FCC Test Report

FCC ID	:	**Q6G-MS5AE5W**
Product Name	:	**Security Network Appliance T55-W**
Model No.	:	**MS5AE5W**
Brand Name	:	**WatchGuard**
Applicant	:	**WatchGuard Technologies, Inc.**
Address	:	**505 5th Ave S. Suite 500, Seattle, WA 98104 USA**
Standard	:	**47 CFR FCC Part 15.407**
Received Date	:	**Jul. 07, 2017**
Tested Date	:	**Jul. 20 ~ Aug. 09, 2017**

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.

Reviewed by:

Along Chen / Assistant Manager

Approved by:

Gary Chang / Manager

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR770703AN	Rev. 01	Initial issue	Aug. 29, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.467MHz 43.85 (Margin -2.72dB) - AV	Pass
15.407(b) 15.209	Radiated Emissions	[dBuV/m at 3m]: 5150.00MHz 53.17 (Margin -0.83dB) - 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: 25.04 5725-5850MHz: 24.26	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 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]	3	6-54 Mbps
5150-5250	n (HT20)	5180-5240	36-48 [4]	3	MCS 0-23
5150-5250	n (HT40)	5190-5230	38-46 [2]	3	MCS 0-23
5150-5250	ac (VHT20)	5180-5240	36-48 [4]	3	MCS 0-9
5150-5250	ac (VHT40)	5190-5230	38-46 [2]	3	MCS 0-9
5150-5250	ac (VHT80)	5210	42 [1]	3	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.					

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]	3	6-54 Mbps
5725-5850	n (HT20)	5745-5825	149-165 [5]	3	MCS 0-23
5725-5850	n (HT40)	5755-5795	151-159 [2]	3	MCS 0-23
5725-5850	ac (VHT20)	5745-5825	149-165 [5]	3	MCS 0-9
5725-5850	ac (VHT40)	5755-5795	151-159 [2]	3	MCS 0-9
5725-5850	ac (VHT80)	5775	155 [1]	3	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.					

1.1.2 Antenna Details

Ant. No.	Model	Type	Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)		
				2400~2483.5	5150~5250	5725~5850
1	ANT 1	dipole	IPEX	4.22	4.21	4.21
2	ANT 2	dipole	IPEX	5.1	5.96	5.96
3	ANT 3	dipole	IPEX	4.95	4.99	4.99

Note: The antennas with highest gain of each type were selected for final testing in this test report.

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	54Vdc from AC adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC adapter	Brand: Senao Model: EAA65A-54 Power Rating: I/P: 100-240Vac, 50/60Hz, 1.8A O/P: 54Vdc, 1.2A Power Line: 1.5m non-shielded with one core
2	RJ45 cable	1.5m non-shielded without core
3	Power cord	1.85m non-shielded without core

1.1.5 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	VHT80	
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	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	QRCT, version: 3.0.187.0		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11a	95.53%	0.20
	VHT20	95.24%	0.21
	VHT40	89.19%	0.50
	VHT80	79.92%	0.97

1.1.7 Power Setting

For Frequency band 5150-5250 MHz		
Modulation Mode	**Test Frequency (MHz)**	**Power Set**
11a	5180	16.00
11a	5200	19.00
11a	5240	19.00
HT20	5180	16.00
HT20	5200	19.00
HT20	5240	19.00
HT40	5190	11.50
HT40	5230	21.00
VHT20	5180	16.00
VHT20	5200	19.00
VHT20	5240	19.00
VHT40	5190	11.50
VHT40	5230	21.00
VHT80	5210	9.00

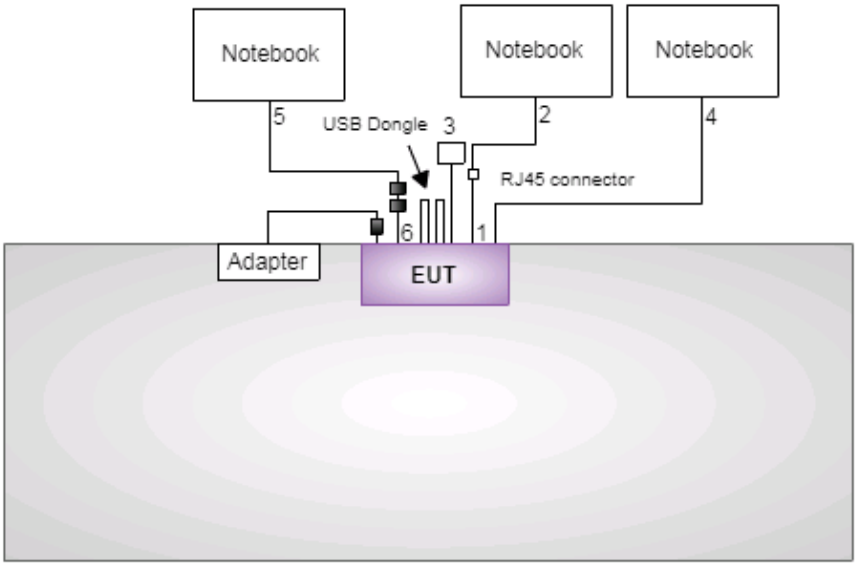
For Frequency band 5725~5850 MHz		
Modulation Mode	**Test Frequency (MHz)**	**Power Set**
11a	5745	20.00
11a	5785	20.00
11a	5825	20.00
HT20	5745	20.00
HT20	5785	20.00
HT20	5825	20.00
HT40	5755	20.00
HT40	5795	20.00
VHT20	5745	20.00
VHT20	5785	20.00
VHT20	5825	20.00
VHT40	5755	20.00
VHT40	5795	20.00
VHT80	5775	20.00

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	DoC	USB to RS232, 1.5m shielded
2	Notebook	DELL	Latitude E5420	DoC	RJ45, 10m non-shielded.
3	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.
4	USB Dongle x2	Gigastone	U211	---	---

1.3 Test Setup Chart

Test Setup Diagram



1. RJ45,1.5m non-shielded
2. RJ45, 10m non-shielded
3. RJ45, 1m non-shielded (x3) with load
4. RJ45, 10m non-shielded
5. USB to RS232, 1.5m shielded
6. LAN to RS232, 1.5m shielded with two cores

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**
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
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 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Nov. 25, 2016	Nov. 24, 2017
Receiver	R&S	ESR3	101658	Nov. 24, 2016	Nov. 23, 2017
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-524	Oct. 13, 2016	Oct. 12, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Dec. 21, 2016	Dec. 20, 2017
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980146	Oct. 08, 2016	Oct. 07, 2017
Preamplifier	Agilent	83017A	MY39501308	Oct. 06, 2016	Oct. 05, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 09, 2016	Dec. 08, 2017
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 09, 2016	Dec. 08, 2017
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	16052	Dec. 09, 2016	Dec. 08, 2017
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Dec. 09, 2016	Dec. 08, 2017
LF cable 10M	Woken	CFD400NL-LW	CFD400NL-002	Dec. 09, 2016	Dec. 08, 2017
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	Mar. 15, 2017	Mar. 14, 2018
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 21, 2016	Nov. 20, 2017
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
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 v01r04
FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
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 ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.63 dB
Time	±0.1%
Temperature	±0.6 ^{o}C

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	24°C / 56%	Alex Huang
Radiated Emissions	03CH01-WS	24°C / 61-62%	Aska Huang Vincent Yeh
RF Conducted	TH01-WS	21°C / 64%	Felix Sung

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- IC site registration No.: 10807A-1

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 ≤1GHz	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 >1GHz 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	---	---

For Frequency band 5725-5850 MHz				
Test item	**Modulation Mode**	**Test Frequency (MHz)**	**Data Rate (Mbps) / MCS**	**Test Configuration**
Conducted Emissions	VHT40	5755	MCS 0	---
Radiated Emissions ≤1GHz	VHT40	5755	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 >1GHz 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	---	---

3 Transmitter Test Results

3.1 Conducted Emissions

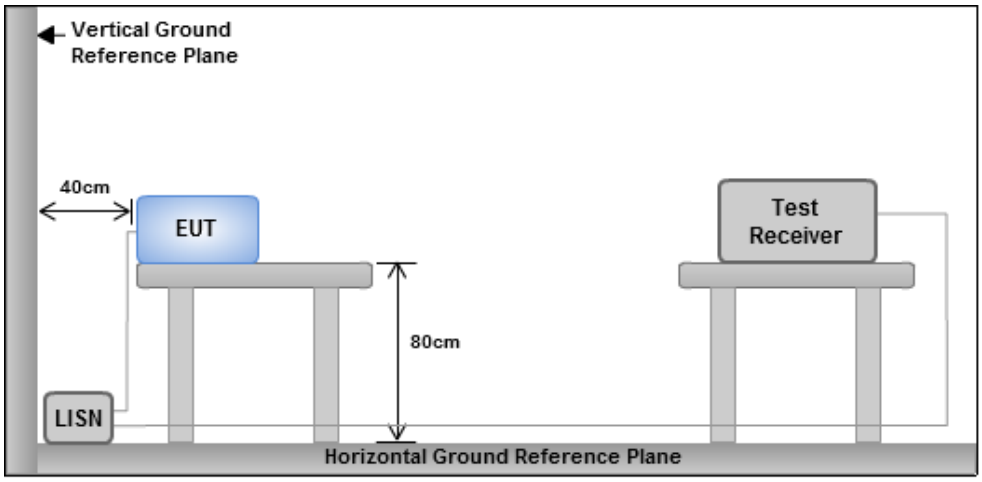
3.1.1 Limit of Conducted Emissions

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.

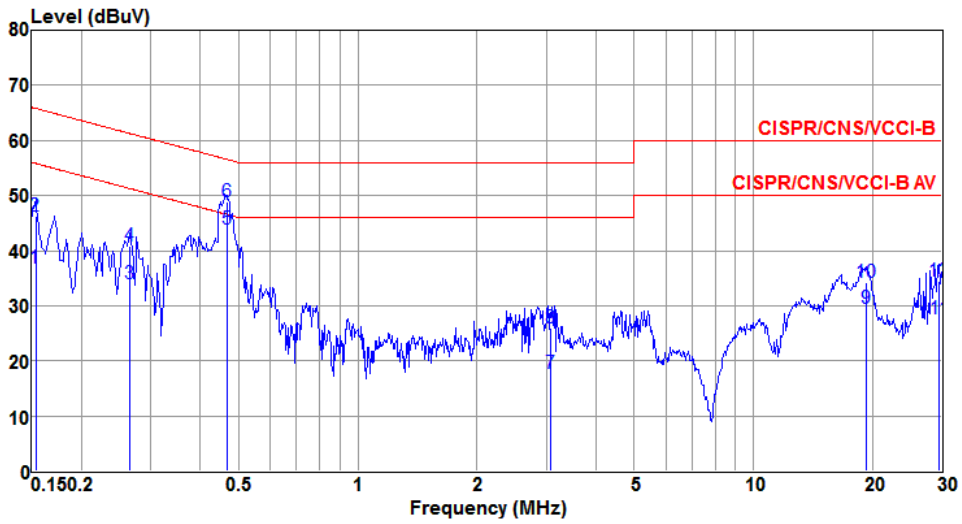
3.1.3 Test Setup



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

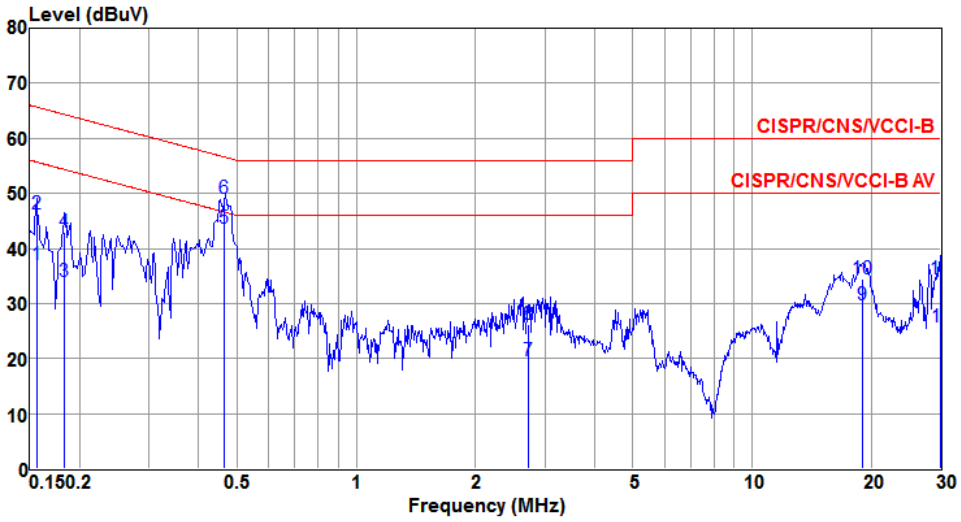
Modulation	VHT20	Test Freq. (MHz)	5240
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.153	36.80	55.82	-19.02	36.69	0.07	0.04	Average
2	0.153	46.30	65.82	-19.52	46.19	0.07	0.04	QP
3	0.264	33.89	51.29	-17.40	33.77	0.08	0.04	Average
4	0.264	40.89	61.29	-20.40	40.77	0.08	0.04	QP
5@	0.467	43.85	46.57	-2.72	43.75	0.06	0.04	Average
6	0.467	48.89	56.57	-7.68	48.79	0.06	0.04	QP
7	3.071	17.68	46.00	-28.32	17.42	0.15	0.11	Average
8	3.071	25.89	56.00	-30.11	25.63	0.15	0.11	QP
9	19.281	29.47	50.00	-20.53	28.82	0.39	0.26	Average
10	19.281	34.11	60.00	-25.89	33.46	0.39	0.26	QP
11	29.573	27.52	50.00	-22.48	26.73	0.45	0.34	Average
12	29.573	34.57	60.00	-25.43	33.78	0.45	0.34	QP

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

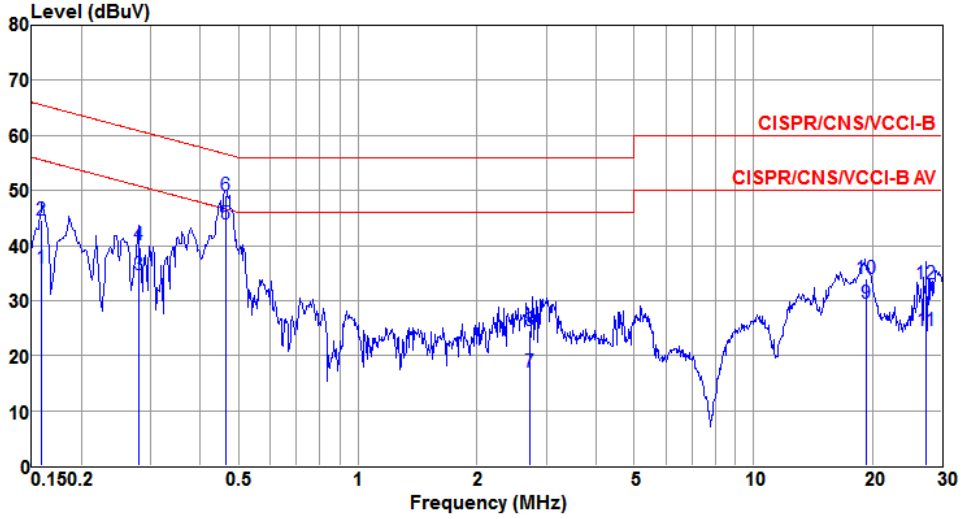
Modulation	VHT20	Test Freq. (MHz)	5240
Power Phase	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	37.08	55.69	-18.61	36.94	0.10	0.04	Average
2	0.156	46.17	65.69	-19.52	46.03	0.10	0.04	QP
3	0.183	33.90	54.33	-20.43	33.77	0.09	0.04	Average
4	0.183	42.84	64.33	-21.49	42.71	0.09	0.04	QP
5@	0.464	43.60	46.63	-3.03	43.44	0.12	0.04	Average
6	0.464	49.17	56.63	-7.46	49.01	0.12	0.04	QP
7	2.723	19.55	46.00	-26.45	19.31	0.15	0.09	Average
8	2.723	26.22	56.00	-29.78	25.98	0.15	0.09	QP
9	18.991	29.71	50.00	-20.29	29.06	0.40	0.25	Average
10	18.991	34.42	60.00	-25.58	33.77	0.40	0.25	QP
11	29.932	25.81	50.00	-24.19	24.97	0.49	0.35	Average
12	29.932	34.36	60.00	-25.64	33.52	0.49	0.35	QP

