

Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 1 of 11

The following information was/were submitted and identified by/on behalf of the client:

Applicant : Mid Ocean Brands B.V.
Applicant's Address : 7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Sample Name : Data Cable
Tested Model : MO2295
Sample Receive Date : Mar. 14, 2024
Sample Testing Period : Mar. 14, 2024 - Mar. 20, 2024

Test Result Summary:

As requested by the applicant, for details refer to attached page(s).

TEST ITEM(S)	TEST REQUESTED	CONCLUSION(S)
Lead, Cadmium, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers(PBDEs) and Phthalates(DBP, BBP, DEHP, DIBP)	As specified by client, to comply with the Limits for Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive (EU) 2015/863 amending Annex II of Directive 2011/65/EU) on the submitted sample(s)	PASS

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Authorized signature:



Lab Manager: Gavin Zhou



Mar. 26, 2024

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Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 2 of 11

Test Result(s):

Part 1. Lead(Pb), Cadmium(Cd), Mercury(Hg), Hexavalent chromium(Cr(VI)), Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers(PBDEs)

Test Method:

Screening Test by XRF spectrometry

With reference to IEC 62321-3-1:2013, Screening of Lead(Pb), Mercury(Hg), Cadmium(Cd), Total chromium(Cr) and Total bromine(Br) by X-ray fluorescence(XRF) spectrometry

Chemical Confirmation Test

Lead(Pb), Cadmium(Cd) – IEC 62321-5:2013, Acid digestion and determined by ICP-OES

Mercury(Hg) – IEC 62321-4:2013/AMD1:2017, Acid digestion and determined by ICP-OES

Cr(VI) – IEC 62321-7-1:2015, Boiling water extraction and determined colorimetrically by UV-vis

& IEC 62321-7-2:2017, Solution extraction and determined colorimetrically by UV-vis

PBBs, PBDEs – IEC 62321-6:2015, Solvent extraction and determined by GC-MS

Part No.	Description	XRF screening Results					Chemical Confirmation Results (mg/kg)	Conclusion(s)
		Pb	Cd	Hg	Total Cr	Total Br		
1	Bamboo	BL	BL	BL	BL	BL	---	PASS
2	Silvery metal ring	BL	BL	BL	IN	---	Cr(VI): Negative	PASS
3	Silvery metal chain	BL	BL	BL	IN	---	Cr(VI): Negative	PASS
4	Silvery metal ring	BL	BL	BL	IN	---	Cr(VI): Negative	PASS
5	Silvery metal	BL	BL	BL	BL	---	---	PASS
6	Silvery metal	BL	BL	BL	BL	---	---	PASS
7-1	White plastic support	BL	BL	BL	BL	BL	---	PASS
7-2	Metal (contact pins)	BL	BL	BL	BL	---	---	PASS
8	Soldering tin (SMD)	BL	BL	BL	BL	---	---	PASS
9-1	Silvery metal	BL	BL	BL	BL	---	---	PASS
9-2	Black plastic support	BL	BL	BL	BL	BL	---	PASS
9-3	Metal (contact pins)	BL	BL	BL	BL	---	---	PASS
10	White plastic frame	BL	BL	BL	BL	BL	---	PASS
11	PCB	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
12	Soldering tin	BL	BL	BL	BL	---	---	PASS
13-1	Silvery metal	BL	BL	BL	BL	---	---	PASS
13-2	Black plastic support	BL	BL	BL	BL	BL	---	PASS
13-3	Metal (contact pins)	BL	BL	BL	BL	---	---	PASS
14	PCB	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
15	Soldering tin (wiring)	BL	BL	BL	BL	---	---	PASS
16	White plastic frame	BL	BL	BL	BL	BL	---	PASS
17	Soldering tin (SMD)	BL	BL	BL	BL	---	---	PASS

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Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 3 of 11

