Maximum Permissible Exposure Evaluation

FCC ID: 2AEP6XM-JPLB1

1. Client Information

Applicant	:	HangZhou XiongMai Technology CO., LTD
Address	:	9th Floor, Building 9, Yinhu Innovation Center, No.9 FuXian Road, YinHu Street, Hangzhou, China
Manufacturer	:	HangZhou XiongMai Technology CO., LTD
Address	:	No.2 Dong Qiao Road, Dongzhou Industrial, Fuyang District, Hangzhou, China

2. General Description of EUT

EUT Name	:	Smart LED Colorful Bulb	
Models No.	:	XM-JPLB1, XM-JPLB, XM-JPLB2, JPLB, JPLB1, JPLB2	
Model Difference	:	All models are identical in the same PCB layout, interior structure and electrical circuits, The only difference is model name for commercial purpose.	
Product Description	:	Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz	
		Number of Channel:	802.11b/g/n(HT20):11 channels **see note(3)** 802.11n(HT40): 7 channels **see note(3)**
		RF Output Power:	802.11b: 8.53 dBm 802.11g: 8.20 dBm 802.11n (HT20): 7.99 dBm 802.11n (HT40): 7.42 dBm
		Antenna Gain:	2 dBi PCB Antenna
		Modulation Type:	802.11b:CCk,DQPSK,DBPSK; 802.11g:64-QAM,QPSK,BPSK 802.11n:64-QAM,16-QAM,QPSK,BPSK
		Bit Rate of Transmitter:	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6 Mbps 802.11n:up to 150Mbps
Power Supply	:	AC Voltage supplied from power network.	

1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, China
Tel: +86 75526509301 Fax: +86 75526509195

Power Rating	:	Input: AC 100~240V,50/60Hz, 3W
Connecting I/O Port(S)	:	Please refer to the User's Manual

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MPE Calculations for WIFI

1. **Antenna Gain:**
   PCB Antenna: 2 dBi.

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

3. **Exposure Evaluation:**
   Equation from page 18 of OET Bulletin 65, Edition 97-01
   $$S=(PG)/4\pi R^2$$
   Where
   S: power density
   P: power input to the antenna
   G: power gain of the antenna in the direction of interest relative to an isotropic radiator.
   R: distance to the center of radiation of the antenna

4. **Test Result:**

Worst Maximum MPE Result							
Mode	**N_{TX}**	**Frequency (MHz)**	**Power (dBm) [P]**	**ANT Gain (dBi) [G]**	**Turn-up Power Tolerance (dB)**	**Distance (cm) [R]**	**Power Density (mW/ cm^2) [S]**
2.4G							
802.11b	**1**	**2437**	**8.53**	**2**	**±1**	**20**	**0.0028**
802.11g	**1**	**2437**	**8.20**	**2**	**±1**	**20**	**0.0026**
802.11n (HT20)	**1**	**2437**	**7.99**	**2**	**±1**	**20**	**0.0025**
802.11n (HT40)	**1**	**2422**	**7.42**	**2**	**±1**	**20**	**0.0022**
Note: **(1) N_{TX}= Number of Transmit Antennas** **(2) RF Output power specifies that Maximum Conducted Peak Output Power.**							

5. **Conclusion:**
As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm^2)
300-1,500	**F/1500**
1,500-100,000	**1.0**

For 802.11b/g/n (2412~2462 MHz)
MPE limit S: 1 mW/ cm^2
The MPE is calculated as 0.0028mW / cm^2 < limit 1 mW / cm^2. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note
For a more detailed features description, please refer to the RF Test Report.

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