

TEST REPORT

Report No.: SHE19110012-03LE

Date: 2019-11-19

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Applicant : Toast, Inc.
Address of Applicant : 401 Park Drive, Suite 801, Boston, MA 02215, USA

Product Name : Data Processing machine
Model No. : TT201
Sample No. : E19110012-03#01
FCC ID : 2AMNG-TT200
ISED Number : 23177-TT200

Standards : FCC CFR47 Part 15, Subpart E
RSS-Gen (Issue 5, March 2019)
RSS-247 (Issue 2, February 2017)

Date of Receipt : 2019-11-12
Date of Test : 2019-11-12 ~ 2019-11-18
Date of Issue : 2019-11-19

Remark:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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(Jennifer Zhou)

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(Authorized signatory: Guoyou Chi)

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Revision Record			
Version	Date	Revisions	Revised By
1.0	2019-11-19	Original	--

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1 General Information

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Services (Shanghai) Co., Ltd.
Address	155 Pingbei Rd, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Details of Application

Company Name	Toast, Inc.
Address	401 Park Drive, Suite 801, Boston, MA 02215, USA
Contact Person	Mr James H Barber
Telephone	(562) 546-2272
Email	jbarber@toasttab.com

1.3 Details of EUT

Product Name	Data Processing machine
Brand Name	Toast
Model No.	TT201
FCC ID	2AMNG-TT200
ISED Number	23177-TT200
Mode of Operation	WLAN 802.11a/n(HT20/40)/ac(HT20/40/80)
Frequency Range	Band I: 5150 MHz ~ 5250 MHz Band IV: 5725 MHz ~ 5850 MHz
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Channel Bandwidth	802.11a: 20MHz; 802.11n: 20MHz, 40MHz; 802.11ac: 20MHz, 40MHz, 80MHz
Antenna Type	Internal Antenna
Antenna Gain	Band I: 2.29 dBi Band IV: 1.92 dBi
Extreme Temperature Range	0°C ~ +55°C
Test Voltage	AC 24V

Note(s):

1. This test report is for approval of PCB, LCD and speaker change based on the original test report No. I19D00071-SRD07 and I19D00071-SRD08.
2. The details product change please refer to the document 'Product Change Description'.
3. Only additional test required in the product change list in this report.

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1.4 Test Methodology

47 CFR Part 15, Subpart E (11-1-19 Edition)	Unlicensed National Information Infrastructure Devices
KDB Publication 789033 D02 v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E
KDB Publication 662911 D01 v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)
RSS-Gen (Issue 5, March 2019)	General Requirements for Compliance of Radio Apparatus
RSS-247 (Issue 2, February 2017)	Digital Transmission Systems (DTSSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test.

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2 Test Condition

2.1 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060

2.2 Equipment List

Name of Equipment	Manufacturer	Model	Serial No.	Cal. Due Date
Spectrum Analyzer	Keysight	N9020B	MY59260184	2020-07-28
Spectrum Analyzer	Rohde & Schwarz	FSV40N	101450	2020-06-24
EMI Test Receiver	Rohde & Schwarz	ESPI3	100173	2020-06-19
EMI Test Receiver	Rohde & Schwarz	ESR 7	101911	2020-06-19
V-network	SCHWARZBECK	NSLK 8127	8127-902	2020-02-20
Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500	100687	2020-08-22
Broadband Antenna	SCHWARZBECK	VULB9163	9163-1037	2020-06-06
Horn Antenna-18G	SCHWARZBECK	BBHA9120D	9120D-1775	2020-06-06
Loop Antenna	SCHWARZBECK	FMZB 1513	N/A	2021-03-19
Horn Antenna-40G	YINGLIAN	LB-180400-KF	N/A	2020-07-26
EMC chamber 9*6*6 (L*W*H)	CHANGNING	966	N/A	2020-06-26
Shielded Enclosure 8*5*4 (L*W*H)	CHANGNING	854	N/A	2020-08-28
Test Software	BL	BL410_E	N/A	N/A

2.3 Measurement Uncertainty

Parameter	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	± 1.5 dB
	> 1GHz	± 1.5 dB
Radiated Emission	30 MHz – 1 GHz	± 3 dB
	> 1GHz	± 3 dB

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3 Test Set-up and Operation Modes

3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

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

Band I (5150 – 5250 MHz)		Band IV (5725 – 5850 MHz)	
Channel	Frequency	Channel	Frequency
The lowest channel(CH36)	5180MHz	The lowest channel(CH149)	5745MHz
The middle channel(CH44)	5220MHz	The middle channel(CH157)	5785MHz
The highest channel(CH48)	5240MHz	The highest channel(CH165)	5825MHz

For 802.11n(HT40), 802.11ac(VHT40)

Band I (5150 – 5250 MHz)		Band IV (5725 – 5850 MHz)	
Channel	Frequency	Channel	Frequency
The lowest channel(CH38)	5190MHz	The lowest channel(CH151)	5755MHz
The highest channel(CH46)	5230MHz	The highest channel(CH159)	5795MHz

For 802.11ac(VHT80)

Band I (5150 – 5250 MHz)		Band IV (5725 – 5850 MHz)	
Channel	Frequency	Channel	Frequency
The lowest channel(CH42)	5210MHz	The lowest channel(CH155)	5775MHz

Through Pre-scan under all rate at lowest channel, the data rate as below table described is the worst case, so we choose these data rate for test.

Type	Data rate
802.11a	6Mbps
802.11n(HT20), 802.11ac(VHT20)	MCS0
802.11n(HT40), 802.11ac(VHT40)	MCS0
802.11ac(VHT80)	MCS0

The basic operation modes are:

- A. On
 - 1. WLAN mode
 - a. Transmitting
 - b. Receiving
- B. Standby

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C. Off

3.2 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	TP00083A	N/A

3.3 Support Software

Description	Manufacturer	Software Name
Software	/	RF Test Tool

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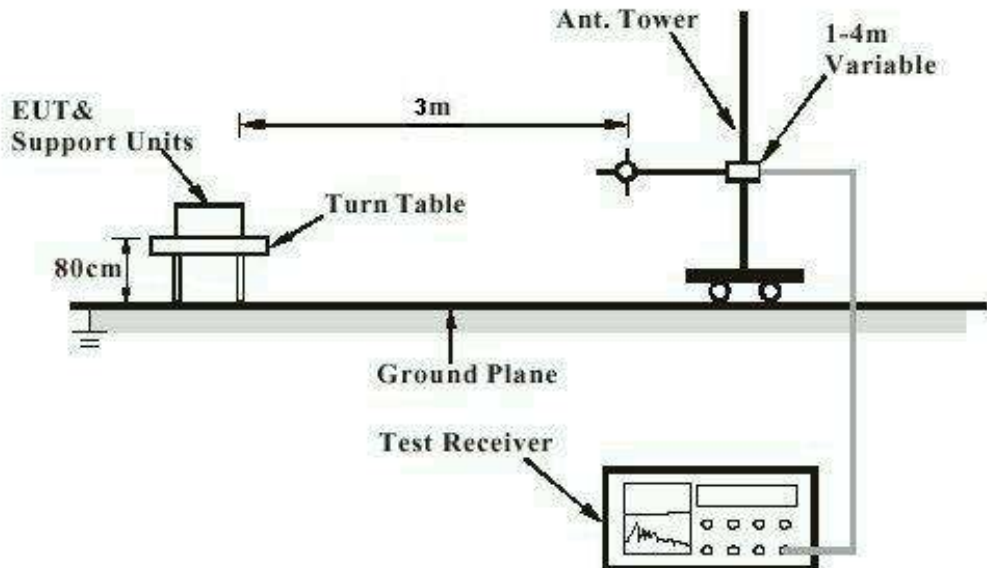
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3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

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4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Spurious Emission

RESULT:

PASS

Test standard	: FCC Part 15.407(b) RSS-247 6.2
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A
Ambient temperature	: 25°C
Relative humidity	: 52%

Notes:

1. Test plots please refer to the annex document "EXHIBIT A of SHE19110012-03LE" and "EXHIBIT B of SHE19110012-03LE".
2. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
3. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
4. The EUT is working in the Normal link mode below 1 GHz.

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4.1.2 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.407(b) RSS-247 6.2
Requirement	: ANSI C63.10-2013, KDB 789033
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High
Operation Mode	: A.1
Ambient temperature	: 25°C
Relative humidity	: 52%

For details refer to following test plot.

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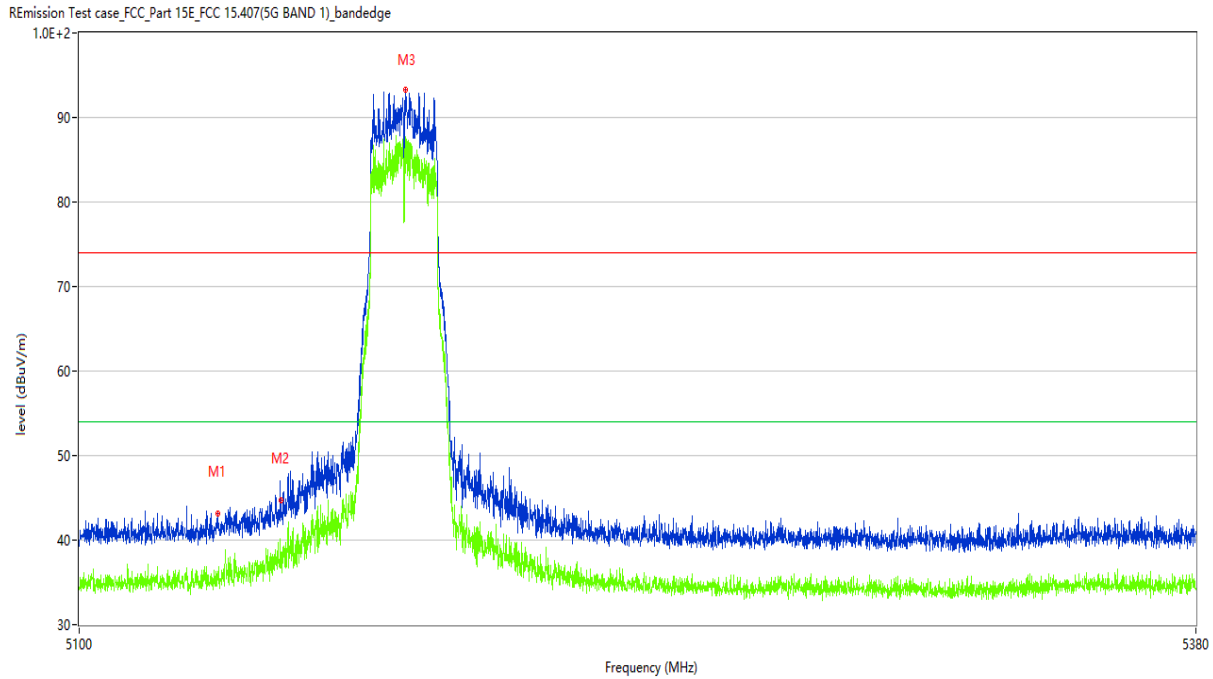
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Figure 1: Band Edge (Restricted-band band-edge), 802.11a, 5180MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5133.872	43.09	1.73	74.0	-30.91	Peak	28.30	100	Horizontal	Pass
1**	5133.872	36.30	1.73	54.0	-17.70	AV	28.30	100	Horizontal	Pass
2	5150.000	44.63	1.71	74.0	-29.37	Peak	6.75	100	H	Pass
2**	5150.000	38.45	1.71	54.0	-15.55	AV	6.75	100	H	Pass
3	5180.200	93.27	1.68	74.0	19.27	Peak	0.00	100	Horizontal	N/A
3**	5180.200	87.77	1.68	54.0	33.77	AV	0.00	100	Horizontal	Fail

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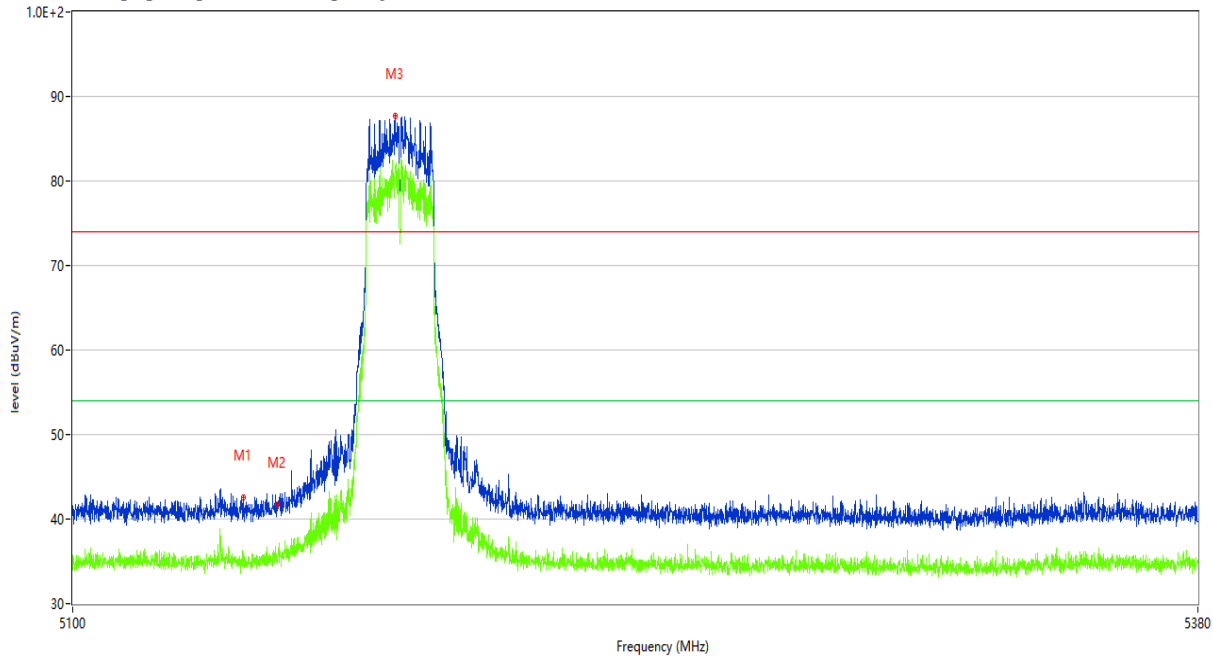
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5141.570	42.53	1.72	74.0	-31.47	Peak	336.70	100	Vertical	Pass
1**	5141.570	35.98	1.72	54.0	-18.02	AV	336.70	100	Vertical	Pass
2	5150.000	41.60	1.71	74.0	-32.40	Peak	277.60	100	V	Pass
2**	5150.000	36.08	1.71	54.0	-17.92	AV	277.60	100	V	Pass
3	5178.660	87.75	1.68	74.0	13.75	Peak	68.40	100	Vertical	N/A
3**	5178.660	81.92	1.68	54.0	27.92	AV	68.40	100	Vertical	Fail

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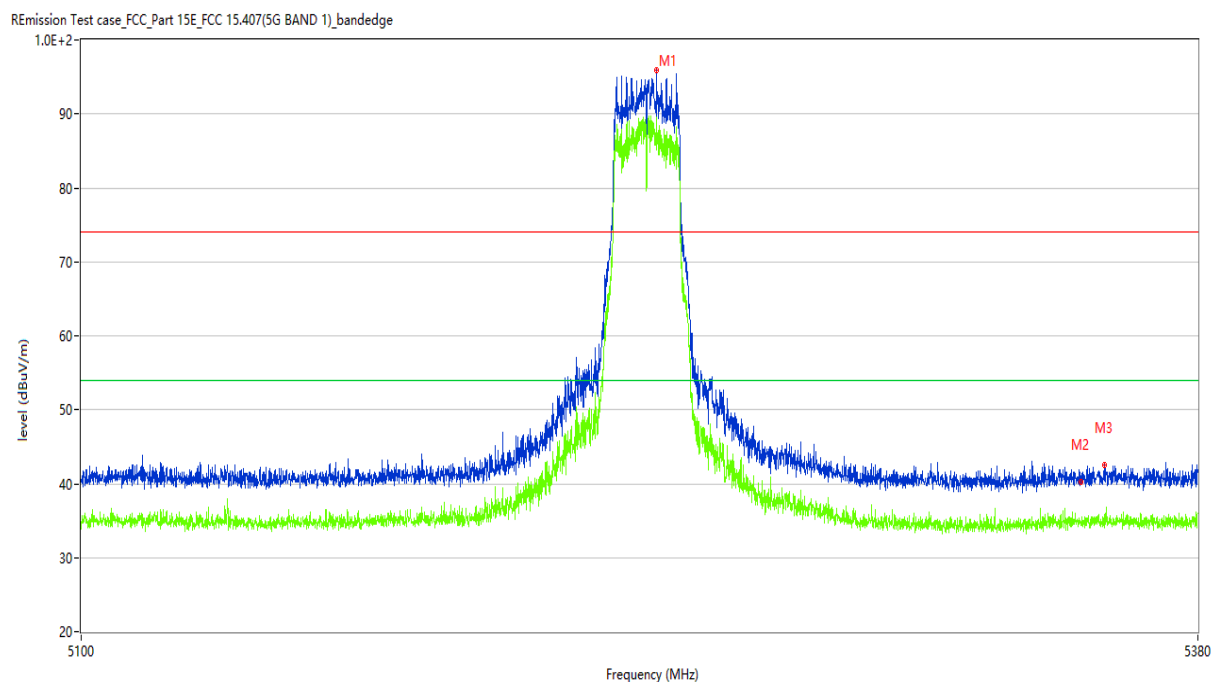
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Figure 2: Band Edge (Restricted-band band-edge), 802.11a, 5240MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5242.414	95.93	1.58	74.0	21.93	Peak	345.40	100	Horizontal	N/A
1**	5242.414	89.52	1.58	54.0	35.52	AV	345.40	100	Horizontal	Fail
2	5350.000	40.42	1.46	74.0	-33.58	Peak	204.25	100	H	Pass
2**	5350.000	34.41	1.46	54.0	-19.59	AV	204.25	100	H	Pass
3	5355.996	42.53	1.46	74.0	-31.47	Peak	246.40	100	Horizontal	Pass
3**	5355.996	34.87	1.46	54.0	-19.13	AV	246.40	100	Horizontal	Pass

