



FCC/IC - TEST REPORT

Report Number : **68.950.17.0810.01** Date of Issue: March 03, 2018

Model : **MBP164CONNECTBU**

Product Type : Baby Monitor

Applicant : Binatone Electronics International Ltd.

Address : Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong

Production Facility : VTech(Dongguan) Telecommunications Ltd.

Address : VTech Science Park, Xia Ling Bei Management Zone,
Liaobu, 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

FCC Registration Number: 514049

IC Registration Number: 10320A-1

Telephone: 86 755 8828 6998
Fax: 86 755 8828 5299



3 Description of the Equipment under Test

Description of the Equipment Under Test

Product:	Baby Monitor
Model no.:	MBP164CONNECTBU
IC:	4522A-MBP164BU
FCC ID:	VLJ-MBP164BU
Options and accessories:	NIL
Rating:	100 – 240VAC, 50/60Hz, 150mA
RF Transmission Frequency:	2412-2462MHz for 802.11b/g/nHT20 2422-2452MHz for 802.11nHT40
No. of Operated Channel:	11
Modulation:	CCK, DQPSK, DBPSK for 802.11b QPSK,BPSK for 802.11g/n
Antenna Type:	PCB Antenna
Antenna Gain:	1.0dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Baby Monitor with WIFI function operating at 2.4GHz



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
RSS-Gen Issue 4 November 2014	General Requirements for the Certification of Radio Apparatus.
RSS-247 Issue 2 2017	Digital Transmission Systems (DTS), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

All the test methods were according to KDB558074 D01 v4.0 DTS Measurement Guidance and ANSI C63.10 (2013).

5 Summary of Test Results

Technical Requirements					
FCC Part 15 Subpart C/RSS-247 Issue 2/RSS-Gen Issue 4					
Test Condition			Pages	Test Result	Test Site
§15.207	RSS-GEN 8.8	Conducted emission AC power port	10	Pass	Site 1
§15.247(b)(1)	RSS-247 Clause 5.4(2)	Conducted peak output power	13	Pass	Site 1
§15.247(e)	RSS-247 Clause 5.2(2)	Power spectral density*	20	Pass	Site 1
§15.247(a)(2)	RSS-247 Clause 5.2(1)	6dB bandwidth	14	Pass	Site 1
§15.247(a)(1)	RSS-247 Clause 5.1(1)	20dB bandwidth and 99% Occupied Bandwidth	14	Pass	Site 1
§15.247(a)(1)	RSS-247 Clause 5.1(2)	Carrier frequency separation	--	N/A	--
§15.247(a)(1)(iii)	RSS-247 Clause 5.1(4)	Number of hopping frequencies	--	N/A	--
§15.247(a)(1)(iii)	RSS-247 Clause 5.1(4)	Dwell Time	--	N/A	--
§15.247(d)	RSS-247 Clause 5.5	Spurious RF conducted emissions	26	Pass	Site 1
§15.247(d)	RSS-247 Clause 5.5	Band edge	32	Pass	Site 1
§15.247(d) & §15.209 &	RSS-247 Clause 5.5 & RSS-GEN 6.13	Spurious radiated emissions for transmitter and receiver	36	Pass	Site 1
§15.203	RSS-GEN 8.3	Antenna requirement	See note 1	Pass	--

Remark 1: N/A – Not Applicable.

Note 1: The EUT uses a permanently PCB antenna, which gain is 1dBi. According to §15.203, 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: VLJ-MBP164BU, IC: 4522A-MBP164BU, complies with Section 15.207, 15.209, 15.205, 15.247 of the FCC Part 15, Subpart C and RSS 247 and RSS-Gen 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: December 01, 2017

Testing Start Date: December 01, 2017

Testing End Date: January 14, 2018

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

Reviewed by:

Laurent Yuan
EMC Section Engineer



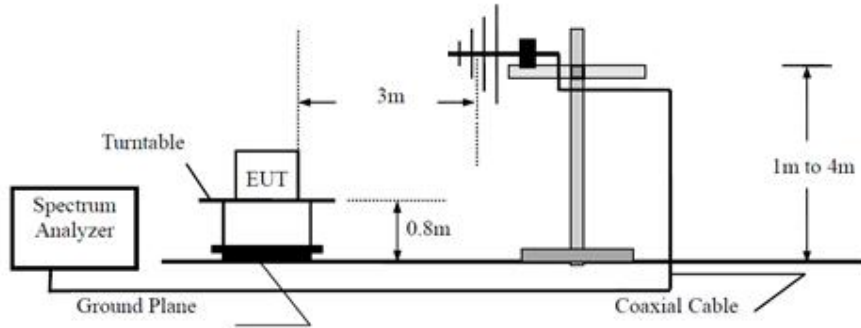
Reviewed by:

Aaron Lai
EMC Project Engineer

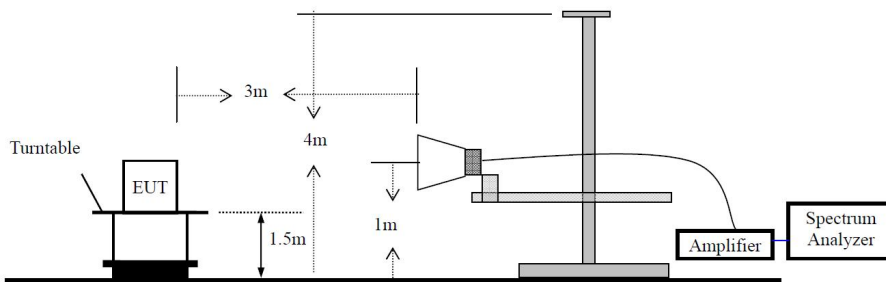
7 Test Setups

7.1 Radiated test setups

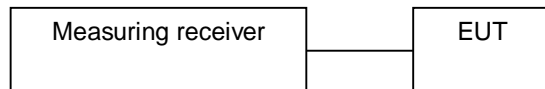
Below 1GHz



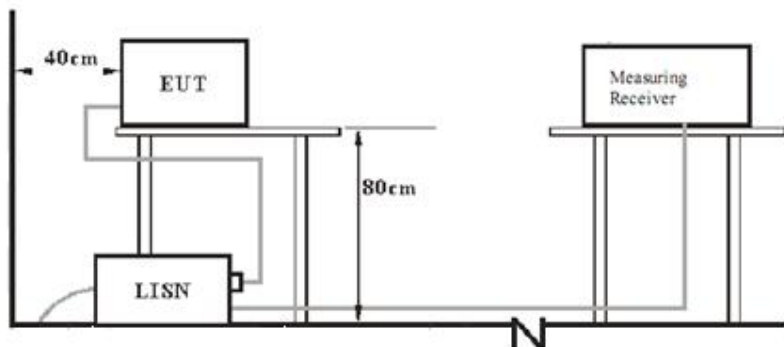
Above 1GHz



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)
---	---	---	---

Test software: RF test tool

The system was configured to channel 1, 6 and 11 for the test.



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

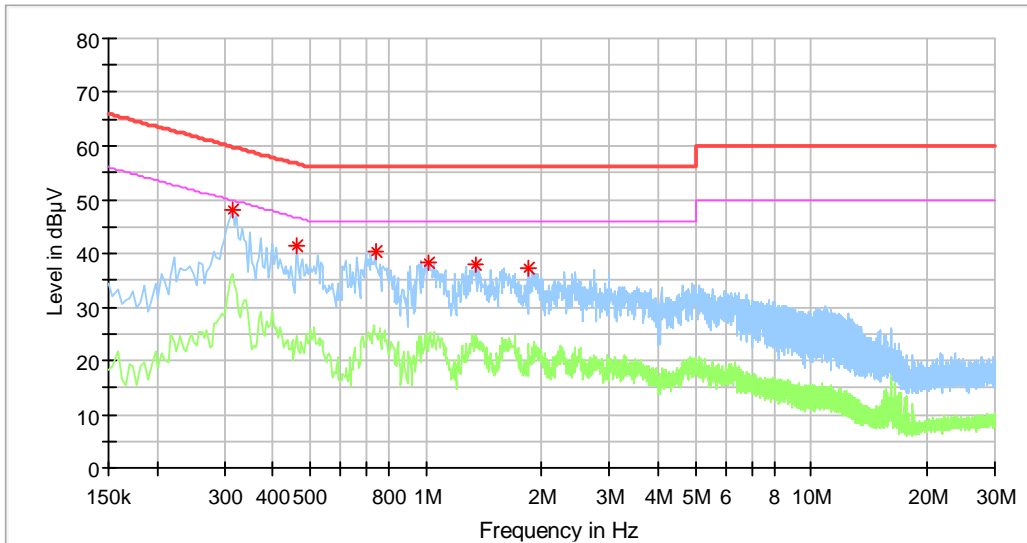
Limit

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 linea

Conducted Emission

Product Type : Baby Monitor
 M/N : MBP164CONNECTBU
 Operating Condition : TX
 Test Specification : Live
 Comment : AC 120V/60Hz

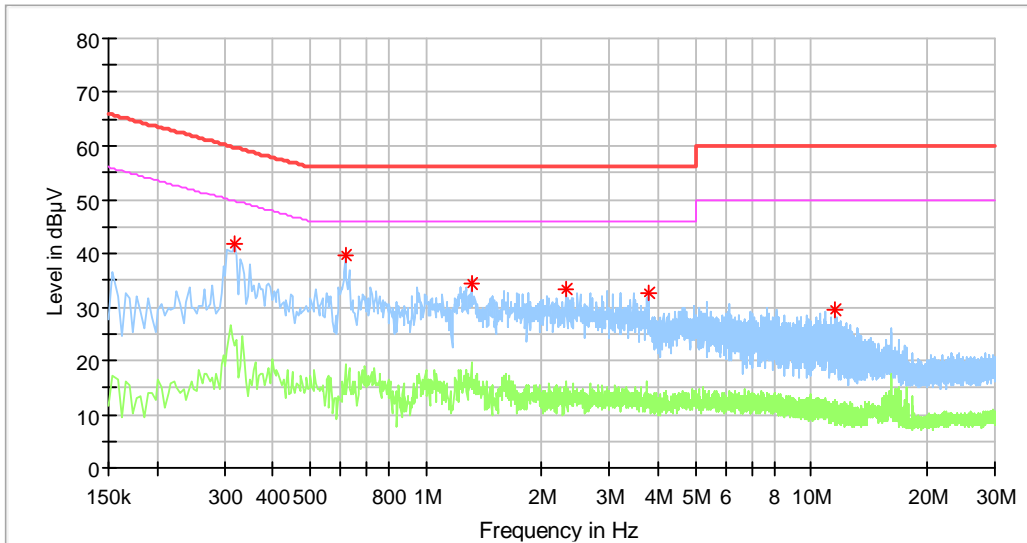


Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.314000	48.16	---	59.86	11.70	L1	10.2
0.462000	41.36	---	56.66	15.30	L1	10.8
0.738000	40.24	---	56.00	15.76	L1	10.2
1.014000	38.28	---	56.00	17.72	L1	10.2
1.338000	37.86	---	56.00	18.14	L1	10.2
1.846000	37.24	---	56.00	18.76	L1	10.3

Remark : “*” Correct factor=cable loss + LISN factor

Conducted Emission

Product Type : Baby Monitor
 M/N : MBP164CONNECTBU
 Operating Condition : TX
 Test Specification : Neutral
 Comment : AC 120V/60Hz



Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.318000	41.77	---	59.76	17.98	N	10.3
0.618000	39.69	---	56.00	16.31	N	10.4
1.310000	34.21	---	56.00	21.79	N	10.4
2.314000	33.20	---	56.00	22.80	N	10.4
3.794000	32.67	---	56.00	23.33	N	10.5
11.582000	29.60	---	60.00	30.40	N	10.9

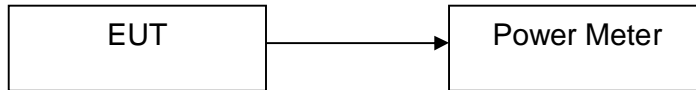
Remark : “*” Correct factor=cable loss + LISN factor

9.2 Conducted Average output power

Test Method

1. Setting the highest output power level of the EUT:
2. Connect to gated RF average power meter.

Test Setup



Limits

According to §15.247 (b) (3), conducted Average output power limit as below:

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

Test result as below table

802.11b

Frequency MHz	Conducted Average Output Power dBm	Result
Top channel 2412MHz	16.8	Pass
Middle channel 2437MHz	16.0	Pass
Bottom channel 2462MHz	15.4	Pass

802.11g

Frequency MHz	Conducted Average Output Power dBm	Result
Top channel 2412MHz	16.5	Pass
Middle channel 2437MHz	16.0	Pass
Bottom channel 2462MHz	15.0	Pass

802.11nHT20

Frequency MHz	Conducted Average Output Power dBm	Result
Top channel 2412MHz	16.3	Pass
Middle channel 2437MHz	15.5	Pass
Bottom channel 2462MHz	14.8	Pass

802.11nHT20

Frequency MHz	Conducted Average Output Power dBm	Result
Top channel 2422MHz	16.3	Pass
Middle channel 2437MHz	15.8	Pass
Bottom channel 2452MHz	15.3	Pass

9.3 6dB bandwidth

Test Method

1. Use the following spectrum analyzer settings:
RBW=100K, VBW \geq 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 \geq 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

Limit

Limit [kHz]

≥ 500

Test result

802.11b

Frequency MHz	99% bandwidth MHz	6dB bandwidth MHz	Result
Bottom channel 2412MHz	14.413	10.072	Pass
Middle channel 2437MHz	14.457	10.029	Pass
Top channel 2462MHz	14.544	10.072	Pass

802.11g

Frequency MHz	99% bandwidth MHz	6dB bandwidth MHz	Result
Bottom channel 2412MHz	16.541	16.368	Pass
Middle channel 2437MHz	16.541	16.320	Pass
Top channel 2462MHz	16.541	16.368	Pass

802.11nHT20

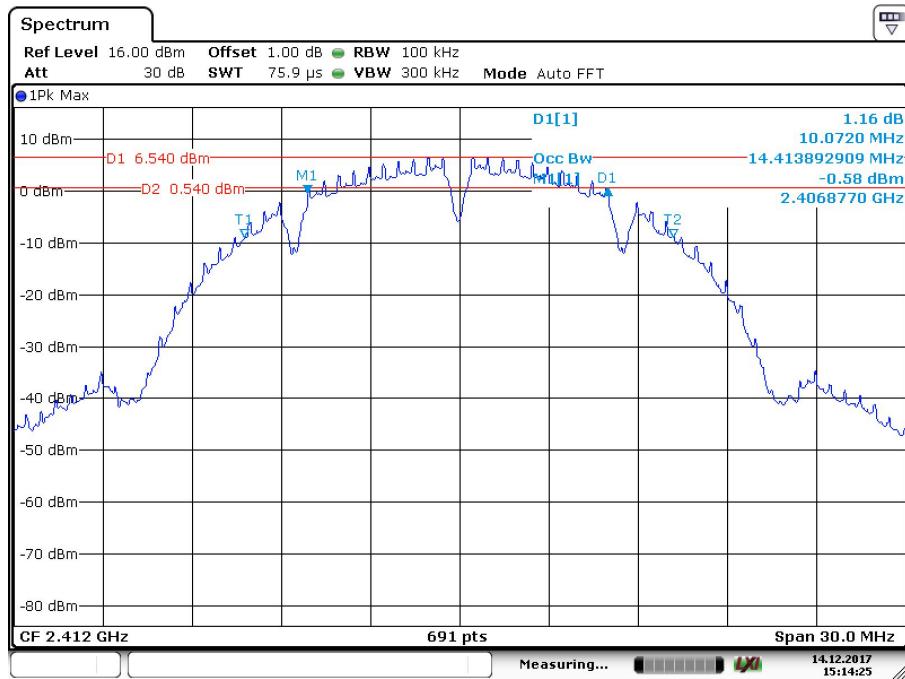
Frequency MHz	99% bandwidth MHz	6dB bandwidth MHz	Result
Bottom channel 2412MHz	17.670	17.583	Pass
Middle channel 2437MHz	17.670	17.323	Pass
Top channel 2462MHz	17.670	17.149	Pass

802.11nHT40

Frequency MHz	99% bandwidth MHz	6dB bandwidth MHz	Result
Bottom channel 2422MHz	36.034	35.514	Pass
Middle channel 2437MHz	36.034	35.948	Pass
Top channel 2452MHz	36.034	35.770	Pass

