



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No...... : WTF24F05113382A1C
Applicant..... : Mid Ocean Brands B.V.
Address..... : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer..... : 105198
Sample Name..... : Wireless mouse in car shape
Sample Model..... : MO7641
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..... : 2024-05-16 & 2024-06-05
Testing period..... : 2024-05-16 to 2024-06-04 & 2024-06-05 to 2024-06-07
Date of Issue..... : 2024-06-07
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.

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WTF24F05113382A1C



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):



**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	Black plastic shell	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 230
2	Silvery coating	BL	BL	BL	BL	BL	NA
3	Black plastic shell without silvery coating	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
4	Black soft plastic sheath	BL	BL	BL	BL	BL	NA
5	Transparent plastic part	BL	BL	BL	BL	BL	NA
6	Black plastic part with silvery plating	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 38
7	Red transparent plastic part	BL	BL	BL	BL	BL	NA
8	Black plastic wheel	BL	BL	BL	BL	BL	NA
9	Black plastic base	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 56
10	Transparent plastic part	BL	BL	BL	BL	BL	NA
11	Silvery metal spring	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
12	Silvery metal sheet	BL	BL	BL	BL	--	NA
13(R1)	Solder	BL	IN	BL	BL	--	Pb : 241
14	Black plastic wheel	BL	BL	BL	BL	BL	NA
15	Black plastic shell (button)	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	
16	Red plastic part(button)	BL	BL	BL	BL	BL	NA
17	White plastic base (button)	BL	BL	BL	BL	BL	NA
18	Coppery metal sheet(button)	BL	BL	BL	BL	--	NA
19	Silvery metal contact(button)	BL	BL	BL	BL	--	NA
20	Silvery metal pin(button)	BL	BL	BL	BL	--	NA
21	Black plastic cap (button)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
22	Black plastic base (button)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
23	Silvery metal sheet (button)	BL	BL	BL	BL	--	NA
24	Silvery-coppery metal sheet(button)	BL	BL	BL	BL	--	NA
25	White plastic shell(socket)	BL	BL	BL	BL	BL	NA
26	Silvery metal pin(socket)	BL	BL	BL	BL	--	NA
27	Black plastic film(electrolytic capacitor)	BL	BL	BL	BL	BL	NA
28	Black rubber stopper(electrolytic capacitor)	BL	BL	BL	BL	BL	NA
29	Brown paper(electrolytic capacitor)	BL	BL	BL	BL	BL	NA
30	Silvery metal shell(electrolytic capacitor)	BL	BL	BL	BL	--	NA
31	Silvery metal pin(electrolytic capacitor)	BL	BL	BL	BL	--	NA
32	Grey metal foil(electrolytic capacitor)	BL	BL	BL	BL	--	NA
33	Silvery-grey metal foil(electrolytic capacitor)	BL	BL	BL	BL	--	NA
34	Yellow resistor with multicolor printing	BL	BL	BL	BL	BL	NA
35	Transparent LED	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND



Report No.: WTF24F05113382A1C

Job No.: FSW2024052881162CJ

Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
36	Silvery metal pin(LED)	BL	BL	BL	BL	--	NA
37	Dark grey plastic shell	BL	BL	BL	BL	BL	NA
38	Dark grey plastic base	BL	BL	BL	BL	BL	NA
39	Yellow transparent plastic adhesive tape	BL	BL	BL	BL	BL	NA
40	Chip EC	BL	BL	BL	BL	BL	NA
41	Silvery metal shell	BL	BL	BL	BL	--	NA
42	Black plastic shell	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
43	Black plastic part	BL	BL	BL	BL	BL	NA
44	Coppery metal sheet	BL	BL	BL	BL	--	NA
45	Silvery metal sheet	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
46	Silvery metal sheet	BL	BL	BL	BL	--	NA
47	Chip IC	BL	BL	BL	BL	BL	NA
48	Red PCB	BL	BL	BL	BL	BL	NA
49	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
50(R1)	Solder	BL	IN	BL	BL	--	Pb : 250
51	Black plastic cap (button)	BL	BL	BL	BL	BL	NA
52	Black plastic base (button)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
53	Silvery metal shell (button)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
54	Silvery metal sheet (button)	BL	BL	BL	BL	--	NA
55	Yellow-green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
56	Red plastic wire covering	BL	BL	BL	BL	BL	NA
57	Black plastic wire covering	BL	BL	BL	BL	BL	NA
58	Silvery metal wire	BL	BL	BL	BL	--	NA
59	White plastic shell(connector)	BL	BL	BL	BL	BL	NA
60	Silvery metal pin(connector)	BL	BL	BL	BL	--	NA
61	Black plastic part(USB plug)	BL	BL	BL	BL	BL	NA
62	Silvery metal shell(USB plug)	BL	BL	BL	BL	--	NA
63	Chip IC(USB plug)	BL	BL	BL	BL	BL	NA
64	Chip crystal oscillator(USB plug)	BL	BL	BL	BL	BL	NA
65	Green PCB(USB plug)	BL	BL	BL	BL	BL	NA
66	Chip capacitor(USB plug)	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	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$LOD < IN < (150+3\sigma) \leq OL$
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.



Report No.: WTF24F05113382A1C

Job No.: FSW2024052881162CJ

- (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 Cr^{6+} for polymer and composite sample is 8 mg/kg and LOQ of Cr^{6+} 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 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 $\mu\text{g}/\text{cm}^2$.

Positive = Presence of Cr^{6+} 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 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.

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+3+5+6+7 [△]	ND	ND	ND	ND
T02	2+4+28 [△]	ND	ND	ND	ND
T03	8+9+10+14+15 [△]	ND	ND	ND	ND
T04	11	--	--	--	--
T05	12	--	--	--	--
T06	13(R1)	--	--	--	--



Report No.: WTF24F05113382A1C

Job No.: FSW2024052881162CJ

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T07	16+17+21+22+25 [△]	ND	ND	ND	ND
T08	18	--	--	--	--
T09	19	--	--	--	--
T10	20	--	--	--	--
T11	23	--	--	--	--
T12	24	--	--	--	--
T13	26	--	--	--	--
T14	27+29+39 [△]	ND	ND	ND	ND
T15	30	--	--	--	--
T16	31	--	--	--	--
T17	32	--	--	--	--
T18	33	--	--	--	--
T19	34+40+47+49+63 [△]	ND	ND	ND	ND
T20	35+56+57 [△]	ND	ND	136	ND
T21	36	--	--	--	--
T22	37+38+42+43 [△]	ND	ND	ND	ND
T23	41	--	--	--	--
T24	44	--	--	--	--
T25	45	--	--	--	--
T26	46	--	--	--	--
T27	48+55+65 [△]	ND	ND	ND	ND
T28	50(R1)	--	--	--	--
T29	51+52+59+61 [△]	ND	ND	ND	ND
T30	53	--	--	--	--
T31	54	--	--	--	--
T32	58	--	--	--	--
T33	60	--	--	--	--
T34	62	--	--	--	--
T35	64+66 [△]	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:

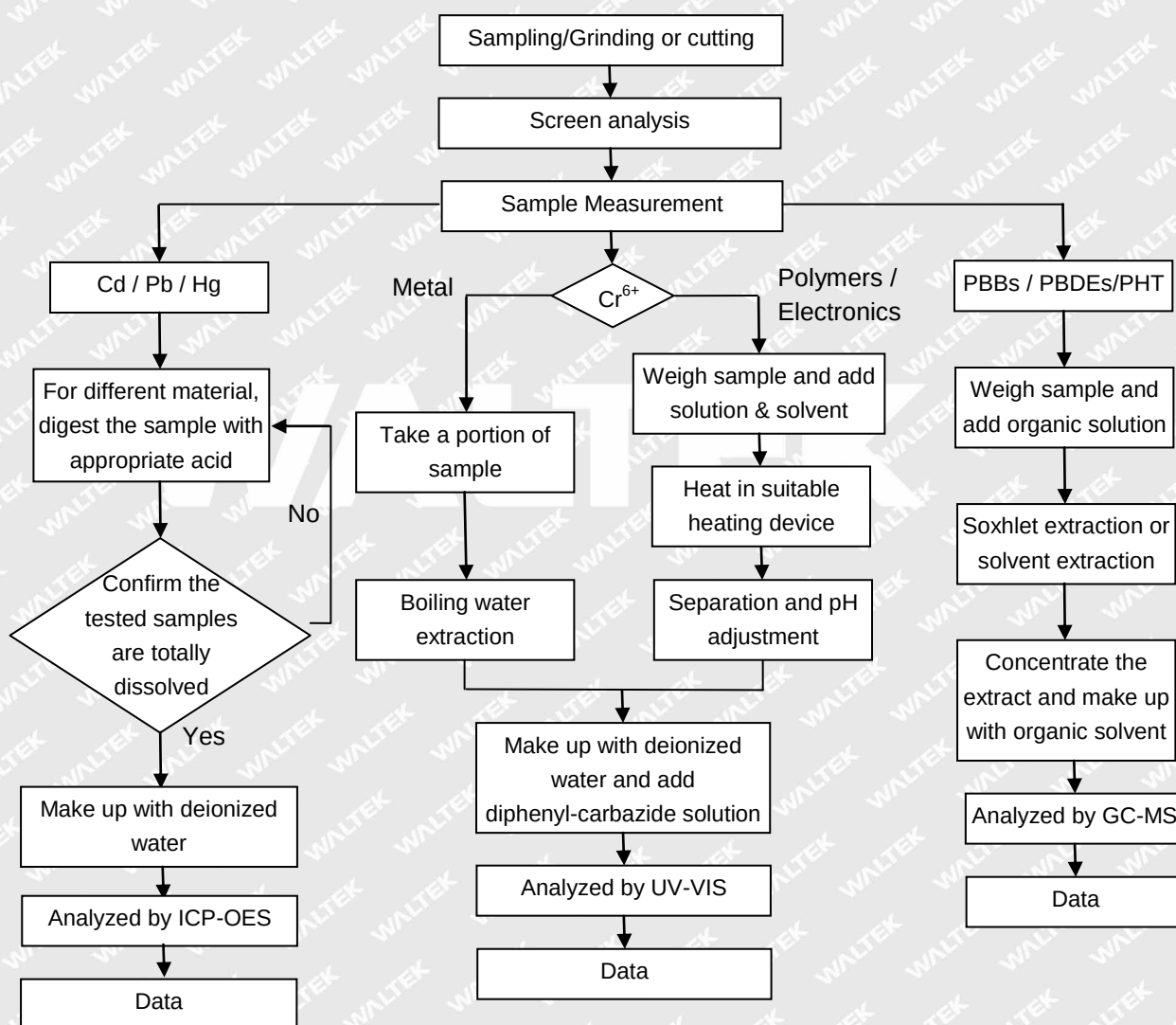
“DBP” denotes Dibutyl phthalate, “BBP” denotes Benzyl butyl phthalate (BBP), “DEHP” denotes Bis(2-ethylhexyl)-phthalate, “DIBP” denotes Diisobutyl phthalate, “PHT” denotes Phthalates.



