



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No. : WTF21F08089123A1C

Applicant : Mid Ocean Brands B.V.

Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

Manufacturer : 110075

Sample Name : TWS earbuds with charging base

Model No. : MO9838

Sample Receiving Date : 2021-08-26 & 2021-09-26 & 2021-10-12

Testing Period : 2021-08-26 to 2021-09-18 & 2021-09-26 to 2021-10-16

Date of Issue : 2021-10-18

Test Result : Please refer to next page (s)

Remarks:

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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 62321-2:2013, 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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**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	Transparent plastic label with black printing	BL	BL	BL	BL	BL	NA
3	Silvery magnetic sheet	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND
4	Silvery metal strip	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
5	Black sponge	BL	BL	BL	BL	BL	NA
6	Semi-transparent plastic sheet	BL	BL	BL	BL	BL	NA
7	White soft plastic cap	BL	BL	BL	BL	BL	NA
8	Silvery metal screw	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
9	White plastic jacket of plug	BL	BL	BL	BL	BL	NA
10	Solder of plug	BL	BL	BL	BL	BL	NA
11	Silvery metal shell of plug	BL	BL	BL	BL	BL	NA
12	Silvery metal pin of plug	BL	BL	BL	BL	BL	NA
13	Black plastic core of plug	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
14	Grey plastic core of plug	BL	BL	BL	BL	BL	NA
15	Red plastic wire covering	BL	BL	BL	BL	BL	NA
16	White plastic wire covering	BL	BL	BL	BL	BL	NA
17	Coppery metal wire	BL	BL	BL	BL	BL	NA
18	White plastic wire jacket	BL	BL	BL	BL	BL	NA
19	White plastic jacket of plug	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 of plug	BL	BL	BL	BL	BL	NA
21	Silvery metal pin of plug	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
22	Black plastic core of plug	BL	BL	BL	BL	BL	NA
23	Solder of plug	BL	BL	BL	BL	BL	NA
24	Silvery fibrous net	BL	BL	BL	BL	BL	NA
25	Solder	BL	BL	BL	BL	BL	NA
26	Coppery metal sheet	BL	BL	BL	BL	BL	NA
27	White plastic shell	BL	BL	BL	BL	BL	NA
28	Golden metal strip	BL	OL	BL	BL	BL	#Pb : 2.40 × 10⁴
29	Blue PCB	BL	BL	BL	BL	BL	NA
30	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
31	Blue PCB	BL	BL	BL	BL	BL	NA
32	Solder	BL	BL	BL	BL	BL	NA
33	Chip inductor	BL	BL	BL	BL	BL	NA
34	Chip capacitor	BL	BL	BL	BL	BL	NA
35	Golden metal cap of connector	BL	BL	BL	BL	BL	NA
36	Golden metal base of connector	BL	OL	BL	BL	BL	#Pb : 2.26 × 10⁴
37	Silvery metal spring of connector	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
38	Chip diode	BL	BL	BL	BL	BL	NA
39	Black plastic core of socket	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	Silvery metal shell of socket	BL	BL	BL	BL	BL	NA
41	Silvery metal pin of socket	BL	BL	BL	BL	BL	NA
42	Chip resistor	BL	BL	BL	BL	BL	NA
43	Chip IC	BL	BL	BL	BL	BL	NA
44	Chip audion	BL	BL	BL	BL	BL	NA
45	Chip LED	BL	BL	BL	BL	BL	NA
46	Chip LED	BL	BL	BL	BL	BL	NA
47	Yellow plastic wire covering	BL	BL	BL	BL	BL	NA
48	Red plastic wire covering	BL	BL	BL	BL	BL	NA
49	Black plastic wire covering	BL	BL	BL	BL	BL	NA
50	Coppery metal wire	BL	BL	BL	BL	BL	NA
51	Solder	BL	BL	BL	BL	BL	NA
52	Silvery meal sheet	BL	BL	BL	BL	BL	NA
53	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
54	Solder	BL	BL	BL	BL	BL	NA
55	Chip IC	BL	BL	BL	BL	BL	NA
56	Chip resistor	BL	BL	BL	BL	BL	NA
57	Chip capacitor	BL	BL	BL	BL	BL	NA
58	Solder	BL	BL	BL	BL	BL	NA
59	Yellow plastic film with black printing	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	
60	Chip EC	BL	BL	BL	BL	BL	NA
61	Chip IC	BL	BL	BL	BL	BL	NA
62	Solder	BL	BL	BL	BL	BL	NA
63	Black plastic wire covering	BL	BL	BL	BL	BL	NA
64	Yellow plastic wire covering	BL	BL	BL	BL	BL	NA
65	Coppery metal wire	BL	BL	BL	BL	BL	NA
66	Chip crystal oscillator	BL	BL	BL	BL	BL	NA
67	White plastic wire covering	BL	BL	BL	BL	BL	NA
68	Blue plastic wire covering	BL	BL	BL	BL	BL	NA
69	Red plastic wire covering	BL	BL	BL	BL	BL	NA
70	Silvery metal wire	BL	BL	BL	BL	BL	NA
71	Silvery metal shell of MIC	BL	BL	BL	BL	BL	NA
72	Silvery metal sheet of MIC	BL	BL	BL	BL	BL	NA
73	Silvery metal ring of MIC	BL	BL	BL	BL	BL	NA
74	Silvery metal ring of MIC	BL	BL	BL	BL	BL	NA
75	Silvery plastic film of MIC	BL	BL	BL	BL	BL	NA
76	Yellow plastic gasket of MIC	BL	BL	BL	BL	BL	NA
77	Chip IC of MIC	BL	BL	BL	BL	BL	NA
78	Chip capacitor of MIC	BL	BL	BL	BL	BL	NA
79	Blue 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	
80	Silvery metal shell of loudspeaker	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
81	Silvery metal sheet of loudspeaker	BL	BL	BL	BL	BL	NA
82	Silvery metal base of loudspeaker	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
83	Silvery magnetic ring of loudspeaker	BL	BL	BL	IN	BL	Cr ⁶⁺ : ND
84	Beige PCB of loudspeaker	BL	BL	BL	BL	BL	NA
85	Solder of loudspeaker	BL	BL	BL	BL	BL	NA
86	Golden metal ring of loudspeaker	BL	BL	BL	BL	BL	NA
87	Coppery metal winding of loudspeaker	BL	BL	BL	BL	BL	NA
88	Transparent plastic film of loudspeaker	BL	BL	BL	BL	BL	NA
89	Black adhesive sponge of loudspeaker	BL	BL	BL	BL	BL	NA
90	Black plastic ring of loudspeaker	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.
- (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	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)

