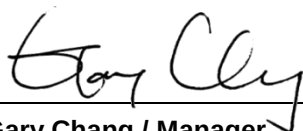


FCC Test Report

FCC ID : P27RC8522
Equipment : Wireless Network FHD Camera
Model No. : RC8522
Multiple Listing : RC8522xxxxxxxx, VistaCam 900xxxxxx
(The 1st x should be "blank" or "-"; the rest x could be 0 to 9, A to Z, "blank" or "-", for marking purpose.)
Brand Name : Sercomm, Vera Control, Inc.
Applicant : Sercomm Corporation
Address : 8F, No. 3-1, YuanQu St., NanKang, Taipei 115,
Taiwan, R.O.C.
Standard : 47 CFR FCC Part 15.407
Received Date : Feb. 25, 2016
Tested Date : Mar. 11 ~ May 24, 2016

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:



Gary Chang / Manager



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Release Record

Report No.	Version	Description	Issued Date
FR622502AN	Rev. 01	Initial issue	Jul. 04, 2016

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 4.525MHz 39.61 (Margin -6.39dB) - AV	Pass
15.407(b) 15.209	Radiated Emissions	[dBuV/m at 3m]: 17355.00MHz 53.00 (Margin -1.00dB) - AV	Pass
15.407(a)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(e)	6dB bandwidth	Meet the requirement of limit	Pass
15.407(a)	RF Output Power	Max Power [dBm]: 5150-5250MHz: 21.28 5725-5850MHz: 21.00	Pass
15.407(a)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Product Details

The following models are provided to this EUT.

Brand Name	Model Name	Main tested model	Product Name
Sercomm	RC8522xxxxxxxx	RC8522	Wireless Network FHD Camera
Vera Control, Inc.	VistaCam 900xxxxx		
✦ The 1st x should be "blank" or "-"; the rest x could be 0 to 9, A to Z, "blank" or "-", for marking purpose			

1.1.2 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
5150-5250	a	5180-5240	36-48 [4]	1	6-54 Mbps
5150-5250	n (HT20)	5180-5240	36-48 [4]	2	MCS 0-15
5150-5250	n (HT40)	5190-5230	38-46 [2]	2	MCS 0-15
5150-5250	ac (VHT20)	5180-5240	36-48 [4]	2	MCS 0-9
5150-5250	ac (VHT40)	5190-5230	38-46 [2]	2	MCS 0-9
5150-5250	ac (VHT80)	5210	42 [1]	2	MCS 0-9
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation. Note 3: 802.11a is transmitting signal through chain 0 only.					

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N _{TX})	Data Rate / MCS
5725-5850	a	5745-5825	149-165 [5]	1	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	2	MCS 0-15
5725-5850	n (HT40)	5755-5795	151-159 [2]	2	MCS 0-15
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	2	MCS 0-9
5725-5850	ac (VHT40)	5755-5795	151-159 [2]	2	MCS 0-9
5725-5850	ac (VHT80)	5775	155 [1]	2	MCS 0-9
Note 1: RF output power specifies that Maximum Conducted Output Power. Note 2: 802.11a/n/ac uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation. Note 3: 802.11a is transmitting signal through chain 0 only.					

1.1.3 Antenna Details

Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)		
			2400~2483.5	5150~5250	5725~5850
Ant 1	Dipole	UFL	3	3.7	3.6
Ant 2	Dipole	UFL	2.8	2	4.1

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter
--------------------------	--------------------

1.1.5 Accessories

Accessories		
No.	Equipment	Description
1	Adapter	Brand: APD Model: WA-12M12FU I/P: 100-240Vac, 50-60Hz, 0.5A Max O/P: 12Vdc, 1A Power line: 2.9m non-shielded w/o core.
2	RJ45 to Micro USB cable	0.15m non-shielded w/o core.

1.1.6 Channel List

For Frequency band 5150-5250 MHz			
802.11 a / HT20 / VHT20		HT40 / VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	VHT 80	
48	5240	42	5210

For Frequency band 5725~5850 MHz			
802.11 a / HT20 / VHT20		HT40 / VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
149	5745	151	5755
153	5765	159	5795
157	5785	VHT80	
161	5805	155	5775
165	5825	---	---

1.1.7 Test Tool and Duty Cycle

Test Tool	telnet		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11a	93.49%	0.29
	VHT20	94.41%	0.25
	VHT40	87.60%	0.58
	VHT80	75.09%	1.24

1.1.8 Power Setting

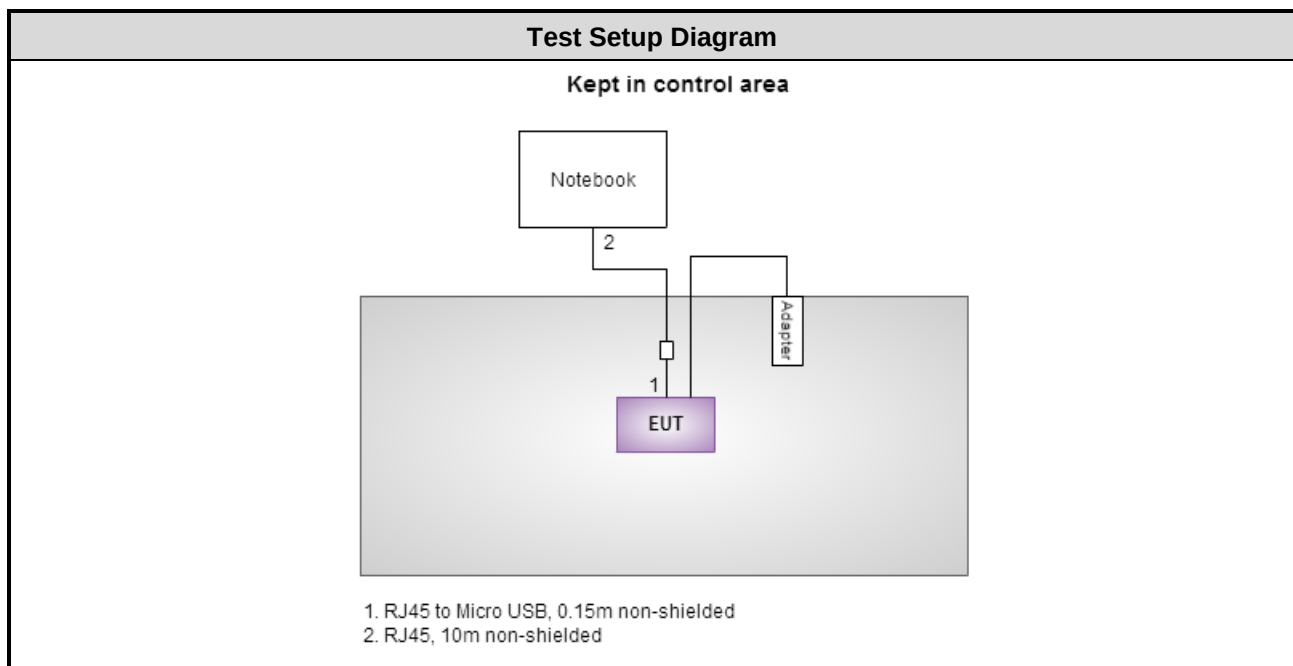
For Frequency band 5150-5250 MHz		
Modulation Mode	Test Frequency (MHz)	Power Set
11a	5180	63
11a	5200	63
11a	5240	63
HT20	5180	63/61
HT20	5200	63/60
HT20	5240	63/60
HT40	5190	63/60
HT40	5230	63/59
VHT20	5180	63/61
VHT20	5200	63/60
VHT20	5240	63/60
VHT40	5190	63/60
VHT40	5230	63/59
VHT80	5210	60/56

For Frequency band 5725~5850 MHz		
Modulation Mode	Test Frequency (MHz)	Power Set
11a	5745	46
11a	5785	56
11a	5825	56
HT20	5745	53/51
HT20	5785	57/55
HT20	5825	57/54
HT40	5755	52/50
HT40	5795	59/56
VHT20	5745	53/51
VHT20	5785	57/55
VHT20	5825	57/54
VHT40	5755	52/50
VHT40	5795	59/56
VHT80	5775	48/46

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E5420	DoC	RJ45, 10m non-shielded.

1.3 Test Setup Chart



1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100169	Oct. 21, 2015	Oct. 20, 2016
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 13, 2015	Nov. 12, 2016
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 21, 2015	Dec. 20, 2016
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber 2 / (03CH02-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101499	Dec. 17, 2015	Dec. 16, 2016
Receiver	R&S	ESR3	101657	Jan. 12, 2016	Jan. 11, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-523	Nov. 09, 2015	Nov. 08, 2016
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1095	Oct. 07, 2015	Oct. 06, 2016
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Nov. 04, 2015	Nov. 03, 2016
Preamplifier	Burgeon	BPA-530	100218	Nov. 03, 2015	Nov. 02, 2016
Preamplifier	Agilent	83017A	MY39501309	Sep. 22, 2015	Sep. 21, 2016
Preamplifier	EMC	EMC184045B	980192	Sep. 01, 2015	Aug. 31, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 10, 2015	Dec. 09, 2016
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 10, 2015	Dec. 09, 2016
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-003	Dec. 10, 2015	Dec. 09, 2016
LF cable 10M	EMCC	CFD400-E	CFD400-001	Dec. 10, 2015	Dec. 09, 2016
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2016	Feb. 16, 2017
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 27, 2015	Nov. 26, 2016
Power Meter	Anritsu	ML2495A	1241002	Sep. 21, 2015	Sep. 20, 2016
Power Sensor	Anritsu	MA2411B	1207366	Sep. 21, 2015	Sep. 20, 2016
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Testing Applied Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.407

ANSI C63.10-2013

FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02

FCC KDB 644545 D03 Guidance for IEEE 802.11ac New Rules v01

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor $k=2$)

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.134 Hz
Conducted power	± 0.808 dB
Frequency error	± 34.134 Hz
Power density	± 0.463 dB
Conducted emission	± 2.670 dB
AC conducted emission	± 2.90 dB
Radiated emission ≤ 1 GHz	± 3.87 dB
Radiated emission > 1 GHz	± 5.60 dB
Time	$\pm 0.1\%$
Temperature	± 0.6 °C

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	23°C / 65%	Alex Tsai
Radiated Emissions	03CH02-WS	18-22°C / 61-62%	Felix Sung Aska Huang
RF Conducted	TH01-WS	24°C / 66%	Alex Huang

➤ FCC site registration No.: 181692

➤ IC site registration No.: 10807A-2

2.2 The Worst Test Modes and Channel Details

For Frequency band 5150-5250 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	VHT20	5240	MCS 0	---
Radiated Emissions ≤ 1 GHz	VHT20	5240	MCS 0	---
RF Output Power	11a	5180 / 5200 / 5240	6 Mbps	---
	HT20	5180 / 5200 / 5240	MCS 0	
	HT40	5190 / 5230	MCS 0	
	VHT20	5180 / 5200 / 5240	MCS 0	
	VHT40	5190 / 5230	MCS 0	
	VHT80	5210	MCS 0	
Radiated Emissions > 1 GHz Emission Bandwidth Peak Power Spectral Density	11a	5180 / 5200 / 5240	6 Mbps	---
	VHT20	5180 / 5200 / 5240	MCS 0	
	VHT40	5190 / 5230	MCS 0	
	VHT80	5210	MCS 0	
Frequency Stability	Un-modulation	5200	---	---
NOTE:				
1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The Z-plane results were found as the worst case and were shown in this report.				