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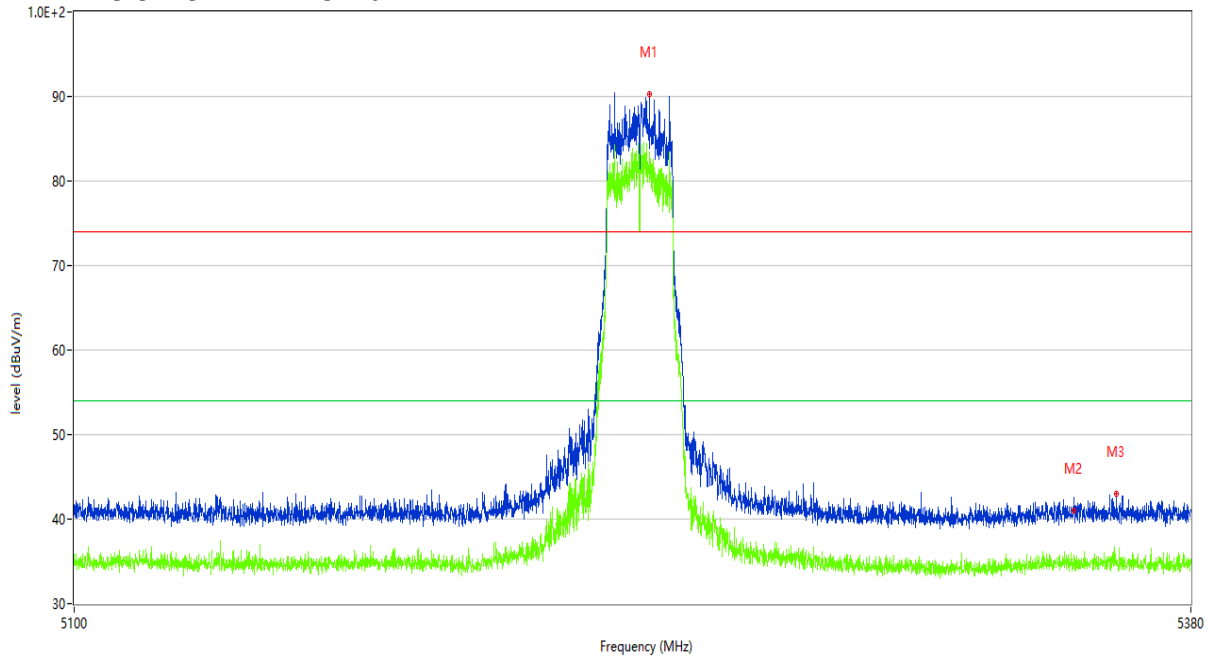
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5242.414	90.26	1.58	74.0	16.26	Peak	308.60	100	Vertical	N/A
1**	5242.414	83.47	1.58	54.0	29.47	AV	308.60	100	Vertical	Fail
2	5350.000	41.04	1.46	74.0	-32.96	Peak	98.08	100	V	Pass
2**	5350.000	34.55	1.46	54.0	-19.45	AV	98.08	100	V	Pass
3	5360.825	43.02	1.46	74.0	-30.98	Peak	299.60	100	Vertical	Pass
3**	5360.825	34.90	1.46	54.0	-19.10	AV	299.60	100	Vertical	Pass

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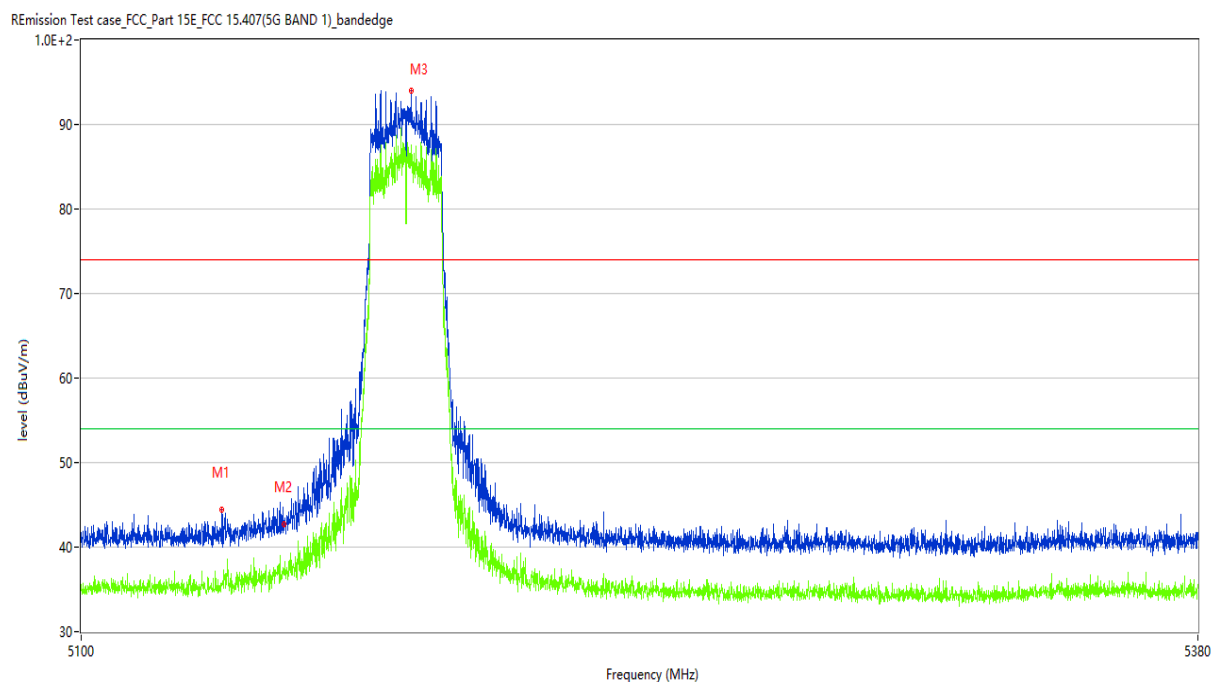
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Figure 3: Band Edge (Restricted-band band-edge), 802.11n(HT20), 5180MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5134.501	44.46	1.73	74.0	-29.54	Peak	3.50	100	Horizontal	Pass
1**	5134.501	35.78	1.73	54.0	-18.22	AV	3.50	100	Horizontal	Pass
2	5150.000	42.91	1.71	74.0	-31.09	Peak	184.87	100	H	Pass
2**	5150.000	36.85	1.71	54.0	-17.15	AV	184.87	100	H	Pass
3	5181.180	93.96	1.68	74.0	19.96	Peak	353.20	100	Horizontal	N/A
3**	5181.180	87.61	1.68	54.0	33.61	AV	353.20	100	Horizontal	Fail

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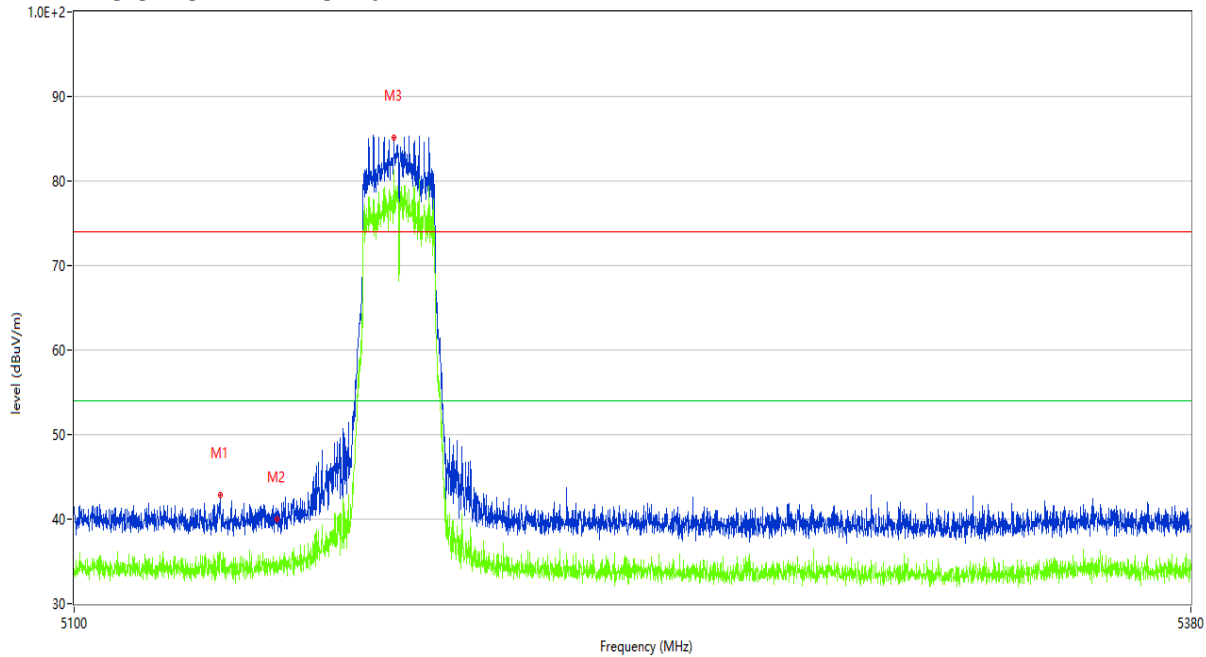
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5135.761	42.92	1.72	74.0	-31.08	Peak	36.90	100	Vertical	Pass
1**	5135.761	35.96	1.72	54.0	-18.04	AV	36.90	100	Vertical	Pass
2	5150.000	39.87	1.71	74.0	-34.13	Peak	29.83	100	V	Pass
2**	5150.000	34.05	1.71	54.0	-19.95	AV	29.83	100	V	Pass
3	5178.660	85.21	1.68	74.0	11.21	Peak	0.50	100	Vertical	N/A
3**	5178.660	81.33	1.68	54.0	27.33	AV	0.50	100	Vertical	Fail

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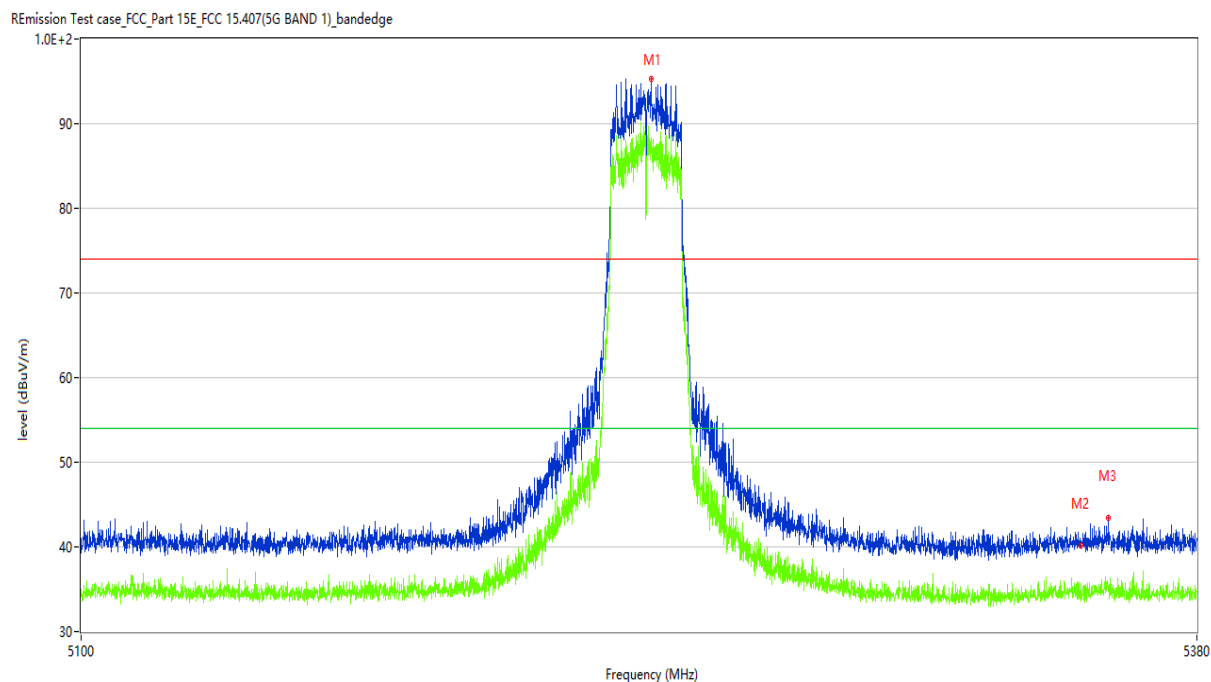
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Figure 4: Band Edge (Restricted-band band-edge), 802.11n(HT20), 5240MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5241.155	95.30	1.58	74.0	21.30	Peak	349.50	100	Horizontal	N/A
1**	5241.155	88.34	1.58	54.0	34.34	AV	349.50	100	Horizontal	Fail
2	5350.000	40.18	1.46	74.0	-33.82	Peak	258.59	100	H	Pass
2**	5350.000	34.12	1.46	54.0	-19.88	AV	258.59	100	H	Pass
3	5357.186	43.44	1.46	74.0	-30.56	Peak	291.50	100	Horizontal	Pass
3**	5357.186	34.67	1.46	54.0	-19.33	AV	291.50	100	Horizontal	Pass

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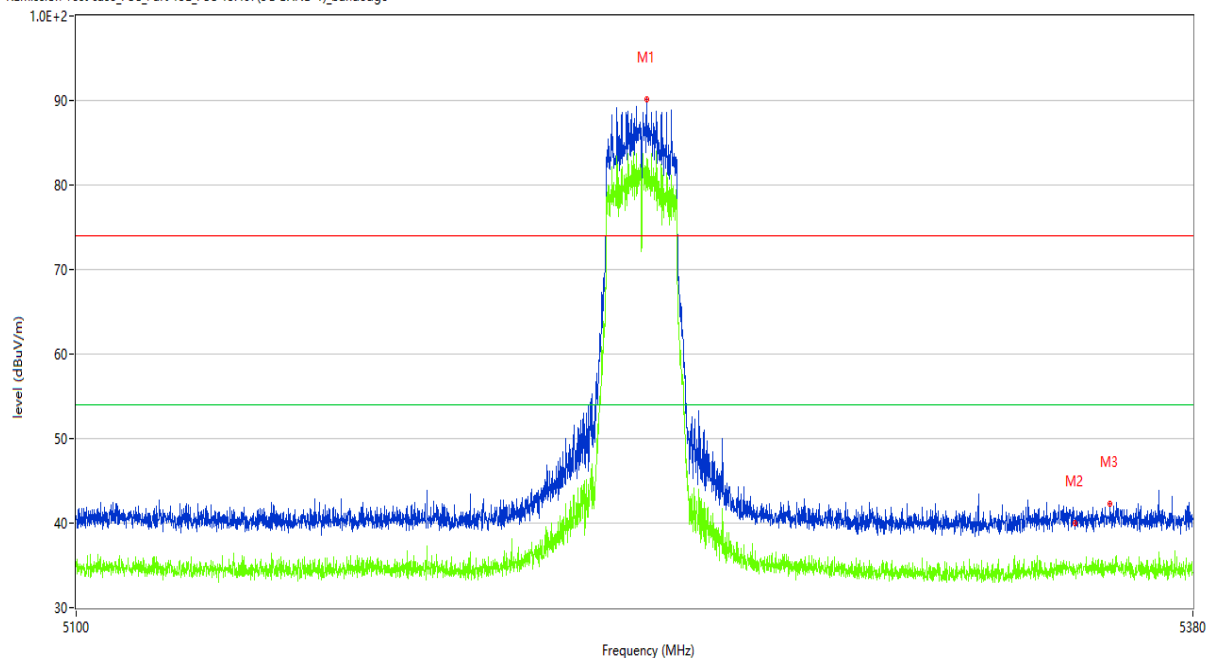
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REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5241.155	90.12	1.58	74.0	16.12	Peak	312.60	100	Vertical	N/A
1**	5241.155	82.24	1.58	54.0	28.24	AV	312.60	100	Vertical	Fail
2	5350.000	40.07	1.46	74.0	-33.93	Peak	277.44	100	V	Pass
2**	5350.000	34.00	1.46	54.0	-20.00	AV	277.44	100	V	Pass
3	5358.655	42.30	1.46	74.0	-31.70	Peak	179.40	100	Vertical	Pass
3**	5358.655	34.61	1.46	54.0	-19.39	AV	179.40	100	Vertical	Pass

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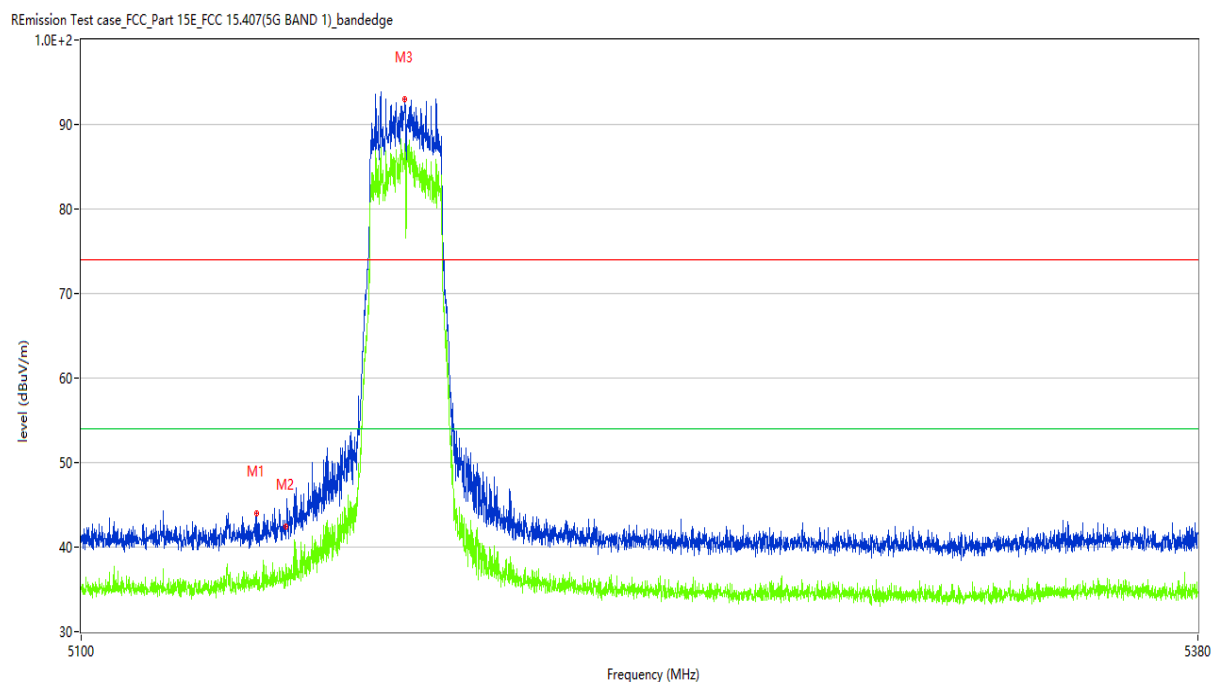
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Figure 5: Band Edge (Restricted-band band-edge), 802.11ac(VHT20), 5180MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5143.039	43.98	1.72	74.0	-30.02	Peak	354.10	100	Horizontal	Pass
1**	5143.039	37.13	1.72	54.0	-16.87	AV	354.10	100	Horizontal	Pass
2	5150.000	42.41	1.71	74.0	-31.59	Peak	291.30	100	H	Pass
2**	5150.000	35.93	1.71	54.0	-18.07	AV	291.30	100	H	Pass
3	5179.640	92.95	1.68	74.0	18.95	Peak	350.20	100	Horizontal	N/A
3**	5179.640	87.68	1.68	54.0	33.68	AV	350.20	100	Horizontal	Fail

