

## Certificate of non-use of The Controlled Substances

Company name           Littelfuse, LP (Subsidiary of Littelfuse, Inc.)

Product Covered        Thyristor TO-92 Package EV series (Wire-Bonded)

Issue Date              February 25, 2009

It is hereby certified by Littelfuse, LP, that there is neither RoHS (EU Directive 2002/95/EC)-restricted substance nor such use, for materials to be used for unit parts, for packing/packaging materials, and for additives and the like in the manufacturing processes. In addition, it is hereby reported to you that the parts and sub-materials, the materials to be used for unit parts, the packing/packaging materials, and the additives and the like in the manufacturing processes, are all composed of the following components.

It is also certified by Littelfuse, LP that the products listed in this report do not contain Halogens and their compounds judged per widely accepted industrial guidelines.

Issued by \_\_\_\_\_

< Senior Product Engineer, Littelfuse, L.P.>

(1) Parts, sub-materials and unit parts

This document covers Thyristor TO-92 Package EV series, supplied by Littelfuse, LP. Please see table 1 on page 2 for the list of products covered.

< Materials used >

Please see table 2 on page 3 and table 3 on page 4 of this document.

(2) The ICP data on all measurable substances

Please see annex 1 through 6 attached to this document.

Remarks :

**1. Pb (lead) contained in die bonding solder (item 3 on page 2) and passivation glass on silicon wafer (item 6) to be categorized as exempt in RoHS Annex 5 and 7.**

**Please refer to Annex 7 of this report for the extract of the applicable exemptions of RoHS (EU Directive 2002/95/EC)**

**Table 1: Littelfuse Part Number covered by this report**

Standard (Catalog) Part Number		SPECIAL DEVICE P/N
L0103DE	S402ES	Any Special P/N which has base standard P/N listed in this table.
L0103ME	S4X8ES	
L0107DE	S4X8ES1	
L0107ME	S602ES	S890S4X8ES1
L0109DE	S6X8ES	S891S6X8ES1
L0109ME	S6X8ES1	
LX803DE	S8X8ES	
LX803ME	S8X8ES1	
LX807DE		
LX807ME		
	Any Standard Part Number listed here may be followed by suffix for packing options, such as RP or AP.	

**Table 2: Homogeneous Material Used**

#	Description	Name of Material	Type	Analysis data
1	Lead finish	Hot solder dip	metal	annex 1.
2	Molding compound	Epoxy resin	plastic	annex 2.
3	Die bonding solder	Solder	metal	annex 3. Pb in this solder is exempted by RoHS Annex 5. Please refer to Annex 7 of this report for the RoHS exemption.
4	Die bonding wire	Gold	metal	annex 4
5	Lead frame	copper alloy	metal	annex 5.
6	Silicon wafer	silicon	metal	annex 6 Pb is from in passivation glass on wafer and is exempted by RoHS Annex 7. Please refer to Annex 7 for the RoHS exemption.
		aluminum	metal	
		glass	glass	

**Table 3: RoHS-regulated substance in raw materials**

Components	Analysis Result						
	Cd Cadmium	Cr Chromium	Hg Mercury	Pb Lead	PBB	PBDE	Total Halogens
<b>As Component Total</b> (Typical Values)	< 2ppm	< 2ppm	< 2ppm	<5 ppm* <sup>1</sup> (2.0% <sup>2</sup> )	< 5 ppm	< 5 ppm	<200ppm
<b>Outside lead finish</b> (Hot-Tin dipping)  See Annex 1 for the detail.	< 2ppm	< 2ppm	< 2ppm	388ppm <sup>3</sup>	---	---	---
<b>Epoxy Resin compound</b> (Mixture of resin, filler and fire retardant)  See Annex 2 for the detail.	< 0.5ppm	< 1ppm	< 2ppm	< 5ppm	< 5ppm	< 5ppm	164 ppm
<b>Die Bonding Solder</b> (Pb/Sn=90/10)  See Annex 3 for the detail.	< 2ppm	< 2ppm	< 2ppm	90% <sup>4</sup>	< 5ppm	< 5ppm	---
<b>Die-bonding Wire</b> (Au wire)  See Annex 4 for the detail.	< 0.5ppm	< 1ppm	< 2ppm	< 5ppm	< 5ppm	< 5ppm	---
<b>Lead frame</b> (Copper Alloy, KFC )  See Annex 5 for the detail.	< 2ppm	< 2ppm	< 2ppm	< 2ppm	---	---	---
<b>Silicon Die</b> (Silicon + Metal electrode + passivation glass)  See Annex 6 for the detail.	< 2ppm	< 2ppm	< 2ppm	3.4% <sup>5</sup>	---	---	< 50ppm

\*1 Less than 5ppm Pb content overall, excluding Pb from the die bonding solder and the passivation glass on the silicon die.

\*2 2.0% or 2.2mg of Pb (lead) content overall, including the RoHS-exempted use of Pb

\*3 Pb (lead) contained in outside finish is not exempted from restriction by RoHS, but considered as process contamination. Littelfuse does not add Pb (lead) intentionally.

