

## Certification Radio test report

**According to the standard:**

CFR 47 FCC PART 15

RSS GEN – Issue 5

RSS 247 – Issue 2

**Equipment under test:**

**S-lynks gateway**

**FCC ID: KQ9-0A01A**

**IC NUMBER: 1317A-0A01A**

**Company:**

**SERCEL Inc**

**Distribution:** Mr TIJOU

**(Company:** SERCEL NANTES)

**Number of pages:** 78 with 1 appendix

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|-----|-----------|---------------------|------------------------------------------------|------|
|     |           |                     | Name and Function                              | Visa |
| 0   | 16-Jan-24 | Creation            | S. LOUIS, Radio Technician                     |      |

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**DESIGNATION OF PRODUCT:** S-lynks gateway

**Serial number (S/N):** EDE565C20271E0004  
EDE565C20271E0007

**Reference / model (P/N):** S-lynks gateway

**Software version:** SLBB\_F V4 S38/20

**MANUFACTURER:** SERCEL Inc

**COMPANY CERTIFYING THE PRODUCT:**

**Company:** SERCEL Inc

**Address:** 17200 Park Row  
TEXAS 77084  
UNITED STATES

**Responsible:** Mr WENTZLER

**COMPANY SUBMITTING THE PRODUCT:**

**Company:** SERCEL NANTES

**Address:** 16 RUE DU BEL AIR  
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**Responsible:** Mr TIJOU

**Person(s) present during the tests:** Mr DESSARCE, the first two days (company: SERCEL)  
Mr PORCHEL, the first day (company: MODULIC)

**DATES OF TEST:** From 1-Dec-20 to 7-Dec-20

**TESTING LOCATION:** EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE

FCC Accredited under US-EU MRA Designation Number: FR0009  
Test Firm Registration Number: 873677

ISED Accredited under CANADA-EU MRA Designation Number: FR0001  
Industry Canada Registration Number: 4452A

**TESTED BY:** M. DUMESNIL

**VISA:**

**WRITTEN BY:** M. DUMESNIL

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## 1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **S-lynks gateway**, in accordance with normative reference.

The product integrates the followings radio functions:

- GNSS receiver
- Wi-Fi 2.4GHz radio part not already certified,
- 2G and LTE-M module already certified (FCC ID : N7NWP77B and IC ID : 2417C-WP77B)
- LoRa radio part not already certified,

This report concern only Wi-Fi 2.4GHz function.

## 2. PRODUCT DESCRIPTION

Category of equipment (ISED): I

Class: A

Utilization: Industrial

Antenna type and gain: The product possesses one external antenna (BKR2400) and two internal antennas.  
The product can emit on the external antenna (SISO) or on the internal antennas as follow:

- For mode b and g the product emit on chains one (SISO), however the mode n the product can emit on the chain one (SISO) or chain one and two (MIMO).

Internal PCB antennas : Antenna 1 Gain at 2412MHz => +4.70dBi

Antenna 1 Gain at 2437MHz => +3.75dBi

Antenna 1 Gain at 2462MHz => +3.48dBi

Antenna 2 Gain at 2412MHz => +3.18dBi

Antenna 2 Gain at 2437MHz => +3.17dBi

Antenna 2 Gain at 2462MHz => +2.05dBi

External dipole antenna (BKR2400) with SMA connector: Gain => +2dBi

Operating frequency range: From 2400 MHz to 2483.5 MHz

Number of channels: 11

Channel spacing: 5MHz

Channel bandwidth: 20 MHz

|                                                                                                                                                                             |                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Modulation:                                                                                                                                                                 | DBPSK<br>OFDM: BPSK<br>OFDM: 64-QAM                                                                                                                                                            |
| Channel tested:                                                                                                                                                             | Channel 1: 2412 MHz<br>Channel 6: 2437 MHz<br>Channel 11: 2462 MHz                                                                                                                             |
| Mode tested:                                                                                                                                                                | 802.11 b SISO<br>802.11 g SISO<br>802.11 n SISO and MIMO (MIMO with internal antennas only)                                                                                                    |
| Data rate:                                                                                                                                                                  | For 802.11b: 1Mbit/s<br>For 802.11g: 6Mbit/s<br>For 802.11n: MCS0                                                                                                                              |
| Correlated signal:                                                                                                                                                          | For mode n the signals are considered as correlated, the mode cyclic delay diversity (CDD) is used. (IEEE 802.11)<br>The product is not using spatial multiplexing or intentional beamforming. |
| Power source:                                                                                                                                                               | Internal battery 7.2Vdc or 12Vdc external power source.                                                                                                                                        |
| Power level adjusted to                                                                                                                                                     | +16 dBm by software                                                                                                                                                                            |
| Power level, frequency range and channels characteristics are not user adjustable.<br>The details pictures of the product and the circuit boards are joined with this file. |                                                                                                                                                                                                |

**3. NORMATIVE REFERENCE**

The standards and testing methods related throughout this report are those listed below.

They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

|                                               |                                                                                                                                                                                           |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CFR 47 FCC Part 15 (2020)                     | Radio Frequency Devices                                                                                                                                                                   |
| ANSI C63.10                                   | 2013<br>Procedures for Compliance Testing of Unlicensed Wireless Devices.                                                                                                                 |
| 558074 D01 DTS v05 r02                        | Guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules. |
| 662911 D01 Multiple Transmitter Output V02r01 | Emissions Testing of Transmitters with Multiple Outputs in the Same Band                                                                                                                  |
| RSP-100                                       | Issue 12, August 2019<br>Certification of Radio Apparatus                                                                                                                                 |
| RSS-Gen                                       | Issue 5, April 2018<br>General Requirements for Compliance of Radio Apparatus                                                                                                             |
| RSS-247                                       | Issue 2, February 2017<br>Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices                                    |

**4. TEST METHODOLOGY**

Radio performance tests procedures given in CFR 47 part 15:

Subpart C – Intentional Radiators

- Paragraph 203: Antenna requirement
- Paragraph 205: Restricted bands of operation
- Paragraph 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements
- Paragraph 212: Modular transmitter
- Paragraph 215: Additional provisions to the general radiated emission limitations
- Paragraph 247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

Radio performance tests procedures given in RSS-Gen:

- Paragraph 2 - General
- Paragraph 3 - Normative publications and related documents
- Paragraph 4 - Labelling requirements
- Paragraph 6 - General administrative and technical requirements
- Paragraph 8 - Licence-exempt Radio Apparatus

Radio performance tests procedures given in RSS-247:

- Paragraph 3 - Certification requirements
- Paragraph 4 - Measurement method
- Paragraph 5 - Standard specifications for frequency hopping systems and digital transmission systems operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz

**5. TEST EQUIPMENT CALIBRATION DATES**

| Emitech Number | Model                        | Type                                      | Last calibration | Calibration interval (years) | Next calibration due |
|----------------|------------------------------|-------------------------------------------|------------------|------------------------------|----------------------|
| 0              | BAT-EMC V3.18.0.26           | Software                                  | /                | /                            | /                    |
| 1406           | EMCO 6502                    | Loop antenna                              | 24/04/2020       | 1                            | 24/04/2021           |
| 2507           | 20dB                         | Attenuator                                | 21/03/2019       | 3                            | 20/03/2022           |
| 4087           | Filtek LP03/1000-7GH         | Low Pass Filter                           | 25/02/2020       | 3                            | 24/02/2023           |
| 4088           | R&S FSP40                    | Spectrum Analyzer                         | 04/05/2020       | 2                            | 04/05/2022           |
| 4195           | Hewlett Packard E3610A       | Power source                              | (1)              | (1)                          | (1)                  |
| 6796           | R&S FSP7                     | Spectrum Analyzer                         | 21/08/2019       | 2                            | 20/08/2021           |
| 7124           | A.H. Systems SAS-572         | Antenna                                   | 05/01/2019       | 3                            | 04/01/2022           |
| 7171           | R&S HL223                    | Antenna                                   | 19/04/2019       | 3                            | 18/04/2022           |
| 7190           | R&S HL223                    | Antenna                                   | 09/03/2019       | 3                            | 08/03/2022           |
| 7240           | Emco 3110                    | Biconical antenna                         | 09/03/2019       | 3                            | 08/03/2022           |
| 7298           | Microtronics BRM50702        | Reject band filter                        | 25/02/2020       | 3                            | 24/02/2023           |
| 7566           | Testo 608-H1                 | Meteo station                             | 22/09/2020       | 2                            | 22/09/2022           |
| 8528           | Schwarzbeck VHA 9103         | Biconical antenna                         | 09/03/2019       | 3                            | 08/03/2022           |
| 8704           | LUCIX Corp S180265L3201 LNA  | Low-noise amplifier                       | 08/09/2020       | 1                            | 08/09/2021           |
| 8707           | R&S ESI7                     | Test receiver                             | 29/06/2020       | 1                            | 29/06/2021           |
| 8732           | Emitech                      | OATS                                      | 03/07/2019       | 3                            | 02/07/2022           |
| 8750           | La Crosse Technology WS-9232 | Meteo station                             | 22/09/2020       | 2                            | 22/09/2022           |
| 8855           | EMITECH                      | Turntable and mat controller              | /                | /                            | /                    |
| 8864           | Champ libre Juigné. V3.5     | Software                                  | /                | /                            | /                    |
| 8896           | ACQUISYS GPS8                | Satellite synchronized frequency standard | /                | /                            | /                    |
| 8974           | STORM MICROWAE k-20cm        | cable                                     | 14/11/2019       | 2                            | 13/11/2021           |
| 9266           | Pasternack DC-18GHz 10dB 2W  | Attenuator                                | 28/09/2018       | 3                            | 27/09/2021           |
| 9398           | N-1.5m                       | cable                                     | 11/06/2020       | 2                            | 11/06/2022           |
| 10730          | Mini-circuit ZFL-1000LN      | Low-noise amplifier                       | 14/02/2020       | 1                            | 13/02/2021           |
| 10759          | COMTEST Cage 3               | Anechoic chamber                          | /                | /                            | /                    |



| Emitech Number | Model                       | Type                             | Last calibration | Calibration interval (years) | Next calibration due |
|----------------|-----------------------------|----------------------------------|------------------|------------------------------|----------------------|
| 10771          | EMCO 3117                   | Antenna                          | 30/11/2019       | 3                            | 29/11/2022           |
| 10789          | MATURO                      | Turntable and mat controller NCD | /                | /                            | /                    |
| 11592          | R&S NRV-Z86                 | Power Sensor                     | 27/08/2019       | 2                            | 26/08/2021           |
| 12590          | LUCIX Corp<br>S005180M3201  | Low-noise amplifier              | 05/08/2020       | 1                            | 05/08/2021           |
| 12912          | Huber + Suhner N-5m         | cable                            | 11/06/2020       | 2                            | 11/06/2022           |
| 12917          | SUCOFLEX K-2m               | cable                            | 26/05/2020       | 2                            | 26/05/2022           |
| 14302          | SUCOFLEX N-1m               | cable                            | 15/12/2018       | 2                            | 14/12/2020           |
| 14303          | SUCOFLEX N-2m               | cable                            | 15/12/2018       | 2                            | 14/12/2020           |
| 14304          | SUCOFLEX N-2.5m             | cable                            | 15/12/2018       | 2                            | 14/12/2020           |
| 14475          | Oregon Scientific<br>BAR206 | Meteo station                    | 24/09/2019       | 2                            | 23/09/2021           |
| 14903          | Fluke 177                   | Multimeter                       | 25/02/2020       | 2                            | 24/02/2022           |
| 15666          | R&S FSV40                   | Spectrum Analyzer                | 24/09/2020       | 2                            | 24/09/2022           |
| 16109          | C&C HPF180400               | High pass filter                 | 26/03/2019       | 3                            | 25/03/2022           |

(1) The equipment is not verified; instead, the output voltage is checked before each measurement with the calibrated multimeter.

## 6. TESTS RESULTS SUMMARY

### 6.1 CFR 47 part 15 requirements

| Test procedure  | Description of test                                                       | Respected criteria? |    |     |     | Comment |
|-----------------|---------------------------------------------------------------------------|---------------------|----|-----|-----|---------|
|                 |                                                                           | Yes                 | No | NAP | NAs |         |
| FCC Part 15.203 | ANTENNA REQUIREMENT                                                       |                     |    | X   |     | Note 1  |
| FCC Part 15.205 | RESTRICTED BANDS OF OPERATION                                             | X                   |    |     |     |         |
| FCC Part 15.207 | CONDUCTED LIMITS                                                          |                     |    | X   |     |         |
| FCC Part 15.209 | RADIATED EMISSION LIMITS; general requirements                            | X                   |    |     |     | Note 2  |
| FCC Part 15.212 | MODULAR TRANSMITTERS                                                      |                     |    | X   |     |         |
| FCC part 15.215 | ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSION LIMITATIONS        |                     |    |     |     |         |
|                 | (a) Alternative to general radiated emission limits                       | X                   |    |     |     |         |
|                 | (b) Unwanted emissions outside of §15.247 frequency bands                 | X                   |    |     |     | Note 3  |
|                 | (c) 20 dB bandwidth and band-edge compliance                              | X                   |    |     |     |         |
| FCC Part 15.247 | OPERATION WITHIN THE BANDS 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz |                     |    |     |     |         |
|                 | (a) (1) Hopping systems                                                   |                     |    | X   |     |         |
|                 | (a) (2) Digital modulation techniques                                     | X                   |    |     |     | Note 4  |
|                 | (b) Maximum peak output power                                             | X                   |    |     |     |         |
|                 | (c) Operation with directional antenna gains > 6 dBi                      |                     |    | X   |     |         |
|                 | (d) Intentional radiator                                                  | X                   |    |     |     |         |
|                 | (e) Peak power spectral density                                           | X                   |    |     |     |         |
|                 | (f) Hybrid system                                                         |                     |    | X   |     |         |
|                 | (g) Frequency hopping requirements                                        |                     |    | X   |     |         |
|                 | (h) Frequency hopping intelligence                                        |                     |    | X   |     |         |
|                 | (i) RF exposure compliance                                                | X                   |    |     |     |         |

NAP: Not Applicable

NAs: Not Asked

Note 1: Professionally installed equipment.

Note 2: See FCC part 15.247 (d).

Note 3: See FCC part 15.209. Unwanted emissions levels are all below the fundamental emission field strength level.

Note 4: The minimum 6 dB bandwidth of the equipment is 9012,5 kHz for 802.11b modulation on channel 1.

## 6.2 RSS-Gen requirements

| Test procedure | Description of test                                           | Criteria respected ? |    |     |     | Comment                     |
|----------------|---------------------------------------------------------------|----------------------|----|-----|-----|-----------------------------|
|                |                                                               | Yes                  | No | NAp | NAs |                             |
| Paragraph 8    | Licence-exempt radio apparatus                                |                      |    |     |     |                             |
| § 8.1          | Measurement Bandwidths and Detector Functions                 | X                    |    |     |     |                             |
| § 8.2          | Pulsed operation                                              | X                    |    |     |     |                             |
| § 8.3          | Prohibition of amplifiers                                     | X                    |    |     |     |                             |
| § 8.4          | User manual notice                                            | X                    |    |     |     | see certification documents |
| § 8.5          | Measurement of licence-exempt devices on-site (in-situ)       |                      |    | X   |     |                             |
| § 8.6          | Operating frequency range of devices in master/slave networks | X                    |    |     |     |                             |
| § 8.7          | Radio frequency identification (RFID) devices                 |                      |    | X   |     |                             |
| § 8.8          | AC power line conducted emissions limits                      |                      |    | X   |     |                             |
| § 8.9          | Transmitter emission limits                                   | X                    |    |     |     |                             |
| § 8.10         | Restricted frequency bands                                    | X                    |    |     |     |                             |
| § 8.11         | Frequency stability                                           |                      |    | X   |     |                             |

NAp: Not Applicable

NAs: Not Asked

## 6.3 RSS-247 requirements

| Test Procedure RSS-247 | Description of test                                                                                                                                         | Criteria respected ? |    |     |     | Comment |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----|-----|-----|---------|
|                        |                                                                                                                                                             | Yes                  | No | NAp | NAs |         |
| Paragraph 5            | Standard specifications for frequency hopping system and digital transmission systems operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz |                      |    |     |     |         |
| 5.1                    | Frequency hopping systems (FHSS)                                                                                                                            |                      |    | X   |     |         |
| 5.2                    | Digital transmission systems                                                                                                                                | X                    |    |     |     | Note    |
| 5.3                    | Hybrid systems                                                                                                                                              |                      |    | X   |     |         |
| 5.4                    | Transmitter output power and equivalent isotropically radiated power (e.i.r.p.) requirements                                                                | X                    |    |     |     |         |
| 5.5                    | Unwanted emissions                                                                                                                                          | X                    |    |     |     |         |

NAp: Not Applicable

NAs: Not Asked

Note: The minimum 6 dB bandwidth of the equipment is 9012,5 kHz for 802.11b modulation on channel 1.

**7. MEASUREMENT UNCERTAINTY**

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s)

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for normal distribution corresponds to a coverage probability of approximately 95%.

| Parameter                          | Emitech<br>Uncertainty          |
|------------------------------------|---------------------------------|
| RF power, conducted                | $\pm 0.75\text{dB}$             |
| Radiated emission valid to 26 GHz  |                                 |
| F < 62.5 MHz:                      | $\pm 5.14\text{ dB}$            |
| 62.5 MHz < F < 1 GHz:              | $\pm 5.13\text{ dB}$            |
| 1 GHz < F < 26 GHz:                | $\pm 5.16\text{ dB}$            |
| AC Power Lines conducted emissions | $\pm 3.38\text{ dB}$            |
| Temperature                        | $\pm 1\text{ }^{\circ}\text{C}$ |
| Humidity                           | $\pm 5\text{ \%}$               |

## 8. OCCUPIED BANDWIDTH

Temperature (°C) : 20.9-21.3

Humidity (%HR): 38.2-40

Date : December 3, 2019 and  
December 4, 2019

Technician : M. DUMESNILM.  
DUMESNIL

Standard: FCC Part 15  
RSS-247

### Test procedure:

Method of paragraphs 11.8 of ANSI C63.10 (6dB Measurement)

Method of paragraphs 6.9.3 of ANSI C63.10 (99% Measurement)

### Test set up:

#### Conducted test

#### Setting:

| Measure          | 6dB                                                    | 99%                    |
|------------------|--------------------------------------------------------|------------------------|
| Center frequency | The centre frequency of the channel under test         |                        |
| Detector         | Peak                                                   |                        |
| Span             | Large enough to capture all products of the modulation | 1.5 to 5 times the OBW |
| RBW              | 100kHz                                                 | 1% to 5% of the OBW    |
| VBW              | 300kHz                                                 | 3 x RBW                |
| Trace            | Max hold                                               |                        |
| Sweep            | Auto                                                   |                        |

### Test operating condition of the equipment:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate (P Software adjusted to +16 dBm).

Power source: 12Vdc by an external power supply

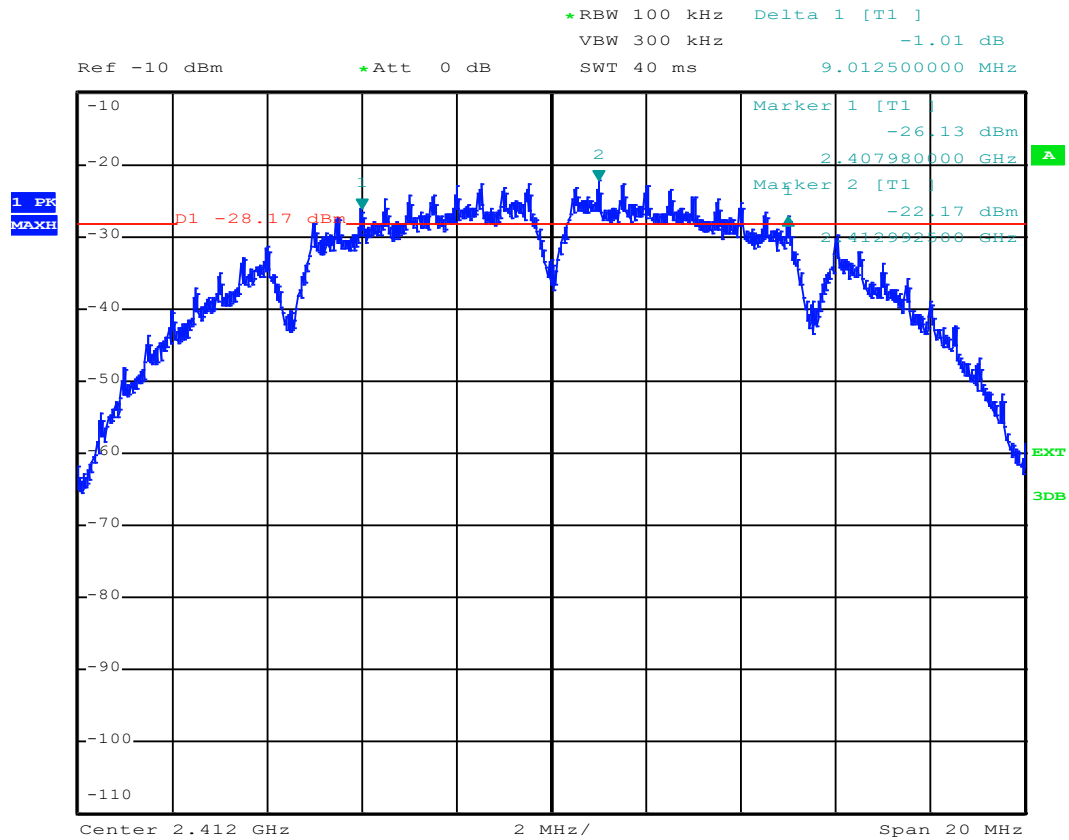
Percentage of voltage variation during the test (%):

± 1

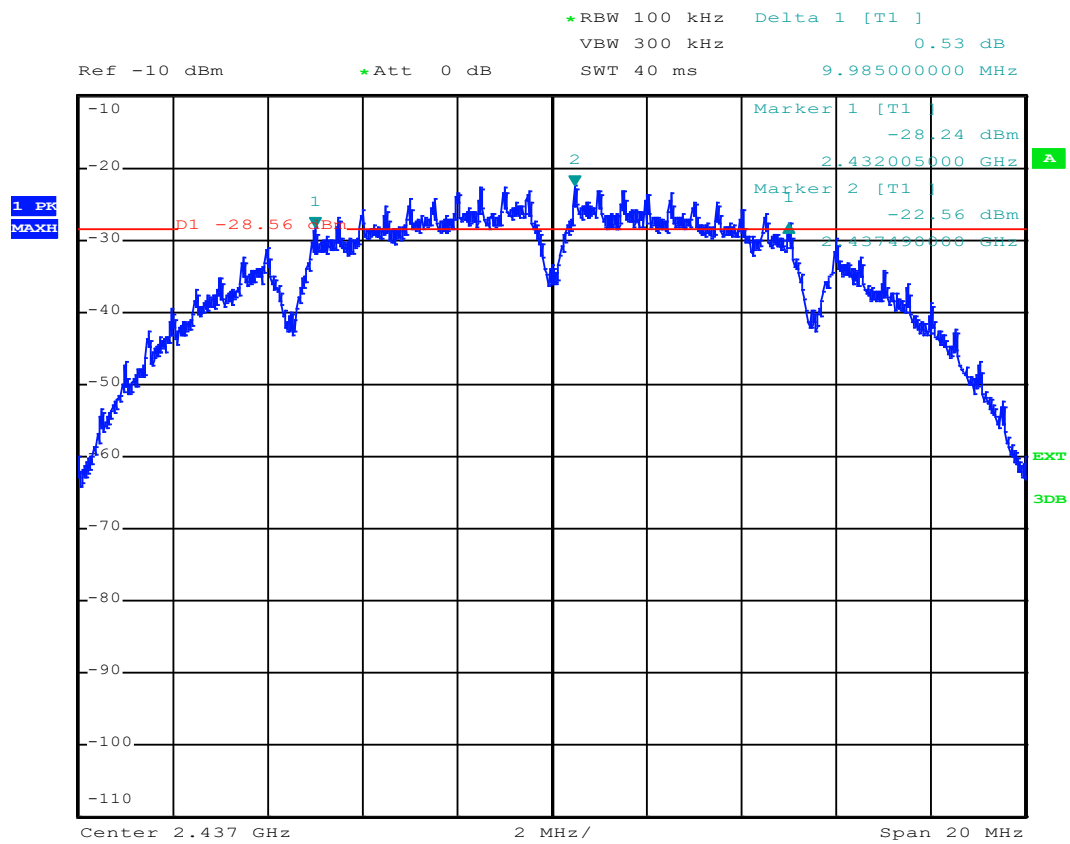
## Results:

Sample N° 1

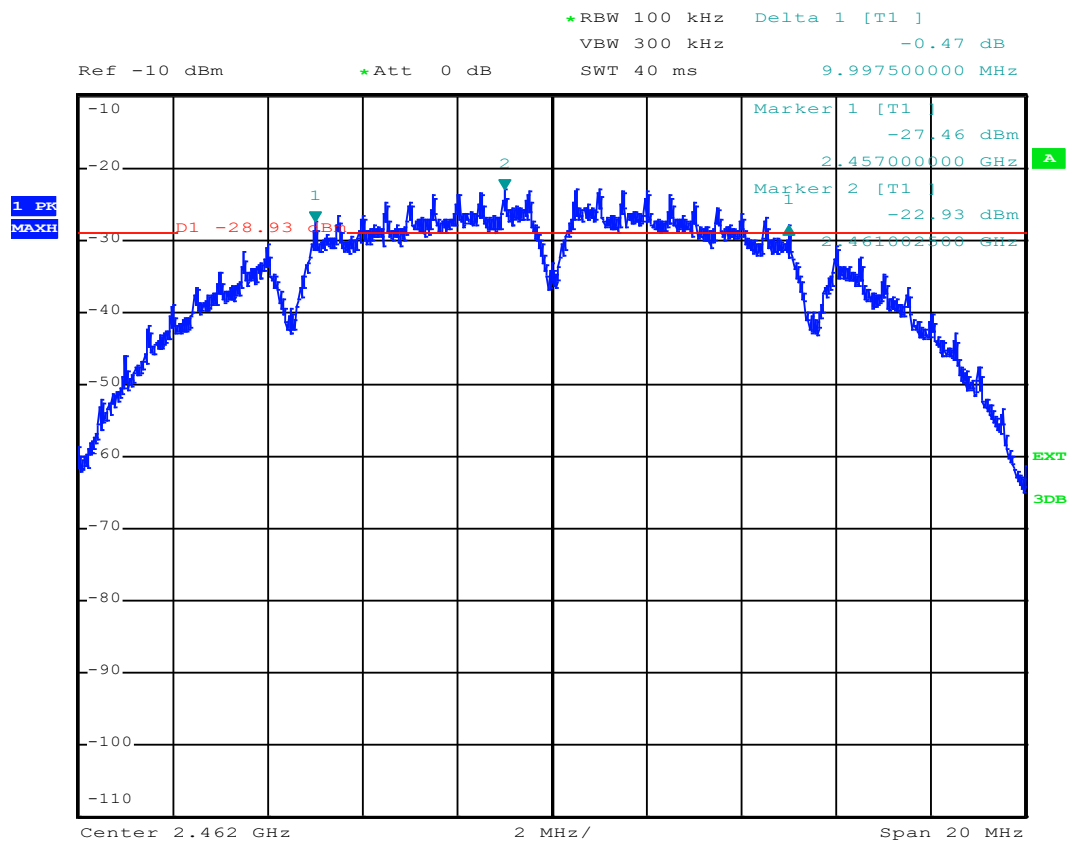
6dB Bandwidth - Low Channel – Mode 802.11.b - SISO



## 6dB Bandwidth - Central Channel – Mode 802.11.b - SISO

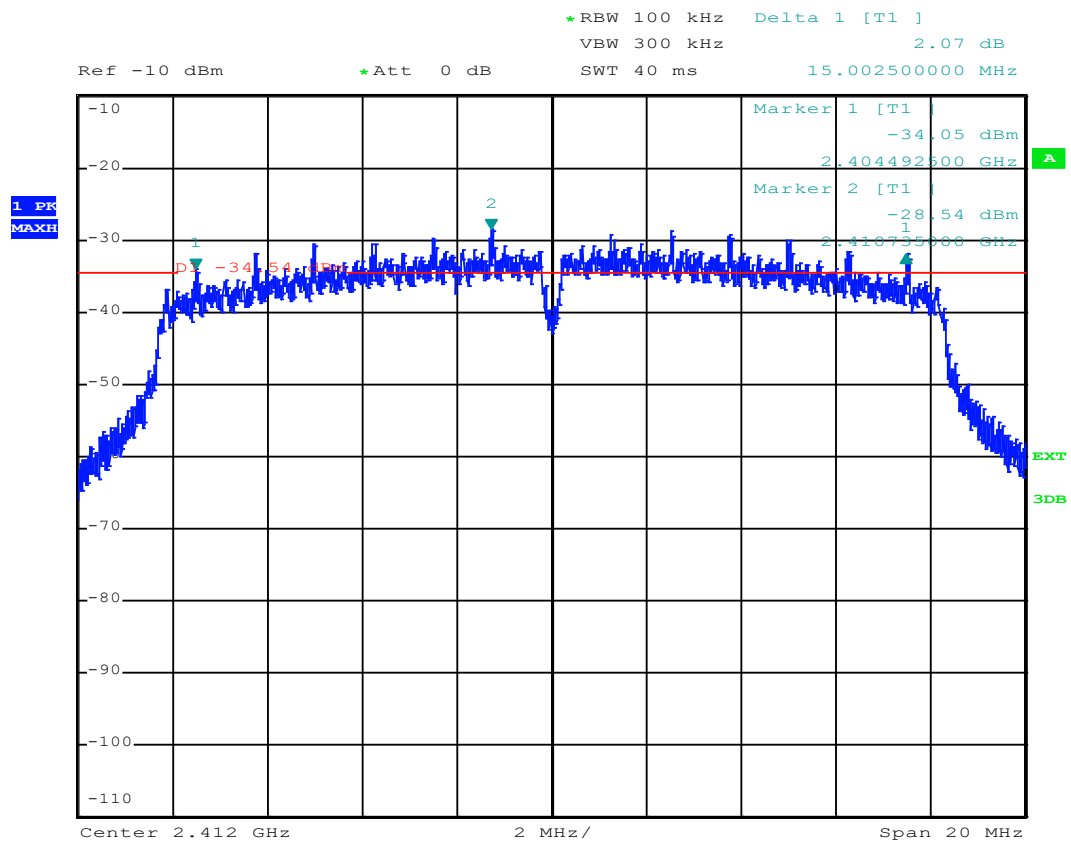


## 6dB Bandwidth - High Channel – Mode 802.11.b - SISO

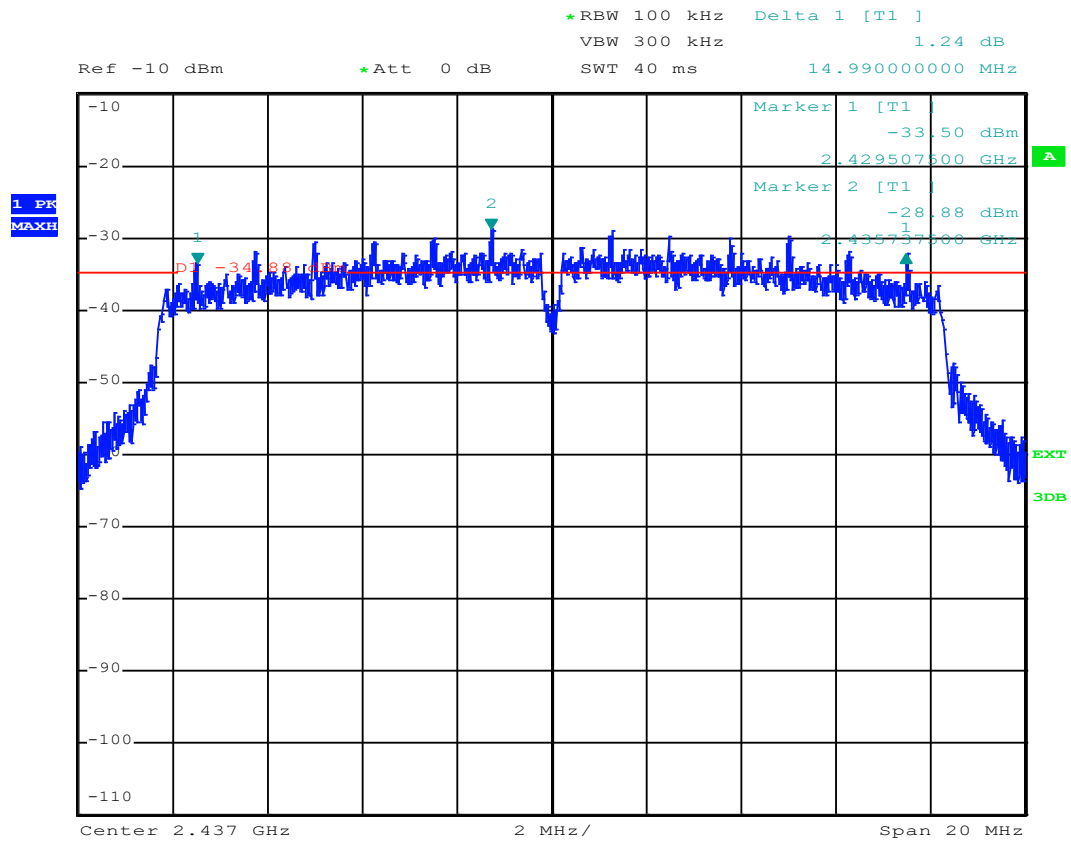




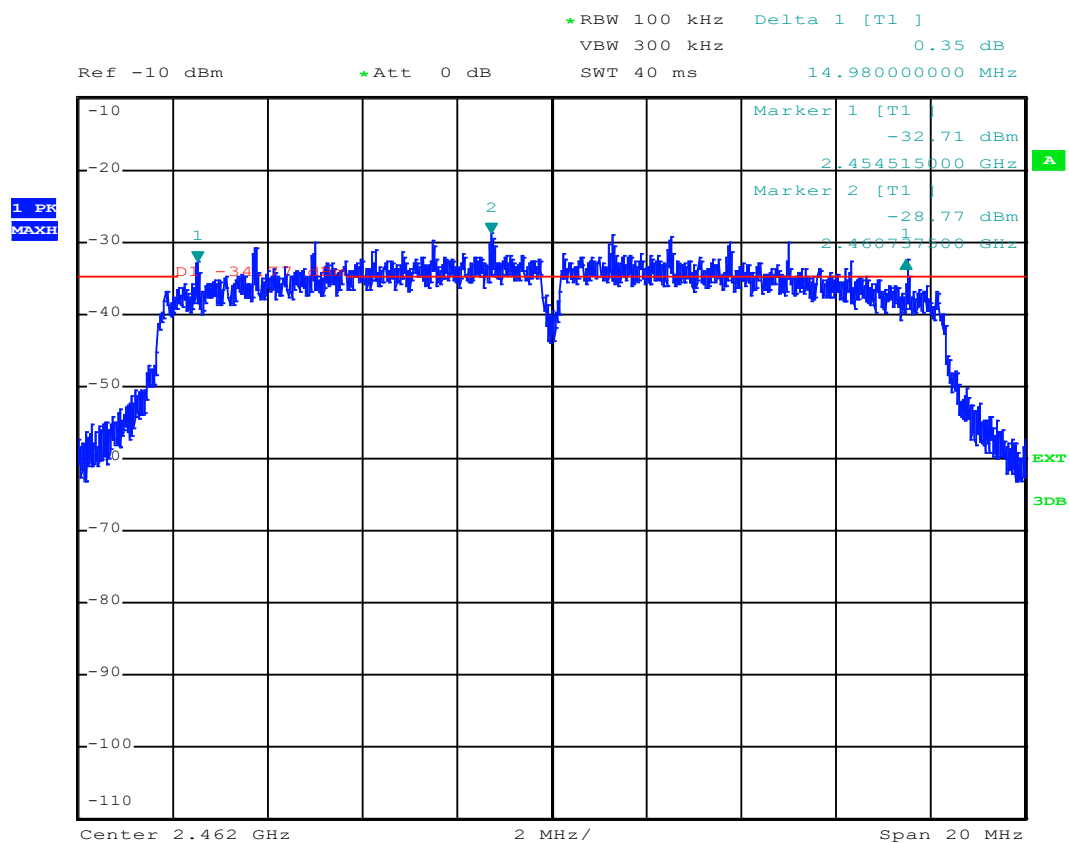
## 6dB Bandwidth - Low Channel – Mode 802.11.g - SISO



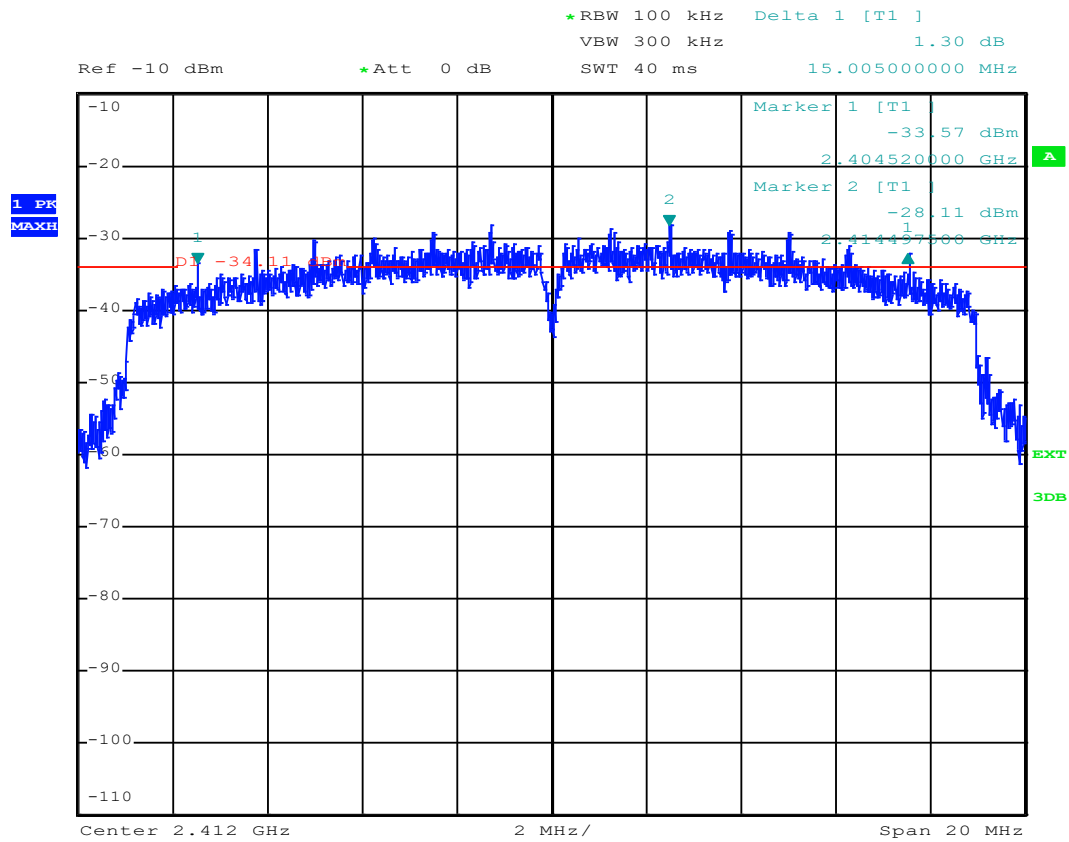
# 6dB Bandwidth - Central Channel – Mode 802.11.g - SISO



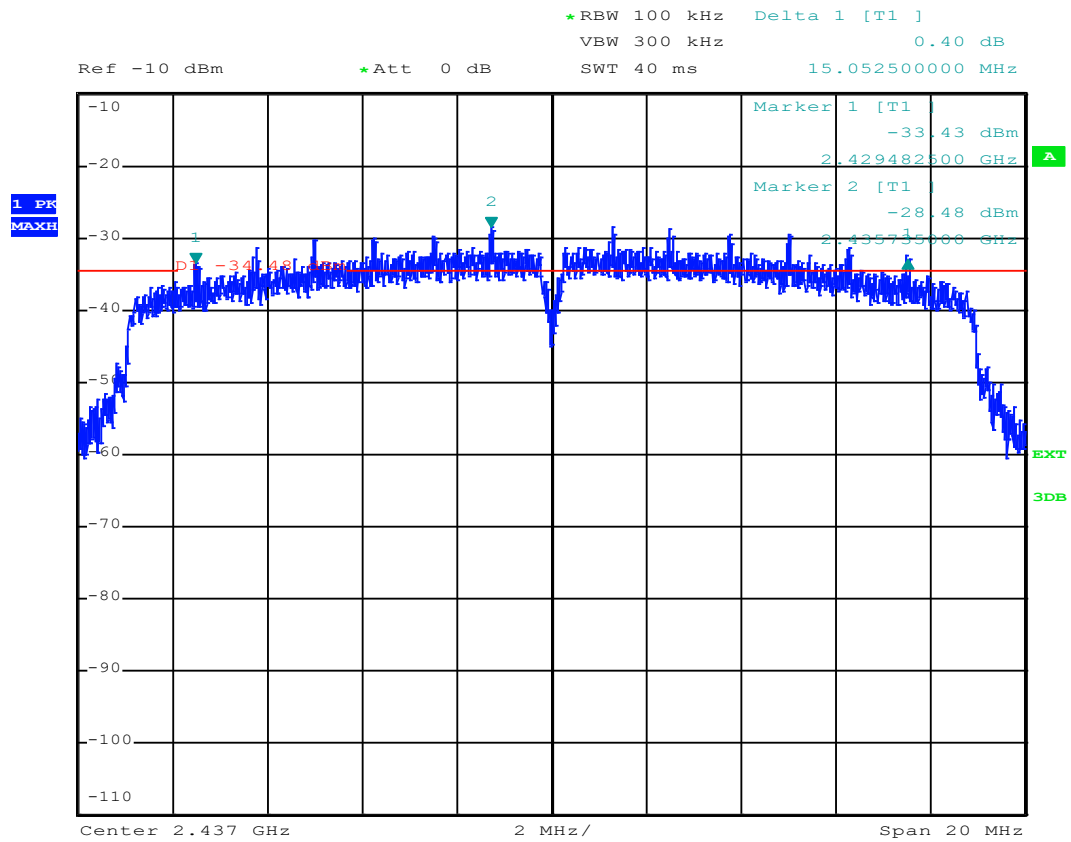
## 6dB Bandwidth - High Channel – Mode 802.11.g - SISO



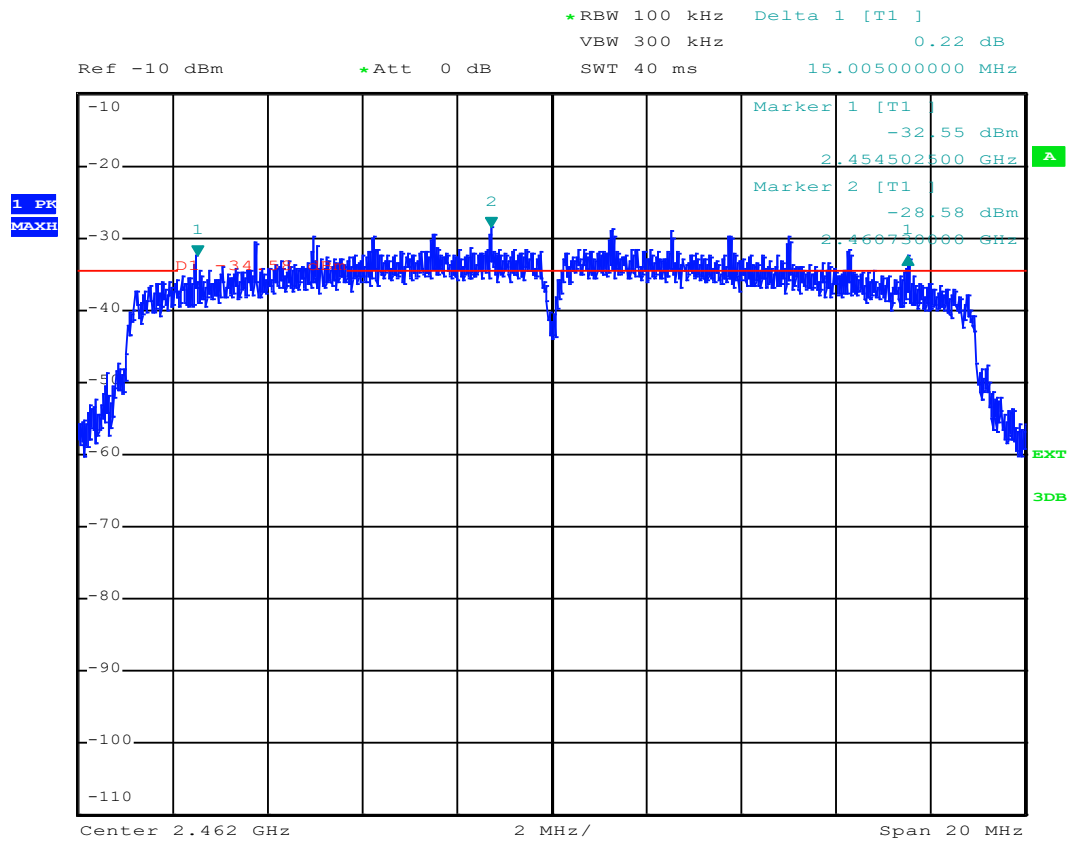
## 6dB Bandwidth - Low Channel – Mode 802.11.n - SISO



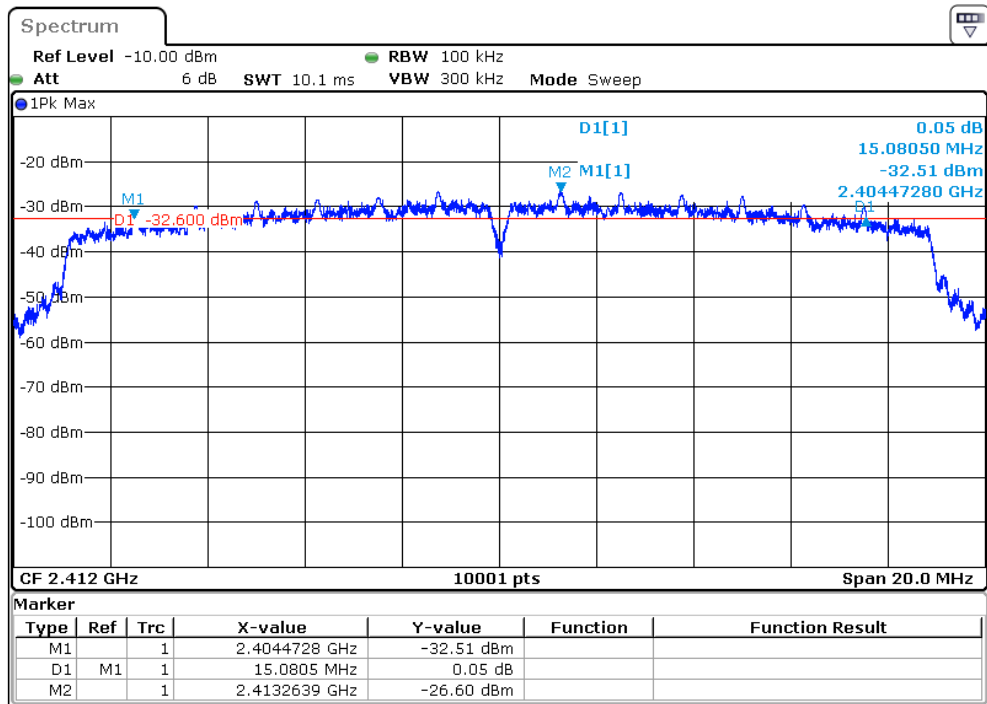
## 6dB Bandwidth - Central Channel – Mode 802.11.n - SISO



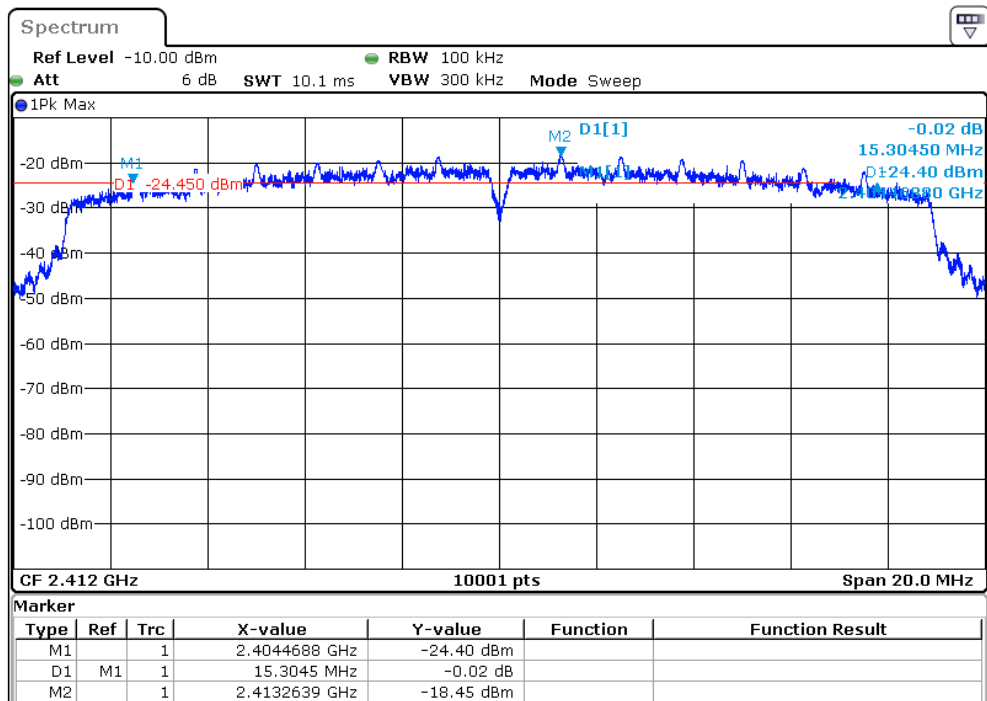
### 6dB Bandwidth - High Channel – Mode 802.11.n - SISO



