

|                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                            |                                                                                                                                                             |                    |                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------|
| <b>Prüfbericht-Nr.:</b><br>Test Report No.:                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>50307265 001</b>                                                                        | <b>Auftrags-Nr.:</b><br>Order No.:                                                                                                                          | <b>238104052</b>   | Seite 1 von 38<br>Page 1 of 38 |
| <b>Kunden-Referenz-Nr.:</b><br>Client Reference No.:                                                                                                                                                                                                                                                                                                                                                                                                        | <b>N/A</b>                                                                                 | <b>Auftragsdatum:</b><br>Order date:                                                                                                                        | <b>16-Aug-2019</b> |                                |
| <b>Auftraggeber:</b><br>Client:                                                                                                                                                                                                                                                                                                                                                                                                                             | 昇陽自行車國際股份有限公司<br>臺南市仁德區義林路 418 號 1 樓                                                       |                                                                                                                                                             |                    |                                |
| <b>Prüfgegenstand:</b><br>Test item:                                                                                                                                                                                                                                                                                                                                                                                                                        | 自行車訓練台                                                                                     |                                                                                                                                                             |                    |                                |
| <b>Bezeichnung / Typ-Nr.:</b><br>Identification / Type No.:                                                                                                                                                                                                                                                                                                                                                                                                 | <b>T2980</b>                                                                               |                                                                                                                                                             |                    |                                |
| <b>Auftrags-Inhalt:</b><br>Order content:                                                                                                                                                                                                                                                                                                                                                                                                                   | NCC LP0002 test report                                                                     |                                                                                                                                                             |                    |                                |
| <b>Prüfgrundlage:</b><br>Test specification:                                                                                                                                                                                                                                                                                                                                                                                                                | NCC Low-power Radio-frequency Devices Technical Regulations<br>LP0002(2018) Section 3.10.1 |                                                                                                                                                             |                    |                                |
| <b>Wareneingangsdatum:</b><br>Date of receipt:                                                                                                                                                                                                                                                                                                                                                                                                              | 06-Aug-2019                                                                                |                                                                                                                                                             |                    |                                |
| <b>Prüfmuster-Nr.:</b><br>Test sample No.:                                                                                                                                                                                                                                                                                                                                                                                                                  | A000974034-003<br>A000974034-006                                                           |                                                                                                                                                             |                    |                                |
| <b>Prüfzeitraum:</b><br>Testing period:                                                                                                                                                                                                                                                                                                                                                                                                                     | 03-Oct-2019 – 18-Oct-2019                                                                  |                                                                                                                                                             |                    |                                |
| <b>Ort der Prüfung:</b><br>Place of testing:                                                                                                                                                                                                                                                                                                                                                                                                                | EMC/RF Laboratory Taipei                                                                   |                                                                                                                                                             |                    |                                |
| <b>Prüflaboratorium:</b><br>Testing laboratory:                                                                                                                                                                                                                                                                                                                                                                                                             | TUV Rheinland Taiwan Ltd.                                                                  |                                                                                                                                                             |                    |                                |
| <b>Prüfergebnis*:</b><br>Test result*:                                                                                                                                                                                                                                                                                                                                                                                                                      | Pass                                                                                       |                                                                                                                                                             |                    |                                |
| <b>geprüft von / tested by:</b><br>25-Oct-2019 Jack Chang/Project Manager<br>Datum Name / Stellung Unterschrift<br>Date(Report Date) Name / Position Signature                                                                                                                                                                                                                                                                                              |                                                                                            | <b>kontrolliert von / reviewed by:</b><br>25-Oct-2019 Arvin Ho/Vice General Manager<br>Datum Name / Stellung Unterschrift<br>Date Name / Position Signature |                    |                                |
| <b>Sonstiges / Other:</b><br>.                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                            |                                                                                                                                                             |                    |                                |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br>Condition of the test item at delivery:                                                                                                                                                                                                                                                                                                                                                             |                                                                                            | Prüfmuster vollständig und unbeschädigt<br>Test item complete and undamaged                                                                                 |                    |                                |
| <p>* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft<br/>P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p> <p>Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor<br/>P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</p>              |                                                                                            |                                                                                                                                                             |                    |                                |
| <p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b><br/>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</p> |                                                                                            |                                                                                                                                                             |                    |                                |

## TEST SUMMARY

### **5.1.1 ANTENNA REQUIREMENT**

RESULT: *Passed*

### **5.1.2 PEAK OUTPUT POWER**

RESULT: *Passed*

### **5.1.3 6dB BANDWIDTH**

RESULT: *Passed*

### **5.1.4 POWER DENSITY**

RESULT: *Passed*

### **5.1.5 CONDUCTED SPURIOUS EMISSIONS AND FREQUENCY BAND EDGE MEASURED IN 100kHz BANDWIDTH**

RESULT: *Passed*

### **5.1.6 SPURIOUS EMISSION**

RESULT: *Passed*

### **5.2.1 MAINS CONDUCTED EMISSIONS**

RESULT: *Passed*

## Contents

|            |                                                                                               |           |
|------------|-----------------------------------------------------------------------------------------------|-----------|
| <b>1.</b>  | <b>GENERAL REMARKS .....</b>                                                                  | <b>5</b>  |
| <b>1.1</b> | <b>COMPLEMENTARY MATERIALS.....</b>                                                           | <b>5</b>  |
| <b>1.2</b> | <b>DECISION RULE OF CONFORMITY.....</b>                                                       | <b>5</b>  |
| <b>2.</b>  | <b>TEST SITES .....</b>                                                                       | <b>6</b>  |
| <b>2.1</b> | <b>TEST LABORATORY .....</b>                                                                  | <b>6</b>  |
| <b>2.2</b> | <b>TEST FACILITY.....</b>                                                                     | <b>6</b>  |
| <b>2.3</b> | <b>LIST OF TEST AND MEASUREMENT INSTRUMENTS.....</b>                                          | <b>7</b>  |
| <b>2.4</b> | <b>TRACEABILITY .....</b>                                                                     | <b>8</b>  |
| <b>2.5</b> | <b>CALIBRATION .....</b>                                                                      | <b>8</b>  |
| <b>2.6</b> | <b>MEASUREMENT UNCERTAINTY.....</b>                                                           | <b>8</b>  |
| <b>3.</b>  | <b>GENERAL PRODUCT INFORMATION.....</b>                                                       | <b>9</b>  |
| <b>3.1</b> | <b>PRODUCT FUNCTION AND INTENDED USE .....</b>                                                | <b>9</b>  |
| <b>3.2</b> | <b>SYSTEM DETAILS AND RATINGS.....</b>                                                        | <b>9</b>  |
| <b>3.3</b> | <b>INDEPENDENT OPERATION MODES.....</b>                                                       | <b>10</b> |
| <b>3.4</b> | <b>NOISE GENERATING AND NOISE SUPPRESSING PARTS .....</b>                                     | <b>10</b> |
| <b>3.5</b> | <b>SUBMITTED DOCUMENTS.....</b>                                                               | <b>10</b> |
| <b>4.</b>  | <b>TEST SET-UP AND OPERATION MODES.....</b>                                                   | <b>11</b> |
| <b>4.1</b> | <b>PRINCIPLE OF CONFIGURATION SELECTION .....</b>                                             | <b>11</b> |
| <b>4.2</b> | <b>TEST OPERATION AND TEST SOFTWARE.....</b>                                                  | <b>11</b> |
| <b>4.3</b> | <b>SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT .....</b>                                      | <b>12</b> |
| <b>4.4</b> | <b>COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....</b>                                         | <b>12</b> |
| <b>4.5</b> | <b>TEST SETUP DIAGRAM .....</b>                                                               | <b>12</b> |
| <b>5.</b>  | <b>TEST RESULTS .....</b>                                                                     | <b>14</b> |
| <b>5.1</b> | <b>TRANSMITTER REQUIREMENT &amp; TEST SUITES .....</b>                                        | <b>14</b> |
| 5.1.1      | <i>Antenna Requirement .....</i>                                                              | <i>14</i> |
| 5.1.2      | <i>Peak Output Power .....</i>                                                                | <i>15</i> |
| 5.1.3      | <i>6dB Bandwidth .....</i>                                                                    | <i>16</i> |
| 5.1.4      | <i>Power Density .....</i>                                                                    | <i>20</i> |
| 5.1.5      | <i>Conducted spurious emissions and Frequency Band Edge measured in 100kHz Bandwidth.....</i> | <i>24</i> |
| 5.1.6      | <i>Spurious Emission .....</i>                                                                | <i>30</i> |
| <b>5.2</b> | <b>MAINS EMISSIONS.....</b>                                                                   | <b>31</b> |
| 5.2.1      | <i>Mains Conducted Emissions.....</i>                                                         | <i>31</i> |
| <b>6.</b>  | <b>PHOTOGRAPHS OF THE TEST SET-UP.....</b>                                                    | <b>32</b> |

**Produkte**  
*Products*

**Prüfbericht - Nr.: 50307265 001**  
*Test Report No.*

**Seite 4 von 38**  
*Page 4 of 38*

|           |                                 |           |
|-----------|---------------------------------|-----------|
| <b>7.</b> | <b>LIST OF TABLES .....</b>     | <b>38</b> |
| <b>8.</b> | <b>LIST OF PHOTOGRAPHS.....</b> | <b>38</b> |

## 1. General Remarks

### 1.1 Complementary Materials

The following attachments are integral parts of this test report:

**Appendix P: Photo Documentation internal view**  
(File Name: 50307265 001 APPENDIXP)

**Appendix D: Test Result of Radiated Emissions**  
(File Name: 50307265 001 APPENDIXD)

Test Specifications

The following standards were applied.

**Table 1: Applied Standard and Test Levels**

| <b>Radio</b>                                                                              |
|-------------------------------------------------------------------------------------------|
| NCC Low-power Radio-frequency Devices Technical Regulations LP0002(2018) (107 年 1 月 10 日) |

### 1.2 Decision Rule of conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

## 2. Test Sites

### 2.1 Test Laboratory

Conducted test site:  
TUV Rheinland Taiwan Ltd.  
Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.  
Taipei City 105  
Taiwan (R.O.C.)

Radiated test site:  
TUV Rheinland Taiwan Ltd.  
Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.  
New Taipei City 244  
Taiwan (R.O.C.)

### 2.2 Test Facility

TUV Rheinland Taiwan Ltd.

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.  
Taipei City 105  
Taiwan (R.O.C.)

