



# FCC CO-LOCATION RADIO TEST REPORT

FCC ID : PY7-26726G  
Equipment : GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII  
a/b/g/n/lac/lax, GPS, WPC and NFC  
Brand Name : Sony  
Applicant : Sony Corporation  
1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan  
Manufacturer : Sony Corporation  
1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan  
Standard : FCC Part 15 Subpart E §15.407

The product was received on Feb. 23, 2021 and testing was started from Mar. 17, 2021 and completed on Mar. 19, 2021. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

*Louis Wu*

Approved by: Louis Wu

**Sporton International Inc. Wensan Laboratory**

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)



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## History of this test report

| Report No. | Version | Description                                           | Issued Date   |
|------------|---------|-------------------------------------------------------|---------------|
| FR0D2215G  | 01      | Initial issue of report                               | Mar. 26, 2021 |
| FR0D2215G  | 02      | Add remark description in section 2.1                 | Apr. 07, 2021 |
| FR0D2215G  | 03      | 1. Revise LTE band 7 bandwidth<br>2. Remove test data | Apr. 14, 2021 |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |
|            |         |                                                       |               |

## Summary of Test Result

| Report Clause | Ref Std. Clause        | Test Items          | Result (PASS/FAIL) | Remark                                     |
|---------------|------------------------|---------------------|--------------------|--------------------------------------------|
| 3.1           | 15.407(b)              | Unwanted Emissions  | Pass               | Under limit<br>4.35 dB at<br>17956.000 MHz |
| 3.2           | 15.203 &<br>15.407 (a) | Antenna Requirement | 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.

Reviewed by: Wii Chang

Report Producer: Cindy Liu

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n/ac/ax, NFC, FM Receiver, WPC/WPT, and GNSS.

| Product Specification subjective to this standard |                                                  |
|---------------------------------------------------|--------------------------------------------------|
| Antenna Type                                      | <Ant. 0>: Loop Antenna<br><Ant. 1>: Loop Antenna |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

| EUT Information List |            |            |                            |
|----------------------|------------|------------|----------------------------|
| HW Version           | SW Version | S/N        | Performed Test Item        |
| A                    | 0.325      | QV7200H36F | Radiated Spurious Emission |

| Accessory List |                      |
|----------------|----------------------|
| AC Adapter     | Model Name : XQZ-UC1 |
|                | S/N : 0020W51300105  |
| Earphone       | Model Name : STH40D  |
|                | S/N : N/A            |
| USB Cable      | Model Name : XQZ-UB1 |
|                | S/N : N/A            |

**Note:**

1. Above EUT list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report.
3. For other wireless features of this EUT, test report will be issued separately.

## 1.2 Modification of EUT

No modifications are made to the EUT during all test items.

### 1.3 Testing Location

|                    |                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site          | Sporton International Inc. Wensan Laboratory                                                                                                  |
| Test Site Location | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| Test Site No.      | <b>Sporton Site No.</b><br>03CH16-HY                                                                                                          |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW0007

### 1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ ANSI C63.10-2013

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

### 2.1 Carrier Frequency and Channel

<Ant. 0>

| 2400-2483.5 MHz |             |
|-----------------|-------------|
| Bluetooth       |             |
| Channel         | Freq. (MHz) |
| 39              | 2480        |

MIMO <Ant. 0+1>

| 2400-2483.5 MHz |             |         |             | 5150-5350 MHz |             |
|-----------------|-------------|---------|-------------|---------------|-------------|
| 802.11b         |             | 802.11g |             | 802.11a       |             |
| Channel         | Freq. (MHz) | Channel | Freq. (MHz) | Channel       | Freq. (MHz) |
| 01              | 2412        | 01      | 2412        | 36            | 5180        |

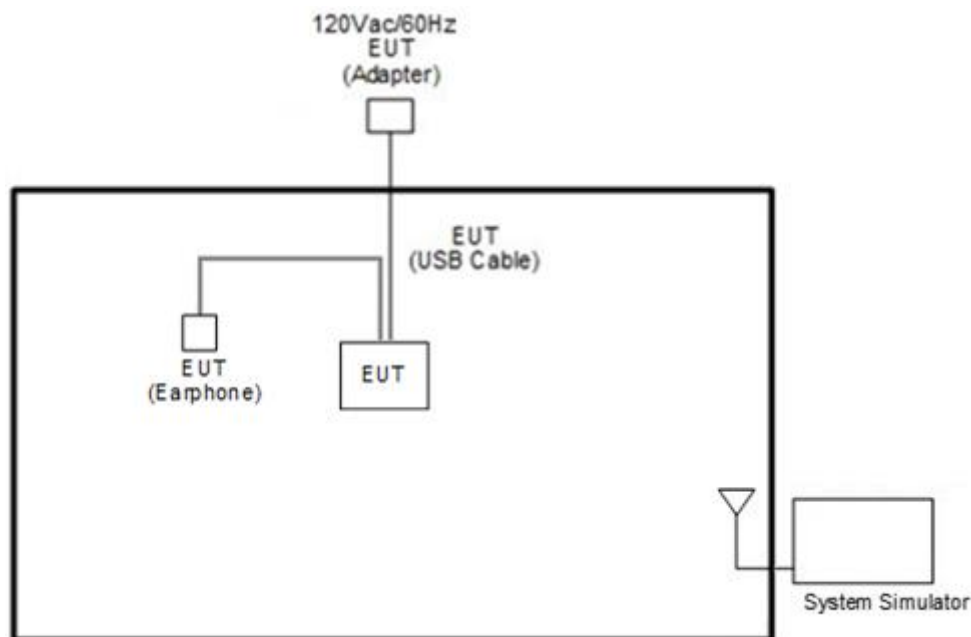
**Remark:** During the Radiated Spurious Emission test, the EUT turn on the WWAN functions simultaneously.

<Co-Location>

| Modulation                                                         | Data Rate          |
|--------------------------------------------------------------------|--------------------|
| 2.4GHz 802.11g for MIMO Ant. 0+1 + GSM850                          | MCS0 + GMSK        |
| 2.4GHz 802.11b for MIMO Ant. 0+1 + LTE Band 7                      | MCS0 + QPSK        |
| 5GHz 802.11a for MIMO Ant. 0+1 + Bluetooth for Ant. 0 + GSM850     | MCS0 + GFSK + GMSK |
| 5GHz 802.11a for MIMO Ant. 0+1 + Bluetooth for Ant. 0 + LTE Band 7 | MCS0 + GFSK + QPSK |

**Remark:** For Radiated Spurious Emission Test Items, Ant. 0 means Chain 0 and Ant. 1 means Chain 1.

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

| Item | Equipment        | Brand Name | Model Name | FCC ID | Data Cable | Power Cord      |
|------|------------------|------------|------------|--------|------------|-----------------|
| 1.   | System Simulator | Anritsu    | MT8820C    | N/A    | N/A        | Unshielded,1.8m |

## 2.4 EUT Operation Test Setup

The RF test items, utility "CMD" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

### 3 Test Result

#### 3.1 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

##### 3.1.1 Limit of Unwanted Emissions

- (1) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

| Frequency<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 – 0.490      | 2400/F(kHz)                          | 300                              |
| 0.490 – 1.705      | 24000/F(kHz)                         | 30                               |
| 1.705 – 30.0       | 30                                   | 30                               |
| 30 – 88            | 100                                  | 3                                |
| 88 – 216           | 150                                  | 3                                |
| 216 - 960          | 200                                  | 3                                |
| Above 960          | 500                                  | 3                                |

**Note:** The following formula is used to convert the EIRP to field strength.

$$E = \frac{1000000\sqrt{30P}}{3} \text{ } \mu\text{V/m, where P is the eirp (Watts)}$$

| EIRP (dBm) | Field Strength at 3m (dBμV/m) |
|------------|-------------------------------|
| - 27       | 68.3                          |

- (2) KDB789033 D02 v02r01 G)2)c)

- (i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.
- (ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

##### 3.1.2 Measuring Instruments

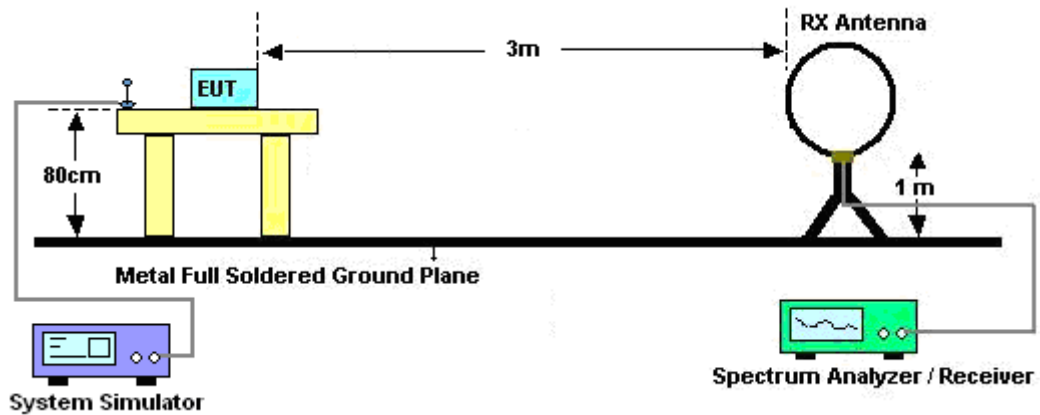
See list of measuring equipment of this test report.

