



TEST REPORT

Report No...... : WTF24F04096665C
Applicant..... : Mid Ocean Brands B.V.
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer..... : 106613
Sample Name..... : Round wireless speaker LED
Sample Model..... : MO9062
Test Requested..... : Refer to next page (s)
Test Method..... : Refer to next page (s)
Test Conclusion..... : Refer to next page (s)
Date of Receipt sample..... : 2024-04-26 & 2024-05-20
Testing period..... : 2024-04-26 to 2024-05-15 & 2024-05-20 to 2024-05-22
Date of Issue..... : 2024-05-22
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

Swing.Liang



WTF24F04096665C



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Job No.: FSW2024050833231CJ

Summary:

Test Requested	Test Conclusion
In accordance with the RoHS Directive 2011/65/EU and its amendment (EU) No. 2015/863, to determine the 10 restricted substances content in the submitted sample.	Pass (Please refer to next pages for details)

Sample Photo(s):





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

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

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
1	White plastic base	BL	BL	BL	BL	BL	NA
2	White plastic button	BL	BL	BL	BL	BL	NA
3	Yellow transparent glue	BL	BL	BL	BL	BL	NA
4	White plastic button	BL	BL	BL	BL	BL	NA
5	White plastic shell	BL	BL	BL	BL	BL	NA
6	Semi-transparent plastic holder	BL	BL	BL	BL	BL	NA
7	Silvery metal net without white coating	BL	BL	BL	BL	--	NA
8	White coating	BL	BL	BL	BL	BL	NA
9	Chip IC	BL	BL	BL	BL	BL	NA
10	Black plastic wire covering	BL	BL	BL	BL	BL	NA
11	White plastic wire covering	BL	BL	BL	BL	BL	NA
12	Red plastic wire covering	BL	BL	BL	BL	BL	NA
13	Silvery metal wire	BL	BL	BL	BL	--	NA
14	Chip resistor	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND
15	Chip capacitor	BL	BL	BL	BL	BL	NA



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
16	Silvery metal sheet	BL	BL	BL	BL	--	NA
17	Solder	BL	BL	BL	BL	--	NA
18	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
19	Black paper ring	BL	BL	BL	BL	BL	NA
20	Black soft plastic sheet	BL	BL	BL	BL	BL	NA
21	Black paper sheet	BL	BL	BL	BL	BL	NA
22	Black plastic film	BL	BL	BL	BL	BL	NA
23	Brown paper holder	BL	BL	BL	BL	BL	NA
24	Red varnished wire	BL	BL	BL	BL	BL	NA
25	Coppery metal wire	BL	BL	BL	BL	--	NA
26	Brown fibrous net	BL	BL	BL	BL	BL	NA
27	Silvery metal holder	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
28	Red plastic wire covering	BL	BL	BL	BL	BL	NA
29	Black plastic wire covering	BL	BL	BL	BL	BL	NA
30	Coppery metal wire	BL	BL	BL	BL	--	NA
31	Black magnetic core	BL	BL	BL	BL	--	NA
32	Silvery metal rivet	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
33	Solder	BL	IN	BL	BL	--	Pb :218
34	White paper sheet	BL	BL	BL	BL	BL	NA
35	Silvery metal shell(USB socket)	BL	BL	BL	BL	--	NA



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
36	Silvery metal pin(USB socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
37	Black plastic core(USB socket)	BL	BL	BL	BL	BL	NA
38	Silvery metal shell(Micro SD Card socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
39	Silvery metal pin(Micro SD Card socket)	BL	IN	BL	IN	--	Pb :306 Cr ⁶⁺ : Negative
40	Silvery metal spring(Micro SD Card socket)	BL	BL	BL	BL	--	NA
41	Black plastic core(Micro SD Card socket)	BL	BL	BL	BL	BL	NA
42(R1)	Solder	BL	IN	BL	BL	--	Pb :192
43	Silvery metal sheet(socket)	BL	IN	BL	BL	--	Pb :358
44	Black plastic core(socket)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
45	Silvery metal shell(Type-C socket)	BL	BL	BL	BL	--	NA
46	Silvery metal pin(Type-C socket)	BL	IN	BL	BL	--	Pb :116
47	Black plastic core(Type-C socket)	BL	BL	BL	BL	BL	NA
48(R1)	Chip LED	BL	BL	BL	BL	BL	NA
49	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
50	Chip IC	BL	BL	BL	BL	BL	NA
51	Black plastic key(switch)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
52	Brown plastic sheet(switch)	BL	BL	BL	BL	BL	NA
53	Silvery metal shell(switch)	BL	BL	BL	BL	--	NA
54	Silvery metal sheet(switch)	BL	BL	BL	BL	--	NA
55	Chip MIC	BL	BL	BL	BL	BL	NA



