

**Test Report No.:** SHAEC24009720601 **Date:** May 21, 2024 Page 1 of 13

Client Name: Jiangsu JieJie Microelectronics Co.,LTD

Client Address: 3000 Qiantangjiang Road, Economic Development Zone, Qidong ,Jiangsu , China

Sample Name: Mesa Device Chip(5 inch)

Model No.: 5 inch

Client Ref. Information: 4 inch 6 inch

The above sample(s) and information were provided by the client.

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SGS Job No.: TIC10202405110914597ZBO

Sample Receiving Date: May 13, 2024

Testing Period: May 13, 2024 ~ May 21, 2024

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

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

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

| Test Requirement  | Conclusion  |
|---|-------------|
| EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU - Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) | Pass        |
| Halogen   | See Results |
| Hexabromocyclododecane (HBCDD)  | See Results |
| Perfluorooctane sulfonates (PFOS) and its derivatives and Perfluorooctanoic acid (PFOA) and its salts   | See Results |

Signed for and on behalf of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Annie Lin

Annie Liu

**Approved Signatory** 





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#### Test Result(s):

Test Part Description:

| SN ID | Sample No. | SGS Sample ID           | Description       |
|-------|------------|-------------------------|-------------------|
| SN1   | A1         | SHA24-0097206-0001.C001 | Silvery/grey chip |

#### Remarks:

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

EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU - Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)

Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017,

IEC 62321-6:2015 and IEC 62321-8:2017, analysis was performed by ICP-OES/AAS, UV-

Vis and GC-MS.

| Test Item(s)                              | Limit | Unit(s) | MDL | A1    |
|---|-------|---------|-----|-------|
| Lead (Pb)                                 | 1000  | mg/kg   | 2   | 5646▲ |
| Mercury (Hg)                              | 1000  | mg/kg   | 2   | ND    |
| Cadmium (Cd)                              | 100   | mg/kg   | 2   | ND    |
| Hexavalent Chromium (Cr(VI))              | 1000  | mg/kg   | 8   | ND    |
| Polybromobiphenyl (PBB)                   | 1000  | mg/kg   | -   | ND    |
| Monobrominated biphenyl (MonoBB)          | -     | mg/kg   | 5   | ND    |
| Dibrominated biphenyl (DiBB)              | -     | mg/kg   | 5   | ND    |
| Tribrominated biphenyl (TriBB)            | -     | mg/kg   | 5   | ND    |
| Tetrabrominated biphenyl (TetraBB)        | -     | mg/kg   | 5   | ND    |
| Pentabrominated biphenyl (PentaBB)        | -     | mg/kg   | 5   | ND    |
| Hexabrominated biphenyl (HexaBB)          | -     | mg/kg   | 5   | ND    |
| Heptabrominated biphenyl (HeptaBB)        | -     | mg/kg   | 5   | ND    |
| Octabrominated biphenyl (OctaBB)          | -     | mg/kg   | 5   | ND    |
| Nonabrominated biphenyl (NonaBB)          | -     | mg/kg   | 5   | ND    |
| Decabrominated biphenyl (DecaBB)          | -     | mg/kg   | 5   | ND    |
| Polybromodiphenyl ether(PBDE)             | 1000  | mg/kg   | •   | ND    |
| Monobrominated diphenyl ether (MonoBDE)   | -     | mg/kg   | 5   | ND    |
| Dibrominated diphenyl ether (DiBDE)       | -     | mg/kg   | 5   | ND    |
| Tribrominated diphenyl ether (TriBDE)     | -     | mg/kg   | 5   | ND    |
| Tetrabrominated diphenyl ether (TetraBDE) | -     | mg/kg   | 5   | ND    |
| Pentabrominated diphenyl ether (PentaBDE) | -     | mg/kg   | 5   | ND    |
| Hexabrominated diphenyl ether (HexaBDE)   | -     | mg/kg   | 5   | ND    |
| Heptabrominated diphenyl ether (HeptaBDE) | -     | mg/kg   | 5   | ND    |



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| Test Item(s)                            | Limit | Unit(s) | MDL | A1 |
|---|-------|---------|-----|----|
| Octabrominated diphenyl ether (OctaBDE) | -     | mg/kg   | 5   | ND |
| Nonabrominated diphenyl ether (NonaBDE) | -     | mg/kg   | 5   | ND |
| Decabrominated diphenyl ether (DecaBDE) | -     | mg/kg   | 5   | ND |
| Bis(2-ethylhexyl) phthalate (DEHP)      | 1000  | mg/kg   | 50  | ND |
| Butyl benzyl phthalate (BBP)            | 1000  | mg/kg   | 50  | ND |
| Dibutyl phthalate (DBP)                 | 1000  | mg/kg   | 50  | ND |
| Diisobutyl phthalate (DIBP)             | 1000  | mg/kg   | 50  | ND |

#### Notes:

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (2) IEC 62321 series is equivalent to EN 62321 series.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.
- (4) ▲ According to the declaration from the client, Lead (Pb) in No.A1 is exempted by EU RoHS directive 2011/65/EU based on |ANNEX III 7(c)-I|: Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.

