

EcoFlow Inc.

# TEST REPORT

**SCOPE OF WORK**

FCC TESTING— EF-GC-H-55, EF-GC-H-35, EF-GC-H-45

**REPORT NUMBER**

250307026SZN-003

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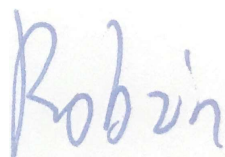


Intertek Report No.: 250307026SZN-003

**EcoFlow Inc.**Application  
For  
Certification**FCC ID: 2A2P9-RF403****Portable Fridge****Model: EF-GC-H-55, EF-GC-H-35, EF-GC-H-45****Brand Name: EF ECOFLOW, ECOFLOW****2.4GHz Wi-Fi Transceiver**

Report No.: 250307026SZN-003

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-23]

**Prepared and Checked by:****Robin Zhou**  
**Senior Project Engineer****Approved by:**

---

**Johnny Wang**  
**Project Engineer**  
**Date: 25 April 2025**

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**Intertek Testing Services Shenzhen Ltd. Longhua Branch**

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## MEASUREMENT/TECHNICAL REPORT

This report concerns (check one)      Original Grant ☒ Class II Change ☐

Equipment Type: DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes ☐      No ☒

If yes, defer until: \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?      Yes ☐      No ☒

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-23] Edition] provision.

Report prepared by:

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## 1.0 Summary of Test results

Applicant: EcoFlow Inc.

Applicant Address: RM 401,Plant #1,Runheng Industrial Zone, Fuhai Street,Bao'an District, Shenzhen 518000, China

Manufacturer: EcoFlow Inc.

Manufacturer Address: RM 401,Plant #1,Runheng Industrial Zone, Fuhai Street,Bao'an District, Shenzhen 518000, China

Model: EF-GC-H-55, EF-GC-H-45, EF-GC-H-35

FCC ID: 2A2P9-RF403

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d), 15.209, FCC 15.205	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

## 2.0 General Description

### 2.1 Product Description

The Equipment Under Test (EUT) is a Portable Fridge, EF-GC-H-55, EF-GC-H-45, EF-GC-H-35 with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20/ax-VHT20, 11 channels with 5MHz channel spacing and 2422-2452MHz for 802.11n-HT40, 7 channels with 5MHz channel spacing. The EUT is powered by DC 21.6 V from battery or DC 14.5V from adapter or DC 12V, DC 24V from Car charger and DC 11-30V from Solar input. For more detail information pls. refer to the user manual.

#### Ratings:

Solar Input: DC 11-30V, 8A Max, 110W Max,  
Car Input: DC 12 or DC 24V, 8A Max, 100W Max,  
Lithium-ion battery: DC 21.6V, 13.8Ah, 298.08Wh

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM; BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM for OFDMA; CCK, DQPSK, DBPSK for DSSS.

Antenna Type: PCB antenna

Antenna Gain: 6.63dBi (This information is provided by applicant, and the applicant is responsible for the authenticity of the provided information.)

The Model: EF-GC-H-35, EF-GC-H-45 are the same as the Model: EF-GC-H-55 in hardware aspect. The difference in model number, capacity, size, weight, temperature zone and lamp board serve as marketing strategy. After the evaluation, the model EF-GC-H-55 has been evaluated for all tests, the models EF-GC-H-45 and EF-GC-H- 35 have only been evaluated for conducted emission and radiated emission (30MHz to 1GHz) tests. For details see below:

Model number	Capacity	Size	Weight	Temperature zone	Lamp board
EF-GC-H-35	35L	706×400×405 mm	20.46kg	Single temperature zone and single control	Single lamp board
EF-GC-H-45	45L	706×400×480 mm	23.165kg	Dual temperature zone and dual control	Dual lamp board
EF-GC-H-55	55L	706×466×480 mm	25.21kg	Dual temperature zone and dual control	Dual lamp board

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

### 2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

Remaining portions are subject to the following procedures:

1. Receiver portion of Wi-Fi: exempt from technical requirement of this Part.
2. Other Digital Function: Subject to FCC Part 15B SDOC.

## 2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

## 2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Shenzhen NTEK Testing Technology Co., Ltd.** and located at No. 24 Xinfu East Road Xiangshan Community, Xinqiao St, Baoan District, Shenzhen, Guangdong, China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN11884).

### 3.0 System Test Configuration

#### 3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology.

The EUT was powered by DC 14.5V from adapter input and DC 21.6V from the battery during the test. The radiation emission test was powered by the battery and the conducted emission test was powered by the adapter. Only the worst data is reported in this report.

On 802.11b/g/n-HT20/n-HT40/ax-VHT20 mode, only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The EUT and transmitting antenna was centered on the turntable.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

#### 3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The fixed frequency software uses ESP32, version v3.6.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.



### 3.3 Special Accessories

N/A.

### 3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

### 3.5 Equipment Modification

Any modifications installed previous to testing by EcoFlow Inc. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Shenzhen NTEK Testing Technology Co., Ltd.

### 3.6 Support Equipment List and Description

Description	Manufacturer	Remark
Adapter	FOSHAN SHUNDE GUANYUDA POWER SUPPLY CO.,LTD	Model: GM95-145600-D Input: 100-240V- 50-60Hz 2.5A Max Output: 14.5V $\overline{\text{---}}$ 6.0A 87.0W
Car charger	FOSHAN SHUNDE GUAN YUDA POWER SUPPLY C	DC 12/24V
Battery	EcoFlow Inc.	DC 21.6V, 13.8Ah, 298.08Wh

Applicant: EcoFlow Inc.

Date of Test: 26 March 2025

Worst Case Model: EF-GC-H-55

#### 4.0 Measurement Results

##### 4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter has a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gain greater than or equal to 6 dBi, the maximum allowed transmitter output is  $30-(6.63-6)=29.37\text{dBm}$

IEEE 802.11b (Antenna Gain = 6.63dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	11.06	12.7644
Middle Channel: 2437	10.87	12.2180
High Channel: 2462	10.68	11.6950

IEEE 802.11g (Antenna Gain = 6.63dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	9.78	9.5060
Middle Channel: 2437	9.71	9.3541
High Channel: 2462	9.11	8.1470

IEEE 802.11n-HT20 (Antenna Gain = 6.63dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	8.54	7.1450
Middle Channel: 2437	8.29	6.7453
High Channel: 2462	7.83	6.0674

IEEE 802.11n-HT40 (Antenna Gain = 6.63dBi) (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2422	8.23	6.6527
Middle Channel: 2437	8.02	6.3387
High Channel: 2452	8.1	6.4565

IEEE 802.11ax-VHT20 (Antenna Gain = 6.63dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	8.87	7.7090
Middle Channel: 2437	8.6	7.2444
High Channel: 2462	7.61	5.7677

Cable loss: 1.5 dB      External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 11.06dBm

EUT max. E.I.R.P = 11.06dBm + 6.63dBi = 17.69dBm =58.75mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: EcoFlow Inc.

Date of Test: 26 March 2025

Worst Case Model: EF-GC-H-55

#### 4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Limit: The 6 dB Bandwidth is at least 500 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.06
2437	9.54
2462	9.642

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.287
2437	16.335
2462	16.482

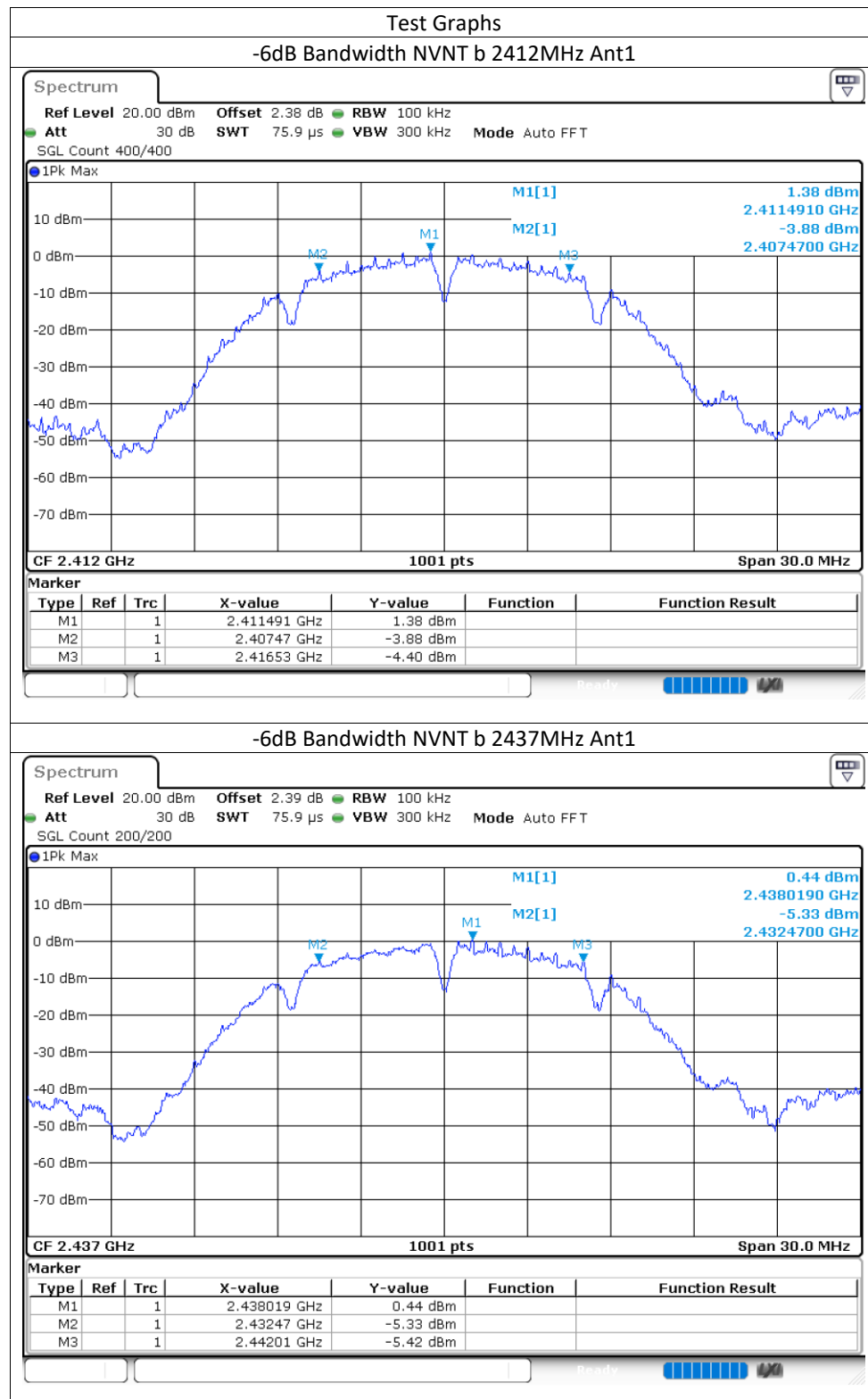
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.634
2437	16.413
2462	16.029

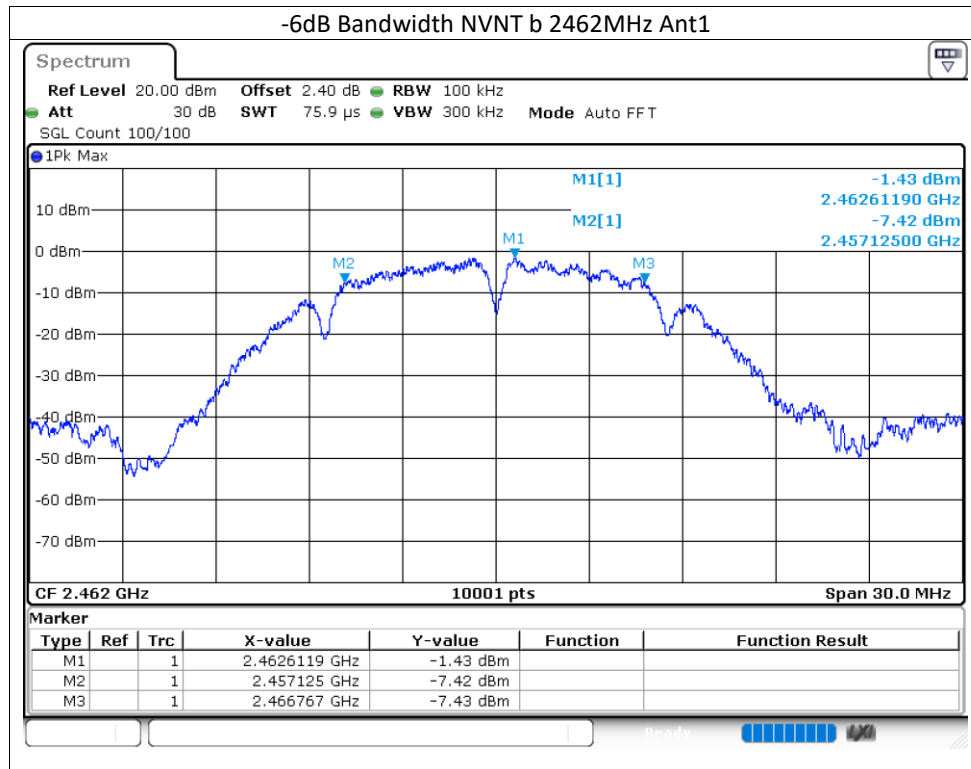
IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.1
2437	33.786
2452	32.31

IEEE 802.11ax-VHT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.65
2437	18.99
2462	18.834

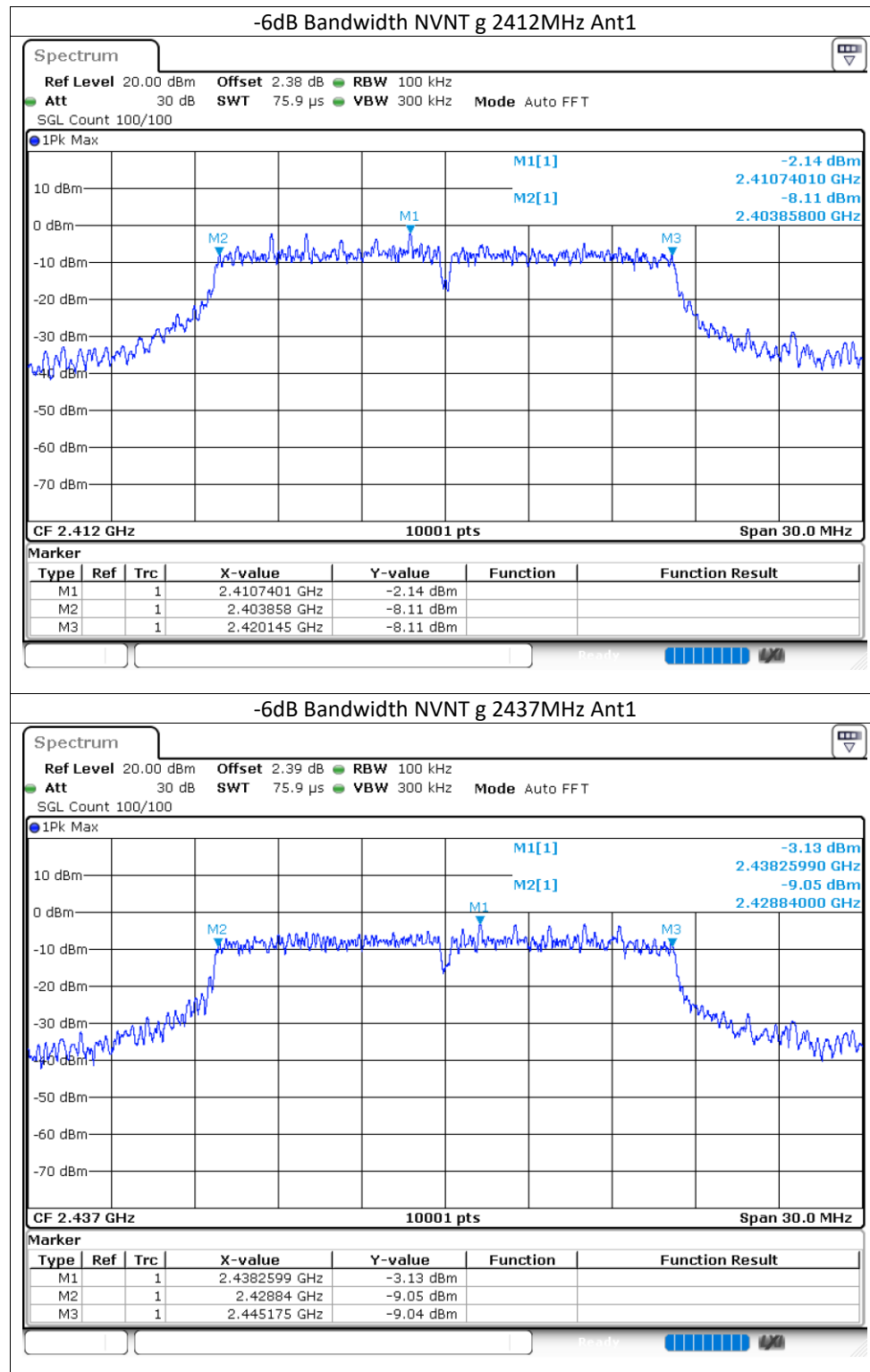
The test plots are attached as below.

