

## Test Report

No. TSNEC1801895403

Date: 12 Oct 2018

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JINAN HFZT ELECTRONIC CO., LTD

NO.978 TIANCHEN ROAD, HI-TECH DEVELOPMENT ZONE, JINAN CITY  
CHINA

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

SGS Job No. : TP18-008275 - TJ

Model No. : SOT-23

Client Ref. Info. : Other Model No.:

PLASTIC DIODES, BRIDGE RECTIFIERS, MOS, DO-41, DO-15, DO-27, R-1, R-6, SMA, SMB, SMC, MBS, MBF, DB, WOM, KBL, KBU, KBJ, KBP, KBPC, SOT-323, SOT-363, SOT-523, SOT-723, SOT-923, SOT-113, SOT-89, SOD-123, SOD-323, SOD-523, SOD-723, SOD-923, TO-92 TO-126, TO-220, TO-251, TO-252, TO-3P, TO-247, TO-263, TO-277, ABS, SOP-4, SOP-8, DFN, QFN

Date of Sample Received : 09 Oct 2018


Testing Period : 09 Oct 2018 - 12 Oct 2018

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).

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



Reabeca Zhou  
Approved Signatory



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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	TSN18-018954.002	black solid with silvery metal (mix all)

Remarks :

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

**Cadmium, Lead, Mercury, Hexavalent Chromium, PBBs(Polybrominated biphenyls), PBDEs (Polybrominated biphenyl ethers),Dibutyl phthalate (DBP),Butyl benzyl phthalate (BBP),Bis (2-ethylhexyl) phthalate (DEHP) and Diisobutyl Phthalates (DIBP)**

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

Test Item(s)	Unit	MDL	002
Cadmium (Cd)	mg/kg	2	ND
Lead (Pb)	mg/kg	2	ND
Mercury (Hg)	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	mg/kg	8	ND
Sum of PBBs	mg/kg	-	ND
Monobromobiphenyl	mg/kg	5	ND
Dibromobiphenyl	mg/kg	5	ND
Tribromobiphenyl	mg/kg	5	ND
Tetrabromobiphenyl	mg/kg	5	ND
Pentabromobiphenyl	mg/kg	5	ND
Hexabromobiphenyl	mg/kg	5	ND
Heptabromobiphenyl	mg/kg	5	ND
Octabromobiphenyl	mg/kg	5	ND
Nonabromobiphenyl	mg/kg	5	ND
Decabromobiphenyl	mg/kg	5	ND
Sum of PBDEs	mg/kg	-	ND
Monobromodiphenyl ether	mg/kg	5	ND
Dibromodiphenyl ether	mg/kg	5	ND
Tribromodiphenyl ether	mg/kg	5	ND
Tetrabromodiphenyl ether	mg/kg	5	ND

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<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Pentabromodiphenyl ether	mg/kg	5	ND
Hexabromodiphenyl ether	mg/kg	5	ND
Heptabromodiphenyl ether	mg/kg	5	ND
Octabromodiphenyl ether	mg/kg	5	ND
Nonabromodiphenyl ether	mg/kg	5	ND
Decabromodiphenyl ether	mg/kg	5	ND
Dibutyl phthalate (DBP)	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	mg/kg	50	ND

### Notes :

- (1) IEC 62321 series is equivalent to EN 62321 series  
[http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)
- (2) On 4 June 2015, Commission Directive (EU) 2015/863 was published in the Official Journal of the European Union (OJEU) to include the phthalates BBP, DBP, DEHP and DIBP into ANNEX II of the Rohs Recast Directive. The new law restricts each phthalate to no more than 0.1% in each homogeneous material of an electrical product.
- (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) The restriction of DEHP, BBP, DBP and DIBP shall not apply to cables or spare parts for the repair, the reuse, the updating of functionalities or upgrading of capacity of EEE placed on the market before 22 July 2019, and of medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, placed on the market before 22 July 2021.
- (5) The restriction of DEHP, BBP and DBP shall not apply to toys which are already subject to the restriction of DEHP, BBP and DBP through entry 51 of Annex XVII to Regulation (EC) No 1907/2006.

