

FCC Test Report

FCC ID : I88WAC6502D-E
Equipment : 802.11 ac Unified Pro Access Point
Model No. : WAC6502D-S, WAC6502D-E
Brand Name : ZyXEL
Applicant : ZyXEL Communications Corporation
Address : No. 2, Gongye E. 9th Road, Hsinchu Science
Park, Hsinchu, Taiwan
Standard : 47 CFR FCC Part 15.407
Received Date : Sep. 18, 2014
Tested Date : Sep. 23 ~ Oct. 31, 2014

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



Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Local Support Equipment List	8
1.3	Test Setup Chart	9
1.4	The Equipment List	10
1.5	Testing Applied Standards	11
1.6	Measurement Uncertainty	11
2	TEST CONFIGURATION	12
2.1	Testing Condition	12
2.2	The Worst Test Modes and Channel Details	13
3	TRANSMITTER TEST RESULTS.....	14
3.1	Conducted Emissions.....	14
3.2	Emission Bandwidth	23
3.3	RF Output Power	25
3.4	Peak Power Spectral Density	27
3.5	Peak Excursion.....	29
3.6	Transmitter Radiated and Band Edge Emissions	32
3.7	Frequency Stability.....	79
4	TEST LABORATORY INFORMATION	81

Release Record

Report No.	Version	Description	Issued Date
FR491801AN	Rev. 01	Initial issue	Dec. 01, 2014

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.223MHz 40.50 (Margin -12.20dB) - AV	Pass
15.407(b)(1)(2)(3) 15.209	Radiated Emissions	[dBuV/m at 3m]: 5150.00MHz 53.27 (Margin -0.73dB) - AV	Pass
15.407(a)(1)(2)(3)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(a)(1)(2)(3)	RF Output Power	Max Power [dBm]: 15.87	Pass
15.407(a)(1)(2)(3)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(a)(6)	Peak Excursion	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	Product Name	Description
ZyXEL	WAC6502D-S	802.11 ac Unified Pro Access Point	With internal antenna
	WAC6502D-E		With external antenna

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]	2	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.					

1.1.3 Antenna Details

Ant. No.	Type	Antenna Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)					Remark
			2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5850	
1	Dipole	RSMA	5	7	7	7	7	For WAC6502D-E
2	Dipole	IPEX	4	6	6	6	6	For WAC6502D-S

Note:

- The antenna connector of PCB board of EUT is IPEX.
- WAC6502D-E has a RSMA connector jack to connect antenna and PCB board of EUT.

1.1.4 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	1. AC Adapter (support unit only.) Brand: DVE Model: DSA-24CA-12 120120 Rating: I/P: 100-240Vac, 50/60Hz, 0.8A O/P: 12Vdc, 2A
	2. POE Injector (support unit for radiated emission test only.) Brand: ZyXEL Model: PoE12-HP Rating: I/P: 100-240Vac, 50/60Hz, 1.5A max. O/P: 48Vdc, 42.1W
	3. POE Injector (support unit for conducted emission only.) Brand: PowerDsine 3001GC Model: E018205D G Rating: I/P: 100-250Vac, 50/60Hz, 0.5A O/P: 48Vdc, 0.35A

1.1.5 Accessories

N/A

1.1.6 Channel List

802.11 a / HT20 / VHT20		HT40 / VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	VHT80	
48	5240	42	5210

1.1.7 Test Tool and Duty Cycle

Test Tool	CART, V4.9		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11a	98.09%	0.08
	VHT20	98.16%	0.08
	VHT40	94.59%	0.24
	VHT80	97.14%	0.13

1.1.8 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11a	5180	11
11a	5200	11
11a	5240	10.5
HT20	5180	11.5
HT20	5200	11.5
HT20	5240	11
HT40	5190	13.5
HT40	5230	13.5
VHT20	5180	11.5
VHT20	5200	11.5
VHT20	5240	11
VHT40	5190	13.5
VHT40	5230	13.5
VHT80	5210	13.5

1.2 Local Support Equipment List

Support Equipment List (Adapter Mode)					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E5430	C0GB4X1	RJ45, 10m non-shielded w/o core.
2	Notebook	DELL	Latitude E5430	9ZFB4X1	RJ45, 10m non-shielded w/o core.
3	AC Adapter	DVE	DSA-24CA-12 120120	---	---

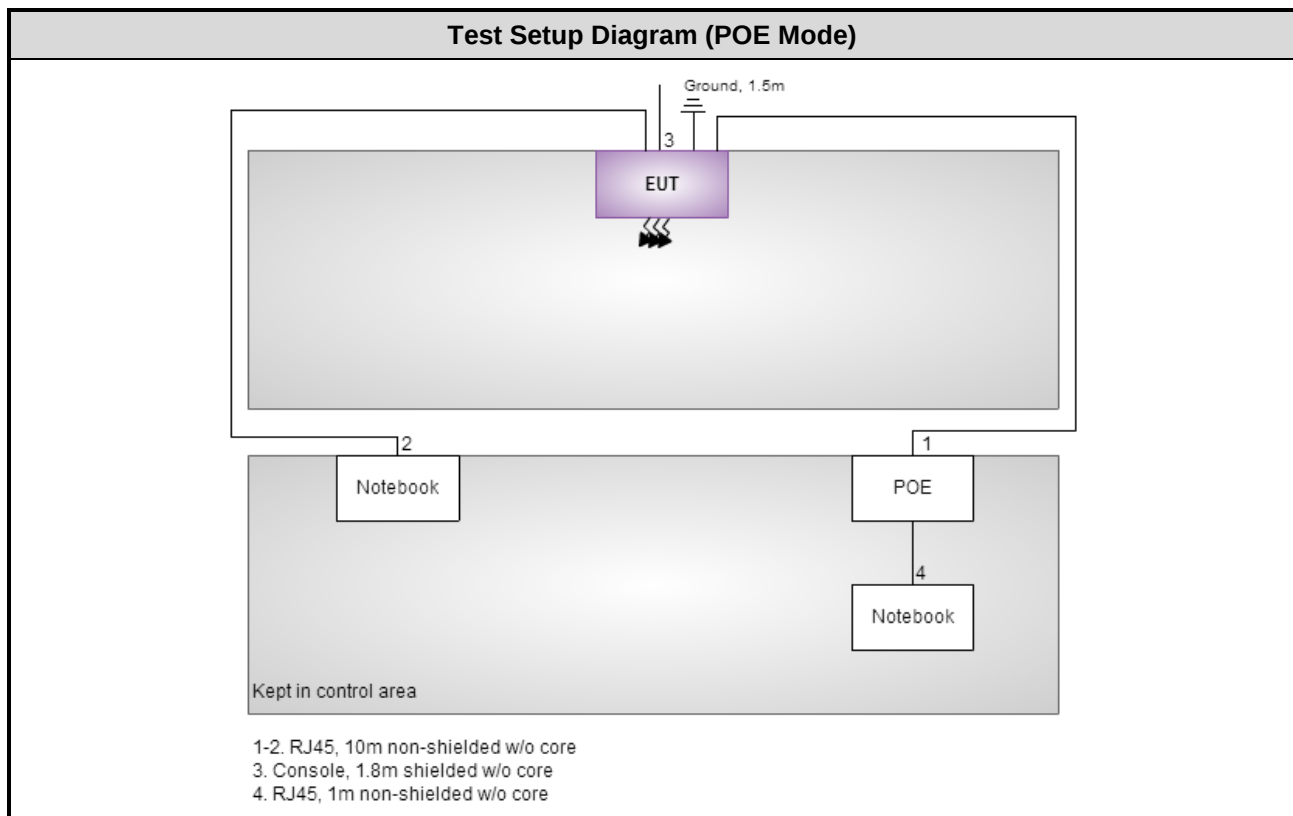
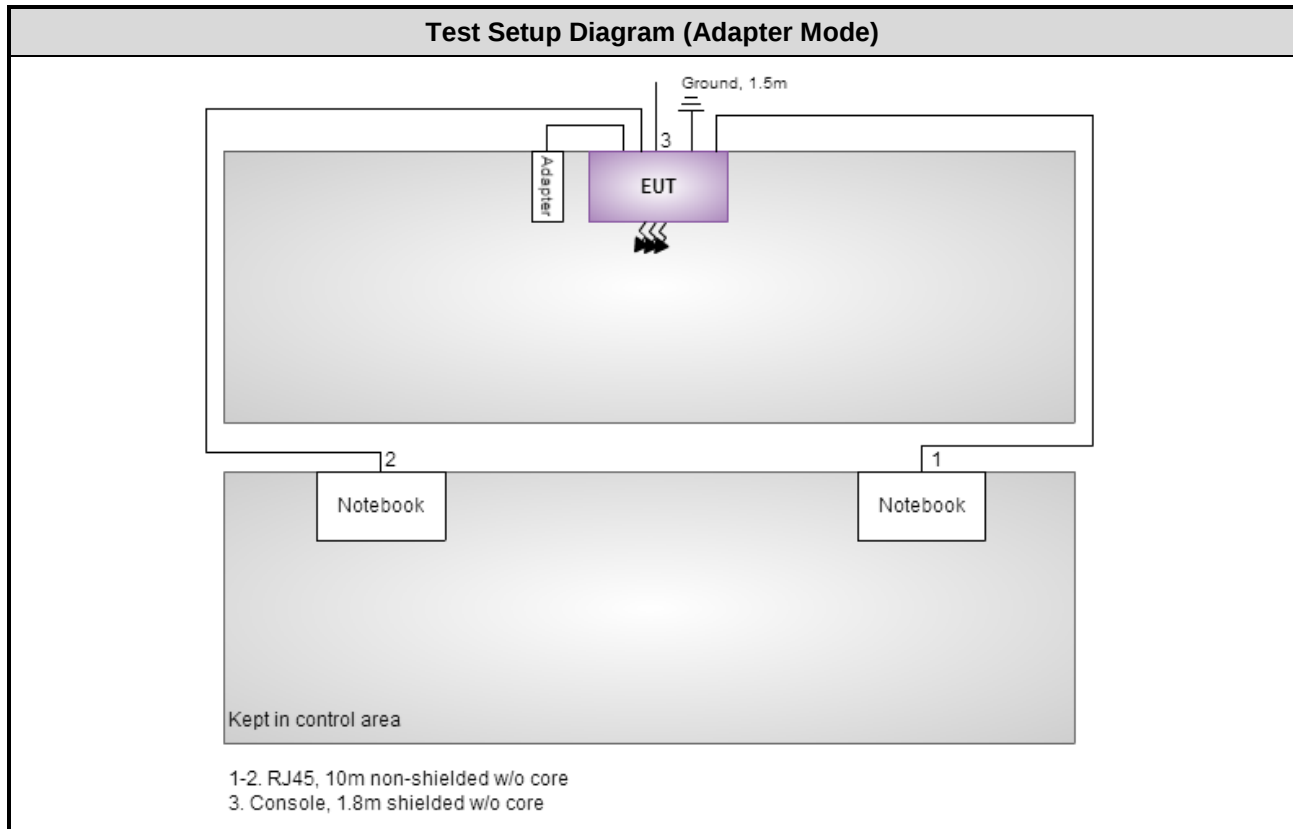
Note: No. 3 was provided by applicant.

Support Equipment List (POE Mode)					
No.	Equipment	Brand	Model	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	Latitude E5430	C0GB4X1	RJ45, 10m non-shielded w/o core.
2	Notebook	DELL	Latitude E5430	9ZFB4X1	RJ45, 1m non-shielded w/o core.
3	POE Injector	ZyXEL	PoE12-HP	---	RJ45, 10m non-shielded w/o core.
4	POE Injector	PowerDsine 3001GC	E018205D G	---	RJ45, 10m non-shielded w/o core.

Note:

- 1) No. 3 & 4 were provided by applicant.
- 2) No. 3 was for radiated emission test used.
- 3) No. 4 was for conducted emission test used.

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	100132	Nov. 14, 2013	Nov. 13, 2014
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 23, 2013	Nov. 22, 2014
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127-666	Dec. 04, 2013	Dec. 03, 2014
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Apr. 23, 2014	Apr. 22, 2015
50 ohm terminal (Support Unit)	NA	50	04	Apr. 18, 2014	Apr. 17, 2015
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 3 / (03CH03-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 16, 2014	Sep. 15, 2015
Receiver	Agilent	N9038A	MY53290044	Jan. 08, 2014	Jan. 07, 2015
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-562	Feb. 07, 2014	Feb. 06, 2015
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 20, 2014	Feb. 19, 2015
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Dec. 27, 2013	Dec. 26, 2014
Preamplifier	EMC	EMC02325	980187	Nov. 22, 2013	Nov. 21, 2014
Preamplifier	Agilent	83017A	MY53270014	Sep. 17, 2014	Sep. 16, 2015
Preamplifier	EMC	EMC184045B	980192	Aug. 26, 2014	Aug. 25, 2015
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 19, 2014	Feb. 18, 2015
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22601/4	Feb. 19, 2014	Feb. 18, 2015
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 19, 2014	Feb. 18, 2015
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 17, 2014	Feb. 16, 2015
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 17, 2014	Feb. 16, 2015
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 17, 2014	Feb. 16, 2015
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Note: Calibration Interval of instruments listed above is two 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, 2014	Feb. 16, 2015
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Dec. 11, 2013	Dec. 10, 2014
Power Meter	Anritsu	ML2495A	1241001	Sep. 11, 2014	Sep. 10, 2015
Power Sensor	Anritsu	MA2411B	1207362	Sep. 12, 2014	Sep. 11, 2015
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 C63.10-2009

FCC KDB 412172

FCC KDB 789033 D01 General UNII Test procedures v01r04

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

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

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
Temperature	± 0.6 °C
Conducted emission	± 2.670 dB
AC conducted emission	± 2.92 dB
Radiated emission ≤ 1 GHz	± 3.26 dB
Radiated emission > 1 GHz	± 4.94 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	20°C / 61%	Skys Huang
Radiated Emissions	03CH03-WS	21-25°C / 63-69%	Haru Yang Anderson Hung Aska Huang
RF Conducted	TH01-WS	21°C / 64%	Brad Wu

➤ FCC site registration No.: 390588

➤ IC site registration No.: 10807C-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	VHT40	5230	6 Mbps	1, 2, 3, 4
Radiated Emissions $\leq 1\text{GHz}$	VHT40	5230	6 Mbps	1, 2, 3, 4
RF Output Power	11a	5180 / 5200 / 5240	6 Mbps	3
	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 $>1\text{GHz}$	11a	5180 / 5200 / 5240	6 Mbps	1, 3
	VHT20	5180 / 5200 / 5240	MCS 0	
	VHT40	5190 / 5230	MCS 0	
	VHT80	5210	MCS 0	
Emission Bandwidth Peak Power Spectral Density	11a	5180 / 5200 / 5240	6 Mbps	3
	VHT20	5180 / 5200 / 5240	MCS 0	
	VHT40	5190 / 5230	MCS 0	
	VHT80	5210	MCS 0	
Peak Excursion	11a	5240	6 Mbps	3
	HT20	5240	MCS 0	
	HT40	5230	MCS 0	
	VHT20	5240	MCS 0	
	VHT40	5230	MCS 0	
	VHT80	5210	MCS 0	
Frequency Stability	Un-modulation	5240	---	---

NOTE:

1. This device can be powered by AC adapter or POE. Each power supply was selected for final testing as below configuration.
2. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.
3. Test configurations are listed as below:
 - 1) Configuration 1: model WAC6502D-S, AC Adapter mode
 - 2) Configuration 2: model WAC6502D-S, POE mode
 - 3) Configuration 3: model WAC6502D-E, AC Adapter mode
 - 4) Configuration 4: model WAC6502D-E, POE mode

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

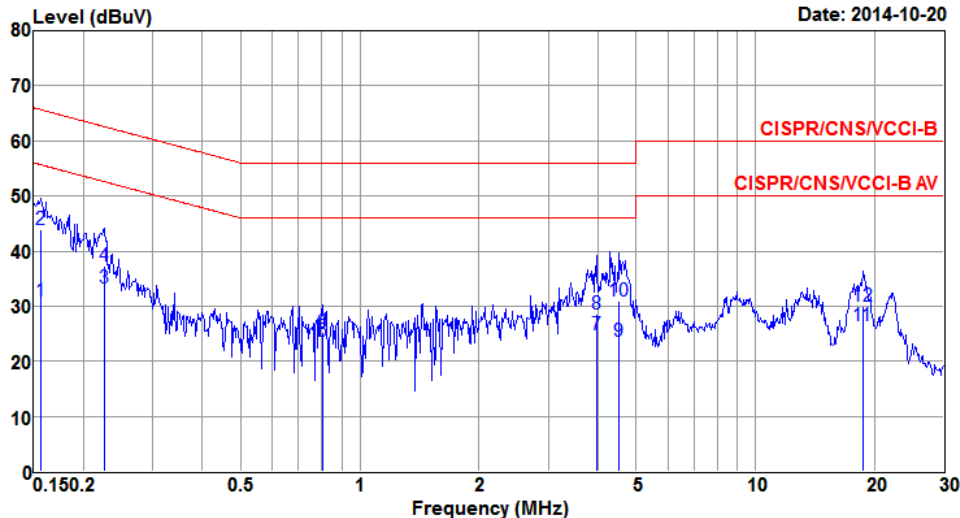
3.1.3 Test Setup



- 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	VHT40	Test Freq. (MHz)	5230
Power Phase	Line	Test Configuration	1

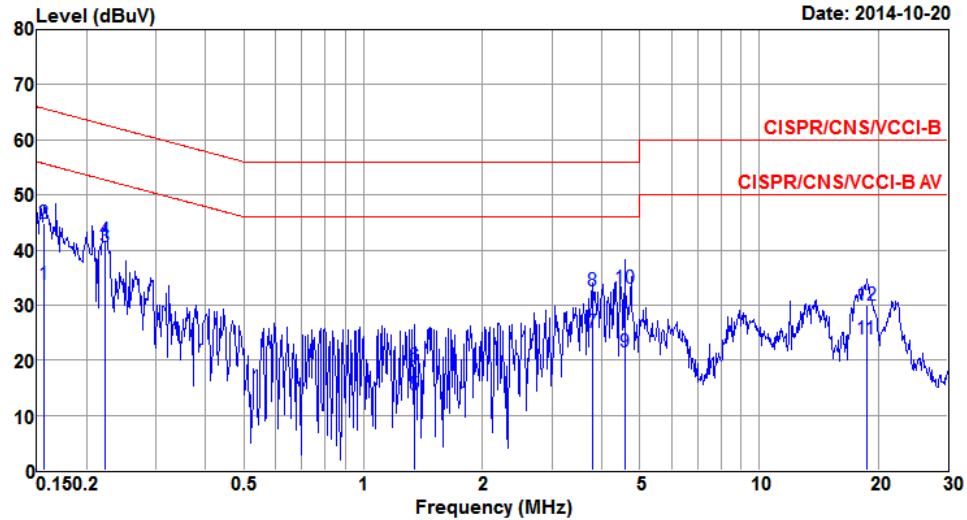


Date: 2014-10-20

	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	30.91	55.65	-24.74	30.48	0.41	0.02	Average
2	0.156	43.93	65.65	-21.72	43.50	0.41	0.02	QP
3*	0.226	33.35	52.61	-19.26	32.90	0.44	0.01	Average
4	0.226	37.26	62.61	-25.35	36.81	0.44	0.01	QP
5	0.804	23.72	46.00	-22.28	23.02	0.68	0.02	Average
6	0.804	25.25	56.00	-30.75	24.55	0.68	0.02	QP
7	3.964	24.84	46.00	-21.16	23.62	1.07	0.15	Average
8	3.964	28.51	56.00	-27.49	27.29	1.07	0.15	QP
9	4.525	23.56	46.00	-22.44	22.25	1.15	0.16	Average
10	4.525	31.00	56.00	-25.00	29.69	1.15	0.16	QP
11	18.721	26.43	50.00	-23.57	24.00	2.05	0.38	Average
12	18.721	29.86	60.00	-30.14	27.43	2.05	0.38	QP

