



# TEST REPORT

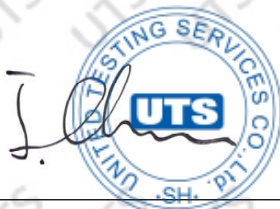
No. : SH170500501C03

Report Date: 2017/05/12

**Applicant** : Tongfu MICROELECTRONICS CO., LTD.  
**Address** : No.288,Chongchuan Road,Nantong,Jiangsu, China

The following sample(s) was/were submitted and identified by/on behalf of the applicant as:

**Sample Name** : DIP8  
**Receiving Date** : May.03, 2017  
**Testing Period** : May.03, 2017 - May.12, 2017  
**Test Requested** : Please refer to next page(s).  
**Test Method** : Please refer to next page(s).  
**Test Results** : Please refer to next page(s).



Approved by Jeffery Chou

Tim Bian

Reviewed by Tim Bian

Luciana Wang

Redact by Luciana Wang

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## TEST RESULTS:

### 1. RoHS 6

| Test Items                          | Methods | MDL (mg/kg) | Results (mg/kg) |             | Limited Value* (mg/kg) |
|-------------------------------------|---------|-------------|-----------------|-------------|------------------------|
|                                     |         |             | 1#              | 2#          |                        |
| Pb                                  | M1      | 2           | N.D             | N.D.        | 1000                   |
| Cd                                  |         | 2           | N.D.            | N.D.        | 100                    |
| Hg                                  | M2      | 2           | N.D.            | N.D.        | 1000                   |
| Cr (VI)                             | M3a     | ---         | Negative        | ---         | ---(metal)             |
|                                     | M3      | 2           | ---             | N.D.        | 1000(nonmetal)         |
| Monobromobiphenyl (MonoBB)          | M4      | 5           | ---             | N.D.        | ---                    |
| Dibromobiphenyl (DiBB)              |         | 5           | ---             | N.D.        | ---                    |
| Tribromobiphenyl (TriBB)            |         | 5           | ---             | N.D.        | ---                    |
| Tetrabromobiphenyl (TetraBB)        |         | 5           | ---             | N.D.        | ---                    |
| Pentabromobiphenyl (PentaBB)        |         | 5           | ---             | N.D.        | ---                    |
| Hexabromobiphenyl (HexaBB)          |         | 5           | ---             | N.D.        | ---                    |
| Heptabromobiphenyl (HeptaBB)        |         | 5           | ---             | N.D.        | ---                    |
| Octabromobiphenyl (OctaBB)          |         | 5           | ---             | N.D.        | ---                    |
| Nonabromobiphenyl (NonaBB)          |         | 5           | ---             | N.D.        | ---                    |
| Decabromobiphenyl (DecaBB)          |         | 5           | ---             | N.D.        | ---                    |
| <b>Total PBBs / sum of above</b>    |         | ---         | ---             | <b>N.D.</b> | 1000                   |
| Monobromodiphenyl ether (MonoBDE)   |         | 5           | ---             | N.D.        | ---                    |
| Dibromodiphenyl ether (DiBDE)       |         | 5           | ---             | N.D.        | ---                    |
| Tribromodiphenyl ether (TriBDE)     |         | 5           | ---             | N.D.        | ---                    |
| Tetrabromodiphenyl ether (TetraBDE) | 5       | ---         | N.D.            | ---         |                        |
| Pentabromodiphenyl ether (PentaBDE) | 5       | ---         | N.D.            | ---         |                        |
| Hexabromodiphenyl ether (HexaBDE)   | 5       | ---         | N.D.            | ---         |                        |
| Heptabromodiphenyl ether (HeptaBDE) | 5       | ---         | N.D.            | ---         |                        |
| Octabromodiphenyl ether (OctaBDE)   | 5       | ---         | N.D.            | ---         |                        |
| Nonabromodiphenyl ether (NonaBDE)   | 5       | ---         | N.D.            | ---         |                        |
| Decabromodiphenyl ether (DecaBDE)   | 5       | ---         | N.D.            | ---         |                        |
| <b>Total PBDEs / sum of above</b>   | ---     | ---         | <b>N.D.</b>     | 1000        |                        |

Remark : \*The Limited value is based on the RoHS directive 2011/65/EU.



