

Test Report

Report No.: AGC07090181201-001

Date: Jan.04, 2019

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Applicant:

Address:

Report on the submitted sample(s) said to be:

Sample Name: Power bank

Sample Model: F5

Sample Received Date: Dec.20, 2018

Testing Period: Dec.20, 2018 to Jan.04, 2019

Test site: 6/F., Building 2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Baoan District, Shenzhen, Guangdong, China

Test Requested: Please refer to following page(s).

Test Method: Please refer to following page(s).

Test Result: Please refer to following page(s).

Approved by: 

Liulinwen, Lewis

Technical Director



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Test Requested:

1. As specified by client, to determine Lead(Pb), Cadmium(Cd), Mercury(Hg) content accordance with European Directive 2006/66/EC and its amendments 2013/56/EU.
2. As specified by client, to determine the Pb, Cd, Hg, Cr⁶⁺, PBBs, PBDEs content in the submitted sample in accordance with EU RoHS Directive 2011/65/EU(RoHS) and its amendment directives on XRF and Chemical Method.

Conclusion
Pass
Pass
Test Methods:

A: Screening by X-ray Fluorescence Spectrometry (XRF) :With reference to IEC 62321-3-1:2013 Ed 1.0 Screening – Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry

B: Chemical test:

Test Item	Test Method	Measuring Instrument	MDL
Cadmium (Cd)	IEC 62321-5:2013 Ed 1.0	ICP-OES	2 mg/kg
Lead (Pb)	IEC 62321-5:2013 Ed 1.0	ICP-OES	2 mg/kg
Mercury (Hg)	IEC 62321-4:2013+A1:2017 Ed 1.1	ICP-OES	2 mg/kg
Non-metal Hexavalent Chromium (Cr ⁶⁺)	IEC 62321-7-2:2017 Ed 1.0	UV-Vis	1 mg/kg
Metal Hexavalent Chromium (Cr ⁶⁺)	IEC 62321-7-1:2015 Ed 1.0	UV-Vis	/
PBBs/PBDEs	IEC 62321-6:2015 Ed 1.0	GC-MS	5 mg/kg

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Test Results:
A、EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
1	Black plating	BL	BL	BL	BL	BL
2	Silver metal shell	BL	BL	BL	BL	-
3	Dark plastic frame	BL	BL	BL	BL	BL
4	Brown tape(battery)	BL	BL	BL	BL	BL
5	Barley paper(battery)	BL	BL	BL	BL	BL
6	Electric core(battery)	BL	BL	BL	BL	BL
7	Double faced adhesive tape(battery)	BL	BL	BL	BL	BL
8	Tin solder(battery)	BL	BL	BL	BL	-
9	Red wire jacket(battery)	BL	BL	BL	BL	BL
10	Black wire jacket(battery)	BL	BL	BL	BL	BL
11	Wire core(battery)	BL	BL	BL	BL	-
12	Magnetic plane inductance	BL	BL	BL	BL	BL
13	Tin solder	BL	OL*	BL	BL	-
14	PCB board	BL	BL	BL	BL	X*
15	IC body(IC)	BL	BL	BL	BL	BL
16	Tin plating pin(IC)	BL	BL	BL	BL	-
17	Chip capacitor	BL	BL	BL	BL	BL
18	Chip resistor	BL	BL	BL	BL	BL
19	Chip LED	BL	BL	BL	BL	BL
20	USB metal joint(USB joint)	BL	BL	BL	BL	-
21	Black plastic joint(USB joint)	BL	BL	BL	BL	BL
22	Contact pin(USB joint)	BL	BL	BL	BL	-
23	Micro metal joint(Micro joint)	BL	BL	BL	BL	-
24	Black plastic joint(Micro joint)	BL	BL	BL	BL	BL

