# TEST REPORT

| | |
|---|---|
| **Report Reference No.....................** : | **TRE1712019102**          R/C…….: 72398 |
| **FCC ID..............................................** : | **ZSW-10-013** |
| **Applicant's name...........................** : | **b mobile HK Limited** |
| Address...............................................: | Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong. |
| Manufacturer.....................................: | b mobile HK Limited |
| Address...............................................: | Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong. |
| **Test item description ....................** : | **Mobile Phone** |
| Trade Mark ......................................: | Bmobile |
| Model/Type reference.......................: | C210 |
| Listed Model(s) ................................: | - |
| **Standard .........................................** : | **FCC CFR Title 47 Part 15 Subpart C Section 15.247** |
| Date of receipt of test sample……....: | Dec.20,2017 |
| Date of testing………………………..: | Dec.21,2017 - Jan.21,2018 |
| Date of issue…………………….…...: | Jan.22,2018 |
| **Result................. …………………..:** | **PASS** |

| | | |
|---|---|---|
| Compiled by ( position+printedname+signature)...: | File administrators Candy Liu | *Candy Liu* |
| Supervised by ( position+printed name+signature)..: | Project Engineer Cary Luo | *Cary Luo* |
| Approved by (Position+Printed name+Signature): | RF Manager  Hans Hu | *Hans Hu* |

| | |
|---|---|
| **Testing Laboratory Name .............** : | **Shenzhen Huatongwei International Inspection Co., Ltd.** |
| Address...........................................: | 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China |

# Contents

# 1. <u>TEST STANDARDS AND REPORT VERSION</u>

## 1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.10-2013: American National Standard forTesting Unlicensed Wireless Devicese

## 1.2. Report version

| Version No. | Date of issue | Description |
|---|---|---|
| 00 | Jan.22,2018 | Original |
| | | |
| | | |
| | | |
| | | |

## 2. TEST DESCRIPTION

| Test Item | Section in CFR 47 | Result | Test Engineer |
|---|---|---|---|
| Antenna Requirement | 15.203/15.247 (c) | Pass | Zhaohui.Ouyang |
| AC Power Line Conducted Emissions | 15.207 | Pass | Zhaohui.Ouyang |
| Conducted Peak Output Power | 15.247 (b)(1) | Pass | Zhaohui.Ouyang |
| 20 dB Bandwidth | 15.247 (a)(1) | Pass | Zhaohui.Ouyang |
| Carrier Frequencies Separation | 15.247 (a)(1) | Pass | Zhaohui.Ouyang |
| Hopping Channel Number | 15.247 (a)(1) | Pass | Zhaohui.Ouyang |
| Dwell Time | 15.247 (a)(1) | Pass | Zhaohui.Ouyang |
| Pseudorandom Frequency Hopping Sequence | 15.247(b)(4) | Pass | Zhaohui.Ouyang |
| Restricted band | 15.247(d)/15.205 | Pass | Zhaohui.Ouyang |
| Radiated Emissions | 15.247(d)/15.209 | Pass | Zhaohui.Ouyang |

Note: The measurement uncertainty is not included in the test result.

## 3.  <u>SUMMARY</u>

### 3.1.  Client Information

| | |
|---|---|
| Applicant: | b mobile HK Limited |
| Address: | Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong. |
| Manufacturer: | b mobile HK Limited |
| Address: | Flat 18; 14/F Block 1; Golden Industrial Building;16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong. |

### 3.2.  Product Description

| | |
|---|---|
| Name of EUT: | Mobile Phone |
| Trade Mark: | Bmobile |
| Model No.: | C210 |
| Listed Model(s): | - |
| IMEI: | 353185089995288 |
| Power supply: | DC 3.7V |
| Adapter information: | Input:100-240Va.c.,50/60Hz,0.15A<br>Output: 5Vd.c.,500mA |
| Hardware version: | Z675-MB-V1.0 |
| Software version: | Bmobile_C210_V001 |
| **Bluetooth** | |
| Version: | Supported BT2.1+EDR |
| Modulation: | GFSK, π/4DQPSK, 8DPSK |
| Operation frequency: | 2402MHz~2480MHz |
| Channel number: | 79 |
| Channel separation: | 1MHz |
| Antenna type: | Integral  Antenna |
| Antenna gain: | 1.0dBi |

### 3.3.  Operation state

➢ **Test frequency list**

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

| Channel | Frequency (MHz) |
|---|---|
| 00 | 2402 |
| 01 | 2403 |
| ⋮ | ⋮ |
| 39 | 2441 |
| ⋮ | ⋮ |
| 77 | 2479 |
| 78 | 2480 |

➢ **TEST MODE**

| For RF test items: |
|---|
| The engineering test program was provided and enabled to make EUT continuous transmit |
| For AC power line conducted emissions: |
| The EUT was set to connect with the Bluetooth instrument under large package sizes transmission. |
| For Radiated suprious emissions test  item: |
| The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data recorded in the report. |

### 3.4.  EUT configuration

**The following peripheral devices and interface cables were connected during the measurement:**
● - supplied by the manufacturer
○ - supplied by the lab

| / | | Manufacturer: | / |
|---|---|---|---|
| | | Model No.: | / |
| / | | Manufacturer: | / |
| | | Model No.: | / |

### 3.5.  Modifications

No modifications were implemented to meet testing criteria.

# 4. TEST ENVIRONMENT

## 4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.
Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

## 4.2. Test Facility

**CNAS-Lab Code: L1225**

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

**A2LA-Lab Cert. No.: 3902.01**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**FCC-Registration No.: 762235**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

**IC-Registration No.:5377B-1**

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

**ACA**

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

## 4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature: | 15~35°C |
| Relative Humidity: | 30~60 % |
| Air Pressure: | 950~1050mba |

## 4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

| Test Items | Measurement Uncertainty | Notes |
|---|---|---|
| Transmitter power conducted | 0.57 dB | (1) |
| Transmitter power Radiated | 2.20 dB | (1) |
| Conducted spurious emissions 9kHz~40GHz | 1.60 dB | (1) |
| Radiated spurious emissions 9kHz~40GHz | 2.20 dB | (1) |
| Conducted Emissions 9kHz~30MHz | 3.39 dB | (1) |
| Radiated Emissions 30~1000MHz | 4.24 dB | (1) |
| Radiated Emissions 1~18GHz | 5.16 dB | (1) |
| Radiated Emissions 18~40GHz | 5.54 dB | (1) |
| Occupied Bandwidth | --------- | (1) |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

### 4.5.  Equipments Used during the Test

**Conducted Emissions**

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. (mm-dd-yy) | Next Cal. (mm-dd-yy) |
|---|---|---|---|---|---|---|
| 1 | EMI Test Receiver | R&S | ESCI | 101247 | 11/11/2017 | 11/10/2018 |
| 2 | Artificial Mains | SCHWARZBECK | NNLK 8121 | 573 | 11/11/2017 | 11/10/2018 |
| 3 | 2-Line V-Network | R&S | ESH3-Z5 | 100049 | 11/11/2017 | 11/10/2018 |
| 4 | Pulse Limiter | R&S | ESH3-Z2 | 101488 | 11/11/2017 | 11/10/2018 |
| 5 | RF Connection Cable | HUBER+SUHNER | EF400 | N/A | 11/21/2017 | 11/20/2018 |
| 6 | Test Software | R&S | ES-K1 | N/A | N/A | N/A |

**Radiated Emissions**

| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. (mm-dd-yy) | Next Cal. (mm-dd-yy) |
|---|---|---|---|---|---|---|
| 1 | EMI Test Receiver | R&S | ESCI | 101247 | 11/11/2017 | 11/10/2018 |
| 2 | Loop Antenna | R&S | HFH2-Z2 | 100020 | 11/20/2017 | 11/19/2018 |
| 3 | Ultra-Broadband Antenna | SCHWARZBECK | VULB9163 | 538 | 4/5/2017 | 4/4/2018 |
| 4 | Preamplifier | SCHWARZBECK | BBV 9743 | 9743-0022 | 10/18/2017 | 10/17/2018 |
| 5 | RF Connection Cable | HUBER+SUHNER | RE-7-FL | N/A | 11/21/2017 | 11/20/2018 |
| 6 | EMI Test Software | R&S | ESK1 | N/A | N/A | N/A |
| 7 | Spectrum Analyzer | R&S | FSP40 | 100597 | 11/11/2017 | 11/10/2018 |
| 8 | Horn Antenna | SCHWARZBECK | 9120D | 1011 | 3/27/2017 | 3/26/2018 |
| 9 | Horn Antenna | SCHWARZBECK | BBHA9170 | 25841 | 3/27/2017 | 3/26/2018 |
| 10 | Broadband Preamplifier | SCHWARZBECK | BBV 9718 | 9718-248 | 10/18/2017 | 10/17/2018 |
| 11 | High pass filter | Compliance Direction systems | BSU-6 | 34202 | 11/11/2017 | 11/10/2018 |
| 12 | RF Connection Cable | HUBER+SUHNER | RE-7-FH | N/A | 11/21/2017 | 11/20/2018 |
| 13 | EMI Test Software | Audix | E3 | N/A | N/A | N/A |
| 14 | Turntable | MATURO | TT2.0 | / | N/A | N/A |
| 15 | Antenna Mast | MATURO | TAM-4.0-P | / | N/A | N/A |

| RF Conducted Test | | | | | | |
|------|------------------|--------------|-----------|------------|------------------------|------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Last Cal. (mm-dd-yy) | Next Cal. (mm-dd-yy) |
| 1 | Spectrum Analyzer | R&S | FSV40 | 100048 | 11/11/2017 | 11/10/2018 |
| 2 | EXA Signal Analyzer | Agilent | N9020A | 184247 | 9/22/2017 | 9/21/2018 |
| 3 | Power Meter | Agilent | U2021XA | 178231 | 9/22/2017 | 9/21/2018 |
| 4 | OSP | R&S | OSP120 | 101317 | N/A | N/A |

# 5.  TEST CONDITIONS AND RESULTS

## 5.1.  Antenna requirement

### Requirement

**FCC CFR Title 47 Part 15 Subpart C Section 15.203:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.  The use of a permanently attached antenna or of anantenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):**

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

### Test Result:

☒ **Passed**              ☐ **Not Applicable**

The directional gain of the antenna less than 1.0 dBi, please refer to the below antenna photo.
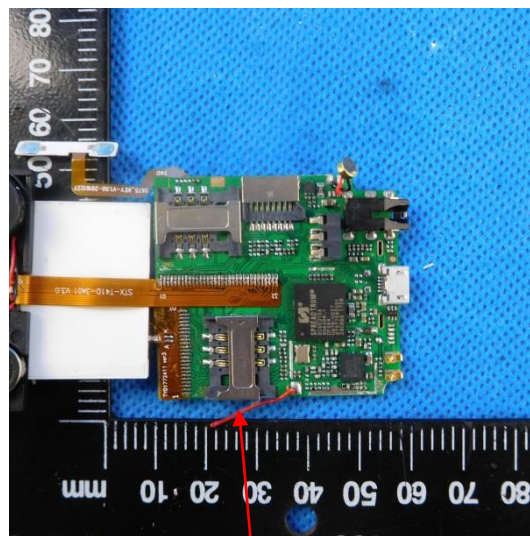


BT ANT

## 5.2.  Conducted Emissions (AC Main)

**LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.207

| Frequency range (MHz) | Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

**TEST CONFIGURATION**
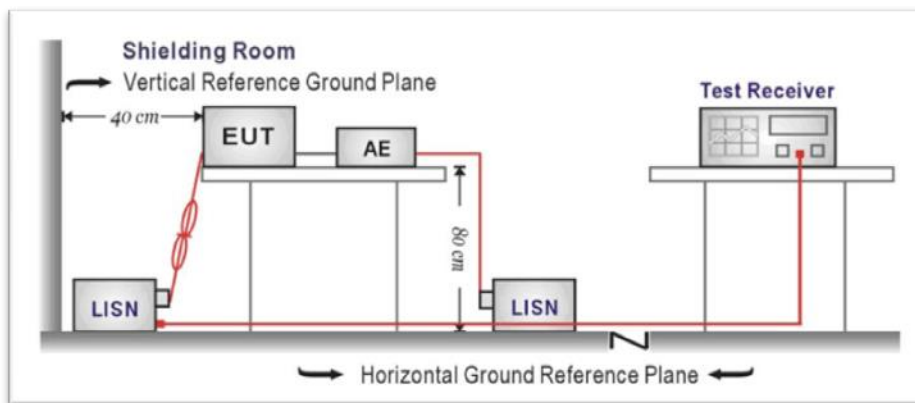


**TEST PROCEDURE**

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

**TEST RESULTS**

☒ **Passed**          ☐ **Not Applicable**

Note:
1)   Transd= Cable lose + Pulse Limiter Factor + Artificial Mains Factor
2)   Margin= Limit - Level

| Test Line: | L |
|---|---|



x x x MES   GM1712285002_fin

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.163500 | 53.20 | 10.0 | 65 | 12.1 | QP | L1 | GND |
| 0.267000 | 38.50 | 9.9 | 61 | 22.7 | QP | L1 | GND |
| 0.330000 | 35.60 | 9.9 | 60 | 23.9 | QP | L1 | GND |
| 1.036500 | 24.30 | 10.1 | 56 | 31.7 | QP | L1 | GND |
| 2.917500 | 22.60 | 10.1 | 56 | 33.4 | QP | L1 | GND |
| 18.397500 | 28.10 | 10.6 | 60 | 31.9 | QP | L1 | GND |

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
|---|---|---|---|---|---|---|---|
| 0.163500 | 38.70 | 10.0 | 55 | 16.6 | AV | L1 | GND |
| 0.217500 | 31.90 | 9.9 | 53 | 21.0 | AV | L1 | GND |
| 0.321000 | 28.80 | 9.9 | 50 | 20.9 | AV | L1 | GND |
| 0.379500 | 27.20 | 9.9 | 48 | 21.1 | AV | L1 | GND |
| 1.018500 | 17.50 | 10.1 | 46 | 28.5 | AV | L1 | GND |
| 23.127000 | 24.40 | 10.7 | 50 | 25.6 | AV | L1 | GND |

| Test Line: | N |
| --- | --- |



x x x MES  GM1712285001_fin

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0.159000 | 51.70 | 10.0 | 66 | 13.8 | QP | N | GND |
| 0.217500 | 47.10 | 9.9 | 63 | 15.8 | QP | N | GND |
| 0.271500 | 42.70 | 9.9 | 61 | 18.4 | QP | N | GND |
| 0.321000 | 37.60 | 9.9 | 60 | 22.1 | QP | N | GND |
| 0.388500 | 31.40 | 9.9 | 58 | 26.7 | QP | N | GND |
| 0.649500 | 28.40 | 10.0 | 56 | 27.6 | QP | N | GND |

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Detector | Line | PE |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0.163500 | 39.70 | 10.0 | 55 | 15.6 | AV | N | GND |
| 0.213000 | 32.20 | 9.9 | 53 | 20.9 | AV | N | GND |
| 0.321000 | 26.50 | 9.9 | 50 | 23.2 | AV | N | GND |
| 0.433500 | 19.70 | 9.9 | 47 | 27.5 | AV | N | GND |
| 18.289500 | 17.10 | 10.6 | 50 | 32.9 | AV | N | GND |
| 23.127000 | 23.90 | 10.7 | 50 | 26.1 | AV | N | GND |