802.11b

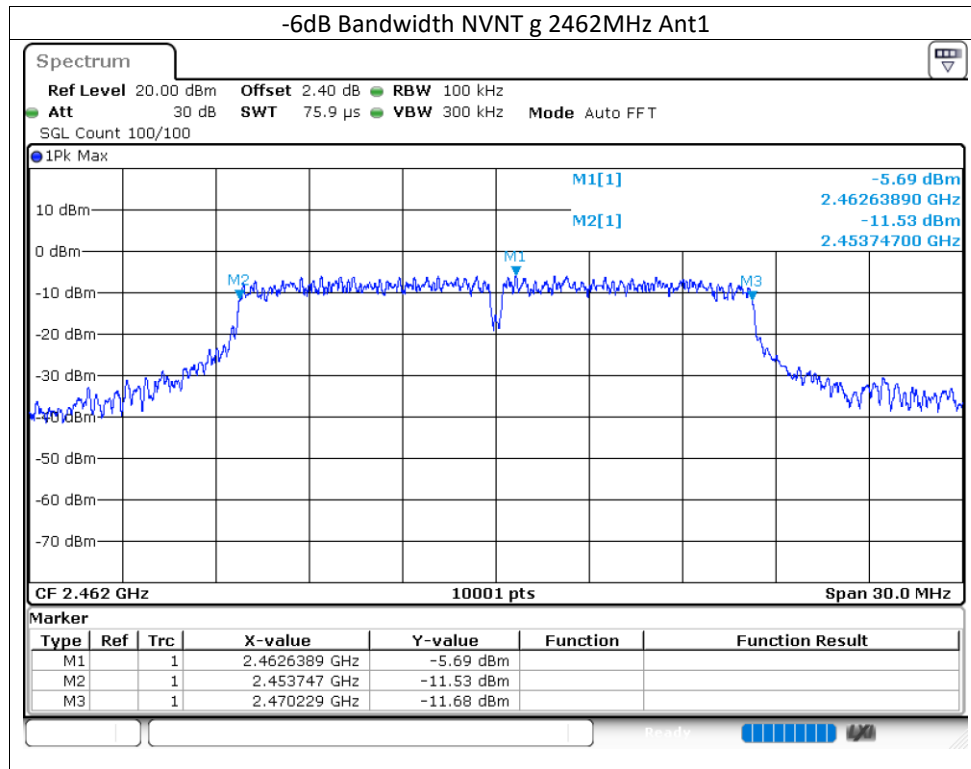




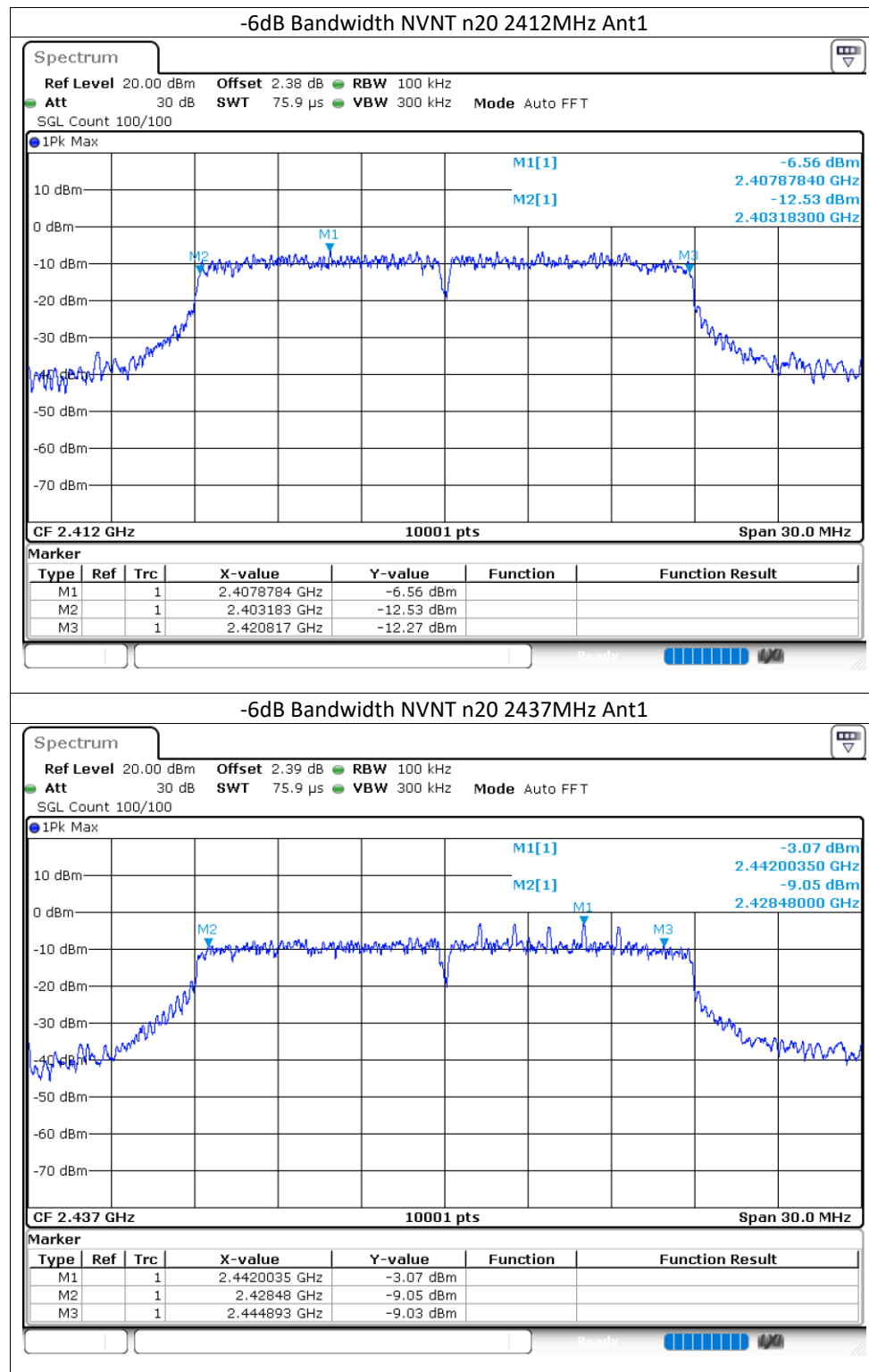
802.11g

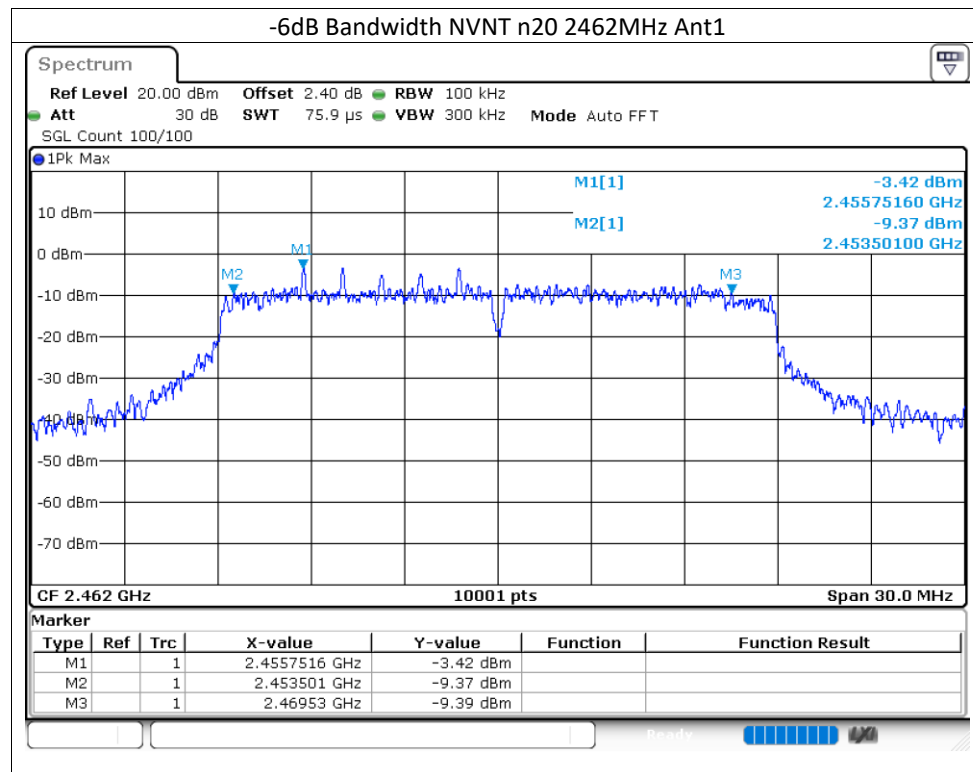




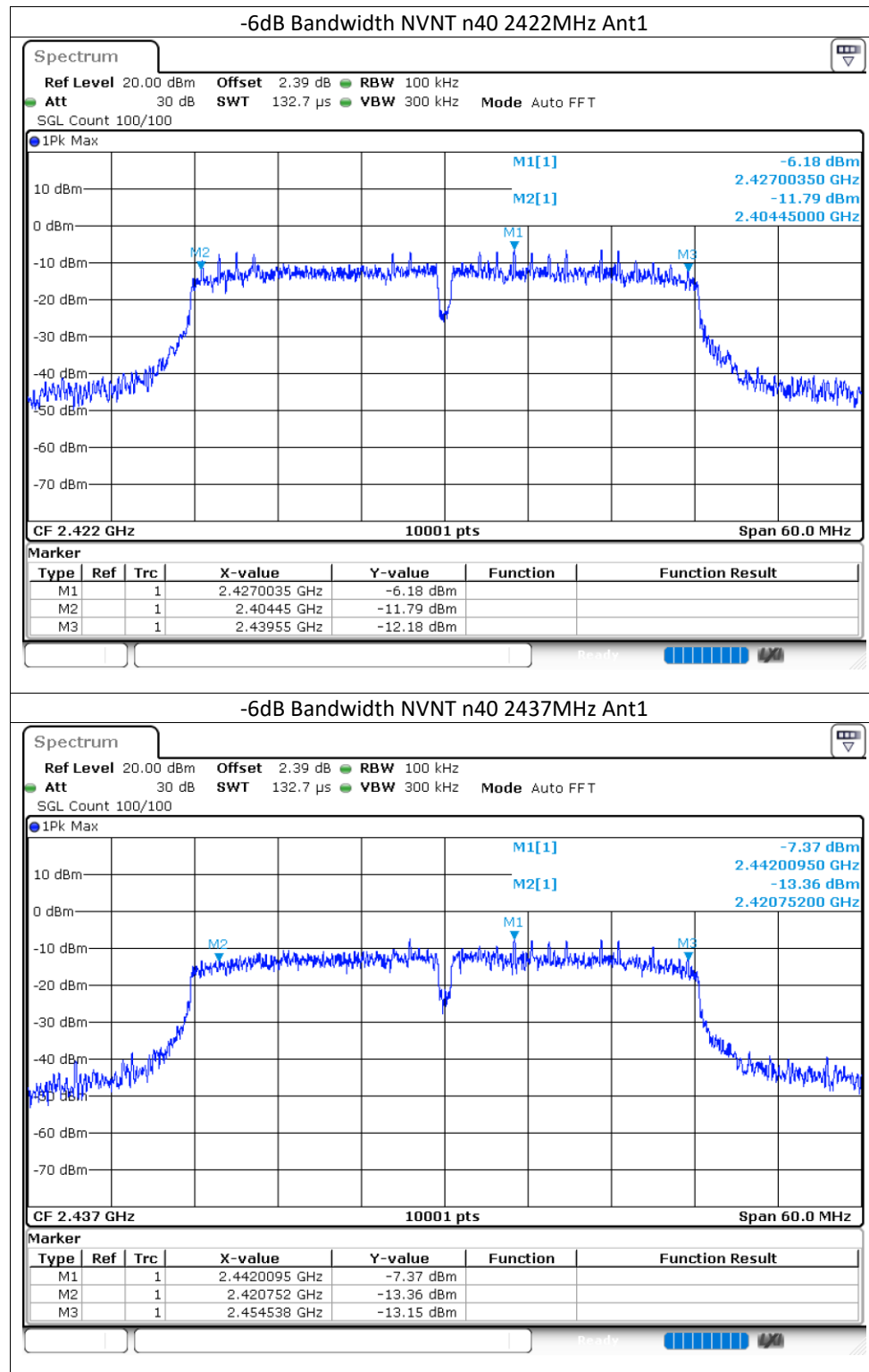


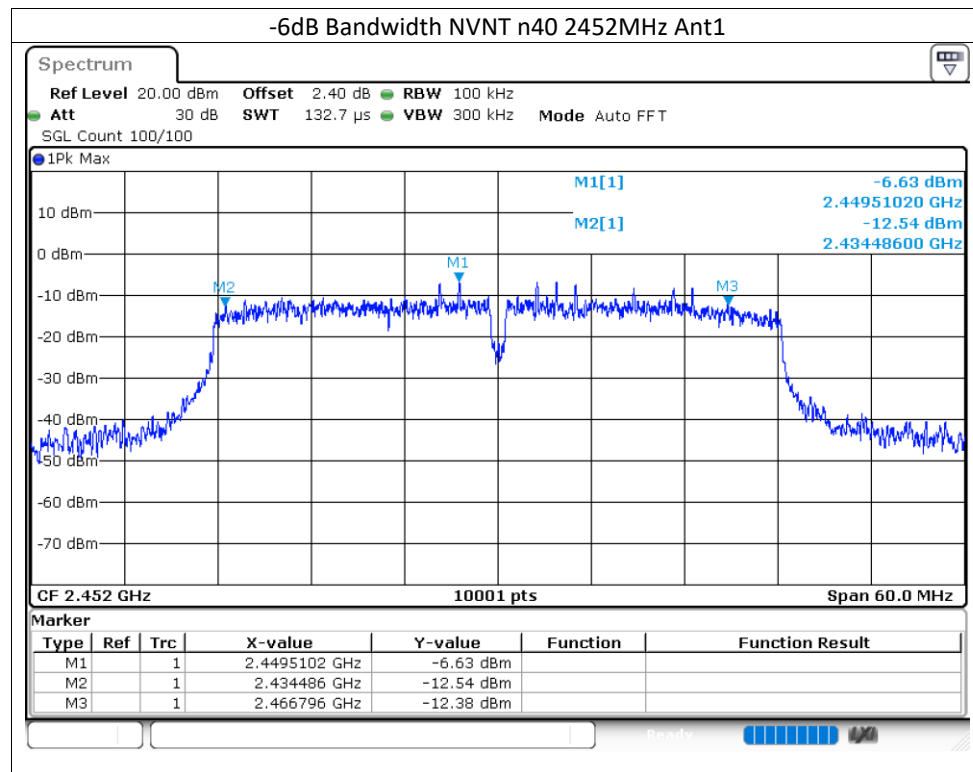
802.11n-HT20



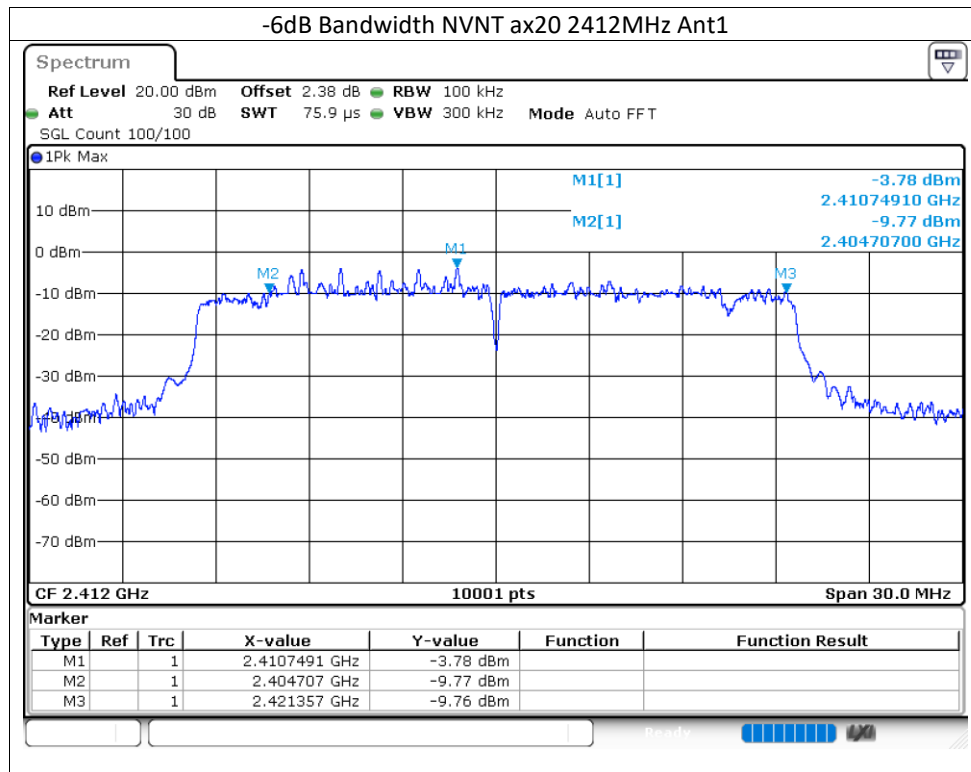


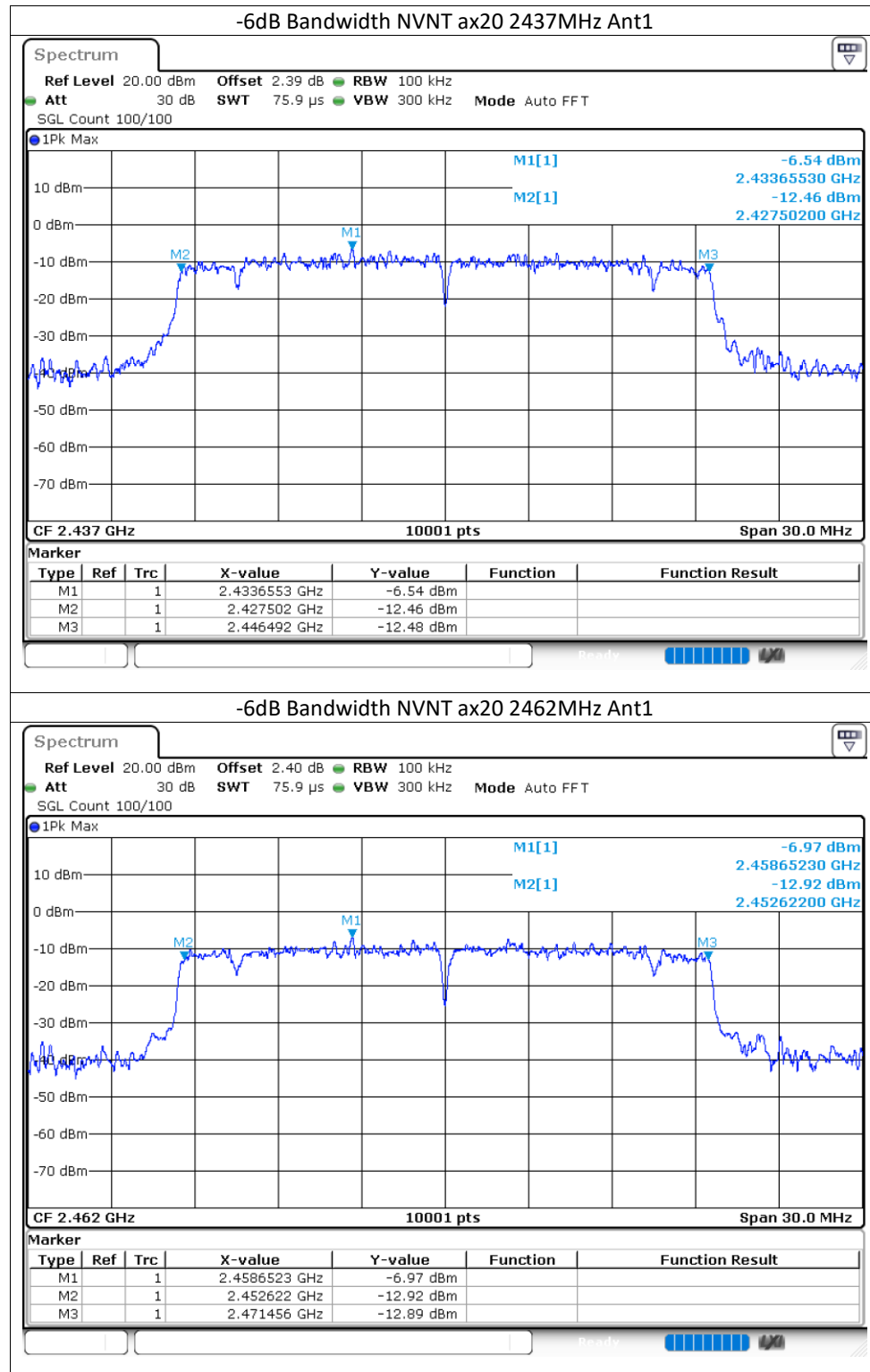
802.11n-HT40





802.11ax-VHT20





Applicant: EcoFlow Inc.

