FCC RF Test Report

APPLICANT	:	Sonim Technologies, Inc.
EQUIPMENT	:	LTE Smartphone
BRAND NAME	:	Sonim
MODEL NAME	:	XP7700
MARKETING NAME	:	XP7
FCC ID	:	WYPL22V012AA
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

The product was received on Jul. 13, 2015 and testing was completed on Aug. 25, 2015. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 2353

SPORTON INTERNATIONAL (SHENZHEN) INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR571301F	Rev. 01	Initial issue of report	Sep. 21, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm/MHz &15.209(a)	Pass	Under limit 4.06 dB at 5695.080 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 4.97 dB at 0.630 MHz
3.6	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.7	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.8	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Sonim Technologies, Inc.
1825 S. Grant St., Suite 200., San Mateo, CA, 94402

1.2 Manufacturer

Sonim Technologies (Shenzhen) Limited
2nd Floor, No. 2 Building Phase B, Daqian Industrial park, Longchang Road, 67 District, Baoan, Shenzhen, P. R. China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	LTE Smartphone
Brand Name	Sonim
Model Name	XP7700
Marketing Name	XP7
FCC ID	WYPL22V012AA
EUT supports Radios application	CDMA/EV-DO/LTE/NFC/ WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN5GHz 802.11a/n HT20/HT40/ Bluetooth v2.1 + EDR/Bluetooth v4.0 LE
IMEI Code	Conducted: 990005160203379 Radiation: NA Conduction: 99000516020317
Type Number	L22V012AA
HW Version	A
SW Version	7A.0.0-00-4.4.4-15.01.07
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	802.11a : 9.23 dBm / 0.0084 W 802.11n HT20 : 8.97 dBm / 0.0079 W 802.11n HT40 : 9.15 dBm / 0.0082 W
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
Antenna Type / Gain	PIFA Antenna with gain -1.00 dBi

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	**Sporton Site No.**	
	TH01-SZ	CO01-SZ

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	**Sporton Site No.**	**FCC Registration No.**
	03CH01-SZ	831040

Note: The test site complies with ANSI C63.4 2009 requirement.

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v01
- ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5745 ~ 5825 MHz Band 4 (U-NII-3)	149	5745	**159**	**5795**
	151	**5755**	161	5805
	153	5765	165	5825
	157	5785		

Note: The above Frequency and Channel in boldface were 802.11n HT40.

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

WLAN 5GHz 802.11a Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate / 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 149	5745	8.85	CH 157	8.98	8.92	8.87	8.86	9.17	9.05	9.02
CH 157	5785	**9.23**								
CH 165	5825	8.90								

WLAN 5GHz 802.11n-HT20 Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index / MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 149	5745	8.57	CH 157	8.80	8.84	8.87	8.90	8.86	8.90	8.87
CH 157	5785	**8.97**								
CH 165	5825	8.85								

WLAN 5GHz 802.11n-HT40 Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	MCS Index / MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 151	5755	9.01	CH 159	9.06	9.03	8.92	9.00	9.01	8.92	9.07
CH 159	5795	**9.15**								

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

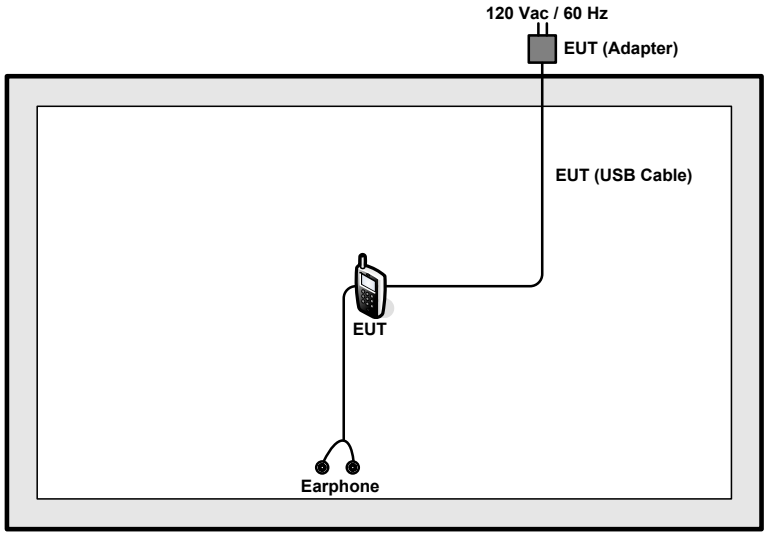
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

AC Conducted Emission	Mode 1 : CDMA2000 BC0 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable (Charging from Adapter)
Remark: For Radiated TCs, the tests were performed with adapter, earphone and USB cable.	

