



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Report No. : WTF21F10108565A1C

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 : 1080P StreamCam with white LED

Model No. : MO6395

Sample Receiving Date : 2021-10-15 & 2021-11-06

Testing Period..... : 2021-10-15 to 2021-10-27 & 2021-11-06 to 2021-11-09

Date of Issue : 2021-11-11

Test Result : Please refer to next page (s)

Remarks:

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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

Compiled by:

Approved by:

Fat. Li

Swing Liang

Fat.Li / Project Engineer

Swing.Liang / Technical Manager



- 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 sheet	BL	BL	BL	BL	BL	NA
2	White paper adhesive label with green printing	BL	BL	BL	BL	BL	NA
3	Black plastic shell	BL	BL	BL	BL	BL	NA
4	Black plastic sheet	BL	BL	BL	BL	IN	PBBs : ND PBDEs : 90
5	Silvery metal block	BL	BL	BL	BL	BL	NA
6	Black sponge adhesive tape	BL	BL	BL	BL	BL	NA
7	Black sponge adhesive tape	BL	BL	BL	BL	BL	NA
8	Silvery metal screw	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
9	Silvery metal strip	BL	BL	BL	BL	BL	NA
10	Silvery metal screw	BL	BL	BL	BL	BL	NA
11	Silvery metal screw	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
12	Silvery metal screw with black plating	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
13	Silvery metal screw with black plating	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
14	Golden metal sheet	BL	BL	BL	BL	BL	NA
15	Black plastic shell	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
16	Black plastic sheet	BL	BL	BL	BL	BL	NA
17	Transparent glass sheet	BL	BL	BL	BL	BL	NA
18	Black plastic shell	BL	BL	BL	BL	BL	NA
19	Transparent plastic sheet	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 sheet	BL	BL	BL	BL	BL	NA
21	White plastic holder	BL	BL	BL	BL	BL	NA
22	Blue plastic film	BL	BL	BL	BL	BL	NA
23	Silvery plastic film	BL	BL	BL	BL	BL	NA
24	Silvery metal ring	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
25	Silvery metal shell	BL	BL	BL	BL	BL	NA
26	Black fibrous adhesive tape	BL	BL	BL	BL	BL	NA
27	Silvery metal holder	BL	BL	BL	BL	BL	NA
28	Solder	BL	BL	BL	BL	BL	NA
29	White PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
30	Chip LED	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
31	Chip resistor	BL	BL	BL	BL	BL	NA
32	Black plastic wire covering	BL	BL	BL	BL	BL	NA
33	Black plastic jacket of plug	BL	BL	BL	BL	BL	NA
34	Silvery metal shell of plug	BL	BL	BL	BL	BL	NA
35	White plastic core of plug	BL	BL	BL	BL	BL	NA
36	Silvery metal pin of plug	BL	BL	BL	BL	BL	NA
37	Solder	BL	BL	BL	BL	BL	NA
38	Black plastic wire covering	BL	BL	BL	BL	BL	NA
39	Chip audion	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	Red plastic wire covering	BL	BL	BL	BL	BL	NA
41	Silvery metal wire	BL	BL	BL	BL	BL	NA
42	Chip capacitor	BL	BL	BL	BL	BL	NA
43	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
44	Solder	BL	BL	BL	BL	BL	NA
45	Black plastic jacket	BL	BL	BL	BL	BL	NA
46	Black magnetic core	BL	BL	BL	BL	BL	NA
47	Chip resistor	BL	BL	BL	BL	BL	NA
48	Chip capacitor	BL	BL	BL	BL	BL	NA
49	Chip resistor	BL	BL	BL	BL	BL	NA
50	Chip inductor	BL	BL	BL	BL	BL	NA
51	Chip capacitor	BL	BL	BL	BL	BL	NA
52	Chip EC	BL	BL	BL	BL	BL	NA
53	Black PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
54	Chip audion	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 IC	BL	BL	BL	BL	BL	NA
58	Chip IC	BL	BL	BL	BL	BL	NA
59	Chip 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	
60	Silvery metal sheet	BL	BL	BL	BL	BL	NA
61	Black plastic sheet	BL	BL	BL	BL	BL	NA
62	Green PCB	BL	BL	BL	BL	IN	PBBs : ND PBDEs : ND
63	Silvery metal sheet	BL	BL	BL	BL	BL	NA
64	Solder	BL	BL	BL	BL	BL	NA
65	Beige PCB	BL	BL	BL	BL	BL	NA
66	Yellow plastic wire covering	BL	BL	BL	BL	BL	NA
67	Black plastic wire covering	BL	BL	BL	BL	BL	NA
68	Red plastic wire covering	BL	BL	BL	BL	BL	NA
69	Black plastic wire jacket	BL	BL	BL	BL	BL	NA
70	Black heat-shrinkable tube	BL	BL	BL	BL	BL	NA
71	White plastic wire covering	BL	BL	BL	BL	BL	NA
72	Green plastic wire covering	BL	BL	BL	BL	BL	NA
73	Blue plastic wire covering	BL	BL	BL	BL	BL	NA
74	Silvery metal wire	BL	BL	BL	IN	BL	Cr ⁶⁺ : Negative
75	Silvery metal wire	BL	BL	BL	BL	BL	NA
76	Black heat-shrinkable tube	BL	BL	BL	BL	BL	NA
77	Silvery metal foil	BL	BL	BL	BL	BL	NA
78	Black plastic cord anchorage	BL	BL	BL	BL	BL	NA
79	Yellow fibrous adhesive tape	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	$\mu\text{g}/\text{cm}^2$	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.

2. Phthalates:

Serial No.	Part No.	Result (mg/kg)			
		DBP	BBP	DEHP	DIBP
T01	1+3+4+15 [△]	<50	<50	112	<50
T02	2	<50	<50	<50	<50
T03	6	<50	<50	<50	<50
T04	7	<50	<50	<50	<50
T05	16	<50	<50	<50	<50
T06	17+29+30+31+39 [△]	<50	<50	<50	<50
T07	18	<50	<50	<50	<50
T08	19	<50	<50	<50	<50
T09	20	<50	<50	<50	<50
T10	21	<50	<50	<50	<50
T11	22	<50	<50	<50	<50
T12	26	<50	<50	<50	<50
T13	32	<50	<50	<50	<50
T14	33	<50	<50	<50	<50
T15	35+61 [△]	<50	<50	<50	<50
T16	38	125	<50	<50	<50
T17	40	123	<50	<50	<50
T18	42+43+46+47+48 [△]	<50	<50	<50	<50
T19	45	77	<50	151	<50
T20	49+50+51+52+53 [△]	<50	<50	<50	<50
T21	54+55+56+57+58 [△]	<50	<50	<50	<50
T22	59+62+65 [△]	<50	<50	<50	<50
T23	66	<50	<50	<50	<50
T24	67	<50	<50	<50	<50
T25	68	<50	<50	<50	<50
T26	69	<50	<50	<50	<50
T27	70	<50	<50	<50	<50
T28	71	<50	<50	<50	<50
T29	72	<50	<50	<50	<50
T30	73	<50	<50	<50	<50
T31	76	<50	<50	72	<50
T32	78	<50	<50	<50	<50
T33	79	<50	<50	<50	<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

