

**FCC/IC - TEST REPORT**Report Number : **68.950.18.0301.02** Date of Issue: **October 24, 2018**Model : **904100**Product Type : **eClip**Applicant : **Elepho Inc.,**Address : **c/o Jay Companies, 466 Central Ave (2nd floor), Cedarhurst,  
New York 11516, USA.**Manufacturer : **VINTECH CORP.**Address : **4F-7, No.27, Sec 3, Chung Shan North Rd, Taipei, Taiwan, R.O.C**Test Result : **n Positive      o Negative**Total pages including  
Appendices: **28**

*TÜV SÜD Certification and Testing (China) Co., Ltd. – Shenzhen Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.*

*TÜV SÜD Certification and Testing (China) Co., Ltd. – Shenzhen Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. – Shenzhen Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. – Shenzhen Branch issued reports.*

*This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval*

## 1 Table of Contents

|     |                                                   |    |
|-----|---------------------------------------------------|----|
| 1   | Table of Contents.....                            | 2  |
| 2   | Details about the Test Laboratory .....           | 3  |
| 3   | Description of the Equipment Under Test.....      | 4  |
| 4   | Summary of Test Standards.....                    | 5  |
| 5   | Summary of Test Results.....                      | 6  |
| 6   | General Remarks.....                              | 7  |
| 7   | Test Setups.....                                  | 8  |
| 8   | Systems test configuration .....                  | 9  |
| 9   | Technical Requirement .....                       | 10 |
| 9.1 | Conducted peak output power .....                 | 10 |
| 9.2 | Power spectral density .....                      | 11 |
| 9.3 | 6 dB Bandwidth and 99% Occupied Bandwidth.....    | 12 |
| 9.4 | Spurious RF conducted emissions .....             | 16 |
| 9.5 | Band edge .....                                   | 21 |
| 9.6 | Spurious radiated emissions for transmitter ..... | 23 |
| 10  | Test Equipment List.....                          | 27 |
| 11  | System Measurement Uncertainty .....              | 28 |

## 2 Details about the Test Laboratory

### Details about the Test Laboratory

#### Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch  
Building 12 & 13, Zhiheng Wisdomland Business Park, Nantou Checkpoint  
Road 2, Nanshan District  
Shenzhen 518052  
P.R. China

Telephone: 86 755 8828 6998  
Fax: 86 755 828 5299

FCC Registration No.: 514049

IC Registration No.: 10320A

### 3 Description of the Equipment Under Test

|                            |                                       |
|----------------------------|---------------------------------------|
| Product:                   | eClip                                 |
| Model no.:                 | 904100                                |
| FCC ID:                    | 2AQVJ9041EC                           |
| Rated Input:               | 3.0Vdc supplied by CR2032 button cell |
| RF Transmission Frequency: | 2402MHz-2480MHz                       |
| No. of Operated Channel:   | 40                                    |
| Modulation:                | GFSK                                  |
| Antenna Type:              | Integrated antenna                    |
| Antenna Gain:              | 2.0dBi                                |

## 4 Summary of Test Standards

| Test Standards                             |                                                                                                                             |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| FCC Part 15 Subpart C<br>10-1-2017 Edition | PART 15 - RADIO FREQUENCY DEVICES<br>Subpart C - Intentional Radiators                                                      |
| RSS-Gen Issue 5<br>April 2018              | General Requirements for Compliance of Radio Apparatus                                                                      |
| RSS-247<br>Issue 2 February 2017           | Digital Transmission Systems (DTS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices |

All the test methods were according to KDB 558074 D01 15.247 Meas Guidance v05 and ANSI C63.10 (2013).

## 5 Summary of Test Results

| Technical Requirements                                 |                                             |            |           |                                     |                          |                                     |
|--------------------------------------------------------|---------------------------------------------|------------|-----------|-------------------------------------|--------------------------|-------------------------------------|
| FCC Part 15 Subpart C/ RSS-247 Issue 2/RSS-Gen Issue 5 |                                             |            |           |                                     |                          |                                     |
| Test Condition                                         |                                             | Pages      | Test Site | Test Result                         |                          |                                     |
|                                                        |                                             |            |           | Pass                                | Fail                     | N/A                                 |
| §15.207 & RSS-GEN 8.8                                  | Conducted emission AC power port            | ---        | ---       | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| §15.247 (b) (1) & RSS-247 5.4(d)                       | Conducted peak output power                 | 10         | Site 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| §15.247(a)(1) & RSS-247 5.1(b)                         | 20dB bandwidth                              | ---        | ---       | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| §15.247(a)(1) & RSS-247 5.1(b)                         | Carrier frequency separation                | ---        | ---       | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| §15.247(a)(1)(iii) & RSS-247 5.1(d)                    | Number of hopping frequencies               | ---        | ---       | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| §15.247(a)(1)(iii) & RSS-247 5.1(d)                    | Dwell Time                                  | ---        | ---       | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| §15.247(e) & RSS-247 5.2(b)                            | Power spectral density                      | 11         | Site 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| §15.247(a)(2) & RSS-247 5.2(a) & RSS-GEN 6.7           | 6dB bandwidth and 99% Occupied Bandwidth    | 12         | Site 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| §15.247(d) & RSS-247 5.5                               | Spurious RF conducted emissions             | 16         | Site 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| §15.247(d) & RSS-247 5.5                               | Band edge                                   | 21         | Site 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| §15.247(d) & §15.209 & RSS-247 5.5 & RSS-Gen 6.13      | Spurious radiated emissions for transmitter | 23         | Site 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |
| §15.203 & RSS-Gen 6.8                                  | Antenna requirement                         | See note 1 |           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            |

Note 1: N/A=Not Applicable.

Note 2: The EUT uses an Integrated antenna, which gain is 2.0dBi. In accordance to §15.203 & RSS-Gen 6.8, it is considered sufficiently to comply with the provisions of this section.

## 6 General Remarks

### Remarks

This submittal(s) (test report) is update base on report 68.950.18.0301.01, only update the manufacturer name without further testing.

This submittal(s) (test report) is intended for FCC ID: 2AQVJ9041EC, complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C rules and RSS-247, RSS-GEN.

### SUMMARY:

All tests according to the regulations cited on page 5 were

n - Performed

o - **Not** Performed

The Equipment under Test

n - **Fulfills** the general approval requirements.

o - **Does not** fulfill the general approval requirements.

Sample Received Date: July 17, 2018

Testing Start Date: July 20, 2018

Testing End Date: August 2, 2018

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch -

Reviewed by:

Prepared by:

Tested by:



