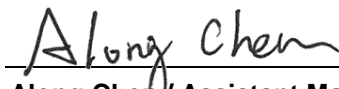


# FCC Co-Location Test Report

**FCC ID** : R3USCBT20  
**Product Description** : True Wireless Gaming Earbuds  
**Model No.** : SCBT20  
**Brand Name** : EPOS  
**Applicant** : DSEA A/S  
**Address** : Kongebakken 9, DK-2765 Smørum, Denmark  
**Standard** : 47 CFR FCC Part 15.247  
47 CFR FCC Part 15.209  
**Received Date** : Jun. 05, 2020  
**Tested Date** : Jun. 30 ~ Jul. 01, 2020

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:



Along Chen / Assistant Manager

Approved by:



Gary Chang / Manager



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## Release Record

| Report No. | Version | Description  | Issued Date   |
|------------|---------|--|---------------|
| FR060501CO | Rev. 01 | Initial issue  | Aug. 20, 2020 |
| FR060501CO | Rev. 02 | 1. Updating antenna gain for BT.<br>2. Updating applicant's information. | Nov. 06, 2020 |
| FR060501CO | Rev. 03 | 1. Adding antenna brand & model.<br>2. Updating charging box rating.     | Dec. 07, 2020 |

## Summary of Test Results

| FCC Rules           | Test Items         | Measured   | Result |
|---------------------|--------------------|--|--------|
| 15.247(d)<br>15.209 | Radiated Emissions | [dBuV/m at 3m]:43.58MHz<br>32.69 (Margin -7.31dB) - PK | Pass   |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

# 1 General Description

## 1.1 Information

### 1.1.1 Specification

|                            |   |
|----------------------------|---|
| <b>BT</b>                  |   |
| <b>Operating Frequency</b> | 2402 MHz ~ 2480 MHz   |
| <b>Modulation Type</b>     | Bluetooth BR(1Mbps): GFSK<br>Bluetooth EDR (2Mbps): $\pi/4$ -DQPSK<br>Bluetooth EDR (3Mbps): 8-DPSK |
| <b>NFMI</b>                |   |
| <b>Operating Frequency</b> | 10.579 MHz  |

### 1.1.2 Power Supply Type of Equipment under Test (EUT)

|                          |   |
|--------------------------|---|
| <b>Power Supply Type</b> | Battery 3.7Vdc  |
|                          | Master earbud: Max charge current: 60mA , Max discharge current: 14mA |
|                          | Slave earbud: Max charge current: 60mA, Max discharge current: 4mA    |
|                          | Chargebox: Max charge current: 560mA , Max discharge current: 200mA   |

### 1.1.3 Antenna Details

| Brand   | Model                | Type         | Gain (dBi) | Connector | Remark        |
|---------|----------------------|--------------|------------|-----------|---------------|
| Cicent  | TB011                | Monopole     | -2.80      | NA        | For Bluetooth |
| PulseGM | GF5520-72XJLC(3.7uH) | coil antenna | ---        | ---       | For NFMI      |

### 1.1.4 Accessories

| No. | Equipment                      | Description   |
|-----|--------------------------------|---|
| 1   | Battery                        | Brand: Guangdong Mic Power New Energy Co. Ltd.<br>Model: M1254S2<br>Rating: 3.7Vdc, 60mAh |
| 2   | USB cable                      | Brand: EPOS<br>Model: EPUL57<br>Line: 0.57m shielded without core                         |
| 3   | Charging box                   | Brand: EPOS<br>Model: SCBT20<br>Rating: 5V = 600mA  |
| 4   | Bluetooth dongle               | Brand: EPOS<br>Model: SCBT16  |
| 5   | USB-C to USB-A extension cable | Brand: SENNHEISER<br>Model: TB011<br>Line:1.35m shielded without core                     |

