

# TEST REPORT

**Applicant:** CC&C Technologies, Inc.  
**Address:** 8F, No.150, Jian Yi Rd, Zhonghe District, New Taipei City,235, Taiwan  
**Equipment Type:** ac2x2+BT5.0 USB2.0  
**Model Name:** CM-8822CU-V2  
**Brand Name:** CC&C  
**FCC ID:** PANCM8822CUV2  
**Test Standard:** 47 CFR Part 15 Subpart E (refer section 3.1)  
**Sample Arrival Date:** Nov. 28, 2022  
**Test Date:** Dec. 05, 2022 - Dec. 12, 2022  
**Date of Issue:** Feb. 13, 2023

**ISSUED BY:**

Shenzhen BALUN Technology Co., Ltd.

**Tested by:** Julie Zhu

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**Approved by:** Liao Jianming  
(Technical Director)

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<b>Revision History</b>		
<u>Version</u>	<u>Issue Date</u>	<u>Revisions</u>
<u>Rev. 01</u>	<u>Jan. 05, 2023</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>Feb. 13, 2023</u>	<u>Updated antenna gain</u>

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# 1 GENERAL INFORMATION

## 1.1 Test Laboratory

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

## 1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	<input checked="" type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input type="checkbox"/> 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

## 2 PRODUCT INFORMATION

### 2.1 Applicant Information

Applicant	CC&C Technologies, Inc.
Address	8F, No.150, Jian Yi Rd, Zhonghe District, New Taipei City,235, Taiwan

### 2.2 Manufacturer Information

Manufacturer	CC&C Technologies, Inc.
Address	8F, No.150, Jian Yi Rd, Zhonghe District, New Taipei City,235, Taiwan

### 2.3 Factory Information

Factory	Kunshan CC&C Technologies, Co., Ltd
Address	No.9 building, 3rd Main Street, Kunshan Free Trade Zone, Jiangsu Province, P. R. China

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

EUT Name	ac2x2+BT5.0 USB2.0
Model Name Under Test	CM-8822CU-V2
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V. A
Software Version	V15(WIFI+BT)
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

## 2.5 Technical Information

Network and Wireless connectivity	Bluetooth (BR+EDR+BLE) 2.4G WIFI 802.11b, 802.11g, 802.11n(HT20/40) 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80) U-NII-1/3
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The requirement for the following technical information of the EUT was tested in this report:

Frequency Range	U-NII-1: 5150 MHz to 5250 MHz, U-NII-3: 5725 MHz to 5850 MHz	
Product Type	<input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable <input type="checkbox"/> Fix Location	
Modulation technology	OFDM	
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK	
Product Type	Mobile and Portable for FCC standard	
Transfer Rate (Mbps) (Single RF path)	802.11a: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6 Mbps 802.11n: up to 150 Mbps 802.11ac: up to VHT-MCS9	
Channel Bandwidth	802.11a: 20 MHz 802.11n: 20 MHz, 40 MHz 802.11ac: 20 MHz, 40 MHz, 80 MHz	
Antenna System (eg., MIMO, Smart Antenna)	Cyclic Delay Diversity (CDD) for 802.11a Multi Input Multi Output (MIMO) for 802.11n/ac	
Categorization as Correlated or Completely Uncorrelated	Categorization as Correlated for 802.11a Categorization as Uncorrelated for 802.11n/ac	
Antenna Type	Main Antenna Aux. Antenna	External Antenna
Antenna Gain	Main Antenna Aux. Antenna	U-NII-1: 5150 MHz to 5250 MHz: 3.09 dBi U-NII-3: 5725 MHz to 5850 MHz: 3.01 dBi U-NII-1: 5150 MHz to 5250 MHz: 3.09 dBi U-NII-3: 5725 MHz to 5850 MHz: 3.01 dBi
Total directional gain	For power spectral density(PSD) measurements	Correlated: U-NII-1: 5150 MHz to 5250 MHz: 6.10 dBi U-NII-3: 5725 MHz to 5850 MHz: 6.02 dBi Formulas: Directional gain = $GANT + 10 \log(NANT)$ dBi Uncorrelated: U-NII-1: 5150 MHz to 5250 MHz: 3.09 dBi U-NII-3: 5725 MHz to 5850 MHz: 3.01 dBi Formulas: Directional gain = $GANT$
	For power measurements	Correlated: U-NII-1: 5150 MHz to 5250 MHz: 6.10 dBi U-NII-3: 5725 MHz to 5850 MHz: 6.02 dBi Formulas: Directional gain = $GANT + 10 \log(NANT)$ dBi

	Uncorrelated: U-NII-1: 5150 MHz to 5250 MHz: 3.09 dBi U-NII-3: 5725 MHz to 5850 MHz: 3.01 dBi Formulas: Directional gain = $GANT$
About the Product	The equipment is module, intended for used with information technology equipment.

Mode	Antenna		
	Main Antenna	Aux. Antenna	MIMO
802.11a	√	√	--
802.11n20	√	√	√
802.11n40	√	√	√
802.11ac20	√	√	√
802.11ac40	√	√	√
802.11ac80	√	√	√

Note: All the configurations were tested, but only the worst data was shown in this report.

## 2.6 Channel List

20 MHz		40 MHz		80 MHz	
Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
<b>36</b>	<b>5180</b>	<b>38</b>	<b>5190</b>	<b>42</b>	<b>5210</b>
40	5200	<b>46</b>	<b>5230</b>	<b>155</b>	<b>5775</b>
<b>44</b>	<b>5220</b>	151	5755		
<b>48</b>	<b>5240</b>	159	5795		
<b>149</b>	<b>5745</b>				
153	5765				
<b>157</b>	<b>5785</b>				
161	5805				
<b>165</b>	<b>5825</b>				

The Lowest frequency, the middle frequency and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11a/n(HT20)/ac(VHT20)

U-NII-1 (5150 - 5250 MHz)			U-NII-3 (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
36	Low	5180	149	Low	5745
44	Mid	5220	157	Mid	5785
48	High	5240	165	High	5825

For 802.11n(HT40)/ac(VHT40)

U-NII-1 (5150 - 5250 MHz)			U-NII-3 (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
38	Low	5190	151	Low	5755
46	High	5230	159	High	5795

For 802.11ac(VHT80)

U-NII-1 (5150 - 5250 MHz)			U-NII-3 (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
42	Mid	5210	155	Mid	5775

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	Modulation Type	U-NII-1	U-NII-3
				Channel	Channel
RF Output Power	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
	11ac(20 MHz)	6.5		48/44/36	165/157/149
	11ac(40 MHz)	13.5		46/38	159/151
	11ac(80 MHz)	29.3		42	155
Emission Bandwidth & 99% Occupied Bandwidth	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
	11ac(20 MHz)	6.5		48/44/36	165/157/149
	11ac(40 MHz)	13.5		46/38	159/151
	11ac(80 MHz)	29.3		42	155
6 dB bandwidth	11a	6	BPSK	N/A	165/157/149
	11n(20 MHz)	6.5		N/A	165/157/149
	11n(40 MHz)	13.5		N/A	159/151
	11ac(20 MHz)	6.5		N/A	165/157/149
	11ac(40 MHz)	13.5		N/A	159/151
	11ac(80 MHz)	29.3		N/A	155
Power Spectral Density	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
	11ac(20 MHz)	6.5		48/44/36	165/157/149
	11ac(40 MHz)	13.5		46/38	159/151
	11ac(80 MHz)	29.3		42	155
Radiated Spurious Emissions	11a	6	BPSK	48/44/36	165/157/149
	11n(20 MHz)	6.5		48/44/36	165/157/149
	11n(40 MHz)	13.5		46/38	159/151
	11ac(20 MHz)	6.5		48/44/36	165/157/149
	11ac(40 MHz)	13.5		46/38	159/151
	11ac(80 MHz)	29.3		42	155
Band Edge (Restricted-band)	11a	6	BPSK	48/36	165/149
	11n(20 MHz)	6.5		48/36	165/149
	11n(40 MHz)	13.5		46/38	159/151
	11ac(20 MHz)	6.5		48/36	165/149
	11ac(40 MHz)	13.5		46/38	159/151
	11ac(80 MHz)	29.3		42	155

### 3 SUMMARY OF TEST RESULTS

#### 3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15 Subpart E	Unlicensed National Information Infrastructure Devices
2	KDB Publication 789033 D02v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
3	KDB Publication 662911 D01v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
4	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

#### 3.2 Test Verdict

No.	Description	FCC Part No.	RSS Part No.	Test Result	Verdict
1	Antenna Requirement	15.203	RSS-247, 6.2	--	Note <sup>1</sup>
2	RF Output Power	15.407(a)	RSS-247, 6.2	ANNEX A.1	Note <sup>4</sup>
3	Emission Bandwidth & 99% Occupied Bandwidth	15.407(a)	RSS-247, 6.2	ANNEX A.2	Note <sup>4</sup>
4	6 dB bandwidth	15.407(e)	RSS-247, 6.2	ANNEX A.3	Note <sup>4</sup>
5	Power Spectral Density	15.407(a)	RSS-247, 6.2	ANNEX A.4	Note <sup>4</sup>
6	Conducted Emission	15.207	RSS-GEN, 8.8	ANNEX A.5	Pass
7	Radiated Spurious Emissions and Band Edge (Restricted-band)	15.407(b)	RSS-247, 6.2	ANNEX A.6	Pass
8	Receiver Spurious Emissions	--	RSS-Gen, 7.1.2	--	N/A <sup>Note2</sup>

Note <sup>1</sup>: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203.

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

Note <sup>3</sup>: Under all normal operating conditions specified in the user manual, frequency stability can keep radiation within the operating frequency band.

Note<sup>4</sup>: Compared with the EUT in the test report BL-EC19A0003-604, the EUT in this report has replaced the radiation antenna, Other hardware circuits and software are the same as those mentioned in the test report BL-EC19A0003-604.

Therefore, so just radiation test of Conducted Emissions, Radiated Spurious Emissions and Band Edge (Restricted-band band-edge) were retested in this report. Other test items please refer to the report BL-EC19A0003-604 issued by Shenzhen BALUN Technology Co., Ltd. on December 12, 2019 for all test data.

## 4 GENERAL TEST CONFIGURATIONS

### 4.1 Test Environments

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

Relative Humidity	45% to 55%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+20.7°C to +25°C
	LT (Low Temperature)	0°C
	HT (High Temperature)	50°C
Working Voltage of the EUT	NV (Normal Voltage)	DC 3.3 V
	LV (Low Voltage)	DC 3.135 V
	HV (High Voltage)	DC 3.465 V

### 4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2022.01.04	2023.01.03
Spectrum Analyzer	KEYSIGHT	N9020A	MY52510065	2022.09.06	2023.09.05
Signaling Unit	ROHDE&SCHWARZ	CMW500	171150	2022.06.29	2023.06.28
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	01631	2022.02.03	2025.02.02
Test Antenna-Horn (18-40 GHz)	A-INFO	LB-180400KF	J211060273	2021.07.02	2024.07.01
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	2021.09.04	2024.09.03
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2022.09.09	2023.09.08
Test Antenna-Bi-Log(30 MHz-1 GHz)	SCHWARZBECK	VULB 9168	00883	2022.04.01	2025.03.31
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60 *7.35m	N/A	2021.08.15	2024.08.14
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2022.09.09	2023.09.08
LISN	SCHWARZBECK	NSLK 8127	8127-687	2022.06.01	2023.05.31
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	N/A	2022.02.19	2025.02.18
Amplifier (1-12GHz)	COM-MV	LSCX_LNA 1-12G-01	180602	2020.09.08	2023.09.07
Amplifier (7-18GHz)	COM-MV	XKu_LNA7-18G-01	180601	2020.09.08	2023.09.07
Amplifier (18-40GHz)	COM-MV	KA_LNA18-40G-01	18050001	2020.09.08	2023.09.07

### 4.3 Test Software List

Description	Manufacturer	Software Version	Serial No.	Applicable test Setup
BL410R	BALUN	V2.1.1.488	N/A	The section 4.5.1
BL410E	BALUN	V19.8.28.435	N/A	The section 4.5.2&4.5.3&4.5.4&4.5.5

### 4.4 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  $k=2$ .

Parameters	Uncertainty
Occupied Channel Bandwidth	2.8%
RF output power, conducted	1.28 dB
Power Spectral Density, conducted	1.30 dB
Unwanted Emissions, conducted	1.84 dB
All emissions, radiated	5.36 dB
Temperature	0.82°C
Humidity	4.1%

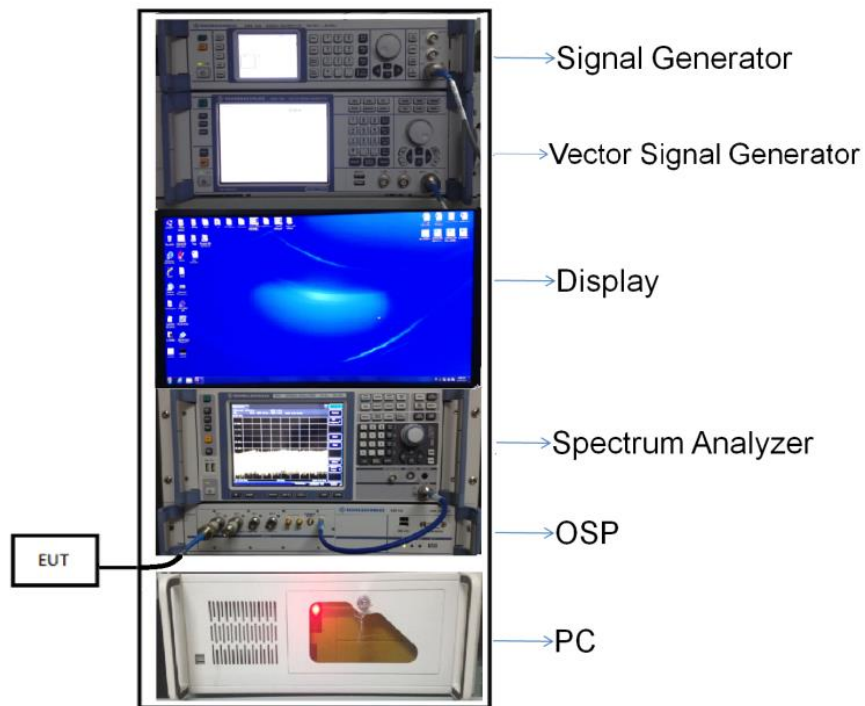
## 4.5 Description of Test Setup

### 4.5.1 For Antenna Port Test

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

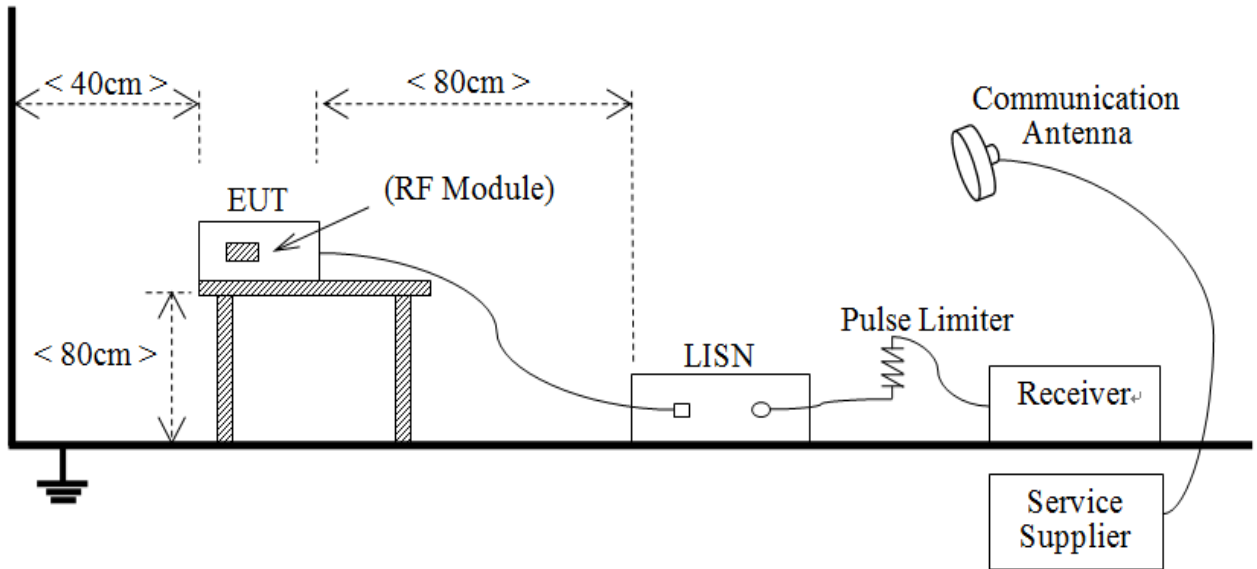
For example: the measurement value is 10 dBm and the cable 0.5dBm used, then the final result of EUT:

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



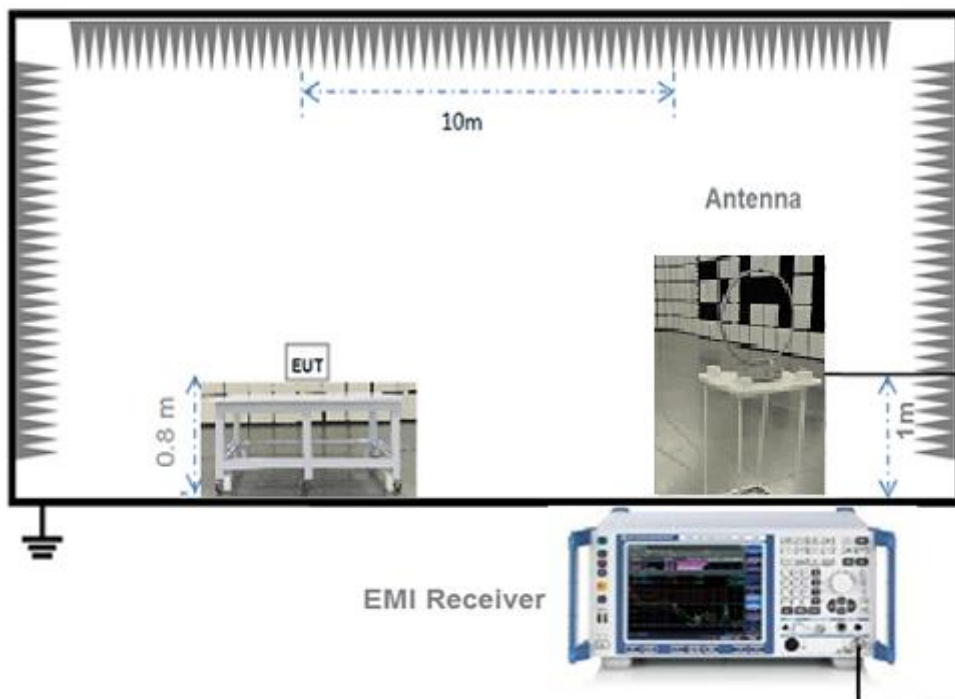
(Diagram 1)

### 4.5.2 For AC Power Supply Port Test



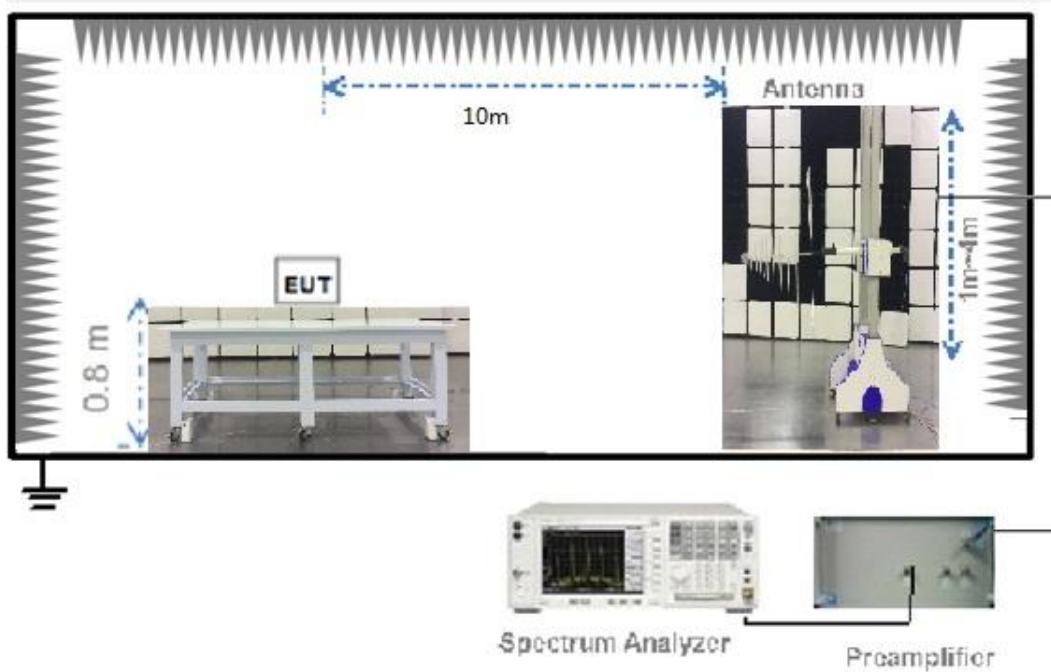
(Diagram 2)

### 4.5.3 For Radiated Test (Below 30 MHz)



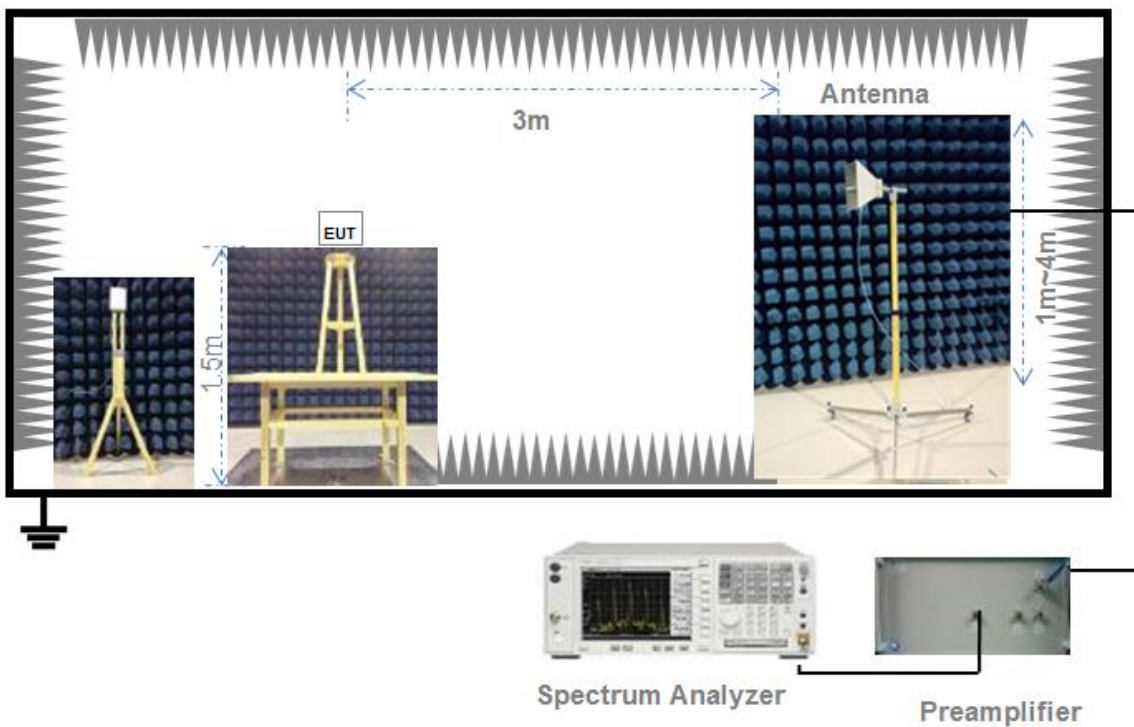
(Diagram 3)

#### 4.5.4 For Radiated Test (30 MHz-1 GHz)



(Diagram 4)

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



(Diagram 5)

## 5 TEST ITEMS

### 5.1 RF Output Power

#### 5.1.1 Test Limit

FCC §15.407(a)

The maximum conducted output power should not exceed:

Frequency Band (MHz)	Limit
5150-5250	250 mW
5250-5350	250 mW or 11 dBm + 10log B, whichever is less.
5470-5725	250 mW or 11 dBm + 10log B, whichever is less.
5725-5850	1 W
Note: Where "B" is the 26 dB emissions bandwidth in MHz.	

