

No. SHAEC1207176307 A02

Date: 06 Jun 2012

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JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY (SUQIAN) CO., LTD. NO.5 PUTUO MOUNT RD., SUCHENG DISTRICT, SUQIAN, JIANGSU CHINA

THIS REPORT IS TO SUPERSEDE TEST REPORT NO.SHAEC1207176305A01 DATE: 2012/05/23

The following sample(s) was/were submitted and identified on behalf of the clients as: package part TO-247 (include TO-3P/TO-220); pinlead part TO-247 (include TO-3P/TO-220))

SGS Job No. : SP12-013405 - SH
Composition : Black Plastic Part
Composition : Silvery Metal Part
Date of Sample Received : 09 May 2012

Testing Period: 09 May 2012 - 17 May 2012

Test Requested: Selected test(s) as requested by client.

Test Method: Please refer to next page(s).

Test Results: Please refer to next page(s).

Signed for and on behalf of SGS-CSTC Ltd.

Fan Jingjie, JJ Approved Signatory

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In the company of the sample (s) tested.

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Test Results:

Test Part Description:

Specimen No.	SGS Sample ID	Description
1	SHA12-071763.001	Black body with silvery metal part(mix all*)
2	SHA12-071763.002	Silvery pin part

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
- (5) Determination of PBBs / PBDEs content by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	2981▲
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	2	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND

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Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>	
Monobromodiphenyl ether	-	mg/kg	5	ND	
Dibromodiphenyl ether	-	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) *The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value and only for reference.
- (3) A=According to the declaration from the client, Lead (Pb) in No.001 is exempted by EU RoHS Directive 2011/65/EU based on: Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).

RoHS Directive 2011/65/EU

Test Method: With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES.
- (2) Determination of Lead by ICP-OES.
- (3) Determination of Mercury by ICP-OES.
- (4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-Vis.
- (5) Determination of PBBs / PBDEs by GC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	-	-	\Diamond	Negative
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND

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Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>	
Heptabromobiphenyl	-	mg/kg	5	ND	
Octabromobiphenyl	-	mg/kg	5	ND	
Nonabromobiphenyl	-	mg/kg	5	ND	
Decabromobiphenyl	-	mg/kg	5	ND	
Sum of PBDEs	1000	mg/kg	-	ND	
Monobromodiphenyl ether	-	mg/kg	5	ND	
Dibromodiphenyl ether	-	mg/kg	5	ND	
Tribromodiphenyl ether	-	mg/kg	5	ND	
Tetrabromodiphenyl ether	-	mg/kg	5	ND	
Pentabromodiphenyl ether	-	mg/kg	5	ND	
Hexabromodiphenyl ether	-	mg/kg	5	ND	
Heptabromodiphenyl ether	-	mg/kg	5	ND	
Octabromodiphenyl ether	-	mg/kg	5	ND	
Nonabromodiphenyl ether	-	mg/kg	5	ND	
Decabromodiphenyl ether	-	mg/kg	5	ND	

Notes:

- (1) The maximum permissible limit is quoted from directive 2011/65/EU, Annex II
- (2) ♦Spot-test:

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

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

◇Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

Phthalates

Test Method: With reference to EN14372: 2004, analysis was performed by GC-MS.

Test Item(s)	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Dibutyl Phthalate (DBP)	%	0.003	ND
Benzylbutyl Phthalate (BBP)	%	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	%	0.003	ND
Diisononyl Phthalate (DINP)	%	0.010	ND
Di-n-octyl Phthalate (DNOP)	%	0.003	ND

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Test Item(s)	<u>Unit</u>	<u>MDL</u>	<u>001</u>	
Diisodecyl Phthalate (DIDP)	%	0.010	ND	
Di-n-hexyl Phthalate (DnHP)	%	0.003	ND	
Diisobutyl Phthalate (DIBP)	%	0.003	ND	

Notes:

- (1) DBP,BBP,DEHP Reference information: Entry 51 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC):
 - i) Shall not be used as substances or in mixtures, in concentrations greater than 0,1 % by weight of the plasticised material, in toys and childcare articles.
 - ii) Toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.

Please refer to Regulation (EC) No 552/2009 to get more detail information DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2005/84/EC).

- i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.
- ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.

Please refer to Regulation (EC) No 552/2009 to get more detail information

Polynuclear Aromatic Hydrocarbons (PAH)

Test Method: With reference to ZEK 01.2-08 of German ZLS and its amendments, analysis was performed by GC-MS.

Test Item(s) Total 18 PAHs	<u>Unit</u> mg/kg	MDL -	<u>001</u> ND
Naphthalene(NAP)	mg/kg	0.2	ND
Acenaphthylene(ANY)	mg/kg	0.2	ND
Acenaphthene(ANA)	mg/kg	0.2	ND
Fluorene(FLU)	mg/kg	0.2	ND
Phenanthrene(PHE)	mg/kg	0.2	ND
Anthracene(ANT)	mg/kg	0.2	ND

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Test Item(s) Fluoranthene(FLT)		<u>Unit</u> mg/kg	MDL 0.2	<u>001</u> ND	
Pyrene(PYR)		mg/kg	0.2	ND	
Benzo(a)anthracene(BaA)		mg/kg	0.2	ND	
Chrysene(CHR)		mg/kg	0.2	ND	
Benzo(b)fluoranthene(BbF)		mg/kg	0.4	ND	
Benzo(j)fluoranthene(BjF) Benzo(k)fluoranthene(BkF)		mg/kg	0.2	ND	
Benzo(a)pyrene(BaP)		mg/kg	0.2	ND	
Indeno(1,2,3-c,d)pyrene(IPY)		mg/kg	0.2	ND	
Dibenzo(a,h)anthracene(DBA)		mg/kg	0.2	ND	
Benzo(g,h,i)perylene(BPE)		mg/kg	0.2	ND	
Benzo(e)pyrene(BeP)		mg/kg	0.2	ND	

Tetrabromobisphenol A (TBBP-A)

Test Method: With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.