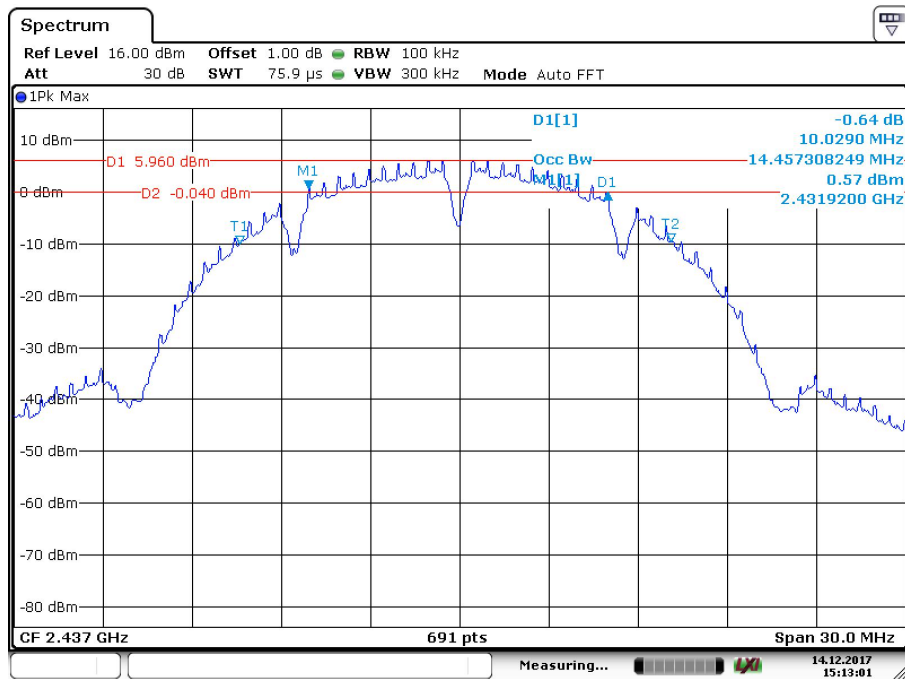
6dB bandwidth

802.11b



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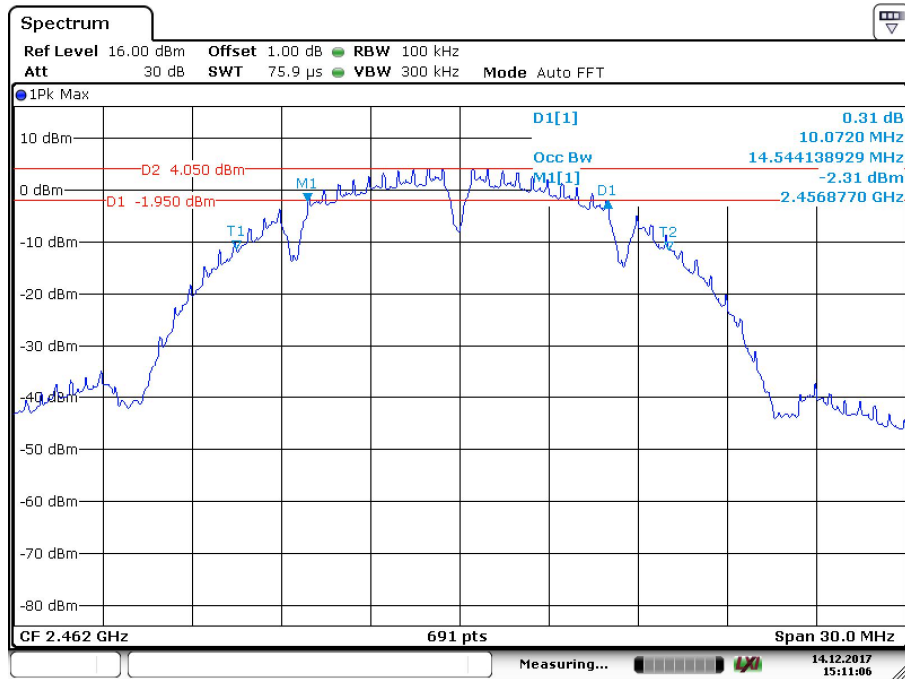
2412MHz



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2437MHz

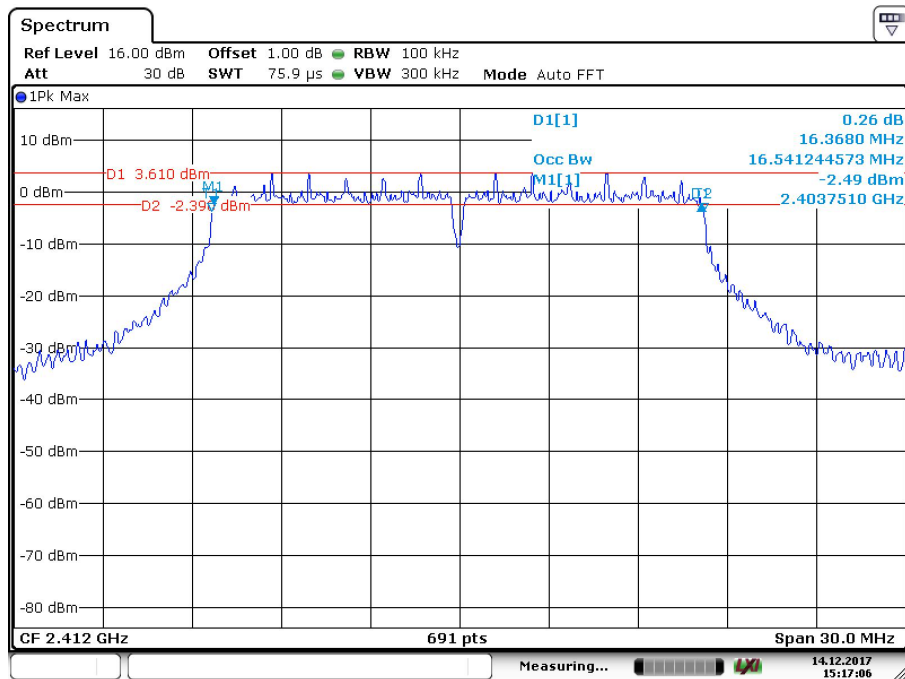
6dB bandwidth



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2462MHz

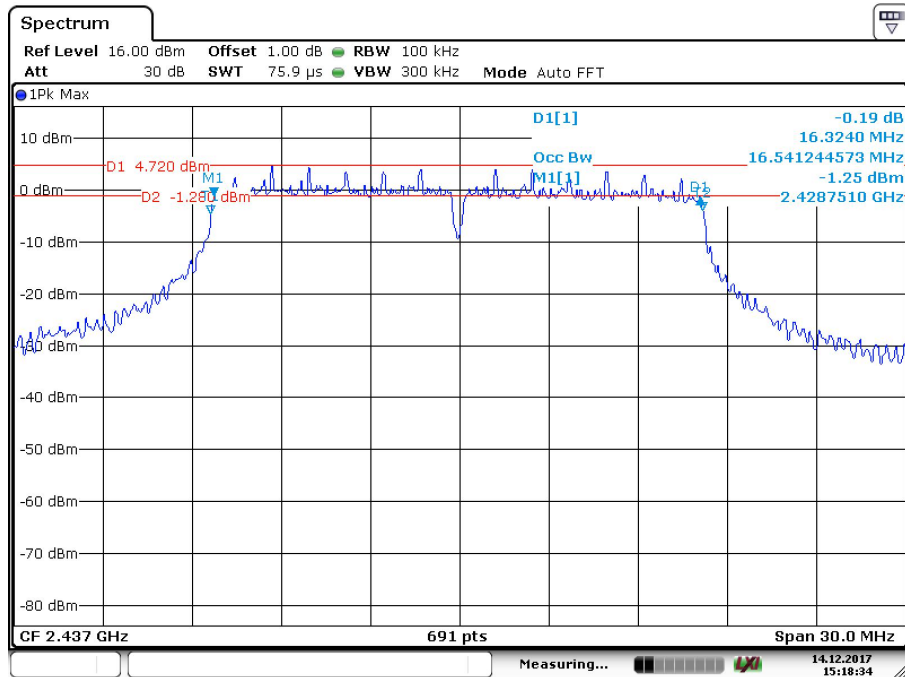
802.11g



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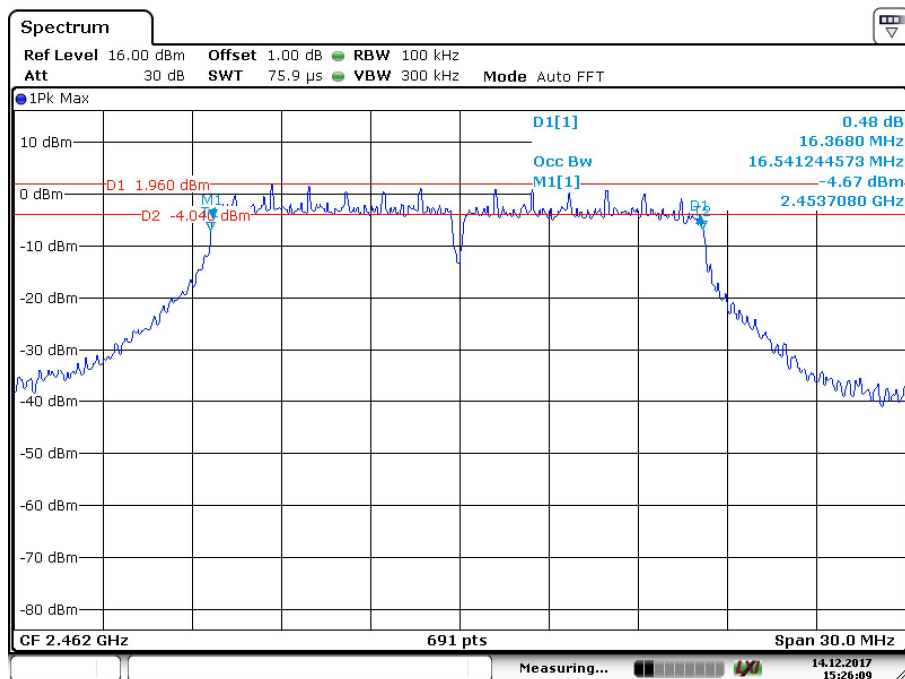
2412MHz

6dB bandwidth



Date: 14.DEC.2017 15:18:34

2437MHz

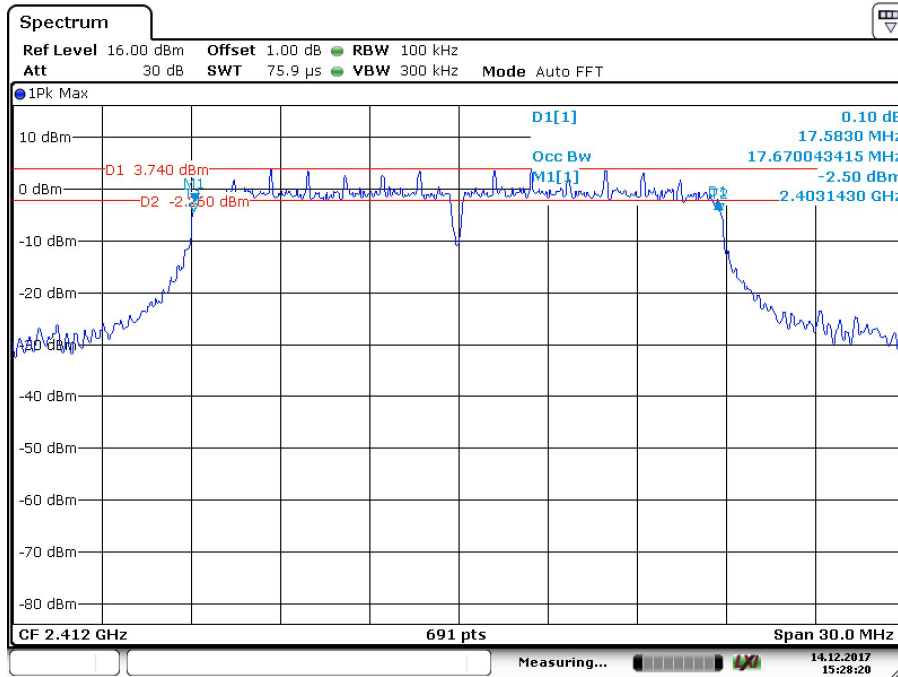


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2462MHz

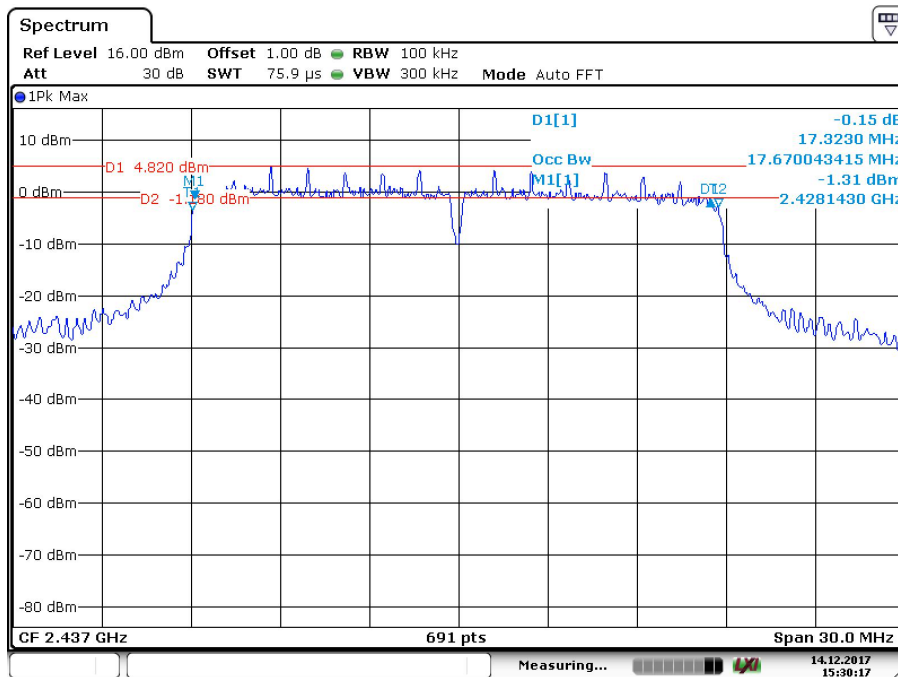
6dB bandwidth

802.11nHT20



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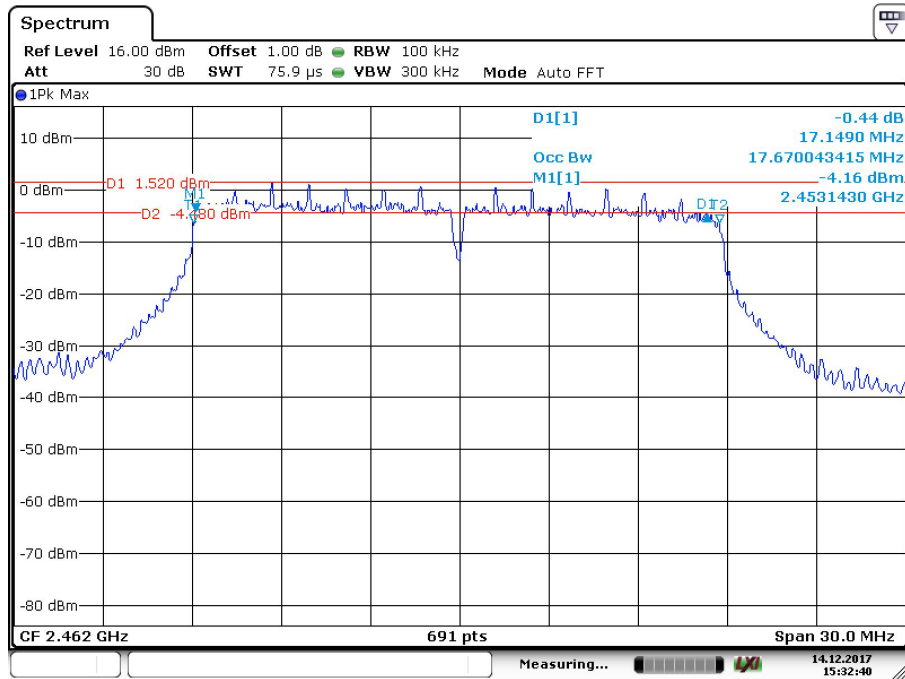
2412MHz