John Zhi  
Project Manager



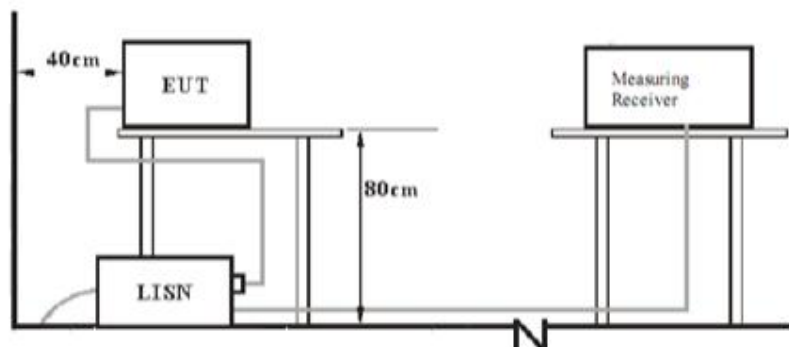
Alan Xiong  
Project Engineer



Tree Zhan  
Test Engineer

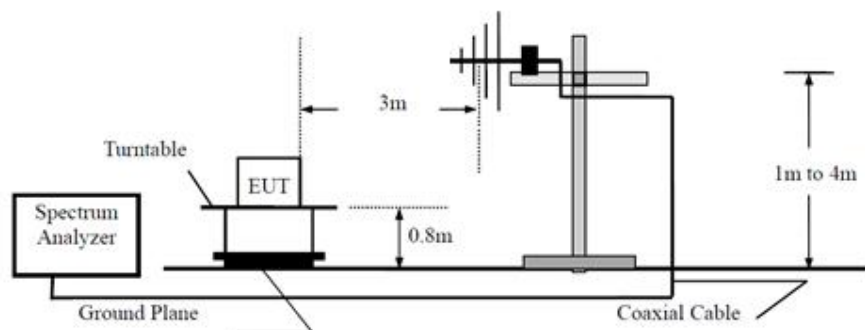
## 7 Test Setups

### 7.1 AC Power Line Conducted Emission test setups

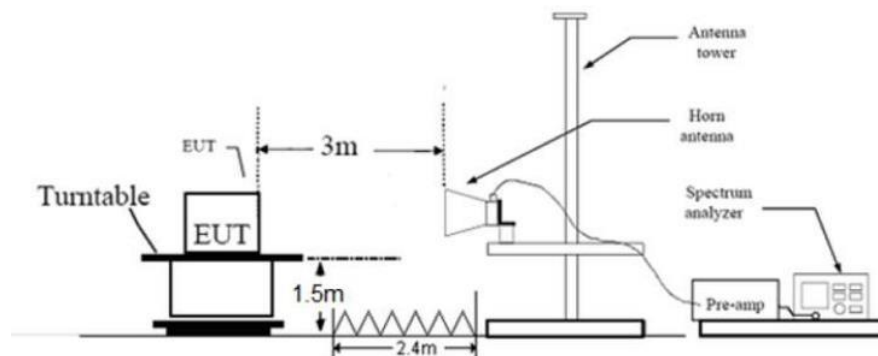


### 7.2 Radiated test setups

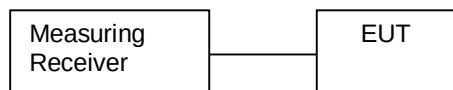
Below 1GHz



Above 1GHz



### 7.3 Conducted RF test setups



## 8 Systems test configuration

Auxiliary Equipment Used during Test:

| DESCRIPTION | MANUFACTURER | MODEL NO. | S/N |
|-------------|--------------|-----------|-----|
| PC          | Lenovo       | X240      | --- |

Remark: the test software is nRFgo.

## 9 Technical Requirement

### 9.1 Conducted peak output power

#### Test Method

1. Use the following spectrum analyzer settings:  
RBW > the 6 dB bandwidth of the emission being measured, VBW $\geq$ 3RBW, Span $\geq$ 3RBW  
Sweep = auto, Detector function = peak, Trace = max hold.
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

#### Limits

According to §15.247 (b) (1) & RSS-247 5.4(d), conducted peak output power limit as below:

| Frequency Range<br>MHz | Limit<br>W | Limit<br>dBm |
|------------------------|------------|--------------|
| 2400-2483.5            | $\leq 1$   | $\leq 30$    |

Test result as below table

| Frequency<br>MHz       | Conducted Peak<br>Output Power<br>dBm | Result |
|------------------------|---------------------------------------|--------|
| Bottom channel 2402MHz | -3.44                                 | Pass   |
| Middle channel 2440MHz | -3.41                                 | Pass   |
| Top channel 2480MHz    | -4.39                                 | Pass   |

## 9.2 Power spectral density

### Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz, VBW $\geq$ 3RBW, Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

### Limit

Limit [dBm]

$\leq 8$

### Test result

| Frequency<br>MHz       | Power spectral<br>density<br>dBm | Result |
|------------------------|----------------------------------|--------|
| Top channel 2402MHz    | -17.74                           | Pass   |
| Middle channel 2440MHz | -19.41                           | Pass   |
| Bottom channel 2480MHz | -18.94                           | Pass   |

### 9.3 6 dB Bandwidth and 99% Occupied Bandwidth

#### Test Method for 6 dB Bandwidth

1. Use the following spectrum analyzer settings:  
RBW=100K, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq$  6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

#### Test Method for 99 % Bandwidth

1. Use the following spectrum analyzer settings:  
RBW=1% to 5% of the actual occupied, VBW $\geq$ 3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq$  6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

#### Limit

Limit [kHz]

