



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No...... : WTF23F01007223R1C
Applicant..... : Mid Ocean Brands B.V.
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer..... : 109979
Sample Name..... : TWS earbuds with charging box
Sample Model..... : MO9754
Date of Receipt sample..... : 2023-01-12 & 2023-02-13 & 2023-12-06
Testing period..... : 2023-01-12 to 2023-01-31 & 2023-02-13 to 2023-02-17 & 2023-12-06 to 2023-12-12
Date of Issue..... : 2023-12-13
Test Result..... : Refer to next page (s)
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)
Note..... : As per client's requirement, the results from No.1 to No.79 were quoted from report No. WTF23F01007223C

Prepared By:

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

Swing.Liang



Report No.: WTF23F01007223R1C

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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Report No.: WTF23F01007223R1C

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 jacket (USB plug)	BL	BL	BL	BL	BL	NA
2	Dark grey glue (USB plug)	BL	BL	BL	BL	BL	NA
3	White plastic sheet (USB plug)	BL	BL	BL	BL	BL	NA
4	Silvery metal shell (USB plug)	BL	BL	BL	BL	--	NA
5	Silvery metal pin (USB plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
6	Solder (USB plug)	BL	BL	BL	BL	--	NA
7	Black plastic jacket (DC plug)	BL	BL	BL	BL	BL	NA
8	Black plastic sheet (DC plug)	BL	BL	BL	BL	BL	NA
9	Silvery metal shell (DC plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
10	Silvery metal pin (DC plug)	BL	BL	BL	BL	--	NA
11	Solder (DC plug)	BL	BL	BL	BL	--	NA
12	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
13	Black plastic wire covering	BL	BL	BL	BL	BL	NA
14	Red plastic wire covering	BL	BL	BL	BL	BL	NA
15	Coppery metal wire	BL	BL	BL	BL	--	NA
16	Black plastic shell	BL	BL	BL	BL	BL	NA
17	Black transparent plastic cover	BL	BL	BL	BL	BL	NA
18	Transparent plastic adhesive label	BL	BL	BL	BL	BL	NA
19	Silvery magnetic sheet	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	Black plastic shell	BL	BL	BL	BL	BL	NA
21	Black soft plastic cap	BL	BL	BL	BL	BL	NA
22	White plastic sheet	BL	BL	BL	BL	BL	NA
23	Black nylon net with glue	BL	BL	BL	BL	BL	NA
24	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
25	Transparent plastic film	BL	BL	BL	BL	BL	NA
26	White sponge with glue	BL	BL	BL	BL	BL	NA
27	Silvery metal sheet	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
28	Silvery magnetic sheet	BL	BL	BL	BL	--	NA
29	Red enamelled wire	BL	BL	BL	BL	BL	NA
30	Silvery metal screw	BL	BL	BL	BL	--	NA
31	Brown transparent plastic adhesive sheet	BL	BL	BL	BL	BL	NA
32	Red plastic wire covering	BL	BL	BL	BL	BL	NA
33	Black plastic wire covering	BL	BL	BL	BL	BL	NA
34	Solder	BL	BL	BL	BL	--	NA
35	Green PCB	BL	BL	BL	BL	BL	NA
36	Black sponge with glue	BL	BL	BL	BL	BL	NA
