| | | | | |
|---|---|---|---|---|
| **Prüfbericht-Nr.:** *Test report no.:* | **60362193 001** | **Auftrags-Nr.:** *Order no.:* | **238135118** | Seite 1 von 41 *Page 1 of 41* |
| **Kunden-Referenz-Nr.:** *Client reference no.:* | **N/A** | **Auftragsdatum:** *Order date:* | **2020.02.25** | |
| **Auftraggeber:** *Client:* | Eve Systems LLC<br>100 Pine St., Suite 1250, San Francisco CA 94111 USA | | | |
| **Prüfgegenstand:** *Test item:* | Eve Aqua | | | |
| **Bezeichnung / Typ-Nr.:** *Identification / Type no.:* | 20EBM8101 | | | |
| **Auftrags-Inhalt:** *Order content:* | FCC Part 15C / ISED RSS-247 Test report (BLE) | | | |
| **Prüfgrundlage:** *Test specification:* | FCC 47CFR Part 15: Subpart C Section 15.247<br>ISED RSS-247 (02-2017) | | | |
| **Wareneingangsdatum:** *Date of sample receipt:* | 2020.03.18 | | | |
| **Prüfmuster-Nr.:** *Test sample no:* | A001077419-004,<br>A001077419-006 | | | |
| **Prüfzeitraum:** *Testing period:* | 2020.03.25 - 2020.04.17 | | | |
| **Ort der Prüfung:** *Place of testing:* | EMC/RF Laboratory Taipei | | | |
| **Prüflaboratorium:** *Testing laboratory:* | TUV Rheinland Taiwan Ltd. | | | |
| **Prüfergebnis*:** *Test result*:* | Pass | | | |
| **überprüft von:** reviewed by: | Mars Y.J. Lin | **genehmigt von:** authorized by: | Arvin Ho | |
| **Datum: 2020.04.22** *Date:* | | **Datum: 2020.04.22** *Date:* | | |
| **Stellung** / *Position:* | **Project Engineer** | **Stellung** / *Position:* | **Vice General Manager** | |
| **Sonstiges** / *Other:* | | | | |
| **Zustand des Prüfgegenstandes bei Anlieferung:** *Condition of the test item at delivery:* | Prüfmuster vollständig und unbeschädigt<br>*Test item complete and undamaged* | | | |

| | | | | | |
|---|---|---|---|---|---|
| * Legende: | 1 = sehr gut | 2 = gut | 3 = befriedigend | 4 = ausreichend | 5 = mangelhaft |
| | P(ass) = entspricht o.g. Prüfgrundlage(n) | | F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | N/A = nicht anwendbar | N/T = nicht getestet |
| ** Legend:* | *1 = very good* | *2 = good* | *3 = satisfactory* | *4 = sufficient* | *5 = poor* |
| | *P(ass) = passed a.m test specification(s)* | | *F(ail) = failed a.m test specification(s)* | *N/A = not applicable* | *N/T = not tested* |

**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.**
*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.*
V05

# TEST SUMMARY

**5.1.1 ANTENNA REQUIREMENT**
*RESULT: Passed*

**5.1.2 MAXIMUM CONDUCTED PEAK OUTPUT POWER**
*RESULT: Passed*

**5.1.3 6DB BANDWIDTH AND 99% 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*

**6.1.1 ELECTROMAGNETIC FIELDS**
*RESULT: Passed*

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# 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: 60362193 001, 60362194 001 APPENDIX P)**

**Appendix D: Test Result of Radiated Emissions**
**(File Name: 60362193 001 APPENDIX D)**

**Test Specifications**

The following standards were applied.

### Table 1: Applied Standard and Test Levels

| Radio |
|---|
| FCC 47CFR Part 15: Subpart C Section 15.247<br>FCC 47CFR Part 2: Subpart J Section 2.1091<br>ISED RSS-247 Issue 2, Feb 2017<br>ISED RSS-102 Issue 5, March 2015<br>ISED RSS-Gen, Issue 5, March 2019<br>ANSI C63.10:2013<br>KDB558074 D01 DTS Meas Guidance v05r02<br>KDB447498 D01 General RF Exposure Guidance v06 |

## 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

TUV Rheinland Taiwan Ltd.

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

## 2.2 Test Facility

TUV Rheinland Taiwan Ltd.

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

FCC Registration No.: 226631
IC Canada Registration No.: 25563
TAF Accredited NCC Test Lab. No.:3567
TAF ISO17025 Certification effective period: 6th-May-2019 to 05th-May-2022

Testing Laboratory
3567

## 2.3 List of Test and Measurement Instruments

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

| Equipment | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due Date |
|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESR7 | 102109 | 2019/4/17 | 2020/4/16 |
| | | | | 2020/3/30 | 2021/3/29 |
| Spectrum Analyzer | R&S | FSV40 | 101508 | 2020/3/16 | 2021/3/15 |
| Pre-Amplifier | Agilent | 8447D | 2727A05146 | 2020/2/17 | 2021/2/16 |
| Pre-Amplifier | EMCI | EMC051845SE | 980635 | 2020/2/11 | 2021/2/10 |
| Pre-Amplifier | EMCI | EMC184045SE | 980656 | 2020/2/11 | 2021/2/10 |
| Bilog Antenna | SCHWARZBECK | VULB-9168 | 00950 | 2020/1/20 | 2021/1/19 |
| Horn Antenna | ETS-Lindgren | 3117 | 00218929 | 2019/11/27 | 2020/11/26 |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | 00896 | 2020/1/17 | 2021/1/16 |
| Loop Antenna | EMCI | LPA600 | 287 | 2019/12/20 | 2020/12/19 |
| Test Software | Audix | e3 | Ver. 9 | N/A | N/A |
| Test Cable | HUBER+SUHNER | SUCOFLEX 104EA | 800057/4EA | 2020/3/25 | 2021/3/24 |
| Test Cable | HUBER+SUHNER | SUCOFLEX 104 | 802244/4 | 2020/3/25 | 2021/3/24 |
| Test Cable | HUBER+SUHNER | SUCOFLEX 104 | MY37203/4 | 2020/3/25 | 2021/3/24 |
| Test Cable | HUBER+SUHNER | SUCOFLEX 102EA | 800897/2EA | 2020/3/25 | 2021/3/24 |
| Test Cable | HUBER+SUHNER | SUCOFLEX 102EA | 800902/2EA | 2020/3/25 | 2021/3/24 |
| Test Cable | HUBER+SUHNER | SUCOFLEX 102EA | 801026/2EA | 2020/3/25 | 2021/3/24 |
| Thermo Chamber | Giant Force | GHT-150-40-CP-SD | MAA1902-010 | 2020/2/1 | 2021/2/1 |
| Signal Generator | R&S | SMB100A03 | 181335 | 2020/1/23 | 2021/1/23 |
| Power Meter | Anritsu | ML2495A | 1901008 | 2019/4/29 | 2020/4/28 |
| Power Sensor | Anritsu | MA2411B | 1725269 | 2019/4/29 | 2020/4/28 |

## 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 | ± 1 x $10^{-7}$ |
| RF power, conducted | ± 1.5 dB |
| RF power density, conducted | ± 3 dB |
| spurious emissions, conducted | ± 3 dB |
| all emissions, radiated | ± 6 dB |
| Temperature | ± 1 ºC |
| Humidity | ± 5 % |

# 3. General Product Information

## 3.1 Product Function and Intended Use

The EUT is a flowmeter. It contains a 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 | Eve Aqua |
| Type Designation | 20EBM8101 |
| FCC ID | SNE-WHV-2 |
| IC | 11192A-WHV002 |
| HVIN | SA-7716 |

**Table 5: Technical Specification of EUT**

| Technical Specification | Value |
|---|---|
| Operating Frequencies | 2402~2480MHz |
| Channel number | 40 |
| Operation Voltage | 3Vdc |
| Modulation | LE 1M:GFSK<br>LE 2M:GFSK |
| Antenna gain | 3.8dBi |

## 3.3 Independent Operation Modes

Basic operation modes are:

A. Transmitting
B. Receiving
C. Normal

## 3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

## 3.5 Submitted Documents

- Circuit Diagram
- Block Diagram
- 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 | | |
|---|---|---|---|
| | 2402 MHz | 2440 MHz | 2480 MHz |
| BLE 1M | 8 | 8 | 8 |
| BLE 2M | 8 | 8 | 8 |

## 4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with USB interface which makes it possible to control them through a test software installed on a notebook computer.

This software nRF_DTM 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: A001077419-004
Radiation sample: A001077419-006

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:

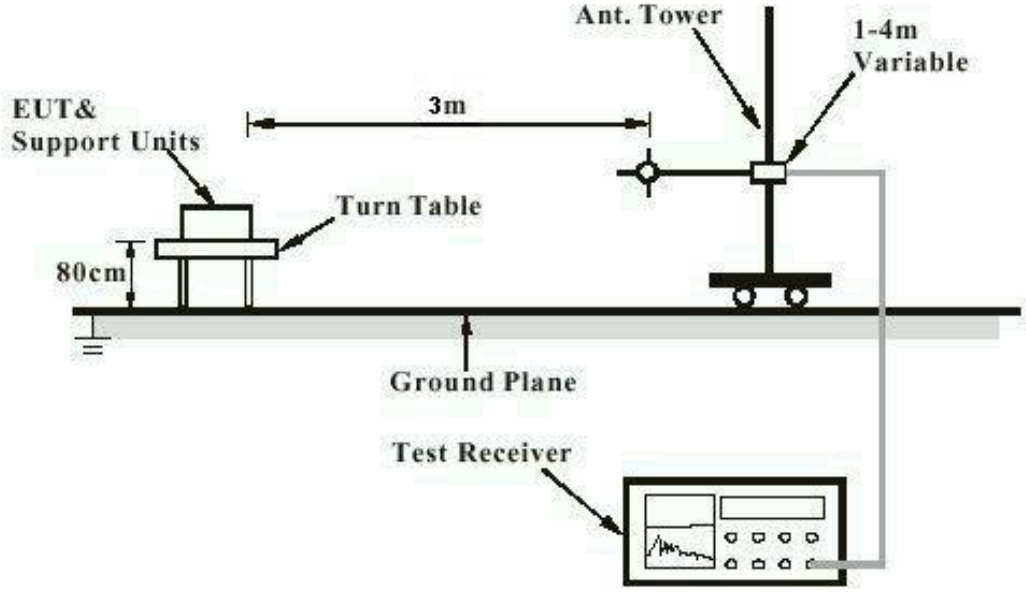
| Kind of Equipment | Manufacturer | Model Name | S/N |
|---|---|---|---|
| HP Labtop | HP | 15-da1046TX | CND9111RJ2 |

## 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)**

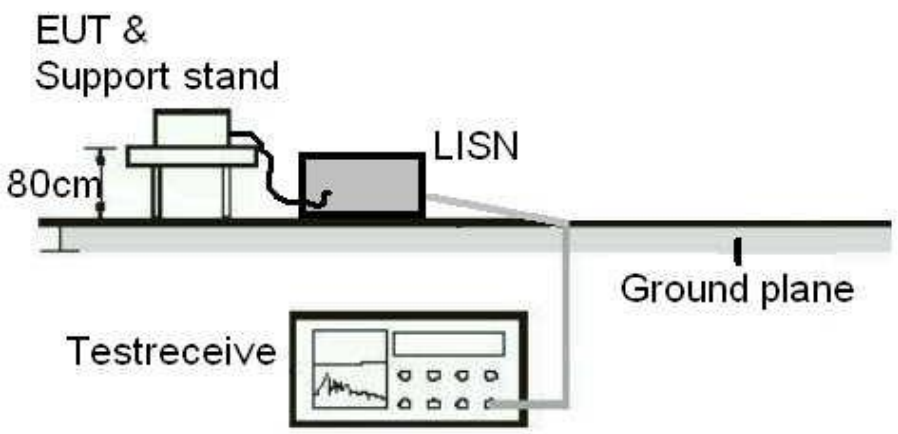
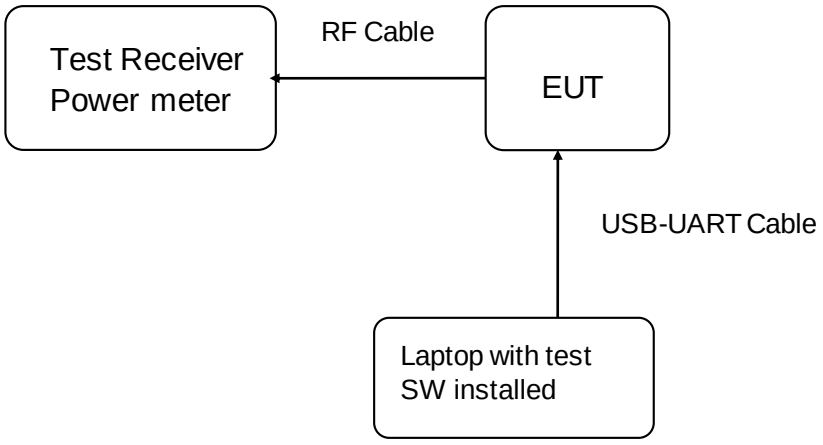



**Diagram of Measurement Equipment Configuration for Conducted Transmitter Measurement**




Note: The output power is measured by power meter according to 8.3.1.3 KDB558074 D01 Meas Guidance v05r02 8.3.1.3.

