

FCC Part 15 Subpart B&C §15.247

Test Report

| | |
|----------------------|-----------------------------|
| Equipment Under Test | AUDIO ASSY – LCD |
| Model Name | DGU-9T45-J100SA |
| Variant Model Name | - |
| FCC ID | 2AE77-DGU9T45J100SA |
| IC Number | - |
| Applicant | DIGEN |
| Manufacturer | DIGEN |
| Date of Test(s) | 2022. 07. 18 ~ 2022. 07. 25 |
| Date of Issue | 2022. 09. 28 |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test report cannot be reproduced, except in full

| Issue to | Issue by |
|--|---|
| DIGEN 89, Seongseo4chacheomdan-ro Dalseo-gu, Daegu, South Korea Tel.: +82 70-7100-1740 Fax: +82 2-532-8811 | DEKRA Korea Co., Ltd. 498-2, Geumeo-ro, Pogok-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, 17030, Rep. of Korea Tel.: +82 31-338-8837 Fax: +82 31-338-8847 |

Revision history

| Revision | Date of issue | Description | Revised by |
|----------|---------------|-------------|------------|
| -- | 2022.09.28 | Initial | - |
| -- | | | |

Table of contents

| | |
|--|-----------|
| 1. Applicant Information | 4 |
| 2. Laboratory Information | 4 |
| 3. Summary of test results..... | 5 |
| 4. EUT Description | 6 |
| 5. Measurement equipment | 7 |
| 6. Antenna Requirement | 8 |
| 7. 20 dB bandwidth & 99% bandwidth | 9 |
| 8. Peak output power | 17 |
| 9. Carrier frequency separation | 23 |
| 10. Number of hopping frequencies | 26 |
| 11. Time of occupancy (Dwell time)..... | 30 |
| 12. Transmitter radiated spurious emissions and conducted spurious emissions .. | 33 |

1. Applicant Information

1.1. Details of applicant

Applicant : DIGEN
Address : 89, Seongseo4chacheomdan-ro, Dalseo-gu, Daegu, South Korea
Contact Person : Myeongcheol Jun
Telephone : +82 70-7100-1740
Fax : +82 2-532-8811

1.2. Manufacturer Information

Manufacturer : DIGEN
Address : 89, Seongseo4chacheomdan-ro, Dalseo-gu, Daegu, South Korea

2. Laboratory Information

Company name : DEKRA Korea Co., Ltd.
Test site number : FCC (KR0151), IC (24841)
Address : 498-2, Geumeo-ro, Pogok-eup, Cheoin-gu, Yongin-si, Gyeonggi-do, 17030, Rep. of Korea
Web site : <http://www.dekra.kr>
Telephone : +82 31-338-8837
Facsimile : +82 31-338-8847

3. Summary of test results

The EUT has been tested according to the following specifications:

| FCC Rule FCC part 15 | Description | Result |
|-------------------------------------|---|--------|
| 15.203 15.247(b)(4) | Antenna requirement | C |
| 15.247(a)(1) | 20 dB bandwidth & 99 % bandwidth | C |
| 15.247(b)(1) | Peak output power | C |
| 15.247(a)(1) | Carrier frequency separation | C |
| 15.247(a)(1)(iii) | Number of hopping frequency | C |
| 15.247(a)(1)(iii) | Time of occupancy (Dwell time) | C |
| 15.205(a) 15.209(a) 15.247(d) | Transmitter radiated spurious emissions, Conducted spurious emission | C |
| 15.207(a) | AC Conducted power line test | N/A |

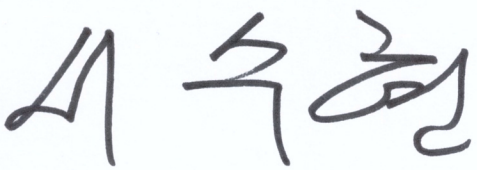
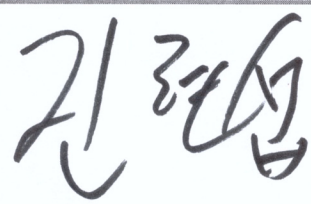
※ Abbreviation

C Complied
N/A Not applicable
F Fail

The sample was tested according to the following specification:

FCC Parts 15.247; ANSI C63.4:2014, ANSI C63.10:2020
FCC Public Notice KDB 558074 D01 v05r02
RSS-247 Issue 2
RSS-GEN Issue 5

Approval Signatories

| Test and Report Completed by : | Report Approval by : |
|---|--|
|  |  |
| Suhyun Seo Test Engineer DEKRA Korea Co., Ltd. | Isaac Jin Technical Manager DEKRA Korea Co., Ltd. |

The above test certificate is a test report not related to the Korean Laboratory Accreditation Scheme

4. EUT Description

| | |
|-------------------------------|----------------------------|
| Kind of product | AUDIO ASSY – LCD |
| Model Name | DGU-9T45-J100SA |
| Variant Model Name | - |
| FCC ID | 2AE77-DGU9T45J100SA |
| IC Number | - |
| Power supply | DC 13.50 V |
| Frequency range | 2 402 MHz ~ 2 480 MHz |
| Modulation technique | GFSK, Pi/4DQPSK, 8DPSK |
| Number of channels | 79 ch |
| Antenna gain / Type | -0.56 dBi / PCB Antenna |
| Test Site Registration Number | FCC (KR0151), IC (24841) |
| H/W version / S/W version | 1.0 / 1.0 |
| Test S/W version | Bluetooth Tester(TC-3000B) |

4.1. Table for Test Modes and Frequency (Bluetooth)

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Mode | Data rate (Worst case) | Frequency (Freq. MHz) |
|------|------------------------|---|
| BDR | DH5 | Lowest (2 402) / Middle (2 441) / Highest (2 480) |
| EDR | 3-DH5 | Lowest (2 402) / Middle (2 441) / Highest (2 480) |

4.2. Information about the FHSS characteristics

4.2.1. Pseudorandom frequency hopping sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1600 hops/s.

4.2.2. Medium access protocol

The manufacturer declares that the device uses Bluetooth protocol. It confirmed that Medium access protocol is implemented.

5. Measurement equipment

| Equipment | Manufacturer | Model | Serial number | Calibration Interval | Calibration date | Calibration due. |
|-----------------------|--------------|------------------------------|-----------------------|----------------------|------------------|------------------|
| Test Receiver | R&S | ESVS30 | 829673/015 | 1 year | 2021-11-22 | 2022-11-22 |
| Signal Generator | R&S | SMB100A | 178128 | 1 year | 2022-05-16 | 2023-05-16 |
| Spectrum Analyzer | R&S | FSV-40 | 100832 | 1 year | 2022-05-16 | 2023-05-16 |
| DC Power Supply | Agilent | U8002A | MY56110033 | 1 year | 2022-05-17 | 2023-05-17 |
| Power Sensor | R&S | NRP-Z85 | 102464 | 1 year | 2022-05-17 | 2023-05-17 |
| Horn Antenna | R&S | HF906 | 100236 | 1 year | 2022-06-27 | 2023-06-27 |
| Horn Antenna | AH Systems | SAS-572 | 269 | 1 year | 2022-05-18 | 2023-05-18 |
| Horn Antenna | AH Systems | SAS-573 | 164 | 1 year | 2022-05-18 | 2023-05-18 |
| Bi-Log Ant. | S/B | VULB 9161SE | 4159 | 2 year | 2022-03-21 | 2024-03-21 |
| Loop Antenna | ETS LINDGREN | 6502 | 00118166 | 2 year | 2022-05-25 | 2024-05-25 |
| Power Amplifier | TESTEK | TK-PA18H | 170013-L | 1 year | 2022-05-16 | 2023-05-16 |
| Power Amplifier | MITEQ | AFS43-01002600 | 2048519 | 1 year | 2022-05-17 | 2023-05-17 |
| Power Amplifier | MITEQ | AMF-6F-2600400 0-33-8P-HS | 1511665 | 1 year | 2022-05-17 | 2023-05-17 |
| Fixed Attenuator | Weinschel | 54A-10 | 80303 | 1 year | 2021-10-26 | 2022-10-26 |
| Controller | INNCO | CO2000 | CO2000/064/6961003/L | N/A | N/A | N/A |
| Antenna Master | INNCO | MA4000 | MA4000/038/6961003/L | N/A | N/A | N/A |
| Controller | INNCO | CO3000 | CO3000/812/34240914/L | N/A | N/A | N/A |
| Antenna Master | INNCO | MA4640-XP-ET | None | N/A | N/A | N/A |
| RF Cable | SUHNER | SUCOFLEX100 | 84047746 | 3 month | 2022-06-20 | 2022-09-20 |
| RF Cable | SUHNER | SUCOFLEX102 | 801270/2 | 3 month | 2022-06-20 | 2022-09-20 |
| RF Cable | SUHNER | SUCOFLEX102 | 801532/2 | 3 month | 2022-06-20 | 2022-09-20 |
| Band Rejection Filter | Micro-Tonics | BRM50702 | 064 | 1 year | 2022-05-16 | 2023-05-16 |
| Power Divider | HP | 11636B | 12481 | 1 year | 2022-05-17 | 2023-05-17 |
| Bluetooth Tester | TESCOM | TC-3000B | 3000B6C0182 | 1 year | 2022-05-17 | 2023-05-17 |

※Remark

Support equipment

| Description | Manufacturer | Model | Serial number |
|-------------|--------------|-------|---------------|
| - | - | - | - |

6. Antenna Requirement

6.1. Standard applicable

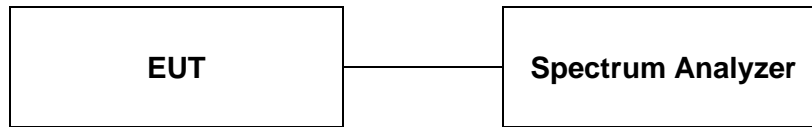
For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section §15.247 (c) if transmitting antennas of directional gain greater than 6 dBi are used.

6.2. Antenna connected construction

Antenna used in this product is PCB antenna,
Antenna gain is -0.56 dBi.

7. 20 dB bandwidth & 99% bandwidth

7.1. Test setup



7.2. Limit

Not applicable

7.3. Test procedure

Peak output power is measured using the following procedure

1. The instrument center frequency is set to the nominal EUT channel center frequency.
2. Span = Between 1.5 times and 5.0 times the OBW.
3. RBW > shall be in the range of 1% to 5% of the OBW
4. VBW $\geq 3 \times$ RBW.
5. Sweep time = No faster than coupled(auto) time.
6. Detector = peak
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
10. A spectral plot of the test results and setup description shall be included in the test report.

