

FCC/ISED

RF

TEST REPORT

ISSUED BY  
Shenzhen BALUN Technology Co., Ltd.



FOR  
**Fully Rugged Windows Tablet**

ISSUED TO  
Shenzhen UniStrong Science & Technology Co., Ltd.

B, 4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China



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Date May 09, 2018

Approved by: Liao Jianming  
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(Technical Director)

Date May 09, 2018



Report No.: BL-EC1830163-603  
EUT Name: Fully Rugged Windows Tablet  
Model Name: UT50  
Brand Name: UniStrong  
Test Standard: 47 CFR Part 15 Subpart C  
RSS-Gen (Issue 4, November 2014)  
RSS-247 (Issue 2, February 2017)  
FCC ID: 2AOPD-UT50  
ISED Number: 11546A-UT50

Test Conclusion: Pass  
Test Date: Apr. 04, 2018 ~ Apr. 17, 2018  
Date of Issue: May 09, 2018

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### Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Apr. 20, 2018</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>May 09, 2018</u>	<u>Update the data of the conduction part other than power.</u>

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# 1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

## 1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

## 1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	<p>The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1.</p> <p>The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.</p> <p>The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01.</p> <p>The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.</p>
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

## 1.3 Laboratory Condition

Ambient Temperature	20°C to 25°C
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

## 1.4 Announce

- (1) The test report reference to the report template version v6.1.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	Shenzhen UniStrong Science & Technology Co.,Ltd.
Address	B, 4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China

### 2.2 Manufacturer Information

Manufacturer	Shenzhen UniStrong Science & Technology Co.,Ltd.
Address	B, 4-4Factory, Zhengcheng Road, Fuyong Baoan District, Shenzhen, China

### 2.3 Factory Information

Factory	N/A
Address	N/A

### 2.4 General Description for Equipment under Test (EUT)

EUT Name	Fully Rugged Windows Tablet
Under Test Model Name	UT50
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V4.0
Software Version	BIOS: R.AA.00.03.00/EC: R.AA.00.03.00/OS: R.AA.00.30.00
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

### 2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	SJYEnergy
	Model No.	BA900
	Serial No.	N/A
	Capacity	2900 mAh
	Rated Voltage	11.4 V
	Limit Charge Voltage	13.05 V
Ancillary Equipment 2	Adapter	
	Brand Name	AK
	Model No.	AK65WG-1900342W1
	Serial No.	N/A
	Rated Input	100-240 V~, 1.5 A, 50/60 Hz
	Rated Output	19 V= 3.42 A
Ancillary Equipment 3	USB Cable	
	Model No.	N/A
	Length (Approx.)	0.8 m

## 2.6 Technical Information

Network and Wireless connectivity	3G Network WCDMA/HSDPA/HSUPA Band 1/2/3/4/5/8 4G Network FDD LTE Band 1/2/3/4/5/7/8/12/13/20/25/26/30 TDD LTE Band 41 Bluetooth 4.0 (BR+EDR+BLE) WIFI 802.11a, 802.11b, 802.11g, 802.11n(HT20/40) and 802.11ac NFC, GPS, GLONASS, BDS
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The requirement for the following technical information of the EUT was tested in this report:

Frequency Range	802.11b/g/n(20 MHz): 2.412 GHz - 2.462 GHz $f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$ , where - $f_c$ = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 1 to 11. 802.11n(40 MHz): 2.422 GHz - 2.452 GHz $f_c = 2412 \text{ MHz} + (N-1)*5 \text{ MHz}$ , where - $f_c$ = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 3 to 9.
Modulation Type	DSSS, OFDM
Product Type	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Antenna System (eg., MIMO, Smart Antenna)	N/A
Categorization as Correlated or Completely Uncorrelated	N/A
Antenna Type	FPC+Cable Antenna
Antenna Gain	1.57 dBi
About the Product	Only the WIFI 802.11b, 802.11g and 802.11n (HT20/40) was tested in this report.

Modulation technology	Modulation Type	Transfer Rate (Mbps)
DSSS (802.11b)	DBPSK	1
	DQPSK	2
	CCK	5.5/ 11
OFDM (802.11g)	BPSK	6 / 9
	QPSK	12 / 18
	16QAM	24 / 36
	64QAM	48 / 54
OFDM (802.11n-20MHz)	BPSK	6.5
	QPSK	13/19.5
	16QAM	26/39
	64QAM	52/58.5/65
OFDM (802.11n-40MHz)	BPSK	13.5
	QPSK	27/40.5
	16QAM	54/81/108
	64QAM	121.5/135

Note: Preliminary tests were performed in different data rate in above table to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	
Output Power	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
6dB Bandwidth	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Conducted Spurious Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Conducted Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Radiated Spurious Emission	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Band Edge	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9
Power spectral density (PSD)	11b/11g/11n20/11n40	1/6/6.5/13.5 Mbps	1/6/11	3/6/9

Note: The above EUT information in section 2.4 and 2.6 was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.



### 3 SUMMARY OF TEST RESULTS

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C (10-1-16 Edition)	Miscellaneous Wireless Communications Services
2	KDB Publication 558074 D01v04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
3	KDB Publication 662911 D01v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
4	RSS-Gen (Issue 4, Nov. 2014)	General Requirements for Compliance of Radio Apparatus
5	RSS-247 (Issue 2, February 2017)	Digital Transmission Systems (DTSS), Frequency Hopping Systems(FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices
6	ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

#### 3.2 Verdict

No.	Description	FCC PART No.	ISED Part No.	Test Result	Verdict
1	Antenna Requirement	15.203; 15.247(b)	RSS-247, 5.4 (6)	N/A	Pass <sup>Note 1</sup>
2	Output Power	15.247(b)	RSS-247, 5.4 (4)	ANNEX A.1	Pass
3	6dB Bandwidth	15.247(a)	RSS-GEN, 6.6; RSS-247, 5.2 (1)	ANNEX A.2	Pass
4	Conducted Spurious Emission	15.247(d)	RSS-247, 5.5	ANNEX A.3	Pass
5	Band Edge(Authorized-band band-edge)	15.209; 15.247(d)	RSS-GEN, 8.9; RSS-247, 5.5	ANNEX A.4	Pass
6	Conducted Emission	15.207	RSS-GEN, 8.8	ANNEX A.5	Pass
7	Radiated Spurious Emission	15.209; 15.247(d)	RSS-247, 5.5	ANNEX A.6	Pass
8	Band Edge(Restricted-band band-edge)	15.209; 15.247(d)	RSS-247, 5.5	ANNEX A.7	Pass
9	Power spectral density (PSD)	15.247(e)	RSS-247, 5.2 (2)	ANNEX A.8	Pass
10	Receiver Spurious Emissions	N/A	RSS-Gen, 7.1.2	N/A	N/A <sup>Note 2</sup>

Note <sup>1</sup>: Please refer to section 5.1.

Note <sup>2</sup>: Only radio communication receivers operating in stand-alone mode within the band 30-960 MHz, as well as scanner receivers, are subject to Industry Canada requirements, so this test is not applicable.

## 4 GENERAL TEST CONFIGURATIONS

### 4.1 Test Environments

During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	45% - 55%	
Atmospheric Pressure	100 kPa - 102 kPa	
Temperature	NT (Normal Temperature)	+22°C to +25°C
Working Voltage of the EUT	NV (Normal Voltage)	11.4 V

### 4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-30	103118	2017.06.12	2018.06.11
Switch Unit with OSP-B157	ROHDE&SCHWARZ	OSP120	101270	2017.06.12	2018.06.11
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2017.09.07	2018.09.06
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2017.06.22	2018.06.21
LISN	SCHWARZBECK	NSLK 8127	8127-687	2017.06.22	2018.06.21
Bluetooth Tester	ROHDE&SCHWARZ	CBT	101005	2017.06.12	2018.06.11
Power Splitter	KMW	DCPD-LDC	1305003215	--	--
Power Sensor	ROHDE&SCHWARZ	NRP-Z21	103971	2017.06.12	2018.06.11
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	--	--
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	--	--
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2017.06.22	2018.06.21
Temperature Chamber	ANGELANTIONI SCIENCE	NTH64-40A	1310	2017.06.27	2018.06.26
Test Antenna- Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2017.11.07	2019.11.08
Test Antenna- Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	2017.07.22	2019.07.21
Test Antenna- Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1148	2016.07.12	2018.07.11
Test Antenna- Horn(15-26.5 GHz)	SCHWARZBECK	BBHA 9170	9170-305	2017.06.22	2018.06.21
Test Antenna- Horn (18-40 GHz)	A-INFO	LB- 180400KF	J211060273	N/A	2019.01.06
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2017.02.24	2019.02.23
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60 *7.35m	N/A	2017.02.21	2019.02.20
Shielded Enclosure	ChangNing	CN-130701	130703	--	--
Signal Generator	ROHDE&SCHWARZ	SMB100A	177746	2017.06.12	2018.06.11
Power Amplifier	OPHIR RF	5225F	1037	2018.02.16	2019.02.15
Power Amplifier	OPHIR RF	5273F	1016	2018.02.16	2019.02.15
Directional Coupler	Werlantone	C5982-10	109275	N/A	N/A
Directional Coupler	Werlantone	CHP-273E	S00801z-01	N/A	N/A

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Feld Strength Meter	Narda	EP601	511WX51129	2017.05.22	2018.05.21
Mouth Simulator	B&K	4227	2423931	2017.11.16	2018.11.15
Sound Calibrator	B&K	4231	2430337	2017.11.16	2018.11.15
Sound Level Meter	B&K	NL-20	00844023	2017.11.16	2018.11.15
Ear Simulator	B&K	4185	2409449	2017.11.16	2018.11.15
Ear Simulator	B&K	4195	2418189	2017.11.16	2018.11.15
Audio analyzer	B&K	UPL 16	100129	2017.11.16	2018.11.15

### 4.3 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	±4%
RF output power, conducted	±1.4 dB
Power Spectral Density, conducted	±2.5 dB
Unwanted Emissions, conducted	±2.8 dB
All emissions, radiated	±5.4 dB
Temperature	±1°C
Humidity	±4%

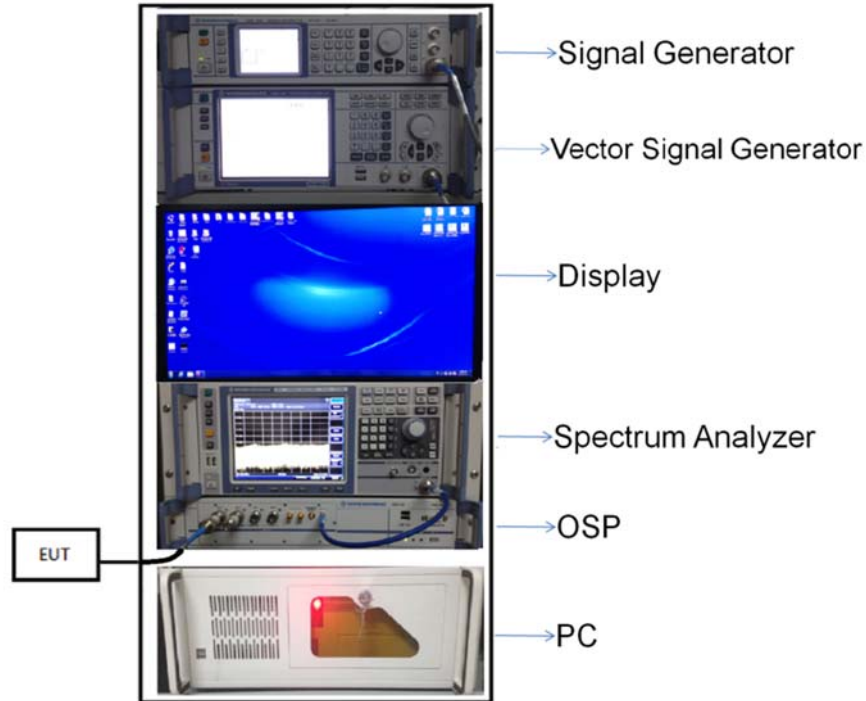
## 4.4 Description of Test Setup

### 4.4.1 For Antenna Port Test

Conducted value (dBm) = Measurement value (dBm) + cable loss (dB)

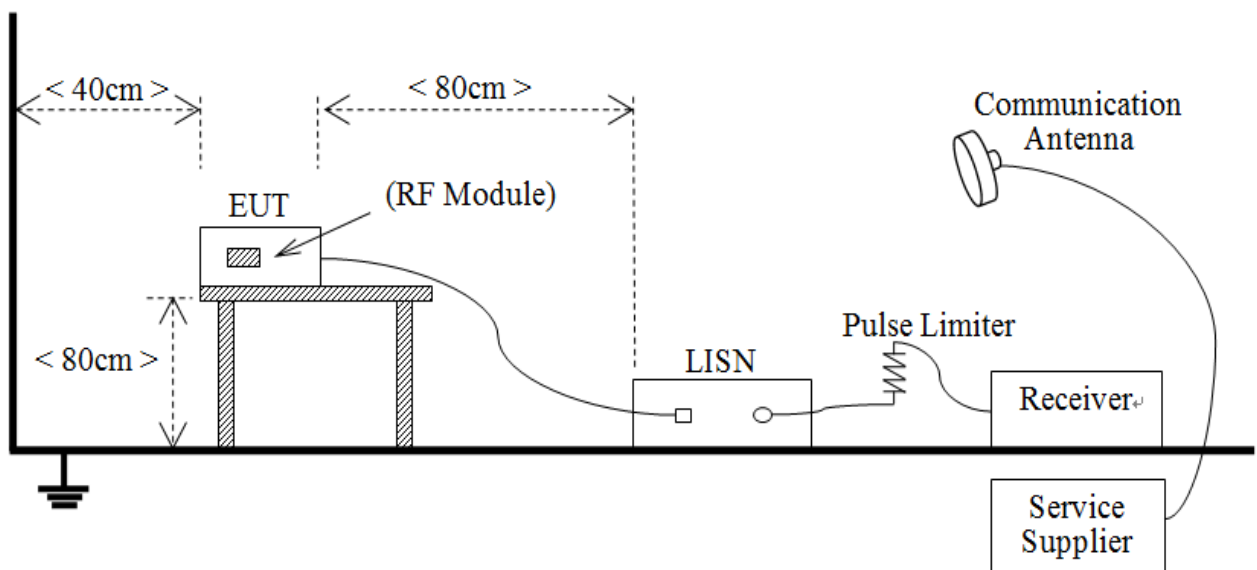
For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT:

Conducted value (dBm) = 10 dBm + 0.5 dB = 10.5 dBm



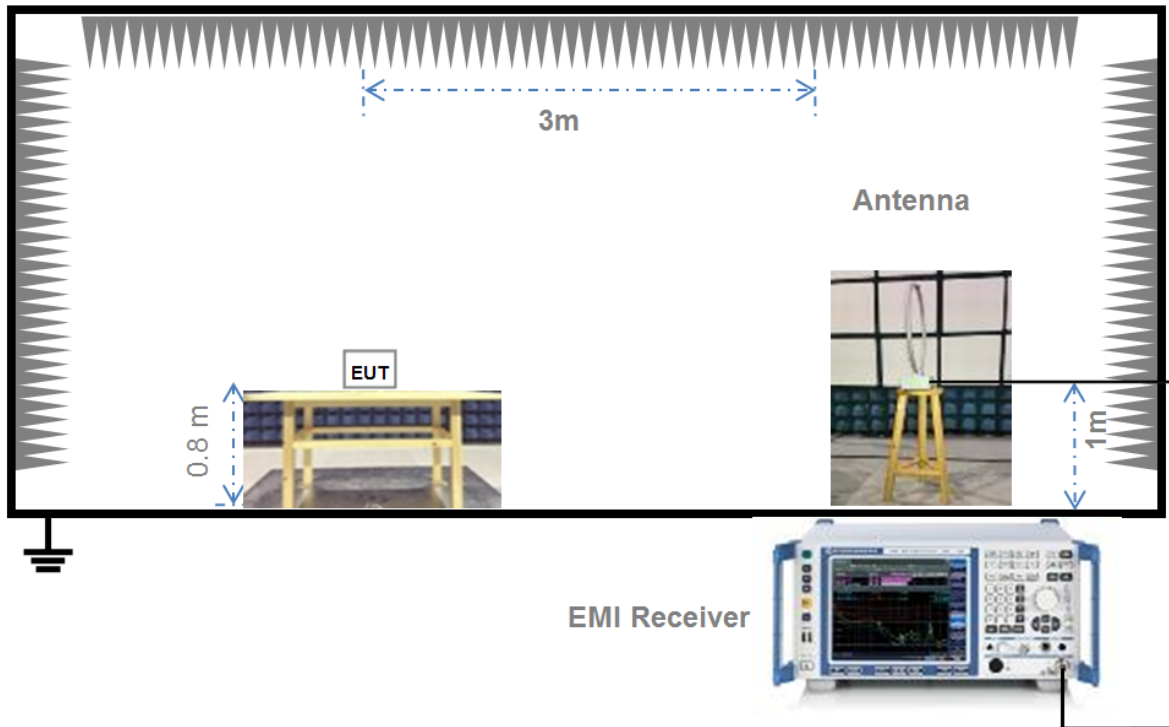
(Diagram 1)

### 4.4.2 For AC Power Supply Port Test



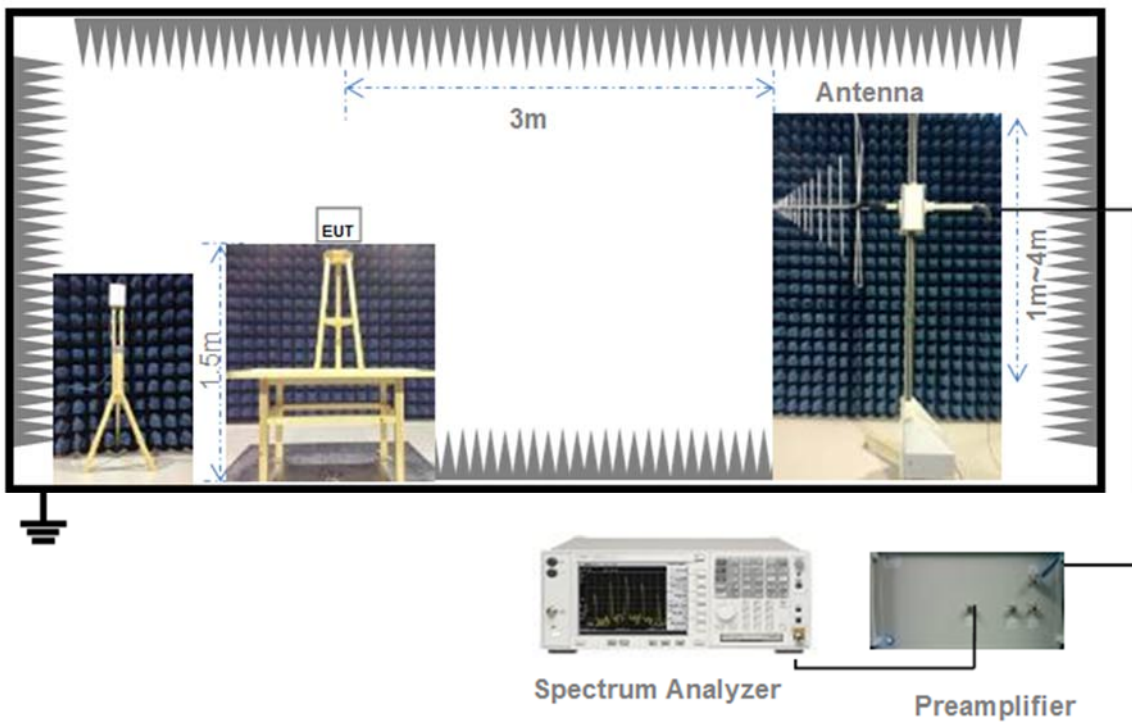
(Diagram 2)

4.4.3 For Radiated Test (Below 30 MHz)



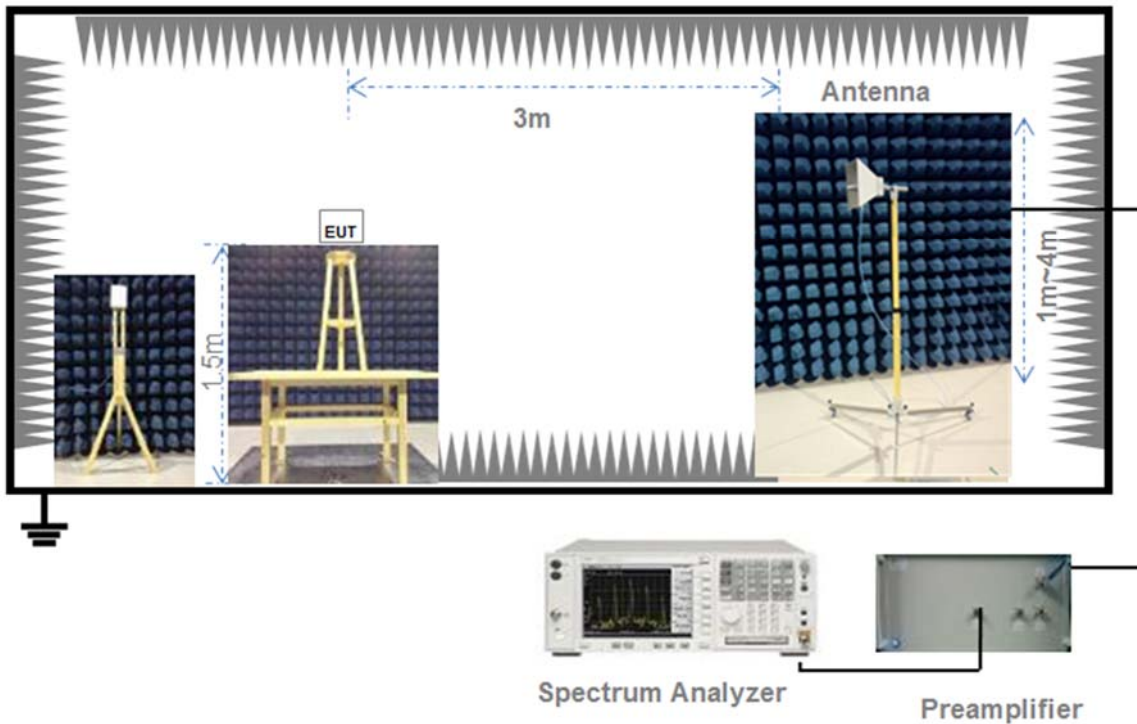
(Diagram 3)

4.4.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

#### 4.4.5 For Radiated Test (Above 1 GHz)



(Diagram 5)

### 4.5 Measurement Results Explanation Example

#### 4.5.1 For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

#### 4.5.2 For radiated band edges and spurious emission test:

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dB $\mu$ V/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

EIRP= Measure Conducted output power Value (dBm) + Maximum transmit antenna gain (dBi) + the appropriate maximum ground reflection factor (dB)

## 5 TEST ITEMS

### 5.1 Antenna Requirements

#### 5.1.1 Relevant Standards

FCC §15.203 & 15.247(b); RSS-247, 5.4 (6)

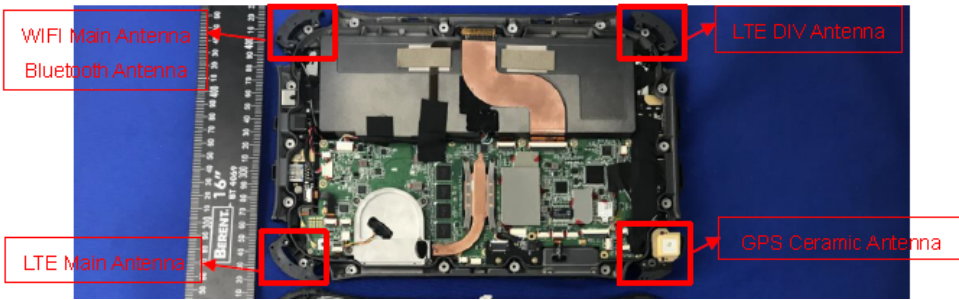
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

If directional gain of transmitting antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

#### 5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product.	An embedded-in antenna design is used.

Reference Documents	Item
Photo	

#### 5.1.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

## 5.2 Output Power

### 5.2.1 Test Limit

FCC § 15.247(b); RSS-247, 5.4 (4)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements.

### 5.2.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.2.3 Test Procedure

#### Maximum peak conducted output power

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

#### Maximum conducted (average) output power (Reporting Only)

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

- 1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.
- 2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
- 3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.

c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

d) Adjust the measurement in dBm by adding  $10\log(1/x)$ , where x is the duty cycle to the measurement result.

#### Measurements of duty cycle

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission.

Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest available value.



Set  $VBW \geq RBW$ . Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are  $> 50/T$  and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if  $T \leq 16.7$  microseconds.)

#### 5.2.4 Test Result

Please refer to ANNEX A.1.

## 5.3 6dB Bandwidth

### 5.3.1 Limit

FCC §15.247(a); RSS-GEN, 6.6

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.

### 5.3.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.3.3 Test Procedure

Use the following spectrum analyzer settings:

Set RBW = 100 kHz.

Set the video bandwidth (VBW)  $\geq 3$  RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 5.3.4 Test Result

Please refer to ANNEX A.2.

## 5.4 Conducted Spurious Emission

### 5.4.1 Limit

FCC §15.247(d); RSS-247, 5.5

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.

### 5.4.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.4.3 Test Procedure

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

- a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).
- b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).
- c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.

The following procedures shall be used to demonstrate compliance to these limits. Note that these procedures can be used in either an antenna-port conducted or radiated test set-up. Radiated tests must conform to the test site requirements and utilize maximization procedures defined herein.

#### Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to  $\geq 1.5$  times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW  $\geq 3 \times$  RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

### Emission level measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.

Set the RBW = 100 kHz.

Set the VBW  $\geq 3 \times$  RBW.

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

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 specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

#### 5.4.4 Test Result

Please refer to ANNEX A.3.

## 5.5 Band Edge (Authorized-band band-edge)

### 5.5.1 Limit

FCC §15.247(d); RSS-GEN, 8.9, RSS-247, 5.5

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.

### 5.5.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.5.3 Test Procedure

The following procedures may be used to determine the peak or average field strength or power of an unwanted emission that is within 2 MHz of the authorized band edge. If a peak detector is utilized, use the procedure described in 13.2.1. Use the procedure described in 13.2.2 when using an average detector and the EUT can be configured to transmit continuously (i.e., duty cycle  $\geq 98\%$ ). Use the procedure described in 13.2.3 when using an average detector and the EUT cannot be configured to transmit continuously but the duty cycle is constant (i.e., duty cycle variations are less than  $\pm 2$  percent). Use the procedure described in 13.2.4 when using an average detector for those cases where the EUT cannot be configured to transmit continuously and the duty cycle is not constant (duty cycle variations equal or exceed 2 percent).

When using a peak detector to measure unwanted emissions at or near the band edge (within 2 MHz of the authorized band), the following integration procedure can be used.

Set instrument center frequency to the frequency of the emission to be measured (must be within 2 MHz of the authorized band edge).

Set span to 2 MHz

RBW = 100 kHz.

VBW  $\geq 3 \times$  RBW.

Detector = peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweep to continue until the trace stabilizes (required measurement time may increase for low duty cycle applications)

Compute the power by integrating the spectrum over 1 MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency (femission)  $\pm 0.5$  MHz. If the instrument does not have a band power function, then sum the amplitude levels (in power units) at 100 kHz intervals extending across the 1 MHz spectrum defined by femission  $\pm 0.5$  MHz.

Standard method(The 99% OBW of the fundamental emission is without 2 MHz of the authorized band):

Span: Wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products that fall outside of the authorized band of operation.

Reference level: As required to keep the signal from exceeding the maximum instrument input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than  $[10 \log (OBW/RBW)]$  below the reference level. Specific guidance is given in 4.1.5.2.

Attenuation: Auto (at least 10 dB preferred).

Sweep time: Coupled.

Resolution bandwidth: 100 kHz.

Video bandwidth: 300 kHz.

Detector: Peak.

Trace: Max hold.

#### 5.5.4 Test Result

Please refer to ANNEX A.4.

## 5.6 Conducted Emission

### 5.6.1 Limit

FCC §15.207; RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

### 5.6.2 Test Setup

See section 4.4.2 for test setup description for the AC power supply port. The photo of test setup please refer to ANNEX B.

### 5.6.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

### 5.6.4 Test Result

Please refer to ANNEX A.5.

## 5.7 Radiated Spurious Emission

### 5.7.1 Limit

FCC §15.209&15.247(c); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

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

Frequency (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

### 5.7.2 Test Setup

See section 4.4.3 to 4.4.5 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.7.3 Test Procedure

Since the emission limits are specified in terms of radiated field strength levels, measurements performed to demonstrate compliance have traditionally relied on a radiated test configuration. Radiated measurements remain the principal method for demonstrating compliance to the specified limits; however antenna-port conducted measurements are also now acceptable to demonstrate compliance (see below for details). When radiated measurements are utilized, test site requirements and procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 shall be followed.

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

#### General Procedure for conducted measurements in restricted bands

- a) Measure the conducted output power (in dBm) using the detector specified (see guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).



- b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see guidance on determining the applicable antenna gain)
- c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
- d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
- e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dBμV/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

- f) Compare the resultant electric field strength level to the applicable limit.
- g) Perform radiated spurious emission test.

Quasi-Peak measurement procedure

The specifications for measurements using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Frequency Interference (CISPR) of the International Electrotechnical Commission.

As an alternative to CISPR quasi-peak measurement, compliance can be demonstrated to the applicable emission limits using a peak detector.

Peak power measurement procedure

Peak emission levels are measured by setting the instrument as follows:

- a) RBW = as specified in Table 1.
- b) VBW ≥ 3 x RBW.
- c) Detector = Peak.
- d) Sweep time = auto.
- e) Trace mode = max hold.
- f) Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be longer for low duty cycle applications).

Table 1—RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

#### Trace averaging across on and off times of the EUT transmissions followed by duty cycle correction

If continuous transmission of the EUT (i.e., duty cycle  $\geq 98$  percent) cannot be achieved and the duty cycle is constant (i.e., duty cycle variations are less than  $\pm 2$  percent), then the following procedure shall be used:

- a) The EUT shall be configured to operate at the maximum achievable duty cycle.
- b) Measure the duty cycle,  $x$ , of the transmitter output signal as described in section 6.0.
- c) RBW = 1 MHz (unless otherwise specified).
- d) VBW  $\geq 3 \times$  RBW.
- e) Detector = RMS, if span/(# of points in sweep)  $\leq$  (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.
- f) Averaging type = power (i.e., RMS).
  - 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
  - 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.
- g) Sweep time = auto.
- h) Perform a trace average of at least 100 traces.
- i) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
  - 1) If power averaging (RMS) mode was used in step f), then the applicable correction factor is  $10 \log(1/x)$ , where  $x$  is the duty cycle.
  - 2) If linear voltage averaging mode was used in step f), then the applicable correction factor is  $20 \log(1/x)$ , where  $x$  is the duty cycle.
  - 3) If a specific emission is demonstrated to be continuous ( $\geq 98$  percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

NOTE: Reduction of the measured emission amplitude levels to account for operational duty factor is not permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.

#### Determining the applicable transmit antenna gain

A conducted power measurement will determine the maximum output power associated with a restricted band emission; however, in order to determine the associated EIRP level, the gain of the transmitting antenna (in dBi) must be added to the measured output power (in dBm).

Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative

antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.

See KDB 662911 for guidance on calculating the additional array gain term when determining the effective antenna gain for a EUT with multiple outputs occupying the same or overlapping frequency ranges in the same band.

#### Radiated spurious emission test

An additional consideration when performing conducted measurements of restricted band emissions is that unwanted emissions radiating from the EUT cabinet, control circuits, power leads, or intermediate circuit elements will likely go undetected in a conducted measurement configuration. To address this concern, a radiated test shall be performed to ensure that emissions emanating from the EUT cabinet (rather than the antenna port) also comply with the applicable limits.

For these cabinet radiated spurious emission measurements the EUT transmit antenna may be replaced with a termination matching the nominal impedance of the antenna. Procedures for performing radiated measurements are specified in ANSI C63.10. All detected emissions shall comply with the applicable limits.

The measurement frequency range is from 30 MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

#### 5.7.4 Test Result

Please refer to ANNEX A.6.

## 5.8 Band Edge (Restricted-band band-edge)

### 5.8.1 Limit

FCC §15.209&15.247(c); RSS-247, 5.5

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

### 5.8.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.8.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported, Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

For transmitters operating above 1 GHz repeat the measurement with an average detector.

### 5.8.4 Test Result

Please refer to ANNEX A.7.

## 5.9 Power Spectral density (PSD)

### 5.9.1 Limit

FCC §15.247(d); RSS-247, 5.2 (2)

The same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

### 5.9.2 Test Setup

See section 4.4.1 for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

### 5.9.3 Test Procedure

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .

Set the VBW  $\geq 3 \text{ RBW}$ .

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 5.9.4 Test Result

Please refer to ANNEX A.8.

## ANNEX A TEST RESULT

### A.1 Output Power

#### Peak Power Test Data

##### 802.11b Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.42	27.67	30	1000	Pass
Middle	15.21	33.19			Pass
High	15.15	32.73			Pass

##### 802.11g Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.15	26.00	30	1000	Pass
Middle	14.91	30.97			Pass
High	15.11	32.43			Pass

##### 802.11n-20 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.02	25.23	30	1000	Pass
Middle	14.97	31.41			Pass
High	15.00	31.62			Pass

##### 802.11n-40 MHz Mode:

Channel	Measured Output Peak Power		Limit		Verdict
	dBm	mW	dBm	mW	
Low	14.70	29.51	30	1000	Pass
Middle	14.98	31.48			Pass
High	14.47	27.99			Pass

E.I.R.P Test Data (For ISED)

## 802.11b Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	15.99	39.72	36	4	Pass
Middle	16.78	47.64			Pass
High	16.72	46.99			Pass

## 802.11g Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	15.72	37.33	36	4	Pass
Middle	16.48	44.46			Pass
High	16.68	46.56			Pass

## 802.11n-20 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	15.59	36.22	36	4	Pass
Middle	16.54	45.08			Pass
High	16.57	45.39			Pass

## 802.11n-40 MHz Mode:

Channel	E.I.R.P		Limit		Verdict
	dBm	mW	dBm	W	
Low	16.27	42.36	36	4	Pass
Middle	16.55	45.19			Pass
High	16.04	40.18			Pass

## A.2 Bandwidth

### Test Data

#### 802.11b Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	9.21	12.79	$\geq 500$
Middle	9.21	12.74	$\geq 500$
High	9.21	12.79	$\geq 500$

#### 802.11g Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	15.22	17.19	$\geq 500$
Middle	15.22	17.31	$\geq 500$
High	15.17	17.37	$\geq 500$

#### 802.11n-20MHz Mode:

Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	15.22	18.29	$\geq 500$
Middle	16.02	18.35	$\geq 500$
High	15.37	18.47	$\geq 500$

#### 802.11n-40MHz Mode:

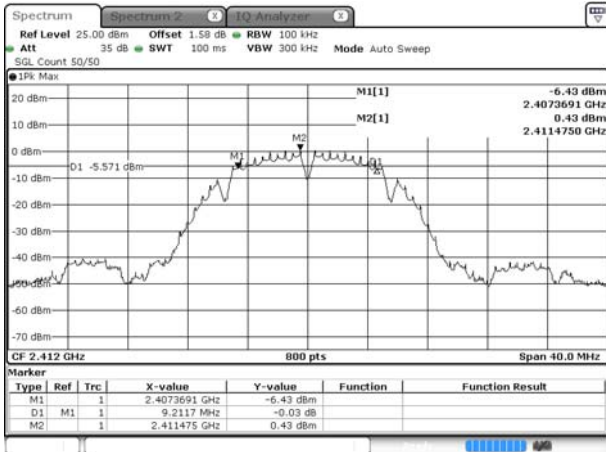
Channel	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limits (kHz)
Low	35.22	36.2	$\geq 500$
Middle	35.17	36.2	$\geq 500$
High	35.22	36.3	$\geq 500$



