# TEST REPORT

**of**

FCC Part 15 Subpart C §15.247

FCC ID: A3LSMC200

| | | |
|---|---|---|
| Equipment Under Test | : | Samsung Gear 360 |
| Model Name | : | SM-C200 |
| Applicant | : | Samsung Electronics Co., Ltd. |
| Manufacturer | : | Samsung Electronics Co., Ltd. |
| Date of Test(s) | : | 2016.01.25 ~ 2016.03.07 |
| Date of Issue | : | 2016.03.17 |

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

**Tested By:** **Jungmin Yang** **Date:** **2016.03.17**

**Approved By:** **Hyunchae You** **Date:** **2016.03.17**

# INDEX

Table of contents

# 1. General Information

## 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.

Telephone : +82 31 688 0901
FAX : +82 31 688 0921

## 1.2. Details of Applicant

Applicant : Samsung Electronics Co., Ltd.
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Contact Person : Ha, Ji-Hoon
Phone No. : +82 31 277 3376

## 1.3. Description of EUT

| | | |
|---|---|---|
| **Kind of Product** | | Samsung Gear 360 |
| **Model Name** | | SM-C200 |
| **Power Supply** | | DC 3.85 V |
| **Frequency Range** | | 2 402 ㎒ ~ 2 480 ㎒ (Bluetooth, Bluetooth Low Energy),<br>2 412 ㎒ ~ 2 462 ㎒ (11b/g/n_HT20),<br>5 745 ㎒ ~ 5 825 ㎒ (Band 3: 11a/n_HT20, 11ac_VHT20),<br>5 755 ㎒ ~ 5 795 ㎒ (Band 3: 11n_HT40, 11ac_VHT40),<br>5 775 ㎒ (Band 3: 11ac_VHT80),<br>5 180 ㎒ ~ 5 240 ㎒ (Band 1: 11a/n_HT20, 11ac_VHT20),<br>5 190 ㎒ ~ 5 230 ㎒ (Band 1: 11n_HT40, 11ac_VHT40),<br>5 210 ㎒ (Band 1: 11ac_VHT80),<br>5 260 ㎒ ~ 5 320 ㎒ (Band 2A: 11a/n_HT20, 11ac_VHT20),<br>5 270 ㎒ ~ 5 310 ㎒ (Band 2A: 11n_HT40, 11ac_VHT40),<br>5 290 ㎒ (Band 2A: 11ac_VHT80),<br>5 500 ㎒ ~ 5 700 ㎒ (Band 2C: 11a/n_HT20, 11ac_VHT20),<br>5 510 ㎒ ~ 5 670 ㎒ (Band 2C: 11n_HT40, 11ac_VHT40),<br>5 530 ㎒ (Band 2C: 11ac_VHT80) |
| **Modulation Technique** | | DSSS, OFDM, GFSK, π/4DQPSK, 8DPSK |
| **Number of Channels** | | 79 channel (Bluetooth), 40 channel (Bluetooth Low Energy), 11 channel (11b/g/n_HT20),<br>5 channel (Band 3: 11a/n_HT20, 11ac_VHT20),<br>2 channel (Band 3: 11n_HT40, 11ac_VHT40), 1 channel (Band 3: 11ac_VHT80),<br>4 channel (Band 1: 11a/n_HT20, 11ac_VHT20),<br>2 channel (Band 1: 11n_HT40, 11ac_VHT40), 1 channel (Band 1: 11ac_VHT80),<br>4 channel (Band 2A: 11a/n_HT20, 11ac_VHT20),<br>2 channel (Band 2A: 11n_HT40, 11ac_VHT40), 1 channel (Band 2A: 11ac_VHT80),<br>8 channel (Band 2C: 11a/n_HT20, 11ac_VHT20),<br>3 channel (Band 2C: 11n_HT40, 11ac_VHT40), 1 channel (Band 2C: 11ac_VHT80) |
| **Antenna Type** | | PIFA (Planar Inverted F Antenna) |
| **Antenna Gain** | **Port#1** | 2 402 ㎒ ~ 2 480 ㎒: -0.55 ㏈i,<br>2 412 ㎒ ~ 2 462 ㎒ (MIMO): -0.55 ㏈i,<br>5 180 ㎒ ~ 5 320 ㎒: -1.40 ㏈i,<br>5 500 ㎒ ~ 5 700 ㎒: 2.70 ㏈i,<br>5 745 ㎒ ~ 5 825 ㎒: -0.70 ㏈i |
| | **Port#2** | 2 412 ㎒ ~ 2 462 ㎒ (MIMO): 0.28 ㏈i |
| **H/W Version** | | REV 0.6 |
| **S/W Version** | | C200.001 |

## 1.4. Declaration by the manufacturer

- WLAN & Bluetooth do not transmit simultaneously.
- WLAN supports MIMO(Multi Input Multi Output) condition at 802.11g and 802.11n of 2.4 ㎓ band.

## 1.5. Test Equipment List

| Equipment | Manufacturer | Model | S/N | Cal Date | Cal Interval | Cal Due. |
|---|---|---|---|---|---|---|
| Signal Generator | Agilent | E8257D | MY51501169 | Jul. 13, 2015 | Annual | Jul. 13, 2016 |
| Spectrum Analyzer | R&S | FSV30 | 103100 | Jun. 22, 2015 | Annual | Jun. 22, 2016 |
| Spectrum Analyzer | Agilent | N9020A | MY53421758 | Sep. 24, 2015 | Annual | Sep. 24, 2016 |
| Attenuator | MCLI | FAS-12-10 | 3 | Jun. 09, 2015 | Annual | Jun. 09, 2016 |
| High Pass Filter | Wainwright Instrument GmbH | WHK3.0/18G-6SS | 4 | Jun. 23, 2015 | Annual | Jun. 23, 2016 |
| High Pass Filter | Wainwright Instrument GmbH | WHK7.5/26.5G-6SS | 15 | Jun. 23, 2015 | Annual | Jun. 23, 2016 |
| Low Pass Filter | Mini-Circuits | NLP-1200+ | V 8979400903-2 | Mar. 12, 2015 | Annual | Mar. 12, 2016 |
| Power Sensor | R&S | NRP-Z81 | 100669 | Mar. 12, 2015 | Annual | Mar. 12, 2016 |
| DC Power Supply | Agilent | U8002A | MY53150029 | Jun. 22, 2015 | Annual | Jun. 22, 2016 |
| Preamplifier | H.P. | 8447F | 2944A03909 | Aug. 27, 2015 | Annual | Aug. 27, 2016 |
| Preamplifier | R&S | SCU-18 | 10117 | Apr. 10, 2015 | Annual | Apr. 10, 2016 |
| Preamplifier | MITEQ Inc. | JS44-18004000-35-8P | 1546891 | May 07, 2015 | Annual | May 07, 2016 |
| Loop Antenna | R&S | HFH2-Z2 | 100118 | Jun. 04, 2015 | Biennial | Jun. 04, 2017 |
| Bilog Antenna | Schwarzbeck Mess-Elektronik | VULB9163 | 396 | Jun. 18, 2015 | Biennial | Jun. 18, 2017 |
| Horn Antenna | R&S | HF906 | 100326 | Feb. 01, 2016 | Biennial | Feb. 01, 2018 |
| Horn Antenna | Schwarzbeck Mess-Elektronik | BBHA9170 | BBHA9170431 | May 15, 2014 | Biennial | May 15, 2016 |
| Antenna Master | INN-CO | MM4000 | N/A | N.C.R. | N/A | N.C.R. |
| Test Receiver | R&S | ESU26 | 100109 | Mar. 07, 2016 | Annual | Mar. 07, 2017 |
| Turn Table | INN-CO | DS 1200 S | N/A | N.C.R. | N/A | N.C.R. |
| Anechoic Chamber | SY Corporation | L × W × H (9.6 m × 6.4 m × 6.6 m) | N/A | N.C.R. | N/A | N.C.R. |
| Test Receiver | R&S | ESCI 7 | 100911 | Dec. 22, 2015 | Annual | Dec. 22, 2016 |
| Two-Line V-Network | R&S | ENV216 | 100190 | Dec. 21, 2015 | Annual | Dec. 21, 2016 |
| Shield Room | SY Corporation | L × W × H (6.5 m × 3.5 m × 3.5 m) | N/A | N.C.R. | N/A | N.C.R. |

## 1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part15 Subpart C | | |
|---|---|---|
| **Standard section** | **Test Item(s)** | **Result** |
| 15.205(a)<br>15.209<br>15.247(d) | Transmitter Radiated Spurious Emissions<br>Conducted Spurious Emission | Complied |
| 15.247(a)(2) | 6 dB Bandwidth | Complied |
| 15.247(b)(3) | Maximum Peak Conducted Output Power | Complied |
| 15.247(e) | Power Spectral Density | Complied |
| 15.207 | AC Power Line Conducted Emission | Complied |

## 1.7. Test Procedure(s)

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009) and the guidance provided in KDB 558074_v03r04 were used in the measurement of the DUT.

## 1.8. Sample calculation

Where relevant, the following sample calculation is provided:

### 1.8.1. Conducted test

Offset value (dB) = Attenuator (dB) + Cable loss (dB)

### 1.8.2. Radiation test

Field strength level (dBμV/m) = Measured level (dBμV) + Antenna factor (dB) + Cable loss (dB) - amplifier gain(dB)

## 1.9. Test report revision

| Revision | Report number | Date of Issue | Description |
|---|---|---|---|
| 0 | F690501/RF-RTL009501 | 2016.02.15 | Initial |
| 1 | F690501/RF-RTL009501-1 | 2016.03.07 | Retest 11g mode (CDD function) |
| 2 | F690501/RF-RTL009501-2 | 2016.03.17 | Modify 11g mode (CDD function) data |

## 1.10. Duty Cycle of EUT

Regarding to KDB558074 v03r04, 6.0, the maximum duty cycles of all modes were investigated and set the spectrum analyzer as below
Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value, Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.

| Mode | Data Rate (Mbps) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **11b** | **1** | **2** | **5.5** | **11** | | | | |
| Duty Cycle (%) | 0.99 | 0.98 | 0.94 | 0.91 | - | - | - | - |
| Correction factor (dB) | 0.04 | 0.09 | 0.27 | 0.41 | - | - | - | - |
| **11g** | **6** | **9** | **12** | **18** | **24** | **36** | **48** | **54** |
| Duty Cycle (%) | 0.93 | 0.89 | 0.86 | 0.80 | 0.79 | 0.71 | 0.64 | 0.64 |
| Correction factor (dB) | 0.32 | 0.51 | 0.66 | 0.97 | 1.02 | 1.49 | 1.94 | 1.94 |
| **11n_HT20** | **MCS8** | **MCS9** | **MCS10** | **MCS11** | **MCS12** | **MCS13** | **MCS14** | **MCS15** |
| Duty Cycle (%) | 0.86 | 0.79 | 0.72 | 0.67 | 0.60 | 0.55 | 0.54 | 0.52 |
| Correction factor (dB) | 0.66 | 1.02 | 1.43 | 1.74 | 2.22 | 2.60 | 2.68 | 2.84 |

Remark:

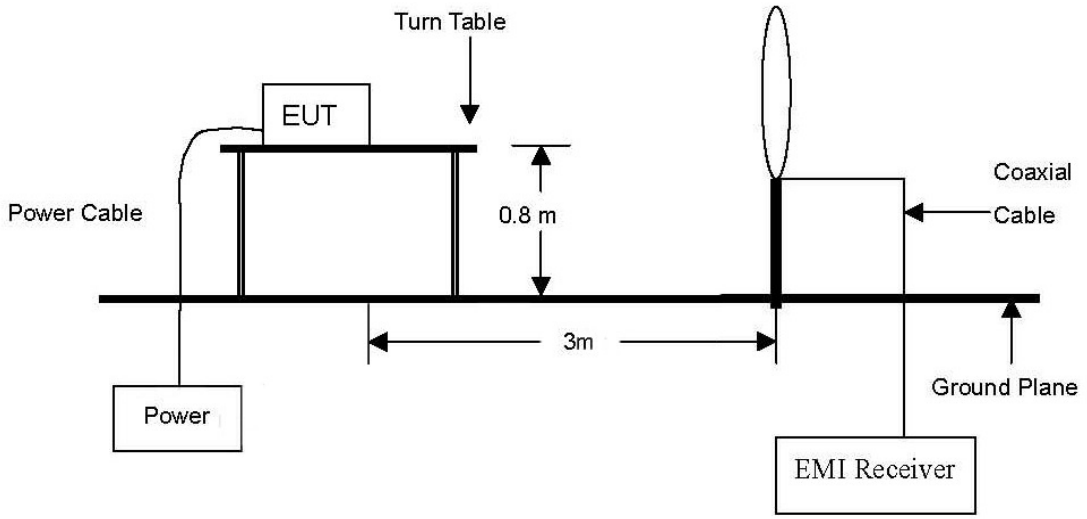
1. As measured duty cycles of EUT, all of mode and data rate keep constant period and are converted to log scale (power averaging) to compensate correction factor to result of average test items.
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (㏈) = 10 log (1 / duty cycle)

