

# TEST REPORT

of

FCC Part 15 Subpart B&C §15.247 / RSS-210 Issue 8, RSS-Gen Issue 3

FCC ID/IC Certification: A3LST200F / 649E-ST200F

Equipment Under Test : Digital Camera  
Model Name : ST200F  
Serial No. : N/A  
Applicant : SAMSUNG ELECTRONICS Co., Ltd.  
Manufacturer : SAMSUNG ELECTRONICS Co., Ltd.  
Manufacturer's factory : TIANJIN SAMSUNG OPTO-ELECTRONICS CO., LTD.  
Date of Test(s) : 2011. 11. 28 ~ 2011. 11. 29  
Date of Issue : 2011. 11. 29

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Date

2011. 11. 29

Alvin Kim

Approved By:



Date

2011. 11. 29

Feel Jeong

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## 1. General Information

### 1.1. Testing Laboratory

SGS Korea Co., Ltd.

- Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-dong, Korea

- 705, Dongcheon-dong Suji-gu, Yongin-si, Gyeonggi-do, Korea

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### 1.2. Details of Applicant

Applicant : SAMSUNG ELECTRONICS Co., Ltd.

Address : 416, Maetan3-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea

Contact Person : Lee, Jae-Ho

Phone No. : +82 +31 277 6803

### 1.3. Details of Factory Information

Name : TIANJIN SAMSUNG OPTO-ELECTRONICS CO., LTD.

Address : No.9 ZhangHeng Street, Micro-Electronic Industrial Park, JinGang Road, Tianjin, China

### 1.4. Description of EUT

|                      |                                           |
|----------------------|-------------------------------------------|
| Kind of Product      | Digital Camera                            |
| Model Name           | ST200F                                    |
| Serial Number        | N / A                                     |
| Power Supply         | DC 3.7 V (Li-ion Battery)                 |
| Frequency Range      | 2 412 ~ 2 462 MHz (802.11b/g/n-HT20_SISO) |
| Modulation Technique | DSSS, OFDM                                |
| Number of Channels   | 11                                        |
| Antenna Type         | Integral Type                             |
| Antenna Gain         | -0.96 dBi                                 |

### 1.5. Declaration by the manufacturer

- 802.11n supports HT20 mode only.

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## 1.6. Test Equipment List

| Equipment          | Manufacturer                  | Model                                | S/N         | Cal Due.      |
|--------------------|-------------------------------|--------------------------------------|-------------|---------------|
| Signal Generator   | R & S                         | SMR40                                | 100272      | Jul. 15, 2012 |
| Spectrum Analyzer  | R & S                         | FSV30                                | 100768      | Mar. 31, 2012 |
| Power Divider      | KRYTAR                        | 6005265                              | 126340      | Sep. 01, 2012 |
| High Pass Filter   | Wainwright                    | WHK3.0/18G-10SS                      | 344         | Jul. 07, 2012 |
| DC power Supply    | Agilent                       | U8002A                               | MY49030063  | Jan. 05, 2012 |
| Preamplifier       | H.P.                          | 8447F                                | 2944A03909  | Jul. 04, 2012 |
| Preamplifier       | R & S                         | SCU 18                               | 10117       | Mar. 23, 2012 |
| Test Receiver      | R & S                         | ESU26                                | 100109      | Feb. 21, 2012 |
| Two-Line V-Network | R & S                         | ENV216                               | 100190      | Jan. 06, 2012 |
| Test Receiver      | R & S                         | ESHS10                               | 863365/018  | Apr. 27, 2012 |
| Bilog Antenna      | SCHWARZBECK<br>MESSELEKTRONIK | VULB9163                             | 396         | Apr. 27, 2013 |
| Horn Antenna       | R & S                         | HF 907                               | 100019      | Jul. 29, 2012 |
| Horn Antenna       | SCHWARZBECK                   | BBH 9120D                            | BBHA9170431 | Mar. 17, 2012 |
| Antenna Master     | EMCO                          | 1050                                 | N.C.R.      | N.C.R.        |
| Turn Table         | Daeil EMC                     | DI-1500                              | N.C.R.      | N.C.R.        |
| Anechoic Chamber   | SY Corporation                | L × W × H<br>(6.5 m×3.5 m×3.5 m)     | N.C.R.      | N.C.R.        |
| Anechoic Chamber   | SY Corporation                | L × W × H<br>(9.6 m × 6.4 m × 6.6 m) | N.C.R.      | N.C.R.        |

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## 1.7. Summary of Test Results

The EUT has been tested according to the following specifications:

| APPLIED STANDARD:FCC Part15 subpart B&C, RSS-210, RSS-Gen |                         |                                                                        |          |
|-----------------------------------------------------------|-------------------------|------------------------------------------------------------------------|----------|
| Standard section                                          |                         | Test Item                                                              | Result   |
| 15.205(a)<br>15.209<br>15.247(d)                          | A8.5                    | Transmitter Radiated Spurious Emissions<br>Conducted Spurious Emission | Complied |
| 15.109(a)                                                 | RSS-Gen 6               | Receiver Radiated Spurious Emission                                    | Complied |
| 15.247(a)(2)                                              | A8.2(a)                 | 6 dB Bandwidth and 99% BW                                              | Complied |
| 15.247(b)(3)                                              | A8.4(4)                 | Maximum Peak Output Power                                              | Complied |
| 15.247(e)                                                 | A8.3(2)                 | Power Spectral Density                                                 | Complied |
| 15.207                                                    | RSS-Gen<br>7.2.4        | Transmitter AC Power Line Conducted<br>Emission                        | Complied |
| 15.107                                                    | RSS-Gen<br>7.2.4        | Receiver AC Power Line Conducted<br>Emission                           | Complied |
| 15.247(i)<br>1.1307(b)(1)                                 | RSS-Gen 5.5/<br>RSS-102 | Maximum Permissible Exposure<br>(Exposure of Humans to RF Fields)      | Complied |

## 1.8. Conclusion of worst-case

The field strength of spurious emission was measured in three orthogonal EUT positions(X-axis, Y-axis and Z-axis). Worst case is Z-axis. 1 Mbps is the highest output power in the 11b. 6 Mbps is the highest output power in the 11g. In case of 11n, we chose MCS0 mode.

## 1.9. Test report revision

| Revision | Report number        | Description |
|----------|----------------------|-------------|
| 0        | F690501/RF-RTL005140 | Initial     |

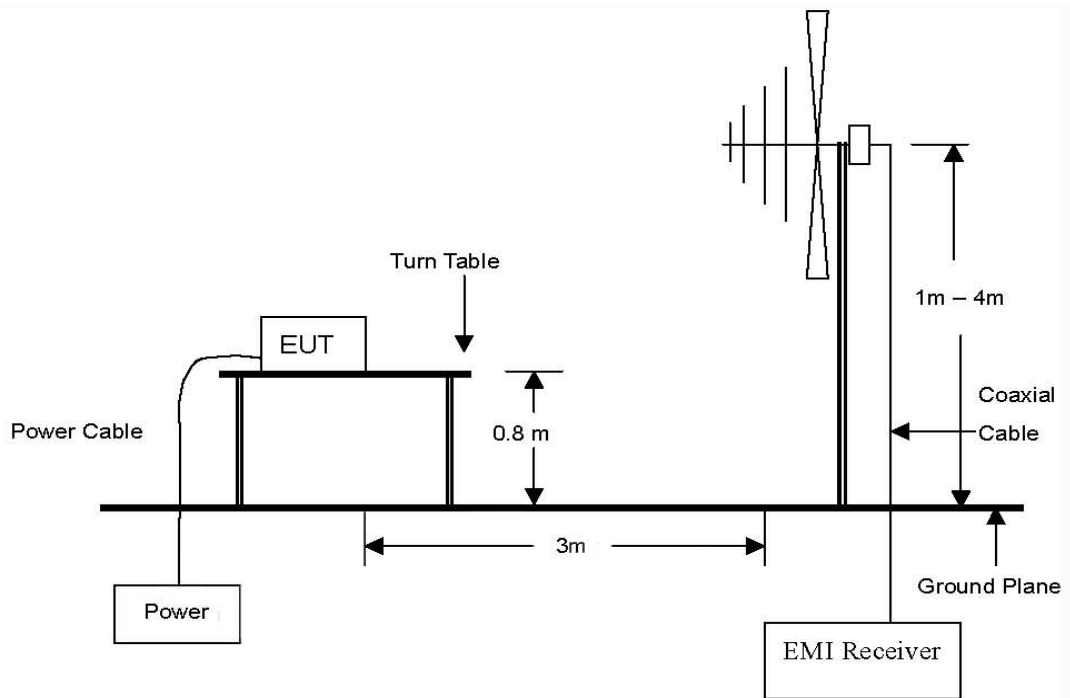
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## 2. Transmitter Radiated Spurious Emissions and Conducted Spurious Emission

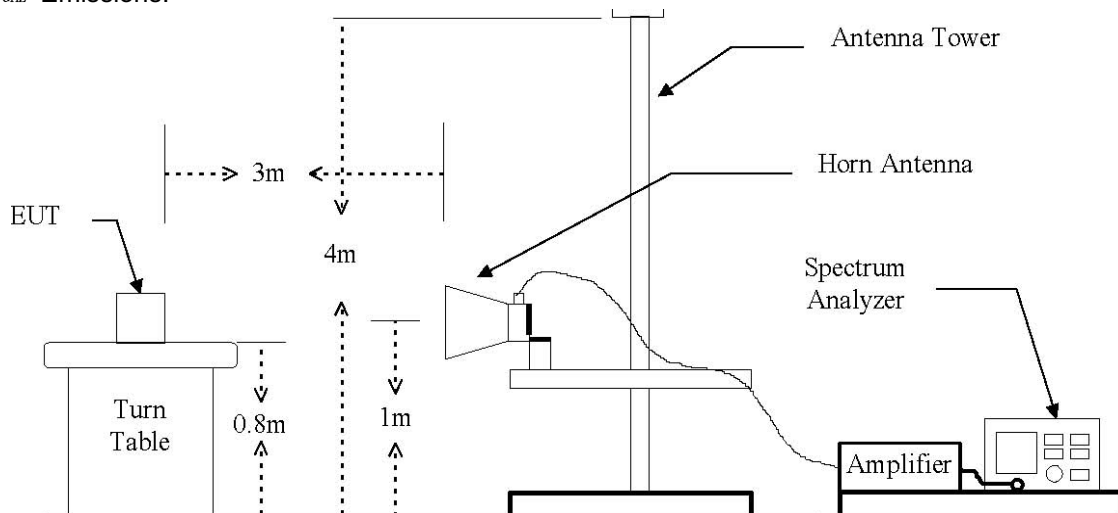
### 2.1. Test Setup

#### 2.1.1. Transmitter Radiated Spurious Emissions

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



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 24 GHz Emissions.



