# RF EXPOSURE EVALUATION

## EUT Specification

| | |
|---|---|
| **EUT** | Deadbolt lock |
| **Model Number** | RD02, RD03<br>(All models are the same except the material of the rear shell is different, We choose model RD02 for all tests.) |
| **FCC ID** | 2A5ZQ-RD02 |
| **Antenna gain (Max)** | 1.3 dBi |
| **Operation Frequency** | 2402 MHz to 2480 MHz |
| **Input Rating** | DC 6V |
| **Max. output power** | -7.82 dBm |

## Test Requirement:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

| Frequency Range(MHz) | Electric Field Strength(V/m) | Magnetic Field Strength(A/m) | Power Density($mW/cm^2$) | Average Time |
|---|---|---|---|---|
| **(A) Limits for Occupational/Control Exposures** | | | | |
| **300-1500** | **--** | **--** | **F/300** | **6** |
| **1500-100000** | **--** | **--** | **5** | **6** |
| **(B) Limits for General Population/Uncontrol Exposures** | | | | |
| **300-1500** | **--** | **--** | **F/1500** | **6** |
| **1500-100000** | **--** | **--** | **1** | **30** |

### 11.1 Friis transmission formula: Pd= (Pout*G)\ ($4*pi*R^2$)

Where

Pd= Power density in $mW/cm^2$

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm=20cm

Pd the limit of MPE, 1mW/cm$^2$. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

### 11.2 Measurement Result

Antenna gain: 1.3dBi

BLE:

| Mode | Channel Freq. (MHz) | Measured power (dBm) | Tune-up power (dBm) | Max tune-up power (dBm) | Antenna Gain （Numeric） | Evaluation result (mW/cm2 ) | Power density Limits (mW/cm2 ) |
|---|---|---|---|---|---|---|---|
| GFSK | 2402 | -8.02 | -8±1 | -7 | 1.349 | -0.002152 | 1 |
| GFSK | 2440 | -8.44 | -8±1 | -7 | 1.349 | -0.002265 | 1 |
| GFSK | 2480 | -7.82 | -8±1 | -7 | 1.349 | -0.002099 | 1 |

Signature:

Tiger Xu

Tiger Xu
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