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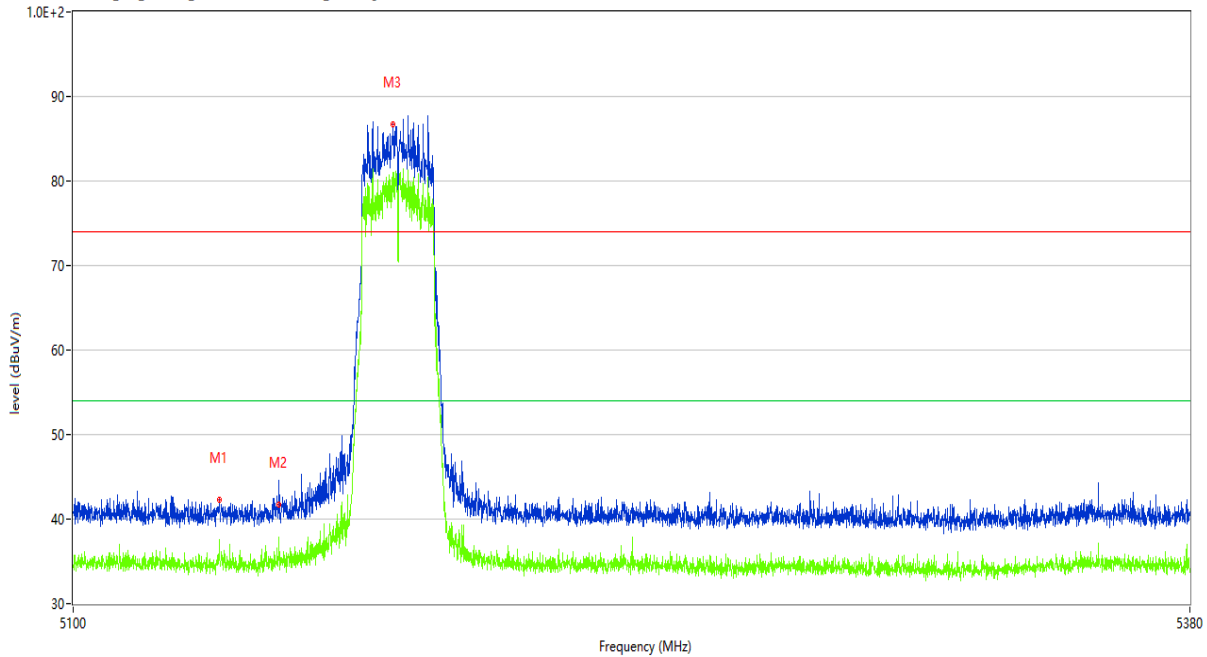
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No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5135.761	42.22	1.72	74.0	-31.78	Peak	0.40	100	Vertical	Pass
1**	5135.761	34.79	1.72	54.0	-19.21	AV	0.40	100	Vertical	Pass
2	5150.000	40.52	1.71	74.0	-33.48	Peak	2.45	100	V	Pass
2**	5150.000	34.70	1.71	54.0	-19.30	AV	2.45	100	V	Pass
3	5178.660	85.41	1.68	74.0	11.41	Peak	1.00	100	Vertical	N/A
3**	5178.660	80.19	1.68	54.0	26.19	AV	1.00	100	Vertical	Fail

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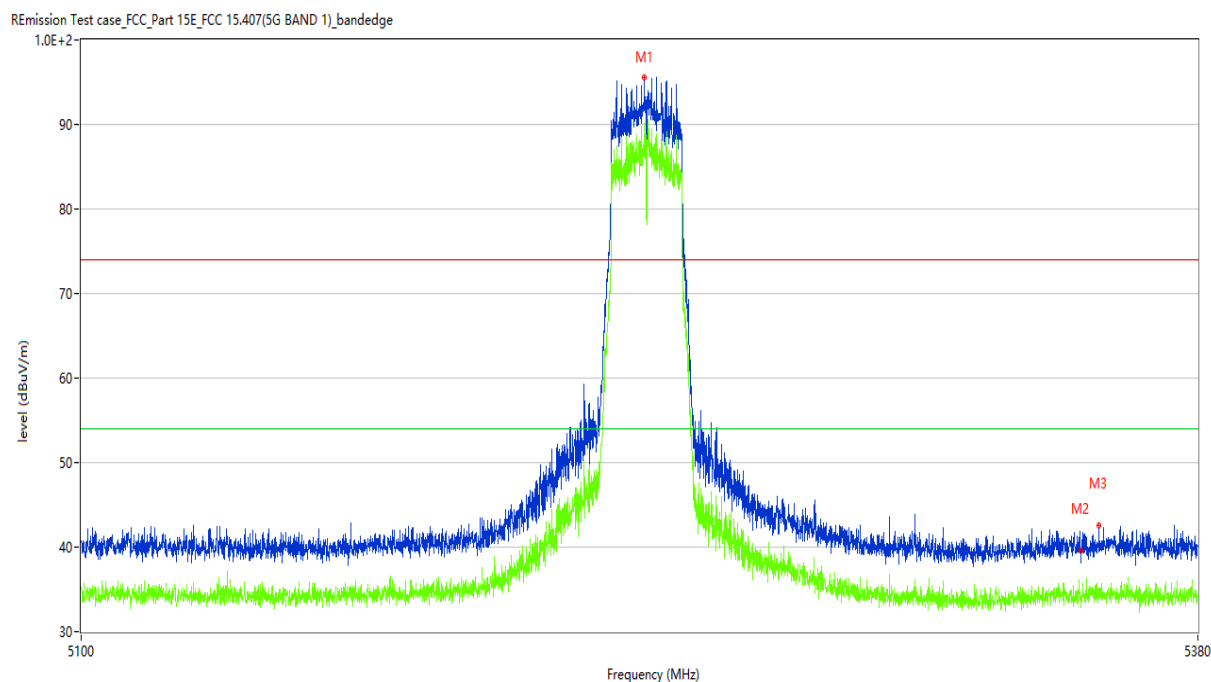
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Figure 6: Band Edge (Restricted-band band-edge), 802.11ac(VHT20), 5240MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5239.335	95.58	1.58	74.0	21.58	Peak	344.80	100	Horizontal	N/A
1**	5239.335	90.09	1.58	54.0	36.09	AV	344.80	100	Horizontal	Fail
2	5350.000	39.61	1.46	74.0	-34.39	Peak	333.41	100	H	Pass
2**	5350.000	33.73	1.46	54.0	-20.27	AV	333.41	100	H	Pass
3	5354.526	42.51	1.46	74.0	-31.49	Peak	331.70	100	Horizontal	Pass
3**	5354.526	34.61	1.46	54.0	-19.39	AV	331.70	100	Horizontal	Pass

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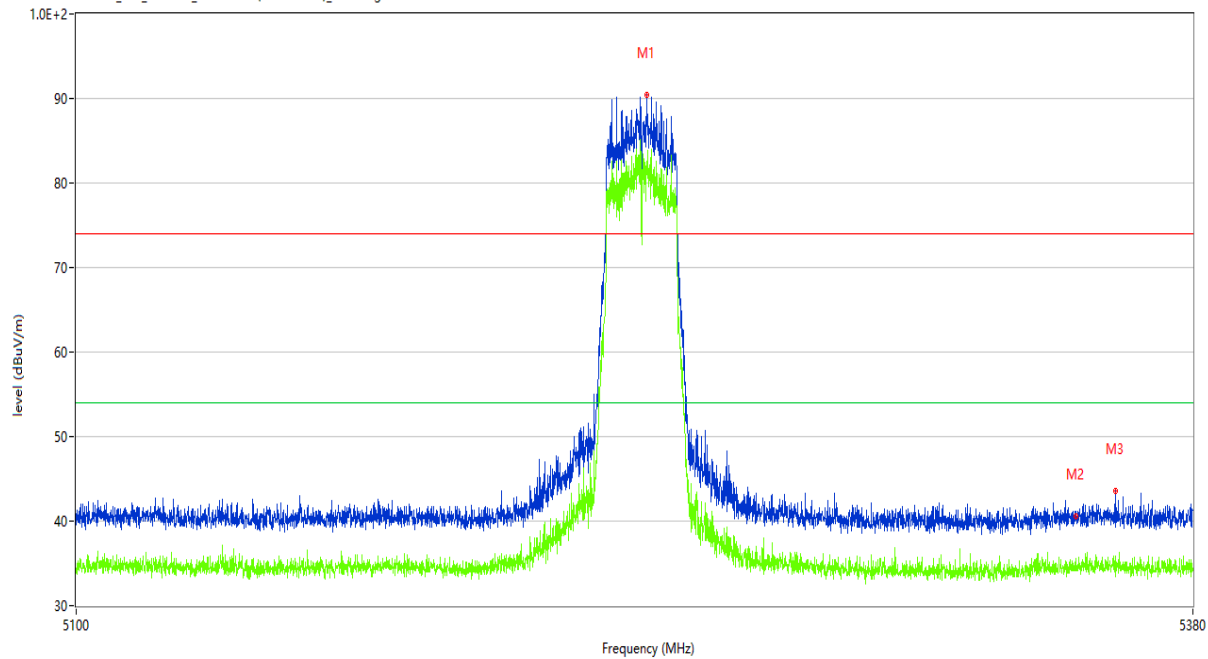
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5241.155	90.48	1.58	74.0	16.48	Peak	313.80	100	Vertical	N/A
1**	5241.155	82.33	1.58	54.0	28.33	AV	313.80	100	Vertical	Fail
2	5350.000	40.39	1.46	74.0	-33.61	Peak	276.72	100	V	Pass
2**	5350.000	34.14	1.46	54.0	-19.86	AV	276.72	100	V	Pass
3	5360.055	43.51	1.46	74.0	-30.49	Peak	360.00	100	Vertical	Pass
3**	5360.055	35.85	1.46	54.0	-18.15	AV	360.00	100	Vertical	Pass

TEST REPORT

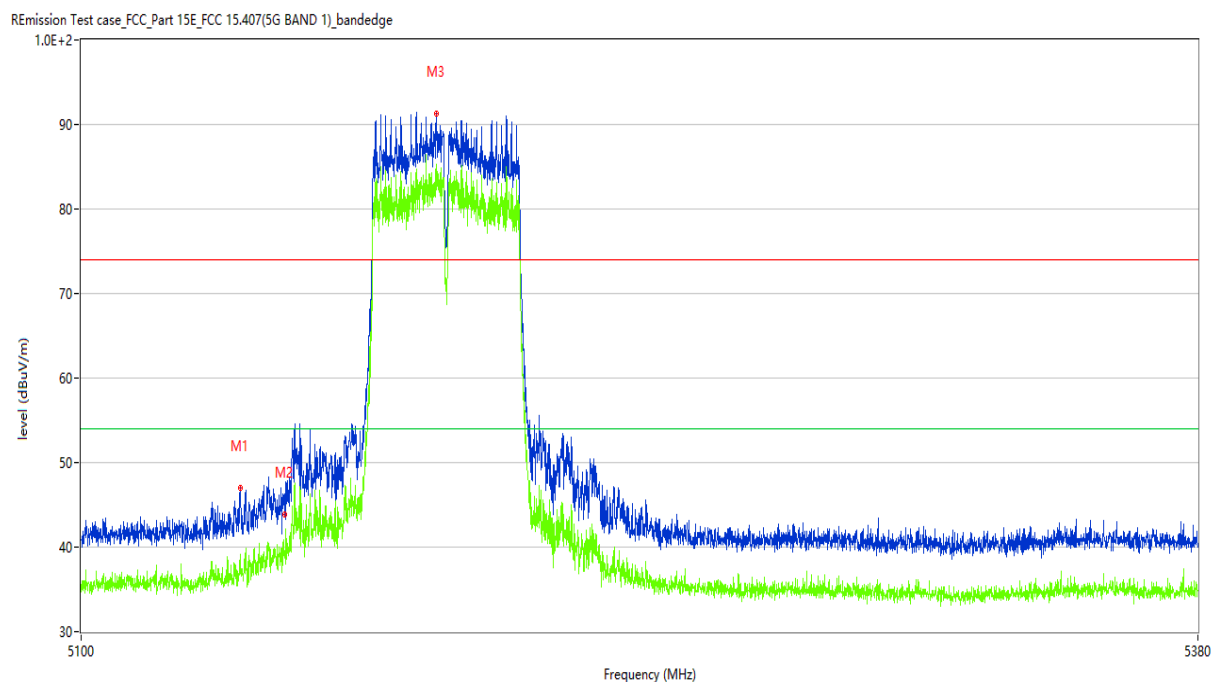
Report No.: SHE19110012-03LE

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Figure 7: Band Edge (Restricted-band band-edge), 802.11n(HT40), 5190MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5138.910	46.98	1.72	74.0	-27.02	Peak	358.10	100	Horizontal	Pass
1**	5138.910	39.18	1.72	54.0	-14.82	AV	358.10	100	Horizontal	Pass
2	5150.000	44.02	1.71	74.0	-29.98	Peak	6.17	100	H	Pass
2**	5150.000	39.25	1.71	54.0	-14.75	AV	6.17	100	H	Pass
3	5187.408	91.28	1.67	74.0	17.28	Peak	349.50	100	Horizontal	N/A
3**	5187.408	85.31	1.67	54.0	31.31	AV	349.50	100	Horizontal	Fail

TEST REPORT

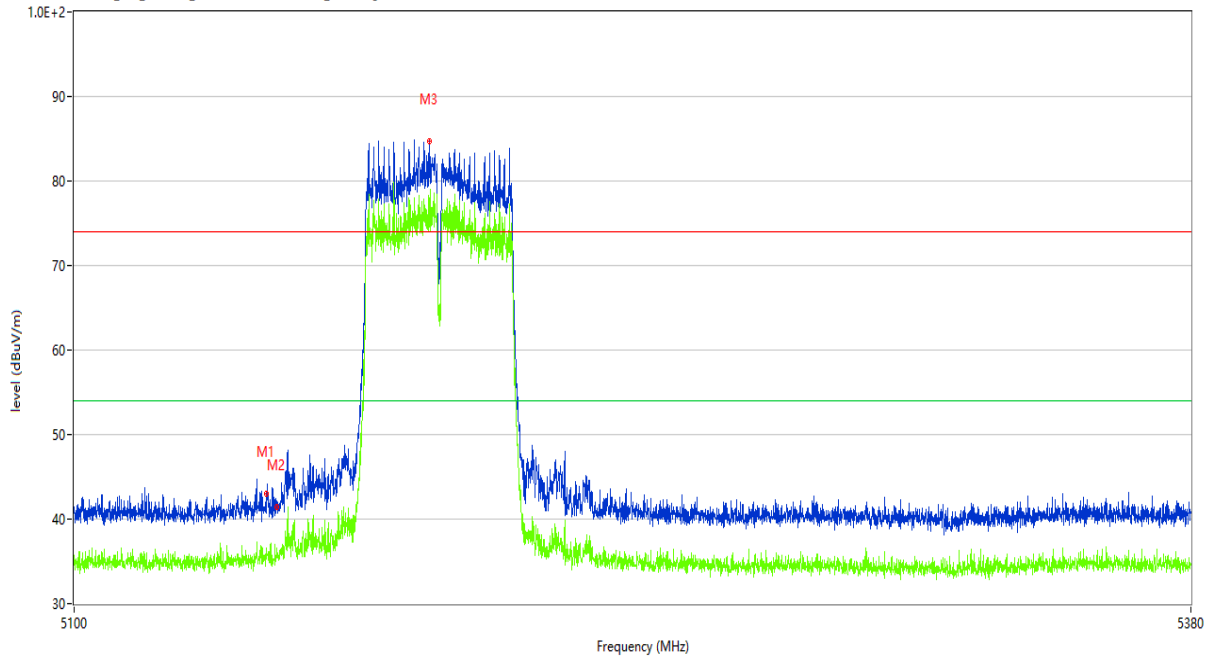
Report No.: SHE19110012-03LE

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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5147.168	42.97	1.71	74.0	-31.03	Peak	33.20	100	Vertical	Pass
1**	5147.168	36.60	1.71	54.0	-17.40	AV	33.20	100	Vertical	Pass
2	5150.000	41.44	1.71	74.0	-32.56	Peak	74.39	100	V	Pass
2**	5150.000	35.17	1.71	54.0	-18.83	AV	74.39	100	V	Pass
3	5187.408	84.67	1.67	74.0	10.67	Peak	130.00	100	Vertical	N/A
3**	5187.408	78.02	1.67	54.0	24.02	AV	130.00	100	Vertical	Fail