7.4. Test results

Complied (Measurement data : refer to the next page)

7.4.1. Test data

Test mode : BDR

| Frequency (MHz) | 20 dB bandwidth (MHz) | 99% bandwidth (MHz) |
|--------------------|--------------------------|------------------------|
| 2 402 | 0.66 | 0.94 |
| 2 441 | 0.66 | 0.94 |
| 2 480 | 0.66 | 0.94 |

Test mode : EDR

| Frequency (MHz) | 20 dB bandwidth (MHz) | 99% bandwidth (MHz) |
|--------------------|--------------------------|------------------------|
| 2 402 | 0.66 | 0.94 |
| 2 441 | 0.66 | 0.94 |
| 2 480 | 0.66 | 0.94 |

※Remark

1. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

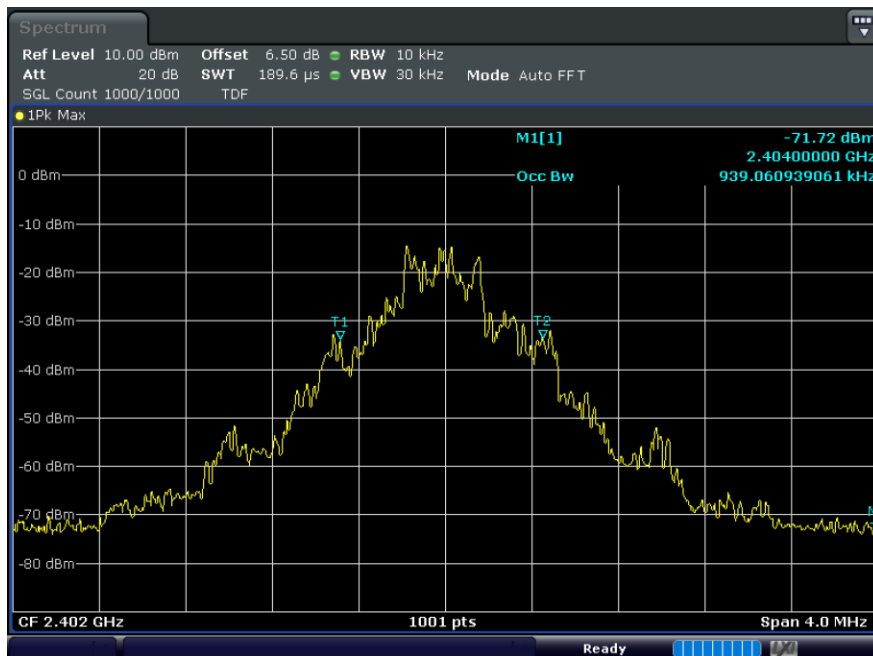
7.4.2. Test plot

Test mode : BDR

A.1. Lowest Ch. (2 402 MHz)_20 dB Bandwidth



A.2. Lowest Ch. (2 402 MHz)_99% Bandwidth



B.1. Middle Ch. (2 441 MHz)_20 dB Bandwidth



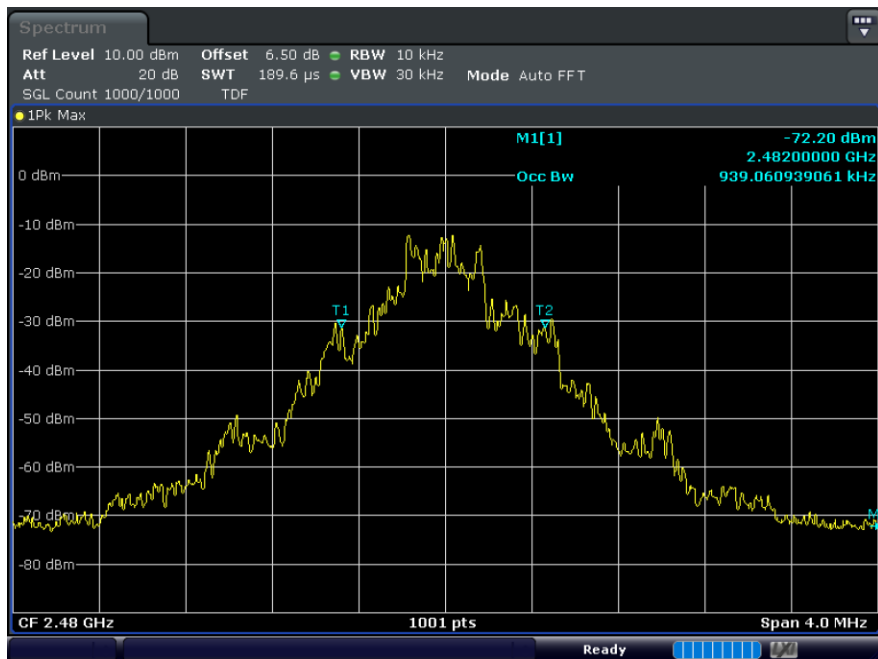
B.2. Middle Ch. (2 441 MHz)_99% Bandwidth



C.1. Highest Ch. (2 480 MHz)_20 dB Bandwidth



C.2. Highest Ch. (2 480 MHz)_99% Bandwidth

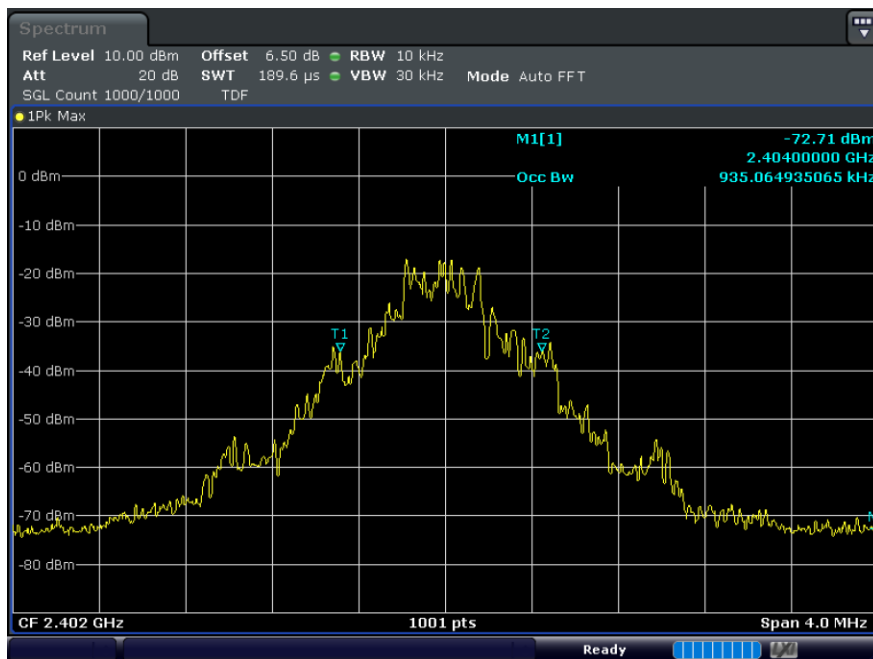


Test mode : EDR

A.1. Lowest Ch. (2 402 MHz)_20 dB Bandwidth



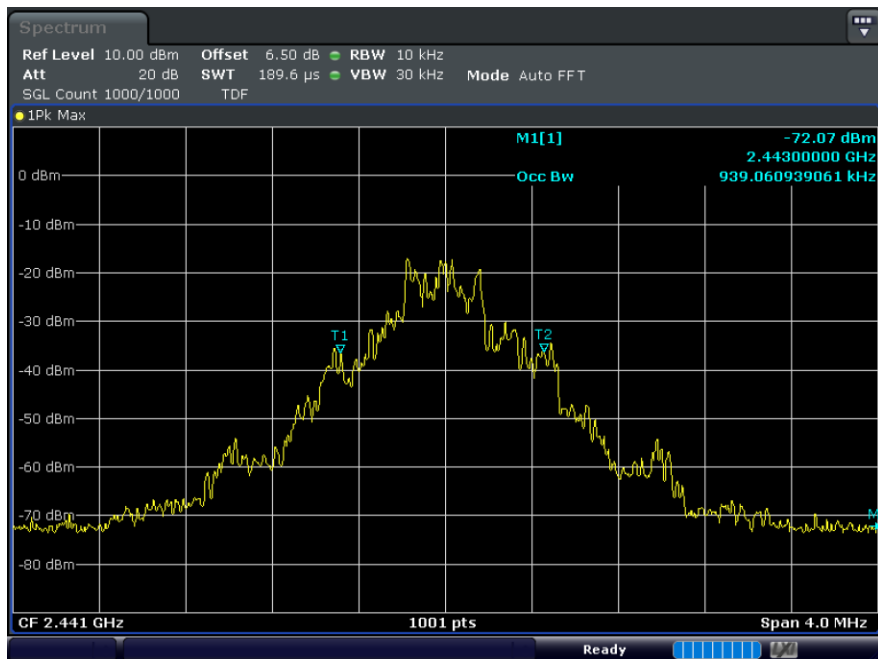
A.2. Lowest Ch. (2 402 MHz)_99% Bandwidth



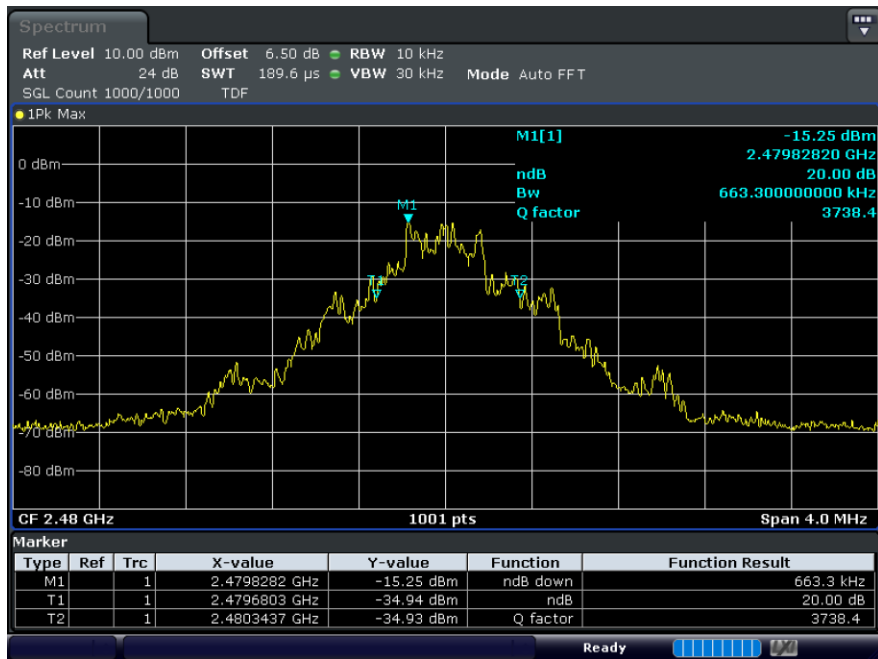
B.1. Middle Ch. (2 441 MHz)_20 dB Bandwidth



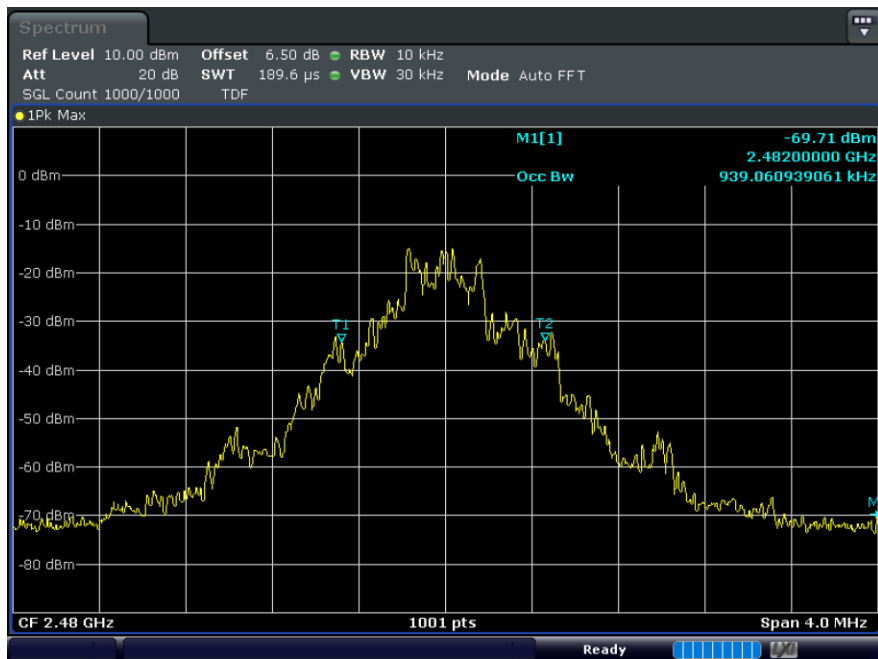
B.2. Middle Ch. (2 441 MHz)_99% Bandwidth



C.1. Highest Ch. (2 480 MHz)_20 dB Bandwidth

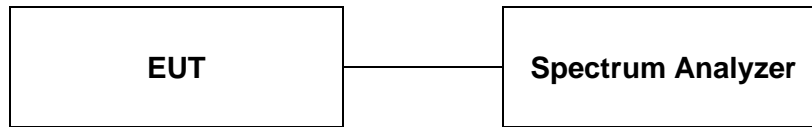


C.2. Highest Ch. (2 480 MHz)_99% Bandwidth



8. Peak output power

8.1. Test setup



8.2. Limit

The maximum peak output power of the intentional radiator shall not exceed the following:

1. §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, provided the systems operate with an output power no greater than 125 mW
2. §15.247(b)(1), For frequency hopping systems operating in the 2400–2483.5 MHz employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5805 MHz band: 1Watt.