### Halogen

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Fluorine (F)	mg/kg	50	ND
Chlorine (Cl)	mg/kg	50	ND
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND



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**Perfluorooctane Sulfonates (PFOS) and Perfluorooctanoic Acid (PFOA)**

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

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>002</u>
Perfluorooctane Sulfonates (PFOS)^	10	mg/kg	10	ND
Perfluorooctanoic Acid (PFOA)	-	mg/kg	10	ND

Notes :

- (1) Max. limit specified by commission regulation (EU) No. 757/2010 amending Regulation (EC) No 850/2004 (previously restricted under entry 53 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006).
- (2) ^: PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing. The above result(s) was/were only given as the informality value and only for reference.



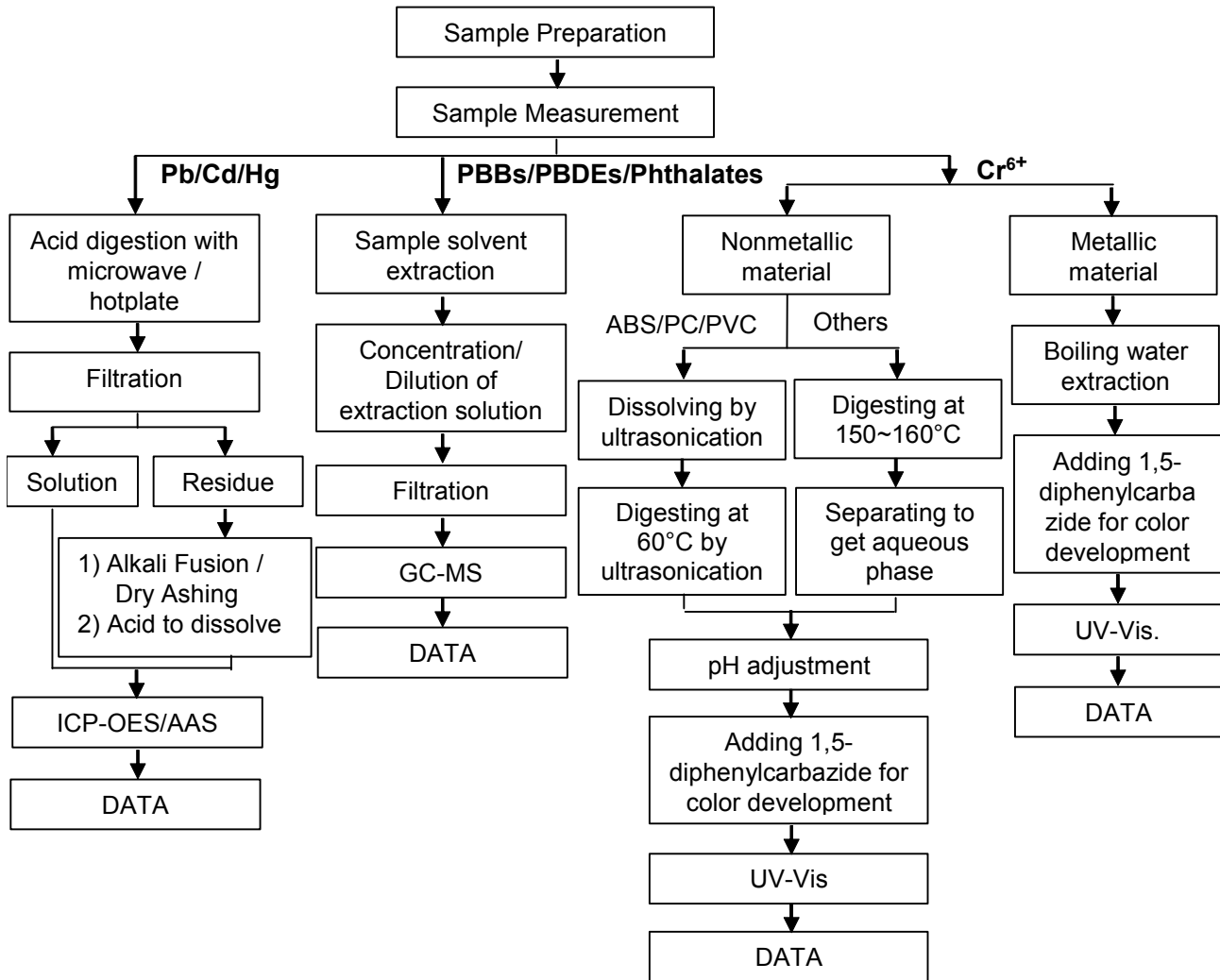
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**Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs/Phthalates Testing Flow Chart**

