

## Test Report

Number: LCZC16040322-E

Date: Apr. 20, 2016

Page 1 of 5

Applicant : GuangDong HaoEr Electronics Co., LTD.

Address : 4th Floor, No. 88, TongAn Road East, DongFeng Town, ZhongShan City

Date of Received : Apr. 09, 2016

Testing Period : From Apr. 09, 2016 to Apr. 13, 2016

Report on the submitted sample said to be :

Item Name : High frequency transformer

### Test Request

As per applicant requirement, According to European RoHS directive **2011/65/EU** and it's Amendment, Test on submitted samples

— Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)) and Polybrominated Biphenyls & Polybrominated Biphenyl Ethers (PBBs & PBDEs) content.

### Conclusion:

**Pass**

Please see the next page(s) for details.

Signed for and on behalf of **LCTECH**

Reviewed by



Ken Lu  
Project Engineer

Approved by



Robert Luo  
Technical Manager

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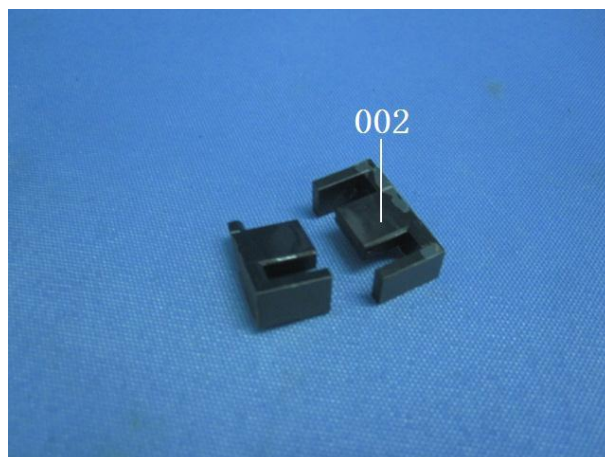
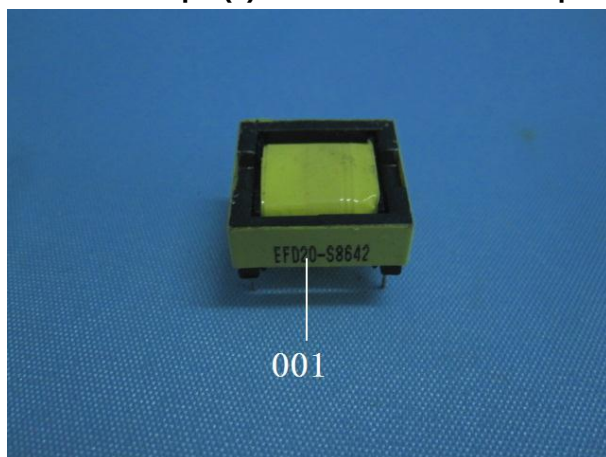
**1 Submitted Sample(s) Information**

**1.1 Photo of submitted product**



**High frequency transformer**

**1.2 The test Sample(s) after disassemble the product.**



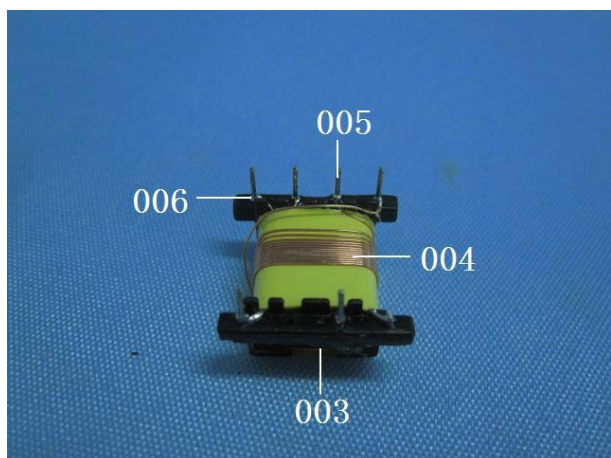
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## 2 Test Results

