



# FCC RF Test Report

**APPLICANT** : Realtek Semiconductor Corp.  
**EQUIPMENT** : 802.11b/g/n RTL8723BS Combo module  
**BRAND NAME** : REALTEK  
**MODEL NAME** : RTL8723BS  
**FCC ID** : TX2-RTL8723BS  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : (DTS) Digital Transmission System

This is a partial report which is included the RF output power and radiated spurious emission test items. The product was received on Nov. 25, 2016 and testing was completed on Jan. 13, 2017. We, SPORTON INTERNATIONAL INC., 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., the test report shall not be reproduced except in full.

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Reviewed by: Joseph Lin / Supervisor

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Approved by: Jones Tsai / Manager



## **SPORTON INTERNATIONAL INC.**

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FCC ID : TX2-RTL8723BS

Page Number : 1 of 15

Report Issued Date : Jan. 20, 2017

Report Version : Rev. 01

Report Template No.: BU5-FR15CBT4.0 Version 1.3



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FR6N2509B  | Rev. 01 | Initial issue of report | Jan. 20, 2017 |
|            |         |                         |               |
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## SUMMARY OF TEST RESULT

| Report Section | FCC Rule           | Description                               | Limit                 | Result | Remark                                  |
|----------------|--------------------|-------------------------------------------|-----------------------|--------|-----------------------------------------|
| 3.1            | 15.247(d)          | Radiated Band Edges and Spurious Emission | 15.209(a) & 15.247(d) | Pass   | Under limit<br>8.67 dB at<br>34.590 MHz |
| 3.2            | 15.203 & 15.247(b) | Antenna Requirement                       | N/A                   | Pass   | -                                       |

# 1 General Description

## 1.1 Applicant

Realtek Semiconductor Corp.

No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

## 1.2 Manufacturer

Realtek Semiconductor Corp.

No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

## 1.3 Product Feature of Equipment Under Test

| Product Feature                 |                                                      |
|---------------------------------|------------------------------------------------------|
| Equipment                       | 802.11b/g/n RTL8723BS Combo module                   |
| Brand Name                      | REALTEK                                              |
| Model Name                      | RTL8723BS                                            |
| FCC ID                          | TX2-RTL8723BS                                        |
| Installed into PC               | Brand Name: UNICOM<br>Model Name: U-BPCIB0, U-BPCIB1 |
| EUT supports Radios application | WLAN 11b/g/n HT20/HT40<br>Bluetooth BR/EDR/LE        |
| EUT Stage                       | Identical Prototype                                  |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification |                                                |
|-----------------------------------------|------------------------------------------------|
| Tx/Rx Frequency Range                   | 2402 MHz ~ 2480 MHz                            |
| Number of Channels                      | 40                                             |
| Carrier Frequency of Each Channel       | 40 Channel(37 hopping + 3 advertising channel) |
| Maximum Output Power to Antenna         | 2.25 dBm (0.0017 W)                            |
| Antenna Type / Gain                     | Dipole Antenna type with gain 2.26 dBi         |
| Type of Modulation                      | Bluetooth LE : GFSK                            |

## 1.5 Modification of EUT

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

## 1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

|                           |                                                                                                                                                                  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC.                                                                                                                                       |
| <b>Test Site Location</b> | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                                          |
|                           | TH05-HY                                                                                                                                                          |

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

|                           |                                                                                                                                        |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC.                                                                                                             |
| <b>Test Site Location</b> | No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                |
|                           | 03CH13-HY                                                                                                                              |

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

## 1.7 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 KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05
- ANSI C63.10-2013

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 2 Test Configuration of Equipment Under Test

### 2.1 Descriptions of Test Mode

The RF output power was recorded in the following table:

| Channel | Frequency | Bluetooth – LE RF Output Power |
|---------|-----------|--------------------------------|
|         |           | Data Rate / Modulation         |
|         |           | GFSK                           |
|         |           | 1Mbps                          |
| Ch00    | 2402MHz   | 1.87 dBm                       |
| Ch19    | 2440MHz   | <b>2.25 dBm</b>                |
| Ch39    | 2480MHz   | 2.04 dBm                       |

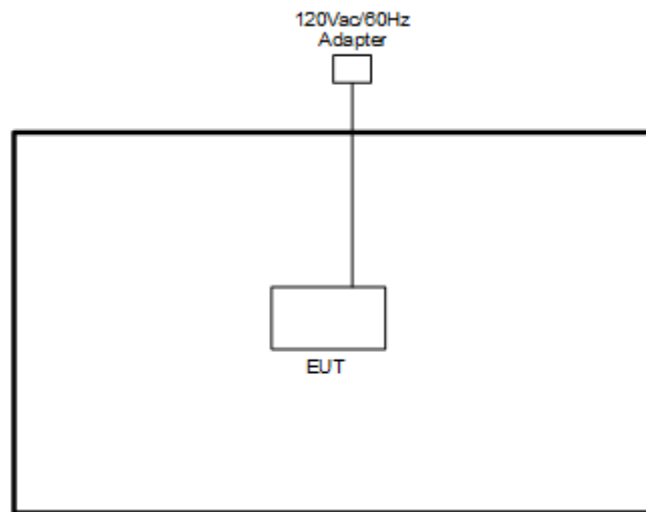
The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

### 2.2 Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

| Summary table of Test Cases |                                                                                                                                  |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Radiated TCs</b>         | Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps<br>Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps<br>Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps |

## 2.3 Connection Diagram of Test System



## 2.4 EUT Operation Test Setup

For Bluetooth function, programmed RF utility, "WLAN Tool" installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

### 3 Test Result

#### 3.1 Radiated Band Edges and Spurious Emission Measurement

##### 3.1.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

| 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                                |

##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.