FCC RegistrationNo.: 180491  
IC Canada Registration No.: 9465A  
TAF Accredited NCC Test Lab. No.:3567  
TAF ISO17025 Certification effective period: 6<sup>th</sup>-May-2019 to 05<sup>th</sup>-May-2022



**Testing Laboratory**  
**3567**

## 2.3 List of Test and Measurement Instruments

**Table 2: List of Test and Measurement Equipment**

| Kind of Equipment  | Manu-facturer   | Type             | S/N         | Last Calibration | Next Calibration |
|--------------------|-----------------|------------------|-------------|------------------|------------------|
| EMI Test Receiver  | Rohde & Schwarz | ESCI 7           | 100797      | 2019/01/16       | 2020/01/16       |
| Two-Line V-Network | Rohde & Schwarz | ENV216           | 101262      | 2019/07/16       | 2020/07/16       |
| Spectrum Analyzer  | R&S             | FSV40            | 101513      | 2019/2/8         | 2020/2/8         |
| Thermo Chamber     | Giant Force     | GHT-150-40-CP-SD | MAA1902-010 | 2019/2/1         | 2020/2/1         |
| Signal Generator   | R&S             | SMB100A03        | 181335      | 2019/1/23        | 2020/1/23        |
| Power Meter        | Anritsu         | ML2495A          | 1901008     | 2019/4/29        | 2020/4/28        |
| Power Sensor       | Anritsu         | MA2411B          | 1725269     | 2019/4/29        | 2020/4/28        |
| EMI Test Receiver  | R&S             | ESR7             | 102109      | 2019/4/17        | 2020/4/16        |
| Spectrum Analyzer  | R&S             | FSV40            | 101509      | 2019/2/4         | 2020/2/4         |
| Pre-Amplifier      | Agilent         | 8447D            | 2727A05146  | 2019/2/22        | 2020/2/22        |
| Pre-Amplifier      | EMCI            | EMC051845SE      | 980635      | 2019/2/25        | 2020/2/25        |
| Pre-Amplifier      | EMCI            | EMC184045SE      | 980656      | 2019/2/23        | 2020/2/23        |
| Bilog Antenna      | SCHWARZBECK     | VULB-9168        | 00950       | 2019/1/14        | 2020/1/14        |
| Horn Antenna       | ETS-Lindgren    | 3117             | 00218929    | 2018/12/27       | 2019/12/27       |
| Horn Antenna       | SCHWARZBECK     | BBHA 9170        | 00890       | 2019/4/12        | 2020/4/11        |
| Loop Antenna       | EMCI            | LPA600           | 287         | 2018/12/20       | 2019/12/19       |
| Test Software      | Audix           | e3               | Ver. 9      | N/A              | N/A              |

## 2.4 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

## 2.5 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular schedule using in house standards or comparisons.

## 2.6 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements.

**Table 3: Emission Measurement Uncertainty**

| Parameter                     | Uncertainty            |
|-------------------------------|------------------------|
| Radio Frequency               | $\pm 1 \times 10^{-7}$ |
| RF power, conducted           | $\pm 1.5$ dB           |
| RF power density, conducted   | $\pm 3$ dB             |
| spurious emissions, conducted | $\pm 3$ dB             |
| all emissions, radiated       | $\pm 6$ dB             |
| Temperature                   | $\pm 1$ °C             |
| Humidity                      | $\pm 5$ %              |

### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a Bicycle training platform. It contains a ANT and Bluetooth compatible module enabling the user to communicate data through a Wireless interface.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

#### 3.2 System Details and Ratings

**Table 4: Basic Information of EUT**

| Item                        | EUT information |
|-----------------------------|-----------------|
| Kind of Equipment/Test Item | 自行車訓練台          |
| Type Designation            | T2980           |
| Brand Name                  | TACX            |

**Table 5: Technical Specification of EUT**

| Technical Specification | Value                                              |
|-------------------------|----------------------------------------------------|
| Operating Frequencies   | ANT: 2403MHz to 2480MHz<br>BLE: 2402MHz to 2480MHz |
| Operation Voltage       | 220Vac to 3.3Vdc                                   |
| Modulation              | ANT: GFSK<br>BLE: GFSK                             |
| Antenna gain            | 2.34dBi                                            |

### **3.3 Independent Operation Modes**

Basic operation modes are:

- A. Transmitting
  - 1. Low channel
  - 2. Middle channel
  - 3. High channel
- B. Receiving
- C. Standby
- D. Off

### **3.4 Noise Generating and Noise Suppressing Parts**

Refer to the Circuit Diagram.

### **3.5 Submitted Documents**

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

## 4. Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

**Table 6: Table for Parameters of Test Software Setting**

| Mode | Channel Frequency |                |              |
|------|-------------------|----------------|--------------|
|      | Low Channel       | Middle Channel | High Channel |
| ANT  | 4                 | 4              | 4            |
| BLE  | 4                 | 4              | 4            |

### 4.2 Test Operation and Test Software

Setup for testing: The EUT is provided with an USB interface which makes it possible to control the module through the test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

The samples were used as follows:  
Conducted sample: A000974034-006  
Radiation sample : A000974034-003

Full test was applied on all test modes, but only worst case was shown.

### 4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

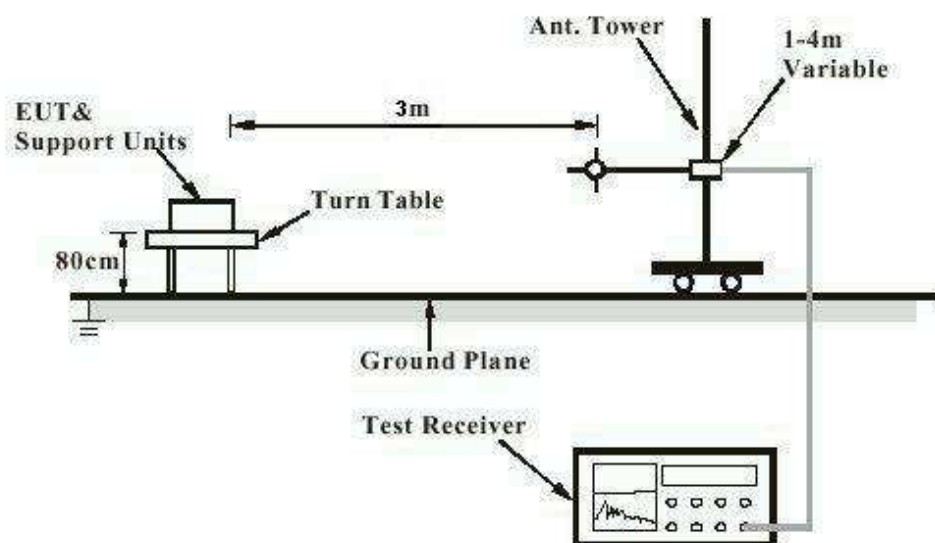
| Description | Manufacturer | Model No.          |
|-------------|--------------|--------------------|
| Notebook    | Lenovo       | E480               |
| Test tool   | TACX         | Radio test mod.bat |

### 4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

### 4.5 Test Setup Diagram

**Diagram of Measurement Configuration for Radiation Test**



Note: Measurements above 1 GHz are done with a table height of 1.5m

**Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)**

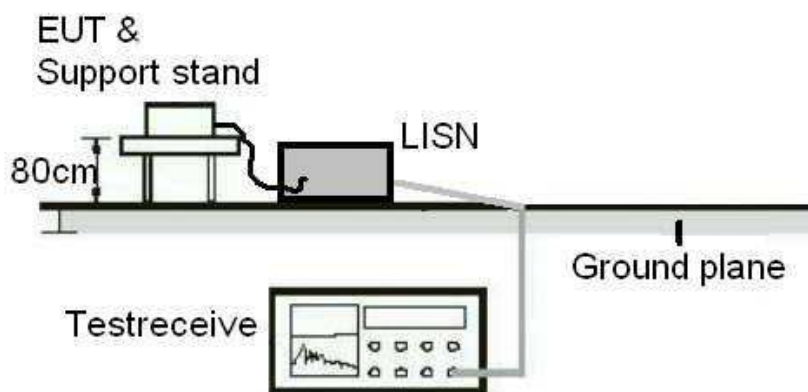
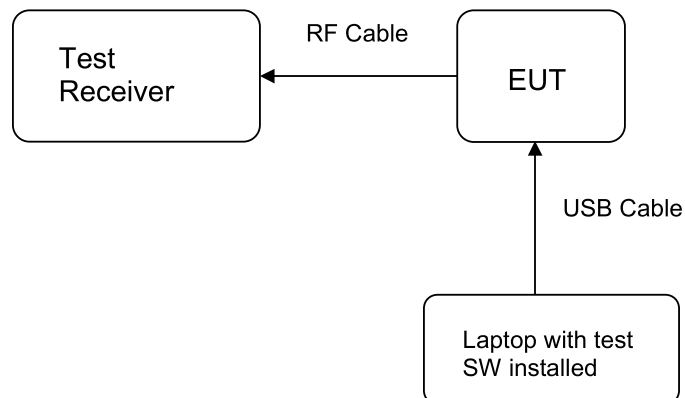


**Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement**



## 5. Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Antenna Requirement

**RESULT:****Passed**

Test standard : LP0002(2018): 2.2, 3.10.1.3, 3.10.1.4

Requirement : use of approved antennas only with directional gains that do not exceed 6 dBi

According to the manufacturer declaration, the EUT has an antenna with Max directional gain of 2.34dBi. The antenna is a printed PCB trace with no possibility of replacement with a non-approved antenna by the end-user. Therefore, the EUT is considered to comply with this provision.

Refer to EUT photo for details.

## 5.1.2 Peak Output Power

**RESULT:**
**Passed**

Test standard : LP0002(2018): 3.10.1.2(1)(C)  
 Basic standard : ANSI C63.10:2013  
 LP0002(2008) Appendix II  
 Limit : 1 Watt  
 Kind of test site : Shielded room

**Test setup**

Test Channel : Low/ Middle/ High  
 Operation Mode : A  
  
 Ambient temperature : 20-24 °C  
 Relative humidity : 50-65 %  
 Atmospheric pressure : 100-103 kPa

**Table 7: Test result of conducted Peak output power, ANT**

| Channel        | Channel Frequency (MHz) | Output Power |         | Limit |
|----------------|-------------------------|--------------|---------|-------|
|                |                         | (dBm)        | (W)     | (W)   |
| Low Channel    | 2403                    | 2.93         | 0.00196 | 1     |
| Middle Channel | 2442                    | 2.34         | 0.00171 | 1     |
| High Channel   | 2480                    | 1.37         | 0.00137 | 1     |

**Table 8: Test result of conducted Peak output power, BLE**

| Channel        | Channel Frequency (MHz) | Output Power |         | Limit |
|----------------|-------------------------|--------------|---------|-------|
|                |                         | (dBm)        | (W)     | (W)   |
| Low Channel    | 2402.0                  | 2.97         | 0.00198 | 1     |
| Middle Channel | 2440.0                  | 2.38         | 0.00173 | 1     |
| High Channel   | 2480.0                  | 1.35         | 0.00136 | 1     |

### 5.1.3 6dB Bandwidth

**RESULT:**
**Passed**

Test standard : LP0002(2018): 3.10.1.6(2)(A)  
 Basic standard : ANSI C63.10:2013  
 Kind of test site : LP0002(2008) Appendix II  
 : Shielded room

**Test setup**

Test Channel : Low/ Middle/ High  
 Operation Mode : A

Ambient temperature : 20-24°C  
 Relative humidity : 50-65%  
 Atmospheric pressure : 100-103 kPa

