



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No...... : WTF23F09200248A2C
Applicant..... : Mid Ocean Brands B.V.
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer : 116266
Sample Name : Recycled ABS TWS earbuds
Sample Model..... : MO6252
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)
Date of Receipt sample : 2023-09-11 & 2023-09-28 & 2023-10-13
Testing period : 2023-09-11 to 2023-09-25 & 2023-09-28 to 2023-10-10 & 2023-10-13 to 2023-10-19
Date of Issue..... : 2023-10-19
Test Result..... : Refer to next page (s)



Prepared By:

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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.

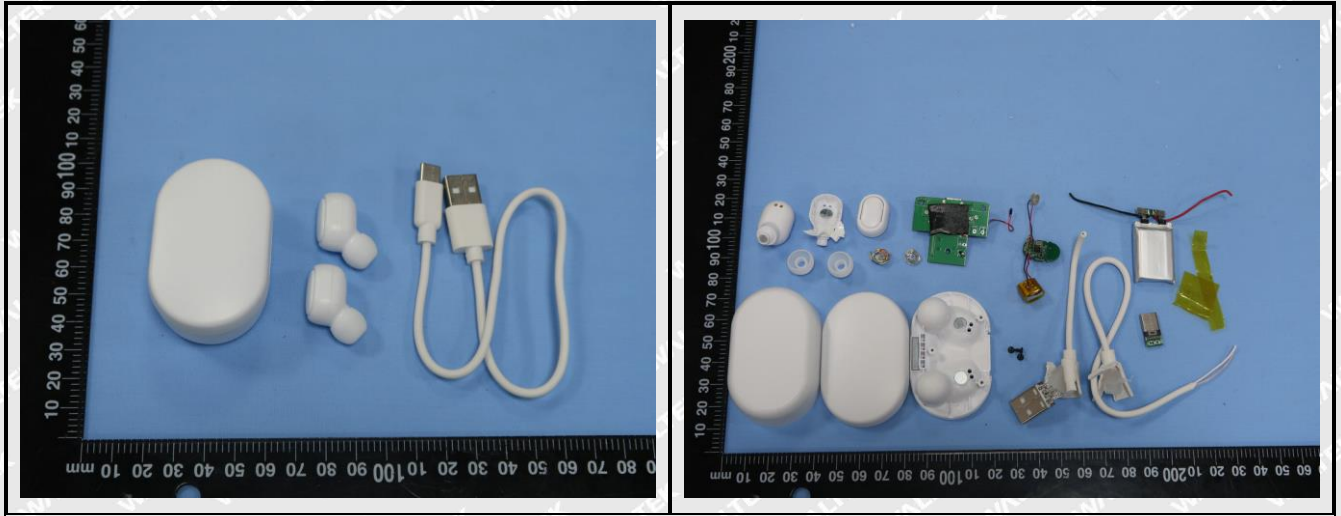
Test Method..... : 1) With reference to IEC 62321-2:2021, disassembly, disjunction and mechanical sample preparation
2) With reference to IEC 62321-3-1:2013, screening - Lead, mercury, cadmium, total chromium and total bromine by X-ray fluorescence spectrometry
3) With reference to IEC 62321-4:2013+AMD1:2017 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.

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Sample Photo(s):