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
56	Chip LED	BL	BL	BL	BL	BL	NA
57	Black plastic key(switch)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
58	Beige plastic shell(switch)	BL	BL	BL	BL	BL	NA
59	Silvery metal shell(switch)	BL	BL	BL	BL	--	NA
60	Silvery metal sheet(switch)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
61	Chip capacitor	BL	BL	BL	BL	BL	NA
62	Chip resistor	BL	IN	BL	IN	BL	Pb :711 Cr ⁶⁺ : ND
63	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
64	Chip IC	BL	BL	BL	BL	BL	NA
65	Yellow transparent plastic adhesive tape	BL	BL	BL	BL	BL	NA
66	Silvery metal screw	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
67	Black plastic jacket(plug)	BL	BL	BL	BL	BL	NA
68	Solder(plug)	BL	BL	BL	BL	--	NA
69	Silvery metal sleeve(plug)	BL	BL	BL	BL	--	NA
70	Black plastic core(plug)	BL	BL	BL	BL	BL	NA
71	Silvery metal pin(plug)	IN	OL	BL	BL	--	Cd :15 #Pb : 2.60×10 ⁴
72	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
73	Yellow plastic wire covering	BL	BL	BL	BL	BL	NA
74	White plastic wire covering	BL	BL	BL	BL	BL	NA
75	Green plastic wire covering	BL	BL	BL	BL	BL	NA



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Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
76	Coppery metal wire	BL	BL	BL	BL	--	NA
77	Black plastic jacket(USB plug)	BL	BL	BL	BL	BL	NA
78	Solder(USB plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
79	Silvery metal pin(USB plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
80	White plastic core(USB plug)	BL	BL	BL	BL	BL	NA
81	Silvery metal shell(USB plug)	BL	BL	BL	BL	--	NA
82	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
83	Red plastic wire covering	BL	BL	BL	BL	BL	NA
84	Black plastic wire covering	BL	BL	BL	BL	BL	NA
85	Coppery metal wire	BL	BL	BL	BL	--	NA
86	Black plastic jacket(Type-C plug)	BL	BL	BL	BL	BL	NA
87	Green PCB(Type-C plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
88	Silvery metal shell(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
89	Silvery metal pin(Type-C plug)	BL	BL	BL	BL	--	NA
90	Black plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA
91	Chip capacitor(Type-C plug)	BL	BL	BL	BL	BL	NA
92	Solder(Type-C plug)	BL	BL	BL	BL	--	NA



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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	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$LOD < IN < (150+3\sigma) \leq OL$
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 ⁶⁺		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 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 $\mu\text{g}/\text{cm}^2$.

- (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 ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)



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

Boiling water extraction:

Negative = Absence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is less than 0.10 ug/cm^2 .

Positive = Presence of Cr^{6+} coating, the detected concentration in boiling water extraction solution is greater than 0.13 ug/cm^2 .

Information on storage conditions and production date of the tested sample is unavailable and thus Cr^{6+} 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-6(c).

2. Phthalates:

Test method:

With reference to IEC 62321-8:2017, determination of Phthalates content by GC-MS.

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1+2+4+5+6 [△]	ND	ND	ND	ND
T02	3+8+10 [△]	ND	ND	ND	ND
T03	7	--	--	--	--
T04	9+14+15+49 [△]	ND	ND	ND	ND
T05	11+12+19 [△]	145	ND	ND	ND
T06	13	--	--	--	--
T07	16	--	--	--	--
T08	17	--	--	--	--
T09	18+63+87 [△]	ND	ND	ND	ND
T10	20+21+22 [△]	122	ND	ND	ND
T11	23+26+28 [△]	ND	ND	ND	ND
T12	24	ND	ND	ND	ND
T13	25	--	--	--	--
T14	27	--	--	--	--
T15	29+34+65 [△]	ND	ND	ND	ND
T16	30	--	--	--	--
T17	31	--	--	--	--
T18	32	--	--	--	--
T19	33	--	--	--	--
T20	35	--	--	--	--
T21	36	--	--	--	--
T22	37+41+44+47+51 [△]	ND	ND	ND	ND
T23	38	--	--	--	--
T24	39	--	--	--	--