### 3.1.3 Test Procedures

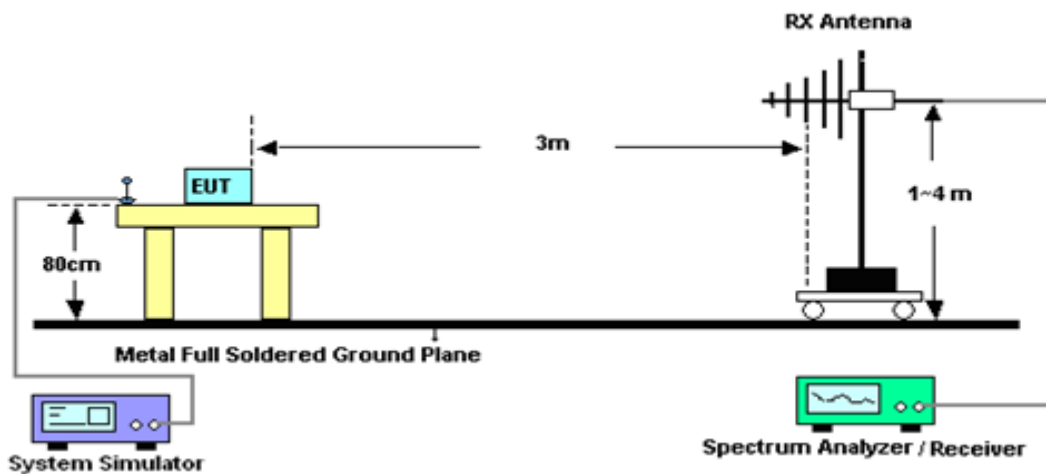
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.  
Section G) Unwanted emissions measurement.  
(1) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
  - RBW = 1 MHz
  - VBW  $\geq$  3 MHz
  - Detector = Peak
  - Sweep time = auto
  - Trace mode = max hold(2) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
  - RBW = 1 MHz
  - VBW = 10 Hz, when duty cycle is no less than 98 percent.
  - VBW  $\geq$  1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was placed on a turntable with 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 3.1.4 Test Setup

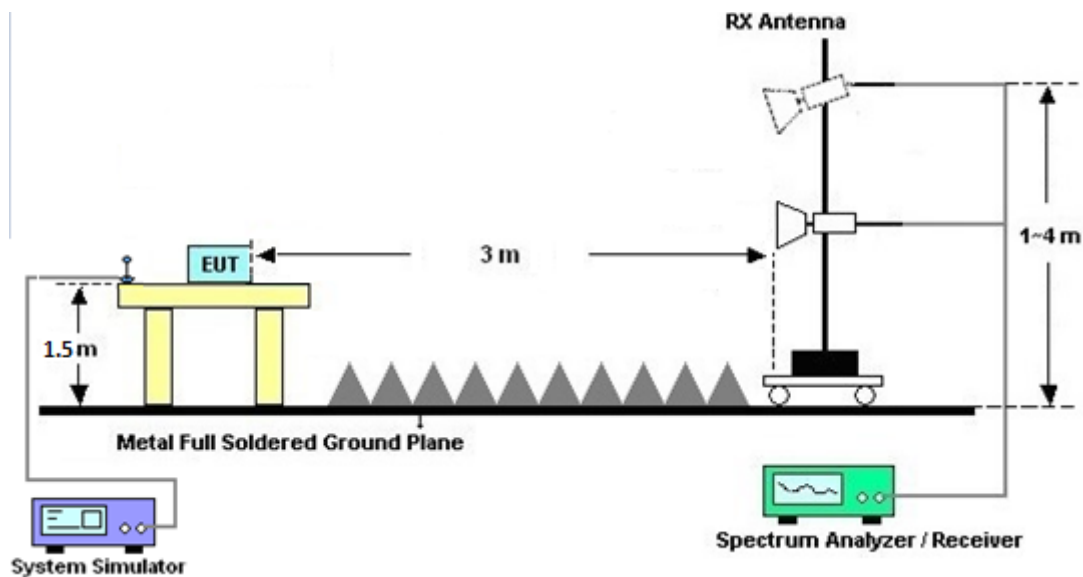
For radiated emissions below 30MHz



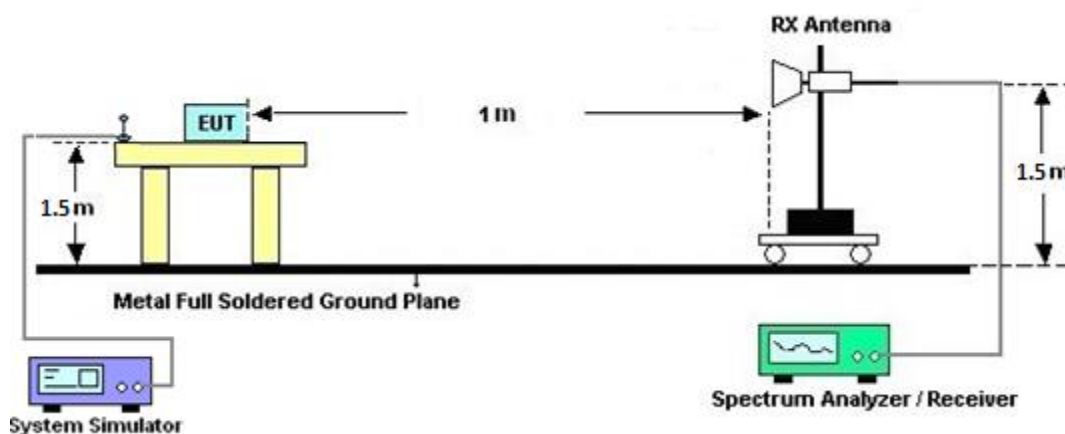
For radiated emissions from 30MHz to 1GHz



For radiated emissions from 1GHz to 18GHz



For radiated emissions above 18GHz



### 3.1.5 Test Result of Radiated Band Edges

Please refer to Appendix A and B.

### 3.1.6 Duty Cycle

Please refer to Appendix C.

### 3.1.7 Test Result of Unwanted Radiated Emission

Please refer to Appendix A and B.



## **3.2 Antenna Requirements**

### **3.2.1 Standard Applicable**

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **3.2.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.2.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 4 List of Measuring Equipment

| Instrument              | Brand Name        | Model No.                         | Serial No.         | Characteristics                  | Calibration Date | Test Date                       | Due Date      | Remark                   |
|-------------------------|-------------------|-----------------------------------|--------------------|----------------------------------|------------------|---------------------------------|---------------|--------------------------|
| Loop Antenna            | Rohde & Schwarz   | HFH2-Z2                           | 100488             | 9 kHz~30 MHz                     | Jul. 14, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Jul. 13, 2021 | Radiation<br>(03CH16-HY) |
| Bilog Antenna           | TESEQ             | CBL 6111D &<br>00802N1D01<br>N-06 | 47020 & 06         | 30MHz to 1GHz                    | Oct. 11, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Oct. 10, 2021 | Radiation<br>(03CH16-HY) |
| Amplifier               | SONOMA            | 310N                              | 371607             | 9kHz~1G                          | Sep. 30, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Sep. 29, 2021 | Radiation<br>(03CH16-HY) |
| Horn Antenna            | SCHWARZBE<br>CK   | BBHA 9120 D                       | 9120D-1522         | 1G~18GHz                         | Sep. 29, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Sep. 28, 2021 | Radiation<br>(03CH16-HY) |
| Amplifier               | EMCI              | EMC051845S<br>E                   | 980729             | 1-18GHz                          | Jul. 10, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Jul. 09, 2021 | Radiation<br>(03CH16-HY) |
| SHF-EHF Horn<br>Antenna | SCHWARZBE<br>CK   | BBHA 9170                         | BBHA91705<br>76    | 18GHz ~40GHz                     | May 22, 2020     | Mar. 17, 2021~<br>Mar. 19, 2021 | May 21, 2021  | Radiation<br>(03CH16-HY) |
| Preamplifier            | Keysight          | 83017A                            | MY5327026<br>4     | 1GHz~26.5GHz                     | Dec. 10, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Dec. 09, 2021 | Radiation<br>(03CH16-HY) |
| EMI Test<br>Receiver    | Keysight          | N9038A                            | MY5905301<br>2     | 3Hz~26.5GHz                      | Nov. 18, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Nov. 17, 2021 | Radiation<br>(03CH16-HY) |
| Spectrum<br>Analyzer    | Agilent           | N9010A                            | MY53470118         | 10Hz~44GHz                       | Jan. 15, 2021    | Mar. 17, 2021~<br>Mar. 19, 2021 | Jan. 14, 2022 | Radiation<br>(03CH16-HY) |
| RF Cable                | HUBER +<br>SUHNER | SUCOFLEX<br>104                   | MY11680/4P<br>E    | NA                               | Aug. 29, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Aug. 28, 2021 | Radiation<br>(03CH16-HY) |
| RF Cable                | HUBER +<br>SUHNER | SUCOFLEX<br>104                   | MY11688/4P<br>E    | NA                               | Aug. 29, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Aug. 28, 2021 | Radiation<br>(03CH16-HY) |
| RF Cable                | HUBER +<br>SUHNER | SUCOFLEX<br>102                   | EC-A5-300-5<br>757 | NA                               | Aug. 29, 2020    | Mar. 17, 2021~<br>Mar. 19, 2021 | Aug. 28, 2021 | Radiation<br>(03CH16-HY) |
| Software                | Audix             | E3<br>6.2009-8-24                 | RK-001136          | N/A                              | N/A              | Mar. 17, 2021~<br>Mar. 19, 2021 | N/A           | Radiation<br>(03CH16-HY) |
| Controller              | ChainTek          | 3000-1                            | N/A                | Control Turn<br>table & Ant Mast | N/A              | Mar. 17, 2021~<br>Mar. 19, 2021 | N/A           | Radiation<br>(03CH16-HY) |
| Antenna Mast            | ChainTek          | MBS-520-1                         | N/A                | 1m~4m                            | N/A              | Mar. 17, 2021~<br>Mar. 19, 2021 | N/A           | Radiation<br>(03CH16-HY) |
| Turn Table              | ChainTek          | T-200-S-1                         | N/A                | 0~360 Degree                     | N/A              | Mar. 17, 2021~<br>Mar. 19, 2021 | N/A           | Radiation<br>(03CH16-HY) |

## 5 Uncertainty of Evaluation

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.5 |
|-------------------------------------------------------------------------|-----|

### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 6.3 |
|-------------------------------------------------------------------------|-----|

### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

|                                                                         |     |
|-------------------------------------------------------------------------|-----|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 4.7 |
|-------------------------------------------------------------------------|-----|



## Appendix A. Radiated Spurious Emission

|                 |                                 |                     |         |
|-----------------|---------------------------------|---------------------|---------|
| Test Engineer : | Karl Hou, CR Liro and Andy Yang | Temperature :       | 20~25°C |
|                 |                                 | Relative Humidity : | 50~60%  |

WIFI 802.11g\_Tx\_Ch01+ WWAN GSM850 CH189 Link

2.4GHz 2400~2483.5MHz

WLAN 802.11g (Band Edge @ 3m)

| WIFI<br>Ant.<br>0+1         | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-----------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11g<br>CH 01<br>2412MHz |      | 2390                 | 56.93               | -17.07                  | 74                          | 41.17                     | 27.56                         | 8.56                   | 30.28                      | 107                  | 29                      | P                       | H               |
|                             |      | 2390                 | 45.44               | -8.56                   | 54                          | 29.68                     | 27.56                         | 8.56                   | 30.28                      | 107                  | 29                      | A                       | H               |
|                             | *    | 2412                 | 106.11              | -                       | -                           | 90.38                     | 27.48                         | 8.6                    | 30.27                      | 107                  | 29                      | P                       | H               |
|                             | *    | 2412                 | 98.74               | -                       | -                           | 83.01                     | 27.48                         | 8.6                    | 30.27                      | 107                  | 29                      | A                       | H               |
|                             |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | H               |
|                             |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | H               |
|                             |      | 2367.75              | 56.33               | -17.67                  | 74                          | 40.49                     | 27.69                         | 8.52                   | 30.29                      | 290                  | 111                     | P                       | V               |
|                             |      | 2390                 | 44.43               | -9.57                   | 54                          | 28.67                     | 27.56                         | 8.56                   | 30.28                      | 290                  | 111                     | A                       | V               |
|                             | *    | 2412                 | 102.2               | -                       | -                           | 86.47                     | 27.48                         | 8.6                    | 30.27                      | 290                  | 111                     | P                       | V               |
|                             | *    | 2412                 | 94.68               | -                       | -                           | 78.95                     | 27.48                         | 8.6                    | 30.27                      | 290                  | 111                     | A                       | V               |
|                             |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | V               |
|                             |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | V               |