### 3.1.3 Test Procedures

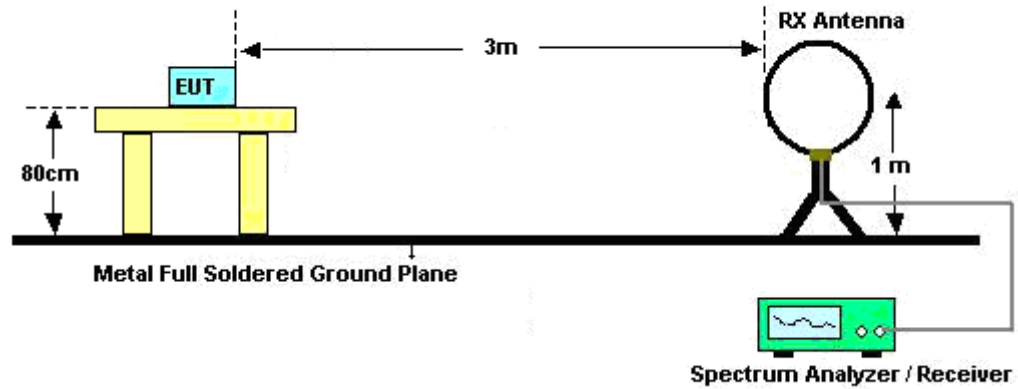
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.

For average measurement:

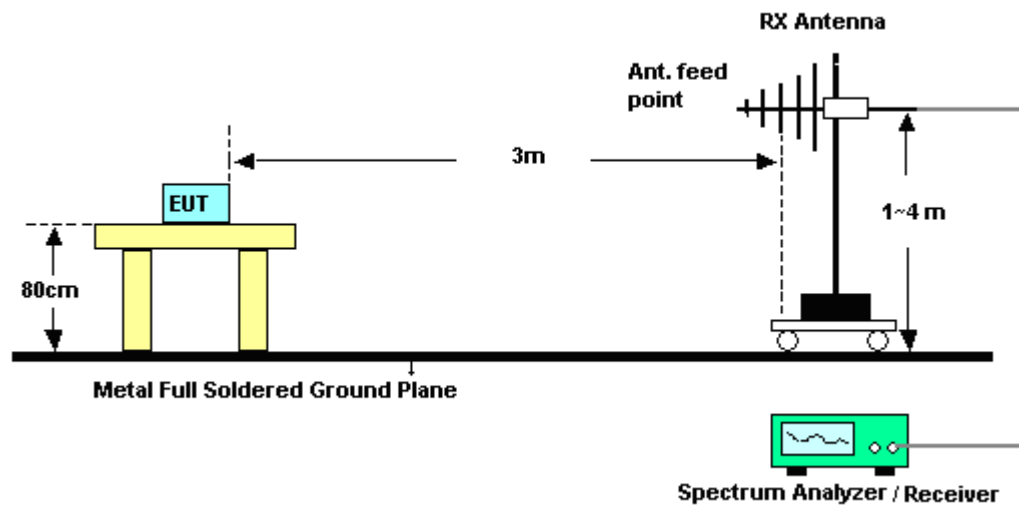
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.1.4 Test Setup

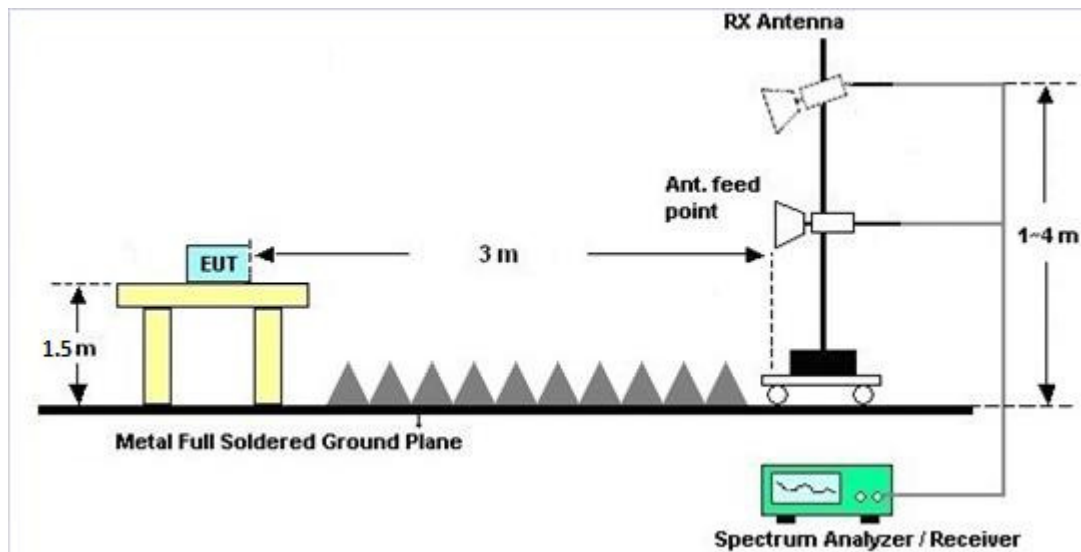
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.1.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

### 3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

### 3.1.7 Duty Cycle

Please refer to Appendix C.