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### 2.1.2. Conducted Spurious Emission



### 2.2. Limit

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

According to § 15.209(a), Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

| Frequency<br>(MHz) | Distance<br>(Meters) | Field Strength<br>(dB $\mu$ V/m) | Field Strength<br>( $\mu$ V/m) |
|--------------------|----------------------|----------------------------------|--------------------------------|
| 30 - 88            | 3                    | 40.0                             | 100                            |
| 88 – 216           | 3                    | 43.5                             | 150                            |
| 216 – 960          | 3                    | 46.0                             | 200                            |
| Above 960          | 3                    | 54.0                             | 500                            |

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## 2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

### 2.3.1. Test Procedures for Radiated Spurious Emissions

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE ;

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

### 2.3.2. Test Procedures for Conducted Spurious Emissions

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

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## 2.4. Test Results

Ambient temperature : (24 ± 2) °C  
Relative humidity : 47 % R.H.

### 2.4.1. Spurious Radiated Emission (Worst case configuration\_11g mode)

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

| Radiated Emissions |                |             | Ant  | Correction Factors |               | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|---------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP + CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 315.02             | 38.90          | Peak        | H    | 12.80              | -24.40        | 27.30           | 46.00          | 18.70       |
| Above 400.00       | Not detected   | -           | -    | -                  | -             | -               | -              | -           |

#### Remark:

1. All spurious emission at channels are almost the same below 1 GHz, so that the channel was chosen at representative in final test.
2. Actual = Reading + AF + AMP + CL

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## 2.4.2. Spurious Radiated Emission

The frequency spectrum above 1000 MHz was investigated. Emission levels are not reported much lower than the limits by over 30 dB.

### DSSS : 802.11b

Low Channel (2 412 MHz)

| Radiated Emissions |                 |             | Ant  | Correction Factors |         | Total            | Limit           |             |
|--------------------|-----------------|-------------|------|--------------------|---------|------------------|-----------------|-------------|
| Frequency (MHz)    | Reading (dB uV) | Detect Mode | Pol. | AF (dB/m)          | CL (dB) | Actual (dB uV/m) | Limit (dB uV/m) | Margin (dB) |
| *2 390.00          | 25.98           | Peak        | V    | 28.47              | 5.23    | 59.68            | 74.00           | 14.32       |
| *2 390.00          | 14.40           | Average     | V    | 28.47              | 5.23    | 48.10            | 54.00           | 5.90        |

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 823.28           | 39.72          | Peak        | V    | 32.86              | -36.67      | 35.91           | 74.00          | 38.09       |
| 4 823.28           | 28.85          | Average     | V    | 32.86              | -36.67      | 25.04           | 74.00          | 48.96       |
| Above 4 900.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

Middle Channel (2 437 MHz)

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 874.07           | 39.38          | Peak        | V    | 33.00              | -36.70      | 35.68           | 74.00          | 38.32       |
| 4 874.07           | 28.92          | Average     | V    | 33.00              | -36.70      | 25.22           | 74.00          | 48.78       |
| Above 4 900.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

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High Channel (2 462 MHz)

| Radiated Emissions |                 |             | Ant  | Correction Factors |         | Total            | Limit           |             |
|--------------------|-----------------|-------------|------|--------------------|---------|------------------|-----------------|-------------|
| Frequency (MHz)    | Reading (dB uV) | Detect Mode | Pol. | AF (dB/m)          | CL (dB) | Actual (dB uV/m) | Limit (dB uV/m) | Margin (dB) |
| *2 483.50          | 24.92           | Peak        | V    | 28.71              | 5.37    | 59.00            | 74.00           | 15.00       |
| *2 483.50          | 14.23           | Average     | V    | 28.71              | 5.37    | 48.31            | 54.00           | 5.69        |

| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
|--------------------|----------------------|-------------|------|--------------------|-------------|-----------------------|----------------------|-------------|
| Frequency (MHz)    | Reading (dB $\mu$ V) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
| 4 924.15           | 39.83                | Peak        | V    | 33.14              | -36.41      | 36.56                 | 74.00                | 37.44       |
| 4 924.15           | 30.76                | Average     | V    | 33.14              | -36.41      | 27.49                 | 74.00                | 46.51       |
| Above 5 000.00     | Not detected         | -           | -    | -                  | -           | -                     | -                    | -           |

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**OFDM : 802.11g**

Low Channel (2 412 MHz)

| Radiated Emissions |                 |             | Ant  | Correction Factors |         | Total            | Limit           |             |
|--------------------|-----------------|-------------|------|--------------------|---------|------------------|-----------------|-------------|
| Frequency (MHz)    | Reading (dB uV) | Detect Mode | Pol. | AF (dB/m)          | CL (dB) | Actual (dB uV/m) | Limit (dB uV/m) | Margin (dB) |
| *2 390.00          | 25.63           | Peak        | V    | 28.47              | 5.23    | 59.33            | 74.00           | 14.67       |
| *2 390.00          | 14.45           | Average     | V    | 28.47              | 5.23    | 48.15            | 54.00           | 5.85        |

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 839.92           | 39.91          | Peak        | V    | 32.91              | -36.79      | 36.03           | 74.00          | 37.97       |
| 4 839.92           | 26.73          | Average     | V    | 32.91              | -36.79      | 22.85           | 74.00          | 51.15       |
| Above 4 900.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

Middle Channel (2 437 MHz)

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 876.24           | 40.58          | Peak        | V    | 33.01              | -36.69      | 36.90           | 74.00          | 37.10       |
| 4 876.24           | 26.82          | Average     | V    | 33.01              | -36.69      | 23.14           | 74.00          | 50.86       |
| Above 4 900.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

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High Channel (2 462 MHz)

| Radiated Emissions |                 |             | Ant  | Correction Factors |         | Total            | Limit           |             |
|--------------------|-----------------|-------------|------|--------------------|---------|------------------|-----------------|-------------|
| Frequency (MHz)    | Reading (dB uV) | Detect Mode | Pol. | AF (dB/m)          | CL (dB) | Actual (dB uV/m) | Limit (dB uV/m) | Margin (dB) |
| *2 483.50          | 25.09           | Peak        | V    | 28.71              | 5.37    | 59.17            | 74.00           | 14.83       |
| *2 483.50          | 14.28           | Average     | V    | 28.71              | 5.37    | 48.36            | 54.00           | 5.64        |

| Radiated Emissions |                      |             | Ant  | Correction Factors |             | Total                 | FCC Limit            |             |
|--------------------|----------------------|-------------|------|--------------------|-------------|-----------------------|----------------------|-------------|
| Frequency (MHz)    | Reading (dB $\mu$ V) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) |
| 4 931.82           | 39.65                | Peak        | V    | 33.17              | -36.37      | 36.45                 | 74.00                | 37.55       |
| 4 931.82           | 27.08                | Average     | V    | 33.17              | -36.37      | 23.88                 | 74.00                | 50.12       |
| Above 5 000.00     | Not detected         | -           | -    | -                  | -           | -                     | -                    | -           |

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**OFDM : 802.11n**

Low Channel (2 412 MHz)

| Radiated Emissions |                 |             | Ant  | Correction Factors |         | Total            | Limit           |             |
|--------------------|-----------------|-------------|------|--------------------|---------|------------------|-----------------|-------------|
| Frequency (MHz)    | Reading (dB uV) | Detect Mode | Pol. | AF (dB/m)          | CL (dB) | Actual (dB uV/m) | Limit (dB uV/m) | Margin (dB) |
| *2 390.00          | 25.38           | Peak        | V    | 28.47              | 5.23    | 59.08            | 74.00           | 14.92       |
| *2 390.00          | 14.46           | Average     | V    | 28.47              | 5.23    | 48.16            | 54.00           | 5.84        |

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 844.70           | 40.84          | Peak        | V    | 32.92              | -36.82      | 36.94           | 74.00          | 37.06       |
| 4 844.70           | 26.86          | Average     | V    | 32.92              | -36.82      | 22.96           | 74.00          | 51.04       |
| Above 4 900.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

Middle Channel (2 437 MHz)

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 882.68           | 39.69          | Peak        | V    | 33.03              | -36.64      | 36.08           | 74.00          | 37.92       |
| 4 882.68           | 26.74          | Average     | V    | 33.03              | -36.64      | 23.13           | 74.00          | 50.87       |
| Above 4 900.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

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High Channel (2 462 MHz)

| Radiated Emissions |                 |             | Ant  | Correction Factors |         | Total            | Limit           |             |
|--------------------|-----------------|-------------|------|--------------------|---------|------------------|-----------------|-------------|
| Frequency (MHz)    | Reading (dB uV) | Detect Mode | Pol. | AF (dB/m)          | CL (dB) | Actual (dB uV/m) | Limit (dB uV/m) | Margin (dB) |
| *2 483.50          | 26.01           | Peak        | V    | 28.71              | 5.37    | 60.09            | 74.00           | 13.91       |
| *2 483.50          | 14.29           | Average     | V    | 28.71              | 5.37    | 48.37            | 54.00           | 5.63        |

| Radiated Emissions |                |             | Ant  | Correction Factors |             | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|-------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP+CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 4 931.02           | 39.07          | Peak        | V    | 33.16              | -36.37      | 35.86           | 74.00          | 38.14       |
| 4 931.02           | 26.78          | Average     | V    | 33.16              | -36.37      | 23.57           | 74.00          | 50.43       |
| Above 5 000.00     | Not detected   | -           | -    | -                  | -           | -               | -              | -           |

Remarks ;

1. “\*” means the restricted band.
2. Measuring frequencies from 1 GHz to the 10<sup>th</sup> harmonic of highest fundamental Frequency.
3. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using peak/average detector mode.
4. Actual = Reading + AF + AMP + CL

