

Maximum Permissible Exposure Evaluation

FCC ID: 2BDNO-BH101

1. Client Information

Applicant	:	AZ Outstanding Co.Ltd
Address	:	213 w ramona blvd, San Gabriel, CA9177
Manufacturer	:	Guangdong Olang Security Technology Co.Ltd
Address	:	No.1 Plant, Guangfeng Industrial Zone, Liexiyi Community, Xiaolan, Zhongshan, Guangdong, China

2. General Description of EUT

EUT Name	:	Smart Lock	
Models No.	:	BH101	
Model Different	:	----	
Product Description	:	Operation Frequency:	Bluetooth 5.0(BLE): 2402MHz~2480MHz
	:	Number of Channel:	Bluetooth 5.0(BLE):40 channels
	:	Antenna Gain:	1.2dBi PCB Antenna
	:	Modulation Type:	GFSK
	:	Bit Rate of Transmitter:	1Mbps
Power Rating	:	Input: DC 6V/1A	
Li-ion Polymer Battery	:	DC 1.5V by AAA battery*4	
Software Version	:	1.0.2	
Hardware Version	:	2.0	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark: The antenna gain provided by the applicant, verified for the RF conduction test and adapter provided by TOBY test lab.			

MPE Calculations for BLE

1. EUT Operation Condition:

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

2. 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

3. Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$

4. Test Result:

Bluetooth LE worst reported.

Bluetooth LE Worst Maximum MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm ²) [S]
GFSK	1	2402	2.506	3±1	4	1.2	20	0.0007
		2440	2.556	3±1	4	1.2	20	0.0007
		2480	2.868	3±1	4	1.2	20	0.0007
<p>Note: N_{TX}= Number of Transmit Antennas RF Output power specifies that Maximum Conducted Peak Output Power.</p>								

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 Bluetooth LE:2402~2480 MHz

MPE limit S: 1mW/ cm²

The MPE is calculated as **0.0007mW/ cm² < limit 1mW / cm²**. 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.

6. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----