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Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
25	Contact pin(Micro joint)	BL	BL	BL	BL	-
26	TYPE metal joint(TYPE-C joint)	BL	BL	BL	X*	-
27	Black plastic joint(TYPE-C joint)	BL	BL	BL	BL	BL
28	Contact pin(TYPE-C joint)	BL	BL	BL	BL	-
29	Black plastic button(touch switch)	BL	BL	BL	BL	BL
30	Silver metal sheet(touch switch)	BL	BL	BL	BL	-
31	Silvery metal shrapnel(touch switch)	BL	BL	BL	X*	-
32	Pin(touch switch)	BL	BL	BL	BL	-
33	White plastic(touch switch)	BL	BL	BL	BL	BL
34	Silver screw	BL	BL	BL	BL	-
35	Black wire	BL	BL	BL	BL	BL
USB data wire						
36	Black handle(USB plug)	BL	BL	BL	BL	BL
37	White plastic(USB plug)	BL	BL	BL	BL	BL
38	Meta contact pin(USB plug)	BL	BL	BL	BL	-
39	Tin solder(USB plug)	BL	BL	BL	BL	-
40	USB metal plug(USB plug)	BL	BL	BL	BL	-
41	Black outer wire jacket(wire rod)	BL	BL	BL	BL	BL
42	Black wire jacket(wire rod)	BL	BL	BL	BL	BL
43	Red wire jacket(wire rod)	BL	BL	BL	BL	BL
44	Wire core(wire rod)	BL	BL	BL	BL	-
45	Black plastic plug(Micro plug)	BL	BL	BL	BL	BL
46	Thimble(Micro plug)	BL	BL	BL	X*	-
47	Contact pin(Micro plug)	BL	BL	BL	BL	-
48	Micro metal plug(Micro plug)	BL	BL	BL	X*	-
Different						

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Seq. No.	Tested Part(s)	Results(mg/kg)				
		Cd	Pb	Hg	Cr	Br
49	Gray plating	BL	BL	BL	BL	BL
50	White outer wire jacket	BL	BL	BL	BL	BL
51	White wire	BL	BL	BL	BL	BL

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70-3\sigma < X$ $< 130+3\sigma \leq OL$	$BL \leq 70-3\sigma < X$ $< 130+3\sigma \leq OL$	$BL \leq 50-3\sigma < X$ $< 150+3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 500-3\sigma < X$ $< 1500+3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 700-3\sigma < X$ $< 1300+3\sigma \leq OL$	$BL \leq 500-3\sigma < X$ $< 1500+3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700-3\sigma < X$	$BL \leq 700-3\sigma < X$	$BL \leq 500-3\sigma < X$
Br	mg/kg	$BL \leq 300-3\sigma < X$	-	$BL \leq 250-3\sigma < X$

Note: BL= Below Limit

OL= Over limited

X= Inconclusive

“-“= Not regulated

*= Scanning by XRF and detected by chemical method. The test results of chemical method please refer to next pages.

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Remark:

- i Results were obtained by XRF for primary scanning, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the above warning value according to IEC 62321-3-1:2013 Ed 1.0.
- ii The XRF scanning test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- iii The maximum permissible limit is quoted from RoHS directive 2011/65/EU:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000

Disclaimers:

This XRF Scanning report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF scanning report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

B、The Test Results of Chemical Method:
1) The Test Results of Pb & Cd

Test Item(s)	Unit	Result(s)
		13
Lead(Pb)	mg/kg	216

Note: N.D. = Not Detected or less than MDL

mg/kg = parts per million

MDL = Method Detection Limit

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2)The Test Results of metal Cr⁶⁺

Test Item(s)	MDL	Result(s)				Limit
		26	31	46	48	
Hexavalent Chromium (Cr ⁶⁺)	See note	Negative	Negative	Negative	Negative	#

Note:

- Negative = Absence of Cr(VI) on the tested areas
- MDL = Method Detection Limit
- Boiling-water-extraction:

Number	Colorimetric result (Cr(VI) concentration)	Qualitative result
1	The sample solution is < the 0,10 µg/cm ² equivalent comparison standard solution	The sample is negative for Cr(VI) – The Cr(VI) concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
2	The sample solution is ≥ the 0,10 µg/cm ² and ≤ the 0,13 µg/cm ² equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination.
3	The sample solution is > the 0,13 µg/cm ² equivalent comparison standard solution	The sample is positive for Cr(VI) – The Cr(VI) concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).

- # = Negative indicates the absence of Cr(VI) on the tested areas concentration is below the limit of quantification. The coating is considered a non-Cr(VI) based coating.
- Uncertainty indicates the absence of Cr(VI) on the tested areas unavoidable coating variations may influence the determination.
- Positive indicates the presence of Cr(VI) on the tested areas concentration is above the limit of quantification and the statistical margin of error. The sample coating is considered to contain Cr(VI).
- Storage conditions and production date of the tested sample are unavailable and thus result of Cr(VI) represent status of the sample at the time of testing.