**WIFI 802.11g\_Tx\_Ch01+ WWAN GSM850 CH189 Link****WIFI 802.11g (Harmonic @ 3m)**

| WIFI<br>Ant.<br>0+1                  | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>(P/A) | Pol.<br>(H/V) |
|--------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-----------------------|---------------|
| <b>802.11g<br/>CH 01<br/>2412MHz</b> |      | 4824                 | 40.3                | -33.7                   | 74                          | 51.15                     | 31.15                         | 13.36                  | 55.36                      | 100                  | 0                       | P                     | H             |
|                                      |      | 17880                | 58.23               | -15.77                  | 74                          | 43.03                     | 46.82                         | 25.63                  | 57.25                      | 100                  | 0                       | P                     | H             |
|                                      |      | 17880                | 48.21               | -5.79                   | 54                          | 33.01                     | 46.82                         | 25.63                  | 57.25                      | 100                  | 0                       | A                     | H             |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                       | H             |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                       | H             |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                       | H             |
|                                      |      | 4824                 | 40.23               | -33.77                  | 74                          | 51.08                     | 31.15                         | 13.36                  | 55.36                      | 100                  | 0                       | P                     | V             |
|                                      |      | 17925                | 58.74               | -15.26                  | 74                          | 42.65                     | 47.72                         | 25.64                  | 57.27                      | 100                  | 0                       | P                     | V             |
|                                      |      | 17925                | 48.75               | -5.25                   | 54                          | 32.66                     | 47.72                         | 25.64                  | 57.27                      | 100                  | 0                       | A                     | V             |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                       | V             |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                       | V             |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                       | V             |



## Emission above 18GHz

| WIFI                       | Note                                                                       | Frequency | Level      | Over   | Limit      | Read   | Antenna  | Path   | Preamp | Ant    | Table   | Peak  | Pol.  |
|----------------------------|----------------------------------------------------------------------------|-----------|------------|--------|------------|--------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                       |                                                                            |           |            | Limit  | Line       | Level  | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 0+1                        |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | (dBμV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11g+<br>GSM 850<br>SHF |                                                                            | 23075     | 40.6       | -33.4  | 74         | 43.01  | 38.68    | 12.47  | 53.56  | 150    | 0       | P     | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                            |                                                                            | 20576     | 40.09      | -33.91 | 74         | 44.29  | 38.06    | 11.22  | 53.48  | 150    | 0       | P     | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                            |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
| Remark                     | 1. No other spurious found.<br>2. All results are PASS against limit line. |           |            |        |            |        |          |        |        |        |         |       |       |



Emission below 1GHz

| WIFI                           | Note                                                                       | Frequency | Level      | Over   | Limit      | Read   | Antenna  | Path   | Preamp | Ant    | Table   | Peak  | Pol.  |
|--------------------------------|----------------------------------------------------------------------------|-----------|------------|--------|------------|--------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                           |                                                                            |           |            | Limit  | Line       | Level  | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 0+1                            |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | (dBμV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11g+<br>GSM 850 Link<br>LF |                                                                            | 78.5      | 25.02      | -14.98 | 40         | 43.06  | 13.35    | 1.32   | 32.71  | -      | -       | P     | H     |
|                                |                                                                            | 99.84     | 25.84      | -17.66 | 43.5       | 40.82  | 16.07    | 1.55   | 32.6   | -      | -       | P     | H     |
|                                |                                                                            | 159.01    | 24.76      | -18.74 | 43.5       | 38.82  | 16.7     | 2.02   | 32.78  | -      | -       | P     | H     |
|                                |                                                                            | 184.23    | 30.52      | -12.98 | 43.5       | 46.13  | 15.03    | 2.22   | 32.86  | -      | -       | P     | H     |
|                                |                                                                            | 585.81    | 27.68      | -18.32 | 46         | 30.37  | 25.82    | 4.16   | 32.67  | -      | -       | P     | H     |
|                                |                                                                            | 938.89    | 33.94      | -12.06 | 46         | 30.07  | 30.27    | 5.41   | 31.81  | 100    | 0       | P     | H     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                |                                                                            | 38.73     | 34.72      | -5.28  | 40         | 46.57  | 20.12    | 0.81   | 32.78  | 100    | 19      | Q     | V     |
|                                |                                                                            | 95.96     | 33.91      | -9.59  | 43.5       | 49.54  | 15.49    | 1.5    | 32.62  | -      | -       | P     | V     |
|                                |                                                                            | 185.2     | 32.14      | -11.36 | 43.5       | 47.73  | 15.04    | 2.23   | 32.86  | -      | -       | P     | V     |
|                                |                                                                            | 408.3     | 28.7       | -17.3  | 46         | 35.26  | 22.4     | 3.43   | 32.39  | -      | -       | P     | V     |
|                                |                                                                            | 666.32    | 28.65      | -17.35 | 46         | 30.25  | 26.45    | 4.44   | 32.49  | -      | -       | P     | V     |
|                                |                                                                            | 945.68    | 33.72      | -12.28 | 46         | 29.32  | 30.68    | 5.43   | 31.71  | -      | -       | P     | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
| Remark                         | 1. No other spurious found.<br>2. All results are PASS against limit line. |           |            |        |            |        |          |        |        |        |         |       |       |



## WIFI 802.11b\_Tx\_Ch01+ WWAN LTE B7 BW: 10MHz CH20800 Link

2.4GHz 2400~2483.5MHz

WLAN 802.11b (Band Edge @ 3m)

| WIFI<br>Ant.                | Note | Frequency | Level      | Over<br>Limit | Limit<br>Line | Read<br>Level | Antenna<br>Factor | Path<br>Loss | Preamp<br>Factor | Ant<br>Pos | Table<br>Pos | Peak<br>Avg. | Pol.    |
|-----------------------------|------|-----------|------------|---------------|---------------|---------------|-------------------|--------------|------------------|------------|--------------|--------------|---------|
| 0+1                         |      | ( MHz )   | ( dBμV/m ) | ( dB )        | ( dBμV/m )    | ( dBμV )      | ( dB/m )          | ( dB )       | ( dB )           | ( cm )     | ( deg )      | ( P/A )      | ( H/V ) |
| 802.11b<br>CH 01<br>2412MHz |      | 2353.575  | 56.54      | -17.46        | 74            | 40.64         | 27.78             | 18.41        | 30.29            | 363        | 30           | P            | H       |
|                             |      | 2351.055  | 44.11      | -9.89         | 54            | 28.2          | 27.79             | 18.41        | 30.29            | 363        | 30           | A            | H       |
|                             | *    | 2412      | 103.64     | 29.64         | -             | -             | 27.48             | 18.52        | 30.27            | 363        | 30           | P            | H       |
|                             | *    | 2412      | 100.49     | 46.49         | -             | -             | 27.48             | 18.52        | 30.27            | 363        | 30           | A            | H       |
|                             |      |           |            |               |               |               |                   |              |                  |            |              |              | H       |
|                             |      |           |            |               |               |               |                   |              |                  |            |              |              | H       |
|                             |      | 2311.47   | 56.39      | -17.61        | 74            | 40.47         | 27.88             | 18.34        | 30.3             | 300        | 265          | P            | V       |
|                             |      | 2352.63   | 44.14      | -9.86         | 54            | 28.24         | 27.78             | 18.41        | 30.29            | 300        | 265          | A            | V       |
|                             | *    | 2412      | 98.48      | 24.48         | -             | -             | 27.48             | 18.52        | 30.27            | 300        | 265          | P            | V       |
|                             | *    | 2412      | 95.32      | 41.32         | -             | -             | 27.48             | 18.52        | 30.27            | 300        | 265          | A            | V       |
|                             |      |           |            |               |               |               |                   |              |                  |            |              |              | V       |
|                             |      |           |            |               |               |               |                   |              |                  |            |              |              | V       |

**WIFI 802.11b\_Tx\_Ch01+ WWAN LTE B7 BW: 10MHz CH20800 Link****WIFI 802.11g (Harmonic @ 3m)**

| WIFI<br>Ant.<br>0+1                  | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|--------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| <b>802.11b<br/>CH 01<br/>2412MHz</b> |      | 4824                 | 40.5                | -33.5                   | 74                          | 51.35                     | 31.15                         | 13.36                  | 55.36                      | 100                  | 0                       | P                       | H               |
|                                      |      | 17955                | 60.23               | -13.77                  | 74                          | 43.5                      | 48.35                         | 25.66                  | 57.28                      | 100                  | 0                       | P                       | H               |
|                                      |      | 17955                | 48.83               | -5.17                   | 54                          | 32.1                      | 48.35                         | 25.66                  | 57.28                      | 100                  | 0                       | A                       | H               |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | H               |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | H               |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | H               |
|                                      |      | 4824                 | 40.22               | -33.78                  | 74                          | 51.07                     | 31.15                         | 13.36                  | 55.36                      | 100                  | 0                       | P                       | V               |
|                                      |      | 17985                | 60.19               | -13.81                  | 74                          | 42.82                     | 48.99                         | 25.67                  | 57.29                      | 100                  | 0                       | P                       | V               |
|                                      |      | 17985                | 49.34               | -4.66                   | 54                          | 31.97                     | 48.99                         | 25.67                  | 57.29                      | 100                  | 0                       | A                       | V               |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | V               |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | V               |
|                                      |      |                      |                     |                         |                             |                           |                               |                        |                            |                      |                         |                         | V               |