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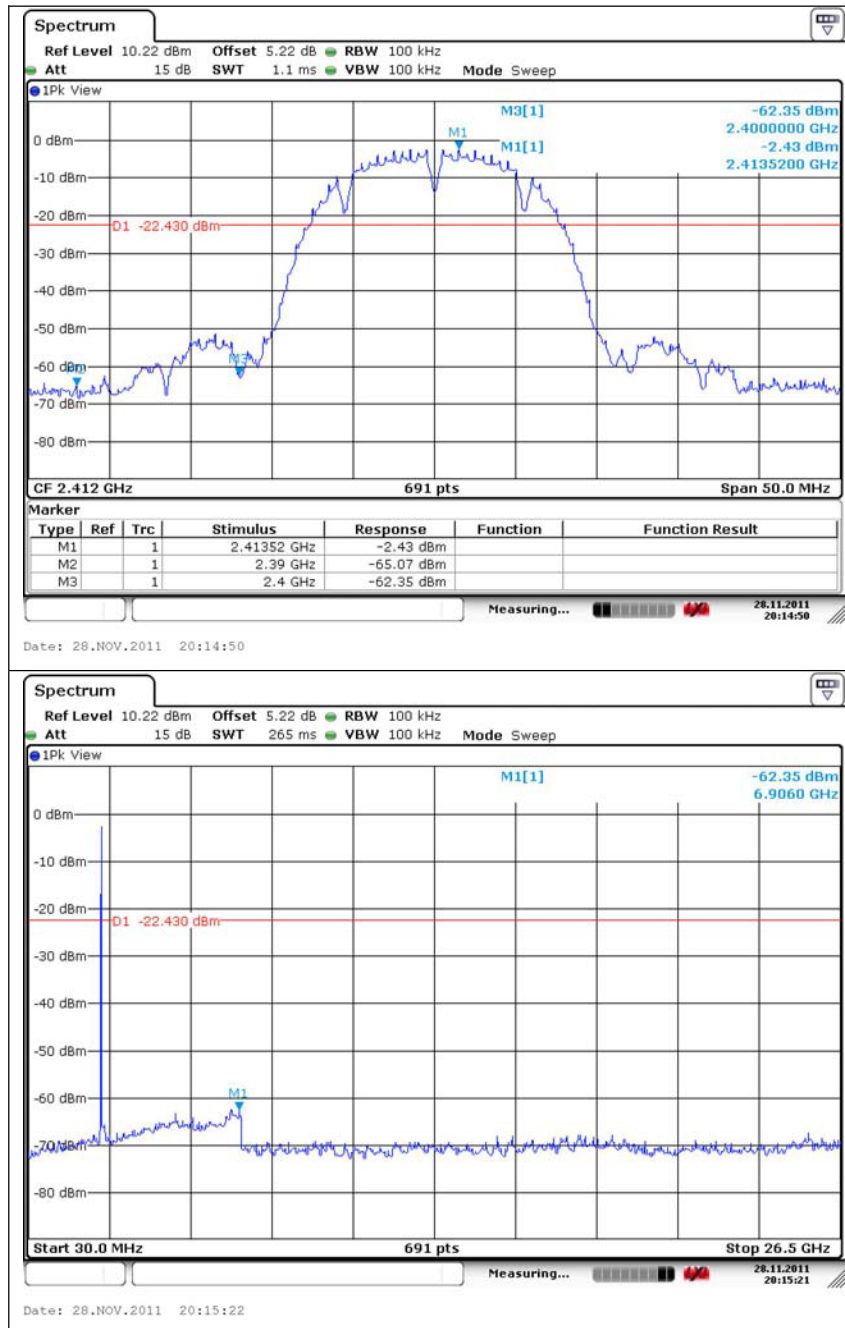
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### 2.4.3. Spurious RF Conducted Emissions: Plot of Spurious RF Conducted Emission

DSSS : 802.11b

Low Channel



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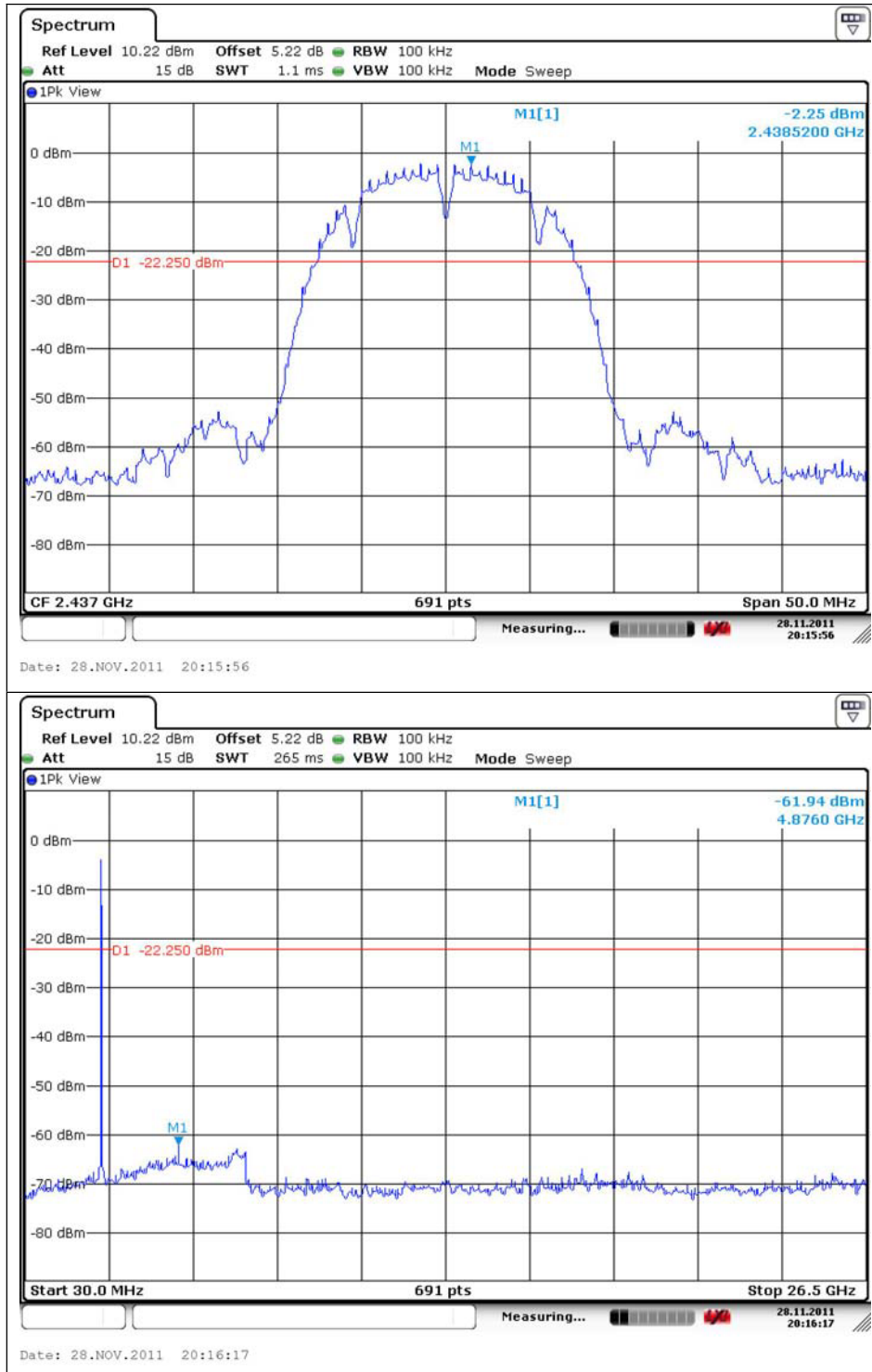
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## Middle Channel



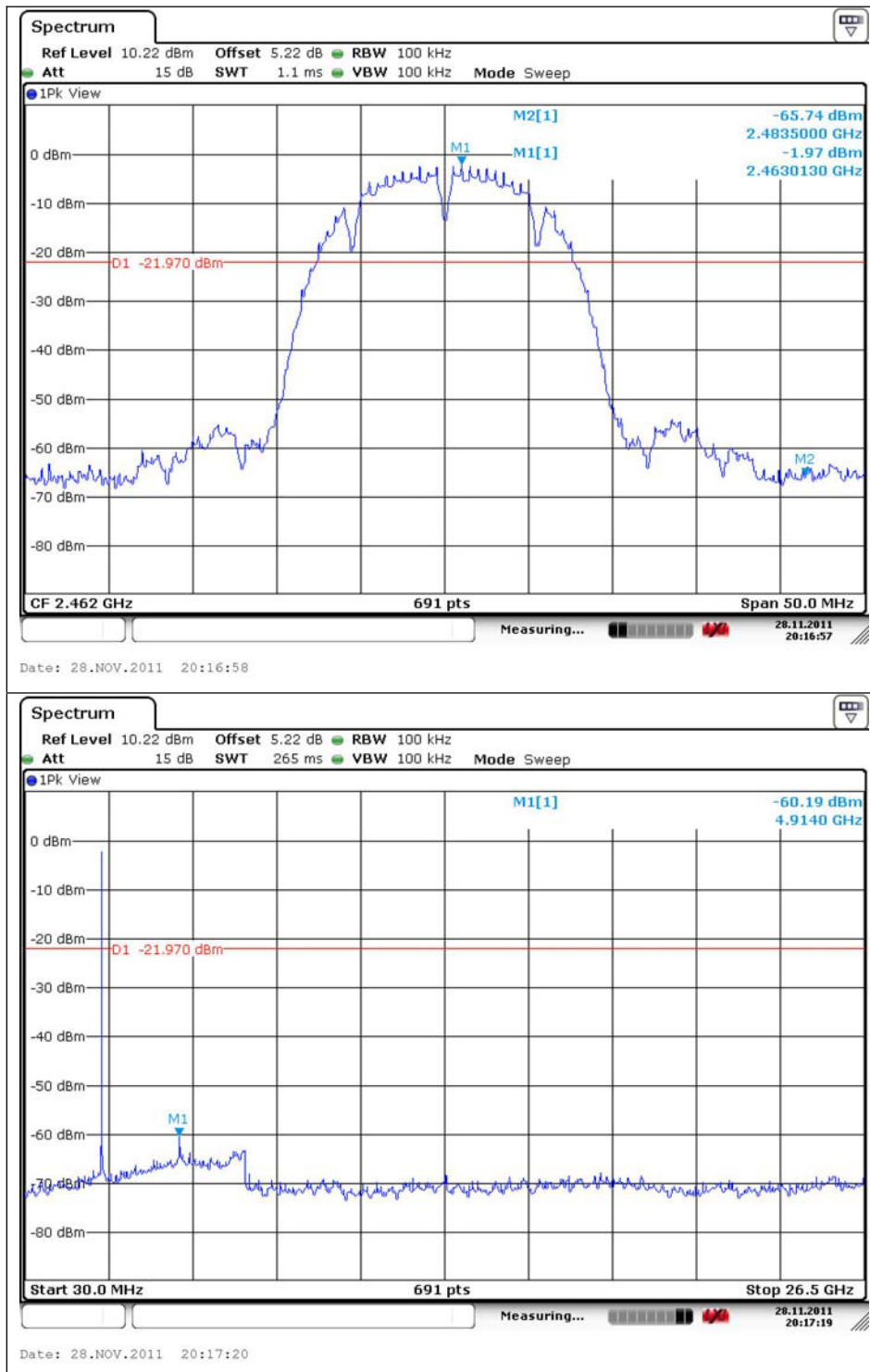
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## High Channel