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Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T25	40	--	--	--	--
T26	42(R1)	--	--	--	--
T27	43	--	--	--	--
T28	45	--	--	--	--
T29	46	--	--	--	--
T30	48(R1)	ND	ND	ND	ND
T31	50+55+56+61+62 [△]	ND	ND	ND	ND
T32	52+57+58+70+80 [△]	ND	ND	ND	ND
T33	53	--	--	--	--
T34	54	--	--	--	--
T35	59	--	--	--	--
T36	60	--	--	--	--
T37	64+91 [△]	ND	ND	ND	ND
T38	66	--	--	--	--
T39	67+72+73 [△]	414	ND	157	ND
T40	68	--	--	--	--
T41	69	--	--	--	--
T42	71	--	--	--	--
T43	74+75+77 [△]	223	ND	ND	ND
T44	76	--	--	--	--
T45	78	--	--	--	--
T46	79	--	--	--	--
T47	81	--	--	--	--
T48	82+83+84 [△]	416	ND	174	ND
T49	85	--	--	--	--
T50	86+90 [△]	ND	ND	ND	ND
T51	88	--	--	--	--
T52	89	--	--	--	--
T53	92	--	--	--	--

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.



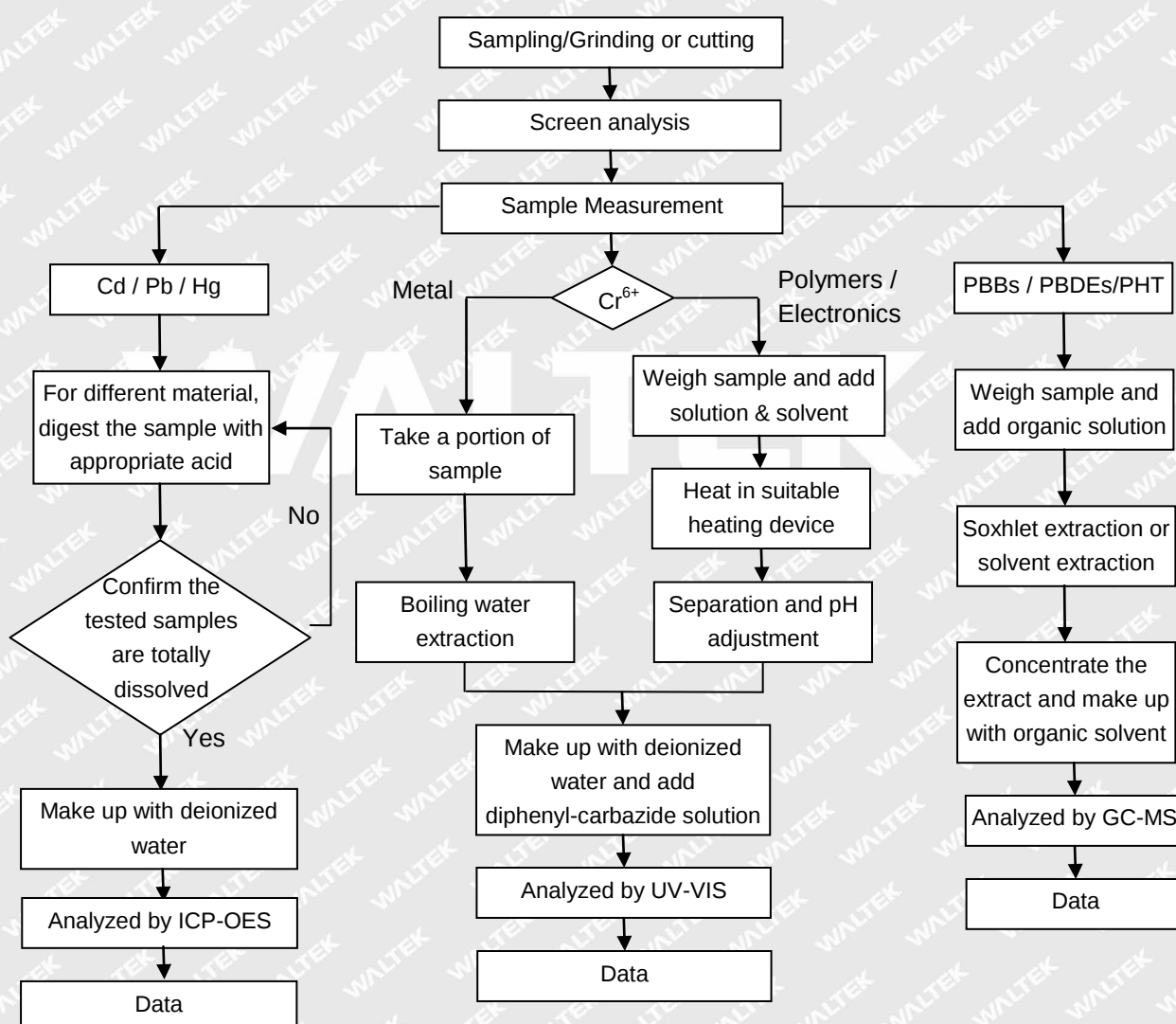
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(6) RoHS requirement