Test plots

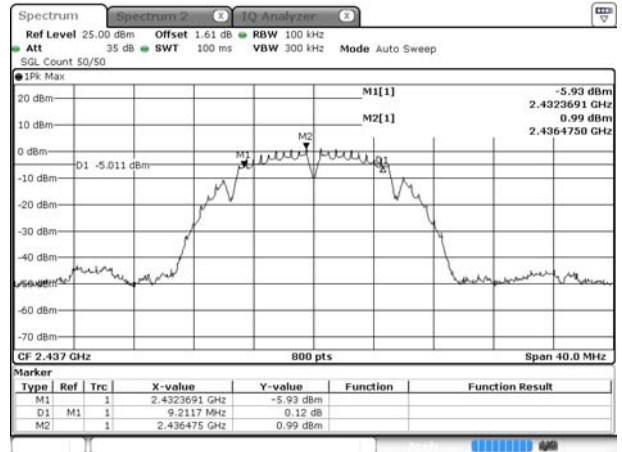
6 dB Bandwidth

802.11b LOW CHANNEL



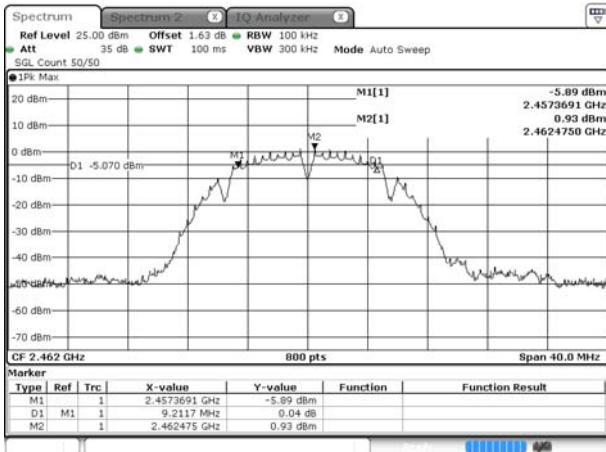
Date: 4 MAY 2018 07:50:37

802.11b MIDDLE CHANNEL



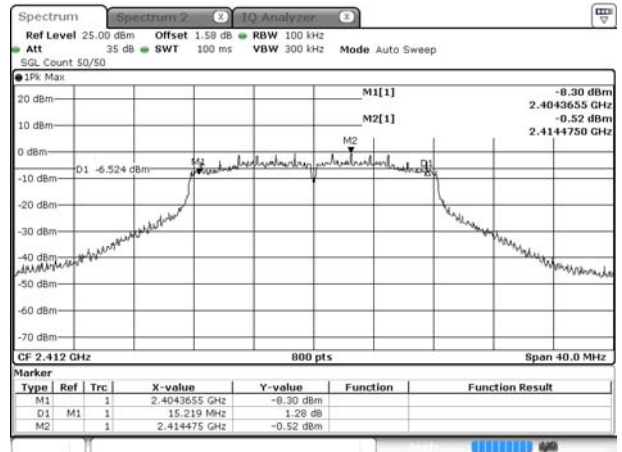
Date: 4 MAY 2018 08:18:55

802.11b HIGH CHANNEL



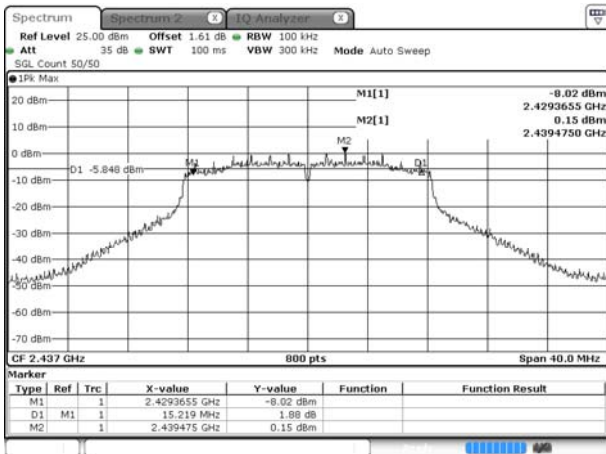
Date: 4 MAY 2018 08:23:13

802.11g LOW CHANNEL



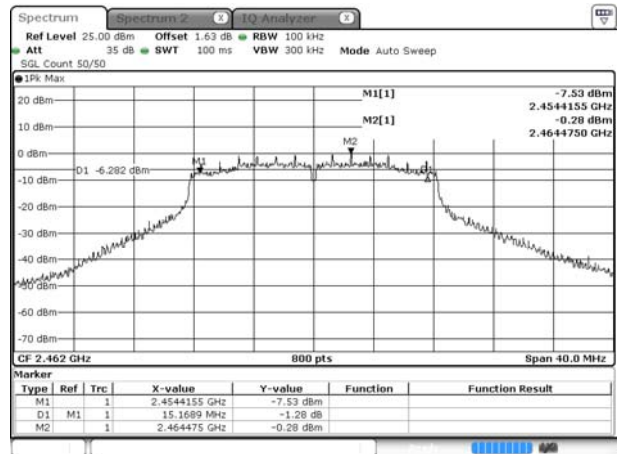
Date: 4 MAY 2018 08:25:24

802.11g MIDDLE CHANNEL



Date: 4 MAY 2018 08:27:41

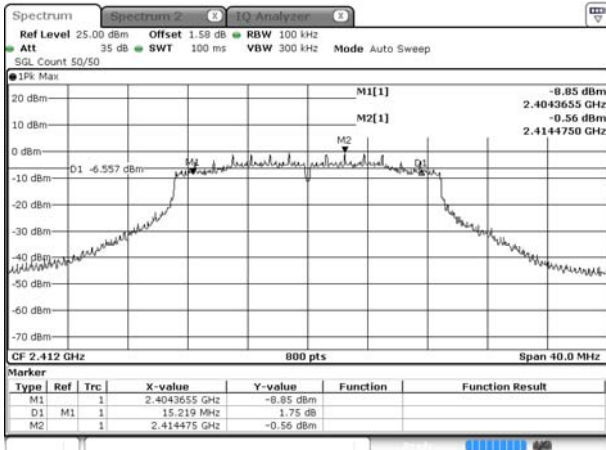
802.11g HIGH CHANNEL



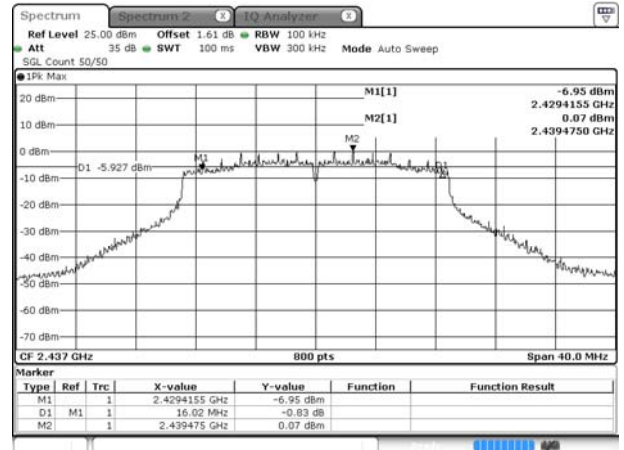
Date: 4 MAY 2018 08:31:54

802.11n-20 MHz LOW CHANNEL

802.11 n-20 MHz MIDDLE CHANNEL



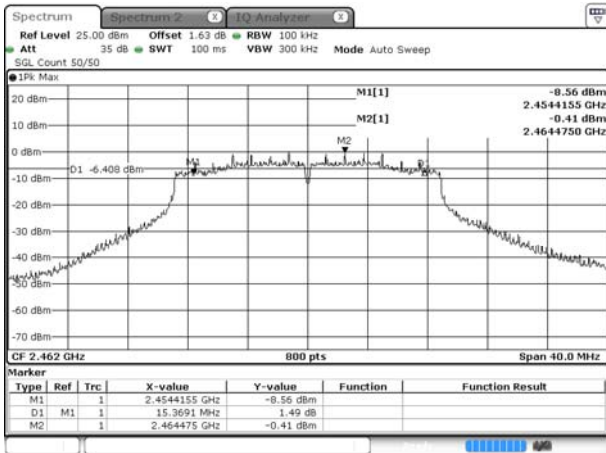
Date: 4 MAY 2018 08:35:24



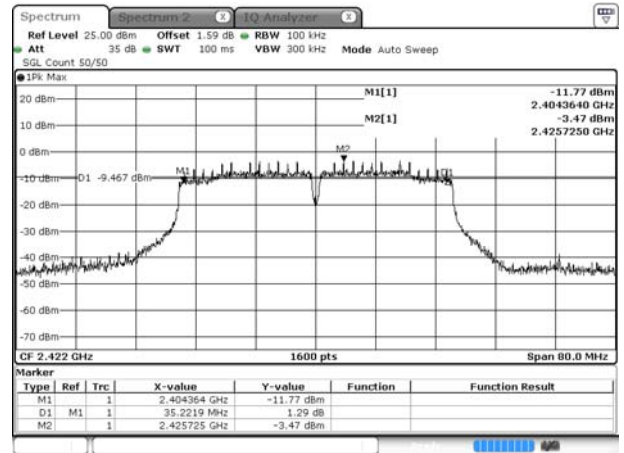
Date: 4 MAY 2018 08:37:27

802.11n-20 MHz HIGH CHANNEL

802.11n-40 MHz LOW CHANNEL



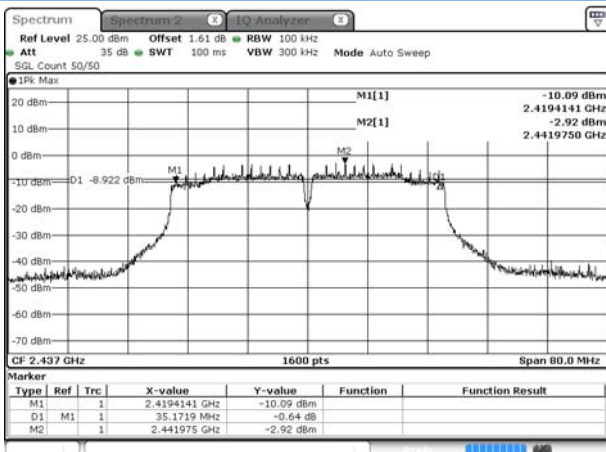
Date: 4 MAY 2018 08:40:57



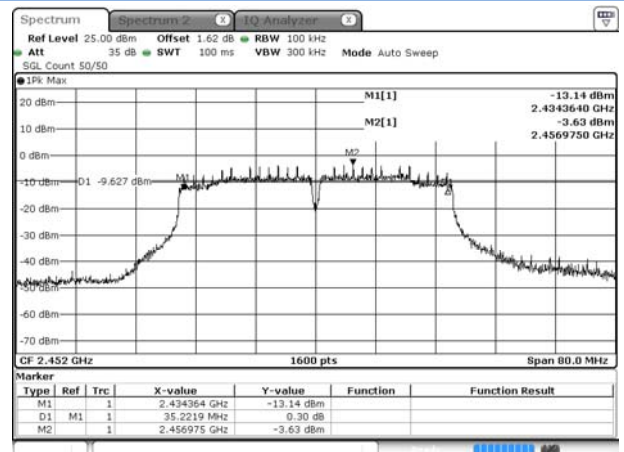
Date: 4 MAY 2018 08:44:20

802.11n-40 MHz MIDDLE CHANNEL

802.11n-40 MHz HIGH CHANNEL



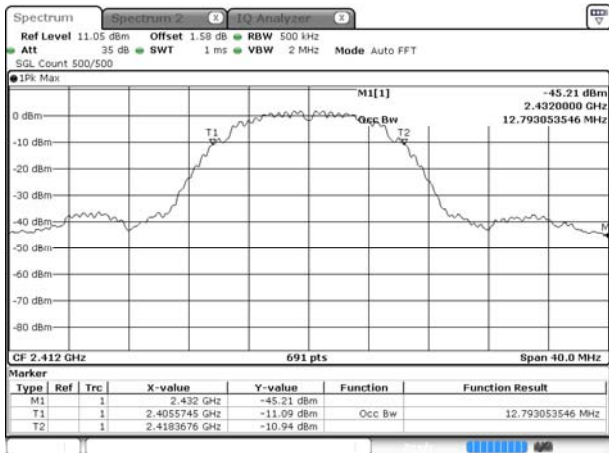
Date: 4 MAY 2018 08:48:04



Date: 4 MAY 2018 08:51:12

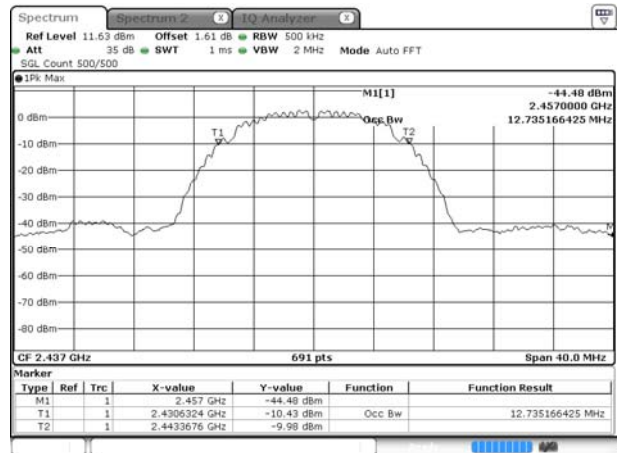
99% Bandwidth

802.11b LOW CHANNEL



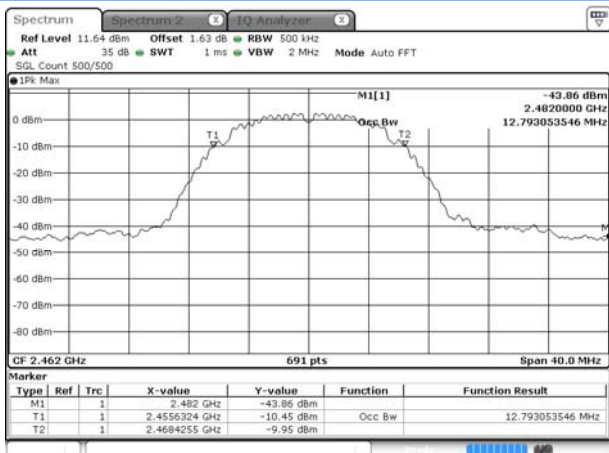
Date: 4 MAY 2018 07:50:48

802.11b MIDDLE CHANNEL



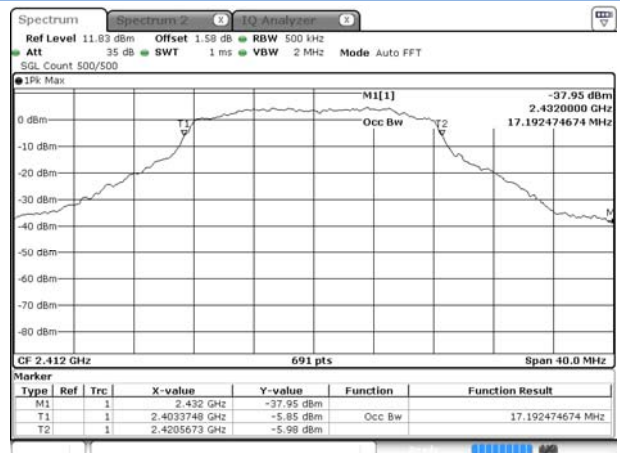
Date: 4 MAY 2018 08:19:05

802.11b HIGH CHANNEL



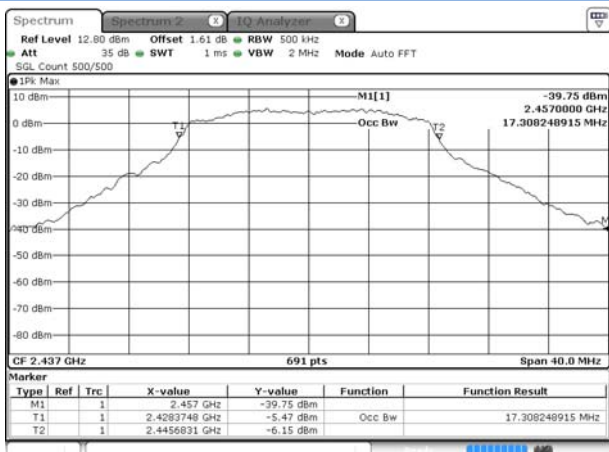
Date: 4 MAY 2018 08:23:23

802.11g LOW CHANNEL



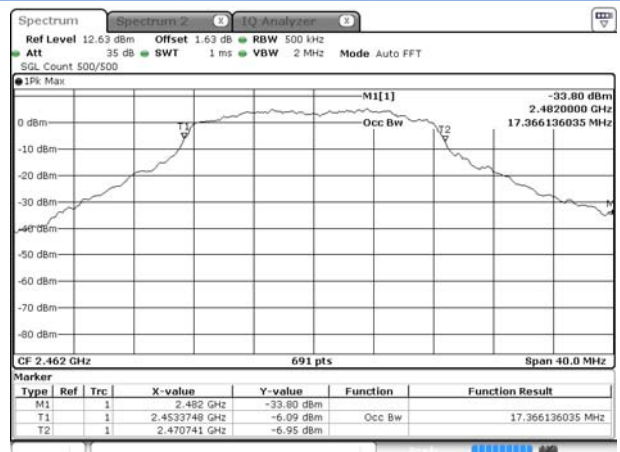
Date: 4 MAY 2018 08:25:33

802.11g MIDDLE CHANNEL



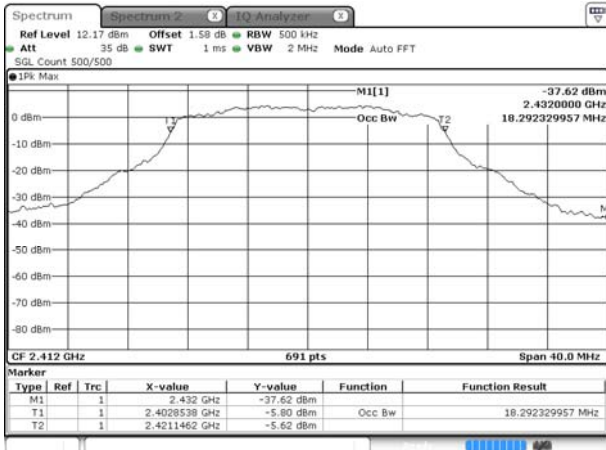
Date: 4 MAY 2018 08:27:49

802.11g HIGH CHANNEL



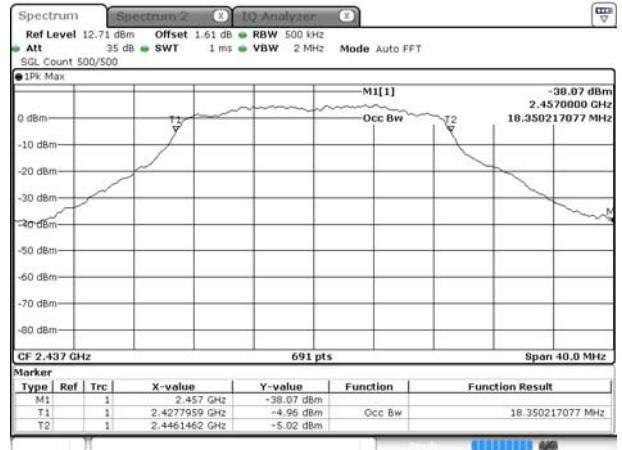
Date: 4 MAY 2018 08:32:04

802.11n-20 MHz LOW CHANNEL



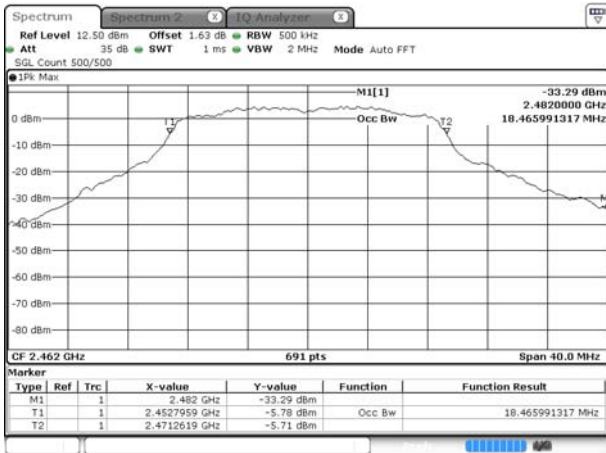
Date: 4 MAY 2018 08:35:34

802.11 n-20 MHz MIDDLE CHANNEL



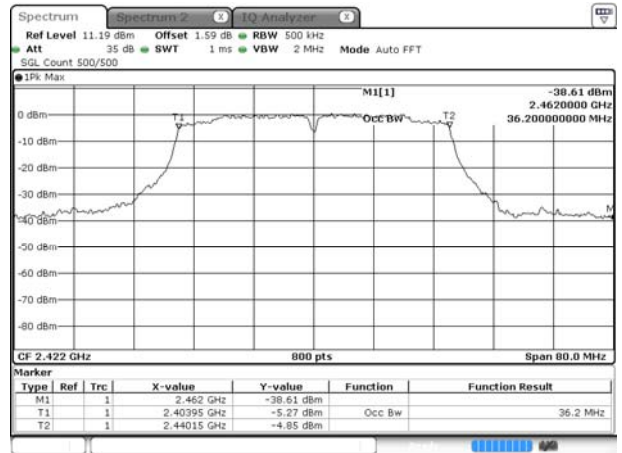
Date: 4 MAY 2018 08:37:36

802.11n-20 MHz HIGH CHANNEL



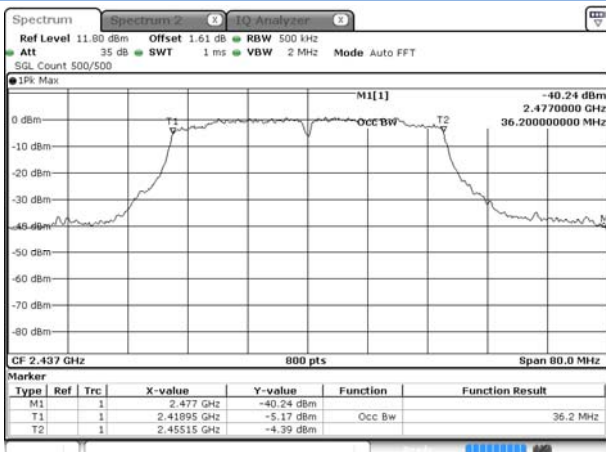
Date: 4 MAY 2018 08:41:07

802.11n-40 MHz LOW CHANNEL



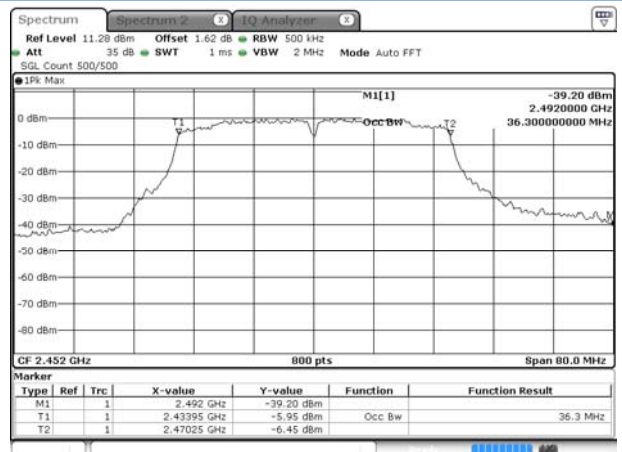
Date: 4 MAY 2018 08:44:31

802.11n-40 MHz MIDDLE CHANNEL



Date: 4 MAY 2018 08:48:15

802.11n-40 MHz HIGH CHANNEL



Date: 4 MAY 2018 08:51:23

### A.3 Conducted Spurious Emissions

#### Test Data

##### 802.11b Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-40.08	0.45	-19.55	Pass
Middle	-40.73	1.01	-18.99	Pass
High	-41.22	0.20	-19.80	Pass

##### 802.11g Mode:

Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-40.68	-0.50	-20.50	Pass
Middle	-40.16	-0.09	-20.09	Pass
High	-40.20	-0.47	-20.47	Pass

##### 802.11n-20MHz Mode:

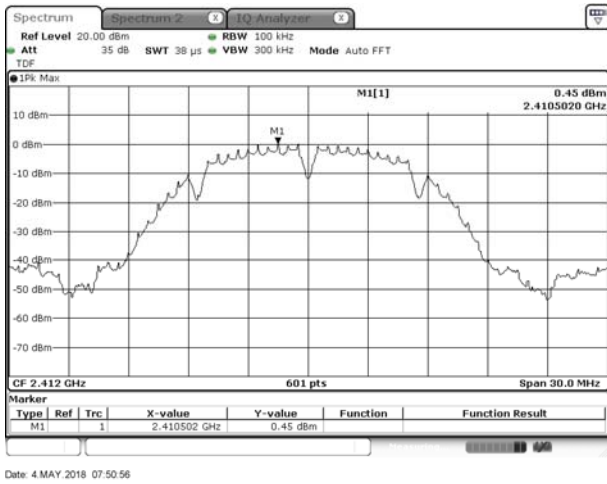
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-40.22	-0.44	-20.44	Pass
Middle	-40.31	0.08	-19.92	Pass
High	-40.47	-0.50	-20.50	Pass

##### 802.11n-40MHz Mode:

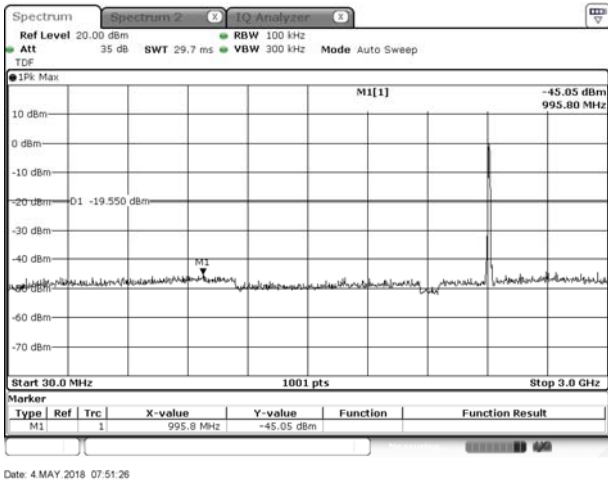
Channel	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low	-39.96	-3.39	-23.39	Pass
Middle	-40.07	-3.01	-23.01	Pass
High	-41.20	-3.47	-23.47	Pass

Test Plots

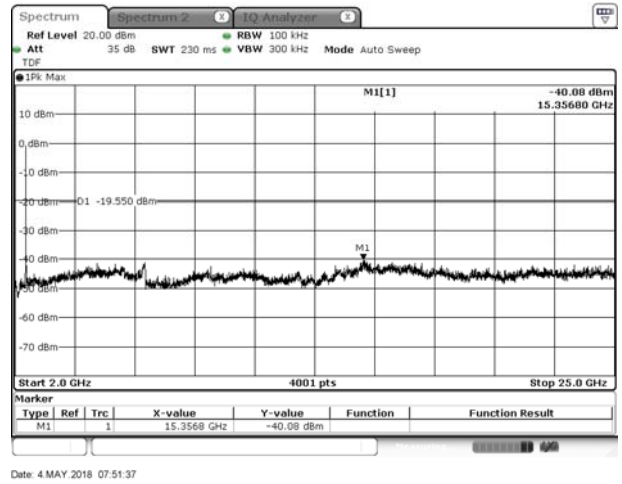
802.11b LOW CHANNEL CARRIER LEVEL



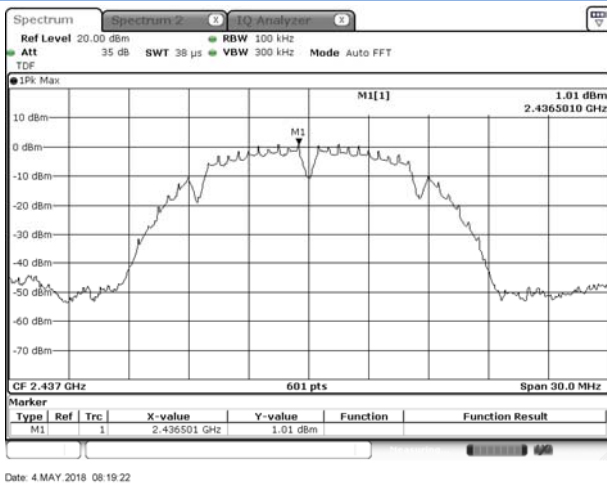
802.11b LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



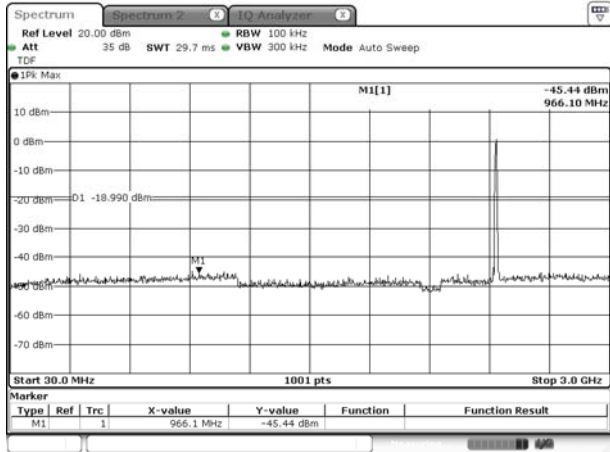
802.11b LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



