

FCC RF Test Report

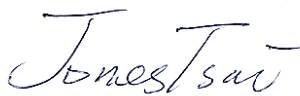
APPLICANT : Sonim Technologies, Inc.
EQUIPMENT : LTE Smartphone
BRAND NAME : Sonim
MODEL NAME : XP7700
MARKETING NAME : XP7
FCC ID : WYPL22V012AA
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

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



SPORTON INTERNATIONAL (SHENZHEN) INC.

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TABLE OF CONTENTS

SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Feature of Equipment Under Test	5
1.4 Product Specification of Equipment Under Test	6
1.5 Modification of EUT	7
1.6 Testing Location	7
1.7 Applicable Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency Channel	9
2.2 Pre-Scanned RF Power	10
2.3 Test Mode	12
2.4 Connection Diagram of Test System	14
2.5 Support Unit used in test configuration and system	15
2.6 EUT Operation Test Setup	15
2.7 Measurement Results Explanation Example	15
3 TEST RESULT	16
3.1 26dB & 99% Occupied Bandwidth Measurement	16
3.2 Maximum Conducted Output Power Measurement	18
3.3 Power Spectral Density Measurement	20
3.4 Unwanted Radiated Emission Measurement	23
3.5 AC Conducted Emission Measurement	28
3.6 Frequency Stability Measurement	32
3.7 Automatically Discontinue Transmission	33
3.8 Antenna Requirements	34
4 LIST OF MEASURING EQUIPMENTS	35
5 UNCERTAINTY OF EVALUATION	36
APPENDIX A. CONDUCTED TEST RESULTS	
APPENDIX B. RADIATED TEST RESULTS	
APPENDIX C. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR571301E	Rev. 01	Initial issue of report	Sep. 21, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm (depend on band)	Pass	-
3.4	15.407(b)	Unwanted Emissions	$\leq -17, -27$ dBm (depend on band)&15.209(a)	Pass	Under limit 3.1 dB at 5357.810 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 & Specification	
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
MEID 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 Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5580 MHz 5660 MHz ~ 5700 MHz
Maximum Output Power to Antenna	<5180 MHz ~ 5240 MHz> 802.11a : 8.68 dBm / 0.0074 W 802.11n HT20 : 8.66 dBm / 0.0073 W 802.11n HT40 : 8.60 dBm / 0.0072 W <5260 MHz ~ 5320 MHz> 802.11a : 8.33 dBm / 0.0068 W 802.11n HT20 : 8.24 dBm / 0.0067 W 802.11n HT40 : 8.24 dBm / 0.0067 W <5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz> 802.11a : 9.18 dBm / 0.0083 W 802.11n HT20 : 9.06 dBm / 0.0081 W 802.11n HT40 : 9.15 dBm / 0.0082 W
Antenna Type	PIFA Antenna
Antenna Gain	<5180 MHz ~ 5240 MHz> : -1.00 dBi <5260 MHz ~ 5320 MHz> : -1.00 dBi <5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz > : -1.00 dBi
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)

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 above 1 GHz 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 Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5180- 5240 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5260-5320 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54	5270	62	5310
	56	5280	64	5320

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500-5580 MHz and 5660-5700 MHz Band 3 (U-NII-2C)	100	5500	116	5580
	102	5510	132	5660
	104	5520	134	5670
	108	5540	136	5680
	110	5550	140	5700
	112	5560		

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.

5GHz 802.11a RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index 6Mbps	Channel	9M bps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 36	5180	8.68	CH 36	8.41	8.39	8.36	8.37	8.62	8.51	8.46
CH 44	5220	8.53								
CH 48	5240	8.45								
CH 52	5260	8.33	CH 52	8.09	8.05	8.01	8.01	8.28	8.17	8.12
CH 60	5300	8.09								
CH 64	5320	7.88								
CH 100	5500	8.35	CH 116	8.95	8.92	8.90	8.89	9.17	9.04	9.02
CH 116	5580	9.18								
CH 140	5700	7.62								

5GHz 802.11n HT20 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	8.60	CH 44	8.50	8.49	8.53	8.56	8.50	8.52	8.52
CH 44	5220	8.66								
CH 48	5240	8.44								
CH 52	5260	8.24	CH 52	8.12	8.13	8.15	8.18	8.16	8.19	8.17
CH 60	5300	8.08								
CH 64	5320	7.91								
CH 100	5500	8.33	CH 116	8.94	8.96	8.98	9.04	9.01	9.03	9.00
CH 116	5580	9.06								
CH 140	5700	7.65								



5GHz 802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	8.60	CH 38	8.53	8.51	8.40	8.48	8.48	8.41	8.53
CH 46	5230	8.46								
CH 54	5270	8.24	CH 54	8.13	8.14	7.99	8.07	8.03	8.00	8.16
CH 62	5310	7.95								
CH 102	5510	8.27	CH 134	9.08	9.07	8.95	9.04	9.03	8.97	9.10
CH 110	5550	8.72								
CH 134	5670	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.	



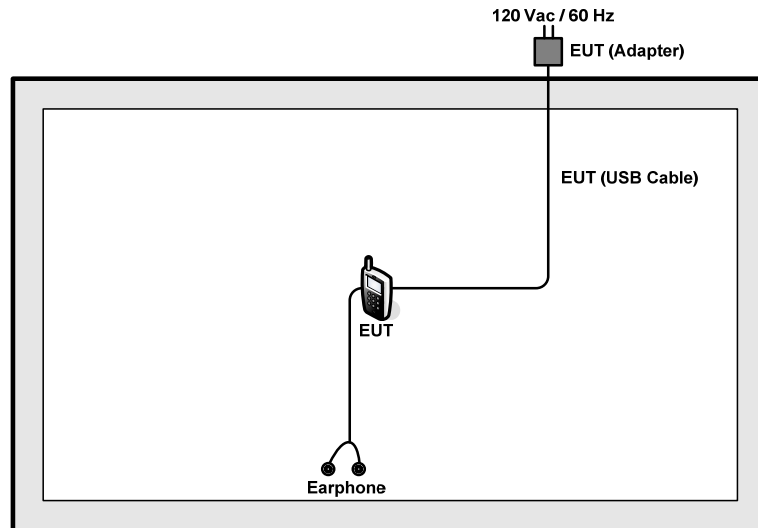
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5580 MHz and 5660-5700MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5580 MHz and 5660-5700MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

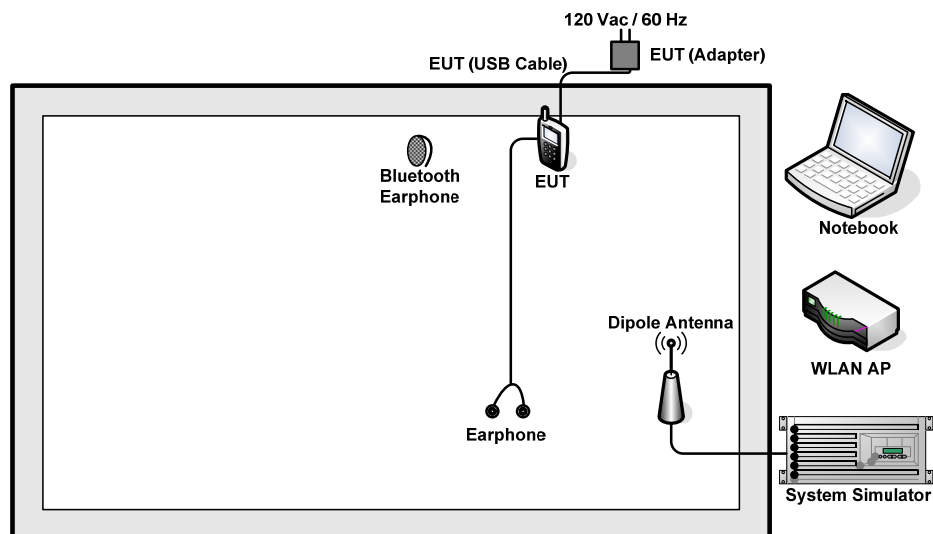
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5580 MHz and 5660-5700MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134

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 cable 1.2 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 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

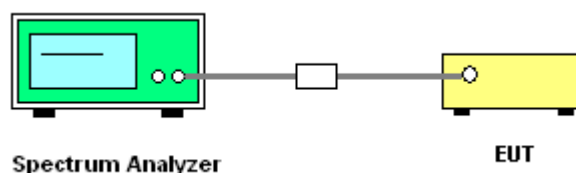
3.1.2 Measuring Instruments

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
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. 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%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
8. Measure and record the results in the test report.

