



### FCC- TEST REPORT

Report Number : **68.950.17.365.01** Date of Issue: June 19, 2017

Model : SP8001, SP8000, SWK 360 A1

Product Type : 360 wifi panoramic camera

Applicant : Lidl US Trading, LLC

Address : 3500 S. Clark Street, Arlington Virginia United States 22202

Production Facility : DONGGUAN AOMEIJIA ELECTRONIC CO., LTD

Address : Lefushan industrial zone, Yonganpu Village, Fenggang town,  
: Dongguan, Guangdong, China.

Test Result :  **Positive**       **Negative**

Total pages including Appendices : 56

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## 2 Details about the Test Laboratory

### Details about the Test Laboratory

#### Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch  
Building 12&13, Zhiheng Wisdomland Business Park,  
Nantou Checkpoint Road 2, Nanshan District,  
Shenzhen City, 518052,  
P. R. China

Telephone: 86 755 8828 6998

Fax: 86 755 828 5299

FCC Registration No.: 502708

### 3 Description of the Equipment under Test

#### Description of the Equipment Under Test

Product:	360 wifi panoramic camera
Model no.:	SP8001, SP8000, SWK 360 A1 Three models are same except for the Model name difference. So the tests were applied on SWK 360 A1, other models are deemed to fulfil the EMC test without further testing.
FCC ID:	2AJ90-SWK360A1
Options and accessories:	NIL
Rating:	DC 3.7V, 1050mAH(Supplied by rechargeable battery) DC 5V, 1000mA(Charged by the mini-USB port)
RF Transmission Frequency:	2412MHz -2462MHz
No. of Operated Channel:	11
Modulation:	CCK DSSS, OFDM
Antenna Type:	Integral Antenna
Antenna gain:	1.2dBm
Description of the EUT:	The Equipment Under Test (EUT) is a 360 wifi panoramic camera which supports 2.4G WLAN functions.



## 4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2016 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

All the test methods were according to KDB558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2013).

## 5 Summary of Test Results

Technical Requirements						
FCC Part 15 Subpart C						
Test Condition		Pages	Test Site	Test Result		
				Pass	Fail	N/A
§15.207	Conducted emission AC power port	10	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (b) (1)	Conducted peak output power	13	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(a)(1)	20dB bandwidth	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)	Carrier frequency separation	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii)	Number of hopping frequencies	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(1)(iii)	Dwell Time	---	---	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
§15.247(a)(2)	6dB bandwidth and 99% Occupied Bandwidth	20	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(e)	Power spectral density	27	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d)	Spurious RF conducted emissions	34	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d)	Band edge	47	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247(d) & §15.209	Spurious radiated emissions for transmitter	52	Site 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.203	Antenna requirement	See note 1		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a patch antenna, which gain is 1.2dBi. In accordance to §15.203 and RSS-Gen 8.3 , It is considered sufficiently to comply with the provisions of this section.



## 6 General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: 2AJ9O-SWK360A1 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15, Subpart C Rules.

### SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed

- Not Performed

The Equipment under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

Sample Received Date: May 3, 2017

Testing Start Date: May 3, 2017

Testing End Date: May 23, 2017

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch –

Reviewed by:

Phoebe Hu  
EMC Section Manager

Prepared by:

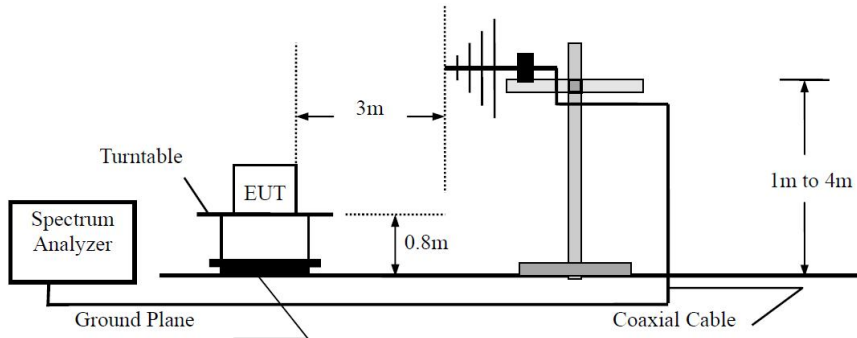
Mark Chen  
EMC Project Engineer

Tested by:

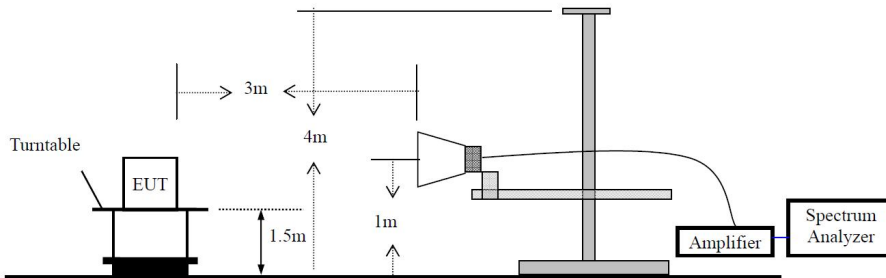
Endy Xie  
EMC Test Engineer

## 7 Test Setups

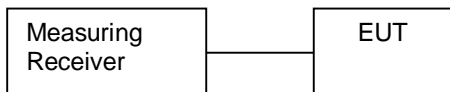
### 7.1 Radiated test setups Below 1GHz



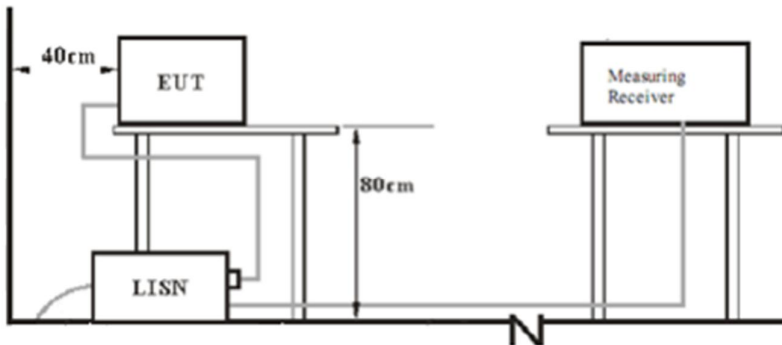
### Above 1GHz



### 7.2 Conducted RF test setups



### 7.3 AC Power Line Conducted Emission test setups







## 8 Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Adapter	---	---	---
Notebook	Lenovo	X220	---



## 9 Technical Requirement

### 9.1 Conducted Emission

#### Test Method

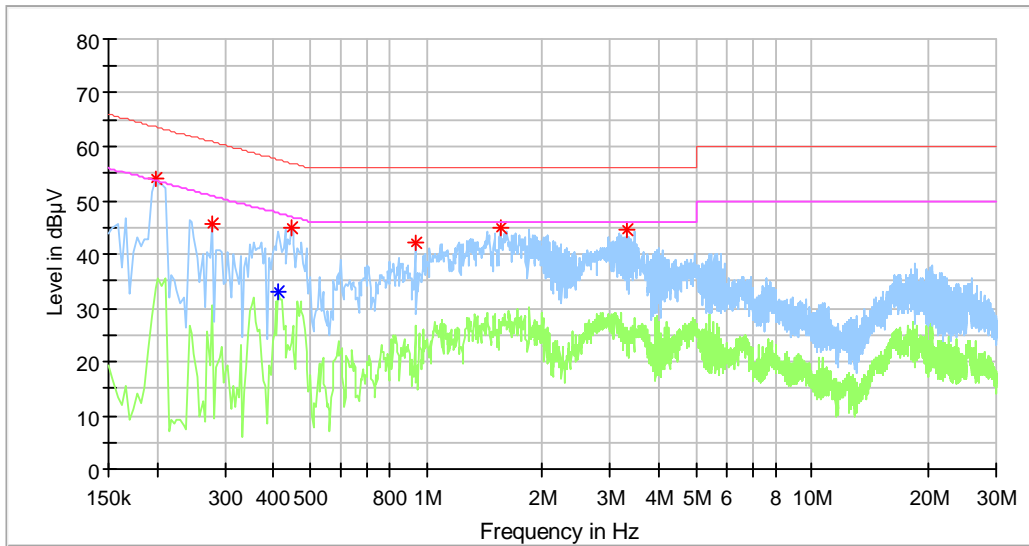
1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

#### Limit

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50
***Decreasing linear		

## Conducted Emission

Product Type : 360 wifi panoramic camera  
 M/N : SWK 360 A1  
 Operating Condition : Charging & TX  
 Test Specification : Live  
 Comment : AC 120V/60Hz



### Critical Freqs

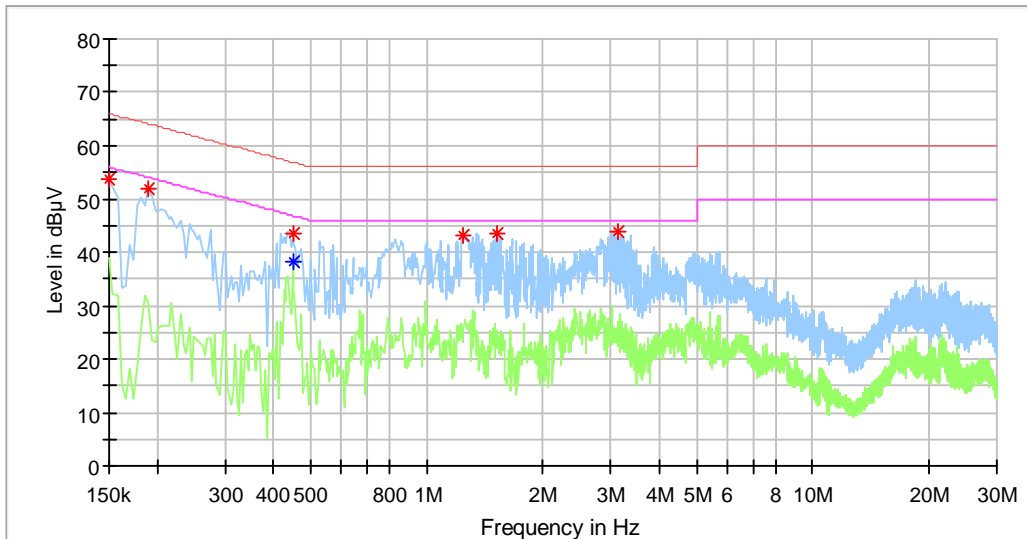
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.198000	54.21	---	63.69	9.49	L1	10.3
0.278000	45.60	---	60.88	15.28	L1	10.3
0.414000	---	32.98	47.57	14.59	L1	11.5
0.446000	45.04	---	56.95	11.91	L1	11.0
0.938000	41.95	---	56.00	14.05	L1	10.4
1.550000	44.74	---	56.00	11.26	L1	10.4
3.314000	44.56	---	56.00	11.44	L1	10.4

### Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---	---	---

## Conducted Emission

Product Type : 360 wifi panoramic camera  
 M/N : SWK 360 A1  
 Operating Condition : Charging & TX  
 Test Specification : Neutral  
 Comment : AC 120V/60Hz



### Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.150000	53.74	---	66.00	12.26	N	10.3
0.190000	51.99	---	64.04	12.04	N	10.3
0.450000	---	38.41	46.88	8.46	N	10.3
0.450000	43.52	---	56.88	13.35	N	10.3
1.246000	43.12	---	56.00	12.88	N	10.4
1.526000	43.67	---	56.00	12.33	N	10.4
3.114000	43.94	---	56.00	12.06	N	10.4

### Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
---	---	---	---	---		---

## 9.2 Conducted peak output power

### Test Method

1. Use the following spectrum analyzer settings:  
 RBW > the 6 dB bandwidth of the emission being measured, VBW ≥ 3RBW, Span ≥ 3RBW  
 Sweep = auto, Detector function = peak, Trace = max hold.
2. Add a correction factor to the display.
3. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

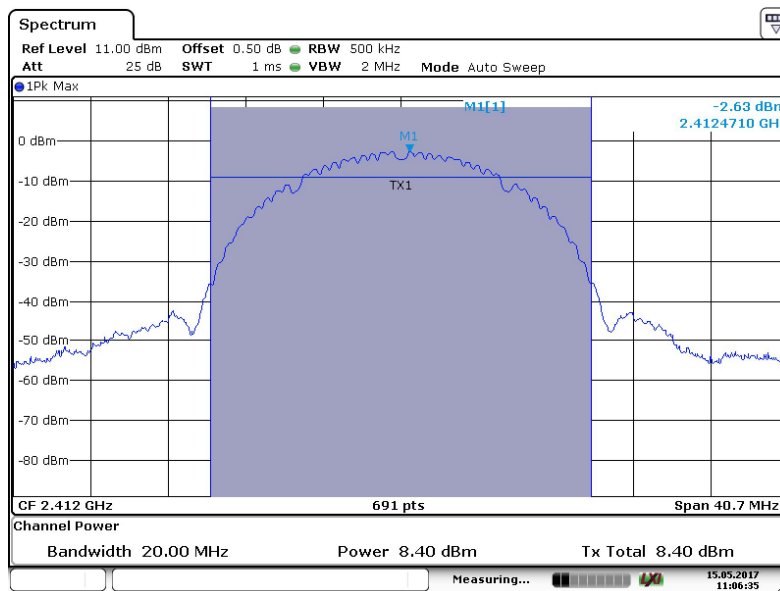
### Limits

Frequency Range MHz	Limit W	Limit dBm
2412MHz-2462MHz	≤1	≤30

Test result as below table

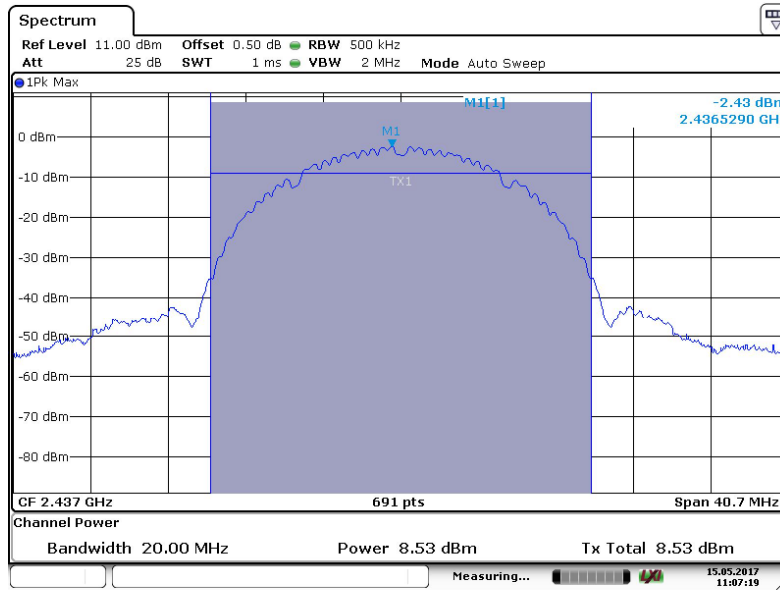
802.11b

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	8.40	Pass
Middle channel 2437MHz	8.53	Pass
High channel 2462MHz	7.62	Pass



