

## RoHS Consolidated Test

**Applicant** : Shenzhen Red Star Electronics Co., Ltd.  
**Address** : Jin Yu Alley 1-8, SiFangPu Community, PingDi Street, Longgang District,  
Shenzhen City, GuangDong, China  
**Manufacturer** : Shenzhen Red Star Electronics Co., Ltd.  
**Address** : Jin Yu Alley 1-8, SiFangPu Community, PingDi Street, Longgang District,  
Shenzhen City, GuangDong, China

### SAMPLE INFORMATION

**Sample Name** : USB Lanyard Cable  
**Sample Model** : RXD-888  
**Trademark** : N/A

### TEST INFORMATION

**Date of Receipt** : 2017-11-15  
**Date of Test** : 2017-11-15 to 2017-11-21  
**Results** : Please refer to next page(s).  
**Test Items** : **PASS**

### TEST REQUEST

A EU RoHS Directive 2011/65/EU and its amendment directives

*Andy*

Test/Witness Engineer



Approved & Authorized



**Results:**

**A. EU RoHS Directive 2011/65/EU and its amendment directives on XRF**

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
A	USB Lanyard Cable					
1	Casing	BL	BL	BL	BL	BL
2	White plastic	BL	BL	BL	BL	BL
3	Wire	BL	BL	BL	BL	BL
4	Black shell	BL	BL	BL	BL	BL
5	PCB	BL	BL	BL	BL	BL
6	Diode	BL	BL	BL	BL	BL
7	Transparent plastic	BL	BL	BL	BL	BL
8	lens	BL	BL	BL	BL	BL

\*\*\*\*\*

Note:

-- = Not Conducted

\* = Screening by XRF and detected by chemical method. The test results of chemical method please refer to next pages.

Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr( VI )) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70 - 3\sigma < X < 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma < X < 130 + 3\sigma \leq OL$	$BL \leq 50 - 3\sigma < X < 150 + 3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X < 1500 + 3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X < 1500 + 3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	mg/kg	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$

\*\*\*\*\*

Note:

- BL = Below Limit
- OL = Over Limit
- X = Inconclusive

- ii The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- iii The maximum permissible limit is quoted from the document 2005/618/EC amending RoHS directive 2011/65/EU:

Disclaimers:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr( VI ))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

\*\*\*\*\*

**B. The Test Results of Chemical Method:**

Test method:

Lead & Cadmium Content:

With reference to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-AES)

Mercury Content:

With reference to IEC 62321-4:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-AES)

Hexavalent Chromium Content:

With reference to IEC 62321-7-1:2015, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

**1) The test results of Cr ( VI )**

Item	MDL	Results			Limit
		4	7	33	
Hexavalent Chromium (Cr ( VI ) )	**	Negative	Negative	Negative	#

\*\*\*\*\*

## Note:

- Negative = Absence of Cr( VI ) on the tested areas
- MDL = Method Detection Limit
- mg/kg = ppm
- \*\* = Spot-test:

Negative = Absence of Cr(VI ) coating/ surface layer, Positive = Presence of Cr(VI ) coating/ surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed)

## Boiling-water-extraction:

Negative = Absence of Cr( VI) coating/ surface layer, Positive = Presence of Cr( VI) coating/ surface layer;

(The detected concentration in boiling- water-extraction solution is equal or greater than 0.02 mg/kg with 50cm sample surface areas.)

- #=

Positive indicates the presence of Cr(VI) on the tested areas and result be regarded as conflict with RoHS requirement.

Negative indicates the absence of Cr(VI ) on the tested areas and result be regarded as no conflict with RoHS requirement.

- #1 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #2 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).
- #3 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to RoHS directive 2011/65/EU and its amendments, Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).

