

# FCC RF Test Report

**APPLICANT** : ZTE CORPORATION  
**EQUIPMENT** : Andriod Phone (SmartPhone)  
**BRAND NAME** : ZTE  
**MODEL NAME** : ZTE-U V960, ZTE-SKATE  
**FCC ID** : Q78-ZTEUV960  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : Digital Transmission System (DTS)

The product was received on Sep. 26, 2011 and completely tested on Sep. 28, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



**SPORTON INTERNATIONAL (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



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## SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 9.10 dB at 1.72 MHz
3.7	15.247(d)	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.58 dB at 49.17 MHz
3.8	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

# 1 General Description

## 1.1 Applicant

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.2 Manufacturer

**ZTE CORPORATION**

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
<b>Equipment</b>	Andriod Phone (SmartPhone)
<b>Brand Name</b>	ZTE
<b>Model Name</b>	ZTE-U V960, ZTE-SKATE
<b>FCC ID</b>	Q78-ZTEUV960
<b>Tx/Rx Frequency Range</b>	2400 MHz ~ 2483.5 MHz
<b>Number of Channels</b>	11
<b>Carrier Frequency of Each Channel</b>	2412+(n-1)*5 MHz; n=1~11
<b>Channel Spacing</b>	5 MHz
<b>Maximum Output Power to Antenna</b>	802.11b : 19.89 dBm (0.097 W) 802.11g : 19.81 dBm (0.096 W) 802.11n (BW 20MHz) : 19.56 dBm (0.090 W)
<b>Antenna Type</b>	PIFA Antenna with gain -1.8 dBi
<b>HW Version</b>	p5qB
<b>SW Version</b>	TELCEL_P743USV1.0.0B01
<b>Type of Modulation</b>	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
<b>EUT Stage</b>	Identical Prototype

**Remark:**

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.		
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		
	TH01-KS	CO01-KS	03CH01-KS

## 1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (Certification), recorded in a separate test report.

## 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	Signal Generator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
4.	Router	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
6.	Notebook	Acer	Trave Imate 2413 Lci	QDS-BRCM1016	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m

## 2 Test Configuration of Equipment Under Test

### 2.1 RF Power

Preliminary tests were performed in different data rate and recorded the RF power output in the following table:

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	19.44	19.08	19.03	19.18
CH 06	2437 MHz	19.58	19.66	19.39	19.73
CH 11	2462 MHz	19.86	19.82	19.66	<b>19.89</b>

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	19.12	18.86	18.22	17.88	17.44	17.51	17.52	17.41
CH 06	2437 MHz	19.76	19.12	18.56	18.08	18.16	18.21	18.16	18.01
CH 11	2462 MHz	<b>19.81</b>	19.22	18.27	18.26	18.12	18.27	18.26	18.23

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	19.12	17.84	17.54	17.43	17.73	17.62	17.54	17.12
CH 06	2437 MHz	<b>19.56</b>	18.32	18.12	18.21	18.02	18.08	17.74	17.75
CH 11	2462 MHz	19.26	18.09	17.91	18.26	17.74	17.86	17.75	17.47

**Remark:**

1. The data rates of WLAN 802.11b/g/n were set in 11Mbps for 802.11b, 6Mbps for 802.11g and 6.5Mbps for 802.11n (BW 20MHz) for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.



## 2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 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), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

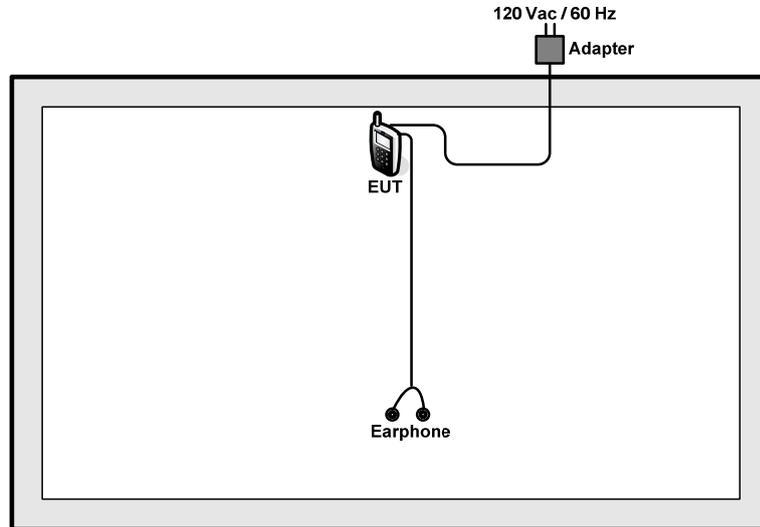
The following tables are showing the test modes as the worst cases (E1 and H plane) and recorded in this report.

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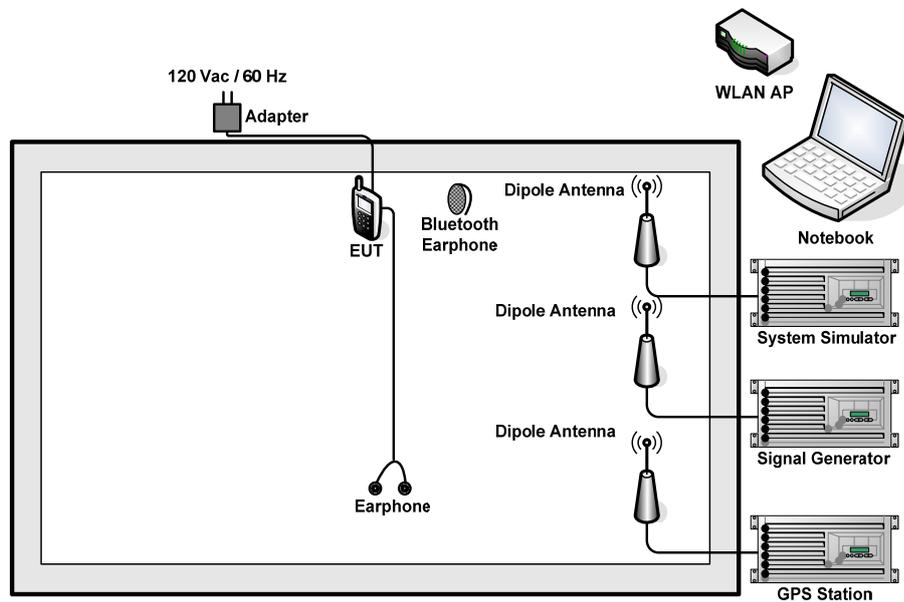
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
AC Conducted Emission	Mode 1 : GSM 850 Idle + Bluetooth Link + WIFI Link + Adapter + Earphone + FM Rx + GPS Rx	
<b>Remark:</b> The worst case of conducted emission is mode 1; only the test data of it was reported.		

## 2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>





## **2.4 RF Utility**

The programmed RF utility "cmd.exe" is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

### 3 Test Result

#### 3.1 6dB Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

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

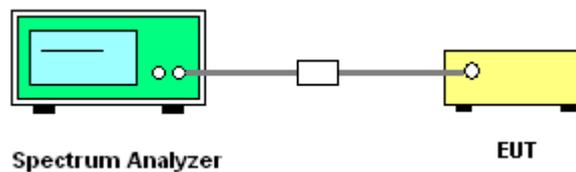
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.  
In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

##### 3.1.4 Test Setup





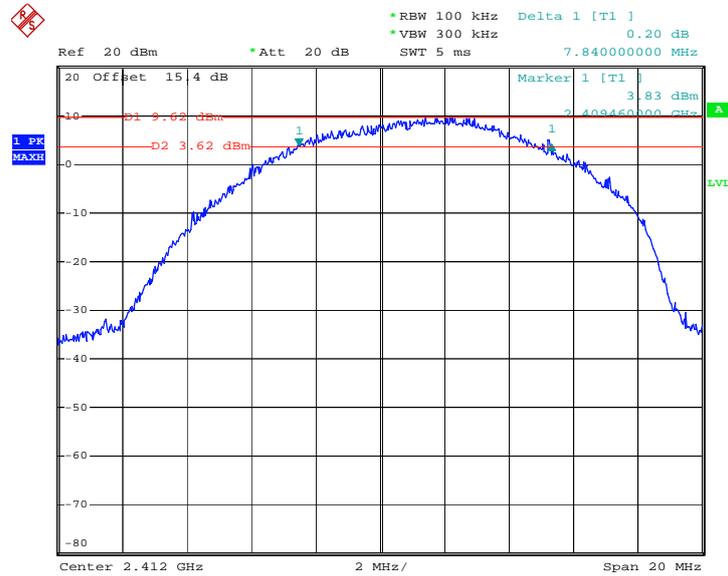
3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

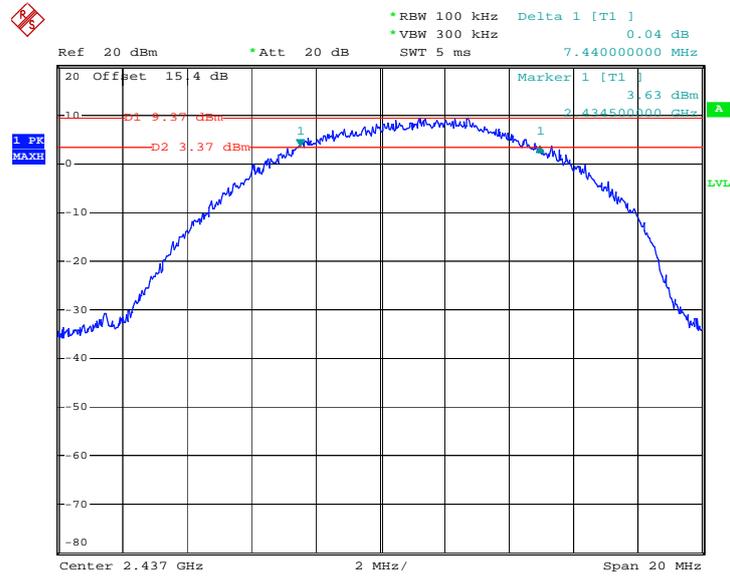
Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.84	0.5	Pass
06	2437	7.44	0.5	Pass
11	2462	7.76	0.5	Pass

Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01

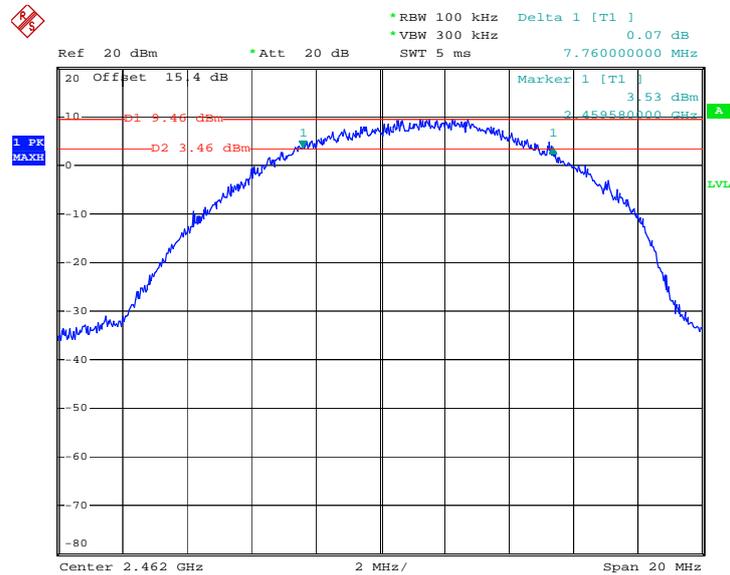




Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11

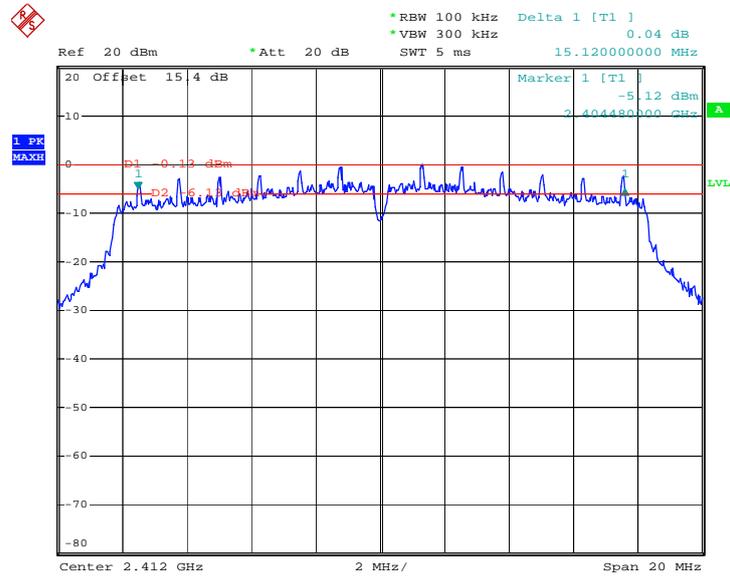




Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

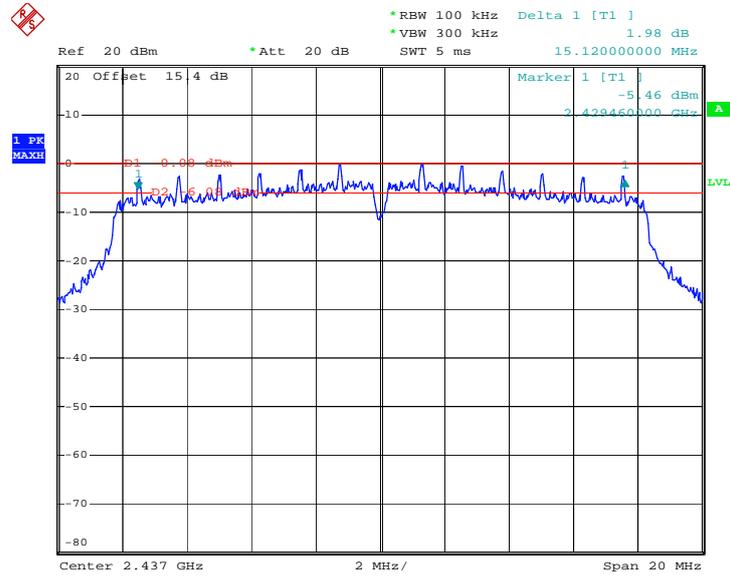
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.12	0.5	Pass
06	2437	15.12	0.5	Pass
11	2462	15.16	0.5	Pass

Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01

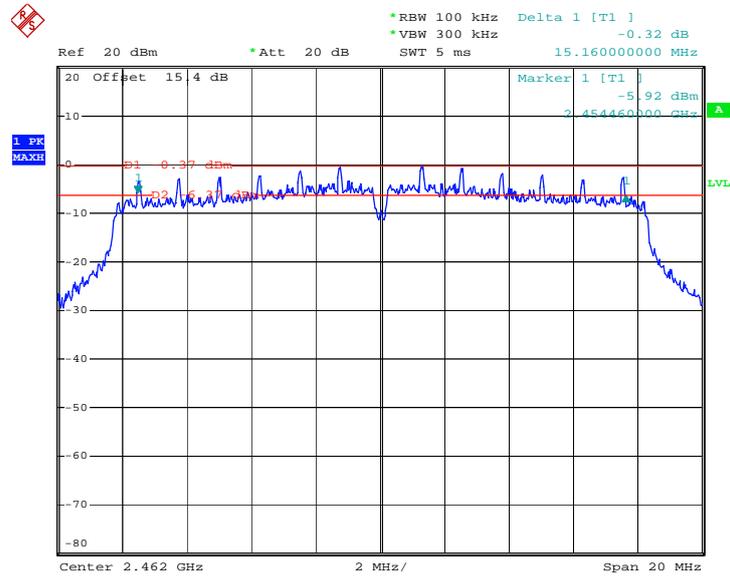




Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11

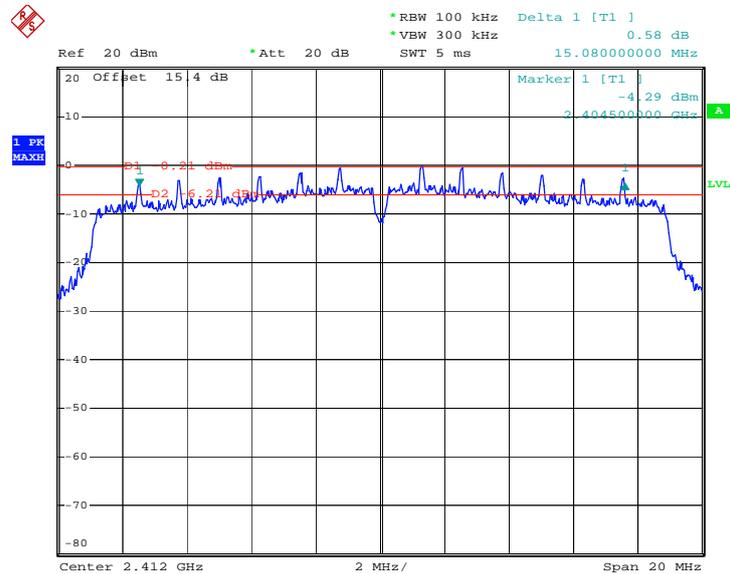




Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

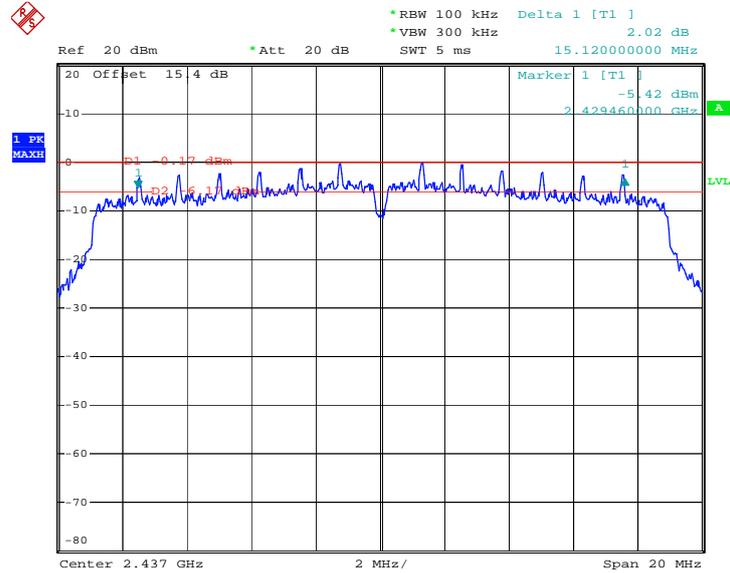
Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.08	0.5	Pass
06	2437	15.12	0.5	Pass
11	2462	15.16	0.5	Pass

Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01

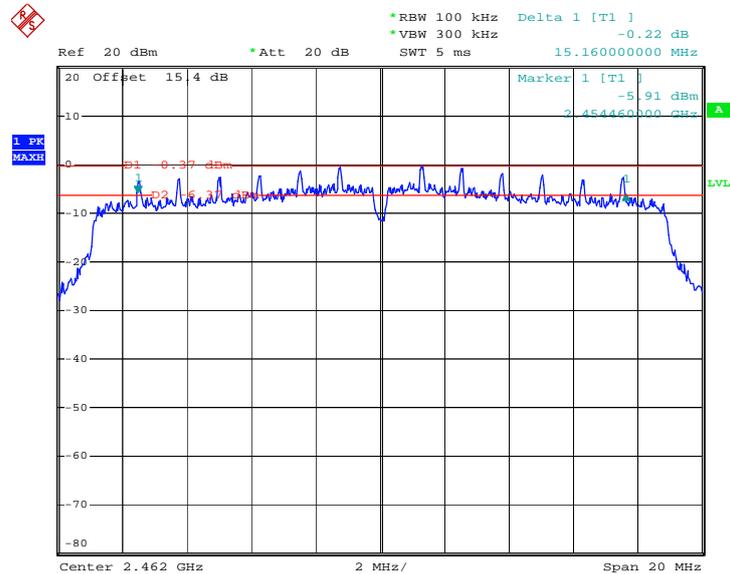




Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Mode 9 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 11



## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

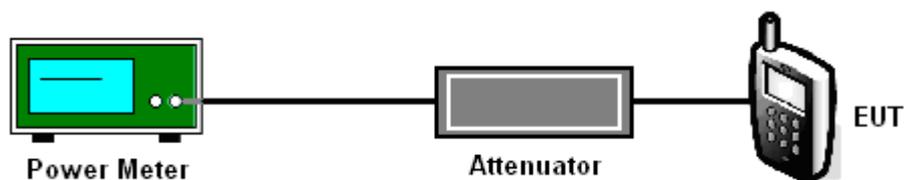
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the power meter by a low loss cable.
3. Measure the power by power meter.