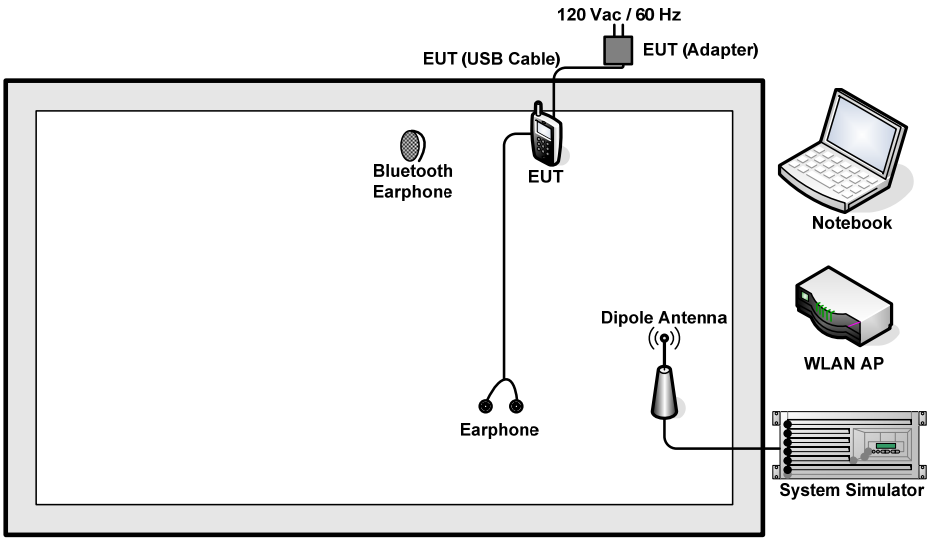
Ch. #		Band IV：5745 ~ 5825 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-815	KA2IR815A1	N/A	Unshielded, 1.8 m
2.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	E540	FCC DoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable1.2 m
4.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A
5.	Earphone	Lenovo	BH102	FCC DoC	Shielded, 1.2 m	N/A

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuously transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 6.5 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 6.5 + 10 = 16.5 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Description of 6dB Bandwidth

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

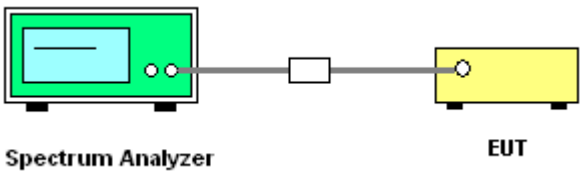
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

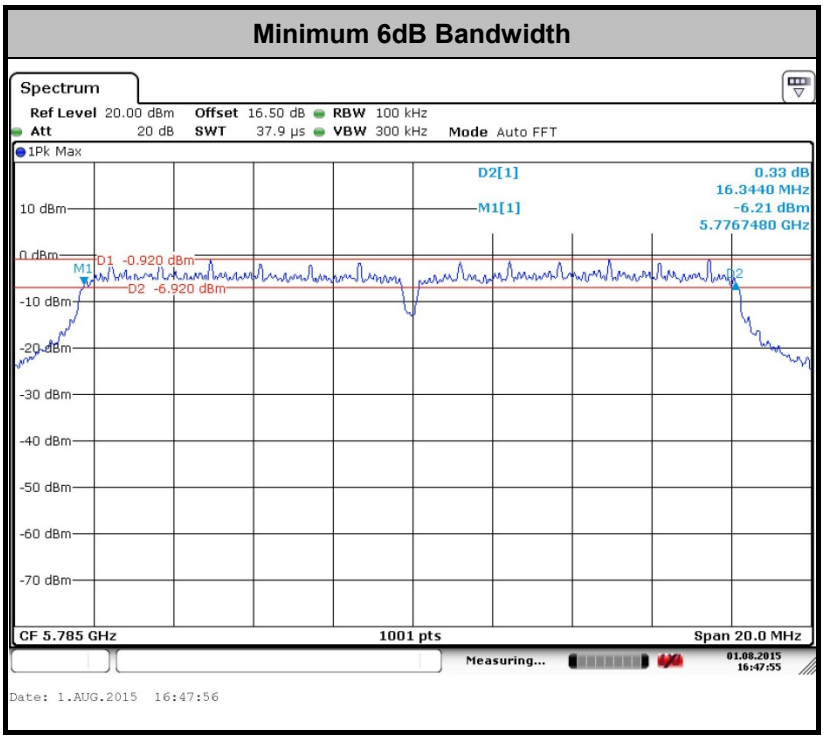
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

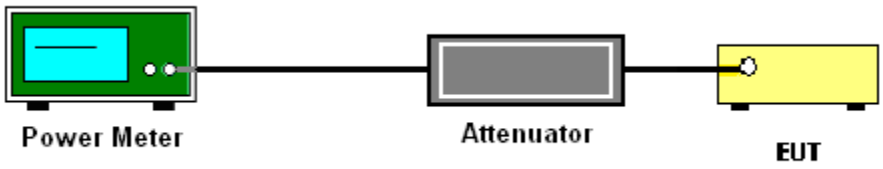
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
Section F) Maximum power spectral density.

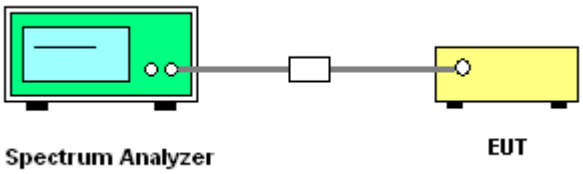
 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
   - Measure the duty cycle.
   - Set span to encompass the entire emission bandwidth (EBW) of the signal.
   - Set RBW = 300 kHz.
   - Set VBW ≥ 1 MHz.
   - Number of points in sweep ≥ 2 Span / RBW.
   - Sweep time = auto.
   - Detector = RMS
   - Trace average at least 100 traces in power averaging mode.
   - Add 10 log(500kHz/RBW) to the test result.
   - 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. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