\*4 Pb (lead) contained in die bonding solder is exempted from restriction by RoHS Annex 7, first item.

\*5 Pb (lead) contained in Silicon wafer is from passivation glass and is exempted from restriction by RoHS Annex 5.

**Please refer to Annex 7 of this report for the applicable exemptions of RoHS (EU Directive 2002/95/EC)**

**Annex 1: Analysis Result of Outside Lead Finish Material (Page 1 of 2)****Test Report No. F690501/LF-CTSAYAA08-10497**

Issued Date: April 10, 2008

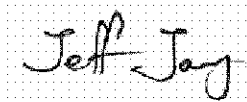
Page 1 of 2

**To: HEESUNG MATERIAL LTD.**  
#151-8 Buk-ri Namsa-myeon  
Cheoin-gu  
Yongin-city  
GYEONGGI-DO  
Korea

The following merchandise was submitted and identified by the client as :

**Product Name** : S100S-B20  
**SGS File No.** : AYAA08-10497  
**Received Date** : April 03, 2008  
**Test Performing Date** : April 04, 2008  
**Test Performed** : SGS Testing Korea tested the sample(s) selected by applicant with following results  
**Test Results** : For further details, please refer to following page(s)  
**Buyer(s)** : SAMSUNG, LG

**Pluto Kim**  
**Monet Jeong**  
**Billy Oh / Testing Person**

**SGS Testing Korea Co. Ltd.****Jeff Jang / Chemical Lab Mgr**

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F052 Version2

## Annex 1: Analysis Result of Outside Lead Finish Material (Page 2 of 2)



**Test Report No.** F690501/LF-CTSAYAA08-10497

**Issued Date:** April 10, 2008

Page 2 of 2

**Sample No.** : AYAA08-10497.001

**Sample Description** : S100S-B20

**Item No./Part No.** : N/A

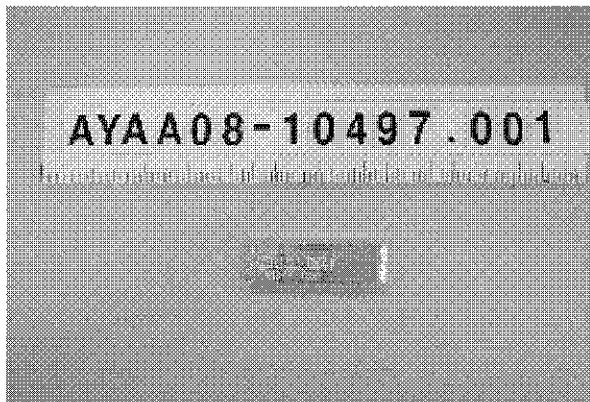
**Heavy Metals**

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	5	388
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

**Picture of Sample as Received:**

**Sample Color :**

**Silver**



\*\*\* End \*\*\*

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) \*\* = Qualitative analysis (No Unit)
  - (6) Negative = Undetectable / Positive = Detectable

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F052 Version2

**Annex 2: Analysis Result of Molding Compound (Page 1 of 5)****TEST REPORT**

Applicant : KCC Corporation  
Address : Jeonju Industrial Complex No. 3, 846, Yongam-ri,  
Bongdong-eup, Wanju-gun, Jeonbuk, Korea

Page: 1 of 5

Report No. RT08R-2956-003

Date: May. 07, 2008

Sample Description : The following submitted sample(s) said to be:-

Name/Type of Product : KTMC-1050G+  
Sample ID No. : RT08R-2956-003  
Manufacturer/Vender : KCC Corporation

Sample received : Apr. 30, 2008  
Testing Date : Apr. 30, 2008 ~ May. 07, 2008  
Testing Laboratory : Intertek Testing Center  
Testing Environment : Temperature : ( 22 ~ 26 ) °C      Relative Humidity : ( 55 ~ 65 ) %

Test Method(s) : Please see the following page(s).  
Test Result(s) : Please see the following page(s).

\* Note 1 : The test results presented in this report relate only to the object tested.

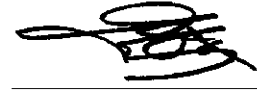
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Approved by,



E.Y. Lee / Lab. Technical Manager

Authorized by,



H.W. Yoo / Lab. General Manager

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Intertek Testing Center

Seoul Office : Tel : 02-2109-1250 Fax : 02-2109-1259 Gumi Office : Tel : 054-462-7647 Fax : 054-462-7657 Web Site : [www.intertek.co.kr](http://www.intertek.co.kr)  
Seoul Lab. : #709, 7F, Ace Techno Tower V, 197-22, Guro-3Dong, Guro-Gu, Seoul 152-766 Korea Tel : 02-2109-1260 Fax : 02-2109-1258  
Ulsan Lab. : #340-2, Yongam-Ri, Chongryang-Myun, Uiju-Gun, Ulsan 689-865 Korea Tel : 052-257-6754 Fax : 052-276-6792

