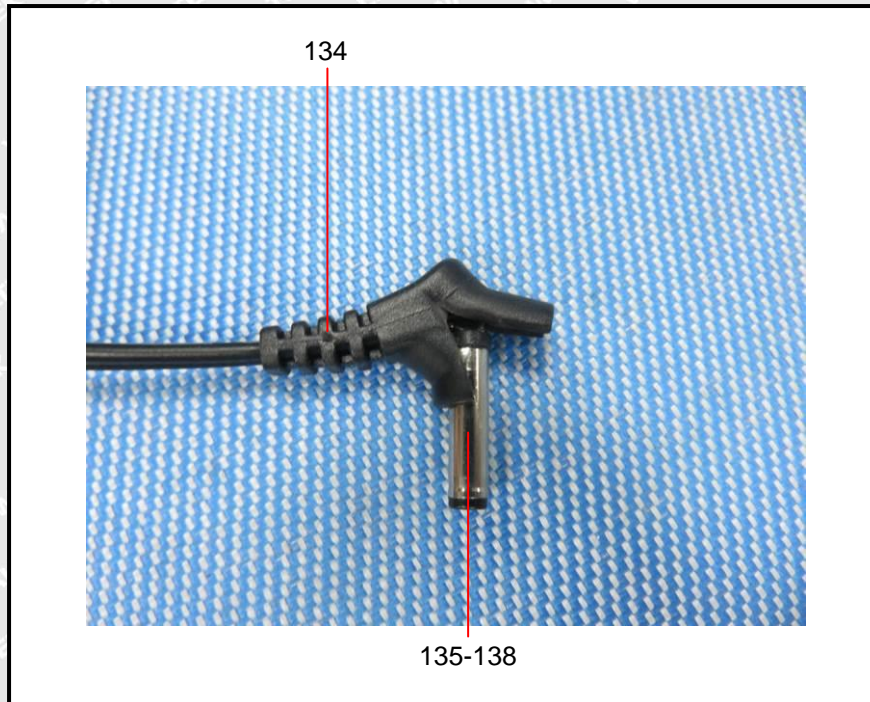












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===== End of Report =====