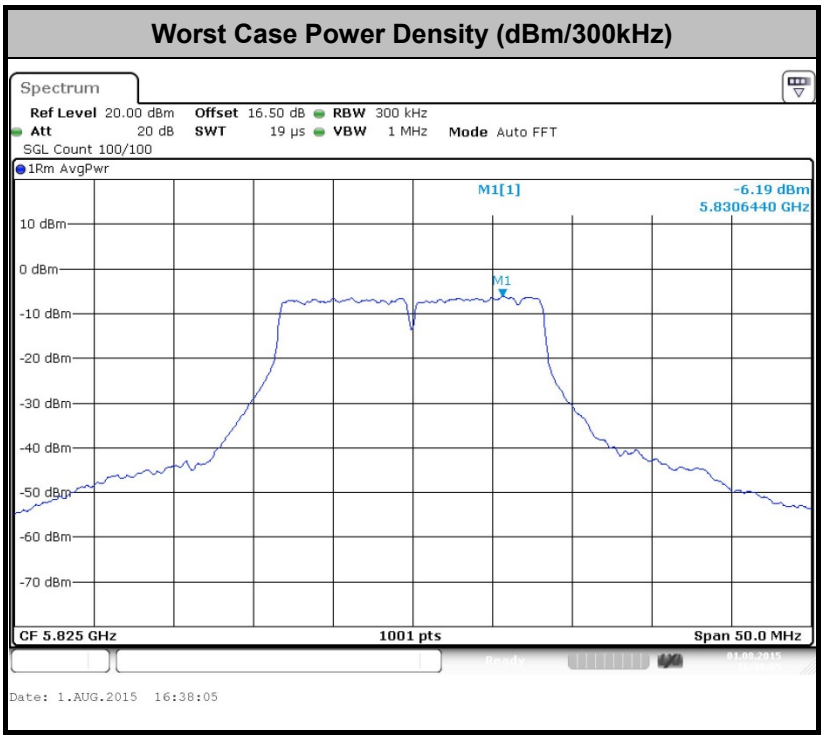
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/300kHz)



3.4 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5725-5850 MHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBμV/m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBμV/m).

(2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

(3) KDB789033 v01r03 H)2)c)(i) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

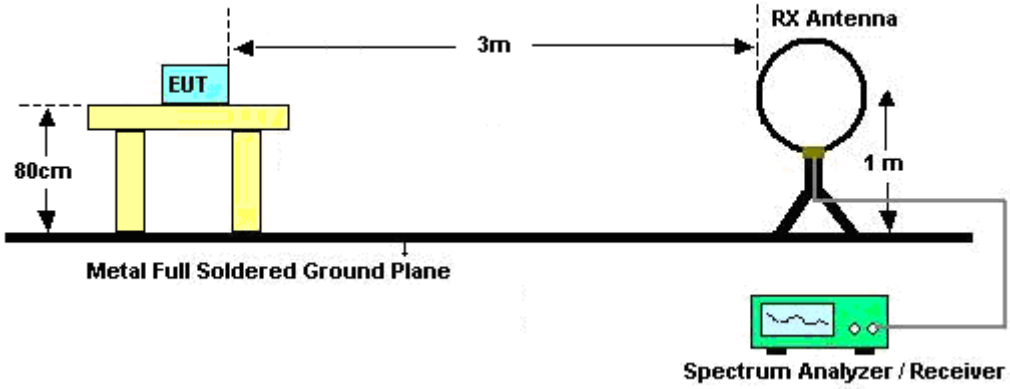
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.04	1.36	0.73	1kHz
802.11n HT20	86.67	1.28	0.78	1kHz
802.11n HT40	76.09	0.64	1.57	3kHz

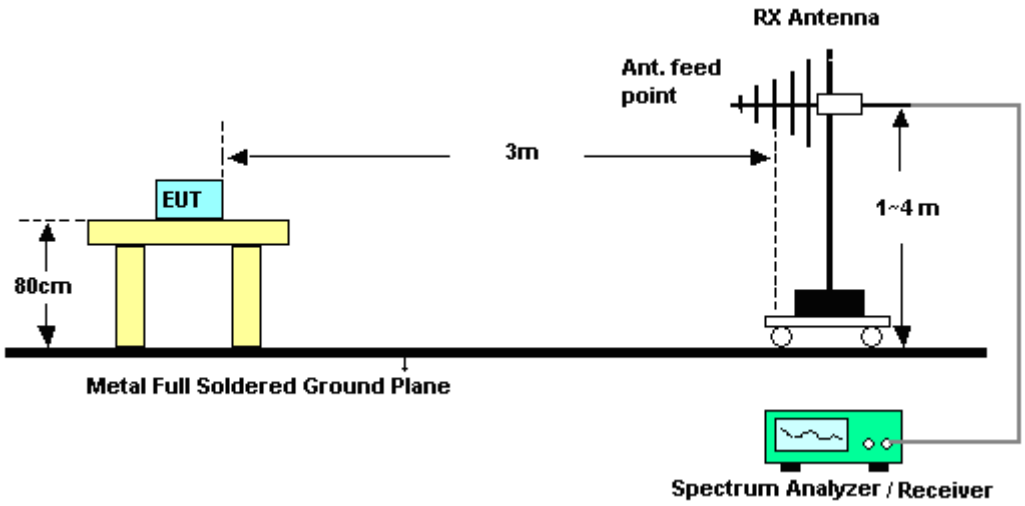
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