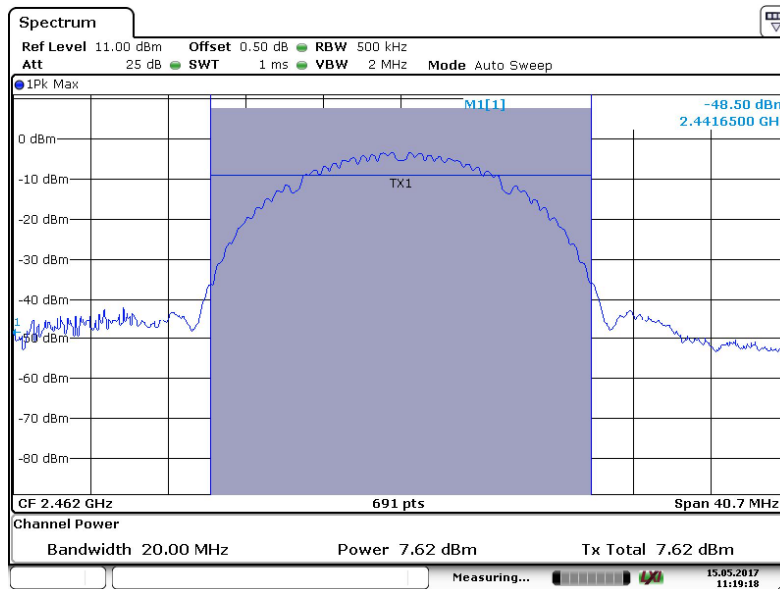
Date: 15.MAY.2017 11:06:35

2412MHz



Date: 15.MAY.2017 11:07:19

2437MHz

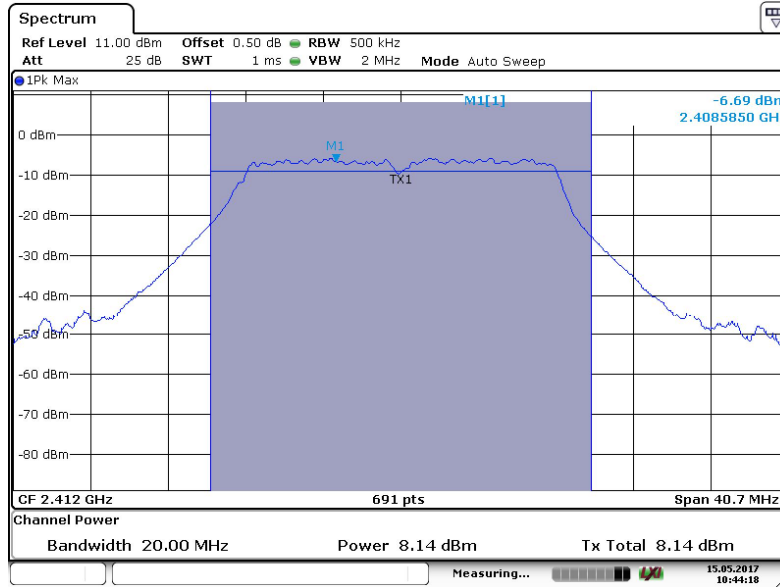


Date: 15.MAY.2017 11:19:18

2462MHz

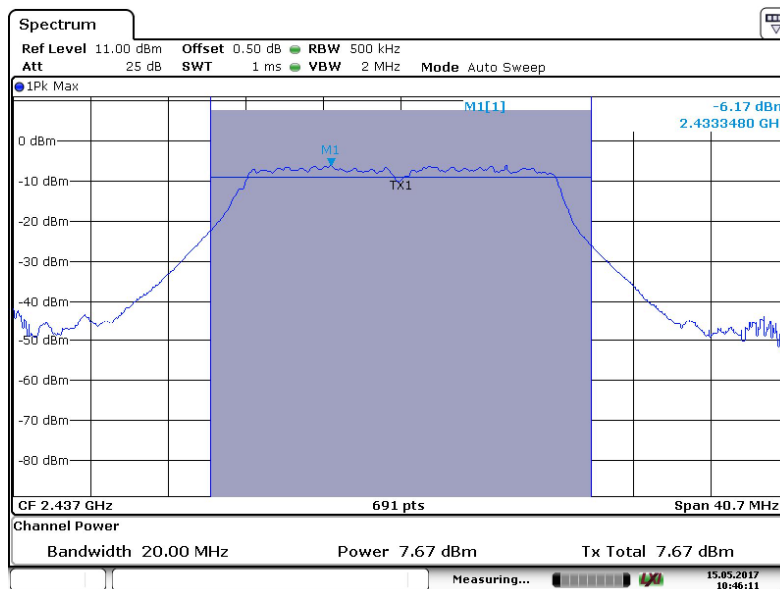
802.11g

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	8.14	Pass
Middle channel 2437MHz	7.67	Pass
High channel 2462MHz	7.06	Pass



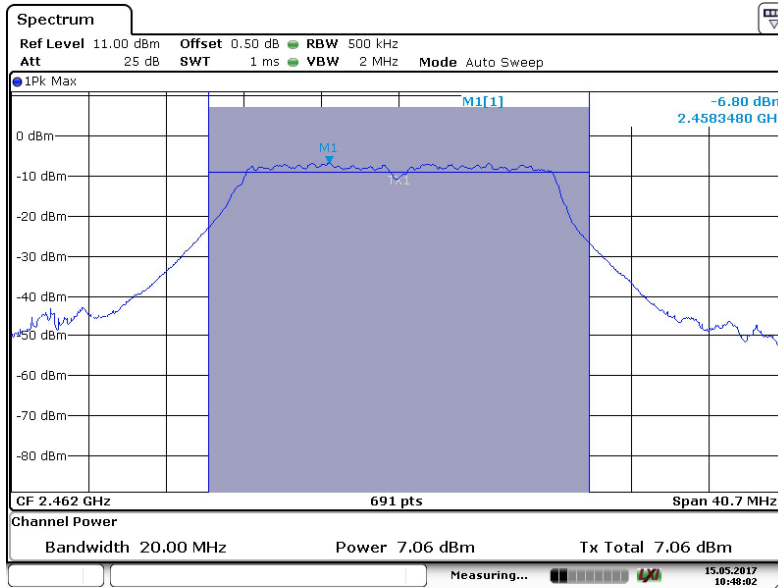
Date: 15.MAY.2017 10:44:18

2412MHz



Date: 15.MAY.2017 10:46:11

2437MHz

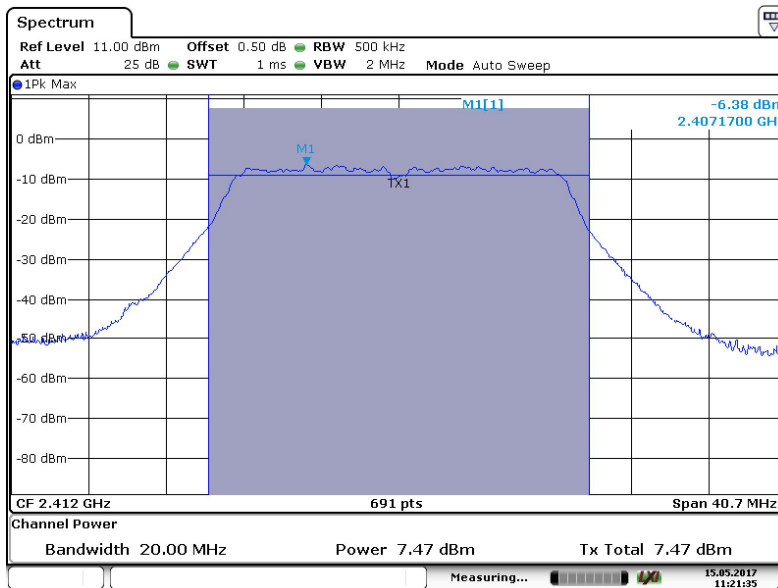


Date: 15.MAY.2017 10:48:02

2462MHz

802.11n20

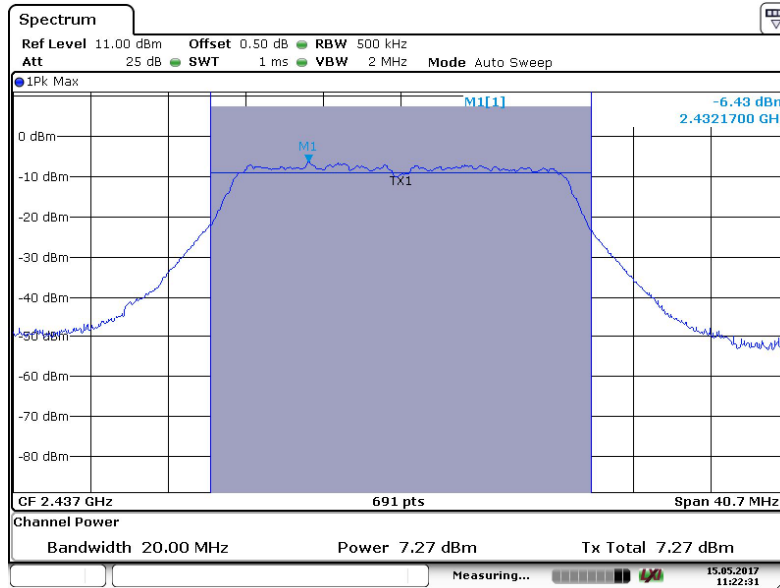
Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	7.47	Pass
Middle channel 2437MHz	7.27	Pass
High channel 2462MHz	6.50	Pass



Date: 15.MAY.2017 11:21:35

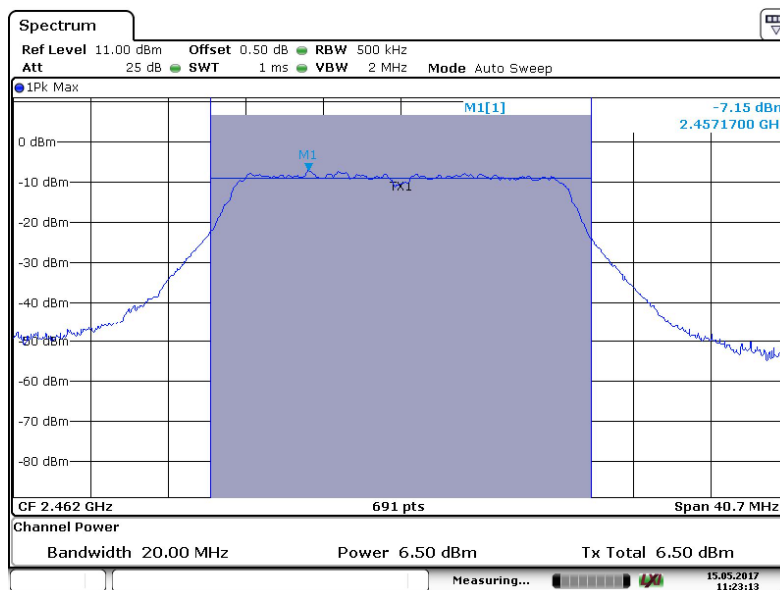
2412MHz





Date: 15.MAY.2017 11:22:32

2437MHz

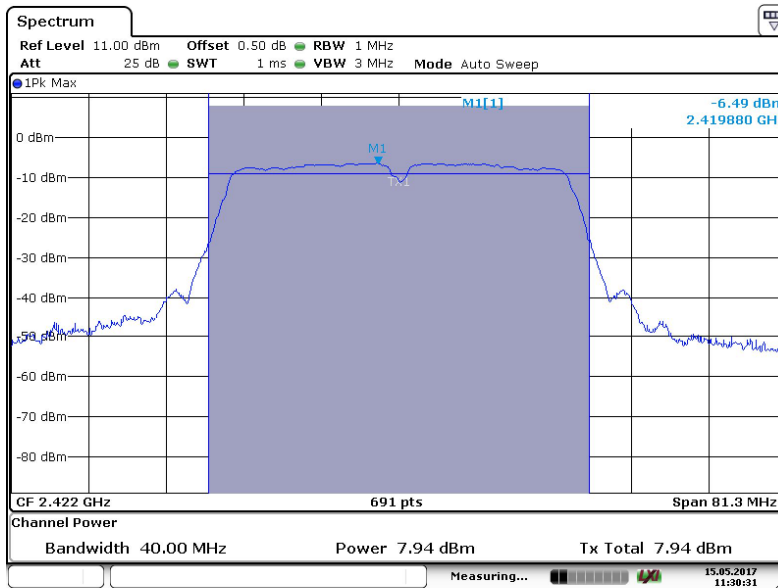


Date: 15.MAY.2017 11:23:13

2462MHz

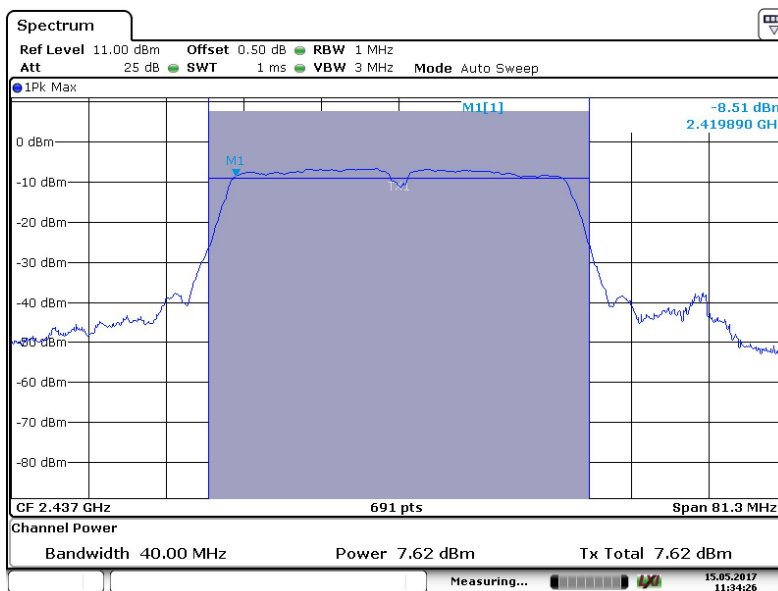
802.11n40

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	7.94	Pass
Middle channel 2437MHz	7.62	Pass
High channel 2462MHz	7.28	Pass



