

## Test Report

Report No.: GNB190704233R2EN

Date: 2019-10-29

Page 1 of 13

Applicant : [REDACTED]

Address : [REDACTED]

Sample Name : Wireless Power bank

Tested Model : AST-WR078

Model/Type reference : AST-WR013, AST-WR048, AST-WR059, AST-WR060, AST-WR068, AST-WR069, AST-WR070, AST-WR071, AST-WR072, AST-WR073, AST-WR075, AST-WR076, AST-WR077, AST-WR079, AST-WR089, AST-WR090, AST-WR091, AST-WR093, AST-WR094, AST-WR095, AST-WR098, AST-WR100, AST-WR101, AST-WR910, AST-WR914, AST-WR925, AST-WR086, AST-WR070B, AST-WR094, AST-WR103, AST-WR041, AST-WR061, AST-WR065, AST-WR085, AST-WR086, AST-WR099, AST-WR111

Sample Receiving date: : 2019-07-04

Test period : 2019-07-04 – 2019-07-16

Test Requirement : The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, RoHS Directive 2011/65/EU and its amendment Directive (EU) 2015/863.

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

Test result : Please refer to next page(s).

Conclusion : Based on the verification results of the submitted sample(s), the results of Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(CrVI), Polybrominated biphenyls(PBBs), Polybrominated diphenyl ethers(PBDEs), Dibutyl phthalate(DBP), Butyl benzyl phthalate(BBP), Di-2-ethylhexyl phthalate(DEHP) and Di-iso-butyl phthalate(DIBP) content comply with the requirements as set by RoHS Directive 2011/65/EU and its amendment Directive (EU) 2015/863.

Note : The test results are related only to the tested items.

Authorized signature



Lab Manager: Gavin Zhou



2019-10-29

**A. Pb, Cd, Cr(VI), Hg, PBBs&PBDEs****Test Method:**

1. Disassembly, disjointment and mechanical sample preparation
  - Ref. to IEC 62321-2: 2013, Disassembly, disjointment and mechanical sample preparation.
2. With reference to IEC 62321-1: 2013, tests were performed for the samples indicated by the photos in this report.
  - (1) Screening – Lead, mercury, cadmium, total chromium and total bromine
    - Ref. to IEC 62321-3-1: 2013, Screening for Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry.
  - (2) Wet chemical test method
    - a. Total Lead, Cadmium, Chromium and Mercury content
      - Ref. to IEC 62321-4: 2013, determination of Mercury in polymers, metals and electronics by ICP-OES.
      - Ref. to IEC 62321-5: 2013, determination of Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by ICP-OES.
    - b. Chromium (VI) content
      - For Colourless and coloured corrosion-protected coatings on metals, Ref. to IEC 62321-7-1: 2015, determination of presence of hexavalent chromium (Cr(VI)) in colourless and coloured corrosion-protected coatings on metals by the colorimetric method.
      - For polymers and electronics, Ref. to IEC 62321-7-2: 2017, determination of hexavalent chromium (Cr(VI)) in polymers and electronics by the colorimetric method.
    - c. PBBs, PBDEs
      - Ref. to IEC 62321-6: 2015, determination of polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatography -mass spectrometry (GC-MS).