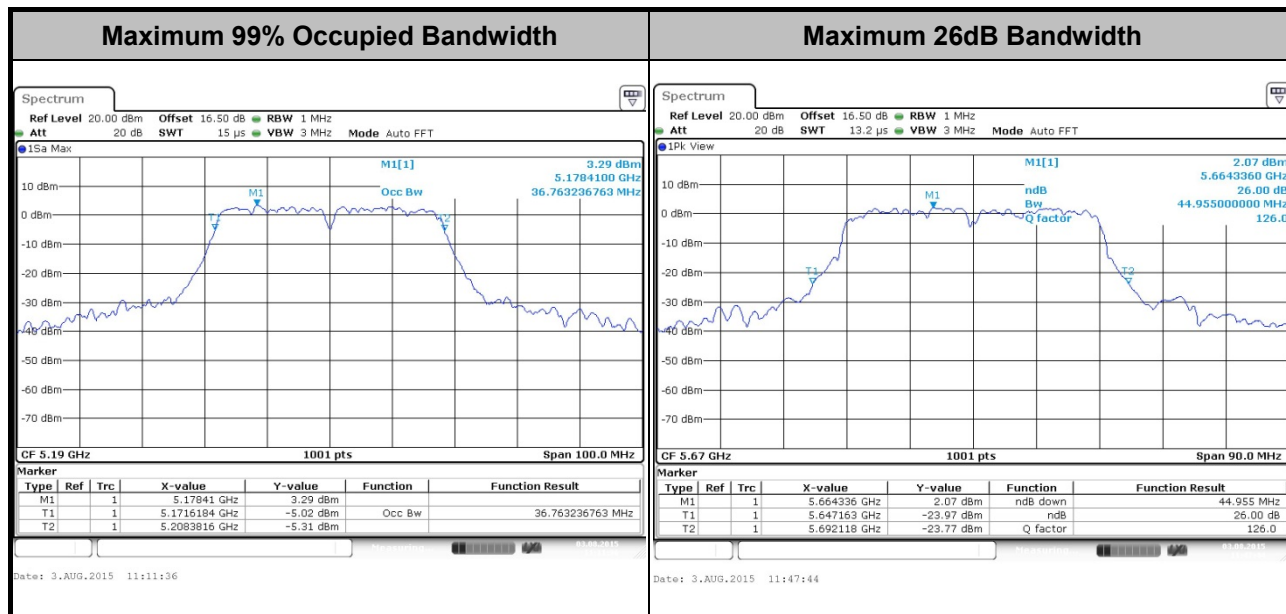
3.1.4 Test Setup





3.1.5 Test Result of 26dB & 99% Occupied Bandwidth Plots

Please refer to Appendix A.



3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

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.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.2.2 Measuring Instruments

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

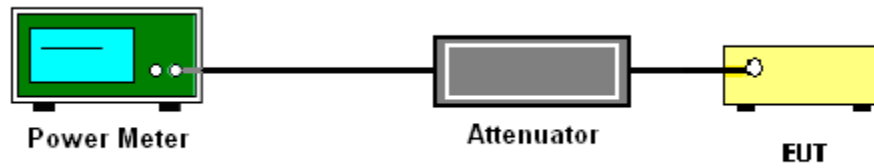
3.2.3 Test Procedures

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 mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

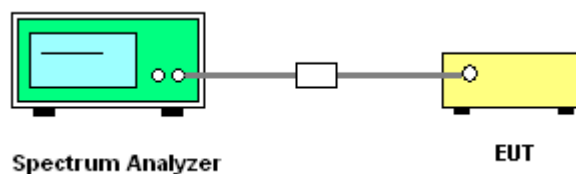
Section F) Maximum power spectral density.

Method SA-2

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

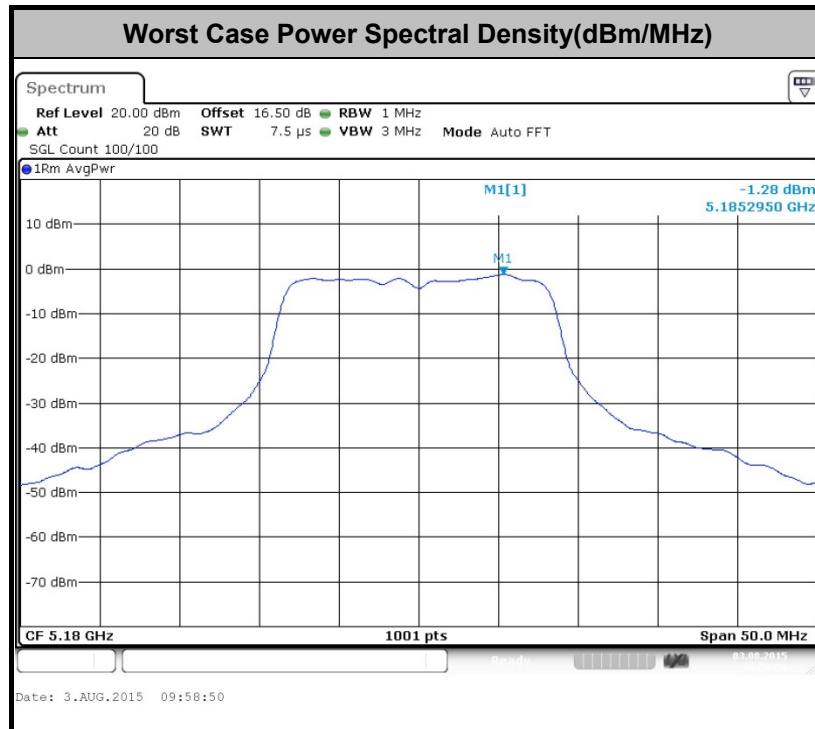
1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - 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.



Note: Average Power Density (dB) = Measured value+ Duty Factor

3.4 Unwanted Radiated Emission 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 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

- (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.

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

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

- (3) KDB789033 v01 G)2)c) 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 \geq 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

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

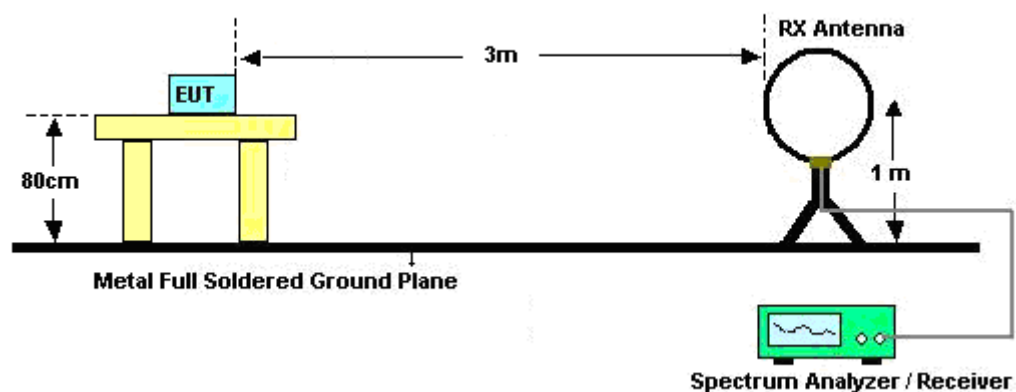
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

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

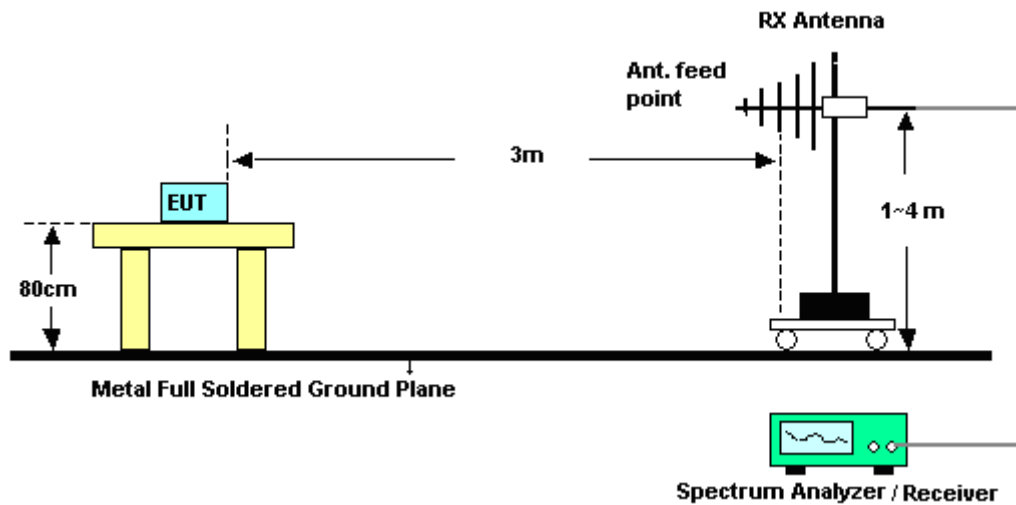
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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

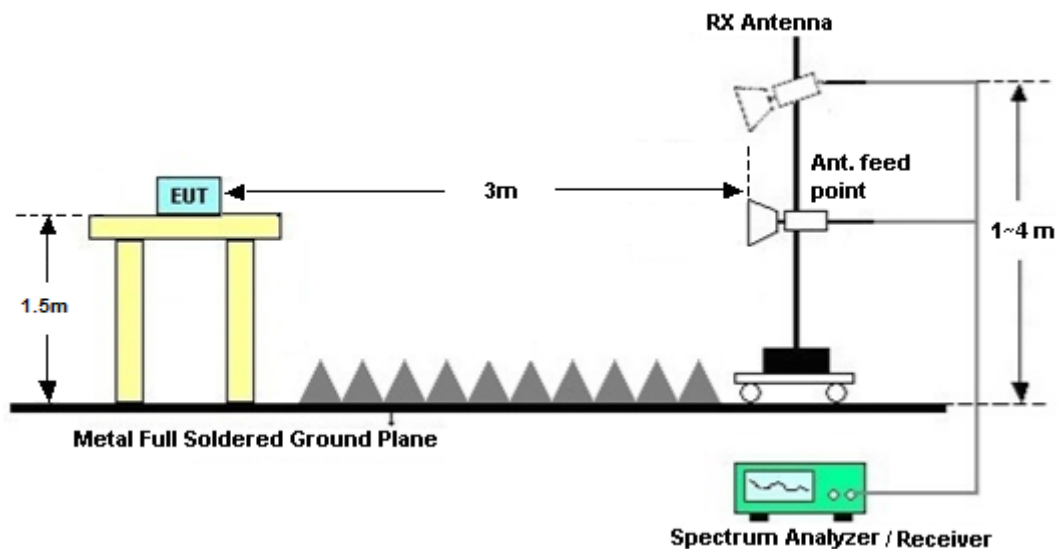
For radiated emissions below 30MHz



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 (dB μ V)	
	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.

