

# Test Report

No.: SHAEC24000195801

Date: Jan 19, 2024

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Client Name: YANGZHOU YANGJIE ELECTRONIC TECHNOLOGY CO., LTD.

Client Address: NO. 26 MID PIONEER PARK ROAD, WEIYANG ECONOMIC DEVELOPMENT ZONE, YANGZHOU, JIANGSU CHINA

Sample Name: Diode

Client Ref. Information: 1.Tin ball; 2.Molding Compound (halogen 1) ; 3.Molding Compound (halogen Free 1) ; 4.GPP Chip; 5.SKY Chip; 6.Ink; 8.Molding Compound (halogen Free 3) ; 10.Lead Frame/Jumper/Lead Wire; 26.Solder Paste/Solder Perform/Solder Wire

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

SGS Job No.: SHP24-000085

Sample Receiving Date: Jan 03, 2024

Testing Period: Jan 03, 2024 ~ Jan 15, 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
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass
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

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

Annie Liu

Annie Liu  
Approved Signatory

scan to see the report



B30243B6



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**Test Result(s):**

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA24-0001958-0001.C001	Silvery metal
SN2	A2	SHA24-0001958-0001.C002	Gray solid
SN3	A3	SHA24-0001958-0001.C003	Gray solid
SN4	A4	SHA24-0001958-0001.C004	Gray/black solid sheet
SN5	A5	SHA24-0001958-0001.C005	Colorful solid sheet
SN6	A6	SHA24-0001958-0001.C006	Silvery liquid
SN7	A8	SHA24-0001958-0001.C008	Gray solid
SN8	A10	SHA24-0001958-0001.C010	Copper metal
SN9	A26	SHA24-0001958-0001.C026	Silvery metal wire

**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	A2	A3	A4
Lead (Pb)	1000	mg/kg	2	ND	ND	32265▲
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybrominated biphenyls (PBB)	1000	mg/kg	-	ND	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A2	A3	A4
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybrominated diphenyl ethers (PBDE)	1000	mg/kg	-	ND	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	ND	ND

Test Item(s)	Limit	Unit(s)	MDL	A5	A6	A8
Lead (Pb)	1000	mg/kg	2	ND	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybrominated biphenyls (PBB)	1000	mg/kg	-	ND	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A5	A6	A8
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybrominated diphenyl ethers (PBDE)	1000	mg/kg	-	ND	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	ND	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.A4 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>

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Test Method: With reference to Titration method, IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analysis was performed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A26
Cadmium (Cd)	100	mg/kg	2	ND
Lead(Pb)	0.1	%	-	92.1 <sup>▲</sup>
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI)) <sup>▼</sup>	-	µg/cm <sup>2</sup>	0.10	ND
Polybrominated biphenyls (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
Polybrominated diphenyl ethers (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
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis(2-ethylhexyl) phthalate (DEHP)	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) <sup>▼</sup> = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm<sup>2</sup>. The sample coating is considered to contain CrVI.  
 b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm<sup>2</sup>). The coating is considered a non-CrVI based coating.



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c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive - unavoidable coating variations may influence the determination.

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

(4)▲ According to the declaration from the client, Lead (Pb) in No.A26 is exempted by EU RoHS directive 2011/65/EU based on [ANNEX III 7(a)]: Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).

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>

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Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analysis was performed by ICP-OES/AAS, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1	A10
Lead (Pb)	1000	mg/kg	2	31	7
Mercury (Hg)	1000	mg/kg	2	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm <sup>2</sup>	0.10	ND	ND
Polybrominated biphenyls (PBB)	1000	mg/kg	-	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND
Polybrominated diphenyl ethers (PBDE)	1000	mg/kg	-	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND



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# Test Report

No.: SHAEC24000195801

Date: Jan 19, 2024

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Test Item(s)	Limit	Unit(s)	MDL	A1	A10
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	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) ▼ =
  - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm<sup>2</sup>. The sample coating is considered to contain Cr(VI).
  - b. The sample is negative for Cr(VI) if Cr(VI) is ND (concentration less than 0.10 µg/cm<sup>2</sup>). The coating is considered a non-Cr(VI) based coating.
  - c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive-unavoidable coating variations may influence the determination.