Date of Test: 26 March 2025

Worst Case Model: EF-GC-H-55

#### 4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Limit: The Power Density does not exceed 8dBm/3 kHz.

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-13.6
2437	-13.47
2462	-14.06

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-16.44
2437	-16.31
2462	-16.99

IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-18.66
2437	-18.7
2462	-19.11

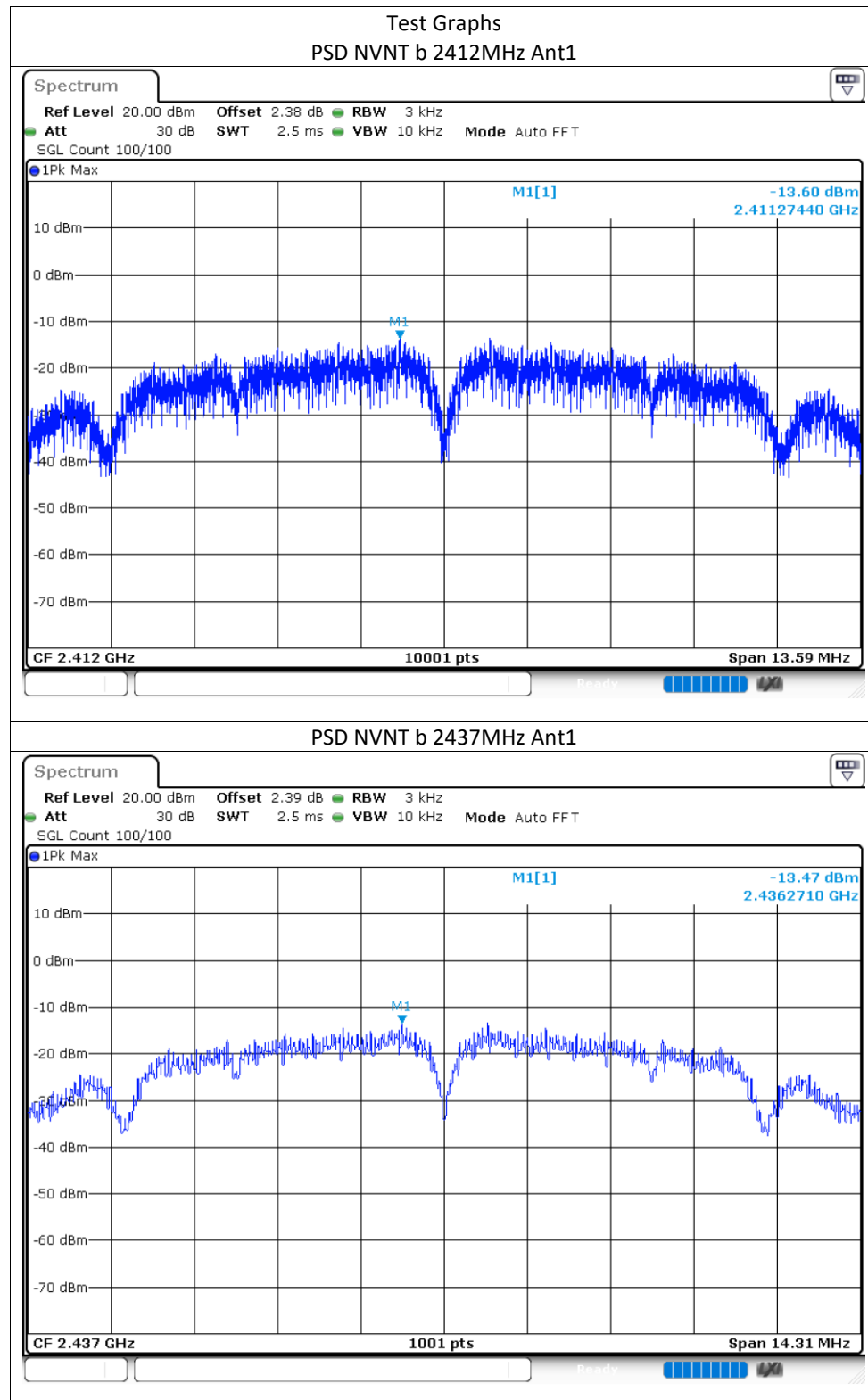
IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2422	-20.31
2437	-20.82
2452	-21.02

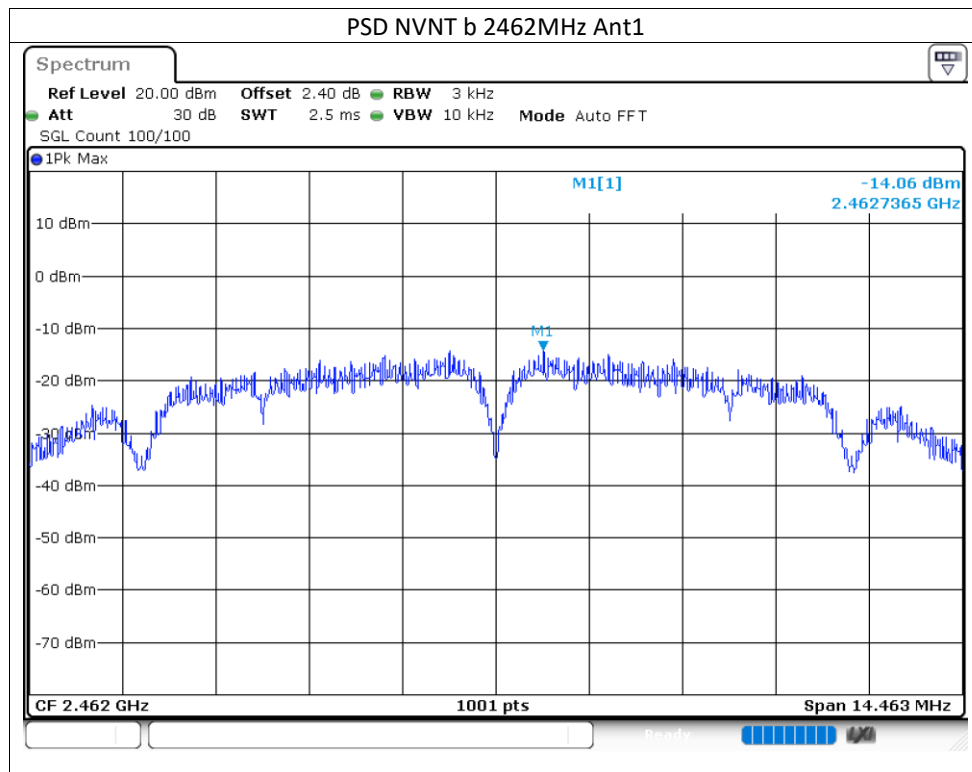


IEEE 802.11ax-VHT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-18.88
2437	-19.38
2462	-19.66

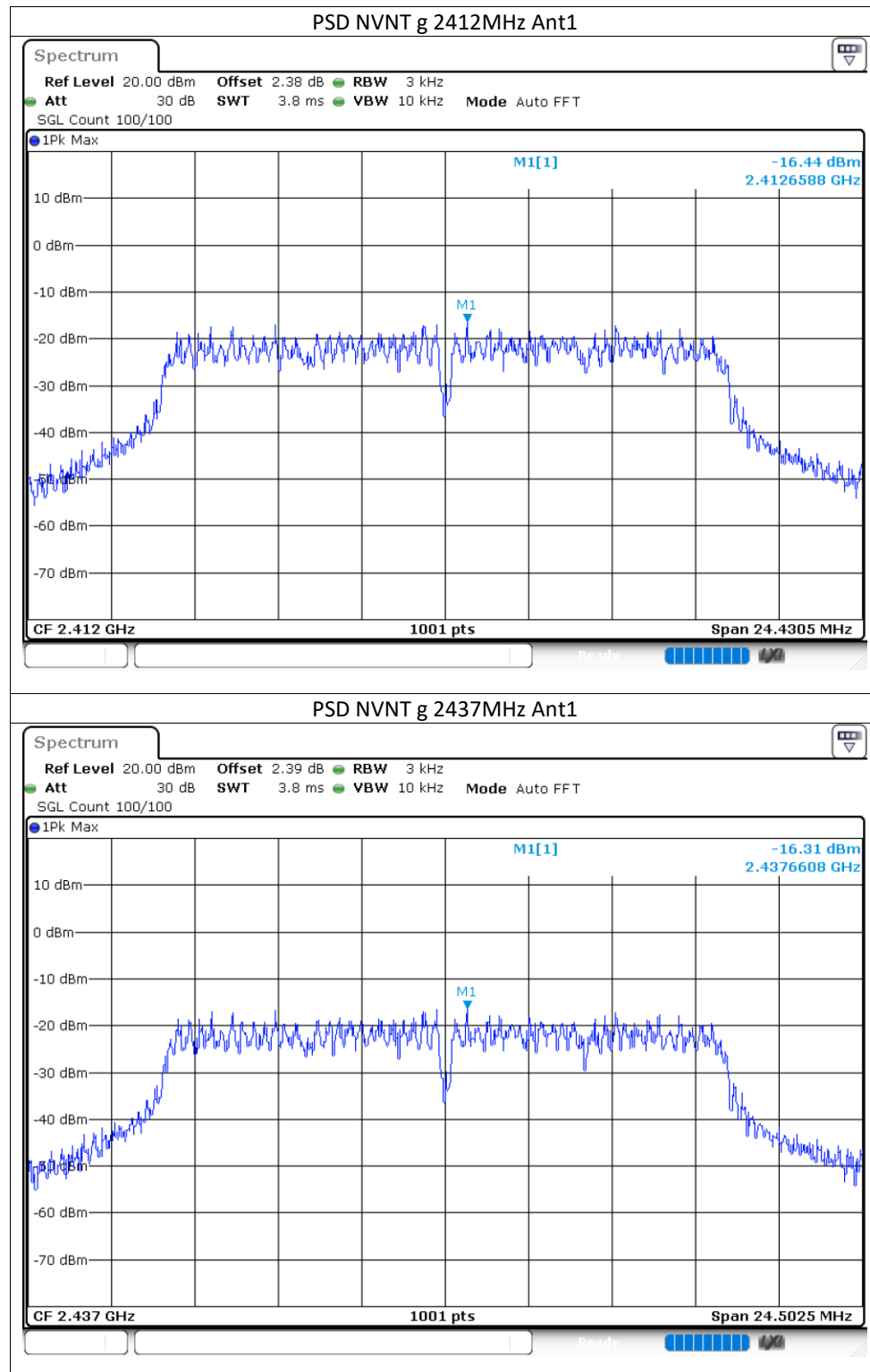
The test plots are attached as below.