## 5.3. Conducted Peak Output Power

### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1):
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt.
For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### TEST CONFIGURATION
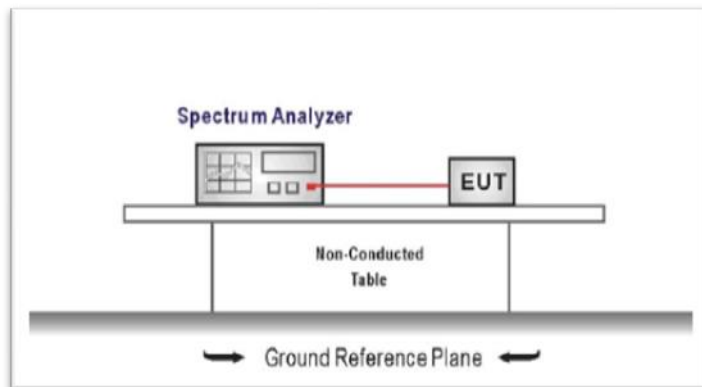


### TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the pathloss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
   Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
   RBW≥ the 20 dB bandwidth of the emission being measured, VBW≥RBW
   Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.
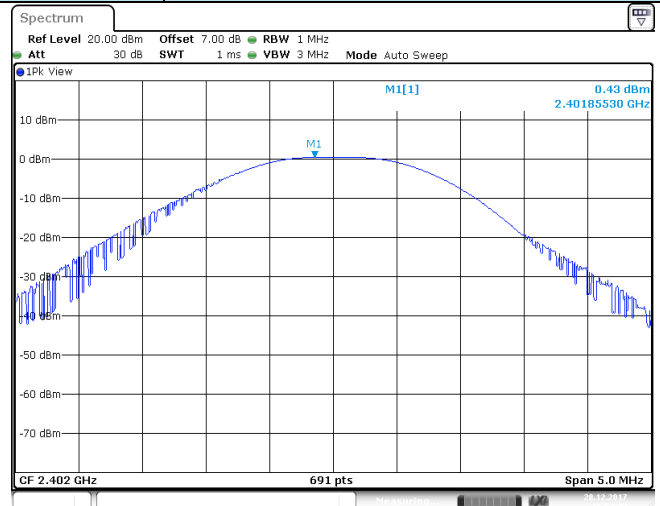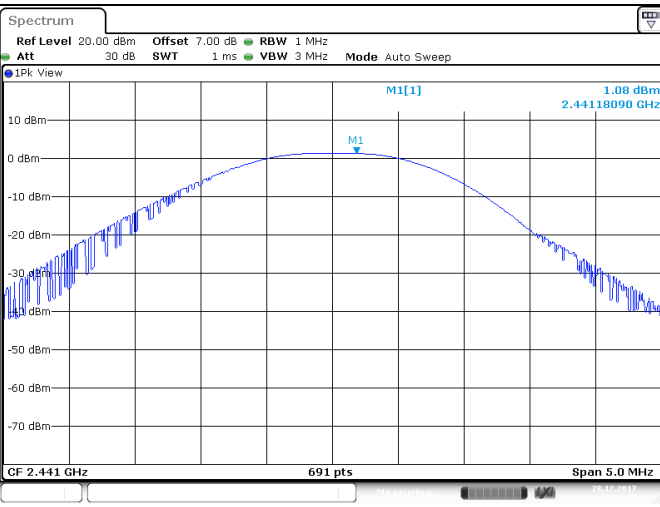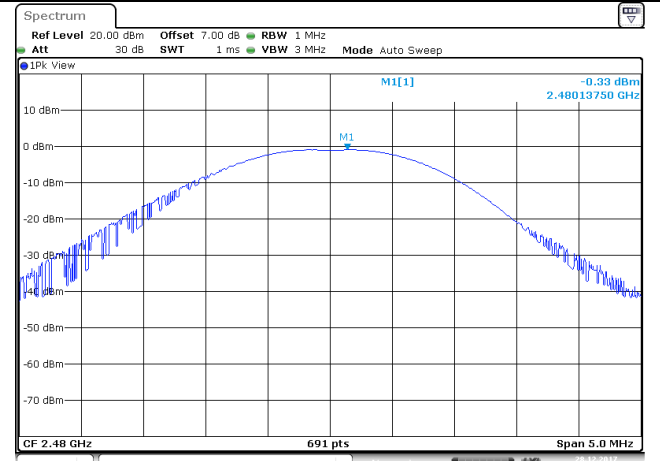
### TEST MODE:
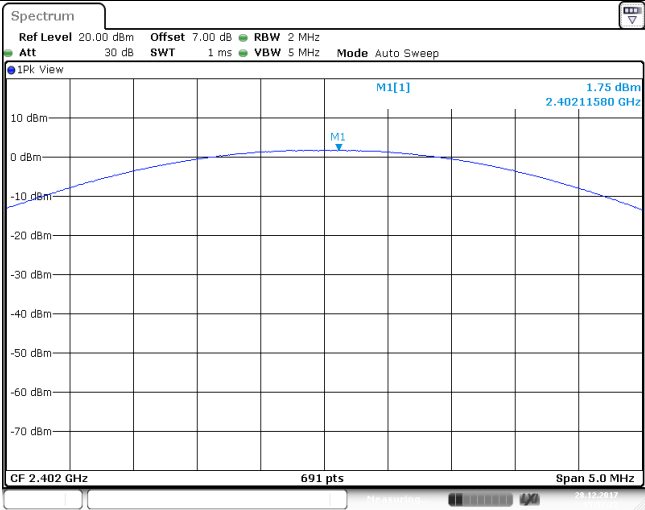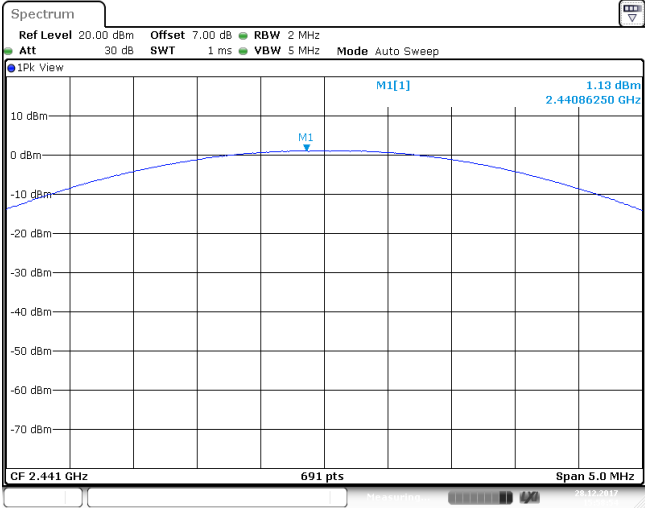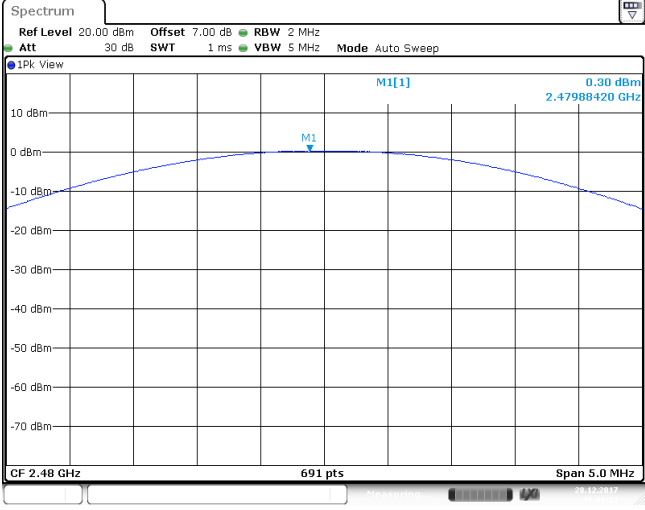
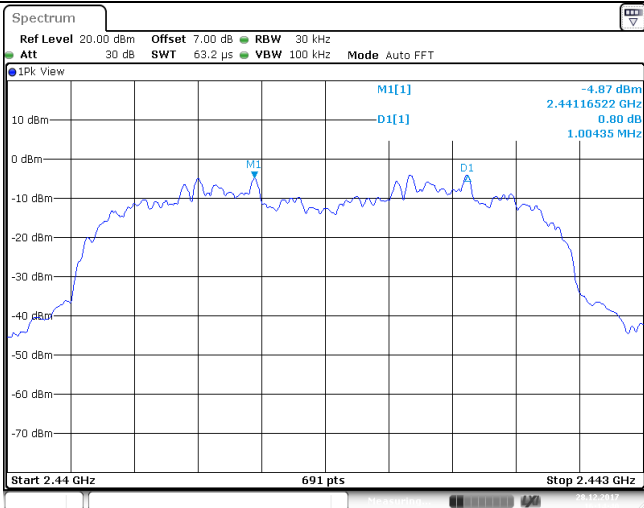Please refer to the clause 3.3
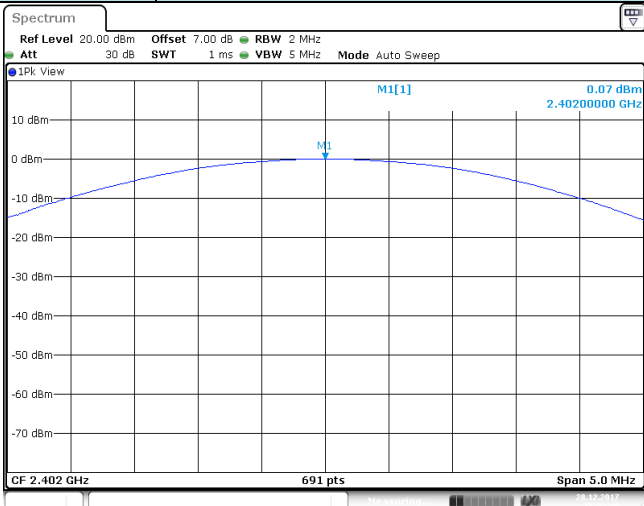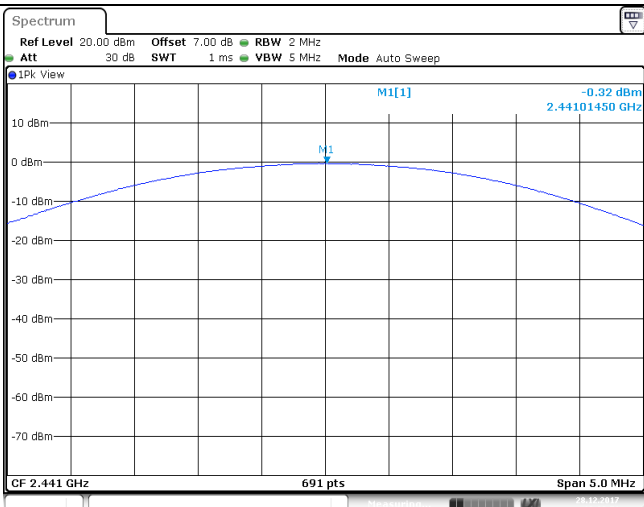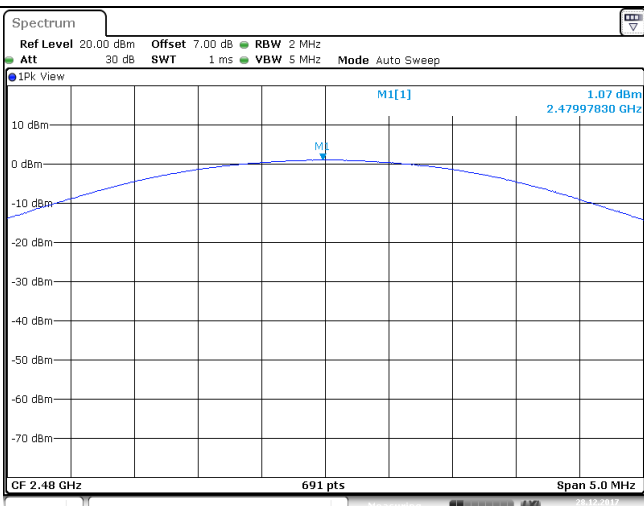
### TEST RESULTS

☒ **Passed**        ☐ **Not Applicable**

| Modulation type | Channel | Output power (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|
| GFSK | 00 | 0.43 | ≤ 30.00 | Pass |
| | 39 | 1.08 | | |
| | 78 | -0.33 | | |
| π/4DQPSK | 00 | 1.75 | ≤ 21.00 | Pass |
| | 39 | 1.13 | | |
| | 78 | 0.30 | | |
| 8DPSK | 00 | 0.07 | ≤ 21.00 | Pass |
| | 39 | -0.32 | | |
| | 78 | 1.07 | | |

| Modulation Type: | GFSK |
|---|---|
| CH00 |  |
| CH39 |  |
| CH78 |  |

| Modulation Type: | π/4DQPSK |
|---|---|
| CH00 |  |
| CH39 |  |
| CH78 |  |

| Modulation Type: | 8DPSK |
|---|---|
| CH00 |  |
| CH39 |  |
| CH78 |  |

## 5.4.  20 dB Bandwidth

**LIMIT**

N/A

**TEST CONFIGURATION**
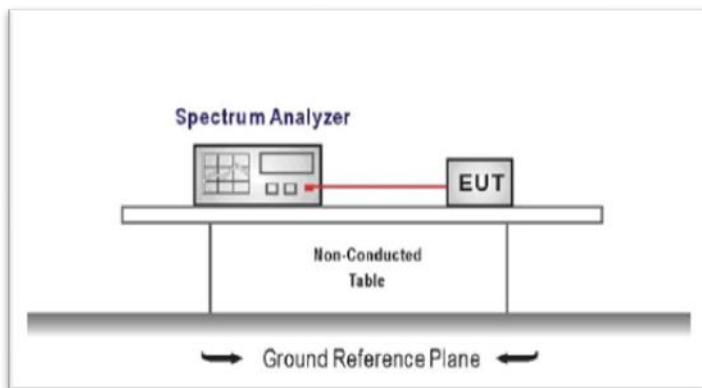


**TEST PROCEDURE**

1.  The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2.  Set to the maximum power setting and enable the EUT transmit continuously
3.  Use the following spectrum analyzer settings:
    Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
    RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW
    Sweep = auto, Detector function = peak, Trace = max hold
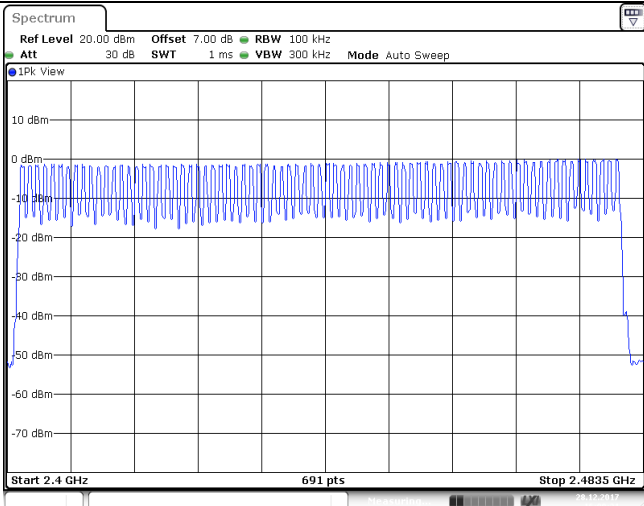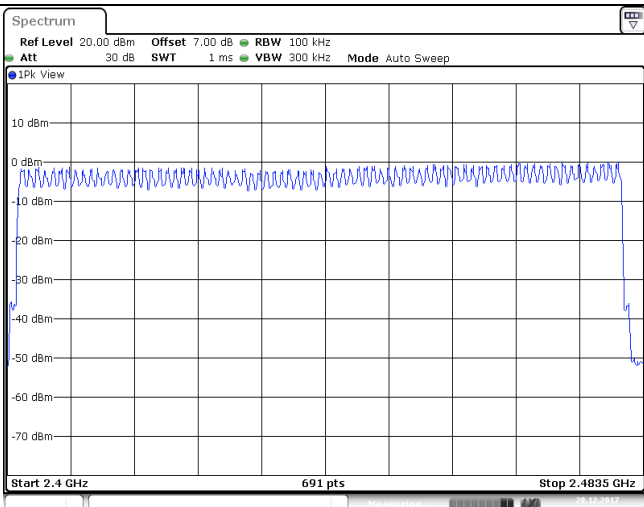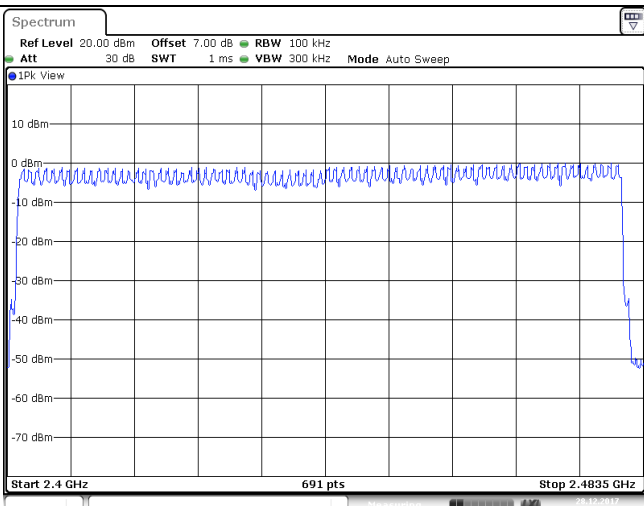4.  Measure and record the results in the test report.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed**          ☐ **Not Applicable**

