ANNEX2

FCC Test report for Hue Dimmer Switch, NAM, Hue Dimmer Switch, EU

Models 324131092621 for Hue Dimmer Switch, NAM 324131137411 for Hue Dimmer Switch, EU

Guangzhou, date of issue: 2015-05-27

Author Daniel He

By order of Philips Lighting Company at New Jersey, US

Author : Daniel He	Reviewed : Tim Yan
Pages : 14 pages	Annex : 1

DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch
Building A3, No.3 Qiyun Road, Science City, Guangzhou Hi-Tech Industrial Development Zone, Guangzhou, P.R. China
Tel +86 20 6661 2000 Fax +86 20 6661 2001 www.dekra-certification.com

CONTENTS

1 CONCLUSION

The device under test (DUT) as mentioned in this report complies with RF Exposure Compliance requirements of the KDB 447498 (D01) General RF Exposure Guidance v05r02.

FCC ID: CIW-9290011736X

The test results in this report belong to model 324131092621, and the results are also representative for model 324131137411.

The conclusion and results stated in this test report are based on a non-recurrent examination of sample(s) provided by the applicant.

The tests described in this report do not result in the right to use any approval mark as conferred by DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch As far as the tests were based on certain specifications; these are mentioned in the report.

2 SUMMARY

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

2.1 Applied standards

Standard	Title
KDB 447498 D01 General RF Exposure Guidance v05r02	Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

2.2 Reference standards

Standard	Year	Title
ANSI C63.10	2009	American National Standard for Testing Unlicensed Wireless Devices
FCC/KDB-558074 D01 v03r02	2014	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247

3 GENERAL INFORMATION

3.1 Model description

The apparatus as supplied for the test is Hue Dimmer Switch, NAM, Hue Dimmer Switch, EU model 324131092621 intended for residential use, the product contains electronic control circuitry and powered by 3Vdc (CR2450 Button cell Battery).

According to customer's declaration,

1) Model 324131092621 is identical to model 324131137411 except for the model designation and silkscreen of the button.

2) The characteristics of device are:

Operating Frequency	2405 MHz – 2480 MHz	
Operating Temperature Range	-5 – 45 ℃	
Antenna Assembly	Type	Internal, PCB antenna
	Gain	Maximum 2,99 dBi
Modulation Type	O-QPSK	
Adaptivity	Adaptive	

Hence, model 324131092621 was chosen for full testing, and the corresponding data is representative of the model 324131137411.

Figure 1 Model 324131092621

The operating modes as stated in the user manual are On and OFF mode.

3.2 Product Information

Equipment under test	Hue Dimmer Switch, NAM, Hue Dimmer Switch, EU
Trade mark	PHILIPS
Tested Type	324131092621
Represented type(s)	324131137411
Rating	3Vdc (CR2450 Button cell Battery)

3.3 Customer Information

Applicant	Philips Lighting Company
Contact person	James R Cyre
Telephone	785 8221511
Telefax	785 8221510
Address	A Div of North American Philips Lighting, 200 Franklin Square Drive, Somerset, New Jersey

Manufacturer	AZ e-lite Pte Ltd.
Contact person	Jason Saw
Telephone	+65 6594 2277
Telefax	+65 6749 1198
Address	31 Ubi Road 1 Aztech Building

Factory	Aztech Communication Device (DG) Ltd.
Contact person	Sam Jiang
Telephone	+86 769 83936688
Telefax	+86 769 8393 1138
Address	Jiu Jiang Shui Village, Chang Ping Town

4 TEST INFORMATION

4.1 Test configuration

Requirements:	15.31(e): For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery. 15.32: Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows: Testing shall be in accordance with the procedures specified in Section 15.31 of this part.
Test frequencies and frequency range:	According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table: According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

EUT channels and frequencies list:

Channel	**Frequency (MHz)**
0	2405
1	2410
2	2415
3	2420
4	2425
5	2430
6	2435
7	2440
8	2445
9	2450
10	2455
11	2460
12	2465
13	2470
14	2475
15	2480

The device was modified, which can select the channel and transmitting continuously. Test frequencies are lowest channel: 2405 MHz, middle channel: 2440MHz and highest channel: 2480 MHz

4.2 Special accessories of the EUT

None.

4.3 Assistant equipment used on the test

None.

4.4 Test laboratory

Location	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch
Registration Number	245651
Address	Building A3, No.3 Qiyun Road, Science City, Guangzhou Hi-Tech Industrial Development Zone, Guangzhou, P.R. China
Date	2015-03-20 to 2015-03-31
Supervised by	Daniel He

4.5 Test facility

The semi-anechoic chamber test site and corresponding measurement facility are located at the premises of DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch.

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSV	SN101012	2014/09/11	1 Year
3	RF Cable	/	/	/	2014/09/11	1 Year
4	Temp & Humi Programmable Chamber	ESPEC	EL-10KA	08107561	2014/06/16	1 Year
5	DC Power Source	APC	ADL-100V-50A	D31102J076	2014/06/24	1 Year

4.6 Environmental conditions

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained within the applicable ranges.