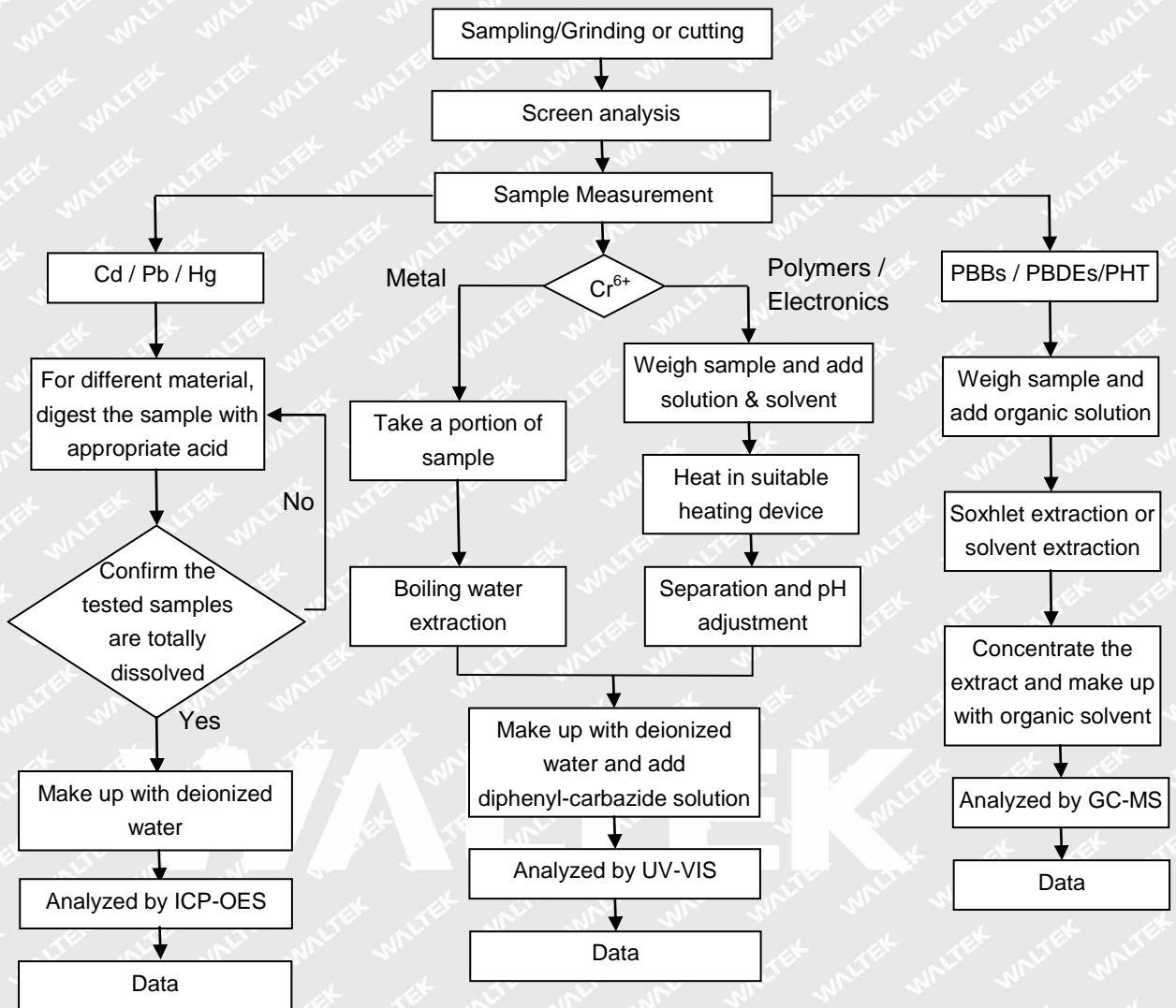
Restricted Substances	Limits
Dibutyl phthalate (DBP)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP)	0.1% (1000 mg/kg)
Di(2-ethylhexyl) phthalate (DEHP)	0.1% (1000 mg/kg)
Di-iso-butyl phthalate (DIBP)	0.1% (1000 mg/kg)

- (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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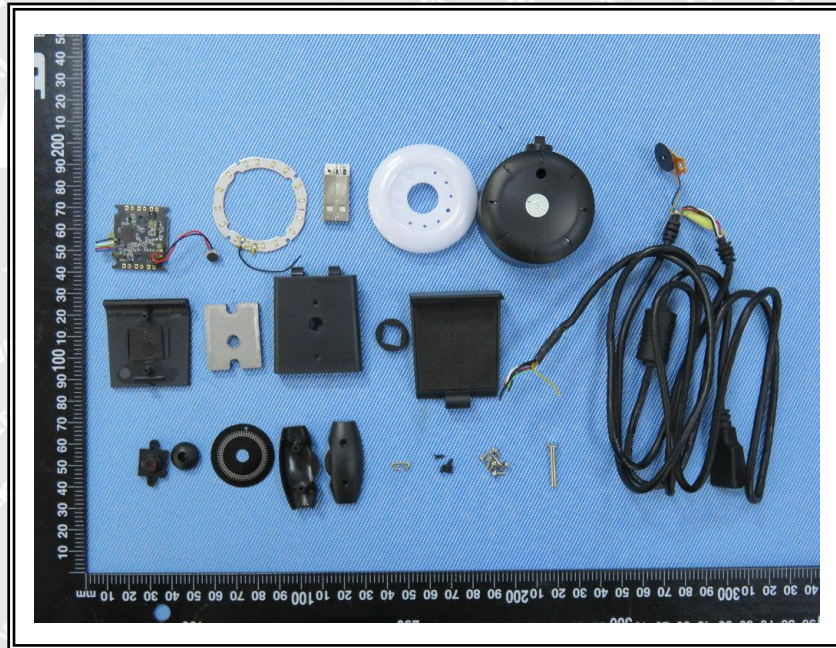


Measurement Flowchart:



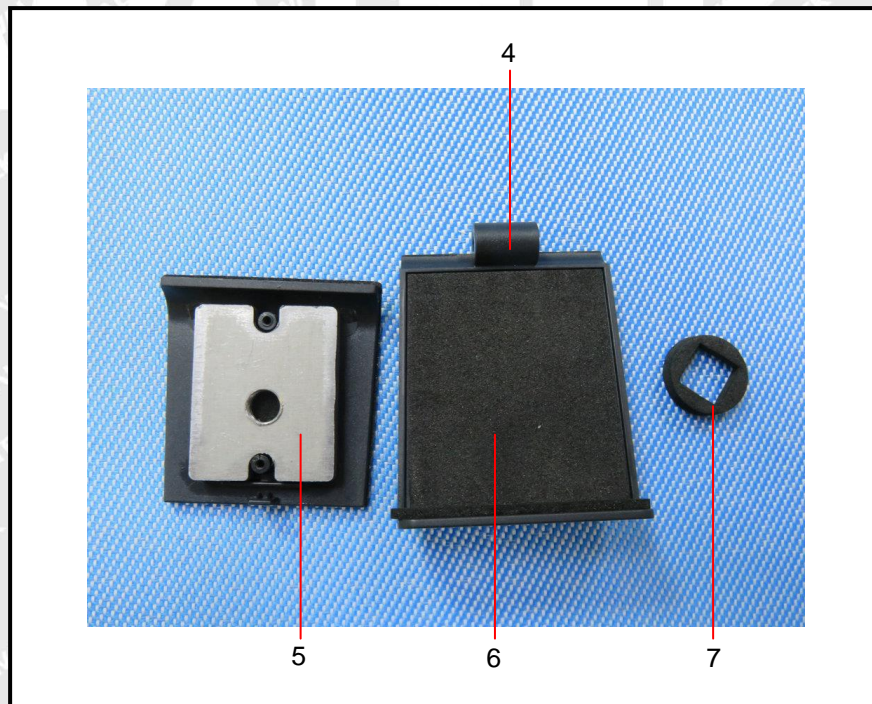
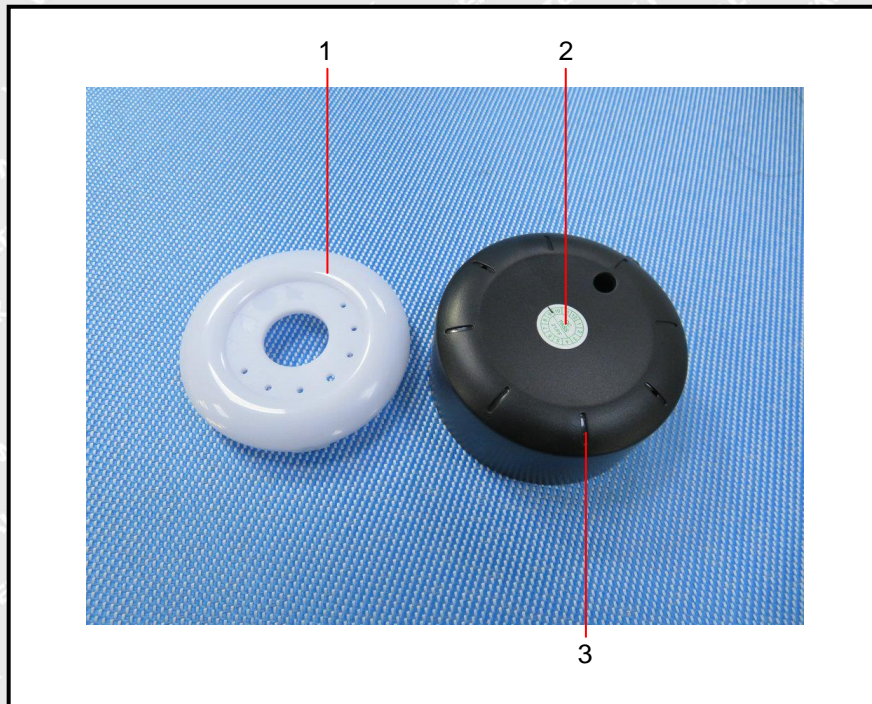