Part No.	Description	XRF screening Results					Chemical Confirmation Results (mg/kg)	Conclusion(s)
		Pb	Cd	Hg	Total Cr	Total Br		
18-1	Silvery metal	BL	BL	BL	BL	---	---	PASS
18-2	White plastic support	BL	BL	BL	BL	BL	---	PASS
18-3	Metal (contact pins)	BL	BL	BL	BL	---	---	PASS
19	PCB	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
20	Soldering tin (wiring)	BL	BL	BL	BL	---	---	PASS
21	White plastic frame	BL	BL	BL	BL	BL	---	PASS
22	SMD resistor	BL	BL	BL	BL	BL	---	PASS
23	SMD capacitor	BL	BL	BL	BL	BL	---	PASS
24	SMD audion	BL	BL	BL	BL	BL	---	PASS
25	SMD chip (IC)	BL	BL	BL	BL	BL	---	PASS
26	Soldering tin (SMD)	BL	BL	BL	BL	---	---	PASS
27-1	Silvery metal	BL	BL	BL	BL	---	---	PASS
27-2	White plastic support	BL	BL	BL	BL	BL	---	PASS
27-3	Metal (contact pins)	BL	BL	BL	BL	---	---	PASS
28	PCB	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
29	Soldering tin (wiring)	BL	BL	BL	BL	---	---	PASS
30	White plastic frame	BL	BL	BL	BL	BL	---	PASS
31	White plastic casing	BL	BL	BL	BL	BL	---	PASS
32	Varnished wire	BL	BL	BL	BL	BL	---	PASS
33	Soldering tin (SMD)	BL	BL	BL	BL	---	---	PASS
34	White plastic bushings	BL	BL	BL	BL	BL	---	PASS
35	Heat shrink tubing	BL	BL	BL	BL	BL	---	PASS
36	Soldering tin	BL	BL	BL	BL	---	---	PASS

Remark:

(^1) Screening Test by XRF spectrometry

- XRF analysis of the result(s) may only related to the surface of the sample(s).
- The results of total Cr and total Br only represent the total content of the elements, do not represent Cr(VI), PBBs and PBDEs content correspondingly. As restricted by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU, The result(s) is expressed as total Cr while test items on restricted substances is Cr(VI). The result(s) is expressed as total Br while test items on restricted substances are PBBs and PBDEs.
- The results are obtained by XRF screening for primary judgment, further chemical confirmation by ICP-OES (for Pb, Cd, Hg), UV-vis (for Cr(VI)) and GC-MSD (for PBBs, PBDEs) may be performed, if the XRF screening result(s) exceeds the below limits according to IEC 62321-3-1:2013 Table A.2 - Screening limits in mg/kg for regulated elements in various matrices.

Element	Polymers	Metals	Composite material
Cd	BL $\leq (70-3\sigma) < X$ $< (130+3\sigma) \leq OL$	BL $\leq (70-3\sigma) < X$ $< (130+3\sigma) \leq OL$	LOD $< X < (150+3\sigma) \leq OL$

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Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 4 of 11

Element	Polymers	Metals	Composite material
Pb	BL $\leq$ (700-3 σ) <X < (1300+3 σ) $\leq$ OL	BL $\leq$ (700-3 σ) <X < (1300+3 σ) $\leq$ OL	BL $\leq$ (500-3 σ) <X < (1500+3 σ) $\leq$ OL
Hg	BL $\leq$ (700-3 σ) <X < (1300+3 σ) $\leq$ OL	BL $\leq$ (700-3 σ) <X < (1300+3 σ) $\leq$ OL	BL $\leq$ (500-3 σ) <X < (1500+3 σ) $\leq$ OL
Br	BL $\leq$ (300-3 σ) <X	Not applicable	BL $\leq$ (250-3 σ) <X
Cr	BL $\leq$ (700-3 σ) <X	BL $\leq$ (700-3 σ) <X	BL $\leq$ (500-3 σ) <X

BL = Below limit, OL = Over limit, IN = Inconclusive, 3 σ = Repeability of the analyser at the action level,
X = The region where further investigation is necessary, LOD = Limit of detection.

(d) The XRF screening test of selected elements - The result(s) was/ were only given for reference, as the result(s) may be different to the actual content in the non-uniformity composition, and the results differ based on various factors, including but not limited to the tested part(s)/component(s) size, thickness, surface flatness, equipment parameters and matrix effect etc.