### 3.2.4 Test Setup





3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.18	30	Pass
06	2437	19.73	30	Pass
11	2462	19.89	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.12	30	Pass
06	2437	19.76	30	Pass
11	2462	19.81	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.12	30	Pass
06	2437	19.56	30	Pass
11	2462	19.26	30	Pass

### 3.3 Band Edges Measurement

#### 3.3.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

#### 3.3.2 Measuring Instruments

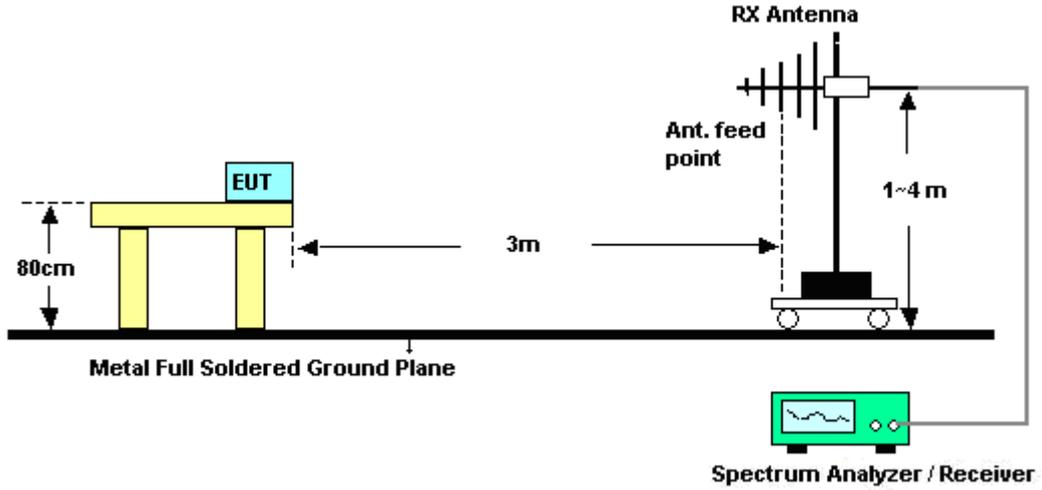
See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

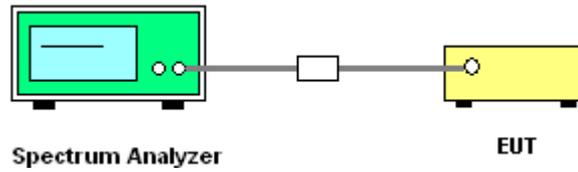
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Apply to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation as in FCC Section 15.35(b) and (c).

### 3.3.4 Test Setup

#### <Radiated Band Edges>



#### <Conducted Band Edges>





3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	21~22°C
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2334.13	55.11	-18.89	74	52.98	32.76	3.27	33.9	134	328	Peak
2334.13	41.93	-12.07	54	39.8	32.76	3.27	33.9	134	328	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2334.13	55.12	-18.88	74	52.99	32.76	3.27	33.9	102	314	Peak
2334.13	41.24	-12.76	54	39.11	32.76	3.27	33.9	102	314	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.66	58.78	-15.22	74	56.29	33.01	3.68	34.2	103	339	Peak
2483.66	40.76	-13.24	54	38.27	33.01	3.68	34.2	103	339	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	52.09	-21.91	74	49.6	33.01	3.68	34.2	118	297	Peak
2483.5	40.65	-13.35	54	38.16	33.01	3.68	34.2	118	297	Average



Test Mode :	Mode 4	Temperature :	21~22°C
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.61	60.45	-13.55	74	58.17	32.86	3.47	34.05	161	333	Peak
2389.61	44.62	-9.38	54	42.34	32.86	3.47	34.05	161	333	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.99	61.01	-12.99	74	58.73	32.86	3.47	34.05	126	266	Peak
2389.99	44.2	-9.8	54	41.92	32.86	3.47	34.05	126	266	Average

Test Mode :	Mode 6	Temperature :	21~22°C
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	64.92	-9.08	74	62.43	33.01	3.68	34.2	107	61	Peak
2483.5	42.47	-11.53	54	39.98	33.01	3.68	34.2	107	61	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	62.62	-11.38	74	60.13	33.01	3.68	34.2	122	261	Peak
2483.5	44.1	-9.9	54	41.61	33.01	3.68	34.2	122	261	Average



Test Mode :	Mode 7	Temperature :	21~22°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.99	58.39	-15.61	74	56.11	32.86	3.47	34.05	100	353	Peak
2389.99	40.3	-13.7	54	38.02	32.86	3.47	34.05	100	353	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2389.8	53.8	-20.2	74	51.52	32.86	3.47	34.05	130	266	Peak
2389.8	39.1	-14.9	54	36.82	32.86	3.47	34.05	130	266	Average

Test Mode :	Mode 9	Temperature :	21~22°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	51.5	-22.5	74	49.01	33.01	3.68	34.2	182	67	Peak
2483.5	39.59	-14.41	54	37.1	33.01	3.68	34.2	182	67	Average

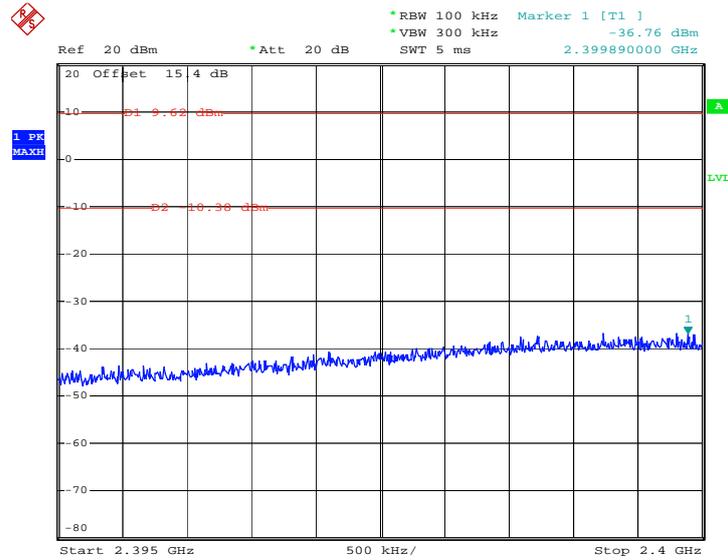
ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.66	54.58	-19.42	74	52.09	33.01	3.68	34.2	100	301	Peak
2483.66	42.69	-11.31	54	40.2	33.01	3.68	34.2	100	301	Average



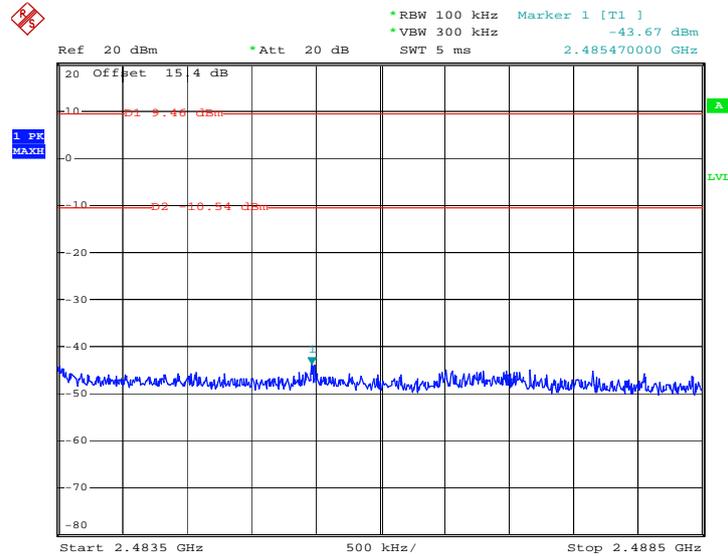
### 3.3.6 Test Plots of Conducted Band Edges

Test Mode :	Mode 1 and 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	45~47%
Test Channel :	01 and 11	Test Engineer :	Jun Liu

Low Band Edge Plot on 802.11b Channel 01



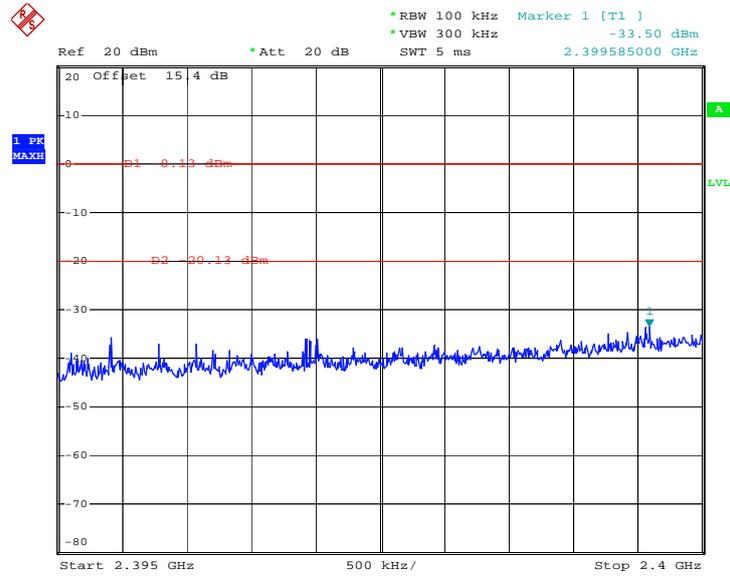
High Band Edge Plot on 802.11b Channel 11



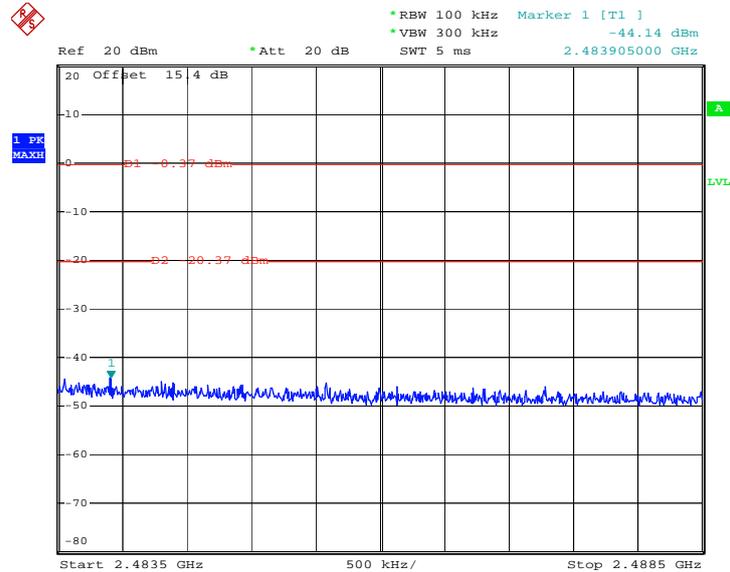


Test Mode :	Mode 4 and 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	45~47%
Test Channel :	01 and 11	Test Engineer :	Jun Liu