8.3. Test procedure

Peak output power is measured using the following procedure

1. Frequency hopping shall be disabled for this test.
2. Span = Approximately five times the 20 dB bandwidth, centered on a hopping channel.
3. RBW > 20 dB bandwidth of the emission being measured.
4. VBW ≥ RBW.
5. Sweep time = No faster than coupled(auto) time.
6. Detector = peak
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the marker-to-peak function to set the marker to the peak of the emission.
10. The indicated level is the peak output power, after any corrections for external attenuators and cables.
11. A spectral plot of the test results and setup description shall be included in the test report.

8.4. Test results

Complied (Measurement data : refer to the next page)

8.4.1. Test data

Test mode : BDR

| Frequency (MHz) | Peak output power (dBm) | Limit (dBm) |
|--------------------|----------------------------|----------------|
| 2 402 | -6.43 | 30.00 |
| 2 441 | -6.20 | |
| 2 480 | -4.48 | |

Test mode : EDR

| Frequency (MHz) | Peak output power (dBm) | Limit (dBm) |
|--------------------|----------------------------|----------------|
| 2 402 | -8.81 | 30.00 |
| 2 441 | -8.97 | |
| 2 480 | -6.99 | |

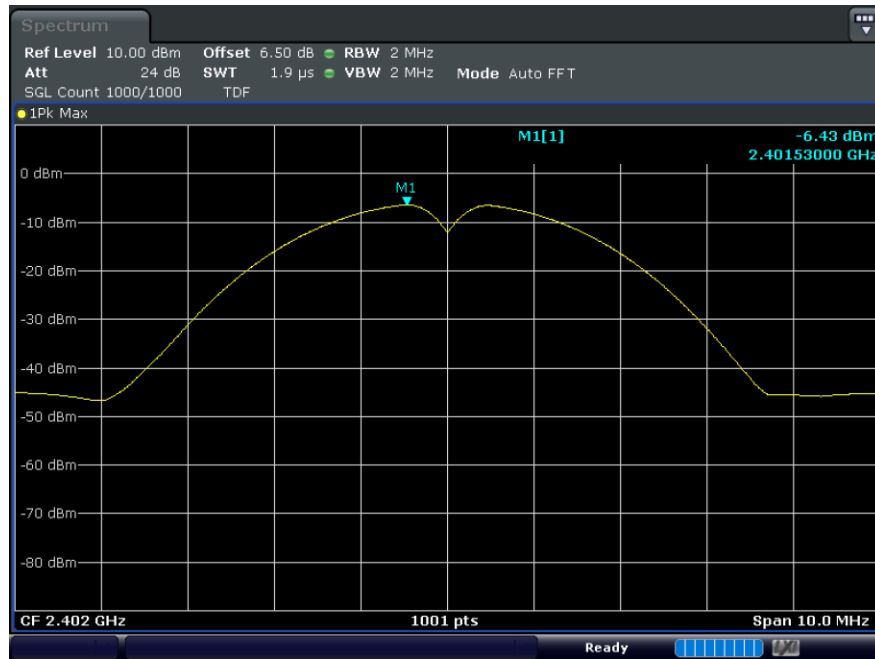
※Remark

1. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

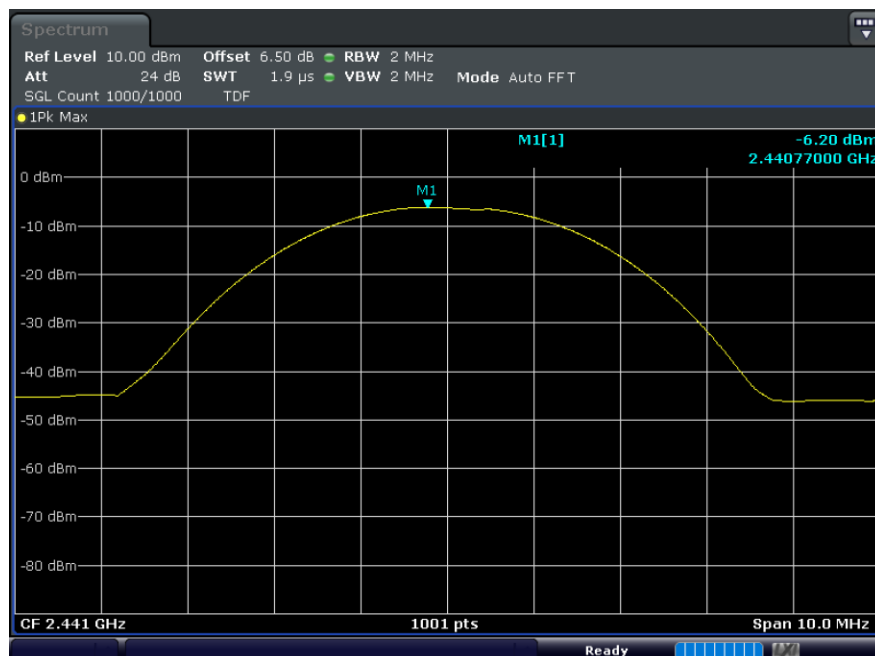
8.4.2. Test plot

Test mode : BDR

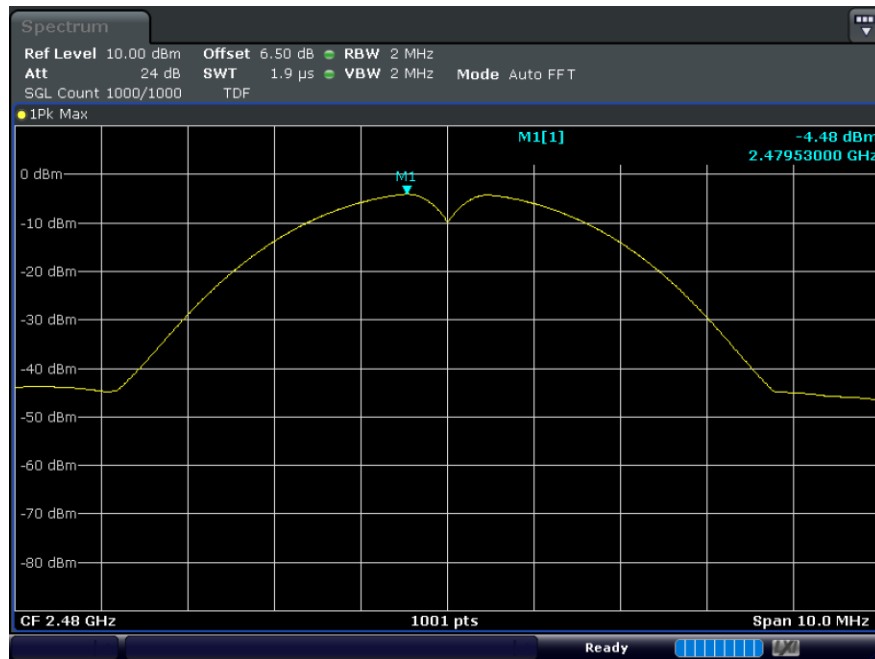
A. Lowest Ch. (2 402 MHz)