More information about exemption can be found via the following link:

https://rohs.sgsonline.com.cn/PDFLinks/en/RSTS-TP-037%20RoHS%20Exemption%20%28EN%29.pdf

#### **Halogen**

Test Method: With reference to EN 14582:2016, analysis was performed by IC.

| Test Item(s) | Unit(s) | MDL | A1 |
|--------------|---------|-----|----|
| Fluorine(F)  | mg/kg   | 20  | ND |
| Chlorine(Cl) | mg/kg   | 50  | ND |
| Bromine(Br)  | mg/kg   | 50  | ND |
| lodine(I)    | mg/kg   | 50  | ND |

#### Hexabromocyclododecane (HBCDD)

Test Method: With reference to IEC 62321-9:2021, analysis was performed by GC-MS.

| Test Item(s)                   | CAS No.      | Unit(s) | MDL | A1 |
|--------------------------------|--------------|---------|-----|----|
|                                | 134237-50-6  |         |     |    |
|                                | /134237-51-7 |         |     |    |
| Hexabromocyclododecane (HBCDD) | /134237-52-8 | mg/kg   | 20  | ND |
|                                | /25637-99-4  |         |     |    |
|                                | /3194-55-6   |         |     |    |

## <u>Perfluorooctane sulfonates (PFOS) and its derivatives and Perfluorooctanoic acid (PFOA) and its salts</u>

Test Method: With reference to CEN/TS 15968:2010, analysis was performed by HPLC-MS or LC-MS/MS.



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| Test Item(s)  | CAS No.    | Unit(s) | MDL | A1 |
|---|------------|---------|-----|----|
| PFOS, its salts and related compounds                       |            |         |     |    |
| Perfluorooctane sulfonates (PFOS) and its derivatives       | -          | mg/kg   | -   | ND |
| Perfluorooctane sulfonates (PFOS), its salts^               | 1763-23-1  | mg/kg   | 10  | ND |
| N-ethylperfluoro-1-octanesulfonamide (EtFOSA)               | 4151-50-2  | mg/kg   | 10  | ND |
| N-methylperfluoro-1-octanesulfonamide (MeFOSA)              | 31506-32-8 | mg/kg   | 10  | ND |
| 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol (EtFOSE)   | 1691-99-2  | mg/kg   | 10  | ND |
| 2-(N-methylperfluoro-1-octanesulfonamido)- ethanol (MeFOSE) | 24448-09-7 | mg/kg   | 10  | ND |
| Perfluorooctane Sulfonamide (PFOSA), its salts^             | 754-91-6   | mg/kg   | 10  | ND |
| PFOA, its salts   |            |         |     |    |
| Perfluorooctanoic acid (PFOA), its salts^                   | 335-67-1   | mg/kg   | 10  | ND |

#### Notes:

1. ^=Substances refer to its salts/derivative listed in below table.

| Substance Name   | CAS No.     |
|--|-------------|
| PFOS, its salts & derivatives  |             |
| Perfluorooctane sulfonates (PFOS)  | 1763-23-1   |
| Potassium Perfluorooctanesulfonate (PFOS-K)  | 2795-39-3   |
| Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)   | 29457-72-5  |
| Sodium perfluorooctanesulfonate (PFOS-Na)  | 4021-47-0   |
| Ammonium perfluorooctanesulfonate (PFOS-NH <sub>4</sub> )  | 29081-56-9  |
| Perfluorooctane sulfonate diethanolamine salt (PFOS-NH <sub>2</sub> (C <sub>2</sub> H <sub>4</sub> OH) <sub>2</sub> )  | 70225-14-8  |
| Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-N(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub> )  | 56773-42-3  |
| N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-N(C <sub>10</sub> H <sub>21</sub> ) <sub>2</sub> (CH <sub>3</sub> ) <sub>2</sub> ) | 251099-16-8 |
| Perfluorooctane Sulfonyl fluoride (PFOS-F)   | 307-35-7    |
| Magnesium bis(heptadecafluorooctanesulphonate) (PFOS-Mg)   | 91036-71-4  |
| Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate  | 71463-74-6  |
| PFOSA, its salts   |             |
| Perfluorooctane Sulfonamide (PFOSA)  | 754-91-6    |
| Perfluorooctanesulfonamide lithium salt (1:1) (PFOSA-Li)   | 76752-79-9  |
| PFOA, its salts  |             |
| Perfluorooctanoic acid (PFOA)  | 335-67-1    |
| Sodium perfluorooctanoate (PFOA-Na)  | 335-95-5    |
| Potassium perfluorooctanoate (PFOA-K)  | 2395-00-8   |
| Silver perfluorooctanoate (PFOA-Ag)  | 335-93-3    |