Low Band Edge Plot on 802.11g Channel 01



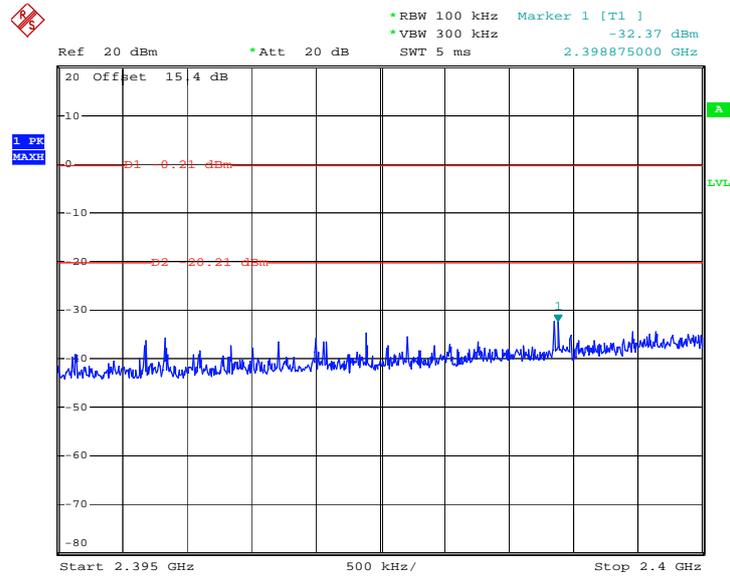
High Band Edge Plot on 802.11g Channel 11



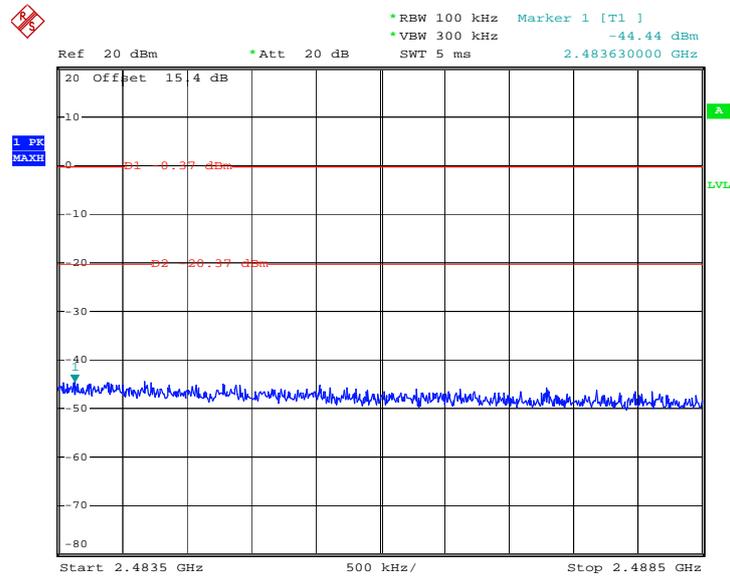


Test Mode :	Mode 7 and 9	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~47%
Test Channel :	01 and 11	Test Engineer :	Jun Liu

Low Band Edge Plot on 802.11n (BW 20MHz) Channel 01



High Band Edge Plot on 802.11n (BW 20MHz) Channel 11



## 3.4 Spurious Emission Measurement

### 3.4.1 Limit of Spurious Emission Measurement

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

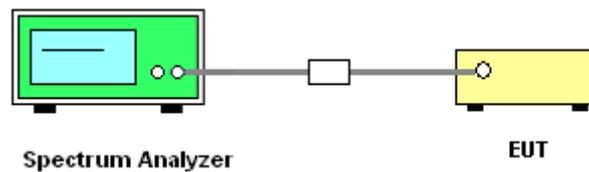
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

### 3.4.4 Test Setup

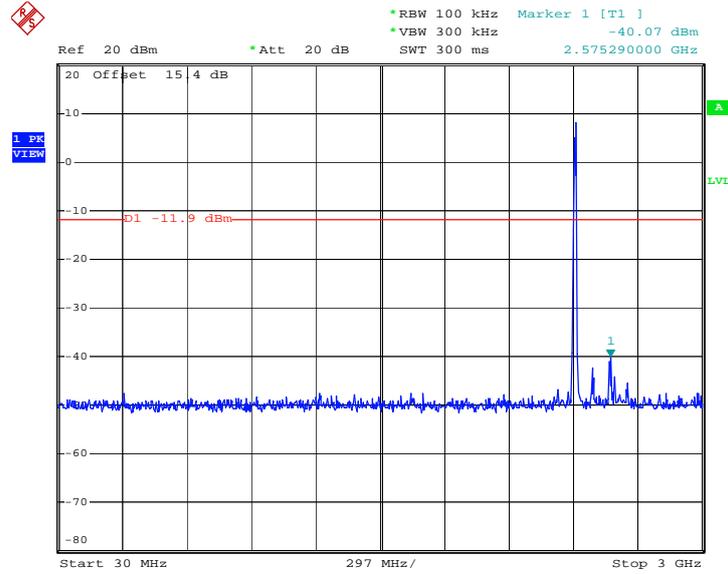




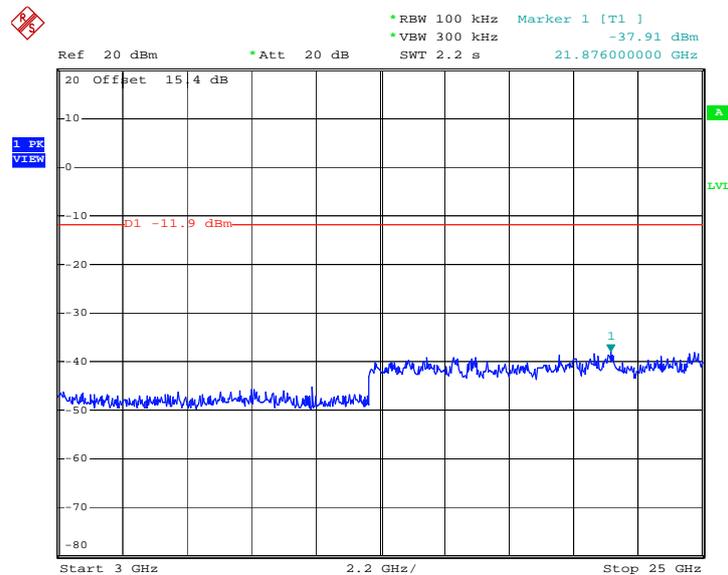
### 3.4.5 Test Plots of Spurious Emission

Test Mode :	Mode 1	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	45~47%
Test Channel :	01	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



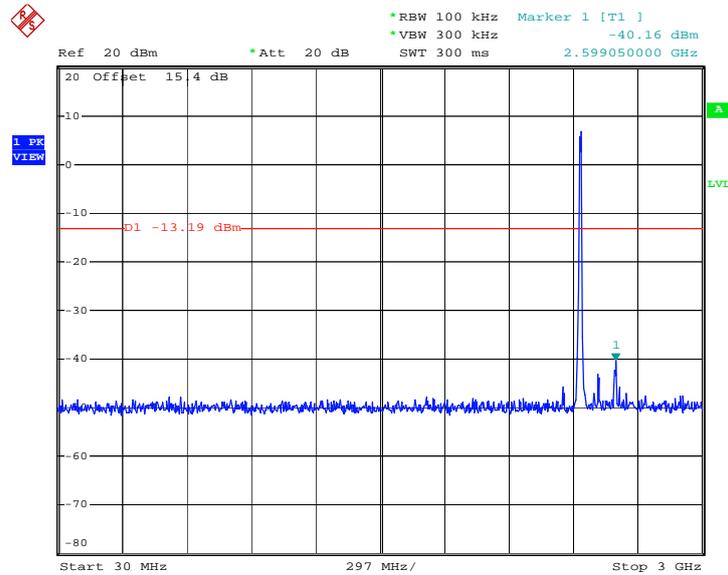
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



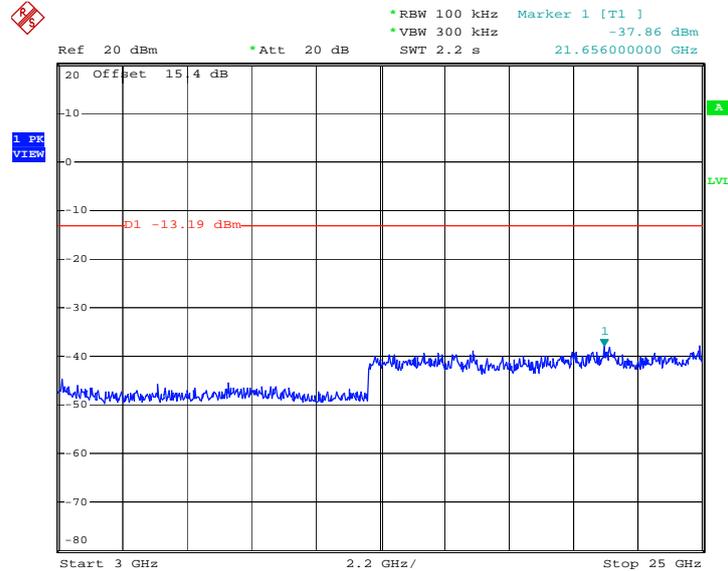


Test Mode :	Mode 2	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	45~47%
Test Channel :	06	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



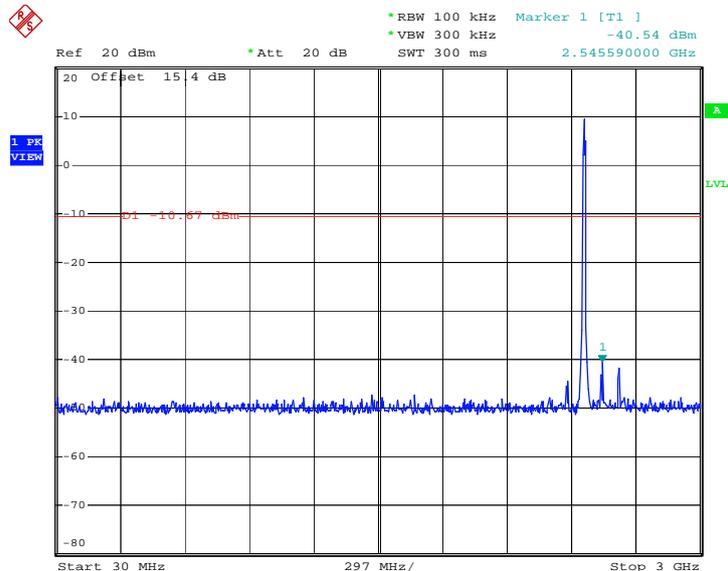
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