**Table 9: Test result of 6dB Bandwidth, ANT**

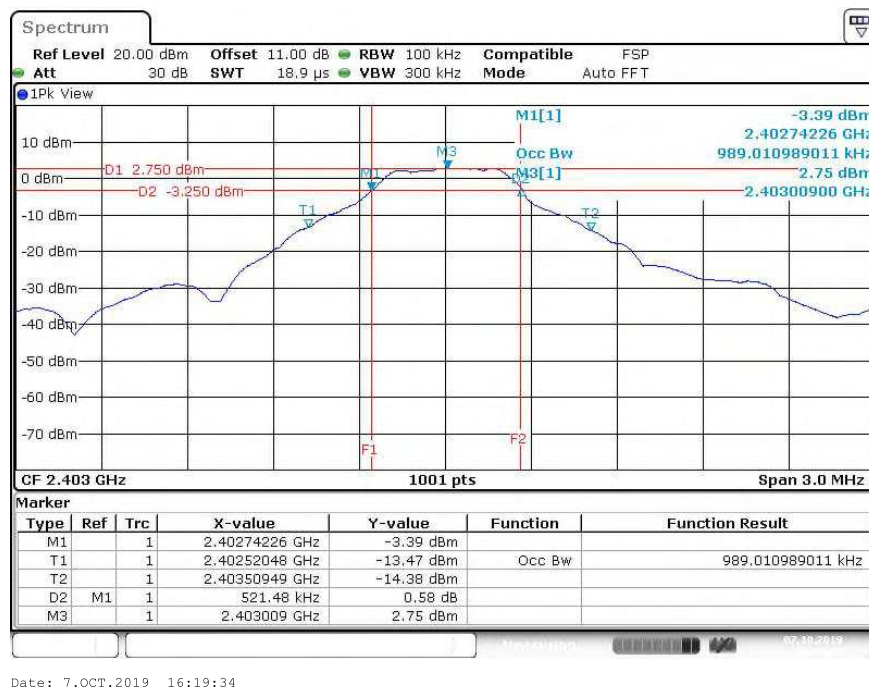
| Channel      | Channel Frequency (MHz) | 6dB Bandwidth (kHz) | Limit (kHz) | Result |
|--------------|-------------------------|---------------------|-------------|--------|
| Low Channel  | 2403                    | 521.48              | >500        | Pass   |
| Mid Channel  | 2442                    | 536.46              | >500        | Pass   |
| High Channel | 2480                    | 542.46              | >500        | Pass   |

**Table 10: Test result of 6dB Bandwidth, BLE**

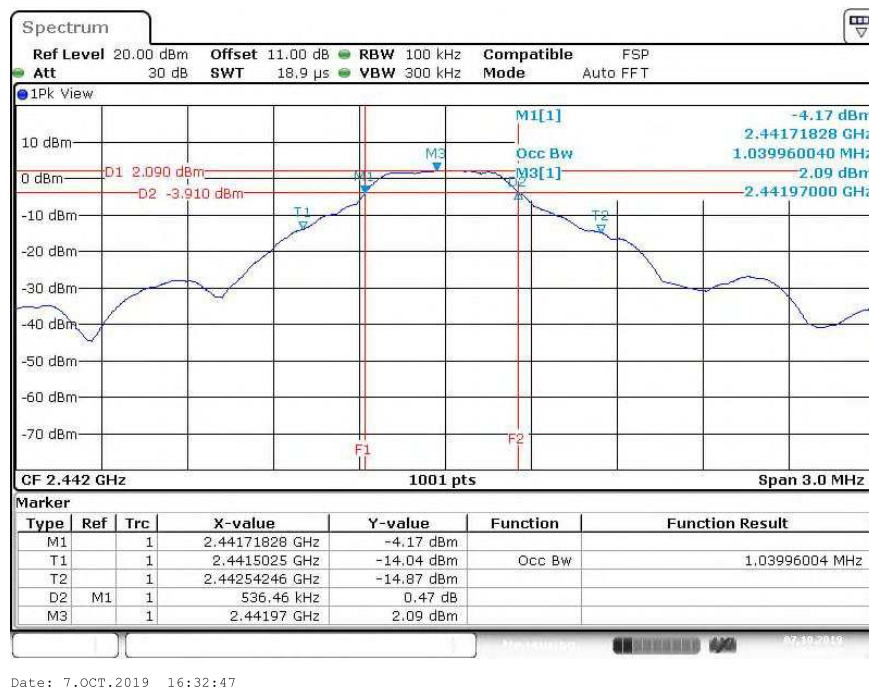
| Channel      | Channel Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (kHz) | Result |
|--------------|-------------------------|---------------------|-------------|--------|
| Low Channel  | 2402                    | 701.3               | >500        | Pass   |
| Mid Channel  | 2440                    | 695.3               | >500        | Pass   |
| High Channel | 2480                    | 692.31              | >500        | Pass   |

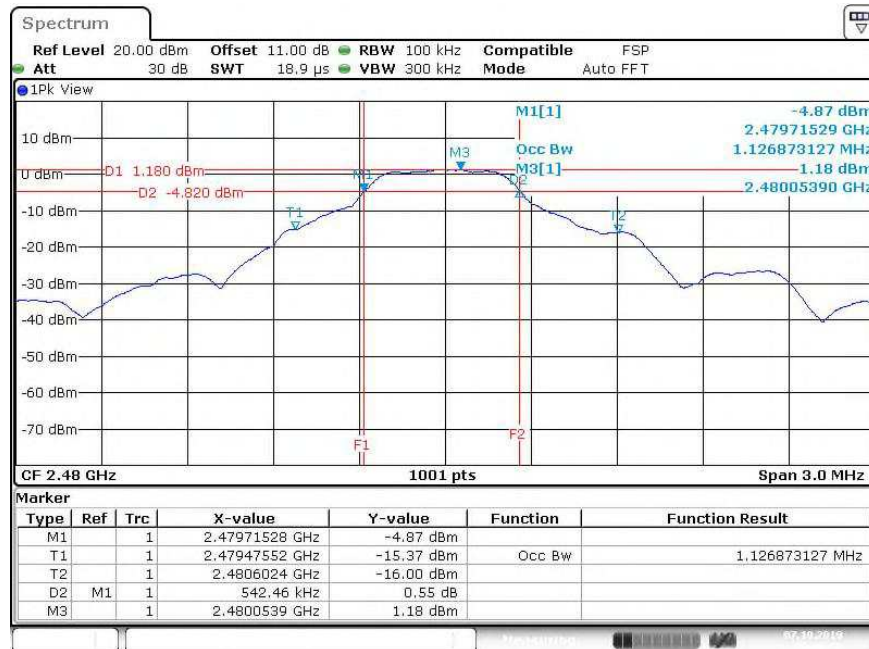
## Test Plot of 6dB Bandwidth, ANT

### Low Channel

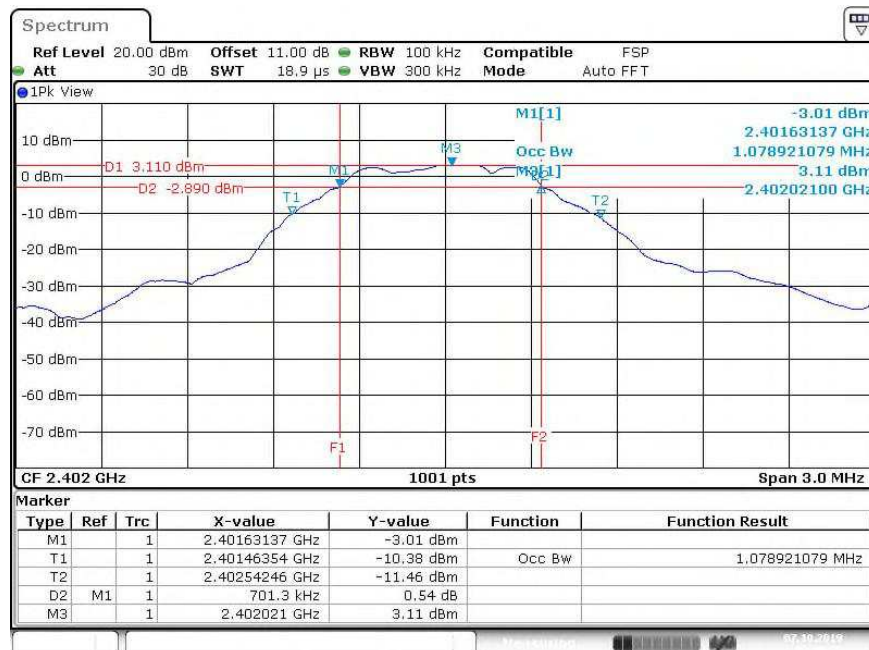


### Middle Channel

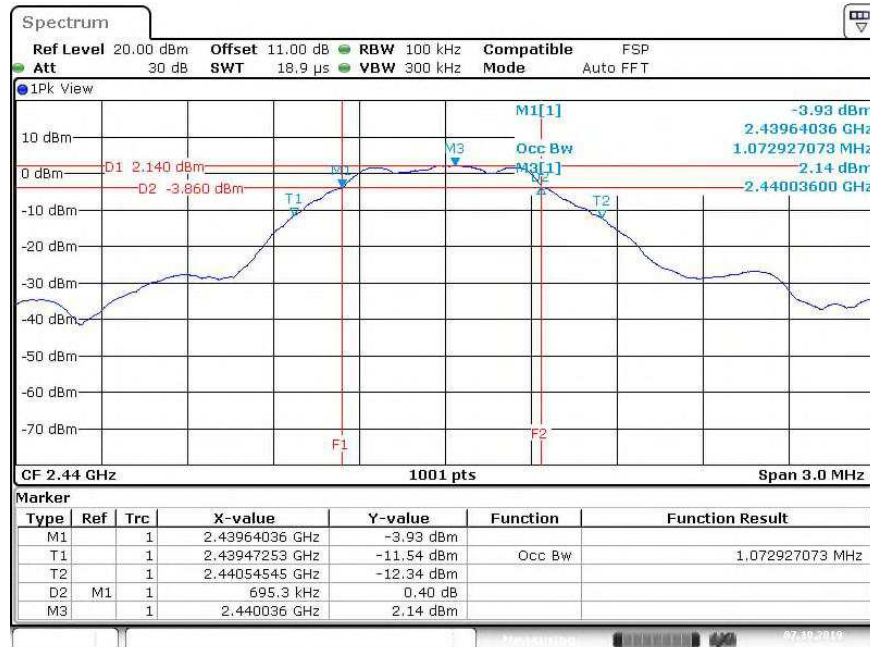


**High Channel**


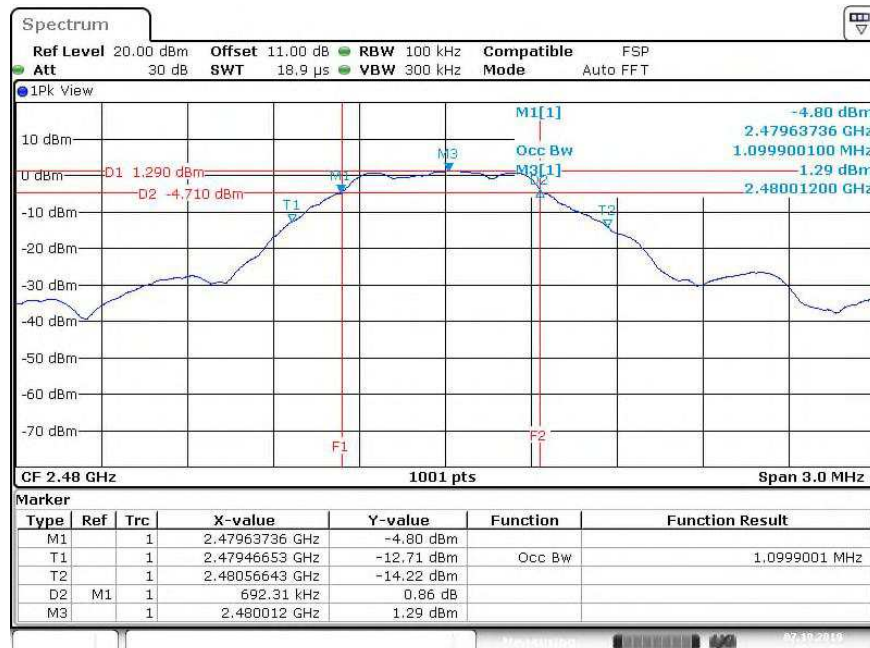
Date: 7.OCT.2019 16:35:46

**Test Plot of 6dB Bandwidth, BLE**
**Low Channel**


Date: 7.OCT.2019 14:30:25

**Middle Channel**


Date: 7.OCT.2019 11:18:31

**High Channel**


Date: 7.OCT.2019 11:22:54

### 5.1.4 Power Density

**RESULT:****Passed**

Test standard : LP0002(2018): 3.10.1.6 (2)(B)  
Basic standard : ANSI C63.10:2013  
LP0002(2008) Appendix II  
Kind of test site : Shielded room

