

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: Hangzhou Gubei Electronics Technology Co.,Ltd  
Address of applicant: Room106, Building 1, No.611 Jianghong Road, Binjiang, Hangzhou, Zhejiang 310052, China

Manufacturer: Hangzhou Gubei Electronics Technology Co.,Ltd  
Address of manufacturer: Room106, Building 1, No.611 Jianghong Road, Binjiang, Hangzhou, Zhejiang 310052, China

### General Description of EUT:

Product Name: Universal Remote  
Trade Name: BroadLink  
Model No.: RM mini 3  
FCC ID: 2ACDZ-RMMINI3-RM  
Rated Voltage: DC5V

### Technical Characteristics of EUT:

Wi-Fi  
Support Standards: 802.11b, 802.11g, 802.11n  
Frequency Range: 2412-2462MHz for 802.11b/g/n-HT20  
2422-2452MHz for 802.11n-HT40  
RF Output Power: 17.05dBm (Conducted)  
Type of Modulation: CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM  
Data Rate: 1-11Mbps, 6-54Mbps, up to 150Mbps  
Quantity of Channels: 11 for 802.11b/g/n-HT20; 7 for 802.11n-HT40  
Channel Separation: 5MHz  
Type of Antenna: PCB Antenna  
Antenna Gain: 1.50dBi

## 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

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

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

Maximum Tune-Up output power: 18.0 (dBm)

Maximum peak output power at antenna input terminal: 63.10 (mW)

Prediction distance: >20(cm)

Prediction frequency: 2412 (MHz)

Antenna gain: 1.5 (dBi)

Directional gain (numeric gain): 1.4

The worst case is power density at prediction frequency at 20cm: 0.018(mw/cm<sup>2</sup>)

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

Result: Pass