



# FCC RF Test Report

**APPLICANT** : TCL Communication Ltd.  
**EQUIPMENT** : LTE Tablet  
**BRAND NAME** : AT&T  
**MODEL NAME** : 9020A  
**MARKETING NAME** : TINT  
**FCC ID** : 2ACCJB003  
**STANDARD** : FCC Part 15 Subpart E §15.407  
**CLASSIFICATION** : (NII) Unlicensed National Information Infrastructure

The product was received on Dec. 08, 2014 and testing was completed on Jan. 13, 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.

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Reviewed by: Joseph Lin / Supervisor

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Approved by: Jones Tsai / Manager



**SPORTON INTERNATIONAL (SHENZHEN) INC.**

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## REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4D0805D	Rev. 01	Initial issue of report	Jan. 27, 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	$\leq 24$ dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	$\leq 11$ 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 3.91 dB at 34.850 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 10.35 dB at 0.500 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

**TCL Communication Ltd.**

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P. R. China. 201203

## 1.2 Manufacturer

**TCL Communication Ltd.**

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P. R. China. 201203

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
<b>Equipment</b>	LTE Tablet
<b>Brand Name</b>	AT&T
<b>Model Name</b>	9020A
<b>Marketing Name</b>	TINT
<b>FCC ID</b>	2ACCJB003
<b>EUT supports Radios application</b>	WCDMA/HSPA/HSPA+(Downlink Only)/LTE/ WLAN2.4GHz 802.11b/g/n HT20/ WLAN5GHz 802.11a/n HT20/HT40/ Bluetooth v3.0+EDR/Bluetooth v4.0 LE
<b>HW Version</b>	V05
<b>SW Version</b>	B1F
<b>EUT Stage</b>	Production Unit

**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	
<b>Tx/Rx Frequency Range</b>	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5580 MHz 5660 MHz ~ 5700 MHz
<b>Maximum Output Power to Antenna</b>	<b>&lt;5180 MHz ~ 5240 MHz&gt;</b> 802.11a : 9.16 dBm / 0.0082 W 802.11n HT20 : 9.19 dBm / 0.0083 W 802.11n HT40 : 11.05 dBm / 0.0127 W <b>&lt;5260 MHz ~ 5320 MHz&gt;</b> 802.11a : 9.06 dBm / 0.0081 W 802.11n HT20 : 9.06 dBm / 0.0081 W 802.11n HT40 : 10.86 dBm / 0.0122 W <b>&lt;5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz &gt;</b> 802.11a : 10.64 dBm / 0.0116 W 802.11n HT20 : 10.64 dBm / 0.0116 W 802.11n HT40 : 11.53 dBm / 0.0142 W
<b>99% Occupied Bandwidth</b>	<b>&lt;5180 MHz ~ 5240 MHz&gt;</b> 802.11a : 18.30 MHz 802.11n HT20 : 19.10 MHz 802.11n HT40 : 36.60 MHz
<b>Antenna Type</b>	IFA Antenna
<b>Antenna Gain</b>	5150 MHz ~ 5250 MHz : 2.20 dBi 5250 MHz ~ 5350 MHz : 2.20 dBi 5470 MHz ~ 5725 MHz : 2.20 dBi
<b>Type of Modulation</b>	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

<b>Test Site</b>	SPORTON INTERNATIONAL (SHENZHEN) INC.	
<b>Test Site Location</b>	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	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	TH01-SZ	CO01-SZ

<b>Test Site</b>	SPORTON INTERNATIONAL (SHENZHEN) INC.	
<b>Test Site Location</b>	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	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Registration No.</b>
	03CH01-SZ	831040



## **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 (X 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)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	<b>38</b>	<b>5190</b>	<b>46</b>	<b>5230</b>
	40	5200	48	5240

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	<b>54</b>	<b>5270</b>	<b>62</b>	<b>5310</b>
	56	5280	64	5320

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5600 MHz and 5650-5725 MHz Band 3 (U-NII-2C)	100	5500	116	5580
	<b>102</b>	<b>5510</b>	132	5660
	104	5520	<b>134</b>	<b>5670</b>
	108	5540	136	5680
	<b>110</b>	<b>5550</b>	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. Data Rate							
Channel	Frequency (MHz)	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 36	5180	9.13	CH 48	9.00	9.09	9.10	9.12	9.13	9.01	8.96
CH 44	5220	8.95								
CH 48	5240	9.16								
CH 52	5260	9.01	CH 60	8.86	8.98	9.01	9.02	9.01	8.88	8.83
CH 60	5300	9.06								
CH 64	5320	8.95								
CH 100	5500	9.76	CH 116	10.42	10.43	10.48	10.56	10.53	10.39	10.27
CH 116	5580	10.64								
CH 140	5700	9.35								

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	9.19	CH 36	8.99	9.01	8.95	8.96	8.87	8.83	8.93
CH 44	5220	9.08								
CH 48	5240	9.08								
CH 52	5260	9.06	CH 52	8.97	8.99	8.93	8.94	8.85	8.81	8.91
CH 60	5300	8.91								
CH 64	5320	8.89								
CH 100	5500	9.64	CH 116	10.39	10.42	10.43	10.38	10.30	10.33	10.40
CH 116	5580	10.64								
CH 140	5700	9.35								



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	10.18	CH 46	11.02	10.93	10.84	10.97	10.97	10.85	10.90
CH 46	5230	11.05								
CH 54	5270	10.86	CH 54	10.37	10.22	10.20	10.23	10.20	10.15	10.22
CH 62	5310	10.55								
CH 102	5510	9.53	CH 134	10.98	10.81	10.82	10.89	10.81	10.79	10.76
CH 110	5550	10.52								
CH 134	5670	11.53								

## 2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

Test Cases				
Conducted TCs	Test Items	Mode	Data rate	Test Channel
	26dB and 99% BW Power Spectral Density	802.11a	6 Mbps	L/M/H
		802.11n HT20	6.5 Mbps	L/M/H
		802.11n HT40	13.5 Mbps	L/M/H
	Output Power	802.11a	6 Mbps	L/M/H
		802.11n HT20	6.5 Mbps	L/M/H
		802.11n HT40	13.5 Mbps	L/M/H
	Frequency Stability	802.11a	6 Mbps	L/M/H
Radiated TCs	Radiated Band Edge	802.11a	6 Mbps	L/H
		802.11n HT20	6.5 Mbps	L/H
		802.11n HT40	13.5 Mbps	L/H
	Radiated Spurious Emission	802.11a	6 Mbps	L/M/H
		802.11n HT20	6.5 Mbps	L/M/H
		802.11n HT40	13.5 Mbps	L/M/H
AC Conducted Emission	Mode 1 : WCDMA Band II Idle + Bluetooth Link + WLAN (5G) Link + USB Cable (Charging from Adapter) + Earphone			
Remark: For radiated TCs, the tests were performance with adapter, battery, USB cable and earphone.				



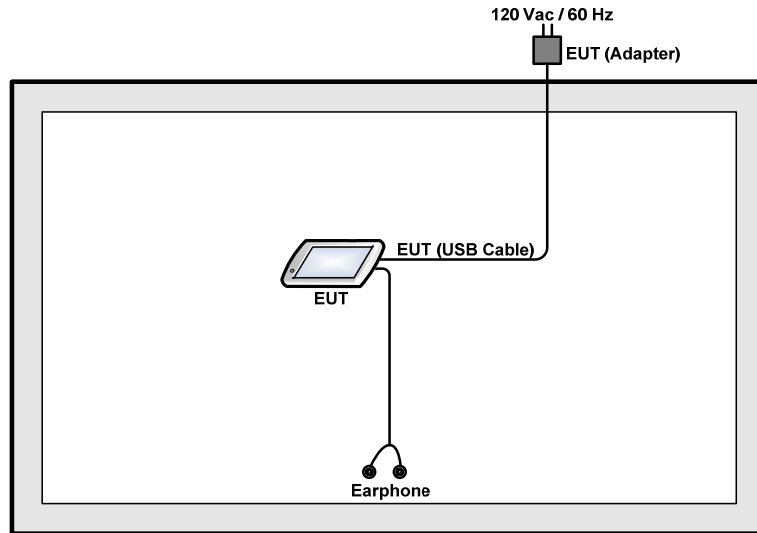
Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5600 MHz and 5650-5725MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5600 MHz and 5650-5725MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