**Test setup**

Test Channel : Low/ Middle/ High  
Operation Mode : A  
Ambient temperature : 20-24°C  
Relative humidity : 50-65%  
Atmospheric pressure : 100-103 kPa

**Table 11: Test result of Power Density, ANT**

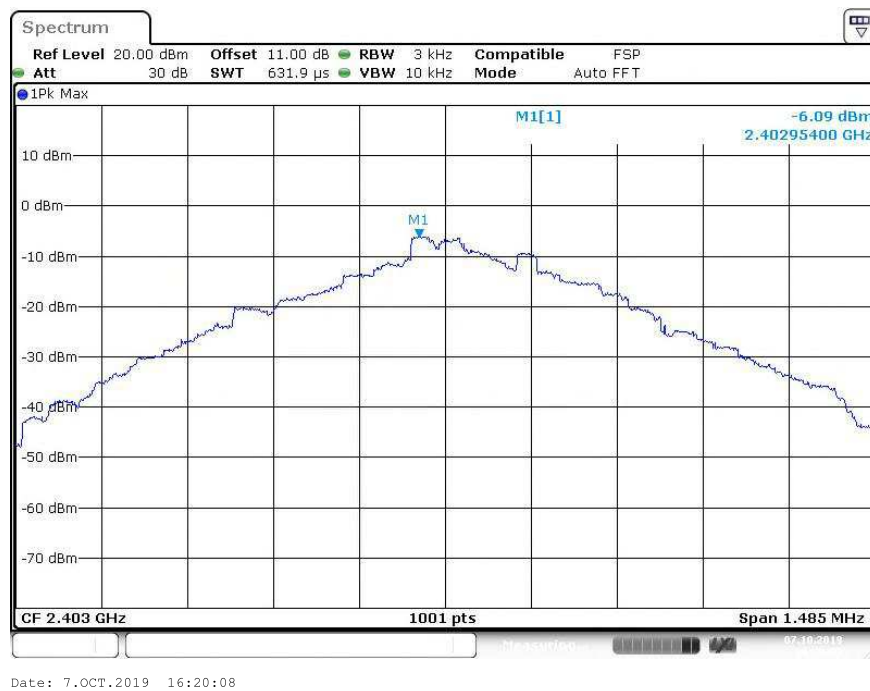
| Channel        | Channel Frequency (MHz) | Power Density | Limit |
|----------------|-------------------------|---------------|-------|
|                |                         | (dBm)         | (dBm) |
| Low Channel    | 2403                    | -6.09         | 8     |
| Middle Channel | 2442                    | -6.67         | 8     |
| High Channel   | 2480                    | -8.79         | 8     |

**Table 12: Test result of Power Density, BLE**

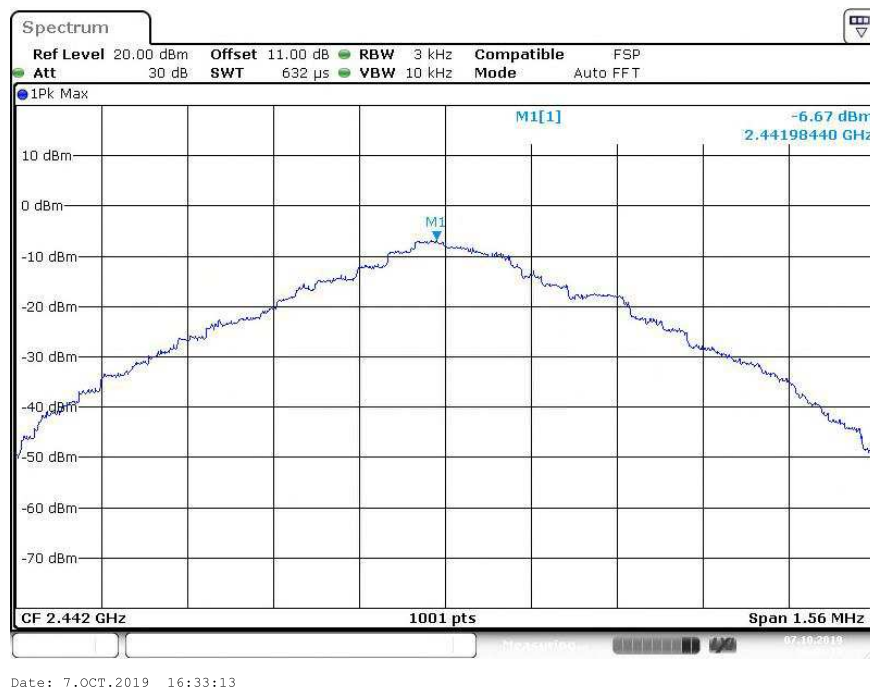
| Channel        | Channel Frequency (MHz) | Power Density | Limit |
|----------------|-------------------------|---------------|-------|
|                |                         | (dBm)         | (dBm) |
| Low Channel    | 2402                    | -9.80         | 8     |
| Middle Channel | 2440                    | -10.00        | 8     |
| High Channel   | 2480                    | -10.61        | 8     |

