

# HCT CO., LTD.

## CERTIFICATE OF COMPLIANCE FCC Certification

<b>Applicant Name:</b> POINTMOBILE CO.,LTD	<b>Date of Issue:</b> December 13, 2013
<b>Address:</b> Gasan-dong,B-9F Kabul Great Valley 32,Digital-ro9-gil, Geumcheon-gu, Seoul, Korea 153-709	<b>Test Site/Location:</b> HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang- myeon, Icheon-si, Gyeonggi-do, Korea
	<b>Report No.:</b> HCTR1311FR13-1
	<b>HCT FRN:</b> 0005866421

**FCC ID : V2X-PM40**

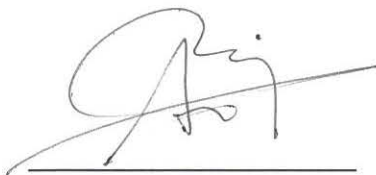
**APPLICANT : POINTMOBILE CO.,LTD**

**FCC Model(s):** PM40  
**EUT Type:** Mobile computer  
**Max. RF Output Power:** Wi-Fi 802.11a (5180~5240) (13.00 dBm)/ Wi-Fi 802.11a (5260~5320) (13.12 dBm)/  
 Wi-Fi 802.11a (5500~5700) (12.50 dBm)/ Wi-Fi 802.11n\_20 MHz BW (5180~5240) (12.06 dBm)/  
 Wi-Fi 802.11n\_20 MHz BW(5260~5320)(12.10 dBm)/ Wi-Fi 802.11n\_20 MHz BW(5500~5700)(11.53 dBm)  
**Frequency Range:** 20 MHz BW: 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/  
 5500 MHz - 5700 MHz (UNII 2e)  
**Modulation type** OFDM  
**FCC Classification:** Unlicensed National Information Infrastructure(UNII)  
**FCC Rule Part(s):** Part 15.407

**Engineering Statement:**

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)



**Report prepared by**  
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**Test engineer of RF Team**



**Approved by**  
: Chang Seok Choi  
**Manager of RF Team**

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FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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# Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1311FR13	November 22, 2013	- First Approval Report
HCTR1311FR13-1	December 18, 2013	- Revised the rule section to 15.407 from 15.247 on Page 18 and 71

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## 1. GENERAL INFORMATION

**Applicant:** POINTMOBILE CO.,LTD  
**Address:** Gasan-dong,B-9F Kabul Great Valley 32,Digital-ro9-gil, Geumcheon-gu, Seoul, Korea 153-709  
**FCC ID:** V2X-PM40  
**EUT Type:** Mobile computer  
**Model name(s):** PM40  
**Date(s) of Tests:** August 27, 2013 ~ November 22, 2013  
**Place of Tests:** HCT Co., Ltd.  
 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea  
 (IC Recognition No. : 5944A-3)

## 2. EUT DESCRIPTION

<b>EUT Type</b>	Mobile computer	
<b>FCC Model Name</b>	PM40	
<b>Power Supply</b>	DC 3.8 V	
<b>Battery Type</b>	Li-ion Battery	
<b>Frequency Range</b>	TX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) where) Not supported 5600 MHz – 5640 MHz
	RX_20 MHz BW:	5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2)/ 5500 MHz - 5700 MHz (UNII 2e) where) Not supported 5600 MHz – 5640 MHz
<b>Max. RF Output Power:</b>	Wi-Fi 802.11a (5180~5240) (13.00 dBm)/ Wi-Fi 802.11a (5260~5320) (13.12 dBm)/ Wi-Fi 802.11a (5500~5700) (12.50 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (12.06 dBm)/ Wi-Fi 802.11n_20 MHz BW(5260~5320)(12.10 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(11.53 dBm)	
<b>Modulation Type</b>	OFDM(802.11a, 802.11n)	
<b>Antenna Specification</b>	Manufacturer: Karam Solution Antenna type: FPCB Antenna Peak Gain : 0 dBi	

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### 3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D01 General UNII Test Procedures v01r03 dated April 08, 2013 entitled “ Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices, the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) – Part 15, Subpart E” were used in the measurement.

#### 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

#### 3.3 GENERAL TEST PROCEDURES

##### Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

##### Conducted Antenna Terminal

See Section from 8.1 to 8.4.(KDB 789033)

#### 3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

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## 4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 21, 2011 (Registration Number: 90661)

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

## 6. ANTENNA REQUIREMENTS

### According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

\* The antennas of this E.U.T are permanently attached.

\*The E.U.T Complies with the requirement of §15.203

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## 7. SUMMARY OF TEST RESULTS

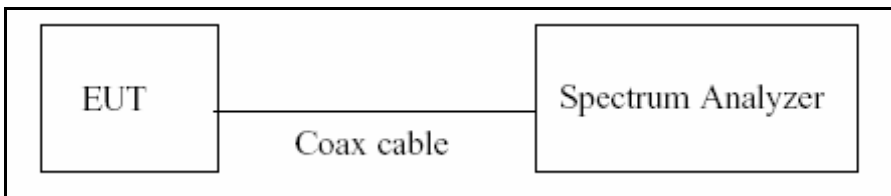
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
<b><u>TRANSMITTER MODE(TX)</u></b>				
26dB Bandwidth	NA	NA	CONDUCTED	PASS
Maximum Conducted Output Power	§15.407(a)(1)	< 4+10 log <sub>10</sub> (BW) dBm (5150-5250 MHz) < 11+10 log <sub>10</sub> (BW) dBm (5250-5350 MHz) < 11+10 log <sub>10</sub> (BW) dBm (5470-5725 MHz)		PASS
Peak Power Spectral Density	§15.407(a)(1), (5)	<4 dBm/ MHz (5150-5250) <11 dBm/ MHz (5250-5350) <11 dBm/ MHz (5470-5725)		PASS
Peak Excursion	§15.407(a)(6)	<13 dB/ MHz maximum difference		PASS
Frequency Stability	§15.407(g)	NA		PASS
Undesirable Emissions	§15.407(b)(1), (2), (3)	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	RADIATED	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 5.407(b)(1), (5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207	<FCC 15.207 limits	LINE CONDUCTED	PASS

## 8. TEST RESULT

### 8.1 DUTY CYCLE

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set  $RBW \geq EBW$  if possible; otherwise, set RBW to the largest available value. Set  $VBW \geq RBW$ . Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are  $> 50/T$ , where  $T$  is defined in section B)1)a), and the number of sweep points across duration  $T$  exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if  $T \leq 16.7$  microseconds.)

#### TEST CONFIGURATION



#### TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, B)2) in KDB 789033( issued 04/08/2013)

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if  $T \leq 6.25$  microseconds. ( $50/6.25 = 8$ )

The zero-span method was used because all measured  $T$  data are  $> 6.25$  microseconds and both RBW and VBW are  $> 50/T$ .

1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ( $\geq$  RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep  $> 100$
6. Trace mode = Clear write
7. Measure  $T_{total}$  and  $T_{on}$
8. Calculate Duty Cycle =  $T_{on} / T_{total}$  and Duty Cycle Factor =  $10 * \log(1/\text{Duty Cycle})$

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### Duty Cycle Factor

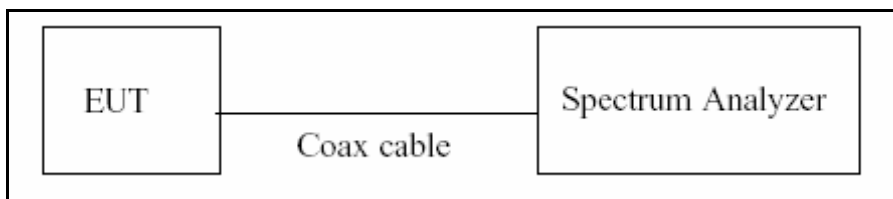
Mode	Data Rate	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle	Duty Cycle Factor
802.11a	6	1.395	2.405	0.58004158	2.365
	9	0.940	1.950	0.48205128	3.169
	12	0.708	1.719	0.41186736	3.852
	18	0.480	1.491	0.32193159	4.922
	24	0.364	1.376	0.26453488	5.775
	36	0.252	1.263	0.19952494	7.000
	48	0.192	1.203	0.15960100	7.970
	54	0.177	1.188	0.14898990	8.268
802.11n_20 MHz BW	6.5	1.310	2.320	0.56465517	2.482
	13	0.672	1.683	0.39928699	3.987
	19.5	0.459	1.470	0.31224490	5.055
	26	0.354	1.365	0.25934066	5.861
	39	0.246	1.260	0.19523810	7.094
	52	0.196	1.206	0.16252073	7.891
	58.5	0.180	1.191	0.15113350	8.206
	65	0.165	1.176	0.14030612	8.529

## 8.2 26 dB BANDWIDTH MEASUREMENT

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033(issued 04/08/2013), at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

### TEST CONFIGURATION



### TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to( Page 3 in KDB 789033, issued 04/08/2013)

9. RBW = approximately 1 % of the emission bandwidth
10. VBW > RBW
11. Detector = Peak
12. Trace mode = max hold
13. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

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**TEST RESULTS**

20 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	22.90	N/A	Pass
5200	40	21.87	N/A	Pass
5240	48	21.67	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	21.81	N/A	Pass
5300	60	22.54	N/A	Pass
5320	64	21.90	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	21.93	N/A	Pass
5580	116	22.89	N/A	Pass
5700	140	22.04	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5180	36	23.60	N/A	Pass
5200	40	22.95	N/A	Pass
5240	48	23.55	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	22.97	N/A	Pass
5300	60	23.77	N/A	Pass
5320	64	22.45	N/A	Pass

Conducted 26 dB Bandwidth Measurements for 802.11n

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5500	100	22.94	N/A	Pass
5580	116	22.95	N/A	Pass
5700	140	23.19	N/A	Pass

Note :

1. In order to simplify the report, attached plots were only the most wide channel.



**20 dB BW TEST RESULTS(Additional Test)**

**Conducted 20 dB Bandwidth Measurements for 802.11a**

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	18.63	N/A	Pass

**Conducted 20 dB Bandwidth Measurements for 802.11n\_20 MHz BW**

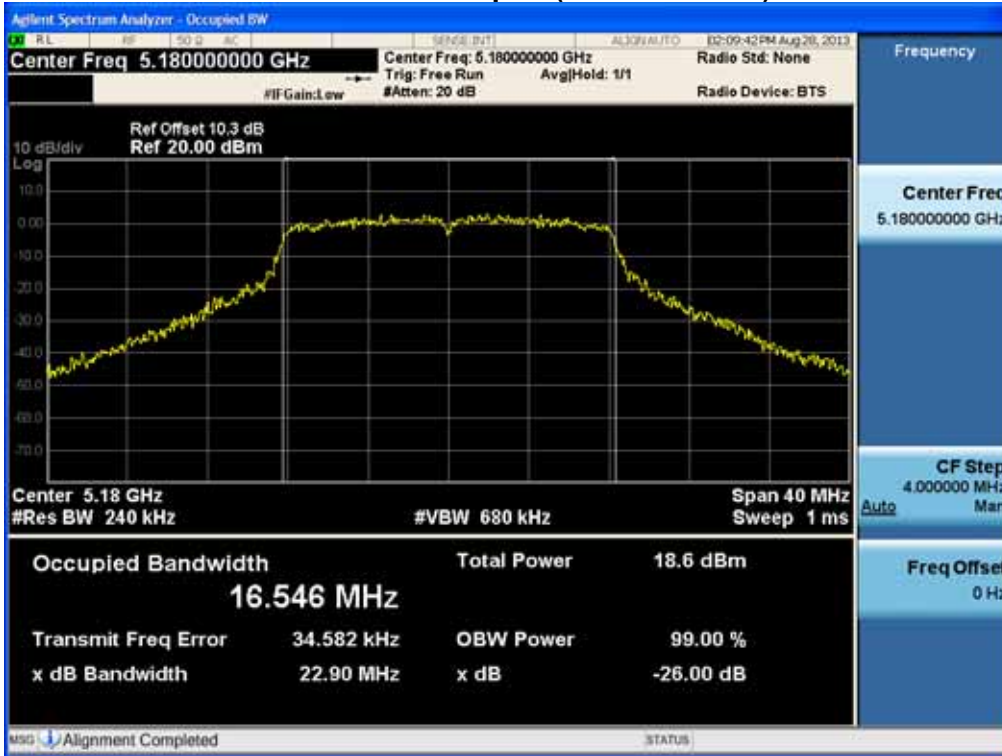
802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5260	52	19.45	N/A	Pass

**Note : We performed the 20 dB BW test to prove that no part of the fundamental emissions of any UNII2 band signal lies within the UNII band 1.**

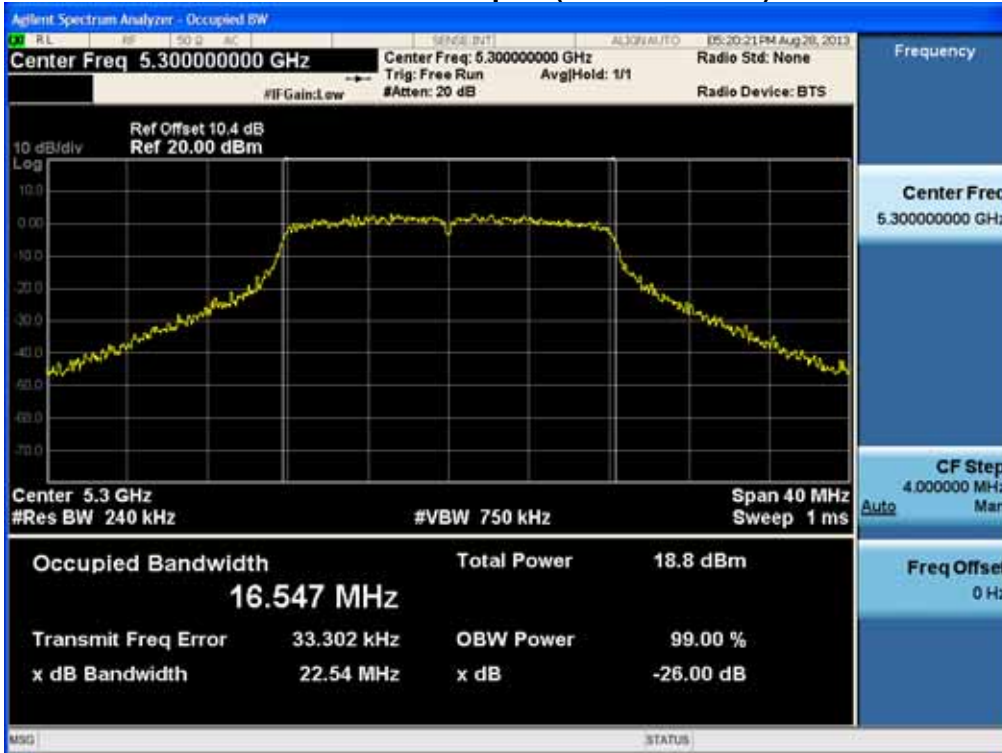
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**RESULT PLOTS**  
20 MHz BW

