

Test Report

No. SHAEC2104967807

Date: 29 Mar 2021

Page 1 of 12

Topdiode Manufacturing Company Limited
Rooms 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, HK

The following sample(s) was/were submitted and identified on behalf of the clients as : DIODE BRIDGE

SGS Job No. : SP21-008018 - SUZ
Date of Sample Received : 23 Mar 2021
Testing Period : 23 Mar 2021 - 29 Mar 2021
Test Requested : Selected test(s) as requested by client.
Test Method : Please refer to next page(s).
Test Results : Please refer to next page(s).
Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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



Mindy Yu
Approved Signatory

scan to see the report



SHAEC2104967807



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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	SHA21-049678.001	Silver metal
SN2	SHA21-049678.002	Copper metal
SN3	SHA21-049678.003	Grey solid
SN4	SHA21-049678.004	Grey solid

Remarks :

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

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, IEC62321-5:2013, IEC62321-7-2:2017, IEC 62321-6:2015 and IEC62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	003	004
Cadmium (Cd)	100	mg/kg	2	ND	ND
Lead (Pb)	1000	mg/kg	2	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND
Sum of PBBs	1000	mg/kg	-	ND	ND
Monobromobiphenyl	-	mg/kg	5	ND	ND
Dibromobiphenyl	-	mg/kg	5	ND	ND
Tribromobiphenyl	-	mg/kg	5	ND	ND
Tetrabromobiphenyl	-	mg/kg	5	ND	ND
Pentabromobiphenyl	-	mg/kg	5	ND	ND
Hexabromobiphenyl	-	mg/kg	5	ND	ND
Heptabromobiphenyl	-	mg/kg	5	ND	ND
Octabromobiphenyl	-	mg/kg	5	ND	ND
Nonabromobiphenyl	-	mg/kg	5	ND	ND
Decabromobiphenyl	-	mg/kg	5	ND	ND
Sum of PBDEs	1000	mg/kg	-	ND	ND
Monobromodiphenyl ether	-	mg/kg	5	ND	ND



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Test Item(s)	Limit	Unit	MDL	003	004
Dibromodiphenyl ether	-	mg/kg	5	ND	ND
Tribromodiphenyl ether	-	mg/kg	5	ND	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND	ND
Octabromodiphenyl ether	-	mg/kg	5	ND	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND	ND
Decabromodiphenyl ether	-	mg/kg	5	ND	ND
Di-butyl Phthalate (DBP)	1000	mg/kg	50	ND	ND
Benzyl Butyl Phthalate (BBP)	1000	mg/kg	50	ND	ND
Di-2-Ethyl Hexyl Phthalate (DEHP)	1000	mg/kg	50	ND	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND	ND

Notes :

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25
- (2) 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.

RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+AMD1:2017, Titration method, IEC62321-5:2013 and IEC62321-7-1:2015, analyzed by ICP-OES, AAS and UV-Vis .

Test Item(s)	Limit	Unit	MDL	001	002
Cadmium (Cd)	100	mg/kg	2	ND	ND
Lead (Pb)	1000	mg/kg	2		ND
Mercury (Hg)	1000	mg/kg	2	ND	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm ²	0.10	ND	ND
Lead (Pb)	-	%	-	92.60▲	

Notes :

- (1)The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863. IEC 62321 series is equivalent to EN 62321 series
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25



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(2)▼ = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm².

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/cm²). The coating is considered a non-CrVI based coating

c. The result between 0.10 µg/cm² and 0.13 µg/cm² 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.

(3)▲According to the declaration from the client, Lead (Pb) in No.001 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).