**WIFI 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN GSM850 CH189 Link****Band 1 - 5150~5250MHz****WIFI 802.11a (Band Edge @ 3m)**

| WIFI<br>Ant.<br>0+1                  | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>(P/A) | Pol.<br>(H/V) |
|--------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-----------------------|---------------|
| <b>802.11a<br/>CH 36<br/>5180MHz</b> |      | 5005.98              | 53.2                | -20.8                   | 74                          | 38.47                   | 31.51                         | 12.87                  | 29.65                      | 242                  | 314                     | P                     | H             |
|                                      |      | 5150                 | 41.19               | -12.81                  | 54                          | 26.01                   | 31.8                          | 13.05                  | 29.67                      | 242                  | 314                     | A                     | H             |
|                                      | *    | 5180                 | 107.41              | -                       | -                           | 92.32                   | 31.68                         | 13.09                  | 29.68                      | 242                  | 314                     | P                     | H             |
|                                      | *    | 5180                 | 100.29              | -                       | -                           | 85.2                    | 31.68                         | 13.09                  | 29.68                      | 242                  | 314                     | A                     | H             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | H             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | H             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | V             |
|                                      |      | 5148.2               | 53.71               | -20.29                  | 74                          | 38.53                   | 31.8                          | 13.05                  | 29.67                      | 350                  | 4                       | P                     | V             |
|                                      |      | 5149.24              | 40.76               | -13.24                  | 54                          | 25.58                   | 31.8                          | 13.05                  | 29.67                      | 350                  | 4                       | A                     | V             |
|                                      | *    | 5180                 | 105.18              | -                       | -                           | 90.09                   | 31.68                         | 13.09                  | 29.68                      | 350                  | 4                       | P                     | V             |
|                                      | *    | 5180                 | 97.57               | -                       | -                           | 82.48                   | 31.68                         | 13.09                  | 29.68                      | 350                  | 4                       | A                     | V             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | V             |

**Bluetooth (1M) (Band Edge @ 3m)**

| BT                                                 | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|----------------------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| <b>Bluetooth<br/>(1Mbps)<br/>CH 39<br/>2441MHz</b> |      | 2363.06              | 46.43               | -27.57                  | 74                          | 40.49                     | 27.72                         | 8.51                   | 30.29                      | 100                  | 199                     | P                       | H               |
|                                                    |      | 2363.06              | 21.67               | -32.33                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                                    | *    | 2441                 | 100.98              | -                       | -                           | -                         | 27.42                         | 8.66                   | 30.27                      | 100                  | 199                     | P                       | H               |
|                                                    | *    | 2441                 | 76.22               | -                       | -                           | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                                    |      | 2493.28              | 46.3                | -27.7                   | 74                          | 40.39                     | 27.4                          | 8.76                   | 30.25                      | 100                  | 199                     | P                       | H               |
|                                                    |      | 2493.28              | 21.54               | -32.46                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                                    |      | 2346.96              | 46.57               | -27.43                  | 74                          | 40.57                     | 27.81                         | 8.48                   | 30.29                      | 141                  | 68                      | P                       | V               |
|                                                    |      | 2346.96              | 21.81               | -32.19                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |
|                                                    | *    | 2441                 | 102.74              | -                       | -                           | -                         | 27.42                         | 8.66                   | 30.27                      | 141                  | 68                      | P                       | V               |
|                                                    | *    | 2441                 | 77.98               | -                       | -                           | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |
|                                                    |      | 2496.22              | 45.67               | -28.33                  | 74                          | 39.75                     | 27.4                          | 8.77                   | 30.25                      | 141                  | 68                      | P                       | V               |
|                                                    |      | 2496.22              | 20.91               | -33.09                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |



**WIFI 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN GSM850 CH189 Link**  
**(Harmonic @ 3m)**

| ANT                                               | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|---------------------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| <b>11a_Ch36+<br/>BT_Ch39+<br/>GSM850<br/>Link</b> |      | 4882                 | 55.93               | -18.07                  | 74                          | 39.86                     | 31.14                         | 14.56                  | 29.63                      | 100                  | 0                       | P                       | H               |
|                                                   |      | 4882                 | 31.17               | -22.83                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                                   |      | 7323                 | 47.5                | -26.5                   | 74                          | 50.69                     | 36.45                         | 16.62                  | 56.26                      | 100                  | 0                       | P                       | H               |
|                                                   |      | 7323                 | 22.74               | -31.26                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                                   |      | 10360                | 57.82               | -10.38                  | 68.2                        | 55.22                     | 39.44                         | 19.39                  | 56.23                      | 100                  | 0                       | P                       | H               |
|                                                   |      | 15540                | 47.21               | -26.79                  | 74                          | 41.42                     | 37.98                         | 23.22                  | 55.41                      | 100                  | 0                       | P                       | H               |
|                                                   |      | 17967                | 59.65               | -14.35                  | 74                          | 42.89                     | 48.61                         | 25.44                  | 57.29                      | 100                  | 0                       | P                       | H               |
|                                                   |      | 17967                | 48.88               | -5.12                   | 54                          | 32.12                     | 48.61                         | 25.44                  | 57.29                      | 100                  | 0                       | A                       | H               |
|                                                   |      | 4882                 | 55.51               | -18.49                  | 74                          | 39.44                     | 31.14                         | 14.56                  | 29.63                      | 100                  | 0                       | P                       | V               |
|                                                   |      | 4882                 | 30.75               | -23.25                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |
|                                                   |      | 7323                 | 46.44               | -27.56                  | 74                          | 49.63                     | 36.45                         | 16.62                  | 56.26                      | 100                  | 0                       | P                       | V               |
|                                                   |      | 7323                 | 21.68               | -32.32                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |
|                                                   |      | 10360                | 55.81               | -12.39                  | 68.2                        | 53.21                     | 39.44                         | 19.39                  | 56.23                      | 100                  | 0                       | P                       | V               |
|                                                   |      | 15540                | 48.09               | -25.91                  | 74                          | 42.3                      | 37.98                         | 23.22                  | 55.41                      | 100                  | 0                       | P                       | V               |
|                                                   |      | 17967                | 59.41               | -14.59                  | 74                          | 42.65                     | 48.61                         | 25.44                  | 57.29                      | 100                  | 0                       | P                       | V               |
|                                                   |      | 17967                | 48.65               | -5.35                   | 54                          | 31.89                     | 48.61                         | 25.44                  | 57.29                      | 100                  | 0                       | A                       | V               |

**WLAN 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN LTE B7 BW: 10MHz CH20800****Band 1 - 5150~5250MHz****WIFI 802.11a (Band Edge @ 3m)**

| WIFI<br>Ant.<br>0+1                  | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>(P/A) | Pol.<br>(H/V) |
|--------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-----------------------|---------------|
| <b>802.11a<br/>CH 36<br/>5180MHz</b> |      | 5001.04              | 54.05               | -19.95                  | 74                          | 39.34                   | 31.5                          | 12.86                  | 29.65                      | 286                  | 300                     | P                     | H             |
|                                      |      | 5069.68              | 42.56               | -11.44                  | 54                          | 27.59                   | 31.68                         | 12.95                  | 29.66                      | 286                  | 300                     | A                     | H             |
|                                      | *    | 5180                 | 106.44              | -                       | -                           | 91.35                   | 31.68                         | 13.09                  | 29.68                      | 286                  | 300                     | P                     | H             |
|                                      | *    | 5180                 | 99.06               | -                       | -                           | 83.97                   | 31.68                         | 13.09                  | 29.68                      | 286                  | 300                     | A                     | H             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | H             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | H             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | V             |
|                                      |      | 5068.9               | 53.99               | -20.01                  | 74                          | 39.02                   | 31.68                         | 12.95                  | 29.66                      | 387                  | 345                     | P                     | V             |
|                                      |      | 5069.68              | 44.36               | -9.64                   | 54                          | 29.39                   | 31.68                         | 12.95                  | 29.66                      | 387                  | 345                     | A                     | V             |
|                                      | *    | 5180                 | 105.14              | -                       | -                           | 90.05                   | 31.68                         | 13.09                  | 29.68                      | 387                  | 345                     | P                     | V             |
|                                      | *    | 5180                 | 96.86               | -                       | -                           | 81.77                   | 31.68                         | 13.09                  | 29.68                      | 387                  | 345                     | A                     | V             |
|                                      |      |                      |                     |                         |                             |                         |                               |                        |                            |                      |                         |                       | V             |

**2.4GHz 2400~2483.5MHz****BT (Band Edge @ 3m)**

| BT                              | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>(P/A) | Pol.<br>(H/V) |
|---------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-----------------------|---------------|
| <b>BT<br/>CH 39<br/>2441MHz</b> |      | 2345.14              | 46.92               | -27.08                  | 74                          | 40.92                     | 27.81                         | 8.48                   | 30.29                      | 400                  | 303                     | P                     | H             |
|                                 |      | 2345.14              | 22.16               | -31.84                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                     | H             |
|                                 | *    | 2441                 | 100.03              | -                       | -                           | -                         | 27.42                         | 8.66                   | 30.27                      | 400                  | 303                     | P                     | H             |
|                                 | *    | 2441                 | 75.27               | -                       | -                           | -                         | -                             | -                      | -                          | -                    | -                       | A                     | H             |
|                                 |      | 2492.86              | 46.12               | -27.88                  | 74                          | 40.21                     | 27.4                          | 8.76                   | 30.25                      | 400                  | 303                     | P                     | H             |
|                                 |      | 2492.86              | 21.36               | -32.64                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                     | H             |
|                                 |      | 2333.94              | 46.71               | -27.29                  | 74                          | 40.72                     | 27.83                         | 8.46                   | 30.3                       | 301                  | 104                     | P                     | V             |
|                                 |      | 2333.94              | 21.95               | -32.05                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                     | V             |
|                                 | *    | 2441                 | 100.44              | -                       | -                           | -                         | 27.42                         | 8.66                   | 30.27                      | 301                  | 104                     | P                     | V             |
|                                 | *    | 2441                 | 75.68               | -                       | -                           | -                         | -                             | -                      | -                          | -                    | -                       | A                     | V             |
|                                 |      | 2483.97              | 47.18               | -26.82                  | 74                          | 41.29                     | 27.4                          | 8.74                   | 30.25                      | 301                  | 104                     | P                     | V             |
|                                 |      | 2483.97              | 22.42               | -31.58                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                     | V             |