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

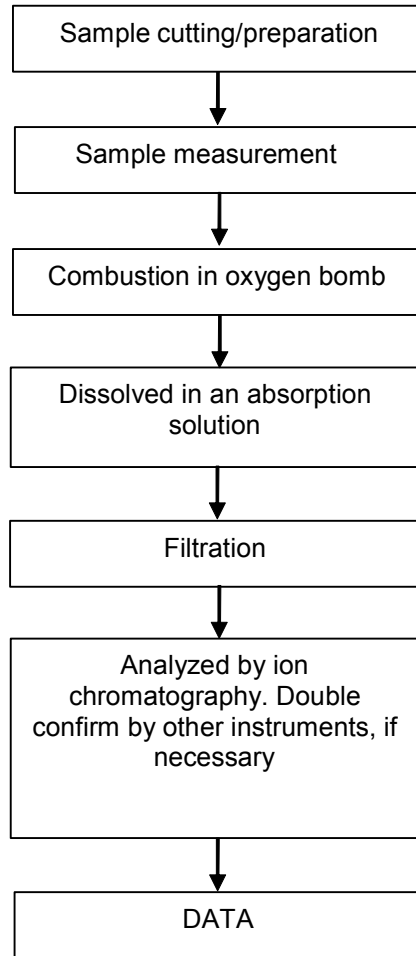


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**Halogen Testing Flow Chart**

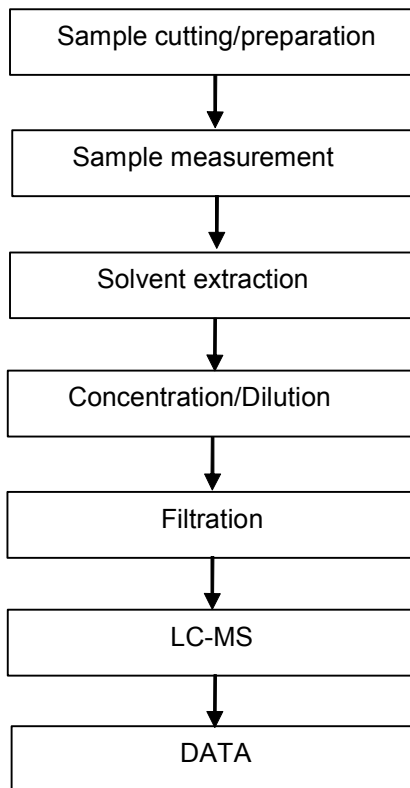


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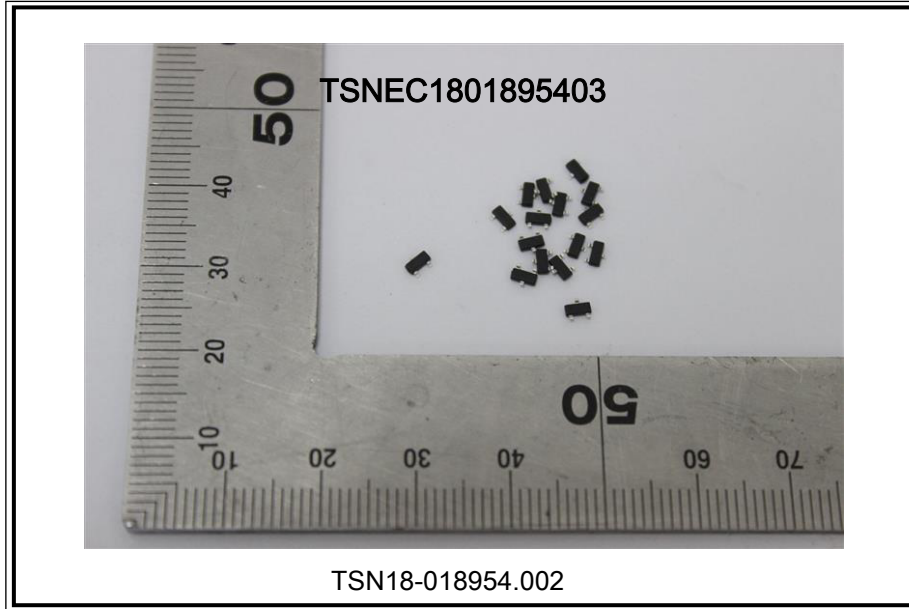
PFOS/PFOA Testing Flow Chart



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