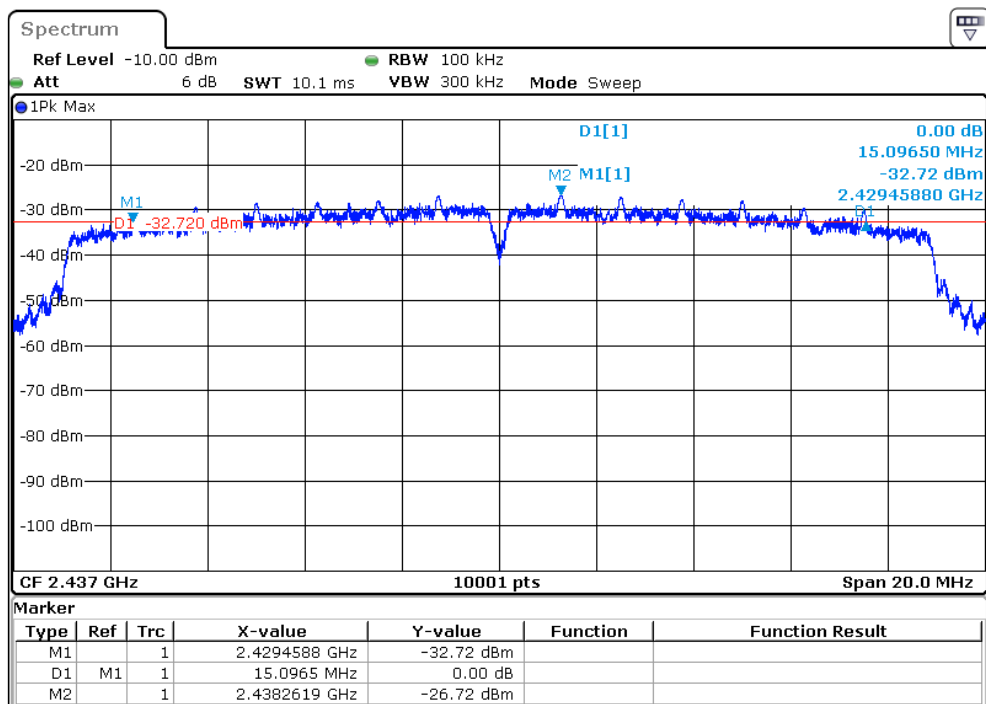
## 6dB Bandwidth – Low Channel – RF1 – Mode 802.11.n - MIMO



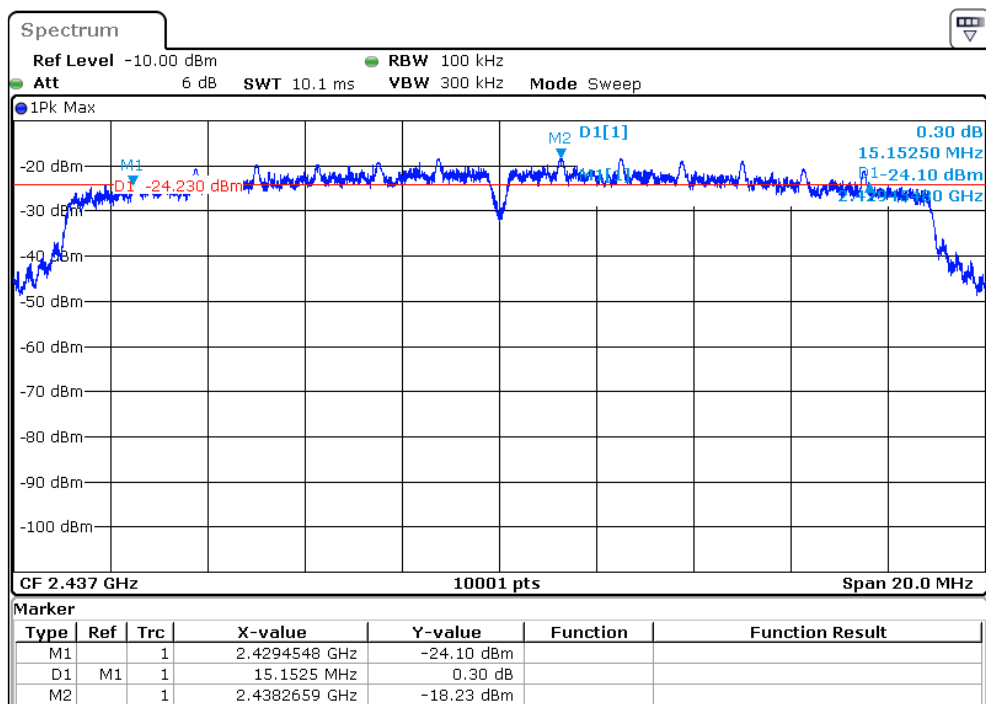
## 6dB Bandwidth – Low Channel – RF2 – Mode 802.11.n - MIMO



## 6dB Bandwidth – Central Channel – RF1 – Mode 802.11.n - MIMO

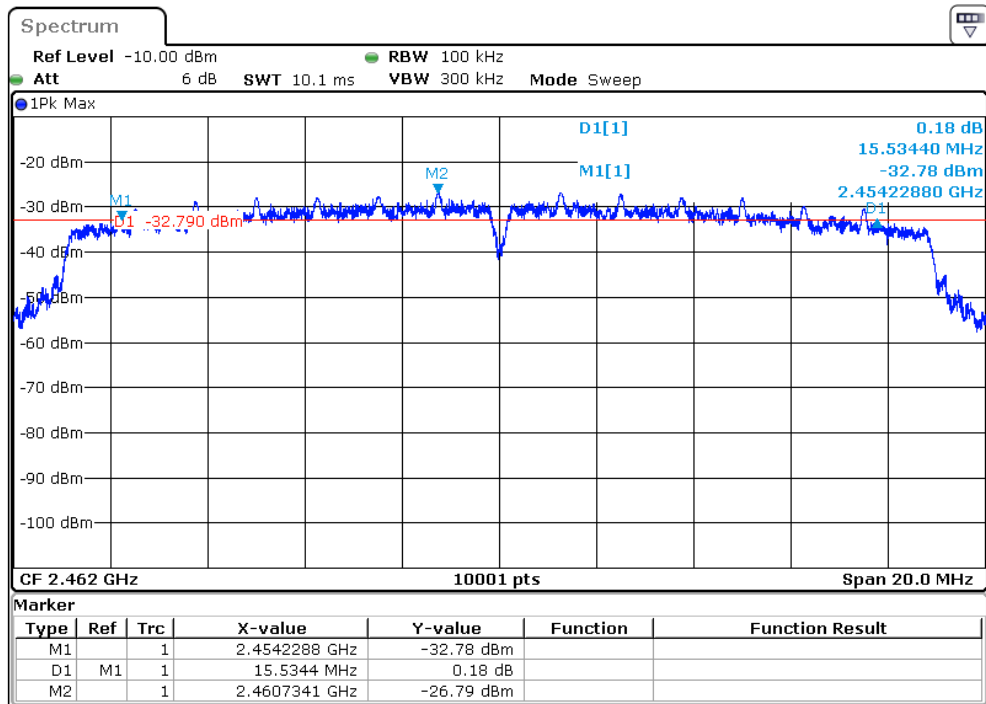


## 6dB Bandwidth – Central Channel – RF2 – Mode 802.11.n - MIMO

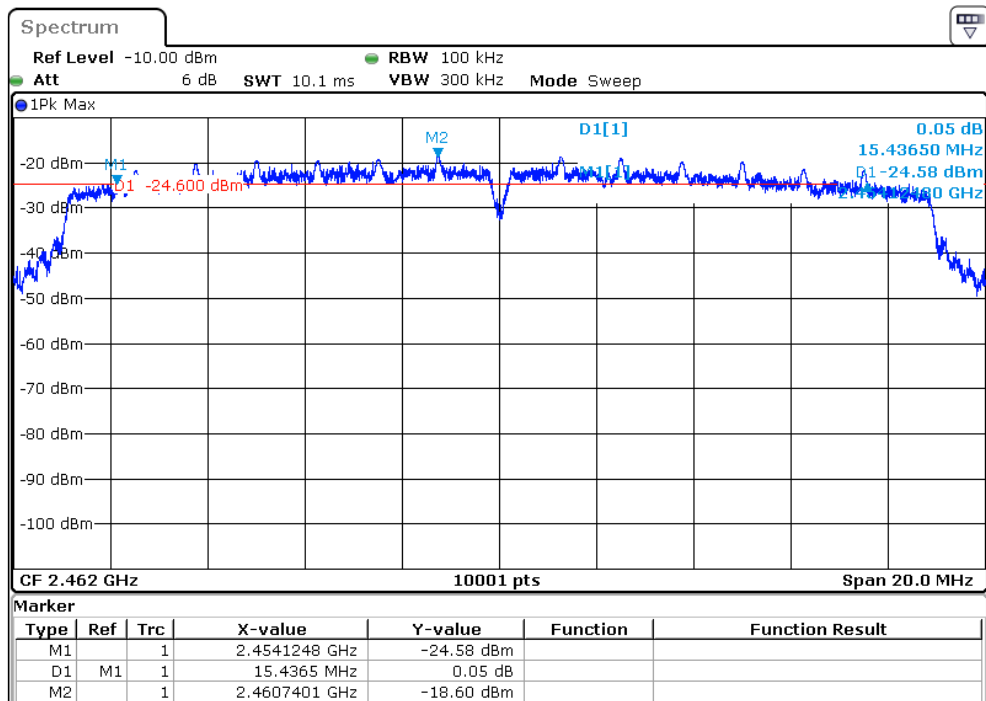




### 6dB Bandwidth – High Channel – RF1 – Mode 802.11.n - MIMO



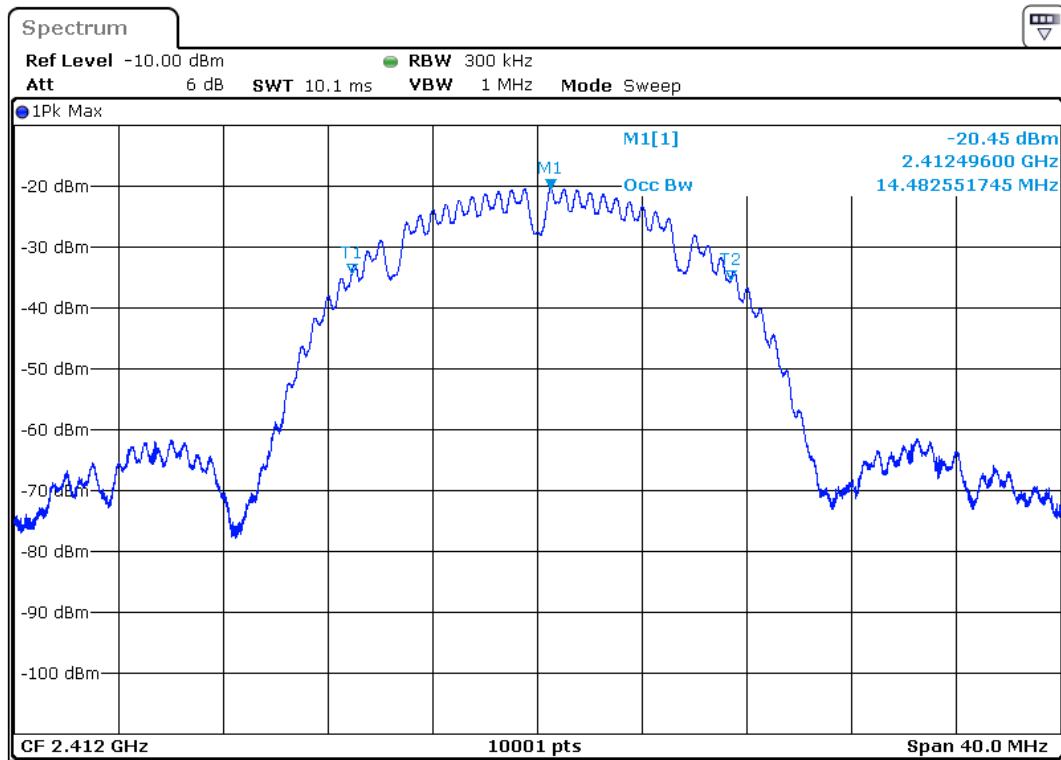
### 6dB Bandwidth – High Channel – RF2 – Mode 802.11.n - MIMO



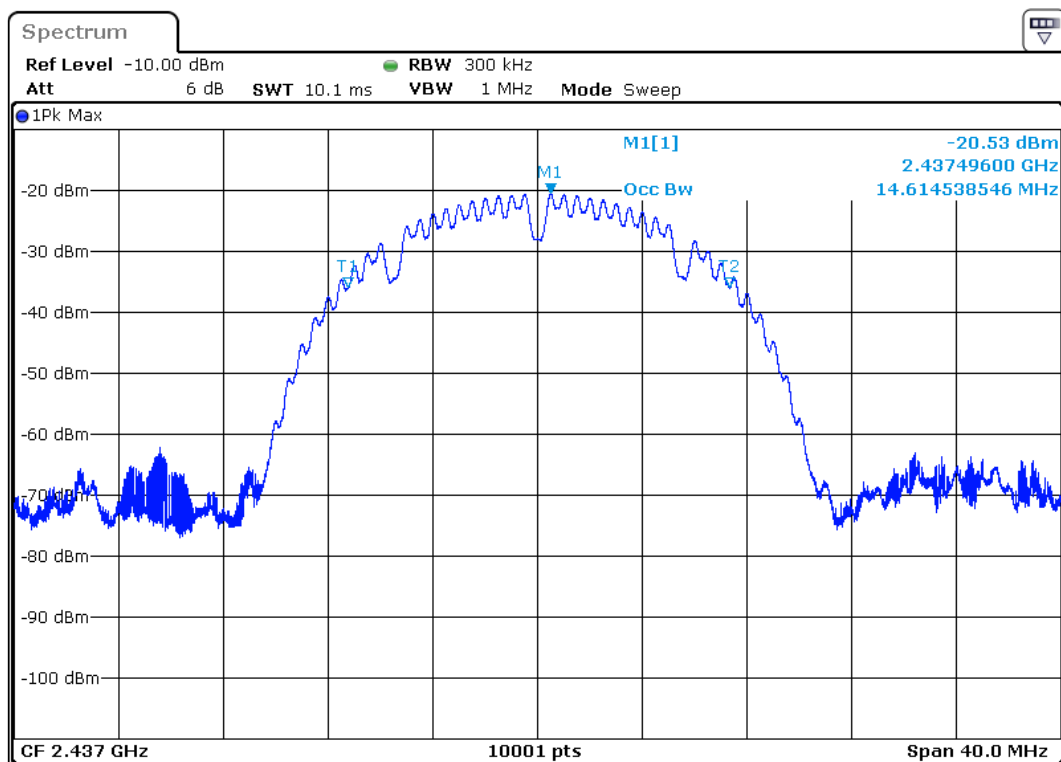
Limit:

Shall be at least 500 kHz

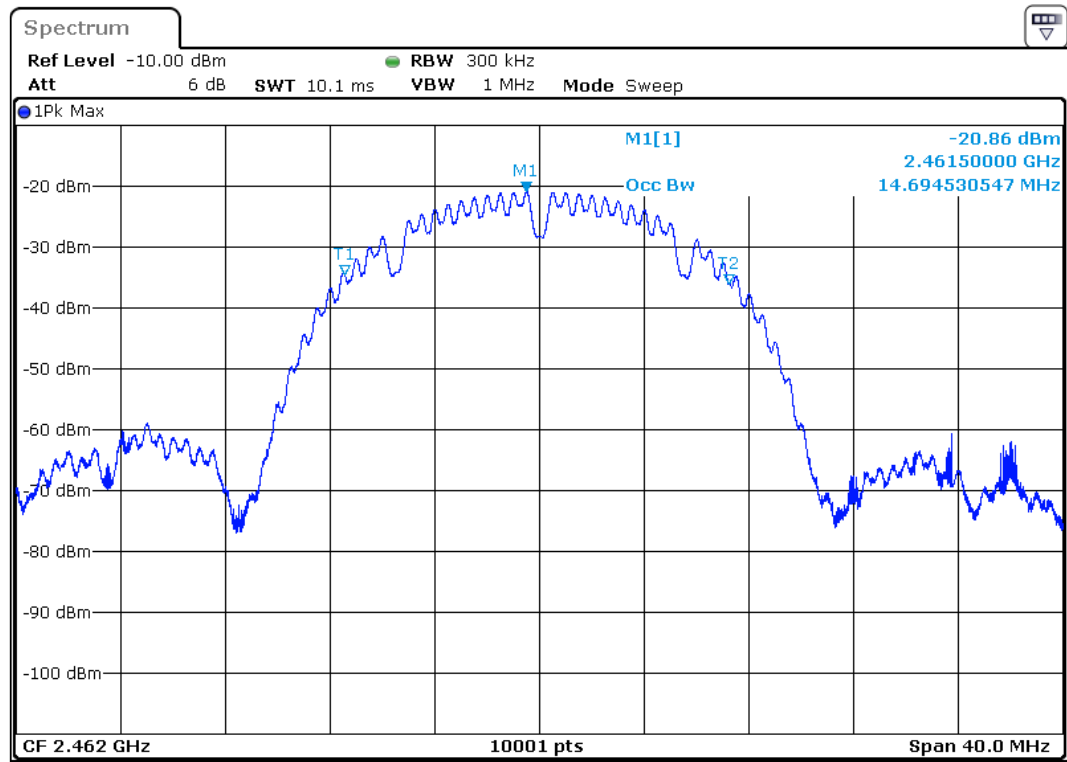
## 99% Bandwidth - Low Channel – Mode 802.11.b - SISO



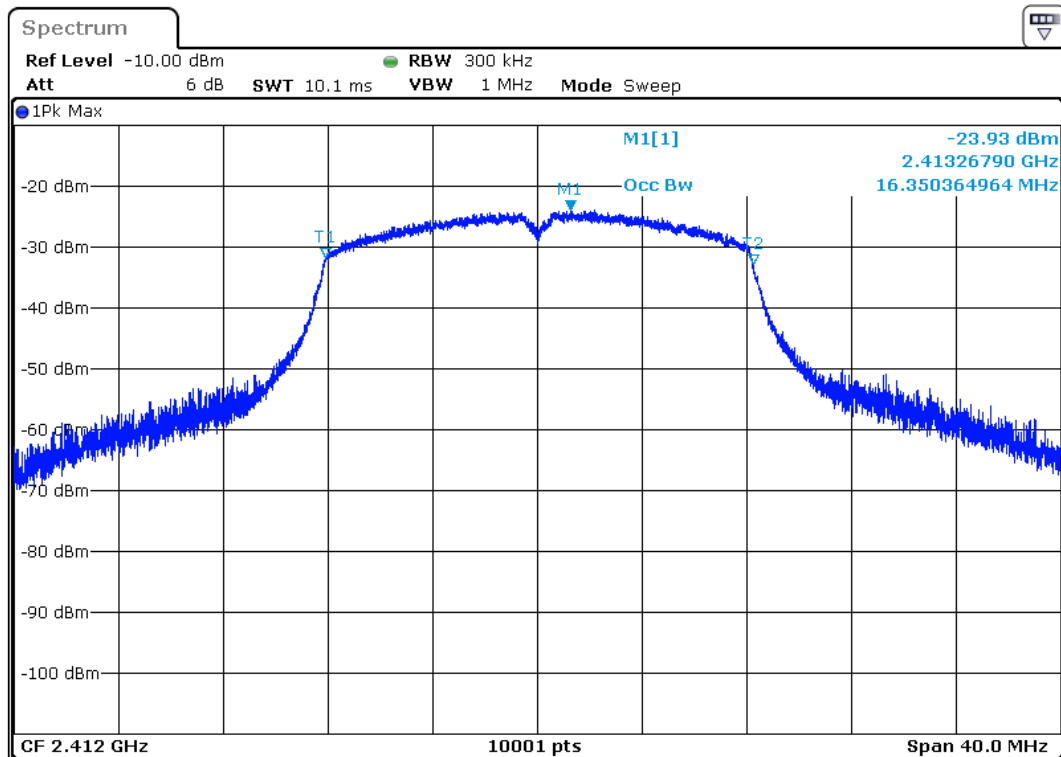
## 99% Bandwidth - Central Channel – Mode 802.11.b - SISO



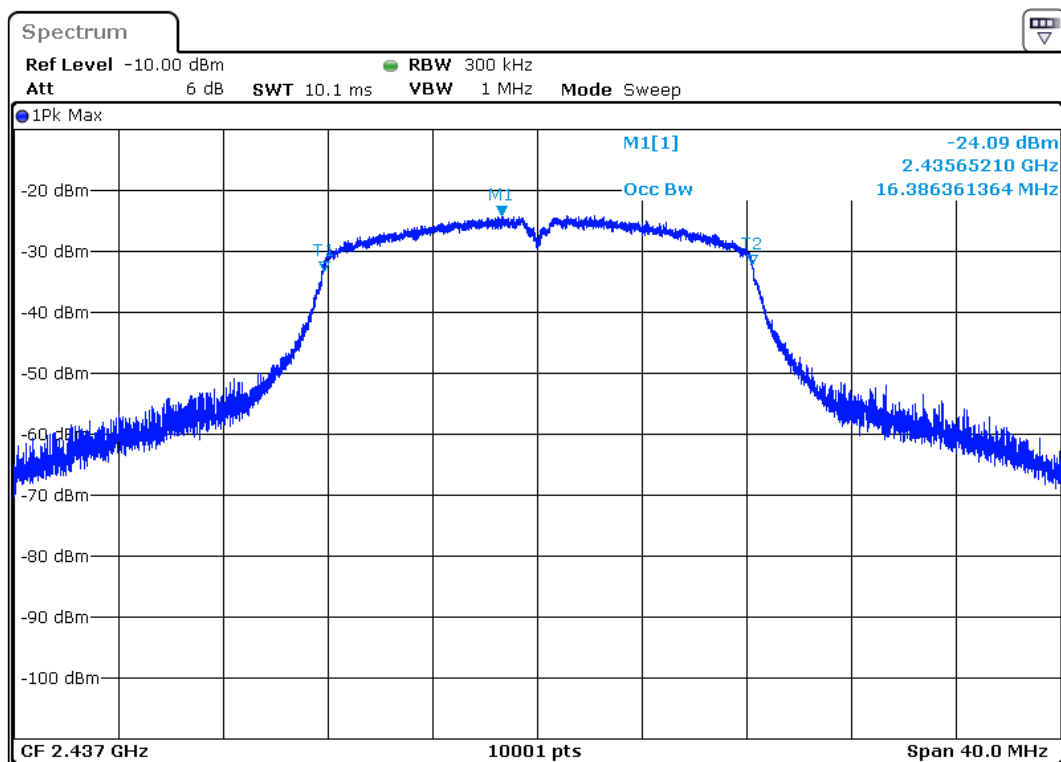
## 99% Bandwidth - High Channel – Mode 802.11.b - SISO