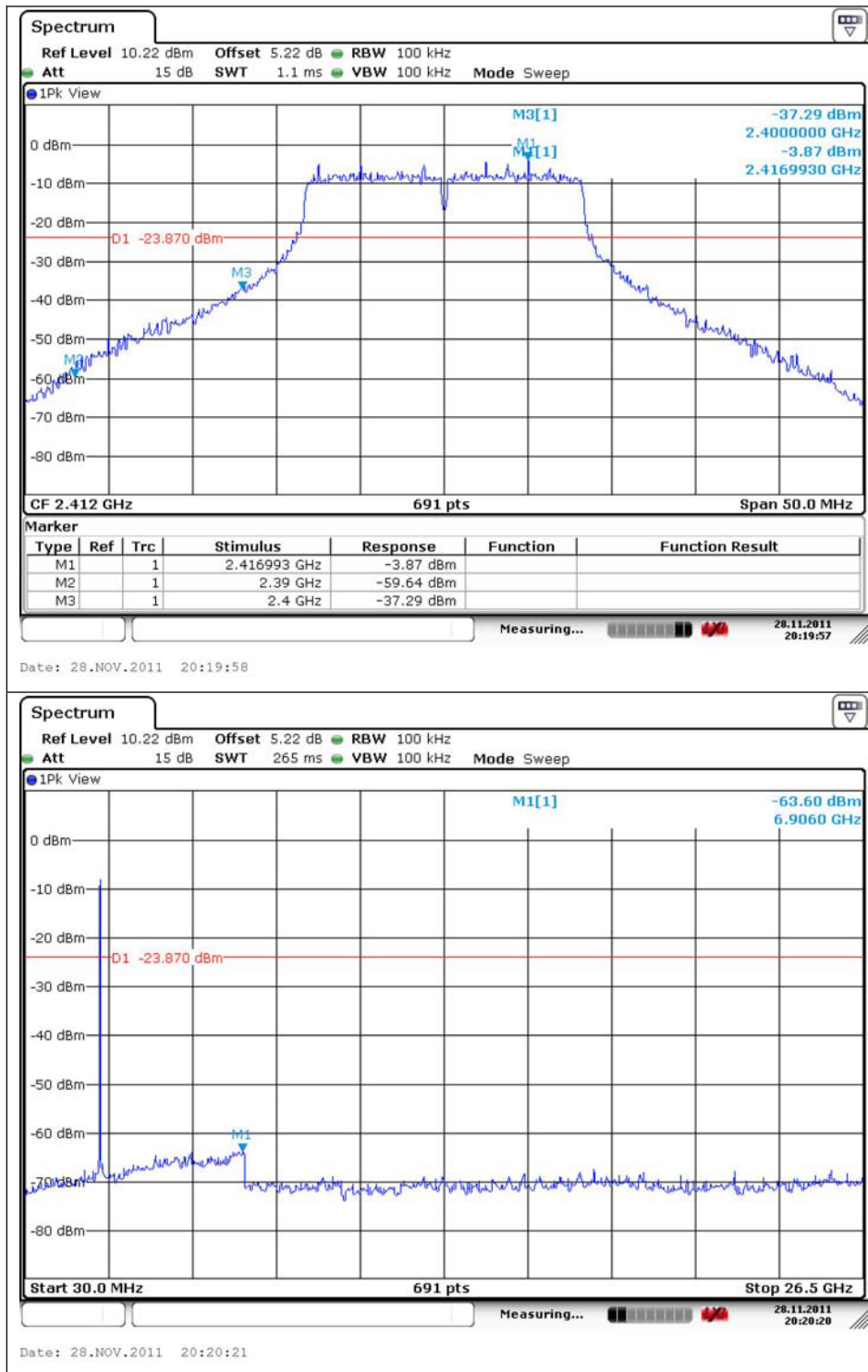
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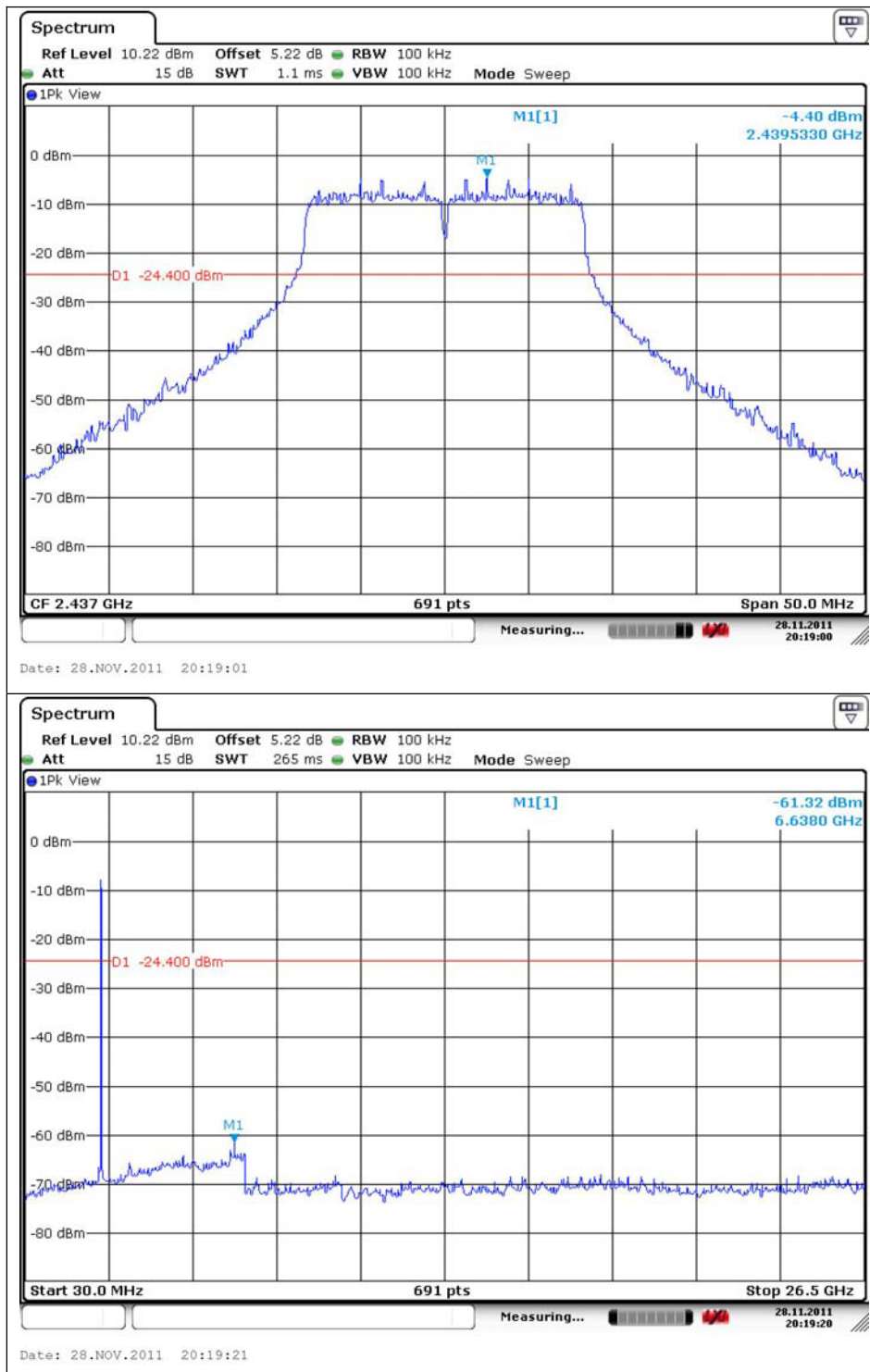
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**OFDM : 802.11g**  
Low Channel



