

## Test Report

No.: EKR23701858

Date: 02-Aug-2023

Page: 1 of 10

NXP SEMICONDUCTORS  
HIGH TECH CAMPUS 60, 5656AG EINDHOVEN, THE NETHERLANDS

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

Sample Submitted By : NXP SEMICONDUCTORS NETHERLANDS B.V.  
Sample Name : OAK HILL PB-FRIT WAFER

Sample Receiving Date : 25-Jul-2023  
Testing Period : 25-Jul-2023 to 02-Aug-2023

**Test Requested** : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).  
(2) Please refer to next pages for the other item(s).

**Test Results** : Please refer to following pages.

*Ray Chang*

Ray Chang, Ph.D./Department Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.

Chemical Laboratory-Kaohsiung



PIN CODE: 4CB05D42

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# Test Report

No.: EKR23701858

Date: 02-Aug-2023

Page: 2 of 10

NXP SEMICONDUCTORS  
HIGH TECH CAMPUS 60, 5656AG EINDHOVEN, THE NETHERLANDS

## Test Part Description

No.1 : WAFER

## Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Lead (Pb)		mg/kg	2	10500
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Hexavalent Chromium Cr(VI)	With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.	mg/kg	8	n.d.
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	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>Sum of PBBs</b>		mg/kg	-	n.d.
Monobromodiphenyl ether		mg/kg	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.	
<b>Sum of PBDEs</b>	mg/kg	-	n.d.	

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# Test Report

No.: EKR23701858

Date: 02-Aug-2023

Page: 3 of 10

NXP SEMICONDUCTORS  
HIGH TECH CAMPUS 60, 5656AG EINDHOVEN, THE NETHERLANDS

Test Item(s)	Method	Unit	MDL	Result
				No.1
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.
Iodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.

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# Test Report

No.: EKR23701858

Date: 02-Aug-2023

Page: 4 of 10

NXP SEMICONDUCTORS  
HIGH TECH CAMPUS 60, 5656AG EINDHOVEN, THE NETHERLANDS

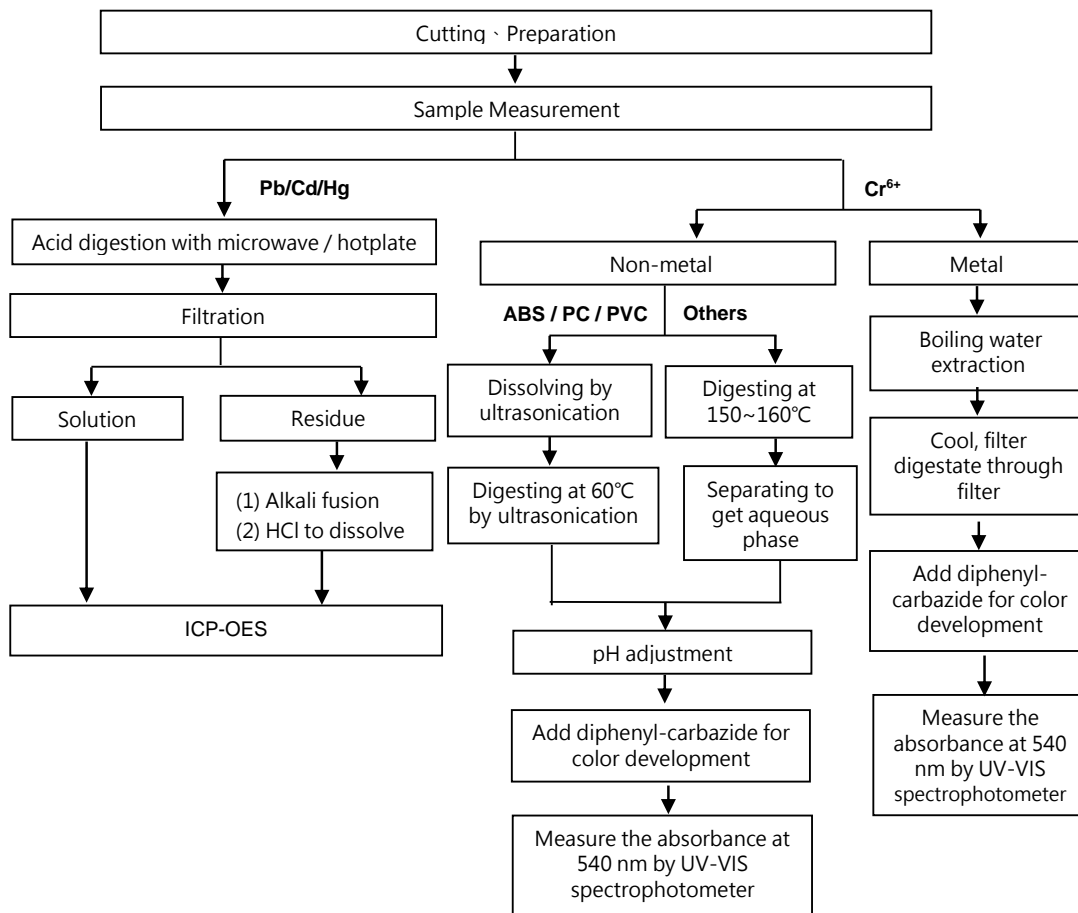
## Note :

