



Technical Report No. 64.164.13.02158.01

Rev. 00

Dated 2013-08-29

Client: ZhongShan LiangYi Lighting CO., LTD
BeiHai Industrial Zone, Guzhen Town, ZhongShan, GuangDong,
P.R.China

Test Subject: The submitted sample was identified and described by client as:
Lamp
Model: GU110601-1R, GU110601-2S, GU110601-3S, GU110601-3SP,
GU110601-4S, LED12036-1R, LED12036-2TU, LED12036-3R,
LED12036-4TU2

Test Requested: **To test for compliance with 2011/65/EU Annex II – Restriction of Hazardous Substances (RoHS)**
(1) Heavy Metals (Lead, Cadmium, Hexavalent Chromium and Mercury) Tests
(2) Brominated Flame Retardants (PBBs & PBDEs) Tests

Test Method: Please refer to next page(s)

Test Result: Please refer to next page(s)

Conclusion : The submitted sample was evaluated in accordance with the following directive(s). The verdict(s) was/were drawn as follow:

2011/65/EU Annex II – Restriction of Hazardous Substances (RoHS) - Heavy Metals Test **PASS**

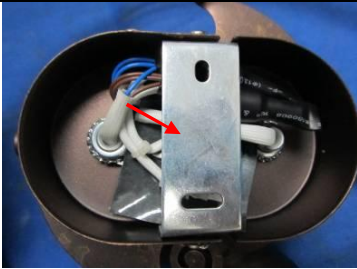


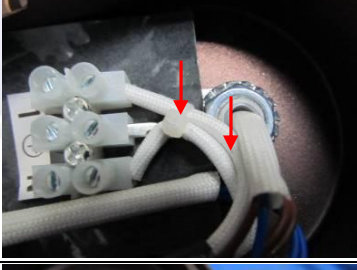

2011/65/EU Annex II – Restriction of Hazardous Substances (RoHS) - Polybrominated Biphenyls & Polybrominated Biphenyl Ethers (PBB & PBDE) Tests **PASS**




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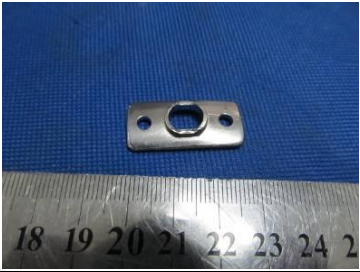

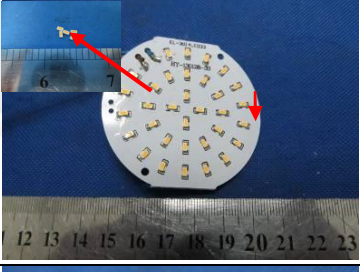
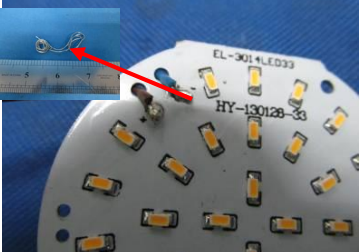
1. Description of the test subject

Sample No.	Model No.	Description	Photograph
001	GU110601-3SP	Brown coating	
002		Silvery metal base	
003		Silvery metal tube	
004	GU110601-3SP	Black plastic part with brown coating	
005	GU110601-3SP	Silvery metal screw	
006	GU110601-3SP	Silvery metal joint	
007	GU110601-3SP	Silvery metal ring	
008		Silvery metal spring	




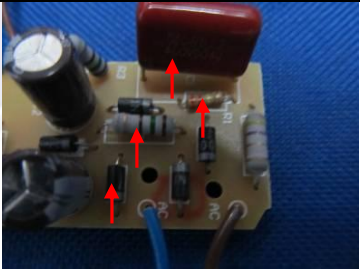
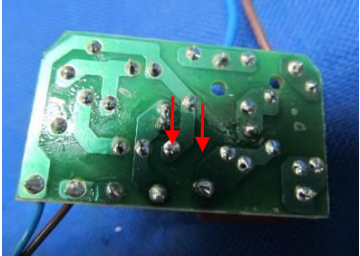
Sample No.	Model No.	Description	Photograph
009	GU110601-3SP	Beige ceramic	
010	GU110601-3SP	Silvery metal mica sheet	
011		Silvery metal tube	
012		Silvery metal spring	
013	GU110601-3SP	Brown plastic wire jacket	
014		Blue plastic wire jacket	
015		Silvery metal wire	
016		White fiber glass tube	
017		Silvery metal terminal	
018	GU110601-3SP	Silvery metal ring	
019		Silvery metal screw	
020	GU110601-3SP	Silvery metal part	
021		Silvery metal nut	
022		Silvery metal washer	

