

# Test Report

No.: EG170502018C05MVer.1.0

Date: May 12, 2017

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

**Sample Name** : SOP28  
**Quantity** : 1pc  
**Model** : Metal pin、Black main part  
**Lot No.** : /  
**Supplier** : /

**Received Date** : May 02, 2017  
**Test Period** : May 02, 2017 ~May 10, 2017

## Test Summary

No.	Test Item	Test Conclusion
1	Directive 2011/65/EU (RoHS)	Pass
2	Fluorine(F),Chlorine(Cl), Bromine(Br), Iodine(I)	Pass
3	Hexabromocyclododecan (HBCDD)	Pass
4	Phthalates (16P)	Pass
5	PFOS, PFOA	Pass
6	Antimony (Sb)	N/A

Remark: Pass: meet the requirement; Fail: Doesn' t meet the requirement; N/A: Without conclusions or provide test results only.

Signed for and on behalf of  
EMTEK (SUZHOU) CO., LTD

Prepared by: May  
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May  
Assistant Engineer

Reviewed by: Jason  
Jiang Yufeng,  
Jason  
Technical supervisor

Approved by: Mickey  
Yuan Qi,  
Mickey  
Authorized signatory  
May 12, 2017

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## Sample Description

Sample No.	Sample Number	Sample Name	Model
01	EG170502018C05	SOP28	Metal pin
02		SOP28	Black main part

## Summary of Test Results

### 1. RoHS

#### 1.1 Test Method

Test Item	Test Method
Cadmium (Cd), Lead (Pb)	IEC 62321-5:2013
Mercury (Hg)	IEC 62321-4:2013
Hexavalent Chromium (Cr <sup>6+</sup> )	IEC 62321-7-1:2015/IEC 62321-7-2:2017
PBBs & PBDEs	IEC 62321-6:2015

#### 1.2 Test Instrument

Instrument Name	Manufacturer	Instrument Model	Instrument No.	Calibration Valid Date
ICP-OES	Agilent	720	E-C-007	2017/09/01
UV-Vis	SHIMADZU	UV-2600	E-V-011	2017/08/30
GC-MS	Agilent	7890B-5977A	E-C-001	2017/09/01

#### 1.3 Test Result: Limit according to EU Directive 2011/65/EU (RoHS)

Test Item	Result (mg/kg)	MDL (mg/kg)	Limit (mg/kg)
	01		
Cadmium (Cd)	N.D.	2	100
Lead (Pb)	27	2	1000
Mercury (Hg)	N.D.	2	1000
Hexavalent Chromium (Cr <sup>6+</sup> )	Negative	0.02*	1000

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Test Item	Result (mg/kg)	MDL (mg/kg)	Limit (mg/kg)
	02		
Cadmium (Cd)	N.D.	2	100
Lead (Pb)	N.D.	2	1000
Mercury (Hg)	N.D.	2	1000
Hexavalent Chromium (Cr <sup>6+</sup> )	N.D.	2	1000

Test Item	Result (mg/kg)	MDL (mg/kg)	Limit (mg/kg)
	02		
Polybrominated Biphenyls (Mono – Deca) (PBBs)	N.D.	--	1000
Monobromobiphenyl	N.D.	5	--
Dibromobiphenyl	N.D.	5	--
Tribromobiphenyl	N.D.	5	--
Tetrabromobiphenyl	N.D.	5	--
Pentabromobiphenyl	N.D.	5	--
Hexabromobiphenyl	N.D.	5	--
Heptabromobiphenyl	N.D.	5	--
Octabromobiphenyl	N.D.	5	--
Nonabromobiphenyl	N.D.	5	--
Decabromobiphenyl	N.D.	5	--
Polybrominated Diphenylethers (Mono – Deca) (PBDEs)	N.D.	--	1000
Monobromodiphenyl ether	N.D.	5	--
Dibromodiphenyl ether	N.D.	5	--
Tribromodiphenyl ether	N.D.	5	--
Tetrabromodiphenyl ether	N.D.	5	--
Pentabromodiphenyl ether	N.D.	5	--
Hexabromodiphenyl ether	N.D.	5	--
Heptabromodiphenyl ether	N.D.	5	--
Octabromodiphenyl ether	N.D.	5	--
Nonabromodiphenyl ether	N.D.	5	--
Decabromodiphenyl ether	N.D.	5	--