(6) RoHS requirement

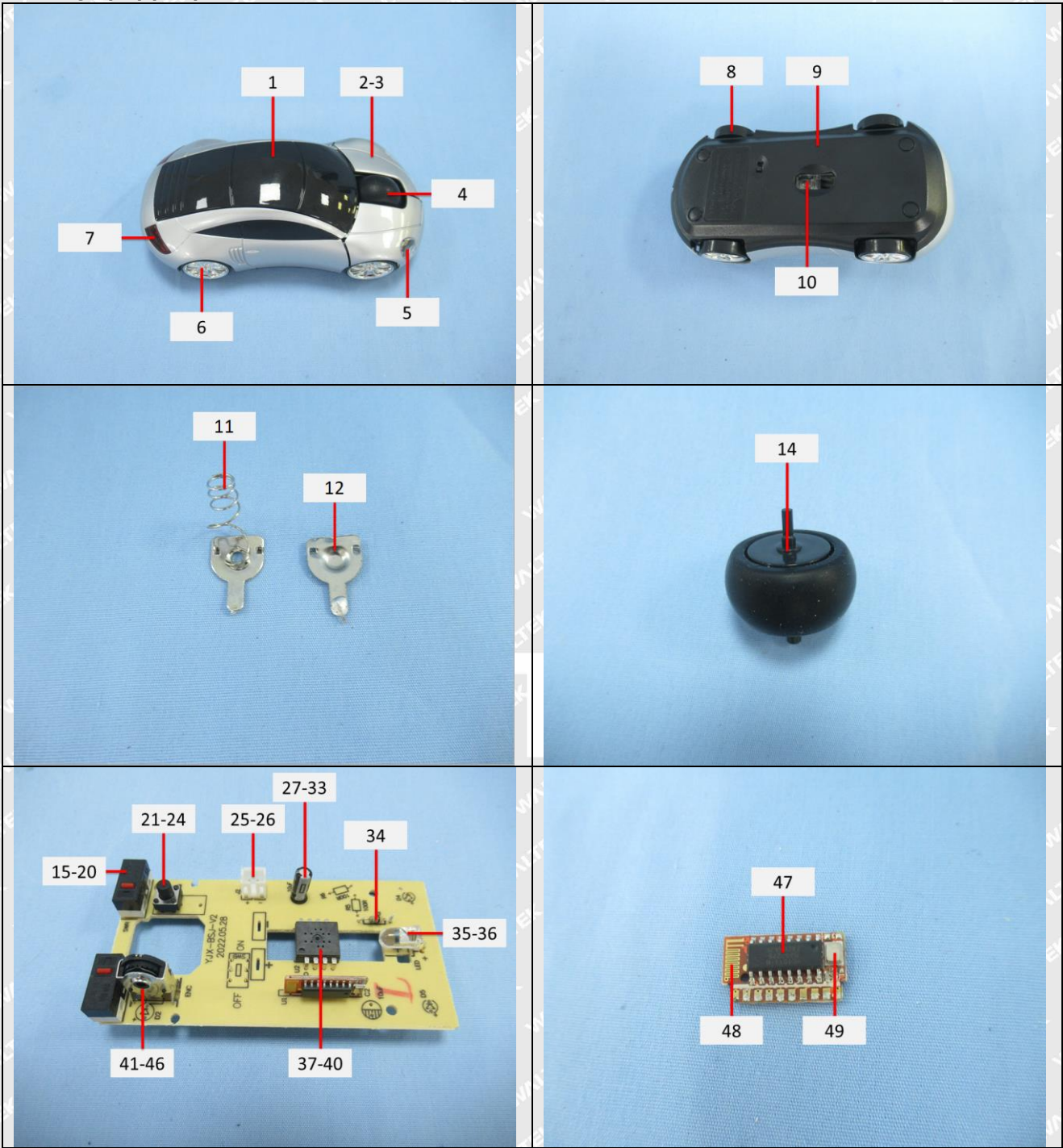
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