## WIFI 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN LTE B7 BW: 10MHz CH20800 LINK

(Harmonic @ 3m)

| BT                                      | Note | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>( dBμV ) | Antenna<br>Factor<br>( dB/m ) | Path<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>( P/A ) | Pol.<br>( H/V ) |
|-----------------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 11a_Ch36+<br>BT_Ch39+<br>LTE B7<br>Link |      | 4882                 | 56.17               | -17.83                  | 74                          | 40.1                      | 31.14                         | 14.56                  | 29.63                      | 100                  | 0                       | P                       | H               |
|                                         |      | 4882                 | 31.41               | -22.59                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                         |      | 7323                 | 47.1                | -26.9                   | 74                          | 50.29                     | 36.45                         | 16.62                  | 56.26                      | 100                  | 0                       | P                       | H               |
|                                         |      | 7323                 | 22.34               | -31.66                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | H               |
|                                         |      | 10360                | 58.09               | -10.11                  | 68.2                        | 55.49                     | 39.44                         | 19.39                  | 56.23                      | 100                  | 0                       | P                       | H               |
|                                         |      | 15540                | 47.72               | -26.28                  | 74                          | 41.93                     | 37.98                         | 23.22                  | 55.41                      | 100                  | 0                       | P                       | H               |
|                                         |      | 17956                | 60.82               | -13.18                  | 74                          | 44.28                     | 48.38                         | 25.44                  | 57.28                      | 100                  | 0                       | P                       | H               |
|                                         |      | 17956                | 49.65               | -4.35                   | 54                          | 33.11                     | 48.38                         | 25.44                  | 57.28                      | 100                  | 0                       | A                       | H               |
|                                         |      | 4882                 | 54.88               | -19.12                  | 74                          | 38.81                     | 31.14                         | 14.56                  | 29.63                      | 100                  | 0                       | P                       | V               |
|                                         |      | 4882                 | 30.12               | -23.88                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |
|                                         |      | 7323                 | 46.25               | -27.75                  | 74                          | 49.44                     | 36.45                         | 16.62                  | 56.26                      | 100                  | 0                       | P                       | V               |
|                                         |      | 7323                 | 21.49               | -32.51                  | 54                          | -                         | -                             | -                      | -                          | -                    | -                       | A                       | V               |
|                                         |      | 10360                | 57.68               | -10.52                  | 68.2                        | 55.08                     | 39.44                         | 19.39                  | 56.23                      | 100                  | 0                       | P                       | V               |
|                                         |      | 15540                | 47.98               | -26.02                  | 74                          | 42.19                     | 37.98                         | 23.22                  | 55.41                      | 100                  | 0                       | P                       | V               |
|                                         |      | 17956                | 60.42               | -13.58                  | 74                          | 43.88                     | 48.38                         | 25.44                  | 57.28                      | 100                  | 0                       | P                       | V               |
|                                         |      | 17956                | 49.1                | -4.9                    | 54                          | 32.56                     | 48.38                         | 25.44                  | 57.28                      | 100                  | 0                       | A                       | V               |

## Emission above 18GHz

| WIFI                                    | Note                                                                       | Frequency | Level      | Over   | Limit      | Read   | Antenna  | Path   | Preamp | Ant    | Table   | Peak  | Pol.  |
|-----------------------------------------|----------------------------------------------------------------------------|-----------|------------|--------|------------|--------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                                    |                                                                            |           |            | Limit  | Line       | Level  | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 0+1                                     |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | (dBμV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 11a_Ch36+<br>BT_Ch39+<br>LTE B7<br>Link |                                                                            | 25502     | 41.07      | -27.13 | 68.2       | 40.84  | 39.8     | 23.37  | 53.4   | 150    | 0       | P     | H     |
|                                         |                                                                            | 34302     | 43.24      | -24.96 | 68.2       | 39.5   | 41.06    | 27.66  | 55.44  | 150    | 0       | P     | H     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | H     |
|                                         |                                                                            | 20574     | 38.87      | -35.13 | 74         | 43.08  | 38.06    | 20.76  | 53.49  | 150    | 0       | P     | V     |
|                                         |                                                                            | 30606     | 43.46      | -24.74 | 68.2       | 41.92  | 40.46    | 25.86  | 55.24  | 150    | 0       | P     | V     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
|                                         |                                                                            |           |            |        |            |        |          |        |        |        |         |       | V     |
| Remark                                  | 1. No other spurious found.<br>2. All results are PASS against limit line. |           |            |        |            |        |          |        |        |        |         |       |       |



## Emission below 1GHz

| WIFI                                 | Note                                                                       | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Path   | Preamp | Ant    | Table   | Peak  | Pol.  |
|--------------------------------------|----------------------------------------------------------------------------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|-------|-------|
| Ant.                                 |                                                                            |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |
| 0+1                                  |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 11a_Ch36+<br>BT_Ch39+<br>LTE B7 Link |                                                                            | 64.92     | 26.41      | -13.59 | 40         | 46.09    | 11.92    | 1.18   | 32.78  | -      | -       | P     | H     |
|                                      |                                                                            | 78.5      | 27.28      | -12.72 | 40         | 45.32    | 13.35    | 1.32   | 32.71  | -      | -       | P     | H     |
|                                      |                                                                            | 157.07    | 24.91      | -18.59 | 43.5       | 38.88    | 16.81    | 2      | 32.78  | -      | -       | P     | H     |
|                                      |                                                                            | 183.26    | 27.93      | -15.57 | 43.5       | 43.51    | 15.05    | 2.23   | 32.86  | -      | -       | P     | H     |
|                                      |                                                                            | 770.11    | 30.34      | -15.66 | 46         | 30.15    | 28.12    | 4.79   | 32.72  | -      | -       | P     | H     |
|                                      |                                                                            | 954.41    | 34.79      | -11.21 | 46         | 30       | 30.9     | 5.46   | 31.57  | 100    | 0       | P     | H     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | H     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | H     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | H     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | H     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | H     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | H     |
|                                      |                                                                            | 38.73     | 35.46      | -4.54  | 40         | 47.31    | 20.12    | 0.81   | 32.78  | 100    | 27      | Q     | V     |
|                                      |                                                                            | 71.71     | 34.46      | -5.54  | 40         | 53.44    | 12.51    | 1.25   | 32.74  | -      | -       | P     | V     |
|                                      |                                                                            | 94.99     | 30.87      | -12.63 | 43.5       | 46.72    | 15.29    | 1.49   | 32.63  | -      | -       | P     | V     |
|                                      |                                                                            | 184.23    | 34.38      | -9.12  | 43.5       | 49.99    | 15.03    | 2.22   | 32.86  | -      | -       | P     | V     |
|                                      |                                                                            | 723.55    | 30.34      | -15.66 | 46         | 30.77    | 27.44    | 4.64   | 32.51  | -      | -       | P     | V     |
|                                      |                                                                            | 946.65    | 34.07      | -11.93 | 46         | 29.64    | 30.69    | 5.43   | 31.69  | -      | -       | P     | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
|                                      |                                                                            |           |            |        |            |          |          |        |        |        |         |       | V     |
| Remark                               | 1. No other spurious found.<br>2. All results are PASS against limit line. |           |            |        |            |          |          |        |        |        |         |       |       |



**Note symbol**

|     |                                                                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| *   | <b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| -   | The signal is <b>Unintentional Radiators</b> .                                                                                                           |
| P/A | <b>Peak</b> or <b>Average</b>                                                                                                                            |
| H/V | <b>Horizontal</b> or <b>Vertical</b>                                                                                                                     |



A calculation example for radiated spurious emission is shown as below:

| WIFI           | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Path   | Preamp | Ant    | Table   | Peak    | Pol.    |
|----------------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| Ant.           |      |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
| Simultaneously |      | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| 802.11b        |      | 2390      | 55.45      | -18.55 | 74         | 54.51    | 32.22    | 4.58   | 35.86  | 103    | 308     | P       | H       |
| CH 01          |      |           |            |        |            |          |          |        |        |        |         |         |         |
| 2412MHz        |      | 2390      | 43.54      | -10.46 | 54         | 42.6     | 32.22    | 4.58   | 35.86  | 103    | 308     | A       | H       |

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)  
 = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
 = 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)  
 = 55.45 (dBμV/m)
2. Over Limit(dB)  
 = Level(dBμV/m) – Limit Line(dBμV/m)  
 = 55.45(dBμV/m) – 74(dBμV/m)  
 = -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)  
 = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)  
 = 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)  
 = 43.54 (dBμV/m)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)  
 = 43.54(dBμV/m) – 54(dBμV/m)  
 = -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



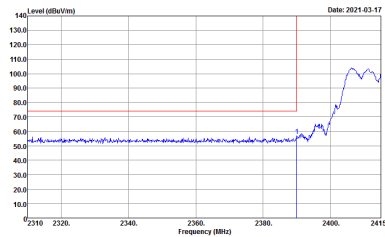
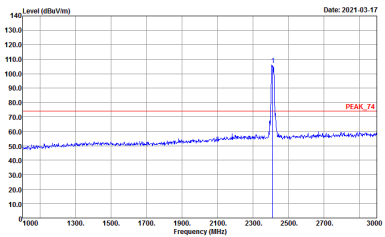
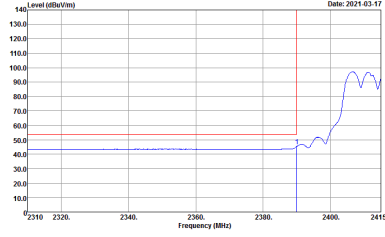
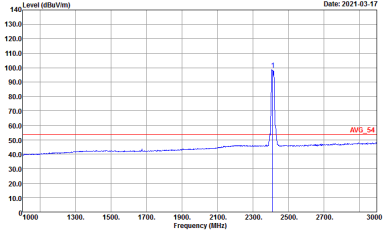
## Appendix B. Radiated Spurious Emission

|                 |                                 |                     |         |
|-----------------|---------------------------------|---------------------|---------|
| Test Engineer : | Karl Hou, CR Liro and Andy Yang | Temperature :       | 20~25°C |
|                 |                                 | Relative Humidity : | 50~60%  |

WLAN 802.11g\_Tx\_Ch01+ WWAN GSM850 Ch189 Link

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                          |                                                                                                                                                                                                             |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11g CH01 2412MHz                                                                                                                                                                                          |                                                                                                                                                                                                             |
| 0+1  | Horizontal                                                                                                                                                                                                    | Fundamental                                                                                                                                                                                                 |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
|      |  <p>Site : 03CH16-HY<br/>Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>    |  <p>Site : 03CH16-HY<br/>Condition : AVG_54 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>    |
| Avg. |                                                                                                                                                                                                               |                                                                                                                                                                                                             |



| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                     |                                                                                                                       |
|------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11b CH01 2412MHz                                                                                                     |                                                                                                                       |
| 0+1  | Vertical                                                                                                                 | Fundamental                                                                                                           |
| Peak | <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
|      | <p>Site : 03CH16-HY<br/>Condition : AV6_BE_54 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>     | <p>Site : 03CH16-HY<br/>Condition : AV6_54 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>     |



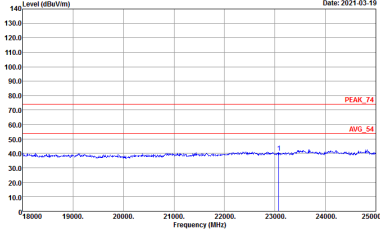
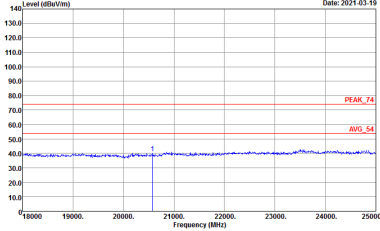
WLAN 802.11g\_Tx\_Ch01+ WWAN GSM850 Ch189 Link

(Harmonic @ 3m)