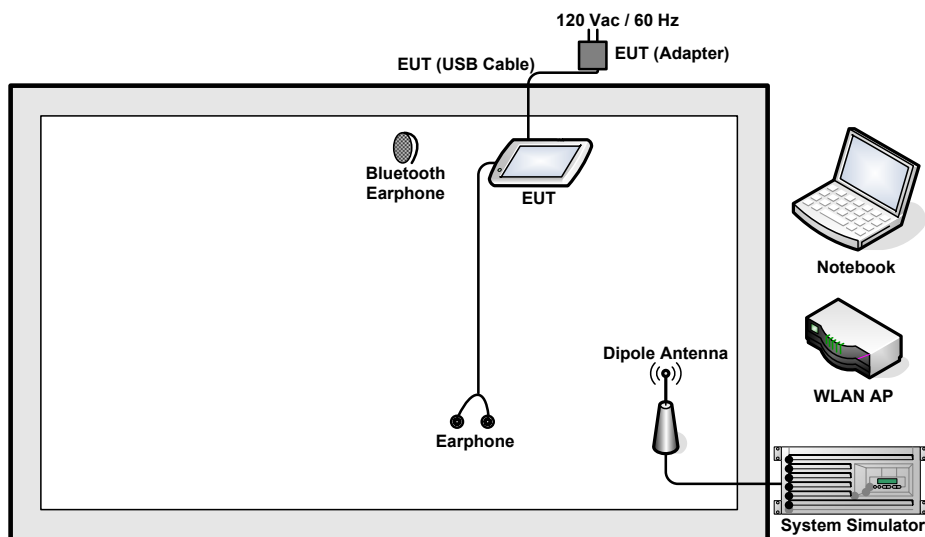
Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5600 MHz and 5650-5725MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134

## 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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-815	KA2DIR815A1	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A
5.	Earphone	Apple	N/A	N/A	Unshielded, 1.2 m	N/A
6.	DC Power Supply	TOPWORD	3303DR	N/A	N/A	Unshielded, 1.8 m

## 2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous 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 6.5dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 6.5 + 10 = 16.5 \text{ (dB)}\end{aligned}$$

### 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.

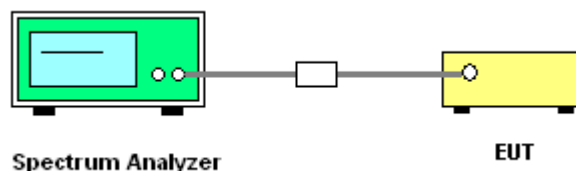
##### 3.1.2 Measuring Instruments

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**

<b>Test Band :</b>	5GHz band 1	<b>Temperature :</b>	24~26℃
<b>Test Engineer :</b>	Fly Liang	<b>Relative Humidity :</b>	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	99% Bandwidth (MHz)	99% Bandwidth EIRP Limit (dBm)
11a	6Mbps	1	36	5180	18.20	22.60
11a	6Mbps	1	44	5220	18.30	22.62
11a	6Mbps	1	48	5240	18.25	22.61
HT20	MCS0	1	36	5180	19.05	22.80
HT20	MCS0	1	44	5220	19.05	22.80
HT20	MCS0	1	48	5240	19.10	22.81
HT40	MCS0	1	38	5190	36.60	23.01
HT40	MCS0	1	46	5230	36.50	23.01

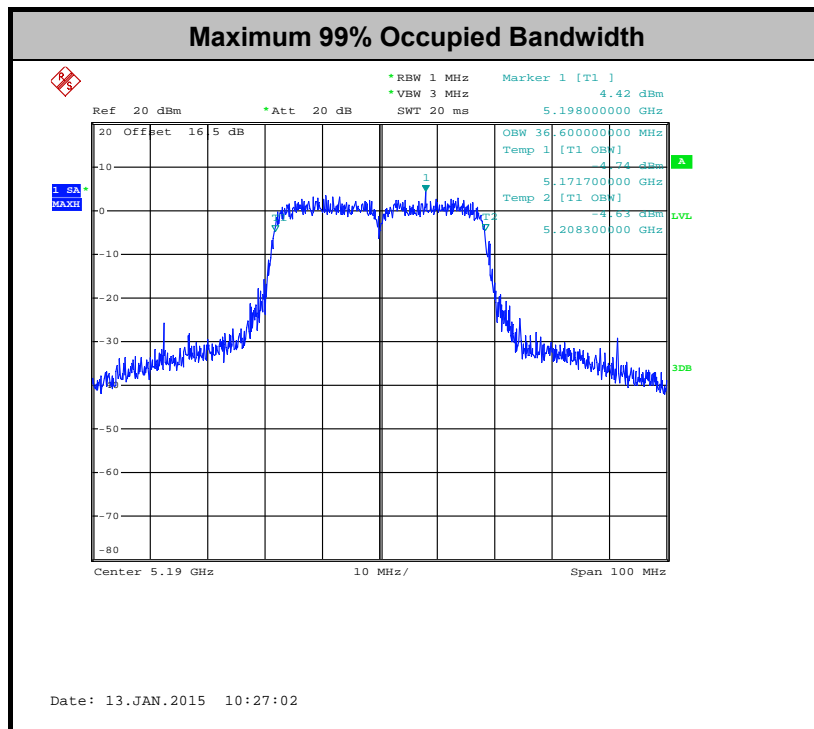
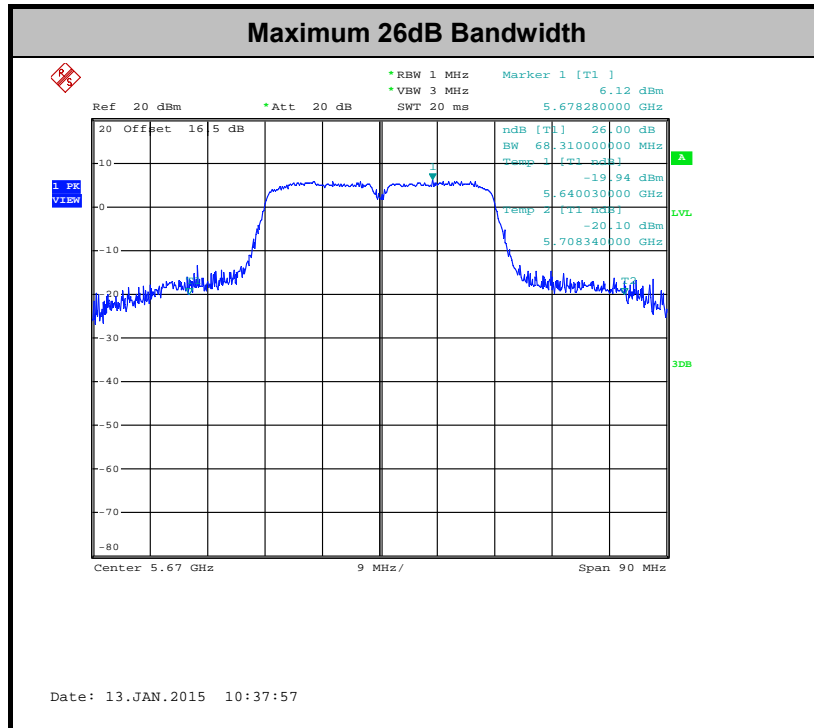
<b>Test Band :</b>	5GHz band 2	<b>Temperature :</b>	24~26℃
<b>Test Engineer :</b>	Fly Liang	<b>Relative Humidity :</b>	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	52	5260	23.75	23.98
11a	6Mbps	1	60	5300	23.90	23.98
11a	6Mbps	1	64	5320	23.75	23.98
HT20	MCS0	1	52	5260	24.15	23.98
HT20	MCS0	1	60	5300	24.40	23.98
HT20	MCS0	1	64	5320	24.10	23.98
HT40	MCS0	1	54	5270	45.81	23.98
HT40	MCS0	1	62	5310	45.54	23.98



<b>Test Band :</b>	5GHz band 3	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Fly Liang	<b>Relative Humidity :</b>	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	100	5500	23.65	23.98
11a	6Mbps	1	116	5580	24.15	23.98
11a	6Mbps	1	140	5700	27.25	23.98
HT20	MCS0	1	100	5500	24.25	23.98
HT20	MCS0	1	116	5580	23.95	23.98
HT20	MCS0	1	140	5700	28.45	23.98
HT40	MCS0	1	102	5510	45.27	23.98
HT40	MCS0	1	110	5550	45.27	23.98
HT40	MCS0	1	134	5670	68.31	23.98



## 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.

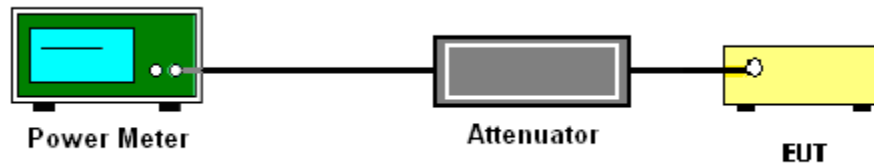
### 3.2.3 Test Procedures

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

<b>Test Band :</b>	5GHz band 1	<b>Temperature :</b>	24~26℃
<b>Test Engineer :</b>	Fly Liang	<b>Relative Humidity :</b>	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	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	9.13	24.00	2.20	Pass
11a	6Mbps	1	44	5220	0.60	8.95	24.00	2.20	Pass
11a	6Mbps	1	48	5240	0.60	9.16	24.00	2.20	Pass
HT20	MCS0	1	36	5180	0.66	9.19	24.00	2.20	Pass
HT20	MCS0	1	44	5220	0.66	9.08	24.00	2.20	Pass
HT20	MCS0	1	48	5240	0.66	9.08	24.00	2.20	Pass
HT40	MCS0	1	38	5190	1.21	10.18	24.00	2.20	Pass
HT40	MCS0	1	46	5230	1.21	11.05	24.00	2.20	Pass