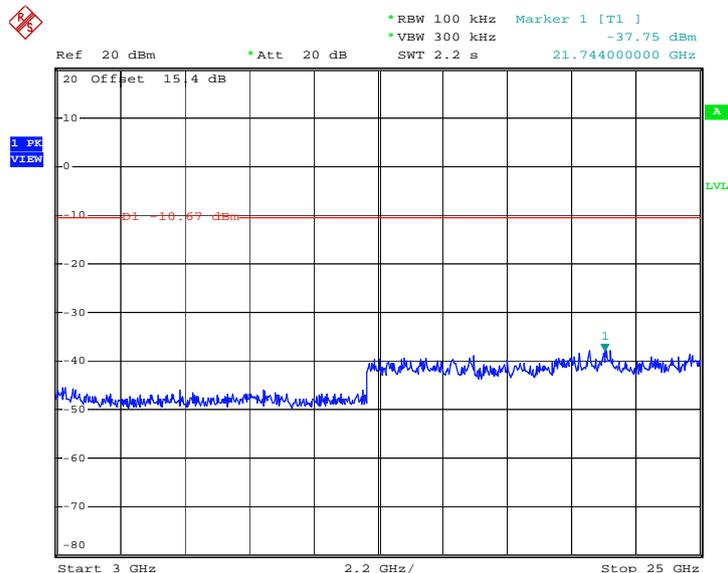


Test Mode :	Mode 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	45~47%
Test Channel :	11	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



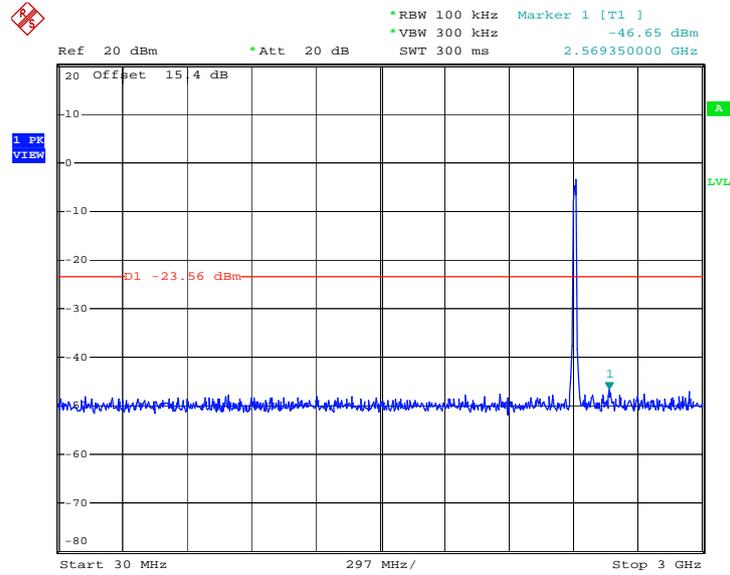
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



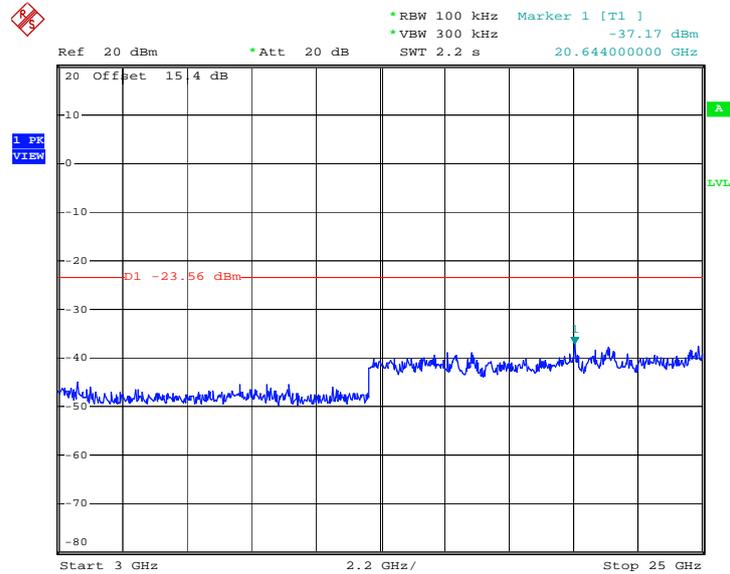


Test Mode :	Mode 4	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	45~47%
Test Channel :	01	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



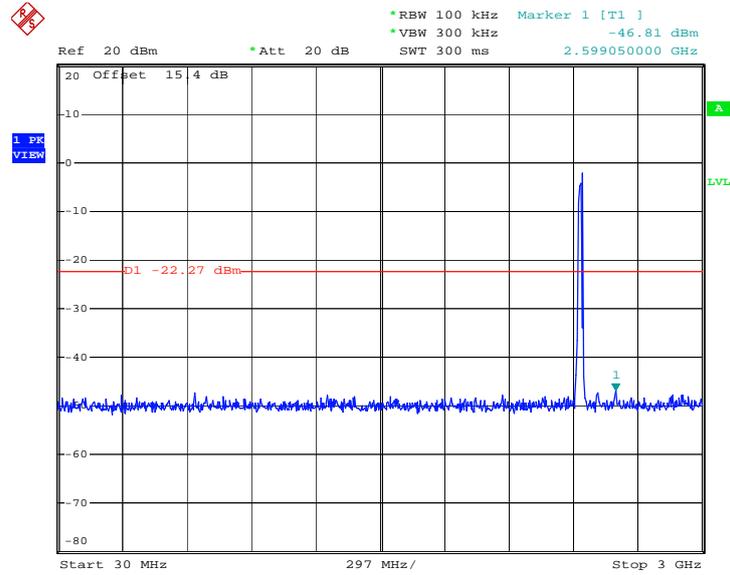
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



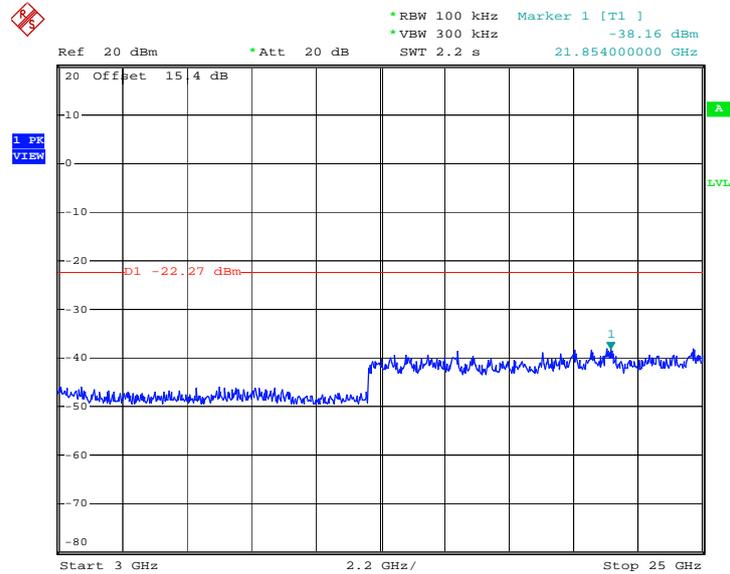


Test Mode :	Mode 5	Temperature :	23~24
Test Band :	802.11g	Relative Humidity :	45~47
Test Channel :	06	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



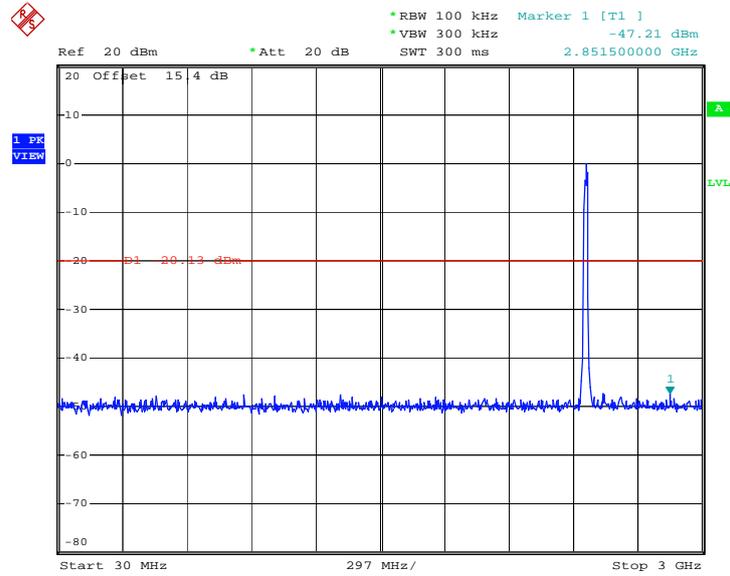
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



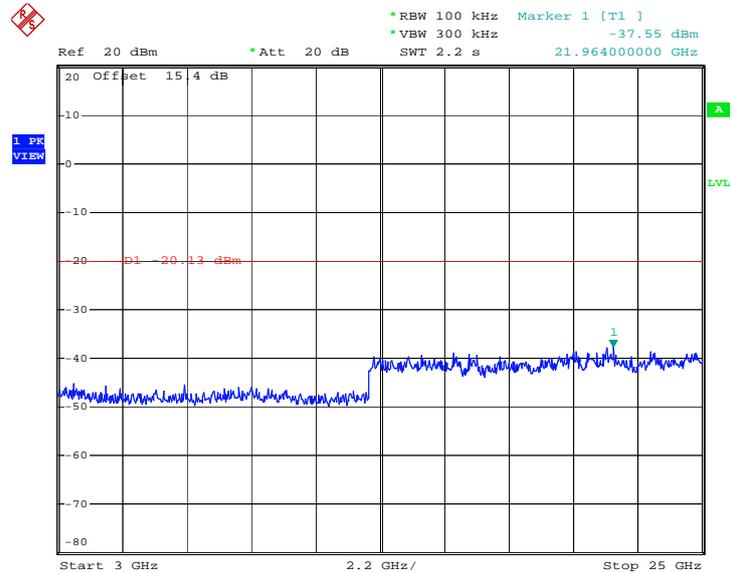


Test Mode :	Mode 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	45~47%
Test Channel :	11	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