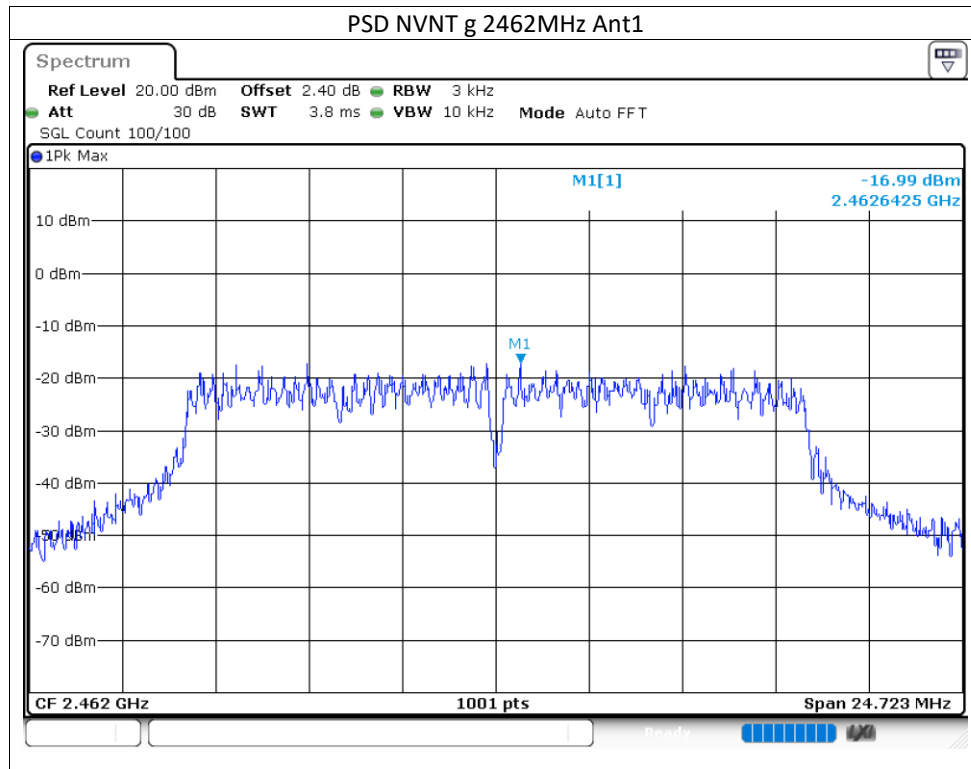
802.11b



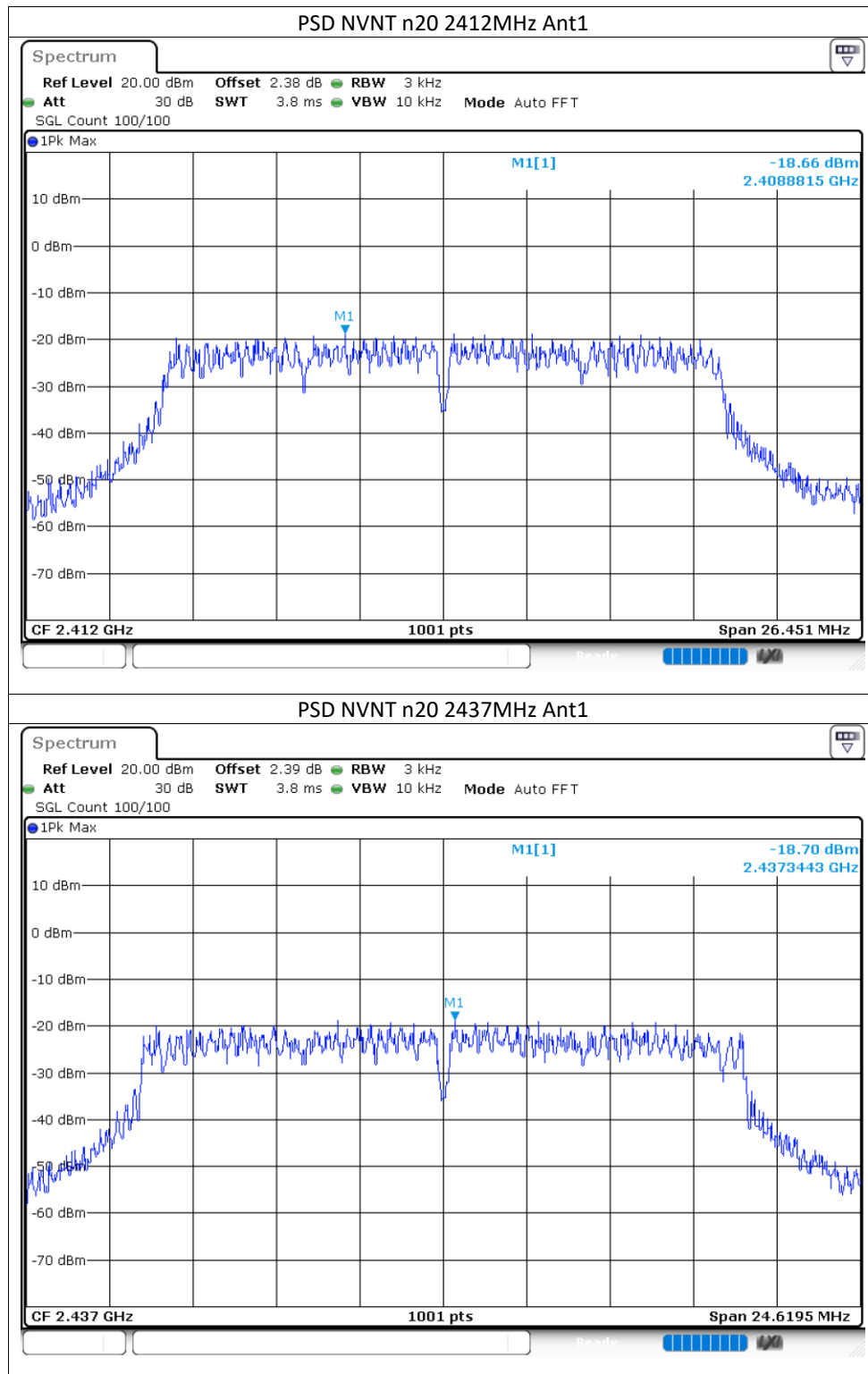


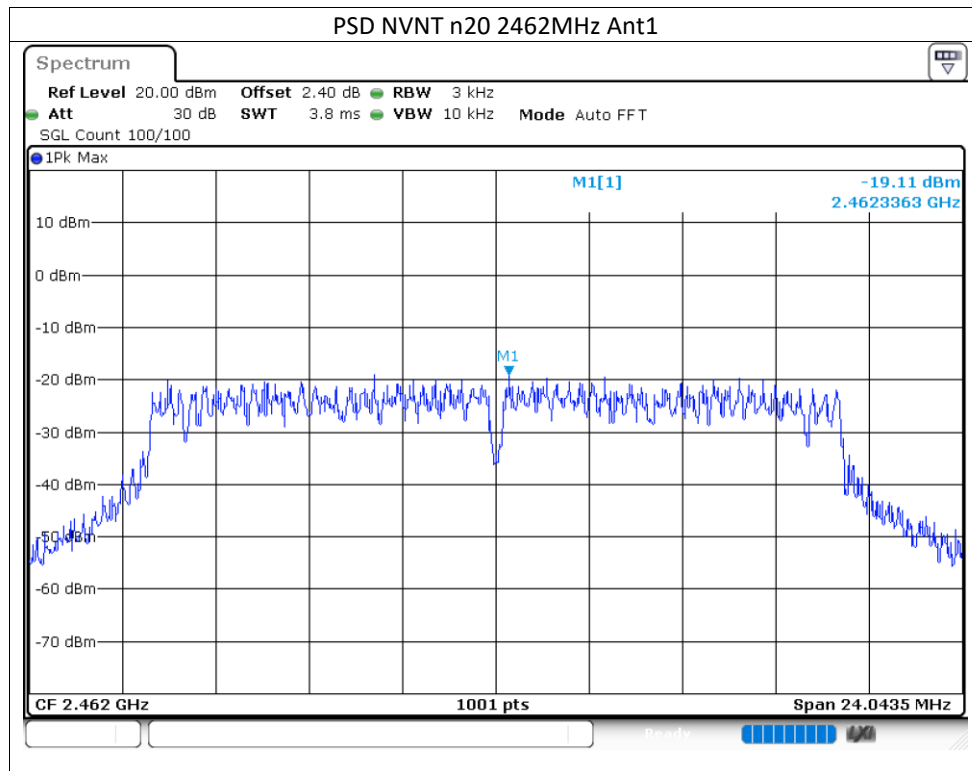
802.11g



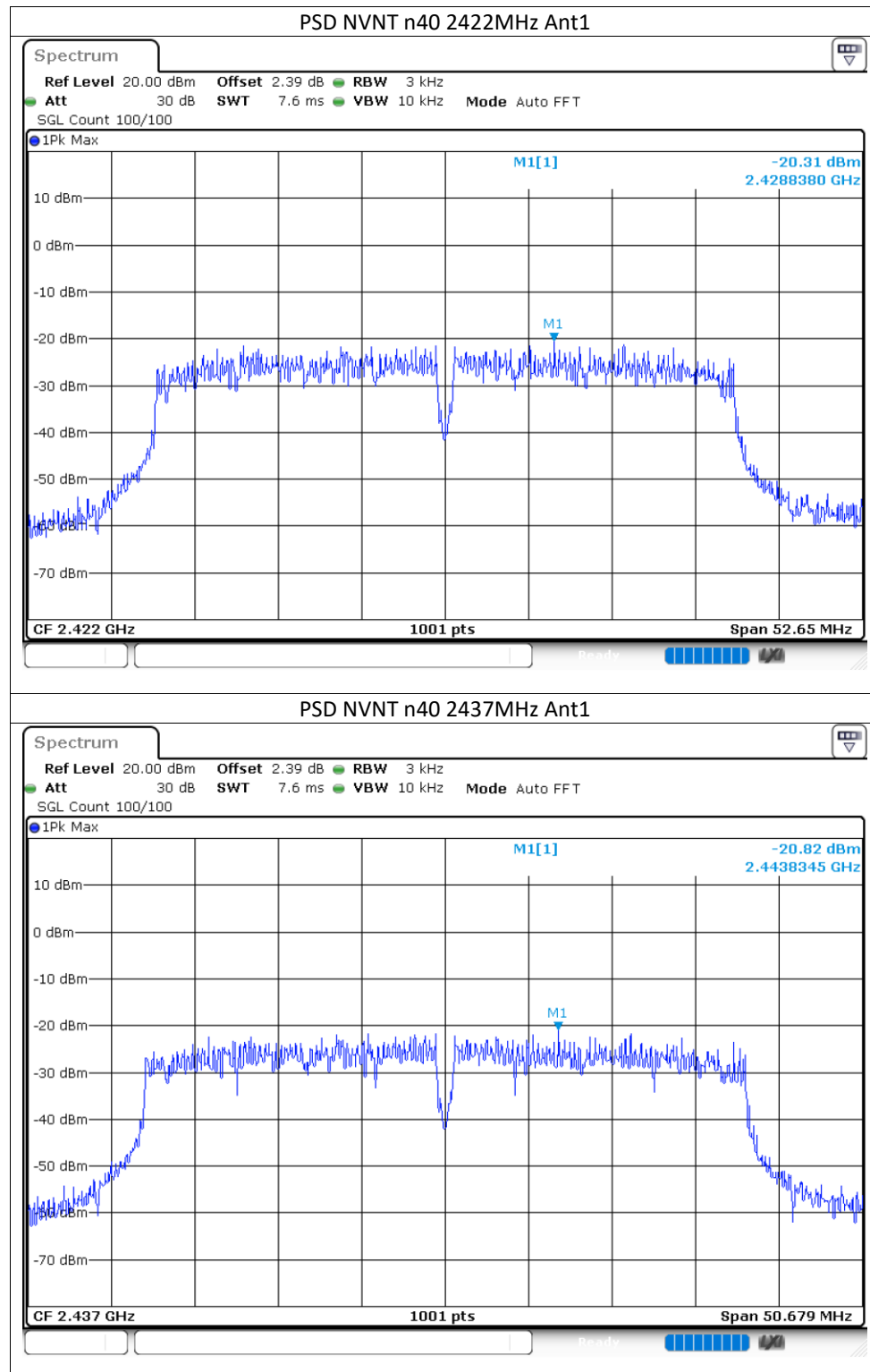


802.11n-HT20

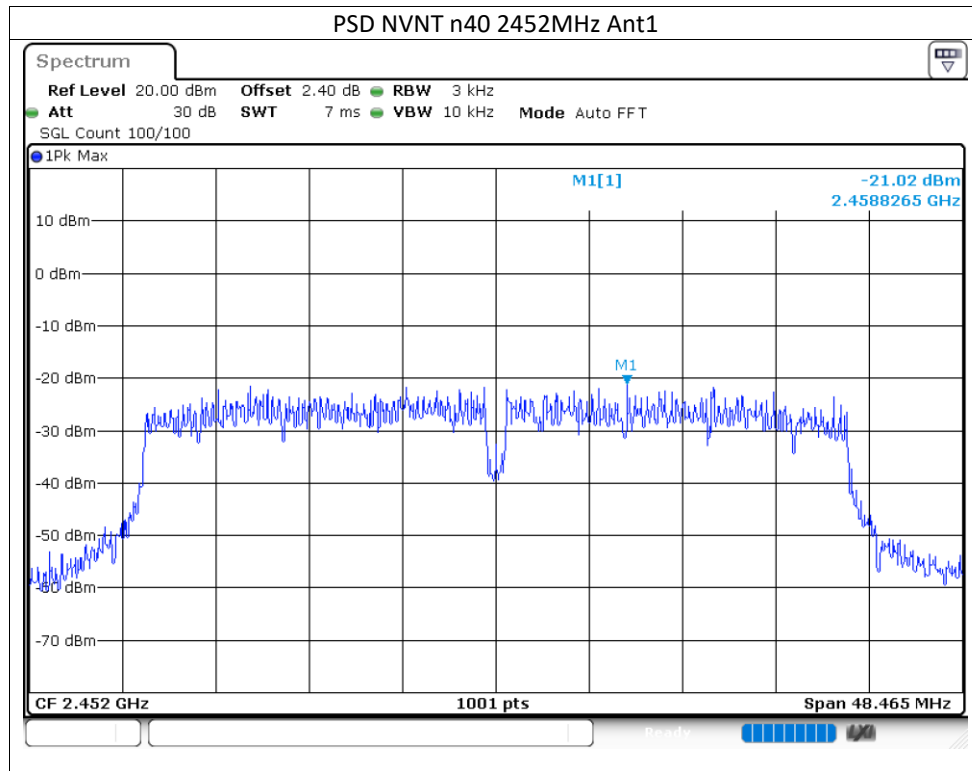




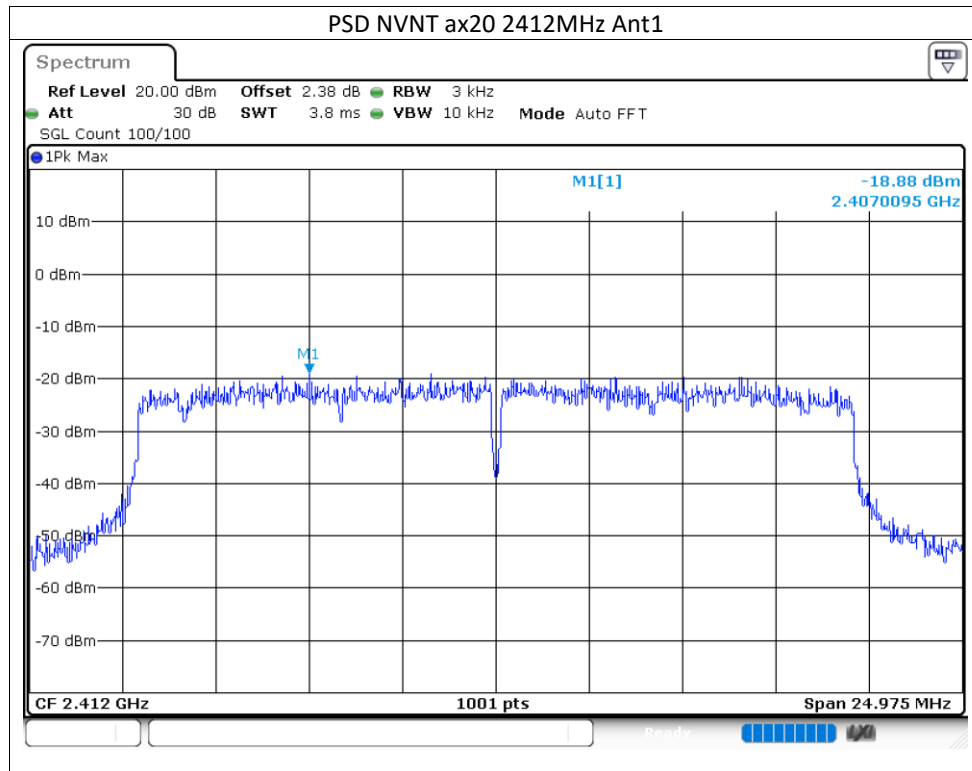
802.11n-HT40

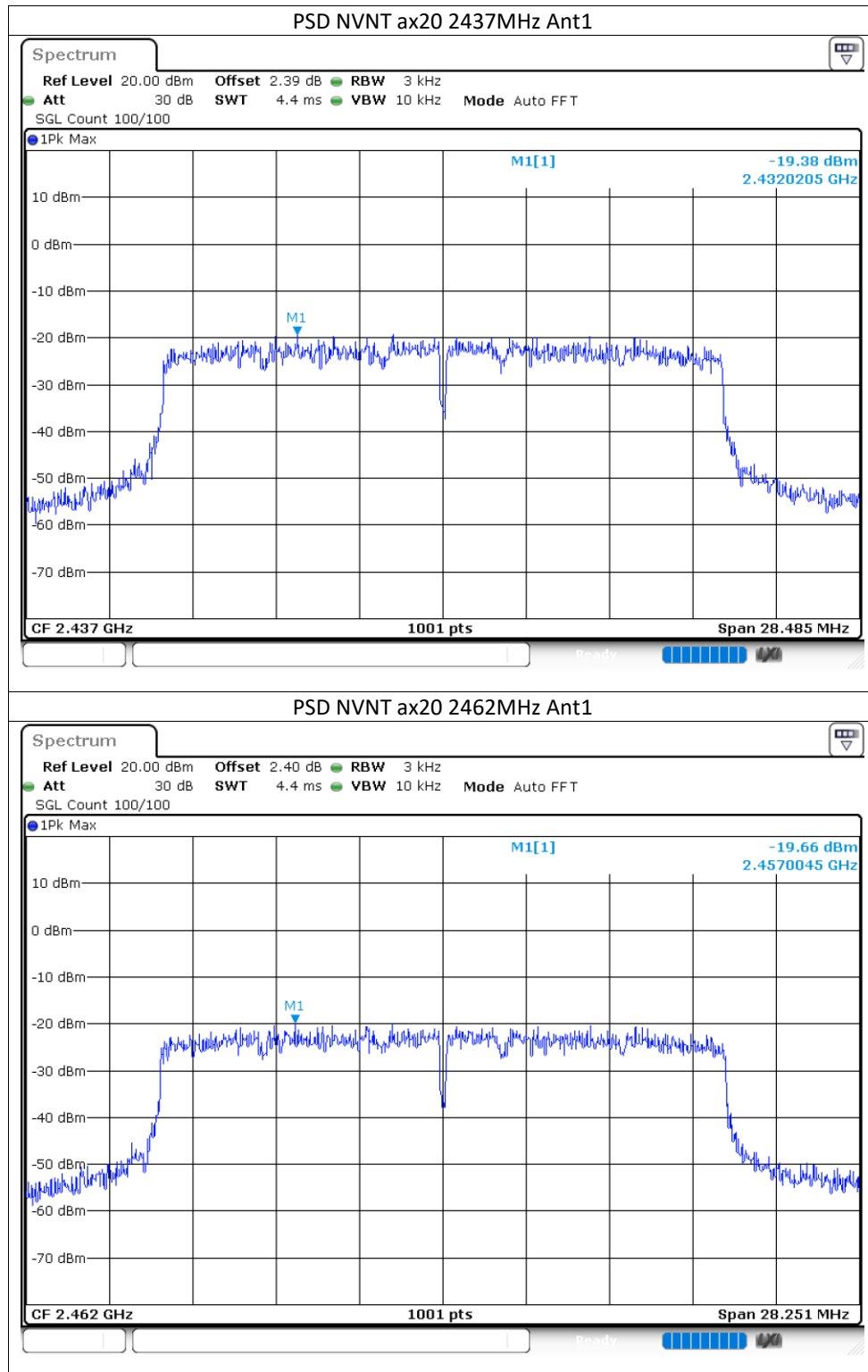






802.11ax-VHT20





Applicant: EcoFlow Inc.

Date of Test: 26 March 2025

Worst Case Model: EF-GC-H-55

#### 4.4 Out of Band Conducted Emissions, FCC Rule 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. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

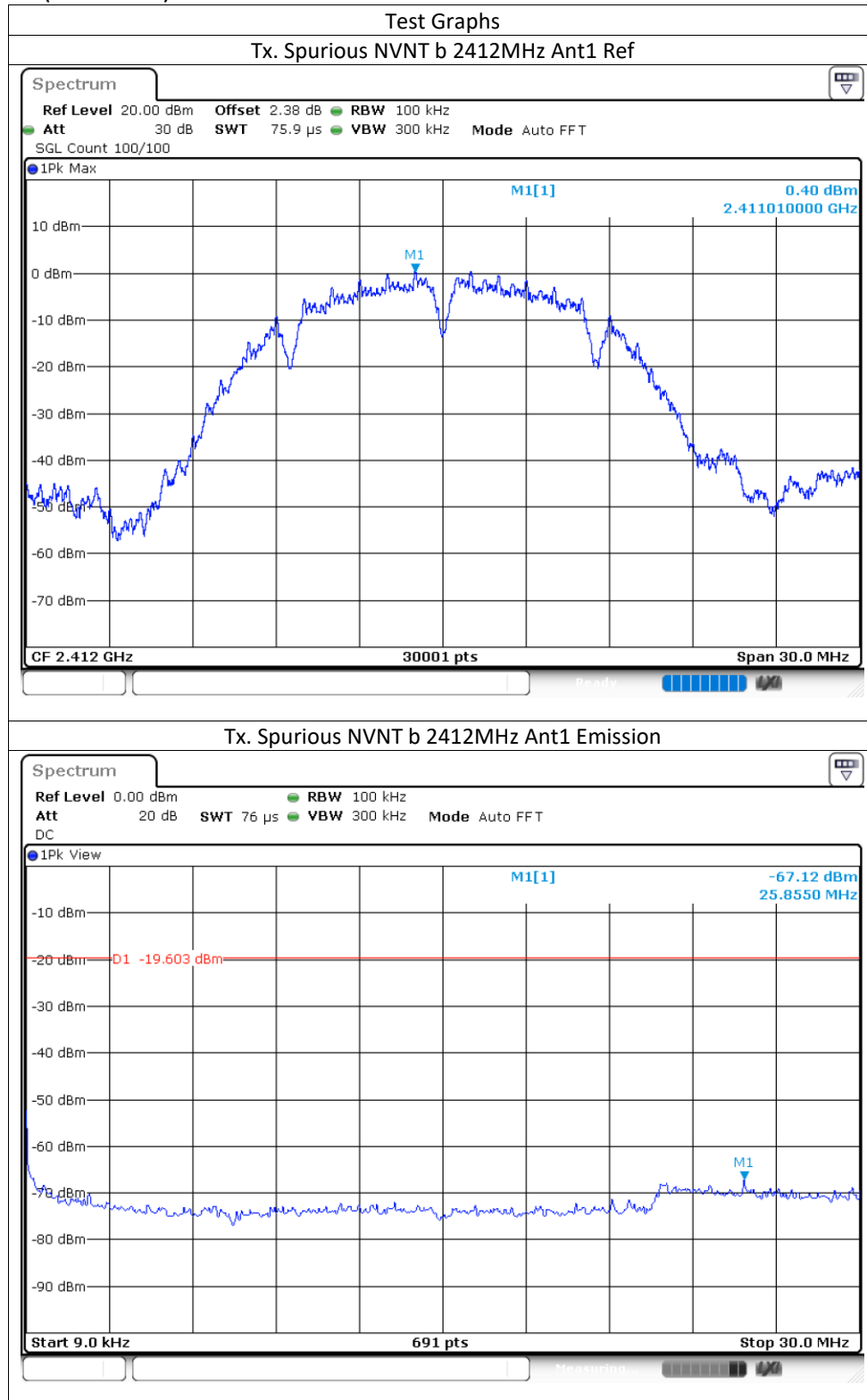
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20 and 13.5Mbps for 802.11n-HT40.