#### 5.1.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

#### 5.1.3 Test Procedure

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

The E.I.R.P used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.

#### 5.1.4 Test Result

Please refer to ANNEX A.1.



## 5.2 Emission Bandwidth and 6 dB Bandwidth

### 5.2.1 Limit

#### FCC §15.407(a)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

### 5.2.2 Test Setup

The test setup photo please refer to 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

### 5.2.3 Test Procedure

#### Emission bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set VBW  $\geq 3 \times$  RBW,
3. Detector = Peak.
4. Trace mode = Max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

#### Occupied Bandwidth

1. Set Span = 1.5 times to 5.0 times the OBW
2. Set RBW = 1% to 5% of the OBW.
3. Set VBW  $\geq 3 \times$  RBW, Detector = Peak.
4. Trace mode = Max hold.
5. Use the 99% power bandwidth function of the instrument.

#### 6 dB bandwidth

1. Set RBW = 100 kHz, VBW = 300 kHz.
2. Detector = Peak. Trace mode = Max hold.
3. Allow the trace to stabilize.
4. 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.

### 5.2.4 Test Result

Please refer to ANNEX A.2 and ANNEX A.3.

## 5.3 Power Spectral density (PSD)

### 5.3.1 Limit

FCC §15.407(a)

The maximum power spectral density should not exceed:

Frequency Band (MHz)	Limit
5150-5250	11 dBm/MHz
5250-5350	11 dBm/MHz
5470-5725	11 dBm/MHz
5725-5850	30 dBm/500kHz

### 5.3.2 Test Setup

The section 4.5.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

### 5.3.3 Test Procedure

Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth.

1. Set RBW = 510 kHz/1 MHz, VBW  $\geq$  3\*RBW, Sweep time = Auto, Detector = RMS.
2. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak marker function to determine the maximum amplitude level.
4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.

### 5.3.4 Test Result

Please refer to ANNEX A.4.

## 5.4 Conducted Emission

### 5.4.1 Limit

FCC §15.207

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 U-NII-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

### 5.4.2 Test Setup

The section 4.5.2 (Diagram 2) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

### 5.4.3 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.

### 5.4.4 Test Result

Please refer to ANNEX A.5.

## 5.5 Radiated Spurious Emissions and Band Edge (Restricted-band)

### 5.5.1 Limit

FCC §15.209 & 15.407(b)

Frequency (MHz)	Field Strength (μV/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<sup>1</sup>: The Limit for radiated test was performed according to FCC Part 15C

Note<sup>2</sup>: The tighter limit applies at the band edge.

Un-restricted band emissions	
Out Operating Band (MHz)	Limit
5150 - 5250	e.i.r.p. -27 dBm (68.2 dBuV/m@3m)
5250 - 5350	e.i.r.p. -27 dBm (68.2 dBuV/m@3m)
5470 - 5725	e.i.r.p. -27 dBm (68.2 dBuV/m@3m)
5725 - 5850	<p>All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</p>

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength.

## 5.5.2 Test Setup

The section 4.5.3-4.5.5 (Diagram 3 - Diagram 5) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

## 5.5.3 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 appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies  $\leq 30$  MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies  $> 1000$  MHz).

c) 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).

d) 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 dB $\mu$ V/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

e) Compare the resultant electric field strength level to the applicable limit.

f) 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  $\geq 3 \times$  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  $\text{span}/(\# \text{ of points in sweep}) \leq (\text{RBW}/2)$ . 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

#### 5.5.4 Test Result

Please refer to ANNEX A.6.



## ANNEX A TEST RESULT

### A.1 RF Output Power

Note: The RF Output Power please refer to report: BL-EC19A0003-604, which was issued by Shenzhen BALUN Technology Co., Ltd. on Dec. 16, 2019, **section A.1 RF Output Power**.

### A.2 Emission Bandwidth & 99% Bandwidth

Note: The Emission Bandwidth & 99% Bandwidth please refer to report: BL-EC19A0003-604, which was issued by Shenzhen BALUN Technology Co., Ltd. on Dec. 16, 2019, **section A.2 Emission Bandwidth & 99% Bandwidth**.

### A.3 6 dB Bandwidth

Note: The 6 dB Bandwidth please refer to report: BL-EC19A0003-604, which was issued by Shenzhen BALUN Technology Co., Ltd. on Dec. 16, 2019, **section A.3 6 dB Bandwidth**.

### A.4 Power Spectral Density

Note: The Power Spectral Density please refer to report: BL-EC19A0003-604, which was issued by Shenzhen BALUN Technology Co., Ltd. on Dec. 16, 2019, **section A.4 Power Spectral Density**.

## A.5 Conducted Emissions

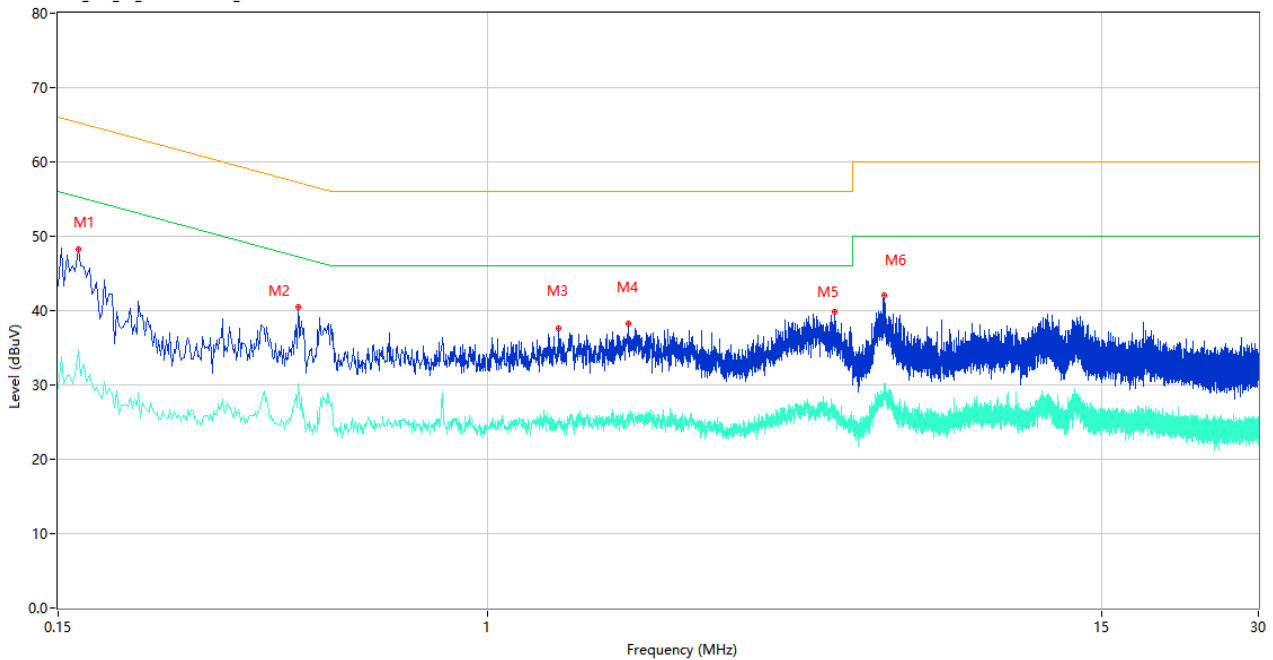
Note <sup>1</sup>: The EUT is working in the Normal link mode. All modes have been tested and normal link mode is worst.

Note <sup>2</sup>: 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

#### PHASE L

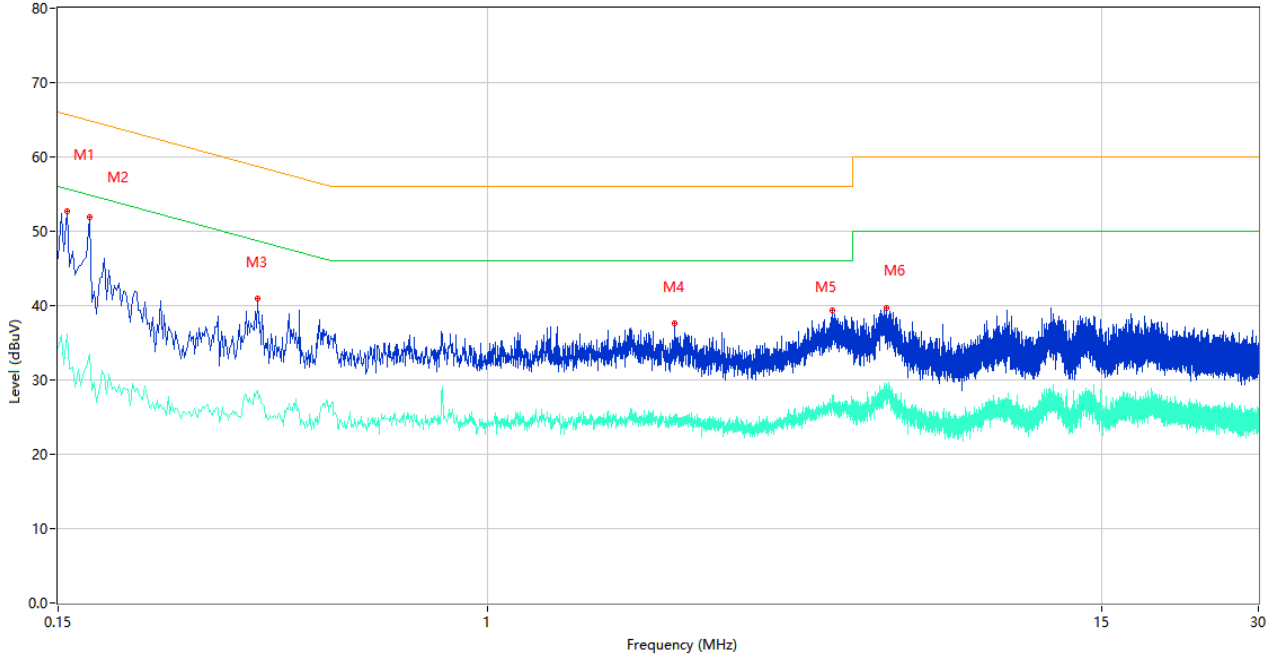
CE Test case FCC\_CE\_FCC PART 15B\_Class B



No.	Frequency (MHz)	Results (dBUV)	Factor (dB)	Limit (dBUV)	Margin (dB)	Detector	Line	Verdict
1	0.164	48.19	10.08	65.26	17.07	Peak	L	Pass
1**	0.164	34.58	10.08	55.26	20.68	AV	L	Pass
2	0.432	40.52	10.42	57.21	16.69	Peak	L	Pass
2**	0.432	30.19	10.42	47.21	17.02	AV	L	Pass
3	1.366	37.59	10.02	56.00	18.41	Peak	L	Pass
3**	1.366	25.02	10.02	46.00	20.98	AV	L	Pass
4	1.858	38.19	10.31	56.00	17.81	Peak	L	Pass
4**	1.858	26.25	10.31	46.00	19.75	AV	L	Pass
5	4.612	39.92	10.50	56.00	16.08	Peak	L	Pass
5**	4.612	26.55	10.50	46.00	19.45	AV	L	Pass
6	5.738	42.04	10.60	60.00	17.96	Peak	L	Pass
6**	5.738	29.34	10.60	50.00	20.66	AV	L	Pass

**PHASE N**

CE Test case\_FCC\_CE\_FCC PART 15B\_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.156	52.76	10.09	65.67	12.91	Peak	N	Pass
1**	0.156	36.17	10.09	55.67	19.50	AV	N	Pass
2	0.172	51.85	10.07	64.86	13.01	Peak	N	Pass
2**	0.172	33.47	10.07	54.86	21.39	AV	N	Pass
3	0.362	40.91	10.92	58.68	17.77	Peak	N	Pass
3**	0.362	28.64	10.92	48.68	20.04	AV	N	Pass
4	2.276	37.62	10.32	56.00	18.38	Peak	N	Pass
4**	2.276	25.25	10.32	46.00	20.75	AV	N	Pass
5	4.572	39.36	10.55	56.00	16.64	Peak	N	Pass
5**	4.572	28.00	10.55	46.00	18.00	AV	N	Pass
6	5.810	39.73	10.21	60.00	20.27	Peak	N	Pass
6**	5.810	27.85	10.21	50.00	22.15	AV	N	Pass

## A.6 Radiated Spurious Emissions and Band Edge (Restricted-band)

### Test Data

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

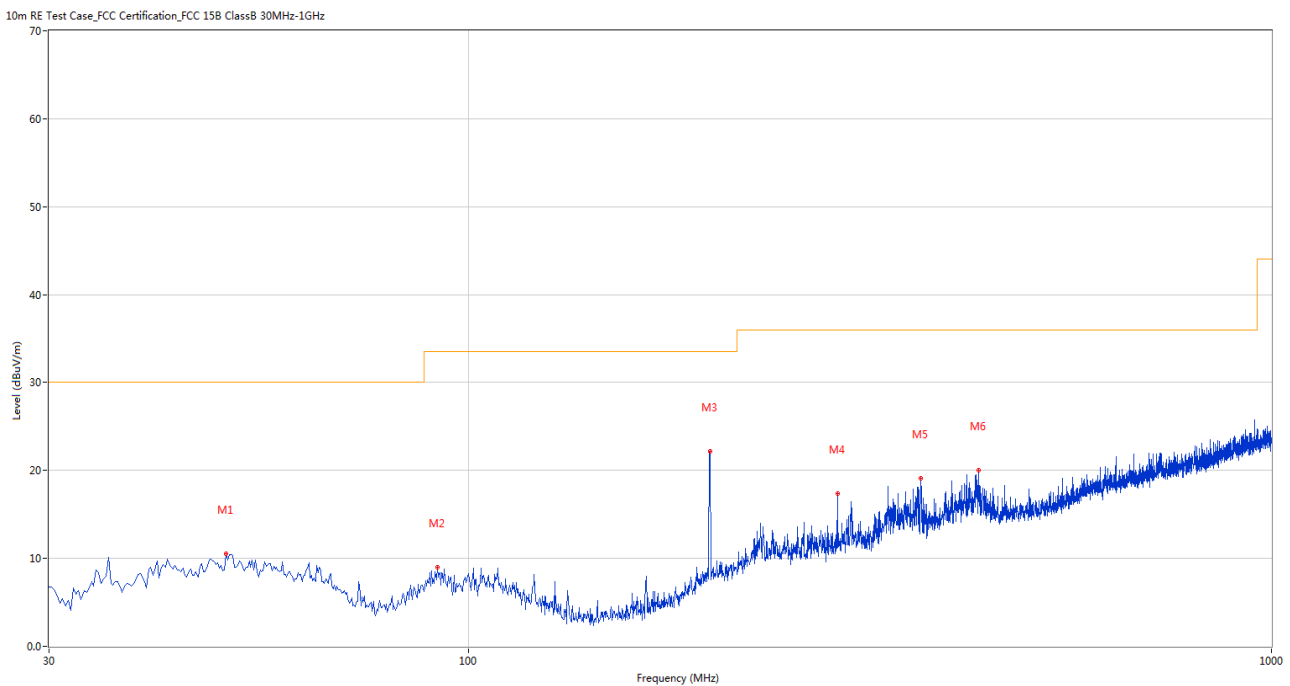
Note <sup>2</sup>: For the test data above 1 GHz, According the ANSI C63.4, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

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. All modes have been tested and normal link mode is worst.

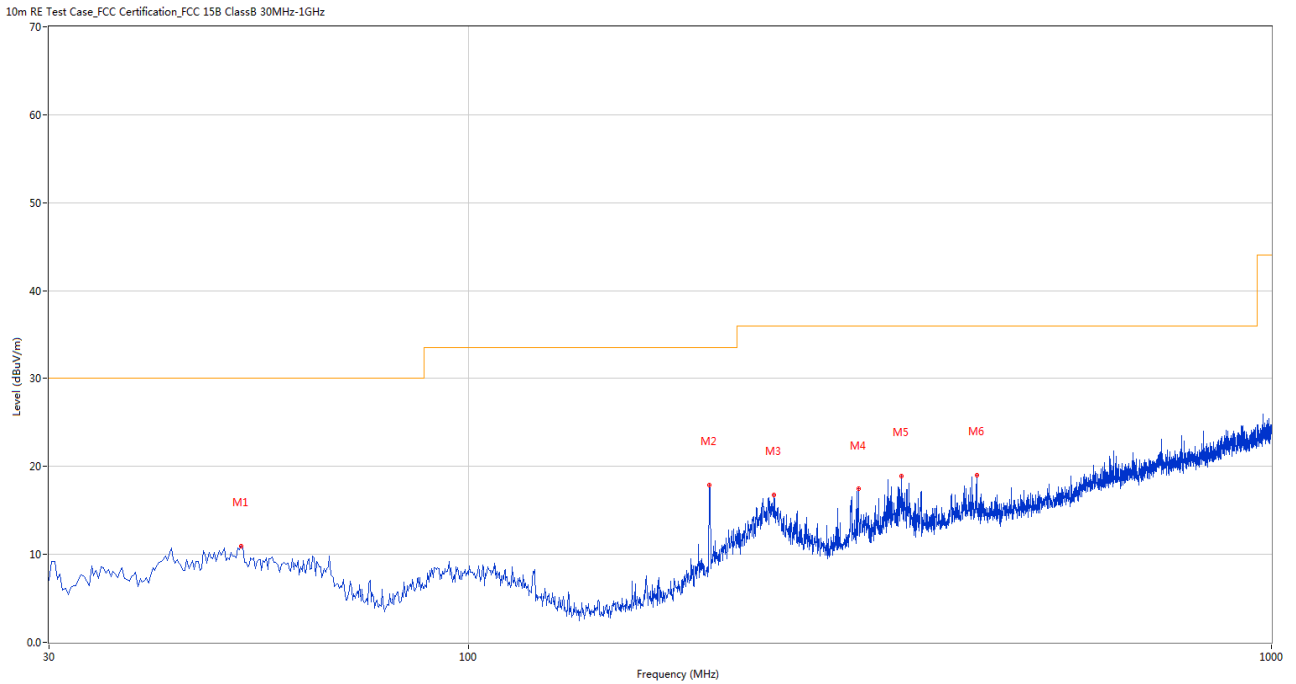
Note <sup>5</sup>: For Multiple transmitter output, the quantity 10 log (NANT) dB is added to each spectrum value before comparing to the emission limit. When testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(NANT) if the measurements are made relative to the in-band emissions on the individual outputs.

### 30 MHz to 1 GHz, ANT H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	49.880	10.57	-26.31	30.0	19.43	Peak	335.00	200	Horizontal	Pass
2	91.337	8.98	-29.29	33.5	24.52	Peak	360.00	100	Horizontal	Pass
3	199.950	22.14	-27.78	33.5	11.36	Peak	226.00	200	Horizontal	Pass
4	287.956	17.39	-25.19	36.0	18.61	Peak	177.00	200	Horizontal	Pass
5	365.779	19.15	-23.65	36.0	16.85	Peak	189.00	200	Horizontal	Pass
6	431.722	20.02	-22.06	36.0	15.98	Peak	118.00	200	Horizontal	Pass

30 MHz to 1 GHz, ANT V



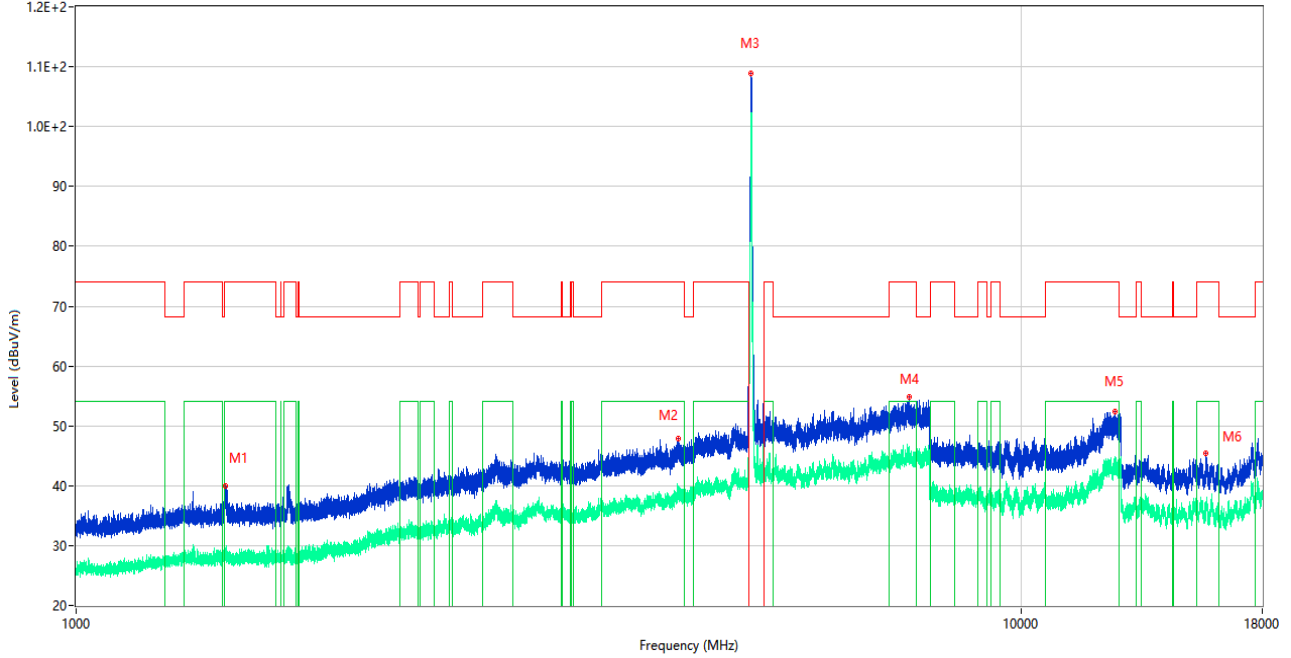
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	52.062	10.97	-26.17	30.0	19.03	Peak	140.00	200	Vertical	Pass
2	199.223	17.85	-27.79	33.5	15.65	Peak	335.00	100	Vertical	Pass
3	239.953	16.79	-26.69	36.0	19.21	Peak	326.00	100	Vertical	Pass
4	305.896	17.42	-24.72	36.0	18.58	Peak	28.00	100	Vertical	Pass
5	346.141	18.95	-23.53	36.0	17.05	Peak	47.00	100	Vertical	Pass
6	429.298	19.03	-21.75	36.0	16.97	Peak	41.00	100	Vertical	Pass

Note: The spurious above 18G is noise only, do not show on the report.