(^2) Chemical Confirmation Test

(a) 1000mg/kg = 0.1%; RL = Reporting Limit; N.D. = Not detected (< RL).

(b) RL and Limits of test items.

Test Item(s)	Reporting Limit (RL)	Limit
Lead(Pb)	10 mg/kg	1000 mg/kg (0.1%)
Cadmium(Cd)	10 mg/kg	100 mg/kg (0.01%)
Mercury(Hg)	10 mg/kg	1000 mg/kg (0.1%)
Chromium VI (Cr VI)	Polymer and composite material: 10 mg/kg, Metal: 0.10 ug/cm ²	1000 mg/kg (0.1%)
Group PBBs	Single compound of PBBs: 50 mg/kg	1000 mg/kg (0.1%)
Group PBDEs	Single compound of PBDEs: 50 mg/kg	1000 mg/kg (0.1%)

(c) According to IEC 62321-7-1:2015, result of Cr(VI) for metal sample is shown as below:

If Cr(VI) concentration > 0.13 ug/cm², the sample contains Cr(VI) which is positive for Cr(VI);

If Cr(VI) concentration < 0.10 ug/cm², the sample does not contain Cr(VI) which is negative for Cr(VI);

If Cr(VI) concentration $\geq$ 0.10 ug/cm² and $\leq$ 0.13 ug/cm², the result is considered to be inconclusive –

Unavoidable coating variations may influence the determination.

Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 5 of 11

Part 2. Phthalates - Dibutyl phthalate(DBP), Butyl benzyl phthalate(BBP), Bis(2-ethylhexyl) phthalate (DEHP), Diisobutyl phthalate(DIBP)

Test Method: IEC 62321-8:2017, Solvent extraction and determined by GC-MS

<u>Part No.</u>	<u>Test Results (mg/kg)</u>				<u>Conclusion(s)</u>
	<u>DBP</u>	<u>BBP</u>	<u>DEHP</u>	<u>DIBP</u>	
	<u>RL (mg/kg)</u>				
	50	50	50	50	
	<u>Limit (mg/kg)</u>				
	1000	1000	1000	1000	
1	N.D.	N.D.	N.D.	N.D.	PASS
7-1 + 9-2 + 13-2	N.D.	N.D.	N.D.	N.D.	PASS
10 + 16 + 21	N.D.	N.D.	N.D.	N.D.	PASS
11 + 14 + 19	N.D.	N.D.	N.D.	N.D.	PASS
18-2 + 27-2	N.D.	N.D.	N.D.	N.D.	PASS
28	N.D.	N.D.	N.D.	N.D.	PASS
30 + 31 + 34	N.D.	N.D.	N.D.	N.D.	PASS
35	N.D.	N.D.	N.D.	N.D.	PASS

- Note:**
1. 1000mg/kg = 0.1%;
 2. N.D. = Not detected (<RL);
 3. The test parts were analyzed on behalf of the applicant as mixing sample in one testing. The above results were only given as the informality value and only for reference.

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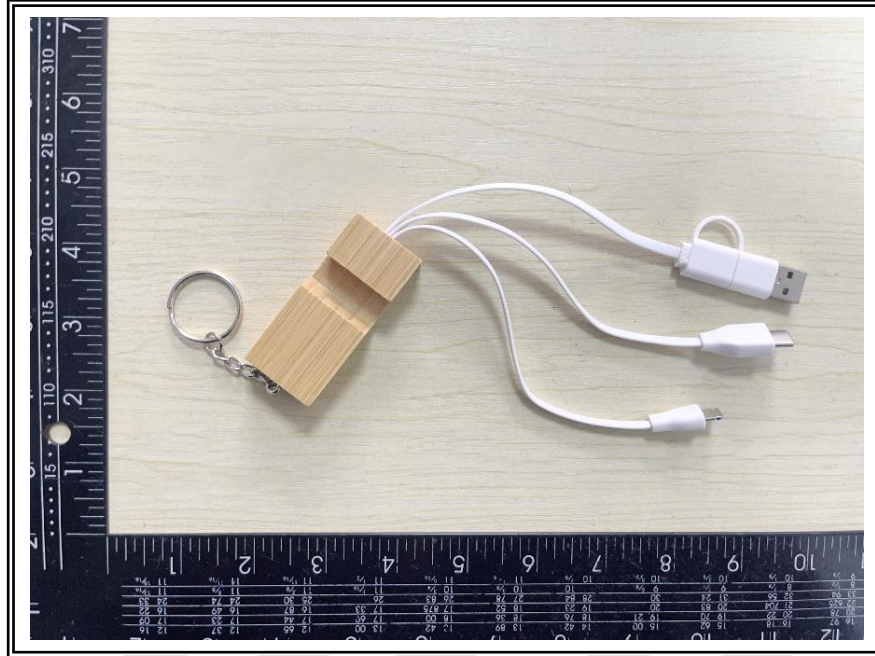
Test Report