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## Middle Channel



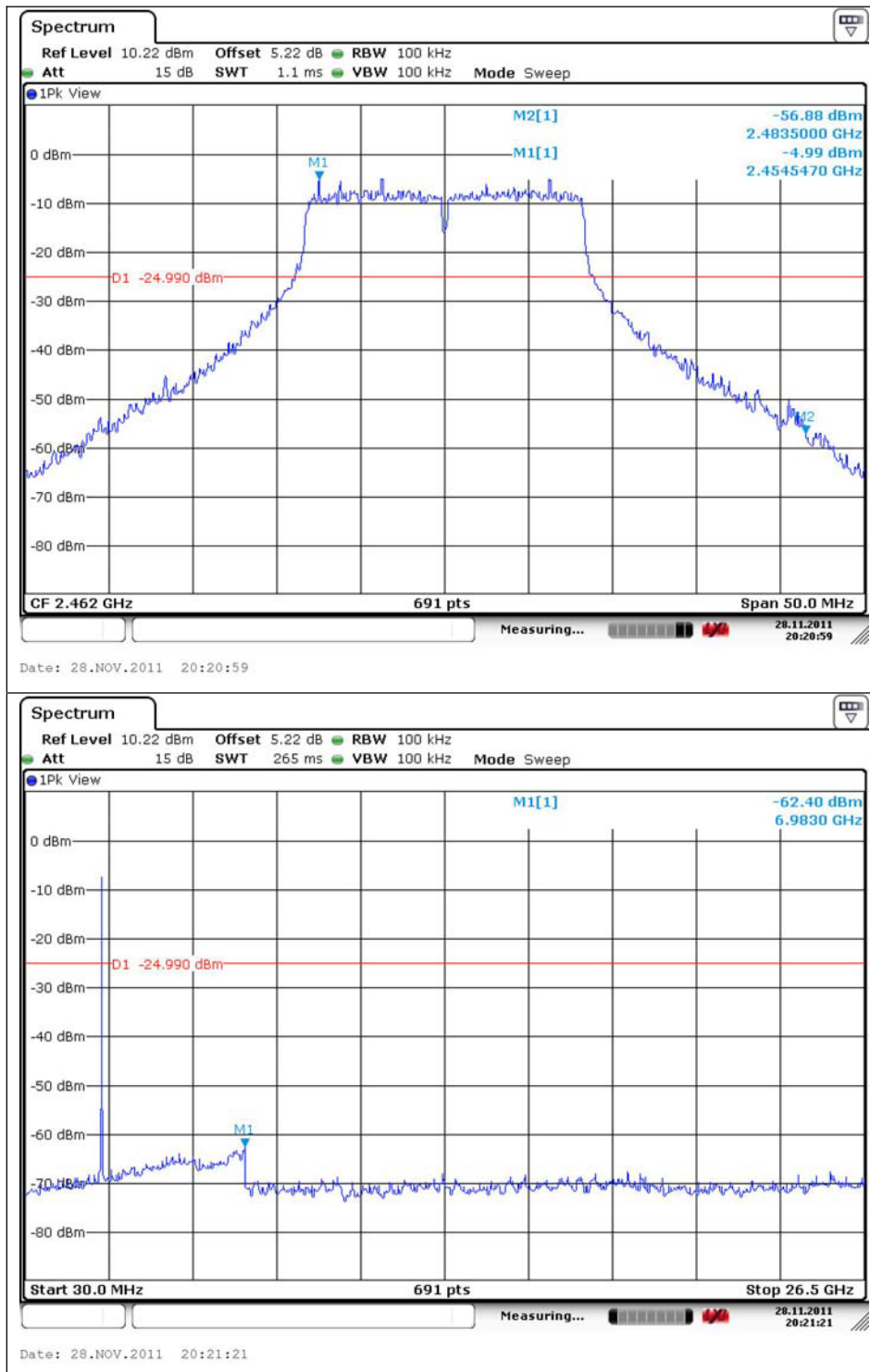
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## High Channel



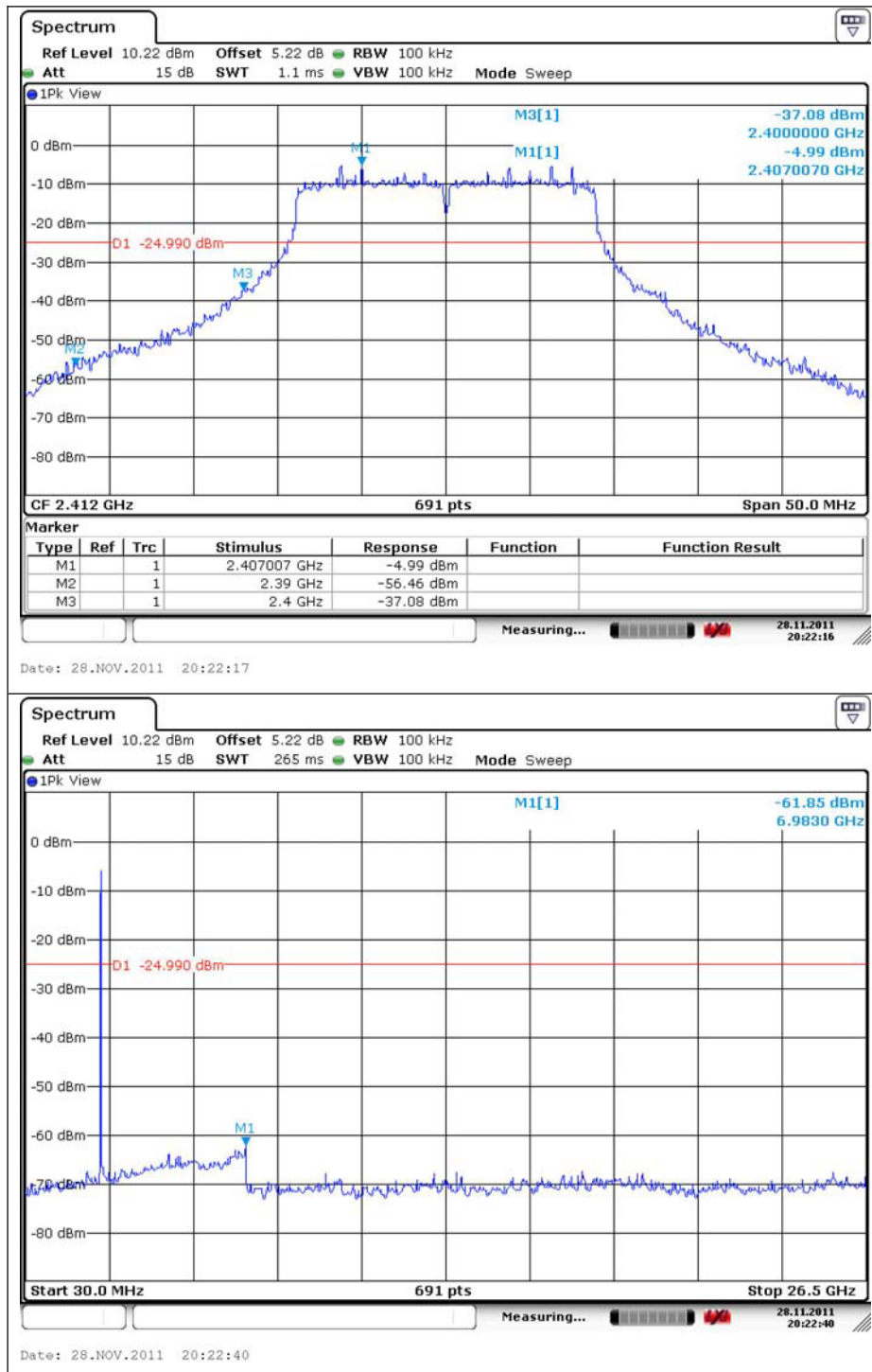
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**OFDM : 802.11n**  
Low Channel



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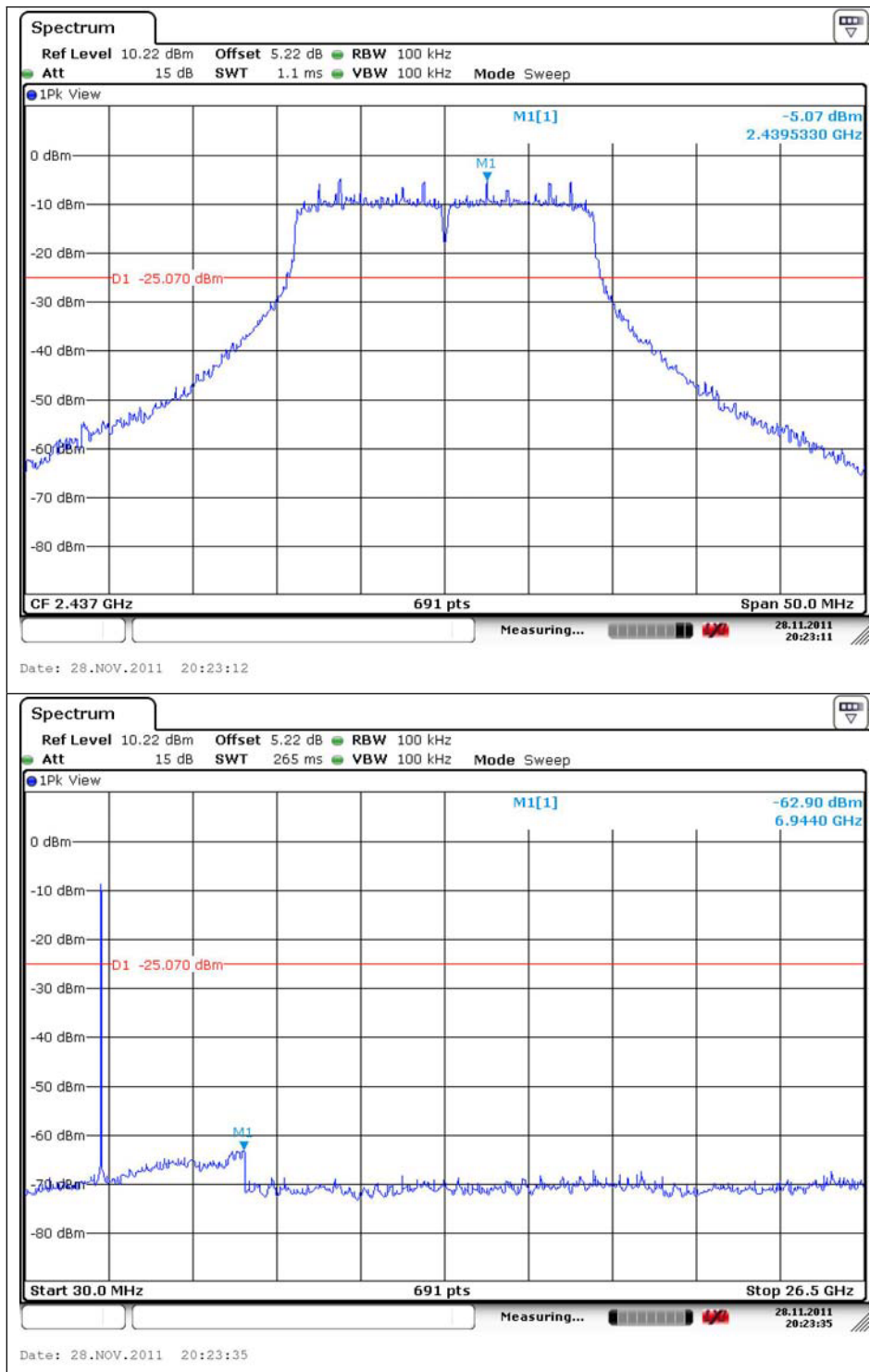
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## Middle Channel