Main Antenna

11a, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT H

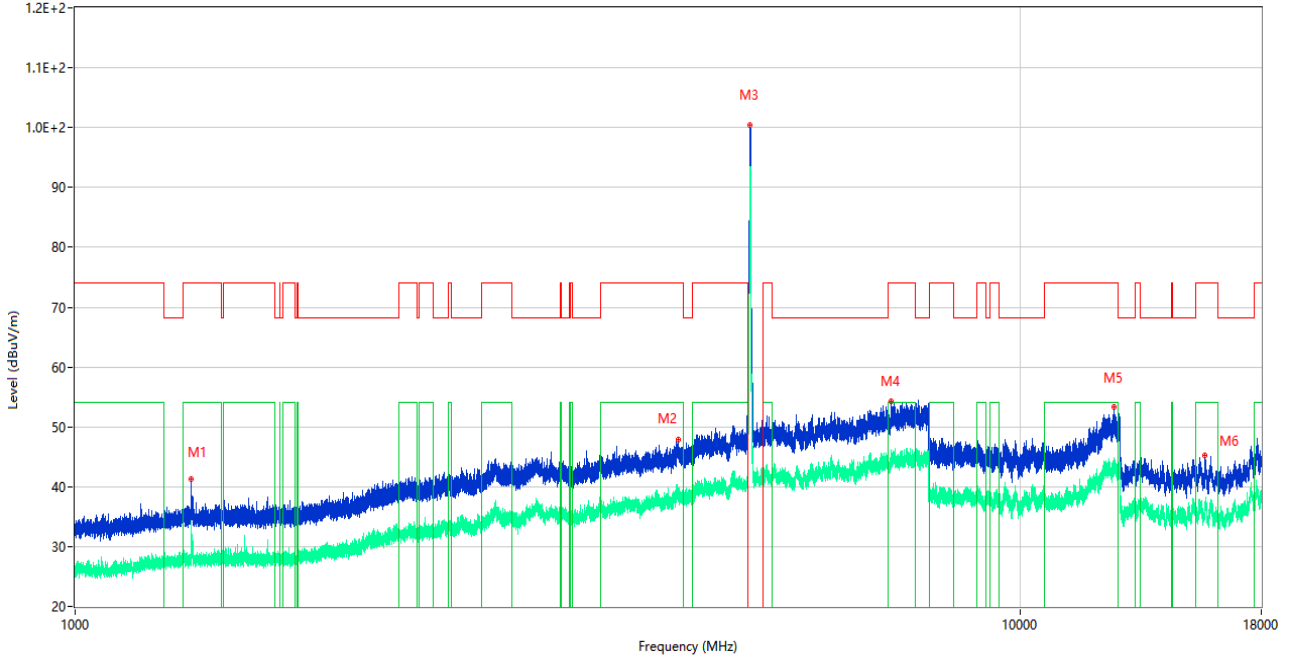
RE Test case FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.400	39.97	-19.48	74.0	34.03	Peak	202.00	100	Horizontal	Pass
1**	1440.400	28.64	-19.48	54.0	25.36	AV	202.00	100	Horizontal	Pass
2	4339.250	47.95	-5.44	74.0	26.05	Peak	235.00	100	Horizontal	Pass
2**	4339.250	39.40	-5.44	54.0	14.60	AV	235.00	100	Horizontal	Pass
3	5178.500	108.89	-4.47	--	--	Peak	16.00	200	Horizontal	N/A
3**	5178.500	101.04	-4.47	--	--	AV	16.00	200	Horizontal	N/A
4	7608.750	54.82	-0.29	74.0	19.18	Peak	0.00	200	Horizontal	Pass
4**	7608.750	46.35	-0.29	54.0	7.65	AV	0.00	200	Horizontal	Pass
5	12580.187	52.45	1.33	74.0	21.55	Peak	297.00	150	Horizontal	Pass
5**	12580.187	43.84	1.33	54.0	10.16	AV	297.00	150	Horizontal	Pass
6	15700.500	45.46	2.81	74.0	28.54	Peak	298.00	100	Horizontal	Pass
6**	15700.500	35.56	2.81	54.0	18.44	AV	298.00	100	Horizontal	Pass

11a, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT V

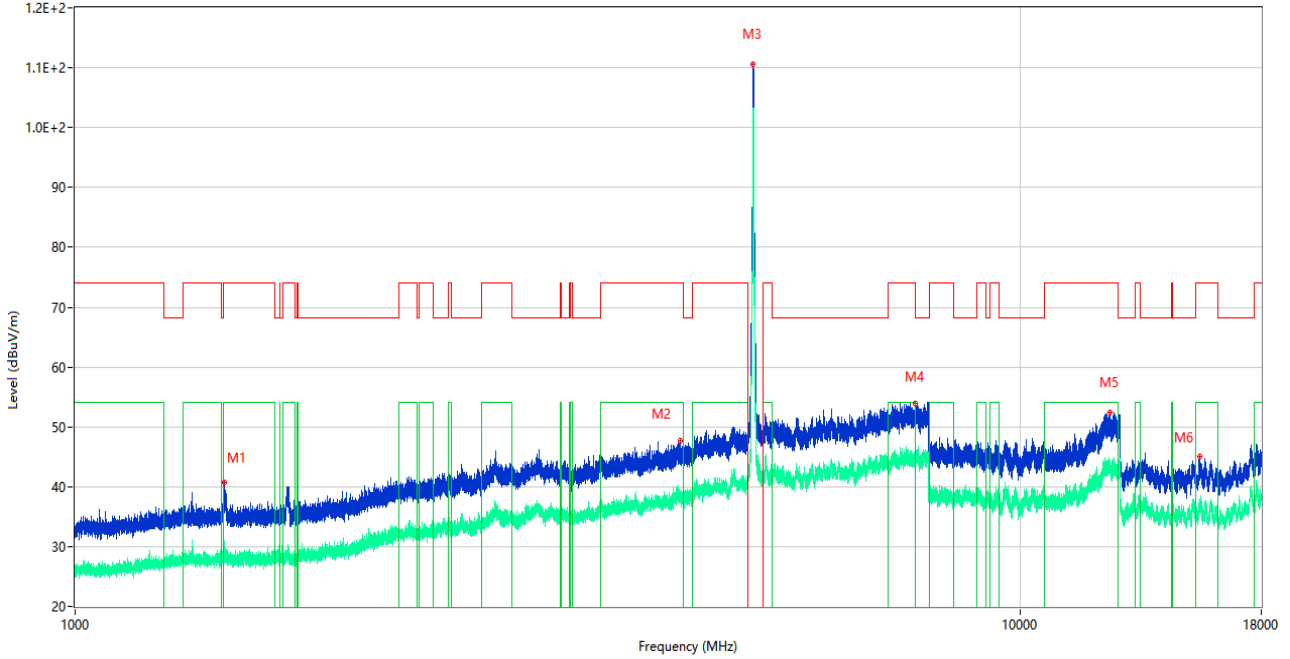
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1327.700	41.36	-19.34	74.0	32.64	Peak	131.00	200	Vertical	Pass
1**	1327.700	29.92	-19.34	54.0	24.08	AV	131.00	200	Vertical	Pass
2	4350.000	47.91	-5.73	74.0	26.09	Peak	234.00	100	Vertical	Pass
2**	4350.000	38.96	-5.73	54.0	15.04	AV	234.00	100	Vertical	Pass
3	5176.500	100.41	-4.55	--	--	Peak	269.00	100	Vertical	N/A
3**	5176.500	92.66	-4.55	--	--	AV	269.00	100	Vertical	N/A
4	7307.750	54.21	-1.61	74.0	19.79	Peak	143.00	300	Vertical	Pass
4**	7307.750	44.18	-1.61	54.0	9.82	AV	143.00	300	Vertical	Pass
5	12582.563	53.28	1.31	74.0	20.72	Peak	6.00	150	Vertical	Pass
5**	12582.563	43.94	1.31	54.0	10.06	AV	6.00	150	Vertical	Pass
6	15697.875	45.29	2.74	74.0	28.71	Peak	334.00	400	Vertical	Pass
6**	15697.875	36.64	2.74	54.0	17.36	AV	334.00	400	Vertical	Pass

11a, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT H

RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz

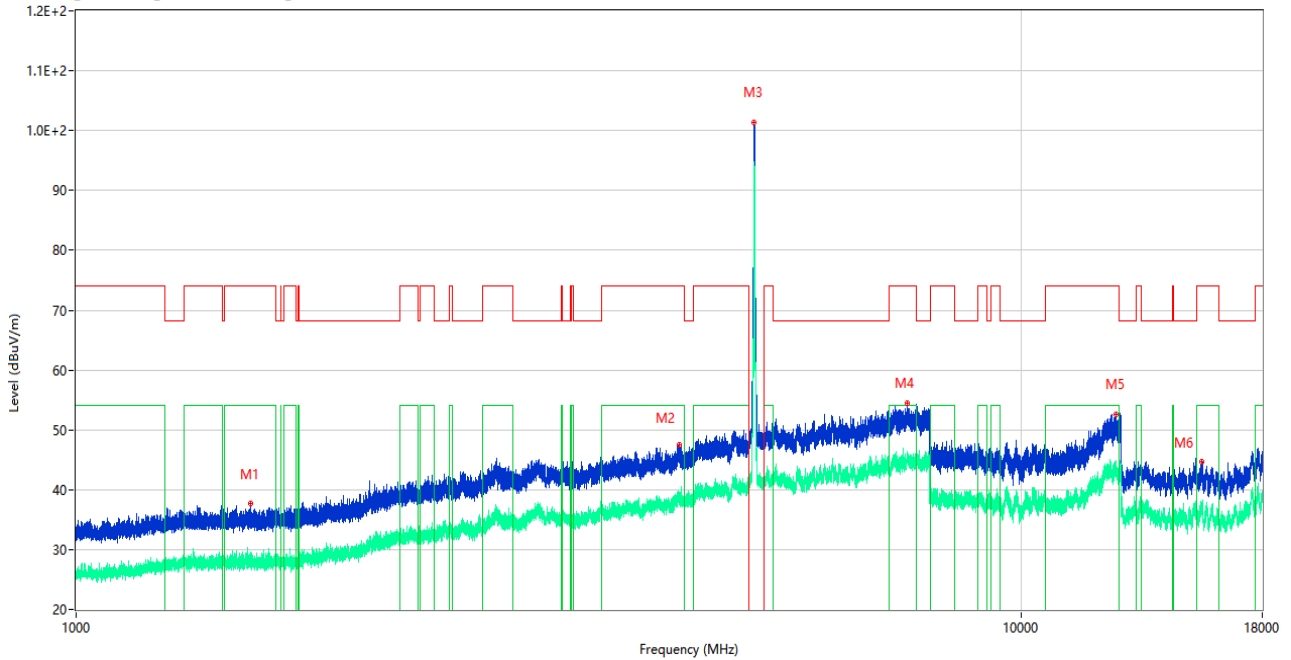


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1439.800	40.72	-19.57	74.0	33.28	Peak	81.00	300	Horizontal	Pass
1**	1439.800	30.88	-19.57	54.0	23.12	AV	81.00	300	Horizontal	Pass
2	4374.750	47.63	-6.96	74.0	26.37	Peak	203.00	100	Horizontal	Pass
2**	4374.750	38.07	-6.96	54.0	15.93	AV	203.00	100	Horizontal	Pass
3	5221.250	110.65	-4.90	--	--	Peak	7.00	150	Horizontal	N/A
3**	5221.250	102.67	-4.90	--	--	AV	7.00	150	Horizontal	N/A
4	7742.750	53.94	-1.10	74.0	20.06	Peak	325.00	100	Horizontal	Pass
4**	7742.750	43.87	-1.10	54.0	10.13	AV	325.00	100	Horizontal	Pass
5	12450.987	52.42	0.88	74.0	21.58	Peak	270.00	100	Horizontal	Pass
5**	12450.987	42.84	0.88	54.0	11.16	AV	270.00	100	Horizontal	Pass
6	15493.125	45.03	2.73	74.0	28.97	Peak	238.00	400	Horizontal	Pass
6**	15493.125	37.17	2.73	54.0	16.83	AV	238.00	400	Horizontal	Pass



11a, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT V

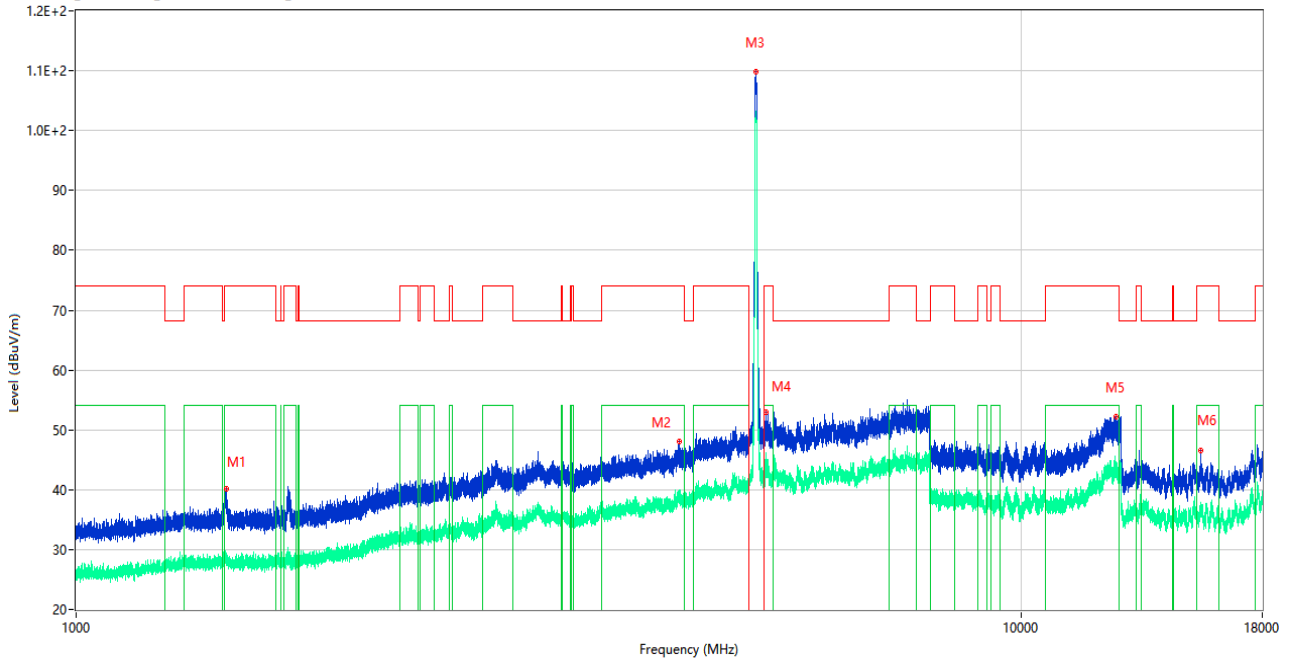
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1530.000	37.66	-19.68	74.0	36.34	Peak	92.00	300	Vertical	Pass
1**	1530.000	26.92	-19.68	54.0	27.08	AV	92.00	300	Vertical	Pass
2	4346.750	47.49	-6.20	74.0	26.51	Peak	140.00	200	Vertical	Pass
2**	4346.750	38.61	-6.20	54.0	15.39	AV	140.00	200	Vertical	Pass
3	5220.500	101.35	-4.76	--	--	Peak	269.00	200	Vertical	N/A
3**	5220.500	94.63	-4.76	--	--	AV	269.00	200	Vertical	N/A
4	7578.000	54.43	-0.02	74.0	19.57	Peak	344.00	200	Vertical	Pass
4**	7578.000	45.27	-0.02	54.0	8.73	AV	344.00	200	Vertical	Pass
5	12600.849	52.61	1.14	74.0	21.39	Peak	243.00	100	Vertical	Pass
5**	12600.849	42.30	1.14	54.0	11.70	AV	243.00	100	Vertical	Pass
6	15518.063	44.58	2.33	74.0	29.42	Peak	85.00	400	Vertical	Pass
6**	15518.063	37.44	2.33	54.0	16.56	AV	85.00	400	Vertical	Pass

11a, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT H

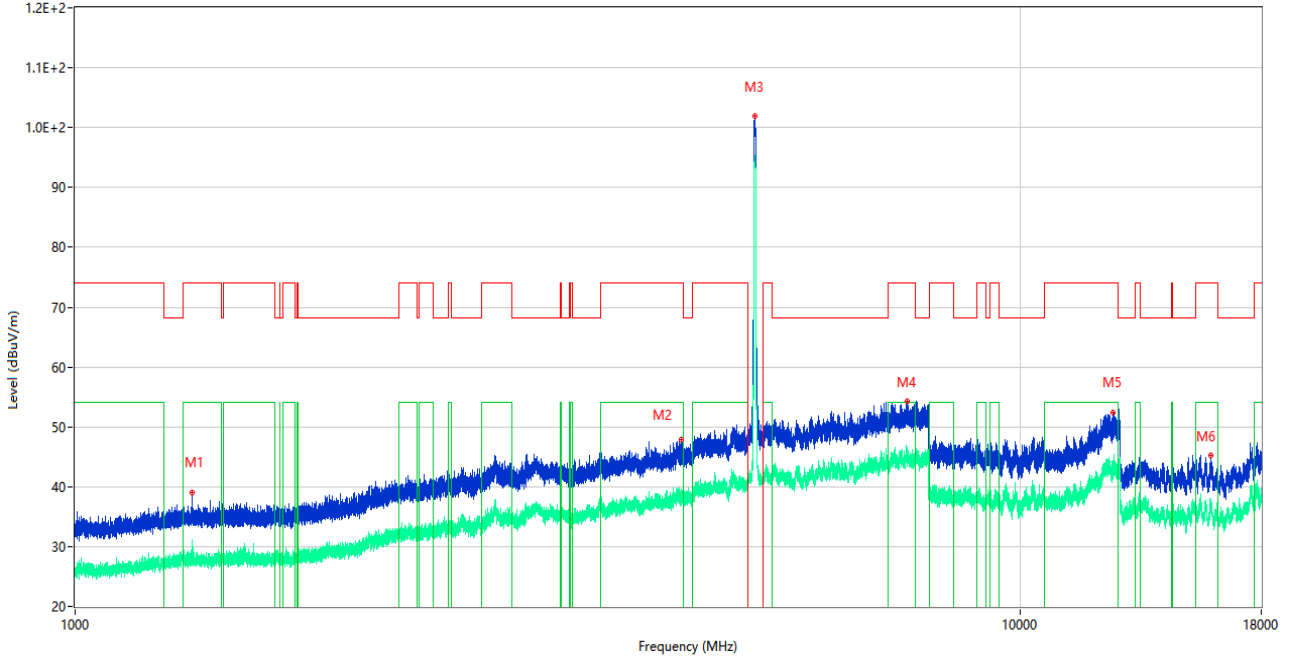
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1442.400	40.18	-19.45	74.0	33.82	Peak	196.00	300	Horizontal	Pass
1**	1442.400	28.21	-19.45	54.0	25.79	AV	196.00	300	Horizontal	Pass
2	4346.000	48.00	-5.86	74.0	26.00	Peak	164.00	200	Horizontal	Pass
2**	4346.000	38.87	-5.86	54.0	15.13	AV	164.00	200	Horizontal	Pass
3	5245.250	109.76	-5.09	--	--	Peak	34.00	200	Horizontal	N/A
3**	5245.250	102.41	-5.09	--	--	AV	34.00	200	Horizontal	N/A
4	5372.750	53.03	-4.30	74.0	20.97	Peak	16.00	200	Horizontal	Pass
4**	5372.750	43.06	-4.30	54.0	10.94	AV	16.00	200	Horizontal	Pass
5	12605.362	52.17	1.10	74.0	21.83	Peak	275.00	150	Horizontal	Pass
5**	12605.362	43.07	1.10	54.0	10.93	AV	275.00	150	Horizontal	Pass
6	15487.875	46.51	2.78	74.0	27.49	Peak	0.00	300	Horizontal	Pass
6**	15487.875	36.98	2.78	54.0	17.02	AV	0.00	300	Horizontal	Pass

11a, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT V

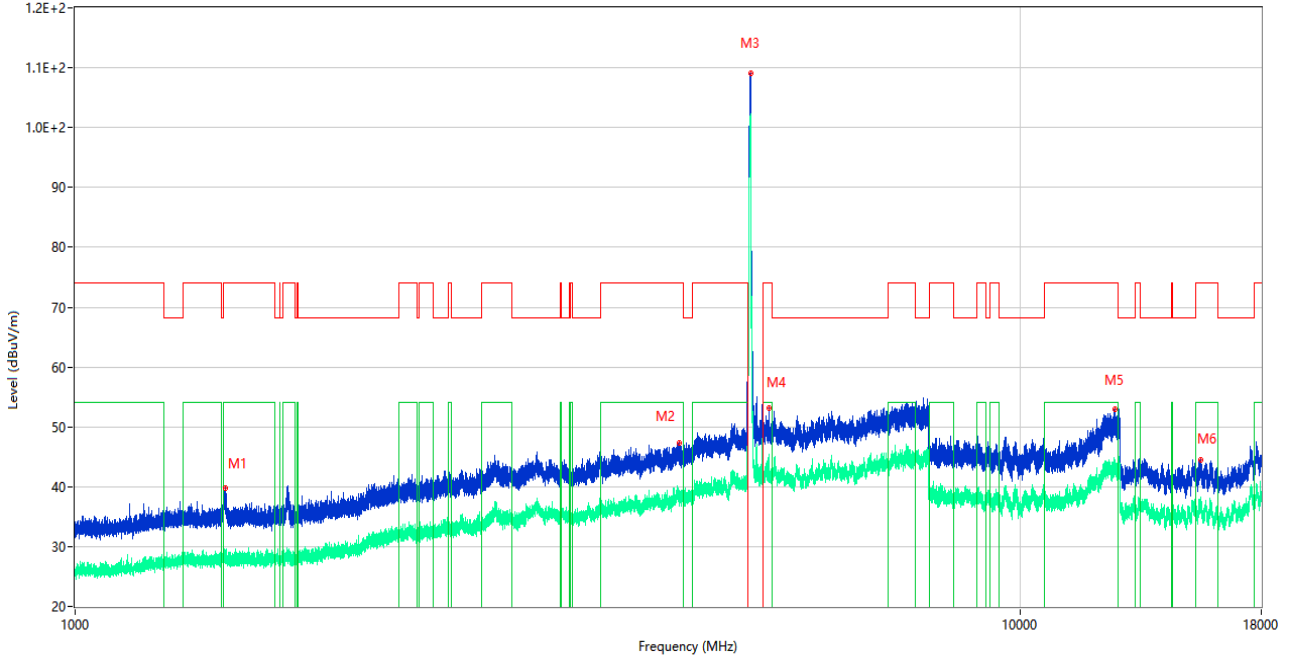
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.200	39.09	-19.34	74.0	34.91	Peak	274.00	200	Vertical	Pass
1**	1329.200	29.02	-19.34	54.0	24.98	AV	274.00	200	Vertical	Pass
2	4378.250	47.83	-6.40	74.0	26.17	Peak	73.00	100	Vertical	Pass
2**	4378.250	38.65	-6.40	54.0	15.35	AV	73.00	100	Vertical	Pass
3	5237.250	101.85	-5.21	--	--	Peak	267.00	200	Vertical	N/A
3**	5237.250	94.33	-5.21	--	--	AV	267.00	200	Vertical	N/A
4	7604.000	54.31	-0.97	74.0	19.69	Peak	92.00	200	Vertical	Pass
4**	7604.000	45.47	-0.97	54.0	8.53	AV	92.00	200	Vertical	Pass
5	12549.075	52.46	1.59	74.0	21.54	Peak	109.00	100	Vertical	Pass
5**	12549.075	43.13	1.59	54.0	10.87	AV	109.00	100	Vertical	Pass
6	15903.938	45.21	2.52	74.0	28.79	Peak	311.00	200	Vertical	Pass
6**	15903.938	36.50	2.52	54.0	17.50	AV	311.00	200	Vertical	Pass