Report No.: GNBZ240314137EN

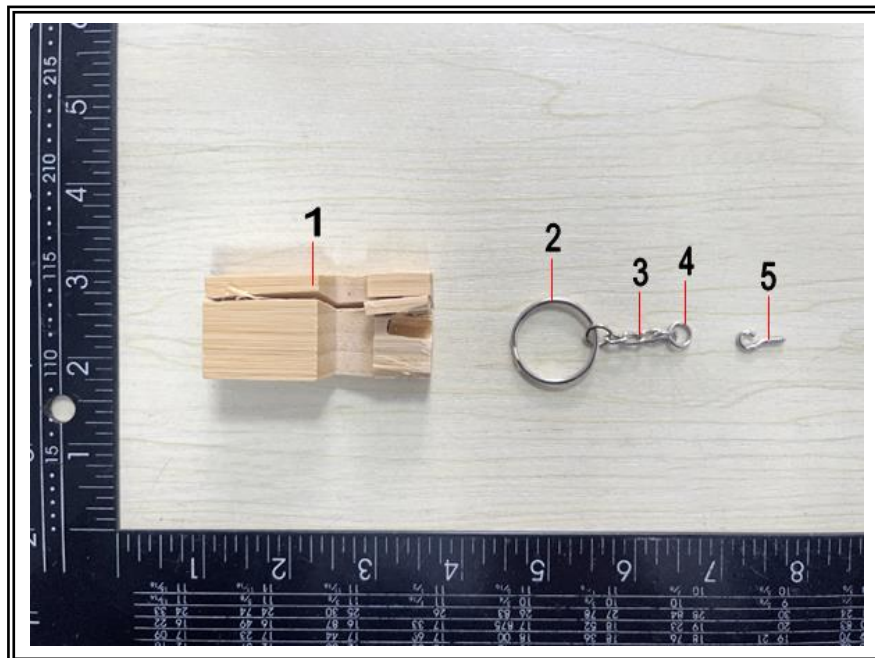
Issue Date: Mar. 26, 2024

Page 6 of 11

Sample photo(s):