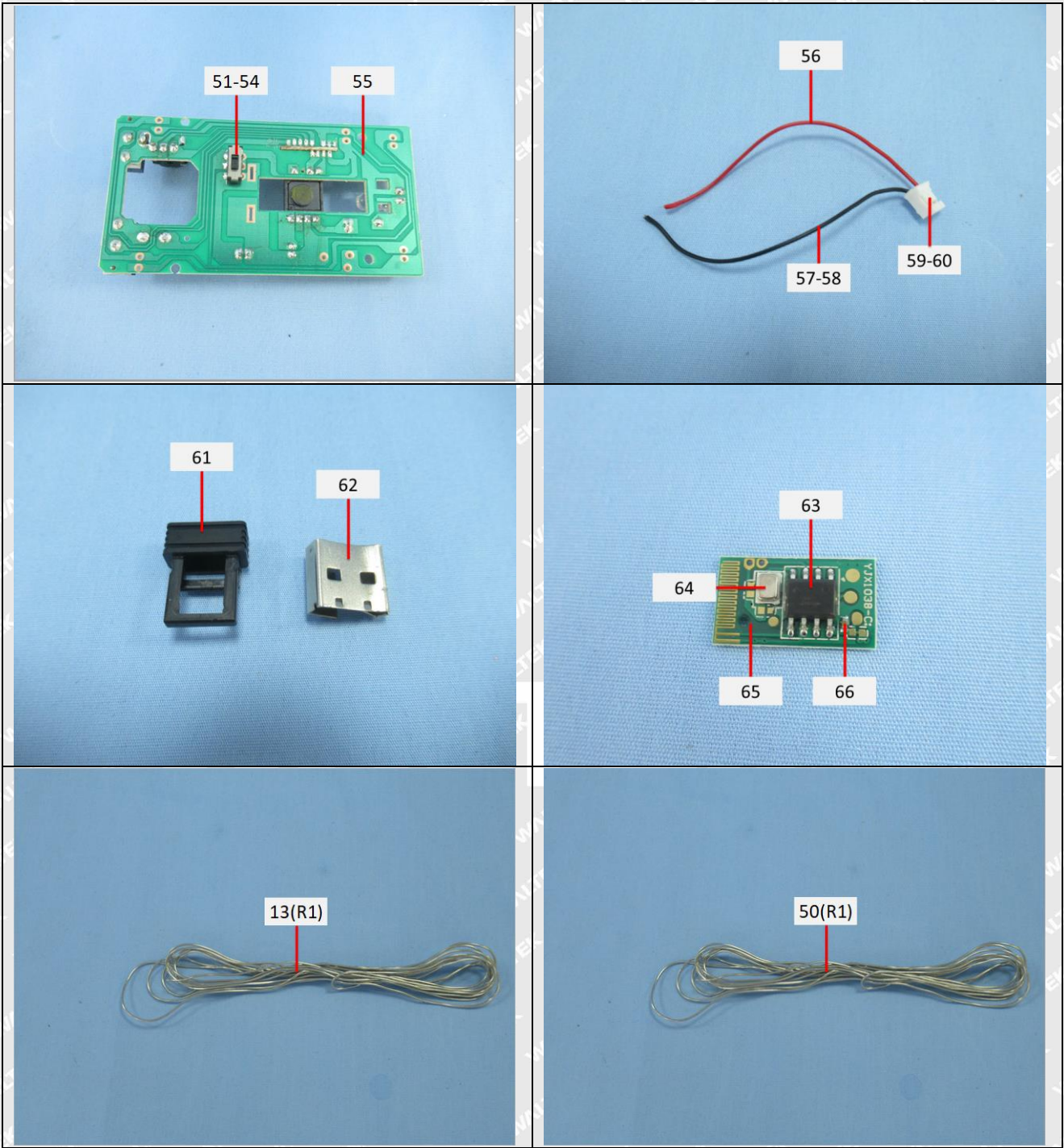
- (7) “△”= As client's requirement, the testing was conducted based on mixed components. Results are calculated by the minimum weight of mixed components.

Measurement Flowchart:



Photograph(s) of parts tested:







Report No.: WTF24F05113382A1C

Job No.: FSW2024052881162CJ

Remarks:

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

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