11n20, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT H

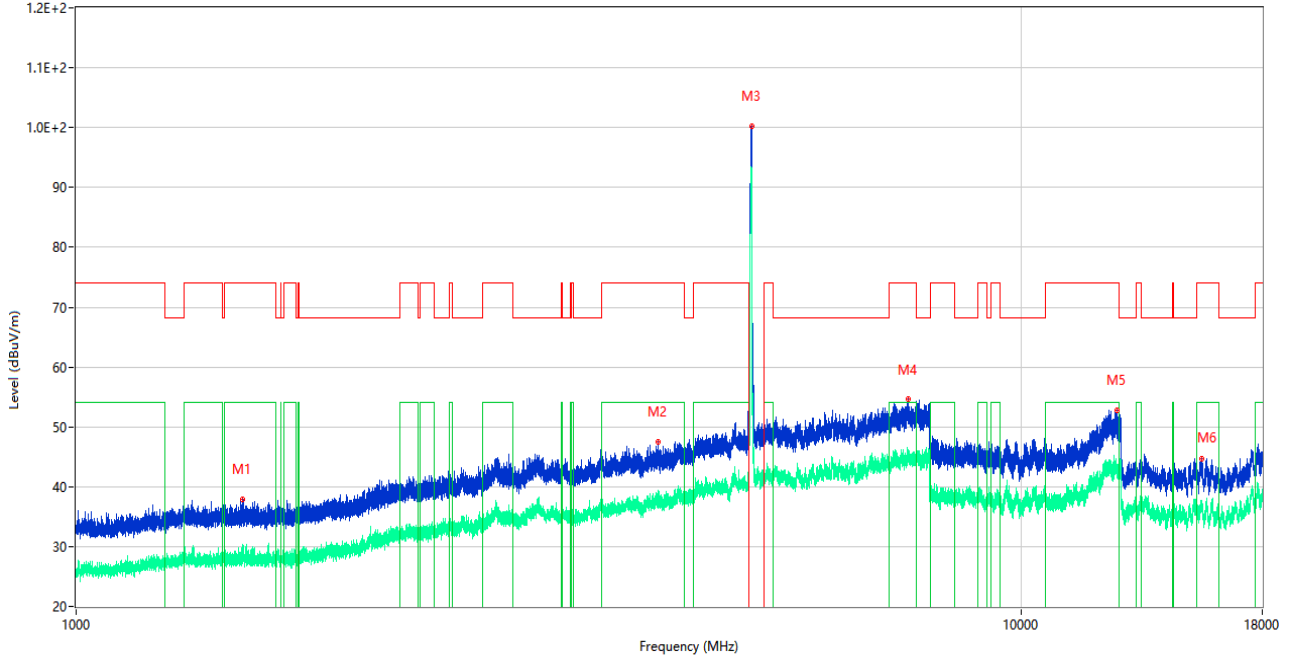
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.700	39.72	-19.57	74.0	34.28	Peak	158.00	300	Horizontal	Pass
1**	1440.700	28.18	-19.57	54.0	25.82	AV	158.00	300	Horizontal	Pass
2	4356.500	47.38	-6.27	74.0	26.62	Peak	360.00	400	Horizontal	Pass
2**	4356.500	38.58	-6.27	54.0	15.42	AV	360.00	400	Horizontal	Pass
3	5187.500	109.12	-4.29	--	--	Peak	34.00	100	Horizontal	N/A
3**	5187.500	100.75	-4.29	--	--	AV	34.00	100	Horizontal	N/A
4	5421.750	53.18	-4.80	74.0	20.82	Peak	34.00	200	Horizontal	Pass
4**	5421.750	43.97	-4.80	54.0	10.03	AV	34.00	200	Horizontal	Pass
5	12618.424	52.90	0.99	74.0	21.10	Peak	92.00	100	Horizontal	Pass
5**	12618.424	42.79	0.99	54.0	11.21	AV	92.00	100	Horizontal	Pass
6	15550.875	44.54	1.68	74.0	29.46	Peak	34.00	100	Horizontal	Pass
6**	15550.875	37.00	1.68	54.0	17.00	AV	34.00	100	Horizontal	Pass

11n20, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT V

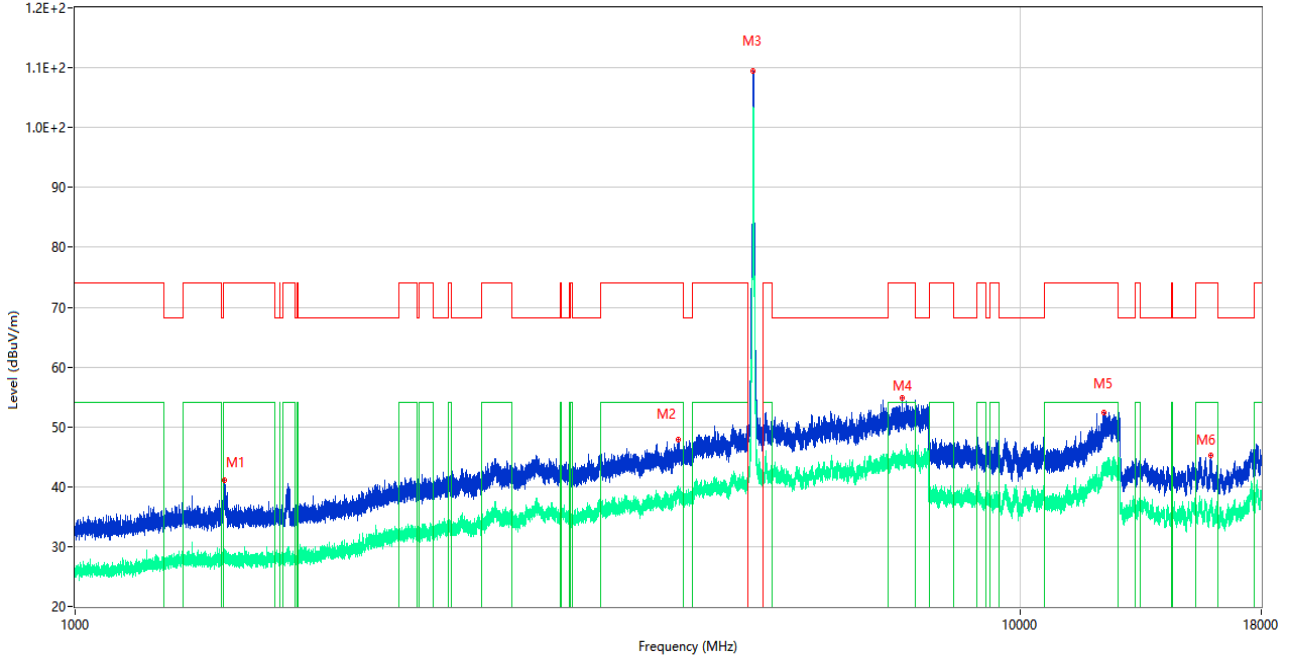
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1501.000	37.93	-19.32	74.0	36.07	Peak	249.00	200	Vertical	Pass
1**	1501.000	30.43	-19.32	54.0	23.57	AV	249.00	200	Vertical	Pass
2	4125.750	47.50	-6.92	74.0	26.50	Peak	360.00	200	Vertical	Pass
2**	4125.750	37.71	-6.92	54.0	16.29	AV	360.00	200	Vertical	Pass
3	5184.000	100.23	-4.16	--	--	Peak	272.00	200	Vertical	N/A
3**	5184.000	92.84	-4.16	--	--	AV	272.00	200	Vertical	N/A
4	7589.250	54.61	-0.47	74.0	19.39	Peak	52.00	400	Vertical	Pass
4**	7589.250	46.22	-0.47	54.0	7.78	AV	52.00	400	Vertical	Pass
5	12640.037	52.82	0.81	74.0	21.18	Peak	294.00	100	Vertical	Pass
5**	12640.037	42.86	0.81	54.0	11.14	AV	294.00	100	Vertical	Pass
6	15518.063	44.70	2.33	74.0	29.30	Peak	315.00	400	Vertical	Pass
6**	15518.063	36.76	2.33	54.0	17.24	AV	315.00	400	Vertical	Pass

11n20, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT H

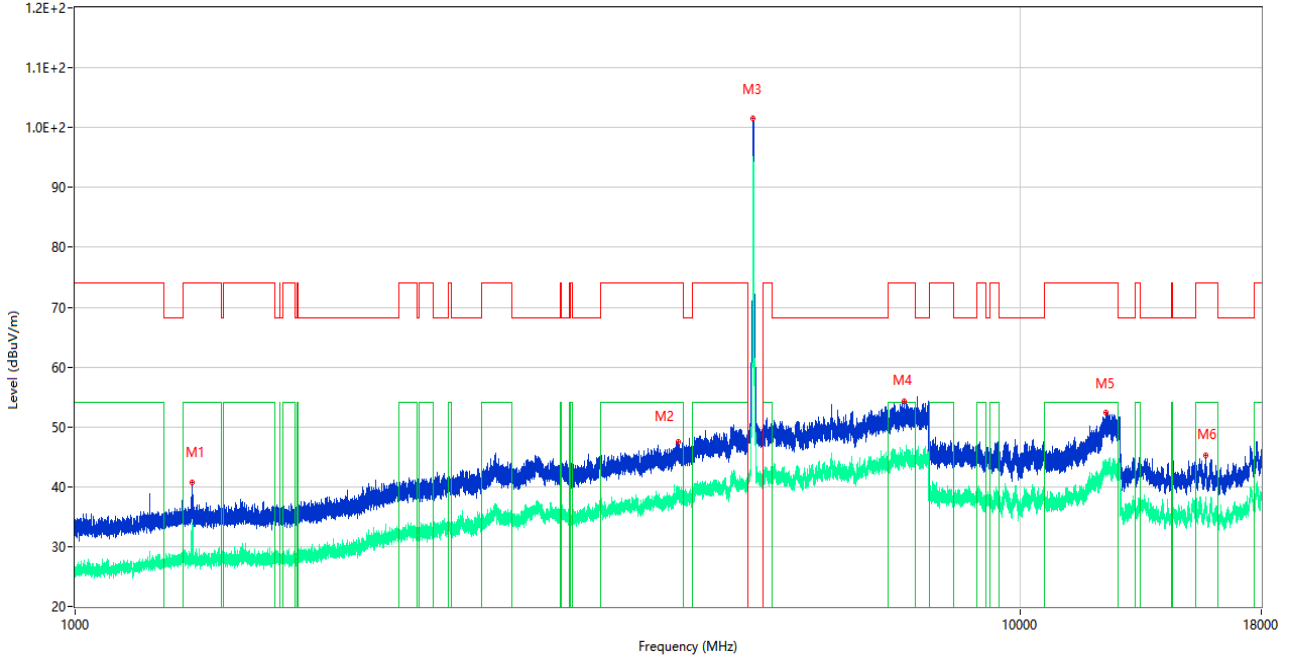
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1439.000	41.00	-19.85	74.0	33.00	Peak	193.00	100	Horizontal	Pass
1**	1439.000	28.31	-19.85	54.0	25.69	AV	193.00	100	Horizontal	Pass
2	4344.500	47.84	-5.33	74.0	26.16	Peak	293.00	100	Horizontal	Pass
2**	4344.500	39.55	-5.33	54.0	14.45	AV	293.00	100	Horizontal	Pass
3	5220.500	109.54	-4.76	--	--	Peak	33.00	200	Horizontal	N/A
3**	5220.500	102.14	-4.76	--	--	AV	33.00	200	Horizontal	N/A
4	7499.250	54.89	-0.16	74.0	19.11	Peak	123.00	300	Horizontal	Pass
4**	7499.250	45.07	-0.16	54.0	8.93	AV	123.00	300	Horizontal	Pass
5	12270.963	52.34	0.49	74.0	21.66	Peak	190.00	100	Horizontal	Pass
5**	12270.963	42.64	0.49	54.0	11.36	AV	190.00	100	Horizontal	Pass
6	15930.188	45.17	2.71	74.0	28.83	Peak	52.00	400	Horizontal	Pass
6**	15930.188	36.28	2.71	54.0	17.72	AV	52.00	400	Horizontal	Pass

11n20, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT V

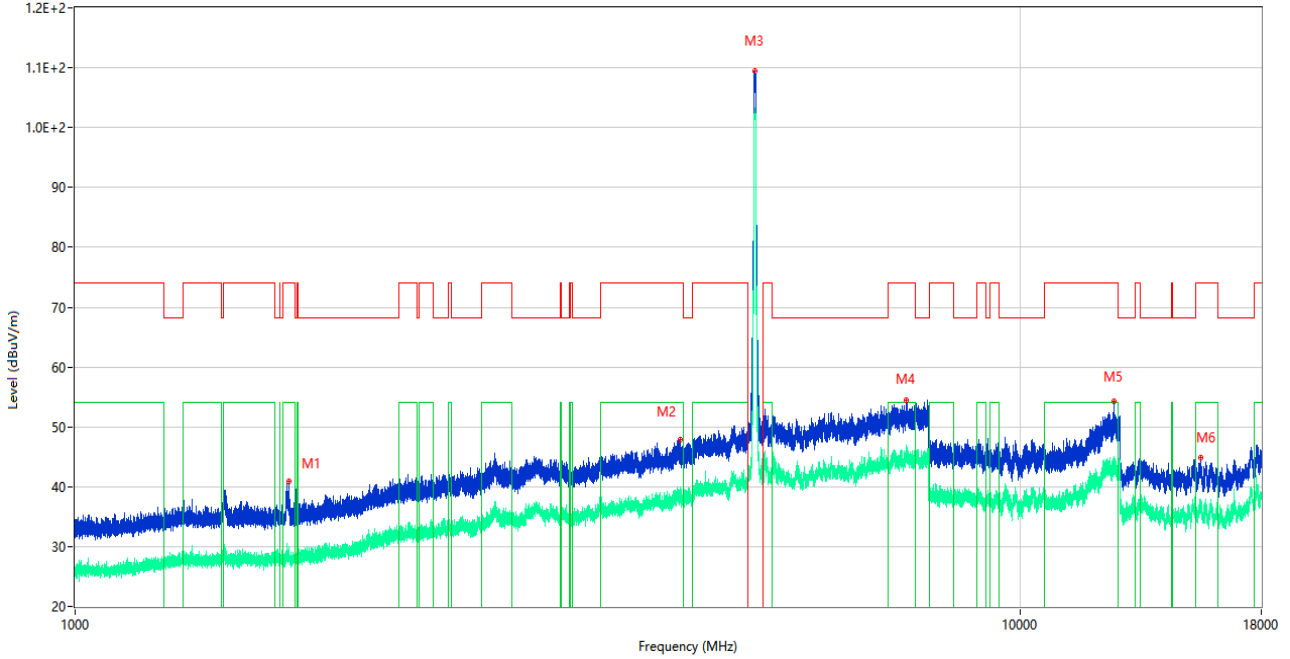
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.400	40.64	-19.23	74.0	33.36	Peak	107.00	100	Vertical	Pass
1**	1330.400	27.91	-19.23	54.0	26.09	AV	107.00	100	Vertical	Pass
2	4349.500	47.43	-5.45	74.0	26.57	Peak	54.00	300	Vertical	Pass
2**	4349.500	39.69	-5.45	54.0	14.31	AV	54.00	300	Vertical	Pass
3	5218.750	101.48	-4.96	--	--	Peak	277.00	200	Vertical	N/A
3**	5218.750	94.20	-4.96	--	--	AV	277.00	200	Vertical	N/A
4	7541.250	54.19	-1.25	74.0	19.81	Peak	0.00	100	Vertical	Pass
4**	7541.250	45.64	-1.25	54.0	8.36	AV	0.00	100	Vertical	Pass
5	12342.688	52.37	0.72	74.0	21.63	Peak	110.00	100	Vertical	Pass
5**	12342.688	42.74	0.72	54.0	11.26	AV	110.00	100	Vertical	Pass
6	15708.375	45.23	2.63	74.0	28.77	Peak	145.00	200	Vertical	Pass
6**	15708.375	37.54	2.63	54.0	16.46	AV	145.00	200	Vertical	Pass

11n20, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT H

RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz

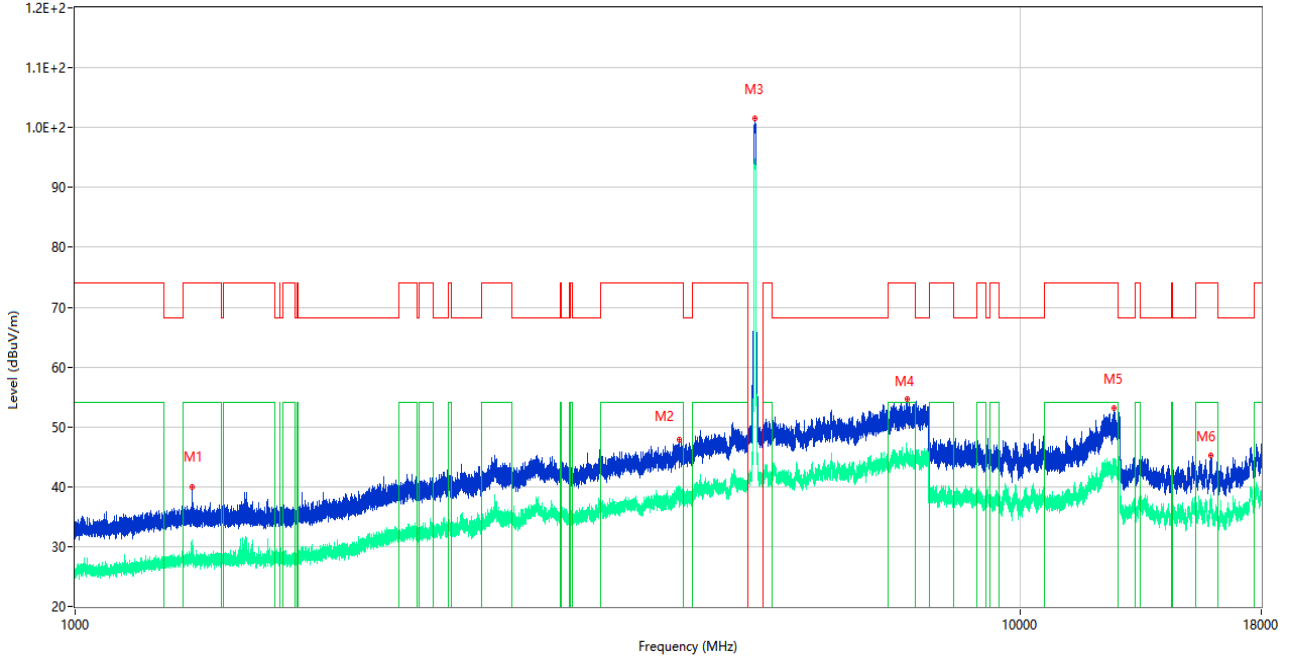


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1683.000	40.85	-19.25	74.0	33.15	Peak	158.00	100	Horizontal	Pass
1**	1683.000	29.00	-19.25	54.0	25.00	AV	158.00	100	Horizontal	Pass
2	4370.750	47.82	-6.33	74.0	26.18	Peak	324.00	200	Horizontal	Pass
2**	4370.750	38.83	-6.33	54.0	15.17	AV	324.00	200	Horizontal	Pass
3	5244.750	109.52	-5.29	--	--	Peak	32.00	100	Horizontal	N/A
3**	5244.750	102.08	-5.29	--	--	AV	32.00	100	Horizontal	N/A
4	7578.000	54.39	-0.02	74.0	19.61	Peak	68.00	300	Horizontal	Pass
4**	7578.000	45.64	-0.02	54.0	8.36	AV	68.00	300	Horizontal	Pass
5	12579.951	54.25	1.34	74.0	19.75	Peak	359.00	150	Horizontal	Pass
5**	12579.951	44.31	1.34	54.0	9.69	AV	359.00	150	Horizontal	Pass
6	15519.375	44.78	2.30	74.0	29.22	Peak	116.00	400	Horizontal	Pass
6**	15519.375	37.79	2.30	54.0	16.21	AV	116.00	400	Horizontal	Pass



11n20, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT V

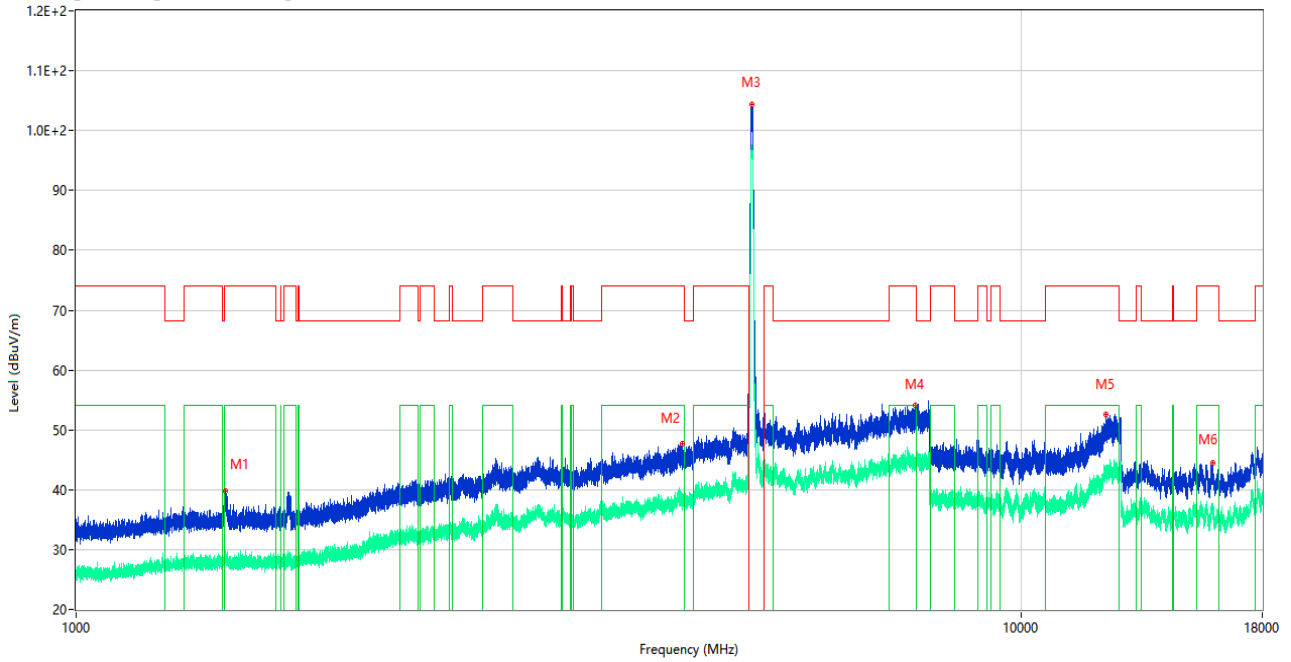
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.600	39.90	-19.33	74.0	34.10	Peak	103.00	100	Vertical	Pass
1**	1330.600	28.91	-19.33	54.0	25.09	AV	103.00	100	Vertical	Pass
2	4358.500	47.87	-6.21	74.0	26.13	Peak	330.00	200	Vertical	Pass
2**	4358.500	38.38	-6.21	54.0	15.62	AV	330.00	200	Vertical	Pass
3	5246.250	101.48	-5.23	--	--	Peak	237.00	200	Vertical	N/A
3**	5246.250	94.52	-5.23	--	--	AV	237.00	200	Vertical	N/A
4	7590.250	54.57	-0.63	74.0	19.43	Peak	0.00	300	Vertical	Pass
4**	7590.250	45.43	-0.63	54.0	8.57	AV	0.00	300	Vertical	Pass
5	12579.713	53.12	1.34	74.0	20.88	Peak	125.00	200	Vertical	Pass
5**	12579.713	44.28	1.34	54.0	9.72	AV	125.00	200	Vertical	Pass
6	15915.750	45.22	2.61	74.0	28.78	Peak	233.00	300	Vertical	Pass
6**	15915.750	36.77	2.61	54.0	17.23	AV	233.00	300	Vertical	Pass

