

Test Report No.: SHAPH24013272205 **Date**: Jul 25, 2024 Page 1 of 19

Client Name: JIANGSU XINSHUN MICROELECTRONICS CO.,LTD

Client Address: NO.78 CHANGSHAN RD., JIANGYIN CITY, JIANGSU PRO., CHINA

Sample Name: epitaxy PNP chip

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

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

Mei Shen

Approved Signatory



SHAPH24013272205 Verification:



Test Report No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 2 of 19

Test Result(s):

Test Part Description

SN ID	Sample No.	SGS Sample ID	Description
SN1	003	SHA24-0132722-0001.C003	Color silicon wafer

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) %%ÁMÁP[oÁÜ^* |æe^å

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



Test Report No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 3 of 19

Test Item(s)	Limit	Unit(s)	MDL	003
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.

Element(s)

Test Method: With reference to US EPA 3052:1996, analysis was performed by ICP-OES/AAS.

Test Item(s)	Unit(s)	MDL	003
Arsenic(As)	mg/kg		



Test Report No.: SHAPH24013272205 **Date**: Jul 25, 2024 Page 4 of 19

Test Method: Modified CEN/TS 15968:2010, analysis was performed by LC-MS or LC-MS/MS and GC-

MS.

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	003
PFOS, its salts and related compounds					
Perfluorooctane sulfonic acid (PFOS), its salts^	1763-23-1	-	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	4151-50-2	-	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA)	31506-32-8	-	mg/kg	0.010	ND
2-(N-ethylperfluoro-1- octanesulfonamido)-ethanol (N-EtFOSE)	1691-99-2	-	mg/kg	0.010	ND
2-(N-methylperfluoro- 1- octanesulfonamido) -ethanol (N- MeFOSE)	24448-09-7	-	mg/kg	0.010	ND
Perfluorooctane sulfonamide (PFOSA), its salts^	754-91-6	-	mg/kg	0.010	ND
Sum of Perfluorooctane sulfonic acid (PFOS) and its derivatives	-	10	mg/kg	-	ND
PFOA, its salts			•		
Perfluorooctanoic acid (PFOA), its salts^	335-67-1	0.025	mg/kg	0.010	ND
PFOA-related compounds					
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS), its salts^	39108-34-4	-	mg/kg	0.010	ND
Methyl perfluorooctanoate (Me-PFOA)	376-27-2	-	mg/kg	0.100	ND
Ethyl perfluorooctanoate (Et-PFOA)	3108-24-5	-	mg/kg	0.100	ND
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA)	27905-45-9	-	mg/kg	0.100	ND
1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA)	1996-88-9	-	mg/kg	0.100	ND
Perfluoro-1-iodooctane (PFOI)	507-63-1	-	mg/kg	0.100	ND
2H,2H-Perfluorodecane Acid (H ₂ PFDA/8:2 FTCA), its salts [^]	27854-31-5	-	mg/kg	0.010	ND
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH)	678-39-7	1	mg/kg	0.100	ND
1-lodo-1H,1H,2H,2H-perfluorodecane (8:2 FTI)	2043-53-0	1	mg/kg	0.100	ND
1H,1H,2H,2H- Perfluorodecyltriethoxysilane (8:2 FTSi(OC ₂ H ₅) ₃)	101947-16-4	-	mg/kg	0.100	ND
bis(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10- heptadecafluorodecyl) hydrogen phosphate (8:2 diPAP) , its salts ^	678-41-1	-	mg/kg	0.010	ND
2H,2H,3H,3H-Perfluoroundecanoic Acid (H ₄ PFUnDA / 8:3 FTCA), its salts ^	34598-33-9	-	mg/kg	0.010	ND
1H,1H,2H-Heptadecafluoro-1-decene (PFDE)	21652-58-4	-	mg/kg	0.100	ND
3-Perfluoroheptyl propanoic acid (7:3 FTCA)	812-70-4	-	mg/kg	0.010	ND
Sum of PFOA-related compounds	-	1.0	mg/kg	-	ND