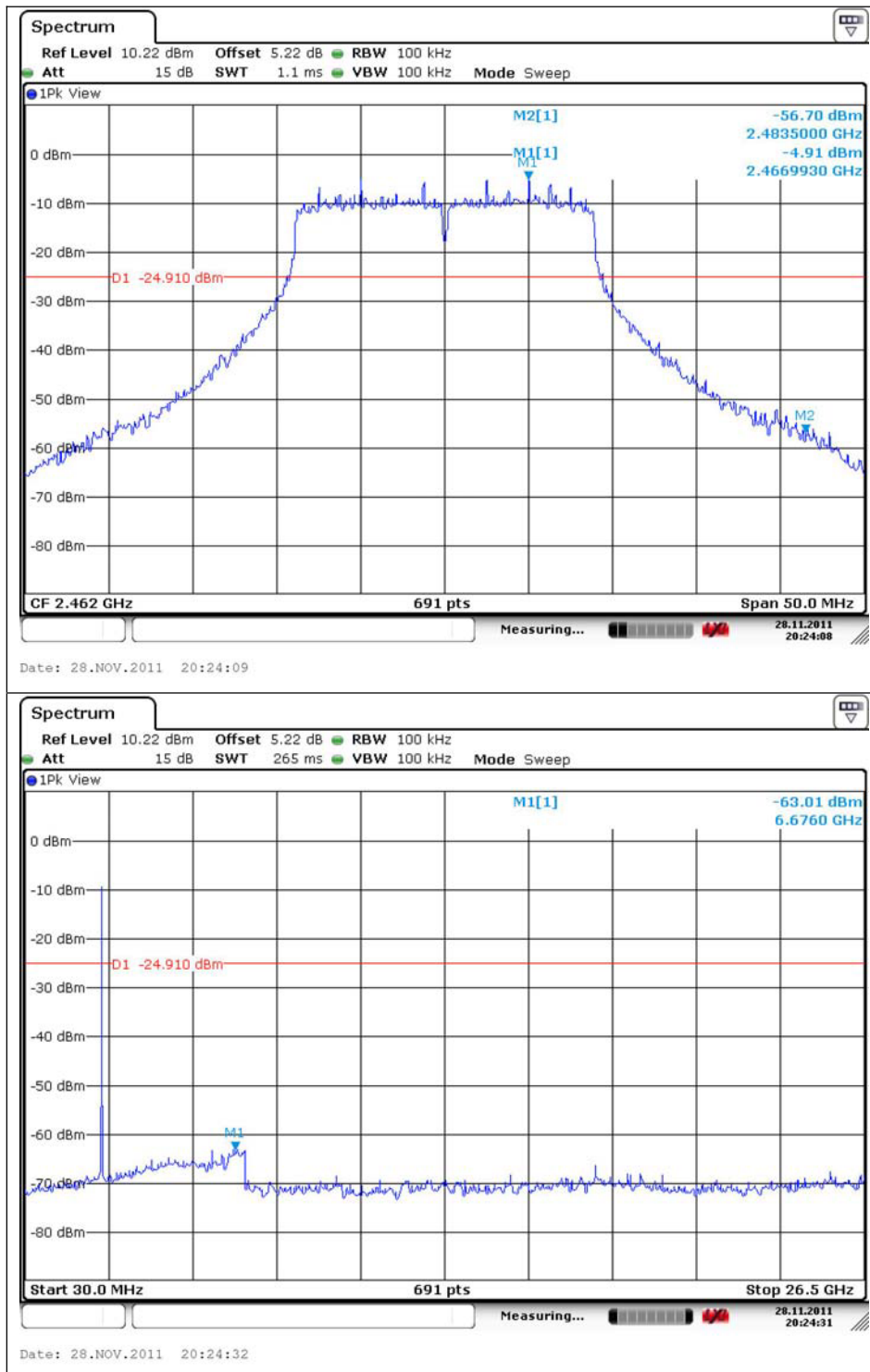
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## High Channel



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### 3. Receiver Radiated spurious emissions

#### 3.1. Test setup - Same as clause 2.1.

##### 3.1.1. Receiver Radiated Spurious Emissions - Same as clause 2.1.1.

#### 3.2. Limit

According to §15.109(a), Except for Class A digital devices, the field strength of radiated emission from unintentional radiator at a distance of 3 m shall not exceed the following values:

| Frequency<br>(MHz) | Distance<br>(Meters) | Radiated<br>(dB $\mu$ V/m) | Radiated<br>( $\mu$ V/m) |
|--------------------|----------------------|----------------------------|--------------------------|
| 30 - 88            | 3                    | 40.0                       | 100                      |
| 88 – 216           | 3                    | 43.5                       | 150                      |
| 216 – 960          | 3                    | 46.0                       | 200                      |
| Above 960          | 3                    | 54.0                       | 500                      |

#### 3.3. Test Procedures - Same as clause 2.3.

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

##### 3.3.1. Test Procedures for Radiated Spurious Emissions- Same as clause 2.3.1.

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### 3.4. Test Results

Ambient temperature : (24 ± 2) °C  
Relative humidity : 47 % R.H.

#### 3.4.1. Spurious Radiated Emission (Worst case configuration\_11g mode)

The frequency spectrum from 30 MHz to 26.5 GHz was investigated. Emission levels are not reported much lower than the limits by over 30 dB. All reading values are peak values.

| Radiated Emissions |                |             | Ant  | Correction Factors |               | Total           | FCC Limit      |             |
|--------------------|----------------|-------------|------|--------------------|---------------|-----------------|----------------|-------------|
| Frequency (MHz)    | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m)          | AMP + CL (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 315.02             | 38.10          | Peak        | H    | 12.80              | -24.40        | 26.50           | 46.00          | 19.50       |
| 360.00             | 38.10          | Peak        | H    | 13.30              | -24.90        | 26.50           | 46.00          | 19.50       |
| 765.02             | 35.60          | Peak        | H    | 20.40              | -23.90        | 32.10           | 46.00          | 13.90       |
| Above 800.00       | Not detected   | -           | -    | -                  | -             | -               | -              | -           |

#### Remark:

1. All spurious emission at channels are almost the same from 30 MHz to 26.5 GHz, so that the middle channel was chosen at representative in final test.
2. Actual = Reading + AF + AMP + CL

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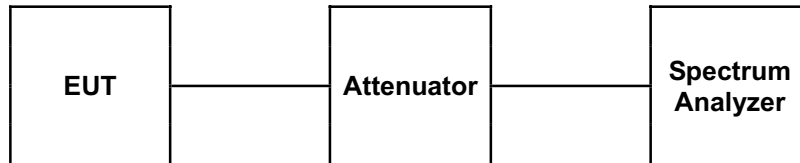
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## 4. 6 dB Bandwidth Measurement

### 4.1. Test Setup



### 4.2. Limit

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 ~928 MHz, 2 400 ~ 2 483.5 MHz, and 5 725 ~ 5 825 MHz bands. The minimum of 6 dB Bandwidth shall be at least 500 kHz

### 4.3. Test Procedure

1. The 6 dB band width was measured with a spectrum analyzer connected to RF antenna connector(conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency. The analyzer center frequency was set to the EUT carrier frequency, using the analyzer. Display Line and Marker Delta functions, the 6 dB band width of the emission was determined.
2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW = 100 kHz, VBW = 100 kHz, Span = 50 MHz.

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#### 4.4. Test Results

Ambient temperature : (24 ± 2) °C  
Relative humidity : 47 % R.H.

| Operation Mode | Channel | Channel Frequency (MHz) | 6 dB Bandwidth (MHz) | 99 % Bandwidth (MHz) |
|----------------|---------|-------------------------|----------------------|----------------------|
| DSSS (802.11b) | Low     | 2 412                   | 10.13                | 13.89                |
|                | Middle  | 2 437                   | 10.13                | 13.82                |
|                | High    | 2 462                   | 10.17                | 13.82                |
| OFDM (802.11g) | Low     | 2 412                   | 16.35                | 17.44                |
|                | Middle  | 2 437                   | 16.32                | 17.29                |
|                | High    | 2 462                   | 16.35                | 17.44                |
| OFDM (802.11n) | Low     | 2 412                   | 17.51                | 18.45                |
|                | Middle  | 2 437                   | 17.51                | 18.38                |
|                | High    | 2 462                   | 17.62                | 18.45                |

