

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 1 of 12

Applicant:

Address:

Guangdong, China

The following sample was submitted and identified by/on behalf of the client as:

Sample Name: Micro USB Cable

Model No.: B1267-03

Sample Received Date: 2017.02.20

Testing Period: 2017.02.20—2017.02.24

Test Requested: According to customer's requirements, Split the sample and determine the Pb, Cd, Hg, Cr(VI), PBBs & PBDEs content of the parts.

Test Method:

1. Sample prepared with reference to IEC 62321-2:2013
2. Sample Screening testing with reference to IEC 62321-3-1:2013
3. Wet Chemical Test Method
  - a. Determination of Lead ,Cadmium by ICP-OES with reference to IEC 62321-5:2013
  - b. Determination of Mercury by ICP-OES with reference to IEC 62321-4:2013
  - c. Determination of Hexavalent Chromium in colourless and coloured corrosion-protected coatings on metals by UV-VIS method reference to IEC 62321-7-1:2015
  - d. Determination of Hexavalent Chromium in polymers and electronics by UV-Vis Method with reference to IEC 62321:2008, Annex C
  - e. Determination of PBBs and PBDEs by GC-MS with reference to IEC 62321-6:2015

Test Result(s): Please refer to the following page(s).

Conclusion: Base upon the performed tests by submitted sample, the test results comply with the limits as set by Directive (EU) 2015/863 - Amendment of EU RoHS Directive 2011/65/EU (RoHS 2.0) Annex II.

Checked by



Chris Zhong

Signed for and on behalf of TCT



Kim Zhang  
Technical Manager



## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 2 of 12

### Test Result(s):

| Part No. | Part Description        | Restricted Substances                     | Result of EDXRF (1)                | Result of Chemical Testing (2) (mg/kg)  | Conclusion on RoHS                                       | Data Submitted / Resubmitted Date |
|----------|-------------------------|---|------------------------------------|---|--|-----------------------------------|
| 1        | Silvery color metal     | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>---<br>--- | ---<br>---<br>---<br>---<br>---<br>---  | Comply<br>Comply<br>Comply<br>Comply<br>NA<br>NA         | Feb. 22, 2017                     |
| 2        | Black soft plastic      | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>---  | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 3        | White plastic           | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>IN<br>IN   | ---<br>---<br>---<br>---<br>N.D.<br>196 | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017<br>Feb. 24, 2017    |
| 4        | White soft plastic      | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>---  | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 5        | Silvery color metal pin | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>---<br>--- | ---<br>---<br>---<br>---<br>---<br>---  | Comply<br>Comply<br>Comply<br>Comply<br>NA<br>NA         | Feb. 22, 2017                     |

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 3 of 12

| Part No. | Part Description           | Restricted Substances                     | Result of EDXRF (1)                | Result of Chemical Testing (2) (mg/kg) | Conclusion on RoHS                                       | Data Submitted / Resubmitted Date |
|----------|----------------------------|---|------------------------------------|--|--|-----------------------------------|
| 6        | Solder                     | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>---<br>--- | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>NA<br>NA         | Feb. 22, 2017                     |
| 7        | Black plastic cable jacket | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 8        | Red plastic jacket         | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 9        | Black plastic jacket       | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 10       | White plastic jacket       | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 4 of 12

| Part No. | Part Description             | Restricted Substances                     | Result of EDXRF (1)                | Result of Chemical Testing (2) (mg/kg) | Conclusion on RoHS                                       | Data Submitted / Resubmitted Date |
|----------|------------------------------|---|------------------------------------|--|--|-----------------------------------|
| 11       | Green plastic jacket         | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 12       | Copper color metal wire core | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>---<br>--- | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>NA<br>NA         | Feb. 22, 2017                     |
| 13       | Solder                       | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>---<br>--- | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>NA<br>NA         | Feb. 22, 2017                     |
| 14       | Black plastic                | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>BL<br>BL   | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>Comply<br>Comply | Feb. 22, 2017                     |
| 15       | Silvery color metal pin      | Pb<br>Cd<br>Hg<br>Cr(VI)<br>PBBs<br>PBDEs | BL<br>BL<br>BL<br>BL<br>---<br>--- | ---<br>---<br>---<br>---<br>---<br>--- | Comply<br>Comply<br>Comply<br>Comply<br>NA<br>NA         | Feb. 22, 2017                     |

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 5 of 12

**Remark:**

(1) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is  $\text{Cr}^{6+}$ .