**Note:** Final Output Power equals to Measured Output Power adds the duty factor.





<b>Test Band :</b>	5GHz band 2	<b>Temperature :</b>	24~26℃
<b>Test Engineer :</b>	Fly Liang	<b>Relative Humidity :</b>	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	52	5260	0.60	9.01	23.98	2.20	Pass
11a	6Mbps	1	60	5300	0.60	9.06	23.98	2.20	Pass
11a	6Mbps	1	64	5320	0.60	8.95	23.98	2.20	Pass
HT20	MCS0	1	52	5260	0.66	9.06	23.98	2.20	Pass
HT20	MCS0	1	60	5300	0.66	8.91	23.98	2.20	Pass
HT20	MCS0	1	64	5320	0.66	8.89	23.98	2.20	Pass
HT40	MCS0	1	54	5270	1.21	10.86	23.98	2.20	Pass
HT40	MCS0	1	62	5310	1.21	10.55	23.98	2.20	Pass

**Note:** Final Output Power equals to Measured Output Power adds the duty factor.



<b>Test Band :</b>	5GHz band 3	<b>Temperature :</b>	24~26℃
<b>Test Engineer :</b>	Fly Liang	<b>Relative Humidity :</b>	50~53%

Mod.	Data Rate	N <sub>TX</sub>	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	100	5500	0.60	9.76	23.98	2.20	Pass
11a	6Mbps	1	116	5580	0.60	10.64	23.98	2.20	Pass
11a	6Mbps	1	140	5700	0.60	9.35	23.98	2.20	Pass
HT20	MCS0	1	100	5500	0.66	9.64	23.98	2.20	Pass
HT20	MCS0	1	116	5580	0.66	10.64	23.98	2.20	Pass
HT20	MCS0	1	140	5700	0.66	9.35	23.98	2.20	Pass
HT40	MCS0	1	102	5510	1.21	9.53	23.98	2.20	Pass
HT40	MCS0	1	110	5550	1.21	10.52	23.98	2.20	Pass
HT40	MCS0	1	134	5670	1.21	11.53	23.98	2.20	Pass

**Note:** Final Output Power equals to Measured Output Power adds the duty factor.



### **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.

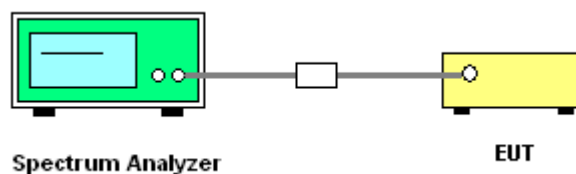
Section F) Maximum power spectral density.

#### # 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

Test Band :	5GHz band 1	Temperature :	24~26°C
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	CH	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	36	5180	0.60	-2.20	11.00	2.20	Pass
11a	6Mbps	1	44	5220	0.60	-2.50	11.00	2.20	Pass
11a	6Mbps	1	48	5240	0.60	-2.56	11.00	2.20	Pass
HT20	MCS0	1	36	5180	0.66	-2.40	11.00	2.20	Pass
HT20	MCS0	1	44	5220	0.66	-2.70	11.00	2.20	Pass
HT20	MCS0	1	48	5240	0.66	-2.77	11.00	2.20	Pass
HT40	MCS0	1	38	5190	1.21	-4.67	11.00	2.20	Pass
HT40	MCS0	1	46	5230	1.21	-3.24	11.00	2.20	Pass

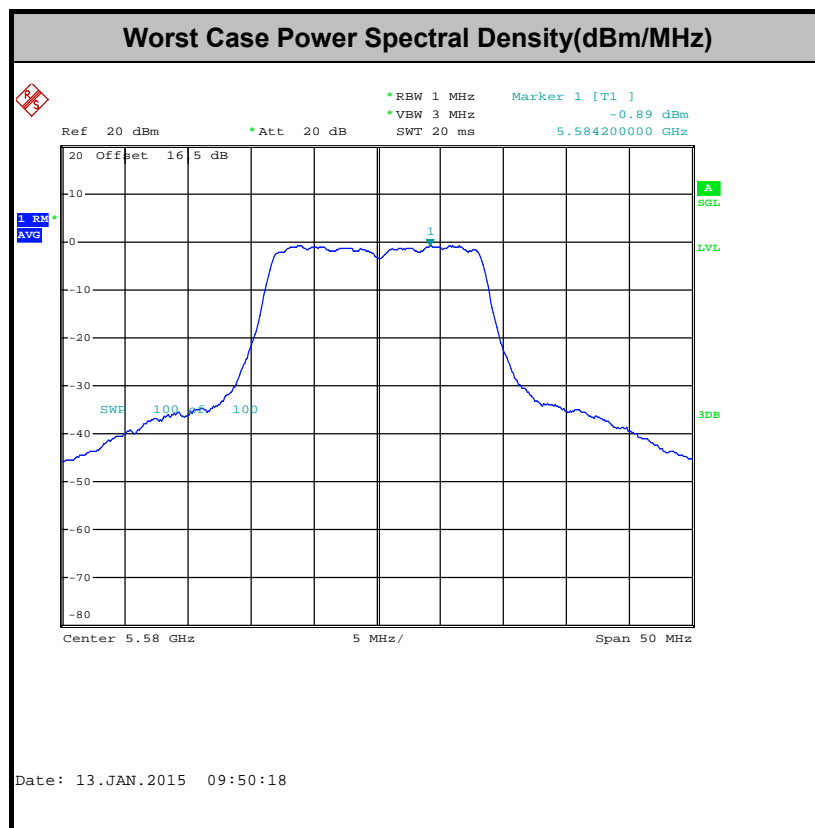
Test Band :	5GHz band 2	Temperature :	24~26°C
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	CH	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	52	5260	0.60	-2.93	11.00	2.20	Pass
11a	6Mbps	1	60	5300	0.60	-2.72	11.00	2.20	Pass
11a	6Mbps	1	64	5320	0.60	-2.59	11.00	2.20	Pass
HT20	MCS0	1	52	5260	0.66	-3.11	11.00	2.20	Pass
HT20	MCS0	1	60	5300	0.66	-3.02	11.00	2.20	Pass
HT20	MCS0	1	64	5320	0.66	-2.71	11.00	2.20	Pass
HT40	MCS0	1	54	5270	1.21	-3.95	11.00	2.20	Pass
HT40	MCS0	1	62	5310	1.21	-3.95	11.00	2.20	Pass



Test Band :	5GHz band 3	Temperature :	24~26°C
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N <sub>TX</sub>	CH	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	100	5500	0.60	-1.76	11.00	2.20	Pass
11a	6Mbps	1	116	5580	0.60	-0.29	11.00	2.20	Pass
11a	6Mbps	1	140	5700	0.60	-2.05	11.00	2.20	Pass
HT20	MCS0	1	100	5500	0.66	-1.93	11.00	2.20	Pass
HT20	MCS0	1	116	5580	0.66	-0.49	11.00	2.20	Pass
HT20	MCS0	1	140	5700	0.66	-2.51	11.00	2.20	Pass
HT40	MCS0	1	102	5510	1.21	-4.36	11.00	2.20	Pass
HT40	MCS0	1	110	5550	1.21	-3.52	11.00	2.20	Pass
HT40	MCS0	1	134	5670	1.21	-2.77	11.00	2.20	Pass



**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 Part 15.205.

#### 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 Part 15.205 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.

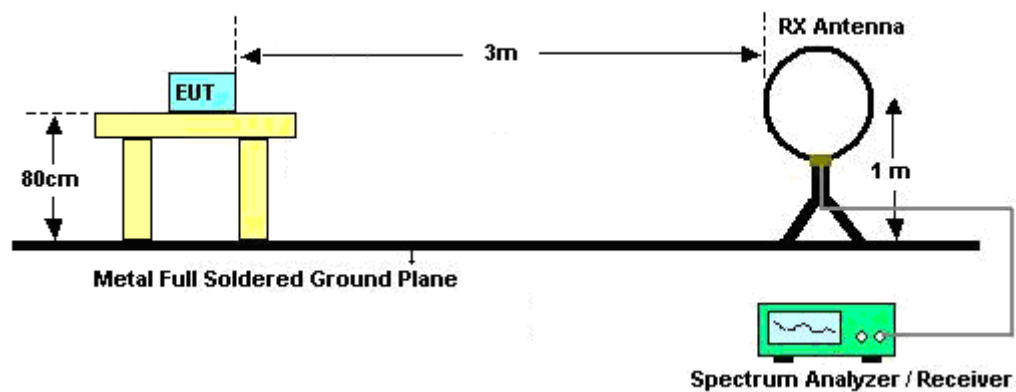
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.13	1.35	0.74	1kHz
802.11n HT20	85.95	1.27	0.79	1kHz
802.11n HT40	75.71	0.64	1.57	3kHz

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.

