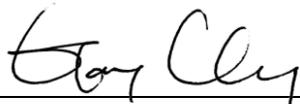


# FCC Test Report

**FCC ID** : PY313200235  
**Equipment** : LTE Gateway  
**Model No.** : LG6100D  
**Brand Name** : NETGEAR  
**Applicant** : NETGEAR, Inc.  
**Address** : 350 East Plumeria Drive, San Jose, California  
95134, USA  
**Standard** : 47 CFR FCC Part 15.407  
**Received Date** : Oct. 11, 2013  
**Tested Date** : Oct. 11 ~ Nov. 01, 2013

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

Approved & Reviewed by:



Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FR3O2308AN	Rev. 01	Initial issue	Nov. 11, 2013

## Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.594MHz 40.65 (Margin -5.35dB) - AV	Pass
15.407(b)(1)(2)(3) 15.209	Radiated Emissions	[dBuV/m at 3m]: 5150.00MHz 53.90 (Margin -0.10dB) - AV	Pass
15.407(a)(1)(2)(3)	Emission Bandwidth	Meet the requirement of limit	Pass
15.407(a)(1)(2)(3)	RF Output Power	Power [dBm]: 11a: 16.54 HT20: 16.52 HT40: 16.51 VHT20: 16.57 VHT40: 16.55 VHT80: 15.58	Pass
15.407(a)(1)(2)(3)	Peak Power Spectral Density	Meet the requirement of limit	Pass
15.407(a)(6)	Peak Excursion	Meet the requirement of limit	Pass
15.407(g)	Frequency Stability	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
IEEE Std. 802.11	Frequency Range (MHz)	Ch. Freq. (MHz)	Channel Number	Transmit Chains (N <sub>TX</sub> )	Data Rate / MCS
a	5150-5250	5180-5240	36-48 [4]	2	6-54 Mbps
n (HT20)	5150-5250	5180-5240	36-48 [4]	2	MCS 0-7
n (HT40)	5150-5250	5190-5230	38-46 [2]	2	MCS 0-7
ac (VHT20)	5150-5250	5180-5240	36-48 [4]	2	MCS 0-8
ac (VHT40)	5150-5250	5190-5230	38-46 [2]	2	MCS 0-8
ac (VHT80)	5150-5250	5210	42 [1]	2	MCS 0-9

Note 1: RF output power specifies that Maximum Conducted Output Power.  
 Note 2: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

### 1.1.2 Antenna Details

Model	Type	Operating Frequency (MHz) / Gain (dBi)					Connector
		2400~2483.5	5150~5250	5250~5350	5470~5725	5725~5825	
401-10006-01	PCB Dipole Antenna	2.4	---	---	---	---	U.FL
401-10007-01	PCB Dipole Antenna	---	2.9	---	---	3.0	U.FL

### 1.1.3 EUT Operational Condition

<b>Power Supply Type</b>	12Vdc from AC adapter
--------------------------	-----------------------

### 1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	AC adapter 1	Brand Name: NETGEAR Model Name: P030WF120B Power Rating: I/P: 100-240Vac, 50-60Hz, 1.0A O/P: 12Vdc, 2.5A Power Line: DC 1.8m non-shielded cable w/o core
2	AC adapter 2	Brand Name: NETGEAR Model Name: MU30-5120250-A1 Power Rating: I/P: 100-240Vac, 50-60Hz, 0.8A O/P: 12Vdc, 2.5A Power Line: DC 1.8m non-shielded cable w/o core
3	AC adapter 3	Brand Name: NETGEAR Model Name: SAS030F1 Power Rating: I/P: 100-120Vac, 47-63Hz, 0.9A O/P: 12Vdc, 2.5A Power Line: DC 1.8m non-shielded cable w/o core

### 1.1.5 Channel List

Frequency band (MHz)		5150~5250	
802.11 a / HT20 / VHT20		HT40 / VHT40	
Channel	Frequency(MHz)	Channel	Frequency(MHz)
36	5180	38	5190
40	5200	46	5230
44	5220	<b>VHT80</b>	
48	5240	42	5210

### 1.1.6 Test Tool and Duty Cycle

Test Tool	CART, Ver 4.9		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11a	98.26%	0.08
	VHT20	98.14%	0.08
	VHT40	94.78%	0.23
	VHT80	89.45%	0.48

### 1.1.7 Power Setting

Channel	Frequency(MHz)	11a	HT20	VHT20
CH 36	5180	13.5	13.5	13.5
CH 40	5200	13.5	13.5	13.5
CH 48	5240	13.5	13.5	13.5

Channel	Frequency(MHz)	HT40	VHT40	VHT80
CH 38	5190	14	14	---
CH 46	5230	14	14	---
CH 42	5210	---	---	13

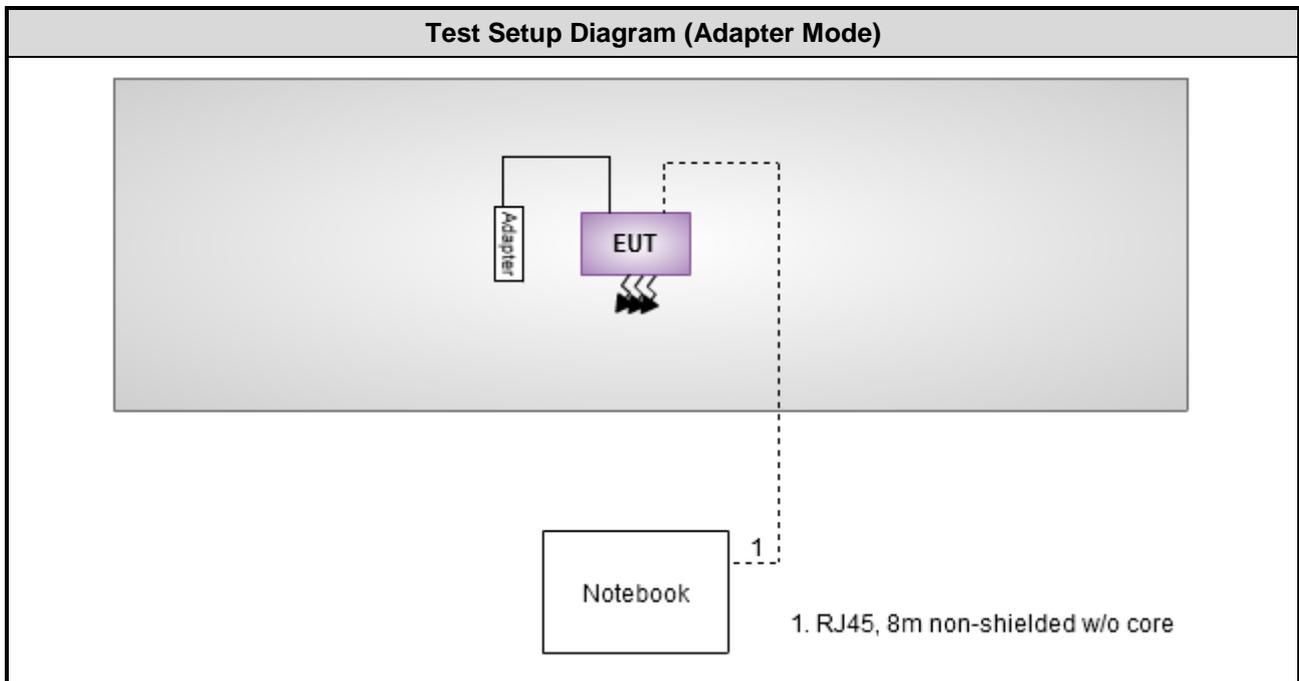
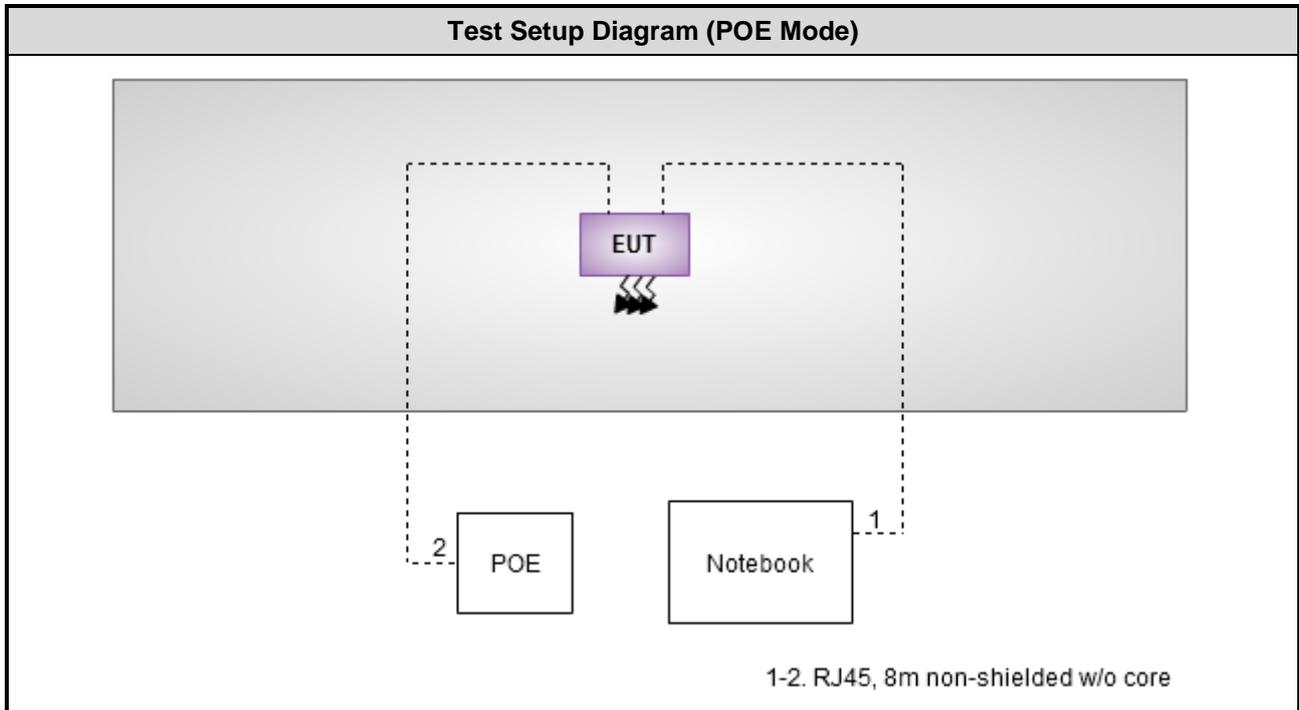
## 1.2 Local Support Equipment List

Support Equipment List						
No.	Equipment	Brand	Model	S/N	FCC ID	Signal cable / Length (m)
1	Notebook	DELL	E6430	---	DoC	RJ45, 8m non-shielded w/o core.
2	POE	PowerDsine	PD-3001G C/AC	---	DoC	RJ45, 8m non-shielded w/o core.

Note:

- 1) No. 2 was supplied by applicant.
- 2) POE is for POE mode only.

### 1.3 Test Setup Chart



## 1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Until
EMC Receiver	R&S	ESCS 30	100169	Oct. 15, 2013	Oct. 14, 2014
LISN	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-667	Dec. 04, 2012	Dec. 03, 2013
LISN (Support Unit)	SCHWARZBECK MESS-ELEKTRONIK	Schwarzbeck 8127	8127-666	Dec. 04, 2012	Dec. 03, 2013
ISN	TESEQ	ISN T800	34406	Apr. 08, 2013	Apr. 07, 2014
ISN	TESEQ	ISN T200A	30494	Apr. 09, 2013	Apr. 08, 2014
ISN	TESEQ	ISN ST08	22589	Jan. 24, 2013	Jan. 23, 2014
RF Current Probe	FCC	F-33-4	121630	Dec. 04, 2012	Dec. 03, 2013
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Dec. 25, 2012	Dec. 24, 2013
ESH3-Z6 V-Network(+)	R&S	ESH3-Z6	100920	Nov. 21, 2012	Nov. 20, 2013
ESH3-Z6 V-Network(-)	R&S	ESH3-Z6	100951	Jan. 30, 2013	Jan. 29, 2014
Two-Line V-Network	R&S	ENV216	101579	Jan. 07, 2013	Jan. 06, 2014
50 ohm terminal	NA	50	01	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal	NA	50	02	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal	NA	50	03	Apr. 22, 2013	Apr. 21, 2014
50 ohm terminal (Support Unit)	NA	50	04	Apr. 22, 2013	Apr. 21, 2014

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	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
TEMP&HUMIDITY CHAMBER	GIANT FORCE	GCT-225-40-SP-SD	MAF1212-002	Nov. 29, 2012	Nov. 28, 2013
Power Meter	Anritsu	ML2495A	1241002	Oct. 24, 2013	Oct. 23, 2014
Power Sensor	Anritsu	MA2411B	1027366	Oct. 24, 2013	Oct. 23, 2014
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 13, 2014

Note: Calibration Interval of instruments listed above is one year.

