FCC Test Report

FCC ID	:	**I88WAC6503D-S**
Equipment	:	**802.11 ac Unified Pro Access Point**
Model No.	:	**WAC6503D-S**
Brand Name	:	**ZyXEL**
Applicant	:	**ZyXEL Communications Corporation**
Address	:	**No. 2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Oct. 07, 2014**
Tested Date	:	**Oct. 14 ~ Nov. 5, 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

Testing Laboratory
2732

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Release Record

Report No.	Version	Description	Issued Date
FR4O0702AI	Rev. 01	Initial issue	Dec. 11, 2014

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.213MHz 40.05 (Margin -13.04dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 5416.00MHz 53.49 (Margin -0.51dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 29.73	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	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**
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 (Average) 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	Antenna Connector	Operating Frequencies (MHz) / Antenna Gain (dBi)				
				2400~2483.5	**5150~5250**	**5250~5350**	**5470~5725**	**5725~5850**
1	WAC6503D-S	Dipole	IPEX	4	6	6	6	6

1.1.3 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

1.1.4 Accessories

NA

1.1.5 Channel List

Frequency band (MHz)		5725~5850	
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	CART, Version: 4.9		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11a	98.32%	0.07
	VHT20	98.72%	0.06
	VHT40	95.20%	0.21
	VHT80	89.93%	0.46

1.1.7 Power Setting

Modulation Mode	Test Frequency (MHz)	Power Set
11a	5745	26
11a	5785	27
11a	5825	27
HT20	5745	25.5
HT20	5785	27
HT20	5825	27
HT40	5755	24
HT40	5795	27
VHT20	5745	25.5
VHT20	5785	27
VHT20	5825	27
VHT40	5755	24
VHT40	5795	27
VHT80	5775	21.5

1.2 Local Support Equipment List

Support Equipment List (Adapter Mode)					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook01	DELL	Latitude E5430	C0GB4X1	RJ45, 10m non-shielded w/o core.
2	Notebook02	DELL	Latitude E6440	JMXMD12	RJ45, 10m non-shielded w/o core.
3	AC Adapter	DVE	DSA-24CA-12 120120	---	---

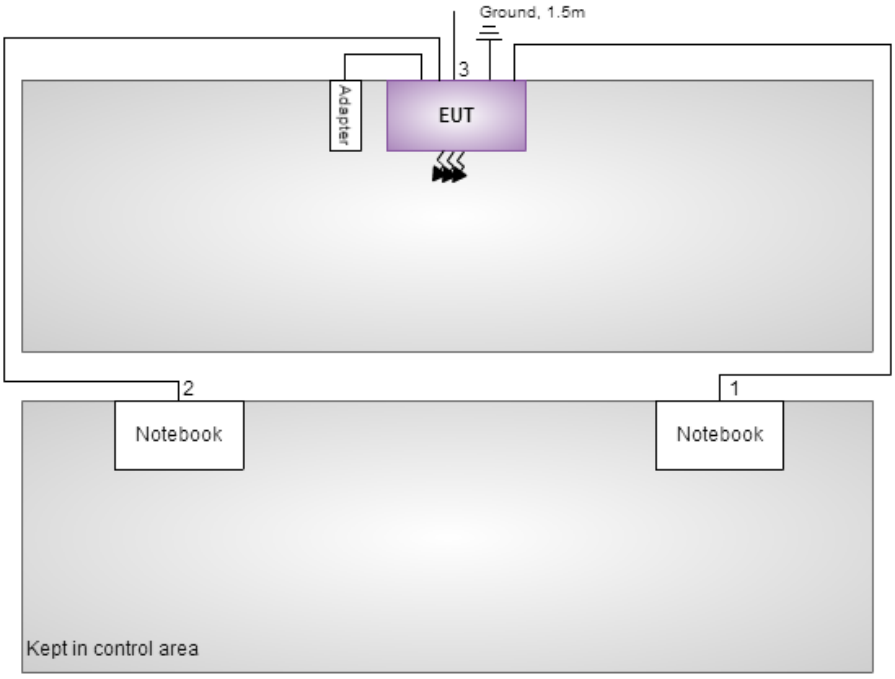
Note: No. 3 was provided by applicant.

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.

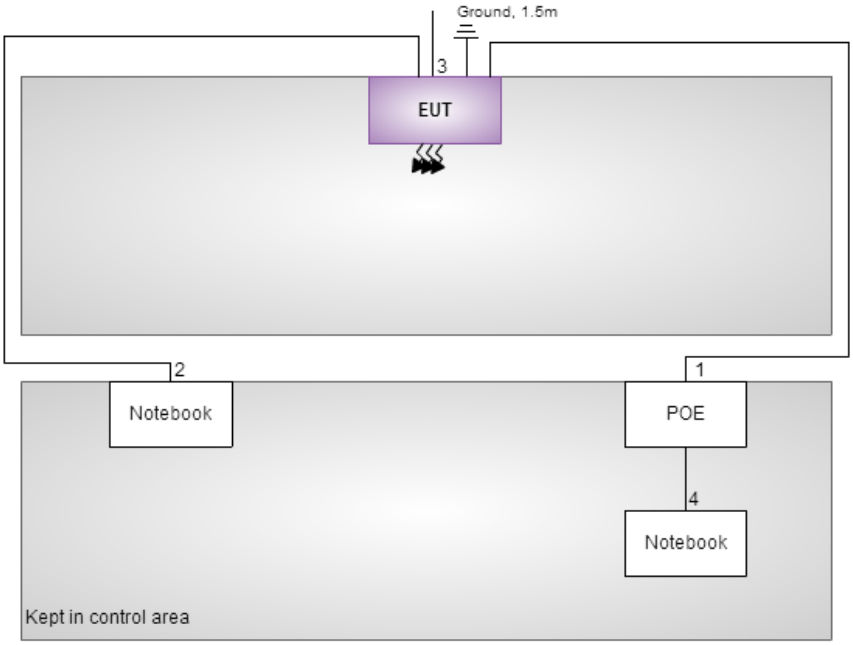
1.3 Test Setup Chart

Test Setup Diagram (Adapter Mode)



1-2. RJ45, 10m non-shielded w/o core
3. Console, 1.8m shielded w/o core

Test Setup Diagram (POE Mode)



1-2. RJ45, 10m non-shielded w/o core
3. Console, 1.8m shielded w/o core
4. RJ45, 1m non-shielded w/o core

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Test Date	Nov. 4 ~ Nov. 5, 2014				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
EMC Receiver	R&S	ESCS 30	100169	Oct. 17, 2014	Oct. 16, 2015
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)				
Test Date	Oct. 14 ~ Oct. 23, 2014				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 16, 2014	Sep. 15, 2015
Receiver	R&S	ESR3	101657	Jan. 18, 2014	Jan. 17, 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	BBHA9170154	Jan. 10, 2014	Jan. 09, 2015
Preamplifier	EMC	EMC02325	980187	Sep. 26, 2014	Sep. 25, 2015
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)				
Test Date	Nov. 04,2014				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101063	Feb. 17, 2014	Feb. 16, 2015
Power Meter	Anritsu	ML2495A	1241002	Sep. 29, 2014	Sep. 28, 2015
Power Sensor	Anritsu	MA2411B	1207366	Sep. 29, 2014	Sep. 28, 2015
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

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

47 CFR FCC Part 15.247
ANSI C63.10-2009
FCC KDB 558074 D01 DTS Meas Guidance v03r02
FCC KDB 644545 D01 Guidance for IEEE 802 11ac v01r02 Old Rules
FCC KDB 644545 D02 Alternative Guidance for 802 11ac Old 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 ^{o}C
Conducted emission	±2.670 dB
AC conducted emission	±2.92 dB
Radiated emission ≤ 1GHz	±3.26 dB
Radiated emission > 1GHz	±4.94 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 58-62%	Peter Lin
Radiated Emissions	03CH03-WS	21-26°C / 62-67%	Anderson Hung Aska Huang
RF Conducted	TH01-WS	21°C / 64%	Felix Sung

- 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	11a	5785	6 Mbps	1.2
Radiated Emissions ≤1GHz	11a	5785	6 Mbps	1.2
Maximum Output Power	11a	5745 / 5785 / 5825	6 Mbps	1
	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 6dB bandwidth Power spectral density	11a	5745 / 5785 / 5825	6 Mbps	1
	VHT20	5745 / 5785 / 5825	MCS 0	
	VHT40	5755 / 5795	MCS 0	
	VHT80	5775	MCS 0	

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: AC Adapter mode
   (2) Configuration 2: POE mode

3 Transmitter Test Results

3.1 Conducted Emissions

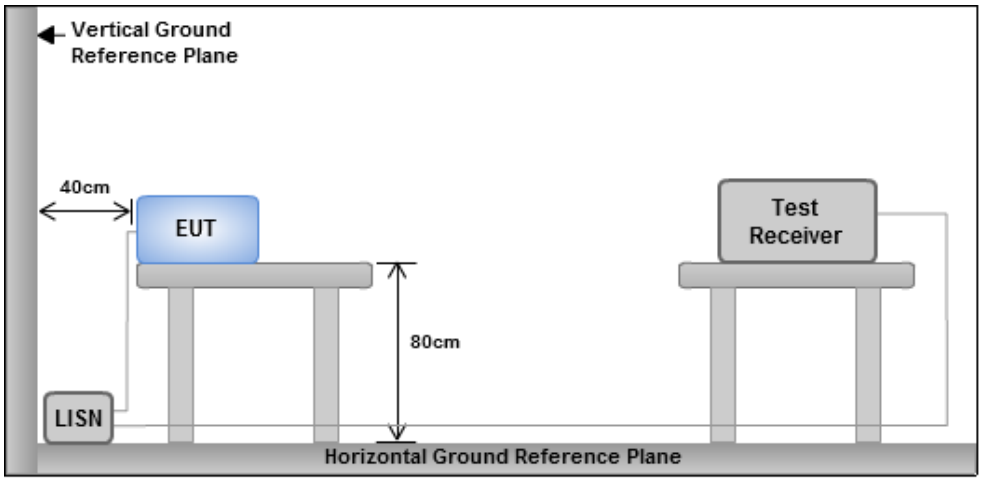
3.1.1 Limit of Conducted Emissions

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.

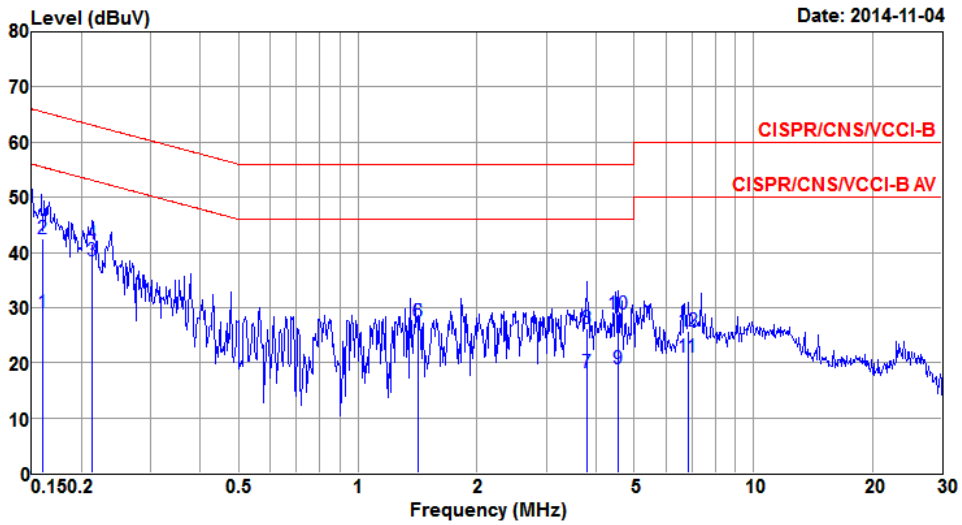
3.1.3 Test Setup



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

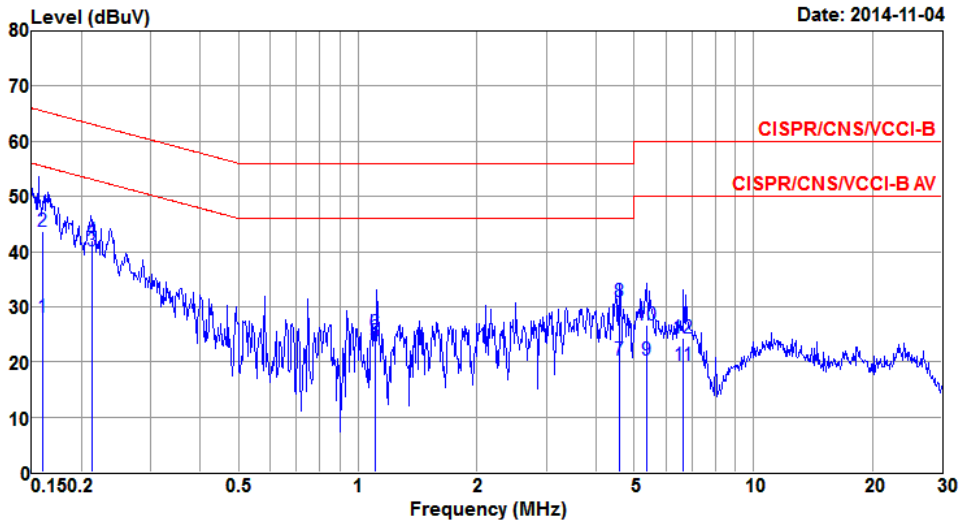
Modulation Mode	11a	Test Freq. (MHz)	5785
Power Phase	Line	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.160	29.07	55.48	-26.41	28.64	0.41	0.02	Average
2	0.160	42.47	65.48	-23.01	42.04	0.41	0.02	QP
3*	0.213	38.46	53.10	-14.64	38.02	0.43	0.01	Average
4	0.213	41.66	63.10	-21.44	41.22	0.43	0.01	QP
5	1.418	27.28	46.00	-18.72	26.39	0.87	0.02	Average
6	1.418	27.37	56.00	-28.63	26.48	0.87	0.02	QP
7	3.795	18.08	46.00	-27.92	16.87	1.07	0.14	Average
8	3.795	26.19	56.00	-29.81	24.98	1.07	0.14	QP
9	4.551	18.99	46.00	-27.01	17.67	1.16	0.16	Average
10	4.551	28.86	56.00	-27.14	27.54	1.16	0.16	QP
11	6.845	21.01	50.00	-28.99	19.36	1.44	0.21	Average
12	6.845	25.70	60.00	-34.30	24.05	1.44	0.21	QP