# 2. Transmitter Radiated Spurious Emissions and Conducted Spurious Emission

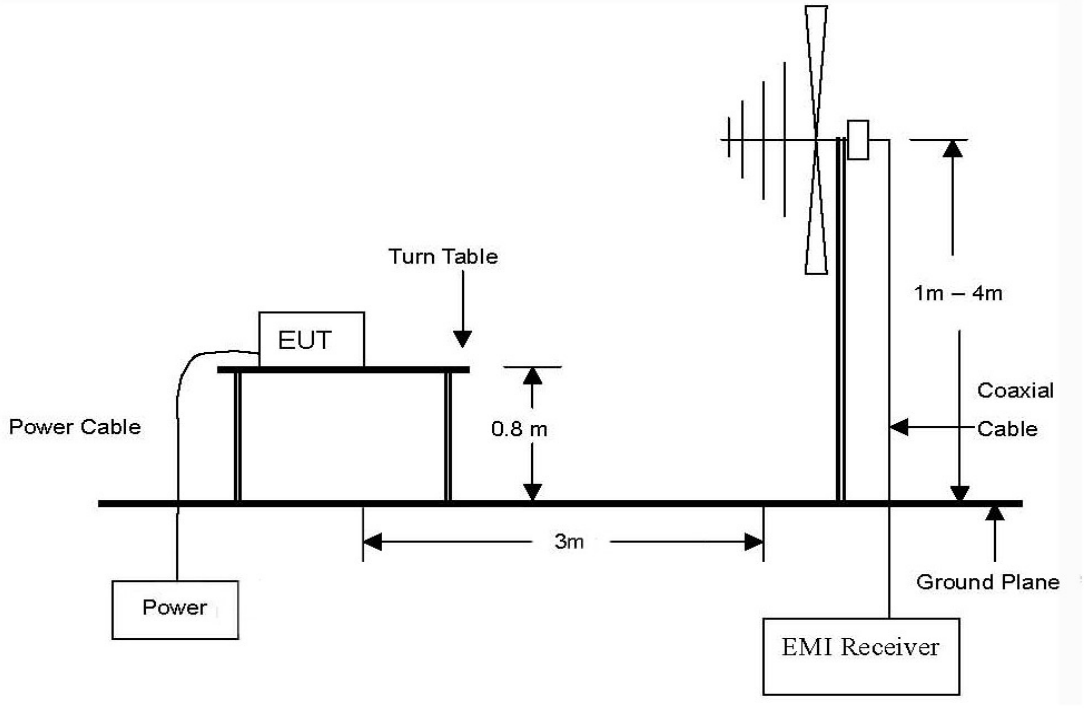
## 2.1. Test Setup

### 2.1.1. Transmitter Radiated Spurious Emissions

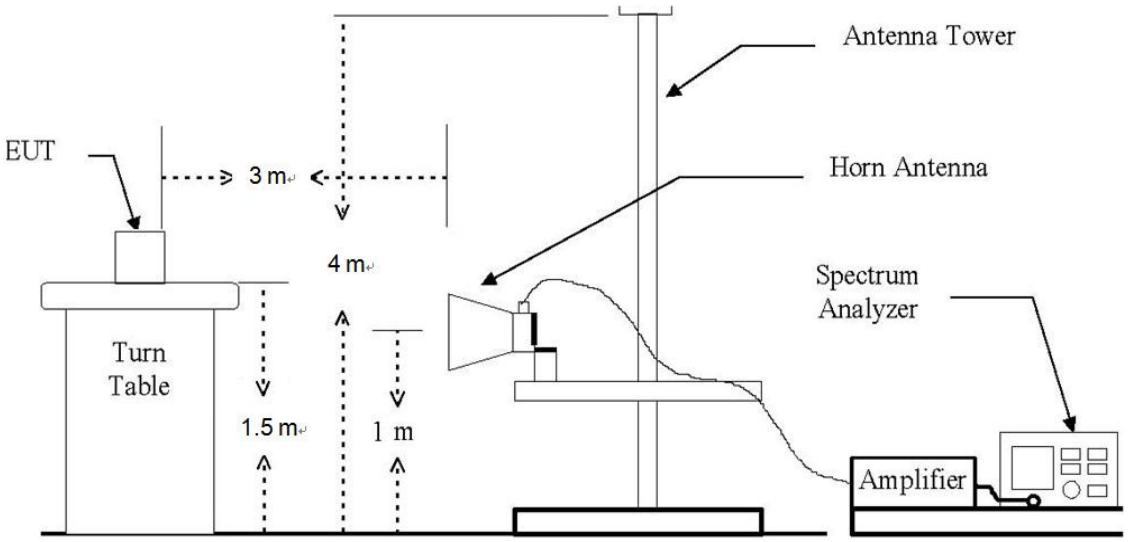
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions.




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



The diagram below shows the test setup that is utilized to make the measurements for emission. The spurious emissions were investigated form 1 ㎓ to the 10th harmonic of the highest fundamental frequency or 40 ㎓, whichever is lower.



### 2.1.2. Conducted Spurious Emission


## 2.2. Limit

According to §15.247(d), in any 100 ㎑ 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 ㏈ below that in the 100 ㎑ 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 ㏈ instead of 20 ㏈. 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 (㎒) | Distance (Meters) | Field Strength (㏈㎶/m) | Field Strength (㎶/m) |
|---|---|---|---|
| 0.009 – 0.490 | 300 | 20 log (2 400/F(㎑)) | 2 400/F(㎑) |
| 0.490 – 1.705 | 30 | 20 log (24 000/F(㎑)) | 24 000/F(㎑) |
| 1.705 – 30.0 | 30 | 29.54 | 30 |
| 30 - 88 | 3 | 40.0 | 100** |
| 88 – 216 | 3 | 43.5 | 150** |
| 216 – 960 | 3 | 46.0 | 200** |
| Above 960 | 3 | 54.0 | 500 |

## 2.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates in section 11.0 & 12.0 of KDB 558074_v03r04 and ANSI C63.10-2009.

Remark:

Testing for radiated emissions above 1 ㎓ was performed with the EUT elevated at 1.5m instead of 0.8m. 1.5m is the required height in ANSI C63.10:2013 as referenced by RSS-Gen issue 4. This test height has been permitted by FCC as discussed in FCC-TCB conference call in December 2014.

### 2.3.1. Test Procedures for emission below 30 ㎒

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. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
3. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
4. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum Hold Mode.

### 2.3.2. Test Procedures for emission from above 30 ㎒

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 below 1 ㎓ and 1.5 meters above the ground at a 3 meter anechoic chamber test site above 1 ㎓. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 ㎓, 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 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a bi-log antenna, a horn 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 ㏈ 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 ㏈ 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;

All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

1. Unwanted Emissions into Non-Restricted Frequency Bands

- The Reference Level Measurement refer to section 11.2
Set analyzer center frequency to DTS channel center frequency, SPAN ≥ 1.5 times the DTS bandwidth, the RBW = 100 ㎑ and VBW ≥ 3 x RBW, Detector = Peak, Sweep time = Auto couple, Trace = Max hold.

- Unwanted Emissions Level Measurement refer to section 11.3
Set the center frequency and span to encompass frequency range to be measured, the RBW = 100 ㎑ and VBW ≥ 3 x RBW, Detector = Peak, Sweep time = Auto couple, Trace = Max hold.

2. Unwanted Emissions into Restricted Frequency Bands

- Peak Power measurement procedure refer to section 12.2.4
Set RBW = as specified in Table 1, VBW ≥ 3 x RBW, Detector = Peak, Sweep time = auto, Trace = Max hold.

**Table 1- RBW as a function of frequency**

| Frequency | RBW |
|---|---|
| 9 – 150 ㎑ | 200 – 300 ㎐ |
| 0.15 – 30 ㎒ | 9 – 10 ㎑ |
| 30 – 1 000 ㎒ | 100 – 120 ㎑ |
| >1 000 ㎒ | 1 ㎒ |

-Average Power measurements procedure refer to section 12.2.5.2
The EUT shall be configured to operate at the maximum achievable duty cycle.
Measure the duty cycle, x, of the transmitter output signal as described in section 6.0.
Set RBW = 1 ㎒, VBW ≥ 3 x RBW, Detector = RMS, if span / (# of points in sweep) ≤ (RBW/2).
Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied then the detector mode shall be set to peak.

Averaging type = power (i.e., RMS).
As an alternative the detector and averaging type may be set for linear voltage averaging.
Some instruments require linear display mode in order to use linear voltage averaging. Log or ㏈ averaging shall not be used. Sweep time = auto, Perform a trace average of at least 100 traces.

A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
1) If power averaging (RMS) mode was used in step f), then the applicable correction factor is 10 log (1/x), where x is the duty cycle.

3. To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes (X, Y, Z). Worst orthogonal plan of EUT is **X – axis** during radiation test.

### 2.3.3. Test Procedures for Conducted Spurious Emissions

All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

Per the guidance of KDB 558074 v03r04, section 11.1 & 11.2 & 11.3, the reference level for out of band emissions is established from the plots of this section since the band edge emissions are measured with a RBW of 100 ㎑. This reference level is then used as the limit in subsequent plots for out of band spurious emissions shown in section 2.4.3. The limit for out of band spurious emission at the band edge is 20 ㏈ or 30 ㏈ below the fundamental emission level measured in a 100 ㎑ bandwidth.

1. Conducted Emissions at Band Edge
 - The Measurement refer to section 11.2
   Set the center frequency and span to encompass frequency range to be measured, the RBW = 100 ㎑ and VBW ≥ 3 x RBW, Detector = Peak, Sweep time = Auto couple, Trace = Max hold, Ensure that the number of measurement points ≥ span/RBW, The trace was allowed to stabilize.

2. Conducted Spurious Emissions
 - The Measurement refer to section 11.3
   Start frequency was set to 9 ㎑ and stop frequency was set to 25 ㎓ (separated into two plots per channel), RBW = 100 ㎑, VBW ≥ 3 x RBW, Detector = Peak, Sweep time = Auto couple, Trace = Max hold, The trace was allowed to stabilize.

3. Correction function
 - For plots showing conducted spurious emissions from 9 ㎑ to 25 ㎓, all path loss of wide frequency range was investigated and compensated to spectrum analyzer as Correction function.
   So, the reading values shown in plots were final result.

## 2.4. Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

### 2.4.1. Radiated Spurious Emission below 1 000 ㎒

The frequency spectrum from 9 ㎑ to 1 000 ㎒ was investigated. All reading values are peak values.

| Radiated Emissions | | | Ant | Correction Factors | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP + CL (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| 360.00 | 39.80 | Peak | H | 15.75 | -25.44 | 30.11 | 46.00 | 15.89 |
| 648.01 | 37.50 | Peak | V | 20.56 | -25.65 | 32.41 | 46.00 | 13.59 |
| 719.95 | 39.00 | Peak | H | 20.86 | -25.52 | 34.34 | 46.00 | 11.66 |
| 792.02 | 44.30 | Peak | H | 21.23 | -25.08 | 40.45 | 46.00 | 5.55 |
| 792.06 | 36.20 | Peak | V | 22.44 | -25.08 | 33.56 | 46.00 | 12.44 |
| Above 800.00 | Not detected | - | - | - | - | - | - | - |

Remark:

1. Spurious emissions for all channels were investigated and almost the same below 1 ㎓.
2. Reported spurious emissions are in **11b / 1Mbps / middle channel** as worst case among other modes.
3. Radiated spurious emission measurement as below.
   (Actual = Reading + Antenna Factor + Amp + CL)
4. According to §15.31(o), emission levels are not report much lower than the limits by over 20 ㏈.