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

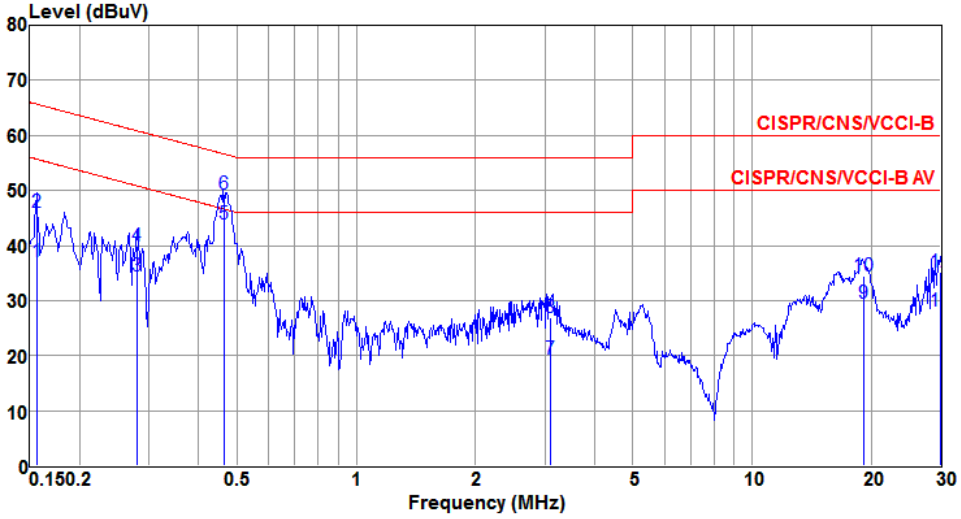
Modulation	VHT40	Test Freq. (MHz)	5755
Power Phase	Line		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	35.80	55.52	-19.72	35.68	0.08	0.04	Average
2	0.159	44.71	65.52	-20.81	44.59	0.08	0.04	QP
3	0.279	34.68	50.85	-16.17	34.56	0.08	0.04	Average
4	0.279	40.09	60.85	-20.76	39.97	0.08	0.04	QP
5@	0.465	43.80	46.60	-2.80	43.70	0.06	0.04	Average
6	0.465	49.07	56.60	-7.53	48.97	0.06	0.04	QP
7	2.721	16.91	46.00	-29.09	16.67	0.15	0.09	Average
8	2.721	24.62	56.00	-31.38	24.38	0.15	0.09	QP
9	19.320	29.42	50.00	-20.58	28.77	0.39	0.26	Average
10	19.320	34.03	60.00	-25.97	33.38	0.39	0.26	QP
11	27.338	24.62	50.00	-25.38	23.86	0.44	0.32	Average
12	27.338	33.00	60.00	-27.00	32.24	0.44	0.32	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)	5755
Power Phase	Neutral		



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.156	37.03	55.69	-18.66	36.89	0.10	0.04	Average
2	0.156	46.11	65.69	-19.58	45.97	0.10	0.04	QP
3	0.279	34.43	50.85	-16.42	34.28	0.11	0.04	Average
4	0.279	39.92	60.85	-20.93	39.77	0.11	0.04	QP
5@	0.465	43.88	46.61	-2.73	43.72	0.12	0.04	Average
6	0.465	49.24	56.61	-7.37	49.08	0.12	0.04	QP
7	3.096	19.41	46.00	-26.59	19.14	0.15	0.12	Average
8	3.096	26.82	56.00	-29.18	26.55	0.15	0.12	QP
9	19.109	29.62	50.00	-20.38	28.97	0.40	0.25	Average
10	19.109	34.57	60.00	-25.43	33.92	0.40	0.25	QP
11	29.837	28.01	50.00	-21.99	27.17	0.49	0.35	Average
12	29.837	35.26	60.00	-24.74	34.42	0.49	0.35	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.

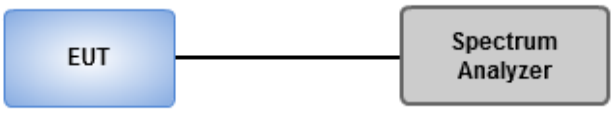
Occupied Bandwidth

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

6dB Bandwidth

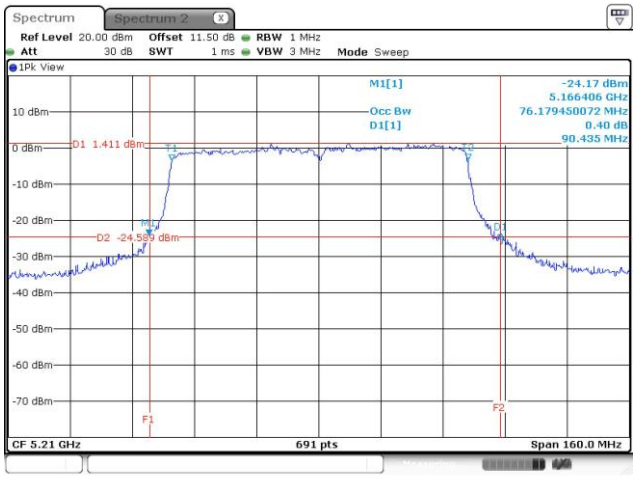
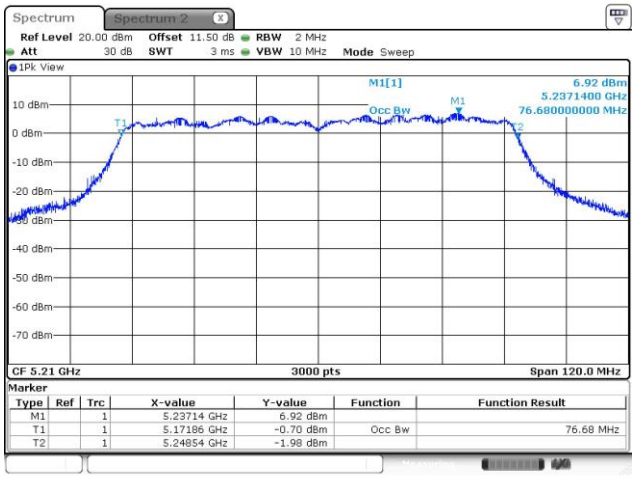
1. Set RBW = 100kHz, VBW = 300kHz
2. Detector = Peak,Trace mode = max hold.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB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

3.2.3 Test Setup

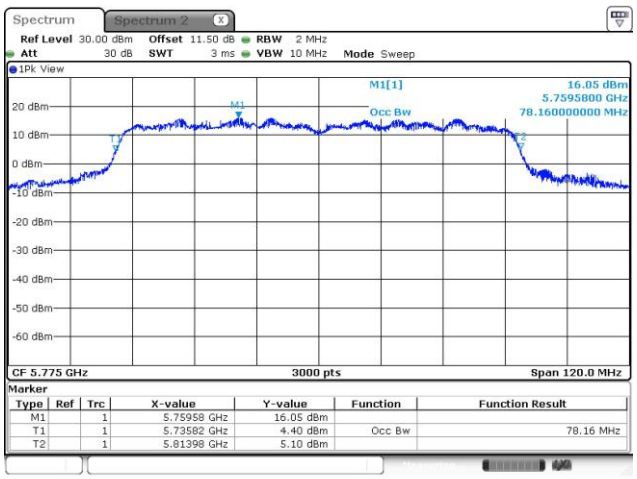
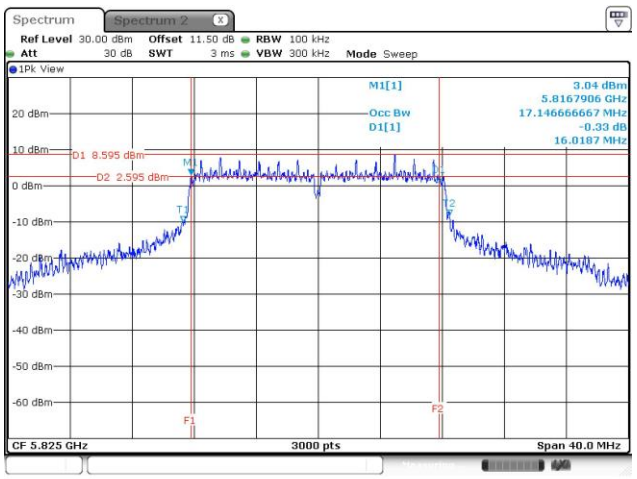


3.2.4 Test Result of Emission Bandwidth

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	3	5180	26.61	25.80	25.16	---	16.95	16.85	17.01	---
11a	3	5200	40.87	41.01	37.68	---	18.91	17.66	18.97	---
11a	3	5240	42.97	42.75	39.28	---	19.32	17.94	19.54	---
VHT20	3	5180	35.43	29.86	28.12	---	18.06	17.92	18.13	---
VHT20	3	5200	46.67	44.86	42.17	---	18.99	19.04	19.15	---
VHT20	3	5240	47.68	46.30	46.81	---	19.42	19.23	18.66	---
VHT40	3	5190	47.07	46.03	46.73	---	37.08	36.94	36.96	---
VHT40	3	5230	89.57	86.09	87.54	---	37.96	38.24	38.08	---
VHT80	3	5210	89.04	90.44	87.65	---	76.68	76.36	76.48	---

Worst Plot of 26dB Bandwidth	Worst Plot of 99% Bandwidth
	

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	3	5745	17.32	17.32	17.70	---	16.29	16.33	16.35	---	0.5
11a	3	5785	17.16	17.19	17.52	---	16.27	16.31	16.05	---	0.5
11a	3	5825	17.03	17.22	17.06	---	16.07	16.30	16.02	---	0.5
VHT20	3	5745	18.24	18.18	18.59	---	16.89	17.27	17.55	---	0.5
VHT20	3	5785	18.16	18.19	18.42	---	17.54	17.18	17.30	---	0.5
VHT20	3	5825	18.05	18.11	18.15	---	17.17	17.51	17.54	---	0.5
VHT40	3	5755	37.38	37.34	38.84	---	36.01	36.28	35.29	---	0.5
VHT40	3	5795	37.20	37.20	37.50	---	35.51	35.32	35.72	---	0.5
VHT80	3	5775	76.72	76.72	78.16	---	75.39	75.28	73.78	---	0.5

Worst Plots of 99% Bandwidth	Worst Plots 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	3	5180	17.81	17.69	17.52	---	175.637	22.45	30.00
11a	3	5200	19.99	20.21	19.5	---	293.849	24.68	30.00
11a	3	5240	20.18	19.93	20.46	---	313.806	24.97	30.00
HT20	3	5180	17.88	16.05	17.19	---	154.008	21.88	30.00
HT20	3	5200	20.15	19.81	20.28	---	305.893	24.86	30.00
HT20	3	5240	20.25	20.12	20.31	---	316.126	25.00	30.00
HT40	3	5190	12.18	11.62	11.52	---	45.231	16.55	30.00
HT40	3	5230	20.21	19.65	20.28	---	303.871	24.83	30.00
VHT20	3	5180	18.07	17.12	17.17	---	167.763	22.25	30.00
VHT20	3	5200	20.23	19.86	20.35	---	310.659	24.92	30.00
VHT20	3	5240	20.32	20.14	20.34	---	319.066	**25.04**	30.00
VHT40	3	5190	12.25	11.68	11.58	---	45.899	16.62	30.00
VHT40	3	5230	20.35	19.76	20.41	---	312.917	24.95	30.00
VHT80	3	5210	9.98	9.28	10.75	---	30.311	14.82	30.00

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	3	5745	18.47	18.85	19.04	---	227.211	23.56	30.00
11a	3	5785	18.84	18.36	18.76	---	220.271	23.43	30.00
11a	3	5825	18.21	18.6	18.27	---	205.808	23.13	30.00
HT20	3	5745	18.41	18.61	18.95	---	220.477	23.43	30.00
HT20	3	5785	18.27	18.51	18.91	---	215.904	23.34	30.00
HT20	3	5825	18.39	18.68	18.48	---	213.284	23.29	30.00
HT40	3	5755	19.61	19.41	19.35	---	264.808	24.23	30.00
HT40	3	5795	18.33	18.81	18.25	---	210.944	23.24	30.00
VHT20	3	5745	18.43	18.68	19	---	222.886	23.48	30.00
VHT20	3	5785	18.33	18.55	18.93	---	217.854	23.38	30.00
VHT20	3	5825	18.41	18.73	18.5	---	214.782	23.32	30.00
VHT40	3	5755	19.62	19.44	19.39	---	266.420	**24.26**	30.00
VHT40	3	5795	18.34	18.85	18.26	---	211.958	23.26	30.00
VHT80	3	5775	18.31	18.86	18.25	---	211.512	23.25	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
☐	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 ≥ 10 * (number of points in sweep) * (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

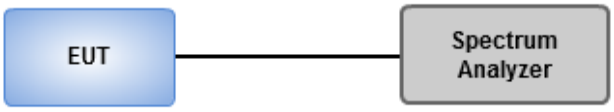
☐ Method SA-1

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 ≥ 10 * (number of points in sweep) * (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

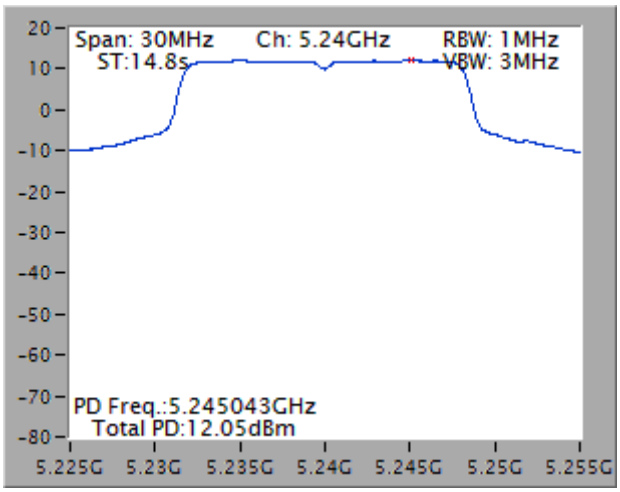


3.4.4 Test Result of Peak Power Spectral Density

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	3	5180	10.12	0.20	10.32	13.15
11a	3	5200	11.95	0.20	12.15	13.15
11a	3	5240	12.05	0.20	12.25	13.15
VHT20	3	5180	9.69	0.21	9.90	13.15
VHT20	3	5200	11.79	0.21	12.00	13.15
VHT20	3	5240	11.18	0.21	11.39	13.15
VHT40	3	5190	0.94	0.50	1.44	13.15
VHT40	3	5230	8.78	0.50	9.28	13.15
VHT80	3	5210	-4.72	0.97	-3.75	13.15

Note:
1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.
3. Directional gain = $10 * \log((10^{4.21/20}+10^{5.96/20}+10^{4.99/20})^3/3)$ = 9.85 dBi > 6dBi
   Limit shall be reduced to 17 dBm – (9.85 dBi – 6 dBi) = 13.15 dBm.

Worst Plot



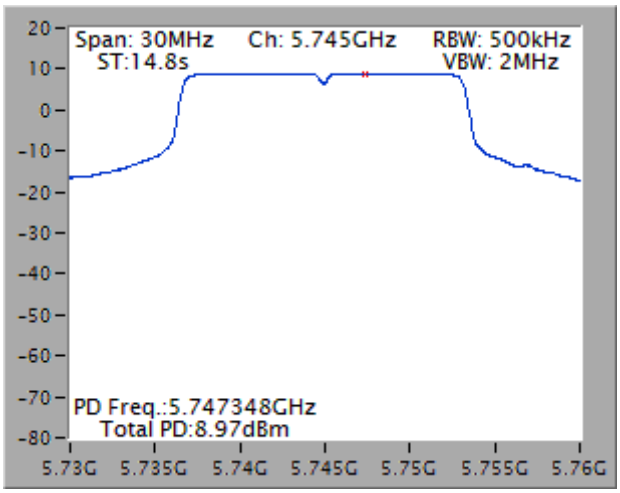
Note: The plot without duty factor.