<b>Test Item</b>	Radiated Emission above 1GHz				
<b>Test Site</b>	966 chamber 2 / (03CH02-WS)				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH02-WS	Jan. 02, 2013	Jan. 01, 2014
Spectrum Analyzer	R&S	FSV40	101499	Jan. 28, 2013	Jan. 27, 2014
Receiver	R&S	ESR3	101657	Jan. 30, 2013	Jan. 29, 2014
Bilog Antenna	Schwarzbeck	VULB9168	VULB9168-524	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120D	BBHA 9120 D 1095	Jan. 29, 2013	Jan. 28, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100218	Dec. 14, 2012	Dec. 13, 2013
Amplifier	Agilent	83017A	MY39501309	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16140/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16018/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16015/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-003	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-004	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	060608	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

<b>Test Item</b>	Radiated Emission above 1GHz				
<b>Test Site</b>	966 chamber 2 / (03CH02-WS)				
<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Date</b>	<b>Calibration Until</b>
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					

## 1.5 Testing Applied Standards

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

47 CFR FCC Part 15.407

ANSI C63.10-2009

FCC KDB 412172

FCC KDB 789033 D01 General UNII Test procedures v01r03

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

Note: The EUT has been tested and complied with FCC part 15B requirement. FCC Part 15B test results are issued to another report.

## 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	±74.147 Hz
Conducted power	±0.717 dB
Power density	±2.687 dB
Frequency error	±74.147 Hz
Temperature	±0.3 °C
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

## 2 Test Configuration

### 2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 61%	Skys Huang
Radiated Emissions	03CH02-WS	24°C / 64% 26°C / 63%	Haru Yang Anderson Hong
RF Conducted	TH01-WS	23°C / 62%	Felix Sung

➤ FCC site registration No.: 657002

➤ IC site registration No.: 10807A-2

### 2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	VHT20	5200	6 Mbps	1, 2
Radiated Emissions <1GHz	VHT20	5200	6 Mbps	1, 2
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	---
	HT20	5180 / 5200 / 5240	MCS 0	---
	HT40	5190 / 5230	MCS 0	---
	VHT80	5210	MCS 0	---
Peak Excursion	11a	5200	6 Mbps	---
	VHT20	5240	MCS 0	---
	VHT40	5230	MCS 0	---
	VHT80	5210	MCS 0	---
Frequency Stability	Un-modulation	5200	---	---

**NOTE:**

- Three adapters had been pretested and found that adapter 2 (model: MU30-5120250-A1) was the worst case and was chosen for final test.
- EUT has 2 types of power supply, each type is selected to perform radiated emission and conduction emission test as below test configuration.
  - Configuration 1 : POE Mode.
  - Configuration 2 : Adapter Mode.

## 3 Transmitter Test Results

### 3.1 Conducted Emissions

#### 3.1.1 Limit of Conducted Emissions

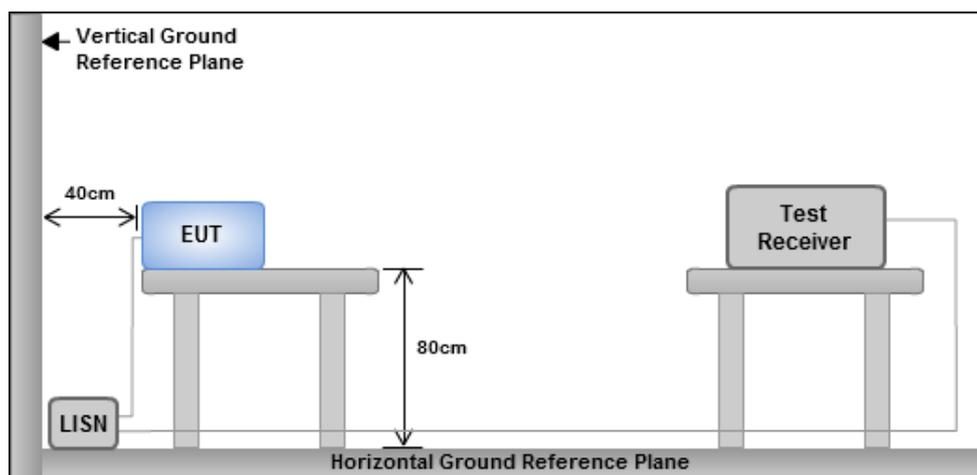
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

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  $\Omega$  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

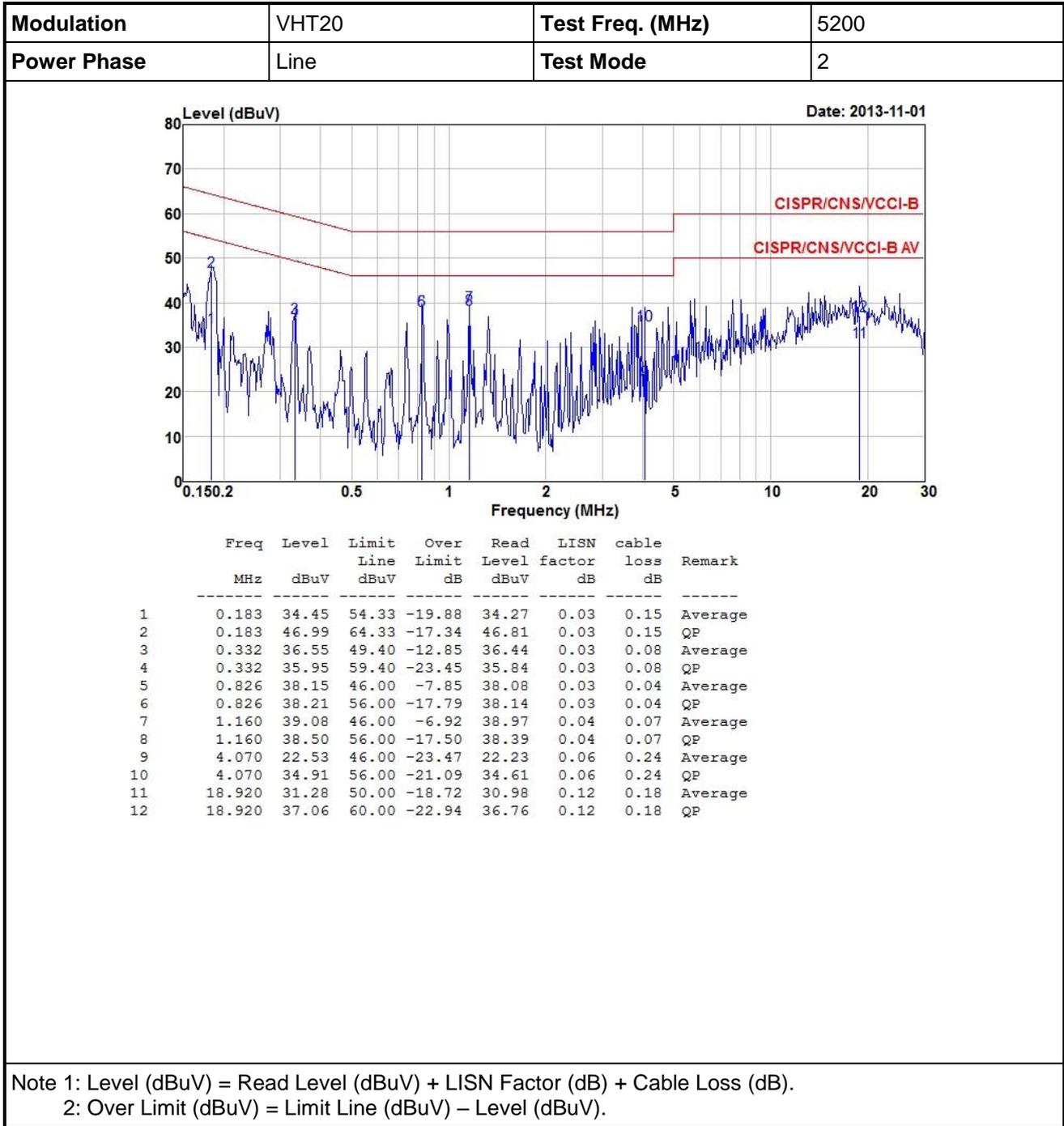
#### 3.1.3 Test Setup



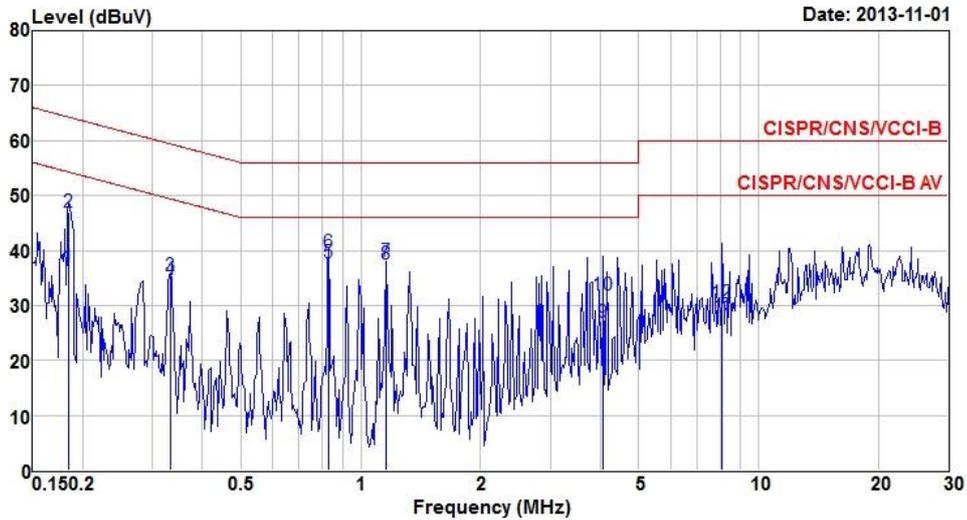
Note: 1. Support units were connected to second LISN.

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



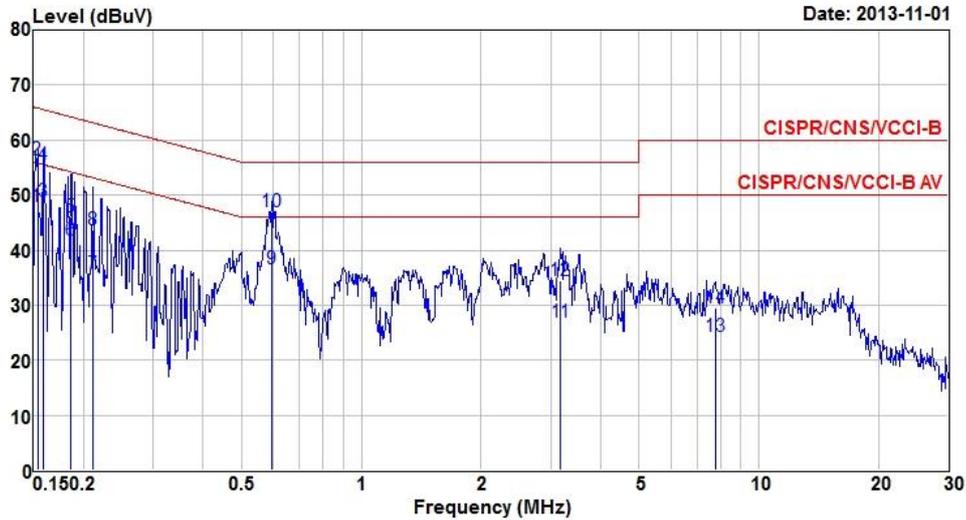
<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Power Phase</b>	Neutral	<b>Test Mode</b>	2