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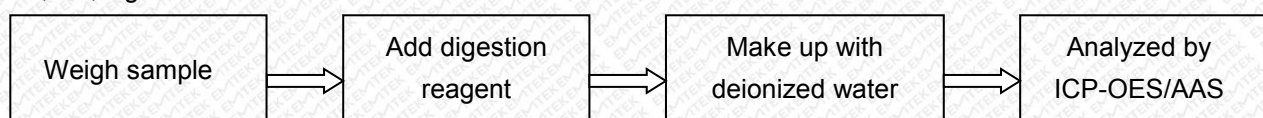
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## Note

- 1) N.D. = Not Detected (Less than Detection Limit)
- 2) MDL= Method Detection Limit.
- 3) \*: 0.02 mg/kg refers to the MQL of sample extraction liquid.
- 4) Negative = Absence of Cr<sup>6+</sup> in the metallic sample  
Positive = Presence of Cr<sup>6+</sup> in the metallic sample  
(The tested sample should further verified by boiling-water-extraction method if the spot test result cannot be confirmed or spot test result is negative)
- 5) Specimens, which requested to determine Lead, Cadmium and Mercury content, have been dissolved completely

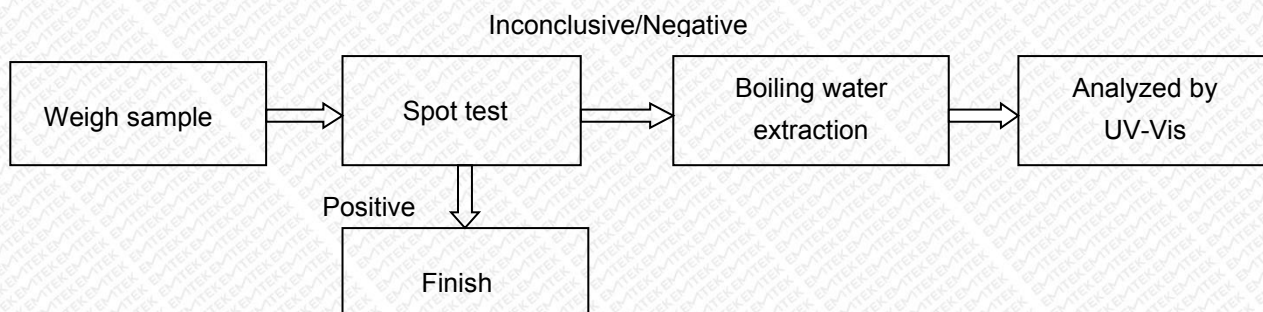
## 1.4 Test Flowchart

Pb, Cd, Hg Test Process:

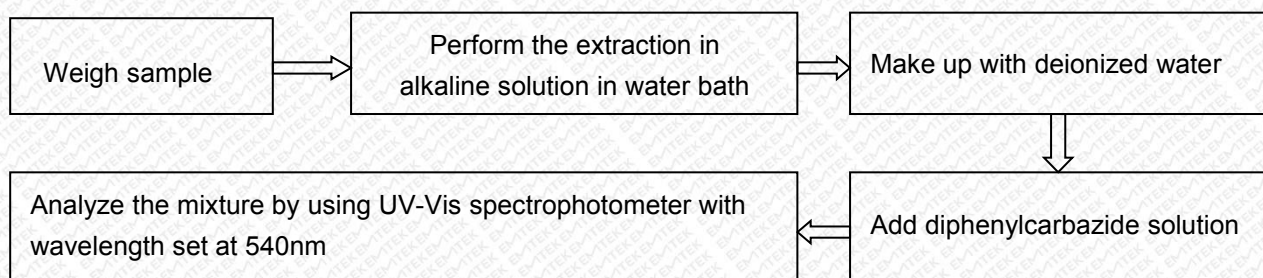


Cr<sup>6+</sup> Test Process:

Metal:



Nonmetal;



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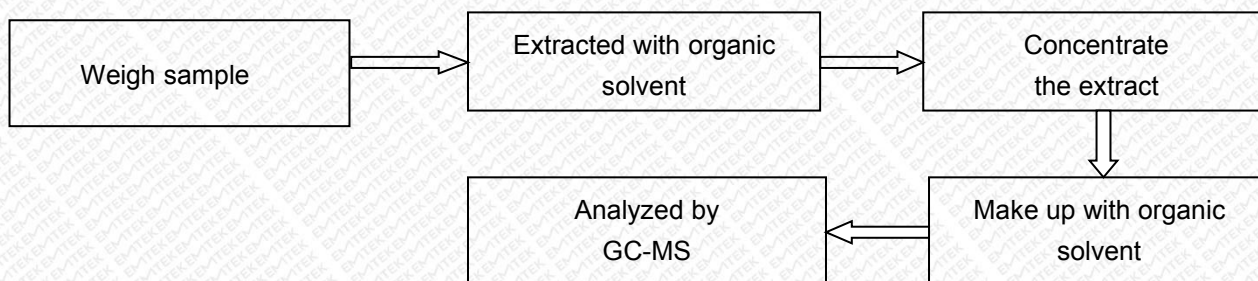
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PBBs & PBDEs Test Process:



## 2. Halogen

### 2.1 Test Method

Test Item	Test Method
Fluorine(F), Chlorine(Cl), Bromine(Br), Iodine(I)	EN 14582:2007

### 2.2 Test Instrument

Instrument Name	Manufacturer	Instrument Model	Instrument No.	Calibration Valid Date
IC	Thermo Fisher	ICS-900	E-C-011	2017/09/01

### 2.3 Test Result: Limit according to Halogen-free requirements IEC 61249-2-21: 2003

Test Item	Results (mg/kg)	MDL (mg/kg)	Limit (mg/kg)
	02		
Fluorine(F)	N.D.	50	----
Chlorine(Cl)	N.D.	50	900
Bromine(Br)	N.D.	50	900
Iodine(I)	N.D.	50	----
Chlorine(Cl)+ Bromine(Br)	N.D.	----	1500

#### Note

- 1) N.D. = Not Detected (Less than Detection Limit)
- 2) MDL= Method Detection Limit.
- 3) "----": IEC 61249-2-21: 2003 isn't Regulated Limit Requirement.

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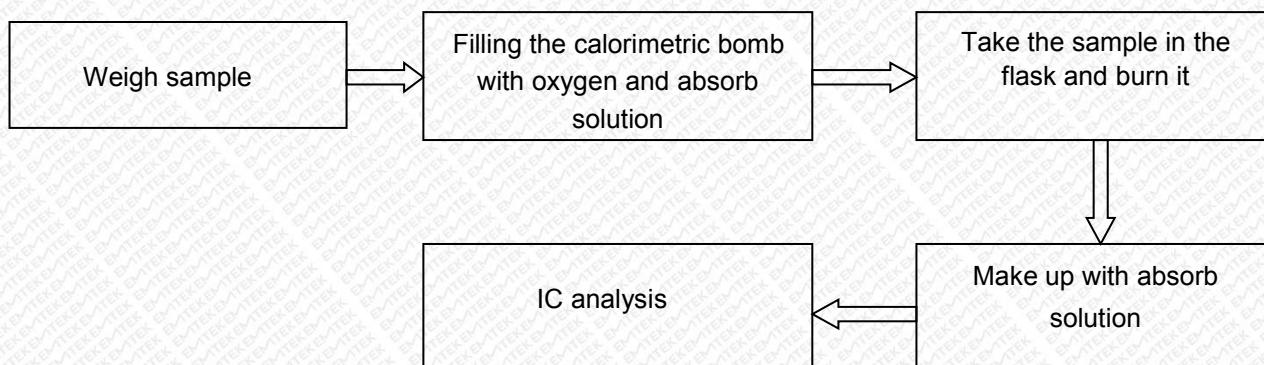
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## 2.4 Test Flowchart



## 3. HBCDD

### 3.1 Test Method

Test Item	Test Method
Hexabromocyclododecan (HBCDD)	US EPA 3540C:1996

### 3.2 Test Instrument

Instrument Name	Manufacturer	Instrument Model	Instrument No.	Calibration Valid Date
GC-MS	Agilent	7890B-5977A	E-C-001	2017/09/01

### 3.3 Test Result : Limit according to the REACH Regulation (EC) NO.1907/2006

Test Item	Unit	MDL	Result	Limit
			02	
Hexabromocyclododecan (HBCDD)	mg/kg	5	N.D.	1000

### Note

- 1) N.D. = Not Detected (Less than Detection Limit)
- 2) MDL= Method Detection Limit.

### 3.4 Test Flowchart

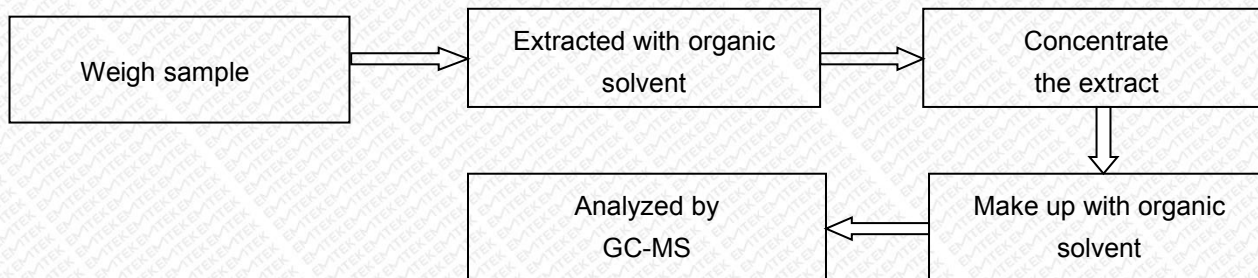
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## 4. Phthalate (16P)