## Test Plot of Power Density, ANT

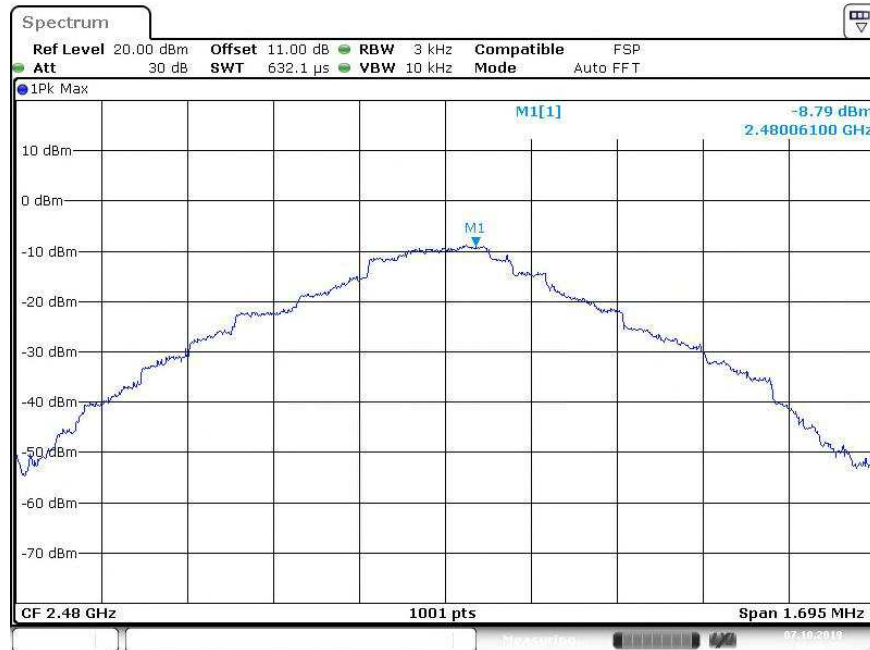
### Low Channel



### Middle Channel

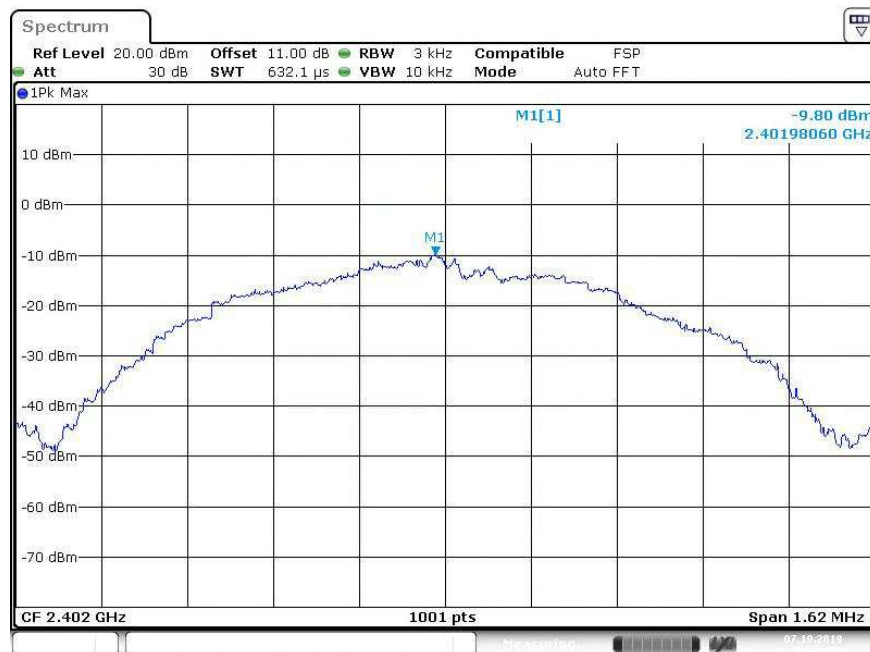


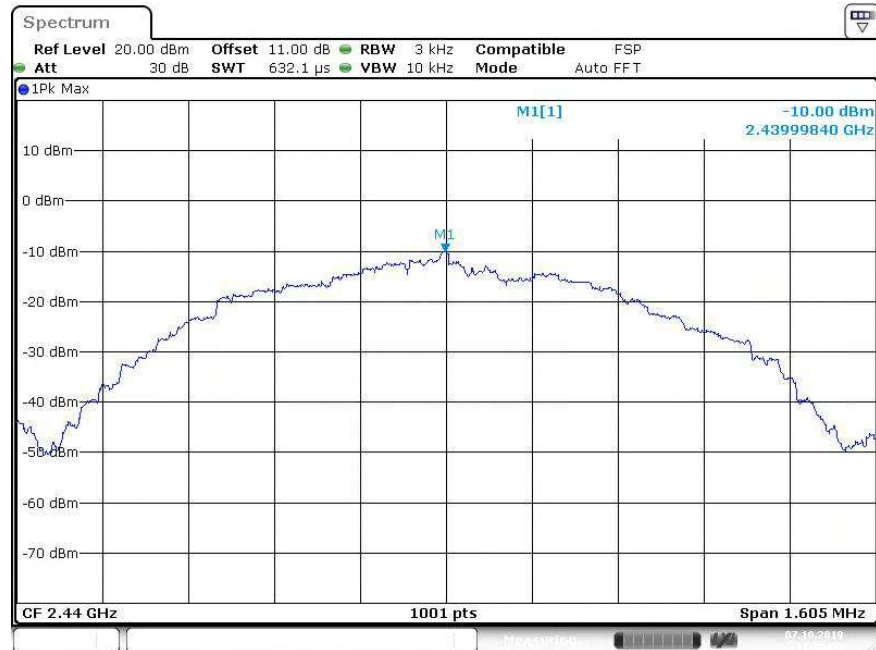
### High Channel



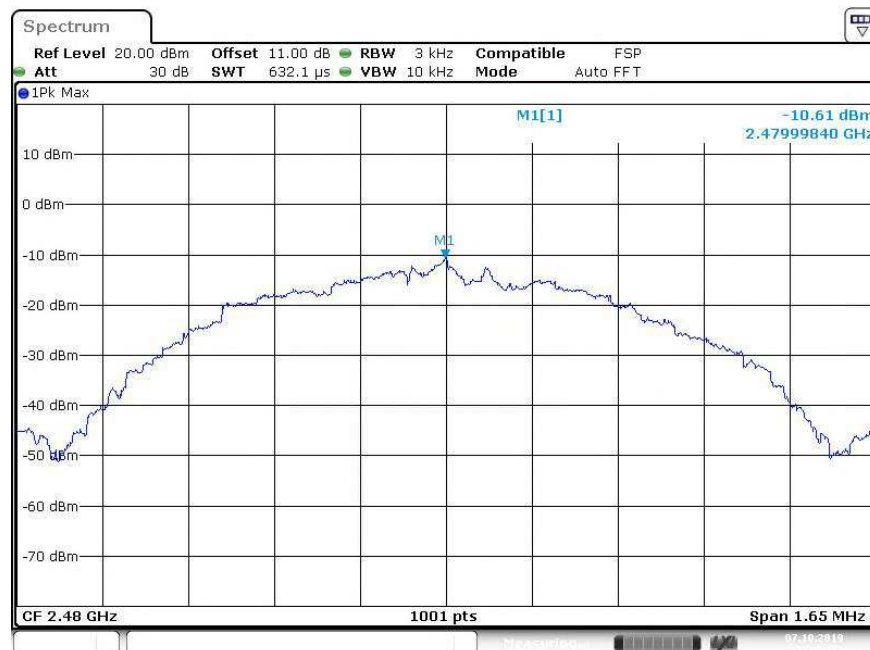
### Test Plot of Power Density, BLE

#### Low Channel



**Middle Channel**


Date: 7.OCT.2019 11:18:51

**High Channel**


Date: 7.OCT.2019 11:23:31

**5.1.5 Conducted spurious emissions and Frequency Band Edge  
measured in 100kHz Bandwidth****RESULT:****Passed**

|                   |   |                                                                                                                   |
|-------------------|---|-------------------------------------------------------------------------------------------------------------------|
| Test standard     | : | LP0002(2018): 3.10.1.5                                                                                            |
| Basic standard    | : | ANSI C63.10:2013                                                                                                  |
|                   |   | LP0002(2008) Appendix II                                                                                          |
| Limit             | : | 20dB (below that in the 100kHz bandwidth within the<br>band that contains the highest level of the desired power) |
| Kind of test site | : | Shielded room                                                                                                     |

**Test setup**

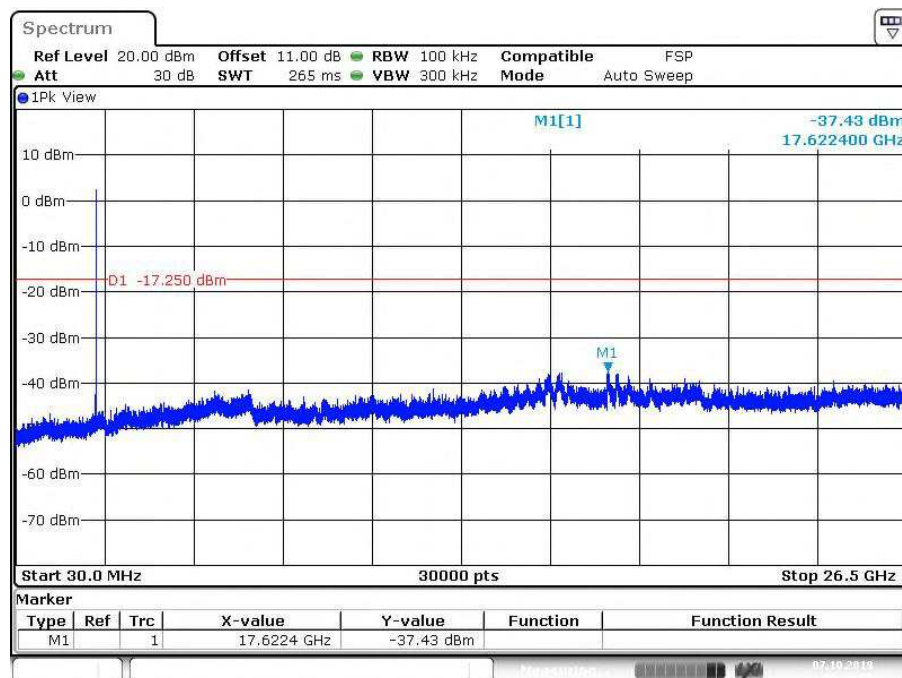
|                      |   |                                                         |
|----------------------|---|---------------------------------------------------------|
| Test Channel         | : | Low/ Mid/ High for spurious, Low/ High for<br>Band Edge |
| Operation mode       | : | A                                                       |
| Ambient temperature  | : | 20-24°C                                                 |
| Relative humidity    | : | 50-65%                                                  |
| Atmospheric pressure | : | 100-103 kPa                                             |

All emissions are more than 20dB below fundamental, details refer to following test plot, and compliance is achieved as well.

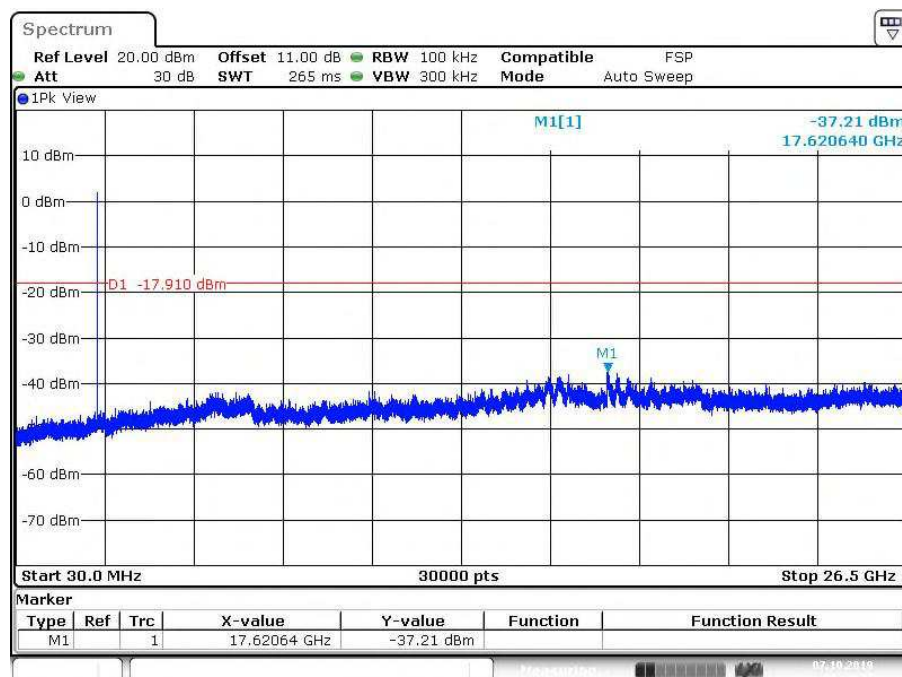
Due to the small size of the product and that there are no inductive components of significant size, 9kHz to 30MHz frequency range is not tested based on technical judgment.