37	Solder	BL	BL	BL	BL	--	NA
38	Red metal wire	BL	BL	BL	BL	--	NA
39	Black diode	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	Chip LED	BL	BL	BL	BL	BL	NA
41	Silvery metal shell (switch)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
42	Golden metal button (switch)	BL	BL	BL	BL	--	NA
43	Silvery metal sheet (switch)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
44	Dark grey plastic base (switch)	BL	BL	BL	BL	BL	NA
45	Golden metal pin (socket)	BL	BL	BL	BL	--	NA
46	Golden metal base (socket)	IN	OL	BL	IN	--	Cd :13 #Pb : 2.16×10⁴ Cr ⁶⁺ : Negative
47	Silvery metal spring (socket)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
48	Chip capacitor	BL	BL	BL	BL	BL	NA
49	Silvery metal shell (DC socket)	BL	BL	BL	BL	--	NA
50	Silvery metal pin (DC socket)	BL	BL	BL	BL	--	NA
51	Black plastic sheet (DC socket)	BL	BL	BL	BL	BL	NA
52	Chip resistor	BL	BL	BL	BL	BL	NA
53	Dark grey magnetic core (inductor)	BL	BL	BL	BL	--	NA
54	Coppery enamelled wire (inductor)	BL	BL	BL	BL	BL	NA
55	Chip IC	BL	BL	BL	BL	BL	NA
56	Chip IC	BL	BL	BL	BL	BL	NA
57	Chip capacitor	BL	BL	BL	BL	BL	NA
58	Chip oscillator	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	
59	Chip audion	BL	BL	BL	BL	BL	NA
60	Chip IC	BL	BL	BL	BL	BL	NA
61	Chip capacitor	BL	BL	BL	BL	BL	NA
62	Chip diode	BL	BL	BL	BL	BL	NA
63	Silvery metal shell (MIC)	BL	BL	BL	BL	--	NA
64	Chip resistor	BL	BL	BL	BL	BL	NA
65	Chip LED	BL	BL	BL	BL	BL	NA
66	Black plastic button (switch)	BL	BL	BL	BL	BL	NA
67	Black plastic wire covering	BL	BL	BL	BL	BL	NA
68	Solder	BL	BL	BL	BL	--	NA
69	Blue enamelled wire	BL	BL	BL	BL	BL	NA
70	Red enamelled wire	BL	BL	BL	BL	BL	NA
71	Green enamelled wire	BL	BL	BL	BL	BL	NA
72	White plastic wire jacket	BL	BL	BL	BL	BL	NA
73	White plastic jacket (DC plug)	BL	BL	BL	BL	BL	NA
74	White plastic jacket (USB plug)	BL	BL	BL	BL	BL	NA
75	Transparent plastic cover	BL	BL	BL	BL	BL	NA
76	White plastic shell	BL	BL	BL	BL	BL	NA
77	White plastic shell	BL	BL	BL	BL	BL	NA
78	White soft plastic cap	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	
79	Silvery plastic net	BL	BL	BL	BL	BL	NA
80	Solder(Type-C plug)	BL	BL	BL	BL	--	NA
81	Black plastic core(Type-C plug)	BL	BL	BL	BL	BL	NA
82	Golden metal pin(Type-C plug)	BL	BL	BL	BL	--	NA
83	Green PCB(Type-C plug)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
84	Chip resistor(Type-C plug)	BL	OL	BL	BL	BL	*Pb : 6.92×10^3
85	Silvery metal sheet(Type-C plug)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
86	Golden metal strip	IN	OL	BL	BL	--	Cd :31 #Pb : 2.21×10^4
87	White sponge adhesive tape	BL	BL	BL	BL	BL	NA
88	Silvery metal shell(socket)	BL	BL	BL	BL	--	NA
89	Silvery metal pin(socket)	BL	BL	BL	BL	--	NA
90	Black plastic core(socket)	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 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.