**26 dB Bandwidth plot (802.11a-CH 36)**



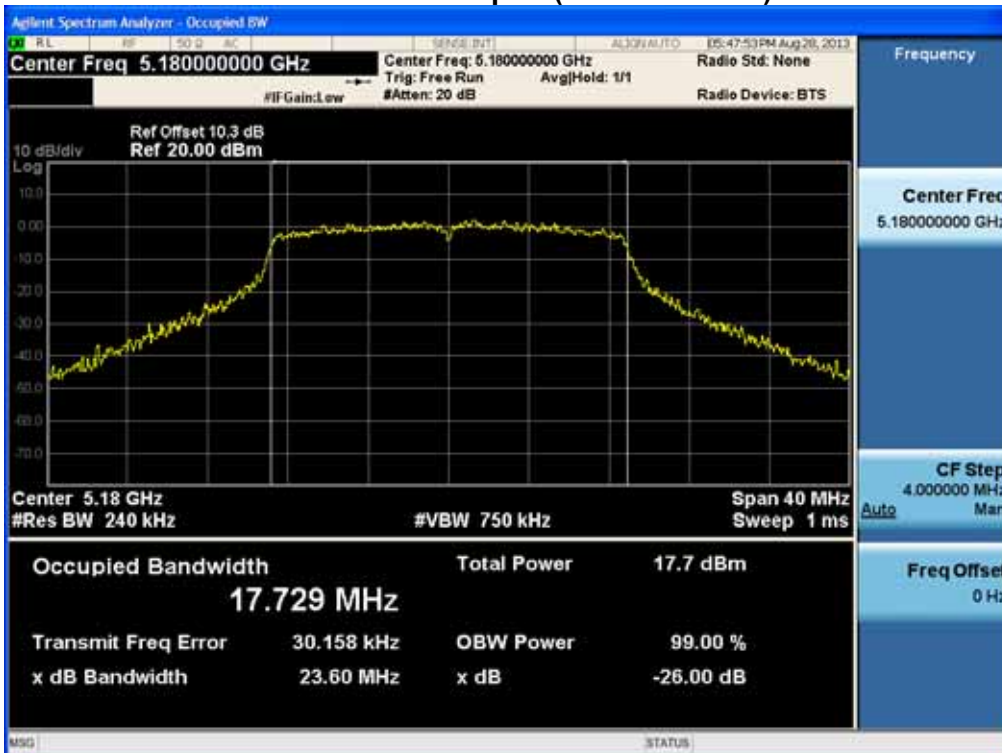
**26 dB Bandwidth plot (802.11a-CH 60)**



### 26 dB Bandwidth plot (802.11a-CH 116)

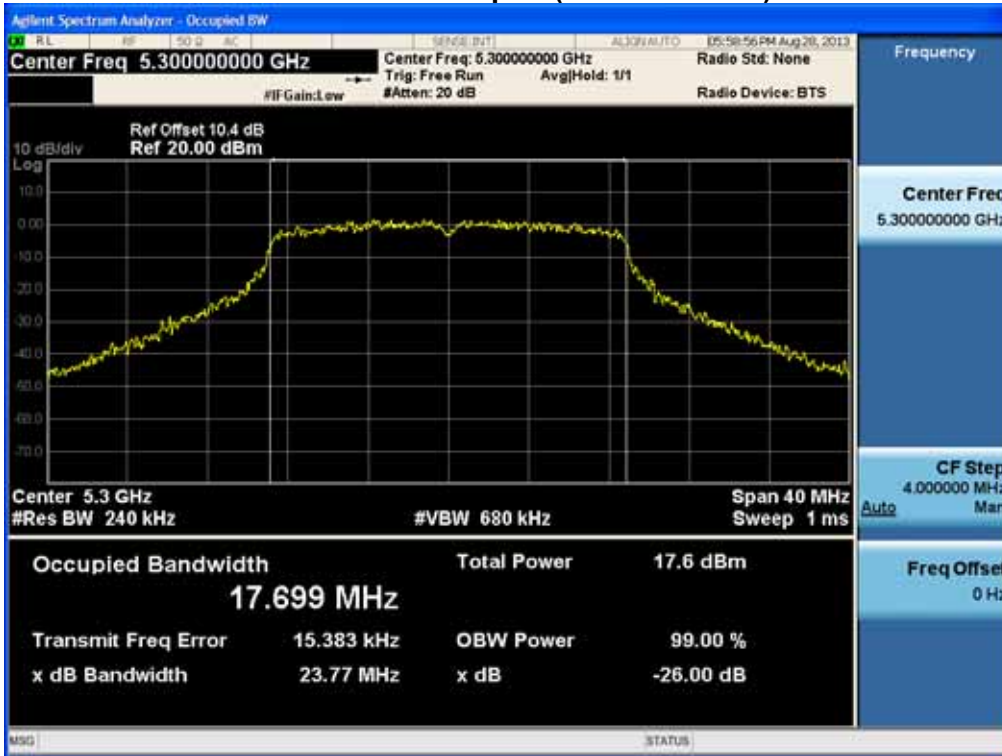


### 26 dB Bandwidth plot (802.11n-CH 36)

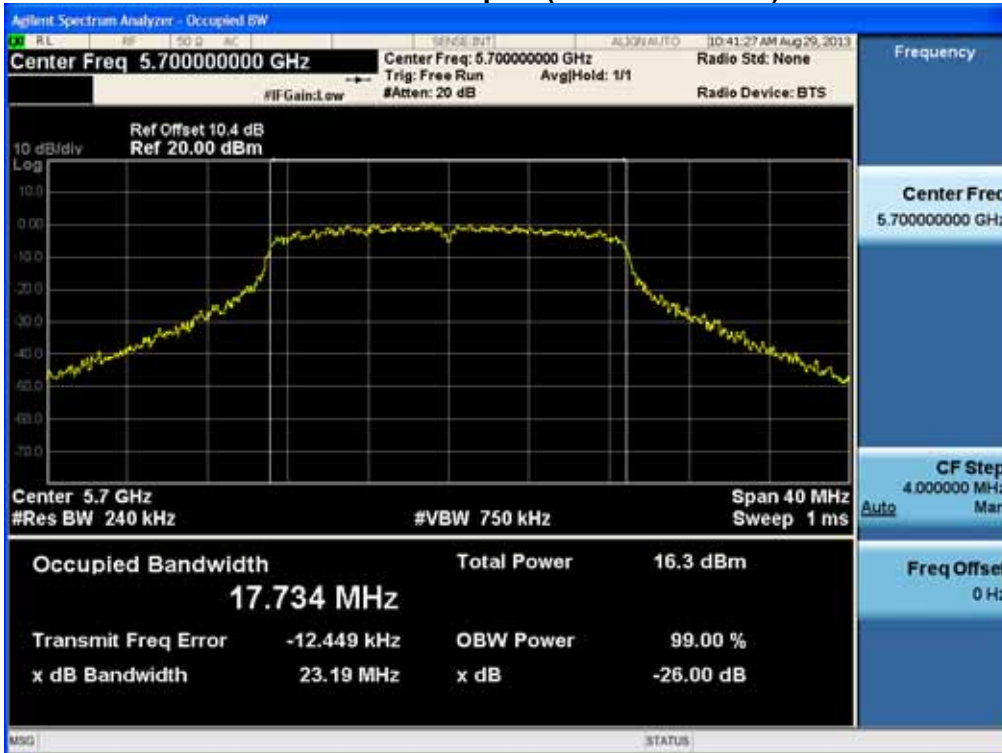


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### 26 dB Bandwidth plot (802.11n-CH 60)



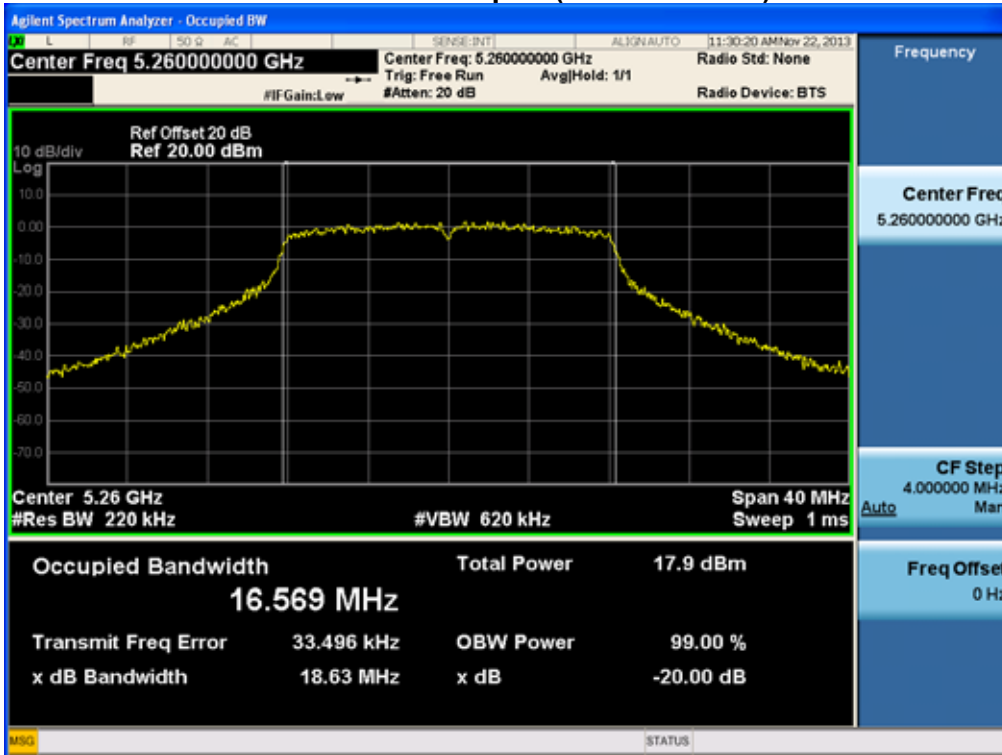
### 26 dB Bandwidth plot (802.11n-CH 140)



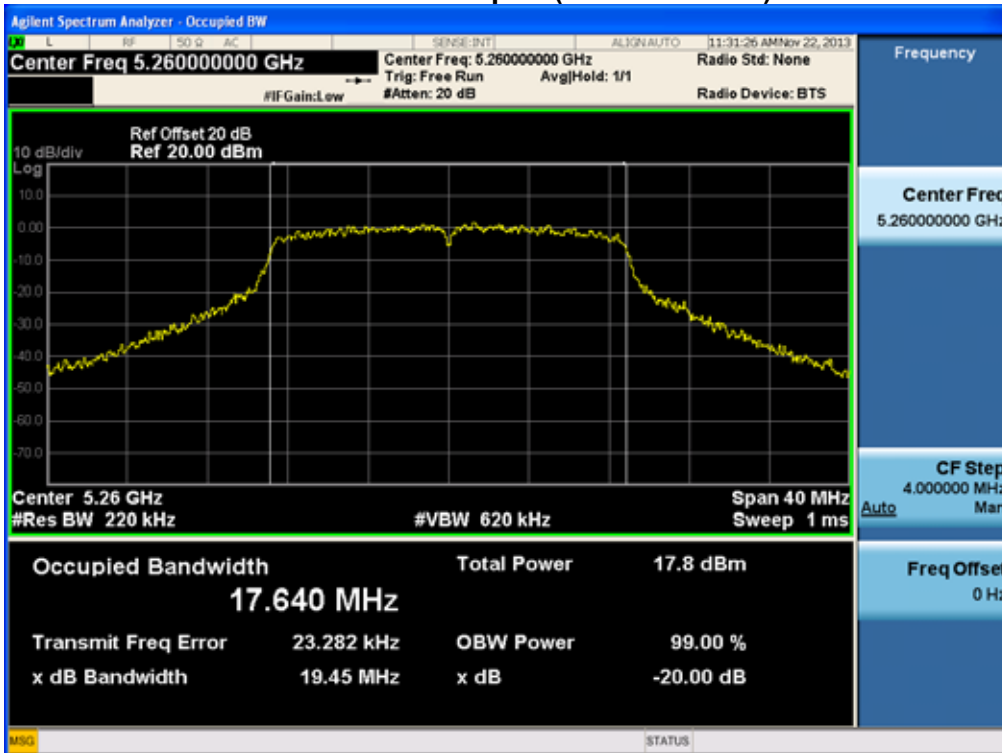


RESULT PLOTS(20 dB Bandwidth)

20 dB Bandwidth plot (802.11a-CH 52)



20 dB Bandwidth plot (802.11n-CH 52)





### 8.3 OUTPUT POWER MEASUREMENT

#### Test Requirements and limit, §15.407(a)(1)

The transmitter output is connected to the input of a RF power sensor. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

. In the 5.15 – 5.25 GHz band, the maximum permissible conducted output power is the lesser of 50 mW ((16.99 dBm) and  $4 \text{ dBm} + 10 \log_{10}(26 \text{ dB BW})$ ).

In the 5.25 – 5.35 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and  $11 \text{ dBm} + 10 \log_{10}(26 \text{ dB BW})$ .

In the 5.47 – 5.725 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and  $11 \text{ dBm} + 10 \log_{10}(26 \text{ dB BW})$ .