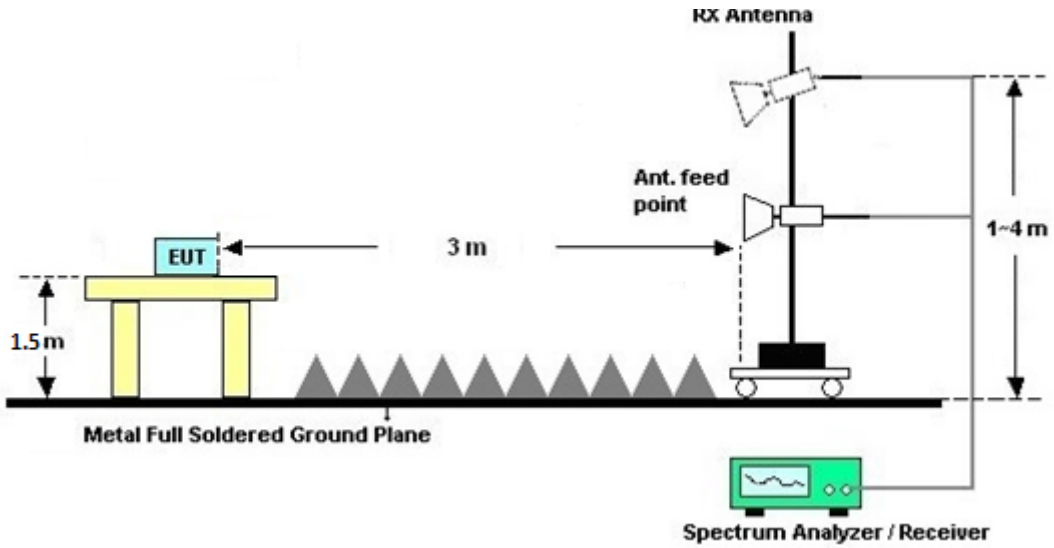
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix B.

3.4.7 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that 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 the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

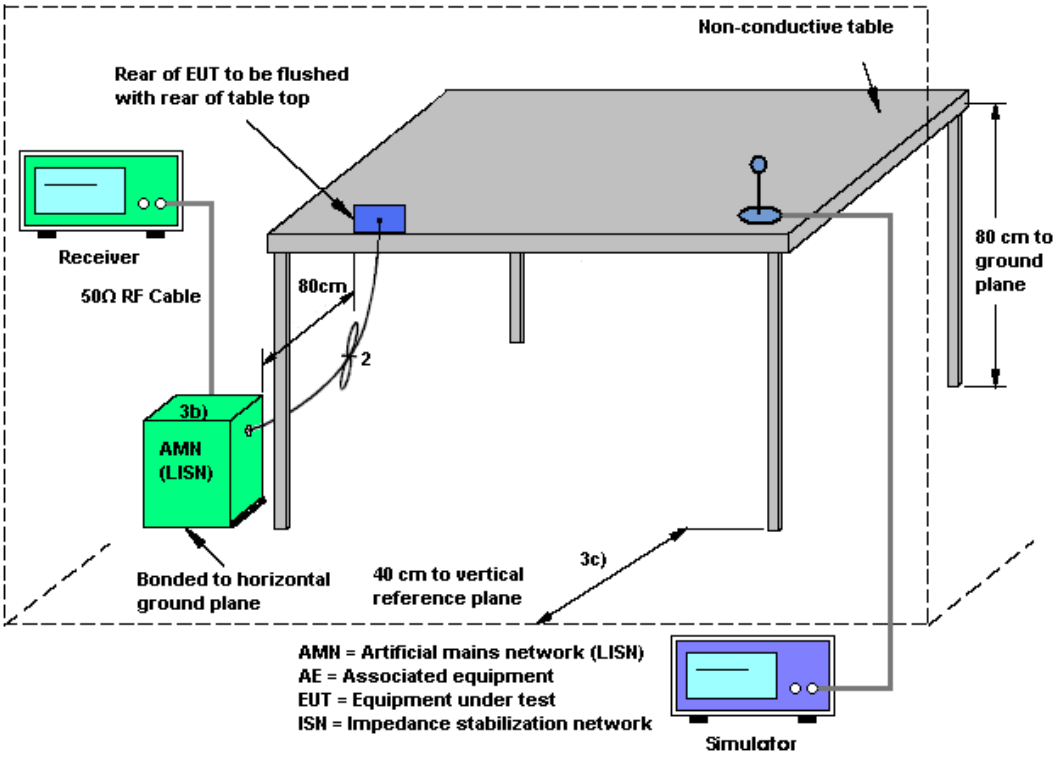
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

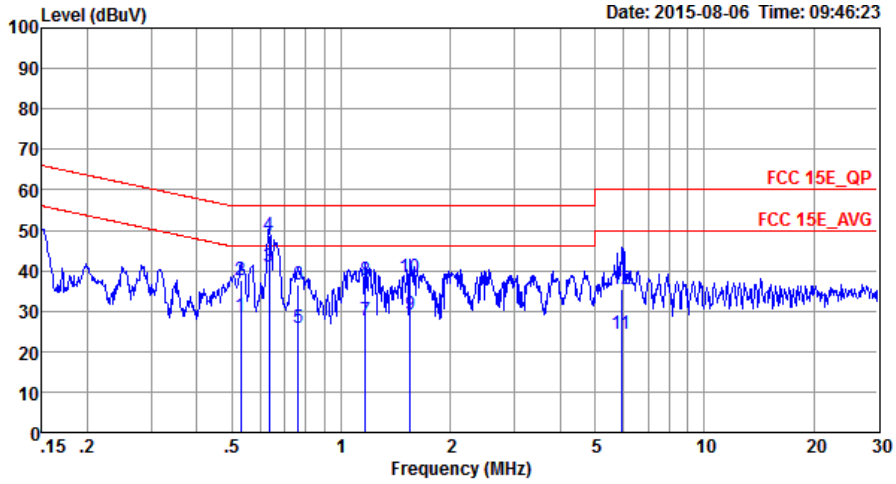
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Jacky Yang	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	CDMA2000 BC0 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable (Charging from Adapter)		

