



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No...... : WTF23F05108440A1C
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..... : Optical mouse in RABS bamboo
Sample Model..... : MO2085
Date of Receipt sample..... : 2023-05-19 & 2023-06-02
Testing period..... : 2023-05-19 to 2023-05-29 & 2023-06-02 to 2023-06-06
Date of Issue..... : 2023-06-07
Test Result..... : Refer to next page (s)

Prepared By:

Waltek Testing Group (Foshan) Co., Ltd.

Address: No.13-19, 2/F., 2nd Building, Sunlink International Machinery City,
Chencun, Shunde District, Foshan, Guangdong, China

Tel:+86-757-23811398 Fax:+86-757-23811381 E-mail:info@waltek.com.cn

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.
- 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)

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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	White plastic shell	BL	BL	BL	BL	BL	NA
2	White plastic shell	BL	BL	BL	BL	BL	NA
3	White plastic shell	BL	BL	BL	BL	BL	NA
4	White plastic shell	BL	BL	BL	BL	BL	NA
5	Transparent plastic sheet	BL	BL	BL	BL	BL	NA
6	Silvery metal screw	BL	BL	BL	BL	--	NA
7	Black plastic wire covering	BL	BL	BL	BL	BL	NA
8	Silvery metal spring	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
9	White plastic shell(connector)	BL	BL	BL	BL	BL	NA
10	Silvery metal pin(connector)	BL	BL	BL	BL	--	NA
11	Red plastic wire covering	BL	BL	BL	BL	BL	NA
12	Silvery metal wire	BL	BL	BL	BL	--	NA
13	Silvery metal sheet	BL	BL	BL	BL	--	NA
14	Silvery crystal oscillator	BL	BL	BL	BL	BL	NA
15	Black EC	BL	BL	BL	BL	BL	NA
16	Transparent LED	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
17	Silvery metal pin(LED)	BL	BL	BL	BL	--	NA
18	White plastic middle wheel	BL	BL	BL	BL	BL	NA
19	White soft plastic ring	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	Black plastic film(electrolytic capacitor)	BL	BL	BL	BL	BL	NA
21	Black rubber stopper(electrolytic capacitor)	BL	BL	BL	BL	BL	NA
22	Brown paper(electrolytic capacitor)	BL	BL	BL	BL	BL	NA
23	Silvery metal shell(electrolytic capacitor)	BL	BL	BL	BL	--	NA
24	Silvery metal foil(electrolytic capacitor)	BL	BL	BL	BL	--	NA
25	Grey metal foil(electrolytic capacitor)	BL	BL	BL	BL	--	NA
26	Silvery metal pin(electrolytic capacitor)	BL	BL	BL	BL	--	NA
27	White plastic shell(socket)	BL	BL	BL	BL	BL	NA
28	Silvery metal pin(socket)	BL	BL	BL	BL	--	NA
29	Silvery metal shell	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
30	Silvery metal sheet	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative
31	Coppery metal ring	BL	BL	BL	BL	--	NA
32	Silvery metal pin	BL	BL	BL	BL	--	NA
33	Black plastic holder	BL	BL	BL	BL	BL	NA
34	Black audion	BL	BL	BL	BL	BL	NA
35	Green inductor with multicolour printing	BL	BL	BL	BL	BL	NA
36	Silvery metal pin(inductor)	BL	BL	BL	BL	--	NA
37	Black plastic key(switch)	BL	BL	BL	BL	BL	NA
38	Black plastic base(switch)	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
39	Silvery metal shell(switch)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative



Part No.	Part Description	Result of XRF					Result of Wet Chemical Testing (mg/kg)
		Cd	Pb	Hg	Cr	Br	
40	Silvery metal sheet(switch)	BL	BL	BL	BL	--	NA
41	Black plastic shell(switch)	BL	BL	BL	BL	BL	NA
42	White plastic base(switch)	BL	BL	BL	BL	BL	NA
43	White plastic key(switch)	BL	BL	BL	BL	BL	NA
44	Coppery metal sheet(switch)	BL	BL	BL	BL	--	NA
45	Silvery metal pin(switch)	BL	BL	BL	BL	--	NA
46	Yellow green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
47	Chip resistor	BL	OL	BL	BL	BL	*Pb : 8.28×10^4
48	Chip IC	BL	BL	BL	BL	BL	NA
49	Chip capacitor	BL	BL	BL	BL	BL	NA
50	Solder	BL	IN	BL	BL	--	Pb :311
51	White plastic shell	BL	BL	BL	BL	BL	NA
52	Silvery metal shell	BL	BL	BL	BL	--	NA
53	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
54	Black IC	BL	BL	BL	BL	BL	NA
55	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
56	Chip capacitor	BL	BL	BL	BL	BL	NA
57	Light yellow bamboo shell	BL	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 ≤ (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 5mg/kg, LOQ of Cr⁶⁺ for polymer and composite sample is 8mg/kg and LOQ of Cr⁶⁺ for metal sample is 0.1µg/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)



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- (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 0.10ug/cm².

