

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: Shenzhen Kunpeng Innovation Intelligent Technology Co., Ltd.  
Address of applicant: RM6227 Chuang Ye Cheng, No. 106 Xing Hua Road, Xing Wei Community, Fu Yong Street, Bao an District, ShenZhen

Manufacturer: Shenzhen Kunpeng Innovation Intelligent Technology Co., Ltd.  
Address of manufacturer: RM6227 Chuang Ye Cheng, No. 106 Xing Hua Road, Xing Wei Community, Fu Yong Street, Bao an District, ShenZhen

### General Description of EUT:

Product Name: Intelligent audio desk lamp  
Trade Name: /  
Model No.: YM001  
Adding Model(s): /  
Type-C Input: 5V/3A 9V/3A 12V/3A  
Rate Power: Wireless Output: 5W/7.5W/10W  
Battery: DC3.7V  
Battery Capacity: 1200mA  
Software Version: REV:3.3  
Hardware Version: REV:3.3  
FCC ID: 2A29P-YM001  
Equipment Type: Mobile

### Technical Characteristics of EUT:

#### Bluetooth

Bluetooth Version: V5.0 (BR/EDR mode)  
Frequency Range: 2402-2480MHz  
RF Output Power: 3.187dBm (Conducted)  
Data Rate: 1Mbps, 2Mbps, 3Mbps  
Modulation: GFSK,  $\pi/4$  DQPSK, 8DPSK  
Quantity of Channels: 79  
Channel Separation: 1MHz  
Type of Antenna: PCB Antenna  
Antenna Gain: 2dBi

## 1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

| Frequency range<br>(MHz) | Electric Field<br>Strength (E)<br>(V/m) | Magnetic Field<br>Strength (H)<br>(A/m) | Power Density<br>(S) (mW/cm <sup>2</sup> ) | Averaging Times<br>  E   <sup>2</sup> ,   H   <sup>2</sup> or<br>S (minutes) |
|--------------------------|---|---|--|--|
| 0.3-3.0                  | 614                                     | 1.63                                    | (100)*                                     | 6  |
| 3.0-30                   | 1842/f                                  | 4.89/f                                  | (900/f)*                                   | 6  |
| 30-300                   | 61.4                                    | 0.163                                   | 1.0  | 6  |
| 300-1500                 | /                                       | /                                       | F/300                                      | 6  |
| 1500-100000              | /                                       | /                                       | 5  | 6  |

(b) Limits for General Population / Uncontrolled Exposure

| Frequency range<br>(MHz) | Electric Field<br>Strength (E)<br>(V/m) | Magnetic Field<br>Strength (H)<br>(A/m) | Power Density<br>(S) (mW/cm <sup>2</sup> ) | Averaging Times<br>  E   <sup>2</sup> ,   H   <sup>2</sup> or<br>S (minutes) |
|--------------------------|---|---|--|--|
| 0.3-1.34                 | 614                                     | 1.63                                    | (100)*                                     | 30   |
| 1.34-30                  | 824/f                                   | 2.19/f                                  | (180/f)*                                   | 30   |
| 30-300                   | 27.5                                    | 0.073                                   | 0.2  | 30   |
| 300-1500                 | /                                       | /                                       | F/1500                                     | 30   |
| 1500-100000              | /                                       | /                                       | 1  | 30   |

Note: f = frequency in MHz: \* = Plane-wave equivalents power density

### 1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mw/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator,  
the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

### 1.4 MPE Calculation Result

For Bluetooth

Maximum Tune-Up output power: 4(dBm)

Maximum peak output power at antenna input terminal: 2.51 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2402(MHz)

Antenna gain: 2 (dBi)

Directional gain (numeric gain): 1.58

The worst case is power density at prediction frequency at 20cm: 0.0008(mw/cm<sup>2</sup>)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm<sup>2</sup>)

Result: Pass