### 3.1.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix A and B.



## **3.2 Antenna Requirements**

### **3.2.1 Standard Applicable**

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### **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           | Manufacturer      | Model No.                       | Serial No.      | Characteristics | Calibration Date | Test Date                        | Due Date      | Remark                |
|----------------------|-------------------|---------------------------------|-----------------|-----------------|------------------|----------------------------------|---------------|-----------------------|
| Power Meter          | Agilent           | E4416A                          | GB41292344      | 300MHz~40GHz    | Dec. 26, 2016    | Jan. 07, 2017                    | Dec. 25, 2017 | Conducted (TH05-HY)   |
| Power Sensor         | Agilent           | E9327A                          | US40441548      | 300MHz~40GHz    | Dec. 26, 2016    | Jan. 07, 2017                    | Dec. 25, 2017 | Conducted (TH05-HY)   |
| Hygrometer           | Testo             | 608-H2                          | 41410069        | N/A             | Aug. 28, 2016    | Jan. 07, 2017                    | Aug. 27, 2017 | Conducted (TH05-HY)   |
| Spectrum Analyzer    | Rohde & Schwarz   | FSP40                           | 100055          | 9kHz-40GHz      | Jul. 17, 2016    | Dec.13.2016~<br>Jan.07.2017      | Jul. 16, 2017 | Conducted (TH05-HY)   |
| Loop Antenna         | Rohde & Schwarz   | HFH2-Z2                         | 100315          | 9 kHz~30 MHz    | Sep. 02, 2015    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Sep. 01, 2017 | Radiation (03CH13-HY) |
| Amplifier            | Sonoma-Instrument | 310 N                           | 187282          | 9KHz~1GHz       | Dec. 31, 2015    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Dec. 30, 2016 | Radiation (03CH13-HY) |
| Bilog Antenna        | TESEQ             | CBL<br>6111D&00800<br>N1D01N-06 | 40103&04        | 30MHz to 1GHz   | Jan. 13, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Jan. 12, 2017 | Radiation (03CH13-HY) |
| EMI Test Receiver    | Keysight          | N9038A(MXE)                     | MY55420170      | N/A             | Mar. 10, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Mar. 09, 2017 | Radiation (03CH13-HY) |
| Horn Antenna         | SCHWARZBECK       | BBHA 9120 D                     | 9120D-1241      | 1GHz ~ 18GHz    | Apr. 25, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Apr. 24, 2017 | Radiation (03CH13-HY) |
| Preamplifier         | MITEQ             | AMF-7D-00101<br>800-30-10P      | 1590074         | 1GHz~18GHz      | Jun. 27, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Jun. 26, 2017 | Radiation (03CH13-HY) |
| Preamplifier         | MITEQ             | JS44-1800400<br>0-33-8P         | 1840917         | 18GHz ~ 40GHz   | Jun. 14, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Jun. 13, 2017 | Radiation (03CH13-HY) |
| Preamplifier         | Keysight          | 83017A                          | MY53270147      | 1GHz~26.5GHz    | Jan. 30, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Jan. 29, 2017 | Radiation (03CH13-HY) |
| Spectrum Analyzer    | Keysight          | N9010A                          | MY55370526      | N/A             | Mar. 14, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Mar. 13, 2017 | Radiation (03CH13-HY) |
| Antenna Mast         | EMEC              | AM-BS-4500-B                    | N/A             | 1m~4m           | N/A              | Dec. 16, 2016 ~<br>Jan. 13, 2017 | N/A           | Radiation (03CH13-HY) |
| Turn Table           | EMEC              | TT2000                          | N/A             | 0~360 Degree    | N/A              | Dec. 16, 2016 ~<br>Jan. 13, 2017 | N/A           | Radiation (03CH13-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK       | BBHA 9170                       | BBHA91705<br>84 | 18GHz- 40GHz    | Nov. 08, 2016    | Dec. 16, 2016 ~<br>Jan. 13, 2017 | Nov. 07, 2017 | Radiation (03CH13-HY) |

## 5 Uncertainty of Evaluation

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

|                                                                            |     |
|----------------------------------------------------------------------------|-----|
| Measuring Uncertainty for a Level of Confidence<br>of 95% ( $U = 2Uc(y)$ ) | 4.9 |
|----------------------------------------------------------------------------|-----|

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

|                                                                            |     |
|----------------------------------------------------------------------------|-----|
| Measuring Uncertainty for a Level of Confidence<br>of 95% ( $U = 2Uc(y)$ ) | 5.4 |
|----------------------------------------------------------------------------|-----|

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

|                                                                            |     |
|----------------------------------------------------------------------------|-----|
| Measuring Uncertainty for a Level of Confidence<br>of 95% ( $U = 2Uc(y)$ ) | 4.3 |
|----------------------------------------------------------------------------|-----|



## Appendix A. Radiated Spurious Emission

|                 |                                       |                     |         |
|-----------------|---------------------------------------|---------------------|---------|
| Test Engineer : | Alex Jheng, Bill Chang, and Wilson Wu | Temperature :       | 25~26°C |
|                 |                                       | Relative Humidity : | 50~52%  |

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

| BLE                     | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|-------------------------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
|                         |      | ( MHz )   | ( dBμV/m ) | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
|                         |      |           |            | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| BLE<br>CH 00<br>2402MHz |      | 2377.305  | 52.69      | -21.31 | 74         | 49.61    | 27.11    | 6.96   | 30.99  | 138    | 128     | P       | H       |
|                         |      | 2374.68   | 43.46      | -10.54 | 54         | 40.38    | 27.11    | 6.96   | 30.99  | 138    | 128     | A       | H       |
|                         | *    | 2402      | 89.41      | -      | -          | 86.27    | 27.15    | 6.98   | 30.99  | 138    | 128     | P       | H       |
|                         | *    | 2402      | 87.73      | -      | -          | 84.59    | 27.15    | 6.98   | 30.99  | 138    | 128     | A       | H       |
|                         |      |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |      |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |      | 2334.675  | 53.47      | -20.53 | 74         | 50.54    | 27.03    | 6.91   | 31.01  | 204    | 151     | P       | V       |
|                         |      | 2361.975  | 44.77      | -9.23  | 54         | 41.77    | 27.07    | 6.93   | 31     | 204    | 151     | A       | V       |
|                         | *    | 2402      | 98.4       | -      | -          | 95.26    | 27.15    | 6.98   | 30.99  | 204    | 151     | P       | V       |
|                         | *    | 2402      | 96.81      | -      | -          | 93.67    | 27.15    | 6.98   | 30.99  | 204    | 151     | A       | V       |
|                         |      |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |      |           |            |        |            |          |          |        |        |        |         |         | V       |
| BLE<br>CH 19<br>2440MHz |      | 2344.02   | 52.91      | -21.09 | 74         | 49.97    | 27.03    | 6.91   | 31     | 112    | 141     | P       | H       |
|                         |      | 2346.96   | 43.27      | -10.73 | 54         | 40.33    | 27.03    | 6.91   | 31     | 112    | 141     | A       | H       |
|                         | *    | 2440      | 89.69      | -      | -          | 86.35    | 27.28    | 7.03   | 30.97  | 112    | 141     | P       | H       |
|                         | *    | 2440      | 88.67      | -      | -          | 85.33    | 27.28    | 7.03   | 30.97  | 112    | 141     | A       | H       |
|                         |      | 2489.08   | 52.91      | -21.09 | 74         | 49.38    | 27.4     | 7.09   | 30.96  | 112    | 141     | P       | H       |
|                         |      | 2484.25   | 43.67      | -10.33 | 54         | 40.21    | 27.36    | 7.07   | 30.97  | 112    | 141     | A       | H       |
|                         |      | 2351.72   | 52.96      | -21.04 | 74         | 49.96    | 27.07    | 6.93   | 31     | 198    | 152     | P       | V       |
|                         |      | 2327.78   | 44.5       | -9.5   | 54         | 41.63    | 26.99    | 6.89   | 31.01  | 198    | 152     | A       | V       |
|                         | *    | 2440      | 98.6       | -      | -          | 95.26    | 27.28    | 7.03   | 30.97  | 198    | 152     | P       | V       |
|                         | *    | 2440      | 97.1       | -      | -          | 93.76    | 27.28    | 7.03   | 30.97  | 198    | 152     | A       | V       |
|                         |      | 2493.14   | 52.5       | -21.5  | 74         | 48.97    | 27.4     | 7.09   | 30.96  | 198    | 152     | P       | V       |
|                         |      | 2497.62   | 43.64      | -10.36 | 54         | 40.11    | 27.4     | 7.09   | 30.96  | 198    | 152     | A       | V       |