802.11b MIDDLE CHANNEL CARRIER LEVEL

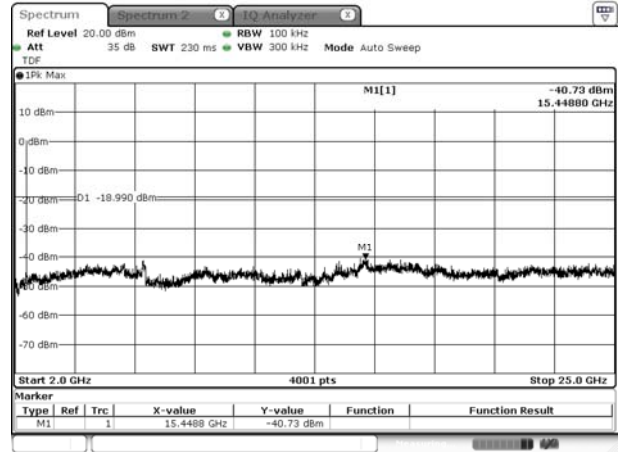


802.11b MIDDLE CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



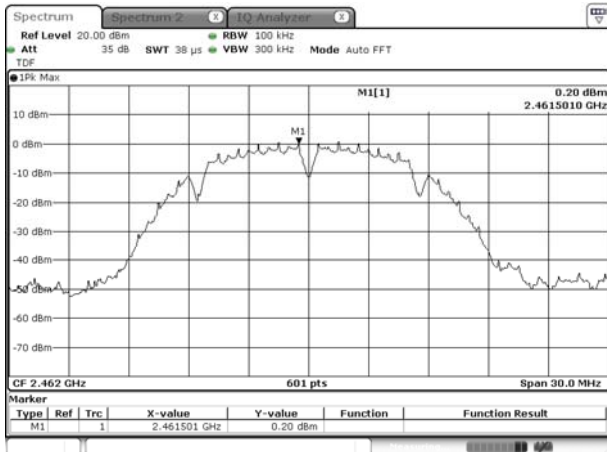
Date: 4 MAY 2018 08:19:45

802.11b MIDDLE CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



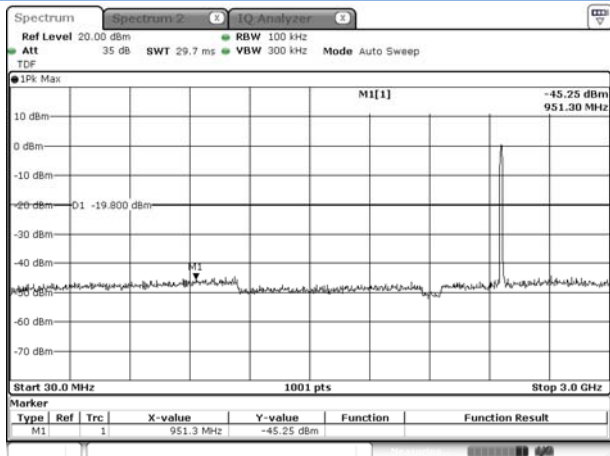
Date: 4 MAY 2018 08:19:53

802.11b HIGH CHANNEL CARRIER LEVEL



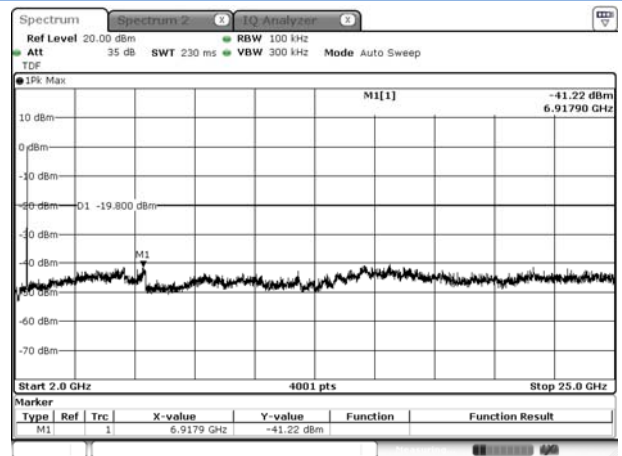
Date: 4 MAY 2018 08:23:31

802.11b HIGH CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



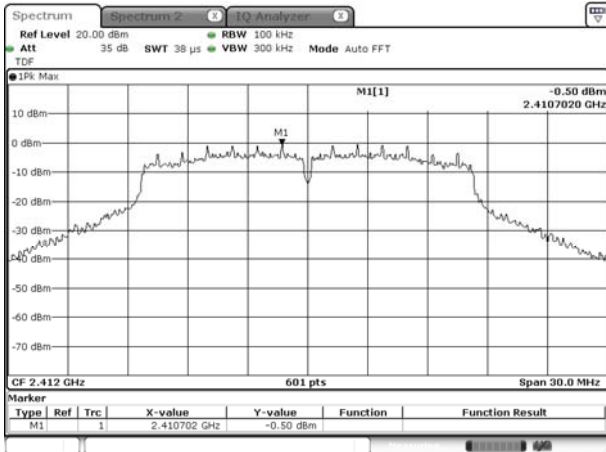
Date: 4 MAY 2018 08:23:49

802.11b HIGH CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



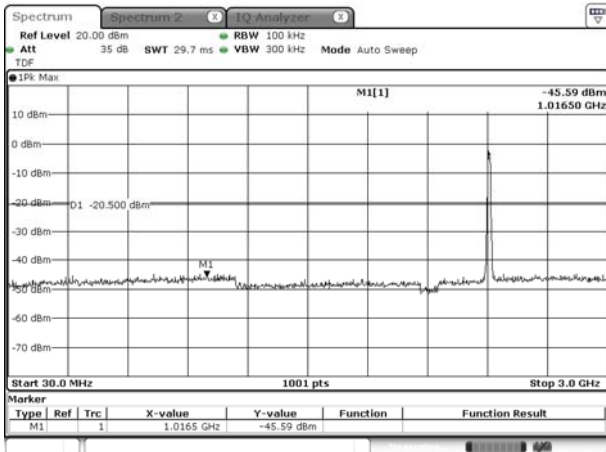
Date: 4 MAY 2018 08:23:55

802.11g LOW CHANNEL CARRIER LEVEL



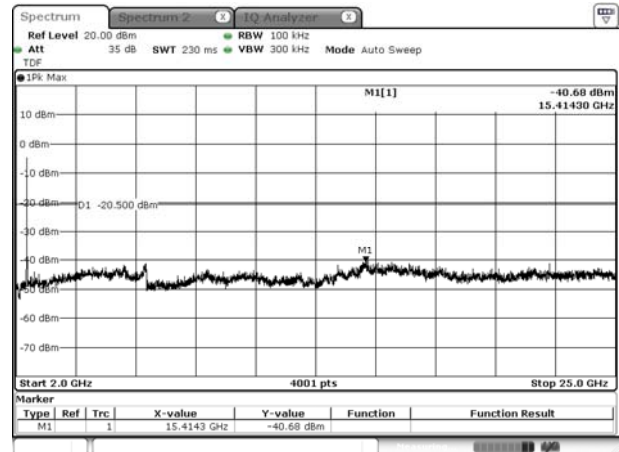
Date: 4 MAY 2018 08:25:46

802.11g LOW CHANNEL, SPURIOUS 30 MHz ~ 3 GHz



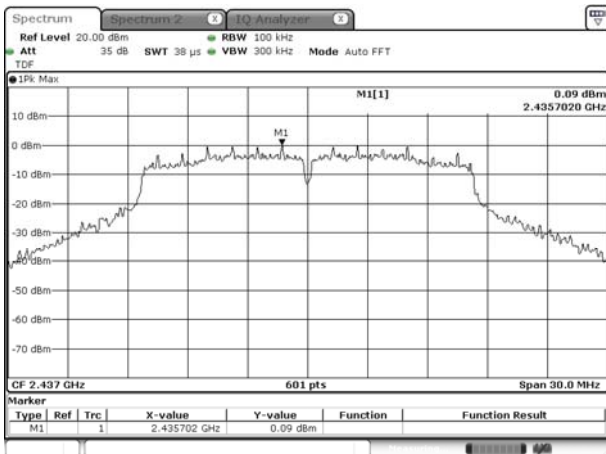
Date: 4 MAY 2018 08:26:16

802.11g LOW CHANNEL, SPURIOUS 2 GHz ~ 25 GHz



Date: 4 MAY 2018 08:26:23

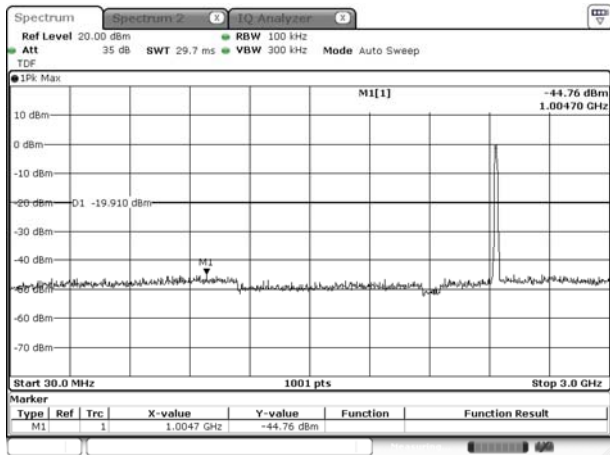
802.11g MIDDLE CHANNEL CARRIER LEVEL



Date: 4 MAY 2018 08:29:30

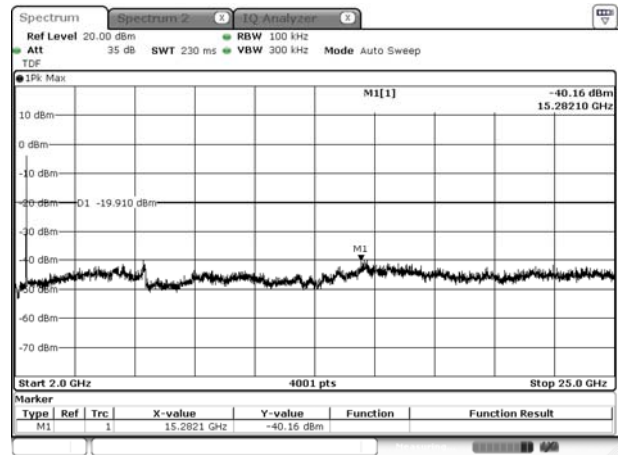


802.11g MIDDLE CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



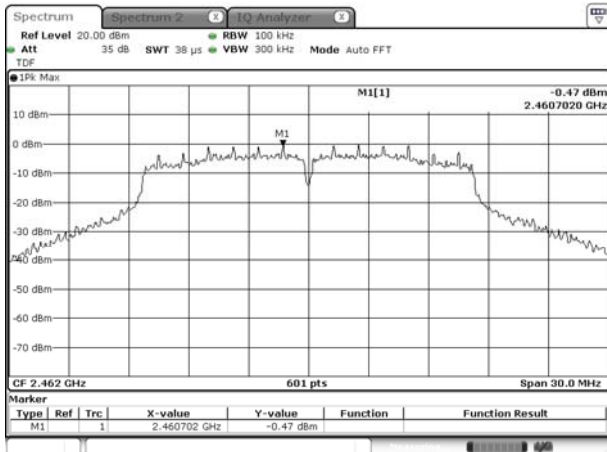
Date: 4 MAY 2018 08:29:54

802.11g MIDDLE CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



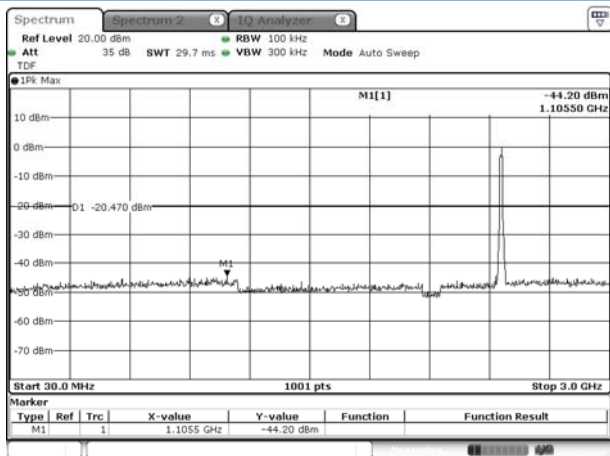
Date: 4 MAY 2018 08:30:01

802.11g HIGH CHANNEL CARRIER LEVEL



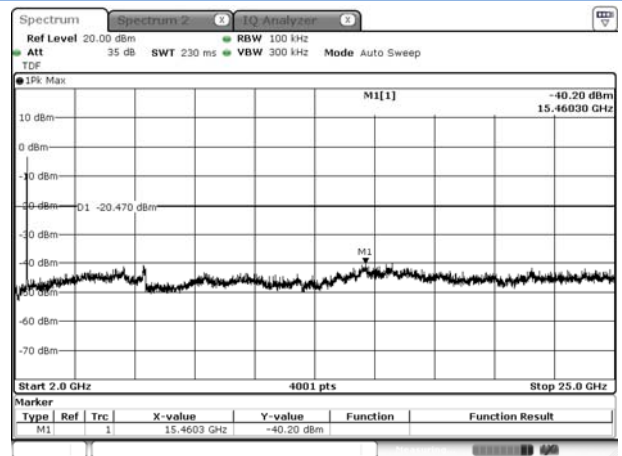
Date: 4 MAY 2018 08:32:12

802.11g HIGH CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



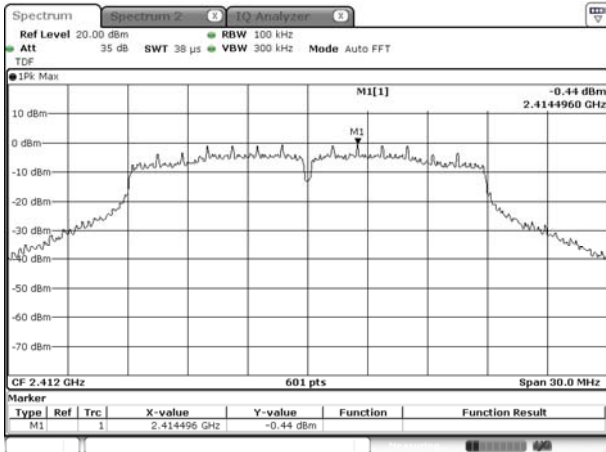
Date: 4 MAY 2018 08:32:30

802.11g HIGH CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



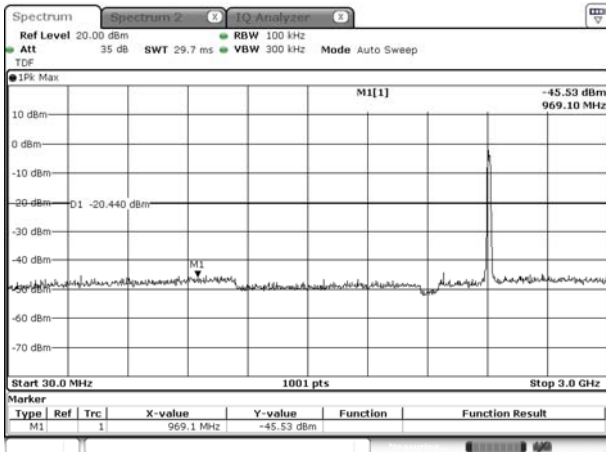
Date: 4 MAY 2018 08:32:39

802.11n-20 MHz LOW CHANNEL CARRIER LEVEL



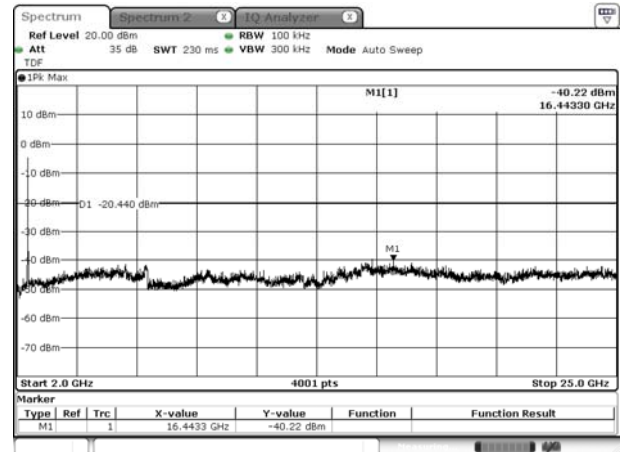
Date: 4 MAY 2018 08:35:51

802.11n-20 MHz LOW CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



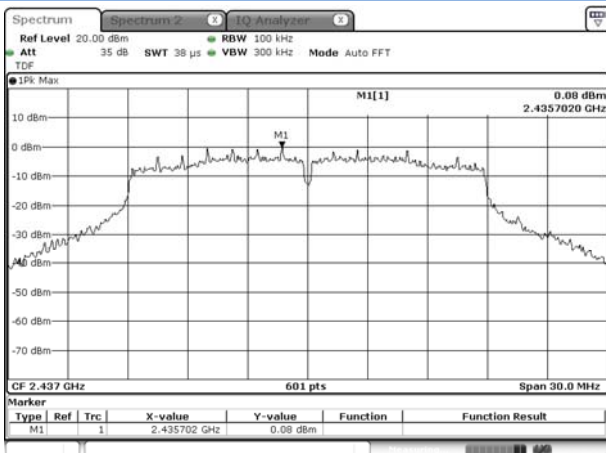
Date: 4 MAY 2018 08:36:09

802.11n-20 MHz LOW CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



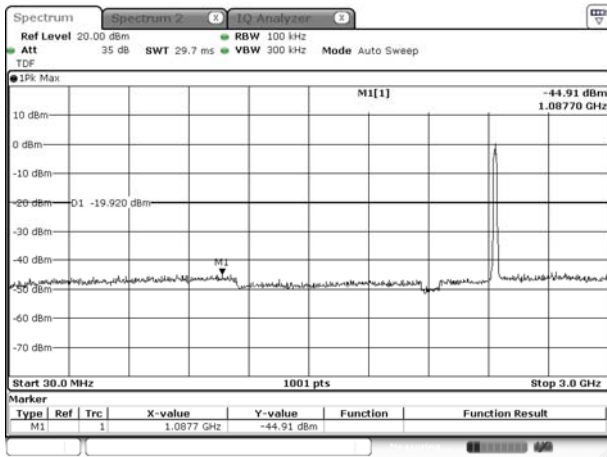
Date: 4 MAY 2018 08:36:18

802.11n-20 MHz MIDDLE CHANNEL CARRIER  
LEVEL



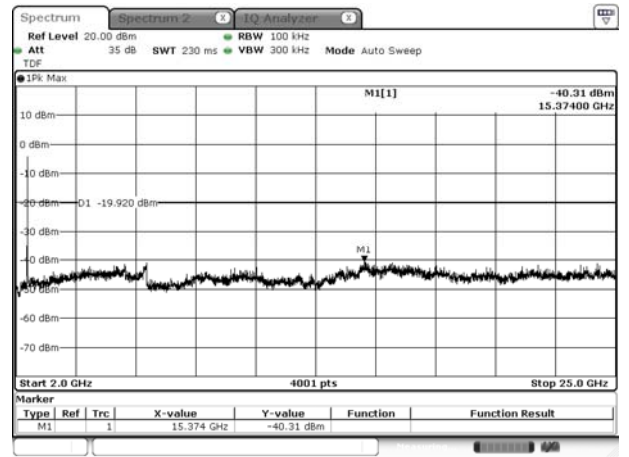
Date: 4 MAY 2018 08:37:51

802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



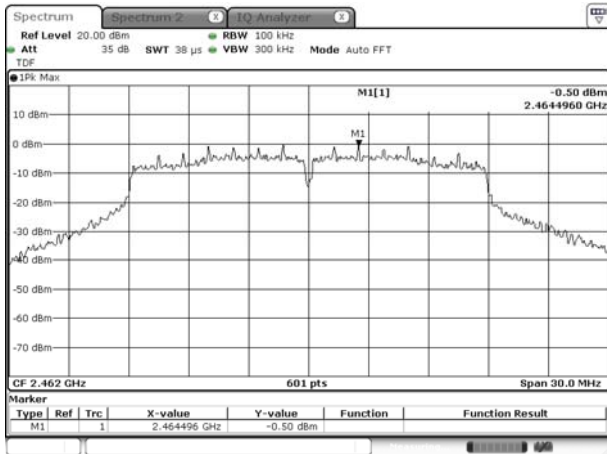
Date: 4 MAY 2018 08:38:42

802.11n-20 MHz MIDDLE CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



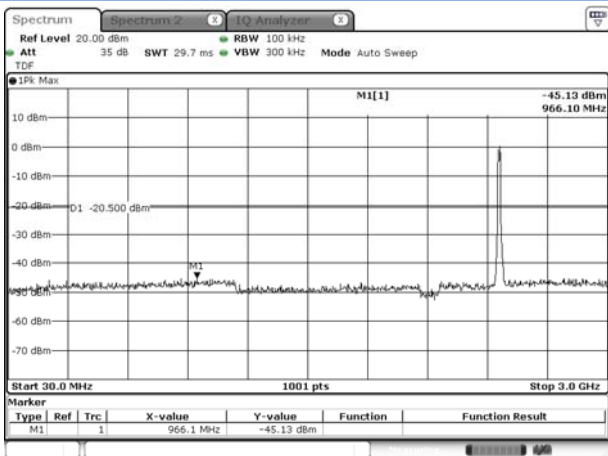
Date: 4 MAY 2018 08:38:49

802.11n-20 MHz HIGH CHANNEL CARRIER LEVEL



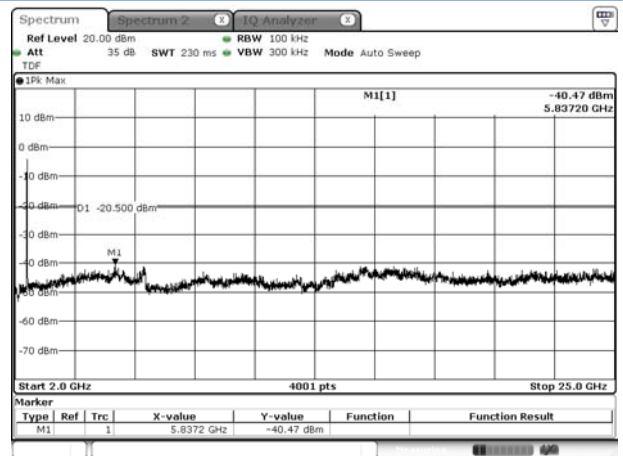
Date: 4 MAY 2018 08:41:15

802.11n-20 MHz HIGH CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



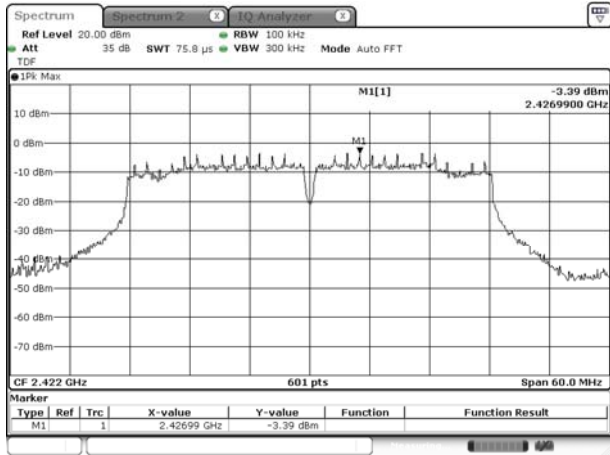
Date: 4 MAY 2018 08:41:31

802.11n-20 MHz HIGH CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



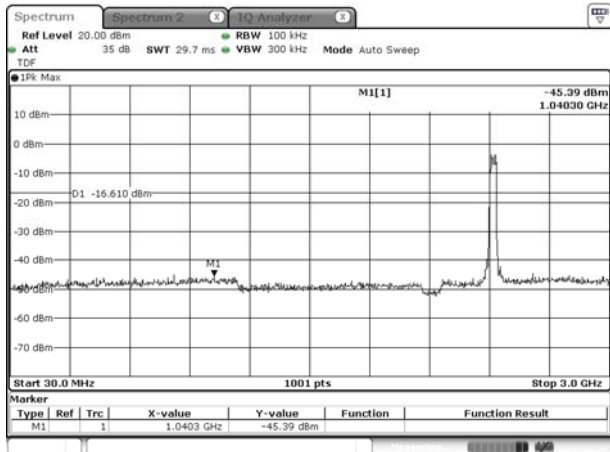
Date: 4 MAY 2018 08:41:39

802.11n-40 MHz LOW CHANNEL CARRIER LEVEL



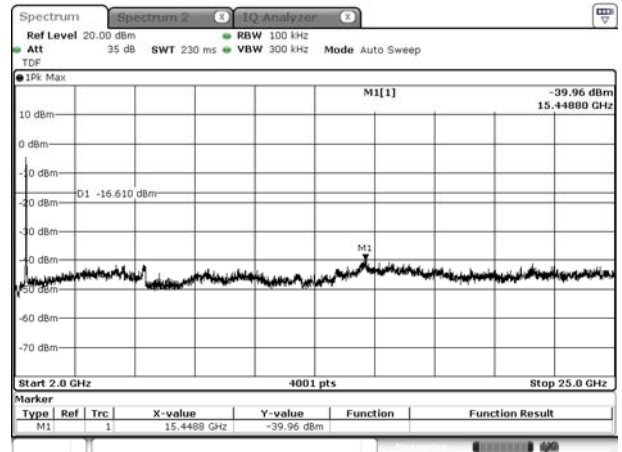
Date: 4 MAY 2018 08:44:46

802.11n-40 MHz LOW CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



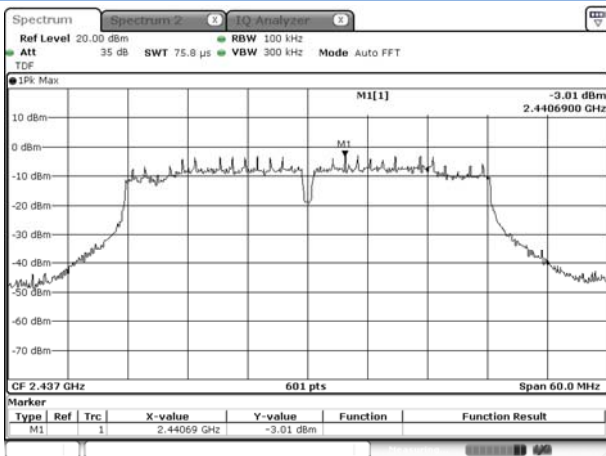
Date: 4 MAY 2018 08:45:28

802.11n-40 MHz LOW CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



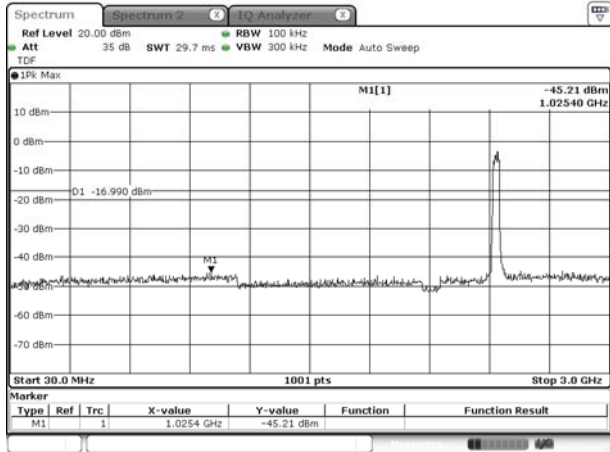
Date: 4 MAY 2018 08:45:36

802.11n-40 MHz MIDDLE CHANNEL CARRIER LEVEL



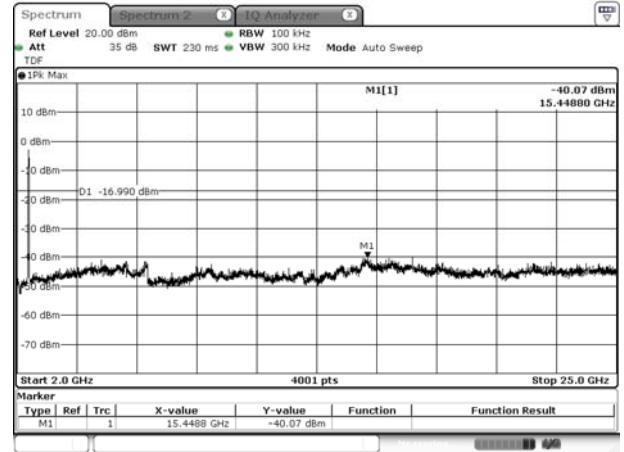
Date: 4 MAY 2018 08:48:23

802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



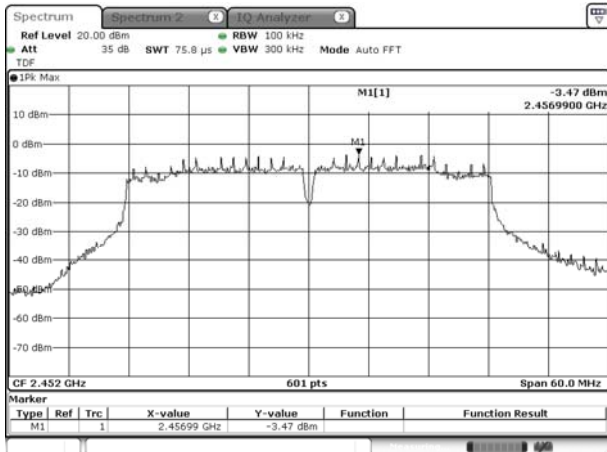
Date: 4 MAY 2018 08:48:53

802.11n-40 MHz MIDDLE CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



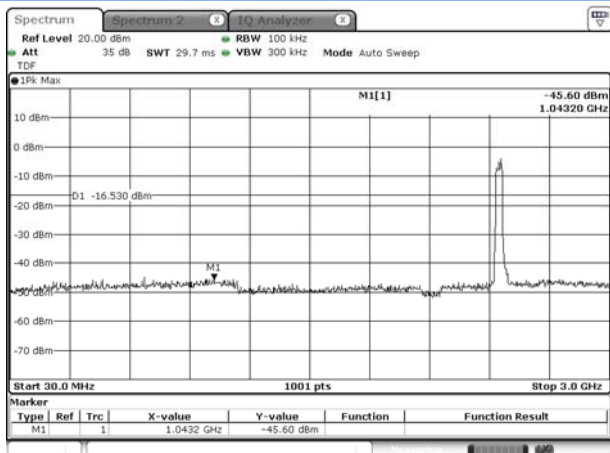
Date: 4 MAY 2018 08:49:02

802.11n-40 MHz HIGH CHANNEL CARRIER LEVEL



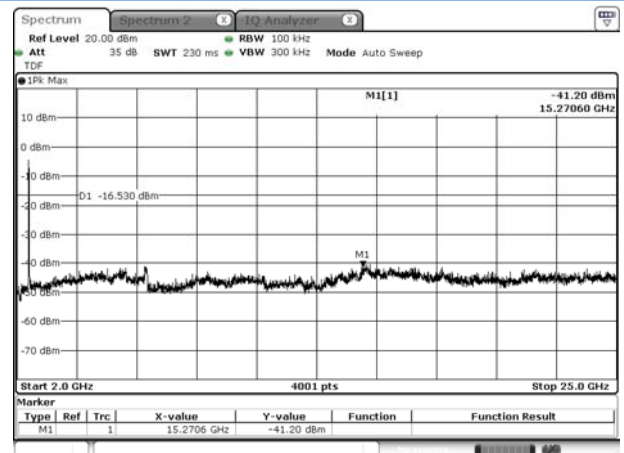
Date: 4 MAY 2018 08:51:38

802.11n-40 MHz HIGH CHANNEL, SPURIOUS  
30 MHz ~ 3 GHz



Date: 4 MAY 2018 08:52:09

802.11n-40 MHz HIGH CHANNEL, SPURIOUS  
2 GHz ~ 25 GHz



Date: 4 MAY 2018 08:52:17

## A.4 Band Edge (Authorized-band band-edge)

### Test Data

Note: The 99% OBW of the fundamental emission is without 2 MHz of the authorized band.

#### 802.11b Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-48.85	0.45	-19.55	Pass
High Channel	-49.43	0.20	-19.80	Pass

#### 802.11g Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-31.27	-0.50	-20.50	Pass
High Channel	-45.48	-0.47	-20.47	Pass

#### 802.11n-20 MHz Mode:

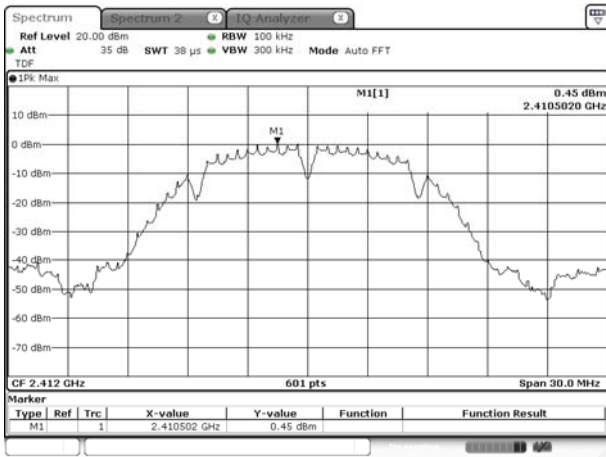
Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-31.81	-0.44	-20.44	Pass
High Channel	-44.42	-0.50	-20.50	Pass

#### 802.11n-40 MHz Mode:

Channel	Measured Max. Band Edge Emission (dBm)	Limit (dBm)		Verdict
		Carrier Level	Calculated 20 dBc Limit	
Low Channel	-36.26	-3.39	-23.39	Pass
High Channel	-41.84	-3.47	-23.47	Pass

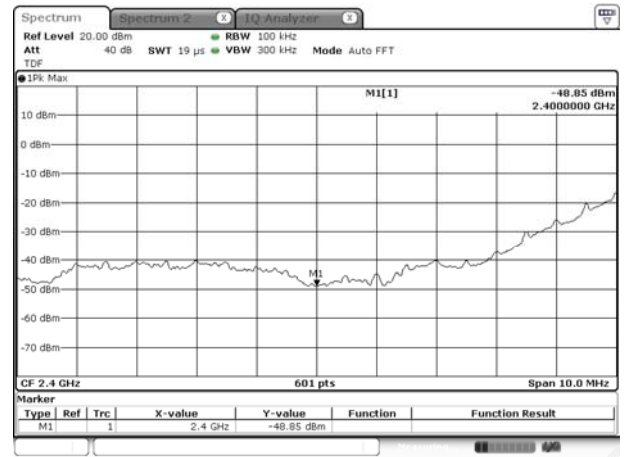
Test Plots

802.11b LOW CHANNEL, Carrier level



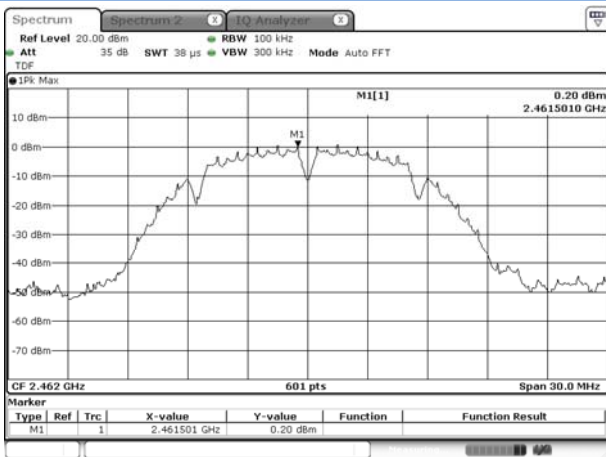
Date: 4 MAY 2018 07:50:56

802.11b LOW CHANNEL, Band Edge



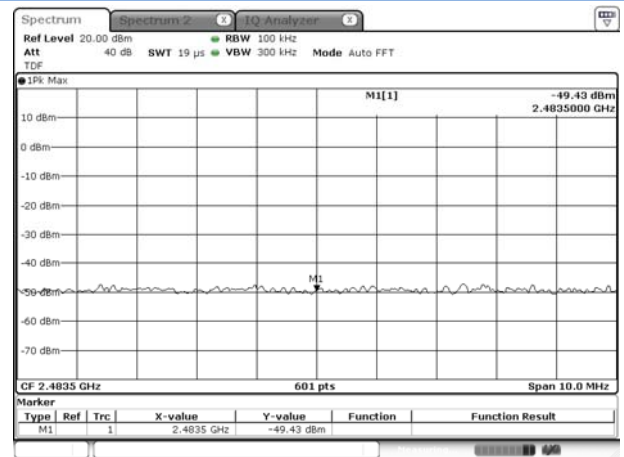
Date: 4 MAY 2018 07:51:47

802.11b HIGH CHANNEL, Carrier level



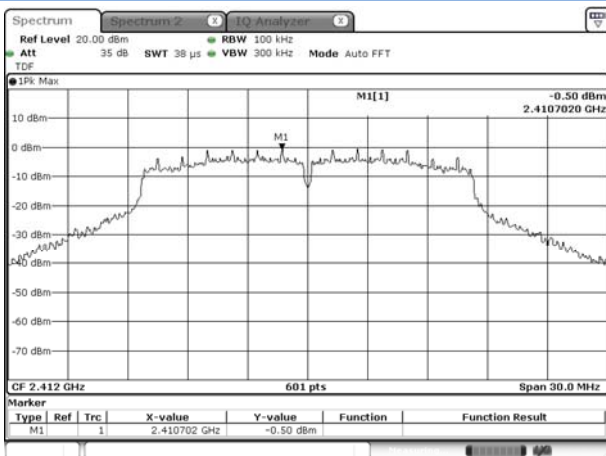
Date: 4 MAY 2018 08:23:31

802.11b HIGH CHANNEL, Band Edge



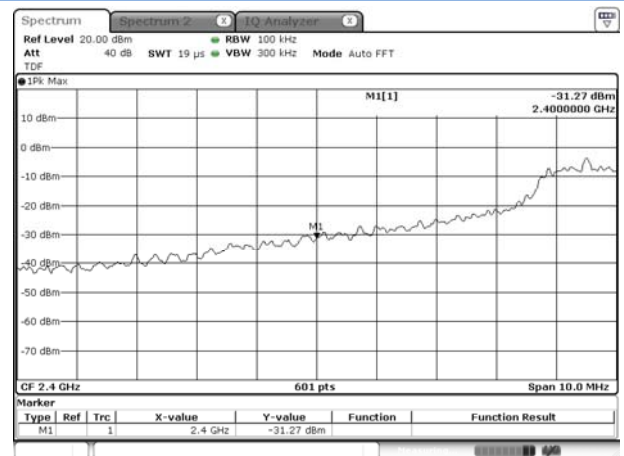
Date: 4 MAY 2018 08:24:02

802.11g LOW CHANNEL, Carrier level



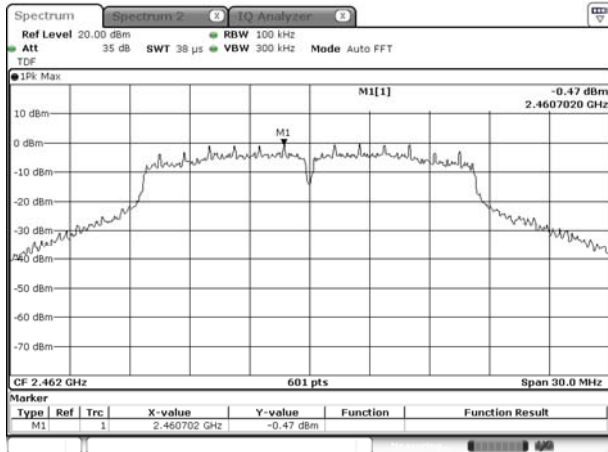
Date: 4 MAY 2018 08:25:46

802.11g LOW CHANNEL, Band Edge



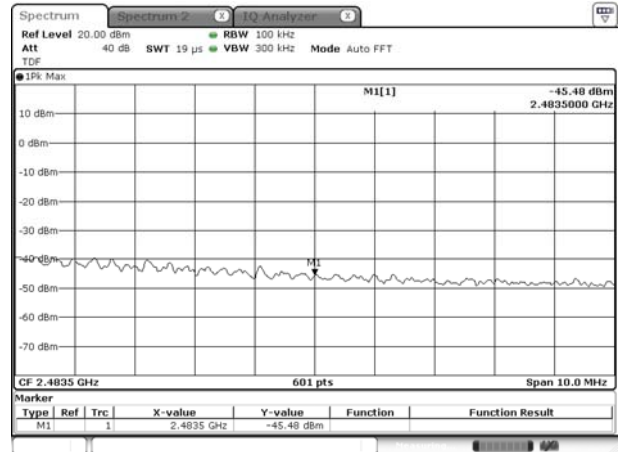
Date: 4 MAY 2018 08:26:30

802.11g HIGH CHANNEL, Carrier level



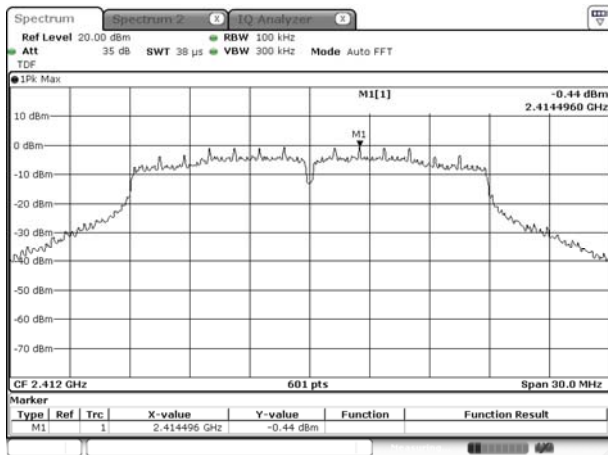
Date: 4 MAY 2018 08:32:12

802.11g HIGH CHANNEL, Band Edge



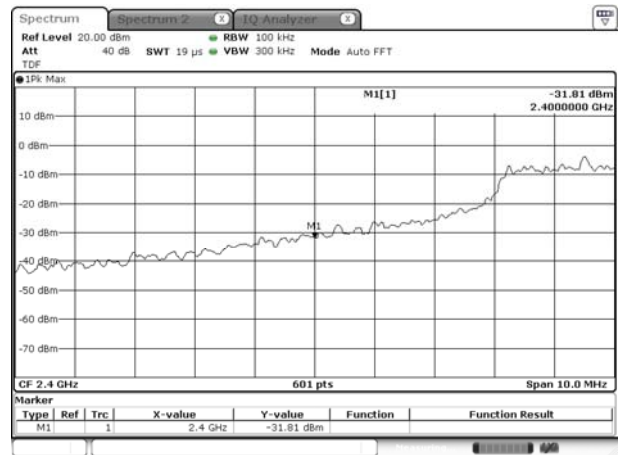
Date: 4 MAY 2018 08:32:46

802.11n-20 MHz LOW CHANNEL, Carrier level



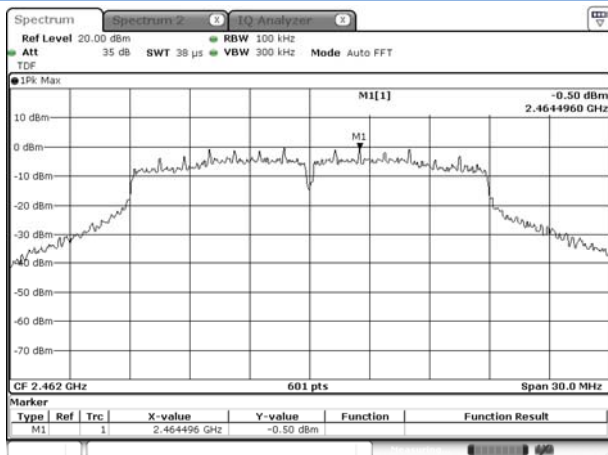
Date: 4 MAY 2018 08:35:51

802.11n-20 MHz LOW CHANNEL, Band Edge



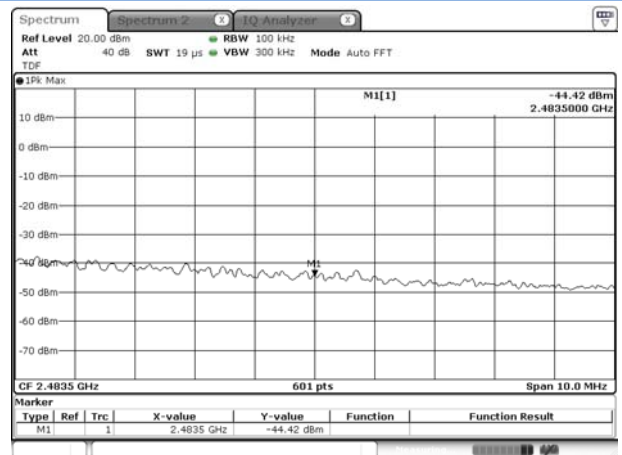
Date: 4 MAY 2018 08:36:25

802.11n-20 MHz HIGH CHANNEL, Carrier level



Date: 4 MAY 2018 08:41:15

802.11n-20 MHz HIGH CHANNEL, Band Edge

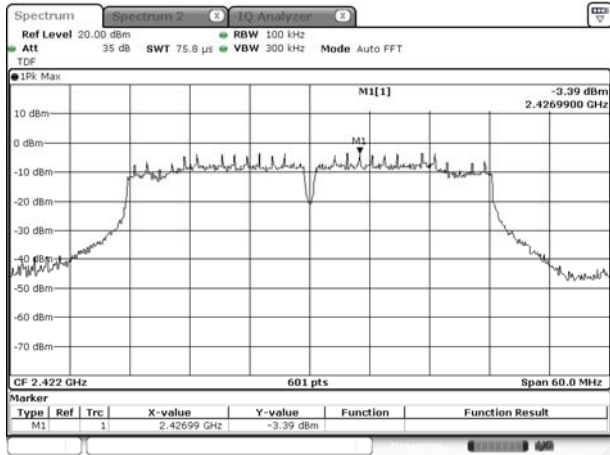


Date: 4 MAY 2018 08:41:45

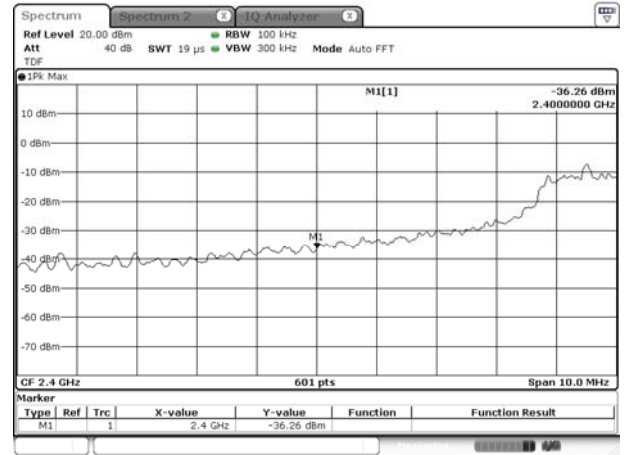


802.11n-40 MHz LOW CHANNEL, Carrier level

802.11n-40 MHz LOW CHANNEL, Band Edge



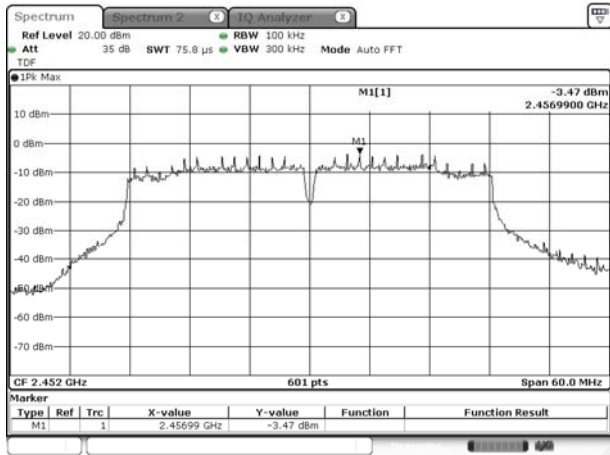
Date: 4 MAY 2018 08:44:46



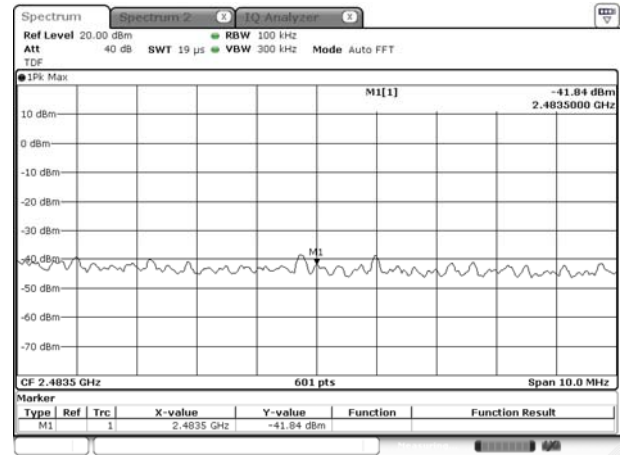
Date: 4 MAY 2018 08:46:00

802.11n-40 MHz HIGH CHANNEL, Carrier level

802.11n-40 MHz HIGH CHANNEL, Band Edge



Date: 4 MAY 2018 08:51:38



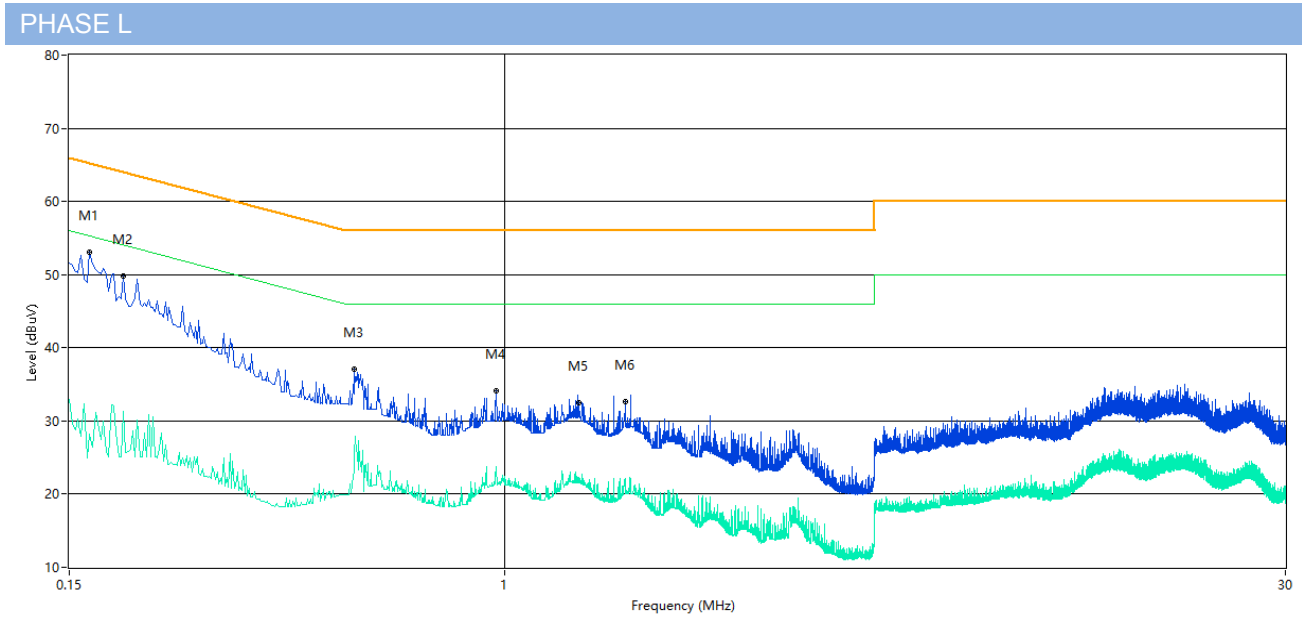
Date: 4 MAY 2018 08:52:23

## A.5 Conducted Emissions

Note 1: The EUT is working in the Normal link mode.

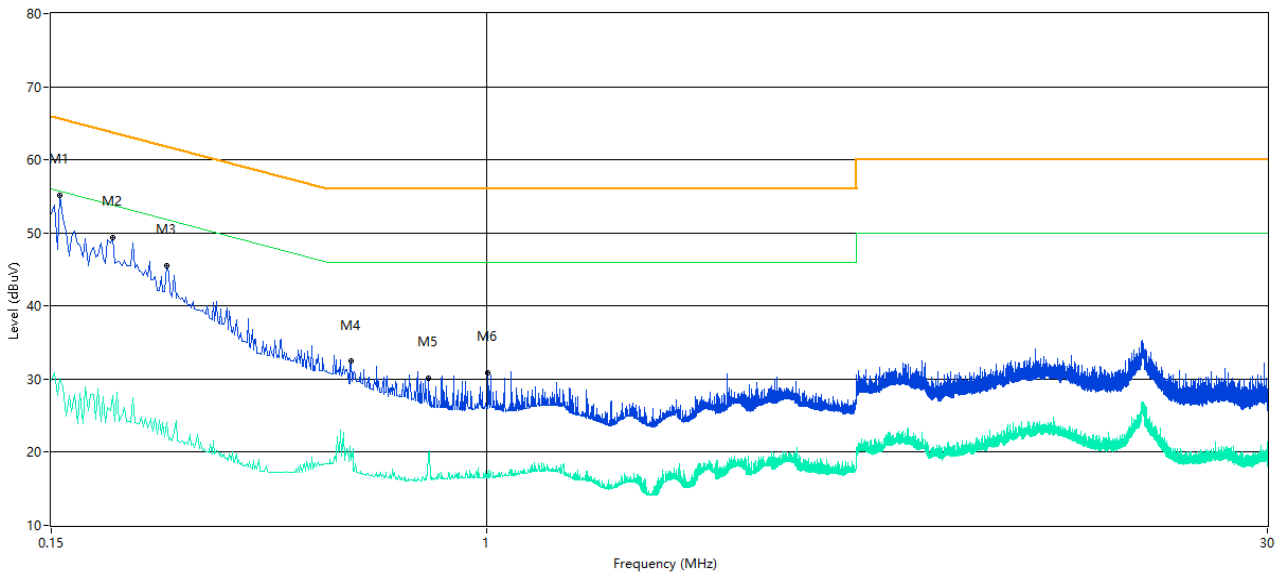
Note 2: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 60 Hz and 240 VAC, 50 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz ) shown here.

### Test Data and Plots



Frequency (MHz)	Peak Level (dBuV)	Q-peak Level (dBuV)	Average Level (dBuV)	Factor (dB)	QP Limit (dBuV)	AV Limit (dBuV)	Margin (dB)	Line	Verdict
0.164	56.98	48.07	32.52	10.01	65.3	55.3	17.23	L Line	Pass
0.190	53.82	45.45	29.39	10.01	64.0	54.0	18.55	L Line	Pass
0.520	39.47	32.77	26.03	10.02	56.0	46.0	19.97	L Line	Pass
0.964	35.48	27.46	22.25	10.03	56.0	46.0	23.75	L Line	Pass
1.382	33.44	27.08	21.76	10.05	56.0	46.0	24.24	L Line	Pass
1.692	33.47	26.05	21.26	10.06	56.0	46.0	24.74	L Line	Pass

## PHASE N



Frequency (MHz)	Peak Level (dBuV)	Q-peak Level (dBuV)	Average Level (dBuV)	Factor (dB)	QP Limit (dBuV)	AV Limit (dBuV)	Margin (dB)	Line	Verdict
0.156	56.06	47.96	29.66	10.00	65.7	55.7	17.74	N Line	Pass
0.196	51.69	43.67	27.26	10.01	63.8	53.8	20.13	N Line	Pass
0.248	46.81	37.70	23.83	10.01	61.8	51.8	24.10	N Line	Pass
0.554	34.59	26.93	20.25	10.02	56.0	46.0	25.75	N Line	Pass
0.776	34.16	26.21	22.89	10.03	56.0	46.0	23.11	N Line	Pass
1.006	31.78	21.94	16.80	10.03	56.0	46.0	29.20	N Line	Pass

## A.6 Radiated Emission

Note<sup>1</sup>: The symbol of "--" in the table which means not application.

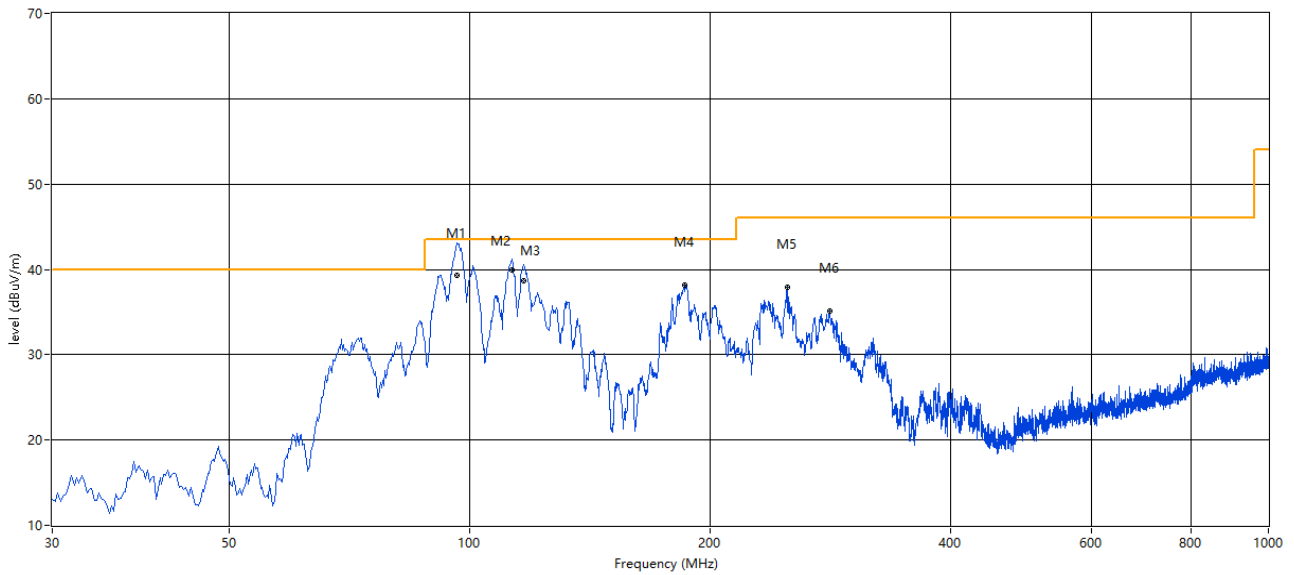
Note<sup>2</sup>: For the test data above 1 GHz, According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note<sup>3</sup>: The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

Note<sup>4</sup>: The EUT is working in the Normal link mode below 1 GHz.

