



Test Report

No.: DGC141029016AE02

Date: November 03, 2014

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Applicant: DONGGUAN BETTER ELECTRONICS TECHNOLOGY CO., LTD.

Address: Room 601 of 16 Block, No.1 Headquarters Valley, Hisinchu Road, Songshan Lake High-tech Industrial Development Zone, Dongguan City, Guangdong Province

Manufacturer: FoShan Wholesome Electronics Co., Ltd

Address: NO.17, WuFeng Industrial District, Zhangcha of FOSHAN City, GUANGDONG Province

Sample Name: Thermostat

Model No.: KST series, ATM series, KSD series

Date of Sample Received: October 29, 2014

Test period: October 29, 2014 to November 03, 2014

Test requested: In accordance with RoHS Directive 2011/65/EU.

Test method: With reference to IEC 62321-2008 Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products, XRF scanning first test, then using chemical test method to confirm.

Test result: Please refer to next page.

Conclusion: Based on the test results, the submitted sample(s) comply with the RoHS Directive 2011/65/EU.

Written by:

Amanda

Checked by:

Libro

Approved by:

Coby



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Test method:

Testing Item	Pretreatment Method	Measuring Instrument	MDL
Lead (Pb)	IEC 62321: section 8/9/10	ICP-OES	2mg/kg
Cadmium (Cd)	IEC 62321: section 8/9/10	ICP-OES	2mg/kg
Mercury (Hg)	IEC 62321: section 7	ICP-OES	2mg/kg
Chromium (Cr ⁶⁺)	IEC 62321: Annex C	UV-Vis	2mg/kg
	IEC 62321: Annex B		---
PBBs/PBDEs	IEC 62321: Annex A	GC-MS	5mg/kg

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Details of test results(Unit: mg/kg):

Part No.	Test Part Name	Restricted Substances	Results of EDXRF	Result of Chemical Testing	Conclusion on RoHS
1	Golden metal axis of knob switch	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
2	Silvery-gray metal block	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
3	Silvery-gray metal reflective sheet	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
4	Silvery aluminium sheet	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
5	Silvery-gray metal sheet	Cr ⁶⁺	IN	Negative	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
6	Silvery metal gasket of knob switch	Cr ⁶⁺	IN	Negative	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply

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Part No.	Test Part Name	Restricted Substances	Results of EDXRF	Result of Chemical Testing	Conclusion on RoHS
7	Purple material	Cr ⁶⁺	IN	N.D.	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
8	Beige-white material	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
9	Golden metal spring sheet	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
10	Silvery metal spring sheet	Cr ⁶⁺	IN	Negative	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
11	Copper-colored metal spring sheet	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
12	White ceramic	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply

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Part No.	Test Part Name	Restricted Substances	Results of EDXRF	Result of Chemical Testing	Conclusion on RoHS
13	Gray-white ceramic	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	OL	Note (6)	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
14	Silvery metal contacted point of spring sheet	Cr ⁶⁺	BL	/	Comply
		Cd	OL	Note (5)	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
15	Transparent rubber sleeve of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
16	Brown plastic jacket of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
17	Silvery copper wire of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
18	White plastic crust of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	IN	N.D.	Comply
		PBDEs		N.D.	Comply

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Part No.	Test Part Name	Restricted Substances	Results of EDXRF	Result of Chemical Testing	Conclusion on RoHS
19	Silvery metal crust of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
20	Circinal silvery-gray metal gasket of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
21	Black rubber core of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply
22	Black solid glue of thermostat	Cr ⁶⁺	BL	/	Comply
		Cd	BL	/	Comply
		Pb	BL	/	Comply
		Hg	BL	/	Comply
		PBBs	BL	/	Comply
		PBDEs		/	Comply

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Note:

- (1) (a) It is the result on total Br while test PBBs/PBDEs by XRF, It is the result on total Cr while test Cr^{6+} by XRF;
(b) Results are obtained by XRF for primary screening and further chemical testing by ICP-OES (for Pb, Cd and Hg), UV-Vis (for Cr^{6+}) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-2008 (unit: mg/kg);