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## 2. PFOS&PFOA

**Test Method:** With reference to EPA 3550C:2007 and EPA 8321B:2007 Detection of non-volatile material that can be solvent extraction by high-performance liquid chromatography with thermal ionization mass spectrometry.

| Test Item                        | Unit | MDL    | Test Result |      | Limited Value** |
|----------------------------------|------|--------|-------------|------|-----------------|
|                                  |      |        | 1#          | 2#   |                 |
| Perfluorooctane sulfonates(PFOS) | %    | 0.0001 | N.D.        | N.D. | 0.1             |
| Perfluorooctanoic Acid(PFOA)     |      | 0.0001 | N.D.        | N.D. | ---             |

**Remark :** \*\*The Limited value is based on Directive 2006/122/EC.

## 3. Sb

**Test Method:** With reference to EPA 3052-1996 & EPA 6010C-2007, analysis was performed by ICP-OES.

| Test Item | Unit  | MDL | Test Result |    |
|-----------|-------|-----|-------------|----|
|           |       |     | 1#          | 2# |
| Sb        | mg/kg | 10  | 220         | 86 |

## 4. HBCDD

**Test Method:** With reference to EPA 3550C-2007&EPA 8270D-2007, analysis was performed by GC-MS.

| Test Item                      | Unit  | MDL | Test Result |
|--------------------------------|-------|-----|-------------|
|                                |       |     | 2#          |
| Hexabromocyclododecane (HBCDD) | mg/kg | 20  | N.D.        |

## 5. Halogen

**Test Method:** With reference to EN 14582: 2007, analysis was performed by IC.

| Test Item     | Unit  | MDL | Limit | Test Result |
|---------------|-------|-----|-------|-------------|
|               |       |     |       | 2#          |
| Fluorine (F)  | mg/kg | 30  | ---   | 149         |
| Chlorine (Cl) | mg/kg | 30  | 900   | 60          |
| Bromine (Br)  | mg/kg | 30  | 900   | N.D.        |
| Iodine (I)    | mg/kg | 30  | ---   | N.D.        |
| Total (Cl+Br) | mg/kg | --- | 1500  | 60          |



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## 6. 15P

**Test Method:** With reference to EPA 3550C-2007&EPA 8270D-2007, analysis was performed by GC-MS.

| Test Items   | Unit  | MDL | Test Results |
|--|-------|-----|--------------|
|  |       |     | 2#           |
| Di-iso-nonyl phthalate (DINP)  | mg/kg | 50  | N.D.         |
| Di-n-octyl phthalate (DNOP)  |       | 10  | N.D.         |
| Di (2-ethyl hexyl)-phthalate (DEHP) (DOP)                            |       | 10  | N.D.         |
| Diisodecyl phthalate (DIDP)  |       | 50  | N.D.         |
| Butylbenzyl phthalate (BBP)  |       | 10  | N.D.         |
| Diisobuty phthalate (DIBP)   |       | 10  | N.D.         |
| Dibutyl phthalate (DBP)  |       | 10  | N.D.         |
| Di-n-hexyl phthalate (DNHP)  |       | 10  | N.D.         |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich |       | 10  | N.D.         |
| 1,2-Benzenedicarboxylic acid, ihexylester, branched and linear       |       | 10  | N.D.         |
| Bis(2-methoxyethyl) phthalate(DMEP)                                  |       | 10  | N.D.         |
| Diisopentylphthalate (DIPP)  |       | 10  | N.D.         |
| Dipentyl phthalate (DPP)   |       | 10  | N.D.         |
| N-pentyl-isopentylphthalate  |       | 10  | N.D.         |
| Dipentyl phthalate (DNPP)  |       | 10  | N.D.         |

- Note :**
- 1) “---” = Not Regulated.
  - 2) MDL = Method Detection Limit.
  - 3) N.D. = Not detected, less than MDL.
  - 4) M1: With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.
  - 5) M2: With reference to IEC 62321-4: 2013, analysis was performed by ICP-OES.
  - 6) M3: With reference to IEC 62321-7-2: 2017, analysis was performed by UV-Vis.  
M3a: With reference to IEC 62321-7-1: 2015, analysis was performed by UV-Vis Colorimetric Determination.
  - 7) M4: With reference to IEC 62321-6: 2015, analysis was performed by GC-MS.
  - 8) Boiling water extraction method:  
Negative: The Cr(VI) concentration of plating detected is blow  $0.1\mu\text{g}/\text{cm}^2$ ;