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R1	A-405	ABS	DO-34	DO-35	DO-41	DO-15
DO-201AE	R5	R6	R6M	HVM	HVO3	HVO7
FV5M	FV20M	FH	DO-214AC	DO-214AA	DO-214AB	MINI-MELF(DO-213AA)
SMBF	MBF	SOD-123FL	SOD-110	SOD-123	BTS	DL-41
SOD-523	SOT-23	SOT-323	SOT-363	SOT-523	MB	MBS
DBS	RC-2WOM	WOG	2WOG	BR	BR3	BR6
RS	DF	DFS	KBP	KBPC	GBPC	KBPM
KBU	RBU	GBC	GBU	TO-220AB	ITO-220AB	TO-220F
TO-3P	TO-92	TO-247	TO-277	TO-252(DPAK)	TO-263(D2PAK)	O805(2012)
DB-1SD	B-1	RB-15	RS-1	RS-2	RS-5	
BR-25L	KBK	HBL	MBR-25	MBR-25W	MP-6	
MMB-25W	MSBL	SM-1	SM-2	DO-34	DO-35	
LL41	Minimelf	MELF	DO-41G	1206(3216)	DB-IMS	
DO-27	DO-201AD	MDB	DB	BR-25W	BR-6	
MTO3	HT5M	BR8	BR10	MB-25W	MMB-25	
MELF(DO-213AB)	SMAF	KBL	KBJ	LL34	LL35	
SOD-80	SOD-323	TO-220AC	ITO-220AC	TBL	MP-8/10	



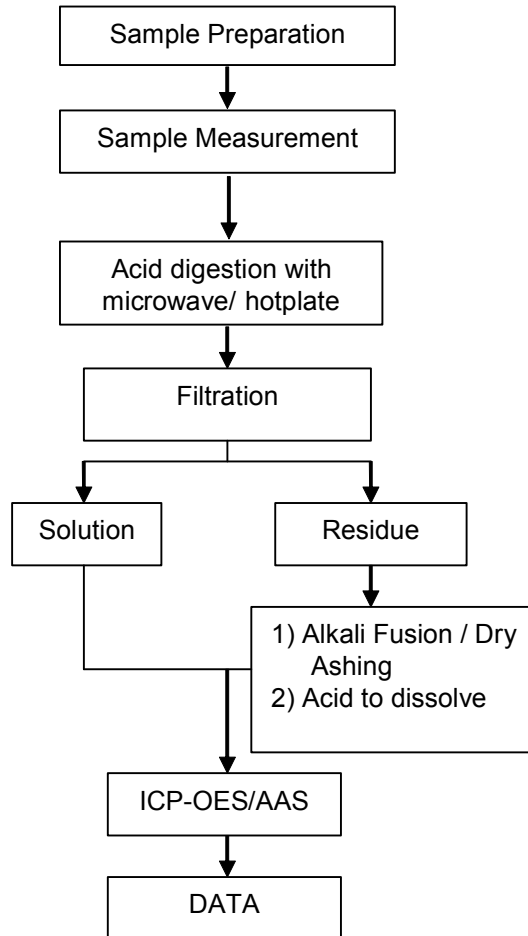
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Elements (IEC62321) Testing Flow Chart