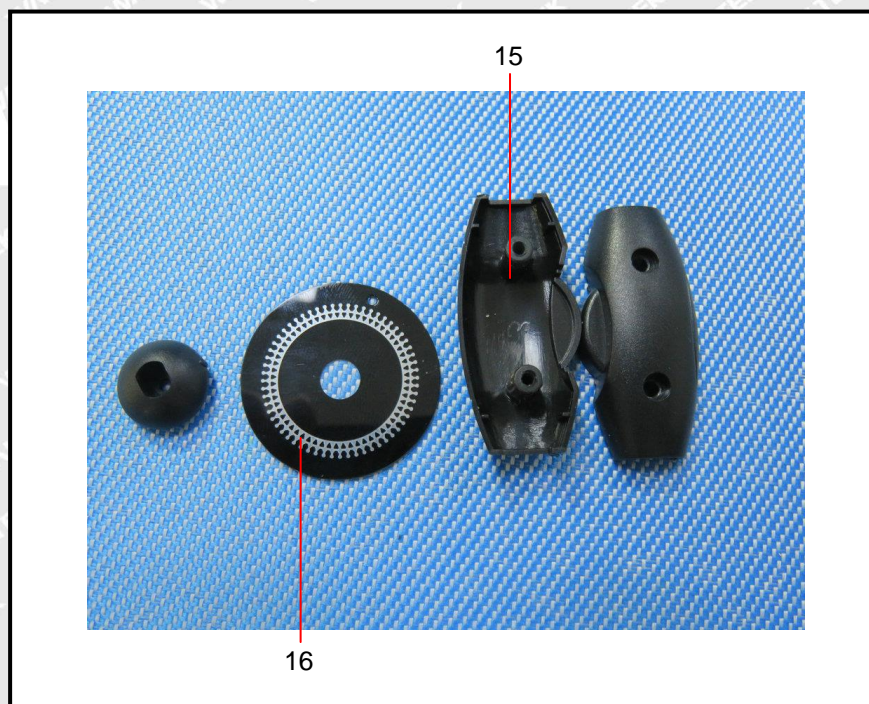
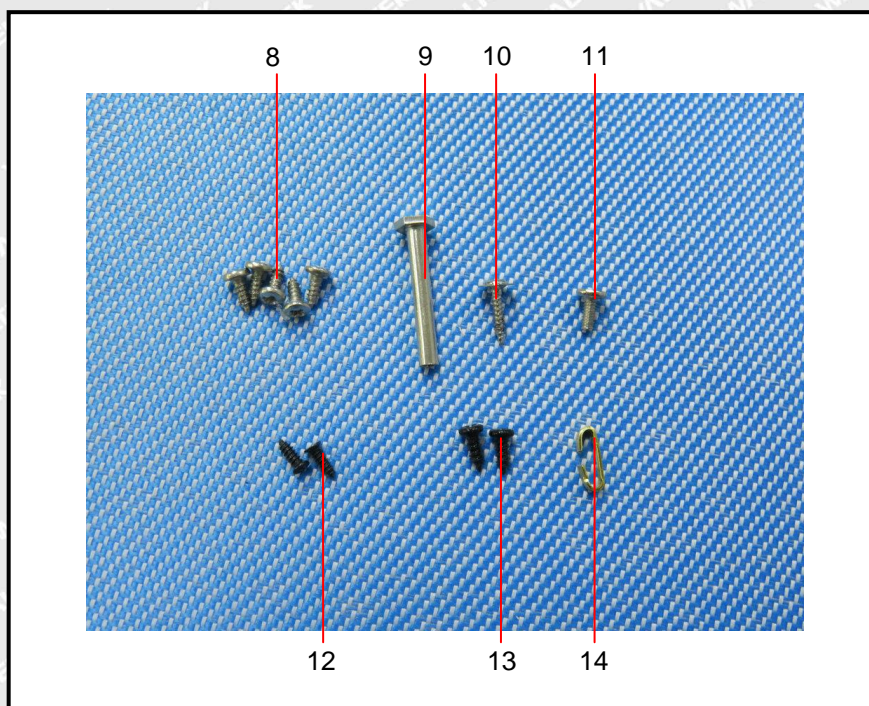
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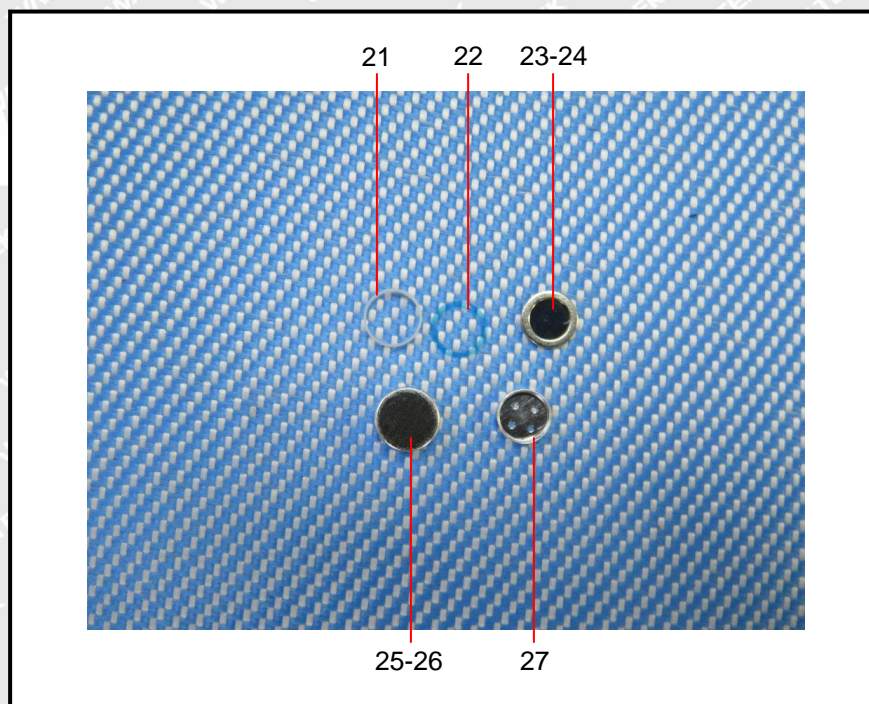
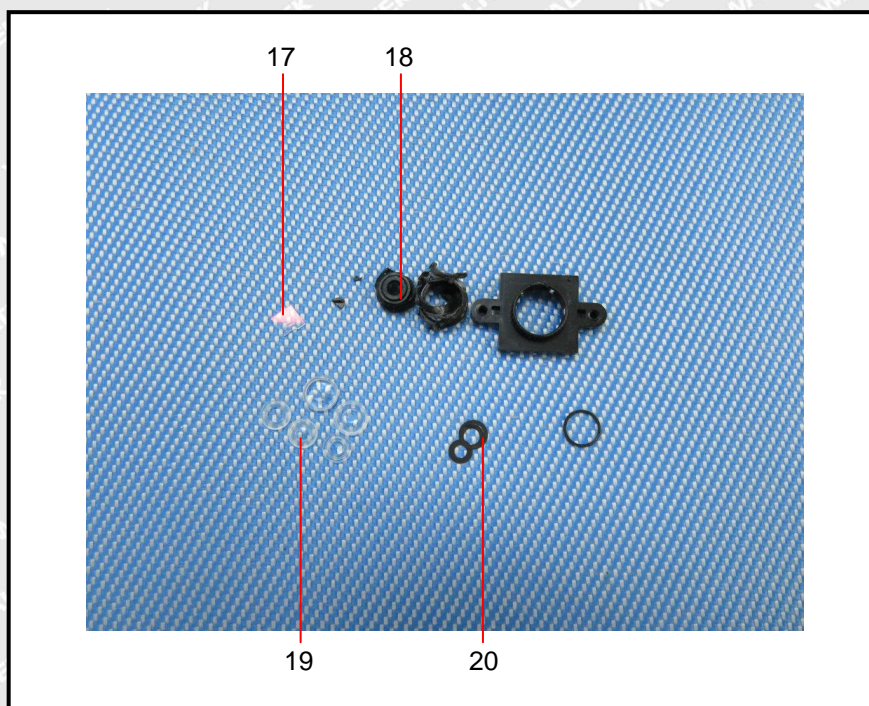


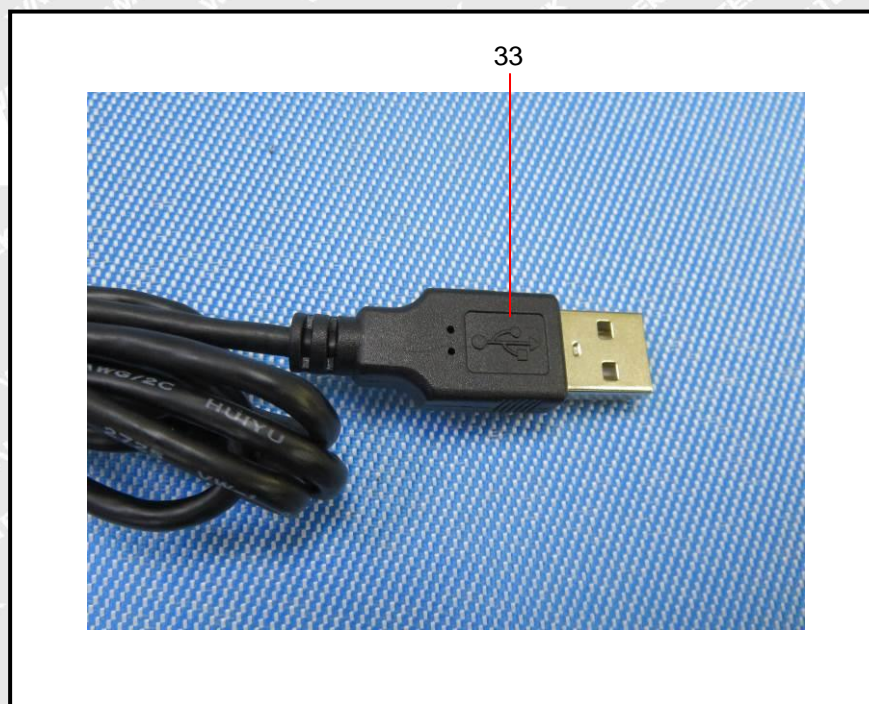
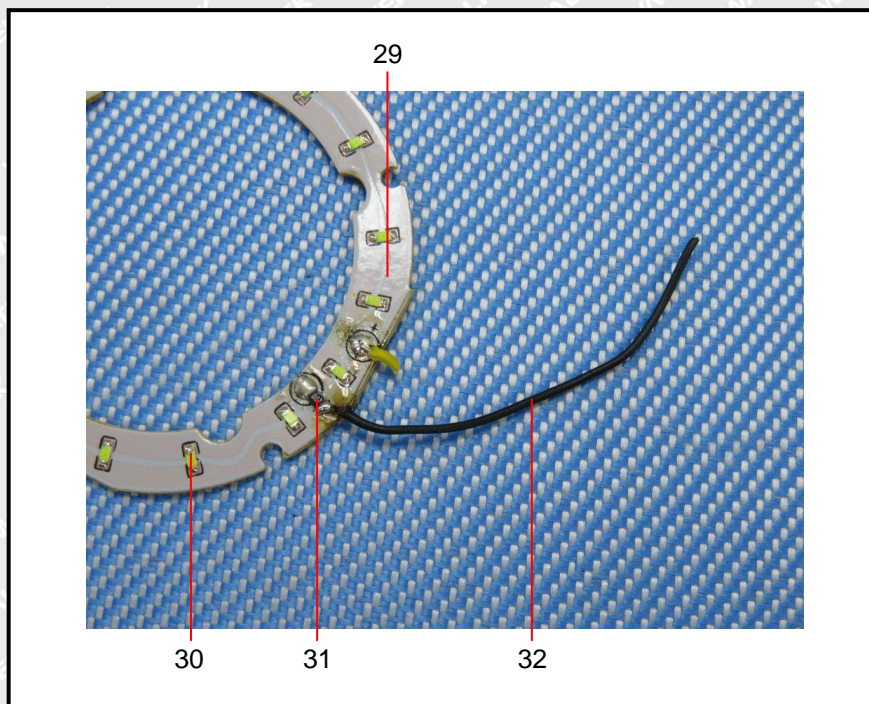