Report No.: WTF23F01007223R1C

- (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 5mg/kg, LOQ of Cr⁶⁺ for polymer and composite sample is 8mg/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)

- (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 $\mu\text{g}/\text{cm}^2$.

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is greater than 0.13 $\mu\text{g}/\text{cm}^2$.

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.
- (12)^{*} = According to the declaration from client, the source of lead in test sample is from the glass or ceramic material of that electronic component which is exempted by Directive 2011/65/EU ANNEX III.



Report No.: WTF23F01007223R1C

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+8+16+17+20 [△]	ND	ND	ND	ND
T04	4	--	--	--	--
T05	5	--	--	--	--
T06	6	--	--	--	--
T07	7	ND	ND	ND	ND
T08	9	--	--	--	--
T09	10	--	--	--	--
T10	11	--	--	--	--
T11	12	ND	ND	ND	ND
T12	13	ND	ND	ND	ND
T13	14	ND	ND	ND	ND
T14	15	--	--	--	--
T15	18	ND	ND	ND	ND
T16	19	--	--	--	--
T17	21	ND	ND	ND	ND
T18	22+44+51+66+75 [△]	ND	ND	ND	ND
T19	23	ND	ND	ND	ND
T20	24	--	--	--	--
T21	25	ND	ND	ND	ND
T22	26	ND	ND	ND	ND
T23	27	--	--	--	--
T24	28	--	--	--	--
T25	29+54+69+70+71 [△]	ND	ND	ND	ND
T26	30	--	--	--	--
T27	31	ND	ND	ND	ND
T28	32	ND	ND	ND	ND
T29	33	ND	ND	ND	ND
T30	34	--	--	--	--
T31	35	ND	ND	ND	ND
T32	36	ND	ND	ND	ND
T33	37	--	--	--	--
T34	38	--	--	--	--
T35	39+40+48+52+55 [△]	ND	ND	ND	ND
T36	41	--	--	--	--
T37	42	--	--	--	--
T38	43	--	--	--	--
T39	45	--	--	--	--
T40	46	--	--	--	--
T41	47	--	--	--	--
T42	49	--	--	--	--



Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T43	50	--	--	--	--
T44	53	--	--	--	--
T45	56+57+58+59+60 [△]	ND	ND	ND	ND
T46	61+62+64+65 [△]	ND	ND	ND	ND
T47	63	--	--	--	--
T48	67	ND	ND	ND	ND
T49	68	--	--	--	--
T50	72	ND	ND	ND	ND
T51	73	ND	ND	92	ND
T52	74	ND	ND	ND	ND
T53	76+77 [△]	ND	ND	ND	ND
T54	78	ND	ND	ND	ND
T55	79	ND	ND	ND	ND
T56	80	--	--	--	--
T57	81	ND	ND	ND	ND
T58	82	--	--	--	--
T59	83	ND	ND	ND	ND
T60	84	ND	ND	ND	ND
T61	85	--	--	--	--
T62	86	--	--	--	--
T63	87	ND	ND	ND	ND
T64	88	--	--	--	--
T65	89	--	--	--	--
T66	90	ND	ND	ND	ND

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.