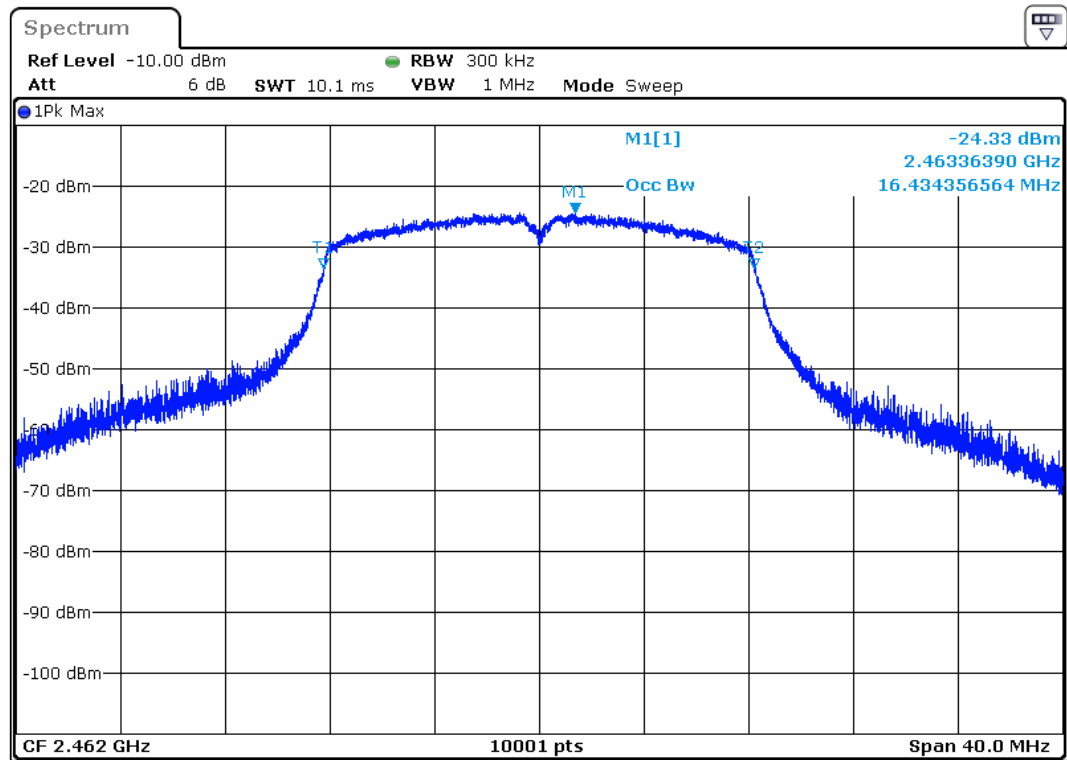
## 99% Bandwidth - Low Channel – Mode 802.11.g - SISO



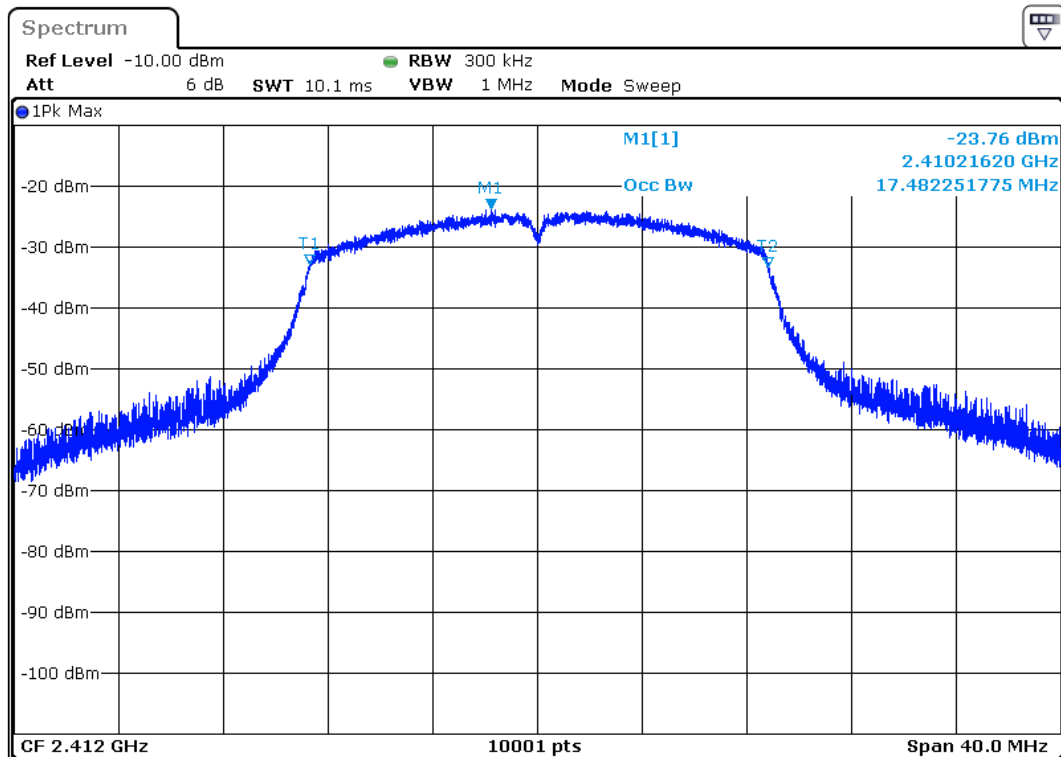
## 99% Bandwidth - Central Channel – Mode 802.11.g - SISO



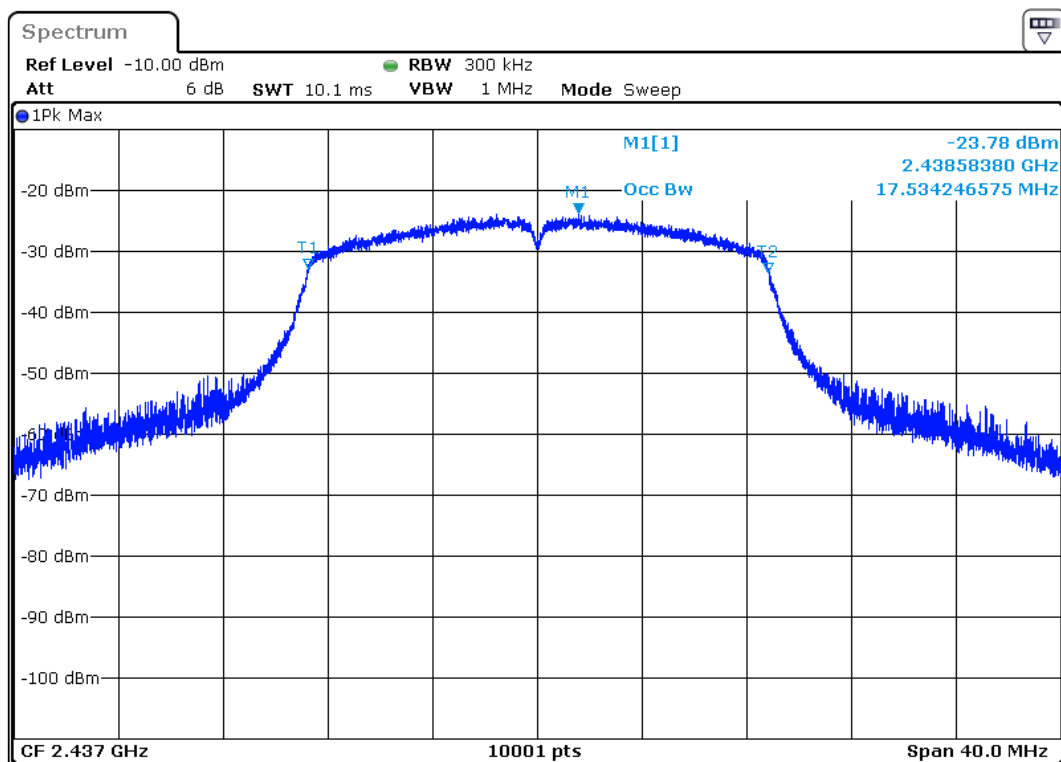
## 99% Bandwidth - High Channel – Mode 802.11.g - SISO



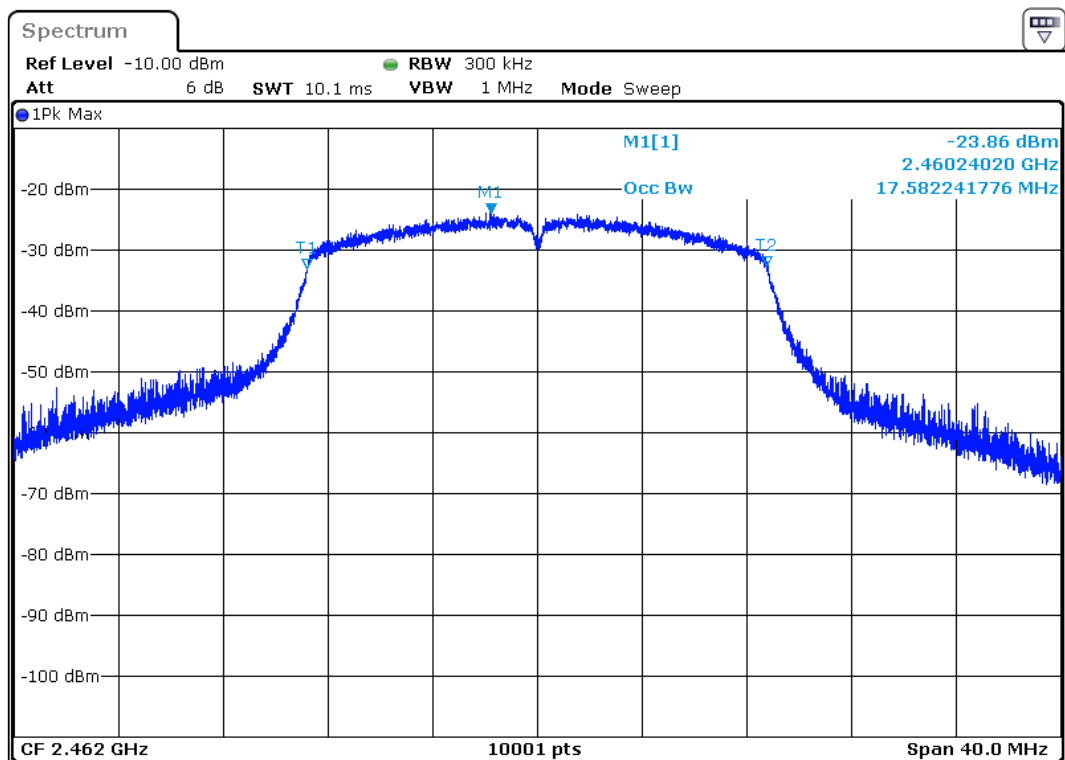
## 99% Bandwidth - Low Channel – Mode 802.11.n - SISO



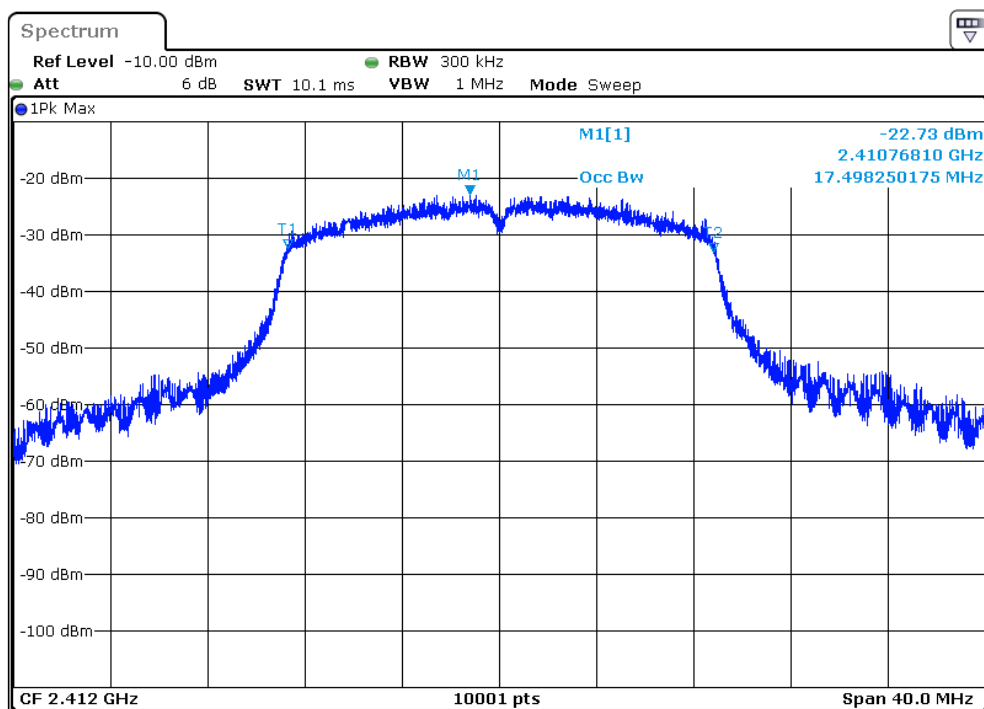
## 99% Bandwidth - Central Channel – Mode 802.11.n - SISO



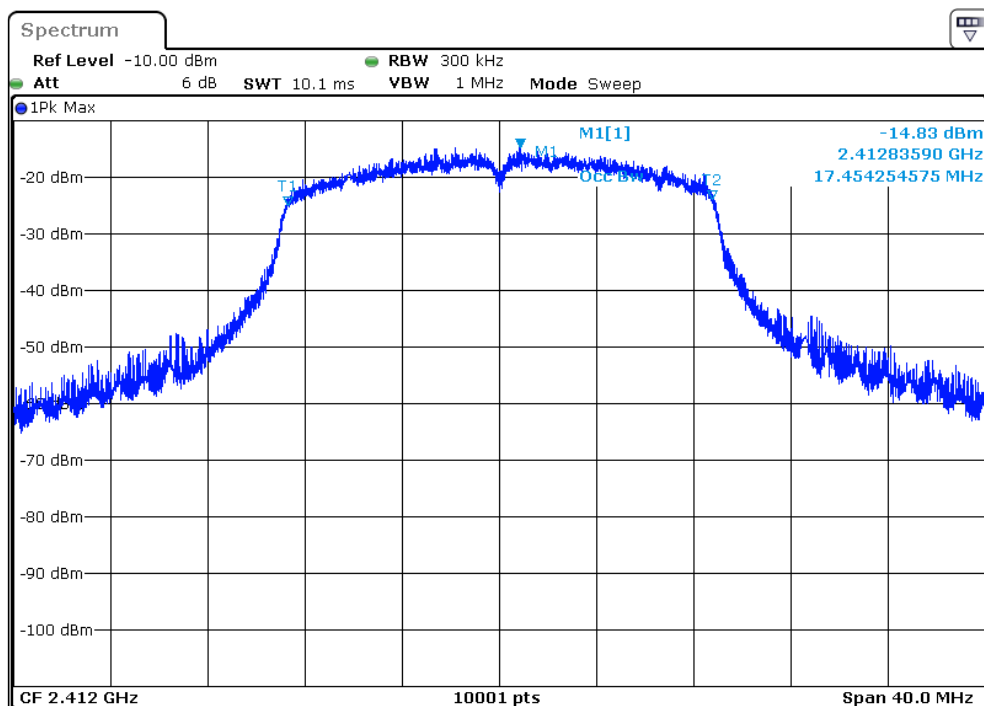
## 99%B Bandwidth - High Channel – Mode 802.11.n - SISO



## 99% Bandwidth – Low Channel – RF1 – Mode 802.11.n - MIMO

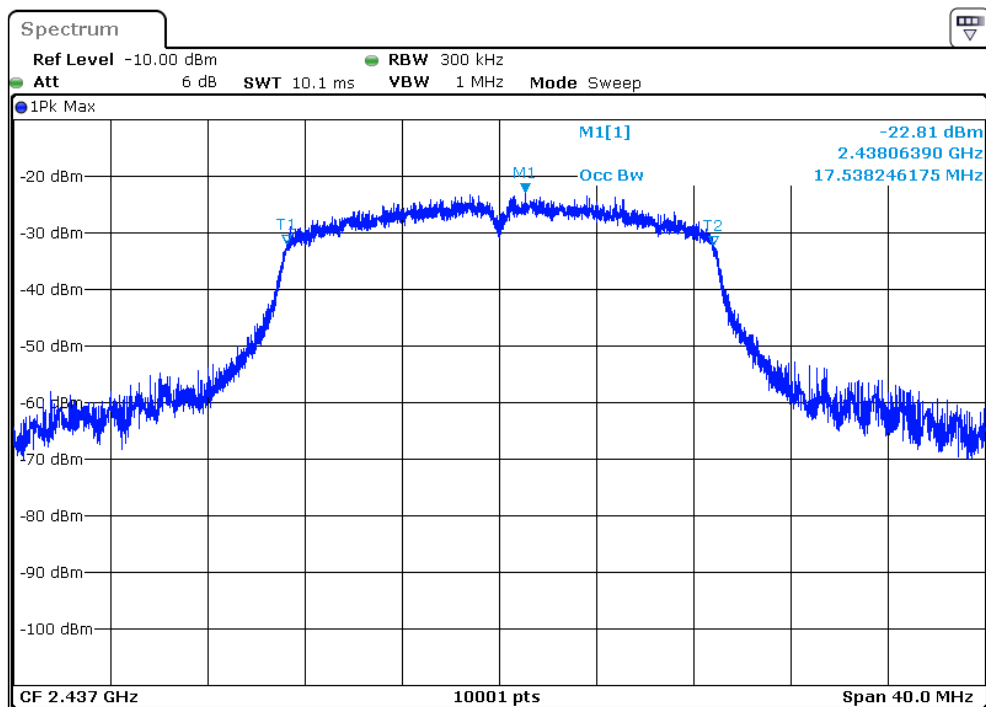


## 99% Bandwidth – Low Channel – RF2 – Mode 802.11.n - MIMO

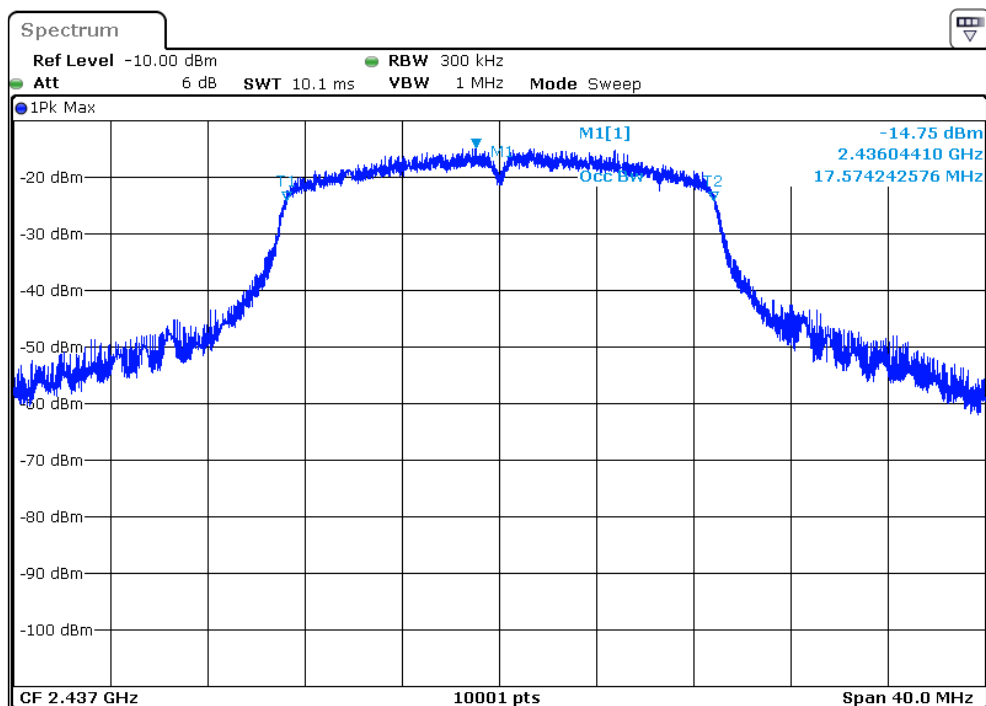




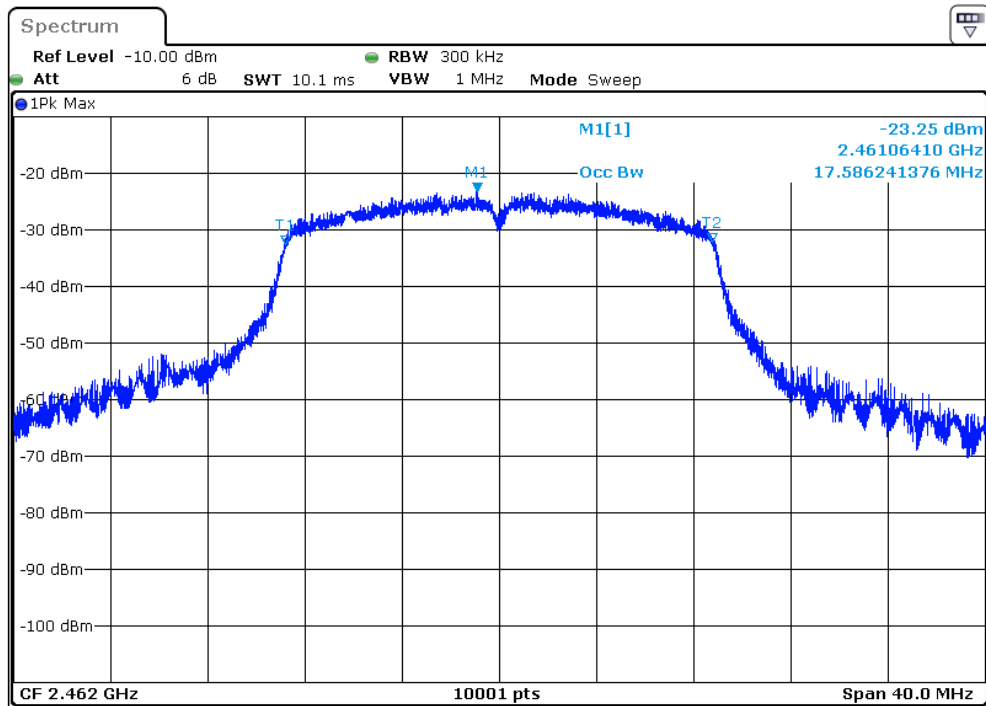
## 99% Bandwidth – Central Channel – RF1 – Mode 802.11.n - MIMO



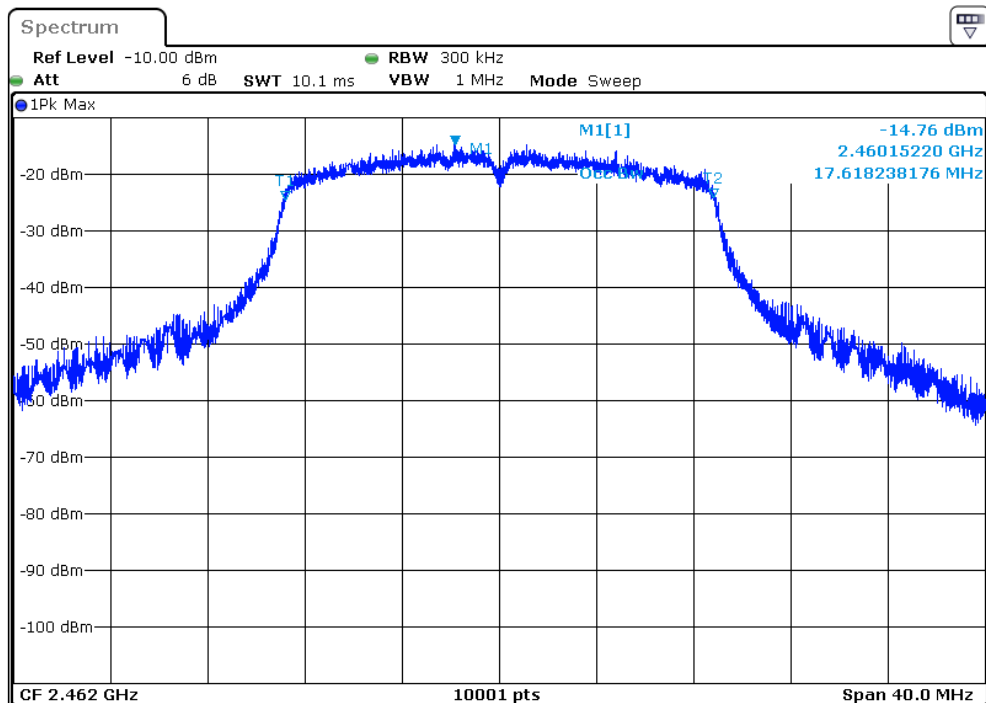
## 99% Bandwidth – Central Channel – RF2 – Mode 802.11.n - MIMO



## 99% Bandwidth – High Channel – RF1 – Mode 802.11.n - MIMO



## 99% Bandwidth – High Channel – RF2 – Mode 802.11.n - MIMO



Measure realized for reporting only

Test conclusion:

RESPECTED STANDARD

**9. BAND EDGE****Temperature (°C) :** 20.9**Humidity (%HR):** 38.2**Date :** December 4, 2020**Technician :** M. DUMESNIL**Standard:** FCC Part 15  
RSS-247**Test procedure:**

Method of paragraph 11.13 of ANSI C63.10

**Test set up:**

Test realized in near field. All field strength measurements are correlated with the radiated maximum peak output power

**Test operating condition of the equipment:**

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate (P Software adjusted to +16 dBm).