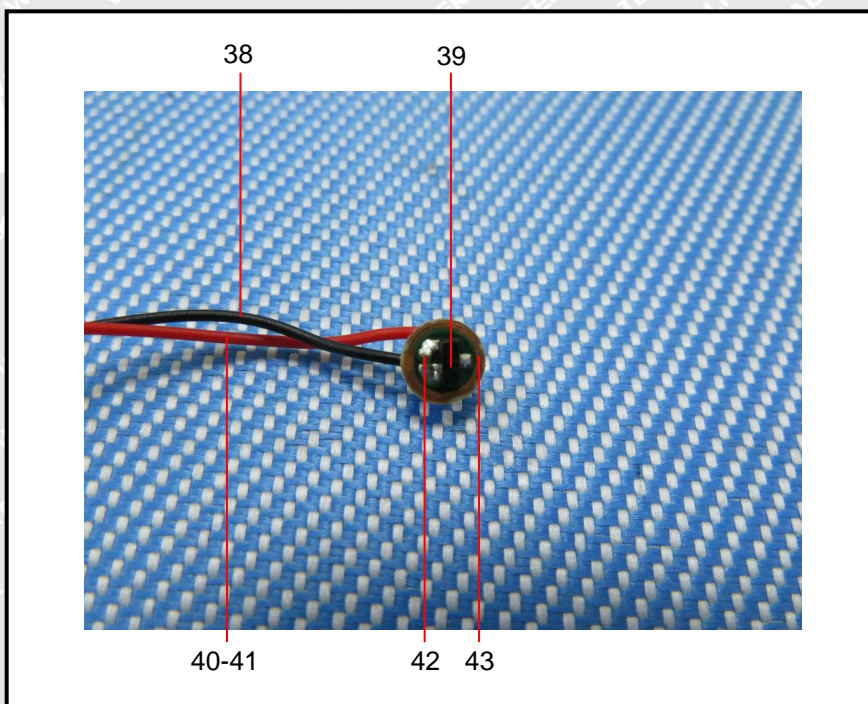
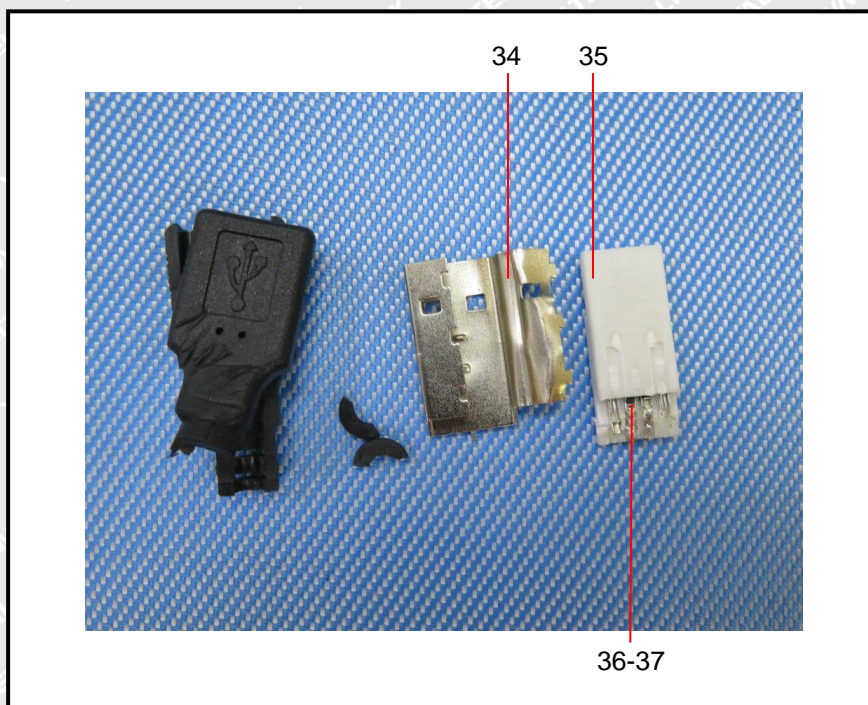
Photograph(s) of parts tested:

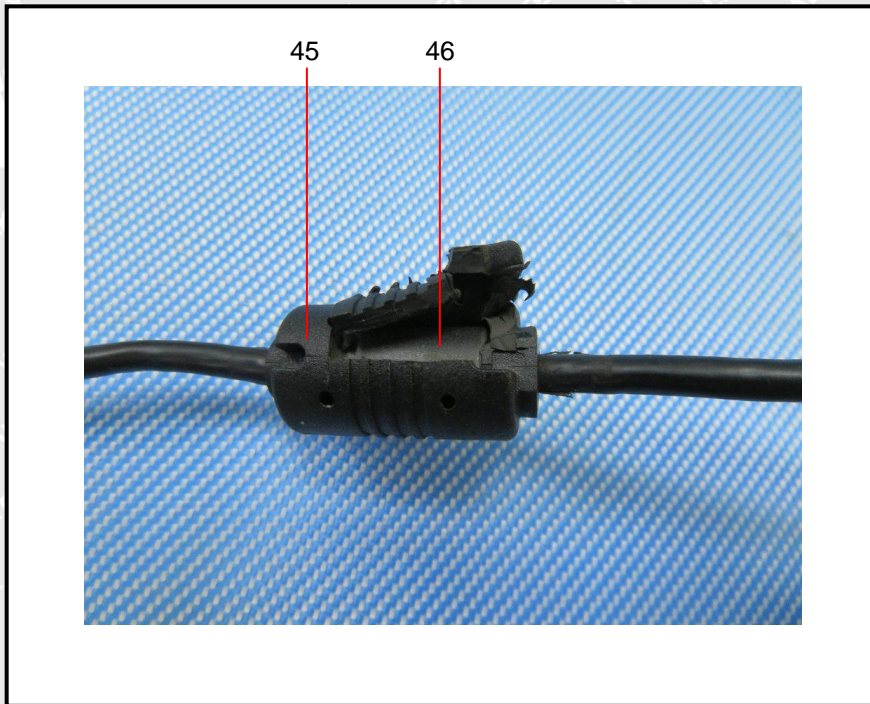
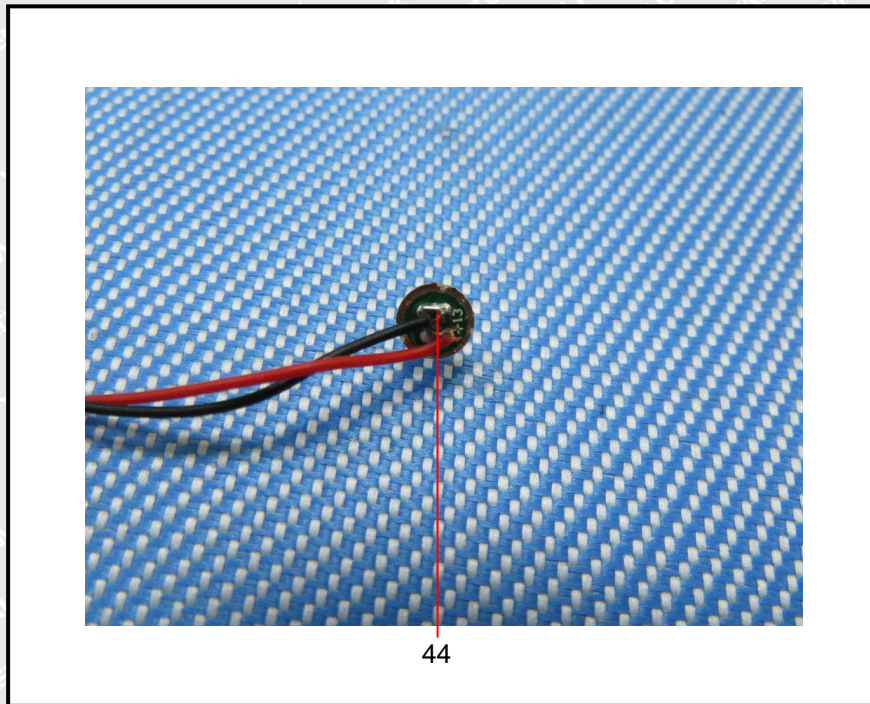


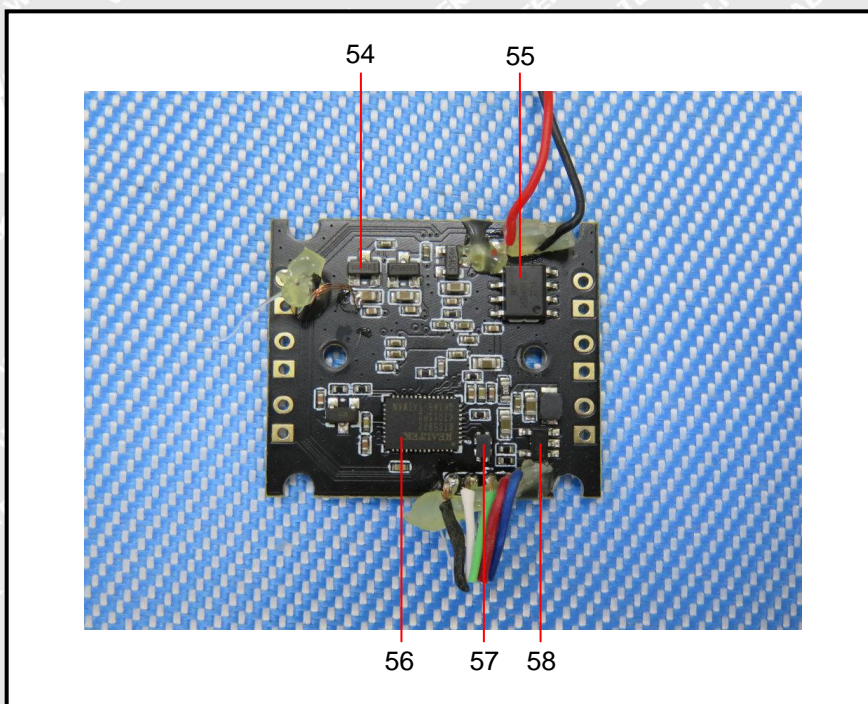
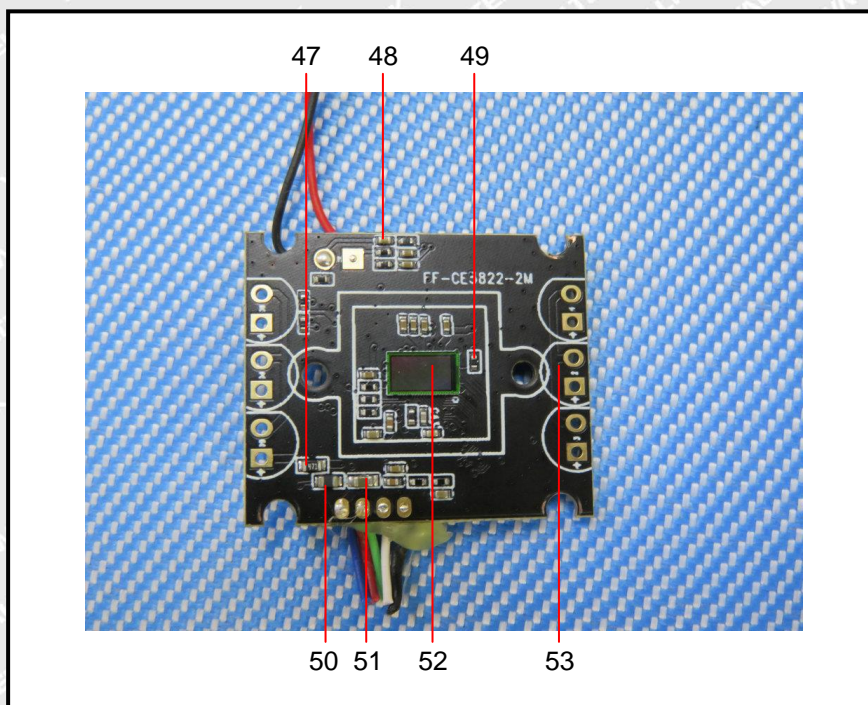