11n40, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT H

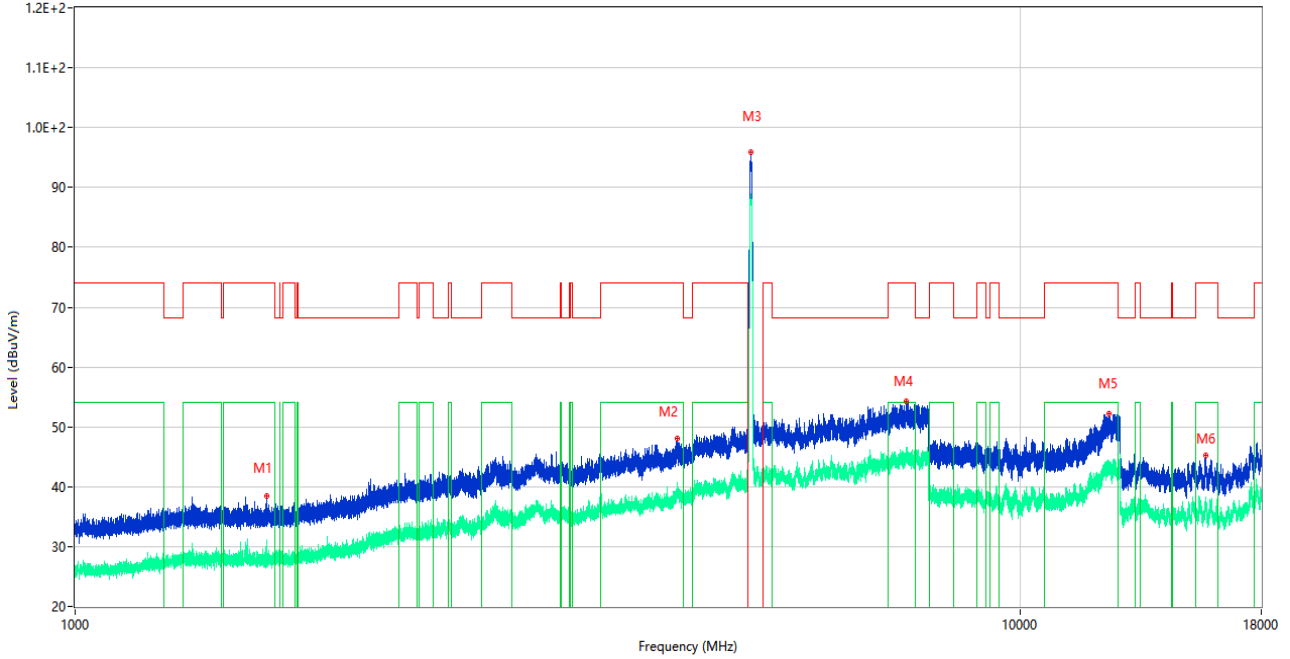
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1439.400	39.81	-19.64	74.0	34.19	Peak	193.00	100	Horizontal	Pass
1**	1439.400	28.62	-19.64	54.0	25.38	AV	193.00	100	Horizontal	Pass
2	4376.500	47.64	-6.78	74.0	26.36	Peak	333.00	400	Horizontal	Pass
2**	4376.500	37.70	-6.78	54.0	16.30	AV	333.00	400	Horizontal	Pass
3	5191.500	104.31	-4.46	--	--	Peak	34.00	100	Horizontal	N/A
3**	5191.500	97.43	-4.46	--	--	AV	34.00	100	Horizontal	N/A
4	7724.000	54.17	-1.59	74.0	19.83	Peak	90.00	200	Horizontal	Pass
4**	7724.000	44.25	-1.59	54.0	9.75	AV	90.00	200	Horizontal	Pass
5	12295.663	52.64	0.63	74.0	21.36	Peak	277.00	100	Horizontal	Pass
5**	12295.663	42.39	0.63	54.0	11.61	AV	277.00	100	Horizontal	Pass
6	15953.812	44.45	2.65	74.0	29.55	Peak	159.00	300	Horizontal	Pass
6**	15953.812	36.48	2.65	54.0	17.52	AV	159.00	300	Horizontal	Pass

11n40, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT V

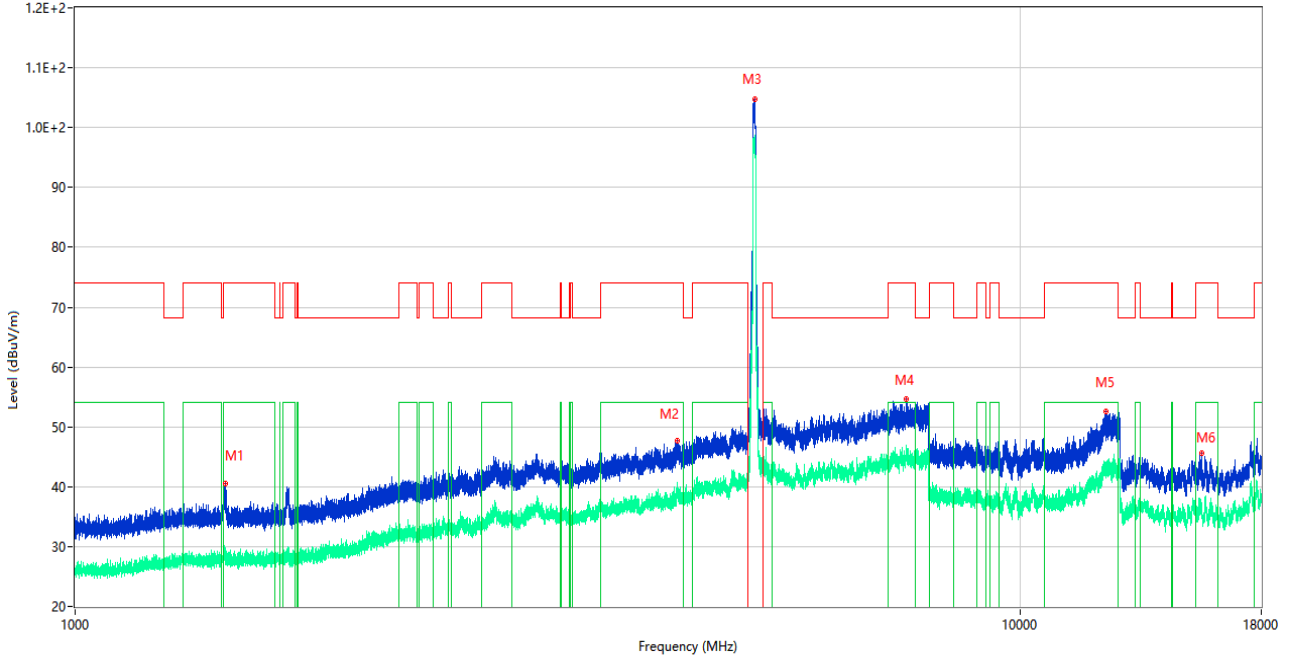
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1596.000	38.38	-19.49	74.0	35.62	Peak	227.00	400	Vertical	Pass
1**	1596.000	27.91	-19.49	54.0	26.09	AV	227.00	400	Vertical	Pass
2	4337.250	48.00	-5.45	74.0	26.00	Peak	69.00	200	Vertical	Pass
2**	4337.250	40.78	-5.45	54.0	13.22	AV	69.00	200	Vertical	Pass
3	5187.500	95.88	-4.29	--	--	Peak	286.00	150	Vertical	N/A
3**	5187.500	88.93	-4.29	--	--	AV	286.00	150	Vertical	N/A
4	7577.750	54.24	-0.00	74.0	19.76	Peak	360.00	300	Vertical	Pass
4**	7577.750	45.82	-0.00	54.0	8.18	AV	360.00	300	Vertical	Pass
5	12420.588	52.27	0.55	74.0	21.73	Peak	118.00	100	Vertical	Pass
5**	12420.588	42.92	0.55	54.0	11.08	AV	118.00	100	Vertical	Pass
6	15730.688	45.26	2.13	74.0	28.74	Peak	289.00	200	Vertical	Pass
6**	15730.688	37.95	2.13	54.0	16.05	AV	289.00	200	Vertical	Pass

11n40, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT H

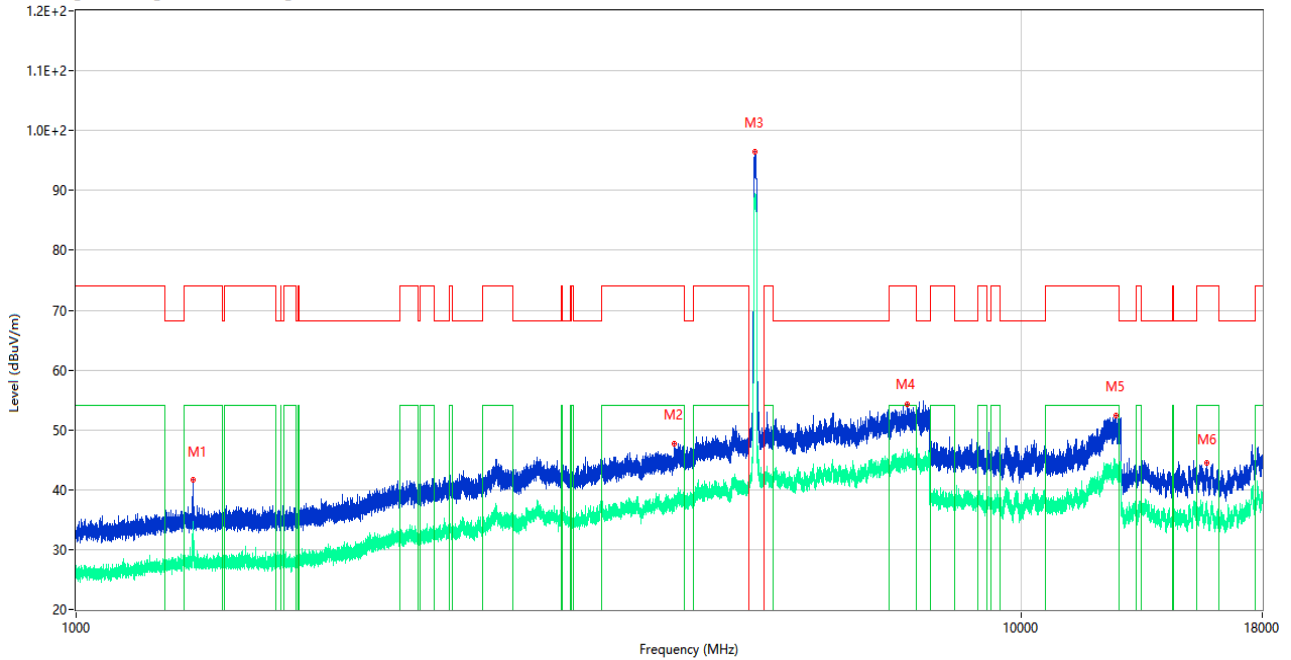
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1441.200	40.54	-19.85	74.0	33.46	Peak	193.00	200	Horizontal	Pass
1**	1441.200	28.81	-19.85	54.0	25.19	AV	193.00	200	Horizontal	Pass
2	4332.250	47.74	-5.32	74.0	26.26	Peak	75.00	100	Horizontal	Pass
2**	4332.250	40.71	-5.32	54.0	13.29	AV	75.00	100	Horizontal	Pass
3	5238.500	104.77	-5.23	--	--	Peak	36.00	200	Horizontal	N/A
3**	5238.500	97.55	-5.23	--	--	AV	36.00	200	Horizontal	N/A
4	7580.250	54.69	0.18	74.0	19.31	Peak	113.00	400	Horizontal	Pass
4**	7580.250	45.97	0.18	54.0	8.03	AV	113.00	400	Horizontal	Pass
5	12332.474	52.56	0.71	74.0	21.44	Peak	230.00	200	Horizontal	Pass
5**	12332.474	43.40	0.71	54.0	10.60	AV	230.00	200	Horizontal	Pass
6	15556.125	45.56	1.45	74.0	28.44	Peak	221.00	400	Horizontal	Pass
6**	15556.125	37.10	1.45	54.0	16.90	AV	221.00	400	Horizontal	Pass

11n40, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT V

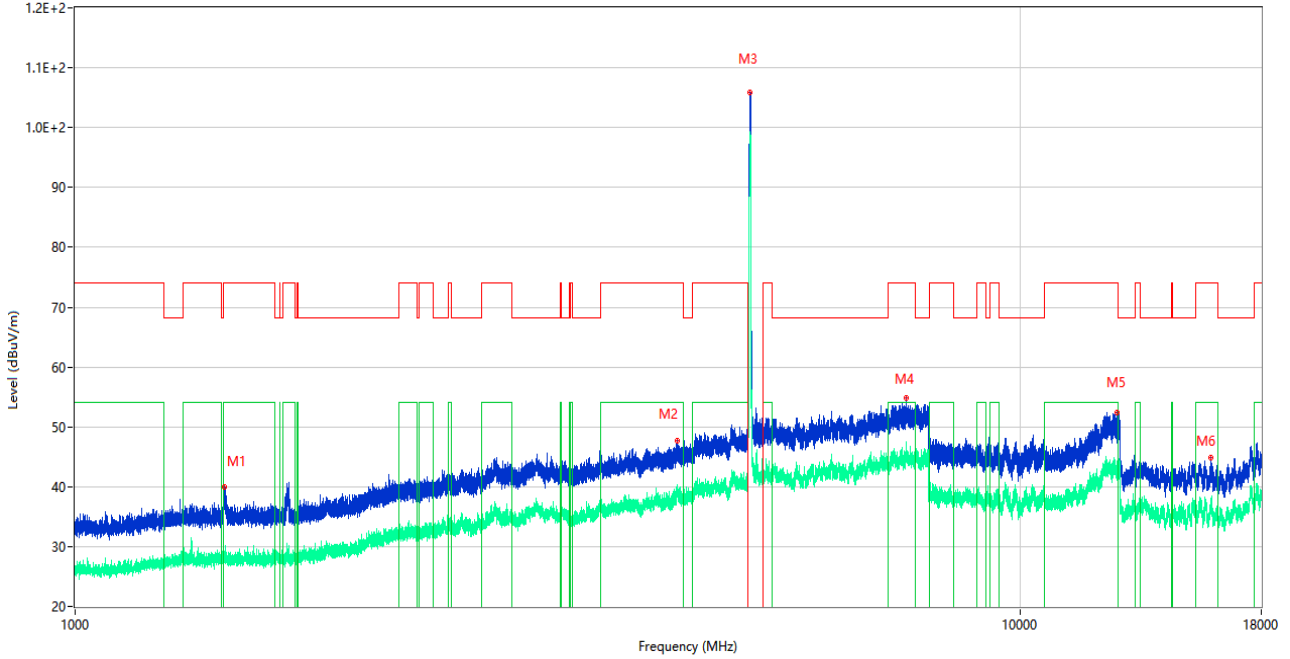
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.300	41.65	-19.18	74.0	32.35	Peak	120.00	100	Vertical	Pass
1**	1330.300	30.59	-19.18	54.0	23.41	AV	120.00	100	Vertical	Pass
2	4298.250	47.63	-5.76	74.0	26.37	Peak	177.00	200	Vertical	Pass
2**	4298.250	38.44	-5.76	54.0	15.56	AV	177.00	200	Vertical	Pass
3	5232.750	96.44	-4.96	--	--	Peak	272.00	100	Vertical	N/A
3**	5232.750	88.39	-4.96	--	--	AV	272.00	100	Vertical	N/A
4	7582.750	54.26	0.29	74.0	19.74	Peak	118.00	200	Vertical	Pass
4**	7582.750	46.80	0.29	54.0	7.20	AV	118.00	200	Vertical	Pass
5	12591.350	52.35	1.23	74.0	21.65	Peak	0.00	100	Vertical	Pass
5**	12591.350	42.92	1.23	54.0	11.08	AV	0.00	100	Vertical	Pass
6	15713.625	44.55	2.52	74.0	29.45	Peak	254.00	200	Vertical	Pass
6**	15713.625	37.99	2.52	54.0	16.01	AV	254.00	200	Vertical	Pass

11ac20, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT H

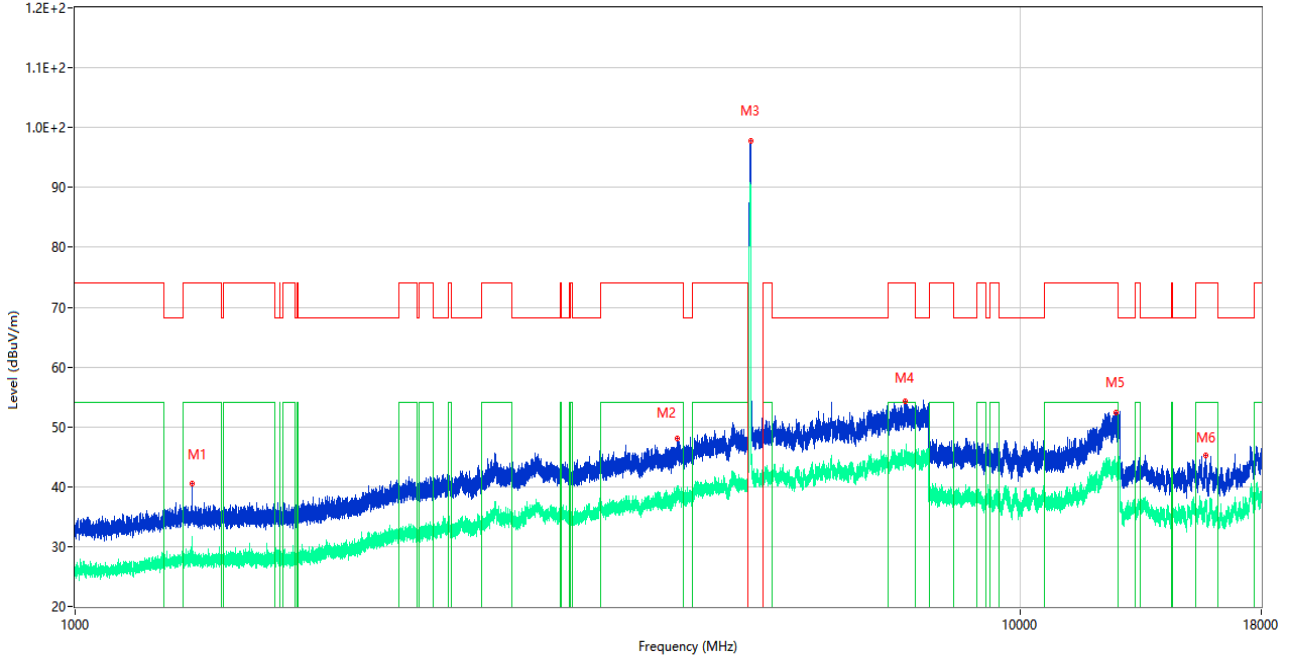
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1438.300	39.95	-19.67	74.0	34.05	Peak	193.00	200	Horizontal	Pass
1**	1438.300	28.27	-19.67	54.0	25.73	AV	193.00	200	Horizontal	Pass
2	4333.500	47.65	-5.47	74.0	26.35	Peak	360.00	200	Horizontal	Pass
2**	4333.500	39.34	-5.47	54.0	14.66	AV	360.00	200	Horizontal	Pass
3	5182.250	105.94	-4.31	--	--	Peak	34.00	200	Horizontal	N/A
3**	5182.250	98.53	-4.31	--	--	AV	34.00	200	Horizontal	N/A
4	7572.250	54.79	-0.55	74.0	19.21	Peak	162.00	300	Horizontal	Pass
4**	7572.250	45.76	-0.55	54.0	8.24	AV	162.00	300	Horizontal	Pass
5	12668.537	52.43	0.64	74.0	21.57	Peak	41.00	150	Horizontal	Pass
5**	12668.537	42.18	0.64	54.0	11.82	AV	41.00	150	Horizontal	Pass
6	15900.000	44.80	2.50	74.0	29.20	Peak	58.00	300	Horizontal	Pass
6**	15900.000	36.05	2.50	54.0	17.95	AV	58.00	300	Horizontal	Pass

11ac20, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT V

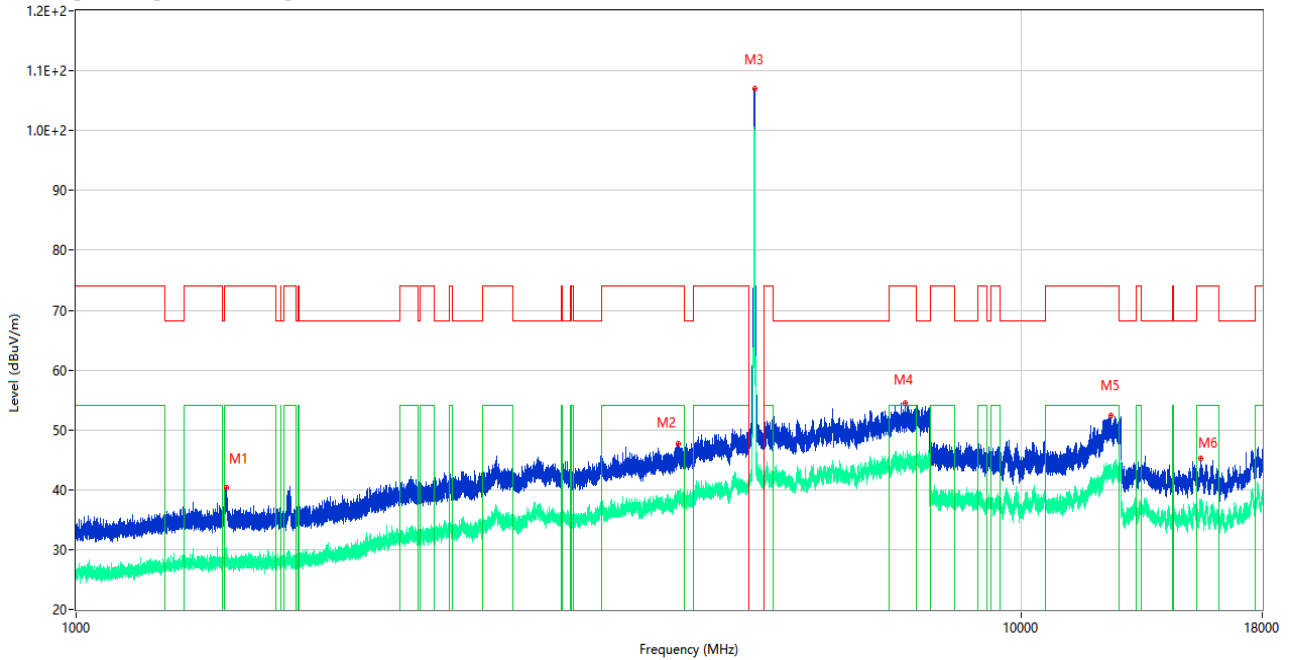
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.800	40.54	-19.60	74.0	33.46	Peak	113.00	100	Vertical	Pass
1**	1329.800	27.67	-19.60	54.0	26.33	AV	113.00	100	Vertical	Pass
2	4333.500	48.09	-5.47	74.0	25.91	Peak	197.00	200	Vertical	Pass
2**	4333.500	39.74	-5.47	54.0	14.26	AV	197.00	200	Vertical	Pass
3	5187.000	97.78	-4.37	--	--	Peak	271.00	150	Vertical	N/A
3**	5187.000	89.46	-4.37	--	--	AV	271.00	150	Vertical	N/A
4	7567.000	54.30	-1.14	74.0	19.70	Peak	326.00	100	Vertical	Pass
4**	7567.000	44.26	-1.14	54.0	9.74	AV	326.00	100	Vertical	Pass
5	12637.662	52.46	0.83	74.0	21.54	Peak	330.00	200	Vertical	Pass
5**	12637.662	42.76	0.83	54.0	11.24	AV	330.00	200	Vertical	Pass
6	15717.562	45.24	2.43	74.0	28.76	Peak	158.00	300	Vertical	Pass
6**	15717.562	36.11	2.43	54.0	17.89	AV	158.00	300	Vertical	Pass