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	3	5745	8.97	0.20	9.17	26.15
11a	3	5785	8.62	0.20	8.82	26.15
11a	3	5825	8.93	0.20	9.13	26.15
VHT20	3	5745	8.70	0.21	8.91	26.15
VHT20	3	5785	8.69	0.21	8.90	26.15
VHT20	3	5825	8.45	0.21	8.66	26.15
VHT40	3	5755	6.12	0.50	6.62	26.15
VHT40	3	5795	5.69	0.50	6.19	26.15
VHT80	3	5775	2.42	0.97	3.39	26.15

Note:

1. D.F is duty factor.
2. Test result is bin-by-bin summing measured value of each TX port.
3. Directional gain = $10 * \log((10^{4.21/20}+10^{5.96/20}+10^{4.99/20})^3/3) = 9.85$ dBi > 6dBi
   Limit shall be reduced to 30 dBm – (9.85 dBi – 6 dBi) = 26.15 dBm.

Worst Plot



Note: The plot without 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

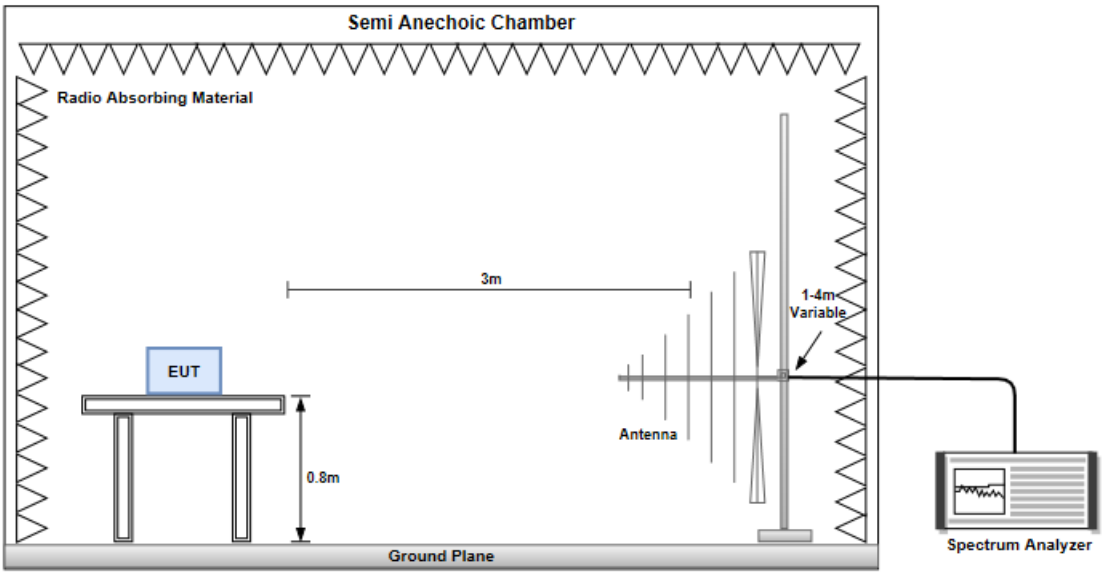
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

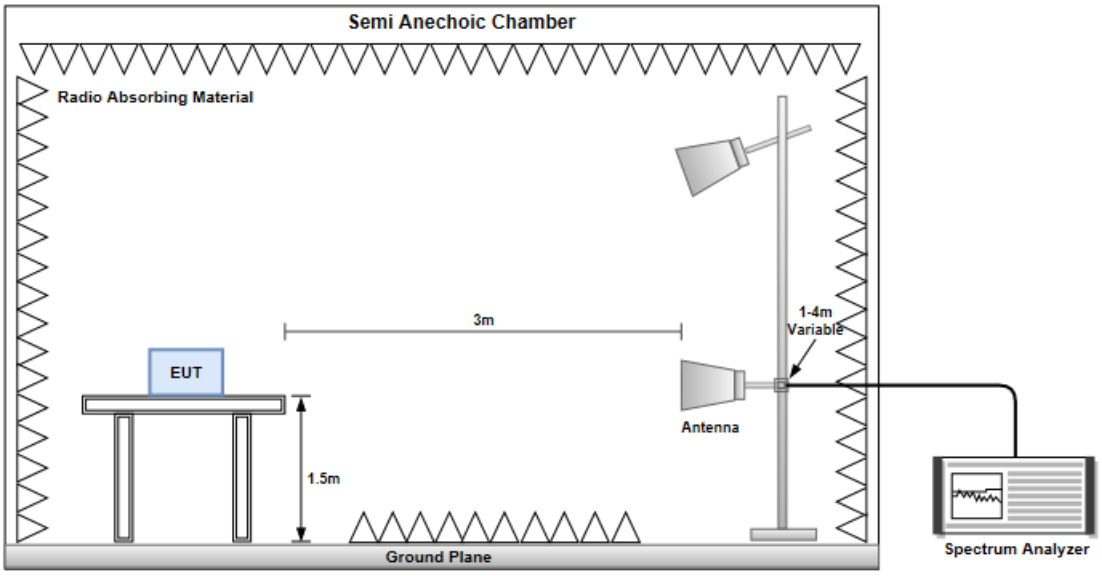
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

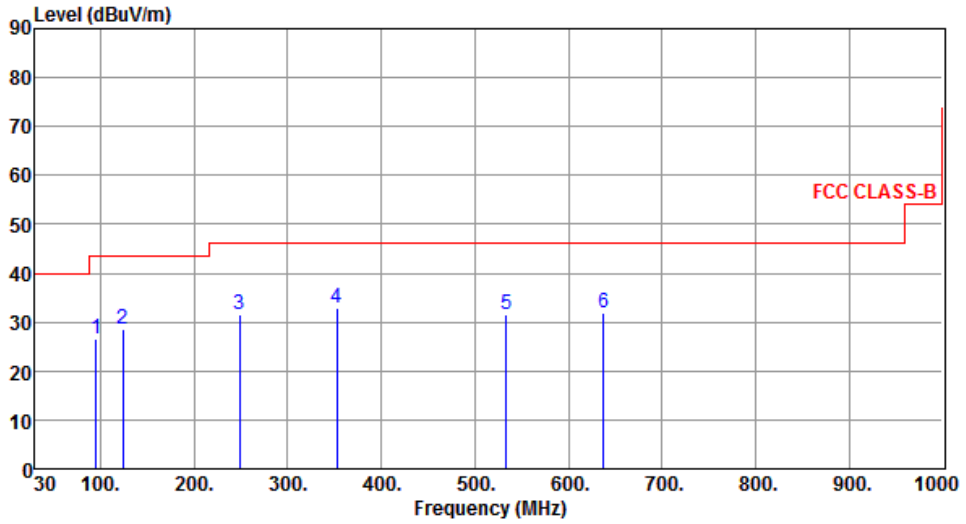


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

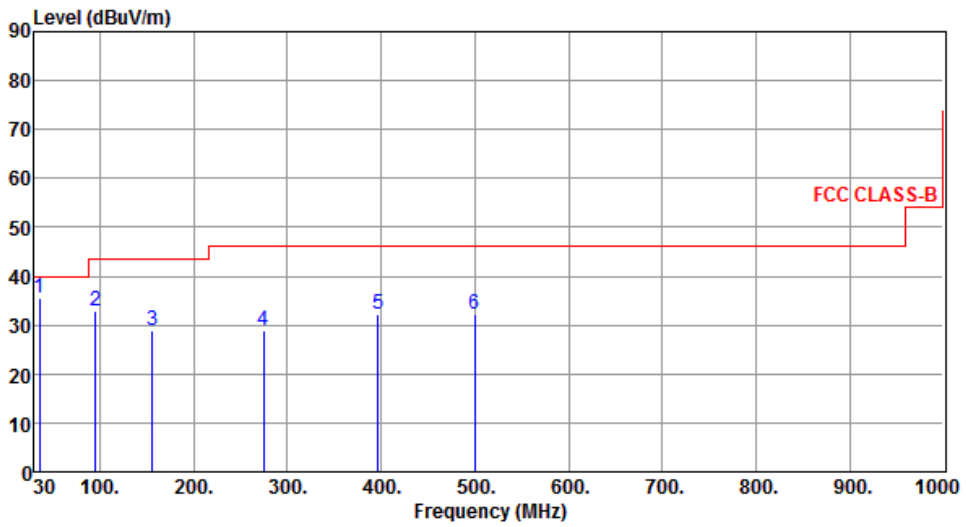
Modulation	VHT20	**Test Freq. (MHz)**	5240
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	94.99	26.62	43.50	-16.88	40.34	-13.72	Peak	---	---
2	124.09	28.53	43.50	-14.97	38.72	-10.19	Peak	---	---
3	248.25	31.39	46.00	-14.61	40.80	-9.41	Peak	---	---
4	353.01	32.98	46.00	-13.02	39.29	-6.31	Peak	---	---
5	533.43	31.46	46.00	-14.54	33.58	-2.12	Peak	---	---
6	637.22	31.82	46.00	-14.18	32.13	-0.31	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.

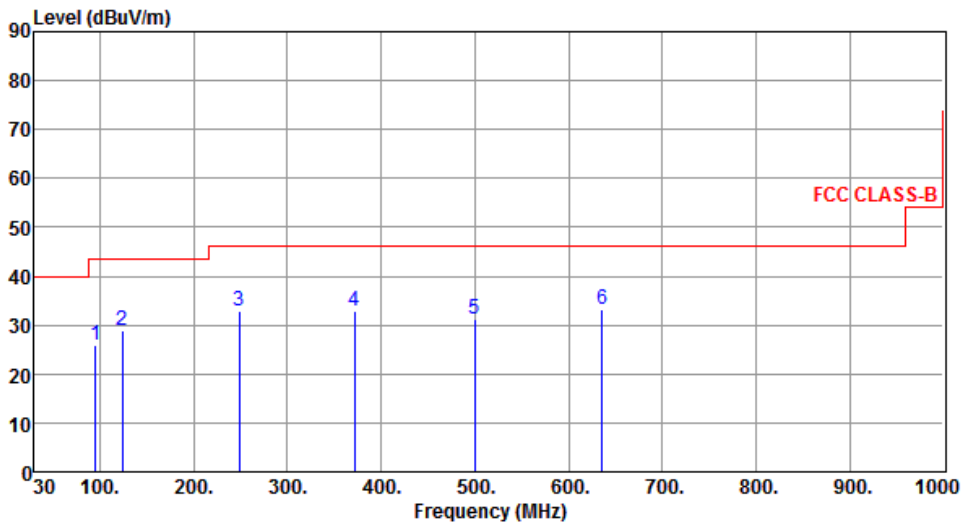
Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	35.31	35.69	40.00	-4.31	44.20	-8.51	QP	100	153
2	94.99	32.81	43.50	-10.69	46.53	-13.72	Peak	---	---
3	156.10	28.99	43.50	-14.51	37.26	-8.27	Peak	---	---
4	274.44	28.74	46.00	-17.26	37.08	-8.34	Peak	---	---
5	396.66	32.11	46.00	-13.89	37.16	-5.05	Peak	---	---
6	499.48	32.28	46.00	-13.72	35.13	-2.85	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.

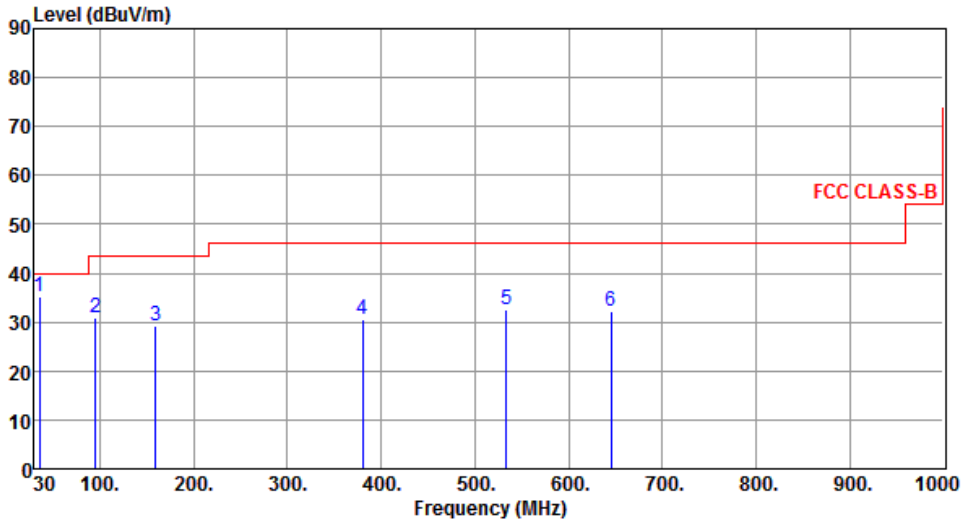
Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	94.99	26.00	43.50	-17.50	39.72	-13.72	Peak	---	---
2	124.09	28.82	43.50	-14.68	39.01	-10.19	Peak	---	---
3	248.25	32.85	46.00	-13.15	42.26	-9.41	Peak	---	---
4	371.44	32.83	46.00	-13.17	38.61	-5.78	Peak	---	---
5	499.48	31.27	46.00	-14.73	34.12	-2.85	Peak	---	---
6	636.25	33.29	46.00	-12.71	33.61	-0.32	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).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		

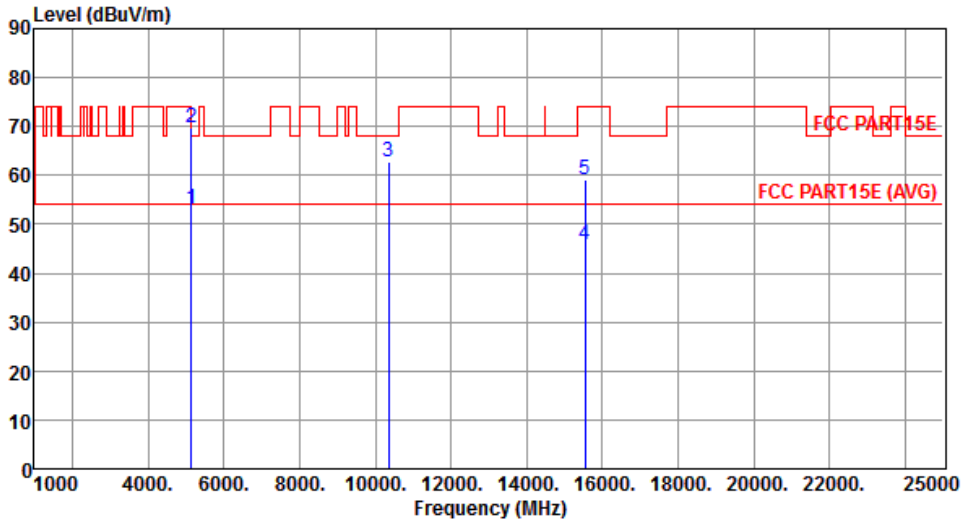


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	35.34	35.31	40.00	-4.69	43.82	-8.51	QP	100	149
2	94.99	31.05	43.50	-12.45	44.77	-13.72	Peak	---	---
3	159.01	29.38	43.50	-14.12	37.62	-8.24	Peak	---	---
4	380.17	30.43	46.00	-15.57	35.96	-5.53	Peak	---	---
5	533.43	32.53	46.00	-13.47	34.65	-2.12	Peak	---	---
6	644.98	32.13	46.00	-13.87	32.35	-0.22	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.

