

# Qingdao Intelligent&Precise Electronics Co., Ltd

## MPE ASSESSMENT REPORT

**Report Type:**

FCC Part §2.1091, §2.1093 and §1.1307(b) assessment report

**Model:**

ZDGF7638GU-CB

**REPORT NUMBER:**

191102805SHA-004

**ISSUE DATE:**

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**DOCUMENT CONTROL NUMBER:**

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**Applicant:** Qingdao Intelligent&Precise Electronics Co., Ltd  
No.218, Qianwangang Road, Qingdao Economic&Technological  
Development Zone, Shandong, China.

**Manufacturer:** Qingdao Intelligent&Precise Electronics Co., Ltd  
No.218, Qianwangang Road, Qingdao Economic&Technological  
Development Zone, Shandong, China.

**Manufacturing site:** Qingdao Intelligent&Precise Electronics Co., Ltd  
No.218, Qianwangang Road, Qingdao Economic&Technological  
Development Zone, Shandong, China.

**FCC ID:** 2AJVQ-7638GUCB

**SUMMARY:**

The equipment complies with the requirements according to the following standard(s) or Specification:

KDB447498 D01 General RF Exposure Guidance v06

FCC Part2.1091, FCC Part2.1093 FCC Part1.1307(b)

**PREPARED BY:**

Project Engineer  
Nemo Li

**REVIEWED BY:**

Reviewer  
Daniel Zhao

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## Revision History

| Report No.       | Version | Description             | Issued Date       |
|------------------|---------|-------------------------|-------------------|
| 191102805SHA-004 | Rev. 01 | Initial issue of report | December 27, 2019 |
|                  |         |                         |                   |
|                  |         |                         |                   |

## 1 GENERAL INFORMATION

### 1.1 Description of Equipment Under Test (EUT)

|                       |                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------|
| Product name:         | Wireless Module                                                                             |
| Type/Model:           | ZDGF7638GU-CB                                                                               |
| Description of EUT:   | EUT is a Wireless Module with WiFi function and Bluetooth function, and has only one model. |
| Rating:               | DC 3.3V                                                                                     |
| EUT type:             | <input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing       |
| Software Version:     | /                                                                                           |
| Hardware Version:     | /                                                                                           |
| Sample received date: | November 28, 2019                                                                           |
| Date of test:         | November 28, 2019 ~ December 20, 2019                                                       |

### 1.2 Technical Specification

|                      |                      |
|----------------------|----------------------|
| Frequency Band:      | 2400MHz to 2483.5MHz |
| Support Standards:   | Bluetooth Low Energy |
| Operating Frequency: | 2402MHz to 2480MHz   |
| Type of Modulation:  | GFSK                 |
| Channel Number:      | 40                   |
| Channel Separation:  | 2MHz                 |
| Antenna Information: | PIFA Antenna, 0.2dBi |

|                       |                                         |
|-----------------------|-----------------------------------------|
| Frequency Band:       | 2400MHz ~ 2483.5MHz                     |
| Support Standards:    | Bluetooth BR+EDR                        |
| Operating Frequency:  | 2402MHz to 2480MHz                      |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS) |
| Type of Modulation:   | GFSK, $\pi/4$ -DQPSK, 8DPSK             |
| Channel Number:       | 79 (0 - 78)                             |
| Channel Separation:   | 1 MHz                                   |
| Antenna:              | PIFA Antenna, 0.2dBi                    |

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|                      |                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Band:      | 2400MHz ~ 2483.5MHz                                                                                                                                                                                         |
| Support Standards:   | IEEE 802.11b, IEEE 802.11g, IEEE 802.11n(HT20), IEEE 802.11n(HT40)                                                                                                                                          |
| Operating Frequency: | 2412MHz to 2462MHz for IEEE 802.11b/g/n(HT20)<br>2422MHz to 2452MHz for IEEE 802.11n(HT40)                                                                                                                  |
| Type of Modulation:  | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>IEEE 802.11g: OFDM (64-QAM, 16-QAM, QPSK, BPSK)<br>IEEE 802.11n(HT20): OFDM (64-QAM, 16-QAM, QPSK, BPSK)<br>IEEE 802.11n(HT40): OFDM (64-QAM, 16-QAM, QPSK, BPSK) |
| Channel Number:      | 11 Channels for 802.11b, 802.11g and 802.11n(HT20)<br>7 Channels for 802.11n(HT40)                                                                                                                          |
| Channel Separation:  | 5 MHz                                                                                                                                                                                                       |
| Antenna Information: | PIFA Antenna<br>Antenna 0: 0.80dBi, Antenna 1: 0.65dBi                                                                                                                                                      |