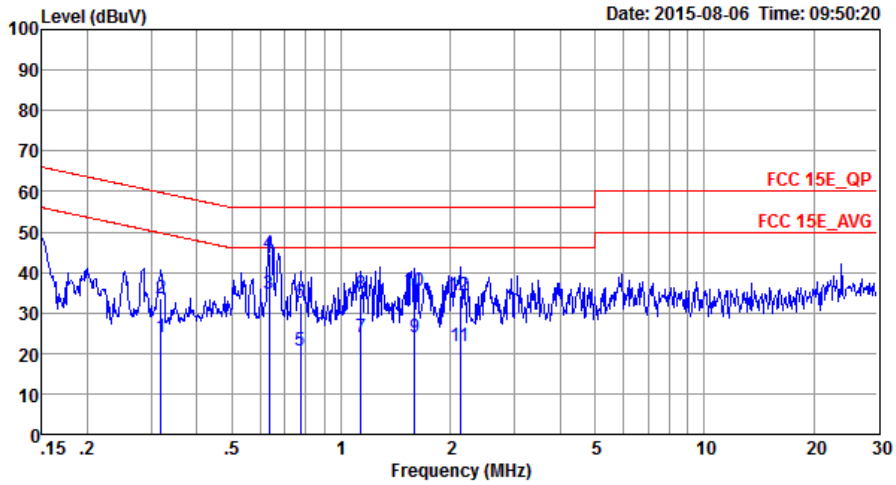


Site : CO01-SZ
Condition: FCC 15E_QP LISN_L_20150304 LINE

Mode : Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.53	28.60	-17.40	46.00	17.80	0.65	10.15	Average
2		0.53	37.50	-18.50	56.00	26.70	0.65	10.15	QP
3	*	0.63	41.03	-4.97	46.00	30.30	0.58	10.15	Average
4		0.63	48.73	-7.27	56.00	38.00	0.58	10.15	QP
5		0.76	25.68	-20.32	46.00	15.00	0.53	10.15	Average
6		0.76	36.48	-19.52	56.00	25.80	0.53	10.15	QP
7		1.17	27.56	-18.44	46.00	16.90	0.50	10.16	Average
8		1.17	37.66	-18.34	56.00	27.00	0.50	10.16	QP
9		1.55	29.15	-16.85	46.00	18.50	0.48	10.17	Average
10		1.55	38.45	-17.55	56.00	27.80	0.48	10.17	QP
11		5.90	24.32	-25.68	50.00	13.40	0.66	10.26	Average
12		5.90	35.52	-24.48	60.00	24.60	0.66	10.26	QP

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Jacky Yang	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	CDMA2000 BC0 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable (Charging from Adapter)		



Site : CO01-SZ
Condition: FCC 15E_QP LISN_N_20150304 NEUTRAL

Mode : Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.32	23.98	-25.77	49.75	13.21	0.58	10.19	Average
2		0.32	33.58	-26.17	59.75	22.81	0.58	10.19	QP
3	*	0.63	34.82	-11.18	46.00	24.10	0.57	10.15	Average
4		0.63	44.72	-11.28	56.00	34.00	0.57	10.15	QP
5		0.77	20.80	-25.20	46.00	10.10	0.55	10.15	Average
6		0.77	32.50	-23.50	56.00	21.80	0.55	10.15	QP
7		1.14	24.02	-21.98	46.00	13.30	0.56	10.16	Average
8		1.14	34.52	-21.48	56.00	23.80	0.56	10.16	QP
9		1.59	23.84	-22.16	46.00	13.09	0.57	10.18	Average
10		1.59	35.44	-20.56	56.00	24.69	0.57	10.18	QP
11		2.12	21.87	-24.13	46.00	11.11	0.57	10.19	Average
12		2.12	34.27	-21.73	56.00	23.51	0.57	10.19	QP

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

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

3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.6.4 Test Setup

3.6.5 Test Result of Frequency Stability

Please refer to Appendix A.

3.7 Automatically Discontinue Transmission

3.7.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.7.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.8 Antenna Requirements

3.8.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 Antenna Gain

The antenna gain is less than 6 dBi. Therefore, it is not necessary to reduce maximum output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	Aug. 01, 2015	Sep. 24, 2015	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Jan. 28, 2015	Aug. 01, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Jan. 28, 2015	Aug. 01, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Sep. 16, 2015	Aug. 01, 2015	Sep. 15, 2015	Conducted (TH01-SZ)
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2015	Aug. 25, 2015	May 25, 2016	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz; Max 30dBm	Sep. 25, 2014	Aug. 25, 2015	Sep. 24, 2015	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 06, 2015	Aug. 25, 2015	May 05, 2016	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz~2GHz	Nov. 07, 2014	Aug. 25, 2015	Nov. 06, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Aug. 25, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Sep. 04, 2014	Aug. 25, 2015	Sep. 03, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz / 30 dB	Jan. 28, 2015	Aug. 25, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 05, 2015	Aug. 25, 2015	May 04, 2016	Radiation (03CH01-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 28, 2015	Aug. 25, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Aug. 25, 2015	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Aug. 25, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Aug. 25, 2015	NCR	Radiation (03CH01-SZ)
EMI Receiver	R&S	ESCI7	100724	9kHz~3GHz;	Jan. 28, 2015	Aug. 06, 2015	Jan. 27, 2016	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	103892	9kHz~30MHz	Feb. 02, 2015	Aug. 06, 2015	Feb. 01, 2016	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	AN3016	16850	9kHz~30MHz	Feb. 02, 2015	Aug. 06, 2015	Feb. 01, 2016	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Aug. 08, 2014	Aug. 06, 2015	Aug. 07, 2015	Conduction (CO01-SZ)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.3dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9dB**