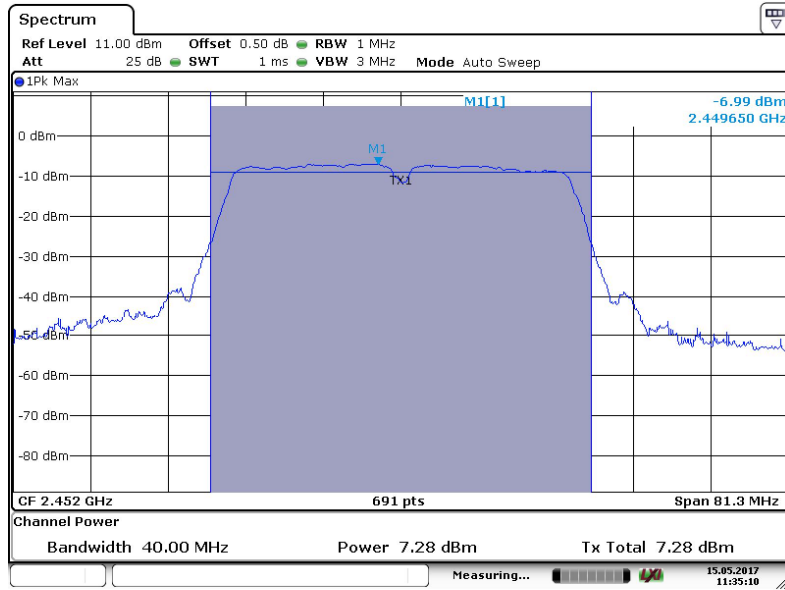
Date: 15.MAY.2017 11:30:31

2422MHz



Date: 15.MAY.2017 11:34:27

2437MHz



Date: 15.MAY.2017 11:35:10

2452MHz

### 9.3 6dB bandwidth and 99% Occupied Bandwidth

#### Test Method

1. Use the following spectrum analyzer settings:  
RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

#### Limit

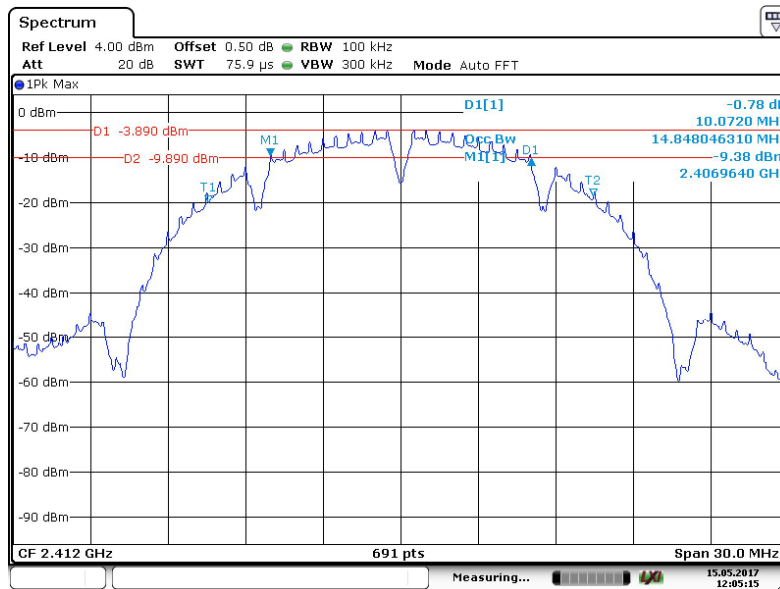
Limit [kHz]

≥500

#### Test result

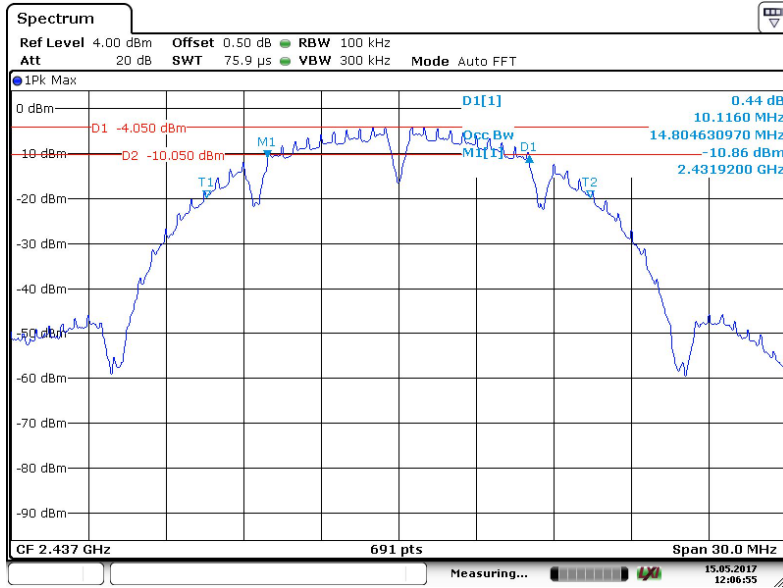
802.11b

Frequency MHz	6dB bandwidth MHz	99% Bandwidth MHz	Result
Low channel 2412MHz	10.072	14.848	Pass
Middle channel 2437MHz	10.116	14.848	Pass
High channel 2462MHz	10.072	14.848	Pass



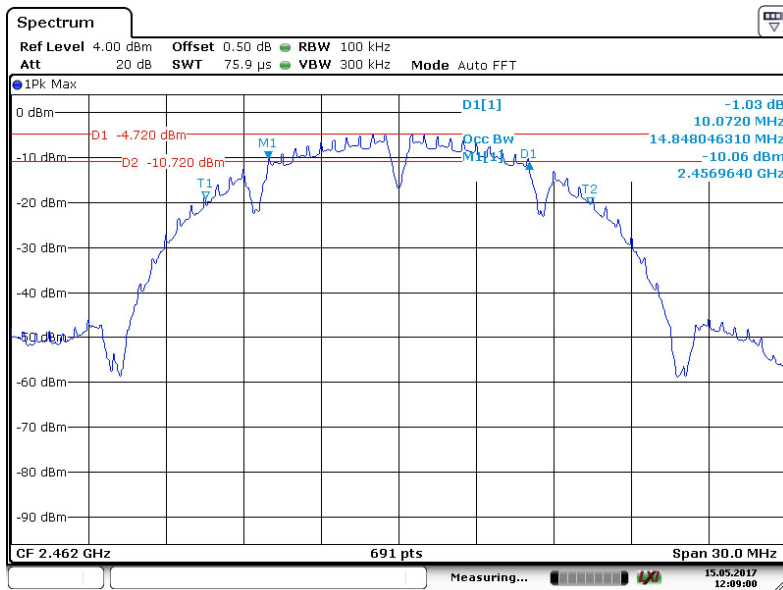
Date: 15.MAY.2017 12:05:15

2412MHz



Date: 15.MAY.2017 12:06:55

2437MHz

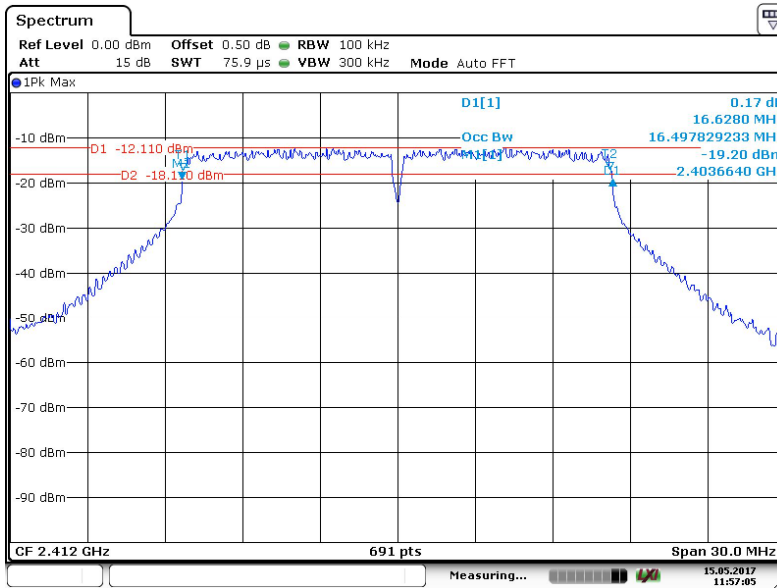


Date: 15.MAY.2017 12:09:00

2462MHz

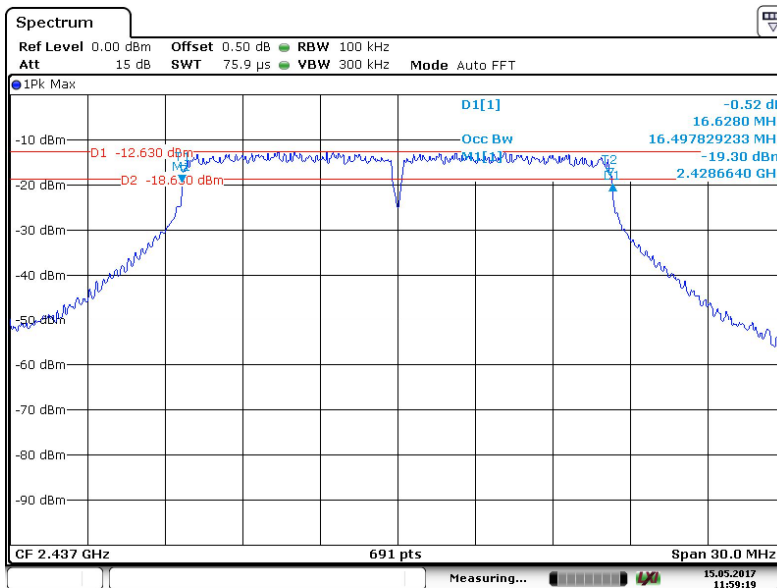
802.11g

Frequency MHz	6dB bandwidth MHz	99% Bandwidth MHz	Result
Low channel 2412MHz	16.628	16.4978	Pass
Middle channel 2437MHz	16.628	16.4978	Pass
High channel 2462MHz	16.628	16.4978	Pass



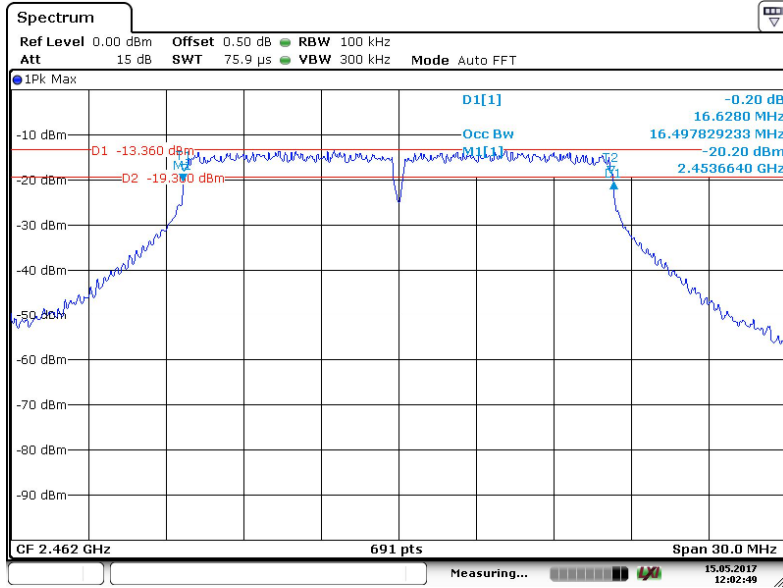
Date: 15.MAY.2017 11:57:06

2412MHz



Date: 15.MAY.2017 11:59:19

2437MHz

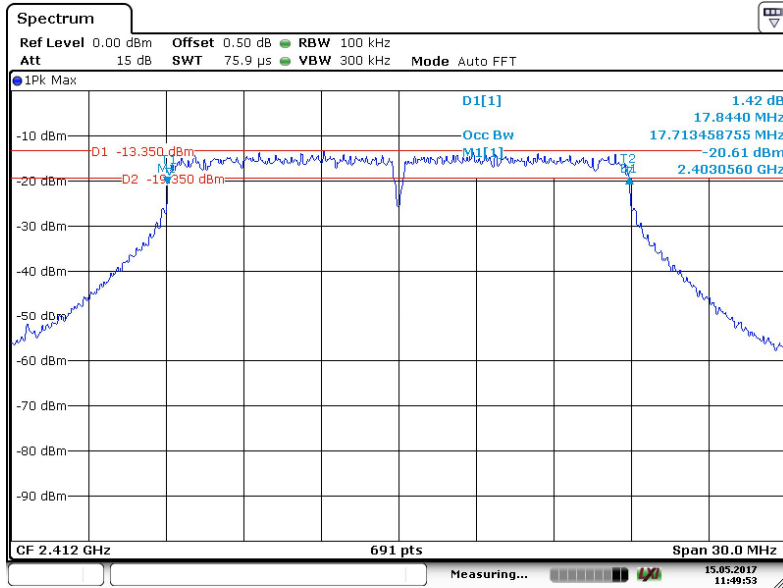


Date: 15.MAY.2017 12:02:49

2462MHz

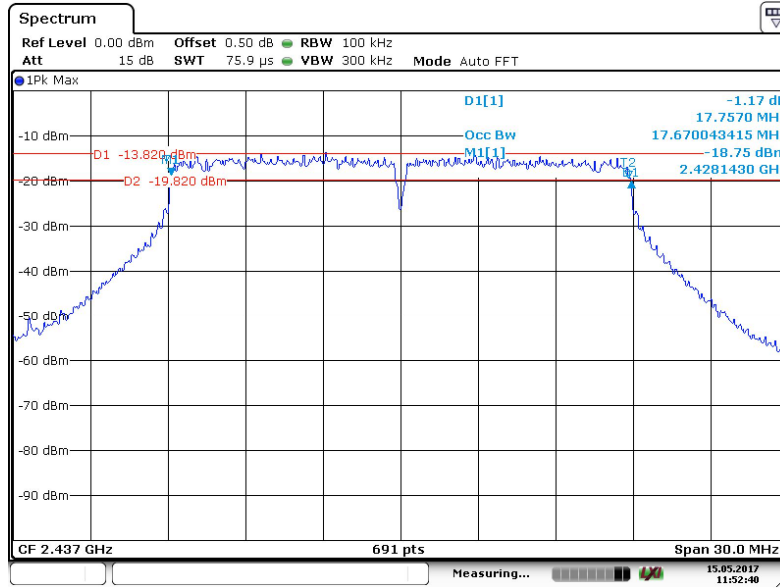
802.11n20

Frequency MHz	6dB bandwidth MHz	99% Bandwidth MHz	Result
Low channel 2412MHz	17.844	17.713	Pass
Middle channel 2437MHz	17.757	17.670	Pass
High channel 2462MHz	17.844	17.7568	Pass



