

TEST REPORT

Report No.: HA0119091461CHEM

Date: September 20, 2019

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Applicant :

Address :

Manufacture :

Address :

The following samples were submitted and identified by/on behalf of the client as:

Sample Description : Flash light

Model No. :

Date of Sample Received : September 12, 2019

Sample Testing Date : September 12, 2019 to September 20, 2019

Test Requested	In accordance with the RoHS Directive 2011/65/EU and amend Directive (EU) 2015/863.
Test Method	<ul style="list-style-type: none"> - With reference to IEC 62321-2:2013, disassembly, disjointment and sample preparation were performed. - With reference to IEC 62321-3-1:2013, screening by EDXRF Spectroscopy. - With reference to IEC 62321-5:2013, determination of Lead, Cadmium by ICP-OES. - With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES. - With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS. - With reference to IEC 62321-7-2:2017 & IEC 62321-7-1:2015, determination of Hexavalent Chromium by spot test/Colorimetric using UV-Vis. - With reference to IEC 62321-8:2017, determination of Diisobutyl phthalate(DIBP), Dibutyl phthalate(DBP), Benzylbutyl phthalate(BBP) and Bis(2-ethylhexyl) phthalate (DEHP) by GC-MS.
Test Result	Please refer to next pages.
Test Conclusion	Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and amend Directive (EU) 2015/863.

***** For Further Details, Please Refer to the Following Page(s) *****

Compiled by:

Kevin Cheng

Kevin Cheng / Project Engineer

Approved by:



Milse Xie / Laboratory Supervisor

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The main instrument and equipment

No.	Equipment Name	Model No.	Calibration date	The use (√)
HA03018-01	EDXRF Spectroscopy	EDX1800BS	2019.02.22-2020.02.22	√
HA03003-01	ICP-OES	ICP-710ES	2019.02.22-2020.02.22	√
HA03004-01	UV-Vis	TU-1810DPC	2019.02.22-2020.02.22	√
HA03006-02	GC-MS	TRACE GC/ISQ	2019.02.22-2020.02.22	√
HA03009-01	MDS	MDS-10	2019.02.22-2020.02.22	√

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Sample Disassembly List

Part No.	Parts/Raw material name	
	Component Name	Part Description
1	Casing parts	Black metal parts
2		Silver metal shell
3		Black rubber button
4		White plastic parts
5		Black rubber seal
6		Yellow metal spring
7		Brown metal parts
8		White plastic wafer
9		Transparent plastic lamp shade
10		White rubber switch
11		Yellow metal switch
12	Wire parts	White plastic plug case
13		Silver metal core
14		White plastic leather
15		Pink plastic leather
16		White plastic leather
17		Blue rubber leather
18		Red rubber leather
19		Silver metal plug housing
20		Black plastic plug inner core
21		White plastic plug inner core
22	PCB board parts	Silver metal PCB board
23		SMD LED
24		Black plastic switch
25		Silver metal square

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Sample Disassembly List		
Part No.	Parts/Raw material name	
	Component Name	Part Description
26	PCB board parts	Silver foil
27		Soldering
28		Silver metal spring
29		Silver metal plug housing
30		Black plastic plug inner core
31		SMT triode
32		Patch diode
33		SMD resistor
34		IC
35		Patch capacitance
36		Green PCB board
37	Other parts	Blue plastic battery case
38		Silver metal shell
39		Ferrous metal shell
40		Transparent plastic lamp shade
41		Black plastic rope
42		Black plastic rope buckle
43		Black plastic rope

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Screening Test by XRF Spectroscopy

Part No.	Part Description	Result (mg/kg)									
		Pb	screening	Cd	screening	Hg	screening	Cr	screening	Br	screening
1	Black metal parts	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
2	Silver metal shell	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
3	Black rubber button	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
4	White plastic parts	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
5	Black rubber seal	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
6	Yellow metal spring	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
7	Brown metal parts	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
8	White plastic wafer	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
9	Transparent plastic lamp shade	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
10	White rubber switch	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
11	Yellow metal switch	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
12	White plastic plug case	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
13	Silver metal core	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
14	White plastic leather	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
15	Pink plastic leather	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
16	White plastic leather	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
17	Blue rubber leather	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
18	Red rubber leather	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
19	Silver metal plug housing	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
20	Black plastic plug inner core	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
21	White plastic plug inner core	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
22	Silver metal PCB board	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
23	SMD LED	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
24	Black plastic switch	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL

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Screening Test by XRF Spectroscopy											
Part No.	Part Description	Result (mg/kg)									
		Pb	screening	Cd	screening	Hg	screening	Cr	screening	Br	screening
25	Silver metal square	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
26	Silver foil	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
27	Soldering	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
28	Silver metal spring	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
29	Silver metal plug housing	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
30	Black plastic plug inner core	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
31	SMT triode	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
32	Patch diode	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
33	SMD resistor	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
34	IC	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
35	Patch capacitance	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
36	Green PCB board	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
37	Blue plastic battery case	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
38	Silver metal shell	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
39	Ferrous metal shell	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	---	---
40	Transparent plastic lamp shade	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
41	Black plastic rope	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
42	Black plastic rope buckle	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL
43	Black plastic rope	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL	N.D.	BL

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Remark:

1. BL= Below Limit, OL= Over Limit, LOD = Limit of Detection, --- = Not Regulated, / = Not Tested
2. "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.
3. mg/kg= milligram per kilogram.
4. The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample be of non-uniformity composition.
5. N.D. = Not Detected, less than the value of Method Detection Limit.
6. Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr(VI)) 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	$BL \leq (70-3\sigma) < IN < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < IN < (30+3\sigma) \leq OL$	$LOD < IN < (150+3\sigma) \leq OL$
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	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < IN < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < IN < (1500+3\sigma) \leq L$
Cr	$BL \leq (700-3\sigma) < IN$	$BL \leq (700-3\sigma) < IN$	$BL \leq (500-3\sigma) < IN$
Br	$BL \leq (300-3\sigma) < IN$	---	$BL \leq (250-3\sigma) < IN$

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Confirmation Test by Wet Chemistry

Part No.	Part Description	Result (mg/kg)						Conclusion
		Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	
MDL		2	2	2	2^	2	2	
1	Black metal parts	/	/	/	/	---	---	P
2	Silver metal shell	/	/	/	/	---	---	P
3	Black rubber button	/	/	/	/	/	/	P
4	White plastic parts	/	/	/	/	/	/	P
5	Black rubber seal	/	/	/	/	/	/	P
6	Yellow metal spring	/	/	/	/	---	---	P
7	Brown metal parts	/	/	/	/	---	---	P
8	White plastic wafer	/	/	/	/	/	/	P
9	Transparent plastic lamp shade	/	/	/	/	/	/	P
10	White rubber switch	/	/	/	/	/	/	P
11	Yellow metal switch	/	/	/	/	---	---	P
12	White plastic plug case	/	/	/	/	/	/	P
13	Silver metal core	/	/	/	/	---	---	P
14	White plastic leather	/	/	/	/	/	/	P
15	Pink plastic leather	/	/	/	/	/	/	P
16	White plastic leather	/	/	/	/	/	/	P
17	Blue rubber leather	/	/	/	/	/	/	P
18	Red rubber leather	/	/	/	/	/	/	P
19	Silver metal plug housing	/	/	/	/	---	---	P
20	Black plastic plug inner core	/	/	/	/	/	/	P
21	White plastic plug inner core	/	/	/	/	/	/	P
22	Silver metal PCB board	/	/	/	/	---	---	P
23	SMD LED	/	/	/	/	---	---	P