Power source: 12 Vdc by an external power supply

Percentage of voltage variation during the test (%):

 $\pm 1$

## Results:

Lower Band Edge: From 2398 MHz to 2400 MHz

Upper Band Edge: From 2483.5 MHz to 2485.5 MHz

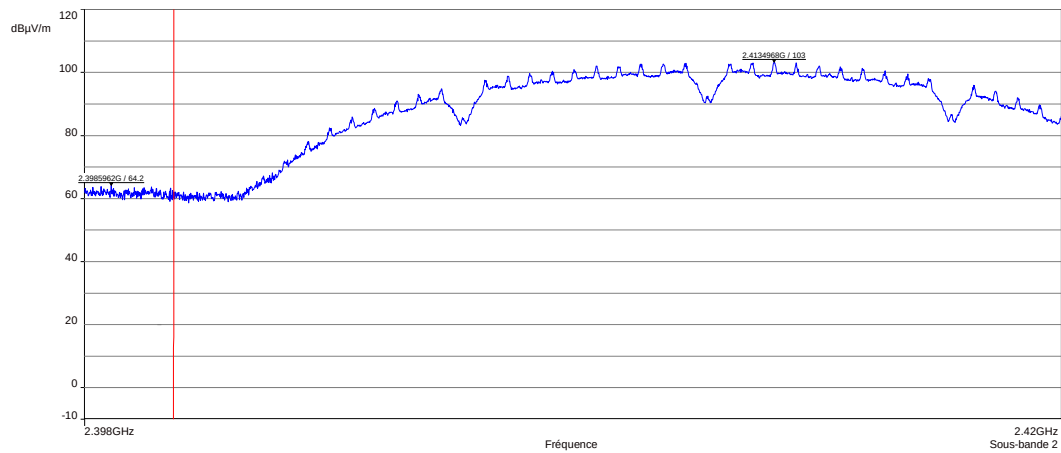
## Internal antenna

Sample N° 1      WiFi mode 802.11.b - SISO

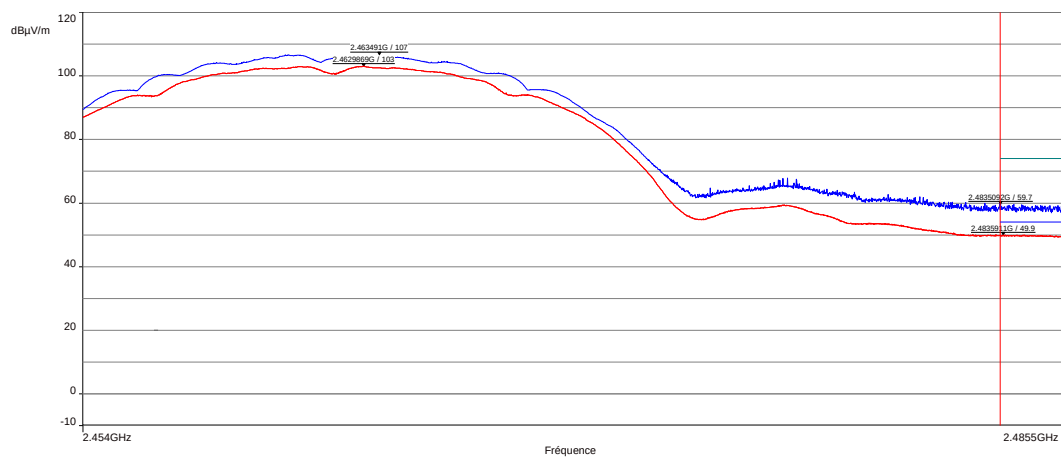
| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 103                                          | Peak                       | 2398.5962                                      | -38.8                 | 64.2                                               | 83             | 18.8        |
| 2462                        | 107                                          | Peak                       | 2483.5092                                      | -47.3                 | 59.7                                               | 74             | 14.3        |
| 2462                        | 103                                          | Average                    | 2483.5911                                      | -53.1                 | 49.9                                               | 54             | 4.1         |

(1) Marker-Delta method

## Low channel



## High channel

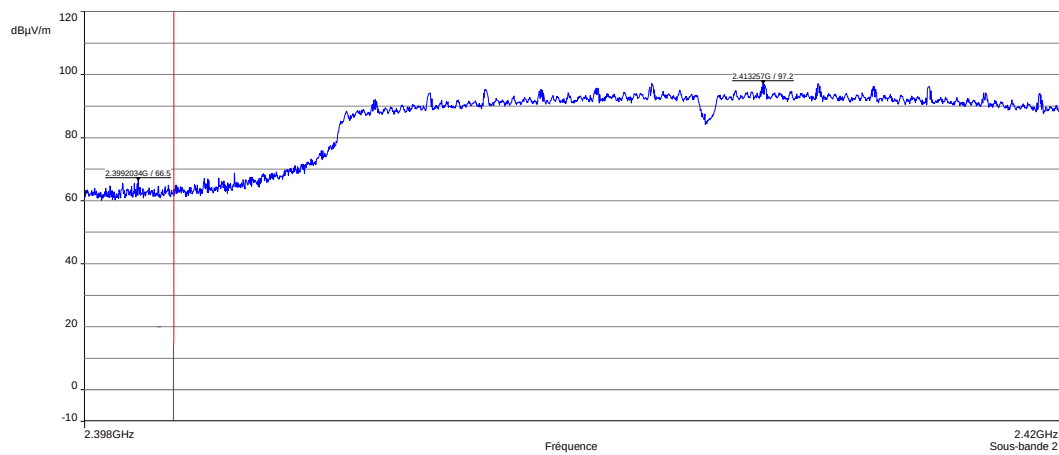


# Sample N° 1      WiFi mode 802.11.g - SISO

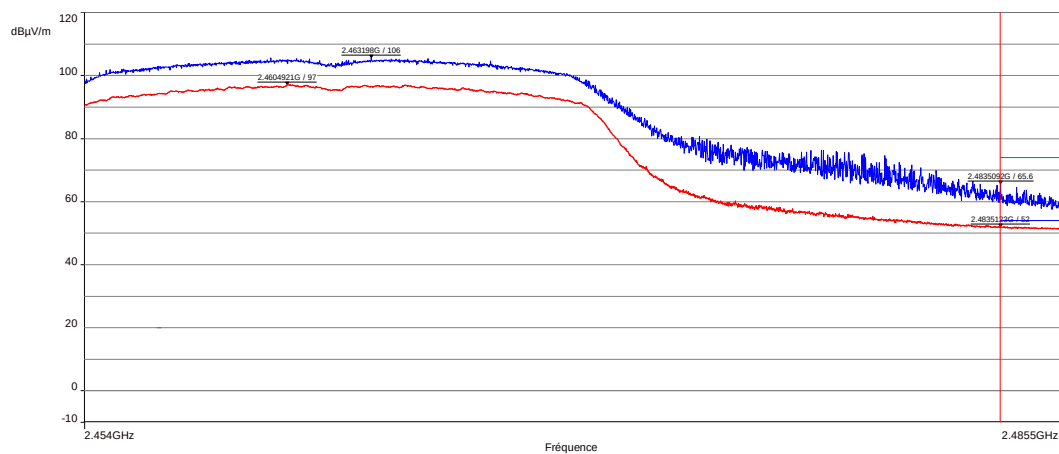
| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 97.2                                         | Peak                       | 2399.2034                                      | -30.7                 | 66.5                                               | 77.2           | 10.7        |
| 2462                        | 106                                          | Peak                       | 2483.5092                                      | -40.4                 | 65.6                                               | 74             | 8.4         |
| 2462                        | 97                                           | Average                    | 2483.5123                                      | -45                   | 52                                                 | 54             | 2           |

(1) Marker-Delta method

## Low channel



## High channel

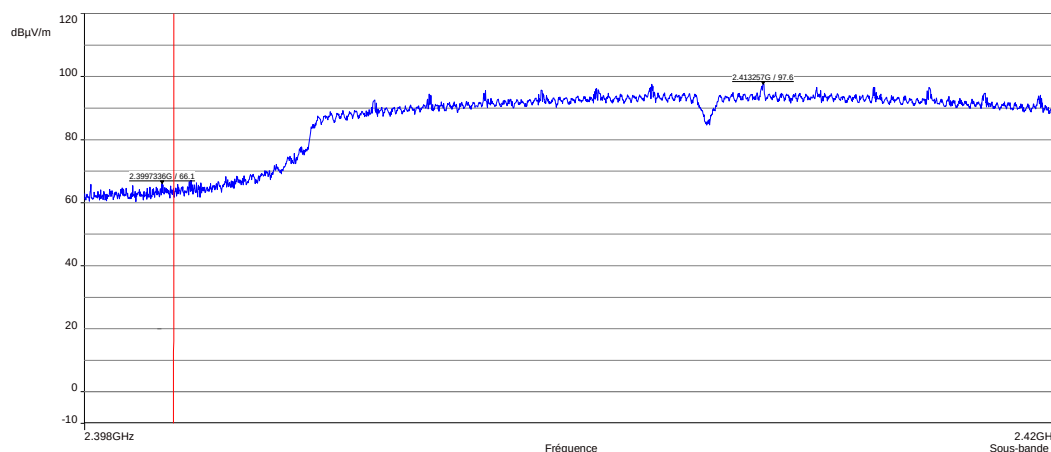


# Sample N° 1      WiFi mode 802.11.n - SISO

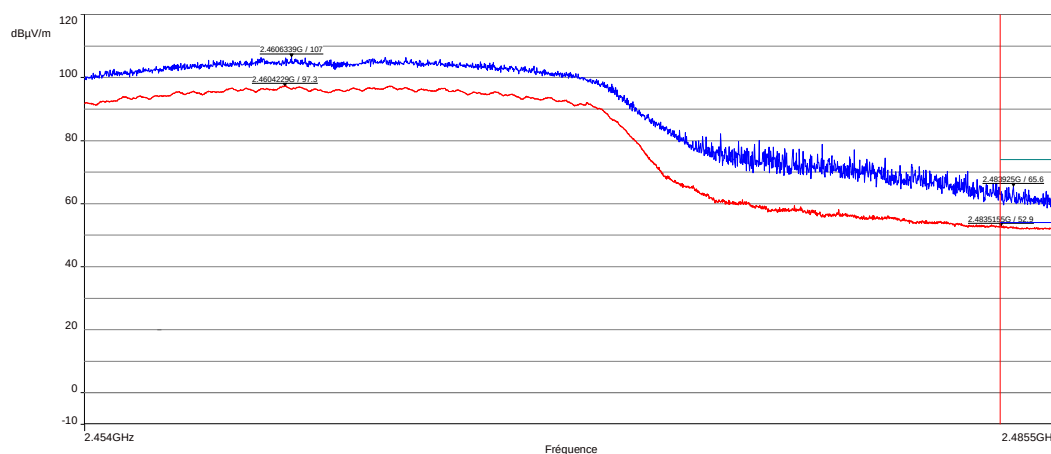
| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 97.6                                         | Peak                       | 2399.7336                                      | -31.5                 | 66.1                                               | 77.6           | 11.5        |
| 2462                        | 103                                          | Peak                       | 2483.925                                       | -37.4                 | 65.6                                               | 74             | 8.4         |
| 2462                        | 97.3                                         | Average                    | 2483.5155                                      | -44.4                 | 52.9                                               | 54             | 1.1         |

(1) Marker-Delta method

## Low channel



## High channel

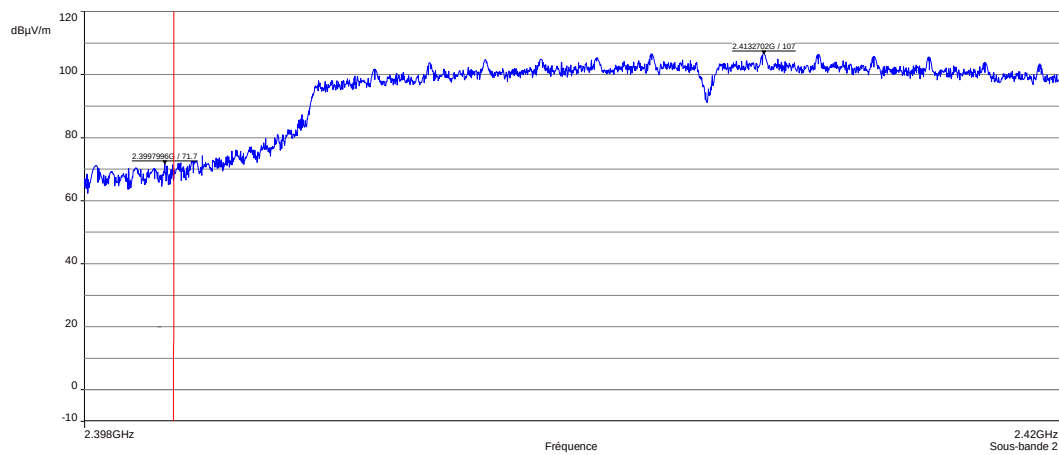


# Sample N° 1      WiFi mode 802.11.n - MIMO

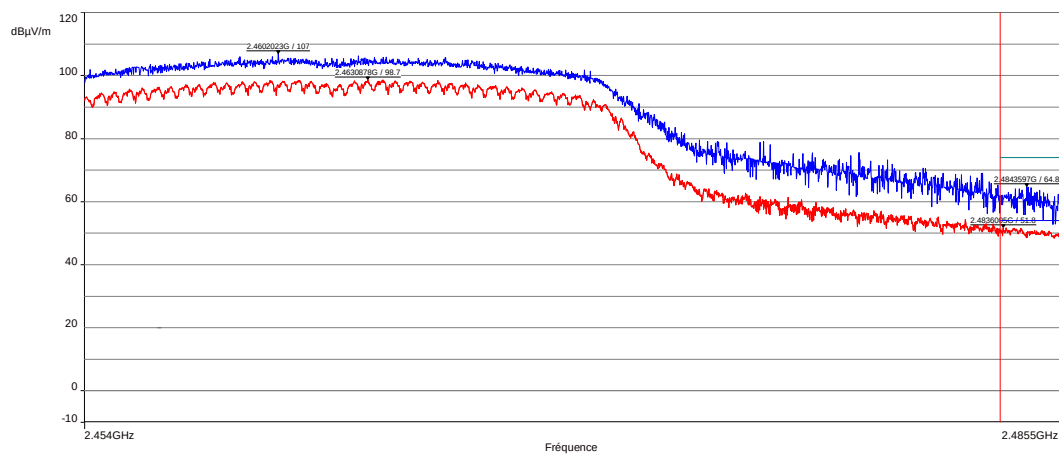
| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 107                                          | Peak                       | 2399.7996                                      | -35.3                 | 71.7                                               | 87             | 15.3        |
| 2462                        | 107                                          | Peak                       | 2484.3597                                      | -42.2                 | 64.8                                               | 74             | 9.2         |
| 2462                        | 98.7                                         | Average                    | 2483.6005                                      | -46.9                 | 51.8                                               | 54             | 2.2         |

(1) Marker-Delta method

## Low channel



## High channel



## External antenna

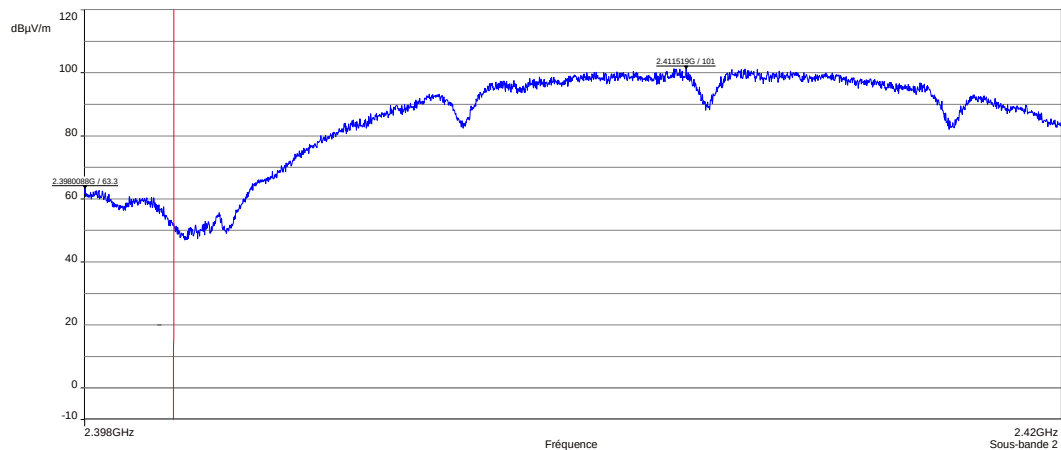
Sample N° 1      WiFi mode 802.11.b - SISO

| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 101                                          | Peak                       | 2398.0088                                      | -37.7                 | 63.3                                               | 81             | 17.7        |
| 2462                        | 106                                          | Peak                       | 2483.673                                       | -52.3                 | 53.7 (2)                                           | 74             | 20.3        |
| 2462                        | 101                                          | Average                    | 2483.525                                       | -54.9                 | 46.1                                               | 54             | 7.9         |

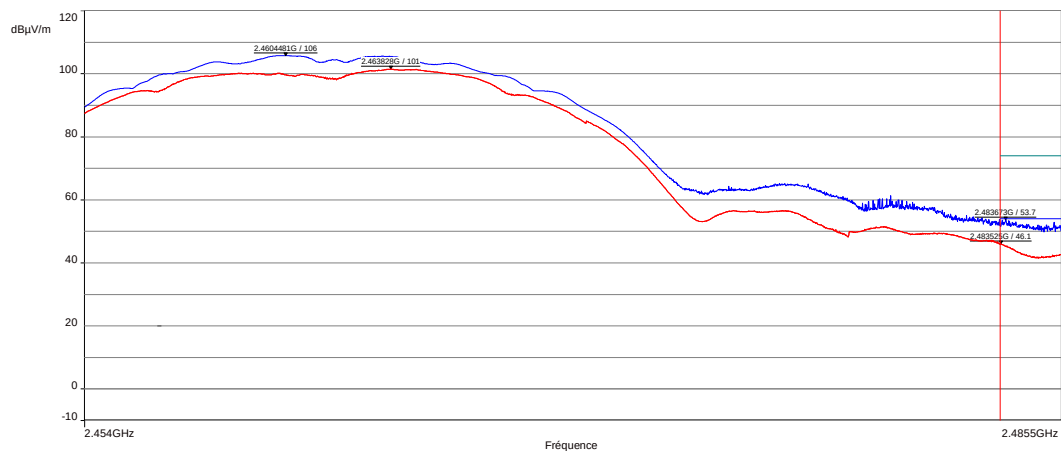
(1) Marker-Delta method

(2) The peak level is lower than the average limit (54 dBμV/m)

### Low channel



### High channel



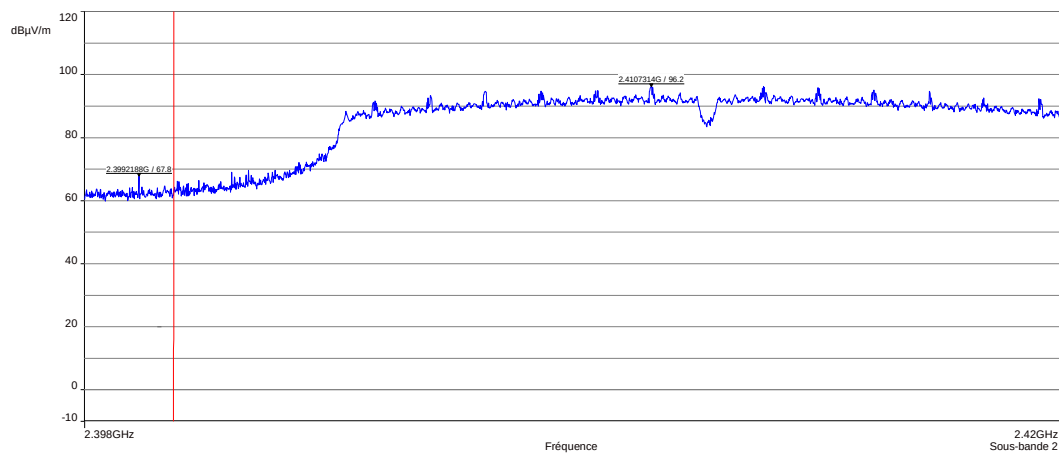


# Sample N° 1      WiFi mode 802.11.g - SISO

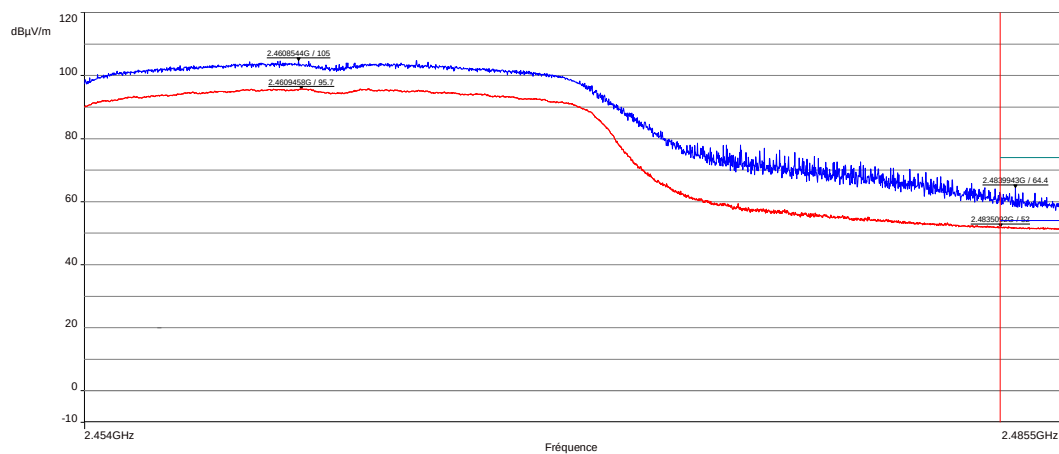
| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 96.2                                         | Peak                       | 2399.2188                                      | -28.4                 | 67.8                                               | 76.2           | 8.4         |
| 2462                        | 105                                          | Peak                       | 2483.9943                                      | -40.6                 | 64.4                                               | 74             | 9.6         |
| 2462                        | 95.7                                         | Average                    | 2483.5092                                      | -43.7                 | 52                                                 | 54             | 2           |

(1) Marker-Delta method

## Low channel



## High channel

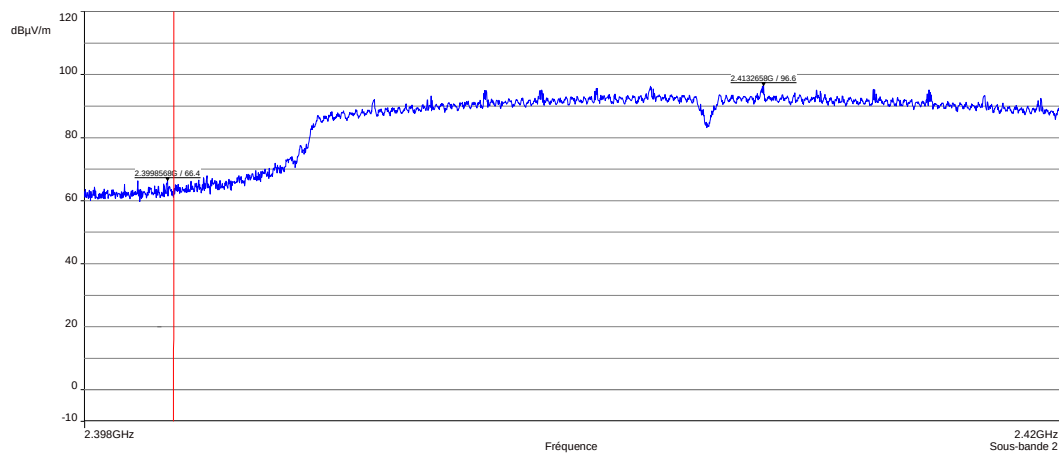


# Sample N° 1      WiFi mode 802.11.n - SISO

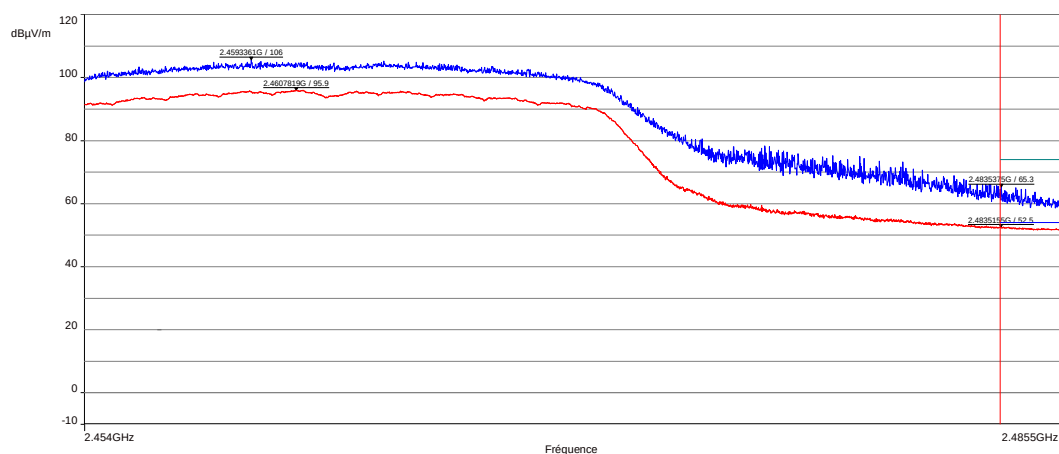
| Fundamental frequency (MHz) | Field Strength Level of fundamental (dBμV/m) | Detector (Peak or Average) | Frequency of maximum Band-edges Emission (MHz) | Delta Marker (dB) (1) | Calculated Max Out-of-Band Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----------------------------|----------------------------------------------|----------------------------|------------------------------------------------|-----------------------|----------------------------------------------------|----------------|-------------|
| 2412                        | 96.6                                         | Peak                       | 2399.8568                                      | -30.2                 | 66.4                                               | 76.6           | 10.2        |
| 2462                        | 106                                          | Peak                       | 2483.5375                                      | -40.7                 | 65.3                                               | 74             | 8.7         |
| 2462                        | 95.9                                         | Average                    | 2483.5155                                      | -43.4                 | 52.5                                               | 54             | 1.5         |

(1) Marker-Delta method

## Low channel



## High channel



## Test conclusion:

RESPECTED STANDARD

## 10. PEAK CONDUCTED OUTPUT POWER

Temperature (°C) : 20.8

Humidity (%HR): 38

Date : December 4, 2020

Technician : M. DUMESNIL

**Standard:** FCC Part 15  
RSS-247

### Test procedure:

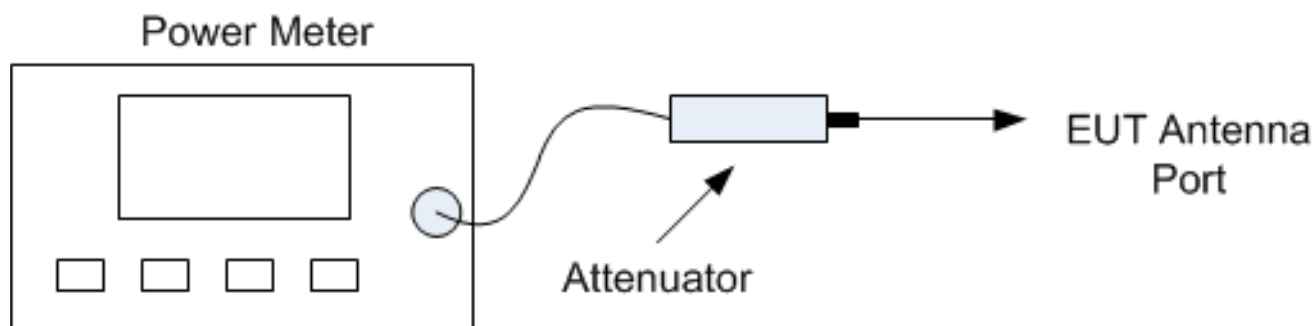
For FCC Part 15: paragraph 15.247 (b)

For RSS-247: paragraph 5.4

PKPM1 Peak power meter method of paragraph 11.9.1.3 of ANSI C63.10

### Test set up:

#### Conducted test



The measure is realized in conducted mode with a calibrated peak power reading power meter.