Tested Model: MO2295



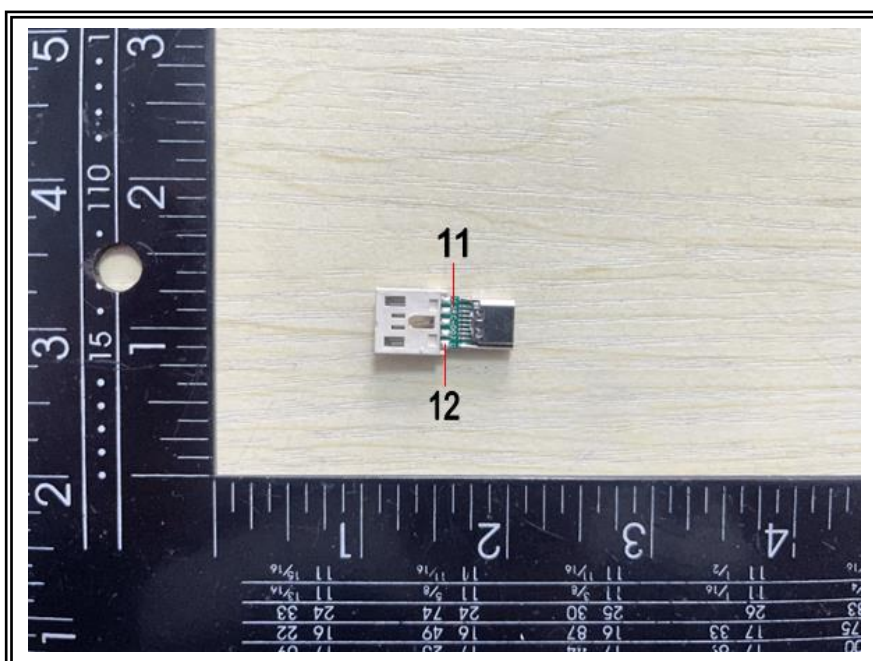
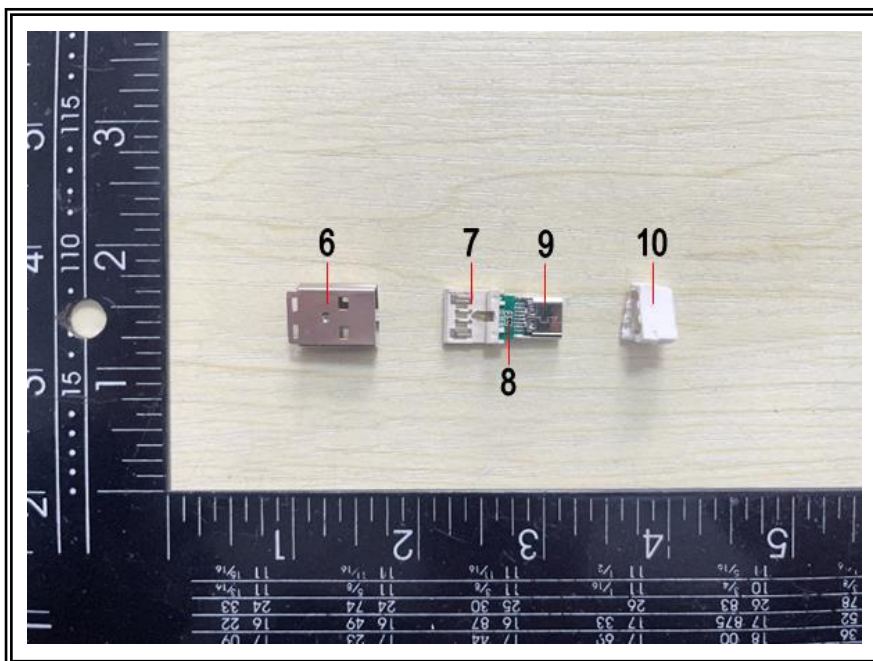
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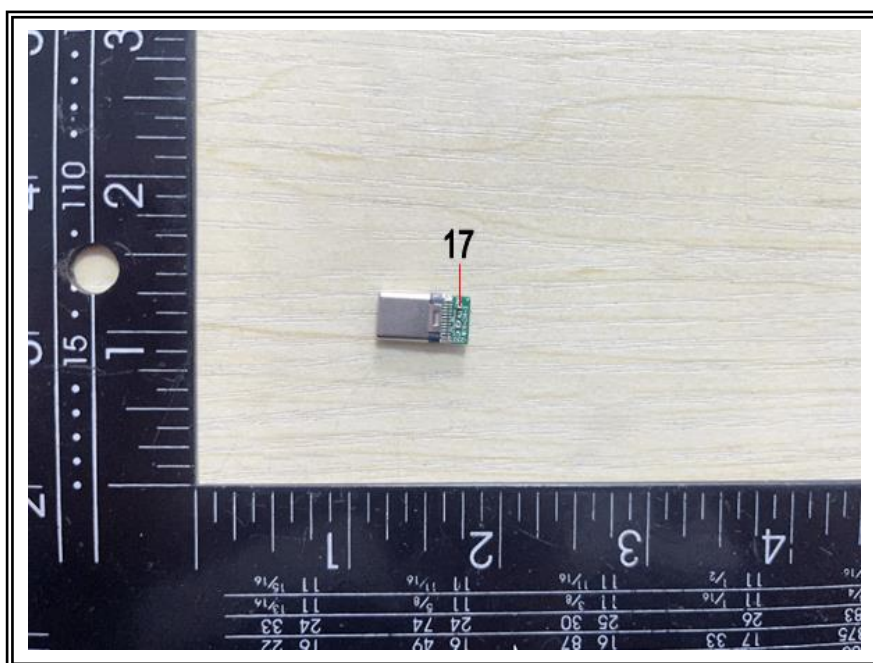
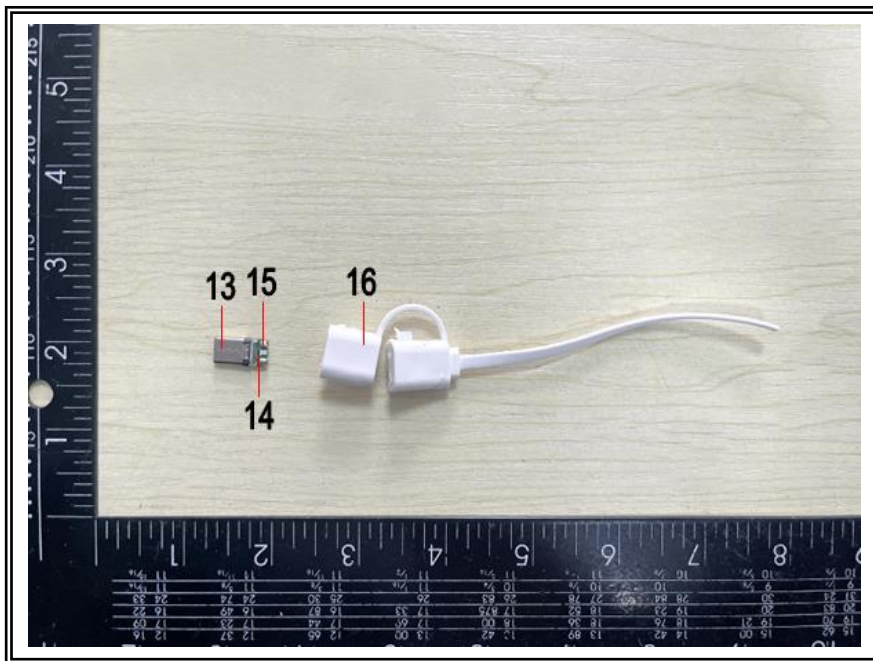
Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 7 of 11