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

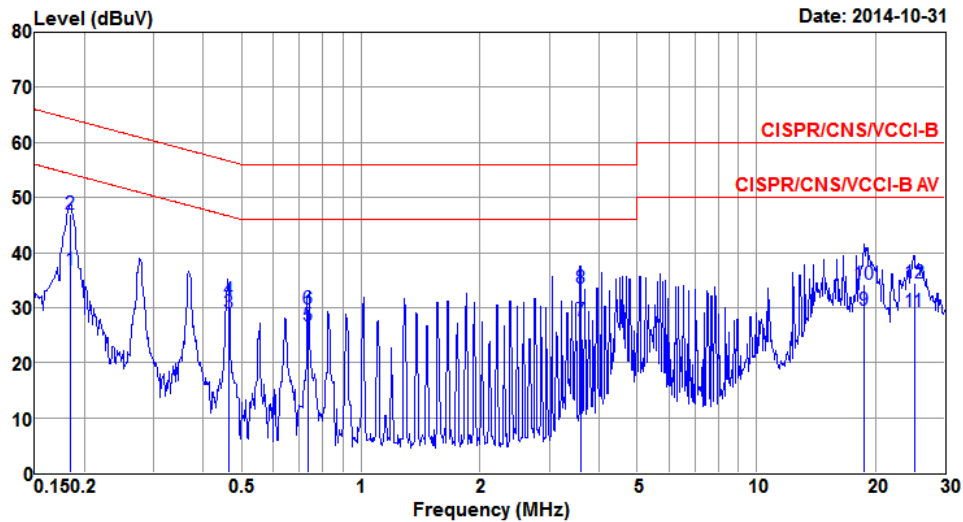
Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Neutral	Test Configuration	1



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line dBuV	Limit dB	Level dBuV	factor dB	loss dB	
1	0.156	33.77	55.65	-21.88	33.26	0.49	0.02	Average
2	0.156	44.87	65.65	-20.78	44.36	0.49	0.02	QP
3*	0.223	40.50	52.70	-12.20	39.96	0.53	0.01	Average
4	0.223	41.74	62.70	-20.96	41.20	0.53	0.01	QP
5	1.345	13.80	46.00	-32.20	12.86	0.92	0.02	Average
6	1.345	18.91	56.00	-37.09	17.97	0.92	0.02	QP
7	3.799	25.00	46.00	-21.00	23.73	1.13	0.14	Average
8	3.799	32.55	56.00	-23.45	31.28	1.13	0.14	QP
9	4.574	21.44	46.00	-24.56	20.07	1.21	0.16	Average
10	4.574	33.16	56.00	-22.84	31.79	1.21	0.16	QP
11	18.721	23.91	50.00	-26.09	21.01	2.52	0.38	Average
12	18.721	29.89	60.00	-30.11	26.99	2.52	0.38	QP

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

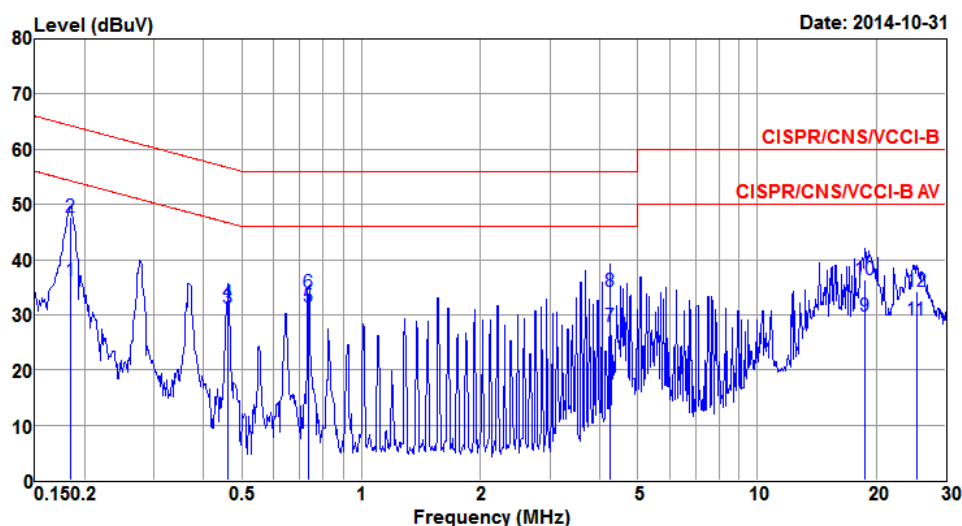
Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Line	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.184	36.88	54.30	-17.42	36.48	0.39	0.01	Average
2*	0.184	47.04	64.30	-17.26	46.64	0.39	0.01	QP
3	0.463	29.02	46.65	-17.63	28.61	0.39	0.02	Average
4	0.463	31.41	56.65	-25.24	31.00	0.39	0.02	QP
5	0.737	26.73	46.00	-19.27	26.31	0.40	0.02	Average
6	0.737	29.64	56.00	-26.36	29.22	0.40	0.02	QP
7	3.596	27.57	46.00	-18.43	26.98	0.46	0.13	Average
8	3.596	33.55	56.00	-22.45	32.96	0.46	0.13	QP
9	18.715	29.51	50.00	-20.49	28.58	0.55	0.38	Average
10	18.715	34.24	60.00	-25.76	33.31	0.55	0.38	QP
11	25.058	29.20	50.00	-20.80	28.20	0.55	0.45	Average
12	25.058	34.49	60.00	-25.51	33.49	0.55	0.45	QP

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

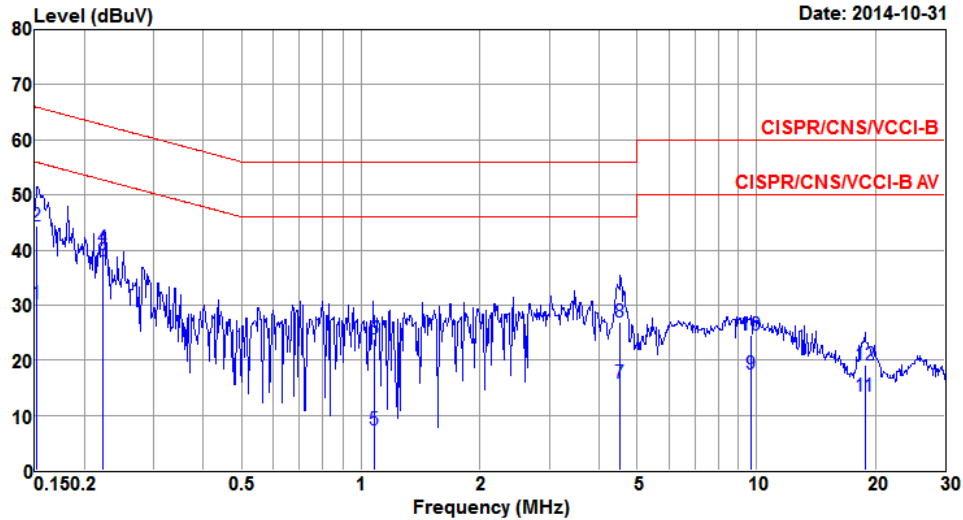
Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Neutral	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.185	36.19	54.27	-18.08	35.70	0.48	0.01	Average
2	0.185	47.71	64.27	-16.56	47.22	0.48	0.01	QP
3	0.461	31.06	46.67	-15.61	30.57	0.47	0.02	Average
4	0.461	32.22	56.67	-24.45	31.73	0.47	0.02	QP
5*	0.738	31.40	46.00	-14.60	30.90	0.48	0.02	Average
6	0.738	34.00	56.00	-22.00	33.50	0.48	0.02	QP
7	4.242	27.76	46.00	-18.24	27.08	0.52	0.16	Average
8	4.242	34.26	56.00	-21.74	33.58	0.52	0.16	QP
9	18.726	29.67	50.00	-20.33	28.73	0.56	0.38	Average
10	18.726	36.37	60.00	-23.63	35.43	0.56	0.38	QP
11	25.314	29.08	50.00	-20.92	28.10	0.53	0.45	Average
12	25.314	34.17	60.00	-25.83	33.19	0.53	0.45	QP

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

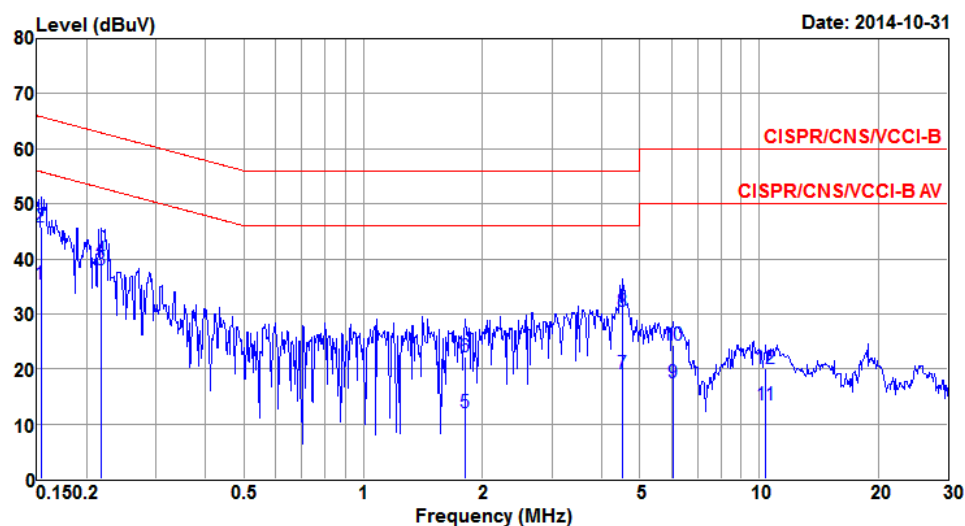
Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Line	Test Configuration	3



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line dBuV	Limit dB	Level dBuV	factor dB	loss dB	
1	0.151	30.27	55.94	-25.67	29.84	0.41	0.02	Average
2	0.151	44.32	65.94	-21.62	43.89	0.41	0.02	QP
3*	0.223	37.95	52.70	-14.75	37.50	0.44	0.01	Average
4	0.223	40.30	62.70	-22.40	39.85	0.44	0.01	QP
5	1.078	7.30	46.00	-38.70	6.52	0.76	0.02	Average
6	1.078	23.77	56.00	-32.23	22.99	0.76	0.02	QP
7	4.528	15.77	46.00	-30.23	14.46	1.15	0.16	Average
8	4.528	26.99	56.00	-29.01	25.68	1.15	0.16	QP
9	9.705	17.42	50.00	-32.58	15.49	1.68	0.25	Average
10	9.705	24.57	60.00	-35.43	22.64	1.68	0.25	QP
11	18.820	13.55	50.00	-36.45	11.11	2.06	0.38	Average
12	18.820	19.15	60.00	-40.85	16.71	2.06	0.38	QP

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

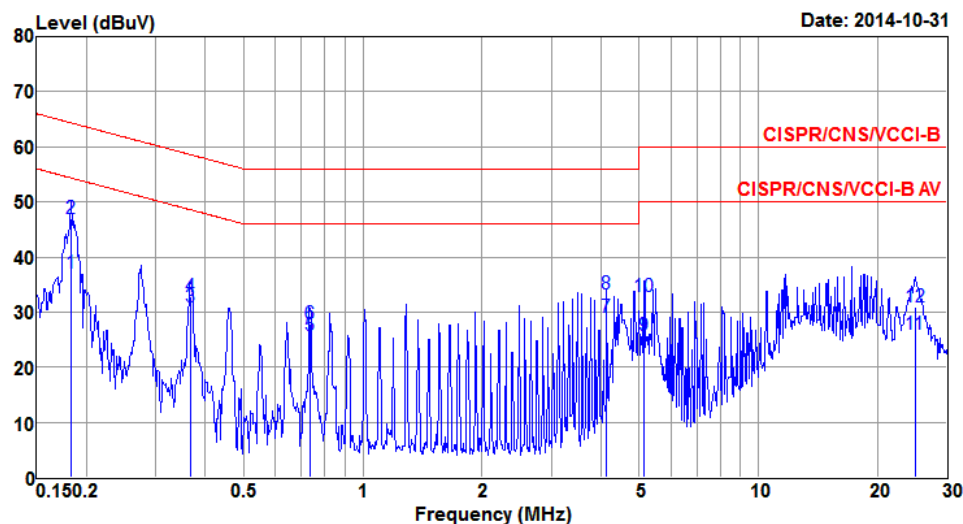
Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Neutral	Test Configuration	3



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.153	35.45	55.82	-20.37	34.94	0.49	0.02	Average
2	0.153	45.68	65.82	-20.14	45.17	0.49	0.02	QP
3*	0.219	38.01	52.88	-14.87	37.48	0.52	0.01	Average
4	0.219	39.84	62.88	-23.04	39.31	0.52	0.01	QP
5	1.810	12.00	46.00	-34.00	10.93	1.05	0.02	Average
6	1.810	22.21	56.00	-33.79	21.14	1.05	0.02	QP
7	4.525	19.12	46.00	-26.88	17.75	1.21	0.16	Average
8	4.525	30.34	56.00	-25.66	28.97	1.21	0.16	QP
9	6.056	17.45	50.00	-32.55	15.85	1.40	0.20	Average
10	6.056	24.26	60.00	-35.74	22.66	1.40	0.20	QP
11	10.397	13.40	50.00	-36.60	11.39	1.76	0.25	Average
12	10.397	20.14	60.00	-39.86	18.13	1.76	0.25	QP

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

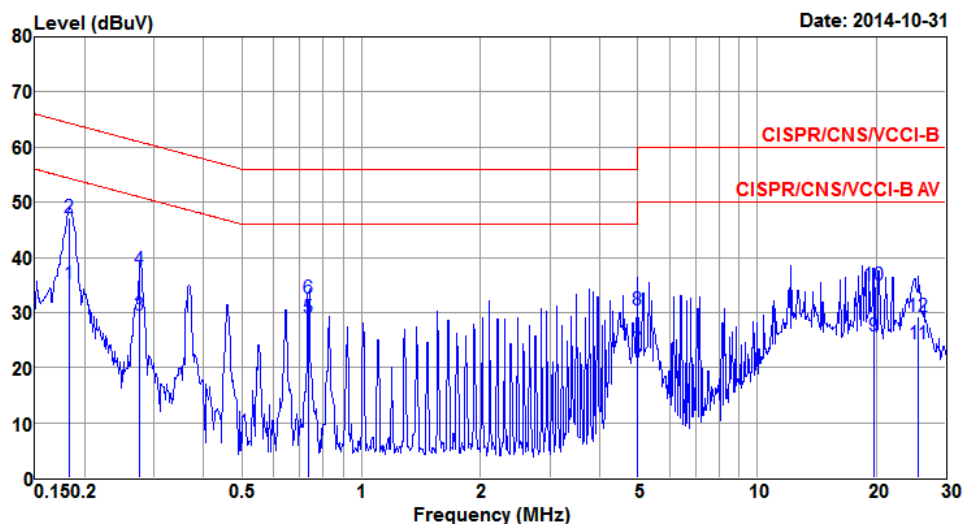
Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Line	Test Configuration	4



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line	Limit	Level	factor	loss	
			dBuV	dB	dBuV	dB	dB	
1	0.182	36.99	54.37	-17.38	36.59	0.39	0.01	Average
2	0.182	46.92	64.37	-17.45	46.52	0.39	0.01	QP
3	0.367	30.96	48.56	-17.60	30.55	0.39	0.02	Average
4	0.367	32.75	58.56	-25.81	32.34	0.39	0.02	QP
5	0.737	25.68	46.00	-20.32	25.26	0.40	0.02	Average
6	0.737	27.95	56.00	-28.05	27.53	0.40	0.02	QP
7*	4.141	29.15	46.00	-16.85	28.54	0.46	0.15	Average
8	4.141	33.30	56.00	-22.70	32.69	0.46	0.15	QP
9	5.154	25.77	50.00	-24.23	25.11	0.48	0.18	Average
10	5.154	32.76	60.00	-27.24	32.10	0.48	0.18	QP
11	24.922	25.95	50.00	-24.05	24.95	0.55	0.45	Average
12	24.922	30.92	60.00	-29.08	29.92	0.55	0.45	QP

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

Modulation	VHT40	Test Freq. (MHz)	5230
Power Phase	Neutral	Test Configuration	4



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.183	35.28	54.33	-19.05	34.79	0.48	0.01	Average
2	0.183	47.26	64.33	-17.07	46.77	0.48	0.01	QP
3	0.276	29.58	50.94	-21.36	29.09	0.48	0.01	Average
4	0.276	37.66	60.94	-23.28	37.17	0.48	0.01	QP
5*	0.735	29.13	46.00	-16.87	28.63	0.48	0.02	Average
6	0.735	32.54	56.00	-23.46	32.04	0.48	0.02	QP
7	4.977	23.06	46.00	-22.94	22.36	0.53	0.17	Average
8	4.977	30.42	56.00	-25.58	29.72	0.53	0.17	QP
9	19.709	25.81	50.00	-24.19	24.86	0.56	0.39	Average
10	19.709	34.84	60.00	-25.16	33.89	0.56	0.39	QP
11	25.591	24.29	50.00	-25.71	23.31	0.53	0.45	Average
12	25.591	29.38	60.00	-30.62	28.40	0.53	0.45	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 Test Procedures