For Frequency band 5725-5850 MHz				
Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	VHT20	5785	MCS 0	---
Radiated Emissions ≤ 1 GHz	VHT20	5785	MCS 0	---
RF Output Power	11a	5745 / 5785 / 5825	6 Mbps	---
	HT20	5745 / 5785 / 5825	MCS 0	
	HT40	5755 / 5795	MCS 0	
	VHT20	5745 / 5785 / 5825	MCS 0	
	VHT40	5755 / 5795	MCS 0	
	VHT80	5775	MCS 0	
Radiated Emissions > 1 GHz Emission Bandwidth 6dB bandwidth Peak Power Spectral Density	11a	5745 / 5785 / 5825	6 Mbps	---
	VHT20	5745 / 5785 / 5825	MCS 0	
	VHT40	5755 / 5795	MCS 0	
	VHT80	5775	MCS 0	
Frequency Stability	Un-modulation	5785	---	---
NOTE:				
1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The Z-plane results were found as the worst case and were shown in this report.				

3 Transmitter Test Results

3.1 Conducted Emissions

3.1.1 Limit of Conducted Emissions

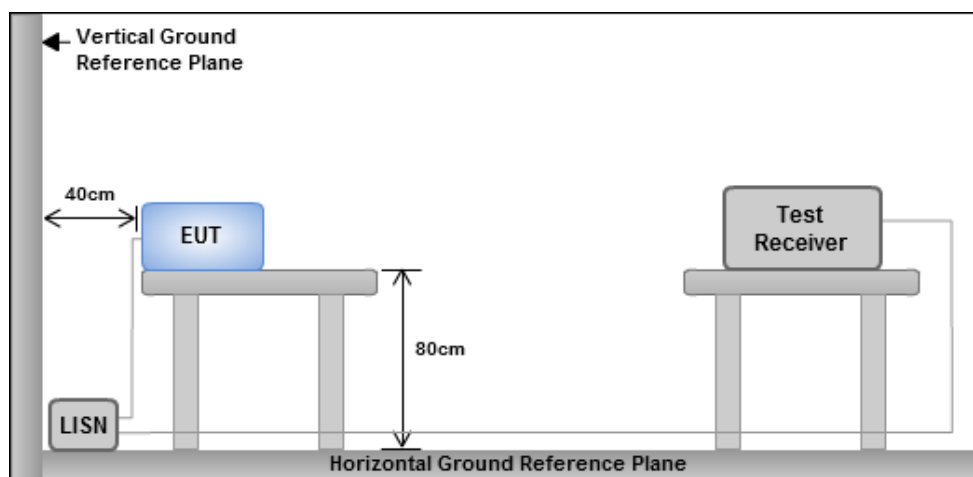
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

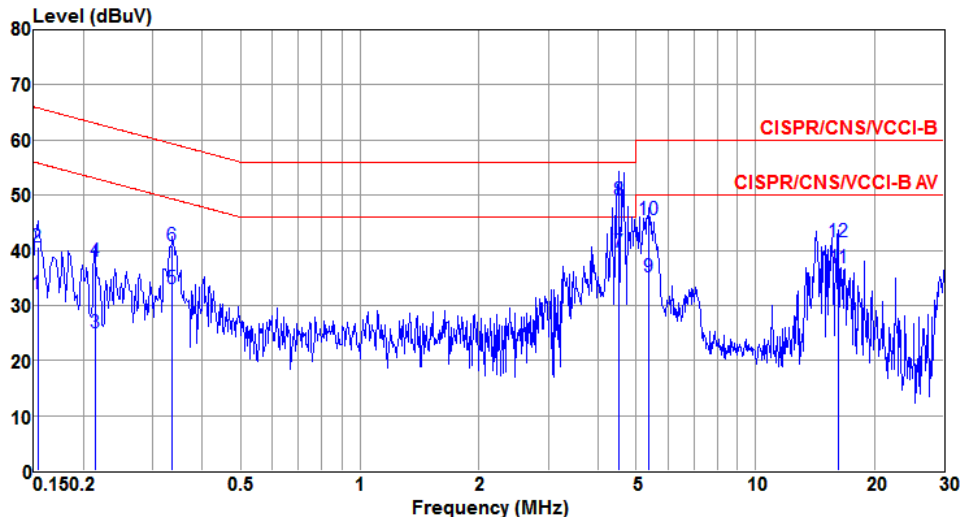
3.1.3 Test Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

Modulation	VHT20	Test Freq. (MHz)	5240
Power Phase	Line		

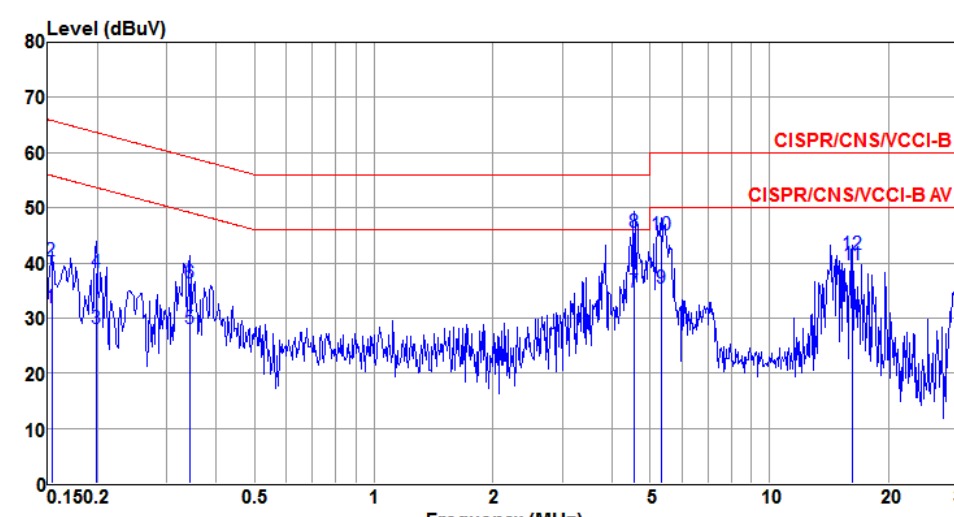


	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.153	32.01	55.82	-23.81	31.88	0.11	0.02	Average
2	0.153	40.56	65.82	-25.26	40.43	0.11	0.02	QP
3	0.214	25.07	53.05	-27.98	24.94	0.11	0.02	Average
4	0.214	37.90	63.05	-25.15	37.77	0.11	0.02	QP
5	0.336	33.03	49.31	-16.28	32.88	0.12	0.03	Average
6	0.336	40.81	59.31	-18.50	40.66	0.12	0.03	QP
7@	4.525	39.61	46.00	-6.39	39.28	0.20	0.13	Average
8	4.525	49.06	56.00	-6.94	48.73	0.20	0.13	QP
9	5.390	35.12	50.00	-14.88	34.78	0.21	0.13	Average
10	5.390	45.65	60.00	-14.35	45.31	0.21	0.13	QP
11	16.226	36.93	50.00	-13.07	36.40	0.33	0.20	Average
12	16.226	41.62	60.00	-18.38	41.09	0.33	0.20	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	VHT20	Test Freq. (MHz)	5240																																																																																																																														
Power Phase	Neutral																																																																																																																																
Level (dBuV) <table><thead><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>LISN</th><th>cable</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>dBuV</th><th>dB</th><th>dBuV</th><th>dB</th><th>dB</th><th></th></tr></thead><tbody><tr><td>1</td><td>0.162</td><td>29.46</td><td>55.34</td><td>-25.88</td><td>29.32</td><td>0.12</td><td>0.02</td><td>Average</td></tr><tr><td>2</td><td>0.162</td><td>40.51</td><td>65.34</td><td>-24.83</td><td>40.37</td><td>0.12</td><td>0.02</td><td>QP</td></tr><tr><td>3</td><td>0.201</td><td>25.78</td><td>53.58</td><td>-27.80</td><td>25.66</td><td>0.10</td><td>0.02</td><td>Average</td></tr><tr><td>4</td><td>0.201</td><td>37.75</td><td>63.58</td><td>-25.83</td><td>37.63</td><td>0.10</td><td>0.02</td><td>QP</td></tr><tr><td>5</td><td>0.334</td><td>37.88</td><td>49.35</td><td>-11.47</td><td>37.72</td><td>0.13</td><td>0.03</td><td>Average</td></tr><tr><td>6</td><td>0.334</td><td>44.04</td><td>59.35</td><td>-15.31</td><td>43.88</td><td>0.13</td><td>0.03</td><td>QP</td></tr><tr><td>7</td><td>4.598</td><td>34.05</td><td>46.00</td><td>-11.95</td><td>33.73</td><td>0.19</td><td>0.13</td><td>Average</td></tr><tr><td>8@</td><td>4.598</td><td>45.34</td><td>56.00</td><td>-10.66</td><td>45.02</td><td>0.19</td><td>0.13</td><td>QP</td></tr><tr><td>9</td><td>5.362</td><td>31.32</td><td>50.00</td><td>-18.68</td><td>30.99</td><td>0.20</td><td>0.13</td><td>Average</td></tr><tr><td>10</td><td>5.362</td><td>39.16</td><td>60.00</td><td>-20.84</td><td>38.83</td><td>0.20</td><td>0.13</td><td>QP</td></tr><tr><td>11</td><td>16.226</td><td>38.07</td><td>50.00</td><td>-11.93</td><td>37.51</td><td>0.36</td><td>0.20</td><td>Average</td></tr><tr><td>12</td><td>16.226</td><td>39.87</td><td>60.00</td><td>-20.13</td><td>39.31</td><td>0.36</td><td>0.20</td><td>QP</td></tr></tbody></table>					Freq	Level	Limit	Over	Read	LISN	cable	Remark		MHz	dBuV	dBuV	dB	dBuV	dB	dB		1	0.162	29.46	55.34	-25.88	29.32	0.12	0.02	Average	2	0.162	40.51	65.34	-24.83	40.37	0.12	0.02	QP	3	0.201	25.78	53.58	-27.80	25.66	0.10	0.02	Average	4	0.201	37.75	63.58	-25.83	37.63	0.10	0.02	QP	5	0.334	37.88	49.35	-11.47	37.72	0.13	0.03	Average	6	0.334	44.04	59.35	-15.31	43.88	0.13	0.03	QP	7	4.598	34.05	46.00	-11.95	33.73	0.19	0.13	Average	8@	4.598	45.34	56.00	-10.66	45.02	0.19	0.13	QP	9	5.362	31.32	50.00	-18.68	30.99	0.20	0.13	Average	10	5.362	39.16	60.00	-20.84	38.83	0.20	0.13	QP	11	16.226	38.07	50.00	-11.93	37.51	0.36	0.20	Average	12	16.226	39.87	60.00	-20.13	39.31	0.36	0.20	QP
	Freq	Level	Limit	Over	Read	LISN	cable	Remark																																																																																																																									
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11	16.226	38.07	50.00	-11.93	37.51	0.36	0.20	Average																																																																																																																									
12	16.226	39.87	60.00	-20.13	39.31	0.36	0.20	QP																																																																																																																									
Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB). Note 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).																																																																																																																																	