TEST REPORT

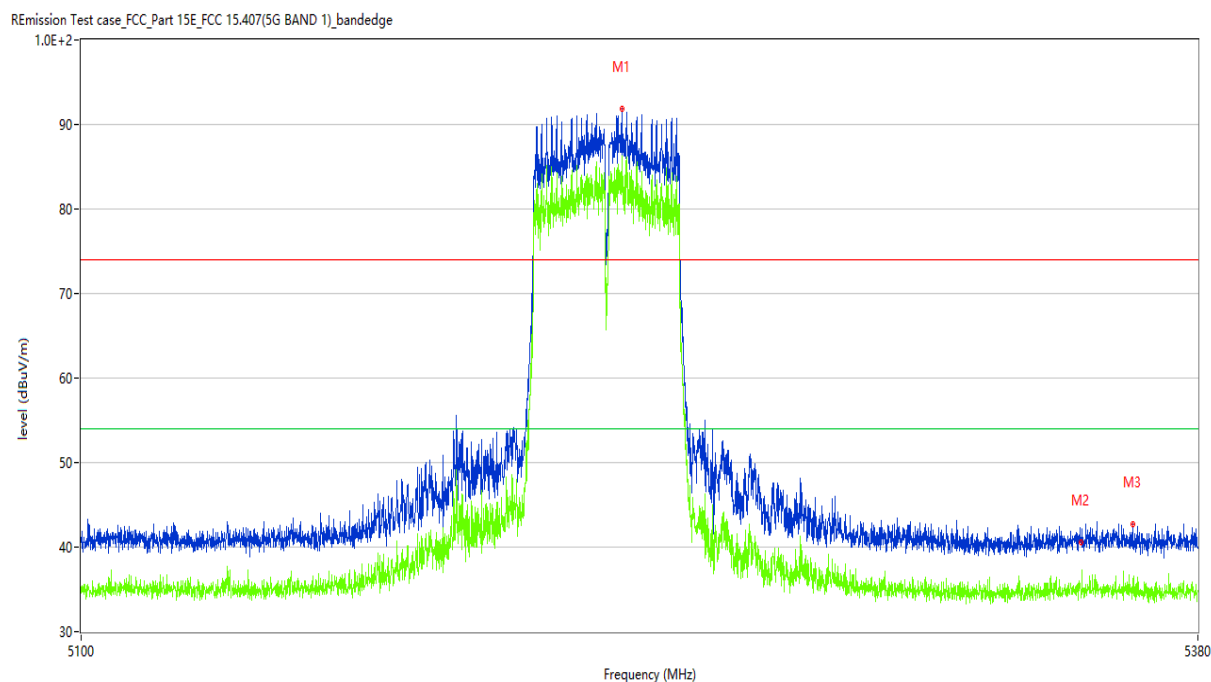
Report No.: SHE19110012-03LE

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Figure 8: Band Edge (Restricted-band band-edge), 802.11n(HT40), 5230MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5233.667	91.89	1.59	74.0	17.89	Peak	2.00	100	Horizontal	N/A
1**	5233.667	86.24	1.59	54.0	32.24	AV	2.00	100	Horizontal	Fail
2	5350.000	40.55	1.46	74.0	-33.45	Peak	27.60	100	H	Pass
2**	5350.000	34.12	1.46	54.0	-19.88	AV	27.60	100	H	Pass
3	5363.204	42.78	1.46	74.0	-31.22	Peak	0.40	100	Horizontal	Pass
3**	5363.204	36.22	1.46	54.0	-17.78	AV	0.40	100	Horizontal	Pass

TEST REPORT

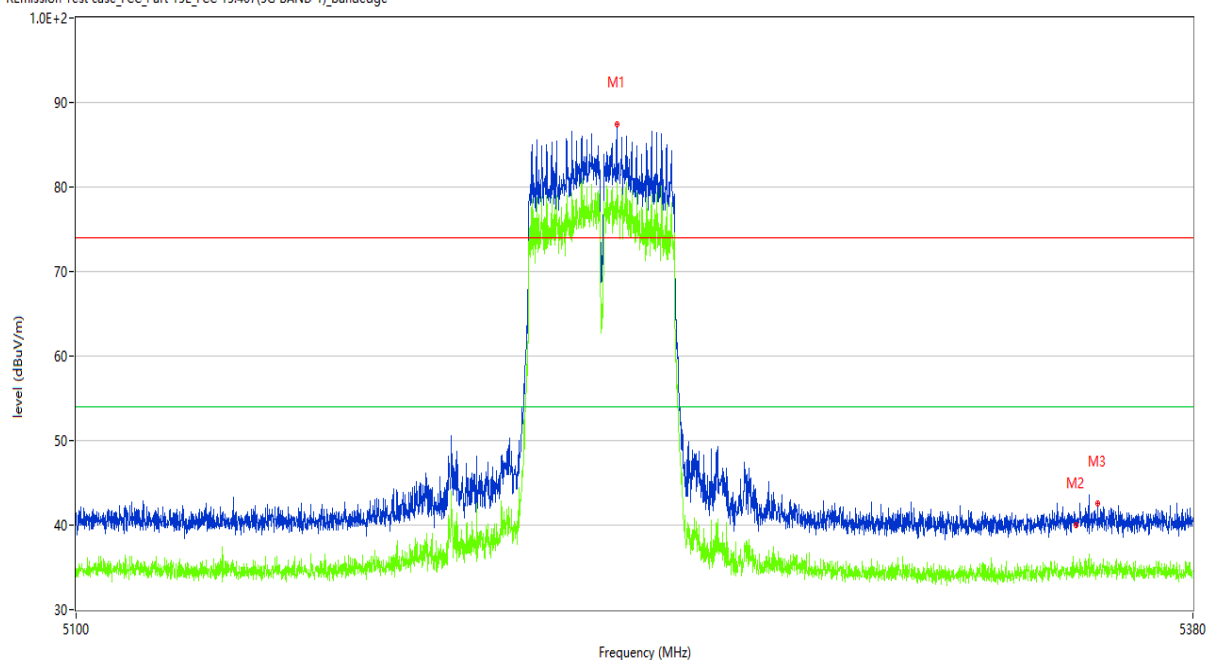
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequen cy (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5233.66 7	87.40	1.59	74.0	13.40	Peak	314.20	100	Vertical	N/A
1**	5233.66 7	80.40	1.59	54.0	26.40	AV	314.20	100	Vertical	Fail
2	5350.00 0	40.01	1.46	74.0	-33.99	Peak	295.87	100	V	Pass
2**	5350.00 0	34.30	1.46	54.0	-19.70	AV	295.87	100	V	Pass
3	5355.50 6	42.62	1.46	74.0	-31.38	Peak	327.90	100	Vertical	Pass
3**	5355.50 6	35.01	1.46	54.0	-18.99	AV	327.90	100	Vertical	Pass

TEST REPORT

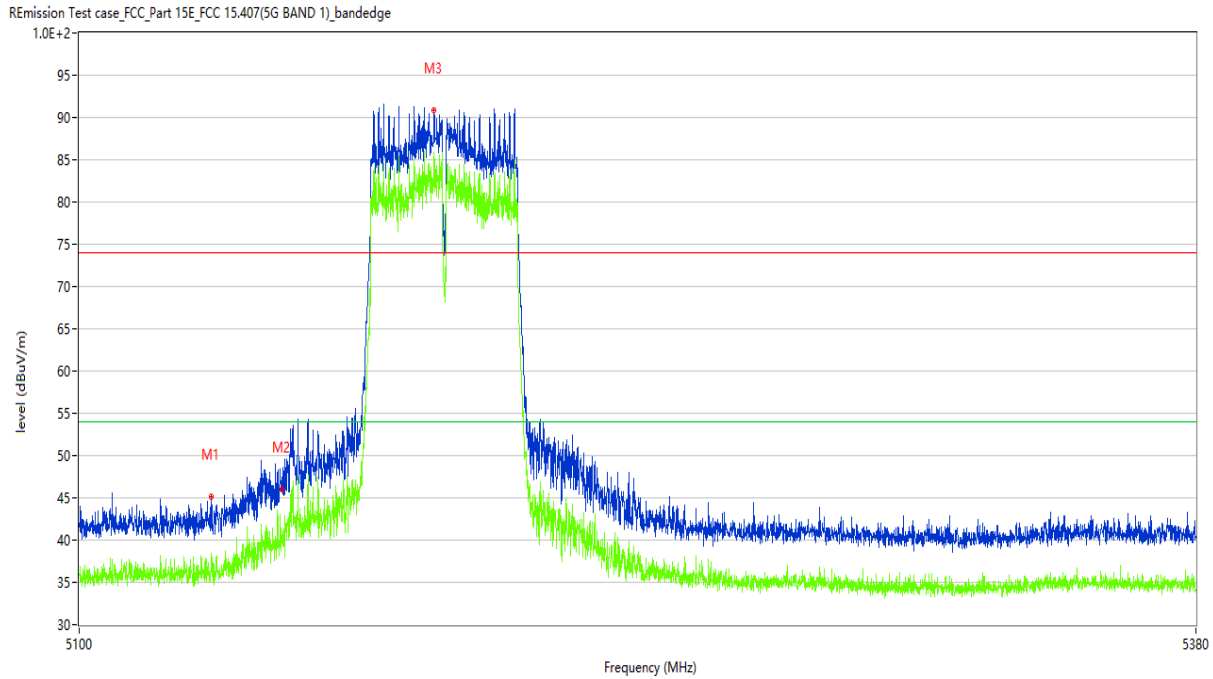
Report No.: SHE19110012-03LE

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Figure 9: Band Edge (Restricted-band band-edge), 802.11ac(VHT40), 5190MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5132.402	45.14	1.73	74.0	-28.86	Peak	0.50	100	Horizontal	Pass
1**	5132.402	38.01	1.73	54.0	-15.99	AV	0.50	100	Horizontal	Pass
2	5150.000	45.90	1.71	74.0	-28.10	Peak	166.20	100	H	Pass
2**	5150.000	39.93	1.71	54.0	-14.07	AV	166.20	100	H	Pass
3	5187.408	90.89	1.67	74.0	16.89	Peak	357.80	100	Horizontal	N/A
3**	5187.408	85.83	1.67	54.0	31.83	AV	357.80	100	Horizontal	Fail

TEST REPORT

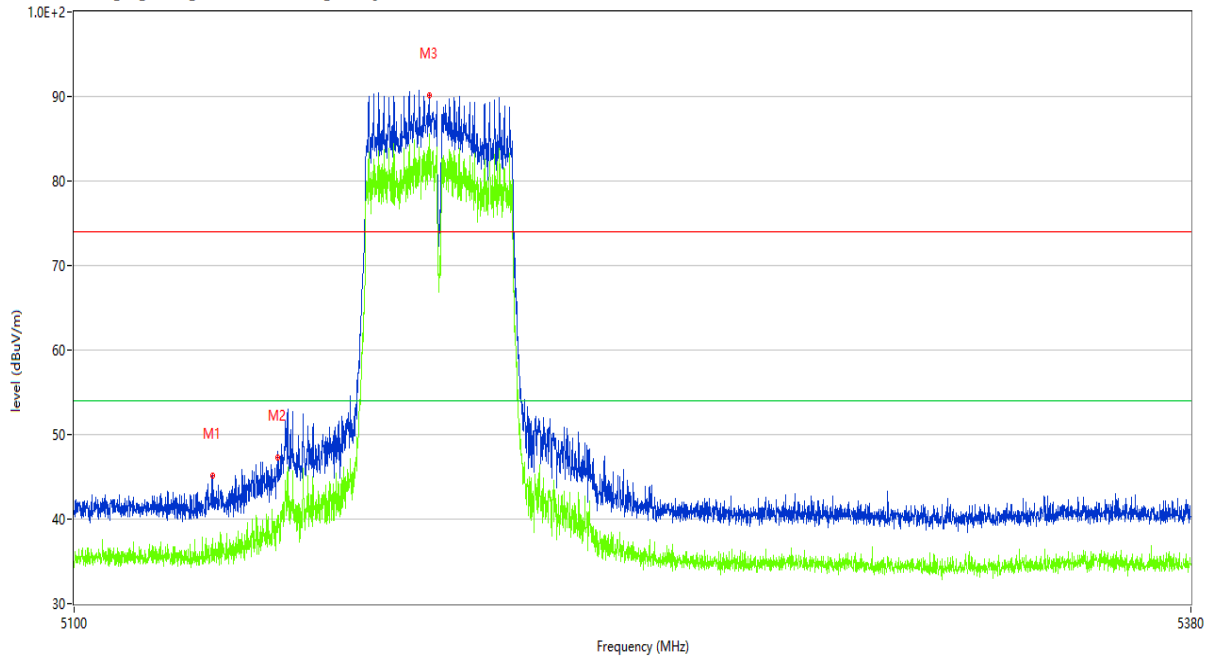
Report No.: SHE19110012-03LE

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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5134.011	45.21	1.73	74.0	-28.79	Peak	0.40	100	Vertical	Pass
1**	5134.011	36.82	1.73	54.0	-17.18	AV	0.40	100	Vertical	Pass
2	5150.000	47.64	1.71	74.0	-26.36	Peak	5.92	100	Vertical	Pass
2**	5150.000	39.03	1.71	54.0	-14.97	AV	5.92	100	Vertical	Pass
3	5187.408	90.21	1.67	74.0	16.21	Peak	1.00	100	Vertical	N/A
3**	5187.408	85.58	1.67	54.0	31.58	AV	1.00	100	Vertical	Fail

TEST REPORT

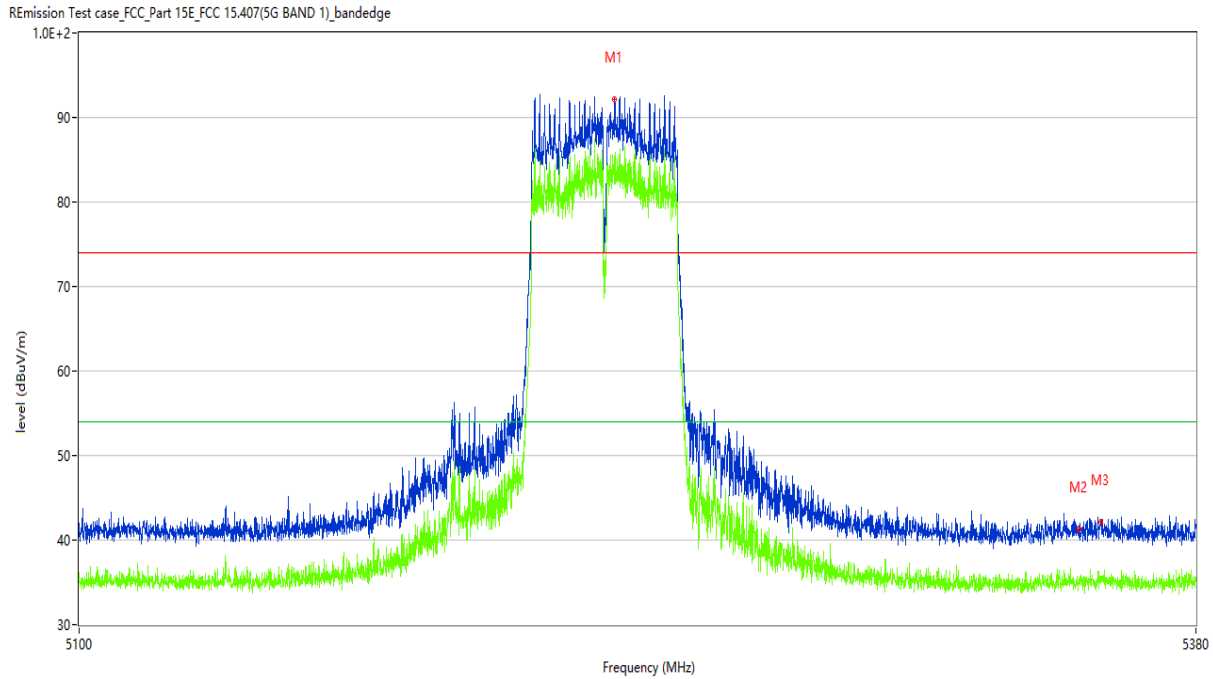
Report No.: SHE19110012-03LE

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Figure 10: Band Edge (Restricted-band band-edge), 802.11ac(VHT40), 5230MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5232.407	92.07	1.60	74.0	18.07	Peak	347.30	100	Horizontal	N/A
1**	5232.407	85.16	1.60	54.0	31.16	AV	347.30	100	Horizontal	Fail
2	5350.000	41.25	1.46	74.0	-32.75	Peak	309.04	100	Horizontal	Pass
2**	5350.000	34.22	1.46	54.0	-19.78	AV	309.04	100	Horizontal	Pass
3	5355.576	42.18	1.46	74.0	-31.82	Peak	351.40	100	Horizontal	Pass
3**	5355.576	34.70	1.46	54.0	-19.30	AV	351.40	100	Horizontal	Pass

TEST REPORT

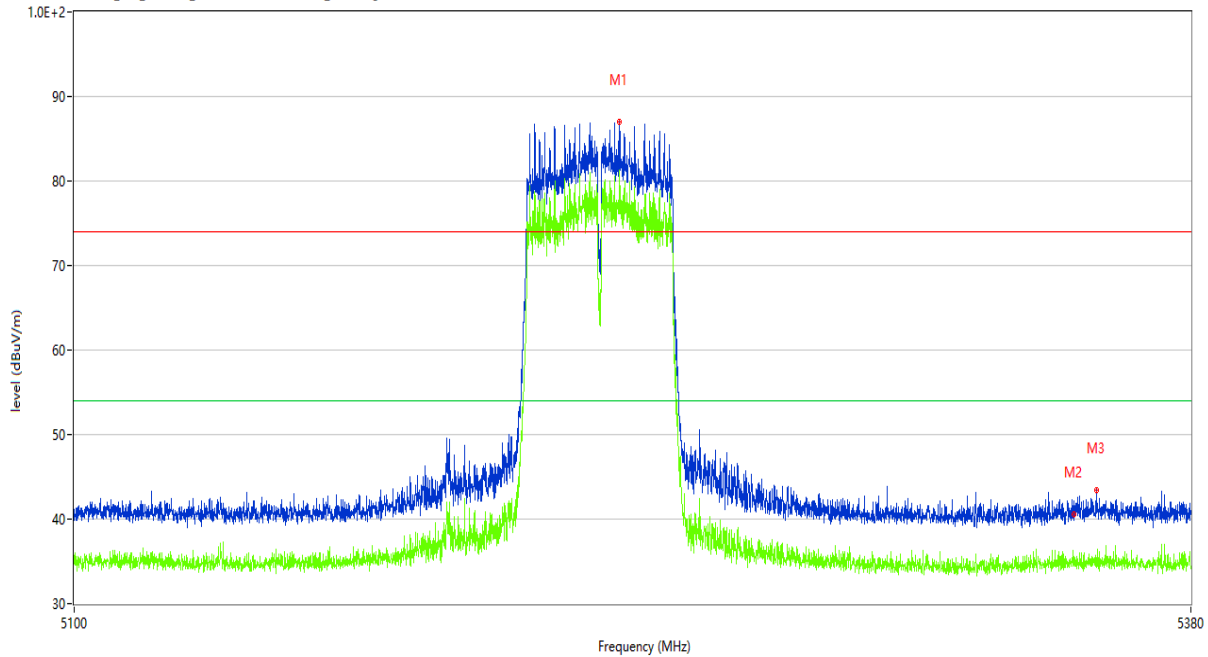
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5234.926	86.96	1.59	74.0	12.96	Peak	316.50	100	V	N/A
1**	5234.926	81.26	1.59	54.0	27.26	AV	316.50	100	V	Fail
2	5350.000	40.60	1.46	74.0	-33.40	Peak	172.89	100	V	Pass
2**	5350.000	34.91	1.46	54.0	-19.09	AV	172.89	100	V	Pass
3	5355.716	43.36	1.46	74.0	-30.64	Peak	144.20	100	V	Pass
3**	5355.716	35.30	1.46	54.0	-18.70	AV	144.20	100	V	Pass