Appendix A. Conducted Test Results

Report Number : FR571301F

Test Engineer:	Fly Liang	Temperature:	24~26	°C
Test Date:	2015/8/1	Relative Humidity:	50~53	%

TEST RESULTS DATA
6dB Bandwidth

Band IV							
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	6 dB Bandwidth (MHz)	FCC 6dB Bandwidth Limit (MHz)	Pass/Fail
11a	6M bps	1	149	5745	16.42	0.5	Pass
11a	6Mbps	1	157	5785	16.34	0.5	Pass
11a	6Mbps	1	165	5825	16.34	0.5	Pass
HT20	MCS 0	1	149	5745	17.58	0.5	Pass
HT20	MCS 0	1	157	5785	17.58	0.5	Pass
HT20	MCS 0	1	165	5825	17.58	0.5	Pass
HT40	MCS 0	1	151	5755	35.60	0.5	Pass
HT40	MCS 0	1	159	5795	35.64	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.60	8.85	30.00	-1.00		Pass
11a	6Mbps	1	157	5785	0.60	9.23	30.00	-1.00		Pass
11a	6Mbps	1	165	5825	0.60	8.90	30.00	-1.00		Pass
HT20	MCS 0	1	149	5745	0.62	8.57	30.00	-1.00		Pass
HT20	MCS 0	1	157	5785	0.62	8.97	30.00	-1.00		Pass
HT20	MCS 0	1	165	5825	0.62	8.85	30.00	-1.00		Pass
HT40	MCS 0	1	151	5755	1.19	9.01	30.00	-1.00		Pass
HT40	MCS 0	1	159	5795	1.19	9.15	30.00	-1.00		Pass

Report Number : FR571301F

TEST RESULTS DATA
Power Spectral Density

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	10log (500kHz /RBW) Factor (dB)	Average Power Density (dBm/500kHz)	Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	149	5745	0.60	2.22	-3.96	30.00	-1.00	Pass
11a	6Mbps	1	157	5785	0.60	2.22	-3.87	30.00	-1.00	Pass
11a	6Mbps	1	165	5825	0.60	2.22	-3.37	30.00	-1.00	Pass
HT20	MCS 0	1	149	5745	0.62	2.22	-3.82	30.00	-1.00	Pass
HT20	MCS 0	1	157	5785	0.62	2.22	-4.22	30.00	-1.00	Pass
HT20	MCS 0	1	165	5825	0.62	2.22	-4.35	30.00	-1.00	Pass
HT40	MCS 0	1	151	5755	1.19	2.22	-7.05	30.00	-1.00	Pass
HT40	MCS 0	1	159	5795	1.19	2.22	-6.60	30.00	-1.00	Pass

Report Number : FR571301F

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6M bps	1	149	5745	5744.925	-0.075	-13.05	20	3.5	
11a	6M bps	1	149	5745	5744.900	-0.100	-17.41	20	4.35	
11a	6M bps	1	149	5745	5744.900	-0.100	-17.41	20	3.8	
11a	6M bps	1	149	5745	5744.925	-0.075	-13.05	-30	3.8	
11a	6M bps	1	149	5745	5744.925	-0.075	-13.05	50	3.8	

Appendix B. Radiated Test Results

15E Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5692.92	44.99	-23.31	68.3	38.84	32.3	7.36	33.51	150	38	P	H
		5724.6	46.25	-32.05	78.3	40.05	32.36	7.36	33.52	150	38	P	H
	*	5745	90.81	-	-	84.54	32.39	7.41	33.53	150	38	P	H
		5745	83.56	-	-	77.29	32.39	7.41	33.53	150	38	A	H
		5692.52	51.53	-16.77	68.3	45.38	32.3	7.36	33.51	236	296	P	V
		5724.76	60.42	-17.88	78.3	54.22	32.36	7.36	33.52	236	296	P	V
	*	5745	102.69	-	-	96.42	32.39	7.41	33.53	236	296	P	V
		5745	95.29	-	-	89.02	32.39	7.41	33.53	236	296	A	V
802.11a CH 157 5785MHz		5688.28	45.47	-22.83	68.3	39.32	32.3	7.36	33.51	198	276	P	H
		5718.6	45.7	-32.6	78.3	39.5	32.36	7.36	33.52	198	276	P	H
	*	5785	92.05	-	-	85.7	32.44	7.45	33.54	198	276	P	H
		5785	83.44	-	-	77.09	32.44	7.45	33.54	198	276	A	H
		5854.96	44.73	-33.57	78.3	38.2	32.58	7.51	33.56	198	276	P	H
		5869.44	44.3	-24	68.3	37.77	32.58	7.51	33.56	198	276	P	H
		5693.96	45.92	-22.38	68.3	39.77	32.3	7.36	33.51	236	305	P	V
		5719.4	45.64	-32.66	78.3	39.44	32.36	7.36	33.52	236	305	P	V
	*	5785	102.78	-	-	96.43	32.44	7.45	33.54	236	305	P	V
		5785	95.5	-	-	89.15	32.44	7.45	33.54	236	305	A	V
		5855.04	45.91	-32.39	78.3	39.38	32.58	7.51	33.56	236	305	P	V
		5873.04	45.77	-22.53	68.3	39.21	32.61	7.51	33.56	236	305	P	V