# Test Report

Report No.: GNB190704233R2EN

Date: 2019-10-29

Page 3 of 13

## Test result(s):

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	Transparent plastic	BL	BL	BL	BL	BL	---	Pass
2	Black plastic shell	BL	BL	BL	BL	BL	---	Pass
3	Grey plastic	BL	BL	BL	BL	BL	---	Pass
4	White plastic frame	BL	BL	BL	BL	BL	---	Pass
5-1	Silvery metal	BL	BL	BL	BL	---	---	Pass
5-2	Black plastic support	BL	BL	BL	BL	BL	---	Pass
5-3	Metal (pins)	BL	BL	BL	BL	---	---	Pass
5-4	Soldering tin (wiring)	358 (BL)	BL	BL	BL	---	---	Pass
6	White wire sheath	BL	BL	BL	BL	BL	---	Pass
7	Blue metal wire	BL	BL	BL	BL	---	---	Pass
8	Red metal wire	BL	BL	BL	BL	---	---	Pass
9	Red wire sheath	BL	BL	BL	BL	BL	---	Pass
10	Silvery metal	BL	BL	BL	BL	---	---	Pass
11	Black wire sheath	BL	BL	BL	BL	BL	---	Pass
12	Black foam	BL	BL	BL	BL	BL	---	Pass
13	Yellow tape	BL	BL	BL	BL	BL	---	Pass
14-1	Silvery metal	BL	BL	BL	BL	---	---	Pass
14-2	Black plastic support	BL	BL	BL	BL	BL	---	Pass
14-3	Metal (pins)	BL	BL	BL	BL	---	---	Pass
15	Soldering tin (wiring)	136 (BL)	BL	BL	BL	---	---	Pass
16	Black plastic (inner support)	BL	BL	BL	BL	BL	---	Pass
17	Metal (pins)	BL	BL	BL	BL	---	---	Pass
18	LED light	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
19	SMD chip (IC)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
20	Inductor	BL	BL	BL	BL	BL	---	Pass
21	SMD diode	BL	BL	BL	BL	BL	---	Pass
22	SMD chip (IC)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
23	Soldering tin (SMD)	190 (BL)	BL	BL	BL	---	---	Pass

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# Test Report

Report No.: GNB190704233R2EN

Date: 2019-10-29

Page 4 of 13

Part No.	Part Description	Results of EDXRF					Chemical confirmation results (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
24-1	Black plastic button (switch)	BL	BL	BL	BL	BL	---	Pass
24-2	Silvery metal cover	BL	BL	BL	BL	---	---	Pass
24-3	Metal (reed)	BL	BL	BL	BL	---	---	Pass
24-4	White plastic shell	BL	BL	BL	BL	BL	---	Pass
25	SMD audion	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
26	SMD resistor	BL	BL	BL	BL	BL	---	Pass
27	SMD capacitor	BL	BL	BL	BL	BL	---	Pass
28	PCB board	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
29	Magnet	BL	BL	BL	BL	---	---	Pass
30	Copper wire	BL	BL	BL	BL	---	---	Pass
31	Pink textile sheath	BL	BL	BL	BL	BL	---	Pass
32	Green plastic	BL	BL	BL	BL	BL	---	Pass
33	Sensor	BL	BL	BL	BL	BL	---	Pass
34	Black wire sheath	BL	BL	BL	BL	BL	---	Pass
35	Silvery metal (USB)	BL	BL	BL	IN	---	Cr(VI): Negative	Pass
36	Metal (pins)	BL	BL	BL	BL	---	---	Pass
37	Soldering tin	129 (BL)	BL	BL	BL	---	---	Pass
38	White plastic support	BL	BL	BL	BL	BL	---	Pass
39	Black plastic frame	BL	BL	BL	BL	BL	---	Pass
40	Black wire casing	BL	BL	BL	BL	BL	---	Pass
41	Yellow wire sheath	BL	BL	BL	BL	BL	---	Pass
42	Copper wire	BL	BL	BL	BL	---	---	Pass
43	Pink wire sheath	BL	BL	BL	BL	BL	---	Pass
44	Silvery metal	BL	BL	BL	BL	---	---	Pass
45	Metal (pins)	BL	BL	BL	BL	---	---	Pass
46	Black plastic support	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	Pass
47	Soldering tin	322 (BL)	BL	BL	BL	---	---	Pass
48	White plastic shell	BL	BL	BL	BL	BL	---	Pass
49	White plastic frame	BL	BL	BL	BL	BL	---	Pass
50	White wire casing	BL	BL	BL	BL	BL	---	Pass

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## Remark:

(^1) “---”= Not Applicable;

(^2) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr(VI).

(b) The XRF screening test for RoHS elements-The reading may be different to the actual content in the sample be of non-uniformity composition.