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**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	White plastic shell	BL	BL	BL	BL	BL	NA
2	White plastic jacket (Type-C plug)	BL	BL	BL	BL	BL	NA
3	White plastic wire jacket	BL	BL	BL	BL	BL	NA
4	White plastic jacket (USB plug)	BL	BL	BL	BL	BL	NA
5	Silvery magnetic block	BL	BL	BL	BL	--	NA
6	Brown plastic adhesive tape	BL	BL	BL	BL	BL	NA
7	Red plastic wire covering	BL	BL	BL	BL	BL	NA
8	Silvery metal wire	BL	BL	BL	BL	--	NA
9	Chip IC	BL	BL	BL	BL	BL	NA
10	Chip resistor	BL	BL	BL	BL	BL	NA
11	Black plastic wire covering	BL	BL	BL	BL	BL	NA
12	Solder	BL	BL	BL	BL	--	NA
13	Silvery metal sheet	BL	BL	BL	BL	--	NA
14	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
15	Silvery metal screw with black plating	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
16	Black sponge double faced adhesive tape	BL	BL	BL	BL	BL	NA
17	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
18	Chip IC	BL	BL	BL	BL	BL	NA
19	Chip LED	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 shell (Type-C socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
21	Black plastic core(Type-C socket)	BL	BL	BL	BL	BL	NA
22	Silvery metal pin (Type-C socket)	BL	BL	BL	BL	--	NA
23	Chip capacitor	BL	BL	BL	BL	BL	NA
24	Black magnetic core(inductor)	BL	BL	BL	BL	--	NA
25	Copper varnished wire(inductor)	BL	BL	BL	BL	BL	NA
26	Solder	BL	BL	BL	BL	--	NA
27	Red varnished wire	BL	BL	BL	BL	BL	NA
28	Black body	BL	BL	BL	BL	BL	NA
29	Golden metal strip	IN	OL	BL	BL	--	Cd :29 #Pb : 3.67×10⁴
30	White plastic shell	BL	BL	BL	BL	BL	NA
31	Silvery metal net with adhesive	BL	BL	BL	BL	--	NA
32	White soft plastic cap	BL	BL	BL	BL	BL	NA
33	Transparent plastic bracket	BL	BL	BL	BL	BL	NA
34	Black plastic wire covering	BL	BL	BL	BL	BL	NA
35	Red plastic wire covering	BL	BL	BL	BL	BL	NA
36	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
37	Brown PCB	BL	BL	BL	BL	BL	NA
38	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
39	Chip IC	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	Red plastic wire covering	BL	BL	BL	BL	BL	NA
41	Black plastic wire covering	BL	BL	BL	BL	BL	NA
42	Brown plastic film(button)	BL	BL	BL	BL	BL	NA
43	Silvery metal pin(button)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
44	Grey plastic shell(button)	BL	BL	BL	BL	BL	NA
45	Chip EC	BL	BL	BL	BL	BL	NA
46	Solder	BL	BL	BL	BL	--	NA
47	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
48	Golden metal gasket(loudspeaker)	BL	BL	BL	BL	--	NA
49	Silvery metal cover(loudspeaker)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
50	Coppery varnished wire(loudspeaker)	BL	BL	BL	BL	BL	NA
51	Silvery magnetic block(loudspeaker)	BL	BL	BL	BL	--	NA
52	Transparent plastic film(loudspeaker)	BL	BL	BL	BL	BL	NA
53	Solder(USB plug)	BL	BL	BL	BL	--	NA
54	Transparent dry glue(USB plug)	BL	BL	BL	BL	BL	NA
55	Silvery metal shell(USB plug)	BL	BL	BL	BL	--	NA
56	White plastic core(USB plug)	BL	BL	BL	BL	BL	NA
57	Silvery metal pin (USB plug)	BL	BL	BL	BL	--	NA
58	Green PCB(Type-C plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
59	Solder(Type-C plug)	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	Black plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA
61	Silvery metal pin(Type-C plug)	BL	BL	BL	BL	--	NA
62	Transparent plastic wire covering	BL	BL	BL	BL	BL	NA
63	White plastic wire covering	BL	BL	BL	BL	BL	NA
64	Coppery metal wire	BL	BL	BL	BL	--	NA
65	Golden metal shell	BL	BL	BL	BL	--	NA
66	Silvery metal spring	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 Cr⁶⁺) 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 ≤ (70-3σ) < IN < (130+3σ) ≤ OL	BL ≤ (70-3σ) < IN < (130+3σ) ≤ OL	LOD < IN < (150+3σ) ≤ OL
Pb	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL
Hg	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (700-3σ) < IN < (1300+3σ) ≤ OL	BL ≤ (500-3σ) < IN < (1500+3σ) ≤ OL
Cr	BL ≤ (700-3σ) < IN	BL ≤ (700-3σ) < IN	BL ≤ (500-3σ) < IN
Br	BL ≤ (300-3σ) < IN	--	BL ≤ (250-3σ) < 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, μg/cm²= 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 ⁶⁺		PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	µg/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 5 mg/kg, LOQ of Cr⁶⁺ for polymer and composite sample is 8 mg/kg and LOQ of Cr⁶⁺ for metal sample is 0.1 µg/cm².