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Confirmation Test by Wet Chemistry								
Part No.	Part Description	Result (mg/kg)						Conclusion
		Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs	
MDL		2	2	2	2^	2	2	
24	Black plastic switch	/	/	/	/	/	/	P
25	Silver metal square	/	/	/	/	---	---	P
26	Silver foil	/	/	/	/	---	---	P
27	Soldering	/	/	/	/	---	---	P
28	Silver metal spring	/	/	/	/	---	---	P
29	Silver metal plug housing	/	/	/	/	---	---	P
30	Black plastic plug inner core	/	/	/	/	/	/	P
31	SMT triode	/	/	/	/	---	---	P
32	Patch diode	/	/	/	/	---	---	P
33	SMD resistor	/	/	/	/	---	---	P
34	IC	/	/	/	/	---	---	P
35	Patch capacitance	/	/	/	/	---	---	P
36	Green PCB board	/	/	/	/	/	/	P
37	Blue plastic battery case	/	/	/	/	/	/	P
38	Silver metal shell	/	/	/	/	---	---	P
39	Ferrous metal shell	/	/	/	/	---	---	P
40	Transparent plastic lamp shade	/	/	/	/	/	/	P
41	Black plastic rope	/	/	/	/	/	/	P
42	Black plastic rope buckle	/	/	/	/	/	/	P
43	Black plastic rope	/	/	/	/	/	/	P

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Limit requirements:						
	Pb	Cd	Hg	Cr(VI)	PBBs	PBDEs
Maximum permissible Limit (mg/kg)	1000	100	1000	1000	1000	1000
Remark: <ol style="list-style-type: none"> 1. N.D. = Not Detected, less than the value of Method Detection Limit. 2. mg/kg= milligram per kilogram. 3. MDL= Method Detection Limit in wet chemical test, --- = Not Regulated, / = Not Tested. 4. P =The result complies with the limit requirement, F =The result does not comply with the limit requirement. 5. “^”= MDL of Cr(VI) for non-metal sample is 2mg/kg, MDL of Cr(VI) for metal sample is 0.02mg/kg(Sample extraction solution). 6. Result on Cr(VI) for metal sample is shown as Positive/Negative. Positive = Presence of Cr(VI); Negative = Absence of Cr(VI). (Positive indicates the presence of Cr⁶⁺ on the tested areas, the result be regarded as conflict with RoHS requirement. Negative indicates the absence of Cr⁶⁺ on the tested areas, the result be regarded as no conflict with RoHS requirement.) 						

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DIBP, DBP, BBP, DEHP						
Test No.	Part No.	Result (mg/kg)				Conclusion
		DIBP	DBP	BBP	DEHP	
MDL		30	30	30	30	
T01	3+5+10	N.D.	N.D.	N.D.	N.D.	P
T02	4+8+12	N.D.	N.D.	N.D.	N.D.	P
T03	9+40	N.D.	N.D.	N.D.	N.D.	P
T04	14+15+16	N.D.	N.D.	N.D.	N.D.	P
T05	17+18	N.D.	N.D.	N.D.	N.D.	P
T06	20+21+30	N.D.	N.D.	N.D.	N.D.	P
T07	24+36	N.D.	N.D.	N.D.	N.D.	P
T08	37	N.D.	N.D.	N.D.	N.D.	P
T09	41+42+43	N.D.	N.D.	N.D.	N.D.	P
Limit requirements:						
		DIBP	DBP	BBP	DEHP	
Maximum permissible Limit (mg/kg)		1000	1000	1000	1000	
Remark:						
1. DIBP= Diisobutyl phthalate, DBP= Dibutyl phthalate, BBP= Benzylbutyl phthalate, DEHP= Bis(2-ethylhexyl) phthalate 2. N.D. = Not Detected, less than the value of Method Detection Limit. 3. mg/kg= milligram per kilogram. 4. MDL= Method Detection Limit in wet chemical test. 5. P =The result complies with the limit requirement, F =The result does not comply with the limit requirement.						