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is greater than 0.13ug/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 the glass or ceramic material of that electronic component which is exempted by Directive 2011/65/EU ANNEX III.

2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1+2+3+4+5 [△]	ND	ND	ND	ND
T02	6	--	--	--	--
T03	7	ND	ND	ND	ND
T04	8	--	--	--	--
T05	9+18+33+37 [△]	ND	ND	ND	ND
T06	10	--	--	--	--
T07	11	ND	ND	ND	ND
T08	12	--	--	--	--
T09	13	--	--	--	--
T10	14+15+34+35+47 [△]	ND	ND	ND	ND
T11	16	ND	ND	ND	ND
T12	17	--	--	--	--
T13	19	ND	ND	ND	ND
T14	20	ND	ND	ND	ND
T15	21	ND	ND	ND	ND
T16	22	ND	ND	ND	ND
T17	23	--	--	--	--
T18	24	--	--	--	--
T19	25	--	--	--	--
T20	26	--	--	--	--
T21	27	ND	ND	ND	ND
T22	28	--	--	--	--
T23	29	--	--	--	--
T24	30	--	--	--	--
T25	31	--	--	--	--
T26	32	--	--	--	--



Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T27	36	--	--	--	--
T28	38	ND	ND	ND	ND
T29	39	--	--	--	--
T30	40	--	--	--	--
T31	41+42+43+51 [△]	ND	ND	ND	ND
T32	44	--	--	--	--
T33	45	--	--	--	--
T34	46+53 [△]	ND	ND	ND	ND
T35	48+49+54+55+56 [△]	ND	ND	ND	ND
T36	50	--	--	--	--
T37	52	--	--	--	--
T38	57	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.