## Test Plot 100kHz Conducted Emissions, ANT

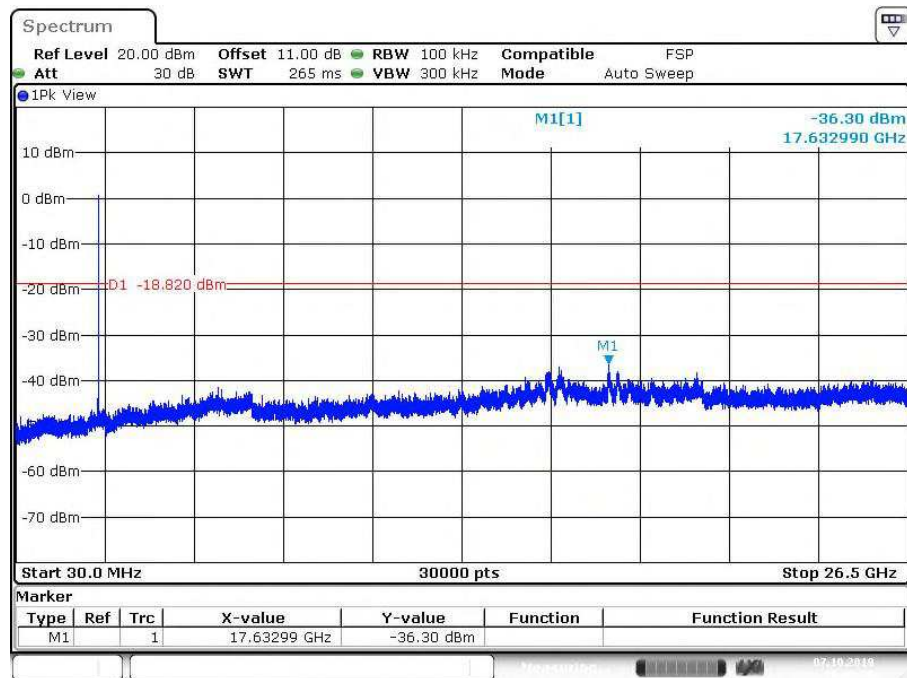
### Low Channel



### Middle Channel

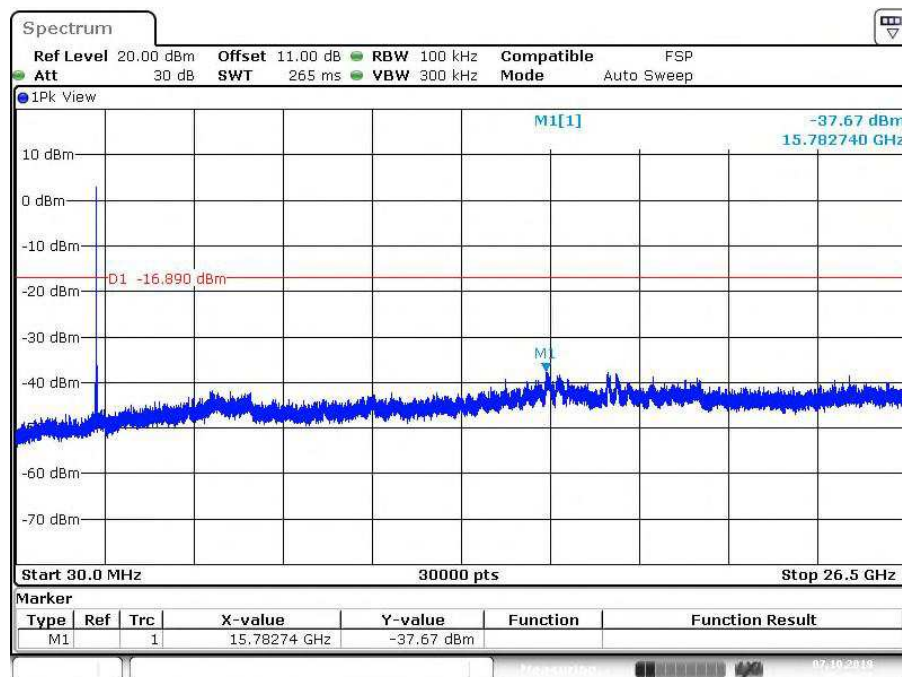


### High Channel

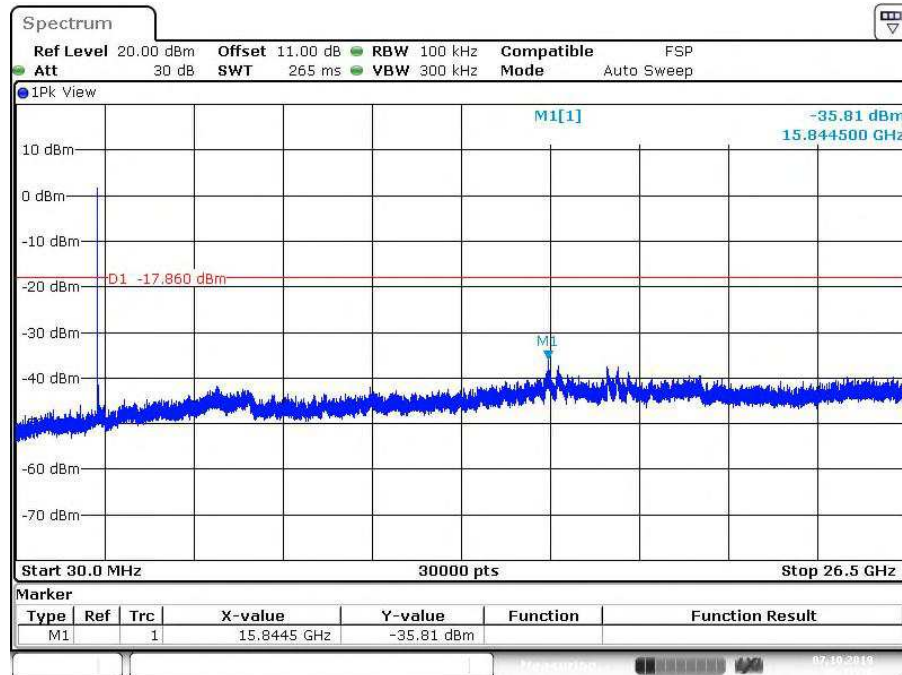


### Test Plot 100kHz Conducted Emissions, BLE

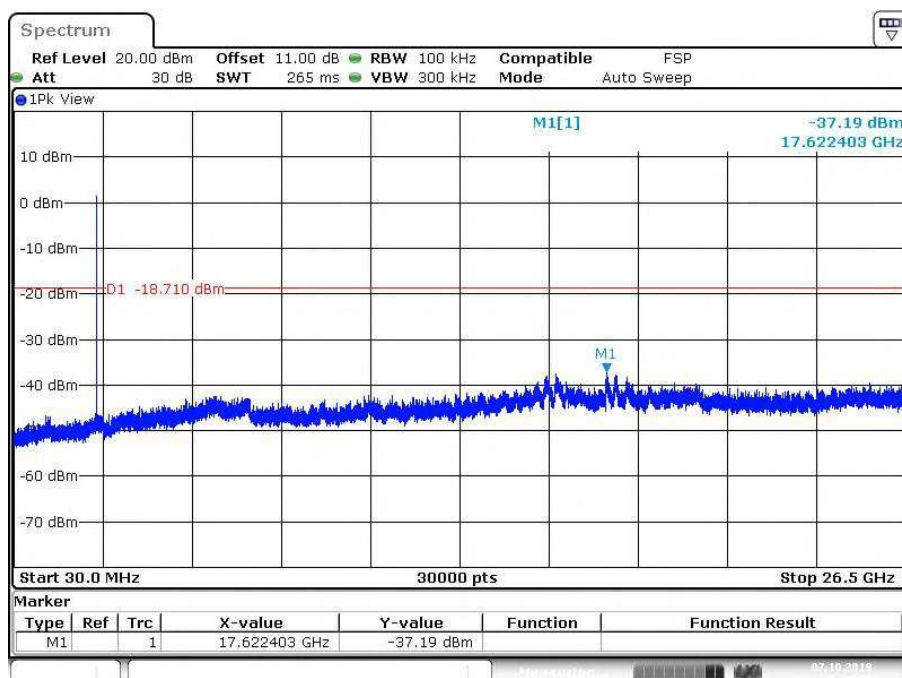
#### Low Channel



### Middle Channel

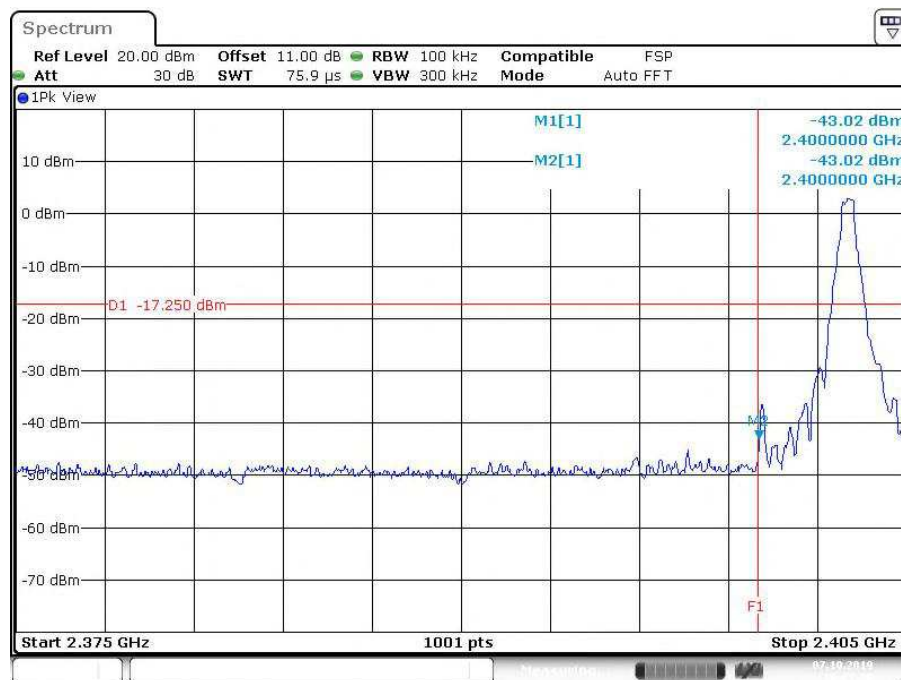


### High Channel

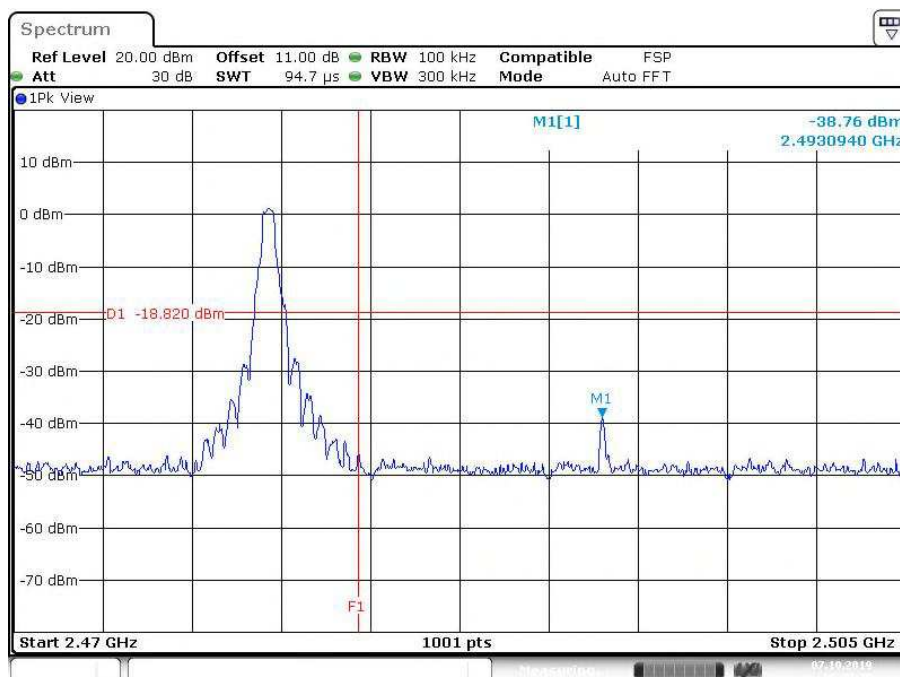


## Test Plot 100kHz RBW of Band Edge,ANT

### Low Channel

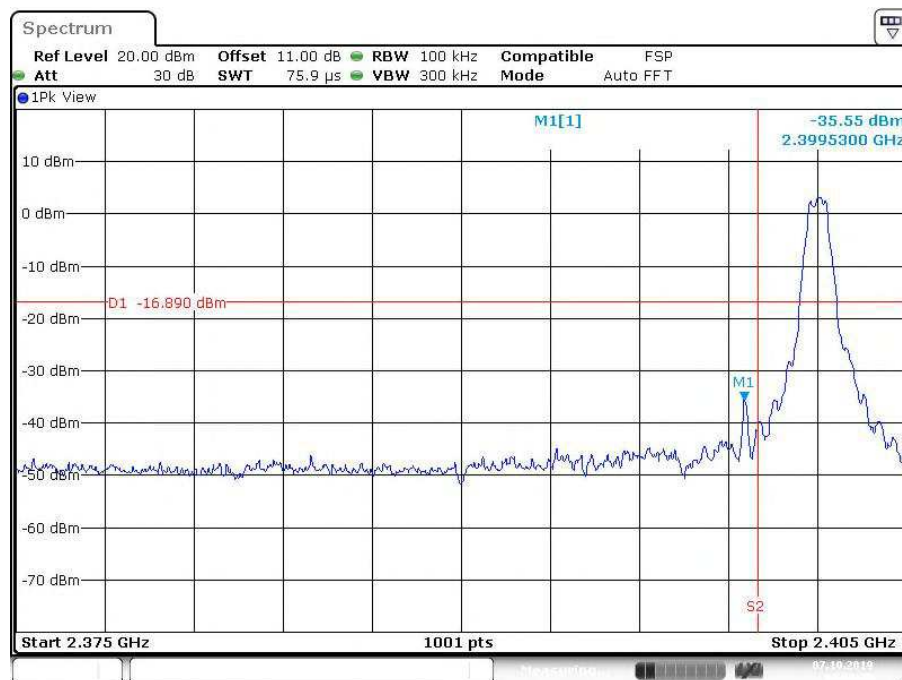


### High Channel

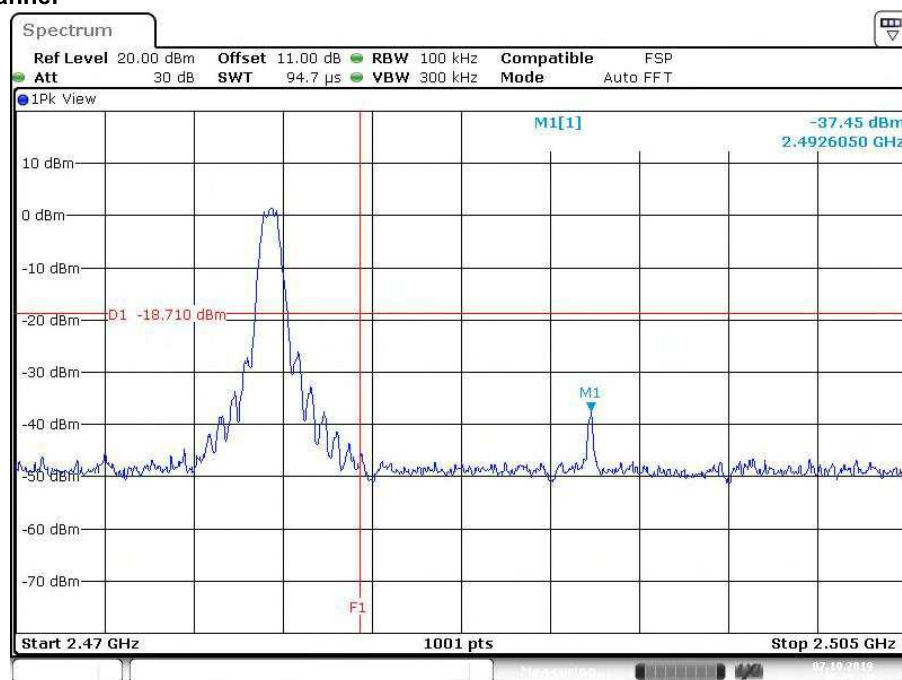


## Test Plot 100kHz RBW of Band Edge, BLE

### Low Channel



### High Channel



### 5.1.6 Spurious Emission

**RESULT:****Passed**

|                   |   |                                                                                                                                                                                                                                                                                                               |
|-------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test standard     | : | LP0002(2018): 3.10.1.5                                                                                                                                                                                                                                                                                        |
| Basic standard    | : | ANSI C63.10: 2013, LP0002(2008) Appendix II                                                                                                                                                                                                                                                                   |
