

Report No: SZ180810331EN Report Date: 2018/8/24

Applicant: UTOP Electronic (Guangzhou) Co., Ltd.

Address: NO.51 Shi Nan Road Huijiang Village Dashi town Panyu area, Guangzhou city, china.

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the client.

Sample Name Transformer series

Sample Received Date 2018.8.20

Testing Period 2018.8.20-2018.8.24

Test Requirment(s):

Test	Item(s)	Test Standard(s)	Conclusion
1	Lead (Pb),Cadmium (Cd),Mercury (Hg) and Hexavalent Chromium (Cr(VI))	2011/65/EU	Pass
2	Polybrominated Biphenyls(PBBs) and PolybrominatedDipheny Ethers (PBDEs) Content	2011/65/EU	Pass
3	Phthalates content	2011/65/EU & (EU)2015/863	Pass
4	Halogen test	IEC 61249-2-21:2003	Pass

Note: "EN" denotes English report.

******* For Further Details, Please Refer To the Following Page(s) ***********

Approved by:

Vargas He Lab Director Shenzhen IMPAG Testing Technology Co., Ltd



Report No: SZ180810331EN Report Date: 2018/8/24

1.Lead (Pb), Cadmium (Cd), Mercury (Hg) and Hexavalent Chromium (Cr(VI))

With reference to IEC 62321-4:2013/IEC 62321-5:2013/ IEC 62321-7-2: 2017, and analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) and UV-Vis spectrophotometer

Test Item(s)	Result(s)	MDL	Limit
	001		
Lead(Pb)(mg/kg)	19.2	2.0	≤1000
Cadmium(Cd)(mg/kg)	N.D.	2.0	≤100
Mercury(Hg)(mg/kg)	N.D.	2.0	≤1000
Hexavalent Chromium(Cr(VI))(mg/kg)	N.D.	2.0	≤1000

Note: The sample(s) had been digested totally tested for Lead, Cadmium, Mercury

- "MDL" denotes Method Detection Limit
- "N.D." : denotes Not Detected (<MDL)
- "mg/kg": denotes milligram per kilogram

2.Lead (Pb), Cadmium (Cd), Mercury (Hg) and Hexavalent Chromium (Cr(VI))

With reference to IEC 62321-4:2013/IEC 62321-5:2013/IEC62321-7-1:2015, and analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) and UV-Vis spectrophotometer.

Test Item(s)	Result(s)	MDL	Limit
	002		
Lead(Pb)(mg/kg)	N.D.	2.0	≤1000
Cadmium(Cd)(mg/kg)	N.D.	2.0	≤100
Mercury(Hg)(mg/kg)	N.D.	2.0	≤1000
Hexavalent Chromium(Cr(VI))(μg/cm²)	N.D.	0.10	

Note: The sample(s) had been digested totally tested for Lead, Cadmium, Mercury

- "MDL" denotes Method Detection Limit
- " N.D." : denotes Not Detected (<MDL)
- "mg/kg": denotes milligram per kilogram
- The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than $0.13\mu g/cm^2$. The sample coating is considered to contain Cr(VI),
- The sample is negative for Cr(VI) if the Cr(VI) is N.D. (concentration is less than $0.10\mu g/cm^2$). The sample coating is considered a non-Cr(VI) base coating,
- The result between $0.10~\mu g/cm^2$ and $0.13~\mu g/cm^2$ is considered to be inconclusive unavoidable coating variations may influence the determination.



Report No: SZ180810331EN Report Date: 2018/8/24

3. Polybrominated Biphenyls (PBBs) and Polybrominated Dipheny Ethers (PBDEs) Content

With reference to IEC 62321-6: 2015, and analyzed by Gas Chromatography and Mass Spectrometry (GC-MS).

T . I. ()	Result(s)	MDI	Limit
Test Item(s)	001	MDL	
Monobromobiphenyl (1Br-PBB)(mg/kg)	N.D.	5.0	
Dibromobiphenyl (2Br-PBB)(mg/kg)	N.D.	5.0	
Tribromobiphenyl (3Br-PBB)(mg/kg)	N.D.	5.0	
Tetrabromobiphenyl (4Br-PBB)(mg/kg)	N.D.	5.0	
Pentabromobiphenyl (5Br-PBB)(mg/kg)	N.D.	5.0	
Hexabromobiphenyl (6Br-PBB)(mg/kg)	N.D.	5.0	
Heptabromobiphenyl (7Br-PBB)(mg/kg)	N.D.	5.0	
Octabromobiphenyl (8Br-PBB)(mg/kg)	N.D.	5.0	
Nonabromobiphenyl (9Br-PBB)(mg/kg)	N.D.	5.0	
Decabromobiphenyl (10Br-PBB)(mg/kg)	N.D.	5.0	
Sum of Polybrominated Biphenyls (mg/kg)	N.D.		≤1000
Monobromodiphenyl ether (1Br-PBDE)(mg/kg)	N.D.	5.0	
Dibromodiphenyl ether (2Br-PBDE)(mg/kg)	N.D.	5.0	
Tribromodiphenyl ether (3Br-PBDE)(mg/kg)	N.D.	5.0	
Tetrabromodiphenyl ether (4Br-PBDE)(mg/kg)	N.D.	5.0	
Pentabromodiphenyl ether (5Br-PBDE)(mg/kg)	N.D.	5.0	
Hexabromodiphenyl ether (6Br-PBDE)(mg/kg)	N.D.	5.0	
Heptabromodiphenyl ether (7Br-PBDE)(mg/kg)	N.D.	5.0	
Octabromodiphenyl ether (8Br-PBDE)(mg/kg)	N.D.	5.0	
Nonabromodiphenyl ether (9Br-PBDE)(mg/kg)	N.D.	5.0	
Decabromodiphenyl ether (10Br-PBDE)(mg/kg)	N.D.	5.0	
Sum of PolybrominatedDiphenyl Ethers(mg/kg)	N.D.		≤1000