- (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 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+6+13+14+22 [△]	<50	<50	<50	<50
T02	2	<50	<50	<50	<50
T03	3+83 [△]	<50	<50	<50	<50
T04	5	<50	<50	<50	<50
T05	7	<50	<50	<50	<50
T06	9	<50	<50	<50	<50
T07	15	<50	<50	<50	<50
T08	16	<50	<50	<50	<50
T09	18	<50	<50	<50	<50
T10	19	<50	<50	<50	<50
T11	24	<50	<50	368	<50
T12	27	<50	<50	<50	<50
T13	29+30+31+53+79 [△]	<50	<50	<50	<50
T14	33+34+38+42+43 [△]	<50	<50	<50	<50
T15	39	<50	<50	<50	<50
T16	44+45+46+55+56 [△]	<50	<50	<50	<50
T17	47	374	<50	66	<50
T18	48	69	<50	<50	<50
T19	49	<50	<50	72	<50
T20	57+60+61+66+77 [△]	<50	<50	<50	<50
T21	59	<50	<50	71	<50
T22	63	<50	<50	<50	<50
T23	64	<50	<50	66	<50
T24	67	<50	<50	<50	<50
T25	68	<50	<50	<50	<50
T26	69	<50	<50	<50	<50
T27	75	<50	<50	<50	<50
T28	76	<50	<50	<50	<50
T29	78	<50	<50	<50	<50
T30	84	<50	<50	<50	<50
T31	88	74	<50	368	<50
T32	89	140	<50	61	<50
T33	90	<50	<50	78	<50

Note:

- (1) "<" = less than
- (2) mg/kg = milligram per kilogram= ppm
- (3) Abbreviation:
 "DBP" denotes Dibutyl phthalate, "BBP" denotes Benzyl butyl phthalate (BBP), "DEHP" denotes Bis(2-ethylhexyl)-phthalate, "DIBP" denotes Diisobutyl phthalate, "PHT" denotes Phthalates.



(4) RoHS requirement

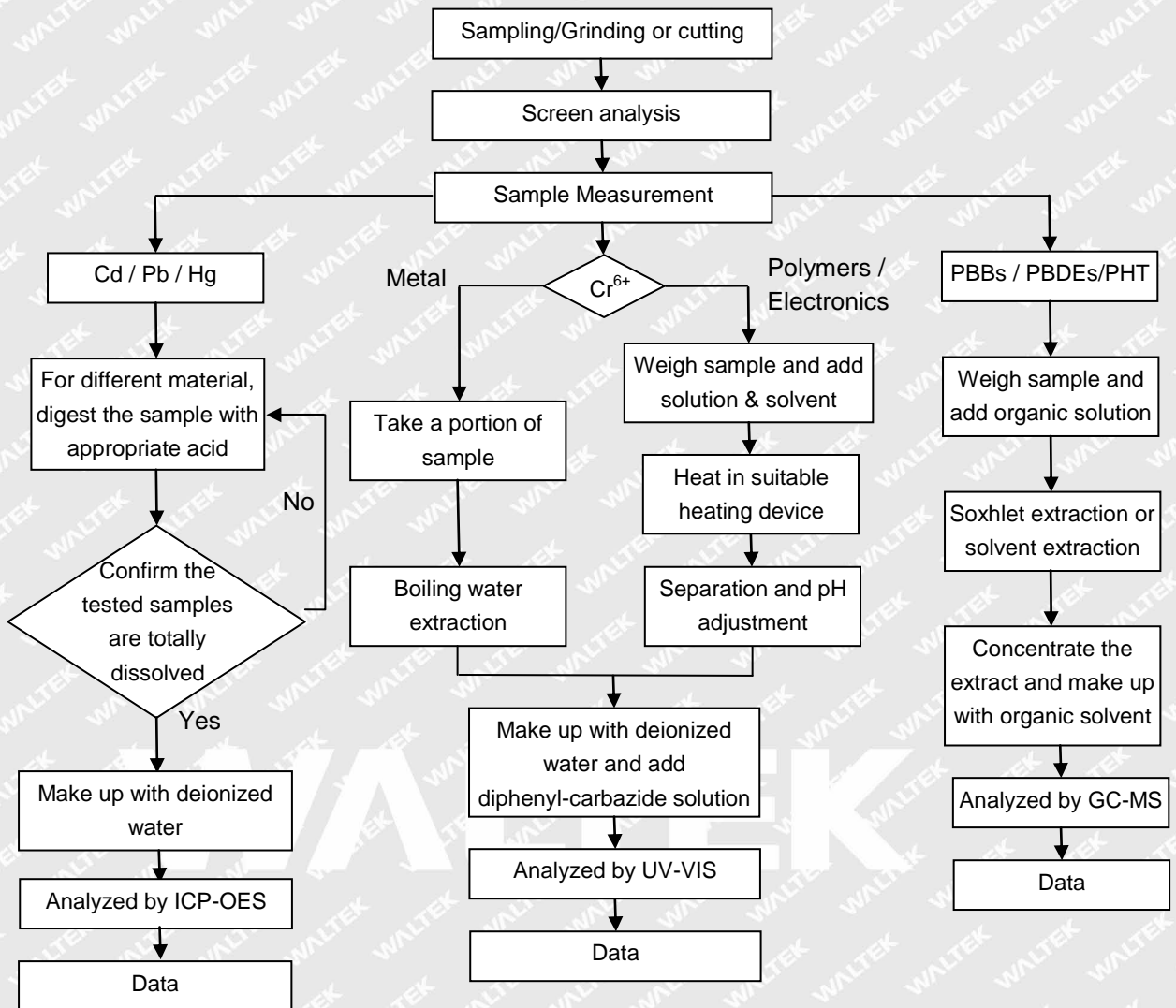
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