(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 ⁶⁺)	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 Cr⁶⁺ on metal sample by boiling water extraction test method, and result is shown as Positive/Negative.

Boiling water extraction:

Negative = Absence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is less than 0.10 µg/cm².

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is greater than 0.13 µg/cm².

Information on storage conditions and production date of the tested sample is unavailable and thus Cr⁶⁺ 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.

(11)[#] = According to the declaration from client, the source of lead in test sample is from copper alloy while lead as copper alloy containing up to 4% lead by weight is exempted by Directive 2011/65/EU ANNEX III.



2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1	ND	ND	ND	ND
T02	2	ND	ND	ND	ND
T03	3	ND	ND	ND	ND
T04	4	ND	ND	ND	ND
T05	5	--	--	--	--
T06	6	ND	ND	ND	ND
T07	7	ND	ND	ND	ND
T08	8	--	--	--	--
T09	9+10+18+19+23 [△]	ND	ND	ND	ND
T10	11	ND	ND	ND	ND
T11	12	--	--	--	--
T12	13	--	--	--	--
T13	14+17+36+37+58 [△]	ND	ND	ND	ND
T14	15	ND	ND	ND	ND
T15	16	346	ND	ND	ND
T16	20	--	--	--	--
T17	21	--	--	--	--
T18	22	--	--	--	--
T19	24	--	--	--	--
T20	25+50 [△]	ND	ND	ND	ND
T21	26	--	--	--	--
T22	27	ND	ND	ND	ND
T23	28+38+39+45+47 [△]	ND	ND	ND	ND
T24	29	--	--	--	--
T25	30	ND	ND	ND	ND
T26	31	--	--	--	--
T27	32	ND	ND	ND	ND
T28	33	ND	ND	ND	ND
T29	34	ND	ND	ND	ND
T30	35	ND	ND	ND	ND
T31	40+56 [△]	ND	ND	ND	ND
T32	41	ND	ND	ND	ND
T33	42	ND	ND	ND	ND
T34	43	--	--	--	--
T35	44	ND	ND	ND	ND
T36	46	--	--	--	--
T37	48	--	--	--	--
T38	49	--	--	--	--
T39	51	--	--	--	--
T40	52	ND	ND	ND	ND
T41	53	--	--	--	--
T42	54	ND	ND	ND	ND
T43	55	--	--	--	--



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Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T44	57	--	--	--	--
T45	59	--	--	--	--
T46	60	ND	ND	ND	ND
T47	61	--	--	--	--
T48	62	ND	ND	ND	ND
T49	63	ND	ND	ND	ND
T50	64	--	--	--	--
T51	65	--	--	--	--
T52	66	--	--	--	--

Note:

- (1) mg/kg = milligram per kilogram= ppm
- (2) ND = Not Detected or lower than limit of quantitation.
- (3) -- = Not Regulated.
- (4) LOQ = Limit of quantitation.