## 1.2 The Equipment List

| Test Item               | Radiated Emission          |                          |                  |                  |                   |
|-------------------------|----------------------------|--------------------------|------------------|------------------|-------------------|
| Test Site               | 966 chamber1 / (03CH01-WS) |                          |                  |                  |                   |
| Instrument              | Brand                      | Model No.                | Serial No.       | Calibration Date | Calibration Until |
| Spectrum Analyzer       | R&S                        | FSV40                    | 101498           | Dec. 17, 2019    | Dec. 16, 2020     |
| Receiver                | R&S                        | ESR3                     | 101657           | Feb. 14, 2020    | Feb. 13, 2021     |
| Bilog Antenna           | SCHWARZBECK                | VULB9168                 | VULB9168-522     | Jul. 12, 2019    | Jul. 11, 2020     |
| Horn Antenna<br>1G-18G  | SCHWARZBECK                | BBHA 9120 D              | BBHA 9120 D 1096 | Dec. 12, 2019    | Dec. 11, 2020     |
| Horn Antenna<br>18G-40G | SCHWARZBECK                | BBHA 9170                | BBHA 9170517     | Nov. 15, 2019    | Nov. 14, 2020     |
| Loop Antenna            | R&S                        | HFH2-Z2                  | 100330           | Nov. 13, 2019    | Nov. 12, 2020     |
| Loop Antenna Cable      | KOAX KABEL                 | 101354-BW                | 101354-BW        | Oct. 07, 2019    | Oct. 06, 2020     |
| Preamplifier            | EMC                        | EMC02325                 | 980225           | Jul. 09, 2019    | Jul. 08, 2020     |
| Preamplifier            | Agilent                    | 83017A                   | MY39501308       | Oct. 08, 2019    | Oct. 07, 2020     |
| Preamplifier            | EMC                        | EMC184045B               | 980192           | Aug. 01, 2019    | Jul. 31, 2020     |
| RF Cable                | EMC                        | EMC104-SM-SM-80<br>00    | 181106           | Oct. 07, 2019    | Oct. 06, 2020     |
| RF Cable                | HUBER+SUHNER               | SUCOFLEX104              | MY16019/4        | Oct. 07, 2019    | Oct. 06, 2020     |
| RF Cable                | HUBER+SUHNER               | SUCOFLEX104              | MY16014/4        | Oct. 07, 2019    | Oct. 06, 2020     |
| LF cable 1M             | EMC                        | EMCCFD400-NM-N<br>M-1000 | 160502           | Oct. 07, 2019    | Oct. 06, 2020     |
| LF cable 3M             | Woken                      | CFD400NL-LW              | CFD400NL-001     | Oct. 07, 2019    | Oct. 06, 2020     |
| LF cable 10M            | Woken                      | CFD400NL-LW              | CFD400NL-002     | Oct. 07, 2019    | Oct. 06, 2020     |
| Measurement<br>Software | AUDIX                      | e3                       | 6.120210g        | NA               | NA                |

Note: Calibration Interval of instruments listed above is one year.

### 1.3 Test Standards

47 CFR FCC Part 15.247  
47 CFR FCC Part 15.209  
ANSI C63.10-2013

### 1.4 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

### 1.5 Deviation from Test Standard and Measurement Procedure

None

### 1.6 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

| Measurement Uncertainty       |               |
|-------------------------------|---------------|
| Parameters                    | Uncertainty   |
| Radiated emission $\leq$ 1GHz | $\pm 3.41$ dB |
| Radiated emission $>$ 1GHz    | $\pm 4.59$ dB |

## 2 Test Configuration

### 2.1 Testing Facility

|                             |   |
|-----------------------------|---|
| <b>Test Laboratory</b>      | International Certification Corp.   |
| <b>Test Site</b>            | 03CH01-WS   |
| <b>Address of Test Site</b> | No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C. |

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

### 2.2 The Worst Test Modes and Channel Details

| Test item   | Test Mode                           | Test Configuration |
|---|-------------------------------------|--------------------|
| Radiated Emissions  | NFMI 10.579 MHz + BT 8DPSK 2480 MHz | --                 |
| NOTE:   |                                     |                    |
| 1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The Z-plane results were found as the worst case and were shown in this report. |                                     |                    |
| 2. The selected channel of BT is the maximum power channel of BT mode.  |                                     |                    |