### 1.3 Description of Test Facility

|            |                                                                        |
|------------|------------------------------------------------------------------------|
| Name:      | Intertek Testing Services Shanghai                                     |
| Address:   | Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China |
| Telephone: | 86 21 61278200                                                         |
| Telefax:   | 86 21 54262353                                                         |

|                                                                                   |                                                                               |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| The test facility is recognized, certified, or accredited by these organizations: | CNAS Accreditation Lab<br>Registration No. CNAS L0139                         |
|                                                                                   | FCC Accredited Lab<br>Designation Number: CN1175                              |
|                                                                                   | IC Registration Lab<br>CAB identifier.: CN0051                                |
|                                                                                   | VCCI Registration Lab<br>Registration No.: R-14243, G-10845, C-14723, T-12252 |
|                                                                                   | A2LA Accreditation Lab<br>Certificate Number: 3309.02                         |

## 2 MPE Assessment

Test result: Pass

### 2.1 MPE Assessment Limit

Mobile device exposure for standalone operations:

| Frequency range | E-field strength (V/m) | H-field strength (A/m) | B-field (uT)        | Equivalent plane wave power density $S_{eq}$ (W/m <sup>2</sup> ) |
|-----------------|------------------------|------------------------|---------------------|------------------------------------------------------------------|
| 0-1 Hz          | -                      | $3,2 \times 10^4$      | $4 \times 10^4$     | -                                                                |
| 1-8 Hz          | 10 000                 | $3,2 \times 10^4/f^2$  | $4 \times 10^4/f^2$ | -                                                                |
| 8-25 Hz         | 10 000                 | $4\,000/f$             | $5\,000/f$          | -                                                                |
| 0,025-0,8 kHz   | $250/f$                | $4/f$                  | $5/f$               | -                                                                |
| 0,8-3 kHz       | $250/f$                | 5                      | 6,25                | -                                                                |
| 3-150 kHz       | 87                     | 5                      | 6,25                | -                                                                |
| 0,15-1 MHz      | 87                     | $0,73/f$               | $0,92/f$            | -                                                                |
| 1-10 MHz        | $87/f^{1/2}$           | $0,73/f$               | $0,92/f$            | -                                                                |
| 10-400 MHz      | 28                     | 0,073                  | 0,092               | 2                                                                |
| 400-2 000 MHz   | $1,375 f^{1/2}$        | $0,0037 f^{1/2}$       | $0,0046 f^{1/2}$    | $f/200$                                                          |
| 2-300 GHz       | 61                     | 0,16                   | 0,20                | 10                                                               |

Mobile device exposure for simultaneous transmission operations: **the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is  $\leq 1.0$**

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### 2.2 Assessment Results

Power density (S) is calculated according to the formula:

$$S = PG / (4\pi R^2)$$

Where S = power density in mW/cm<sup>2</sup>

P = Radiated transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

As we can see from the test report 191102805SHA-001, 191102805SHA-002 and 191102805SHA-003:

The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

The Bluetooth and WiFi can support simultaneous transmission.

| Mode      | Frequency band | Max Power | Antenna Gain | R    | S                     | Limits                |
|-----------|----------------|-----------|--------------|------|-----------------------|-----------------------|
|           | (MHz)          | dBm       | dBi          | (cm) | (mW/cm <sup>2</sup> ) | (mW/cm <sup>2</sup> ) |
| WiFi      | 2400 -2483.5   | 17.32     | 0.80         | 20   | 0.0129                | 1                     |
| Bluetooth | 2400 -2483.5   | 6.83      | 0.20         | 20   | 0.0010                | 1                     |

Note: 1 mW/cm<sup>2</sup> from 1.310 Table 1

For the device can support simultaneous transmission, according to 447498 D01 General RF Exposure Guidance v06,

For the device consider simultaneous transmission of WiFi and Bluetooth:

The worst MPE = 0.0129/1 + 0.0010/1 = 0.0139 mW/cm<sup>2</sup> < 1 mW/cm<sup>2</sup>.

## Appendix I

Definition below must be outlined in the User Manual:

To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operations at closer than this distance is not recommended.

\*\*\*\*\* END \*\*\*\*\*