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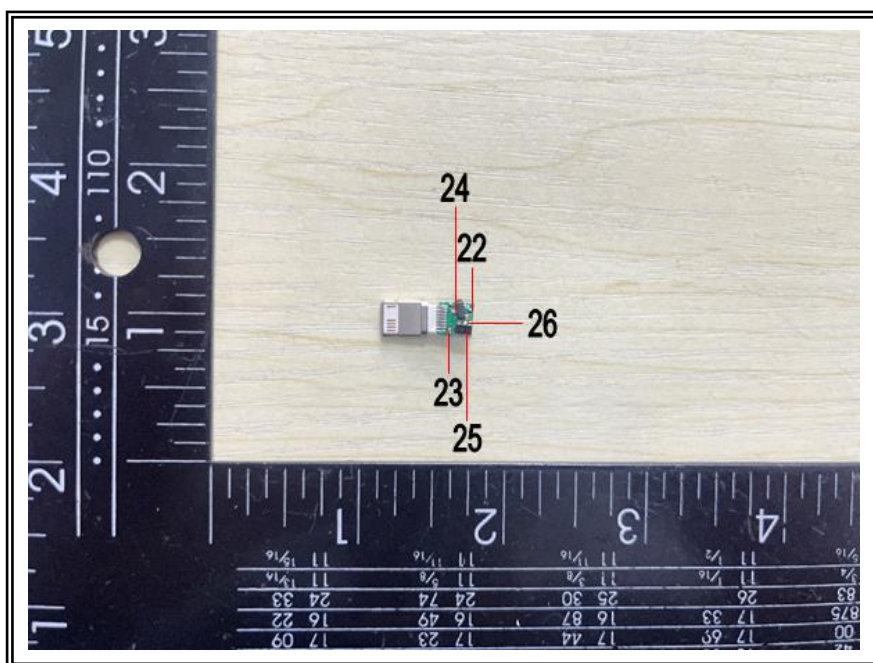
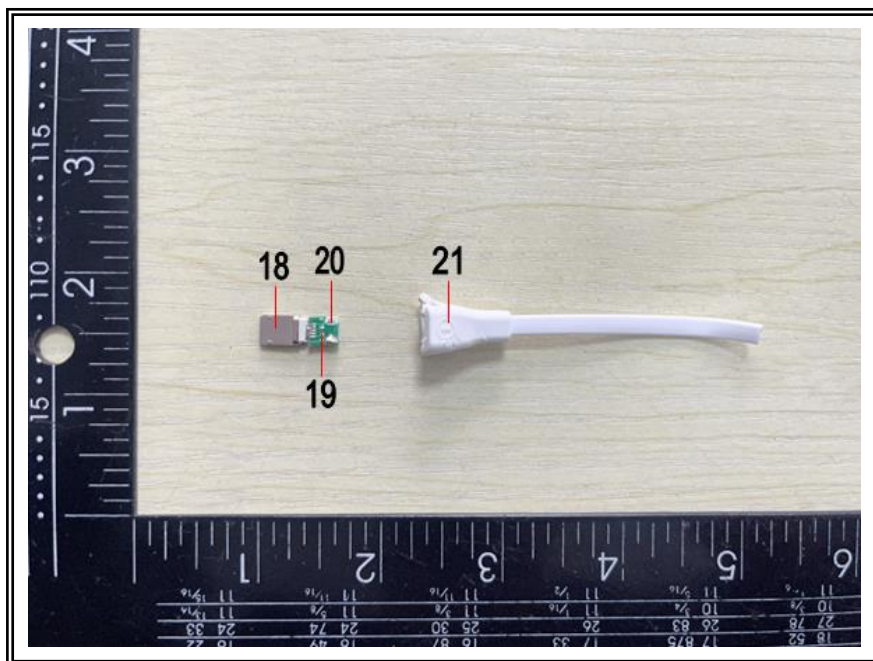
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Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 9 of 11