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

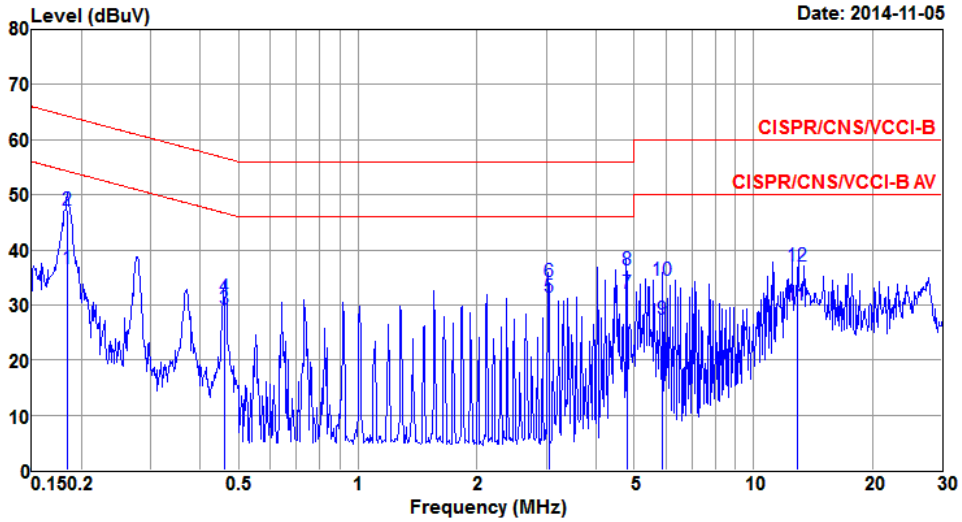
Modulation Mode	11a	Test Freq. (MHz)	5785
Power Phase	Neutral	Test Configuration	1



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.159	28.17	55.49	-27.32	27.66	0.49	0.02	Average
2	0.159	43.62	65.49	-21.87	43.11	0.49	0.02	QP
3*	0.213	40.05	53.09	-13.04	39.52	0.52	0.01	Average
4	0.213	41.95	63.09	-21.14	41.42	0.52	0.01	QP
5	1.108	23.68	46.00	-22.32	22.82	0.84	0.02	Average
6	1.108	25.36	56.00	-30.64	24.50	0.84	0.02	QP
7	4.571	20.36	46.00	-25.64	18.99	1.21	0.16	Average
8	4.571	30.96	56.00	-25.04	29.59	1.21	0.16	QP
9	5.390	20.35	50.00	-29.65	18.85	1.32	0.18	Average
10	5.390	26.67	60.00	-33.33	25.17	1.32	0.18	QP
11	6.662	19.40	50.00	-30.60	17.73	1.46	0.21	Average
12	6.662	24.36	60.00	-35.64	22.69	1.46	0.21	QP

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

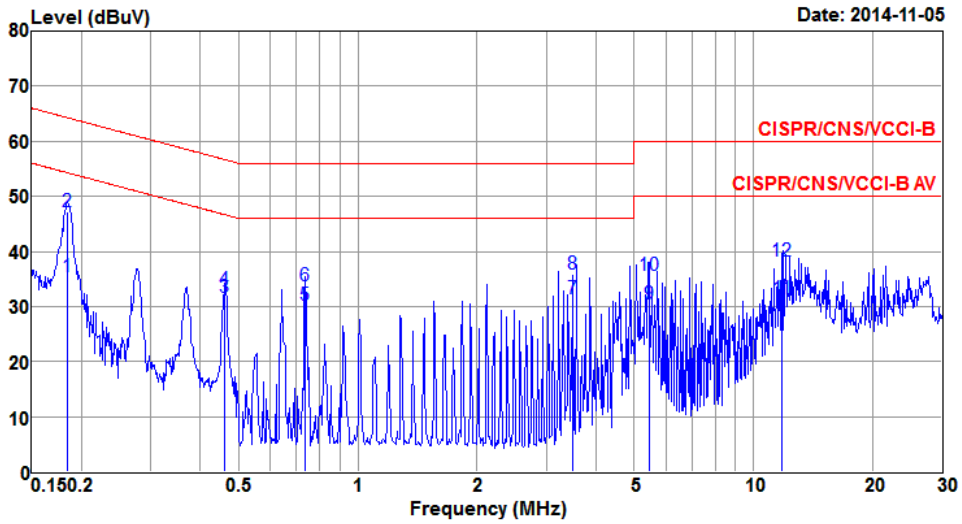
Modulation Mode	11a	Test Freq. (MHz)	5785
Power Phase	Line	Test Configuration	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.184	36.58	54.28	-17.70	36.18	0.39	0.01	Average
2	0.184	47.31	64.28	-16.97	46.91	0.39	0.01	QP
3	0.459	29.27	46.71	-17.44	28.86	0.39	0.02	Average
4	0.459	31.28	56.71	-25.43	30.87	0.39	0.02	QP
5	3.041	31.33	46.00	-14.67	30.78	0.45	0.10	Average
6	3.041	34.31	56.00	-21.69	33.76	0.45	0.10	QP
7*	4.792	32.08	46.00	-13.92	31.43	0.48	0.17	Average
8	4.792	36.46	56.00	-19.54	35.81	0.48	0.17	QP
9	5.898	27.33	50.00	-22.67	26.65	0.49	0.19	Average
10	5.898	34.54	60.00	-25.46	33.86	0.49	0.19	QP
11	12.902	29.90	50.00	-20.10	29.07	0.54	0.29	Average
12	12.902	37.11	60.00	-22.89	36.28	0.54	0.29	QP

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

Modulation Mode	11a	Test Freq. (MHz)	5785
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	0.184	35.41	54.28	-18.87	34.92	0.48	0.01	Average
2	0.184	47.21	64.28	-17.07	46.72	0.48	0.01	QP
3	0.461	31.60	46.67	-15.07	31.11	0.47	0.02	Average
4	0.461	32.97	56.67	-23.70	32.48	0.47	0.02	QP
5	0.736	30.22	46.00	-15.78	29.72	0.48	0.02	Average
6	0.736	33.79	56.00	-22.21	33.29	0.48	0.02	QP
7*	3.505	31.38	46.00	-14.62	30.74	0.52	0.12	Average
8	3.505	35.82	56.00	-20.18	35.18	0.52	0.12	QP
9	5.442	30.41	50.00	-19.59	29.70	0.53	0.18	Average
10	5.442	35.74	60.00	-24.26	35.03	0.53	0.18	QP
11	11.811	31.29	50.00	-18.71	30.46	0.56	0.27	Average
12	11.811	38.29	60.00	-21.71	37.46	0.56	0.27	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 6dB and Occupied Bandwidth

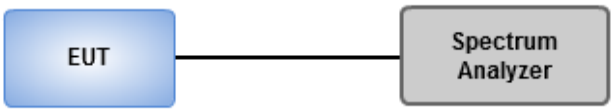
3.2.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.2.2 Test Procedures

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, 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) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

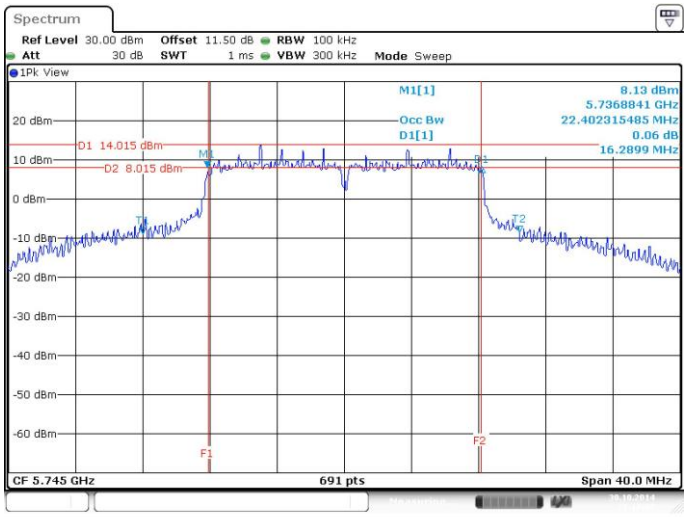
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

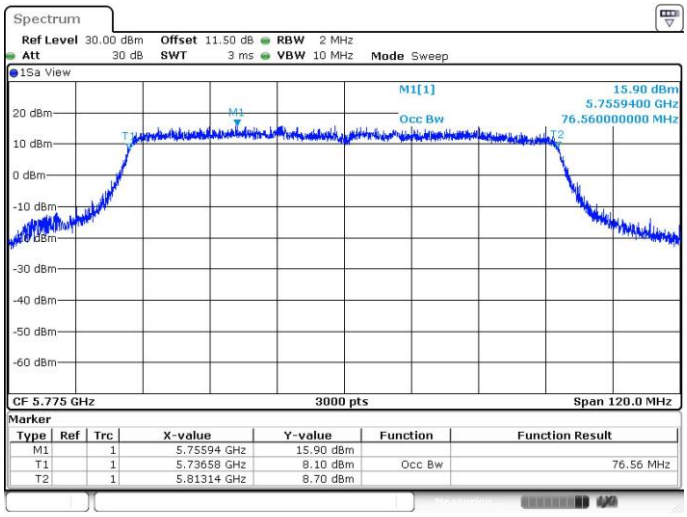
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11a	3	5745	16.29	16.35	16.35	---	500
11a	3	5785	16.35	16.29	16.41	---	500
11a	3	5825	16.35	16.35	16.35	---	500
VHT20	3	5745	17.57	17.62	17.51	---	500
VHT20	3	5785	17.62	17.62	16.57	---	500
VHT20	3	5825	17.51	17.57	17.28	---	500
VHT40	3	5755	36.29	36.29	35.94	---	500
VHT40	3	5795	36.06	36.29	36.41	---	500
VHT80	3	5775	75.59	75.83	75.36	---	500

Worst Plots



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11a	3	5745	20.11	18.69	20.03	---
11a	3	5785	22.29	20.92	21.21	---
11a	3	5825	21.32	20.94	21.27	---
VHT20	3	5745	20.00	18.56	19.15	---
VHT20	3	5785	22.02	21.07	21.91	---
VHT20	3	5825	21.82	20.86	21.35	---
VHT40	3	5755	37.28	37.08	37.06	---
VHT40	3	5795	40.00	39.64	41.04	---
VHT80	3	5775	76.48	76.56	76.40	---

Worst Plots



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

☒ Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

☐ Antenna gain > 6dBi

☐ Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

☐ Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations ,no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

☐ Maximum Peak Conducted Output Power

☐ **Power meter**

1. A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

☒ Maximum Conducted Output Power

☒ **Power meter**

1. A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup

3.3.4 Test Result of Maximum Output Power

Modulation Mode	N_{TX}	Freq. (MHz)	Conducted (Average) Output Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11a	3	5745	24.38	24.31	24.19	---	806.353	29.07	30.00
11a	3	5785	25.05	25.00	24.82	---	939.506	**29.73**	30.00
11a	3	5825	24.51	24.55	24.75	---	866.128	29.38	30.00
HT20	3	5745	24.02	24.03	24.04	---	758.791	28.80	30.00
HT20	3	5785	24.74	24.89	24.97	---	920.221	29.64	30.00
HT20	3	5825	24.53	24.43	24.55	---	846.226	29.27	30.00
HT40	3	5755	22.92	23.27	22.82	---	599.635	27.78	30.00
HT40	3	5795	24.51	24.98	25.11	---	921.602	29.65	30.00
VHT20	3	5745	24.07	24.11	24.06	---	767.585	28.85	30.00
VHT20	3	5785	24.78	24.95	25.03	---	931.635	29.69	30.00
VHT20	3	5825	24.58	24.48	24.61	---	856.689	29.33	30.00
VHT40	3	5755	22.96	23.36	22.90	---	609.452	27.85	30.00
VHT40	3	5795	24.58	25.03	25.18	---	935.108	29.71	30.00
VHT80	3	5775	20.39	20.78	20.46	---	340.243	25.32	30.00

3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

☐ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 30kHz, VBW = 100kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

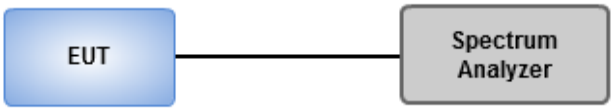
☒ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit. (For 11a / VHT20)

1. Set the RBW = 30kHz, VBW = 100 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Employ trace averaging (RMS) mode over a minimum of 100 traces.
4. Use the peak marker function to determine the maximum amplitude level.

☒ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit. (For VHT40 / VHT80)

1. Set the RBW = 30kHz, VBW = 100 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Manually set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (total on/off period of the transmitted signal).
4. Perform the measurement over a single sweep.
5. Use the peak marker function to determine the maximum amplitude level.
6. Add 10 log (1/x), where x is the duty cycle

3.4.3 Test Setup



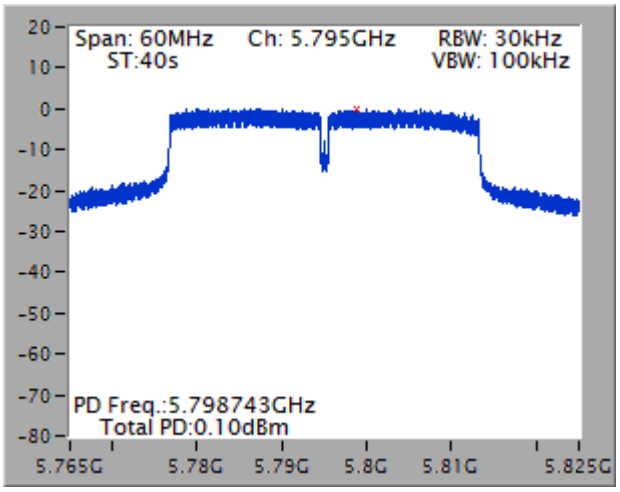
3.4.4 Test Result of Power Spectral Density

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	3	5745	-1.15	0.00	-1.15	3.23
11a	3	5785	-0.94	0.00	-0.94	3.23
11a	3	5825	-1.11	0.00	-1.11	3.23
VHT20	3	5745	-1.49	0.00	-1.49	3.23
VHT20	3	5785	-1.34	0.00	-1.34	3.23
VHT20	3	5825	-1.22	0.00	-1.22	3.23
VHT40	3	5755	-1.20	0.21	-0.99	3.23
VHT40	3	5795	0.10	0.21	0.31	3.23
VHT80	3	5775	-6.23	0.46	-5.77	3.23

Note:

1. Test result is bin-by-bin summing measured value of each TX port.
2. Directional gain = 6 + 10 * log(3/1) = 10.77 dBi > 6 dBi.
   Limit shall be reduced to 8 dBm – (10.77 dBi – 6 dBi) = 3.23 dBm.

Worst Plots



Note: The test plot without duty factor.

3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

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.

