

Test Report

No. HKGEC1200477503

Date: 21 May 2012

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ELECTRONICS INDUSTRY PUBLIC COMPANY LIMITED

65, 68 SOI CHALONG KUNG 31, I-EA-T FRE ZONE
LAT KRABANG INDUSTRIAL ESTATE
LUMPLATIEW, LAT KRABANG
BANGKOK 10520
THAILAND

The following sample(s) was/were submitted and identified on behalf of the clients as : SURFACE MOUNTED DIODES & AUTO RECTIFIER TYPE: SMA, SMB, SMC, SOD, SOT, MELF PLASTIC, AR, MR

SGS Job No. : 1730392 - HK
Manufacturer : ELECTRONICS INDUSTRY PUBLIC
Country of Origin : THAILAND
Country of Destination : THAILAND
Date of Sample Received : 27 Apr 2012
Testing Period : 27 Apr 2012 - 21 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).
Conclusion : Based on the performed tests on submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE) comply with the limits as set by RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of
SGS Hong Kong Limited.



Lam Ka Yung, Allen
Chemist

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
1	HKG12-004775.004	Metal w/ Silvery Plating (Base: Coppery Metal) - Contact Plate
2	HKG12-004775.005	Black Plastic w/ Chip - Body

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/AAS.
- (2) Determination of Lead by ICP-OES/AAS.
- (3) Determination of Mercury by ICP-OES/AAS.
- (4) Determination of Hexavalent Chromium by Colorimetric Method using UV-vis Spectrophotometer.
- (5) Determination of PBB / PBDE content by GC-MS.

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>005</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	13567#
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	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

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>005</u>
Sum of PBDEs	1,000	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

RoHS Directive 2011/65/EU

Test Method : With reference to IEC 62321:2008

- (1) Determination of Cadmium by ICP-OES/AAS.
- (2) Determination of Lead by ICP-OES/AAS.
- (3) Determination of Mercury by ICP-OES/AAS.
- (4) Determination of Hexavalent Chromium by Spot test / Colorimetric Method using UV-vis Spectrophotometer.
- (5) Determination of PBB / PBDE by GC-MS.

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>004</u>
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	5	7
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	-	-	◇	Negative
Sum of PBBs	1,000	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

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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>004</u>
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	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 CrVI coating, Positive = Presence of CrVI 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 CrVI coating; Positive = Presence of CrVI coating

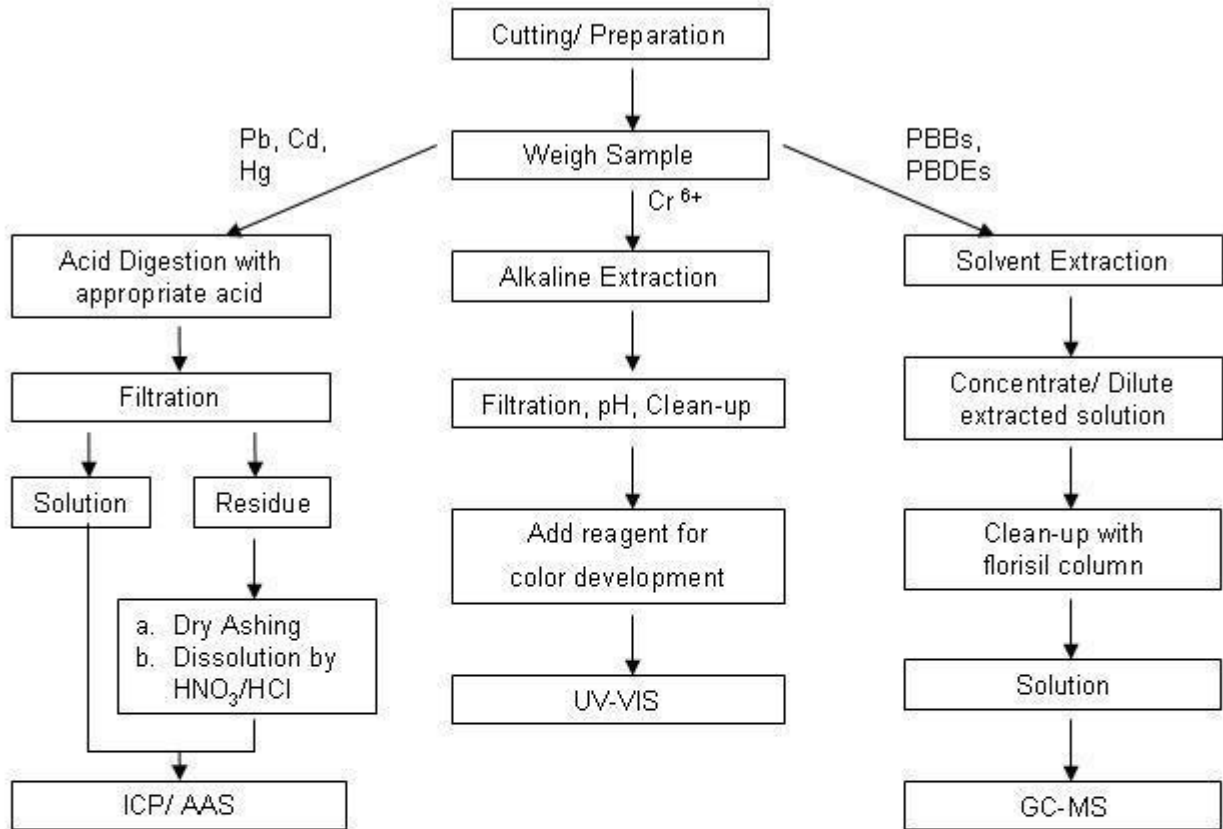
The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