	Freq	Level	Limit	Over	Read	LISN	cable	
	MHz	dBuV	Line	Limit	Level	factor	loss	Remark
			dBuV	dB	dBuV	dB	dB	
1	0.184	37.10	54.28	-17.18	36.93	0.02	0.15	Average
2	0.184	47.00	64.28	-17.28	46.83	0.02	0.15	QP
3	0.332	35.33	49.40	-14.07	35.23	0.02	0.08	Average
4	0.332	34.65	59.40	-24.75	34.55	0.02	0.08	QP
5	0.830	37.68	46.00	-8.32	37.62	0.02	0.04	Average
6	0.830	39.73	56.00	-16.27	39.67	0.02	0.04	QP
7	1.160	38.12	46.00	-7.88	38.02	0.03	0.07	Average
8	1.160	37.52	56.00	-18.48	37.42	0.03	0.07	QP
9	4.070	26.94	46.00	-19.06	26.65	0.05	0.24	Average
10	4.070	31.79	56.00	-24.21	31.50	0.05	0.24	QP
11	8.105	27.92	50.00	-22.08	27.70	0.08	0.14	Average
12	8.105	30.50	60.00	-29.50	30.28	0.08	0.14	QP

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

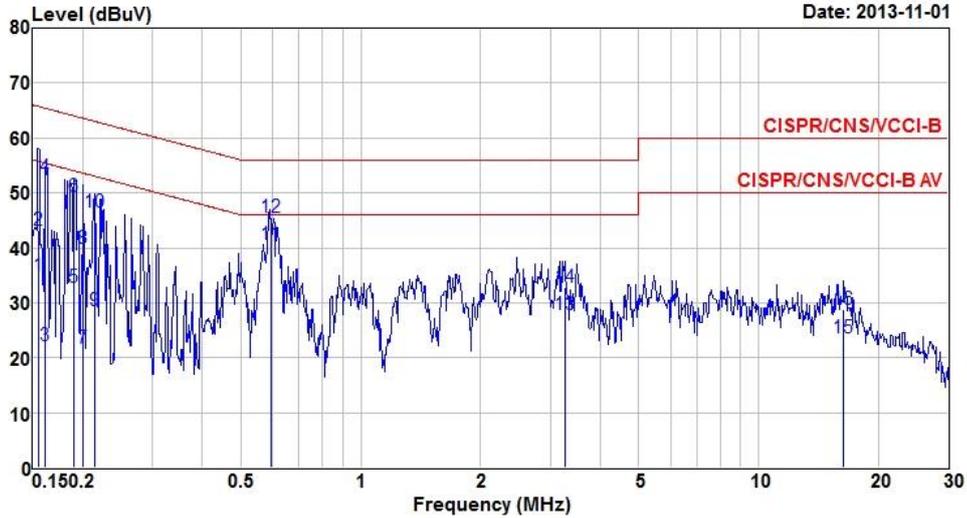
<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Power Phase</b>	Line	<b>Test Mode</b>	2



	Freq	Level	Limit	Over	Read	LISN	cable	Remark
	MHz	dBuV	Line	Limit	Level	factor	loss	
			dBuV	dB	dBuV	dB	dB	
1	0.153	47.95	55.82	-7.87	47.85	0.03	0.07	Average
2	0.153	56.45	65.82	-9.37	56.35	0.03	0.07	QP
3	0.158	48.76	55.56	-6.80	48.65	0.03	0.08	Average
4	0.158	55.51	65.56	-10.05	55.40	0.03	0.08	QP
5	0.186	46.06	54.20	-8.14	45.88	0.03	0.15	Average
6	0.186	41.73	64.20	-22.47	41.55	0.03	0.15	QP
7	0.211	35.65	53.18	-17.53	35.45	0.03	0.17	Average
8	0.211	43.67	63.18	-19.51	43.47	0.03	0.17	QP
9	0.595	36.60	46.00	-9.40	36.52	0.03	0.05	Average
10	0.595	47.09	56.00	-8.91	47.01	0.03	0.05	QP
11	3.173	26.93	46.00	-19.07	26.66	0.06	0.21	Average
12	3.173	34.45	56.00	-21.55	34.18	0.06	0.21	QP
13	7.769	24.37	50.00	-25.63	24.13	0.09	0.15	Average
14	7.769	29.40	60.00	-30.60	29.16	0.09	0.15	QP

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

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Power Phase</b>	Neutral	<b>Test Mode</b>	2



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	LISN factor dB	cable loss dB	Remark
1	0.155	35.01	55.74	-20.73	34.92	0.02	0.07	Average
2	0.155	43.23	65.74	-22.51	43.14	0.02	0.07	QP
3	0.161	22.26	55.43	-33.17	22.15	0.02	0.09	Average
4	0.161	52.82	65.43	-12.61	52.71	0.02	0.09	QP
5	0.190	32.74	54.02	-21.28	32.56	0.02	0.16	Average
6	0.190	49.35	64.02	-14.67	49.17	0.02	0.16	QP
7	0.201	21.75	53.58	-31.83	21.55	0.02	0.18	Average
8	0.201	39.94	63.58	-23.64	39.74	0.02	0.18	QP
9	0.215	28.60	53.01	-24.41	28.41	0.02	0.17	Average
10	0.215	46.50	63.01	-16.51	46.31	0.02	0.17	QP
11	0.594	40.65	46.00	-5.35	40.58	0.02	0.05	Average
12	0.594	45.61	56.00	-10.39	45.54	0.02	0.05	QP
13	3.258	27.90	46.00	-18.10	27.63	0.05	0.22	Average
14	3.258	32.83	56.00	-23.17	32.56	0.05	0.22	QP
15	16.398	23.59	50.00	-26.41	23.33	0.11	0.15	Average
16	16.398	28.84	60.00	-31.16	28.58	0.11	0.15	QP

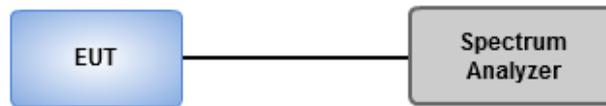
Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).  
 2: Over Limit (dBuV) = Limit Line (dBuV) – Level (dBuV).

## 3.2 Emission Bandwidth

### 3.2.1 Test Procedures

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.

### 3.2.2 Test Setup



### 3.2.3 Test Result of Emission Bandwidth

Emission Bandwidth										
Mode	N <sub>TX</sub>	Freq. (MHz)	26dB Bandwidth (MHz)			99% Bandwidth (MHz)			26dB Limit	99% Limit
			Chain 0	Chain 1	Chain 2	Chain 0	Chain 1	Chain 2		
11a	2	5180	24.87	24.70	---	17.08	17.02	---	17.00	16.31
11a	2	5200	25.22	24.87	---	17.13	17.02	---	17.00	16.31
11a	2	5240	25.16	24.70	---	17.08	17.02	---	17.00	16.31
VHT20	2	5180	26.03	25.86	---	18.18	18.12	---	17.00	16.58
VHT20	2	5200	26.26	25.39	---	18.18	18.12	---	17.00	16.58
VHT20	2	5240	25.91	25.28	---	18.18	18.12	---	17.00	16.58
VHT40	2	5190	50.09	47.07	---	37.16	37.16	---	17.00	17.00
VHT40	2	5230	49.16	49.16	---	37.40	37.16	---	17.00	17.00
VHT80	2	5210	95.77	94.61	---	76.41	76.18	---	17.00	17.00

Worst Plots										

### 3.3 RF Output Power

#### 3.3.1 Limit of RF Output Power

Frequency Band (GHz)		Limit
<input checked="" type="checkbox"/>	5.15~5.25	50mW or 4dBm+10 log B
<input type="checkbox"/>	5.25~5.35	250mW or 11dBm+10 log B
<input type="checkbox"/>	5.47~5.725	250mW or 11dBm+10 log B

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

#### 3.3.2 Test Procedures

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

#### 3.3.3 Test Setup



### 3.3.4 Test Result of Maximum Conducted Output Power

RF Output Power (dBm)								
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Total Power (mW)	Total Power (dBm)	Limit
11a	2	5180	13.58	13.45	---	44.934	16.53	17.00
11a	2	5200	13.64	13.41	---	45.049	16.54	17.00
11a	2	5240	13.44	13.55	---	44.726	16.51	17.00
HT20	2	5180	13.56	13.44	---	44.779	16.51	17.00
HT20	2	5200	13.59	13.42	---	44.835	16.52	17.00
HT20	2	5240	13.45	13.54	---	44.725	16.51	17.00
HT40	2	5190	13.65	13.35	---	44.801	16.51	17.00
HT40	2	5230	13.43	13.56	---	44.728	16.51	17.00

RF Output Power (dBm)								
Mode	N <sub>TX</sub>	Freq. (MHz)	Chain 0	Chain 1	Chain 2	Total Power (mW)	Total Power (dBm)	Limit
VHT20	2	5180	13.59	13.46	---	45.038	16.54	17.00
VHT20	2	5200	13.63	13.48	---	45.352	16.57	17.00
VHT20	2	5240	13.48	13.55	---	44.931	16.53	17.00
VHT40	2	5190	13.68	13.40	---	45.212	16.55	17.00
VHT40	2	5230	13.46	13.58	---	44.985	16.53	17.00
VHT80	2	5210	12.55	12.59	---	36.144	15.58	17.00

### 3.4 Peak Power Spectral Density

#### 3.4.1 Limit of Peak Power Spectral Density

	Frequency Band (GHz)	Limit (dBm)
<input checked="" type="checkbox"/>	5.15~5.25	4
<input type="checkbox"/>	5.25~5.35	11
<input type="checkbox"/>	5.47~5.725	11

#### 3.4.2 Test Procedures

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.

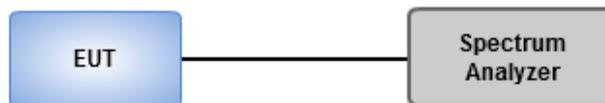
Method SA-2

1. Set RBW = 1 MHz, VBW = 3 MHz, Detector = RMS.
2. Set sweep time  $\geq 10 * (\text{number of points in sweep}) * (\text{symbol period of the transmitted signal})$ .
3. Perform a single sweep.
4. Use the peak marker function to determine the maximum amplitude level.

Method SA-2 Alternative

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

#### 3.4.3 Test Setup

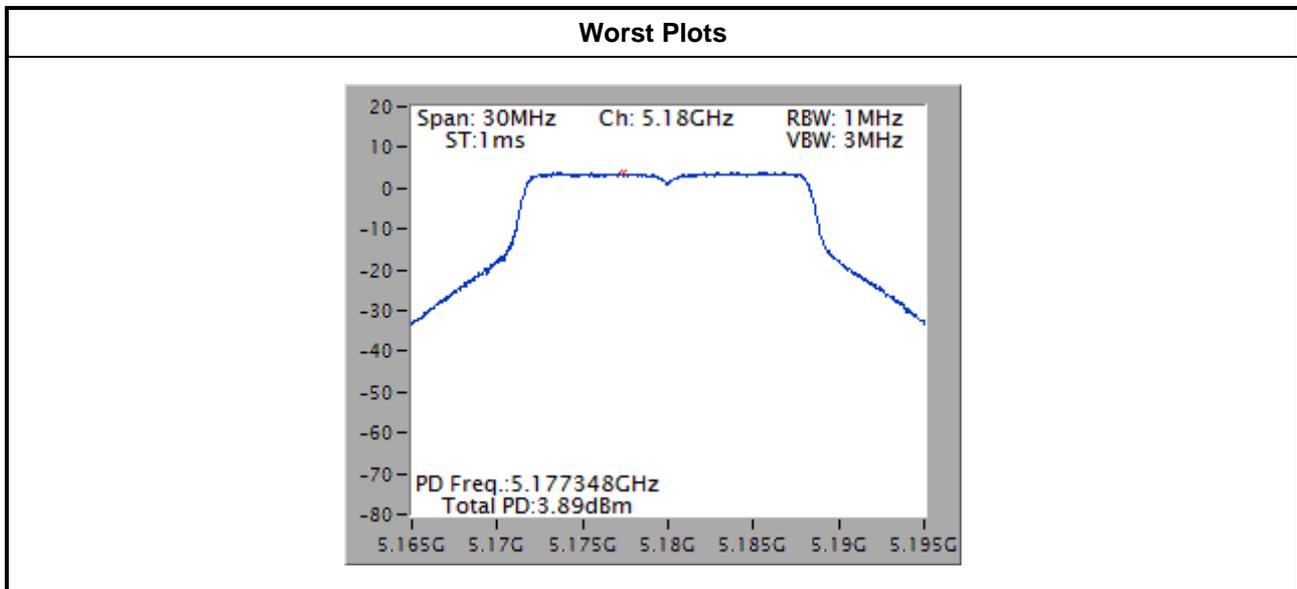


### 3.4.4 Test Result of Peak Power Spectral Density

Condition			Peak Power Spectral Density (dBm)			
Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	PPSD w/o D.F (dBm)	Duty factor (dB)	PPSD with D.F (dBm)	PPSD Limit (dBm)
11a	2	5180	3.89	0.00	3.89	4
11a	2	5200	3.42	0.00	3.42	4
11a	2	5240	3.49	0.00	3.49	4
VHT20	2	5180	3.16	0.00	3.16	4
VHT20	2	5200	3.19	0.00	3.19	4
VHT20	2	5240	3.23	0.00	3.23	4
VHT40	2	5190	-0.54	0.23	-0.31	4
VHT40	2	5230	-0.45	0.23	-0.22	4
VHT80	2	5210	-4.93	0.48	-4.45	4