Test Items	DBP	BBP	DEHP	DIBP
Units	mg/kg	mg/kg	mg/kg	mg/kg
LOQ	50	50	50	50

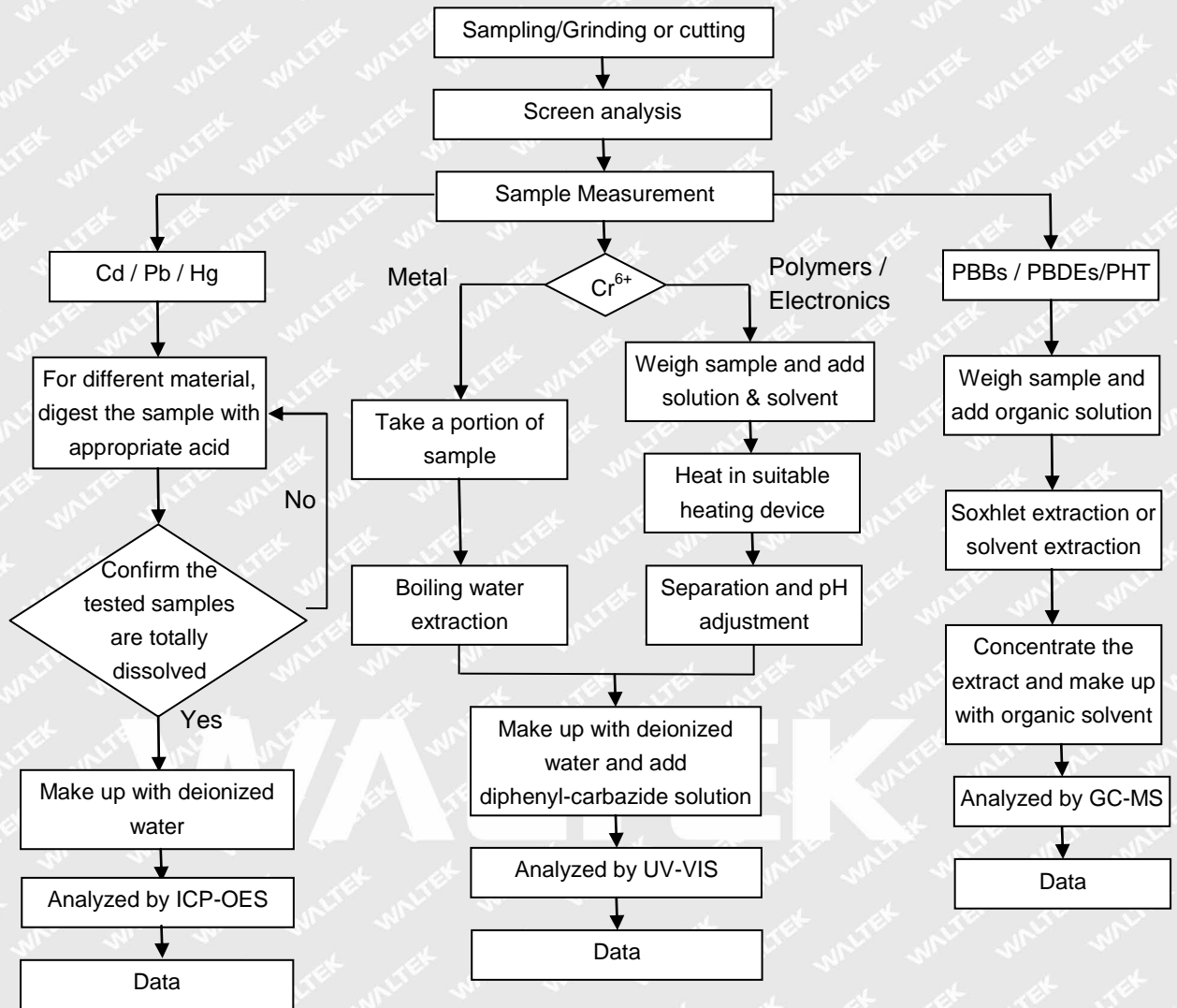
- (5) Abbreviation:
 "DBP" denotes Dibutyl phthalate, "BBP" denotes Benzyl butyl phthalate (BBP), "DEHP" denotes Bis(2-ethylhexyl)-phthalate, "DIBP" denotes Diisobutyl phthalate, "PHT" denotes Phthalates.
- (6) RoHS requirement

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)