# 5. Test Results

## 5.1 Transmitter Requirement & Test Suites

### 5.1.1 Antenna Requirement

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(b)(4), Part 15.203 and ISED RSS-Gen 6.8 |
| Requirement | : | The maximum conducted output power shall be reduced in equal quantity according to the total dBi of the antenna directional gain over 6 dBi. |

According to the manufacturer declaration, the EUT has an antenna with a directional gain of 3.8 dBi. The antenna is a printed PCB trace antenna with no possibility of replacement with a non-approved antenna by the end-user.

The directional gain of this antenna does not exceed 6dBi, so the limit does not reduce.

Refer to EUT photo for details.

## 5.1.2 Maximum conducted Peak output power

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(b)(3), ISED RSS-247 5.4(b) |
| Basic standard | : | ANSI C63.10:2013, KDB558074(8.3.1.3) |
| 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 Maximum conducted Peak output power, BLE 1M**

| Channel | Channel Frequency (MHz) | Output Power | | Limit |
|---|---|---|---|---|
| | | (dBm) | (W) | (W) |
| Low Channel | 2402 | 7.77 | 0.00598 | 1 |
| Middle Channel | 2440 | 7.60 | 0.00575 | 1 |
| High Channel | 2480 | 6.77 | 0.00475 | 1 |

Pmax: 5.9841mW

**Table 8: Test result of Maximum conducted Peak output power, BLE 2M**

| Channel | Channel Frequency (MHz) | Output Power | | Limit |
|---|---|---|---|---|
| | | (dBm) | (W) | (W) |
| Low Channel | 2402 | 7.78 | 0.00600 | 1 |
| Middle Channel | 2440 | 7.61 | 0.00577 | 1 |
| High Channel | 2480 | 6.77 | 0.00475 | 1 |

Pmax: 5.9979mW

## 5.1.3 6dB Bandwidth and 99% Bandwidth

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(a)(2), ISED RSS-247 5.2(a)<br>ISED RSS-Gen (Issue 5) 6.7 |
| Basic standard | : | ANSI C63.10:2013, KDB558074 |
| 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 9: Test result of 6dB Bandwidth, BLE 2M**

| Channel | Channel Frequency (MHz) | 6dB Bandwidth (kHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low Channel | 2402 | 710.29 | >500 | Pass |
| Mid Channel | 2440 | 710.29 | >500 | Pass |
| High Channel | 2480 | 710.29 | >500 | Pass |

**Table 10: Test result of 6dB Bandwidth, BLE 2M**

| Channel | Channel Frequency (MHz) | 6dB Bandwidth (MHz) | Limit (kHz) | Result |
|---|---|---|---|---|
| Low Channel | 2402 | 1.128 | >500 | Pass |
| Mid Channel | 2440 | 1.123 | >500 | Pass |
| High Channel | 2480 | 1.123 | >500 | Pass |

**Table 11: Test result of 99% Bandwidth, BLE 1M**

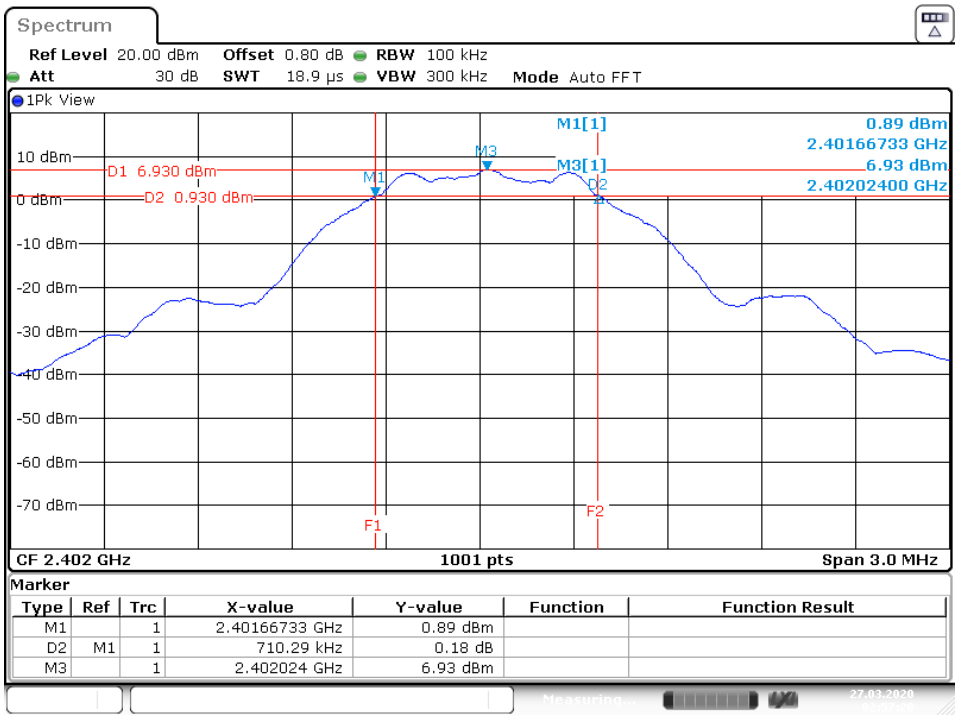
| Channel | Channel Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low Channel | 2402 | 1.051 |
| Mid Channel | 2440 | 1.051 |
| High Channel | 2480 | 1.051 |

**Table 12: Test result of 99% Bandwidth, BLE 2M**

| Channel | Channel Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low Channel | 2402 | 2.042 |
| Mid Channel | 2440 | 2.042 |
| High Channel | 2480 | 2.047 |