Test Report No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 5 of 19

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	003
Conclusion					Pass

Notes:

FÉBÁNÚ à ca à & • Á^-A há Áa Áa Áa Aa Ba A ago Bà A há ago Bà A há Aa C à ÁB ÁB ÁB A há A | [, Ásaba | ^ È

Ú^¦- `[[[&ca)^^A` -[]} 8&Ás&ãáÁÇÚØUÙD	FÏÎHËGHË
Ú[œ••ã{ ÁÚ^¦- *[:[[&æa}^•^•* - -]}ææ^ÁQÚØUÙËSD	Ġ JÍ ĦIJĦ
Ú^; - [[&ca) ^• -]	GJÍÏËŒË
Ù[åã{ Â,^\- - `[[&cæ)^•` - }æe^ÁQÚØUÙËÞæĐ	I€GFËÏË€

 $O\{\{[\}\tilde{a}\{A,^+]^+\}[[\{[\&ca\}^{\bullet}]^-\}]\} \approx AQUOUU$



Test Report No.: SHAPH24013272205 **Date**: Jul 25, 2024 Page 6 of 19

CP ÊP ËÚ^¦-↓" [; [å^&æ) ^ÁŒSã ÁP dÚØÖŒÐ KGÁØVÔŒÐÁ	G Ì Í I Ë IF É
V^dæà`ć]@(•)@(}ã{ÁGPÊGPĒÚ^¦- `[¦[å^&æ)[æc^ÁÇÌKGÁØVÔŒÜ ÚÇÔ;PJDD	jj d j l <u>t</u> i t
Óã ÇHÊHÊ Ê Ê Ê Ê Ê Ê Ê Ê Ê Ê Ê DDÊ Ê €Ê €Ê €Ê @] cæå^&æ `[¦[å^&` DÁ @å¦[*^}Á, @ •] @æ¢ÁÇ KCåãÚŒÚD	ÎÏÌËFË
Ù[åa (Ása (FPÊPÊPÊPÊ) A' ' [a^& D] @ •] @ & AÇ K & AÛCEÚË AD	FFIÍFJËÍË
CPÊPÊPÊPÊÚ^¦- *[[*] å^&æ) [ã\$Áæ\$ããÁÇP₁ÚØW} ֌ KHÁØVÔŒÓ	H ĺ JÌ ËHË
Ú[æ••ã{ ÁCPÊPÊPÊPÊÚ^; ;[;[*] å^&æ)[æc^ÁÇP,ÚØW}ÖCESD	ÌHHF€ÉÌË

Persistent, Bioaccumulative, and Toxic (PBT) Chemicals under US EPA Toxic Substances Control Act (TSCA) Section 6(h)

Test Method: With reference to US EPA 3550C:2007, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	003
Decabromodiphenyl ether (DecaBDE) 1	1163-19-5	Prohibite d	mg/kg	5	ND
Phenol, isopropylated phosphate (3:1) (PIP 3:1)	68937-41-7	Prohibite d	mg/kg	5	ND
2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP) ³	732-26-3	3000	mg/kg	5	ND
Hexachlorobutadiene (HCBD)	87-68-3	Prohibite d	mg/kg	5	ND
Pentachlorothiophenol (PCTP)	133-49-3	10000	mg/kg	5	ND
Conclusion			12:		Pass

Notes:

(1) The regulation is available at the following link.

https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/persistent-bioaccumulative-and-toxic-pbt-chemicals-under

- (2) 1: The submitted sample is exempted if it is plastic for recycling from products or articles containing Deca-BDE.
- (3) ²: The submitted sample is exempted from the regulated scope if it is anyone of the following:
- Hydraulic fluids for aviation or military industry;
- Lubricants and grease;
- New and replacement parts for motor and aerospace vehicles;
- Intermediate in a closed system to produce cyanoacrylate adhesive;
- Specialized engine air filters for locomotive and marine applications;
- Plastic for recycling from products or articles containing PIP (3:1);
- Finished products or articles made of plastic recycled from products or articles containing PIP (3:1).
- (4) ³: The submitted sample is out of the regulated scope if it is not oil or lubricant.