Date: 14.DEC.2017 15:30:17

2437MHz

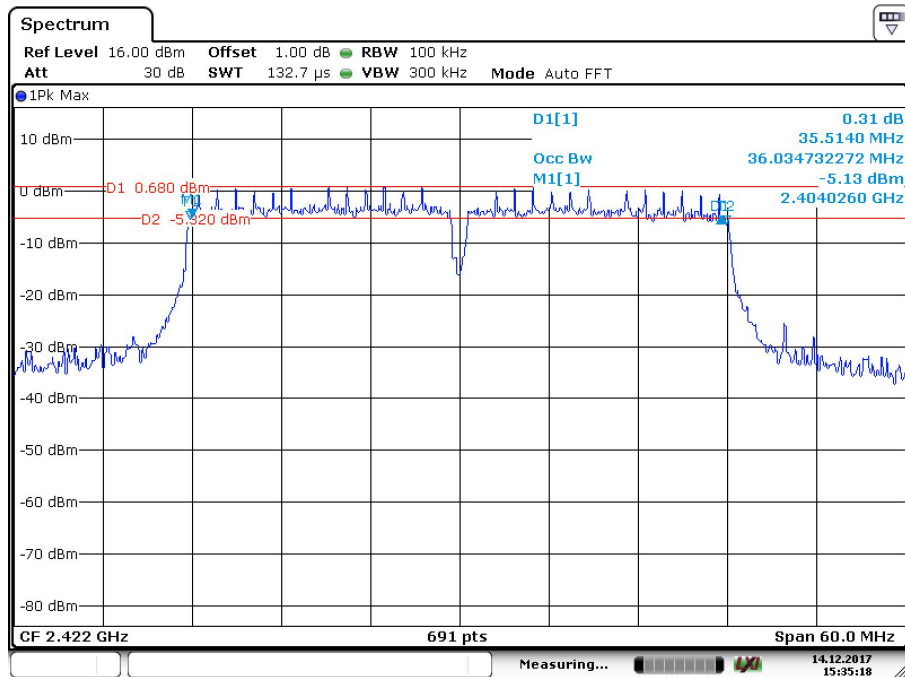
6dB bandwidth



Date: 14.DEC.2017 15:32:41

2462MHz

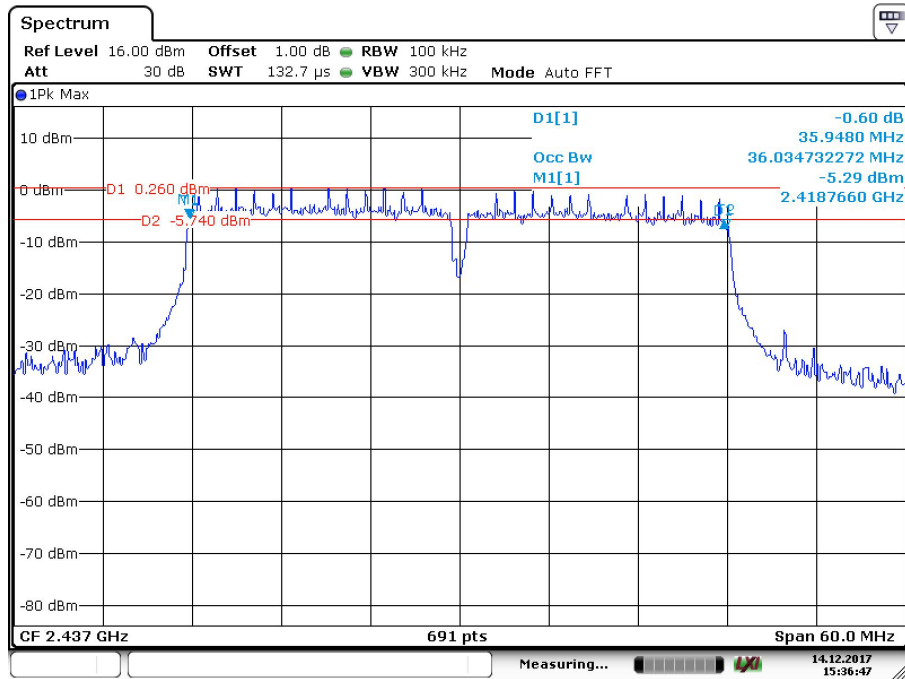
802.11nHT40



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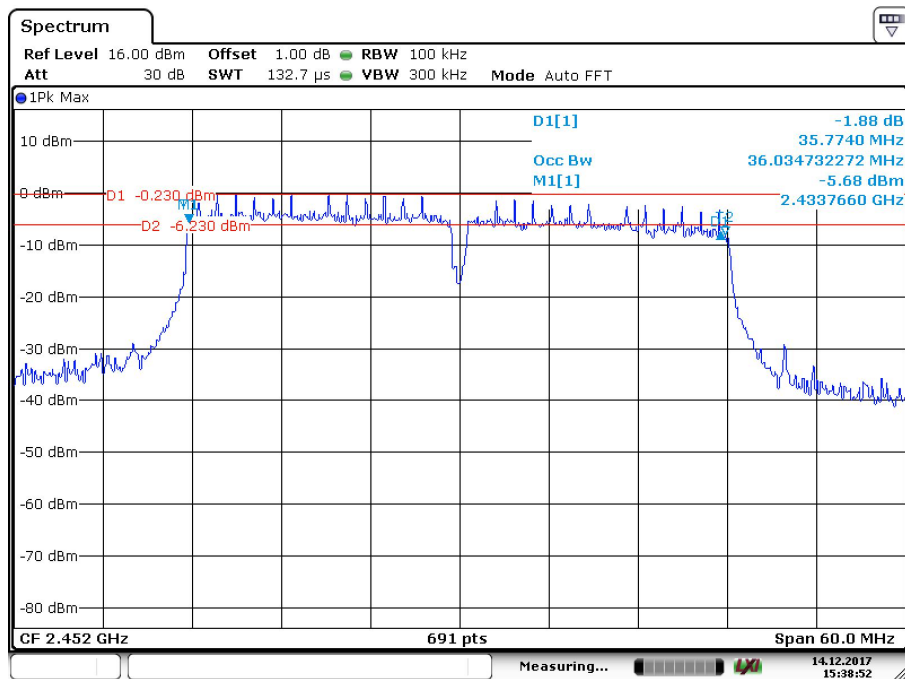
2422MHz

6dB bandwidth



Date: 14.DEC.2017 15:36:47

2437MHz



Date: 14.DEC.2017 15:38:52

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
Top channel 2412MHz	2.29	Pass
Middle channel 2437MHz	1.59	Pass
Bottom channel 2462MHz	-0.35	Pass

802.11g

Frequency MHz	Power spectral density dBm	Result
Top channel 2412MHz	-12.07	Pass
Middle channel 2437MHz	-11.61	Pass
Bottom channel 2462MHz	-15.13	Pass

802.11nHT20

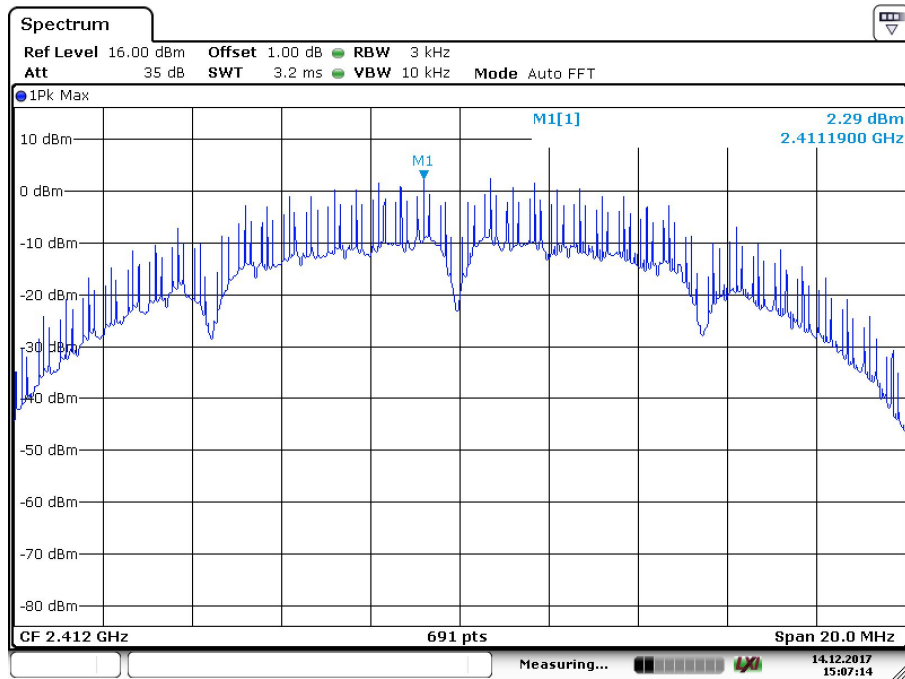
Frequency MHz	Power spectral density dBm	Result
Top channel 2412MHz	-11.98	Pass
Middle channel 2437MHz	-11.41	Pass
Bottom channel 2462MHz	-14.63	Pass

802.11nHT40

Frequency MHz	Power spectral density dBm	Result
Top channel 2422MHz	-15.49	Pass
Middle channel 2437MHz	-15.63	Pass
Bottom channel 2452MHz	-16.39	Pass

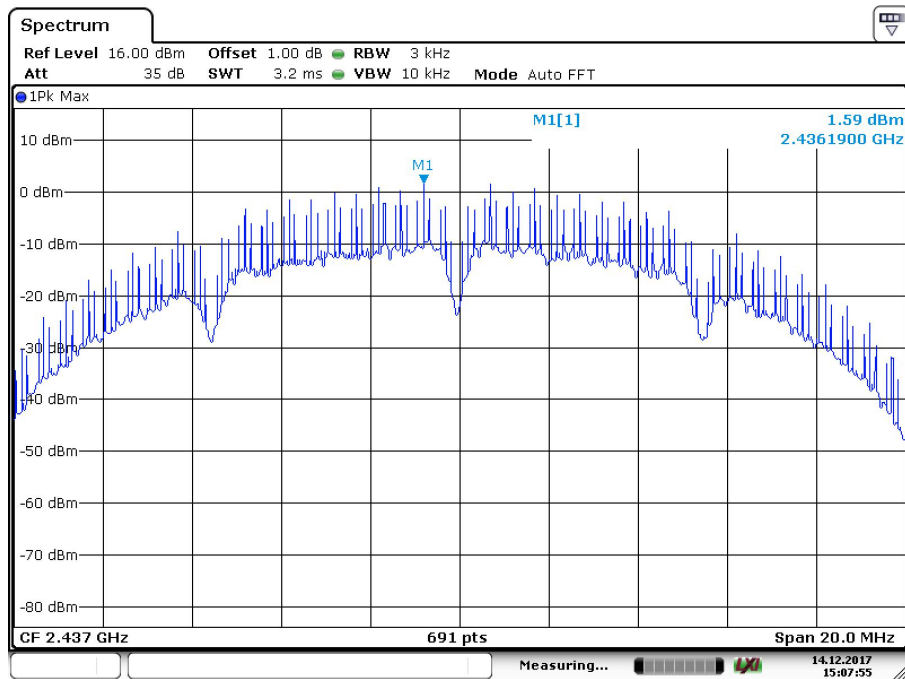
Power Spectral Density

802.11b



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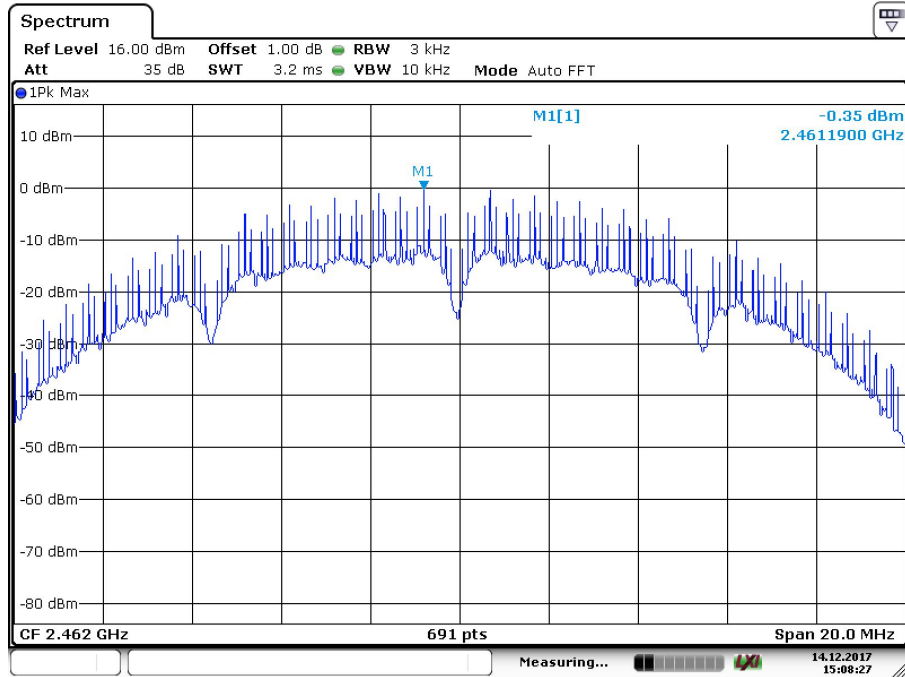
2412MHz



Date: 14.DEC.2017 15:07:55

2437MHz

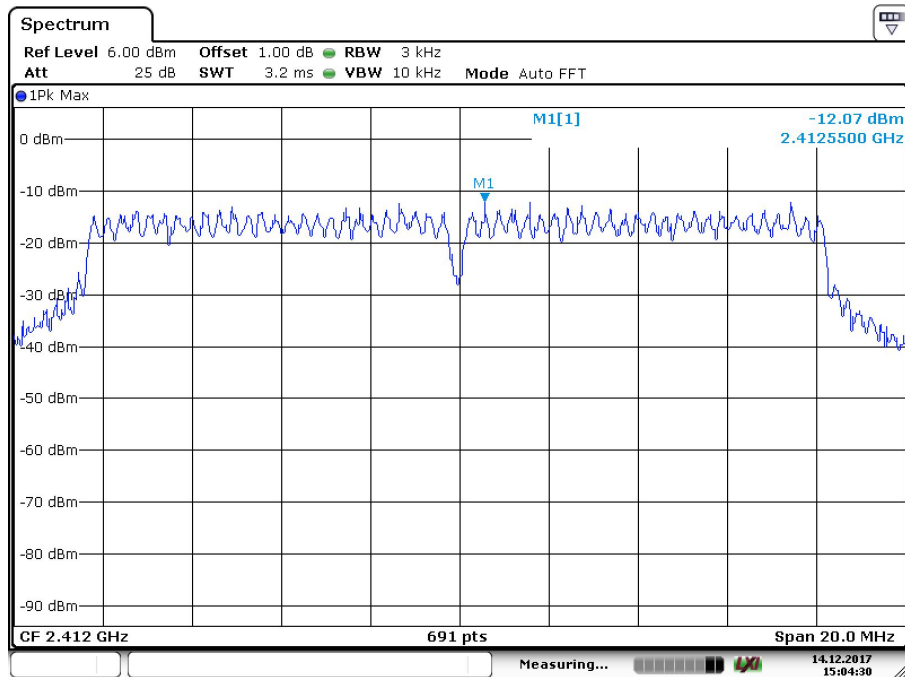
Power Spectral Density



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2462MHz

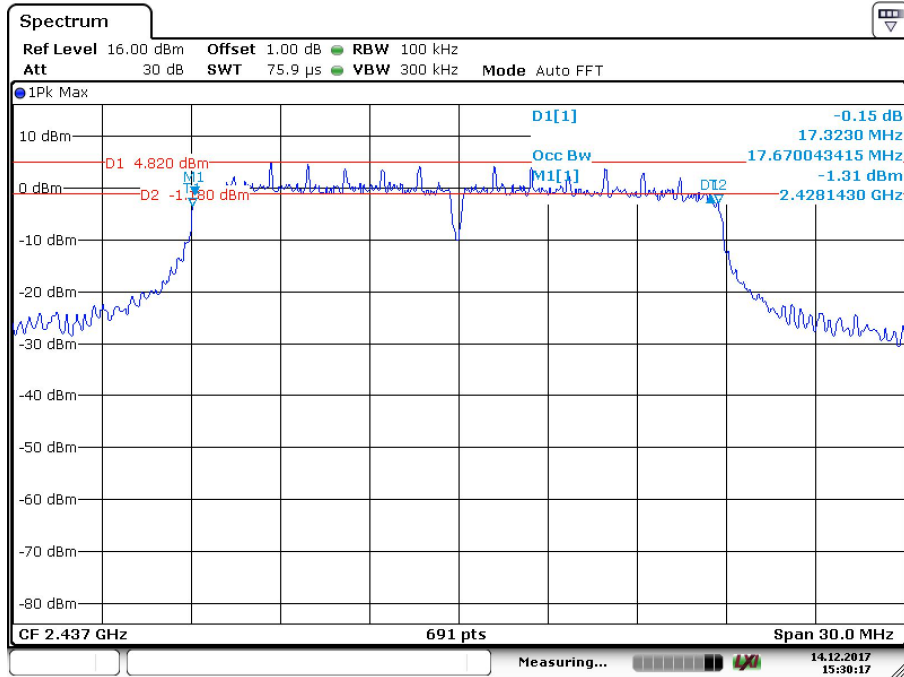
802.11g



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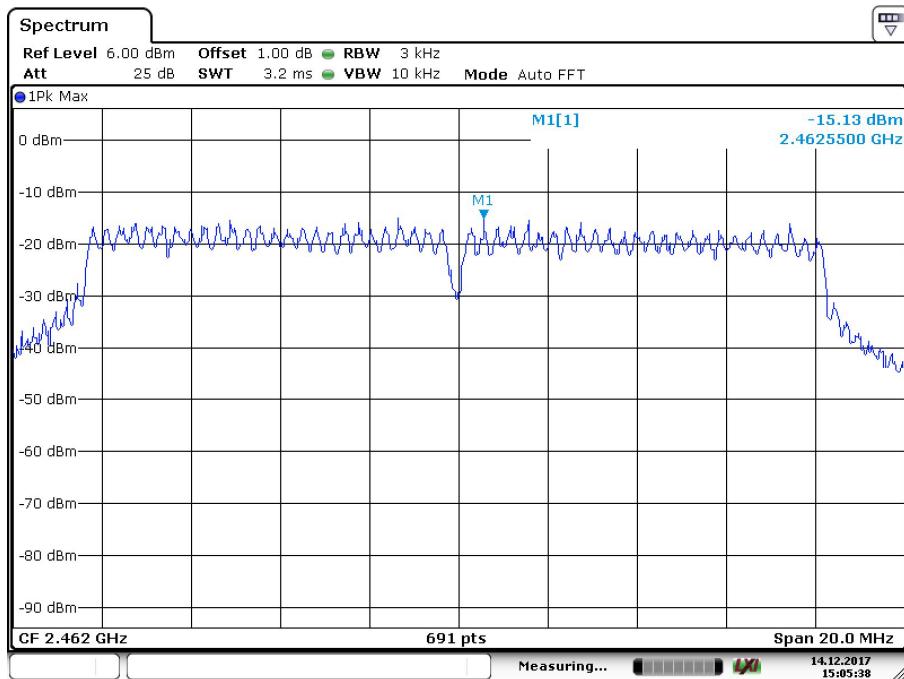
2412MHz