(5) “△”= 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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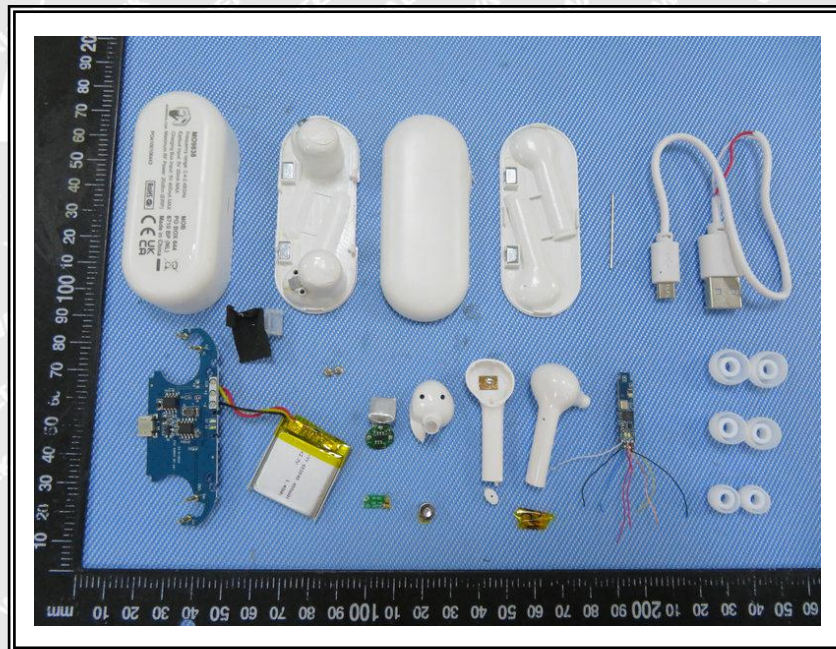


Measurement Flowchart:



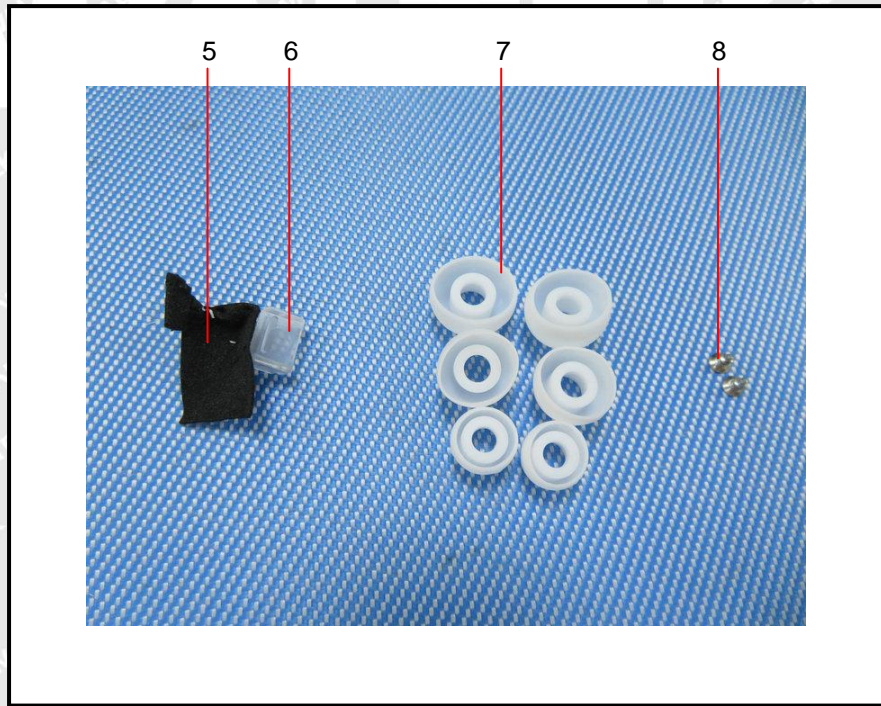
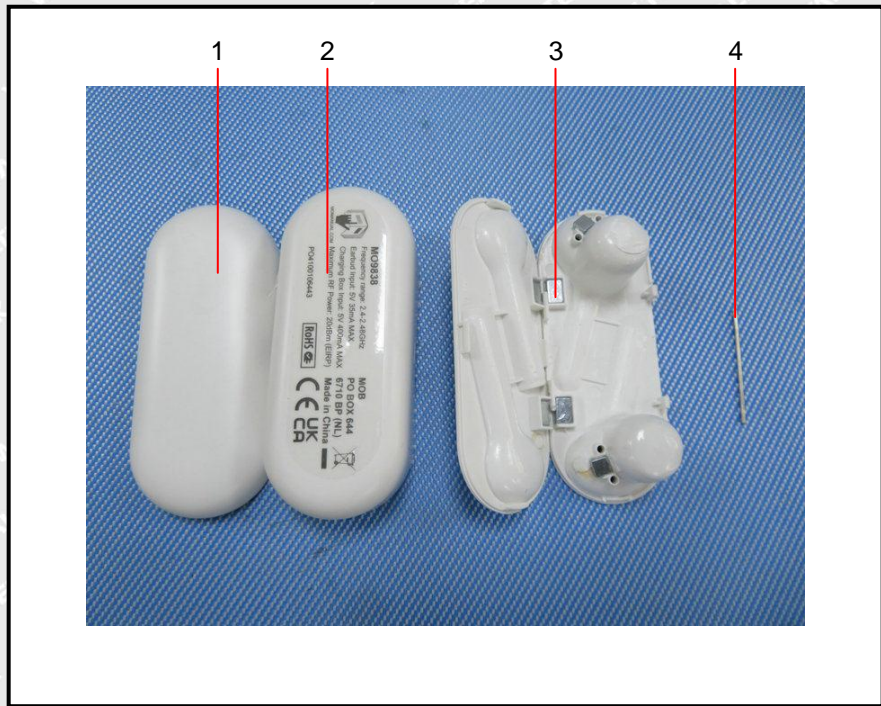