\*\*\*\*\*

**2) The test results of PBBs & PBDEs**

Item	Unit	MDL	Results		Limit
			1	41	
<b>Polybrominated Biphenyls (PBBs)</b>					
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	1000 mg/kg
<b>Polybrominated Diphenylethers (PBDEs)(Mon-Deca)</b>					
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	1000 mg/kg

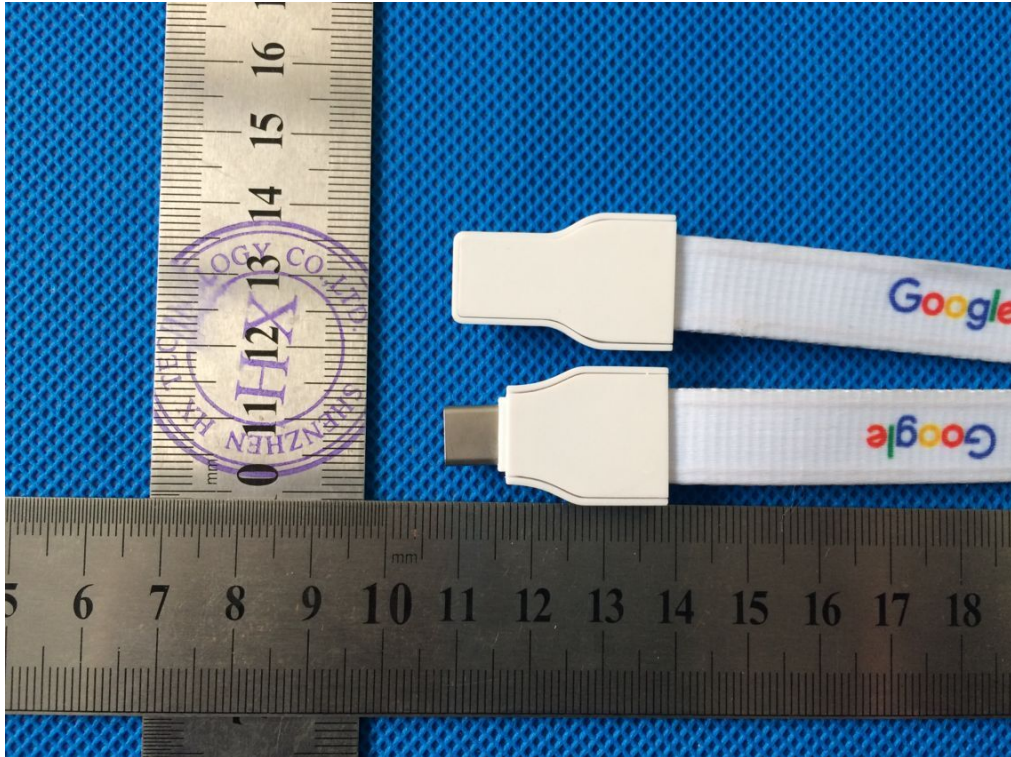
Note:

- N.D. = Not Detected or less than MDL
- mg/kg = ppm
- MDL = Method Detection Limit
- Photo appendix is included.