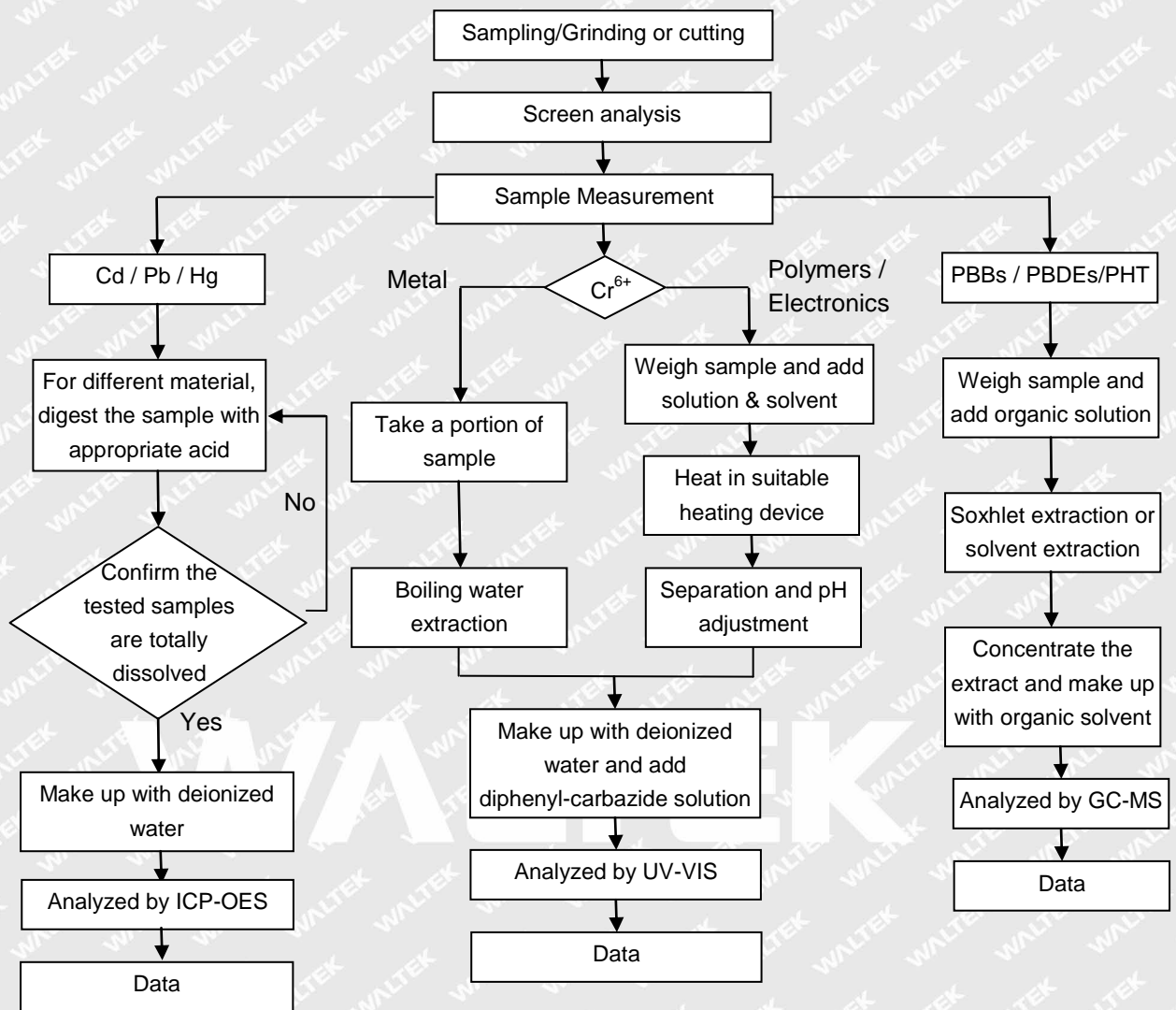
- (6) RoHS requirement

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.