11ac20, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT H

RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz

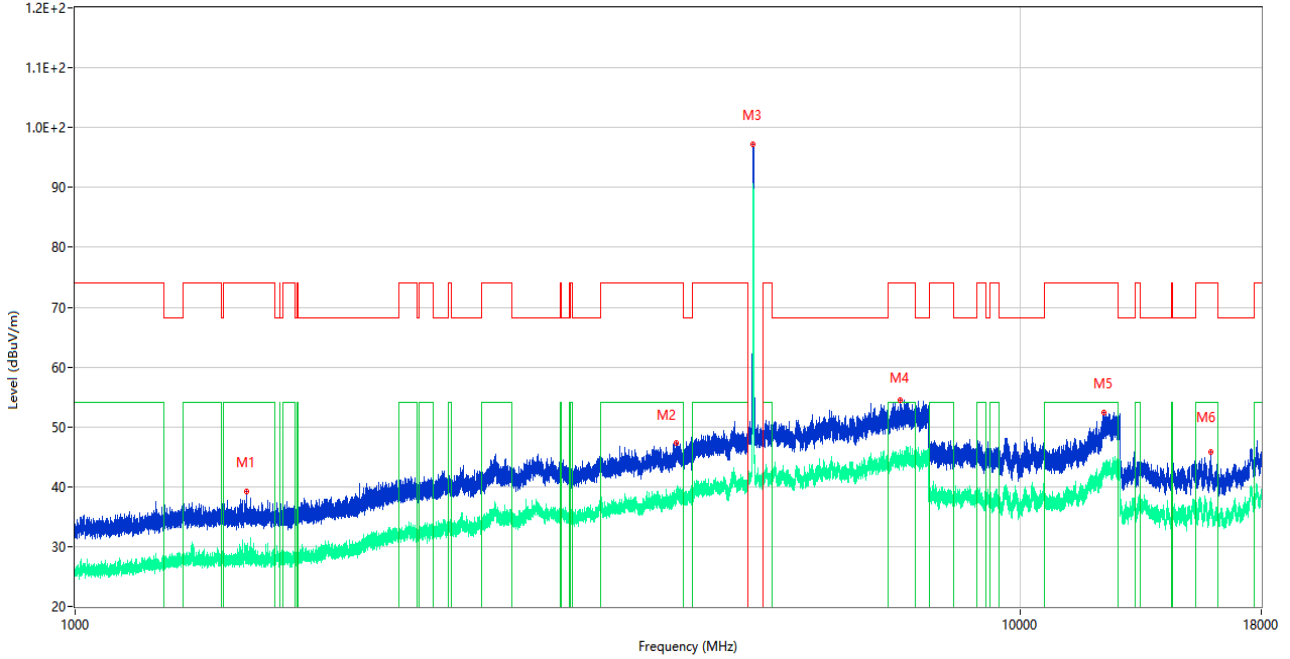


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.900	40.30	-19.64	74.0	33.70	Peak	163.00	200	Horizontal	Pass
1**	1440.900	28.80	-19.64	54.0	25.20	AV	163.00	200	Horizontal	Pass
2	4332.250	47.74	-5.32	74.0	26.26	Peak	87.00	400	Horizontal	Pass
2**	4332.250	39.67	-5.32	54.0	14.33	AV	87.00	400	Horizontal	Pass
3	5223.000	106.97	-4.86	--	--	Peak	33.00	200	Horizontal	N/A
3**	5223.000	99.56	-4.86	--	--	AV	33.00	200	Horizontal	N/A
4	7545.250	54.53	-0.76	74.0	19.47	Peak	161.00	300	Horizontal	Pass
4**	7545.250	45.11	-0.76	54.0	8.89	AV	161.00	300	Horizontal	Pass
5	12459.537	52.45	0.82	74.0	21.55	Peak	63.00	100	Horizontal	Pass
5**	12459.537	43.71	0.82	54.0	10.29	AV	63.00	100	Horizontal	Pass
6	15487.875	45.18	2.78	74.0	28.82	Peak	0.00	200	Horizontal	Pass
6**	15487.875	38.28	2.78	54.0	15.72	AV	0.00	200	Horizontal	Pass



11ac20, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT V

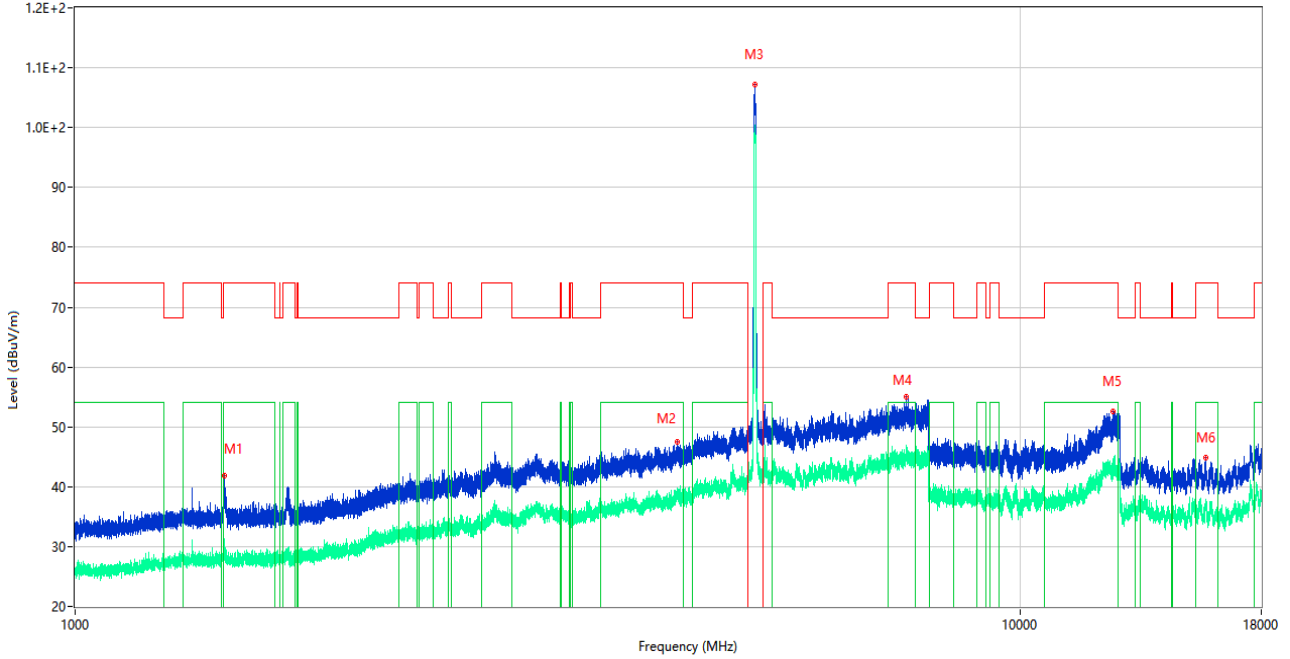
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1519.300	39.16	-19.13	74.0	34.84	Peak	251.00	200	Vertical	Pass
1**	1519.300	27.56	-19.13	54.0	26.44	AV	251.00	200	Vertical	Pass
2	4326.750	47.37	-6.71	74.0	26.63	Peak	179.00	200	Vertical	Pass
2**	4326.750	38.21	-6.71	54.0	15.79	AV	179.00	200	Vertical	Pass
3	5220.250	97.13	-4.89	--	--	Peak	235.00	200	Vertical	N/A
3**	5220.250	89.85	-4.89	--	--	AV	235.00	200	Vertical	N/A
4	7472.000	54.49	-1.00	74.0	19.51	Peak	15.00	100	Vertical	Pass
4**	7472.000	44.61	-1.00	54.0	9.39	AV	15.00	100	Vertical	Pass
5	12278.088	52.37	0.53	74.0	21.63	Peak	357.00	200	Vertical	Pass
5**	12278.088	42.29	0.53	54.0	11.71	AV	357.00	200	Vertical	Pass
6	15911.812	45.71	2.58	74.0	28.29	Peak	253.00	400	Vertical	Pass
6**	15911.812	38.01	2.58	54.0	15.99	AV	253.00	400	Vertical	Pass

11ac20, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT H

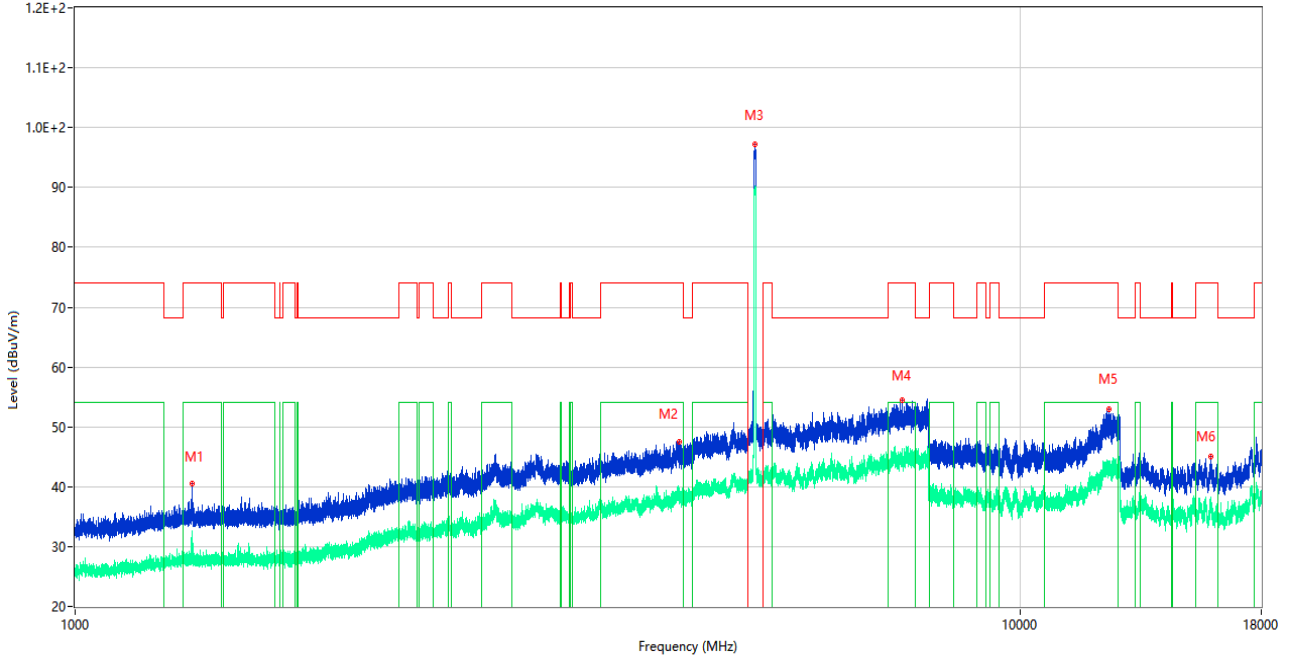
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1437.500	41.87	-19.89	74.0	32.13	Peak	82.00	400	Horizontal	Pass
1**	1437.500	29.18	-19.89	54.0	24.82	AV	82.00	400	Horizontal	Pass
2	4342.500	47.56	-5.70	74.0	26.44	Peak	149.00	300	Horizontal	Pass
2**	4342.500	38.62	-5.70	54.0	15.38	AV	149.00	300	Horizontal	Pass
3	5240.250	107.23	-5.14	--	--	Peak	34.00	150	Horizontal	N/A
3**	5240.250	99.33	-5.14	--	--	AV	34.00	150	Horizontal	N/A
4	7581.000	54.97	-0.16	74.0	19.03	Peak	188.00	200	Horizontal	Pass
4**	7581.000	45.73	-0.16	54.0	8.27	AV	188.00	200	Horizontal	Pass
5	12550.737	52.65	1.60	74.0	21.35	Peak	10.00	200	Horizontal	Pass
5**	12550.737	43.38	1.60	54.0	10.62	AV	10.00	200	Horizontal	Pass
6	15734.625	44.78	2.04	74.0	29.22	Peak	126.00	300	Horizontal	Pass
6**	15734.625	36.77	2.04	54.0	17.23	AV	126.00	300	Horizontal	Pass

11ac20, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT V

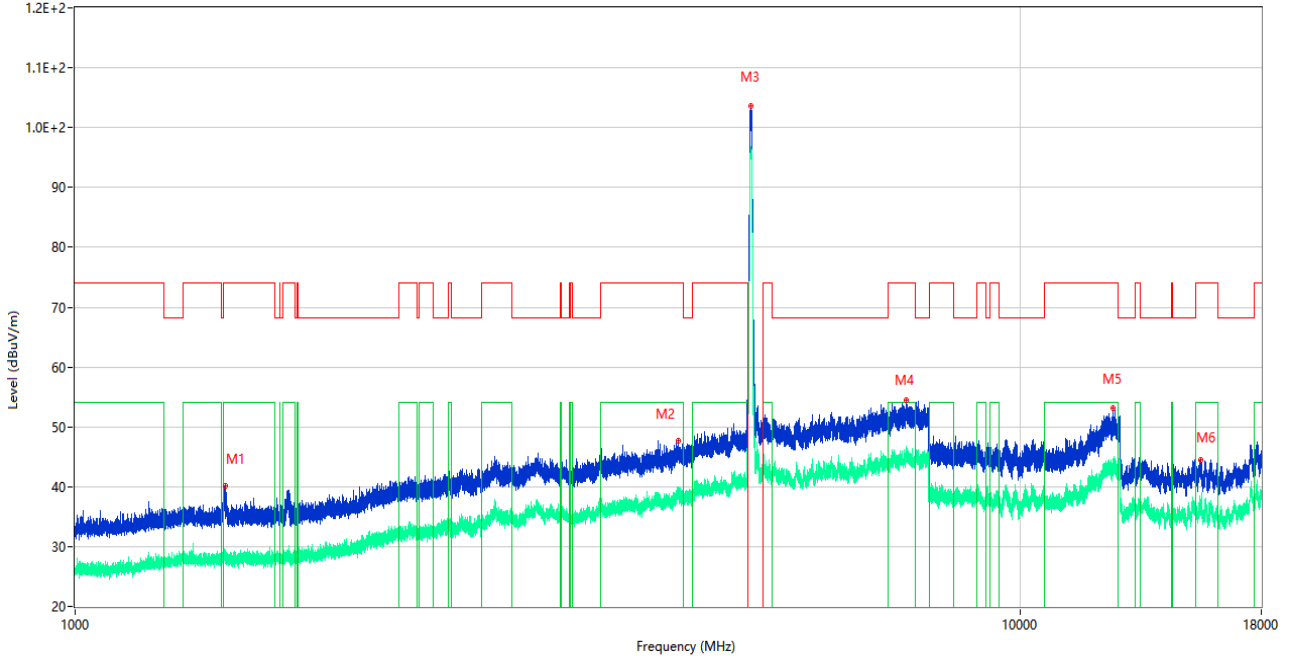
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.100	40.59	-19.08	74.0	33.41	Peak	295.00	300	Vertical	Pass
1**	1330.100	30.40	-19.08	54.0	23.60	AV	295.00	300	Vertical	Pass
2	4357.000	47.55	-6.26	74.0	26.45	Peak	294.00	300	Vertical	Pass
2**	4357.000	38.39	-6.26	54.0	15.61	AV	294.00	300	Vertical	Pass
3	5236.000	97.15	-5.20	--	--	Peak	276.00	100	Vertical	N/A
3**	5236.000	89.55	-5.20	--	--	AV	276.00	100	Vertical	N/A
4	7503.250	54.54	-0.71	74.0	19.46	Peak	331.00	300	Vertical	Pass
4**	7503.250	44.62	-0.71	54.0	9.38	AV	331.00	300	Vertical	Pass
5	12422.013	52.96	0.56	74.0	21.04	Peak	56.00	200	Vertical	Pass
5**	12422.013	43.03	0.56	54.0	10.97	AV	56.00	200	Vertical	Pass
6	15918.375	44.96	2.63	74.0	29.04	Peak	343.00	300	Vertical	Pass
6**	15918.375	38.35	2.63	54.0	15.65	AV	343.00	300	Vertical	Pass

11ac40, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT H

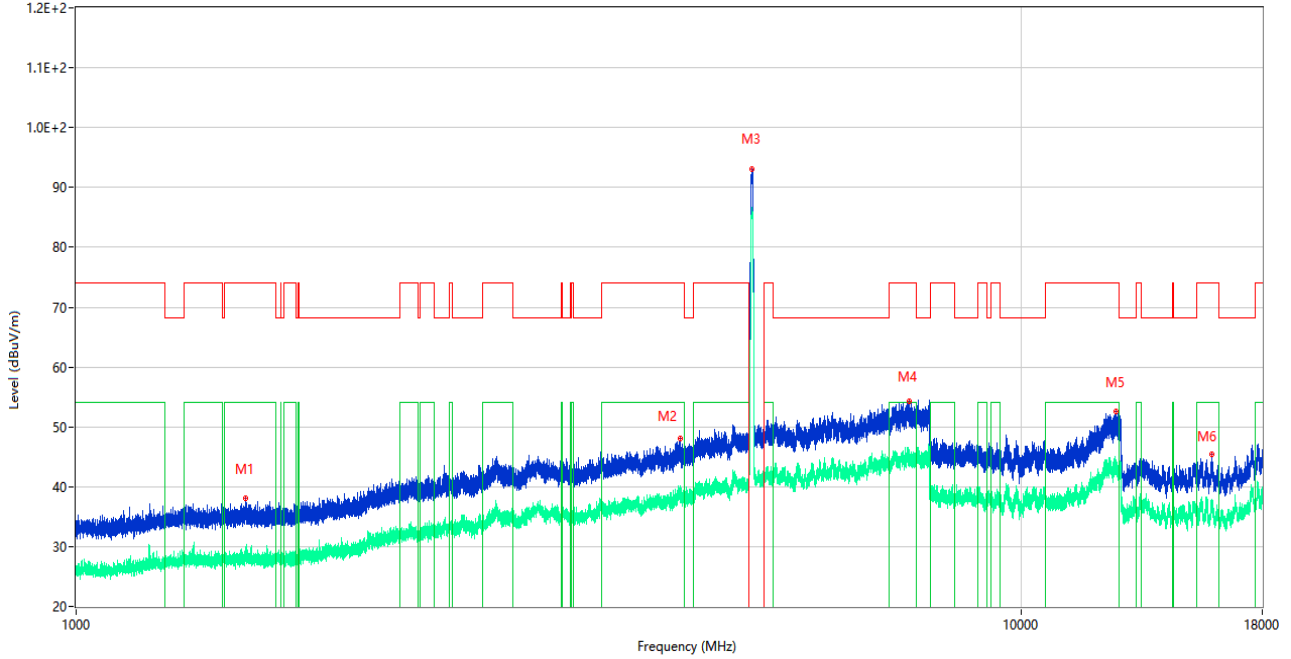
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.700	40.12	-19.57	74.0	33.88	Peak	192.00	100	Horizontal	Pass
1**	1440.700	28.18	-19.57	54.0	25.82	AV	192.00	100	Horizontal	Pass
2	4349.250	47.67	-5.42	74.0	26.33	Peak	304.00	100	Horizontal	Pass
2**	4349.250	38.83	-5.42	54.0	15.17	AV	304.00	100	Horizontal	Pass
3	5187.500	103.55	-4.29	--	--	Peak	32.00	200	Horizontal	N/A
3**	5187.500	96.56	-4.29	--	--	AV	32.00	200	Horizontal	N/A
4	7579.250	54.46	0.11	74.0	19.54	Peak	177.00	400	Horizontal	Pass
4**	7579.250	46.21	0.11	54.0	7.79	AV	177.00	400	Horizontal	Pass
5	12552.875	53.09	1.58	74.0	20.91	Peak	234.00	100	Horizontal	Pass
5**	12552.875	43.00	1.58	54.0	11.00	AV	234.00	100	Horizontal	Pass
6	15540.375	44.56	1.90	74.0	29.44	Peak	0.00	100	Horizontal	Pass
6**	15540.375	37.30	1.90	54.0	16.70	AV	0.00	100	Horizontal	Pass

11ac40, U-NII-1, 1 GHz to 18 GHz, Low Channel, ANT V

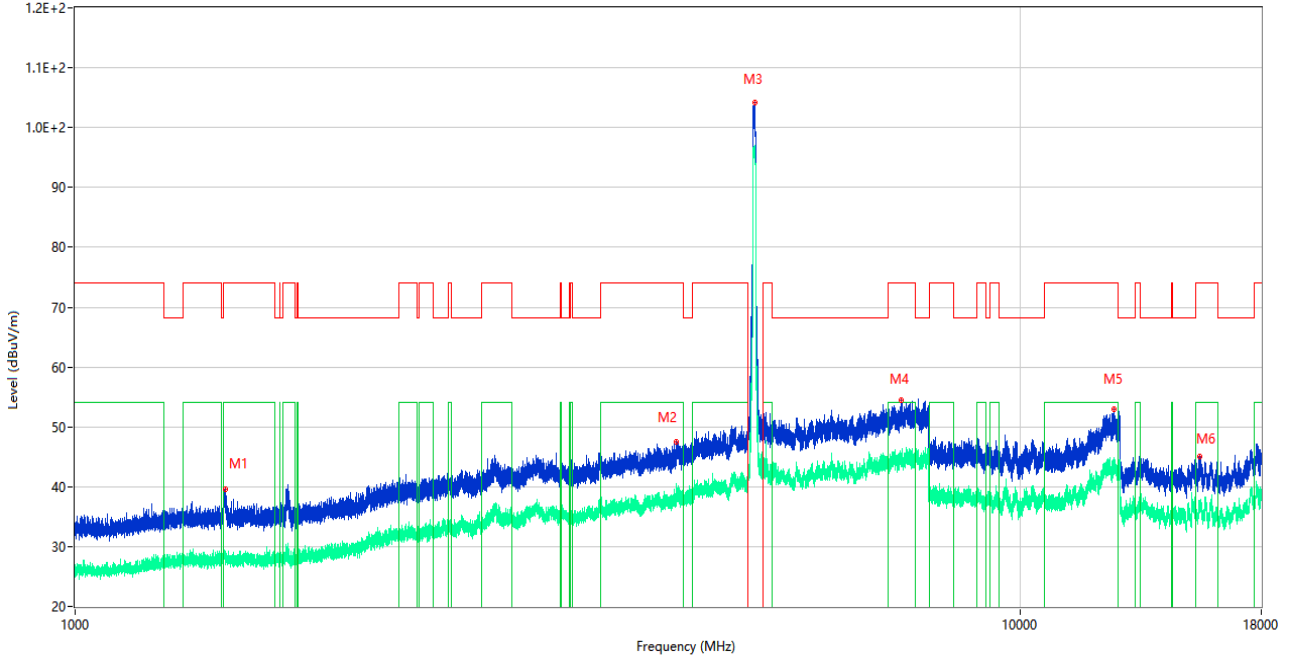
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1511.100	38.02	-18.99	74.0	35.98	Peak	268.00	400	Vertical	Pass
1**	1511.100	29.02	-18.99	54.0	24.98	AV	268.00	400	Vertical	Pass
2	4357.000	47.98	-6.26	74.0	26.02	Peak	325.00	200	Vertical	Pass
2**	4357.000	39.51	-6.26	54.0	14.49	AV	325.00	200	Vertical	Pass
3	5187.250	93.14	-4.30	--	--	Peak	289.00	100	Vertical	N/A
3**	5187.250	86.76	-4.30	--	--	AV	289.00	100	Vertical	N/A
4	7619.500	54.25	-0.71	74.0	19.75	Peak	34.00	300	Vertical	Pass
4**	7619.500	45.99	-0.71	54.0	8.01	AV	34.00	300	Vertical	Pass
5	12614.150	52.49	1.03	74.0	21.51	Peak	145.00	100	Vertical	Pass
5**	12614.150	43.59	1.03	54.0	10.41	AV	145.00	100	Vertical	Pass
6	15918.375	45.46	2.63	74.0	28.54	Peak	0.00	100	Vertical	Pass
6**	15918.375	37.60	2.63	54.0	16.40	AV	0.00	100	Vertical	Pass