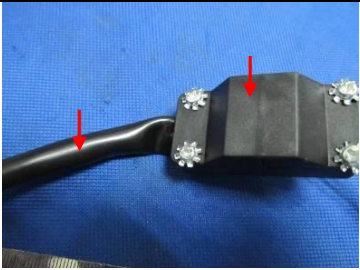

Sample No.	Model No.	Description	Photograph
023	GU110601-3SP	Silvery metal part	
024	GU110601-3SP	Silvery metal screw	
025		Silvery metal washer	
026	GU110601-3SP	Black plastic heating shrinkable tube	
027		Translucent plastic cover inner	
028		Silvery metal terminal inner	
029	GU110601-3SP	Translucent plastic tie	
030		White fiber glass tube	
031	GU110601-3SP	Brown plastic wire jacket	
032		Blue plastic wire jacket	
033		Silvery metal wire	
034		Golden metal terminal	

Sample No.	Model No.	Description	Photograph
035	GU110601-3SP	Blue surfaced metal screw	
036		White plastic part	
037		Blue surfaced metal block	
038	GU110601-3SP	Silvery plastic label with black printing	
039		Grey paper board with transparent film	
040	GU110601-3SP	Silvery metal screw	
041		Transparent plastic tube	
042		Silvery metal tube	
043		Silvery metal nut	
044		Silvery metal washer	
045	GU110601-3SP	Silvery metal part	
046	LED12036-2TU	White coating	

Sample No.	Model No.	Description	Photograph
047	LED12036-2TU	Silvery plated plastic part	
048	LED12036-2TU	Silvery metal part	
049	LED12036-2TU	White plastic shell	
050		Transparent plastic cover	
*051	LED12036-2TU	Yellow LED	
052		Silvery metal with white coating	
*053	LED12036-2TU	Silvery metal solder	

Remark: * means the retest sample was provided by client on 2013-08-27.

Sample No.	Model No.	Description	Photograph
054	LED12036-2TU	Brown plastic wire jacket	
055		Blue plastic wire jacket	
056		Silvery metal wire	
057	LED12036-2TU	Brown plastic wire jacket	
058		Blue plastic wire jacket	
059	LED12036-2TU	Brown plastic shell with white printing(C3)	
060		Silvery metal shell	
061		Black plastic cap	
062		Silvery metal pin	
063		Brown paper foil	
064		Silvery foil	
065	LED12036-2TU	Black body with silvery printing(D3)	
066		Grey body with multicolor printing(R2)	
067		Red body(C1)	
068		brown body with multicolor printing (R1)	
069	LED12036-2TU	Silvery metal solder	
070		Green/beige PCB	

Sample No.	Model No.	Description	Photograph
071	LED12036-2TU	Black plastic tube	
072		Black plastic shell	
073	LED12036-2TU	Silvery metal screw	
074		Silvery metal screw	
075		Silvery metal washer	

2. Order

2.1 Date of Purchase Order

2013-08-14

2.2 Receipt of Test Sample, Location

2013-08-14, 2013-08-27, Guangzhou

2.3 Date of Testing

2013-08-14 to 2013-08-23, 2013-08-27 to 2013-08-29

2.4 Location of Testing

The test was performed in Jiangsu TÜV Product Service Ltd. Shenzhen branch Chemical lab and the test results were reviewed at Jiangsu TÜV Product Service Ltd. Guangzhou Branch.



3. Test Results

3.1 Screening test for the specified hazardous substances of RoHS for the selected materials of the submitted sample:

- Heavy Metal (Cadmium, Chromium, Mercury, Lead) Content Test
- Bromine Content Test

According to EN 62321: 2009, and Quantification analyzed with Energy Dispersive X-ray Fluorescence Spectrometers.

Sample No.	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Mercury [mg/kg]	Total Chromium [mg/kg]	Total Bromine [mg/kg]
Reporting Limit	50	500	500	500	250
RoHS Requirements	100	1000	1000	1000	1000
Sample 001	< 50	< 500	< 500	< 500	< 250
Sample 002	< 50	< 500	< 500	< 500	N.A.
Sample 003	< 50	< 500	< 500	< 500	N.A.
Sample 004	< 50	–	< 500	< 500	–
Sample 005	< 50	< 500	< 500	< 500	N.A.
Sample 006	< 50	< 500	< 500	–	N.A.
Sample 007	< 50	< 500	< 500	–	N.A.
Sample 008	< 50	< 500	< 500	–	N.A.
Sample 009	< 50	< 500	< 500	< 500	< 250
Sample 010	< 50	< 500	< 500	< 500	< 250
Sample 011	< 50	< 500	< 500	–	N.A.
Sample 012	< 50	< 500	< 500	< 500	N.A.
Sample 013	< 50	< 500	< 500	< 500	< 250
Sample 014	< 50	< 500	< 500	< 500	< 250
Sample 015	< 50	< 500	< 500	< 500	N.A.
Sample 016	< 50	< 500	< 500	< 500	< 250
Sample 017	< 50	< 500	< 500	< 500	N.A.
Sample 018	< 50	< 500	< 500	< 500	N.A.
Sample 019	< 50	< 500	< 500	< 500	N.A.
Sample 020	< 50	< 500	< 500	< 500	N.A.
Sample 021	< 50	< 500	< 500	–	N.A.

