# Maximum Permissible Exposure Evaluation

***FCC ID: 2BC2U-RC100B&IC:31675-RC100B***

## 1. General Information about EUT

### 1.1 Client Information

| | | |
|---|---|---|
| **Applicant** | : | Shenzhen LC Co., Ltd |
| **Address** | : | Rooms 602, Building 5, Fenghe Industrial Park, No. 1301-50 Guanguang Road, Xinlan Community, Guanlan Street, Longhua District, Shenzhen,China |
| **Manufacturer** | : | Shenzhen Leqi Innovation Co., Ltd. |
| **Address** | : | Rooms 103, 501 and 601, Building 5, Fenghe Industrial Park, Nos. 1301-50 Guanguang Road, Longhua District, Shenzhen, Guangdong, China. |

### 1.2 General Description of EUT (Equipment Under Test)

| | | | |
|---|---|---|---|
| **EUT Name** | : | COB LED Video Light | |
| **Models No.** | : | RC 100B, RC 100C | |
| **HVIN** | : | RC100B | |
| **Model Different** | : | All these models are identical in the same PCB, layout and electrical circuit, The only difference is model name, brand name and product name. | |
| **Brand Name** | : | SmallRig | |
| **Sample ID** | : | HC-C-202407-0137-01-01 | |
| **Product Description** | : | Operation Frequency: | BLE: 2402MHz~2480MHz |
| **Power Rating** | : | Adapter (Model: EA11211R-2400):<br>Input: 100-240V~50/60Hz 2.0A<br>Output: 24.0V⎓5.41A 130.0W | |
| **Software Version** | : | V1.0 | |
| **Hardware Version** | : | V1.0 | |



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## 1.3 Antenna Information

| Band | Antenna Type | Antenna Gain(dBi) |
|---|---|---|
| Bluetooth LE | Airgain Embedded Antenna | 2.3 |
| **Remark:** The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible. | | |

# 2. Method of Measurement for FCC

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

**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:

∑ of MPE ratios ≤ 1.0

## 3. Test Result:

| Worst MPE Result | | | | | | | |
|---|---|---|---|---|---|---|---|
| Test Mode | Antenna | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | Max. ANT Gain (dBi) [G] | Distance (cm) [R] | Power Density (mW/ $cm^2$) [S] |
| Bluetooth LE | / | 3.053 | 3±1 | 4 | 2.3 | 20 | 0.00085 |
| Note: The antenna gain used max. antenna gain | | | | | | | |

## 4. 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: 2402~2480MHz
MPE limit S: 1mW/ $cm^2$
The MPE is calculated as ***0.00085mW / $cm^2$ < limit 1mW / $cm^2$***.

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.

# 3. Method Of Measurement for IC

## 3.1. Applicable Standard

Radio Standards Specification 102, Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body.

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

## 3.2. Evaluation Method and Limit

According to RSS-102 §4 Table 4, RF Filed Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

| Frequency Range (MHz) | Electric Field (V/m rms) | Magnetic Field (A/m rms) | Power Density ($W/m^2$) | Reference Period (minutes) |
|---|---|---|---|---|
| 0.003-10[21] | 83 | 90 | - | Instantaneous* |
| 0.1-10 | - | $0.73/f$ | - | 6** |
| 1.1-10 | $87/f^{0.5}$ | - | - | 6** |
| 10-20 | 27.46 | 0.0728 | 2 | 6 |
| 20-48 | $58.07/f^{0.25}$ | $0.1540/f^{0.25}$ | $8.944/f^{0.5}$ | 6 |
| 48-300 | 22.06 | 0.05852 | 1.291 | 6 |
| 300-6000 | $3.142f^{0.3417}$ | $0.008335f^{0.3417}$ | $0.02619f^{0.6834}$ | 6 |
| 6000-15000 | 61.4 | 0.163 | 10 | 6 |
| 15000-150000 | 61.4 | 0.163 | 10 | $616000/f^{1.2}$ |
| 150000-300000 | $0.158f^{0.5}$ | $4.21 \times 10^{-4} f^{0.5}$ | $6.67 \times 10^{-5} f$ | $616000/f^{1.2}$ |

**Note:** $f$ is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

| Frequency Band | $f$ (MHz) | Limit of Power Density ($W/m^2$) |
|---|---|---|
| Bluetooth LE | 2402 | 5.35 |
| **Note: Limit=$0.02619f^{0.6834}$ (where $f$ is in MHz).<br>The $f$ in the limit is the frequency of the lowest Channel.** | | |

## 3.3. Calculation Formula

Prediction of power density at the distance of the applicable MPE limit:
**S=PG/4πR²**=Power density(in appropriate units, e.g W/m²)

**P**=power input to antenna (in appropriate units, e.g W)
**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 m)

**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:

∑ of MPE ratios ≤ 1.0

## 3.4. Evaluation Results

| Worst MPE Result | | | | | | | |
|---|---|---|---|---|---|---|---|
| Test Mode | Antenna | Conducted Power(max) (dBm) | Turn-up Power (dB) | Max tune up power (dBm) [P] | Max. ANT Gain (dBi) [G] | Distance (m) [R] | Power Density ($W/m^2$) [S] |
| Bluetooth LE | / | 3.053 | 3±1 | 4 | 2.3 | 0.2 | 0.0085 |
| Note: The antenna gain used max. antenna gain | | | | | | | |

Remark:

1. Output power including turn-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.

**Note**

For a more detailed features description, please refer to the RF Test Report.

**-----END OF THE REPORT------**