## Annex 2: Analysis Result of Molding Compound (Page 2 of 5)

**Intertek**

### TEST REPORT

Page: 2 of 5

Date: May. 07, 2008

Report No. RT08R-2956-003

Sample ID No. : RT08R-2956-003

Sample Description : KTMCM-1050G+

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-111/95/CDV, by acid digestion and determined by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg		5	N.D.
Mercury (Hg)	mg/kg		2	N.D.
Hexavalent Chromium (Cr <sup>6+</sup> ) (For non-metal)	mg/kg	With reference to IEC 62321-111/95/CDV by alkaline digestion and determined by UV-VIS Spectrophotometer	1	N.D.
<b>Polybrominated Biphenyl (PBBs)</b>				
Monobromobiphenyl	mg/kg	With reference to IEC 62321-111/95/CDV, by solvent extraction and determined by GC/MS	5	N.D.
Dibromobiphenyl	mg/kg		5	N.D.
Tribromobiphenyl	mg/kg		5	N.D.
Tetrabromobiphenyl	mg/kg		5	N.D.
Pentabromobiphenyl	mg/kg		5	N.D.
Hexabromobiphenyl	mg/kg		5	N.D.
Heptabromobiphenyl	mg/kg		5	N.D.
Octabromobiphenyl	mg/kg		5	N.D.
Nonabromobiphenyl	mg/kg		5	N.D.
Decabromobiphenyl	mg/kg		5	N.D.
<b>Polybrominated Diphenyl Ether (PBDEs)</b>				
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-111/95/CDV, by solvent extraction and determined by GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg		5	N.D.
Tribromodiphenyl ether	mg/kg		5	N.D.
Tetrabromodiphenyl ether	mg/kg		5	N.D.
Pentabromodiphenyl ether	mg/kg		5	N.D.
Hexabromodiphenyl ether	mg/kg		5	N.D.
Heptabromodiphenyl ether	mg/kg		5	N.D.
Octabromodiphenyl ether	mg/kg		5	N.D.
Nonabromodiphenyl ether	mg/kg		5	N.D.
Decabromodiphenyl ether	mg/kg		5	N.D.

Tested by : Y.K Cho / H.J Kim / W.H Park

Notes : mg/kg = ppm = parts per million  
 < = Less than  
 N.D. = Not detected (<MDL)  
 MDL = Method detection limit

Remark : Tests were conducted with reference to 111/95/CDV version 2007-10-12 which is still a draft method and subject to future changes prior to publication.

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## Annex 2: Analysis Result of Molding Compound (Page 3 of 5)

**Intertek**

### TEST REPORT

Report No. RT08R-2956-003

Page: 3 of 5

Date: May. 07, 2008

Sample ID No. : RT08R-2956-003

Sample Description : KTM-1050G+

Test Items	Unit	Test Method	MDL	Results
Bromine (Br)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Chlorine (Cl)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	164
Antimony (Sb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.

Tested by : YK Cho

Notes : mg/kg = ppm = parts per million  
 < = Less than  
 N.D. = Not detected  
 MDL = Method detection limit

\*View of sample as received;-



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## Annex 2: Analysis Result of Molding Compound (Page 4 of 5)

**Intertek**

### TEST REPORT

Report No. RT08R-2956-003

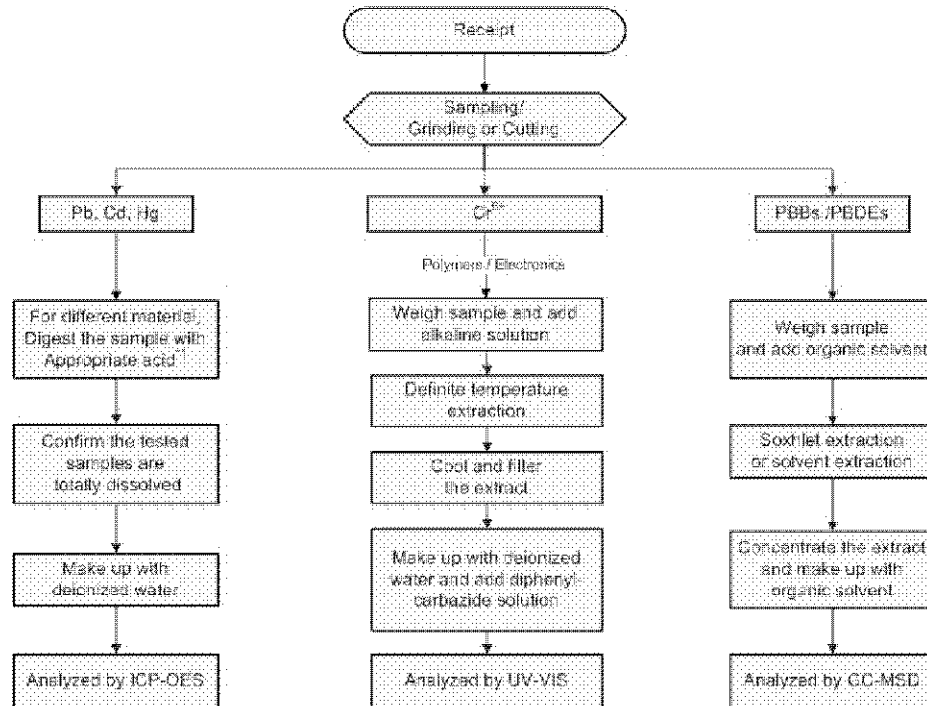
Page: 4 of 5

Date: May. 07, 2008

Sample ID No. : RT08R-2956-003

Sample Description : KTM-1050G+

#### Flow Chart Of Digestion (IEC62321 - 114/95/CDV)



Remarks :

