



TEST REPORT

REPORT No.: **DTI201706091285-1-1**

Date:2017-06-14

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Client Company: SHEN ZHEN STP&GB ELECTRONICS CO., LTD

Client Address: 7th Floor, Building B, Jinhuan, Dasan Village, Dashuikeng, Fucheng Street, Longhua New District, Shenzhen, China

Report on the submitted samples said to be:

Sample Name : SMD INDUCTOR
 Model No. : ZCRH, ZCSH, ZCAS, ZCRS, ZCHC, ZCCS, ZCFS, ZCLS, ZCMF, ZCPS
 Sample Receiving Date : June 09, 2017
 Testing Period : From June 09, 2017 to June 14, 2017
 Results : Please refer to next page(s).

Summary of Test Results:


TEST REQUEST

CONCLUSION

A EU RoHS Directive 2011/65/EU and its amendment directives

Pass

Signed for and on behalf of
DTI

Approved by: 
lab manager



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Results:

A. EU RoHS Directive 2011/65/EU and its amendment directives on XRF

Test method: With reference to IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
1	Black Ceramic Frame (470)	BL	BL	BL	BL	BL
2	Black Ceramic Body (470)	BL	BL	BL	BL	BL
3	Silvery Metal Piece (470)	BL	BL	BL	X	BL
4	Golden Metal Line (470)	BL	BL	BL	X	BL
5	Black Ceramic Frame (1R0)	BL	BL	BL	BL	BL
6	Black Ceramic Body (1R0)	BL	BL	BL	BL	BL
7	Silvery Metal Piece (1R0)	BL	BL	BL	X	BL
8	Golden Metal Line (1R0)	BL	BL	BL	X	BL
9	Black Ceramic Frame (100)	BL	BL	BL	BL	BL
10	Black Ceramic Body (100)	BL	BL	BL	BL	BL
11	Silvery Metal Piece (100)	BL	BL	BL	X	BL
12	Golden Metal Line (100)	BL	BL	BL	X	BL
13	Black Ceramic Body	BL	BL	BL	BL	BL
14	Soldering Tin	X	BL	BL	X	BL
15	Golden Metal Line	BL	BL	BL	X	BL
16	Black Ceramic Body	BL	BL	BL	BL	BL
17	Soldering Tin	X	BL	BL	X	BL
18	Golden Metal Line	BL	BL	BL	X	BL
19	Gray Ceramic Body	BL	BL	BL	BL	BL
20	Silvery Metal Piece	BL	BL	BL	X	BL



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Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
21	Black Ceramic Frame	BL	BL	BL	BL	BL
22	Black Ceramic Body	BL	BL	BL	BL	BL
23	Silvery Metal Piece	BL	BL	BL	X	BL
24	Golden Metal Line	BL	BL	BL	X	BL

Remark:

(1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70 - 3\sigma < X < 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma < X < 130 + 3\sigma \leq OL$	$BL \leq 50 - 3\sigma < X < 150 + 3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X < 1500 + 3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X < 1500 + 3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	mg/kg	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$

Note:

- BL = Below Limit
- OL = Over Limit
- X = Inconclusive



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- (2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2011/65/EU and its amendment directives 2015/863/EU:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominate ddiphenylethers (PBDEs)	1000

(4) Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect(e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.



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B. The Test Results of Chemical Method:

Test method:

Lead, Cadmium, Mercury Content :

With reference to IEC 62321-4:2013 and IEC62321-5:2013, by acid digestion and analysis was performed by Inductively Coupled Plasma- Atomic Emission Spectrophotometer (ICP-AES)

Hexavalent Chromium Content (For metal material):

With reference to IEC 62321-7-1:2015, by boiling-water-extraction and analysis was performed by UV-visible spectrophotometer (UV-Vis)

Hexavalent Chromium Content (For non-metal material):

With reference to IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic/ mass spectrometer (GC-MS)



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1) The test results of Cr (VI)

Item	MDL($\mu\text{g}/\text{cm}^2$)	Results					Limit
		3	4	7	8	11	
Hexavalent Chromium (Cr (VI))	0.05	Negative	Negative	Negative	Negative	Negative	#
Conclusion	/	Pass	Pass	Pass	Pass	Pass	/

Item	MDL($\mu\text{g}/\text{cm}^2$)	Results					Limit
		12	14	15	17	18	
Hexavalent Chromium (Cr (VI))	0.05	Negative	Negative	Negative	Negative	Negative	#
Conclusion	/	Pass	Pass	Pass	Pass	Pass	/