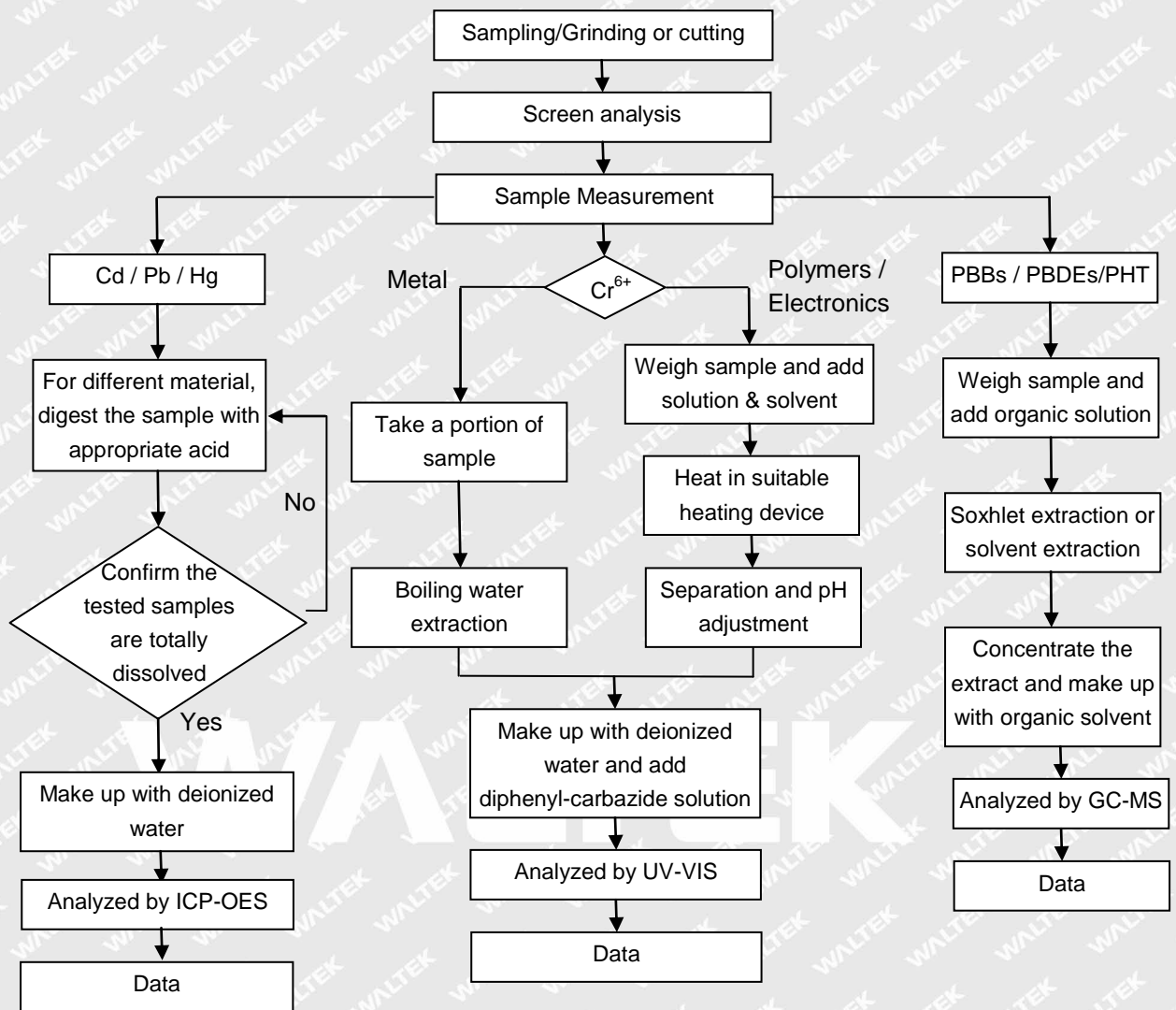
- (6) RoHS requirement

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.