Note:

1. D.F is duty factor
2. Test result is bin-by-bin summing measured value of each TX port.



## 3.5 Peak Excursion

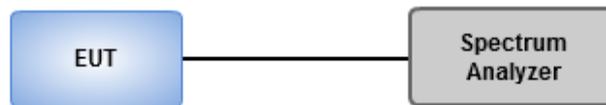
### 3.5.1 Peak Excursion Limit

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

### 3.5.2 Test Procedures

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

### 3.5.3 Test Setup

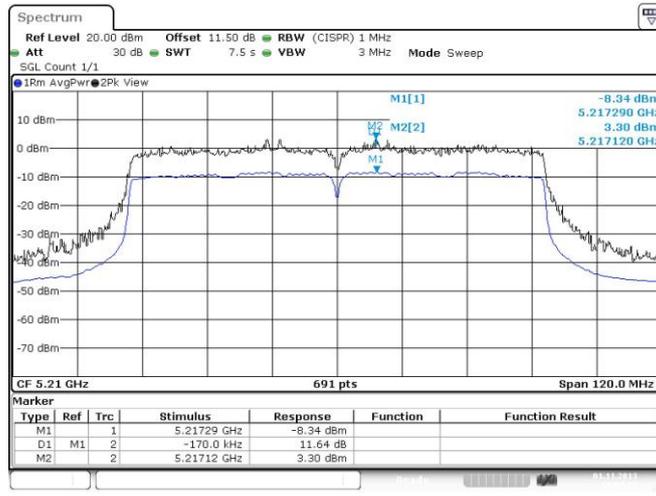


### 3.5.4 Test Result of Peak Excursion

Frequency band(MHz)		5150~5250					
Mode	Modulation Mode	N <sub>TX</sub>	Freq. (MHz)	Measured value(dB)	Duty factor (dB)	Peak Excursion (dB)	Limit
11a	BPSK	2	5200	8.36	0.00	8.36	13
11a	QPSK	2	5200	8.89	0.21	8.68	13
11a	16QAM	2	5200	8.78	0.39	8.39	13
11a	64QAM	2	5200	10.38	0.79	9.59	13
VHT20	BPSK	2	5240	8	0.00	8.00	13
VHT20	QPSK	2	5240	8.57	0.19	8.38	13
VHT20	16QAM	2	5240	9.6	0.44	9.16	13
VHT20	64QAM	2	5240	9.88	0.78	9.10	13
VHT20	256QAM	2	5240	10.38	1.05	9.33	13
VHT40	BPSK	2	5230	8.4	0.23	8.17	13
VHT40	QPSK	2	5230	10.04	0.43	9.61	13
VHT40	16QAM	2	5230	9.69	0.81	8.88	13
VHT40	64QAM	2	5230	9.76	1.30	8.46	13
VHT40	256QAM	2	5230	10.1	1.69	8.41	13
VHT80	BPSK	2	5210	9.66	0.48	9.18	13
VHT80	QPSK	2	5210	10.38	0.86	9.52	13
VHT80	16QAM	2	5210	11.64	1.45	10.19	13
VHT80	64QAM	2	5210	10.49	2.02	8.47	13
VHT80	256QAM	2	5210	10.3	2.38	7.92	13

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

### Worst Plots



Date: 1.NOV.2013 18:07:12

### 3.6 Transmitter Radiated and Band Edge Emissions

#### 3.6.1 Limit of Transmitter Radiated and Band Edge Emissions

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

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

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

Un-restricted band emissions above 1GHz Limit	
Operating Band	Limit
5.15 - 5.25 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.25 - 5.35 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.47 - 5.725 GHz	e.i.r.p. -27 dBm [68.2 dBuV/m@3m]
5.725 - 5.825 GHz	5.715 5.725 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] 5.825 5.835 GHz: e.i.r.p. -17 dBm [78.2 dBuV/m@3m] Other un-restricted band: e.i.r.p. -27 dBm [68.2 dBuV/m@3m]

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

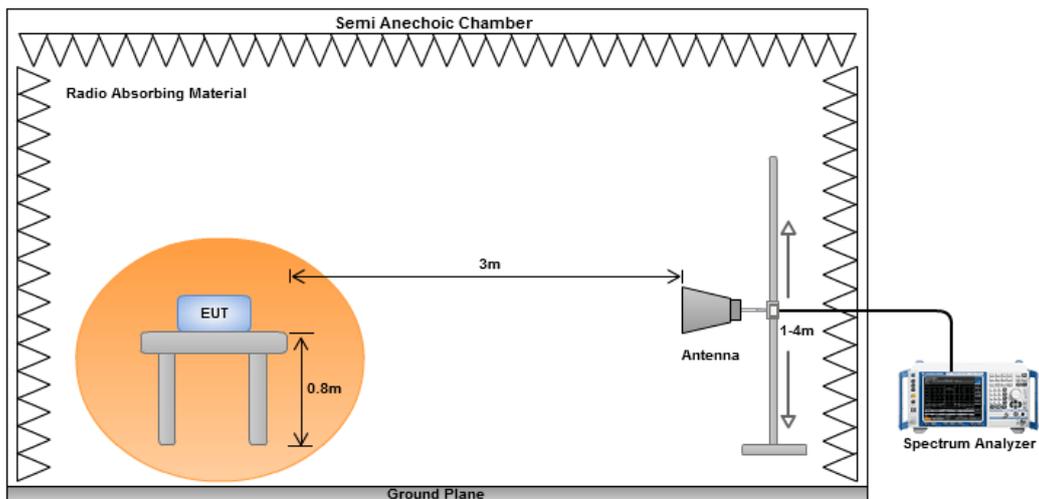
### 3.6.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

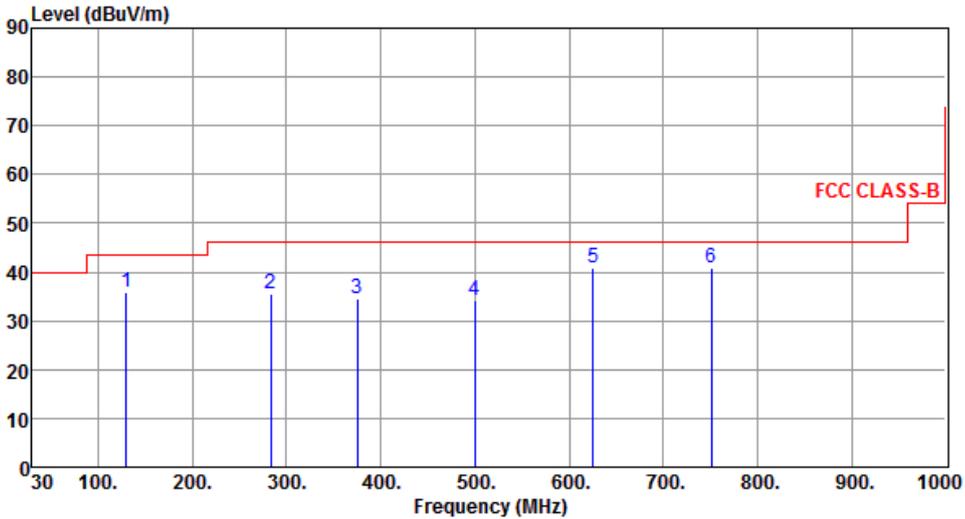
Note:

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

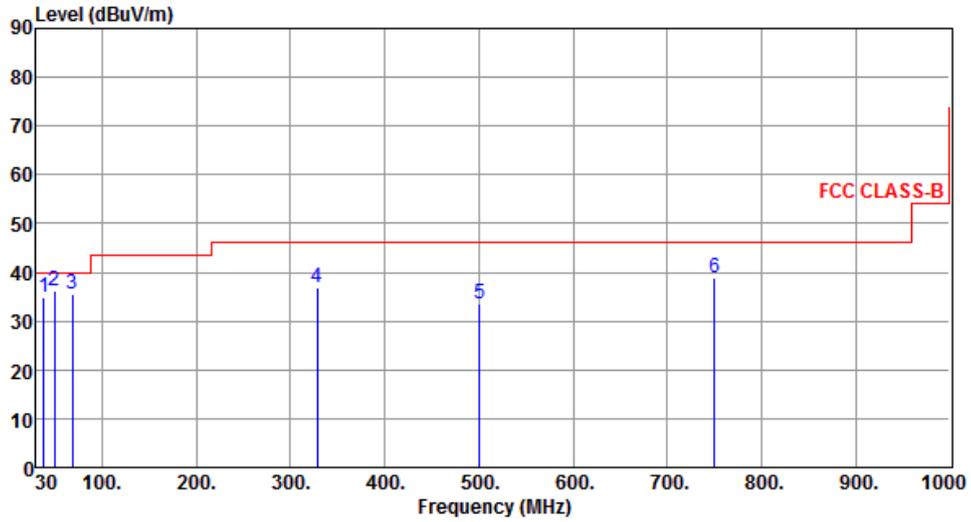
### 3.6.3 Test Setup



### 3.6.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

Modulation	VHT20	Test Freq. (MHz)	5200																																																																
Polarization	Horizontal	Test Configuration	1																																																																
																																																																			
	<table border="1"> <thead> <tr> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>129.84</td> <td>35.72</td> <td>43.50</td> <td>-7.78</td> <td>53.54</td> <td>-17.82</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>2</td> <td>282.96</td> <td>35.61</td> <td>46.00</td> <td>-10.39</td> <td>51.59</td> <td>-15.98</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>3</td> <td>375.41</td> <td>34.68</td> <td>46.00</td> <td>-11.32</td> <td>48.38</td> <td>-13.70</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>500.03</td> <td>34.30</td> <td>46.00</td> <td>-11.70</td> <td>45.25</td> <td>-10.95</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>5</td> <td>625.17</td> <td>40.86</td> <td>46.00</td> <td>-5.14</td> <td>49.45</td> <td>-8.59</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>6</td> <td>750.68</td> <td>41.01</td> <td>46.00</td> <td>-4.99</td> <td>47.62</td> <td>-6.61</td> <td>Peak</td> <td>---</td> </tr> </tbody> </table>	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	129.84	35.72	43.50	-7.78	53.54	-17.82	Peak	---	2	282.96	35.61	46.00	-10.39	51.59	-15.98	Peak	---	3	375.41	34.68	46.00	-11.32	48.38	-13.70	Peak	---	4	500.03	34.30	46.00	-11.70	45.25	-10.95	Peak	---	5	625.17	40.86	46.00	-5.14	49.45	-8.59	Peak	---	6	750.68	41.01	46.00	-4.99	47.62	-6.61	Peak	---			
Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																											
1	129.84	35.72	43.50	-7.78	53.54	-17.82	Peak	---																																																											
2	282.96	35.61	46.00	-10.39	51.59	-15.98	Peak	---																																																											
3	375.41	34.68	46.00	-11.32	48.38	-13.70	Peak	---																																																											
4	500.03	34.30	46.00	-11.70	45.25	-10.95	Peak	---																																																											
5	625.17	40.86	46.00	-5.14	49.45	-8.59	Peak	---																																																											
6	750.68	41.01	46.00	-4.99	47.62	-6.61	Peak	---																																																											
<p>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).</p>																																																																			

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Vertical	<b>Test Configuration</b>	1



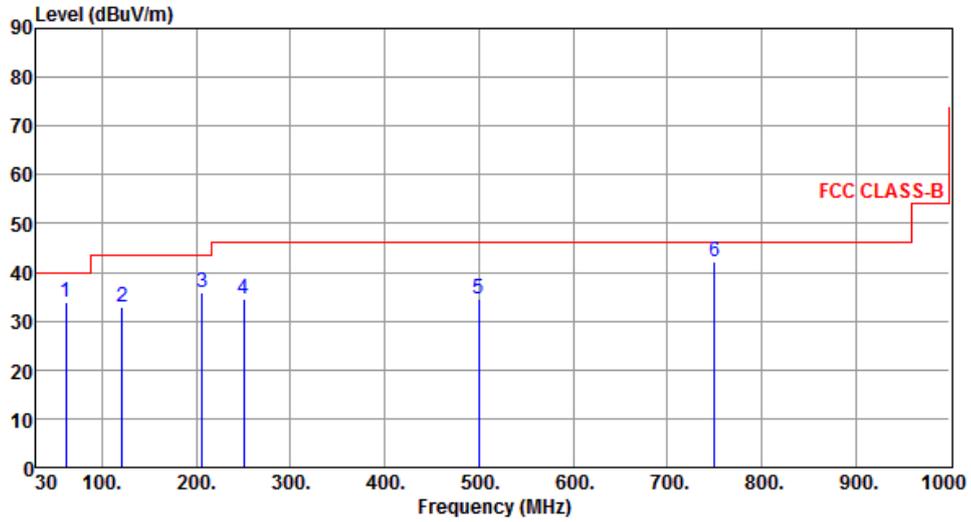
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	38.41	35.02	40.00	-4.98	51.53	-16.51	QP	---	---
2	49.25	36.23	40.00	-3.77	52.19	-15.96	QP	---	---
3	68.75	35.40	40.00	-4.60	53.83	-18.43	QP	---	---
4	328.63	36.70	46.00	-9.30	51.60	-14.90	Peak	---	---
5	500.51	33.40	46.00	-12.60	44.34	-10.94	Peak	---	---
6	750.32	38.72	46.00	-7.28	45.34	-6.62	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).