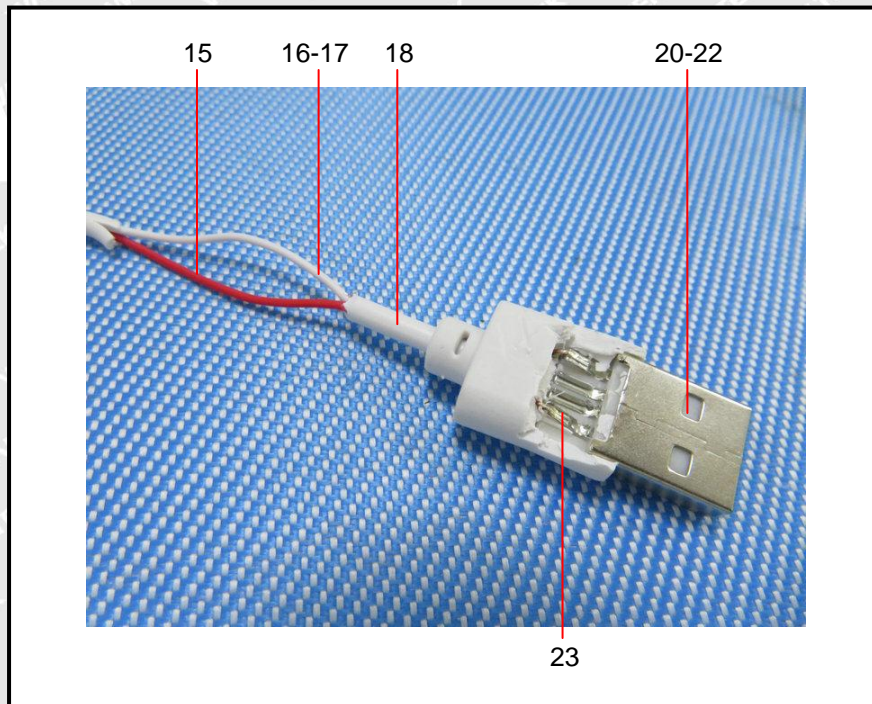
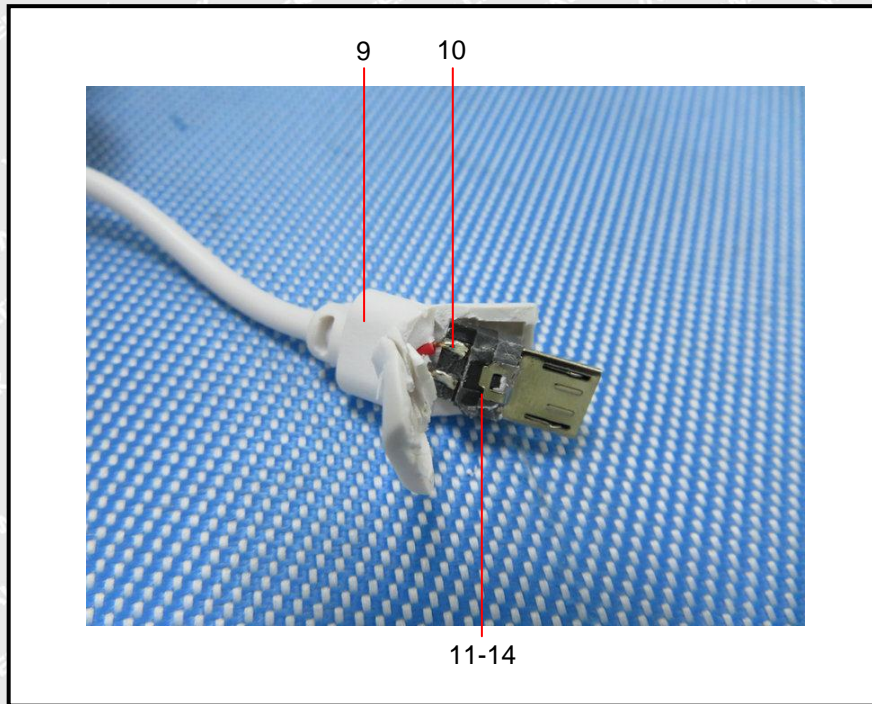
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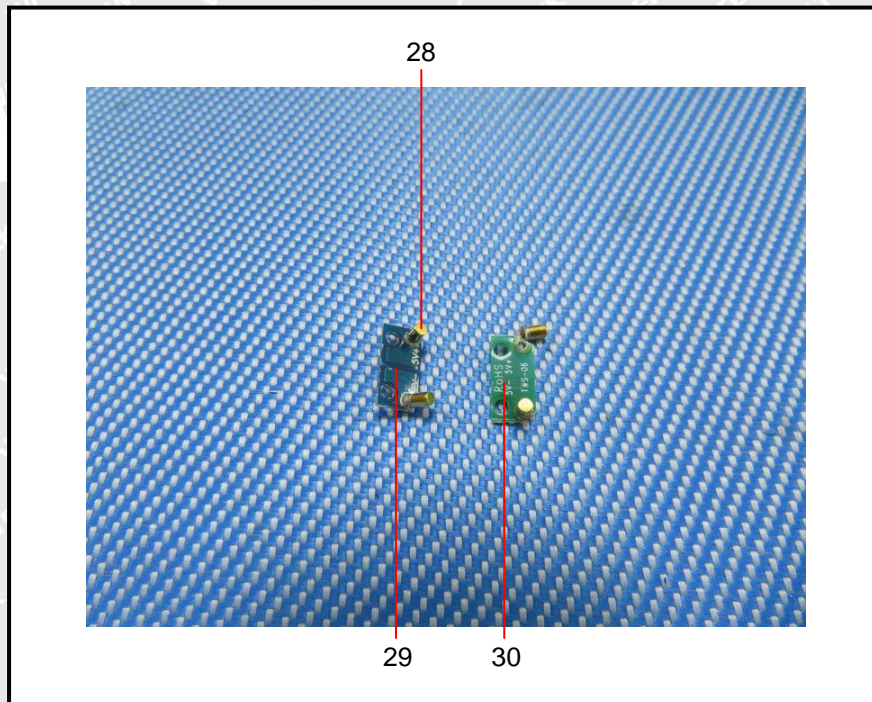
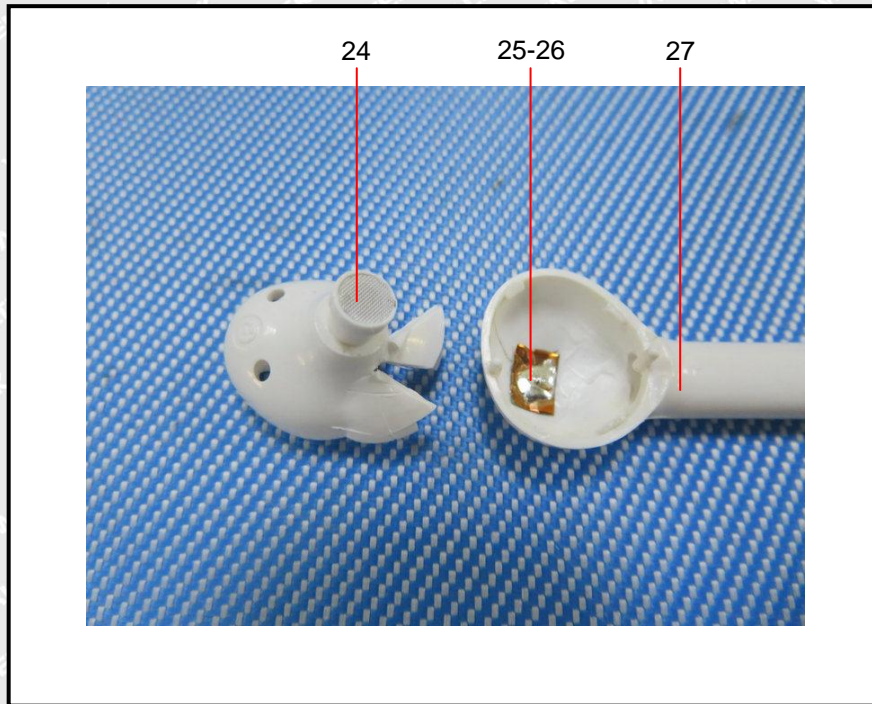