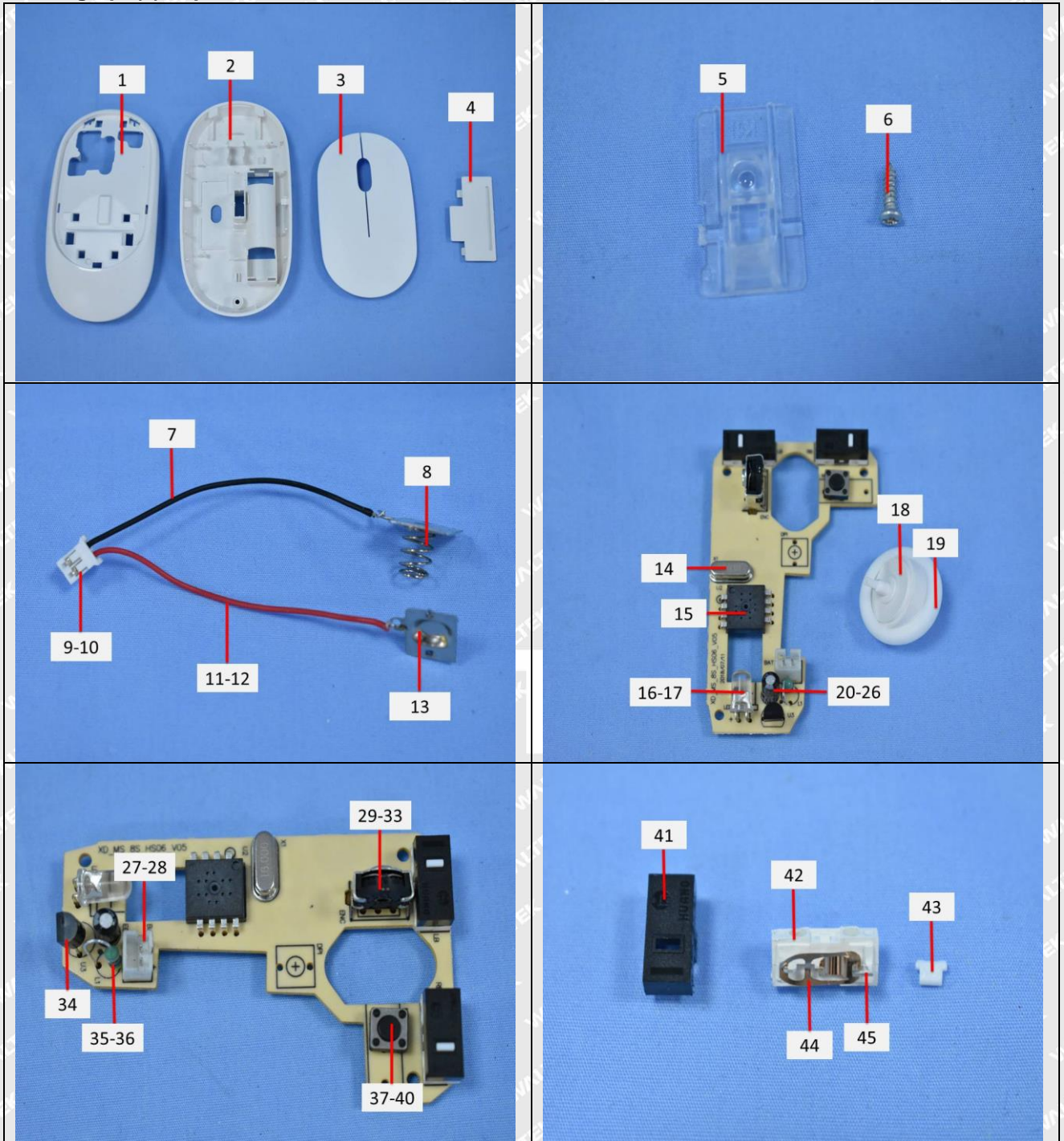


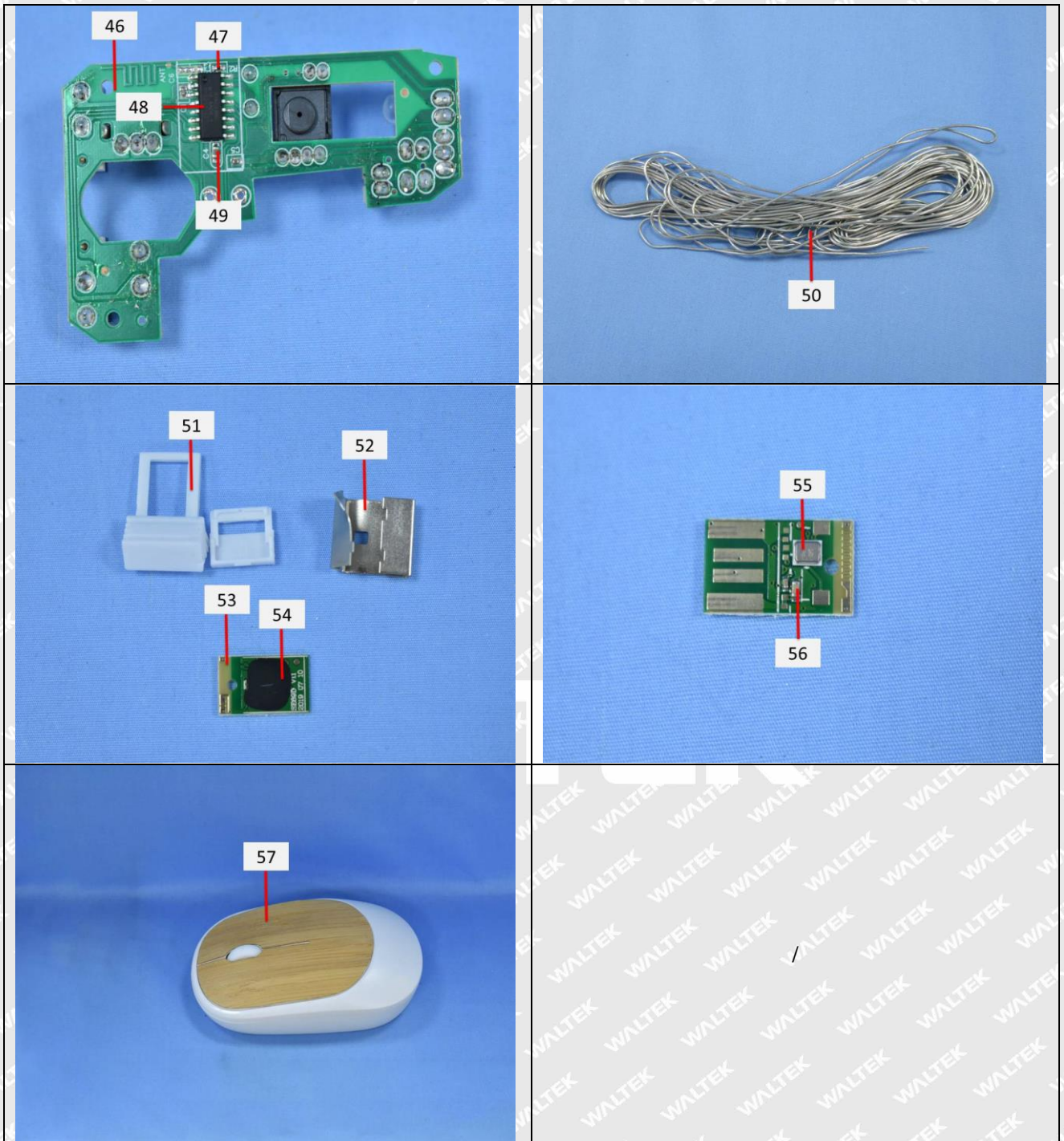
Measurement Flowchart:





Photograph(s) of parts tested:







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Remarks:

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

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