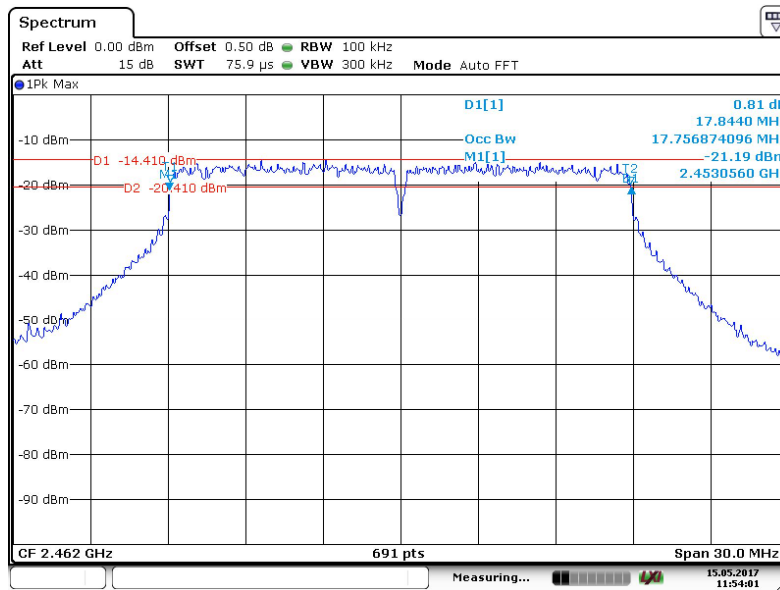
Date: 15.MAY.2017 11:49:53

2412MHz



Date: 15.MAY.2017 11:52:40

2437MHz



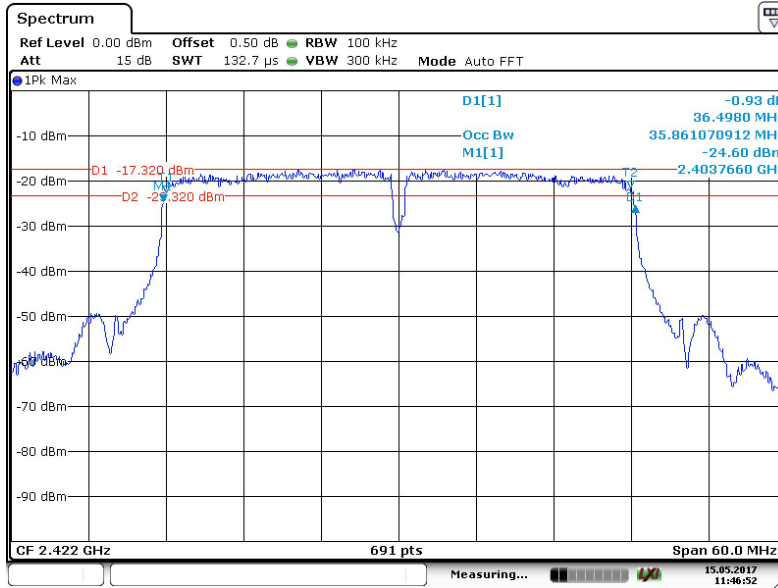
Date: 15.MAY.2017 11:54:01

2462MHz



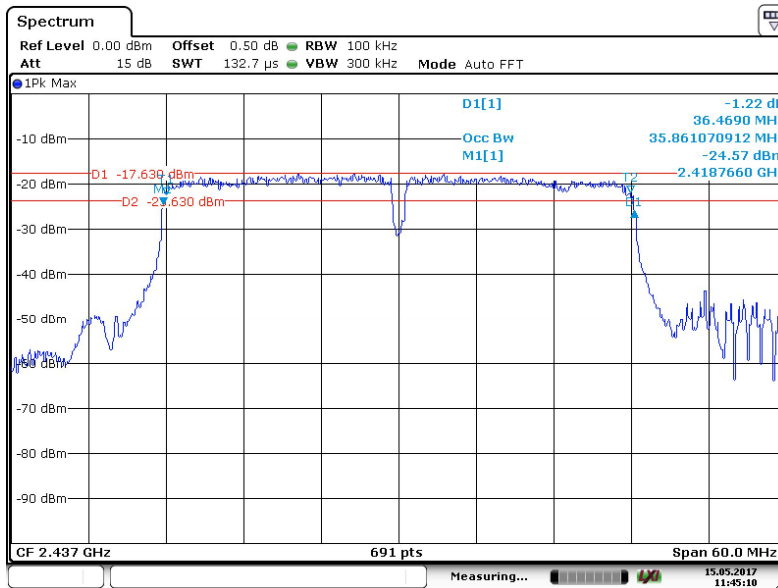
802.11n40

Frequency MHz	6dB bandwidth MHz	99% Bandwidth MHz	Result
Low channel 2412MHz	36.498	35.861	Pass
Middle channel 2437MHz	36.469	35.861	Pass
High channel 2462MHz	36.469	35.861	Pass



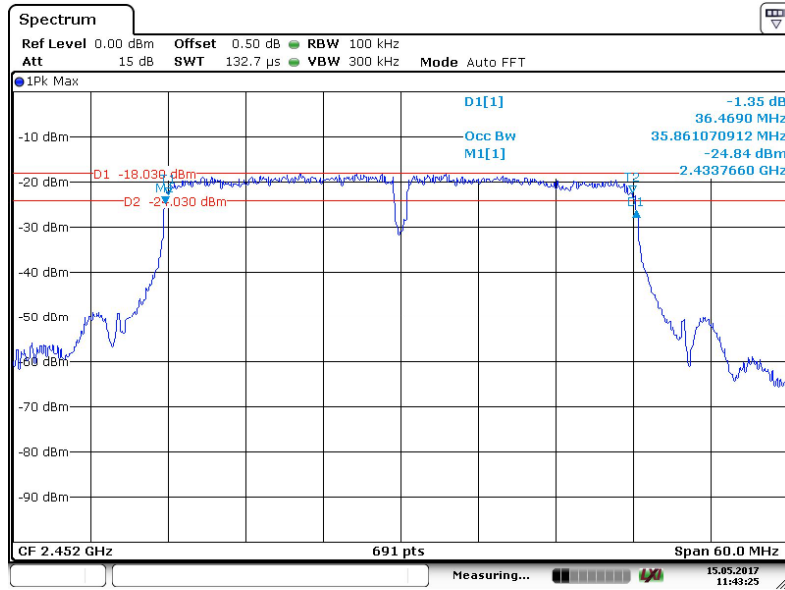
Date: 15.MAY.2017 11:46:52

2422MHz



Date: 15.MAY.2017 11:45:11

2437MHz



Date: 15.MAY.2017 11:43:25

2452MHz

## 9.4 Power spectral density

### Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency.  
RBW=3kHz,VBW≥3RBW,Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

### Limit

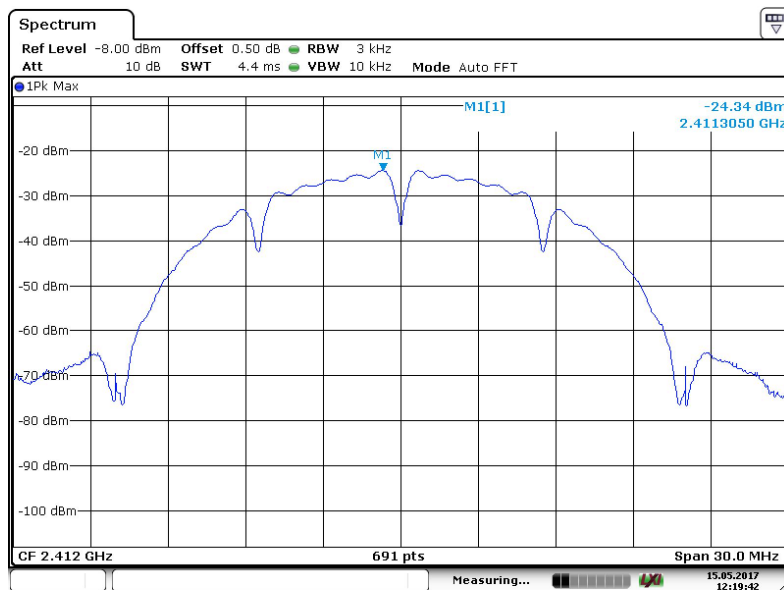
Limit [dBm]

≤8

### Test result

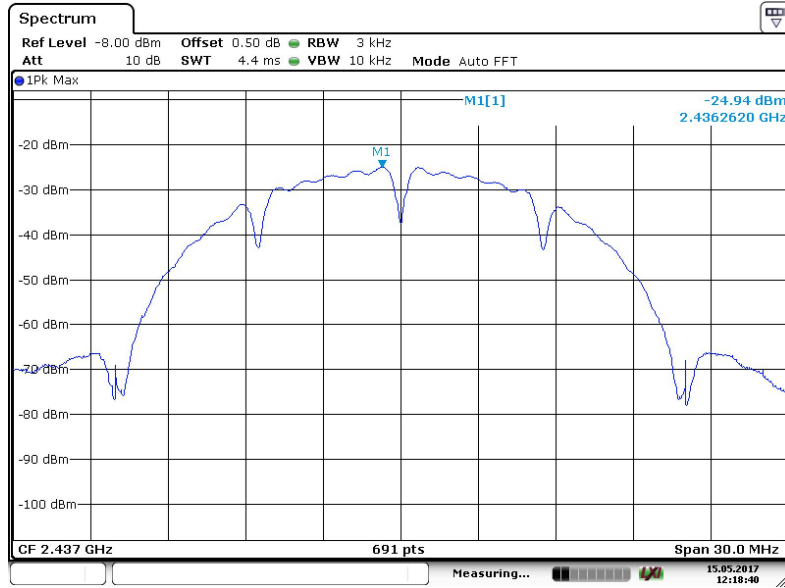
802.11b

Frequency MHz	Power spectral density dBm	Result
Low channel 2412MHz	-24.34	Pass
Middle channel 2437MHz	-24.94	Pass
High channel 2462MHz	-25.72	Pass



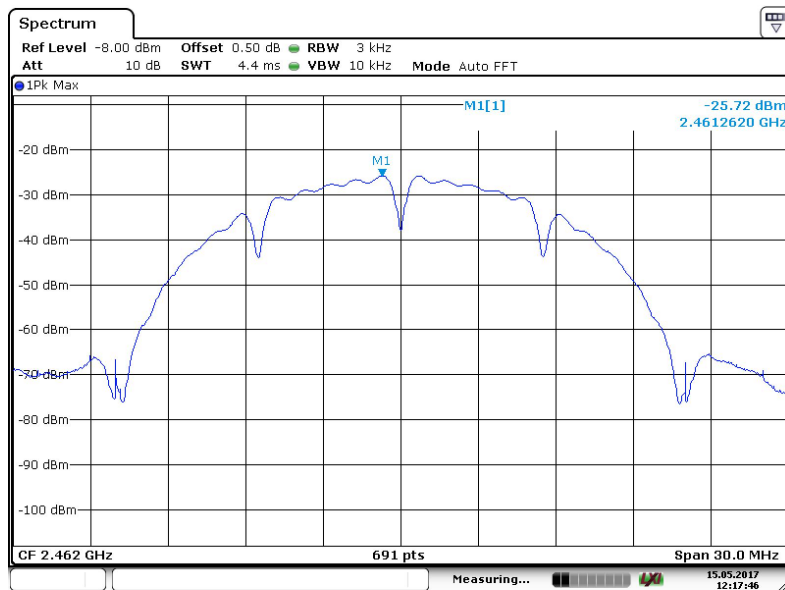
Date: 15.MAY.2017 12:19:42

2412MHz



Date: 15.MAY.2017 12:18:40

2437MHz



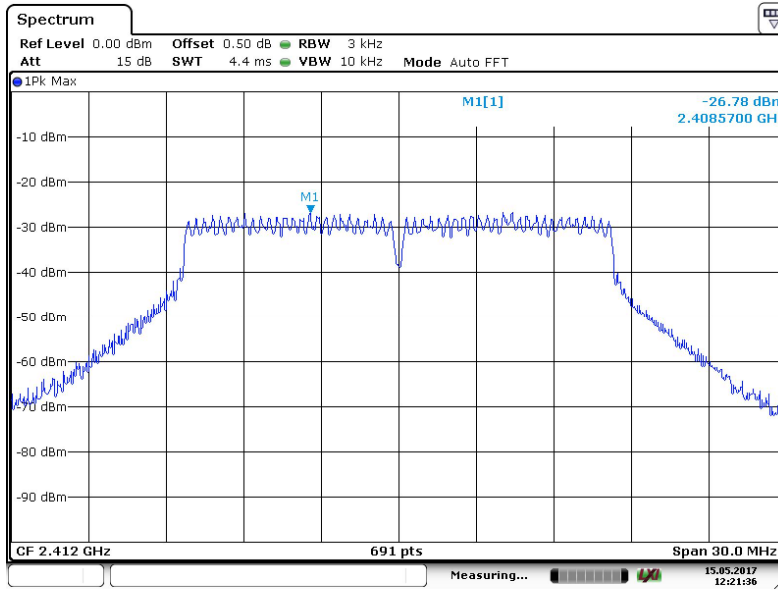
Date: 15.MAY.2017 12:17:47

2462MHz



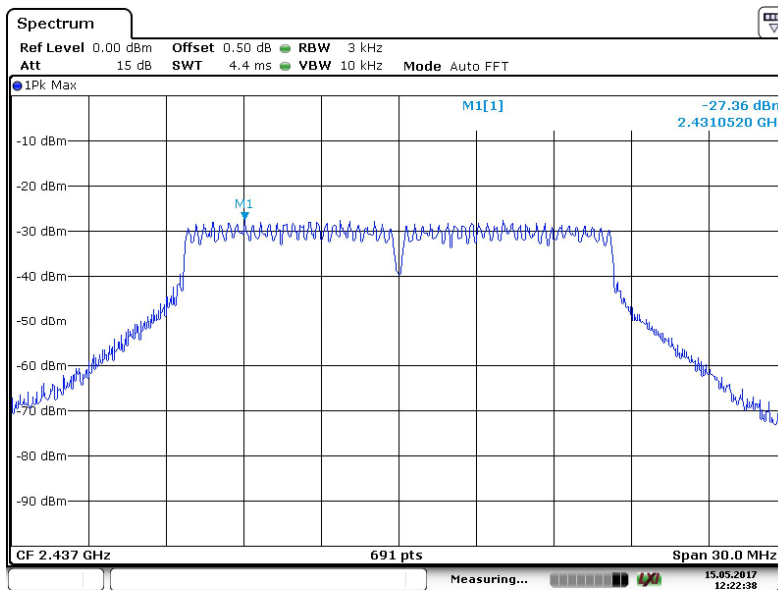
802.11g

Frequency MHz	Power spectral density dBm	Result
Low channel 2412MHz	-26.78	Pass
Middle channel 2437MHz	-27.36	Pass
High channel 2462MHz	-27.94	Pass