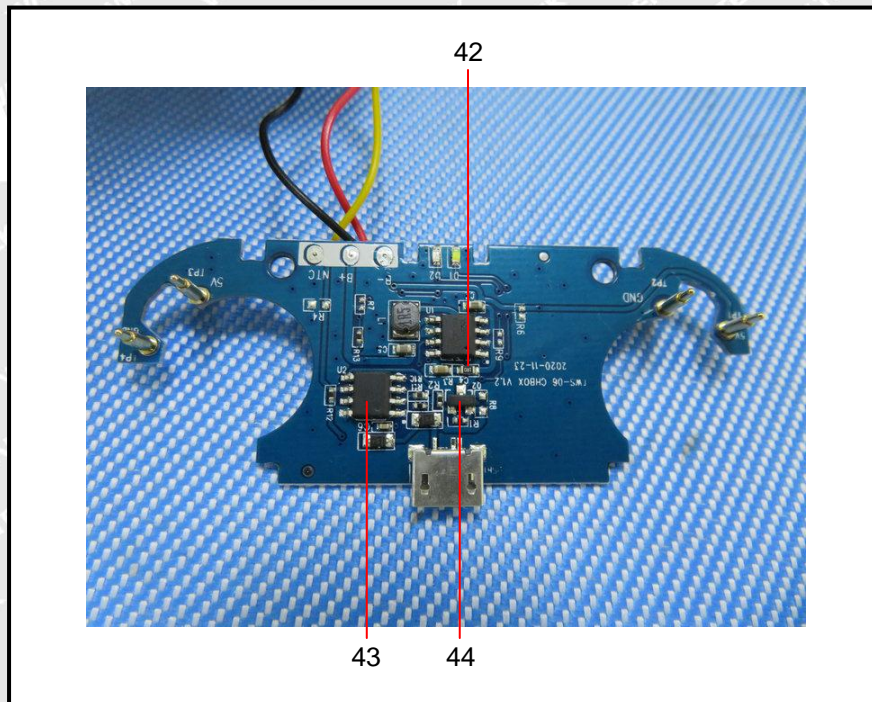
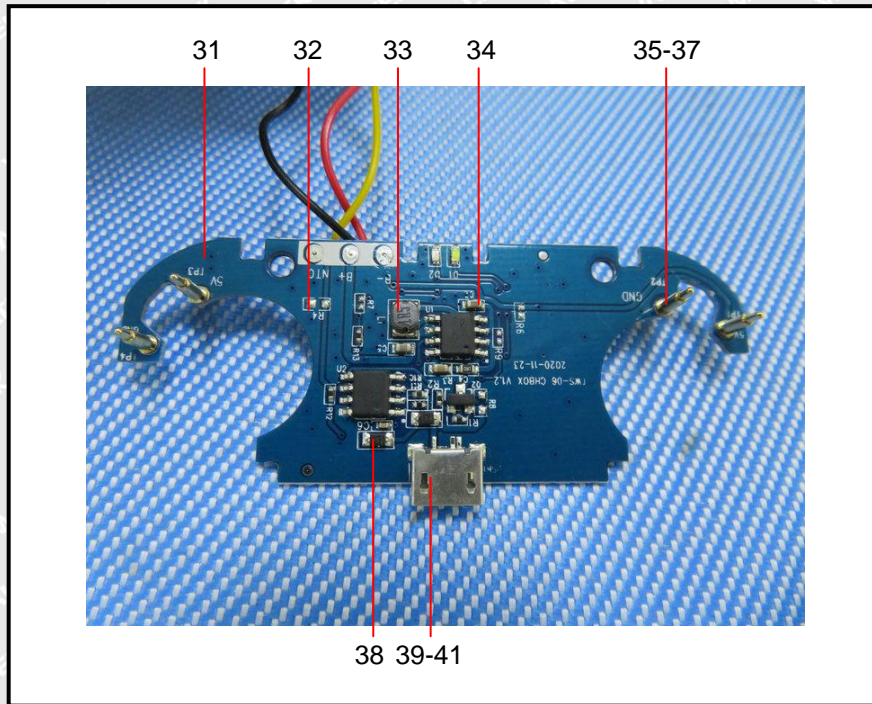