| Modulation type | Channel | 20 dB Bandwidth (MHz) | Limit (MHz) | Result |
|---|---|---|---|---|
| GFSK | 00 | 0.93 | - | Pass |
| | 39 | 0.93 | | |
| | 78 | 0.93 | | |
| π/4DQPSK | 00 | 1.32 | - | Pass |
| | 39 | 1.32 | | |
| | 78 | 1.32 | | |
| 8DPSK | 00 | 1.31 | - | Pass |
| | 39 | 1.31 | | |
| | 78 | 1.31 | | |

| Modulation Type: | GFSK |
|---|---|

| CH00 |  |
| CH39 |  |
| CH78 |  |

| Modulation Type: | π/4DQPSK |
|---|---|
| CH00 |  |
| CH39 |  |
| CH78 |  |

| Modulation Type: | 8DPSK |
|---|---|
| CH00 |  |
| CH39 |  |
| CH78 |  |
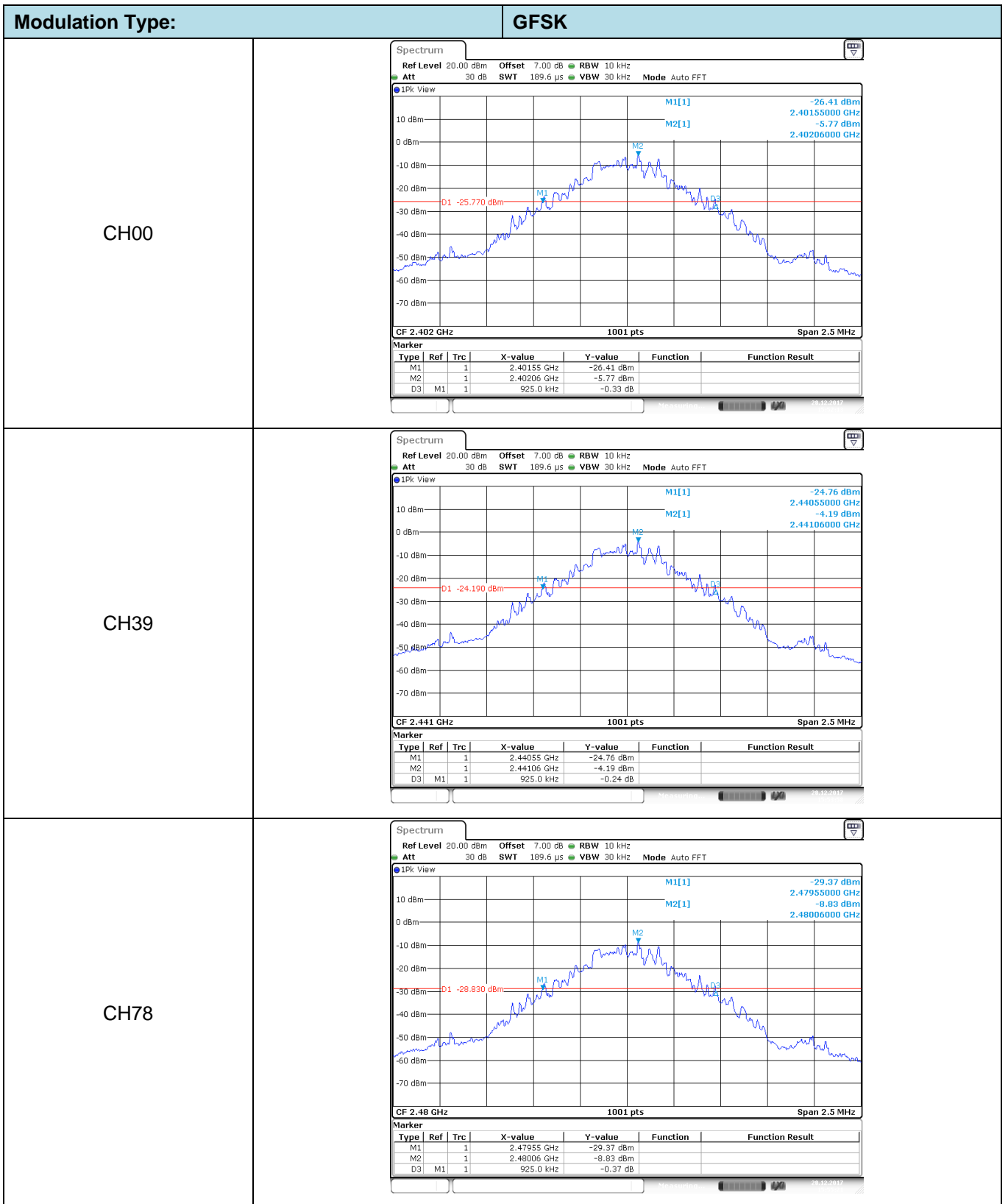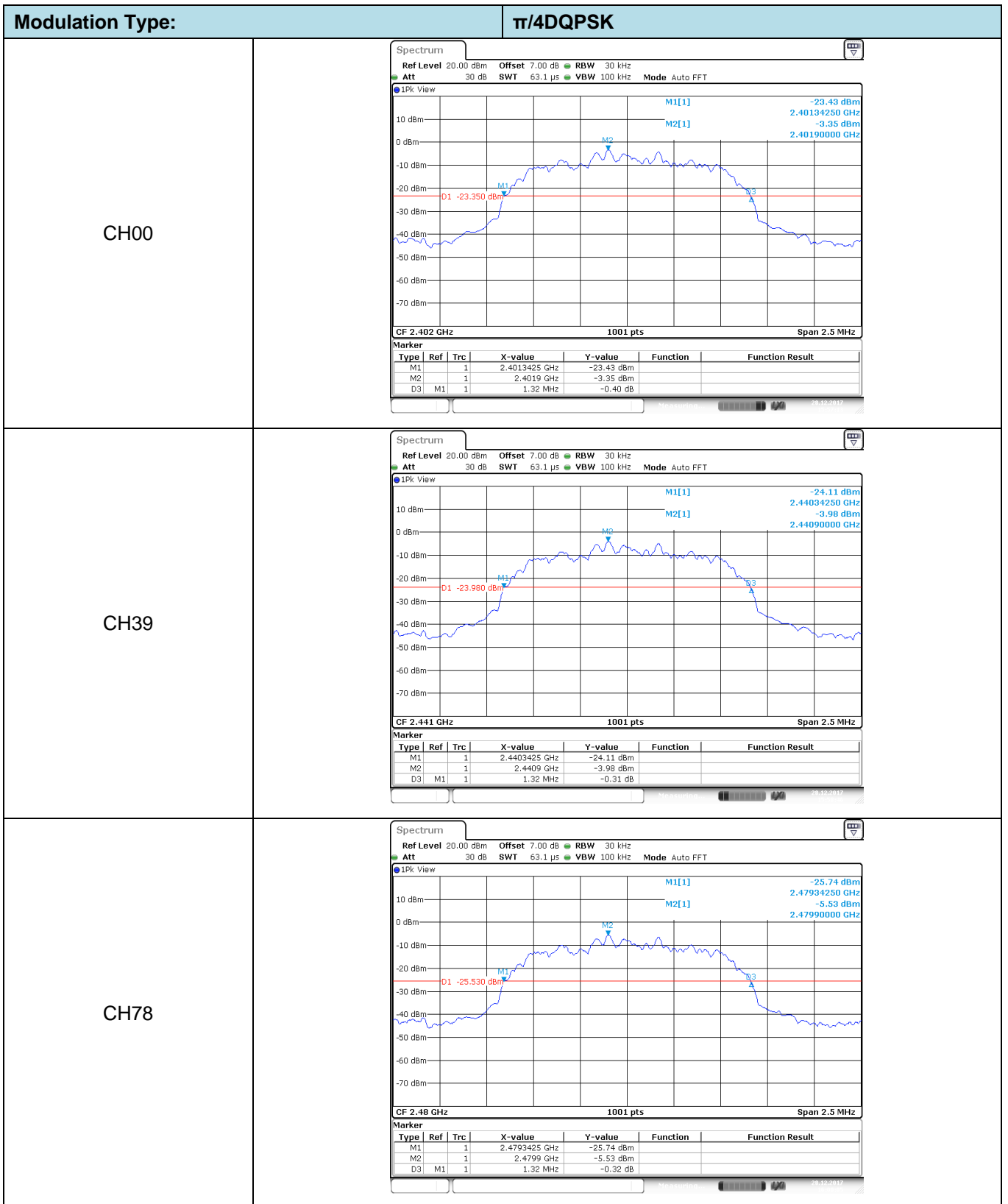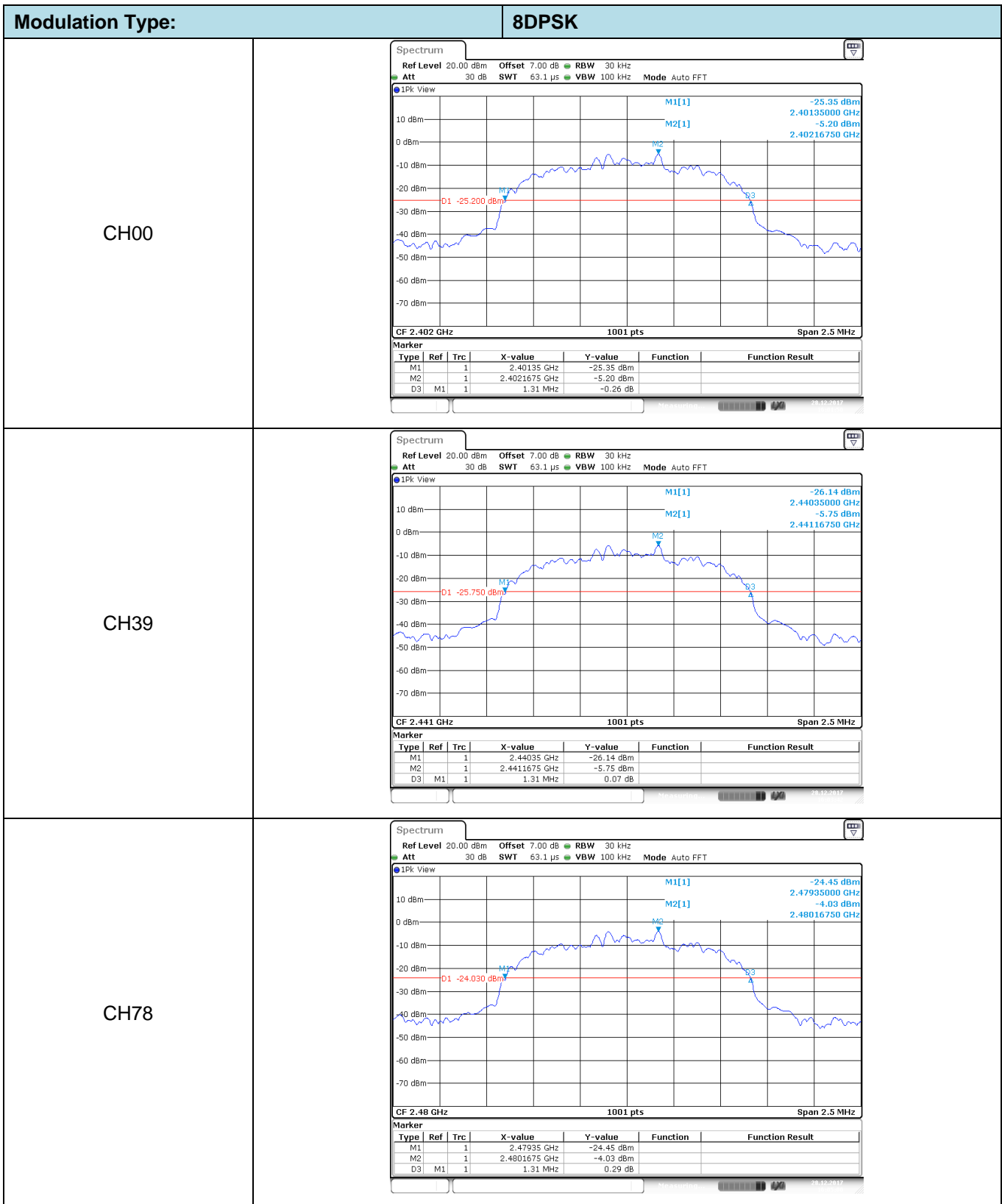
## 5.5.  Carrier Frequencies Separation

**LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively,
Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

**TEST CONFIGURATION**
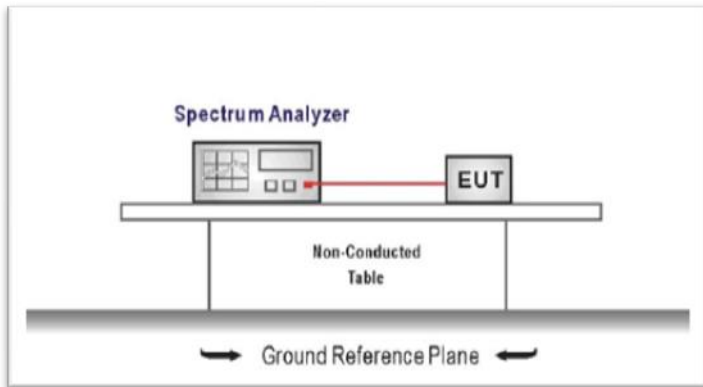


**TEST PROCEDURE**

1.  The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2.  Set to the maximum power setting and enable the EUT transmit continuously
3.  Use the following spectrum analyzer settings:
    Span = wide enough to capture the peaks of two adjacent channels
    RBW ≥ 1% of the span, VBW ≥ RBW
    Sweep = auto, Detector function = peak, Trace = max hold
4.  Measure and record the results in the test report.