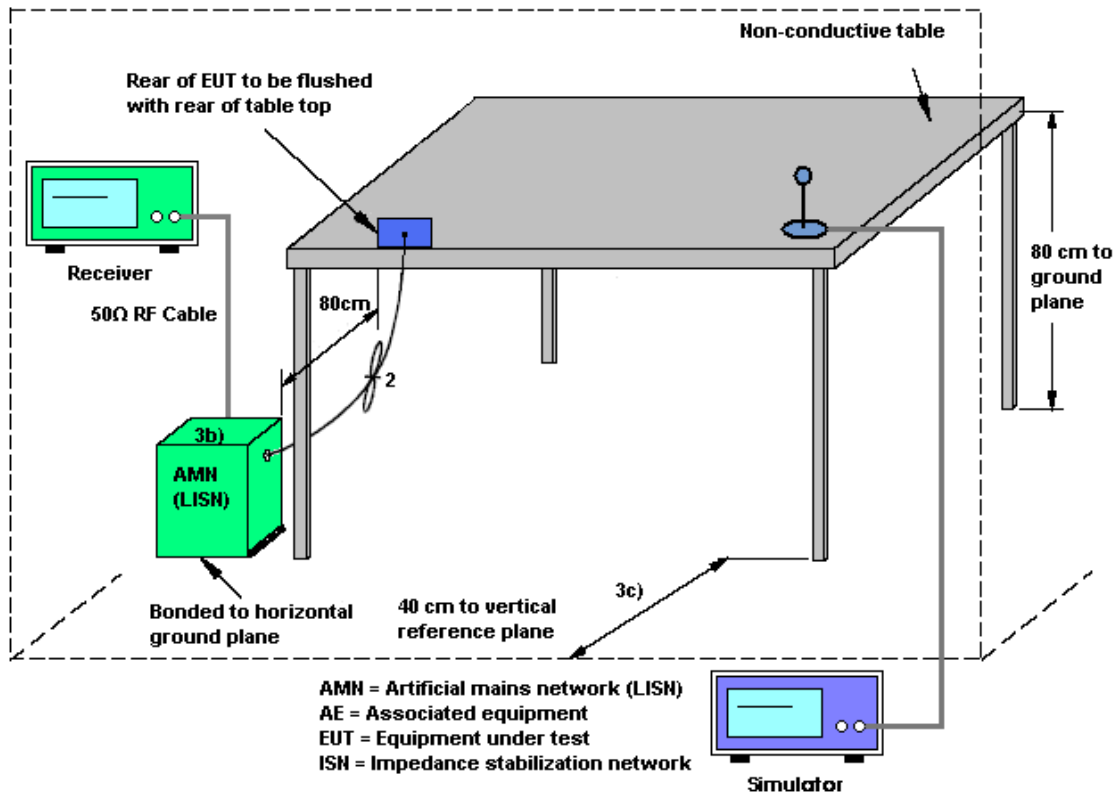
3.5.2 Measuring Instruments

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.

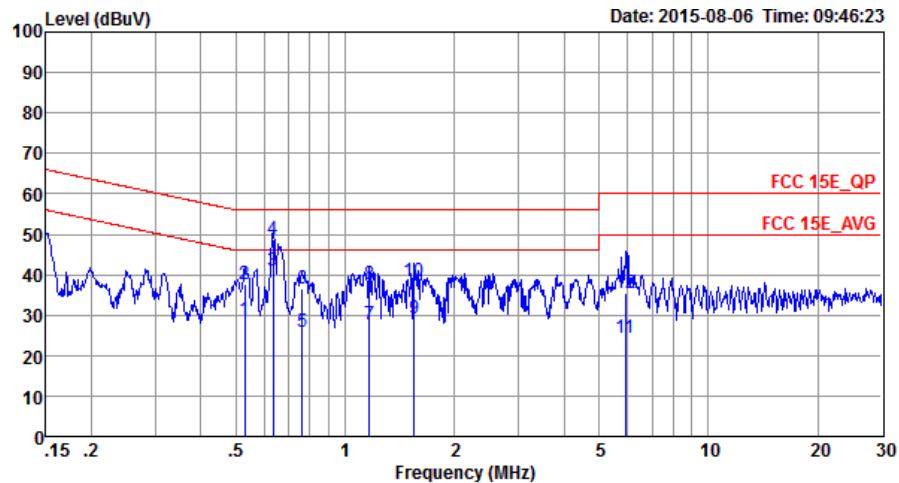
3.5.4 Test Setup





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)		

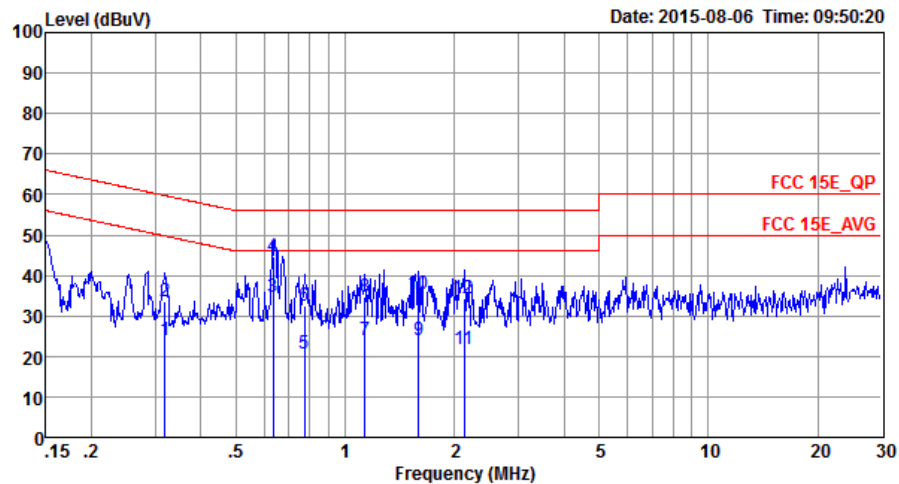


Site : CO01-SZ
Condition: FCC 15E_QP LISN_L_20150304 LINE
Mode : Mode 1

	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	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			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 Equipments

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. 03, 2015	Sep. 24, 2015	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Jan. 28, 2015	Aug. 03, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Jan. 28, 2015	Aug. 03, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhonggroup	LP-150U	H2014081803	-40~+150°C	Sep. 16, 2015	Aug. 03, 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~26.5G Hz	Jan. 28, 2015	Aug. 25, 2015	Jan. 27, 2016	Radiation (03CH01-SZ)
Amplifier	MITEQ	TTA1840-3 5-HG	1871923	18GHz~40GHz	Jul. 18, 2015	Aug. 25, 2015	Jul. 17, 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	ESC17	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% ($U = 2Uc(y)$)	2.3 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.9 dB
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Appendix A. Conducted Test Results

Report Number : FR571301E

Test Engineer:	Fly Liang	Temperature:	24~26	°C
Test Date:	2015/8/3	Relative Humidity:	50~53	%