Modulation	VHT20	Test Freq. (MHz)	5785
Power Phase	Line		

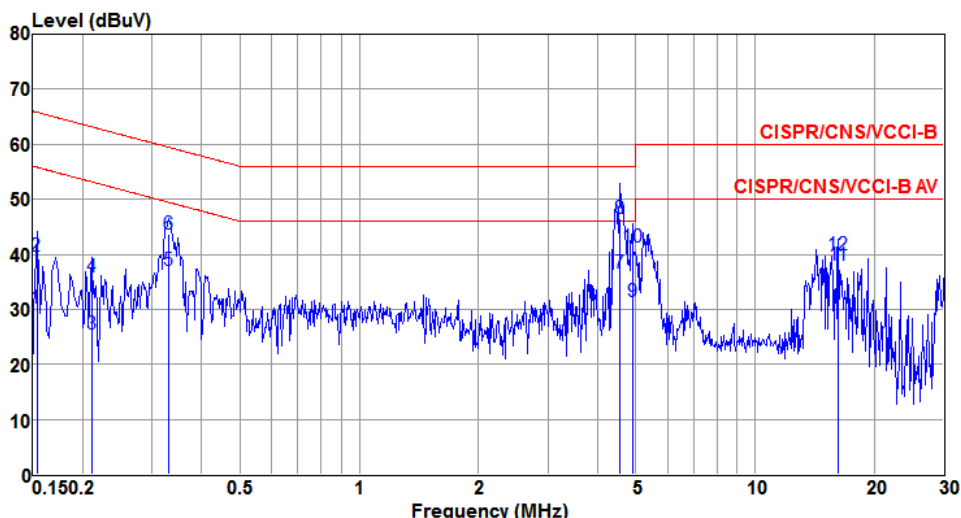


	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.153	31.87	55.82	-23.95	31.74	0.11	0.02	Average
2	0.153	40.29	65.82	-25.53	40.16	0.11	0.02	QP
3	0.199	28.19	53.67	-25.48	28.06	0.11	0.02	Average
4	0.199	38.23	63.67	-25.44	38.10	0.11	0.02	QP
5	0.343	28.17	49.13	-20.96	28.01	0.13	0.03	Average
6	0.343	36.43	59.13	-22.70	36.27	0.13	0.03	QP
7	4.549	34.63	46.00	-11.37	34.30	0.20	0.13	Average
8	4.549	45.59	56.00	-10.41	45.26	0.20	0.13	QP
9	5.333	35.47	50.00	-14.53	35.13	0.21	0.13	Average
10	5.333	45.16	60.00	-14.84	44.82	0.21	0.13	QP
11@	16.226	39.67	50.00	-10.33	39.14	0.33	0.20	Average
12	16.226	41.52	60.00	-18.48	40.99	0.33	0.20	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).

2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	VHT20	Test Freq. (MHz)	5785
Power Phase	Neutral		



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.153	30.26	55.82	-25.56	30.11	0.13	0.02	Average
2	0.153	39.58	65.82	-26.24	39.43	0.13	0.02	QP
3	0.211	25.46	53.18	-27.72	25.34	0.10	0.02	Average
4	0.211	35.98	63.18	-27.20	35.86	0.10	0.02	QP
5	0.330	37.06	49.44	-12.38	36.90	0.13	0.03	Average
6	0.330	43.70	59.44	-15.74	43.54	0.13	0.03	QP
7@	4.549	36.51	46.00	-9.49	36.20	0.18	0.13	Average
8	4.549	46.40	56.00	-9.60	46.09	0.18	0.13	QP
9	4.900	31.31	46.00	-14.69	30.99	0.19	0.13	Average
10	4.900	41.29	56.00	-14.71	40.97	0.19	0.13	QP
11	16.226	38.07	50.00	-11.93	37.51	0.36	0.20	Average
12	16.226	39.83	60.00	-20.17	39.27	0.36	0.20	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 Emission Bandwidth

3.2.1 Limit of Emission bandwidth

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

3.2.2 Test Procedures

26dB Bandwidth

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW, Detector = Peak.
3. Trace mode = max hold.
4. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.

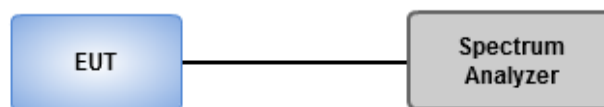
Occupied Bandwidth

1. Set RBW = 1 % to 5 % of the OBW
2. Set VBW $\geq$ 3 RBW
3. Sample detection and single sweep mode shall be used
4. Use the 99 % power bandwidth function of the instrument

6dB Bandwidth

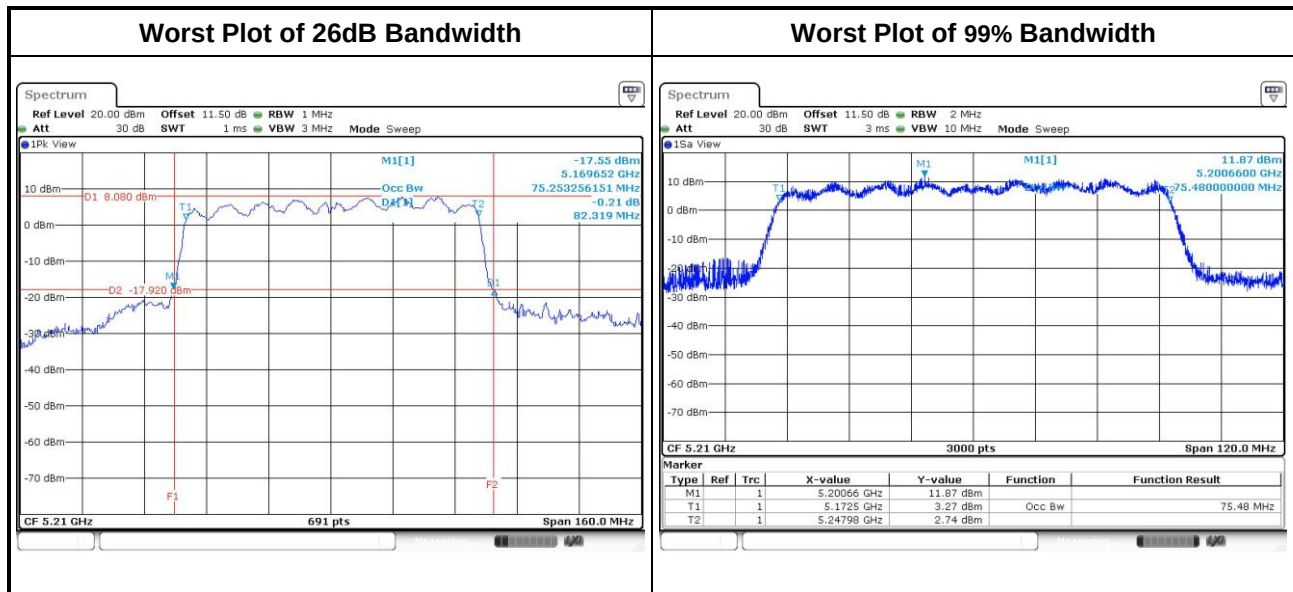
1. Set RBW = 100kHz, VBW = 300kHz
2. Detector = Peak, Trace mode = max hold.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

3.2.3 Test Setup



3.2.4 Test Result of Emission Bandwidth

For Frequency band 5150-5250 MHz										
Emission Bandwidth										
Mode	N _{TX}	Freq. (MHz)	26dB Bandwidth (MHz)				99% Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3
11a	1	5180	29.10	---	---	---	17.16	---	---	---
11a	1	5200	28.70	---	---	---	17.18	---	---	---
11a	1	5240	29.97	---	---	---	17.42	---	---	---
VHT20	2	5180	23.36	28.29	---	---	17.85	17.91	---	---
VHT20	2	5200	27.65	29.80	---	---	17.94	18.01	---	---
VHT20	2	5240	29.86	28.64	---	---	17.94	18.05	---	---
VHT40	2	5190	48.93	48.35	---	---	36.72	36.82	---	---
VHT40	2	5230	45.33	50.09	---	---	36.98	37.08	---	---
VHT80	2	5210	82.09	82.32	---	---	75.48	75.40	---	---

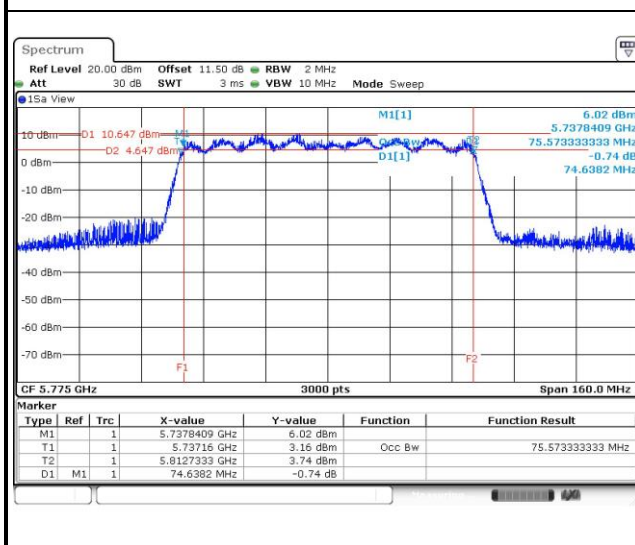


For Frequency band 5725-5850 MHz

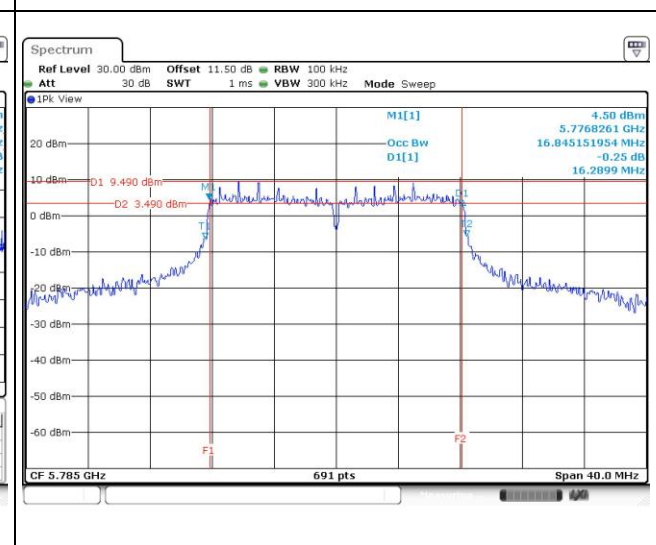
Emission Bandwidth

Mode	N _{TX}	Freq. (MHz)	OBW Bandwidth (MHz)				6dB Bandwidth (MHz)				
			Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3	6dB BW Limit (MHz)
11a	1	5745	16.89	---	---	---	16.35	---	---	---	0.5
11a	1	5785	17.48	---	---	---	16.29	---	---	---	0.5
11a	1	5825	17.43	---	---	---	16.35	---	---	---	0.5
VHT20	2	5745	17.89	17.93	---	---	17.57	17.57	---	---	0.5
VHT20	2	5785	18.08	18.16	---	---	17.57	17.04	---	---	0.5
VHT20	2	5825	18.16	18.28	---	---	17.57	17.57	---	---	0.5
VHT40	2	5755	36.83	37.01	---	---	35.83	35.71	---	---	0.5
VHT40	2	5795	37.47	37.81	---	---	36.06	35.83	---	---	0.5
VHT80	2	5775	75.57	75.57	---	---	75.13	75.13	---	---	0.5

Worst Plot of 99% Bandwidth



Worst Plot of 6dB Bandwidth



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Frequency band 5150-5250 MHz		
Operating Mode		Limit
☐	Outdoor access point	Conducted Power: 1 W The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm)
☐	Indoor access point	Conducted Power: 1 W
☐	Fixed point-to-point access points	Conducted Power: 1 W
☒	Client devices	Conducted Power: 250 mW

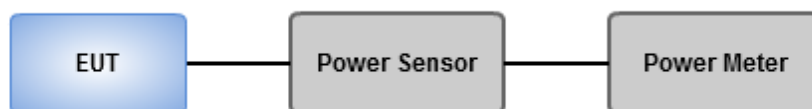
Frequency Band (MHz)	Limit
☐ 5250 ~ 5350	250mW or 11dBm+10 log B
☐ 5470 ~ 5725	250mW or 11dBm+10 log B
☒ 5725 ~ 5850	1 W

Note: "B" is the 26dB emission bandwidth in MHz.