### 2.1 XRF Screening test or(and) Chemical test on the Submitted Sample(s).

| Sample No. | Sample Description                 | Test Results, mg/kg |    |    |          |      |       |
|------------|------------------------------------|---------------------|----|----|----------|------|-------|
|            |                                    | Cd                  | Pb | Hg | Cr(VI)   | PBBs | PBDEs |
| 001        | Yellow Plastic with black printing | BL                  | BL | BL | BL       | BL   | BL    |
| 002        | Black magnet                       | BL                  | BL | BL | BL       | NA   | NA    |
| 003        | Black plastic                      | BL                  | BL | BL | BL       | BL   | BL    |
| 004        | Coppery enameled wire              | BL                  | BL | BL | BL       | BL   | BL    |
| 005        | Silvery metal                      | BL                  | BL | BL | Negative | NA   | NA    |
| 006        | Silvery metal (solder)             | BL                  | BL | BL | BL       | NA   | NA    |

**Remark:**

BL = Below Limit, Comply with RoHS requirement based on XRF Screening test. please see 3.1.

NA= Not applicable;

Negative = The absence of Cr(VI)

**Cr(VI)** = Hexavalent Chromium.

**PBBs** = Polybrominated Biphenyls

**PBDEs**= Polybrominated Biphenyl Ethers

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### 3 Test Methods and Limit

#### 3.1 XRF Screening test limits in mg/kg for regulated elements in different materials

| Element                 | Judgment     | Metallic and non-Metallic materials  | Polymer                              | Complex Material                     |
|-------------------------|--------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Cd                      | BL           | $X \leq (70-3\sigma)$                | $X \leq (70-3\sigma)$                | $X \leq (50-3\sigma)$                |
|                         | Inconclusive | $(70-3\sigma) < X < (130+3\sigma)$   | $(70-3\sigma) < X < (130+3\sigma)$   | $(50-3\sigma) < X < (150+3\sigma)$   |
|                         | OL           | $(130+3\sigma) \leq X$               | $(130+3\sigma) \leq X$               | $(150+3\sigma) \leq X$               |
| Pb                      | BL           | $X \leq (700-3\sigma)$               | $X \leq (700-3\sigma)$               | $X \leq (500-3\sigma)$               |
|                         | Inconclusive | $(700-3\sigma) < X < (1300+3\sigma)$ | $(700-3\sigma) < X < (1300+3\sigma)$ | $(500-3\sigma) < X < (1500+3\sigma)$ |
|                         | OL           | $(1300+3\sigma) \leq X$              | $(1300+3\sigma) \leq X$              | $(1500+3\sigma) \leq X$              |
| Hg                      | BL           | $X \leq (700-3\sigma)$               | $X \leq (700-3\sigma)$               | $X \leq (500-3\sigma)$               |
|                         | Inconclusive | $(700-3\sigma) < X < (1300+3\sigma)$ | $(700-3\sigma) < X < (1300+3\sigma)$ | $(500-3\sigma) < X < (1500+3\sigma)$ |
|                         | OL           | $(1300+3\sigma) \leq X$              | $(1300+3\sigma) \leq X$              | $(1500+3\sigma) \leq X$              |
| Total Cr <sup>[a]</sup> | BL           | $X \leq (700-3\sigma)$               | $X \leq (700-3\sigma)$               | $X \leq (700-3\sigma)$               |
|                         | Inconclusive | $(700-3\sigma) < X$                  | $(700-3\sigma) < X$                  | $(700-3\sigma) < X$                  |
| Total Br <sup>[b]</sup> | BL           | NA                                   | $BL \leq (300-3\sigma)$              | $BL \leq (250-3\sigma)$              |
|                         | Inconclusive | NA                                   | $(300-3\sigma) < X$                  | $(250-3\sigma) < X$                  |

Remark:

- $\sigma$  = Standard Deviation.
- [a] The content of Cr(VI) is always less than total Cr, and BL means that the content of Cr(VI) <1000 mg/kg.
- [b] The limit for total Br, with a 30 % margin of safety, is calculated based on the stoichiometry of Br in the most common congeners of PBB/PBDE, and BL means that the content of PBB/PBDE <1000 mg/kg.
- BL = Below Limit, Comply with RoHS requirement based on XRF Screening test.
- OL= Over Limit, Not comply with RoHS requirement (100ppm for Cd, and 1000ppm for Pb/Hg) based on XRF Screening test.
- Inconclusive =Not to be confirmed by XRF Screening test, Chemical test need to be done.