TEST RESULTS DATA
26dB and 99% OBW

Band I										
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)		
11a	6Mbps	1	36	5180	18.38	23.63	-	22.64		
11a	6Mbps	1	44	5220	18.43	23.28	-	22.66		
11a	6Mbps	1	48	5240	18.43	23.58	-	22.66		
HT20	MCS0	1	36	5180	19.08	23.63	-	22.81		
HT20	MCS0	1	44	5220	18.98	23.88	-	22.78		
HT20	MCS0	1	48	5240	19.33	23.78	-	22.86		
HT40	MCS0	1	38	5190	36.76	42.71	-	23.01		
HT40	MCS0	1	46	5230	36.46	43.79	-	23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I										
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	0.60	8.68	24.00	-1.00		Pass
11a	6Mbps	1	44	5220	0.60	8.53	24.00	-1.00		Pass
11a	6Mbps	1	48	5240	0.60	8.45	24.00	-1.00		Pass
HT20	MCS0	1	36	5180	0.62	8.60	24.00	-1.00		Pass
HT20	MCS0	1	44	5220	0.62	8.66	24.00	-1.00		Pass
HT20	MCS0	1	48	5240	0.62	8.44	24.00	-1.00		Pass
HT40	MCS0	1	38	5190	1.19	8.60	24.00	-1.00		Pass
HT40	MCS0	1	46	5230	1.19	8.46	24.00	-1.00		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail
11a	6Mbps	1	36	5180	0.60	-0.68	11.00	-1.00		Pass
11a	6Mbps	1	44	5220	0.60	-1.98	11.00	-1.00		Pass
11a	6Mbps	1	48	5240	0.60	-2.55	11.00	-1.00		Pass
HT20	MCS0	1	36	5180	0.62	-2.55	11.00	-1.00		Pass
HT20	MCS0	1	44	5220	0.62	-3.14	11.00	-1.00		Pass
HT20	MCS0	1	48	5240	0.62	-3.37	11.00	-1.00		Pass
HT40	MCS0	1	38	5190	1.19	-3.98	11.00	-1.00		Pass
HT40	MCS0	1	46	5230	1.19	-5.22	11.00	-1.00		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	52	5260	18.18	23.33	23.60	29.60	23.98	
11a	6M bps	1	60	5300	18.73	23.68	23.73	29.73	23.98	
11a	6M bps	1	64	5320	18.73	23.73	23.73	29.73	23.98	
HT20	MCS 0	1	52	5260	19.08	23.78	23.81	29.81	23.98	
HT20	MCS 0	1	60	5300	18.78	23.88	23.74	29.74	23.98	
HT20	MCS 0	1	64	5320	18.83	23.58	23.75	29.75	23.98	
HT40	MCS 0	1	54	5270	36.56	44.87	23.98	30.00	23.98	
HT40	MCS 0	1	62	5310	36.66	44.15	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band II										
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	52	5260	0.60	8.33	23.98	-1.00		Pass
11a	6M bps	1	60	5300	0.60	8.09	23.98	-1.00		Pass
11a	6M bps	1	64	5320	0.60	7.88	23.98	-1.00		Pass
HT20	MCS 0	1	52	5260	0.62	8.24	23.98	-1.00		Pass
HT20	MCS 0	1	60	5300	0.62	8.08	23.98	-1.00		Pass
HT20	MCS 0	1	64	5320	0.62	7.91	23.98	-1.00		Pass
HT40	MCS 0	1	54	5270	1.19	8.24	23.98	-1.00		Pass
HT40	MCS 0	1	62	5310	1.19	7.95	23.98	-1.00		Pass

TEST RESULTS DATA
Power Spectral Density

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	52	5260	0.60	-2.64	11.00	-1.00		Pass
11a	6M bps	1	60	5300	0.60	-2.62	11.00	-1.00		Pass
11a	6M bps	1	64	5320	0.60	-2.71	11.00	-1.00		Pass
HT20	MCS 0	1	52	5260	0.62	-1.59	11.00	-1.00		Pass
HT20	MCS 0	1	60	5300	0.62	-2.34	11.00	-1.00		Pass
HT20	MCS 0	1	64	5320	0.62	-2.59	11.00	-1.00		Pass
HT40	MCS 0	1	54	5270	1.19	-5.89	11.00	-1.00		Pass
HT40	MCS 0	1	62	5310	1.19	-5.44	11.00	-1.00		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	100	5500	17.98	23.28	23.55	29.55	23.98	
11a	6M bps	1	116	5580	18.58	23.58	23.69	29.69	23.98	
11a	6M bps	1	140	5700	18.38	23.83	23.64	29.64	23.98	
HT20	MCS 0	1	100	5500	18.88	23.98	23.76	29.76	23.98	
HT20	MCS 0	1	116	5580	19.18	23.68	23.83	29.83	23.98	
HT20	MCS 0	1	140	5700	19.23	23.78	23.84	29.84	23.98	
HT40	MCS 0	1	102	5510	36.36	43.97	23.98	30.00	23.98	
HT40	MCS 0	1	110	5550	36.66	44.33	23.98	30.00	23.98	
HT40	MCS 0	1	134	5670	36.46	44.96	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band III										
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	100	5500	0.60	8.35	23.98	-1.00		Pass
11a	6M bps	1	116	5580	0.60	9.18	23.98	-1.00		Pass
11a	6M bps	1	140	5700	0.60	7.62	23.98	-1.00		Pass
HT20	MCS 0	1	100	5500	0.62	8.33	23.98	-1.00		Pass
HT20	MCS 0	1	116	5580	0.62	9.06	23.98	-1.00		Pass
HT20	MCS 0	1	140	5700	0.62	7.65	23.98	-1.00		Pass
HT40	MCS 0	1	102	5510	1.19	8.27	23.98	-1.00		Pass
HT40	MCS 0	1	110	5550	1.19	8.72	23.98	-1.00		Pass
HT40	MCS 0	1	134	5670	1.19	9.15	23.98	-1.00		Pass

TEST RESULTS DATA
Power Spectral Density

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	100	5500	0.60	-3.42	11.00	-1.00		Pass
11a	6M bps	1	116	5580	0.60	-3.43	11.00	-1.00		Pass
11a	6M bps	1	140	5700	0.60	-1.60	11.00	-1.00		Pass
HT20	MCS 0	1	100	5500	0.62	-3.87	11.00	-1.00		Pass
HT20	MCS 0	1	116	5580	0.62	-3.65	11.00	-1.00		Pass
HT20	MCS 0	1	140	5700	0.62	-1.51	11.00	-1.00		Pass
HT40	MCS 0	1	102	5510	1.19	-6.20	11.00	-1.00		Pass
HT40	MCS 0	1	110	5550	1.19	-6.66	11.00	-1.00		Pass
HT40	MCS 0	1	134	5670	1.19	-5.30	11.00	-1.00		Pass

TEST RESULTS DATA
Frequency Stability

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	36	5180	5179.925	-0.075	-14.48	20	3.5	
11a	6Mbps	1	36	5180	5179.950	-0.050	-9.65	20	4.35	
11a	6Mbps	1	36	5180	5179.950	-0.050	-9.65	20	3.8	
11a	6Mbps	1	36	5180	5179.925	-0.075	-14.48	-30	3.8	
11a	6Mbps	1	36	5180	5179.925	-0.075	-14.48	50	3.8	

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	64	5320	5319.900	-0.100	-18.80	20	3.5	
11a	6Mbps	1	64	5320	5319.925	-0.075	-14.10	20	4.35	
11a	6Mbps	1	64	5320	5319.900	-0.100	-18.80	20	3.8	
11a	6Mbps	1	64	5320	5319.925	-0.075	-14.10	-30	3.8	
11a	6Mbps	1	64	5320	5319.925	-0.075	-14.10	50	3.8	

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	100	5500	5499.950	-0.050	-9.09	20	3.5	
11a	6Mbps	1	100	5500	5499.950	-0.050	-9.09	20	4.35	
11a	6Mbps	1	100	5500	5499.950	-0.050	-9.09	20	3.8	
11a	6Mbps	1	100	5500	5499.925	-0.075	-13.64	-30	3.8	
11a	6Mbps	1	100	5500	5499.925	-0.075	-13.64	50	3.8	



Appendix B. Radiated Test Results

15E Band 1 - 5150~5250MHz

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 36 5180MHz		5128.1	50.41	-23.59	74	45.55	31.48	7.07	33.69	211	336	P	H
		5127.2	37.99	-16.01	54	33.13	31.48	7.07	33.69	211	336	A	H
	*	5180	101.37	-	-	96.39	31.55	7.08	33.65	211	336	P	H
	*	5180	89.74	-	-	84.76	31.55	7.08	33.65	211	336	A	H
		5149.85	50.57	-23.43	74	45.67	31.5	7.07	33.67	204	348	P	V
		5127.8	37.97	-16.03	54	33.11	31.48	7.07	33.69	204	348	A	V
	*	5180	102.35	-	-	97.37	31.55	7.08	33.65	204	348	P	V
	*	5180	90.3	-	-	85.32	31.55	7.08	33.65	204	348	A	V
802.11a CH 44 5220MHz		5118.35	48.07	-25.93	74	43.25	31.45	7.06	33.69	205	334	P	H
		5070.5	34.55	-19.45	54	29.83	31.38	7.06	33.72	205	334	A	H
	*	5220	101.77	-	-	96.72	31.6	7.09	33.64	205	334	P	H
	*	5220	90.19	-	-	85.14	31.6	7.09	33.64	205	334	A	H
		5437.89	48.63	-25.37	74	43.05	31.91	7.15	33.48	205	334	P	H
		5413.58	35.14	-18.86	54	29.61	31.88	7.15	33.5	205	334	A	H
		5069.6	47.66	-26.34	74	42.94	31.38	7.06	33.72	240	347	P	V
		5070.2	34.44	-19.56	54	29.72	31.38	7.06	33.72	240	347	A	V
	*	5220	103.3	-	-	98.25	31.6	7.09	33.64	240	347	P	V
	*	5220	91.47	-	-	86.42	31.6	7.09	33.64	240	347	A	V
		5405.44	48.67	-25.33	74	43.18	31.86	7.13	33.5	240	347	P	V
		5407.2	35.75	-18.25	54	30.24	31.86	7.15	33.5	240	347	A	V