3.5.2 Test Procedures

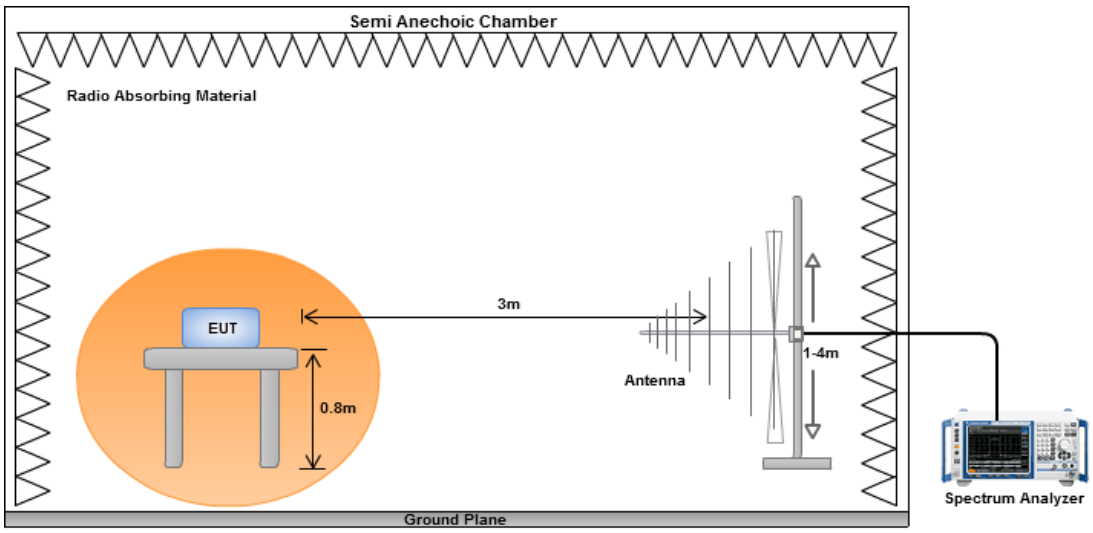
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission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

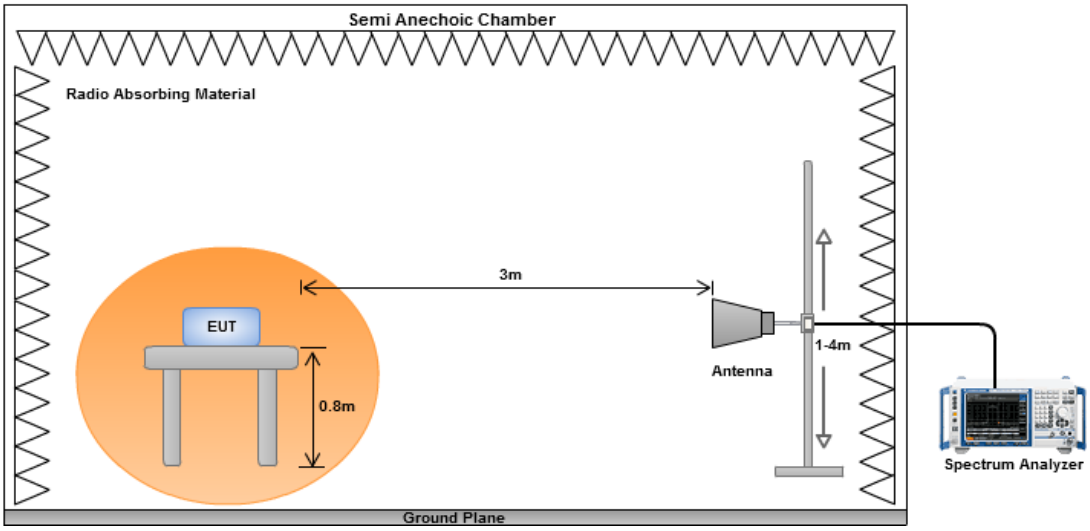
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

3.5.3 Test Setup

Radiated Emissions below 1 GHz

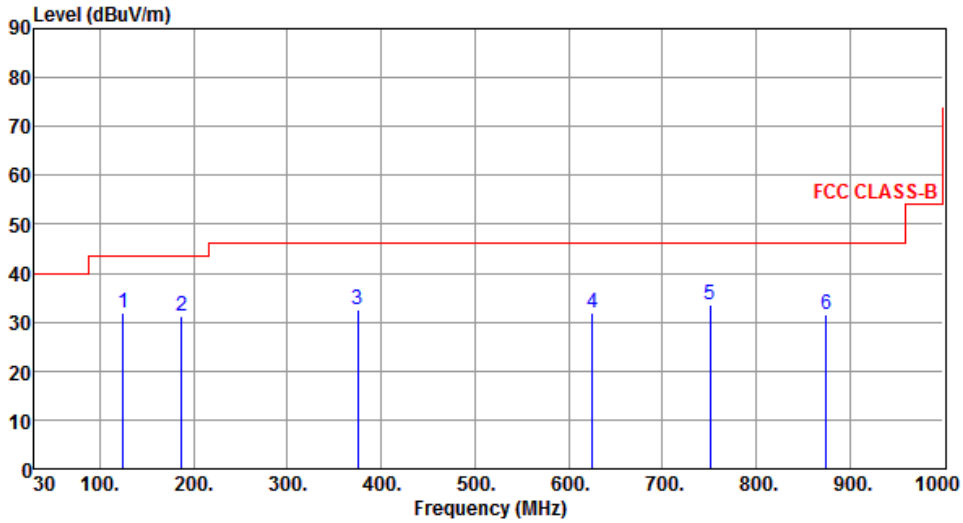


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

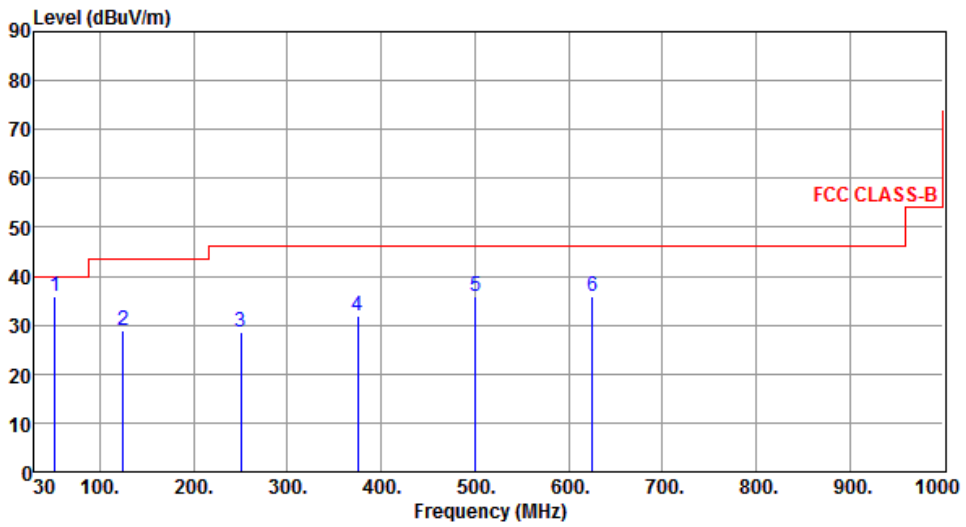
Modulation	11a	**Test Freq. (MHz)**	5785
Polarization	Horizontal	**Test Configuration**	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	125.06	31.91	43.50	-11.59	47.06	-15.15	Peak	---	---
2	187.14	31.10	43.50	-12.40	46.90	-15.80	Peak	---	---
3	375.32	32.42	46.00	-13.58	43.17	-10.75	Peak	---	---
4	625.58	31.87	46.00	-14.13	37.13	-5.26	Peak	---	---
5	750.71	33.53	46.00	-12.47	36.68	-3.15	Peak	---	---
6	874.87	31.41	46.00	-14.59	32.56	-1.15	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.

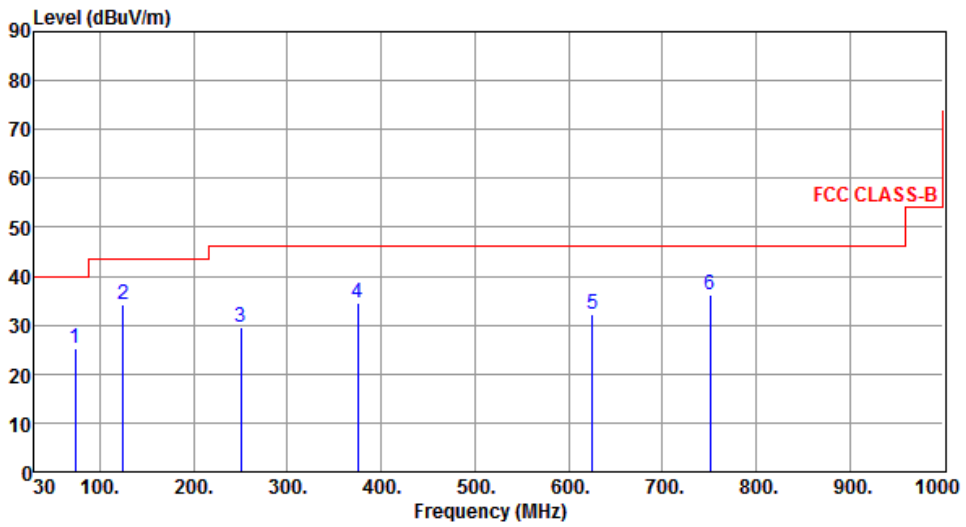
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	52.31	35.87	40.00	-4.13	48.97	-13.10	Peak	---	---
2	125.06	28.85	43.50	-14.65	44.00	-15.15	Peak	---	---
3	250.19	28.44	46.00	-17.56	42.91	-14.47	Peak	---	---
4	375.32	31.96	46.00	-14.04	42.71	-10.75	Peak	---	---
5	500.45	36.02	46.00	-9.98	44.02	-8.00	Peak	---	---
6	625.58	36.02	46.00	-9.98	41.28	-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.

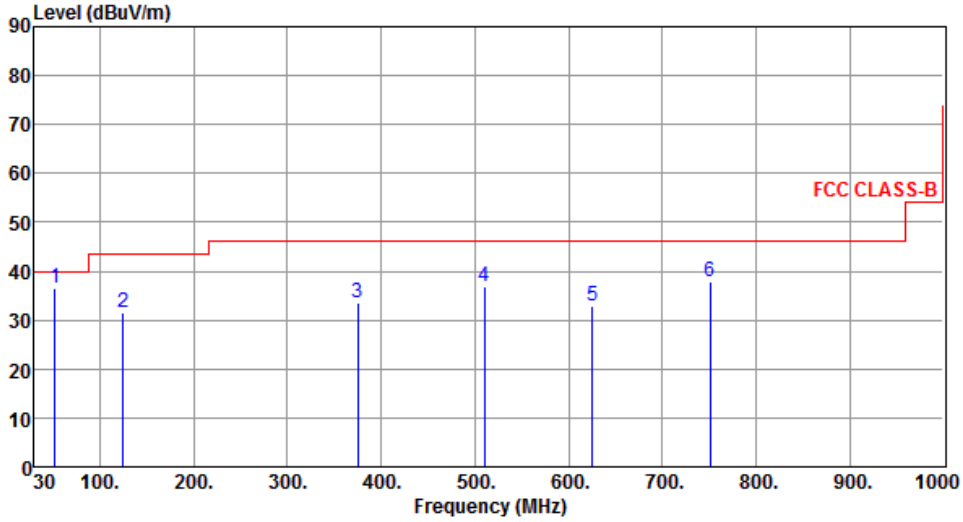
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal	Test Configuration	2



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	73.65	25.16	40.00	-14.84	41.37	-16.21	Peak	---	---
2	125.06	34.27	43.50	-9.23	49.42	-15.15	Peak	---	---
3	250.19	29.55	46.00	-16.45	44.02	-14.47	Peak	---	---
4	375.32	34.66	46.00	-11.34	45.41	-10.75	Peak	---	---
5	625.58	32.38	46.00	-13.62	37.64	-5.26	Peak	---	---
6	750.71	36.05	46.00	-9.95	39.20	-3.15	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	11a	Test Freq. (MHz)	5785
Polarization	Vertical	Test Configuration	2

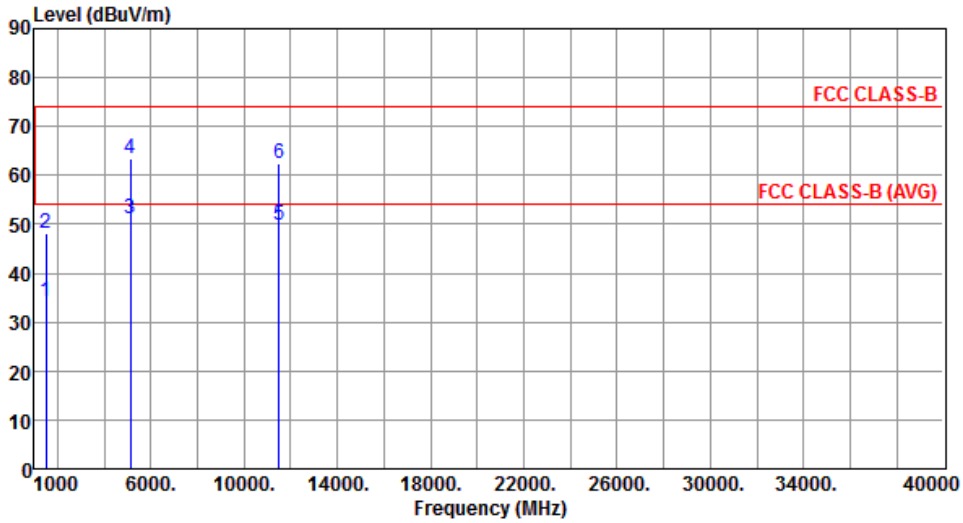


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	52.31	36.40	40.00	-3.60	49.50	-13.10	Peak	---	---
2	125.06	31.47	43.50	-12.03	46.62	-15.15	Peak	---	---
3	375.32	33.47	46.00	-12.53	44.22	-10.75	Peak	---	---
4	510.15	36.93	46.00	-9.07	44.77	-7.84	Peak	---	---
5	625.58	32.73	46.00	-13.27	37.99	-5.26	Peak	---	---
6	750.71	37.81	46.00	-8.19	40.96	-3.15	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

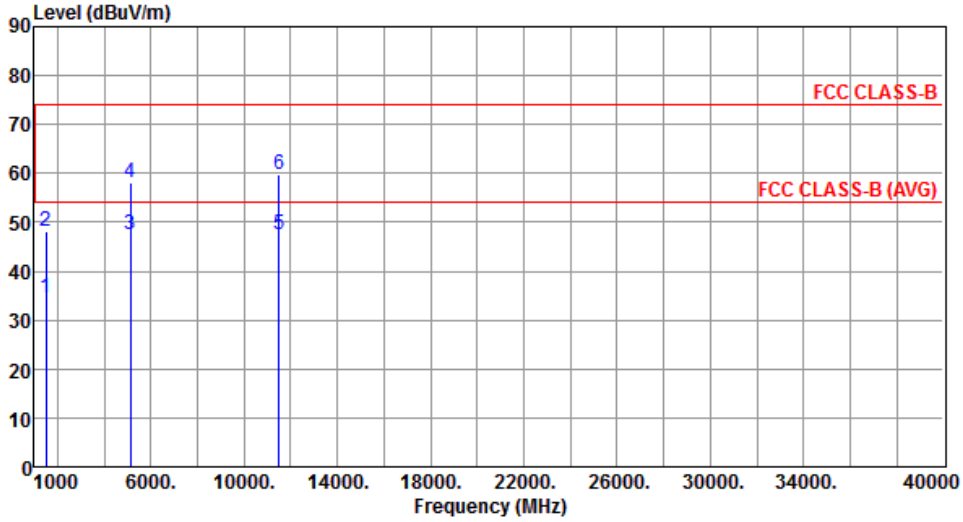
Modulation	11a	**Test Freq. (MHz)**	5745
Polarization	Horizontal	**Test Configuration**	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.35	54.00	-19.65	39.34	-4.99	Average	---	---
2	1500.00	48.26	74.00	-25.74	53.25	-4.99	Peak	---	---
3	5107.00	51.15	54.00	-2.85	45.05	6.10	Average	---	---
4	5107.00	63.46	74.00	-10.54	57.36	6.10	Peak	---	---
5	11490.00	49.66	54.00	-4.34	32.43	17.23	Average	---	---
6	11490.00	62.40	74.00	-11.60	45.17	17.23	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).