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Horizontal	<b>Test Configuration</b>	2



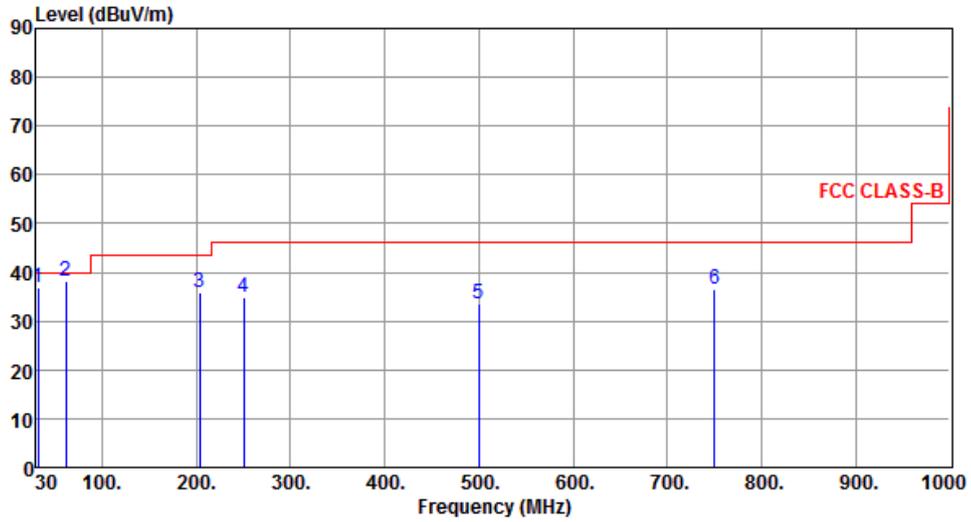
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	61.48	33.96	40.00	-6.04	50.95	-16.99	Peak	---	---
2	121.25	32.84	43.50	-10.66	51.45	-18.61	Peak	---	---
3	206.47	35.93	43.50	-7.57	54.88	-18.95	Peak	---	---
4	250.13	34.67	46.00	-11.33	52.02	-17.35	Peak	---	---
5	500.24	34.58	46.00	-11.42	45.53	-10.95	Peak	---	---
6	750.36	42.09	46.00	-3.91	48.71	-6.62	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).

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Vertical	<b>Test Configuration</b>	2



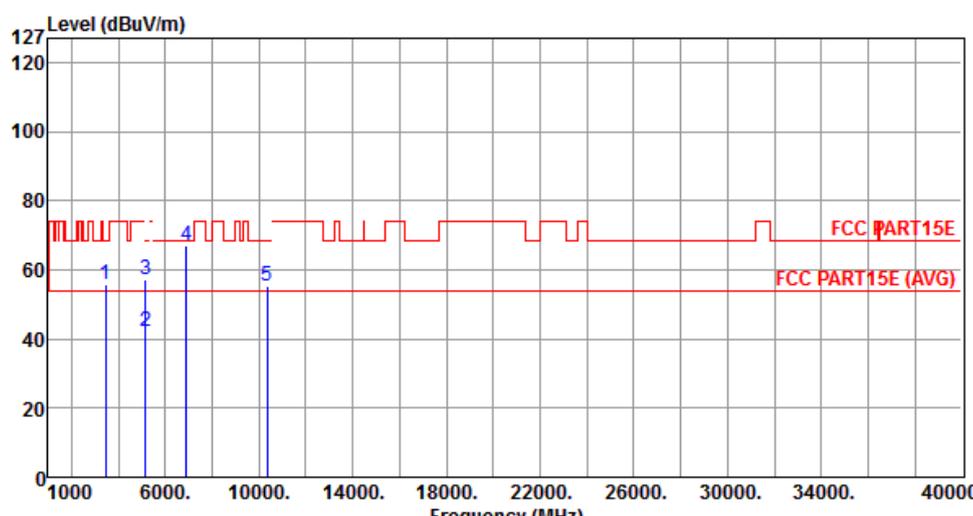
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	32.12	36.84	40.00	-3.16	53.77	-16.93	QP	---	---
2	61.24	38.03	40.00	-1.97	54.97	-16.94	QP	---	---
3	203.47	35.93	43.50	-7.57	54.98	-19.05	Peak	---	---
4	250.26	34.88	46.00	-11.12	52.22	-17.34	Peak	---	---
5	500.12	33.51	46.00	-12.49	44.46	-10.95	Peak	---	---
6	750.36	36.45	46.00	-9.55	43.07	-6.62	Peak	---	---

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

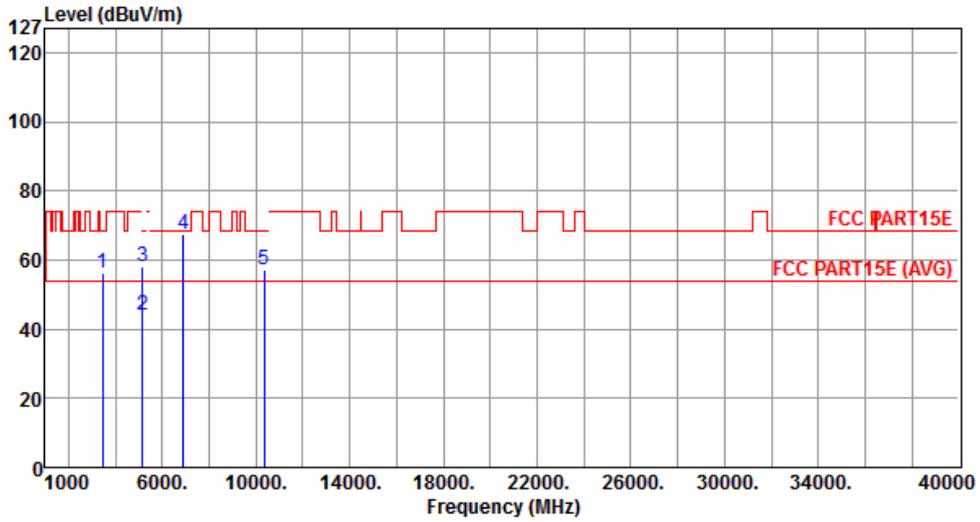
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	11a	Test Freq. (MHz)	5180																																																																
Polarization	Horizontal																																																																		
																																																																			
	<table border="1"> <thead> <tr> <th>Freq.</th> <th>Emission level</th> <th>Limit</th> <th>Margin</th> <th>SA reading</th> <th>Factor</th> <th>Remark</th> <th>ANT High</th> <th>Turn Table</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3453.30</td> <td>55.98</td> <td>68.30</td> <td>-12.32</td> <td>55.20</td> <td>0.78</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>2</td> <td>5150.00</td> <td>42.35</td> <td>54.00</td> <td>-11.65</td> <td>37.10</td> <td>5.25</td> <td>Average</td> <td>---</td> </tr> <tr> <td>3</td> <td>5150.00</td> <td>56.95</td> <td>74.00</td> <td>-17.05</td> <td>51.70</td> <td>5.25</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>6906.70</td> <td>66.95</td> <td>68.30</td> <td>-1.35</td> <td>58.30</td> <td>8.65</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>5</td> <td>10360.00</td> <td>55.25</td> <td>68.30</td> <td>-13.05</td> <td>41.70</td> <td>13.55</td> <td>Peak</td> <td>---</td> </tr> </tbody> </table>	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	1	3453.30	55.98	68.30	-12.32	55.20	0.78	Peak	---	2	5150.00	42.35	54.00	-11.65	37.10	5.25	Average	---	3	5150.00	56.95	74.00	-17.05	51.70	5.25	Peak	---	4	6906.70	66.95	68.30	-1.35	58.30	8.65	Peak	---	5	10360.00	55.25	68.30	-13.05	41.70	13.55	Peak	---			
Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table																																																											
MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg																																																											
1	3453.30	55.98	68.30	-12.32	55.20	0.78	Peak	---																																																											
2	5150.00	42.35	54.00	-11.65	37.10	5.25	Average	---																																																											
3	5150.00	56.95	74.00	-17.05	51.70	5.25	Peak	---																																																											
4	6906.70	66.95	68.30	-1.35	58.30	8.65	Peak	---																																																											
5	10360.00	55.25	68.30	-13.05	41.70	13.55	Peak	---																																																											
<p>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).</p>																																																																			

<b>Modulation</b>	11a	<b>Test Freq. (MHz)</b>	5180
<b>Polarization</b>	Vertical		



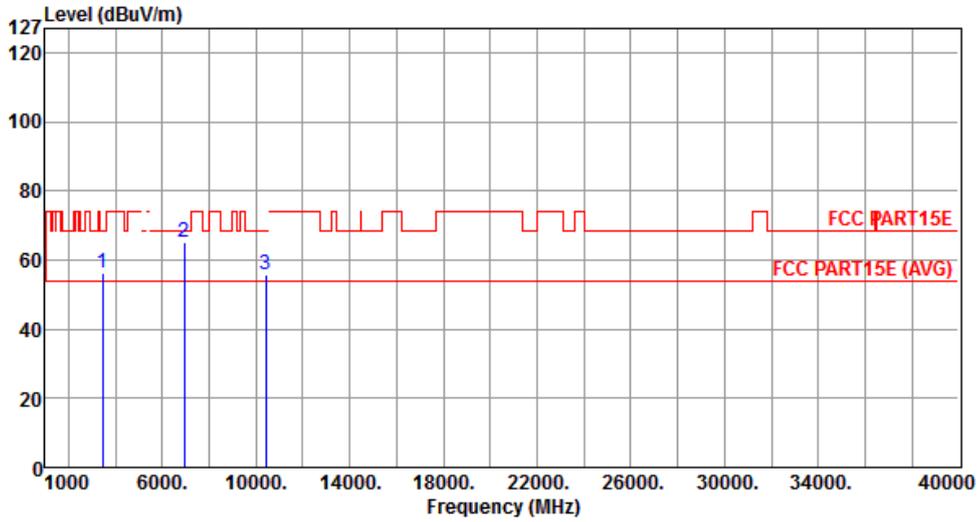
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3453.30	56.18	68.30	-12.12	55.40	0.78	Peak	---	---
2	5150.00	44.19	54.00	-9.81	38.94	5.25	Average	---	---
3	5150.00	58.17	74.00	-15.83	52.92	5.25	Peak	---	---
4	6906.70	67.25	68.30	-1.05	58.60	8.65	Peak	---	---
5	10360.00	57.05	68.30	-11.25	43.50	13.55	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).