**TEST MODE:**
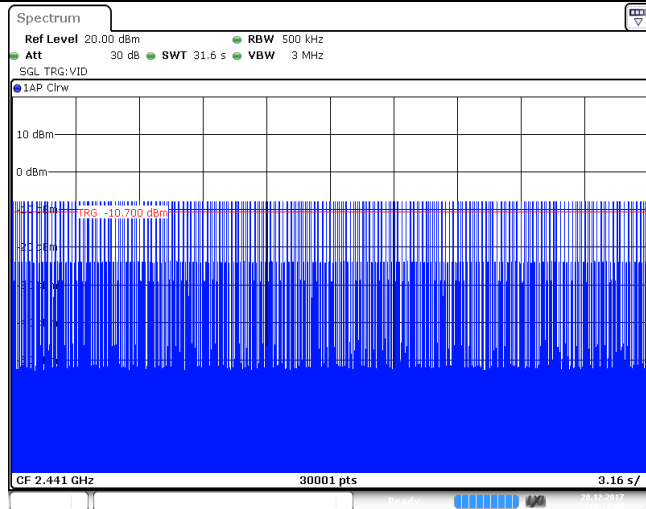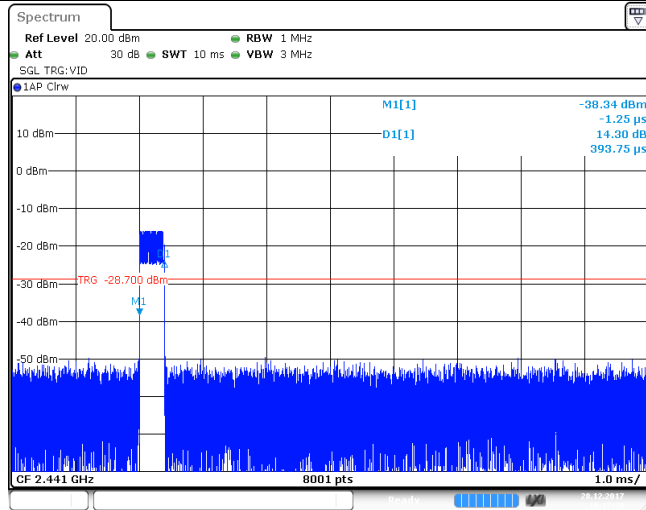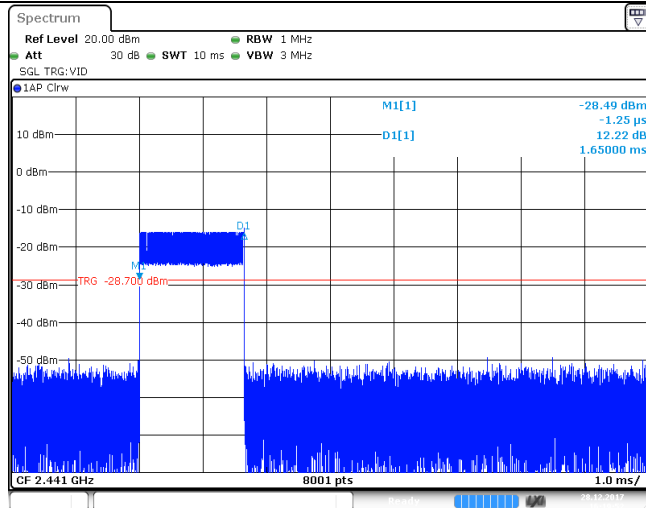Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed**          ☐ **Not Applicable**
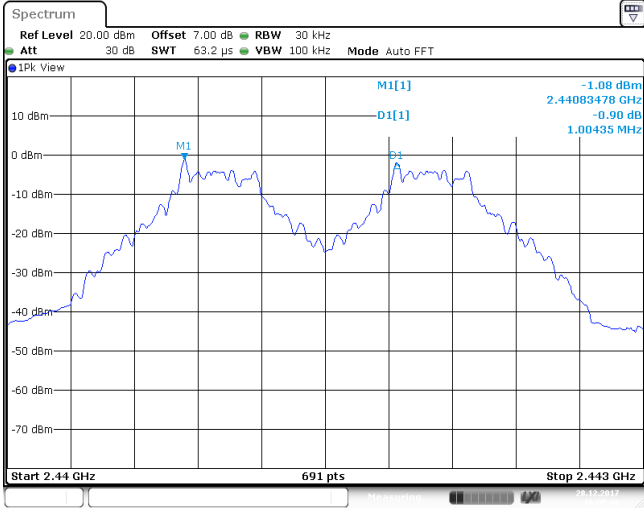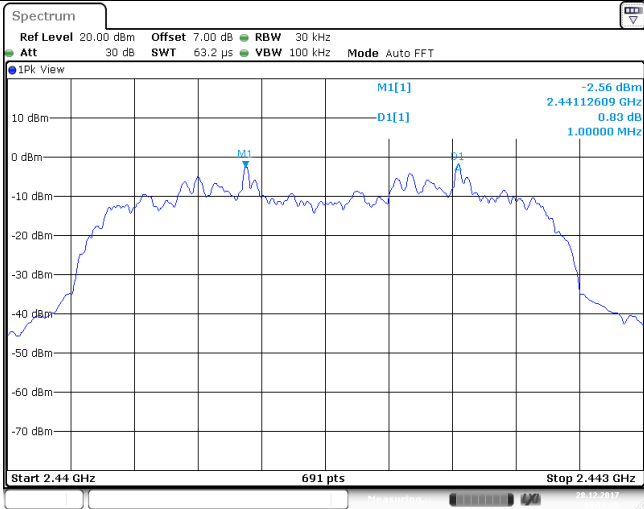
| Modulation type | Channel | Carrier Frequencies Separation (MHz) | Limit (MHz) * | Result |
|---|---|---|---|---|
| GFSK | 39 | 1.00 | ≥0.930 | Pass |
| π/4DQPSK | 39 | 1.00 | ≥0.880 | Pass |
| 8DPSK | 39 | 1.00 | ≥0.873 | Pass |

Note:
*: GFSK limit = The maximum 20 dB Bandwidth for GFSK modulation on the section 5.4.
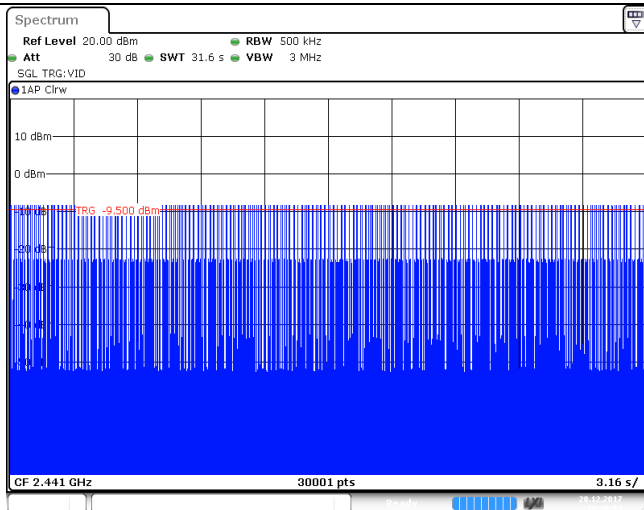   π/4DQPSK limit = 2/3 * The maximum 20 dB Bandwidth for π/4DQPSK modulation on the section 5.4.
   8DPSK limit = 2/3 * The maximum 20 dB Bandwidth for 8DPSK modulation on the section 5.4

| | |
|---|---|
| GFSK |  |
| π/4DQPSK |  |
| 8DPSK |  |

## 5.6. Hopping Channel Number

**LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):Frequency hopping systems in the 2400–2483.5 MHz band shall use at least **15** channels.

**TEST CONFIGURATION**
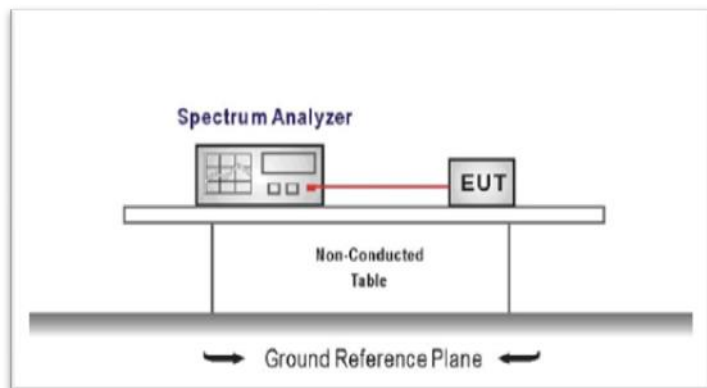


**TEST PROCEDURE**

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:

   Span = the frequency band of operation

   RBW ≥ 1% of the span, VBW ≥ RBW

   Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

**TEST MODE:**

Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed**      ☐ **Not Applicable**

| Modulation type | Channel number | Limit | Result |
|---|---|---|---|
| GFSK | 79 | | |
| π/4DQPSK | 79 | ≥15.00 | Pass |
| 8DPSK | 79 | | |

| | |
|---|---|
| GFSK |  |
| π/4DQPSK |  |
| 8DPSK |  |

## 5.7. Dwell Time

**LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):The average time of occupancy on any channel shall not be greater than 0.4 seconds within a pe-riod of 0.4 seconds multiplied by the number of hopping channels employed.

**TEST CONFIGURATION**
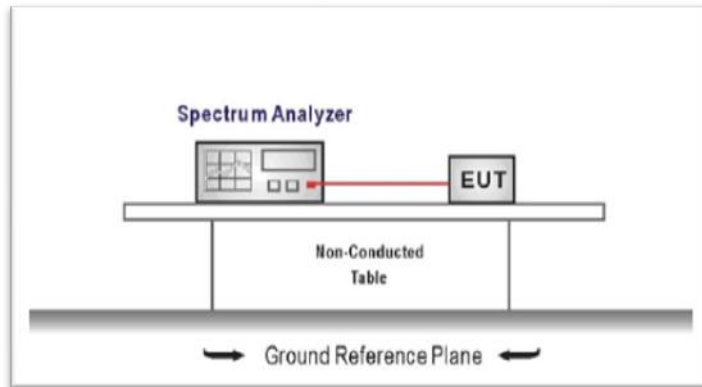


**TEST PROCEDURE**

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
   Span = zero span, centered on a hopping channel, RBW= 1 MHz, VBW ≥ RBW
   Sweep = as necessary to capture the entire dwell time per hopping channel,
   Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

**TEST MODE:**
Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed**　　　　☐ **Not Applicable**

| Modulation type | Channel | Burst Width [ms/hop/ch] | Total Hops[hop*ch] | Dwell time (Second) | Limit (Second) | Result |
|---|---|---|---|---|---|---|
| GFSK | DH1 | 0.39 | 320.00 | 0.13 | ≤ 0.40 | Pass |
| | DH3 | 1.65 | 157.00 | 0.26 | | |
| | DH5 | 2.90 | 102.00 | 0.30 | | |
| π/4DQPSK | 2DH1 | 0.38 | 319.00 | 0.12 | ≤ 0.40 | Pass |
| | 2DH3 | 1.63 | 154.00 | 0.25 | | |
| | 2DH5 | 2.88 | 104.00 | 0.30 | | |
| 8DPSK | 3DH1 | 0.38 | 317.00 | 0.12 | ≤ 0.40 | Pass |
| | 3DH3 | 1.63 | 162.00 | 0.26 | | |
| | 3DH5 | 2.88 | 119.00 | 0.34 | | |