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

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019.



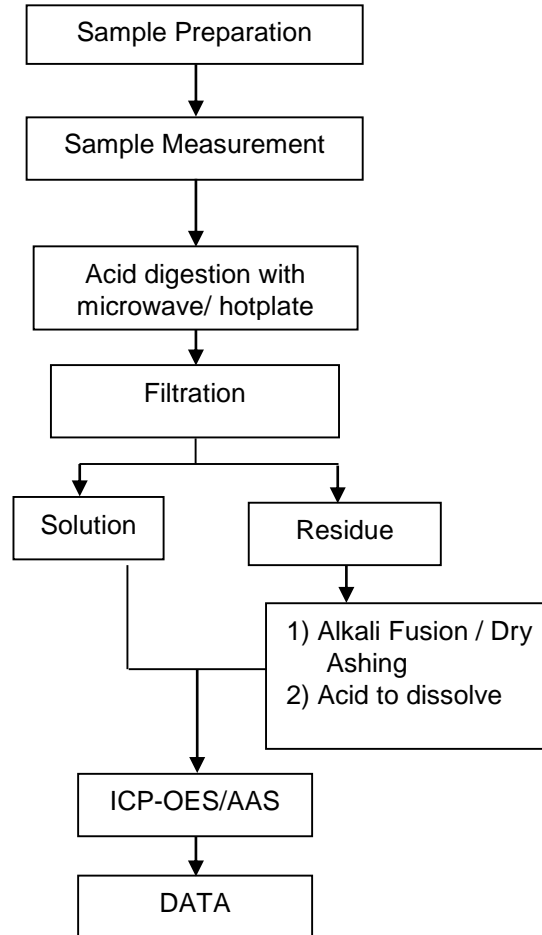
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### Elements Testing Flow Chart