B. Middle Ch. (2 441 MHz)

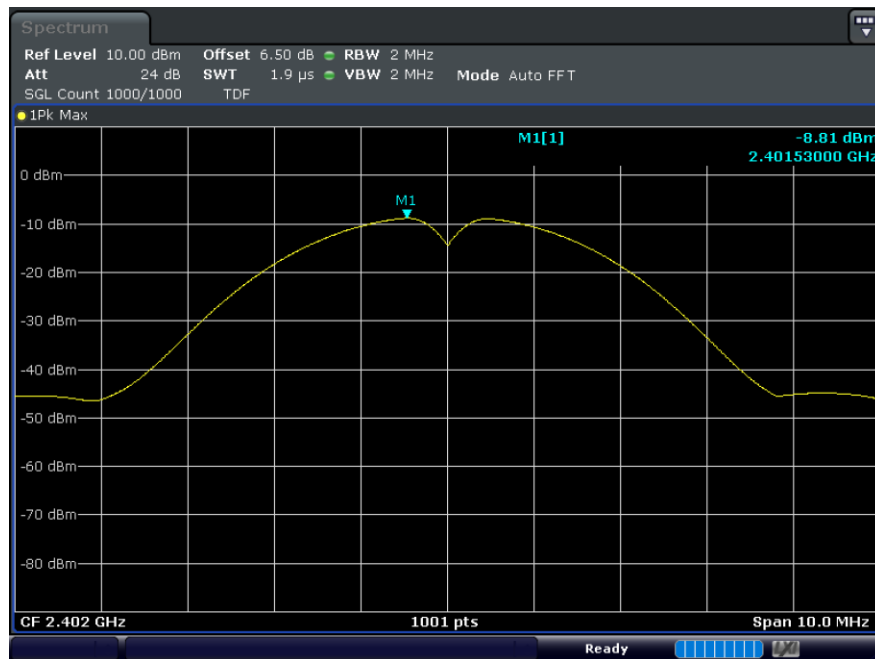


C. Highest Ch. (2 480 MHz)

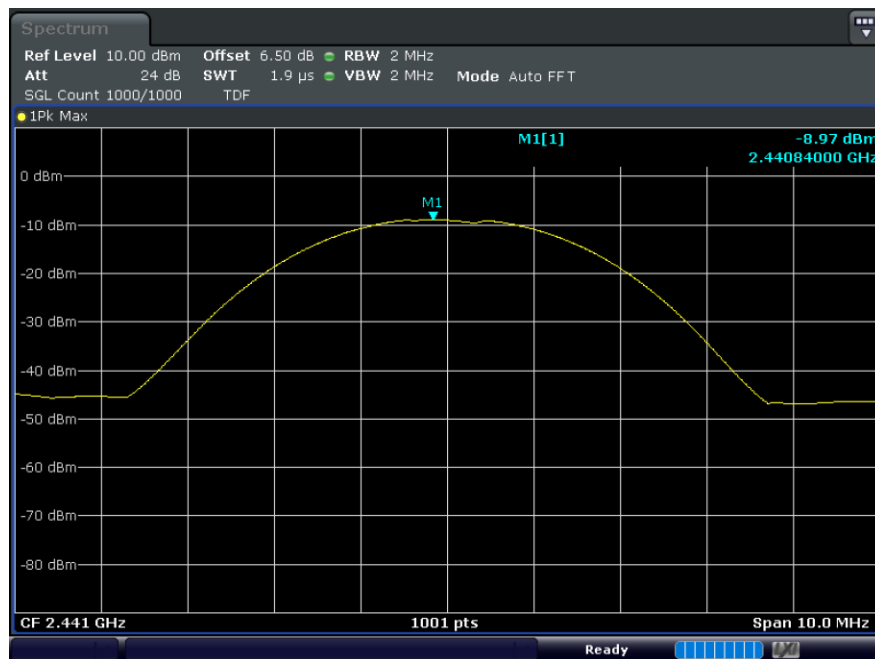


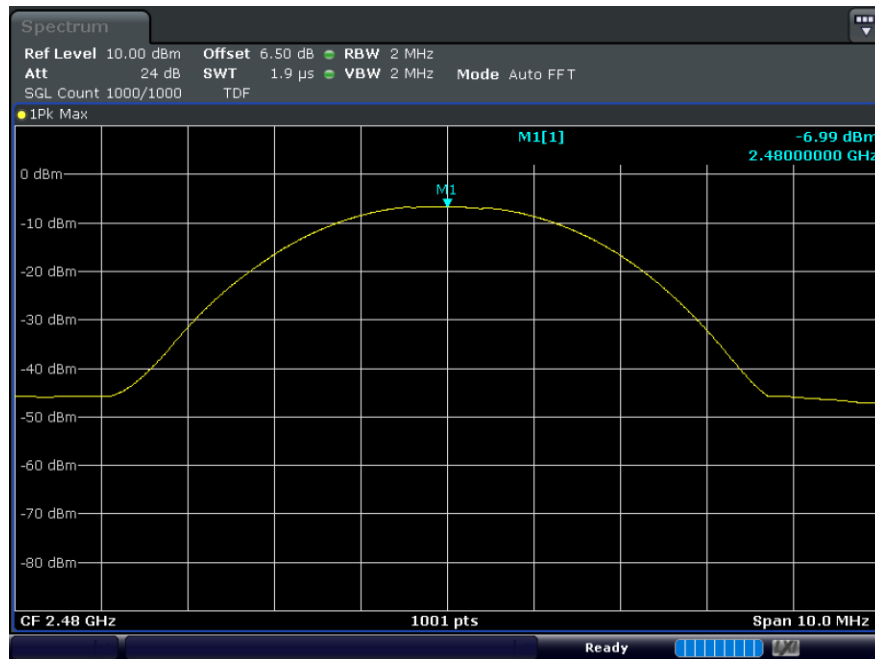
Test mode : EDR

A. Lowest Ch. (2 402 MHz)



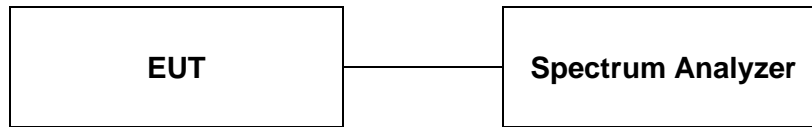
B. Middle Ch. (2 441 MHz)



C. Highest Ch. (2 480 MHz)

9. Carrier frequency separation

9.1. Test setup



9.2. Limit

§15.247(a)(1) Frequency hopping system operating in 2 400 – 2 483.5 MHz. Band may have hopping channel carrier frequencies that are separated by 25 kHz or two-third of 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

9.3. Test procedure

Carrier frequency separation is measured using the following procedure

1. Span = Wide enough to capture the peaks of two adjacent channels.
2. RBW = Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
3. VBW \geq RBW.
4. Sweep time = No faster than coupled(auto) time.
5. Detector = peak
6. Trace mode = max hold
7. Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

Compliance of an EUT with the appropriate regulatory limit shall be determined. A spectral plot of the data shall be included in the test report.

Where the device shares the same channel plan (carrier frequencies and number of channels) across multiple data rates or modulation schemes then the carrier separation need only be measured for one of those modulation schemes or data rates.

9.4. Test results

Complied (Measurement data : refer to the next page)

9.4.1. Test data

Test mode : BDR

| Frequency (MHz) | Adjacent hopping Channel separation (kHz) | Two-third of 20 dB bandwidth (kHz) | Minimum bandwidth (kHz) |
|-----------------|---|------------------------------------|-------------------------|
| 2 441 | 999.00 | 442.00 | 25.00 |

Test mode : EDR

| Frequency (MHz) | Adjacent hopping Channel separation (kHz) | Two-third of 20 dB bandwidth (kHz) | Minimum bandwidth (kHz) |
|-----------------|---|------------------------------------|-------------------------|
| 2 441 | 999.00 | 442.00 | 25.00 |

※Remark

1. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

9.4.2. Test plot

Test mode : BDR

A. Middle Ch. (2 441 MHz)



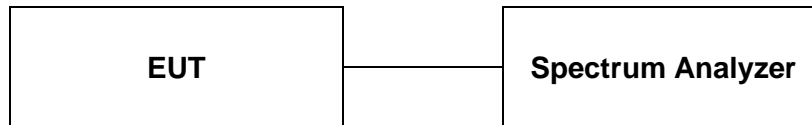
Test mode : EDR

A. Middle Ch. (2 441 MHz)



10. Number of hopping frequencies

10.1. Test setup



10.2. Limit

§15.247(a)(1)(iii) For frequency hopping system operating in the 2400-2483.5 MHz bands shall use at least 15 hopping frequencies.

10.3. Test procedure

Number of hopping frequencies is measured using the following procedure

1. Span = The frequency band of operation. Depending on the number of channels the device supports, it could be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. RBW = To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW \geq RBW.
4. Sweep time = No faster than coupled(auto) time.
5. Detector = peak
6. Trace mode = max hold
7. Allow the trace to stabilize.

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies.

Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A spectral plot of the data shall be included in the test report.

Where the device shares the same channel plan (carrier frequencies and number of channels) across multiple data rates or modulation schemes then the number of channels need only be measured for one of those modulation schemes or data rates.

10.4. Test results

Complied (Measurement data : refer to the next page)

10.4.1. Test data**Test mode : BDR**

| Number of Hopping Frequency | Limit |
|-----------------------------|-----------|
| 79 | ≥ 15 |

Test mode : EDR

| Number of Hopping Frequency | Limit |
|-----------------------------|-----------|
| 79 | ≥ 15 |