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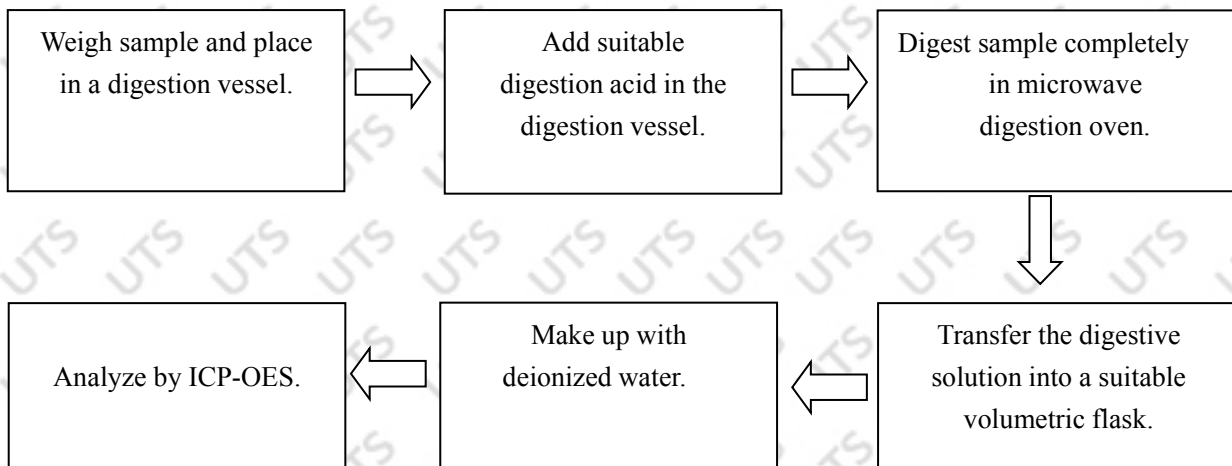
Positive: The Cr(VI) concentration of plating detected is above  $0.13\mu\text{g}/\text{cm}^2$  ;

Inconclusive: The Cr(VI) concentration of plating detected is between  $0.1\mu\text{g}/\text{cm}^2$  and  $0.13\mu\text{g}/\text{cm}^2$  .

**TEST PART DESCRIPTION:** 1# Metallic pin 2# Black main body

## FLOW CHART

### 1. Test for Pb, Hg, Cd and Sb Content



| Sample Material | Digestion Acid  |
|-----------------|---|
| Glass           | HNO <sub>3</sub> /HF  |
| Plastic         | H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl |
| Others          | Any acid to total digestion.  |