### 4.1 Test Method

Test Item	Test Method
Phthalate (16P)	US EPA 3550C:2007/US EPA 8270D:2014

### 4.2 Test Instrument

Instrument Name	Manufacturer	Instrument Model	Instrument No.	Calibration Valid Date
GC-MS	SHIMADZU	QP2010 Ultra	E-C-004	2017/09/06

### 4.3 Test Result: Limit according to the REACH Regulation (EC) NO.1907/2006

Test Item	CAS No.	Result (mg/kg)	MDL (mg/kg)	Limit (mg/kg)
		02		
Di(2-ethylhexyl) phthalate (DEHP) (DOP)	117-81-7	N.D.	30	----
Di-n-butyl phthalate (DBP)	84-74-2	N.D.	30	----
Butyl benzyl phthalate (BBP)	85-68-7	N.D.	30	----
Total (DEHP+DBP+BBP)	----	N.D.	----	1000
Diisononyl phthalate (DINP)	28553-12-0 68515-48-0	N.D.	50	----
Diisooheptyl phthalate (DIDP)	68515-49-1 26761-40-0	N.D.	50	----
Di-n-octyl phthalate (DNOP)	117-84-0	N.D.	30	----
Total (DINP+DIDP+DNOP)	----	N.D.	----	1000
Diisobutyl phthalate (DIBP)	84-69-5	N.D.	30	----

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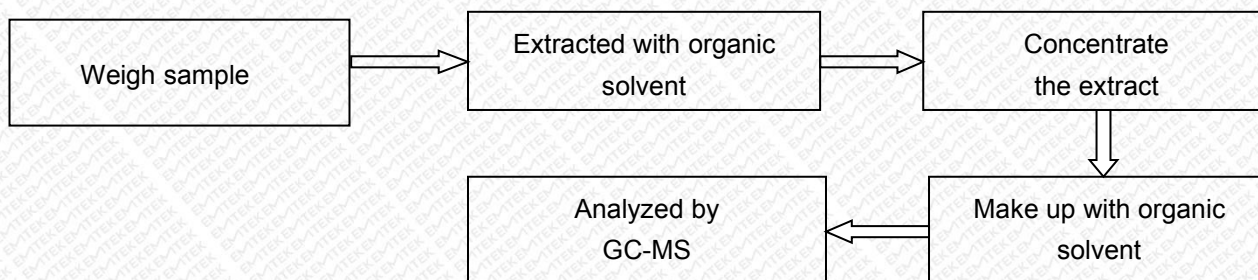
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Dihexyl phthalate (DNHP&DHXP)	84-75-3	N.D.	30	----
Dimethyl phthalate(DMP)	131-11-3	N.D.	30	----
Diethyl phthalate(DEP)	84-66-2	N.D.	30	----
Dihexyl phthalate(DHP)	3648-21-3	N.D.	30	----
Dipentyl phthalate(DPP)	131-18-0	N.D.	30	----
Dipropyl phthalate(DPrp)	131-16-8	N.D.	30	----
Diisooctyl phthalate(DIOP)	27554-26-3	N.D.	50	----
Dicyclohexyl phthalate(DCHP)	84-61-7	N.D.	30	----
Dinonyl phthalate(DNP)	84-76-4	N.D.	30	----

## Note

- 1) N.D. = Not Detected (Less than Detection Limit)
- 2) MDL= Method Detection Limit.

## 4.4 Test Flowchart



## 5. PFOS, PFOA

### 5.1 Test Method

Test Item	Test Method
PFOS, PFOA	US EPA 3550C:2007

### 5.2 Test Instrument

Instrument Name	Manufacturer	Instrument Model	Instrument No.	Calibration Valid Date
LC-MS	SHIMADZU	LCMS-2020	E-V-010	2017/09/05

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## 5.3 Test Result : Limit according to the REACH Regulation (EC) NO.1907/2006

Test Item	Unit	MDL	Result		Limit
			01	02	
Perfluorooctane sulfonic acid and its derivatives (PFOS)	mg/kg	10	N.D.	N.D.	See Note
Perfluorooctanoic Acid (PFOA)	mg/kg	10	N.D.	N.D.	1000