Element	Polymer	Metal	Composite Materials
Cd	$\text{BL} \leq (70 - 3\sigma) < X < (130 + 3\sigma) \leq \text{OL}$	$\text{BL} \leq (70 - 3\sigma) < X < (70 + 3\sigma) \leq \text{OL}$	$\text{LOD} < X < (150 + 3\sigma) \leq \text{OL}$
Pb	$\text{BL} \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq \text{OL}$	$\text{BL} \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq \text{OL}$	$\text{BL} \leq (500 - 3\sigma) < X < (1500 + 3\sigma) \leq \text{OL}$
Hg	$\text{BL} \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq \text{OL}$	$\text{BL} \leq (700 - 3\sigma) < X < (1300 + 3\sigma) \leq \text{OL}$	$\text{BL} \leq (500 - 3\sigma) < X < (1500 + 3\sigma) \leq \text{OL}$
Cr	$\text{BL} \leq (700 - 3\sigma) < X$	$\text{BL} \leq (700 - 3\sigma) < X$	$\text{BL} \leq (500 - 3\sigma) < X$
Br	$\text{BL} \leq (300 - 3\sigma) < X$	---	$\text{BL} \leq (250 - 3\sigma) < X$

(c) OL=Over Limit, BL=Below Limit, IN=Inconclusive, LOD= Limit of Detection;

(d) The XRF screening test for RoHS elements –The reading may be different to the actual content in the sample be of non-uniformity composition.

- (2) (a) mg/kg=ppm=0.0001%, N.D.=Not detected(<MDL), MDL=Method Detection Limit, “---”=Not conducted, “/”=Not available.
(b) According to IEC 62321-2008, result on Cr^{6+} for metal coating sample is shown as Positive/Negative. Negative= Absence of Cr^{6+} coating, Positive= Presence of Cr^{6+} coating

(3) RoHS Requirement

Restricted substances	Limits
Lead (Pb)	0.1% (1000 ppm)
Cadmium (Cd)	0.01% (100 ppm)
Chromium(VI) (Cr^{6+})	0.1% (1000 ppm)
Mercury (Hg)	0.1% (1000 ppm)
Polybrominated biphenyls (PBBs)	0.1% (1000 ppm)
Polybrominated diphenyl ethers (PBDEs)	0.1% (1000 ppm)

The above limits are reference with 2011/65/EU.

- (4) Specimens, which requested to determine Cadmium, Mercury and Lead Content, have been dissolved completely.
(5) Cadmium and its compounds and cadmium plating in electrical contact is exempted.
(6) In accordance with RoHS Directive (2011/65/EU), the lead content in ceramic of electronic components is exempted.

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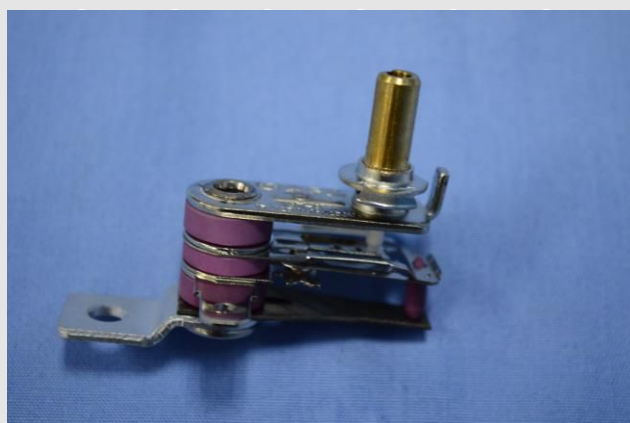
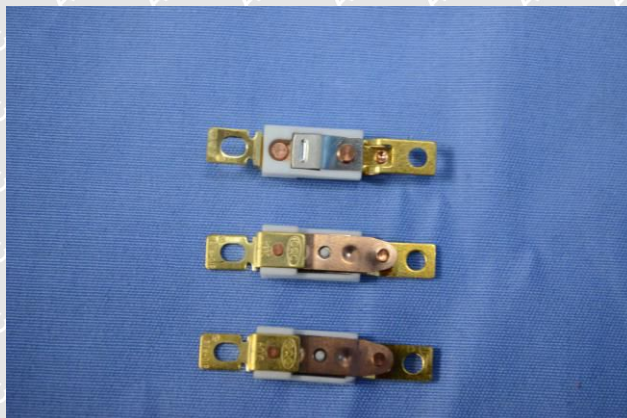
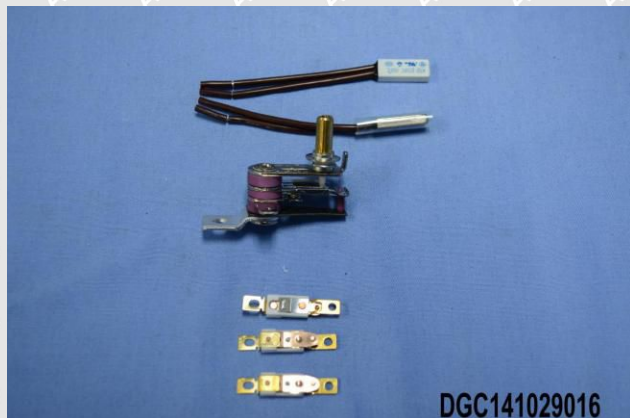
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Photographs of Sample:

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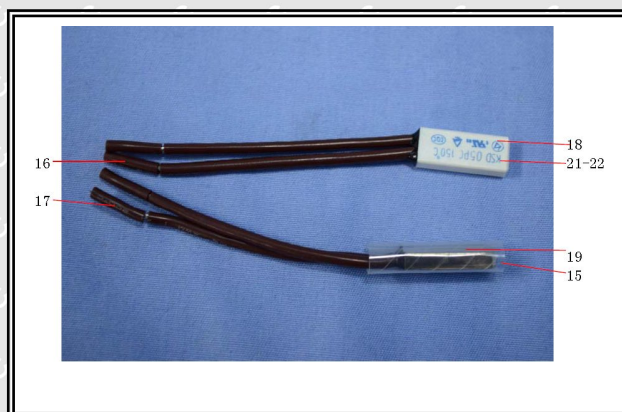
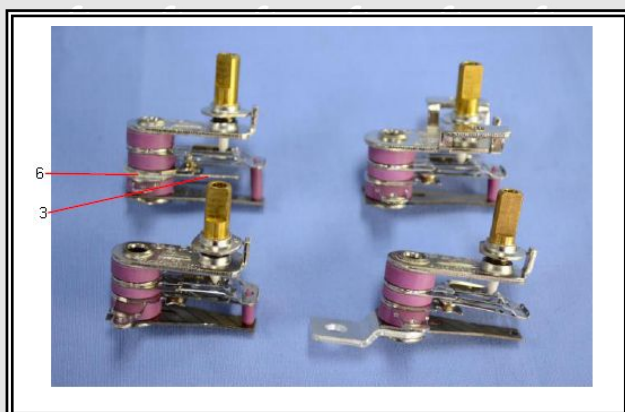
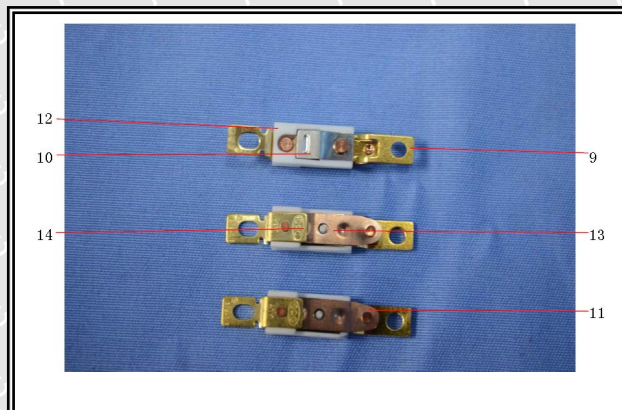
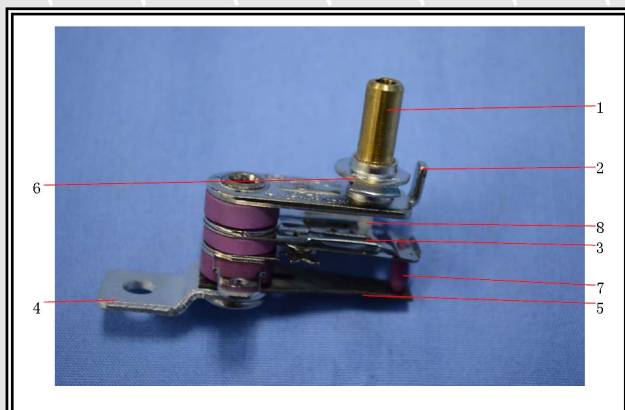
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