(b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for  $\text{Cr}^{6+}$ ) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC62321-3-1:2013 (unit: mg/kg)

| Element | Polymer  | Metal  | Composite Materials  |
|---------|--|--|--|
| Cd      | $\text{BL} \leq (70-3\sigma) < X < (130+3\sigma) \leq \text{OL}$   | $\text{BL} \leq (70-3\sigma) < X < (130+3\sigma) \leq \text{OL}$   | $\text{LOD} < X < (150+3\sigma) \leq \text{OL}$                    |
| Pb      | $\text{BL} \leq (700-3\sigma) < X < (1300+3\sigma) \leq \text{OL}$ | $\text{BL} \leq (700-3\sigma) < X < (1300+3\sigma) \leq \text{OL}$ | $\text{BL} \leq (500-3\sigma) < X < (1500+3\sigma) \leq \text{OL}$ |
| Hg      | $\text{BL} \leq (700-3\sigma) < X < (1300+3\sigma) \leq \text{OL}$ | $\text{BL} \leq (700-3\sigma) < X < (1300+3\sigma) \leq \text{OL}$ | $\text{BL} \leq (500-3\sigma) < X < (1500+3\sigma) \leq \text{OL}$ |
| Br      | $\text{BL} \leq (300-3\sigma) < X$                                 | --   | $\text{BL} \leq (250-3\sigma) < X$                                 |
| Cr      | $\text{BL} \leq (700-3\sigma) < X$                                 | $\text{BL} \leq (700-3\sigma) < X$                                 | $\text{BL} \leq (500-3\sigma) < X$                                 |

(c) BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection, -- = Not Regulated, NA = Not Applicable.

(d) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

(2) (a) 1mg/kg = 1ppm = 0.0001%, N.D.= Not Detected (<MDL), --- = Not Conducted.

(b) Unit and Method Detection Limit (MDL) in wet chemical test

| Test Items | Pb    | Cd    | Hg    |
|------------|-------|-------|-------|
| Units      | mg/kg | mg/kg | mg/kg |
| MDL        | 2     | 2     | 2     |

The MDL for single compound of PBBs & PBDEs is 5 mg/kg and MDL of  $\text{Cr}^{6+}$  for polymer & composite sample is 2 mg/kg.

(c) When  $\text{Cr}^{6+}$  for metal sample is testing according to IEC 62321-7-1:2015, the unit is  $\mu\text{g}/\text{cm}^2$ , and the MDL is 0,10  $\mu\text{g}/\text{cm}^2$ . When the Cr (VI) concentration is  $\square$  the 0,13  $\mu\text{g}/\text{cm}^2$ , the sample is positive for Cr(VI) and considered to contain Cr(VI); when the Cr (VI) concentration is N.D.(< the 0,10  $\mu\text{g}/\text{cm}^2$ ), the sample is negative for Cr(VI) and considered a non-Cr(VI) based coating; when the Cr (VI) concentration is  $\geq$  the 0,10  $\mu\text{g}/\text{cm}^2$  and  $\leq$  the 0,13  $\mu\text{g}/\text{cm}^2$ , the result is considered to be inconclusive - Unavoidable coating variations may influence the determination.

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 6 of 12

(3) The maximum permissible limit is quoted from the Directive (EU) 2015/863 - Amendment of EU RoHS Directive 2011/65/EU (RoHS 2.0) Annex II.

| RoHS Restricted Substances            | Maximum Concentration Value<br>(by weight in homogenous materials) |
|---------------------------------------|--|
| Lead (Pb)                             | 0.1%   |
| Cadmium (Cd)                          | 0.01%  |
| Mercury (Hg)                          | 0.1%   |
| Hexavalent Chromium (Cr VI)           | 0.1%   |
| Polybrominated biphenyls (PBBs)       | 0.1%   |
| Polybrominated diphenylethers (PBDEs) | 0.1%   |



## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 7 of 12

### RoHS Exemptions

| Exemptions   |   |
|--|---|
| RoHS Directive 2011/65/EU ANNEX III  |   |
| Exemption Items  | Expires Date  |
| 1, Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):  |   |
| 1(a), For general lighting purposes < 30 W:3.5 mg  | 2,5 mg shall be used per burner after 31 December 2012                          |
| 1(b), For general lighting purposes ≥ 30 W and < 50W:3.5mg   |   |
| 1(c), For general lighting purposes ≥ 50 W and < 150 W: 5 mg   |   |
| 1(d), For general lighting purposes ≥ 150 W: 15 mg   |   |
| 1(e), For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 7 mg   |   |
| 1(f), For special purposes: 5 mg   |   |
| 2(a), Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):  |   |
| 2(a)(1), Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 4 mg   |   |
| 2(a)(2), Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 3 mg   |   |
| 2(a)(3), Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8):3.5mg  |   |
| 2(a)(4), Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 5 mg   | Expires on 31 December 2012; 3,5 mg may be used per lamp after 31 December 2012 |
| 2(a)(5), Tri-band phosphor with long lifetime (≥ 25 000 h): 5 mg   |   |
| 2(b), Mercury in other fluorescent lamps not exceeding (per lamp):   |   |
| 2(b)(2), Non-linear halophosphate lamps (all diameters): 15 mg   | Expires on 13 April 2016  |
| 2(b)(3), Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9):15mg  |   |
| 2(b)(4), Lamps for other general lighting and special purposes (e.g. induction lamps):15mg   |   |
| 3, Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):                 |   |
| 3(a), Short length (≤500 mm):3.5mg   |   |
| 3(b), Medium length (> 500 mm and ≤ 1 500 mm):5mg  |   |
| 3(c), Long length (> 1 500 mm):13mg  |   |
| 4(a), Mercury in other low pressure discharge lamps (per lamp):15mg  |   |
| 4(b), Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 60: |   |
| 4(b) -I, P ≤155 W:30mg   |   |
| 4(b) -II, 155 W < P ≤ 405 W:40mg   |   |
| 4(b) -III, P > 405 W:40mg  |   |
| 4(c), Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):   |   |
| 4(c)-I, P ≤ 155 W:25mg   |   |

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 8 of 12

| Exemptions   |   |
|--|---|
| RoHS Directive 2011/65/EU ANNEX III  |   |
| Exemption Items  | Expires Date  |
| 4(c)-II, 155 W < P ≤ 405 W:30mg  |   |
| 4(c)-III, P > 405 W:40mg   |   |
| 4(d), Mercury in High Pressure Mercury (vapour) lamps (HPMV)   | Expires on 13 April 2015  |
| 4(e), Mercury in metal halide lamps (MH)   |   |
| 4(f), Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex   |   |
| 5(a), Lead in glass of cathode ray tubes   |   |
| 5(b), Lead in glass of fluorescent tubes not exceeding 0,2 % by weight   |   |
| 6(a), Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0,35 % lead by weight   |   |
| 6(b), Lead as an alloying element in aluminium containing up to 0,4 % lead by weight   |   |
| 6(c), Copper alloy containing up to 4 % lead by weight   |   |
| 7(a), Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead)   |   |
| 7(b), Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications        |   |
| 7(c)-I, Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectric devices, or in a glass or ceramic matrix compound |   |
| 7(c)-II, Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher  |   |
| 7(c)-III, Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC   | Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013 |
| 7(c)-IV, Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors  | Expires on 21 July 2016   |
| 8(a), Cadmium and its compounds in one shot pellet type thermal cut-offs   | Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012 |
| 8(b), Cadmium and its compounds in electrical contacts   |   |
| 9, Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution                                       |   |
| 9(b), Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications                                     |   |
| 11(a), Lead used in C-press compliant pin connector systems  | May be used in spare parts for EEE placed on the market before 24 September 2010  |



## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 9 of 12

| Exemptions   |   |
|--|---|
| RoHS Directive 2011/65/EU ANNEX III  |   |
| Exemption Items  | Expires Date  |
| 11(b), Lead used in other than C-press compliant pin connector systems   | Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013 |
| 12, Lead as a coating material for the thermal conduction module C-ring  | May be used in spare parts for EEE placed on the market before 24 September 2010  |
| 13(a), Lead in white glasses used for optical applications   |   |
| 13(b), Cadmium and lead in filter glasses and glasses used for reflectance standards   |   |
| 14, Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight                       | Expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011 |
| 15, Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages  |   |
| 16, Lead in linear incandescent lamps with silicate coated tubes   | Expires on 1 September 2013   |
| 17, Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications  |   |
| 18(b), Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ( $\text{BaSi}_2\text{O}_5:\text{Pb}$ )               |   |
| 21, Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses  |   |
| 23, Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less   | May be used in spare parts for EEE placed on the market before 24 September 2010  |
| 24, Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors  |   |
| 25, Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring   |   |
| 29, Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC (1)   |   |
| 30, Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more |   |
| 31, Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)  |   |
| 32, Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes  |   |
| 33, Lead in solders for the soldering of thin copper wires of 100 $\mu\text{m}$ diameter and less in power transformers  |   |
| 34, Lead in cermet-based trimmer potentiometer elements  |   |

## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 10 of 12

### Exemptions

RoHS Directive 2011/65/EU ANNEX III

| Exemption Items  | Expires Date                |
|--|-----------------------------|
| 37, Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body  |                             |
| 38, Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide  |                             |
| 39, Cadmium in colour converting II-VI LEDs (< 10 µg Cd per mm <sup>2</sup> of light-emitting area) for use in solid state illumination or display systems | Expires on 1 July 2014      |
| 40, Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment  | Expires on 31 December 2013 |

Note: 1. (\*) OJ L 326, 29.12.1969, p.36.

2. For the purposes of Directive 2011/65/EU, a maximum concentration value of 0,1 % by weight in homogeneous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) and of 0,01 % by weight in homogeneous materials for cadmium shall be tolerated.

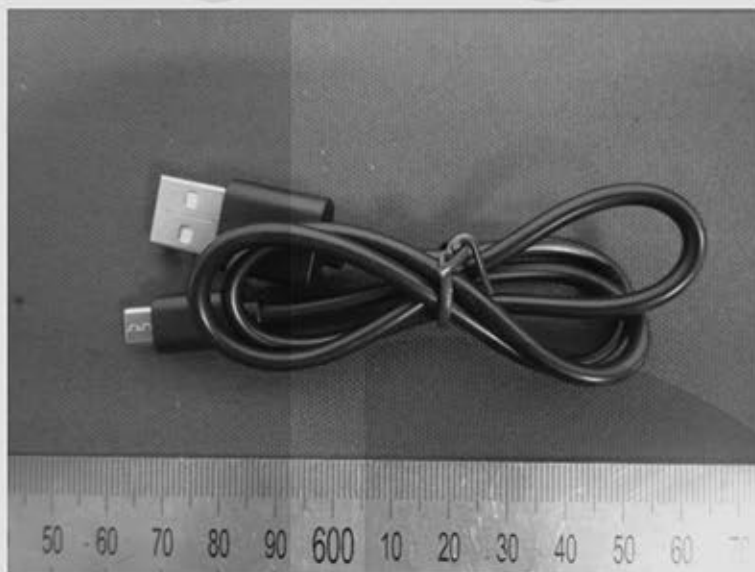
## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