### 2.4.2. Radiated Spurious Emission above 1 000 ㎒

The frequency spectrum above 1 000 ㎒ was investigated. All reading values are peak and average values

**DSSS : 802.11b(1 Mbps) - ANT1**

Low Channel (2 412 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| *2 310.00 | 25.50 | Peak | V | 27.31 | 5.35 | - | 58.16 | 74.00 | 15.84 |
| *2 310.00 | 14.81 | Average | V | 27.31 | 5.35 | - | 47.47 | 54.00 | 6.53 |
| *2 388.76 | 27.05 | Peak | V | 27.45 | 5.38 | - | 59.88 | 74.00 | 14.12 |
| *2 389.84 | 16.03 | Average | V | 27.45 | 5.38 | - | 48.86 | 54.00 | 5.14 |
| *2 390.00 | 25.24 | Peak | V | 27.45 | 5.38 | - | 58.07 | 74.00 | 15.93 |
| *2 390.00 | 15.89 | Average | V | 27.45 | 5.38 | - | 48.72 | 54.00 | 5.28 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dBμV) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| *4 824.01 | 46.71 | Peak | H | 32.77 | -35.17 | - | 44.31 | 74.00 | 29.69 |
| *4 824.06 | 40.71 | Average | H | 32.77 | -35.17 | - | 38.31 | 54.00 | 15.69 |
| Above 4 900.00 | Not detected | - | - | - | - | - | - | - | - |

Middle Channel (2 437 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *4 874.02 | 45.63 | Peak | H | 32.90 | -34.99 | - | 43.54 | 74.00 | 30.46 |
| *4 873.99 | 38.57 | Average | H | 32.90 | -34.99 | - | 36.48 | 54.00 | 17.52 |
| Above 4 900.00 | Not detected | - | - | - | - | - | - | - | - |

High Channel (2 462 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 483.50 | 26.22 | Peak | V | 27.61 | 5.44 | - | 59.27 | 74.00 | 14.73 |
| *2 483.50 | 15.70 | Average | V | 27.61 | 5.44 | - | 48.75 | 54.00 | 5.25 |
| *2 486.45 | 27.82 | Peak | V | 27.62 | 5.45 | - | 60.89 | 74.00 | 13.11 |
| *2 484.15 | 16.23 | Average | V | 27.61 | 5.45 | - | 49.29 | 54.00 | 4.71 |
| *2 500.00 | 25.92 | Peak | V | 27.64 | 5.49 | - | 59.05 | 74.00 | 14.95 |
| *2 500.00 | 15.15 | Average | V | 27.64 | 5.49 | - | 48.28 | 54.00 | 5.72 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *4 923.68 | 45.85 | Peak | H | 33.02 | -35.28 | - | 43.59 | 74.00 | 30.41 |
| *4 923.91 | 40.40 | Average | H | 33.03 | -35.28 | - | 38.15 | 54.00 | 15.85 |
| Above 5 000.00 | Not detected | - | - | - | - | - | - | - | - |

**DSSS : 802.11b(1 Mbps) - ANT2**

Low Channel (2 412 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 310.00 | 25.04 | Peak | V | 27.31 | 5.35 | - | 57.70 | 74.00 | 16.30 |
| *2 310.00 | 14.36 | Average | V | 27.31 | 5.35 | - | 47.02 | 54.00 | 6.98 |
| *2 387.08 | 26.96 | Peak | V | 27.45 | 5.37 | - | 59.78 | 74.00 | 14.22 |
| *2 388.88 | 15.48 | Average | V | 27.45 | 5.38 | - | 48.31 | 54.00 | 5.69 |
| *2 390.00 | 24.53 | Peak | V | 27.45 | 5.38 | - | 57.36 | 74.00 | 16.64 |
| *2 390.00 | 15.17 | Average | V | 27.45 | 5.38 | - | 48.00 | 54.00 | 6.00 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *4 823.84 | 44.81 | Peak | H | 32.77 | -35.17 | - | 42.41 | 74.00 | 31.59 |
| *4 824.00 | 37.20 | Average | H | 32.77 | -35.17 | - | 34.80 | 54.00 | 19.20 |
| Above 4 900.00 | Not detected | - | - | - | - | - | - | - | - |

Middle Channel (2 437 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *4 873.85 | 43.60 | Peak | H | 32.90 | -34.99 | - | 41.51 | 74.00 | 32.49 |
| *4 874.08 | 36.10 | Average | H | 32.90 | -34.99 | - | 34.01 | 54.00 | 19.99 |
| Above 4 900.00 | Not detected | - | - | - | - | - | - | - | - |

High Channel (2 462 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 483.50 | 25.34 | Peak | V | 27.61 | 5.44 | - | 58.39 | 74.00 | 15.61 |
| *2 483.50 | 15.67 | Average | V | 27.61 | 5.44 | - | 48.72 | 54.00 | 5.28 |
| *2 490.45 | 27.20 | Peak | V | 27.62 | 5.46 | - | 60.28 | 74.00 | 13.72 |
| *2 487.10 | 16.00 | Average | V | 27.62 | 5.45 | - | 49.07 | 54.00 | 4.93 |
| *2 500.00 | 25.04 | Peak | V | 27.64 | 5.49 | - | 58.17 | 74.00 | 15.83 |
| *2 500.00 | 15.08 | Average | V | 27.64 | 5.49 | - | 48.21 | 54.00 | 5.79 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *4 924.27 | 46.77 | Peak | H | 33.03 | -35.28 | - | 44.52 | 74.00 | 29.48 |
| *4 923.96 | 41.60 | Average | H | 33.03 | -35.28 | - | 39.35 | 54.00 | 14.65 |
| Above 5 000.00 | Not detected | - | - | - | - | - | - | - | - |

**OFDM: 802.11g(6 Mbps) - ANT1+2**

Low Channel (2 412 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 310.00 | 25.04 | Peak | V | 28.07 | 5.35 | - | 58.46 | 74.00 | 15.54 |
| *2 310.00 | 14.59 | Average | V | 28.07 | 5.35 | 0.32 | 48.33 | 54.00 | 5.67 |
| *2 389.94 | 31.52 | Peak | V | 28.15 | 5.38 | - | 65.05 | 74.00 | 8.95 |
| *2 389.94 | 18.56 | Average | V | 28.15 | 5.38 | 0.32 | 52.41 | 54.00 | 1.59 |
| *2 390.00 | 31.11 | Peak | V | 28.15 | 5.38 | - | 64.64 | 74.00 | 9.36 |
| *2 390.00 | 18.47 | Average | V | 28.15 | 5.38 | 0.32 | 52.32 | 54.00 | 1.68 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| Above 1 000.00 | Not detected | - | - | - | - | - | - | - | - |

Middle Channel (2 437 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| Above 1 000.00 | Not detected | - | - | - | - | - | - | - | - |

High Channel (2 462 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 483.50 | 27.69 | Peak | V | 28.24 | 5.44 | - | 61.37 | 74.00 | 12.63 |
| *2 483.50 | 15.72 | Average | V | 28.24 | 5.44 | 0.32 | 49.72 | 54.00 | 4.28 |
| *2 488.02 | 27.92 | Peak | V | 28.25 | 5.46 | - | 61.63 | 74.00 | 12.37 |
| *2 485.33 | 16.34 | Average | V | 28.25 | 5.45 | 0.32 | 50.36 | 54.00 | 3.64 |
| *2 500.00 | 25.67 | Peak | V | 28.26 | 5.49 | - | 59.42 | 74.00 | 14.58 |
| *2 500.00 | 15.81 | Average | V | 28.26 | 5.49 | 0.32 | 49.88 | 54.00 | 4.12 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *4 934.10 | 49.84 | Peak | V | 33.00 | -35.25 | - | 47.59 | 74.00 | 26.41 |
| *4 934.95 | 36.83 | Average | V | 33.01 | -35.24 | 0.32 | 34.92 | 54.00 | 19.08 |
| Above 5 000.00 | Not detected | - | - | - | - | - | - | - | - |

**OFDM: 802.11n_HT20(MCS8) - ANT1+2**

Low Channel (2 412 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 310.00 | 24.02 | Peak | V | 27.31 | 5.35 | - | 56.68 | 74.00 | 17.32 |
| *2 310.00 | 14.41 | Average | V | 27.31 | 5.35 | 0.66 | 47.73 | 54.00 | 6.27 |
| *2 389.36 | 28.61 | Peak | V | 27.45 | 5.38 | - | 61.44 | 74.00 | 12.56 |
| *2 389.12 | 16.50 | Average | V | 27.45 | 5.38 | 0.66 | 49.99 | 54.00 | 4.01 |
| *2 390.00 | 27.75 | Peak | V | 27.45 | 5.38 | - | 60.58 | 74.00 | 13.42 |
| *2 390.00 | 15.94 | Average | V | 27.45 | 5.38 | 0.66 | 49.43 | 54.00 | 4.57 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| Above 1 000.00 | Not detected | - | - | - | - | - | - | - | - |

Middle Channel (2 437 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| Above 1 000.00 | Not detected | - | - | - | - | - | - | - | - |

High Channel (2 462 ㎒)

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| *2 483.50 | 25.14 | Peak | V | 27.61 | 5.44 | - | 58.19 | 74.00 | 15.81 |
| *2 483.50 | 15.53 | Average | V | 27.61 | 5.44 | 0.66 | 49.24 | 54.00 | 4.76 |
| *2 483.80 | 27.36 | Peak | V | 27.61 | 5.44 | - | 60.41 | 74.00 | 13.59 |
| *2 483.90 | 16.13 | Average | V | 27.61 | 5.44 | 0.66 | 49.84 | 54.00 | 4.16 |
| *2 500.00 | 25.26 | Peak | V | 27.64 | 5.49 | - | 58.39 | 74.00 | 15.61 |
| *2 500.00 | 14.94 | Average | V | 27.64 | 5.49 | 0.66 | 48.73 | 54.00 | 5.27 |

| Radiated Emissions | | | Ant. | Correction Factors | | | Total | Limit | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (㎒) | Reading (dB㎶) | Detect Mode | Pol. | AF (dB/m) | AMP+ CL (dB) | Duty (dB) | Actual (dB㎶/m) | Limit (dB㎶/m) | Margin (dB) |
| Above 1 000.00 | Not detected | - | - | - | - | - | - | - | - |

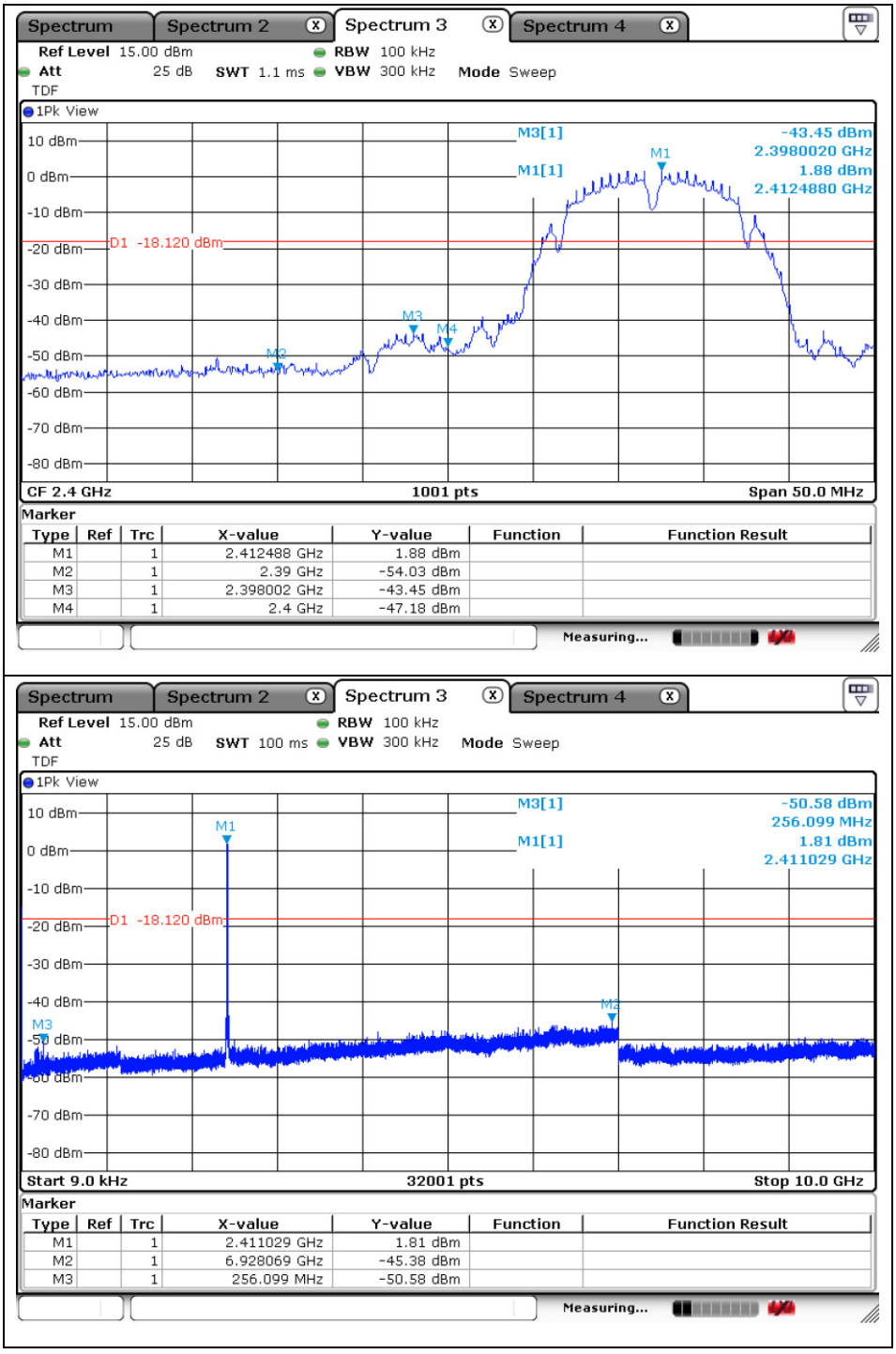
Remarks:

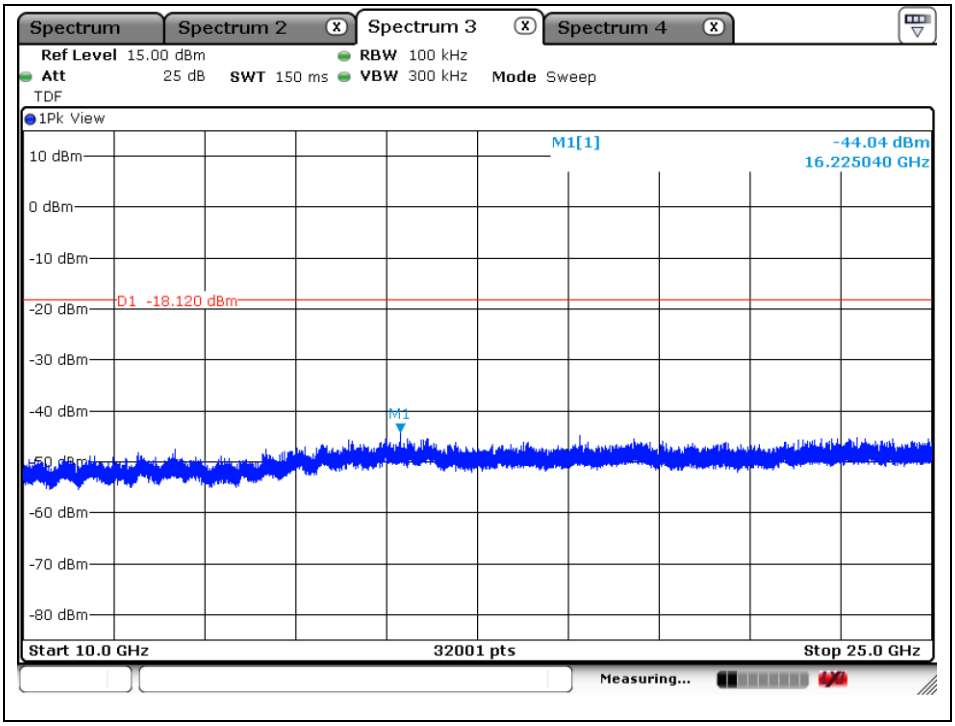
1. "*" means the restricted band.
2. Measuring frequencies from 1 ㎓ to the 10th harmonic of highest fundamental frequency.
3. Radiated emissions measured in frequency above 1 000 ㎒ were made with an instrument using peak/average detector mode.
4. Actual = Reading + AF + AMP + CL or Reading + AF + CL
5. According to § 15.31(o), Emission levels are not reported much lower than the limits by over 20 ㏈.