Limit : 802.11a\_UNII-1 = 16.99 dBm

802.11n\_UNII-1\_20 MHz BW = 16.99 dBm

802.11a\_UNII-2 = 23.98 dBm

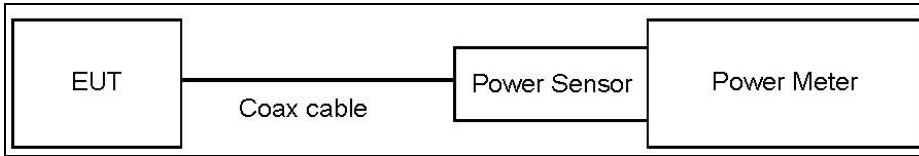
802.11n\_UNII-2\_20 MHz BW = 23.98dBm

802.11a\_UNII-2e = 23.98dBm

802.11n\_UNII-2e\_20 MHz BW = 23.98 dBm

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## TEST CONFIGURATION



## TEST PROCEDURE

We tested according to Method E)3)a) in KDB 789033(issued 04/08/2013).

### ▪ Average Power

1. Measure the duty cycle.
2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3. Add  $10 \log (1/x)$ , where  $x$  is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Note :

1. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5200	10.28
	5240	10.34
UNII 2	5260	10.37
	5300	10.40
	5320	10.39
UNII 2e	5500	10.35
	5580	10.43
	5700	10.43

(Actual value of loss for the attenuator and cable combination)



**TEST RESULTS**

**20 MHz BW**

**Conducted Output Power Measurements (802.11a Mode: 5180~5240)**

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6	10.50	2.365	12.87	16.99
		9	9.55	3.169	12.72	16.99
		12	8.92	3.852	12.77	16.99
		18	7.91	4.922	12.83	16.99
		24	7.05	5.775	12.83	16.99
		36	5.89	7.000	12.89	16.99
		48	5.01	7.970	12.98	16.99
		54	4.73	8.268	13.00	16.99
5200	40	6	10.49	2.365	12.85	16.99
		9	9.67	3.169	12.84	16.99
		12	9.02	3.852	12.87	16.99
		18	7.91	4.922	12.83	16.99
		24	6.97	5.775	12.75	16.99
		36	5.93	7.000	12.93	16.99
		48	4.89	7.970	12.86	16.99
		54	4.71	8.268	12.98	16.99
5240	48	6	10.38	2.365	12.75	16.99
		9	9.63	3.169	12.80	16.99
		12	9.00	3.852	12.85	16.99
		18	8.00	4.922	12.92	16.99
		24	7.07	5.775	12.85	16.99
		36	5.93	7.000	12.93	16.99
		48	4.98	7.970	12.95	16.99
		54	4.68	8.268	12.95	16.99

FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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Conducted Output Power Measurements (802.11a Mode: 5260~5320)

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6	10.54	2.365	12.91	23.98
		9	9.78	3.169	12.95	23.98
		12	9.15	3.852	13.00	23.98
		18	8.06	4.922	12.98	23.98
		24	7.21	5.775	12.99	23.98
		36	6.03	7.000	13.03	23.98
		48	5.15	7.970	13.12	23.98
		54	4.84	8.268	13.11	23.98
5300	60	6	10.48	2.365	12.85	23.98
		9	9.67	3.169	12.84	23.98
		12	9.05	3.852	12.90	23.98
		18	7.98	4.922	12.90	23.98
		24	7.09	5.775	12.87	23.98
		36	6.05	7.000	13.05	23.98
		48	5.14	7.970	13.11	23.98
		54	4.71	8.268	12.98	23.98
5320	64	6	10.44	2.365	12.81	23.98
		9	9.64	3.169	12.81	23.98
		12	9.01	3.852	12.86	23.98
		18	8.00	4.922	12.92	23.98
		24	7.18	5.775	12.96	23.98
		36	6.01	7.000	13.01	23.98
		48	4.99	7.970	12.96	23.98
		54	4.75	8.268	13.02	23.98

FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer	FCC ID: V2X-PM40

**Conducted Output Power Measurements (802.11a Mode: 5500~5700)**

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6	9.87	2.365	12.24	23.98
		9	9.12	3.169	12.29	23.98
		12	8.43	3.852	12.28	23.98
		18	7.43	4.922	12.35	23.98
		24	6.53	5.775	12.31	23.98
		36	5.50	7.000	12.50	23.98
		48	4.46	7.970	12.43	23.98
		54	4.19	8.268	12.46	23.98
5580	116	6	9.35	2.365	11.72	23.98
		9	8.67	3.169	11.84	23.98
		12	7.93	3.852	11.78	23.98
		18	6.94	4.922	11.86	23.98
		24	6.14	5.775	11.92	23.98
		36	4.85	7.000	11.85	23.98
		48	3.99	7.970	11.96	23.98
		54	3.69	8.268	11.96	23.98
5700	140	6	8.71	2.365	11.08	23.98
		9	7.97	3.169	11.14	23.98
		12	7.27	3.852	11.12	23.98
		18	6.30	4.922	11.22	23.98
		24	5.36	5.775	11.14	23.98
		36	4.22	7.000	11.22	23.98
		48	3.31	7.970	11.28	23.98
		54	3.00	8.268	11.27	23.98

**Conducted Output Power Measurements (802.11n Mode: 5180~5240)**

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5180	36	6.5	9.29	2.482	11.77	16.99
		13	7.85	3.987	11.84	16.99
		19.5	6.85	5.055	11.90	16.99
		26	6.11	5.861	11.97	16.99
		39	4.94	7.094	12.03	16.99
		52	3.95	7.891	11.84	16.99
		58.5	3.65	8.206	11.86	16.99
		65	3.44	8.529	11.97	16.99
5200	40	6.5	9.35	2.482	11.83	16.99
		13	7.86	3.987	11.85	16.99
		19.5	6.90	5.055	11.95	16.99
		26	6.05	5.861	11.91	16.99
		39	4.89	7.094	11.99	16.99
		52	3.90	7.891	11.79	16.99
		58.5	3.73	8.206	11.94	16.99
		65	3.39	8.529	11.92	16.99
5240	48	6.5	9.30	2.482	11.78	16.99
		13	7.77	3.987	11.76	16.99
		19.5	6.79	5.055	11.85	16.99
		26	5.98	5.861	11.84	16.99
		39	4.87	7.094	11.97	16.99
		52	3.92	7.891	11.81	16.99
		58.5	3.71	8.206	11.92	16.99
		65	3.53	8.529	12.06	16.99

**Conducted Output Power Measurements (802.11n Mode: 5260~5320)**

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5260	52	6.5	9.38	2.482	11.86	23.98
		13	7.84	3.987	11.83	23.98
		19.5	6.88	5.055	11.93	23.98
		26	6.04	5.861	11.91	23.98
		39	5.01	7.094	12.10	23.98
		52	4.15	7.891	12.04	23.98
		58.5	3.72	8.206	11.92	23.98
		65	3.50	8.529	12.03	23.98
5300	60	6.5	9.33	2.482	11.81	23.98
		13	7.87	3.987	11.86	23.98
		19.5	6.80	5.055	11.86	23.98
		26	6.08	5.861	11.95	23.98
		39	4.91	7.094	12.01	23.98
		52	4.06	7.891	11.95	23.98
		58.5	3.76	8.206	11.97	23.98
		65	3.42	8.529	11.95	23.98
5320	64	6.5	9.29	2.482	11.77	23.98
		13	7.82	3.987	11.81	23.98
		19.5	6.80	5.055	11.86	23.98
		26	5.93	5.861	11.79	23.98
		39	4.88	7.094	11.98	23.98
		52	4.05	7.891	11.94	23.98
		58.5	3.76	8.206	11.97	23.98
		65	3.50	8.529	12.03	23.98



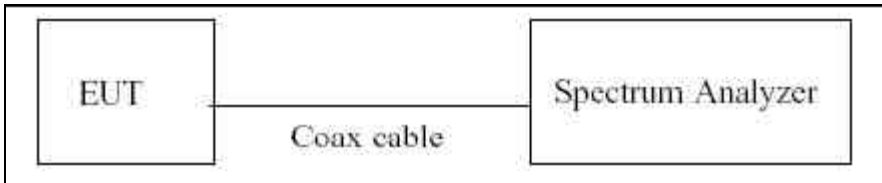
**Conducted Output Power Measurements (802.11n Mode: 5500~5700)**

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5500	100	6.5	8.73	2.482	11.22	23.98
		13	7.25	3.987	11.24	23.98
		19.5	6.28	5.055	11.33	23.98
		26	5.45	5.861	11.31	23.98
		39	4.43	7.094	11.53	23.98
		52	3.59	7.891	11.48	23.98
		58.5	3.18	8.206	11.39	23.98
		65	2.96	8.529	11.49	23.98
5580	116	6.5	8.27	2.482	10.76	23.98
		13	6.87	3.987	10.86	23.98
		19.5	5.82	5.055	10.87	23.98
		26	5.08	5.861	10.94	23.98
		39	3.99	7.094	11.08	23.98
		52	3.11	7.891	11.00	23.98
		58.5	2.80	8.206	11.01	23.98
		65	2.49	8.529	11.02	23.98
5700	140	6.5	7.71	2.482	10.19	23.98
		13	6.31	3.987	10.29	23.98
		19.5	5.17	5.055	10.22	23.98
		26	4.47	5.861	10.33	23.98
		39	3.30	7.094	10.39	23.98
		52	2.34	7.891	10.23	23.98
		58.5	2.18	8.206	10.39	23.98
		65	1.80	8.529	10.33	23.98

## 8.4 POWER SPECTRAL DENSITY

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. The maximum permissible peak power spectral density is 4 dBm/ MHz in the 5.15 GHz – 5.25 GHz band and 11 dBm/ MHz in the 5.25 GHz – 5.35 GHz and 5.47 GHz – 5.725 GHz bands

### TEST CONFIGURATION



### TEST PROCEDURE

We tested according to Method in KDB 789033(issued 04/08/2013).

The spectrum analyzer is set to :

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz.
3. VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2\*span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add  $10 \log(1/x)$ , where x is the duty cycle, to the peak of the spectrum.

### Sample Calculation

PSD = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Output Power = -5 dBm + 10 dB + 0.8 dB + 0.21 dB = 16.01 dBm

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

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Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40

Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5200	10.28
	5240	10.34
UNII 2	5260	10.37
	5300	10.40
	5320	10.39
UNII 2e	5500	10.35
	5580	10.43
	5700	10.43

(Actual value of loss for the attenuator and cable combination)



**TEST RESULTS**

**Conducted Power Density Measurements**

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11a	-4.990	8.268	3.278	4	Pass
5200	40		-5.945	8.268	2.323	4	Pass
5240	48		-5.333	8.268	2.935	4	Pass
5260	52	802.11a	-5.370	7.970	2.600	11	Pass
5300	60		-4.958	7.970	3.012	11	Pass
5320	64		-5.929	8.268	2.339	11	Pass
5500	100	802.11a	-4.930	7.000	2.070	11	Pass
5580	116		-6.132	8.268	2.136	11	Pass
5700	140		-7.133	7.970	0.837	11	Pass

**Conducted Power Density Measurements**

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Duty Cycle Factor (dB)	Measured Power Density(dBm) + Duty Cycle Factor	Limit (dBm)	Pass/Fail
5180	36	802.11n	-6.205	7.094	0.889	4	Pass
5200	40	20MHz	-6.333	7.094	0.761	4	Pass
5240	48	BW	-7.378	8.529	1.151	4	Pass
5260	52	802.11n	-5.692	7.094	1.402	11	Pass
5300	60	20MHz	-5.700	7.094	1.394	11	Pass
5320	64	BW	-5.882	8.529	2.647	11	Pass
5500	100	802.11n	-5.912	7.094	1.182	11	Pass
5580	116	20MHz	-6.555	7.094	0.539	11	Pass
5700	140	BW	-7.093	7.094	0.001	11	Pass

Note :

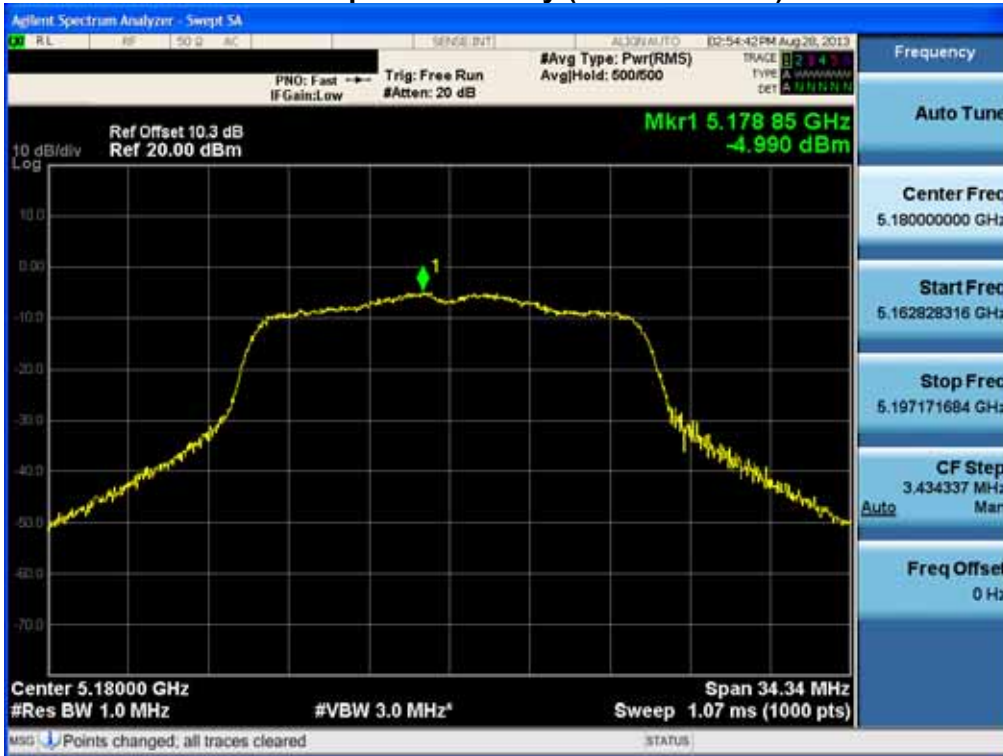
1. In order to simplify the report, attached plots were only the highest PSD channels.

FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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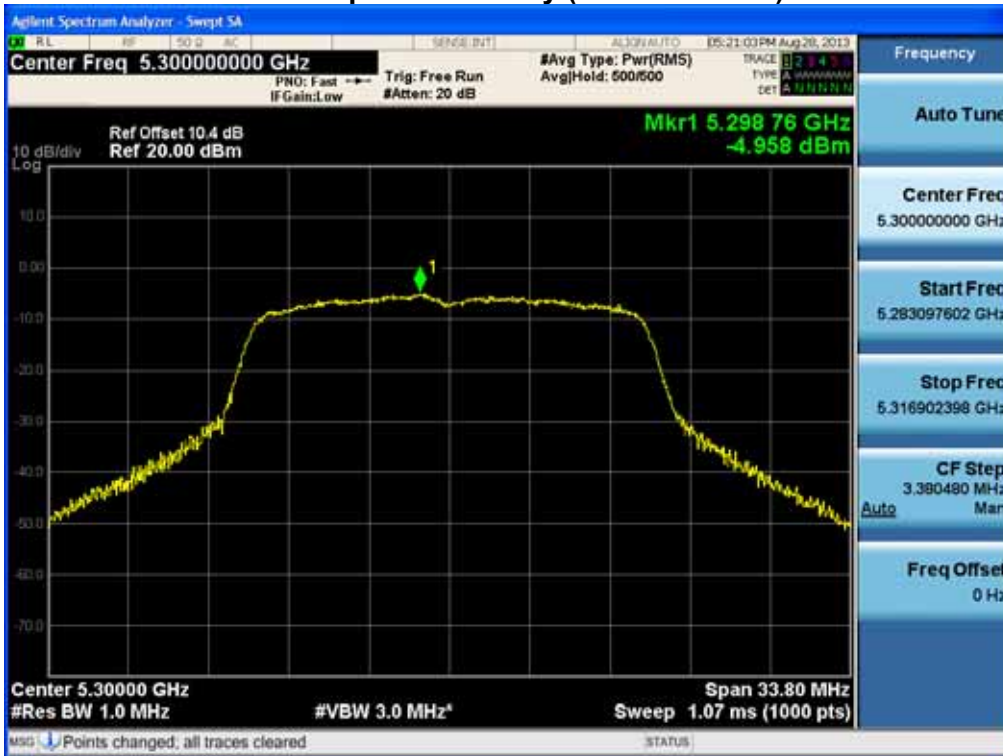
RESULT PLOTS

20 MHz BW

Power Spectral Density (802.11a-CH 36)

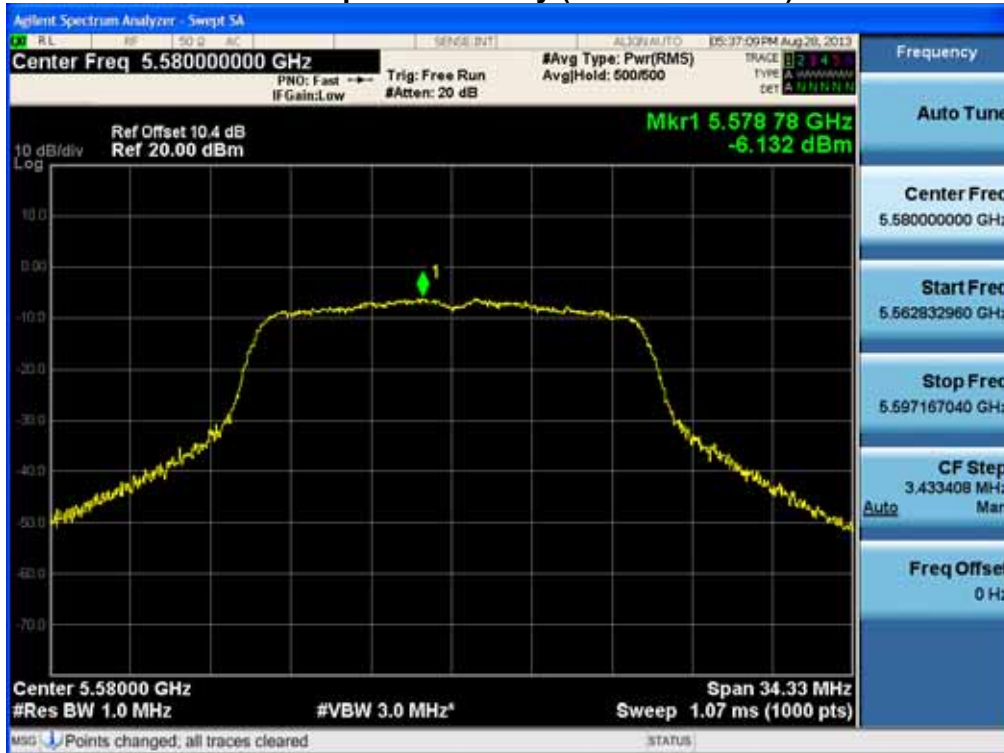


Power Spectral Density (802.11a-CH 60)

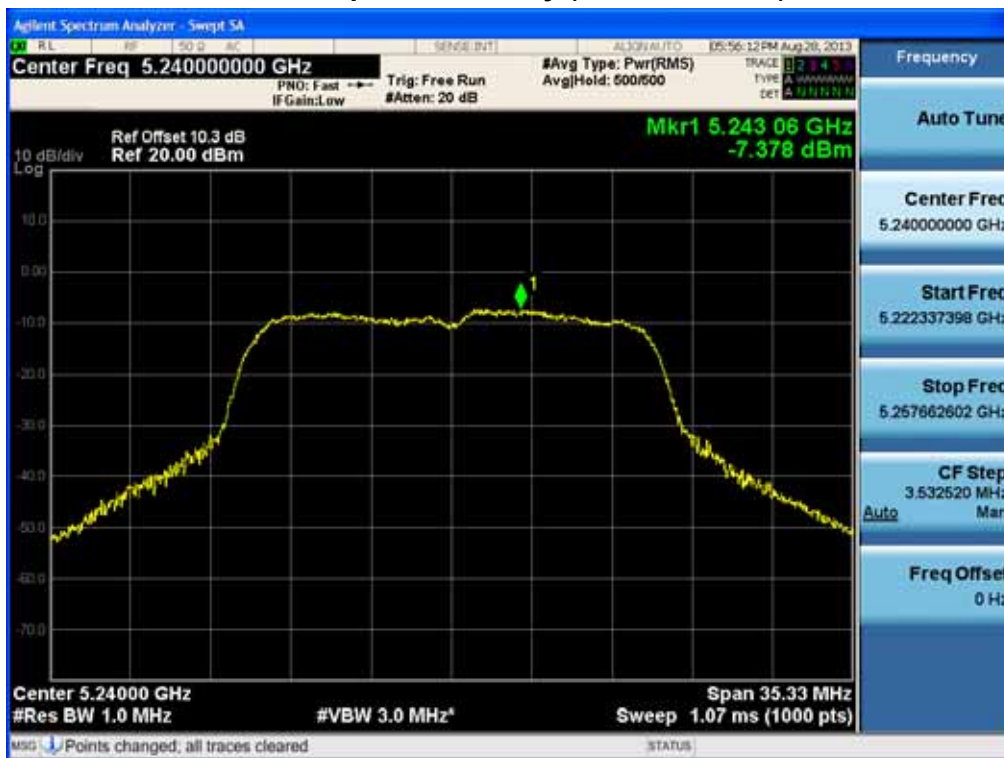


FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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### Power Spectral Density (802.11a-CH 116)

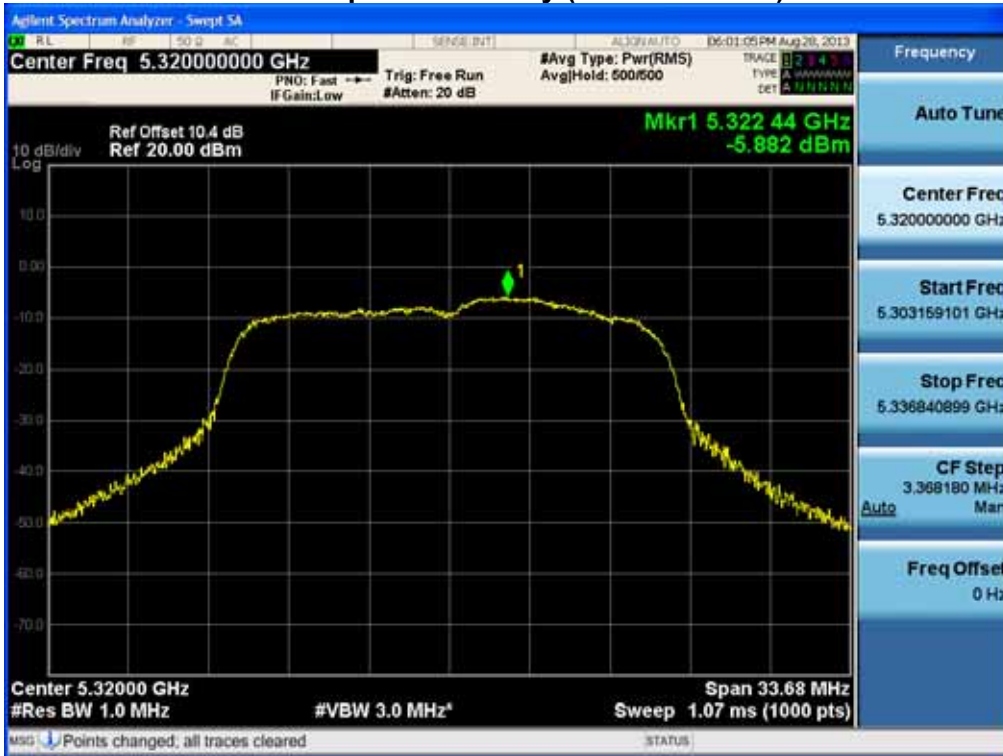


### Power Spectral Density (802.11n-CH 48)

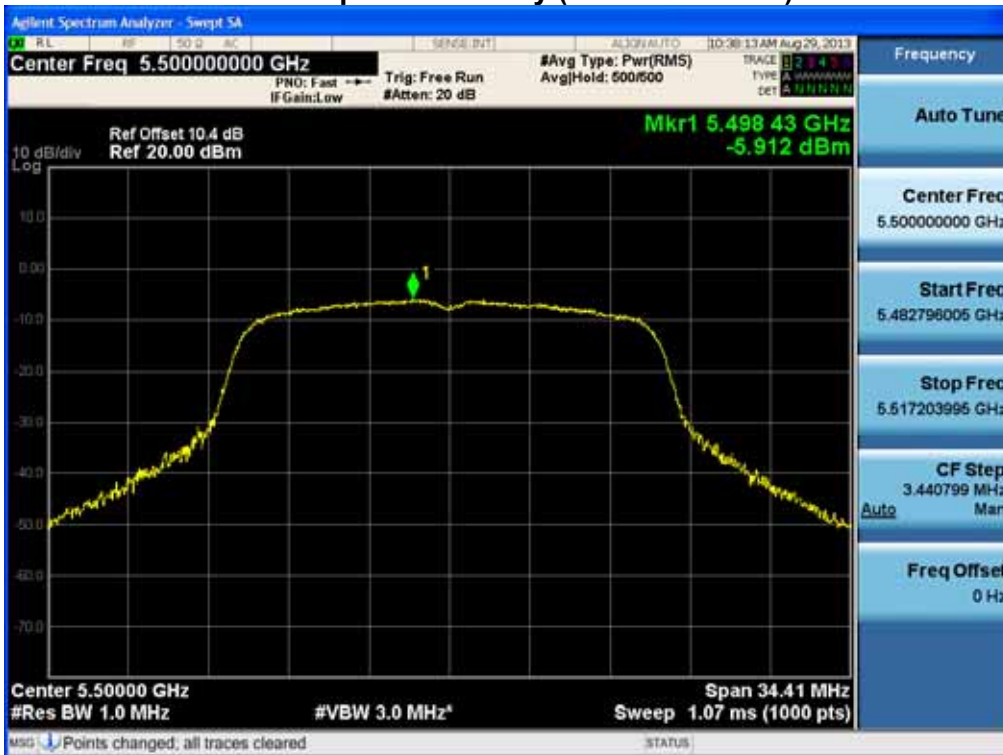


FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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### Power Spectral Density (802.11n-CH 64)



### Power Spectral Density (802.11n-CH 100)

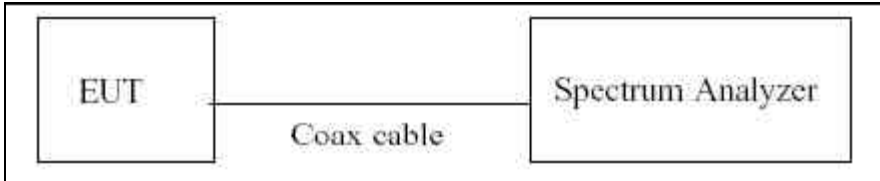


FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer	FCC ID: V2X-PM40

## 8.5 PEAK EXCURSION RATIO

The spectrum analyzer was connected to the antenna terminal while the EUT was operating in the continuous transmission mode at the appropriate center frequencies. The largest permissible difference between the modulation envelope(measured using a peak hold function) and the maximum conducted output power 13 dB/MHz.

### TEST CONFIGURATION



### TEST PROCEDURE

We tested according to KDB 789033(issued 04/08/2013).