Item	MDL($\mu\text{g}/\text{cm}^2$)	Results			Limit
		20	23	24	
Hexavalent Chromium (Cr (VI))	0.05	Negative	Negative	Negative	#
Conclusion	/	Pass	Pass	Pass	/



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2) The test results of Pb

Item	Unit	MDL	Results		Limit
			14	17	
Lead(Pb)	mg/kg	5	278	N.D.	1000
Conclusion	/	/	Pass	Pass	/

Note:

- Negative = Absence of Cr(VI) on the tested areas.
- MDL = Method Detection Limit.
- mg/kg = ppm
- Negative= Sample Cr(VI) concentration is less than 0.10 $\mu\text{g}/\text{cm}^2$.
- Positive = Sample Cr(VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$.
- # =
Positive indicates the presence of Cr(VI) on the tested areas and result be regarded as conflict with RoHS requirement.
- Negative indicates the absence of Cr(VI) on the tested areas and result be regarded as no conflict with RoHS requirement.



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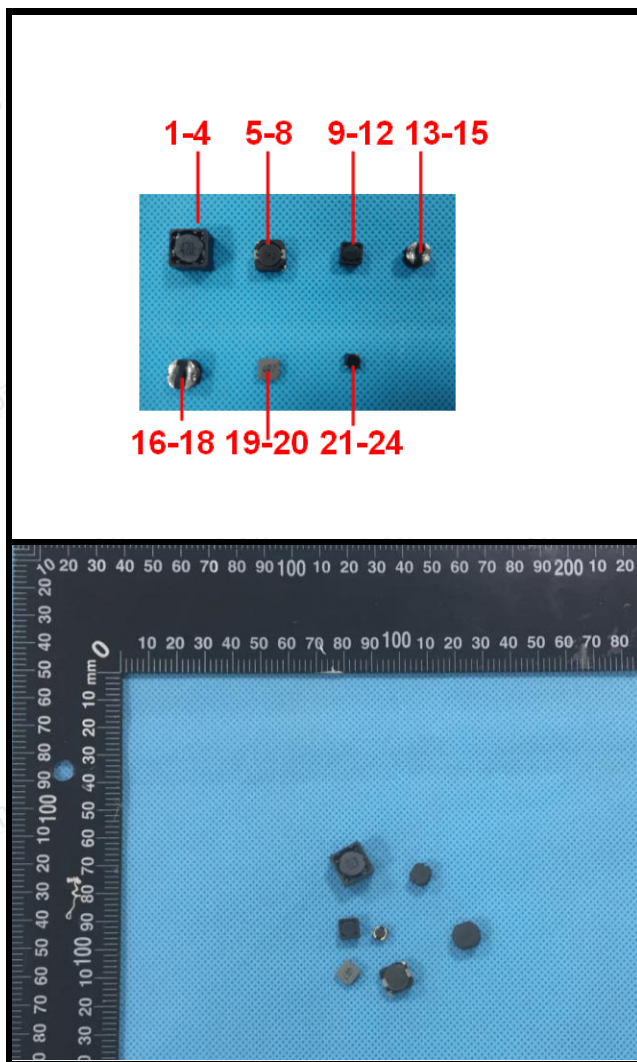
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Appendix Photograph of Sample





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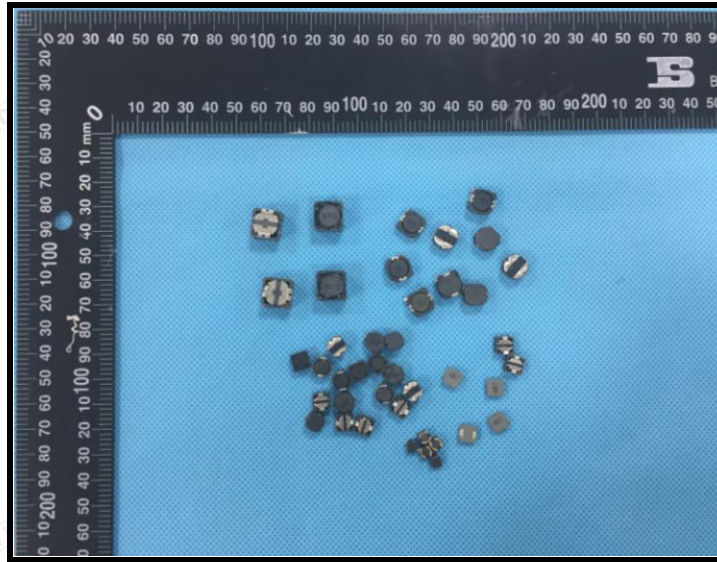


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DTI authenticate the photo on original report only

*** End of Report ***



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