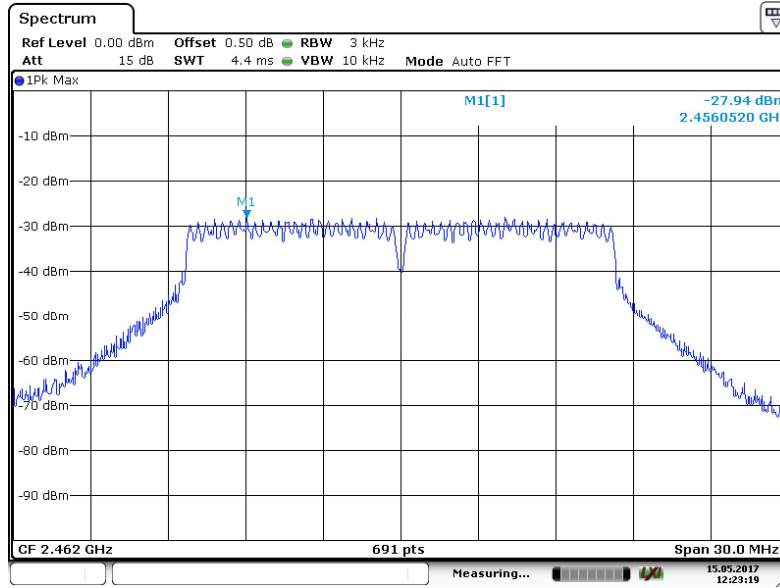
Date: 15.MAY.2017 12:21:36

2412MHz



Date: 15.MAY.2017 12:22:38

2437MHz

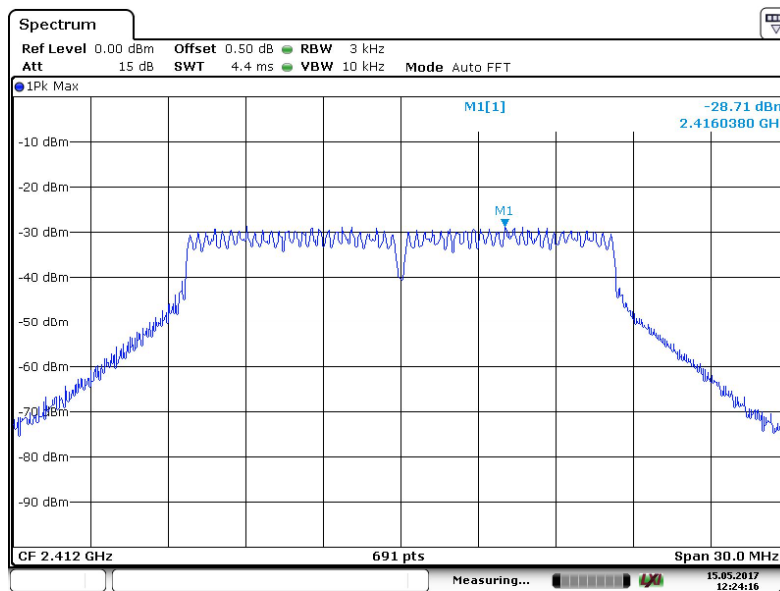


Date: 15.MAY.2017 12:23:19

2462MHz

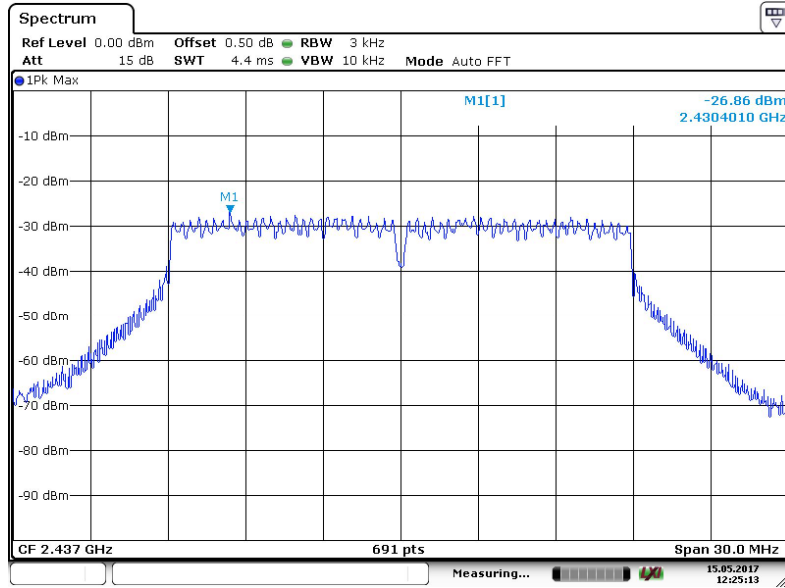
802.11n20

Frequency MHz	Power spectral density dBm	Result
Low channel 2412MHz	-28.71	Pass
Middle channel 2437MHz	-26.86	Pass
High channel 2462MHz	-27.48	Pass



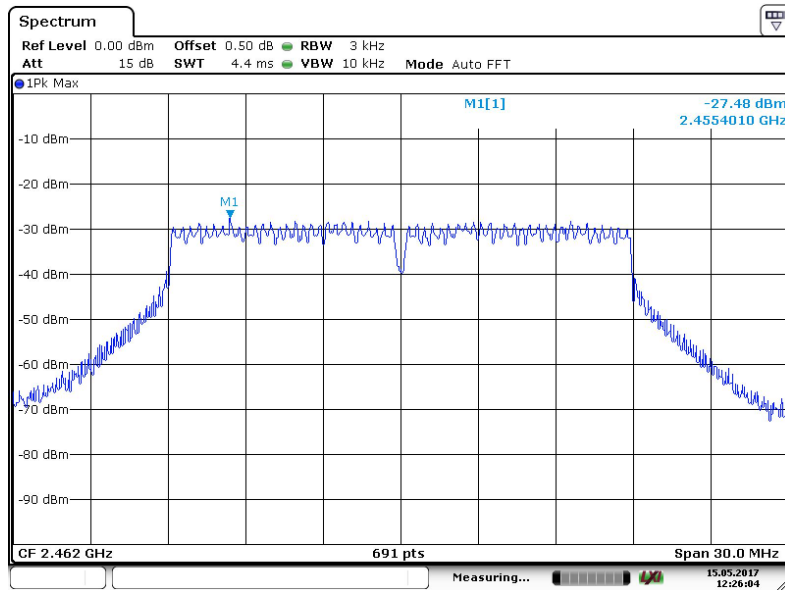
Date: 15.MAY.2017 12:24:15

2412MHz



Date: 15.MAY.2017 12:25:13

2437MHz



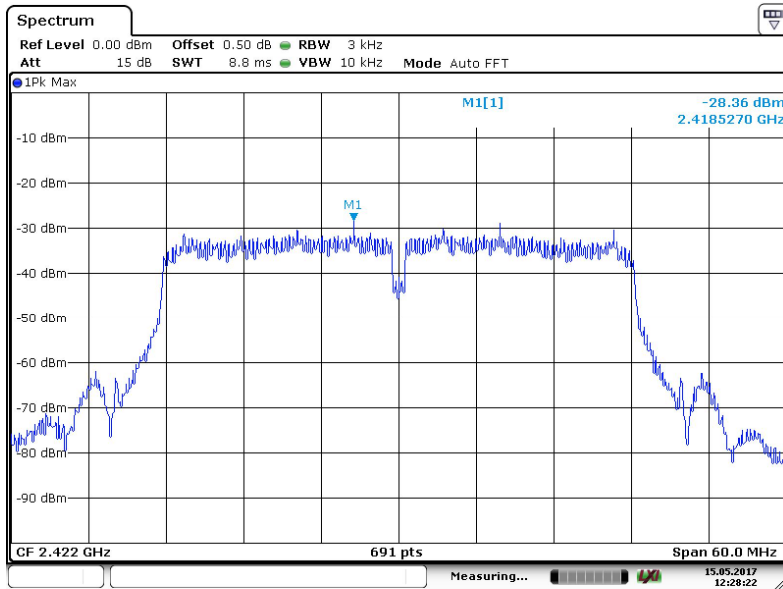
Date: 15.MAY.2017 12:26:05

2462MHz



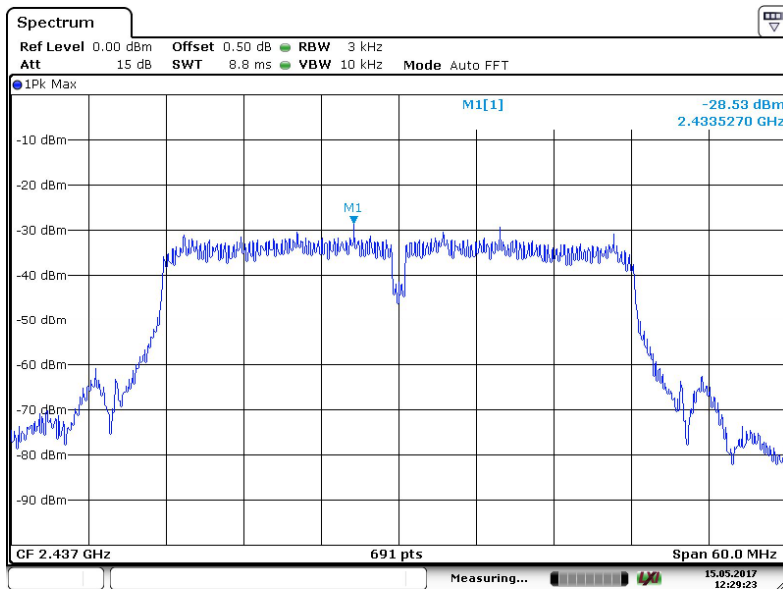
802.11n40

Frequency MHz	Power spectral density dBm	Result
Low channel 2412MHz	-28.36	Pass
Middle channel 2437MHz	-28.53	Pass
High channel 2462MHz	-28.97	Pass



Date: 15.MAY.2017 12:28:22

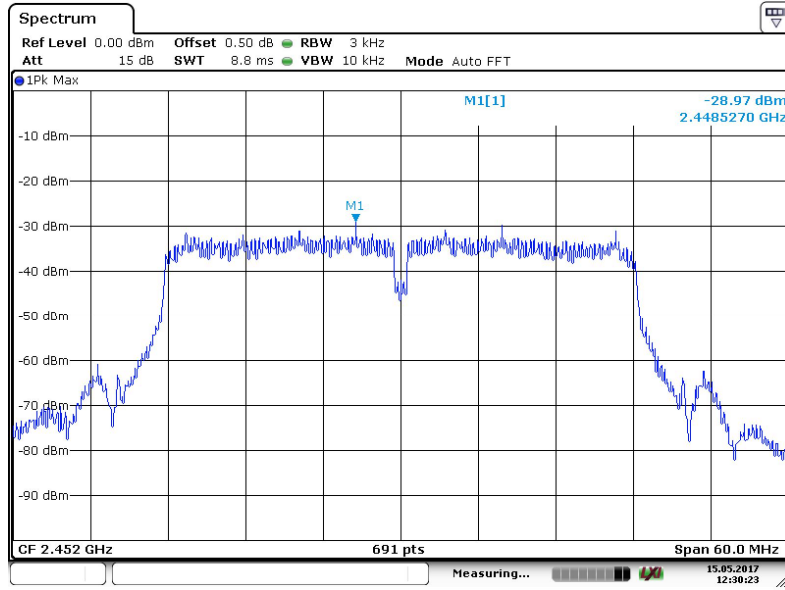
2422MHz



Date: 15.MAY.2017 12:29:23

2437MHz





Date: 15.MAY.2017 12:30:23

2452MHz



## 9.5 Spurious RF conducted emissions

### Test Method

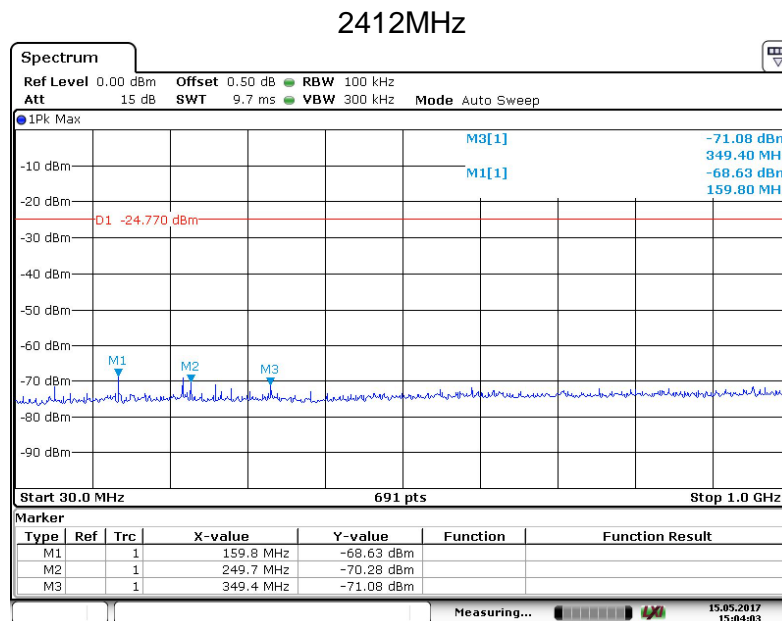
1. Establish a reference level by using the following procedure:
  - a. Set RBW=100 kHz. VBW≥3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
  - b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
  - a. Set the center frequency and span to encompass frequency range to be measured.
  - b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

### Limit

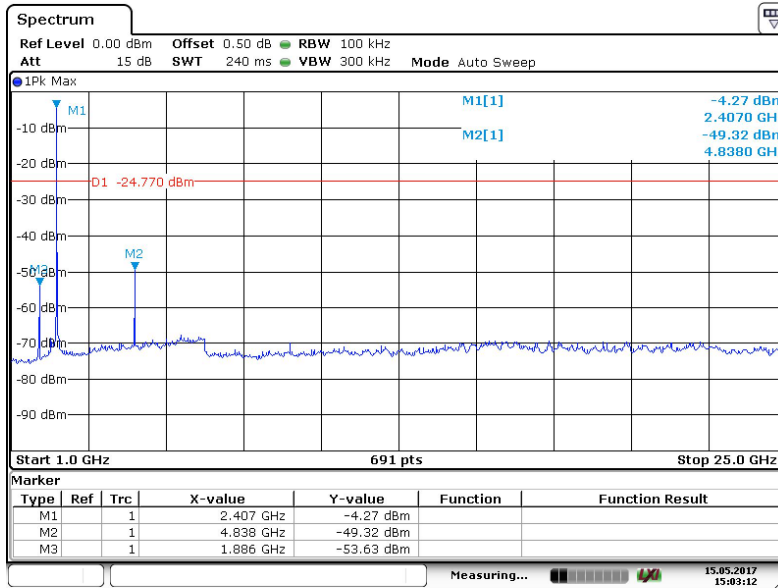
Frequency Range MHz	Limit (dBc)
30-25000	-20