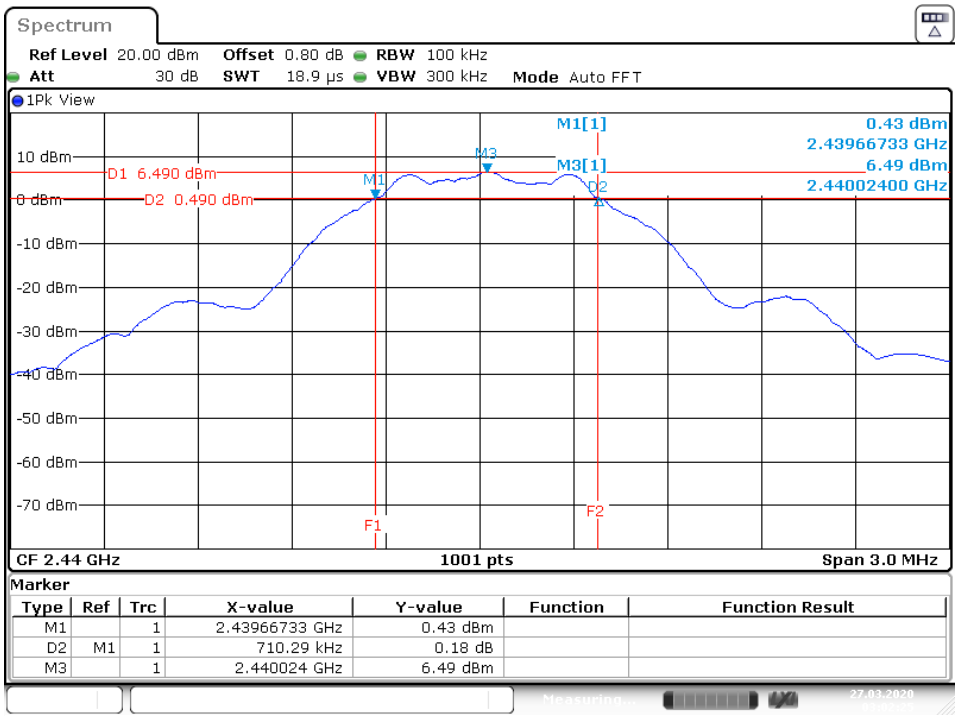
# Test Plot of 6dB Bandwidth, BLE 1M

## Low Channel



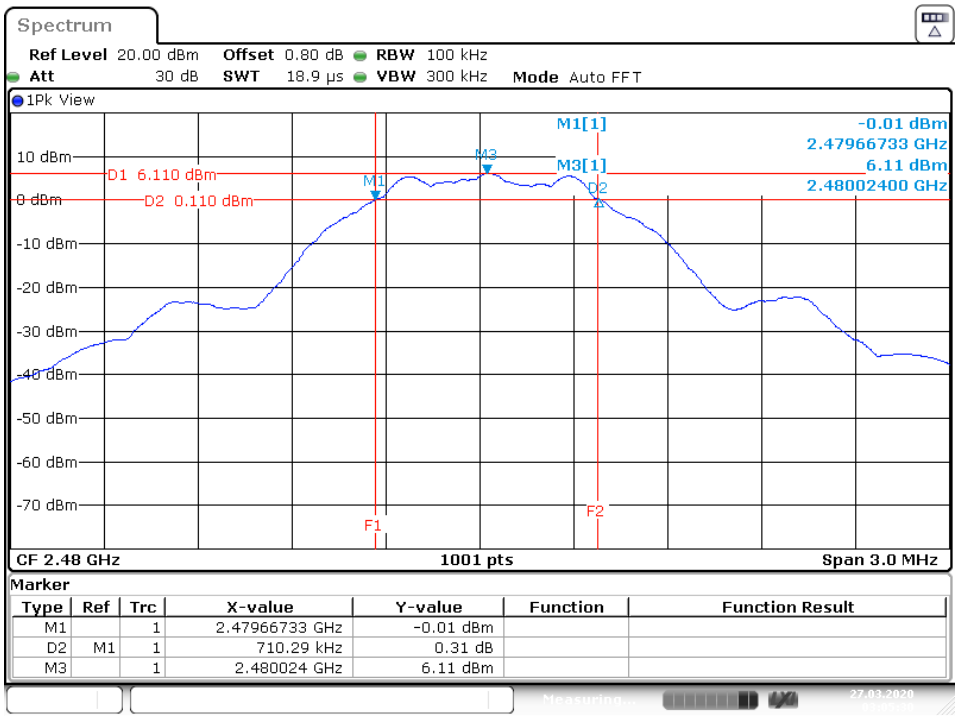

Date: 27.MAR.2020 02:57:20

## Middle Channel




Date: 27.MAR.2020 03:02:25

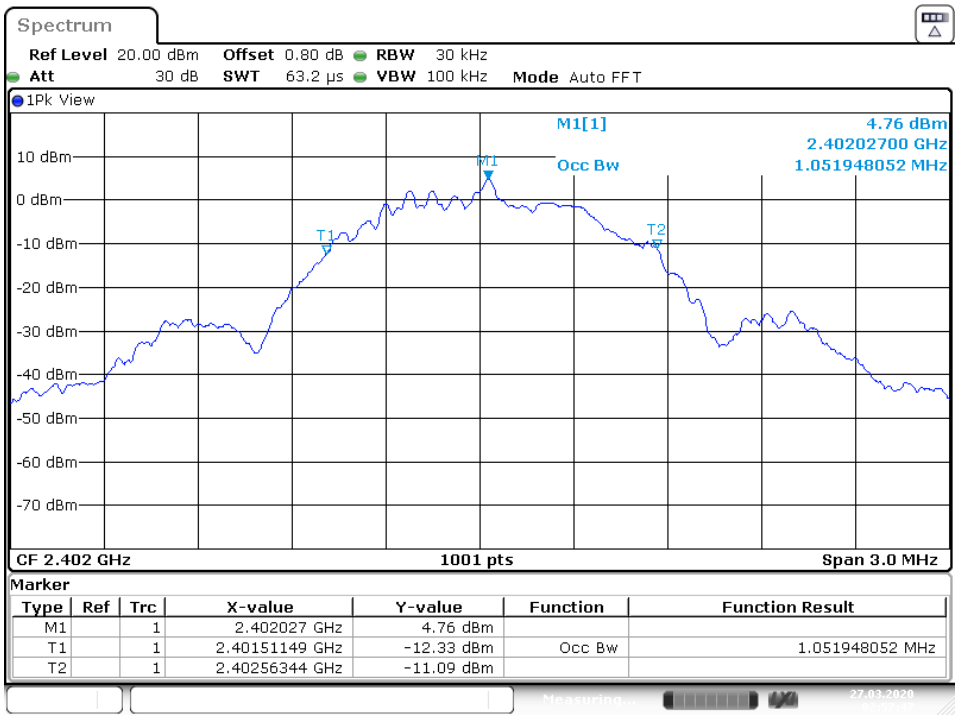
### High Channel




Date: 27.MAR.2020 03:05:30

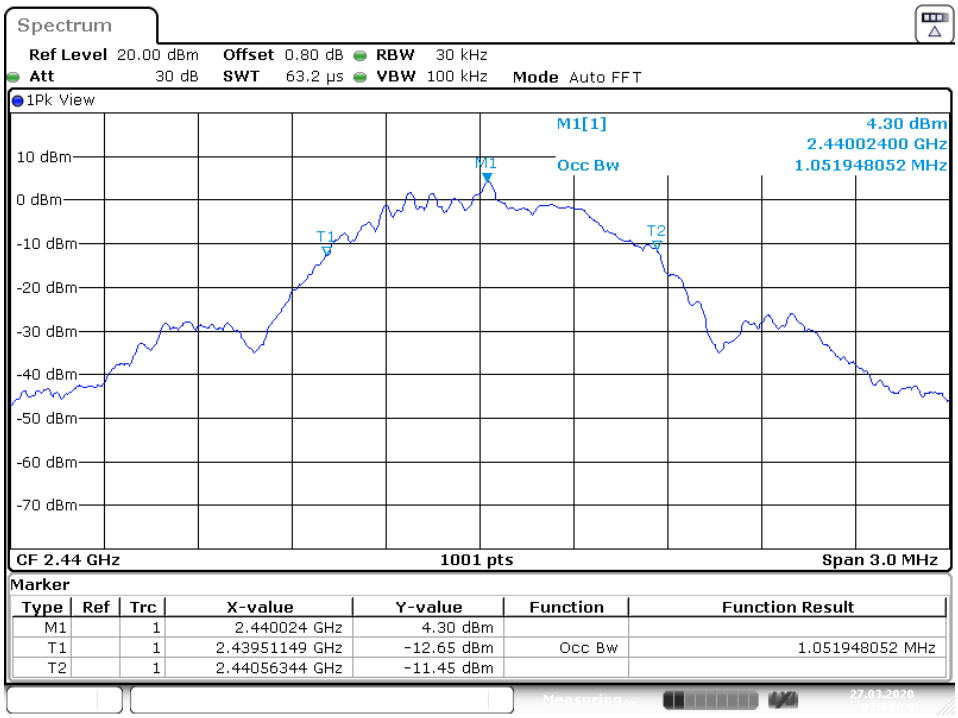
## Test Plot of 99% Bandwidth, BLE 1M

### Low Channel




Date: 27.MAR.2020 02:57:47

## Middle Channel

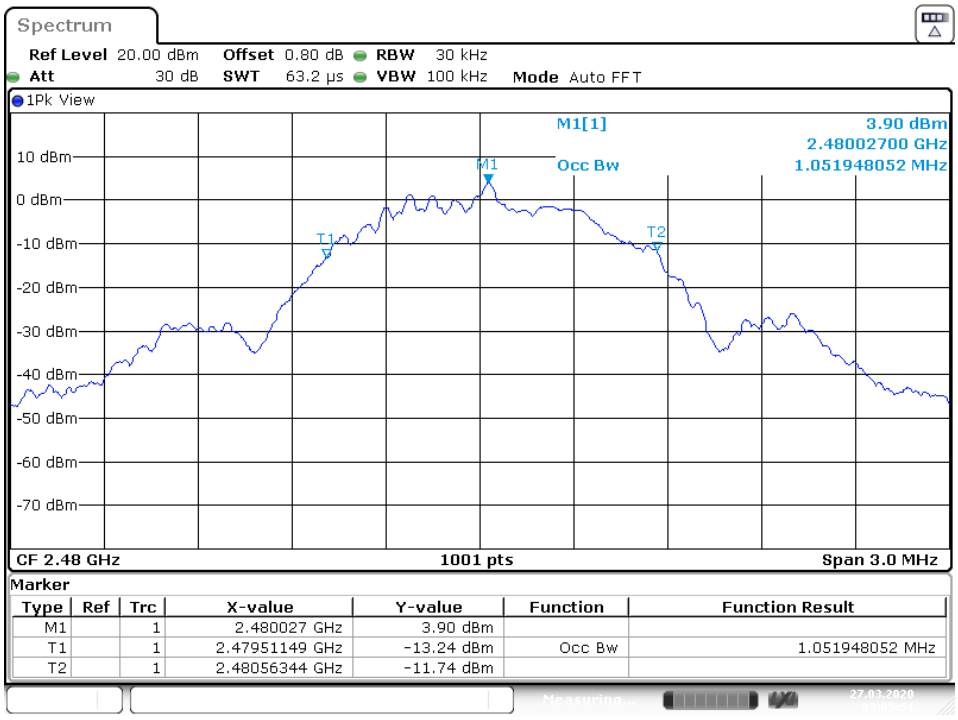



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.440024 GHz | 4.30 dBm | | |
| T1 | | 1 | 2.43951149 GHz | -12.65 dBm | Occ Bw | 1.051948052 MHz |
| T2 | | 1 | 2.44056344 GHz | -11.45 dBm | | |

Date: 27.MAR.2020 03:02:59

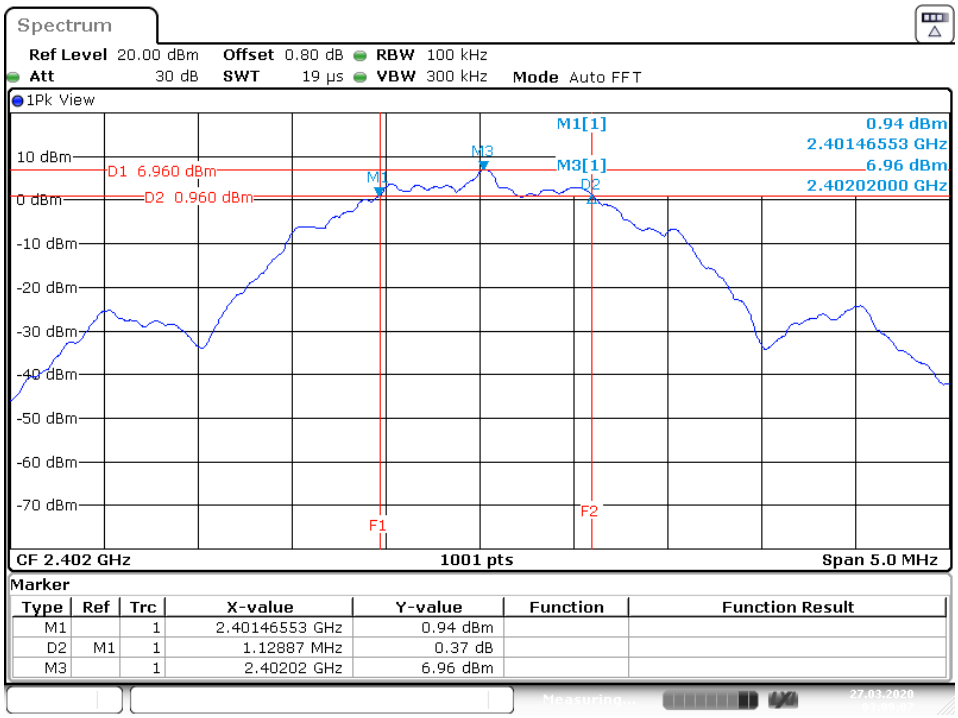
### High Channel




Date: 27.MAR.2020 03:05:51

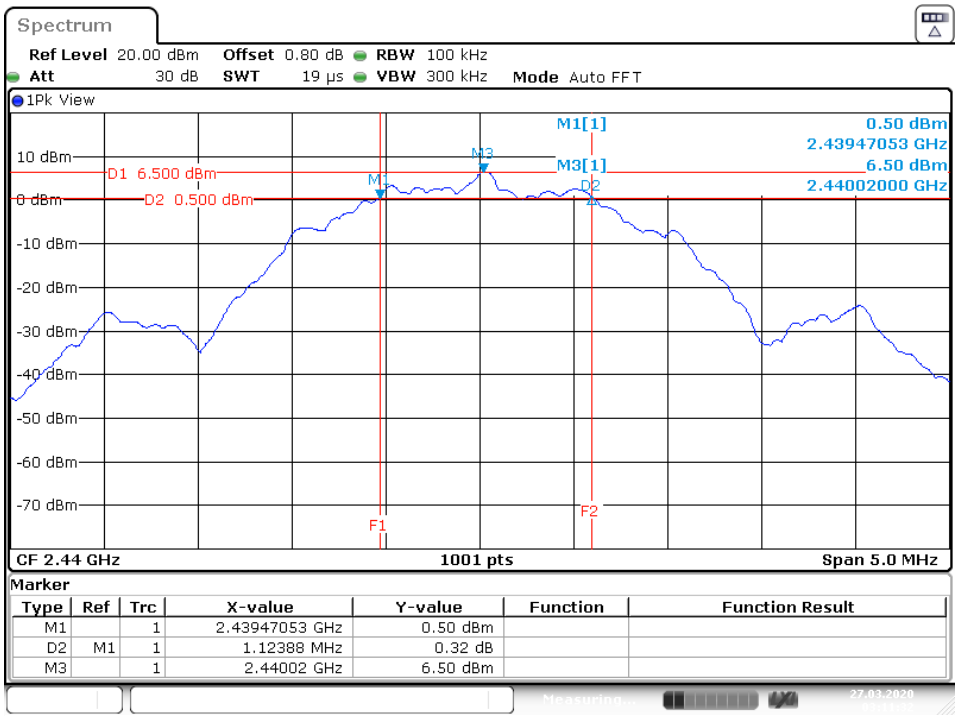
## Test Plot of 6dB Bandwidth, BLE 2M

### Low Channel




Date: 27.MAR.2020 03:09:06

## Middle Channel

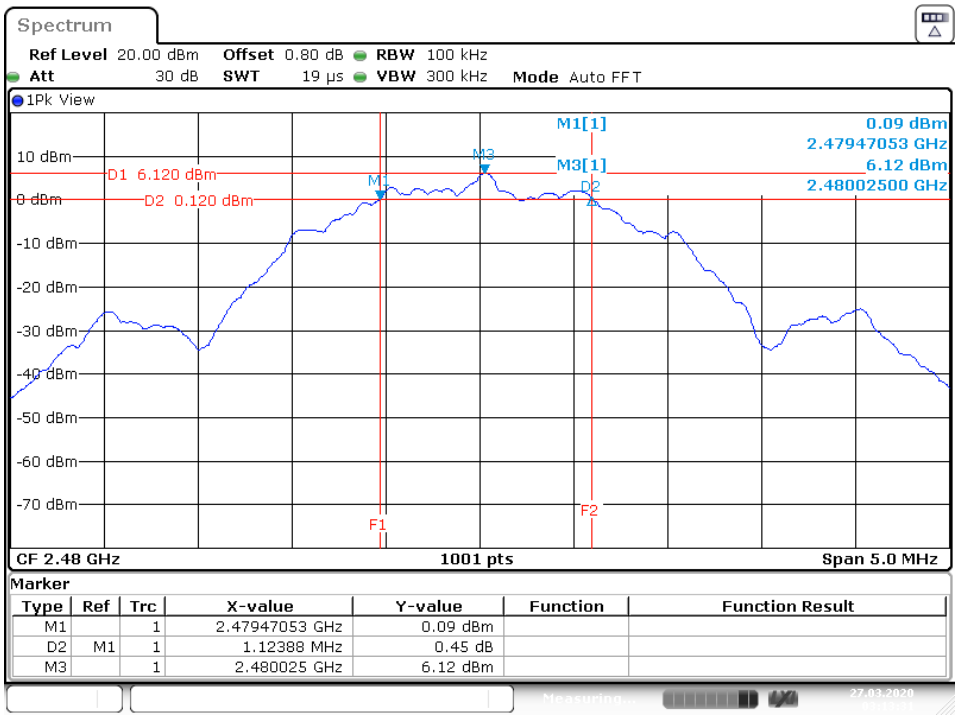



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.43947053 GHz | 0.50 dBm | | |
| D2 | M1 | 1 | 1.12388 MHz | 0.32 dB | | |
| M3 | | 1 | 2.44002 GHz | 6.50 dBm | | |

Date: 27.MAR.2020 03:11:32

## High Channel



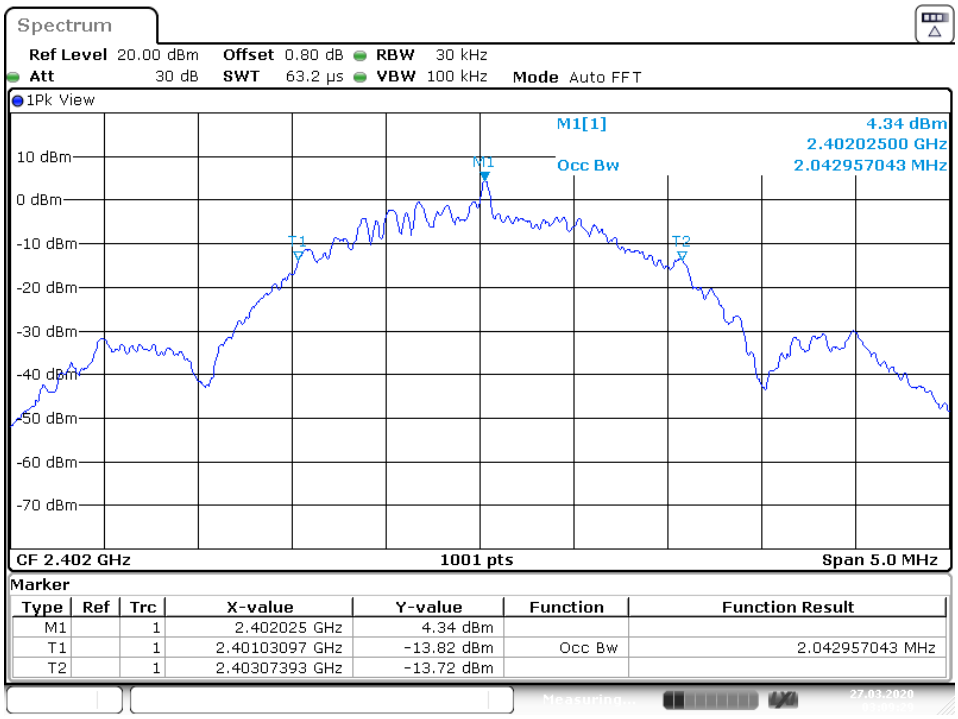

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.47947053 GHz | 0.09 dBm | | |
| D2 | M1 | 1 | 1.12388 MHz | 0.45 dB | | |
| M3 | | 1 | 2.480025 GHz | 6.12 dBm | | |