|                                  |                                                                                             |         |       |        |    |       |       |      |       |     |     |   |   |
|----------------------------------|---------------------------------------------------------------------------------------------|---------|-------|--------|----|-------|-------|------|-------|-----|-----|---|---|
| <b>BLE<br/>CH 39<br/>2480MHz</b> | *                                                                                           | 2480    | 92.27 | -      | -  | 88.81 | 27.36 | 7.07 | 30.97 | 105 | 115 | P | H |
|                                  | *                                                                                           | 2480    | 90.65 | -      | -  | 87.19 | 27.36 | 7.07 | 30.97 | 105 | 115 | A | H |
|                                  |                                                                                             | 2491.2  | 52.47 | -21.53 | 74 | 48.94 | 27.4  | 7.09 | 30.96 | 105 | 115 | P | H |
|                                  |                                                                                             | 2487.36 | 43.56 | -10.44 | 54 | 40.1  | 27.36 | 7.07 | 30.97 | 105 | 115 | A | H |
|                                  |                                                                                             |         |       |        |    |       |       |      |       |     |     |   | H |
|                                  |                                                                                             |         |       |        |    |       |       |      |       |     |     |   | H |
|                                  | *                                                                                           | 2480    | 97.84 | -      | -  | 94.38 | 27.36 | 7.07 | 30.97 | 216 | 147 | P | V |
|                                  | *                                                                                           | 2480    | 96.23 | -      | -  | 92.77 | 27.36 | 7.07 | 30.97 | 216 | 147 | A | V |
|                                  |                                                                                             | 2492.32 | 53.01 | -20.99 | 74 | 49.48 | 27.4  | 7.09 | 30.96 | 216 | 147 | P | V |
|                                  |                                                                                             | 2487.12 | 43.51 | -10.49 | 54 | 40.05 | 27.36 | 7.07 | 30.97 | 216 | 147 | A | V |
|                                  |                                                                                             |         |       |        |    |       |       |      |       |     |     |   | V |
|                                  |                                                                                             |         |       |        |    |       |       |      |       |     |     |   | V |
| <b>Remark</b>                    | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |         |       |        |    |       |       |      |       |     |     |   |   |



## 2.4GHz 2400~2483.5MHz

## BLE (Harmonic @ 3m)

| BLE                     | 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 ) | Cable<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 ) |
|-------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| BLE<br>CH 00<br>2402MHz |                                                                                             | 4804                 | 31.1                | -42.9                   | 74                          | 41.02                     | 31.2                          | 10.06                   | 51.18                      | 100                  | 0                       | P                       | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             | 4804                 | 28.76               | -45.24                  | 74                          | 38.68                     | 31.2                          | 10.06                   | 51.18                      | 100                  | 0                       | P                       | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
| BLE<br>CH 19<br>2440MHz |                                                                                             | 4880                 | 30.59               | -43.41                  | 74                          | 40.32                     | 31.31                         | 10.11                   | 51.15                      | 100                  | 0                       | P                       | H               |
|                         |                                                                                             | 7320                 | 35.89               | -38.11                  | 74                          | 37.8                      | 36.32                         | 12.57                   | 50.8                       | 100                  | 0                       | P                       | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             | 4880                 | 29.39               | -44.61                  | 74                          | 39.12                     | 31.31                         | 10.11                   | 51.15                      | 100                  | 0                       | P                       | V               |
|                         |                                                                                             | 7320                 | 36.08               | -37.92                  | 74                          | 37.99                     | 36.32                         | 12.57                   | 50.8                       | 100                  | 0                       | P                       | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
| BLE<br>CH 39<br>2480MHz |                                                                                             | 4960                 | 30.92               | -43.08                  | 74                          | 40.43                     | 31.44                         | 10.17                   | 51.12                      | 100                  | 0                       | P                       | H               |
|                         |                                                                                             | 7440                 | 36.84               | -37.16                  | 74                          | 38.18                     | 36.66                         | 12.8                    | 50.8                       | 100                  | 0                       | P                       | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | H               |
|                         |                                                                                             | 4960                 | 30.83               | -43.17                  | 74                          | 40.34                     | 31.44                         | 10.17                   | 51.12                      | 100                  | 0                       | P                       | V               |
|                         |                                                                                             | 7440                 | 35.81               | -38.19                  | 74                          | 37.15                     | 36.66                         | 12.8                    | 50.8                       | 100                  | 0                       | P                       | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
|                         |                                                                                             |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         | V               |
| Remark                  | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                           |                               |                         |                            |                      |                         |                         |                 |