Note:

1. All Concentrations express in “mg/kg” (milligram per kilogram), mg/kg ~ ppm
2. “<” = “less than”
3. “N.A.” = “Not Applicable”
4. “–” means further test result refers to next page(s)



Sample No.	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Mercury [mg/kg]	Total Chromium [mg/kg]	Total Bromine [mg/kg]
Reporting Limit	50	500	500	500	250
RoHS Requirements	100	1000	1000	1000	1000
Sample 022	< 50	< 500	< 500	–	N.A.
Sample 023	< 50	< 500	< 500	< 500	N.A.
Sample 024	< 50	< 500	< 500	< 500	N.A.
Sample 025	< 50	< 500	< 500	< 500	N.A.
Sample 026	< 50	< 500	< 500	< 500	< 250
Sample 027	< 50	< 500	< 500	< 500	< 250
Sample 028	< 50	< 500	< 500	< 500	N.A.
Sample 029	< 50	< 500	< 500	< 500	< 250
Sample 030	< 50	< 500	< 500	< 500	< 250
Sample 031	< 50	< 500	< 500	< 500	< 250
Sample 032	< 50	< 500	< 500	< 500	< 250
Sample 033	< 50	< 500	< 500	< 500	N.A.
Sample 034	< 50	< 500	< 500	< 500	N.A.
Sample 035	< 50	< 500	< 500	< 500	N.A.
Sample 036	< 50	< 500	< 500	< 500	< 250
Sample 037	< 50	< 500	< 500	–	N.A.
Sample 038	< 50	< 500	< 500	< 500	< 250
Sample 039	< 50	< 500	< 500	< 500	< 250
Sample 040	< 50	< 500	< 500	< 500	N.A.
Sample 041	< 50	< 500	< 500	< 500	< 250
Sample 042	< 50	< 500	< 500	–	N.A.
Sample 043	< 50	< 500	< 500	–	N.A.
Sample 044	< 50	< 500	< 500	–	N.A.
Sample 045	< 50	< 500	< 500	–	N.A.
Sample 046	< 50	< 500	< 500	< 500	< 250
Sample 047	< 50	< 500	< 500	–	< 250
Sample 048	< 50	< 500	< 500	< 500	N.A.
Sample 049	< 50	< 500	< 500	< 500	–
Sample 050	< 50	< 500	< 500	< 500	< 250
Sample 051 σ	< 50	< 500	< 500	< 500	< 250

Note:

1. All Concentrations express in “mg/kg” (milligram per kilogram), mg/kg ~ ppm
2. “<” = “less than”
3. “N.A.” = “Not Applicable”
4. “–” means further test result refers to next page(s)
5. σ means retest result



Sample No.	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Mercury [mg/kg]	Total Chromium [mg/kg]	Total Bromine [mg/kg]
Reporting Limit	50	500	500	500	250
RoHS Requirements	100	1000	1000	1000	1000
Sample 052	< 50	< 500	< 500	< 500	N.A.
Sample 053 σ	< 50	< 500	< 500	< 500	N.A.
Sample 054	< 50	< 500	< 500	< 500	< 250
Sample 055	< 50	< 500	< 500	< 500	< 250
Sample 056	< 50	< 500	< 500	< 500	N.A.
Sample 057	< 50	< 500	< 500	< 500	< 250
Sample 058	< 50	< 500	< 500	< 500	< 250
Sample 059	< 50	< 500	< 500	< 500	< 250
Sample 060	< 50	< 500	< 500	< 500	N.A.
Sample 061	< 50	< 500	< 500	< 500	< 250
Sample 062	< 50	< 500	< 500	< 500	N.A.
Sample 063	< 50	< 500	< 500	< 500	< 250
Sample 064	< 50	< 500	< 500	< 500	< 250
Sample 065	< 50	< 500	< 500	< 500	–
Sample 066	< 50	< 500	< 500	< 500	< 250
Sample 067	< 50	< 500	< 500	< 500	< 250
Sample 068	< 50	< 500	< 500	< 500	< 250
Sample 069	< 50	< 500	< 500	< 500	N.A.
Sample 070	< 50	< 500	< 500	< 500	< 250
Sample 071	< 50	< 500	< 500	< 500	< 250
Sample 072	< 50	< 500	< 500	< 500	–
Sample 073	< 50	< 500	< 500	–	N.A.
Sample 074	< 50	–	< 500	< 500	N.A.
Sample 075	< 50	< 500	< 500	–	N.A.