Note: - "MDL" denotes Method Detection Limit
- "N.D." : denotes Not Detected (<MDL)
- "mg/kg" : denotes milligram per kilogram

4.Phthalates content

With reference to IEC 62321-8:2017, and analyzed by Gas Chromatography and Mass Spectrometry (GC-MS).

Test Item(s)	Result(s)	MDL	Limit
	001		
Di(2-ethylhexyl) phthalate (DEHP)(%)	N.D.	0.005	≤0.1
Dibutyl phthalate (DBP)(%)	N.D.	0.005	≤0.1
Benzyl butyl phthalate (BBP)(%)	N.D.	0.005	≤0.1
Diisobutyl phthalate (DIBP)(%)	N.D.	0.005	≤0.1

Note: - "MDL" denotes Method Detection Limit - " N.D." : denotes Not Detected (<MDL)

- "%" : Denotes Percentage Based On Weight Of Sample

Shenzhen IMPAQ Testing Technology Co.,Ltd.

Tel.: (86) 755 32998288 Fax: (86) 755 32998299



Report No: SZ180810331EN Report Date: 2018/8/24

5.Halogen test

With reference to BS EN 14582:2016, Test Halogen (F, Cl, Br and I) Content

Test Item(s)	Result(s)	MDL	Limit
F(mg/kg)	N.D.	50	
Cl(mg/kg)	N.D.	50	≤900
Br(mg/kg)	N.D.	50	≤900 ≤900
I(mg/kg)	N.D.	50	
Cl + Br(mg/kg)	N.D.		≤1500

$$\begin{split} \text{Note: -} & \text{ ``MDL'' } & \text{ denotes Method Detection Limit} \\ & \text{-} & \text{``N.D.'' } : \text{ denotes Not Detected (<MDL)} \\ & \text{-} & \text{``mg/kg'' } : \text{ denotes milligram per kilogram} \end{split}$$



Report No: SZ180810331EN Report Date: 2018/8/24 Test Flow Chart Chromium(VI) Content Weigh sample and Put in Add NMP digestion Add phosphate place it in a conical ultrasonication at 60 solution buffer flask C Put in Coloration ,Analyze Adjust the pH value ultrasonication at 60 d by UV-Vis of the solution C Pb/Cd/Hg Content Add digestion Weigh sample Digest samples Filtration solution Analyzed by ICP-Make up with **OES** deionized water Chromium(VI) Content Adding 1,5-Extract samples in Measure Absorbanc Calculate samples diphenylcarbazide surface area boiling water e with UV-Vis for color development Calculate Chromium (VI) content in $\mu g/cm^2$



Report No: SZ180810331EN Report Date: 2018/8/24 PBBs/PBDEs Content Weigh sample and Add reagent into Cool down to room Reflux place it in Soxhlet flask temperature thimble Transfer the extract Analyzed by GC-Concentrated by Filtration into a v- flask and MS rotary evaporator makeup Phthalates Content Weigh sample and Add reagent into Cool down to room Reflux place it in Soxhlet flask temperature thimble Transfer the extract Concentrated by Analyzed by GC-MS Filtration into a v- flask and rotary evaporator makeup Halogen (F, Cl, Br, I) Content Burned in oxygen Preparation Weight Filtration bomb and absorb with alkaline solution Analyzed by IC Constant volume

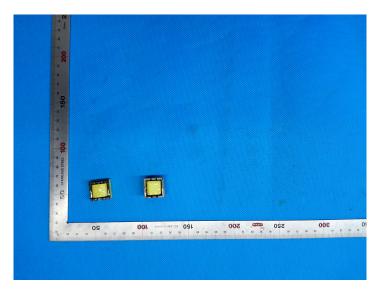


Report No: SZ180810331EN Report Date: 2018/8/24

Tested Sample/Part Description

Sample No.	Tested Material Description
001	Transformer series (non-metal)
002	Transformer series (metal)

Photo(s) of the sample(s)



*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of IMPAQ, this report can't be reproduced except in full.