

# 1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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## 1.1 General Information

### Client Information

Applicant: Hangzhou BroadLink Technology Co., Ltd.  
Address of applicant: Unit C, Building 1, No.57 Jiang'er Road, Changhe Street,  
Binjiang District, Hangzhou, Zhejiang, China

Manufacturer: Hangzhou BroadLink Technology Co., Ltd.  
Address of manufacturer: Unit C, Building 1, No.57 Jiang'er Road, Changhe Street,  
Binjiang District, Hangzhou, Zhejiang, China

### General Description of EUT:

Product Name: Door Sensor  
Trade Name: /  
Model No.: SR4D  
Adding Model(s): SR4, SR4DS, SR4W, DS4, DS4BT  
Rated Voltage: DC1.5"AAA"\*2  
Power Adapter: /  
Hardware Version: /  
FCC ID: 2ATEV-SR4D  
Equipment Type: Mobile Device

<b>Technical Characteristics of EUT:</b>	
<b>Bluetooth</b>	
Bluetooth Version:	V4.2 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	1.38dBm (Conducted)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	-2.56dBi

## 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 (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or 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 (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Times   E   <sup>2</sup> ,   H   <sup>2</sup> or 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 equivalent 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

Bluetooth

Maximum Tune-Up output power: 1.50(dBm)

Maximum peak output power at antenna input terminal: 1.41(mW)

Prediction distance: >20(cm)

Prediction frequency: 2480 (MHz)

Antenna gain: -2.56(dBi)

Directional gain (numeric gain): 0.55

The worst case is power density at prediction frequency at 20cm: 0.0002(mw/cm<sup>2</sup>)

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

Result: Pass