11ac40, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT H

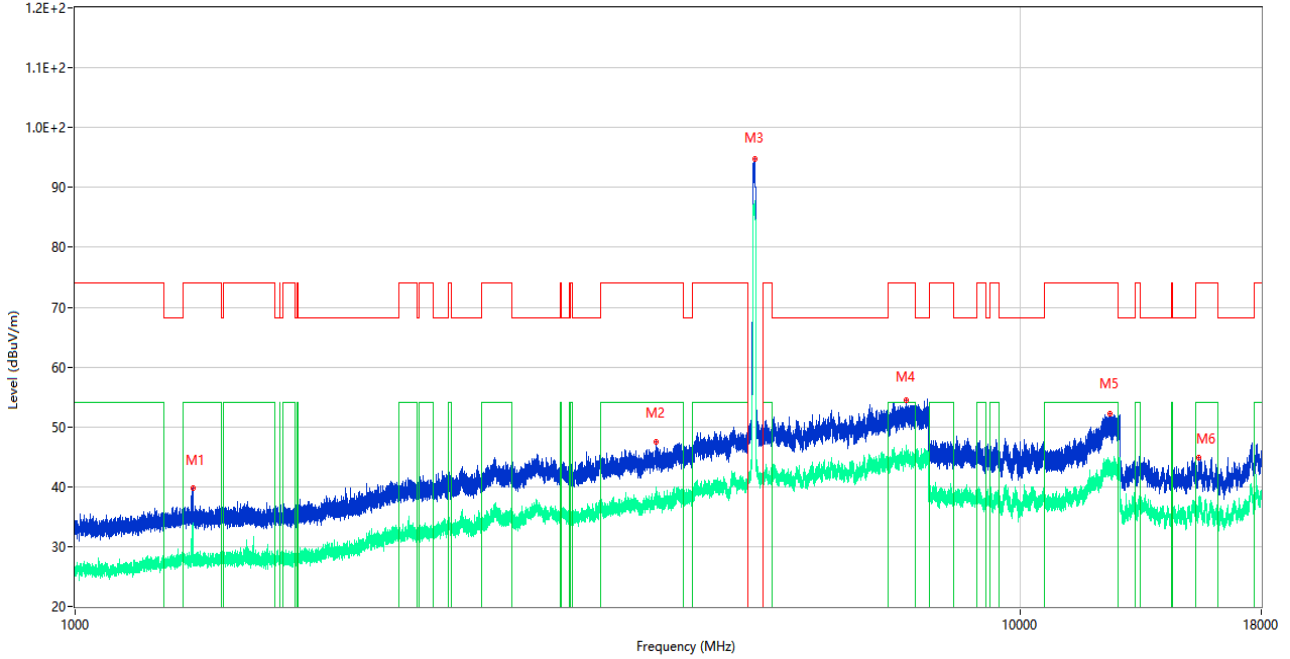
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.900	39.55	-19.64	74.0	34.45	Peak	197.00	100	Horizontal	Pass
1**	1440.900	29.07	-19.64	54.0	24.93	AV	197.00	100	Horizontal	Pass
2	4330.000	47.42	-5.88	74.0	26.58	Peak	306.00	300	Horizontal	Pass
2**	4330.000	38.68	-5.88	54.0	15.32	AV	306.00	300	Horizontal	Pass
3	5235.500	104.09	-5.10	--	--	Peak	33.00	150	Horizontal	N/A
3**	5235.500	95.83	-5.10	--	--	AV	33.00	150	Horizontal	N/A
4	7480.500	54.37	-0.74	74.0	19.63	Peak	198.00	200	Horizontal	Pass
4**	7480.500	45.03	-0.74	54.0	8.97	AV	198.00	200	Horizontal	Pass
5	12576.862	53.02	1.36	74.0	20.98	Peak	342.00	200	Horizontal	Pass
5**	12576.862	43.67	1.36	54.0	10.33	AV	342.00	200	Horizontal	Pass
6	15487.875	44.96	2.78	74.0	29.04	Peak	276.00	400	Horizontal	Pass
6**	15487.875	37.77	2.78	54.0	16.23	AV	276.00	400	Horizontal	Pass

11ac40, U-NII-1, 1 GHz to 18 GHz, High Channel, ANT V

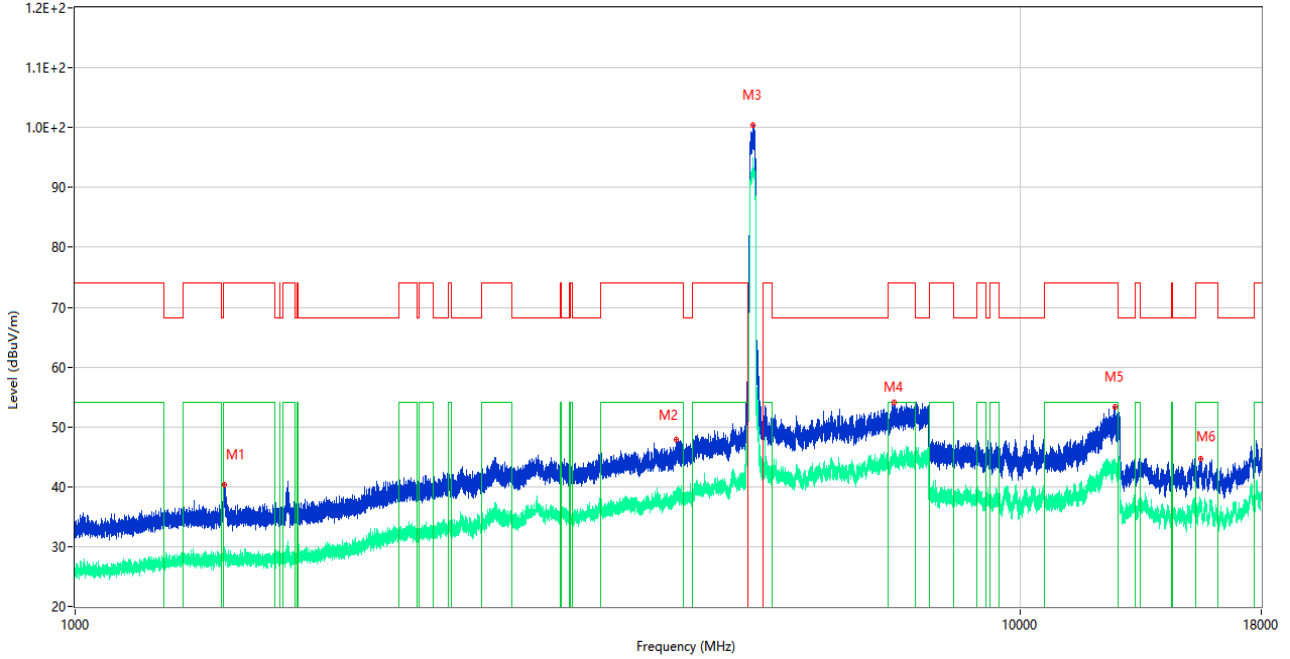
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1332.500	39.75	-19.88	74.0	34.25	Peak	285.00	200	Vertical	Pass
1**	1332.500	31.10	-19.88	54.0	22.90	AV	285.00	200	Vertical	Pass
2	4124.000	47.41	-6.43	74.0	26.59	Peak	279.00	300	Vertical	Pass
2**	4124.000	39.98	-6.43	54.0	14.02	AV	279.00	300	Vertical	Pass
3	5235.250	94.84	-5.26	--	--	Peak	279.00	100	Vertical	N/A
3**	5235.250	86.59	-5.26	--	--	AV	279.00	100	Vertical	N/A
4	7578.750	54.41	0.13	74.0	19.59	Peak	333.00	200	Vertical	Pass
4**	7578.750	45.89	0.13	54.0	8.11	AV	333.00	200	Vertical	Pass
5	12457.400	52.25	0.83	74.0	21.75	Peak	31.00	200	Vertical	Pass
5**	12457.400	43.45	0.83	54.0	10.55	AV	31.00	200	Vertical	Pass
6	15449.813	44.84	3.10	74.0	29.16	Peak	215.00	400	Vertical	Pass
6**	15449.813	36.53	3.10	54.0	17.47	AV	215.00	400	Vertical	Pass

11ac80, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT H

RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz

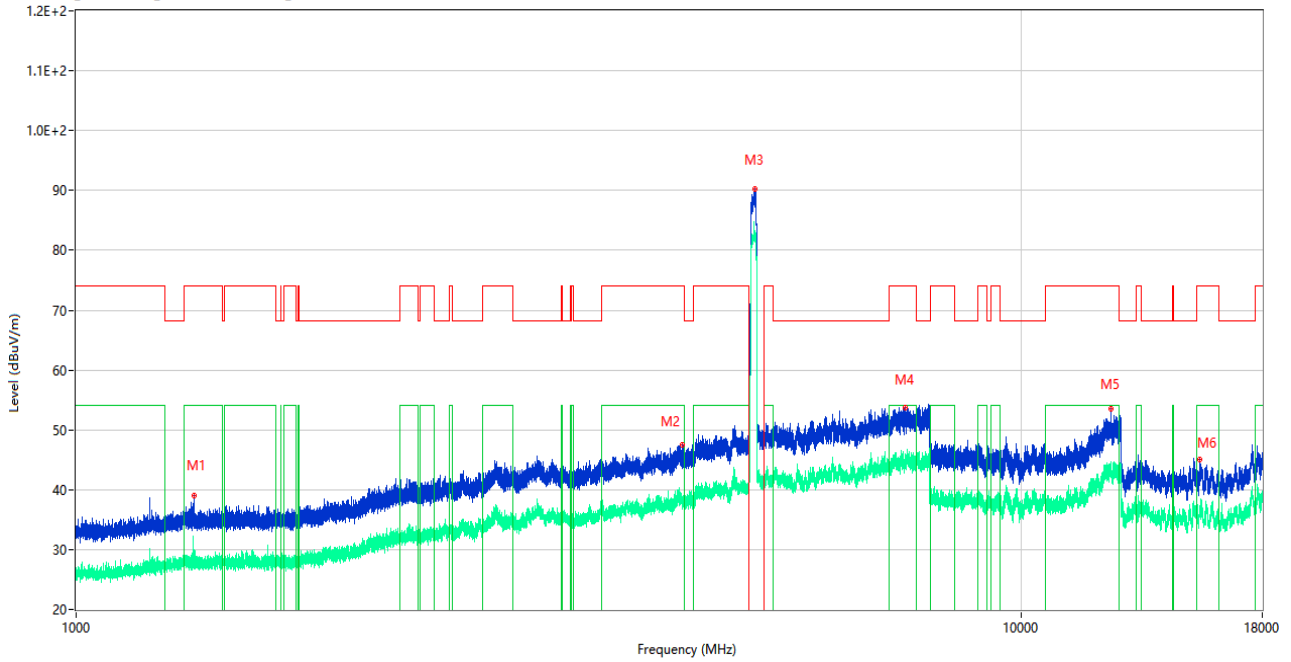


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1437.900	40.33	-19.65	74.0	33.67	Peak	202.00	200	Horizontal	Pass
1**	1437.900	28.20	-19.65	54.0	25.80	AV	202.00	200	Horizontal	Pass
2	4331.000	47.89	-5.42	74.0	26.11	Peak	124.00	100	Horizontal	Pass
2**	4331.000	39.54	-5.42	54.0	14.46	AV	124.00	100	Horizontal	Pass
3	5219.500	100.46	-4.98	--	--	Peak	34.00	150	Horizontal	N/A
3**	5219.500	93.72	-4.98	--	--	AV	34.00	150	Horizontal	N/A
4	7366.500	54.13	-0.54	74.0	19.87	Peak	253.00	100	Horizontal	Pass
4**	7366.500	45.83	-0.54	54.0	8.17	AV	253.00	100	Horizontal	Pass
5	12612.250	53.36	1.05	74.0	20.64	Peak	241.00	150	Horizontal	Pass
5**	12612.250	43.47	1.05	54.0	10.53	AV	241.00	150	Horizontal	Pass
6	15519.375	44.58	2.30	74.0	29.42	Peak	14.00	100	Horizontal	Pass
6**	15519.375	36.73	2.30	54.0	17.27	AV	14.00	100	Horizontal	Pass



11ac80, U-NII-1, 1 GHz to 18 GHz, Middle Channel, ANT V

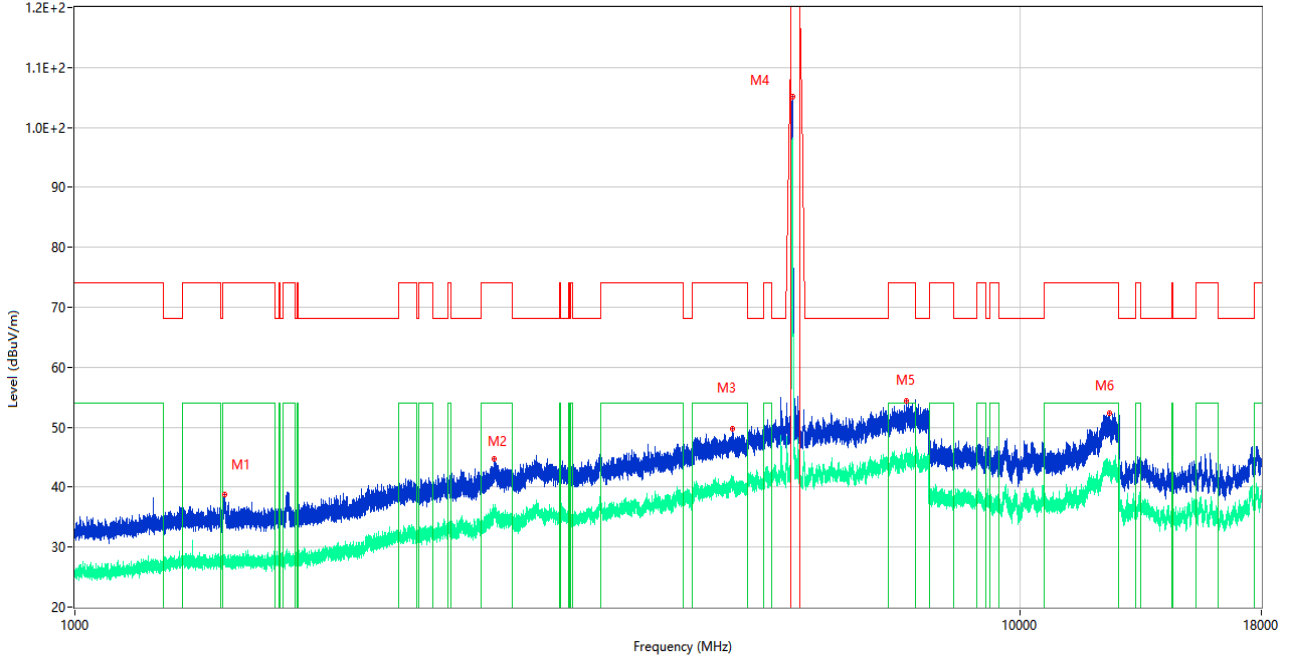
RE Test case\_FCC Part 15E\_FCC 15.407(5.15-5.35)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1332.700	38.96	-19.82	74.0	35.04	Peak	111.00	100	Vertical	Pass
1**	1332.700	29.91	-19.82	54.0	24.09	AV	111.00	100	Vertical	Pass
2	4378.250	47.53	-6.40	74.0	26.47	Peak	125.00	200	Vertical	Pass
2**	4378.250	38.69	-6.40	54.0	15.31	AV	125.00	200	Vertical	Pass
3	5223.000	90.17	-4.86	--	--	Peak	281.00	100	Vertical	N/A
3**	5223.000	82.97	-4.86	--	--	AV	281.00	100	Vertical	N/A
4	7541.500	53.71	-1.46	74.0	20.29	Peak	300.00	300	Vertical	Pass
4**	7541.500	44.76	-1.46	54.0	9.24	AV	300.00	300	Vertical	Pass
5	12435.313	53.57	0.72	74.0	20.43	Peak	2.00	150	Vertical	Pass
5**	12435.313	42.61	0.72	54.0	11.39	AV	2.00	150	Vertical	Pass
6	15465.562	45.09	2.97	74.0	28.91	Peak	346.00	300	Vertical	Pass
6**	15465.562	37.39	2.97	54.0	16.61	AV	346.00	300	Vertical	Pass

11a, U-NII-3, 1 GHz to 18 GHz, Low Channel, ANT H

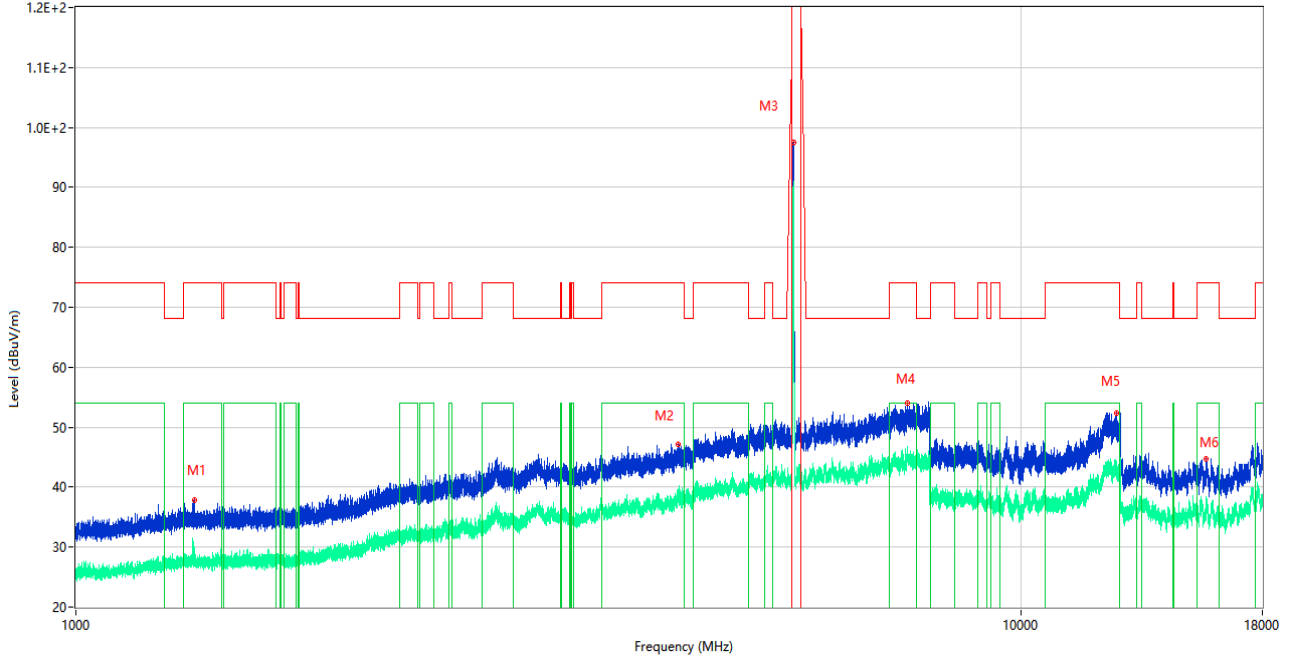
RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.500	38.79	-19.51	74.0	35.21	Peak	177.00	300	Horizontal	Pass
1**	1440.500	28.15	-19.51	54.0	25.85	AV	177.00	300	Horizontal	Pass
2	2778.900	44.68	-10.36	74.0	29.32	Peak	0.00	100	Horizontal	Pass
2**	2778.900	35.95	-10.36	54.0	18.05	AV	0.00	100	Horizontal	Pass
3	4959.250	49.80	-3.64	74.0	24.20	Peak	0.00	150	Horizontal	Pass
3**	4959.250	40.47	-3.64	54.0	13.53	AV	0.00	150	Horizontal	Pass
4	5746.500	105.18	-6.13	--	--	Peak	0.00	150	Horizontal	N/A
4**	5746.500	97.64	-6.13	--	--	AV	0.00	150	Horizontal	N/A
5	7583.250	54.46	-0.08	74.0	19.54	Peak	234.00	100	Horizontal	Pass
5**	7583.250	46.06	-0.08	54.0	7.94	AV	234.00	100	Horizontal	Pass
6	12427.713	52.37	0.63	74.0	21.63	Peak	164.00	400	Horizontal	Pass
6**	12427.713	43.11	0.63	54.0	10.89	AV	164.00	400	Horizontal	Pass

11a, U-NII-3, 1 GHz to 18 GHz, Low Channel, ANT V

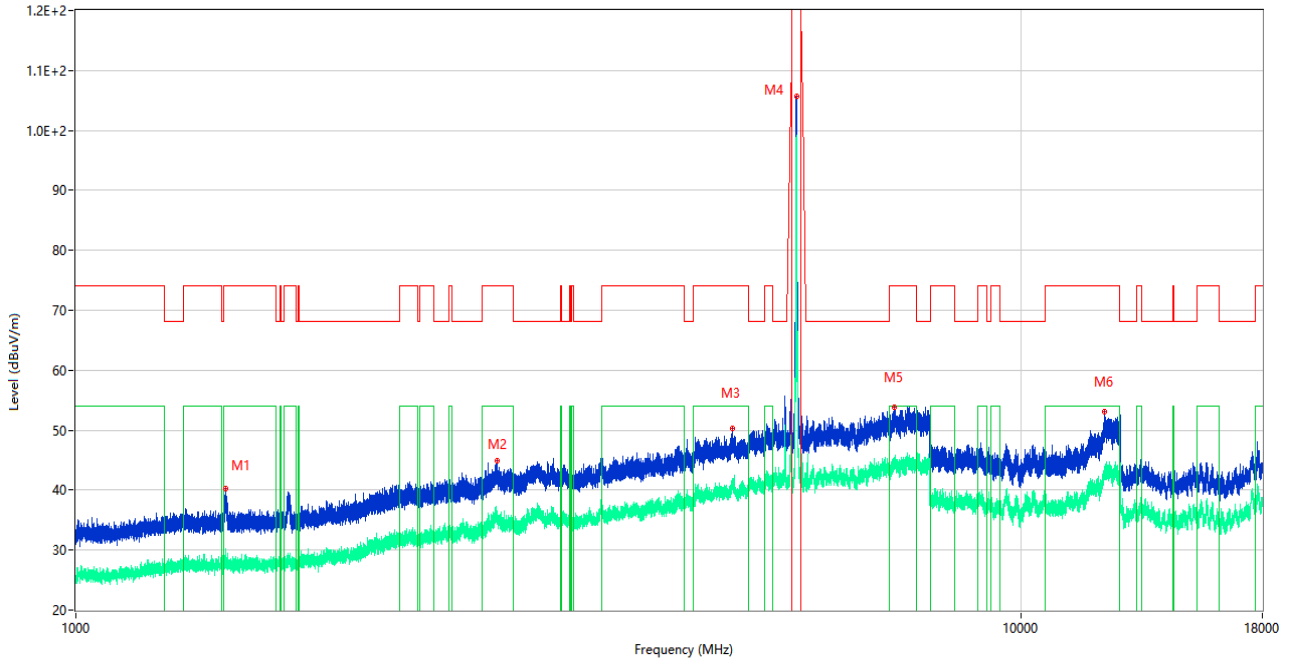
RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1333.700	37.78	-19.41	74.0	36.22	Peak	122.00	400	Vertical	Pass
1**	1333.700	27.61	-19.41	54.0	26.39	AV	122.00	400	Vertical	Pass
2	4333.250	47.17	-5.74	74.0	26.83	Peak	35.00	100	Vertical	Pass
2**	4333.250	38.33	-5.74	54.0	15.67	AV	35.00	100	Vertical	Pass
3	5746.750	97.48	-5.92	--	--	Peak	267.00	100	Vertical	N/A
3**	5746.750	90.07	-5.92	--	--	AV	267.00	100	Vertical	N/A
4	7582.750	53.96	0.29	74.0	20.04	Peak	53.00	200	Vertical	Pass
4**	7582.750	46.74	0.29	54.0	7.26	AV	53.00	200	Vertical	Pass
5	12608.687	52.42	1.08	74.0	21.58	Peak	159.00	200	Vertical	Pass
5**	12608.687	42.86	1.08	54.0	11.14	AV	159.00	200	Vertical	Pass
6	15700.500	44.79	2.81	74.0	29.21	Peak	103.00	100	Vertical	Pass
6**	15700.500	37.70	2.81	54.0	16.30	AV	103.00	100	Vertical	Pass