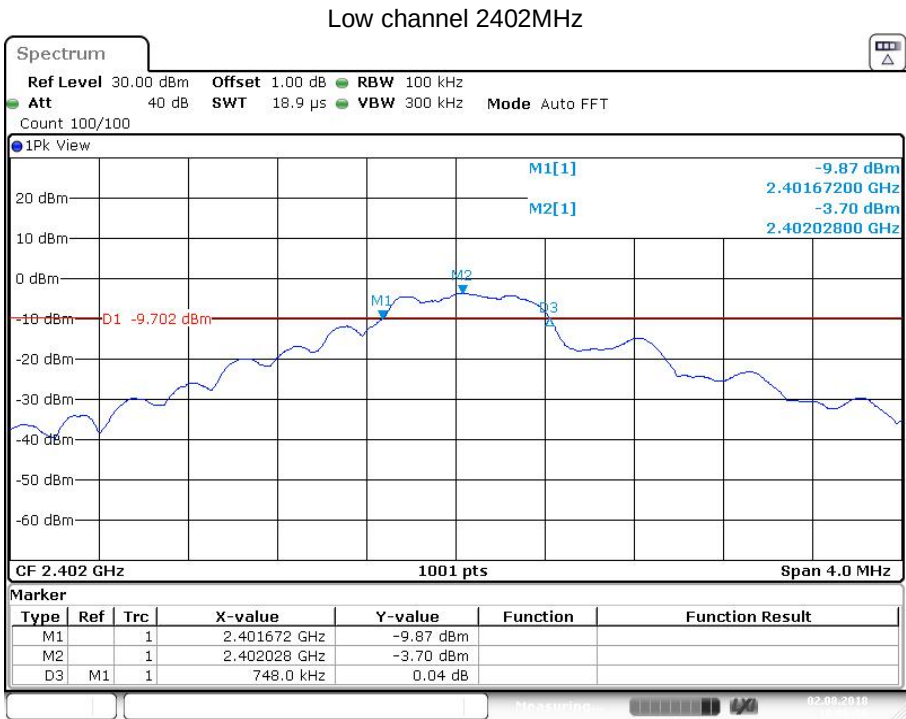
$\geq 500$

#### Test result

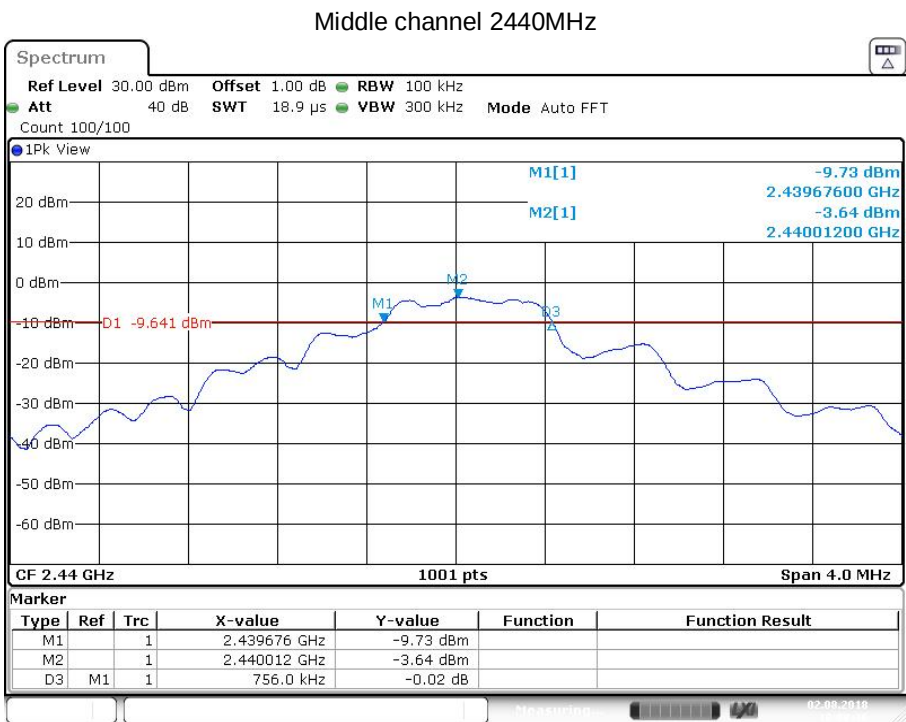
| Frequency<br>MHz       | 6dB bandwidth<br>kHz | 99% bandwidth<br>kHz | Result |
|------------------------|----------------------|----------------------|--------|
| Bottom channel 2402MHz | 748                  | 1906                 | Pass   |
| Middle channel 2440MHz | 756                  | 1810                 | Pass   |
| Top channel 2480MHz    | 692                  | 1570                 | Pass   |