## Emission below 1GHz

## 2.4GHz BLE (LF)

| BLE                 | Note                                                                       | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|---------------------|----------------------------------------------------------------------------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
|                     |                                                                            |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
|                     |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| 2.4GHz<br>BLE<br>LF |                                                                            | 30.54     | 23.63      | -16.37 | 40         | 29.56    | 25.34    | 0.68   | 31.95  | -      | -       | P       | H       |
|                     |                                                                            | 119.91    | 24.12      | -19.38 | 43.5       | 37.33    | 17.5     | 1.16   | 31.87  | -      | -       | P       | H       |
|                     |                                                                            | 250.05    | 36.09      | -9.91  | 46         | 47.46    | 18.7     | 1.71   | 31.78  | 100    | 51      | P       | H       |
|                     |                                                                            | 374.9     | 27.44      | -18.56 | 46         | 35.47    | 21.61    | 2.12   | 31.76  | -      | -       | P       | H       |
|                     |                                                                            | 813.1     | 31.75      | -14.25 | 46         | 32.37    | 27.93    | 3.32   | 31.87  | -      | -       | P       | H       |
|                     |                                                                            | 936.3     | 31.44      | -14.56 | 46         | 29.47    | 29.77    | 3.44   | 31.24  | -      | -       | P       | H       |
|                     |                                                                            |           |            |        |            |          |          |        |        |        |         |         | H       |
|                     |                                                                            |           |            |        |            |          |          |        |        |        |         |         | H       |
|                     |                                                                            |           |            |        |            |          |          |        |        |        |         |         | H       |
|                     |                                                                            |           |            |        |            |          |          |        |        |        |         |         | H       |
|                     |                                                                            |           |            |        |            |          |          |        |        |        |         |         | H       |
|                     |                                                                            |           |            |        |            |          |          |        |        |        |         |         | H       |
|                     |                                                                            | 34.59     | 31.33      | -8.67  | 40         | 39.53    | 23.1     | 0.64   | 31.94  | 100    | 10      | P       | V       |
|                     |                                                                            | 94.8      | 23.69      | -19.81 | 43.5       | 39.11    | 15.45    | 1.02   | 31.89  | -      | -       | P       | V       |
|                     |                                                                            | 250.05    | 25.42      | -20.58 | 46         | 36.79    | 18.7     | 1.71   | 31.78  | -      | -       | P       | V       |
|                     |                                                                            | 419.7     | 22.33      | -23.67 | 46         | 29.35    | 22.48    | 2.28   | 31.78  | -      | -       | P       | V       |
|                     |                                                                            | 839.7     | 30.78      | -15.22 | 46         | 30.94    | 28.2     | 3.41   | 31.77  | -      | -       | P       | V       |
|                     |                                                                            | 942.6     | 32.15      | -13.85 | 46         | 29.95    | 29.94    | 3.44   | 31.18  | -      | -       | 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. |           |            |        |            |          |          |        |        |        |         |         |         |



**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. |
| !   | Test result is <b>over limit</b> line.                                                                                                                   |
| 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  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|---------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| Ant.    |      |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
| 1+2     |      | ( 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. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable 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) + Cable 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

|                        |                                       |                            |         |
|------------------------|---------------------------------------|----------------------------|---------|
| <b>Test Engineer :</b> | Alex Jheng, Bill Chang, and Wilson Wu | <b>Temperature :</b>       | 25~26°C |
|                        |                                       | <b>Relative Humidity :</b> | 50~52%  |

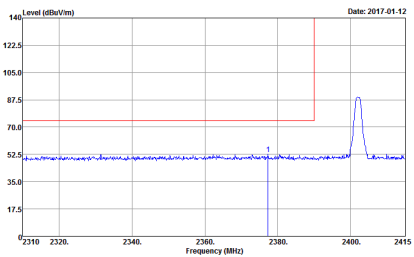
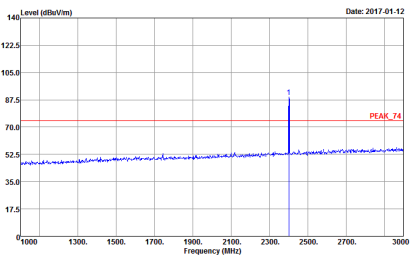
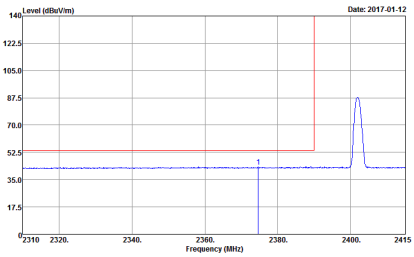
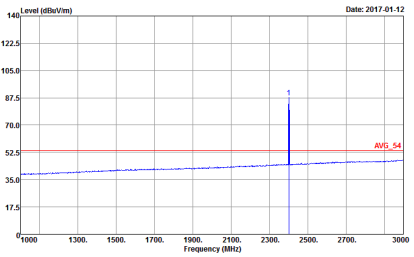
### Note symbol

|    |                       |
|----|-----------------------|
| -L | Low channel location  |
| -R | High channel location |

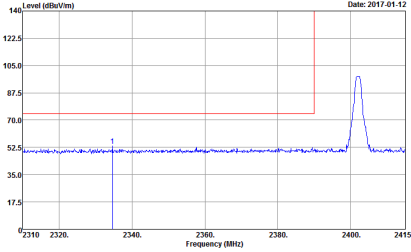
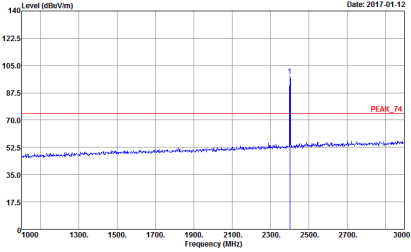
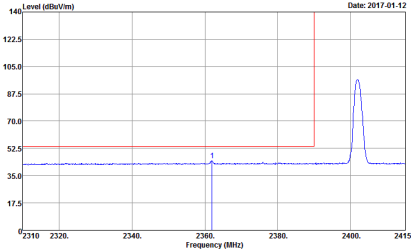
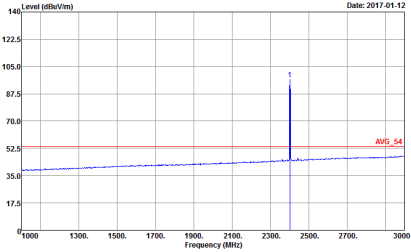