\*1 : List of appropriate acid :

Material	Acid added for digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

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## Annex 2: Analysis Result of Molding Compound (Page 5 of 5)

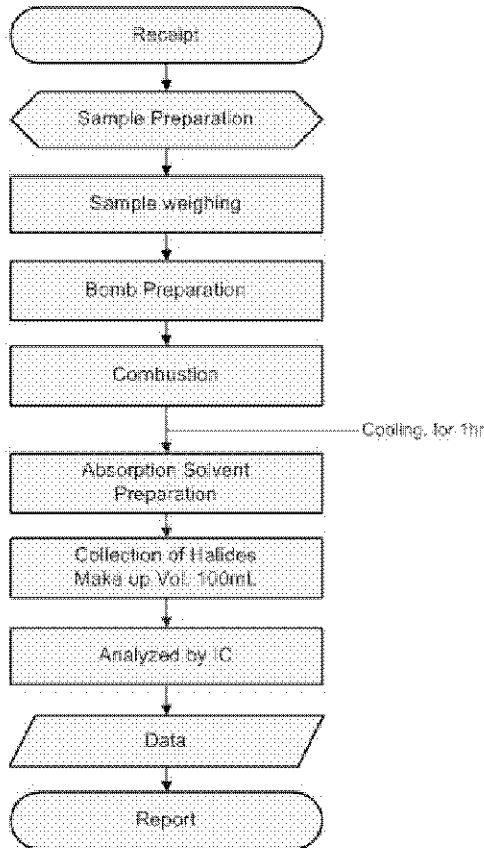
**Intertek**

### TEST REPORT

Page: 5 of 5  
Date: May. 07, 2008

Report No. RT08R-2956-003  
Sample ID No. : RT08R-2956-003  
Sample Description : KTMCM1050G+

#### Flow Chart Of Halogen Testing (EN14582)



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

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## Annex 3: Analysis Result of Die-Bonding Solder (Page 1 of 4)



บริษัท ห้องปฏิบัติการกลาง (ประเทศไทย) จำกัด

Central Laboratory (Thailand) Co., Ltd.

สาขาเชียงใหม่ : 164/86 หมู่ 3 ตำบลดอนแก้ว อำเภอแมริม จังหวัดเชียงใหม่ 50180 ประเทศไทย

Chiangmai Branch : 164/86 Moo 3 Dankaew, Maerim, Chiangmai 50180 Thailand

Tel : (66) 0 5389 6131 , 0 5389 6133 , 0 5389 6248 Fax : (66) 0 5389 6052 http://www.foodsafety-lcfa.com

**Issue Date:** February 5, 2009

**Report No.:** TR (CM) 52/00941

**Page:** 1 of 4

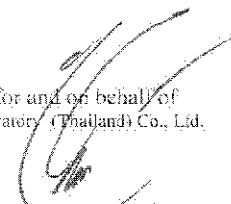
### TEST REPORT

<b>Customer Name and Address</b>	KEC (THAILAND) CO., LTD. Northern Region Industrial Estate 60/28 Moo 4, Banklang, Muang, Lamphun 51000 Thailand.
<b>Sample Description</b>	Wafer
<b>Sample Code</b>	CM - 52/00989
<b>Sample Characteristic and Condition</b>	Sample was contained in plastic box, tightly sealed. Receipt condition : room temperature. Quantity : 2 pieces, total weight 12.74 g, sample condition as per attached photograph.
<b>Received Date</b>	February 2, 2009
<b>Test Date</b>	February 2 - 5, 2009


#### Analysis Results

Test Items	Reference Methods	Test Results	Units	Limit of Detection	RoHS Limit
Lead (Pb)	EPA 3052 detected by ICP-OES	892,600	ppm	1.5	1000
Cadmium (Cd)	EPA 3052 detected by ICP-OES	Not Detected	ppm	1.5	100
Mercury (Hg)	EPA 3052 detected by ICP-OES	Not Detected	ppm	1.5	1000
Hexavalent Chromium (Cr <sup>6+</sup> )	EPA 3060A detected by UV/VIS Spectrophotometer	Not Detected	ppm	2.0	1000

Signed for and on behalf of  
Central Laboratory (Thailand) Co., Ltd.