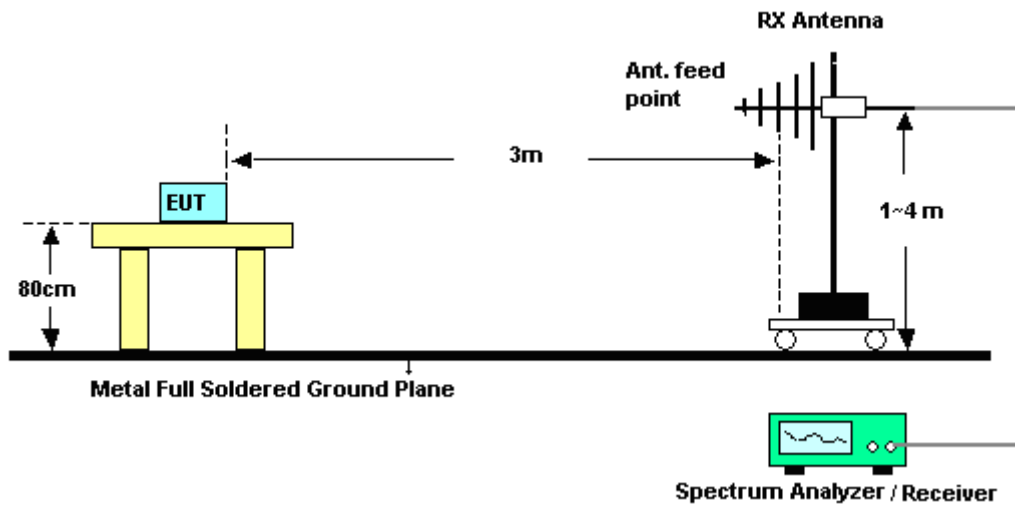
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level 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

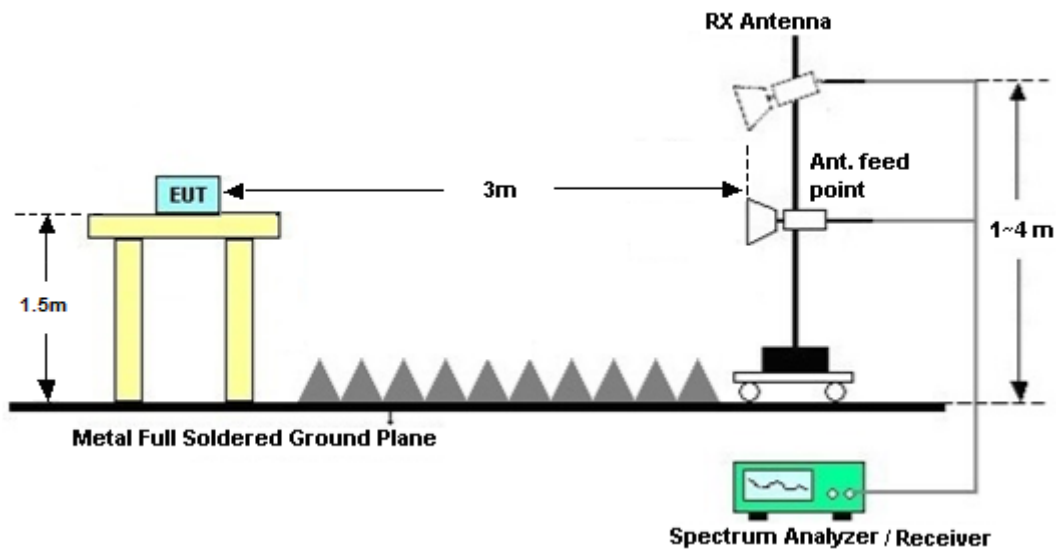
For radiated emissions below 30MHz



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 A.

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

Please refer to Appendix A.

### 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 $\mu$ 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.

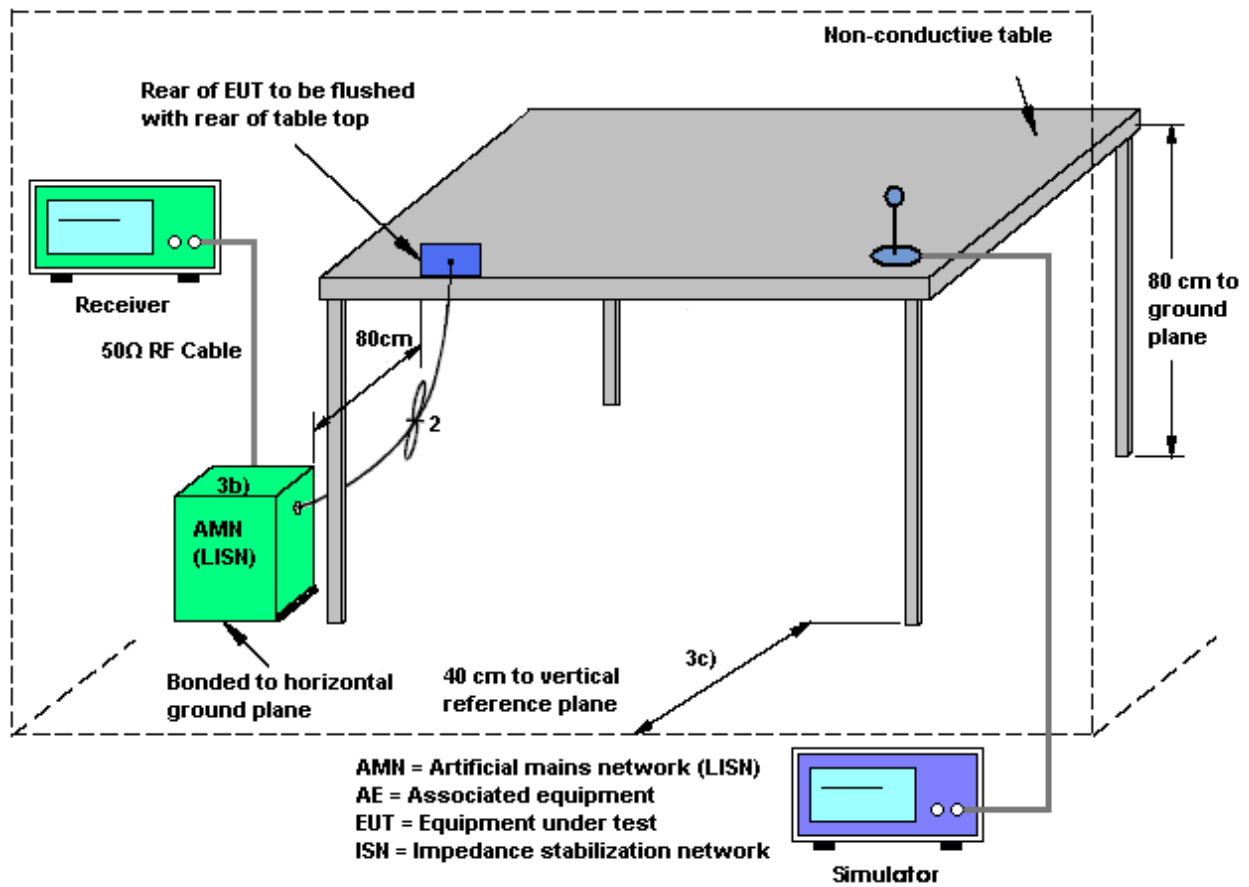
#### 3.5.2 Measuring Instruments

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

#### 3.5.3 Test Procedures

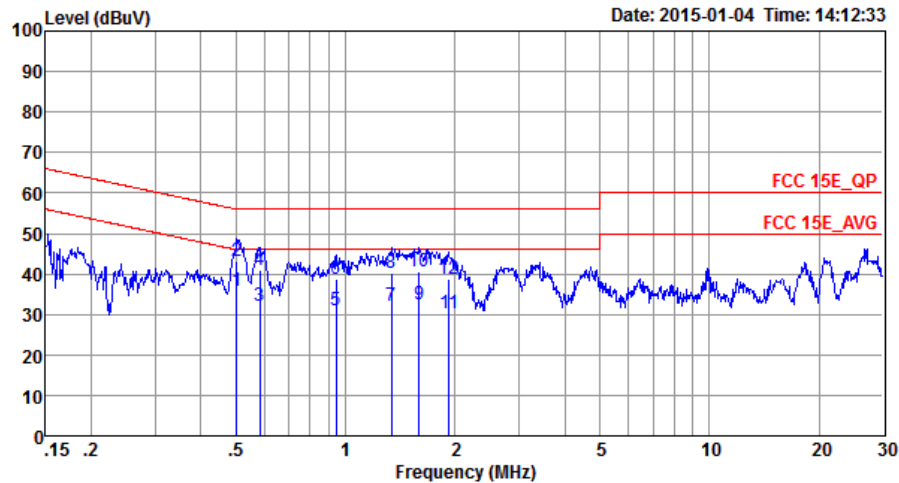
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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 :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band II Idle + Bluetooth Link + WLAN (5G) Link + USB Cable (Charging from Adapter) + Earphone		