(c) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Pb、Cd、Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1: 2013.

Attached table 1, XRF screening limits in mg/kg for regulated elements in various matrices:

Element	Polymer Materials	Metallic Materials	Electronics
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (250+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	N.A.	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

Note: ① BL “below limit” = the result less than the limit.

② OL “over limit” = the result greater than the limit.

③ IN = inconclusive, the region where need further chemical testing by ICP-OES (for Pb、Cd、Hg), UV-VIS (for Cr(VI)) and GC/MSD (for PBBs, PBDEs).

④  $3\sigma$  = Repeability of the analyser at the action level.

⑤ LOD = Limit of detection.

(^3) (a) mg/kg=ppm=0.0001%;

(b) N.D. = Not detected (lower than RL);

(c) Reporting Limit (RL) and Limit of Directive 2011/65/EU.

Parameter	Unit	Limit	Reporting Limit (RL)
Lead (Pb)	mg/kg	1000	10
Cadmium (Cd)	mg/kg	100	10
Mercury (Hg)	mg/kg	1000	10
Chromium VI (Cr VI)	mg/kg	1000	R1
Group PBBs	mg/kg	1000	R2
Group PBDEs	mg/kg	1000	R2

R1: Cr(VI) for metal sample, the reporting limit (RL)= Method Detection Limit (MDL)=0.10 ug/cm<sup>2</sup>.

The reporting limit (RL) of Cr(VI) for polymers and electronics is 10mg/kg.

R2: The reporting limit (RL) for single compound of PBBs & PBDEs is 50mg/kg.

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- (d) According to IEC 62321-7-1: 2015, result on Cr(VI) for metal sample is shown as Negative, Inconclusive or Positive: Negative = Absence of Cr(VI), Inconclusive = Maybe exist Cr(VI), Positive = Presence of Cr(VI).

Colorimetric result (Cr(VI) concentration)	Qualitative result
The sample solution is < the 0.10 ug/cm <sup>2</sup> 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.
The sample solution is ≥ the 0.10 ug/cm <sup>2</sup> and ≤ the 0.13 ug/cm <sup>2</sup> equivalent comparison standard solutions	The result is considered to be inconclusive – Unavoidable coating variations may influence the determination. Recommendation: if addition samples are available, perform a total of 3 trials to increase sampling surface area. Use the averaged result of the 3 trials for the final determination.
The sample solution is > the 0.13 ug/cm <sup>2</sup> 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)

ORIGINAL

# Test Report

Report No.: GNB190704233R2EN

Date: 2019-10-29

Page 7 of 13

## B. Phthalates—DBP, BBP, DEHP & DIBP

**Test Method:** Ref. to IEC 62321-8: 2017

Determination of Phthalates in polymers by Gas Chromatography-Mass Spectrometry (GC-MS)

### Test result:

Test item	DBP	BBP	DEHP	DIBP
Maximum Permissible Limit (mg/kg)	1000	1000	1000	1000

Material No.	Test item (mg/kg)				Conclusion
	DBP	BBP	DEHP	DIBP	
1	N.D.	N.D.	N.D.	N.D.	Pass
2+3+48	N.D.	N.D.	N.D.	N.D.	Pass
4	N.D.	N.D.	N.D.	N.D.	Pass
6	180	N.D.	N.D.	N.D.	Pass
9+11+34	N.D.	N.D.	N.D.	N.D.	Pass
12	N.D.	N.D.	N.D.	N.D.	Pass
13	N.D.	N.D.	N.D.	N.D.	Pass
16+38	N.D.	N.D.	N.D.	N.D.	Pass
28	N.D.	N.D.	N.D.	N.D.	Pass
31	N.D.	N.D.	N.D.	N.D.	Pass
32	N.D.	N.D.	N.D.	N.D.	Pass
39	N.D.	N.D.	250	N.D.	Pass
40+50	N.D.	N.D.	N.D.	N.D.	Pass
41+43	N.D.	N.D.	N.D.	N.D.	Pass
49	N.D.	N.D.	N.D.	N.D.	Pass