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 165 5825MHz	*	5825	91.44	-	-	84.99	32.52	7.48	33.55	200	276	P	H
		5825	83.21	-	-	76.76	32.52	7.48	33.55	200	276	A	H
		5850	46.4	-31.9	78.3	39.9	32.55	7.51	33.56	200	276	P	H
		5863.36	46.93	-21.37	68.3	40.4	32.58	7.51	33.56	200	276	P	H
	*	5825	102.53	-	-	96.08	32.52	7.48	33.55	234	284	P	V
		5825	93.92	-	-	87.47	32.52	7.48	33.55	234	284	A	V
		5850.64	51.63	-26.67	78.3	45.13	32.55	7.51	33.56	234	284	P	V
		5876.8	48.6	-19.7	68.3	42.04	32.61	7.51	33.56	234	284	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15E Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		11490	48.59	-25.41	74	58.23	39.06	11.05	59.75	145	265	P	H
		17235	50.12	-18.18	68.3	52.33	41.39	14.65	58.25	174	321	P	H
		11490	49.18	-24.82	74	58.82	39.06	11.05	59.75	145	265	P	V
		17235	49.09	-19.21	68.3	51.3	41.39	14.65	58.25	174	321	P	V
802.11a CH 157 5785MHz		11570	50.29	-23.71	74	60.13	38.98	11.01	59.83	105	198	P	H
		17355	48.71	-19.59	68.3	49.55	42.18	14.78	57.8	189	185	P	H
		11570	50.43	-23.57	74	60.27	38.98	11.01	59.83	105	198	P	V
		17355	48.4	-19.9	68.3	49.24	42.18	14.78	57.8	189	185	P	V
802.11a CH 165 5825MHz		11650	50.54	-23.46	74	60.55	38.92	10.97	59.9	146	347	P	H
		17475	50.17	-18.13	68.3	49.64	42.98	14.9	57.35	100	360	P	H
		11650	50.09	-23.91	74	60.1	38.92	10.97	59.9	146	347	P	V
		17475	50.58	-17.72	68.3	50.05	42.98	14.9	57.35	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15E Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 149 5745MHz		5688.36	45.77	-22.53	68.3	39.62	32.3	7.36	33.51	150	38	P	H
		5724.04	47.83	-30.47	78.3	41.63	32.36	7.36	33.52	150	38	P	H
	*	5745	90.91	-	-	84.64	32.39	7.41	33.53	150	38	P	H
		5745	83.45	-	-	77.18	32.39	7.41	33.53	150	38	A	H
		5693	50.62	-17.68	68.3	44.47	32.3	7.36	33.51	227	298	P	V
		5724.76	58.44	-19.86	78.3	52.24	32.36	7.36	33.52	227	298	P	V
	*	5745	102.73	-	-	96.46	32.39	7.41	33.53	227	298	P	V
		5745	94.82	-	-	88.55	32.39	7.41	33.53	227	298	A	V
802.11n HT20 CH 157 5785MHz		5696.92	44.85	-23.45	68.3	38.7	32.3	7.36	33.51	196	276	P	H
		5717.48	43.35	-34.95	78.3	37.18	32.33	7.36	33.52	196	276	P	H
	*	5785	91.92	-	-	85.57	32.44	7.45	33.54	196	276	P	H
		5785	83.99	-	-	77.64	32.44	7.45	33.54	196	276	A	H
		5853.76	43.84	-34.46	78.3	37.31	32.58	7.51	33.56	196	276	P	H
		5862.8	45.75	-22.55	68.3	39.22	32.58	7.51	33.56	196	276	P	H
		5694.92	45.73	-22.57	68.3	39.58	32.3	7.36	33.51	236	302	P	V
		5719.88	45.83	-32.47	78.3	39.63	32.36	7.36	33.52	236	302	P	V
	*	5785	102.92	-	-	96.57	32.44	7.45	33.54	236	302	P	V
		5785	95.08	-	-	88.73	32.44	7.45	33.54	236	302	A	V
		5852.08	45.82	-32.48	78.3	39.32	32.55	7.51	33.56	236	302	P	V
		5888.16	46.05	-22.25	68.3	39.46	32.63	7.53	33.57	236	302	P	V