Mr. Ekachai Nakachai  
Director,  
Chiangmai Branch



CERTIFIED

**This report is certified only on the sample tested.**

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FM-QP-24-01-002-R02(11/01/51)P1/4 - CM

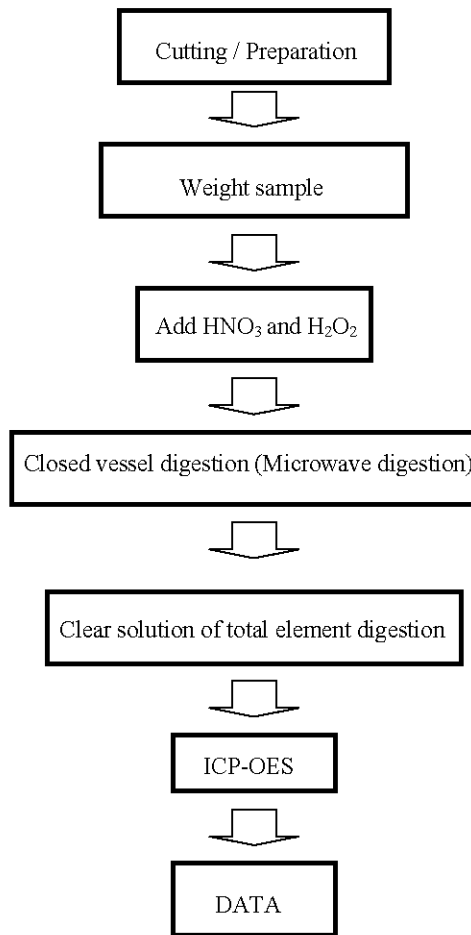
### Annex 3: Analysis Result of Die-Bonding Solder (Page 2 of 4)



บริษัท ห้องปฏิบัติการกลาง (ประเทศไทย) จำกัด  
Central Laboratory (Thailand) Co., Ltd.  
สาขาเชียงใหม่ : 164/86 หมู่ 3 ตำบลดอนแก้ว อำเภอแม่ริม จังหวัดเชียงใหม่ 50180 ประเทศไทย  
Chiangmai Branch : 164/86 Moo 3 Dankaew, Maerim, Chiangmai 50180 Thailand  
Tel : (66) 0 5389 6131 , 0 5389 6133 , 0 5389 6248 Fax : (66) 0 5389 6052 <http://www.foodsafety-lcfa.com>

**Issue Date:** February 5, 2009  
**Report No.:** TR (CM) 52/00941  
**Page:** 2 of 4

#### Flow chart of digestion (EPA 3052 for Pb, Cd, Hg)



Samples were total dissolved by the method according to above flow chart.  
Operator : Mr. Yuthachai Ruengtaweeep  
Chief of Chemistry Laboratory (Heavy Metals) : Mr. Somsak Tharatha

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FM-QP-24-01-002-R02(11/01/51)P2/4 - CM

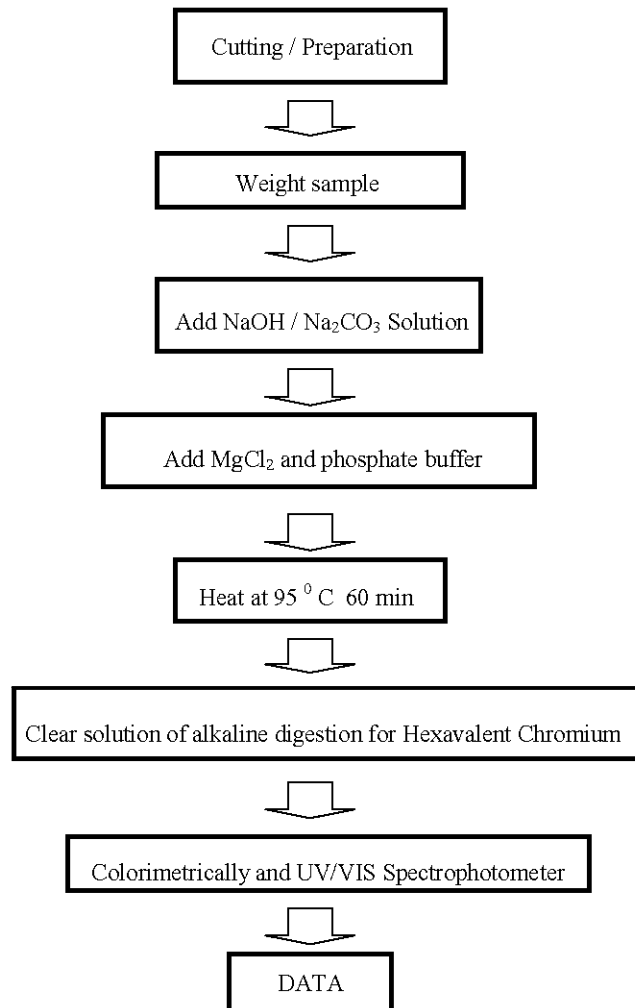
### Annex 3: Analysis Result of Die-bonding Solder (Page 3 of 4)