| Modulation Type: | GFSK |
|---|---|

| DH1 |  |
| |  |
| DH3 |  |

| | |
|---|---|
| |  |
| DH5 |  |
| |  |

| Modulation Type: | π/4DQPSK |
|---|---|
| 2DH1 | <br> |
| 2DH3 |  |

| | |
|---|---|
| |  |
| 2DH5 |  |
| |  |

| Modulation Type: | 8DPSK |
|---|---|
| 3DH1 | <br> |
| 3DH3 |  |

| | |
|---|---|
| |  |
| 3DH5 |  |
| |  |
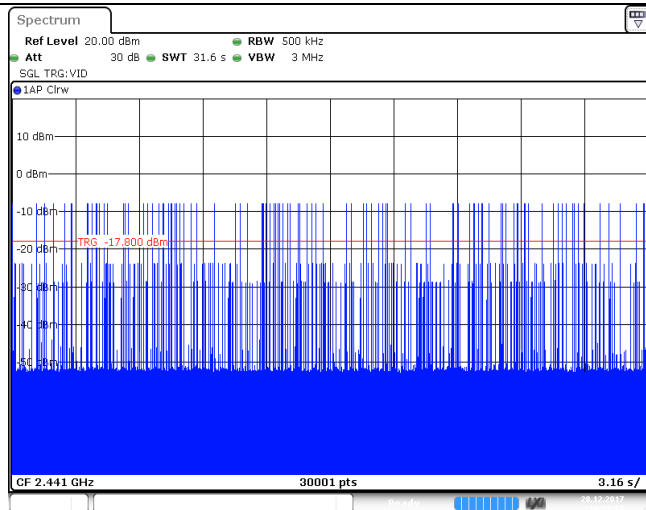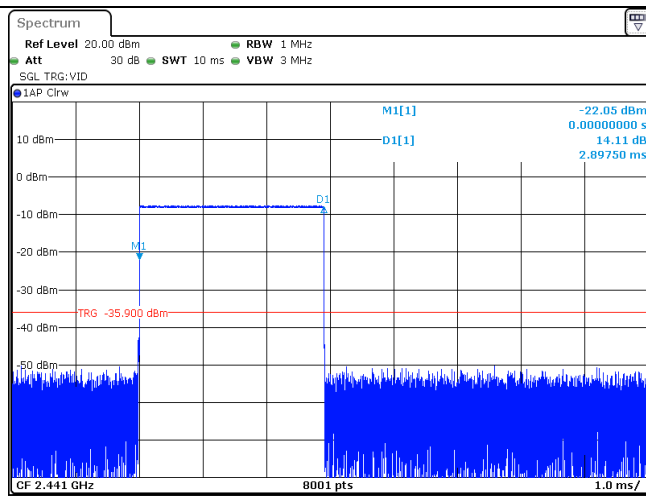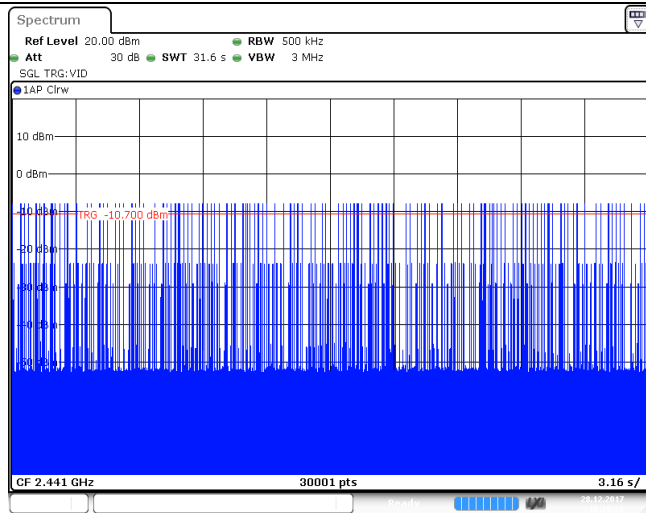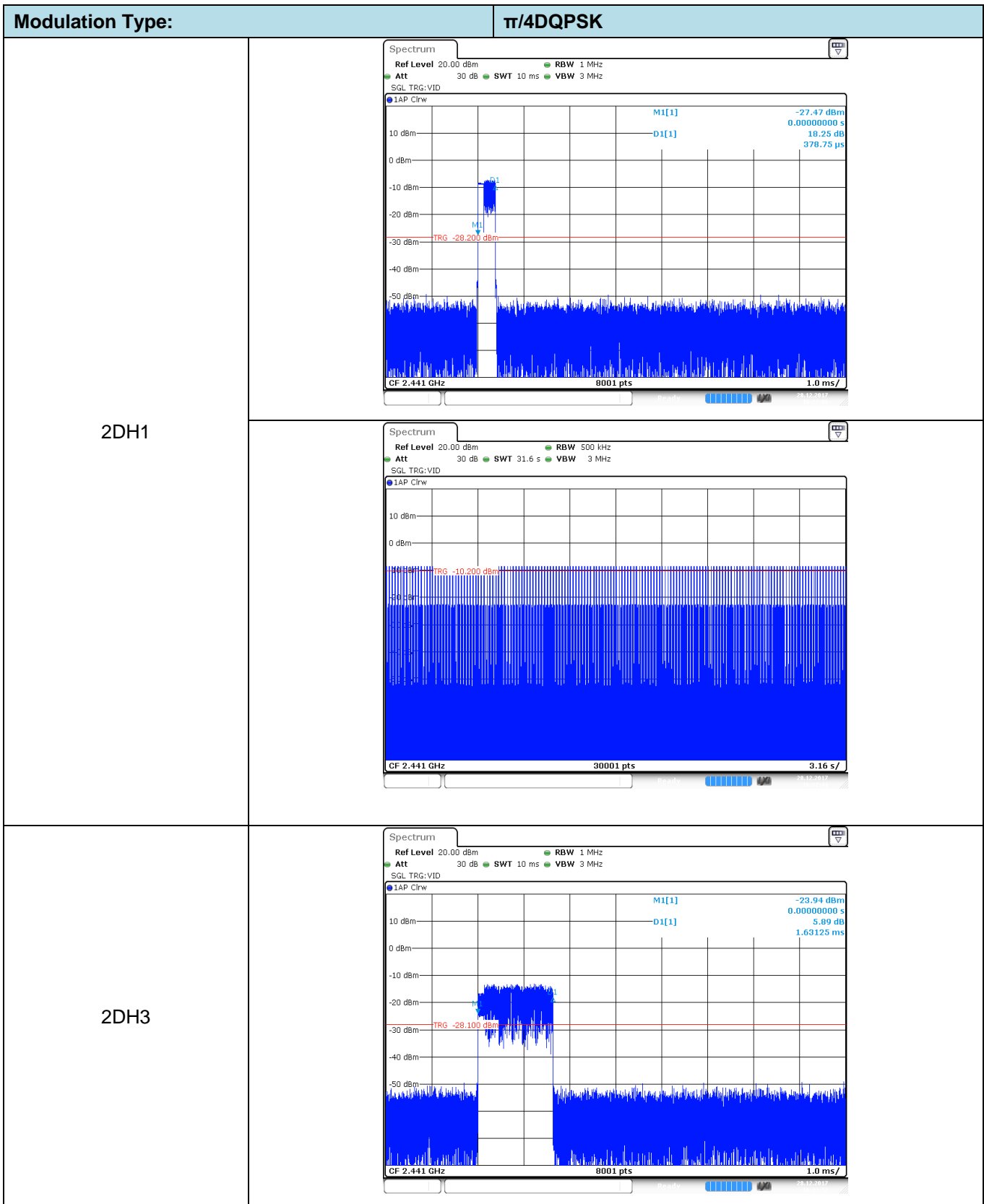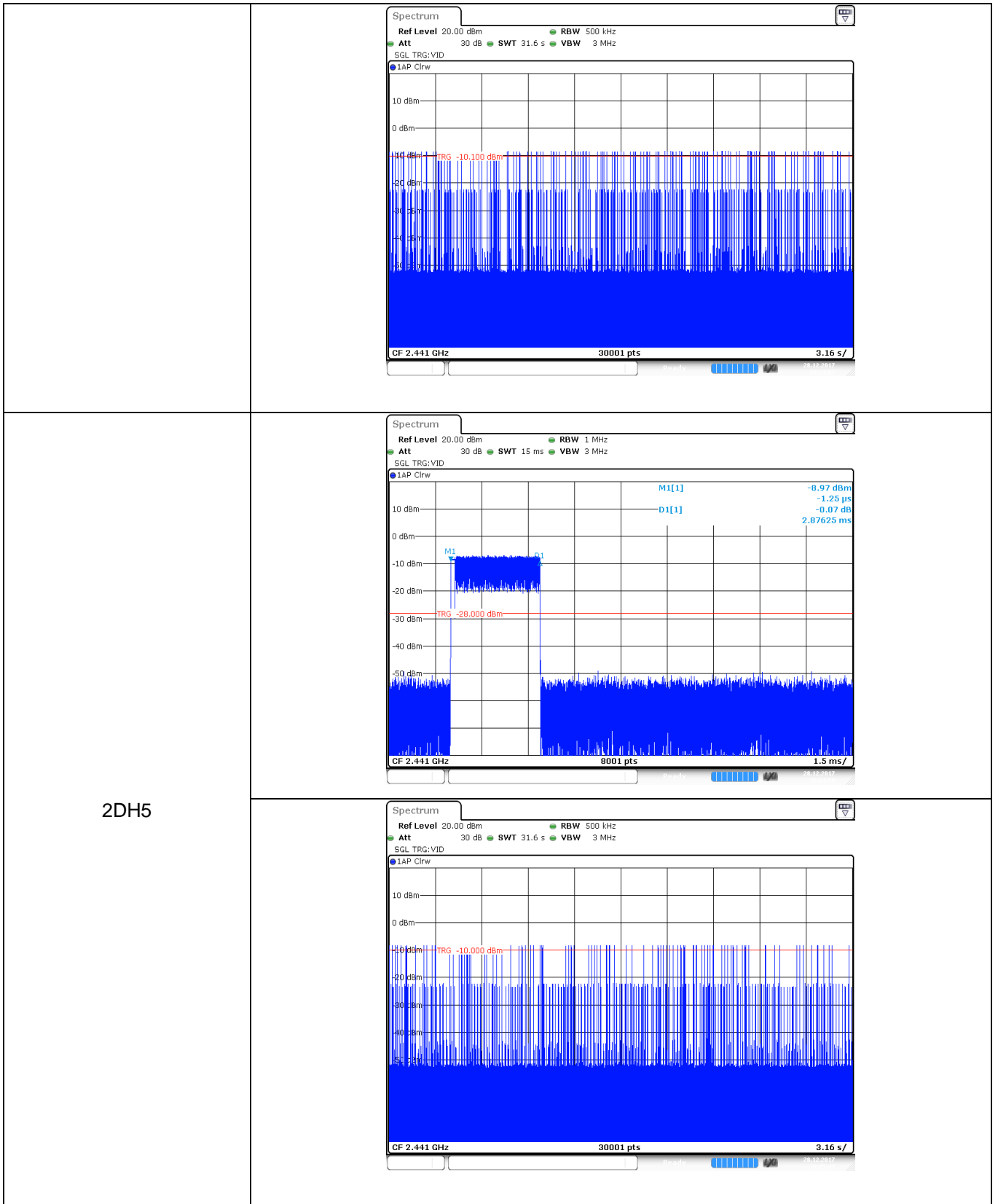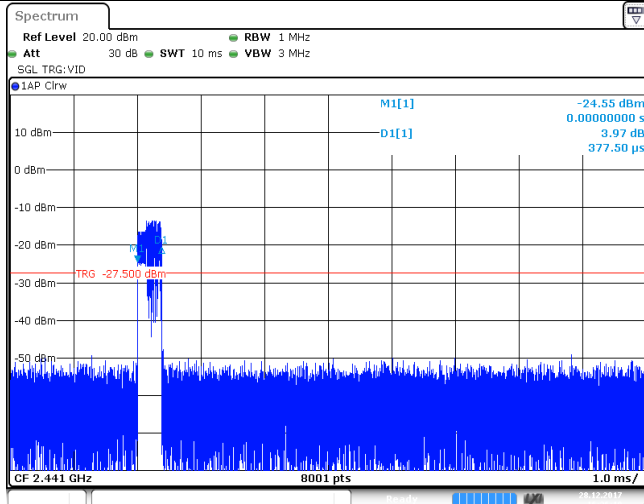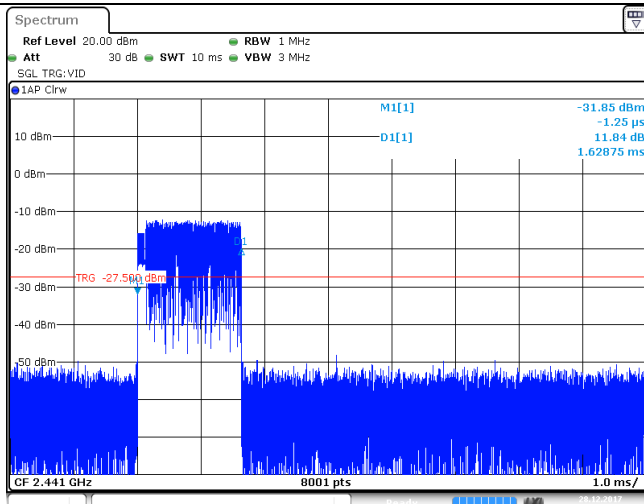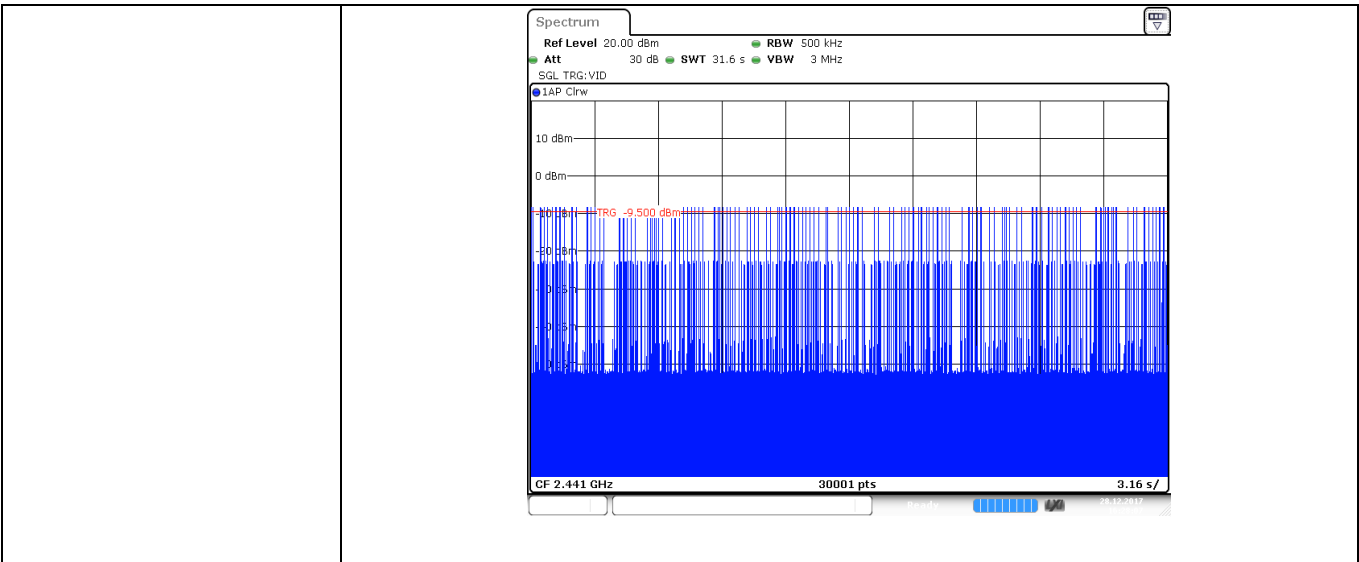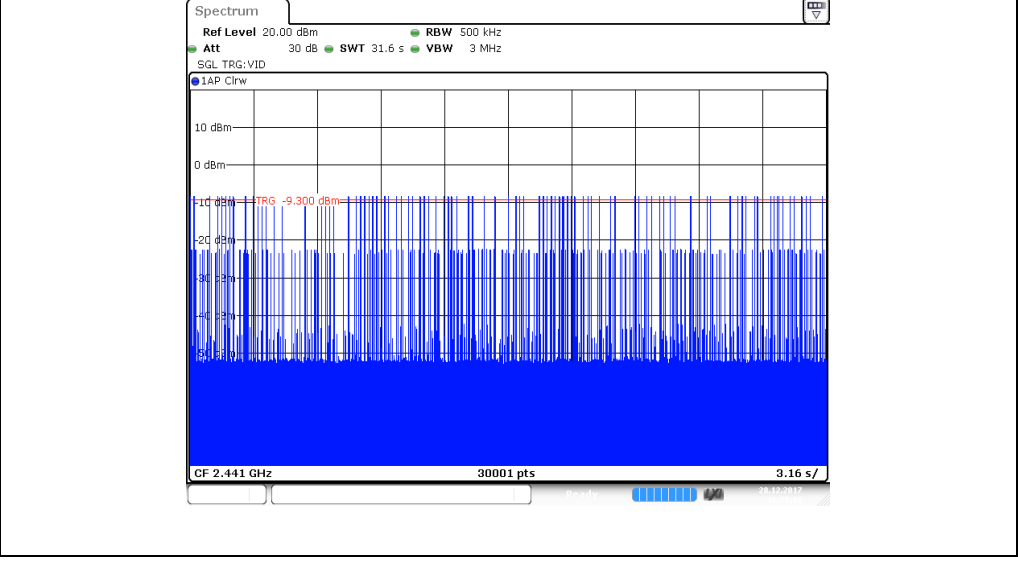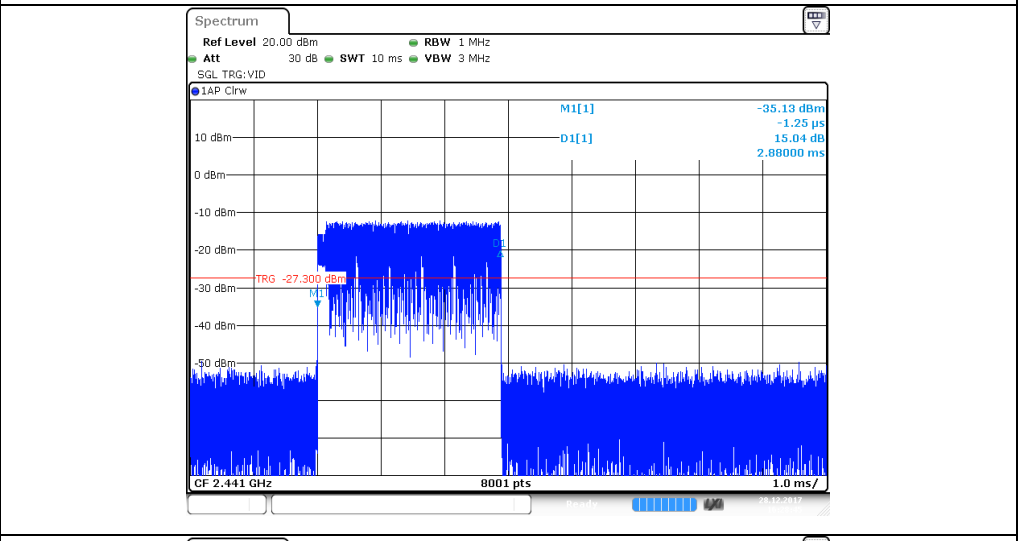
## 5.8. Pseudorandom Frequency Hopping Sequence

**LIMIT**

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1):Frequency hopping systems shall have hopping channel carrier fre-quencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hop-ping channel, whichever is greater. Al-ternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier fre-quencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to chan-nel frequencies that are selected at the system hopping rate from a pseudo ran-domly ordered list of hopping fre-quencies. Each frequency must be used equally on the average by each trans-mitter. The system receivers shall have input bandwidths that match the hop-ping channel bandwidths of their cor-responding transmitters and shall shift frequencies in synchronization with the transmitted signals.