11a, U-NII-3, 1 GHz to 18 GHz, Middle Channel, ANT H

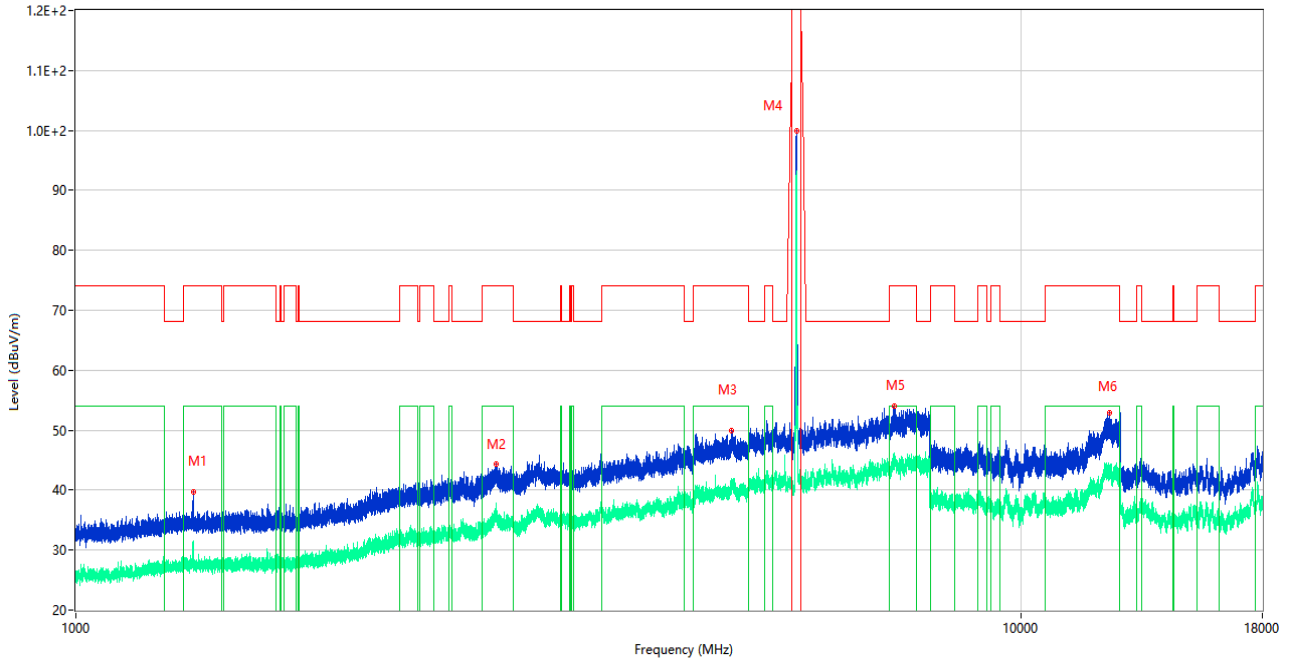
RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1439.400	40.20	-19.64	74.0	33.80	Peak	166.00	150	Horizontal	Pass
1**	1439.400	28.12	-19.64	54.0	25.88	AV	166.00	150	Horizontal	Pass
2	2789.100	44.84	-10.30	74.0	29.16	Peak	214.00	300	Horizontal	Pass
2**	2789.100	36.12	-10.30	54.0	17.88	AV	214.00	300	Horizontal	Pass
3	4953.000	50.31	-3.68	74.0	23.69	Peak	0.00	200	Horizontal	Pass
3**	4953.000	40.59	-3.68	54.0	13.41	AV	0.00	200	Horizontal	Pass
4	5788.500	105.67	-4.43	--	--	Peak	0.00	100	Horizontal	N/A
4**	5788.500	97.84	-4.43	--	--	AV	0.00	100	Horizontal	N/A
5	7351.000	53.90	-1.04	74.0	20.10	Peak	230.00	400	Horizontal	Pass
5**	7351.000	44.24	-1.04	54.0	9.76	AV	230.00	400	Horizontal	Pass
6	12238.662	53.17	0.18	74.0	20.83	Peak	4.00	300	Horizontal	Pass
6**	12238.662	42.78	0.18	54.0	11.22	AV	4.00	300	Horizontal	Pass

11a, U-NII-3, 1 GHz to 18 GHz, Middle Channel, ANT V

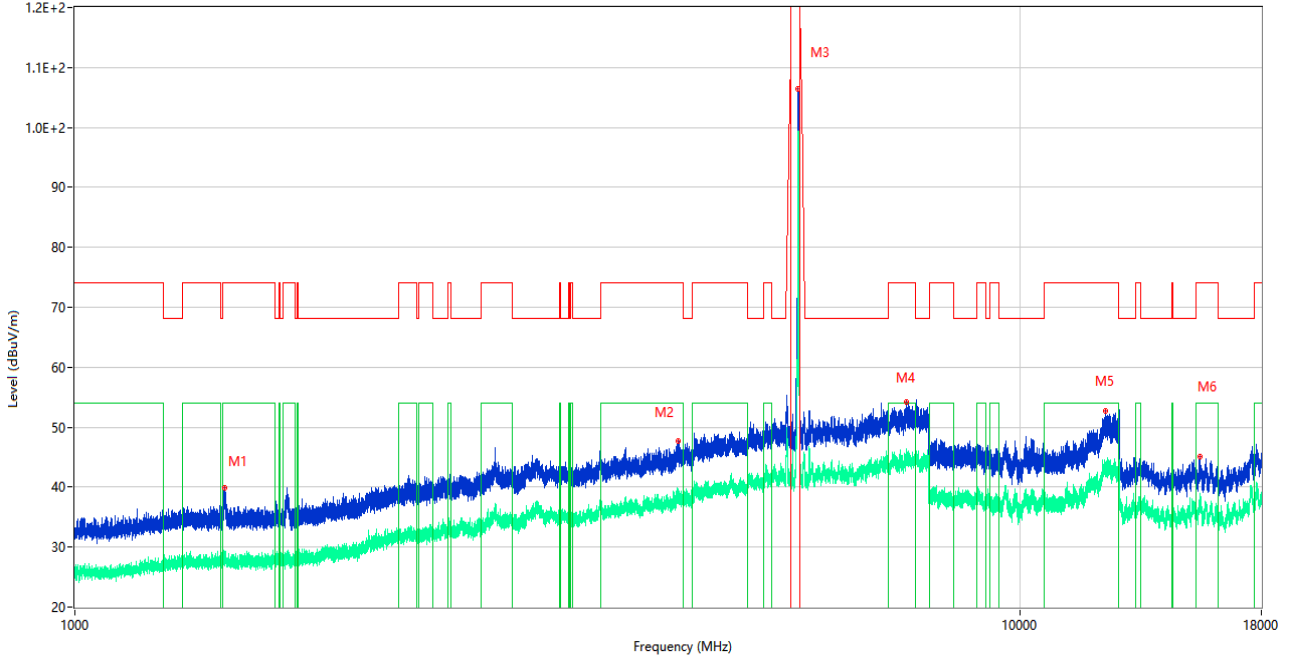
RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1330.600	39.76	-19.33	74.0	34.24	Peak	112.00	200	Vertical	Pass
1**	1330.600	27.73	-19.33	54.0	26.27	AV	112.00	200	Vertical	Pass
2	2782.900	44.42	-9.58	74.0	29.58	Peak	139.00	200	Vertical	Pass
2**	2782.900	36.38	-9.58	54.0	17.62	AV	139.00	200	Vertical	Pass
3	4938.000	49.98	-4.58	74.0	24.02	Peak	68.00	400	Vertical	Pass
3**	4938.000	40.47	-4.58	54.0	13.53	AV	68.00	400	Vertical	Pass
4	5786.250	100.00	-4.56	--	--	Peak	274.00	150	Vertical	N/A
4**	5786.250	92.17	-4.56	--	--	AV	274.00	150	Vertical	N/A
5	7350.750	54.00	-1.00	74.0	20.00	Peak	310.00	300	Vertical	Pass
5**	7350.750	44.36	-1.00	54.0	9.64	AV	310.00	300	Vertical	Pass
6	12395.175	52.83	0.35	74.0	21.17	Peak	108.00	100	Vertical	Pass
6**	12395.175	42.86	0.35	54.0	11.14	AV	108.00	100	Vertical	Pass

11a, U-NII-3, 1 GHz to 18 GHz, High Channel, ANT H

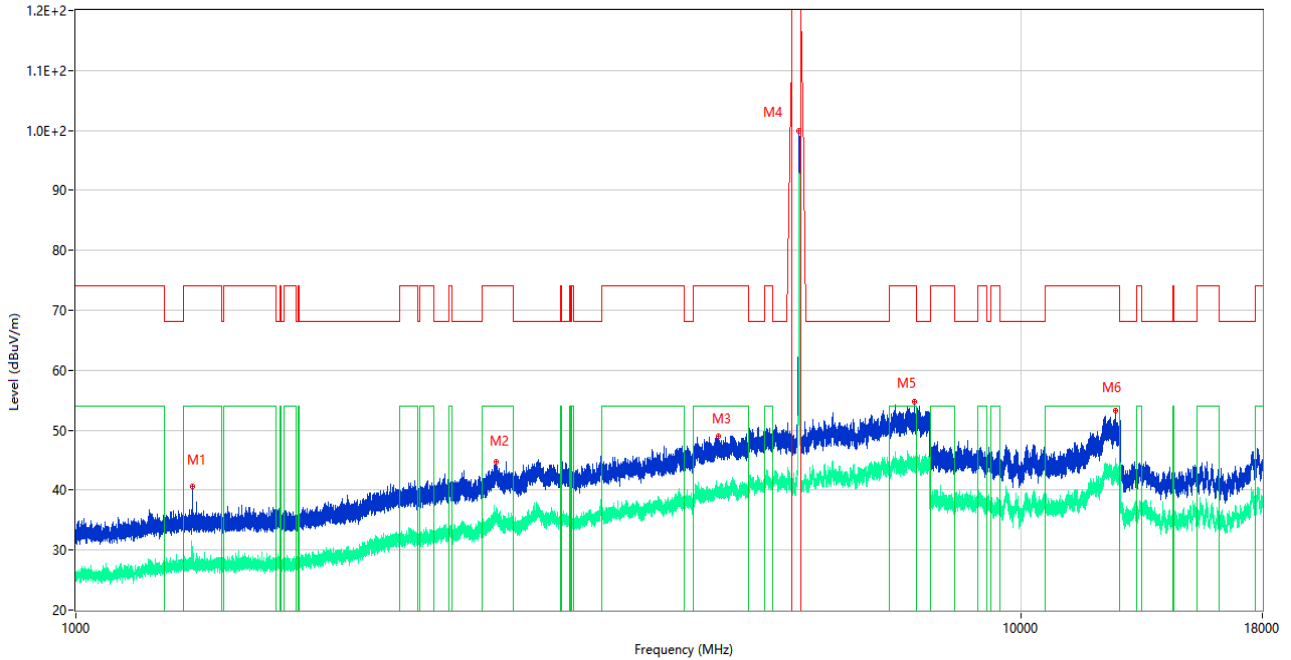
RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1442.200	39.84	-19.58	74.0	34.16	Peak	164.00	200	Horizontal	Pass
1**	1442.200	27.35	-19.58	54.0	26.65	AV	164.00	200	Horizontal	Pass
2	4344.500	47.73	-5.33	74.0	26.27	Peak	274.00	200	Horizontal	Pass
2**	4344.500	39.36	-5.33	54.0	14.64	AV	274.00	200	Horizontal	Pass
3	5826.250	106.42	-4.24	--	--	Peak	2.00	200	Horizontal	N/A
3**	5826.250	98.84	-4.24	--	--	AV	2.00	200	Horizontal	N/A
4	7585.750	54.29	0.05	74.0	19.71	Peak	255.00	300	Horizontal	Pass
4**	7585.750	45.46	0.05	54.0	8.54	AV	255.00	300	Horizontal	Pass
5	12304.925	52.72	0.66	74.0	21.28	Peak	86.00	150	Horizontal	Pass
5**	12304.925	43.48	0.66	54.0	10.52	AV	86.00	150	Horizontal	Pass
6	15483.938	45.06	2.81	74.0	28.94	Peak	110.00	200	Horizontal	Pass
6**	15483.938	37.69	2.81	54.0	16.31	AV	110.00	200	Horizontal	Pass

11a, U-NII-3, 1 GHz to 18 GHz, High Channel, ANT V

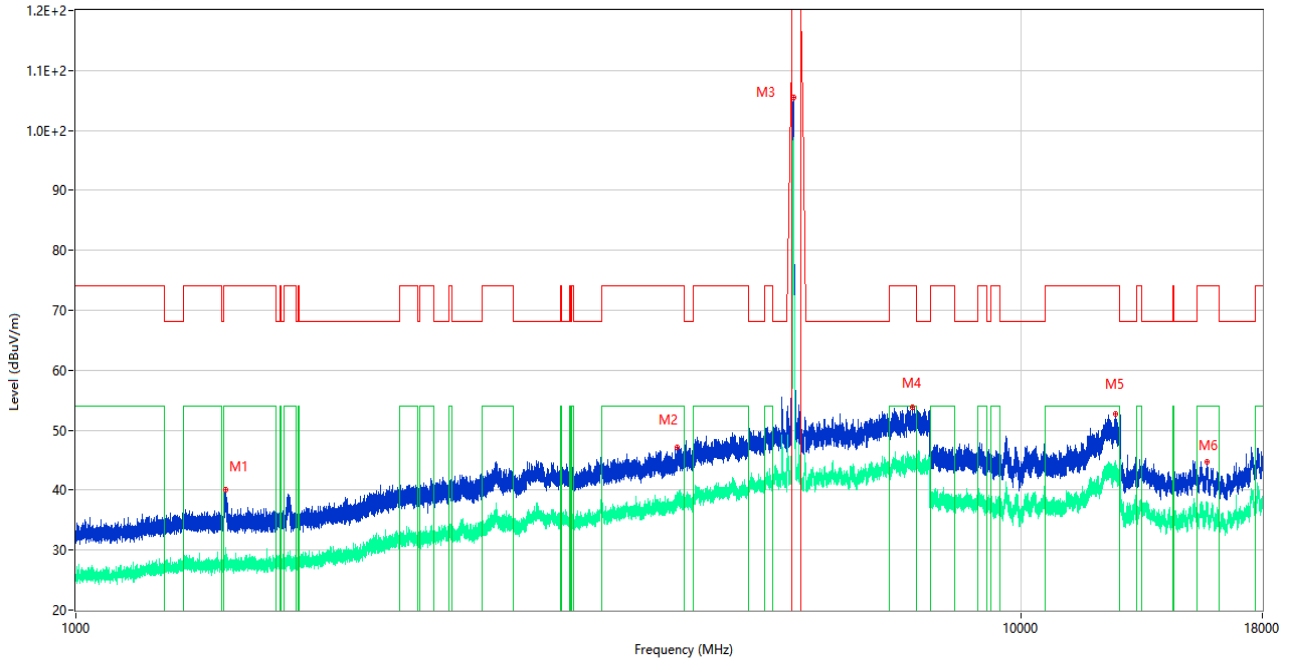
RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1329.400	40.55	-19.57	74.0	33.45	Peak	117.00	400	Vertical	Pass
1**	1329.400	27.52	-19.57	54.0	26.48	AV	117.00	400	Vertical	Pass
2	2782.700	44.72	-9.82	74.0	29.28	Peak	282.00	300	Vertical	Pass
2**	2782.700	36.49	-9.82	54.0	17.51	AV	282.00	300	Vertical	Pass
3	4779.750	49.03	-5.03	74.0	24.97	Peak	285.00	200	Vertical	Pass
3**	4779.750	40.30	-5.03	54.0	13.70	AV	285.00	200	Vertical	Pass
4	5822.250	99.88	-4.24	--	--	Peak	265.00	100	Vertical	N/A
4**	5822.250	92.44	-4.24	--	--	AV	265.00	100	Vertical	N/A
5	7712.500	54.71	-1.29	74.0	19.29	Peak	210.00	100	Vertical	Pass
5**	7712.500	44.74	-1.29	54.0	9.26	AV	210.00	100	Vertical	Pass
6	12579.474	53.34	1.34	74.0	20.66	Peak	82.00	150	Vertical	Pass
6**	12579.474	43.86	1.34	54.0	10.14	AV	82.00	150	Vertical	Pass

11n20, U-NII-3, 1 GHz to 18 GHz, Low Channel, ANT H

RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz

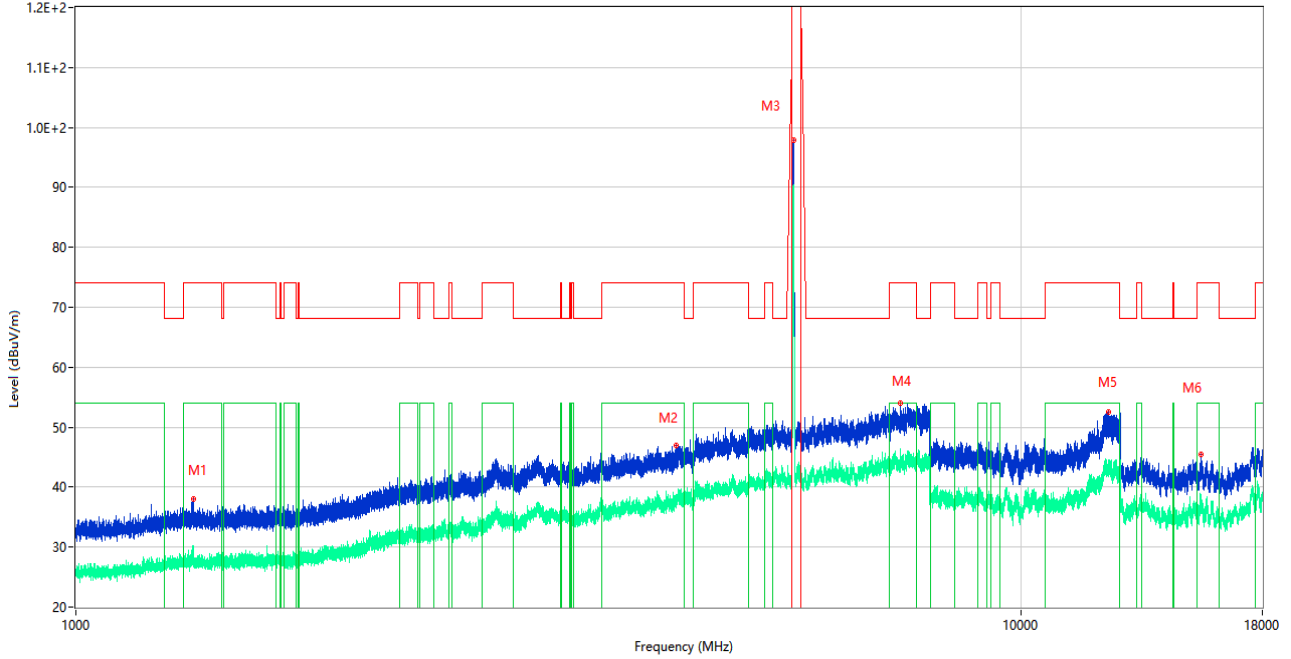


No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1440.100	40.04	-19.45	74.0	33.96	Peak	169.00	200	Horizontal	Pass
1**	1440.100	28.17	-19.45	54.0	25.83	AV	169.00	200	Horizontal	Pass
2	4327.500	47.12	-6.55	74.0	26.88	Peak	27.00	100	Horizontal	Pass
2**	4327.500	37.48	-6.55	54.0	16.52	AV	27.00	100	Horizontal	Pass
3	5743.250	105.49	-5.98	--	--	Peak	8.00	150	Horizontal	N/A
3**	5743.250	97.86	-5.98	--	--	AV	8.00	150	Horizontal	N/A
4	7670.500	53.92	-1.37	74.0	20.08	Peak	271.00	100	Horizontal	Pass
4**	7670.500	44.19	-1.37	54.0	9.81	AV	271.00	100	Horizontal	Pass
5	12579.951	52.70	1.34	74.0	21.30	Peak	123.00	100	Horizontal	Pass
5**	12579.951	43.74	1.34	54.0	10.26	AV	123.00	100	Horizontal	Pass
6	15739.875	44.66	1.92	74.0	29.34	Peak	282.00	300	Horizontal	Pass
6**	15739.875	36.04	1.92	54.0	17.96	AV	282.00	300	Horizontal	Pass



11n20, U-NII-3, 1 GHz to 18 GHz, Low Channel, ANT V

RE Test case\_FCC Part 15E\_FCC 15.407(5.725-5.85)\_1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1331.600	37.94	-19.77	74.0	36.06	Peak	279.00	100	Vertical	Pass
1**	1331.600	28.88	-19.77	54.0	25.12	AV	279.00	100	Vertical	Pass
2	4310.750	46.99	-6.14	74.0	27.01	Peak	308.00	300	Vertical	Pass
2**	4310.750	38.45	-6.14	54.0	15.55	AV	308.00	300	Vertical	Pass
3	5747.500	97.84	-5.73	--	--	Peak	272.00	100	Vertical	N/A
3**	5747.500	89.90	-5.73	--	--	AV	272.00	100	Vertical	N/A
4	7458.750	53.98	-1.56	74.0	20.02	Peak	0.00	200	Vertical	Pass
4**	7458.750	44.74	-1.56	54.0	9.26	AV	0.00	200	Vertical	Pass
5	12362.162	52.48	0.63	74.0	21.52	Peak	72.00	150	Vertical	Pass
5**	12362.162	42.86	0.63	54.0	11.14	AV	72.00	150	Vertical	Pass
6	15490.500	45.55	2.75	74.0	28.45	Peak	60.00	200	Vertical	Pass
6**	15490.500	37.39	2.75	54.0	16.61	AV	60.00	200	Vertical	Pass