802.11a CH 48 5240MHz		5088.05	48.18	-25.82	74	43.43	31.41	7.06	33.72	223	334	P	H
		5140.1	34.7	-19.3	54	29.82	31.5	7.07	33.69	223	334	A	H
	*	5240	102.47	-	-	97.38	31.62	7.09	33.62	223	334	P	H
	*	5240	90.16	-	-	85.07	31.62	7.09	33.62	223	334	A	H
		5459.01	48.57	-25.43	74	42.94	31.93	7.17	33.47	223	334	P	H
		5391.14	35.26	-18.74	54	29.82	31.83	7.13	33.52	223	334	A	H
		5093.75	47.88	-26.12	74	43.09	31.43	7.06	33.7	214	347	P	V
		5094.35	34.41	-19.59	54	29.62	31.43	7.06	33.7	214	347	A	V
	*	5240	103.79	-	-	98.7	31.62	7.09	33.62	214	347	P	V
	*	5240	91.81	-	-	86.72	31.62	7.09	33.62	214	347	A	V
		5444.93	49.95	-24.05	74	44.37	31.91	7.15	33.48	214	347	P	V
		5430.96	35.89	-18.11	54	30.31	31.91	7.15	33.48	214	347	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 36 5180MHz		10360	49.77	-24.23	74	60.08	38.62	10.07	59	152	260	P	H
		15540	49.29	-24.71	74	57.67	38.54	12.77	59.69	189	238	P	H
		10360	49.91	-24.09	74	60.22	38.62	10.07	59	152	260	P	V
		15540	49.85	-24.15	74	58.23	38.54	12.77	59.69	189	238	P	V
802.11a CH 44 5220MHz		10440	49.65	-24.35	74	59.82	38.72	10.13	59.02	125	230	P	H
		15660	49.76	-24.24	74	58.41	38.17	12.93	59.75	110	225	P	H
		10440	49.46	-24.54	74	59.63	38.72	10.13	59.02	125	230	P	V
		15660	49.25	-24.75	74	57.9	38.17	12.93	59.75	110	225	P	V
802.11a CH 48 5240MHz		10480	49.47	-24.53	74	59.56	38.79	10.15	59.03	149	289	P	H
		15720	49.44	-24.56	74	58.24	37.96	13.03	59.79	139	291	P	H
		10480	49.18	-24.82	74	59.27	38.79	10.15	59.03	149	289	P	V
		15720	49.55	-24.45	74	58.35	37.96	13.03	59.79	139	291	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 36 5180MHz		5149.55	49.27	-24.73	74	44.37	31.5	7.07	33.67	150	340	P	H
		5127.95	37.37	-16.63	54	32.51	31.48	7.07	33.69	150	340	A	H
	*	5180	97.15	-	-	92.17	31.55	7.08	33.65	150	340	P	H
	*	5180	87.45	-	-	82.47	31.55	7.08	33.65	150	340	A	H
		5127.35	49.55	-24.45	74	44.69	31.48	7.07	33.69	179	271	P	V
		5128.4	37.43	-16.57	54	32.57	31.48	7.07	33.69	179	271	A	V
	*	5180	99.17	-	-	94.19	31.55	7.08	33.65	179	271	P	V
	*	5180	89.77	-	-	84.79	31.55	7.08	33.65	179	271	A	V
802.11n HT20 CH 44 5220MHz		5017.25	48.79	-25.21	74	44.18	31.31	7.05	33.75	150	25	P	H
		5144.3	34.97	-19.03	54	30.07	31.5	7.07	33.67	150	25	A	H
	*	5220	99.07	-	-	94.02	31.6	7.09	33.64	150	25	P	H
	*	5220	89.05	-	-	84	31.6	7.09	33.64	150	25	A	H
		5424.58	48.82	-25.18	74	43.27	31.88	7.15	33.48	150	25	P	H
		5404.67	35.47	-18.53	54	29.98	31.86	7.13	33.5	150	25	A	H
		5061.35	48.11	-25.89	74	43.41	31.38	7.06	33.74	199	318	P	V
		5146.4	34.63	-19.37	54	29.73	31.5	7.07	33.67	199	318	A	V
	*	5220	98.21	-	-	93.16	31.6	7.09	33.64	199	318	P	V
	*	5220	88.09	-	-	83.04	31.6	7.09	33.64	199	318	A	V
		5393.89	48.6	-25.4	74	43.16	31.83	7.13	33.52	199	318	P	V
		5403.24	35.71	-18.29	54	30.22	31.86	7.13	33.5	199	318	A	V



802.11n HT20 CH 48 5240MHz		5076.35	47.67	-26.33	74	42.92	31.41	7.06	33.72	158	348	P	H
		5145.95	34.53	-19.47	54	29.63	31.5	7.07	33.67	158	348	A	H
	*	5240	99.39	-	-	94.3	31.62	7.09	33.62	158	348	P	H
	*	5240	87.97	-	-	82.88	31.62	7.09	33.62	158	348	A	H
		5405.66	48.38	-25.62	74	42.89	31.86	7.13	33.5	158	348	P	H
		5410.28	35.12	-18.88	54	29.61	31.86	7.15	33.5	158	348	A	H
		5082.05	47.78	-26.22	74	43.03	31.41	7.06	33.72	162	275	P	V
		5147	34.49	-19.51	54	29.59	31.5	7.07	33.67	162	275	A	V
	*	5240	103.15	-	-	98.06	31.62	7.09	33.62	162	275	P	V
	*	5240	91.34	-	-	86.25	31.62	7.09	33.62	162	275	A	V
		5395.98	48.72	-25.28	74	43.25	31.86	7.13	33.52	162	275	P	V
		5436.79	35.82	-18.18	54	30.24	31.91	7.15	33.48	162	275	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 HT20 CH 36 5180MHz		10360	49.38	-24.62	74	59.69	38.62	10.07	59	152	260	P	H
		15540	50.66	-23.34	74	59.04	38.54	12.77	59.69	189	238	P	H
		10360	50.66	-23.34	74	60.97	38.62	10.07	59	152	260	P	V
		15540	49.6	-24.4	74	57.98	38.54	12.77	59.69	189	238	P	V
802.11n HT20 CH 44 5220MHz		10440	50.48	-23.52	74	60.65	38.72	10.13	59.02	125	230	P	H
		15660	49.62	-24.38	74	58.27	38.17	12.93	59.75	110	225	P	H
		10440	49.07	-24.93	74	59.24	38.72	10.13	59.02	125	230	P	V
		15660	46.42	-27.58	74	55.07	38.17	12.93	59.75	110	225	P	V
802.11n HT20 CH 48 5240MHz		10480	49.44	-24.56	74	59.53	38.79	10.15	59.03	149	289	P	H
		15720	49.96	-24.04	74	58.76	37.96	13.03	59.79	139	291	P	H
		10480	50.12	-23.88	74	60.21	38.79	10.15	59.03	149	289	P	V
		15720	49.29	-24.71	74	58.09	37.96	13.03	59.79	139	291	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 38 5190MHz		5130.05	62.36	-11.64	74	57.5	31.48	7.07	33.69	159	348	P	H
		5142.05	45.52	-8.48	54	40.64	31.5	7.07	33.69	159	348	A	H
	*	5190	96.96	-	-	91.98	31.55	7.08	33.65	159	348	P	H
	*	5190	85.66	-	-	80.68	31.55	7.08	33.65	159	348	A	H
		5413.69	48.84	-25.16	74	43.31	31.88	7.15	33.5	159	348	P	H
		5403.79	35.88	-18.12	54	30.39	31.86	7.13	33.5	159	348	A	H
		5129.9	63.33	-10.67	74	58.47	31.48	7.07	33.69	162	277	P	V
		5142.05	46.08	-7.92	54	41.2	31.5	7.07	33.69	162	277	A	V
	*	5190	99.5	-	-	94.52	31.55	7.08	33.65	162	277	P	V
	*	5190	88.16	-	-	83.18	31.55	7.08	33.65	162	277	A	V
		5446.69	48.75	-25.25	74	43.13	31.93	7.17	33.48	162	277	P	V
		5370.68	36.18	-17.82	54	30.77	31.81	7.13	33.53	162	277	A	V
802.11n HT40 CH 46 5230MHz		5050.4	47.74	-26.26	74	43.06	31.36	7.06	33.74	158	355	P	H
		5125.4	35.57	-18.43	54	30.72	31.48	7.06	33.69	158	355	A	H
	*	5230	97.71	-	-	92.62	31.62	7.09	33.62	158	355	P	H
	*	5230	86.05	-	-	80.96	31.62	7.09	33.62	158	355	A	H
		5459.89	48.29	-25.71	74	42.66	31.93	7.17	33.47	158	355	P	H
		5414.68	35.92	-18.08	54	30.39	31.88	7.15	33.5	158	355	A	H
		5134.4	48.08	-25.92	74	43.22	31.48	7.07	33.69	159	277	P	V
		5126.45	35.93	-18.07	54	31.07	31.48	7.07	33.69	159	277	A	V
	*	5230	99.98	-	-	94.89	31.62	7.09	33.62	159	277	P	V
	*	5230	89.12	-	-	84.03	31.62	7.09	33.62	159	277	A	V
		5433.93	49.27	-24.73	74	43.69	31.91	7.15	33.48	159	277	P	V
		5409.4	36.76	-17.24	54	31.25	31.86	7.15	33.5	159	277	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 1 5150~5250MHz
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 HT40 CH 38 5190MHz		10380	49.73	-24.27	74	59.99	38.65	10.1	59.01	150	360	P	H
		15570	50.88	-23.12	74	59.33	38.44	12.82	59.71	100	360	P	H
		10380	49.36	-24.64	74	59.62	38.65	10.1	59.01	150	360	P	V
		15570	50.14	-23.86	74	58.59	38.44	12.82	59.71	100	360	P	V
802.11n HT40 CH 46 5230MHz		10460	50.24	-23.76	74	60.38	38.74	10.15	59.03	100	360	P	H
		15690	49.3	-24.7	74	58.03	38.06	12.98	59.77	100	225	P	H
		10460	50.17	-23.83	74	60.31	38.74	10.15	59.03	100	360	P	V
		15690	49.82	-24.18	74	58.55	38.06	12.98	59.77	100	225	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 2 - 5250~5350MHz