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

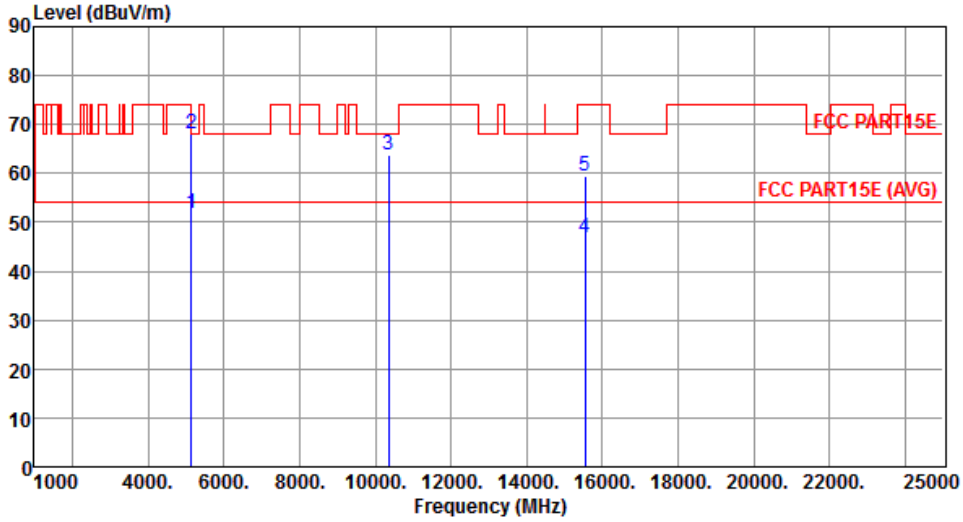
Modulation	11a	**Test Freq. (MHz)**	5180
Polarization	Horizontal		



	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	52.97	54.00	-1.03	48.49	4.48	Average	270	258
2	5150.00	69.77	74.00	-4.23	65.29	4.48	Peak	270	258
3	10360.00	62.66	68.20	-5.54	48.88	13.78	Peak	284	264
4	15540.00	45.84	54.00	-8.16	31.45	14.39	Average	225	49
5	15540.00	59.11	74.00	-14.89	44.72	14.39	Peak	225	49

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).

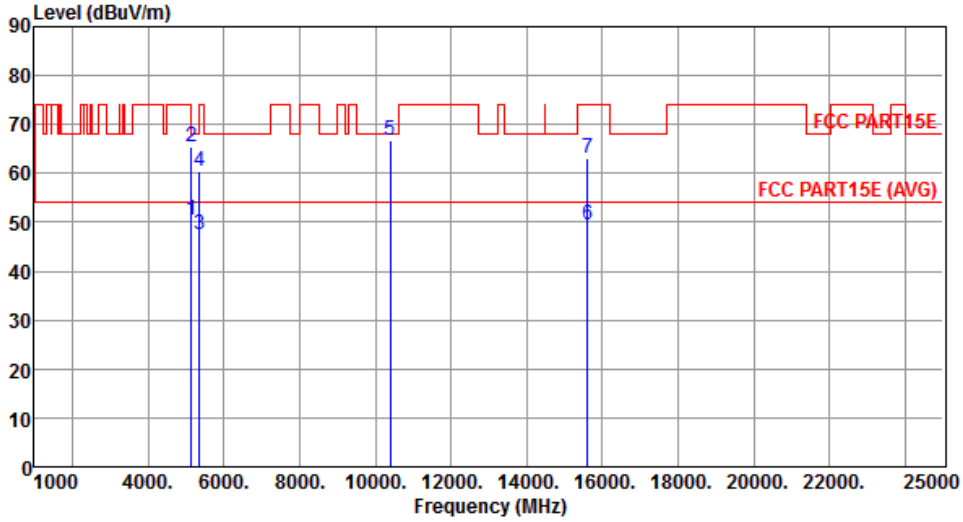
Modulation	11a	Test Freq. (MHz)	5180
Polarization	Vertical		



	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	51.88	54.00	-2.12	47.40	4.48	Average	318	196
2	5150.00	68.12	74.00	-5.88	63.64	4.48	Peak	318	196
3	10360.00	63.73	68.20	-4.47	49.95	13.78	Peak	298	209
4	15540.00	46.93	54.00	-7.07	32.54	14.39	Average	243	343
5	15540.00	59.53	74.00	-14.47	45.14	14.39	Peak	243	343

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).

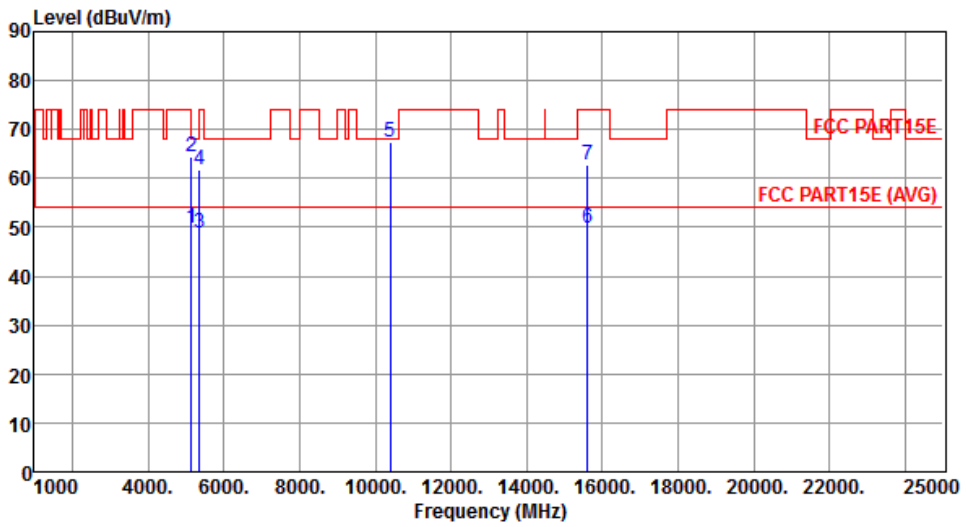
Modulation	11a	Test Freq. (MHz)	5200
Polarization	Horizontal		



	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	50.60	54.00	-3.40	46.12	4.48	Average	295	271
2	5150.00	65.52	74.00	-8.48	61.04	4.48	Peak	295	271
3	5350.00	47.58	54.00	-6.42	42.84	4.74	Average	295	271
4	5350.00	60.34	74.00	-13.66	55.60	4.74	Peak	295	271
5	10400.00	66.66	68.20	-1.54	52.81	13.85	Peak	298	262
6	15600.00	49.52	54.00	-4.48	35.22	14.30	Average	212	42
7	15600.00	62.97	74.00	-11.03	48.67	14.30	Peak	212	42

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).

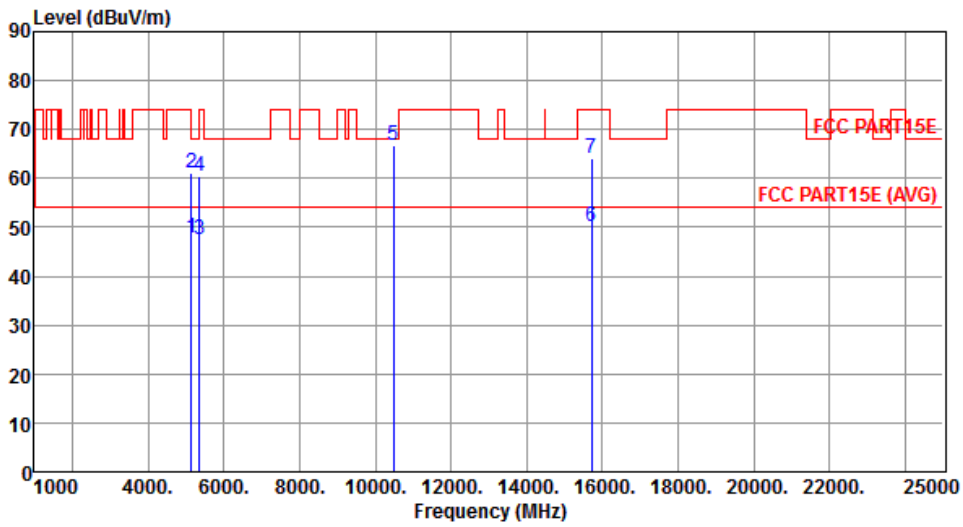
Modulation	11a	Test Freq. (MHz)	5200
Polarization	Vertical		



	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	49.97	54.00	-4.03	45.49	4.48	Average	297	245
2	5150.00	64.33	74.00	-9.67	59.85	4.48	Peak	297	245
3	5350.00	48.84	54.00	-5.16	44.10	4.74	Average	297	245
4	5350.00	61.61	74.00	-12.39	56.87	4.74	Peak	297	245
5	10400.00	67.28	68.20	-0.92	53.43	13.85	Peak	237	9
6	15600.00	49.82	54.00	-4.18	35.52	14.30	Average	170	288
7	15600.00	62.72	74.00	-11.28	48.42	14.30	Peak	170	288

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).

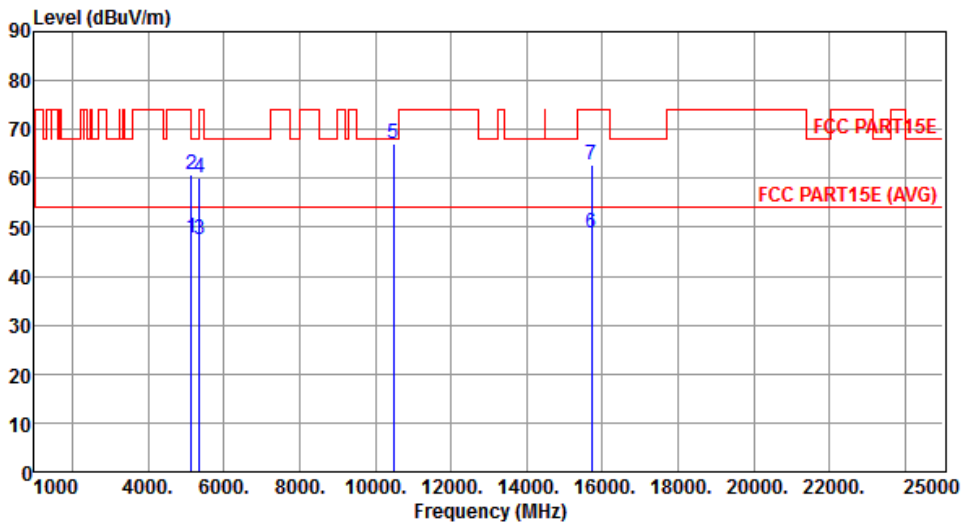
Modulation	11a	Test Freq. (MHz)	5240
Polarization	Horizontal		



	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	47.89	54.00	-6.11	43.41	4.48	Average	305	254
2	5150.00	61.07	74.00	-12.93	56.59	4.48	Peak	305	254
3	5350.00	47.46	54.00	-6.54	42.72	4.74	Average	305	254
4	5350.00	60.56	74.00	-13.44	55.82	4.74	Peak	305	254
5	10480.00	66.75	68.20	-1.45	52.80	13.95	Peak	282	263
6	15720.00	50.11	54.00	-3.89	36.00	14.11	Average	202	35
7	15720.00	64.08	74.00	-9.92	49.97	14.11	Peak	202	35

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).

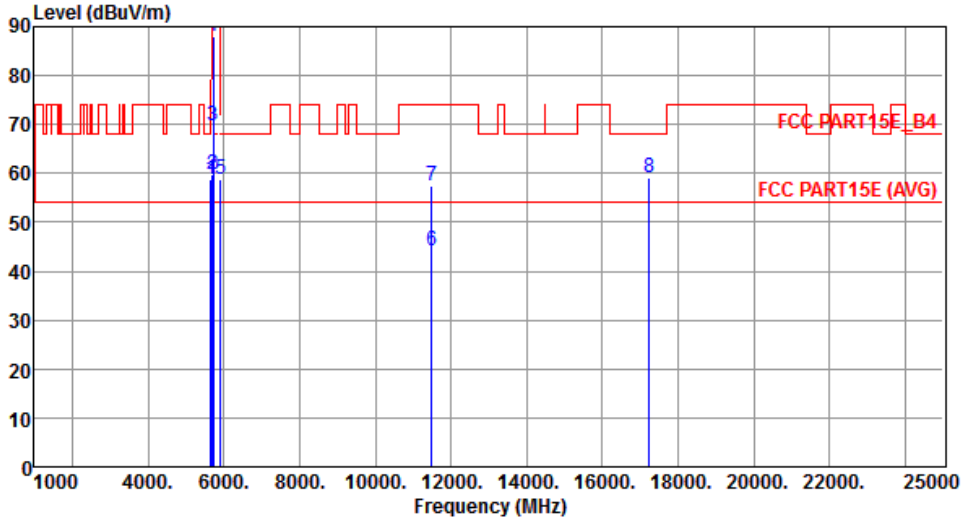
Modulation	11a	Test Freq. (MHz)	5240
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5150.00	47.79	54.00	-6.21	43.31	4.48	Average	312	247
2	5150.00	60.77	74.00	-13.23	56.29	4.48	Peak	312	247
3	5350.00	47.37	54.00	-6.63	42.63	4.74	Average	312	247
4	5350.00	60.27	74.00	-13.73	55.53	4.74	Peak	312	247
5	10480.00	67.18	68.20	-1.02	53.23	13.95	Peak	235	6
6	15720.00	48.94	54.00	-5.06	34.83	14.11	Average	175	305
7	15720.00	62.87	74.00	-11.13	48.76	14.11	Peak	175	305

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).

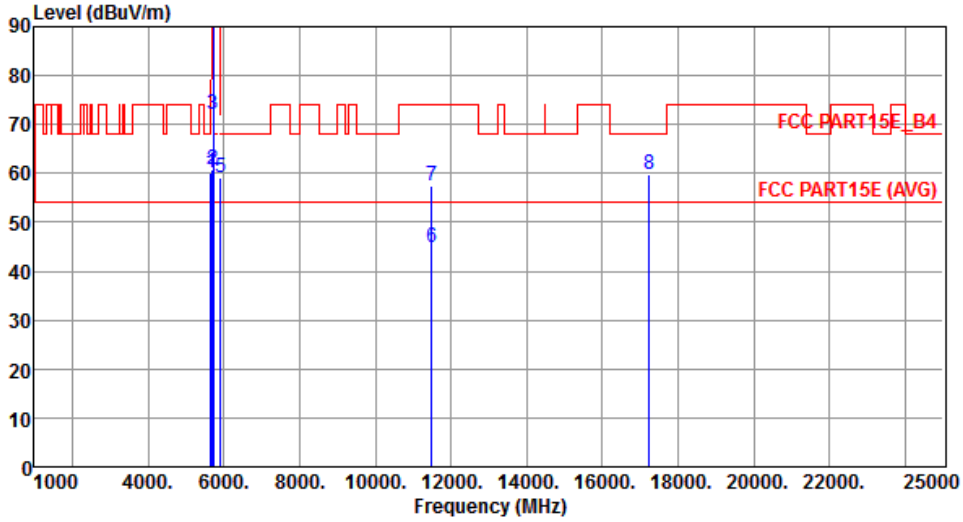
Modulation	11a	Test Freq. (MHz)	5745
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	58.84	68.20	-9.36	53.65	5.19	Peak	100	70
2	5700.00	59.93	105.20	-45.27	54.65	5.28	Peak	100	70
3	5720.00	69.69	110.80	-41.11	64.38	5.31	Peak	100	72
4	5725.00	87.97	122.20	-34.23	82.65	5.32	Peak	100	72
5	5925.00	58.80	68.20	-9.40	53.16	5.64	Peak	100	70
6	11490.00	44.25	54.00	-9.75	29.43	14.82	Average	100	255
7	11490.00	57.37	74.00	-16.63	42.55	14.82	Peak	100	255
8	17235.00	59.26	68.20	-8.94	41.55	17.71	Peak	100	120

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).

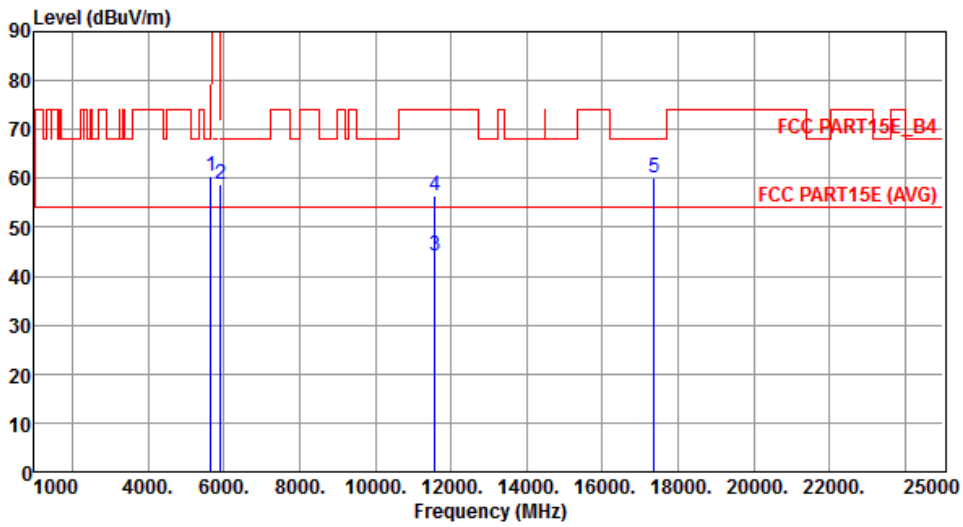
Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	60.16	68.20	-8.04	54.97	5.19	Peak	307	13
2	5700.00	60.78	105.20	-44.42	55.50	5.28	Peak	307	13
3	5720.00	71.92	110.80	-38.88	66.61	5.31	Peak	307	13
4	5725.00	90.18	122.20	-32.02	84.86	5.32	Peak	307	13
5	5925.00	59.05	68.20	-9.15	53.41	5.64	Peak	307	13
6	11490.00	44.96	54.00	-9.04	30.14	14.82	Average	100	5
7	11490.00	57.42	74.00	-16.58	42.60	14.82	Peak	100	5
8	17235.00	59.82	68.20	-8.38	42.11	17.71	Peak	100	96

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).