3.3.2 Test Procedures

- ☒ **Method PM-G (Measurement using a gated RF average power meter)**
 - ☒ Measurements may is performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.3.3 Test Setup



3.3.4 Test Result of Maximum Conducted Output Power

For Frequency band 5150-5250 MHz									
Mode	N _{TX}	Freq. (MHz)	Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11a	1	5180	19.61	---	---	---	91.411	19.61	24.00
11a	1	5200	19.75	---	---	---	94.406	19.75	24.00
11a	1	5240	20.52	---	---	---	112.720	20.52	24.00
HT20	2	5180	17.56	17.8	---	---	117.272	20.69	24.00
HT20	2	5200	17.39	17.50	---	---	111.062	20.46	24.00
HT20	2	5240	18.04	18.41	---	---	133.022	21.24	24.00
HT40	2	5190	16.29	16.39	---	---	86.111	19.35	24.00
HT40	2	5230	17.56	17.11	---	---	108.421	20.35	24.00
VHT20	2	5180	17.61	17.84	---	---	118.490	20.74	24.00
VHT20	2	5200	17.42	17.53	---	---	111.832	20.49	24.00
VHT20	2	5240	18.08	18.45	---	---	134.253	21.28	24.00
VHT40	2	5190	16.31	16.42	---	---	86.609	19.38	24.00
VHT40	2	5230	17.61	17.15	---	---	109.557	20.40	24.00
VHT80	2	5210	16.63	16.51	---	---	90.797	19.58	24.00

For Frequency band 5725-5850 MHz									
Mode	N _{TX}	Freq. (MHz)	Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11a	1	5745	16.56	---	---	---	45.290	16.56	30.00
11a	1	5785	20.57	---	---	---	114.025	20.57	30.00
11a	1	5825	20.61	---	---	---	115.080	20.61	30.00
HT20	2	5745	15.63	15.71	---	---	73.799	18.68	30.00
HT20	2	5785	17.70	18.18	---	---	124.650	20.96	30.00
HT20	2	5825	17.82	17.88	---	---	121.910	20.86	30.00
HT40	2	5755	14.41	14.72	---	---	57.254	17.58	30.00
HT40	2	5795	17.41	17.62	---	---	112.890	20.53	30.00
VHT20	2	5745	15.68	15.74	---	---	74.480	18.72	30.00
VHT20	2	5785	17.75	18.22	---	---	125.941	21.00	30.00
VHT20	2	5825	17.89	17.92	---	---	123.462	20.92	30.00
VHT40	2	5755	14.45	14.79	---	---	57.991	17.63	30.00
VHT40	2	5795	17.47	17.67	---	---	114.326	20.58	30.00
VHT80	2	5775	14.11	14.21	---	---	52.127	17.17	30.00

3.4 Peak Power Spectral Density

3.4.1 Limit of Peak Power Spectral Density

Frequency band 5150-5250 MHz		
Operating Mode		Limit
☐	Outdoor access point	17 dBm / MHz
☐	Indoor access point	17 dBm / MHz
☐	Fixed point-to-point access points	17 dBm / MHz
☒	Mobile and portable client devices	11 dBm / MHz

Frequency Band (MHz)		Limit
☐	5250 ~ 5350	11 dBm / MHz
☐	5470 ~ 5725	11 dBm / MHz
☒	5725 ~ 5850	30 dBm / 500 kHz

3.4.2 Test Procedures

For 5150 ~ 5250 MHz

☐ Method SA-1

1. Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

☒ Method SA-2 Alternative

1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

For 5725 ~ 5850 MHz

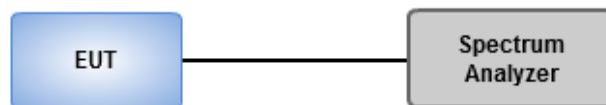
☐ Method SA-1

1. Set RBW = 500 kHz, VBW = 2 MHz, Sweep time = auto, Detector = RMS.
2. Trace average 100 traces.
3. Use the peak marker function to determine the maximum amplitude level.

☒ Method SA-2 Alternative

1. Set RBW = 500 kHz, VBW = 2 MHz, Detector = RMS.
2. Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.
5. Add $10 \log(1/x)$, where x is the duty cycle.

3.4.3 Test Setup

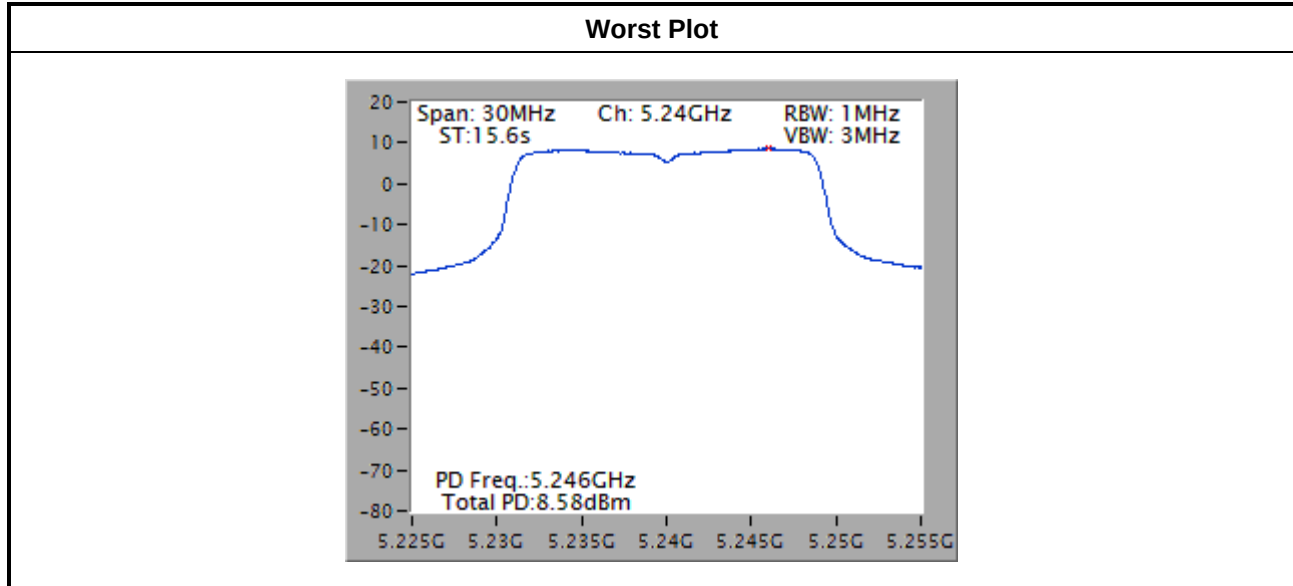


3.4.4 Test Result of Peak Power Spectral Density

For Frequency band 5150-5250 MHz						
Condition			Peak Power Spectral Density (dBm/MHz)			
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm/MHz)	Duty Factor (dB)	PPSD with D.F (dBm/MHz)	PPSD Limit (dBm/MHz)
11a	1	5180	5.00	0.29	5.29	11
11a	1	5200	5.79	0.29	6.08	11
11a	1	5240	6.87	0.29	7.16	11
VHT20	2	5180	7.27	0.25	7.52	11
VHT20	2	5200	7.54	0.25	7.79	11
VHT20	2	5240	8.58	0.25	8.83	11
VHT40	2	5190	4.34	0.58	4.92	11
VHT40	2	5230	5.21	0.58	5.79	11
VHT80	2	5210	2.26	1.24	3.50	11

Note:

1. D.F is duty factor.
2. Test results for VHT20 / VHT40 / VHT80 are bin-by-bin summing measured value of each TX port.

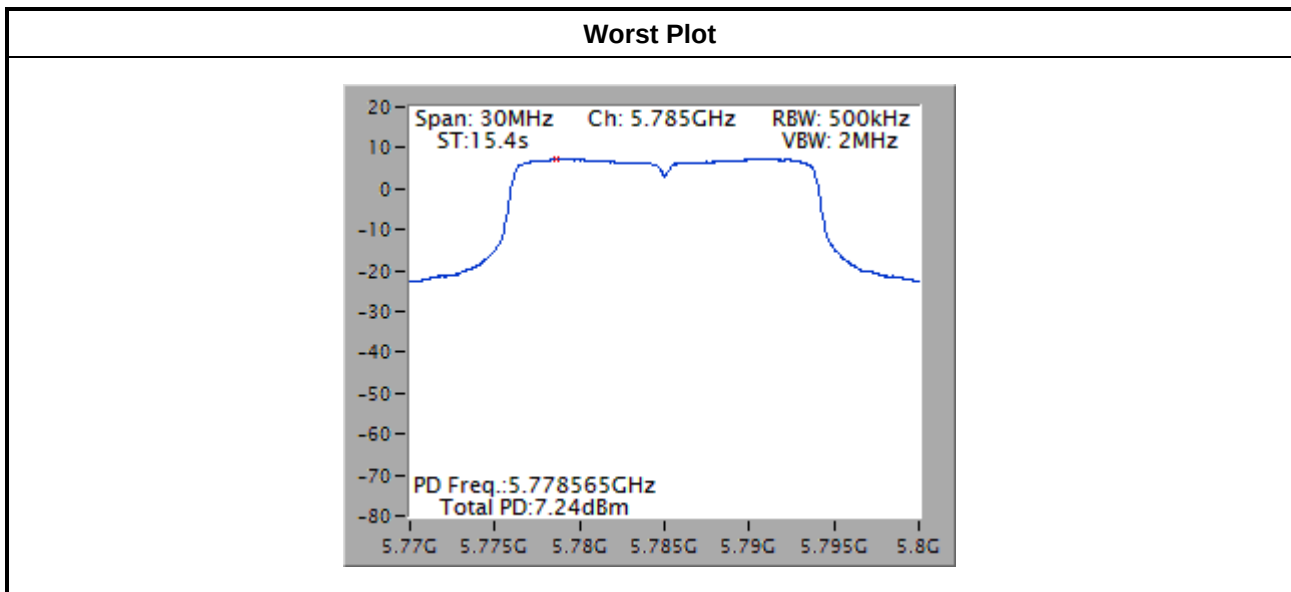


Note: Worst plot is w/o duty factor.

For Frequency band 5725-5850 MHz						
Condition			Peak Power Spectral Density (dBm/500kHz)			
Modulation Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm/500kHz)	Duty Factor (dB)	PPSD with D.F (dBm/500kHz)	PPSD Limit (dBm/500kHz)
11a	1	5745	1.56	0.29	1.85	30.00
11a	1	5785	5.47	0.29	5.76	30.00
11a	1	5825	5.35	0.29	5.64	30.00
VHT20	2	5745	6.16	0.25	6.41	29.14
VHT20	2	5785	7.24	0.25	7.49	29.14
VHT20	2	5825	6.83	0.25	7.08	29.14
VHT40	2	5755	0.85	0.58	1.43	29.14
VHT40	2	5795	3.43	0.58	4.01	29.14
VHT80	2	5775	-3.13	1.24	-1.89	29.14

Note:

1. D.F is duty factor.
2. Test results for VHT20 / VHT40 / VHT80 are bin-by-bin summing measured value of each TX port.
3. For 2TX mode, Directional gain = $10 * \log((10^{3.6/20} + 10^{4.1/20})^2 / 2) = 6.86 \text{ dBi} > 6 \text{ dBi}$
Limit shall be reduced to $30 \text{ dBm} - (6.86 \text{ dBi} - 6 \text{ dBi}) = 29.14 \text{ dBm}$



Note: worst plot is w/o duty factor.