บริษัท ห้องปฏิบัติการกลาง (ประเทศไทย) จำกัด  
Central Laboratory (Thailand) Co., Ltd.  
สาขาเชียงใหม่ : 164/86 หมู่ 3 ตำบลดอนแก้ว อำเภอแม่ริม จังหวัดเชียงใหม่ 50180 ประเทศไทย  
Chiangmai Branch : 164/86 Moo 3 Dankaew, Maerim, Chiangmai 50180 Thailand  
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**Issue Date:** February 5, 2009  
**Report No.:** TR (CM) 52/00941  
**Page:** 3 of 4

#### Flow chart of digestion (EPA 3060A for Cr<sup>6+</sup>)



Samples were total dissolved by the method according to above flow chart.  
Operator : Mr. Yutthachai Ruengtaweep  
Chief of Chemistry Laboratory (Heavy Metals) : Mr. Somsak Tharatha

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FM-QP-24-01-002-R02(11/01/51)P3/4 - CM

## Annex 3: Analysis Result of Die-Bonding Solder (Page 4 of 4)

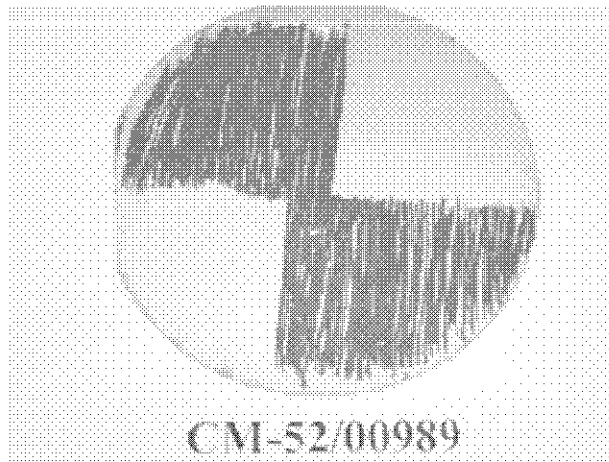


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Central Laboratory (Thailand) Co., Ltd.

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**Issue Date:** February 5, 2009  
**Report No.:** TR (CM) 52/00941  
**Page:** 4 of 4

### Sample Picture



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FM-QP-24-01-002-R02(11/01/51)P4/4 - CM



## Annex 4: Analysis Result of Die-bonding Wire (Page 2 of 4)



**Test Report No.** F690501ALF-CTSAYA08-12072

**Issued Date:** April 24, 2008

Page 2 of 4

**Sample No.** : AYA08-12072.001

**Sample Description** : Gold Bonding Wire(4N)

**Style/Item No.** : Gold Bonding Wire(4N)

**Comments** : Material is gold.

**Heavy Metals**

Test Item	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	2	N.D.
Hexavalent Chromium (CrV)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

**Organic Halogens: PBBs/PBDEs**

Test Item	Unit	Test Method	MDL	Results
Mono bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tri bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetra bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Penta bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexa bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hepta bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octa bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nona bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Deca bromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Mono bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tri bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetra bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Penta bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexa bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hepta bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octa bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nona bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Deca bromodiphenylether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

- NOTE: (1) N.D. = Not detected (<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
 (5) <sup>m</sup> = Qualitative analysis (No Unit)  
 (6) Negative = Undetectable / Positive = Detectable

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## Annex 5: Analysis Result of Lead Frame (page 2 of 5)



**Test Report No.** F690501/LF-CTSAYA U08-08717C

**Issued Date:** September 01, 2008 **Page 2 of 5**

**Sample No.** : AYA08-08717C.001

**Sample Description** : KFC Lot 27663

**Item No./Part No.** : N/A

**Heavy Metals**

Test Item	Unit	Test Method	MDL	Results
Cadmium (Cd), IEC 62321	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), IC P-O ES	1	N.D.
Lead (Pb), IEC 62321	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), IC P-O ES	5	N.D.
Mercury (Hg), IEC 62321	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), IC P-O ES	2	N.D.
Hexavalent Chromium (CrVI) by boiling water extractable	-	With reference to IEC 62321/Ed.1 (11/116/FDIS)	-	Negative

**Flame Retardants: PBBs/PBDEs**

Test Item	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.
Monobromodiphenylether	mg/kg	With reference to IEC 62321/Ed.1 (11/116/FDIS), GC-MS	5	N.D.