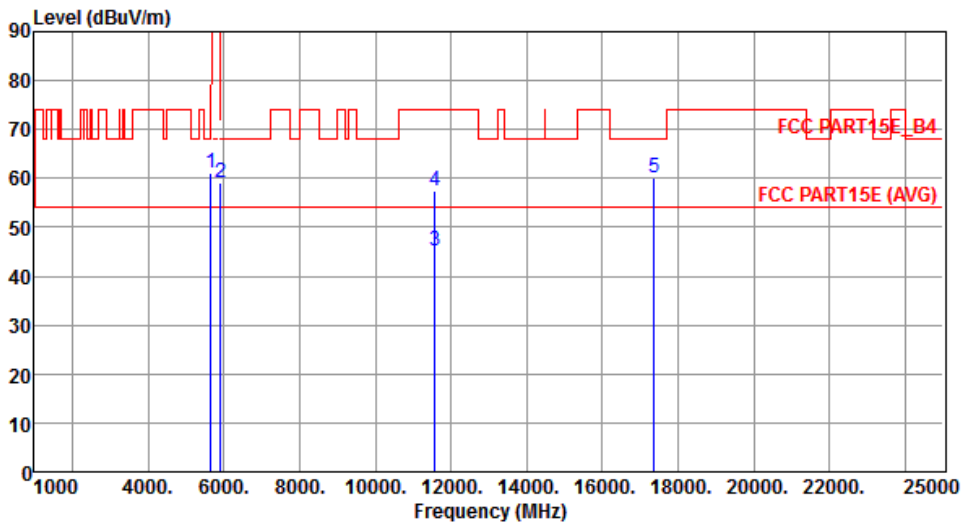
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	60.35	68.20	-7.85	55.16	5.19	Peak	100	72
2	5925.00	58.88	68.20	-9.32	53.24	5.64	Peak	100	72
3	11570.00	44.12	54.00	-9.88	29.48	14.64	Average	100	258
4	11570.00	56.59	74.00	-17.41	41.95	14.64	Peak	100	258
5	17355.00	59.98	68.20	-8.22	41.97	18.01	Peak	100	119

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).

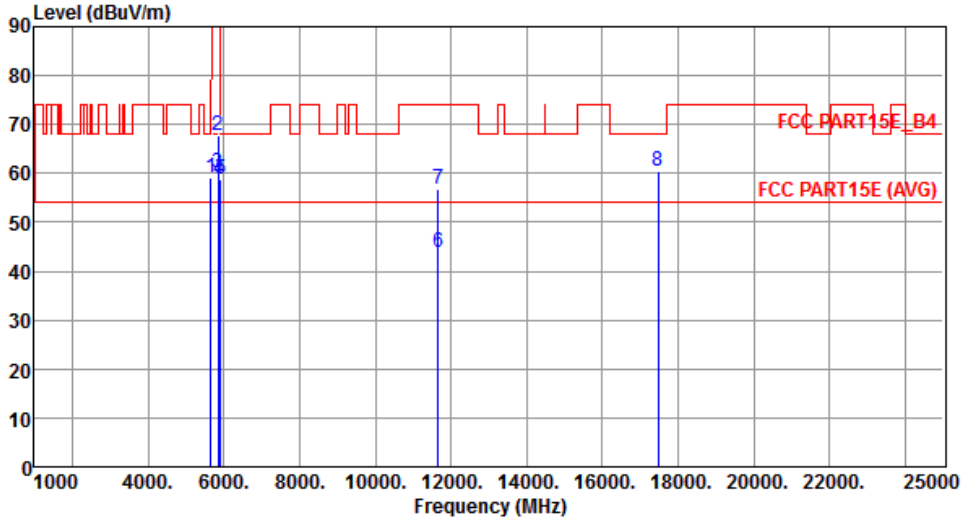
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.08	68.20	-7.12	55.89	5.19	Peak	302	16
2	5925.00	59.17	68.20	-9.03	53.53	5.64	Peak	302	16
3	11570.00	45.09	54.00	-8.91	30.45	14.64	Average	100	0
4	11570.00	57.47	74.00	-16.53	42.83	14.64	Peak	100	0
5	17355.00	59.97	68.20	-8.23	41.96	18.01	Peak	100	107

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).

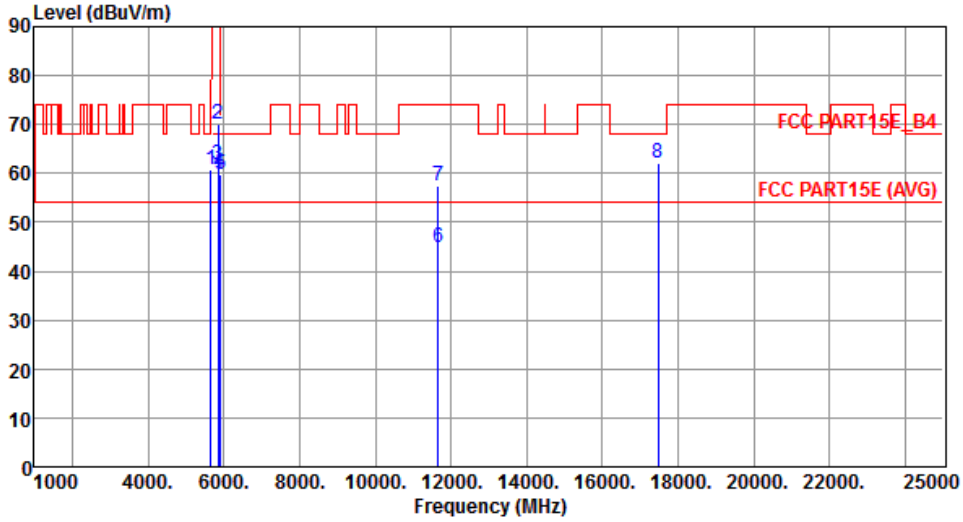
Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	58.97	68.20	-9.23	53.78	5.19	Peak	100	71
2	5850.00	67.90	122.20	-54.30	62.38	5.52	Peak	100	71
3	5855.00	60.06	110.80	-50.74	54.53	5.53	Peak	100	71
4	5875.00	58.94	105.20	-46.26	53.38	5.56	Peak	100	71
5	5925.00	58.86	68.20	-9.34	53.22	5.64	Peak	100	72
6	11650.00	43.98	54.00	-10.02	29.54	14.44	Average	100	251
7	11650.00	56.69	74.00	-17.31	42.25	14.44	Peak	100	251
8	17475.00	60.51	68.20	-7.69	42.22	18.29	Peak	100	125

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)	5825
Polarization	Vertical		

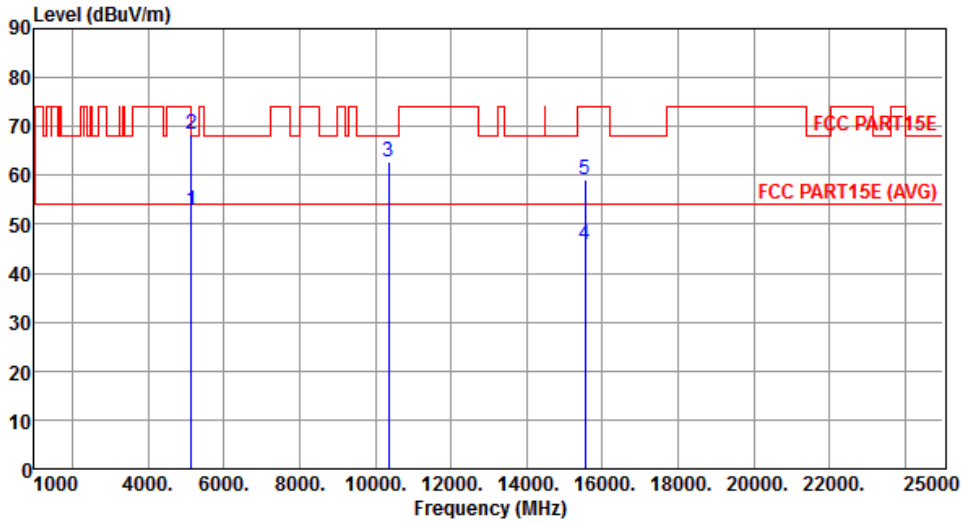


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	60.83	68.20	-7.37	55.64	5.19	Peak	302	13
2	5850.00	69.92	122.20	-52.28	64.40	5.52	Peak	302	13
3	5855.00	61.61	110.80	-49.19	56.08	5.53	Peak	302	13
4	5875.00	60.26	105.20	-44.94	54.70	5.56	Peak	302	13
5	5925.00	59.67	68.20	-8.53	54.03	5.64	Peak	302	13
6	11650.00	44.95	54.00	-9.05	30.51	14.44	Average	100	6
7	11650.00	57.36	74.00	-16.64	42.92	14.44	Peak	100	6
8	17475.00	61.95	68.20	-6.25	43.66	18.29	Peak	100	119

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).

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

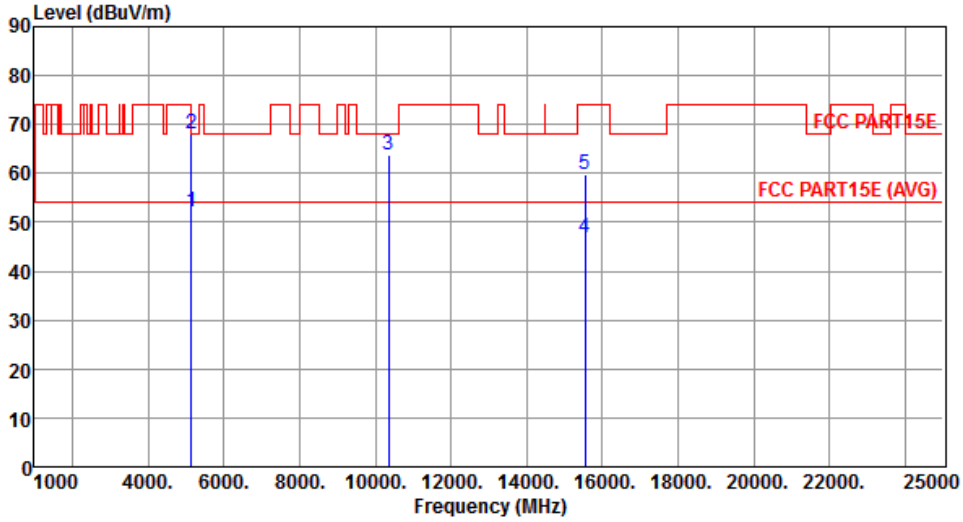
Modulation	VHT20	**Test Freq. (MHz)**	5180
Polarization	Horizontal		



	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	52.72	54.00	-1.28	48.24	4.48	Average	337	240
2	5150.00	68.40	74.00	-5.60	63.92	4.48	Peak	337	240
3	10360.00	62.75	68.20	-5.45	48.97	13.78	Peak	285	267
4	15540.00	45.67	54.00	-8.33	31.28	14.39	Average	221	51
5	15540.00	59.02	74.00	-14.98	44.63	14.39	Peak	221	51

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).

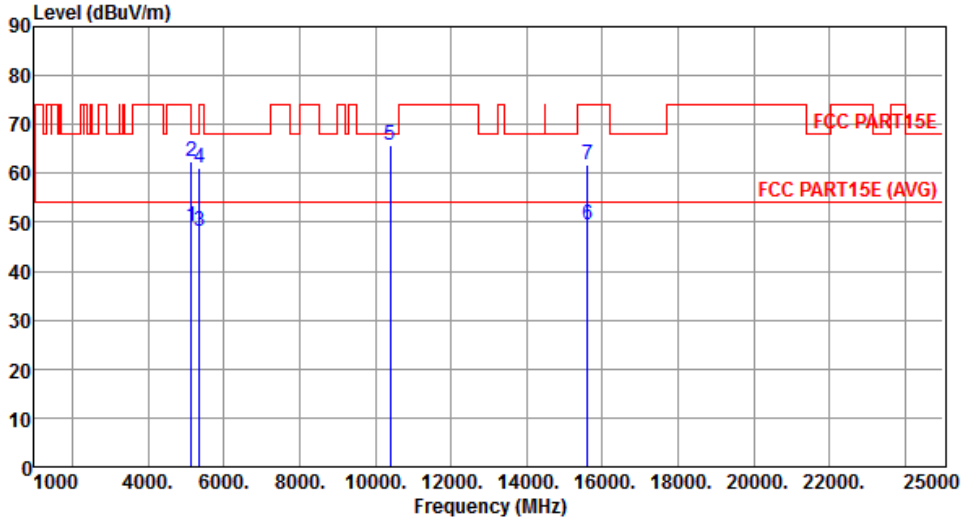
Modulation	VHT20	Test Freq. (MHz)	5180
Polarization	Vertical		



	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	52.09	54.00	-1.91	47.61	4.48	Average	317	195
2	5150.00	68.22	74.00	-5.78	63.74	4.48	Peak	317	195
3	10360.00	63.62	68.20	-4.58	49.84	13.78	Peak	295	210
4	15540.00	46.82	54.00	-7.18	32.43	14.39	Average	242	344
5	15540.00	59.67	74.00	-14.33	45.28	14.39	Peak	242	344

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).

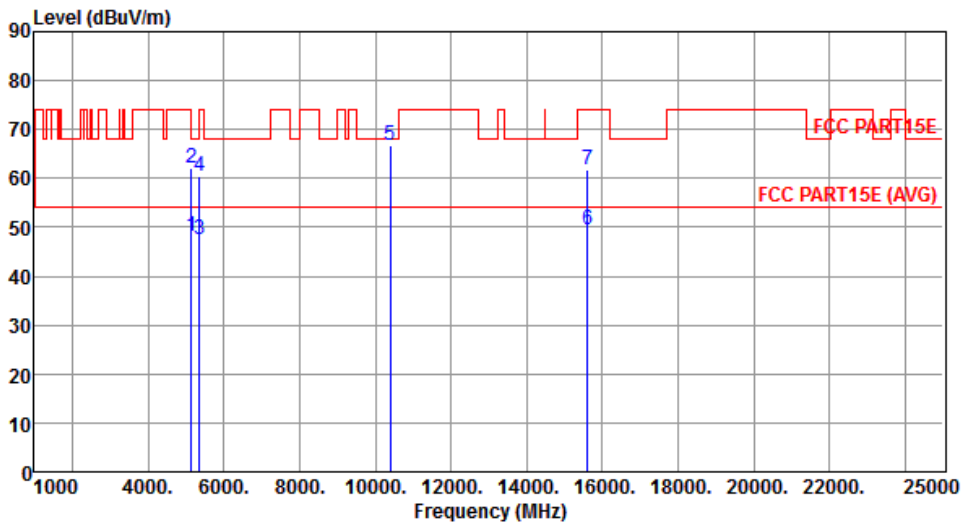
Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Horizontal		



	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	49.20	54.00	-4.80	44.72	4.48	Average	209	35
2	5150.00	62.46	74.00	-11.54	57.98	4.48	Peak	209	35
3	5350.00	48.19	54.00	-5.81	43.45	4.74	Average	209	35
4	5350.00	61.19	74.00	-12.81	56.45	4.74	Peak	209	35
5	10400.00	65.63	68.20	-2.57	51.78	13.85	Peak	216	264
6	15600.00	49.40	54.00	-4.60	35.10	14.30	Average	209	35
7	15600.00	61.79	74.00	-12.21	47.49	14.30	Peak	209	35

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).