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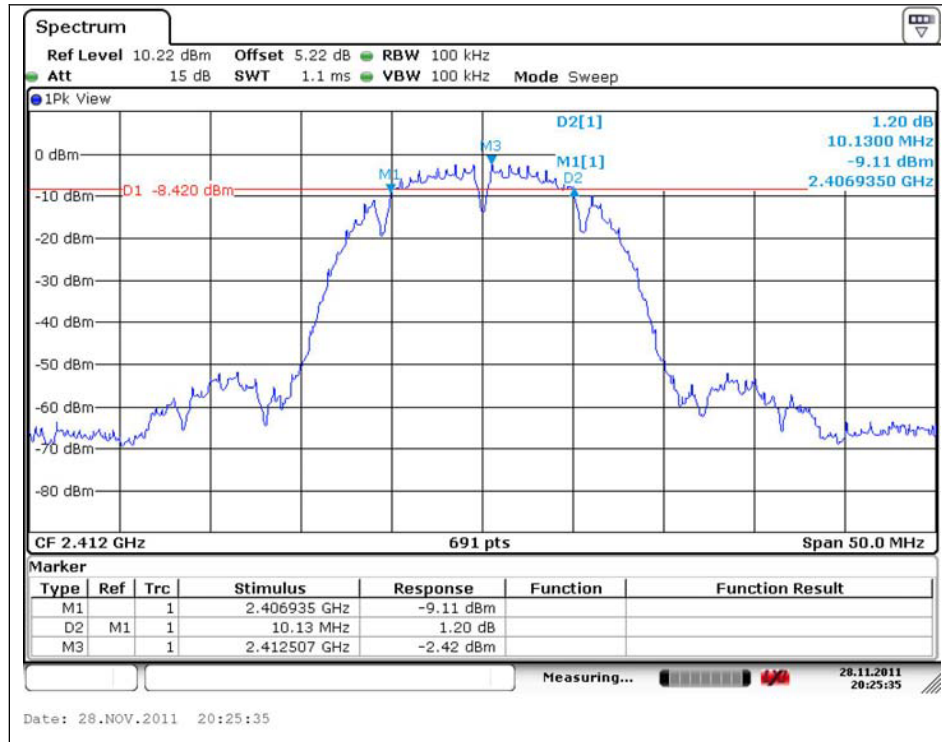
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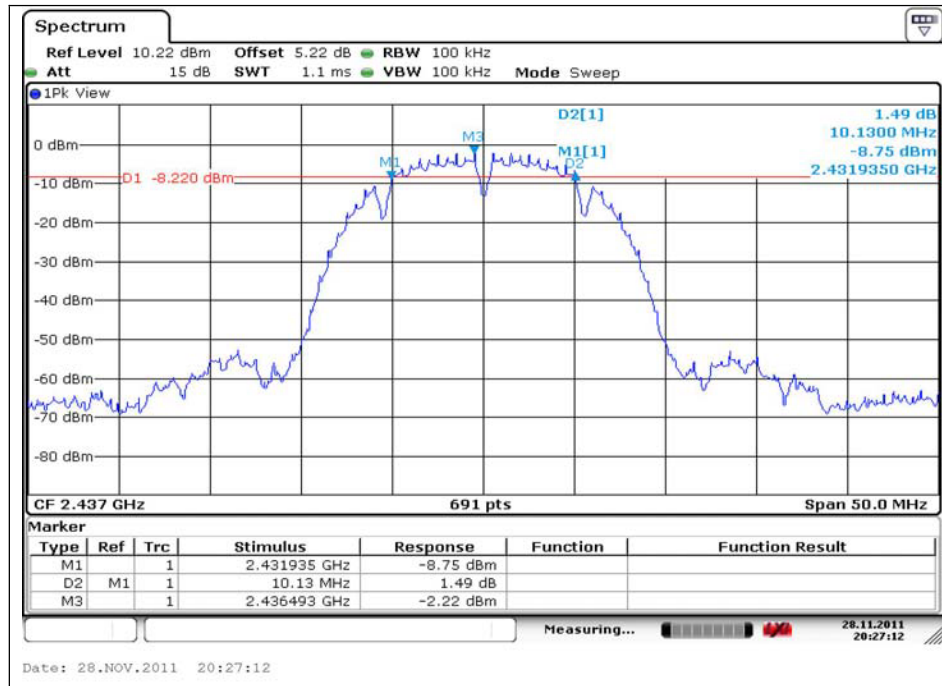
## 6 dB Bandwidth

DSSS : 802.11b

Low Channel



Middle Channel



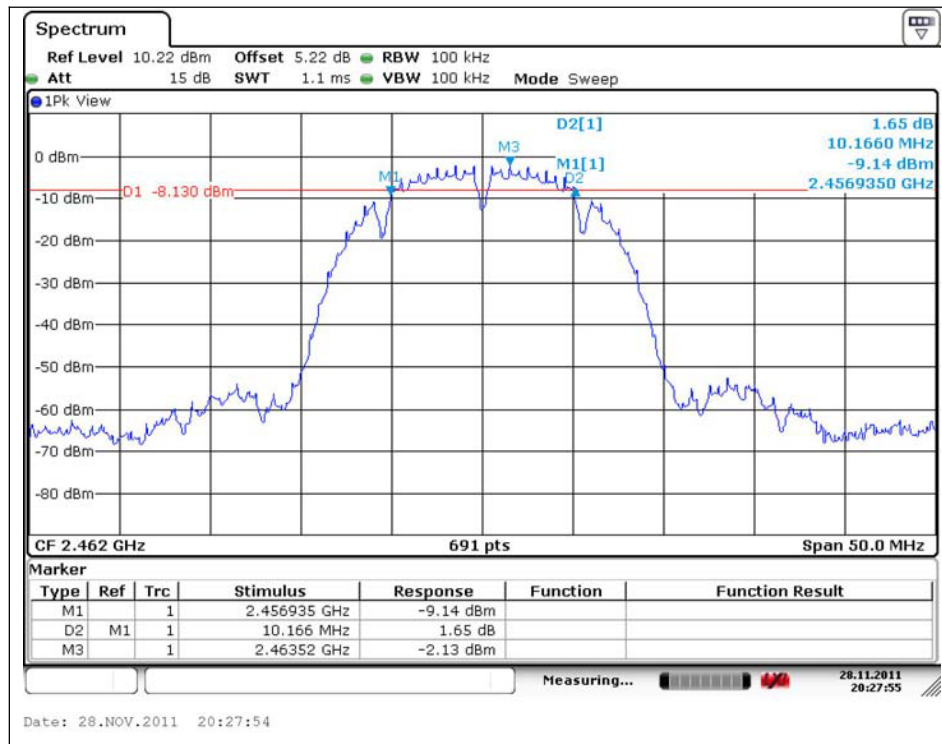
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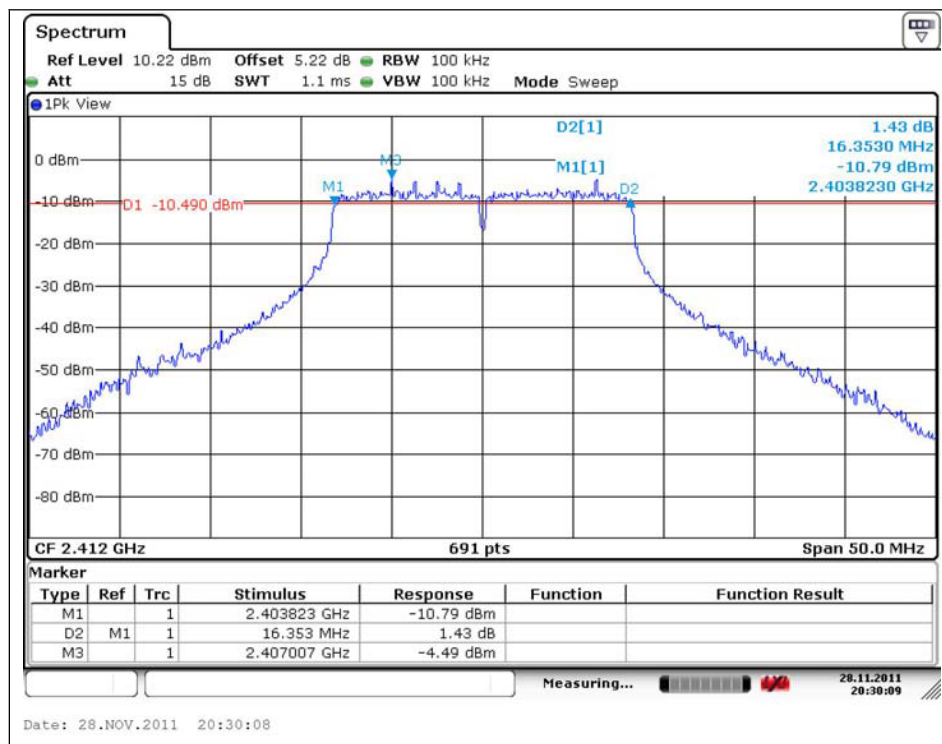
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## High Channel



## OFDM : 802.11g

## Low Channel

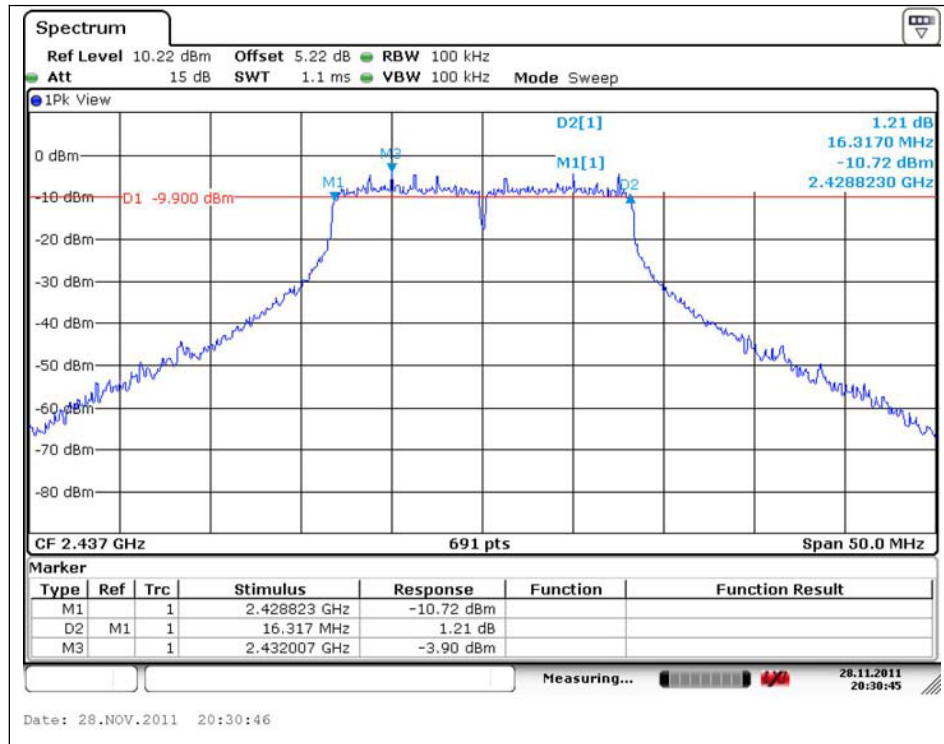


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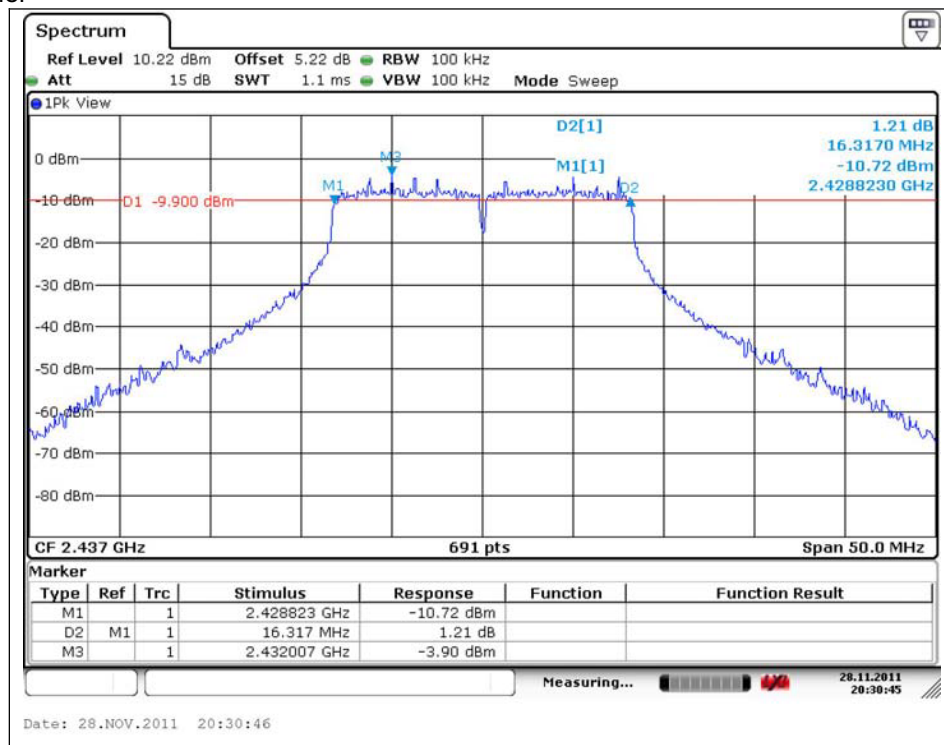
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## Middle Channel