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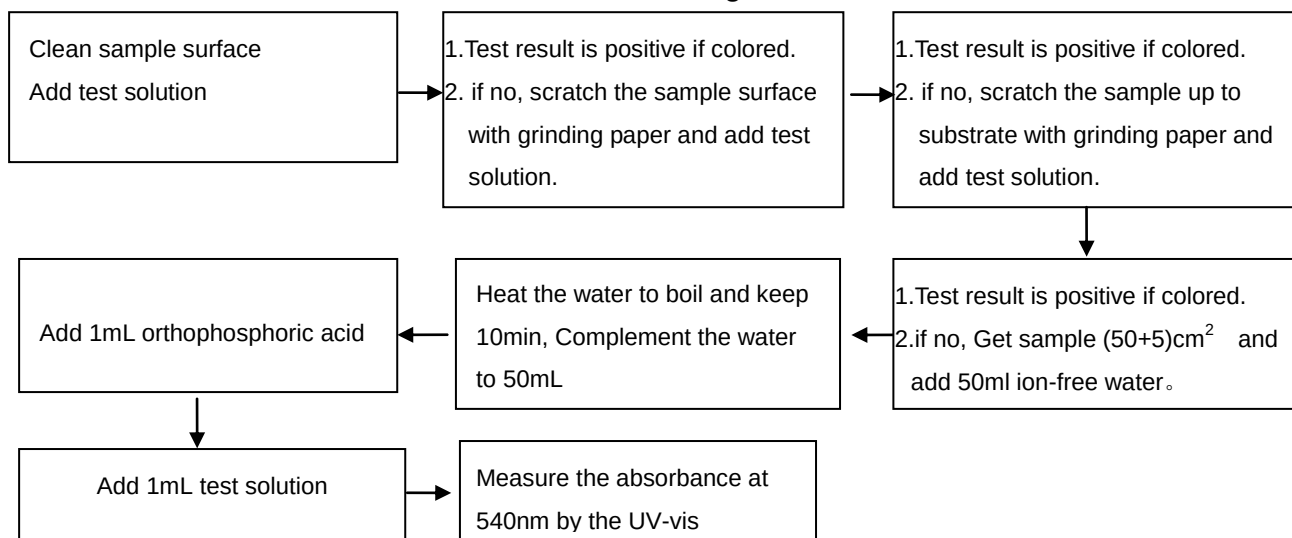
**3.2 Test methods , Report limit (RL) and Maximum Limit**

| Testing Item                  | Testing Method                                                                   | RL (mg/kg)        | Maximum Limit (mg/kg) |
|-------------------------------|----------------------------------------------------------------------------------|-------------------|-----------------------|
| Cd / Pb / Hg<br>Total Cr / Br | With reference to IEC 62321-3-1:2013, Determined by XRF                          | -                 | -                     |
| Cadmium (Cd)                  | With reference to IEC 62321-5:2013,Determined by ICP-OES                         | 5                 | 100                   |
| Lead (Pb)                     |                                                                                  | 5                 | 1000                  |
| Mercury (Hg)                  | With reference to IEC 62321-4:2013,Determined by ICP-OES                         | 5                 | 1000                  |
| Chromium (VI)                 | With reference to IEC 62321(Edition 1.0 2008-12), Annex C. Determined by UV-VIS. | 2                 | 1000                  |
|                               | With reference to IEC 62321(Edition 1.0 2008-12), Annex B. Determined by UV-VIS. | Negative Positive | Negative Positive     |
| PBBs/PBDEs                    | With reference to IEC 62321(Edition 1.0 2008-12), Annex A. Determined by GC/MS   | 5                 | 1000                  |

Remark:

Negative= The absence of Cr(VI).

 Positive= The presence of Cr(VI) by spot test, or the detected concentration in boiling-water-extraction solution is equal or greater than 0.02mg/kg with 50cm<sup>2</sup> sample surface area.

**4 Flow Charts**
**4.1 To Determine Hexavalent Chromium Content in Coating on Metals**


End of Report

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