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

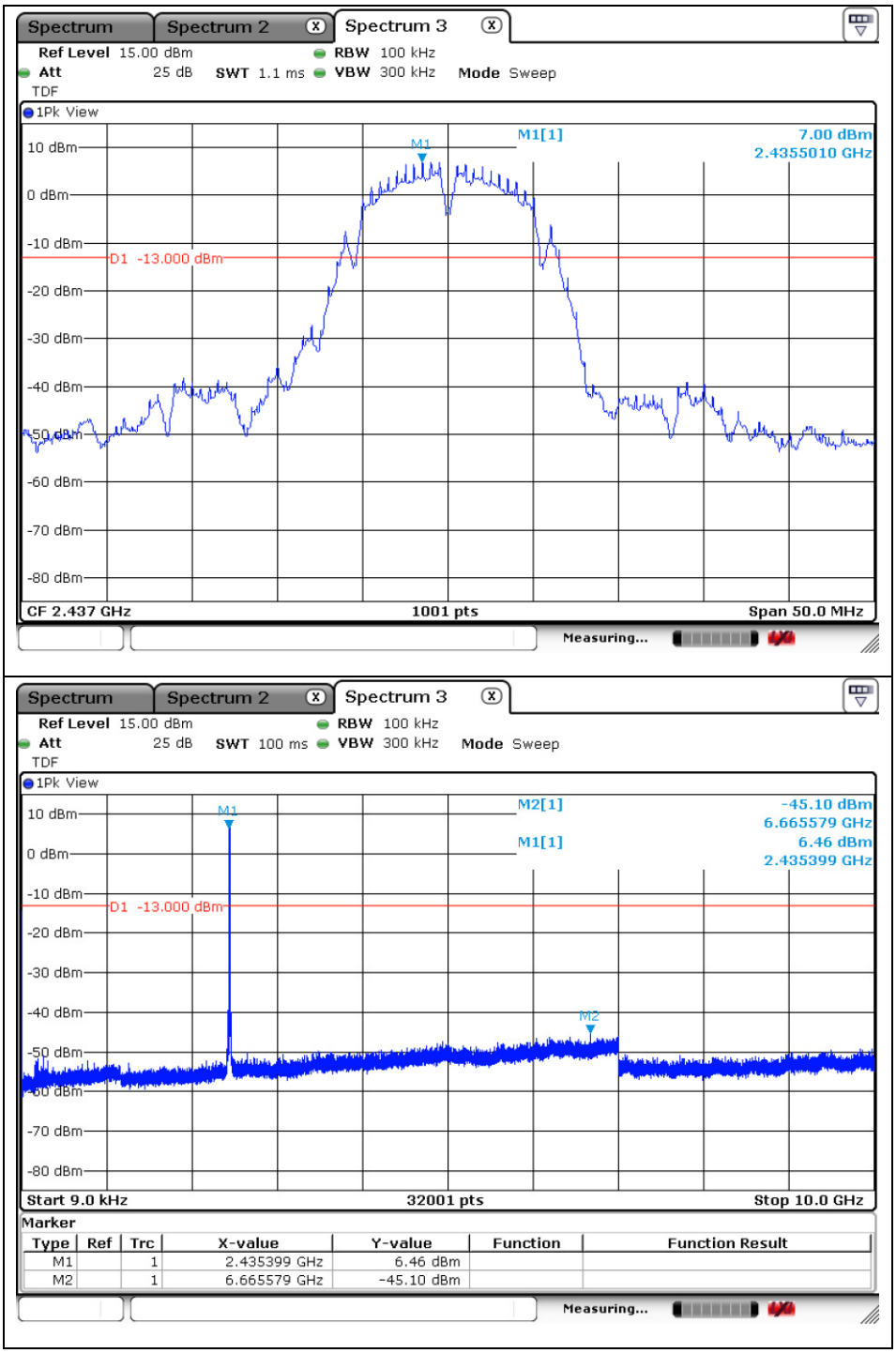
**DSSS: 802.11b(1 Mbps) - ANT1**

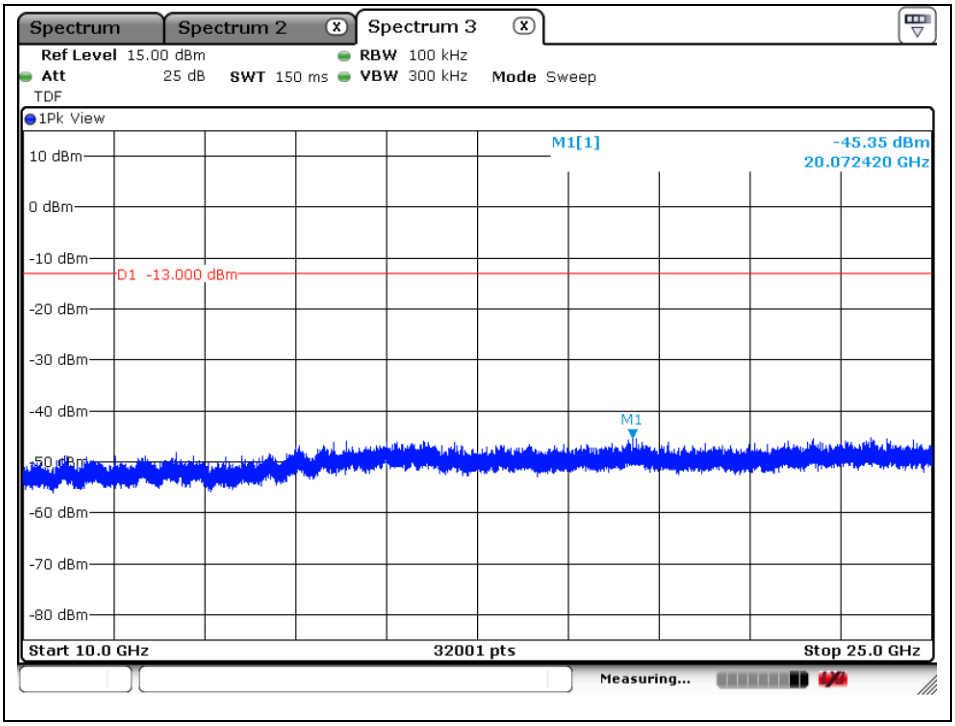
Low Channel



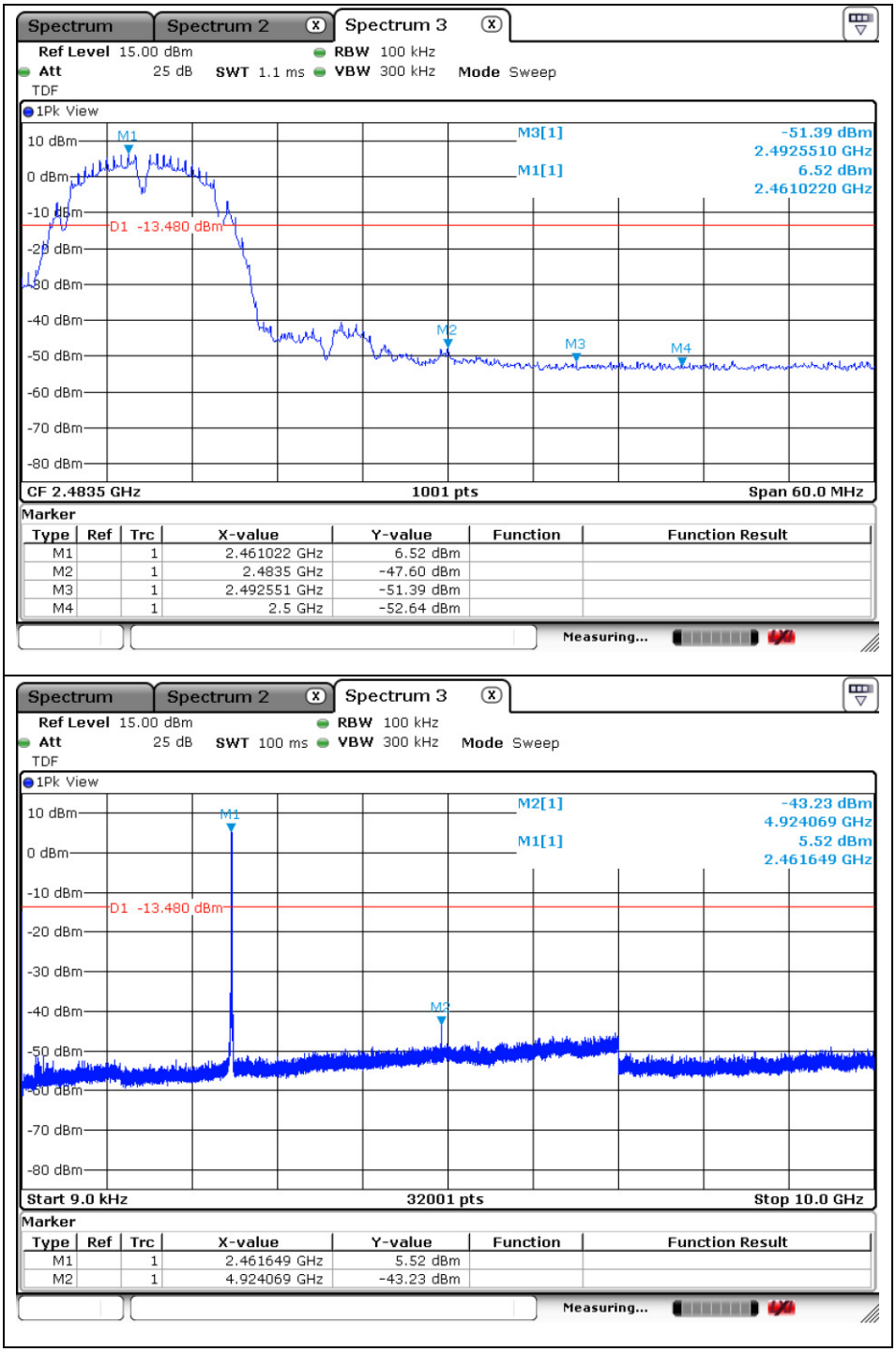


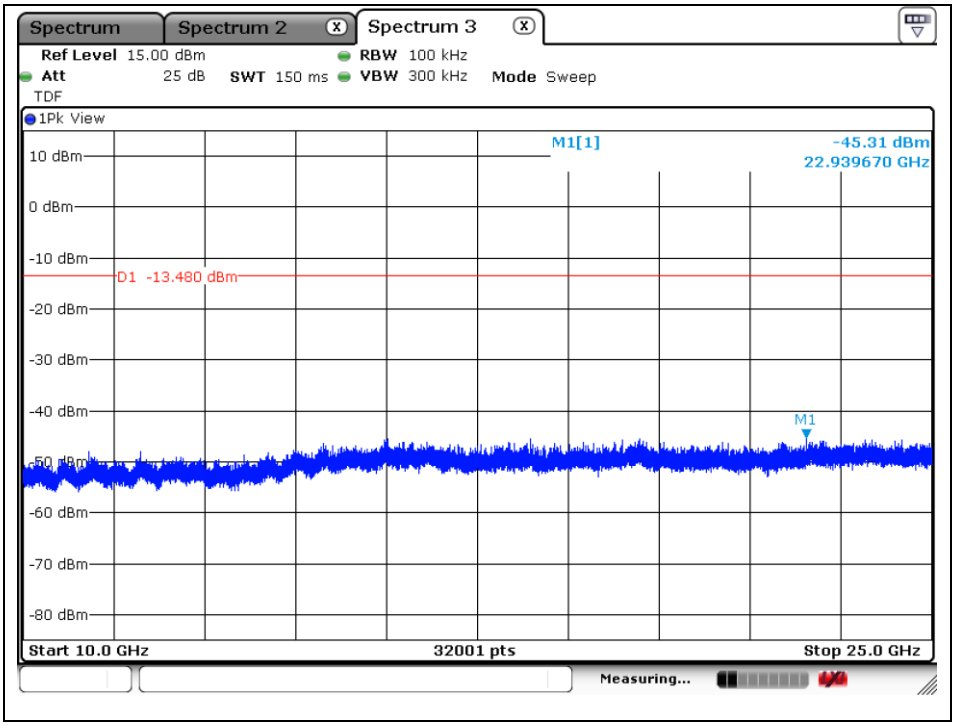
Middle Channel





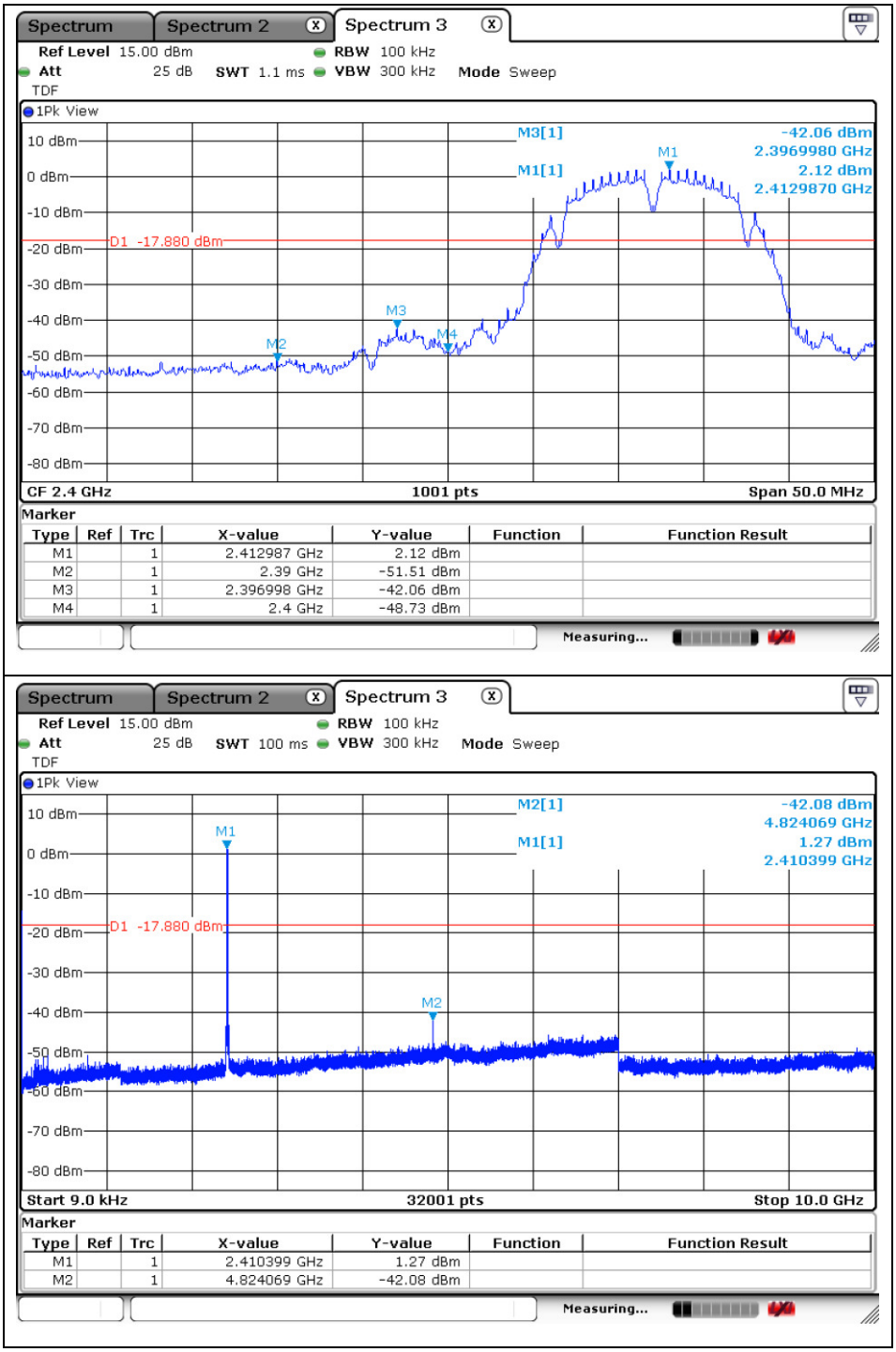
High Channel

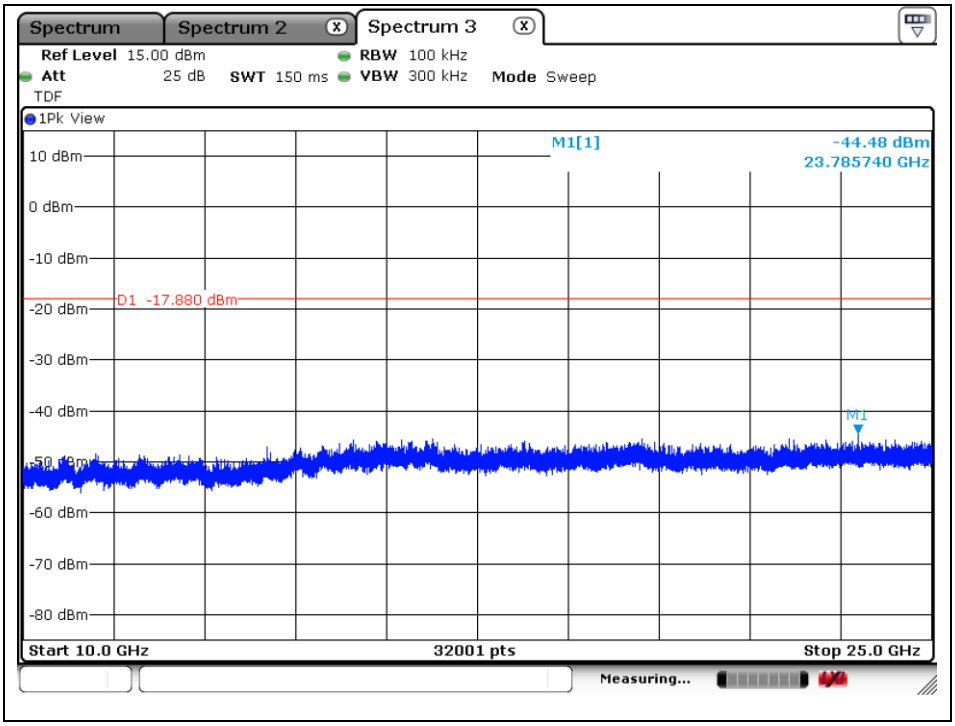




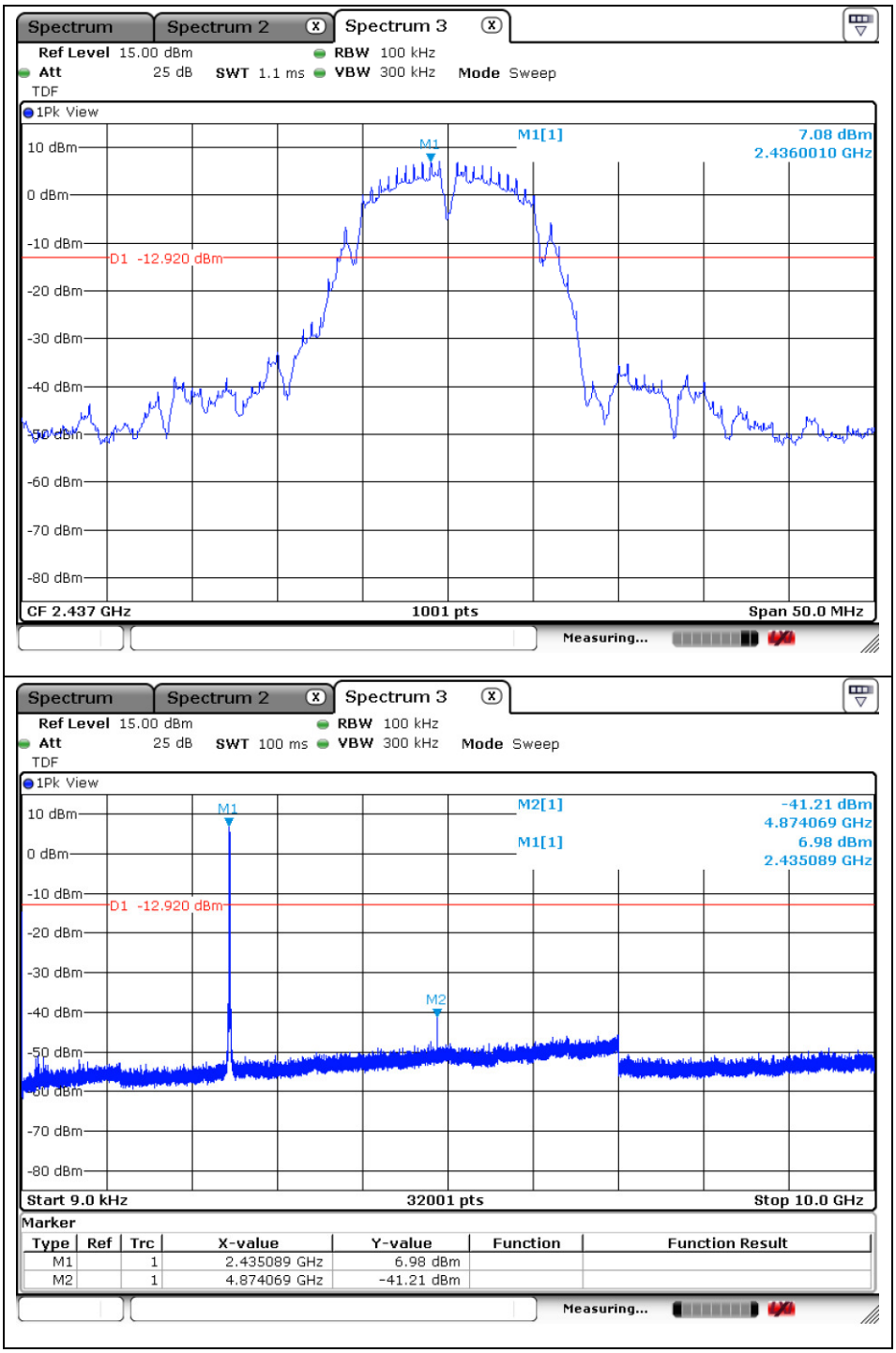