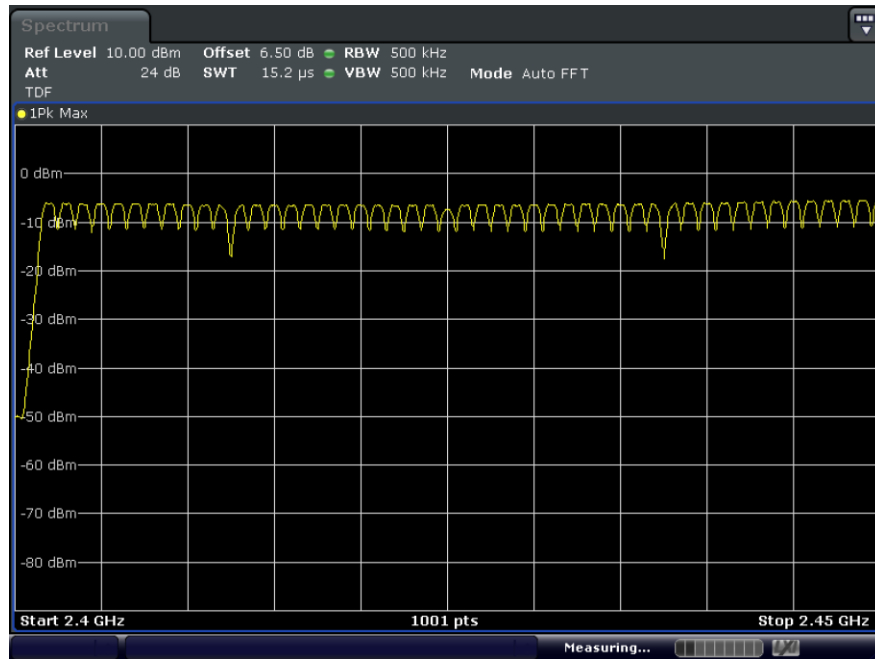
※Remark

1. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

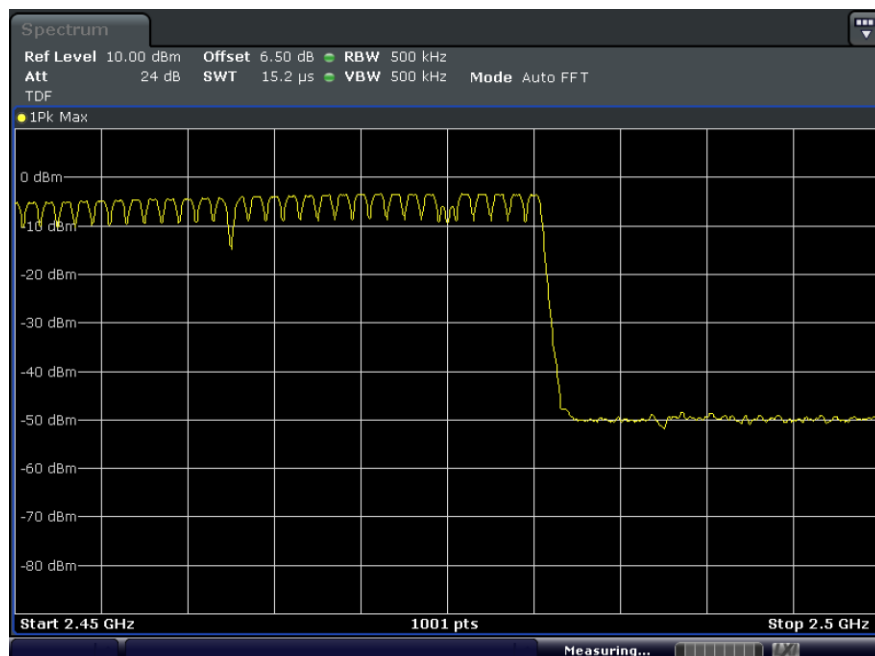
10.4.2. Test plot

Test mode : BDR

A. Lowest Band. (Hopping)

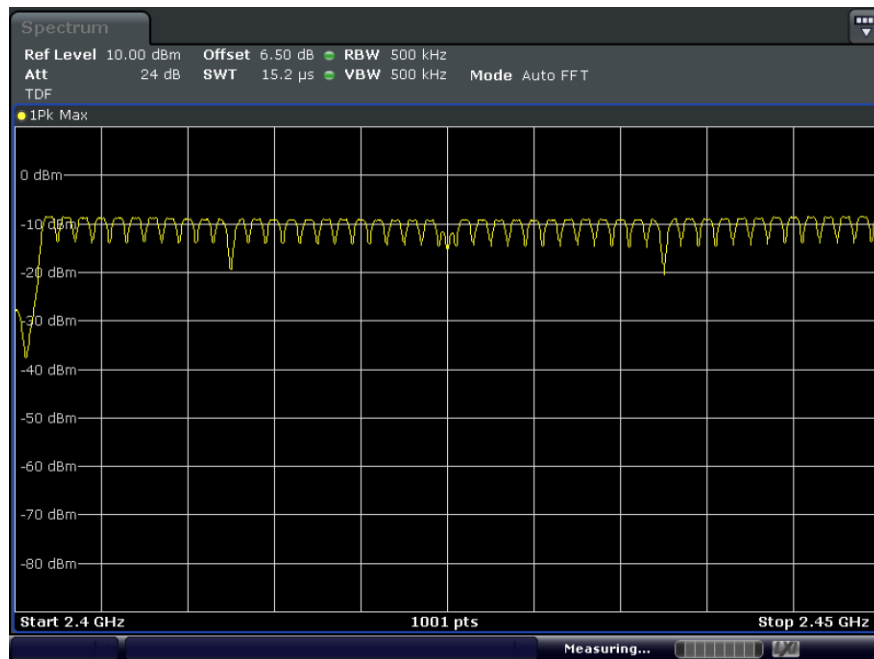


B. Highest Band. (Hopping)

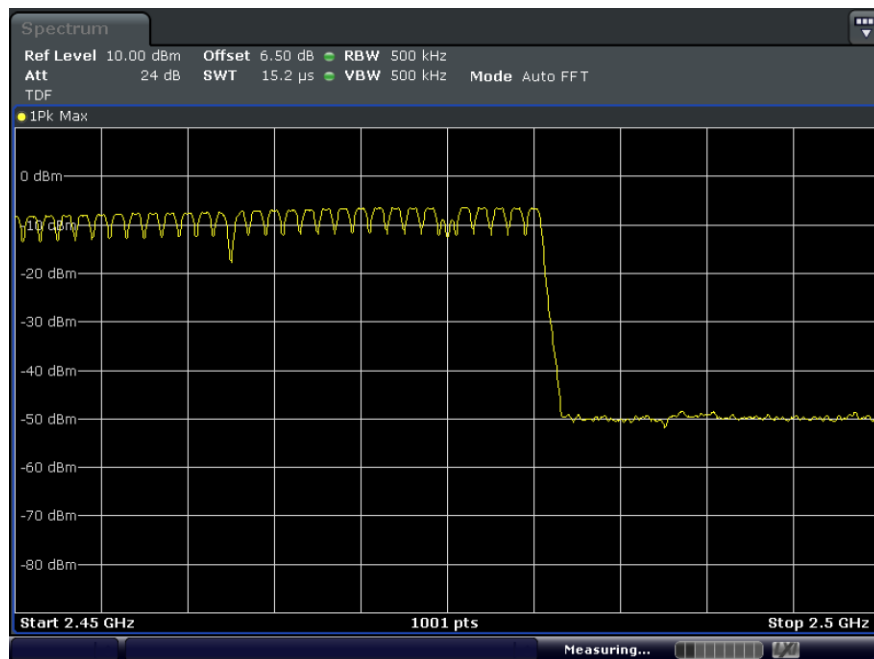


Test mode : EDR

A. Lowest Band. (Hopping)

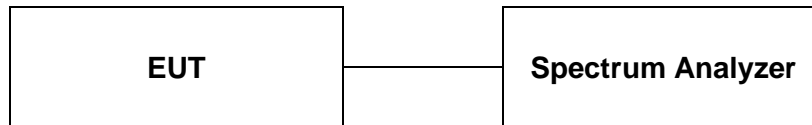


B. Highest Band. (Hopping)



11. Time of occupancy (Dwell time)

11.1. Test setup



11.2. Limit

§15.247(a)(1)(iii) For frequency hopping system operating in the 2 400 – 2 483.5 MHz band, the average time of occupancy on any frequency shall not be greater than 0.4 second within a 31.6 second period.

A period time = $0.4(s) * 79 = 31.6(s)$

11.3. Test procedure

Time of occupancy is measured using the following procedure

1. Span = Zero span, centered on a hopping channel.
2. RBW shall be \leq channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected transmission time per hop.
3. Sweep time = Set so that the start of the first transmission and end of the last transmission for the hop are clearly captured. Setting the sweep time to be slightly longer than the hopping period per channel (hopping period = $1 / \text{hopping rate}$) should achieve this.
4. Use a video trigger, where possible with a trigger delay, so that the start of the transmission is clearly observed. The trigger level might need adjustment to reduce the chance of triggering when the system hops on an adjacent channel.
5. Detector = peak
6. Trace mode = Clear write, single sweep.
7. Place markers at the start of the first transmission on the channel and at the end of the last transmission. The dwell time per hop is the time between these two markers.
8. The hopping rate is 1 600 per second.

11.4. Test results

Complied (Measurement data : refer to the next page)

11.4.1. Test data**Test mode : BDR**

| On Time [ms] | Hopping Rate | Result [s] | Limit [s] |
|-----------------|-----------------|---------------|--------------|
| 0.14 | 266.67 | 0.02 | 0.40 |

Test mode : EDR

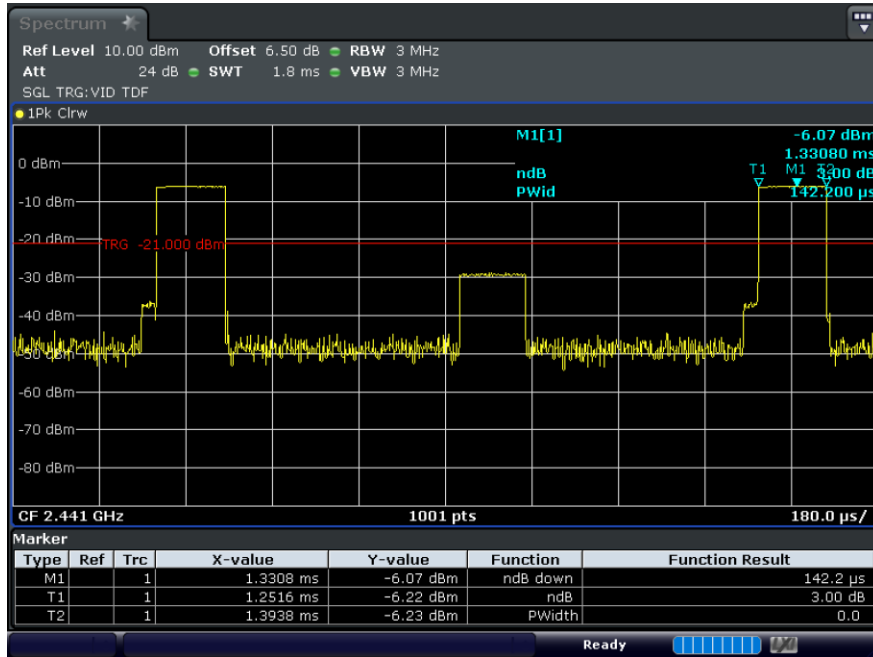
| On Time [ms] | Hopping Rate | Result [s] | Limit [s] |
|-----------------|-----------------|---------------|--------------|
| 0.14 | 266.67 | 0.02 | 0.40 |

※Remark

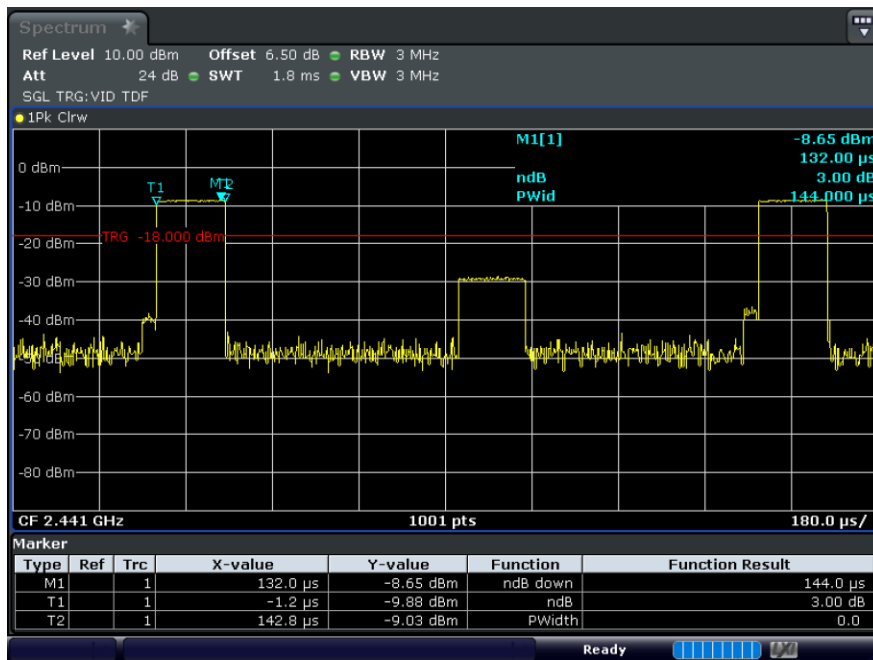
1. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