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



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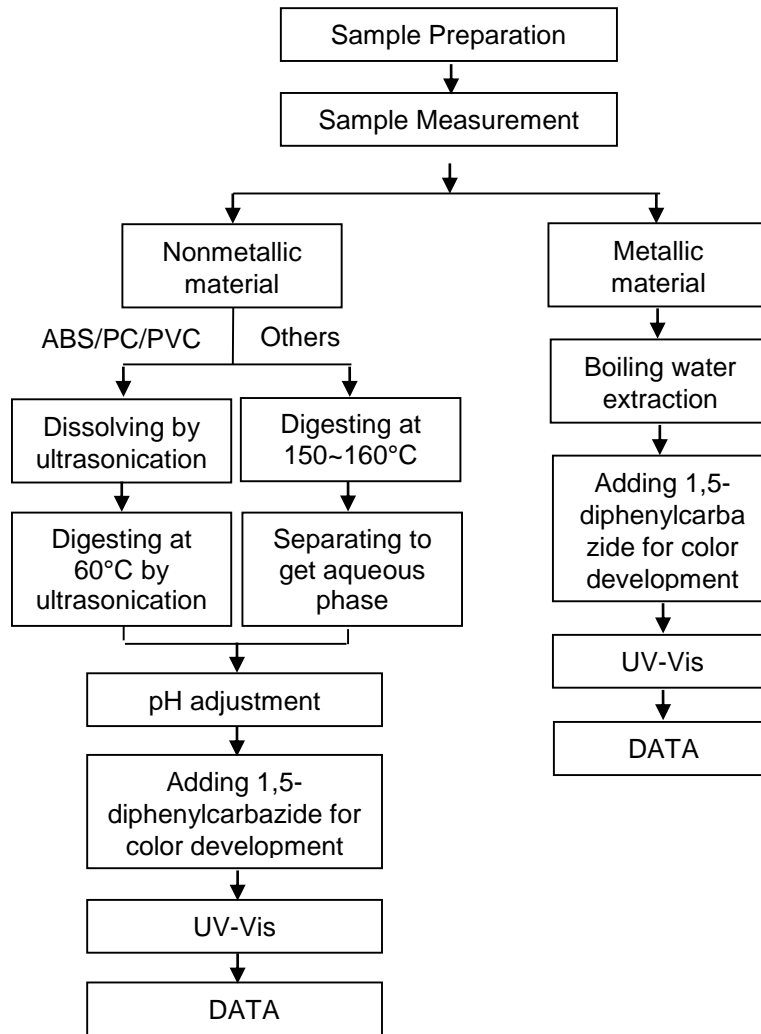
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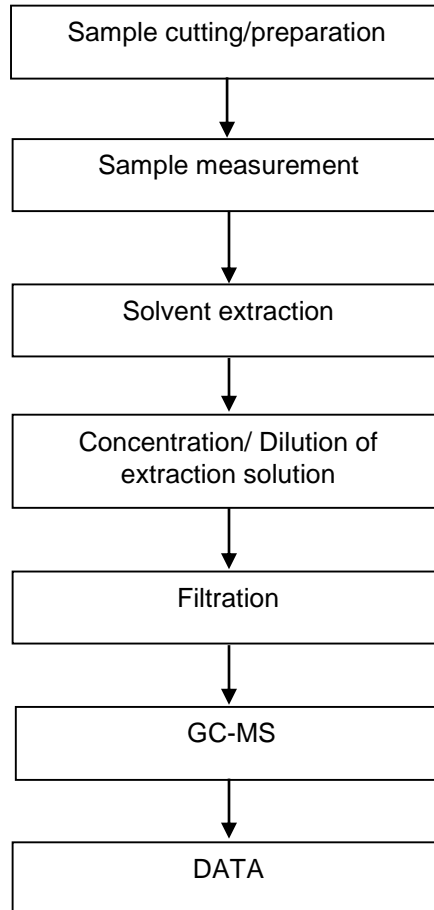
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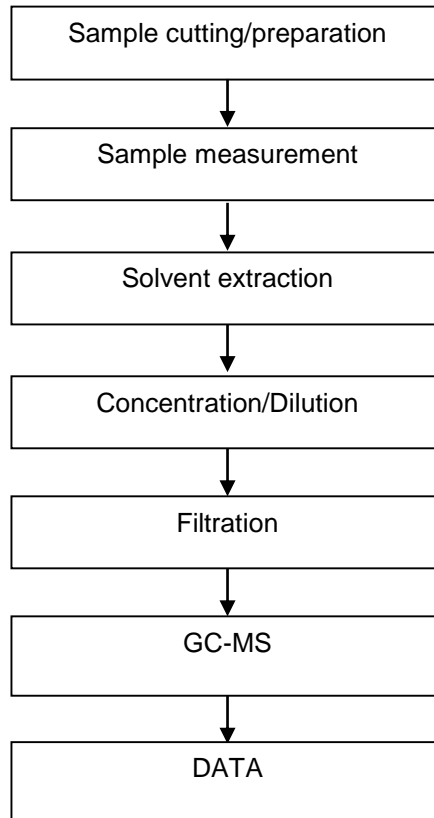
**Hexavalent Chromium (Cr(VI)) Testing Flow Chart**