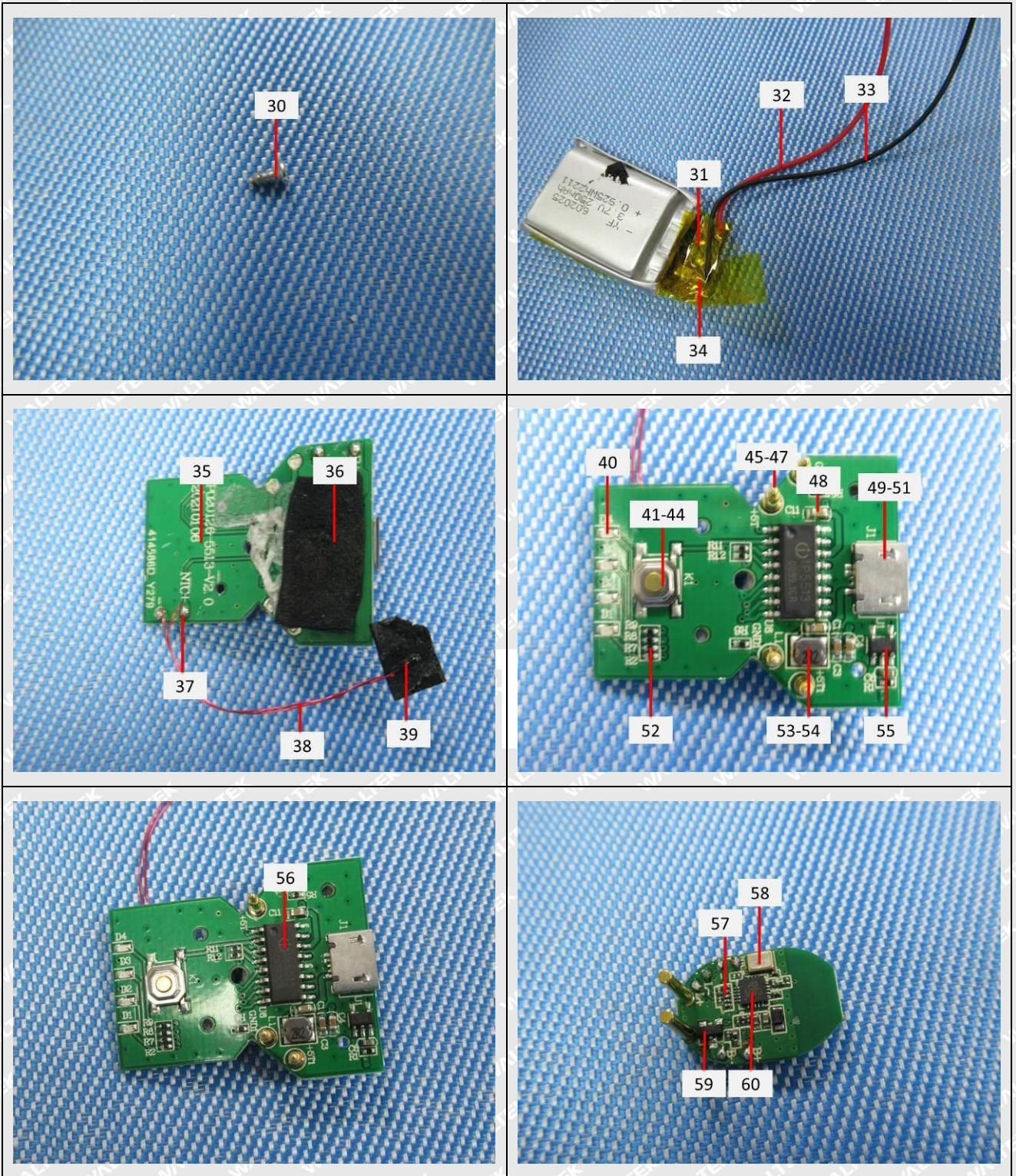
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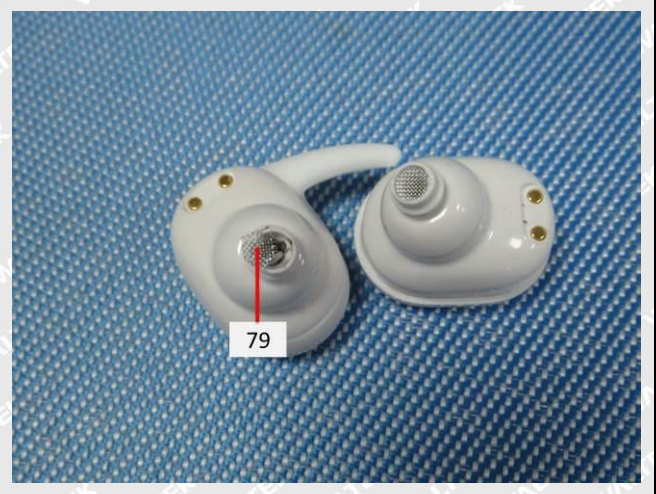
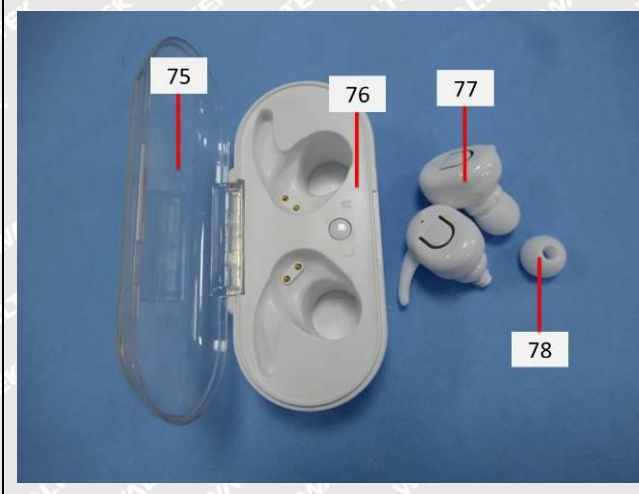