**TEST RESULTS**

The pseudorandom frequency hopping sequence may be generated in a nice-stage shift register whose $5^{th}$ and $9^{th}$ stage outputs are added in a modulo-two addition stage.And the result is fed back to the input of the friststage.The sequence begins with the frist one of 9 consecutive ones,forexample:the shift register is initialized with nine ones.
● Number of shift register stages: 9
● Length of pseudo-random sequence:29-1=511 bits
● Longest sequence of zeros: 8 (non-inverted signal)
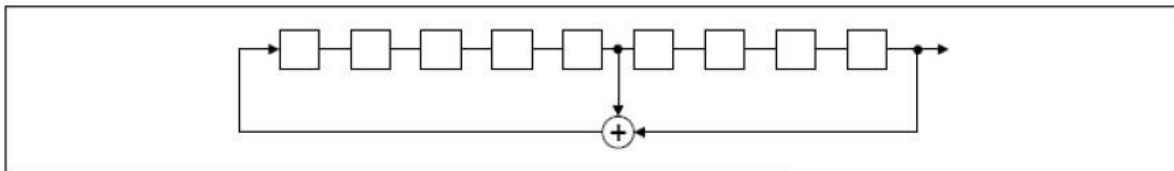


Linear Feedback Shift Register for Generation of the PRBS sequence

An explame of pseudorandom frequency hopping sequence as follows:
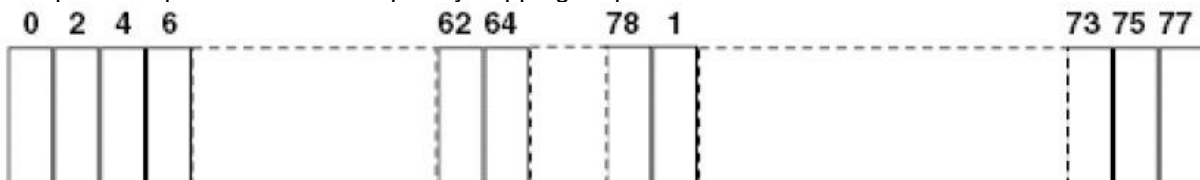


Each frequency used equally one the average by each transmitter.
The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitter and shift frequencies in synchronization with the transmitted signals.

## 5.9.  Restricted band (radiated)

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

**TEST CONFIGURATION**
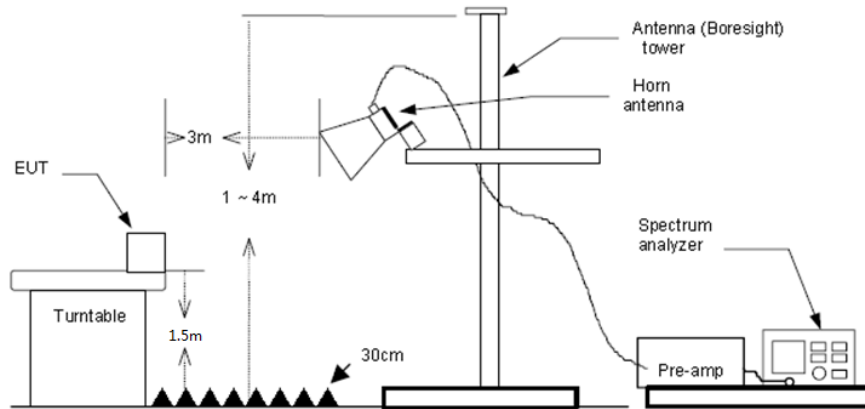


**TEST PROCEDURE**

1.  The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2.  The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3.  The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
4.  The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5.  The receiver set as follow:
    RBW=1 MHz, VBW=3 MHz Peak detector for Peak value
    RBW=1 MHz, VBW=10 Hz Peak detector for Average value.

**TEST MODE:**
Please refer to the clause 3.3

**TEST RESULTS**

☒ **Passed**          ☐ **Not Applicable**

Note:
1)  Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor
2)  Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case's data on the test report.
3)  The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

| CH00 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2310.00 | 35.34 | 28.05 | 6.62 | 37.65 | 32.36 | 74.00 | -41.64 | Vertical | Peak |
| 2390.03 | 37.20 | 27.65 | 6.75 | 37.87 | 33.73 | 74.00 | -40.27 | Vertical | Peak |
| 2310.00 | 34.29 | 28.05 | 6.62 | 37.65 | 31.31 | 74.00 | -42.69 | Horizontal | Peak |
| 2390.03 | 37.59 | 27.65 | 6.75 | 37.87 | 34.12 | 74.00 | -39.88 | Horizontal | Peak |
| 2310.00 | 23.09 | 28.05 | 6.62 | 37.65 | 20.11 | 54.00 | -33.89 | Vertical | Average |
| 2390.03 | 22.90 | 27.65 | 6.75 | 37.87 | 19.43 | 54.00 | -34.57 | Vertical | Average |
| 2310.00 | 22.38 | 28.05 | 6.62 | 37.65 | 19.40 | 54.00 | -34.60 | Horizontal | Average |
| 2390.03 | 22.07 | 27.65 | 6.75 | 37.87 | 18.60 | 54.00 | -35.40 | Horizontal | Average |

| CH78 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 2483.50 | 46.94 | 27.26 | 6.83 | 37.87 | 43.16 | 74.00 | -30.84 | Vertical | Peak |
| 2500.00 | 43.74 | 27.20 | 6.84 | 37.87 | 39.91 | 74.00 | -34.09 | Vertical | Peak |
| 2483.50 | 43.49 | 27.26 | 6.83 | 37.87 | 39.71 | 74.00 | -34.29 | Horizontal | Peak |
| 2500.00 | 34.98 | 27.20 | 6.84 | 37.87 | 31.15 | 74.00 | -42.85 | Horizontal | Peak |
| 2483.50 | 33.38 | 27.26 | 6.83 | 37.87 | 29.60 | 54.00 | -24.40 | Vertical | Average |
| 2500.00 | 22.94 | 27.20 | 6.84 | 37.87 | 19.11 | 54.00 | -34.89 | Vertical | Average |
| 2483.50 | 31.43 | 27.26 | 6.83 | 37.87 | 27.65 | 54.00 | -26.35 | Horizontal | Average |
| 2500.00 | 22.86 | 27.20 | 6.84 | 37.87 | 19.03 | 54.00 | -34.97 | Horizontal | Average |

## 5.10. Band edge and Spurious Emissions (conducted)

### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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, based on either an RF conducted or a radiated measurement.

### TEST CONFIGURATION
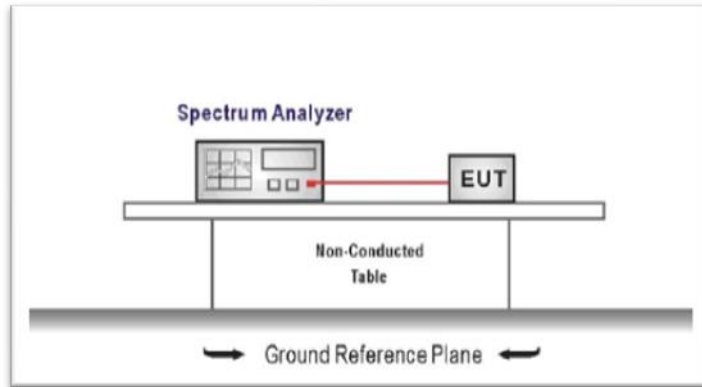


### TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
   RBW = 100 kHz, VBW ≥ RBW, scan up through 10th harmonic.
   Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

### TEST MODE:
Please refer to the clause 3.3
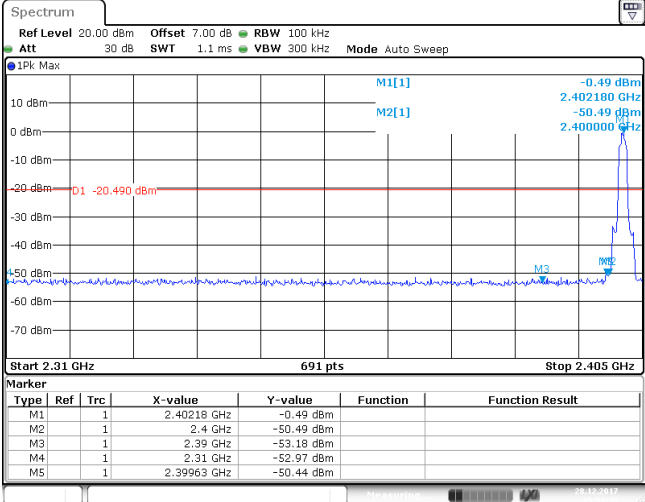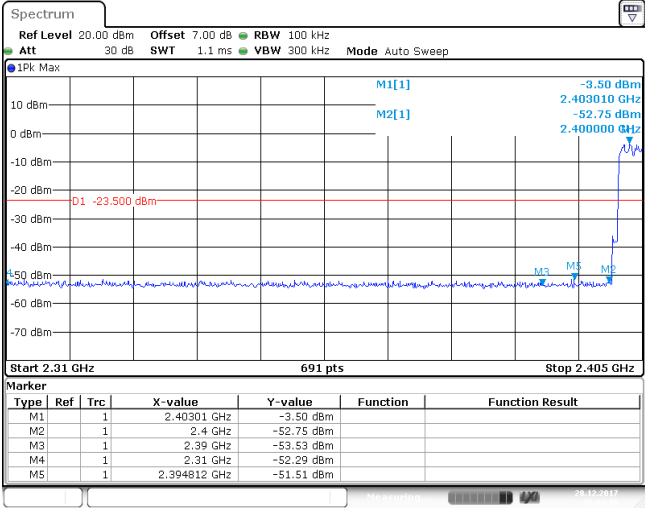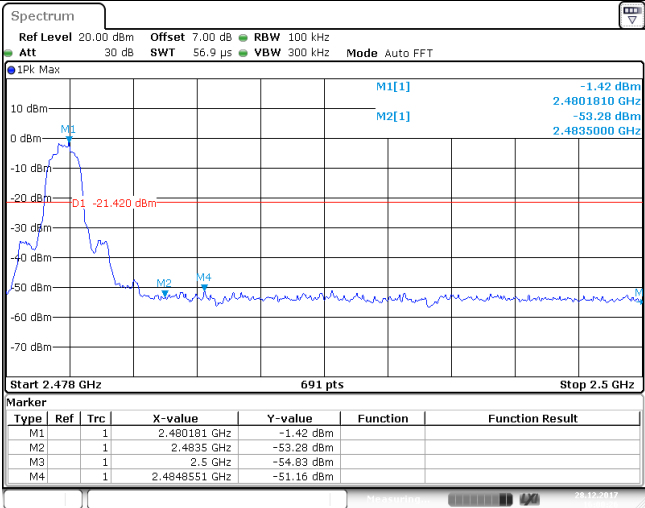
### TEST RESULTS

☒ **Passed**          ☐ **Not Applicable**

| Test Item: | Band edge | | Modulation type: | | GFSK |
|---|---|---|---|---|---|
| CH00<br><br>No hopping mode |  | | | | |
| CH00<br><br>Hopping mode |  | | | | |
| CH78<br><br>No hopping mode |  | | | | |

| | |
|---|---|
| CH78<br><br>Hopping mode |  |

| Test Item: | Band edge | Modulation type: | π/4DQPSK |
|---|---|---|---|

**CH00**

**No hopping mode**

Spectrum
Ref Level 20.00 dBm　Offset 7.00 dB　RBW 100 kHz
Att 30 dB　SWT 1.1 ms　VBW 300 kHz　Mode Auto Sweep
1Pk Max
M1[1]　−0.49 dBm　2.402180 GHz
M2[1]　−50.49 dBm　2.400000 GHz
D1 −20.490 dBm
Start 2.31 GHz　691 pts　Stop 2.405 GHz

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.40218 GHz | −0.49 dBm | | |
| M2 | | 1 | 2.4 GHz | −50.49 dBm | | |
| M3 | | 1 | 2.39 GHz | −53.18 dBm | | |
| M4 | | 1 | 2.31 GHz | −52.97 dBm | | |
| M5 | | 1 | 2.39963 GHz | −50.44 dBm | | |

**CH00**

**Hopping mode**

Spectrum
Ref Level 20.00 dBm　Offset 7.00 dB　RBW 100 kHz
Att 30 dB　SWT 1.1 ms　VBW 300 kHz　Mode Auto Sweep
1Pk Max
M1[1]　−3.50 dBm　2.403010 GHz
M2[1]　−52.75 dBm　2.400000 GHz
D1 −23.500 dBm
Start 2.31 GHz　691 pts　Stop 2.405 GHz

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.40301 GHz | −3.50 dBm | | |
| M2 | | 1 | 2.4 GHz | −52.75 dBm | | |
| M3 | | 1 | 2.39 GHz | −53.53 dBm | | |
| M4 | | 1 | 2.31 GHz | −52.29 dBm | | |
| M5 | | 1 | 2.394812 GHz | −51.51 dBm | | |

**CH78**

**No hopping mode**

Spectrum
Ref Level 20.00 dBm　Offset 7.00 dB　RBW 100 kHz
Att 30 dB　SWT 56.9 μs　VBW 300 kHz　Mode Auto FFT
1Pk Max
M1[1]　−1.42 dBm　2.4801810 GHz
M2[1]　−53.28 dBm　2.4835000 GHz
D1 −21.420 dBm
Start 2.478 GHz　691 pts　Stop 2.5 GHz

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.480181 GHz | −1.42 dBm | | |
| M2 | | 1 | 2.4835 GHz | −53.28 dBm | | |
| M3 | | 1 | 2.5 GHz | −54.83 dBm | | |
| M4 | | 1 | 2.4848551 GHz | −51.16 dBm | | |

| | |
|---|---|
| CH78<br><br>Hopping mode | **Spectrum**<br><br>Ref Level 20.00 dBm   Offset 7.00 dB   RBW 100 kHz<br>Att 30 dB   SWT 56.9 µs   VBW 300 kHz   Mode Auto FFT<br><br>M1[1]  -3.17 dBm  2.4801170 GHz<br>M2[1]  -54.34 dBm  2.4835000 GHz<br><br>Start 2.478 GHz      691 pts      Stop 2.5 GHz |

| Marker | | | | | | |
|---|---|---|---|---|---|---|
| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
| M1 | | 1 | 2.480117 GHz | -3.17 dBm | | |
| M2 | | 1 | 2.4835 GHz | -54.34 dBm | | |
| M3 | | 1 | 2.5 GHz | -54.11 dBm | | |
| M4 | | 1 | 2.4868319 GHz | -51.29 dBm | | |

| Test Item: | Band edge | | Modulation type: | 8DPSK |
|---|---|---|---|---|
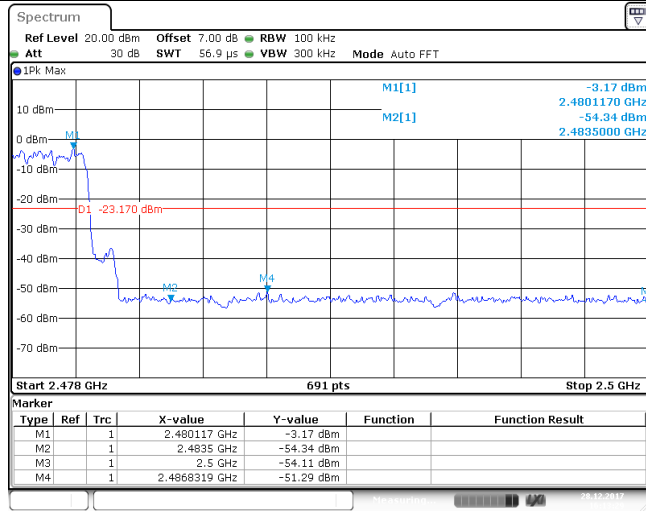
**CH00**