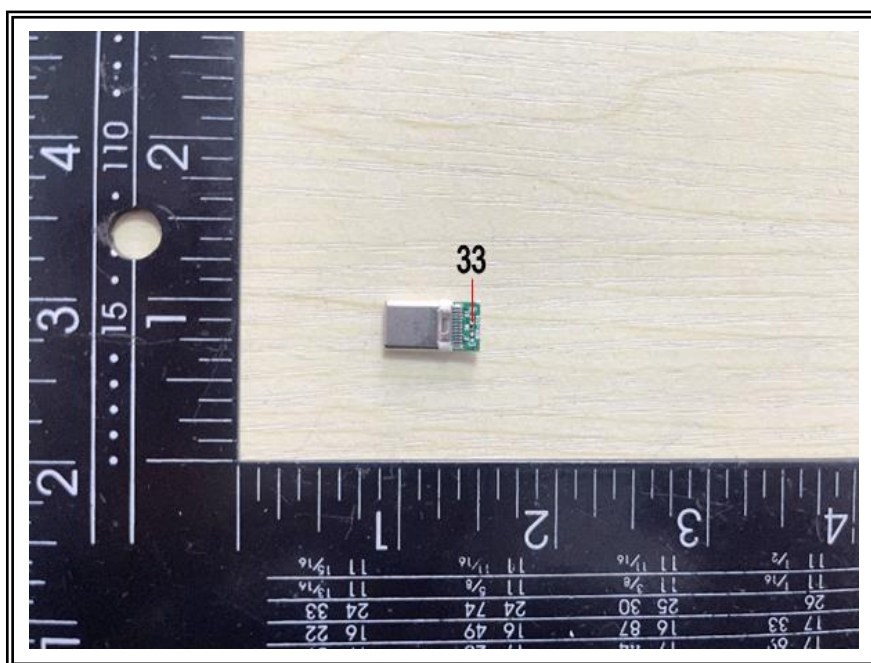
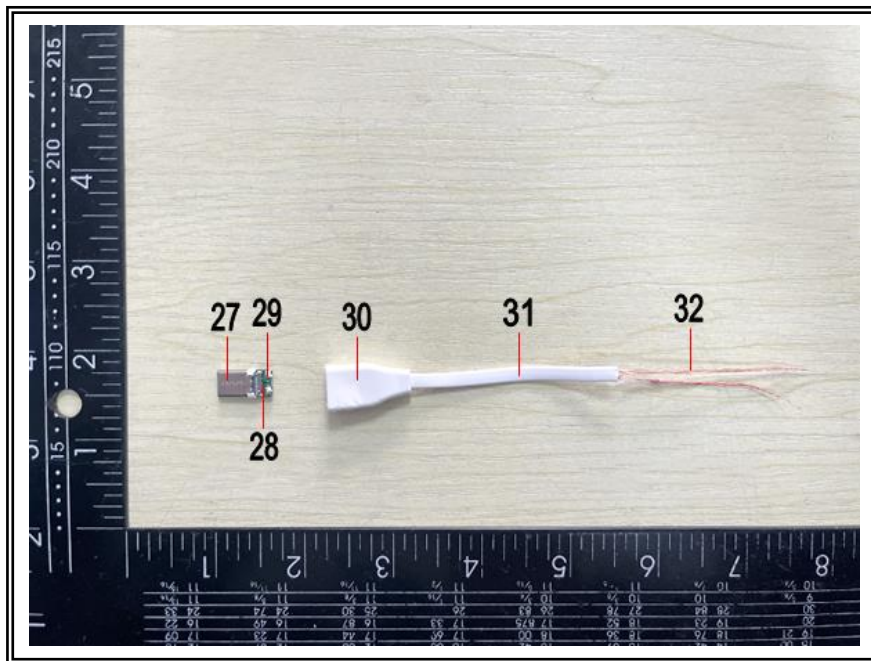
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Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 10 of 11