## Spurious RF conducted emissions

802.11b

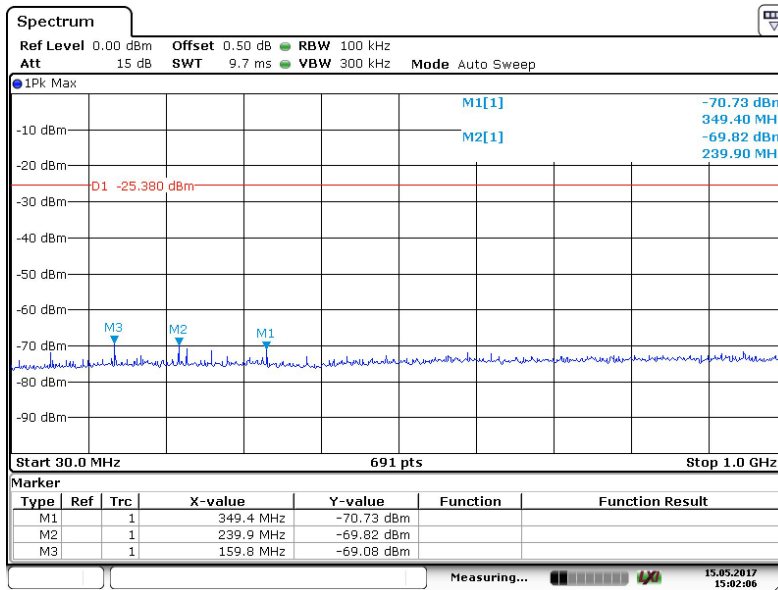


Date: 15.MAY.2017 15:04:03

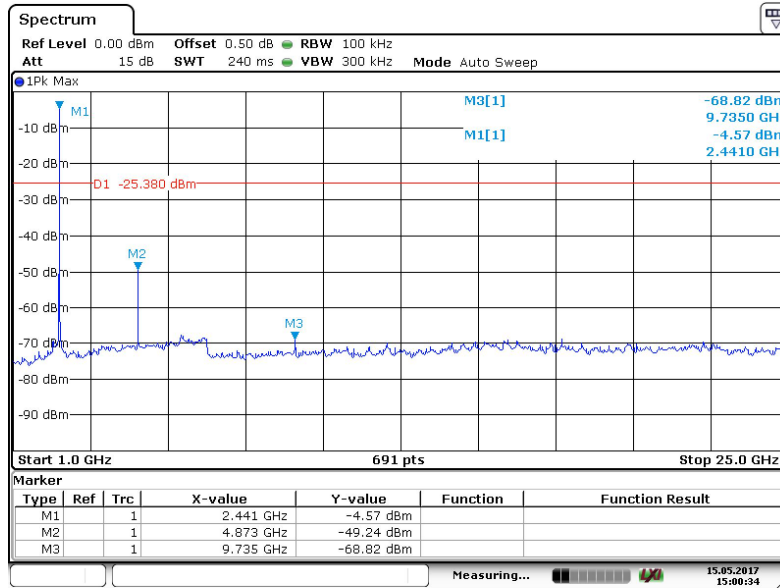


Date: 15.MAY.2017 15:03:12

### 2437MHz

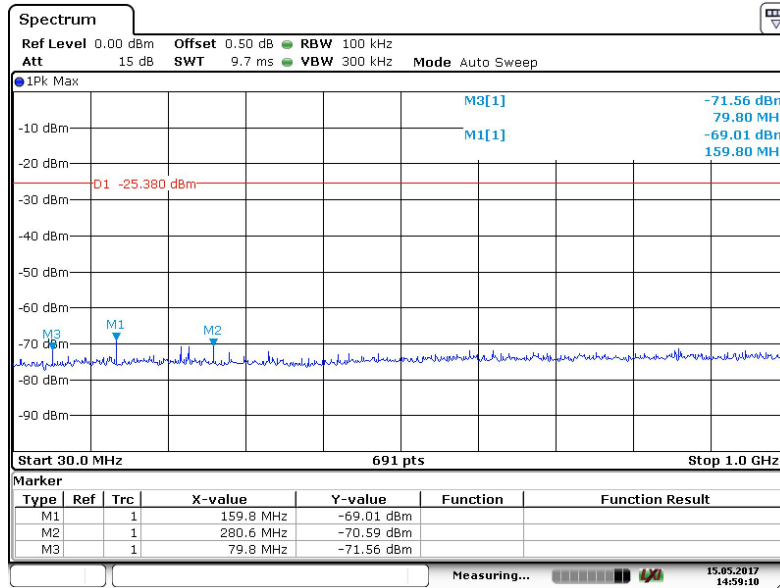


Date: 15.MAY.2017 15:02:06

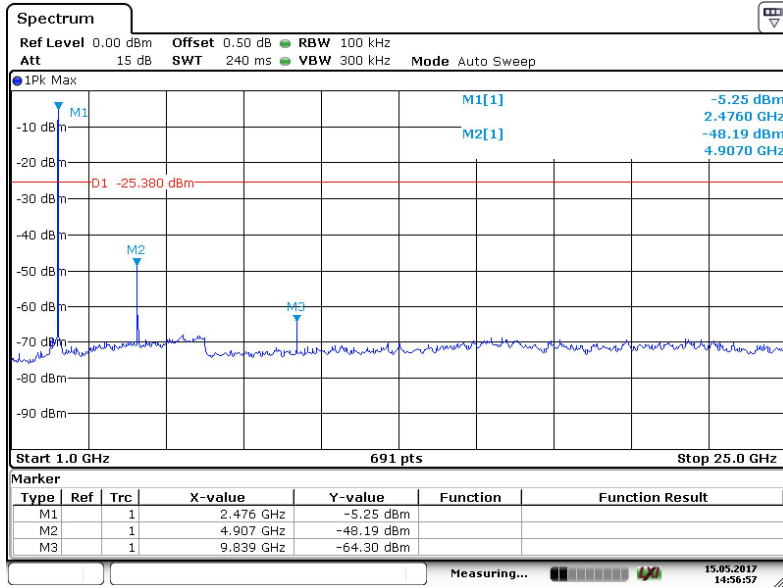


Date: 15.MAY.2017 15:00:34

### 2462MHz



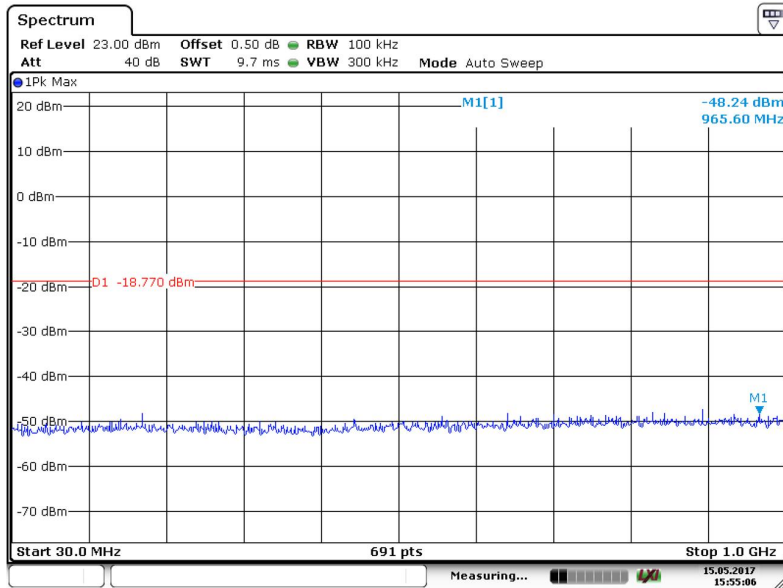
Date: 15.MAY.2017 14:59:10



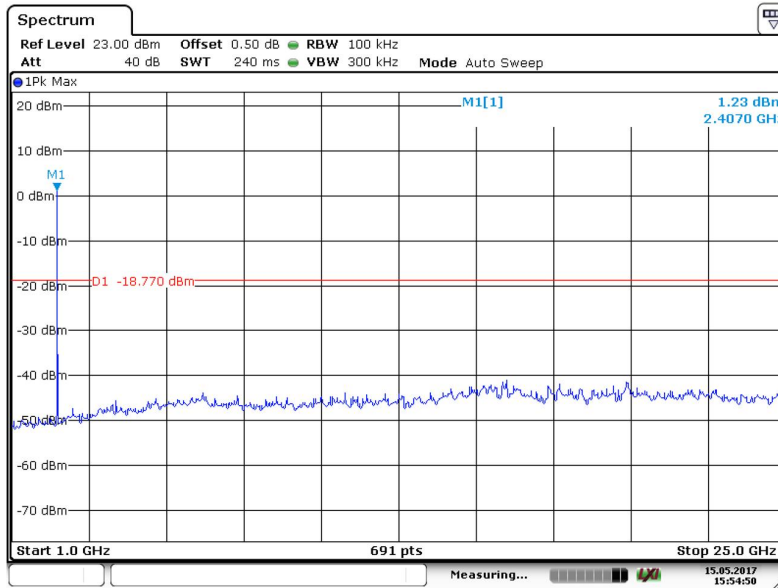
Date: 15.MAY.2017 14:56:57

802.11g

2412MHz

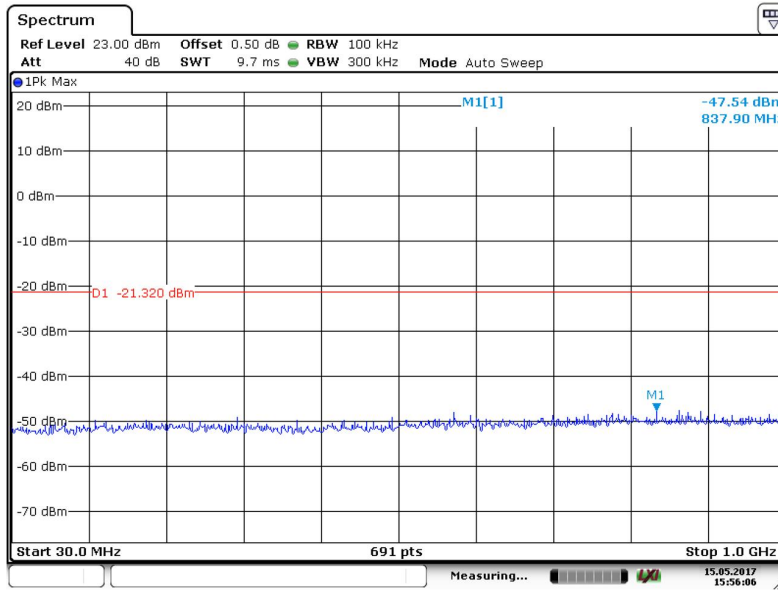


Date: 15.MAY.2017 15:55:06

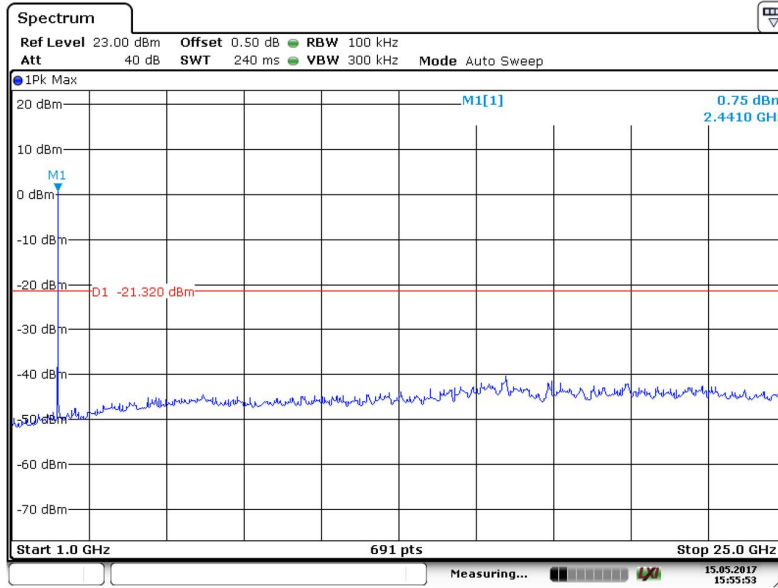


Date: 15.MAY.2017 15:54:50

### 2437MHz

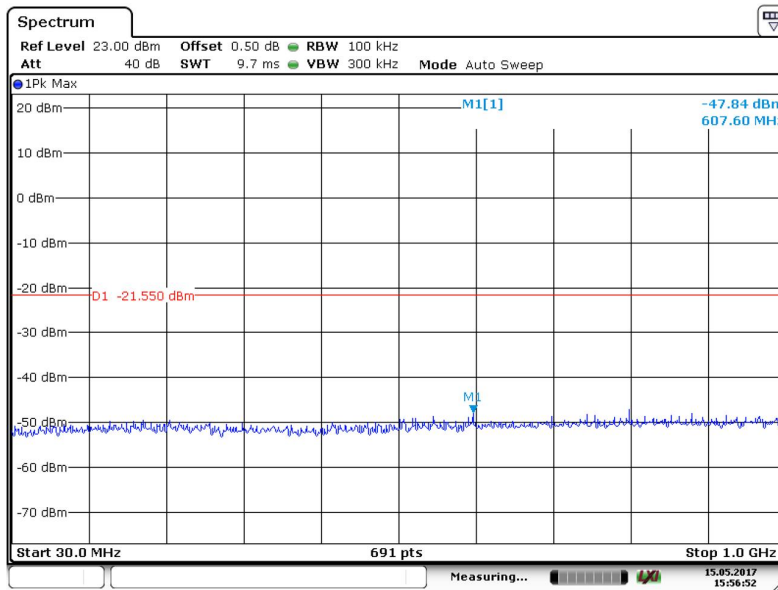


Date: 15.MAY.2017 15:56:06

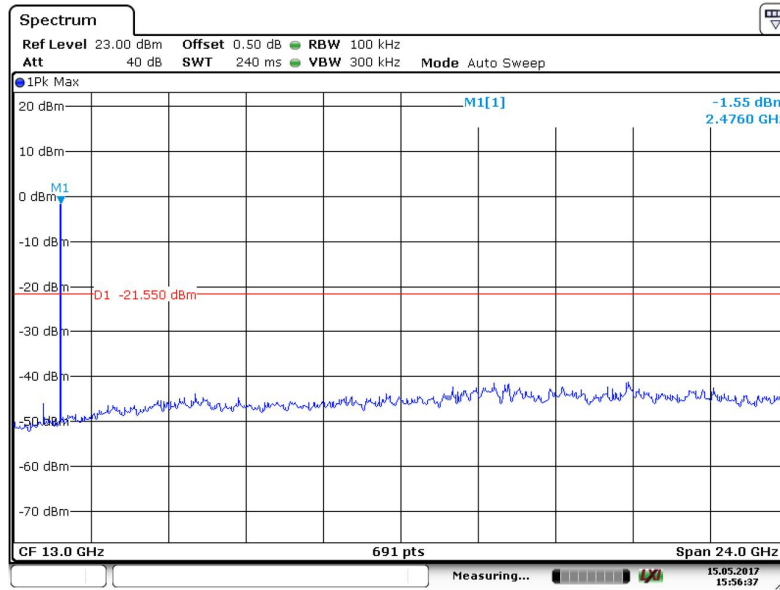


Date: 15.MAY.2017 15:55:53

### 2462MHz



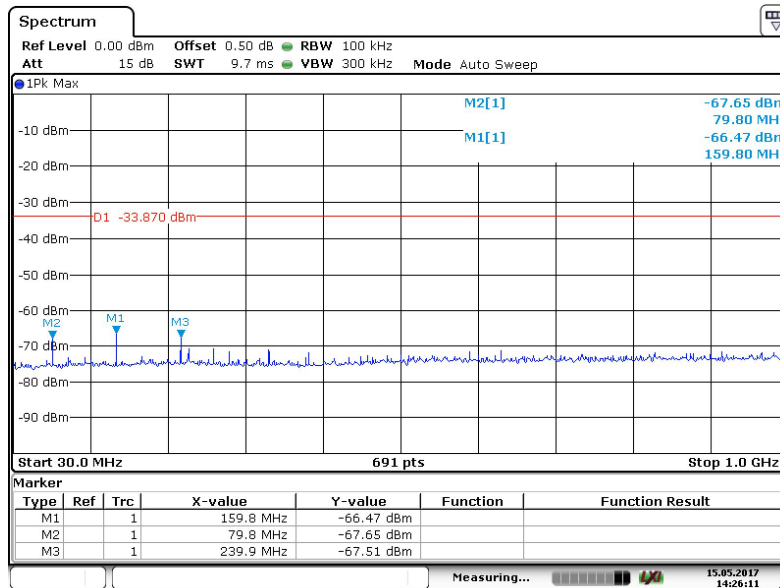
Date: 15.MAY.2017 15:56:52



Date: 15.MAY.2017 15:56:38

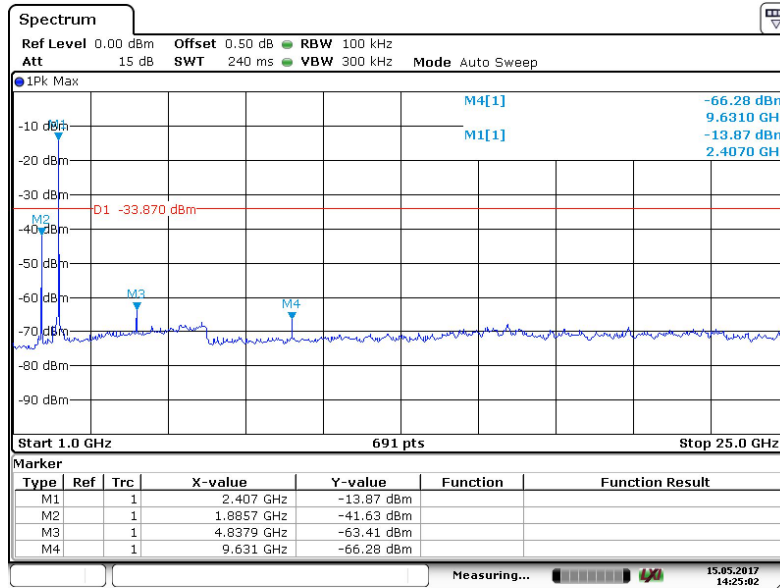
802.11n20

2412MHz



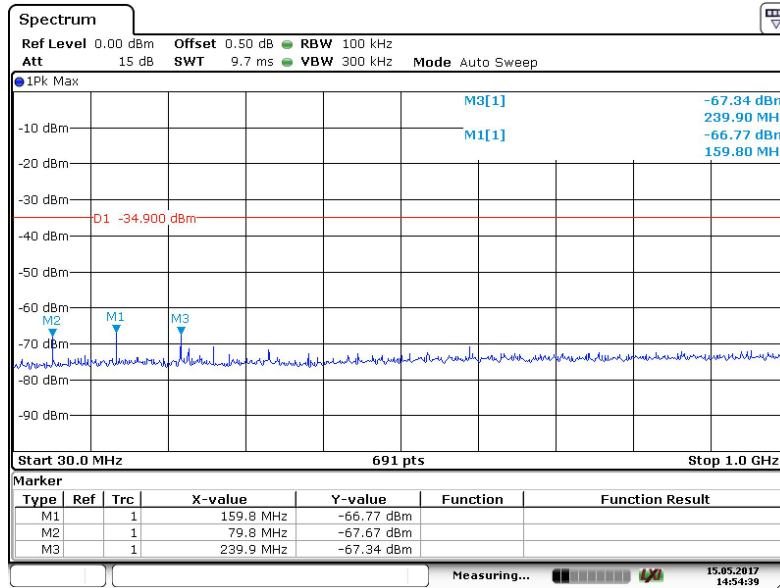
Date: 15.MAY.2017 14:26:11



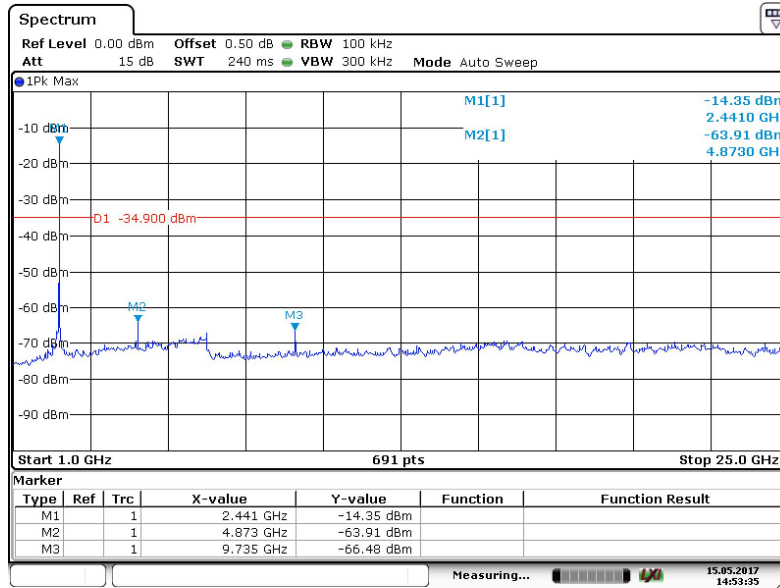