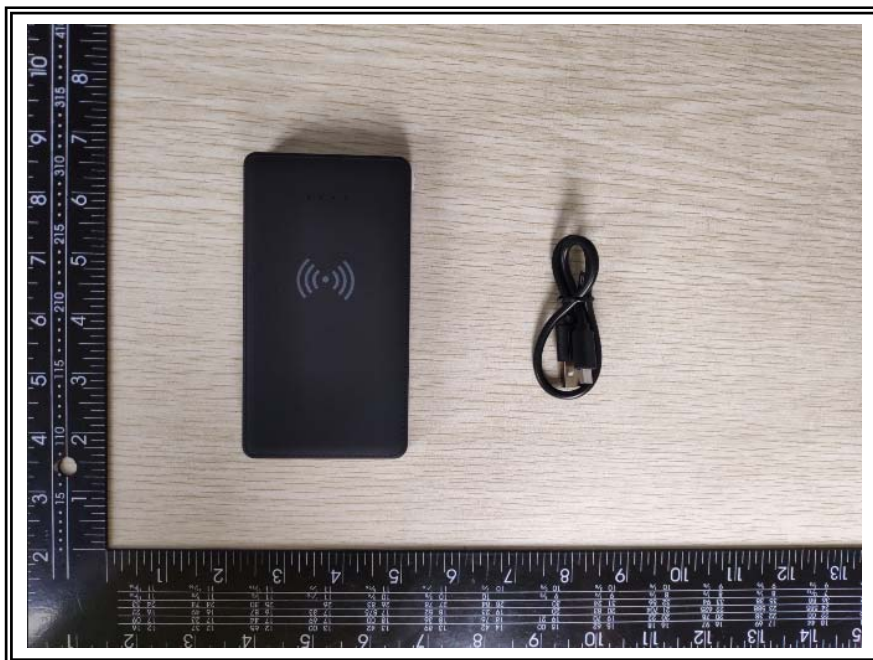
Remark: 1. Reporting Limit (RL) for BBP, DBP, DEHP, DIBP=50mg/kg.  
2. N.D. = Not Detected (<RL).

**Remark:** This report replaces the report No.GNB190704233R1EN, Date: 2019-09-24.

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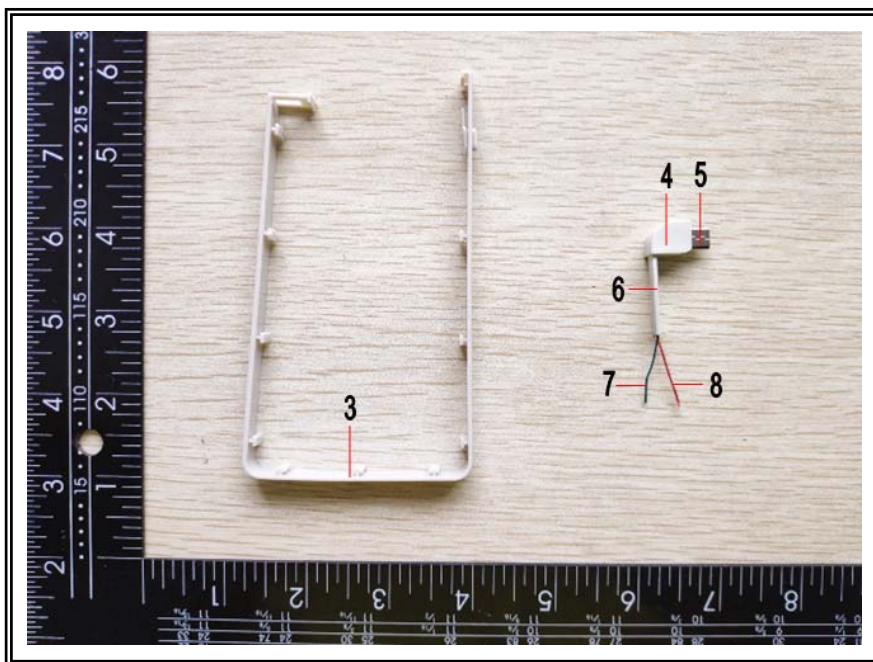