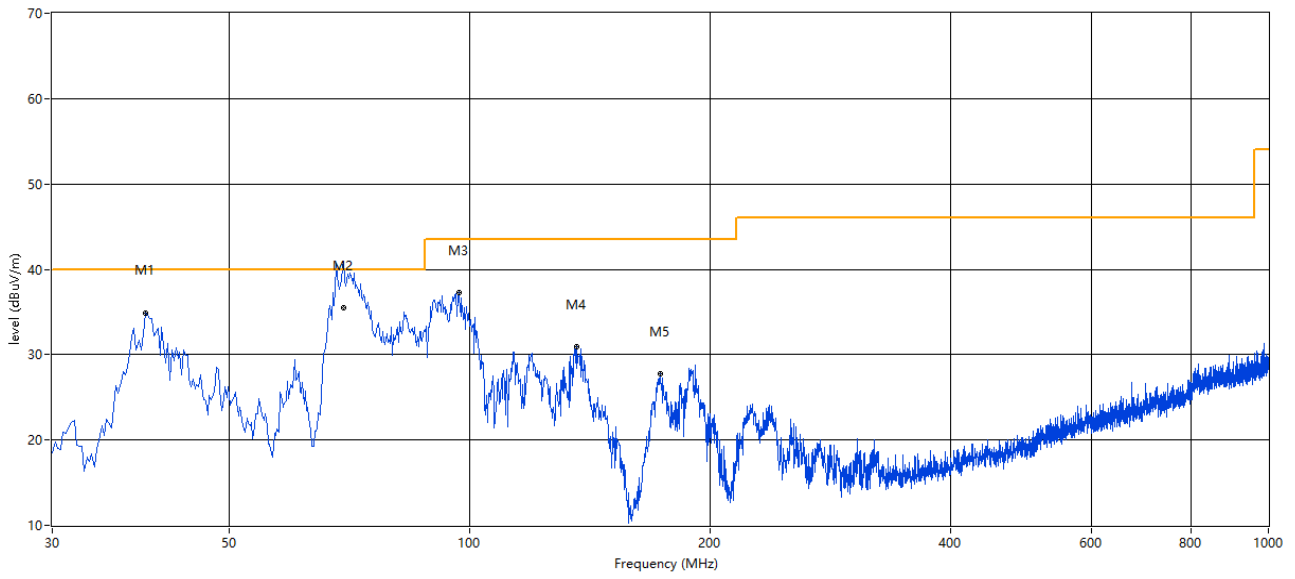
### Test Data and Plots

30 MHz to 1 GHz, ANT H



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
96.540	43.14	39.32	--	-29.12	--	43.5	--	4.18	117.90	236	Horizontal	Pass
113.100	43.55	39.88	--	-28.86	--	43.5	--	3.62	302.30	297	Horizontal	Pass
116.944	42.24	38.64	--	-29.61	--	43.5	--	4.86	308.20	296	Horizontal	Pass
185.889	38.17	--	--	-29.51	--	43.5	--	5.33	0.00	200	Horizontal	Pass
249.650	37.92	--	--	-26.91	--	46.0	--	8.08	158.50	100	Horizontal	Pass
282.379	35.17	--	--	-26.63	--	46.0	--	10.83	322.20	100	Horizontal	Pass

## 30 MHz to 1 GHz, ANT V

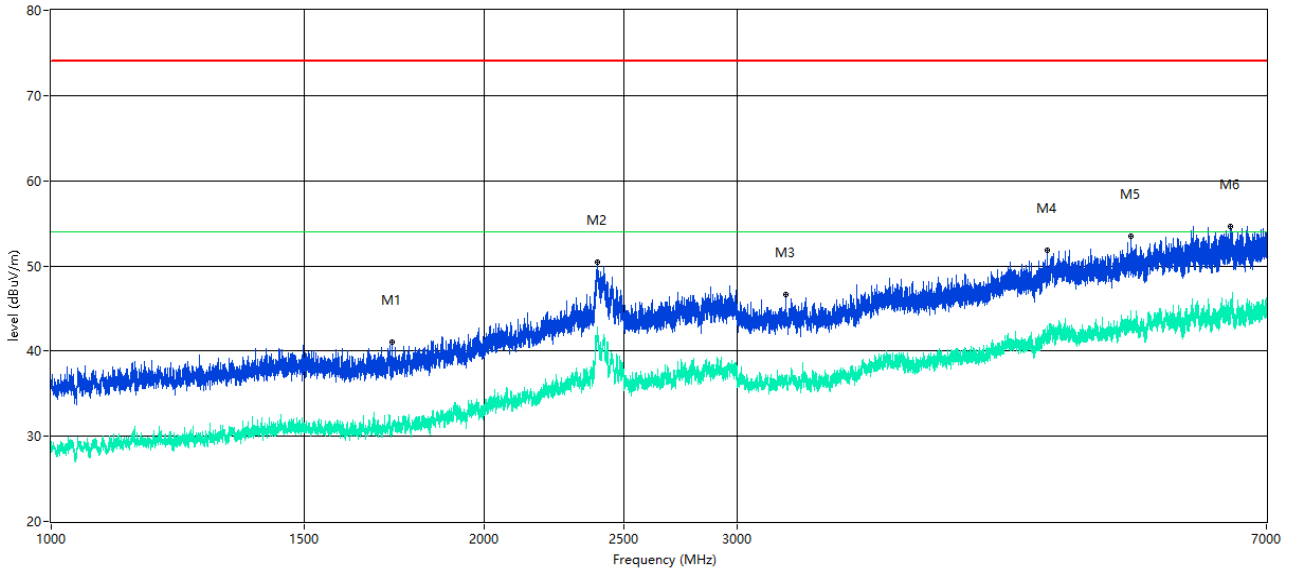


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
39.213	34.91	--	--	-27.31	--	40.0	--	5.09	158.60	100	Vertical	Pass
69.331	41.53	35.46	--	-30.72	--	40.0	--	4.54	307.50	100	Vertical	Pass
96.913	37.33	--	--	-29.05	--	43.5	--	6.17	255.50	100	Vertical	Pass
135.946	30.95	--	--	-31.62	--	43.5	--	12.55	155.60	100	Vertical	Pass
173.039	27.70	--	--	-30.54	--	43.5	--	15.80	129.70	100	Vertical	Pass

Note 1: The marked spikes near 2400 MHz with circle should be ignored because they are Fundamental signal.  
 Note 2: The spurious above 18G is noise only, do not show on the report.

1 GHz to 7 GHz, ANT V 802.11b Low Channel

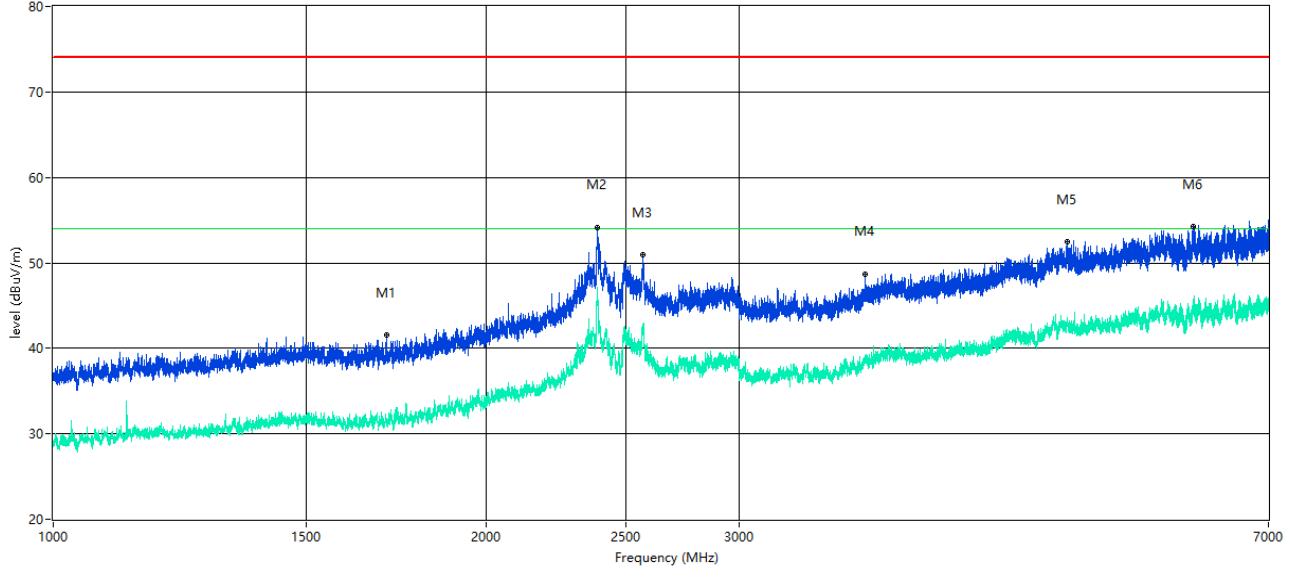
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1726.909	41.04	--	31.6	-11.57	74.0	--	54.0	22.40	67.00	100	Vertical	Pass
2397.325	50.38	--	42.5	-0.01	74.0	--	54.0	11.50	102.00	100	Vertical	Pass
3242.595	46.66	--	36.6	-5.41	74.0	--	54.0	17.40	15.00	100	Vertical	Pass
4931.384	51.88	--	43.0	0.24	74.0	--	54.0	11.00	331.00	100	Vertical	Pass
5630.671	53.48	--	43.4	2.54	74.0	--	54.0	10.60	58.00	100	Vertical	Pass
6606.674	54.67	--	44.6	4.42	74.0	--	54.0	9.40	15.00	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11b Low Channel

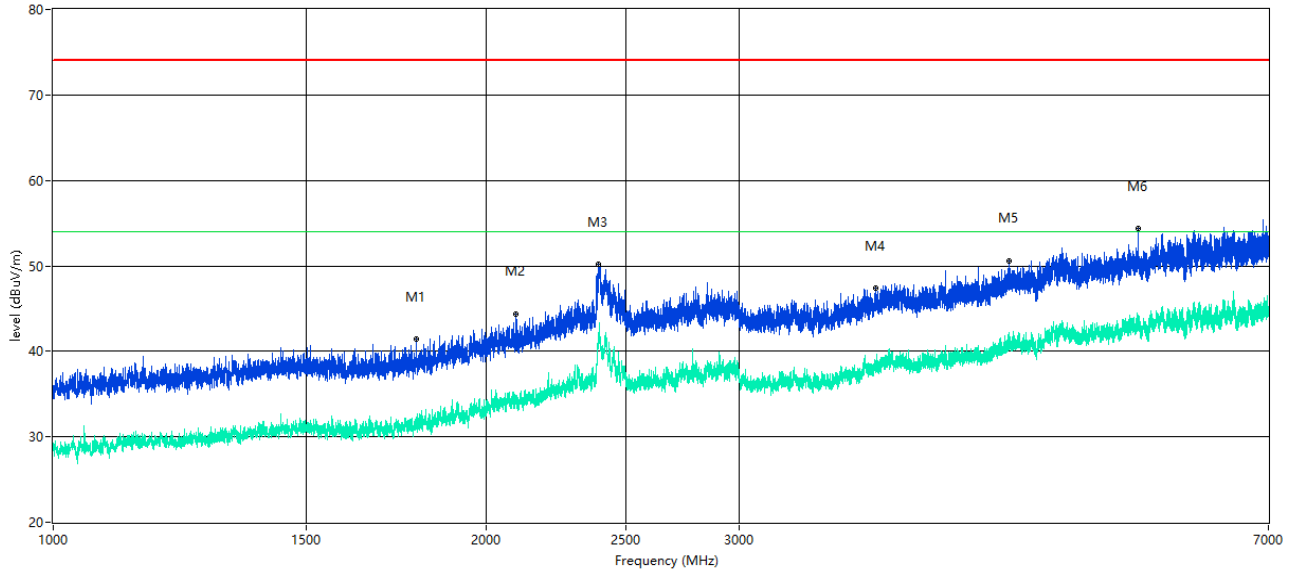
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1705.412	41.54	--	31.4	-11.79	74.0	--	54.0	22.60	217.00	100	Horizontal	Pass
2390.326	54.08	--	46.0	-1.17	74.0	--	54.0	8.00	36.30	100	Horizontal	Pass
2569.804	50.91	--	42.1	-5.45	74.0	--	54.0	11.90	40.00	100	Horizontal	Pass
3671.916	48.61	--	38.7	-3.20	74.0	--	54.0	15.30	226.90	100	Horizontal	Pass
5076.490	52.53	--	43.2	1.75	74.0	--	54.0	10.80	360.00	100	Horizontal	Pass
6204.974	54.26	--	44.6	4.39	74.0	--	54.0	9.40	338.70	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11b Middle Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz

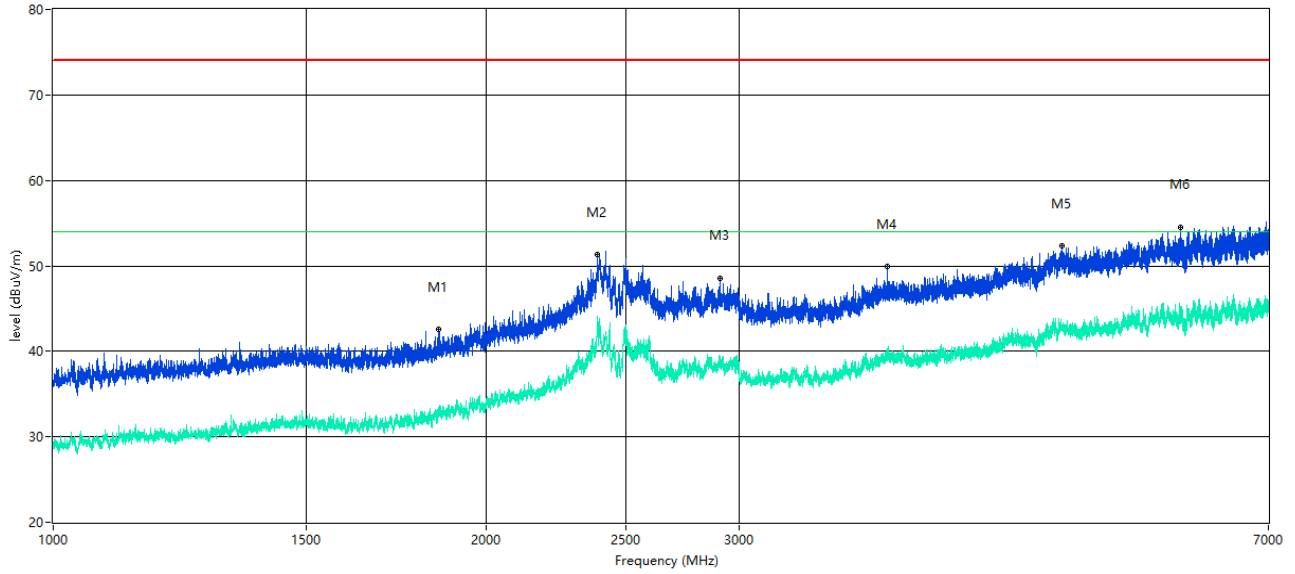


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1789.401	41.44	--	31.3	-10.74	74.0	--	54.0	22.70	181.00	100	Vertical	Pass
2097.863	44.39	--	34.8	-7.72	74.0	--	54.0	19.20	23.20	100	Vertical	Pass
2395.826	50.16	--	40.7	0.07	74.0	--	54.0	13.30	43.90	100	Vertical	Pass
3730.409	47.37	--	38.2	-3.46	74.0	--	54.0	15.80	150.50	100	Vertical	Pass
4623.547	50.58	--	42.2	0.23	74.0	--	54.0	11.80	26.00	100	Vertical	Pass
5681.290	54.35	--	44.0	2.48	74.0	--	54.0	10.00	3.00	100	Vertical	Pass



1 GHz to 7 GHz, ANT H 802.11b Middle Channel

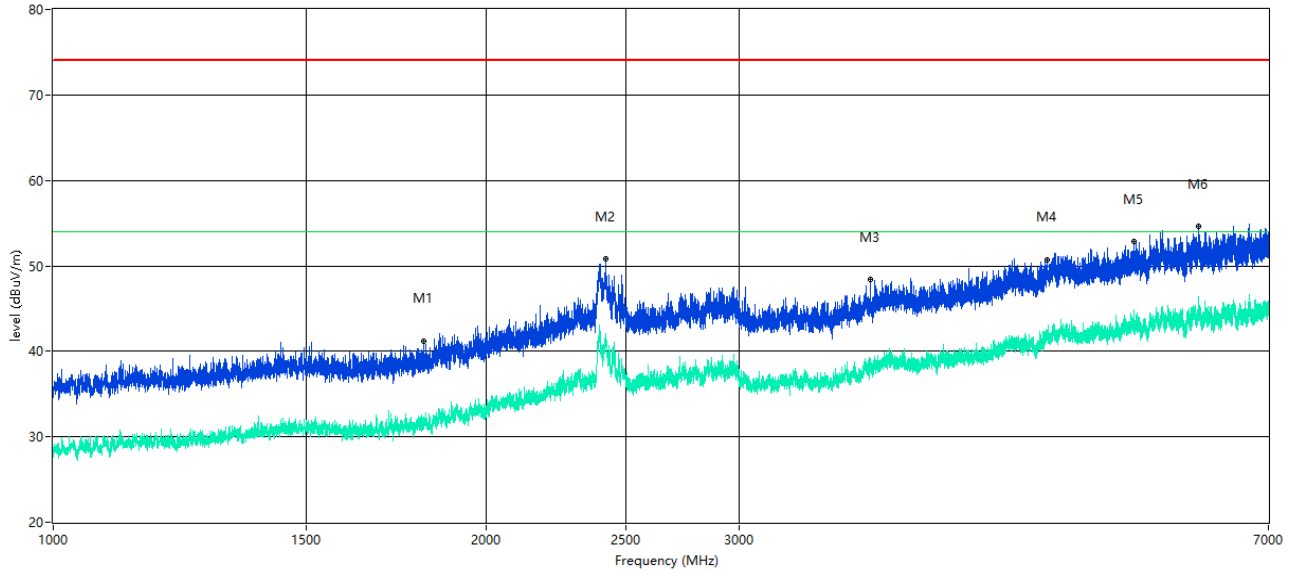
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1854.893	42.61	--	33.3	-9.96	74.0	--	54.0	20.70	258.40	100	Horizontal	Pass
2389.326	51.38	--	42.7	-1.78	74.0	--	54.0	11.30	121.50	100	Horizontal	Pass
2907.012	48.48	--	39.3	-3.08	74.0	--	54.0	14.70	186.30	100	Horizontal	Pass
3803.525	49.91	--	40.0	-2.68	74.0	--	54.0	14.00	268.50	100	Horizontal	Pass
5031.496	52.33	--	42.7	0.88	74.0	--	54.0	11.30	2.00	100	Horizontal	Pass
6085.864	54.47	--	43.9	3.96	74.0	--	54.0	10.10	197.00	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11b High Channel

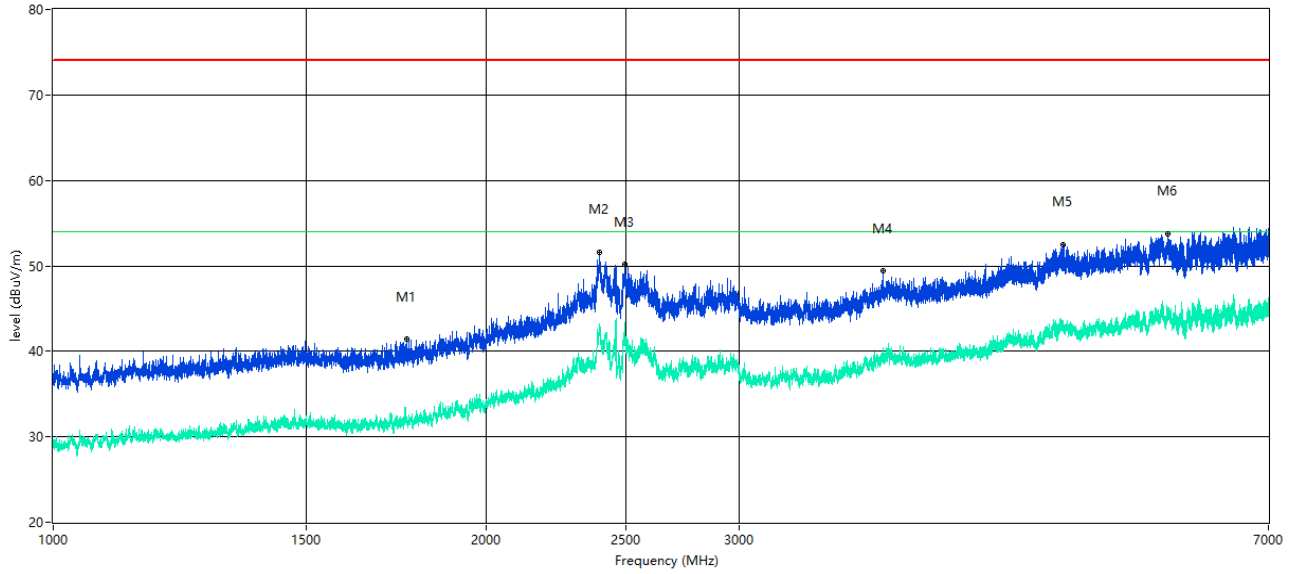
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1811.399	41.23	--	32.1	-10.72	74.0	--	54.0	21.90	200.50	100	Vertical	Pass
2422.322	50.83	--	41.5	-0.83	74.0	--	54.0	12.50	94.00	100	Vertical	Pass
3702.287	48.37	--	38.1	-3.40	74.0	--	54.0	15.90	316.10	100	Vertical	Pass
4909.636	50.66	--	41.5	0.49	74.0	--	54.0	12.50	31.0	100	Vertical	Pass
5648.294	52.86	--	44.8	2.15	74.0	--	54.0	9.20	2.00	100	Vertical	Pass
6261.467	54.67	--	45.2	4.58	74.0	--	54.0	8.80	10.00	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11b High Channel

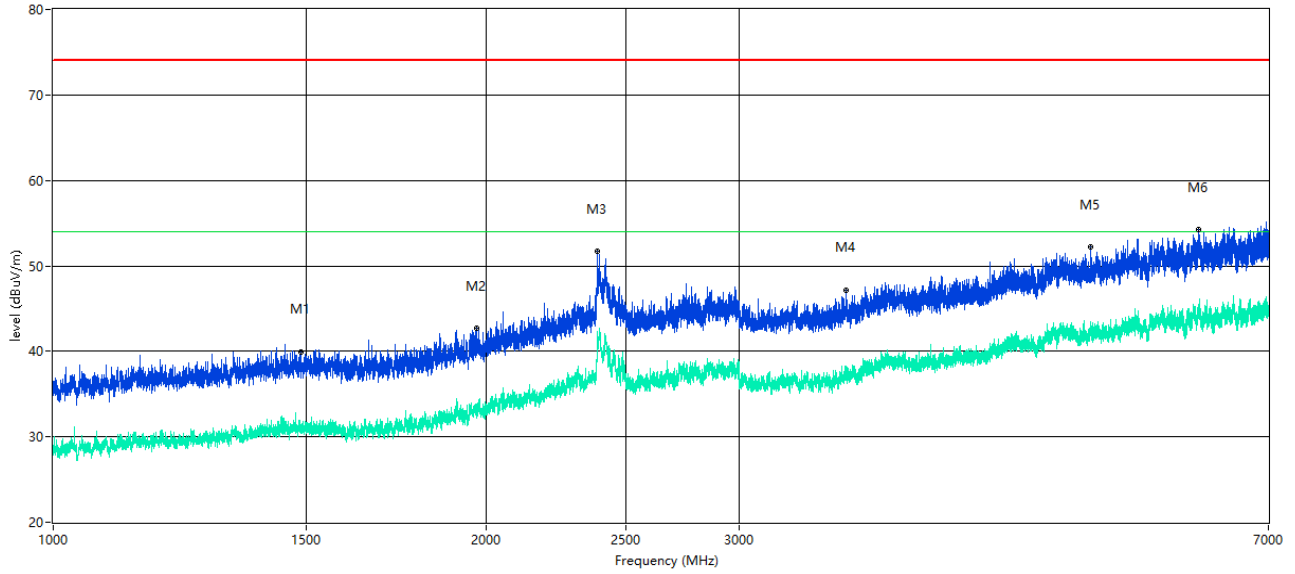
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1760.155	41.40	--	32.1	-11.00	74.0	--	54.0	21.90	139.40	100	Horizontal	Pass
2399.325	51.64	--	43.2	-0.07	74.0	--	54.0	10.80	332.60	100	Horizontal	Pass
2497.313	50.18	--	43.0	-3.40	74.0	--	54.0	11.00	132.20	100	Horizontal	Pass
3775.028	49.45	--	40.4	-2.51	74.0	--	54.0	13.60	8.00	100	Horizontal	Pass
5034.496	52.53	--	42.6	1.04	74.0	--	54.0	11.40	153.80	100	Horizontal	Pass
5959.505	53.78	--	44.7	4.04	74.0	--	54.0	9.30	153.80	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11g Low Channel

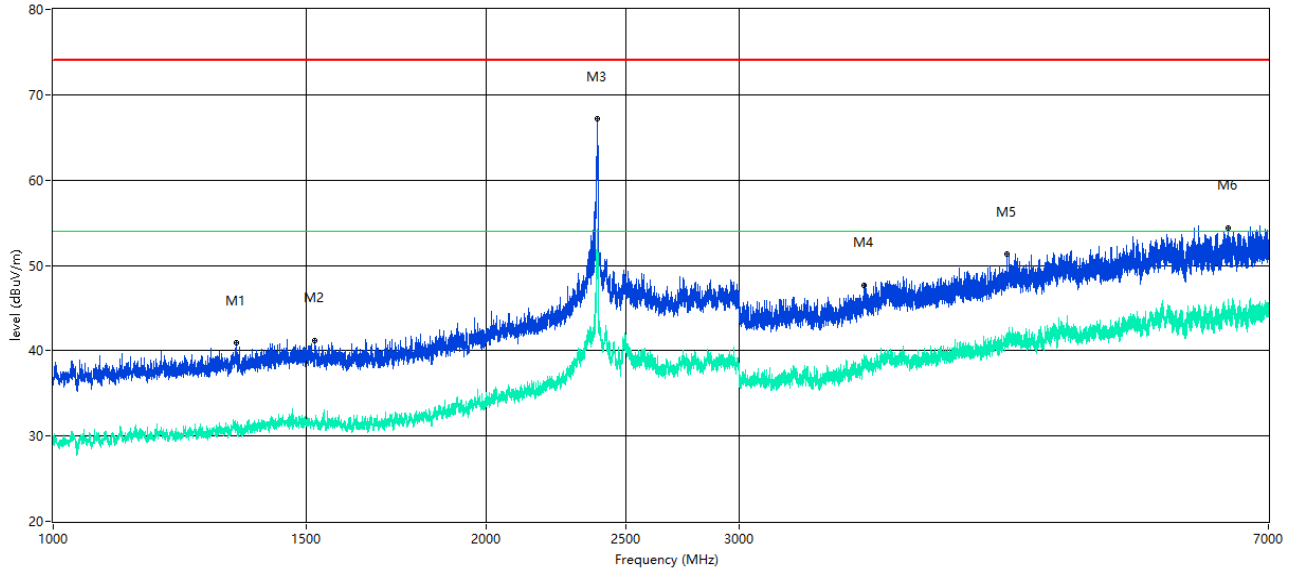
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1486.189	39.97	--	31.1	-11.53	74.0	--	54.0	22.90	122.00	100	Vertical	Pass
1968.379	42.69	--	33.5	-9.08	74.0	--	54.0	20.50	33.00	100	Vertical	Pass
2391.076	51.70	--	42.4	-0.71	74.0	--	54.0	11.60	223.00	100	Vertical	Pass
3560.930	47.10	--	37.7	-4.26	74.0	--	54.0	16.30	105.00	100	Vertical	Pass
5265.467	52.18	--	43.5	1.68	74.0	--	54.0	10.50	15.00	100	Vertical	Pass
6258.593	54.24	--	44.9	4.63	74.0	--	54.0	9.10	63.00	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11g Low Channel

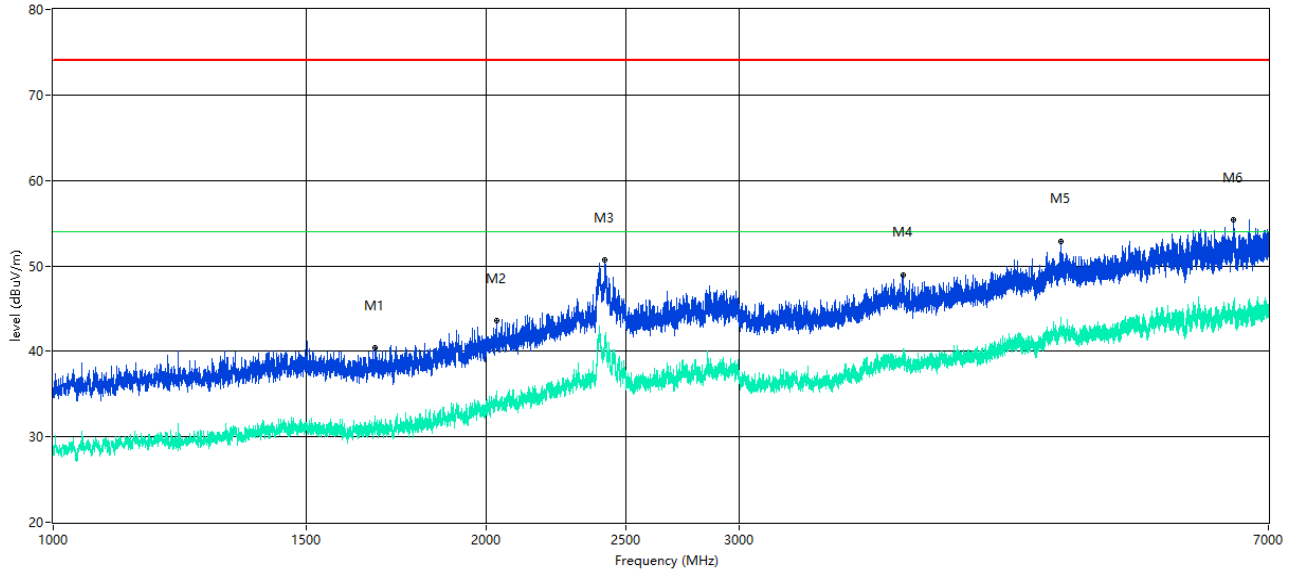
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1341.707	40.95	--	30.9	-12.25	74.0	--	54.0	23.10	57.00	100	Horizontal	Pass
1520.435	41.12	--	31.3	-11.82	74.0	--	54.0	22.70	261.00	100	Horizontal	Pass
2412.326	67.20	--	54.3	-0.56	74.0	--	54.0	-0.30	42.00	100	Horizontal	N.A
3662.542	47.72	--	38.5	-3.72	74.0	--	54.0	15.50	264.00	100	Horizontal	Pass
4605.549	51.33	--	41.9	0.42	74.0	--	54.0	12.10	151.00	100	Horizontal	Pass
6568.304	54.32	--	46.1	5.27	74.0	--	54.0	7.90	142.00	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11g Middle Channel

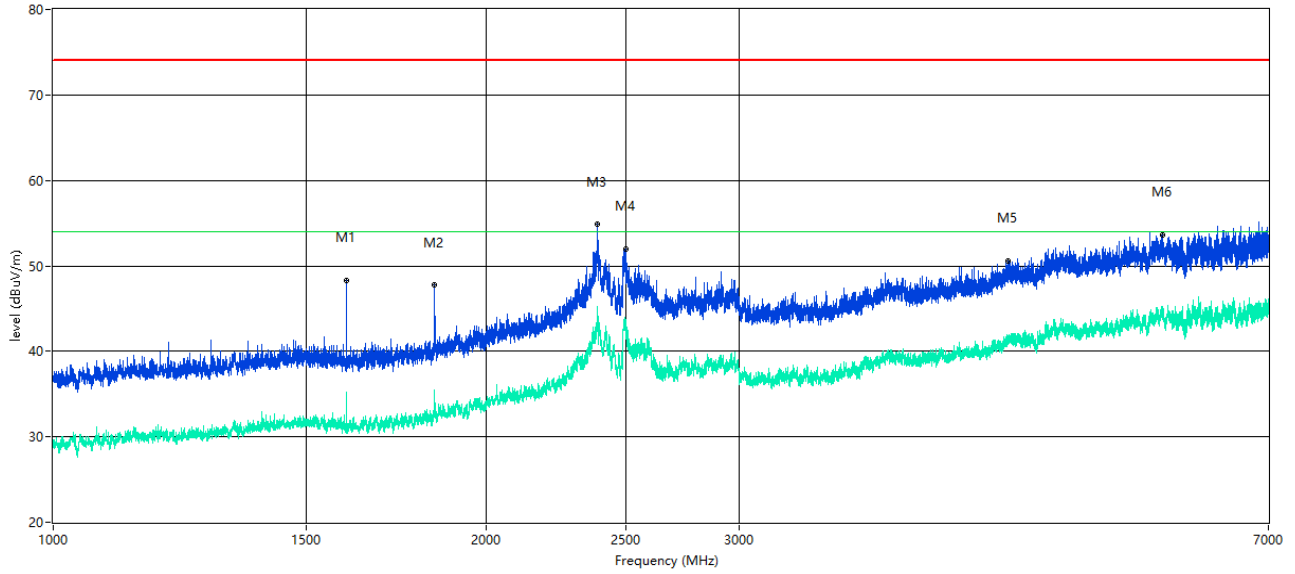
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1673.666	40.40	--	32.4	-11.50	74.0	--	54.0	21.60	18.40	100	Vertical	Pass
2032.871	43.58	--	35.3	-7.71	74.0	--	54.0	18.70	121.50	100	Vertical	Pass
2419.573	50.66	--	41.2	-0.76	74.0	--	54.0	12.80	16.30	100	Vertical	Pass
3897.638	48.96	--	40.3	-2.46	74.0	--	54.0	13.70	268.50	100	Vertical	Pass
5020.247	52.87	--	43.9	1.13	74.0	--	54.0	10.10	32.00	100	Vertical	Pass
6620.047	55.35	--	44.8	5.42	74.0	--	54.0	9.20	197.00	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11g Middle Channel

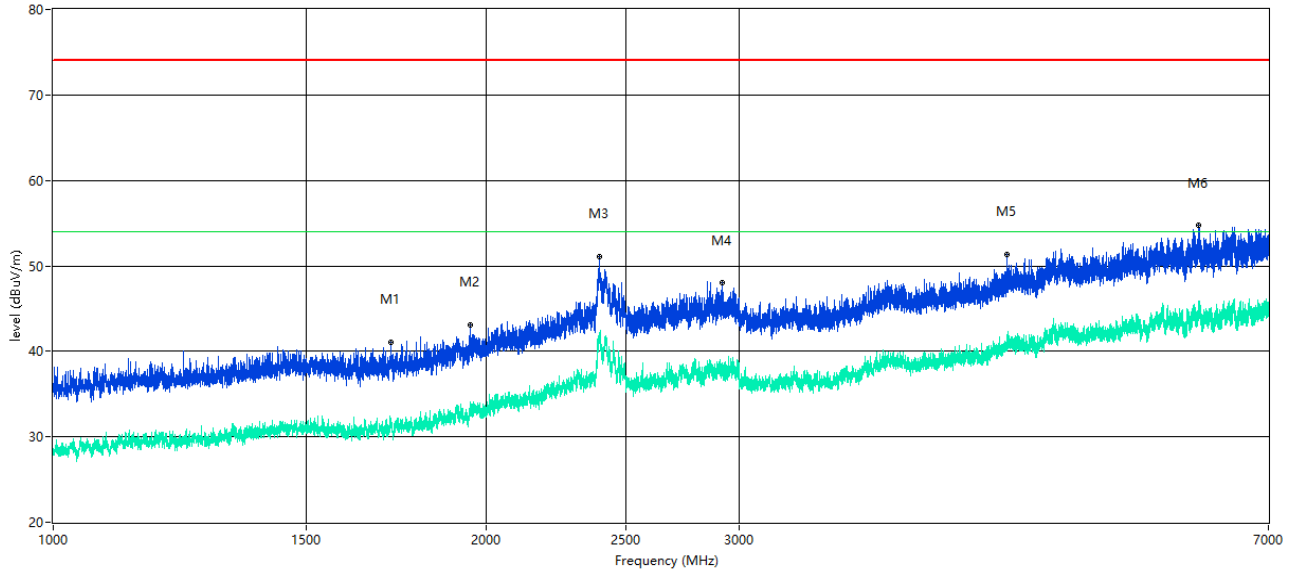
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1599.675	48.33	--	35.2	-12.47	74.0	--	54.0	18.80	1.40	100	Horizontal	Pass
1842.145	47.77	--	35.5	-9.86	74.0	--	54.0	18.50	17.50	100	Horizontal	Pass
2391.826	54.86	--	45.2	-0.25	74.0	--	54.0	8.80	42.50	100	Horizontal	Pass
2500.312	52.02	--	42.9	-4.37	74.0	--	54.0	11.10	128.50	100	Horizontal	Pass
4613.048	50.56	--	41.2	0.23	74.0	--	54.0	12.80	30.00	100	Horizontal	Pass
5904.012	53.67	--	44.8	3.75	74.0	--	54.0	9.20	0.20	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11g High Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz

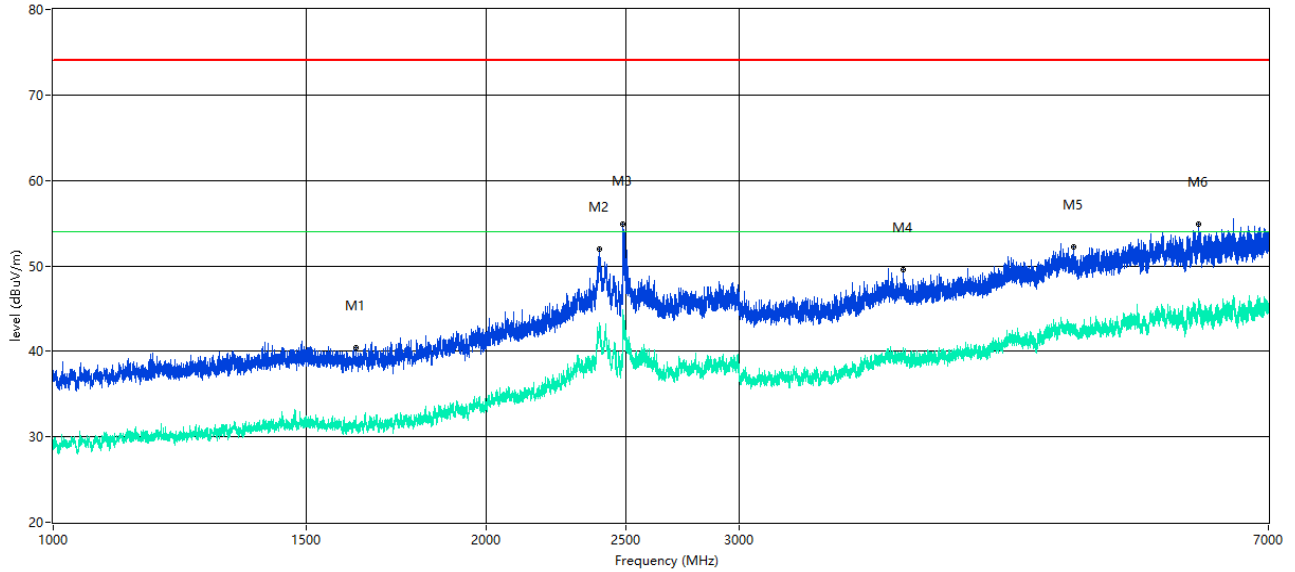


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1717.910	41.09	--	31.6	-11.02	74.0	--	54.0	22.40	245.10	100	Vertical	Pass
1951.381	43.02	--	33.0	-9.13	74.0	--	54.0	21.00	31.10	100	Vertical	Pass
2397.325	51.14	--	41.8	-0.01	74.0	--	54.0	12.20	17.00	100	Vertical	Pass
2920.760	47.98	--	38.6	-2.77	74.0	--	54.0	15.40	22.40	100	Vertical	Pass
4607.049	51.38	--	41.6	0.42	74.0	--	54.0	12.40	1.90	100	Vertical	Pass
6262.967	54.76	--	45.0	4.54	74.0	--	54.0	9.00	259.60	100	Vertical	Pass



1 GHz to 7 GHz, ANT H 802.11g High Channel

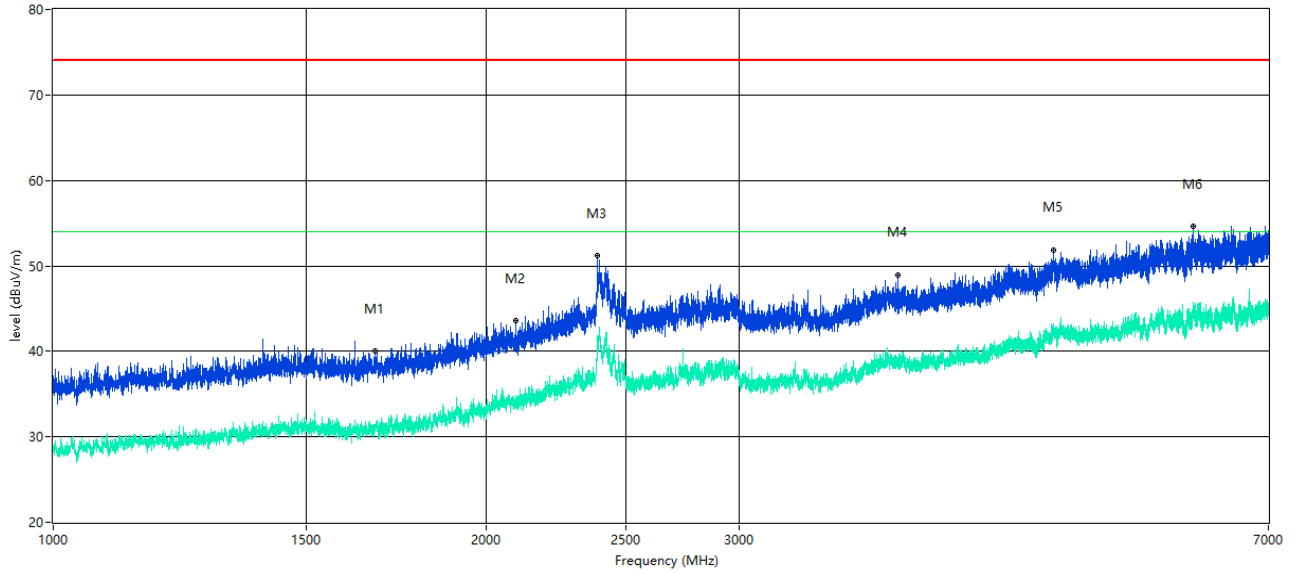
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1624.422	40.43	--	31.8	-11.97	74.0	--	54.0	22.20	95.80	100	Horizontal	Pass
2397.325	51.96	--	42.9	-0.01	74.0	--	54.0	11.10	336.30	100	Horizontal	Pass
2491.064	54.89	--	44.8	-3.61	74.0	--	54.0	9.20	27.40	100	Horizontal	Pass
3902.137	49.56	--	39.4	-2.42	74.0	--	54.0	14.60	273.20	100	Horizontal	Pass
5127.109	52.22	--	42.5	1.11	74.0	--	54.0	11.50	190.20	100	Horizontal	Pass
6262.217	54.94	--	46.0	4.56	74.0	--	54.0	8.00	156.50	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11n20 Low Channel