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

#Remark:

As per client [Electronics Industry Public Company Limited] claimed, it is possible the source of lead in the sample ["sample ID 005" "Black Plastic w/ Chip"] could be from the glass/high melting solder material of that electronic component which is exempted by RoHS regulatory (Directive 2011/65/EU recasting 2002/95/EC). However, the numerical result of detected restricted substances in sample ID 005 cannot be related back to the concentration of the substances in the original homogeneous material.

Flowchart:



- Note : 1) Boiling water test method was also performed for the analysis of Cr (VI) in metal sample.
 2) The polymeric samples were dissolved totally by pre-conditioning method according to above flow chart for Cd, Pb and Hg contents analysis.

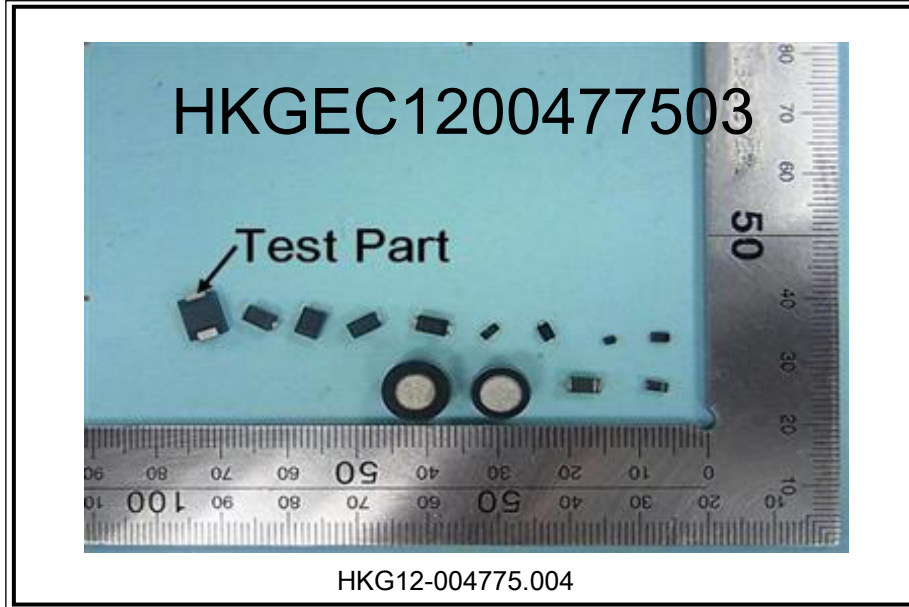
Operator : Chiu Kan Yuen/ Tang Koon Pang (Acid digestion)
Chiu Kan Yuen (Dry Ashing)
Ho Pui Yu, Ivy (Hexavalent Chromium)
Lau Chung Yin, Eric (PBBs and PBDEs)

Section Chief : Chan Chun Kit, Dickson

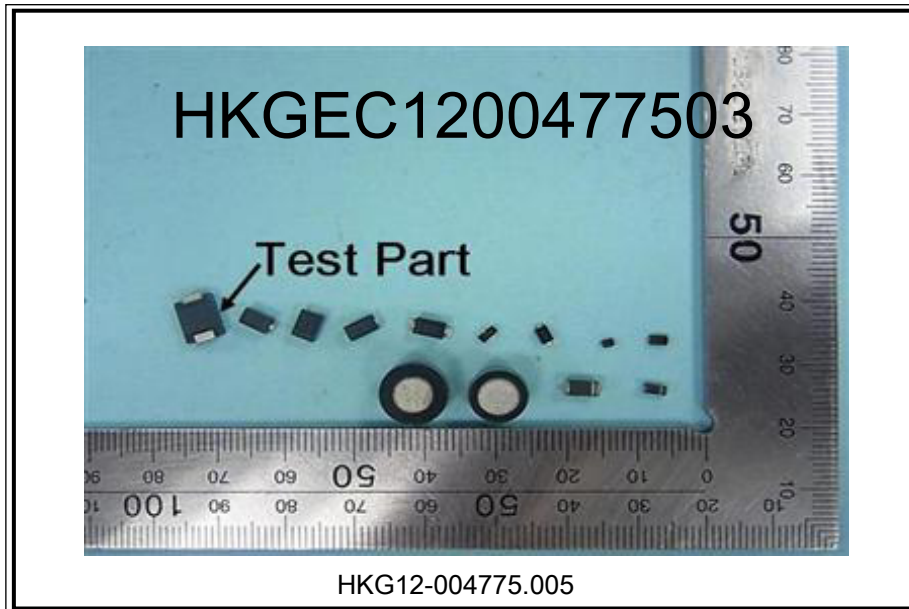
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Sample photo:



HKG12-004775.004



HKG12-004775.005

SGS authenticate the photo on original report only

*** End of Report ***

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