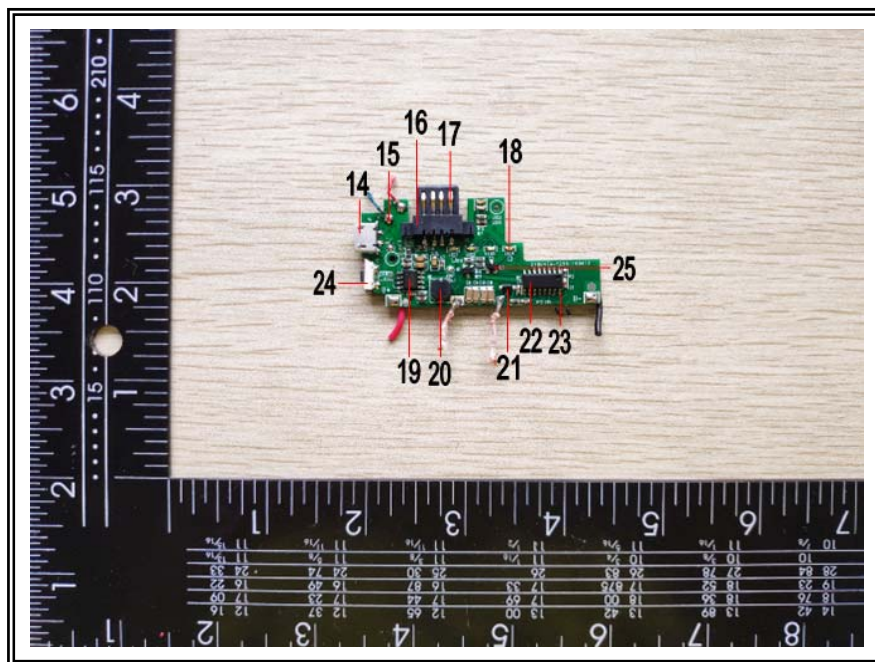
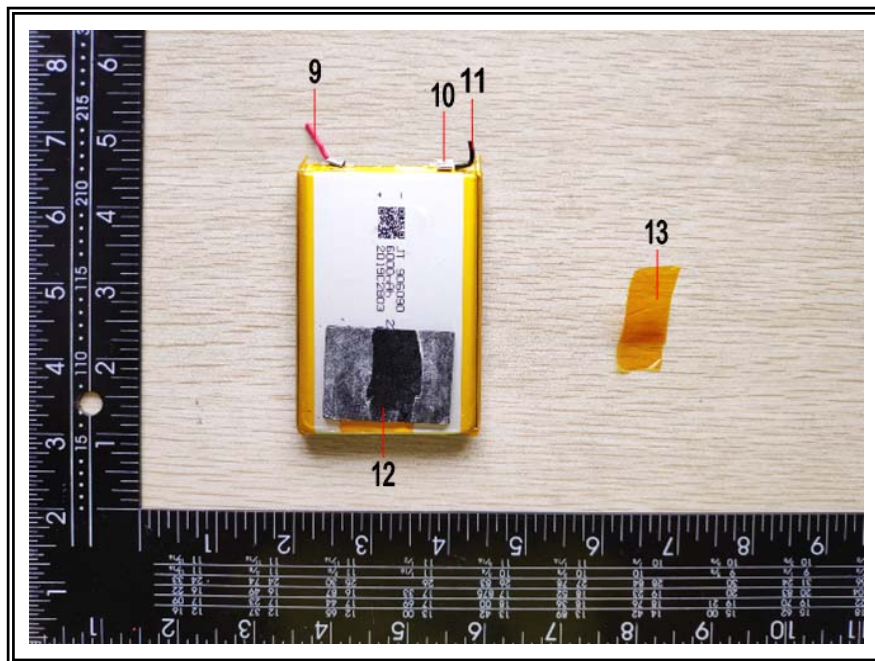
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