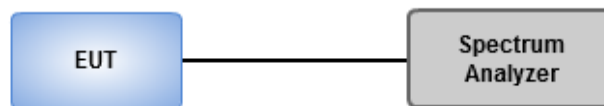
26dB Bandwidth

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

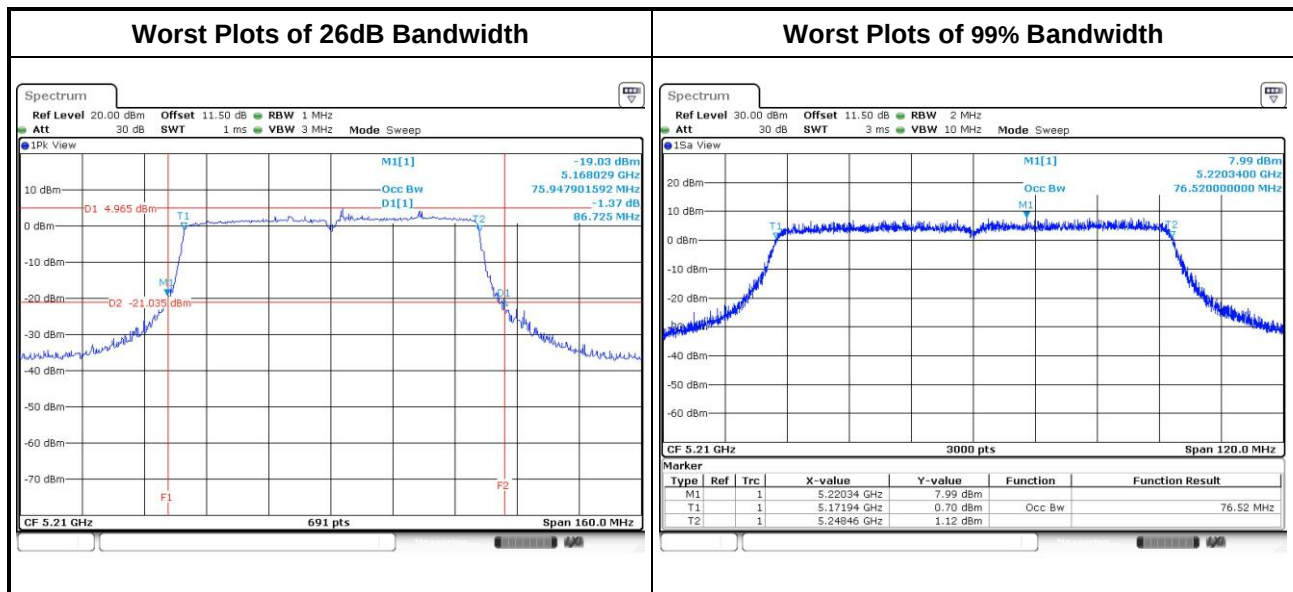
1. Set RBW = 1 % to 5 % of the OBW
2. Set VBW $\geq$ 3 RBW
3. Sample detection and single sweep mode shall be used
4. Use the 99 % power bandwidth function of the instrument

3.2.2 Test Setup



3.2.3 Test Result of Emission Bandwidth

Emission Bandwidth												
Mode	N _{TX}	Freq. (MHz)	26dB Bandwidth (MHz)				99% Bandwidth (MHz)				Power Limit (dBm)	
			Chain 0	Chain 1	Chain 2	Chain 3	Chain 0	Chain 1	Chain 2	Chain 3	26dB BW	99%OBW
11a	2	5180	22.14	21.28	--	--	16.76	16.67	--	--	17.00	16.22
11a	2	5200	22.96	22.14	--	--	16.74	16.65	--	--	17.00	16.21
11a	2	5240	22.78	21.86	--	--	16.74	16.66	--	--	17.00	16.22
VHT20	2	5180	23.65	23.13	--	--	17.88	17.87	--	--	17.00	16.52
VHT20	2	5200	23.19	23.54	--	--	17.88	17.87	--	--	17.00	16.52
VHT20	2	5240	23.71	23.42	--	--	17.88	17.85	--	--	17.00	16.52
VHT40	2	5190	46.61	45.80	--	--	36.82	36.78	--	--	17.00	17.00
VHT40	2	5230	48.23	49.04	--	--	36.80	36.82	--	--	17.00	17.00
VHT80	2	5210	86.73	86.49	--	--	76.52	76.40	--	--	17.00	17.00



3.3 RF Output Power

3.3.1 Limit of RF Output Power

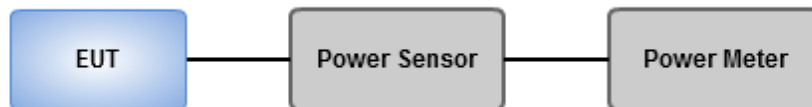
Frequency Band (GHz)		Limit for FCC 15.407
☒	5.15~5.25	50mW or 4dBm+10 log B
☐	5.25~5.35	250mW or 11dBm+10 log B
☐	5.47~5.725	250mW or 11dBm+10 log B
Note: "B" is the 26dB emission bandwidth in MHz.		

3.3.2 Test Procedures

☒ **Power meter**

- ☒ Measurements 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

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	2	5180	10.19	10.21	--	--	20.943	13.21	17.00
11a	2	5200	10.53	10.36	--	--	22.162	13.46	17.00
11a	2	5240	9.95	9.89	--	--	19.635	12.93	17.00
HT20	2	5180	10.53	10.73	--	--	23.128	13.64	17.00
HT20	2	5200	10.76	10.65	--	--	23.527	13.72	17.00
HT20	2	5240	10.31	10.25	--	--	21.332	13.29	17.00
HT40	2	5190	12.89	12.53	--	--	37.360	15.72	17.00
HT40	2	5230	12.86	12.71	--	--	37.983	15.80	17.00
VHT20	2	5180	10.66	10.86	--	--	23.831	13.77	17.00
VHT20	2	5200	10.84	10.72	--	--	23.937	13.79	17.00
VHT20	2	5240	10.4	10.3	--	--	21.680	13.36	17.00
VHT40	2	5190	12.98	12.59	--	--	38.016	15.80	17.00
VHT40	2	5230	12.94	12.78	--	--	38.646	15.87	17.00
VHT80	2	5210	12.71	12.28	--	--	35.568	15.51	17.00

3.4 Peak Power Spectral Density

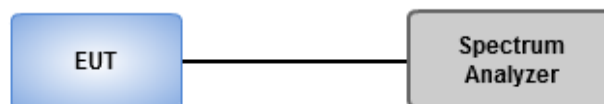
3.4.1 Limit of Peak Power Spectral Density

Frequency Band (GHz)		Limit (dBm) for FCC 15.407
☒	5.15~5.25	4
☐	5.25~5.35	11
☐	5.47~5.725	11

3.4.2 Test Procedures

- ☒ Method SA-1 (For 11a / VHT20)
 - Set RBW = 1 MHz, VBW = 3 MHz, Sweep time = auto, Detector = RMS.
 - Trace average 100 traces.
 - Use the peak marker function to determine the maximum amplitude level.
- ☐ Method SA-2
 - Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
 - Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{symbol period of the transmitted signal})$.
 - Perform a single sweep.
 - Use the peak marker function to determine the maximum amplitude level.
- ☒ Method SA-2 Alternative (For VHT40 / VHT80)
 - Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
 - Set sweep time $\geq 10 \times (\text{number of points in sweep}) \times (\text{total on/off period of the transmitted signal})$.
 - Perform a single sweep.
 - Use the peak marker function to determine the maximum amplitude level.
 - Add $10 \log(1/x)$, where x is the duty cycle.

3.4.3 Test Setup

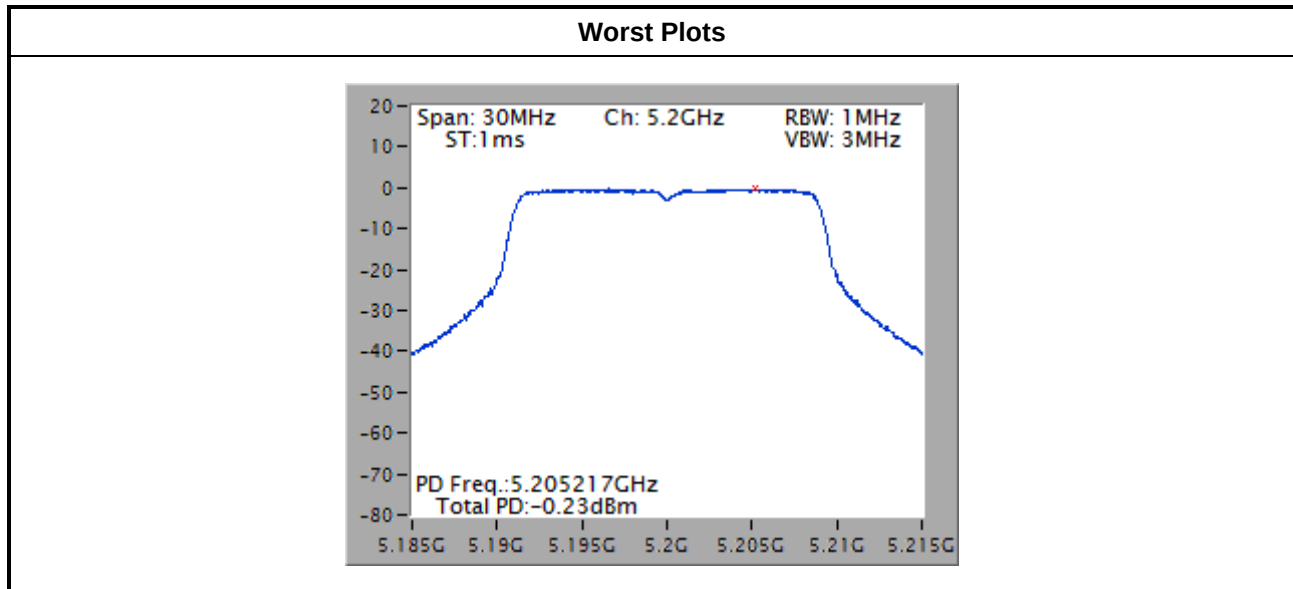


3.4.4 Test Result of Peak Power Spectral Density

Condition			Peak Power Spectral Density (dBm)			
Mode	N _{TX}	Freq. (MHz)	PPSD w/o D.F (dBm)	Duty Factor (dB)	PPSD with D.F (dBm)	PPSD Limit (dBm)
11a	2	5180	-0.33	0.00	-0.33	-0.01
11a	2	5200	-0.30	0.00	-0.30	-0.01
11a	2	5240	-0.43	0.00	-0.43	-0.01
VHT20	2	5180	-0.38	0.00	-0.38	-0.01
VHT20	2	5200	-0.23	0.00	-0.23	-0.01
VHT20	2	5240	-0.24	0.00	-0.24	-0.01
VHT40	2	5190	-1.44	0.24	-1.20	-0.01
VHT40	2	5230	-1.41	0.24	-1.17	-0.01
VHT80	2	5210	-4.72	0.13	-4.59	-0.01

Note:

1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.
3. Directional gain = $7 + 10 * \log(2 / 1) = 10.01 \text{ dBi} > 6 \text{ dBi}$.
Limit shall be reduced to $4 \text{ dBm} - (10.01 \text{ dBi} - 6 \text{ dBi}) = -0.01 \text{ dBm}$.



3.5 Peak Excursion

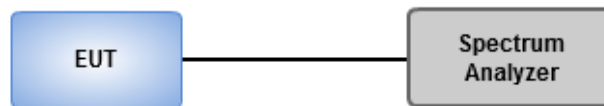
3.5.1 Peak Excursion Limit

Peak excursion of the modulation envelope shall not exceed 13 dB across any 1 MHz bandwidth.

3.5.2 Test Procedures

1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = peak.
2. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak search function to find the peak of the spectrum.
4. Use the procedure of section 3.4.2 to measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD

3.5.3 Test Setup

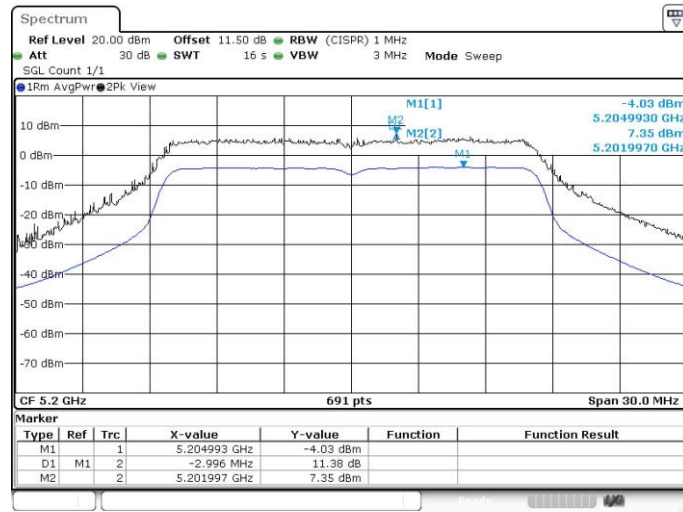


3.5.4 Test Result of Peak Excursion

Mode	Modulation Mode	N _{TX}	Freq. (MHz)	Measured Value(dB)	Duty Factor (dB)	Peak Excursion (dB)	Limit
11a	BPSK	2	5200	8.43	0.00	8.43	13
11a	QPSK	2	5200	10.06	0.19	9.87	13
11a	16QAM	2	5200	10.31	0.40	9.91	13
11a	64QAM	2	5200	11.38	0.67	10.71	13
VHT20	BPSK	2	5200	8.92	0.00	8.92	13
VHT20	QPSK	2	5200	9.51	0.20	9.31	13
VHT20	16QAM	2	5200	10.25	0.35	9.90	13
VHT20	64QAM	2	5200	10.84	0.85	9.99	13
VHT20	256QAM	2	5200	10.78	1.06	9.72	13
VHT40	BPSK	2	5190	8.84	0.24	8.60	13
VHT40	QPSK	2	5190	9.85	0.43	9.42	13
VHT40	16QAM	2	5190	10.64	0.79	9.85	13
VHT40	64QAM	2	5190	10.78	1.24	9.54	13
VHT40	256QAM	2	5190	10.82	1.53	9.29	13
VHT80	BPSK	2	5210	10.3	0.13	10.17	13
VHT80	QPSK	2	5210	10.6	0.16	10.44	13
VHT80	16QAM	2	5210	11.01	0.36	10.65	13
VHT80	64QAM	2	5210	9.92	0.67	9.25	13
VHT80	256QAM	2	5210	10.8	0.88	9.92	13

Note: Measured value = Peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission. Since the duty cycle is < 98 %, duty factor is required to average spectrum
Peak exclusion = Measured value – duty factor

Worst Plots



3.6 Transmitter Radiated and Band Edge Emissions

3.6.1 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]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.825 GHz	5.715 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.825 5.835 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m]

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).

3.6.2 Test Procedures

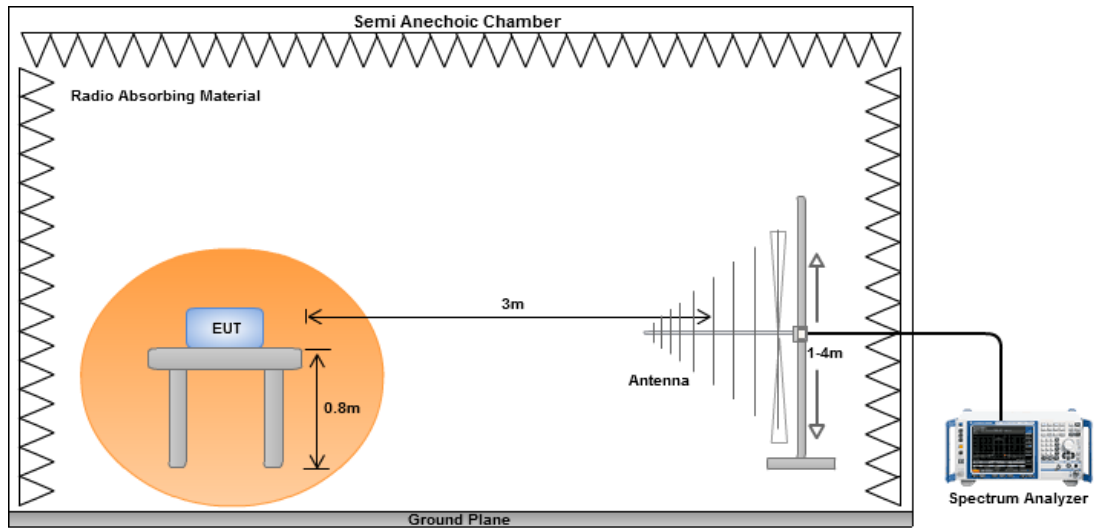
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
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:

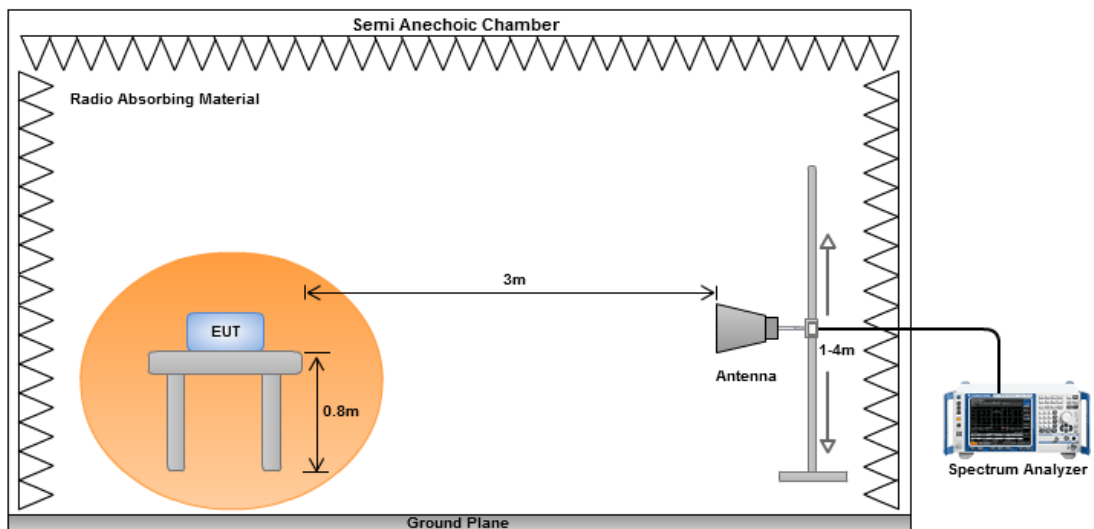
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.6.3 Test Setup

Radiated Emissions below 1 GHz

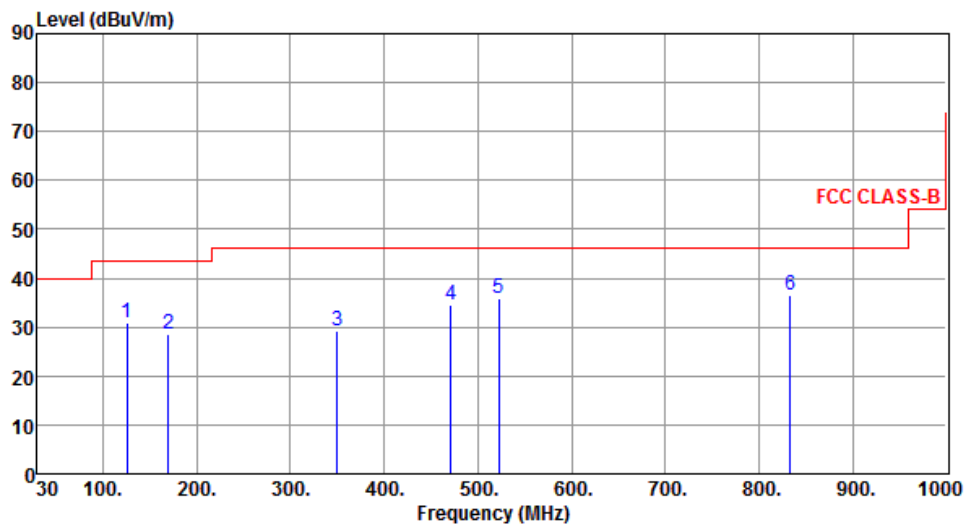


Radiated Emissions above 1 GHz



3.6.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.71	30.85	43.50	-12.65	45.94	-15.09	Peak	---	---
2	169.52	28.54	43.50	-14.96	42.43	-13.89	Peak	---	---
3	350.36	29.16	46.00	-16.84	40.49	-11.33	Peak	---	---
4	470.88	34.57	46.00	-11.43	42.92	-8.35	Peak	---	---
5	522.79	36.03	46.00	-9.97	43.65	-7.62	Peak	---	---
6	833.43	36.49	46.00	-9.51	38.36	-1.87	Peak	---	---