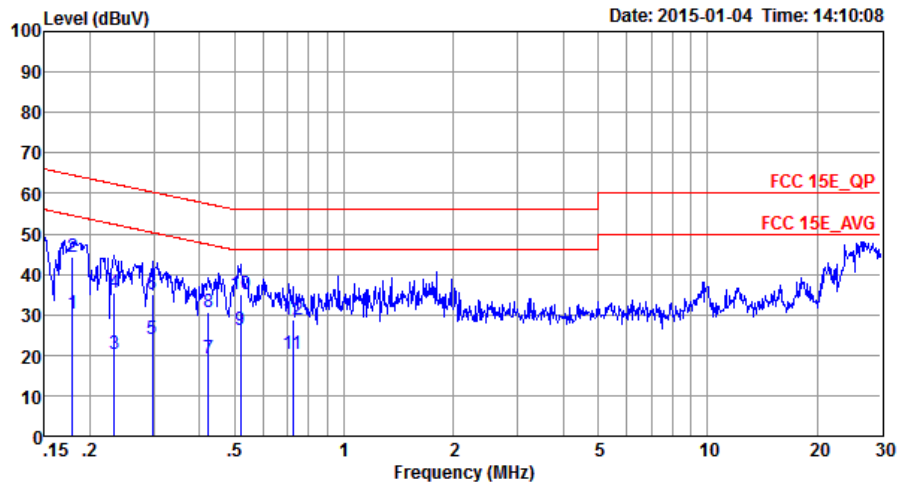


Site : CO01-SZ  
Condition: FCC 15E\_QP LISN\_L\_20140304 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.50	35.65	-10.35	46.00	25.19	0.30	10.16	Average
2	0.50	43.05	-12.95	56.00	32.59	0.30	10.16	QP
3	0.58	32.10	-13.90	46.00	21.70	0.25	10.15	Average
4	0.58	40.80	-15.20	56.00	30.40	0.25	10.15	QP
5	0.94	31.00	-15.00	46.00	20.60	0.25	10.15	Average
6	0.94	38.80	-17.20	56.00	28.40	0.25	10.15	QP
7	1.34	32.11	-13.89	46.00	21.70	0.24	10.17	Average
8	1.34	40.11	-15.89	56.00	29.70	0.24	10.17	QP
9	1.59	32.51	-13.49	46.00	22.10	0.23	10.18	Average
10	1.59	40.51	-15.49	56.00	30.10	0.23	10.18	QP
11	1.93	30.11	-15.89	46.00	19.70	0.22	10.19	Average
12	1.93	38.61	-17.39	56.00	28.20	0.22	10.19	QP



Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Link + WLAN (5G) Link + USB Cable (Charging from Adapter) + Earphone		



Site : C001-SZ  
Condition: FCC 15E\_QP LISN\_N\_20140304 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18	30.14	-24.41	54.55	19.50	0.32	10.32	Average
2	0.18	44.44	-20.11	64.55	33.80	0.32	10.32	QP
3	0.23	20.29	-32.06	52.35	9.69	0.34	10.26	Average
4	0.23	35.59	-26.76	62.35	24.99	0.34	10.26	QP
5	0.30	24.06	-26.26	50.32	13.50	0.36	10.20	Average
6	0.30	35.06	-25.26	60.32	24.50	0.36	10.20	QP
7	0.42	19.06	-28.31	47.37	8.50	0.39	10.17	Average
8	0.42	30.76	-26.61	57.37	20.20	0.39	10.17	QP
9 *	0.52	26.35	-19.65	46.00	15.80	0.39	10.16	Average
10	0.52	34.95	-21.05	56.00	24.40	0.39	10.16	QP
11	0.72	20.31	-25.69	46.00	9.90	0.26	10.15	Average
12	0.72	28.71	-27.29	56.00	18.30	0.26	10.15	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**

<b>Test Band :</b>	5GHz band 1,2,3	<b>Test Engineer :</b>	Fly Liang
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Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	20	3.70
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	20	4.35
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	20	3.90
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	-30	3.90
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	50	3.90

Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	64	5320	5320.025	0.025	4.70	20	3.70
11a	6Mbps	1	64	5320	5319.975	-0.025	-4.70	20	4.35
11a	6Mbps	1	64	5320	5320.025	0.025	4.70	20	3.90
11a	6Mbps	1	64	5320	5320.050	0.050	9.40	-30	3.90
11a	6Mbps	1	64	5320	5320.000	0.000	0.00	50	3.90



Mod.	Data Rate	NTX	Channel	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)
11a	6Mbps	1	100	5500	5500.025	0.025	4.55	20	3.70
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	20	4.35
11a	6Mbps	1	100	5500	5500.075	0.075	13.64	20	3.90
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	-30	3.90
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	50	3.90

**Note:** Center Frequency = (Low Frequency + High Frequency) / 2.

## **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 peak 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	101078	10Hz~40GHz	May 08, 2014	Jan. 13, 2015	May 07, 2015	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	13dBm ~-20dBm	Mar. 03, 2014	Jan. 13, 2015	Mar. 02, 2015	Conducted (TH01-SZ)
Power Sensor	Dare	RPR3006W	TH01SZ00019	0.3GHz~6GHz	Mar. 14, 2014	Jan. 13, 2015	Mar. 13, 2015	Conducted (TH01-SZ)
Thermal Chamber	Hongzhangroup	LP-150U	HD20120425	-40°C~150°C	Feb. 21, 2014	Jan. 13, 2015	Feb. 20, 2015	Conducted (TH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Jan. 12, 2015	Feb. 20, 2015	Radiation (03CH01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2014	Jan. 12, 2015	May 25, 2015	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 09, 2014	Jan. 12, 2015	May 08, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	37877	30MHz~2GHz	Oct. 15, 2014	Jan. 12, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Jan. 12, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridged Horn Antenna	COM-POWER	AH-840	101073	18GHz~40GHz	Jun. 09, 2014	Jan. 12, 2015	Jun. 08, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Jan. 12, 2015	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 08, 2014	Jan. 12, 2015	May 07, 2015	Radiation (03CH01-SZ)
AC Source(AVR)	Chroma	61601	616010001985	100Vac~250Vac	Mar. 25, 2014	Jan. 12, 2015	Mar. 24, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Jan. 12, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Jan. 12, 2015	NCR	Radiation (03CH01-SZ)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Jan. 04, 2015	Feb. 20, 2015	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 04, 2014	Jan. 04, 2015	Mar. 03, 2015	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 04, 2014	Jan. 04, 2015	Mar. 03, 2015	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Sep. 29, 2014	Jan. 04, 2015	Sep. 28, 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. Radiated Spurious Emission