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.

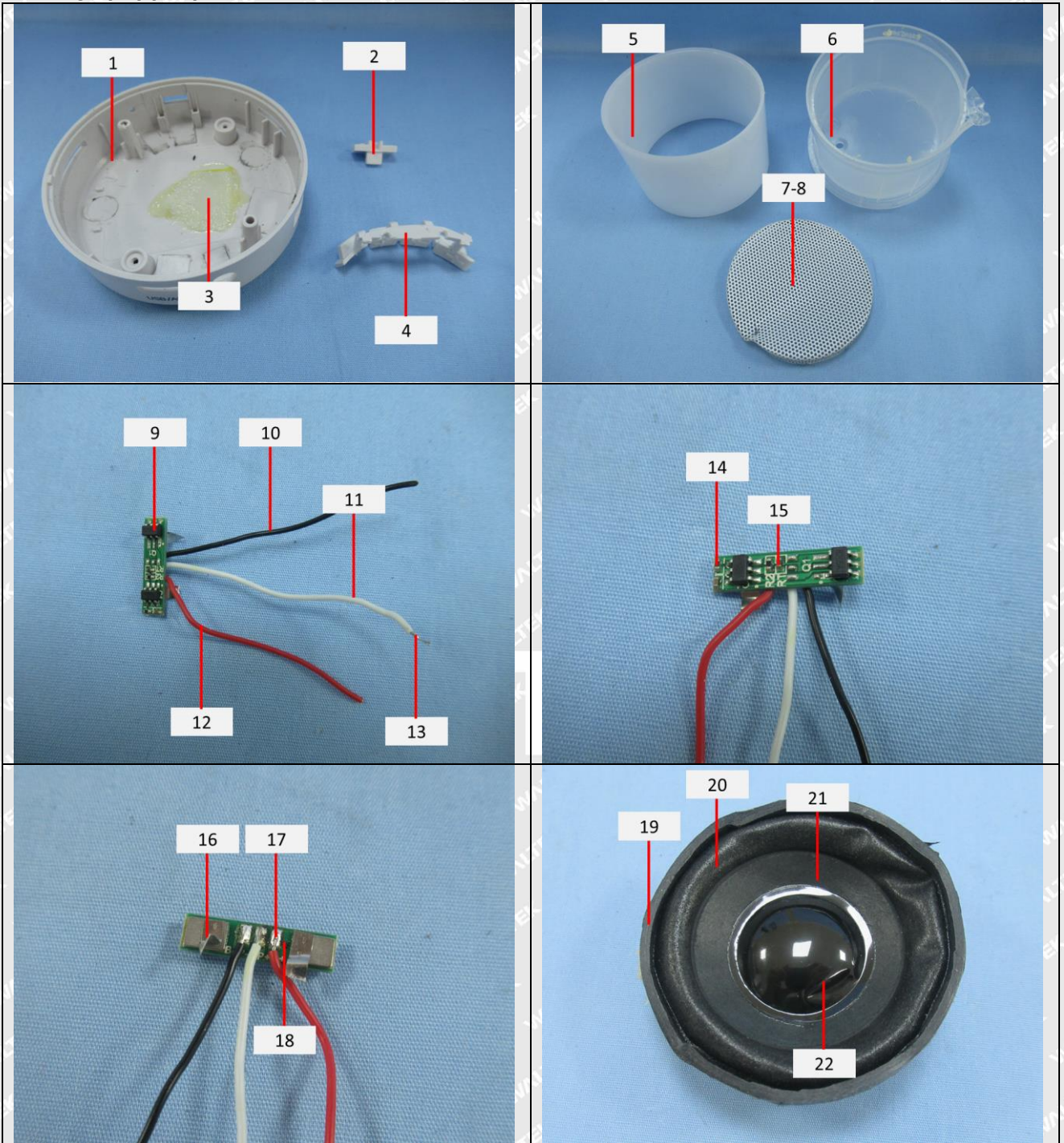
Measurement Flowchart:



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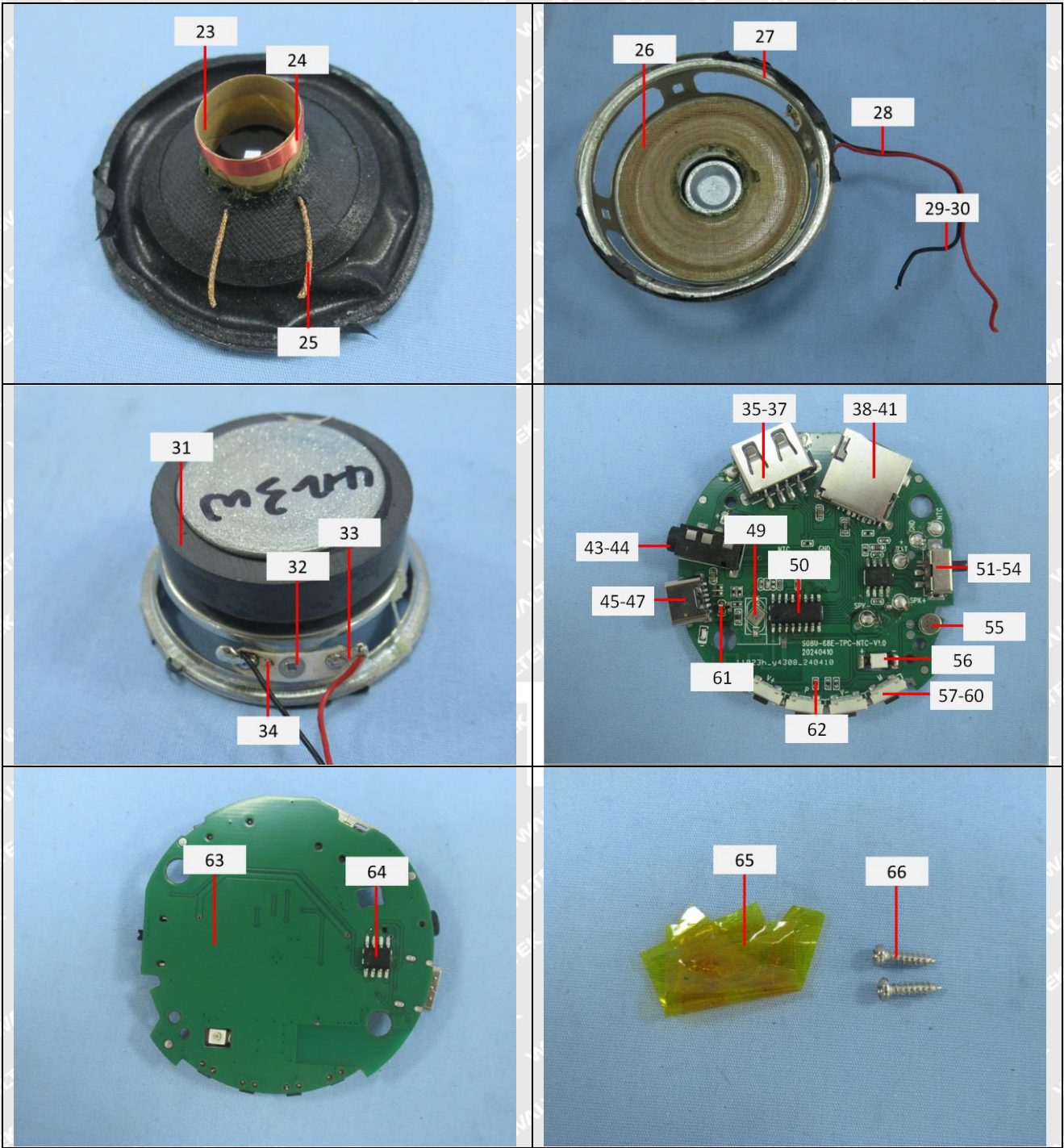
Photograph(s) of parts tested:

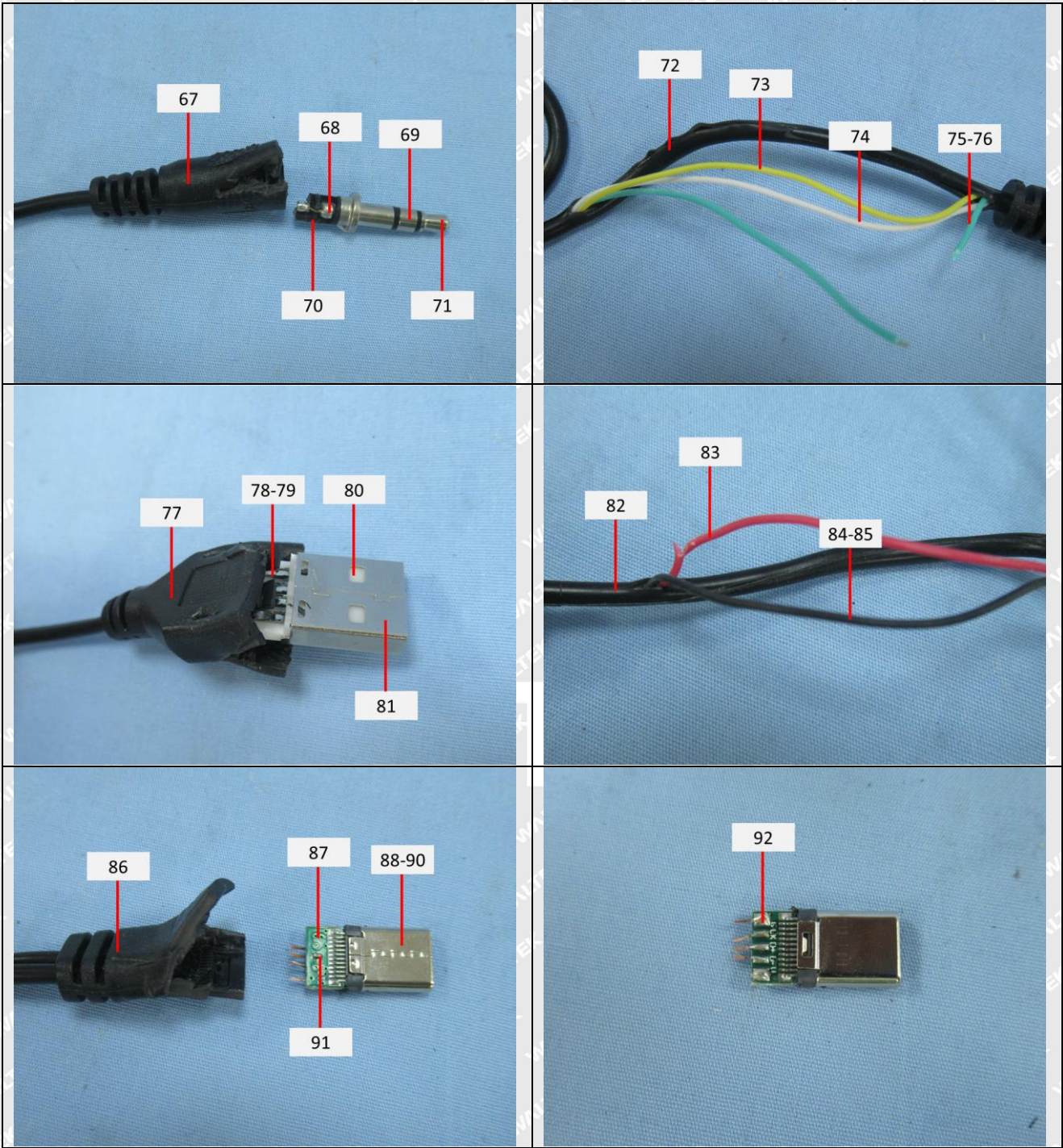




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===== End of Report =====