The power sensor was used on each output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level. Then the results were summed in linear power unit.

### Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate (P Software adjusted to +16 dBm).

Power source: 12 Vdc by an external power supply

Percentage of voltage variation during the test (%):

$\pm 1$

## Results:

Sample N° 1      Low Channel – Mode 802.11.b - SISO

|                                | Maximum Peak conducted output power |       | Limit<br>(W) |
|--------------------------------|-------------------------------------|-------|--------------|
|                                | (dBm)                               | (W)   |              |
| <b>Nominal supply voltage:</b> | 15.38                               | 0.035 | 1            |

*Declared maximum antenna gain: +4.70dBi*

Sample N° 1      Central Channel – Mode 802.11.b - SISO

|                                | Maximum Peak conducted output power |       | Limit<br>(W) |
|--------------------------------|-------------------------------------|-------|--------------|
|                                | (dBm)                               | (W)   |              |
| <b>Nominal supply voltage:</b> | 14.70                               | 0.030 | 1            |

*Declared maximum antenna gain: +3.75dBi*

Sample N° 1      High Channel – Mode 802.11.b - SISO

|                                | Maximum Peak conducted output power |       | Limit<br>(W) |
|--------------------------------|-------------------------------------|-------|--------------|
|                                | (dBm)                               | (W)   |              |
| <b>Nominal supply voltage:</b> | 14.88                               | 0.031 | 1            |

*Declared maximum antenna gain: +3.48dBi*

Sample N° 1      Low Channel – Mode 802.11.g - SISO

|                                        | Maximum Peak conducted<br>output power |       | Limit<br>(W) |
|----------------------------------------|----------------------------------------|-------|--------------|
|                                        | (dBm)                                  | (W)   |              |
| <b>Nominal<br/>supply<br/>voltage:</b> | 17.19                                  | 0.052 | 1            |

*Declared maximum antenna gain: +4.70dBi*

Sample N° 1      Central Channel – Mode 802.11.g - SISO

|                                        | Maximum Peak conducted<br>output power |       | Limit<br>(W) |
|----------------------------------------|----------------------------------------|-------|--------------|
|                                        | (dBm)                                  | (W)   |              |
| <b>Nominal<br/>supply<br/>voltage:</b> | 16.78                                  | 0.048 | 1            |

*Declared maximum antenna gain: +3.75dBi*

Sample N° 1      High Channel – Mode 802.11.g - SISO

|                                        | Maximum Peak conducted<br>output power |       | Limit<br>(W) |
|----------------------------------------|----------------------------------------|-------|--------------|
|                                        | (dBm)                                  | (W)   |              |
| <b>Nominal<br/>supply<br/>voltage:</b> | 17.01                                  | 0.050 | 1            |

*Declared maximum antenna gain: +3.48dBi*

Sample N° 1      Low Channel – Mode 802.11.n - SISO

|                                        | Maximum Peak conducted<br>output power |       | Limit<br>(W) |
|----------------------------------------|----------------------------------------|-------|--------------|
|                                        | (dBm)                                  | (W)   |              |
| <b>Nominal<br/>supply<br/>voltage:</b> | 17.17                                  | 0.052 | 1            |

*Declared maximum antenna gain: +4.70dBi*

Sample N° 1      Central Channel – Mode 802.11.n - SISO

|                                        | Maximum Peak conducted<br>output power |       | Limit<br>(W) |
|----------------------------------------|----------------------------------------|-------|--------------|
|                                        | (dBm)                                  | (W)   |              |
| <b>Nominal<br/>supply<br/>voltage:</b> | 16.72                                  | 0.047 | 1            |

*Declared maximum antenna gain: +3.75dBi*

Sample N° 1      High Channel – Mode 802.11.n - SISO

|                                        | Maximum Peak conducted<br>output power |       | Limit<br>(W) |
|----------------------------------------|----------------------------------------|-------|--------------|
|                                        | (dBm)                                  | (W)   |              |
| <b>Nominal<br/>supply<br/>voltage:</b> | 16.91                                  | 0.049 | 1            |

*Declared maximum antenna gain: +3.48dBi*

### Sample N° 1 Low Channel – Mode 802.11.n - MIMO

| Frequency<br>(MHz) | Transmit<br>chain | Maximum Peak<br>conducted output power |       | Maximum Total<br>Peak conducted<br>output power<br>(W) | Limit<br>(W) |
|--------------------|-------------------|----------------------------------------|-------|--------------------------------------------------------|--------------|
|                    |                   | (dBm)                                  | (W)   |                                                        |              |
| 2412               | 1                 | 17.37                                  | 0.055 | 0.182                                                  | 1            |
| 2412               | 2                 | 21.04                                  | 0.127 |                                                        |              |

Declared maximum antenna gain: Transmit chain 1 at 2412MHz => +4.70dBi  
Transmit chain 2 at 2412MHz => +3.18dBi

### Sample N° 1 Central Channel – Mode 802.11.n - MIMO

| Frequency<br>(MHz) | Transmit<br>chain | Maximum Peak<br>conducted output power |       | Maximum Total<br>Peak conducted<br>output power<br>(W) | Limit<br>(W) |
|--------------------|-------------------|----------------------------------------|-------|--------------------------------------------------------|--------------|
|                    |                   | (dBm)                                  | (W)   |                                                        |              |
| 2437               | 1                 | 17.06                                  | 0.051 | 0.168                                                  | 1            |
| 2437               | 2                 | 20.69                                  | 0.117 |                                                        |              |

Declared maximum antenna gain: Transmit chain 1 at 2437MHz => +3.75dBi  
Transmit chain 2 at 2437MHz => +3.17dBi

### Sample N° 1 High Channel – Mode 802.11.n - MIMO

| Frequency<br>(MHz) | Transmit<br>chain | Maximum Peak<br>conducted output power |       | Maximum Total<br>Peak conducted<br>output power<br>(W) | Limit<br>(W) |
|--------------------|-------------------|----------------------------------------|-------|--------------------------------------------------------|--------------|
|                    |                   | (dBm)                                  | (W)   |                                                        |              |
| 2462               | 1                 | 17.26                                  | 0.053 | 0.166                                                  | 1            |
| 2462               | 2                 | 20.54                                  | 0.113 |                                                        |              |

Declared maximum antenna gain: Transmit chain 1 at 2462MHz => +3.48dBi  
Transmit chain 2 at 2462MHz => +2.05dBi

### Test conclusion:

RESPECTED STANDARD

**11. RADIATED SPURIOUS EMISSIONS****Temperature (°C) :** 20.6-22.4**Humidity (%HR):** 36.7-40.3**Date :** December 1, 2, 3 and 7,  
2020**Technician :** M. DUMESNIL**Standard:** FCC Part 15  
RSS-247**Test procedure:**For FCC Part 15: paragraph 15.205, paragraph 15.209, paragraph 15.247 (d)  
For RSS-247: paragraph 5.5

Emissions in non-restricted frequency bands method of paragraph 11.11 of ANSI C63.10

Emissions in restricted frequency bands method of paragraph 11.12 of ANSI C63.10

**Test set up:**

First an exploratory radiated measurement was performed. During this phase the product is oriented in these two normal positions. Then the final measurement is realized with the product on the most critical orientation.

The measure is realized on open area test site under 1 GHz and in anechoic chamber above 1 GHz.

When the system is tested in an open area test site (OATS), the EUT is placed on a rotating table, 0.8m from a ground plane and when the system is tested in anechoic chamber, the EUT is placed on a rotating table, 1.5 m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

**Frequency range:** From 9 kHz to 10<sup>th</sup> harmonic of the highest fundamental frequency (2462 MHz).**Detection mode:** Quasi-peak ( $F < 1 \text{ GHz}$ )Peak / Average ( $F > 1 \text{ GHz}$ )**Bandwidth:** 200Hz ( $9 \text{ kHz} < F < 150\text{kHz}$ )  
9 kHz ( $150 \text{ kHz} < F < 30\text{MHz}$ )  
120 kHz ( $30 \text{ MHz} < F < 1 \text{ GHz}$ )  
100 kHz / 1 MHz ( $F > 1 \text{ GHz}$ )**Distance of antenna:** 10 meters (in open area test site) / 3 meters (in anechoic room)**Antenna height:** 1 to 4 meters (in open area test site) / 1.5 meter (in anechoic room)**Antenna polarization:** vertical and horizontal (only the highest level is recorded)**Equipment under test operating condition:**

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate (P Software adjusted to +16 dBm).

Power source: 12 Vdc by an external power supply

Percentage of voltage variation during the test (%):

 $\pm 1$



## Results:

### Internal antenna

Sample N° 1 Low Channel – Mode 802.11.b - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength Measured at 3 /10 m (dBμV/m) | Field strength Computed at 3 m (dBμV/m) | Limits at 3 m (dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|---------------------------------------------|-----------------------------------------|------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                       | 29.9                                    | 43.5                   | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 87                     | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                       | 31.3                                    | 87                     | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                       | 28.6                                    | 43.5                   | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                       | 25.8                                    | 87                     | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                       | 28                                      | 87                     | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                       | 24.8                                    | 87                     | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                       | 31.4                                    | 87                     | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 87                     | 56.6        |
| 4824 (1)          | P                         | 1000      | H                                            | 47.5 (2)                                    | /                                       | 74                     | 26.5        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

Sample N° 1 Central Channel – Mode 802.11.b - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength Measured at 3 /10 m (dBμV/m) | Field strength Computed at 3 m (dBμV/m) | Limits at 3 m (dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|---------------------------------------------|-----------------------------------------|------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                       | 29.9                                    | 43.5                   | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 87                     | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                       | 31.3                                    | 87                     | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                       | 28.6                                    | 43.5                   | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                       | 25.8                                    | 87                     | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                       | 28                                      | 87                     | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                       | 24.8                                    | 87                     | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                       | 31.4                                    | 87                     | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 87                     | 56.6        |
| 4874 (1)          | P                         | 1000      | H                                            | 49.1 (2)                                    | /                                       | 74                     | 24.9        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

Sample N° 1 High Channel – Mode 802.11.b - SISO

| Frequencies<br>(MHz) | Detector<br>P<br>QP<br>Av | RBW<br>(kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field<br>strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field<br>strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin<br>(dB) |
|----------------------|---------------------------|--------------|----------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|----------------|
| 125.149 (1)          | P                         | 100          | V                                            | 19.45                                                   | 29.9                                                | 43.5                         | 13.6           |
| 144.41               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 87                           | 56.6           |
| 153.862              | P                         | 100          | V                                            | 20.85                                                   | 31.3                                                | 87                           | 55.7           |
| 164.50 (1)           | P                         | 100          | V                                            | 18.15                                                   | 28.6                                                | 43.5                         | 14.9           |
| 193.166              | P                         | 100          | H                                            | 15.35                                                   | 25.8                                                | 87                           | 61.2           |
| 576                  | P                         | 100          | V                                            | 17.55                                                   | 28                                                  | 87                           | 59             |
| 640                  | P                         | 100          | V                                            | 14.35                                                   | 24.8                                                | 87                           | 62.2           |
| 704                  | P                         | 100          | V                                            | 20.95                                                   | 31.4                                                | 87                           | 55.6           |
| 735.96               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 87                           | 56.6           |
| 4924 (1)             | P                         | 1000         | H                                            | 49.7 (2)                                                | /                                                   | 74                           | 24.3           |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

### Sample N° 1 Low Channel – Mode 802.11.g - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 87                           | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 87                           | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 87                           | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 87                           | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 87                           | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Central Channel – Mode 802.11.g - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 87                           | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 87                           | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 87                           | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 87                           | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 87                           | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 4874 (1)          | P                         | 1000      | H                                            | 47.1 (2)                                             | /                                                | 74                           | 26.9        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

Sample N° 1      High Channel – Mode 802.11.g - SISO

| Frequencies<br>(MHz) | Detector<br>P<br>QP<br>Av | RBW<br>(kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field<br>strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field<br>strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin<br>(dB) |
|----------------------|---------------------------|--------------|----------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|----------------|
| 125.149 (1)          | P                         | 100          | V                                            | 19.45                                                   | 29.9                                                | 43.5                         | 13.6           |
| 144.41               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 87                           | 56.6           |
| 153.862              | P                         | 100          | V                                            | 20.85                                                   | 31.3                                                | 87                           | 55.7           |
| 164.50 (1)           | P                         | 100          | V                                            | 18.15                                                   | 28.6                                                | 43.5                         | 14.9           |
| 193.166              | P                         | 100          | H                                            | 15.35                                                   | 25.8                                                | 87                           | 61.2           |
| 576                  | P                         | 100          | V                                            | 17.55                                                   | 28                                                  | 87                           | 59             |
| 640                  | P                         | 100          | V                                            | 14.35                                                   | 24.8                                                | 87                           | 62.2           |
| 704                  | P                         | 100          | V                                            | 20.95                                                   | 31.4                                                | 87                           | 55.6           |
| 735.96               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 87                           | 56.6           |
| 4924 (1)             | P                         | 1000         | H                                            | 44.3 (2)                                                | /                                                   | 74                           | 29.7           |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

### Sample N° 1 Low Channel – Mode 802.11.n - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 87                           | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 87                           | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 87                           | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 87                           | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 87                           | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Central Channel – Mode 802.11.n - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 87                           | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 87                           | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 87                           | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 87                           | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 87                           | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 4874 (1)          | P                         | 1000      | H                                            | 45.1 (2)                                             | /                                                | 74                           | 28.9        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

Sample N° 1      High Channel – Mode 802.11.n - SISO

| Frequencies<br>(MHz) | Detector<br>P<br>QP<br>Av | RBW<br>(kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field<br>strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field<br>strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin<br>(dB) |
|----------------------|---------------------------|--------------|----------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|----------------|
| 125.149 (1)          | P                         | 100          | V                                            | 19.45                                                   | 29.9                                                | 43.5                         | 13.6           |
| 144.41               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 87                           | 56.6           |
| 153.862              | P                         | 100          | V                                            | 20.85                                                   | 31.3                                                | 87                           | 55.7           |
| 164.50 (1)           | P                         | 100          | V                                            | 18.15                                                   | 28.6                                                | 43.5                         | 14.9           |
| 193.166              | P                         | 100          | H                                            | 15.35                                                   | 25.8                                                | 87                           | 61.2           |
| 576                  | P                         | 100          | V                                            | 17.55                                                   | 28                                                  | 87                           | 59             |
| 640                  | P                         | 100          | V                                            | 14.35                                                   | 24.8                                                | 87                           | 62.2           |
| 704                  | P                         | 100          | V                                            | 20.95                                                   | 31.4                                                | 87                           | 55.6           |
| 735.96               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 87                           | 56.6           |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Low Channel – Mode 802.11.n - MIMO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 87                           | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 87                           | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 87                           | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 87                           | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 87                           | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Central Channel – Mode 802.11.n - MIMO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 87                           | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 87                           | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 87                           | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 87                           | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 87                           | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 87                           | 56.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

# Sample N° 1 High Channel – Mode 802.11.n - MIMO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength Measured at 3 /10 m (dBμV/m) | Field strength Computed at 3 m (dBμV/m) | Limits at 3 m (dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|---------------------------------------------|-----------------------------------------|------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                       | 29.9                                    | 43.5                   | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 87                     | 56.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                       | 31.3                                    | 87                     | 55.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                       | 28.6                                    | 43.5                   | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                       | 25.8                                    | 87                     | 61.2        |
| 576               | P                         | 100       | V                                            | 17.55                                       | 28                                      | 87                     | 59          |
| 640               | P                         | 100       | V                                            | 14.35                                       | 24.8                                    | 87                     | 62.2        |
| 704               | P                         | 100       | V                                            | 20.95                                       | 31.4                                    | 87                     | 55.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 87                     | 56.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

**Applicable limits:** 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.

The highest level recorded in a 100 kHz bandwidth is 107 dBμV/m on channel Low.

So the applicable limit is 87 dBμV/m.

In addition, radiated emissions which fall in the restricted band, as defined in section 15.205 (a), must also comply with the radiated emission limits specified in section 15.209 (a) (see section 15.205 (c)).

In addition, radiated emissions which fall in the restricted band, as defined in Table 6 of RSS-Gen, must also comply with the radiated emission limits specified in Table 4 and Table 5 of RSS-Gen.



## External antenna

Sample N° 1 Low Channel – Mode 802.11.b - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength Measured at 3 /10 m (dBμV/m) | Field strength Computed at 3 m (dBμV/m) | Limits at 3 m (dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|---------------------------------------------|-----------------------------------------|------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                       | 29.9                                    | 43.5                   | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 81                     | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                       | 31.3                                    | 81                     | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                       | 28.6                                    | 43.5                   | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                       | 25.8                                    | 81                     | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                       | 28                                      | 81                     | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                       | 24.8                                    | 81                     | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                       | 31.4                                    | 81                     | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 81                     | 50.6        |
| 4824 (1)          | P                         | 1000      | V                                            | 46.2 (2)                                    | /                                       | 74                     | 27.8        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

Sample N° 1 Central Channel – Mode 802.11.b - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength Measured at 3 /10 m (dBμV/m) | Field strength Computed at 3 m (dBμV/m) | Limits at 3 m (dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|---------------------------------------------|-----------------------------------------|------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                       | 29.9                                    | 43.5                   | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 81                     | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                       | 31.3                                    | 81                     | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                       | 28.6                                    | 43.5                   | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                       | 25.8                                    | 81                     | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                       | 28                                      | 81                     | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                       | 24.8                                    | 81                     | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                       | 31.4                                    | 81                     | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 81                     | 50.6        |
| 4874 (1)          | P                         | 1000      | V                                            | 44.5 (2)                                    | /                                       | 74                     | 29.5        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

# Sample N° 1      High Channel – Mode 802.11.b - SISO

| Frequencies<br>(MHz) | Detector<br>P<br>QP<br>Av | RBW<br>(kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field<br>strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field<br>strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin<br>(dB) |
|----------------------|---------------------------|--------------|----------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|----------------|
| 125.149 (1)          | P                         | 100          | V                                            | 19.45                                                   | 29.9                                                | 43.5                         | 13.6           |
| 144.41               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 81                           | 50.6           |
| 153.862              | P                         | 100          | V                                            | 20.85                                                   | 31.3                                                | 81                           | 49.7           |
| 164.50 (1)           | P                         | 100          | V                                            | 18.15                                                   | 28.6                                                | 43.5                         | 14.9           |
| 193.166              | P                         | 100          | H                                            | 15.35                                                   | 25.8                                                | 81                           | 55.2           |
| 576                  | P                         | 100          | V                                            | 17.55                                                   | 28                                                  | 81                           | 53             |
| 640                  | P                         | 100          | V                                            | 14.35                                                   | 24.8                                                | 81                           | 56.2           |
| 704                  | P                         | 100          | V                                            | 20.95                                                   | 31.4                                                | 81                           | 49.6           |
| 735.96               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 81                           | 50.6           |
| 4924 (1)             | P                         | 1000         | V                                            | 47.2 (2)                                                | /                                                   | 74                           | 26.8           |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

(2) The peak level is lower than the average limit (54 dBμV/m)

### Sample N° 1 Low Channel – Mode 802.11.g - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 81                           | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 81                           | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 81                           | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 81                           | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 81                           | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Central Channel – Mode 802.11.g - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 81                           | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 81                           | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 81                           | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 81                           | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 81                           | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

Sample N° 1      High Channel – Mode 802.11.g - SISO

| Frequencies<br>(MHz) | Detector<br>P<br>QP<br>Av | RBW<br>(kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field<br>strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field<br>strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin<br>(dB) |
|----------------------|---------------------------|--------------|----------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|----------------|
| 125.149 (1)          | P                         | 100          | V                                            | 19.45                                                   | 29.9                                                | 43.5                         | 13.6           |
| 144.41               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 81                           | 50.6           |
| 153.862              | P                         | 100          | V                                            | 20.85                                                   | 31.3                                                | 81                           | 49.7           |
| 164.50 (1)           | P                         | 100          | V                                            | 18.15                                                   | 28.6                                                | 43.5                         | 14.9           |
| 193.166              | P                         | 100          | H                                            | 15.35                                                   | 25.8                                                | 81                           | 55.2           |
| 576                  | P                         | 100          | V                                            | 17.55                                                   | 28                                                  | 81                           | 53             |
| 640                  | P                         | 100          | V                                            | 14.35                                                   | 24.8                                                | 81                           | 56.2           |
| 704                  | P                         | 100          | V                                            | 20.95                                                   | 31.4                                                | 81                           | 49.6           |
| 735.96               | P                         | 100          | V                                            | 19.95                                                   | 30.4                                                | 81                           | 50.6           |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Low Channel – Mode 802.11.n - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 81                           | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 81                           | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 81                           | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 81                           | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 81                           | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

### Sample N° 1 Central Channel – Mode 802.11.n - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength<br>Measured<br>at 3 /10 m<br>(dBμV/m) | Field strength<br>Computed<br>at 3 m<br>(dBμV/m) | Limits at<br>3 m<br>(dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|------------------------------------------------------|--------------------------------------------------|------------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                                | 29.9                                             | 43.5                         | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                                | 31.3                                             | 81                           | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                                | 28.6                                             | 43.5                         | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                                | 25.8                                             | 81                           | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                                | 28                                               | 81                           | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                                | 24.8                                             | 81                           | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                                | 31.4                                             | 81                           | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                                | 30.4                                             | 81                           | 50.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

Sample N° 1 High Channel – Mode 802.11.n - SISO

| Frequencies (MHz) | Detector<br>P<br>QP<br>Av | RBW (kHz) | Polarization<br>H: Horizontal<br>V: Vertical | Field strength Measured at 3 /10 m (dBμV/m) | Field strength Computed at 3 m (dBμV/m) | Limits at 3 m (dBμV/m) | Margin (dB) |
|-------------------|---------------------------|-----------|----------------------------------------------|---------------------------------------------|-----------------------------------------|------------------------|-------------|
| 125.149 (1)       | P                         | 100       | V                                            | 19.45                                       | 29.9                                    | 43.5                   | 13.6        |
| 144.41            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 81                     | 50.6        |
| 153.862           | P                         | 100       | V                                            | 20.85                                       | 31.3                                    | 81                     | 49.7        |
| 164.50 (1)        | P                         | 100       | V                                            | 18.15                                       | 28.6                                    | 43.5                   | 14.9        |
| 193.166           | P                         | 100       | H                                            | 15.35                                       | 25.8                                    | 81                     | 55.2        |
| 576               | P                         | 100       | V                                            | 17.55                                       | 28                                      | 81                     | 53          |
| 640               | P                         | 100       | V                                            | 14.35                                       | 24.8                                    | 81                     | 56.2        |
| 704               | P                         | 100       | V                                            | 20.95                                       | 31.4                                    | 81                     | 49.6        |
| 735.96            | P                         | 100       | V                                            | 19.95                                       | 30.4                                    | 81                     | 50.6        |

P= Peak, QP=Quasi-peak, Av=Average

(1) Restricted bands of operation in 15.205 or in Table 6 of RSS-Gen

**Applicable limits:** 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.

The highest level recorded in a 100 kHz bandwidth is 101 dBμV/m on channel Low.