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Sample Photo



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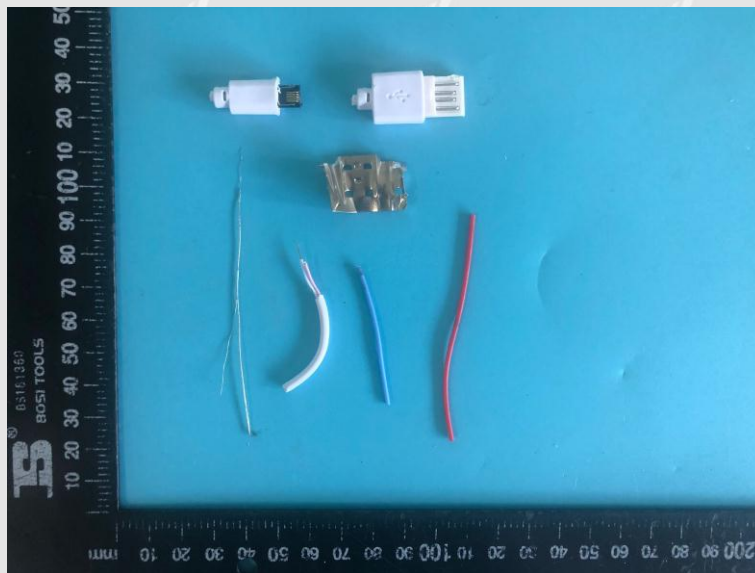
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Test Part Photo



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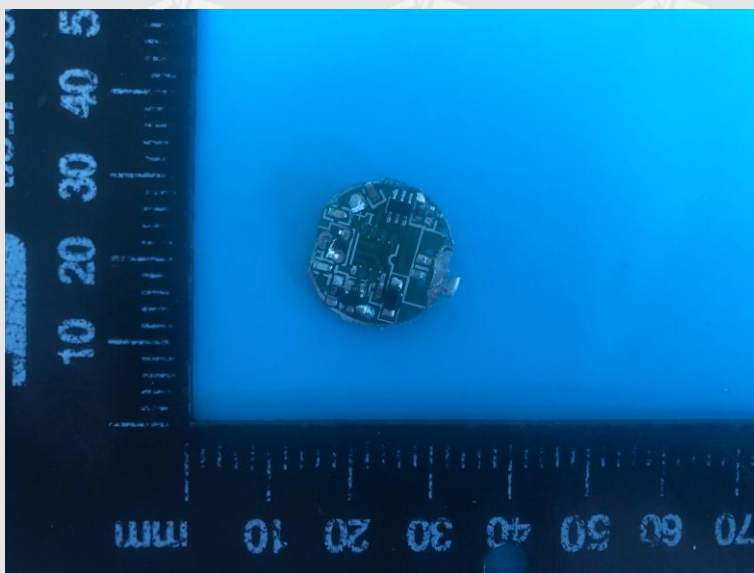
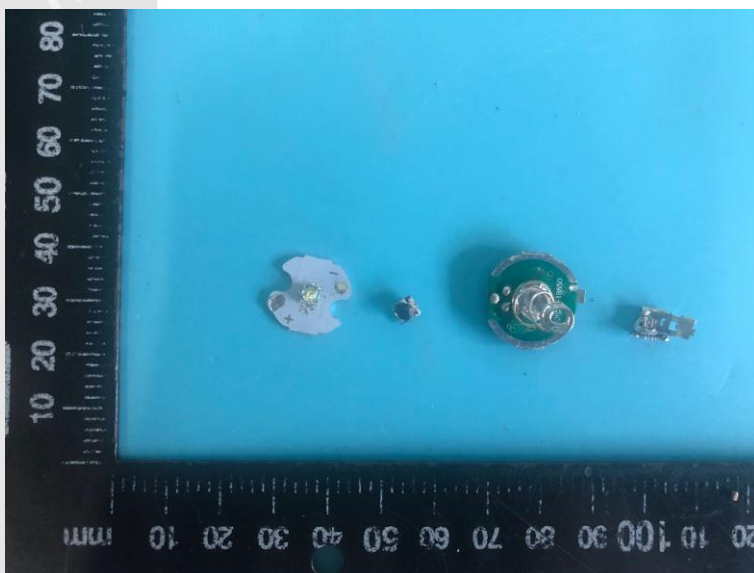
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Test Part Photo



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