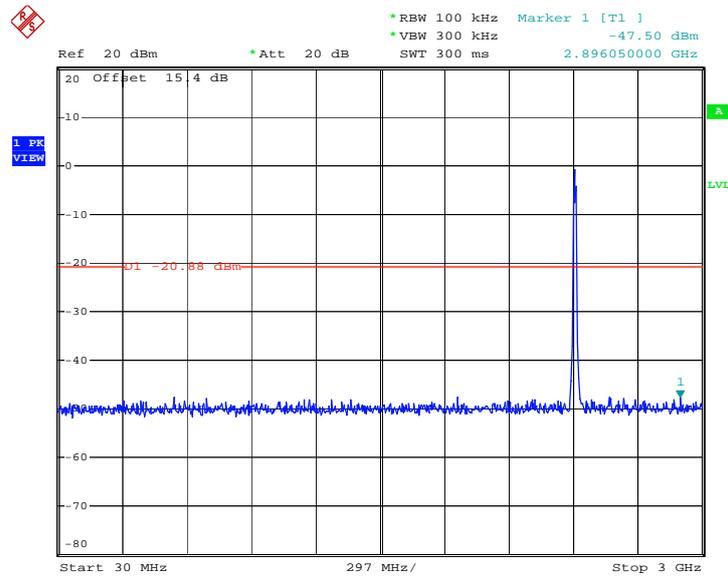
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



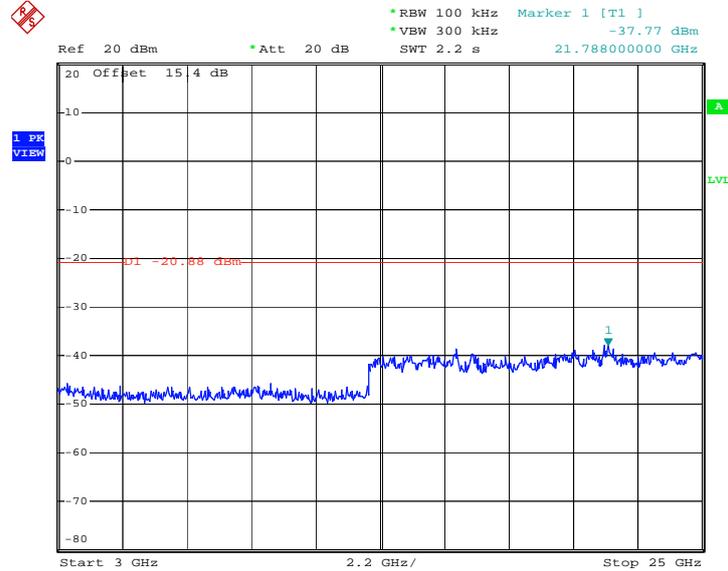


Test Mode :	Mode 7	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~47%
Test Channel :	01	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



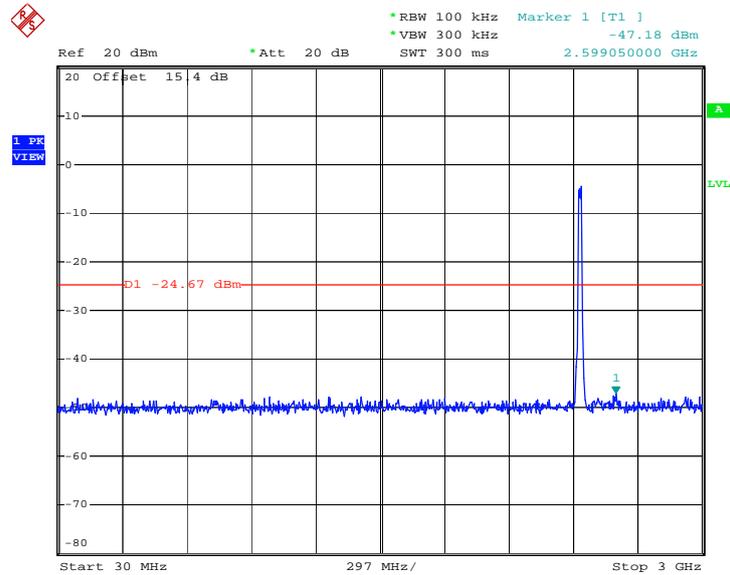
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



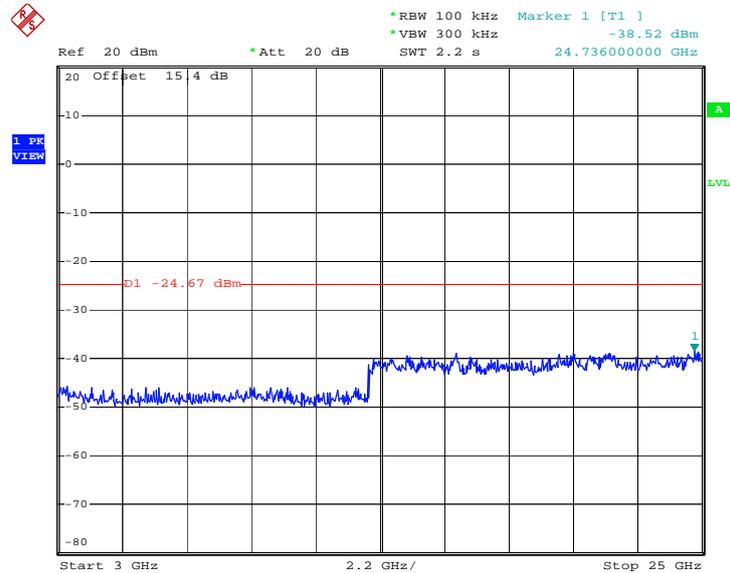


Test Mode :	Mode 8	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~47%
Test Channel :	06	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



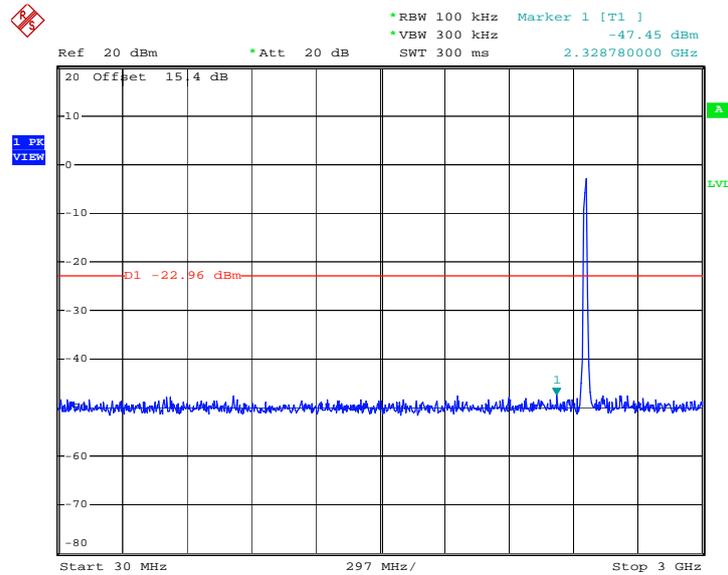
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



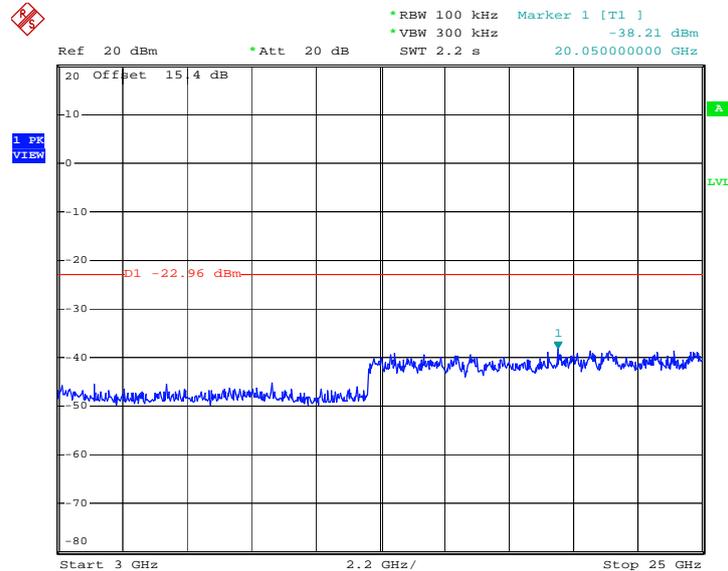


Test Mode :	Mode 9	Temperature :	23~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~47%
Test Channel :	11	Test Engineer :	Jun Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



### 3.5 Power Spectral Density Measurement

#### 3.5.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

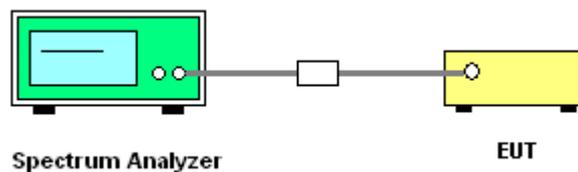
#### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.5.3 Test Procedures

1. The test follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Take the measured data from spectrum analyzer.

#### 3.5.4 Test Setup



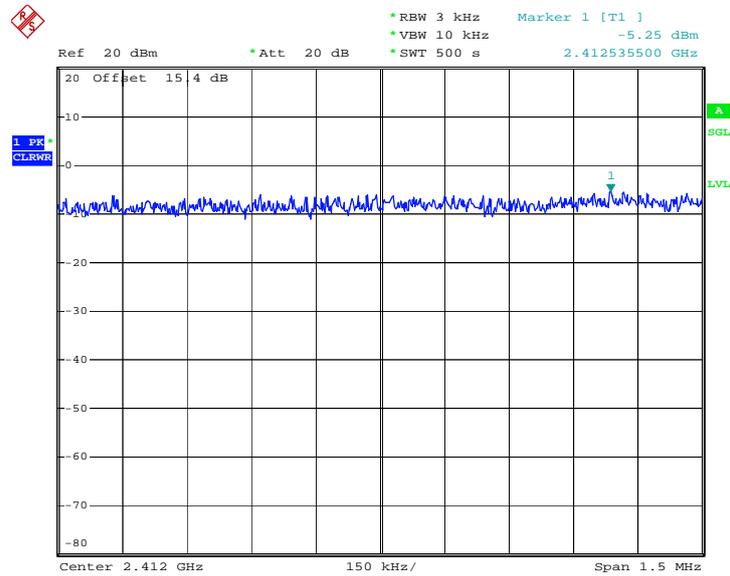


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

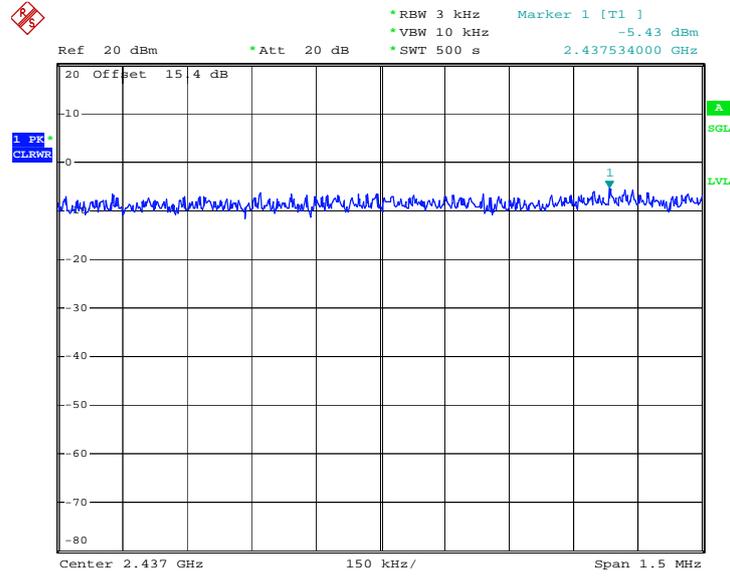
Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-5.25	8	Pass
06	2437	-5.43	8	Pass
11	2462	-5.38	8	Pass