- (7) "△" = As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

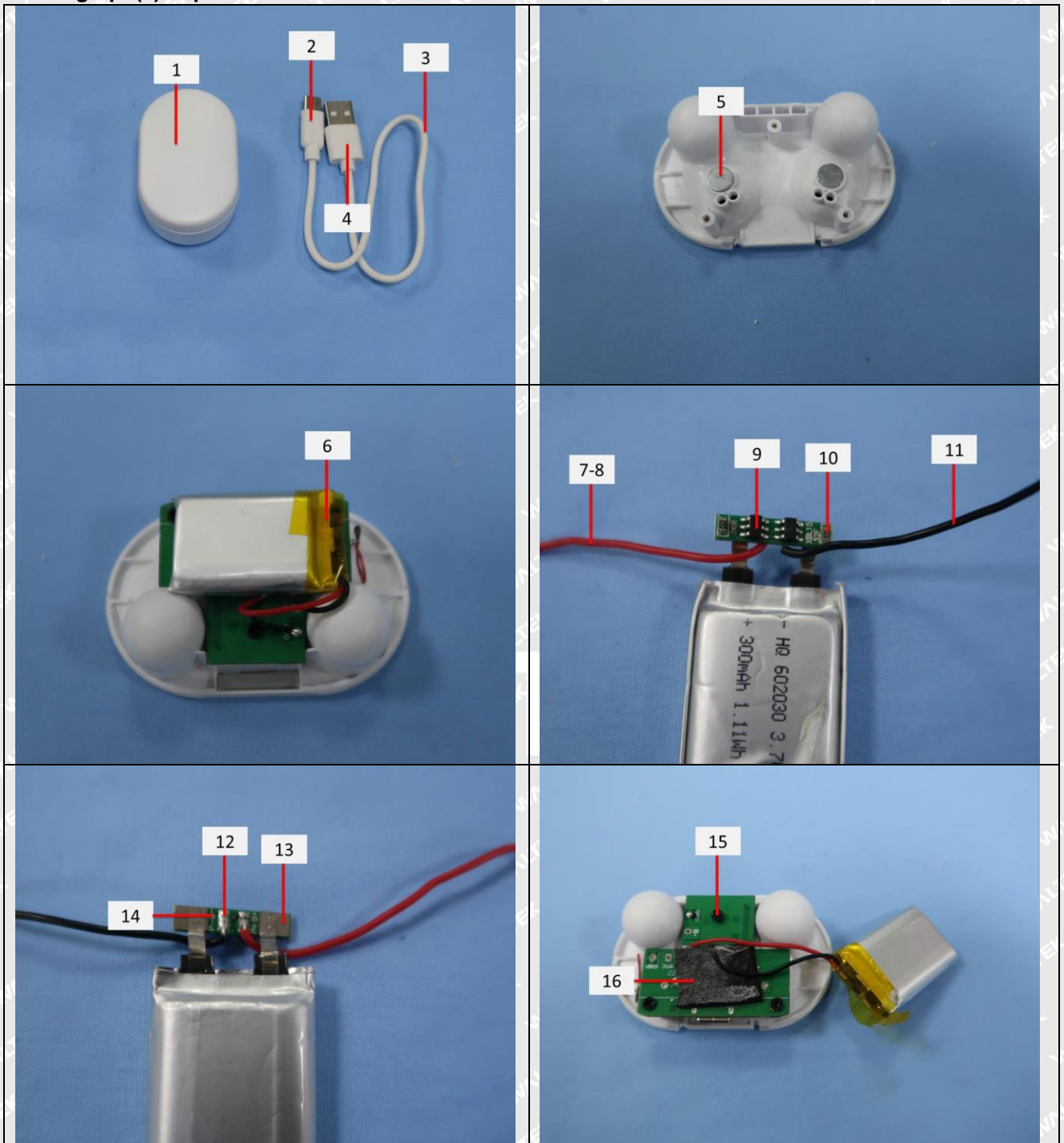


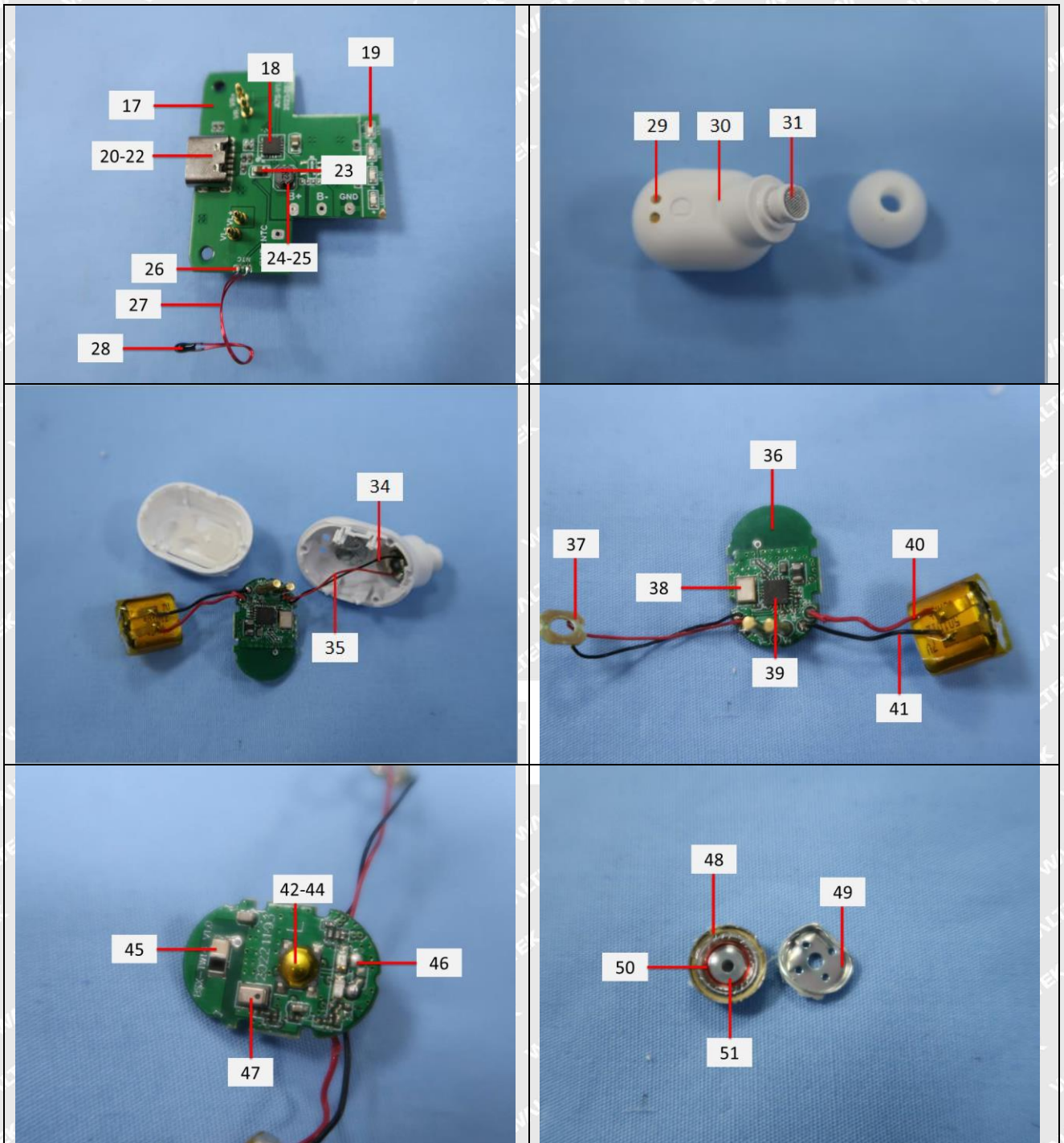
Measurement Flowchart:

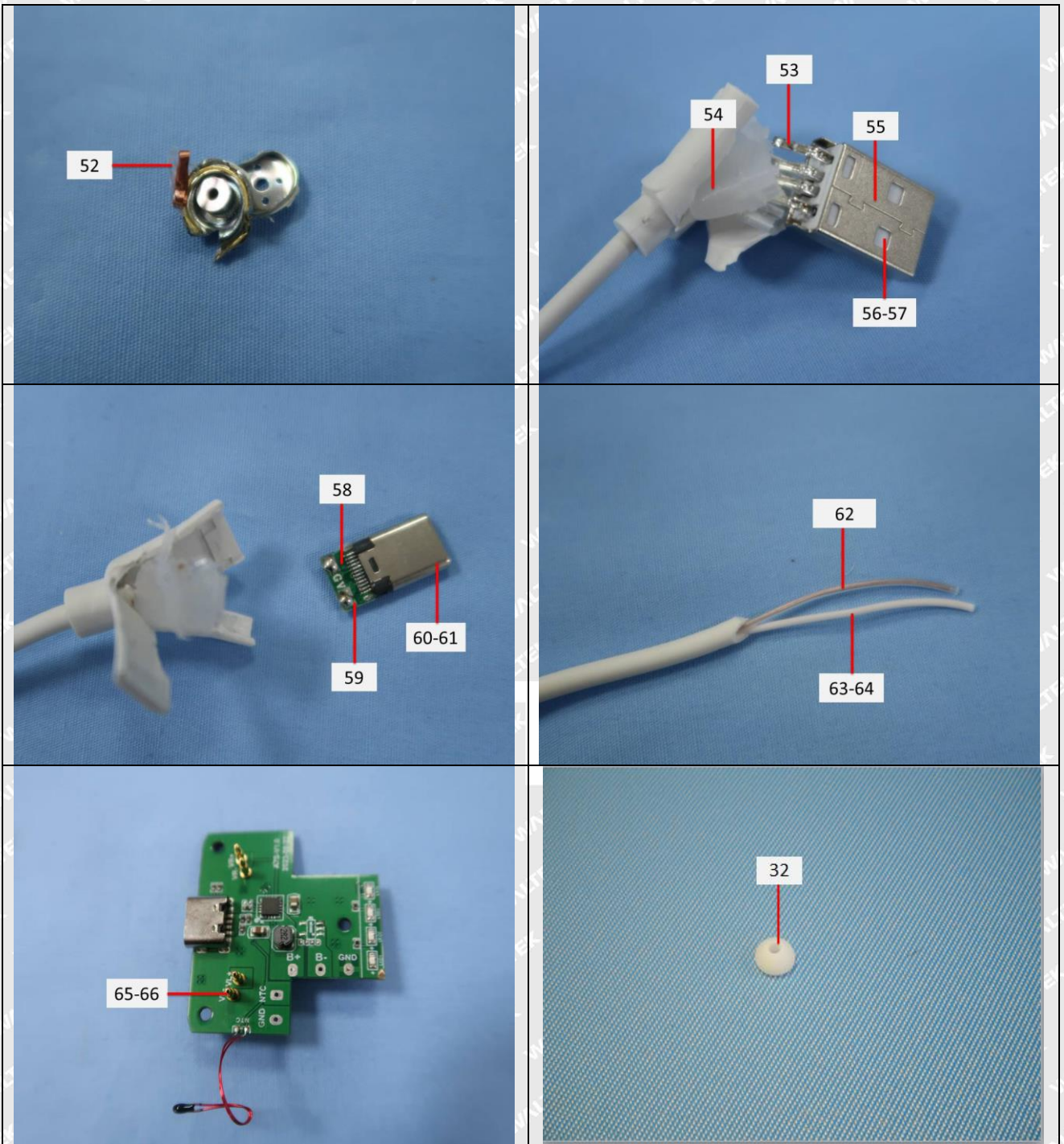




Photograph(s) of parts tested:









Remarks:

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