The spectrum analyzer is set to :

1. Span = Set the span to view the entire emission bandwidth.
2. RBW = 1 MHz
3. VBW  $\geq$  3 MHz
4. Detector Mode = Peak
5. Trace Mode = Max hold
6. Allow the sweeps to continue until the trace stabilizes.
7. Use the peak search function to find the peak of the spectrum.
8. Use the procedure to measure the PPSD
9. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

### Sample Calculation

PER = Peak Level - PPSD

Note :

1. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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Band	Frequency(MHz)	Loss(dB)
UNII 1	5180	10.30
	5200	10.28
	5240	10.34
UNII 2	5260	10.37
	5300	10.40
	5320	10.39
UNII 2e	5500	10.35
	5580	10.43
	5700	10.43

(Actual value of loss for the attenuator and cable combination)

<b>FCC PT.15.407 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1311FR13-1	<b>Date of Issue:</b> December 18, 2013	<b>EUT Type:</b> Mobile computer	<b>FCC ID:</b> V2X-PM40

**TEST RESULTS**

**PEAK EXCURSION RATIO**

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Measured Peak Level (dBm)	Peak Excursion Ratio (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11a	3.278	11.374	8.096	13	Pass
5200	40		2.323	11.603	9.280	13	Pass
5240	48		2.935	11.386	8.451	13	Pass
5260	52	802.11a	2.600	11.078	8.478	13	Pass
5300	60		3.012	10.315	7.303	13	Pass
5320	64		2.339	10.946	8.607	13	Pass
5500	100	802.11a	2.070	10.053	7.983	13	Pass
5580	116		2.136	10.703	8.567	13	Pass
5700	140		0.837	10.138	9.301	13	Pass

**PEAK EXCURSION RATIO**

Frequency (MHz)	Channel No.	Mode	Test Result				
			Measured Power Density (dBm)	Measured Peak Level (dBm)	Peak Excursion Ratio (dB)	Limit (dBm)	Pass/Fail
5180	36	802.11n	0.889	9.598	8.709	13	Pass
5200	40	20MHz BW	0.761	9.605	8.844	13	Pass
5240	48		1.151	9.665	8.514	13	Pass
5260	52	802.11n	1.402	9.916	8.514	13	Pass
5300	60	20MHz BW	1.394	9.289	7.895	13	Pass
5320	64		2.647	9.109	6.462	13	Pass
5500	100	802.11n	1.182	8.952	7.770	13	Pass
5580	116	20MHz BW	0.539	9.022	8.483	13	Pass
5700	140		0.001	8.301	8.300	13	Pass

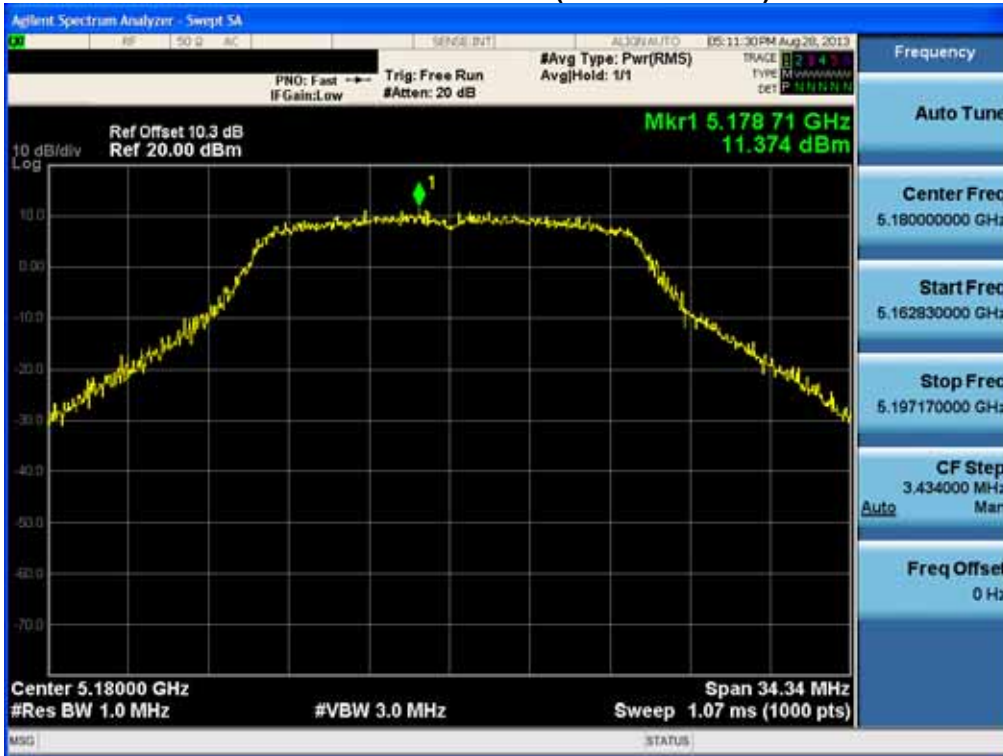
Note :

1. In order to simplify the report, attached plots were only the highest PPSD channels.

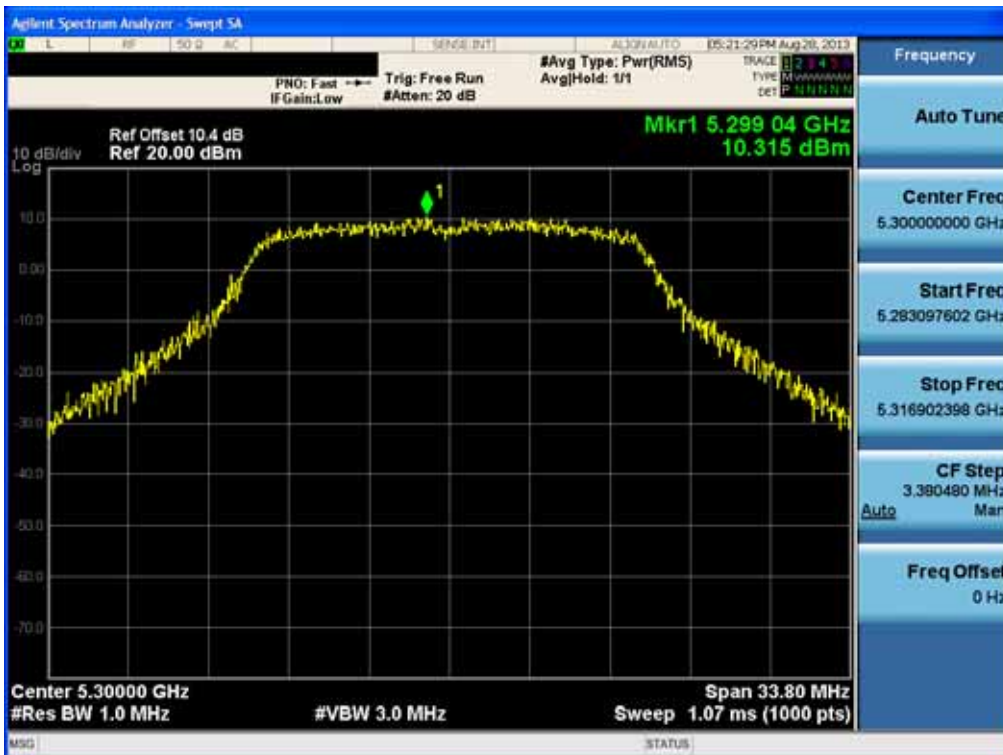
## RESULT PLOTS

20 MHz BW

### Peak Excursion Ratio (802.11a-CH 36)

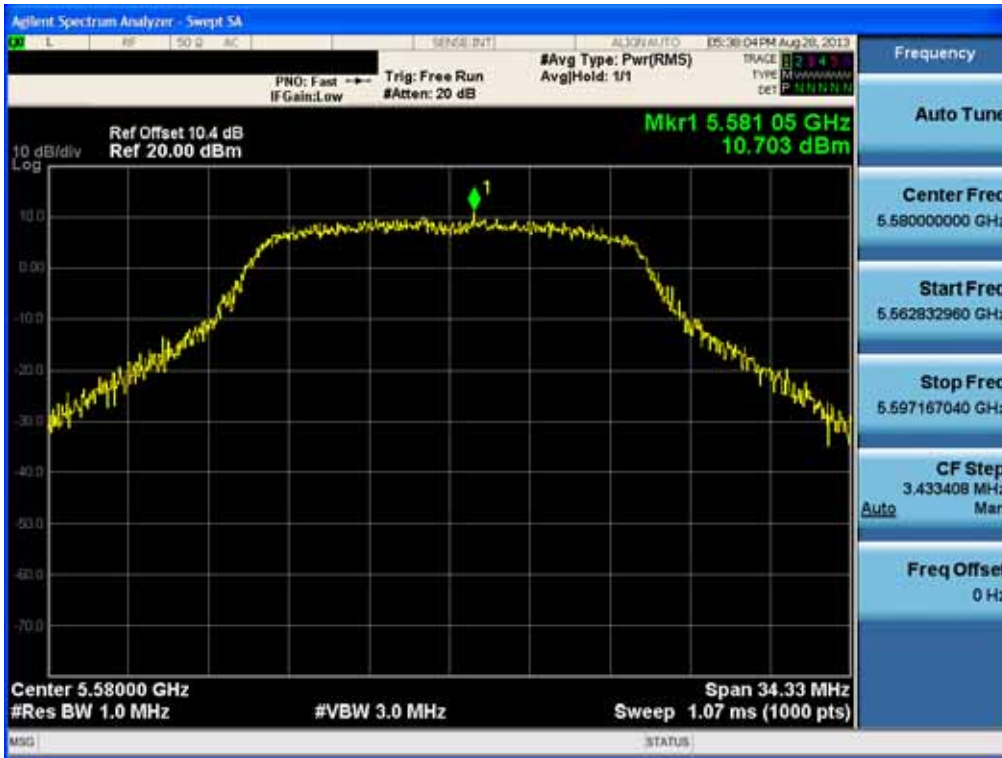


### Peak Excursion Ratio (802.11a-CH 60)

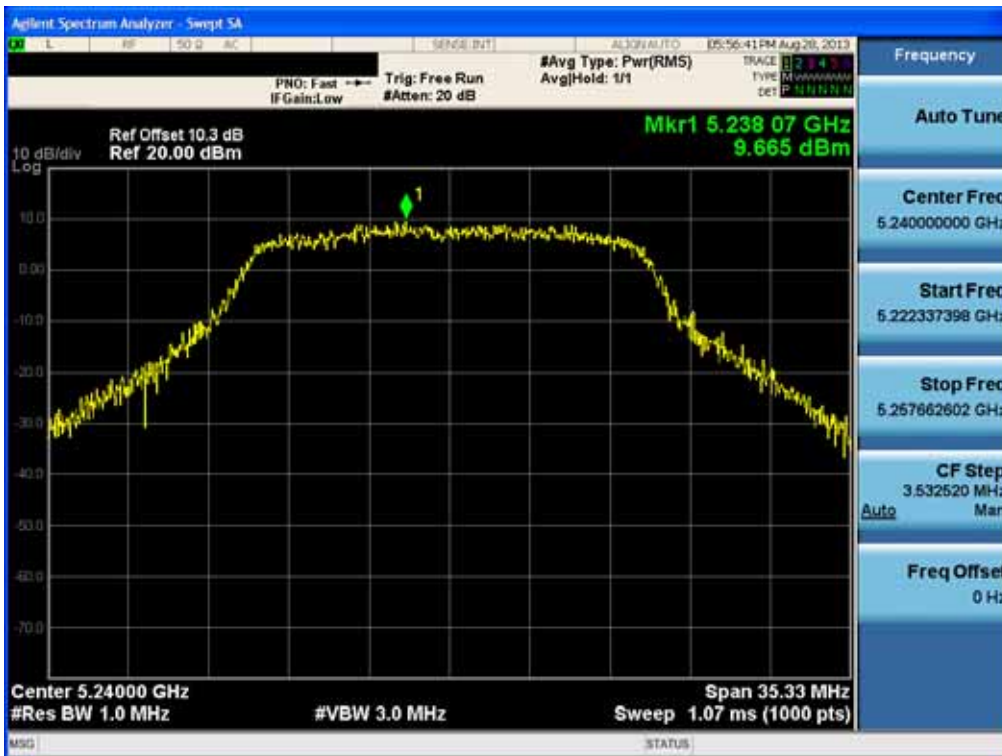


FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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### Peak Excursion Ratio (802.11a-CH 116)

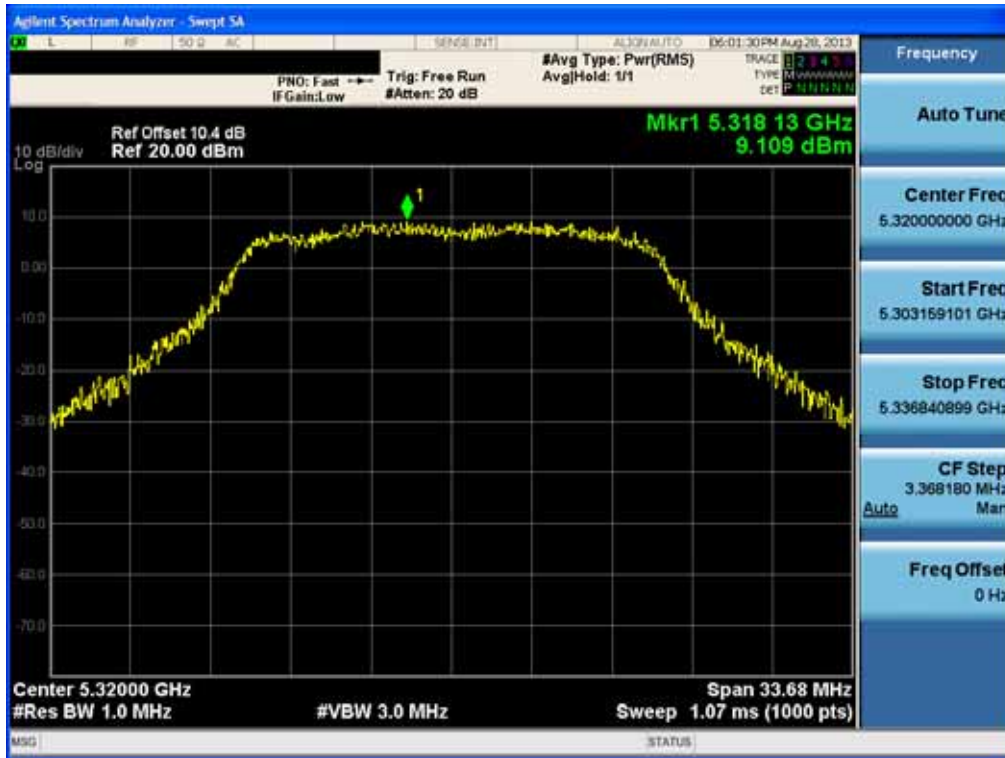


### Peak Excursion Ratio (802.11n-CH 48)



FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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### Peak Excursion Ratio (802.11n-CH 64)



### Peak Excursion Ratio (802.11n-CH 100)



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## 8.6 FREQUENCY STABILITY.