TEST REPORT

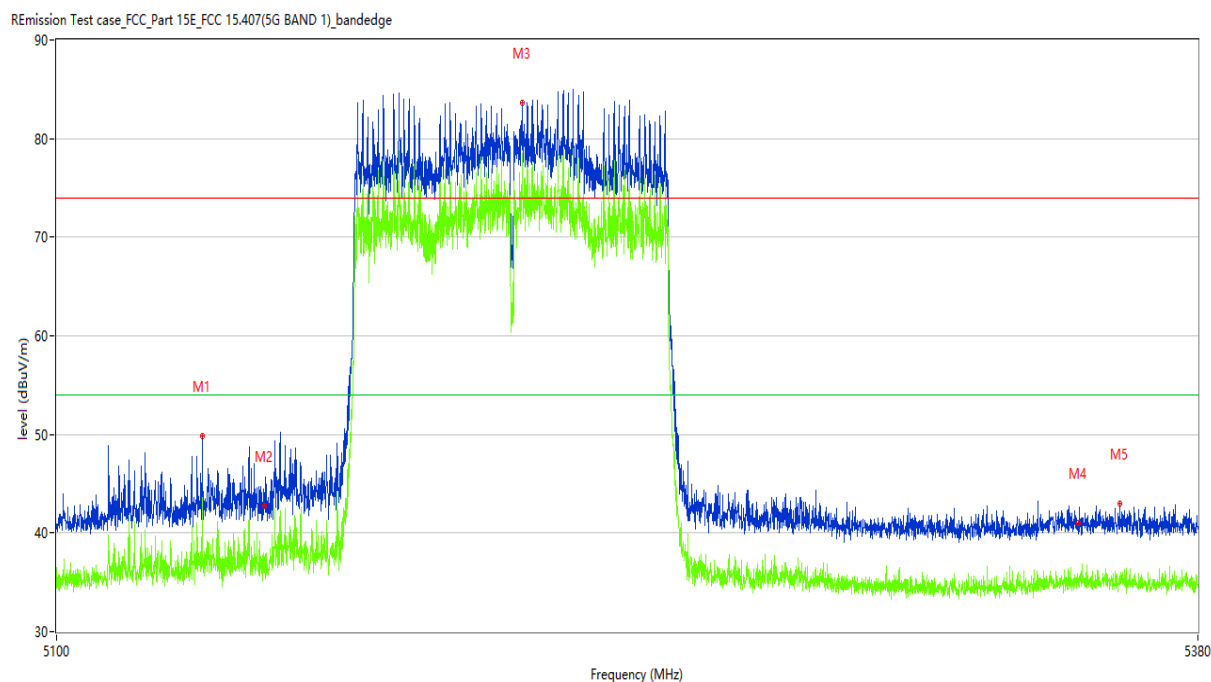
Report No.: SHE19110012-03LE

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Figure 11: Band Edge (Restricted-band band-edge), 802.11ac(VHT80), 5210MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5134.921	49.85	1.73	74.0	-24.15	Peak	314.90	100	Horizontal	Pass
1**	5134.921	43.59	1.73	54.0	-10.41	AV	314.90	100	Horizontal	Pass
2	5150.000	42.82	1.71	74.0	-31.18	Peak	171.18	100	H	Pass
2**	5150.000	37.24	1.71	54.0	-16.76	AV	171.18	100	H	Pass
3	5212.462	83.63	1.64	74.0	9.63	Peak	314.90	100	Horizontal	N/A
3**	5212.462	78.46	1.64	54.0	24.46	AV	314.90	100	Horizontal	Fail
4	5350.000	40.98	1.46	74.0	-33.02	Peak	183.66	100	H	Pass
4**	5350.000	35.12	1.46	54.0	-18.88	AV	183.66	100	H	Pass
5	5360.265	42.95	1.46	74.0	-31.05	Peak	14.10	100	Horizontal	Pass
5**	5360.265	35.60	1.46	54.0	-18.40	AV	14.10	100	Horizontal	Pass

TEST REPORT

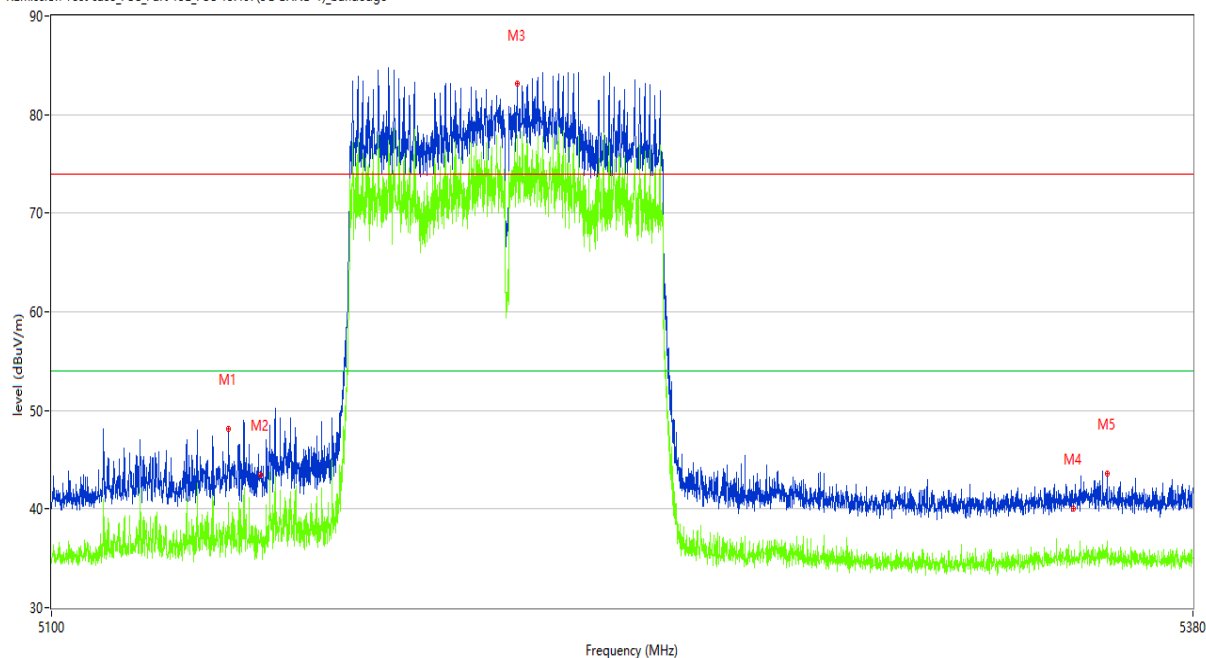
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G BAND 1)_bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5142.409	48.10	1.72	74.0	-25.90	Peak	316.80	100	Vertical	Pass
1**	5142.409	40.64	1.72	54.0	-13.36	AV	316.80	100	Vertical	Pass
2	5150.000	43.53	1.71	74.0	-30.47	Peak	321.20	100	Vertical	Pass
2**	5150.000	36.88	1.71	54.0	-17.12	AV	321.20	100	Vertical	Pass
3	5212.462	83.09	1.64	74.0	9.09	Peak	321.20	100	Vertical	N/A
3**	5212.462	77.87	1.64	54.0	23.87	AV	321.20	100	Vertical	Fail
4	5350.000	40.26	1.46	74.0	-33.74	Peak	7.82	100	Vertical	Pass
4**	5350.000	35.08	1.46	54.0	-18.92	AV	7.82	100	Vertical	Pass
5	5358.375	43.65	1.46	74.0	-30.35	Peak	83.40	100	Vertical	Pass
5**	5358.375	36.78	1.46	54.0	-17.22	AV	83.40	100	Vertical	Pass

TEST REPORT

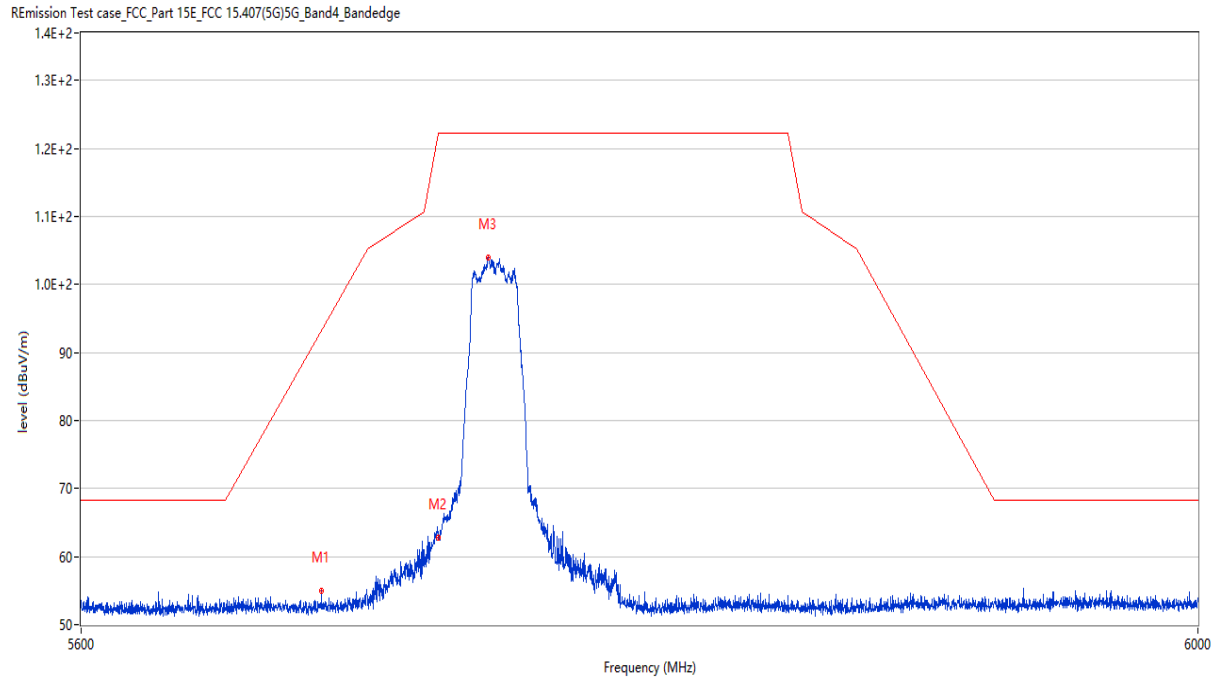
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Figure 12: Band Edge (Restricted-band band-edge), 802.11a, 5745MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5683.779	54.93	2.14	93.2	-38.27	Peak	0.60	100	Horizontal	Pass
2	5725.000	62.77	2.16	122.2	-59.43	Peak	255.71	100	H	Pass
3	5742.664	103.99	2.16	122.2	-18.21	Peak	23.50	100	Horizontal	Pass

TEST REPORT

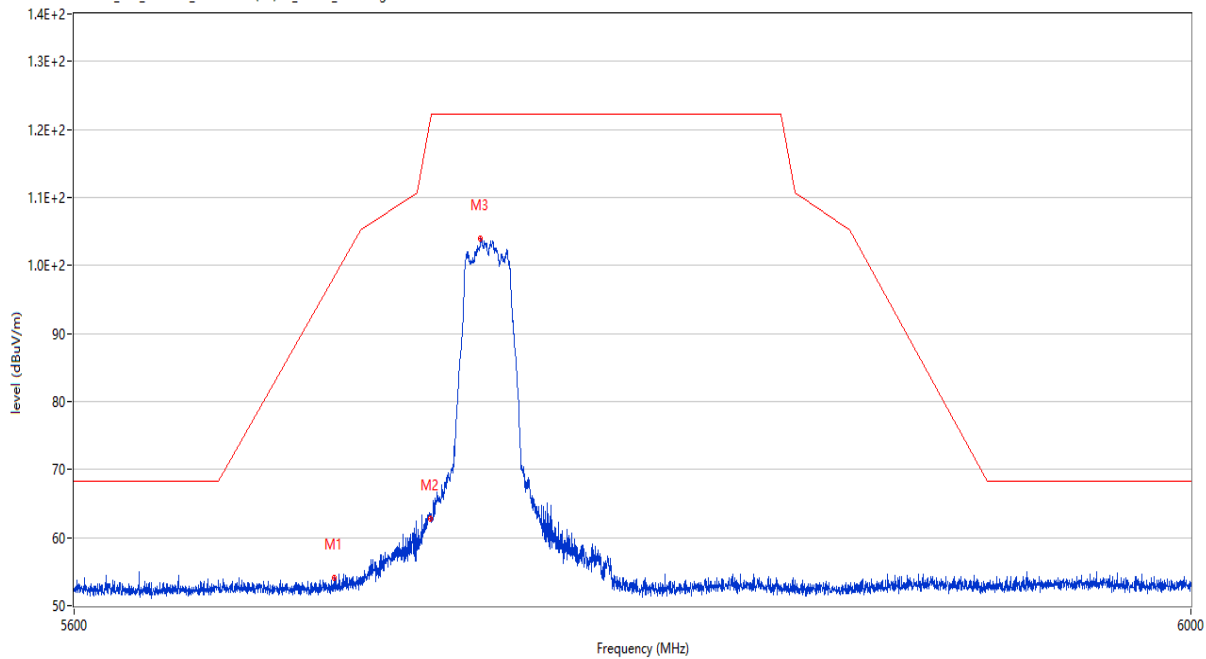
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5690.877	54.09	2.15	98.5	-44.41	Peak	23.10	100	Vertical	Pass
2	5725.000	62.75	2.16	122.2	-59.45	Peak	16.06	100	V	Pass
3	5742.364	103.94	2.16	122.2	-18.26	Peak	23.10	100	Vertical	Pass

TEST REPORT

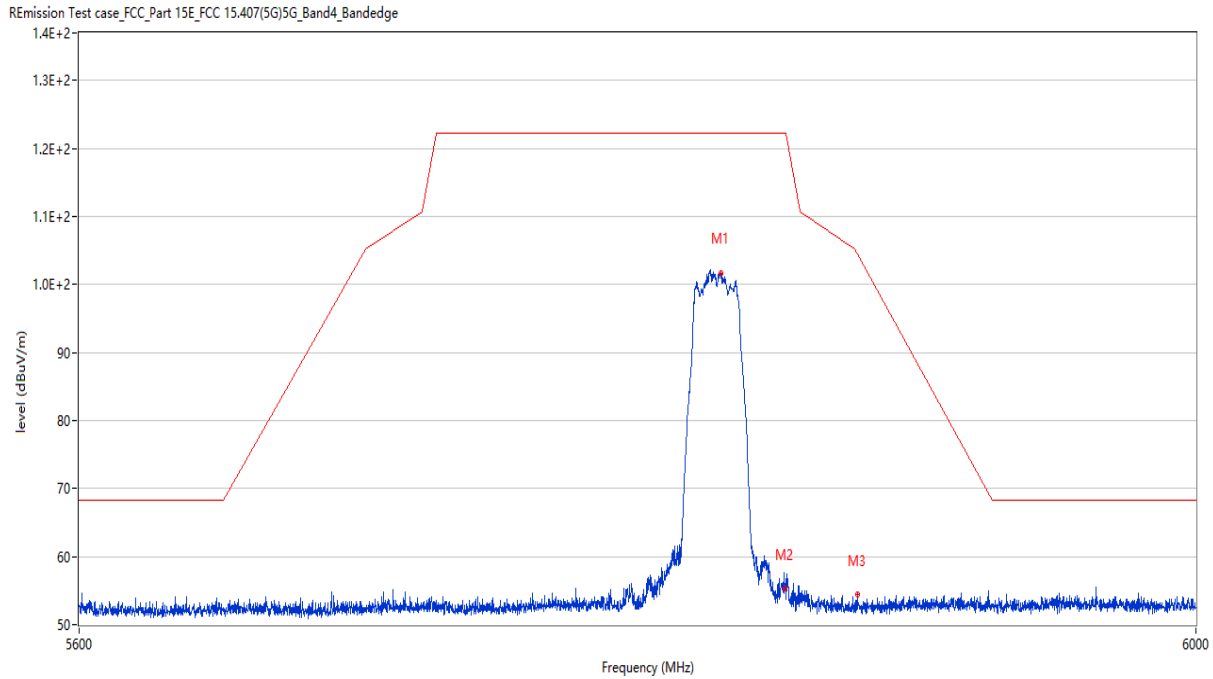
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Figure 13: Band Edge (Restricted-band band-edge), 802.11a, 5825MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5826.543	101.68	2.16	122.2	-20.52	Peak	341.30	100	Vertical	Pass
2	5850.000	54.40	2.16	122.2	-67.80	Peak	347.92	100	V	Pass
3	5875.731	54.38	2.16	104.7	-50.32	Peak	359.60	100	Vertical	Pass

TEST REPORT

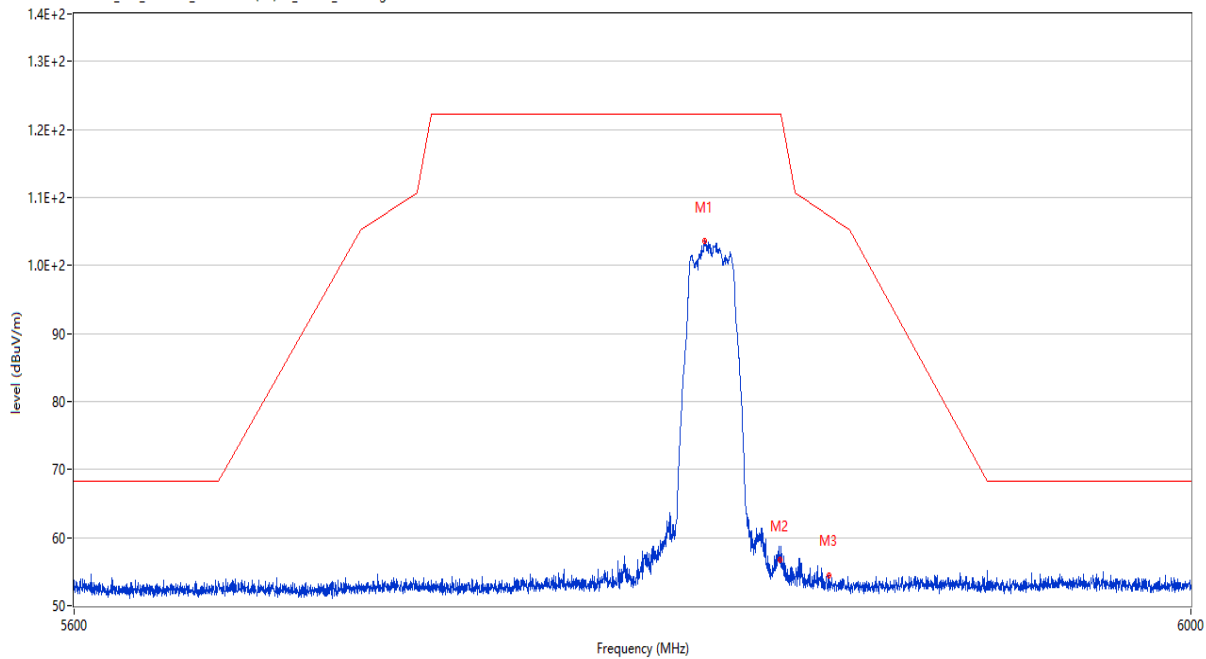
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5822.544	103.68	2.16	122.2	-18.52	Peak	23.50	100	Vertical	Pass
2	5850.000	56.79	2.16	122.2	-65.41	Peak	28.51	100	V	Pass
3	5867.433	54.52	2.16	107.3	-52.78	Peak	32.40	100	Vertical	Pass