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected ( Less than MDL)
4. "-" = Not Regulated

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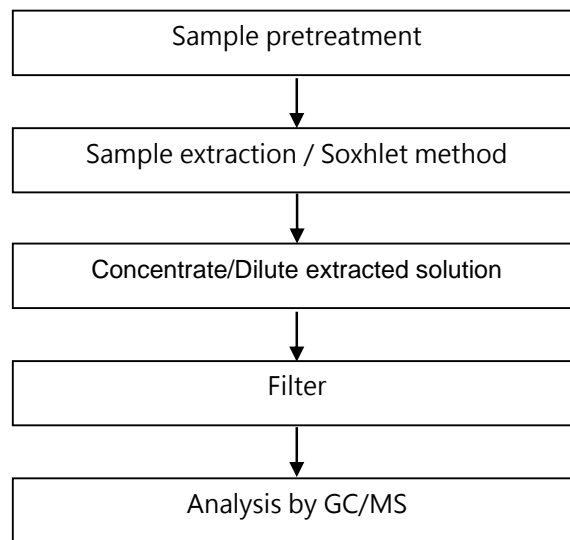
## Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.  
( Cr<sup>6+</sup> test method excluded )



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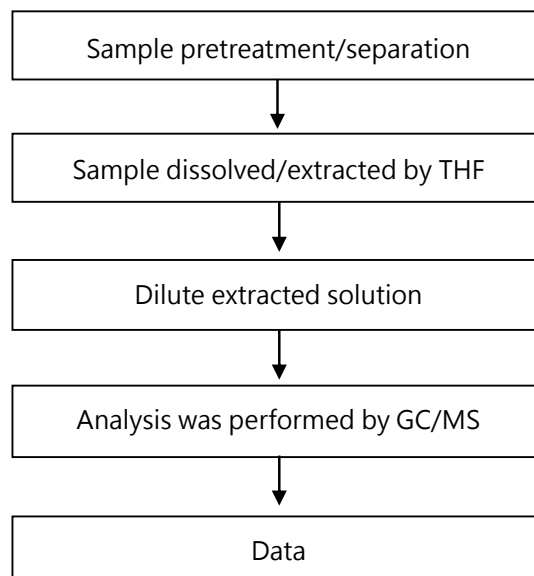
## PBB/PBDE analytical FLOW CHART



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### Analytical flow chart of phthalate content

【 Test method: IEC 62321-8 】

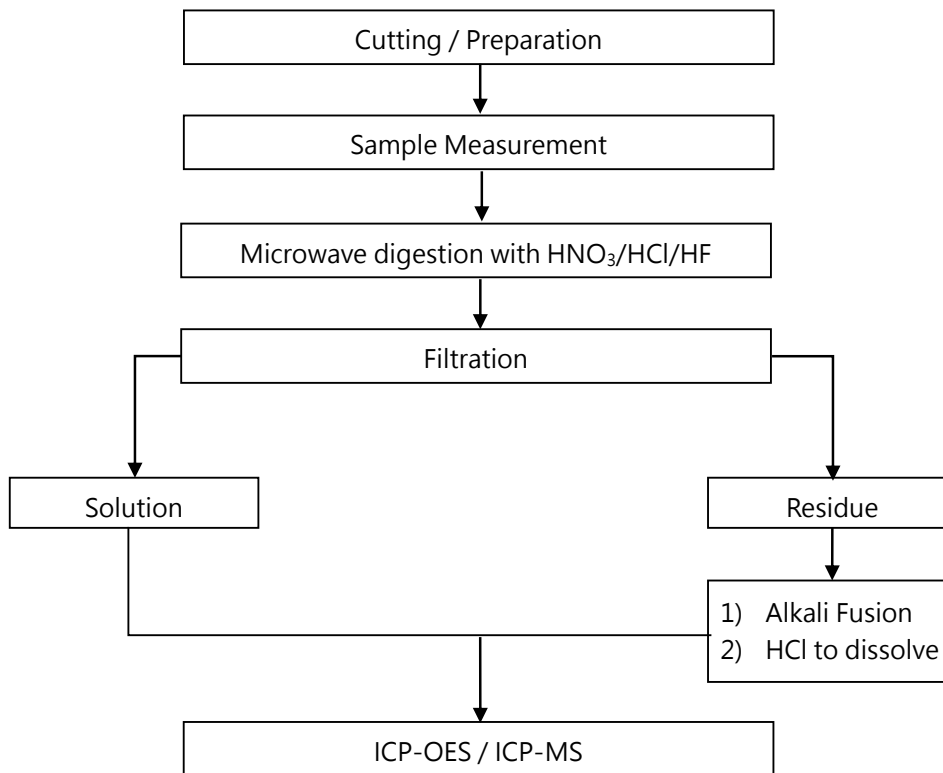


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### Analytical flow chart of Elements (Heavy metal included)

These samples were dissolved totally by pre-conditioning method according to below flow chart.