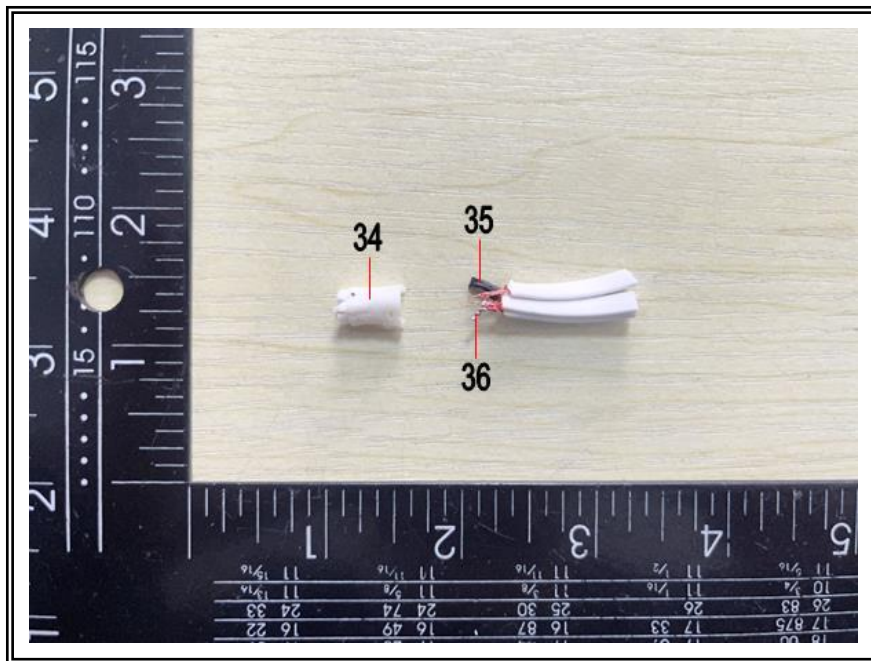
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Test Report

Report No.: GNBZ240314137EN

Issue Date: Mar. 26, 2024

Page 11 of 11



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