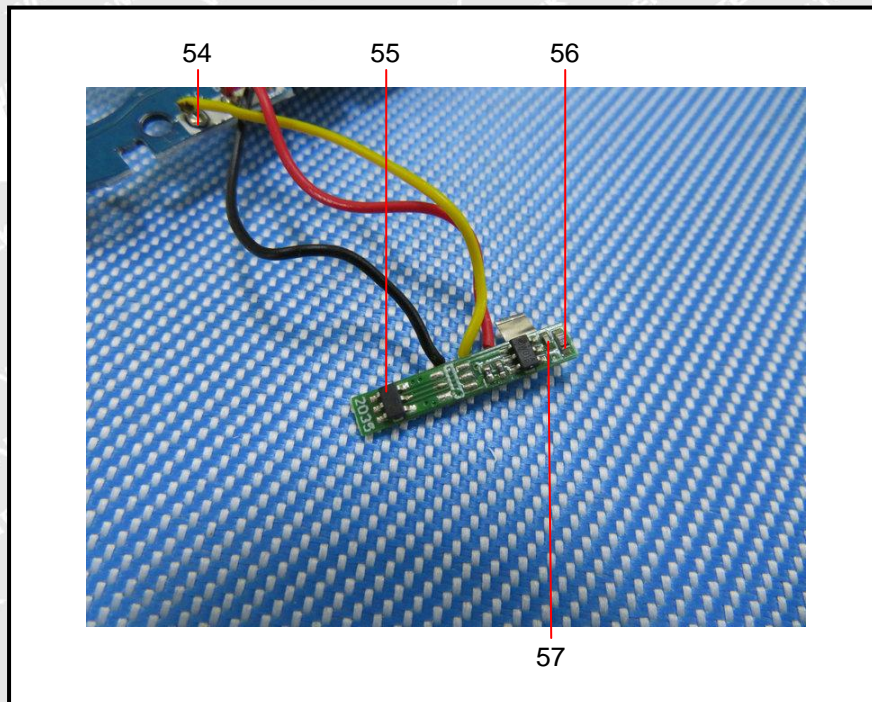
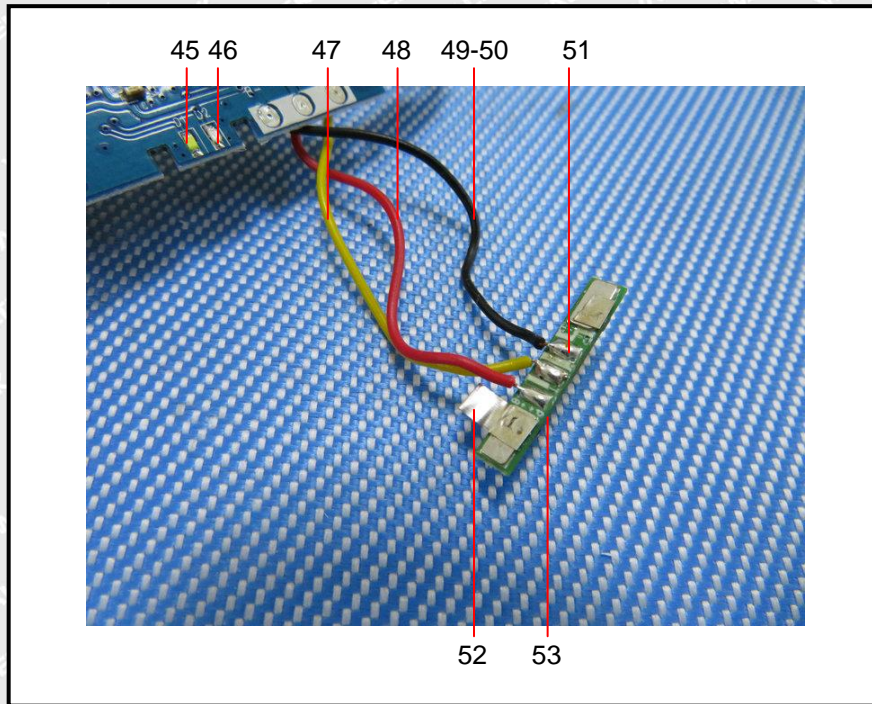
Photograph(s) of parts tested:

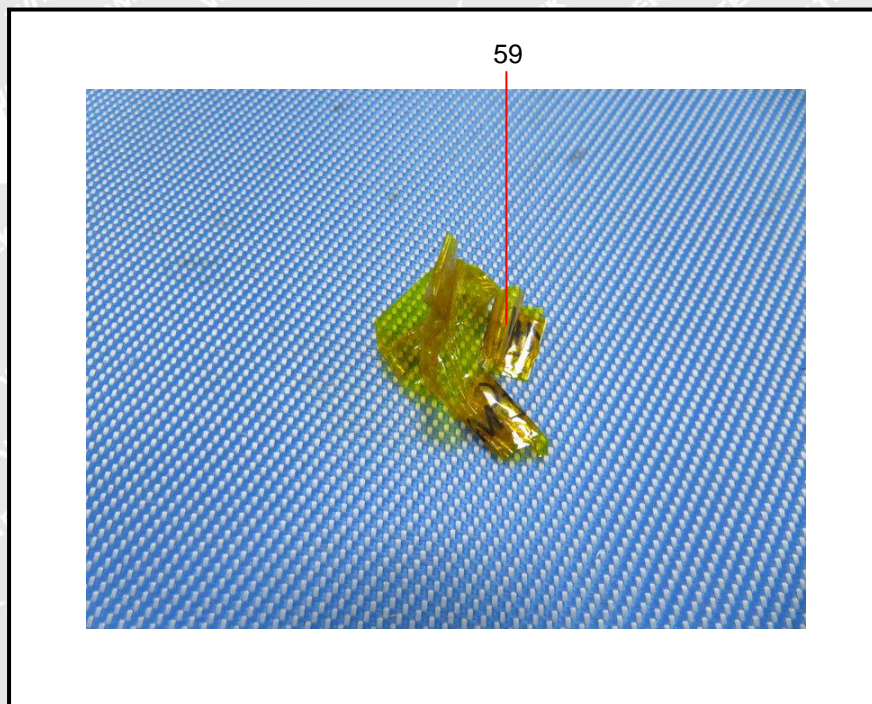
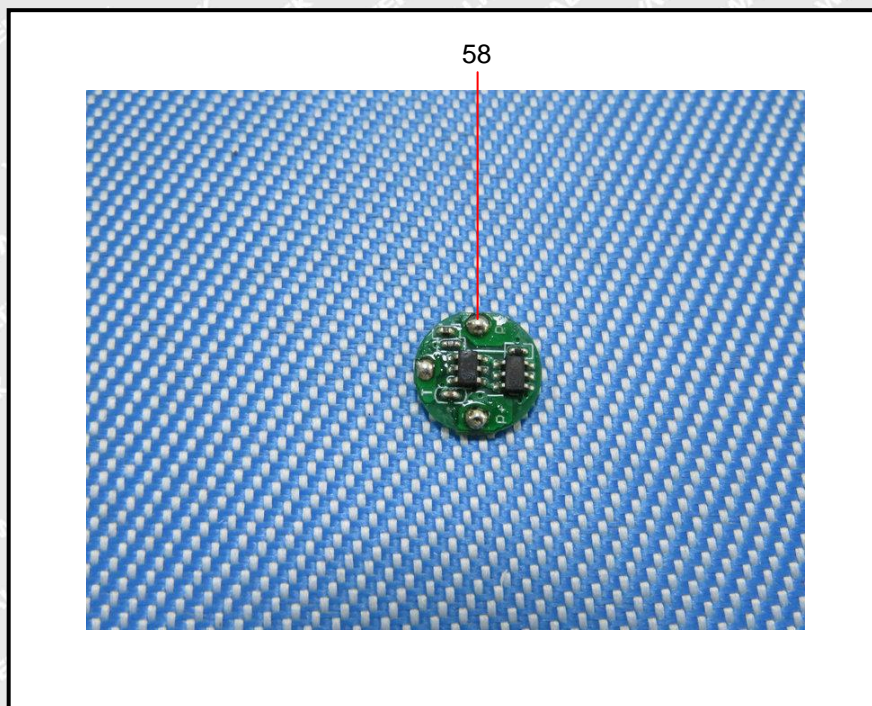


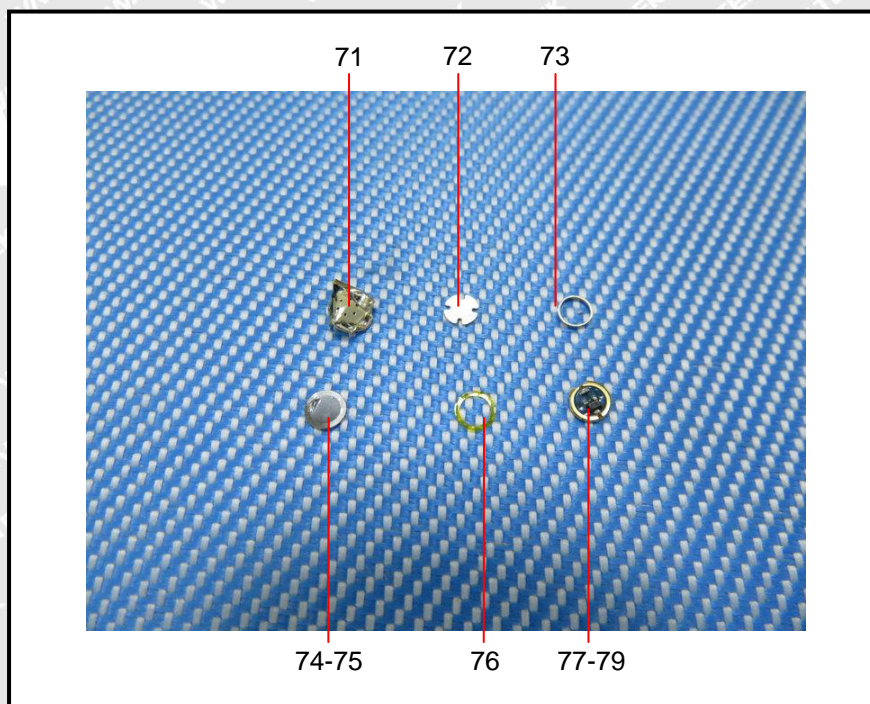
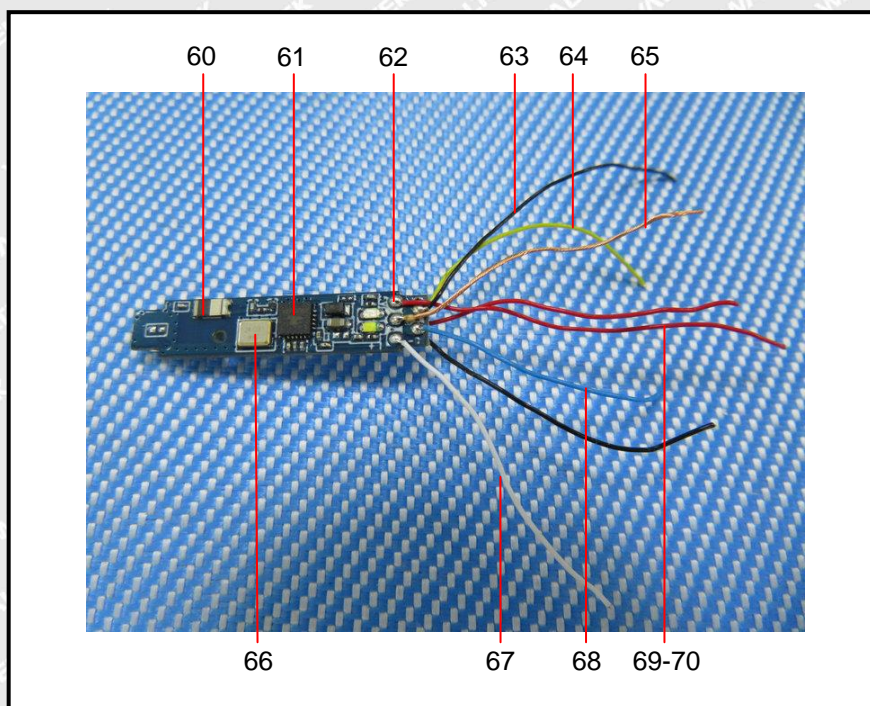