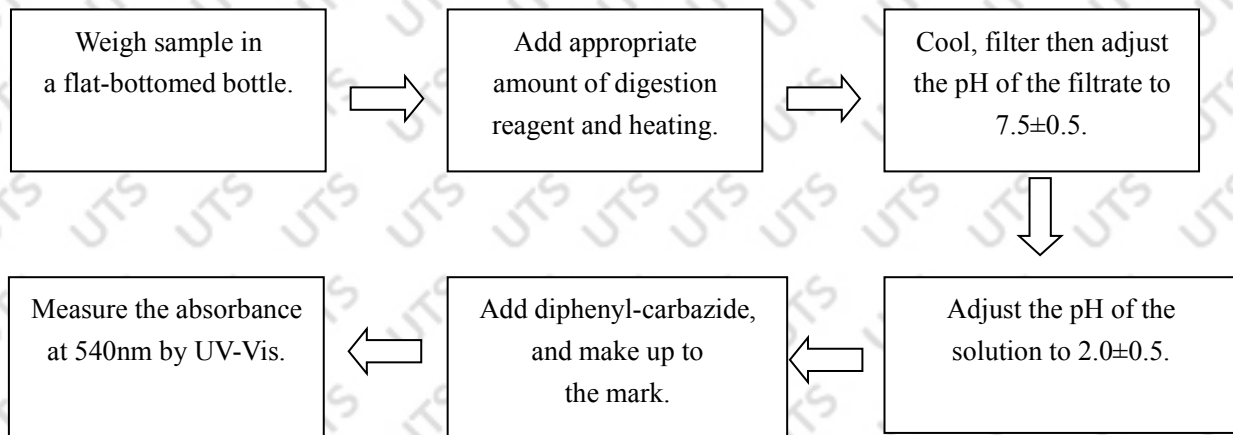
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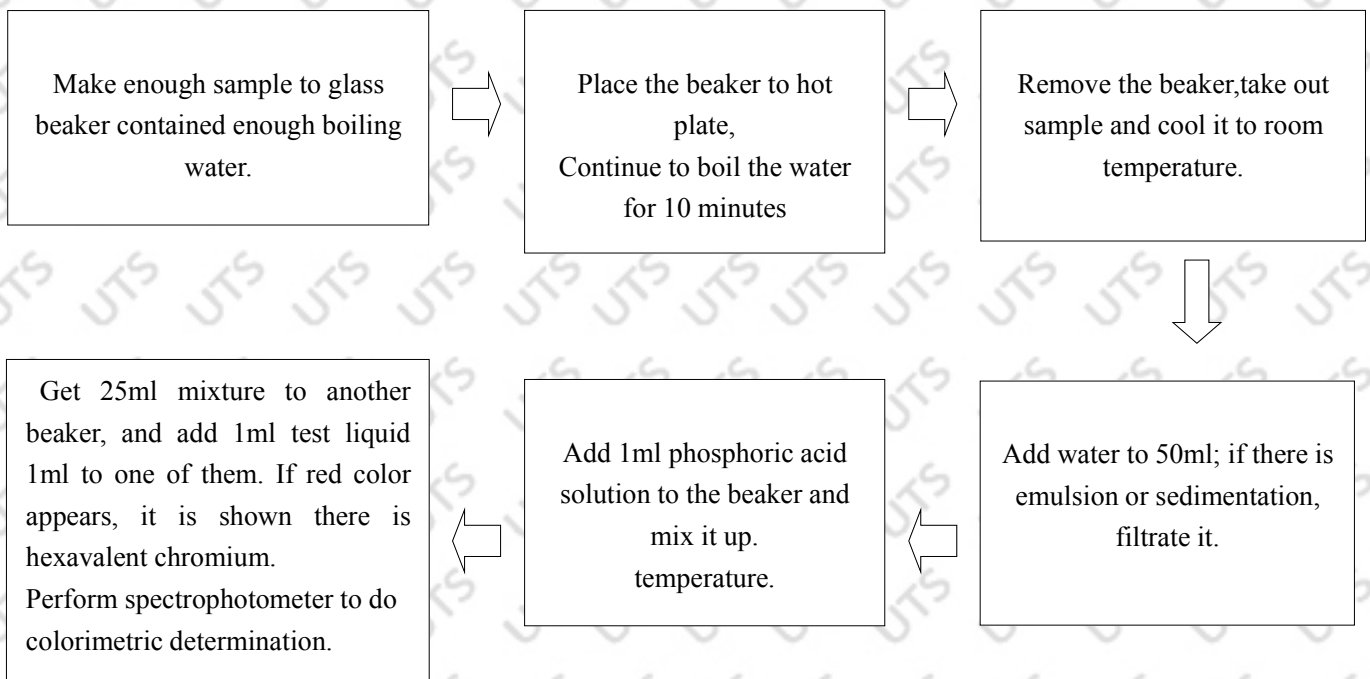
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## 2. Test for Chromium (VI) Content