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 165 5825MHz	*	5825	90.26	-	-	83.81	32.52	7.48	33.55	194	277	P	H
		5825	82.35	-	-	75.9	32.52	7.48	33.55	194	277	A	H
		5855.44	45.98	-32.32	78.3	39.45	32.58	7.51	33.56	194	277	P	H
		5866.48	45.56	-22.74	68.3	39.03	32.58	7.51	33.56	194	277	P	H
	*	5825	101.46	-	-	95.01	32.52	7.48	33.55	204	278	P	V
		5825	93.96	-	-	87.51	32.52	7.48	33.55	204	278	A	V
		5850	53.8	-14.5	68.3	47.3	32.55	7.51	33.56	204	278	P	V
		5876.56	48.55	-19.75	68.3	41.99	32.61	7.51	33.56	204	278	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15E Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n		11490	50.69	-23.31	74	60.33	39.06	11.05	59.75	145	265	P	H
HT20		17235	50.31	-17.99	68.3	52.52	41.39	14.65	58.25	174	321	P	H
CH 149		11490	50.99	-23.01	74	60.63	39.06	11.05	59.75	145	265	P	V
5745MHz		17235	50.31	-17.99	68.3	52.52	41.39	14.65	58.25	174	321	P	V
802.11n		11570	50	-24	74	59.84	38.98	11.01	59.83	105	198	P	H
HT20		17355	50.76	-17.54	68.3	51.6	42.18	14.78	57.8	189	185	P	H
CH 157		11570	50.45	-23.55	74	60.29	38.98	11.01	59.83	105	198	P	V
5785MHz		17355	50.34	-17.96	68.3	51.18	42.18	14.78	57.8	189	185	P	V
802.11n		11650	50.56	-23.44	74	60.57	38.92	10.97	59.9	146	347	P	H
HT20		17475	50.94	-17.36	68.3	50.41	42.98	14.9	57.35	100	360	P	H
CH 165		11650	50.6	-23.4	74	60.61	38.92	10.97	59.9	146	347	P	V
5825MHz		17475	50	-18.3	68.3	49.47	42.98	14.9	57.35	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15E Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 151 5755MHz		5697.4	47.54	-20.76	68.3	41.39	32.3	7.36	33.51	191	276	P	H
		5723.4	48.13	-30.17	78.3	41.93	32.36	7.36	33.52	191	276	P	H
	*	5755	88.19	-	-	81.9	32.41	7.41	33.53	191	276	P	H
		5755	81.54	-	-	75.25	32.41	7.41	33.53	191	276	A	H
		5857.6	46.17	-32.13	78.3	39.64	32.58	7.51	33.56	191	276	P	H
		5878.4	47.12	-21.18	68.3	40.56	32.61	7.51	33.56	191	276	P	H
		5695.08	64.24	-4.06	68.3	58.09	32.3	7.36	33.51	219	277	P	V
		5719.56	58.05	-20.25	78.3	51.85	32.36	7.36	33.52	219	277	P	V
	*	5755	101.27	-	-	94.98	32.41	7.41	33.53	219	277	P	V
		5755	92.98	-	-	86.69	32.41	7.41	33.53	219	277	A	V
		5856.96	45.28	-33.02	78.3	38.75	32.58	7.51	33.56	219	277	P	V
		5874.64	46.97	-21.33	68.3	40.41	32.61	7.51	33.56	219	277	P	V
802.11n HT40 CH 159 5795MHz		5712.36	46.75	-21.55	68.3	40.58	32.33	7.36	33.52	194	277	P	H
		5718.92	45.49	-32.81	78.3	39.29	32.36	7.36	33.52	194	277	P	H
	*	5795	88.82	-	-	82.44	32.47	7.45	33.54	194	277	P	H
		5795	81.04	-	-	74.66	32.47	7.45	33.54	194	277	A	H
		5853.12	47.22	-31.08	78.3	40.72	32.55	7.51	33.56	194	277	P	H
		5887.6	46.84	-21.46	68.3	40.25	32.63	7.53	33.57	194	277	P	H
		5690.6	48.72	-19.58	68.3	42.57	32.3	7.36	33.51	150	276	P	V
		5719.48	49.67	-28.63	78.3	43.47	32.36	7.36	33.52	150	276	P	V
	*	5795	100.83	-	-	94.45	32.47	7.45	33.54	150	276	P	V
		5795	91.81	-	-	85.43	32.47	7.45	33.54	150	276	A	V
		5855.6	64.98	-13.32	78.3	58.45	32.58	7.51	33.56	150	276	P	V
		5862.48	49.74	-18.56	68.3	43.21	32.58	7.51	33.56	150	276	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15E Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n		11510	49.4	-24.6	74	59.07	39.04	11.05	59.76	100	360	P	H
HT40		17265	48.42	-19.88	68.3	50.24	41.62	14.69	58.13	100	360	P	H
CH 151		11510	50.21	-23.79	74	59.88	39.04	11.05	59.76	100	360	P	V
5755MHz		17265	49	-19.3	68.3	50.82	41.62	14.69	58.13	100	360	P	V
802.11n		11590	49.74	-24.26	74	59.61	38.97	11.01	59.85	100	300	P	H
HT40		17385	50.11	-18.19	68.3	50.55	42.41	14.82	57.67	100	200	P	H
CH 159		11590	50.09	-23.91	74	59.96	38.97	11.01	59.85	100	300	P	V
5795MHz		17385	49.8	-18.5	68.3	50.24	42.41	14.82	57.67	100	200	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15E Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		91.11	15.41	-28.09	43.5	36.55	10.86	1.38	33.38			P	H
		149.31	25.45	-18.05	43.5	45.95	11.21	1.53	33.24			P	H
		223.03	34.47	-11.53	46	54.84	10.96	1.8	33.13	100	0	P	H
		275.41	22.96	-23.04	46	41.3	12.9	1.83	33.07			P	H
		334.58	20.93	-25.07	46	37.09	14.74	2.04	32.94			P	H
		408.3	19.79	-26.21	46	33.8	16.62	2.12	32.75			P	H
		32.91	35.07	-4.93	40	50.84	16.61	1	33.38	100	0	P	V
		70.74	22.16	-17.84	40	46.8	7.59	1.14	33.37			P	V
		147.37	26.33	-17.17	43.5	46.79	11.25	1.53	33.24			P	V
		220.12	35.19	-10.81	46	55.68	10.85	1.8	33.14			P	V
		305.48	26.68	-19.32	46	43.8	13.96	1.94	33.02			P	V
		402.48	21.39	-24.61	46	35.5	16.54	2.12	32.77			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency per 15.209(c).
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".