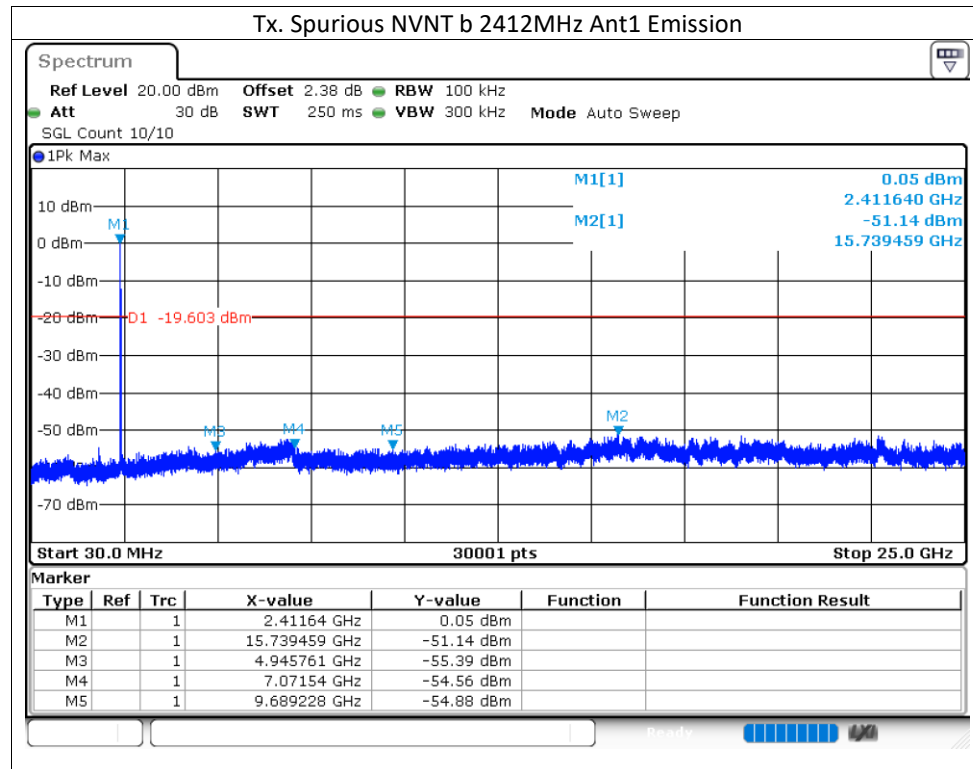
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

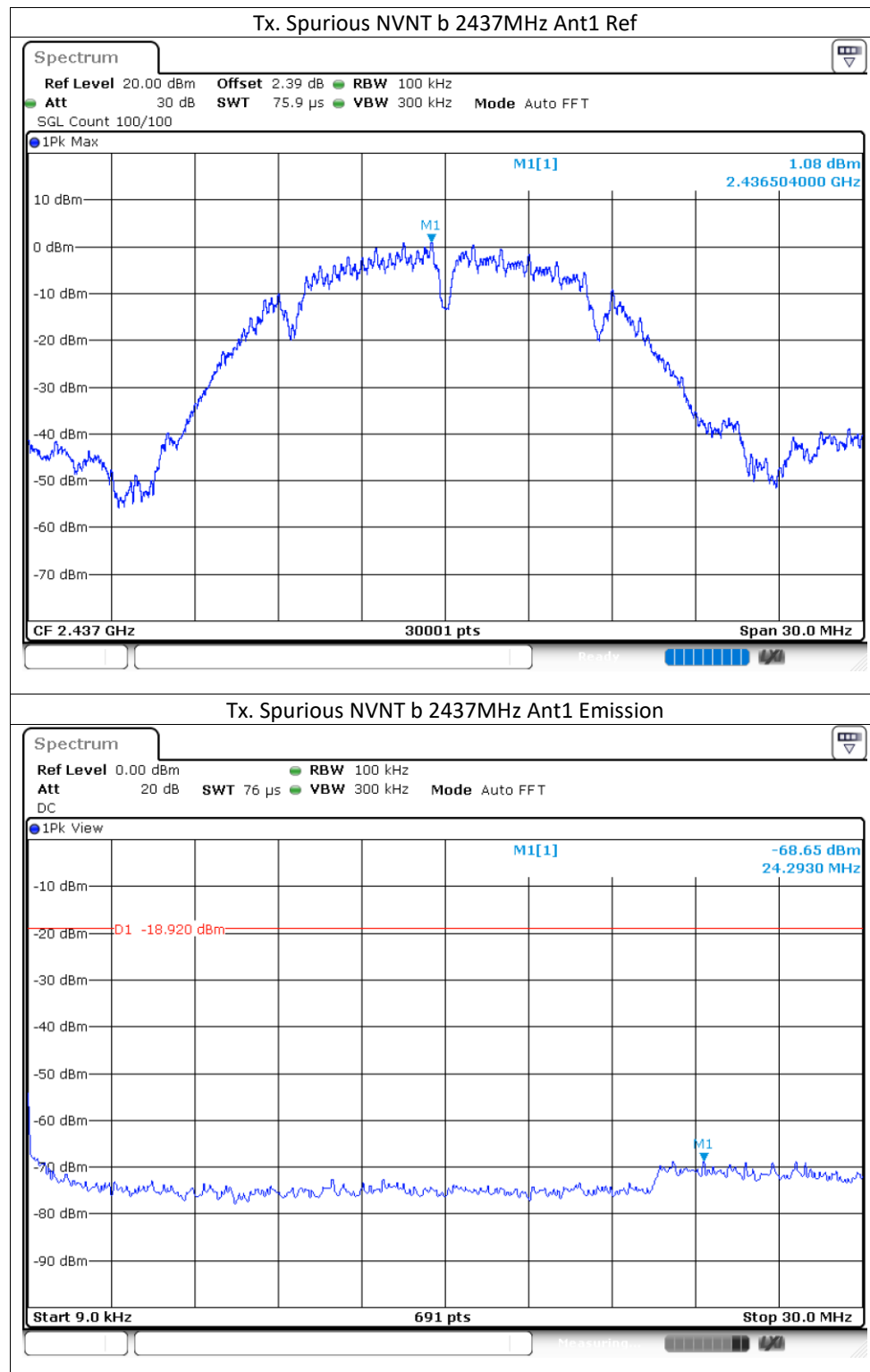
802.11b

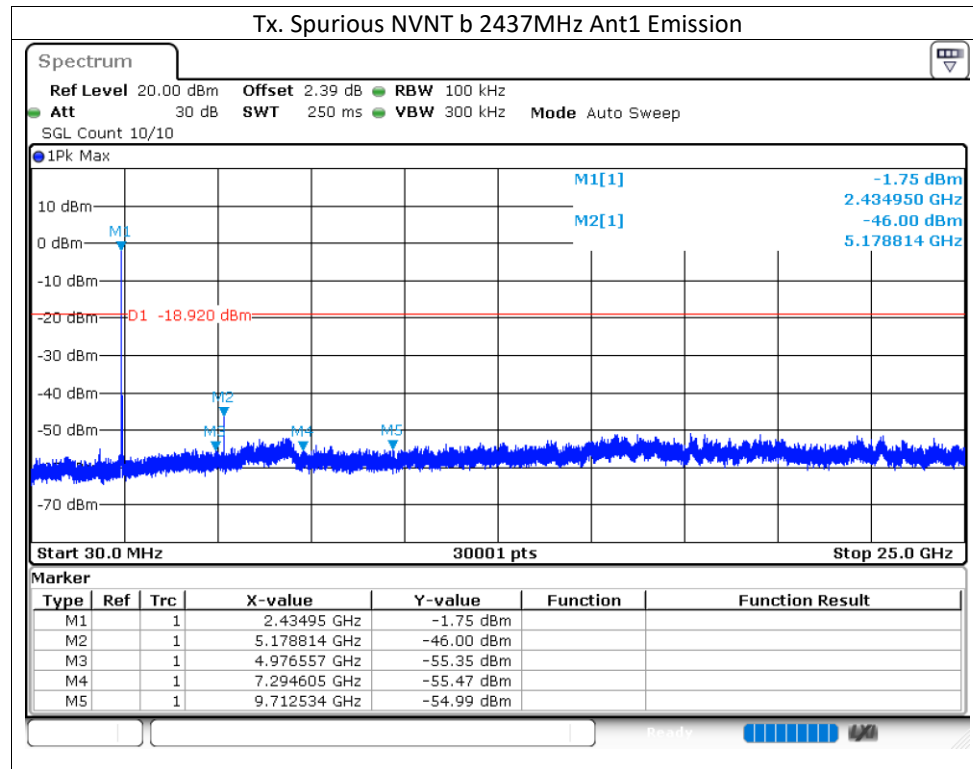
Channel 01 (2412MHz)





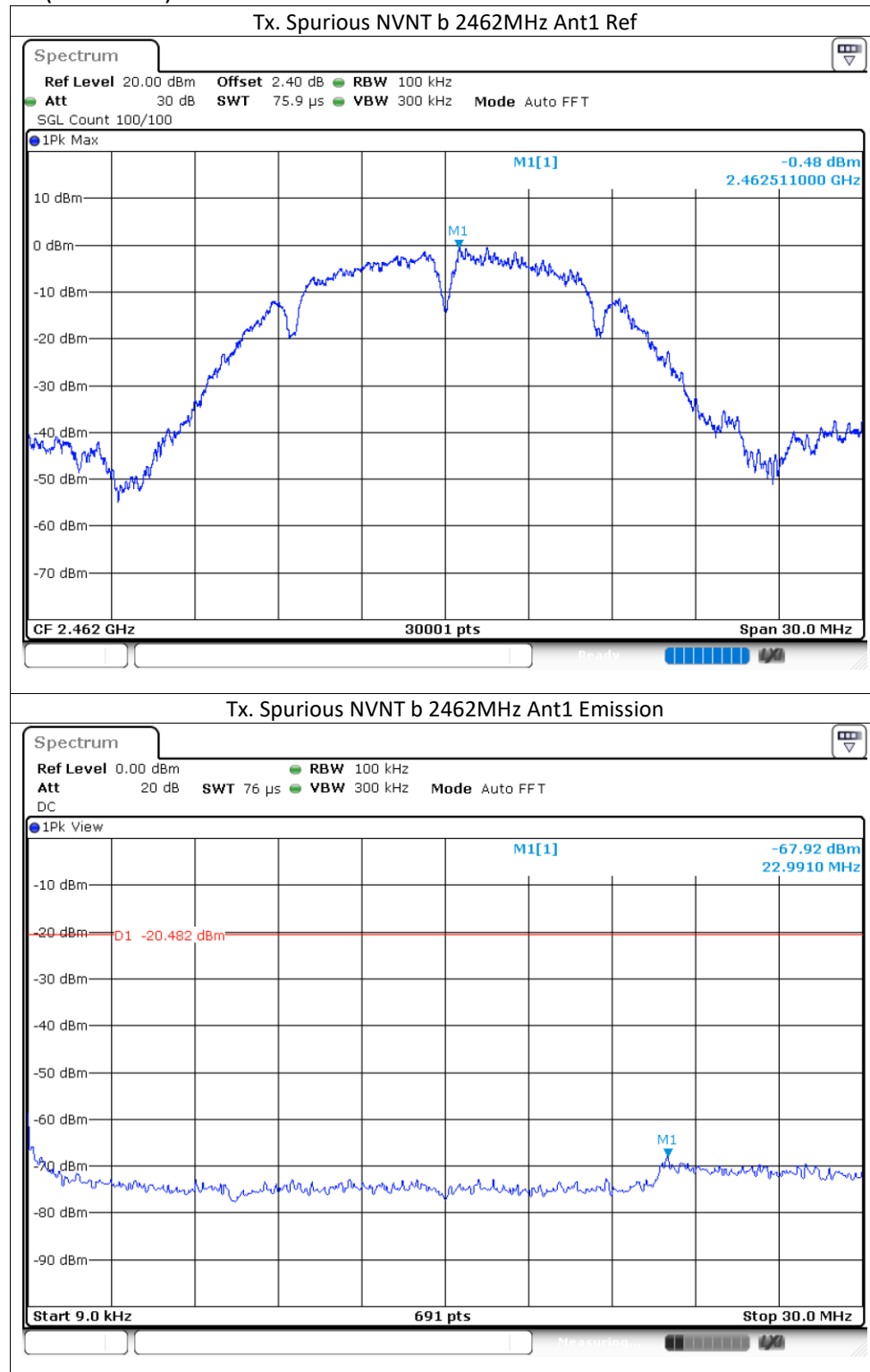
## Channel 06 (2437MHz)

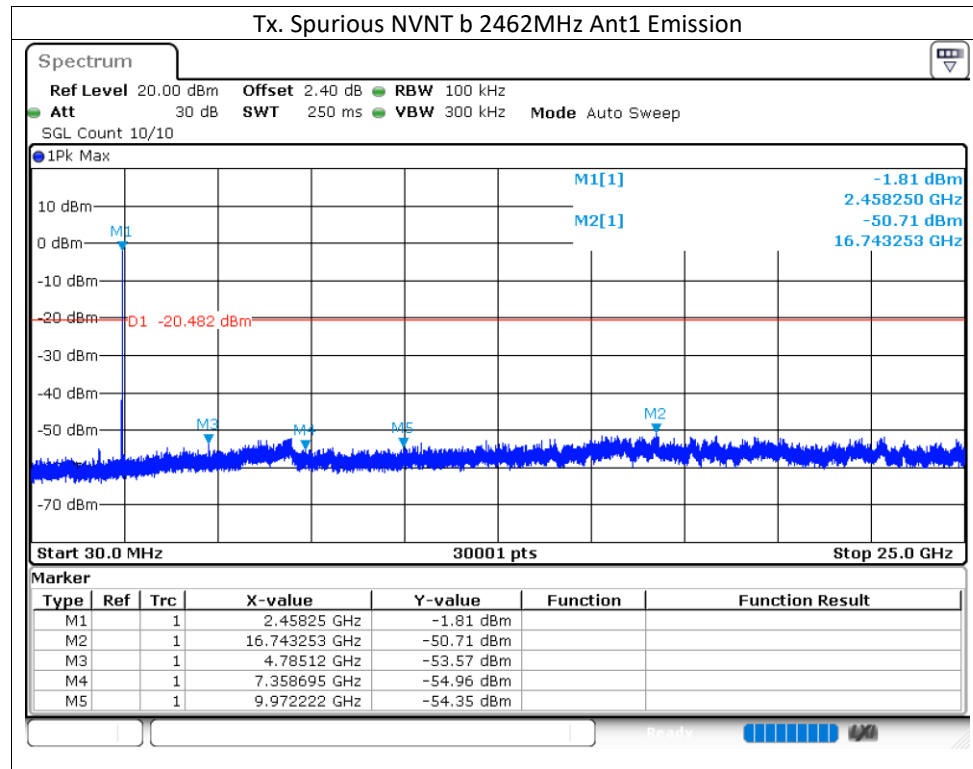






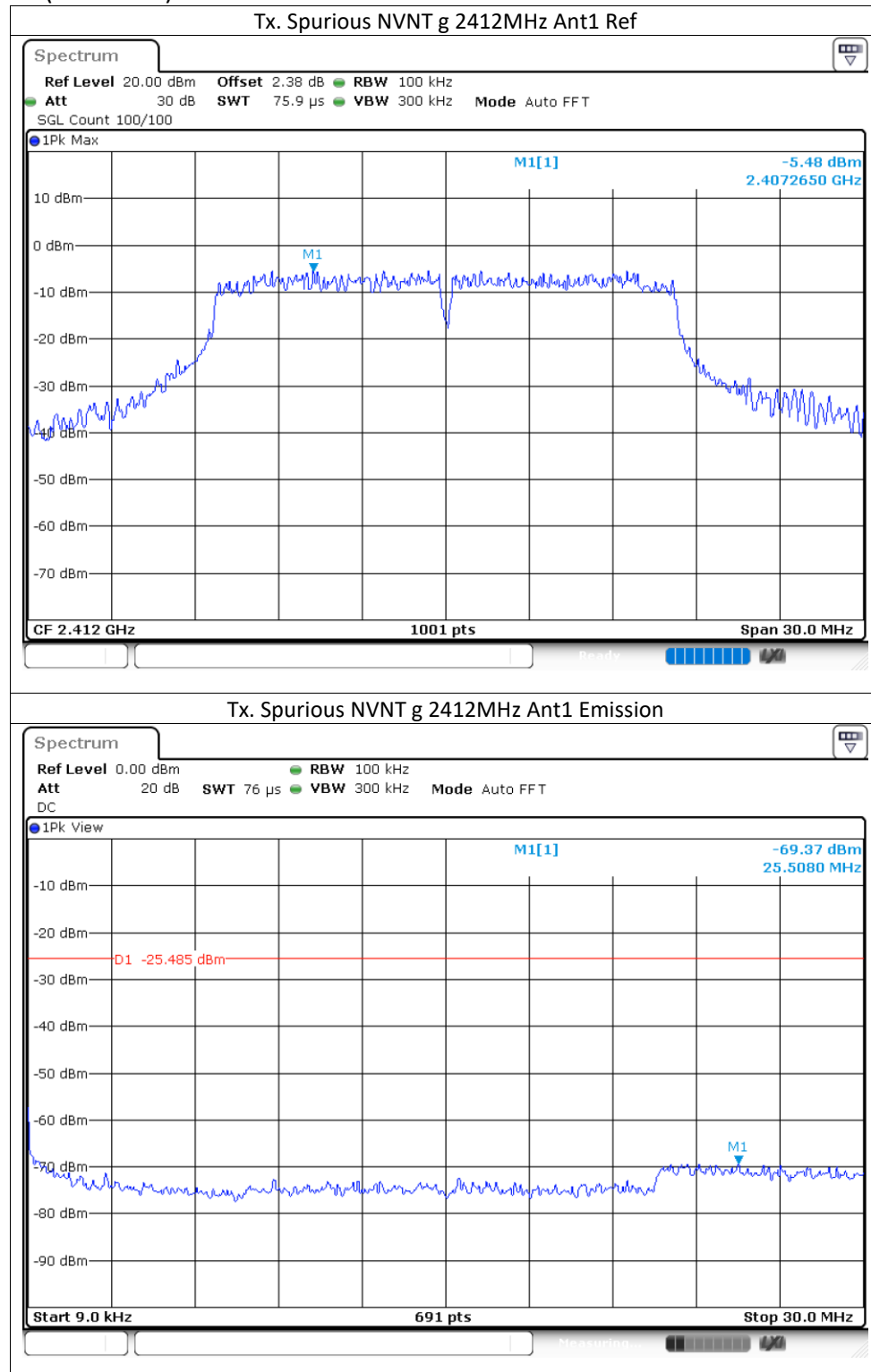
## Channel 11 (2462MHz)

