



## RF Exposure Evaluation Declaration

Product Name : LED lamp  
Model No. : 9290018189  
FCC ID : 2AGBW9290018189X

Applicant : Philips Lighting (China) Investment Co., Ltd.  
Address : Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai

Date of Receipt : Aug. 30th, 2017  
Test Date : Aug. 30th, 2017~ Oct. 12th, 2017  
Issued Date : Jan. 17th, 2018  
Report No. : 1782157R-RF-US- P20V01  
Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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# Test Report Certification

Issued Date : Jan. 17th, 2018

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Address : Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai

Manufacturer : Philips Lighting (China) Investment Co., Ltd.

Address : Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai

Model No. : 9290018189

FCC ID : 2AGBW9290018189X

EUT Voltage : 110 ~ 130Vac, 50-60Hz, 14W

Test Voltage : AC 120V/60Hz

Brand Name : N/A

Applicable Standard : KDB 447498D01V06  
FCC Part1.1310  
RSS-102: Issue 5, 2015

Test Result : Complied

Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.  
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Reviewed By : Frank He  
(Senior Project Manager: Frank He )

Approved By : Harry Zhao  
(Engineering Manager: Harry Zhao )

## 1. RF Exposure Evaluation

### 1.1. Limits

#### For FCC:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

#### Friis Formula

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

$P_d$  = power density in mW/ cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

**For ISED:**

According to RSS 102 Issue 5: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in RSS 102 Clause 4

**LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

<b>Frequency Range (MHz)</b>	<b>Electric Field (V/m rms)</b>	<b>Magnetic Field (A/m rms)</b>	<b>Power Density (W/m<sup>2</sup>)</b>	<b>Reference Period (minutes)</b>
0.003-10 <sup>21</sup>	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> <sup>0.5</sup>	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> <sup>0.25</sup>	0.1540/ <i>f</i> <sup>0.25</sup>	8.944/ <i>f</i> <sup>0.5</sup>	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> <sup>0.3417</sup>	0.008335 <i>f</i> <sup>0.3417</sup>	0.02619 <i>f</i> <sup>0.6834</sup>	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> <sup>1.2</sup>
150000-300000	0.158 <i>f</i> <sup>0.5</sup>	4.21 x 10 <sup>-4</sup> <i>f</i> <sup>0.5</sup>	6.67 x 10 <sup>-5</sup> <i>f</i>	616000/ <i>f</i> <sup>1.2</sup>
<p><b>Note:</b> <i>f</i> is frequency in MHz.  *Based on nerve stimulation (NS).  ** Based on specific absorption rate (SAR).</p>				

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 0.540 mW/cm<sup>2</sup> for 2.4GHz . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

**1.2. Test Procedure**

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18 and 78% RH.

**1.3. Test Result of RF Exposure Evaluation**

Product	:	LED Lamp
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

● **Antenna Information:**

Antenna manufacturer	N/A		
Antenna Delivery	<input checked="" type="checkbox"/> 1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX
Antenna technology	<input checked="" type="checkbox"/> SISO		
	<input type="checkbox"/> MIMO	<input type="checkbox"/> Basic	
		<input type="checkbox"/> Sectorized antenna systems	
		<input type="checkbox"/> Cross-polarized antennas	
		<input type="checkbox"/> Unequal antenna gains, with equal transmit powers	
		<input type="checkbox"/> Spatial Multiplexing	
		<input type="checkbox"/> CDD	
		<input type="checkbox"/> Beam-forming	
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole Antenna	
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PIFA Antenna	
		<input checked="" type="checkbox"/> PCB Antenna	
		<input type="checkbox"/> Slot Antenna	
		<input type="checkbox"/> Ceramic Chip Antenna	
		<input type="checkbox"/> Metal plate type F antenna	
		<input type="checkbox"/> Cross-polarize Antenna	
Antenna Gain	1.42dBi		

- Output Power into Antenna & RF Exposure Evaluation Distance
- Standlone modes

Test Mode	Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Directional Gain (dBi)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Power Density Limit at R = 20 cm (mW/cm <sup>2</sup> )
Zigbee	2400 ~ 2483.5	8.03	1.42	0.0018	1.0

Note: The simultaneous transmission power density is 0.0018mW/cm<sup>2</sup> for LED Lamp without any other radio equipment.

————— The End —————