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3) The Test Results of PBBs & PBDEs

Unit: mg/kg

Item(s)	MDL	Result(s)	Limit
		14	
Polybrominated Biphenyls (PBBs)			
Monobromobiphenyl	5	N.D.	Total PBBs Content <1000
Dibromobiphenyl	5	N.D.	
Tribromobiphenyl	5	N.D.	
Tetrabromobiphenyl	5	N.D.	
Pentabromobiphenyl	5	N.D.	
Hexabromobiphenyl	5	N.D.	
Heptabromobiphenyl	5	N.D.	
Octabromobiphenyl	5	N.D.	
Nonabromodiphenyl	5	N.D.	
Decabromodiphenyl	5	N.D.	
Total content	/	N.D.	
Polybrominated Diphenylethers (PBDEs)			
Monobromodiphenyl ether	5	N.D.	Total PBDEs Content <1000
Dibromodiphenyl ether	5	N.D.	
Tribromodiphenyl ether	5	N.D.	
Tetrabromodiphenyl ether	5	N.D.	
Pentabromodiphenyl ether	5	N.D.	
Hexabromodiphenyl ether	5	N.D.	
Heptabromodiphenyl ether	5	N.D.	
Octabromodiphenyl ether	5	N.D.	
Nonabromodiphenyl ether	5	N.D.	
Decabromodiphenyl ether	5	N.D.	
Total content	/	N.D.	
Conclusion	/	Pass	/

Note: N.D. = Not Detected or less than MDL
 mg/kg = parts per million
 MDL = Method Detection Limit

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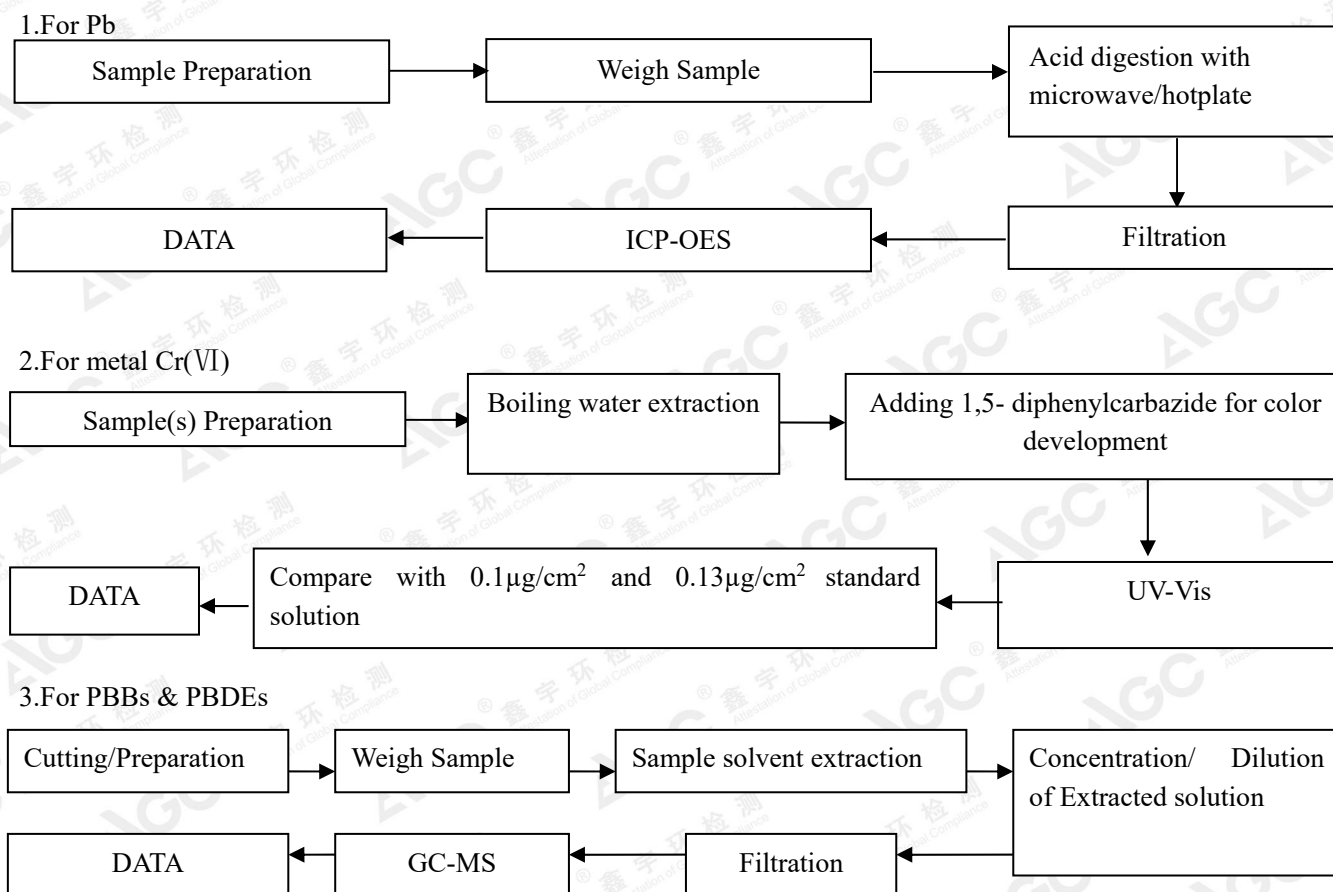
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Test Flow Chart



Test result on specimen No.16 was resubmitted sample on Jan.04, 2019.