6 dB Bandwidth



Date: 2.AUG.2018 10:06:56

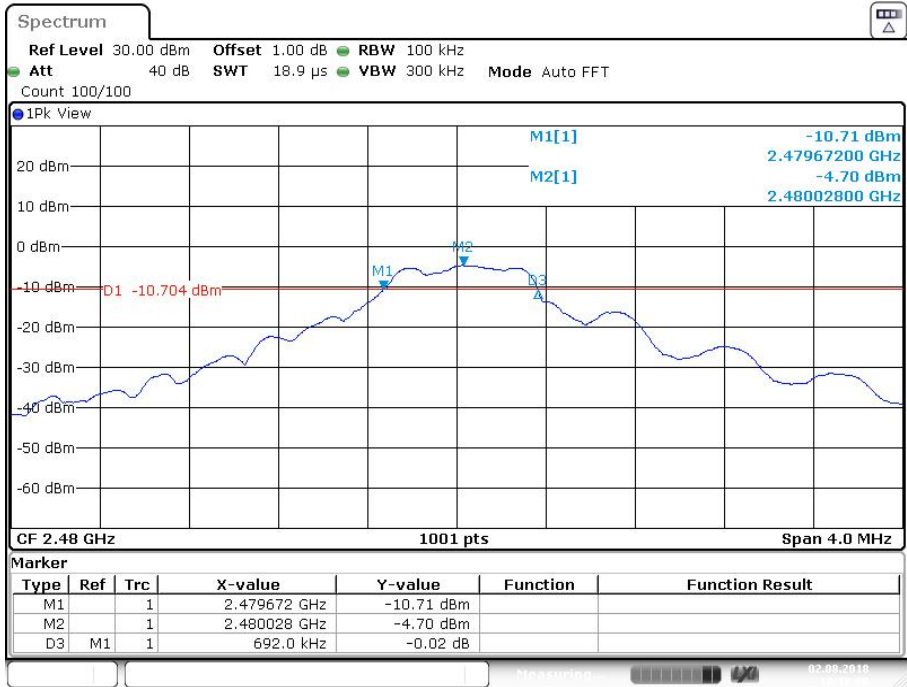


Date: 2.AUG.2018 10:08:36



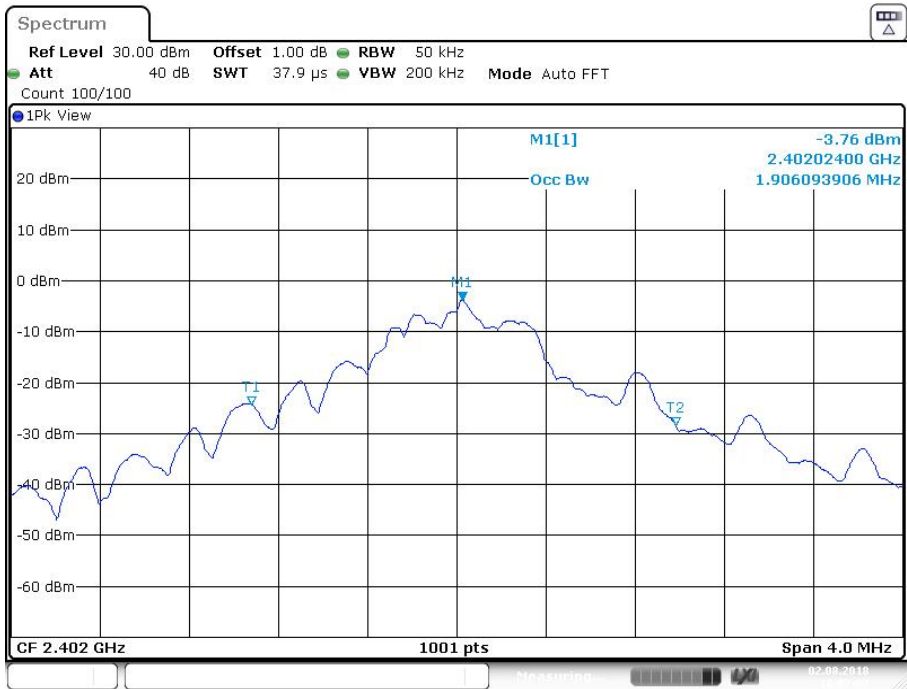
6 dB Bandwidth and 99% Bandwidth

High channel 2480MHz



Date: 2 AUG 2018 10:10:01

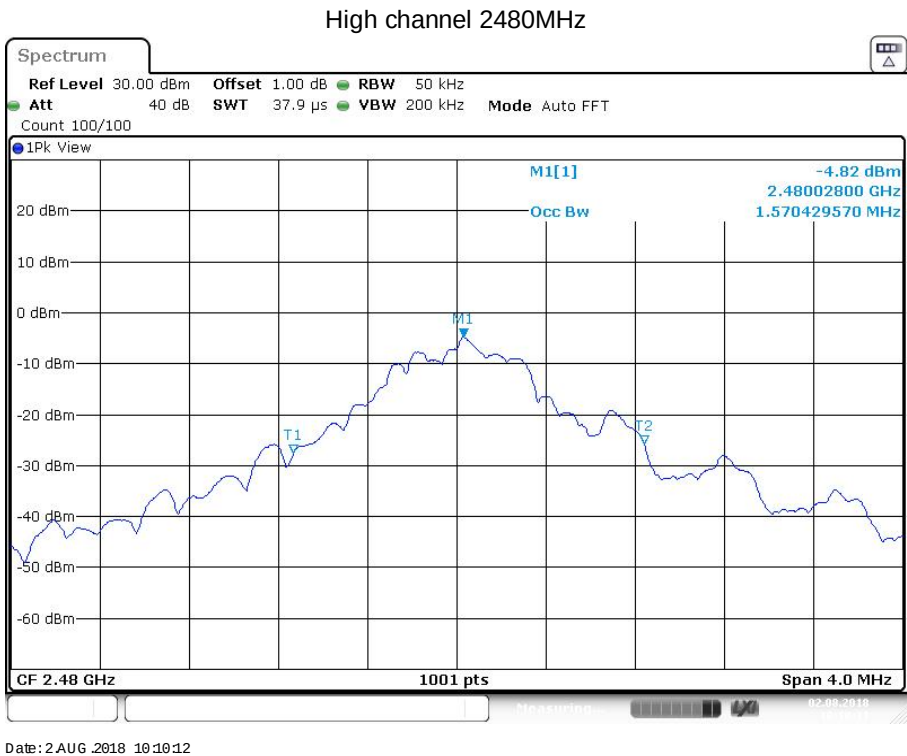
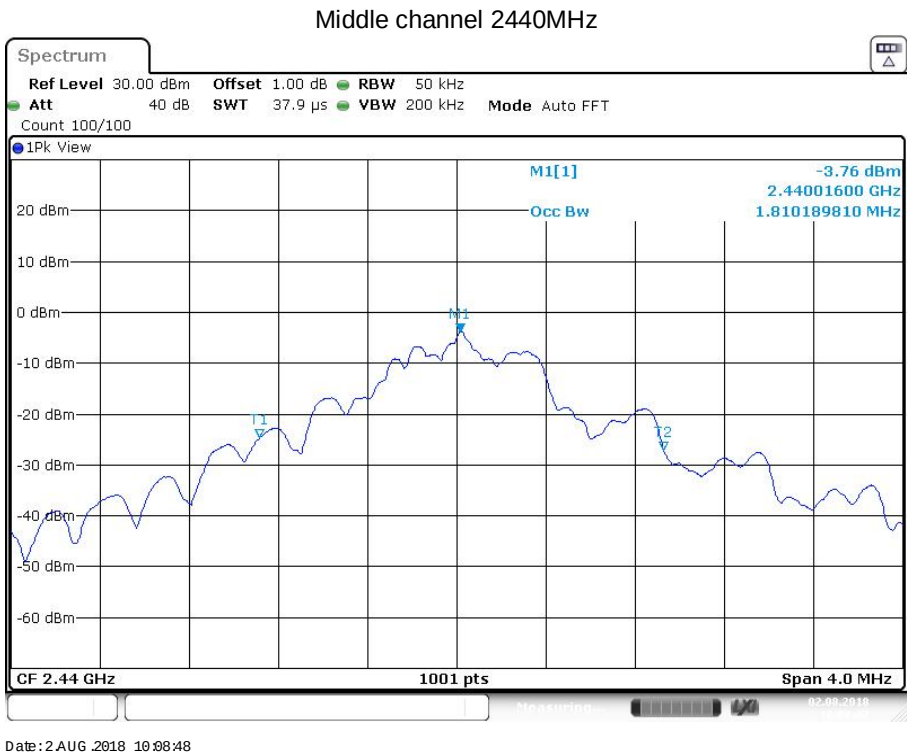
Low channel 2402MHz



Date: 2 AUG 2018 10:17:07



99% Bandwidth



## 9.4 Spurious RF conducted emissions

### Test Method

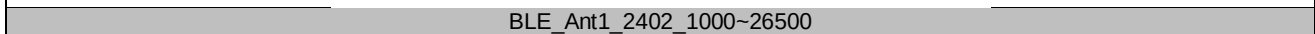
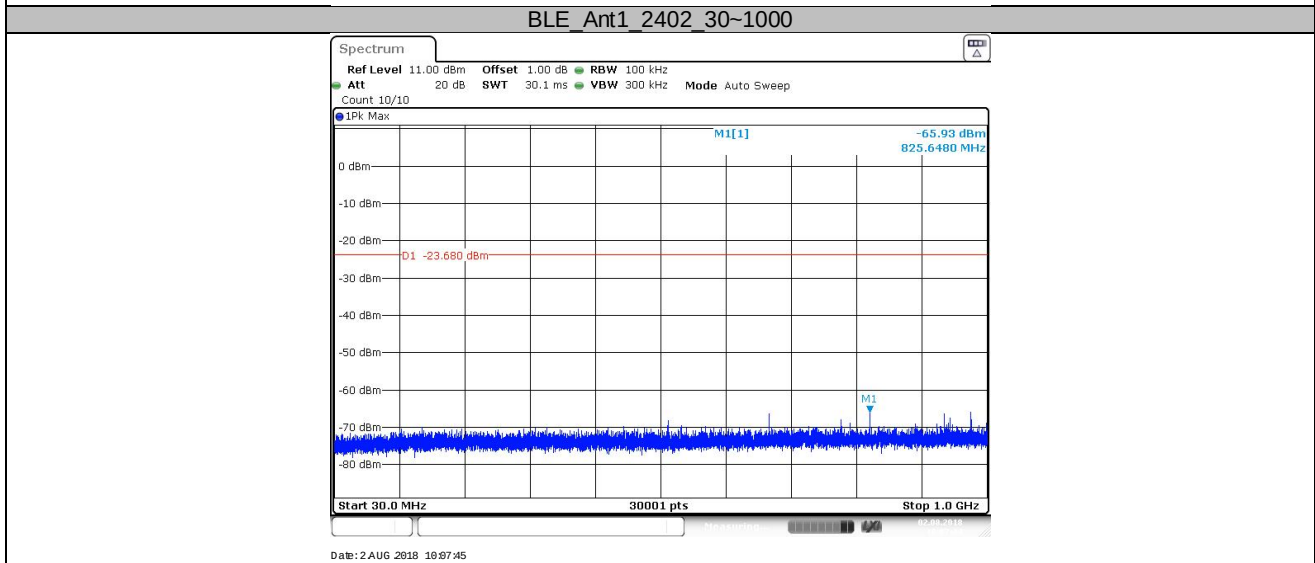
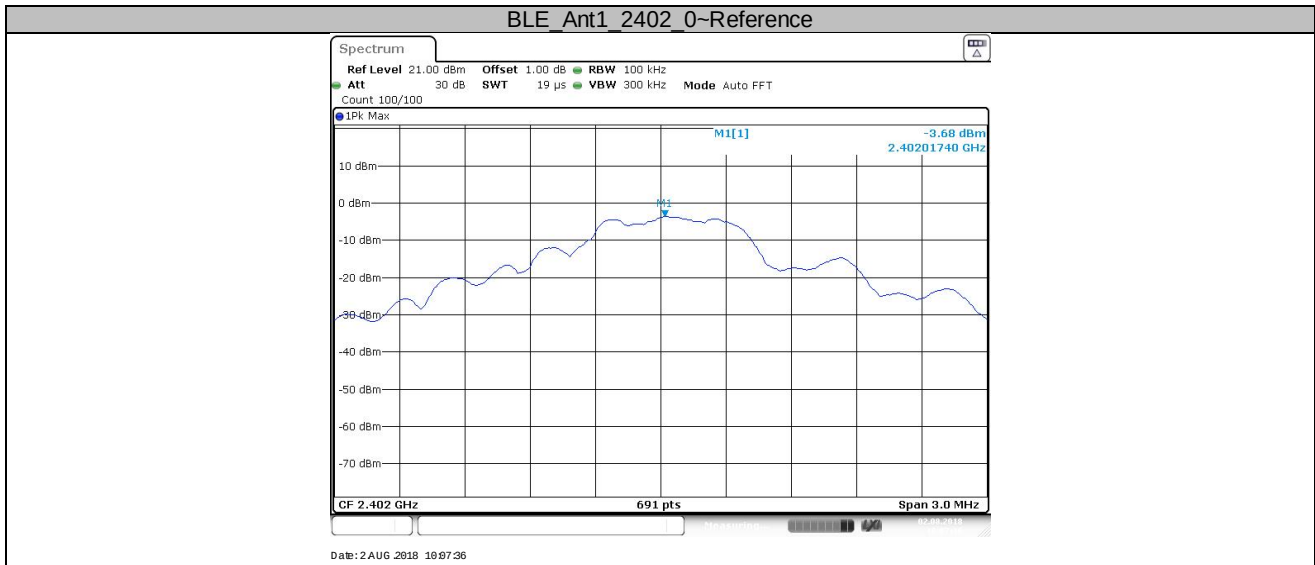
1. Establish a reference level by using the following procedure:
  - a. Set RBW=100 kHz. VBW $\geq$ 3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
  - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
  - a. Set the center frequency and span to encompass frequency range to be measured.
  - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