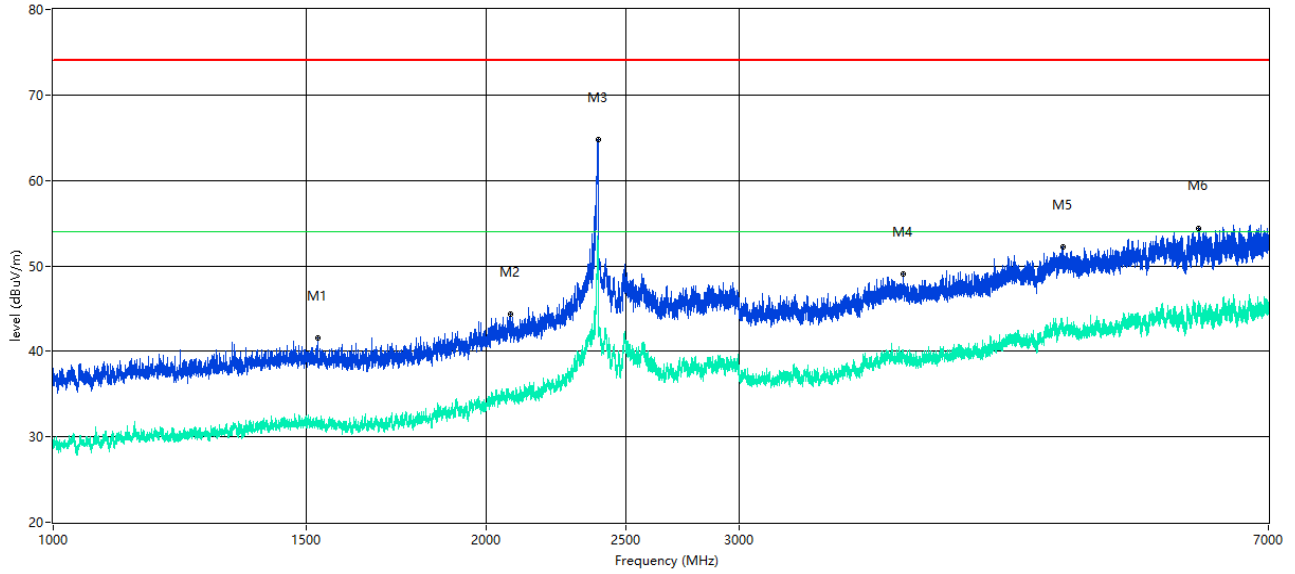
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1673.666	39.99	--	31.5	-11.50	74.0	--	54.0	22.50	245.10	100	Vertical	Pass
2097.363	43.58	--	34.0	-7.78	74.0	--	54.0	20.00	331.10	100	Vertical	Pass
2390.076	51.20	--	41.8	-1.32	74.0	--	54.0	12.20	187.00	100	Vertical	Pass
3866.142	48.89	--	39.1	-2.96	74.0	--	54.0	14.90	206.40	100	Vertical	Pass
4965.879	51.85	--	42.6	1.36	74.0	--	54.0	11.40	33.90	100	Vertical	Pass
6208.474	54.68	--	45.3	4.48	74.0	--	54.0	8.70	259.60	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11n20 Low Channel

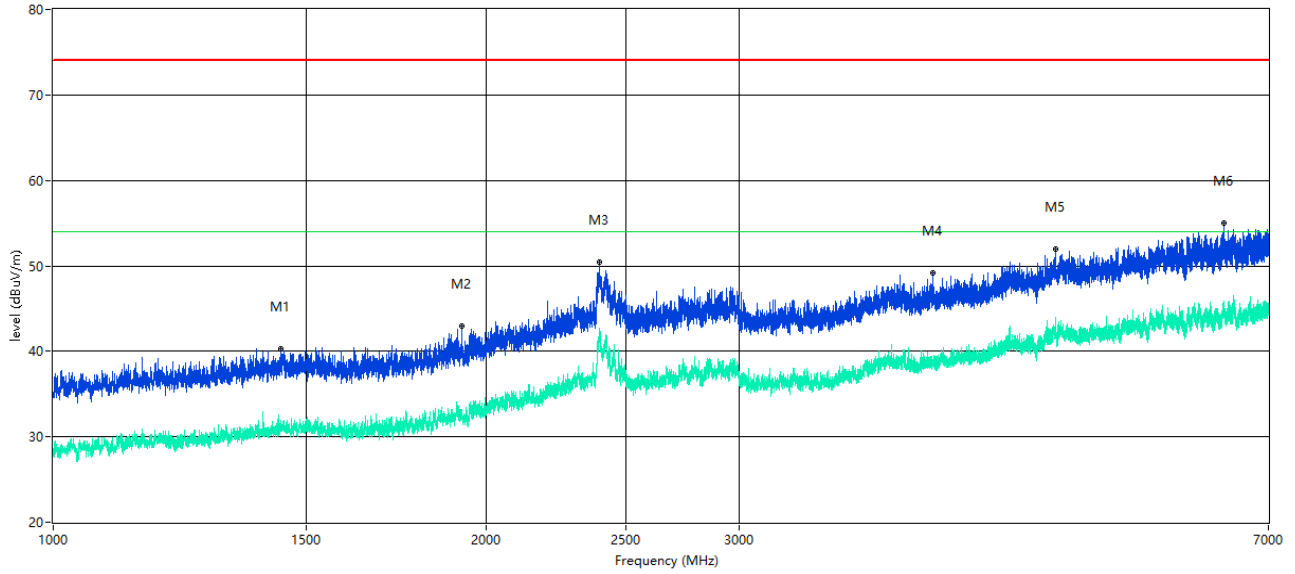
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1526.434	41.51	--	31.9	-11.91	74.0	--	54.0	22.10	176.60	100	Horizontal	Pass
2080.865	44.40	--	34.7	-8.18	74.0	--	54.0	19.30	83.40	100	Horizontal	Pass
2392.326	64.78	--	53.0	0.06	74.0	--	54.0	1.00	37.00	100	Horizontal	N.A
3900.637	49.09	--	39.8	-2.33	74.0	--	54.0	14.20	178.50	100	Horizontal	Pass
5037.870	52.16	--	43.0	1.05	74.0	--	54.0	11.00	269.70	100	Horizontal	Pass
6260.092	54.38	--	45.3	4.62	74.0	--	54.0	8.70	303.30	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11n20 Middle Channel

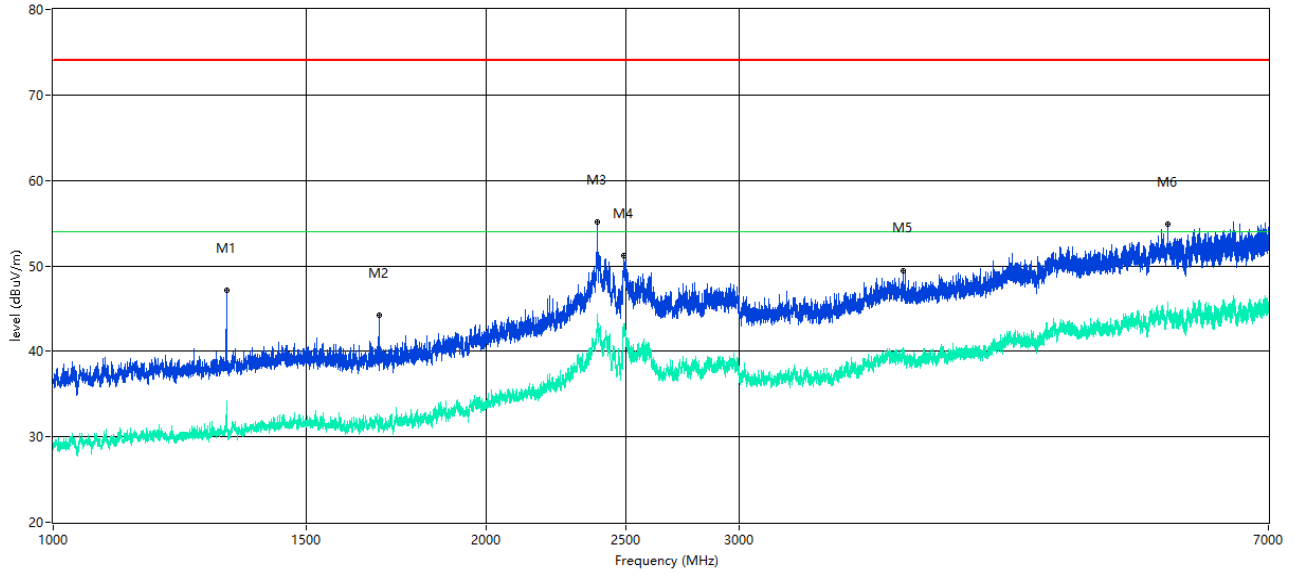
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1440.695	40.25	--	31.9	-11.61	74.0	--	54.0	22.10	195.80	100	Vertical	Pass
1923.635	42.91	--	33.0	-9.57	74.0	--	54.0	21.00	56.30	100	Vertical	Pass
2398.325	50.39	--	41.7	-0.04	74.0	--	54.0	12.30	27.40	100	Vertical	Pass
4088.489	49.17	--	39.0	-2.60	74.0	--	54.0	15.00	233.20	100	Vertical	Pass
4979.753	51.94	--	43.4	1.61	74.0	--	54.0	10.60	190.20	100	Vertical	Pass
6517.685	55.03	--	44.6	5.37	74.0	--	54.0	9.40	156.50	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11n20 Middle Channel

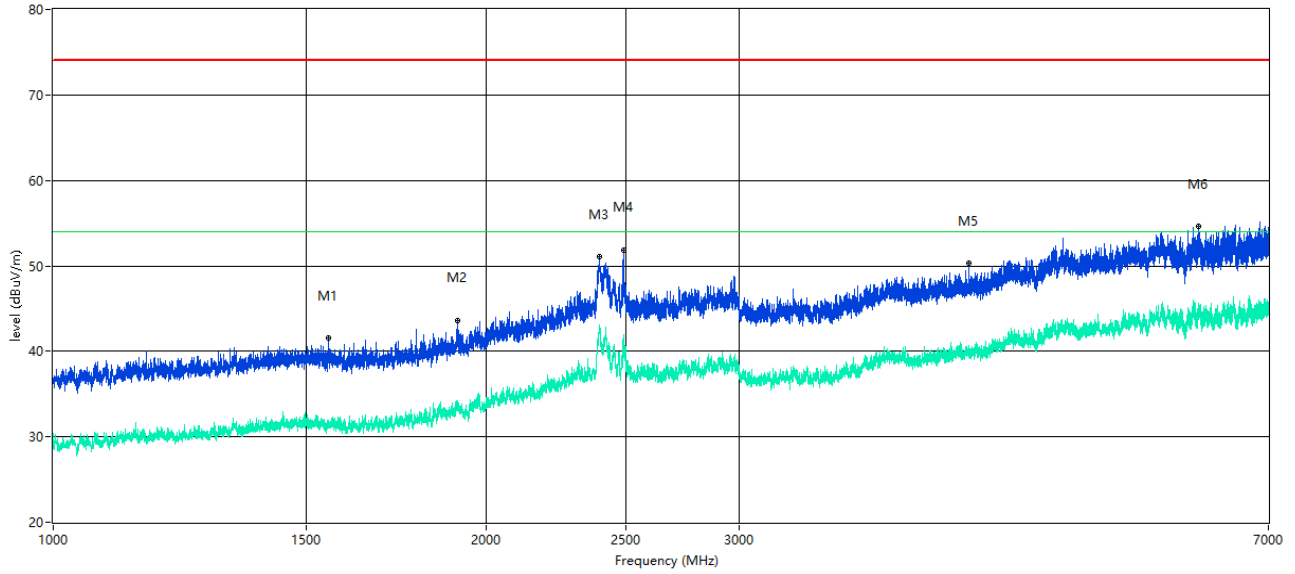
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1319.460	47.14	--	34.2	-12.07	74.0	--	54.0	19.80	87.30	100	Horizontal	Pass
1684.164	44.21	--	32.6	-12.12	74.0	--	54.0	21.40	87.30	100	Horizontal	Pass
2388.826	55.08	--	44.4	-2.09	74.0	--	54.0	9.60	40.60	100	Horizontal	Pass
2491.814	51.17	--	41.9	-3.65	74.0	--	54.0	12.10	36.90	100	Horizontal	Pass
3898.013	49.42	--	40.1	-2.44	74.0	--	54.0	13.90	57.00	100	Horizontal	Pass
5961.755	54.82	--	44.9	3.85	74.0	--	54.0	9.10	204.50	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11n20 High Channel

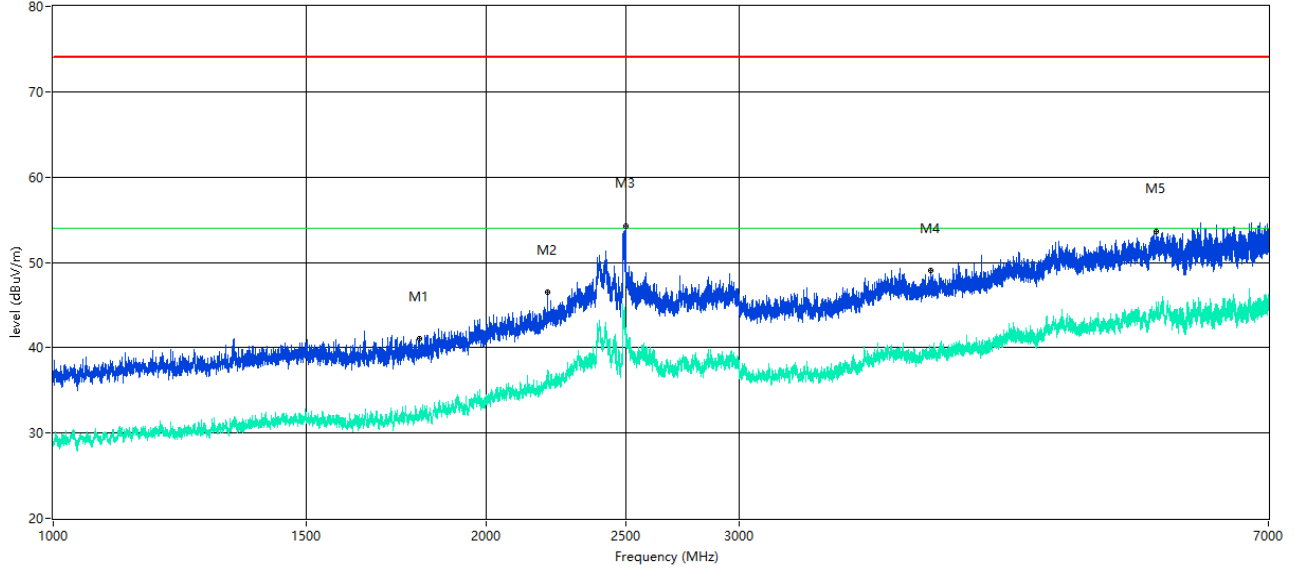
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1554.181	41.54	--	32.0	-11.72	74.0	--	54.0	22.00	45.20	100	Vertical	Pass
1909.386	43.54	--	34.0	-8.90	74.0	--	54.0	20.00	159.30	100	Vertical	Pass
2397.575	51.04	--	42.9	-0.02	74.0	--	54.0	11.10	66.40	100	Vertical	Pass
2494.313	51.89	--	41.9	-3.57	74.0	--	54.0	12.10	20.20	100	Vertical	Pass
4335.583	50.37	--	40.7	-2.14	74.0	--	54.0	13.30	229.40	100	Vertical	Pass
6259.468	54.60	--	45.1	4.63	74.0	--	54.0	8.90	0.80	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11n20 High Channel

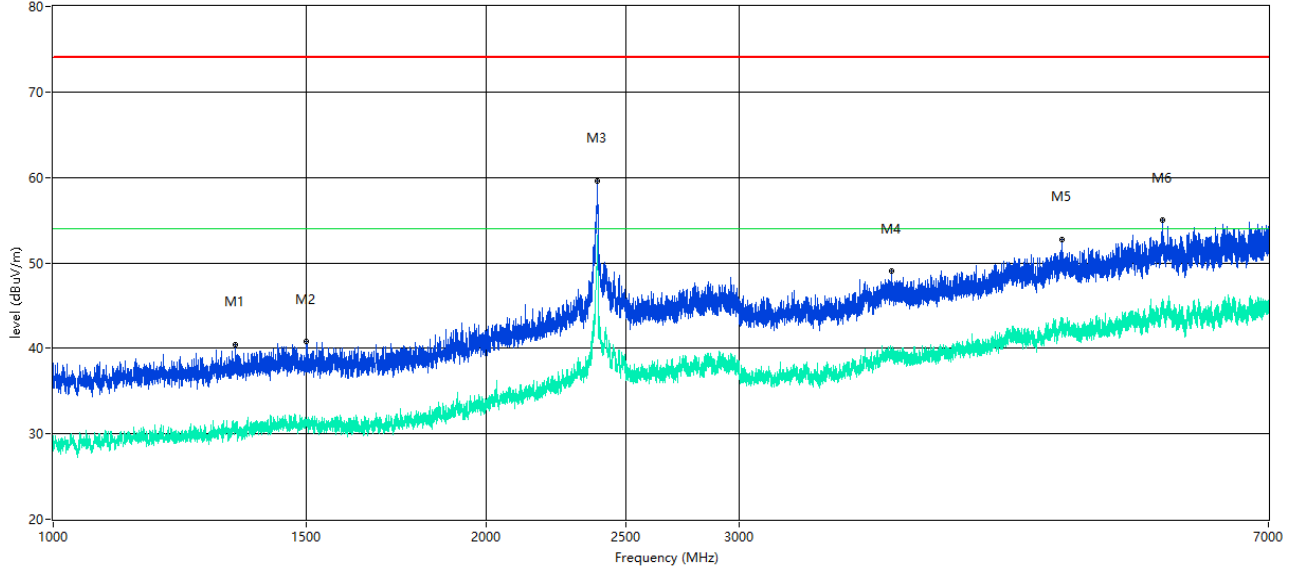
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1798.650	41.02	--	32.1	-10.74	74.0	--	54.0	21.90	322.20	100	Horizontal	Pass
2208.099	46.50	--	37.3	-5.91	74.0	--	54.0	16.70	156.90	100	Horizontal	Pass
2499.813	54.20	--	42.0	-4.19	74.0	--	54.0	12.00	31.90	100	Horizontal	Pass
4076.490	49.01	--	39.4	-2.38	74.0	--	54.0	14.60	99.90	100	Horizontal	Pass
5847.394	53.58	--	45.3	2.82	74.0	--	54.0	8.70	86.80	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11n40 Low Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz

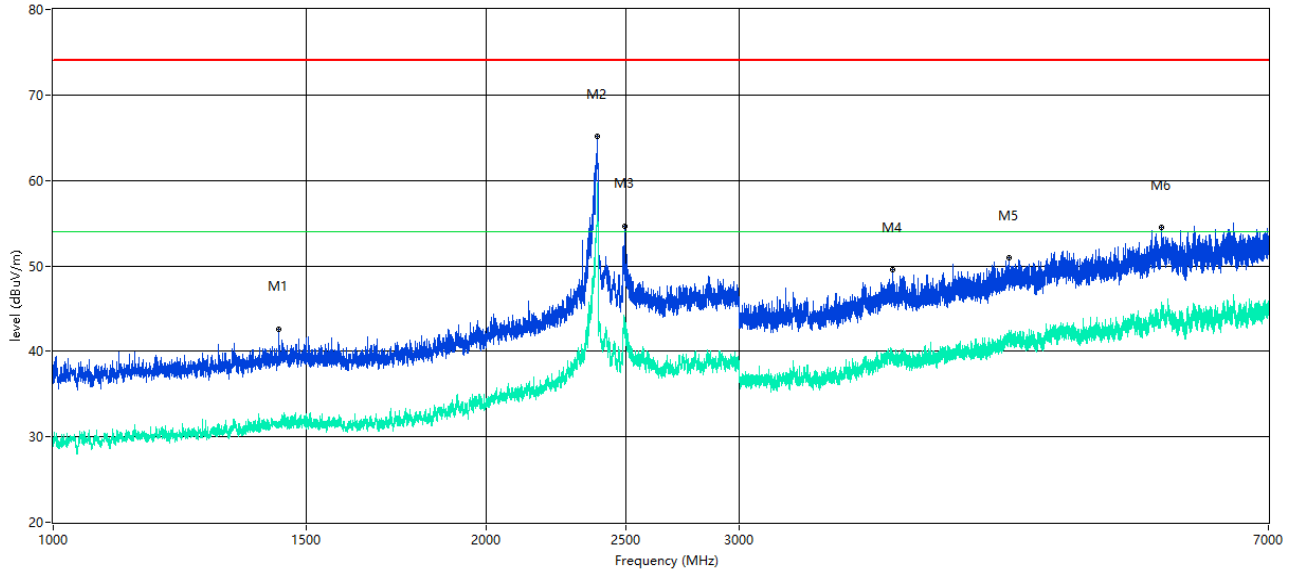


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1337.708	40.44	--	31.2	-11.75	74.0	--	54.0	22.80	173.00	100	Vertical	Pass
1499.188	40.81	--	31.5	-11.54	74.0	--	54.0	22.50	263.00	100	Vertical	Pass
2422.576	59.57	--	53.3	-1.63	74.0	--	54.0	0.70	312.00	100	Vertical	N.A
3825.272	49.05	--	39.5	-2.90	74.0	--	54.0	14.50	231.00	100	Vertical	Pass
5028.121	52.67	--	42.1	0.83	74.0	--	54.0	11.90	272.00	100	Vertical	Pass
5904.012	55.03	--	45.8	3.75	74.0	--	54.0	8.20	76.00	100	Vertical	Pass



1 GHz to 7 GHz, ANT H 802.11n40 Low Channel

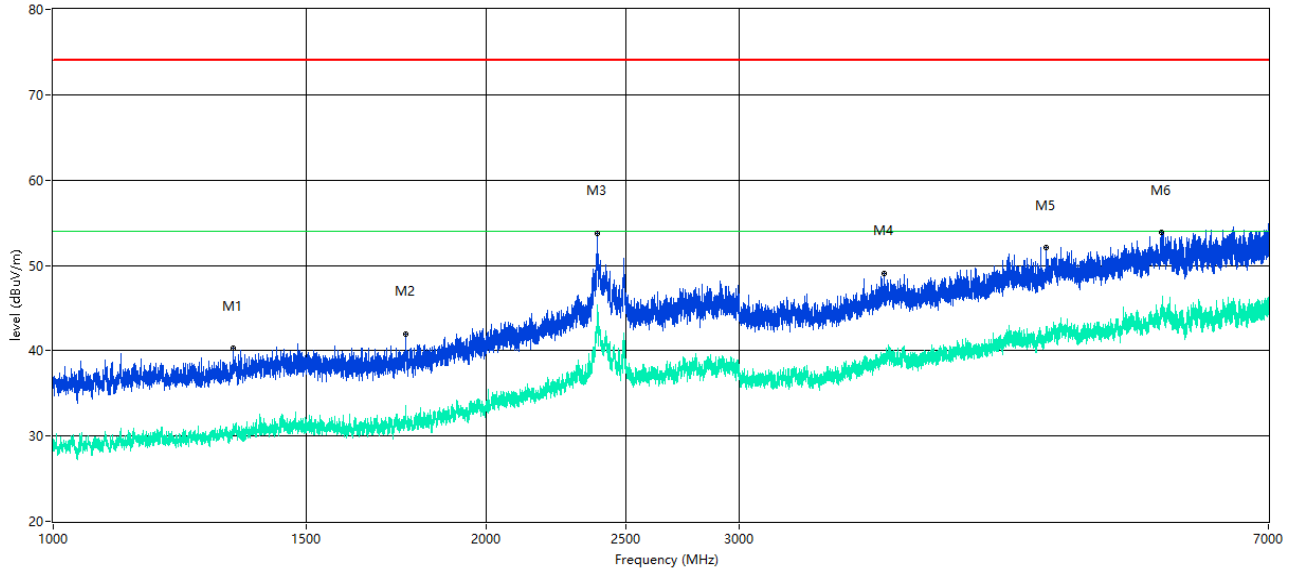
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1435.696	42.54	--	31.4	-11.81	74.0	--	54.0	22.60	227.00	100	Horizontal	Pass
2422.076	65.16	--	59.2	-1.32	74.0	--	54.0	-5.20	245.00	100	Horizontal	N.A
2495.813	54.64	--	43.1	-3.49	74.0	--	54.0	10.90	166.00	100	Horizontal	Pass
3833.146	49.61	--	39.0	-2.88	74.0	--	54.0	15.00	209.00	100	Horizontal	Pass
4619.048	50.89	--	41.6	0.20	74.0	--	54.0	12.40	90.00	100	Horizontal	Pass
5901.762	54.54	--	45.5	3.47	74.0	--	54.0	8.50	287.00	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11n40 Middle Channel

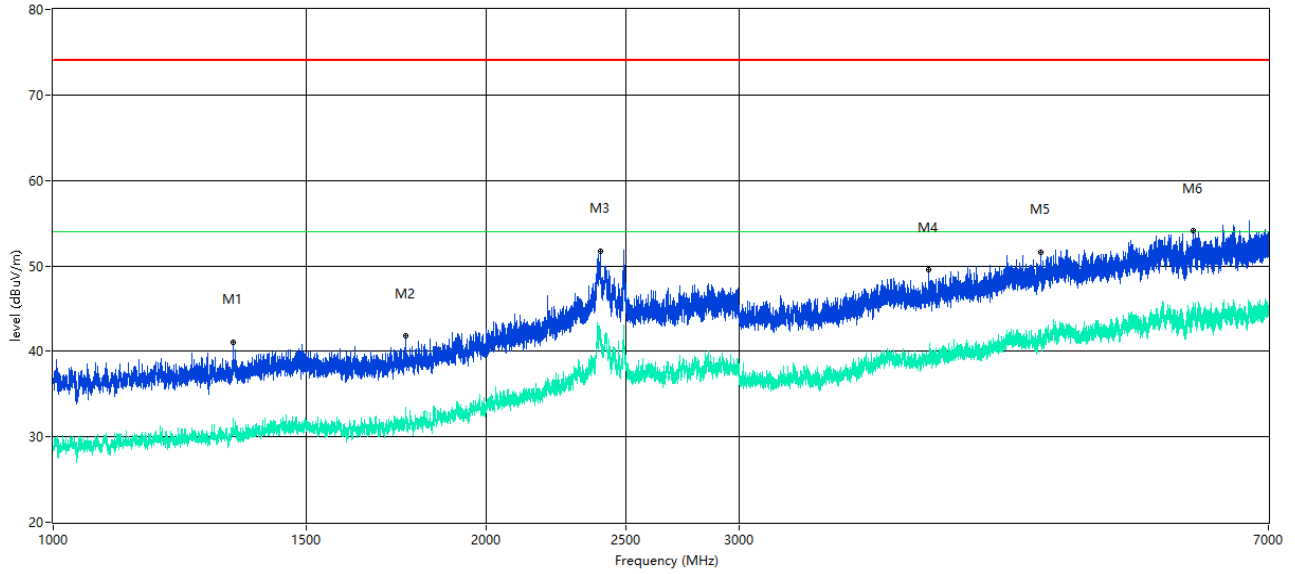
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1333.208	40.32	--	31.4	-11.75	74.0	--	54.0	22.60	275.00	100	Vertical	Pass
1757.655	41.99	--	33.5	-10.78	74.0	--	54.0	20.50	261.00	100	Vertical	Pass
2437.076	53.69	--	44.1	-1.32	74.0	--	54.0	9.90	293.00	100	Vertical	N.A
3780.652	49.06	--	39.2	-2.78	74.0	--	54.0	14.80	222.00	100	Vertical	Pass
4901.762	52.07	--	42.0	0.14	74.0	--	54.0	12.00	270.00	100	Vertical	Pass
5903.262	53.92	--	45.0	3.66	74.0	--	54.0	9.00	238.00	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11n40 Middle Channel

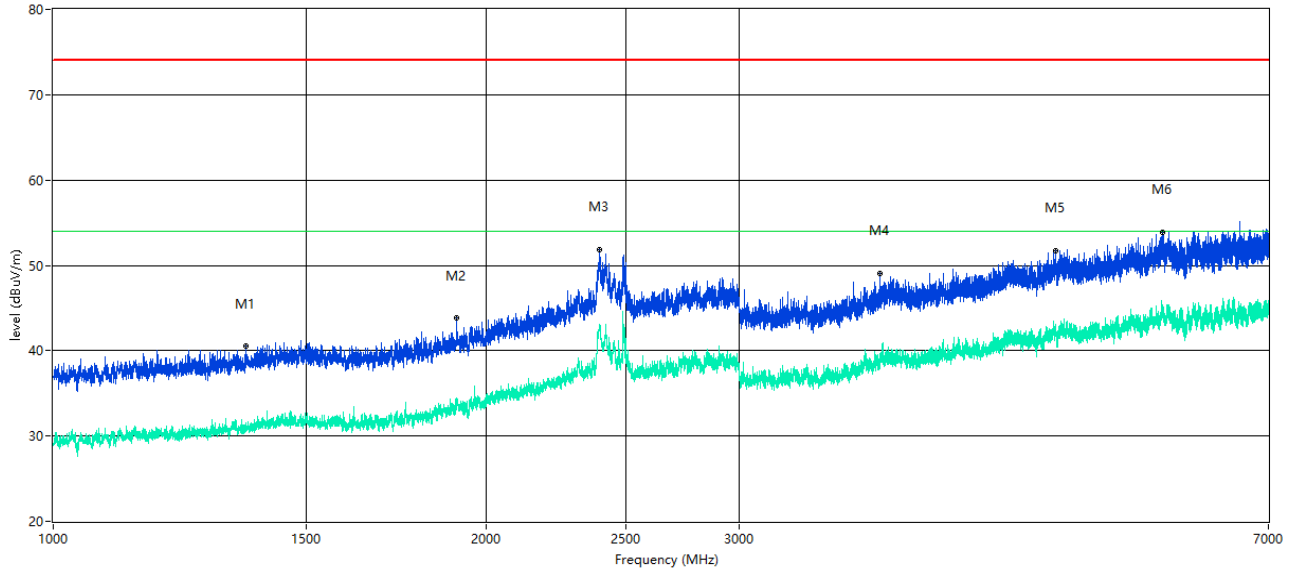
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1333.958	41.02	--	32.1	-11.69	74.0	--	54.0	21.90	83.00	100	Horizontal	Pass
1758.655	41.78	--	33.0	-10.75	74.0	--	54.0	21.00	161.00	100	Horizontal	Pass
2437.825	51.76	--	42.5	-0.10	74.0	--	54.0	11.50	88.00	100	Horizontal	N.A
4061.117	49.57	--	39.6	-3.01	74.0	--	54.0	14.40	241.00	100	Horizontal	Pass
4859.768	51.61	--	42.4	-0.09	74.0	--	54.0	11.60	12.00	100	Horizontal	Pass
6206.224	54.14	--	45.7	4.43	74.0	--	54.0	8.30	238.00	100	Horizontal	Pass

1 GHz to 7 GHz, ANT V 802.11n40 High Channel

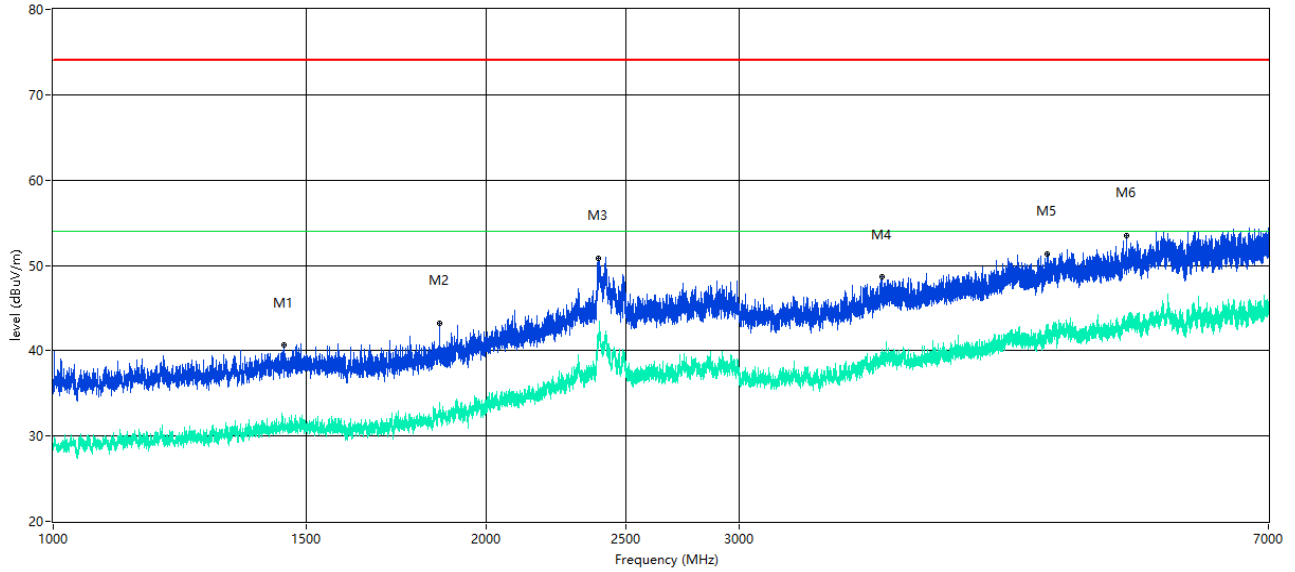
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1361.455	40.49	--	31.5	-12.25	74.0	--	54.0	22.50	241.00	100	Vertical	Pass
1908.886	43.83	--	34.0	-8.84	74.0	--	54.0	20.00	73.00	100	Vertical	Pass
2453.075	51.78	--	43.0	-0.03	74.0	--	54.0	11.00	151.00	100	Vertical	N.A
3759.280	49.06	--	39.2	-3.34	74.0	--	54.0	14.80	40.00	100	Vertical	Pass
4980.877	51.74	--	42.0	1.54	74.0	--	54.0	12.00	225.00	100	Vertical	Pass
5904.387	53.83	--	45.4	3.73	74.0	--	54.0	8.60	76.00	100	Vertical	Pass

1 GHz to 7 GHz, ANT H 802.11n40 High Channel

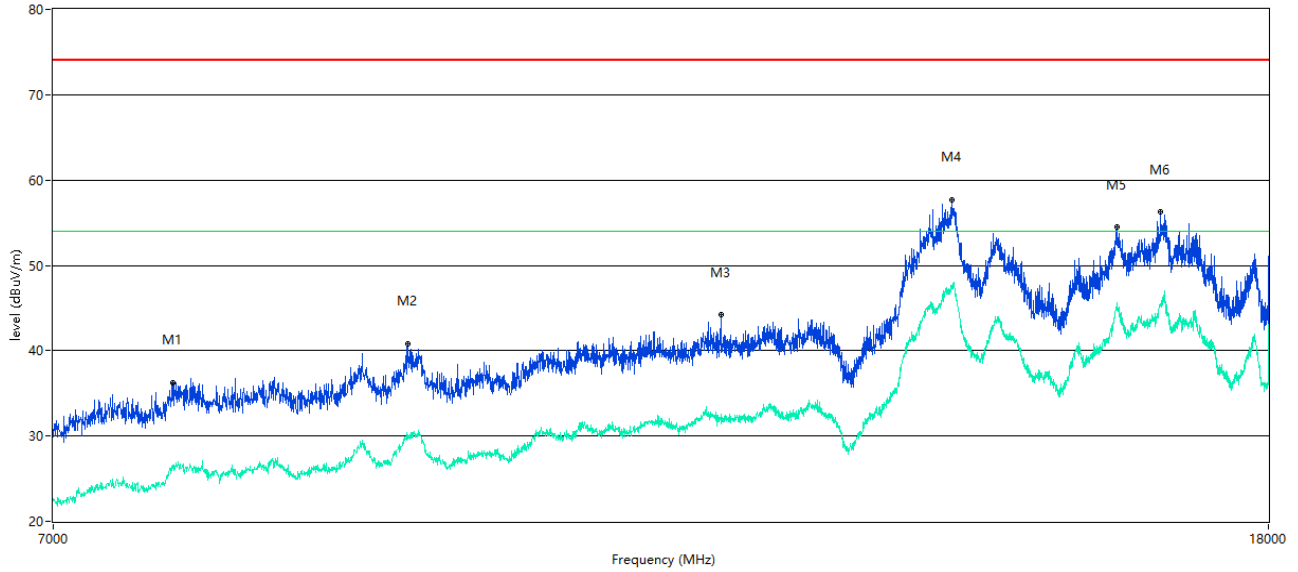
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_1GHz-7GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
1447.444	40.66	--	31.2	-11.68	74.0	--	54.0	22.80	181.00	100	Horizontal	Pass
1855.893	43.15	--	33.9	-9.96	74.0	--	54.0	20.10	230.00	100	Horizontal	Pass
2452.826	50.80	--	41.3	0.12	74.0	--	54.0	12.70	144.00	100	Horizontal	N.A
3770.529	48.68	--	40.1	-2.54	74.0	--	54.0	13.90	83.00	100	Horizontal	Pass
4910.386	51.35	--	42.0	0.51	74.0	--	54.0	12.00	221.00	100	Horizontal	Pass
5577.803	53.55	--	43.5	2.11	74.0	--	54.0	10.50	242.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11b Low Channel

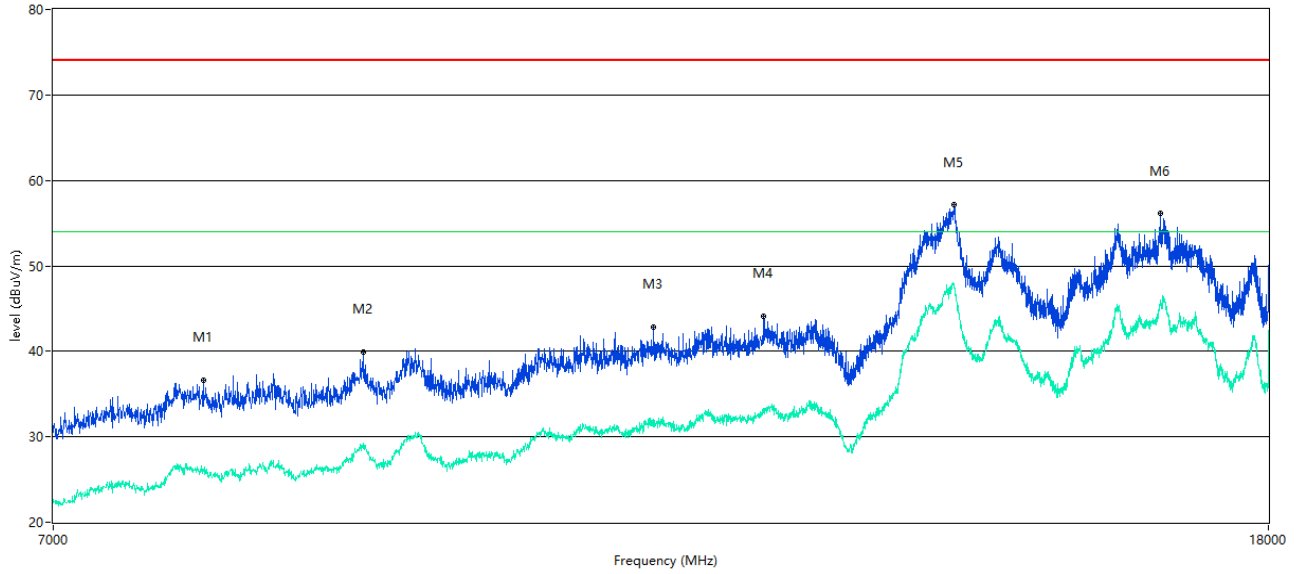
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7679.080	36.29	--	26.6	-8.16	74.0	--	54.0	27.40	226.00	100	Vertical	Pass
9224.194	40.84	--	30.1	-4.69	74.0	--	54.0	23.90	45.00	100	Vertical	Pass
11759.060	44.22	--	32.6	-1.07	74.0	--	54.0	21.40	10.00	100	Vertical	Pass
14076.731	57.71	--	47.3	14.65	74.0	--	54.0	6.70	15.00	100	Vertical	Pass
16001.250	54.46	--	44.7	10.71	74.0	--	54.0	9.30	23.00	100	Vertical	Pass
16553.862	56.23	--	45.5	11.00	74.0	--	54.0	8.50	7.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11b Low Channel