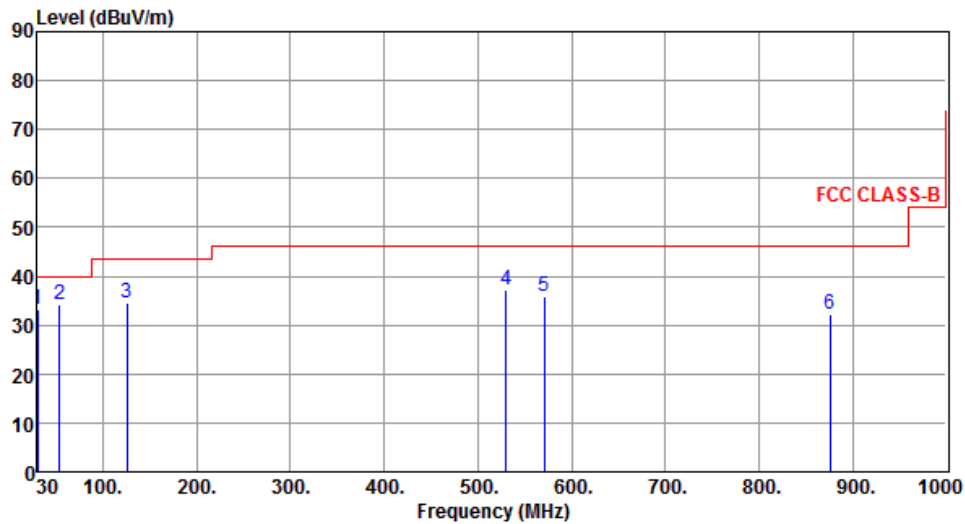
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	30.66	33.35	40.00	-6.65	47.33	-13.98	Peak	---	---
2	53.67	34.18	40.00	-5.82	47.36	-13.18	Peak	---	---
3	125.46	34.53	43.50	-8.97	49.64	-15.11	Peak	---	---
4	529.73	37.22	46.00	-8.78	44.73	-7.51	Peak	---	---
5	570.62	35.94	46.00	-10.06	42.44	-6.50	Peak	---	---
6	875.47	32.18	46.00	-13.82	33.32	-1.14	Peak	---	---

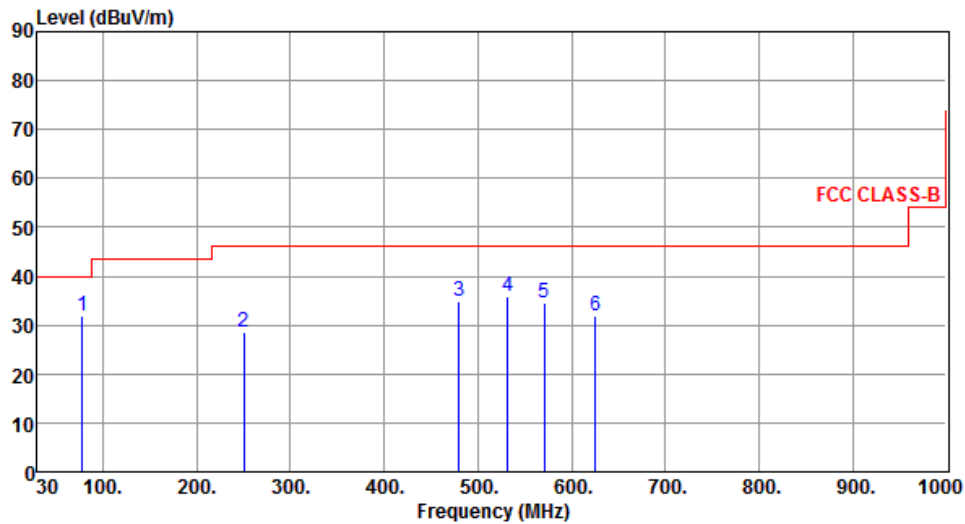
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	77.56	31.89	40.00	-8.11	49.01	-17.12	Peak	---	---
2	250.44	28.59	46.00	-17.41	43.05	-14.46	Peak	---	---
3	479.96	35.02	46.00	-10.98	43.26	-8.24	Peak	---	---
4	531.63	35.86	46.00	-10.14	43.34	-7.48	Peak	---	---
5	570.47	34.55	46.00	-11.45	41.06	-6.51	Peak	---	---
6	625.29	31.72	46.00	-14.28	36.98	-5.26	Peak	---	---

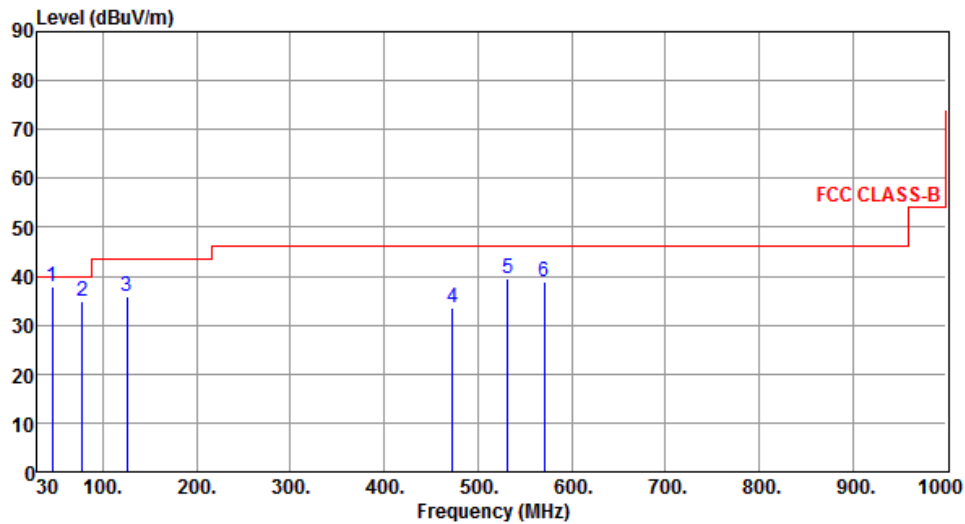
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	45.61	37.82	40.00	-2.18	50.98	-13.16	Peak	---	---
2	77.58	34.86	40.00	-5.14	51.98	-17.12	Peak	---	---
3	125.73	35.74	43.50	-7.76	50.83	-15.09	Peak	---	---
4	472.58	33.61	46.00	-12.39	41.94	-8.33	Peak	---	---
5	532.13	39.55	46.00	-6.45	47.02	-7.47	Peak	---	---
6	570.46	38.94	46.00	-7.06	45.45	-6.51	Peak	---	---

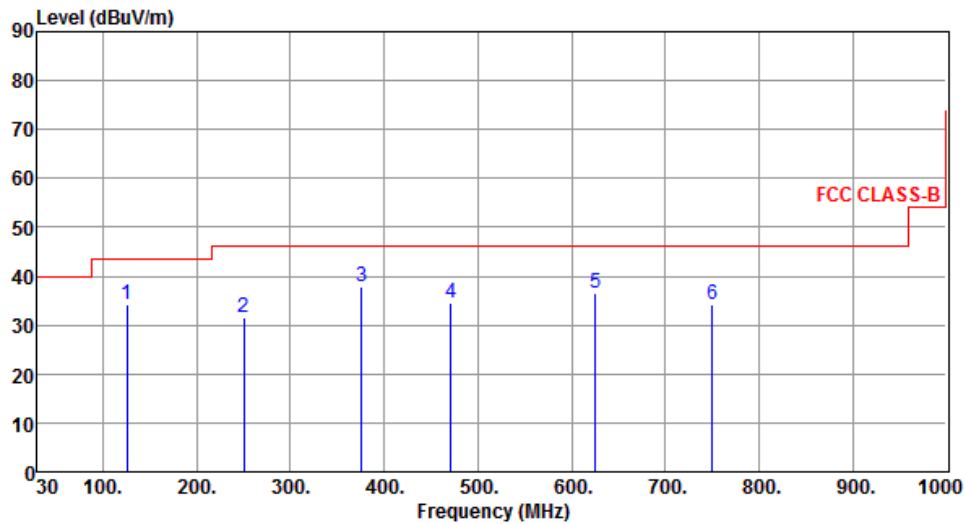
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	3



	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.74	34.37	43.50	-9.13	49.46	-15.09	Peak	---	---
2	250.13	31.46	46.00	-14.54	45.93	-14.47	Peak	---	---
3	375.91	37.84	46.00	-8.16	48.58	-10.74	Peak	---	---
4	470.87	34.64	46.00	-11.36	42.99	-8.35	Peak	---	---
5	625.37	36.55	46.00	-9.45	41.81	-5.26	Peak	---	---
6	750.41	34.28	46.00	-11.72	37.44	-3.16	Peak	---	---

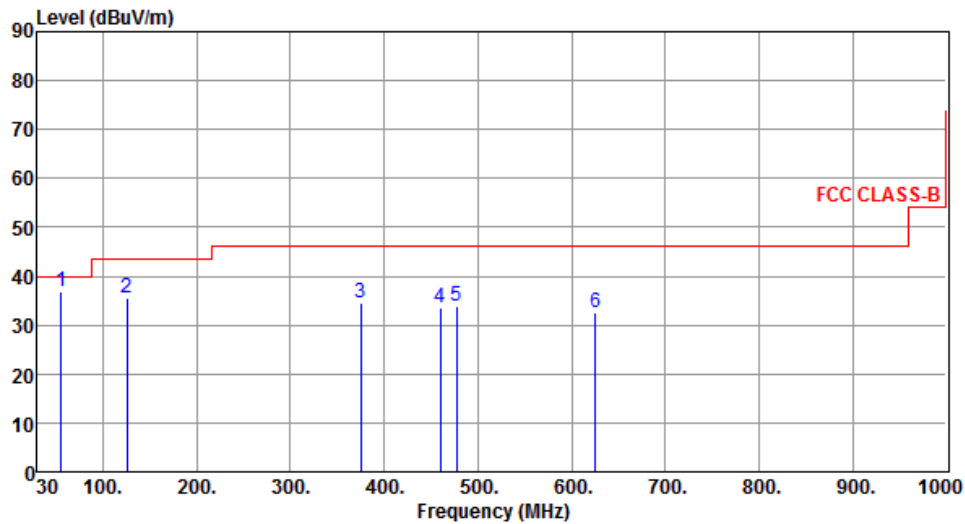
Note 1: Emission Level (dBUV/m) = SA Reading (dBUV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	3



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	55.13	36.88	40.00	-3.12	50.14	-13.26	Peak	---	---
2	125.26	35.64	43.50	-7.86	50.77	-15.13	Peak	---	---
3	375.49	34.58	46.00	-11.42	45.33	-10.75	Peak	---	---
4	459.79	33.43	46.00	-12.57	41.91	-8.48	Peak	---	---
5	477.26	33.94	46.00	-12.06	42.22	-8.28	Peak	---	---
6	625.37	32.46	46.00	-13.54	37.72	-5.26	Peak	---	---

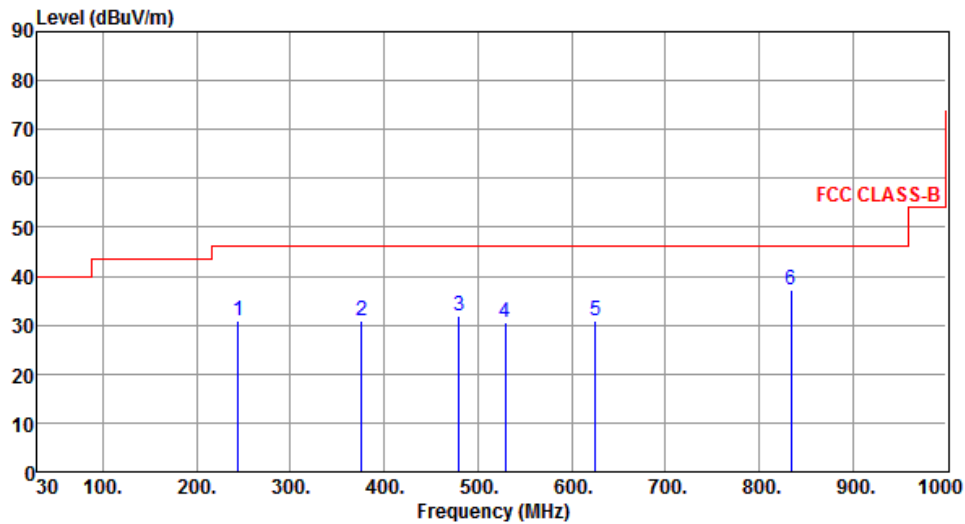
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	4



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	244.58	30.87	46.00	-15.13	45.47	-14.60	Peak	---	---
2	375.63	30.91	46.00	-15.09	41.66	-10.75	Peak	---	---
3	480.12	31.75	46.00	-14.25	39.99	-8.24	Peak	---	---
4	529.43	30.56	46.00	-15.44	38.08	-7.52	Peak	---	---
5	625.73	30.96	46.00	-15.04	36.22	-5.26	Peak	---	---
6	834.52	37.23	46.00	-8.77	39.09	-1.86	Peak	---	---

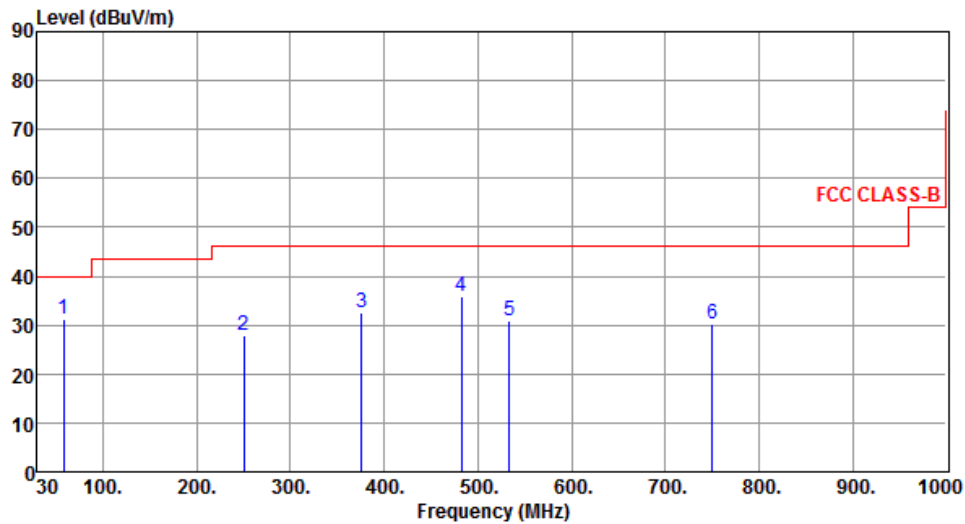
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*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	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	4



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	58.42	31.23	40.00	-8.77	44.68	-13.45	Peak	---	---
2	250.31	27.89	46.00	-18.11	42.36	-14.47	Peak	---	---
3	375.64	32.49	46.00	-13.51	43.24	-10.75	Peak	---	---
4	482.23	35.75	46.00	-10.25	43.97	-8.22	Peak	---	---
5	533.72	30.91	46.00	-15.09	38.36	-7.45	Peak	---	---
6	750.44	30.28	46.00	-15.72	33.44	-3.16	Peak	---	---

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

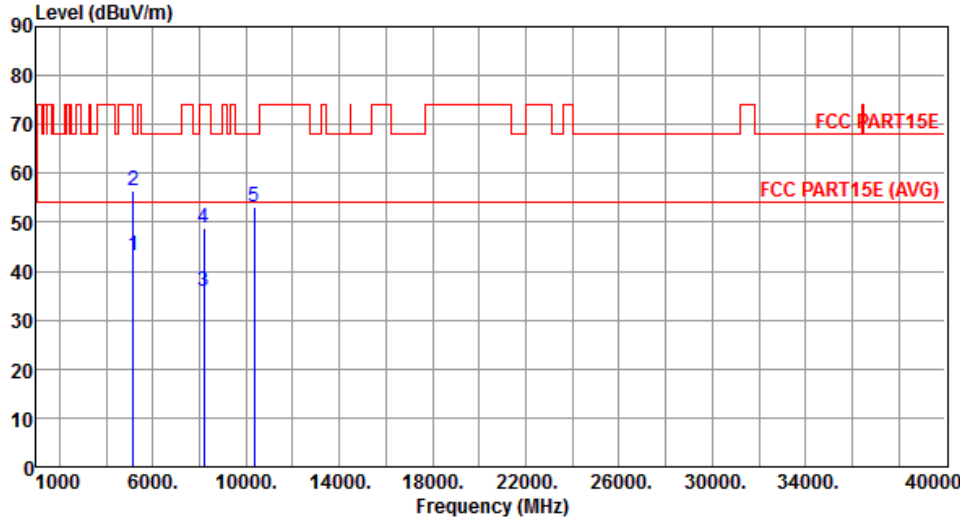
*Factor includes antenna factor , cable loss and amplifier gain

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.

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

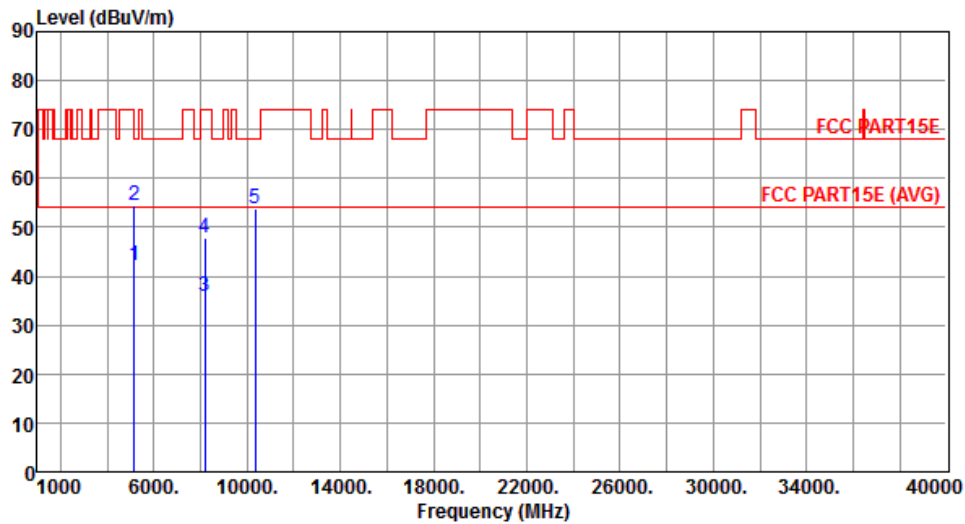
Modulation	11a	Test Freq. (MHz)	5180
Polarization	Horizontal	Test Configuration	1



	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	43.17	54.00	-10.83	36.99	6.18	Average	---	---
2	5150.00	56.61	74.00	-17.39	50.43	6.18	Peak	---	---
3	8188.00	35.90	54.00	-18.10	24.38	11.52	Average	---	---
4	8188.00	48.96	74.00	-25.04	37.44	11.52	Peak	---	---
5	10360.00	53.27	68.20	-14.93	36.31	16.96	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).