### 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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11a CH 36 5180MHz		5012.45	56.53	-17.47	74	44.15	31.61	16.64	35.87	340	296	P	H
		5149.7	43.77	-10.23	54	30.98	31.72	16.88	35.81	340	296	A	H
	*	5180	97.34	-	-	84.45	31.75	16.94	35.8	340	296	P	H
	*	5180	86.09	-	-	73.2	31.75	16.94	35.8	340	296	A	H
		5146.1	57.83	-16.17	74	45.04	31.72	16.88	35.81	340	169	P	V
		5149.85	44.13	-9.87	54	31.34	31.72	16.88	35.81	340	169	A	V
	*	5180	99.69	-	-	86.8	31.75	16.94	35.8	340	169	P	V
	*	5180	88.1	-	-	75.21	31.75	16.94	35.8	340	169	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11a CH 36 5180MHz		10360	48.05	-25.95	74	20.84	38.62	24.11	35.52	152	260	P	H
		15540	47.27	-26.73	74	14.26	38.54	29.32	34.85	189	238	P	H
		10360	47.14	-26.86	74	19.93	38.62	24.11	35.52	152	260	P	V
		15540	48.4	-25.6	74	15.39	38.54	29.32	34.85	189	238	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT20 CH 36 5180MHz		5149.1	56.1	-17.9	74	43.31	31.72	16.88	35.81	340	298	P	H
		5150	44.14	-9.86	54	31.35	31.72	16.88	35.81	340	298	A	H
	*	5180	97.45	-	-	84.56	31.75	16.94	35.8	340	298	P	H
	*	5180	85.57	-	-	72.68	31.75	16.94	35.8	340	298	A	H
		5149.25	56.87	-17.13	74	44.08	31.72	16.88	35.81	340	169	P	V
		5150	44.62	-9.38	54	31.83	31.72	16.88	35.81	340	169	A	V
	*	5180	98.83	-	-	85.94	31.75	16.94	35.8	340	169	P	V
	*	5180	87.18	-	-	74.29	31.75	16.94	35.8	340	169	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT20 CH 36 5180MHz		10360	49.35	-24.65	74	22.14	38.62	24.11	35.52	152	260	P	H
		15540	46.94	-27.06	74	13.93	38.54	29.32	34.85	189	238	P	H
		10360	48.47	-25.53	74	21.26	38.62	24.11	35.52	152	260	P	V
		15540	46.09	-27.91	74	13.08	38.54	29.32	34.85	189	238	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT40 CH 38 5190MHz		5149.85	62.31	-11.69	74	49.52	31.72	16.88	35.81	340	296	P	H
		5150	47.55	-6.45	54	34.76	31.72	16.88	35.81	340	296	A	H
	*	5190	94.85	-	-	81.96	31.75	16.94	35.8	340	296	P	H
	*	5190	83.14	-	-	70.25	31.75	16.94	35.8	340	296	A	H
		5371.45	56.31	-17.69	74	42.88	31.89	17.28	35.74	340	296	P	H
		5459.89	44.35	-9.65	54	30.66	31.96	17.43	35.7	340	296	A	H
		5149.55	66.28	-7.72	74	53.49	31.72	16.88	35.81	340	169	P	V
		5150	49.57	-4.43	54	36.78	31.72	16.88	35.81	340	169	A	V
	*	5190	96.84	-	-	83.95	31.75	16.94	35.8	340	169	P	V
	*	5190	84.43	-	-	71.54	31.75	16.94	35.8	340	169	A	V
		5358.36	56.58	-17.42	74	43.19	31.88	17.25	35.74	340	169	P	V
		5440.64	44.41	-9.59	54	30.77	31.95	17.4	35.71	340	169	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT40 CH 38 5190MHz		10380	50.23	-23.77	74	22.92	38.65	24.18	35.52	152	260	P	H
		15570	47.64	-26.36	74	14.8	38.44	29.24	34.84	189	238	P	H
		10380	49.19	-24.81	74	21.88	38.65	24.18	35.52	152	260	P	V
		15570	46.73	-27.27	74	13.89	38.44	29.24	34.84	189	238	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11a CH 52 5260MHz		5040.65	55.93	-18.07	74	43.45	31.64	16.7	35.86	340	296	P	H
		5086.4	43.41	-10.59	54	30.82	31.67	16.76	35.84	340	296	A	H
	*	5260	94.78	-	-	81.65	31.81	17.1	35.78	340	296	P	H
	*	5260	83.65	-	-	70.52	31.81	17.1	35.78	340	296	A	H
		5364.19	56.37	-17.63	74	42.94	31.89	17.28	35.74	340	296	P	H
		5448.56	43.82	-10.18	54	30.14	31.96	17.43	35.71	340	296	A	H
		5109.35	56.01	-17.99	74	43.33	31.69	16.82	35.83	340	169	P	V
		5073.05	43.36	-10.64	54	30.77	31.67	16.76	35.84	340	169	A	V
	*	5260	96.51	-	-	83.38	31.81	17.1	35.78	340	169	P	V
	*	5260	84.72	-	-	71.59	31.81	17.1	35.78	340	169	A	V
		5458.02	56.9	-17.1	74	43.21	31.96	17.43	35.7	340	169	P	V
		5460	43.98	-10.02	54	30.29	31.96	17.43	35.7	340	169	A	V
802.11a CH 64 5320MHz	*	5320	94.73	-	-	81.45	31.85	17.19	35.76	340	296	P	H
	*	5320	83.83	-	-	70.55	31.85	17.19	35.76	340	296	A	H
		5391.8	56.71	-17.29	74	43.22	31.91	17.31	35.73	340	296	P	H
		5446.25	43.84	-10.16	54	30.16	31.96	17.43	35.71	340	296	A	H
	*	5320	95.69	-	-	82.41	31.85	17.19	35.76	340	169	P	V
	*	5320	84.8	-	-	71.52	31.85	17.19	35.76	340	169	A	V
		5353.96	56.83	-17.17	74	43.44	31.88	17.25	35.74	340	169	P	V
		5350.11	43.81	-10.19	54	30.42	31.88	17.25	35.74	340	169	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 802.11a (Harmonic @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
<b>802.11a</b> <b>CH 52</b> <b>5260MHz</b>		10520	46.28	-27.72	74	18.53	38.84	24.39	35.48	110	220	P	H
		15780	45.53	-28.47	74	13.68	37.79	28.83	34.77	109	345	P	H
		10520	48.37	-25.63	74	20.62	38.84	24.39	35.48	110	220	P	V
		15780	47.04	-26.96	74	15.19	37.79	28.83	34.77	109	345	P	V
<b>802.11a</b> <b>CH 64</b> <b>5320MHz</b>		10640	48.11	-25.89	74	19.96	39	24.6	35.45	152	135	P	H
		15960	47.09	-26.91	74	16.17	37.21	28.42	34.71	173	245	P	H
		10640	46.76	-27.24	74	18.61	39	24.6	35.45	152	135	P	V
		15960	46.57	-27.43	74	15.65	37.21	28.42	34.71	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT20 CH 52 5260MHz		5022.95	56.29	-17.71	74	43.85	31.63	16.67	35.86	340	298	P	H
		5046.8	43.52	-10.48	54	31.03	31.64	16.7	35.85	340	298	A	H
	*	5260	95.37	-	-	82.24	31.81	17.1	35.78	340	298	P	H
	*	5260	82.81	-	-	69.68	31.81	17.1	35.78	340	298	A	H
		5377.5	56.56	-17.44	74	43.07	31.91	17.31	35.73	340	298	P	H
		5458.79	43.98	-10.02	54	30.29	31.96	17.43	35.7	340	298	A	H
		5090	57.15	-16.85	74	44.52	31.68	16.79	35.84	340	169	P	V
		5149.7	43.39	-10.61	54	30.6	31.72	16.88	35.81	340	169	A	V
	*	5260	96.11	-	-	82.98	31.81	17.1	35.78	340	169	P	V
	*	5260	83.71	-	-	70.58	31.81	17.1	35.78	340	169	A	V
		5443.5	56.27	-17.73	74	42.63	31.95	17.4	35.71	340	169	P	V
802.11n HT20 CH 64 5320MHz		5459.78	43.85	-10.15	54	30.16	31.96	17.43	35.7	340	169	A	V
	*	5320	95.13	-	-	81.85	31.85	17.19	35.76	340	296	P	H
	*	5320	82.87	-	-	69.59	31.85	17.19	35.76	340	296	A	H
		5445.48	56.18	-17.82	74	42.54	31.95	17.4	35.71	340	296	P	H
		5459.12	43.83	-10.17	54	30.14	31.96	17.43	35.7	340	296	A	H
	*	5320	95.86	-	-	82.58	31.85	17.19	35.76	340	169	P	V
	*	5320	83.74	-	-	70.46	31.85	17.19	35.76	340	169	A	V
		5458.02	57.12	-16.88	74	43.43	31.96	17.43	35.7	340	169	P	V
Remark		5459.67	43.78	-10.22	54	30.09	31.96	17.43	35.7	340	169	A	V
	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT20 CH 52 5260MHz		10520	47.4	-26.6	74	19.65	38.84	24.39	35.48	110	220	P	H
		15780	49.7	-24.3	74	17.85	37.79	28.83	34.77	109	345	P	H
		10520	47.49	-26.51	74	19.74	38.84	24.39	35.48	110	220	P	V
		15780	47.97	-26.03	74	16.12	37.79	28.83	34.77	109	345	P	V
802.11n HT20 CH 64 5320MHz		10640	47.76	-26.24	74	19.61	39	24.6	35.45	152	135	P	H
		15960	48.05	-25.95	74	17.13	37.21	28.42	34.71	173	245	P	H
		10640	47.3	-26.7	74	19.15	39	24.6	35.45	152	135	P	V
		15960	46.62	-27.38	74	15.7	37.21	28.42	34.71	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11n HT40 CH 54 5270MHz		5080.4	55.95	-18.05	74	43.36	31.67	16.76	35.84	340	296	P	H
		5069.45	43.89	-10.11	54	31.35	31.65	16.73	35.84	340	296	A	H
	*	5270	92.01	-	-	78.88	31.81	17.1	35.78	340	296	P	H
	*	5270	80.18	-	-	67.05	31.81	17.1	35.78	340	296	A	H
		5450.98	56.97	-17.03	74	43.28	31.96	17.43	35.7	340	296	P	H
		5453.18	44.72	-9.28	54	31.03	31.96	17.43	35.7	340	296	A	H
		5007.2	56.43	-17.57	74	44.05	31.61	16.64	35.87	340	169	P	V
		5063.3	44.08	-9.92	54	31.55	31.65	16.73	35.85	340	169	A	V
	*	5270	93.65	-	-	80.52	31.81	17.1	35.78	340	169	P	V
	*	5270	80.71	-	-	67.58	31.81	17.1	35.78	340	169	A	V
		5389.38	56.49	-17.51	74	43	31.91	17.31	35.73	340	169	P	V
		5451.86	44.47	-9.53	54	30.78	31.96	17.43	35.7	340	169	A	V
802.11n HT40 CH 62 5310MHz		5062.85	56.54	-17.46	74	44.01	31.65	16.73	35.85	340	296	P	H
		5031.2	44	-10	54	31.56	31.63	16.67	35.86	340	296	A	H
	*	5310	92.1	-	-	78.82	31.85	17.19	35.76	340	296	P	H
	*	5310	80.17	-	-	66.89	31.85	17.19	35.76	340	296	A	H
		5350.88	57.73	-16.27	74	44.34	31.88	17.25	35.74	340	296	P	H
		5350	45.49	-8.51	54	32.1	31.88	17.25	35.74	340	296	A	H
		5038.55	55.88	-18.12	74	43.4	31.64	16.7	35.86	340	169	P	V
		5114.9	43.93	-10.07	54	31.25	31.69	16.82	35.83	340	169	A	V
	*	5310	93.3	-	-	80.02	31.85	17.19	35.76	340	169	P	V
	*	5310	81.13	-	-	67.85	31.85	17.19	35.76	340	169	A	V
		5350.11	58.08	-15.92	74	44.69	31.88	17.25	35.74	340	169	P	V
		5350.66	45.9	-8.1	54	32.51	31.88	17.25	35.74	340	169	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT40 CH 54 5270MHz		10540	48.08	-25.92	74	20.23	38.86	24.46	35.47	110	220	P	H
		15810	46.48	-27.52	74	14.8	37.69	28.75	34.76	109	345	P	H
		10540	47.37	-26.63	74	19.52	38.86	24.46	35.47	110	220	P	V
		15810	44.48	-29.52	74	12.8	37.69	28.75	34.76	109	345	P	V
802.11n HT40 CH 62 5310MHz		10620	48.94	-25.06	74	20.81	38.98	24.6	35.45	185	215	P	H
		15930	46.54	-27.46	74	15.45	37.31	28.5	34.72	196	190	P	H
		10620	46.97	-27.03	74	18.84	38.98	24.6	35.45	185	215	P	V
		15930	45.09	-28.91	74	14	37.31	28.5	34.72	196	190	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11a CH 100 5500MHz		5424.56	56.33	-17.67	74	42.74	31.93	17.37	35.71	150	110	P	H
		5466.96	43.99	-10.01	54	30.26	31.97	17.46	35.7	150	110	A	H
	*	5500	95	-	-	81.17	32	17.52	35.69	150	110	P	H
	*	5500	82.42	-	-	68.59	32	17.52	35.69	150	110	A	H
		5467.92	56.33	-17.67	74	42.6	31.97	17.46	35.7	150	303	P	V
		5467.12	43.92	-10.08	54	30.19	31.97	17.46	35.7	150	303	A	V
	*	5500	85.09	-	-	71.26	32	17.52	35.69	150	303	P	V
	*	5500	73.88	-	-	60.05	32	17.52	35.69	150	303	A	V
802.11a CH 116 5580MHz		5364.56	56.28	-17.72	74	42.85	31.89	17.28	35.74	150	110	P	H
		5463.92	43.95	-10.05	54	30.22	31.97	17.46	35.7	150	110	A	H
	*	5580	96.73	-	-	82.59	32.11	17.68	35.65	150	110	P	H
	*	5580	84.94	-	-	70.8	32.11	17.68	35.65	150	110	A	H
		5728.12	58.31	-15.69	74	43.5	32.36	18.05	35.6	150	110	P	H
		5754.52	45.43	-8.57	54	30.47	32.41	18.14	35.59	150	110	A	H
		5458.96	56.89	-17.11	74	43.2	31.96	17.43	35.7	150	299	P	V
		5470	43.86	-10.14	54	30.13	31.97	17.46	35.7	150	299	A	V
	*	5580	88.82	-	-	74.68	32.11	17.68	35.65	150	299	P	V
	*	5580	78.03	-	-	63.89	32.11	17.68	35.65	150	299	A	V
		5756.76	58	-16	74	43.04	32.41	18.14	35.59	150	299	P	V
		5753.48	45.3	-8.7	54	30.34	32.41	18.14	35.59	150	299	A	V