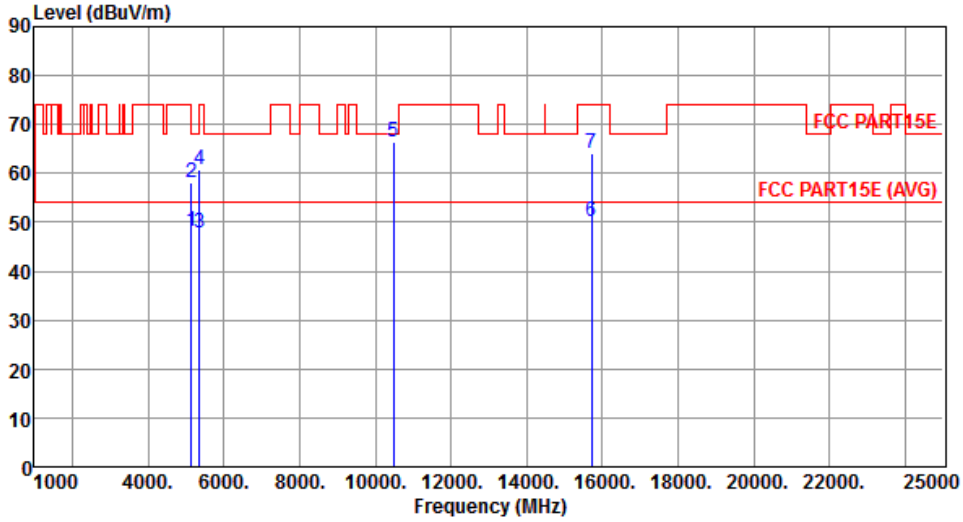
Modulation	VHT20	Test Freq. (MHz)	5200
Polarization	Vertical		



	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	48.27	54.00	-5.73	43.79	4.48	Average	302	197
2	5150.00	62.19	74.00	-11.81	57.71	4.48	Peak	302	197
3	5350.00	47.39	54.00	-6.61	42.65	4.74	Average	302	197
4	5350.00	60.39	74.00	-13.61	55.65	4.74	Peak	302	197
5	10400.00	66.89	68.20	-1.31	53.04	13.85	Peak	233	8
6	15600.00	49.45	54.00	-4.55	35.15	14.30	Average	230	344
7	15600.00	61.85	74.00	-12.15	47.55	14.30	Peak	230	344

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).

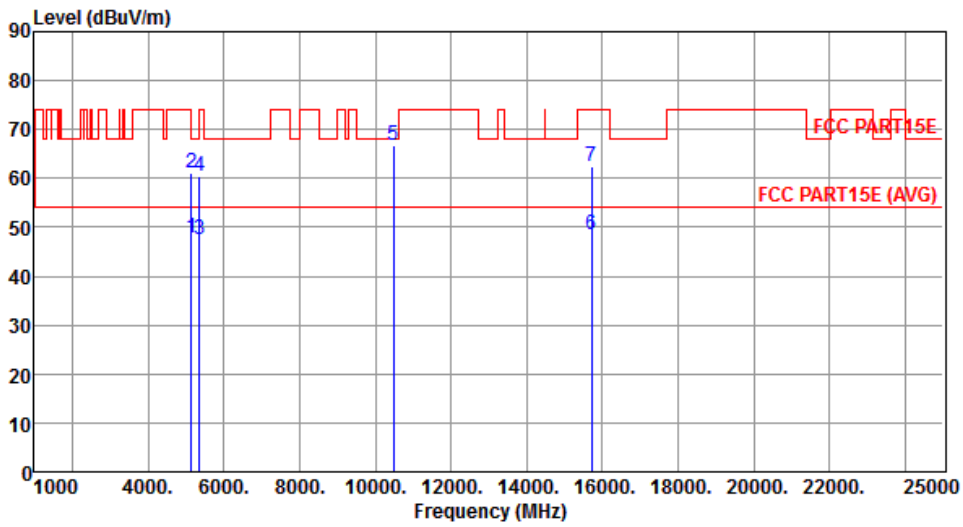
Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Horizontal		



	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	48.02	54.00	-5.98	43.54	4.48	Average	302	253
2	5150.00	58.20	74.00	-15.80	53.72	4.48	Peak	302	253
3	5350.00	47.69	54.00	-6.31	42.95	4.74	Average	302	253
4	5350.00	60.86	74.00	-13.14	56.12	4.74	Peak	302	253
5	10480.00	66.38	68.20	-1.82	52.43	13.95	Peak	281	262
6	15720.00	50.27	54.00	-3.73	36.16	14.11	Average	210	40
7	15720.00	64.24	74.00	-9.76	50.13	14.11	Peak	210	40

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).

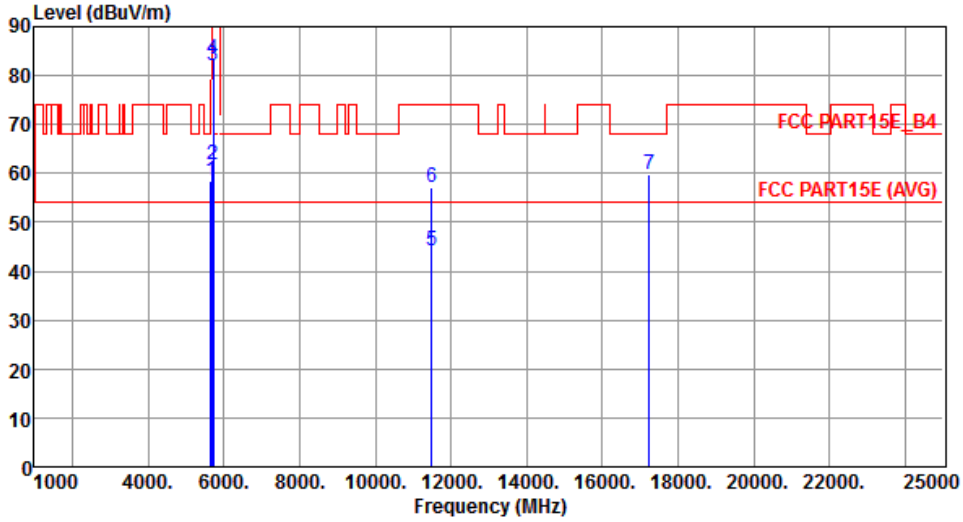
Modulation	VHT20	Test Freq. (MHz)	5240
Polarization	Vertical		



	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	47.91	54.00	-6.09	43.43	4.48	Average	311	245
2	5150.00	61.19	74.00	-12.81	56.71	4.48	Peak	311	245
3	5350.00	47.59	54.00	-6.41	42.85	4.74	Average	311	245
4	5350.00	60.47	74.00	-13.53	55.73	4.74	Peak	311	245
5	10480.00	66.72	68.20	-1.48	52.77	13.95	Peak	215	7
6	15720.00	48.54	54.00	-5.46	34.43	14.11	Average	177	294
7	15720.00	62.53	74.00	-11.47	48.42	14.11	Peak	177	294

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).

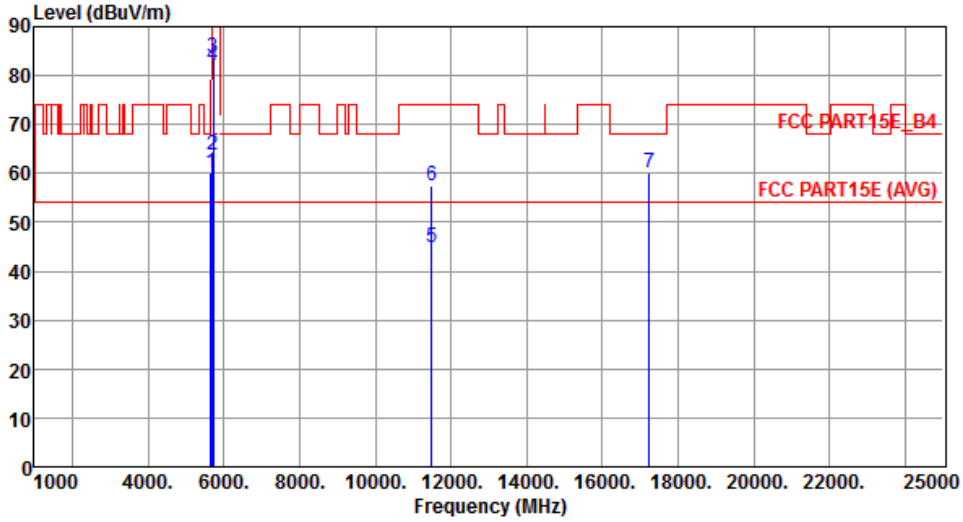
Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	58.58	68.20	-9.62	53.39	5.19	Peak	100	71
2	5700.00	61.63	105.20	-43.57	56.35	5.28	Peak	100	71
3	5720.00	82.04	110.80	-28.76	76.73	5.31	Peak	100	71
4	5725.00	83.25	122.20	-38.95	77.93	5.32	Peak	100	71
5	11490.00	44.23	54.00	-9.77	29.41	14.82	Average	100	251
6	11490.00	57.03	74.00	-16.97	42.21	14.82	Peak	100	251
7	17235.00	59.87	68.20	-8.33	42.16	17.71	Peak	100	119

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).

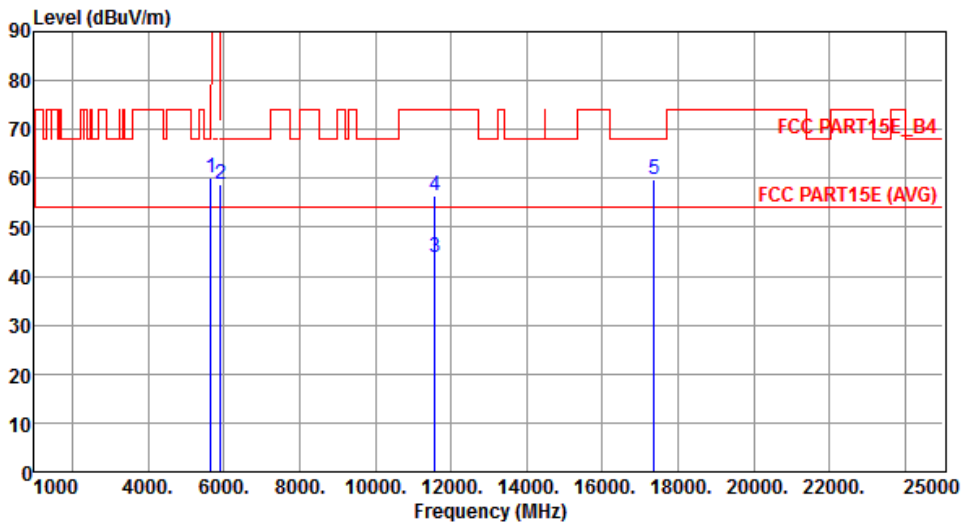
Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	59.95	68.20	-8.25	54.76	5.19	Peak	308	10
2	5700.00	63.75	105.20	-41.45	58.47	5.28	Peak	308	10
3	5720.00	83.80	110.80	-27.00	78.49	5.31	Peak	308	10
4	5725.00	82.06	122.20	-40.14	76.74	5.32	Peak	308	10
5	11490.00	44.94	54.00	-9.06	30.12	14.82	Average	100	15
6	11490.00	57.37	74.00	-16.63	42.55	14.82	Peak	100	15
7	17235.00	60.06	68.20	-8.14	42.35	17.71	Peak	100	95

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).

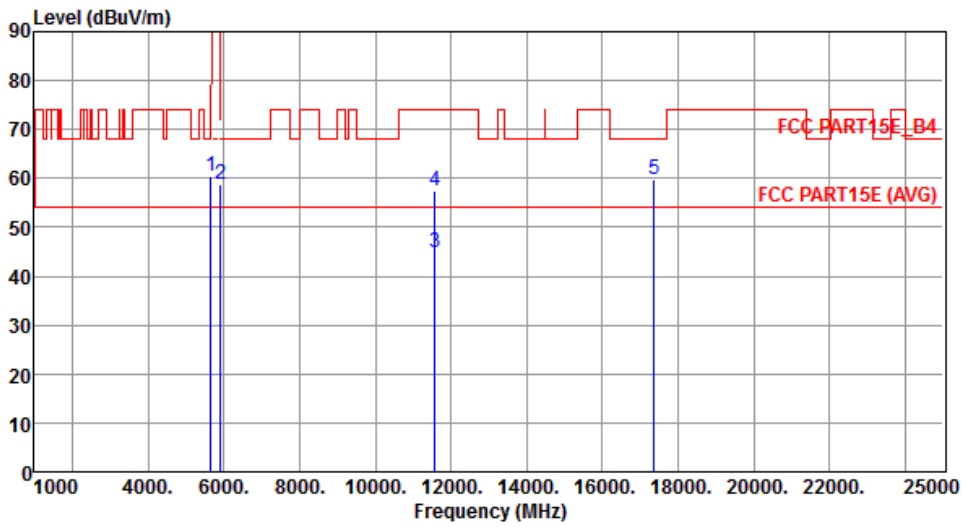
Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	60.04	68.20	-8.16	54.85	5.19	Peak	100	63
2	5925.00	58.94	68.20	-9.26	53.30	5.64	Peak	100	63
3	11570.00	43.95	54.00	-10.05	29.31	14.64	Average	100	251
4	11570.00	56.41	74.00	-17.59	41.77	14.64	Peak	100	251
5	17355.00	59.82	68.20	-8.38	41.81	18.01	Peak	100	125

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).

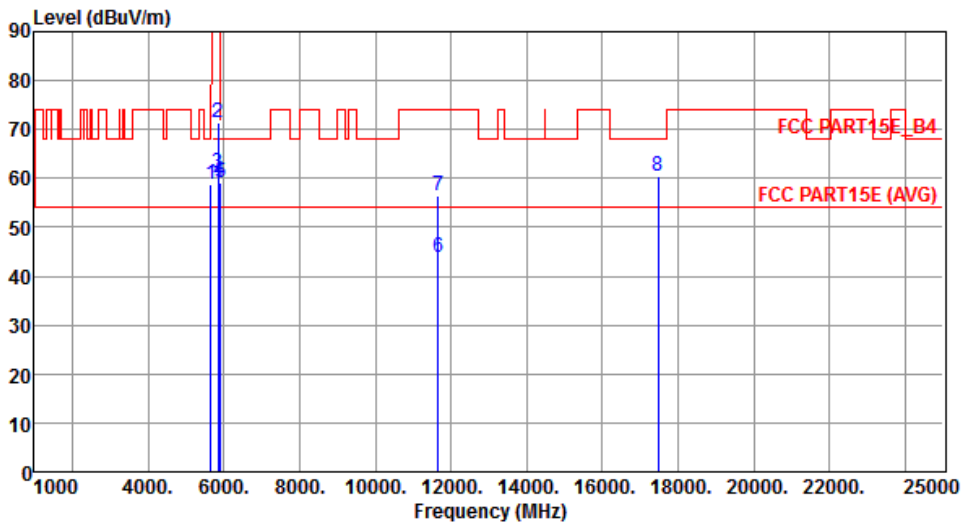
Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	60.48	68.20	-7.72	55.29	5.19	Peak	324	14
2	5925.00	58.94	68.20	-9.26	53.30	5.64	Peak	324	14
3	11570.00	44.92	54.00	-9.08	30.28	14.64	Average	100	2
4	11570.00	57.36	74.00	-16.64	42.72	14.64	Peak	100	2
5	17355.00	59.72	68.20	-8.48	41.71	18.01	Peak	100	116

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).