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical	Test Configuration	1



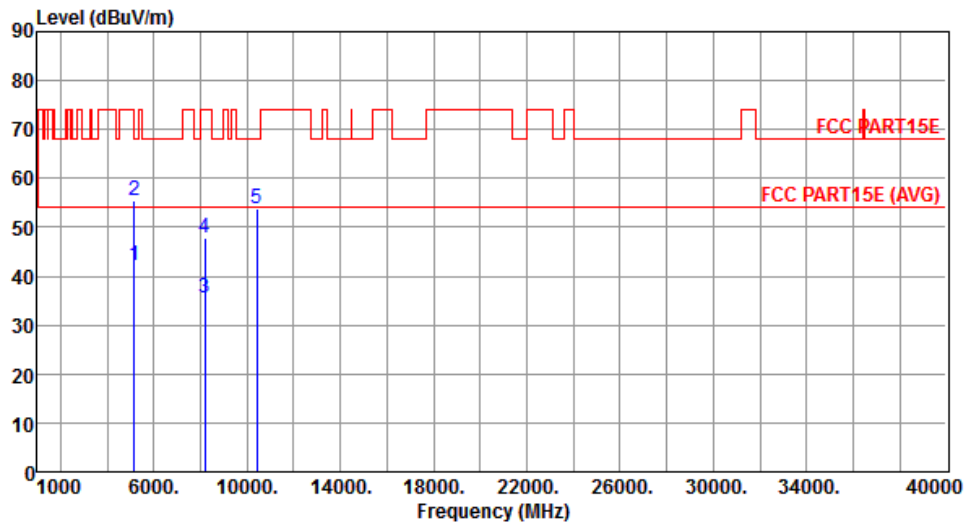
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.10	54.00	-11.90	35.92	6.18	Average	---	---
2	5150.00	54.50	74.00	-19.50	48.32	6.18	Peak	---	---
3	8188.00	35.81	54.00	-18.19	24.29	11.52	Average	---	---
4	8188.00	47.83	74.00	-26.17	36.31	11.52	Peak	---	---
5	10360.00	53.66	68.20	-14.54	36.70	16.96	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).

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Horizontal	Test Configuration	1



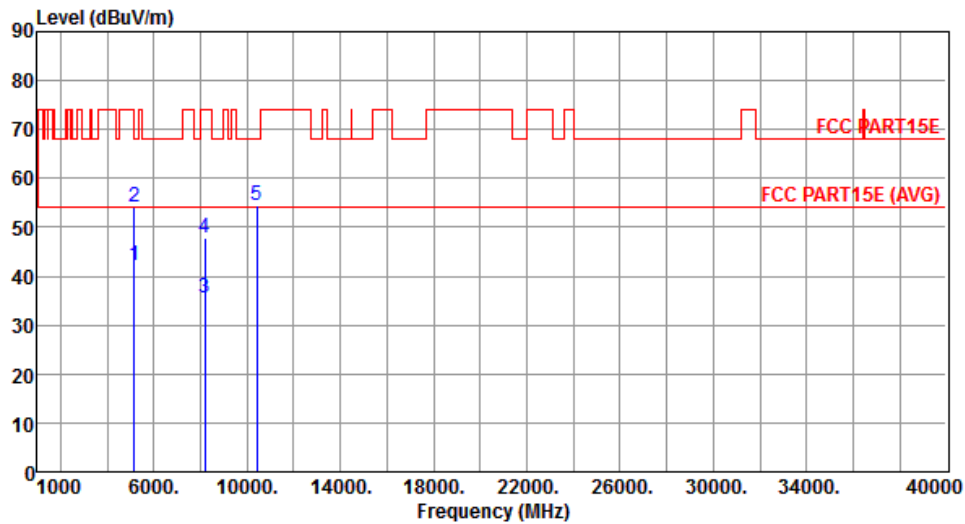
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.09	54.00	-11.91	35.91	6.18	Average	---	---
2	5150.00	55.35	74.00	-18.65	49.17	6.18	Peak	---	---
3	8188.00	35.62	54.00	-18.38	24.10	11.52	Average	---	---
4	8188.00	47.80	74.00	-26.20	36.28	11.52	Peak	---	---
5	10400.00	53.90	68.20	-14.30	36.82	17.08	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).

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Vertical	Test Configuration	1



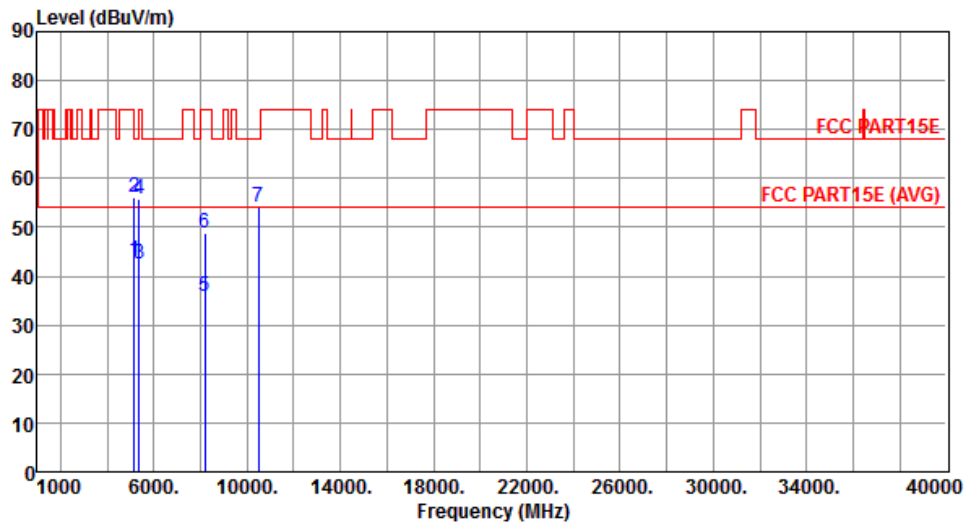
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.12	54.00	-11.88	35.94	6.18	Average	---	---
2	5150.00	54.12	74.00	-19.88	47.94	6.18	Peak	---	---
3	8188.00	35.49	54.00	-18.51	23.97	11.52	Average	---	---
4	8188.00	47.70	74.00	-26.30	36.18	11.52	Peak	---	---
5	10400.00	54.51	68.20	-13.69	37.43	17.08	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).

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Horizontal	Test Configuration	1



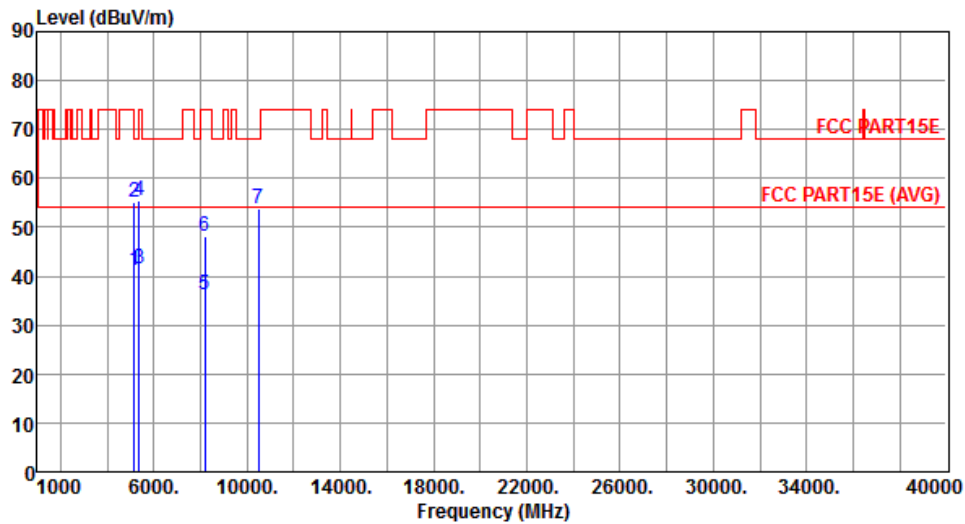
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.08	54.00	-10.92	36.90	6.18	Average	---	---
2	5150.00	55.98	74.00	-18.02	49.80	6.18	Peak	---	---
3	5350.00	42.60	54.00	-11.40	36.09	6.51	Average	---	---
4	5350.00	55.85	74.00	-18.15	49.34	6.51	Peak	---	---
5	8188.00	35.88	54.00	-18.12	24.36	11.52	Average	---	---
6	8188.00	48.67	74.00	-25.33	37.15	11.52	Peak	---	---
7	10480.00	54.22	68.20	-13.98	36.90	17.32	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).

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Vertical	Test Configuration	1



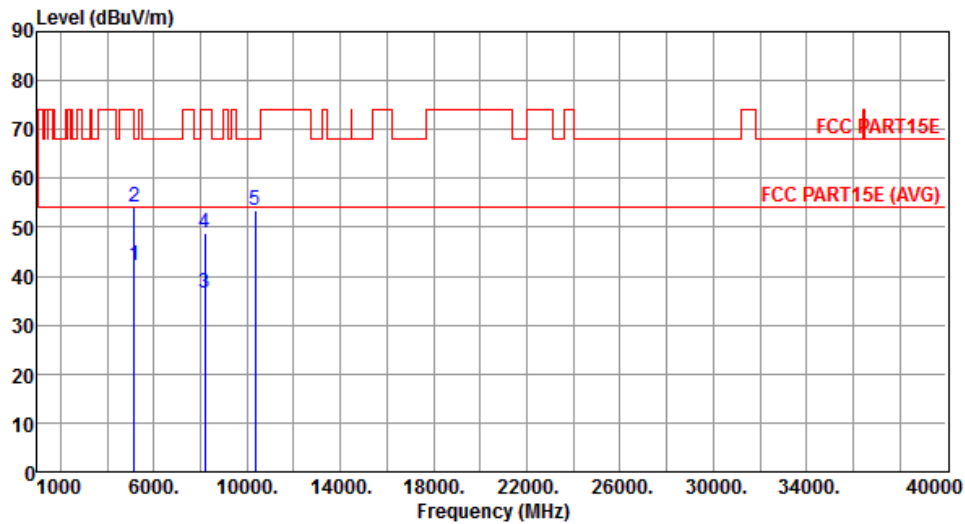
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.30	54.00	-12.70	35.12	6.18	Average	---	---
2	5150.00	55.05	74.00	-18.95	48.87	6.18	Peak	---	---
3	5350.00	41.42	54.00	-12.58	34.91	6.51	Average	---	---
4	5350.00	55.40	74.00	-18.60	48.89	6.51	Peak	---	---
5	8188.00	36.08	54.00	-17.92	24.56	11.52	Average	---	---
6	8188.00	48.31	74.00	-25.69	36.79	11.52	Peak	---	---
7	10480.00	53.96	68.20	-14.24	36.64	17.32	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).

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Horizontal	Test Configuration	3



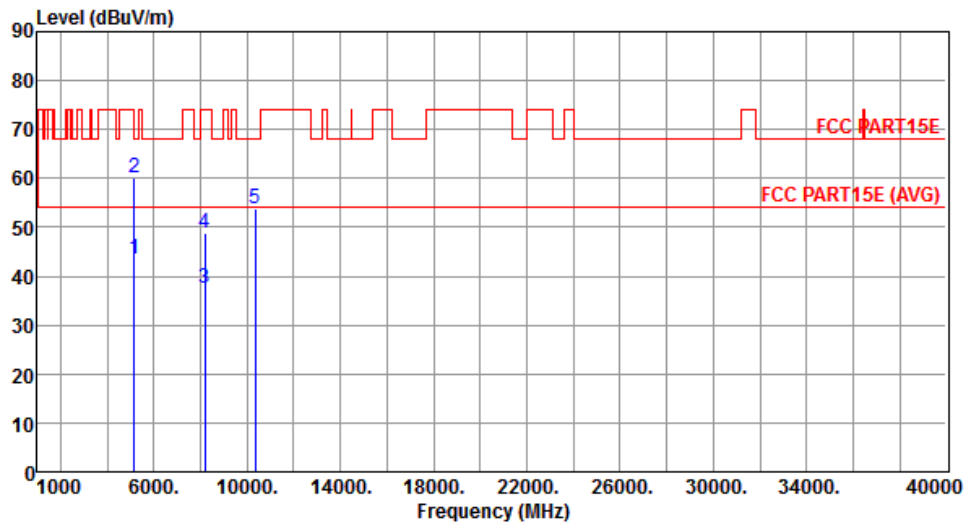
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.26	54.00	-11.74	36.08	6.18	Average	---	---
2	5150.00	54.24	74.00	-19.76	48.06	6.18	Peak	---	---
3	8188.00	36.61	54.00	-17.39	25.09	11.52	Average	---	---
4	8188.00	48.72	74.00	-25.28	37.20	11.52	Peak	---	---
5	10360.00	53.42	68.20	-14.78	36.46	16.96	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).

Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical	Test Configuration	3



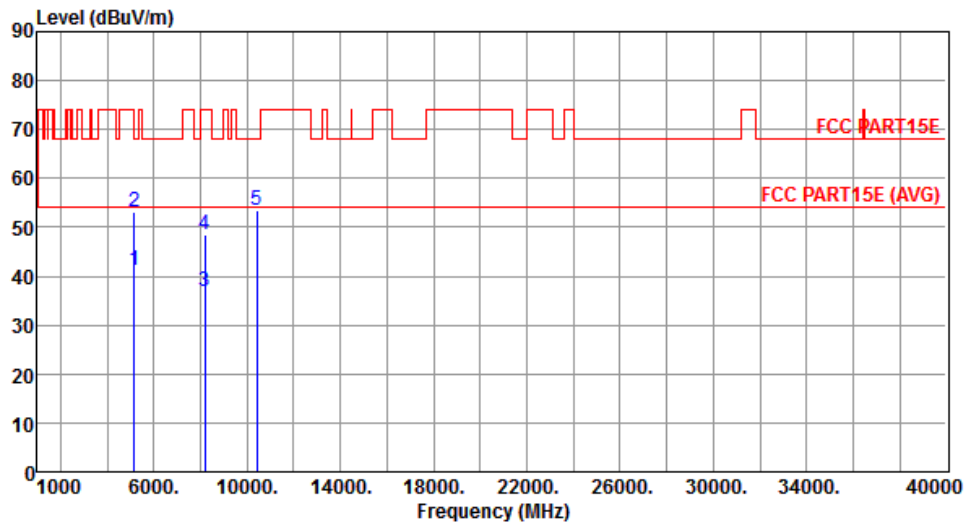
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.58	54.00	-10.42	37.40	6.18	Average	---	---
2	5150.00	60.24	74.00	-13.76	54.06	6.18	Peak	---	---
3	8188.00	37.60	54.00	-16.40	26.08	11.52	Average	---	---
4	8188.00	48.88	74.00	-25.12	37.36	11.52	Peak	---	---
5	10360.00	53.76	68.20	-14.44	36.80	16.96	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).

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Horizontal	Test Configuration	3



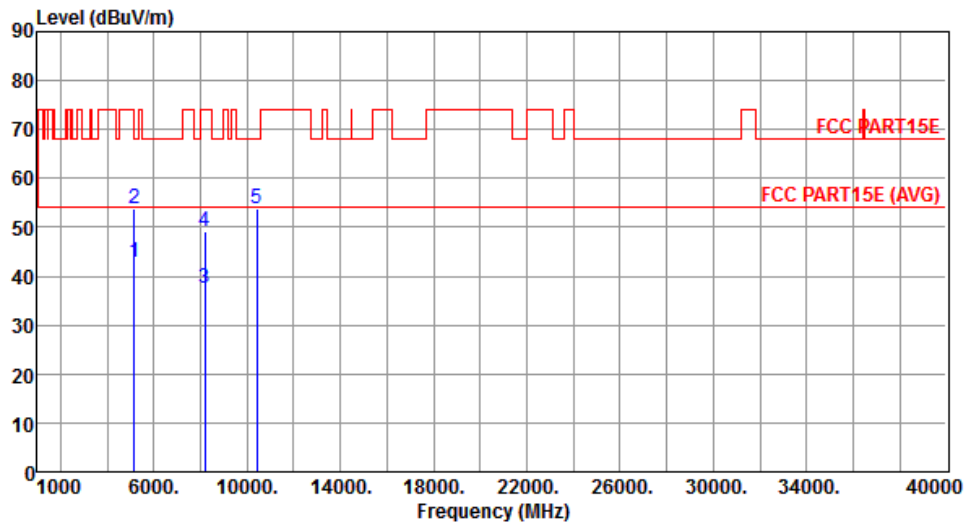
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.32	54.00	-12.68	35.14	6.18	Average	---	---
2	5150.00	53.11	74.00	-20.89	46.93	6.18	Peak	---	---
3	8188.00	36.80	54.00	-17.20	25.28	11.52	Average	---	---
4	8188.00	48.52	74.00	-25.48	37.00	11.52	Peak	---	---
5	10400.00	53.59	68.20	-14.61	36.51	17.08	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).

Modulation	11a	Test Freq. (MHz)	5200
Polarization	Vertical	Test Configuration	3



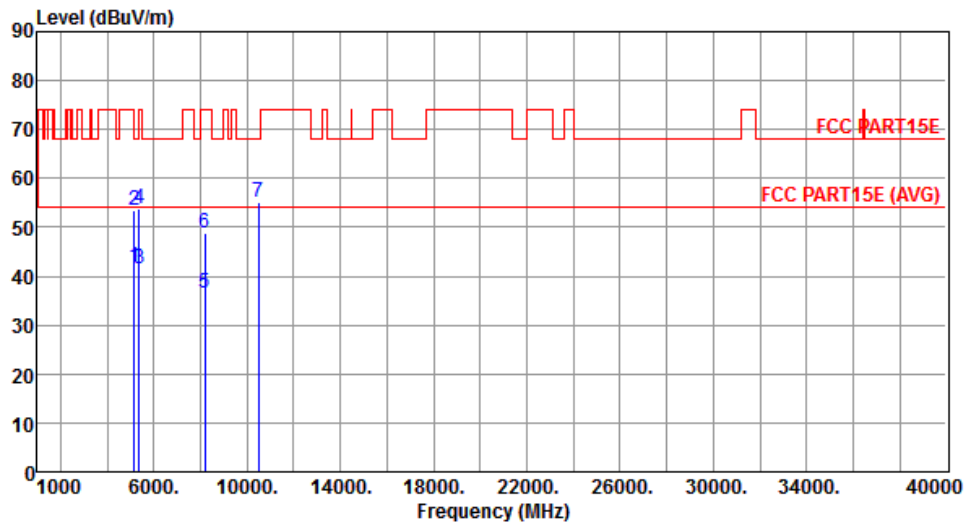
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.70	54.00	-11.30	36.52	6.18	Average	---	---
2	5150.00	53.94	74.00	-20.06	47.76	6.18	Peak	---	---
3	8188.00	37.39	54.00	-16.61	25.87	11.52	Average	---	---
4	8188.00	49.08	74.00	-24.92	37.56	11.52	Peak	---	---
5	10400.00	53.84	68.20	-14.36	36.76	17.08	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).

