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# 1 TEST SUMMARY

## 1.1 Test Facility

Shenzhen Central Standard International Center Co., Ltd. (CSIC)

Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen.

The test facility is recognized, certified or accredited by the following organizations:

CNAS      Registration No.: L11671

FCC      Registration No.: 0031378433      Designation Number: CN1317

IC      CAB identifier: CN0051

A2LA      Lab Cert. No.: 6426.01

## 2 GENERAL INFORMATION

### 2.1 General Description of EUT

| EUT(Product Specifications)             |                                                                                                                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:                           | Wireless Subwoofer                                                                                                                                                                                                             |
| Model:                                  | Q65K-SW                                                                                                                                                                                                                        |
| Series Model(s):                        | Q65K-SW, Q60K-SW, Q6BK-SW, Q65K5-SW, Q6*****-SW, R40C-SW, R45C-SW, R48C-SW, R40D-SW, R45D-SW, R48D-SW, R4***-SW, Q65H-SW, Q60H-SW, Q68H-SW, Q69H-SW, Q6*****-SW (*can be any numerica number"0~9" or alphebtical number "A~Z") |
| Power supply:                           | AC 100-240V~50/60Hz                                                                                                                                                                                                            |
| Hardware version:                       | V03                                                                                                                                                                                                                            |
| Software version:                       | V17                                                                                                                                                                                                                            |
| Technical Specification of Bluetooth    |                                                                                                                                                                                                                                |
| Operating Frequency                     | 2402 - 2480 MHz                                                                                                                                                                                                                |
| Type of Modulation                      | GFSK, $\pi/4$ DQPSK, 8DPSK                                                                                                                                                                                                     |
| Channel Number                          | 79 channels                                                                                                                                                                                                                    |
| Channel Separation                      | 1MHz                                                                                                                                                                                                                           |
| Bluetooth Version                       | Bluetooth 5.3                                                                                                                                                                                                                  |
| Antenna Type                            | PIFA Antenna                                                                                                                                                                                                                   |
| Max. Antenna Gain                       | 2.50 dBi.                                                                                                                                                                                                                      |
| Technical Specification of Bluetooth LE |                                                                                                                                                                                                                                |
| Frequency Range:                        | 2402 MHz to 2480 MHz                                                                                                                                                                                                           |
| Type of Modulation:                     | GFSK                                                                                                                                                                                                                           |
| Channel Number:                         | 40 channels                                                                                                                                                                                                                    |
| Data Rate:                              | 1 Mbps, 2 Mbps                                                                                                                                                                                                                 |
| Channel Separation:                     | 2 MHz                                                                                                                                                                                                                          |
| Antenna Type:                           | PIFA Antenna                                                                                                                                                                                                                   |
| Antenna Gain:                           | 2.50 dBi.                                                                                                                                                                                                                      |

**Remark:** The above information and materials are provided by the Manufacturer.

### 3 Maximum Permissible Exposure (MPE)

#### 3.1 RF Exposure

##### 3.1.1 Limit

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

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

For FCC:

| Frequency Range                                       | Electric Field Strength | Magnetic Field Strength | Power Density         |
|-------------------------------------------------------|-------------------------|-------------------------|-----------------------|
| [MHz]                                                 | [V/m]                   | [A/m]                   | [mW/cm <sup>2</sup> ] |
| Limits for Occupational / controlled Exposures        |                         |                         |                       |
| 300 - 1500                                            | --                      | --                      | f/300                 |
| 1500 - 100000                                         | --                      | --                      | 5.0                   |
| Limits for General population / Uncontrolled Exposure |                         |                         |                       |
| 300 - 1500                                            | --                      | --                      | f/1500                |
| 1500 - 100000                                         | --                      | --                      | 1.0                   |

NOTE: f = Frequency in MHz

### 3.1.2 Friss Formula

Per KDB 447498 D01 v06, 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 calculated or measured field strengths or power density, is  $\leq 1.0$ .

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

### 3.1.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

### 3.1.4 EUT Operating Conditions

EUT was enabled to transmit and receive at lowest, middle and highest channels.

### 3.1.5 Evaluation Result

1) tand-alone transmission MPE

For FCC

Test Results of RF Exposure Calculations for FCC, Stand-alone mode

| Test Mode | Max. conducted power incl. tune-up (dBm) | Distance (cm) | MPE (mW/cm <sup>2</sup> ) | Threshold power (mW/cm <sup>2</sup> ) | Result |
|-----------|------------------------------------------|---------------|---------------------------|---------------------------------------|--------|
| Bluetooth | 7                                        | 20            | 0.00185                   | 1.0                                   | Pass   |

Test Results of RF Exposure Calculations for FCC, Simultaneous mode

| Co-location Mode | Sum of the MPE ratios | Limit | Result |
|------------------|-----------------------|-------|--------|
| N/A              | N/A                   | 1.0   | Pass   |

### 3.1.6 Conclusion

Therefore, the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit.

\*\*\*\*\*THE END\*\*\*\*\*