| Limits            | : | Radiated emissions which fall in the restricted bands, as defined in LP0002(2018): 2.7 , must comply with the radiated emission limits specified in LP0002(2018): 2.8<br>Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in LP0002(2018): 2.8 |
| Kind of test site | : | 3m Semi-Anechoic Chamber                                                                                                                                                                                                                                                                                      |

**Test setup**

|                |   |                   |
|----------------|---|-------------------|
| Test Channel   | : | Low/ Middle/ High |
| Operation mode | : | A, B              |

For details refer to Appendix D.

The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

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

Level(dBuV/m)=Reading(dBuV)+ Factor(dB/m)

## 5.2 Mains Emissions

### 5.2.1 Mains Conducted Emissions

**RESULT:****Passed**

|                   |   |                                                            |
|-------------------|---|------------------------------------------------------------|
| Test standard     | : | LP0002 (2018): 2.3                                         |
| Limits            | : | Mains Conducted emissions as defined in<br>above standards |
| Kind of test site | : | Shielded Room                                              |

**Test setup**

|                |   |        |
|----------------|---|--------|
| Test Channel   | : | Middle |
| Operation mode | : | A      |

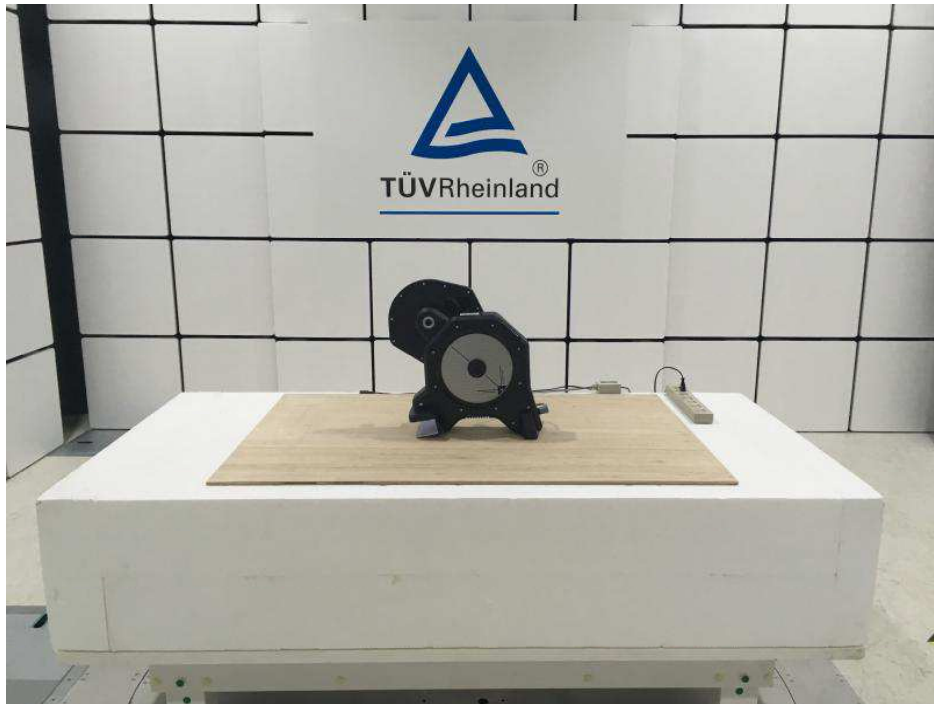
Remark: For details refer to Appendix D.

## 6. Photographs of the Test Set-Up

**Photograph 1: Set-up for Spurious Emissions (Front View 1)**



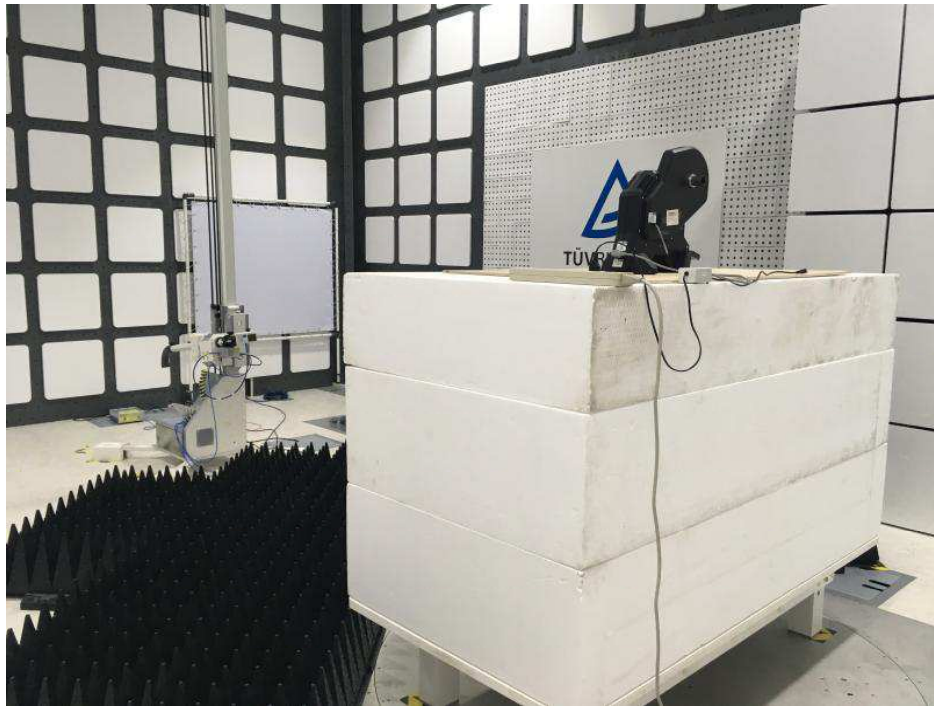
**Photograph 2: Set-up for Spurious Emissions (Front View 2 )**



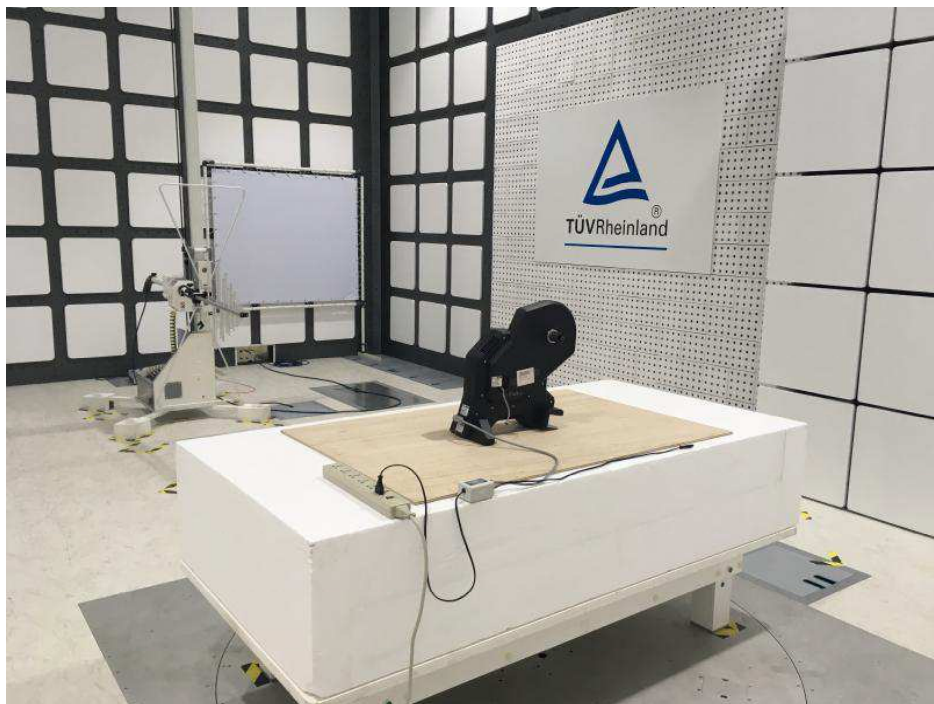
**Photograph 3: Set-up for Spurious Emissions (Back View 1)**