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 52 5260MHz		5011.4	48.67	-25.33	74	44.08	31.31	7.05	33.77	240	334	P	H
		5070.5	34.64	-19.36	54	29.92	31.38	7.06	33.72	240	334	A	H
	*	5260	102.33	-	-	97.16	31.67	7.1	33.6	240	334	P	H
	*	5260	90.09	-	-	84.92	31.67	7.1	33.6	240	334	A	H
		5392.24	48.83	-25.17	74	43.39	31.83	7.13	33.52	240	334	P	H
		5355.83	35.15	-18.85	54	29.77	31.79	7.12	33.53	240	334	A	H
		5037.5	47.53	-26.47	74	42.87	31.36	7.05	33.75	235	345	P	V
		5121.2	34.37	-19.63	54	29.55	31.45	7.06	33.69	235	345	A	V
	*	5260	104.99	-	-	99.82	31.67	7.1	33.6	235	345	P	V
	*	5260	92.89	-	-	87.72	31.67	7.1	33.6	235	345	A	V
		5352.42	49.25	-24.75	74	43.87	31.79	7.12	33.53	235	345	P	V
		5457.14	36	-18	54	30.37	31.93	7.17	33.47	235	345	A	V
802.11a CH 60 5300MHz		5024.3	47.57	-26.43	74	42.93	31.34	7.05	33.75	228	335	P	H
		5130.8	34.52	-19.48	54	29.66	31.48	7.07	33.69	228	335	A	H
	*	5300	101.46	-	-	96.2	31.72	7.11	33.57	228	335	P	H
	*	5300	89.47	-	-	84.21	31.72	7.11	33.57	228	335	A	H
		5352.2	49.86	-24.14	74	44.48	31.79	7.12	33.53	228	335	P	H
		5352.2	38.14	-15.86	54	32.76	31.79	7.12	33.53	228	335	A	H
		5084	47.95	-26.05	74	43.2	31.41	7.06	33.72	205	349	P	V
		5148.95	34.32	-19.68	54	29.42	31.5	7.07	33.67	205	349	A	V
	*	5300	104.58	-	-	99.32	31.72	7.11	33.57	205	349	P	V
	*	5300	92.84	-	-	87.58	31.72	7.11	33.57	205	349	A	V
		5352.53	53.1	-20.9	74	47.72	31.79	7.12	33.53	205	349	P	V
		5352.2	41.2	-12.8	54	35.82	31.79	7.12	33.53	205	349	A	V



802.11a CH 64 5320MHz	*	5320	100.35	-	-	95.07	31.74	7.11	33.57	214	335	P	H
	*	5320	89.03	-	-	83.75	31.74	7.11	33.57	214	335	A	H
		5372.99	49.62	-24.38	74	44.21	31.81	7.13	33.53	214	335	P	H
		5372.11	38.27	-15.73	54	32.86	31.81	7.13	33.53	214	335	A	H
	*	5320	105.27	-	-	99.99	31.74	7.11	33.57	244	345	P	V
	*	5320	93.44	-	-	88.16	31.74	7.11	33.57	244	345	A	V
		5350.12	55.96	-18.04	74	50.58	31.79	7.12	33.53	244	345	P	V
		5372.22	41.82	-12.18	54	36.41	31.81	7.13	33.53	244	345	A	V
Remark	<ol style="list-style-type: none">1. No other spurious found.2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
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 52 5260MHz		10520	49.49	-24.51	74	59.53	38.84	10.18	59.06	110	220	P	H
		15780	49.3	-24.7	74	58.24	37.79	13.09	59.82	109	345	P	H
		10520	48.84	-25.16	74	58.88	38.84	10.18	59.06	110	220	P	V
		15780	49.4	-24.6	74	58.34	37.79	13.09	59.82	109	345	P	V
802.11a CH 60 5300MHz		10600	49.56	-24.44	74	59.47	38.95	10.29	59.15	185	215	P	H
		15900	47.51	-26.49	74	56.73	37.42	13.24	59.88	196	190	P	H
		10600	49.24	-24.76	74	59.15	38.95	10.29	59.15	185	215	P	V
		15900	48.32	-25.68	74	57.54	37.42	13.24	59.88	196	190	P	V
802.11a CH 64 5320MHz		10640	49.31	-24.69	74	59.15	39	10.34	59.18	152	135	P	H
		15960	47.24	-26.76	74	56.6	37.21	13.35	59.92	173	245	P	H
		10640	48.21	-25.79	74	58.05	39	10.34	59.18	152	135	P	V
		15960	46.4	-27.6	74	55.76	37.21	13.35	59.92	173	245	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
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 52 5260MHz		5062.25	48.46	-25.54	74	43.76	31.38	7.06	33.74	150	352	P	H
		5065.4	34.55	-19.45	54	29.85	31.38	7.06	33.74	150	352	A	H
	*	5260	100.14	-	-	94.97	31.67	7.1	33.6	150	352	P	H
	*	5260	88.21	-	-	83.04	31.67	7.1	33.6	150	352	A	H
		5353.3	48.63	-25.37	74	43.25	31.79	7.12	33.53	150	352	P	H
		5414.46	35.2	-18.8	54	29.67	31.88	7.15	33.5	150	352	A	H
		5093.15	47.93	-26.07	74	43.14	31.43	7.06	33.7	168	277	P	V
		5068.7	34.38	-19.62	54	29.66	31.38	7.06	33.72	168	277	A	V
	*	5260	104.28	-	-	99.11	31.67	7.1	33.6	168	277	P	V
	*	5260	91.99	-	-	86.82	31.67	7.1	33.6	168	277	A	V
		5393.12	49.1	-24.9	74	43.66	31.83	7.13	33.52	168	277	P	V
		5447.24	35.97	-18.03	54	30.35	31.93	7.17	33.48	168	277	A	V
802.11n HT20 CH 60 5300MHz		5093.15	47.95	-26.05	74	43.16	31.43	7.06	33.7	150	355	P	H
		5116.4	34.52	-19.48	54	29.71	31.45	7.06	33.7	150	355	A	H
	*	5300	100.26	-	-	95	31.72	7.11	33.57	150	355	P	H
	*	5300	88.26	-	-	83	31.72	7.11	33.57	150	355	A	H
		5352.31	50.14	-23.86	74	44.76	31.79	7.12	33.53	150	355	P	H
		5351.76	38	-16	54	32.62	31.79	7.12	33.53	150	355	A	H
		5044.55	48.34	-25.66	74	43.67	31.36	7.05	33.74	170	277	P	V
		5125.1	34.4	-19.6	54	29.55	31.48	7.06	33.69	170	277	A	V
	*	5300	105.47	-	-	100.21	31.72	7.11	33.57	170	277	P	V
	*	5300	92.72	-	-	87.46	31.72	7.11	33.57	170	277	A	V
		5351.76	52.66	-21.34	74	47.28	31.79	7.12	33.53	170	277	P	V
		5351.65	41.73	-12.27	54	36.35	31.79	7.12	33.53	170	277	A	V