**DSSS: 802.11b(1 Mbps) - ANT2**

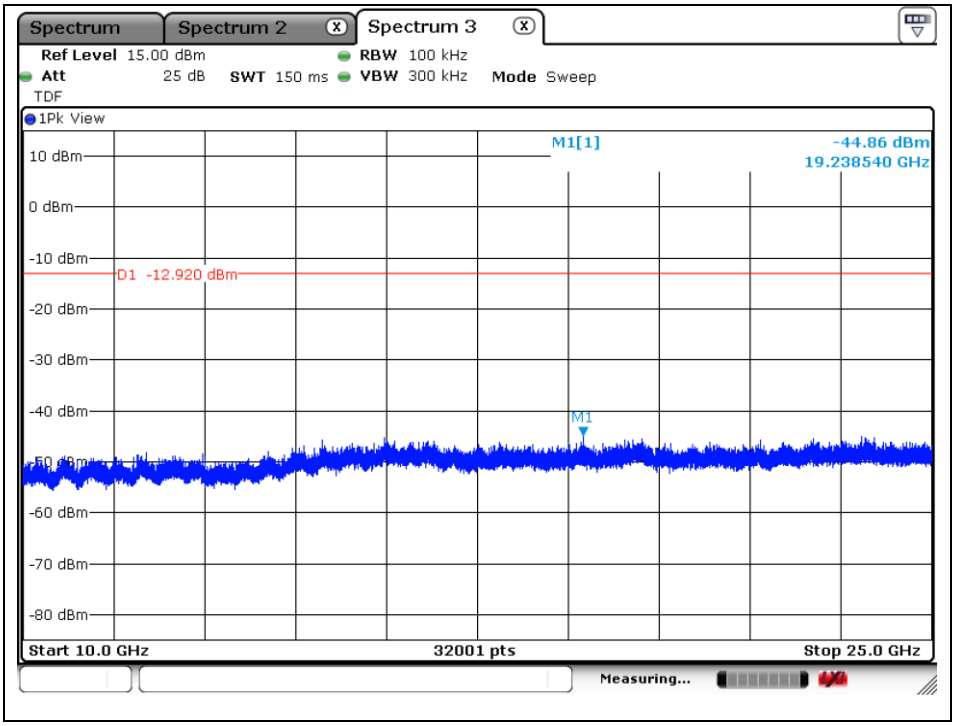
Low Channel



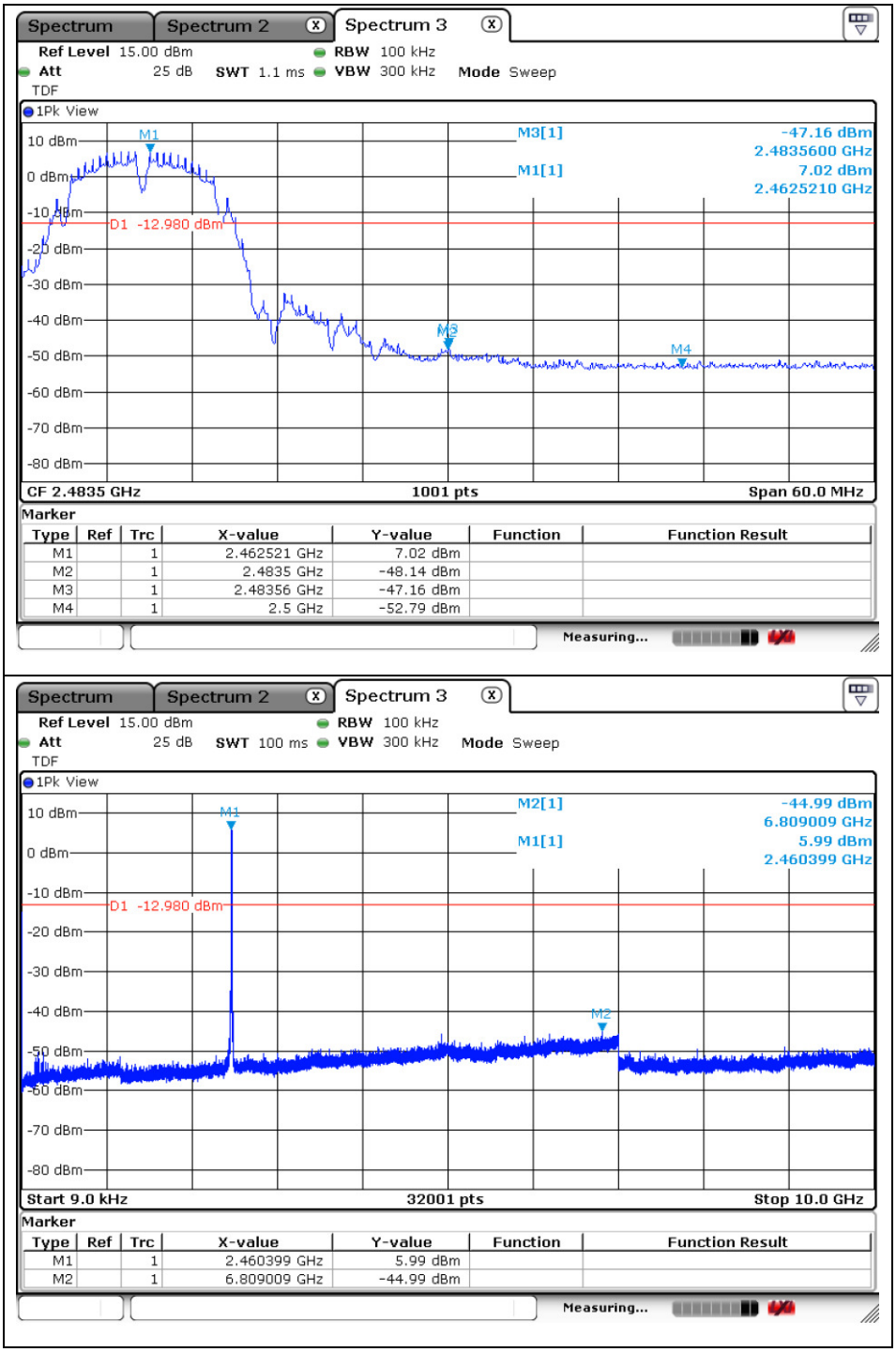

Spectrum
Spectrum 2
Spectrum 3
Ref Level 15.00 dBm
RBW 100 kHz
Att 25 dB
SWT 150 ms
VBW 300 kHz
Mode Sweep
TDF
1Pk View
M1[1]
-44.48 dBm
23.785740 GHz
10 dBm
0 dBm
-10 dBm
D1 -17.880 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
Start 10.0 GHz
32001 pts
Stop 25.0 GHz
Measuring...