3.5 Transmitter Radiated and Band Edge Emissions

3.5.1 Limit of Transmitter Radiated and Band Edge Emissions

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

Un-restricted band emissions above 1GHz Limit		
Operating Band	Limit	
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]	
5.725 - 5.850 GHz	☒	15.407(b)(4)(i) 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.
	☐	15.407(b)(4)(ii) ,compliance with the emission limits in § 15.247(d) Shall be at least 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power,. Attenuation below the general limits specified in §15.209(a) is not required. In addition,radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see § 15.205(c))

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

3.5.2 Test Procedures

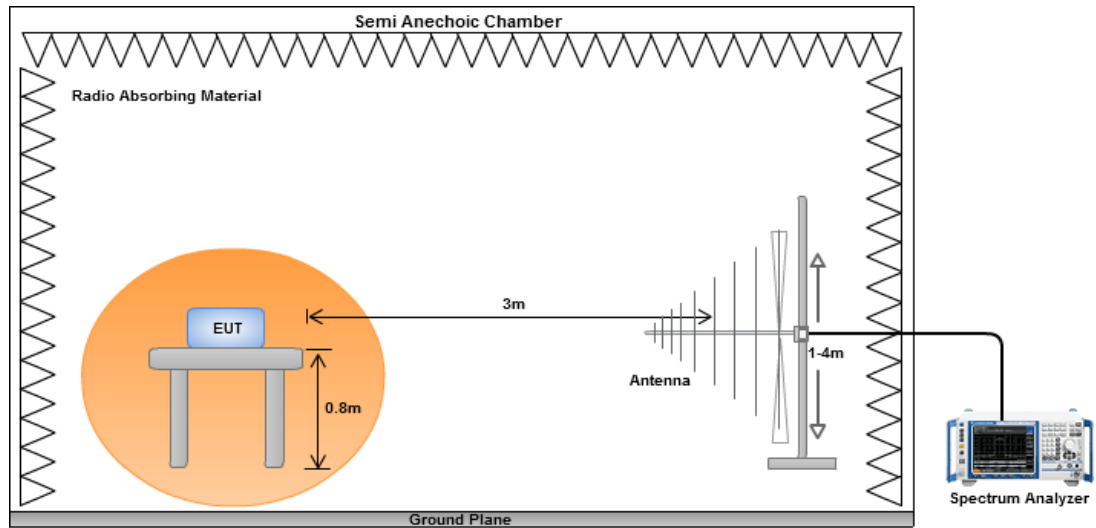
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

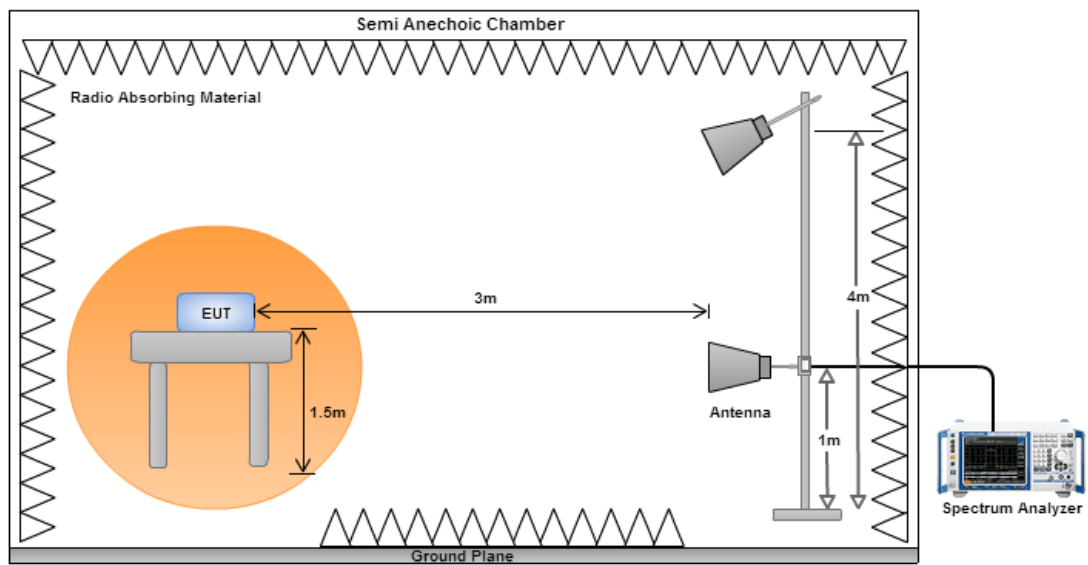
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz

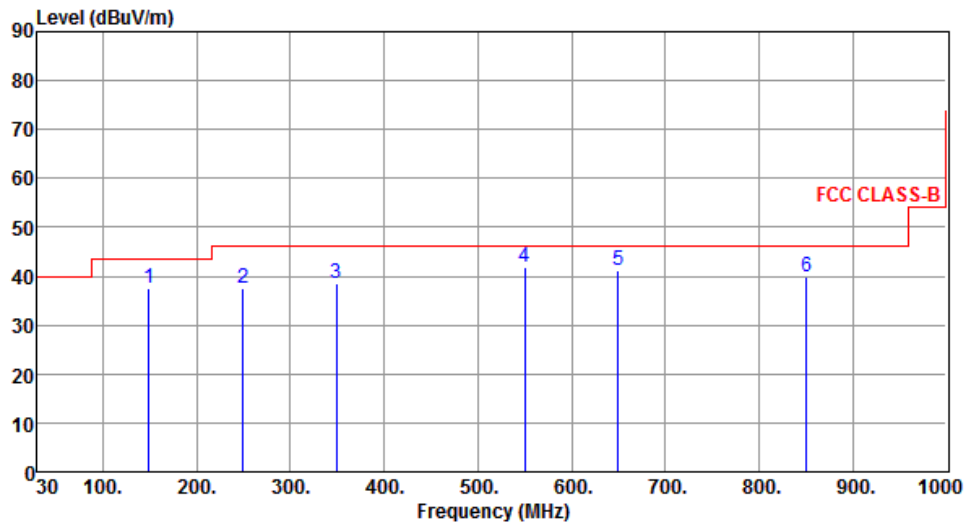


3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Horizontal		
Level (dBuV/m)			

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical		
Level (dBuV/m)			

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	149.31	37.47	43.50	-6.03	49.42	-11.95	Peak	---	---
2	249.22	37.38	46.00	-8.62	50.17	-12.79	Peak	---	---
3	349.13	38.58	46.00	-7.42	48.62	-10.04	Peak	---	---
4	549.92	41.80	46.00	-4.20	47.45	-5.65	Peak	---	---
5	649.83	41.34	46.00	-4.66	45.33	-3.99	Peak	---	---
6	850.62	39.81	46.00	-6.19	41.06	-1.25	Peak	---	---

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

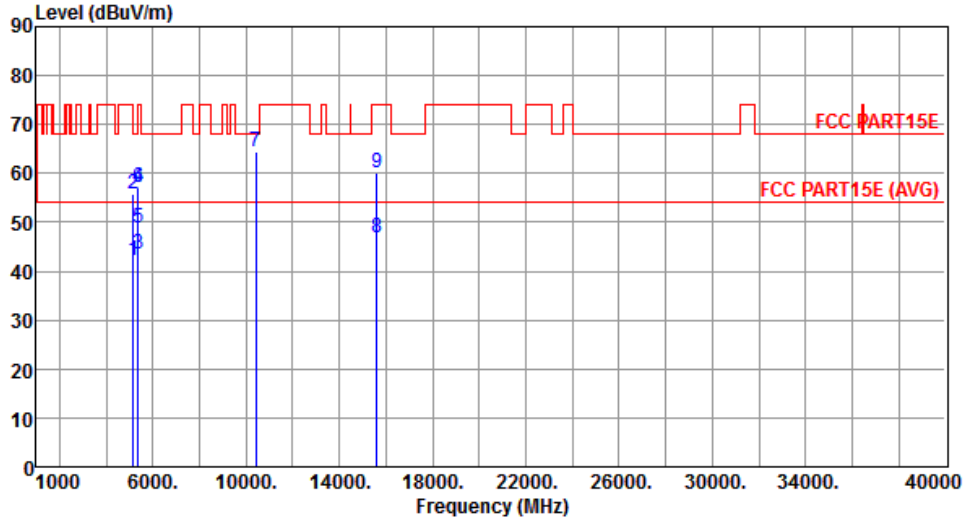
Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		
Level (dBuV/m)			

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11a

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Horizontal		
Level (dBuV/m) <			

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical		
Level (dBuV/m)			

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Horizontal		

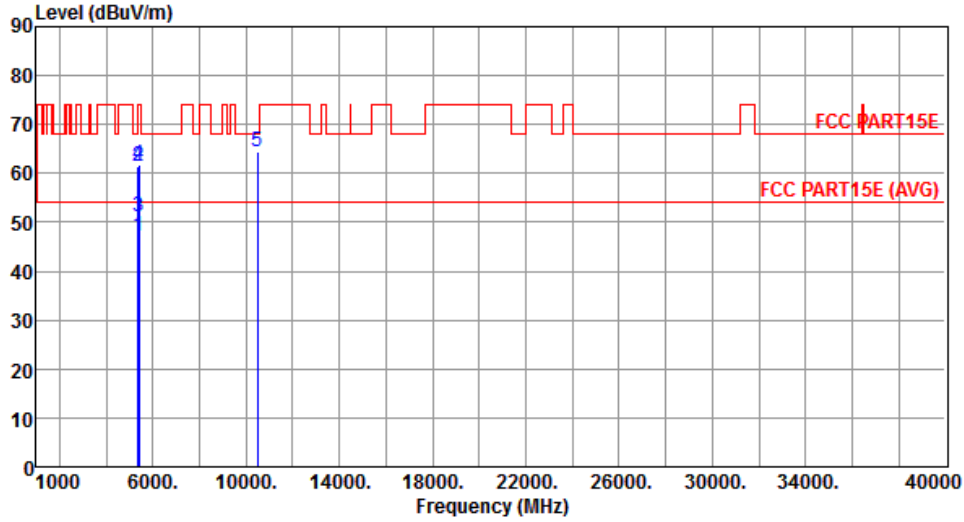


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.11	54.00	-11.89	37.21	4.90	Average	175	158
2	5150.00	55.92	74.00	-18.08	51.02	4.90	Peak	175	158
3	5350.00	43.46	54.00	-10.54	38.33	5.13	Average	175	158
4	5350.00	57.07	74.00	-16.93	51.94	5.13	Peak	175	158
5	5360.00	48.93	54.00	-5.07	43.79	5.14	Average	175	158
6	5360.00	57.01	74.00	-16.99	51.87	5.14	Peak	175	158
7	10400.00	64.29	68.20	-3.91	50.54	13.75	Peak	121	318
8	15600.00	46.83	54.00	-7.17	31.22	15.61	Average	100	300
9	15600.00	60.22	74.00	-13.78	44.61	15.61	Peak	100	300