11.4.2. Test plot

Test mode : BDR



Test mode : EDR

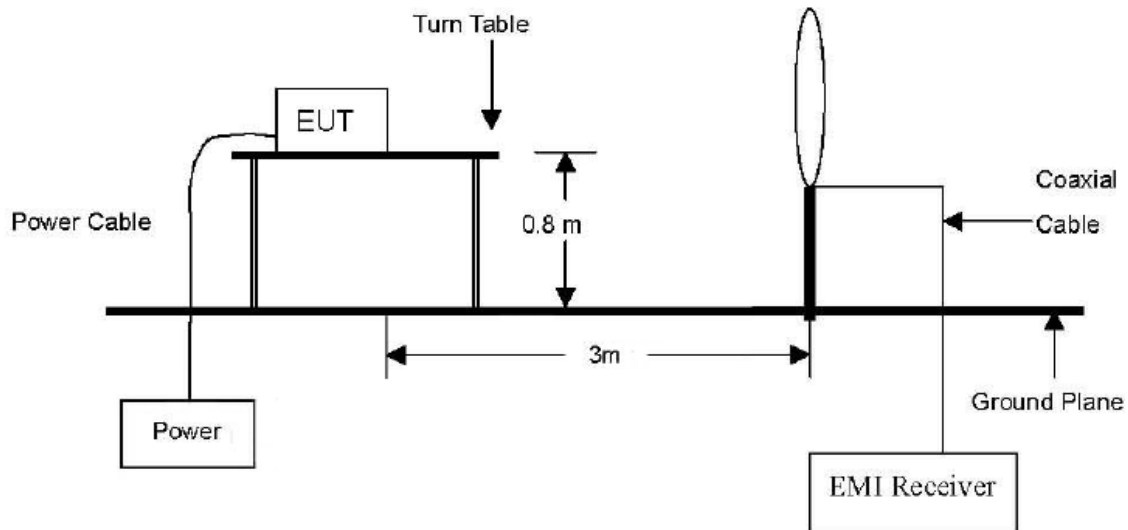


12. Transmitter radiated spurious emissions and conducted spurious emissions

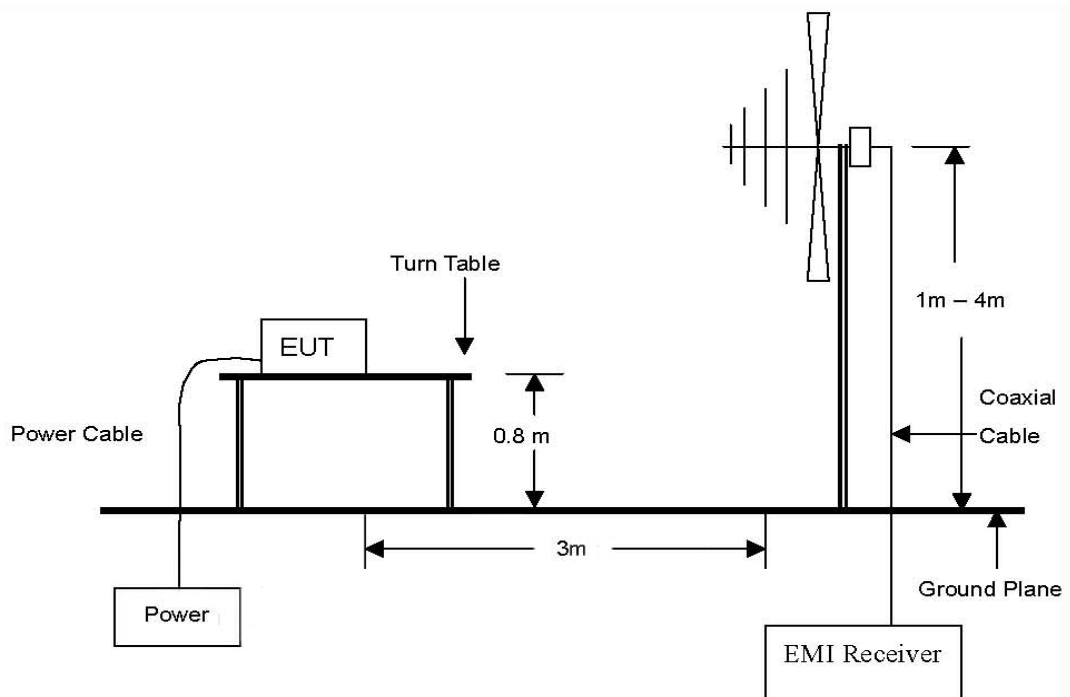
12.1. Test setup

12.1.1. Transmitter radiated spurious emissions

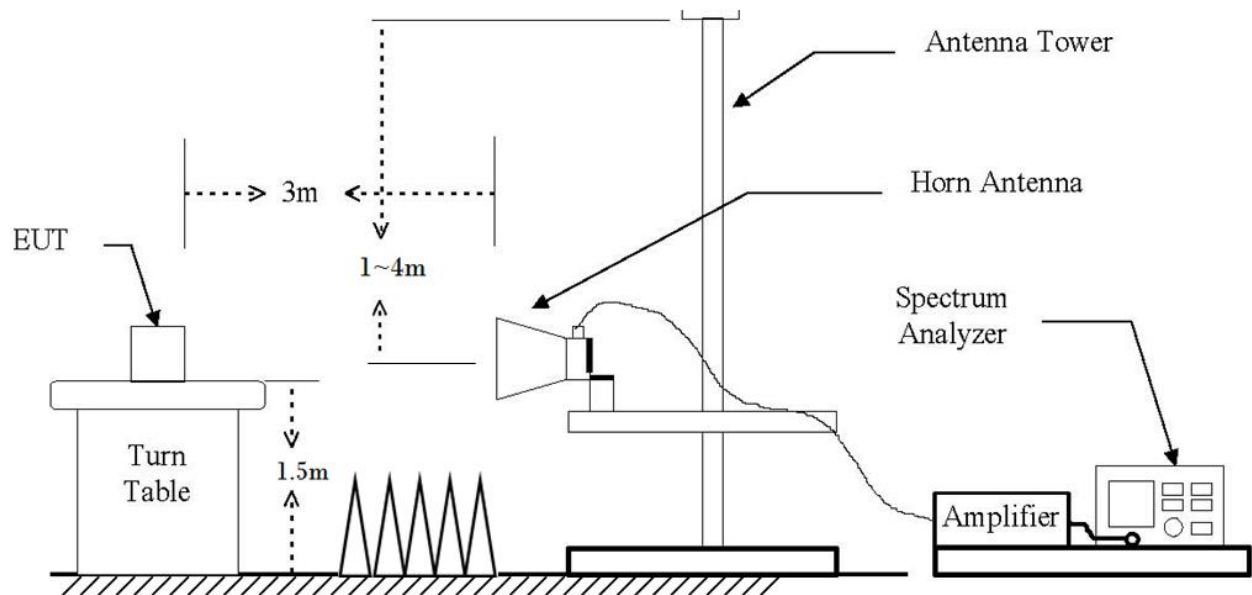
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 40 GHz emissions.



12.2. Limit

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph(b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section §15.205(a), must also comply the radiated emission limits specified in section §15.209(a) (see section §15.205(c))

According to § 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

| Frequency (MHz) | Distance (Meters) | Radiated at 3M (dBuV/m) | Radiated (uV/m) |
|-----------------|-------------------|-------------------------|-----------------|
| 0.009–0.490 | 300 | See the remark | 2400/F(kHz) |
| 0.490–1.705 | 30 | | 24000/F(kHz) |
| 1.705–30.0 | 30 | | 30 |
| 30 - 88 | 3 | 40.0 | 100 |
| 88 – 216 | 3 | 43.52 | 150 |
| 216 – 960 | 3 | 46.02 | 200 |
| Above 960 | 3 | 53.97 | 500 |

※Remark

1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =20log(Specific distance/ test distance)(dB)
Limit line=Specific limits(dBuV) + distance extrapolation factor.

12.3. Test procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.10:2020. In case of the air temperature of the test site is out of the range is 10 to 40 °C before the testing proceeds the warm-up time of EUT maintain adequately.

12.3.1. Test procedures for radiated spurious emissions

1. The EUT is placed on a turntable, which is 0.8 m (Below 1 GHz.)/ 1.5 m (Above 1GHz) above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

※Remark

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 10 kHz for Peak detection (PK) at frequency below 30 MHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) or Quasi-peak detection (QP) at frequency below 1 GHz.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 GHz.

12.3.2. Test procedures for conducted spurious emissions

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW=100 kHz, VBW=100 kHz.

12.4. Test results

12.4.1. Radiated spurious emissions (9 kHz to 30 MHz)

The frequency spectrum from 9 kHz to 30 MHz was investigated. Emission levels are not reported much lower than the limits by over 20 dB. All reading values are peak values.

To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

Test mode : BDR_2 402 MHz (Worst case)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|--|------------------|------|--------------------|-------------------|----------------|
| No other emissions were detected at a level greater than 20dB below limit. | | | | | |

※Remark

1. Result = Reading + Ant. factor - Amp + CL (Cable loss)

2. 15.31 Measurement standards.

The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

3. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

12.4.2. Radiated spurious emissions (30 MHz to 1 000 MHz)

The frequency spectrum from 30 MHz to 1 000 MHz was investigated. Emission levels are not reported much lower than the limits by over 20 dB. All reading values are peak values.

To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

Test mode : BDR_2 402 MHz (Worst case)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|----------------------------|---------------|------|-----------------|----------------|-------------|
| 74.22 | QP | V | 24.90 | 40.00 | 15.10 |
| 149.97 | QP | V | 40.10 | 43.50 | 3.40 |
| 636.38 | QP | H | 42.70 | 46.00 | 3.30 |
| Above 700 MHz Not detected | | | | | |

※Remark

1. Result = Reading + Ant. factor - Amp + CL (Cable loss)

2. 15.31 Measurement standards.

The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

3. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

12.4.3. Radiated spurious emissions & Bandedge (Above 1 000 MHz)

The frequency spectrum above 1 000 MHz was investigated. Emission levels are not reported much lower than the limits by over 20 dB.

To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes.

Test mode : BDR

A. Lowest Ch. (2 402 MHz)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|------------------------------|---------------|------|-----------------|----------------|-------------|
| *2 390.00 | Peak | H | 35.63 | 74.00 | 38.37 |
| 3 200.15 | Peak | V | 39.31 | 74.00 | 34.69 |
| *3 843.57 | Peak | H | 45.78 | 74.00 | 28.22 |
| Above 4 000 MHz Not detected | | | | | |

B. Middle Ch. (2 441 MHz)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|------------------------------|---------------|------|-----------------|----------------|-------------|
| 3 200.05 | Peak | V | 39.09 | 74.00 | 34.91 |
| *3 850.01 | Peak | H | 47.07 | 74.00 | 26.93 |
| Above 4 000 MHz Not detected | | | | | |

※Remark

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental Frequency.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
3. Actual = Reading + Ant. factor - Amp + CL (Cable loss) + DCCF
4. 15.31 Measurement standards.
The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.
5. * is Restricted band.
6. Average measurement did not take place because the peak data did not exceed average limit
7. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

C. Highest Ch. (2 480 MHz)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|------------------------------|---------------|------|-----------------|----------------|-------------|
| *2 498.51 | Peak | V | 24.80 | 74.00 | 49.20 |
| 3 199.90 | Peak | V | 39.33 | 74.00 | 34.67 |
| *3 968.65 | Peak | H | 45.89 | 74.00 | 28.11 |
| Above 4 000 MHz Not detected | | | | | |

※Remark

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental Frequency.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
3. Actual = Reading + Ant. factor - Amp + CL (Cable loss) + DCCF
4. 15.31 Measurement standards.
The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.
5. * is Restricted band.
6. Average measurement did not take place because the peak data did not exceed average limit
7. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

Test mode : EDR

A. Lowest Ch. (2 402 MHz)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|------------------------------|---------------|------|-----------------|----------------|-------------|
| *2 326.50 | Peak | H | 25.24 | 74.00 | 48.76 |
| 3 199.95 | Peak | V | 38.63 | 74.00 | 35.37 |
| *3 843.20 | Peak | H | 45.73 | 74.00 | 28.27 |
| Above 4 000 MHz Not detected | | | | | |

B. Middle Ch. (2 441 MHz)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|------------------------------|---------------|------|-----------------|----------------|-------------|
| 3 200.00 | Peak | V | 39.04 | 74.00 | 34.96 |
| *3 860.89 | Peak | H | 45.14 | 74.00 | 28.86 |
| Above 4 000 MHz Not detected | | | | | |

※Remark

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental Frequency.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
3. Actual = Reading + Ant. factor - Amp + CL (Cable loss) + DCCF
4. 15.31 Measurement standards.
The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.
5. * is Restricted band.
6. Average measurement did not take place because the peak data did not exceed average limit
7. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

C. Highest Ch. (2 480 MHz)

| Frequency (MHz) | Detector Mode | Pol. | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|------------------------------|---------------|------|-----------------|----------------|-------------|
| *2 496.18 | Peak | H | 25.51 | 74.00 | 48.49 |
| 3 200.00 | Peak | V | 39.45 | 74.00 | 34.55 |
| *3 968.00 | Peak | H | 46.39 | 74.00 | 27.61 |
| Above 4 000 MHz Not detected | | | | | |

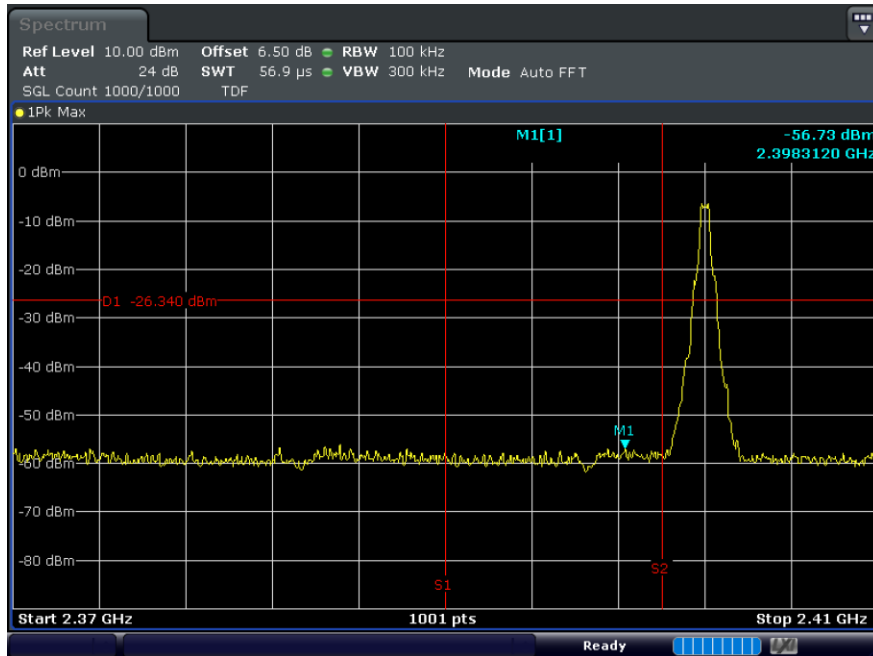
※Remark

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental Frequency.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
3. Actual = Reading + Ant. factor - Amp + CL (Cable loss) + DCCF
4. 15.31 Measurement standards.
The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.
5. * is Restricted band.
6. Average measurement did not take place because the peak data did not exceed average limit
7. These results are satisfied in accordance with decision rules, including measurements and estimates of measurement uncertainty