AfPS GS 2019:01 PAK-Polycyclic Aromatic Hydrocarbons (PAHs)

Test Method: With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS.



Test Report No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 7 of 19

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	003
Benzo(a)pyrene (BaP)	50-32-8	1	mg/kg	0.1	ND
Benzo(e)pyrene (BeP)	192-97-2	1	mg/kg	0.1	ND
Benzo(a)anthracene (BaA)	56-55-3	1	mg/kg	0.1	ND
Benzo(b)fluoranthene (BbF)	205-99-2	1	mg/kg	0.1	ND
Benzo(j)fluoranthene (BjF)	205-82-3	1	mg/kg	0.1	ND
Benzo(k)fluoranthene (BkF)	207-08-9	1	mg/kg	0.1	ND
Chrysene (CHR)	218-01-9	1	mg/kg	0.1	ND
Dibenzo(a,h)anthracene (DBA)	53-70-3	1	mg/kg	0.1	ND
Benzo(g,h,i)perylene (BPE)	191-24-2	1	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene (IPY)	193-39-5	1	mg/kg	0.1	ND
Phenanthrene (PHE)	85-01-8	-	mg/kg	0.1	ND
Dyrono (DVD)	120.00.0			=	

Pyrene (PYR) 129-00-0



Test Report No.: SHAPH24013272205 **Date**: Jul 25, 2024 Page 8 of 19

Benzo(e)pyrene (BeP) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene (BaA) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene (BbF) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene (BjF) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene (BkF)mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene (CHR) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracen e (DBA) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene (BPE) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(1,2,3-cd)pyrene (IPY) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT), mg/kg	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene (NAP) mg/kg	< 1	< 2		< 10)
Sum of 15 PAHs	<1	< 5	< 10	< 20	< 50

Notes:

Remark:

The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1, 2020.

a A ‰@aå+/an Án*æ|î Ás^æ] ^å Ásæ Ásæ Ásæ} Ásæ} A;•[} Ás^4[¦^Á^æ&@] * Ás@ Ásæ ^Á; -ÁFI Á ^æ}•È

^b Use by children includes both active and passive contact by children.

[°]Ö^-ðjádá[}Án‰@|-o-d^¦{Án^]^cádág^^Á&[}cæ&c+Ászè^^}Á-¦[{ÁÜÒOĐÔPÁDE}}^¢ÁYXODÁ*}d^Ã,€Áse(^}å{^}å{^}å{^}iaaáp^*/aaáap^Á&[}cæ&c+Ászè^^}Á-jáUÒOĐÔPÁDE}}^ó¢ÁYXODÁ*}d^Ã,€Áse(^}å{^}å{^}aaáp^*/aaáap^Á&[}cæ&c+Ászè^^}Á-jáUÒOĐÔPÁDE}}^ó¢ÁYXODÁ*}d^Ã,€Áse(^}åå{^}aaáp^*/aaáap^Á&[}cæ&c+Ászè^^}á*

d According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28)

^{% \^•^^}æi \^Á•^+\ @d\Á •^æ\Á @d\Á aæ Á @e\Á aæ Á aæ Á aæ Á aæ Á aæ Ause of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.