**No hopping mode**

Spectrum

Ref Level 20.00 dBm   Offset 7.00 dB   RBW 100 kHz
Att       30 dB   SWT   1.1 ms   VBW 300 kHz   Mode Auto Sweep
1Pk Max

M1[1]   −2.34 dBm   2.402180 GHz
M2[1]   −51.48 dBm   2.400000 GHz

D1 −22.340 dBm

Start 2.31 GHz          691 pts          Stop 2.405 GHz

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.40218 GHz | −2.34 dBm | | |
| M2 | | 1 | 2.4 GHz | −51.48 dBm | | |
| M3 | | 1 | 2.39 GHz | −53.00 dBm | | |
| M4 | | 1 | 2.31 GHz | −52.43 dBm | | |
| M5 | | 1 | 2.39963 GHz | −50.10 dBm | | |

**CH00**

**Hopping mode**

Spectrum

Ref Level 20.00 dBm   Offset 7.00 dB   RBW 100 kHz
Att       30 dB   SWT   1.1 ms   VBW 300 kHz   Mode Auto Sweep
1Pk Max

M1[1]   −3.83 dBm   2.404110 GHz
M2[1]   −52.08 dBm   2.400000 GHz

D1 −23.830 dBm

Start 2.31 GHz          691 pts          Stop 2.405 GHz

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.40411 GHz | −3.83 dBm | | |
| M2 | | 1 | 2.4 GHz | −52.08 dBm | | |
| M3 | | 1 | 2.39 GHz | −52.97 dBm | | |
| M4 | | 1 | 2.31 GHz | −53.64 dBm | | |
| M5 | | 1 | 2.33079 GHz | −50.62 dBm | | |

**CH78**

**No hopping mode**

Spectrum

Ref Level 20.00 dBm   Offset 7.00 dB   RBW 100 kHz
Att       30 dB   SWT   56.9 µs   VBW 300 kHz   Mode Auto FFT
1Pk Max

M1[1]   −1.20 dBm   2.4801810 GHz
M2[1]   −53.52 dBm   2.4835000 GHz

D1 −21.200 dBm

Start 2.478 GHz          691 pts          Stop 2.5 GHz

Marker

| Type | Ref | Trc | X-value | Y-value | Function | Function Result |
|---|---|---|---|---|---|---|
| M1 | | 1 | 2.480181 GHz | −1.20 dBm | | |
| M2 | | 1 | 2.4835 GHz | −53.52 dBm | | |
| M3 | | 1 | 2.5 GHz | −54.25 dBm | | |
| M4 | | 1 | 2.4857478 GHz | −51.40 dBm | | |

| | |
|---|---|
| CH78<br><br>Hoppig mode |  |

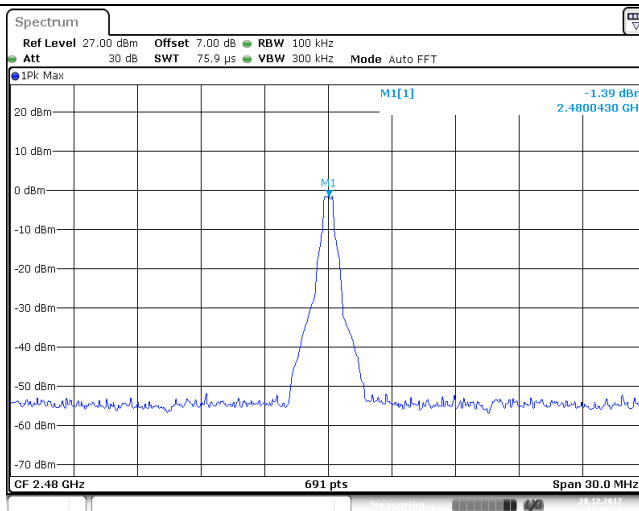| Test Item: | SE | | Modulation type: | GFSK |
|---|---|---|---|---|
| reference level CH00 |  | | | |
| CH00 | <br> | | | |

| | |
|---|---|
| reference level CH39 |  |
| CH39 | <br> |

| reference level CH78 |  |
| --- | --- |
| CH78 |  |
| |  |

| Test Item: | SE | Modulation type: | π/4DQPSK |
|---|---|---|---|
| reference level CH00 |  | | |
| CH00 |  | | |

| reference level CH39 |  |
| CH39 |  |

| reference level CH78 |  |
| CH78 | <br> |

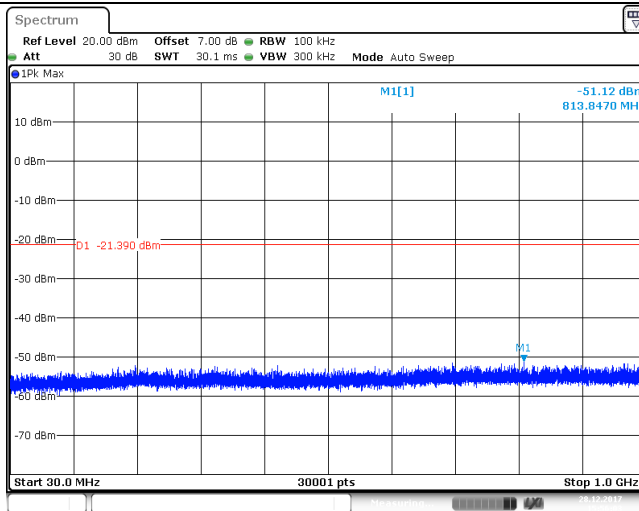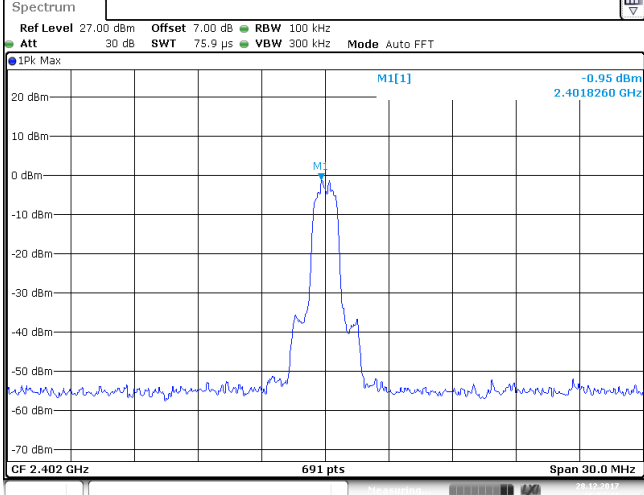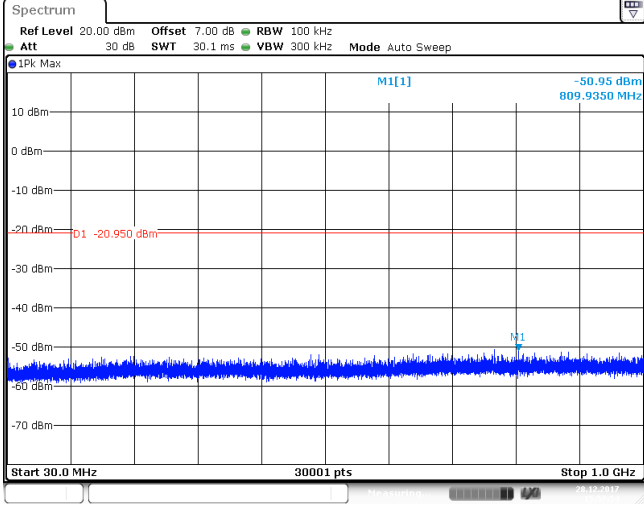| Test Item: | SE | | Modulation type: | 8DPSK |
|---|---|---|---|---|
| reference level CH00 |  | | | |
| CH00 |  | | | |

| | |
|---|---|
| reference level CH39 |  |
| CH39 |  |

| reference level CH78 |  |
|---|---|
| CH78 |  |
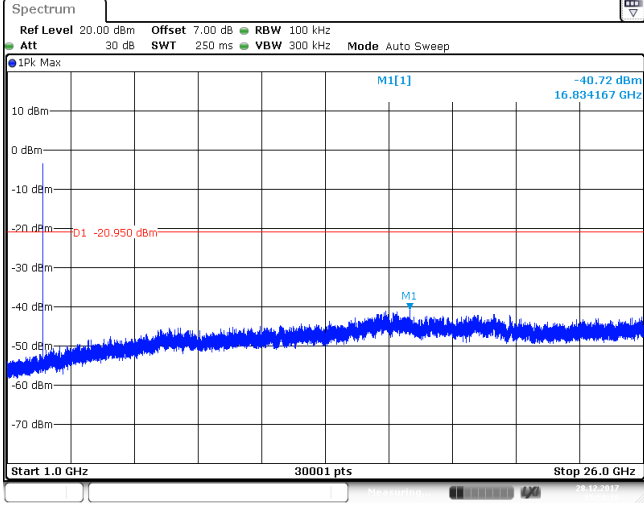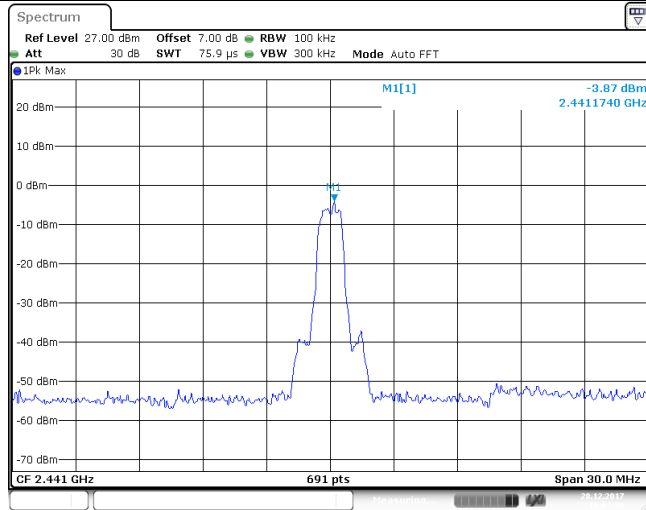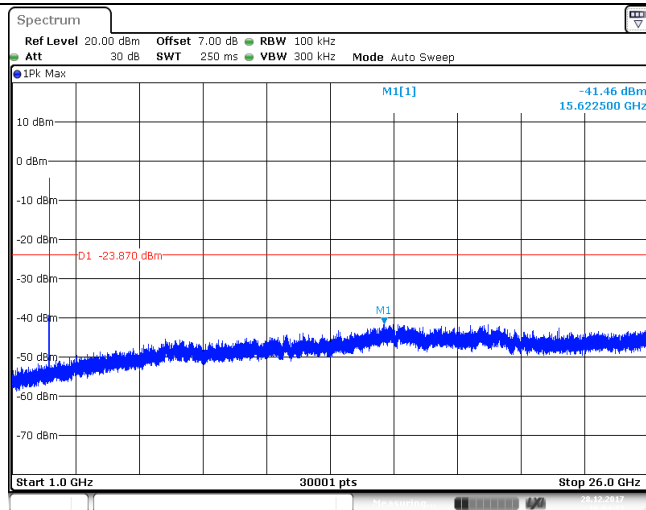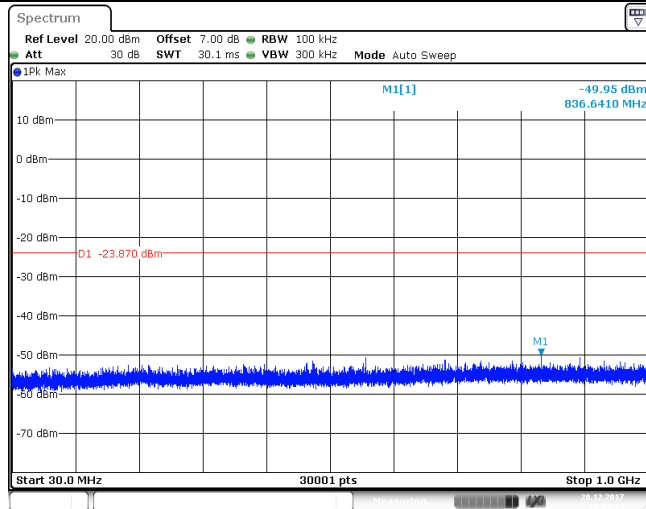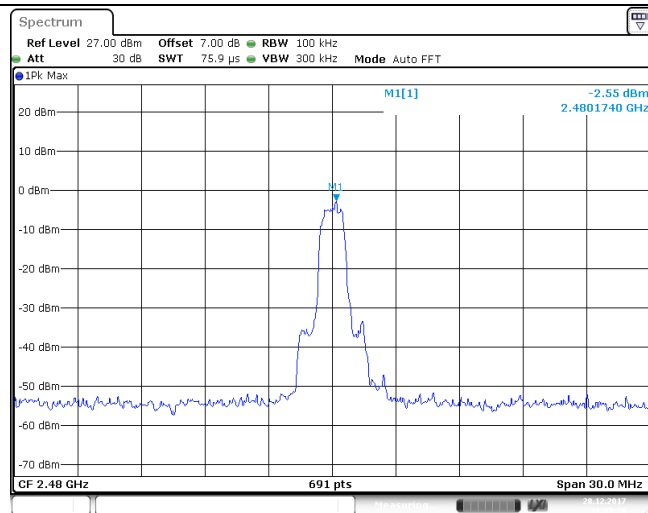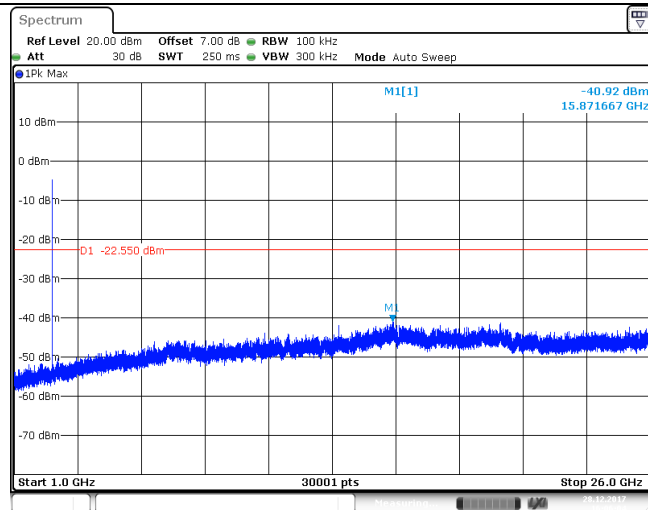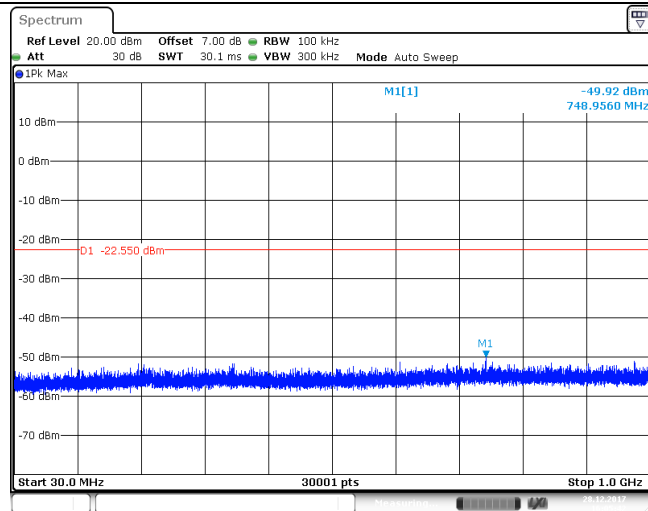
## 5.11. Spurious Emissions (radiated)