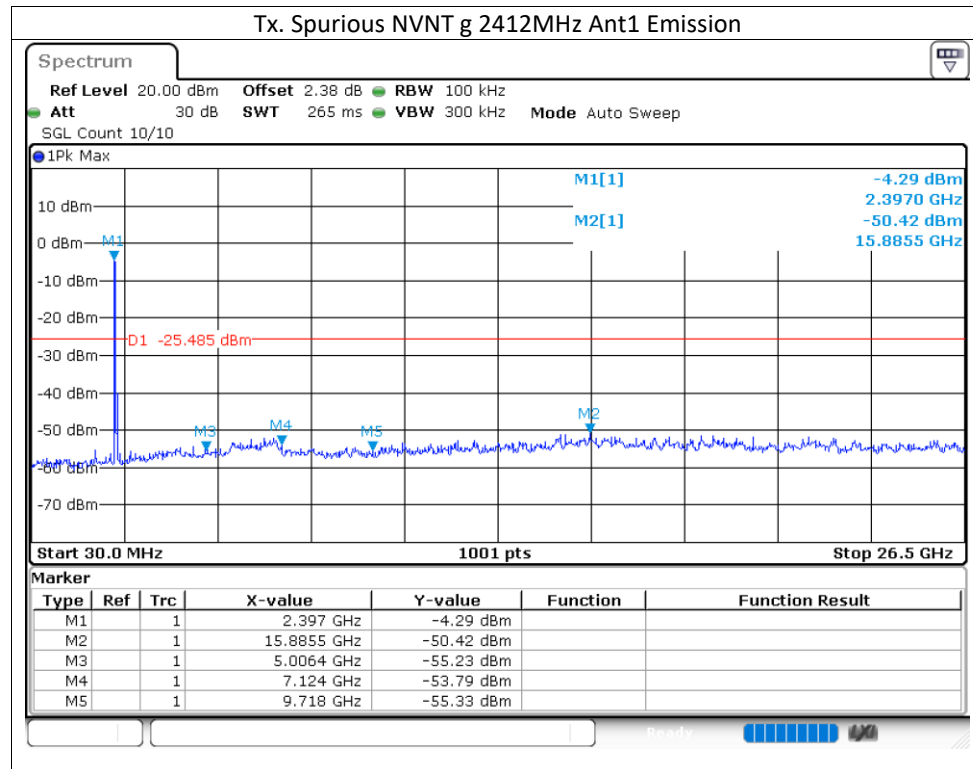




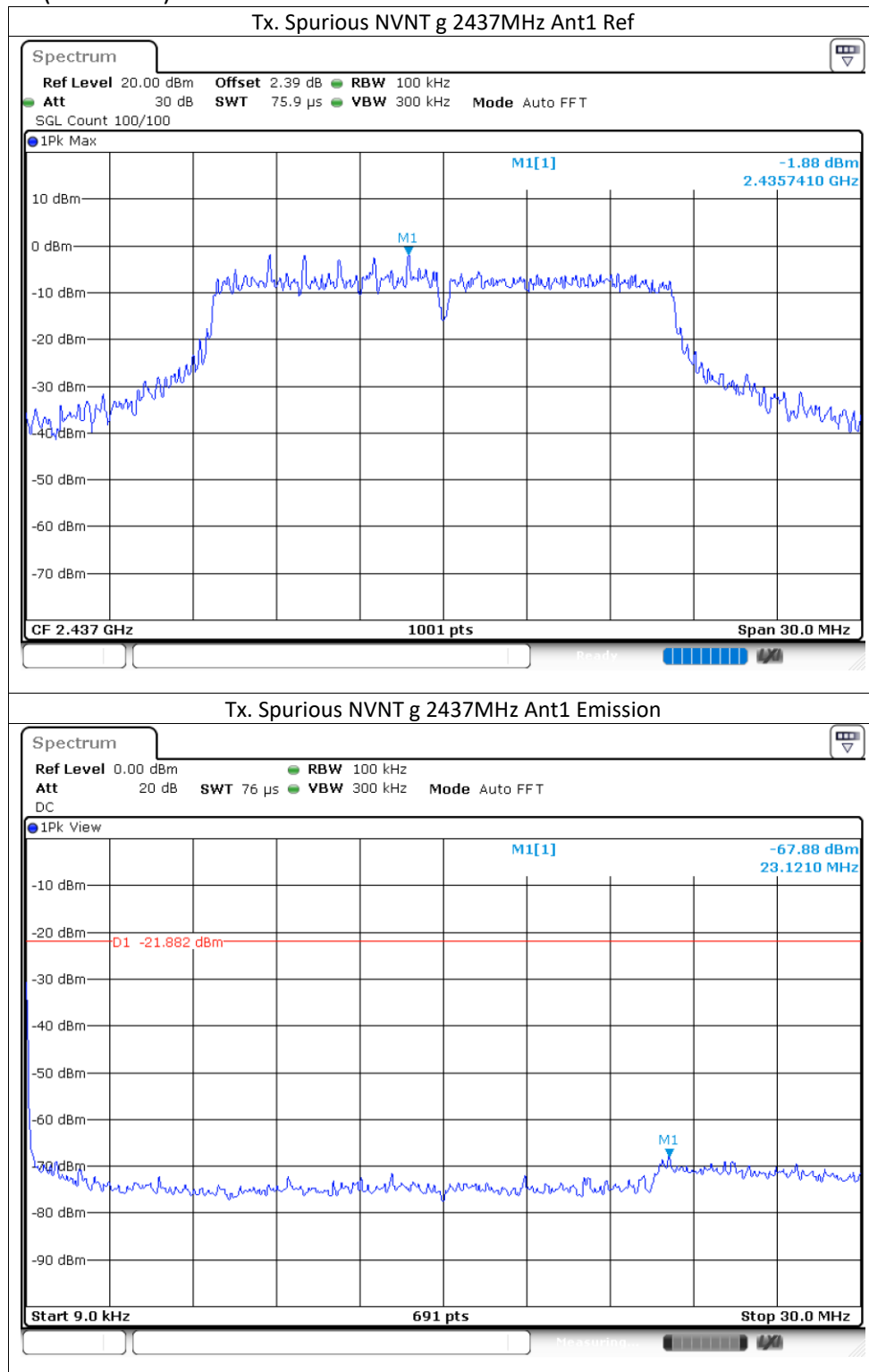
802.11g

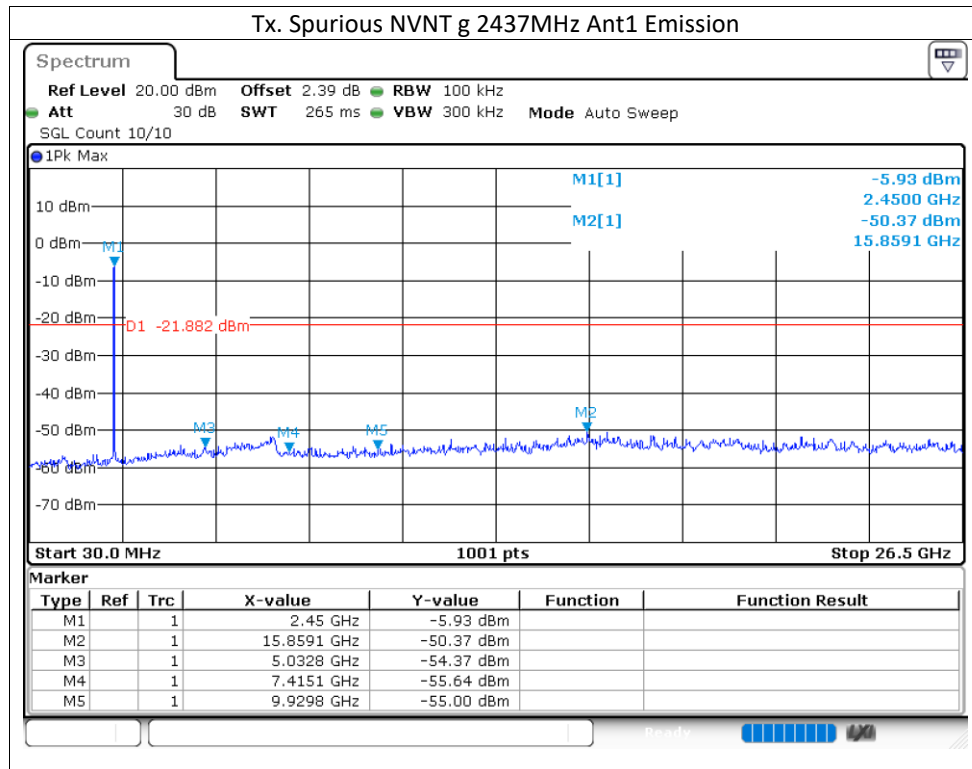
Channel 01 (2412MHz)



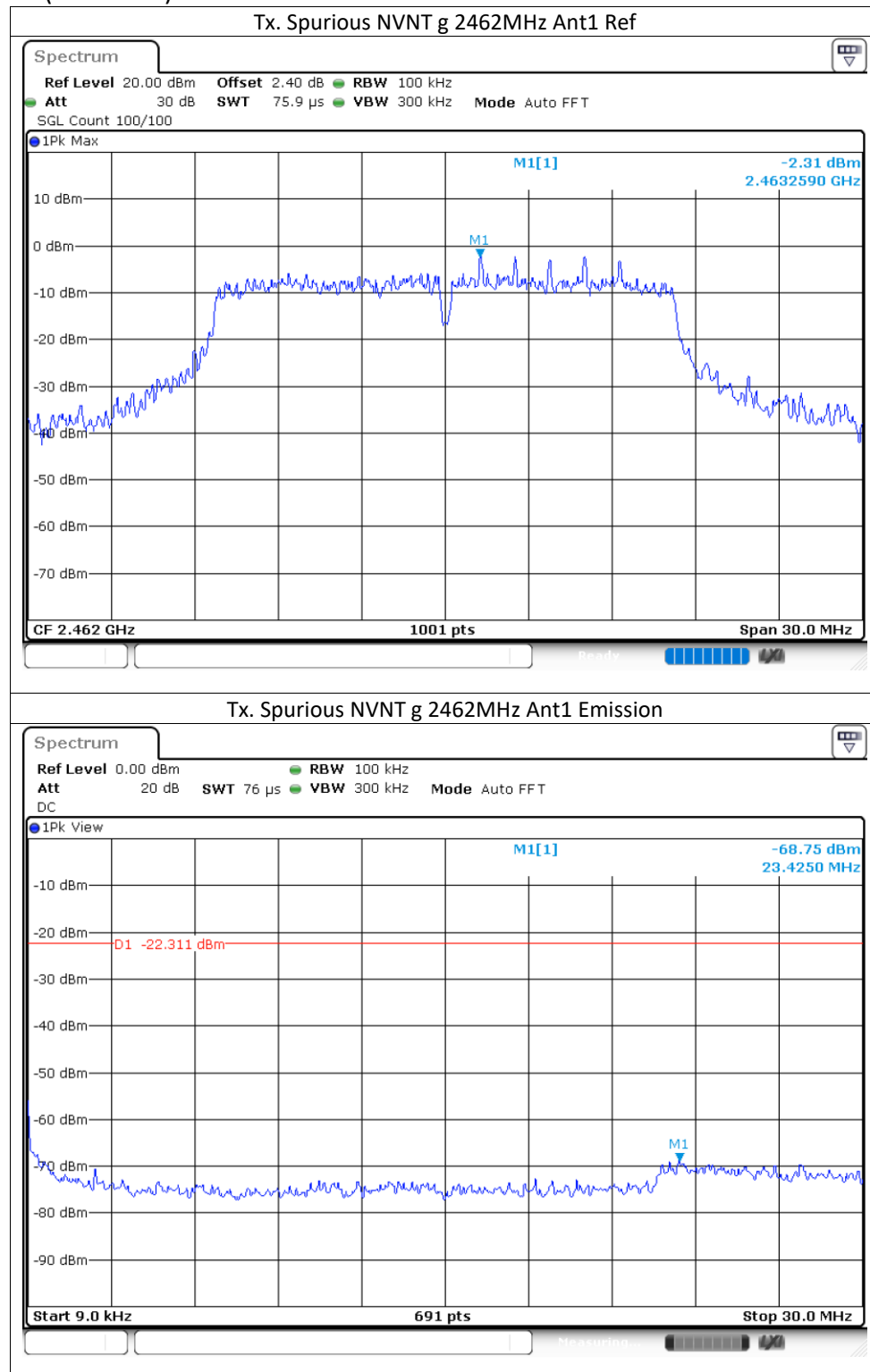


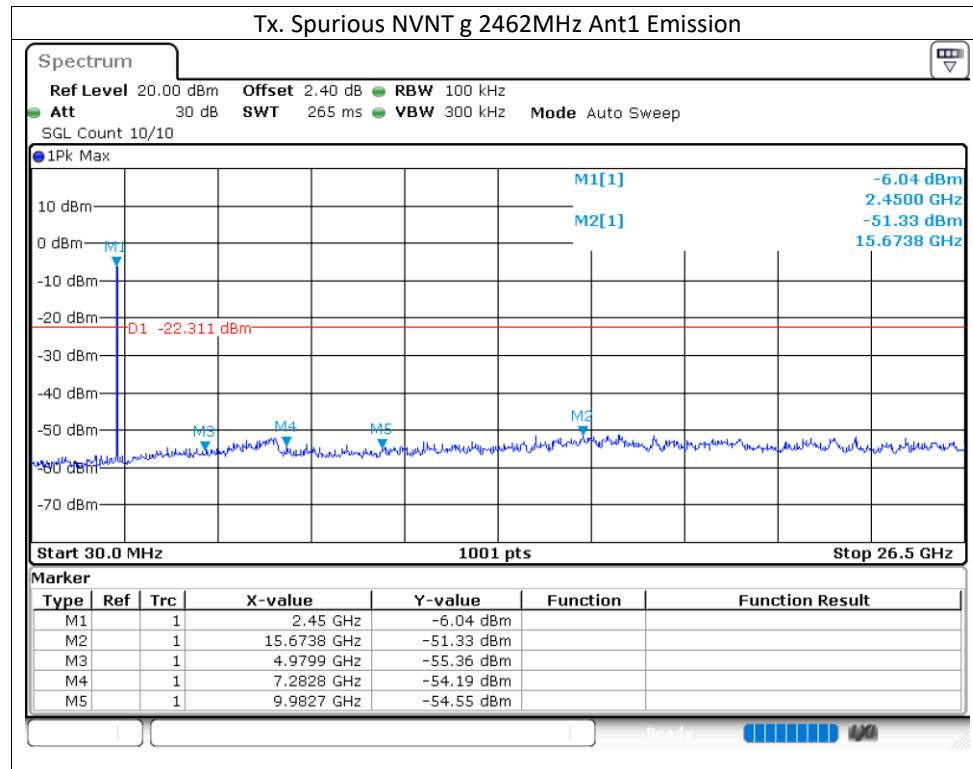
## Channel 06 (2437MHz)