### Nonmetal



### Metal

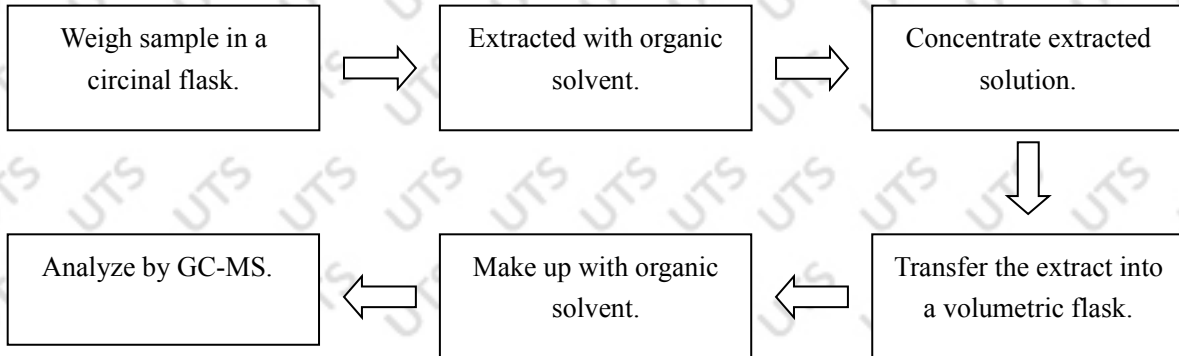


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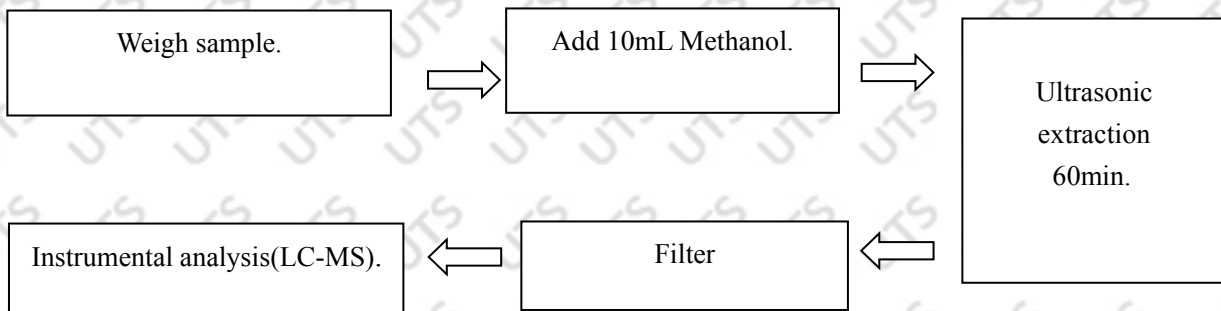
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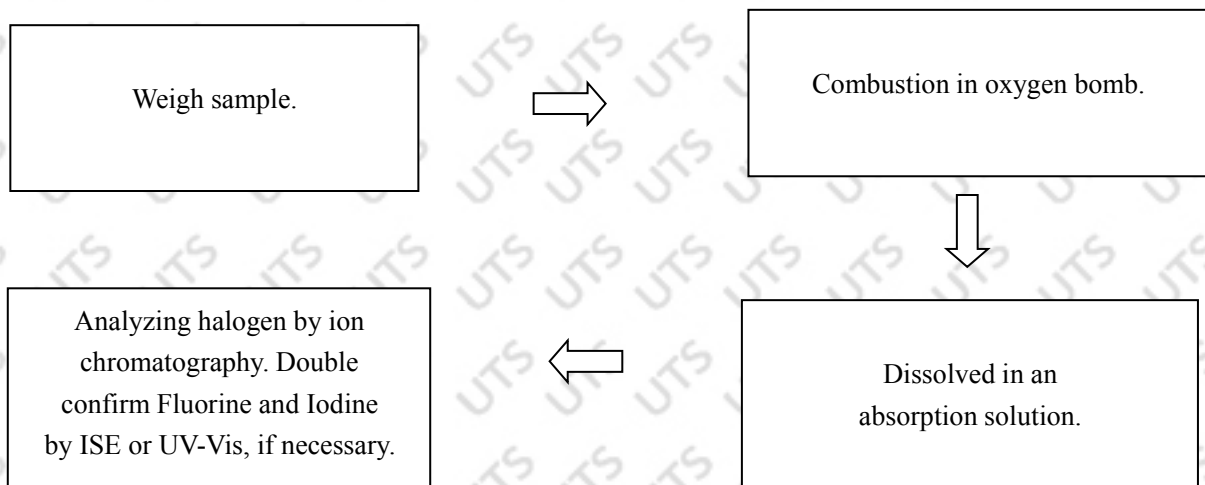
### 3. Test for PBBs&PBDEs & HBCDD & Phthalates Content



### 4. Test for PFOS & PFOA Content



### 5. Test for Halogen content

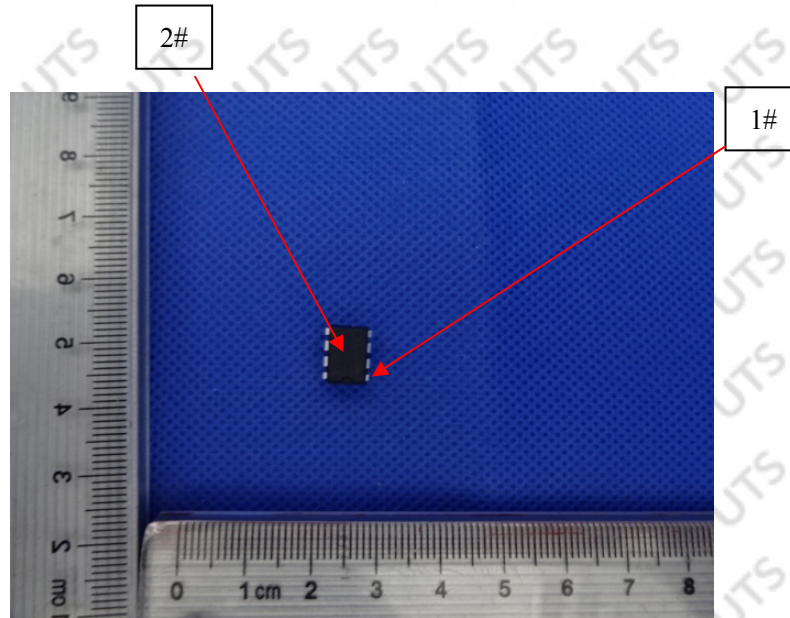


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## SAMPLE PHOTO



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