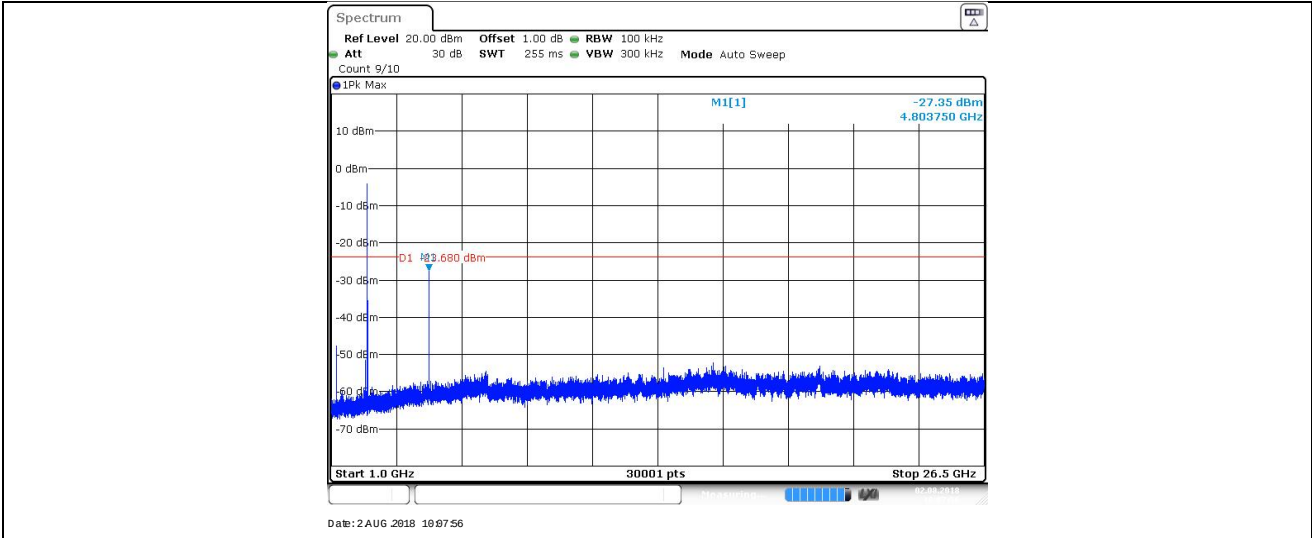
### Limit

| Frequency Range<br>MHz | Limit (dBc) |
|------------------------|-------------|
| 30-25000               | -20         |

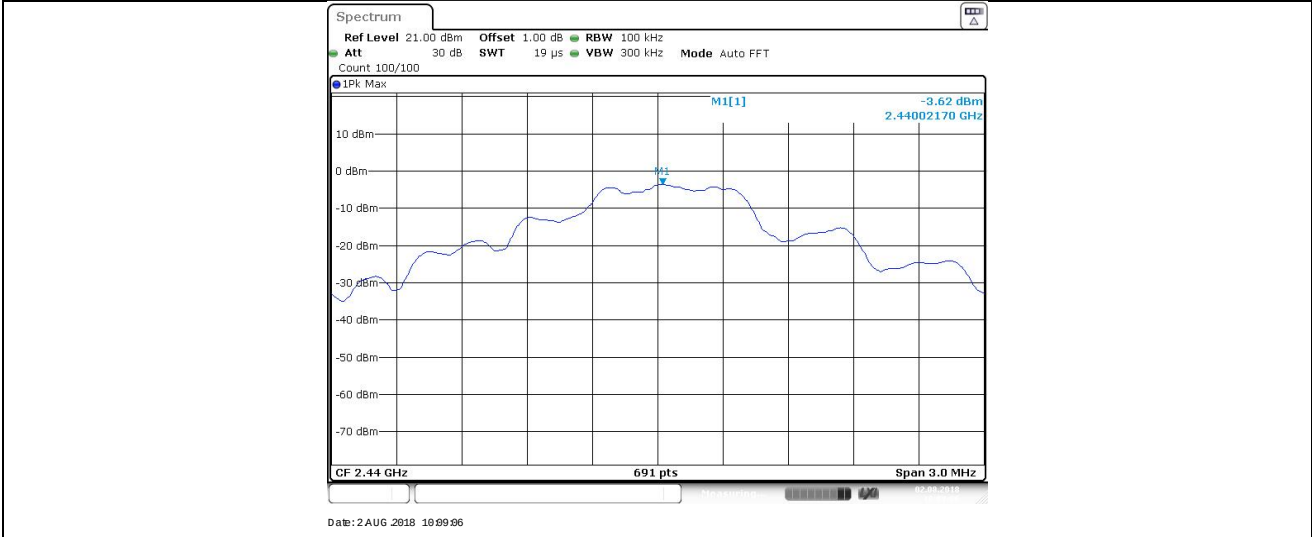
## Spurious RF conducted emissions

| TestMode | Antenna | Channel | FreqRange  | RefLevel | Result | Limit  | Verdict |
|----------|---------|---------|------------|----------|--------|--------|---------|
| BLE      | Ant1    | 2402    | Reference  | -3.68    | -3.68  | ---    | PASS    |
|          |         | 2402    | 30~1000    | -3.68    | -65.93 | -23.68 | PASS    |
|          |         | 2402    | 1000~26500 | -3.68    | -27.35 | -23.68 | PASS    |
|          |         | 2440    | Reference  | -3.62    | -3.62  | ---    | PASS    |
|          |         | 2440    | 30~1000    | -3.62    | -65.71 | -23.62 | PASS    |
|          |         | 2440    | 1000~26500 | -3.62    | -44.45 | -23.62 | PASS    |
|          |         | 2480    | Reference  | -4.74    | -4.74  | ---    | PASS    |
|          |         | 2480    | 30~1000    | -4.74    | -64.46 | -24.74 | PASS    |
|          |         | 2480    | 1000~26500 | -4.74    | -37.66 | -24.74 | PASS    |