Power Spectral Density



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2437MHz

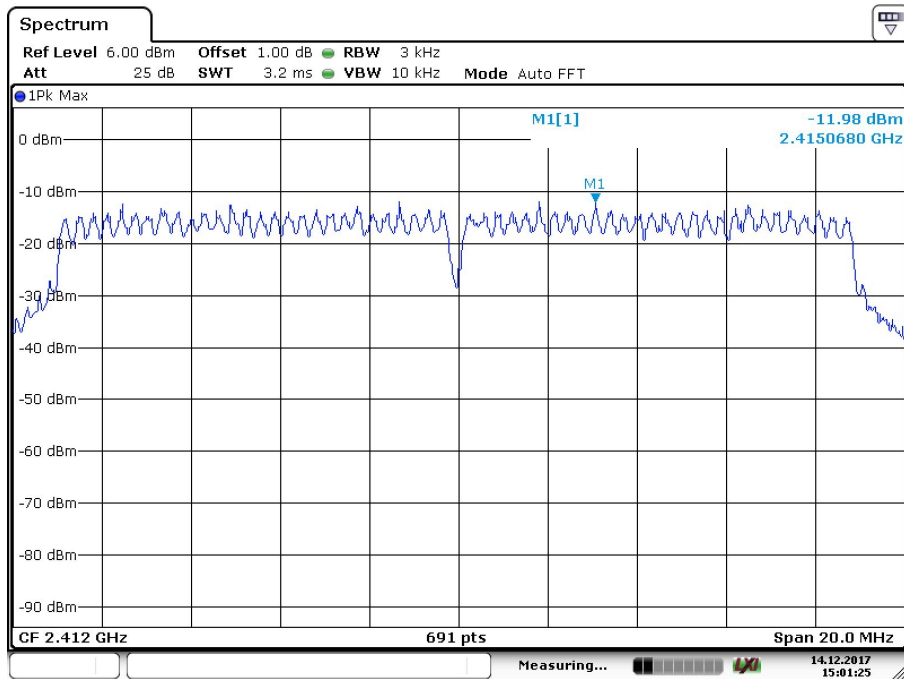


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2462MHz

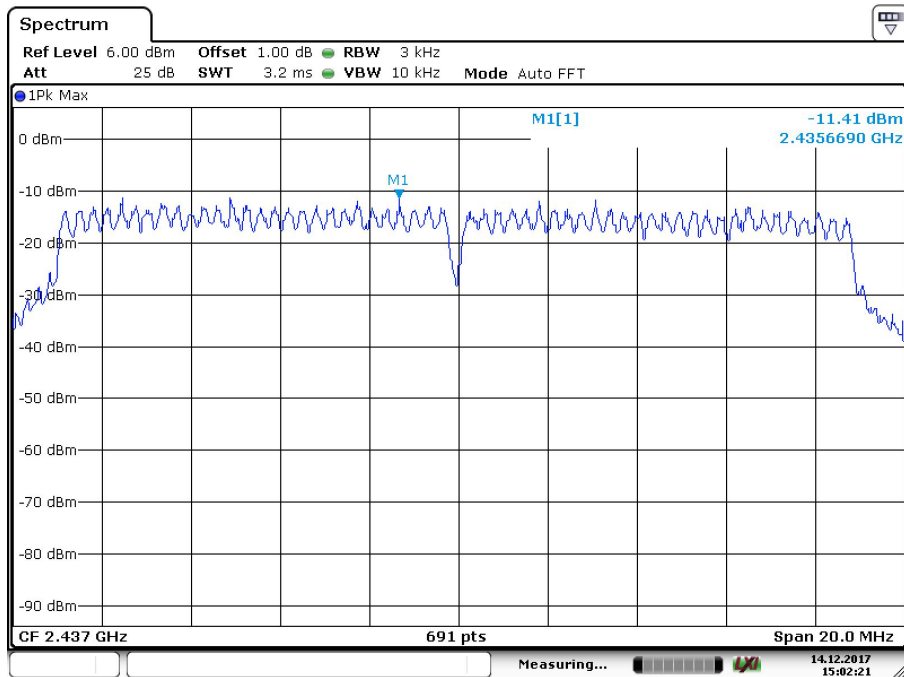
Power Spectral Density

802.11nHT20



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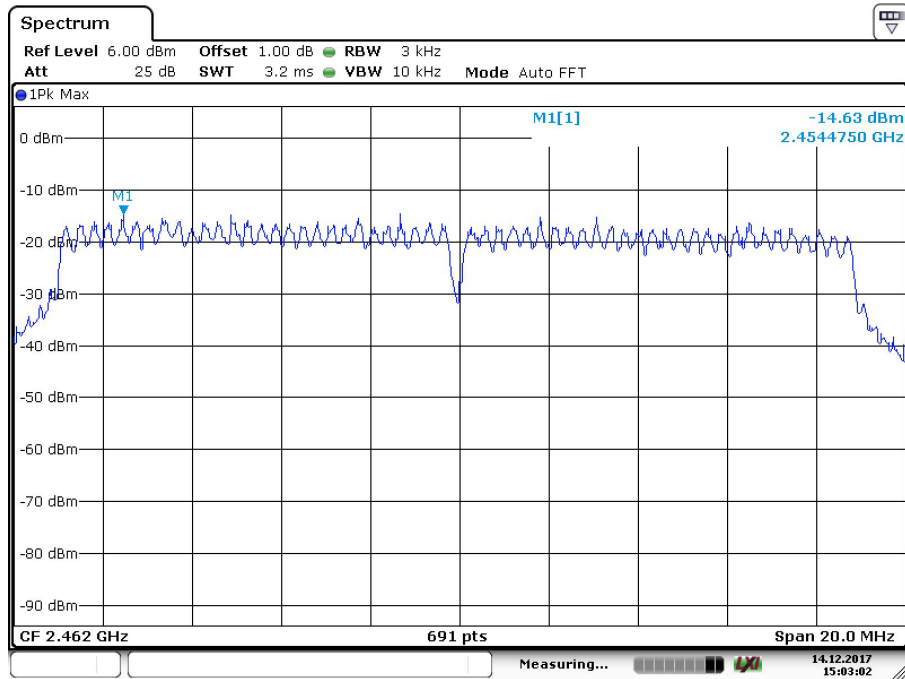
2412MHz



Date: 14.DEC.2017 15:02:21

2437MHz

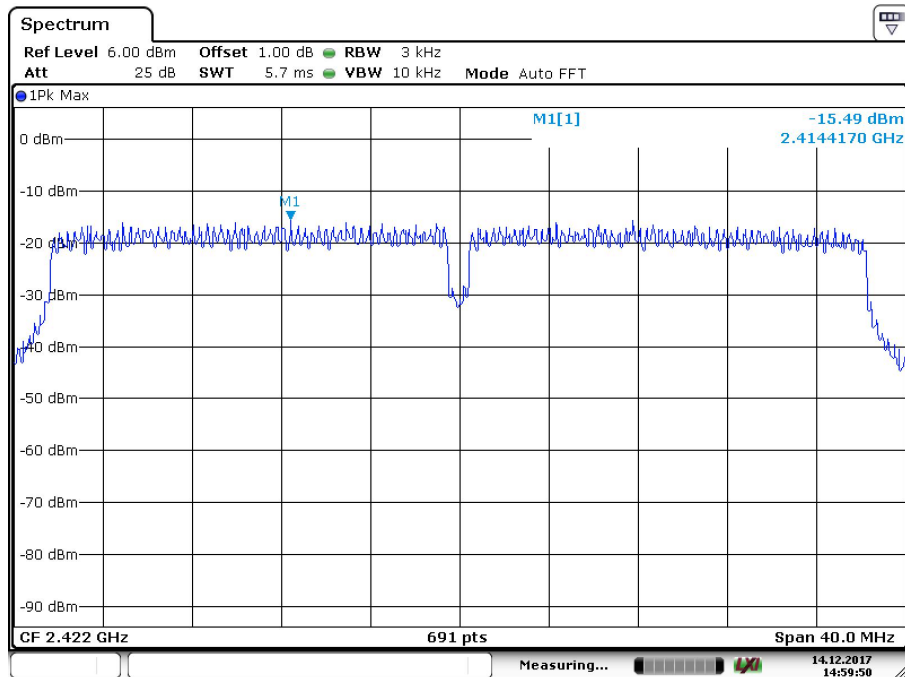
Power Spectral Density



Date: 14.DEC.2017 15:03:01

2462MHz

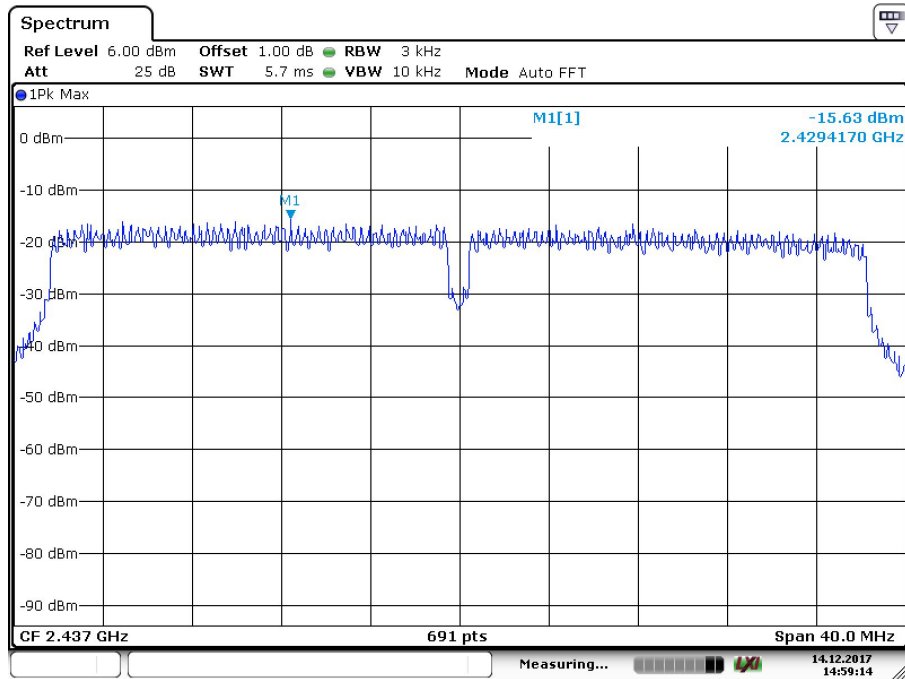
802.11nHT20



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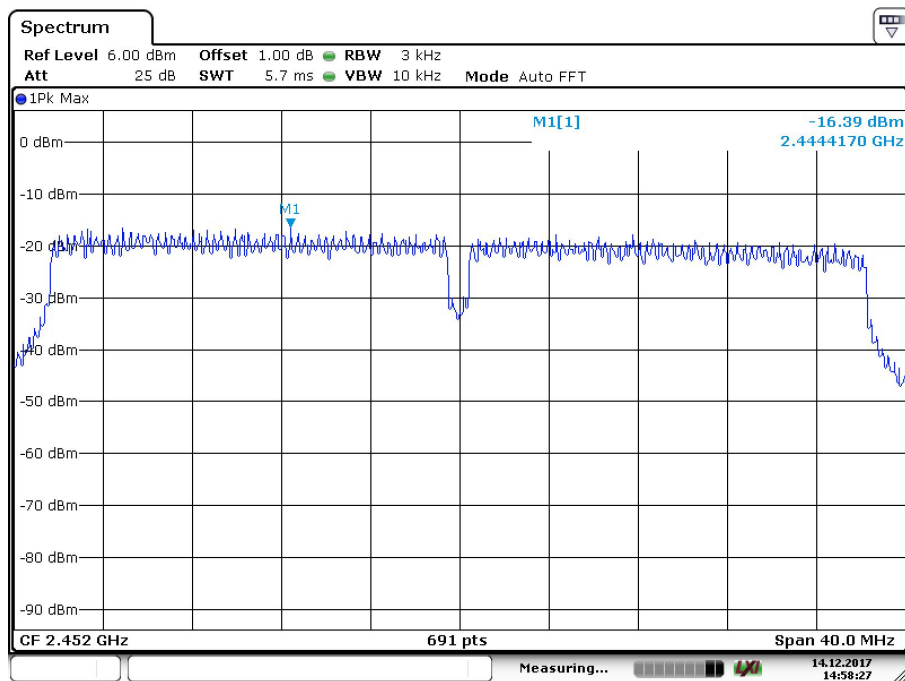
2422MHz

Power Spectral Density



Date: 14.DEC.2017 14:59:14

2437MHz



Date: 14.DEC.2017 14:58:27

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.