<b>Modulation</b>	11a	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Horizontal		



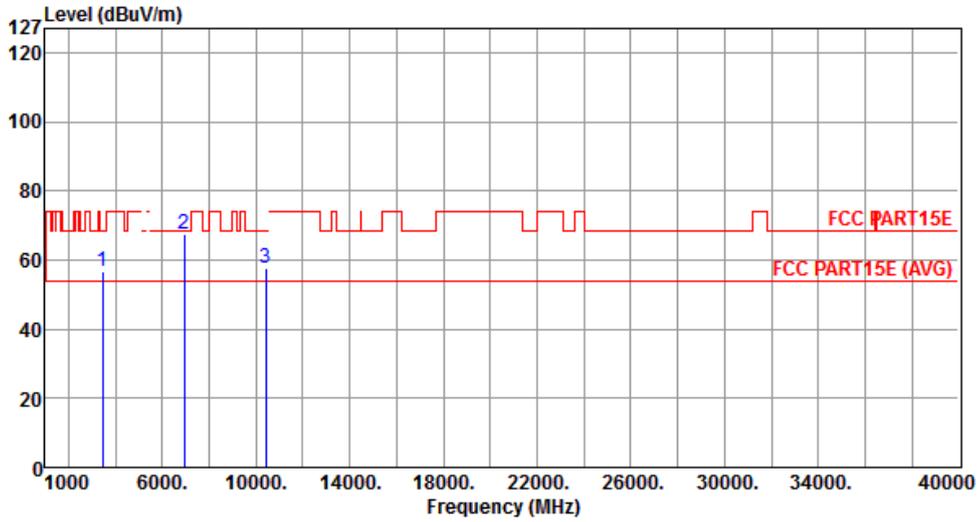
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3466.70	56.37	68.30	-11.93	55.55	0.82	Peak	---	---
2	6933.30	65.11	68.30	-3.19	56.40	8.71	Peak	---	---
3	10400.00	55.69	68.30	-12.61	42.06	13.63	Peak	---	---

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).

<b>Modulation</b>	11a	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Vertical		



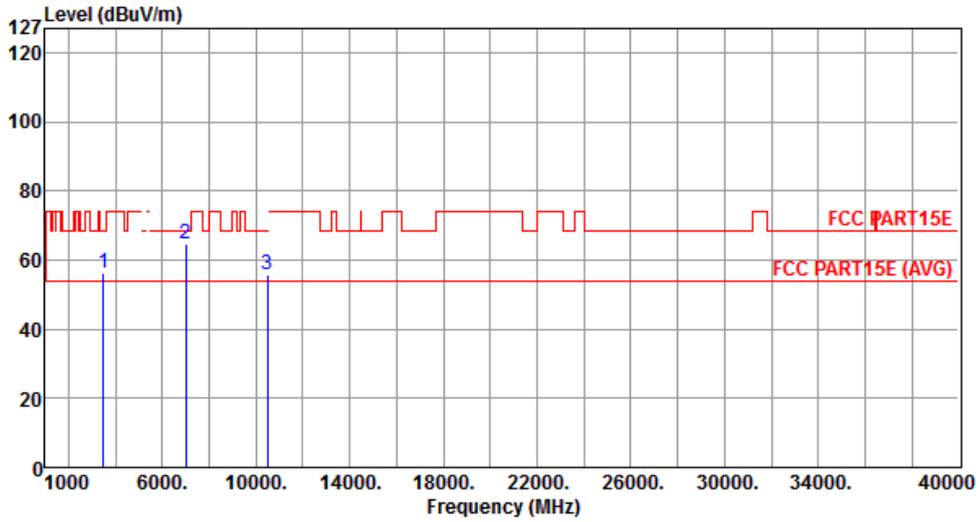
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3466.70	56.63	68.30	-11.67	55.81	0.82	Peak	---	---
2	6933.30	67.71	68.30	-0.59	59.00	8.71	Peak	---	---
3	10400.00	57.43	68.30	-10.87	43.80	13.63	Peak	---	---

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).

<b>Modulation</b>	11a	<b>Test Freq. (MHz)</b>	5240
<b>Polarization</b>	Horizontal		



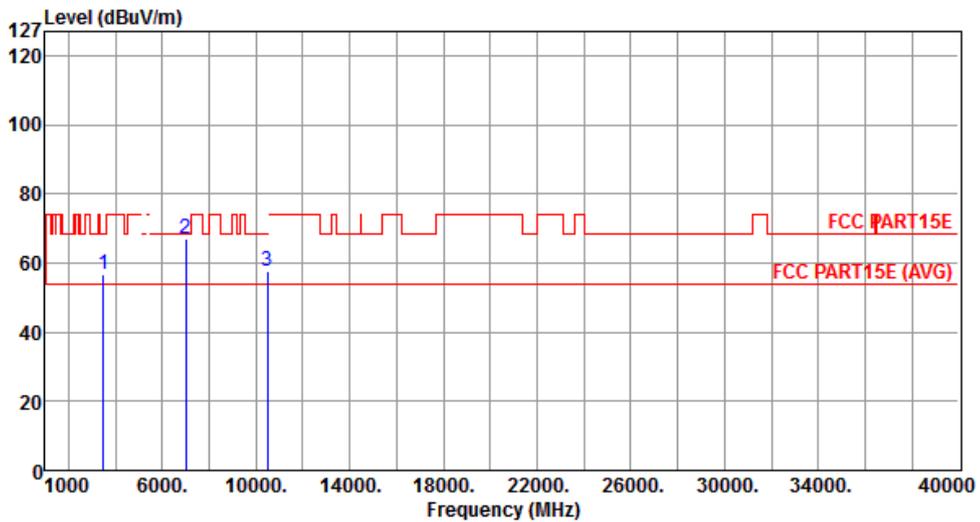
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3493.30	56.46	68.30	-11.84	55.55	0.91	Peak	---	---
2	6986.70	64.44	68.30	-3.86	55.60	8.84	Peak	---	---
3	10480.00	55.61	68.30	-12.69	41.81	13.80	Peak	---	---

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).

<b>Modulation</b>	11a	<b>Test Freq. (MHz)</b>	5240
<b>Polarization</b>	Vertical		



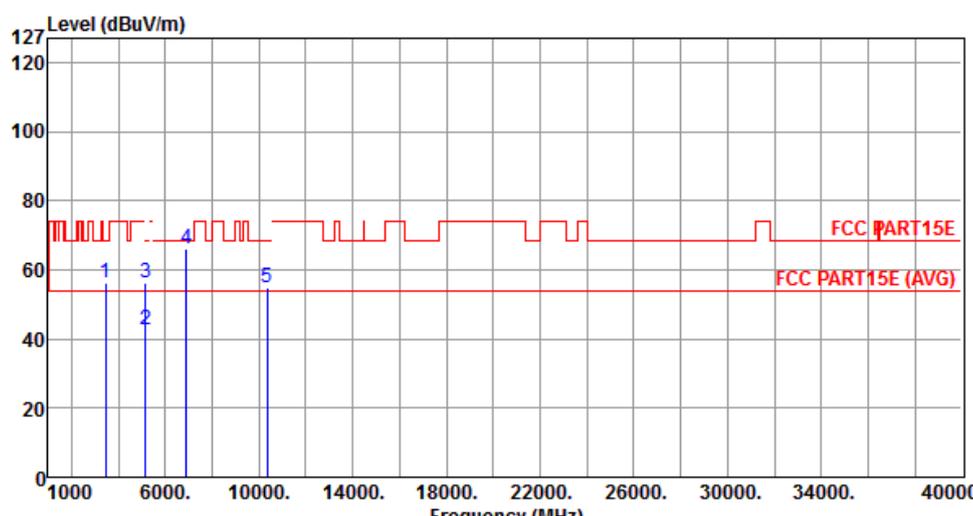
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3493.30	56.55	68.30	-11.75	55.64	0.91	Peak	---	---
2	6986.70	66.94	68.30	-1.36	58.10	8.84	Peak	---	---
3	10480.00	57.48	68.30	-10.82	43.68	13.80	Peak	---	---

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

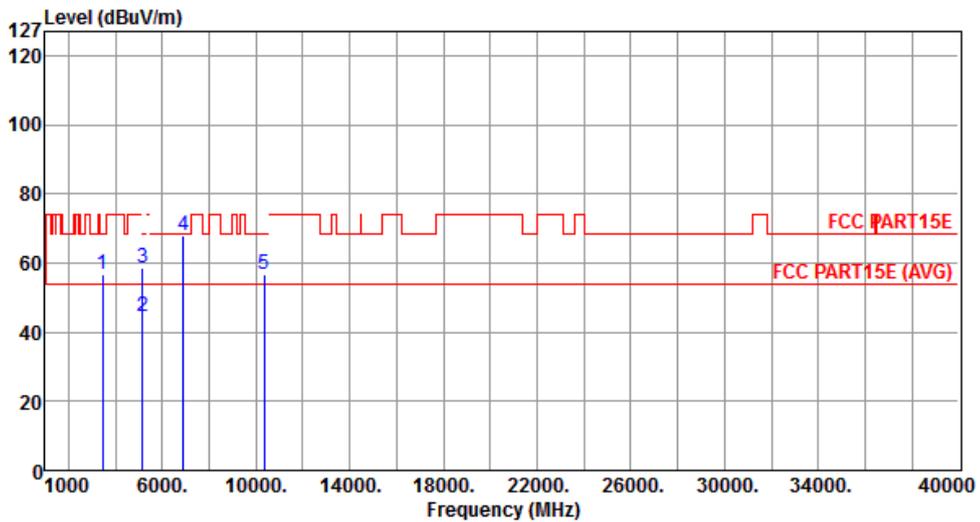
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	VHT20	Test Freq. (MHz)	5180																																																								
Polarization	Horizontal																																																										
																																																											
	<table border="1"> <thead> <tr> <th>Freq. MHz</th> <th>Emission level dBuV/m</th> <th>Limit dBuV/m</th> <th>Margin dB</th> <th>SA reading dBuV</th> <th>Factor dB</th> <th>Remark</th> <th>ANT High cm</th> <th>Turn Table deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3453.30</td> <td>56.43</td> <td>68.30</td> <td>-11.87</td> <td>55.65</td> <td>0.78</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>2</td> <td>5150.00</td> <td>42.67</td> <td>54.00</td> <td>-11.33</td> <td>37.42</td> <td>5.25</td> <td>Average</td> <td>---</td> </tr> <tr> <td>3</td> <td>5150.00</td> <td>56.31</td> <td>74.00</td> <td>-17.69</td> <td>51.06</td> <td>5.25</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>6906.70</td> <td>65.85</td> <td>68.30</td> <td>-2.45</td> <td>57.20</td> <td>8.65</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>5</td> <td>10360.00</td> <td>54.90</td> <td>68.30</td> <td>-13.40</td> <td>41.35</td> <td>13.55</td> <td>Peak</td> <td>---</td> </tr> </tbody> </table>	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg	1	3453.30	56.43	68.30	-11.87	55.65	0.78	Peak	---	2	5150.00	42.67	54.00	-11.33	37.42	5.25	Average	---	3	5150.00	56.31	74.00	-17.69	51.06	5.25	Peak	---	4	6906.70	65.85	68.30	-2.45	57.20	8.65	Peak	---	5	10360.00	54.90	68.30	-13.40	41.35	13.55	Peak	---				
Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg																																																			
1	3453.30	56.43	68.30	-11.87	55.65	0.78	Peak	---																																																			
2	5150.00	42.67	54.00	-11.33	37.42	5.25	Average	---																																																			
3	5150.00	56.31	74.00	-17.69	51.06	5.25	Peak	---																																																			
4	6906.70	65.85	68.30	-2.45	57.20	8.65	Peak	---																																																			
5	10360.00	54.90	68.30	-13.40	41.35	13.55	Peak	---																																																			
<p>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).</p>																																																											

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5180
<b>Polarization</b>	Vertical		



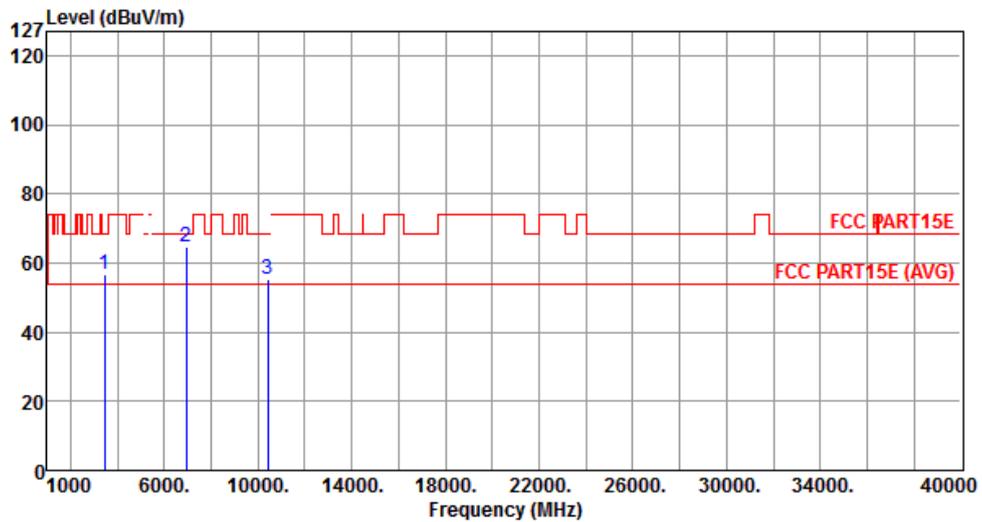
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3453.30	56.52	68.30	-11.78	55.74	0.78	Peak	---	---
2	5150.00	44.68	54.00	-9.32	39.43	5.25	Average	---	---
3	5150.00	58.80	74.00	-15.20	53.55	5.25	Peak	---	---
4	6906.70	68.07	68.30	-0.23	59.42	8.65	Peak	---	---
5	10360.00	56.87	68.30	-11.43	43.32	13.55	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).