### Note

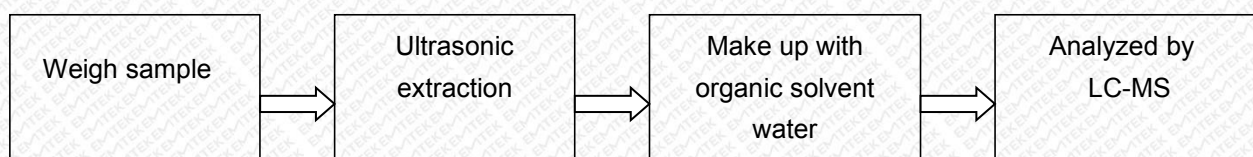
1) N.D. = Not Detected (Less than MDL)

2) MDL= Method Detection Limit.

3) The requirement of Perfluorooctane sulfonic acid and its derivatives (PFOS) is based on Commission Regulation (EU) No.757/2010 amending Regulation (EC) No. 850/2004 on persistent organic pollutants as regards to Annex I, as shown below:

Substance	Scope	Maximum Permissible Limit
Perfluorooctane sulfonic acid and its derivatives (PFOS)	Substances or in preparations	≤10 mg/kg
	Semi-finished products or articles, or parts thereof	< 1000 mg/kg
	Textiles or other coated materials	< 1µg/m <sup>2</sup>
	Articles already in use in the EU	Allowed before 25 Aug 2010
	Fire-fighting foams placed on the market before 27 Dec 2006	Allowed before 27 Jun 2011

## 5.4 Test Flowchart



## 6. Antimony (Sb)

### 6.1 Test Method

Test Item	Test Method
Antimony (Sb)	US EPA 3052:1996

### 6.2 Test Instrument

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Instrument Name	Manufacturer	Instrument Model	Instrument No.	Calibration Valid Date
ICP-OES	Agilent	720	E-C-007	2017/09/01

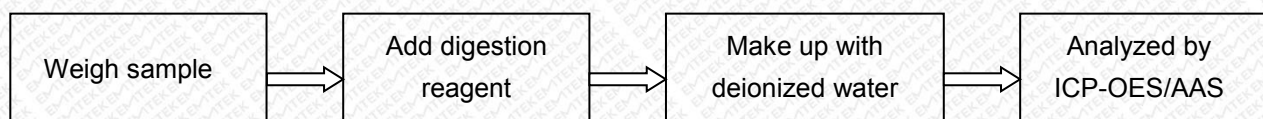
## 6.3 Test Result

Test Item	Unit	MDL	Result	
			01	02
Antimony (Sb)	mg/kg	2	N.D.	N.D.

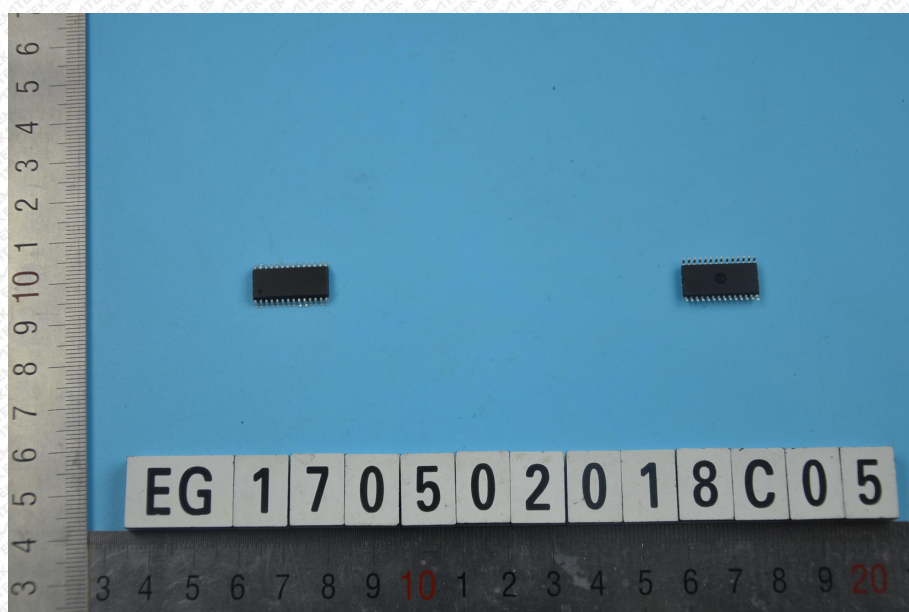
### Note

- 1) N.D. = Not Detected (Less than Detection Limit)
- 2) MDL= Method Detection Limit.

## 6.4 Test Flowchart



## Sample Photo



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

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