2.4GHz 2400~2483.5MHz

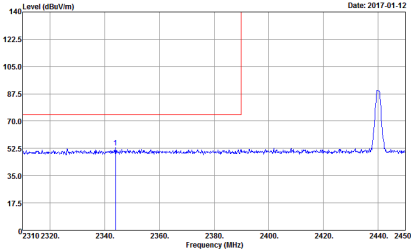
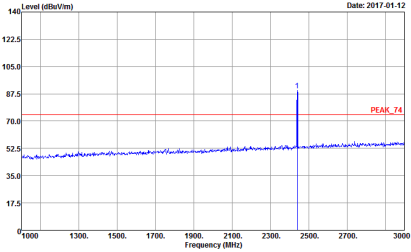
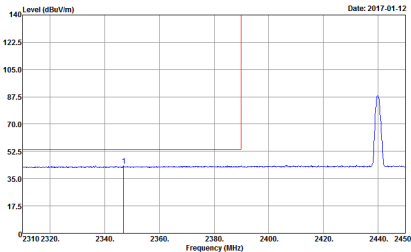
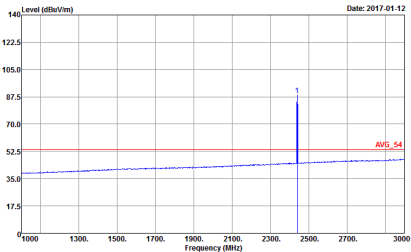
BLE (Band Edge @ 3m)

| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                               |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH00 2402MHz                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                               |
| 1    | Horizontal                                                                                                                                                                                                                                                                      | Fundamental                                                                                                                                                                                                                                                                   |
| Peak | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div> | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div> |
| Avg. | <div><p>Site : 03CH13-HY<br/>Condition : AV6_BE_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div>   | <div><p>Site : 03CH13-HY<br/>Condition : AV6_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div>   |

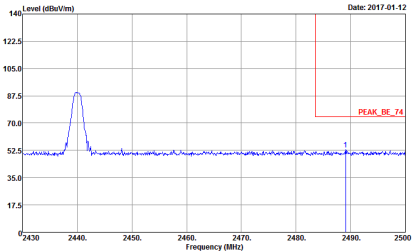
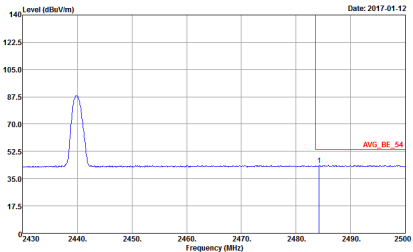


| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH00 2402MHz                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                             |
| 1    | Vertical                                                                                                                                                                                                                                                                      | Fundamental                                                                                                                                                                                                                                                                 |
| Peak | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div> | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div> |
| Avg  | <div><p>Site : 03CH13-HY<br/>Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div>   | <div><p>Site : 03CH13-HY<br/>Condition : AV6_54 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div>   |

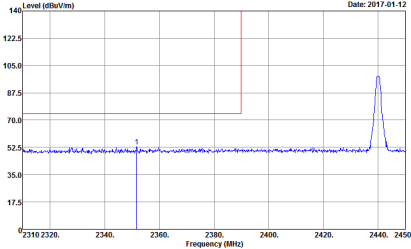
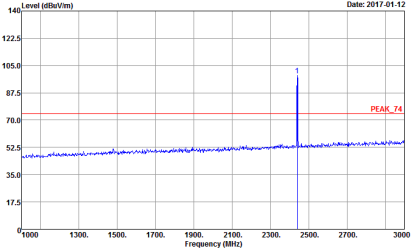
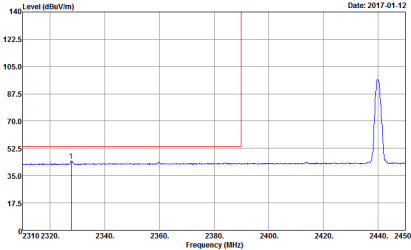
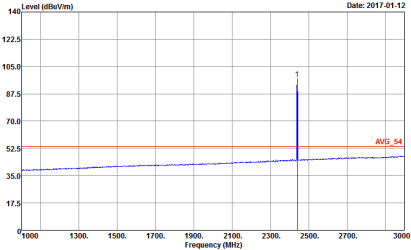


| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                 |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH19 2440MHz - L                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                 |
| 1    | Horizontal                                                                                                                                                                                                                                                                                                                                        | Fundamental                                                                                                                                                                                                                                                                                                                                     |
| Peak | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>Site : 03CH13-HV<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>Site : 03CH13-HV<br/>Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> |
| Avg. | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>Site : 03CH13-HV<br/>Condition : AV6_BE_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div>   | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>Site : 03CH13-HV<br/>Condition : AV6_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div>   |

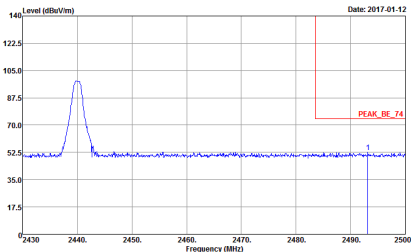
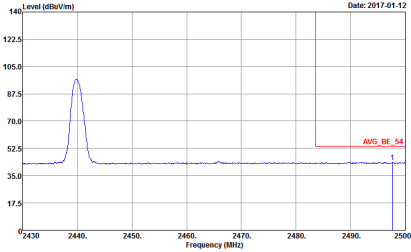


| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                            |             |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| ANT  | BLE CH19 2440MHz - R                                                                                                                                                                                                                                                            |             |
| 1    | Horizontal                                                                                                                                                                                                                                                                      | Fundamental |
| Peak | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> | Left blank  |
| Avg. | <div><p>Site : 03CH13-HY<br/>Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div>   | Left blank  |