## 3 Transmitter Test Results

### 3.1 Unwanted Emissions into Restricted Frequency Bands

#### 3.1.1 Limit of Unwanted Emissions into Restricted Frequency Bands

| Restricted Band Emissions Limit |                       |                         |                      |
|---------------------------------|-----------------------|-------------------------|----------------------|
| Frequency Range (MHz)           | Field Strength (uV/m) | Field Strength (dBuV/m) | Measure Distance (m) |
| 0.009~0.490                     | 2400/F(kHz)           | 48.5 - 13.8             | 300                  |
| 0.490~1.705                     | 24000/F(kHz)          | 33.8 - 23               | 30                   |
| 1.705~30.0                      | 30                    | 29                      | 30                   |
| 30~88                           | 100                   | 40                      | 3                    |
| 88~216                          | 150                   | 43.5                    | 3                    |
| 216~960                         | 200                   | 46                      | 3                    |
| Above 960                       | 500                   | 54                      | 3                    |

**Note 1:**  
 Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

**Note 2:**  
 Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

#### 3.1.2 Test Procedures

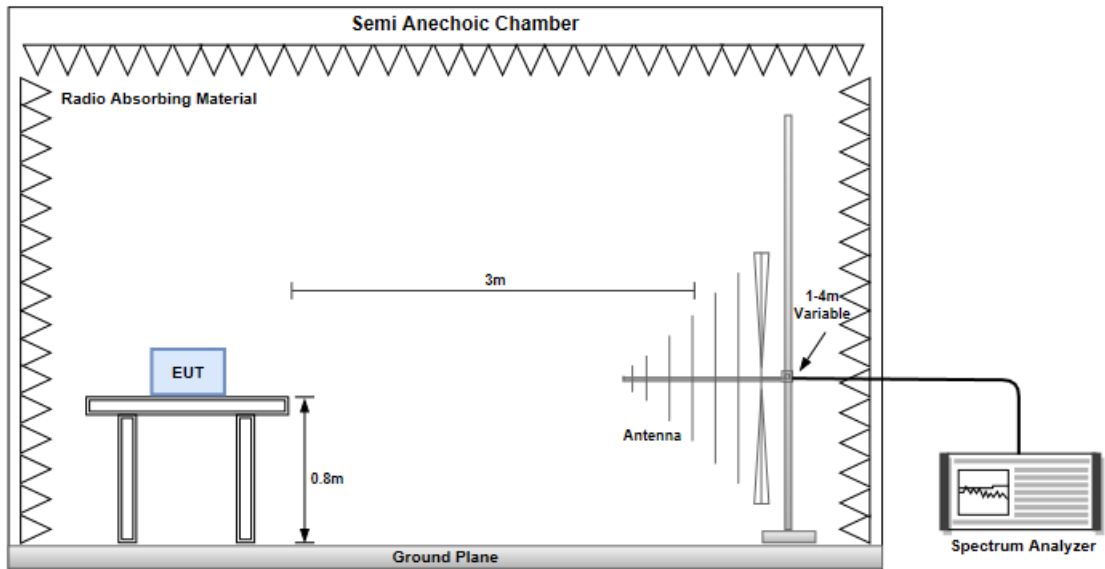
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

**Note:**

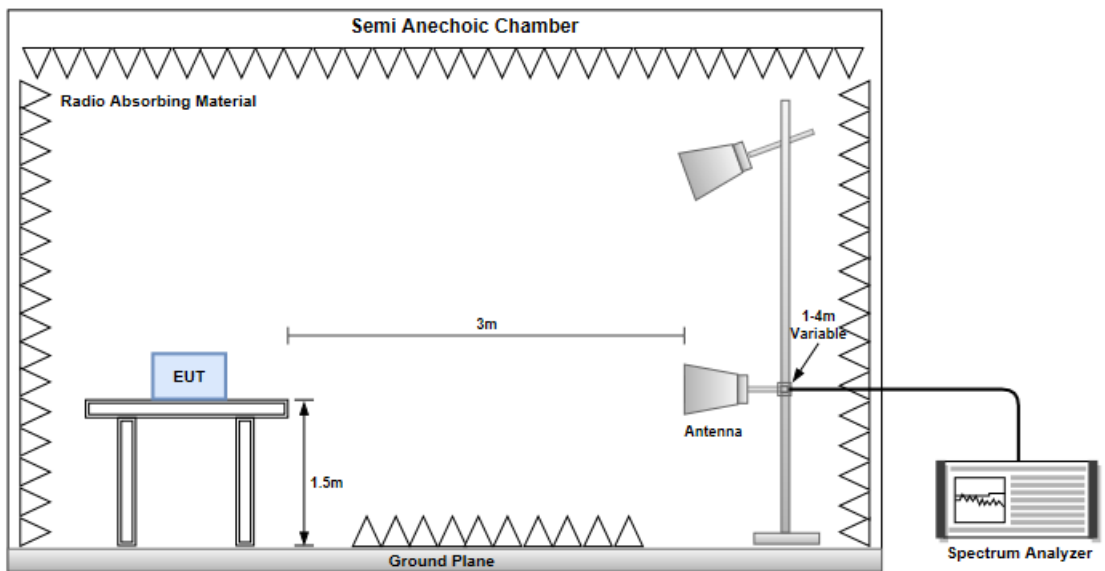
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