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

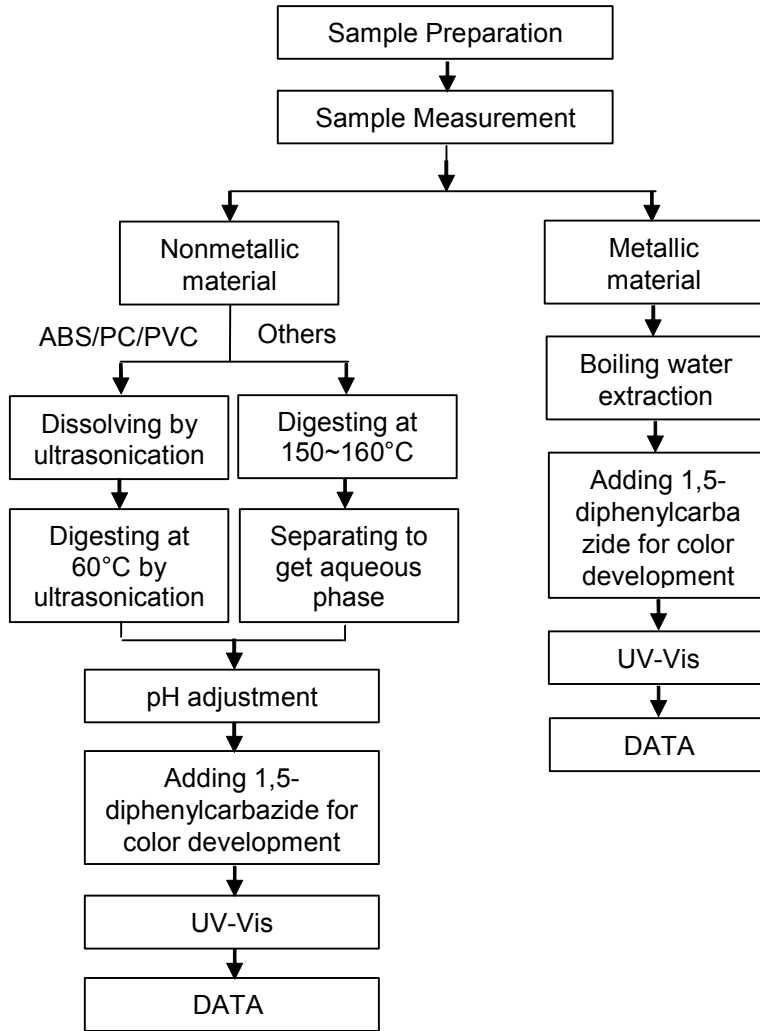


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Hexavalent Chromium (Cr(VI)) Testing Flow Chart

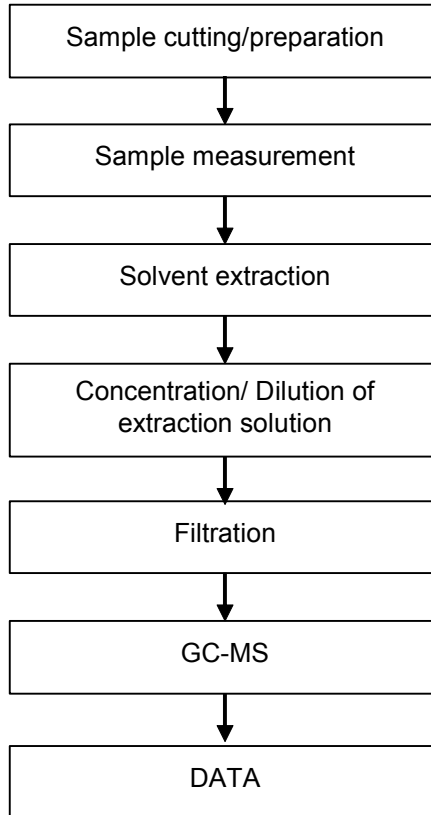


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PBBs/PBDEs Testing Flow Chart

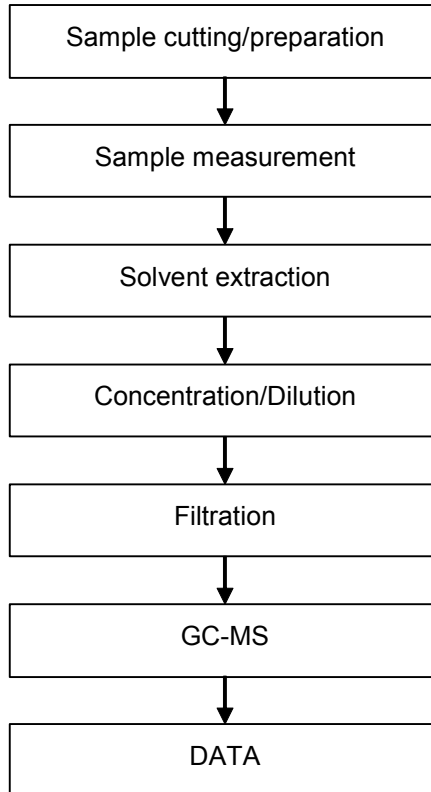


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Phthalates Testing Flow Chart