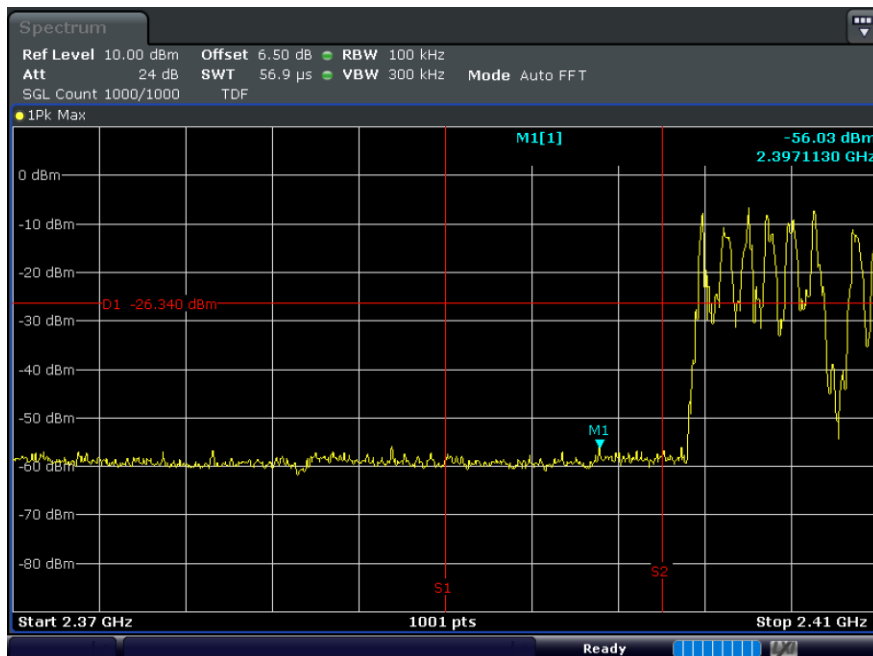
12.4.4. Test plot (Conducted spurious emissions & Bandedge)

Test mode : BDR

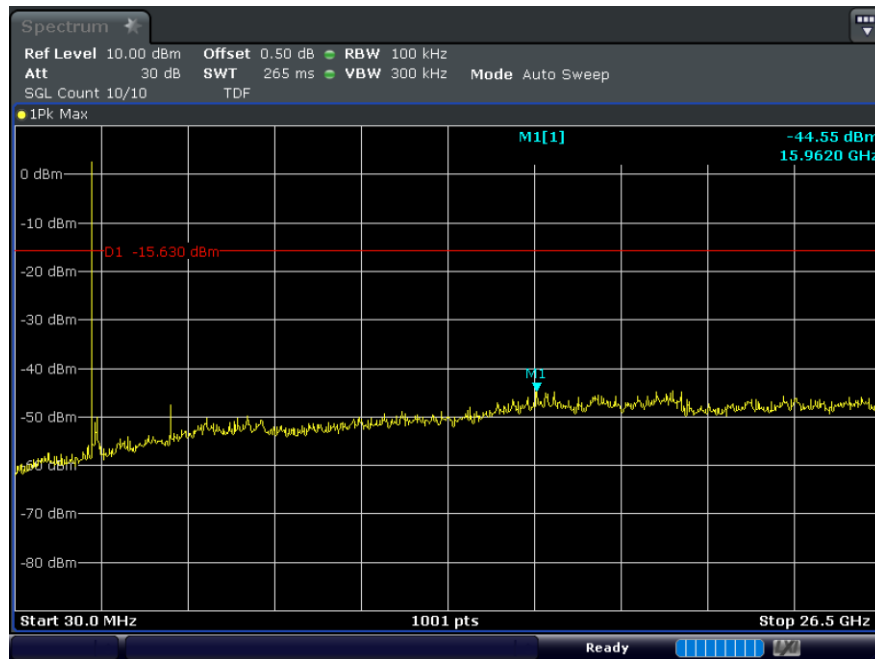
A.1. Lowest Ch. (2 402 MHz)_Band edge



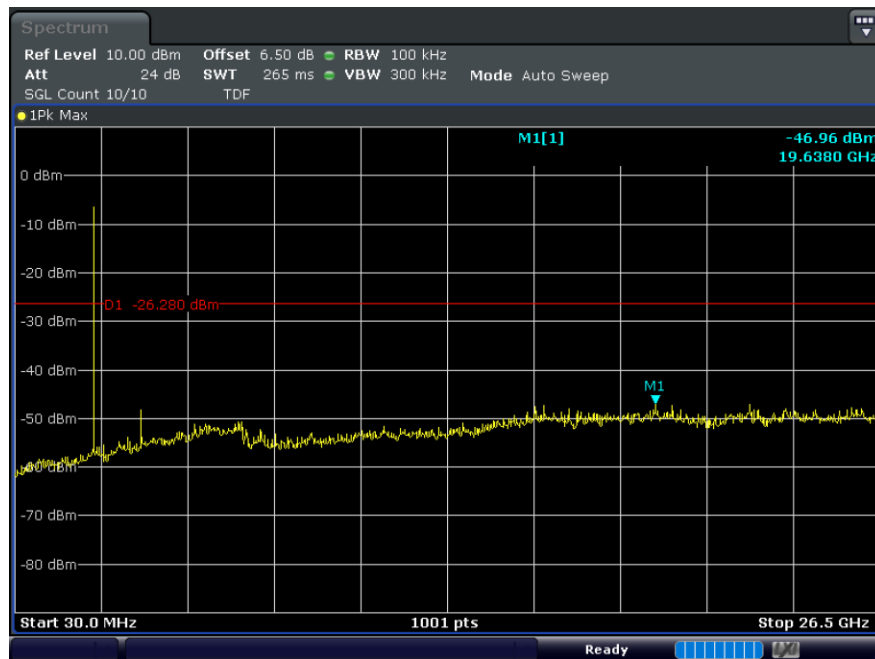
A.2. Lowest Ch. (2 402 MHz)_Band edge(Hopping)



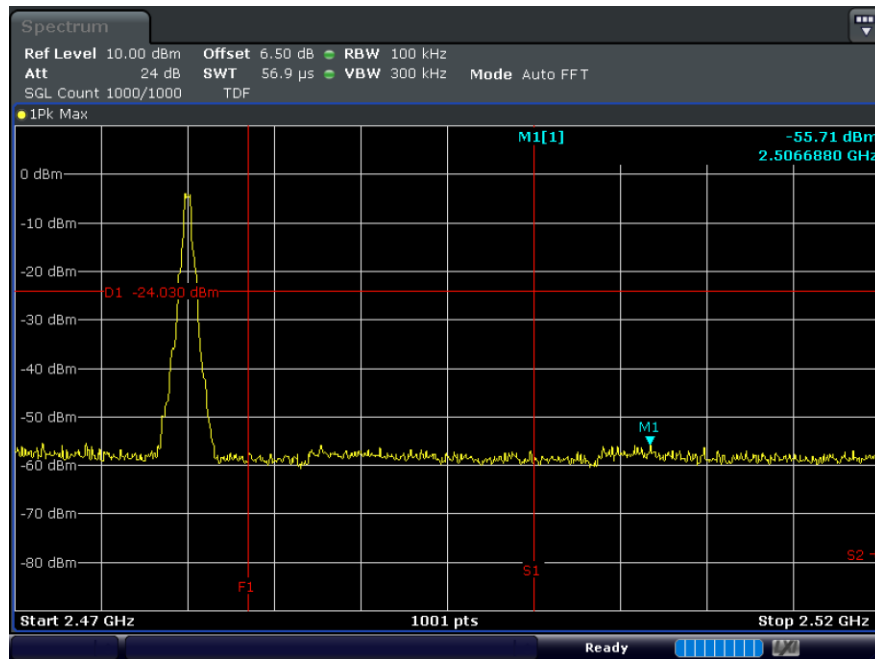
A.3. Lowest Ch. (2 402 MHz)_Spurious emissions



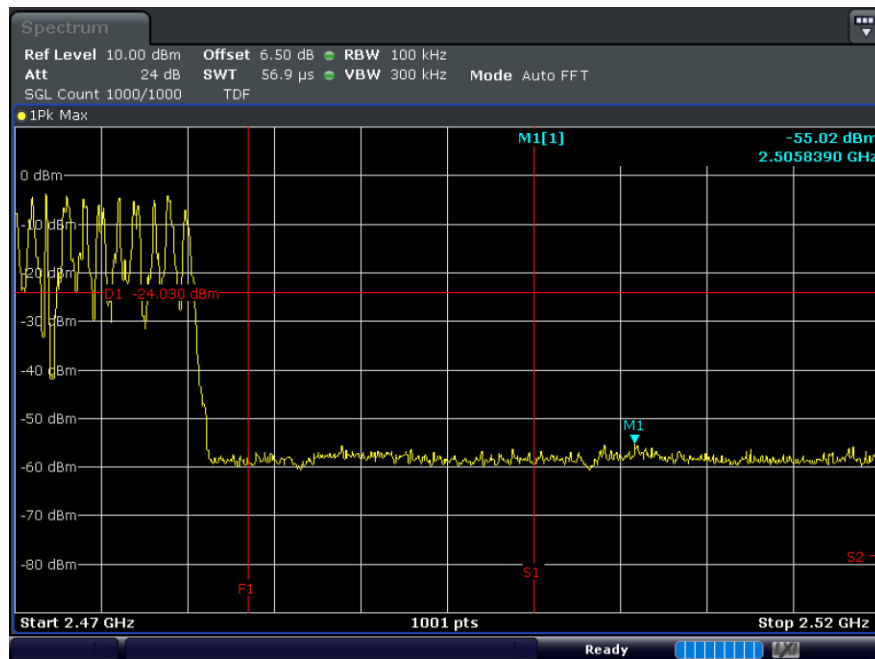
B.1. Middle Ch. (2 441 MHz)_Spurious emissions



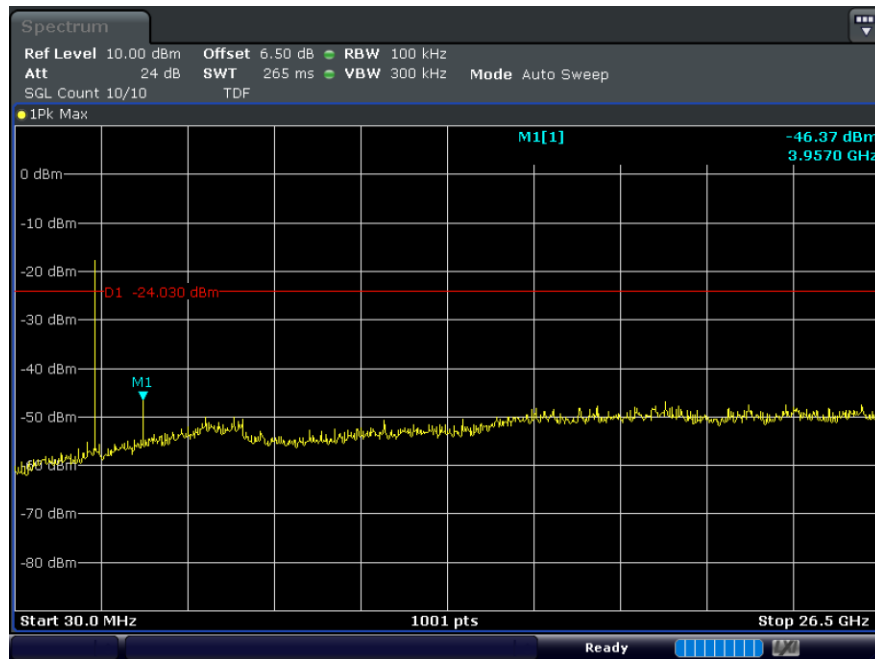
C.1. Highest Ch. (2 480 MHz)_Band edge



C.2. Highest Ch. (2 480 MHz)_Band edge(Hopping)