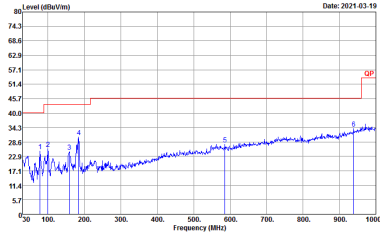
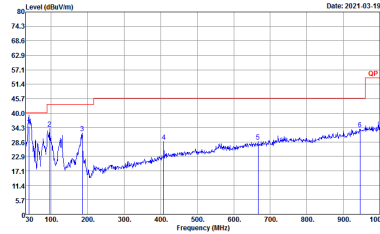
| ANT          | WLAN 802.11g_Tx_Ch01+ WWAN GSM850 Ch189                                                                               |                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                            | Vertical                                                                                                            |
| Peak<br>Avg. | <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |



Emission above 18GHz

| ANT          | WLAN 802.11g_Tx_Ch01+ WWAN GSM850 Ch189 SHF                                                                                                                          |                                                                                                                                                                     |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                           | Vertical                                                                                                                                                            |
| QP /<br>Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 1m SHF HORN 88HA9170584 HORIZONTAL</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 1m SHF HORN 88HA9170584 VERTICAL</p> |
|              |                                                                                                                                                                      |                                                                                                                                                                     |

**Emission below 1GHz**

| ANT          | WLAN 802.11g_Tx_Ch01+ WWAN GSM850 Ch189 LF                                                                                                                |                                                                                                                                                          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                | Vertical                                                                                                                                                 |
| QP /<br>Peak |  <p>Site : 03CH16-HY<br/>Condition : QP 3m 8IL06_47020406 HORIZONTAL</p> |  <p>Site : 03CH16-HY<br/>Condition : QP 3m 8IL06_47020406 VERTICAL</p> |
|              |                                                                                                                                                           |                                                                                                                                                          |



WLAN 802.11b\_Tx\_Ch01+ WWAN LTE B7 BW: 10MHz CH20800 Link

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                       |                                                                                                                         |
|------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11b CH01 2412MHz                                                                                                       |                                                                                                                         |
| 0+1  | Horizontal                                                                                                                 | Fundamental                                                                                                             |
| Peak | <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Avg. | <p>Site : 03CH16-HY<br/>Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>     | <p>Site : 03CH16-HY<br/>Condition : AVG_54 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>     |

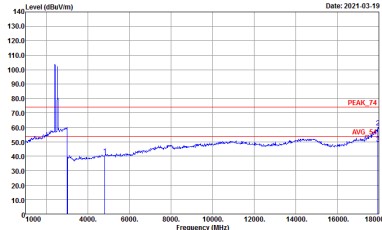
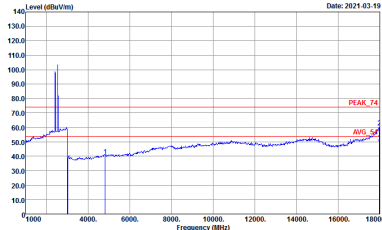


| WIFI | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                     |                                                                                                                       |
|------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11b CH01 2412MHz                                                                                                     |                                                                                                                       |
| 0+1  | Vertical                                                                                                                 | Fundamental                                                                                                           |
| Peak | <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
|      | <p>Site : 03CH16-HY<br/>Condition : AVG_BE_54 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>     | <p>Site : 03CH16-HY<br/>Condition : AVG_54 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>     |



WLAN 802.11b\_Tx\_Ch01+ WWAN LTE B7 BW: 10MHz CH20800 Link

(Harmonic @ 3m)

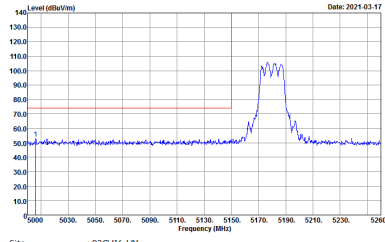
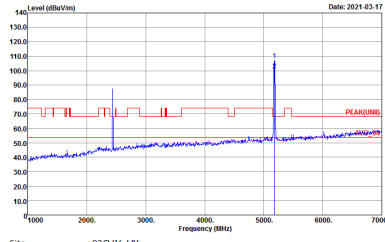
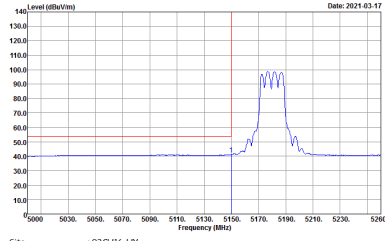
| ANT          | WLAN 802.11b_Tx_Ch01+ WWAN LTE B7 BW: 10MHz CH20800                                                                                                                                                     |                                                                                                                                                                                                        |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                                                              | Vertical                                                                                                                                                                                               |
| Peak<br>Avg. |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |

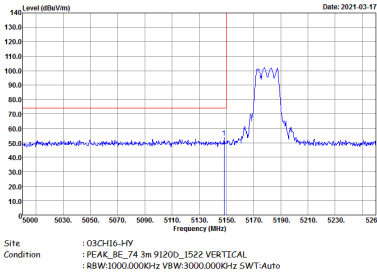
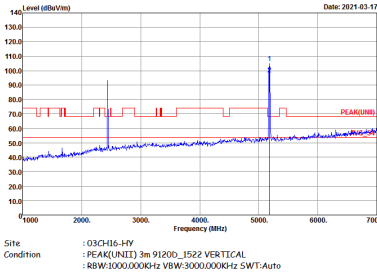
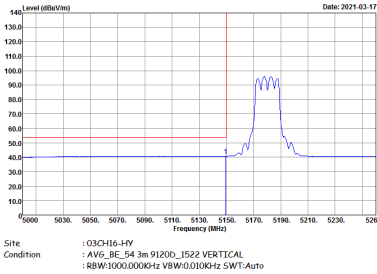


WLAN 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN GSM850 Ch189 Link

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

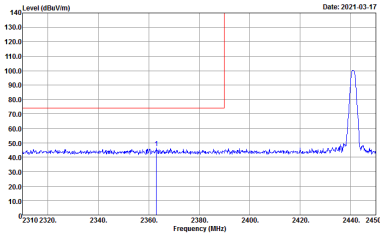
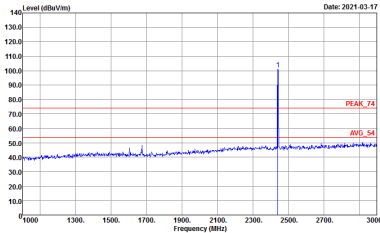
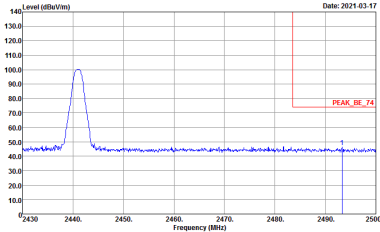
| WIFI | Band 1 5150~5250MHz Band Edge @ 3m                                                                                                                                                                               |                                                                                                                                                                                                                   |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11a CH36 5180MHz                                                                                                                                                                                             |                                                                                                                                                                                                                   |
| 0+1  | Horizontal                                                                                                                                                                                                       | Fundamental                                                                                                                                                                                                       |
| Peak |  <p>Site Condition<br/>: 03CH16-HY<br/>: PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site Condition<br/>: 03CH16-HY<br/>: PEAK(UNIT) 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Avg. |  <p>Site Condition<br/>: 03CH16-HY<br/>: AVG_BE_54 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>   | Left blank                                                                                                                                                                                                        |

| WIFI | Band 1 5150~5250MHz Band Edge @ 3m                                                  |                                                                                    |
|------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| ANT  | 802.11a CH36 5180MHz                                                                |                                                                                    |
| 0+1  | Vertical                                                                            | Fundamental                                                                        |
| Peak |    |  |
| Avg. |  | Left blank                                                                         |

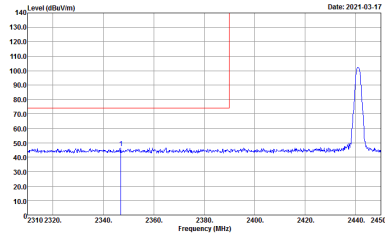
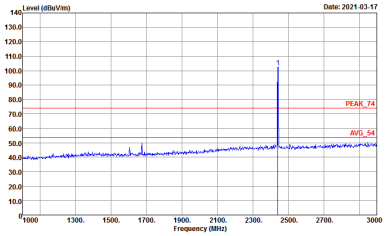
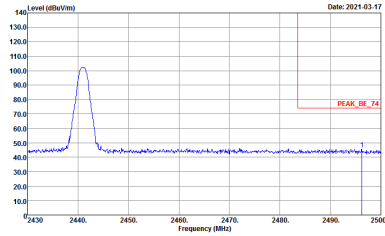


## 2.4GHz 2400~2483.5MHz

## BT (Band Edge @ 3m)

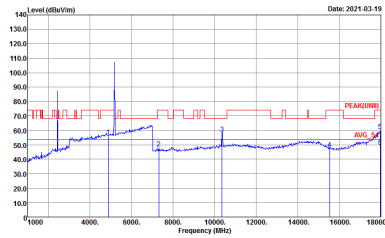
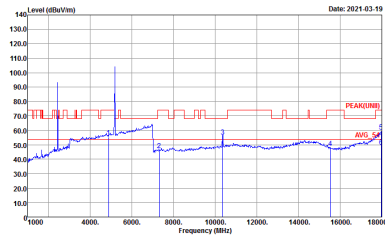
| BT   | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                           |                                                                                                                                                                                                            |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BT CH39 2441MHz                                                                                                                                                                                                |                                                                                                                                                                                                            |
| 0    | Horizontal                                                                                                                                                                                                     | Fundamental                                                                                                                                                                                                |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>   |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | Left blank                                                                                                                                                                                                 |



| BT   | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                       |                                                                                                                                                                                                        |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BT CH39 2441MHz                                                                                                                                                                                            |                                                                                                                                                                                                        |
| 0+1  | Vertical                                                                                                                                                                                                   | Fundamental                                                                                                                                                                                            |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>   |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
|      |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | Left blank                                                                                                                                                                                             |



WLAN 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN GSM850 Ch189 Link  
(Harmonic @ 3m)

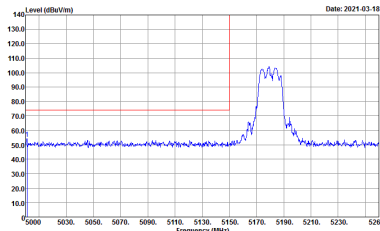
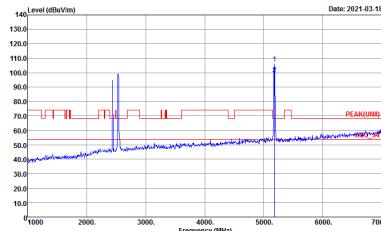
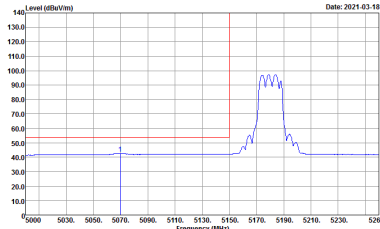
| ANT          | WLAN 802.11a_Tx_Ch36+BT (1M) CH 39_Tx+ WWAN GSM850 Ch189                                                                                                                                                     |                                                                                                                                                                                                             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                                                                   | Vertical                                                                                                                                                                                                    |
| Peak<br>Avg. |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNIT) 3m 91200_1522 HORIZONTAL<br/>: RBW:3000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNIT) 3m 91200_1522 VERTICAL<br/>: RBW:3000.000KHz VBW:3000.000KHz SWT:Auto</p> |