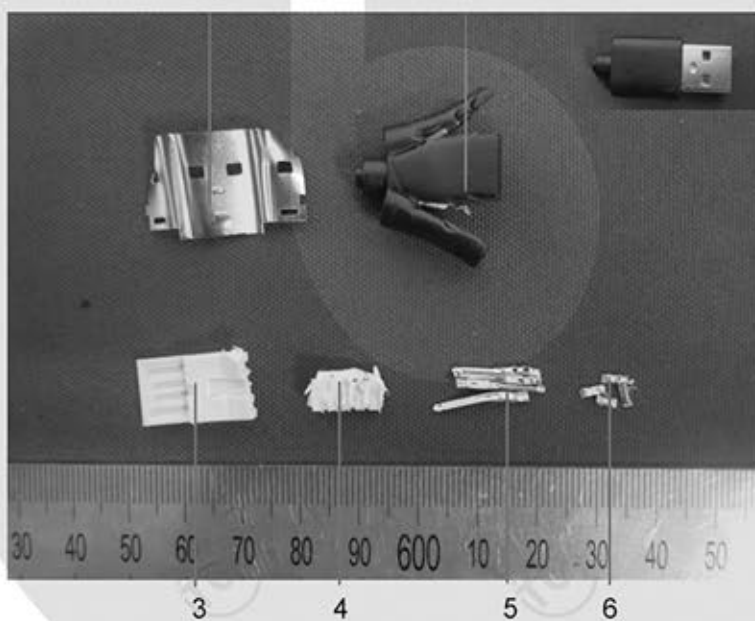
Page No.: 11 of 12

### Photo(s) of the sample(s)



1

2

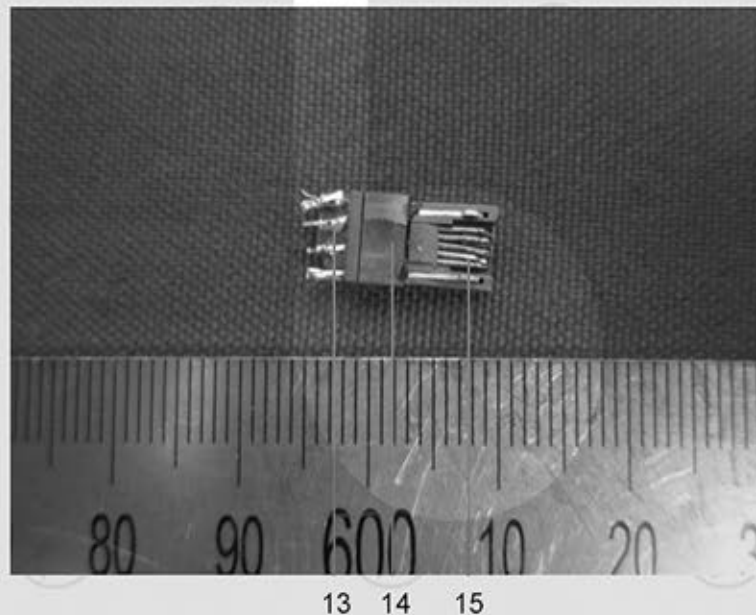
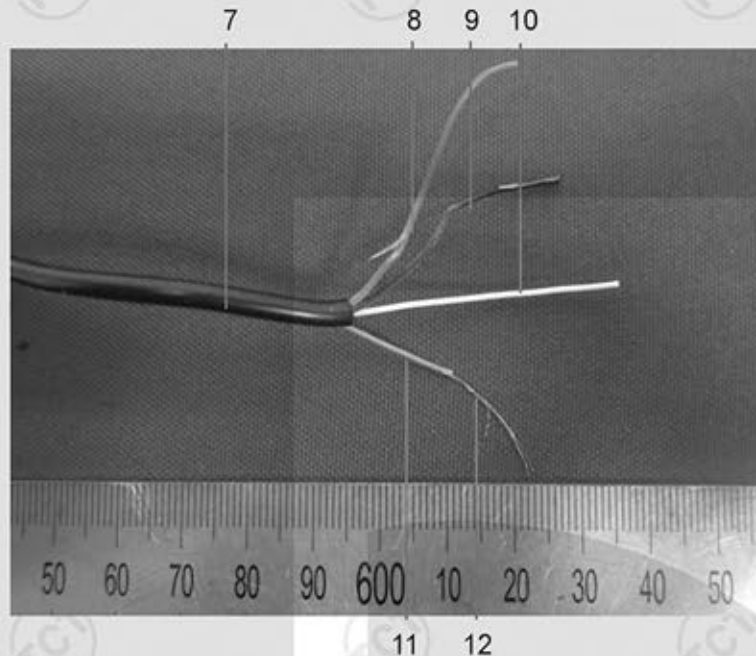


## Test Report

Report No. : TCT170220C009

Date : Feb.24, 2017

Page No.: 12 of 12



\*\*\* End of Report \*\*\*

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