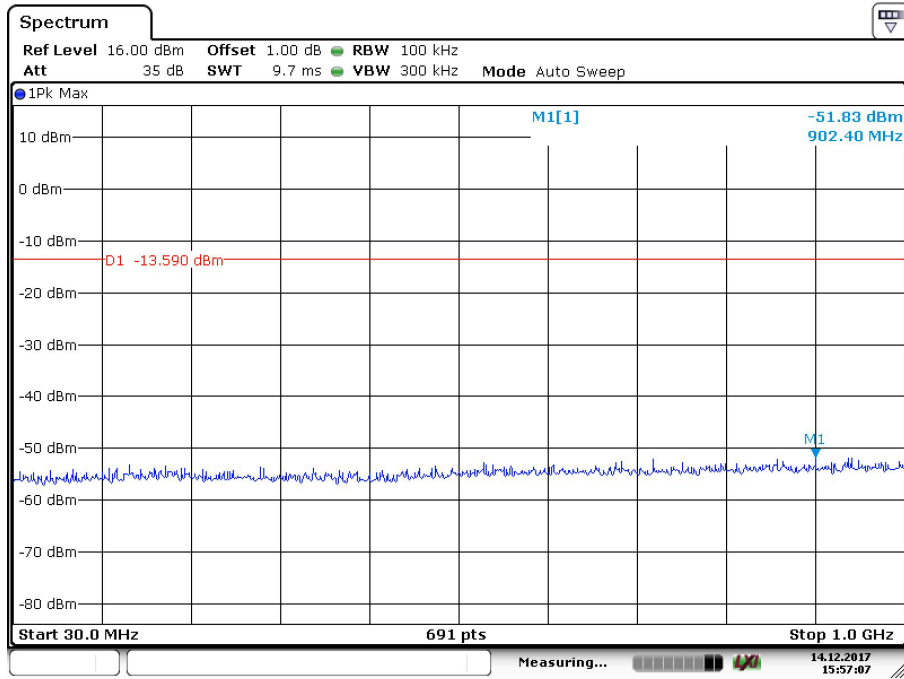
Limit

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

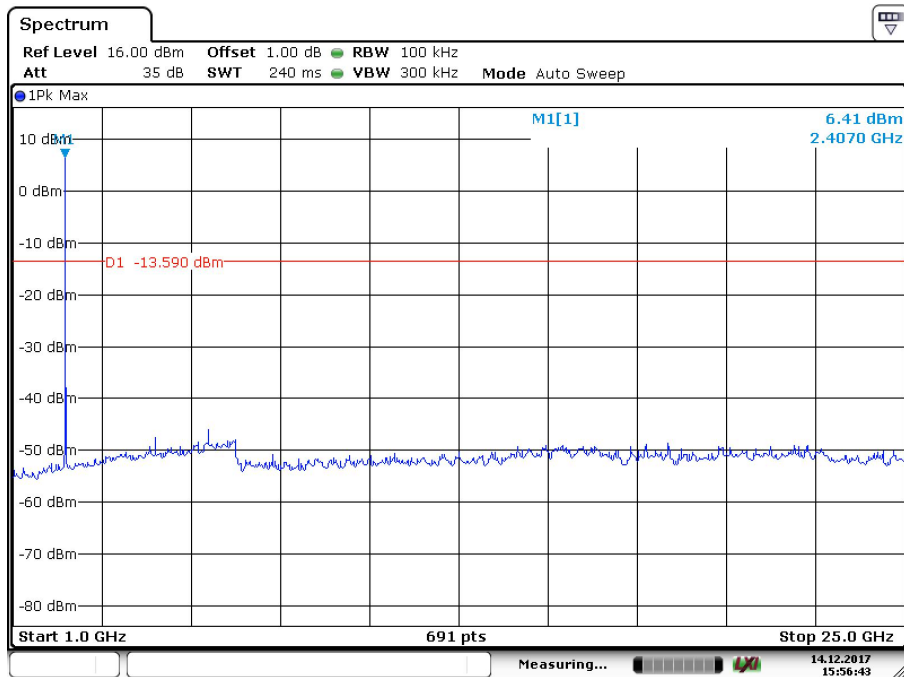


Spurious RF conducted emissions

802.11b



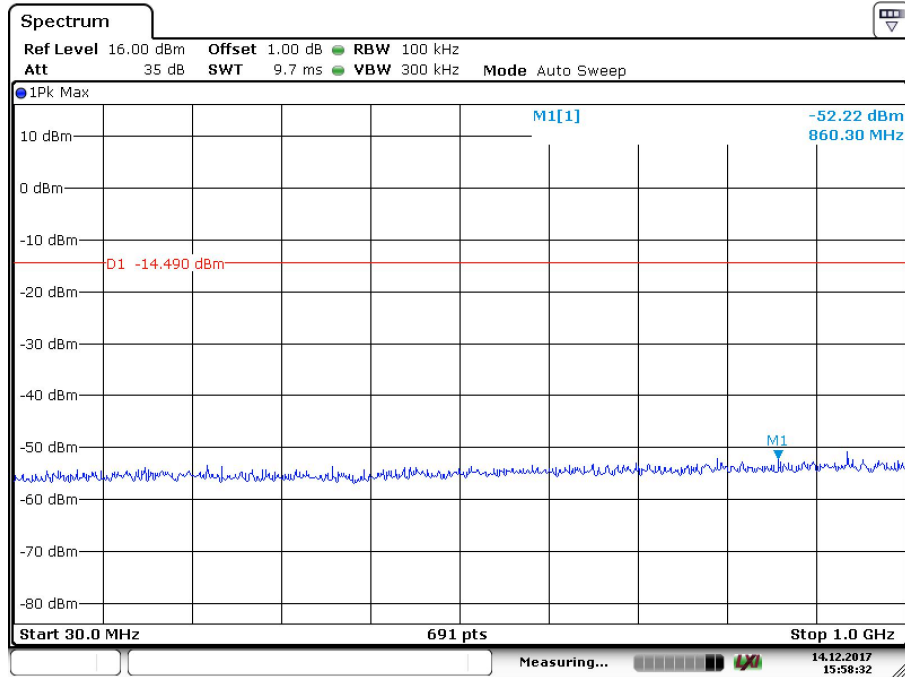
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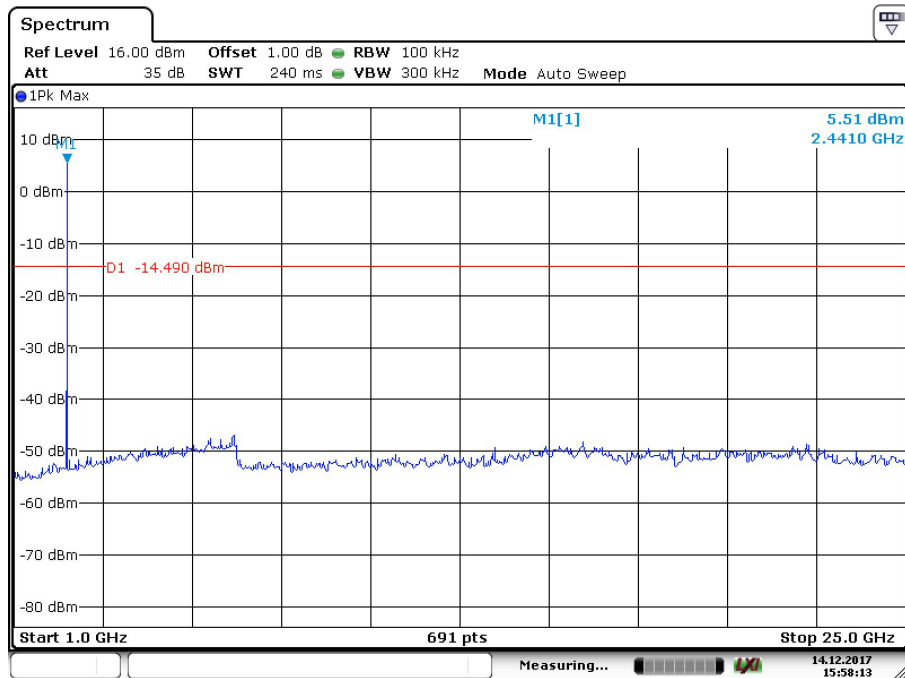
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2412MHz

Spurious RF conducted emissions



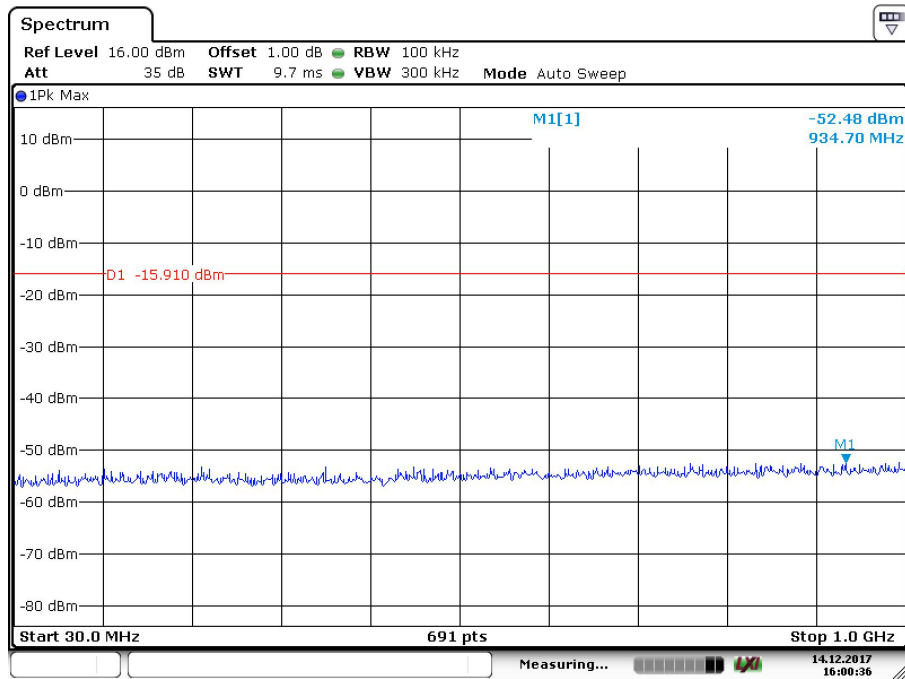
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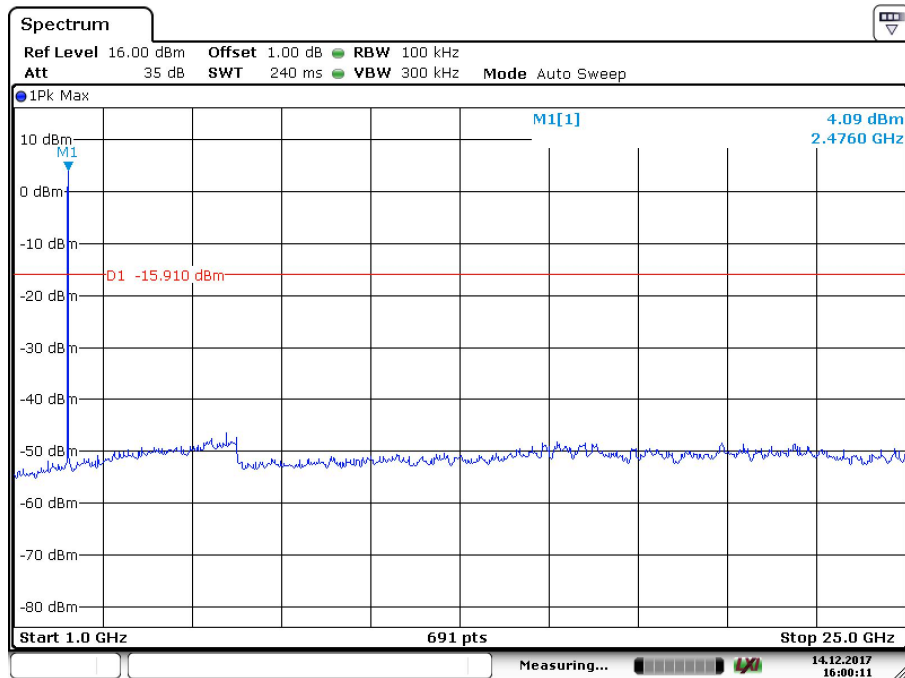
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2437MHz

Spurious RF conducted emissions



Date: 14.DEC.2017 16:00:36

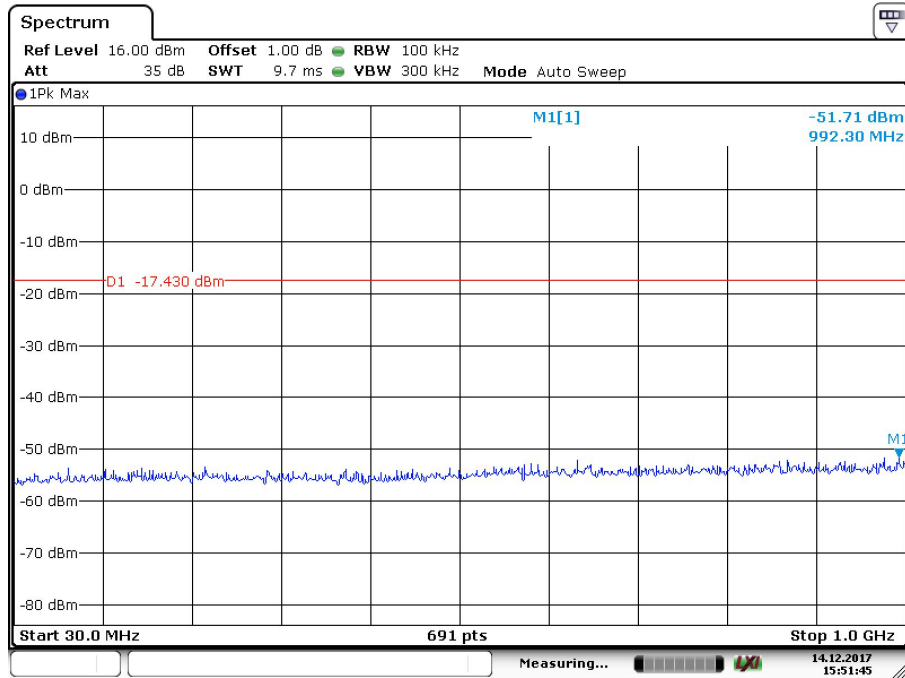


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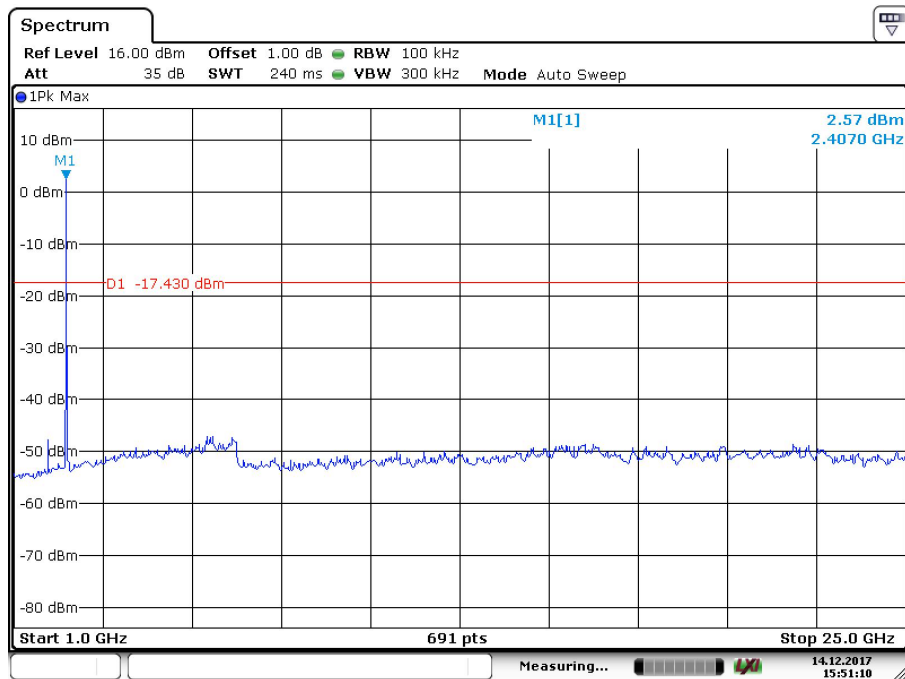
2462MHz