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| Perfluorooctanoyl fluoride (PFOA-F)      | 335-66-0   |
|--|------------|
| Ammonium pentadecafluorooctanoate (APFO) | 3825-26-1  |
| Lithium perfluorooctanoate(PFOA-Li)      | 17125-58-5 |

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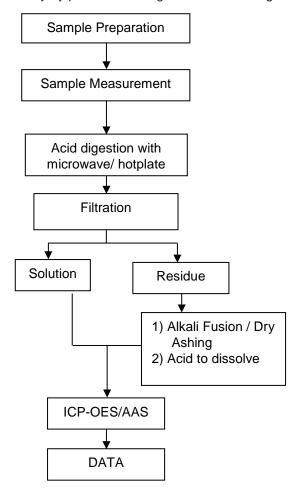
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## **Elements Testing Flow Chart**

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





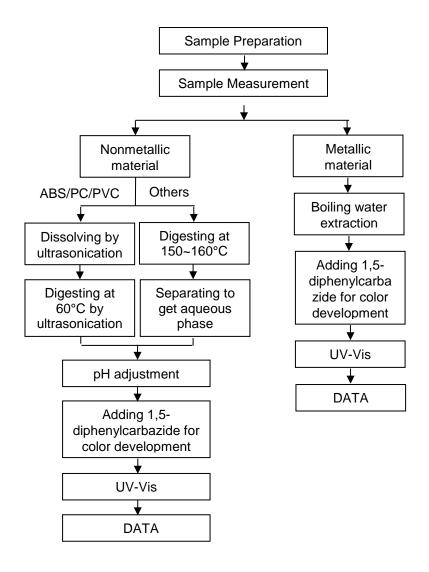
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## Hexavalent Chromium (Cr(VI)) Testing Flow Chart





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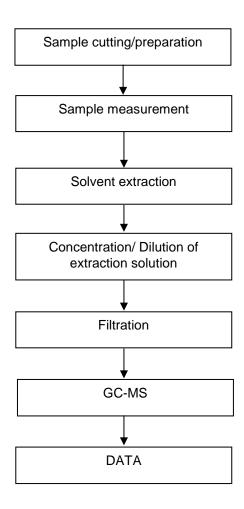
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#### **PBB/PBDE Testing Flow Chart**





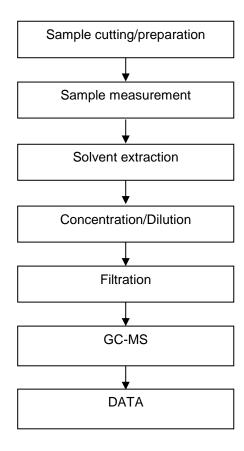
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## **Phthalates Testing Flow Chart**





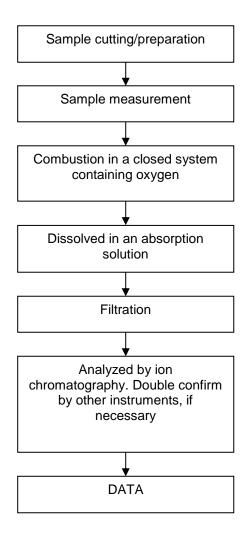
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## **Halogen Testing Flow Chart**





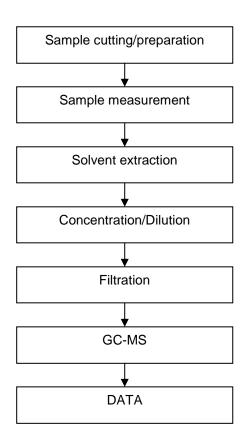
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## **HBCDD Testing Flow Chart**





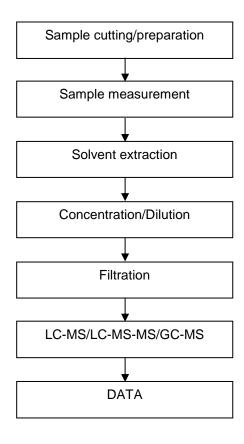
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## PFASs/ PFOS/PFOA Testing Flow Chart





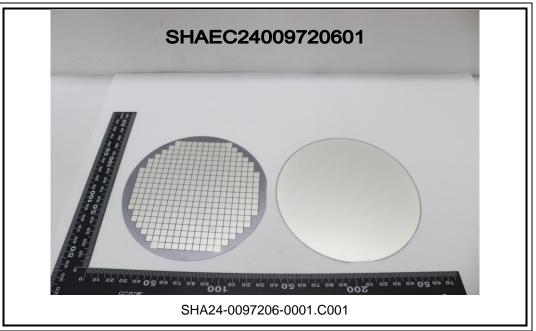
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Sample Photo:



SGS authenticate the photo on original report only

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