### 3.1.3 Test Setup

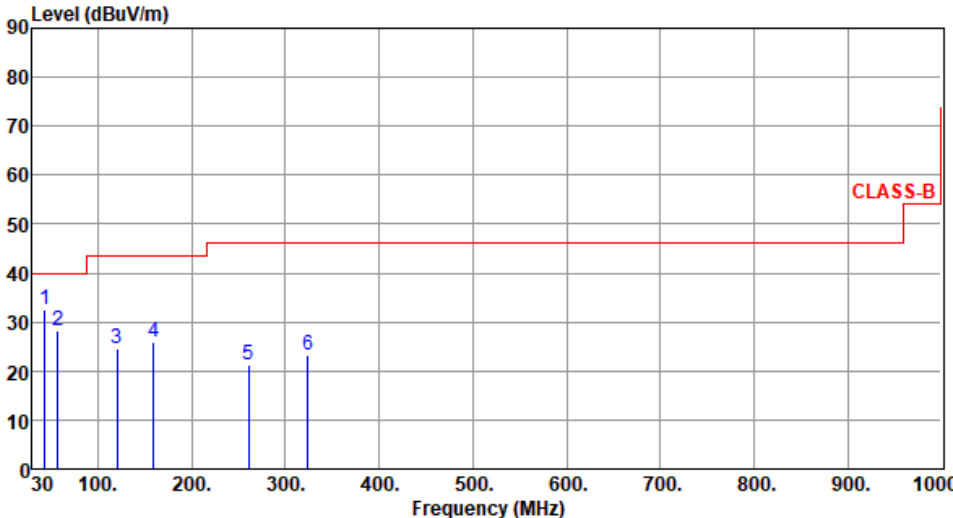
#### Radiated Emissions below 1 GHz



#### Radiated Emissions above 1 GHz

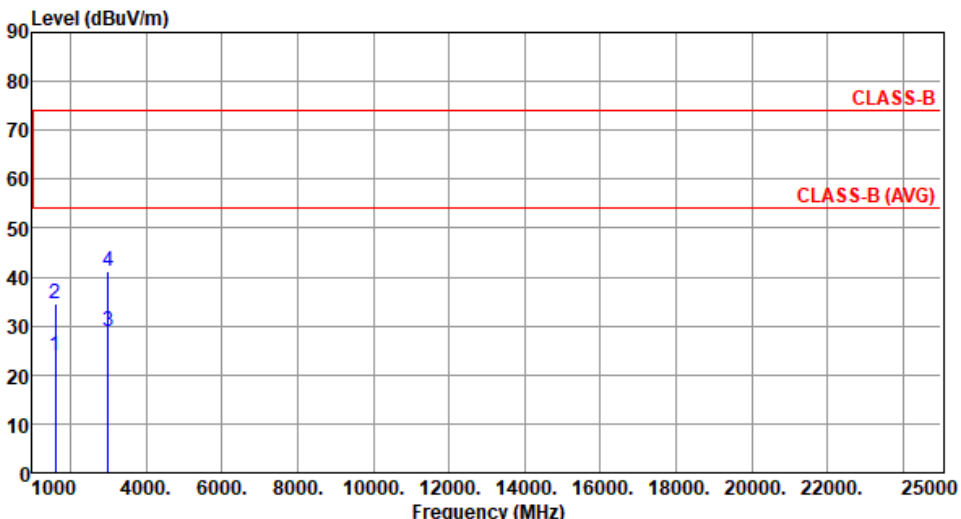


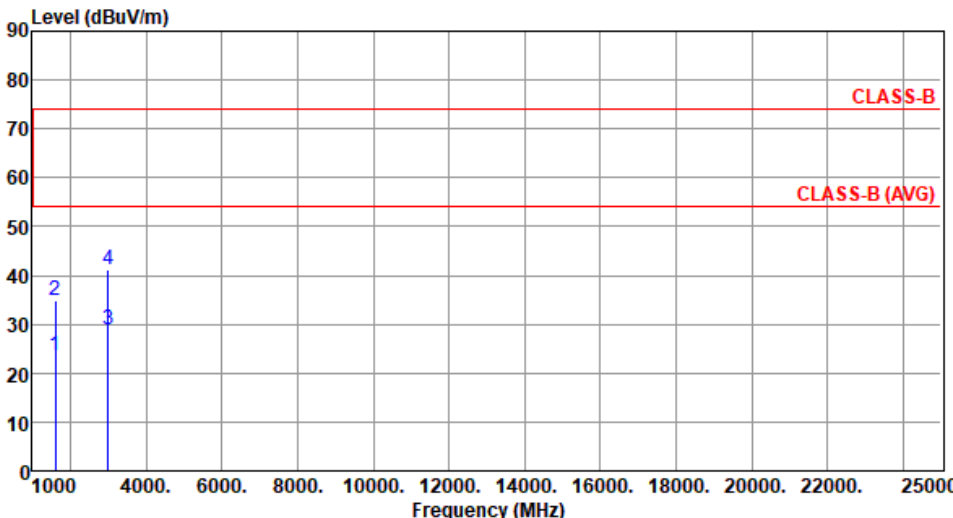


|  |                                     |          |                     |        |         |                 |        |      |       |  |
|--|-------------------------------------|----------|---------------------|--------|---------|-----------------|--------|------|-------|--|
| <b>Test Mode</b>   | NFMI 10.579 MHz + BT 8DPSK 2480 MHz |          |                     |        |         |                 |        |      |       |  |
| <b>Polarization</b>  | Vertical                            |          |                     |        |         |                 |        |      |       |  |
| Test By : Akun Chung   |                                     |          | Temperature(°C): 25 |        |         | Humidity(%): 65 |        |      |       |  |
|  |                                     |          |                     |        |         |                 |        |      |       |  |
|  | Freq.                               | Emission | Limit               | Margin | SA      | Factor          | Remark | ANT  | Turn  |  |
|  | MHz                                 | level    | dBuV/m              | dB     | reading | dB              |        | High | Table |  |
|  |                                     | dBuV/m   |                     |        | dBuV    |                 |        | cm   | deg   |  |
| 1  | 43.58                               | 32.69    | 40.00               | -7.31  | 41.27   | -8.58           | Peak   | ---  | ---   |  |
| 2  | 57.16                               | 28.14    | 40.00               | -11.86 | 37.00   | -8.86           | Peak   | ---  | ---   |  |
| 3  | 120.21                              | 24.50    | 43.50               | -19.00 | 35.54   | -11.04          | Peak   | ---  | ---   |  |
| 4  | 159.01                              | 25.81    | 43.50               | -17.69 | 34.53   | -8.72           | Peak   | ---  | ---   |  |
| 5  | 260.86                              | 21.19    | 46.00               | -24.81 | 31.03   | -9.84           | Peak   | ---  | ---   |  |
| 6  | 323.91                              | 23.20    | 46.00               | -22.80 | 30.87   | -7.67           | Peak   | ---  | ---   |  |

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor\* (dB)  
\*Factor includes antenna factor , cable loss and amplifier gain  
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).  
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