Spurious RF conducted emissions

802.11g



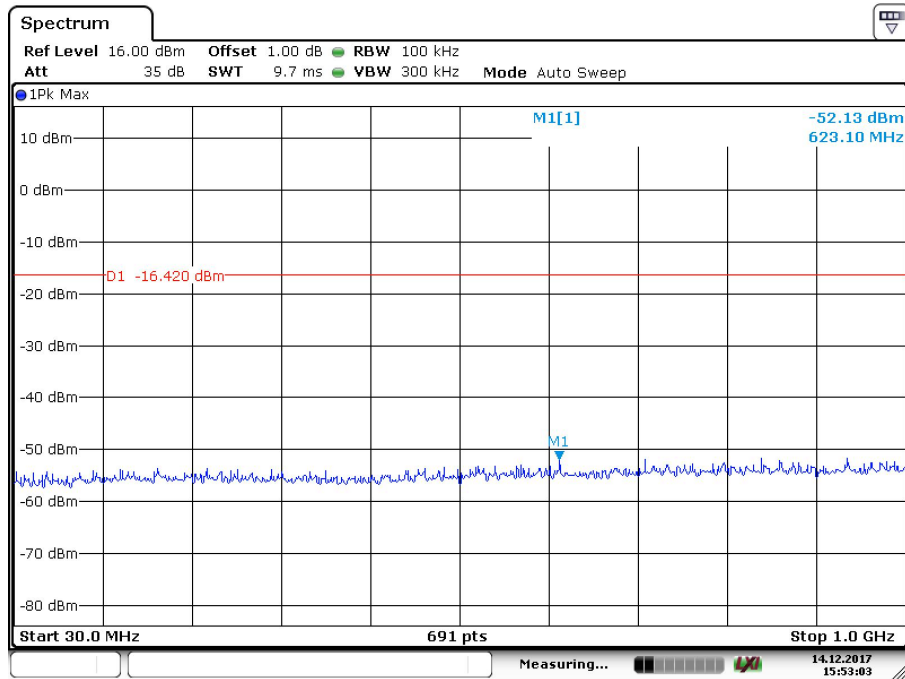
Date: 14.DEC.2017 15:51:45



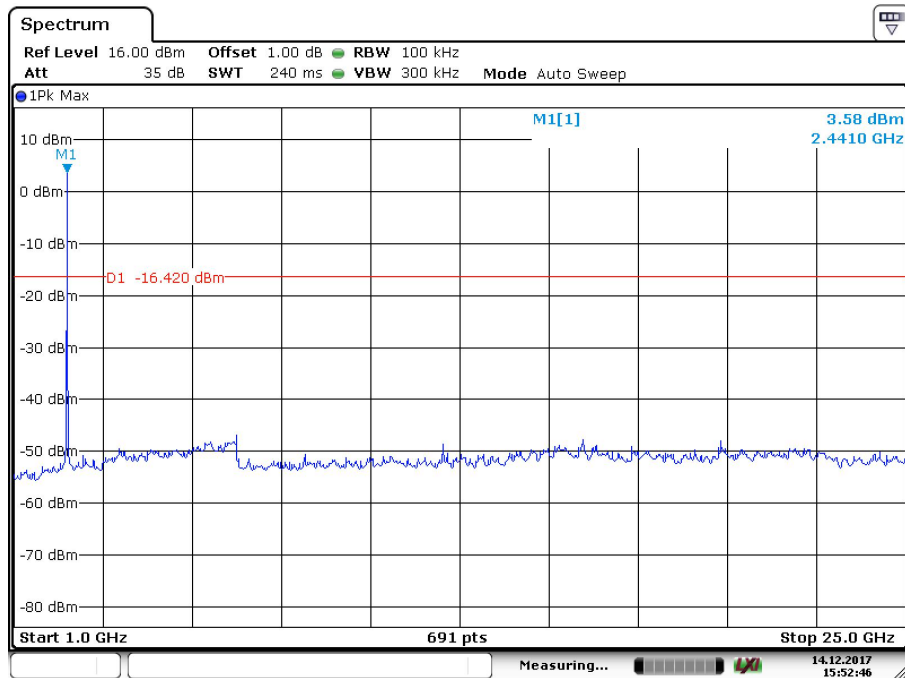
Date: 14.DEC.2017 15:51:09

2412MHz

Spurious RF conducted emissions



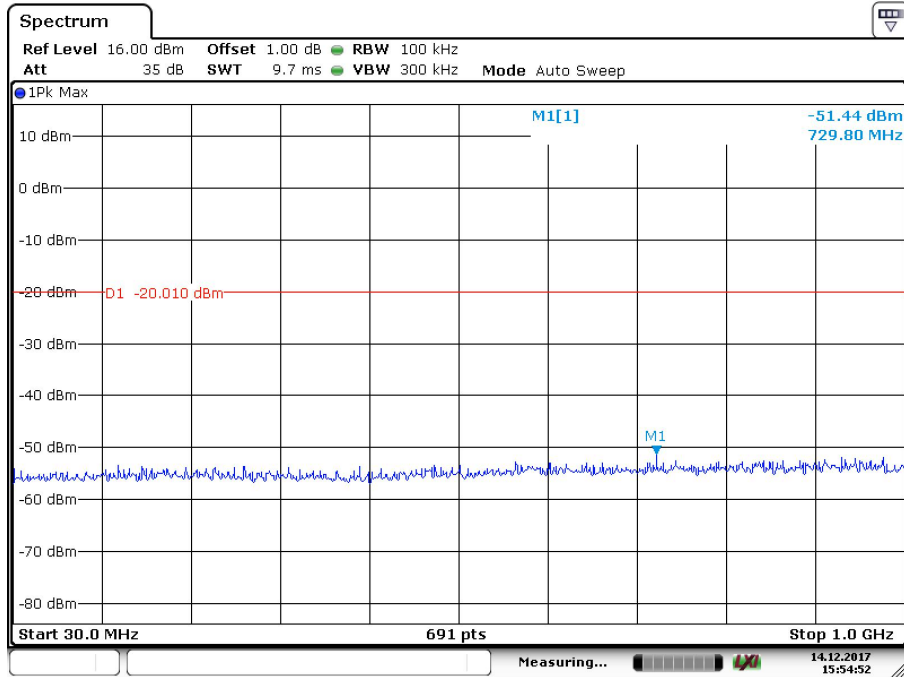
Date: 14.DEC.2017 15:53:04



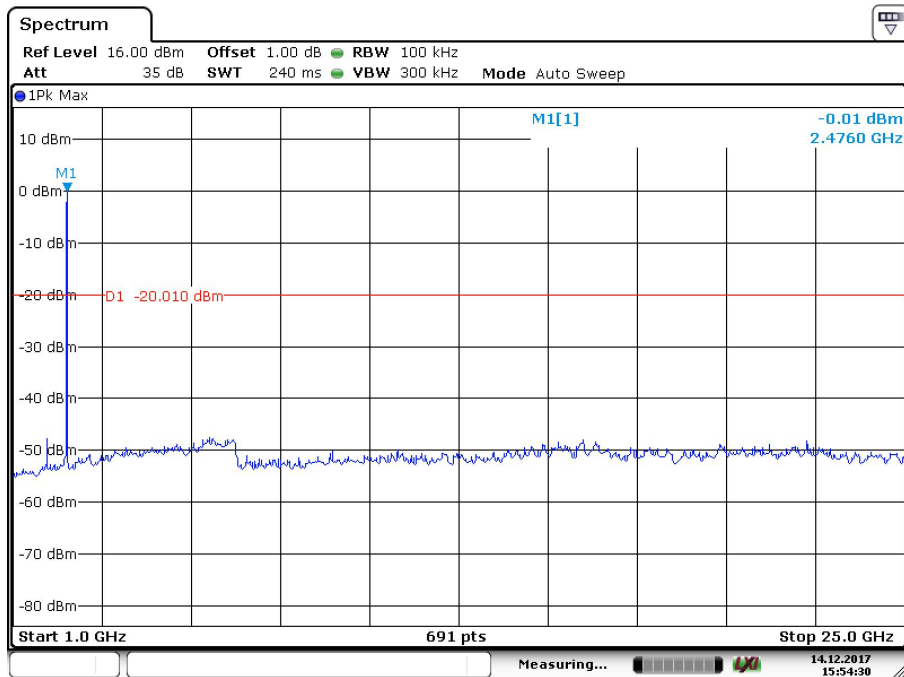
Date: 14.DEC.2017 15:52:46

2437MHz

Spurious RF conducted emissions



Date: 14.DEC.2017 15:54:51

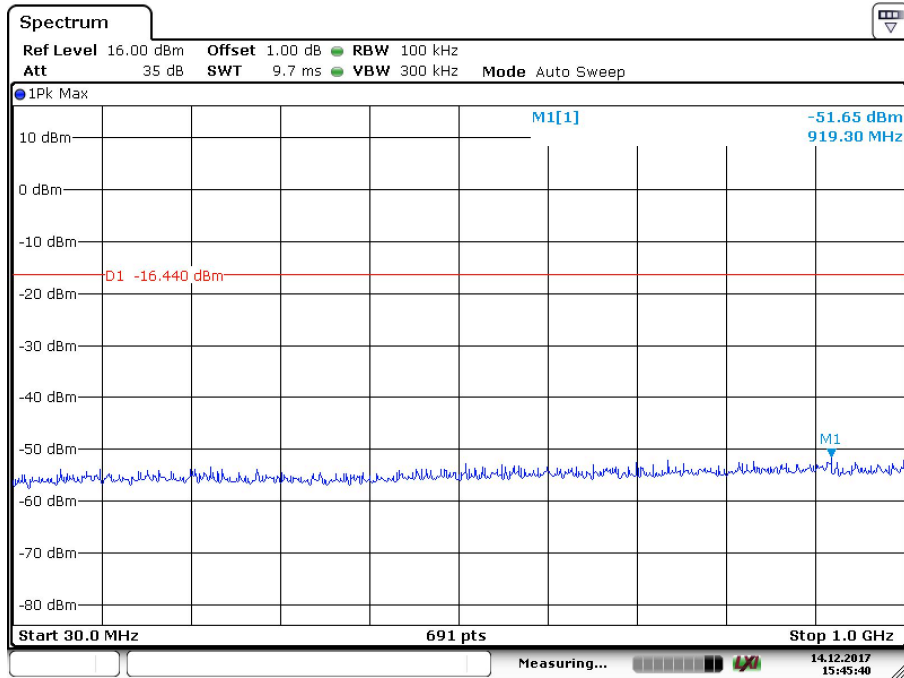


Date: 14.DEC.2017 15:54:30

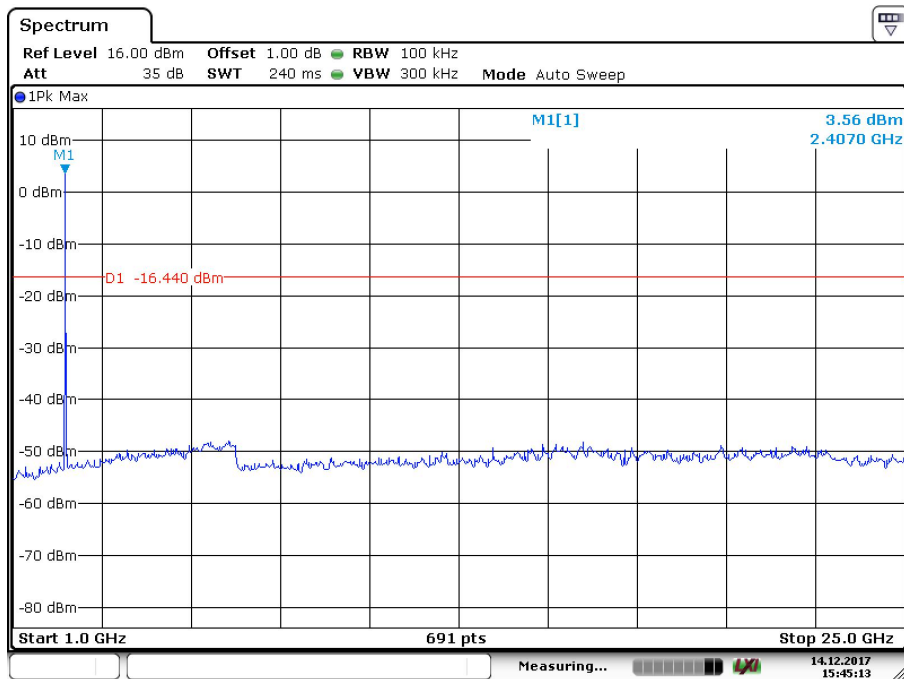
2462MHz

Spurious RF conducted emissions

802.11nHT20



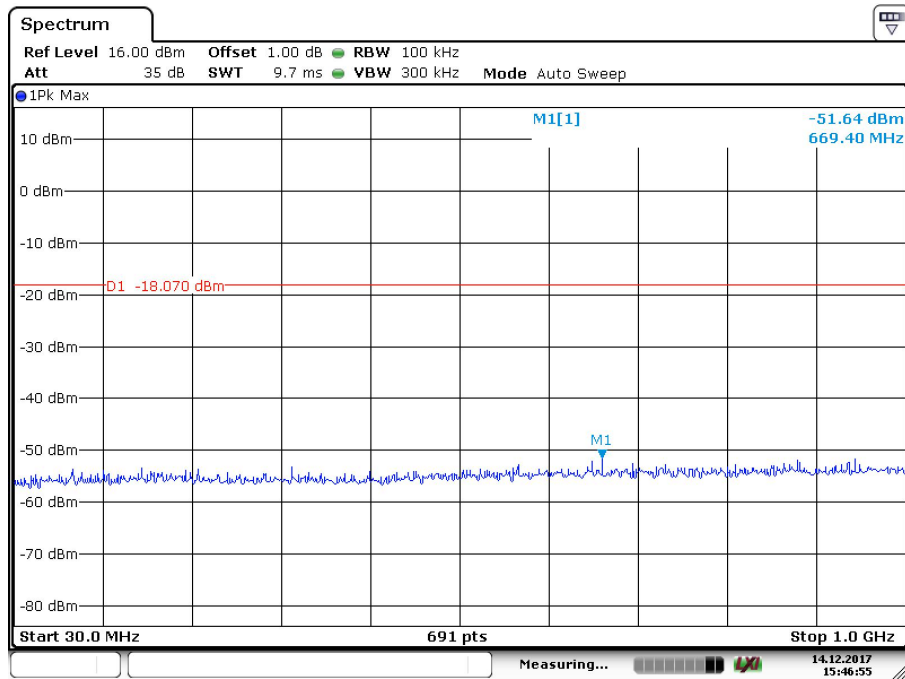
Date: 14.DEC.2017 15:45:40



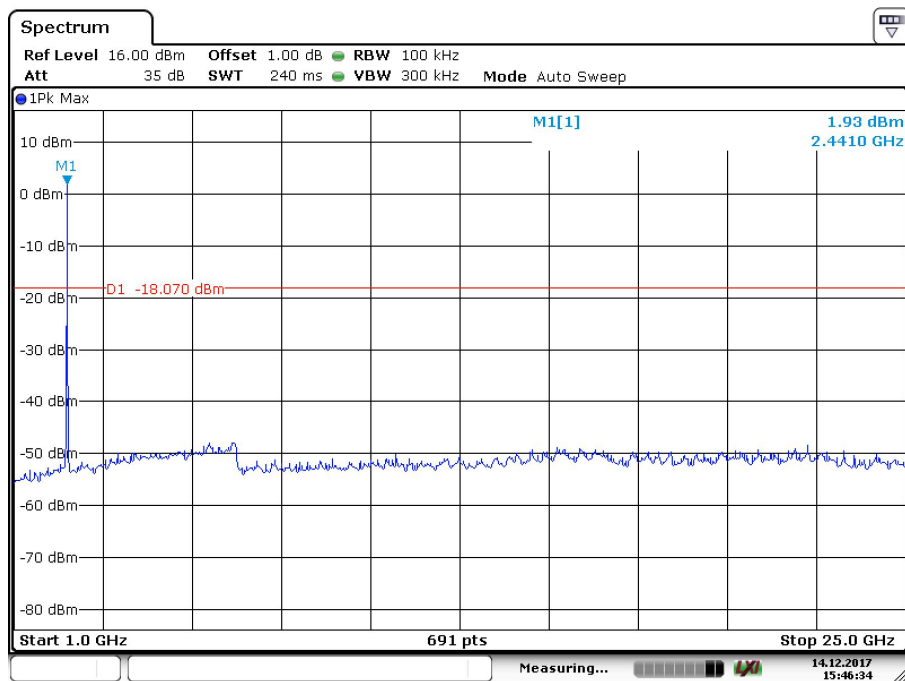
Date: 14.DEC.2017 15:45:13

2412MHz

Spurious RF conducted emissions



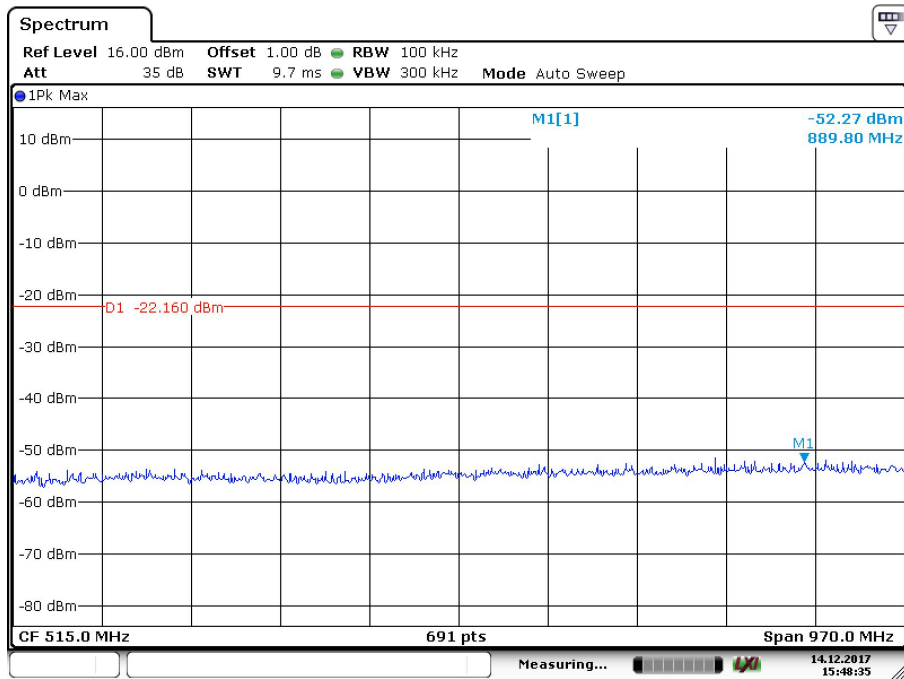
Date: 14.DEC.2017 15:46:55



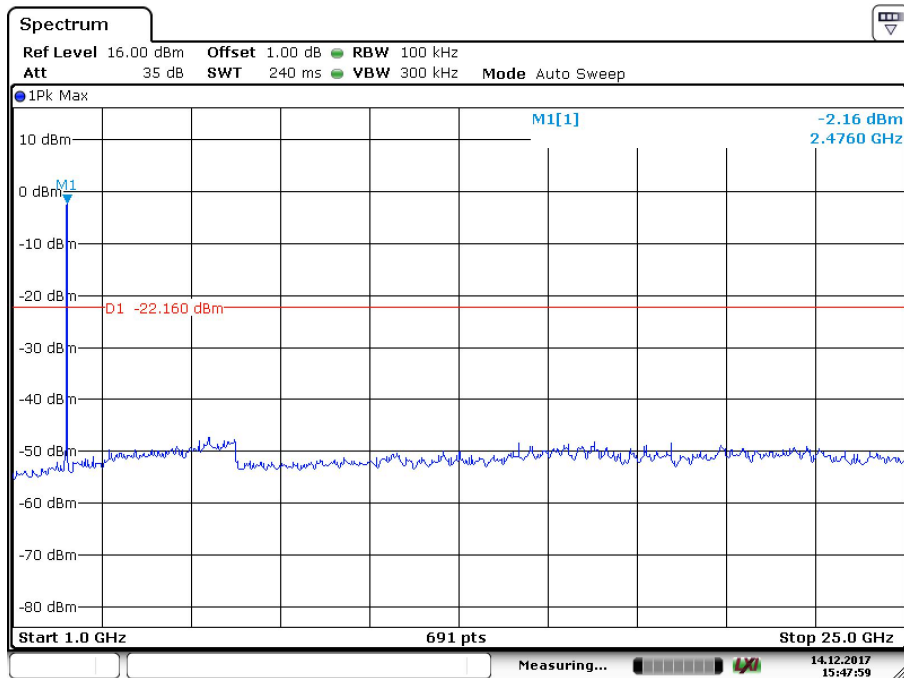
Date: 14.DEC.2017 15:46:34

2437MHz

Spurious RF conducted emissions



Date: 14.DEC.2017 15:48:36

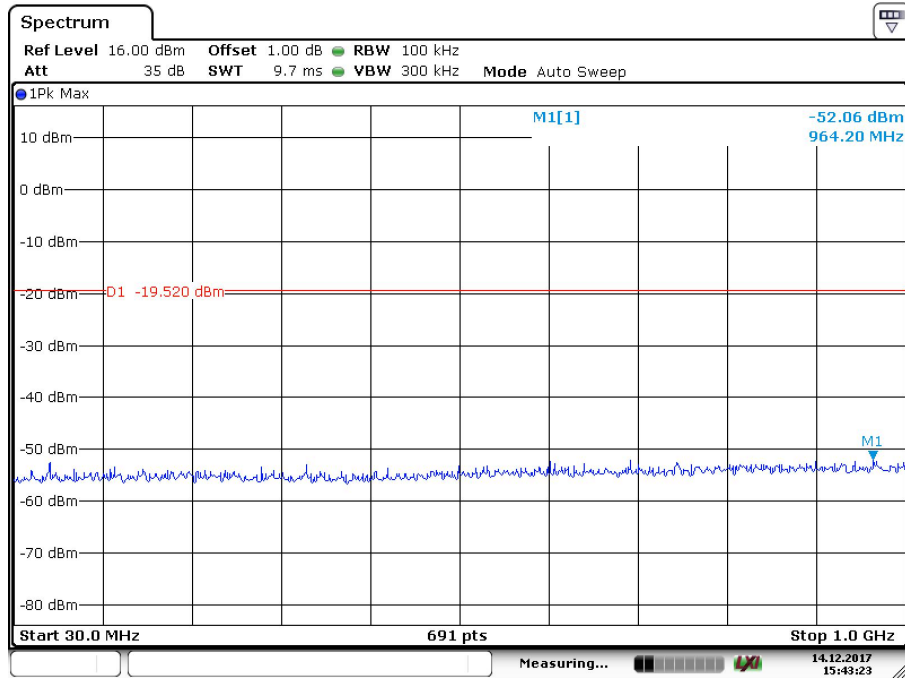


Date: 14.DEC.2017 15:47:59

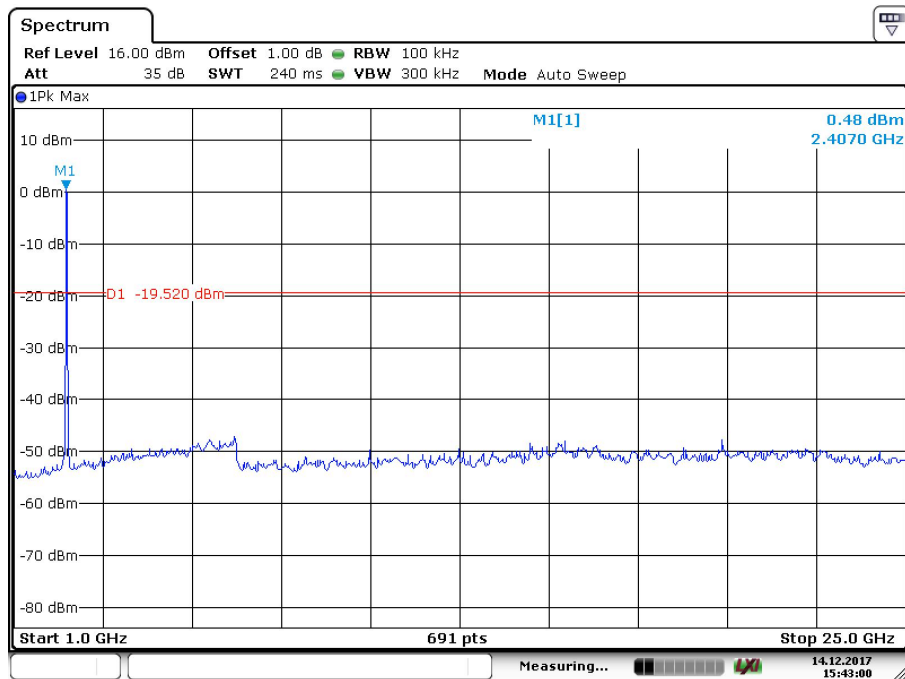
2462MHz

Spurious RF conducted emissions

802.11nHT40



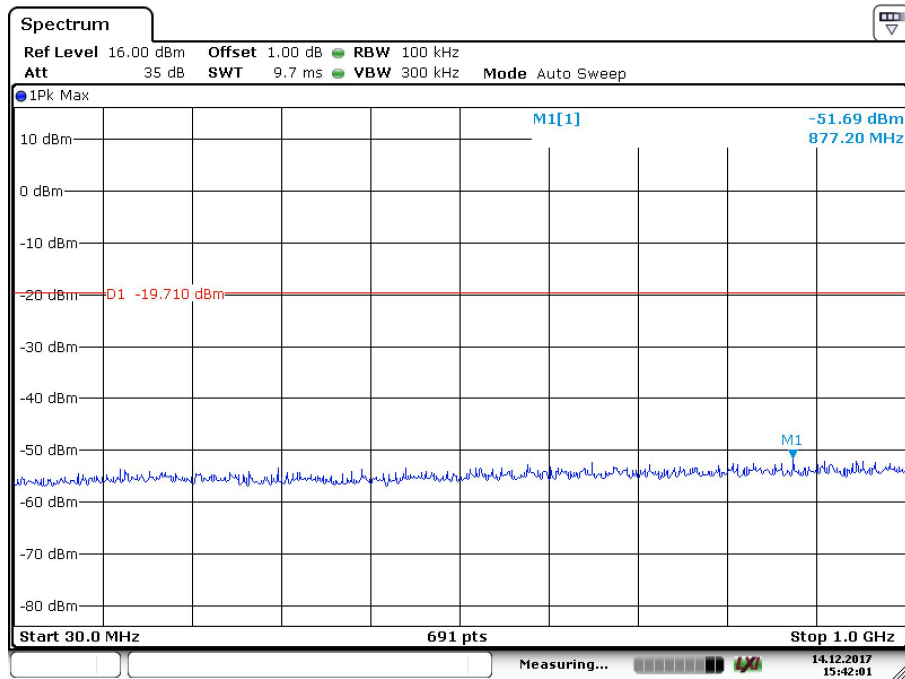
Date: 14.DEC.2017 15:43:23



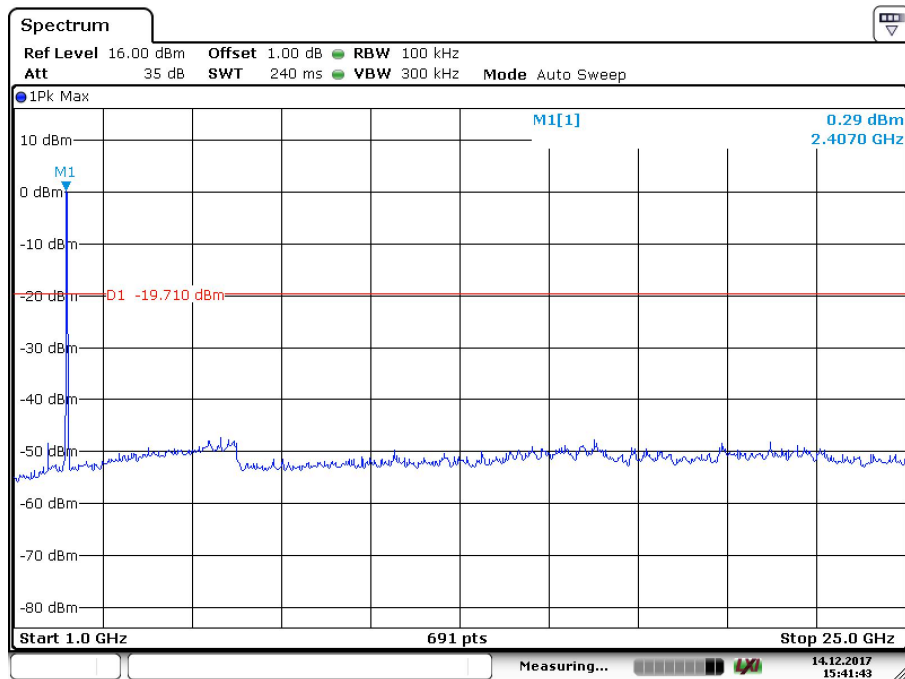
Date: 14.DEC.2017 15:42:59

2422MHz

Spurious RF conducted emissions



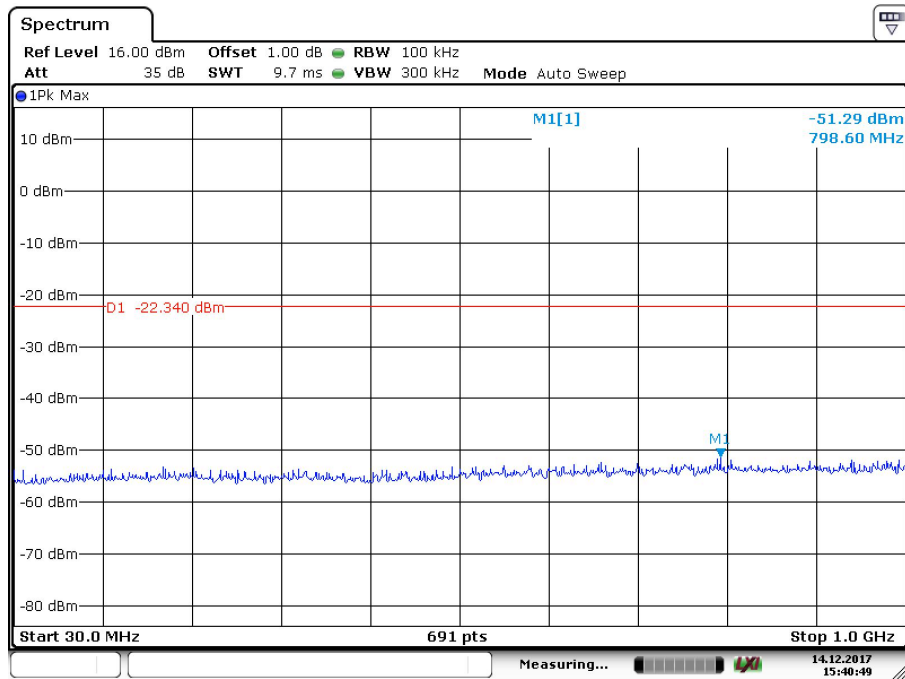
Date: 14.DEC.2017 15:42:01



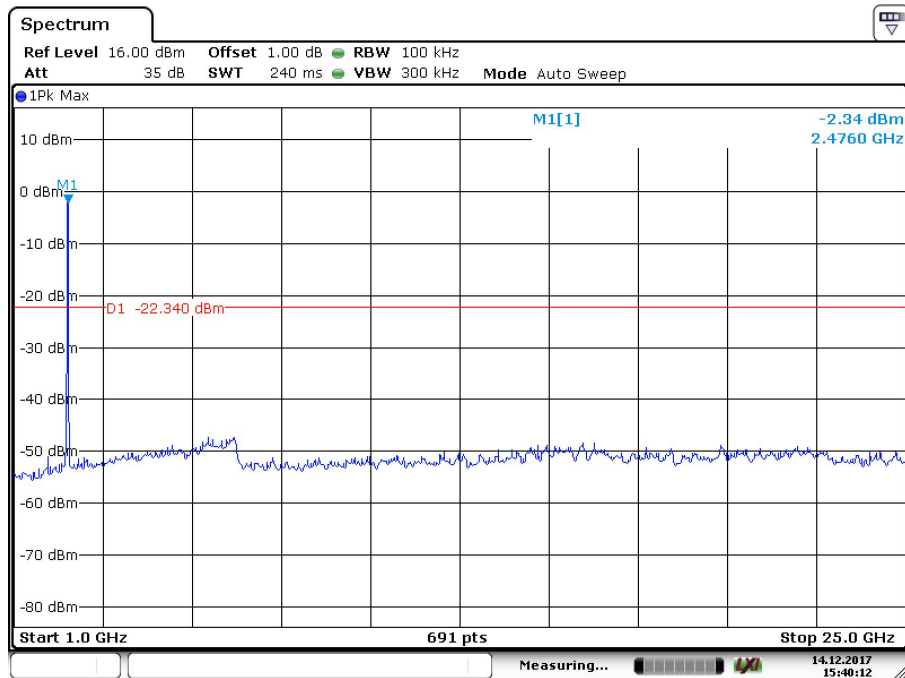
Date: 14.DEC.2017 15:41:43

2437MHz

Spurious RF conducted emissions



Date: 14.DEC.2017 15:40:49



Date: 14.DEC.2017 15:40:12

2452MHz

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

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

Test result

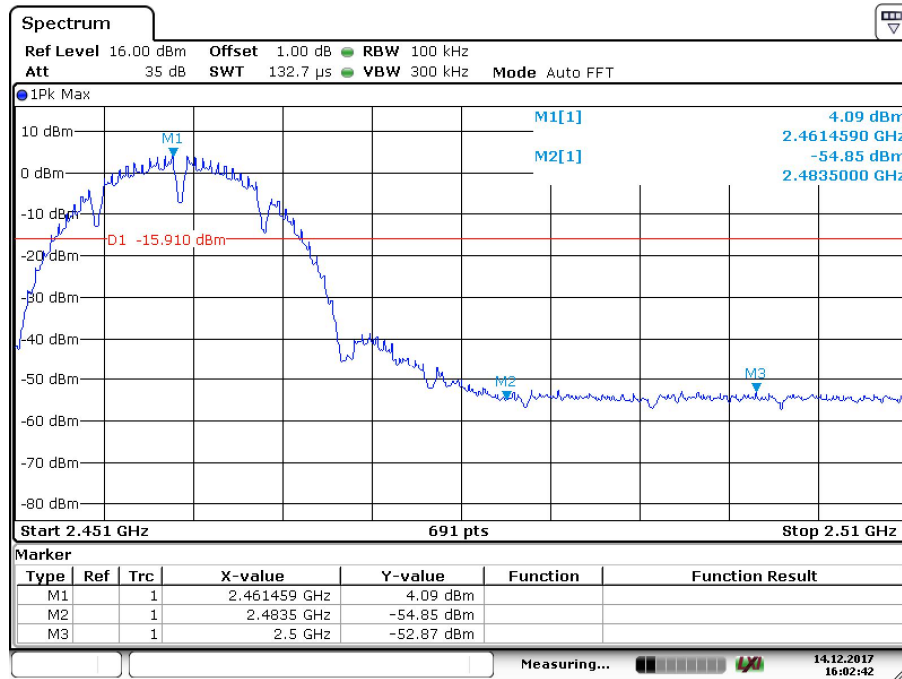
802.11b



Date: 14.DEC.2017 16:04:36

2412MHz

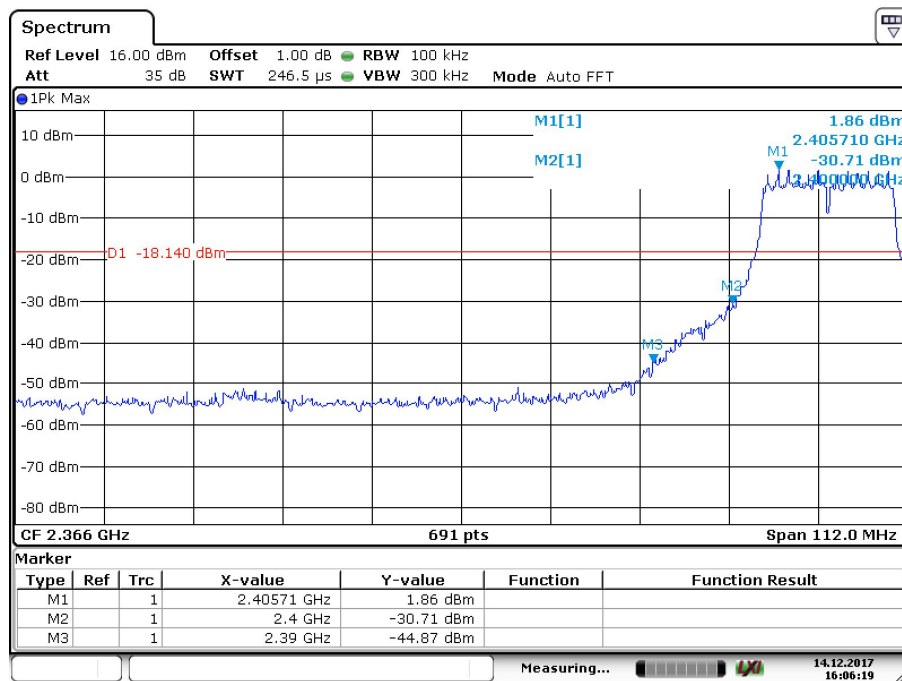
Band edge



Date: 14.DEC.2017 16:02:43

2462MHz

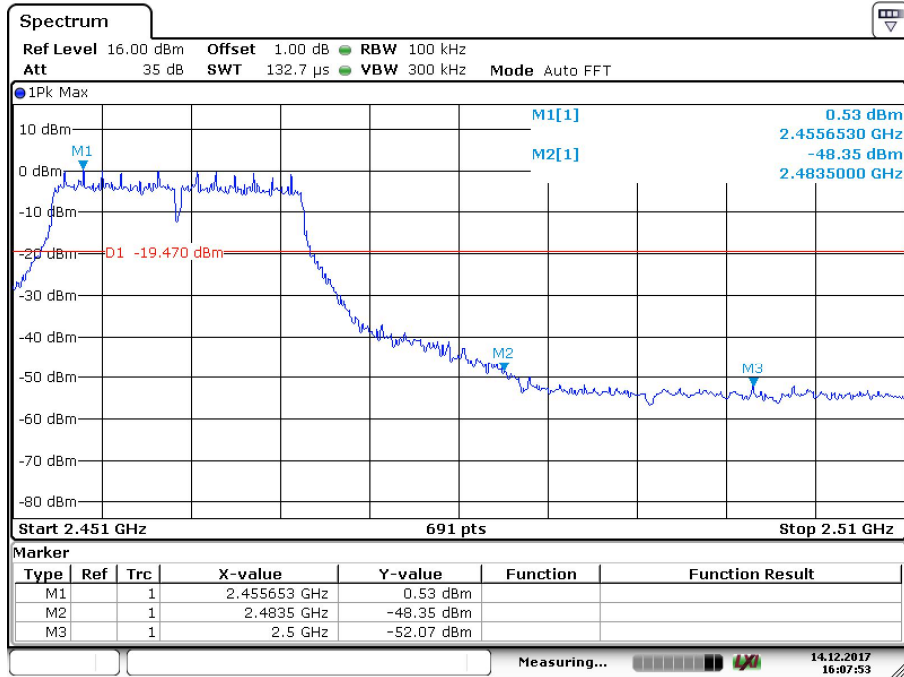
802.11g



Date: 14.DEC.2017 16:06:19

2412MHz

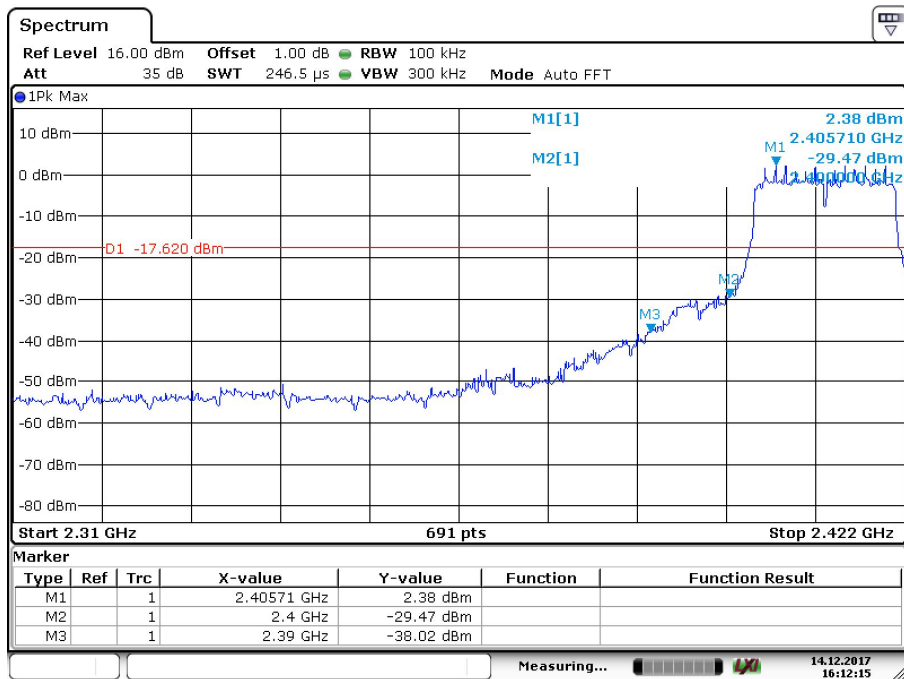
Band edge



Date: 14.DEC.2017 16:07:54

2462MHz

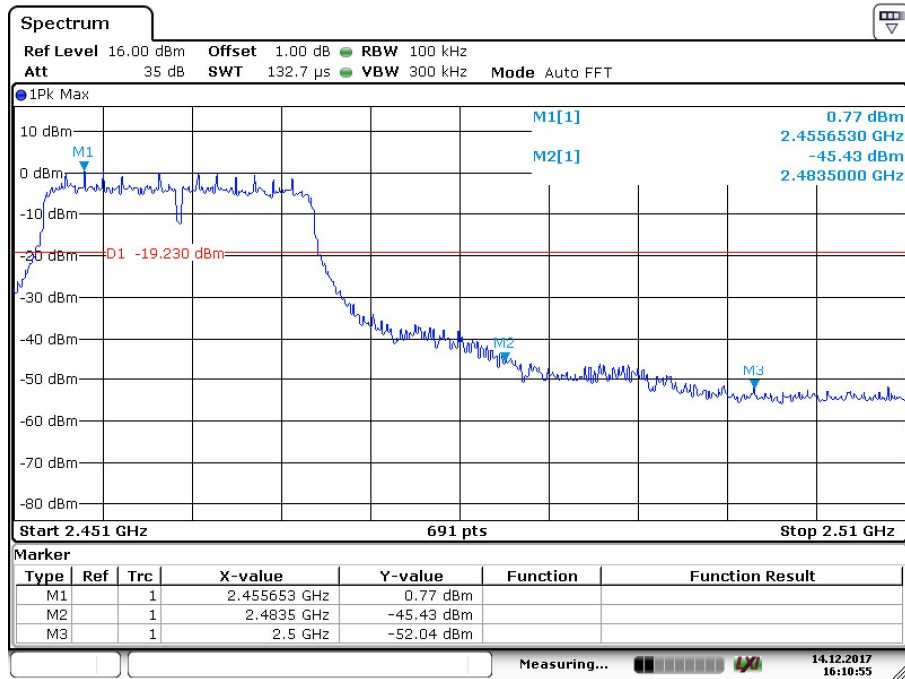
802.11nHT20



Date: 14.DEC.2017 16:12:16

2412MHz

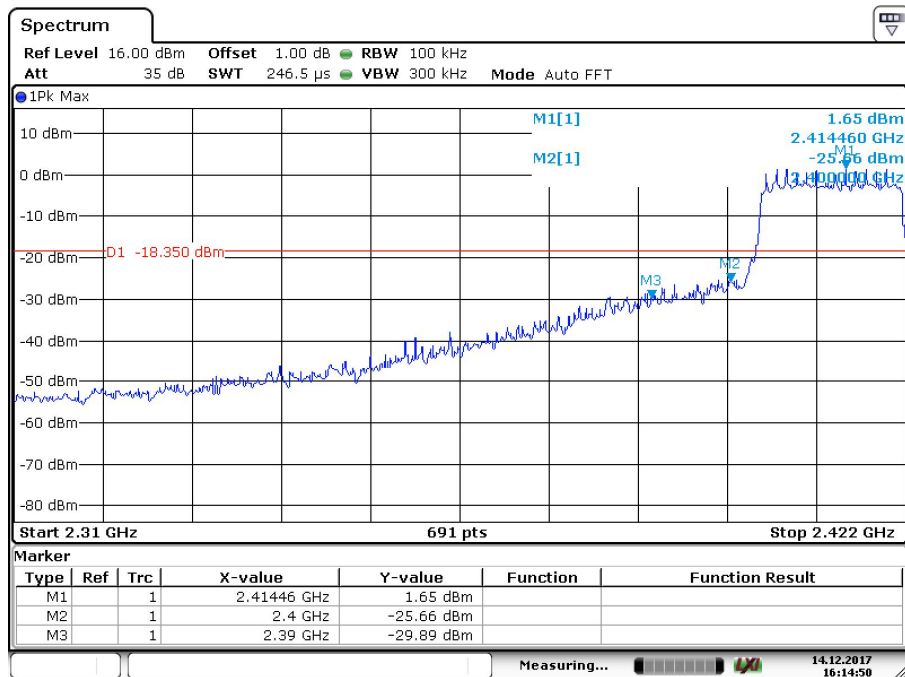
Band edge



Date: 14.DEC.2017 16:10:55

2462MHz

802.11nHT20

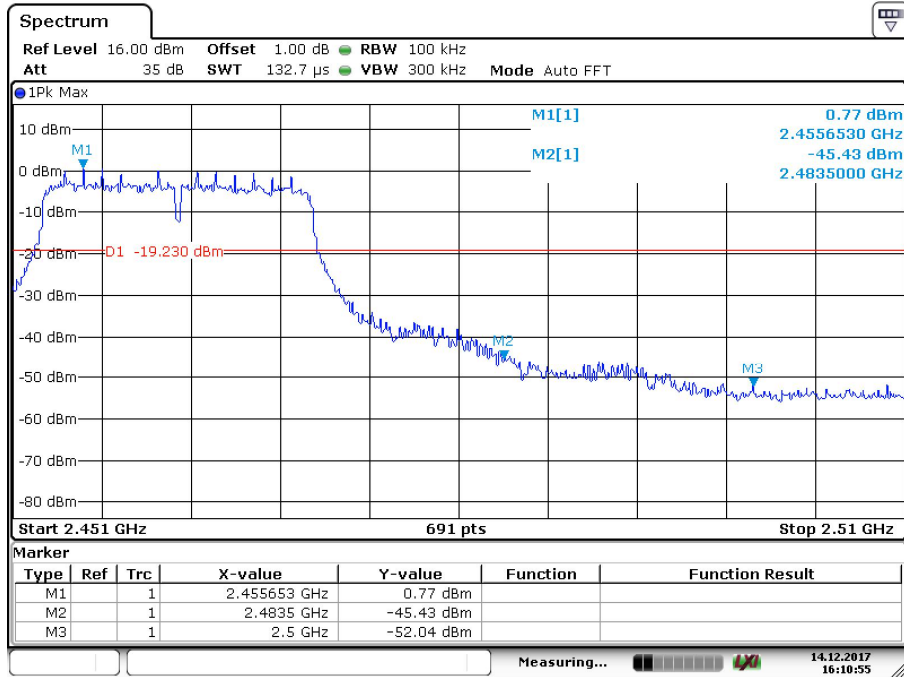


Date: 14.DEC.2017 16:14:50

2422MHz



Band edge



Date: 14.DEC.2017 16:10:55

2452MHz

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 3meter 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:

802.11b

2412MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB	Result
951.257	34.36	Horizontal	46.00	QP	31.0	Pass
43.7600	34.46	Vertical	40.00	QP	17.6	Pass

2412MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB/m	Result
4823.90 *	41.38	Horizontal	74.00	PK	2.6	Pass
4823.90 *	42.02	Vertical	74.00	PK	2.7	Pass

Remark:

- (1) Data of measurement within this 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.

Spurious radiated emissions for transmitter

2437MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB	Result