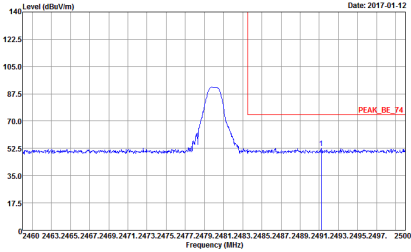
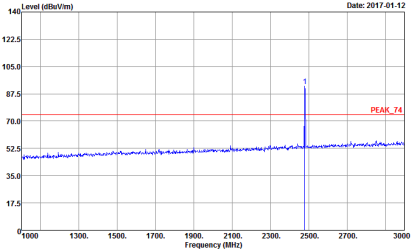
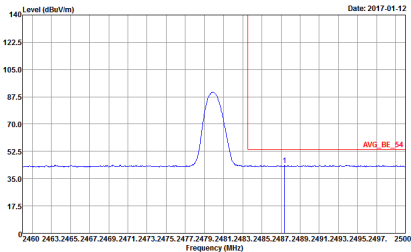
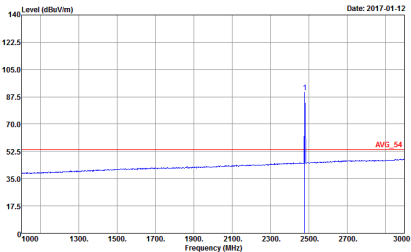


| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH19 2440MHz - L                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                             |
| 1    | Vertical                                                                                                                                                                                                                                                                      | Fundamental                                                                                                                                                                                                                                                                 |
| Peak | <div><p>Site : 03CH13-HV<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> | <div><p>Site : 03CH13-HV<br/>Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> |
| Avg. | <div><p>Site : 03CH13-HV<br/>Condition : AV6_BE_54 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div>   | <div><p>Site : 03CH13-HV<br/>Condition : AV6_54 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div>   |

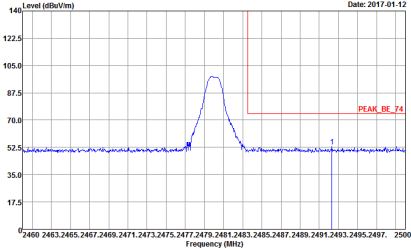
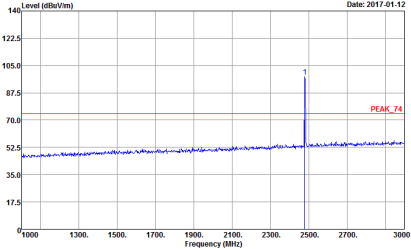
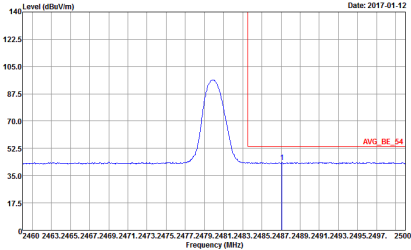
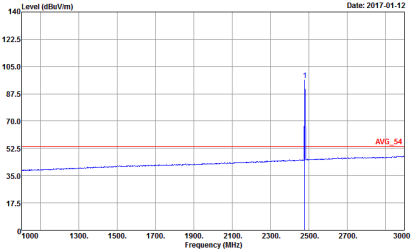


| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                                                                                                                           |             |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| ANT  | BLE CH19 2440MHz - R                                                                                                                                                                                                                                                                                                                                                           |             |
| 1    | Vertical                                                                                                                                                                                                                                                                                                                                                                       | Fundamental |
| Peak |  <p>           Date: 2017-01-12<br/>           Site : 03CH13-HY<br/>           Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL<br/>           RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>           Detector : Peak<br/>           Project : 6N2509<br/>           Mode : 5         </p> | Left blank  |
| Avg. |  <p>           Date: 2017-01-12<br/>           Site : 03CH13-HY<br/>           Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL<br/>           RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>           Detector : Peak<br/>           Project : 6N2509<br/>           Mode : 5         </p>   | Left blank  |



| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                               |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH39 2480MHz                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                               |
| 1    | Horizontal                                                                                                                                                                                                                                                                                                                                                         | Fundamental                                                                                                                                                                                                                                                                                                                                                   |
| Peak | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>PEAK_BE_74</p><p>Site : 03CH13-HV<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div> | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>PEAK_74</p><p>Site : 03CH13-HV<br/>Condition : PEAK_74 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div> |
| Avg. | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>AVG_BE_54</p><p>Site : 03CH13-HV<br/>Condition : AVG_BE_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div>    | <div><p>Level (dBuV/m)</p><p>Frequency (MHz)</p><p>Date: 2017-01-12</p><p>AVG_54</p><p>Site : 03CH13-HV<br/>Condition : AVG_54 3m HORN_9120D_1241 HORIZONTAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div>    |



| BLE  | 2.4GHz 2400~2483.5MHz Band Edge @ 3m                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH39 2480MHz                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                             |
| 1    | Vertical                                                                                                                                                                                                                                                                      | Fundamental                                                                                                                                                                                                                                                                 |
| Peak | <div><p>Site : 03CH13-HV<br/>Condition : PEAK_BE_74 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div> | <div><p>Site : 03CH13-HV<br/>Condition : PEAK_74 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div> |
| Avg. | <div><p>Site : 03CH13-HV<br/>Condition : AVG_BE_54 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div>   | <div><p>Site : 03CH13-HV<br/>Condition : AVG_54 3m HORN_9120D_1241 VERTICAL<br/>RBW:1000.000KHz VBW:3.000KHz SWT:Auto<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div>   |