Date: 27.MAR.2020 03:13:31

# Test Plot of 99% Bandwidth, BLE 2M

## Low Channel

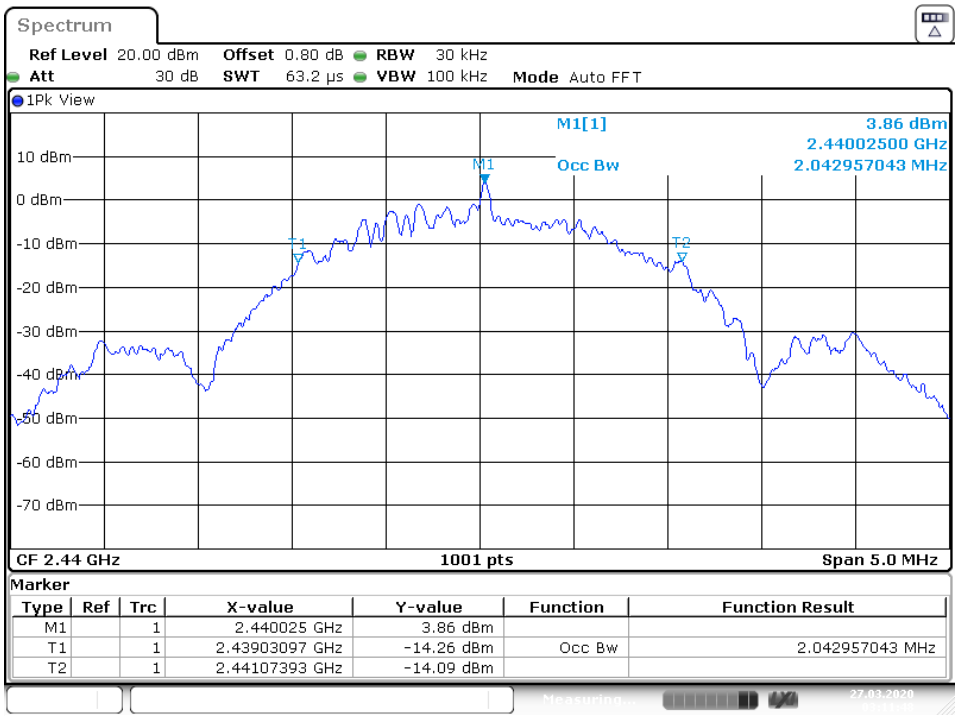



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.402025 GHz | 4.34 dBm | | |
| T1 | | 1 | 2.40103097 GHz | -13.82 dBm | Occ Bw | 2.042957043 MHz |
| T2 | | 1 | 2.40307393 GHz | -13.72 dBm | | |

Date: 27.MAR.2020 03:09:29

## Middle Channel

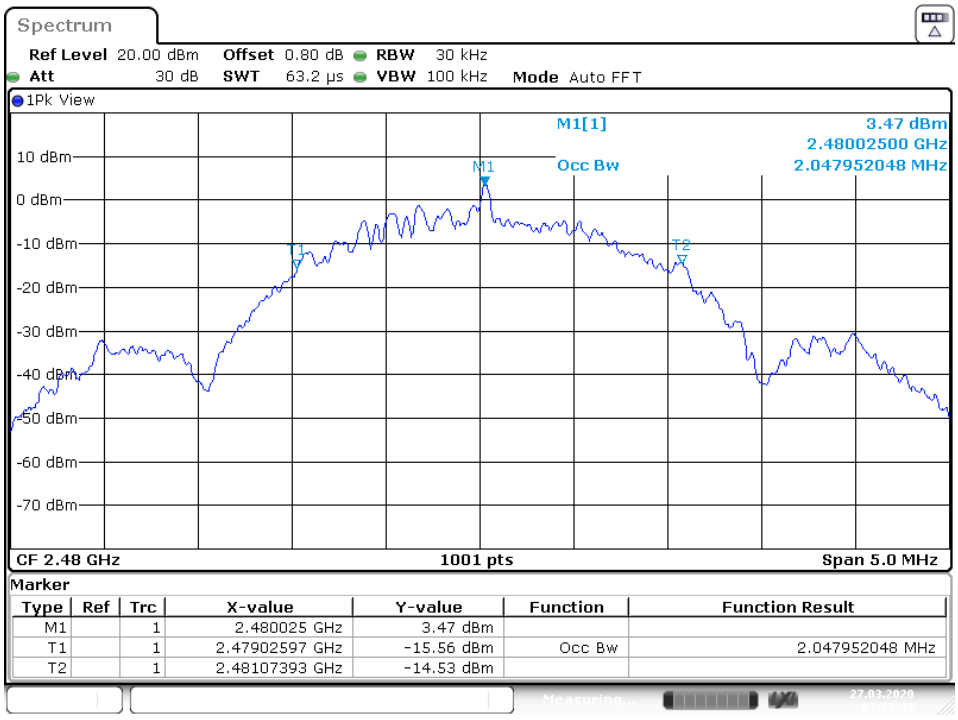



Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.440025 GHz | 3.86 dBm | | |
| T1 | | 1 | 2.43903097 GHz | -14.26 dBm | Occ Bw | 2.042957043 MHz |
| T2 | | 1 | 2.44107393 GHz | -14.09 dBm | | |

Date: 27.MAR.2020 03:11:48

## High Channel




Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.480025 GHz | 3.47 dBm | | |
| T1 | | 1 | 2.47902597 GHz | -15.56 dBm | Occ Bw | 2.047952048 MHz |
| T2 | | 1 | 2.48107393 GHz | -14.53 dBm | | |

Date: 27.MAR.2020 03:13:48

## 5.1.4 Power Density

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(e) , ISED RSS-247 5.2(b) |
| Basic standard | : | ANSI C63.10:2013, KDB558074 |
| 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 13: Test result of Power Density, BLE 1M**

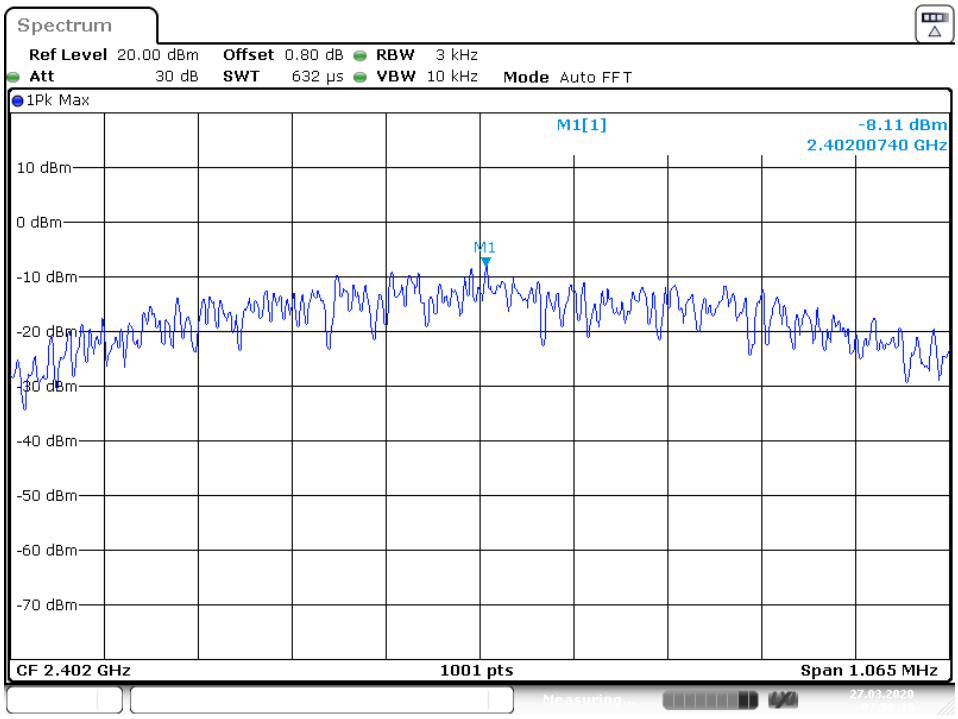
| Channel | Channel Frequency (MHz) | Power Density | Limit |
|---|---|---|---|
| | | (dBm) | (dBm) |
| Low Channel | 2402 | -8.11 | 8 |
| Middle Channel | 2440 | -8.44 | 8 |
| High Channel | 2480 | -8.99 | 8 |

**Table 14: Test result of Power Density, BLE 2M**

| Channel | Channel Frequency (MHz) | Power Density | Limit |
|---|---|---|---|
| | | (dBm) | (dBm) |
| Low Channel | 2402 | -10.69 | 8 |
| Middle Channel | 2440 | -11.02 | 8 |
| High Channel | 2480 | -11.45 | 8 |