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Horizontal		



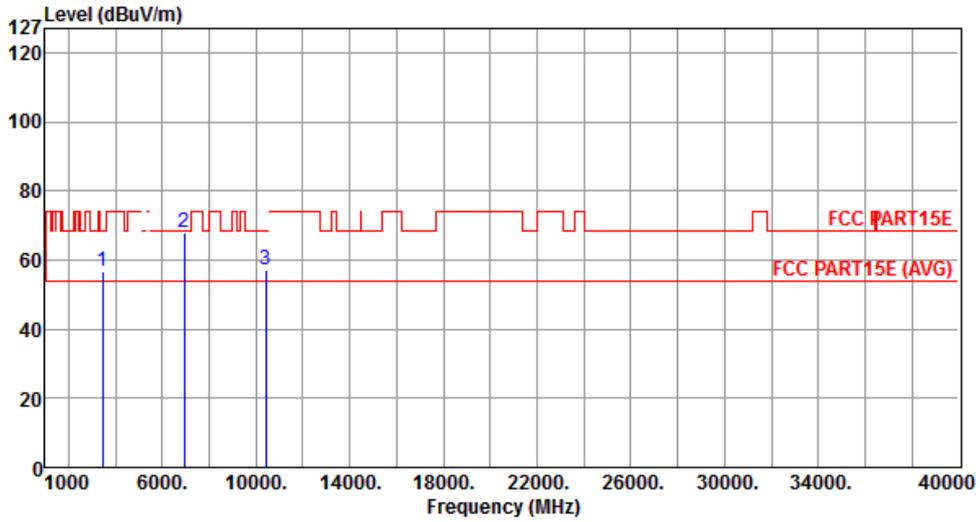
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3466.70	56.78	68.30	-11.52	55.96	0.82	Peak	---	---
2	6933.30	64.82	68.30	-3.48	56.11	8.71	Peak	---	---
3	10400.00	55.24	68.30	-13.06	41.61	13.63	Peak	---	---

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).

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5200
<b>Polarization</b>	Vertical		



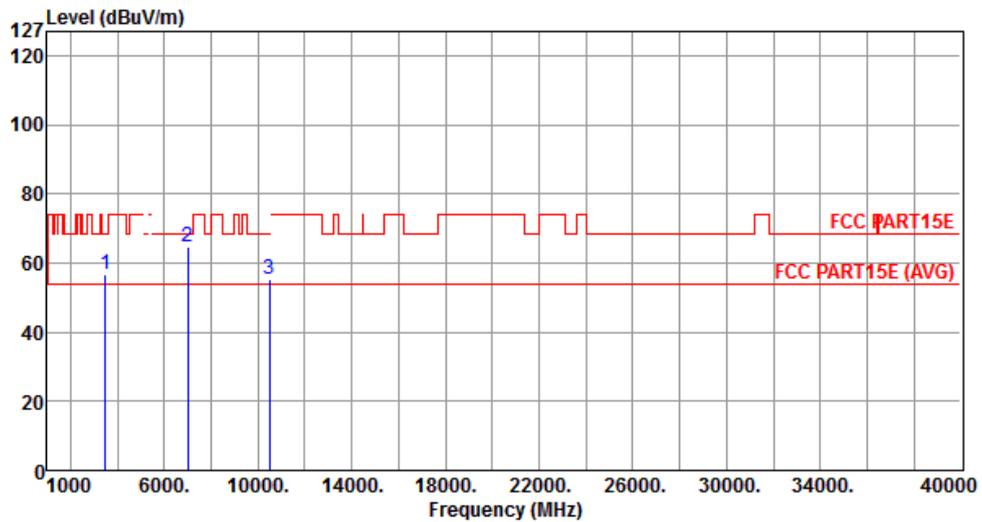
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3466.70	56.82	68.30	-11.48	56.00	0.82	Peak	---	---
2	6933.30	67.81	68.30	-0.49	59.10	8.71	Peak	---	---
3	10400.00	57.10	68.30	-11.20	43.47	13.63	Peak	---	---

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).

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



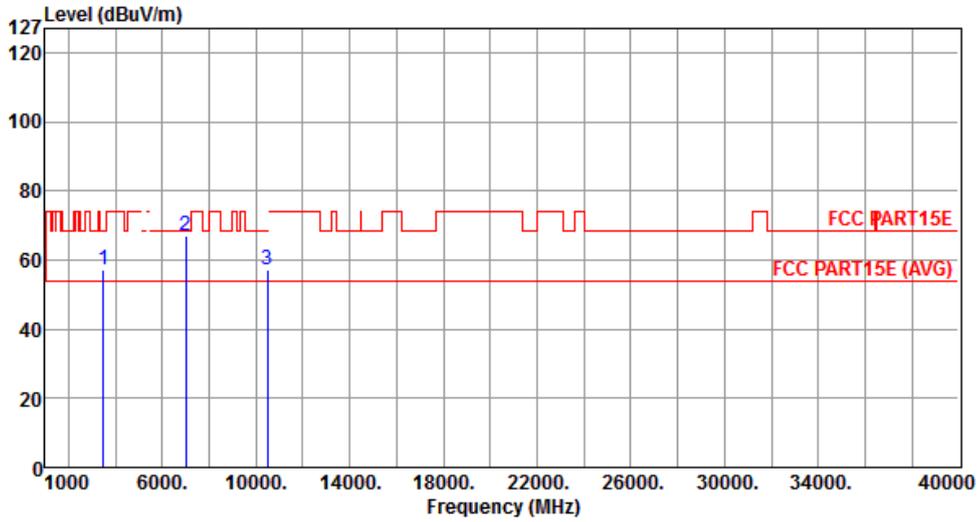
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3493.30	56.81	68.30	-11.49	55.90	0.91	Peak	---	---
2	6986.70	64.74	68.30	-3.56	55.90	8.84	Peak	---	---
3	10480.00	55.23	68.30	-13.07	41.43	13.80	Peak	---	---

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).

<b>Modulation</b>	VHT20	<b>Test Freq. (MHz)</b>	5240
<b>Polarization</b>	Vertical		



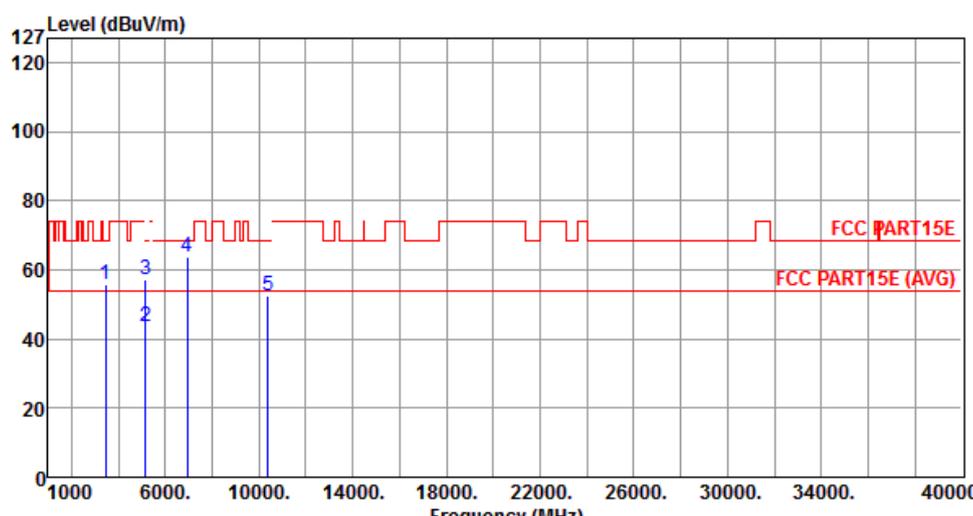
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3493.30	57.23	68.30	-11.07	56.32	0.91	Peak	---	---
2	6986.70	67.04	68.30	-1.26	58.20	8.84	Peak	---	---
3	10480.00	57.23	68.30	-11.07	43.43	13.80	Peak	---	---

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

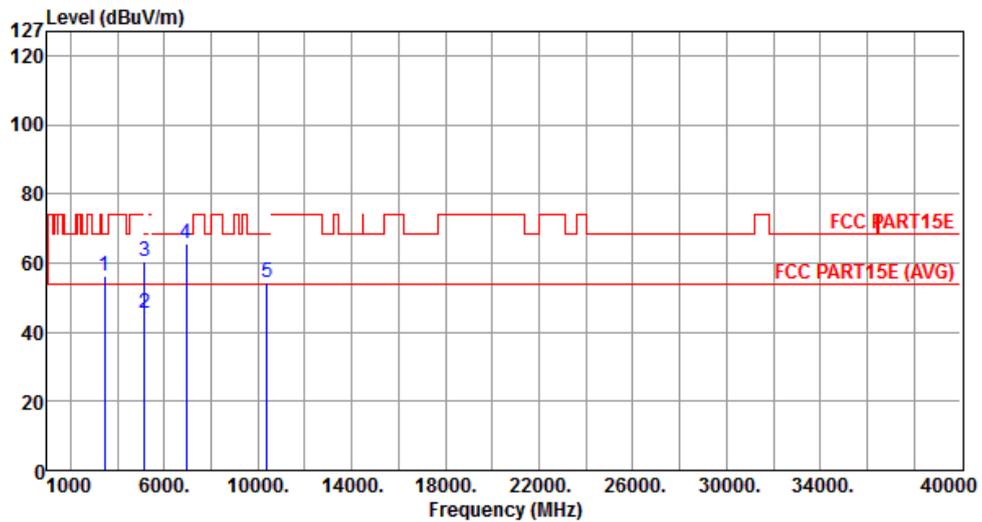
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	VHT40	Test Freq. (MHz)	5190																																																																
Polarization	Horizontal																																																																		
																																																																			
	<table border="1"> <thead> <tr> <th>Freq.</th> <th>Emission level</th> <th>Limit</th> <th>Margin</th> <th>SA reading</th> <th>Factor</th> <th>Remark</th> <th>ANT High</th> <th>Turn Table</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3460.00</td> <td>55.85</td> <td>68.30</td> <td>-12.45</td> <td>55.06</td> <td>0.79</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>2</td> <td>5150.00</td> <td>43.45</td> <td>54.00</td> <td>-10.55</td> <td>38.20</td> <td>5.25</td> <td>Average</td> <td>---</td> </tr> <tr> <td>3</td> <td>5150.00</td> <td>57.35</td> <td>74.00</td> <td>-16.65</td> <td>52.10</td> <td>5.25</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>6920.00</td> <td>63.82</td> <td>68.30</td> <td>-4.48</td> <td>55.14</td> <td>8.68</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>5</td> <td>10380.00</td> <td>52.43</td> <td>68.30</td> <td>-15.87</td> <td>38.84</td> <td>13.59</td> <td>Peak</td> <td>---</td> </tr> </tbody> </table>	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	1	3460.00	55.85	68.30	-12.45	55.06	0.79	Peak	---	2	5150.00	43.45	54.00	-10.55	38.20	5.25	Average	---	3	5150.00	57.35	74.00	-16.65	52.10	5.25	Peak	---	4	6920.00	63.82	68.30	-4.48	55.14	8.68	Peak	---	5	10380.00	52.43	68.30	-15.87	38.84	13.59	Peak	---			
Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table																																																											
MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg																																																											
1	3460.00	55.85	68.30	-12.45	55.06	0.79	Peak	---																																																											
2	5150.00	43.45	54.00	-10.55	38.20	5.25	Average	---																																																											
3	5150.00	57.35	74.00	-16.65	52.10	5.25	Peak	---																																																											
4	6920.00	63.82	68.30	-4.48	55.14	8.68	Peak	---																																																											
5	10380.00	52.43	68.30	-15.87	38.84	13.59	Peak	---																																																											
<p>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).</p>																																																																			

<b>Modulation</b>	VHT40	<b>Test Freq. (MHz)</b>	5190
<b>Polarization</b>	Vertical		