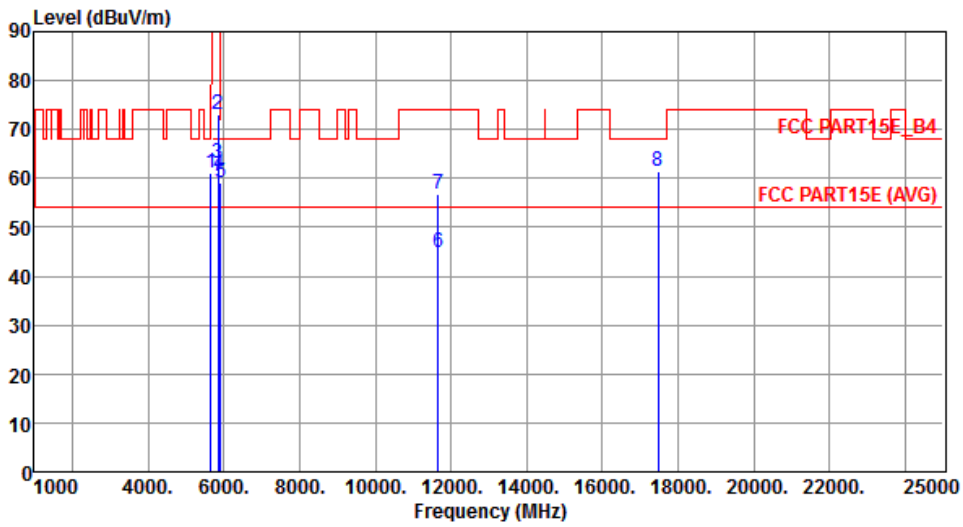
Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	58.94	68.20	-9.26	53.75	5.19	Peak	100	69
2	5850.00	71.34	122.20	-50.86	65.82	5.52	Peak	100	69
3	5855.00	61.26	110.80	-49.54	55.73	5.53	Peak	100	69
4	5875.00	59.44	105.20	-45.76	53.88	5.56	Peak	100	69
5	5925.00	59.06	68.20	-9.14	53.42	5.64	Peak	100	69
6	11650.00	43.72	54.00	-10.28	29.28	14.44	Average	100	250
7	11650.00	56.57	74.00	-17.43	42.13	14.44	Peak	100	250
8	17475.00	60.61	68.20	-7.59	42.32	18.29	Peak	100	125

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)	5825
Polarization	Vertical		

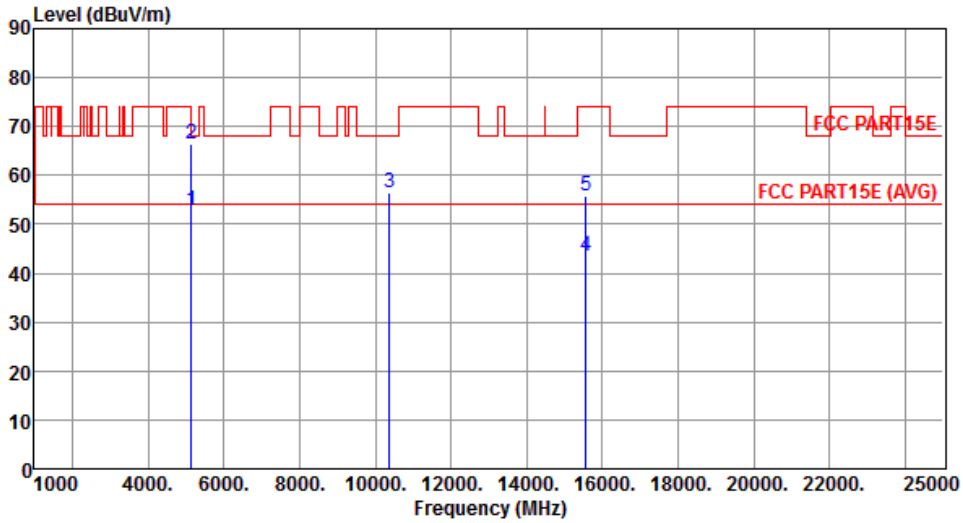


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.16	68.20	-7.04	55.97	5.19	Peak	317	17
2	5850.00	72.94	122.20	-49.26	67.42	5.52	Peak	317	17
3	5855.00	63.09	110.80	-47.71	57.56	5.53	Peak	317	17
4	5875.00	60.67	105.20	-44.53	55.11	5.56	Peak	317	17
5	5925.00	59.18	68.20	-9.02	53.54	5.64	Peak	317	17
6	11650.00	44.87	54.00	-9.13	30.43	14.44	Average	100	8
7	11650.00	56.88	74.00	-17.12	42.44	14.44	Peak	100	8
8	17475.00	61.55	68.20	-6.65	43.26	18.29	Peak	100	120

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).

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

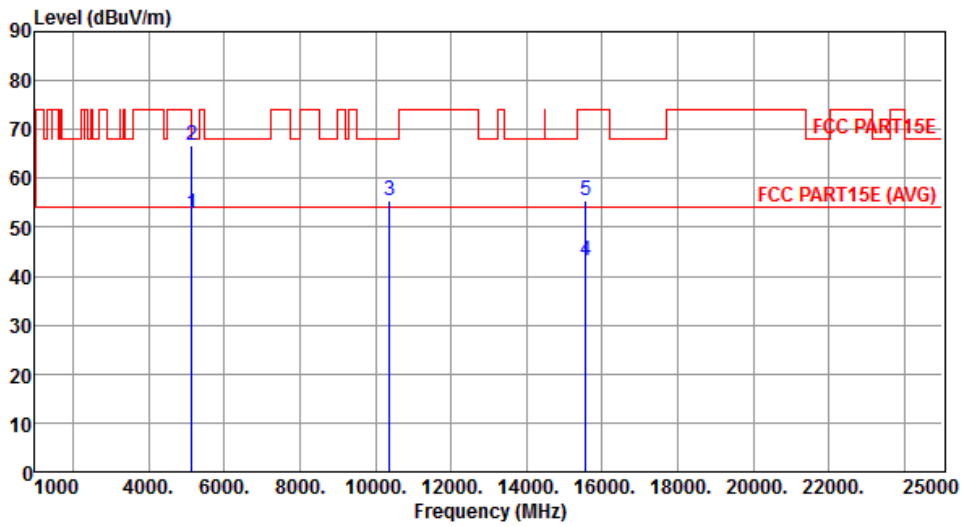
Modulation	VHT40	**Test Freq. (MHz)**	5190
Polarization	Horizontal		



	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	52.91	54.00	-1.09	48.43	4.48	Average	339	234
2	5150.00	66.34	74.00	-7.66	61.86	4.48	Peak	339	234
3	10380.00	56.35	68.20	-11.85	42.53	13.82	Peak	100	156
4	15570.00	43.46	54.00	-10.54	29.12	14.34	Average	100	122
5	15570.00	55.65	74.00	-18.35	41.31	14.34	Peak	100	122

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).

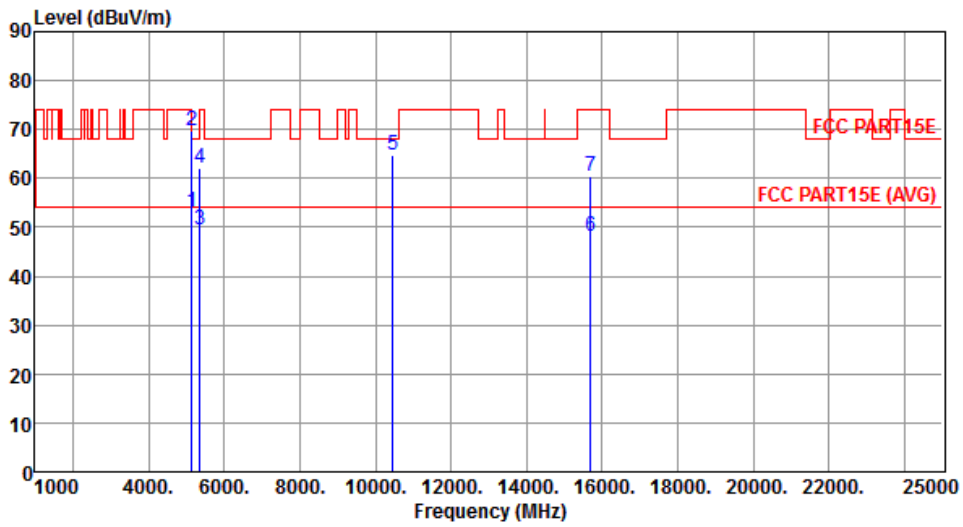
Modulation	VHT40	Test Freq. (MHz)	5190
Polarization	Vertical		



	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	52.82	54.00	-1.18	48.34	4.48	Average	307	245
2	5150.00	66.81	74.00	-7.19	62.33	4.48	Peak	307	245
3	10380.00	55.38	68.20	-12.82	41.56	13.82	Peak	100	125
4	15570.00	43.10	54.00	-10.90	28.76	14.34	Average	100	140
5	15570.00	55.39	74.00	-18.61	41.05	14.34	Peak	100	140

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).

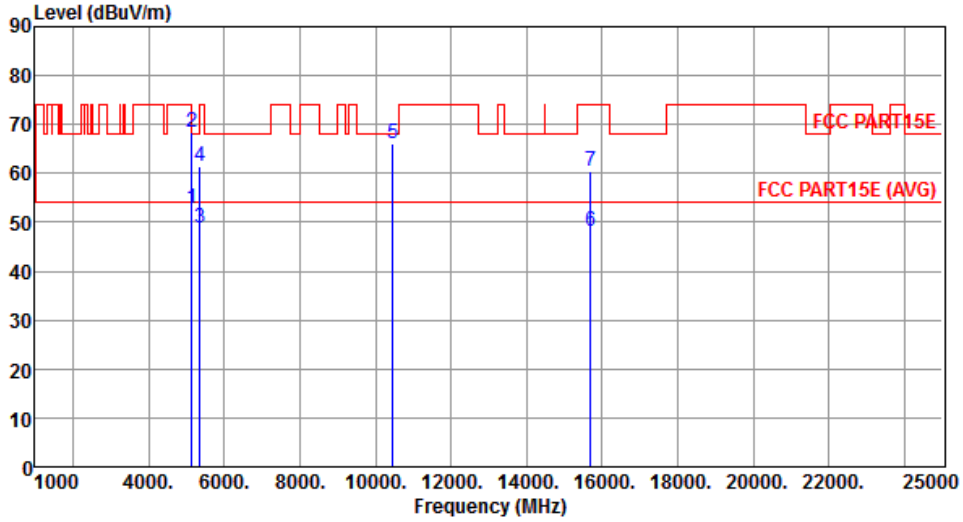
Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Horizontal		



	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	52.99	54.00	-1.01	48.51	4.48	Average	336	232
2	5150.00	69.70	74.00	-4.30	65.22	4.48	Peak	336	232
3	5350.00	49.62	54.00	-4.38	44.88	4.74	Average	336	232
4	5350.00	62.10	74.00	-11.90	57.36	4.74	Peak	336	232
5	10460.00	64.79	68.20	-3.41	50.86	13.93	Peak	213	258
6	15690.00	48.12	54.00	-5.88	33.97	14.15	Average	211	41
7	15690.00	60.43	74.00	-13.57	46.28	14.15	Peak	211	41

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).

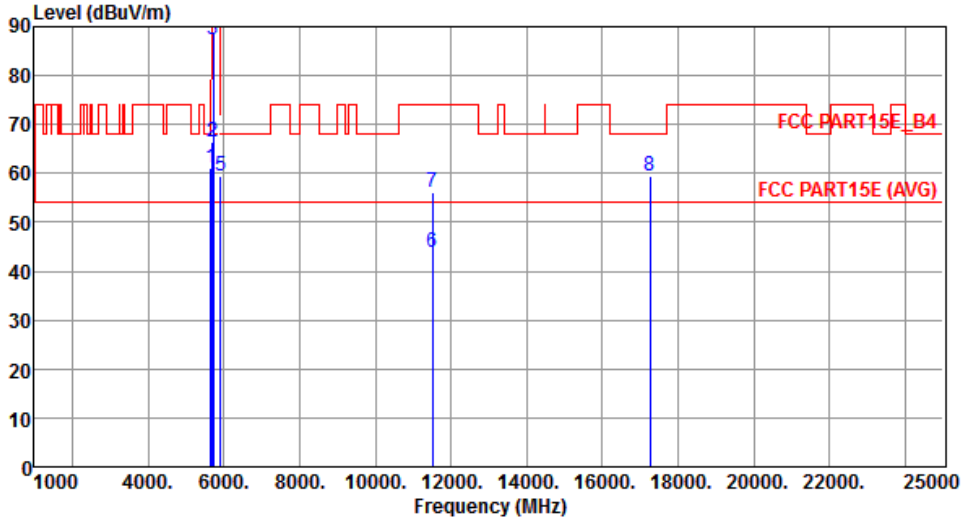
Modulation	VHT40	Test Freq. (MHz)	5230
Polarization	Vertical		



	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	52.93	54.00	-1.07	48.45	4.48	Average	307	247
2	5150.00	68.36	74.00	-5.64	63.88	4.48	Peak	307	247
3	5350.00	48.76	54.00	-5.24	44.02	4.74	Average	307	247
4	5350.00	61.49	74.00	-12.51	56.75	4.74	Peak	307	247
5	10460.00	66.02	68.20	-2.18	52.09	13.93	Peak	237	6
6	15690.00	48.21	54.00	-5.79	34.06	14.15	Average	237	335
7	15690.00	60.43	74.00	-13.57	46.28	14.15	Peak	237	335

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).

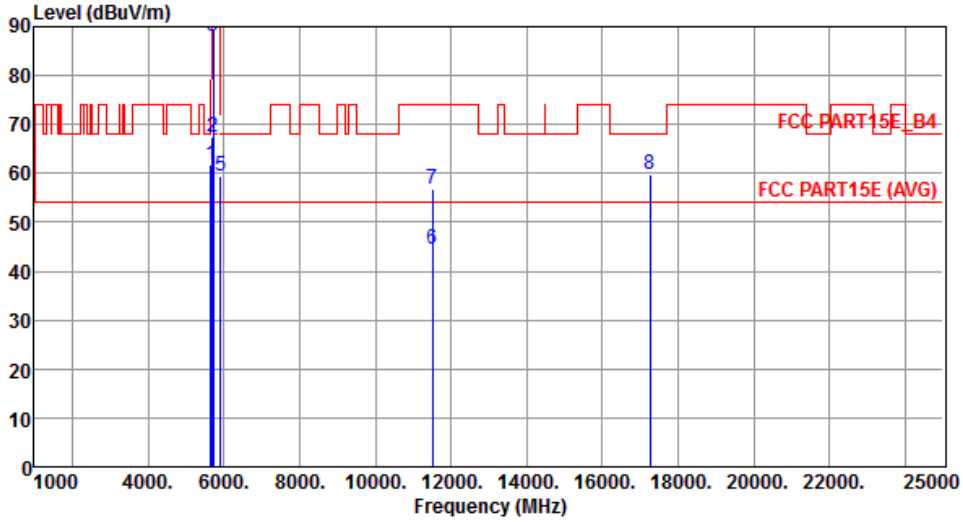
Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.22	68.20	-6.98	56.03	5.19	Peak	100	62
2	5700.00	66.43	105.20	-38.77	61.15	5.28	Peak	100	62
3	5720.00	87.38	110.80	-23.42	82.07	5.31	Peak	100	62
4	5725.00	88.57	122.20	-33.63	83.25	5.32	Peak	100	62
5	5925.00	59.48	68.20	-8.72	53.84	5.64	Peak	100	62
6	11510.00	43.84	54.00	-10.16	29.04	14.80	Average	100	255
7	11510.00	56.07	74.00	-17.93	41.27	14.80	Peak	100	255
8	17265.00	59.29	68.20	-8.91	41.51	17.78	Peak	100	119

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).