Mode 1 : PSD Plot on 802.11b Channel 01

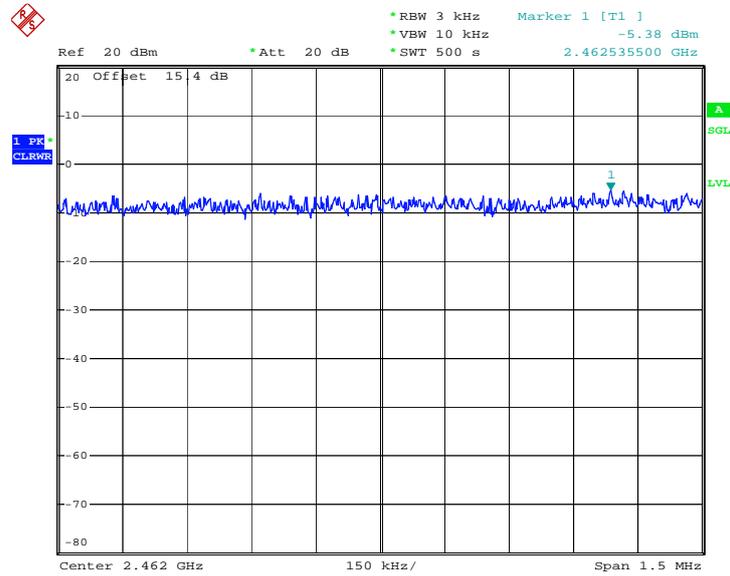




Mode 2 : PSD Plot on 802.11b Channel 06



Mode 3 : PSD Plot on 802.11b Channel 11

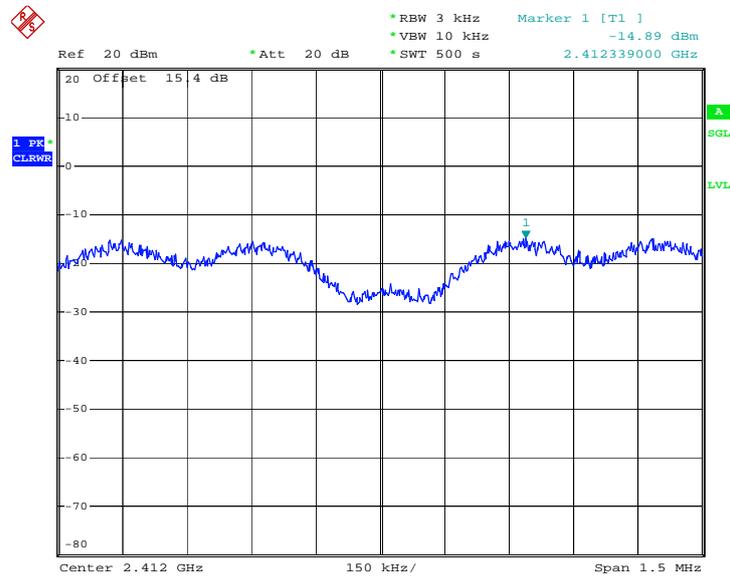




Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

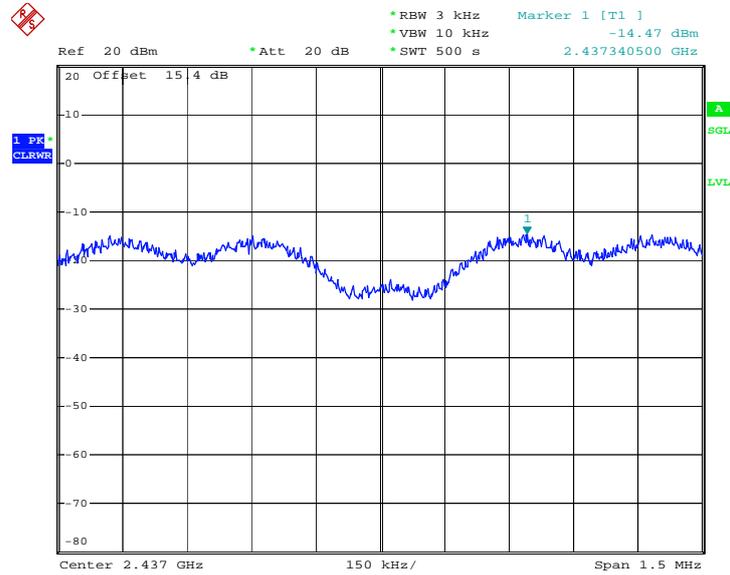
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-14.89	8	Pass
06	2437	-14.47	8	Pass
11	2462	-14.98	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01

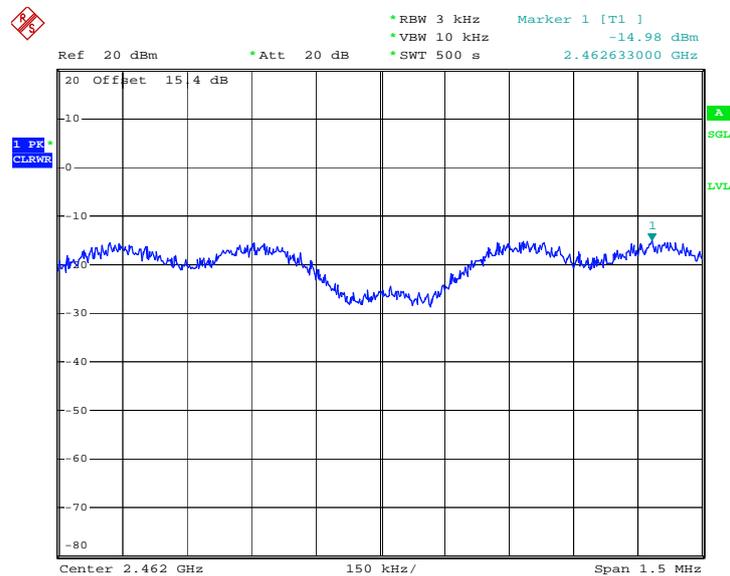




Mode 5 : PSD Plot on 802.11g Channel 06



Mode 6 : PSD Plot on 802.11g Channel 11

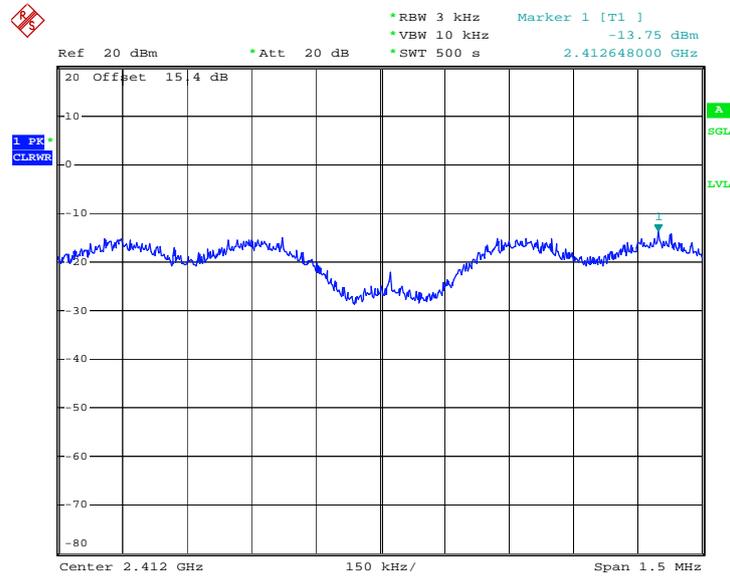




Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Jun Liu	Relative Humidity :	45~47%

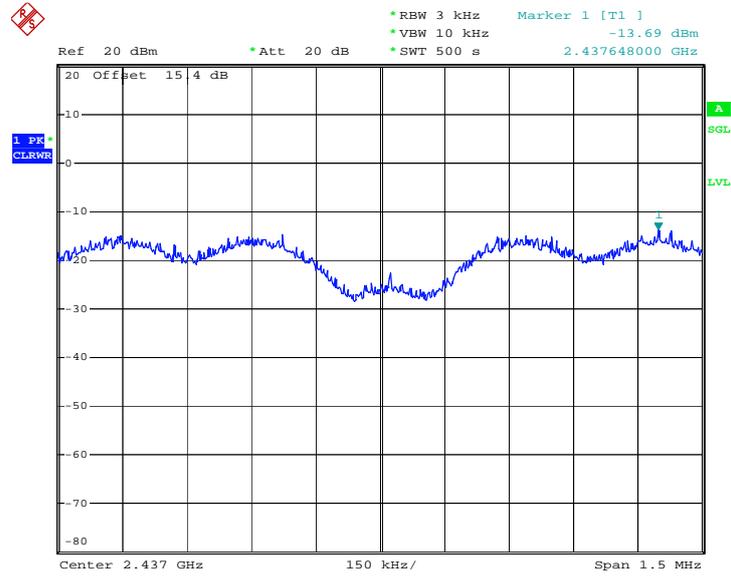
Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-13.75	8	Pass
06	2437	-13.69	8	Pass
11	2462	-13.91	8	Pass

Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01

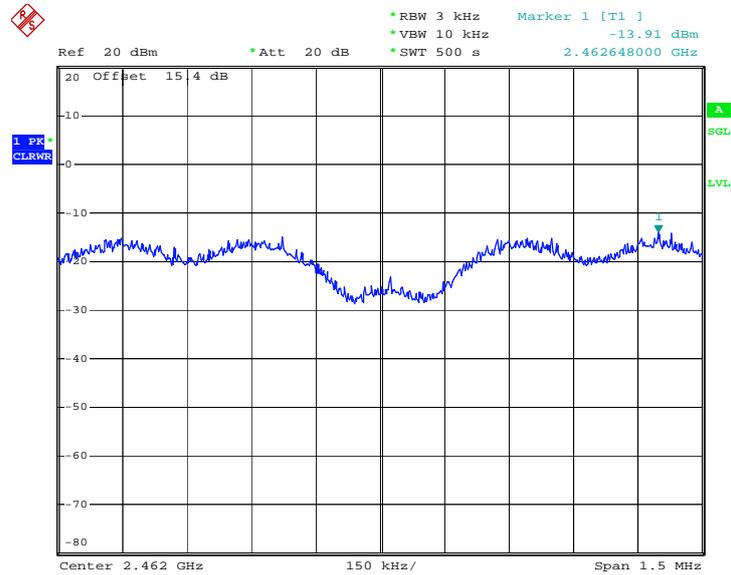




Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06



Mode 9 : PSD Plot on 802.11n (BW 20MHz) Channel 11



## 3.6 AC Conducted Emission Measurement

### 3.6.1 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 (dBuV)	
	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.