Note:

1. All Concentrations express in “mg/kg” (milligram per kilogram), mg/kg ~ ppm
2. “<” = “less than”
3. “N.A.” = “Not Applicable”
4. “–” means further test result refers to next page(s)
5. σ means retest result



3.2 Test for Heavy Metals

– Lead, Cadmium, Hexavalent Chromium and Mercury Tests according to EN 62321: 2009.

Element	Total Cadmium [mg/kg]	Total Lead [mg/kg]	Total Mercury [mg/kg]	Hexavalent Chromium [-]	Hexavalent Chromium [mg/kg]
Detection Limit	5	5	5	Δ	5
RoHS Requirements	100	1000	1000	#	1000
Sample 004	/	184	/	/	/
Sample 006	/	/	/	Negative	/
Sample 007	/	/	/	Negative	/
Sample 008	/	/	/	Negative	/
Sample 011	/	/	/	Negative	/
Sample 021	/	/	/	Negative	/
Sample 022	/	/	/	Negative	/
Sample 037	/	/	/	Negative	/
Sample 042	/	/	/	Negative	/
Sample 043	/	/	/	Negative	/
Sample 044	/	/	/	Negative	/
Sample 045	/	/	/	Negative	/
Sample 047	/	/	/	Negative	/
Sample 069	/	/	/	Negative	/
Sample 073	/	/	/	Negative	/
Sample 074	/	13	/	/	/
Sample 075	/	/	/	Negative	/

Note:

1. All Concentrations express in “mg/kg”(milligram per kilogram), mg/kg - ppm.
2. “N.D.” = “Not Detected”.
3. Δ =Spot-Test:
Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;
(The tested sample should be further verified by boiling-water-extraction method if the spot test result is negative or cannot be confirmed.)
Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02mg/kg with 50 cm² sample surface area.
Storage conditions and production date of the tested sample are unavailable and thus results of Cr(VI) represent status of the sample at the time of testing
4. # = Positive indicates the presence of CrVI on the tested areas.
Negative indicates the absence of CrVI on the tested areas.
5. “-” = Not regulated



3.3 Test for Flame retardants

– Brominated Flame Retardants (PBB& PBDE) according to EN 62321: 2009.

PBBs [mg/kg]	Sample 004	Sample 049	Sample 065	Sample 072
Monobromobiphenyl	N.D.	N.D.	N.D.	N.D.
Dibromobiphenyl	N.D.	N.D.	N.D.	N.D.
Tribromobiphenyl	N.D.	N.D.	N.D.	N.D.
Tetrabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Pentabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Hexabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Heptabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Octabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Nonabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Decabromobiphenyl	N.D.	N.D.	N.D.	N.D.
Sum of PBBs Limit < 1000 mg/kg	N.D.	N.D.	N.D.	N.D.
PBDEs [mg/kg]				
Monobromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Dibromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Tribromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Tetrabromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Pentabromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Hexabromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Heptabromodiphenyl Ether	N.D.	N.D.	N.D.	N.D.
Octabromodiphenyl Ether	N.D.	6	N.D.	N.D.
Nonabromodiphenyl Ether	N.D.	15	N.D.	N.D.
Decabromodiphenyl Ether	N.D.	25	N.D.	N.D.
Sum of PBDEs Limit < 1000 mg/kg	N.D.	46	N.D.	N.D.

Note:

1. All Concentrations express in “mg/kg” (milligram per kilogram), mg/kg ~ ppm.
2. “N.D.” = “Not Detected”, Detection Limit =5 mg/kg.

4. Documentation

Annex 01: Photo of product

Jiangsu TÜV Product Service Ltd. Guangzhou Branch
TÜV SÜD Group



Engineer: Judy Tan
Judy Tan

Technical Report checked: Koyi Chen
Koyi Chen

Annex 01: Photo of product



GU110601-1R



GU110601-2S



GU110601-3S



GU110601-4S



GU110601-3SP



LED 12036-1R



LED 12036-2TU



LED 12036-3R



LED 12036-4TU2