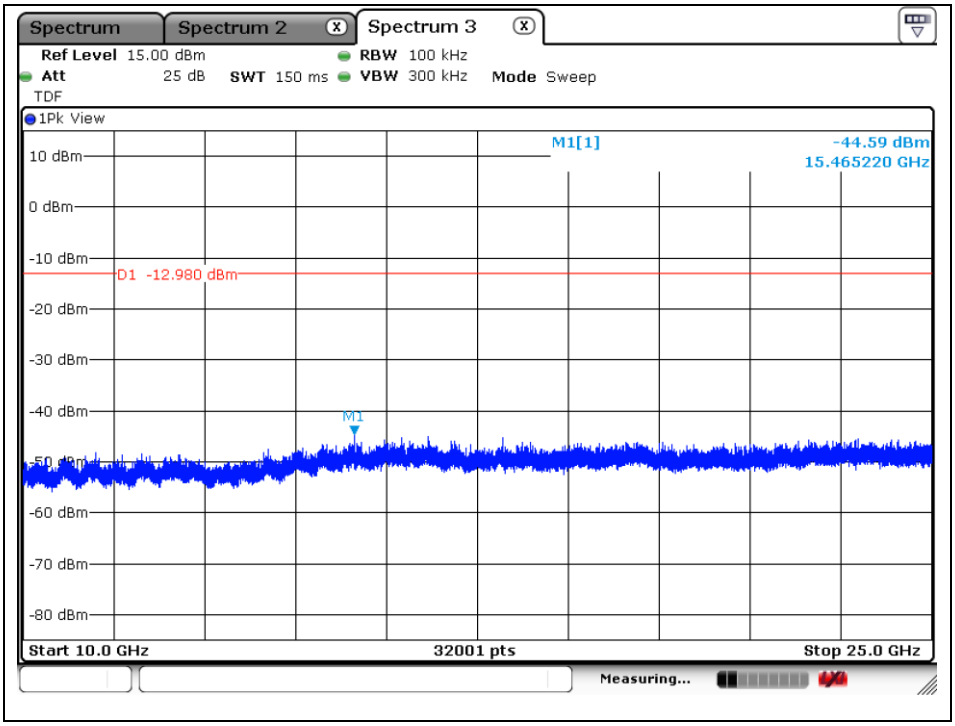
Middle Channel





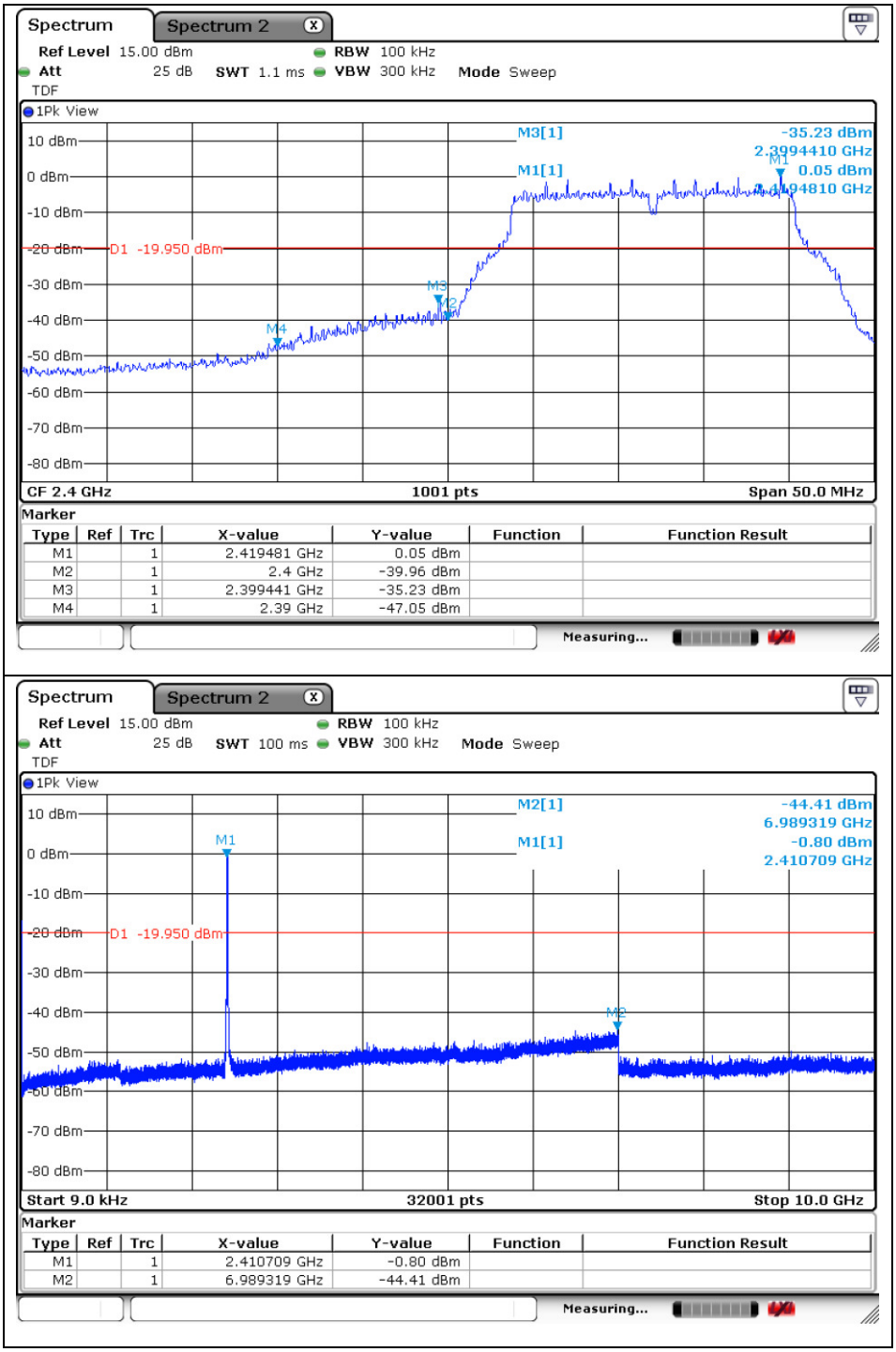
High Channel

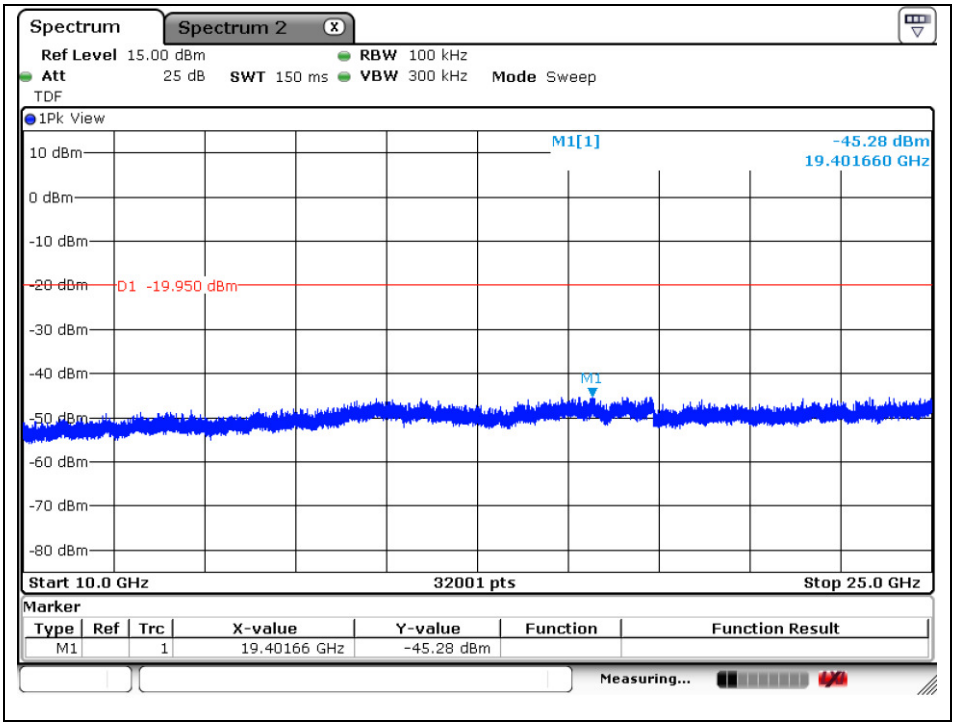




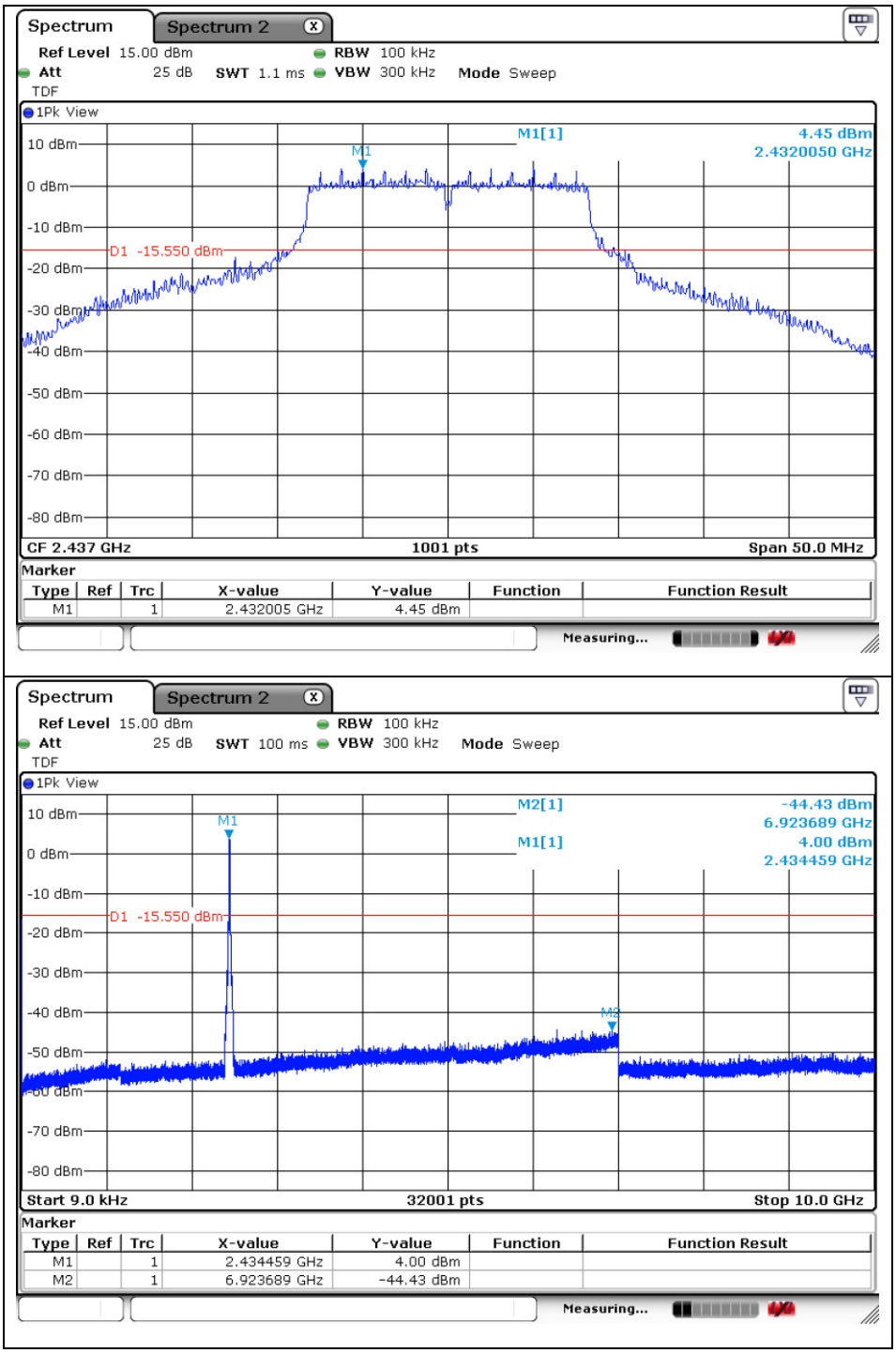
**OFDM: 802.11g(6 Mbps) - ANT1**

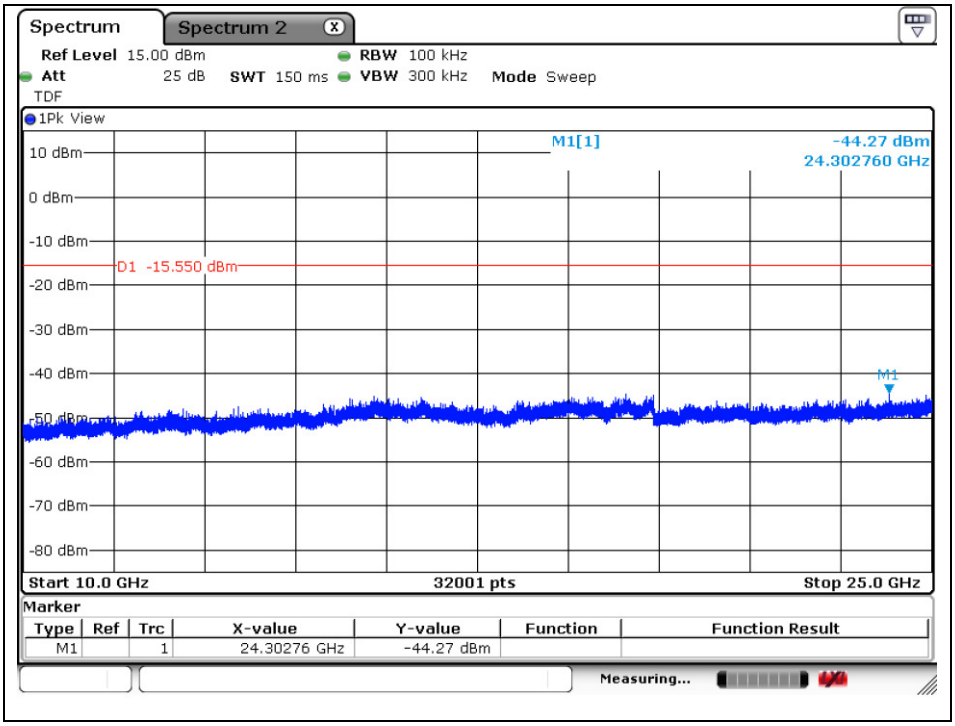
Low Channel



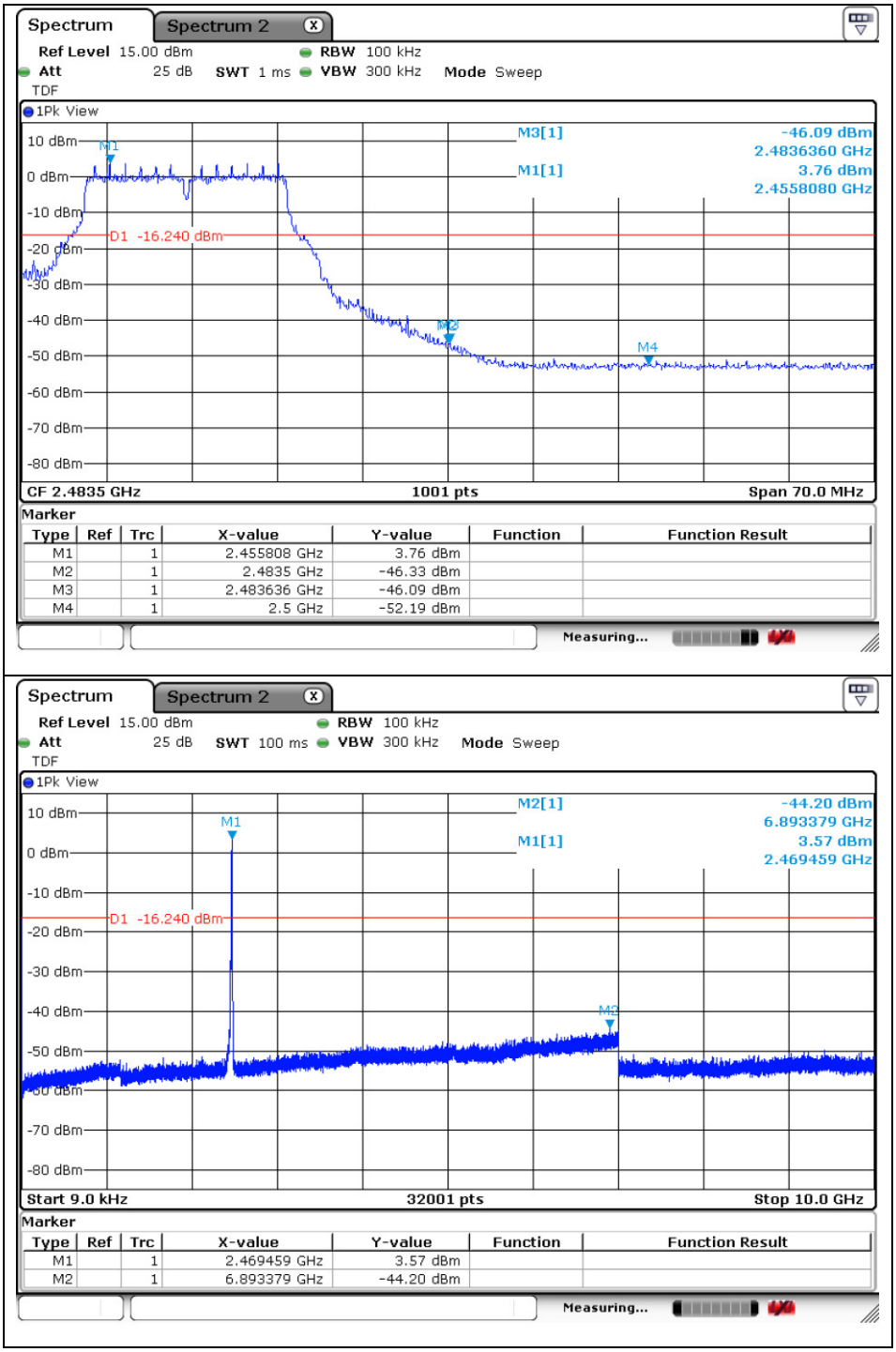