## Channel 11 (2462MHz)

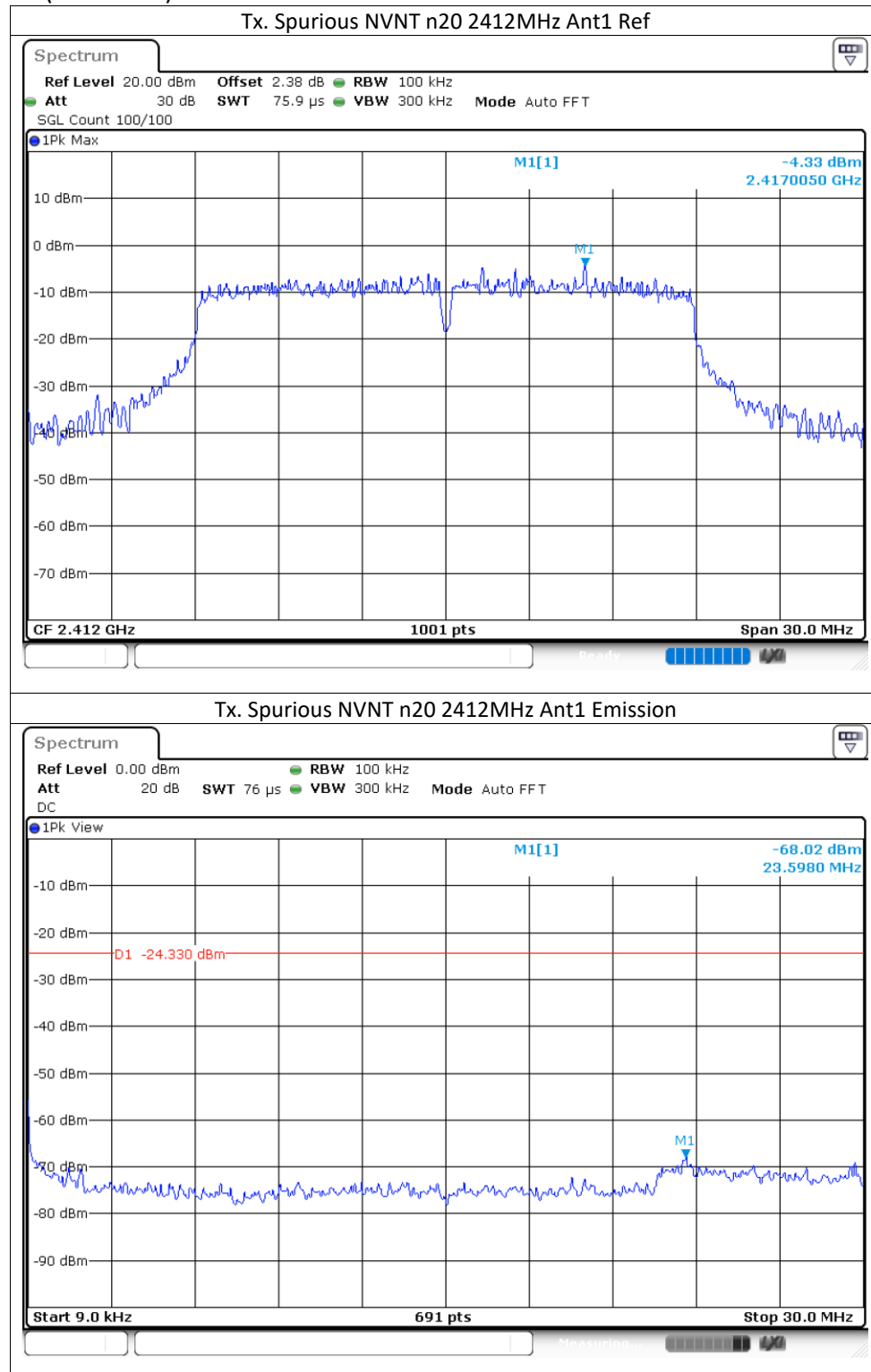


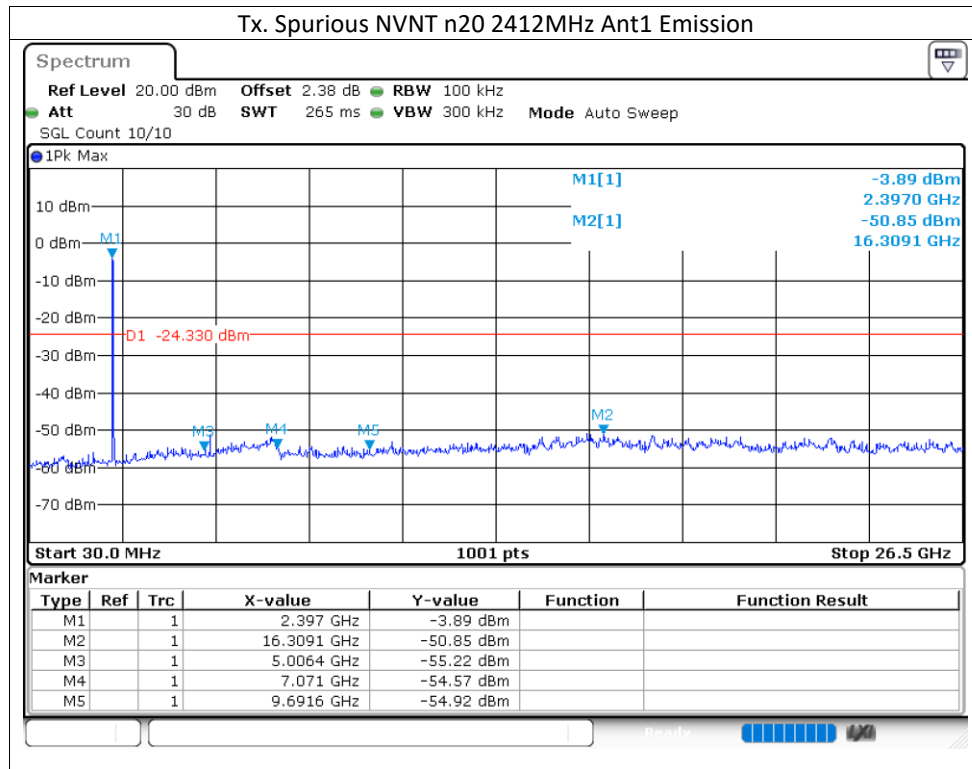




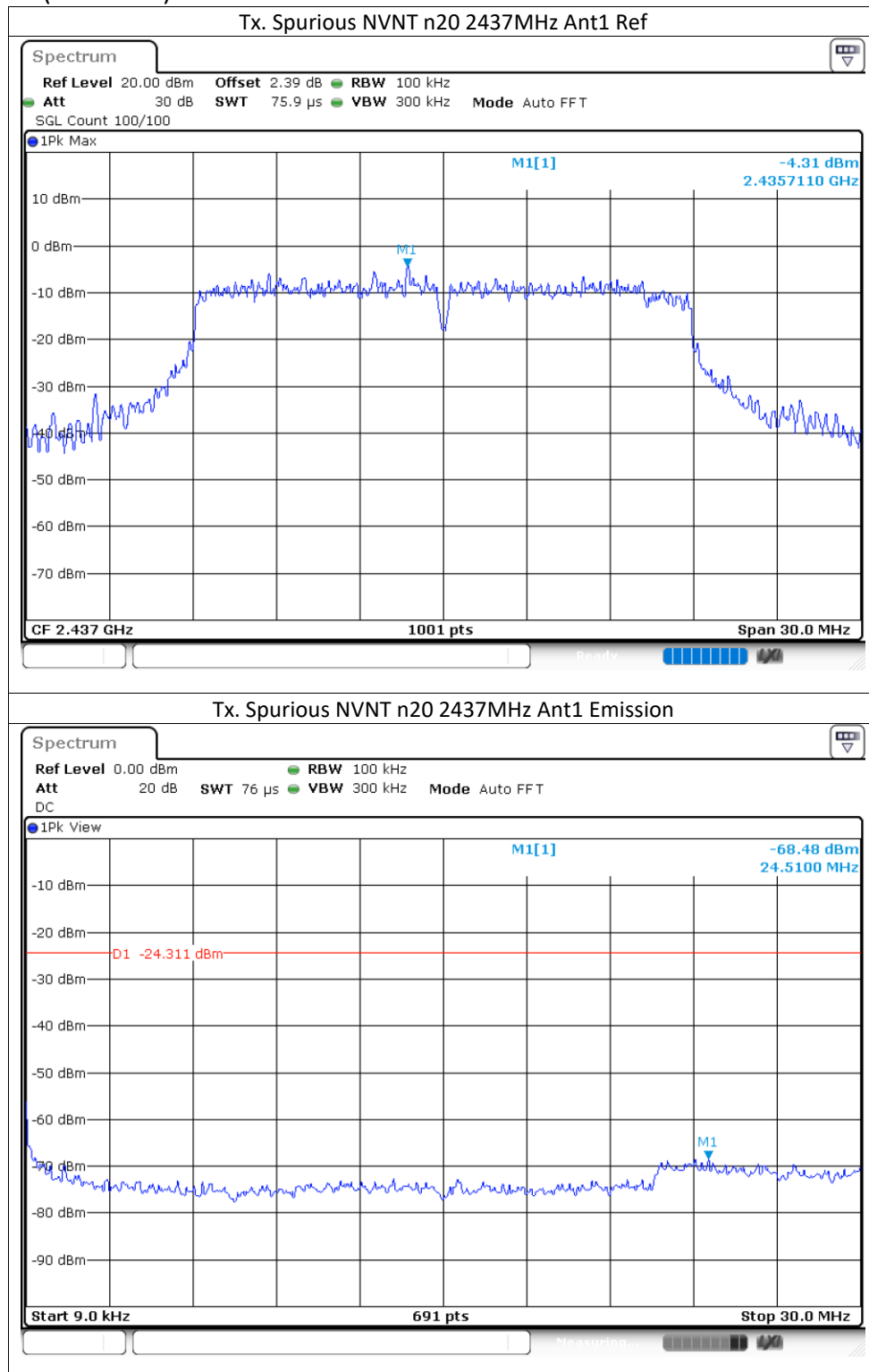
802.11n-HT20

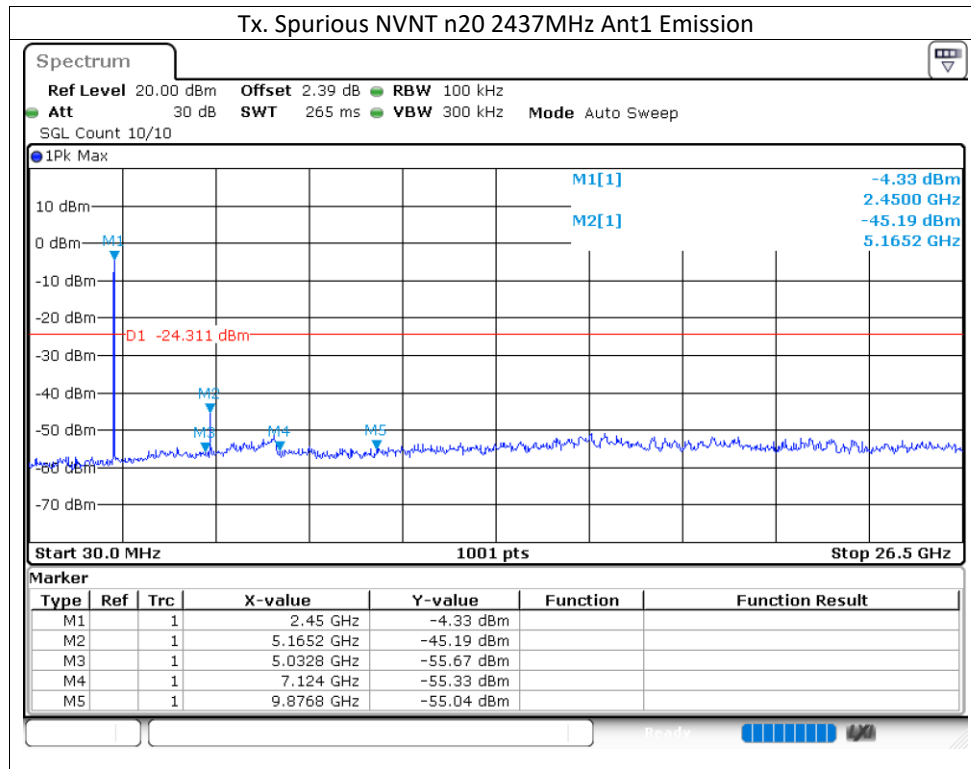
Channel 01 (2412MHz)



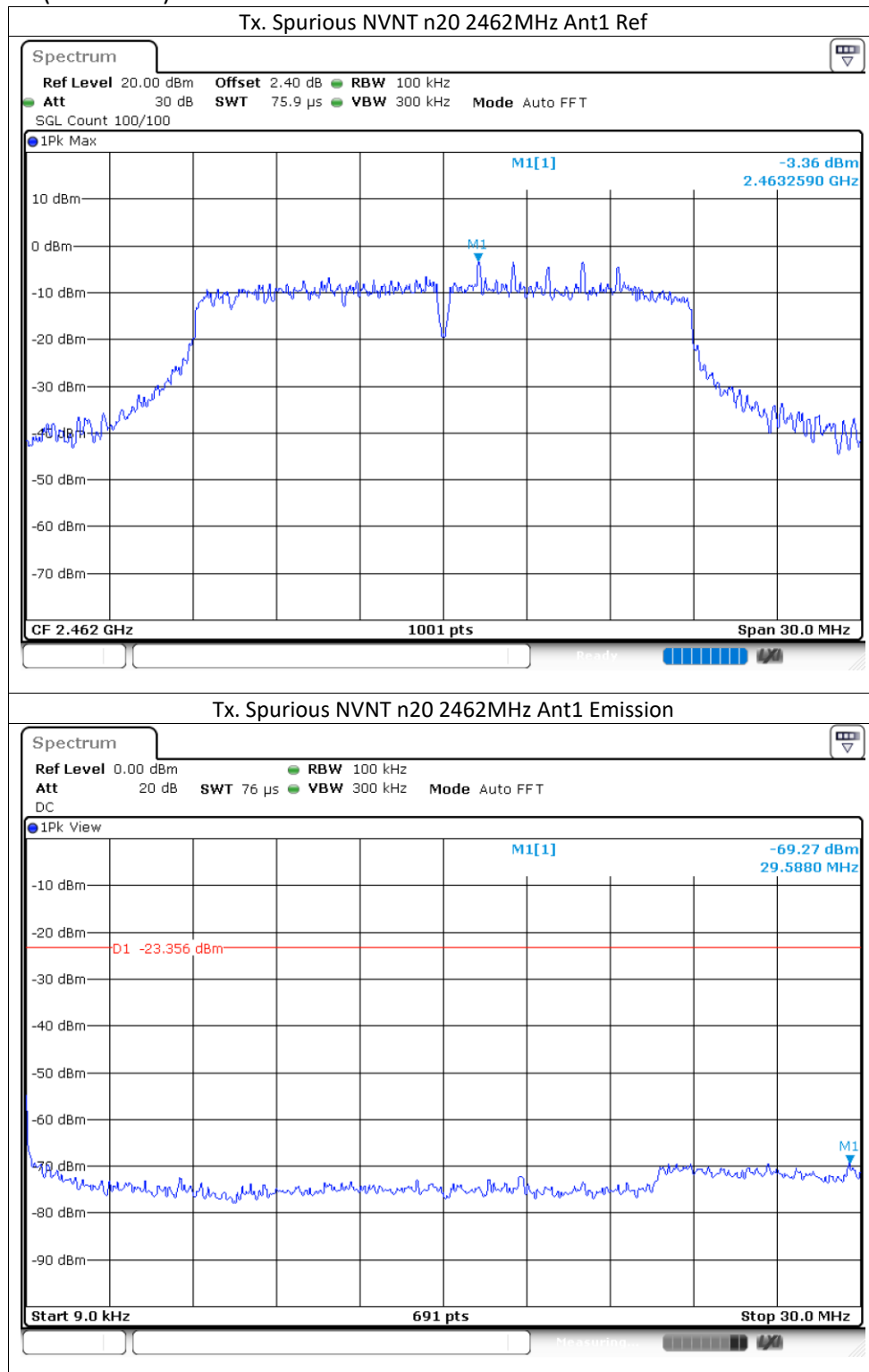


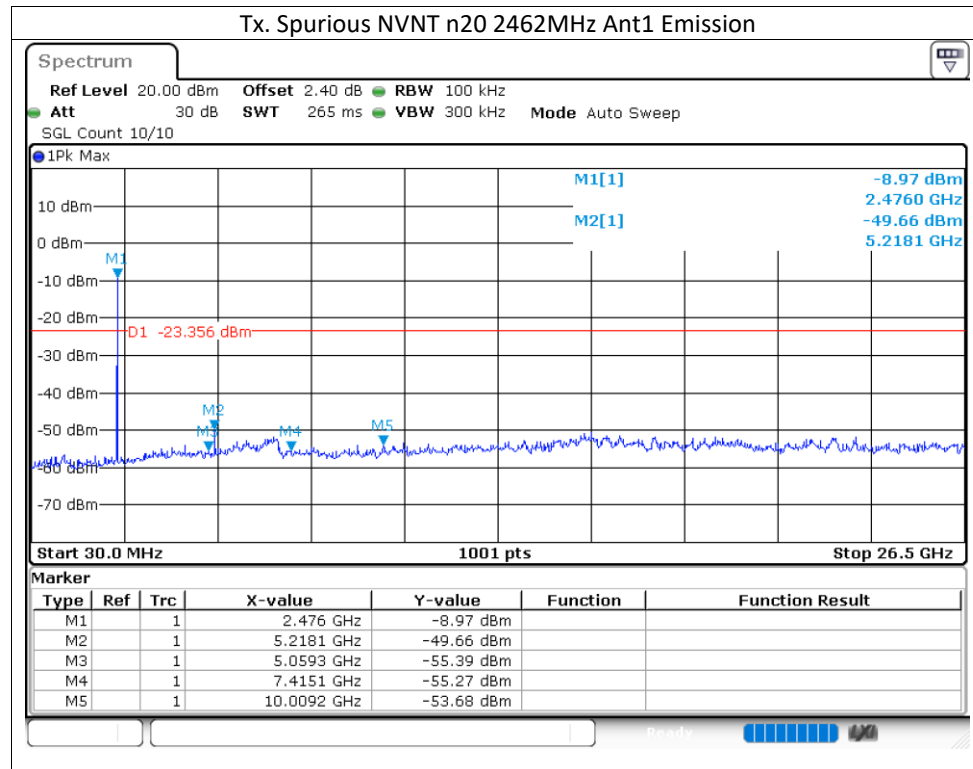
## Channel 06 (2437MHz)





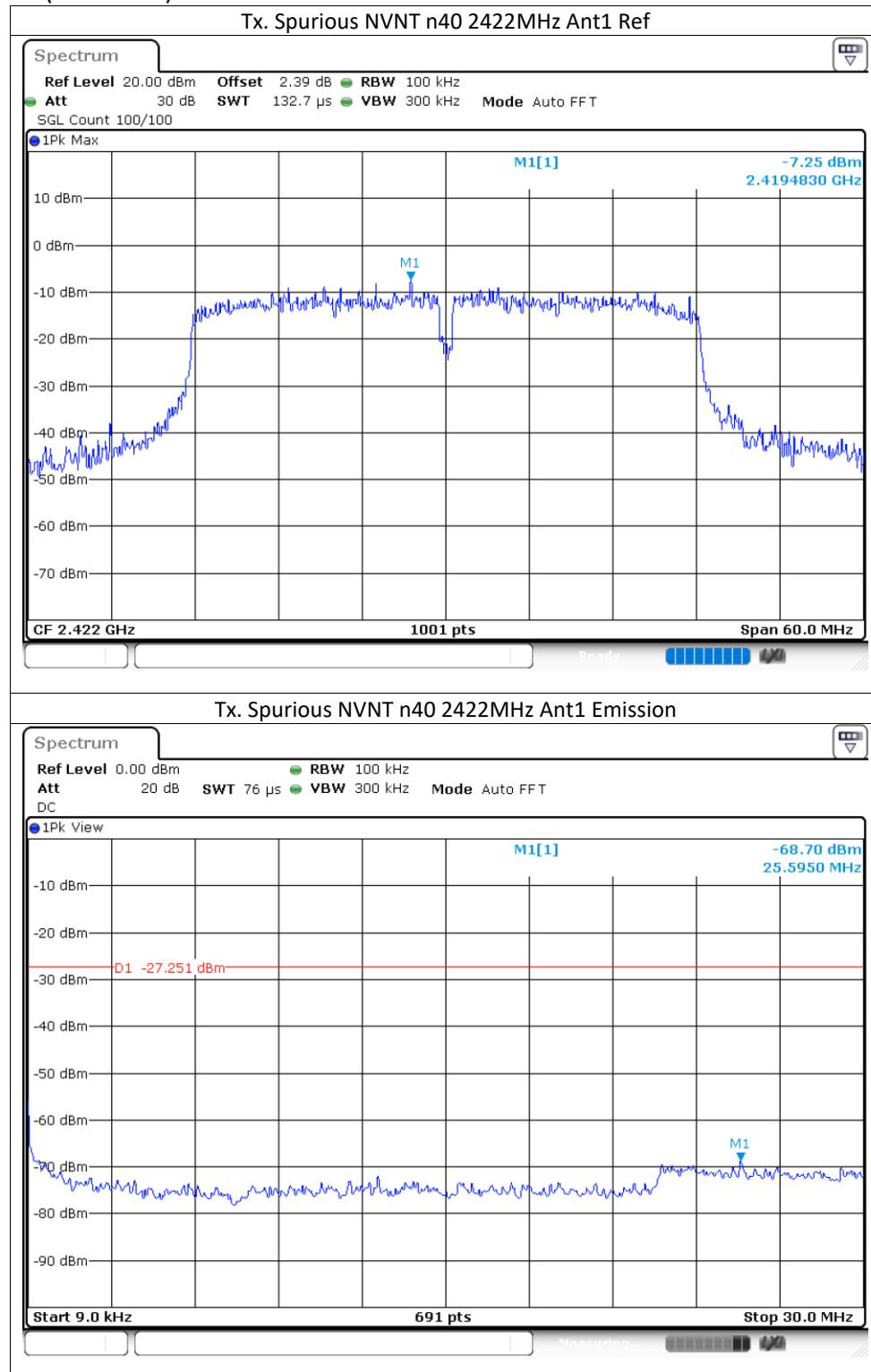
## Channel 11 (2462MHz)