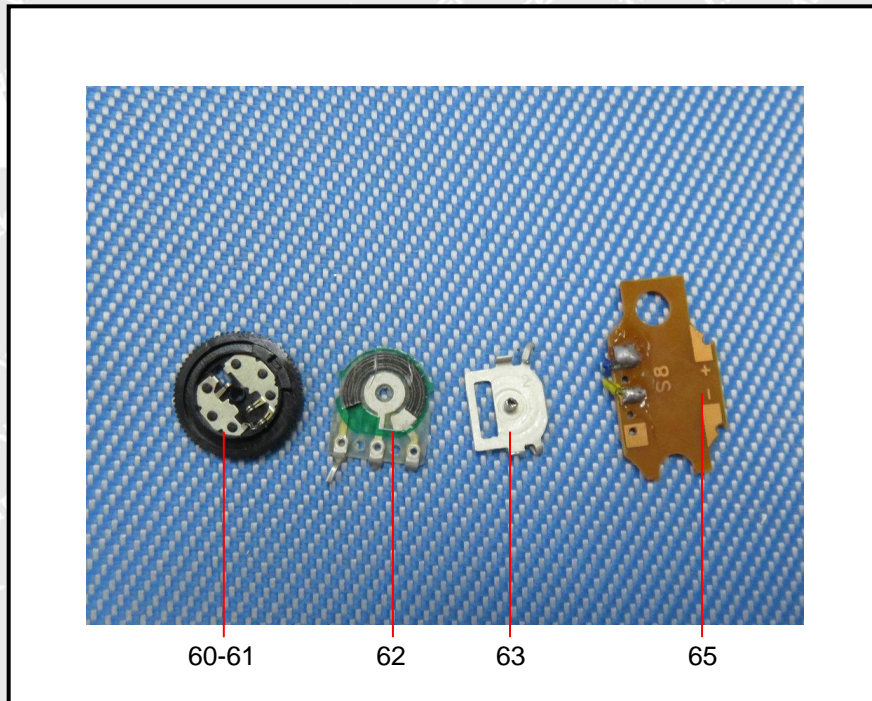
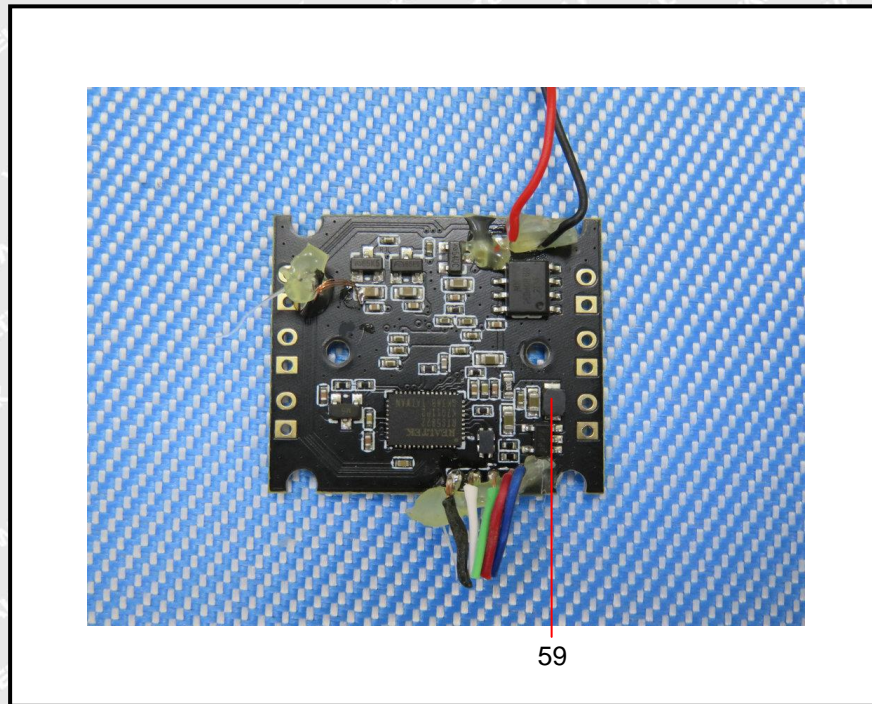


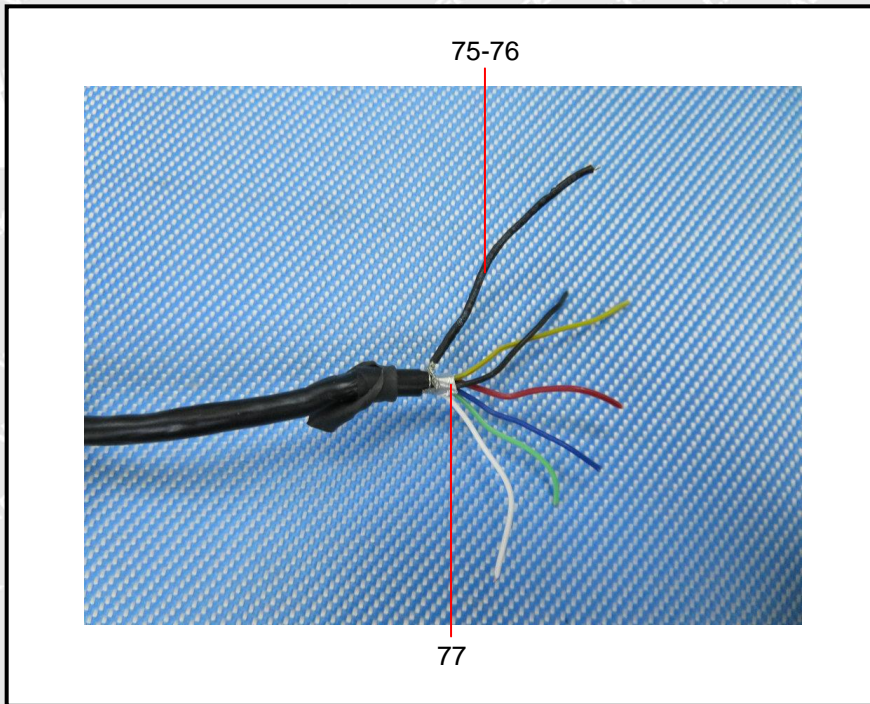
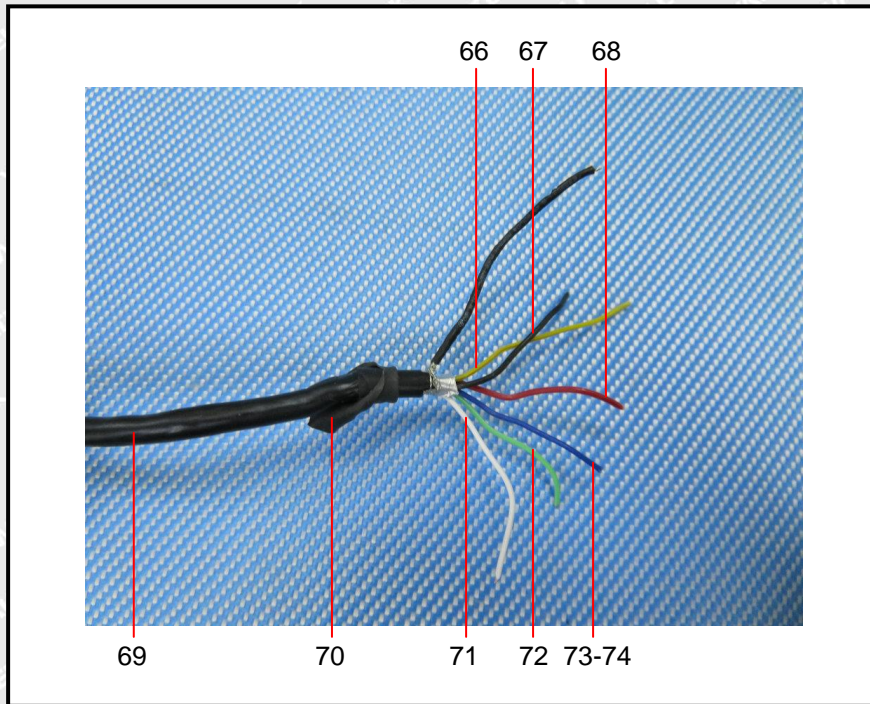