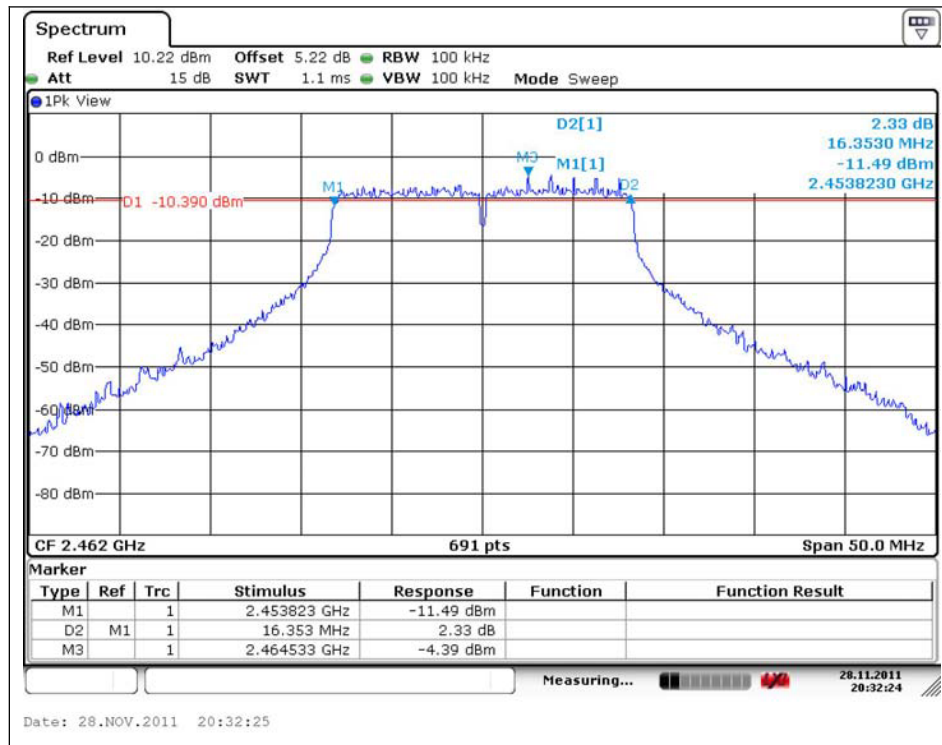
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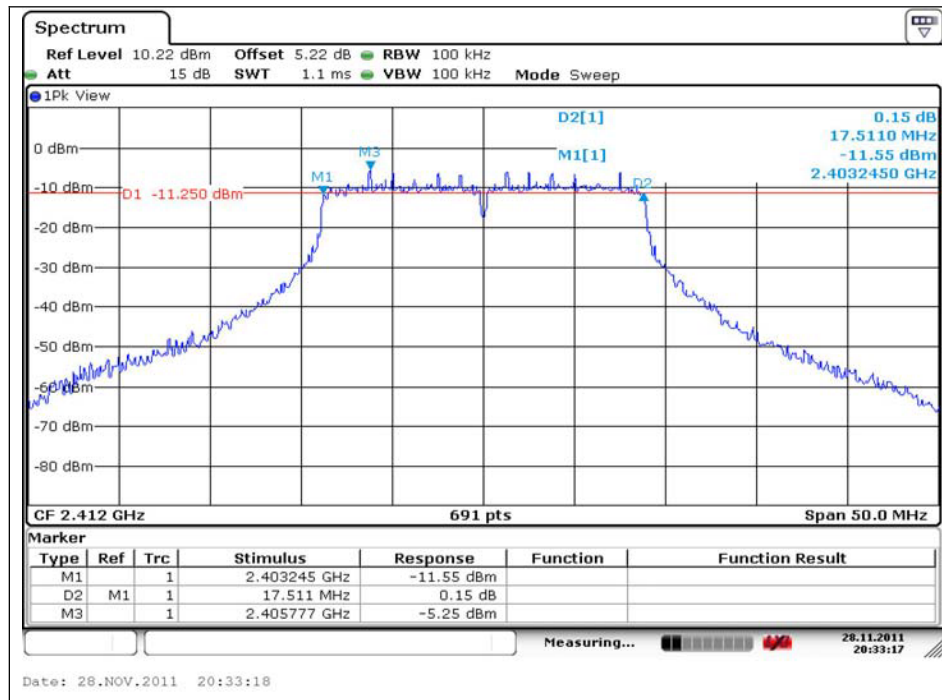
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## High Channel



## OFDM : 802.11n

## Low Channel



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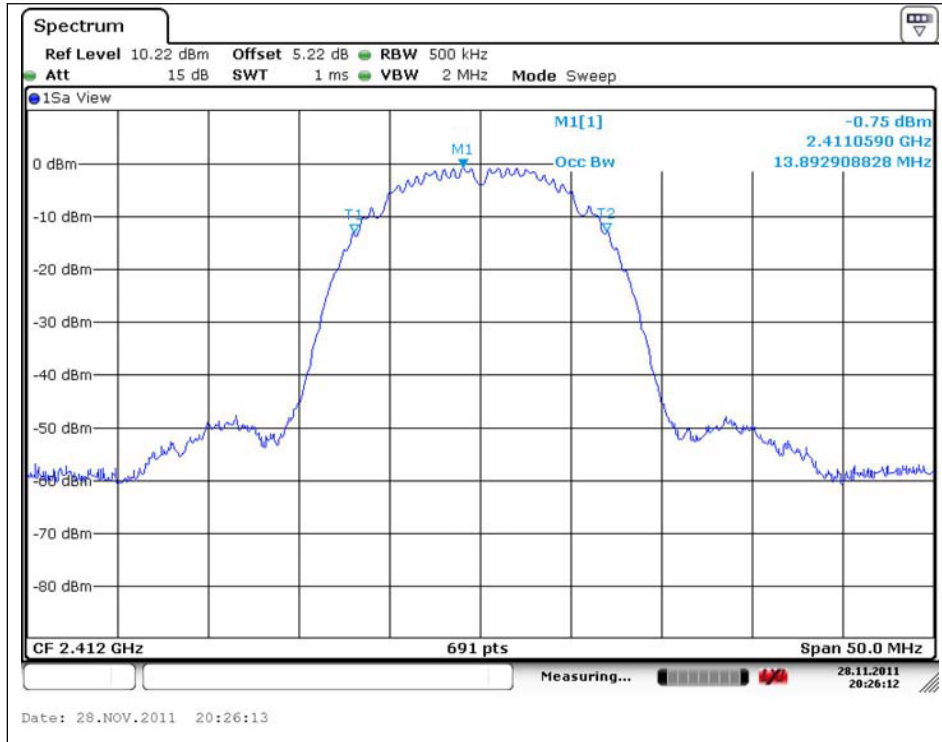




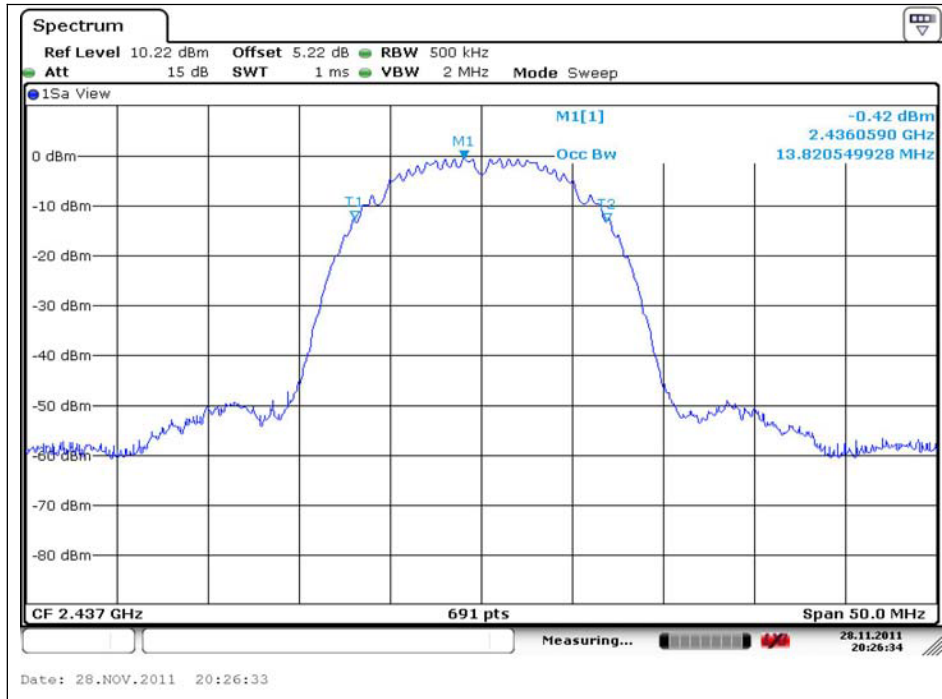
99% Bandwidth

DSSS : 802.11b

Low Channel



Middle Channel



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