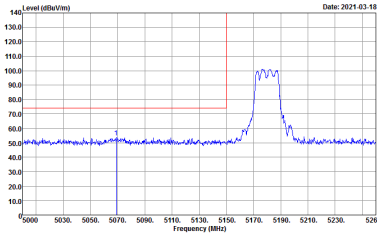
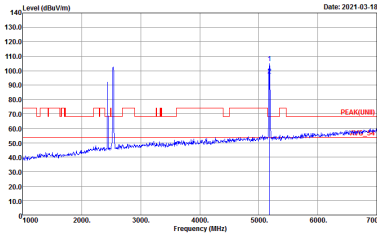
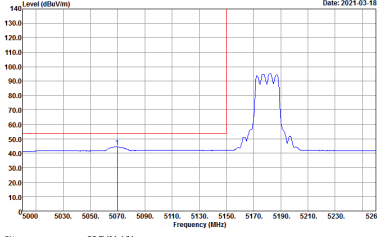
WLAN 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN LTE B7 BW: 10MHz CH20800 Link

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

| WIFI | Band 1 5150~5250MHz Band Edge @ 3m                                                                                                                                                                           |                                                                                                                                                                                                               |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11a CH36 5180MHz                                                                                                                                                                                         |                                                                                                                                                                                                               |
| 0+1  | Horizontal                                                                                                                                                                                                   | Fundamental                                                                                                                                                                                                   |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNIT) 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Avg. |  <p>Site : 03CH16-HY<br/>Condition : AVG_BE_54 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>   | Left blank                                                                                                                                                                                                    |

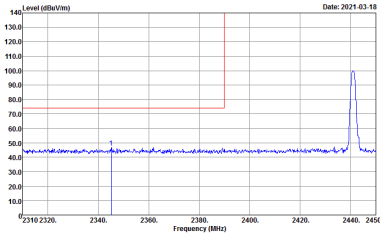
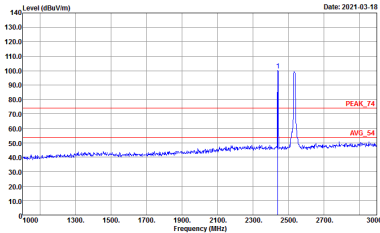
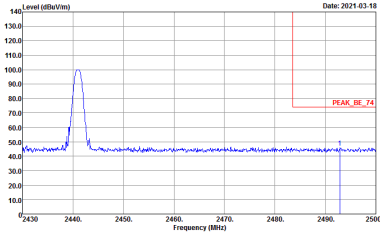


| WIFI | Band 1 5150~5250MHz Band Edge @ 3m                                                                                                                                                                       |                                                                                                                                                                                                            |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | 802.11a CH36 5180MHz                                                                                                                                                                                     |                                                                                                                                                                                                            |
| 0+1  | Vertical                                                                                                                                                                                                 | Fundamental                                                                                                                                                                                                |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNIT1) 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Avg. |  <p>Site : 03CH16-HY<br/>Condition : AVG_BE_54 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:0.010KHz SWT:Auto</p>   | Left blank                                                                                                                                                                                                 |

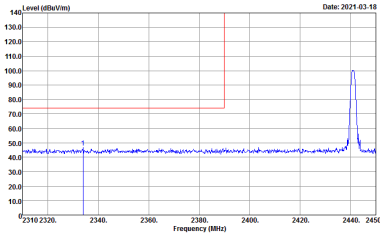
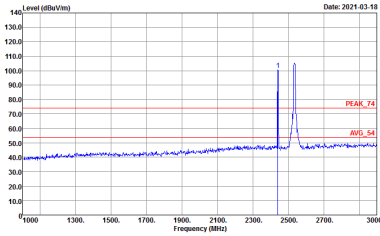
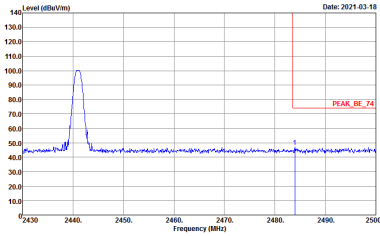


## 2.4GHz 2400~2483.5MHz

## BT (Band Edge @ 3m)

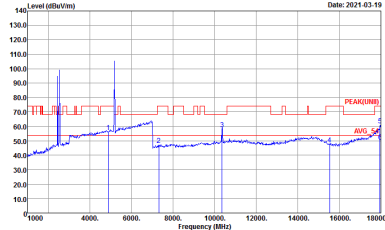
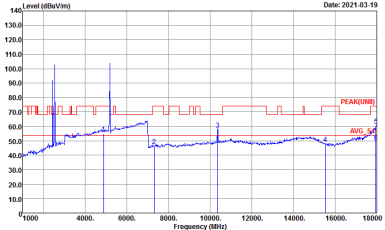
| BT   | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                           |                                                                                                                                                                                                            |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BT CH39 2441MHz                                                                                                                                                                                                |                                                                                                                                                                                                            |
| 0+1  | Horizontal                                                                                                                                                                                                     | Fundamental                                                                                                                                                                                                |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>   |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | Left blank                                                                                                                                                                                                 |



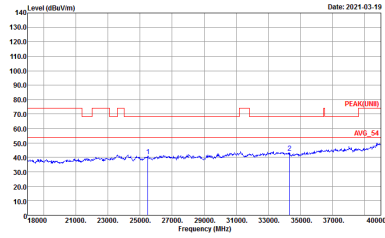
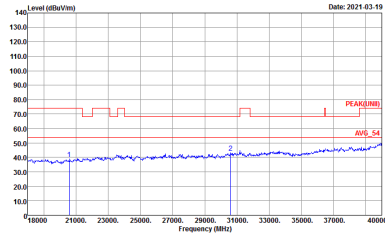
| BT   | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                       |                                                                                                                                                                                                        |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BT CH39 2441MHz                                                                                                                                                                                            |                                                                                                                                                                                                        |
| 0+1  | Vertical                                                                                                                                                                                                   | Fundamental                                                                                                                                                                                            |
| Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>   |  <p>Site : 03CH16-HY<br/>Condition : PEAK_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |
|      |  <p>Site : 03CH16-HY<br/>Condition : PEAK_BE_74 3m 91200_1522 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> | Left blank                                                                                                                                                                                             |



WLAN 802.11a\_Tx\_Ch36+BT (1M) CH 39\_Tx+ WWAN LTE B7 BW: 10MHz CH20800 Link  
(Harmonic @ 3m)

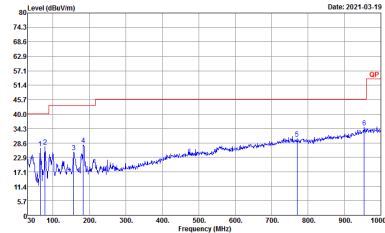
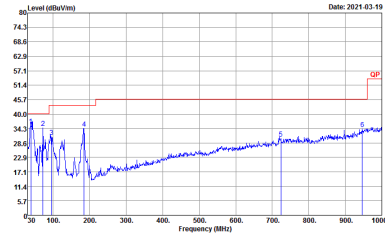
| ANT          | WLAN 802.11a_Tx_Ch36+BT (1M) CH 39_Tx+<br>WWAN LTE B7 BW: 10MHz CH20800                                                                                                                                      |                                                                                                                                                                                                             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                                                                   | Vertical                                                                                                                                                                                                    |
| Peak<br>Avg. |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNIT) 3m 91200_1522 HORIZONTAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNIT) 3m 91200_1522 VERTICAL<br/>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p> |

**Emission above 18GHz**

| ANT          | <b>WLAN 802.11a_Tx_Ch36+BT (1M) CH 39_Tx+</b><br><b>WWAN LTE B7 BW: 10MHz CH20800</b>                                                                                  |                                                                                                                                                                       |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                             | Vertical                                                                                                                                                              |
| QP /<br>Peak |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNB) 1m SHF HORN 88HA9170584 HORIZONTAL</p> |  <p>Site : 03CH16-HY<br/>Condition : PEAK(UNB) 1m SHF HORN 88HA9170584 VERTICAL</p> |
|              |                                                                                                                                                                        |                                                                                                                                                                       |



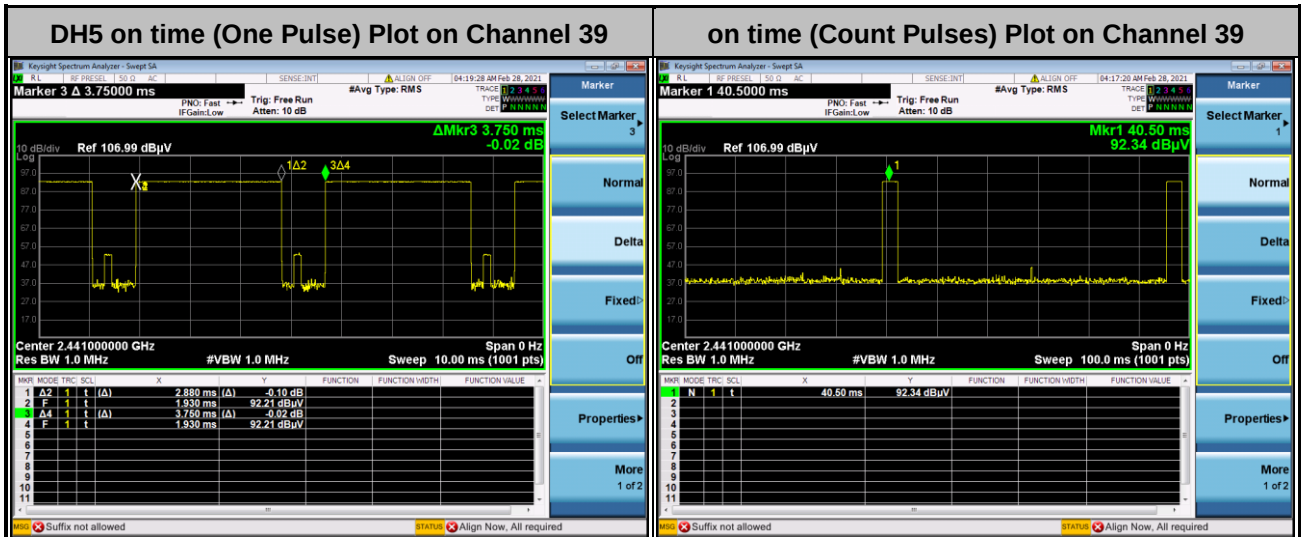
Emission below 1GHz

| ANT          | WLAN 802.11a_Tx_Ch36+BT (1M) CH 39_Tx+<br>WWAN LTE B7 BW: 10MHz CH20800                                                                                   |                                                                                                                                                          |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0+1          | Horizontal                                                                                                                                                | Vertical                                                                                                                                                 |
| QP /<br>Peak |  <p>Site : 03CH16-HY<br/>Condition : QP 3m 81LO6_47020406 HORIZONTAL</p> |  <p>Site : 03CH16-HY<br/>Condition : QP 3m 81LO6_47020406 VERTICAL</p> |

## Appendix C. Duty Cycle Plots

<Ant. 0>

<1Mbps>



**Note:**

1. Worst case Duty cycle = on time/100 milliseconds =  $2 \times 2.88 / 100 = 5.76 \%$
2. Worst case Duty cycle correction factor =  $20 \times \log(\text{Duty cycle}) = -24.79 \text{ dB}$
3. DH5 has the highest duty cycle worst case and is reported.