--	--	Horizontal	--	QP	--	Pass
--	--	Vertical	--	QP	--	Pass

2437MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB	Result
4873.59 *	37.83	Horizontal	74.00	PK	2.5	Pass
4873.59 *	38.27	Vertical	74.00	PK	2.6	Pass

Remark:

- (1) Data of measurement within this 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.

2462MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB/m	Result
--	--	Horizontal	--	QP	--	Pass
--	--	Vertical	--	QP	--	Pass

2462MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB	Result
4923.75 *	38.97	Horizontal	74.00	PK	2.6	Pass
4923.75 *	39.52	Vertical	74.00	PK	2.7	Pass

Remark:

- (1) Data of measurement within this 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.

Spurious radiated emissions for transmitter

802.11g

2412MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB	
---	---	Horizontal	---	QP	---	Pass
---	---	Vertical	---	QP	---	Pass

2412MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB	
6153.75	37.47	Horizontal	74.00	PK	4.0	Pass
4852.50 *	36.35	Vertical	74.00	PK	2.7	Pass

Remark:

- (1) Data of measurement within this 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.

2437MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB/m	
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2437MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB/m	
5115.93 *	36.17	Horizontal	74.00	PK	2.8	Pass
5366.03 *	36.34	Vertical	74.00	PK	3.0	Pass

Remark:

- (1) Data of measurement within this 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.

Spurious radiated emissions for transmitter

2462MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB	Result
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2462MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB	Result
4932.65 *	35.77	Horizontal	74.00	PK	2.6	Pass
7009.68	39.46	Vertical	74.00	PK	5.9	Pass

Remark:

- (1) Data of measurement within this 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.

802.11nHT20

2412MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB/m	Result
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2412MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB/m	Result
3855.93 *	35.76	Horizontal	74.00	PK	0.0	Pass
5026.40 *	36.73	Vertical	74.00	PK	3.2	Pass

Remark:

- (1) Data of measurement within this 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.

Spurious radiated emissions for transmitter

2437MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Corr. dB/m	Result
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2437MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Corr. dB/m	Result
5686.00	36.50	Horizontal	74.00	PK	3.3	Pass
5088.28 *	36.13	Vertical	74.00	PK	2.9	Pass

Remark:

- (1) Data of measurement within this 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.

2462MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Corr. dB/m	Result
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2462MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBμV/m	Detector	Corr. dB/m	Result
4875.00 *	35.92	Horizontal	74.00	PK	2.5	Pass
7008.75	39.15	Vertical	74.00	PK	5.9	Pass