2.4GHz 2400~2483.5MHz

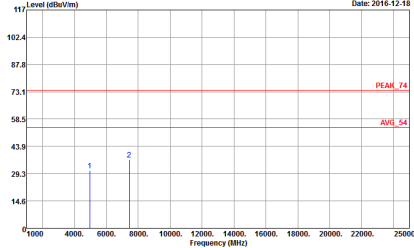
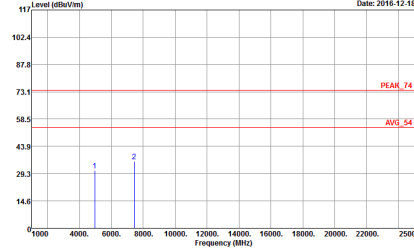
BLE (Harmonic @ 3m)

| BLE          | 2.4GHz 2400~2483.5MHz Harmonic @ 3m                                                                                                                                                     |                                                                                                                                                                                       |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT          | BLE CH00 2402MHz                                                                                                                                                                        |                                                                                                                                                                                       |
| 1            | Horizontal                                                                                                                                                                              | Vertical                                                                                                                                                                              |
| Peak<br>Avg. | <div><p>Level (dBuV/m)</p><p>Date: 2016-12-18</p><p>Site : 03CH13-HY<br/>Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div> | <div><p>Level (dBuV/m)</p><p>Date: 2016-12-19</p><p>Site : 03CH13-HY<br/>Condition : PEAK_74 3m SHF_HORN_584 VERTICAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 4</p></div> |



| BLE          | 2.4GHz 2400~2483.5MHz Harmonic @ 3m                                                                                                         |                                                                                                                                           |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| ANT          | BLE CH19 2440MHz                                                                                                                            |                                                                                                                                           |
| 1            | Horizontal                                                                                                                                  | Vertical                                                                                                                                  |
| Peak<br>Avg. | <div><p>Site : 08CH13-HY<br/>Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> | <div><p>Site : 08CH13-HY<br/>Condition : PEAK_74 3m SHF_HORN_584 VERTICAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 5</p></div> |

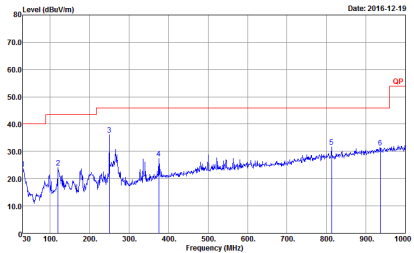
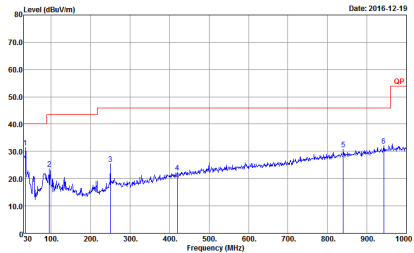


| BLE  | 2.4GHz 2400~2483.5MHz Harmonic @ 3m                                                                                                                                                                                          |                                                                                                                                                                                                                             |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT  | BLE CH39 2480MHz                                                                                                                                                                                                             |                                                                                                                                                                                                                             |
| 1    | Horizontal                                                                                                                                                                                                                   | Vertical                                                                                                                                                                                                                    |
| Peak | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_74 3m SHF_HORN_584 HORIZONTAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div> | <div><p>Site : 03CH13-HY<br/>Condition : PEAK_74 3m SHF_HORN_584 VERTICAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 6</p></div> |



Emission below 1GHz

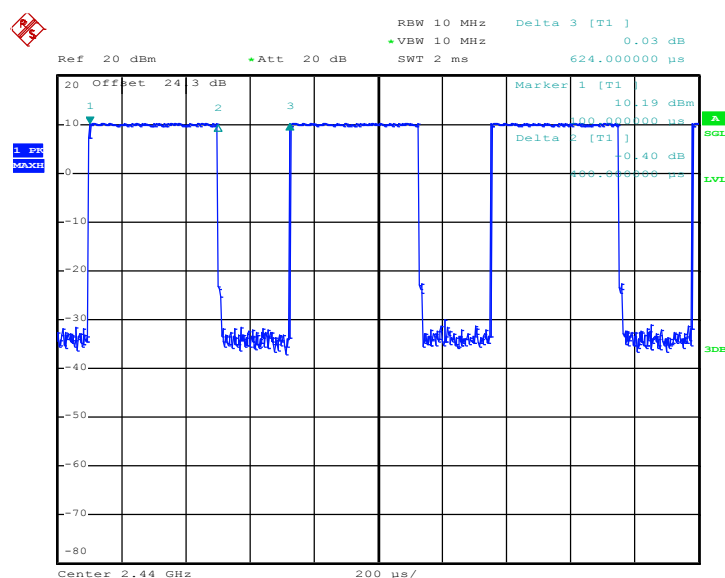
2.4GHz BLE (LF)

| BLE          | 2.4GHz 2400~2483.5MHz                                                                                                                                                                                        |                                                                                                                                                                                                             |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ANT          | BLE LF                                                                                                                                                                                                       |                                                                                                                                                                                                             |
| 1            | Horizontal                                                                                                                                                                                                   | Vertical                                                                                                                                                                                                    |
| QP /<br>Peak |  <p>Site : 03CH13-HY<br/>Condition : QP 3m SLO6_40103 HORIZONTAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 20</p> |  <p>Site : 03CH13-HY<br/>Condition : QP 3m SLO6_40103 VERTICAL<br/>Detector : Peak<br/>Project : 6N2509<br/>Mode : 20</p> |

## Appendix C. Duty Cycle Plots

| Band               | Duty Cycle(%) | T(us)  | 1/T(kHz) | VBW Setting |
|--------------------|---------------|--------|----------|-------------|
| Bluetooth 4.0 – LE | 64.10         | 400.00 | 2.50     | 3kHz        |

### Bluetooth 4.0 – LE



Date: 13.DEC.2016 23:57:42