TEST REPORT

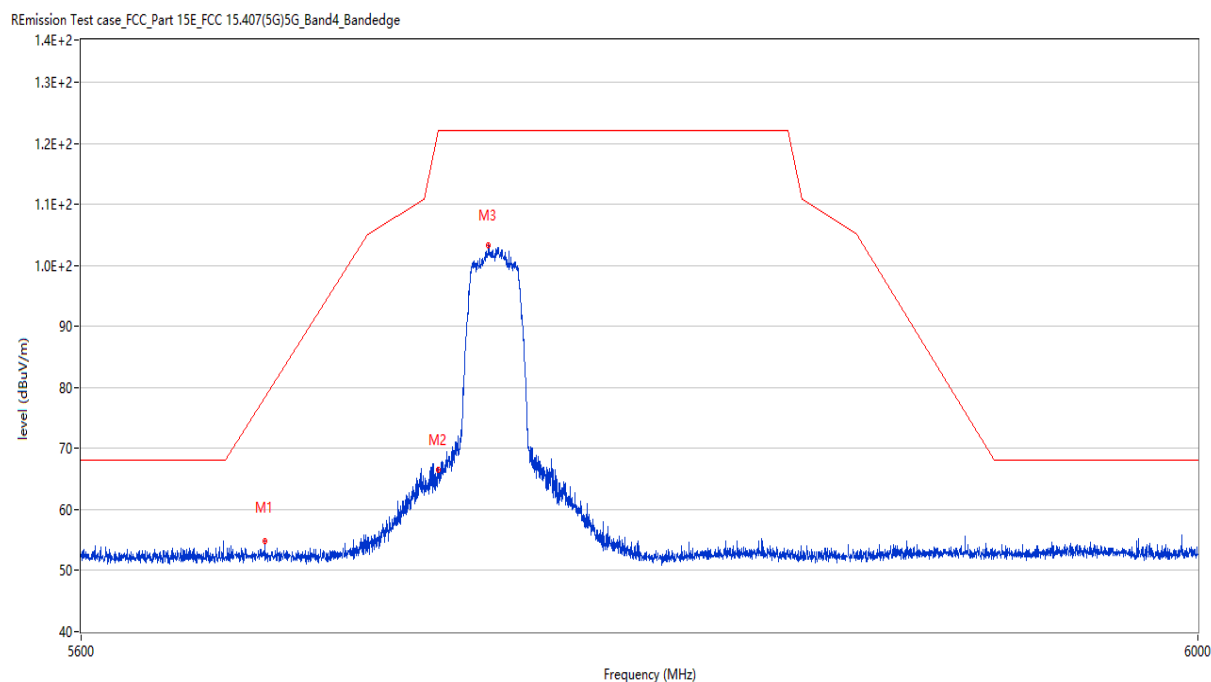
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Figure 14: Band Edge (Restricted-band band-edge), 802.11n(HT20), 5745MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5663.984	54.81	2.12	78.6	-23.79	Peak	354.10	100	Horizontal	Pass
2	5725.000	66.25	2.16	122.2	-55.95	Peak	359.31	100	H	Pass
3	5742.764	103.26	2.16	122.2	-18.94	Peak	345.40	100	Horizontal	Pass

TEST REPORT

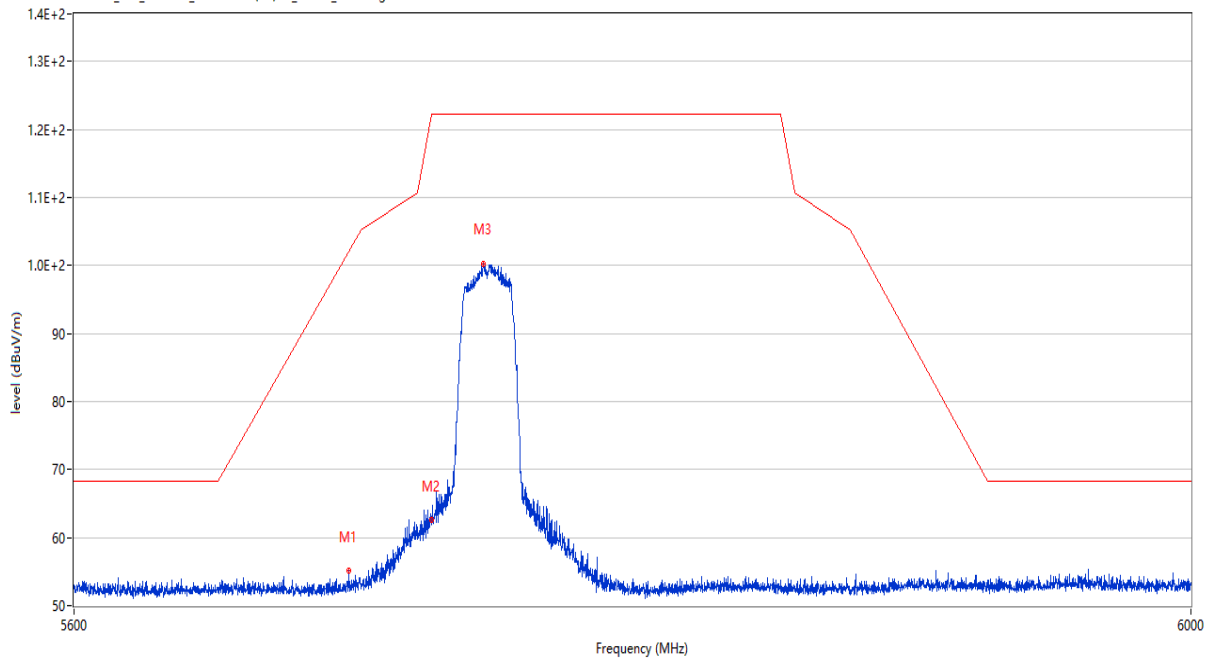
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5695.776	55.11	2.16	102.1	-46.99	Peak	1.10	100	Vertical	Pass
2	5725.000	62.80	2.16	122.2	-59.40	Peak	1.86	100	V	Pass
3	5743.264	100.31	2.16	122.2	-21.89	Peak	0.40	100	Vertical	Pass

TEST REPORT

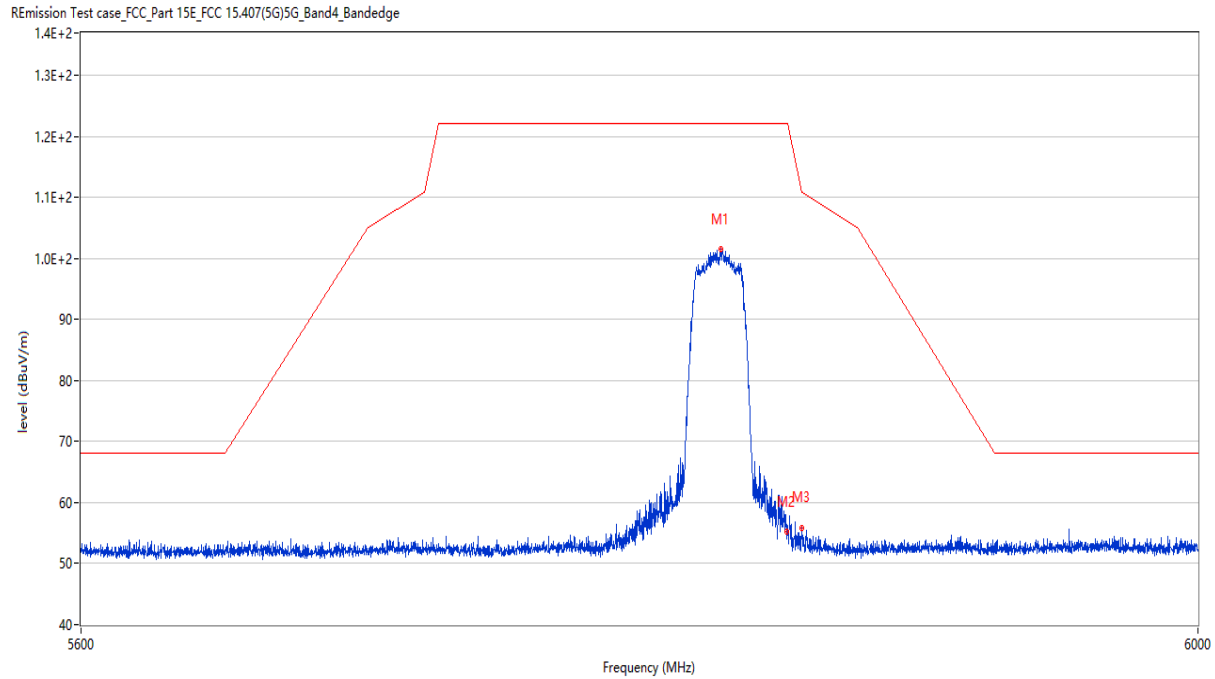
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Figure 15: Band Edge (Restricted-band band-edge), 802.11n(HT20), 5825MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5825.644	101.61	2.16	122.2	-20.59	Peak	344.90	100	Horizontal	Pass
2	5850.000	55.26	2.16	122.2	-66.94	Peak	346.58	100	H	Pass
3	5854.836	55.91	2.16	111.2	-55.29	Peak	353.70	100	Horizontal	Pass

TEST REPORT

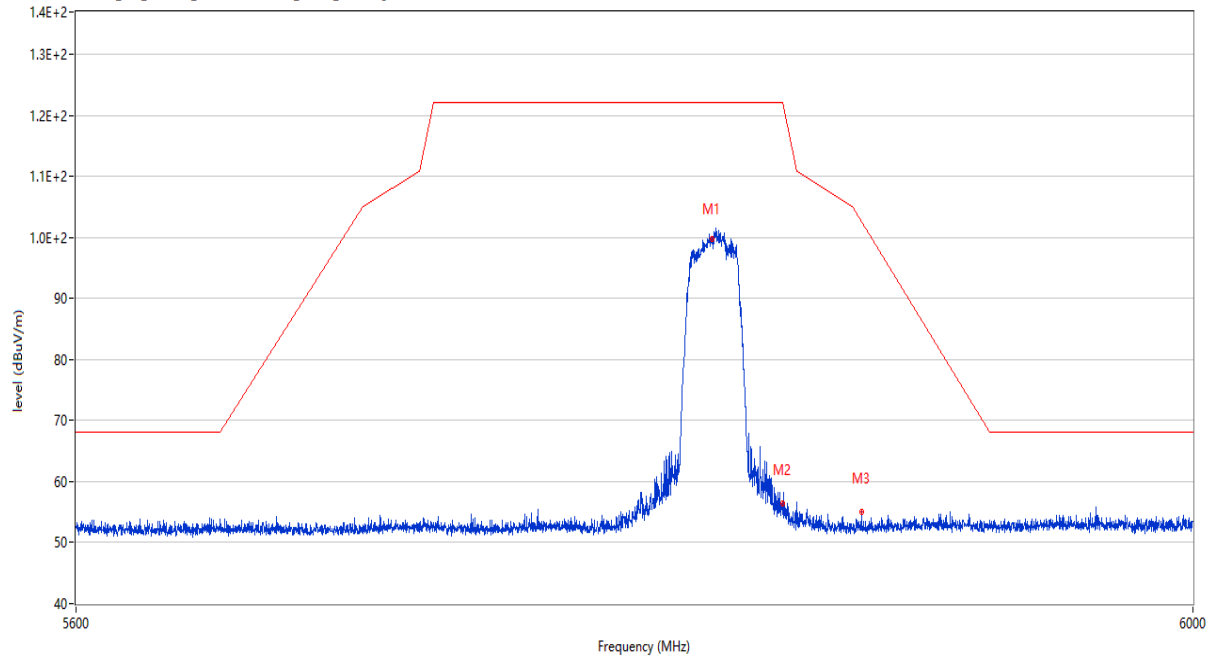
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5824.344	99.78	2.16	122.2	-22.42	Peak	3.50	100	Vertical	Pass
2	5850.000	56.43	2.16	122.2	-65.77	Peak	42.77	100	V	Pass
3	5878.330	55.08	2.16	102.7	-47.62	Peak	67.10	100	Vertical	Pass

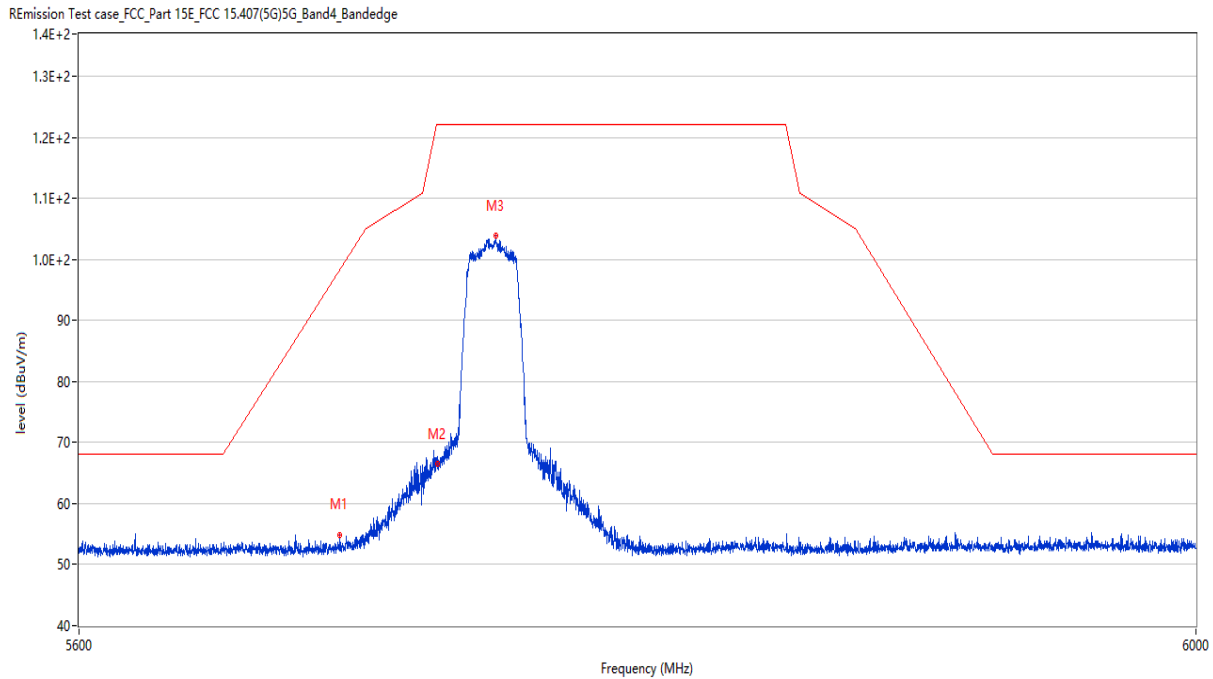
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Figure 16: Band Edge (Restricted-band band-edge), 802.11ac(VHT20), 5745MHz
Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5690.977	54.90	2.15	98.5	-43.60	Peak	271.40	100	Horizontal	Pass
2	5725.000	66.51	2.16	122.2	-55.69	Peak	7.85	100	H	Pass
3	5745.964	103.89	2.16	122.2	-18.31	Peak	27.60	100	Horizontal	Pass

TEST REPORT

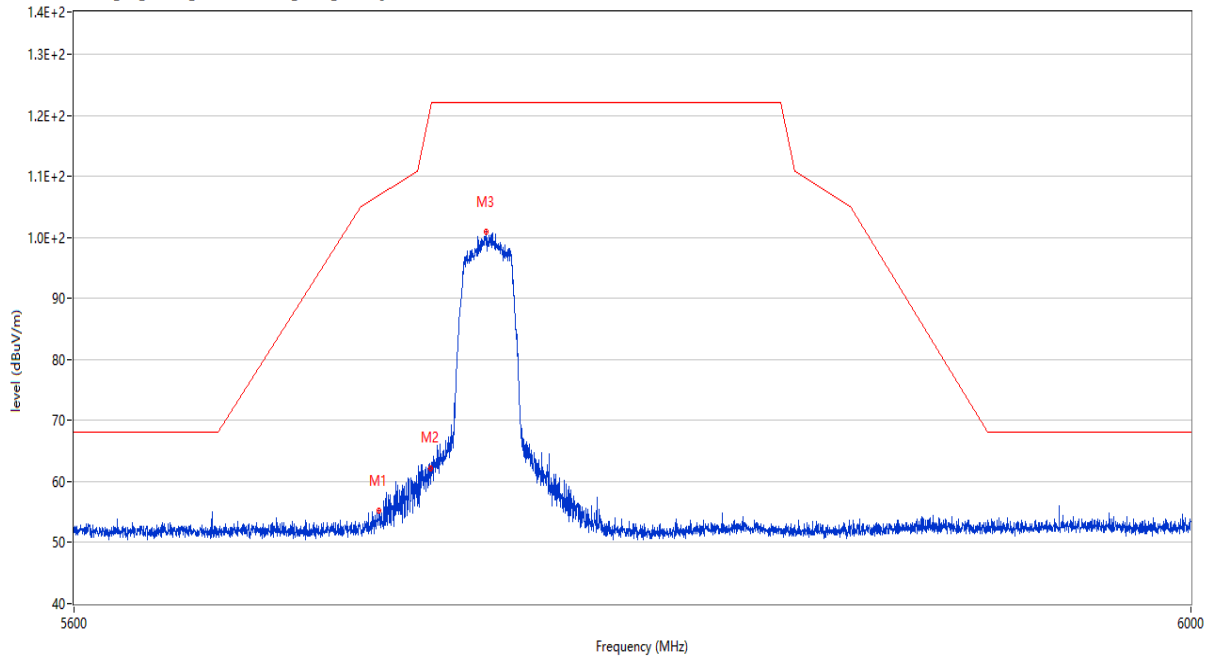
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBUV/m)	Factor (dB)	Limit (dBUV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5706.573	55.29	2.16	107.0	-51.71	Peak	353.80	100	Vertical	Pass
2	5725.000	62.46	2.16	122.2	-59.74	Peak	355.60	100	V	Pass
3	5744.464	101.01	2.16	122.2	-21.19	Peak	356.50	100	Vertical	Pass