802.11n HT20 CH 64 5320MHz	*	5320	99.83	-	-	94.55	31.74	7.11	33.57	150	355	P	H
	*	5320	87.82	-	-	82.54	31.74	7.11	33.57	150	355	A	H
		5351.32	49.33	-24.67	74	43.95	31.79	7.12	33.53	150	355	P	H
		5372	37.74	-16.26	54	32.33	31.81	7.13	33.53	150	355	A	H
	*	5320	104.71	-	-	99.43	31.74	7.11	33.57	157	277	P	V
	*	5320	92.64	-	-	87.36	31.74	7.11	33.57	157	277	A	V
		5372.11	53.06	-20.94	74	47.65	31.81	7.13	33.53	157	277	P	V
		5371.45	42.02	-11.98	54	36.61	31.81	7.13	33.53	157	277	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
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 HT20 CH 52 5260MHz		10520	50.7	-23.3	74	60.74	38.84	10.18	59.06	110	220	P	H
		15780	49.42	-24.58	74	58.36	37.79	13.09	59.82	109	345	P	H
		10520	50.65	-23.35	74	60.69	38.84	10.18	59.06	110	220	P	V
		15780	46.43	-27.57	74	55.37	37.79	13.09	59.82	109	345	P	V
802.11n HT20 CH 60 5300MHz		10600	50.41	-23.59	74	60.32	38.95	10.29	59.15	185	215	P	H
		15900	48.46	-25.54	74	57.68	37.42	13.24	59.88	196	190	P	H
		10600	50.28	-23.72	74	60.19	38.95	10.29	59.15	185	215	P	V
		15900	48.76	-25.24	74	57.98	37.42	13.24	59.88	196	190	P	V
802.11n HT20 CH 64 5320MHz		10640	50.7	-23.3	74	60.54	39	10.34	59.18	152	135	P	H
		15960	49.13	-24.87	74	58.49	37.21	13.35	59.92	173	245	P	H
		10640	49.77	-24.23	74	59.61	39	10.34	59.18	152	135	P	V
		15960	48.81	-25.19	74	58.17	37.21	13.35	59.92	173	245	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
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 54 5270MHz		5105.9	48.79	-25.21	74	43.98	31.45	7.06	33.7	155	355	P	H
		5056.85	35.1	-18.9	54	30.4	31.38	7.06	33.74	155	355	A	H
	*	5270	97.52	-	-	92.35	31.67	7.1	33.6	155	355	P	H
	*	5270	86.18	-	-	81.01	31.67	7.1	33.6	155	355	A	H
		5381.02	48.28	-25.72	74	42.84	31.83	7.13	33.52	155	355	P	H
		5373.32	36.12	-17.88	54	30.7	31.81	7.13	33.52	155	355	A	H
		5130.8	47.93	-26.07	74	43.07	31.48	7.07	33.69	182	276	P	V
		5104.25	35.24	-18.76	54	30.45	31.43	7.06	33.7	182	276	A	V
	*	5270	101.9	-	-	96.73	31.67	7.1	33.6	182	276	P	V
	*	5270	90.06	-	-	84.89	31.67	7.1	33.6	182	276	A	V
		5374.42	49.9	-24.1	74	44.48	31.81	7.13	33.52	182	276	P	V
		5372.88	38	-16	54	32.59	31.81	7.13	33.53	182	276	A	V
802.11n HT40 CH 62 5310MHz		5117.6	47.64	-26.36	74	42.83	31.45	7.06	33.7	150	356	P	H
		5124.65	35.12	-18.88	54	30.27	31.48	7.06	33.69	150	356	A	H
	*	5310	97.38	-	-	92.1	31.74	7.11	33.57	150	356	P	H
	*	5310	85.97	-	-	80.69	31.74	7.11	33.57	150	356	A	H
		5369.8	62.78	-11.22	74	57.37	31.81	7.13	33.53	150	356	P	H
		5357.92	45.58	-8.42	54	40.2	31.79	7.12	33.53	150	356	A	H
		5107.55	48.45	-25.55	74	43.64	31.45	7.06	33.7	180	278	P	V
		5108	35.27	-18.73	54	30.46	31.45	7.06	33.7	180	278	A	V
	*	5310	101.89	-	-	96.61	31.74	7.11	33.57	180	278	P	V
	*	5310	90.73	-	-	85.45	31.74	7.11	33.57	180	278	A	V
		5369.8	69.21	-4.79	74	63.8	31.81	7.13	33.53	180	278	P	V
		5357.81	50.9	-3.1	54	45.52	31.79	7.12	33.53	180	278	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 2 5250~5350MHz
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 HT40 CH 54 5270MHz		10540	49.63	-24.37	74	59.62	38.86	10.23	59.08	110	220	P	H
		15810	49.2	-24.8	74	58.21	37.69	13.14	59.84	109	345	P	H
		10540	49.37	-24.63	74	59.36	38.86	10.23	59.08	110	220	P	V
		15810	48.95	-25.05	74	57.96	37.69	13.14	59.84	109	345	P	V
802.11n HT40 CH 62 5310MHz		10620	48.69	-25.31	74	58.54	38.98	10.34	59.17	100	220	P	H
		15930	47.75	-26.25	74	57.04	37.31	13.3	59.9	100	100	P	H
		10620	49.12	-24.88	74	58.97	38.98	10.34	59.17	100	220	P	V
		15930	48.61	-25.39	74	57.9	37.31	13.3	59.9	100	100	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Band 3 - 5470~5725MHz

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 100 5500MHz		5469.68	49.25	-24.75	74	43.6	31.95	7.17	33.47	192	339	P	H
		5447.28	37.29	-16.71	54	31.67	31.93	7.17	33.48	192	339	A	H
	*	5500	98.32	-	-	92.58	32	7.19	33.45	192	339	P	H
	*	5500	86.44	-	-	80.7	32	7.19	33.45	192	339	A	H
		5447.6	52.79	-21.21	74	47.17	31.93	7.17	33.48	191	309	P	V
		5447.44	41.23	-12.77	54	35.61	31.93	7.17	33.48	191	309	A	V
	*	5500	105	-	-	99.26	32	7.19	33.45	191	309	P	V
	*	5500	93.43	-	-	87.69	32	7.19	33.45	191	309	A	V
802.11a CH 116 5580MHz		5434.64	47.98	-26.02	74	42.4	31.91	7.15	33.48	157	340	P	H
		5393.2	35.35	-18.65	54	29.91	31.83	7.13	33.52	157	340	A	H
	*	5580	98.73	-	-	92.87	32.11	7.23	33.48	157	340	P	H
	*	5580	87.25	-	-	81.39	32.11	7.23	33.48	157	340	A	H
		5742.2	48.56	-25.44	74	42.29	32.39	7.41	33.53	157	340	P	H
		5761.72	35.58	-18.42	54	29.29	32.41	7.41	33.53	157	340	A	H
		5394	49.35	-24.65	74	43.91	31.83	7.13	33.52	184	311	P	V
		5438.48	36.16	-17.84	54	30.58	31.91	7.15	33.48	184	311	A	V
	*	5580	106.1	-	-	100.24	32.11	7.23	33.48	184	311	P	V
	*	5580	94.42	-	-	88.56	32.11	7.23	33.48	184	311	A	V
		5763.8	49.13	-24.87	74	42.84	32.41	7.41	33.53	184	311	P	V
		5764.92	35.85	-18.15	54	29.56	32.41	7.41	33.53	184	311	A	V



802.11a CH 140 5700MHz	*	5700	89.44	-	-	83.29	32.3	7.36	33.51	155	297	P	H
	*	5700	80.36	-	-	74.21	32.3	7.36	33.51	155	297	A	H
		5764.36	48.72	-25.28	74	42.43	32.41	7.41	33.53	155	297	P	H
		5728.2	35.86	-18.14	54	29.61	32.36	7.41	33.52	155	297	A	H
	*	5700	103.16	-	-	97.01	32.3	7.36	33.51	168	292	P	V
	*	5700	94.04	-	-	87.89	32.3	7.36	33.51	168	292	A	V
		5725.56	58.16	-15.84	74	51.96	32.36	7.36	33.52	168	292	P	V
		5725.08	40.83	-13.17	54	34.63	32.36	7.36	33.52	168	292	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz

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 100 5500MHz		11000	49.72	-24.28	74	58.95	39.5	10.83	59.56	163	230	P	H
		16500	47.4	-26.6	74	55.24	38.47	13.36	59.67	178	296	P	H
		11000	49.98	-24.02	74	59.21	39.5	10.83	59.56	163	230	P	V
		16500	47.97	-26.03	74	55.81	38.47	13.36	59.67	178	296	P	V
802.11a CH 116 5580MHz		11160	49.26	-24.74	74	58.64	39.35	10.9	59.63	170	200	P	H
		16740	48.79	-25.21	74	55.24	39.11	13.86	59.42	156	350	P	H
		11160	49.72	-24.28	74	59.1	39.35	10.9	59.63	170	200	P	V
		16740	48.66	-25.34	74	55.11	39.11	13.86	59.42	156	350	P	V
802.11a CH 140 5700MHz		11400	49.42	-24.58	74	59.01	39.13	11	59.72	147	285	P	H
		17100	48.82	-25.18	74	52.58	40.48	14.53	58.77	165	246	P	H
		11400	49.3	-24.7	74	58.89	39.13	11	59.72	147	285	P	V
		17100	48.93	-25.07	74	52.69	40.48	14.53	58.77	165	246	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz
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 100 5500MHz		5462	49.64	-24.36	74	44.01	31.93	7.17	33.47	153	3	P	H
		5448.08	38.25	-15.75	54	32.63	31.93	7.17	33.48	153	3	A	H
	*	5500	99.4	-	-	93.66	32	7.19	33.45	153	3	P	H
	*	5500	87.51	-	-	81.77	32	7.19	33.45	153	3	A	H
		5448.4	53.47	-20.53	74	47.85	31.93	7.17	33.48	150	312	P	V
		5447.92	41.98	-12.02	54	36.36	31.93	7.17	33.48	150	312	A	V
	*	5500	105.14	-	-	99.4	32	7.19	33.45	150	312	P	V
	*	5500	93.41	-	-	87.67	32	7.19	33.45	150	312	A	V
802.11n HT20 CH 116 5580MHz		5358.16	48.92	-25.08	74	43.54	31.79	7.12	33.53	150	3	P	H
		5390.96	35.27	-18.73	54	29.83	31.83	7.13	33.52	150	3	A	H
	*	5580	99.78	-	-	93.92	32.11	7.23	33.48	150	3	P	H
	*	5580	88.01	-	-	82.15	32.11	7.23	33.48	150	3	A	H
		5740.12	48.46	-25.54	74	42.19	32.39	7.41	33.53	150	3	P	H
		5745.64	35.65	-18.35	54	29.38	32.39	7.41	33.53	150	3	A	H
		5448.24	48.84	-25.16	74	43.22	31.93	7.17	33.48	150	314	P	V
		5393.84	36.07	-17.93	54	30.63	31.83	7.13	33.52	150	314	A	V
	*	5580	106.46	-	-	100.6	32.11	7.23	33.48	150	314	P	V
	*	5580	95.02	-	-	89.16	32.11	7.23	33.48	150	314	A	V
		5755.24	49.35	-24.65	74	43.06	32.41	7.41	33.53	150	314	P	V
		5763.96	36.16	-17.84	54	29.87	32.41	7.41	33.53	150	314	A	V