- NOTE: (1) N.D. = Not detected (<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
 (5) <sup>m</sup> = Qualitative analysis (No Unit)  
 (6) Negative = Undetectable / Positive = Detectable

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F055/Version2

03/09/2008 10:00:00

11/11/16/FDIS, GC-MS

03/09/2008 10:00:00





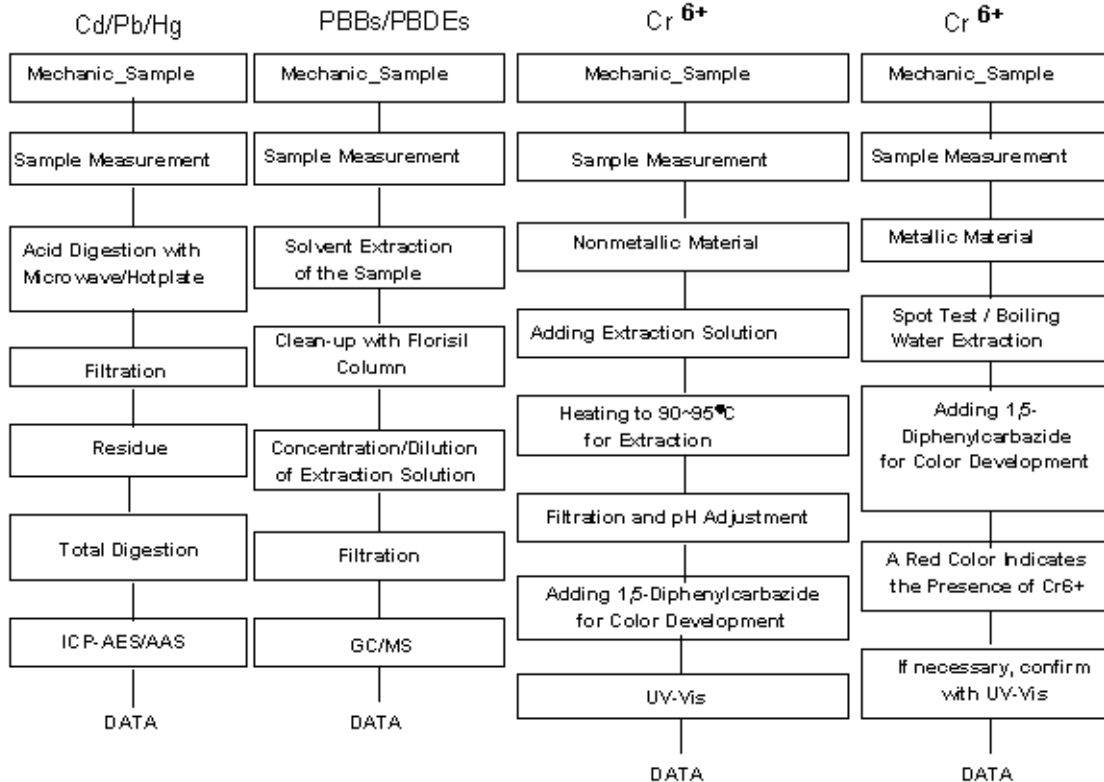
## Annex 5: Analysis Result of Lead Frame (page 5 of 5)



**Test Report No.** F690501.LF-CTSAYA U08-08717C

**Issued Date:** September 01, 2008 **Page** 5 of 5

### Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup>/PBBs&PBDEs Testing



The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.

Operator Sharpless Park

Section Chief Thomas Huang

\*\*\* End \*\*\*

- NOTE: (1) N.D. = Not detected (<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
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 (5) <sup>m</sup> = Qualitative analysis (No Unit)  
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03/09/2008 10:00:00

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## Annex 6: Analysis Result of Silicon Wafer (Page 2 of 5)



### Test Report

No. : CE/2009/B06609 Date : 2009/12/05 Page : 2 of 5

LITEON SEMICONDUCTOR CORP.  
28-1, WU SHIN STREET, TA WU LUNG, KEELUNG 204, TAIWAN, R. O. C.



#### Test Result(s)

PART NAME NO.1 : WAFER

Test Item (s):	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Cadmium by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Lead by ICP-AES.	2	34300
Mercury (Hg)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Mercury by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Hexavalent Chromium for non-metallic samples by UV/Vis Spectrometry.	2	n.d.
Halogen		With reference to BS EN 14682:2007. Analysis was performed by IC method for F, Cl, Br, I content.		
Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	With reference to BS EN 14682:2007. Analysis was performed by IC method for Fluorine content.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)	mg/kg	With reference to BS EN 14682:2007. Analysis was performed by IC method for Chlorine content.	50	n.d.
Halogen-Bromine (Br) (CAS No.: 010097-32-2)	mg/kg	With reference to BS EN 14682:2007. Analysis was performed by IC method for Bromine content.	50	n.d.
Halogen-Iodine (I) (CAS No.: 014362-44-8)	mg/kg	With reference to BS EN 14682:2007. Analysis was performed by IC method for Iodine content.	50	n.d.

- Note : 1. mg/kg = ppm; 0.1wt% = 1000ppm  
2. n.d. = Not Detected  
3. MDL = Method Detection Limit

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## Annex 6: Analysis Result of Silicon Wafer (Page 4 of 5)



### Test Report

No. : CE/2009/B06609 Date : 2009/12/05 Page : 4 of 5

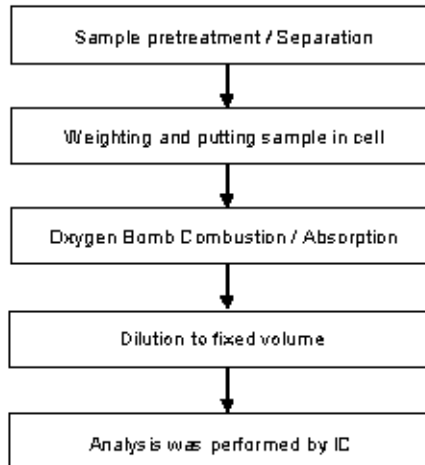
LITEON SEMICONDUCTOR CORP.