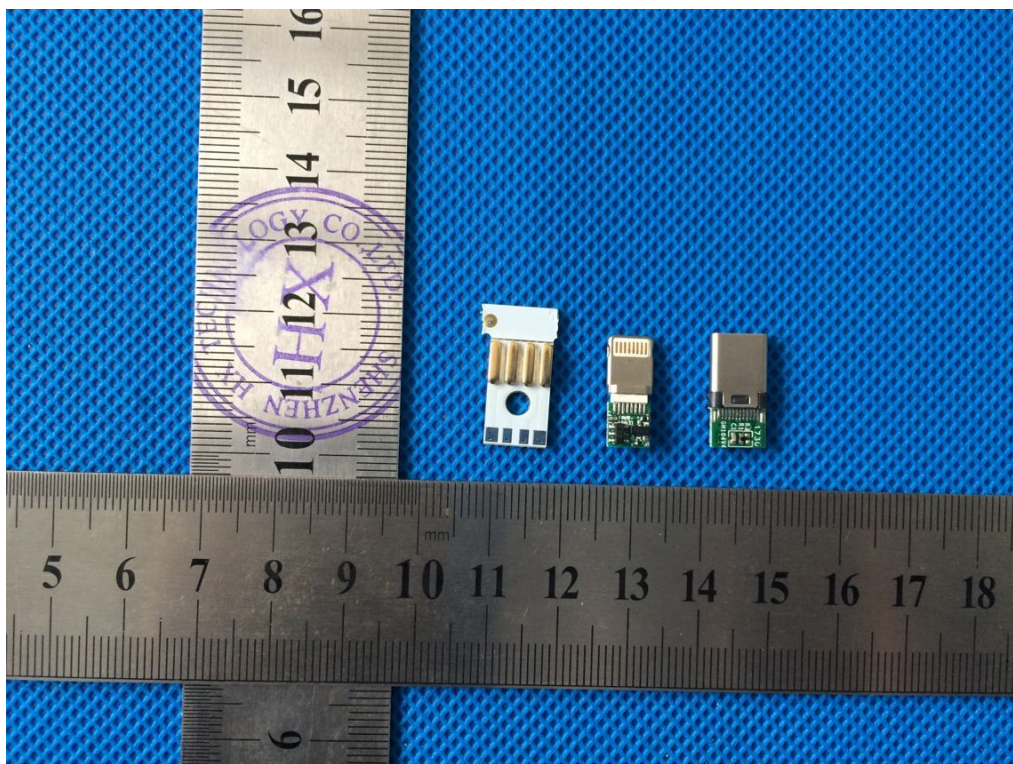
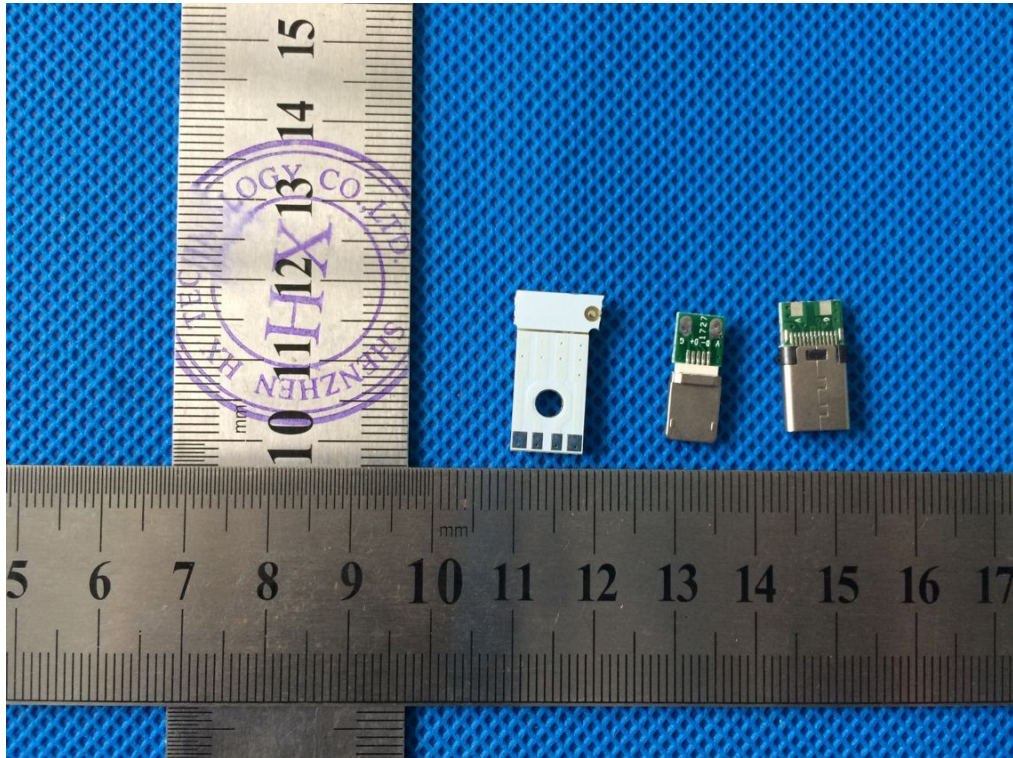
\*\*\*\*\*

## Appendix

### Photograph of Sample









**END OF REPORT**