**LIMIT**

**FCC CFR Title 47 Part 15 Subpart C Section 15.209**

| Frequency | Limit (dBuV/m @3m) | Value |
|---|---|---|
| 30 MHz ~ 88 MHz | 40.00 | Quasi-peak |
| 88 MHz ~ 216 MHz | 43.50 | Quasi-peak |
| 216 MHz ~ 960 MHz | 46.00 | Quasi-peak |
| 960 MHz ~ 1 GHz | 54.00 | Quasi-peak |
| Above 1 GHz | 54.00 | Average |
| | 74.00 | Peak |

**TEST CONFIGURATION**

➢    Below 30 MHz
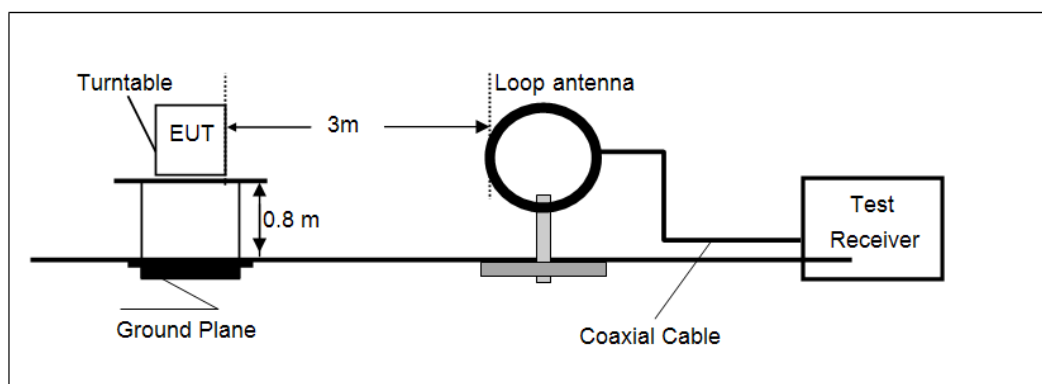


➢    30 MHz ~1000 MHz
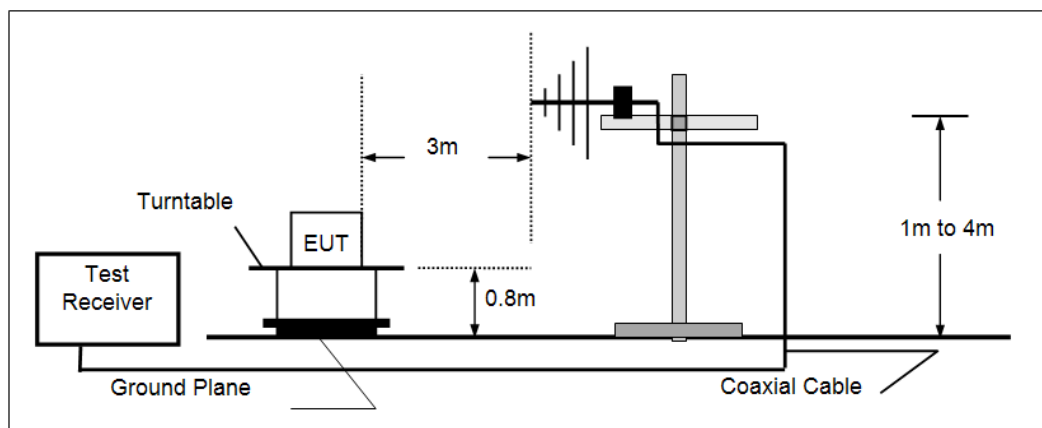


➢    Above 1 GHz
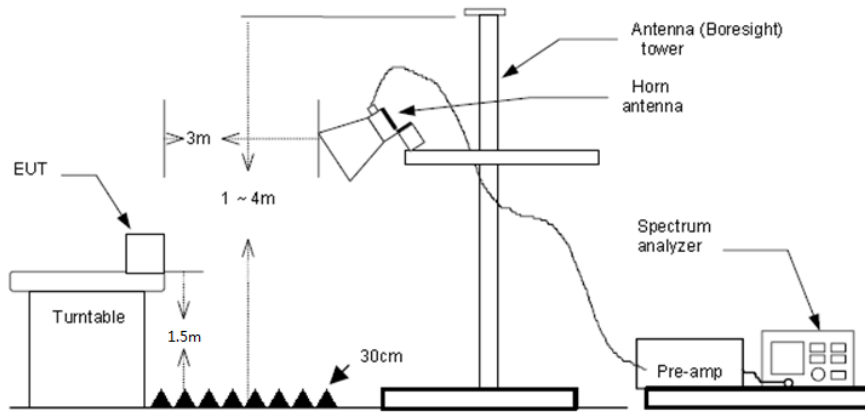
## TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10:2013.
2. The EUT is placed on a turn table with 0.8 meter above ground for below 1GHz, 1.5 meter above ground for above 1GHz.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
    (1) Span shall wide enough to fully capture the emission being measured;
    (2) Below 1 GHz:
        RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
        If the emission level of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
    (3) From 1 GHz to 10$^{th}$ harmonic:
        RBW=1 MHz, VBW=3 MHz Peak detector for Peak value
        RBW=1 MHz, VBW=10 Hz Peak detector for Average value.

## TEST MODE:
Please refer to the clause 3.3

## TEST RESULTS

☒ **Passed**          ☐ **Not Applicable**

Note:
1) Final  Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2) The emission levels of other frequencies are very lower than the limit and not show in test report.
3) Below 1 GHz,Have pre-scan all modulation mode, found the GFSK modulation High channel which it was worst case, so only the worst case's data on the test report.
4) Above 1 GHz,Have pre-scan all modulation mode, found the GFSK modulation which it was worst case, so only the worst case's data on the test report
5) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

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

> **30 MHz ~ 1 GHz**

| Polarization: | Vertical |
|---|---|
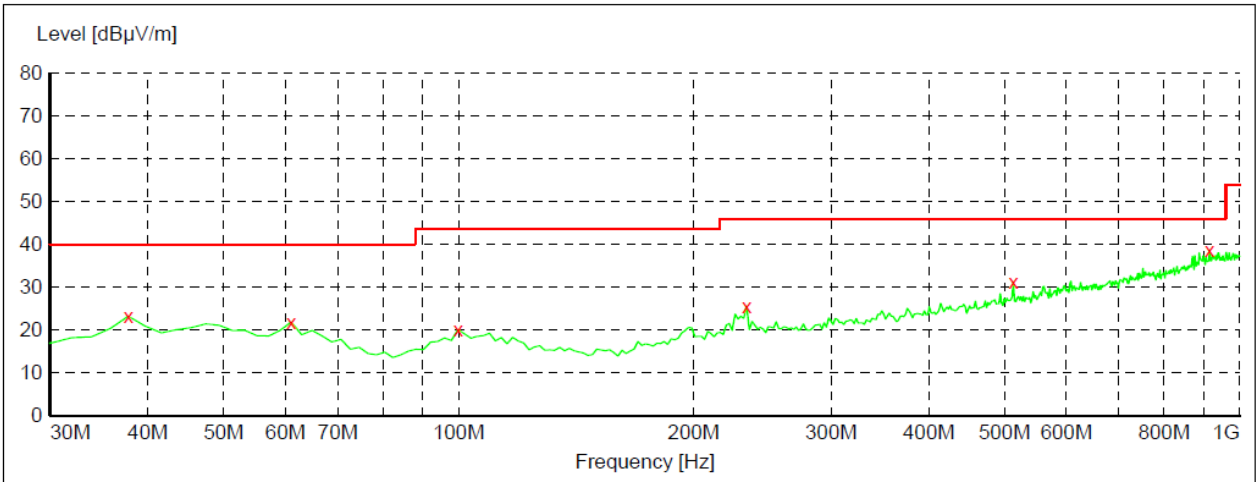


x x x MES GM1712256040_red

| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|---|---|---|---|---|---|---|---|---|
| 37.760000 | 23.20 | -10.8 | 40.0 | 16.8 | QP | 100.0 | 63.00 | VERTICAL |
| 61.040000 | 21.90 | -10.3 | 40.0 | 18.1 | QP | 100.0 | 360.00 | VERTICAL |
| 99.840000 | 20.10 | -10.6 | 43.5 | 23.4 | QP | 100.0 | 169.00 | VERTICAL |
| 233.700000 | 25.60 | -9.1 | 46.0 | 20.4 | QP | 100.0 | 169.00 | VERTICAL |
| 513.060000 | 31.30 | -1.4 | 46.0 | 14.7 | QP | 100.0 | 185.00 | VERTICAL |
| 914.640000 | 38.70 | 6.9 | 46.0 | 7.3 | QP | 100.0 | 116.00 | VERTICAL |

| Polarization: | Horizontal |
|---|---|
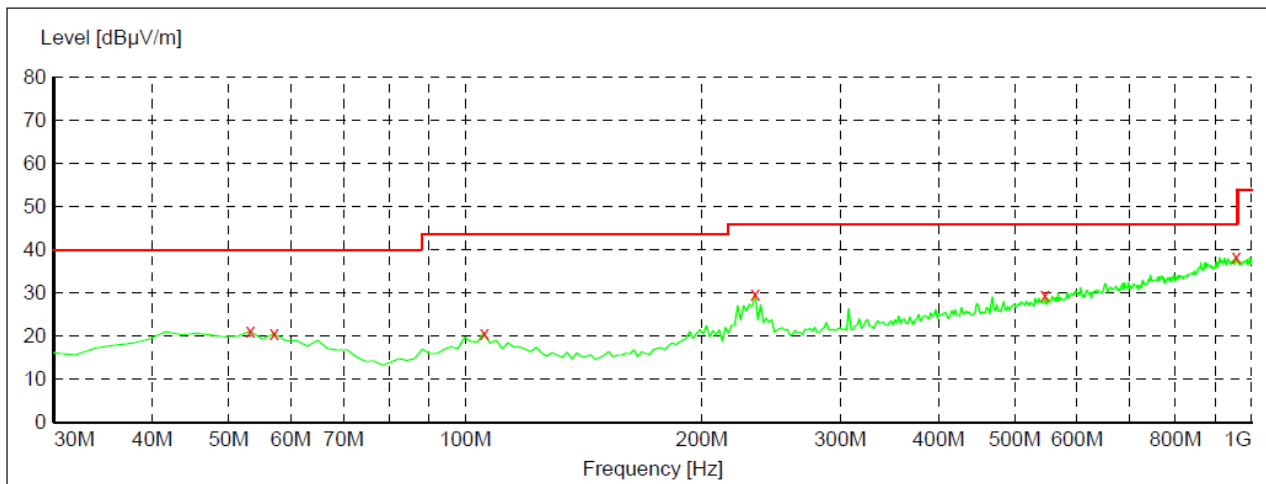


x x x MES GM1712256039_red

| Frequency MHz | Level dBµV/m | Transd dB | Limit dBµV/m | Margin dB | Det. | Height cm | Azimuth deg | Polarization |
|---|---|---|---|---|---|---|---|---|
| 53.280000 | 21.20 | -9.0 | 40.0 | 18.8 | QP | 300.0 | 177.00 | HORIZONTAL |
| 57.160000 | 20.60 | -9.4 | 40.0 | 19.4 | QP | 100.0 | 102.00 | HORIZONTAL |
| 105.660000 | 20.70 | -10.5 | 43.5 | 22.8 | QP | 100.0 | 196.00 | HORIZONTAL |
| 233.700000 | 29.90 | -9.1 | 46.0 | 16.1 | QP | 100.0 | 114.00 | HORIZONTAL |
| 546.040000 | 29.40 | -0.8 | 46.0 | 16.6 | QP | 100.0 | 102.00 | HORIZONTAL |
| 955.380000 | 38.30 | 7.3 | 46.0 | 7.7 | QP | 100.0 | 0.00 | HORIZONTAL |

➢ **1 GHz ~ 25 GHz**

| CH00 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 1495.10 | 48.06 | 25.80 | 5.27 | 36.58 | 42.55 | 74.00 | -31.45 | Vertical | Peak |
| 2097.51 | 50.32 | 26.69 | 6.35 | 37.32 | 46.04 | 74.00 | -27.96 | Vertical | Peak |
| 3192.37 | 41.27 | 28.80 | 7.71 | 38.20 | 39.58 | 74.00 | -34.42 | Vertical | Peak |
| 7209.02 | 35.57 | 36.21 | 11.87 | 35.07 | 48.58 | 74.00 | -25.42 | Vertical | Peak |
| 1439.09 | 39.24 | 25.86 | 5.11 | 36.51 | 33.70 | 74.00 | -40.30 | Horizontal | Peak |
| 2972.75 | 37.88 | 28.57 | 7.47 | 38.25 | 35.67 | 74.00 | -38.33 | Horizontal | Peak |
| 4809.50 | 36.33 | 31.58 | 9.55 | 36.93 | 40.53 | 74.00 | -33.47 | Horizontal | Peak |
| 5112.49 | 33.88 | 31.85 | 9.76 | 36.29 | 39.20 | 74.00 | -34.80 | Horizontal | Peak |

| CH39 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 1464.96 | 37.99 | 25.83 | 5.19 | 36.54 | 32.47 | 74.00 | -41.53 | Vertical | Peak |
| 3428.21 | 38.16 | 28.43 | 8.00 | 38.51 | 36.08 | 74.00 | -37.92 | Vertical | Peak |
| 4629.32 | 33.30 | 30.99 | 9.47 | 37.19 | 36.57 | 74.00 | -37.43 | Vertical | Peak |
| 6251.26 | 31.95 | 33.00 | 11.00 | 35.30 | 40.65 | 74.00 | -33.35 | Vertical | Peak |
| 1724.17 | 46.13 | 25.25 | 5.81 | 36.98 | 40.21 | 74.00 | -33.79 | Horizontal | Peak |
| 3844.28 | 35.39 | 29.64 | 8.56 | 38.20 | 35.39 | 74.00 | -38.61 | Horizontal | Peak |
| 4883.52 | 38.05 | 31.43 | 9.59 | 36.73 | 42.34 | 74.00 | -31.66 | Horizontal | Peak |
| 7319.96 | 32.63 | 36.30 | 11.99 | 34.92 | 46.00 | 74.00 | -28.00 | Horizontal | Peak |

| CH78 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization | Test value |
| 1786.72 | 44.66 | 25.37 | 5.93 | 37.11 | 38.85 | 74.00 | -35.15 | Vertical | Peak |
| 3266.35 | 44.09 | 28.40 | 7.80 | 38.32 | 41.97 | 74.00 | -32.03 | Vertical | Peak |
| 4958.68 | 39.68 | 31.46 | 9.64 | 36.52 | 44.26 | 74.00 | -29.74 | Vertical | Peak |
| 7451.57 | 35.58 | 36.20 | 12.24 | 34.86 | 49.16 | 74.00 | -24.84 | Vertical | Peak |
| 1046.89 | 47.76 | 25.34 | 4.32 | 36.65 | 40.77 | 74.00 | -33.23 | Horizontal | Peak |
| 1724.17 | 50.31 | 25.25 | 5.81 | 36.98 | 44.39 | 74.00 | -29.61 | Horizontal | Peak |
| 4958.68 | 35.79 | 31.46 | 9.64 | 36.52 | 40.37 | 74.00 | -33.63 | Horizontal | Peak |
| 8549.59 | 33.55 | 37.10 | 12.88 | 34.45 | 49.08 | 74.00 | -24.92 | Horizontal | Peak |

Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

# 6. <u>TEST SETUP PHOTOS</u>

Conducted Emissions (AC Mains)



Radiated Emissions





# 6. <u>TEST SETUP PHOTOS</u>

## 7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No.: TRE1712019101.


--------End of Report--------