### Duty Cycle Correction Factor Consideration for AFH mode:

Bluetooth normal hopping rate is 1600Hz and reduced to 800Hz in AFH mode; due to the reduced number of hopping frequencies, with the same packet configuration the dwell time in each channel frequency within 100msec period is longer in AFH mode than normal mode.

In AFH mode, the minimum hopping frequencies are 20, to get the longest dwell time DH5 packet is observed; the period to have DH5 packet completing one hopping sequence is

$$2.88 \text{ ms} \times 20 \text{ channels} = 57.6 \text{ ms}$$

There cannot be 2 complete hopping sequences within 100ms period, considering the random hopping behavior, maximum 2 hops can be possibly observed within the period.  $[100 \text{ ms} / 57.6 \text{ ms}] = 2 \text{ hops}$

Thus, the maximum possible ON time:

$$2.88 \text{ ms} \times 2 = 5.76 \text{ ms}$$

Worst case Duty Cycle Correction factor, which is derived from the maximum possible ON time,

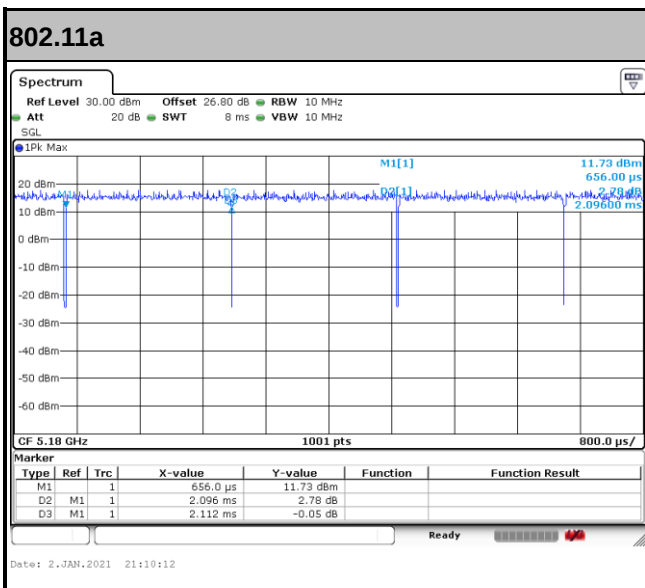
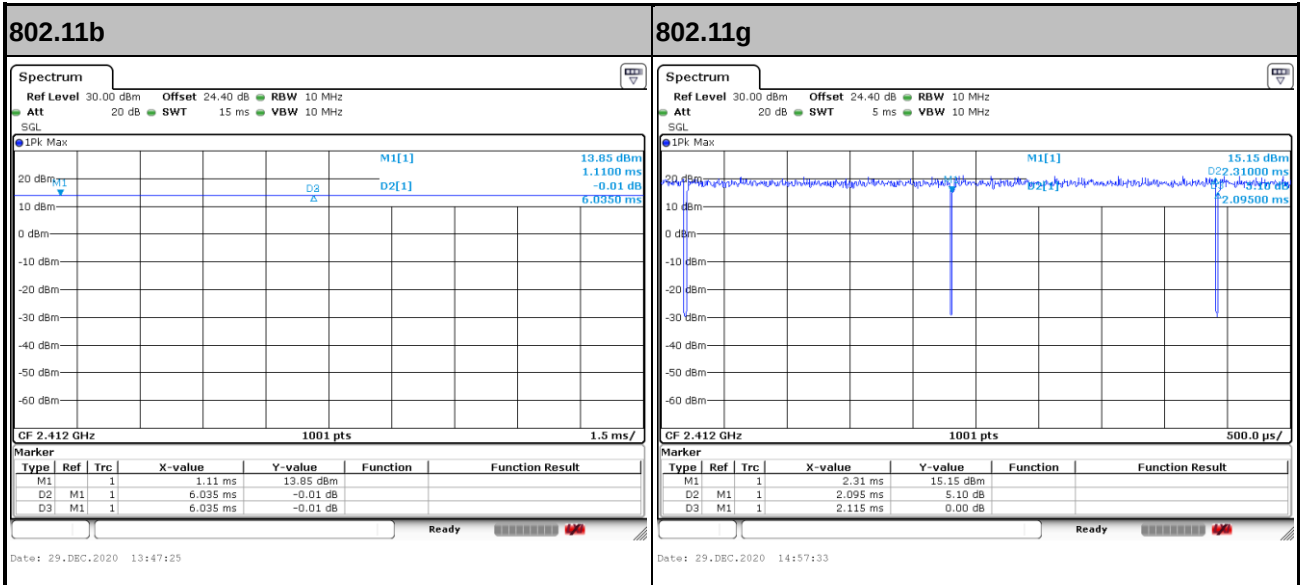
$$20 \times \log(5.76 \text{ ms}/100 \text{ ms}) = -24.79 \text{ dB}$$



| Antenna | Band                      | Duty Cycle(%) | T(us) | 1/T(kHz) | VBW Setting | Duty Factor(dB) |
|---------|---------------------------|---------------|-------|----------|-------------|-----------------|
| 0+1     | 2.4GHz 802.11b for Ant. 0 | 100.00        | -     | -        | 10Hz        | 0.00            |
| 0+1     | 2.4GHz 802.11b for Ant. 1 | 100.00        | -     | -        | 10Hz        | 0.00            |
| 0+1     | 2.4GHz 802.11g for Ant. 0 | 99.05         | -     | -        | 10Hz        | 0.04            |
| 0+1     | 2.4GHz 802.11g for Ant. 1 | 99.29         | -     | -        | 10Hz        | 0.03            |
| 0+1     | 5GHz 802.11a for Ant. 0   | 99.24         | -     | -        | 10Hz        | 0.03            |
| 0+1     | 5GHz 802.11a for Ant. 1   | 99.24         | -     | -        | 10Hz        | 0.03            |

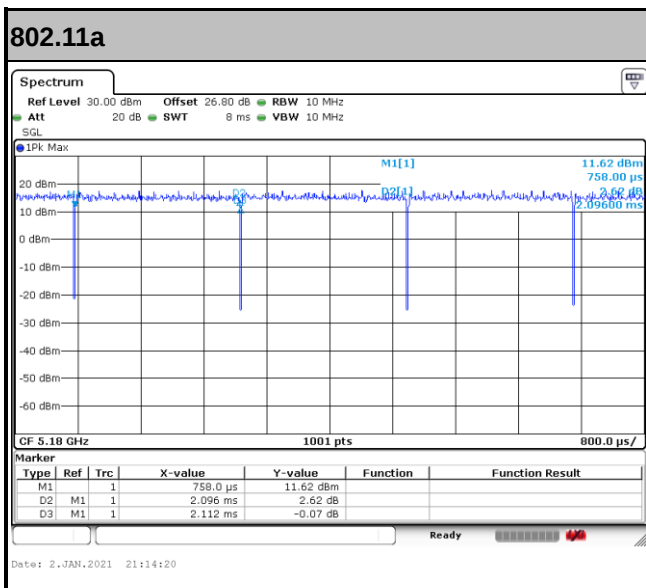
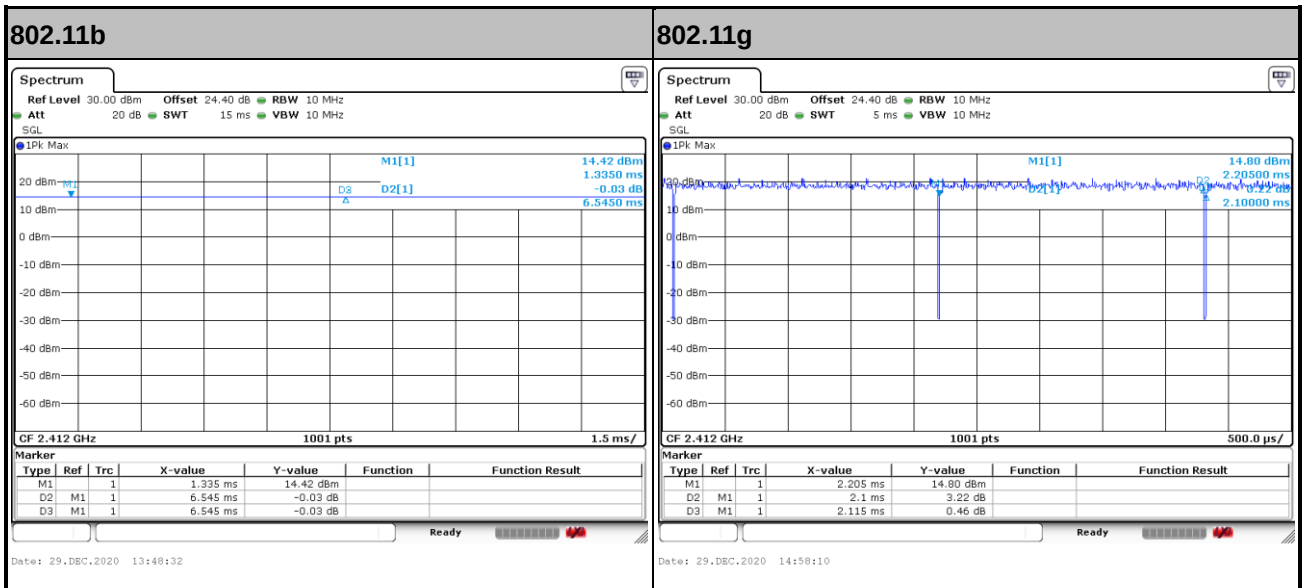


## MIMO <Ant. 0>





MIMO <Ant. 1>



—THE END—