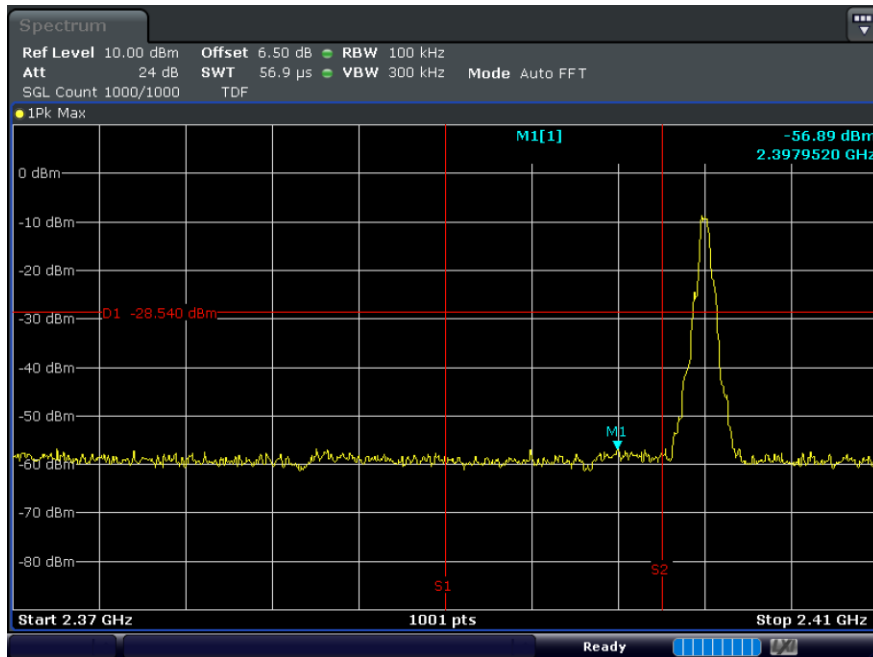


C.3. Highest Ch. (2 480 MHz)_Spurious emissions

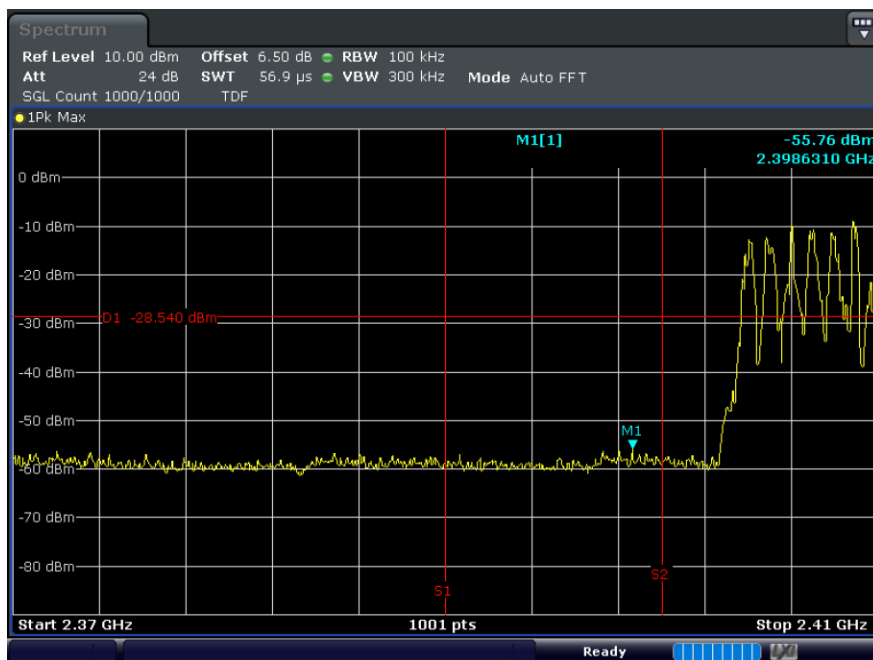


Test mode : EDR

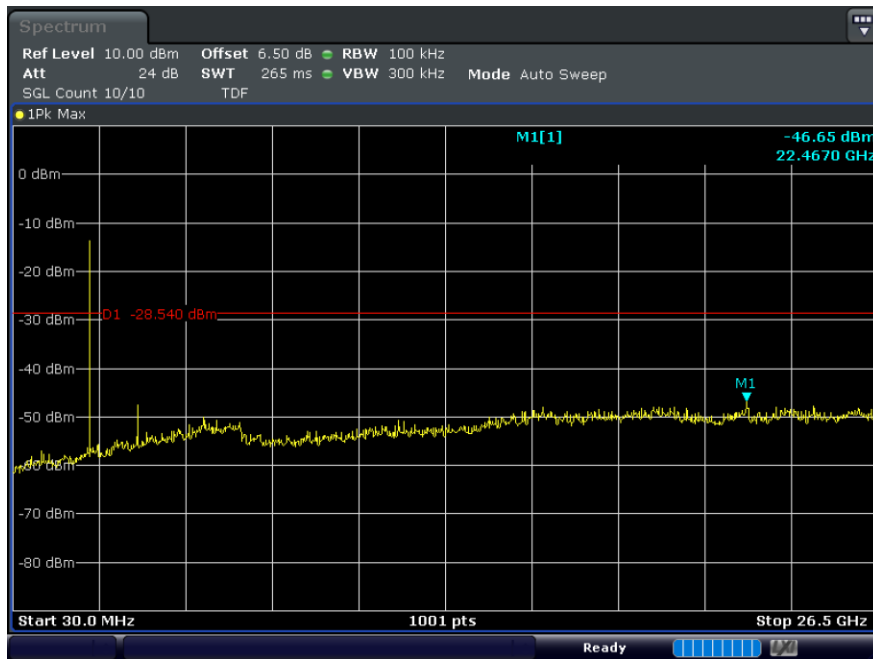
A.1. Lowest Ch. (2 402 MHz)_Band edge



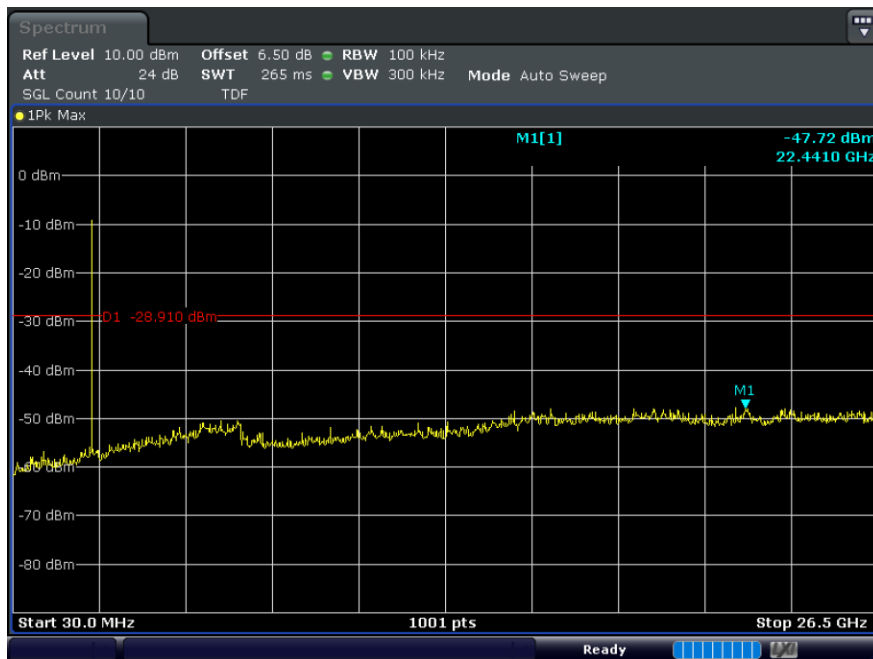
A.2. Lowest Ch. (2 402 MHz)_Band edge(Hopping)



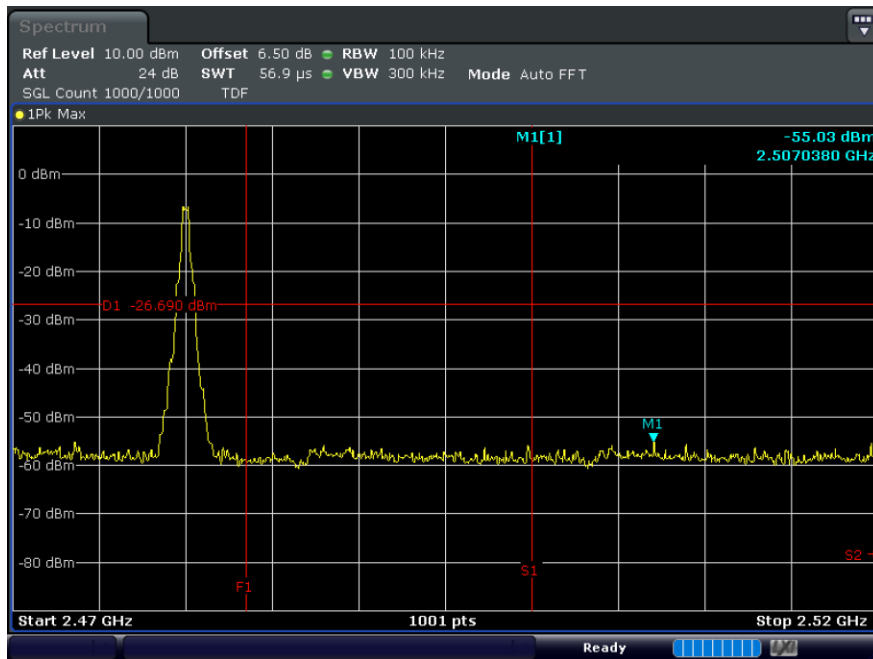
A.3. Lowest Ch. (2 402 MHz)_Spurious emissions



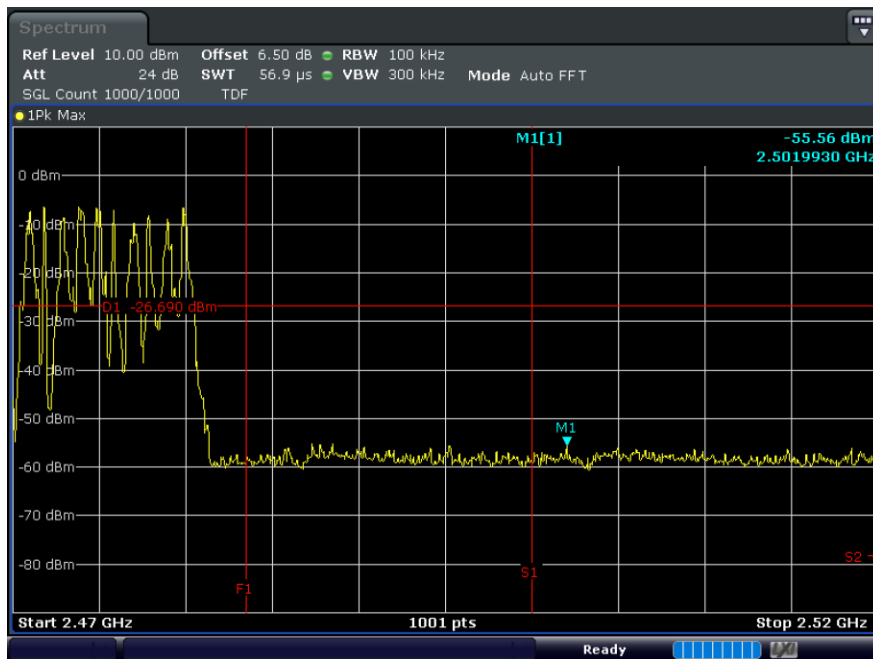
B.1. Middle Ch. (2 441 MHz)_Spurious emissions



C.1. Highest Ch. (2 480 MHz)_Band edge



C.2. Highest Ch. (2 480 MHz)_Band edge(Hopping)



C.3. Highest Ch. (2 480 MHz)_Spurious emissions