The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 and 50 . The temperature was incremented by 10 intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

### 20 MHz BW

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,180,000,000 Hz  
 CHANNEL: 36  
 REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. ( )	Frequency (kHz)	Frequency Error (kHz)
100%	3.800	+20(Ref)	5 179 999.58	-0.42
100%		-30	5 179 997.11	-2.89
100%		-20	5 179 997.95	-2.05
100%		-10	5 179 998.43	-1.57
100%		0	5 179 998.86	-1.14
100%		+10	5 179 999.26	-0.74
100%		+30	5 179 999.76	-0.24
100%		+40	5 180 000.04	0.04
100%		+50	5 180 000.19	0.19
115%	4.370	+20	5 180 000.19	-0.44
Batt. Endpoint	3.500	+20	5 180 000.19	-0.37

### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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OPERATING BAND: UNII Band 2  
 OPERATING FREQUENCY: 5,260,000,000 Hz  
 CHANNEL: 52  
 REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. ( )	Frequency (kHz)	Frequency Error (kHz)
100%	3.800	+20(Ref)	5 259 999.66	-0.34
100%		-30	5 259 997.24	-2.76
100%		-20	5 259 997.43	-2.57
100%		-10	5 259 997.86	-2.14
100%		0	5 259 998.43	-1.57
100%		+10	5 259 999.16	-0.84
100%		+30	5 259 999.76	-0.24
100%		+40	5 259 999.92	-0.08
100%		+50	5 260 000.16	0.16
115%		4.370	+20	5 259 999.62
Batt. Endpoint	3.500	+20	5 259 999.69	-0.31

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,500,000,000 Hz  
 CHANNEL: 100  
 REFERENCE VOLTAGE: 3.8 VDC

Voltage (%)	Power (VDC)	Temp. ( )	Frequency (kHz)	Frequency Error (kHz)
100%	3.800	+20(Ref)	5 499 999.66	-0.34
100%		-30	5 499 996.96	-3.04
100%		-20	5 499 997.16	-2.84
100%		-10	5 499 997.45	-2.55
100%		0	5 499 997.92	-2.08
100%		+10	5 499 998.37	-1.63
100%		+30	5 499 999.89	-0.11
100%		+40	5 499 999.69	-0.31
100%		+50	5 500 000.16	0.16
115%		4.370	+20	5 499 999.64
Batt. Endpoint	3.500	+20	5 499 999.68	-0.32

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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**8.7 RADIATED MEASUREMENT.**

**8.7.1 RADIATED SPURIOUS EMISSIONS.**

Test Requirements and limit, §15.205, §15.209, §15.407

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

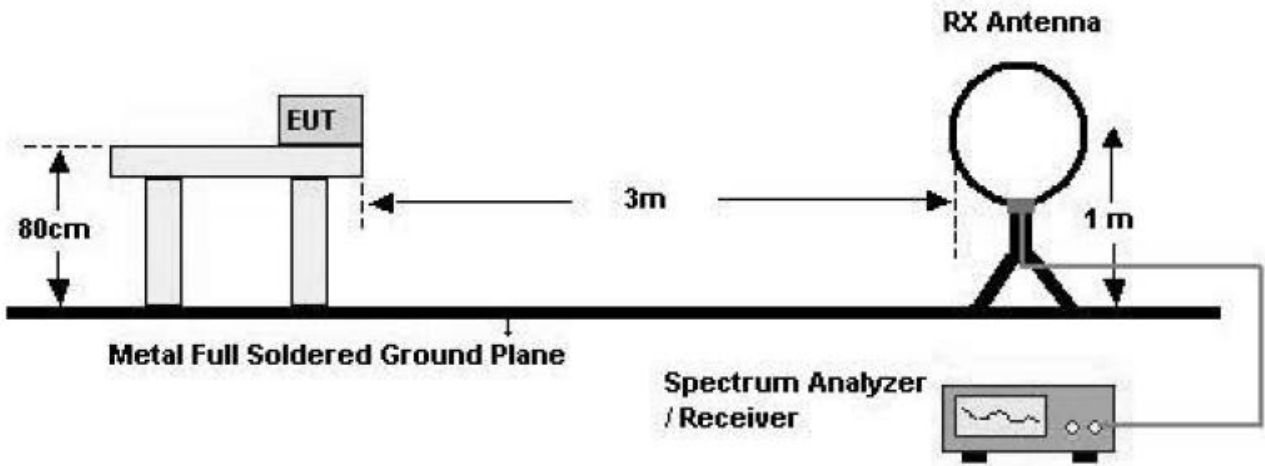
**§15.407, KDB 789033**

All harmonics that do not lie in a restricted band are subject to a peak limit of -27 dBm/MHz. At a distance of 3 meters the field strength limit in dBµV/m can be determined by adding a “conversion” factor of 95.2 dB to the EIRP limit of -27 dBm/MHz to obtain the limit for out of band spurious emissions of 68.2 dBµV/m.

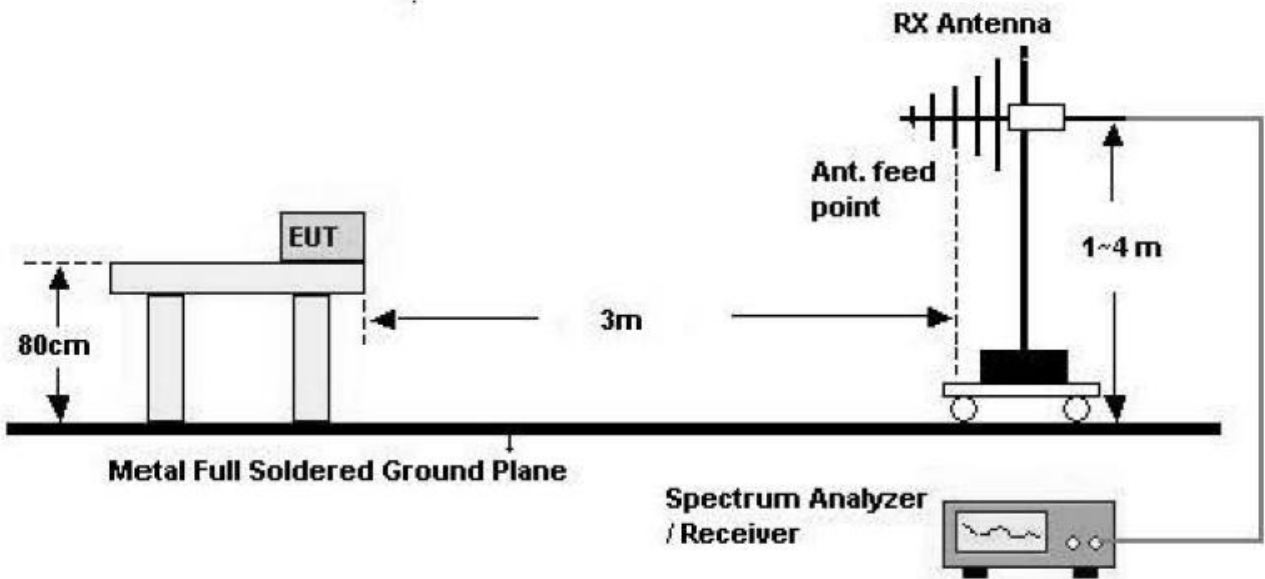
<b>FCC PT.15.407 TEST REPORT</b>		<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
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### Test Configuration

#### Below 30 MHz

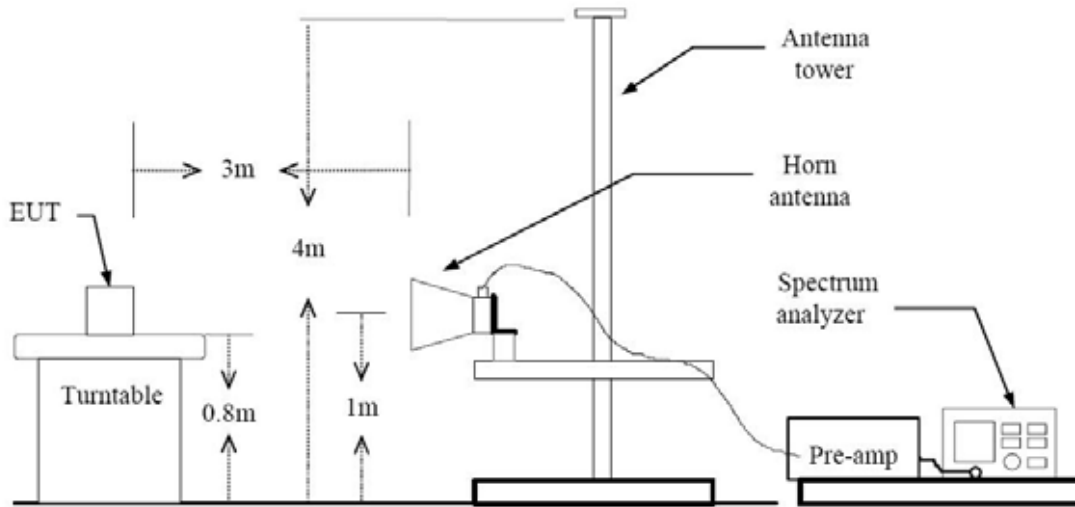


#### 30 MHz - 1 GHz



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**Above 1 GHz**



**TEST PROCEDURE USED**

ANSI C63.4(2003)

Method H)5) in KDB 789033, issued 04/08/2013 (Peak)

Method H)6)d) in KDB 789033, issued 04/08/2013 (Average)

**. Spectrum setting:**

- Peak.

1. RBW = 1 MHz

2. VBW  $\geq$  3 MHz

3. Detector = Peak

4. Sweep Time = auto

5. Trace mode = max hold

6. Allow sweeps to continue until the trace stabilizes.

7. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

- Average ( Method VB :Averaging using reduced video bandwidth)

1. RBW = 1 MHz

2. VBW

2.1. If the EUT is configured to transmit with duty cycle  $\geq$  98 percent, set VBW  $\leq$  RBW/100(i.e., 10 kHz) but not less than 10 Hz.

2.2. If the EUT duty cycle is < 98 percent, set VBW  $\geq$  1/T, where T is the minimum transmission duration.

3. The analyzer is set to linear detector mode.

4. Detector = Peak.

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5. Sweep time = auto.
6. Trace mode = max hold.
7. Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle.

**Note :**

1. We used the case 2 for 802.11a/n to perform the average filed strength measurements for RSE and radiated band edge test.
2. The actual setting value of VBW for 802.11a/n.

Mode	Worst Data rate (Mbps)	T <sub>on</sub> (ms)	T <sub>total</sub> (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	6	1.395	2.405	58.0	716.8	1000
n_20	6.5	1.310	2.320	56.5	763.4	1000



## TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V	dB /m	dB	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
No Critical peaks found							

### Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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## TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V	dB /m	dB	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
No Critical peaks found							

### Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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**Above 1 GHz**

Standard Battery

Band : UNII 1  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10360	63.31	-6.51	V	56.80	68.20	11.40	PK
15540	63.69	-6.42	V	57.27	73.98	16.71	PK
15540	50.31	-6.42	V	43.89	53.98	10.09	AV
10360	63.75	-6.51	H	57.24	68.20	10.96	PK
15540	64.37	-6.42	H	57.95	73.98	16.03	PK
15540	50.25	-6.42	H	43.83	53.98	10.15	AV

Band : UNII 1  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5200 MHz  
 Channel No. 40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10400	62.96	-6.49	V	56.47	68.20	11.73	PK
15600	64.77	-7.15	V	57.62	73.98	16.36	PK
15600	50.42	-7.15	V	43.27	53.98	10.71	AV
10400	62.57	-6.49	H	56.08	68.20	12.12	PK
15600	64.38	-7.15	H	57.23	73.98	16.75	PK
15600	50.50	-7.15	H	43.35	53.98	10.63	AV



Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10480	63.71	-6.96	V	56.75	68.20	11.45	PK
15720	63.80	-6.62	V	57.18	73.98	16.80	PK
15720	50.66	-6.62	V	44.04	53.98	9.94	AV
10480	63.22	-6.96	H	56.26	68.20	11.94	PK
15720	63.95	-6.96	H	56.99	73.98	16.99	PK
15720	50.34	-6.62	H	43.72	53.98	10.26	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band : UNII 1  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10360	63.32	-6.51	V	56.81	68.20	11.39	PK
15540	63.81	-6.42	V	57.39	73.98	16.59	PK
15540	49.89	-6.42	V	43.47	53.98	10.51	AV
10360	63.29	-6.51	H	56.78	68.20	11.42	PK
15540	62.94	-6.42	H	56.52	73.98	17.46	PK
15540	50.03	-6.42	H	43.61	53.98	10.37	AV

Band : UNII 1  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5200 MHz  
 Channel No. 40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10400	62.95	-6.49	V	56.46	68.20	11.74	PK
15600	64.94	-7.15	V	57.79	73.98	16.19	PK
15600	50.35	-7.15	V	43.20	53.98	10.78	AV
10400	62.61	-6.49	H	56.12	68.20	12.08	PK
15600	64.30	-7.15	H	57.15	73.98	16.83	PK
15600	50.59	-7.15	H	43.44	53.98	10.54	AV



Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10480	63.57	-6.96	V	56.61	68.20	11.59	PK
15720	63.67	-6.62	V	57.05	73.98	16.93	PK
15720	50.36	-6.62	V	43.74	53.98	10.24	AV
10480	62.92	-6.96	H	55.96	68.20	12.24	PK
15720	63.77	-6.96	H	56.81	73.98	17.17	PK
15720	50.31	-6.62	H	43.69	53.98	10.29	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band : UNII 2  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5260 MHz  
 Channel No. 52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10520	63.84	-6.52	V	57.32	68.20	10.88	PK
15780	63.53	-6.67	V	56.86	73.98	17.12	PK
15780	50.22	-6.67	V	43.55	53.98	10.43	AV
10520	63.01	-6.52	H	56.49	68.20	11.71	PK
15780	63.87	-6.67	H	57.20	73.98	16.78	PK
15780	50.23	-6.67	H	43.56	53.98	10.42	AV

Band : UNII 2  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5300 MHz  
 Channel No. 60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10600	62.34	-6.72	V	55.62	73.98	18.36	PK
10600	48.94	-6.72	V	42.22	53.98	11.76	AV
15900	62.45	-7.00	V	55.45	73.98	18.53	PK
15900	49.67	-7.00	V	42.67	53.98	11.31	AV
10600	62.66	-6.72	H	55.94	73.98	18.04	PK
10600	48.90	-6.72	H	42.18	53.98	11.80	AV
15900	62.99	-7.00	H	55.99	73.98	17.99	PK
15900	49.36	-7.00	H	42.36	53.98	11.62	AV



Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10640	62.74	-6.43	V	56.31	73.98	17.67	PK
10640	48.67	-6.43	V	42.24	53.98	11.74	AV
15960	63.19	-6.93	V	56.26	73.98	17.72	PK
15960	49.33	-6.93	V	42.40	53.98	11.58	AV
10640	62.66	-6.43	H	56.23	73.98	17.75	PK
10640	48.62	-6.43	H	42.19	53.98	11.79	AV
15960	62.18	-6.93	H	55.25	73.98	18.73	PK
15960	49.25	-6.93	H	42.32	53.98	11.66	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band : UNII 2  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5260 MHz  
 Channel No. 52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10520	63.23	-6.52	V	56.71	68.20	11.49	PK
15780	63.87	-6.67	V	57.20	73.98	16.78	PK
15780	50.22	-6.67	V	43.55	53.98	10.43	AV
10520	63.21	-6.52	H	56.69	68.20	11.51	PK
15780	64.23	-6.67	H	57.56	73.98	16.42	PK
15780	50.25	-6.67	H	43.58	53.98	10.40	AV

Band : UNII 2  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5300 MHz  
 Channel No. 60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10600	62.30	-6.72	V	55.58	73.98	18.40	PK
10600	48.77	-6.72	V	42.05	53.98	11.93	AV
15900	62.50	-7.00	V	55.50	73.98	18.48	PK
15900	49.87	-7.00	V	42.87	53.98	11.11	AV
10600	62.78	-6.72	H	56.06	73.98	17.92	PK
10600	49.02	-6.72	H	42.30	53.98	11.68	AV
15900	62.98	-7.00	H	55.98	73.98	18.00	PK
15900	49.22	-7.00	H	42.22	53.98	11.76	AV



Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10640	62.53	-6.43	V	56.10	73.98	17.88	PK
10640	48.50	-6.43	V	42.07	53.98	11.91	AV
15960	62.93	-6.93	V	56.00	73.98	17.98	PK
15960	49.12	-6.93	V	42.19	53.98	11.79	AV
10640	62.54	-6.43	H	56.11	73.98	17.87	PK
10640	48.56	-6.43	H	42.13	53.98	11.85	AV
15960	61.99	-6.93	H	55.06	73.98	18.92	PK
15960	49.21	-6.93	H	42.28	53.98	11.70	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11000	61.57	-5.06	V	56.51	73.98	17.47	PK
11000	48.49	-5.06	V	43.43	53.98	10.55	AV
16500	62.33	-4.35	V	57.98	68.20	10.22	PK
11000	62.13	-5.06	H	57.07	73.98	16.91	PK
11000	48.38	-5.06	H	43.32	53.98	10.66	AV
16500	62.47	-4.35	H	58.12	68.20	10.08	PK

Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5580 MHz  
 Channel No. 116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11160	62.16	-5.55	V	56.61	73.98	17.37	PK
11160	49.96	-5.55	V	44.41	53.98	9.57	AV
16740	64.81	-3.73	V	61.08	68.20	7.12	PK
11160	63.68	-5.55	H	58.13	73.98	15.85	PK
11160	49.55	-5.55	H	44.00	53.98	9.98	AV
16740	63.54	-3.73	H	59.81	68.20	8.39	PK



Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.89	-6.08	V	56.81	73.98	17.17	PK
11400	49.11	-6.08	V	43.03	53.98	10.95	AV
17100	62.39	-0.85	V	61.54	68.20	6.66	PK
11400	62.31	-6.08	H	56.23	73.98	17.75	PK
11400	49.20	-6.08	H	43.12	53.98	10.86	AV
17100	61.77	-0.85	H	60.92	68.20	7.28	PK

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40





Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11000	61.69	-5.06	V	56.63	73.98	17.35	PK
11000	48.18	-5.06	V	43.12	53.98	10.86	AV
16500	62.44	-4.35	V	58.09	68.20	10.11	PK
11000	61.97	-5.06	H	56.91	73.98	17.07	PK
11000	48.32	-5.06	H	43.26	53.98	10.72	AV
16500	62.65	-4.35	H	58.30	68.20	9.90	PK

Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5580 MHz  
 Channel No. 116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11160	62.95	-5.55	V	57.40	73.98	16.58	PK
11160	49.82	-5.55	V	44.27	53.98	9.71	AV
16740	64.55	-3.73	V	60.82	68.20	7.38	PK
11160	63.75	-5.55	H	58.20	73.98	15.78	PK
11160	49.77	-5.55	H	44.22	53.98	9.76	AV
16740	63.72	-3.73	H	59.99	68.20	8.21	PK



Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.90	-6.08	V	56.82	73.98	17.16	PK
11400	49.03	-6.08	V	42.95	53.98	11.03	AV
17100	63.20	-0.85	V	62.35	68.20	5.85	PK
11400	62.50	-6.08	H	56.42	73.98	17.56	PK
11400	49.20	-6.08	H	43.12	53.98	10.86	AV
17100	61.89	-0.85	H	61.04	68.20	7.16	PK

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Extended Battery

Band : UNII 1  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10360	63.11	-6.51	V	56.60	68.20	11.60	PK
15540	63.30	-6.42	V	56.88	73.98	17.10	PK
15540	49.68	-6.42	V	43.26	53.98	10.72	AV
10360	63.07	-6.51	H	56.56	68.20	11.64	PK
15540	62.86	-6.42	H	56.44	73.98	17.54	PK
15540	49.81	-6.42	H	43.39	53.98	10.59	AV

Band : UNII 1  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5200 MHz  
 Channel No. 40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10400	62.71	-6.49	V	56.22	68.20	11.98	PK
15600	64.54	-7.15	V	57.39	73.98	16.59	PK
15600	50.26	-7.15	V	43.11	53.98	10.87	AV
10400	62.30	-6.49	H	55.81	68.20	12.39	PK
15600	64.14	-7.15	H	56.99	73.98	16.99	PK
15600	50.38	-7.15	H	43.23	53.98	10.75	AV



Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10480	63.50	-6.96	V	56.54	68.20	11.66	PK
15720	63.53	-6.62	V	56.91	73.98	17.07	PK
15720	50.30	-6.62	V	43.68	53.98	10.30	AV
10480	62.90	-6.96	H	55.94	68.20	12.26	PK
15720	63.61	-6.96	H	56.65	73.98	17.33	PK
15720	50.15	-6.62	H	43.53	53.98	10.45	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 1  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10360	63.24	-6.51	V	56.73	68.20	11.47	PK
15540	63.38	-6.42	V	56.96	73.98	17.02	PK
15540	49.59	-6.42	V	43.17	53.98	10.81	AV
10360	63.09	-6.51	H	56.58	68.20	11.62	PK
15540	62.88	-6.42	H	56.46	73.98	17.52	PK
15540	49.91	-6.42	H	43.49	53.98	10.49	AV

Band : UNII 1  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5200 MHz  
 Channel No. 40 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10400	62.81	-6.49	V	56.32	68.20	11.88	PK
15600	64.65	-7.15	V	57.50	73.98	16.48	PK
15600	50.27	-7.15	V	43.12	53.98	10.86	AV
10400	62.55	-6.49	H	56.06	68.20	12.14	PK
15600	64.20	-7.15	H	57.05	73.98	16.93	PK
15600	50.40	-7.15	H	43.25	53.98	10.73	AV



Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5240 MHz
Channel No.	48 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10480	63.47	-6.96	V	56.51	68.20	11.69	PK
15720	63.55	-6.62	V	56.93	73.98	17.05	PK
15720	50.28	-6.62	V	43.66	53.98	10.32	AV
10480	62.88	-6.96	H	55.92	68.20	12.28	PK
15720	63.71	-6.96	H	56.75	73.98	17.23	PK
15720	50.23	-6.62	H	43.61	53.98	10.37	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 2  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5260 MHz  
 Channel No. 52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10520	63.64	-6.52	V	57.12	68.20	11.08	PK
15780	63.46	-6.67	V	56.79	73.98	17.19	PK
15780	50.03	-6.67	V	43.36	53.98	10.62	AV
10520	62.88	-6.52	H	56.36	68.20	11.84	PK
15780	63.73	-6.67	H	57.06	73.98	16.92	PK
15780	50.01	-6.67	H	43.34	53.98	10.64	AV

Band : UNII 2  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5300 MHz  
 Channel No. 60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10600	62.03	-6.72	V	55.31	73.98	18.67	PK
10600	48.86	-6.72	V	42.14	53.98	11.84	AV
15900	62.21	-7.00	V	55.21	73.98	18.77	PK
15900	49.30	-7.00	V	42.30	53.98	11.68	AV
10600	62.49	-6.72	H	55.77	73.98	18.21	PK
10600	48.87	-6.72	H	42.15	53.98	11.83	AV
15900	62.67	-7.00	H	55.67	73.98	18.31	PK
15900	49.11	-7.00	H	42.11	53.98	11.87	AV



Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10640	62.43	-6.43	V	56.00	73.98	17.98	PK
10640	48.45	-6.43	V	42.02	53.98	11.96	AV
15960	62.91	-6.93	V	55.98	73.98	18.00	PK
15960	49.06	-6.93	V	42.13	53.98	11.85	AV
10640	62.13	-6.43	H	55.70	73.98	18.28	PK
10640	48.44	-6.43	H	42.01	53.98	11.97	AV
15960	61.98	-6.93	H	55.05	73.98	18.93	PK
15960	49.05	-6.93	H	42.12	53.98	11.86	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40





Band : UNII 2  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5260 MHz  
 Channel No. 52 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10520	63.18	-6.52	V	56.66	68.20	11.54	PK
15780	63.69	-6.67	V	57.02	73.98	16.96	PK
15780	50.18	-6.67	V	43.51	53.98	10.47	AV
10520	63.01	-6.52	H	56.49	68.20	11.71	PK
15780	63.99	-6.67	H	57.32	73.98	16.66	PK
15780	50.09	-6.67	H	43.42	53.98	10.56	AV

Band : UNII 2  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5300 MHz  
 Channel No. 60 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10600	62.00	-6.72	V	55.28	73.98	18.70	PK
10600	48.67	-6.72	V	41.95	53.98	12.03	AV
15900	62.33	-7.00	V	55.33	73.98	18.65	PK
15900	49.61	-7.00	V	42.61	53.98	11.37	AV
10600	62.50	-6.72	H	55.78	73.98	18.20	PK
10600	48.88	-6.72	H	42.16	53.98	11.82	AV
15900	62.81	-7.00	H	55.81	73.98	18.17	PK
15900	49.08	-7.00	H	42.08	53.98	11.90	AV



Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
10640	62.43	-6.43	V	56.00	73.98	17.98	PK
10640	48.45	-6.43	V	42.02	53.98	11.96	AV
15960	62.91	-6.93	V	55.98	73.98	18.00	PK
15960	49.06	-6.93	V	42.13	53.98	11.85	AV
10640	62.13	-6.43	H	55.70	73.98	18.28	PK
10640	48.44	-6.43	H	42.01	53.98	11.97	AV
15960	61.98	-6.93	H	55.05	73.98	18.93	PK
15960	49.05	-6.93	H	42.12	53.98	11.86	AV

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11000	61.34	-5.06	V	56.28	73.98	17.70	PK
11000	48.22	-5.06	V	43.16	53.98	10.82	AV
16500	62.24	-4.35	V	57.89	68.20	10.31	PK
11000	61.91	-5.06	H	56.85	73.98	17.13	PK
11000	48.12	-5.06	H	43.06	53.98	10.92	AV
16500	62.39	-4.35	H	58.04	68.20	10.16	PK

Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5580 MHz  
 Channel No. 116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11160	62.61	-5.55	V	57.06	73.98	16.92	PK
11160	49.69	-5.55	V	44.14	53.98	9.84	AV
16740	64.30	-3.73	V	60.57	68.20	7.63	PK
11160	63.43	-5.55	H	57.88	73.98	16.10	PK
11160	49.46	-5.55	H	43.91	53.98	10.07	AV
16740	63.45	-3.73	H	59.72	68.20	8.48	PK



Band :	UNII 2e
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.82	-6.08	V	56.74	73.98	17.24	PK
11400	48.95	-6.08	V	42.87	53.98	11.11	AV
17100	62.17	-0.85	V	61.32	68.20	6.88	PK
11400	62.21	-6.08	H	56.13	73.98	17.85	PK
11400	49.12	-6.08	H	43.04	53.98	10.94	AV
17100	61.68	-0.85	H	60.83	68.20	7.37	PK

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11000	61.30	-5.06	V	56.24	73.98	17.74	PK
11000	48.23	-5.06	V	43.17	53.98	10.81	AV
16500	62.31	-4.35	V	57.96	68.20	10.24	PK
11000	61.87	-5.06	H	56.81	73.98	17.17	PK
11000	48.10	-5.06	H	43.04	53.98	10.94	AV
16500	62.42	-4.35	H	58.07	68.20	10.13	PK

Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5580 MHz  
 Channel No. 116 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11160	62.59	-5.55	V	57.04	73.98	16.94	PK
11160	49.72	-5.55	V	44.17	53.98	9.81	AV
16740	64.31	-3.73	V	60.58	68.20	7.62	PK
11160	63.51	-5.55	H	57.96	73.98	16.02	PK
11160	49.57	-5.55	H	44.02	53.98	9.96	AV
16740	63.52	-3.73	H	59.79	68.20	8.41	PK



Band :	UNII 2e
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5700 MHz
Channel No.	140 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11400	62.74	-6.08	V	56.66	73.98	17.32	PK
11400	48.99	-6.08	V	42.91	53.98	11.07	AV
17100	62.28	-0.85	V	61.43	68.20	6.77	PK
11400	62.23	-6.08	H	56.15	73.98	17.83	PK
11400	49.18	-6.08	H	43.10	53.98	10.88	AV
17100	61.72	-0.85	H	60.87	68.20	7.33	PK

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



## 8.7.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS

### Test Requirements and limit, §15.407, §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

#### Standard Battery

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	56.45	-0.51	H	55.94	73.98	18.04	PK
5150	42.98	-0.51	H	42.47	53.98	11.51	AV
5150	55.48	-0.51	V	54.97	73.98	19.01	PK
5150	41.66	-0.51	V	41.15	53.98	12.83	AV

Band :	UNII 1
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	56.31	-0.51	H	55.80	73.98	18.18	PK
5150	42.05	-0.51	H	41.54	53.98	12.44	AV
5150	53.52	-0.51	V	53.01	73.98	20.97	PK
5150	39.92	-0.51	V	39.41	53.98	14.57	AV