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Vertical		
Level (dBuV/m) <			

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Horizontal		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5350.00	47.15	54.00	-6.85	42.02	5.13	Average	204	164
2	5350.00	61.55	74.00	-12.45	56.42	5.13	Peak	204	164
3	5400.00	51.04	54.00	-2.96	45.85	5.19	Average	204	164
4	5400.00	61.71	74.00	-12.29	56.52	5.19	Peak	204	164
5	10480.00	64.50	68.20	-3.70	50.60	13.90	Peak	116	317

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Vertical		

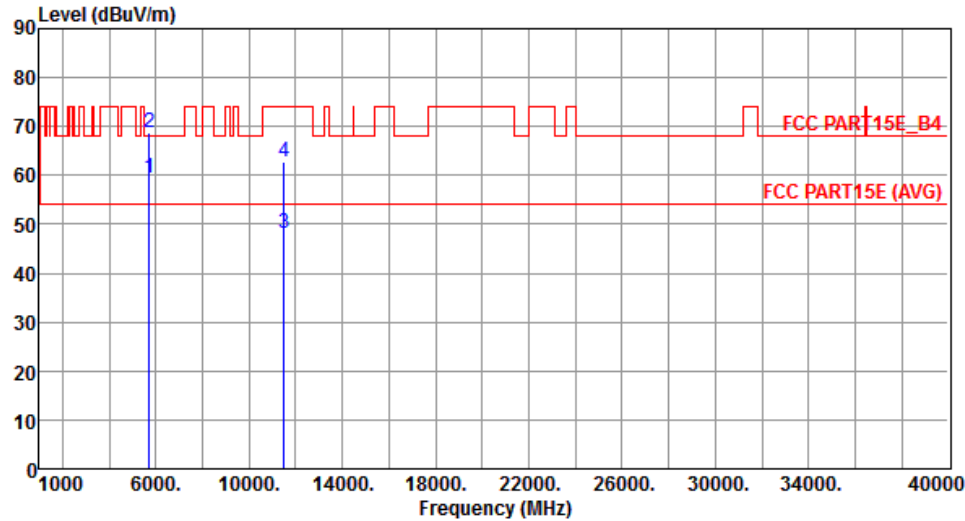


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5350.00	42.42	54.00	-11.58	37.29	5.13	Average	210	205
2	5350.00	56.77	74.00	-17.23	51.64	5.13	Peak	210	205
3	5400.00	44.63	54.00	-9.37	39.44	5.19	Average	210	205
4	5400.00	56.30	74.00	-17.70	51.11	5.19	Peak	210	205
5	10480.00	64.78	68.20	-3.42	50.88	13.90	Peak	232	65

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		
Level (dBuV/m) <			

Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		



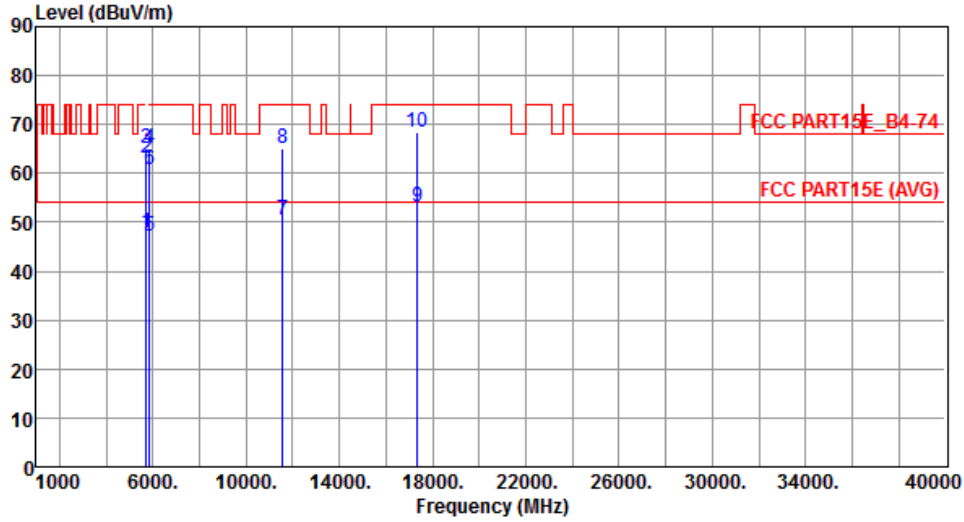
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	59.34	68.20	-8.86	53.64	5.70	Peak	295	149
2	5725.00	68.87	78.20	-9.33	63.16	5.71	Peak	295	149
3	11490.00	48.28	54.00	-5.72	33.66	14.62	Average	222	68
4	11490.00	62.74	74.00	-11.26	48.12	14.62	Peak	222	68

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	47.93	54.00	-6.07	42.23	5.70	Average	265	189
2	5715.00	63.23	74.00	-10.77	57.53	5.70	Peak	265	189
3	5725.00	65.15	78.20	-13.05	59.44	5.71	Peak	265	189
4	5850.00	65.19	78.20	-13.01	59.22	5.97	Peak	265	189
5	5860.00	47.20	54.00	-6.80	41.22	5.98	Average	265	189
6	5860.00	60.77	74.00	-13.23	54.79	5.98	Peak	265	189
7	11570.00	50.65	54.00	-3.35	36.13	14.52	Average	221	166
8	11570.00	65.11	74.00	-8.89	50.59	14.52	Peak	221	166
9	17355.00	53.00	54.00	-1.00	31.71	21.29	Average	249	272
10	17355.00	68.51	74.00	-5.49	47.22	21.29	Peak	249	272

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

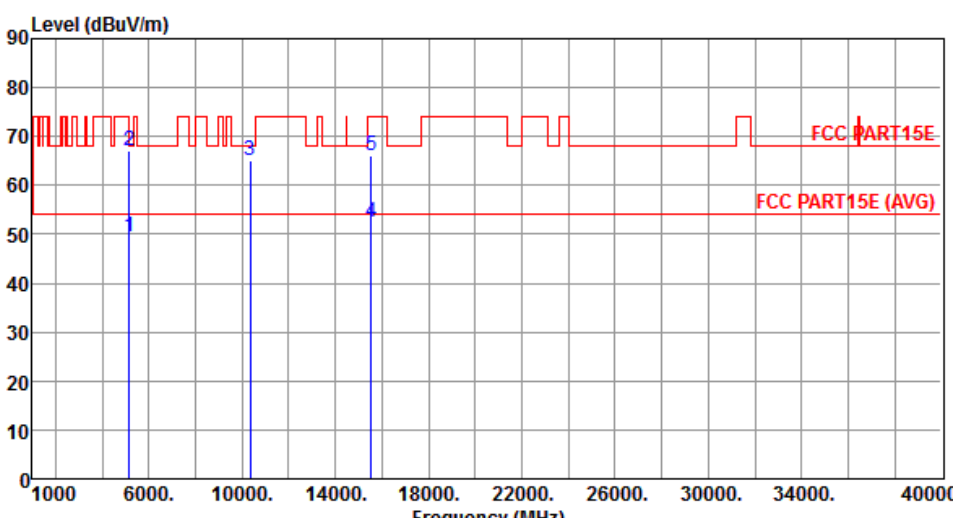
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		
Level (dBuV/m) <			

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		
Level (dBuV/m)			

Modulation	11a	Test Freq. (MHz)	5825
Polarization	Vertical		
Level (dBuV/m) </			

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT20

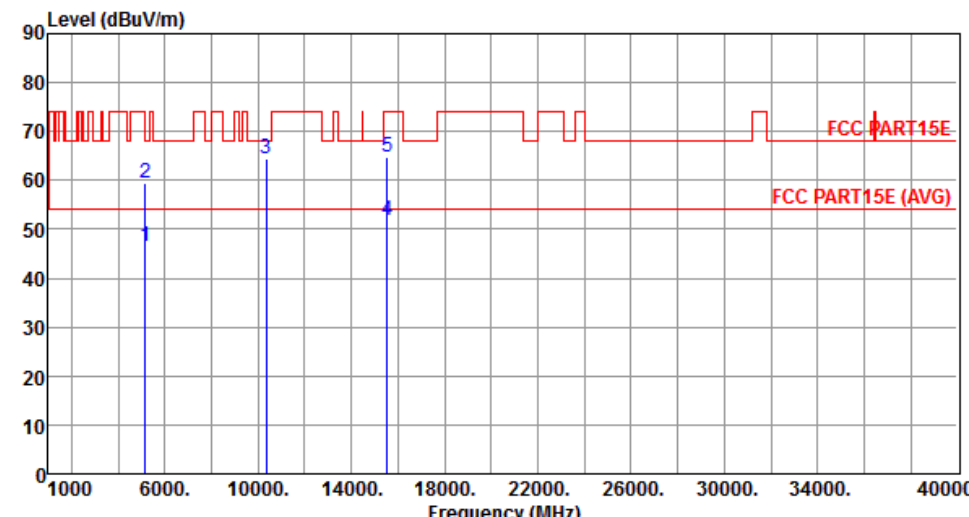
Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	49.57	54.00	-4.43	44.67	4.90	Average	268	184
2	5150.00	66.96	74.00	-7.04	62.06	4.90	Peak	268	184
3	10360.00	65.14	68.20	-3.06	51.47	13.67	Peak	263	237
4	15540.00	52.35	54.00	-1.65	36.63	15.72	Average	198	100
5	15540.00	66.12	74.00	-7.88	50.40	15.72	Peak	198	100

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

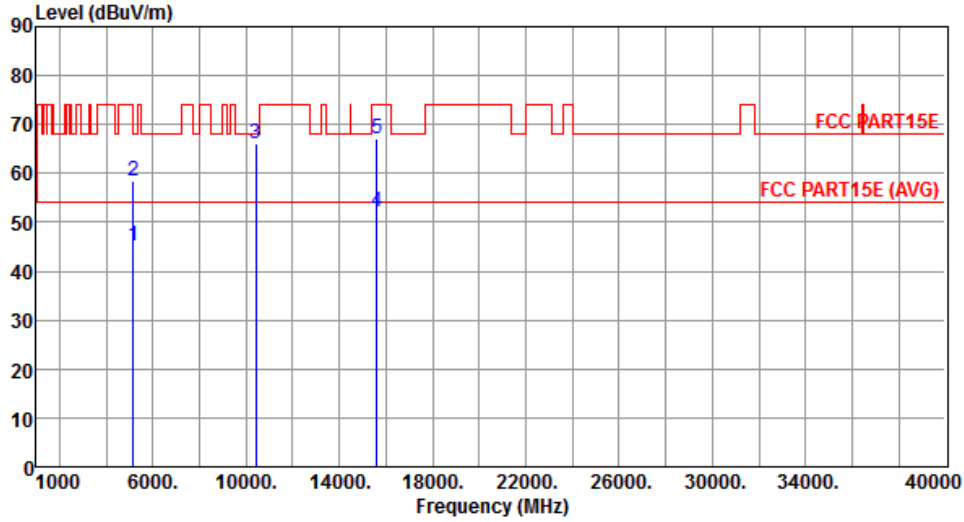
Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Vertical		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	46.56	54.00	-7.44	41.66	4.90	Average	201	33
2	5150.00	59.45	74.00	-14.55	54.55	4.90	Peak	201	33
3	10360.00	64.48	68.20	-3.72	50.81	13.67	Peak	205	344
4	15540.00	51.85	54.00	-2.15	36.13	15.72	Average	100	5
5	15540.00	64.79	74.00	-9.21	49.07	15.72	Peak	100	5