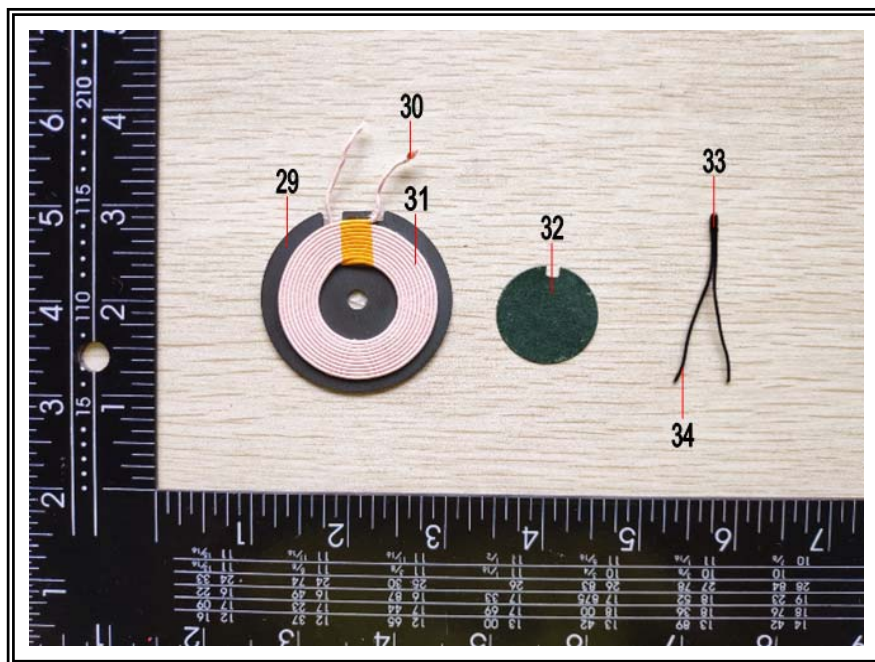
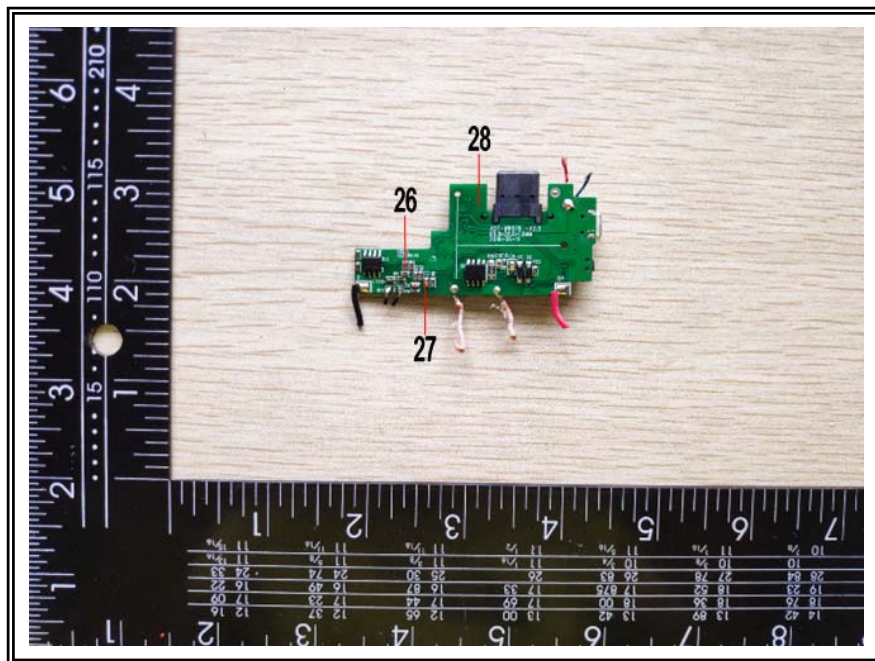