TEST REPORT

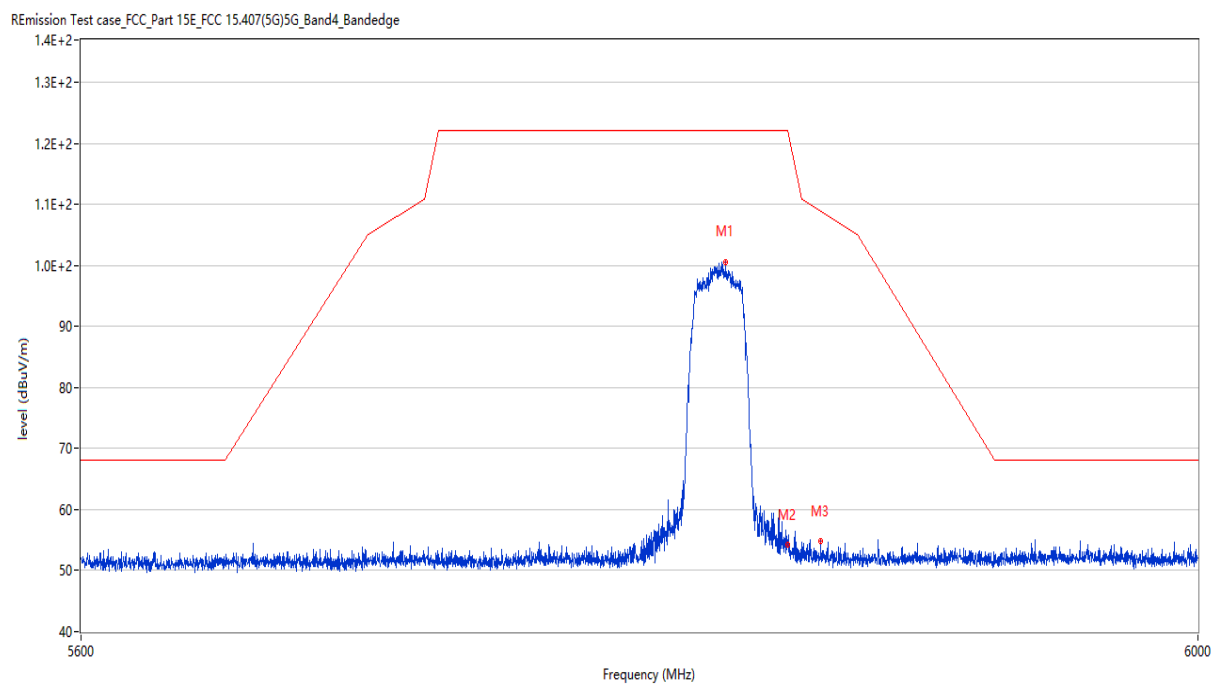
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Figure 17: Band Edge (Restricted-band band-edge), 802.11ac(VHT20), 5825MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5827.543	100.64	2.16	122.2	-21.56	Peak	356.50	100	Horizontal	Pass
2	5850.000	54.49	2.16	122.2	-67.71	Peak	359.31	100	H	Pass
3	5861.835	54.85	2.16	108.9	-54.05	Peak	358.00	100	Horizontal	Pass

TEST REPORT

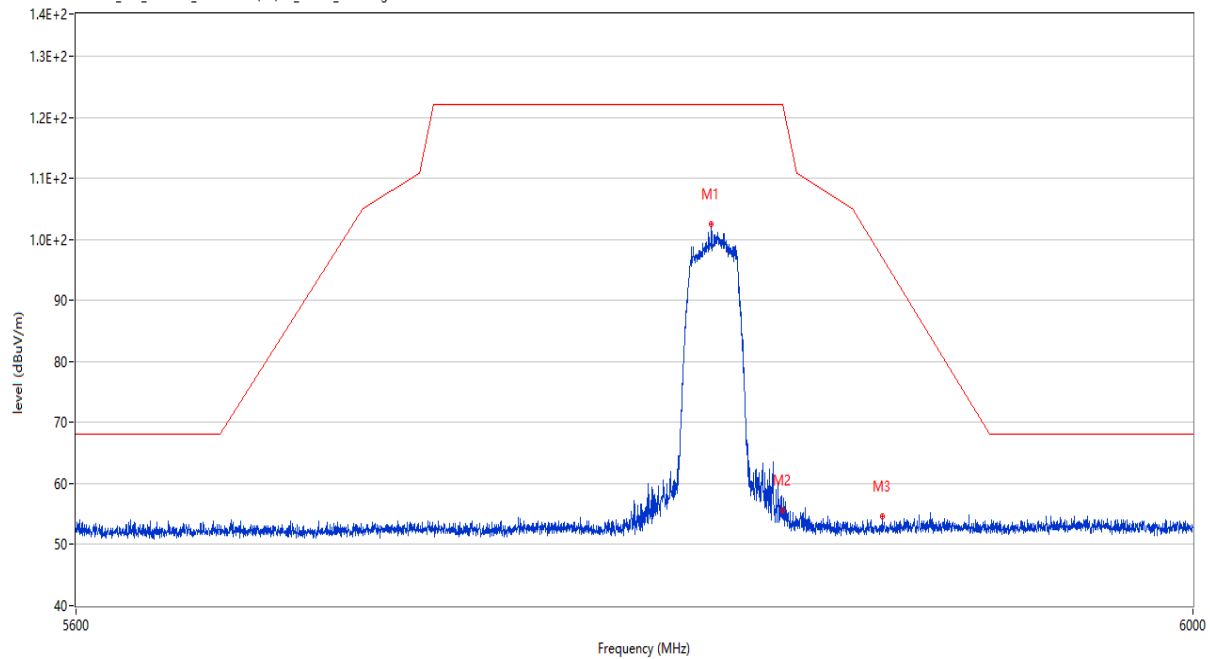
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REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5824.144	102.54	2.16	122.2	-19.66	Peak	68.30	100	Vertical	Pass
2	5850.000	55.35	2.16	122.2	-66.85	Peak	22.02	100	V	Pass
3	5886.028	54.57	2.16	97.0	-42.43	Peak	15.30	100	Vertical	Pass

TEST REPORT

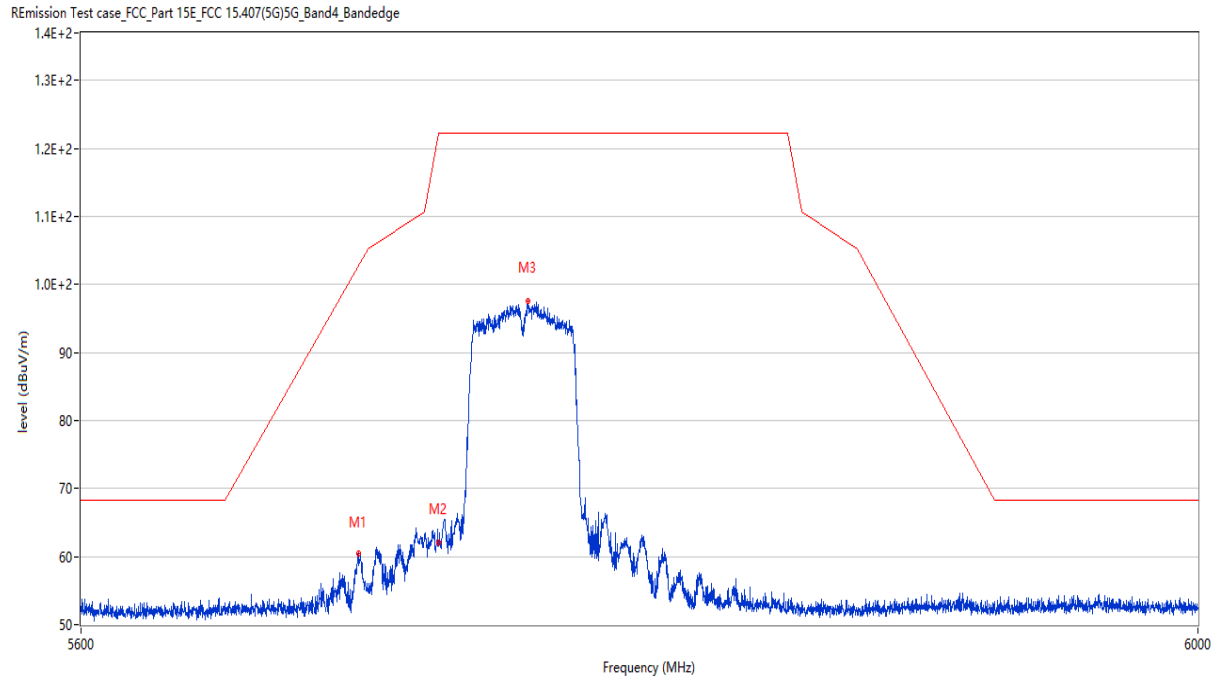
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Figure 18: Band Edge (Restricted-band band-edge), 802.11n(HT40), 5755MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5696.976	60.55	2.16	103.0	-42.45	Peak	0.00	100	H	Pass
2	5725.000	62.01	2.16	122.2	-60.19	Peak	26.26	100	H	Pass
3	5756.661	97.60	2.16	122.2	-24.60	Peak	75.10	100	H	Pass

TEST REPORT

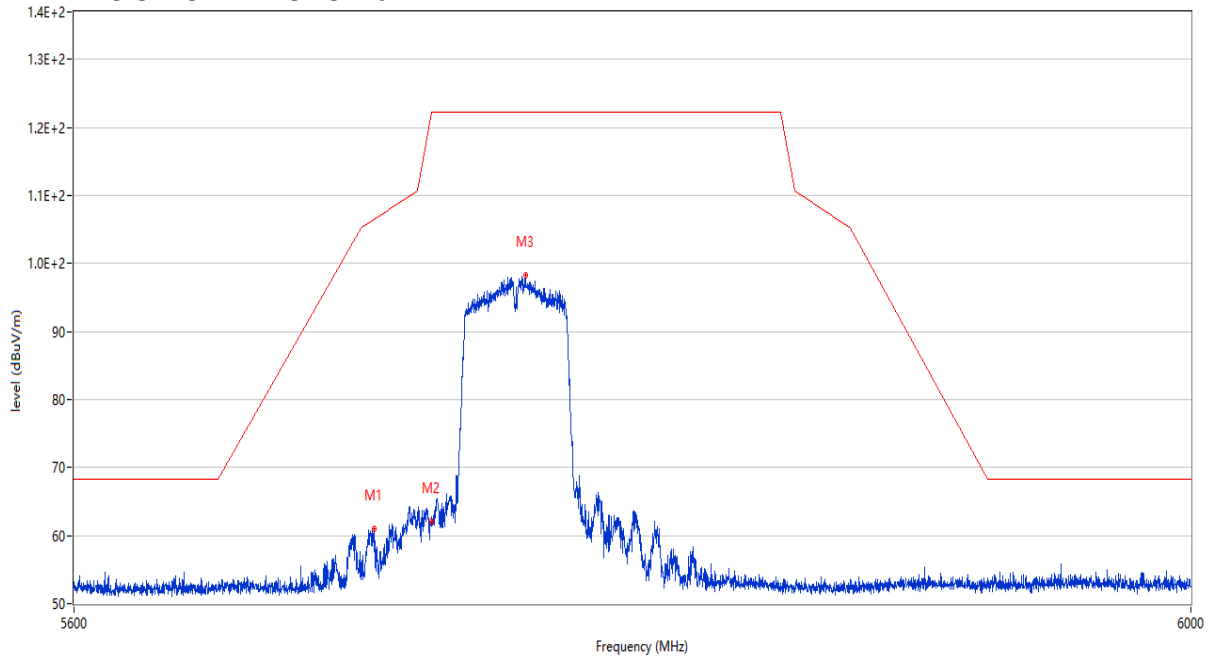
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REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5704.774	60.95	2.16	106.5	-45.55	Peak	356.70	100	Vertical	Pass
2	5725.000	61.83	2.16	122.2	-60.37	Peak	358.98	100	Vertical	Pass
3	5758.360	98.34	2.16	122.2	-23.86	Peak	358.10	100	Vertical	Pass

TEST REPORT

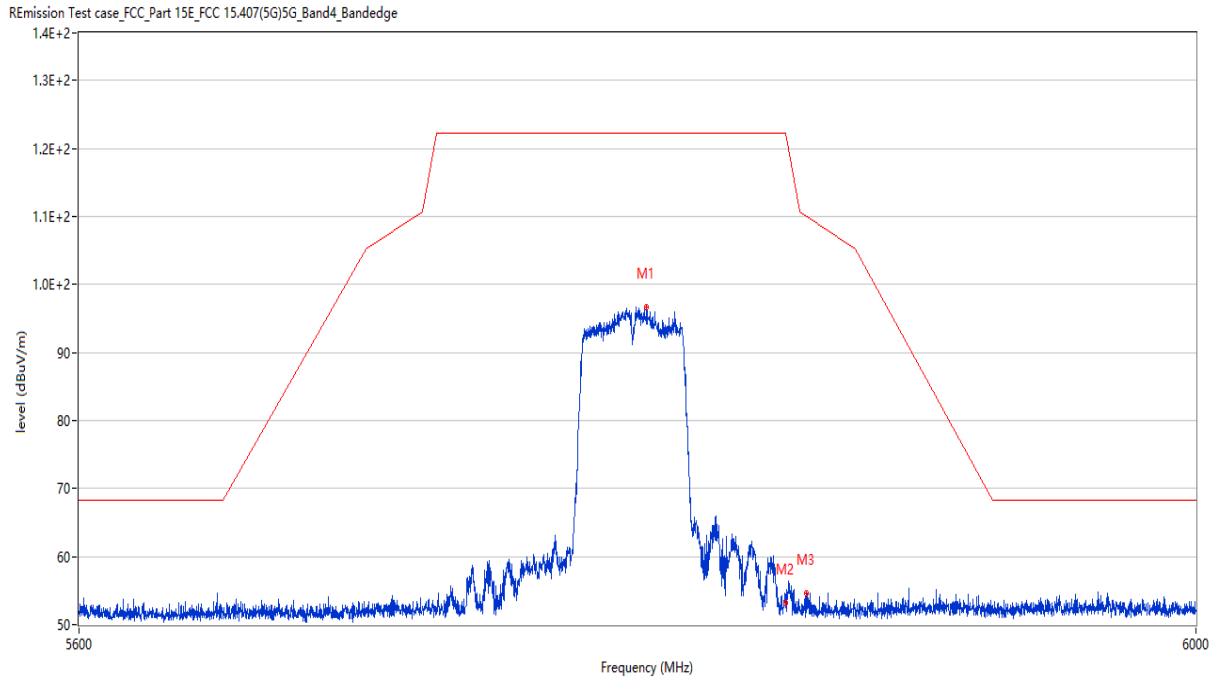
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Figure 19: Band Edge (Restricted-band band-edge), 802.11n(HT40), 5795MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5799.850	96.70	2.16	122.2	-25.50	Peak	356.30	100	Horizontal	Pass
2	5850.000	53.18	2.16	122.2	-69.02	Peak	359.44	100	H	Pass
3	5857.336	54.64	2.16	110.1	-55.46	Peak	356.30	100	Horizontal	Pass

TEST REPORT

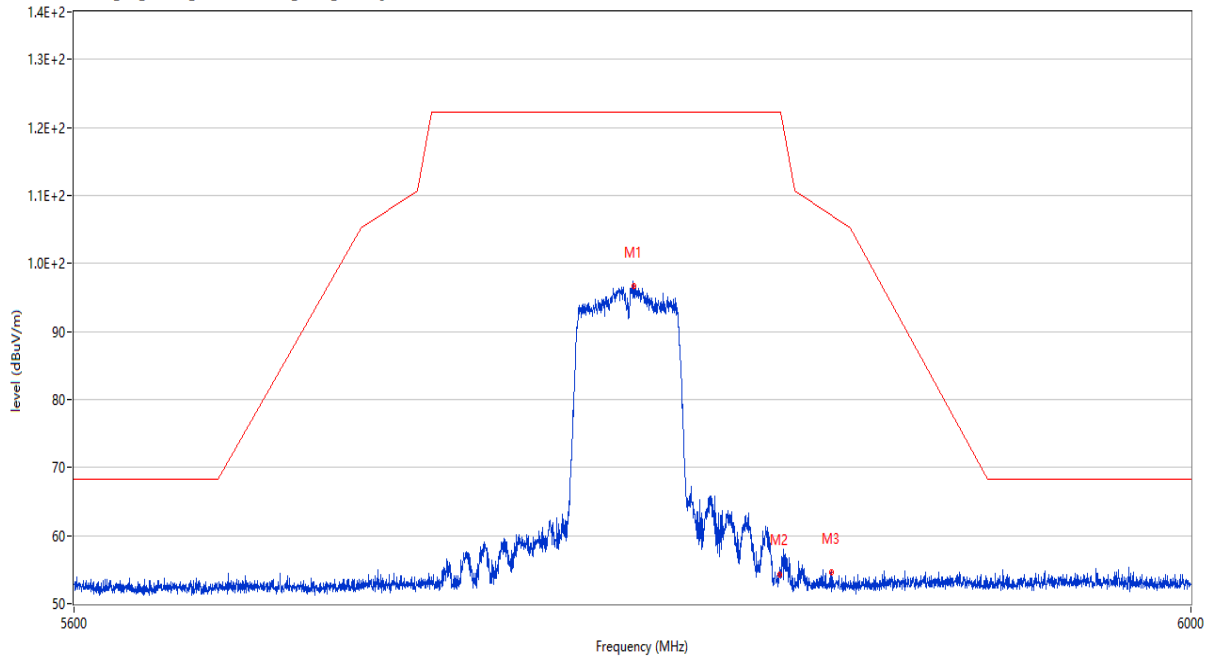
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REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5797.051	96.63	2.16	122.2	-25.57	Peak	67.80	100	Vertical	Pass
2	5850.000	53.63	2.16	122.2	-68.57	Peak	79.97	100	V	Pass
3	5868.333	54.65	2.16	107.1	-52.45	Peak	67.80	100	Vertical	Pass