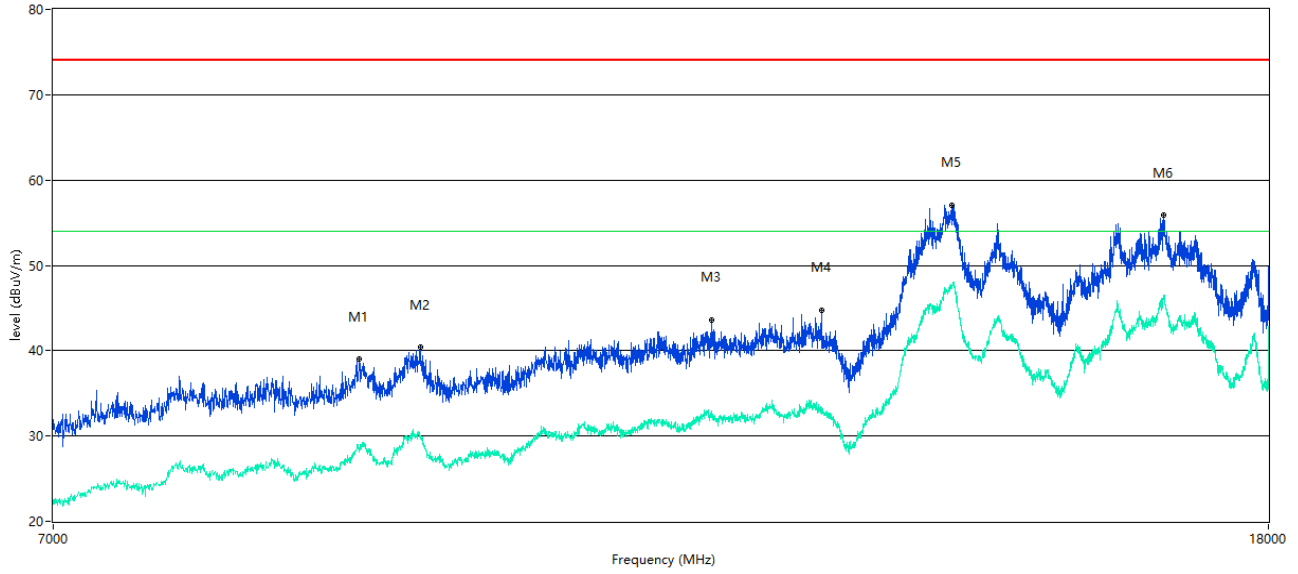
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7866.033	36.64	--	26.0	-8.67	74.0	--	54.0	28.00	2.00	100	Horizontal	Pass
8905.274	39.96	--	29.2	-5.05	74.0	--	54.0	24.80	4.00	100	Horizontal	Pass
11159.710	42.87	--	31.9	-2.10	74.0	--	54.0	22.10	0.00	100	Horizontal	Pass
12157.711	44.15	--	32.8	-0.72	74.0	--	54.0	21.20	0.00	100	Horizontal	Pass
14101.475	57.11	--	47.5	14.72	74.0	--	54.0	6.50	0.00	100	Horizontal	Pass
16551.112	56.09	--	45.5	10.96	74.0	--	54.0	8.50	0.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11b Middle Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz

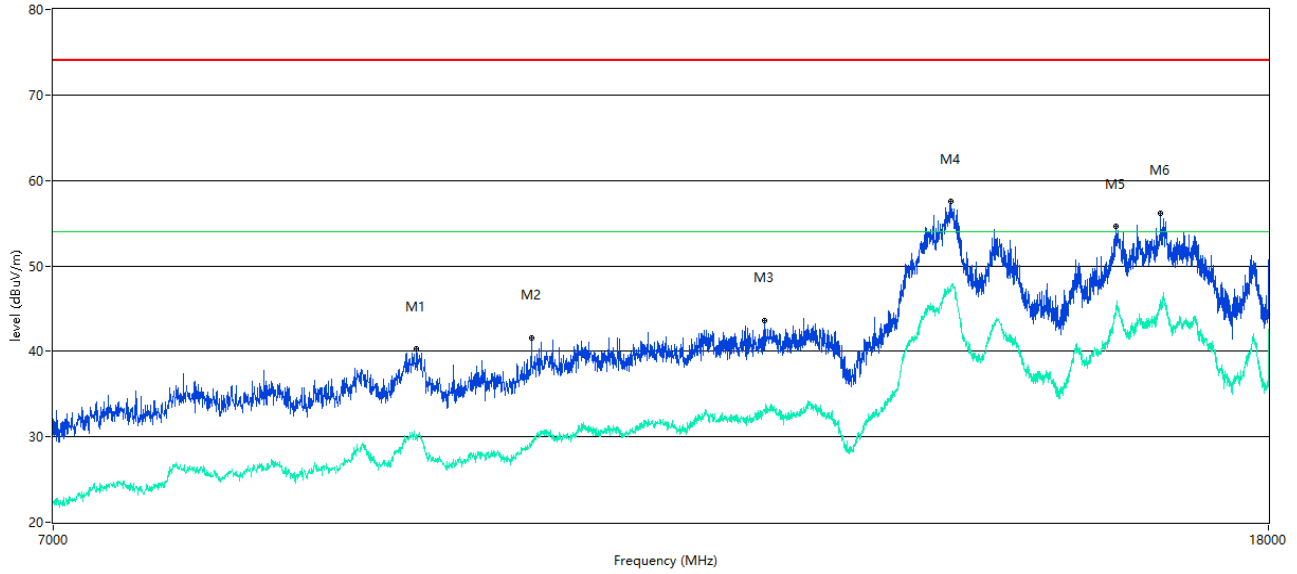


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8880.530	39.02	--	28.4	-5.34	74.0	--	54.0	25.60	20.00	100	Vertical	Pass
9309.423	40.42	--	29.8	-4.25	74.0	--	54.0	24.20	55.00	100	Vertical	Pass
11673.832	43.55	--	32.9	-0.61	74.0	--	54.0	21.10	180.00	100	Vertical	Pass
12721.320	44.77	--	33.3	-0.41	74.0	--	54.0	20.70	23.00	100	Vertical	Pass
14076.731	57.09	--	47.5	14.65	74.0	--	54.0	6.50	46.00	100	Vertical	Pass
16589.603	55.87	--	46.5	11.84	74.0	--	54.0	7.50	99.00	100	Vertical	Pass



7 GHz to 18 GHz, ANT H 802.11b Middle Channel

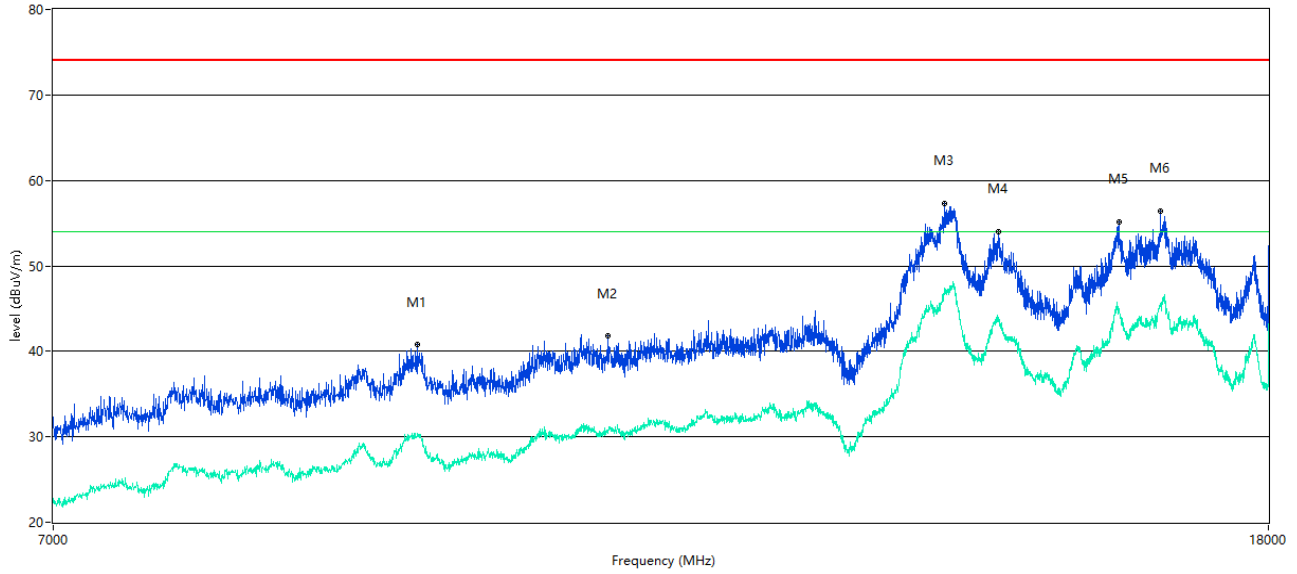
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9281.930	40.24	--	30.2	-4.15	74.0	--	54.0	23.80	5.00	100	Horizontal	Pass
10150.712	41.61	--	29.5	-3.52	74.0	--	54.0	24.50	7.00	100	Horizontal	Pass
12163.209	43.64	--	32.9	-0.67	74.0	--	54.0	21.10	11.00	100	Horizontal	Pass
14062.984	57.52	--	47.3	14.50	74.0	--	54.0	6.70	15.00	100	Horizontal	Pass
15993.002	54.63	--	44.6	10.46	74.0	--	54.0	9.40	0.00	100	Horizontal	Pass
16548.363	56.17	--	45.6	10.92	74.0	--	54.0	8.40	0.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11b High Channel

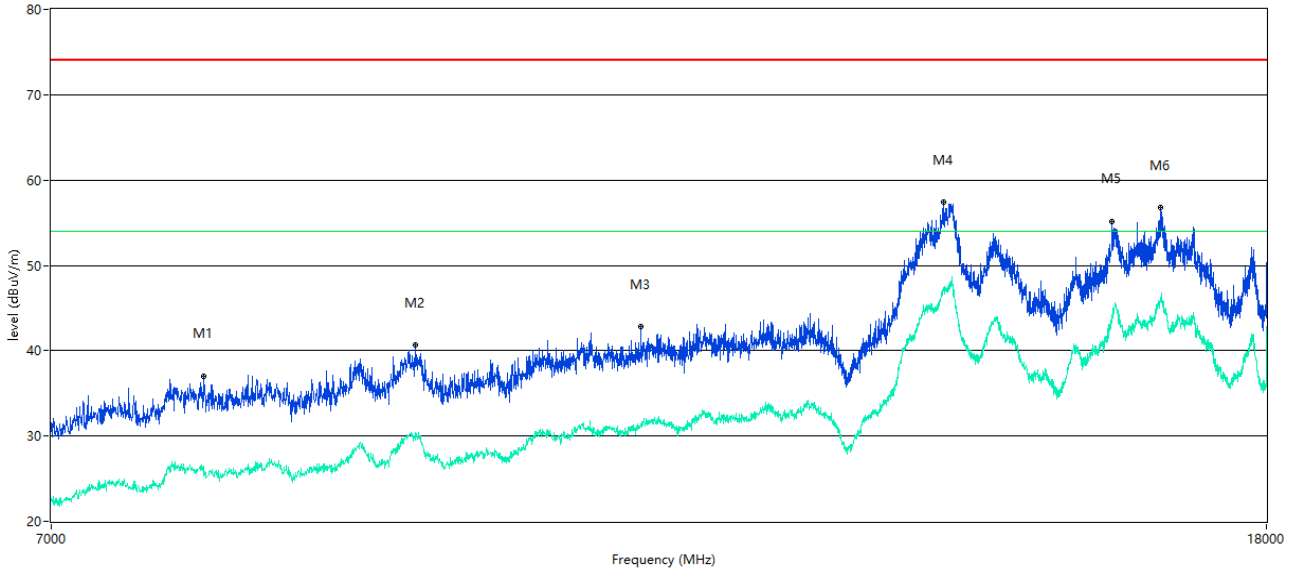
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9287.428	40.76	--	30.3	-4.06	74.0	--	54.0	23.70	80.00	100	Vertical	Pass
10772.057	41.79	--	30.8	-1.79	74.0	--	54.0	23.20	234.00	100	Vertical	Pass
13997.001	57.31	--	47.4	14.10	74.0	--	54.0	6.60	16.00	100	Vertical	Pass
14596.351	54.02	--	43.5	10.36	74.0	--	54.0	10.50	15.00	100	Vertical	Pass
16023.244	55.16	--	44.8	9.99	74.0	--	54.0	9.20	8.00	100	Vertical	Pass
16551.112	56.44	--	45.3	10.96	74.0	--	54.0	8.70	67.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11b High Channel

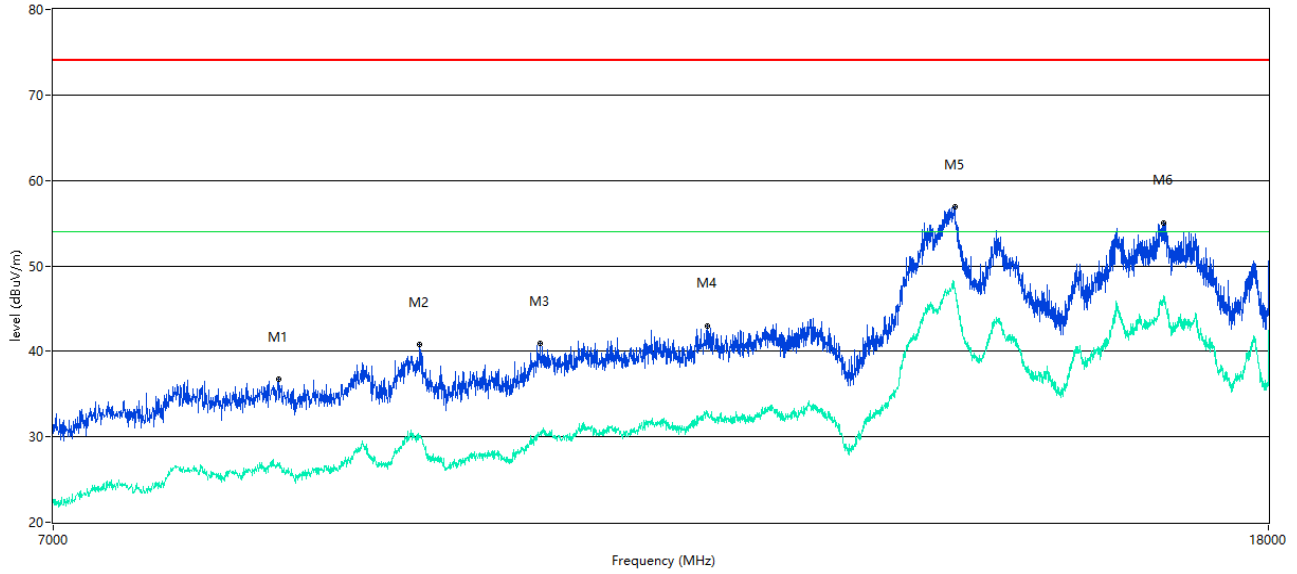
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7882.529	37.04	--	25.3	-8.74	74.0	--	54.0	28.70	2.00	100	Horizontal	Pass
9292.927	40.65	--	29.6	-4.01	74.0	--	54.0	24.40	43.00	100	Horizontal	Pass
11068.983	42.77	--	31.4	-1.67	74.0	--	54.0	22.60	97.00	100	Horizontal	Pass
14005.249	57.38	--	47.1	14.24	74.0	--	54.0	6.90	15.00	100	Horizontal	Pass
15968.258	55.19	--	43.6	9.57	74.0	--	54.0	10.40	261.00	100	Horizontal	Pass
16581.355	56.77	--	46.1	11.66	74.0	--	54.0	7.90	34.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11g Low Channel

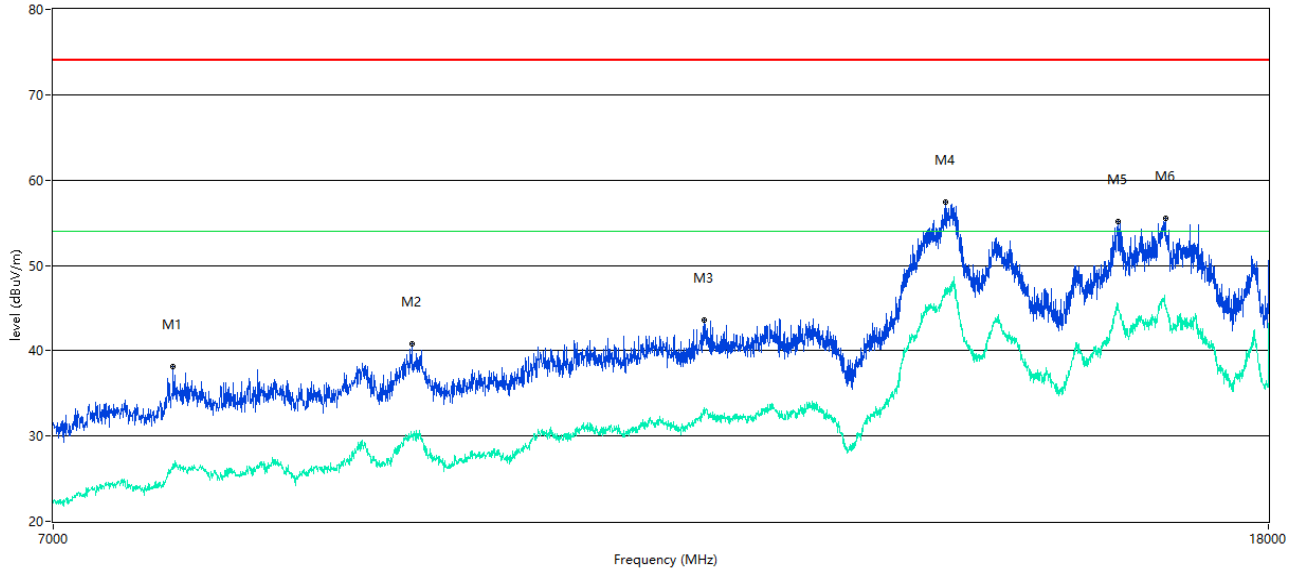
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8338.915	36.70	--	26.9	-6.93	74.0	--	54.0	27.10	73.00	100	Vertical	Pass
9306.673	40.74	--	29.9	-4.18	74.0	--	54.0	24.10	235.00	100	Vertical	Pass
10219.445	40.87	--	30.5	-2.52	74.0	--	54.0	23.50	16.00	100	Vertical	Pass
11638.090	42.97	--	33.0	-0.77	74.0	--	54.0	21.00	180.00	100	Vertical	Pass
14106.973	56.87	--	47.3	14.37	74.0	--	54.0	6.70	26.00	100	Vertical	Pass
16597.851	55.02	--	46.5	12.09	74.0	--	54.0	7.50	53.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11g Low Channel

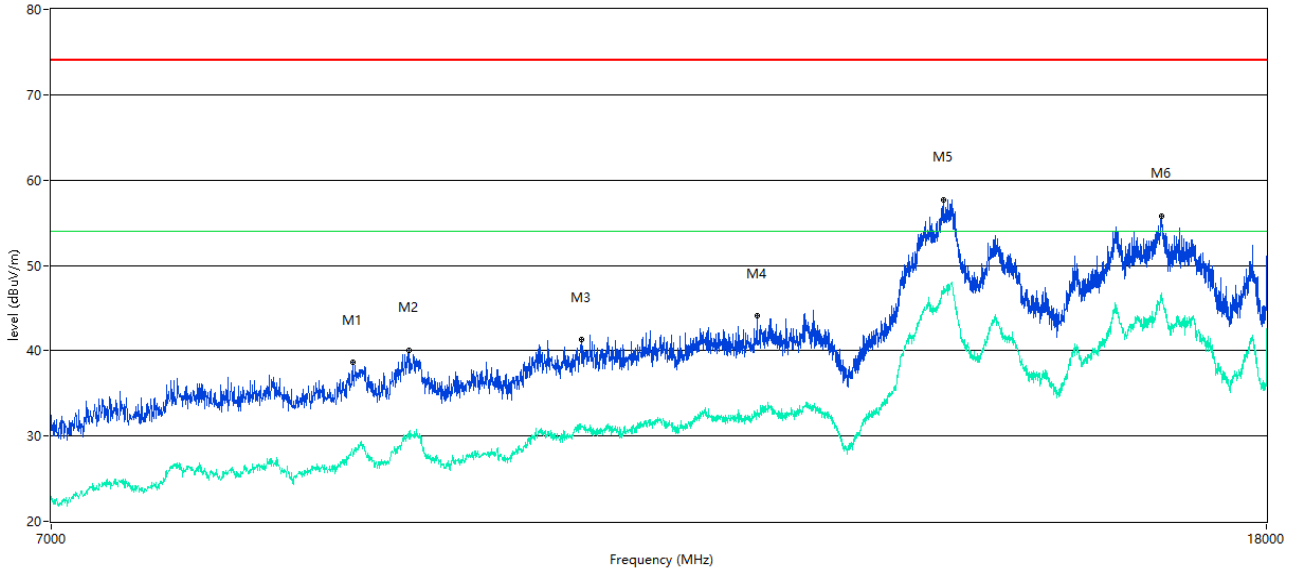
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7684.579	38.13	--	26.3	-8.04	74.0	--	54.0	27.70	78.00	100	Horizontal	Pass
9251.687	40.85	--	29.9	-4.36	74.0	--	54.0	24.10	162.00	100	Horizontal	Pass
11613.347	43.60	--	33.4	-0.59	74.0	--	54.0	20.60	108.00	100	Horizontal	Pass
14005.249	57.38	--	47.3	14.24	74.0	--	54.0	6.70	231.00	100	Horizontal	Pass
16009.498	55.11	--	45.5	10.44	74.0	--	54.0	8.50	42.00	100	Horizontal	Pass
16622.594	55.46	--	45.2	11.41	74.0	--	54.0	8.80	55.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11g Middle Channel

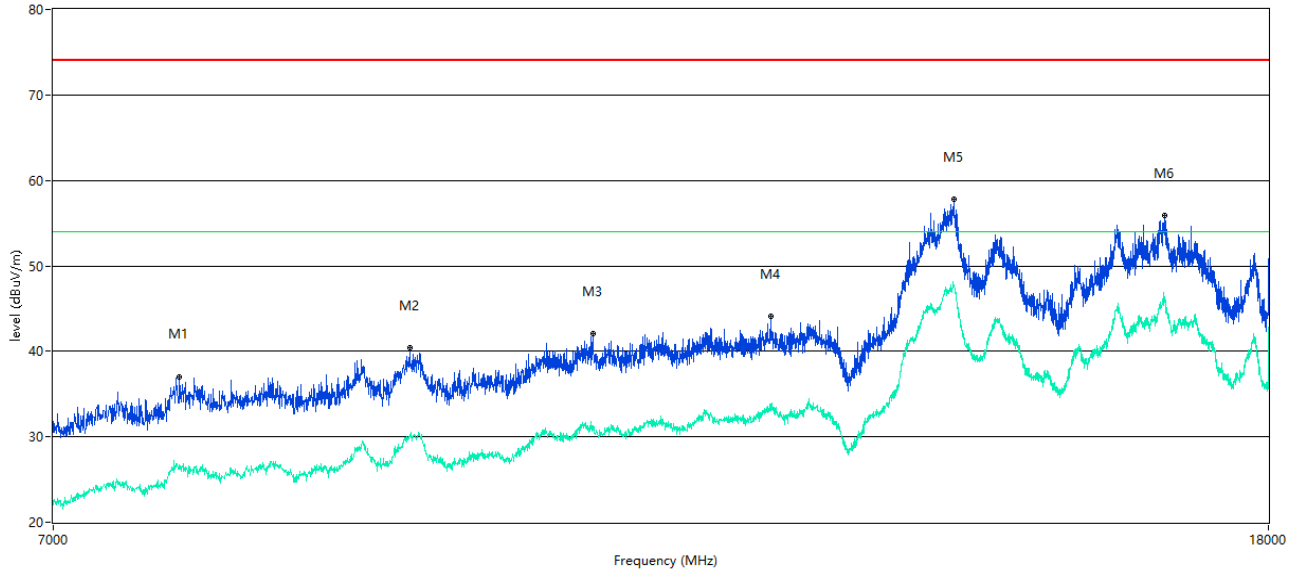
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8853.037	38.59	--	27.6	-5.75	74.0	--	54.0	26.40	23.00	100	Vertical	Pass
9243.439	40.08	--	30.0	-4.53	74.0	--	54.0	24.00	38.00	100	Vertical	Pass
10568.608	41.30	--	31.1	-2.02	74.0	--	54.0	22.90	188.00	100	Vertical	Pass
12119.220	44.11	--	32.6	-1.00	74.0	--	54.0	21.40	24.00	100	Vertical	Pass
13999.750	57.74	--	47.3	14.17	74.0	--	54.0	6.70	15.00	100	Vertical	Pass
16592.352	55.81	--	46.4	11.91	74.0	--	54.0	7.60	90.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11g Middle Channel

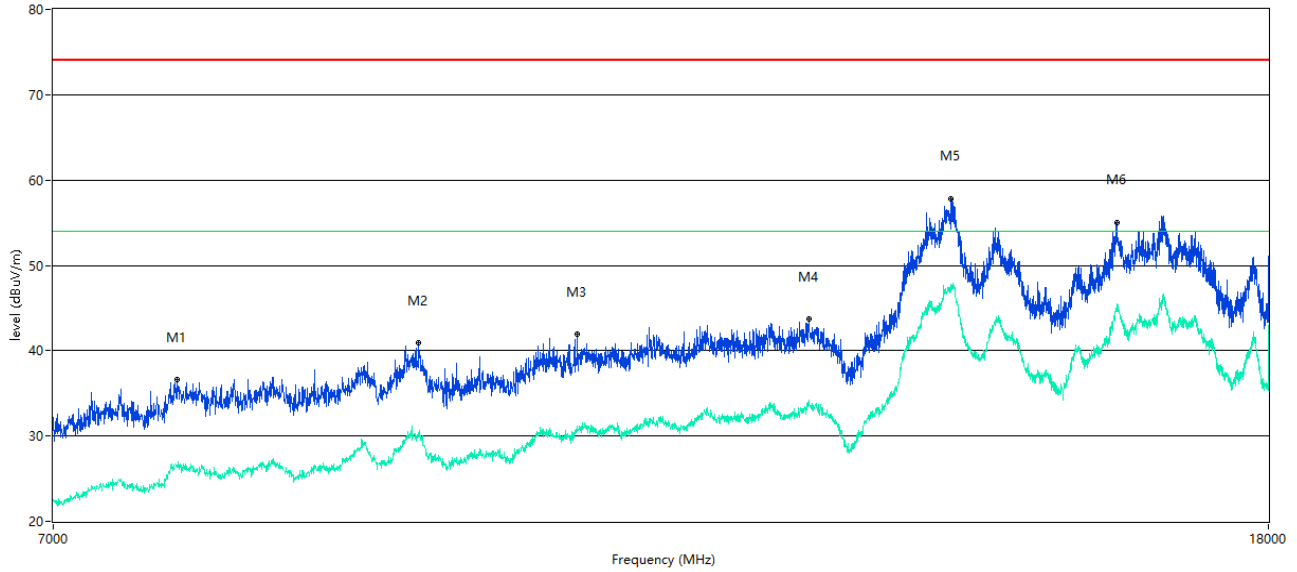
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7720.320	37.05	--	26.5	-7.82	74.0	--	54.0	27.50	27.00	100	Horizontal	Pass
9235.191	40.40	--	30.3	-4.58	74.0	--	54.0	23.70	158.00	100	Horizontal	Pass
10645.589	42.01	--	31.2	-1.72	74.0	--	54.0	22.80	28.00	100	Horizontal	Pass
12223.694	44.06	--	33.9	-0.35	74.0	--	54.0	20.10	34.00	100	Horizontal	Pass
14098.725	57.79	--	47.7	14.80	74.0	--	54.0	6.30	221.00	100	Horizontal	Pass
16608.848	55.87	--	45.7	11.82	74.0	--	54.0	8.30	68.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11g High Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz

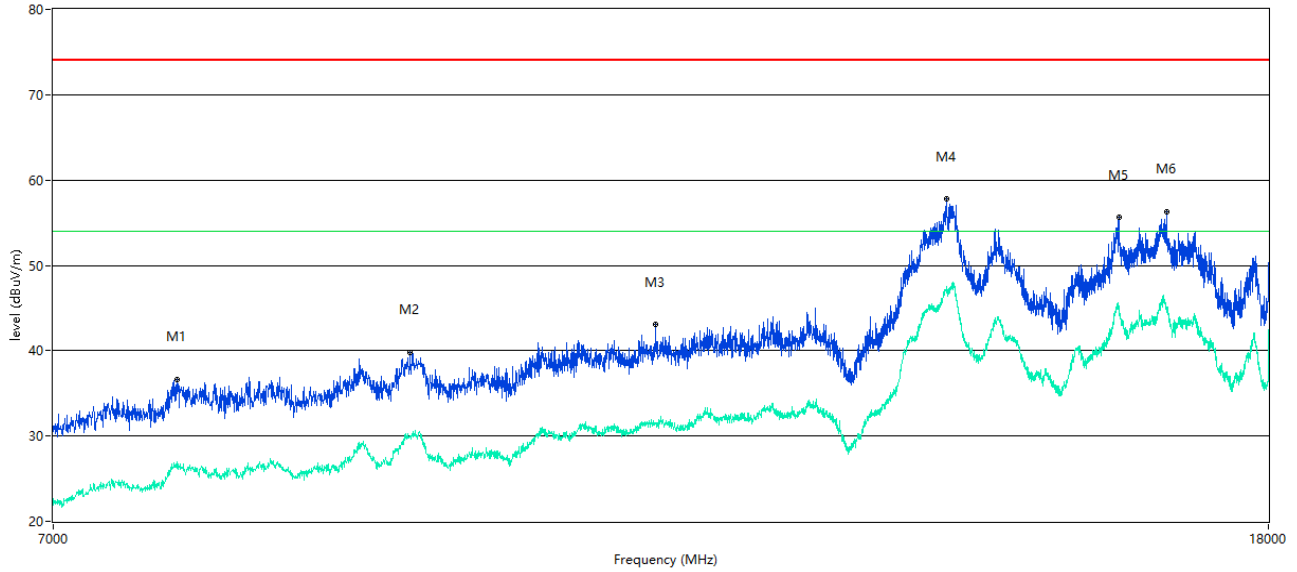


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7709.323	36.62	--	26.3	-7.77	74.0	--	54.0	27.70	92.00	100	Vertical	Pass
9301.175	40.88	--	30.3	-4.05	74.0	--	54.0	23.70	64.00	100	Vertical	Pass
10521.870	41.92	--	31.1	-2.53	74.0	--	54.0	22.90	88.00	100	Vertical	Pass
12597.601	43.71	--	34.2	0.29	74.0	--	54.0	19.80	102.00	100	Vertical	Pass
14060.235	57.85	--	47.8	14.46	74.0	--	54.0	6.20	480.00	100	Vertical	Pass
15998.500	55.07	--	44.6	10.69	74.0	--	54.0	9.40	70.00	100	Vertical	Pass



7 GHz to 18 GHz, ANT H 802.11g High Channel

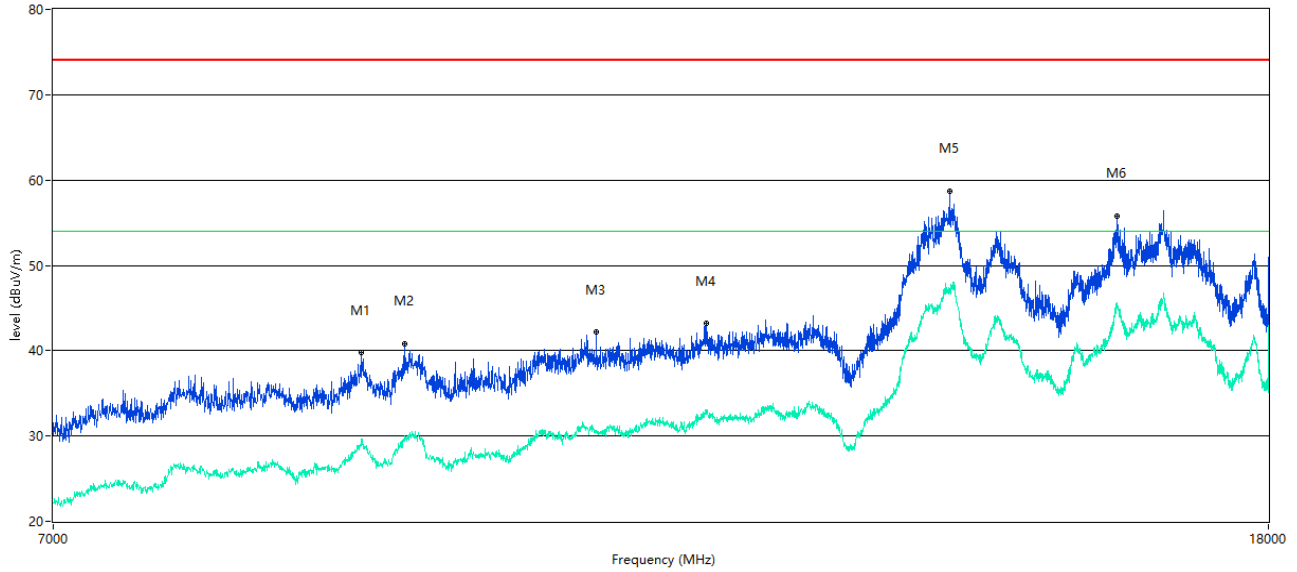
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7709.323	36.67	--	26.2	-7.77	74.0	--	54.0	27.80	23.00	100	Horizontal	Pass
9237.941	39.80	--	30.0	-4.58	74.0	--	54.0	24.00	51.00	100	Horizontal	Pass
11178.955	43.08	--	31.5	-2.14	74.0	--	54.0	22.50	10.00	100	Horizontal	Pass
14016.246	57.76	--	47.6	14.24	74.0	--	54.0	6.40	84.00	100	Horizontal	Pass
16023.244	55.63	--	45.1	9.99	74.0	--	54.0	8.90	223.00	100	Horizontal	Pass
16630.842	56.34	--	45.2	11.08	74.0	--	54.0	8.80	35.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11n20 Low Channel

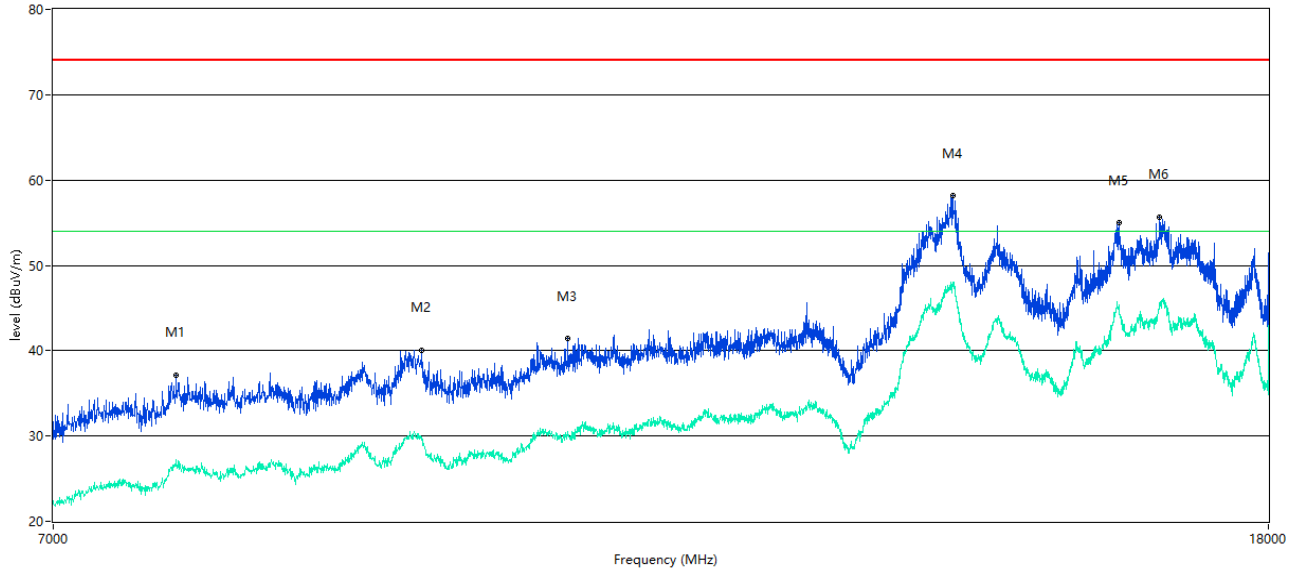
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8897.026	39.80	--	29.6	-4.94	74.0	--	54.0	24.40	70.00	100	Vertical	Pass
9199.450	40.86	--	30.0	-4.83	74.0	--	54.0	24.00	58.00	100	Vertical	Pass
10675.831	42.15	--	30.4	-1.74	74.0	--	54.0	23.60	8.00	100	Vertical	Pass
11632.592	43.20	--	33.1	-0.71	74.0	--	54.0	20.90	60.00	100	Vertical	Pass
14046.488	58.71	--	47.2	14.34	74.0	--	54.0	6.80	105.00	100	Vertical	Pass
16006.748	55.80	--	45.6	10.53	74.0	--	54.0	8.40	0.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11n20 Low Channel

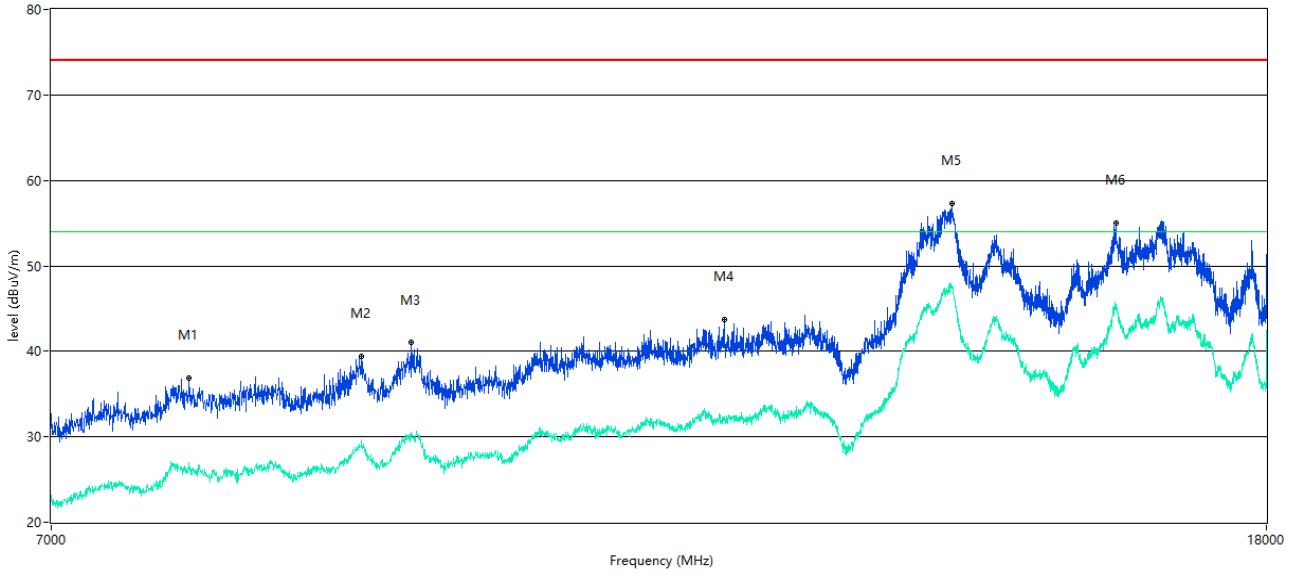
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7701.075	37.16	--	27.2	-7.75	74.0	--	54.0	26.80	45.00	100	Horizontal	Pass
9320.420	40.09	--	29.9	-4.45	74.0	--	54.0	24.10	5.00	100	Horizontal	Pass
10444.889	41.43	--	30.5	-2.72	74.0	--	54.0	23.50	7.00	100	Horizontal	Pass
14084.979	58.17	--	48.0	14.84	74.0	--	54.0	6.00	105.00	100	Horizontal	Pass
16023.244	54.98	--	45.4	9.99	74.0	--	54.0	8.60	210.00	100	Horizontal	Pass
16542.864	55.67	--	45.0	10.83	74.0	--	54.0	9.00	34.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11n20 Middle Channel

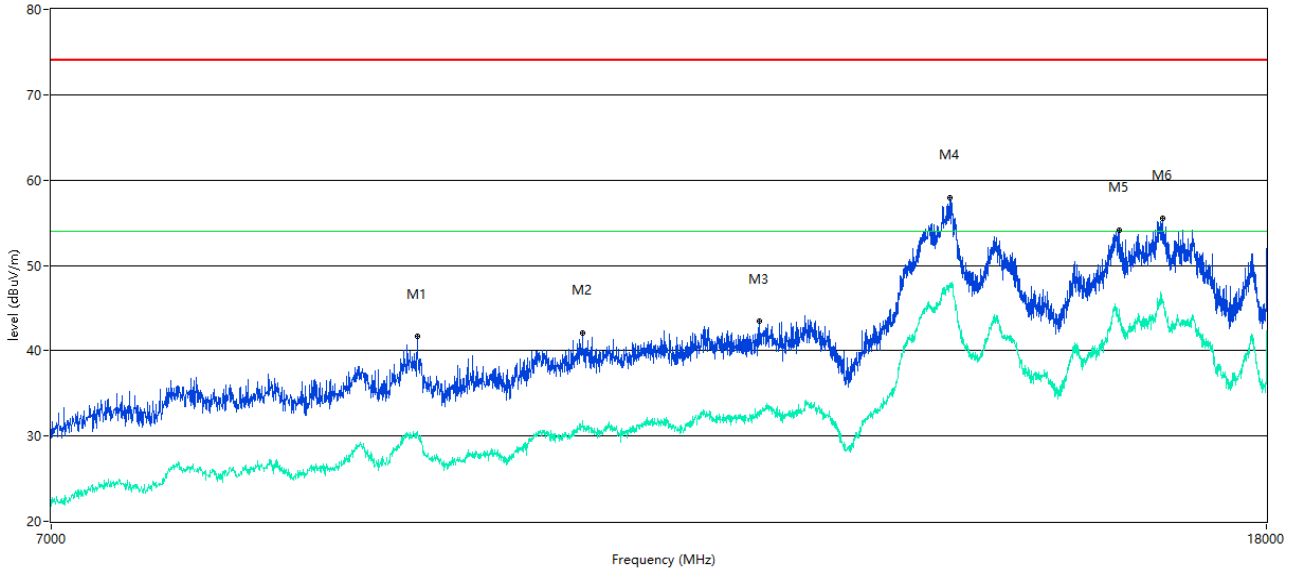
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
7791.802	36.93	--	26.9	-8.25	74.0	--	54.0	27.10	86.00	100	Vertical	Pass
8908.023	39.44	--	29.6	-5.14	74.0	--	54.0	24.40	46.00	100	Vertical	Pass
9262.684	41.03	--	30.3	-4.23	74.0	--	54.0	23.70	25.00	100	Vertical	Pass
11808.548	43.74	--	32.3	-1.13	74.0	--	54.0	21.70	180.00	100	Vertical	Pass
14093.227	57.31	--	47.4	14.80	74.0	--	54.0	6.60	90.00	100	Vertical	Pass
16012.247	55.03	--	45.1	10.34	74.0	--	54.0	8.90	55.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11n20 Middle Channel