<b>802.11a</b> <b>CH 140</b> <b>5700MHz</b>	*	5700	96.34	-	-	81.68	32.3	17.97	35.61	150	298	P	H
	*	5700	84.21	-	-	69.55	32.3	17.97	35.61	150	298	A	H
		5748.76	58.49	-15.51	74	43.6	32.39	18.09	35.59	150	298	P	H
		5749.64	45.32	-8.68	54	30.43	32.39	18.09	35.59	150	298	A	H
	*	5700	88.52	-	-	73.86	32.3	17.97	35.61	218	284	P	V
	*	5700	76.68	-	-	62.02	32.3	17.97	35.61	218	284	A	V
		5759.24	59.01	-14.99	74	44.05	32.41	18.14	35.59	218	284	P	V
		5734.52	45.5	-8.5	54	30.61	32.39	18.09	35.59	218	284	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11a CH 100 5500MHz		11000	47.77	-26.23	74	18.37	39.5	25.25	35.35	163	230	P	H
		16500	46.74	-27.26	74	14.02	38.47	28.96	34.71	178	296	P	H
		11000	47.24	-26.76	74	17.84	39.5	25.25	35.35	163	230	P	V
		16500	47.23	-26.77	74	14.51	38.47	28.96	34.71	178	296	P	V
802.11a CH 116 5580MHz		11160	46.2	-27.8	74	16.71	39.35	25.45	35.31	170	200	P	H
		16740	46.75	-27.25	74	12.88	39.11	29.47	34.71	156	350	P	H
		11160	46.57	-27.43	74	17.08	39.35	25.45	35.31	170	200	P	V
		16740	47.01	-26.99	74	13.14	39.11	29.47	34.71	156	350	P	V
802.11a CH 140 5700MHz		11400	48.45	-25.55	74	18.86	39.13	25.7	35.24	147	285	P	H
		17100	49.84	-24.16	74	14.14	40.48	29.93	34.71	165	246	P	H
		11400	48.61	-25.39	74	19.02	39.13	25.7	35.24	147	285	P	V
		17100	47.22	-26.78	74	11.52	40.48	29.93	34.71	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT20 CH 100 5500MHz		5452.88	56.06	-17.94	74	42.37	31.96	17.43	35.7	340	296	P	H
		5465.04	44.02	-9.98	54	30.29	31.97	17.46	35.7	340	296	A	H
	*	5500	96.51	-	-	82.68	32	17.52	35.69	340	296	P	H
	*	5500	84.35	-	-	70.52	32	17.52	35.69	340	296	A	H
		5415.28	56.41	-17.59	74	42.83	31.93	17.37	35.72	340	169	P	V
		5469.68	43.84	-10.16	54	30.11	31.97	17.46	35.7	340	169	A	V
	*	5500	98.48	-	-	84.65	32	17.52	35.69	340	169	P	V
	*	5500	86.18	-	-	72.35	32	17.52	35.69	340	169	A	V
802.11n HT20 CH 116 5580MHz		5398.96	56.3	-17.7	74	42.76	31.92	17.34	35.72	340	296	P	H
		5466	43.95	-10.05	54	30.22	31.97	17.46	35.7	340	296	A	H
	*	5580	97.68	-	-	83.54	32.11	17.68	35.65	340	296	P	H
	*	5580	86	-	-	71.86	32.11	17.68	35.65	340	296	A	H
		5755.4	58.42	-15.58	74	43.46	32.41	18.14	35.59	340	296	P	H
		5760.12	45.45	-8.55	54	30.49	32.41	18.14	35.59	340	296	A	H
		5445.84	56.38	-17.62	74	42.7	31.96	17.43	35.71	340	156	P	V
		5468.72	43.93	-10.07	54	30.2	31.97	17.46	35.7	340	156	A	V
	*	5580	97.74	-	-	83.6	32.11	17.68	35.65	340	156	P	V
	*	5580	86.03	-	-	71.89	32.11	17.68	35.65	340	156	A	V
		5754.04	58.61	-15.39	74	43.65	32.41	18.14	35.59	340	156	P	V
		5764.28	45.4	-8.6	54	30.44	32.41	18.14	35.59	340	156	A	V