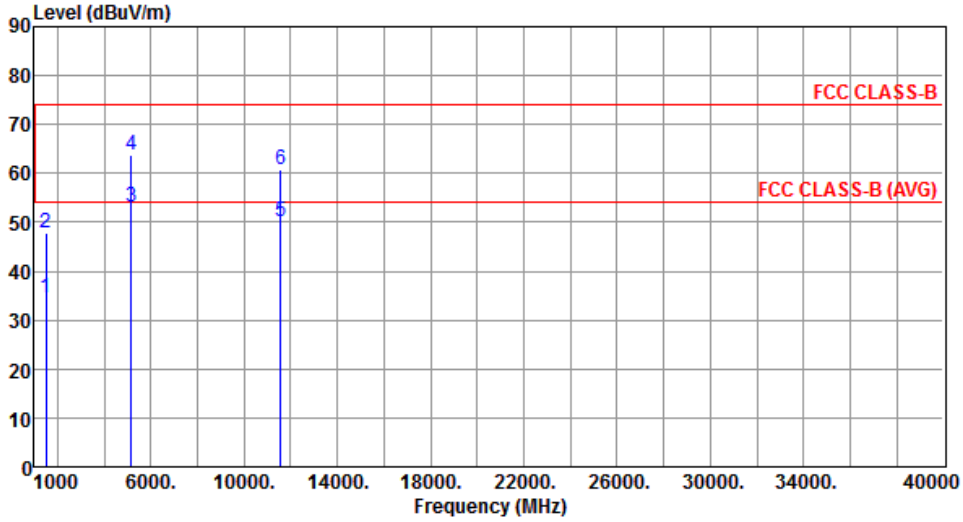
Modulation	11a	Test Freq. (MHz)	5745
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.44	54.00	-19.56	39.43	-4.99	Average	---	---
2	1500.00	48.19	74.00	-25.81	53.18	-4.99	Peak	---	---
3	5107.00	47.39	54.00	-6.61	41.29	6.10	Average	---	---
4	5107.00	58.27	74.00	-15.73	52.17	6.10	Peak	---	---
5	11490.00	47.55	54.00	-6.45	30.32	17.23	Average	---	---
6	11490.00	59.92	74.00	-14.08	42.69	17.23	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).

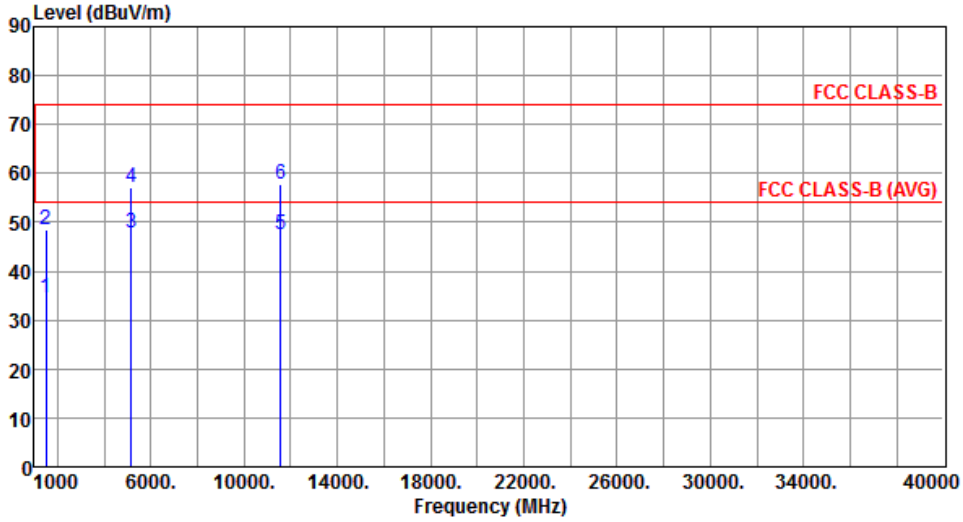
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.64	54.00	-19.36	39.63	-4.99	Average	---	---
2	1500.00	47.80	74.00	-26.20	52.79	-4.99	Peak	---	---
3	5146.00	53.26	54.00	-0.74	47.08	6.18	Average	---	---
4	5146.00	63.70	74.00	-10.30	57.52	6.18	Peak	---	---
5	11570.00	50.04	54.00	-3.96	32.95	17.09	Average	---	---
6	11570.00	60.78	74.00	-13.22	43.69	17.09	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).

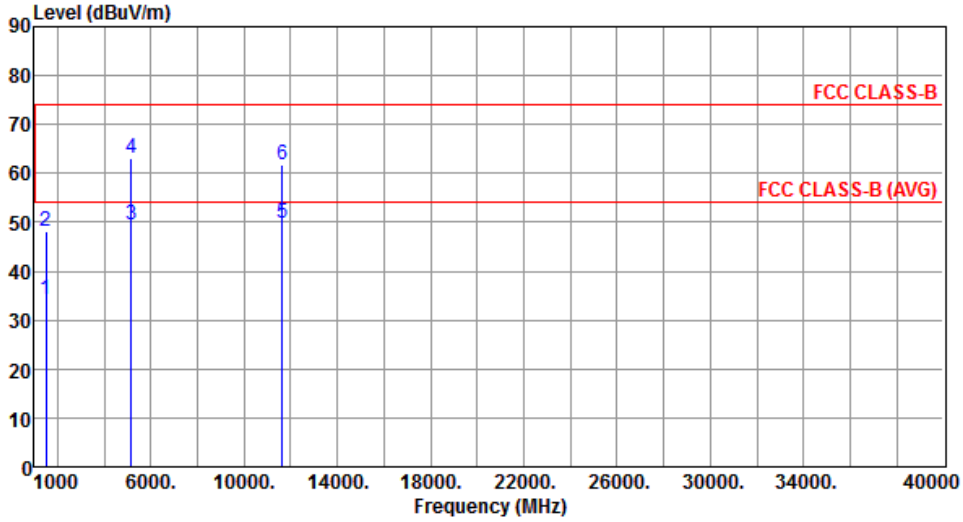
Modulation	11a	Test Freq. (MHz)	5785
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.53	54.00	-19.47	39.52	-4.99	Average	---	---
2	1500.00	48.33	74.00	-25.67	53.32	-4.99	Peak	---	---
3	5146.00	47.66	54.00	-6.34	41.48	6.18	Average	---	---
4	5146.00	57.17	74.00	-16.83	50.99	6.18	Peak	---	---
5	11570.00	47.51	54.00	-6.49	30.42	17.09	Average	---	---
6	11570.00	57.76	74.00	-16.24	40.67	17.09	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).

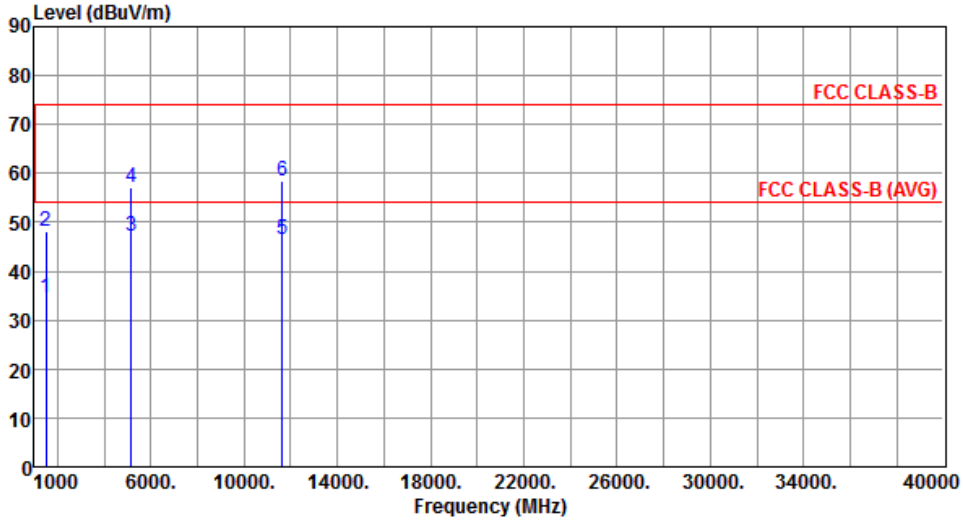
Modulation	11a	Test Freq. (MHz)	5825
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.35	54.00	-19.65	39.34	-4.99	Average	---	---
2	1500.00	48.30	74.00	-25.70	53.29	-4.99	Peak	---	---
3	5149.00	49.64	54.00	-4.36	43.46	6.18	Average	---	---
4	5149.00	63.23	74.00	-10.77	57.05	6.18	Peak	---	---
5	11650.00	49.76	54.00	-4.24	32.82	16.94	Average	---	---
6	11650.00	61.78	74.00	-12.22	44.84	16.94	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)	5825
Polarization	Vertical	Test Configuration	1

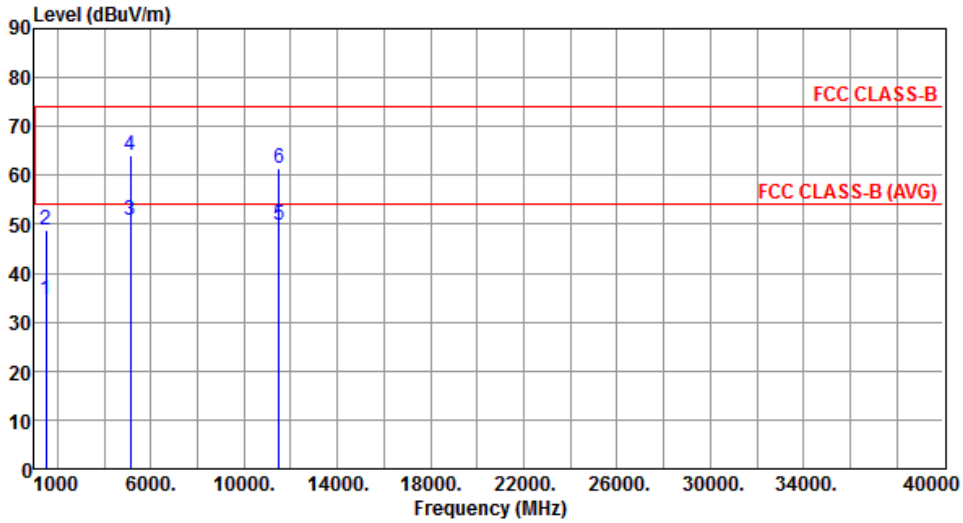


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.48	54.00	-19.52	39.47	-4.99	Average	---	---
2	1500.00	48.19	74.00	-25.81	53.18	-4.99	Peak	---	---
3	5149.00	47.24	54.00	-6.76	41.06	6.18	Average	---	---
4	5149.00	57.00	74.00	-17.00	50.82	6.18	Peak	---	---
5	11650.00	46.64	54.00	-7.36	29.70	16.94	Average	---	---
6	11650.00	58.31	74.00	-15.69	41.37	16.94	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).

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

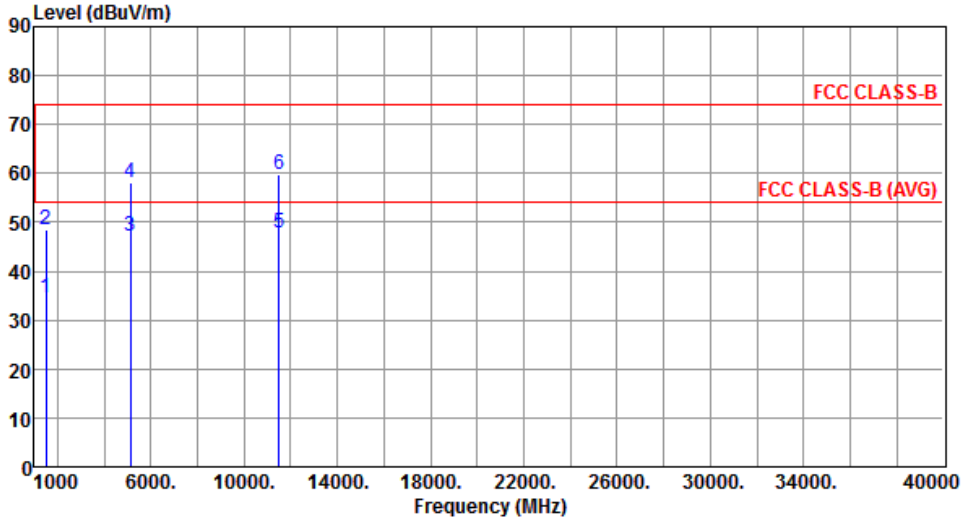
Modulation	VHT20	**Test Freq. (MHz)**	5745
Polarization	Horizontal	**Test Configuration**	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.58	54.00	-19.42	39.57	-4.99	Average	---	---
2	1500.00	48.76	74.00	-25.24	53.75	-4.99	Peak	---	---
3	5107.00	50.72	54.00	-3.28	44.62	6.10	Average	---	---
4	5107.00	63.95	74.00	-10.05	57.85	6.10	Peak	---	---
5	11490.00	49.88	54.00	-4.12	32.65	17.23	Average	---	---
6	11490.00	61.40	74.00	-12.60	44.17	17.23	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).