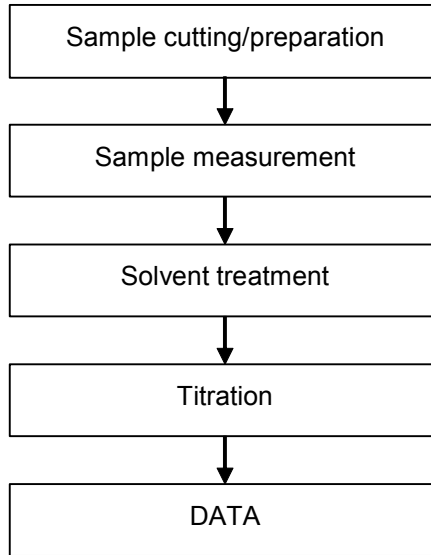


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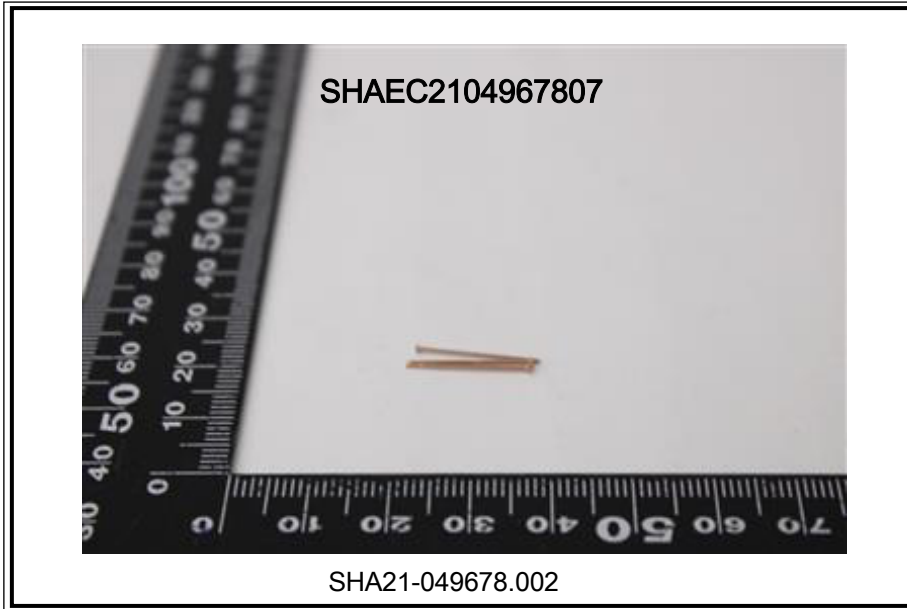
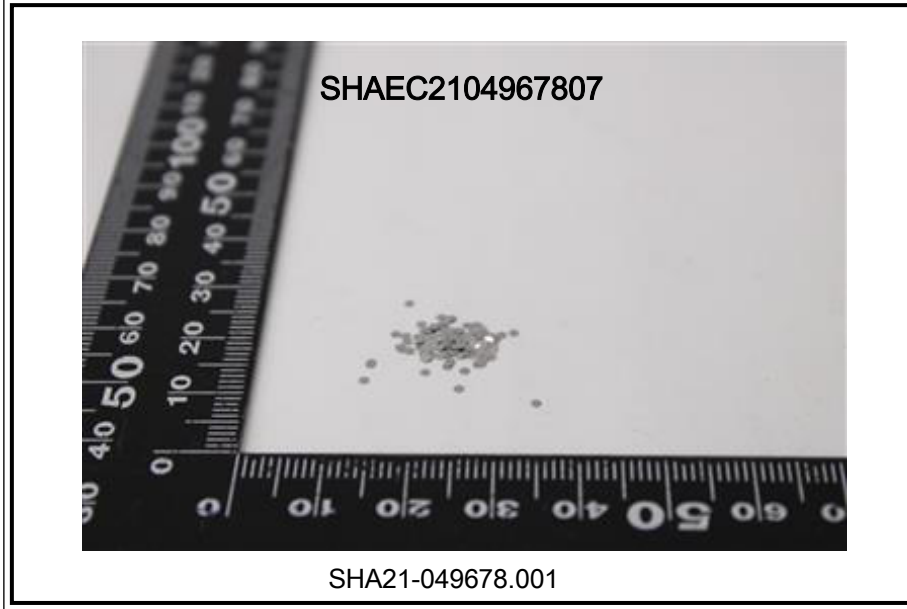
Titration Testing Flow Chart



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