<b>802.11n HT20 CH 140 5700MHz</b>	*	5700	95.42	-	-	80.76	32.3	17.97	35.61	340	296	P	H
	*	5700	84.11	-	-	69.45	32.3	17.97	35.61	340	296	A	H
		5739.08	58.21	-15.79	74	43.32	32.39	18.09	35.59	340	296	P	H
		5751.56	45.55	-8.45	54	30.59	32.41	18.14	35.59	340	296	A	H
	*	5700	95.24	-	-	80.58	32.3	17.97	35.61	340	156	P	V
	*	5700	83.87	-	-	69.21	32.3	17.97	35.61	340	156	A	V
		5728.6	58.23	-15.77	74	43.42	32.36	18.05	35.6	340	156	P	V
		5752.2	45.61	-8.39	54	30.65	32.41	18.14	35.59	340	156	A	V
Remark	<ol style="list-style-type: none"><li>1. No other spurious found.</li><li>2. All results are PASS against Peak and Average limit line.</li></ol>												



## 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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT20 CH 100 5500MHz		11000	48.14	-25.86	74	18.74	39.5	25.25	35.35	163	230	P	H
		16500	46.44	-27.56	74	13.72	38.47	28.96	34.71	178	296	P	H
		11000	47.8	-26.2	74	18.4	39.5	25.25	35.35	163	230	P	V
		16500	48.03	-25.97	74	15.31	38.47	28.96	34.71	178	296	P	V
802.11n HT20 CH 116 5580MHz		11160	47.21	-26.79	74	17.72	39.35	25.45	35.31	170	200	P	H
		16740	49.48	-24.52	74	15.61	39.11	29.47	34.71	156	350	P	H
		11160	48.45	-25.55	74	18.96	39.35	25.45	35.31	170	200	P	V
		16740	47.57	-26.43	74	13.7	39.11	29.47	34.71	156	350	P	V
802.11n HT20 CH 140 5700MHz		11400	49.24	-24.76	74	19.65	39.13	25.7	35.24	147	285	P	H
		17100	47.3	-26.7	74	11.6	40.48	29.93	34.71	165	246	P	H
		11400	48.83	-25.17	74	19.24	39.13	25.7	35.24	147	285	P	V
		17100	47.39	-26.61	74	11.69	40.48	29.93	34.71	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11n HT40 CH 102 5510MHz		5465.36	56.51	-17.49	74	42.78	31.97	17.46	35.7	340	296	P	H
		5470	45.03	-8.97	54	31.3	31.97	17.46	35.7	340	296	A	H
	*	5510	94.4	-	-	80.56	32	17.52	35.68	340	296	P	H
	*	5510	82.89	-	-	69.05	32	17.52	35.68	340	296	A	H
		5746.92	58.34	-15.66	74	43.45	32.39	18.09	35.59	340	296	P	H
		5736.2	46.07	-7.93	54	31.18	32.39	18.09	35.59	340	296	A	H
		5465.36	56.12	-17.88	74	42.39	31.97	17.46	35.7	340	169	P	V
		5468.08	44.89	-9.11	54	31.16	31.97	17.46	35.7	340	169	A	V
	*	5510	95.7	-	-	81.86	32	17.52	35.68	340	169	P	V
	*	5510	83.96	-	-	70.12	32	17.52	35.68	340	169	A	V
		5764.36	58.2	-15.8	74	43.24	32.41	18.14	35.59	340	169	P	V
		5750.52	46.1	-7.9	54	31.21	32.39	18.09	35.59	340	169	A	V
802.11n HT40 CH 110 5550MHz		5470	56.49	-17.51	74	42.76	31.97	17.46	35.7	340	296	P	H
		5466.16	44.56	-9.44	54	30.83	31.97	17.46	35.7	340	296	A	H
	*	5550	94.91	-	-	80.86	32.08	17.64	35.67	340	296	P	H
	*	5550	83.32	-	-	69.27	32.08	17.64	35.67	340	296	A	H
		5735	58.79	-15.21	74	43.9	32.39	18.09	35.59	340	296	P	H
		5757.56	46.13	-7.87	54	31.17	32.41	18.14	35.59	340	296	A	H
		5378.8	56.62	-17.38	74	43.13	31.91	17.31	35.73	340	169	P	V
		5458.8	44.62	-9.38	54	30.93	31.96	17.43	35.7	340	169	A	V
	*	5550	96.62	-	-	82.57	32.08	17.64	35.67	340	169	P	V
	*	5550	84.7	-	-	70.65	32.08	17.64	35.67	340	169	A	V
		5741.48	58.31	-15.69	74	43.42	32.39	18.09	35.59	340	169	P	V
		5764.68	46.16	-7.84	54	31.2	32.41	18.14	35.59	340	169	A	V



<b>802.11n</b> <b>HT40</b> <b>CH 134</b> <b>5670MHz</b>		5374.32	55.97	-18.03	74	42.53	31.89	17.28	35.73	340	296	P	H
		5467.92	44.52	-9.48	54	30.79	31.97	17.46	35.7	340	296	A	H
	*	5670	95.63	-	-	81.04	32.28	17.93	35.62	340	296	P	H
	*	5670	84.06	-	-	69.47	32.28	17.93	35.62	340	296	A	H
		5756.2	58.1	-15.9	74	43.14	32.41	18.14	35.59	340	296	P	H
		5764.12	46.07	-7.93	54	31.11	32.41	18.14	35.59	340	296	A	H
		5440.24	56.21	-17.79	74	42.57	31.95	17.4	35.71	340	169	P	V
		5467.12	44.41	-9.59	54	30.68	31.97	17.46	35.7	340	169	A	V
	*	5670	95.89	-	-	81.3	32.28	17.93	35.62	340	169	P	V
	*	5670	84.1	-	-	69.51	32.28	17.93	35.62	340	169	A	V
		5763.08	58.06	-15.94	74	43.1	32.41	18.14	35.59	340	169	P	V
		5749.32	46.19	-7.81	54	31.3	32.39	18.09	35.59	340	169	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT40 CH 102 5510MHz		11020	49.5	-24.5	74	20.07	39.48	25.29	35.34	163	230	P	H
		16530	47.72	-26.28	74	14.84	38.56	29.03	34.71	178	296	P	H
		11020	48.7	-25.3	74	19.27	39.48	25.29	35.34	163	230	P	V
		16530	45.45	-28.55	74	12.57	38.56	29.03	34.71	178	296	P	V
802.11n HT40 CH 110 5550MHz		11100	48.7	-25.3	74	19.24	39.41	25.37	35.32	163	230	P	H
		16650	46.68	-27.32	74	13.26	38.88	29.25	34.71	178	296	P	H
		11100	48.6	-25.4	74	19.14	39.41	25.37	35.32	163	230	P	V
		16650	44.78	-29.22	74	11.36	38.88	29.25	34.71	178	296	P	V
802.11n HT40 CH 134 5670MHz		11340	48.02	-25.98	74	18.47	39.19	25.62	35.26	170	200	P	H
		17010	47.6	-26.4	74	12.49	39.91	29.91	34.71	156	350	P	H
		11340	47.78	-26.22	74	18.23	39.19	25.62	35.26	170	200	P	V
		17010	45.37	-28.63	74	10.26	39.91	29.91	34.71	156	350	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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	(dBμV)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT40 LF		160.95	25.72	-17.78	43.5	41.76	12.05	2.37	30.46	150	360	P	H
		285.11	23.76	-22.24	46	37.22	13.76	3.08	30.3	-	-	P	H
		443.22	19.89	-26.11	46	28.98	17.03	3.92	30.04	-	-	P	H
		616.85	21.73	-24.27	46	27.56	19.34	4.58	29.75	-	-	P	H
		805.03	24.04	-21.96	46	27.04	20.98	5.43	29.41	-	-	P	H
		971.87	26.32	-27.68	54	27.16	22.29	5.98	29.11	-	-	P	H
		34.85	36.09	-3.91	40	50.18	15.55	0.99	30.63	150	0	P	V
		113.42	29.39	-14.11	43.5	45.36	12.65	1.89	30.51	-	-	P	V
		258.92	21.76	-24.24	46	36.46	12.69	2.95	30.34	-	-	P	V
		486.87	19.88	-26.12	46	28	17.68	4.16	29.96	-	-	P	V
		684.75	21.95	-24.05	46	26.91	19.78	4.93	29.67	-	-	P	V
		890.39	24.71	-21.29	46	26.41	21.78	5.78	29.26	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

**Note symbol**

*	<b>Fundamental Frequency</b> 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 <b>over limit</b> line.
P/A	<b>P</b> eak or <b>A</b> verage
H/V	<b>H</b> orizontal or <b>V</b> 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.
				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		( 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”.