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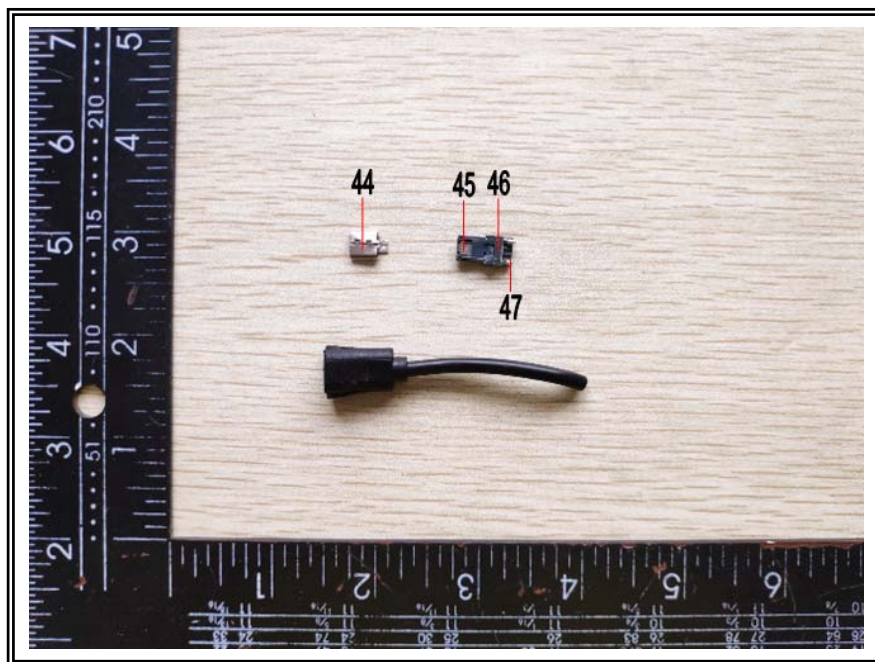
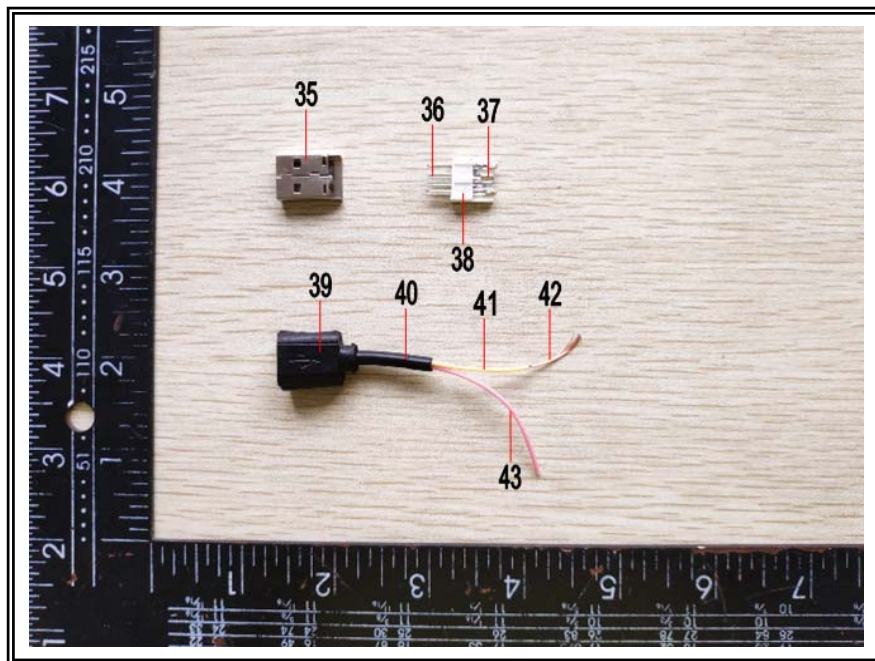






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