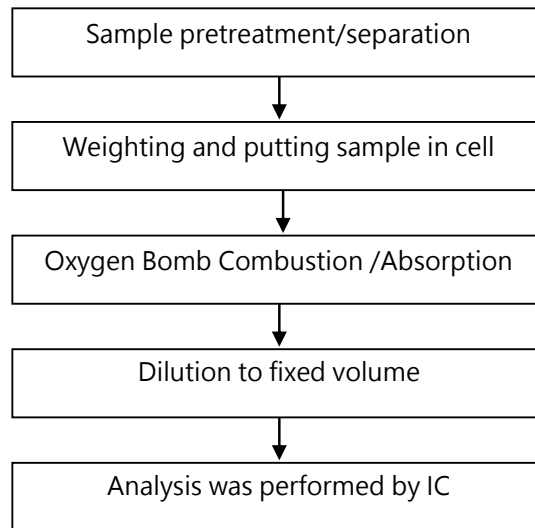
【Reference method : US EPA 3051 · US EPA 3052】



\* US EPA 3051 method does not add HF.



### Analytical flow chart of Halogen

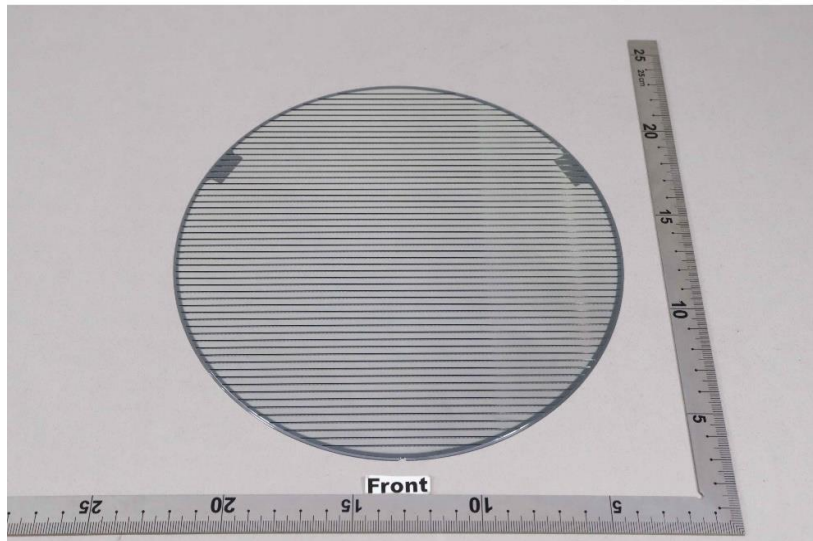


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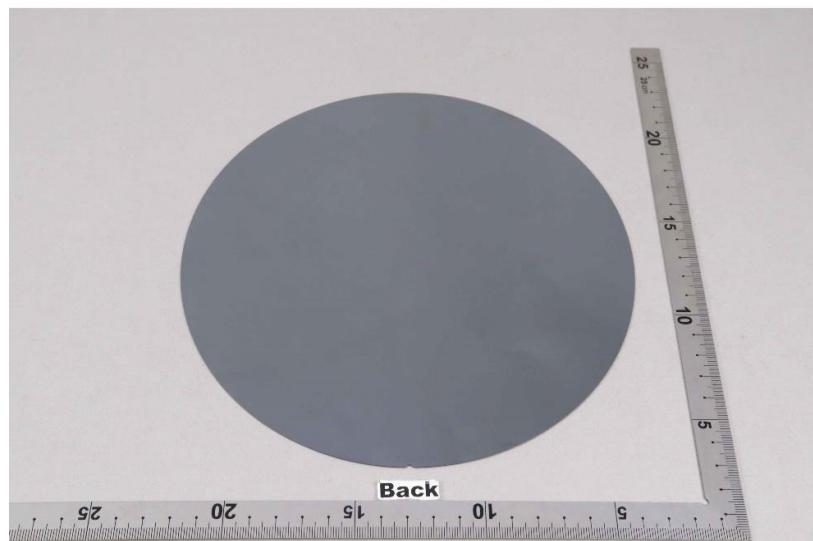
NXP SEMICONDUCTORS  
HIGH TECH CAMPUS 60, 5656AG EINDHOVEN, THE NETHERLANDS

\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

### EKR23701858



### EKR23701858



\*\* End of Report \*\*

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