So the applicable limit is 81 dBμV/m.

In addition, radiated emissions which fall in the restricted band, as defined in section 15.205 (a), must also comply with the radiated emission limits specified in section 15.209 (a) (see section 15.205 (c)).

In addition, radiated emissions which fall in the restricted band, as defined in Table 6 of RSS-Gen, must also comply with the radiated emission limits specified in Table 4 and Table 5 of RSS-Gen.

**Test conclusion:**

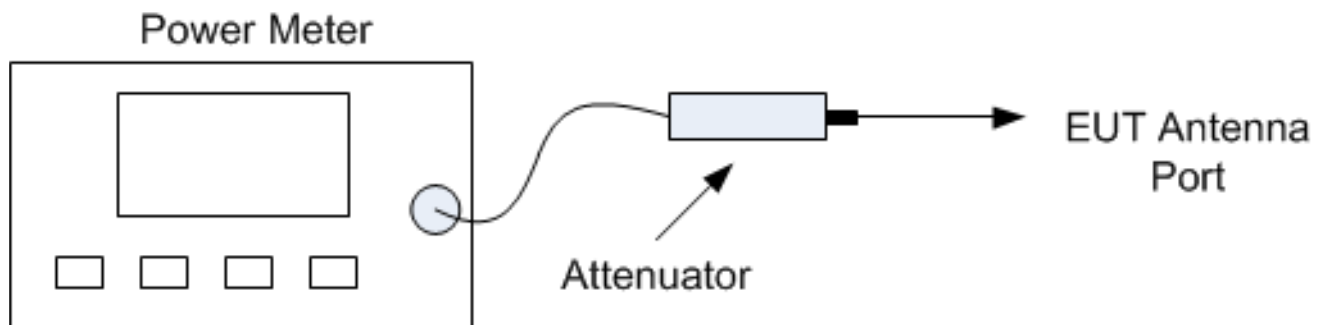
RESPECTED STANDARD

**12. PEAK CONDUCTED POWER SPECTRAL DENSITY****Temperature (°C) :** 20.8**Humidity (%HR):** 38**Date :** December 4, 2020**Technician :** M. DUMESNIL**Standard:** FCC Part 15  
RSS-247**Test procedure:**

For FCC Part 15: paragraph 15.247 (e), paragraph 15.247 (f)

For RSS-247: paragraph 5.2

PKPSD (Peak PSD) method of paragraph 11.10.2 of ANSI C63.10

**Test set up:**Conducted test

The measure is realized in conducted mode with an analyser.

Span: 15, 23 or 25 MHz  
Resolution bandwidth: 3 kHz  
Video bandwidth: 10 kHz  
Detector: RMS  
Number of points: 10001  
Sweep time: Auto  
Trace mode: Max hold

Then the peak marker function is used.

The measure is repeated on each output port of the EUT. Then the results were summed in linear power unit.

**Equipment under test operating condition:**

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate (P Software adjusted to +16 dBm).

Power source: 12 Vdc by an external power supply

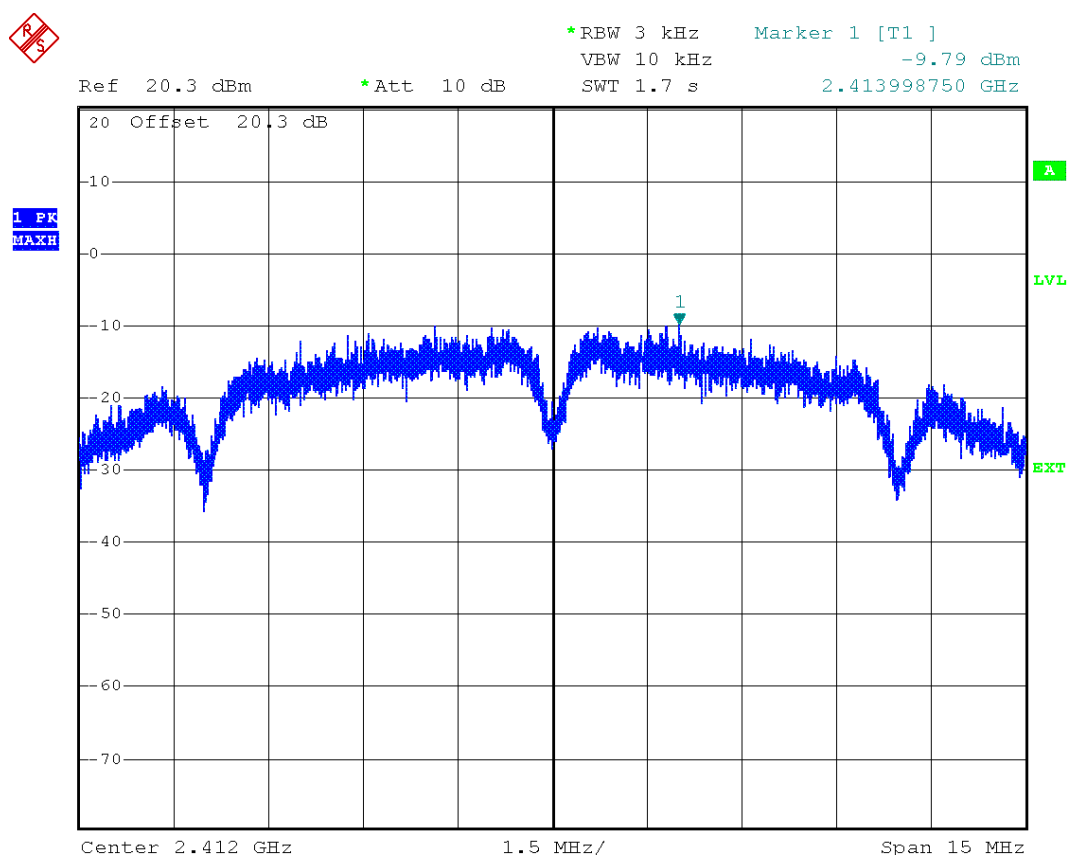
Percentage of voltage variation during the test (%):  $\pm 1$

## Results:

Sample N° 1      Low Channel – Mode 802.11.b - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -9.79                                                    | 8                      |

Declared maximum antenna gain: +4.70dBi

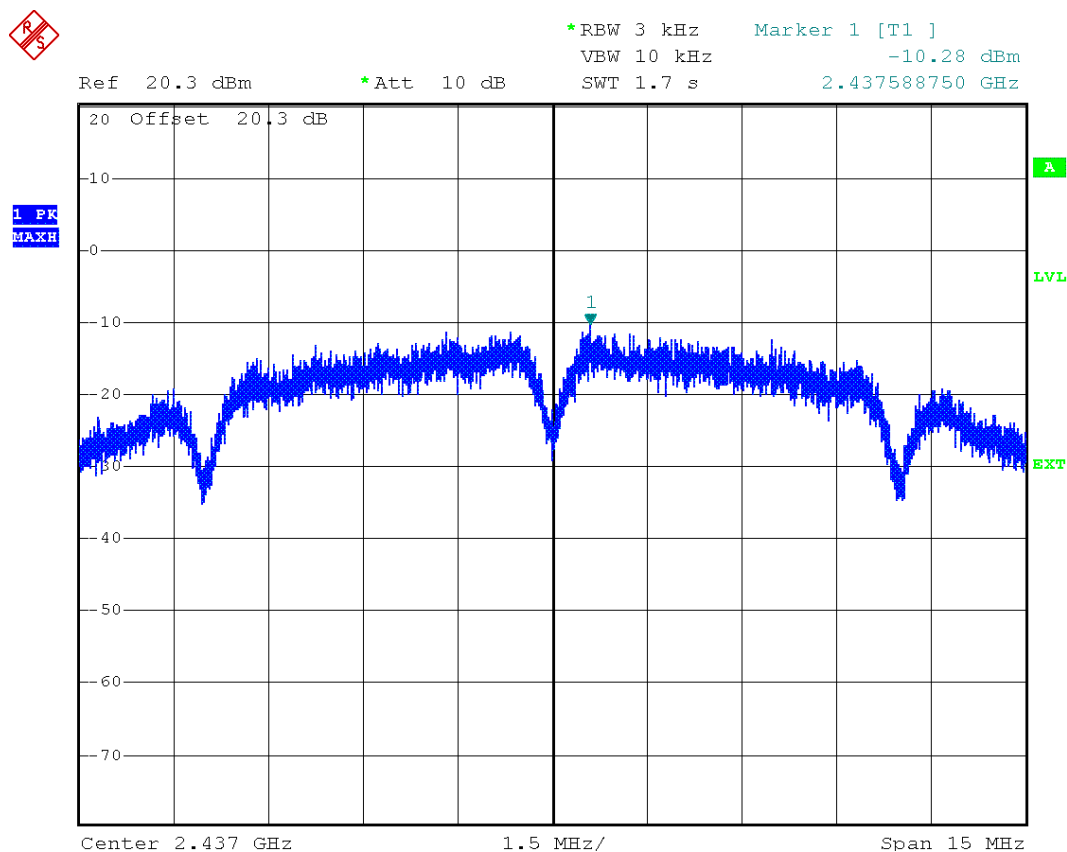




Sample N° 1      Central Channel – Mode 802.11.b - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -10.28                                                   | 8                      |

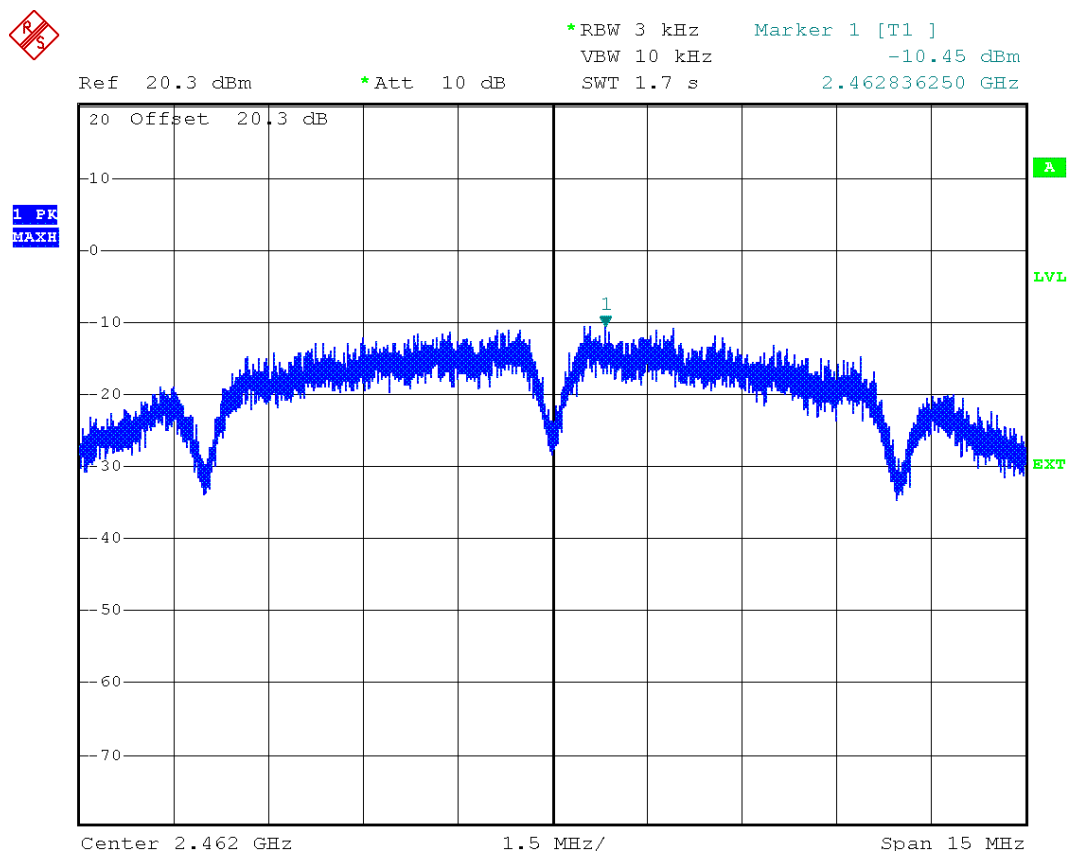
Declared maximum antenna gain: +3.75dBi



Sample N° 1      High Channel – Mode 802.11.b - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -10.45                                                   | 8                      |

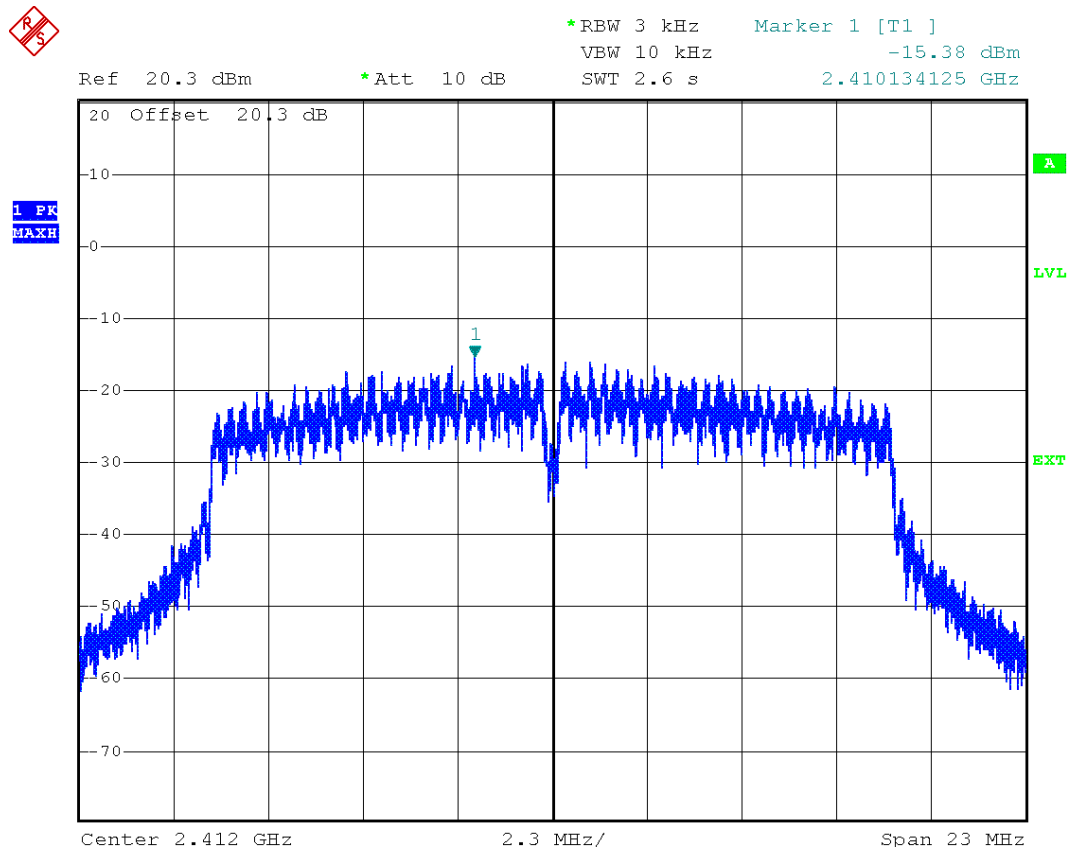
Declared maximum antenna gain: +3.48dBi



Sample N° 1      Low Channel – Mode 802.11.g - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -15.38                                                   | 8                      |

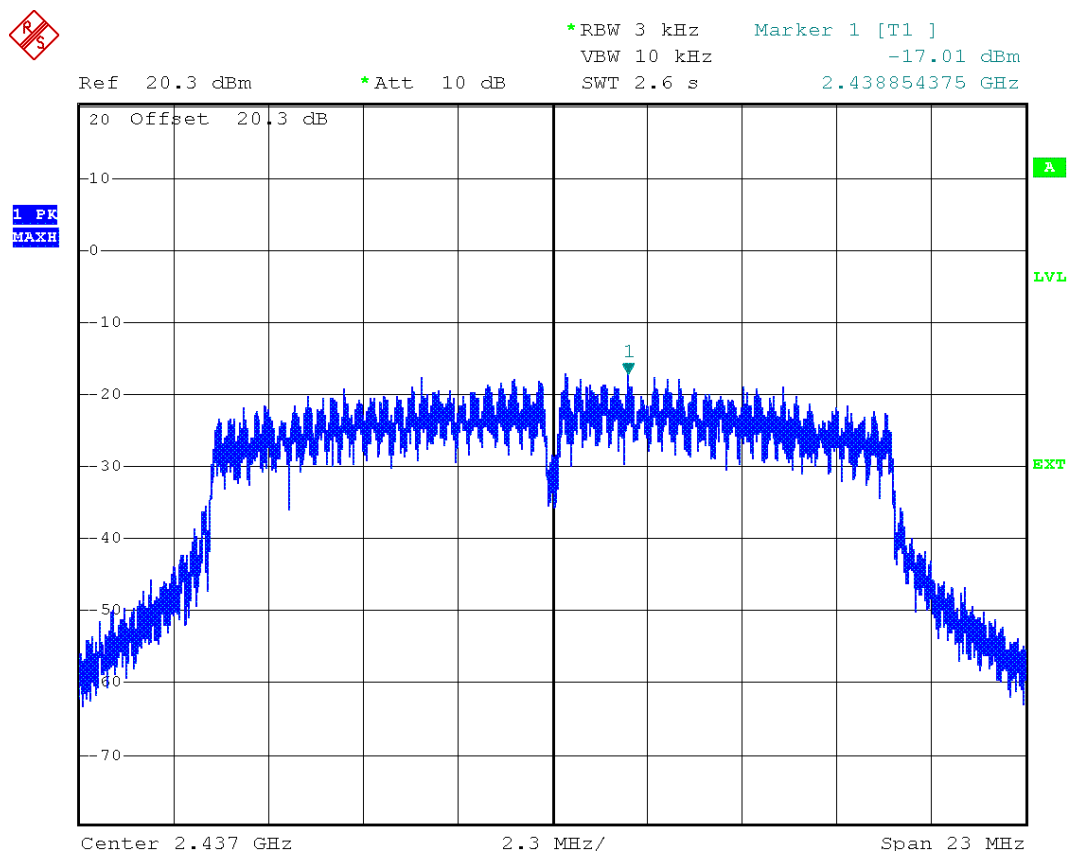
Declared maximum antenna gain: +4.70dBi



Sample N° 1      Central Channel – Mode 802.11.g - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -17.01                                                   | 8                      |

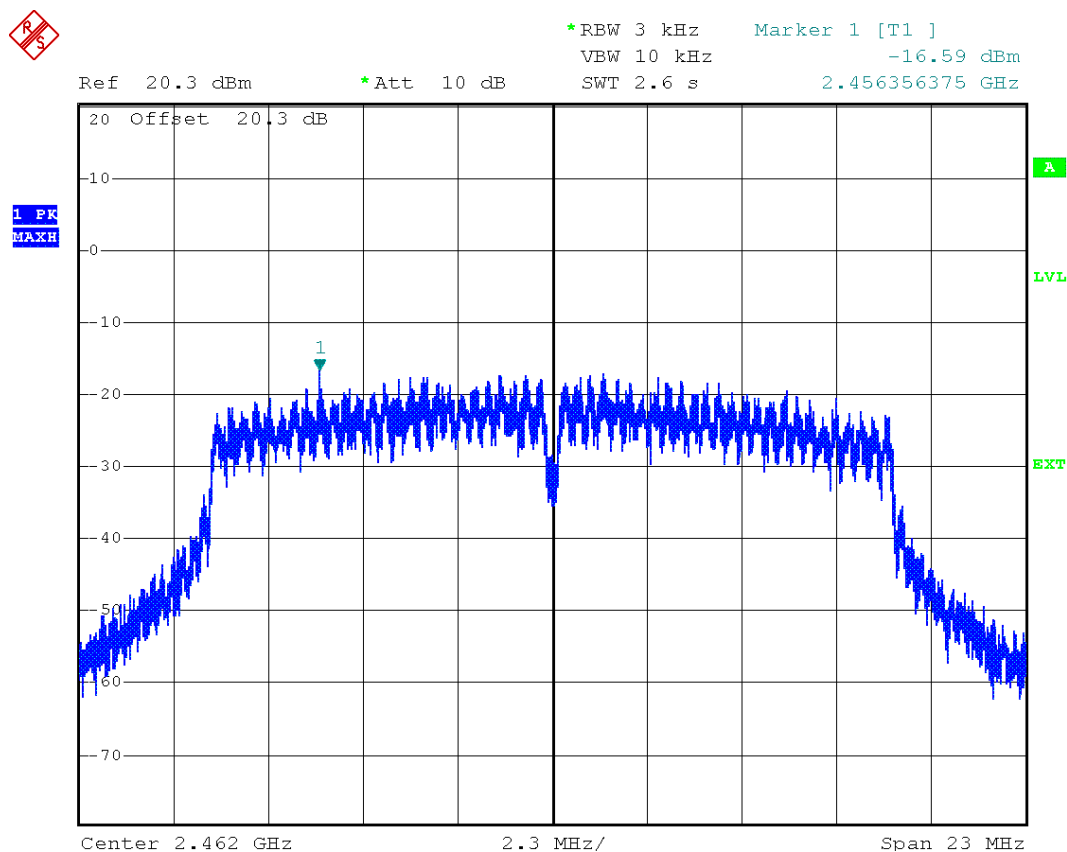
Declared maximum antenna gain: +3.75dBi



Sample N° 1      High Channel – Mode 802.11.g - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -16.59                                                   | 8                      |

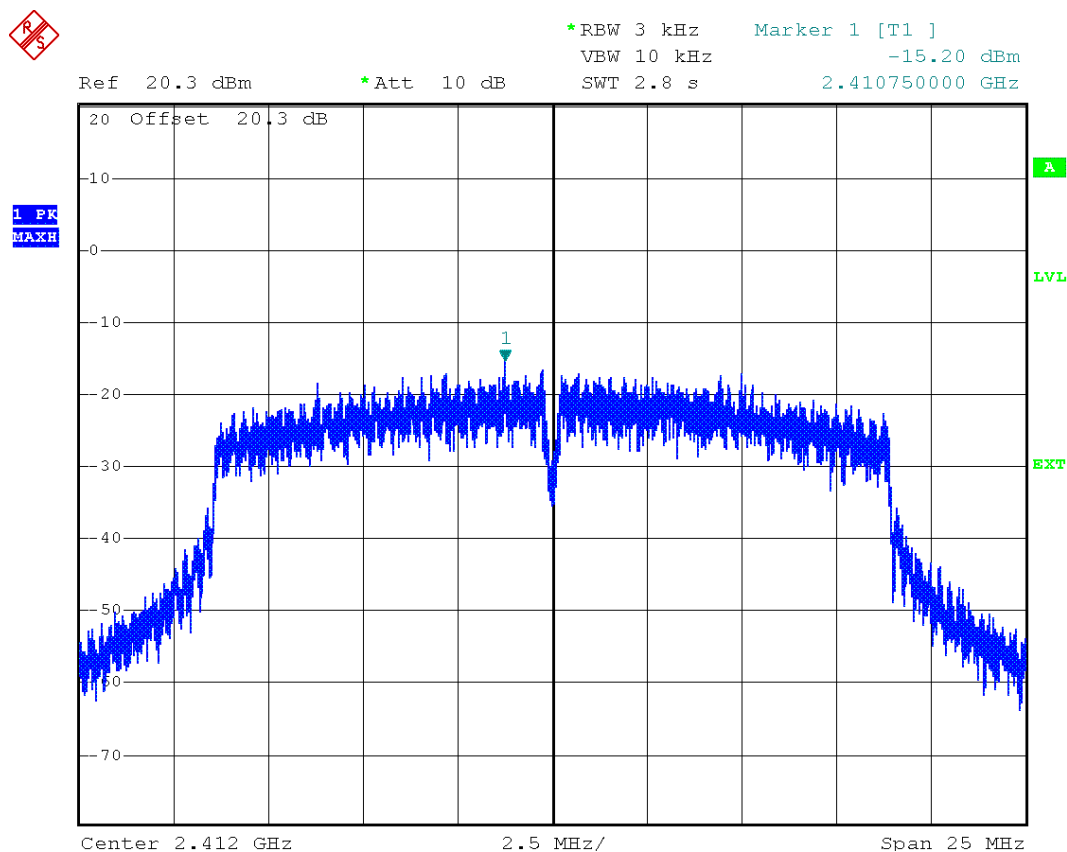
Declared maximum antenna gain: +3.48dBi



Sample N° 1      Low Channel – Mode 802.11.n - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -15.20                                                   | 8                      |