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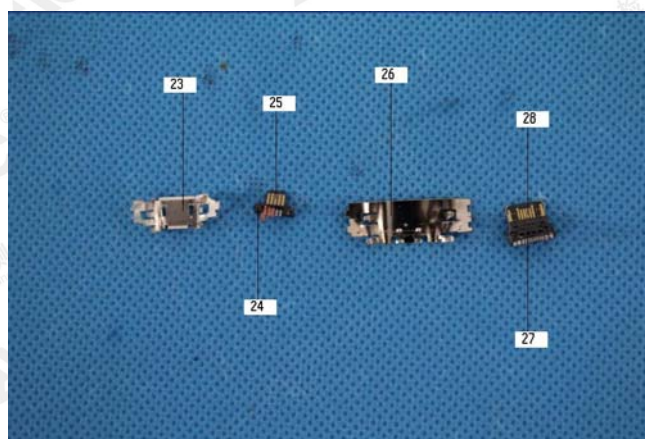
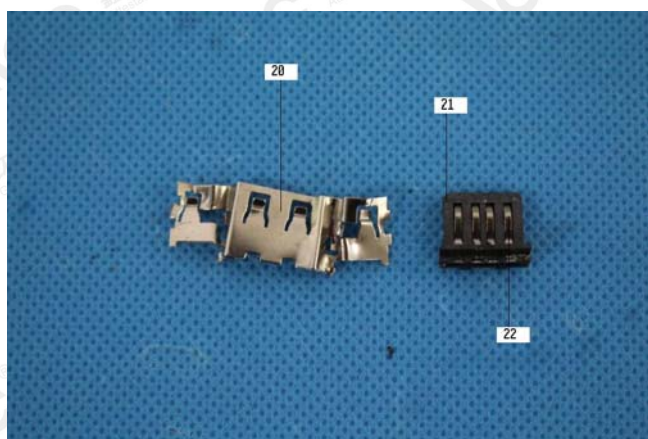
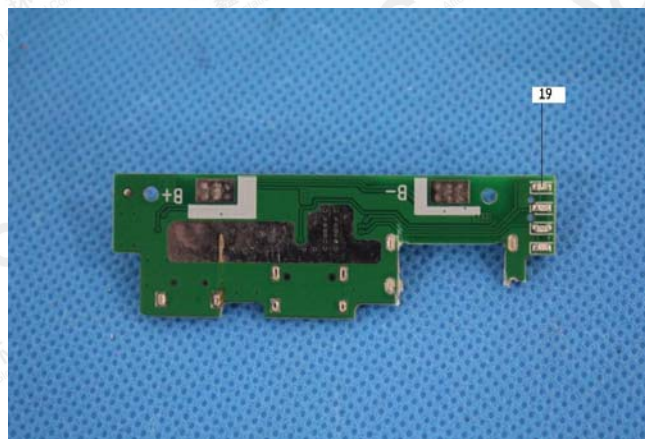
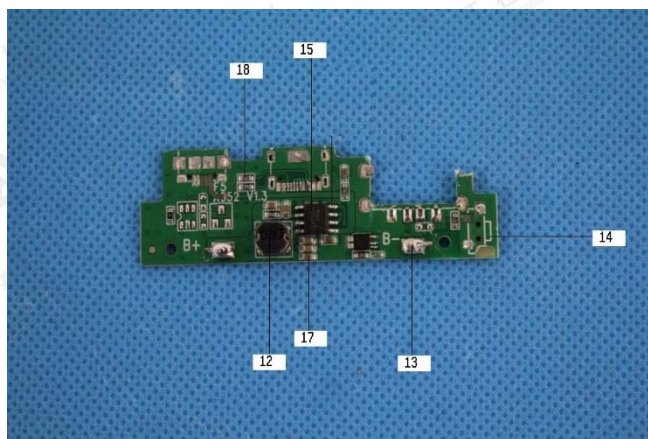
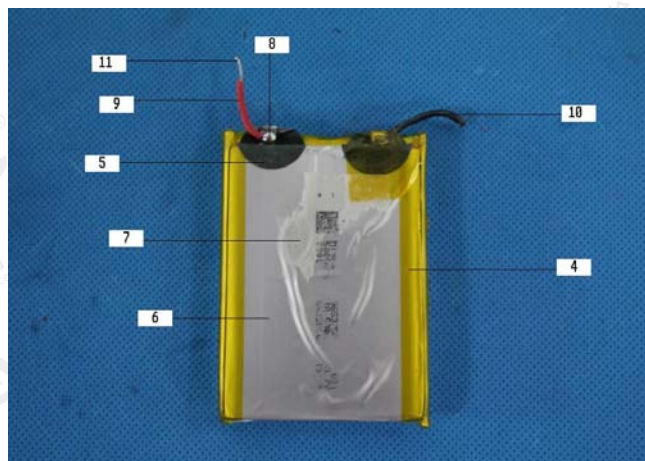
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The photo of the sample