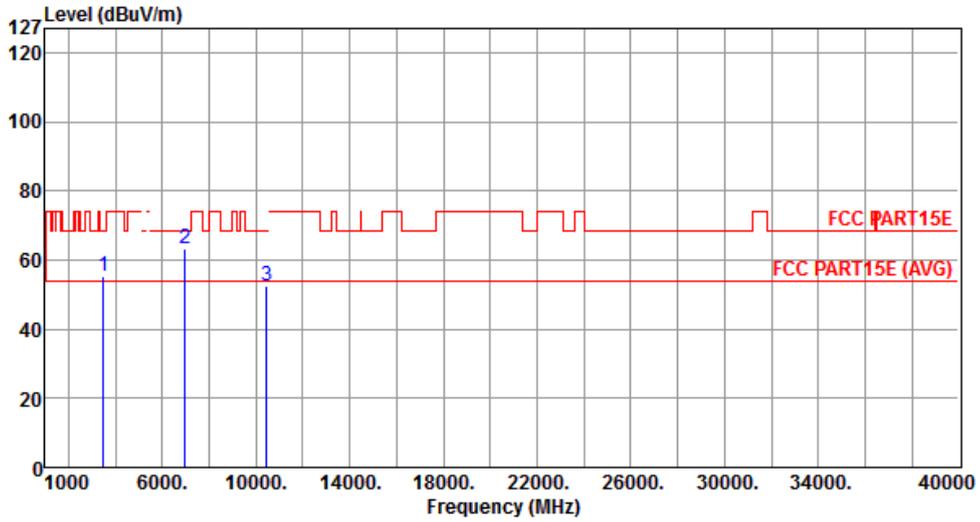
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3460.00	56.02	68.30	-12.28	55.23	0.79	Peak	---	---
2	5150.00	45.65	54.00	-8.35	40.40	5.25	Average	---	---
3	5150.00	60.25	74.00	-13.75	55.00	5.25	Peak	---	---
4	6920.00	65.78	68.30	-2.52	57.10	8.68	Peak	---	---
5	10380.00	54.57	68.30	-13.73	40.98	13.59	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).

<b>Modulation</b>	VHT40	<b>Test Freq. (MHz)</b>	5230
<b>Polarization</b>	Horizontal		



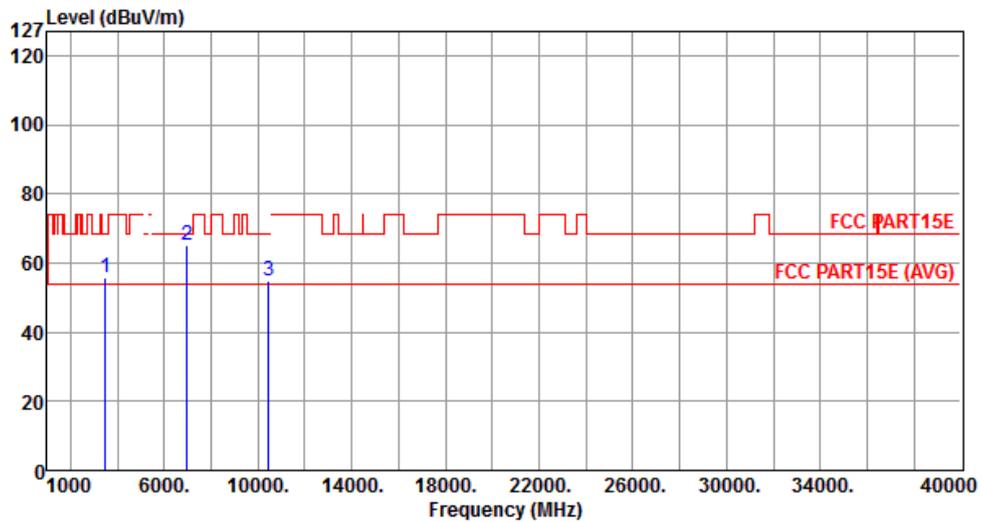
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3486.70	55.43	68.30	-12.87	54.56	0.87	Peak	---	---
2	6973.30	63.31	68.30	-4.99	54.50	8.81	Peak	---	---
3	10460.00	52.69	68.30	-15.61	38.94	13.75	Peak	---	---

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).

<b>Modulation</b>	VHT40	<b>Test Freq. (MHz)</b>	5230
<b>Polarization</b>	Vertical		



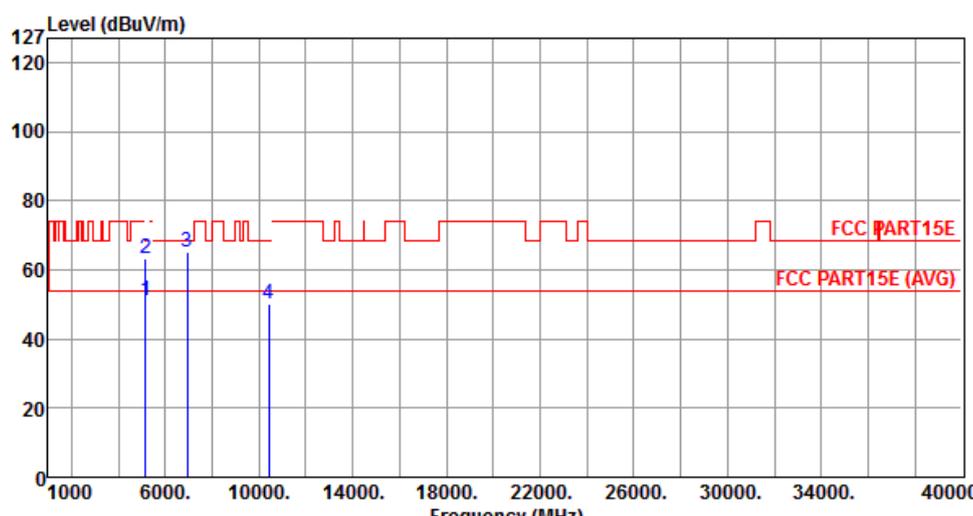
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	3486.70	55.83	68.30	-12.47	54.96	0.87	Peak	---	---
2	6973.30	65.22	68.30	-3.08	56.41	8.81	Peak	---	---
3	10460.00	54.83	68.30	-13.47	41.08	13.75	Peak	---	---

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

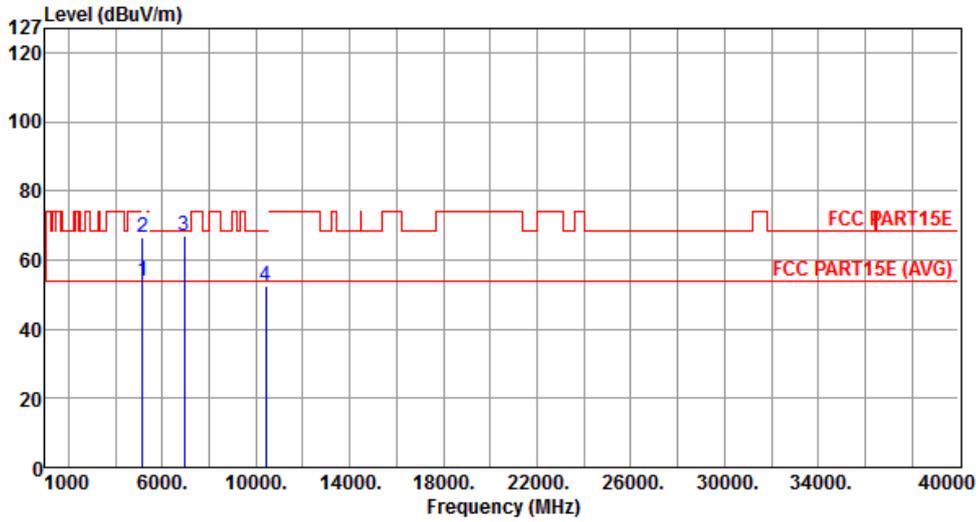
\*Factor includes antenna factor , cable loss and amplifier gain

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

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

Modulation	VHT80	Test Freq. (MHz)	5210																																																							
Polarization	Horizontal																																																									
																																																										
	<table border="1"> <thead> <tr> <th>Freq.</th> <th>Emission level</th> <th>Limit</th> <th>Margin</th> <th>SA reading</th> <th>Factor</th> <th>Remark</th> <th>ANT High</th> <th>Turn Table</th> </tr> <tr> <th>MHz</th> <th>dBuV/m</th> <th>dBuV/m</th> <th>dB</th> <th>dBuV</th> <th>dB</th> <th></th> <th>cm</th> <th>deg</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5150.00</td> <td>51.05</td> <td>54.00</td> <td>-2.95</td> <td>45.80</td> <td>5.25</td> <td>Average</td> <td>---</td> </tr> <tr> <td>2</td> <td>5150.00</td> <td>63.35</td> <td>74.00</td> <td>-10.65</td> <td>58.10</td> <td>5.25</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>3</td> <td>6946.70</td> <td>65.04</td> <td>68.30</td> <td>-3.26</td> <td>56.30</td> <td>8.74</td> <td>Peak</td> <td>---</td> </tr> <tr> <td>4</td> <td>10420.00</td> <td>50.15</td> <td>68.30</td> <td>-18.15</td> <td>36.48</td> <td>13.67</td> <td>Peak</td> <td>---</td> </tr> </tbody> </table>	Freq.	Emission level	Limit	Margin	SA reading	Factor	Remark	ANT High	Turn Table	MHz	dBuV/m	dBuV/m	dB	dBuV	dB		cm	deg	1	5150.00	51.05	54.00	-2.95	45.80	5.25	Average	---	2	5150.00	63.35	74.00	-10.65	58.10	5.25	Peak	---	3	6946.70	65.04	68.30	-3.26	56.30	8.74	Peak	---	4	10420.00	50.15	68.30	-18.15	36.48	13.67	Peak	---			
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<p>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).</p>																																																										

<b>Modulation</b>	VHT80	<b>Test Freq. (MHz)</b>	5210
<b>Polarization</b>	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	53.90	54.00	-0.10	48.65	5.25	Average	---	---
2	5150.00	66.45	74.00	-7.55	61.20	5.25	Peak	---	---
3	6946.70	66.94	68.30	-1.36	58.20	8.74	Peak	---	---
4	10420.00	52.53	68.30	-15.77	38.86	13.67	Peak	---	---

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

\*Factor includes antenna factor , cable loss and amplifier gain

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

## 3.7 Frequency Stability

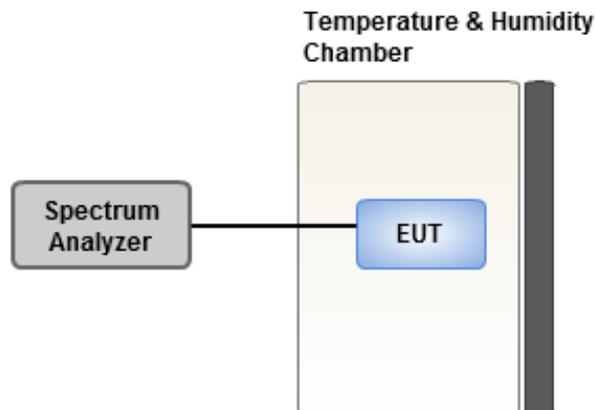
### 3.7.1 Limit of Frequency Stability

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

### 3.7.2 Test Procedures

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

### 3.7.3 Test Setup



### 3.7.4 Test Result of Frequency Stability

Frequency: 5200 MHz	Frequency Drift (ppm)			
	0 minute	2 minutes	5 minutes	10 minutes
T20°C Vmax	-0.47	-0.19	-0.52	-0.37
T20°C Vmin	3.99	3.94	4.47	4.51
T60°C Vnom	5.01	5.66	5.71	5.28
T50°C Vnom	4.04	4.35	3.94	3.87
T40°C Vnom	0.69	0.75	0.88	1.29
T30°C Vnom	0.49	0.17	1.35	0.37
T20°C Vnom	0.38	0.35	0.57	0.69
T10°C Vnom	0.24	0.56	0.66	0.29
T0°C Vnom	-0.58	-0.76	-0.64	-0.44
T-10°C Vnom	0.12	0.12	0.66	0.80
T-20°C Vnom	-0.95	-1.04	-0.98	-0.90
T-30°C Vnom	-3.03	-2.83	-2.50	-2.69
Vnom [Vdc]: 110		Vmax [Vdc]: 126.5		Vmin [Vdc]: 93.5
Tnom [°C]: 20		Tmax [°C]: 60		Tmin [°C]: -30

## 4 Test laboratory information

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

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

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

### **Linkou**

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

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Fax: 886-3-318-0155

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