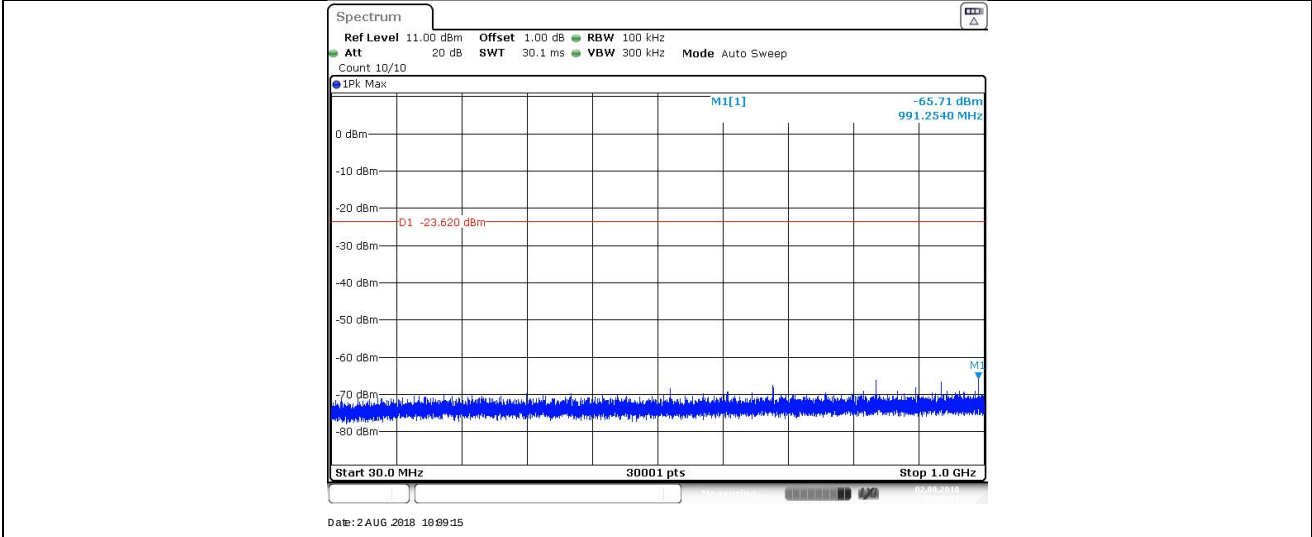




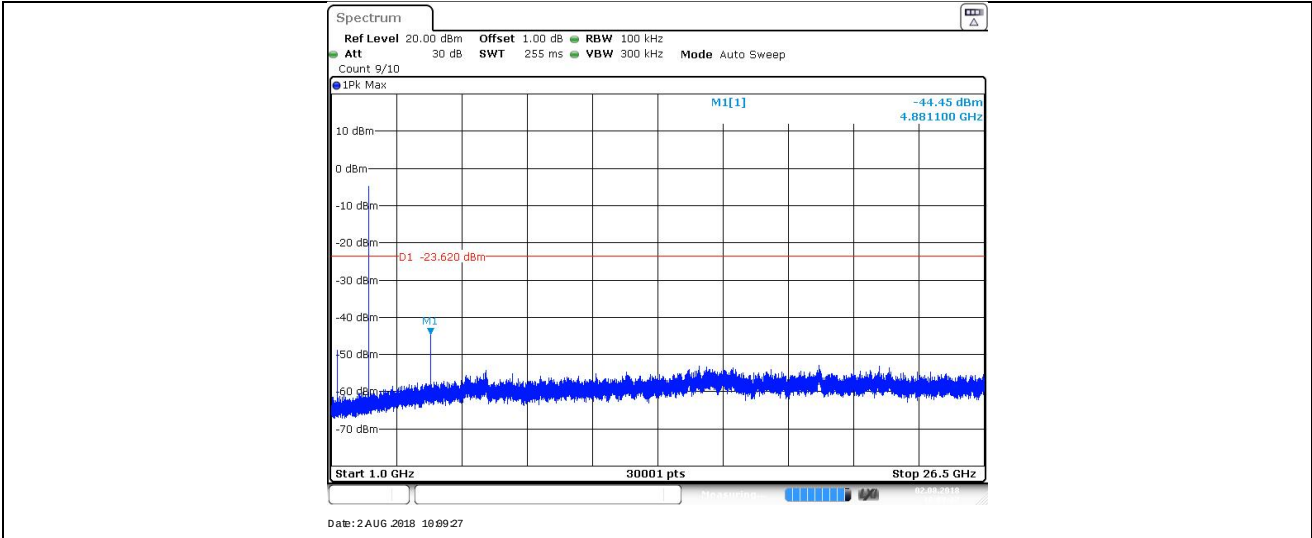
BLE\_Ant1\_2440\_0-Reference



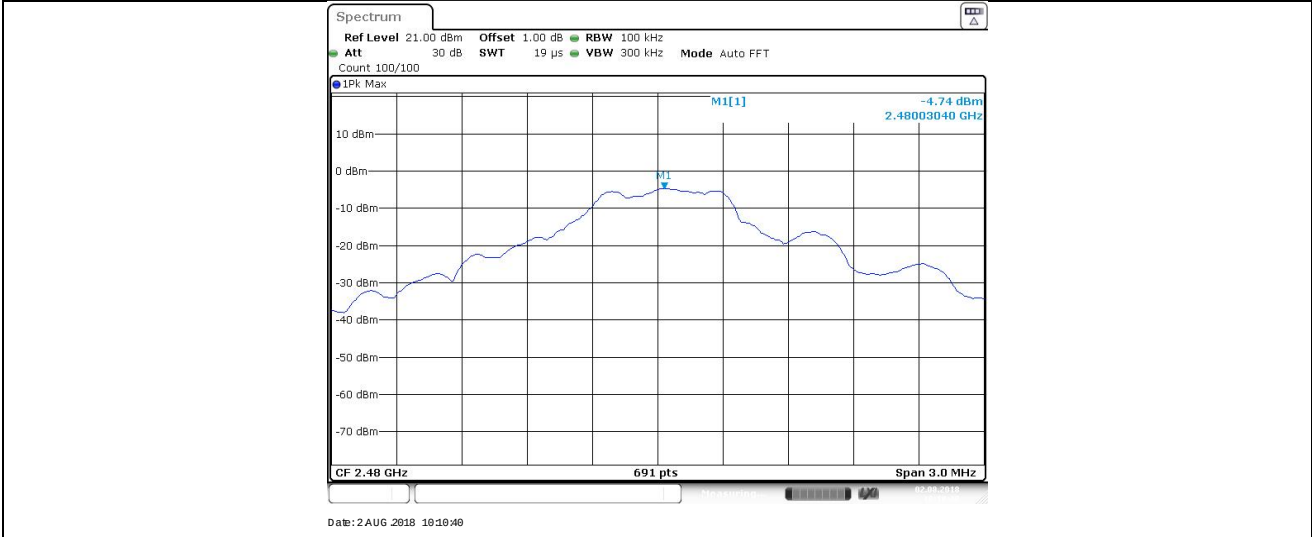
BLE\_Ant1\_2440\_30-1000



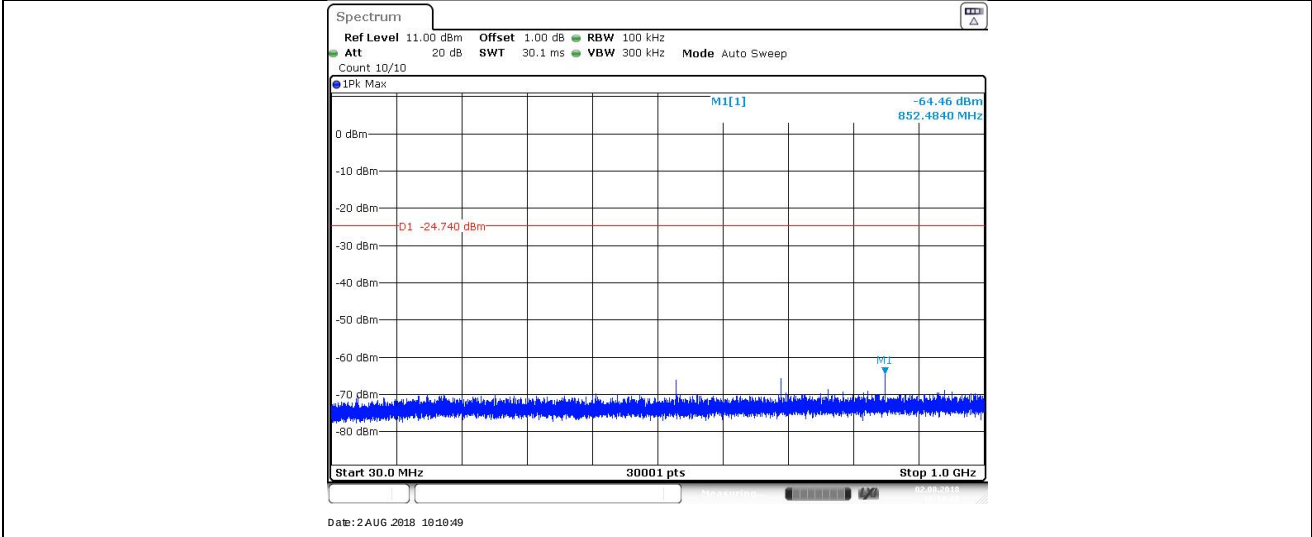
BLE\_Ant1\_2440\_1000-26500



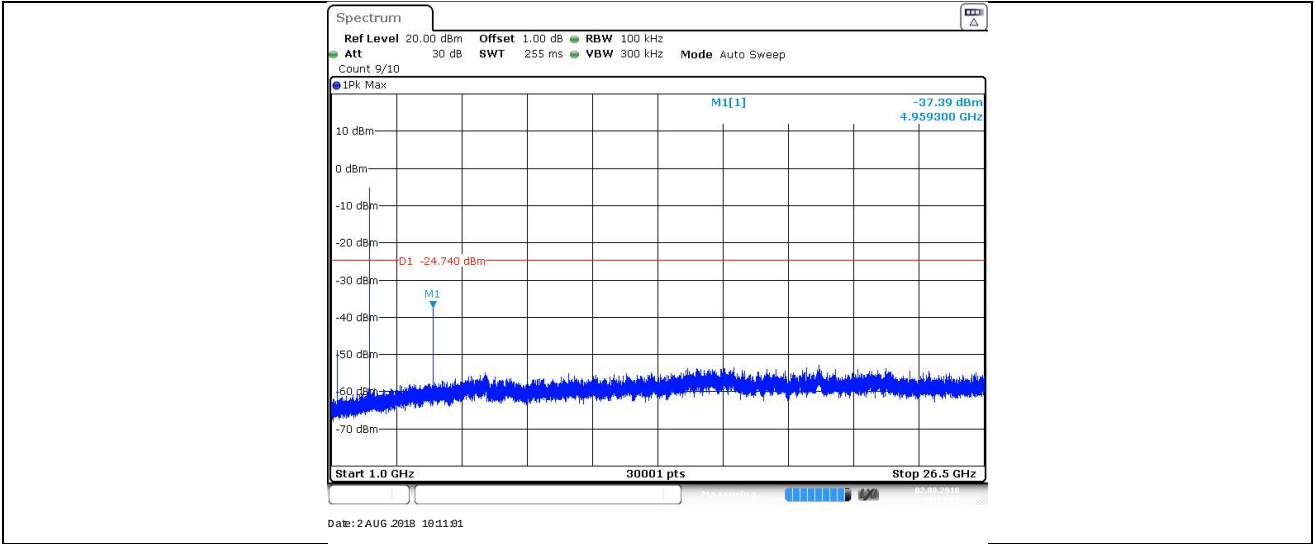
BLE\_Ant1\_2480\_0-Reference



BLE\_Ant1\_2480\_30-1000



BLE\_Ant1\_2480\_1000-26500



## 9.5 Band edge

### Test Method

- 1 Use the following spectrum analyzer settings:  
Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 100 kHz, VBW  $\geq$  RBW, Sweep = auto, Detector function = peak, Trace = max hold.
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section.