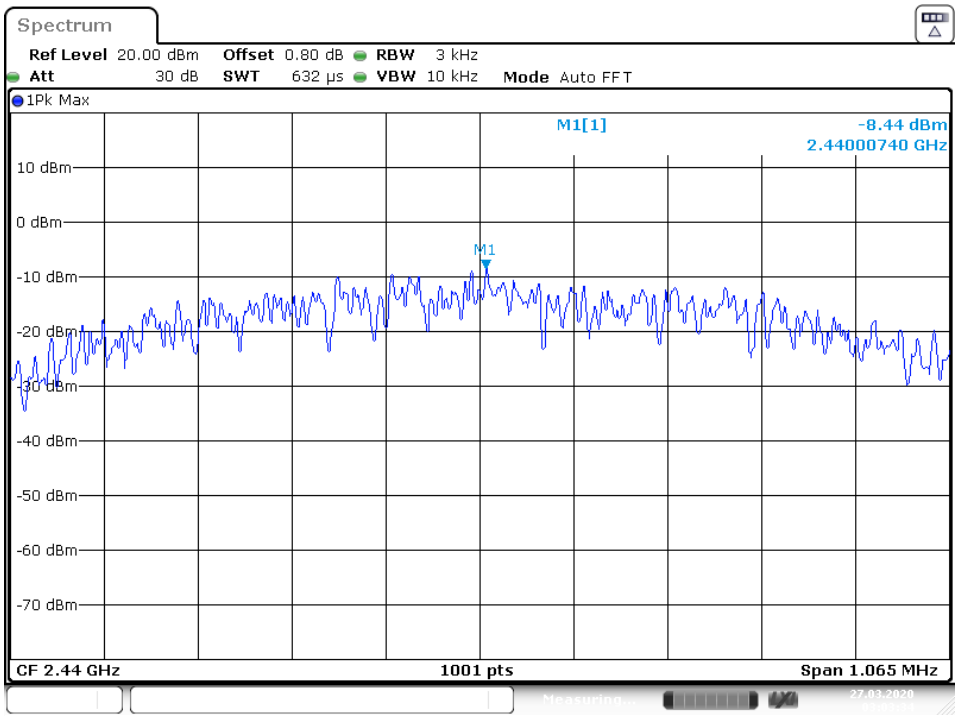
# Test Plot of Power Density, BLE 1M

## Low Channel



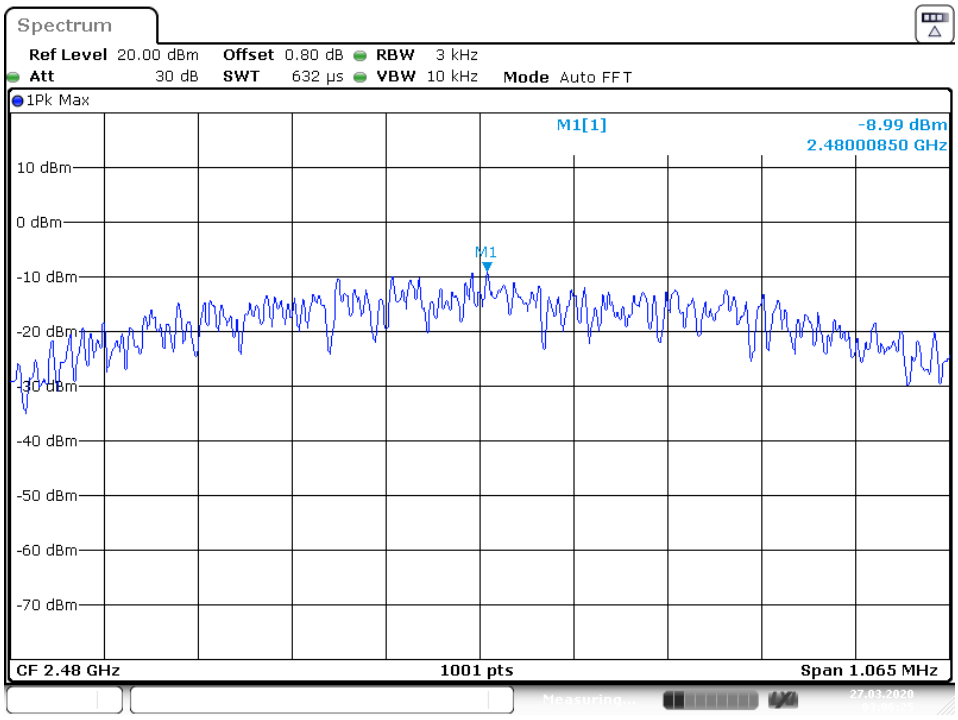

Date: 27.MAR.2020 02:58:15

## Middle Channel




Date: 27.MAR.2020 03:03:34

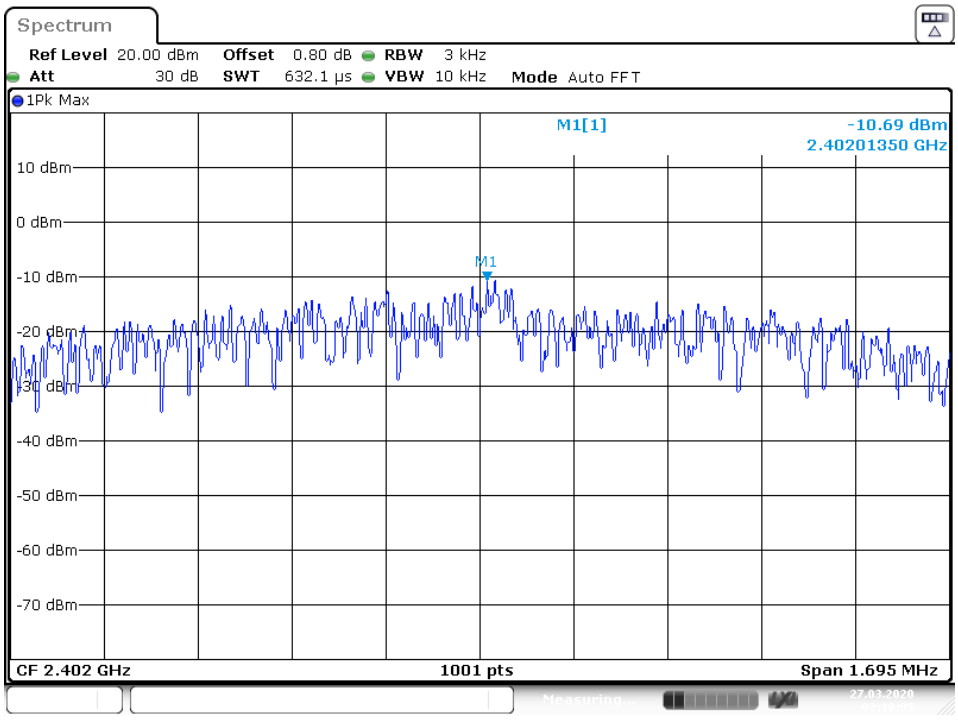
### High Channel




Date: 27.MAR.2020 03:06:25

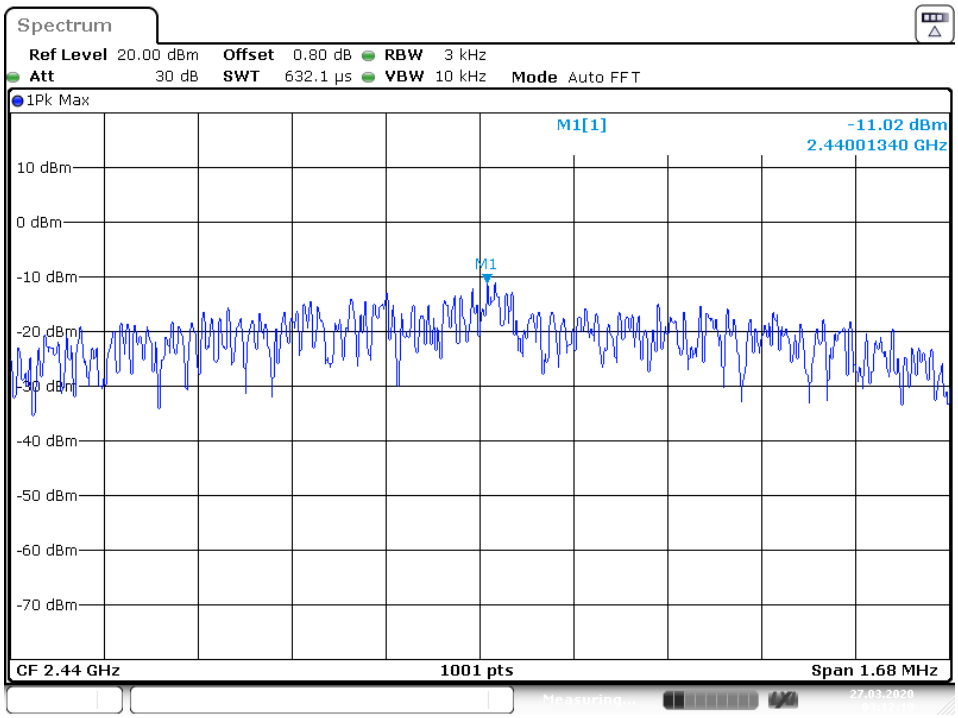
## Test Plot of Power Density, BLE 2M

### Low Channel



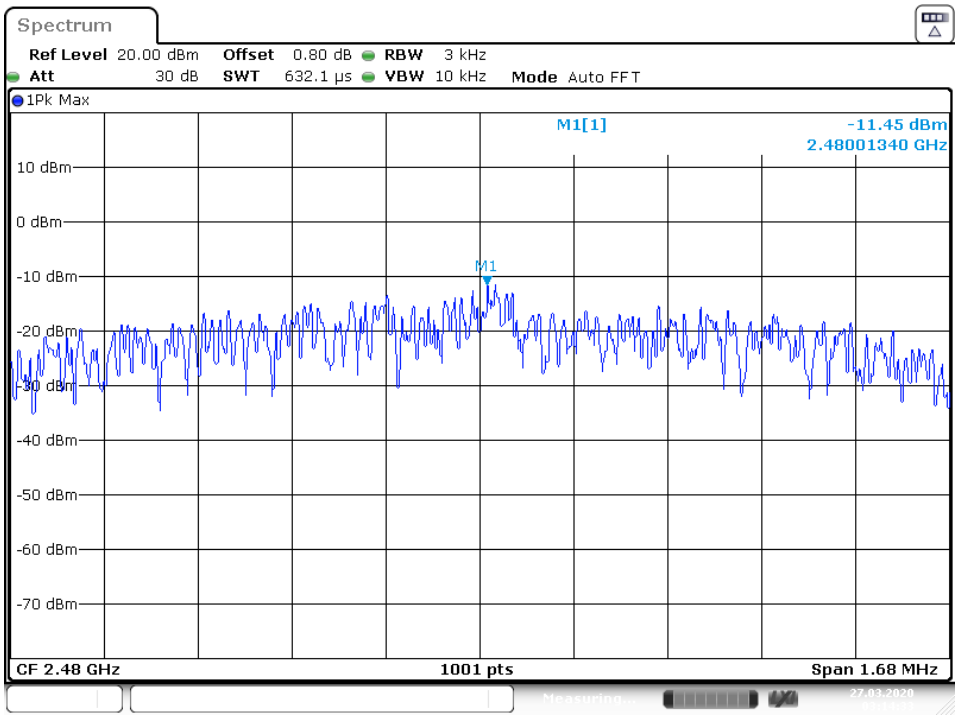

Date: 27.MAR.2020 03:10:05

## Middle Channel




Date: 27.MAR.2020 03:12:10

## High Channel




Date: 27.MAR.2020 03:14:33

## 5.1.5 Conducted spurious emissions and Frequency Band Edge measured in 100kHz Bandwidth

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC part 15.247(d), RSS-247 5.5 |
| Basic standard | : | ANSI C63.10:2013, KDB558074 |
| Limit | : | 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power) |
| Kind of test site | : | Shielded room |

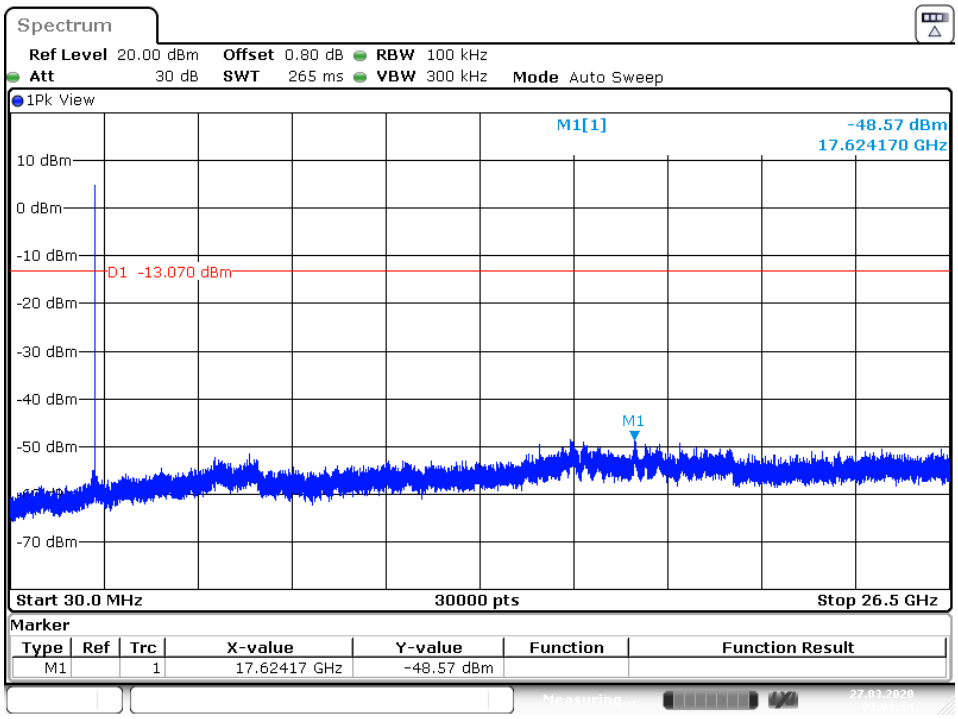
**Test setup**

| | | |
|---|---|---|
| Test Channel | : | Low/ Mid/ High for spurious, Low/ High for 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.

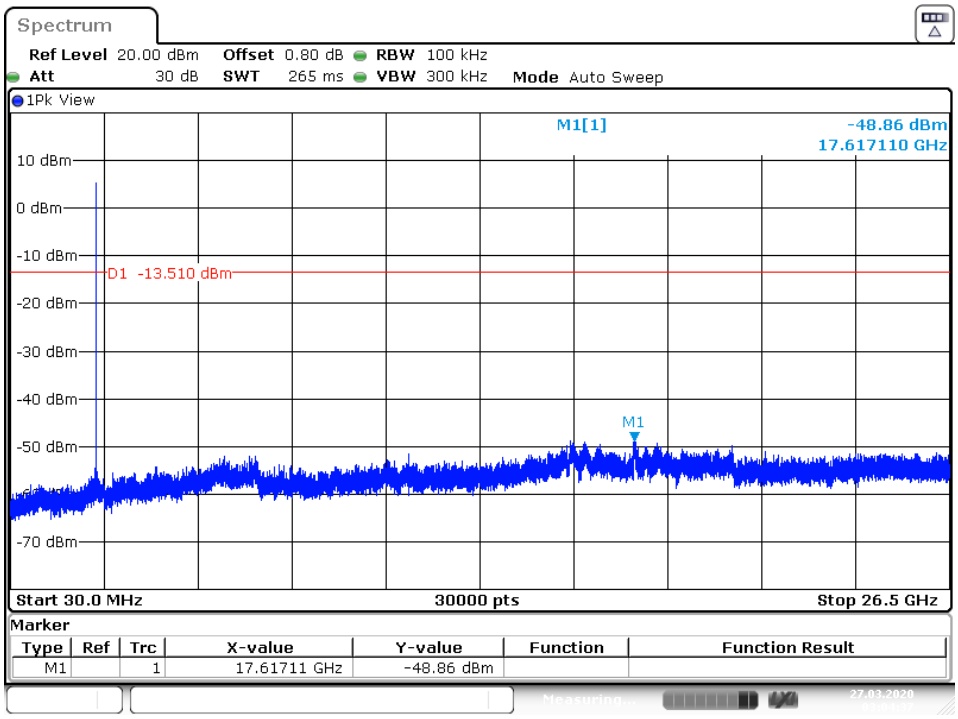
# Test Plot 100kHz Conducted Emissions, BLE 1M