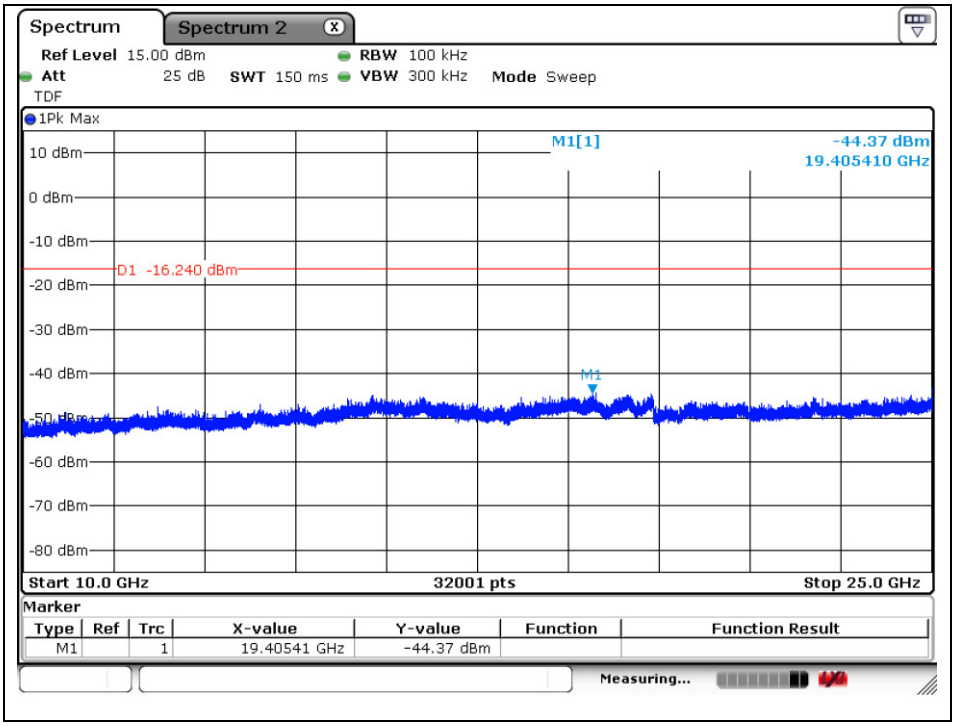
Middle Channel





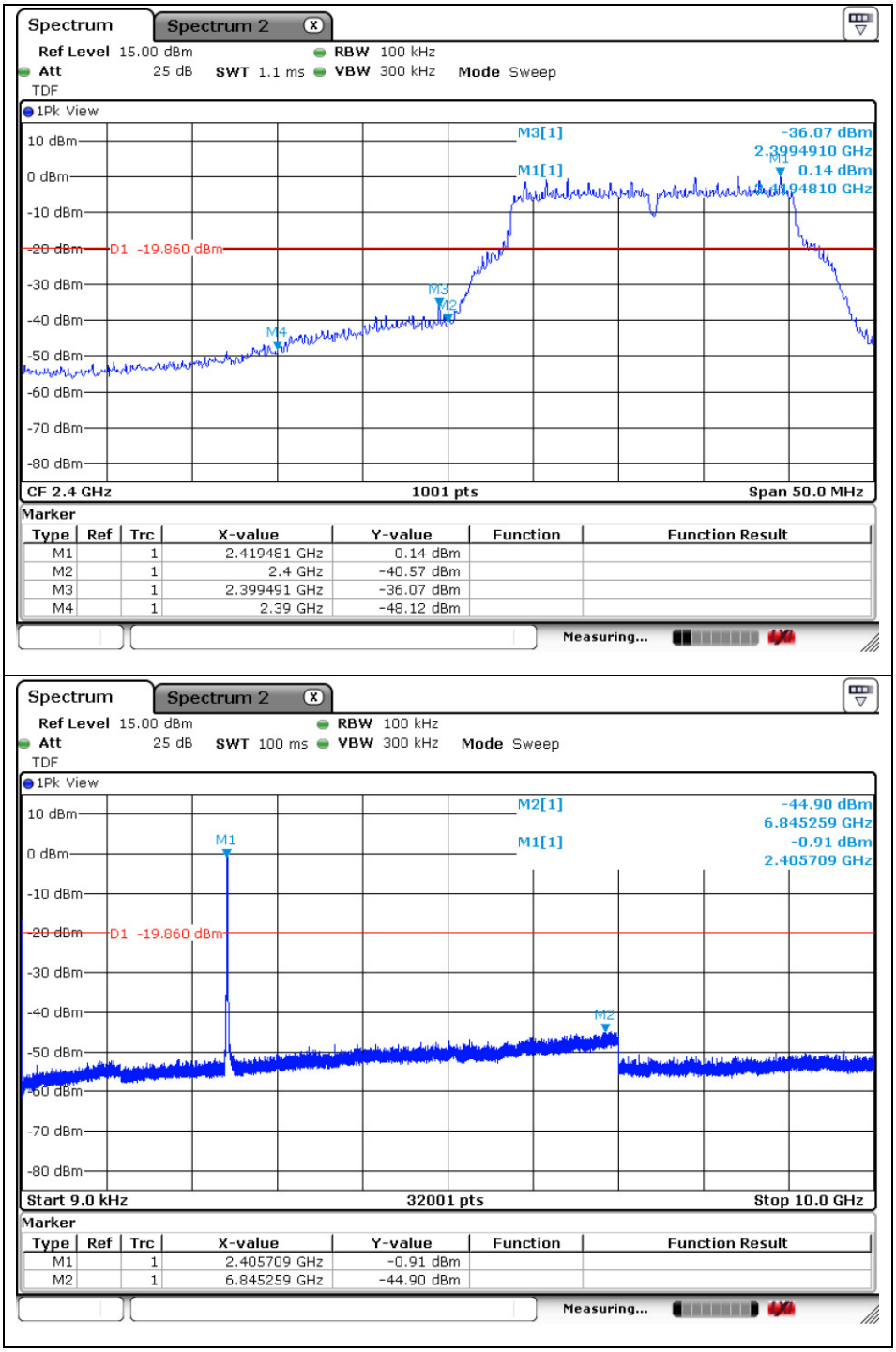
High Channel

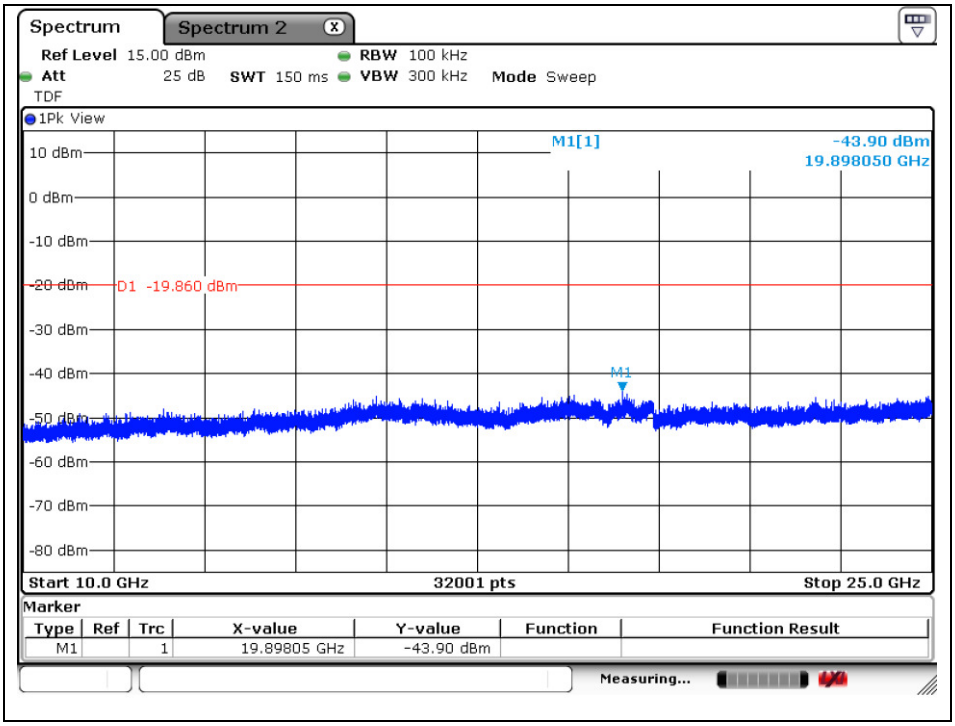




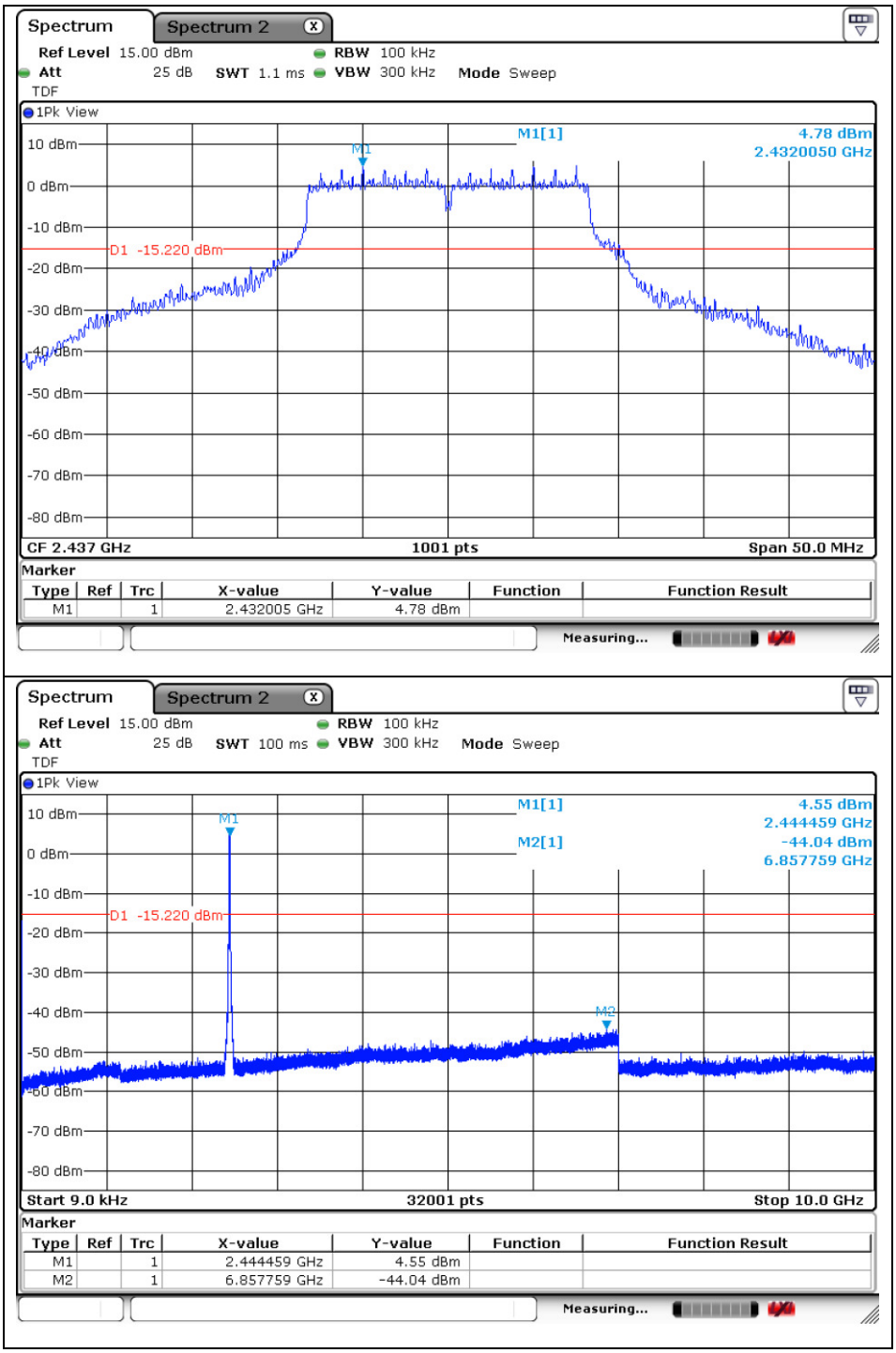
**OFDM: 802.11g(6 Mbps) - ANT2**

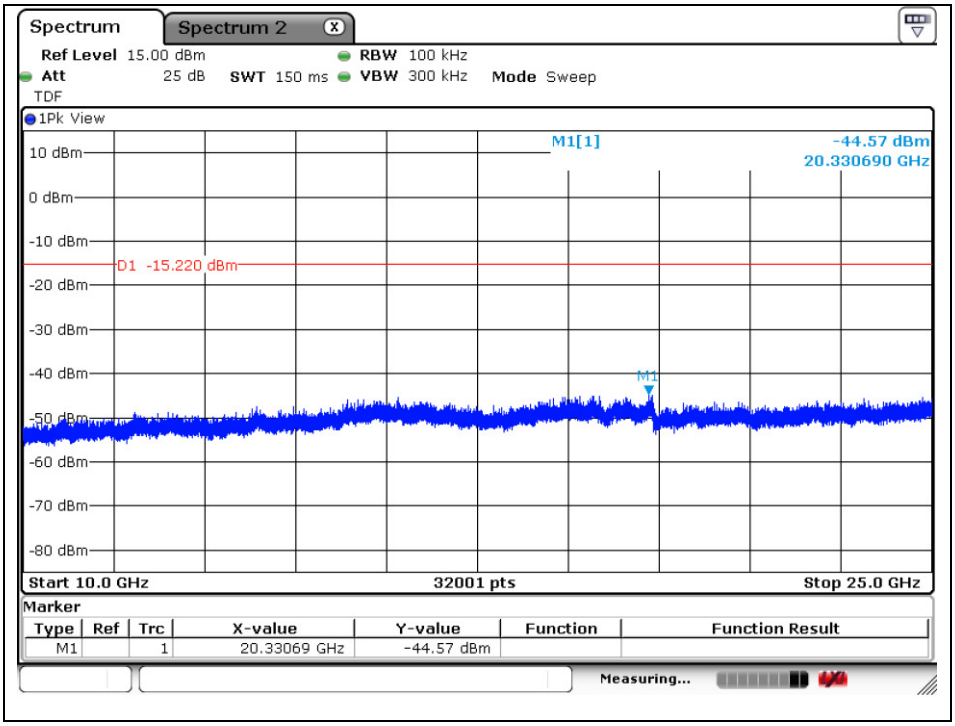
Low Channel





Middle Channel





High Channel