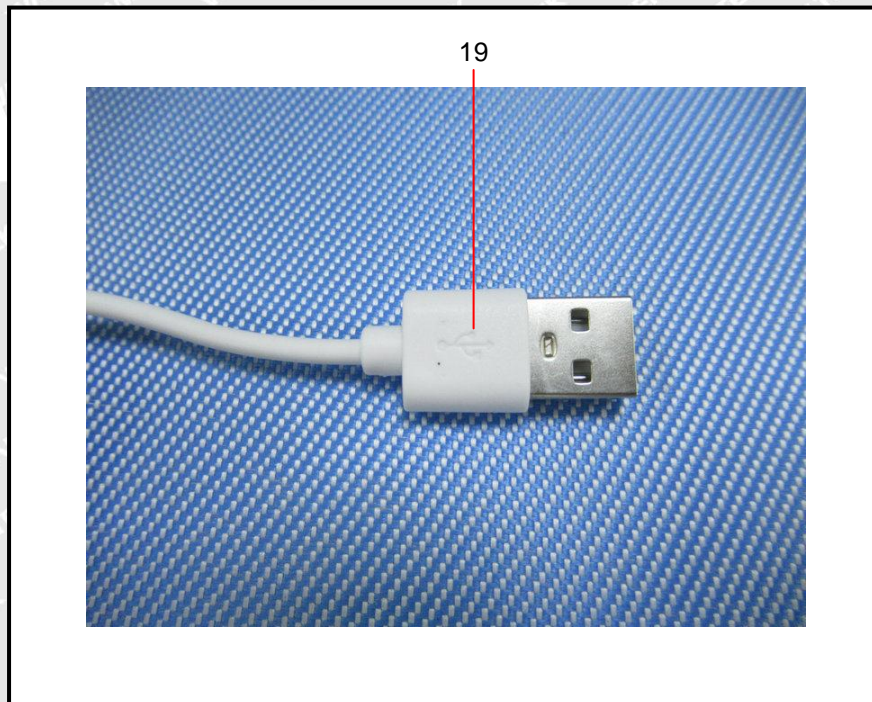
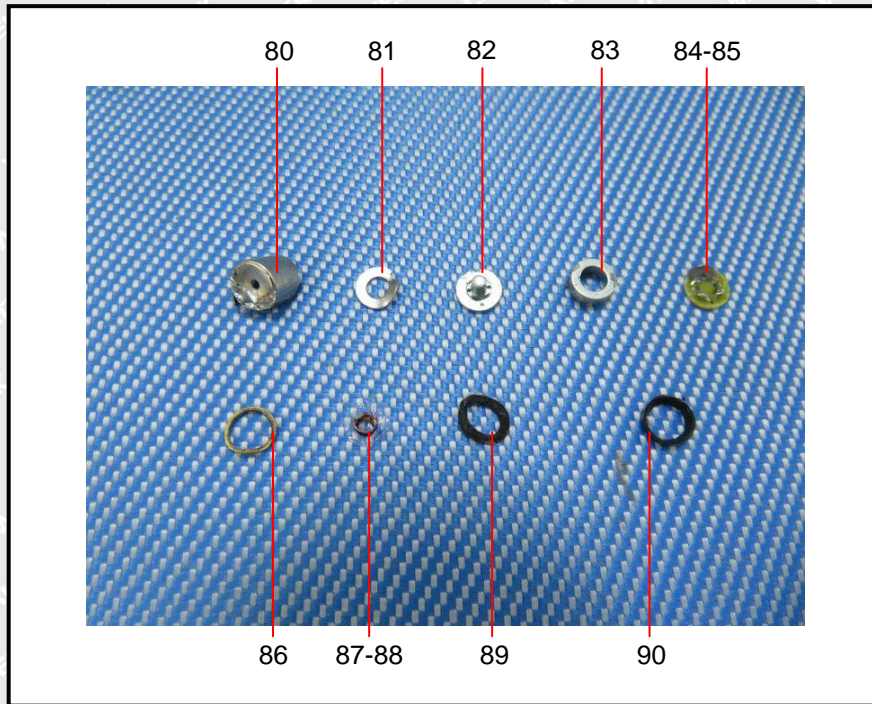












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