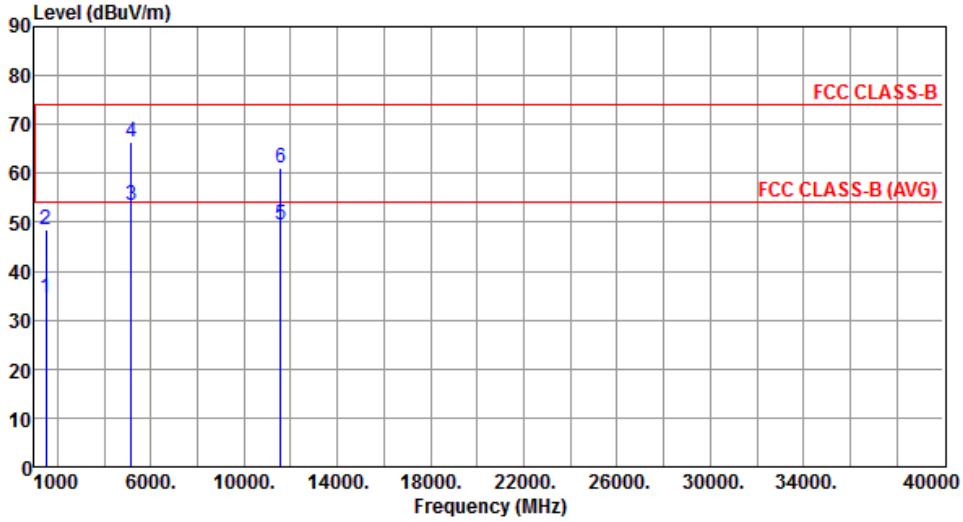
Modulation	VHT20	Test Freq. (MHz)	5745
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.44	54.00	-19.56	39.43	-4.99	Average	---	---
2	1500.00	48.40	74.00	-25.60	53.39	-4.99	Peak	---	---
3	5107.00	47.20	54.00	-6.80	41.10	6.10	Average	---	---
4	5107.00	58.01	74.00	-15.99	51.91	6.10	Peak	---	---
5	11490.00	47.88	54.00	-6.12	30.65	17.23	Average	---	---
6	11490.00	59.72	74.00	-14.28	42.49	17.23	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).

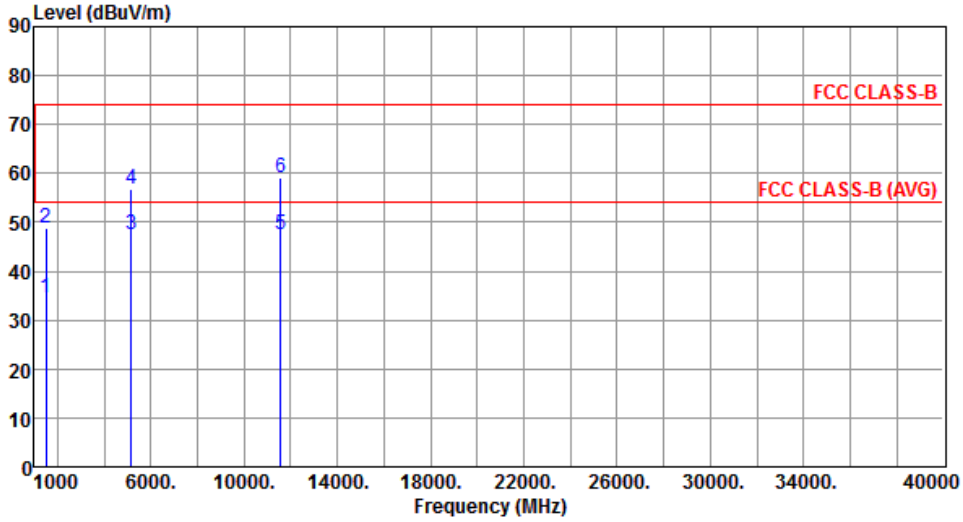
Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.53	54.00	-19.47	39.52	-4.99	Average	---	---
2	1500.00	48.44	74.00	-25.56	53.43	-4.99	Peak	---	---
3	5146.00	53.49	54.00	-0.51	47.31	6.18	Average	---	---
4	5146.00	66.31	74.00	-7.69	60.13	6.18	Peak	---	---
5	11570.00	49.42	54.00	-4.58	32.33	17.09	Average	---	---
6	11570.00	61.25	74.00	-12.75	44.16	17.09	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).

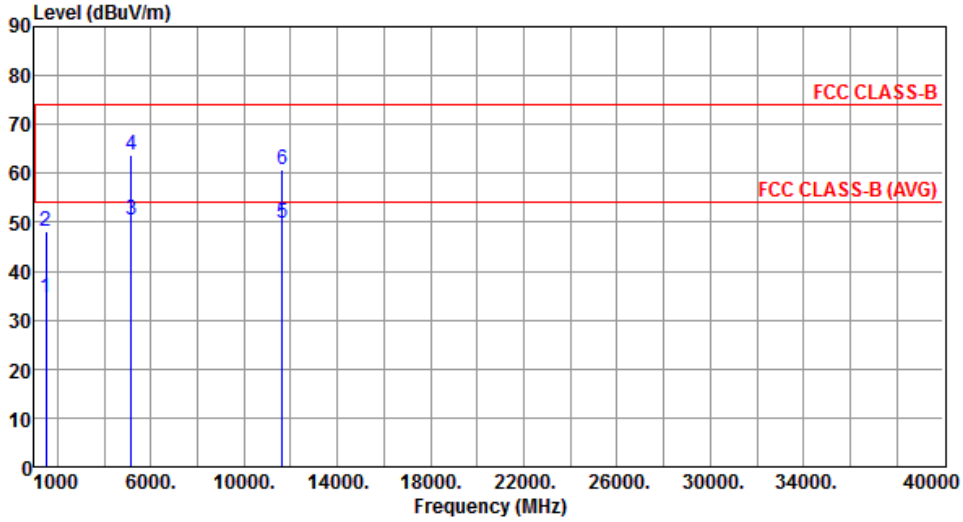
Modulation	VHT20	Test Freq. (MHz)	5785
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.64	54.00	-19.36	39.63	-4.99	Average	---	---
2	1500.00	48.76	74.00	-25.24	53.75	-4.99	Peak	---	---
3	5146.00	47.51	54.00	-6.49	41.33	6.18	Average	---	---
4	5146.00	56.86	74.00	-17.14	50.68	6.18	Peak	---	---
5	11570.00	47.47	54.00	-6.53	30.38	17.09	Average	---	---
6	11570.00	58.98	74.00	-15.02	41.89	17.09	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).

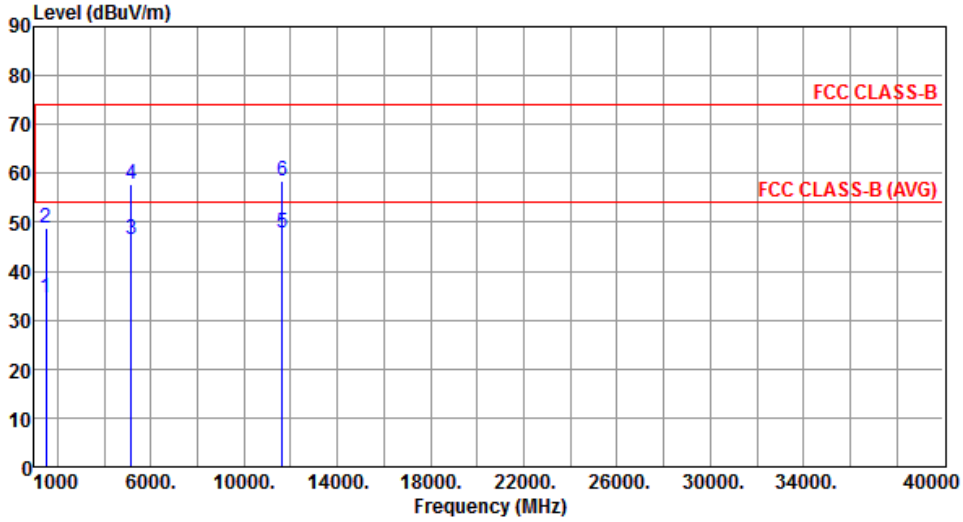
Modulation	VHT20	Test Freq. (MHz)	5825
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.39	54.00	-19.61	39.38	-4.99	Average	---	---
2	1500.00	48.23	74.00	-25.77	53.22	-4.99	Peak	---	---
3	5150.00	50.50	54.00	-3.50	44.32	6.18	Average	---	---
4	5150.00	63.89	74.00	-10.11	57.71	6.18	Peak	---	---
5	11650.00	49.77	54.00	-4.23	32.83	16.94	Average	---	---
6	11650.00	60.65	74.00	-13.35	43.71	16.94	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)	5825
Polarization	Vertical	Test Configuration	1

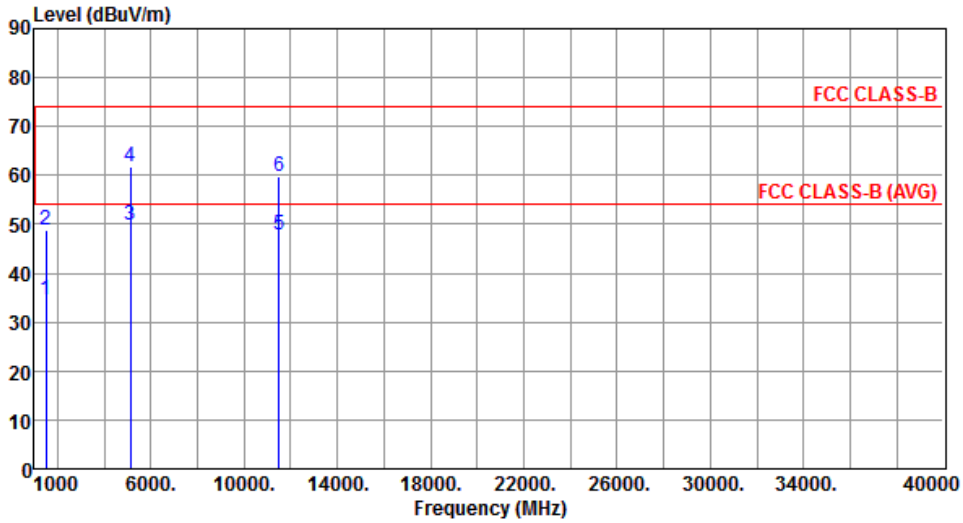


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.65	54.00	-19.35	39.64	-4.99	Average	---	---
2	1500.00	48.73	74.00	-25.27	53.72	-4.99	Peak	---	---
3	5150.00	46.56	54.00	-7.44	40.38	6.18	Average	---	---
4	5150.00	57.65	74.00	-16.35	51.47	6.18	Peak	---	---
5	11650.00	47.69	54.00	-6.31	30.75	16.94	Average	---	---
6	11650.00	58.32	74.00	-15.68	41.38	16.94	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).

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

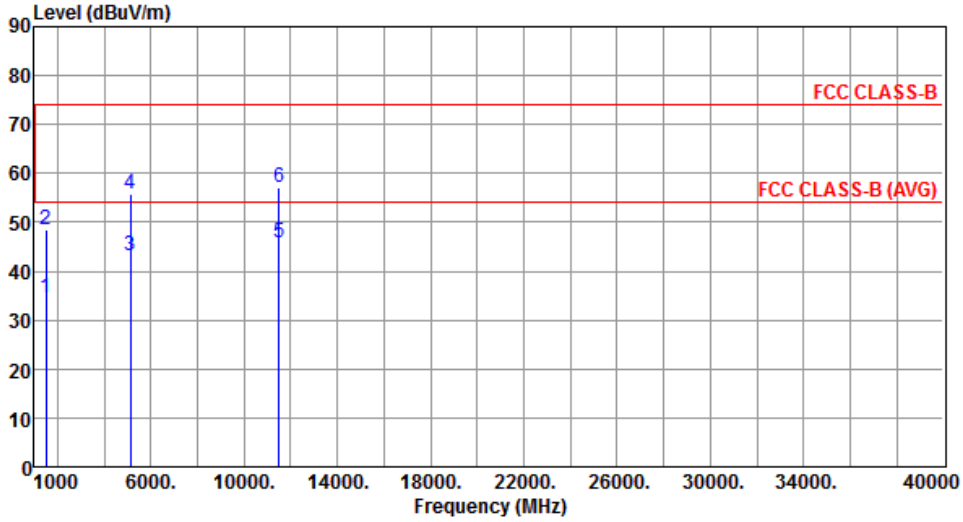
Modulation	VHT40	**Test Freq. (MHz)**	5755
Polarization	Horizontal	**Test Configuration**	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.44	54.00	-19.56	39.43	-4.99	Average	---	---
2	1500.00	48.73	74.00	-25.27	53.72	-4.99	Peak	---	---
3	5126.00	49.96	54.00	-4.04	43.83	6.13	Average	---	---
4	5126.00	61.88	74.00	-12.12	55.75	6.13	Peak	---	---
5	11510.00	47.94	54.00	-6.06	30.74	17.20	Average	---	---
6	11510.00	59.73	74.00	-14.27	42.53	17.20	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).

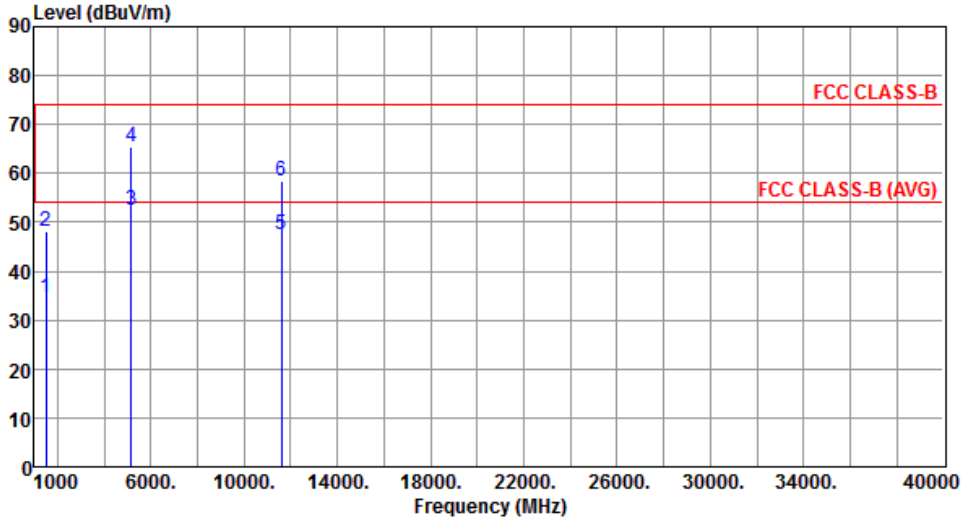
Modulation	VHT40	Test Freq. (MHz)	5755
Polarization	Vertical	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.48	54.00	-19.52	39.47	-4.99	Average	---	---
2	1500.00	48.60	74.00	-25.40	53.59	-4.99	Peak	---	---
3	5126.00	43.30	54.00	-10.70	37.17	6.13	Average	---	---
4	5126.00	55.68	74.00	-18.32	49.55	6.13	Peak	---	---
5	11510.00	45.84	54.00	-8.16	28.64	17.20	Average	---	---
6	11510.00	57.16	74.00	-16.84	39.96	17.20	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).