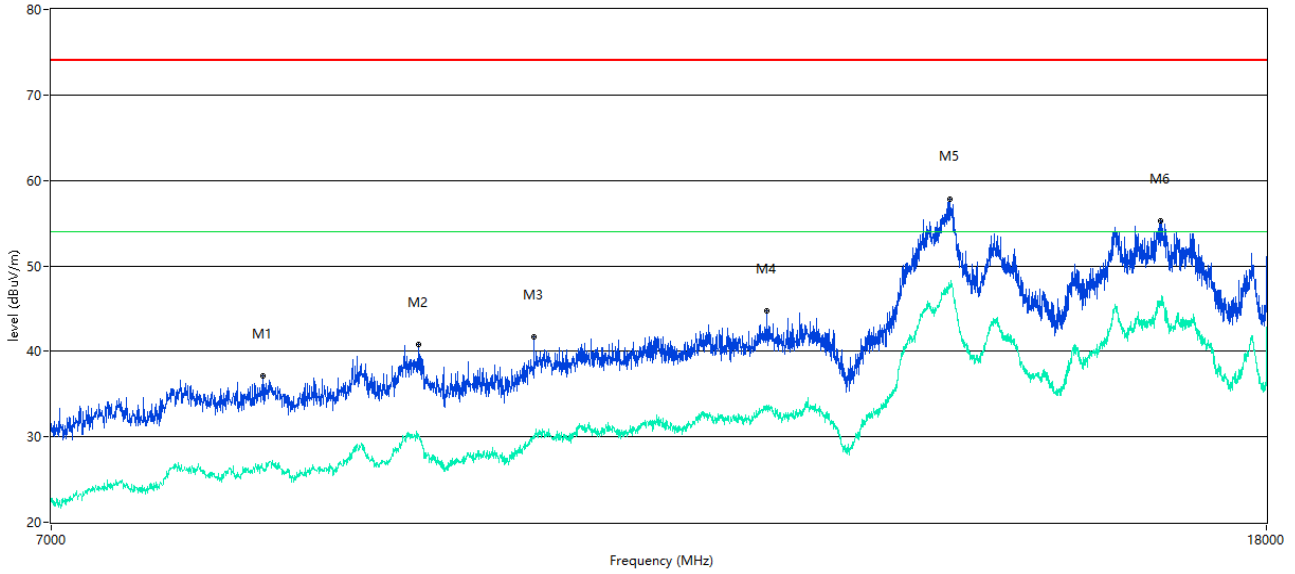
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9303.924	41.66	--	30.5	-4.11	74.0	--	54.0	23.50	98.00	100	Horizontal	Pass
10579.605	42.11	--	31.8	-1.79	74.0	--	54.0	22.20	85.00	100	Horizontal	Pass
12132.967	43.44	--	33.0	-0.90	74.0	--	54.0	21.00	210.00	100	Horizontal	Pass
14073.982	57.94	--	47.3	14.60	74.0	--	54.0	6.70	165.00	100	Horizontal	Pass
16050.737	54.16	--	44.9	9.23	74.0	--	54.0	9.10	45.00	100	Horizontal	Pass
16600.600	55.55	--	45.9	12.12	74.0	--	54.0	8.10	36.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11n20 High Channel

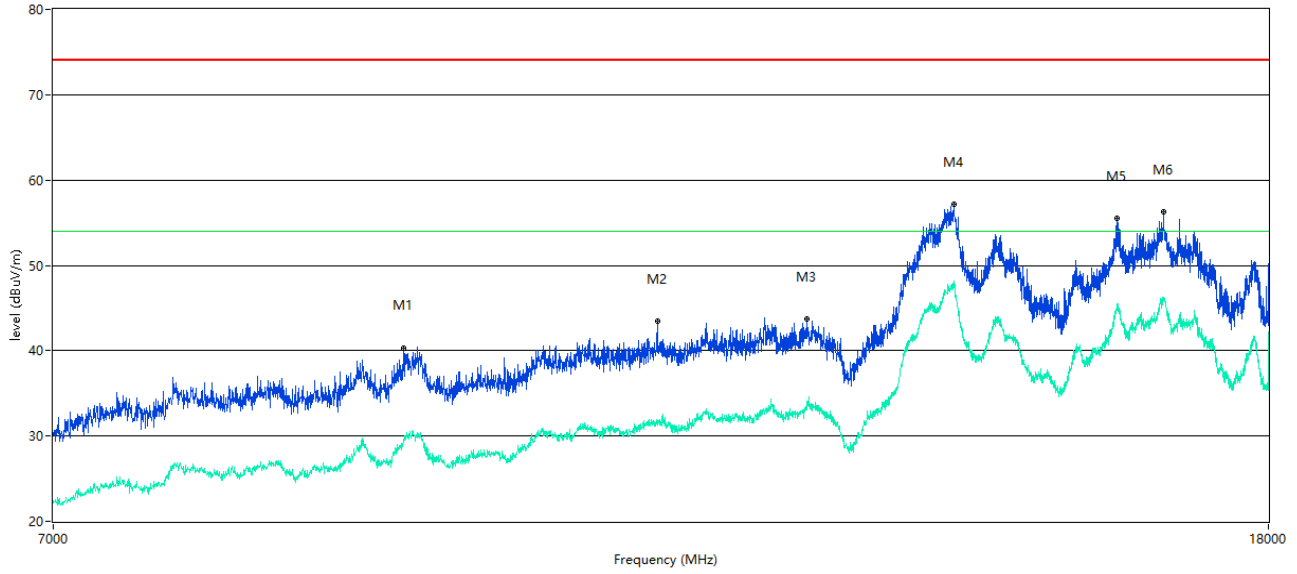
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8250.937	37.08	--	26.1	-7.30	74.0	--	54.0	27.90	80.00	100	Vertical	Pass
9309.423	40.76	--	30.2	-4.25	74.0	--	54.0	23.80	56.00	100	Vertical	Pass
10186.453	41.64	--	30.2	-2.88	74.0	--	54.0	23.80	107.00	100	Vertical	Pass
12209.948	44.79	--	33.7	-0.44	74.0	--	54.0	20.30	354.00	100	Vertical	Pass
14076.731	57.82	--	47.4	14.65	74.0	--	54.0	6.60	15.00	100	Vertical	Pass
16581.355	55.23	--	45.8	11.66	74.0	--	54.0	8.20	62.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11n20 High Channel

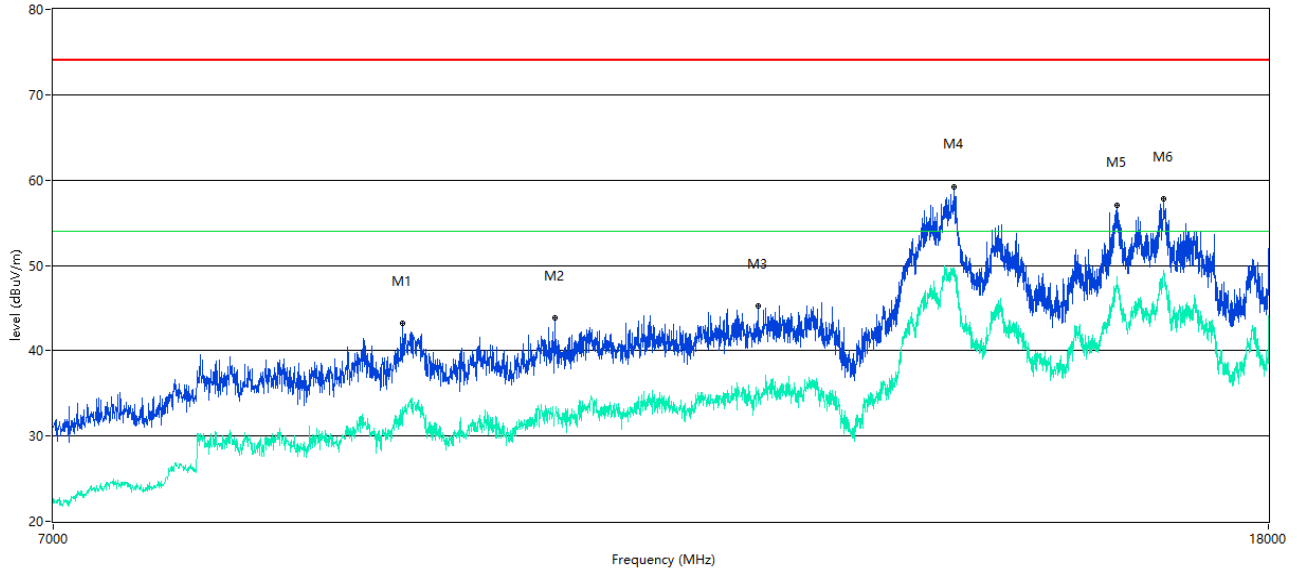
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9191.202	40.26	--	29.5	-5.15	74.0	--	54.0	24.50	45.00	100	Horizontal	Pass
11192.702	43.46	--	31.8	-2.13	74.0	--	54.0	22.20	86.00	100	Horizontal	Pass
12578.355	43.73	--	34.1	0.12	74.0	--	54.0	19.90	78.00	100	Horizontal	Pass
14095.976	57.13	--	48.2	14.77	74.0	--	54.0	5.80	106.00	100	Horizontal	Pass
15995.751	55.55	--	44.8	10.57	74.0	--	54.0	9.20	46.00	100	Horizontal	Pass
16595.101	56.25	--	46.2	12.00	74.0	--	54.0	7.80	73.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11n40 Low Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz

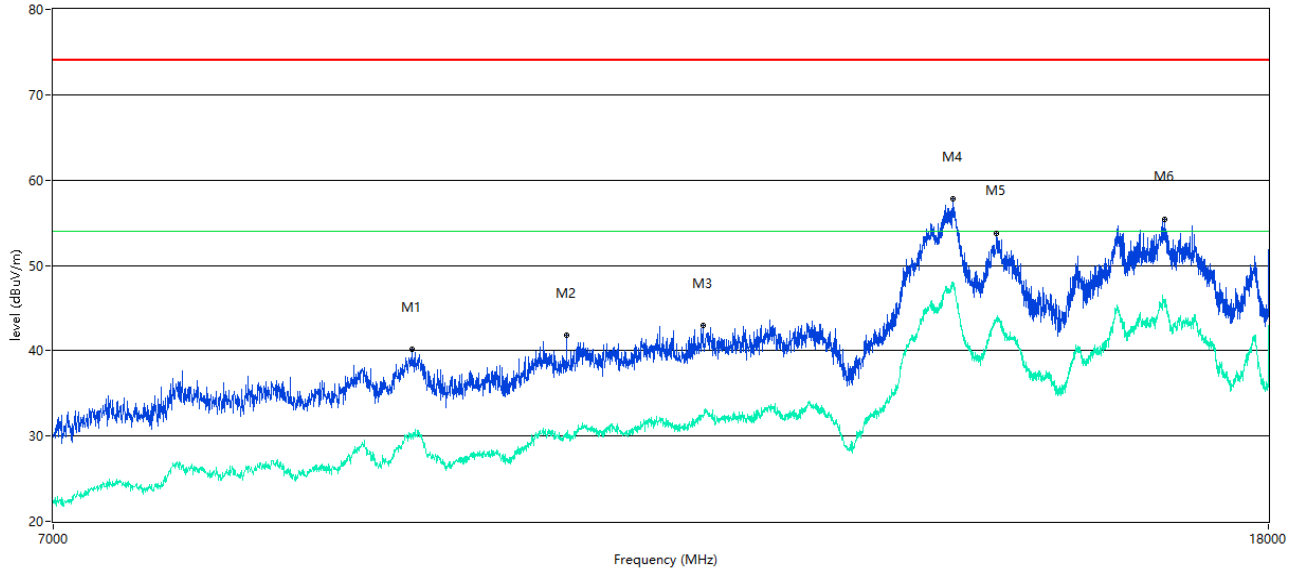


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9185.704	43.16	--	33.3	-5.33	74.0	--	54.0	20.70	83.00	100	Vertical	Pass
10337.666	43.84	--	32.3	-2.49	74.0	--	54.0	21.70	215.00	100	Vertical	Pass
12102.724	45.23	--	35.5	-1.01	74.0	--	54.0	18.50	10.00	100	Vertical	Pass
14095.976	59.23	--	49.7	14.77	74.0	--	54.0	4.30	80.00	100	Vertical	Pass
16001.250	57.09	--	48.6	10.71	74.0	--	54.0	5.40	23.00	100	Vertical	Pass
16592.352	57.78	--	49.4	11.91	74.0	--	54.0	4.60	6.00	100	Vertical	Pass



7 GHz to 18 GHz, ANT H 802.11n40 Low Channel

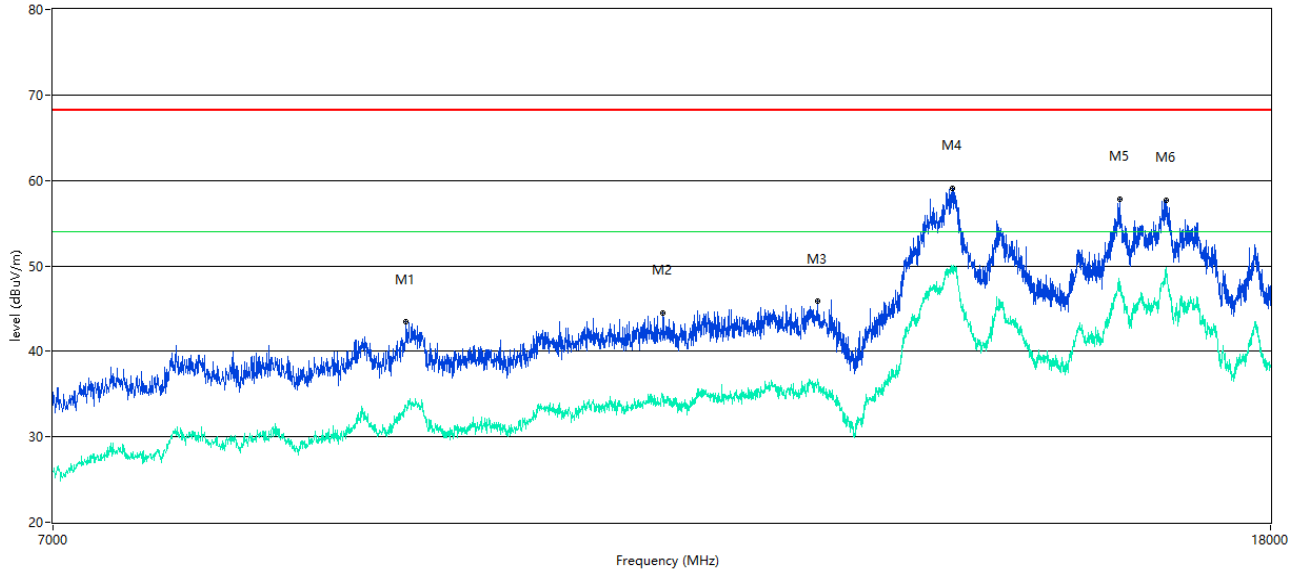
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9248.938	40.13	--	29.9	-4.42	74.0	--	54.0	24.10	73.00	100	Horizontal	Pass
10431.142	41.76	--	30.4	-2.75	74.0	--	54.0	23.60	107.00	100	Horizontal	Pass
11596.851	42.95	--	32.5	-0.88	74.0	--	54.0	21.50	226.00	100	Horizontal	Pass
14090.477	57.79	--	48.0	14.83	74.0	--	54.0	6.00	46.00	100	Horizontal	Pass
14574.356	53.77	--	43.7	10.08	74.0	--	54.0	10.30	15.00	100	Horizontal	Pass
16603.349	55.44	--	46.0	12.02	74.0	--	54.0	8.00	320.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11n40 Middle Channel

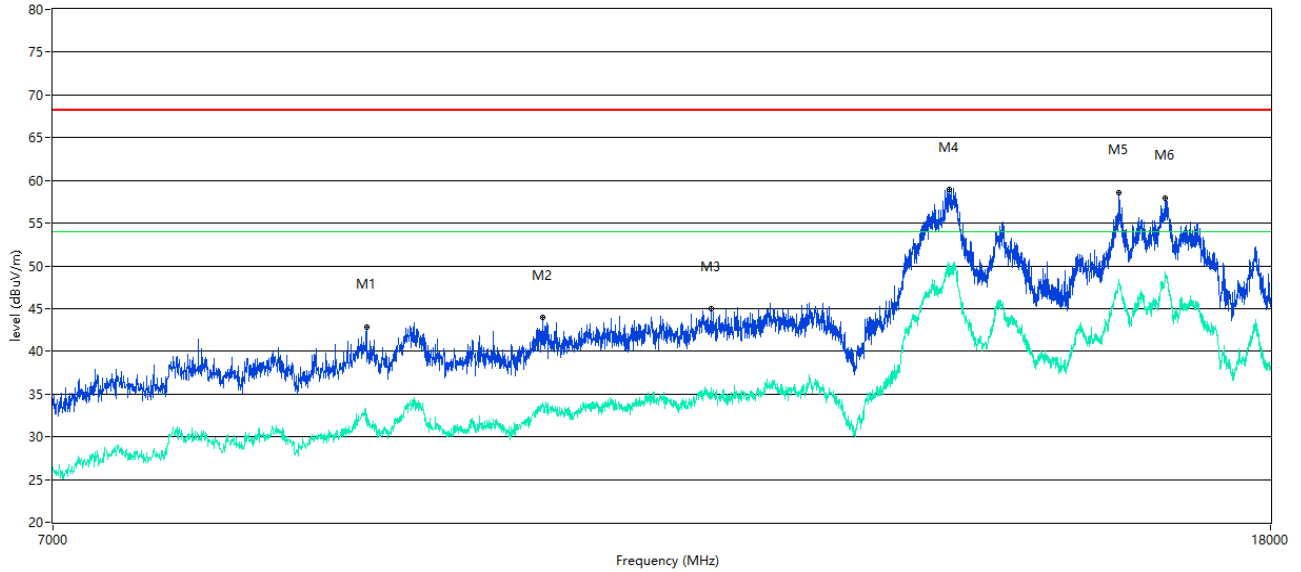
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz\_wifi



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9204.949	43.53	--	33.7	-4.80	68.2	--	54.0	20.30	148.00	100	Vertical	Pass
11236.691	44.52	--	35.0	-1.67	68.2	--	54.0	19.00	45.00	100	Vertical	Pass
12663.584	45.84	--	36.3	0.11	68.2	--	54.0	17.70	55.00	100	Vertical	Pass
14068.483	59.12	--	49.6	14.56	68.2	--	54.0	4.40	121.00	100	Vertical	Pass
16009.498	57.74	--	48.1	10.44	68.2	--	54.0	5.90	23.00	100	Vertical	Pass
16595.101	57.69	--	49.4	12.00	68.2	--	54.0	4.60	255.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11n40 Middle Channel

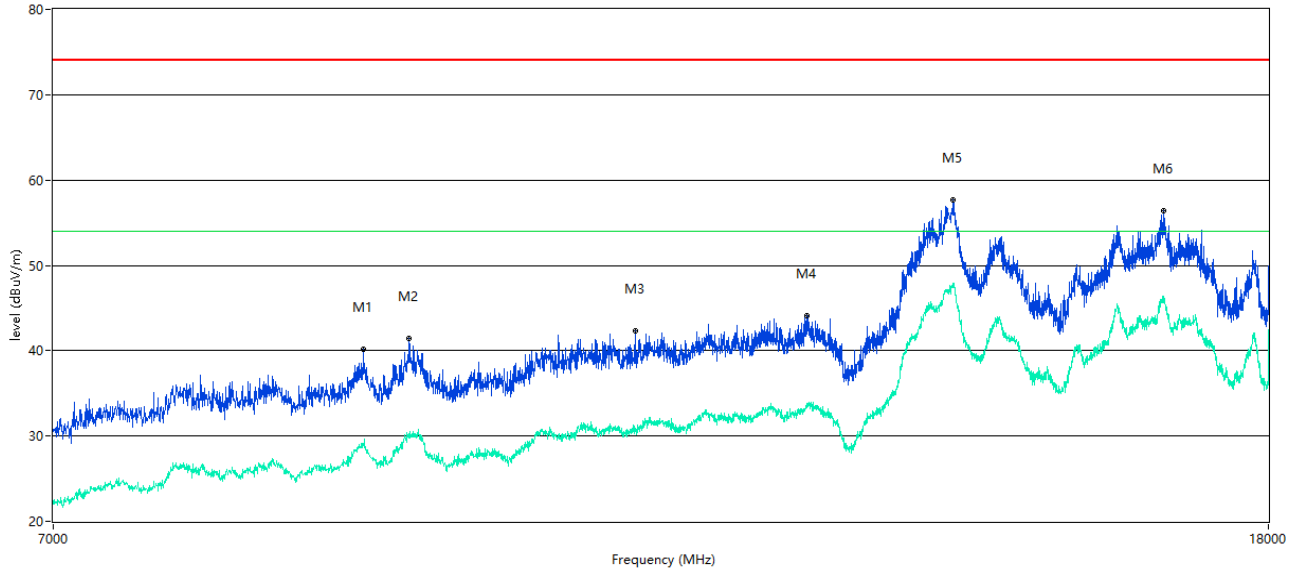
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz\_wifi



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8927.268	42.78	--	32.3	-5.58	68.2	--	54.0	21.70	223.00	100	Horizontal	Pass
10233.192	44.04	--	33.9	-2.28	68.2	--	54.0	20.10	83.00	100	Horizontal	Pass
11660.085	44.98	--	35.7	-0.84	68.2	--	54.0	18.30	242.00	100	Horizontal	Pass
14024.494	58.93	--	50.0	14.25	68.2	--	54.0	4.00	263.00	100	Horizontal	Pass
16001.250	58.58	--	47.7	10.71	68.2	--	54.0	6.30	357.00	100	Horizontal	Pass
16589.603	57.99	--	49.3	11.84	68.2	--	54.0	4.70	243.00	100	Horizontal	Pass

7 GHz to 18 GHz, ANT V 802.11n40 High Channel

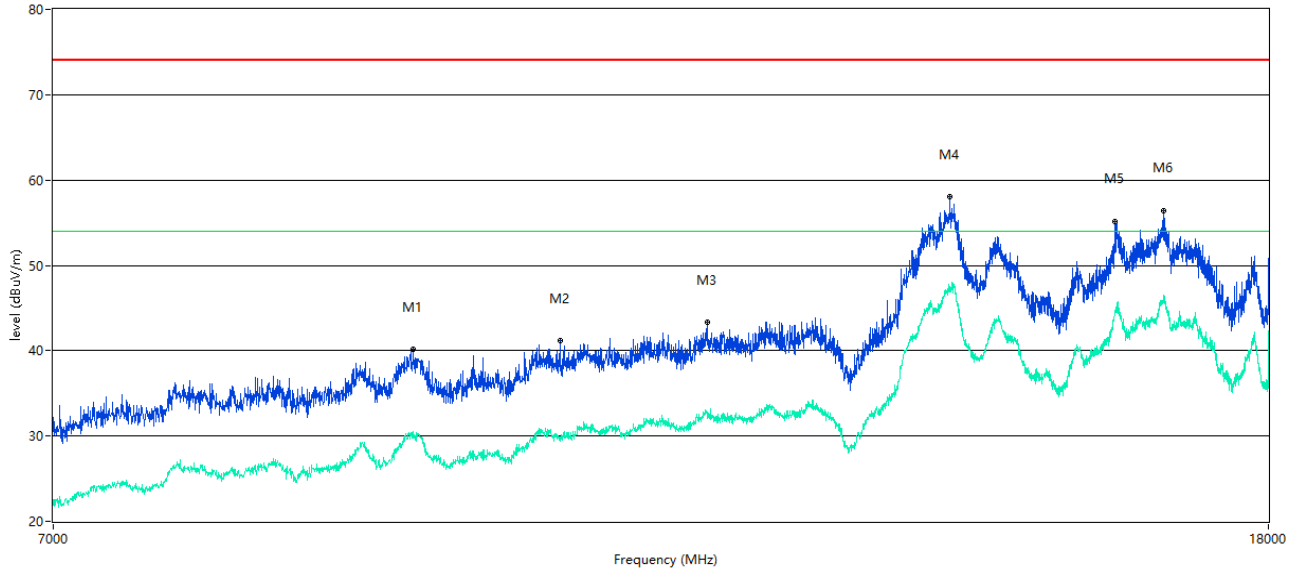
REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
8908.023	40.11	--	29.1	-5.14	74.0	--	54.0	24.90	4.00	100	Vertical	Pass
9232.442	41.42	--	30.0	-4.61	74.0	--	54.0	24.00	23.00	100	Vertical	Pass
11002.999	42.32	--	30.8	-1.72	74.0	--	54.0	23.20	80.00	100	Vertical	Pass
12578.355	44.06	--	33.8	0.12	74.0	--	54.0	20.20	262.00	100	Vertical	Pass
14087.728	57.67	--	47.6	14.85	74.0	--	54.0	6.40	315.00	100	Vertical	Pass
16597.851	56.37	--	46.4	12.09	74.0	--	54.0	7.60	8.00	100	Vertical	Pass

7 GHz to 18 GHz, ANT H 802.11n40 High Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247\_7GHz-18GHz



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
9259.935	40.15	--	30.0	-4.28	74.0	--	54.0	24.00	51.00	100	Horizontal	Pass
10381.655	41.17	--	29.9	-2.79	74.0	--	54.0	24.10	8.00	100	Horizontal	Pass
11635.341	43.29	--	32.6	-0.72	74.0	--	54.0	21.40	0.00	100	Horizontal	Pass
14054.736	58.02	--	47.5	14.39	74.0	--	54.0	6.50	105.00	100	Horizontal	Pass
15976.506	55.19	--	44.7	9.93	74.0	--	54.0	9.30	73.00	100	Horizontal	Pass
16597.851	56.44	--	46.5	12.09	74.0	--	54.0	7.50	238.00	100	Horizontal	Pass

## A.7 Band Edge (Restricted-band band-edge)

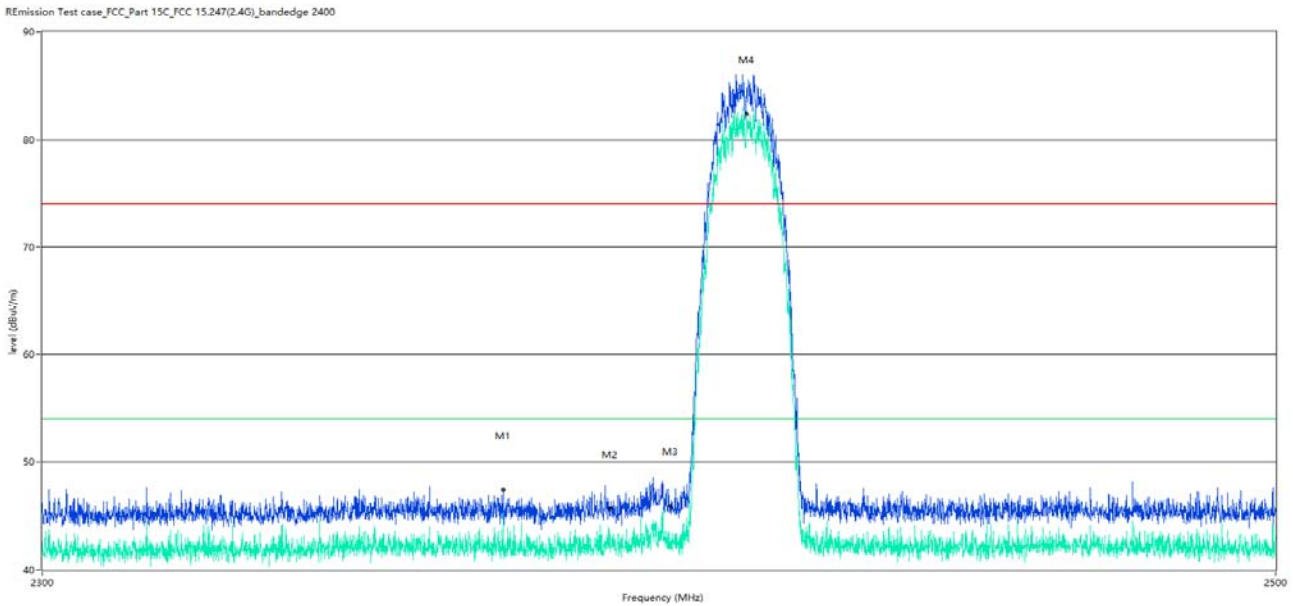
### Test Data

Note<sup>1</sup>: The lowest and highest channels are tested to verify the band edge emissions. Please refer to the following the plots for emissions values.

Note<sup>2</sup>: The test data all are tested in the vertical and horizontal antenna which the trace is max hold. So these plots have shown the worst case.

Note<sup>3</sup>: According the ANSI C63.10-2013, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

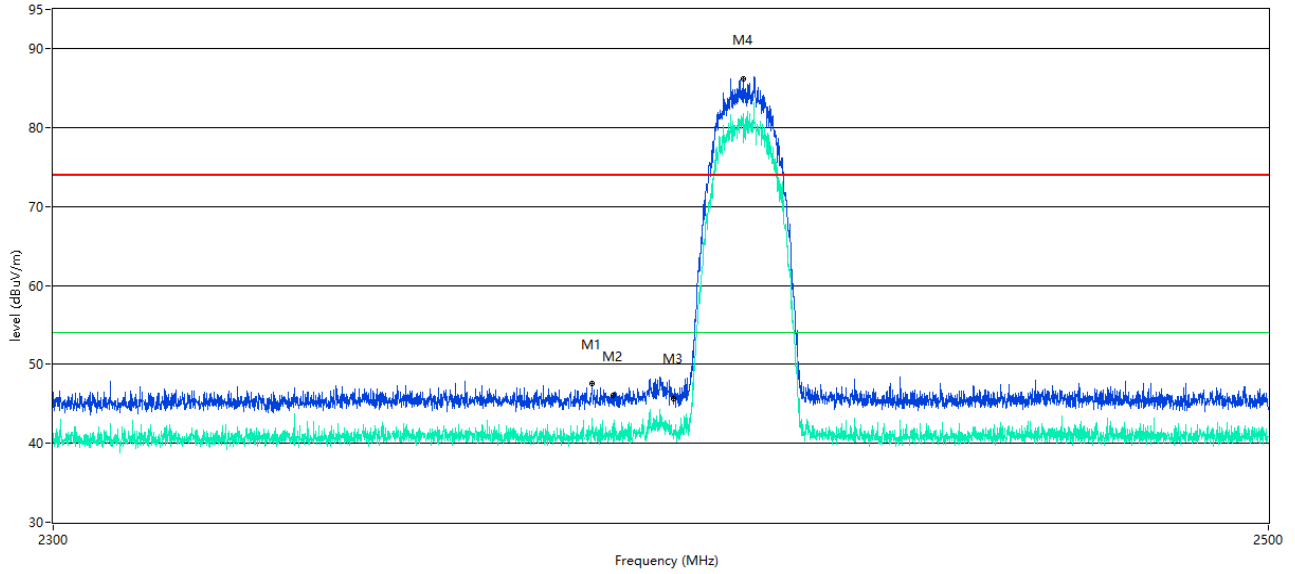
#### ANT V 802.11b Low Channel



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2372.832	47.41	--	45.4	36.06	74.0	--	54.0	8.60	284.50	100	Vertical	Pass
2390.000	45.55	--	42.5	36.09	74.0	--	54.0	11.50	145.34	100	Vertical	Pass
2400.000	46.00	--	42.4	35.93	74.0	--	54.0	11.60	217.35	100	Vertical	Pass
2412.000	82.38	--	79.4	35.92	74.0	--	54.0	-25.40	43.87	100	Vertical	N.A

ANT H 802.11b Low Channel

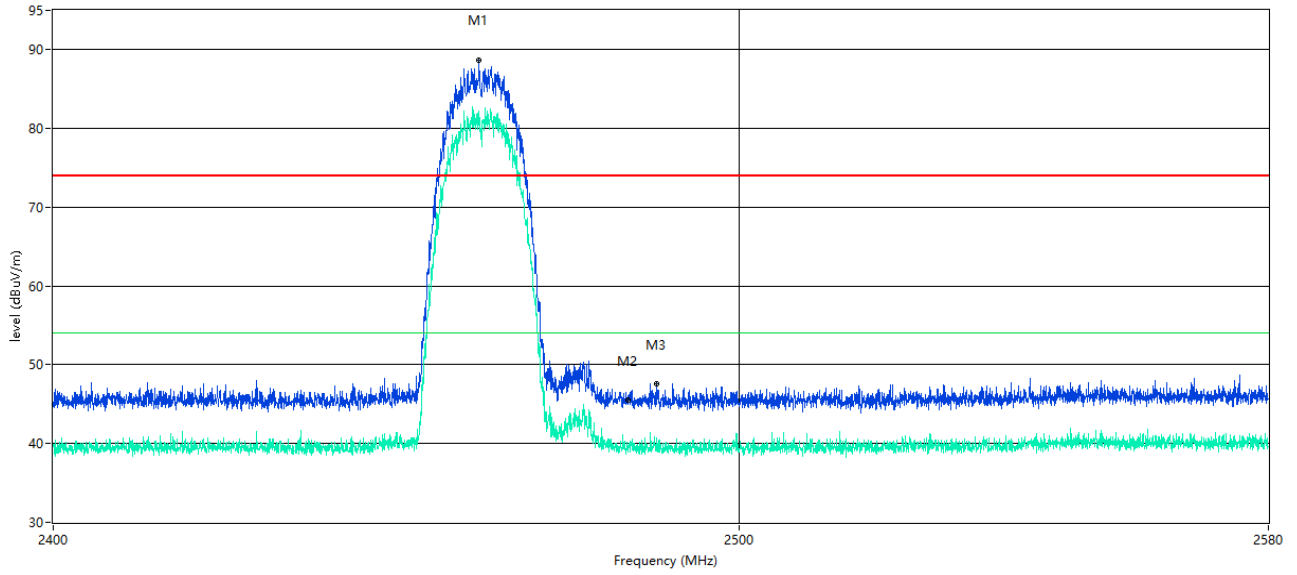
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2386.578	47.60	--	43.2	36.06	74.0	--	54.0	10.80	233.30	100	Horizontal	Pass
2390.000	46.09	--	41.7	36.09	74.0	--	54.0	12.30	66.45	100	Horizontal	Pass
2400.000	45.45	--	40.9	35.93	74.0	--	54.0	13.10	289.60	100	Horizontal	Pass
2411.572	86.27	--	81.2	35.93	74.0	--	54.0	-27.20	96.60	100	Horizontal	N.A

ANT V 802.11b High Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480

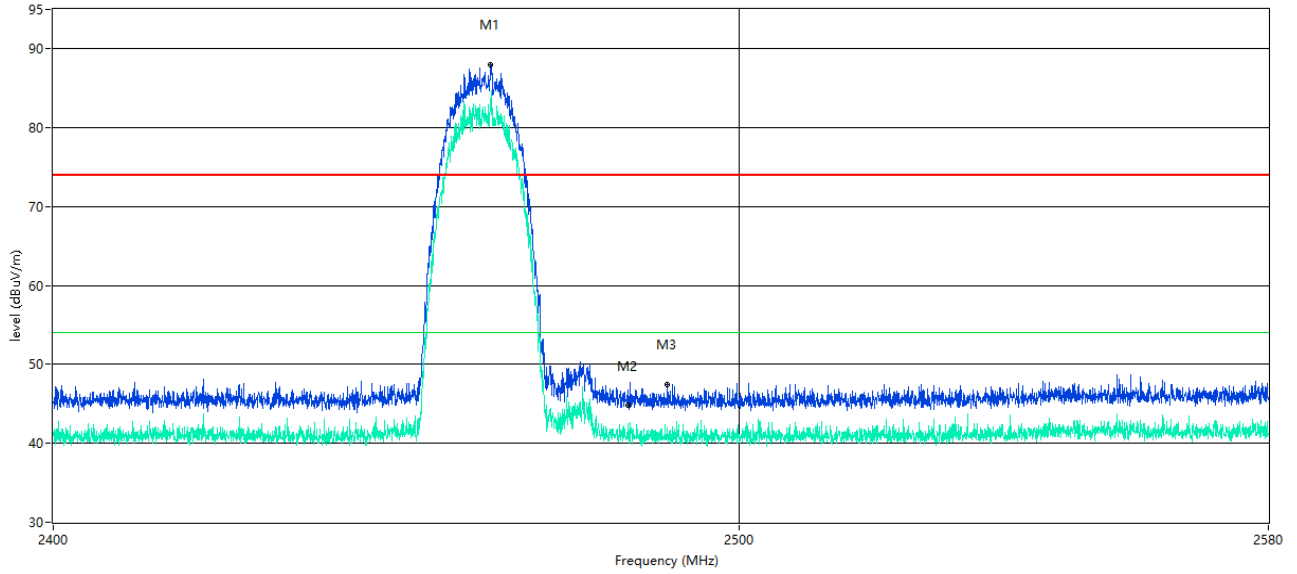


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2461.590	88.70	--	81.7	36.15	74.0	--	54.0	-27.70	103.00	100	Vertical	N.A
2483.500	45.50	--	39.7	35.93	74.0	--	54.0	14.30	170.91	100	Vertical	Pass
2487.773	47.55	--	40.8	35.88	74.0	--	54.0	13.20	39.80	100	Vertical	Pass



ANT H 802.11b High Channel

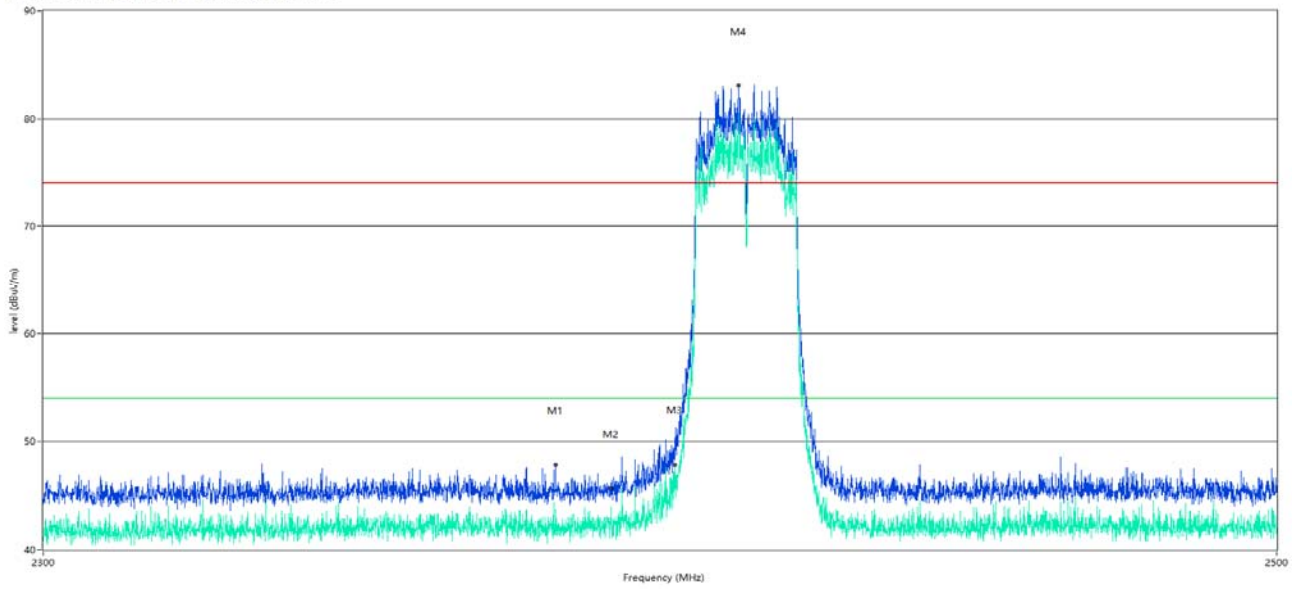
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2463.299	88.02	--	82.6	36.15	74.0	--	54.0	-28.60	99.80	100	Horizontal	N.A
2483.500	44.81	--	41.7	35.93	74.0	--	54.0	12.30	58.07	100	Horizontal	Pass
2489.348	47.48	--	40.5	35.87	74.0	--	54.0	13.50	153.70	100	Horizontal	Pass

ANT V 802.11g Low Channel

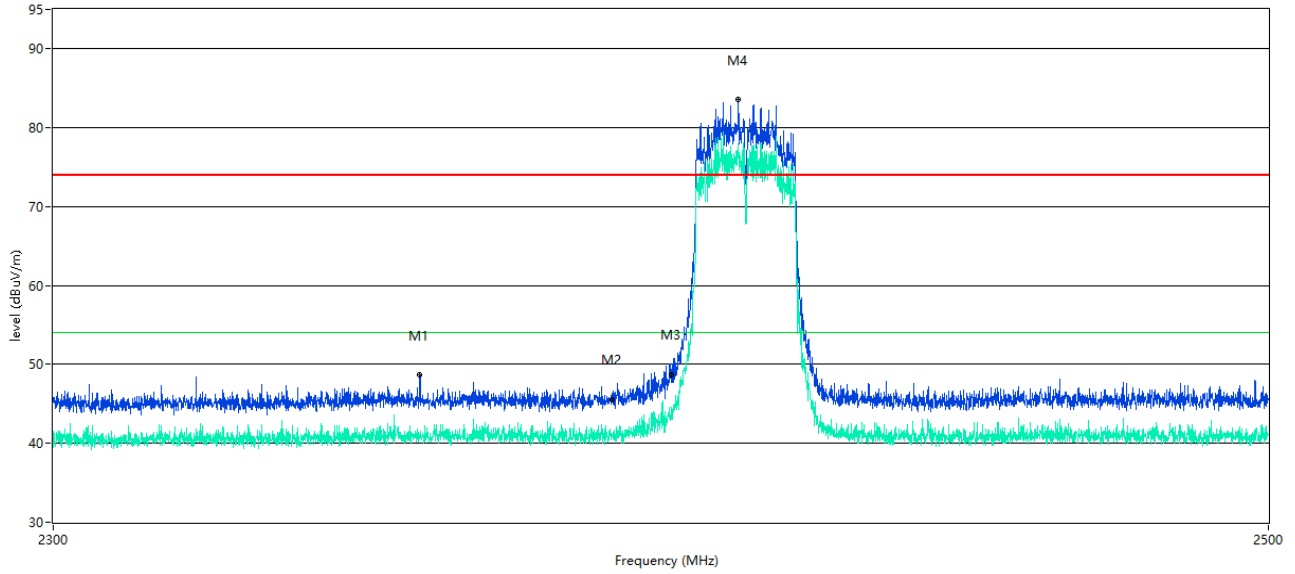
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2381.080	47.87	--	43.8	35.93	74.0	--	54.0	10.20	308.10	100	Vertical	Pass
2390.000	45.70	--	43.3	36.09	74.0	--	54.0	10.70	67.28	100	Vertical	Pass
2400.000	48.03	--	44.6	35.93	74.0	--	54.0	9.40	104.00	100	Vertical	Pass
2410.672	83.07	--	80.5	35.94	74.0	--	54.0	-26.50	102.50	100	Vertical	N.A