## Low Channel



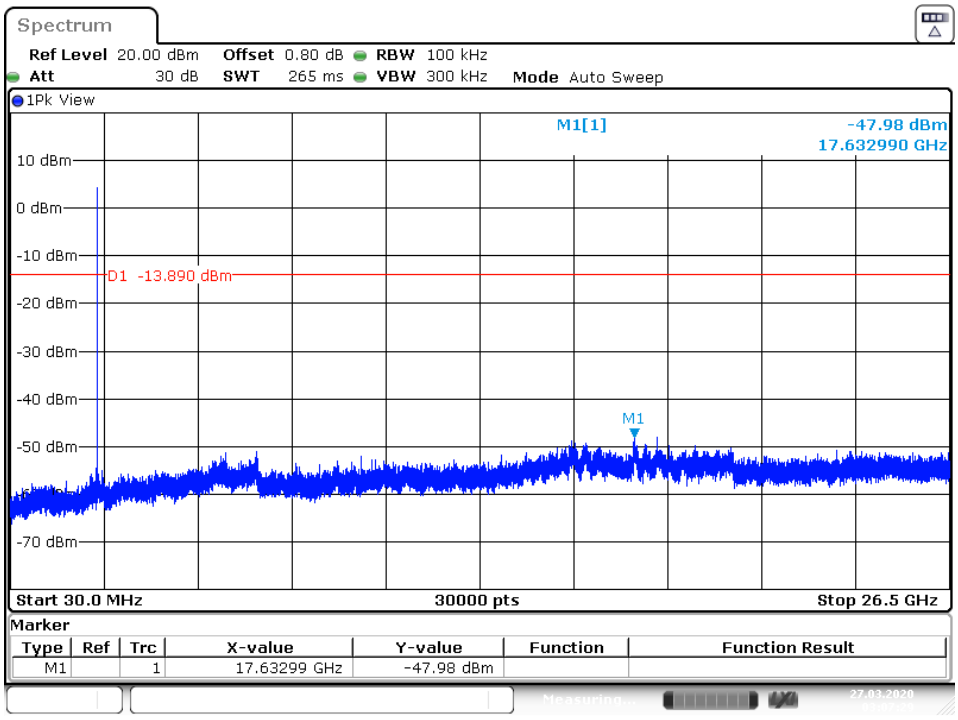

Date: 27.MAR.2020 03:01:14

## Middle Channel




Date: 27.MAR.2020 03:04:37

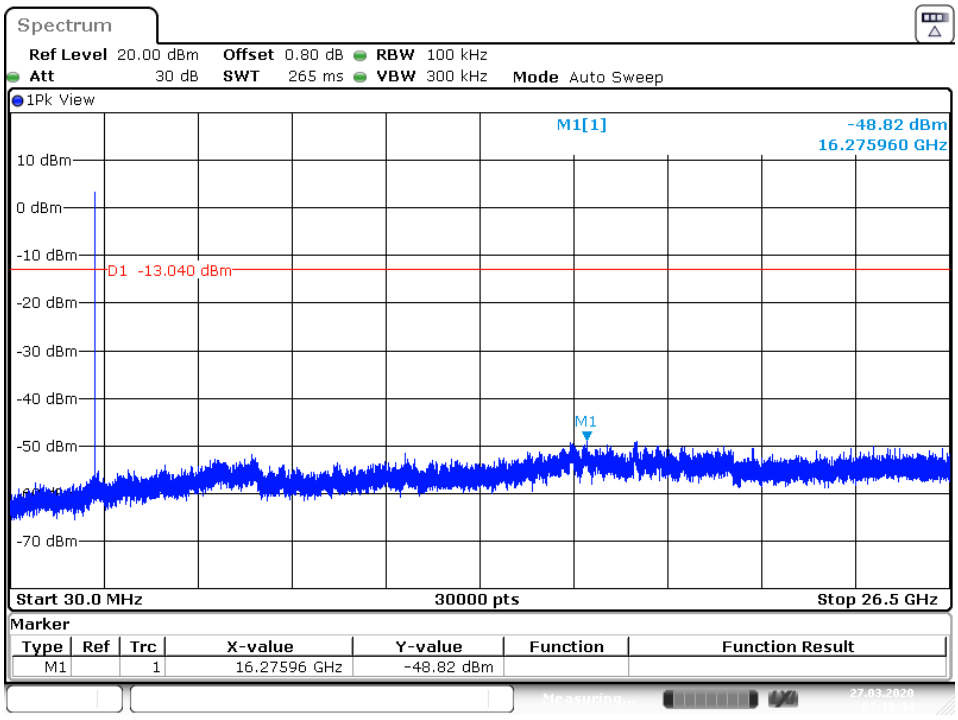
### High Channel




Date: 27.MAR.2020 03:07:29

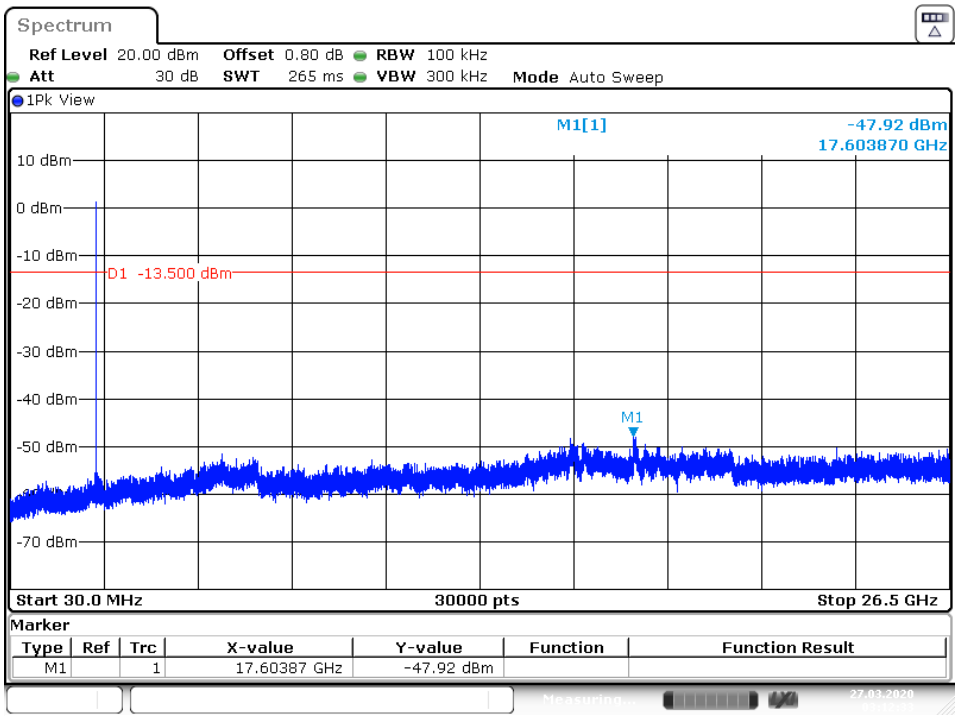
## Test Plot 100kHz Conducted Emissions, BLE 2M

### Low Channel



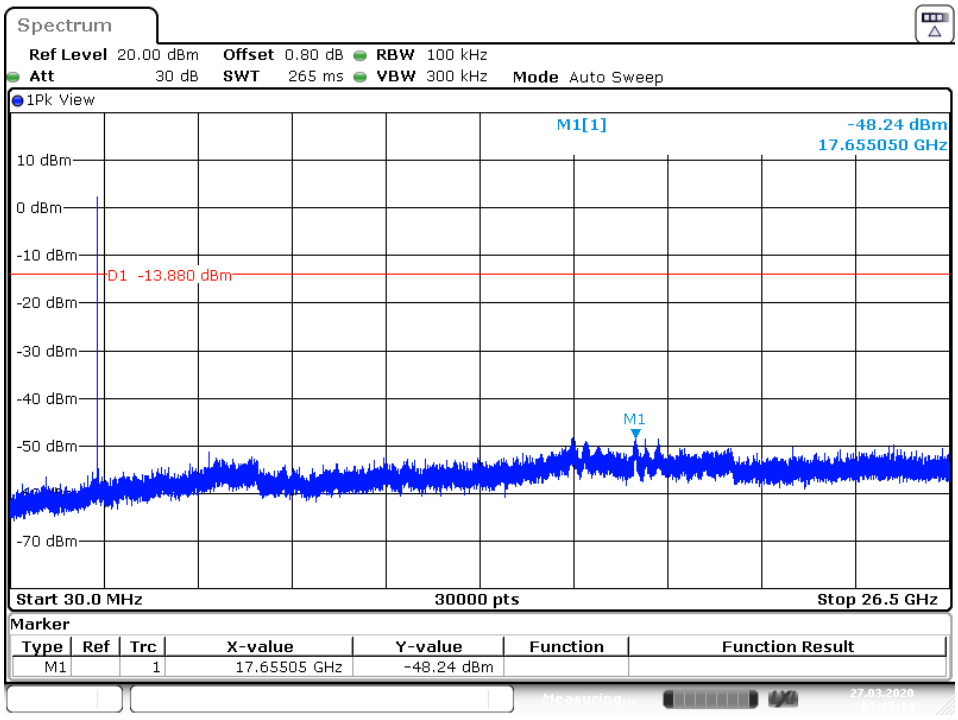

Date: 27.MAR.2020 03:10:44

## Middle Channel




Date: 27.MAR.2020 03:12:33

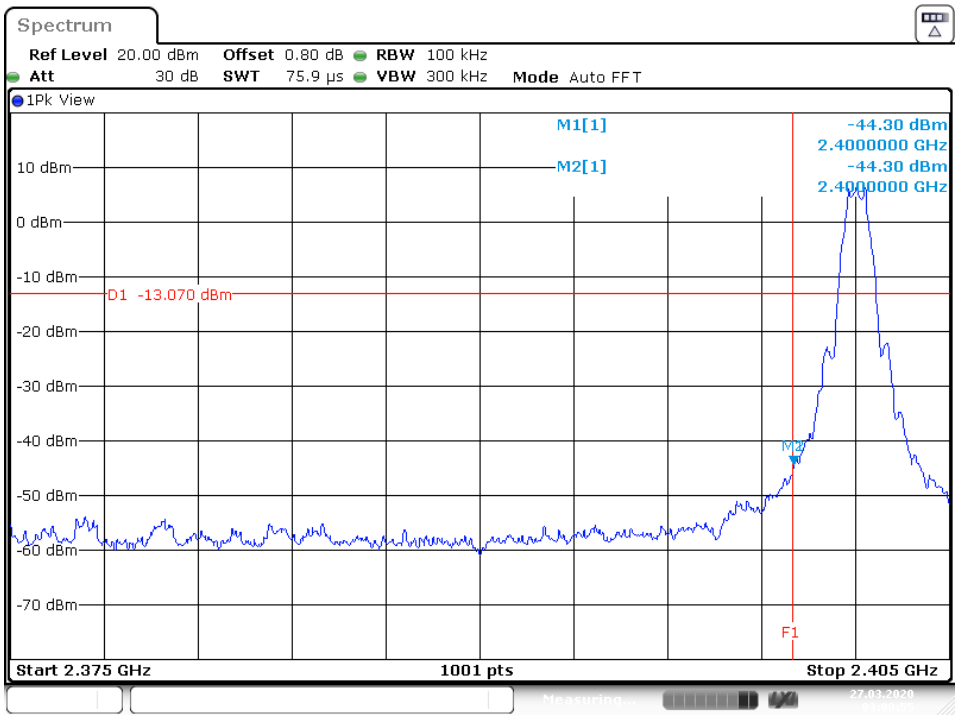
## High Channel




Date: 27.MAR.2020 03:15:14

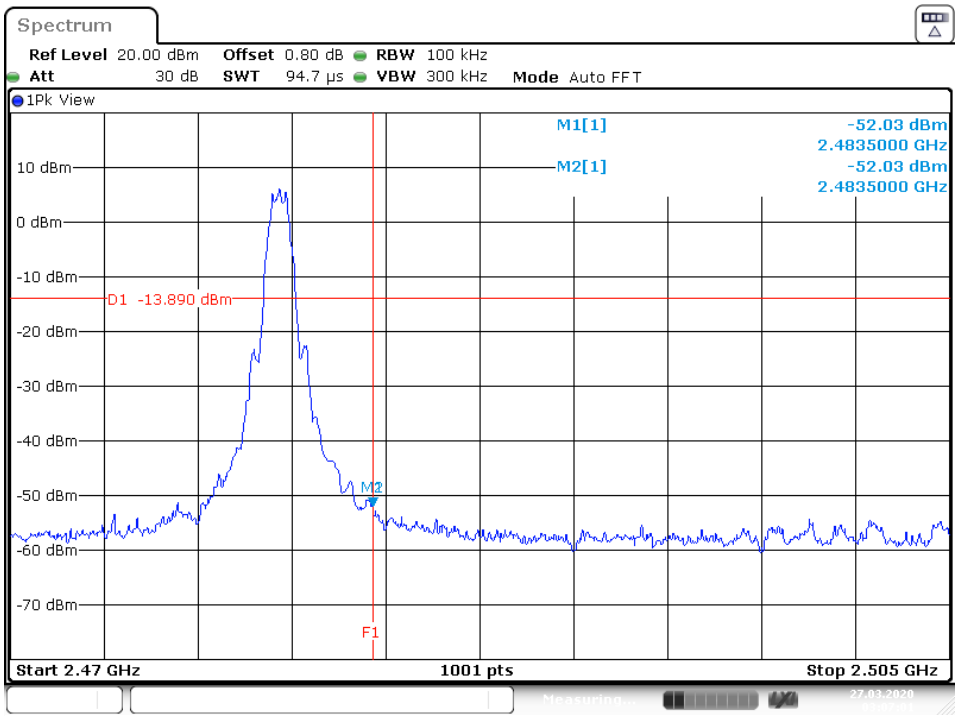
# Test Plot 100kHz RBW of Band Edge, BLE 1M