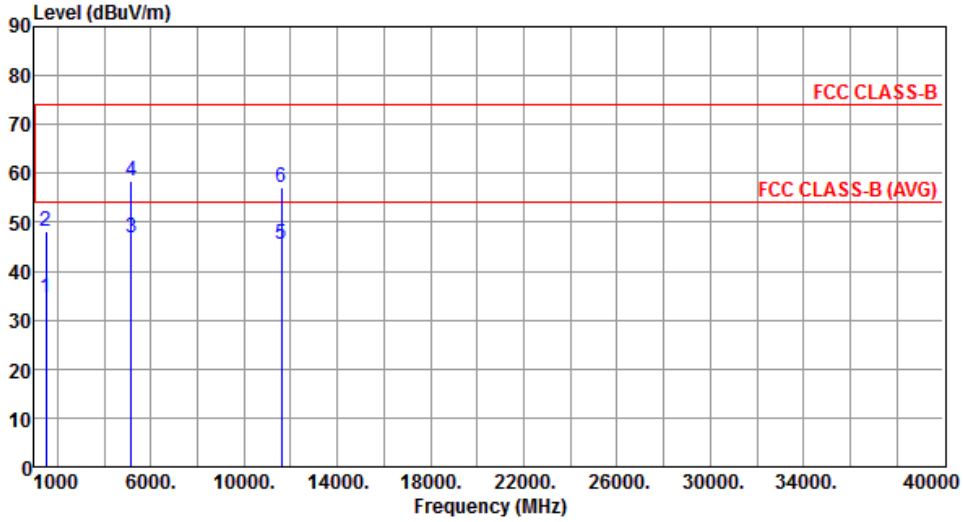
Modulation	VHT40	Test Freq. (MHz)	5795
Polarization	Horizontal	Test Configuration	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.55	54.00	-19.45	39.54	-4.99	Average	---	---
2	1500.00	48.19	74.00	-25.81	53.18	-4.99	Peak	---	---
3	5146.00	52.38	54.00	-1.62	46.20	6.18	Average	---	---
4	5146.00	65.56	74.00	-8.44	59.38	6.18	Peak	---	---
5	11590.00	47.58	54.00	-6.42	30.53	17.05	Average	---	---
6	11590.00	58.36	74.00	-15.64	41.31	17.05	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)	5795
Polarization	Vertical	Test Configuration	1

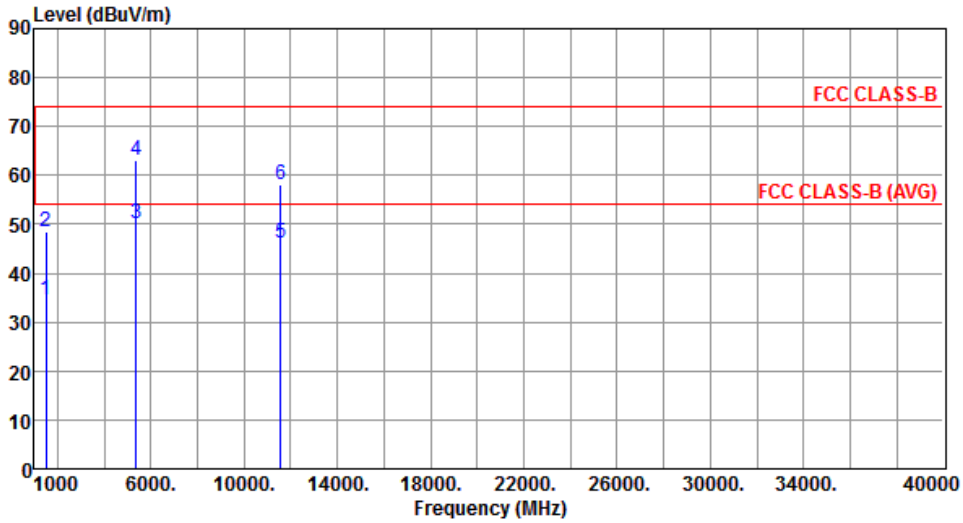


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.51	54.00	-19.49	39.50	-4.99	Average	---	---
2	1500.00	48.28	74.00	-25.72	53.27	-4.99	Peak	---	---
3	5146.00	46.68	54.00	-7.32	40.50	6.18	Average	---	---
4	5146.00	58.31	74.00	-15.69	52.13	6.18	Peak	---	---
5	11590.00	45.62	54.00	-8.38	28.57	17.05	Average	---	---
6	11590.00	57.07	74.00	-16.93	40.02	17.05	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).

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

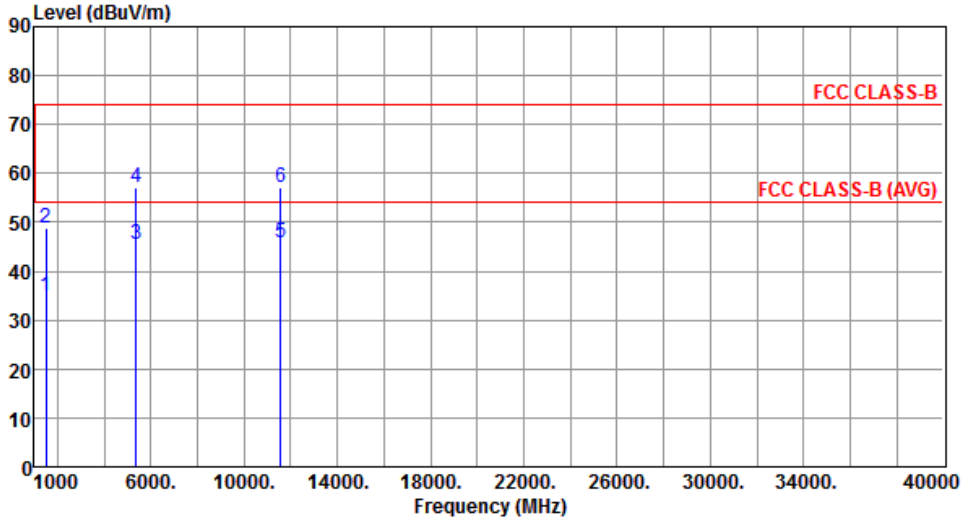
Modulation	VHT80	**Test Freq. (MHz)**	5775
Polarization	Horizontal	**Test Configuration**	1



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	1500.00	34.57	54.00	-19.43	39.56	-4.99	Average	---	---
2	1500.00	48.33	74.00	-25.67	53.32	-4.99	Peak	---	---
3	5350.00	50.14	54.00	-3.86	43.63	6.51	Average	---	---
4	5350.00	63.26	74.00	-10.74	56.75	6.51	Peak	---	---
5	11550.00	46.25	54.00	-7.75	29.12	17.13	Average	---	---
6	11550.00	58.25	74.00	-15.75	41.12	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)	5775
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	1500.00	34.73	54.00	-19.27	39.72	-4.99	Average	---	---
2	1500.00	48.69	74.00	-25.31	53.68	-4.99	Peak	---	---
3	5350.00	45.53	54.00	-8.47	39.02	6.51	Average	---	---
4	5350.00	57.11	74.00	-16.89	50.60	6.51	Peak	---	---
5	11550.00	45.75	54.00	-8.25	28.62	17.13	Average	---	---
6	11550.00	57.09	74.00	-16.91	39.96	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).

3.6 Unwanted Emissions into Non-Restricted Frequency Bands

3.6.1 Limit of Unwanted Emissions into Non-Restricted Frequency Bands

The peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.6.2 Test Procedures

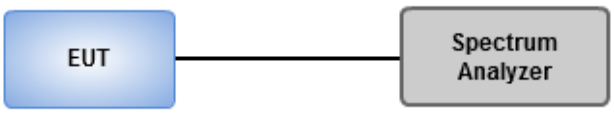
Reference Level Measurement

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Set Sweep time = auto couple, Trace mode = max hold.
3. Allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

Unwanted Emissions Level Measurement

1. Set RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Trace Mode = max hold, Sweep = auto couple.
3. Allow the trace to stabilize.
4. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

3.6.3 Test Setup

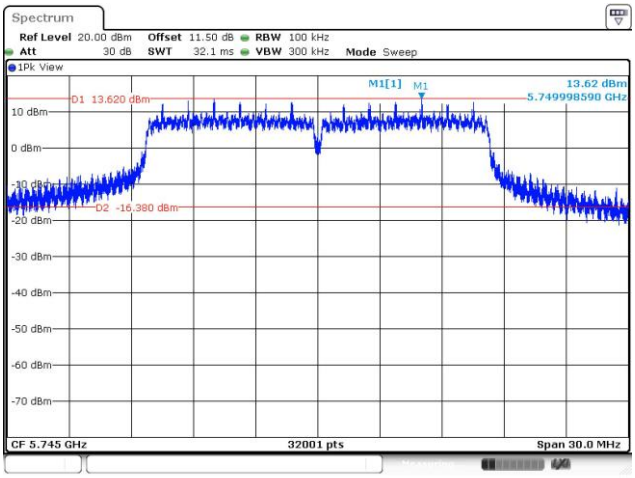
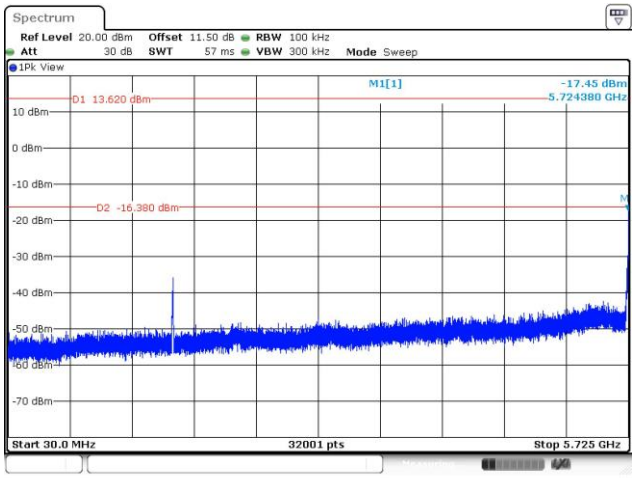
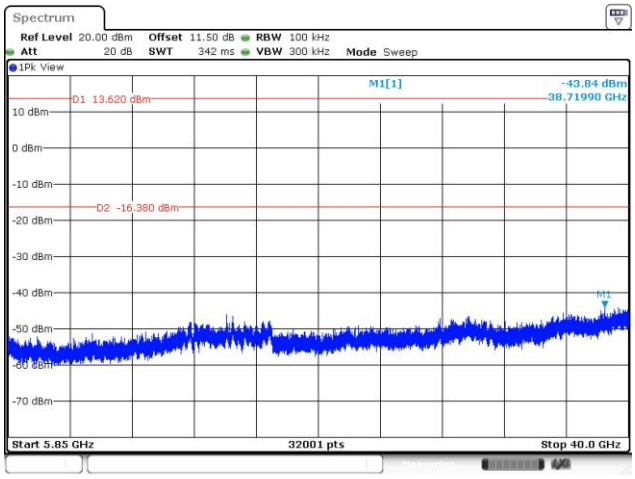
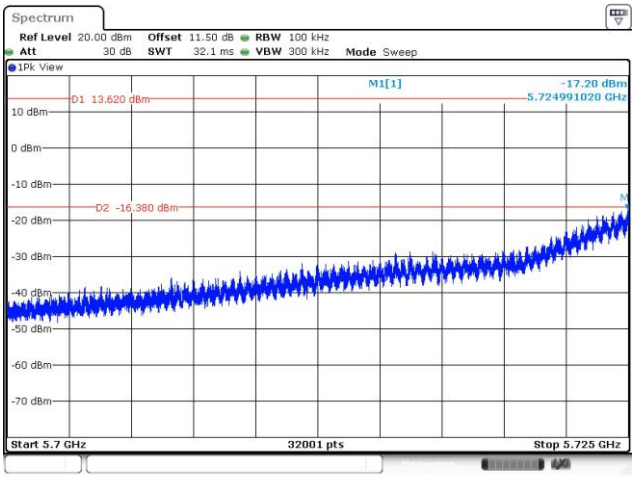


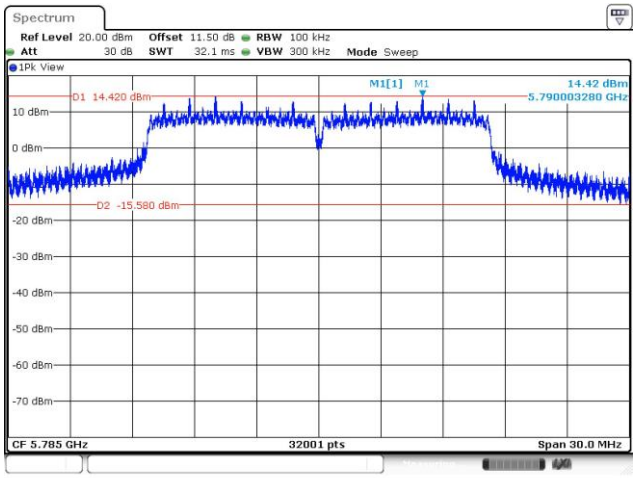
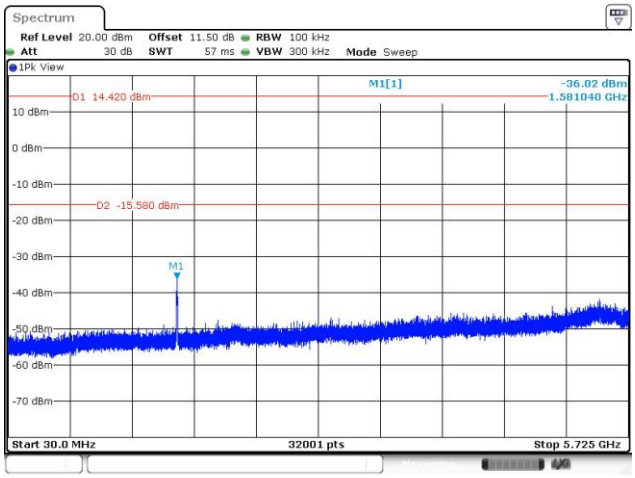
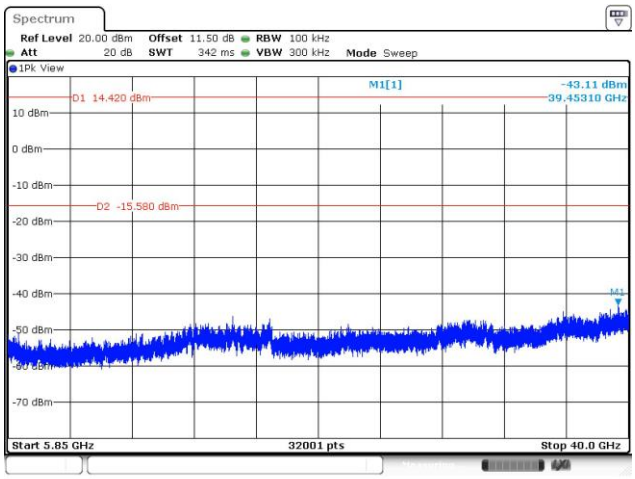
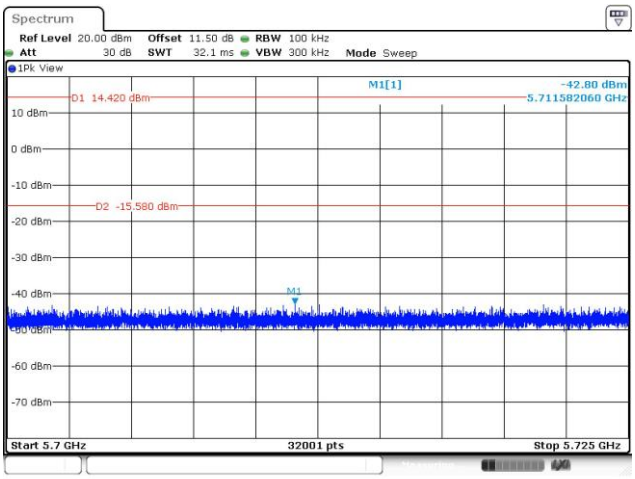
3.6.4 Test Result of Emissions in non-restricted frequency bands