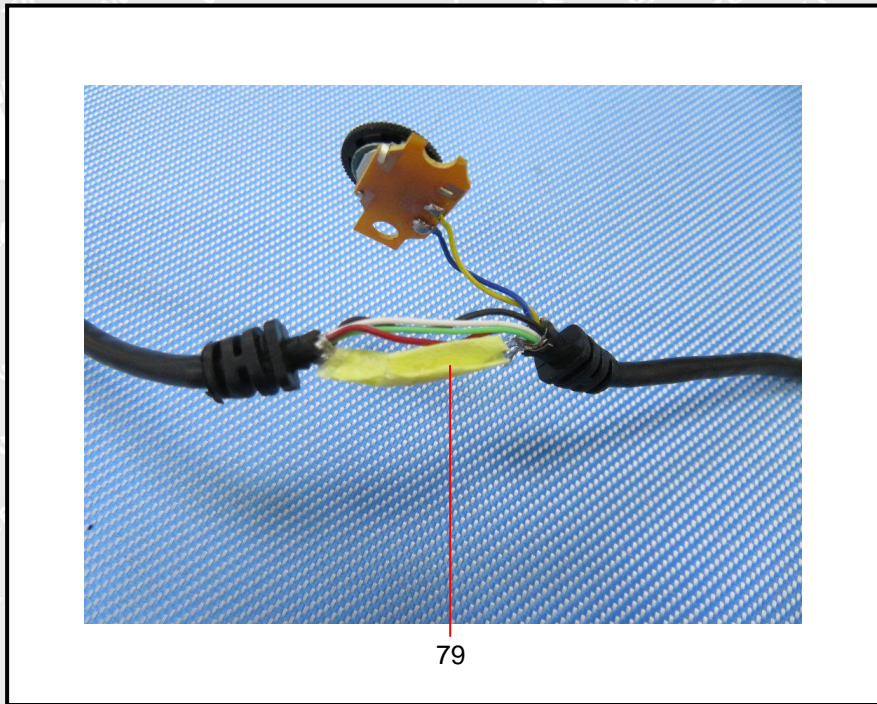
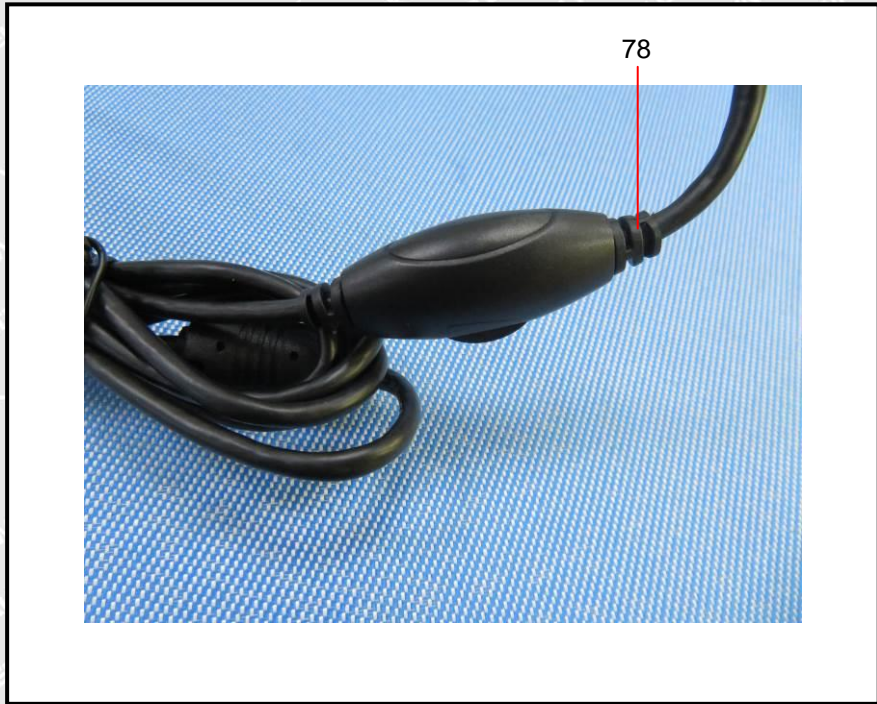


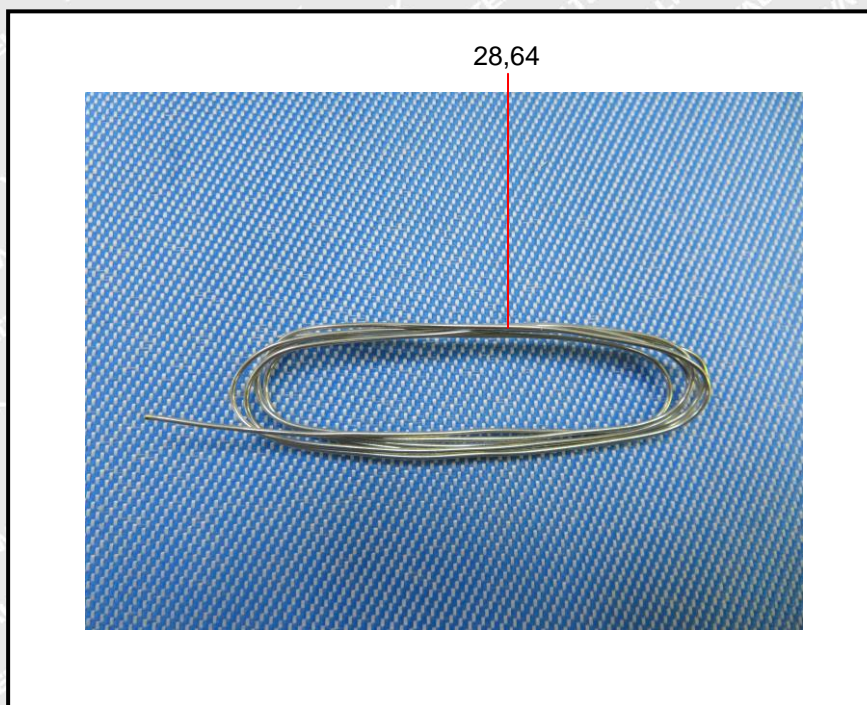












===== End of Report =====

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