### PBBs/PBDEs Testing Flow Chart



**Phthalates Testing Flow Chart**



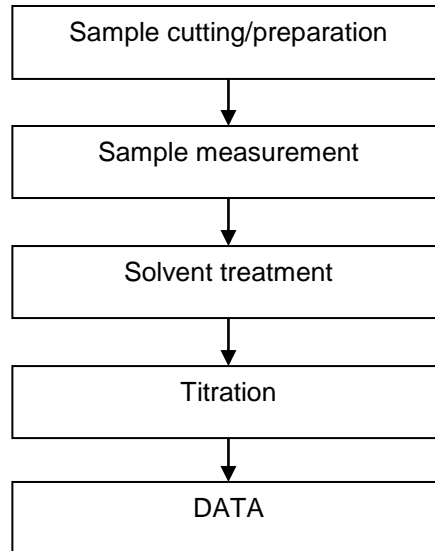
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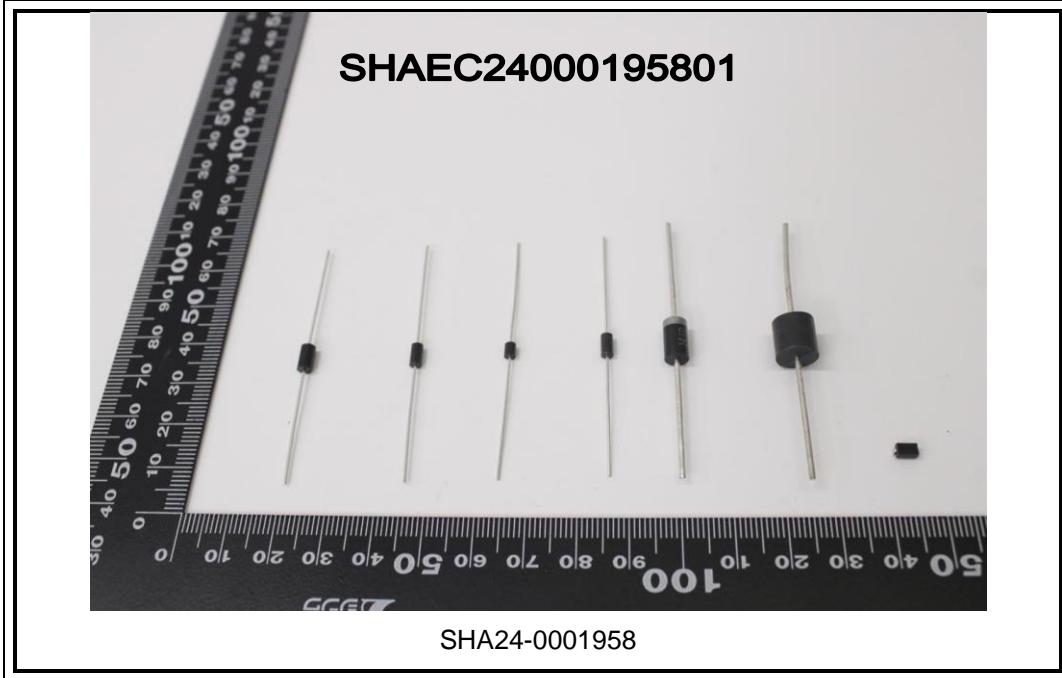
### Titration Testing Flow Chart