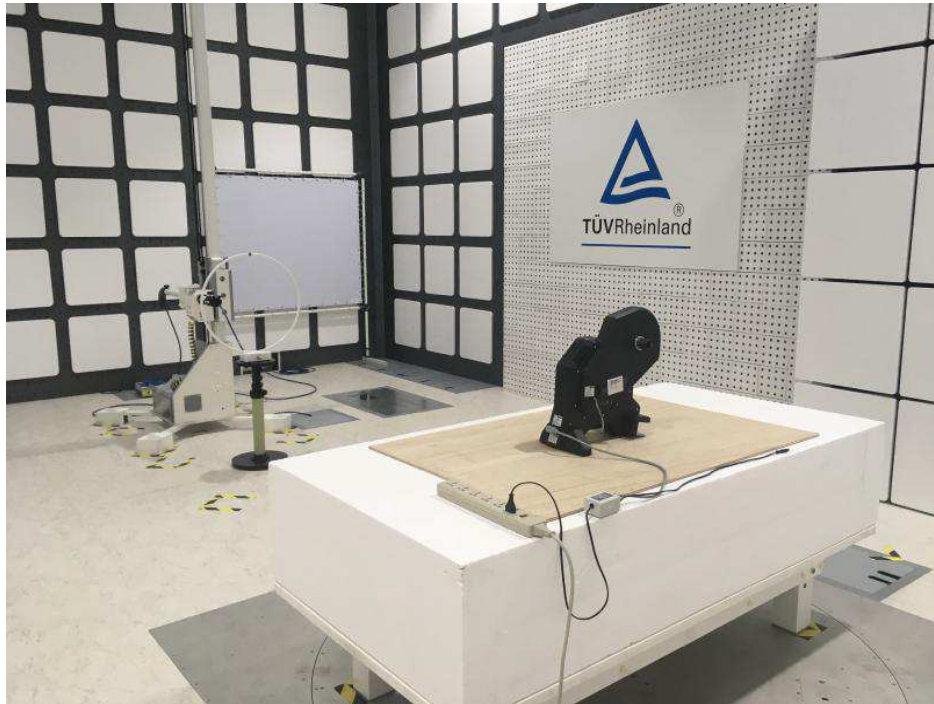
**Photograph 4: Set-up for Spurious Emissions (Back View 2)**



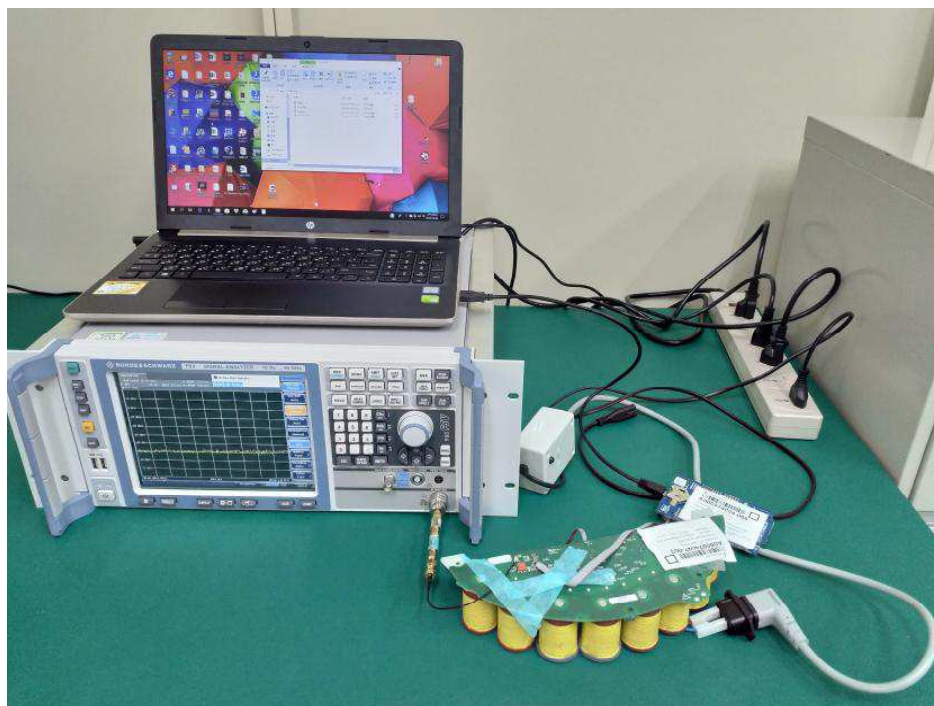
**Photograph 5: Set-up for Spurious Emissions (Back View 3)**



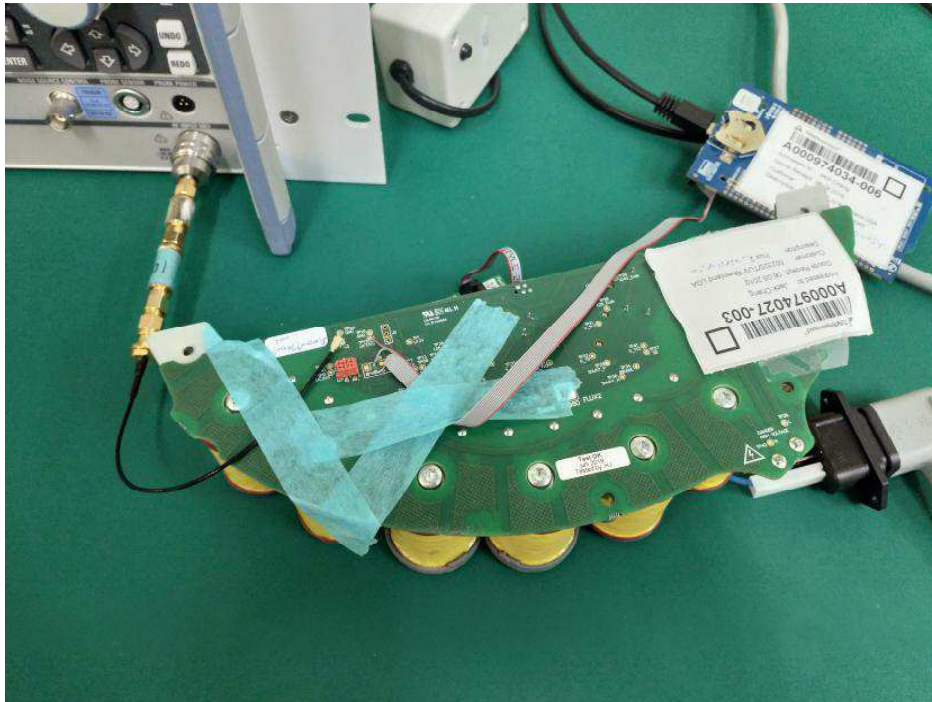
**Photograph 6: Set-up for Spurious Emissions (Back View 4)**



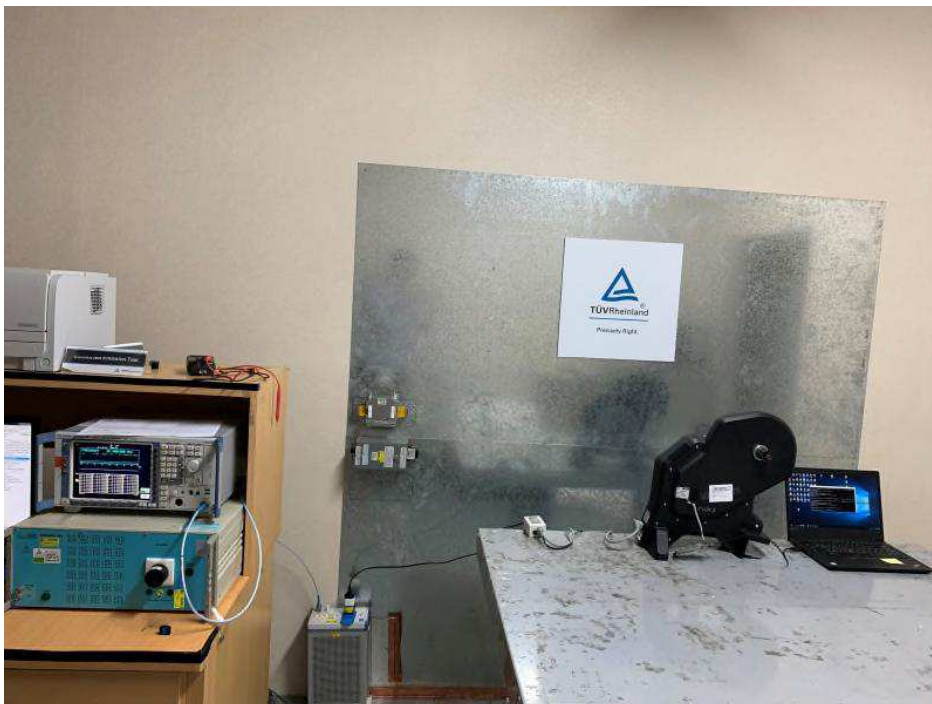
**Photograph 7: Set-up for Conducted testing**



**Photograph 8: Set-up for Conducted testing**



**Photograph 9: Set-up for AC Mains (View 1)**



**Photograph 10: Set-up for AC Mains (View 2)**



## 7. List of Tables

|                                                               |    |
|---------------------------------------------------------------|----|
| Table 1: Applied Standard and Test Levels .....               | 5  |
| Table 2: List of Test and Measurement Equipment .....         | 7  |
| Table 3: Emission Measurement Uncertainty.....                | 8  |
| Table 4: Basic Information of EUT .....                       | 9  |
| Table 5: Technical Specification of EUT .....                 | 9  |
| Table 6: Table for Parameters of Test Software Setting .....  | 11 |
| Table 7: Test result of conducted Peak output power, ANT..... | 15 |
| Table 8: Test result of conducted Peak output power, BLE..... | 15 |
| Table 9: Test result of 6dB Bandwidth, ANT .....              | 16 |
| Table 10: Test result of 6dB Bandwidth, BLE.....              | 16 |
| Table 11: Test result of Power Density, ANT .....             | 20 |
| Table 12: Test result of Power Density, BLE.....              | 20 |

## 8. List of Photographs

|                                                                 |    |
|-----------------------------------------------------------------|----|
| Photograph 1: Set-up for Spurious Emissions (Front View 1)..... | 32 |
| Photograph 2: Set-up for Spurious Emissions (Front View 2)..... | 33 |
| Photograph 3: Set-up for Spurious Emissions (Back View 1).....  | 33 |
| Photograph 4: Set-up for Spurious Emissions (Back View 2).....  | 34 |
| Photograph 5: Set-up for Spurious Emissions (Back View 3).....  | 34 |
| Photograph 6: Set-up for Spurious Emissions (Back View 4).....  | 35 |
| Photograph 7: Set-up for Conducted testing .....                | 35 |
| Photograph 8: Set-up for Conducted testing .....                | 36 |
| Photograph 9: Set-up for AC Mains (View 1).....                 | 36 |
| Photograph 10: Set-up for AC Mains (View 2) .....               | 37 |