No.: SHAPH24013272205 **Date:** Jul 25, 2024

Page 9 of 19

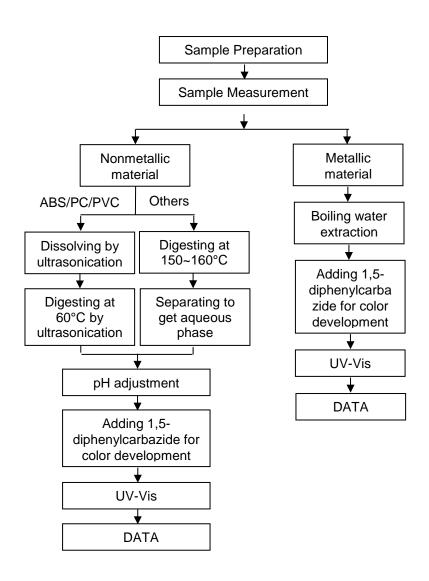
Elements Testing Flow Chart



No.: SHAPH24013272205 **Date:** Jul 25, 2024

Page 10 of 19

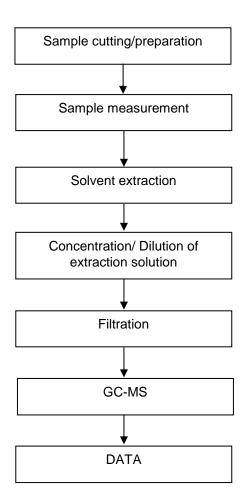
Hexavalent Chromium (Cr(VI)) Testing Flow Chart





No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 11 of 19

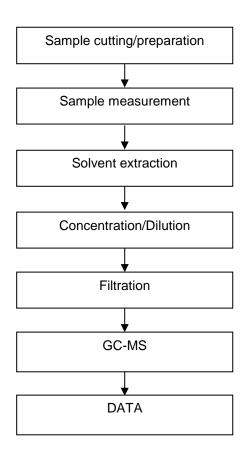
PBB/PBDE Testing Flow Chart





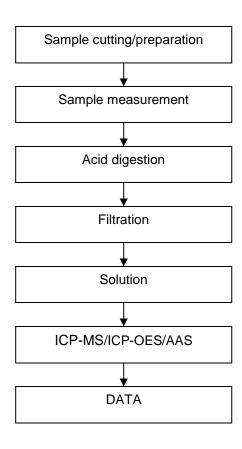
No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 12 of 19

Phthalates Testing Flow Chart





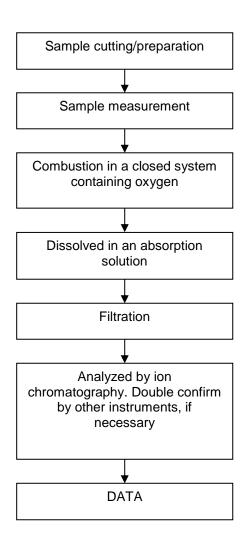
Elements Testing Flow Chart





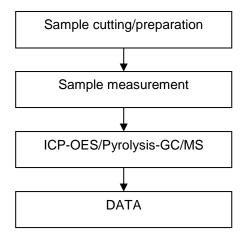
No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 14 of 19

Halogen Testing Flow Chart



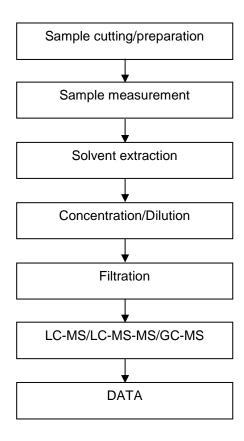


Red Phosphorus Testing Flow Chart





PFASs/ PFOS/PFOA Testing Flow Chart

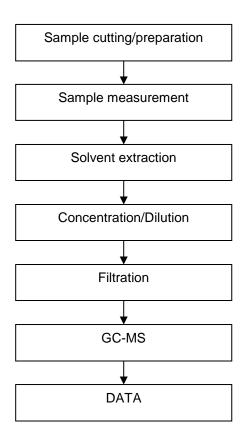


Test Report No.:



No.: SHAPH24013272205 **Date:** Jul 25, 2024 Page 18 of 19

PAHs Testing Flow Chart





Test Report No.: SHAPH24013272205 **Date**: Jul 25, 2024 Page 19 of 19

Sample Photo:



SGS authenticate the photo on original report only

*** End of Report ***