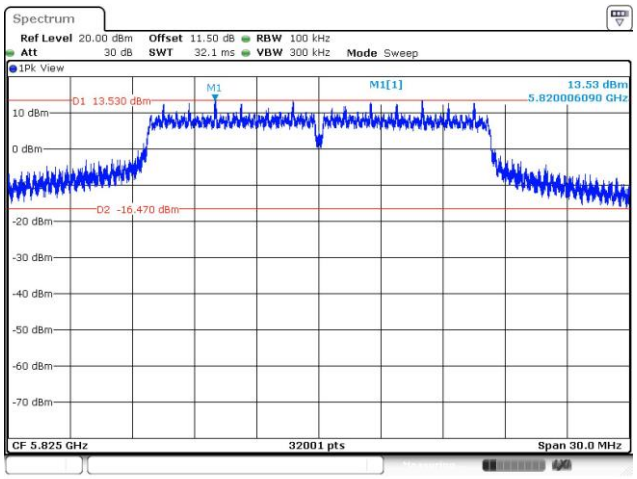
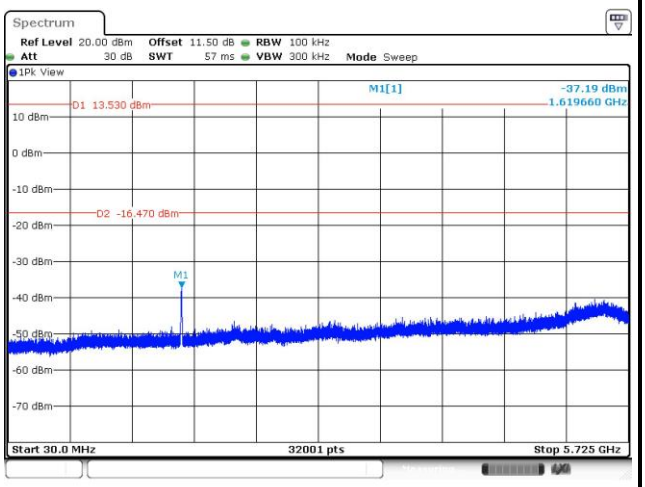
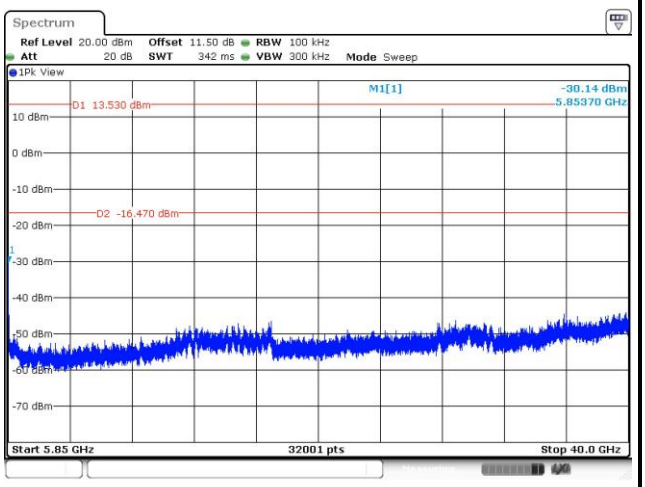
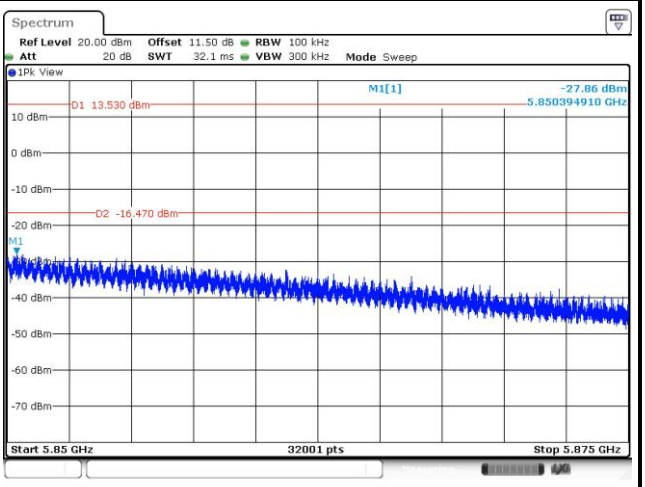
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.5 Unwanted Emissions into Non-Restricted Frequency Bands

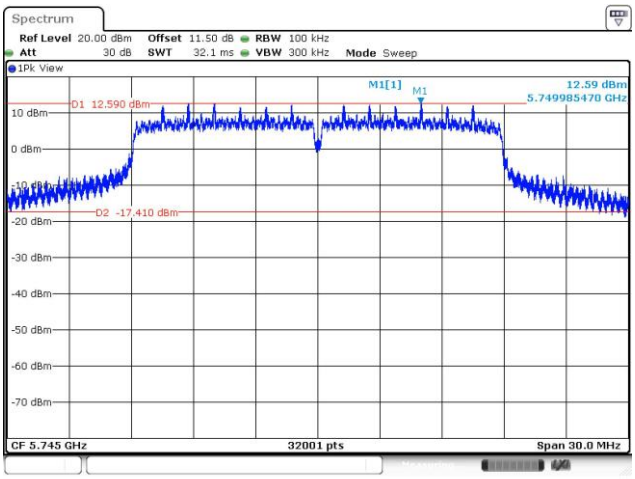
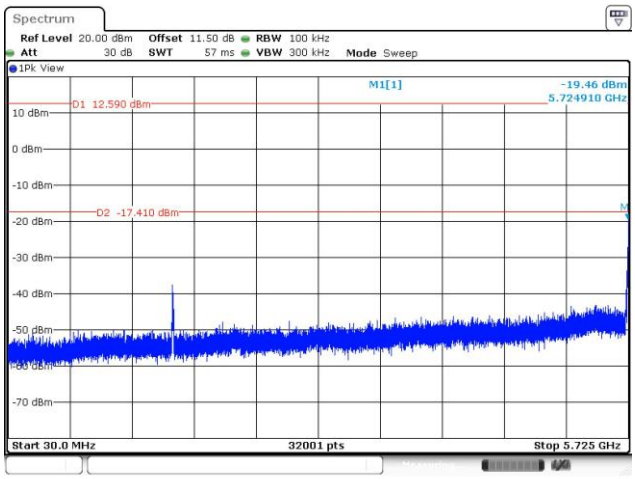
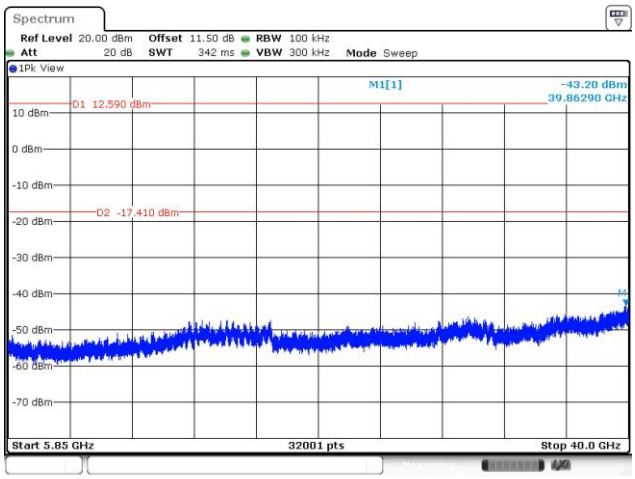
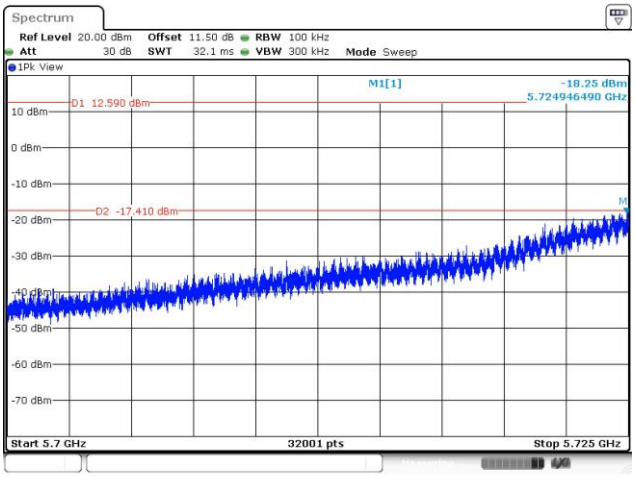
802.11a

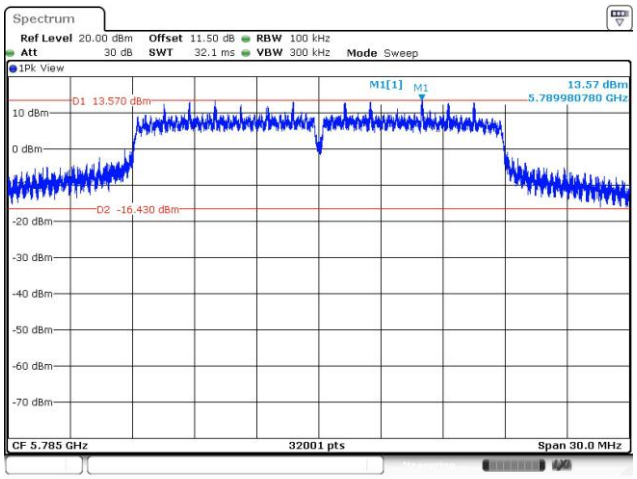
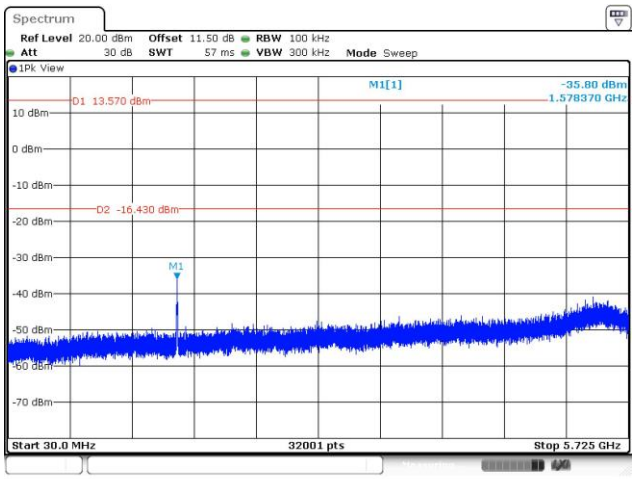
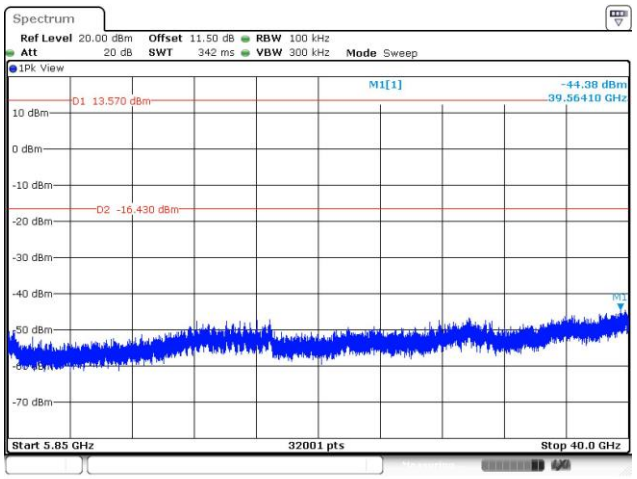
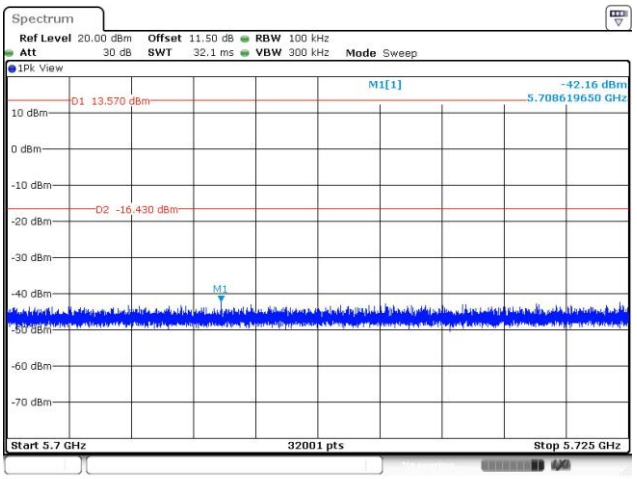
Reference Level	Tx 5745MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