802.11n HT20 CH 140 5700MHz	*	5700	97.75	-	-	91.6	32.3	7.36	33.51	176	322	P	H
	*	5700	86.84	-	-	80.69	32.3	7.36	33.51	176	322	A	H
		5725.56	53.11	-20.89	74	46.91	32.36	7.36	33.52	176	322	P	H
		5725.08	37.94	-16.06	54	31.74	32.36	7.36	33.52	176	322	A	H
	*	5700	104.76	-	-	98.61	32.3	7.36	33.51	156	316	P	V
	*	5700	94.14	-	-	87.99	32.3	7.36	33.51	156	316	A	V
		5725.48	59.6	-14.4	74	53.4	32.36	7.36	33.52	156	316	P	V
		5725	43.07	-10.93	54	36.87	32.36	7.36	33.52	156	316	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz

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		11000	50.82	-23.18	74	60.05	39.5	10.83	59.56	163	230	P	H
HT20		16500	50	-24	74	57.84	38.47	13.36	59.67	178	296	P	H
CH 100		11000	49.44	-24.56	74	58.67	39.5	10.83	59.56	163	230	P	V
5500MHz		16500	50.8	-23.2	74	58.64	38.47	13.36	59.67	178	296	P	V
802.11n		11160	50	-24	74	59.38	39.35	10.9	59.63	170	200	P	H
HT20		16740	49.31	-24.69	74	55.76	39.11	13.86	59.42	156	350	P	H
CH 116		11160	49.87	-24.13	74	59.25	39.35	10.9	59.63	170	200	P	V
5580MHz		16740	50.14	-23.86	74	56.59	39.11	13.86	59.42	156	350	P	V
802.11n		11400	50.81	-23.19	74	60.4	39.13	11	59.72	147	285	P	H
HT20		17100	50.62	-23.38	74	54.38	40.48	14.53	58.77	165	246	P	H
CH 140		11400	50.6	-23.4	74	60.19	39.13	11	59.72	147	285	P	V
5700MHz		17100	50.67	-23.33	74	54.43	40.48	14.53	58.77	165	246	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz

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 102 5510MHz		5450.32	62.21	-11.79	74	56.58	31.93	7.17	33.47	166	3	P	H
		5461.84	45.8	-8.2	54	40.17	31.93	7.17	33.47	166	3	A	H
	*	5510	96.58	-	-	90.85	32	7.19	33.46	166	3	P	H
	*	5510	85.12	-	-	79.39	32	7.19	33.46	166	3	A	H
		5757.64	48.96	-25.04	74	42.67	32.41	7.41	33.53	166	3	P	H
		5761.96	36.32	-17.68	54	30.03	32.41	7.41	33.53	166	3	A	H
		5450.16	68.45	-5.55	74	62.82	31.93	7.17	33.47	150	313	P	V
		5462	50.88	-3.12	54	45.25	31.93	7.17	33.47	150	313	A	V
	*	5510	102.59	-	-	96.86	32	7.19	33.46	150	313	P	V
	*	5510	91.41	-	-	85.68	32	7.19	33.46	150	313	A	V
		5764.68	49.3	-24.7	74	43.01	32.41	7.41	33.53	150	313	P	V
		5745.64	36.51	-17.49	54	30.24	32.39	7.41	33.53	150	313	A	V
802.11n HT40 CH 110 5550MHz		5468.24	48.67	-25.33	74	43.02	31.95	7.17	33.47	229	346	P	H
		5447.6	36.31	-17.69	54	30.69	31.93	7.17	33.48	229	346	A	H
	*	5550	91.74	-	-	85.92	32.08	7.21	33.47	229	346	P	H
	*	5550	81.2	-	-	75.38	32.08	7.21	33.47	229	346	A	H
		5739.56	48.78	-25.22	74	42.51	32.39	7.41	33.53	229	346	P	H
		5758.28	36.48	-17.52	54	30.19	32.41	7.41	33.53	229	346	A	H
		5465.36	49.91	-24.09	74	44.26	31.95	7.17	33.47	163	296	P	V
		5447.12	37.97	-16.03	54	32.35	31.93	7.17	33.48	163	296	A	V
	*	5550	101.22	-	-	95.4	32.08	7.21	33.47	163	296	P	V
	*	5550	90.78	-	-	84.96	32.08	7.21	33.47	163	296	A	V
		5736.04	49.12	-24.88	74	42.85	32.39	7.41	33.53	163	296	P	V
		5738.76	36.71	-17.29	54	30.44	32.39	7.41	33.53	163	296	A	V



802.11n HT40 CH 134 5670MHz		5438.48	48.01	-25.99	74	42.43	31.91	7.15	33.48	152	324	P	H
		5405.04	35.81	-18.19	54	30.32	31.86	7.13	33.5	152	324	A	H
	*	5670	96.33	-	-	90.23	32.28	7.32	33.5	152	324	P	H
	*	5670	85.16	-	-	79.06	32.28	7.32	33.5	152	324	A	H
		5730.04	61.68	-12.32	74	55.43	32.36	7.41	33.52	152	324	P	H
		5725.32	37.22	-16.78	54	31.02	32.36	7.36	33.52	152	324	A	H
		5406.64	49.19	-24.81	74	43.68	31.86	7.15	33.5	150	313	P	V
		5466.96	36.67	-17.33	54	31.02	31.95	7.17	33.47	150	313	A	V
	*	5670	103.92	-	-	97.82	32.28	7.32	33.5	150	313	P	V
	*	5670	92.65	-	-	86.55	32.28	7.32	33.5	150	313	A	V
		5729.96	69.13	-4.87	74	62.88	32.36	7.41	33.52	150	313	P	V
		5725.08	40.94	-13.06	54	34.74	32.36	7.36	33.52	150	313	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E band 3 - 5470~5725MHz

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		11020	49.99	-24.01	74	59.23	39.48	10.85	59.57	100	230	P	H
HT40		16530	49.71	-24.29	74	57.34	38.56	13.44	59.63	100	300	P	H
CH 102		11020	50.15	-23.85	74	59.39	39.48	10.85	59.57	100	230	P	V
5510MHz		16530	49.58	-24.42	74	57.21	38.56	13.44	59.63	100	300	P	V
802.11n		11100	50.45	-23.55	74	59.76	39.41	10.88	59.6	100	200	P	H
HT40		16650	48.67	-25.33	74	55.6	38.88	13.7	59.51	100	350	P	H
CH 110		11100	50.65	-23.35	74	59.96	39.41	10.88	59.6	100	200	P	V
5550MHz		16650	48.82	-25.18	74	55.75	38.88	13.7	59.51	100	350	P	V
802.11n		11340	50.11	-23.89	74	59.63	39.19	10.98	59.69	200	360	P	H
HT40		17010	49.08	-24.92	74	53.82	39.91	14.45	59.1	200	360	P	H
CH 134		11340	50.41	-23.59	74	59.93	39.19	10.98	59.69	200	360	P	V
5670MHz		17010	49.23	-24.77	74	53.97	39.91	14.45	59.1	200	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



15E Emission below 1GHz

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)
802.11n HT40 LF		33.88	22.86	-17.14	40	39.16	16.08	1	33.38	-	-	P	H
		150.28	27.02	-16.48	43.5	47.54	11.19	1.53	33.24	-	-	P	H
		220.12	35.19	-10.81	46	55.68	10.85	1.8	33.14	100	0	P	H
		305.48	22.83	-23.17	46	39.95	13.96	1.94	33.02	-	-	P	H
		470.38	20.71	-25.29	46	33.49	17.48	2.31	32.57	-	-	P	H
		603.27	20.3	-25.7	46	31.03	18.82	2.57	32.12	-	-	P	H
		33.88	33.56	-6.44	40	49.86	16.08	1	33.38	100	0	P	V
		89.17	23.81	-19.69	43.5	45.48	10.58	1.14	33.39	-	-	P	V
		146.4	26.26	-17.24	43.5	46.71	11.27	1.53	33.25	-	-	P	V
		220.12	35.79	-10.21	46	56.28	10.85	1.8	33.14	-	-	P	V
		311.3	25	-21	46	41.96	14.11	1.94	33.01	-	-	P	V
		407.33	20.76	-25.24	46	34.78	16.61	2.12	32.75	-	-	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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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”.