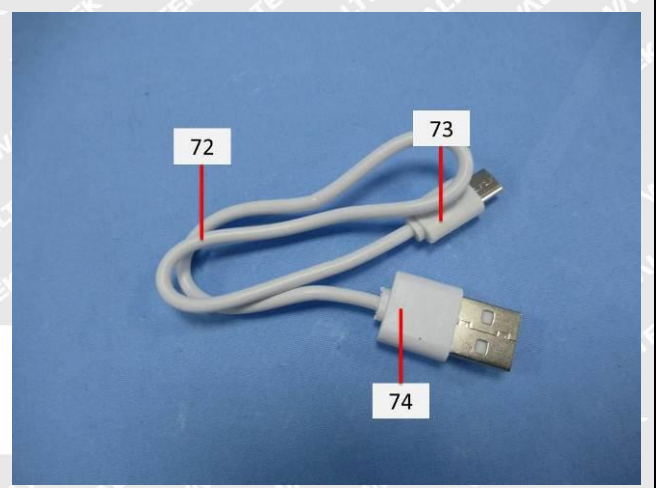
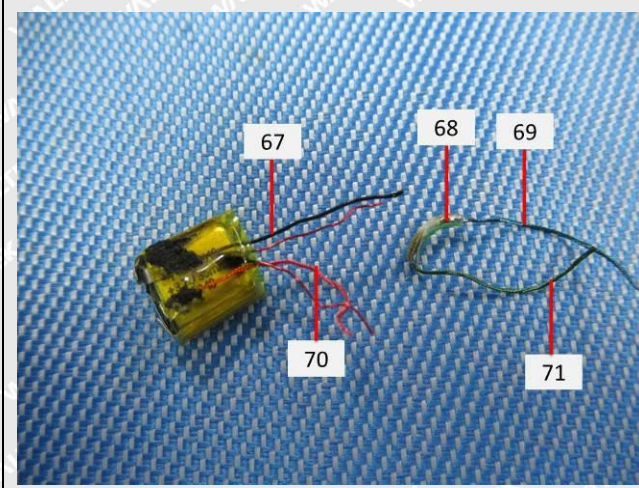
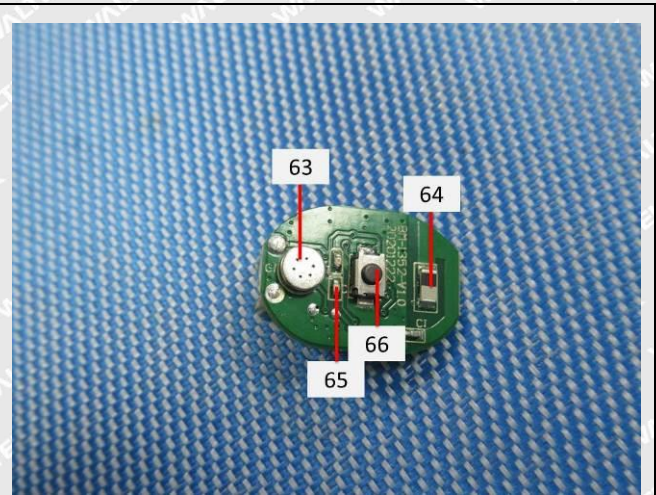
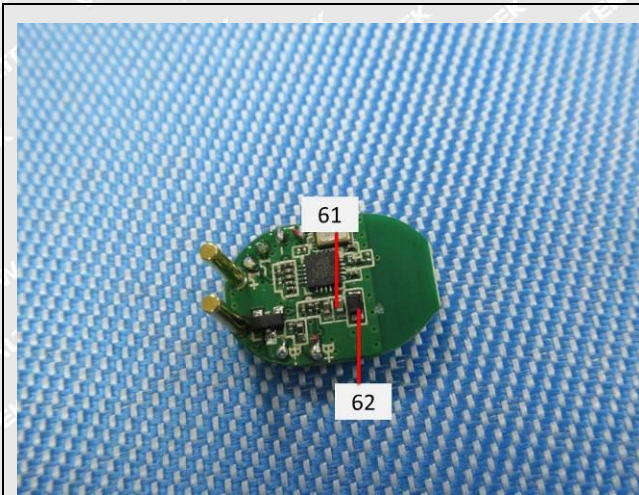