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Horizontal	Test Configuration	3



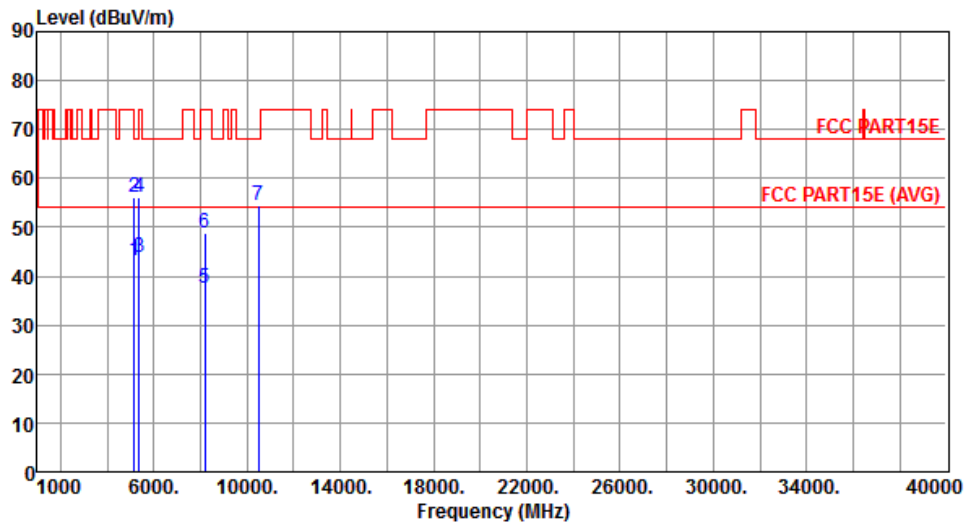
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.76	54.00	-12.24	35.58	6.18	Average	---	---
2	5150.00	53.45	74.00	-20.55	47.27	6.18	Peak	---	---
3	5350.00	41.58	54.00	-12.42	35.07	6.51	Average	---	---
4	5350.00	53.85	74.00	-20.15	47.34	6.51	Peak	---	---
5	8188.00	36.68	54.00	-17.32	25.16	11.52	Average	---	---
6	8188.00	48.86	74.00	-25.14	37.34	11.52	Peak	---	---
7	10480.00	55.01	68.20	-13.19	37.69	17.32	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).

Modulation	11a	Test Freq. (MHz)	5240
Polarization	Vertical	Test Configuration	3



	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	43.10	54.00	-10.90	36.92	6.18	Average	---	---
2	5150.00	56.17	74.00	-17.83	49.99	6.18	Peak	---	---
3	5350.00	43.94	54.00	-10.06	37.43	6.51	Average	---	---
4	5350.00	56.26	74.00	-17.74	49.75	6.51	Peak	---	---
5	8188.00	37.43	54.00	-16.57	25.91	11.52	Average	---	---
6	8188.00	48.68	74.00	-25.32	37.16	11.52	Peak	---	---
7	10480.00	54.62	68.20	-13.58	37.30	17.32	Peak	---	---

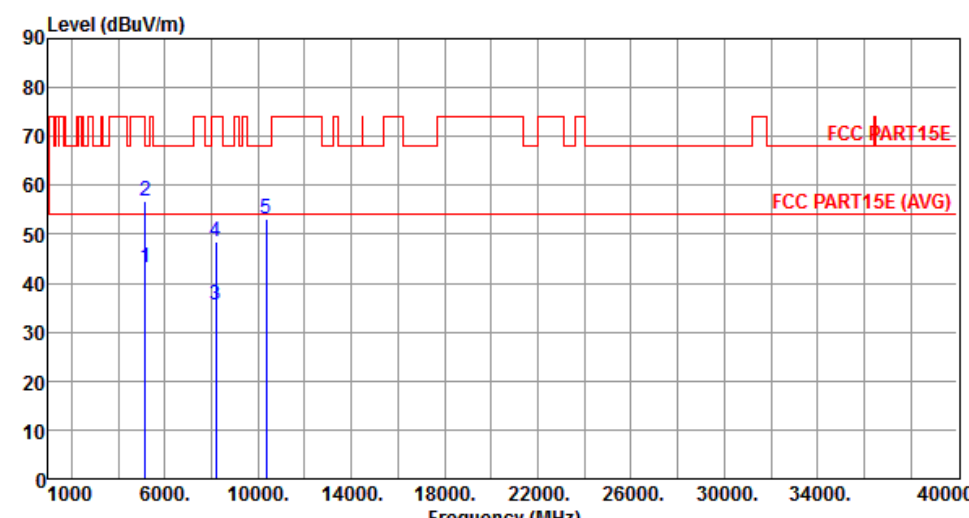
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

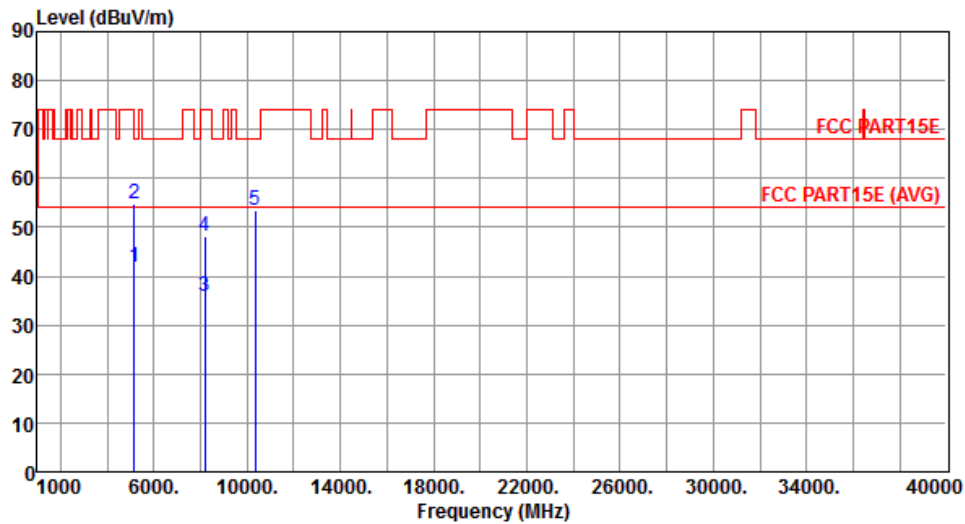
Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Horizontal	Test Configuration	1



	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	43.25	54.00	-10.75	37.07	6.18	Average	---	---
2	5150.00	56.94	74.00	-17.06	50.76	6.18	Peak	---	---
3	8188.00	35.69	54.00	-18.31	24.17	11.52	Average	---	---
4	8188.00	48.53	74.00	-25.47	37.01	11.52	Peak	---	---
5	10360.00	53.10	68.20	-15.10	36.14	16.96	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).

Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Vertical	Test Configuration	1



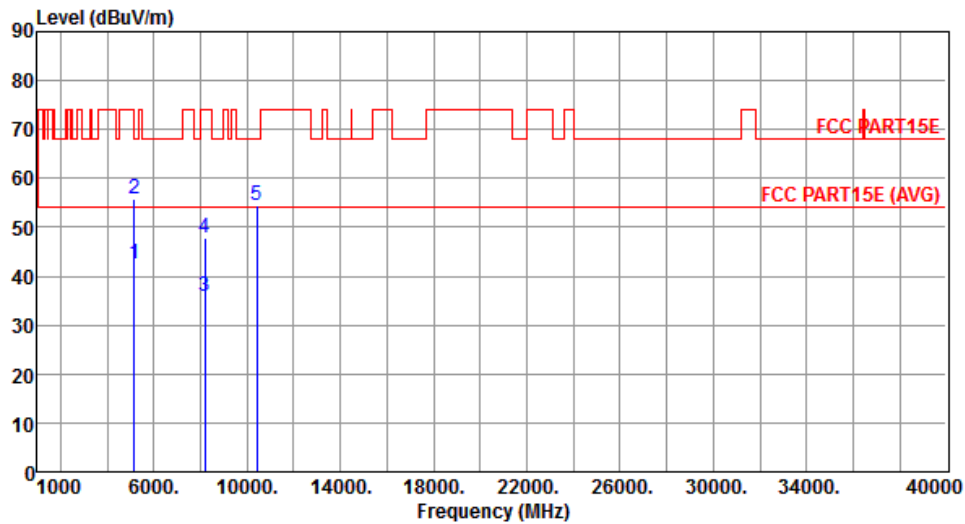
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.98	54.00	-12.02	35.80	6.18	Average	---	---
2	5150.00	54.75	74.00	-19.25	48.57	6.18	Peak	---	---
3	8188.00	36.00	54.00	-18.00	24.48	11.52	Average	---	---
4	8188.00	48.27	74.00	-25.73	36.75	11.52	Peak	---	---
5	10360.00	53.41	68.20	-14.79	36.45	16.96	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).

Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Horizontal	Test Configuration	1



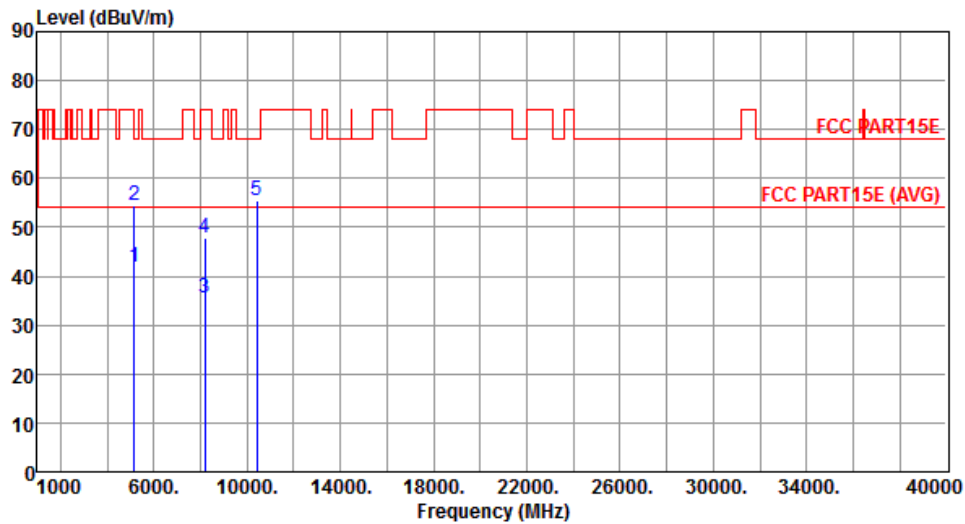
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.64	54.00	-11.36	36.46	6.18	Average	---	---
2	5150.00	55.84	74.00	-18.16	49.66	6.18	Peak	---	---
3	8188.00	35.71	54.00	-18.29	24.19	11.52	Average	---	---
4	8188.00	47.88	74.00	-26.12	36.36	11.52	Peak	---	---
5	10400.00	54.38	68.20	-13.82	37.30	17.08	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).

Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Vertical	Test Configuration	1



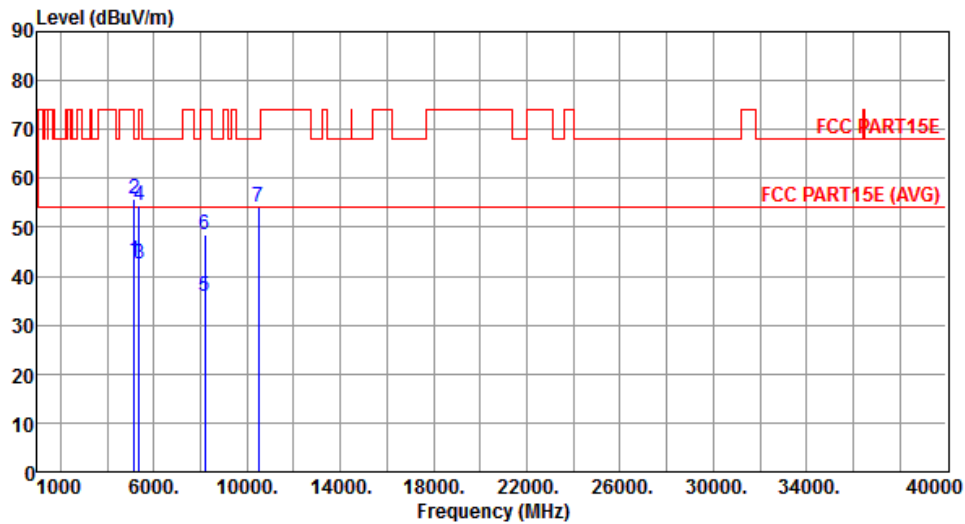
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.00	54.00	-12.00	35.82	6.18	Average	---	---
2	5150.00	54.46	74.00	-19.54	48.28	6.18	Peak	---	---
3	8188.00	35.59	54.00	-18.41	24.07	11.52	Average	---	---
4	8188.00	47.78	74.00	-26.22	36.26	11.52	Peak	---	---
5	10400.00	55.40	68.20	-12.80	38.32	17.08	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).

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Horizontal	Test Configuration	1



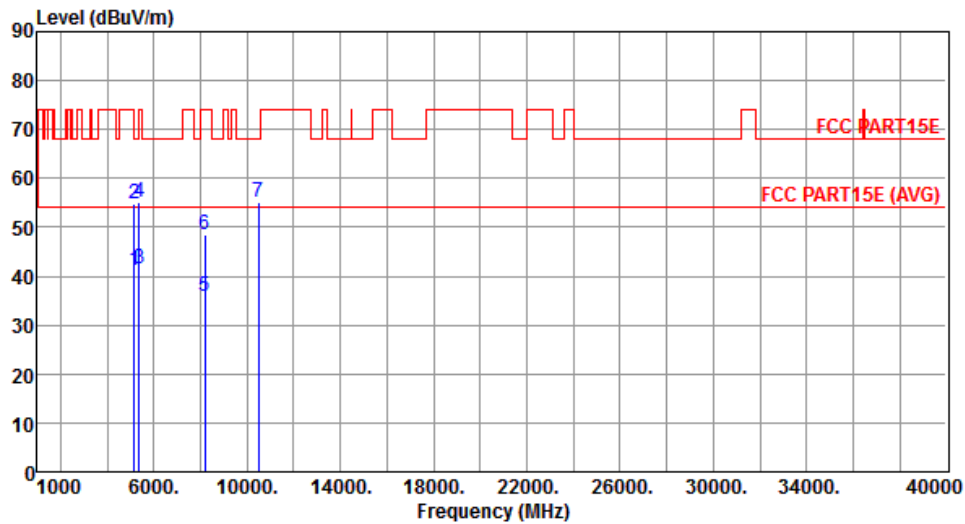
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.15	54.00	-10.85	36.97	6.18	Average	---	---
2	5150.00	55.68	74.00	-18.32	49.50	6.18	Peak	---	---
3	5350.00	42.40	54.00	-11.60	35.89	6.51	Average	---	---
4	5350.00	54.60	74.00	-19.40	48.09	6.51	Peak	---	---
5	8188.00	35.72	54.00	-18.28	24.20	11.52	Average	---	---
6	8188.00	48.51	74.00	-25.49	36.99	11.52	Peak	---	---
7	10480.00	54.14	68.20	-14.06	36.82	17.32	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).

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical	Test Configuration	1



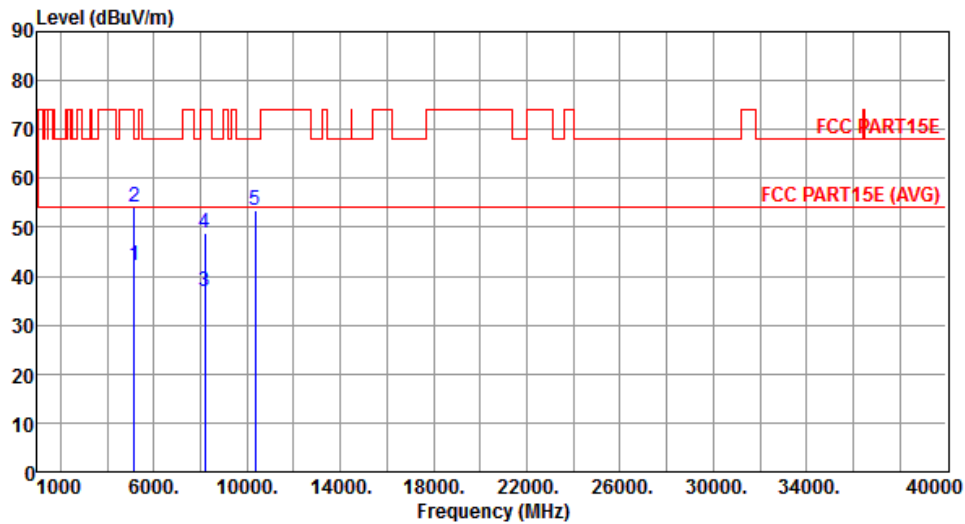
	Freq. MHz	Emission level dBUV/m	Limit dBUV/m	Margin dB	SA reading dBUV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.34	54.00	-12.66	35.16	6.18	Average	---	---
2	5150.00	54.84	74.00	-19.16	48.66	6.18	Peak	---	---
3	5350.00	41.51	54.00	-12.49	35.00	6.51	Average	---	---
4	5350.00	55.17	74.00	-18.83	48.66	6.51	Peak	---	---
5	8188.00	35.90	54.00	-18.10	24.38	11.52	Average	---	---
6	8188.00	48.60	74.00	-25.40	37.08	11.52	Peak	---	---
7	10480.00	55.12	68.20	-13.08	37.80	17.32	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).

Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Horizontal	Test Configuration	3



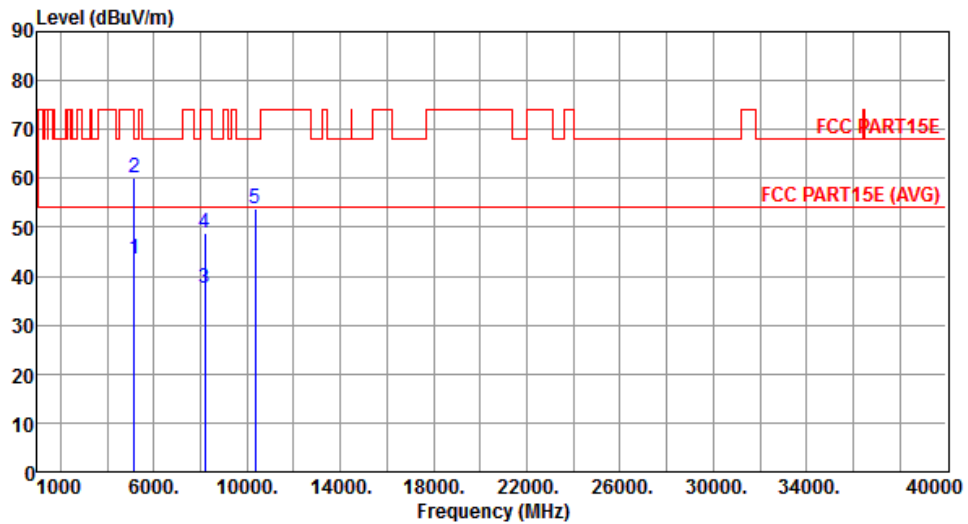
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.05	54.00	-11.95	35.87	6.18	Average	---	---
2	5150.00	54.11	74.00	-19.89	47.93	6.18	Peak	---	---
3	8188.00	36.70	54.00	-17.30	25.18	11.52	Average	---	---
4	8188.00	48.80	74.00	-25.20	37.28	11.52	Peak	---	---
5	10360.00	53.45	68.20	-14.75	36.49	16.96	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).

Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Vertical	Test Configuration	3



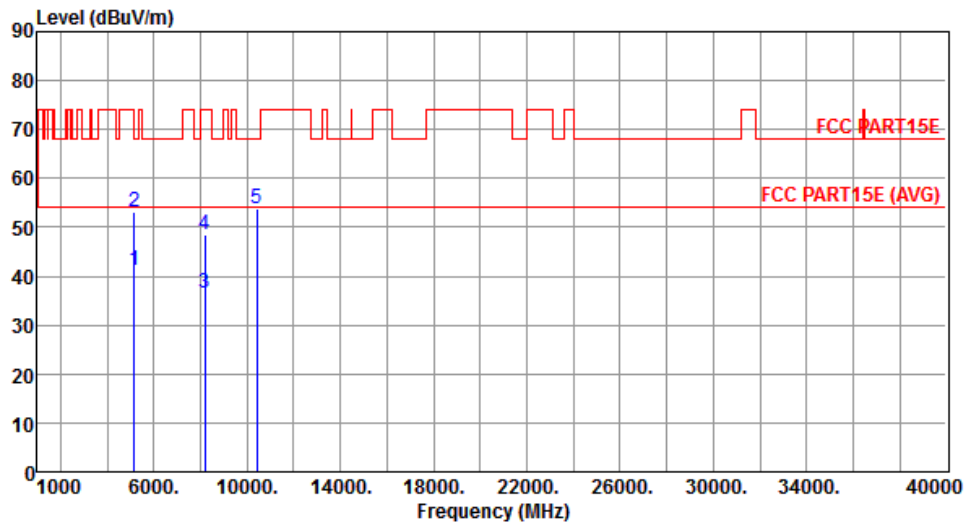
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	43.48	54.00	-10.52	37.30	6.18	Average	---	---
2	5150.00	60.06	74.00	-13.94	53.88	6.18	Peak	---	---
3	8188.00	37.49	54.00	-16.51	25.97	11.52	Average	---	---
4	8188.00	48.77	74.00	-25.23	37.25	11.52	Peak	---	---
5	10360.00	53.95	68.20	-14.25	36.99	16.96	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).

Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Horizontal	Test Configuration	3



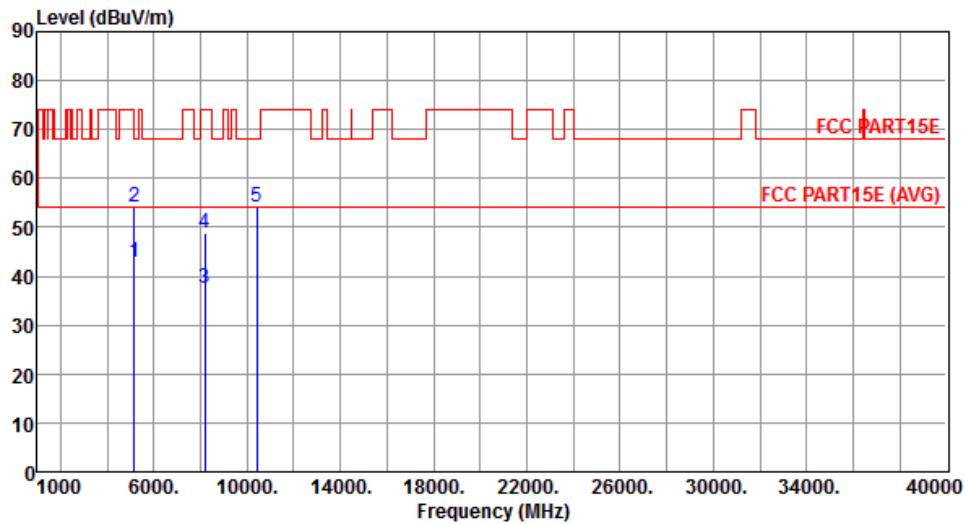
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.17	54.00	-12.83	34.99	6.18	Average	---	---
2	5150.00	53.26	74.00	-20.74	47.08	6.18	Peak	---	---
3	8188.00	36.63	54.00	-17.37	25.11	11.52	Average	---	---
4	8188.00	48.46	74.00	-25.54	36.94	11.52	Peak	---	---
5	10400.00	53.83	68.20	-14.37	36.75	17.08	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).

Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Vertical	Test Configuration	3



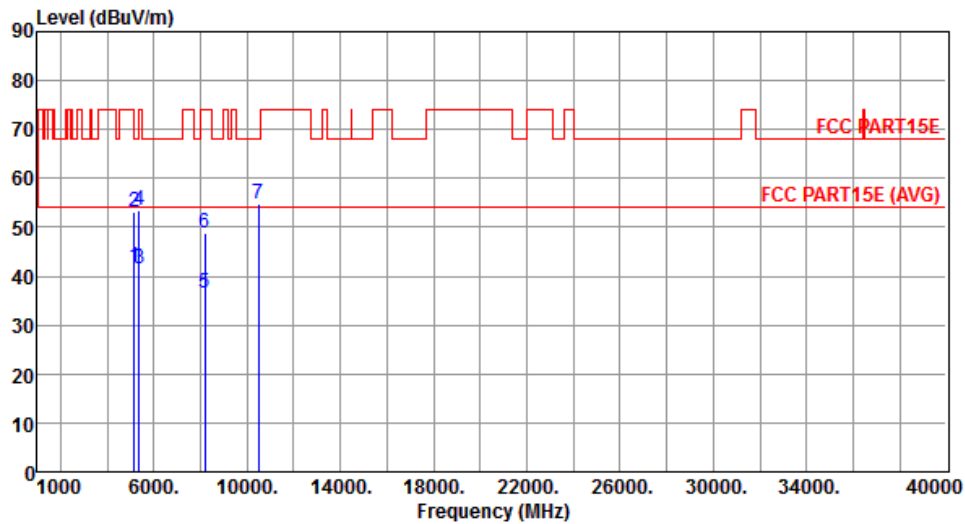
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.91	54.00	-11.09	36.73	6.18	Average	---	---
2	5150.00	54.00	74.00	-20.00	47.82	6.18	Peak	---	---
3	8188.00	37.61	54.00	-16.39	26.09	11.52	Average	---	---
4	8188.00	48.90	74.00	-25.10	37.38	11.52	Peak	---	---
5	10400.00	54.29	68.20	-13.91	37.21	17.08	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).

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Horizontal	Test Configuration	3



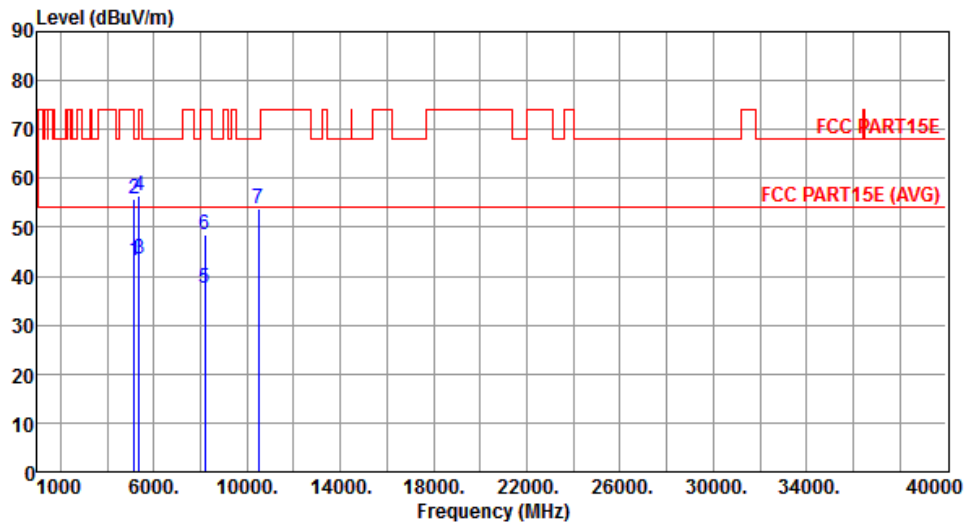
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.87	54.00	-12.13	35.69	6.18	Average	---	---
2	5150.00	53.12	74.00	-20.88	46.94	6.18	Peak	---	---
3	5350.00	41.51	54.00	-12.49	35.00	6.51	Average	---	---
4	5350.00	53.47	74.00	-20.53	46.96	6.51	Peak	---	---
5	8188.00	36.61	54.00	-17.39	25.09	11.52	Average	---	---
6	8188.00	48.81	74.00	-25.19	37.29	11.52	Peak	---	---
7	10480.00	54.90	68.20	-13.30	37.58	17.32	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).

Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical	Test Configuration	3



	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	43.06	54.00	-10.94	36.88	6.18	Average	---	---
2	5150.00	55.90	74.00	-18.10	49.72	6.18	Peak	---	---
3	5350.00	43.44	54.00	-10.56	36.93	6.51	Average	---	---
4	5350.00	56.33	74.00	-17.67	49.82	6.51	Peak	---	---
5	8188.00	37.69	54.00	-16.31	26.17	11.52	Average	---	---
6	8188.00	48.46	74.00	-25.54	36.94	11.52	Peak	---	---
7	10480.00	53.96	68.20	-14.24	36.64	17.32	Peak	---	---

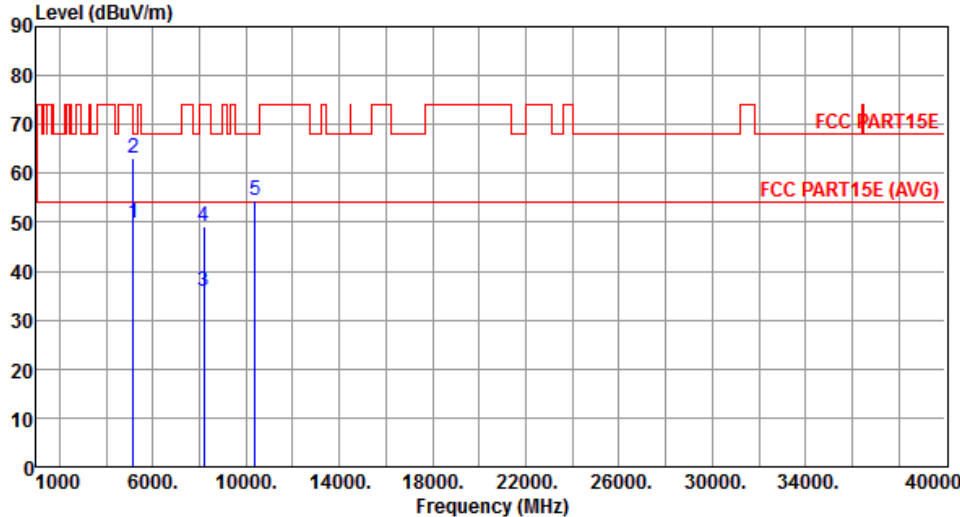
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

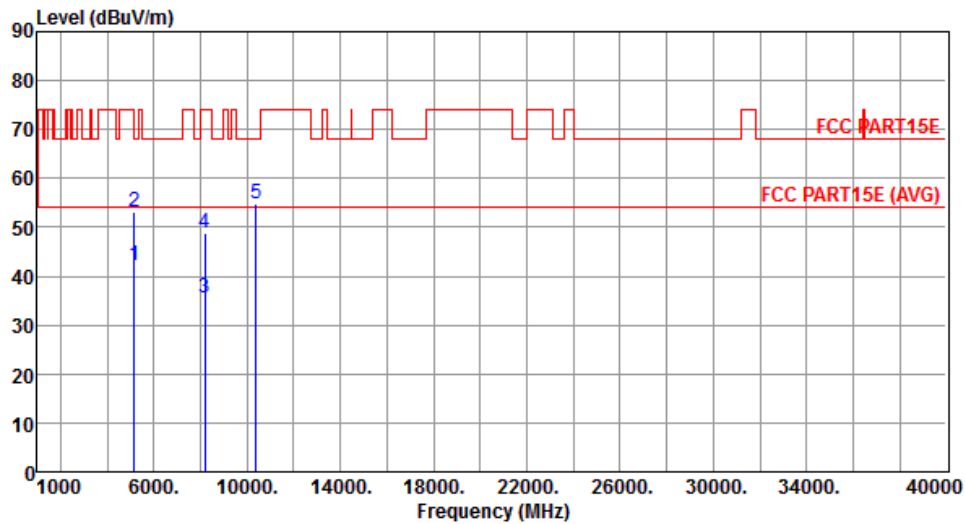
Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Horizontal	Test Configuration	1



	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	49.90	54.00	-4.10	43.72	6.18	Average	---	---
2	5150.00	63.05	74.00	-10.95	56.87	6.18	Peak	---	---
3	8188.00	36.00	54.00	-18.00	24.48	11.52	Average	---	---
4	8188.00	49.28	74.00	-24.72	37.76	11.52	Peak	---	---
5	10380.00	54.54	68.20	-13.66	37.52	17.02	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).

Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Vertical	Test Configuration	1



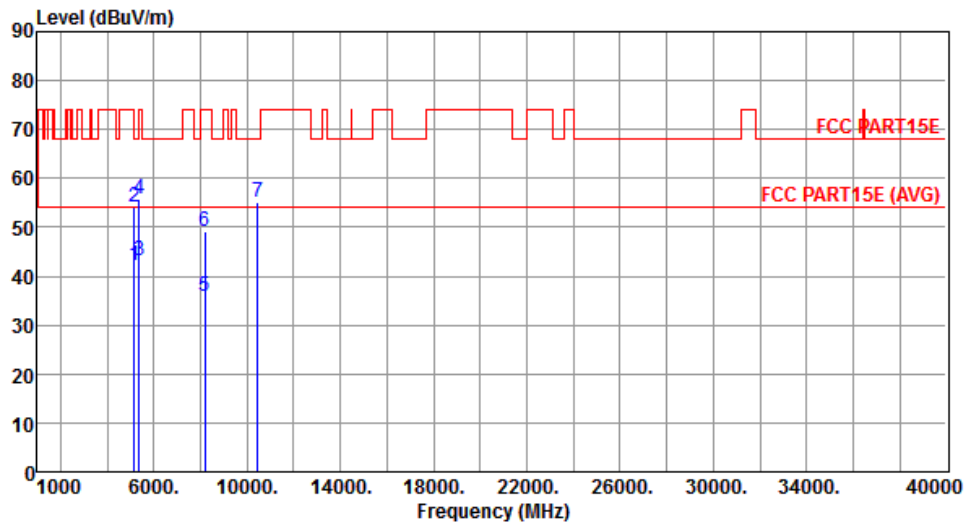
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.30	54.00	-11.70	36.12	6.18	Average	---	---
2	5150.00	53.11	74.00	-20.89	46.93	6.18	Peak	---	---
3	8188.00	35.60	54.00	-18.40	24.08	11.52	Average	---	---
4	8188.00	48.87	74.00	-25.13	37.35	11.52	Peak	---	---
5	10380.00	54.67	68.20	-13.53	37.65	17.02	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).

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	1



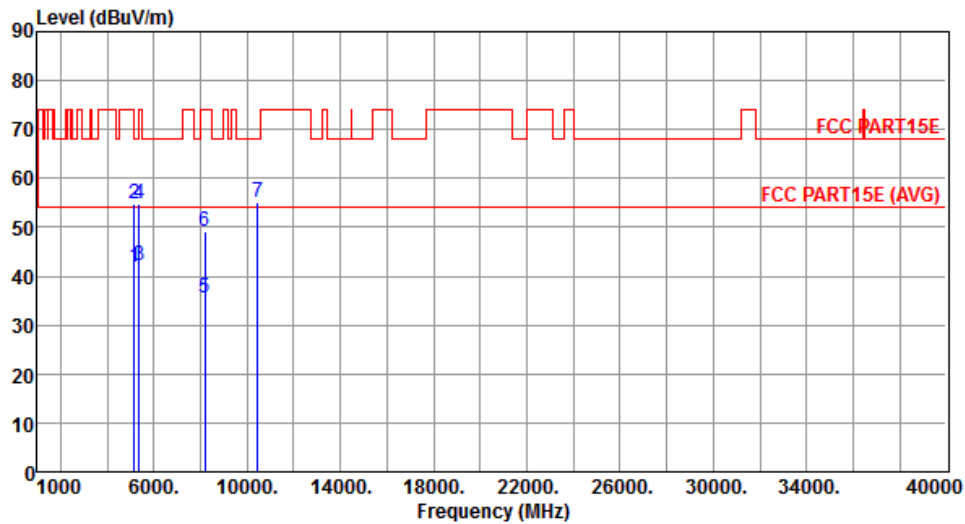
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.31	54.00	-11.69	36.13	6.18	Average	---	---
2	5150.00	54.08	74.00	-19.92	47.90	6.18	Peak	---	---
3	5350.00	43.26	54.00	-10.74	36.75	6.51	Average	---	---
4	5350.00	55.69	74.00	-18.31	49.18	6.51	Peak	---	---
5	8188.00	36.00	54.00	-18.00	24.48	11.52	Average	---	---
6	8188.00	49.08	74.00	-24.92	37.56	11.52	Peak	---	---
7	10460.00	55.05	68.20	-13.15	37.79	17.26	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).