ANT H 802.11g Low Channel

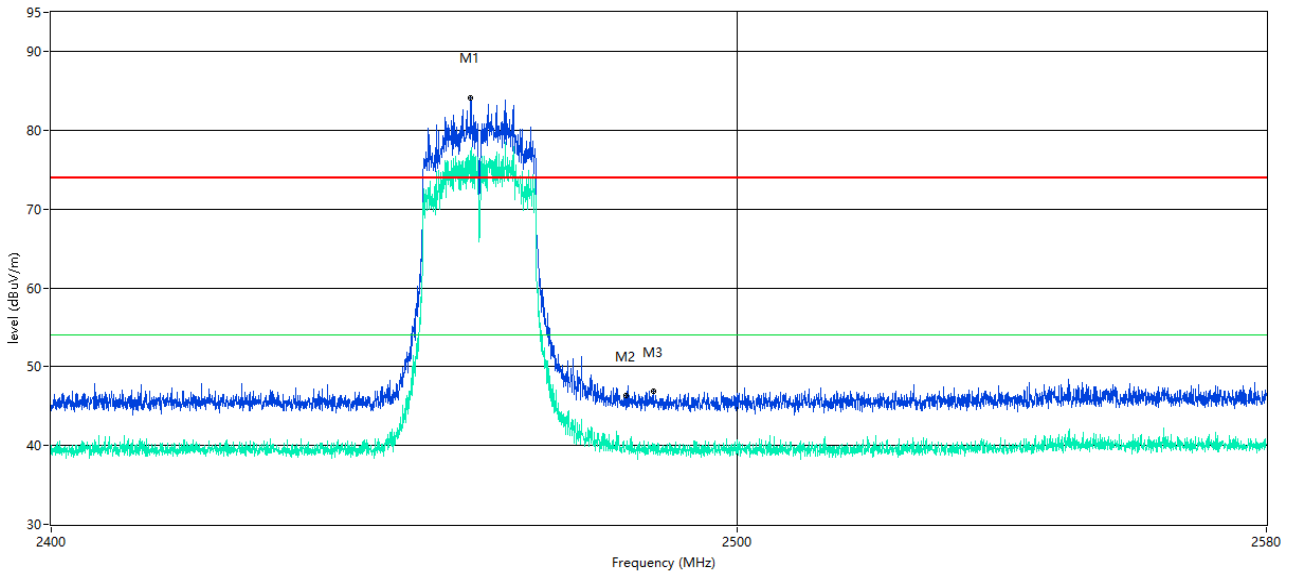
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2358.585	48.66	--	40.8	36.08	74.0	--	54.0	13.20	67.40	100	Horizontal	Pass
2390.000	45.59	--	41.2	36.09	74.0	--	54.0	12.80	166.66	100	Horizontal	Pass
2400.000	48.57	--	44.1	35.93	74.0	--	54.0	9.90	138.85	100	Horizontal	Pass
2410.722	83.58	--	77.9	35.94	74.0	--	54.0	-23.90	102.50	100	Horizontal	N.A

ANT V 802.11g High Channel

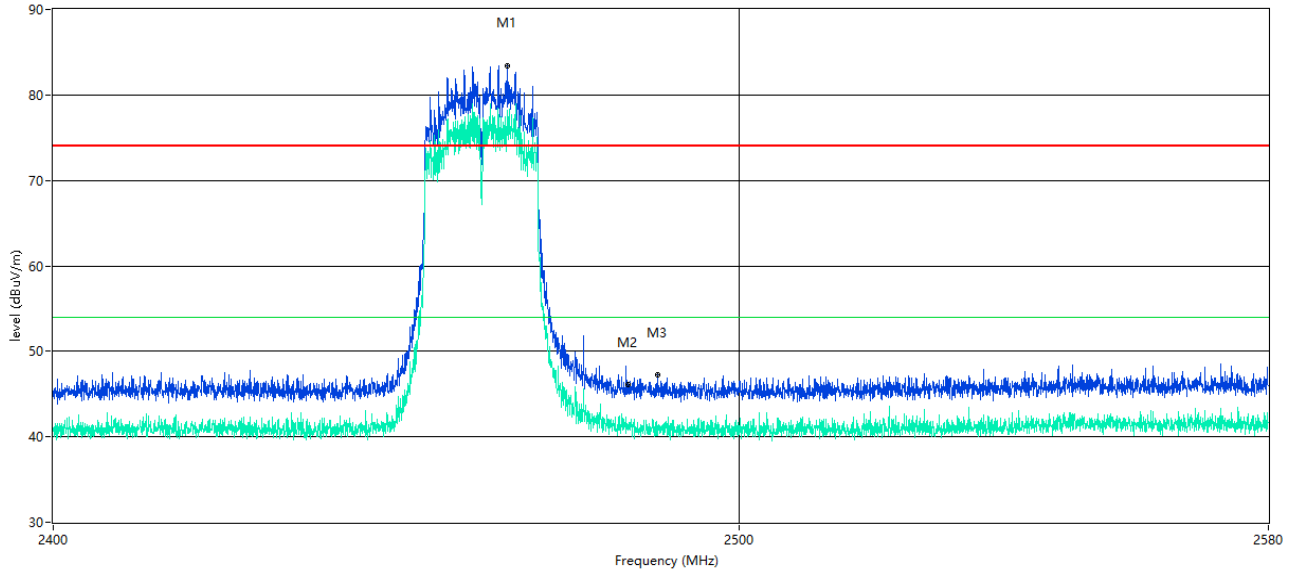
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2460.690	84.17	--	77.0	36.14	74.0	--	54.0	-23.00	101.80	100	Vertical	N.A
2483.500	46.36	--	40.0	35.93	74.0	--	54.0	14.00	140.81	100	Vertical	Pass
2487.593	46.87	--	40.1	35.88	74.0	--	54.0	13.90	189.00	100	Vertical	Pass

ANT H 802.11g High Channel

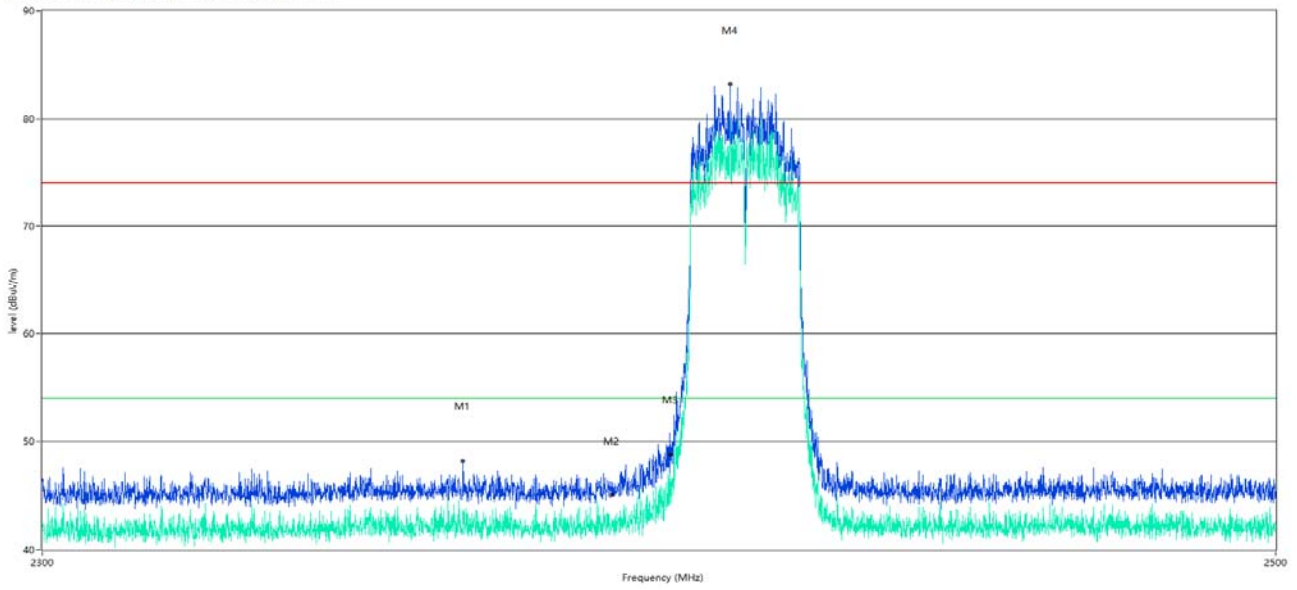
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2465.729	83.43	--	78.2	36.12	74.0	--	54.0	-24.20	99.40	100	Horizontal	N.A
2483.500	46.07	--	40.8	35.93	74.0	--	54.0	13.20	115.45	100	Horizontal	Pass
2487.908	47.31	--	41.3	35.88	74.0	--	54.0	12.70	352.60	100	Horizontal	Pass

ANT V 802.11n20 Low Channel

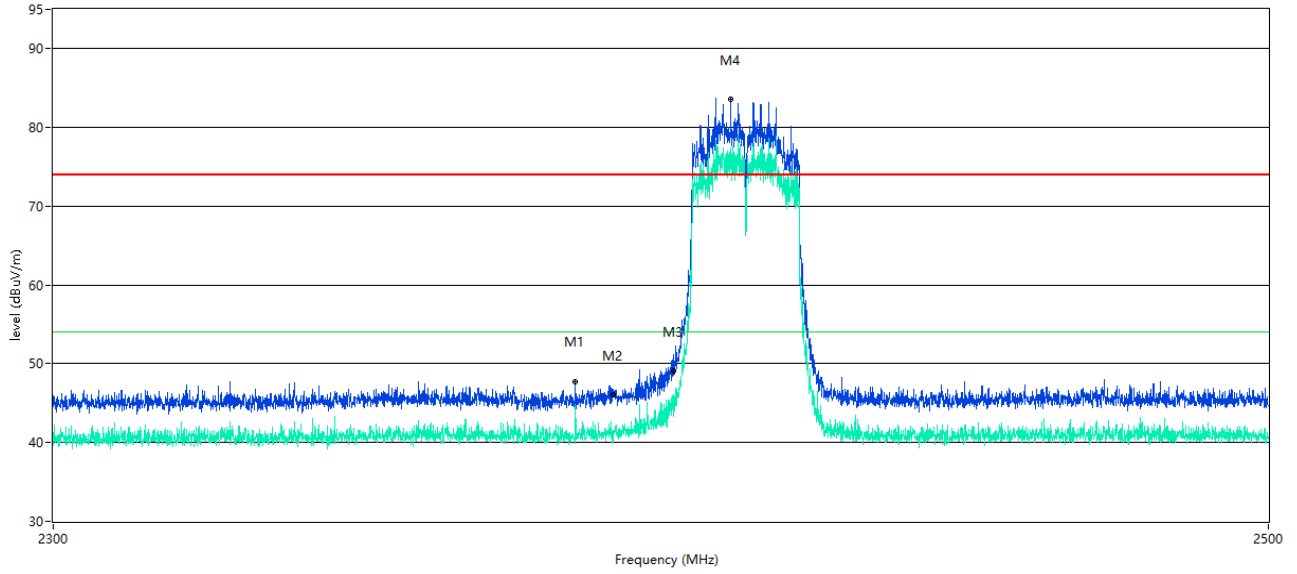
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2366.383	48.25	--	43.4	36.16	74.0	--	54.0	10.60	153.50	100	Vertical	Pass
2390.000	45.10	--	41.8	36.09	74.0	--	54.0	12.20	55.55	100	Vertical	Pass
2400.000	49.04	--	45.8	35.93	74.0	--	54.0	8.20	99.45	100	Vertical	Pass
2409.473	83.23	--	79.7	35.96	74.0	--	54.0	-25.70	96.40	100	Vertical	N.A

ANT H 802.11n20 Low Channel

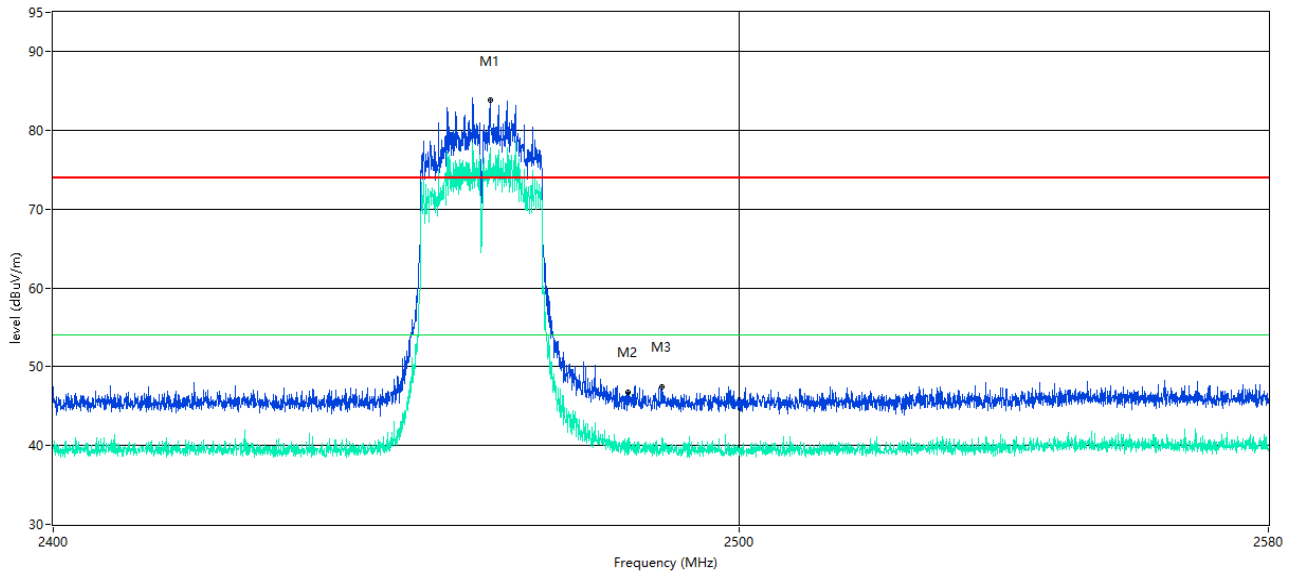
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2383.929	47.79	--	44.9	36.00	74.0	--	54.0	9.10	146.60	100	Horizontal	Pass
2390.000	46.03	--	40.0	36.09	74.0	--	54.0	14.00	145.75	100	Horizontal	Pass
2400.000	49.04	--	43.9	35.93	74.0	--	54.0	10.10	148.15	100	Horizontal	Pass
2409.473	83.59	--	77.5	35.96	74.0	--	54.0	-23.50	98.40	100	Horizontal	N.A

ANT V 802.11n20 High Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480

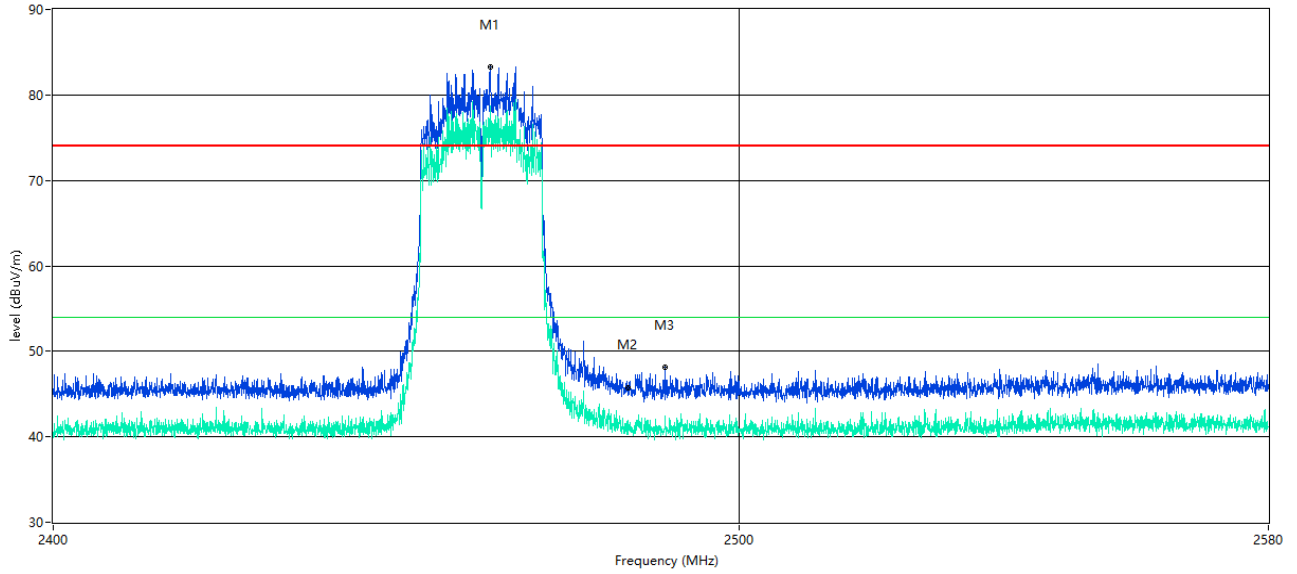


Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2463.209	83.92	--	77.8	36.15	74.0	--	54.0	-23.80	104.50	100	Vertical	N.A
2483.500	46.78	--	40.9	35.93	74.0	--	54.0	13.10	103.88	100	Vertical	Pass
2488.583	47.46	--	41.0	35.87	74.0	--	54.0	13.00	360.00	100	Vertical	Pass



ANT H 802.11n20 High Channel

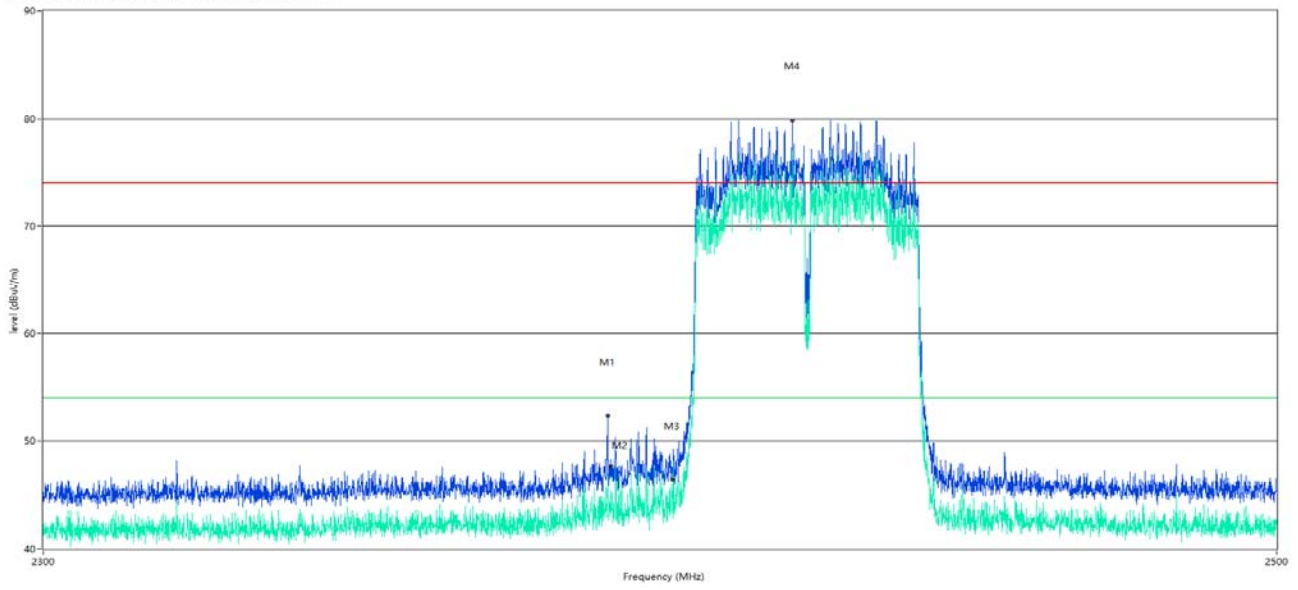
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2463.254	83.28	--	78.7	36.15	74.0	--	54.0	-24.70	99.80	100	Horizontal	N.A
2483.500	45.78	--	41.0	35.93	74.0	--	54.0	13.00	207.37	100	Horizontal	Pass
2489.078	48.09	--	42.5	35.87	74.0	--	54.0	11.50	119.00	100	Horizontal	Pass

ANT V 802.11n40 Low Channel

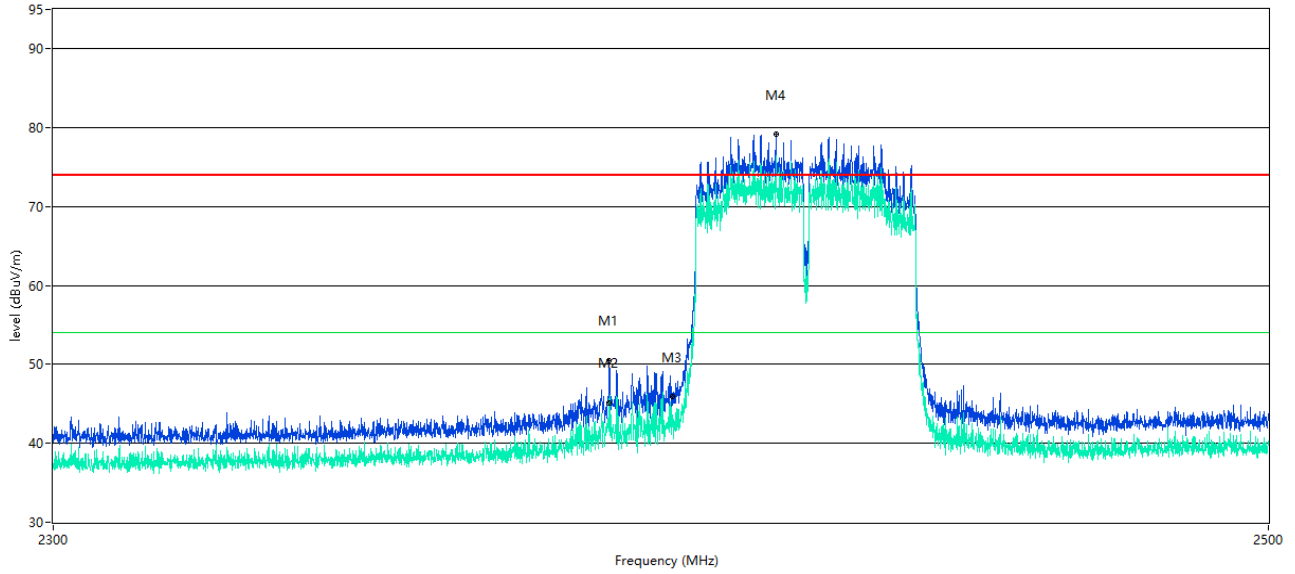
R/Emission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2389.428	52.31	--	47.0	36.09	74.0	--	54.0	7.00	97.90	100	Vertical	Pass
2390.000	47.58	--	43.9	36.09	74.0	--	54.0	10.10	156.00	100	Vertical	Pass
2400.000	46.55	--	43.7	35.93	74.0	--	54.0	10.30	101.35	100	Vertical	Pass
2419.470	79.83	--	77.0	35.91	74.0	--	54.0	-23.00	97.90	100	Vertical	N.A

ANT H 802.11n40 Low Channel

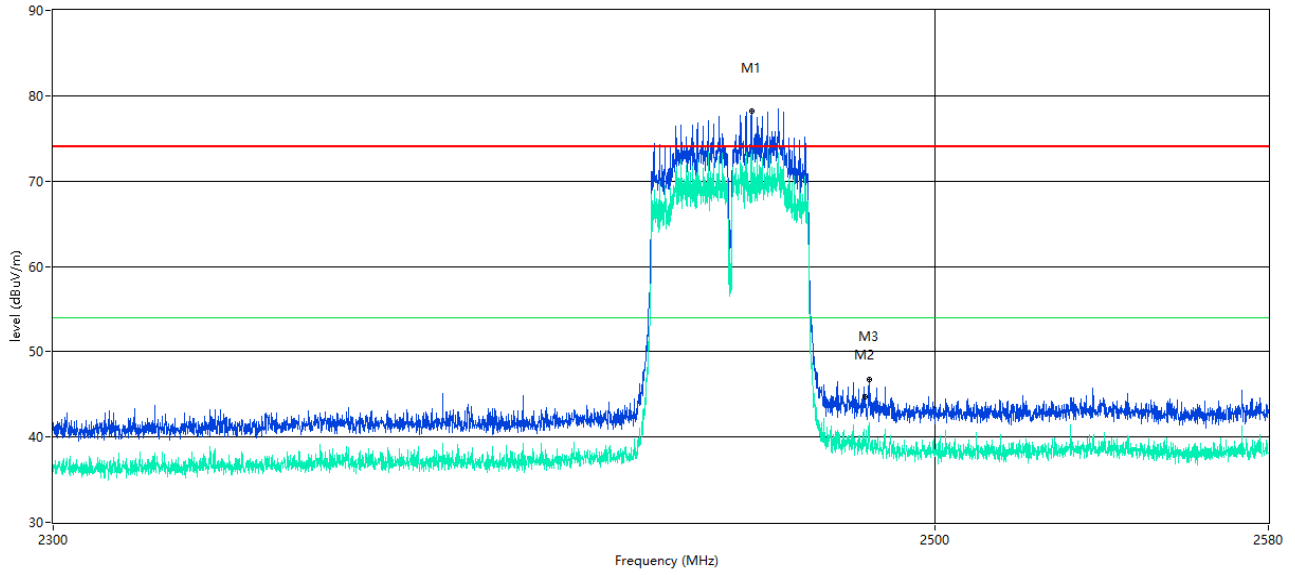
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2400



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2389.478	50.51	--	45.2	2.03	74.0	--	54.0	8.80	5.70	100	Horizontal	Pass
2390.000	45.02	--	41.9	2.02	74.0	--	54.0	12.10	11.28	100	Horizontal	Pass
2400.000	45.91	--	41.0	1.85	74.0	--	54.0	13.00	82.00	100	Horizontal	Pass
2416.971	79.17	--	76.4	2.12	74.0	--	54.0	-22.40	108.70	100	Horizontal	N.A

ANT V 802.11n40 High Channel

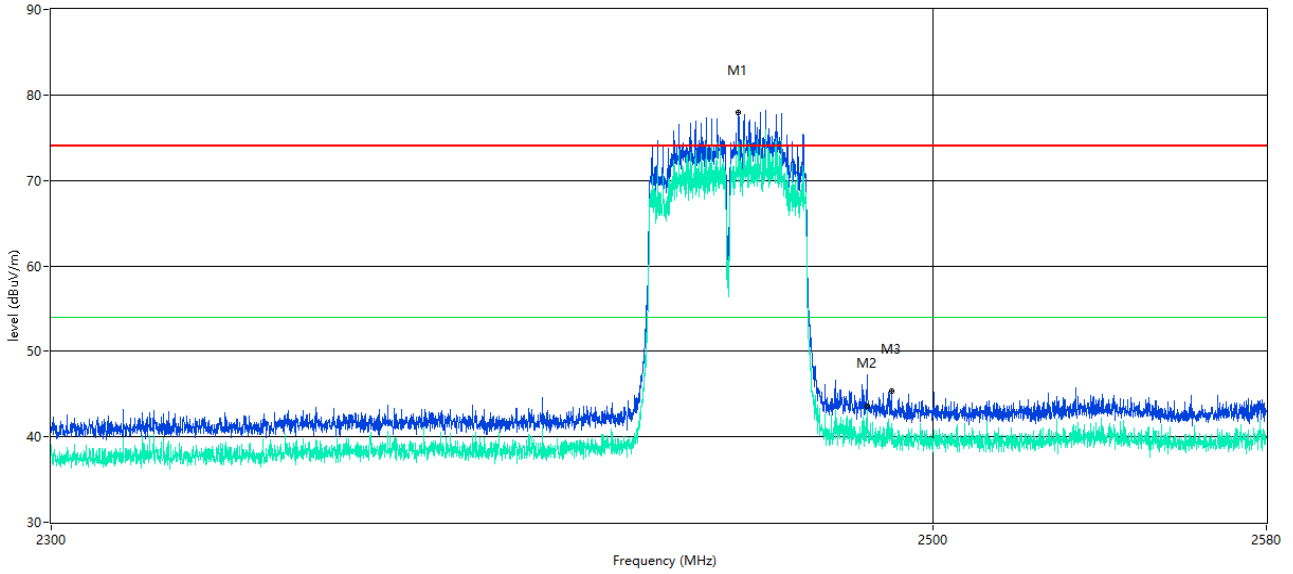
REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2456.971	78.19	--	73.6	2.34	74.0	--	54.0	-19.60	128.50	100	Vertical	N.A
2483.500	44.69	--	39.7	2.71	74.0	--	54.0	14.30	191.46	100	Vertical	Pass
2484.474	46.77	--	41.4	2.71	74.0	--	54.0	12.60	20.50	100	Vertical	Pass

ANT H 802.11n40 High Channel

REmission Test case\_FCC\_Part 15C\_FCC 15.247(2.4G)\_bandedge 2480



Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
2454.451	77.93	--	74.5	2.31	74.0	--	54.0	-20.50	126.20	100	Horizontal	N.A
2483.500	43.63	--	40.9	2.71	74.0	--	54.0	13.10	9.06	100	Horizontal	Pass
2490.142	45.32	--	41.6	2.71	74.0	--	54.0	12.40	142.00	100	Horizontal	Pass

## A.8 Power Spectral Density (PSD)

### Test Data

802.11b Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-14.59	8
Middle	-14.13	8
High	-14.43	8

802.11g Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-14.97	8
Middle	-14.35	8
High	-14.89	8

802.11n-20 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-14.66	8
Middle	-13.85	8
High	-14.28	8

802.11n-40 MHz Mode:

Channel	Spectral power density (dBm/3kHz)	Limit (dBm/3kHz)
Low	-17.24	8
Middle	-16.87	8
High	-17.58	8

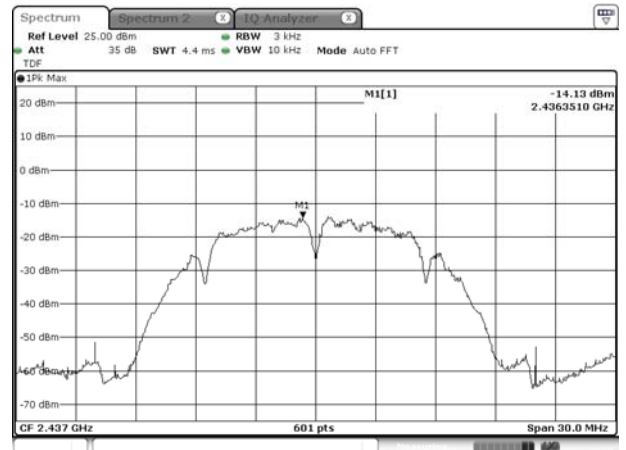
Test plots

802.11b LOW CHANNEL



Date: 4 MAY 2018 07:52:07

802.11b MIDDLE CHANNEL



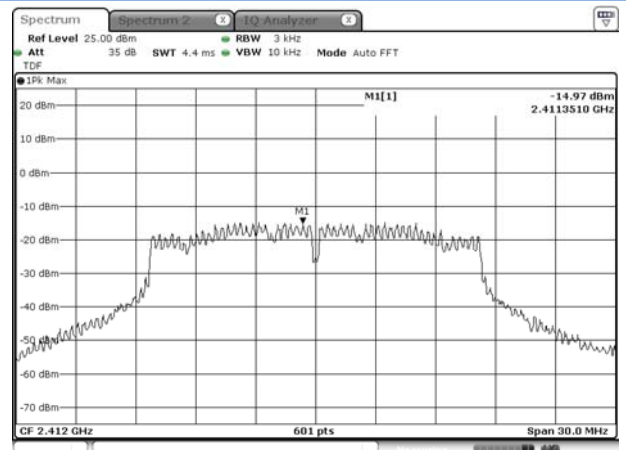
Date: 4 MAY 2018 08:20:01

802.11b HIGH CHANNEL



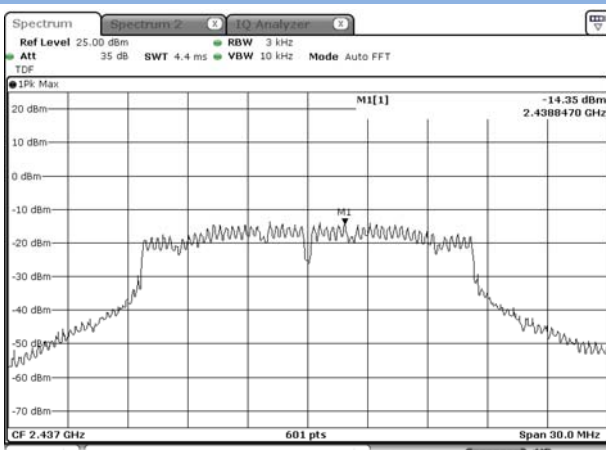
Date: 4 MAY 2018 08:24:13

802.11g LOW CHANNEL



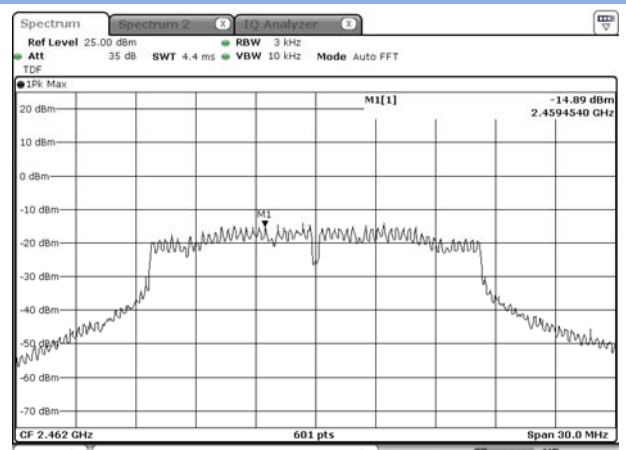
Date: 4 MAY 2018 08:26:44

802.11g MIDDLE CHANNEL



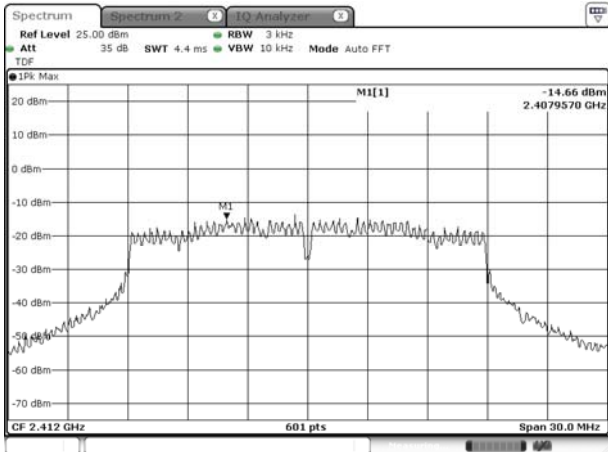
Date: 4 MAY 2018 08:30:15

802.11g HIGH CHANNEL



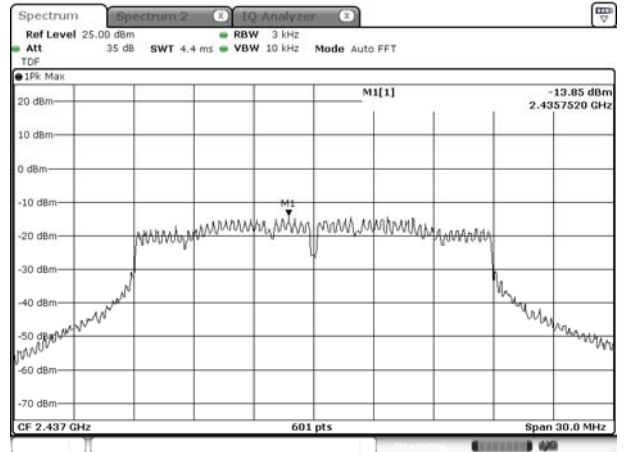
Date: 4 MAY 2018 08:32:58

802.11n-20 MHz LOW CHANNEL



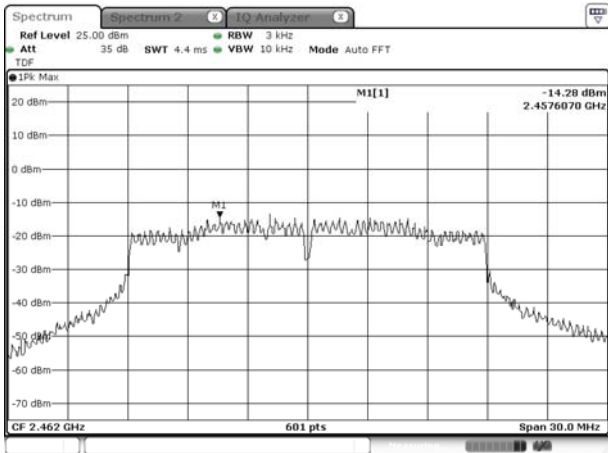
Date: 4 MAY 2018 08:36:39

802.11 n-20 MHz MIDDLE CHANNEL



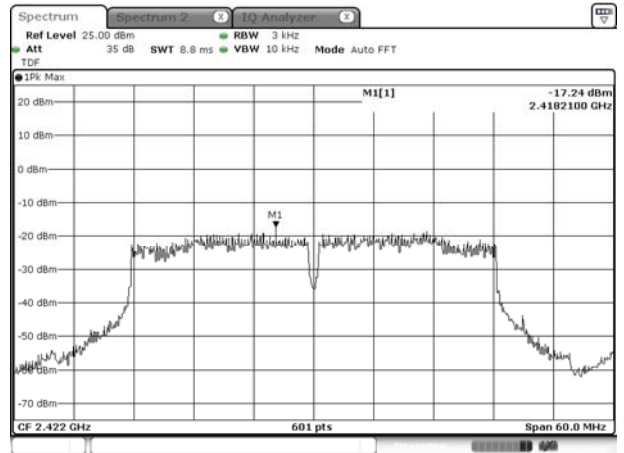
Date: 4 MAY 2018 08:39:09

802.11n-20 MHz HIGH CHANNEL



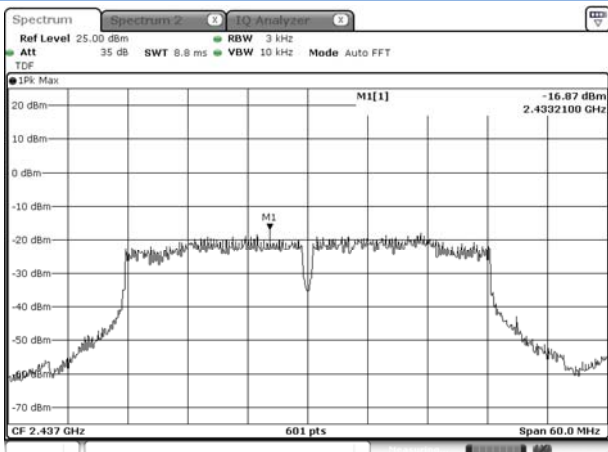
Date: 4 MAY 2018 08:41:58

802.11n-40 MHz LOW CHANNEL



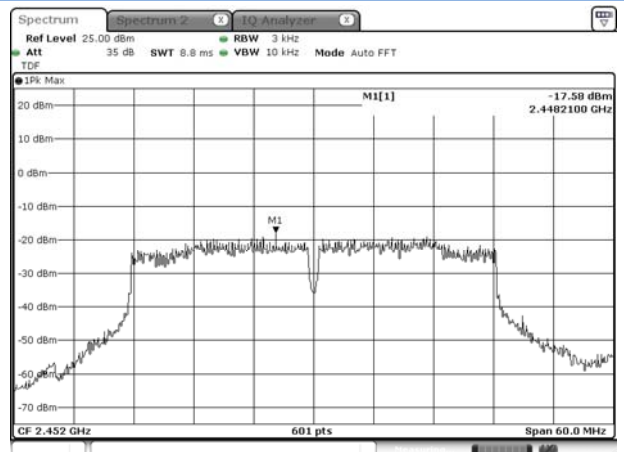
Date: 4 MAY 2018 08:47:14

802.11n-40 MHz MIDDLE CHANNEL



Date: 4 MAY 2018 08:49:13

802.11n-40 MHz HIGH CHANNEL



Date: 4 MAY 2018 08:52:42



## **ANNEX B TEST SETUP PHOTOS**

Please refer the document "BL-EC1830163-AR.pdf".

## **ANNEX C EUT EXTERNAL PHOTOS**

Please refer the document "BL-EC1830163-AW.pdf".

## **ANNEX D EUT INTERNAL PHOTOS**

Please refer the document "BL-EC1830163-AI.pdf".

--END OF REPORT--