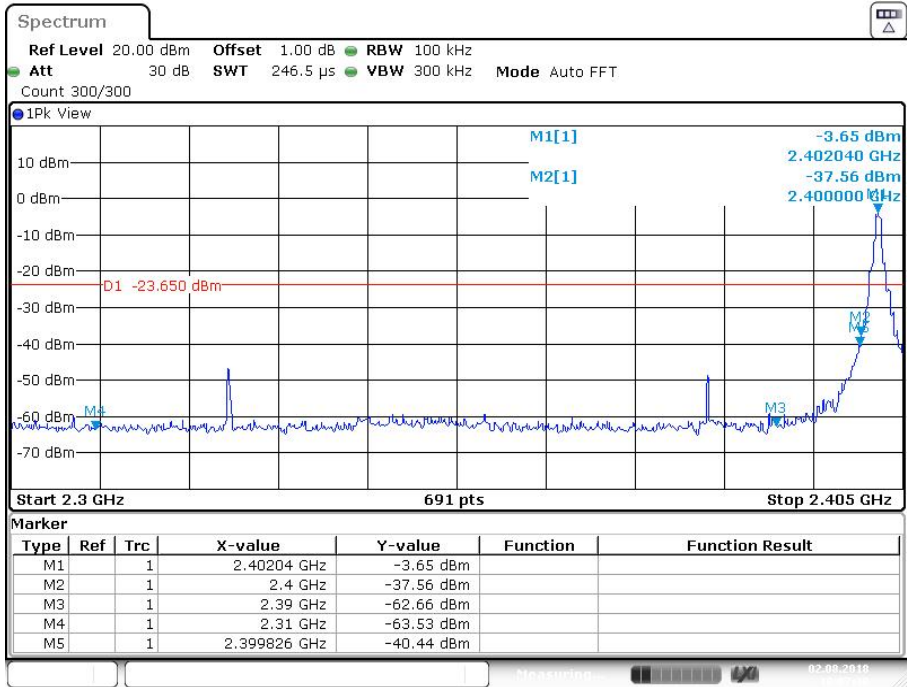
### Limit

| Frequency Range<br>MHz | Limit (dBc) |
|------------------------|-------------|
| 30-25000               | -20         |



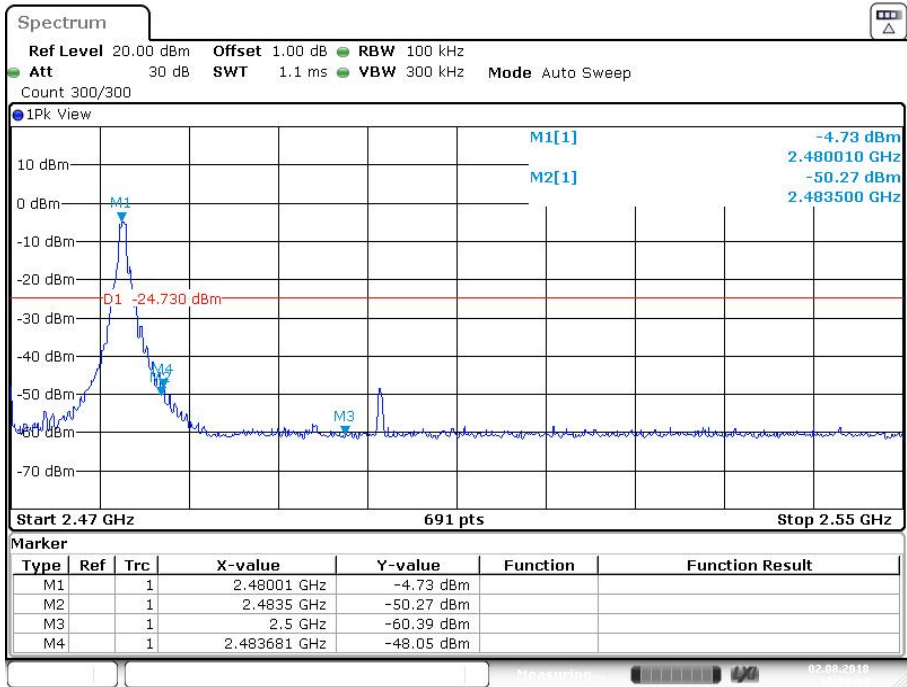
Band edge testing

2402MHz



Date: 2 AUG 2018 10:07:30

2480MHz



Date: 2 AUG 2018 10:10:34

## 9.6 Spurious radiated emissions for transmitter

### Test Method

- 1: The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
- 3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5: Use the following spectrum analyzer settings According to C63.10:

#### For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 1MHz, VBW  $\geq$  RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.