## Low Channel




Date: 27.MAR.2020 03:00:55

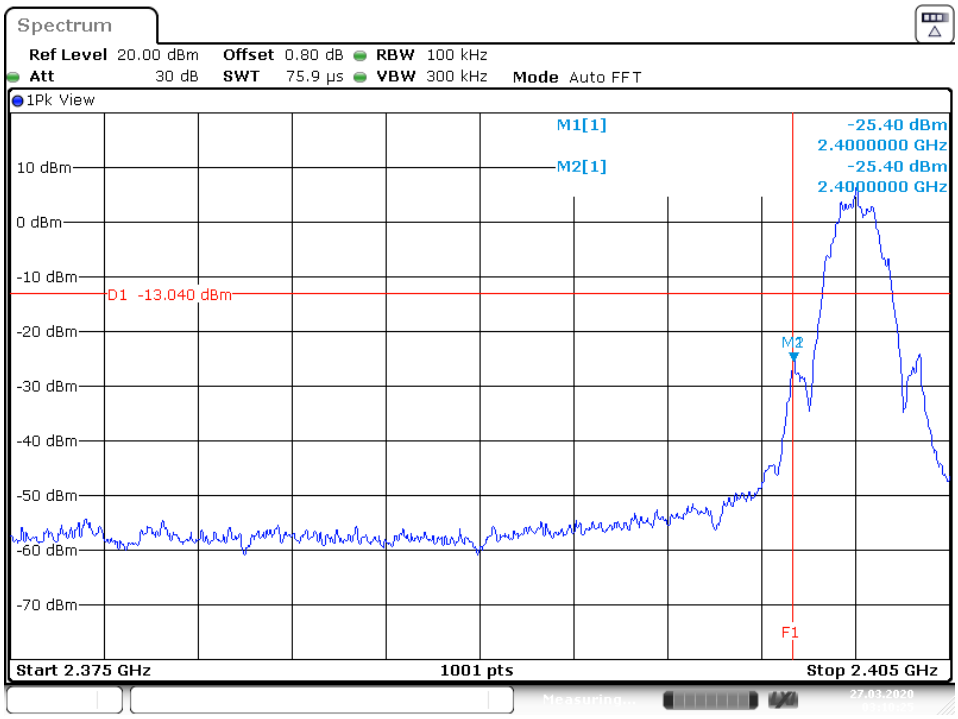
## High Channel




Date: 27.MAR.2020 03:07:01

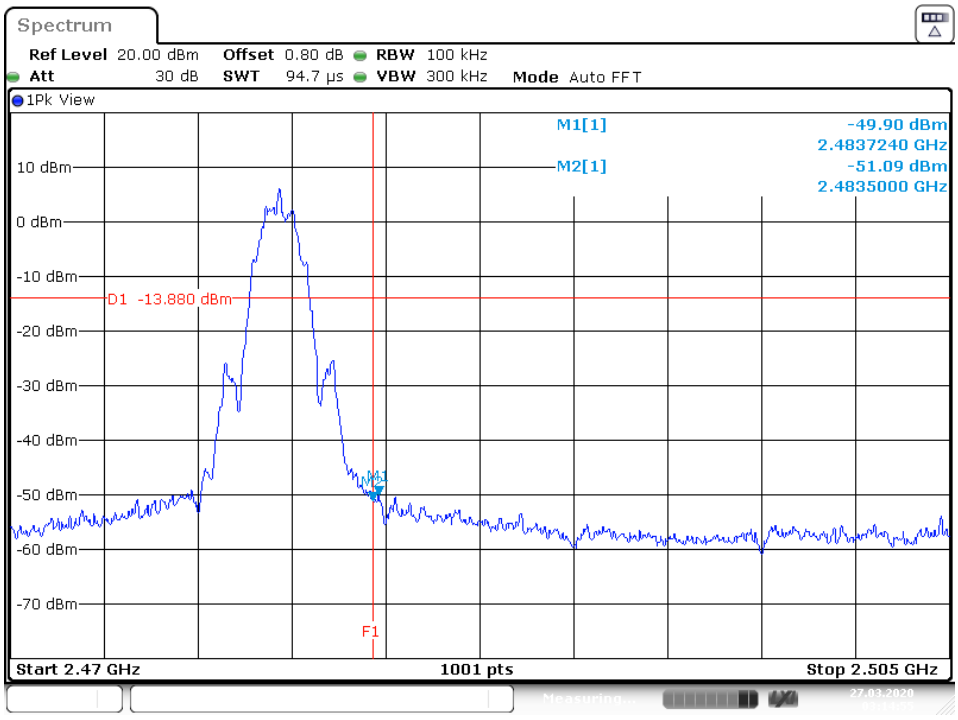
# Test Plot 100kHz RBW of Band Edge, BLE 2M

## Low Channel




Date: 27.MAR.2020 03:10:25

## High Channel




Date: 27.MAR.2020 03:14:55

## 5.1.6 Spurious Emission

**RESULT:** **Passed**

| | | |
|---|---|---|
| Test standard | : | FCC part 15.247(d), FCC 15.205, FCC 15.209, ISED RSS-247 5.5 and ISED RSS-Gen issue 5 |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i5, 8.10 (Table 7), must comply with the radiated emission limits specified in FCC 15.209(a) and ISED RSS-Gen i5, 8.9 (Table 5 and 6).<br>Emission radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in FCC15.247(d) and ISED RSS-247 i2, 5.5 |
| Kind of test site | : | 3m Semi-Anechoic Chamber |

**Test setup**

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

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)

# 6. Safety Human exposure

## 6.1 Radio Frequency Exposure Compliance

### 6.1.1 Electromagnetic Fields

**RESULT:** **Passed**

Test standard : FCC KDB Publication 447498 D01 v06
FCC CFR 47 Part 2 Subpart J Section 2.1091
ISED RSS-102 issue 5, 2.5.2

Separation distance is more than 20 cm, thus mobile device exposure limits can be applied.

**FCC Maximum Exposure:**

| Mode | Frequency (MHz) | Antenna Gain (dBi) | Antenna Gain (numeric) | Maximum Output Power (dBm) | Output Power (mW) | Power Density (S)(mW/cm$^2$) | Test Result |
|---|---|---|---|---|---|---|---|
| BLE 2M | 2402 | 3.80 | 2.3988 | 7.7800 | 5.9979 | 0.002864 | Pass |

**Limit FCC: 1500-100,000 MHz 1.0 mW/cm$^2$**

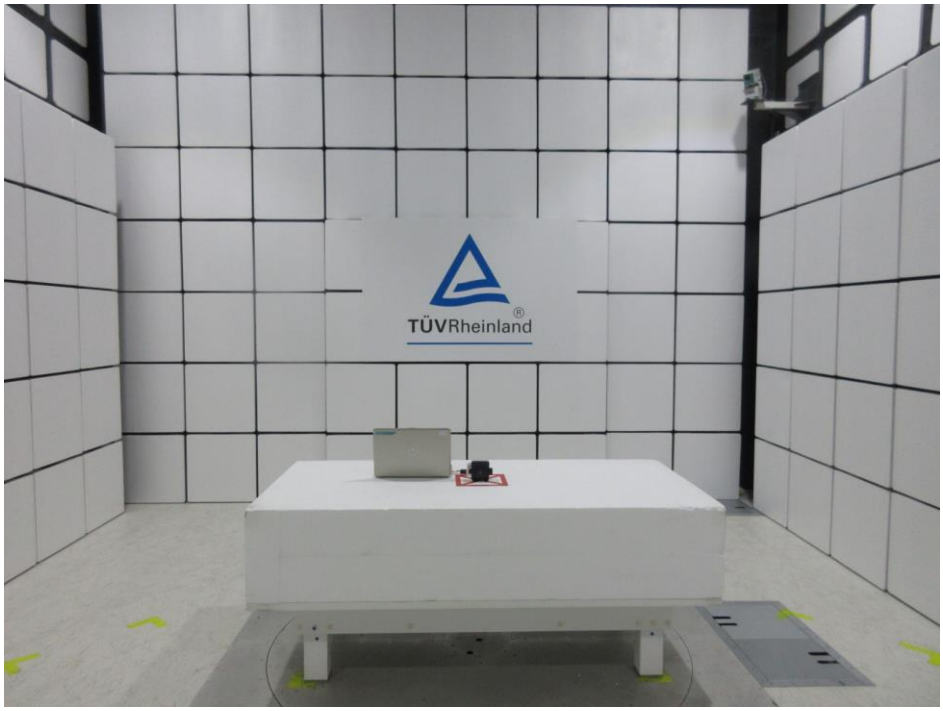
**ISED:**
**Exemption Limits for Routine Evaluation – RF Exposure Evaluation**

At or above 300MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W, where f is in MHz;
f= 2402MHz
$1.31 \times 10^{-2} \times 2402^{0.6834} = 2.67$W

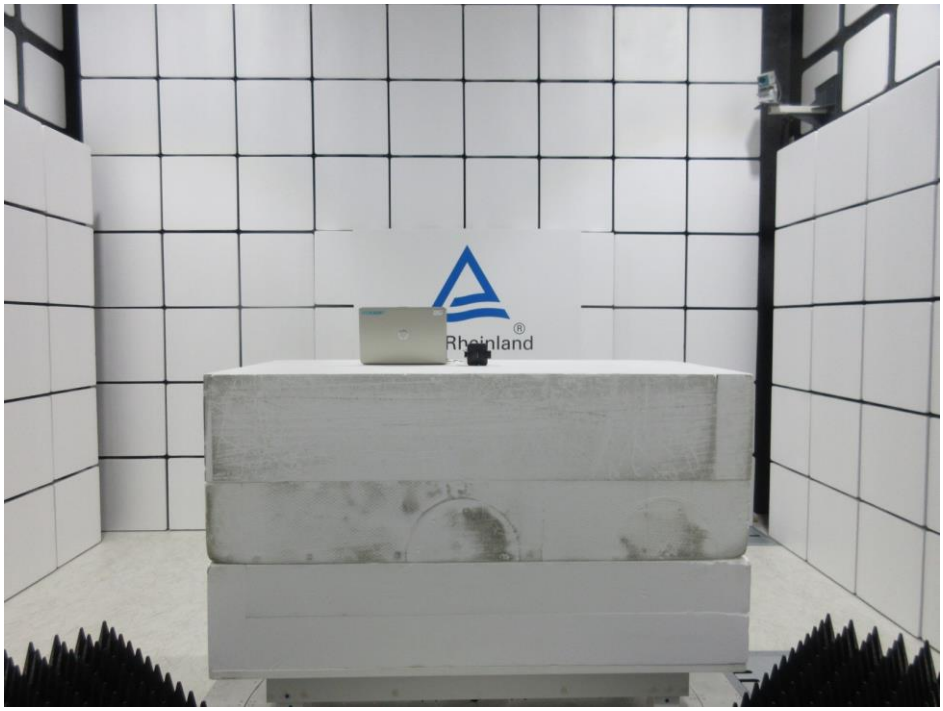
After evaluation the 2402MHz e.i.r.p 11.58dBm calculated result is closer to its limit.
11.58dBm = 0.01438W, it is well below the limit of Exemption Limits for Routine Evaluation, so RF exposure assessment meets its standards.