Date: 15.MAY.2017 14:25:02

### 2437MHz

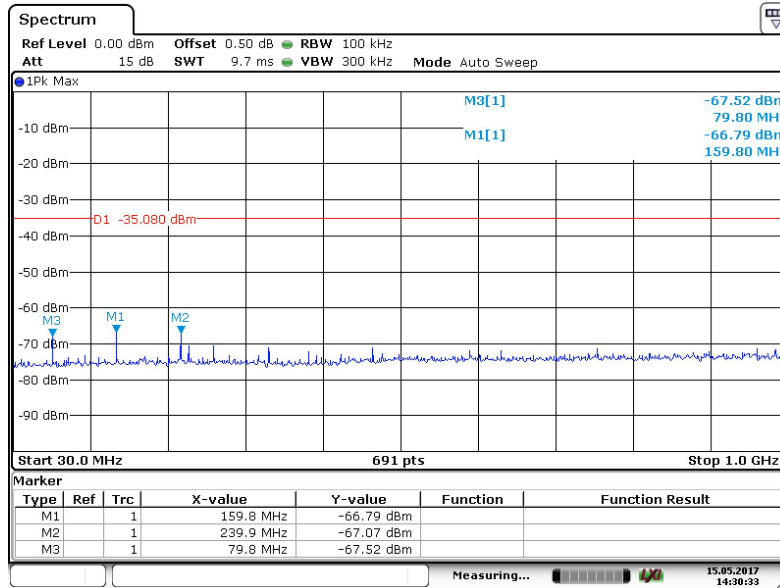


Date: 15.MAY.2017 14:54:39

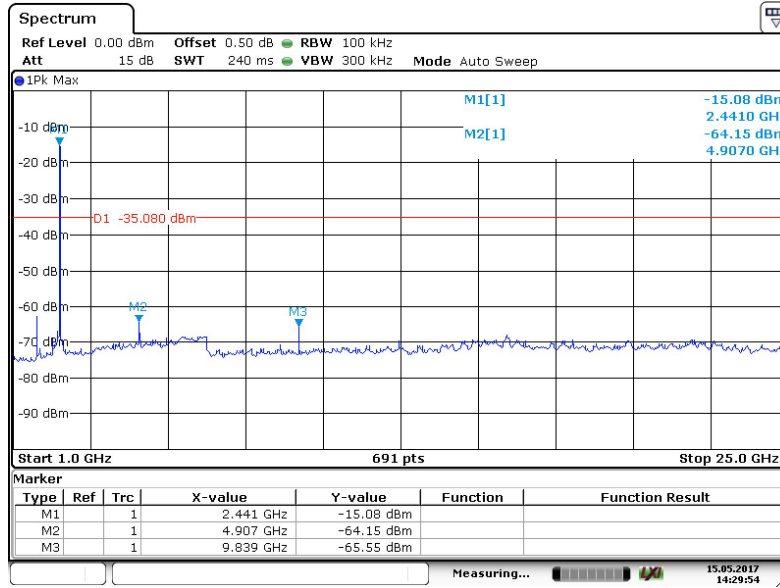


Date: 15.MAY.2017 14:53:35

### 2462MHz



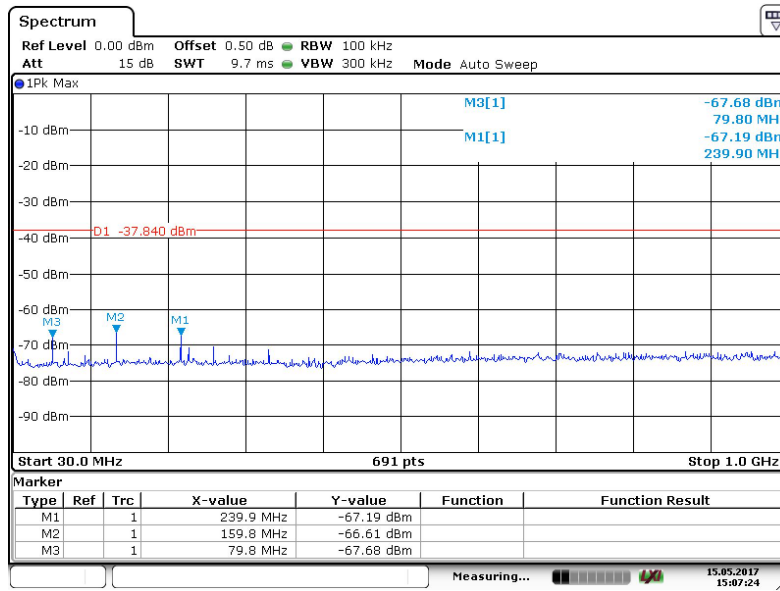
Date: 15.MAY.2017 14:30:34



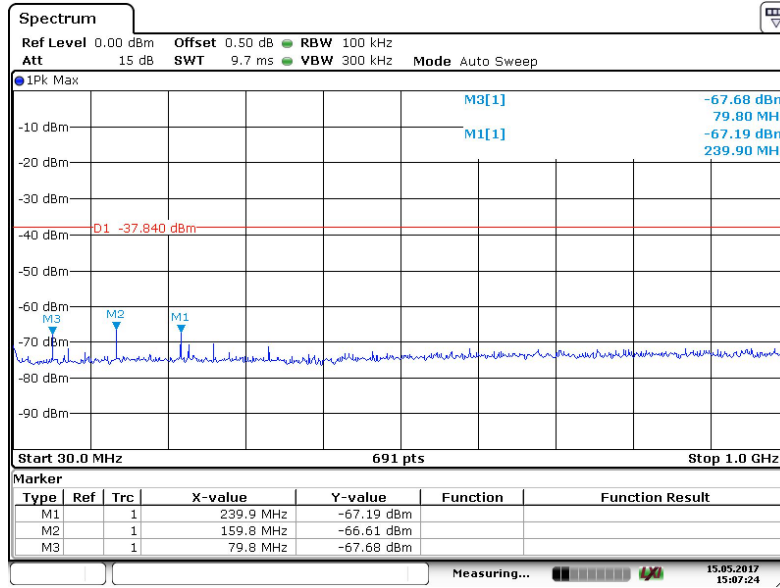
Date: 15.MAY.2017 14:29:54

802.11n40

2422MHz

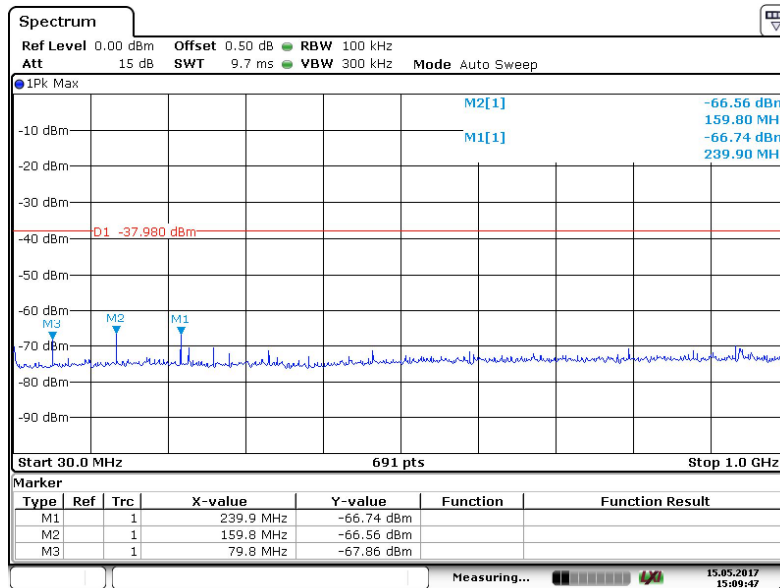


Date: 15.MAY.2017 15:07:23

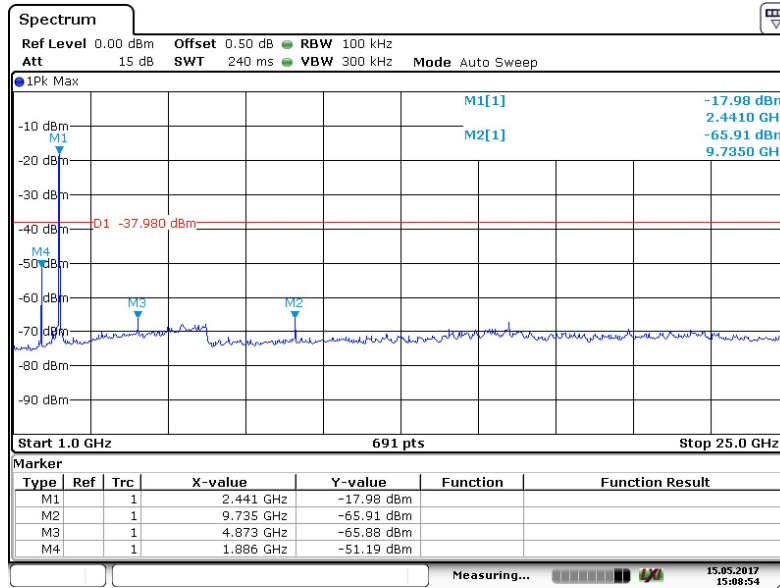


Date: 15.MAY.2017 15:07:23

2437MHz

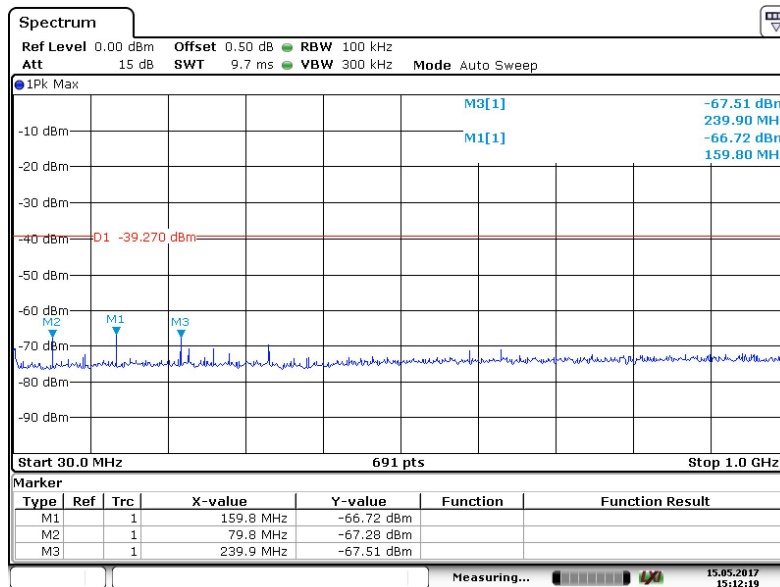


Date: 15.MAY.2017 15:09:47

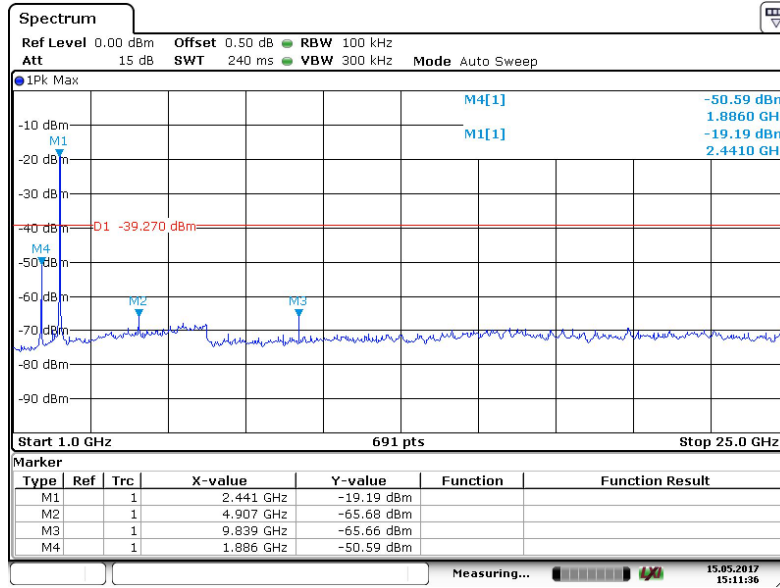


Date: 15.MAY.2017 15:08:54

### 2452MHz



Date: 15.MAY.2017 15:12:19



Date: 15.MAY.2017 15:11:37

## 9.6 Band edge

### Test Method

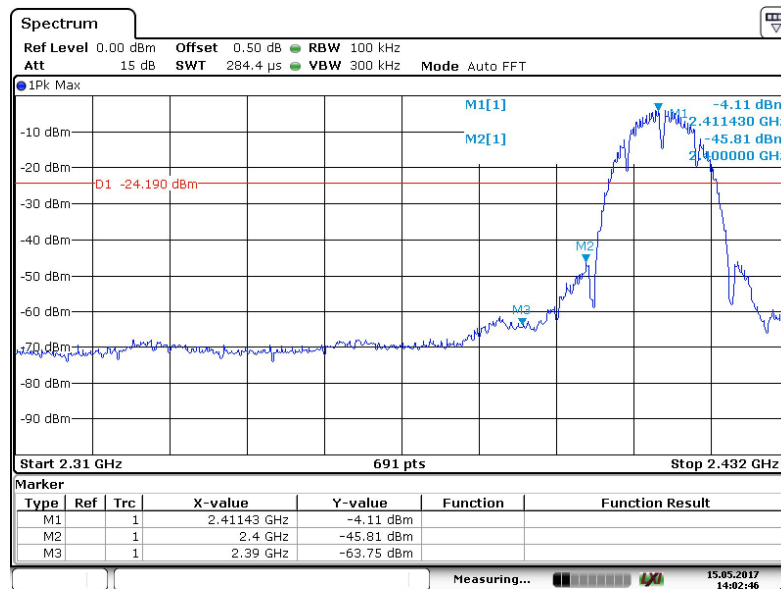
- 1 Use the following spectrum analyzer settings:  
Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 100 kHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold.
- 2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
- 3 The level displayed must comply with the limit specified in this Section.