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

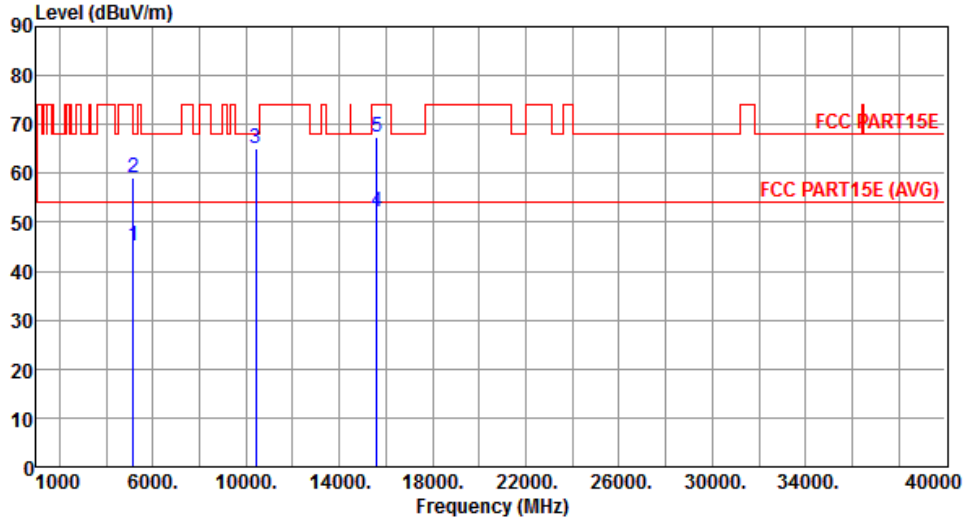
Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Horizontal		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.13	54.00	-8.87	40.23	4.90	Average	268	184
2	5150.00	58.55	74.00	-15.45	53.65	4.90	Peak	268	184
3	10400.00	66.02	68.20	-2.18	52.27	13.75	Peak	260	237
4	15600.00	52.28	54.00	-1.72	36.67	15.61	Average	200	100
5	15600.00	67.00	74.00	-7.00	51.39	15.61	Peak	200	100

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Vertical		



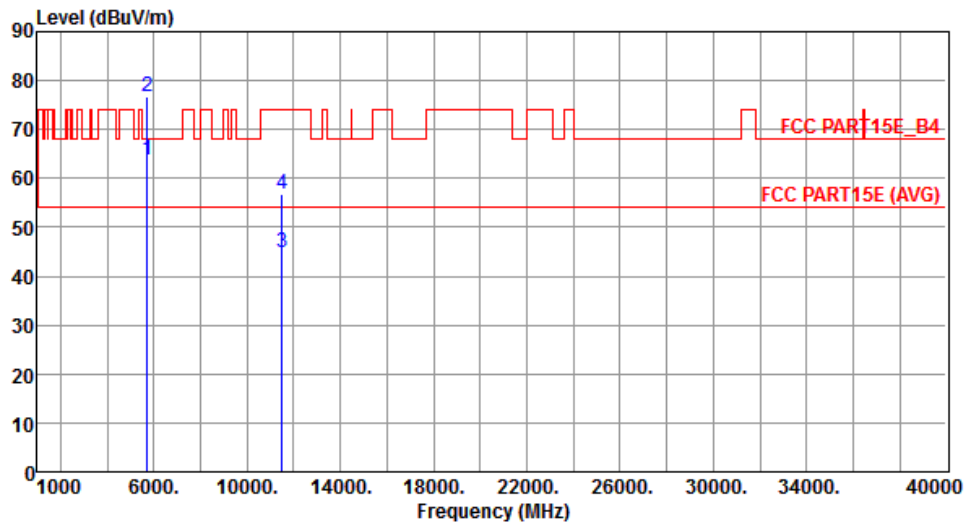
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.21	54.00	-8.79	40.31	4.90	Average	200	33
2	5150.00	59.25	74.00	-14.75	54.35	4.90	Peak	200	33
3	10400.00	64.99	68.20	-3.21	51.24	13.75	Peak	200	342
4	15600.00	52.13	54.00	-1.87	36.52	15.61	Average	100	5
5	15600.00	67.45	74.00	-6.55	51.84	15.61	Peak	100	5

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Horizontal		
 </			

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical		
Level (dBuV/m)			

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Horizontal		



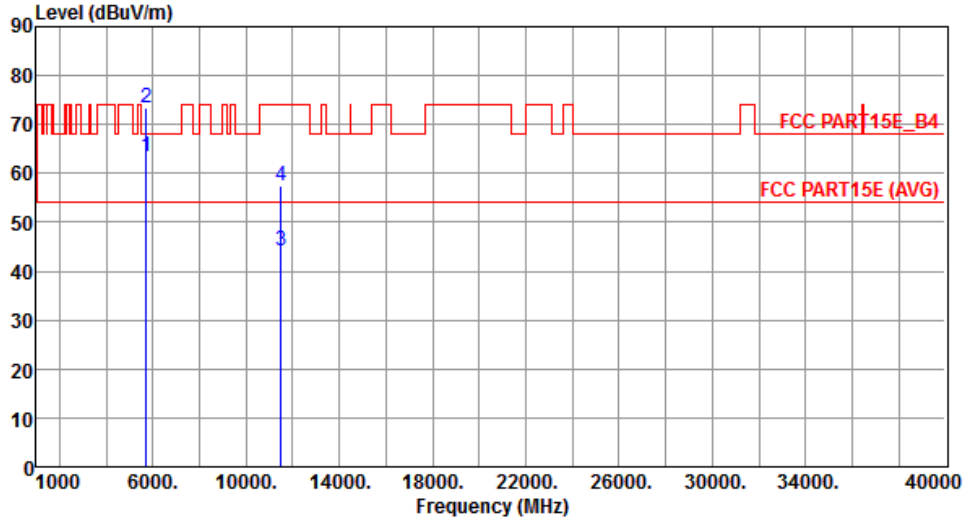
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	63.77	68.20	-4.43	58.07	5.70	Peak	248	167
2	5725.00	76.84	78.20	-1.36	71.13	5.71	Peak	248	167
3	11490.00	44.78	54.00	-9.22	30.16	14.62	Average	166	212
4	11490.00	56.88	74.00	-17.12	42.26	14.62	Peak	166	212

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	63.39	68.20	-4.81	57.69	5.70	Peak	119	346
2	5725.00	73.46	78.20	-4.74	67.75	5.71	Peak	119	346
3	11490.00	44.19	54.00	-9.81	29.57	14.62	Average	188	212
4	11490.00	57.49	74.00	-16.51	42.87	14.62	Peak	188	212

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		
Level (dBuV/m)			

Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		
Level (dBuV/m) </			

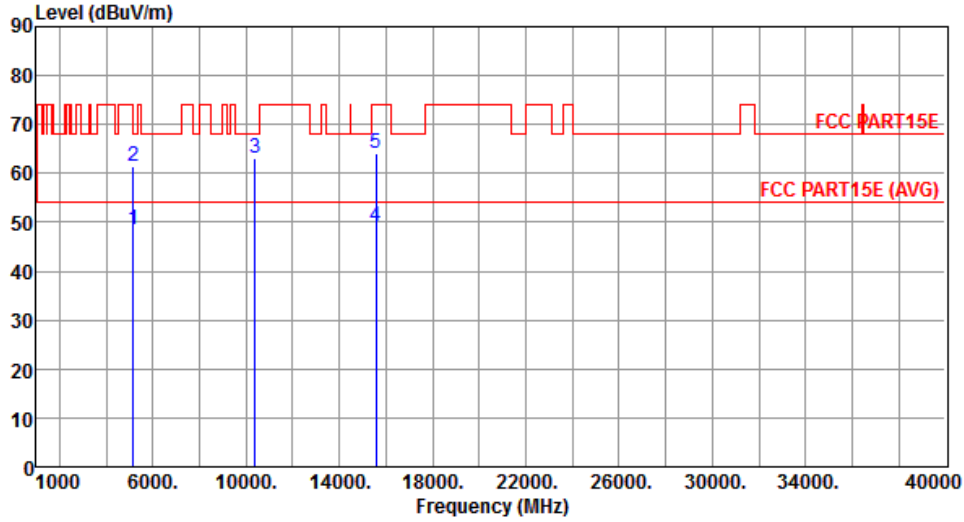
Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal		
Level (dBuV/m) <			

Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Vertical		
Level (dBuV/m) <			

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT40

Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Horizontal		
Level (dBuV/m) </			

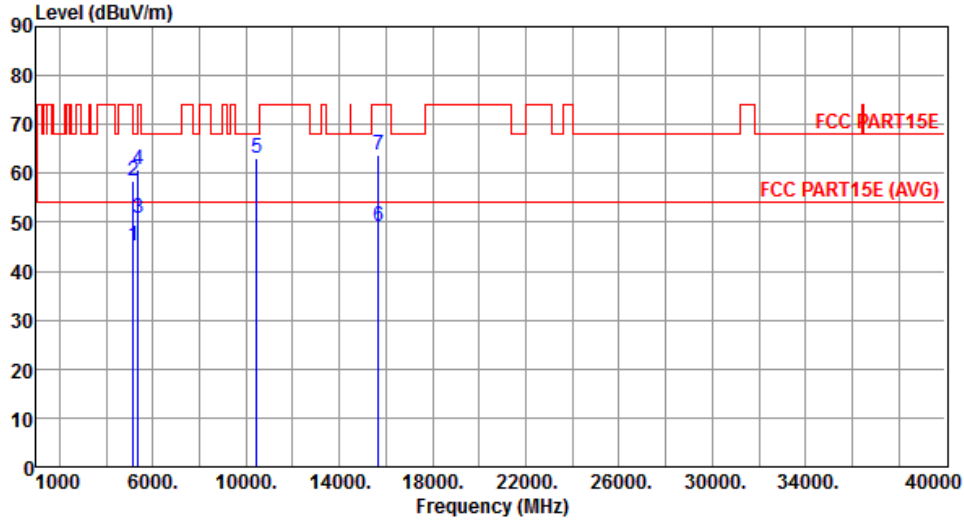
Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Vertical		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	48.51	54.00	-5.49	43.61	4.90	Average	168	27
2	5150.00	61.43	74.00	-12.57	56.53	4.90	Peak	168	27
3	10380.00	62.94	68.20	-5.26	49.23	13.71	Peak	263	283
4	15570.00	49.19	54.00	-4.81	33.52	15.67	Average	263	10
5	15570.00	63.94	74.00	-10.06	48.27	15.67	Peak	263	10

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal		

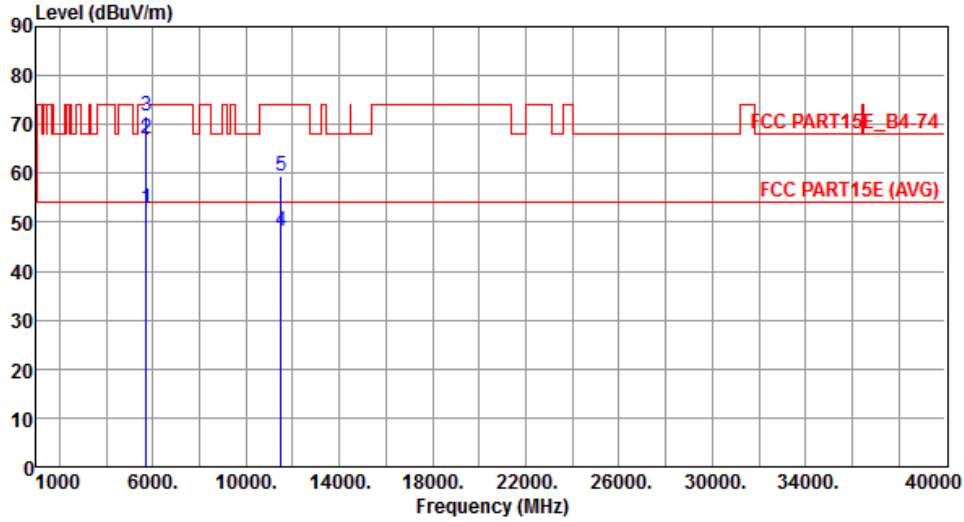


	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	45.11	54.00	-8.89	40.21	4.90	Average	250	187
2	5150.00	58.52	74.00	-15.48	53.62	4.90	Peak	250	187
3	5350.00	50.72	54.00	-3.28	45.59	5.13	Average	250	187
4	5350.00	60.75	74.00	-13.25	55.62	5.13	Peak	250	187
5	10460.00	63.17	68.20	-5.03	49.31	13.86	Peak	185	170
6	15690.00	49.32	54.00	-4.68	33.89	15.43	Average	190	100
7	15690.00	63.90	74.00	-10.10	48.47	15.43	Peak	190	100