Remark:

- (1) Data of measurement within this 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.

Spurious radiated emissions for transmitter

802.11nHT40

2422MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB	
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2422MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB	
4920.93 *	36.08	Horizontal	74.00	PK	2.6	Pass
4861.40 *	36.16	Vertical	74.00	PK	2.6	Pass

Remark:

- (3) Data of measurement within this 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.
- (4) “*” means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

2437MHz (30MHz – 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB	
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2437MHz (Above 1GHz)

Frequency	Emission Level	Polarization	Limit	Detector	Corr.	Result
MHz	dBuV/m		dBμV/m		dB	
5003.90 *	36.13	Horizontal	74.00	PK	2.9	Pass
3855.93 *	40.46	Vertical	74.00	PK	0.1	Pass

Remark:

- (3) Data of measurement within this 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.
- (4) “*” means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.



Spurious radiated emissions for transmitter

2452MHz (30MHz – 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB/m	Result
--	--	Horizontal	--	QP	---	Pass
--	--	Vertical	--	QP	---	Pass

2452MHz (Above 1GHz)

Frequency MHz	Emission Level dBuV/m	Polarization	Limit dBuV/m	Detector	Corr. dB/m	Result
5059.31 *	36.59	Horizontal	74.00	PK	2.8	Pass
4962.65 *	36.45	Vertical	74.00	PK	2.8	Pass

Remark:

- (3) Data of measurement within this 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.
- (4) “*” 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
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2018-7-14
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2018-7-14
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2018-8-2
Horn Antenna	Rohde & Schwarz	HF907	102294	2018-7-14
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2018-7-14
3m Semi-anechoic chamber	TDK	9X6X6	----	2019-5-29
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2018-7-14
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2018-8-2
Horn Antenna	Rohde & Schwarz	HF907	102294	2018-7-14
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2018-7-14
LISN	Rohde & Schwarz	ENV4200	100249	2018-7-14
LISN	Rohde & Schwarz	ENV216	100326	2018-7-14
ISN	Rohde & Schwarz	ENY81	100177	2018-7-14
ISN	Rohde & Schwarz	ENY81-CA6	101664	2018-7-14
High Voltage Probe	Rohde & Schwarz	TK9420(VT94 20)	9420-58	2018-7-14
RF Current Probe	Rohde & Schwarz	EZ-17	100816	2018-7-14

Conducted RF tests

- Conducted peak output power
- 6dB 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
Uncertainty for Radiated Spurious Emission 25MHz-3000MHz	Horizontal: 4.98dB; Vertical: 5.06dB;
Uncertainty for Radiated Spurious Emission 3000MHz-18000MHz	Horizontal: 4.95dB; Vertical: 4.94dB;
Uncertainty for Radiated Spurious Emission 18000MHz-40000MHz	Horizontal: 5.14dB; Vertical: 5.12dB;
Uncertainty for Conducted RF test with TS 8997	Power level test involved: 2.06dB Frequency test involved: 1.16×10^{-7}