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**Sample Photo:**



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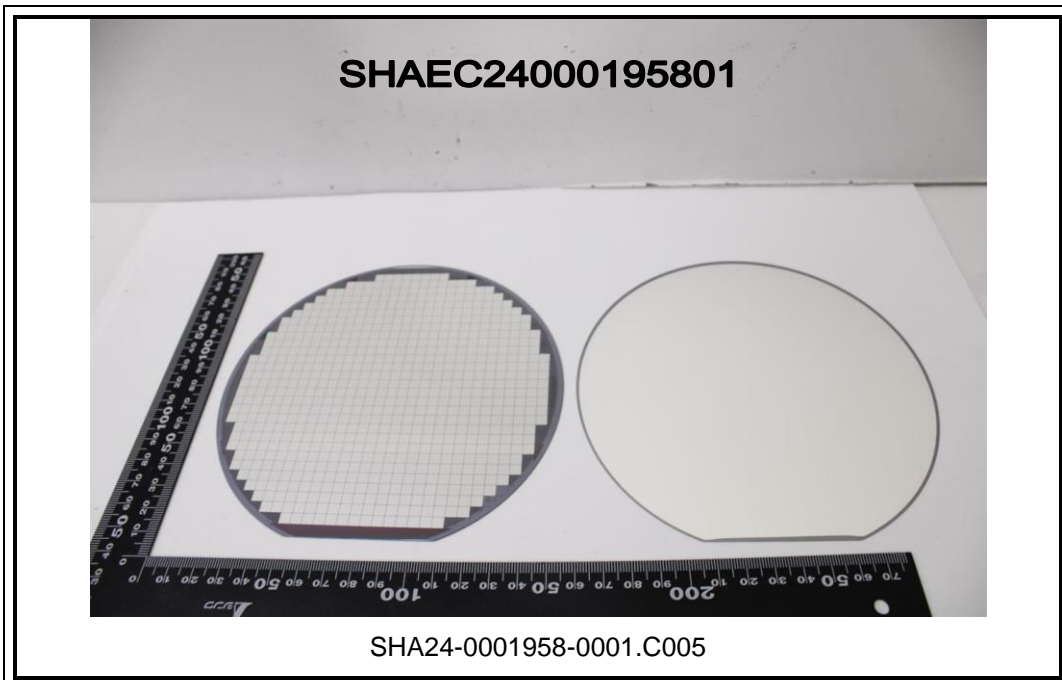
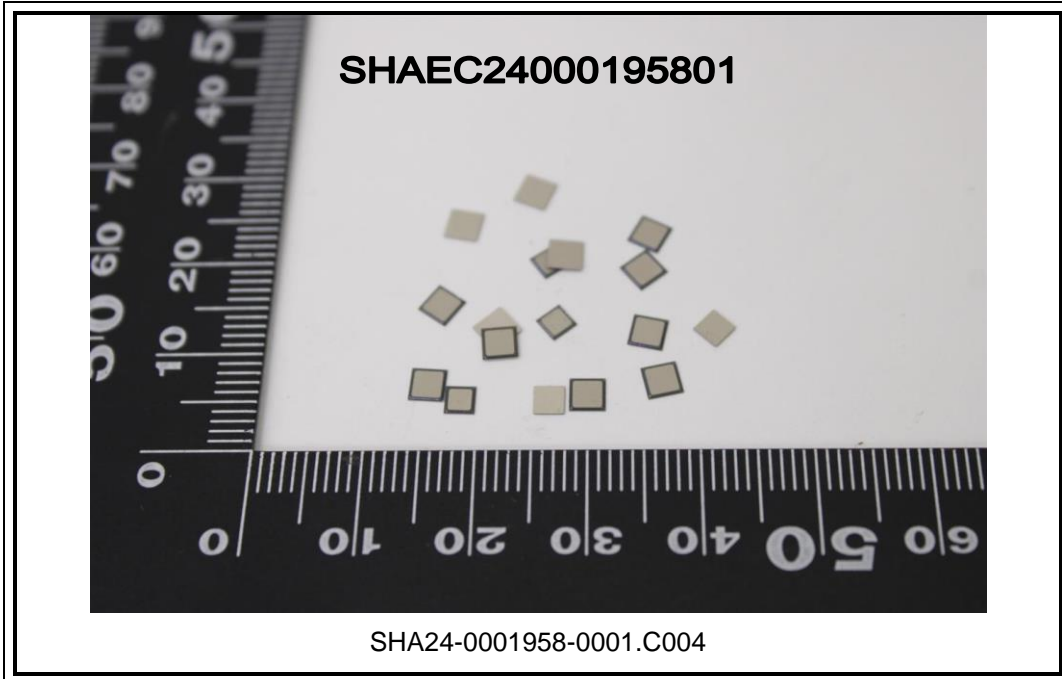
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