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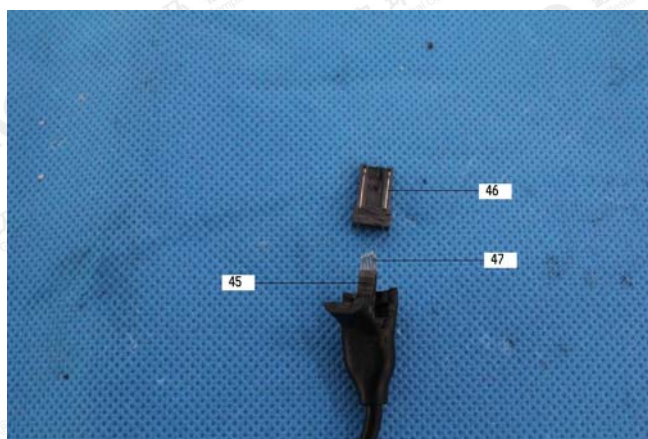
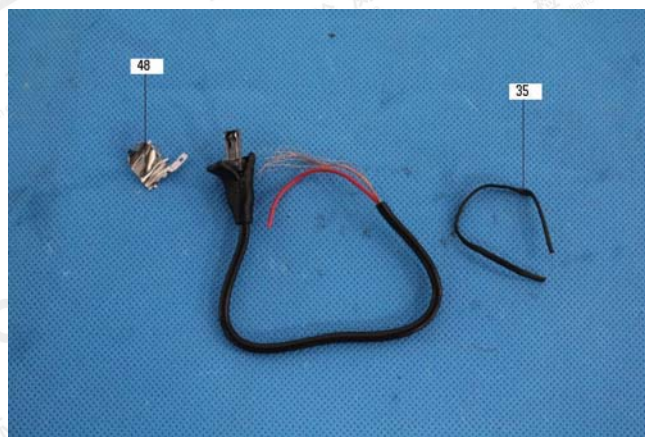
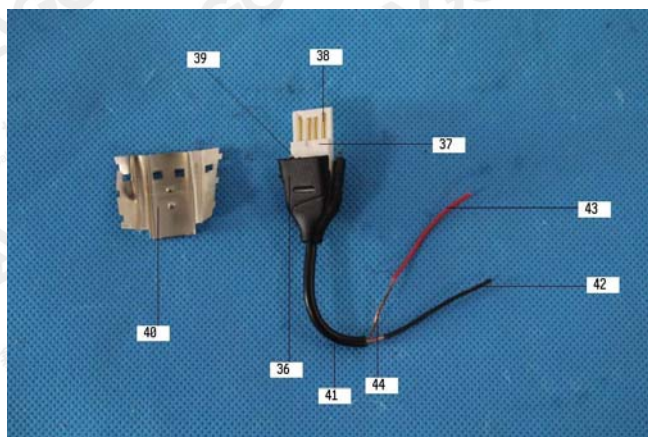
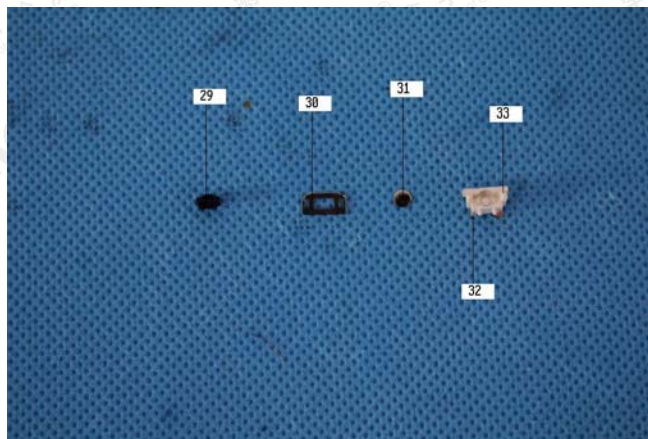
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