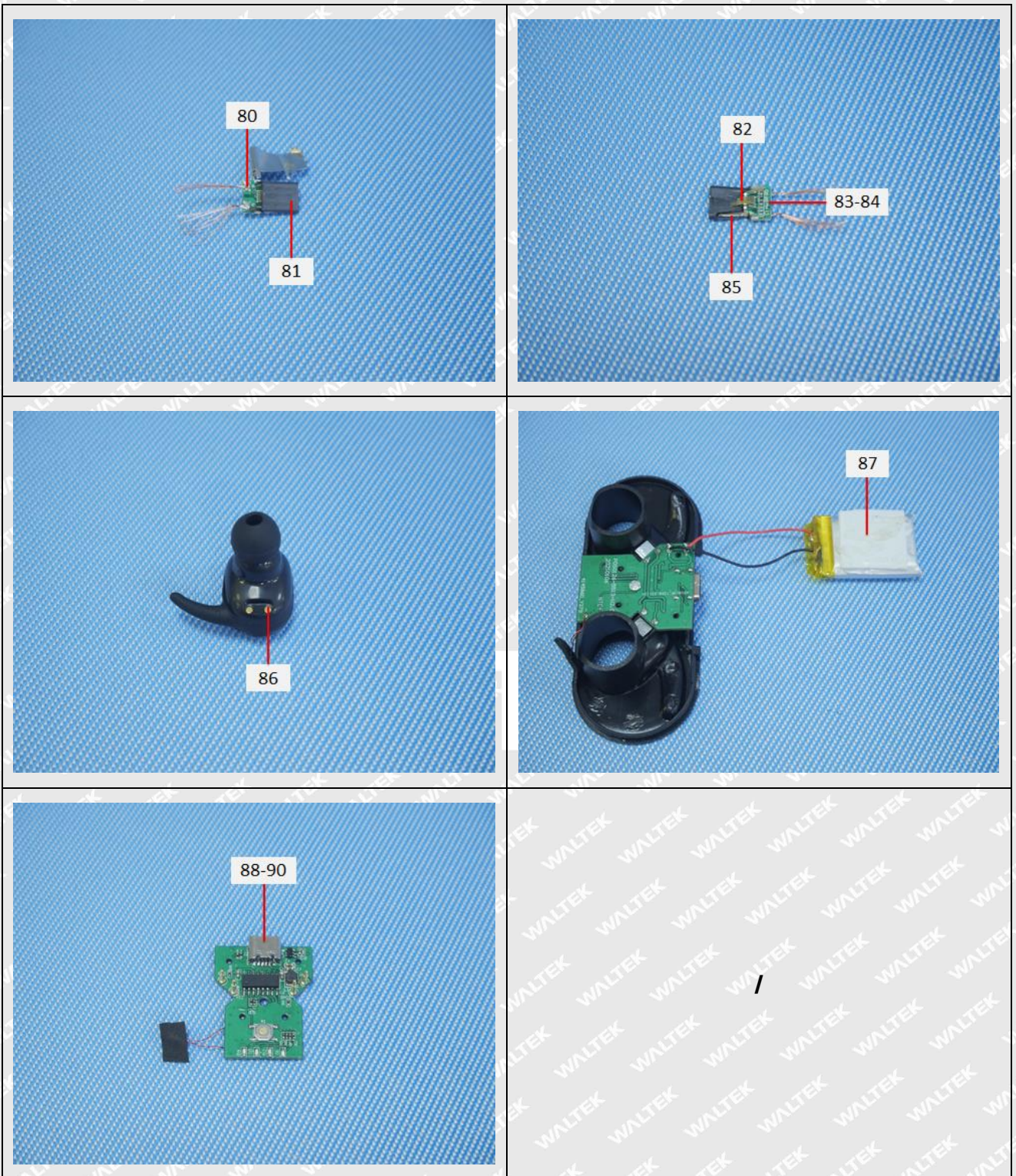


Photograph(s) of parts tested:











Report No.: WTF23F01007223R1C

Remarks:

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

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