TEST REPORT

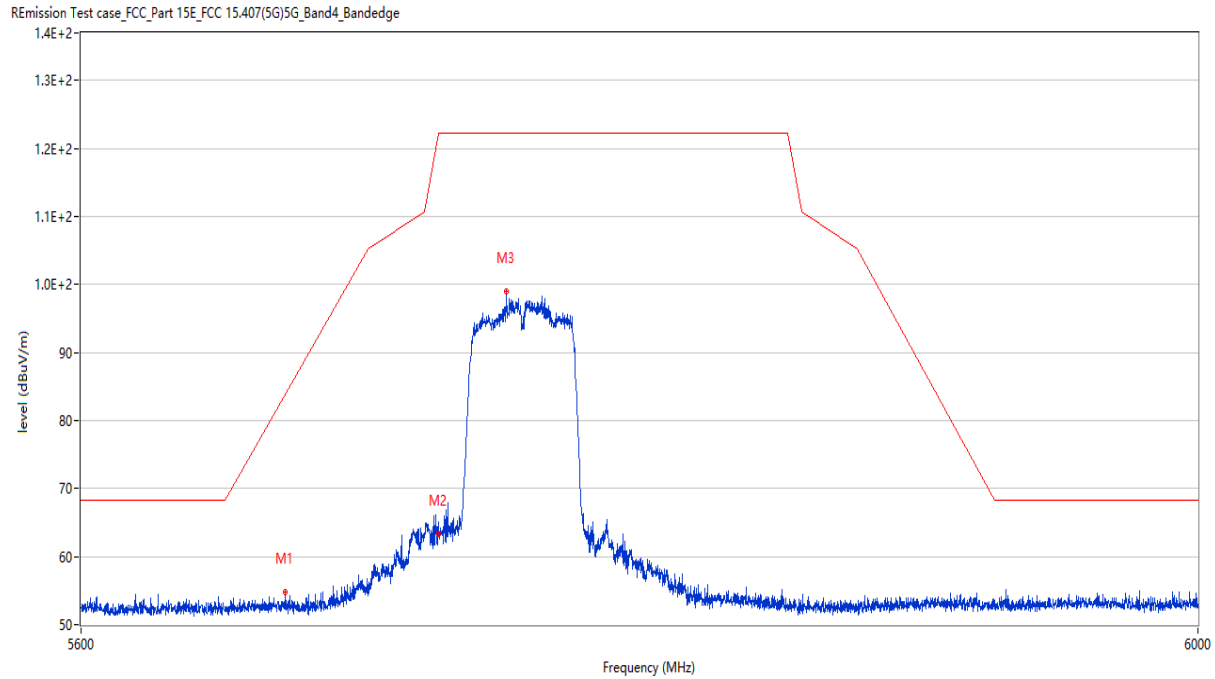
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Figure 20: Band Edge (Restricted-band band-edge), 802.11ac(VHT40), 5755MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5671.082	54.82	2.13	83.8	-28.98	Peak	357.90	100	Horizontal	Pass
2	5725.000	63.14	2.16	122.2	-59.06	Peak	110.42	100	H	Pass
3	5749.163	98.93	2.16	122.2	-23.27	Peak	357.90	100	Horizontal	Pass

TEST REPORT

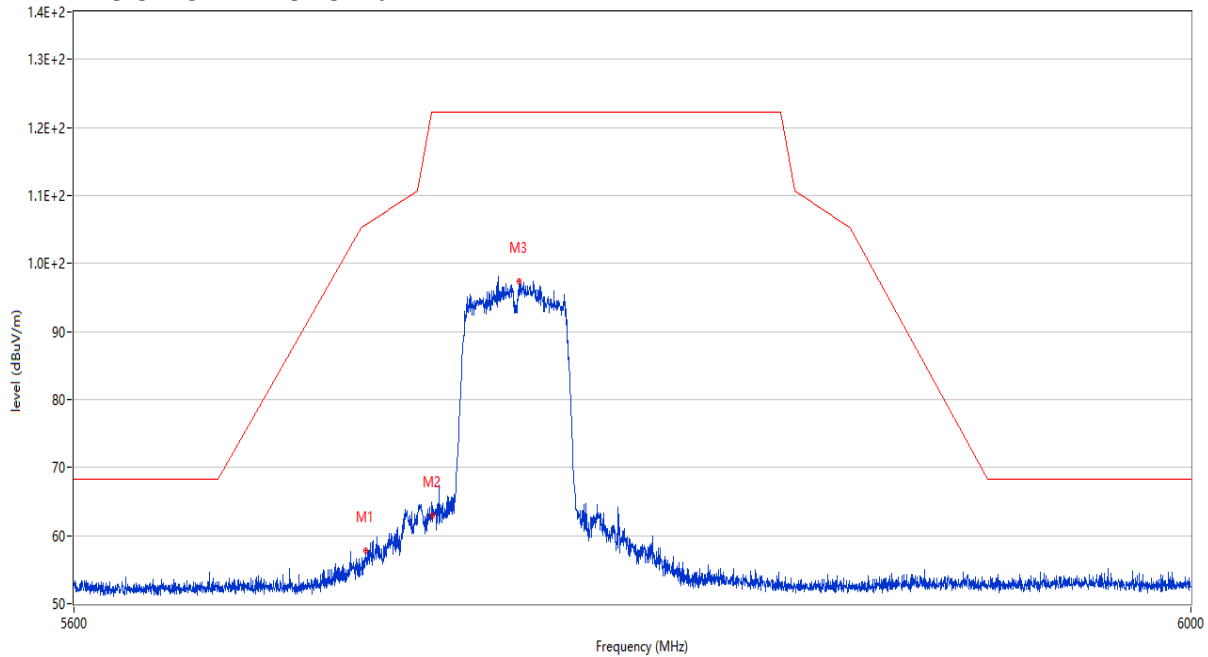
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5701.775	57.79	2.16	105.7	-47.91	Peak	68.90	100	Vertical	Pass
2	5725.000	63.17	2.16	122.2	-59.03	Peak	80.66	100	V	Pass
3	5756.061	97.38	2.16	122.2	-24.82	Peak	1.00	100	Vertical	Pass

TEST REPORT

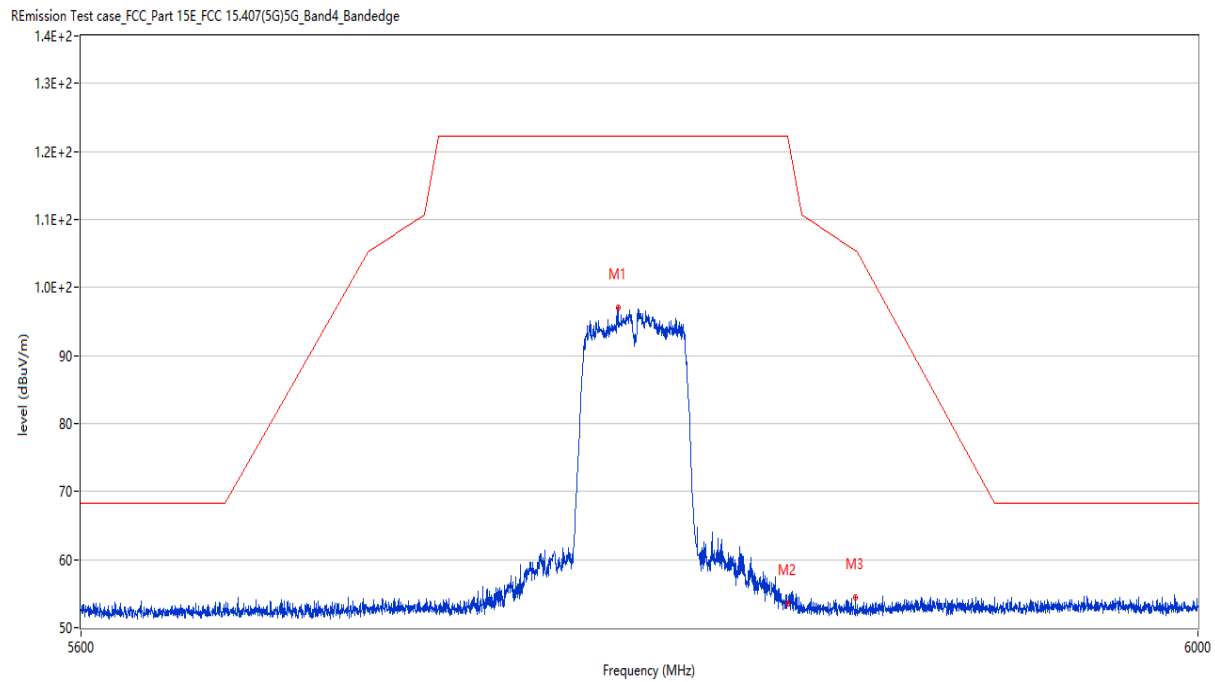
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Figure 21: Band Edge (Restricted-band band-edge), 802.11ac(VHT40), 5795MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5788.853	96.99	2.16	122.2	-25.21	Peak	97.60	100	Horizontal	Pass
2	5850.000	53.54	2.16	122.2	-68.66	Peak	31.25	100	H	Pass
3	5874.431	54.44	2.16	105.4	-50.96	Peak	1.00	100	Horizontal	Pass

TEST REPORT

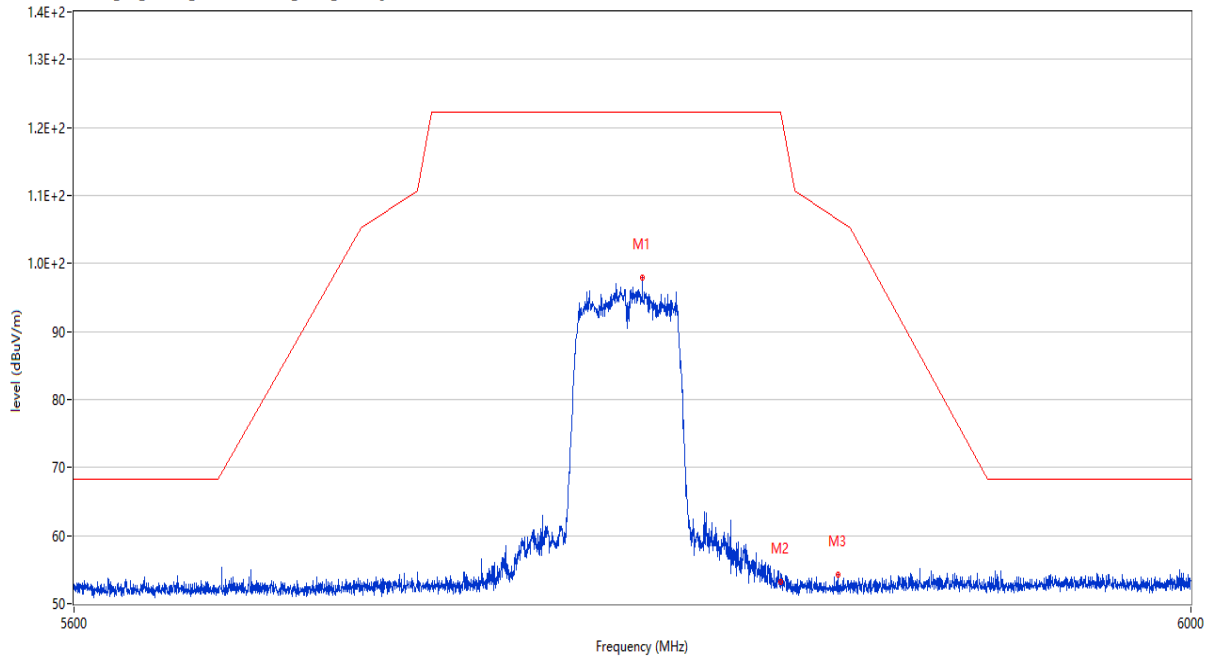
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REmission Test case_FCC_Part 15E_FCC 15.407(5G)5G_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5800.050	97.98	2.16	122.2	-24.22	Peak	356.70	100	Vertical	Pass
2	5850.000	53.04	2.16	122.2	-69.16	Peak	345.94	100	V	Pass
3	5870.532	54.17	2.16	106.4	-52.23	Peak	152.30	100	Vertical	Pass

TEST REPORT

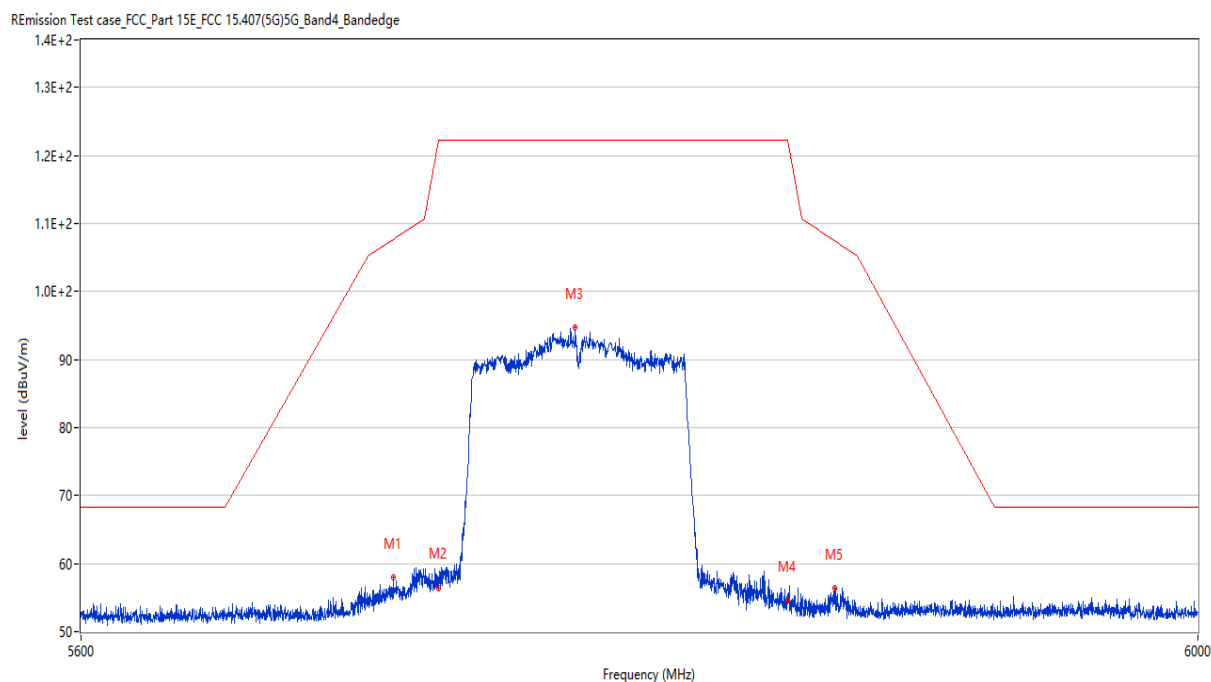
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Figure 22: Band Edge (Restricted-band band-edge), 802.11ac(VHT80), 5775MHz

Horizontal



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5708.973	58.02	2.16	107.7	-49.68	Peak	1.00	100	Horizontal	Pass
2	5725.000	56.29	2.16	122.2	-65.91	Peak	61.45	100	H	Pass
3	5773.457	94.72	2.16	122.2	-27.48	Peak	63.00	100	Horizontal	Pass
4	5850.000	54.50	2.16	122.2	-67.70	Peak	21.74	100	H	Pass
5	5866.833	56.42	2.16	107.5	-51.08	Peak	67.80	100	Horizontal	Pass

TEST REPORT

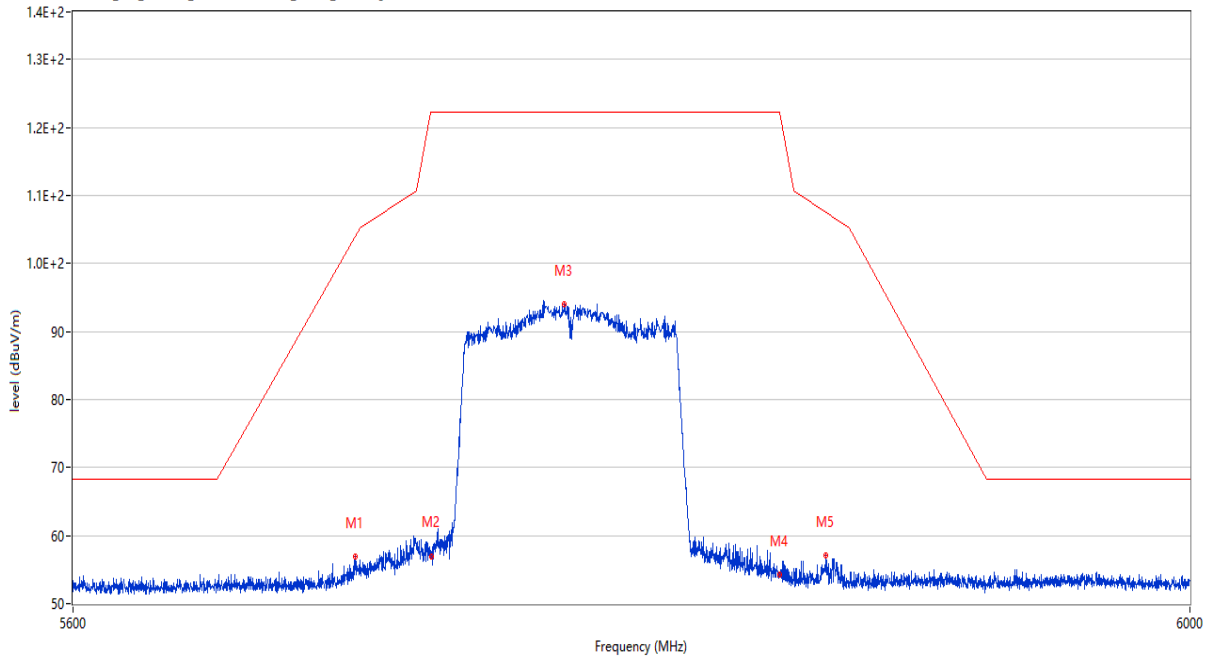
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Vertical

REmission Test case_FCC_Part 15E_FCC 15.407(5G)_Band4_Bandedge



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	5698.575	56.90	2.16	104.2	-47.30	Peak	0.00	100	Vertical	Pass
2	5725.000	56.99	2.16	122.2	-65.21	Peak	156.28	100	V	Pass
3	5772.557	93.98	2.16	122.2	-28.22	Peak	29.90	100	Vertical	Pass
4	5850.000	54.22	2.16	122.2	-67.98	Peak	244.57	100	V	Pass
5	5866.633	57.06	2.16	107.5	-50.44	Peak	60.70	100	Vertical	Pass

End of the report