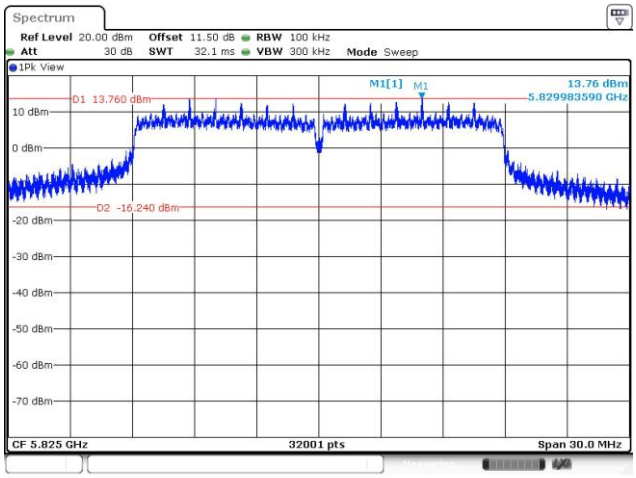
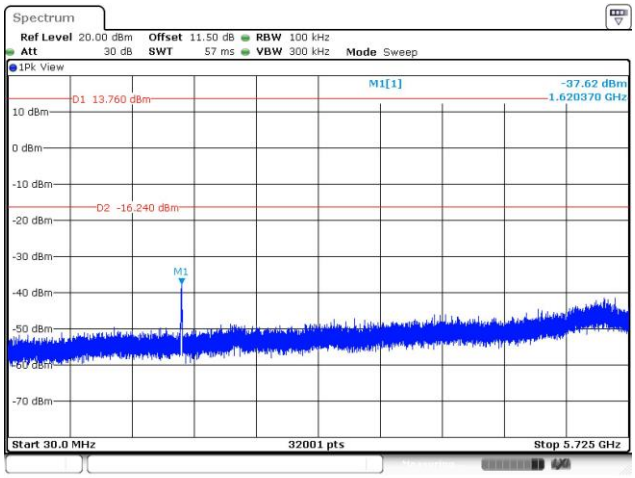
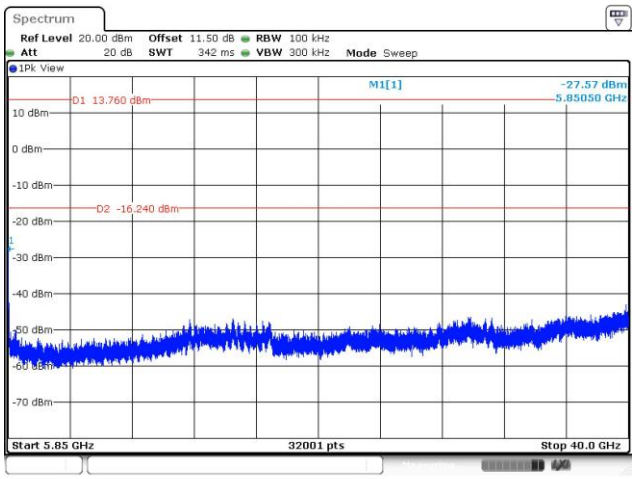
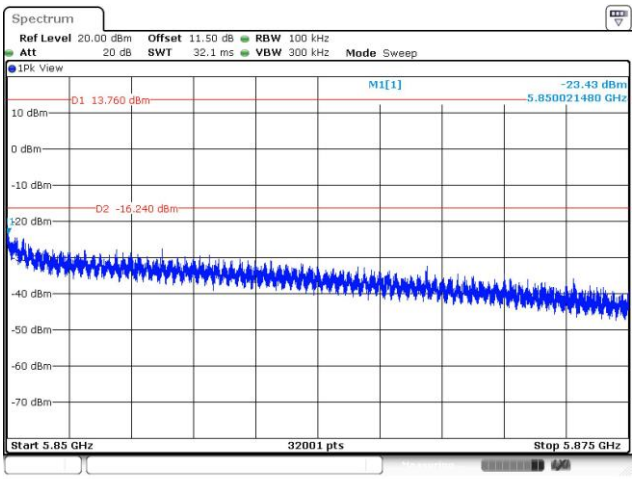
Reference Level	Tx 5785MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 5825MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

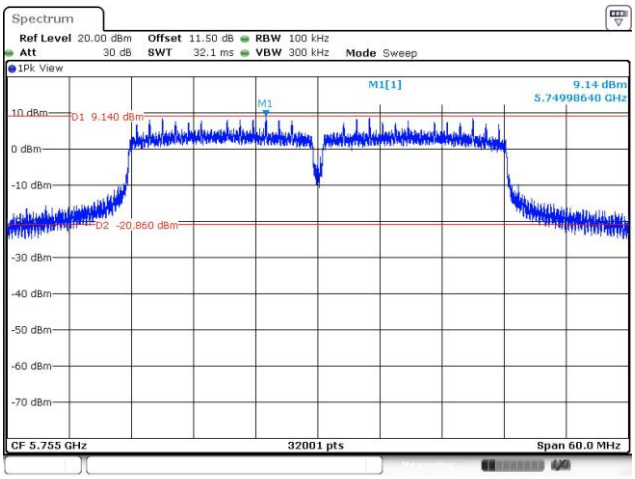
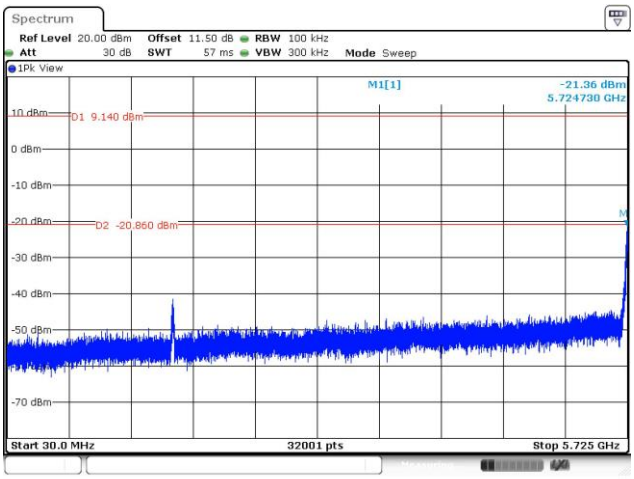
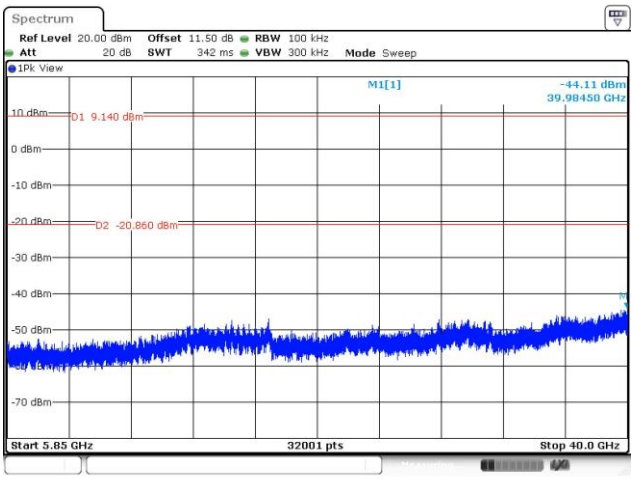
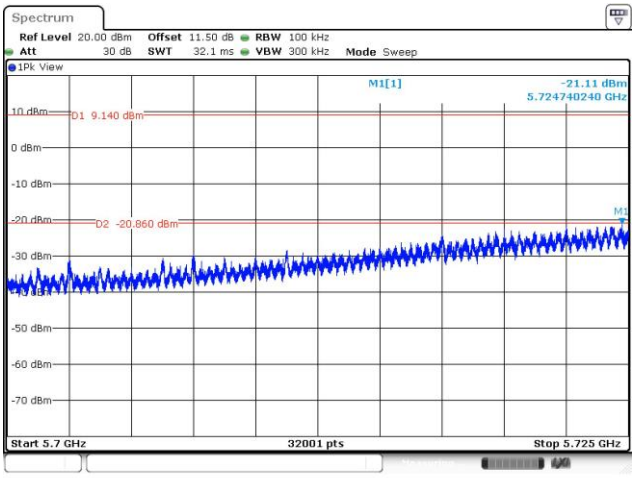
802.11n VHT20

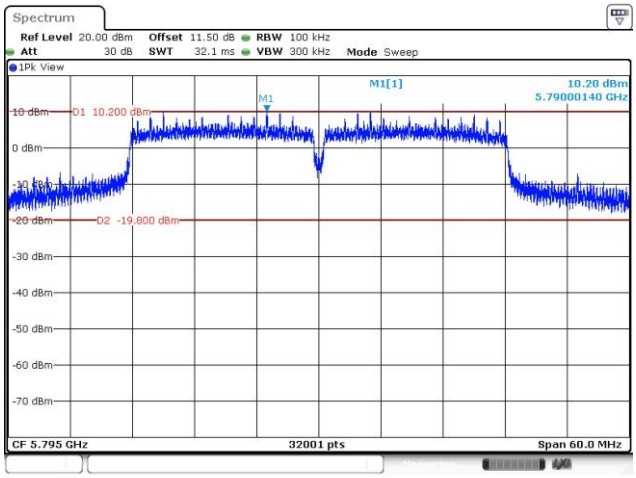
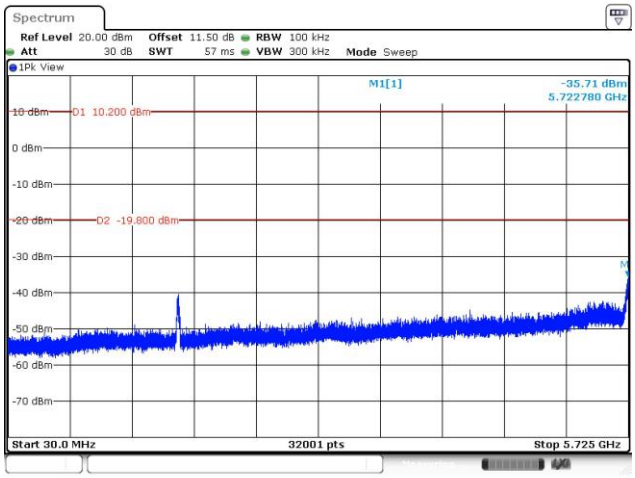
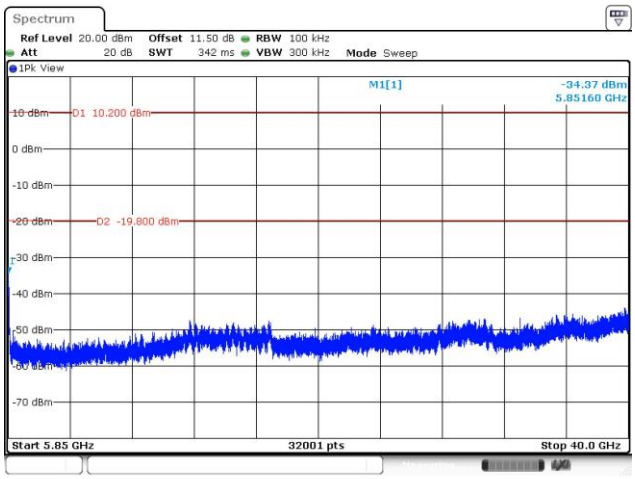
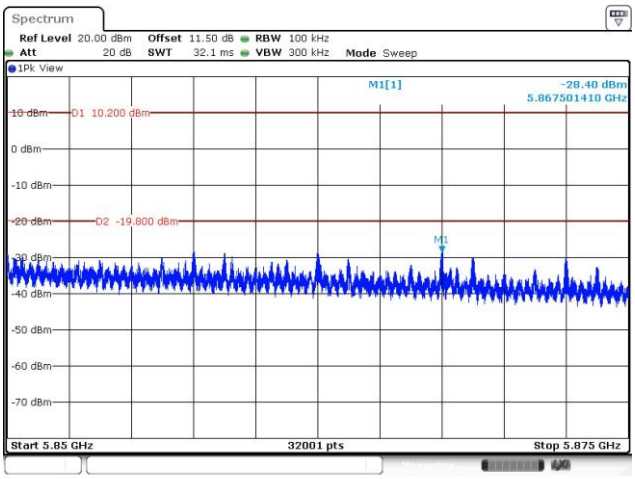
Reference Level	Tx 5745MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 5785MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

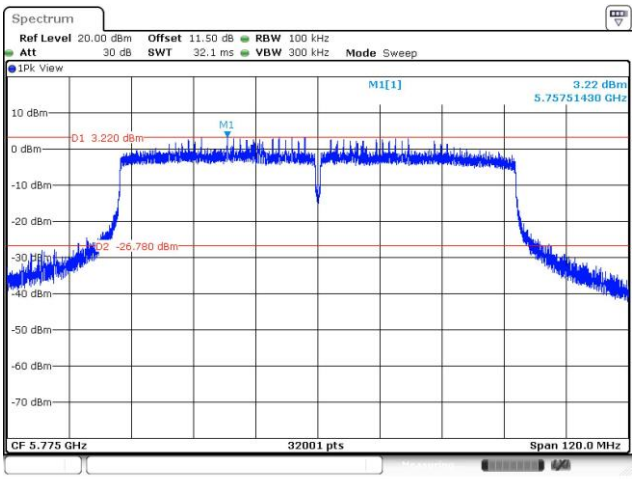
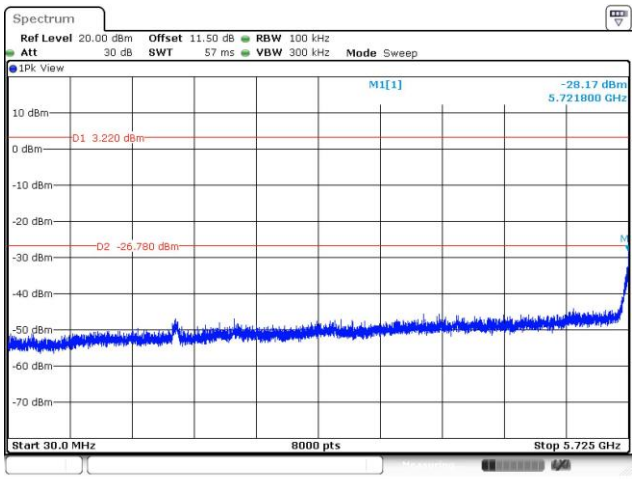
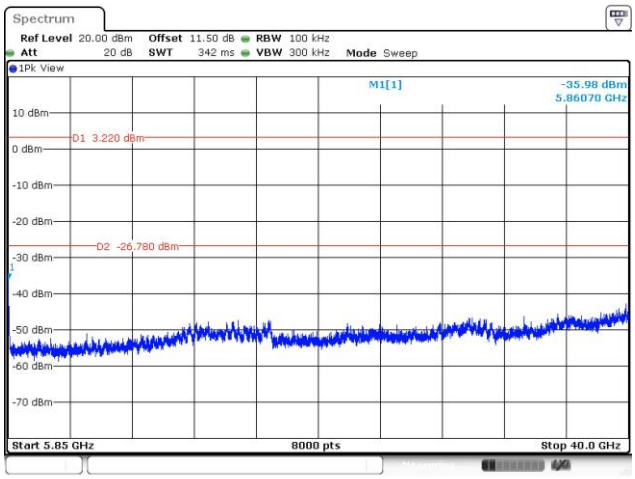
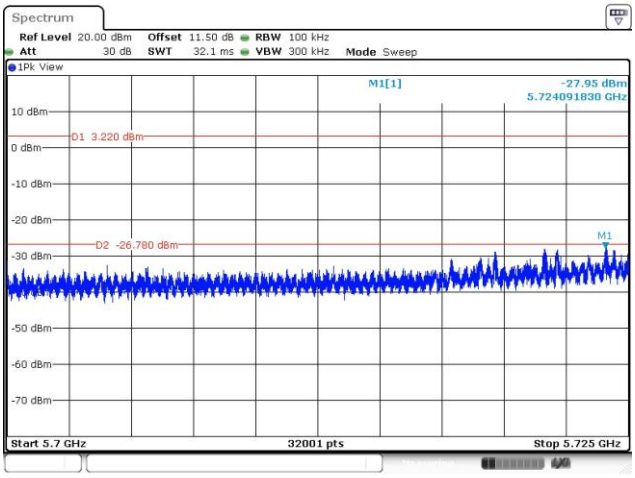
Reference Level	Tx 5825MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

802.11n VHT40

Reference Level	Tx 5755MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 5795MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

802.11n VHT80

Reference Level	Tx 5775MHz / 30MHz~40GHz (down 20dBc)
	
---	
---	

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.

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 Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 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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