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	1



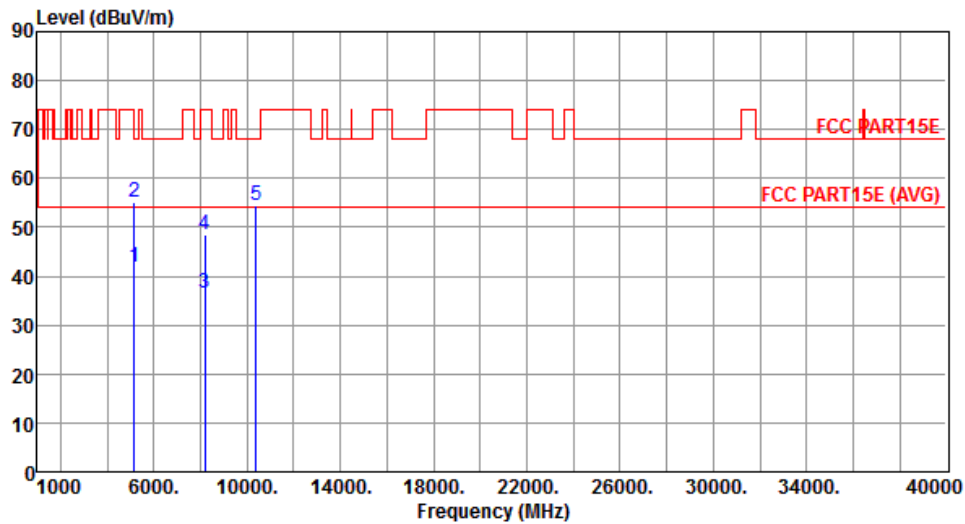
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.98	54.00	-12.02	35.80	6.18	Average	---	---
2	5150.00	54.65	74.00	-19.35	48.47	6.18	Peak	---	---
3	5350.00	42.19	54.00	-11.81	35.68	6.51	Average	---	---
4	5350.00	54.76	74.00	-19.24	48.25	6.51	Peak	---	---
5	8188.00	35.67	54.00	-18.33	24.15	11.52	Average	---	---
6	8188.00	49.10	74.00	-24.90	37.58	11.52	Peak	---	---
7	10460.00	55.07	68.20	-13.13	37.81	17.26	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).

Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Horizontal	Test Configuration	3



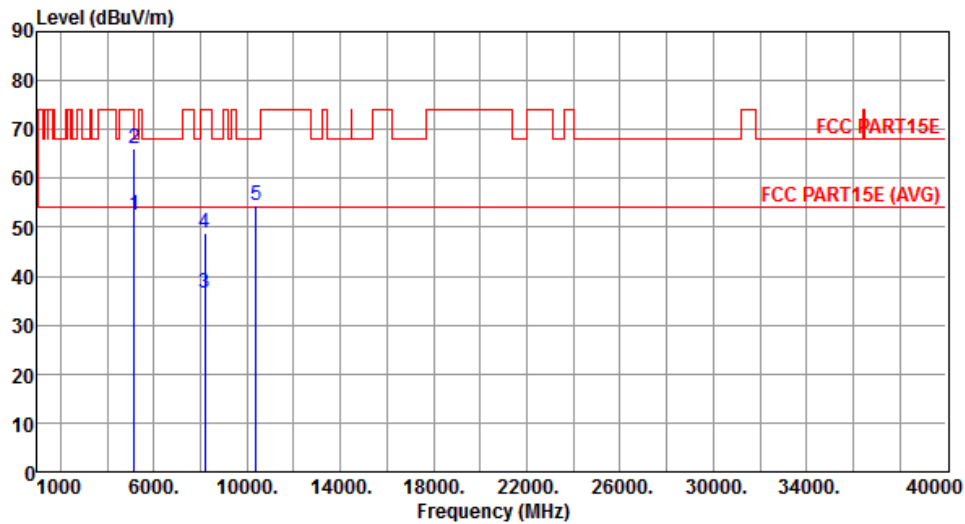
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.95	54.00	-12.05	35.77	6.18	Average	---	---
2	5150.00	55.28	74.00	-18.72	49.10	6.18	Peak	---	---
3	8188.00	36.57	54.00	-17.43	25.05	11.52	Average	---	---
4	8188.00	48.52	74.00	-25.48	37.00	11.52	Peak	---	---
5	10380.00	54.50	68.20	-13.70	37.48	17.02	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).

Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Vertical	Test Configuration	3



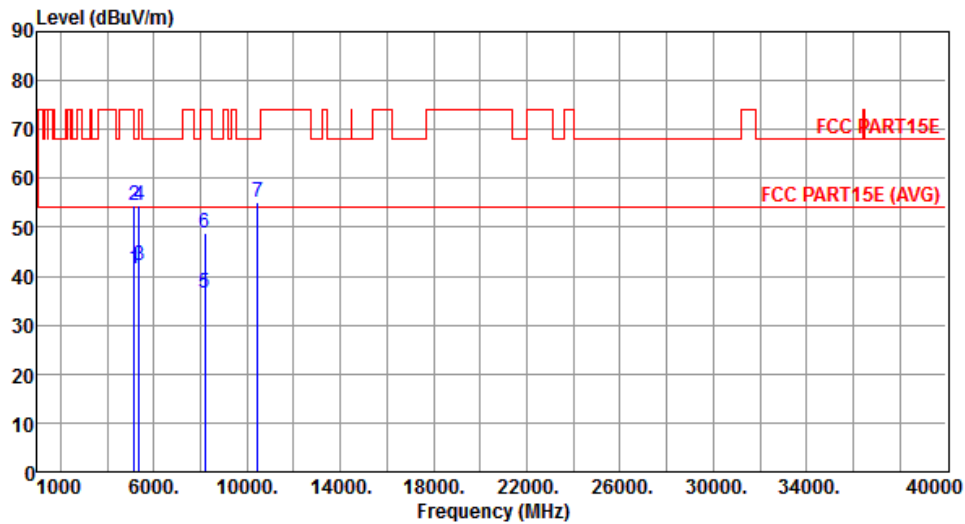
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	52.58	54.00	-1.42	46.40	6.18	Average	---	---
2	5150.00	66.20	74.00	-7.80	60.02	6.18	Peak	---	---
3	8188.00	36.69	54.00	-17.31	25.17	11.52	Average	---	---
4	8188.00	48.87	74.00	-25.13	37.35	11.52	Peak	---	---
5	10380.00	54.63	68.20	-13.57	37.61	17.02	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).

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal	Test Configuration	3



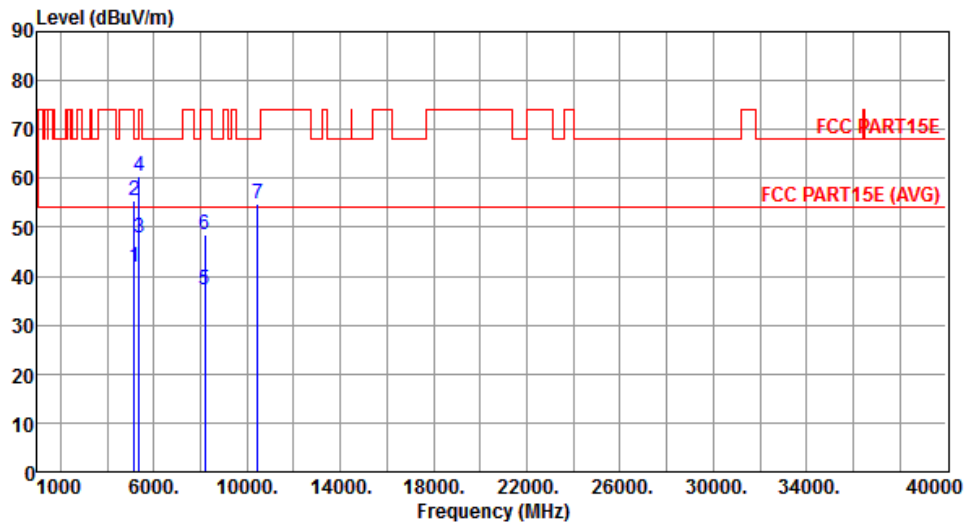
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	41.37	54.00	-12.63	35.19	6.18	Average	---	---
2	5150.00	54.62	74.00	-19.38	48.44	6.18	Peak	---	---
3	5350.00	42.08	54.00	-11.92	35.57	6.51	Average	---	---
4	5350.00	54.31	74.00	-19.69	47.80	6.51	Peak	---	---
5	8188.00	36.45	54.00	-17.55	24.93	11.52	Average	---	---
6	8188.00	48.72	74.00	-25.28	37.20	11.52	Peak	---	---
7	10460.00	55.16	68.20	-13.04	37.90	17.26	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).

Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical	Test Configuration	3



	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	41.80	54.00	-12.20	35.62	6.18	Average	---	---
2	5150.00	55.31	74.00	-18.69	49.13	6.18	Peak	---	---
3	5350.00	47.92	54.00	-6.08	41.41	6.51	Average	---	---
4	5350.00	60.33	74.00	-13.67	53.82	6.51	Peak	---	---
5	8188.00	37.35	54.00	-16.65	25.83	11.52	Average	---	---
6	8188.00	48.63	74.00	-25.37	37.11	11.52	Peak	---	---
7	10460.00	54.89	68.20	-13.31	37.63	17.26	Peak	---	---

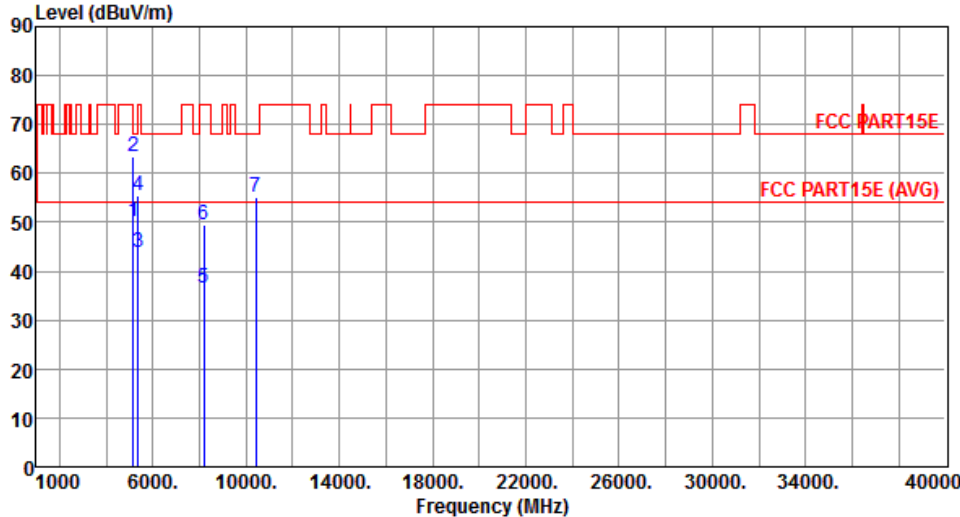
Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)

*Factor includes antenna factor , cable loss and amplifier gain

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

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

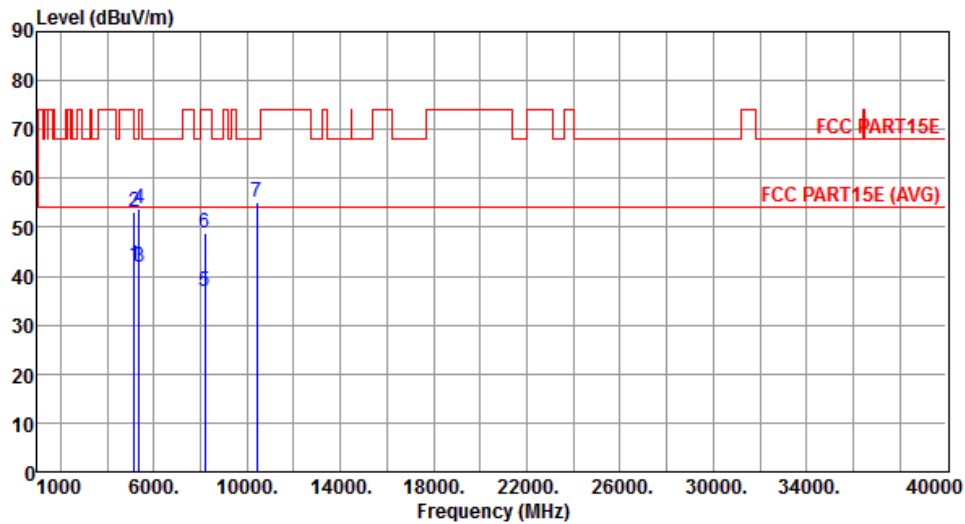
Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Horizontal	Test Configuration	1



	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	50.15	54.00	-3.85	43.97	6.18	Average	---	---
2	5150.00	63.28	74.00	-10.72	57.10	6.18	Peak	---	---
3	5350.00	43.94	54.00	-10.06	37.43	6.51	Average	---	---
4	5350.00	55.58	74.00	-18.42	49.07	6.51	Peak	---	---
5	8188.00	36.50	54.00	-17.50	24.98	11.52	Average	---	---
6	8188.00	49.45	74.00	-24.55	37.93	11.52	Peak	---	---
7	10420.00	55.19	68.20	-13.01	38.06	17.13	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).

Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Vertical	Test Configuration	1



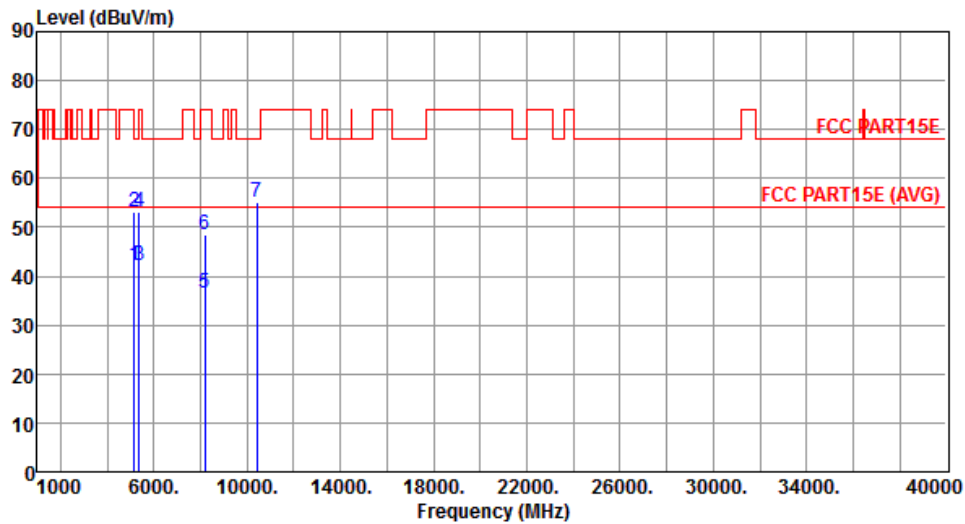
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.34	54.00	-11.66	36.16	6.18	Average	---	---
2	5150.00	53.30	74.00	-20.70	47.12	6.18	Peak	---	---
3	5350.00	41.97	54.00	-12.03	35.46	6.51	Average	---	---
4	5350.00	53.64	74.00	-20.36	47.13	6.51	Peak	---	---
5	8188.00	37.00	54.00	-17.00	25.48	11.52	Average	---	---
6	8188.00	48.88	74.00	-25.12	37.36	11.52	Peak	---	---
7	10420.00	55.11	68.20	-13.09	37.98	17.13	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).

Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Horizontal	Test Configuration	3



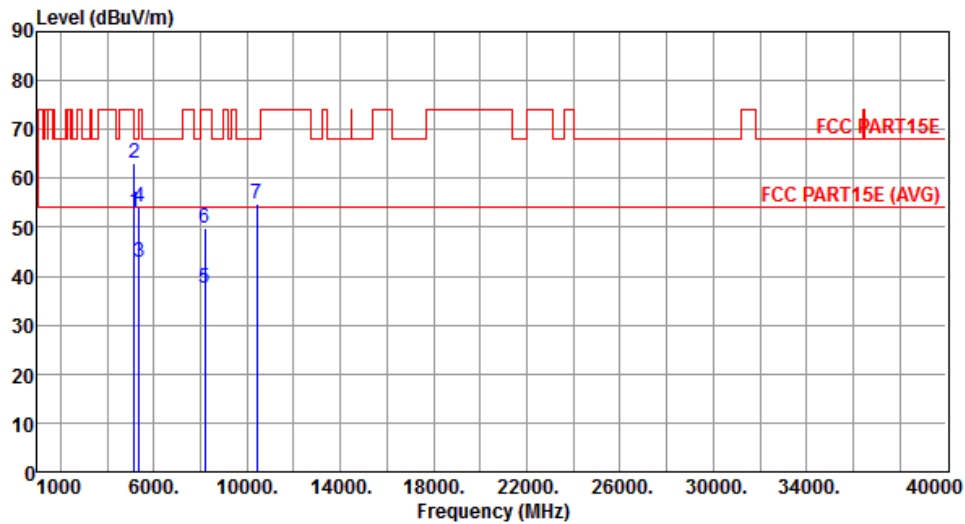
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	42.14	54.00	-11.86	35.96	6.18	Average	---	---
2	5150.00	53.11	74.00	-20.89	46.93	6.18	Peak	---	---
3	5350.00	42.12	54.00	-11.88	35.61	6.51	Average	---	---
4	5350.00	53.22	74.00	-20.78	46.71	6.51	Peak	---	---
5	8188.00	36.67	54.00	-17.33	25.15	11.52	Average	---	---
6	8188.00	48.57	74.00	-25.43	37.05	11.52	Peak	---	---
7	10420.00	54.97	68.20	-13.23	37.84	17.13	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).

Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Vertical	Test Configuration	3



	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	53.27	54.00	-0.73	47.09	6.18	Average	---	---
2	5150.00	63.21	74.00	-10.79	57.03	6.18	Peak	---	---
3	5350.00	42.94	54.00	-11.06	36.43	6.51	Average	---	---
4	5350.00	54.22	74.00	-19.78	47.71	6.51	Peak	---	---
5	8188.00	37.57	54.00	-16.43	26.05	11.52	Average	---	---
6	8188.00	49.68	74.00	-24.32	38.16	11.52	Peak	---	---
7	10420.00	54.91	68.20	-13.29	37.78	17.13	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).

3.7 Frequency Stability

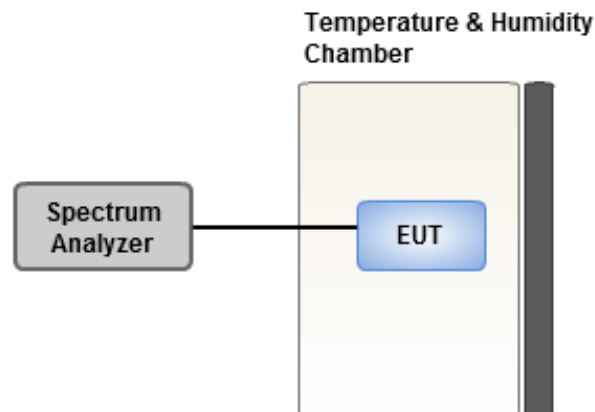
3.7.1 Limit of Frequency Stability

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.

3.7.2 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.

3.7.3 Test Setup



3.7.4 Test Result of Frequency Stability

Frequency: 5200 MHz	Frequency Drift (ppm)			
Temperature (°C)	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	2.13	2.21	2.71	2.21
T20°C Vmin	2.83	3.47	3.28	2.67
T50°C Vnom	4.57	4.00	4.39	4.20
T40°C Vnom	4.08	2.95	3.58	3.59
T30°C Vnom	2.98	3.33	3.37	2.96
T20°C Vnom	2.82	3.03	2.97	3.21
T10°C Vnom	2.21	2.68	2.93	2.41
T0°C Vnom	1.96	1.75	2.59	2.28
T-10°C Vnom	2.04	1.33	1.26	1.31
T-20°C Vnom	0.78	0.60	0.57	0.23
T-30°C Vnom	0.32	0.23	0.46	-0.05
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, 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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If you have any suggestion, please feel free to contact us as below information

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Email: ICC_Service@icertifi.com.tw

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