Ambient temperature	15 °C – 25 °C
Relative Humidity air	30% - 60%

4.7 Measurement Uncertainty

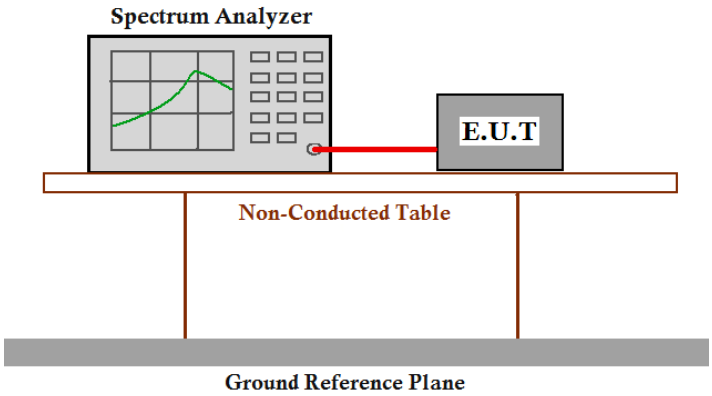
Test Item	Uncertainty
RF Output power, conducted	±0,6dB

Remark：

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 PORTABLE DEVICES RF EXPOSURE

Test Requirement:	KDB 447498 D01 Section 4.3
Test Method:	FCC/KDB-558074 D01 v03r02 Clause 9.1.1
Test Status:	Enter test mode for the product. Test in Channel lowest (2405MHz), middle (2440MHz) and highest (2480MHz), keep in continuously transmitting status.
Test Configuration:	



Test Procedure:	

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable

(Cable loss =1.5dB) from the antenna port to the spectrum.

2. Set the RBW≥DTS bandwidth
3. Set the VBW ≥ 3 x RBW
4. Set the span ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Use peak marker function to determine the peak amplitude level.
9. Report the worst case.

Results

The product belongs to standalone portable device base the FCC rule part 2.1091&2.1093. The transmission frequencies of the device are between 100 MHz and 6 GHz. The worst case test separation distance is 5mm.

The Max Conducted Output Power and SAR Test Exclusion Threshold (mW) are listed below:

Transmit frequency (GHz)	Max Conducted Output Power (mW)	SAR Test Exclusion Threshold (mW)
2,405	3,78	9,67
2,440	3,66	9,60
2,480	3,44	9,52

The SAR Test Exclusion Threshold for 100 MHz to 6 GHz is calculated from:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Conclusion:

According to SAR Exclusion Threshold in KDB 447498 (D01) General RF Exposure Guidance v05r02, the SAR report is not required.

6 TEST SETUP AND ARRANGEMENT

The photograph shows the tested device.

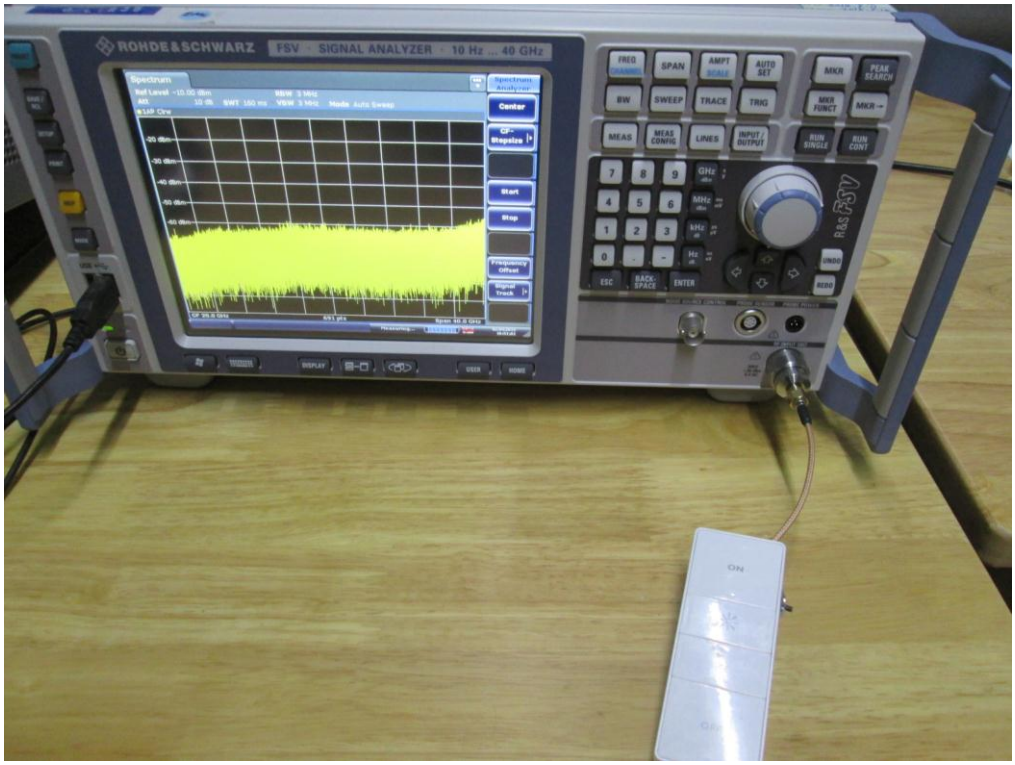


Figure 2 Conducted measurement Test setup