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical		
Level (dBuV/m) </			

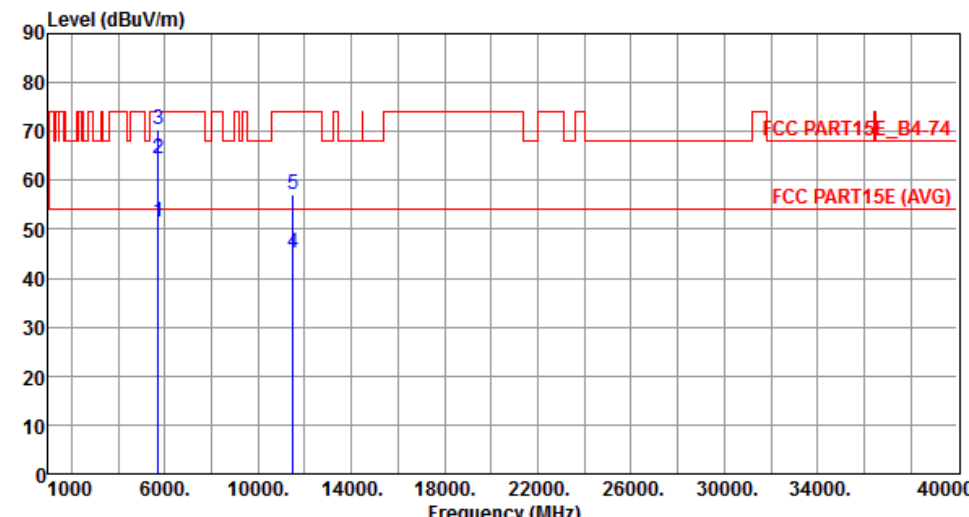
Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	52.66	54.00	-1.34	46.96	5.70	Average	238	169
2	5715.00	67.09	74.00	-6.91	61.39	5.70	Peak	238	169
3	5725.00	71.79	78.20	-6.41	66.08	5.71	Peak	238	169
4	11510.00	48.15	54.00	-5.85	33.53	14.62	Average	208	295
5	11510.00	59.30	74.00	-14.70	44.68	14.62	Peak	208	295

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	51.56	54.00	-2.44	45.86	5.70	Average	121	347
2	5715.00	64.32	74.00	-9.68	58.62	5.70	Peak	121	347
3	5725.00	70.30	78.20	-7.90	64.59	5.71	Peak	121	347
4	11510.00	45.24	54.00	-8.76	30.62	14.62	Average	155	30
5	11510.00	56.97	74.00	-17.03	42.35	14.62	Peak	155	30

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal		
Level (dBuV/m)			

Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Vertical		
Level (dBuV/m)			

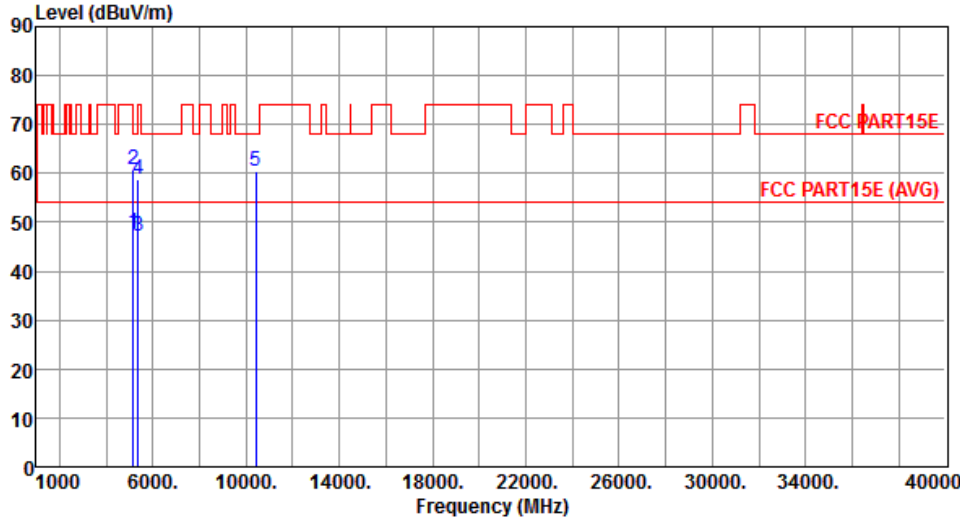
3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for VHT80

Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Horizontal		

	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	52.69	54.00	-1.31	47.79	4.90	Average	274	187
2	5150.00	64.92	74.00	-9.08	60.02	4.90	Peak	274	187
3	5350.00	48.65	54.00	-5.35	43.52	5.13	Average	274	187
4	5350.00	58.93	74.00	-15.07	53.80	5.13	Peak	274	187
5	10420.00	60.16	68.20	-8.04	46.38	13.78	Peak	188	142

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

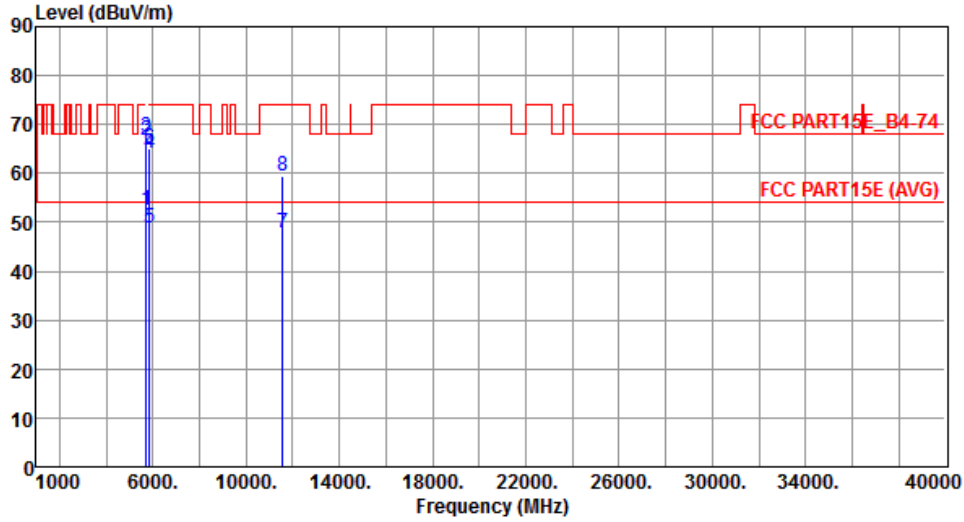
Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	47.85	54.00	-6.15	42.95	4.90	Average	169	31
2	5150.00	60.80	74.00	-13.20	55.90	4.90	Peak	169	31
3	5350.00	47.10	54.00	-6.90	41.97	5.13	Average	169	31
4	5350.00	58.82	74.00	-15.18	53.69	5.13	Peak	169	31
5	10420.00	60.55	68.20	-7.65	46.77	13.78	Peak	188	199

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Horizontal		



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5715.00	52.51	54.00	-1.49	46.81	5.70	Average	243	171
2	5715.00	66.72	74.00	-7.28	61.02	5.70	Peak	243	171
3	5725.00	67.49	78.20	-10.71	61.78	5.71	Peak	243	171
4	5850.00	64.06	78.20	-14.14	58.09	5.97	Peak	243	171
5	5860.00	48.79	54.00	-5.21	42.81	5.98	Average	243	171
6	5860.00	65.24	74.00	-8.76	59.26	5.98	Peak	243	171
7	11550.00	47.78	54.00	-6.22	33.23	14.55	Average	243	282
8	11550.00	59.38	74.00	-14.62	44.83	14.55	Peak	243	282

Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBUV/m) – Limit (dBUV/m).

Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Vertical		
Level (dBuV/m) </			

3.6 Frequency Stability

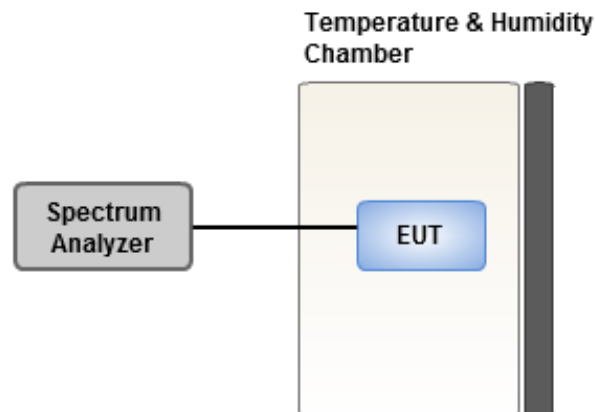
3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

3.6.2 Test Procedures

1. The EUT is installed in an environment test chamber with external power source.
2. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT.
3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
4. When temperature is stabled, measure the frequency stability.
5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.

3.6.3 Test Setup



3.6.4 Test Result of Frequency Stability

Frequency: 5200 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	6.81	7.09	7.26	6.74
T20°C Vmin	5.92	5.72	6.64	6.67
T50°C Vnom	5.90	6.84	6.01	6.17
T40°C Vnom	5.63	5.14	5.38	5.58
T30°C Vnom	5.34	5.53	5.01	5.52
T20°C Vnom	4.49	5.13	5.04	4.89
T10°C Vnom	4.08	4.35	4.53	4.38
T0°C Vnom	2.91	2.99	2.76	2.95
T-10°C Vnom	3.98	4.03	3.99	4.14
T-20°C Vnom	2.39	1.57	2.03	1.48
T-30°C Vnom	0.95	1.01	1.36	1.33
Vnom [Vac]: 120		Vmax [Vac]: 138		Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50		Tmin [°C]: -30

Frequency: 5785 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	5.92	5.94	6.40	5.41
T20°C Vmin	5.42	5.08	5.93	4.94
T50°C Vnom	5.09	5.15	4.85	5.64
T40°C Vnom	4.32	3.97	4.60	4.48
T30°C Vnom	4.42	4.57	5.04	5.48
T20°C Vnom	4.23	4.24	3.92	3.56
T10°C Vnom	3.17	3.31	2.96	3.31
T0°C Vnom	2.63	3.00	3.00	3.14
T-10°C Vnom	3.23	2.71	2.82	2.87
T-20°C Vnom	1.67	2.22	1.66	1.82
T-30°C Vnom	0.87	1.04	1.60	0.93
Vnom [Vac]: 120		Vmax [Vac]: 138		Vmin [Vac]: 102
Tnom [°C]: 20		Tmax [°C]: 50		Tmin [°C]: -30

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website <http://www.icertifi.com.tw>.

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