RF Exposure Evaluation Declaration

Product Name	:	LED lamp
Model No.	:	9290018189
IC	:	20812-8189X

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

Date of Receipt	:	Aug. 30th, 2017
Test Date		Aug. 30th, 2017~ Oct. 12th, 2017
Issued Date	:	Feb. 06th, 2018
Report No.	:	1782157R-RF-CA-P20V01
Report Version	:	V1.1

Test Report Certification

Issued Date : Feb. 06th, 2018
Report No. : 1782157R-RF-CA-P20V01

Product Name	:	LED lamp
Applicant	:	Philips Lighting (China) Investment Co., Ltd.
Address	:	Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai,China.
Manufacturer	:	Philips Lighting (China) Investment Co., Ltd.
Address	:	Building 9, Lane 888, Tianlin Road, Minhang district, Shanghai,China.
Model No.	:	9290018189
IC	:	20812-8189X
Brand Name	:	N/A
EUT Voltage	:	110 ~ 130Vac, 50-60Hz, 14W
Applicable Standard	:	RSS-102: Issue 5, 2015
Test Result	:	Complied
Performed Location	:	DEKRA Testing and Certification (Suzhou) Co., Ltd. No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 IC Lab Code: 4075B

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Reviewed By : Frank he

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Approved By : Harry Zhao

(Engineering Manager : Harry Zhao)

1. RF Exposure Evaluation

1.1. Limits

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)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m^2)	Reference Period (minutes)
$0.003\text{-}10^{21}$	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142f^{0.3417}$	$0.008335f^{0.3417}$	$0.02619f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4*pi*r2)

Where

Pd = power density in mW/cm2

Pout = 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

Pd id the limit of MPE. 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	☒	1*TX+1*RX	☐	2*TX+2*RX	☐	3*TX+3*RX
Antenna technology	☒	SISO				
	☐	MIMO	☐	Basic		
			☐	Sectorized antenna systems		
			☐	Cross-polarized antennas		
			☐	Unequal antenna gains, with equal transmit powers		
			☐	Spatial Multiplexing		
			☐	CDD		
			☐	Beam-forming		
Antenna Type	☐	External	☐	Dipole Antenna		
	☒	Internal	☐	PIFA Antenna		
			☒	PCB Antenna		
			☐	Slot Antenna		
			☐	Ceramic Chip Antenna		
			☐	Metal plate type F antenna		
			☐	Cross-polarize Antenna		
Antenna Gain	1.42dBi					

- Output Power into Antenna & RF Exposure Evaluation Distance:
- The tune-up power is ±0.5dB, so the maximum conducted power we used to calculate RF exposure is 8.53dBm.

Test Mode	Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Directional Gain (dBi)	Power Density at R = 20 cm (mW/cm2)	Power Density Limit at R = 20 cm (mW/cm2)
Zigbee	2400 ~ 2483.5	8.53	1.42	0.0020	0.54

Note: The maximum transmission power density is 0.0020mW/cm2 for LED lamp without any other radio equipment.

The End