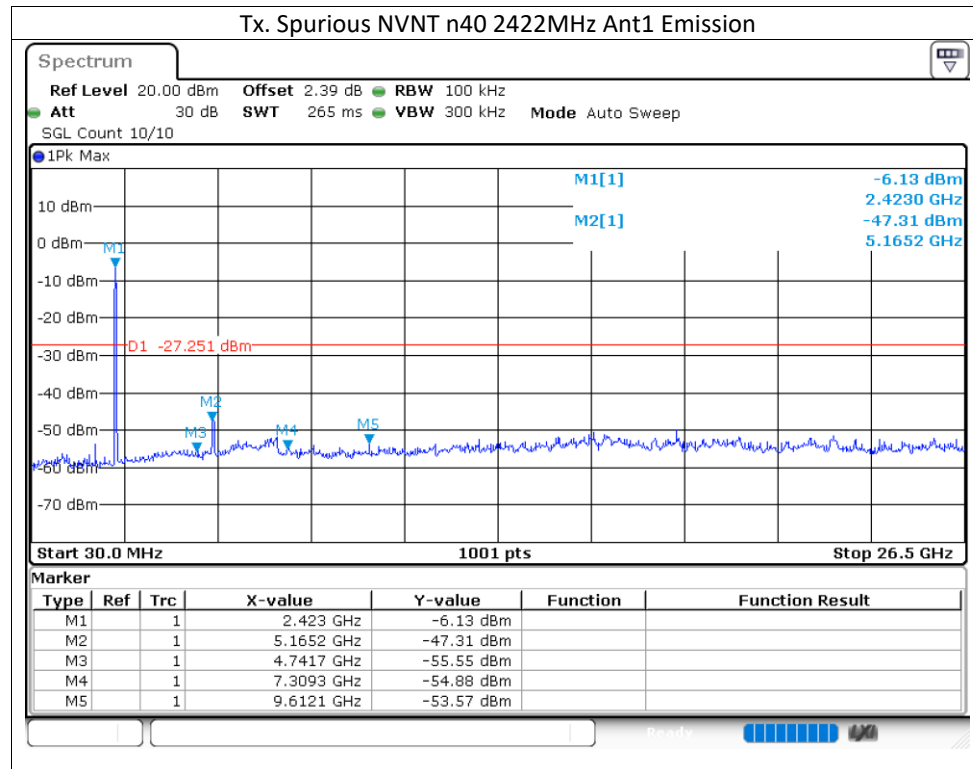




802.11n-HT40

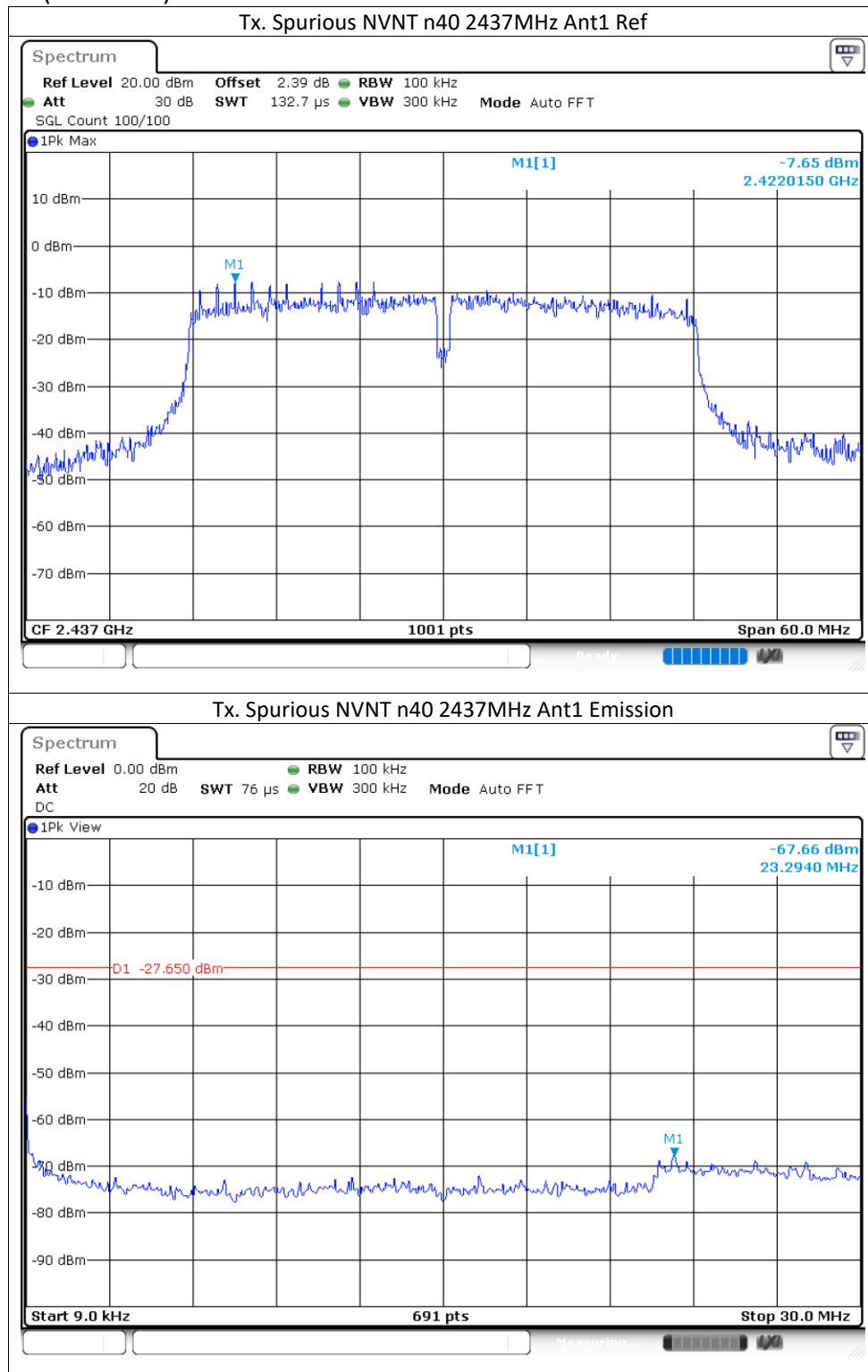
Channel 01 (2422MHz)

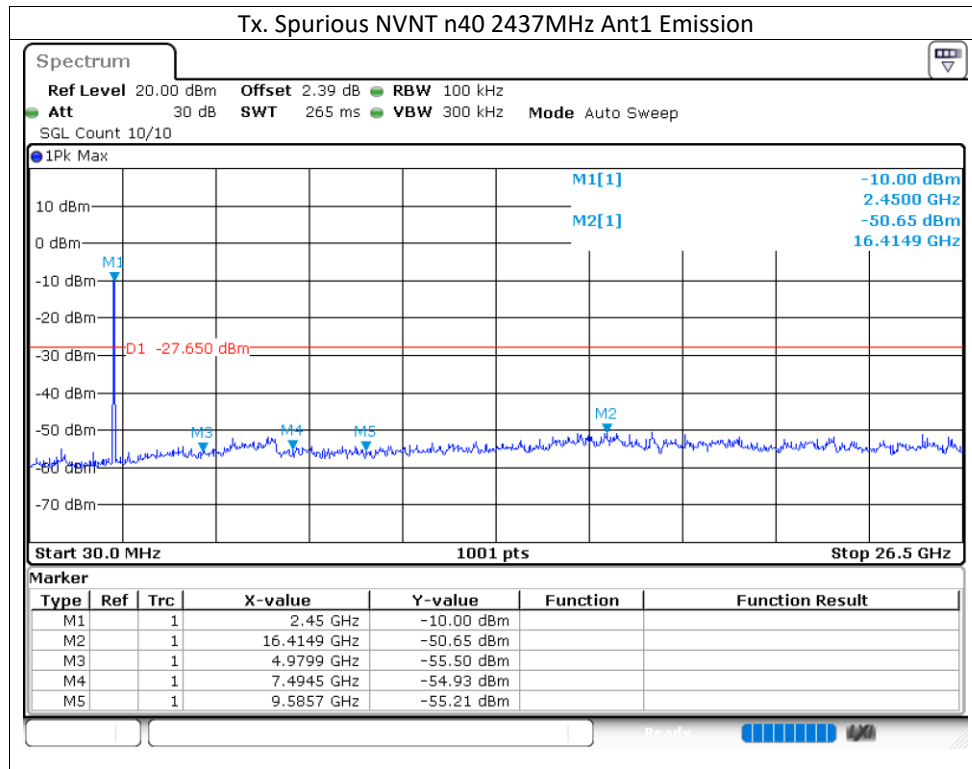




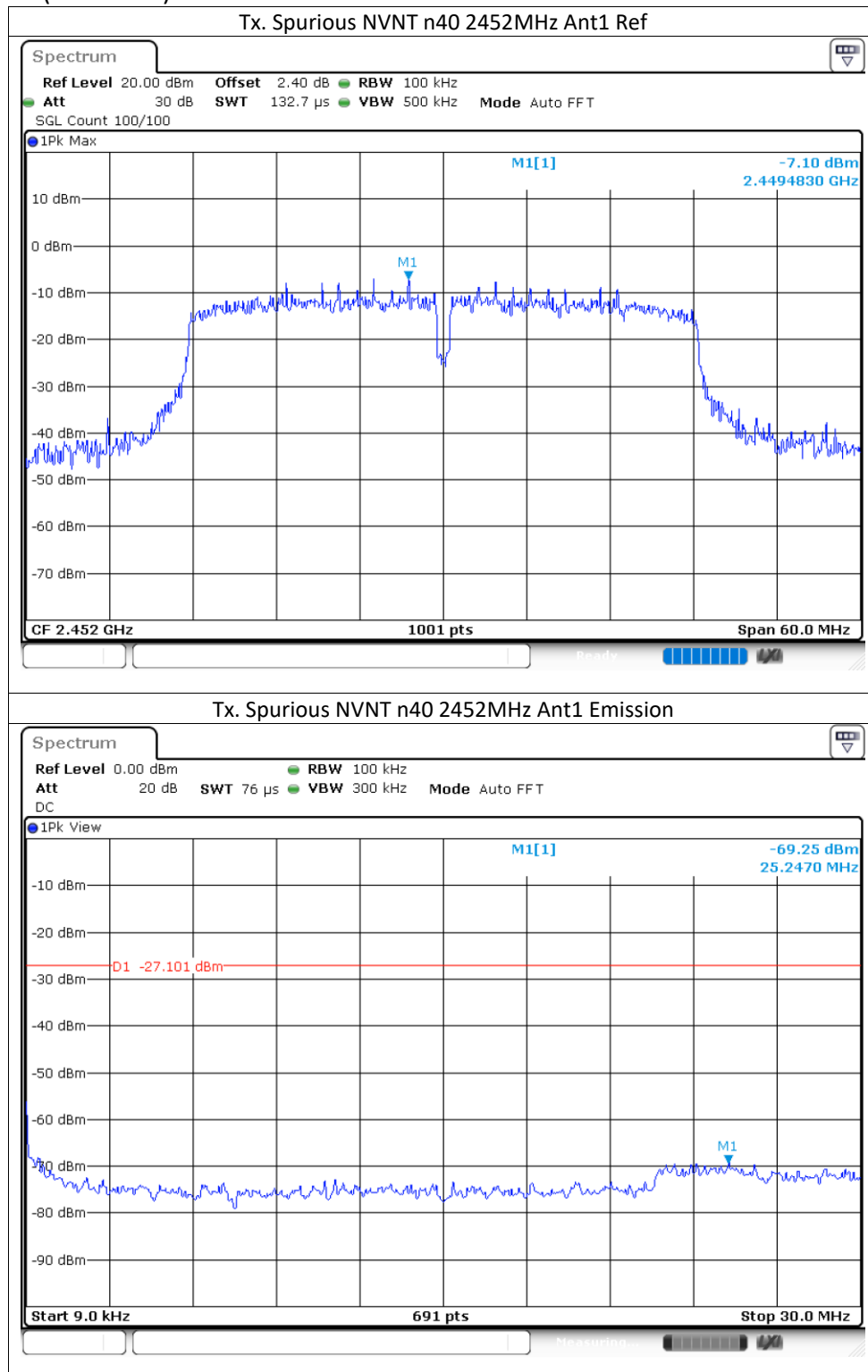


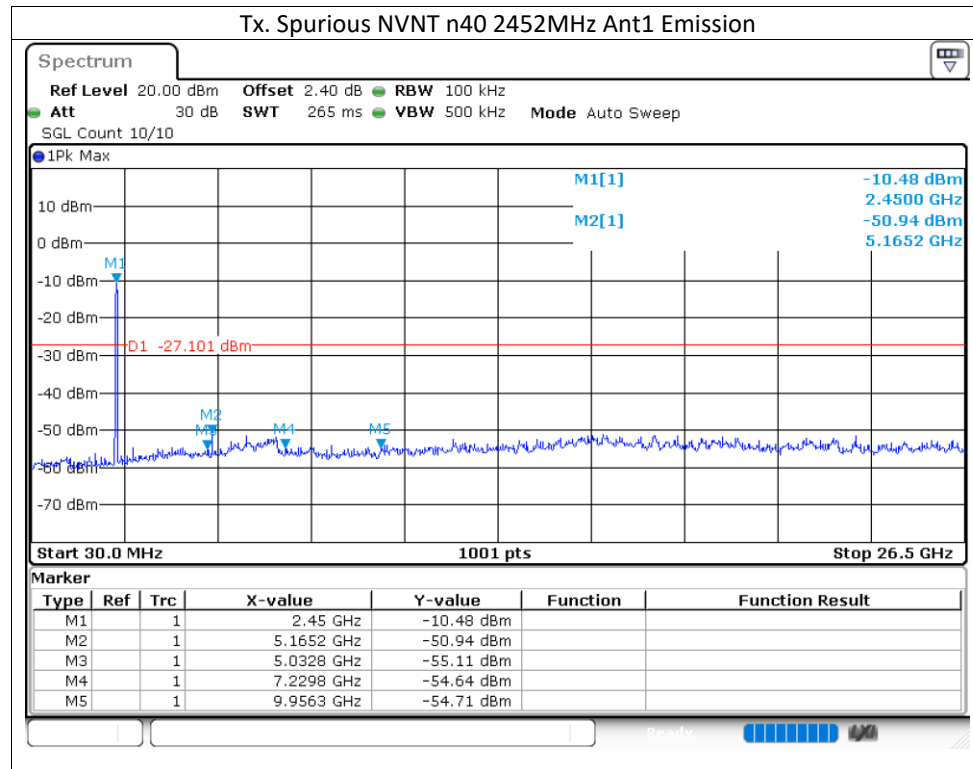
## Channel 06 (2437MHz)





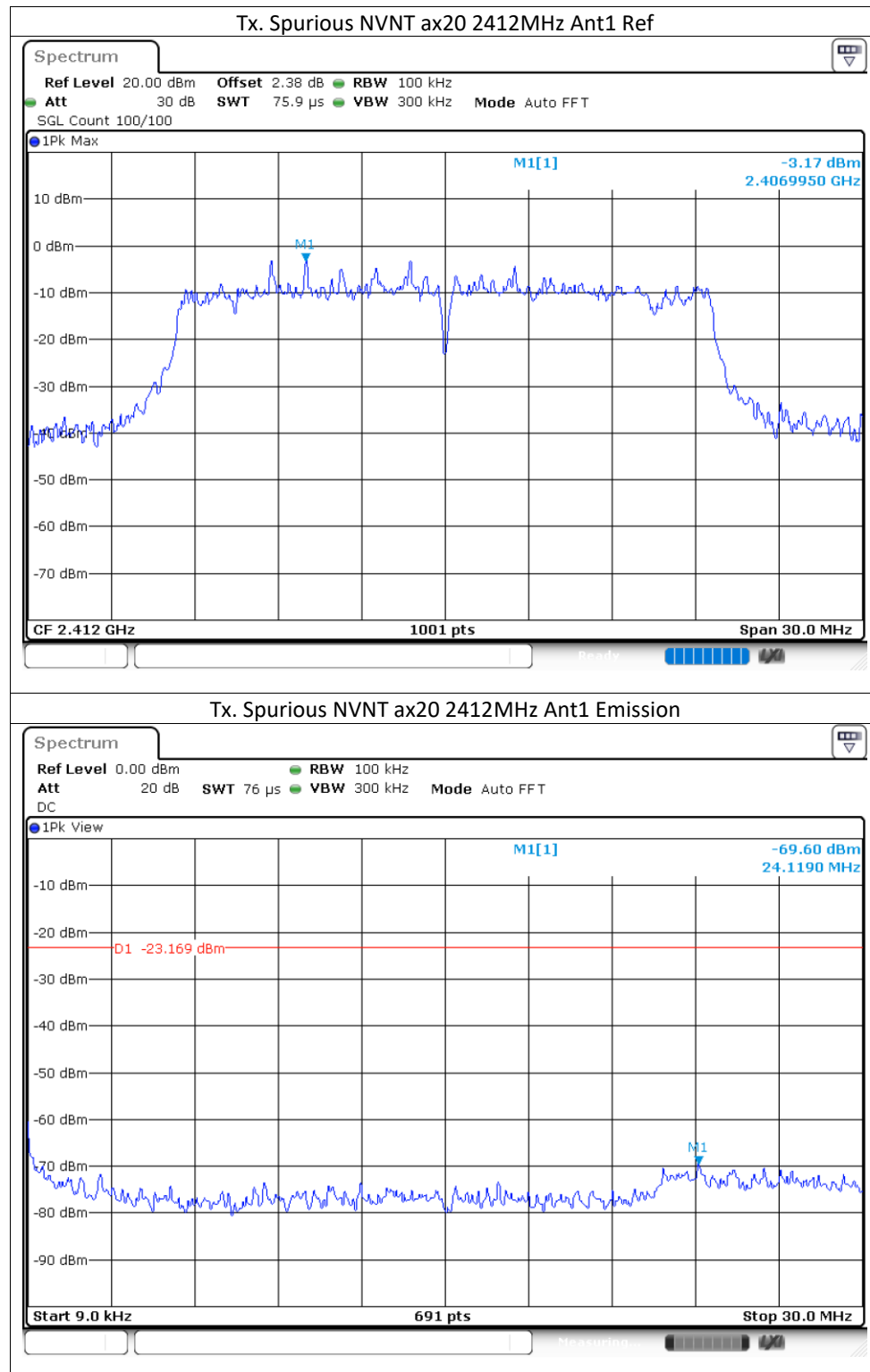
## Channel 11 (2452MHz)

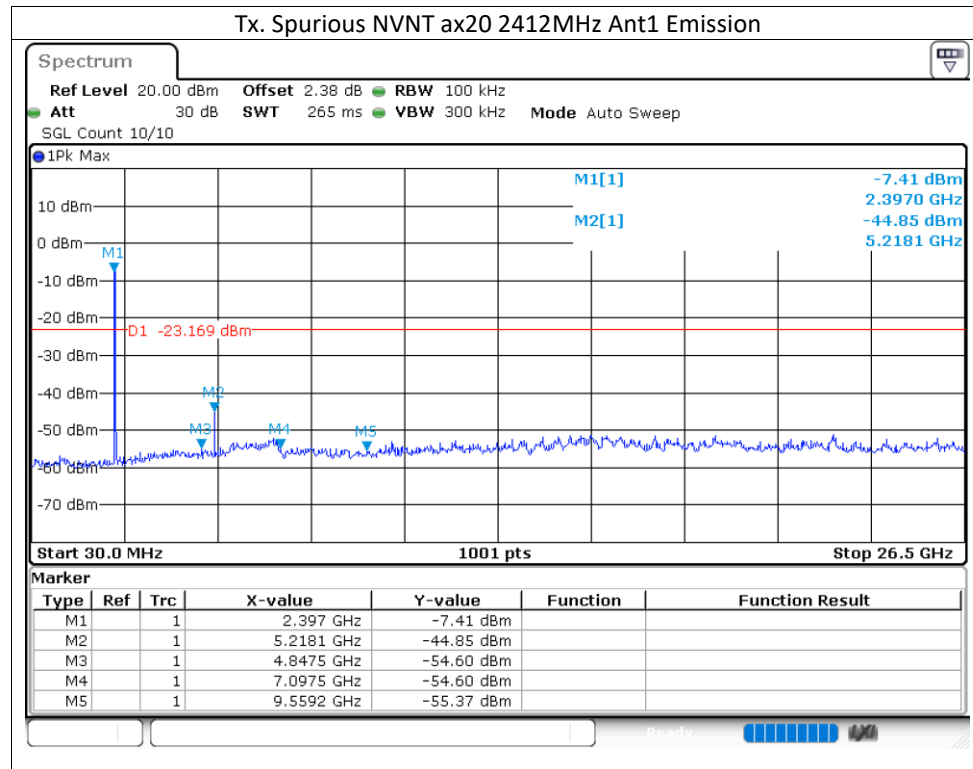




802.11ax-VHT20

Channel 01 (2412MHz)





## Channel 06 (2437MHz)