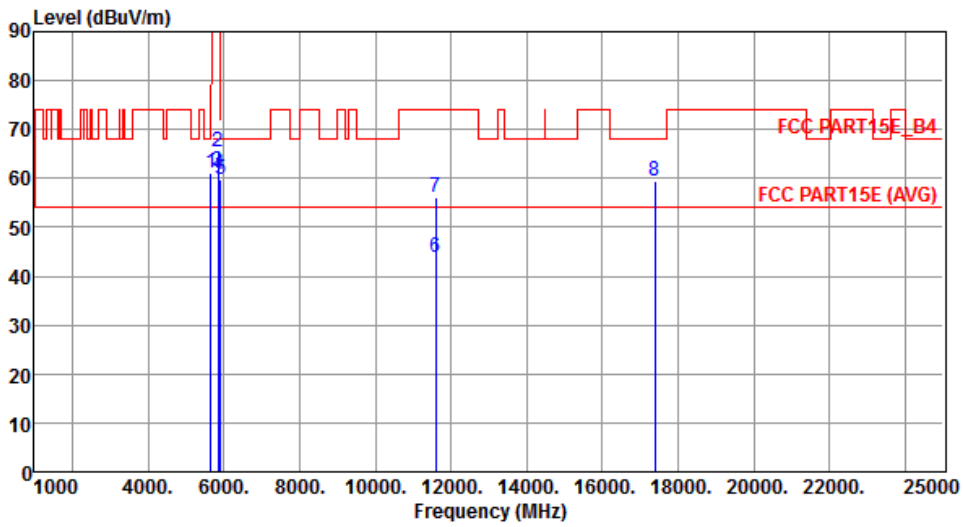
Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.82	68.20	-6.38	56.63	5.19	Peak	301	14
2	5700.00	67.50	105.20	-37.70	62.22	5.28	Peak	301	14
3	5720.00	88.07	110.80	-22.73	82.76	5.31	Peak	301	14
4	5725.00	89.48	122.20	-32.72	84.16	5.32	Peak	301	14
5	5925.00	59.59	68.20	-8.61	53.95	5.64	Peak	301	14
6	11510.00	44.62	54.00	-9.38	29.82	14.80	Average	100	7
7	11510.00	56.95	74.00	-17.05	42.15	14.80	Peak	100	7
8	17265.00	59.74	68.20	-8.46	41.96	17.78	Peak	100	109

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).

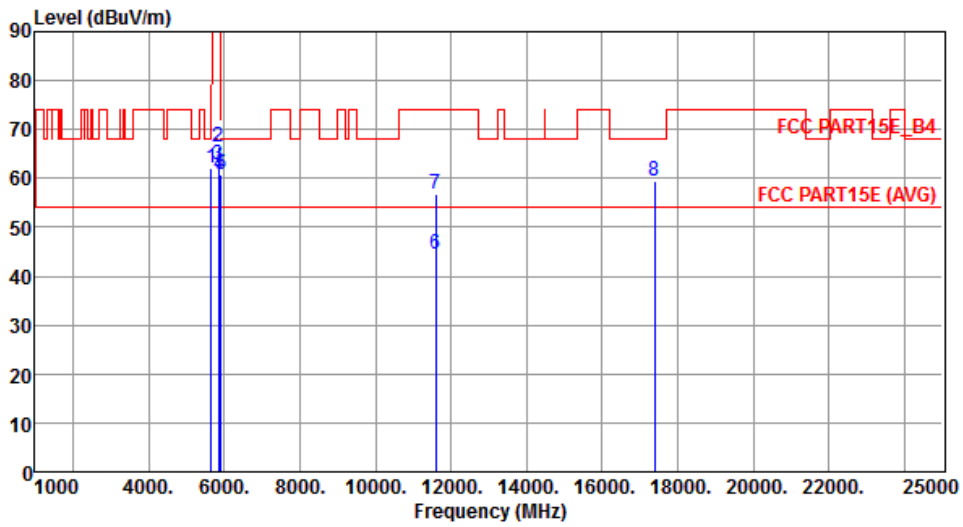
Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.04	68.20	-7.16	55.85	5.19	Peak	100	66
2	5850.00	65.34	122.20	-56.86	59.82	5.52	Peak	100	66
3	5855.00	61.40	110.80	-49.40	55.87	5.53	Peak	100	66
4	5875.00	60.90	105.20	-44.30	55.34	5.56	Peak	100	66
5	5925.00	59.66	68.20	-8.54	54.02	5.64	Peak	100	66
6	11590.00	43.72	54.00	-10.28	29.13	14.59	Average	100	258
7	11590.00	56.23	74.00	-17.77	41.64	14.59	Peak	100	258
8	17385.00	59.46	68.20	-8.74	41.39	18.07	Peak	100	121

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	Vertical		

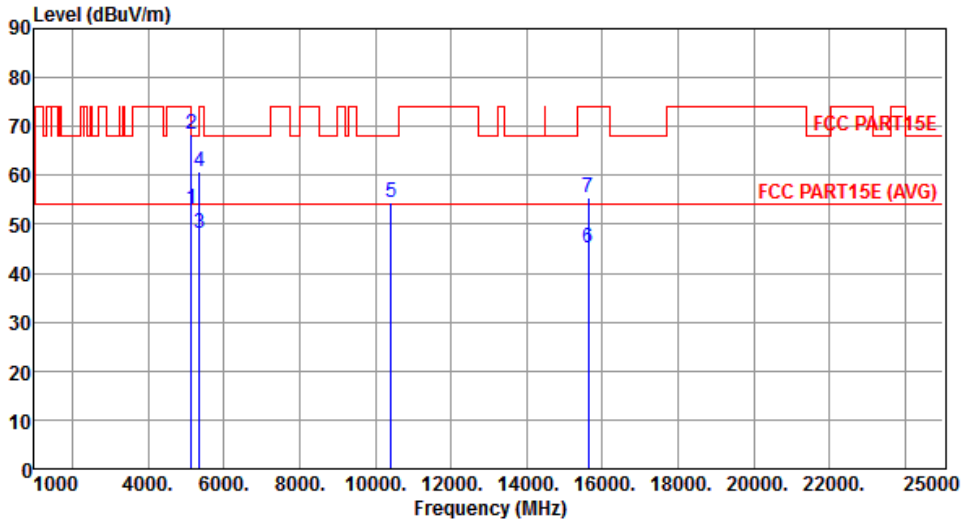


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	61.94	68.20	-6.26	56.75	5.19	Peak	325	13
2	5850.00	66.29	122.20	-55.91	60.77	5.52	Peak	325	13
3	5855.00	62.69	110.80	-48.11	57.16	5.53	Peak	325	13
4	5875.00	60.84	105.20	-44.36	55.28	5.56	Peak	325	13
5	5925.00	60.80	68.20	-7.40	55.16	5.64	Peak	325	13
6	11590.00	44.58	54.00	-9.42	29.99	14.59	Average	100	6
7	11590.00	56.87	74.00	-17.13	42.28	14.59	Peak	100	6
8	17385.00	59.39	68.20	-8.81	41.32	18.07	Peak	100	110

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).

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

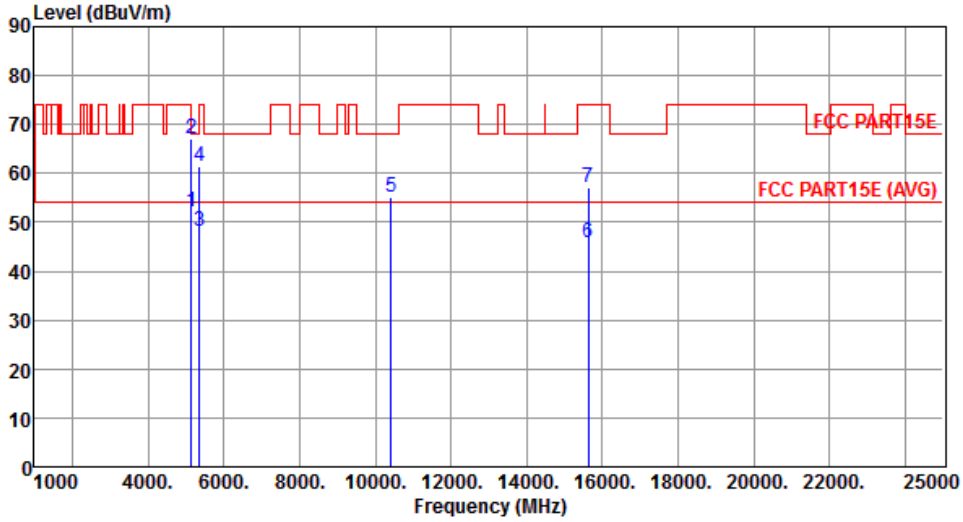
Modulation	VHT80	**Test Freq. (MHz)**	5210
Polarization	Horizontal		



	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	53.17	54.00	-0.83	48.69	4.48	Average	269	299
2	5150.00	68.27	74.00	-5.73	63.79	4.48	Peak	269	299
3	5350.00	48.25	54.00	-5.75	43.51	4.74	Average	269	299
4	5350.00	60.86	74.00	-13.14	56.12	4.74	Peak	269	299
5	10420.00	54.30	68.20	-13.90	40.43	13.87	Peak	100	247
6	15630.00	45.07	54.00	-8.93	30.82	14.25	Average	100	35
7	15630.00	55.45	74.00	-18.55	41.20	14.25	Peak	100	35

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).

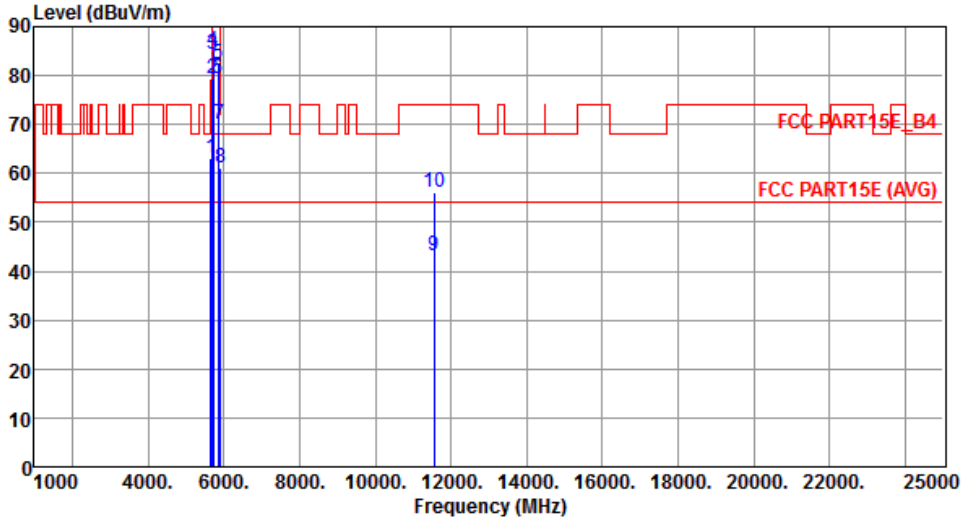
Modulation	VHT80	Test Freq. (MHz)	5210
Polarization	Vertical		



	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	52.27	54.00	-1.73	47.79	4.48	Average	339	199
2	5150.00	67.07	74.00	-6.93	62.59	4.48	Peak	339	199
3	5350.00	48.16	54.00	-5.84	43.42	4.74	Average	339	199
4	5350.00	61.28	74.00	-12.72	56.54	4.74	Peak	339	199
5	10420.00	55.13	68.20	-13.07	41.26	13.87	Peak	100	11
6	15630.00	45.73	54.00	-8.27	31.48	14.25	Average	100	322
7	15630.00	57.11	74.00	-16.89	42.86	14.25	Peak	100	322

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).

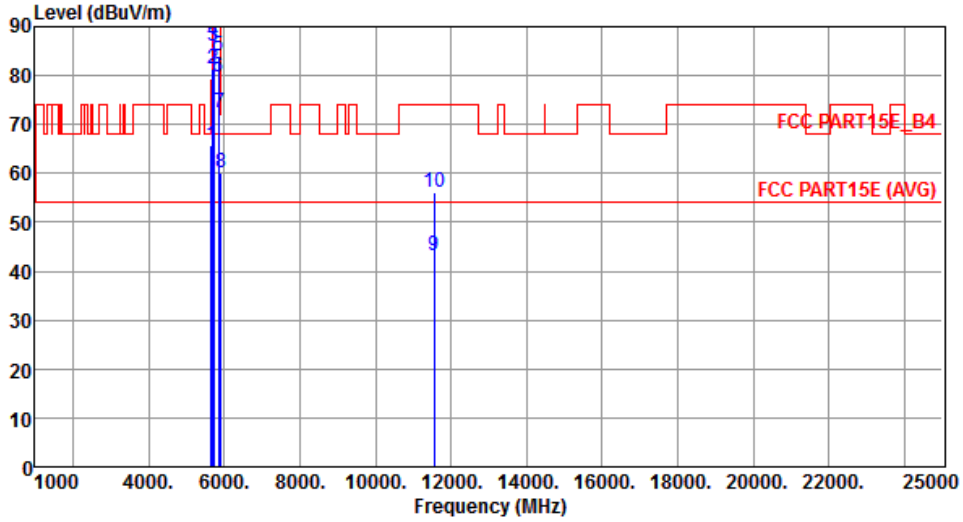
Modulation	VHT80	Test Freq. (MHz)	5775
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	63.25	68.20	-4.95	58.06	5.19	Peak	100	62
2	5700.00	79.49	105.20	-25.71	74.21	5.28	Peak	100	62
3	5720.00	84.43	110.80	-26.37	79.12	5.31	Peak	100	62
4	5725.00	85.10	122.20	-37.10	79.78	5.32	Peak	100	62
5	5850.00	82.24	122.20	-39.96	76.72	5.52	Peak	100	62
6	5855.00	79.38	110.80	-31.42	73.85	5.53	Peak	100	62
7	5875.00	69.92	105.20	-35.28	64.36	5.56	Peak	100	62
8	5925.00	61.20	68.20	-7.00	55.56	5.64	Peak	100	62
9	11550.00	43.20	54.00	-10.80	28.51	14.69	Average	100	163
10	11550.00	55.97	74.00	-18.03	41.28	14.69	Peak	100	163

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		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	5650.00	65.81	68.20	-2.39	60.62	5.19	Peak	330	12
2	5700.00	81.42	105.20	-23.78	76.14	5.28	Peak	330	12
3	5720.00	85.87	110.80	-24.93	80.56	5.31	Peak	330	12
4	5725.00	87.03	122.20	-35.17	81.71	5.32	Peak	330	12
5	5850.00	84.07	122.20	-38.13	78.55	5.52	Peak	330	12
6	5855.00	79.83	110.80	-30.97	74.30	5.53	Peak	330	12
7	5875.00	72.52	105.20	-32.68	66.96	5.56	Peak	330	12
8	5925.00	60.20	68.20	-8.00	54.56	5.64	Peak	330	12
9	11550.00	43.15	54.00	-10.85	28.46	14.69	Average	100	193
10	11550.00	56.17	74.00	-17.83	41.48	14.69	Peak	100	193

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 Frequency Stability

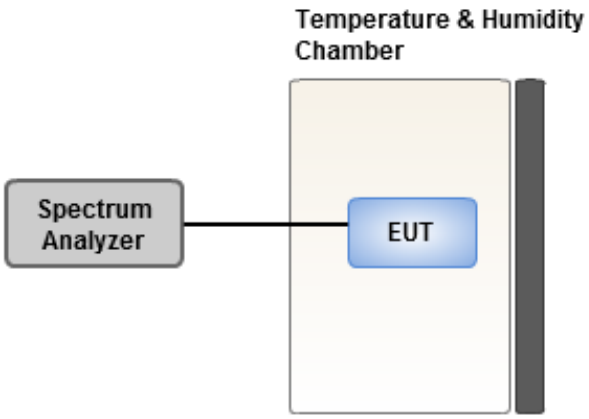
3.6.1 Limit of Frequency Stability

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°CVmax	5.61	6.21	5.64	5.72
T20°CVmin	4.54	5.06	4.47	4.49
T50°CVnom	3.40	3.41	3.81	3.21
T40°CVnom	3.68	3.37	4.02	3.60
T30°CVnom	3.13	3.09	3.76	3.59
T20°CVnom	2.70	3.41	2.47	3.49
T10°CVnom	2.45	1.97	2.71	2.75
T0°CVnom	1.72	1.70	2.01	2.62
T-10°CVnom	1.63	1.65	1.89	2.38
T-20°CVnom	0.85	0.63	1.47	0.80
T-30°CVnom	-0.06	-0.11	0.39	-0.30
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°CVmax	4.66	4.78	5.24	4.95
T20°CVmin	4.01	4.16	4.33	3.97
T50°CVnom	3.73	3.70	3.35	4.05
T40°CVnom	3.08	3.53	3.83	3.11
T30°CVnom	2.90	2.71	2.91	3.17
T20°CVnom	2.67	3.15	2.87	2.19
T10°CVnom	2.39	3.12	2.66	2.39
T0°CVnom	2.72	2.94	3.01	2.90
T-10°CVnom	1.46	1.32	1.56	1.79
T-20°CVnom	1.45	1.41	2.07	1.37
T-30°CVnom	1.39	1.78	1.81	1.61
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 District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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