### Limit

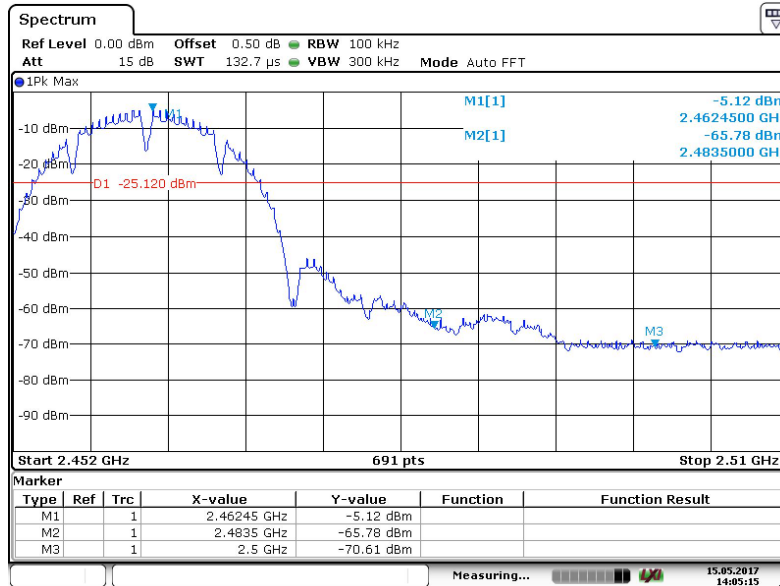
In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) and RSS-Gen8.10, must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)) and RSS-Gen.

### Test result

#### 802.11b

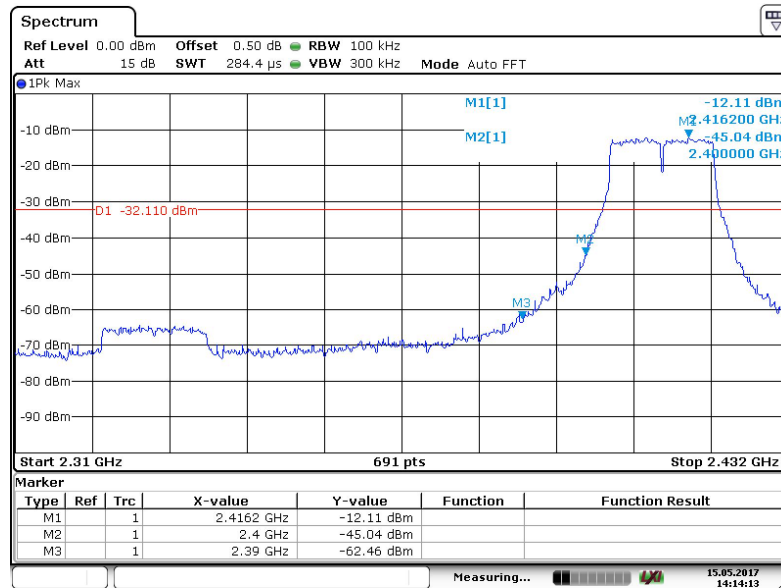


Date: 15.MAY.2017 14:02:47



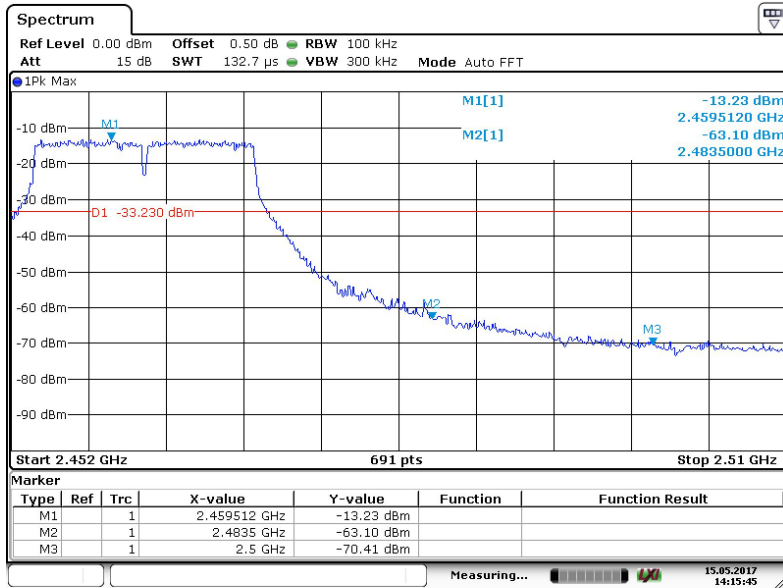
Date: 15.MAY.2017 14:05:16

**802.11g**



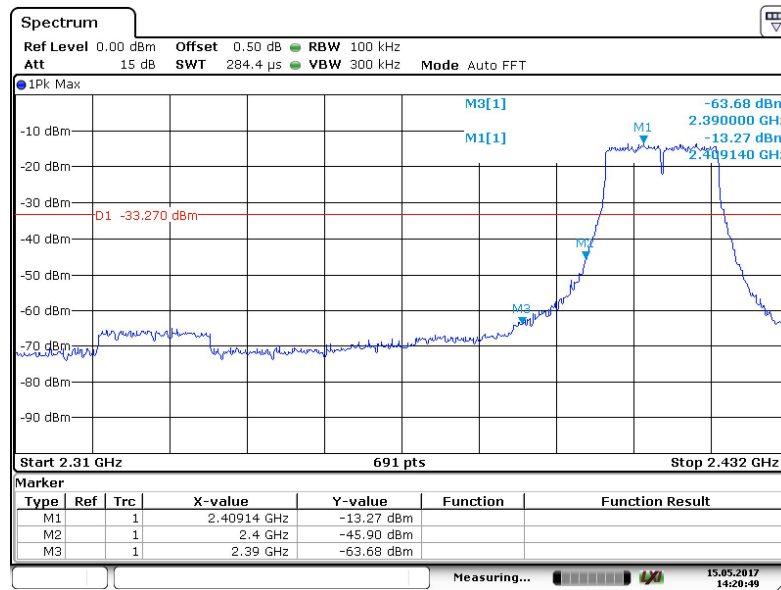
Date: 15.MAY.2017 14:14:13



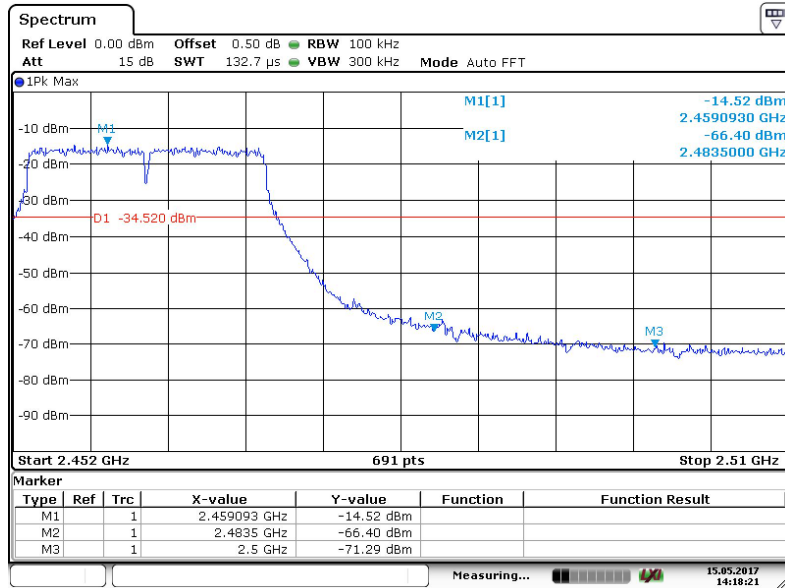


Date: 15.MAY.2017 14:15:45

**802.11n20**

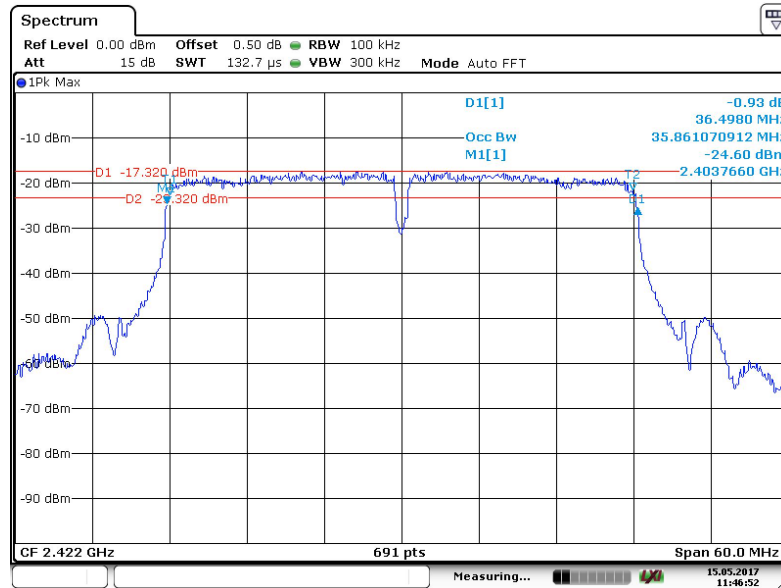


Date: 15.MAY.2017 14:20:49

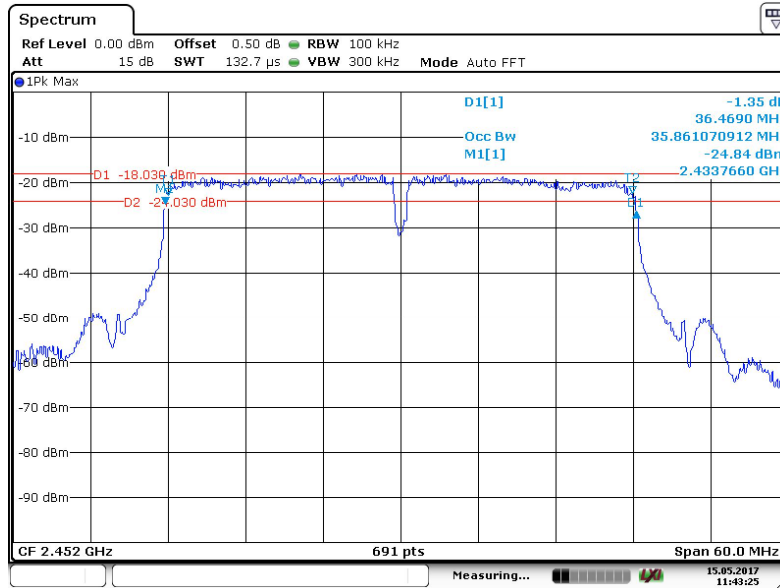


Date: 15.MAY.2017 14:18:21

**802.11n40**



Date: 15.MAY.2017 11:46:52



Date: 15.MAY.2017 11:43:25

## 9.7 Spurious radiated emissions for transmitter

### Test Method

- 1: The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
- 3: The height of antenna 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5: Use the following spectrum analyzer settings According to C63.10:

#### For Above 1GHz

Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 1MHz, VBW $\geq$ RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.

#### For Below 1GHz

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious  
RBW = 100 KHz, VBW $\geq$ RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

### Note:

- 1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
- 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ( $20\log(1/\text{duty cycle})$ ).
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.



**Limit**

The radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

## Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

**Transmitting spurious emission test result as below is the WORST case for all Test Modes and Channels:**

### 802.11b:

2412MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Margin dBuV/m	Result
933.56	33.31	Horizontal	46.00	PK	12.69	Pass
54.98	30.81	Vertical	40	PK	9.19	Pass
14954.06	48.52	Horizontal	74.00	PK	25.48	Pass
15215.16	46.75	Vertical	74.00	PK	27.25	Pass

2437MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Margin dBuV/m	Result
933.56	33.31	Horizontal	46.00	PK	12.69	Pass
54.98	30.81	Vertical	40	PK	9.19	Pass
14995.78	47.43	Horizontal	74.00	PK	26.57	Pass
15019.22	47.19	Vertical	74.00	PK	26.81	Pass

2462MHz

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Margin dBuV/m	Result
933.56	33.31	Horizontal	46.00	PK	12.69	Pass
54.98	30.81	Vertical	40	PK	9.19	Pass
15822.66	47.99	Horizontal	74.00	PK	26.01	Pass
4923.75	49.57	Vertical	74.00	PK	24.43	Pass

Remark:

- (1) Data of measurement within 30-1000MHz frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.
- (2) "\*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.



## 10 Test Equipment List

### List of Test Instruments

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
C	Signal Generator	Rohde & Schwarz	SMB100A	108272	2017-7-15
	Signal Analyzer	Rohde & Schwarz	FSV40	101030	2017-7-15
	Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2017-7-15
	RF Switch Module	Rohde & Schwarz	OSP120/OS P-B157	101226/100851	2017-7-15
RE	EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2017-7-15
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2017-8-3
	Horn Antenna	Rohde & Schwarz	HF907	102294	2017-7-15
	Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2017-7-15
	3m Semi-anechoic chamber	TDK	9X6X6	----	2019-5-29

**C - Conducted RF tests**

- Conducted peak output power
- 6dB bandwidth and 99% Occupied Bandwidth
- Power spectral density\*
- Spurious RF conducted emissions
- Band edge



## 11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.98dB; Vertical: 5.06dB;
Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.95dB; Vertical: 4.94dB;
Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 5.14dB; Vertical: 5.12dB;
Conducted RF test with TS 8997	Power level test involved: 2.06dB Frequency test involved: 1.16x10 <sup>-7</sup>