#### For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 100 KHz, VBW  $\geq$  RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

### Note:

- 1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
- 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ( $20\log(1/\text{duty cycle})$ ).
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

## Spurious radiated emissions for transmitter

### Limit

The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

| Frequency<br>MHz | Field Strength<br>$\mu\text{V/m}$ | Field Strength<br>$\text{dB}\mu\text{V/m}$ | Detector |
|------------------|-----------------------------------|--------------------------------------------|----------|
| 30-88            | 100                               | 40                                         | QP       |
| 88-216           | 150                               | 43.5                                       | QP       |
| 216-960          | 200                               | 46                                         | QP       |
| 960-1000         | 500                               | 54                                         | QP       |
| Above 1000       | 500                               | 54                                         | AV       |
| Above 1000       | 5000                              | 74                                         | PK       |

## Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

### Transmitting spurious emission test result as below:

#### Low channel 2402MHz Test Result

| Frequency Band | Frequency       | Emission Level | Polarization | Limit  | Detector | Margin | Correct factor | Result |
|----------------|-----------------|----------------|--------------|--------|----------|--------|----------------|--------|
|                | MHz             | dBμV/m         |              | dBμV/m |          | dBμV/m | (dB)           |        |
| 30-1000MHz     | 37.01           | 16.34          | H            | 40     | QP       | 23.66  | -26.1          | Pass   |
|                | 57.75           | 15.26          | H            | 40     | QP       | 24.74  | -27.0          | Pass   |
|                | 874.98          | 22.81          | H            | 46     | QP       | 23.19  | -16.1          | Pass   |
|                | Other Frequency | ---            | H            | ---    | ---      | ---    | ---            | Pass   |
|                | 32.10           | 24.03          | V            | 40     | QP       | 15.97  | -25.5          | Pass   |
|                | 62.50           | 18.45          | V            | 40     | QP       | 21.55  | -28.4          | Pass   |
|                | Other Frequency | ---            | V            | ---    | ---      | ---    | ---            | Pass   |
| 1000-25000MHz  | *4803.75        | 52.38          | H            | 74     | PK       | 21.62  | 2.8            | Pass   |
|                | *7206.09        | 41.06          | H            | 74     | PK       | 32.94  | 4.9            | Pass   |
|                | Other Frequency | ---            | H            | 74     | ---      | ---    | ---            | Pass   |
|                | *4803.75        | 51.73          | V            | 74     | PK       | 22.27  | 3.0            | Pass   |
|                | Other Frequency | ---            | V            | 74     | ---      | ---    | ---            | Pass   |

#### Middle channel 2440MHz Test Result

| Frequency Band | Frequency       | Emission Level | Polarization | Limit  | Detector | Margin | Correct factor | Result |
|----------------|-----------------|----------------|--------------|--------|----------|--------|----------------|--------|
|                | MHz             | dBμV/m         |              | dBμV/m |          | dBμV/m | (dB)           |        |
| 1000-25000MHz  | *4879.69        | 45.07          | H            | 74     | PK       | 28.93  | 2.6            | Pass   |
|                | Other Frequency | ---            | H            | 74     | ---      | ---    | ---            | Pass   |
|                | *4880.16        | 43.13          | V            | 74     | PK       | 30.87  | 2.8            | Pass   |
|                | Other Frequency | ---            | V            | 74     | ---      | ---    | ---            | Pass   |

#### High channel 2480MHz Test Result

| Frequency Band | Frequency       | Emission Level | Polarization | Limit  | Detector | Margin | Correct factor | Result |
|----------------|-----------------|----------------|--------------|--------|----------|--------|----------------|--------|
|                | MHz             | dBμV/m         |              | dBμV/m |          | dBμV/m | (dB)           |        |
| 1000-25000MHz  | *7440.00        | 42.53          | H            | 74     | PK       | 31.47  | 6.1            | Pass   |
|                | Other Frequency | --             | H            | --     | --       | --     | --             | Pass   |
|                | *3630.00        | 37.70          | V            | 74     | PK       | 36.30  | -1.0           | Pass   |
|                | Other Frequency | --             | V            | --     | --       | --     | --             | Pass   |

Remark:

- (1) “\*” means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.
- (2) Data of measurement within this frequency range shown “--” in the table above means the reading of emissions are the noise floor or attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (3) Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain  
Below 1GHz: Corrector factor = Antenna Factor + Cable Loss

## 10 Test Equipment List

### List of Test Instruments

#### Radiated Emission Test

| DESCRIPTION                         | MANUFACTURER    | MODEL NO. | SERIAL NO.      | CAL. DUE DATE |
|-------------------------------------|-----------------|-----------|-----------------|---------------|
| EMI Test Receiver                   | Rohde & Schwarz | ESR 26    | 101269          | 2019-7-6      |
| Trilog Super Broadband Test Antenna | Schwarzbeck     | VULB 9163 | 707             | 2019-6-28     |
| Horn Antenna                        | Rohde & Schwarz | HF907     | 102294          | 2019-6-28     |
| Pre-amplifier                       | Rohde & Schwarz | SCU 18    | 102230          | 2019-7-6      |
| Signal Generator                    | Rohde & Schwarz | SMY01     | 839369/005      | 2019-7-6      |
| Attenuator                          | Agilent         | 8491A     | MY39264334      | 2019-7-6      |
| 3m Semi-anechoic chamber            | TDK             | 9X6X6     | ----            | 2020-7-7      |
| Test software                       | Rohde & Schwarz | EMC32     | Version 9.15.00 | N/A           |

#### TS8997 Test System

| DESCRIPTION                               | MANUFACTURER    | MODEL NO.          | SERIAL NO.       | CAL. DUE DATE |
|-------------------------------------------|-----------------|--------------------|------------------|---------------|
| Signal Generator                          | Rohde & Schwarz | SMB100A            | 108272           | 2019-7-6      |
| Vector Signal Generator                   | Rohde & Schwarz | SMBV100A           | 262825           | 2019-7-6      |
| Communication Synthetical Test Instrument | Rohde & Schwarz | CMW 270            | 101251           | 2019-5-31     |
| Signal Analyzer                           | Rohde & Schwarz | FSV40              | 101030           | 2019-7-6      |
| Vector Signal Generator                   | Rohde & Schwarz | SMU 200A           | 105324           | 2019-7-6      |
| RF Switch Module                          | Rohde & Schwarz | OSP120/OSP-B157    | 101226/100851    | 2019-7-6      |
| Power Splitter                            | Weinschel       | 1580               | SC319            | 2019-7-5      |
| 10dB Attenuator                           | Weinschel       | 4M-10              | 43152            | 2019-7-6      |
| 10dB Attenuator                           | R&S             | DNF                | DNF-001          | 2019-7-6      |
| 10dB Attenuator                           | R&S             | DNF                | DNF-002          | 2019-7-6      |
| 10dB Attenuator                           | R&S             | DNF                | DNF-003          | 2019-7-6      |
| 10dB Attenuator                           | R&S             | DNF                | DNF-004          | 2019-7-6      |
| Test software                             | Rohde & Schwarz | EMC32              | Version 10.38.00 | N/A           |
| Test software                             | Tonscend        | System for BT/WIFI | Version 2.6      | N/A           |

## 11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

| System Measurement Uncertainty                              |                                                                                    |
|-------------------------------------------------------------|------------------------------------------------------------------------------------|
| Test Items                                                  | Extended Uncertainty                                                               |
| Uncertainty for Radiated Spurious Emission 25MHz-3000MHz    | Horizontal: 4.91dB;<br>Vertical: 4.89dB;                                           |
| Uncertainty for Radiated Spurious Emission 3000MHz-25000MHz | Horizontal: 4.80dB;<br>Vertical: 4.79dB;                                           |
| Uncertainty for Conducted RF test with TS 8997              | Power level test involved: 2.13dB<br>Frequency test involved: $0.6 \times 10^{-7}$ |