<b>FCC PT.15.407 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer	FCC ID: V2X-PM40



**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

<b>FCC PT.15.407 TEST REPORT</b>	<b>FCC CERTIFICATION REPORT</b>		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
<b>Test Report No.</b> HCTR1311FR13-1	<b>Date of Issue:</b> December 18, 2013	<b>EUT Type:</b> Mobile computer	<b>FCC ID:</b> V2X-PM40





Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5350	54.55	-0.19	H	54.36	73.98	19.62	PK
5350	40.14	-0.19	H	39.95	53.98	14.03	AV
5350	53.12	-0.19	V	52.93	73.98	21.05	PK
5350	39.00	-0.19	V	38.81	53.98	15.17	AV

Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5350	54.03	-0.19	H	53.84	73.98	20.14	PK
5350	39.66	-0.19	H	39.47	53.98	14.51	AV
5350	53.22	-0.19	V	53.03	73.98	20.95	PK
5350	38.44	-0.19	V	38.25	53.98	15.73	AV

**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5460	53.99	0.38	H	54.37	73.98	19.61	PK
5460	40.18	0.38	H	40.56	53.98	13.42	AV
*5470	55.02	0.24	H	55.26	68.20	12.94	PK
5460	52.18	0.38	V	52.56	73.98	21.42	PK
5460	38.97	0.38	V	39.35	53.98	14.63	AV
*5470	54.65	0.24	V	54.89	68.20	13.31	PK

Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5700 MHz  
 Channel No. 140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	60.72	1.05	H	61.77	68.20	6.44	PK
*5725	59.33	1.05	V	60.38	68.20	7.83	PK



Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5460	53.87	0.38	H	54.25	73.98	19.73	PK
5460	39.45	0.38	H	39.83	53.98	14.15	AV
*5470	55.36	0.24	H	55.6	68.20	12.60	PK
5460	53.26	0.38	V	53.64	73.98	20.34	PK
5460	38.71	0.38	V	39.09	53.98	14.89	AV
*5470	55.21	0.24	V	55.45	68.20	12.75	PK

Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5700 MHz  
 Channel No. 140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	59.11	1.05	H	60.16	68.20	8.05	PK
*5725	58.37	1.05	V	59.42	68.20	8.79	AV

**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n/ac mode test. . Worst case of EUT is lowest data rate in 802.11a/n
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. \*(\*) is radiated band edge test frequency.(not restricted band emissions)



Extended Battery

Band : UNII 1  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	56.65	-0.51	H	56.14	73.98	17.84	PK
5150	42.25	-0.51	H	41.74	53.98	12.24	AV
5150	55.28	-0.51	V	54.77	73.98	19.21	PK
5150	40.68	-0.51	V	40.17	53.98	13.81	AV

Band : UNII 1  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5150	58.22	-0.51	H	57.71	73.98	16.27	PK
5150	42.66	-0.51	H	42.15	53.98	11.83	AV
5150	55.28	-0.51	V	54.77	73.98	19.21	PK
5150	40.74	-0.51	V	40.23	53.98	13.75	AV

**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



Band :	UNII 2
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5350	58.98	-0.19	H	58.79	73.98	15.19	PK
5350	44.28	-0.19	H	44.09	53.98	9.89	AV
5350	56.12	-0.19	V	55.93	73.98	18.05	PK
5350	42.74	-0.19	V	42.55	53.98	11.43	AV

Band :	UNII 2
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency [MHz]	Reading dBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5350	57.96	-0.19	H	57.77	73.98	16.21	PK
5350	44.87	-0.19	H	44.68	53.98	9.30	AV
5350	54.38	-0.19	V	54.19	73.98	19.79	PK
5350	42.75	-0.19	V	42.56	53.98	11.42	AV

**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n/ac
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40



Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5460	56.69	0.38	H	57.07	73.98	16.91	PK
5460	42.97	0.38	H	43.35	53.98	10.63	AV
*5470	58.04	0.24	H	58.28	68.20	9.92	PK
5460	54.32	0.38	V	54.7	73.98	19.28	PK
5460	41.35	0.38	V	41.73	53.98	12.25	AV
*5470	57.05	0.24	V	57.29	68.20	10.91	PK

Band : UNII 2e  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5700 MHz  
 Channel No. 140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	58.14	1.05	H	59.19	68.20	9.02	PK
*5725	56.91	1.05	V	57.96	68.20	10.25	PK



Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
5460	55.73	0.38	H	56.11	73.98	17.87	PK
5460	43.93	0.38	H	44.31	53.98	9.67	AV
*5470	62.19	0.24	H	62.43	68.20	5.77	PK
5460	53.33	0.38	V	53.71	73.98	20.27	PK
5460	41.87	0.38	V	42.25	53.98	11.73	AV
*5470	59.89	0.24	V	60.13	68.20	8.07	PK

Band : UNII 2e  
 Operation Mode: 802.11 n\_20 MHz BW  
 Transfer Rate: 6.5 Mbps  
 Operating Frequency 5700 MHz  
 Channel No. 140 Ch

Frequency [MHz]	Reading DBuV	AN.+CL+AMP+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
*5725	57.73	1.05	H	58.78	68.20	9.43	PK
*5725	54.26	1.05	V	55.31	68.20	12.90	AV

**Notes:**

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n/ac mode test. . Worst case of EUT is lowest data rate in 802.11a/n
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. "\*" is radiated band edge test frequency.(not restricted band emissions)

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40

## 8.8 POWERLINE CONDUCTED EMISSIONS

### Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test for 48 Mbps, Ch.52 and 802.11a mode in UNII 2. Because 802.11a mode in UNII 2 is worst case.



## RESULT PLOTS

### Conducted Emissions (Line 1)

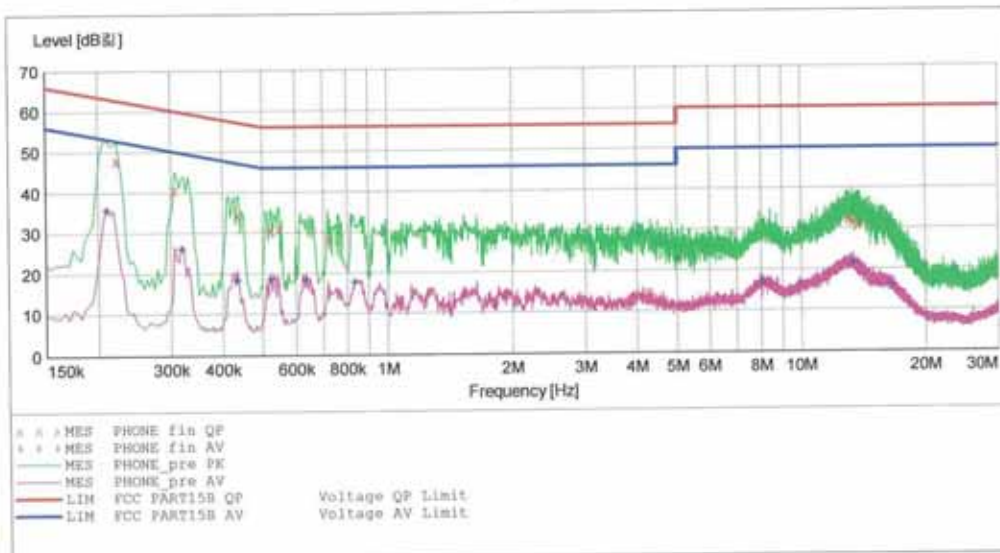
HCT

EMC

EUT: PM40  
 Manufacturer: POINT MOBILE  
 Operating Condition: WLAN MODE(UNII)  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART15B  
 Comment: N  
 Start of Test: 2013-11-22 / 9:36:14 오후

#### SCAN TABLE: "FCC CLASS B(N)"

Short Description:			FCC CLASS B(N)				
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer	
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



#### MEASUREMENT RESULT: "PHONE\_fin QP"

2013-11-22 9:38 오후

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.222001	47.90	10.0	63	14.9	----	----
0.306001	40.60	10.0	60	19.4	----	----
0.434001	34.20	10.0	57	23.0	----	----
0.524000	30.70	10.0	56	25.3	----	----
0.548000	30.90	10.0	56	25.1	----	----
0.720000	28.10	10.0	56	27.9	----	----
13.040000	32.30	10.9	60	27.7	----	----
13.288000	31.80	10.9	60	28.2	----	----
13.736000	31.10	11.0	60	28.9	----	----

**MEASUREMENT RESULT: "PHONE\_fin AV"**

2013-11-22 9:38오.후

Frequency MHz	Level dB <sub>μV</sub>	Transd dB	Limit dB <sub>μV</sub>	Margin dB	Line	PE
0.210001	35.70	10.0	53	17.5	---	---
0.318001	25.90	10.0	50	23.8	---	---
0.434001	18.30	10.0	47	28.9	---	---
0.524000	18.40	10.0	46	27.6	---	---
0.636000	18.30	10.0	46	27.7	---	---
0.836000	17.50	10.0	46	28.5	---	---
8.040000	16.80	10.6	50	33.2	---	---
13.384000	21.30	10.9	50	28.7	---	---
16.536000	16.00	11.1	50	34.0	---	---

FCC PT.15.407 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer	FCC ID: V2X-PM40

## Conducted Emissions (Line 2)

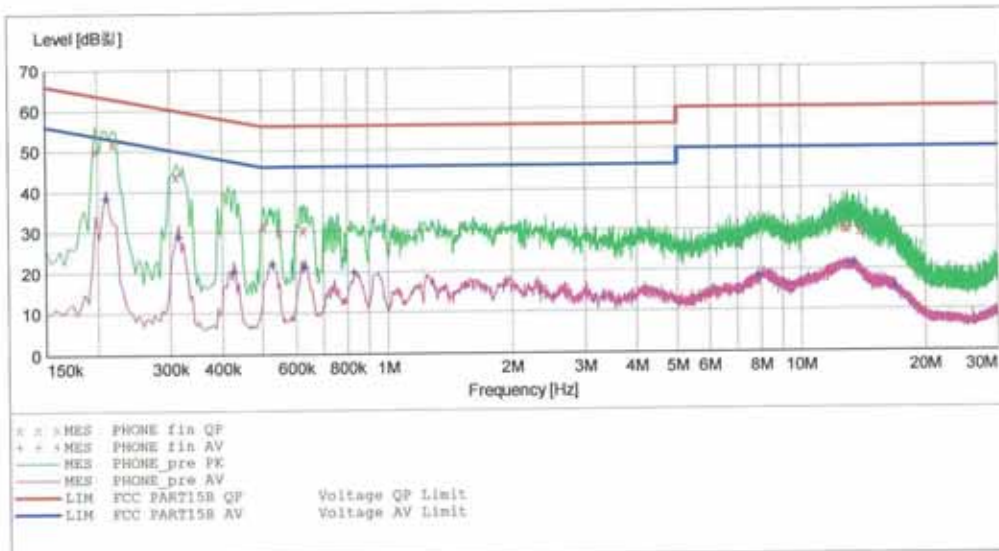
HCT

EMC

EUT: PM40  
 Manufacturer: POINT MOBILE  
 Operating Condition: WLAN MODE(UNII)  
 Test Site: SHIELD ROOM  
 Operator: JS LEE  
 Test Specification: FCC PART15B  
 Comment: H  
 Start of Test: 2013-11-22 / 9:31:46 오후

### SCAN TABLE: "FCC CLASS B(H)"

Short Description: FCC CLASS B(H)				Detector	Meas. Time	IF Bandw.	Transducer
Start Frequency	Stop Frequency	Step Width	Step				
150.0 kHz	500.0 kHz	4.0 kHz		MaxPeak	10.0 ms	9 kHz	None
				Average			
500.0 kHz	5.0 MHz	4.0 kHz		MaxPeak	10.0 ms	9 kHz	None
				Average			
5.0 MHz	30.0 MHz	4.0 kHz		MaxPeak	10.0 ms	9 kHz	None
				Average			



### MEASUREMENT RESULT: "PHONE\_fin QP"

2013-11-22 9:34 오후

Frequency MHz	Level dBμ	Transd dB	Limit dBμ	Margin dB	Line	PE
0.198001	50.10	9.8	64	13.6	---	---
0.218001	51.90	9.8	63	11.0	---	---
0.310001	43.80	9.8	60	16.1	---	---
0.504000	31.50	9.8	56	24.5	---	---
0.548000	29.80	9.8	56	26.2	---	---
0.628000	30.50	9.8	56	25.5	---	---
12.652000	30.00	10.6	60	30.0	---	---
12.944000	29.90	10.6	60	30.1	---	---
13.888000	29.30	10.7	60	30.7	---	---

**MEASUREMENT RESULT: "PHONE\_fin AV"**

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.210001	38.30	9.8	53	15.0	---	---
0.314001	28.80	9.8	50	21.1	---	---
0.426001	20.20	9.8	47	27.1	---	---
0.528000	21.90	9.8	46	24.1	---	---
0.632000	21.20	9.8	46	24.8	---	---
0.832000	19.80	9.8	46	26.2	---	---
7.900000	18.10	10.3	50	31.9	---	---
13.372000	21.10	10.7	50	28.9	---	---
16.868000	15.40	10.8	50	34.6	---	---

FCC PT.15.407 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCTR1311FR13-1	Date of Issue: December 18, 2013	EUT Type: Mobile computer		FCC ID: V2X-PM40

## 9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/17/2014	3150
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	04/16/2014	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	04/25/2014	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/14/2014	MY51110063
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/10/2014	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2014	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2014	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	07/05/2015	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/08/2014	839117/011
Agilent	N1911A /Power Meter	Annual	01/22/2014	MY45100523
Agilent	N1921A /POWER SENSOR	Annual	07/11/2014	MY45241059
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/08/2014	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	04/16/2014	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	04/16/2014	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	03/19/2014	1
Hewlett Packard	11636B/Power Divider	Annual	10/22/2014	11377
Agilent	87300B/Directional Coupler	Annual	12/24/2013	3116A03621
Hewlett Packard	11667B / Power Splitter	Annual	05/29/2014	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	10/29/2014	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/05/2014	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	04/24/2014	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
CERNEX	CBLU1183540 / POWER AMP	Annual	07/24/2014	21691
Agilent	8493C / Attenuator(10 dB)	Annual	07/24/2014	76649
WEINSCHL	2-3 / Attenuator(3 dB)	Annual	10/28/2014	BR0617