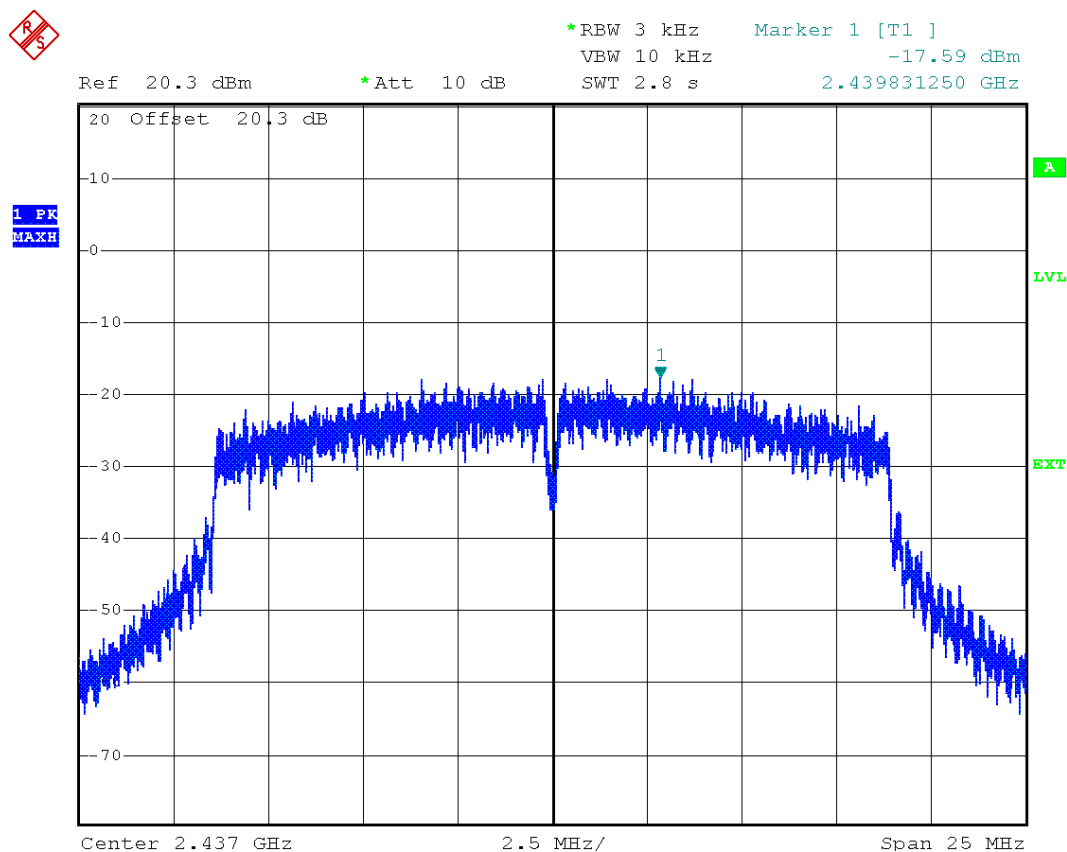
Declared maximum antenna gain: +4.70dBi



Sample N° 1      Central Channel – Mode 802.11.n - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -17.59                                                   | 8                      |

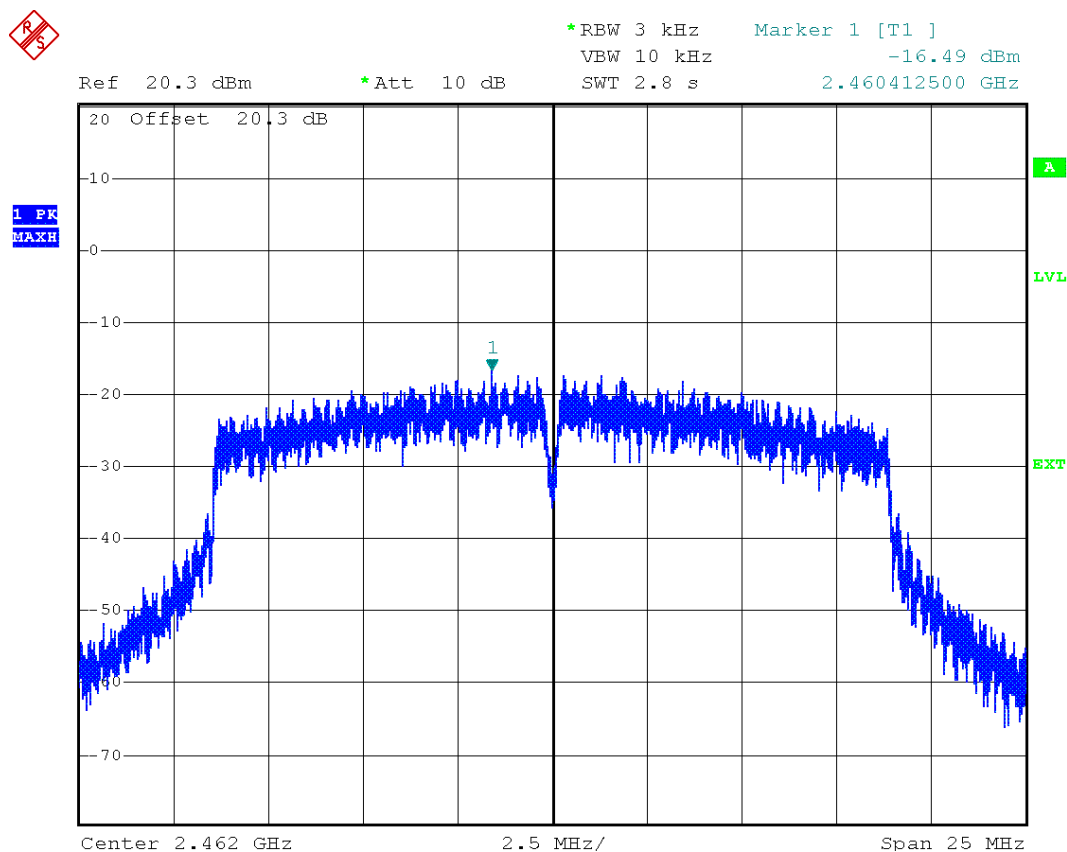
Declared maximum antenna gain: +3.75dBi



Sample N° 1      High Channel – Mode 802.11.n - SISO

|                            | Maximum Peak conducted<br>power density<br>(dBm / 3 kHz) | Limit<br>(dBm / 3 kHz) |
|----------------------------|----------------------------------------------------------|------------------------|
| Nominal supply<br>voltage: | -16.49                                                   | 8                      |

Declared maximum antenna gain: +3.48dBi

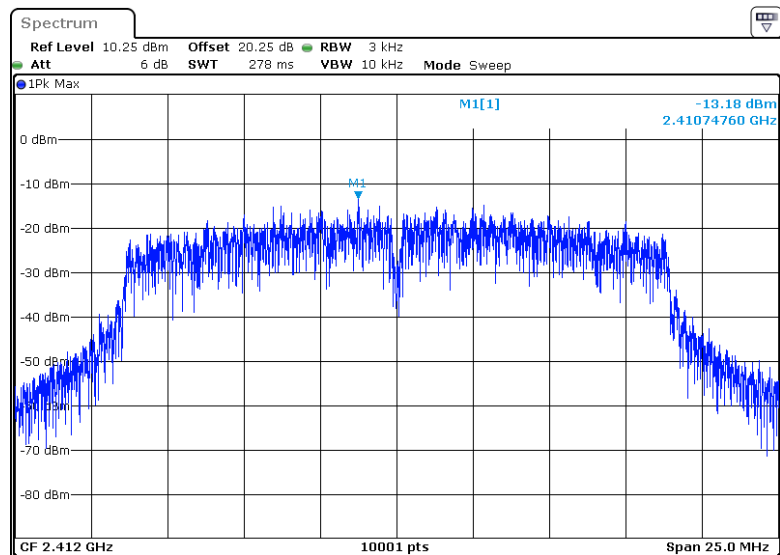
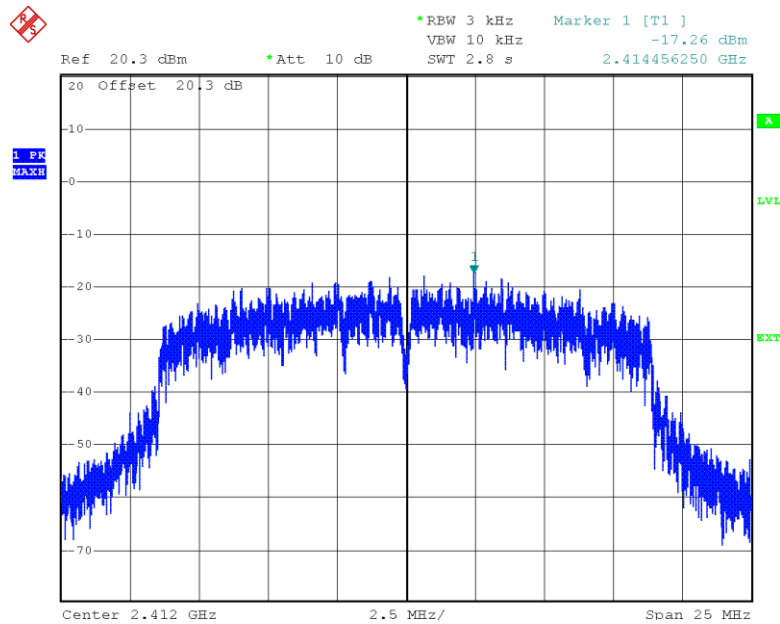




Sample N° 1      Low Channel – Mode 802.11.n - MIMO

| Frequency<br>(MHz) | Transmit<br>chain | Maximum Peak<br>conducted<br>power density: | Maximum Total<br>Peak conducted<br>power density | Limit         |
|--------------------|-------------------|---------------------------------------------|--------------------------------------------------|---------------|
|                    |                   | (dBm / 3 kHz)                               | (dBm / 3 kHz)                                    | (dBm / 3 kHz) |
| 2412               | 1                 | -17.26                                      | -11.75                                           | 8             |
| 2412               | 2                 | -13.18                                      |                                                  |               |

Declared maximum antenna gain: Transmit chain 1 at 2412MHz => +4.70dBi  
Transmit chain 2 at 2412MHz => +3.18dBi

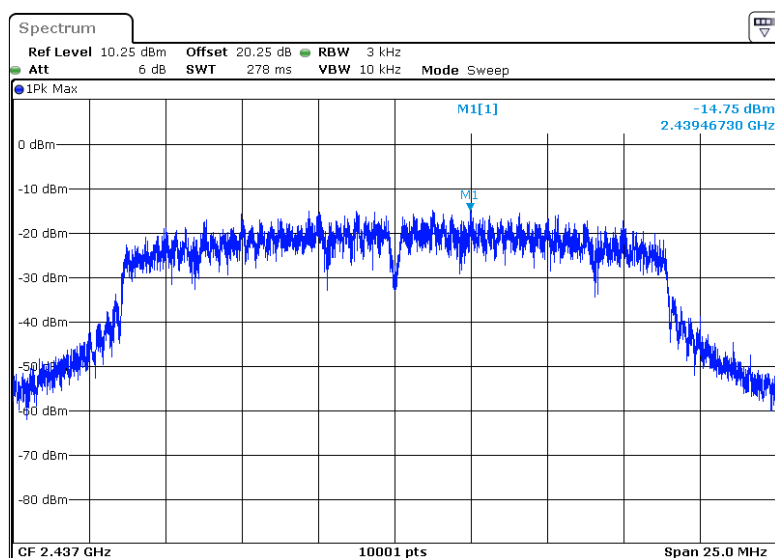
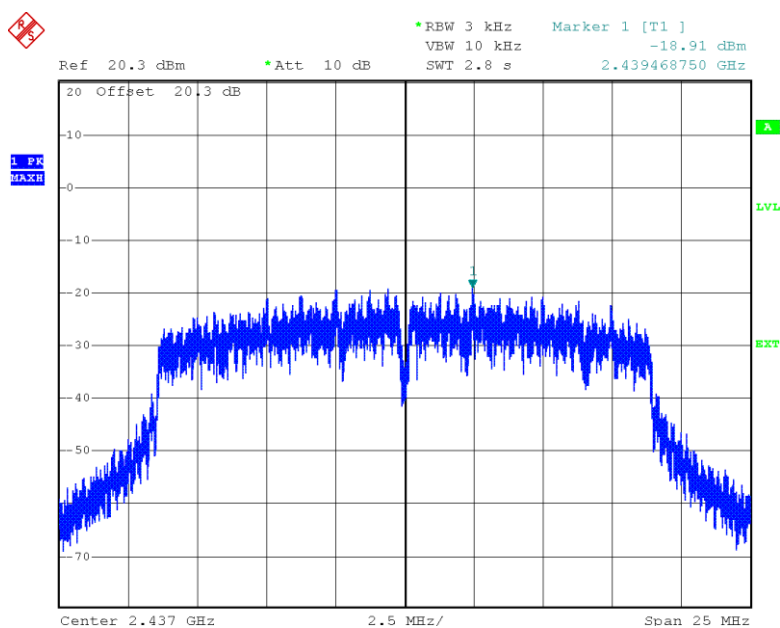


Sample N° 1 Central Channel – Mode 802.11.n - MIMO

| Frequency<br>(MHz) | Transmit<br>chain | Maximum Peak<br>conducted<br>power density: | Maximum Total<br>Peak conducted<br>power density | Limit         |
|--------------------|-------------------|---------------------------------------------|--------------------------------------------------|---------------|
|                    |                   | (dBm / 3 kHz)                               | (dBm / 3 kHz)                                    | (dBm / 3 kHz) |
| 2437               | 1                 | -18.91                                      | -13.34                                           | 8             |
| 2437               | 2                 | -14.75                                      |                                                  |               |

Declared maximum antenna gain: Transmit chain 1 at 2437MHz => +3.75dBi

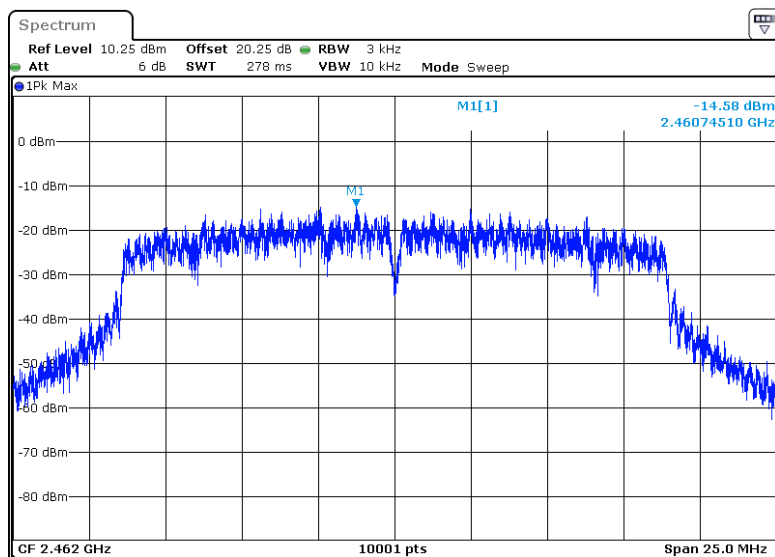
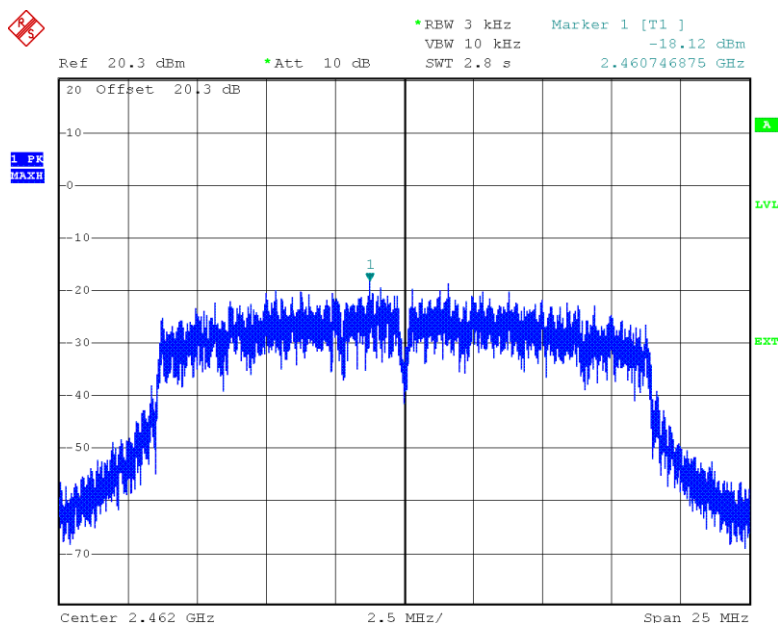
Transmit chain 2 at 2437MHz => +3.17dBi



Sample N° 1 High Channel – Mode 802.11.n - MIMO

| Frequency<br>(MHz) | Transmit<br>chain | Maximum Peak<br>conducted<br>power density: | Maximum Total<br>Peak conducted<br>power density | Limit         |
|--------------------|-------------------|---------------------------------------------|--------------------------------------------------|---------------|
|                    |                   | (dBm / 3 kHz)                               | (dBm / 3 kHz)                                    | (dBm / 3 kHz) |
| 2462               | 1                 | -18.12                                      | -12.99                                           | 8             |
| 2462               | 2                 | -14.58                                      |                                                  |               |

Declared maximum antenna gain: Transmit chain 1 at 2462MHz => +3.48dBi  
Transmit chain 2 at 2462MHz => +2.05dBi



Test conclusion:

RESPECTED STANDARD

End of report, 1 appendix to be forwarded

## APPENDIX 1: Test equipment list

### Occupied bandwidth

| TYPE                                           | MANUFACTURER    | EMITECH NUMBER |
|------------------------------------------------|-----------------|----------------|
| Satellite synchronized frequency standard GPS8 | ACQUISYS        | 8896           |
| Spectrum Analyzer FSP40                        | Rohde & Schwarz | 4088           |
| Spectrum Analyzer FSV40                        | Rohde & Schwarz | 15666          |
| N-1M Cable                                     | SUCOFLEX        | 14302          |
| Attenuator 8491A-20dB                          | Hewlett Packard | 2507           |
| Power source E3610A                            | Hewlett Packard | 4195           |
| Multimeter 177                                 | Fluke           | 14903          |
| Meteo station 608-H1                           | Testo           | 7566           |
| 50 Ohms Load                                   | -               | -              |
| Software                                       | GPIBSHOT V2.4   | -              |
| Software                                       | RS Commander    | -              |

### Band edge

| TYPE                                           | MANUFACTURER       | EMITECH NUMBER |
|------------------------------------------------|--------------------|----------------|
| Full anechoic chamber                          | EMITECH            | 10759          |
| Turntable and mat controller NCD               | MATURO             | 10789          |
| Satellite synchronized frequency standard GPS8 | ACQUISYS           | 8896           |
| Spectrum Analyzer FSP40                        | Rohde & Schwarz    | 4088           |
| Antenna 3117                                   | ETS-Lindgren       | 10771          |
| N-2M Cable                                     | SUCOFLEX           | 14303          |
| N-2.5M Cable                                   | SUCOFLEX           | 14304          |
| N-5M Cable                                     | Huber + Suhner     | 12912          |
| Power source E3610A                            | Hewlett Packard    | 4195           |
| Multimeter 177                                 | Fluke              | 14903          |
| Meteo station 608-H1                           | Testo              | 7566           |
| Software                                       | BAT-EMC V3.18.0.26 | 0000           |

### Peak conducted output power

| TYPE                  | MANUFACTURER               | EMITECH NUMBER |
|-----------------------|----------------------------|----------------|
| N-1M Cable            | SUCOFLEX                   | 14302          |
| Attenuator 8491A-20dB | Hewlett Packard            | 2507           |
| Power sensor NRV-Z86  | Rohde & Schwarz            | 11592          |
| Power source E3610A   | Hewlett Packard            | 4195           |
| Multimeter 177        | Fluke                      | 14903          |
| Meteo station WS-9232 | La Crosse Technology       | 8750           |
| 50 Ohms Load          | -                          | -              |
| Software              | R&S Power Viewer Plus V5.9 | -              |

### Radiated spurious emissions

| TYPE                                           | MANUFACTURER             | EMITECH NUMBER |
|------------------------------------------------|--------------------------|----------------|
| Open test site                                 | EMITECH                  | 8732           |
| Turntable and mat controller                   | EMITECH                  | 8855           |
| Full anechoic chamber                          | EMITECH                  | 10759          |
| Turntable and mat controller NCD               | MATURO                   | 10789          |
| Satellite synchronized frequency standard GPS8 | ACQUISYS                 | 8896           |
| Test receiver ESI7                             | Rohde & Schwarz          | 8707           |
| Spectrum Analyzer FSP40                        | Rohde & Schwarz          | 4088           |
| Loop antenna 6502                              | EMCO                     | 1406           |
| Biconical antenna VHA 9103                     | Schwarzbeck              | 8528           |
| Biconical antenna 3110                         | Emco                     | 7240           |
| Log periodic antenna HL223                     | Rohde & Schwarz          | 7171           |
| Log periodic antenna HL223                     | Rohde & Schwarz          | 7190           |
| Antenna 3117                                   | ETS-Lindgren             | 10771          |
| Antenna SAS-572                                | A.H Systems              | 7124           |
| Low-noise amplifier ZFL-1000LN                 | Mini-circuit             | 10730          |
| Low-noise amplifier S005180M3201               | LUCIX Corp.              | 12590          |
| Low-noise amplifier S180265L3201               | LUCIX Corp.              | 8704           |
| N-1.5M Cable                                   | SUCOFLEX                 | 9398           |
| N-2M Cable                                     | SUCOFLEX                 | 14303          |
| N-2.5M Cable                                   | SUCOFLEX                 | 14304          |
| N-5M Cable                                     | Huber + Suhner           | 12912          |
| Cable k-20cm                                   | STORM MICROWAE           | 8974           |
| Cable k-2M                                     | SUCOFLEX                 | 12917          |
| Attenuator PE7004-10                           | Pasternack               | 9266           |
| Low pass filter LP03/1000-7GH                  | Filtek                   | 4087           |
| Reject band filter BRM50702                    | Microtronics             | 7298           |
| High pass filter HPF180400                     | C&C                      | 16109          |
| Power source E3610A                            | Hewlett Packard          | 4195           |
| Multimeter 177                                 | Fluke                    | 14903          |
| Meteo station BAR 206                          | Oregon Scientific        | 14475          |
| Meteo station 608-H1                           | Testo                    | 7566           |
| 50 Ohms Load                                   | -                        | -              |
| Software                                       | BAT-EMC V3.18.0.26       | 0000           |
| Software                                       | Champ libre Juigné. V3.5 | 8864           |

**Peak conducted power spectral density**

| TYPE                    | MANUFACTURER               | EMITECH NUMBER |
|-------------------------|----------------------------|----------------|
| N-1M Cable              | SUCOFLEX                   | 14302          |
| Attenuator 8491A-20dB   | Hewlett Packard            | 2507           |
| Spectrum Analyzer FSP7  | Rohde & Schwarz            | 6796           |
| Spectrum Analyzer FSV40 | Rohde & Schwarz            | 15666          |
| Power source E3610A     | Hewlett Packard            | 4195           |
| Multimeter 177          | Fluke                      | 14903          |
| Meteo station WS-9232   | La Crosse Technology       | 8750           |
| 50 Ohms Load            | -                          | -              |
| Software                | R&S Power Viewer Plus V5.9 | -              |
| Software                | GPIBShot V2.4              | -              |