28-1, WU SHIN STREET, TA WU LUNG, KEELUNG 204, TAIWAN, R. O. C.



#### Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Alan Chen
- 2) Name of the person in charge of measurement: Troy Chang



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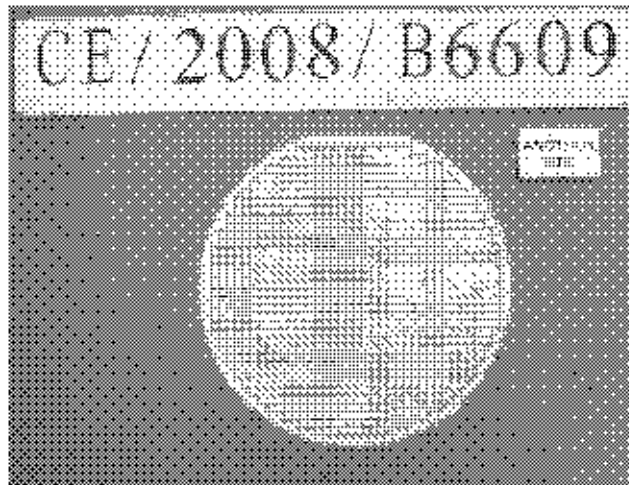
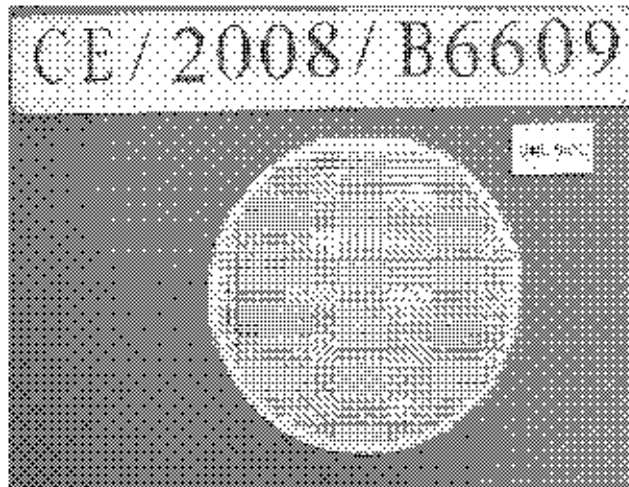
**Annex 6: Analysis Result of Silicon Wafer (Page 5 of 5)**



**Test Report**

No. : CE/2008/B6609 Date : 2008/12/05 Page : 5 of 5

LITEON SEMICONDUCTOR CORP.  
28-1, WU SHIN STREET, TA WU LUNG, KEELUNG 204, TAIWAN, R. O. C.



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## Annex 7: Applicable RoHS exemptions

13.2.2003 EN Official Journal of the European Union L 37/19

**DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**  
**of 27 January 2003**  
**on the restriction of the use of certain hazardous substances in electrical and electronic equipment**

13.2.2003 EN Official Journal of

*Article 4*

**Prevention**

1. Member States shall ensure that, from 1 July 2006, new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE). National measures restricting or prohibiting the use of these substances in electrical and electronic equipment which were adopted in line with Community legislation before the adoption of this Directive may be maintained until 1 July 2006.

to be protected and an overall strategy that in particular restricts the use of cadmium and stimulates research into substitutes should therefore be implemented. The Reso-

13.2.2 EN Official Journal of the European Union L 37/23

2. Paragraph 1 shall not apply to the applications listed in the Annex.

ANNEX

**Applications of lead, mercury, cadmium and hexavalent chromium, which are exempted from the requirements of Article 4(1)**

1. Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
2. Mercury in straight fluorescent lamps for general purposes not exceeding:
 

— halophosphate	10 mg
— triphosphate with normal lifetime	5 mg
— triphosphate with long lifetime	8 mg.
3. Mercury in straight fluorescent lamps for special purposes.
4. Mercury in other lamps not specifically mentioned in this Annex.
5. Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
6. Lead as an alloying element in steel containing up to 0,35 % lead by weight, aluminium containing up to 0,4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
7. — Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85 % lead),
  - lead in solders for servers, storage and storage array systems (exemption granted until 2010),
  - lead in solders for network infrastructure equipment for switching, signalling, transmission as well as network management for telecommunication,
  - lead in electronic ceramic parts (e.g. piezoelectronic devices).
8. Cadmium plating except for applications banned under Directive 91/338/EEC (\*) amending Directive 76/769/EEC (\*\*) relating to restrictions on the marketing and use of certain dangerous substances and preparations.