 Test Item(s)
 Unit
 MDL
 001

 Tetrabromobisphenol A (TBBP-A)
 mg/kg
 10
 ND

Hexabromocyclododecane (HBCDD)

Test Method: With reference to US EPA 3550C: 2007, analysis was performed by GC-MS.

Test Item(s) Unit MDL 001
Hexabromocyclododecane (HBCDD) mg/kg 10 ND

PFOS (Perfluorooctane Sulfonates) and PFOA (Perfluorooctanoic Acid)

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Test Method: With reference to US EPA 3550C: 2007, analysis was performed by HPLC-MS.

Test Item(s)	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Perfluorooctane Sulfonates (PFOS) and related	1000	mg/kg	10	ND
Acid,Metal Salt and Amide				
Perfluorooctanoic Acid (PFOA)	-	mg/kg	10	ND

Notes:

Max. limit specified by commission regulation (EU) No. 757/2010 (previously restricted under entry 53 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006)

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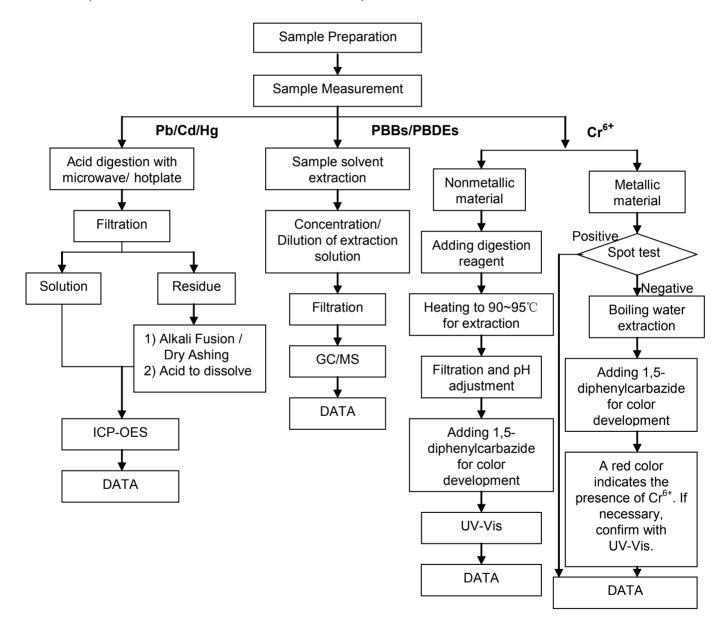
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ATTACHMENTS

RoHS Testing Flow Chart

- 1) Name of the person who made testing: Jan Shi/Yoyo Wang/Allen Xiao/Gary Xu
- 2) Name of the person in charge of testing: Jeff Zhang/George Xu/ Linda Li
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr6+ and PBBs/PBDEs test method excluded)



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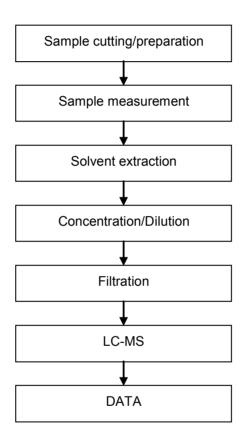
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PFOS/PFOA Testing Flow Chart

- 1) Name of the person who made testing: Judy Li
- 2) Name of the person in charge of testing: Linda Li





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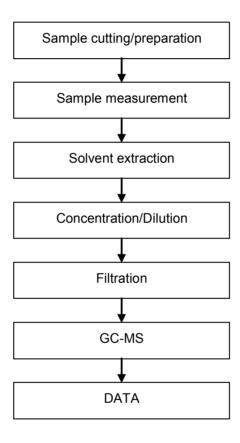
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Phthalates Testing Flow Chart

1) Name of the person who made testing: Elyn Yao

2) Name of the person in charge of testing: Rachel Zhang



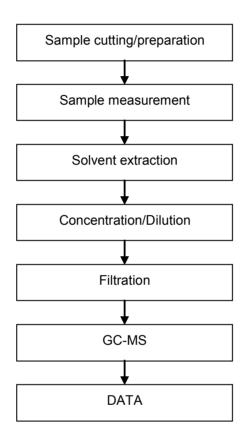


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HBCDD Testing Flow Chart

- 1) Name of the person who made testing: Gary Xu
- 2) Name of the person in charge of testing: Linda Li





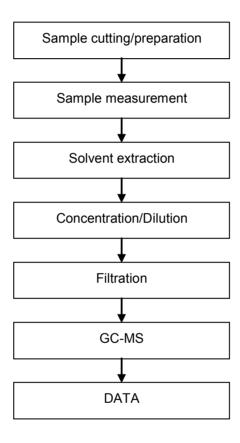
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PAHs Testing Flow Chart

- 1) Name of the person who made testing: Lisa Duan
- 2) Name of the person in charge of testing: Jessie Huang





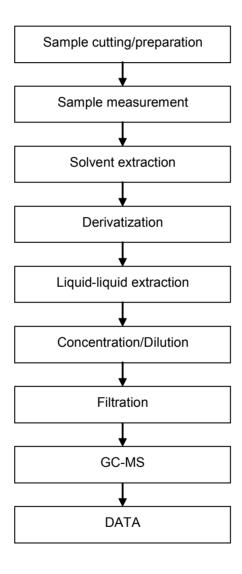
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TBBP-A Testing Flow Chart

- 1) Name of the person who made testing: Gary Xu
- 2) Name of the person in charge of testing: Linda Li





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Sample photo:





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