### 3.1.5 Transmitter Radiated Unwanted Emissions (Above 1GHz)

|   |                                     |          |                     |        |         |                 |         |      |       |  |
|---|-------------------------------------|----------|---------------------|--------|---------|-----------------|---------|------|-------|--|
| <b>Test Mode</b>  | NFMI 10.579 MHz + BT 8DPSK 2480 MHz |          |                     |        |         |                 |         |      |       |  |
| <b>Polarization</b>   | Horizontal                          |          |                     |        |         |                 |         |      |       |  |
| Test By : Roger Lu  |                                     |          | Temperature(°C): 24 |        |         | Humidity(%): 65 |         |      |       |  |
|  <p>The graph displays the radiated unwanted emission levels in dBuV/m across a frequency range from 1000 MHz to 25000 MHz. Two horizontal red lines indicate the limits for CLASS-B (at approximately 74 dBuV/m) and CLASS-B (AVG) (at approximately 54 dBuV/m). Four vertical blue lines represent measured peaks at 1600 MHz (labeled 2) and 3000 MHz (labeled 3 and 4). The peak at 3000 MHz (labeled 4) is the highest, reaching approximately 41 dBuV/m.</p> |                                     |          |                     |        |         |                 |         |      |       |  |
|   | Freq.                               | Emission | Limit               | Margin | SA      | Factor          | Remark  | ANT  | Turn  |  |
|   | MHz                                 | level    | dBuV/m              | dB     | reading | dB              |         | High | Table |  |
|   |                                     | dBuV/m   |                     |        | dBuV    |                 |         | cm   | deg   |  |
| 1   | 1600.00                             | 23.75    | 54.00               | -30.25 | 30.47   | -6.72           | Average | 100  | 50    |  |
| 2   | 1600.00                             | 34.63    | 74.00               | -39.37 | 41.35   | -6.72           | Peak    | 100  | 50    |  |
| 3   | 3000.00                             | 29.02    | 54.00               | -24.98 | 30.26   | -1.24           | Average | 100  | 20    |  |
| 4   | 3000.00                             | 41.10    | 74.00               | -32.90 | 42.34   | -1.24           | Peak    | 100  | 20    |  |
| <p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)<br/>         *Factor includes antenna factor , cable loss and amplifier gain<br/>         Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>   |                                     |          |                     |        |         |                 |         |      |       |  |

|   |                                     |          |                    |        |         |                |         |      |       |  |
|---|-------------------------------------|----------|--------------------|--------|---------|----------------|---------|------|-------|--|
| <b>Test Mode</b>  | NFMI 10.579 MHz + BT 8DPSK 2480 MHz |          |                    |        |         |                |         |      |       |  |
| <b>Polarization</b>   | Vertical                            |          |                    |        |         |                |         |      |       |  |
| Test By :Roger Lu   |                                     |          | Temperature(°C):24 |        |         | Humidity(%):65 |         |      |       |  |
|   |                                     |          |                    |        |         |                |         |      |       |  |
|   | Freq.                               | Emission | Limit              | Margin | SA      | Factor         | Remark  | ANT  | Turn  |  |
|   | MHz                                 | level    | dBuV/m             | dB     | reading | dB             |         | High | Table |  |
|   |                                     | dBuV/m   |                    |        | dBuV    |                |         | cm   | deg   |  |
| 1   | 1600.00                             | 23.53    | 54.00              | -30.47 | 30.25   | -6.72          | Average | 100  | 60    |  |
| 2   | 1600.00                             | 34.76    | 74.00              | -39.24 | 41.48   | -6.72          | Peak    | 100  | 60    |  |
| 3   | 3000.00                             | 28.88    | 54.00              | -25.12 | 30.12   | -1.24          | Average | 100  | 30    |  |
| 4   | 3000.00                             | 41.32    | 74.00              | -32.68 | 42.56   | -1.24          | Peak    | 100  | 30    |  |
| <p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)<br/> *Factor includes antenna factor , cable loss and amplifier gain<br/> Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p> |                                     |          |                    |        |         |                |         |      |       |  |

## 4 Photographs of EUT

Please refer to Photographs of EUT, reference No. EP060501.

## 5 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

### **Linkou**

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333, Taiwan, R.O.C.

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City 333, Taiwan, R.O.C..

If you have any suggestion, please feel free to contact us as below information

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==END==