# 7. Photographs of the Test Set-Up

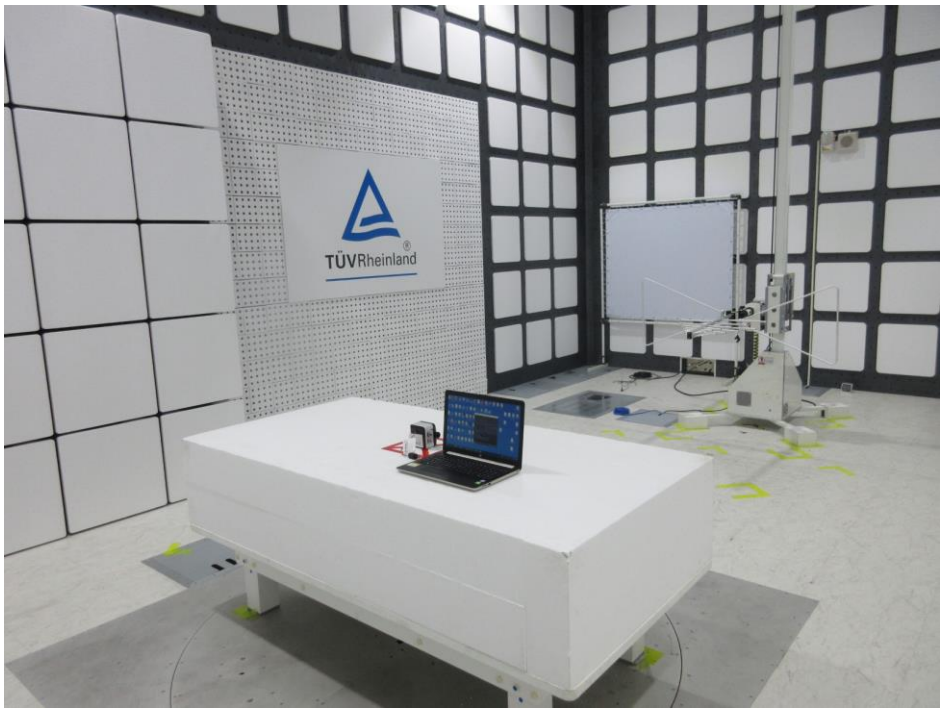
**Photograph 1: Set-up for Spurious Emissions (Front View 1)**



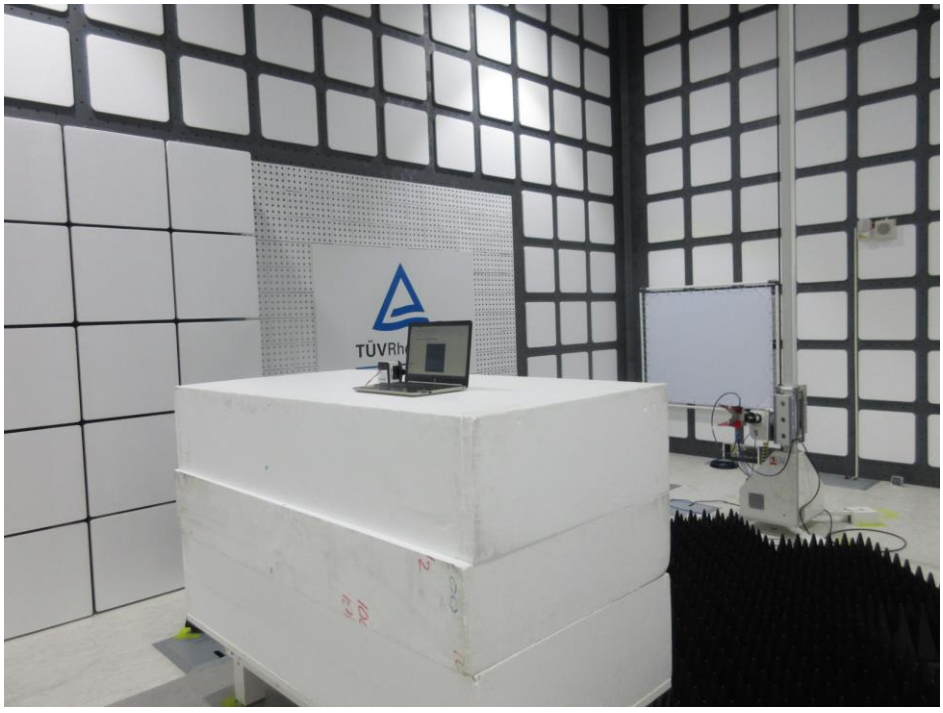

**Photograph 2: Set-up for Spurious Emissions (Front View 2)**



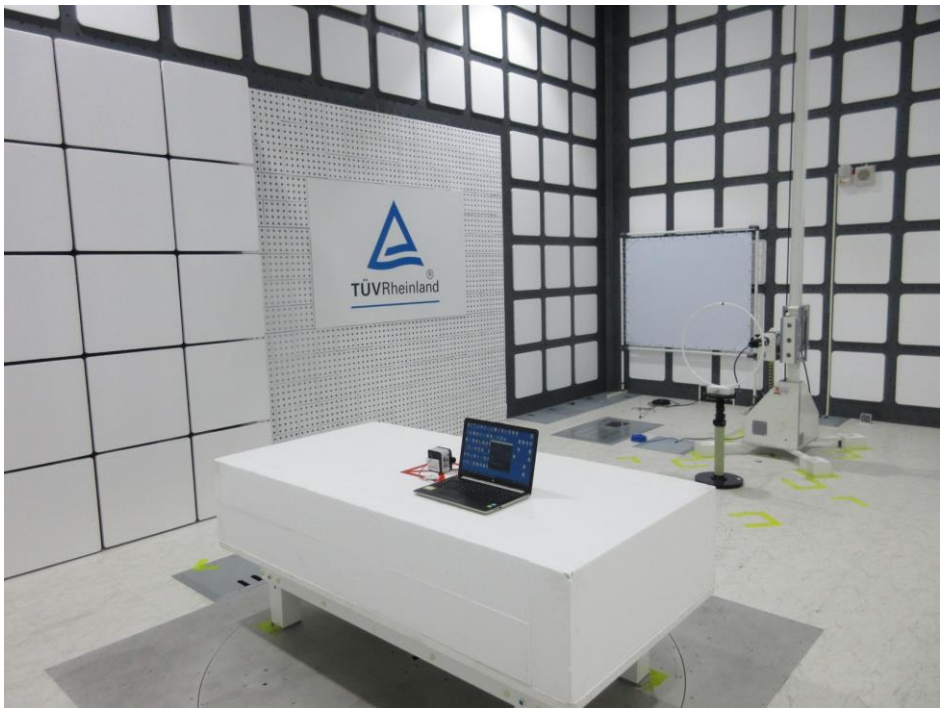
**Photograph 3: Set-up for Spurious Emissions (Back View 1)**



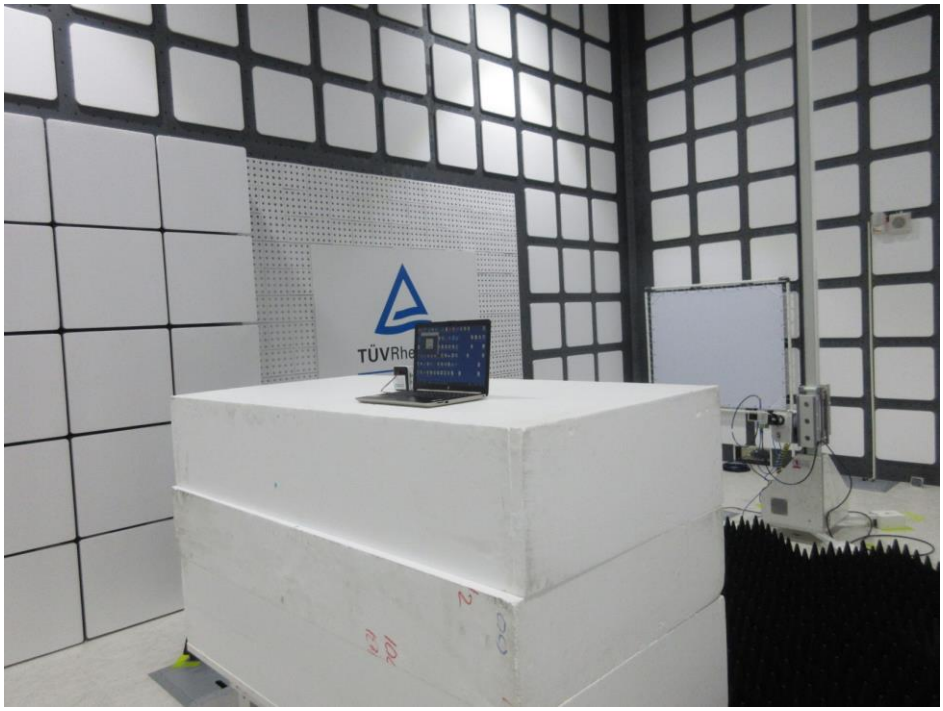

**Photograph 4: Set-up for Spurious Emissions (Back View 2)**



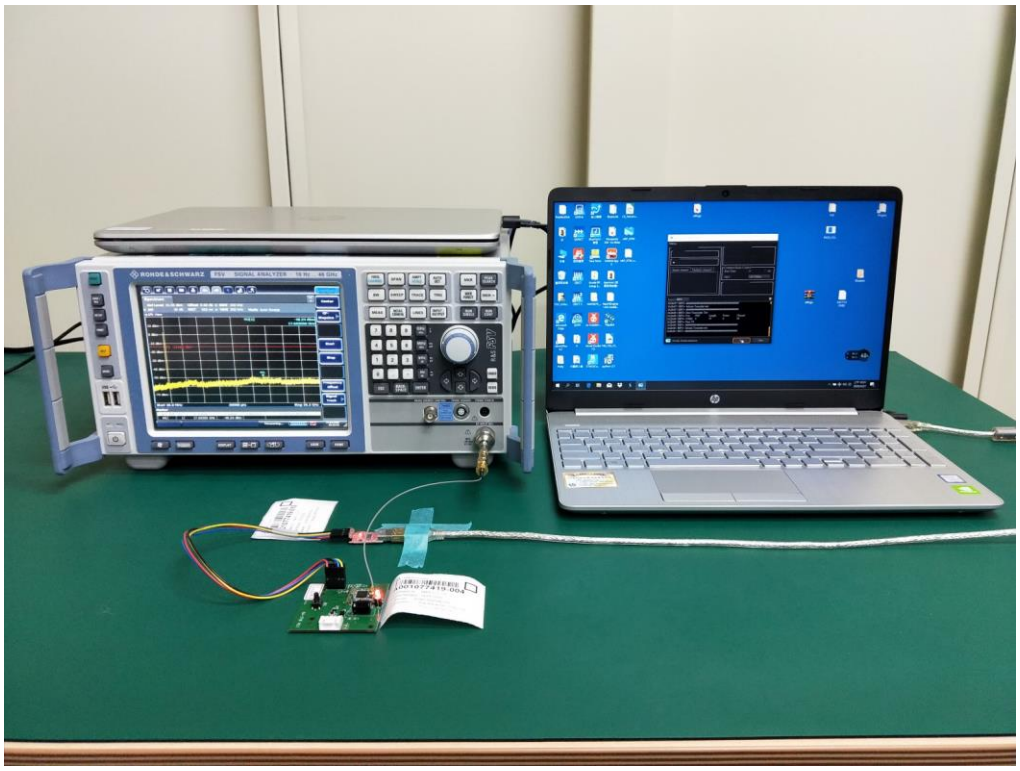
**Photograph 5: Set-up for Spurious Emissions (Back View 3)**



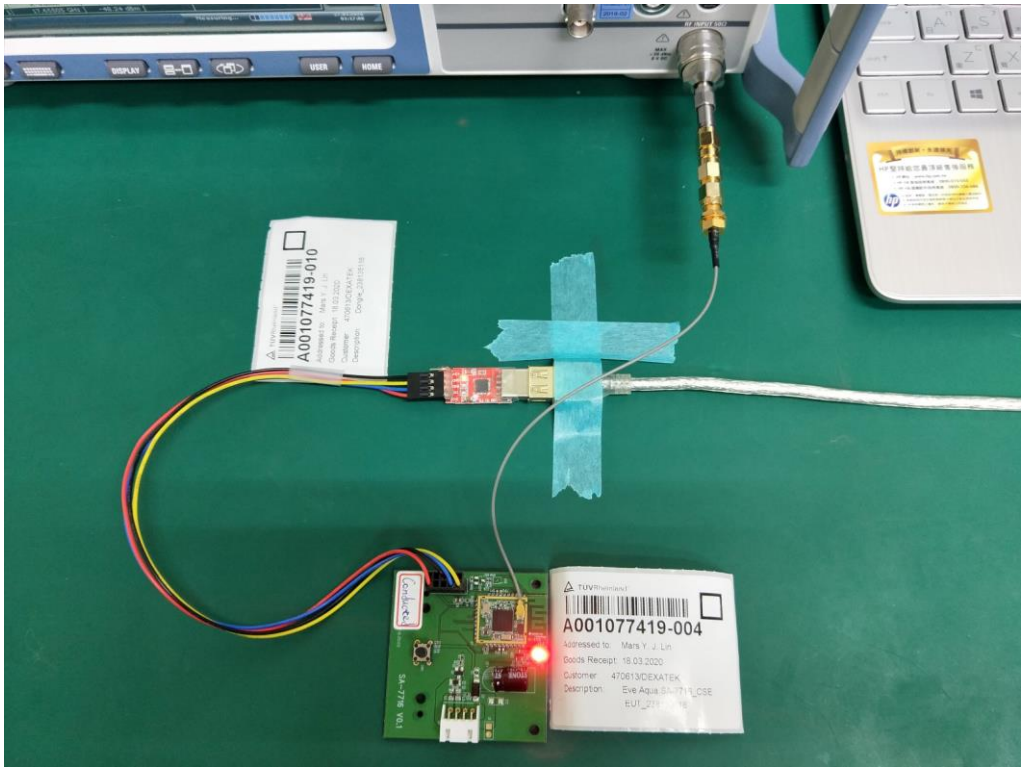

**Photograph 6: Set-up for Spurious Emissions (Back View 4)**



**Photograph 7: Set-up for Conducted Testing (View 1)**



**Photograph 8: Set-up for Conducted Testing (View 2)**



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