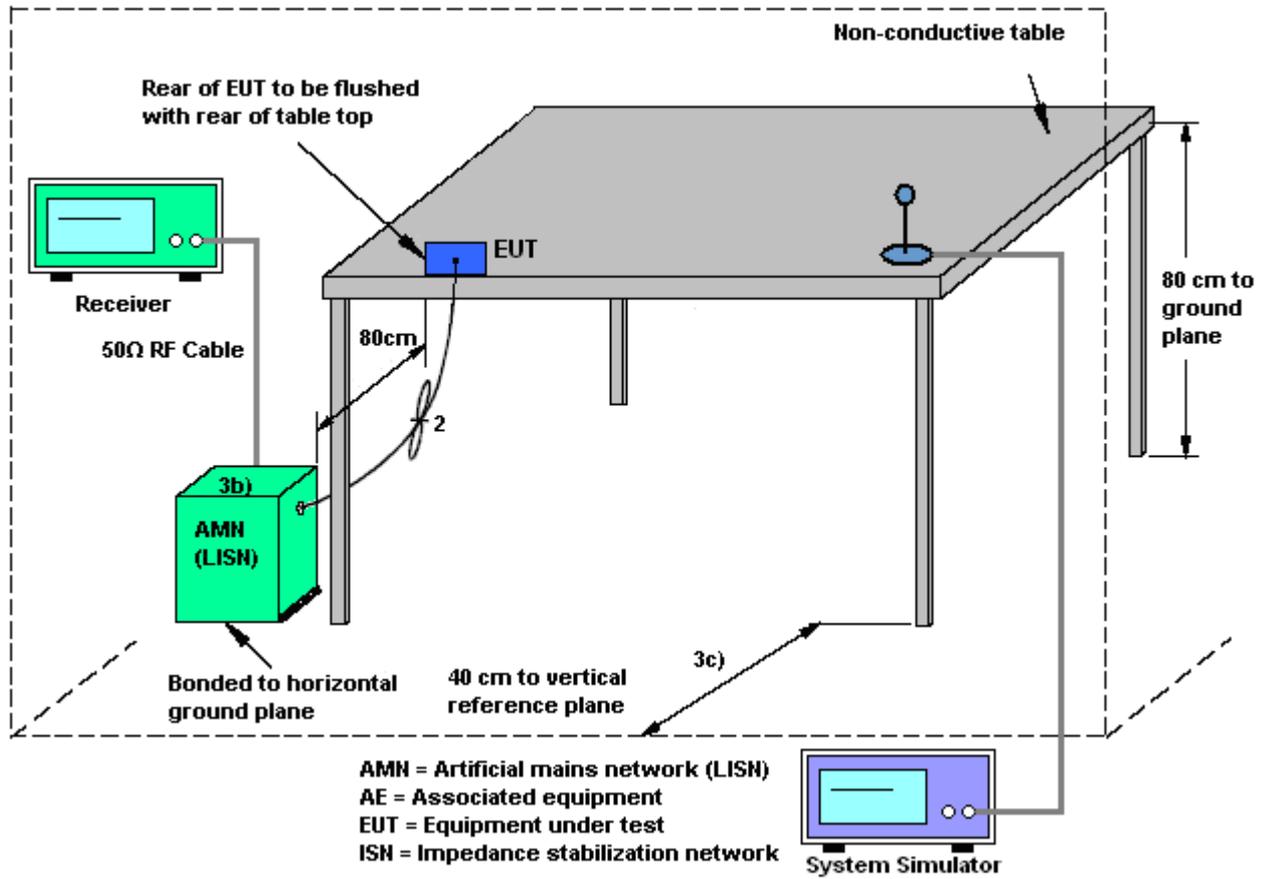
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

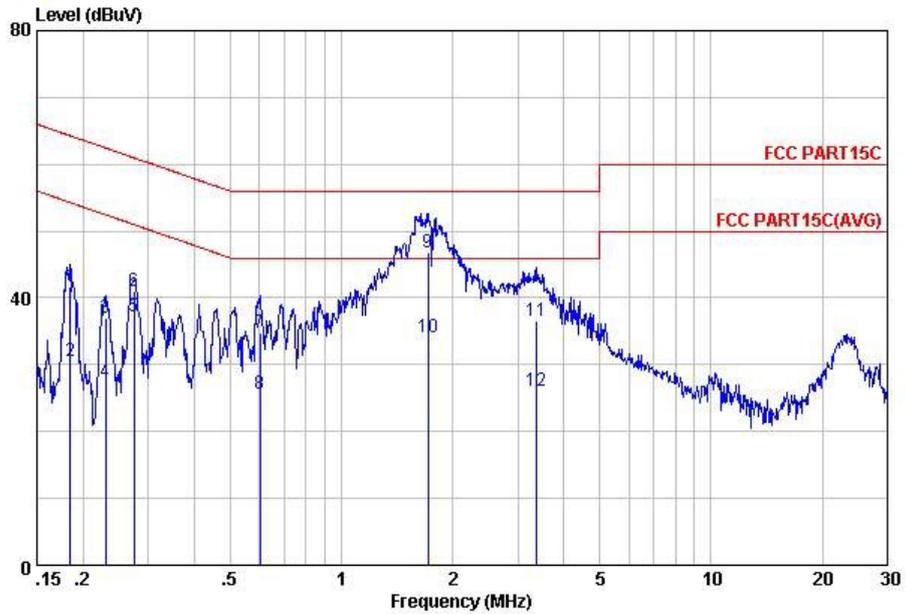
### 3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Jun Liu	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM 850 Idle + Bluetooth Link + WIFI Link + Adapter + Earphone + FM Rx + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

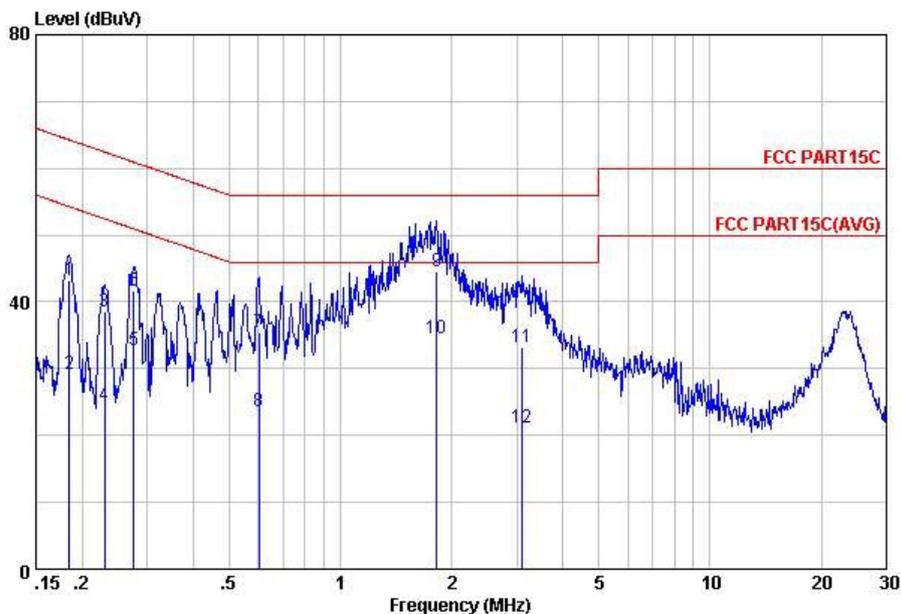


Site : C001-KS  
 Condition: FCC PART15C LISN-100807 LINE  
 Project : (ER) 192604  
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.18	41.78	-22.50	64.28	31.70	-0.07	10.15	QP
2	0.18	30.48	-23.80	54.28	20.40	-0.07	10.15	Average
3	0.23	36.99	-25.45	62.44	26.90	-0.07	10.16	QP
4	0.23	27.39	-25.05	52.44	17.30	-0.07	10.16	Average
5	0.27	37.29	-13.69	50.98	27.20	-0.07	10.16	Average
6	0.27	41.09	-19.89	60.98	31.00	-0.07	10.16	QP
7	0.60	34.74	-21.26	56.00	24.61	-0.09	10.22	QP
8	0.60	25.74	-20.26	46.00	15.61	-0.09	10.22	Average
9	1.72	46.90	-9.10	56.00	36.70	-0.11	10.31	QP
10	1.72	34.00	-12.00	46.00	23.80	-0.11	10.31	Average
11	3.38	36.55	-19.45	56.00	26.29	-0.12	10.38	QP
12	3.38	26.15	-19.85	46.00	15.89	-0.12	10.38	Average



Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Jun Liu	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM 850 Idle + Bluetooth Link + WIFI Link + Adapter + Earphone + FM Rx + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS  
 Condition: FCC PART15C LISN-100807 NEUTRAL  
 Project : (FR) 192604  
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.18	43.17	-21.11	64.28	33.09	-0.07	10.15	QP
2	0.18	29.17	-25.11	54.28	19.09	-0.07	10.15	Average
3	0.23	38.49	-23.95	62.44	28.40	-0.07	10.16	QP
4	0.23	24.49	-27.95	52.44	14.40	-0.07	10.16	Average
5	0.28	32.69	-18.25	50.94	22.59	-0.07	10.17	Average
6	0.28	41.69	-19.25	60.94	31.59	-0.07	10.17	QP
7	0.60	35.54	-20.46	56.00	25.40	-0.08	10.22	QP
8	0.60	23.64	-22.36	46.00	13.50	-0.08	10.22	Average
9	1.82	44.61	-11.39	56.00	34.40	-0.11	10.32	QP
10	1.82	34.51	-11.49	46.00	24.30	-0.11	10.32	Average
11	3.11	33.25	-22.75	56.00	23.00	-0.12	10.37	QP
12	3.11	21.15	-24.85	46.00	10.90	-0.12	10.37	Average

### 3.7 Radiated Emission Measurement

#### 3.7.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

#### 3.7.2 Measuring Instruments

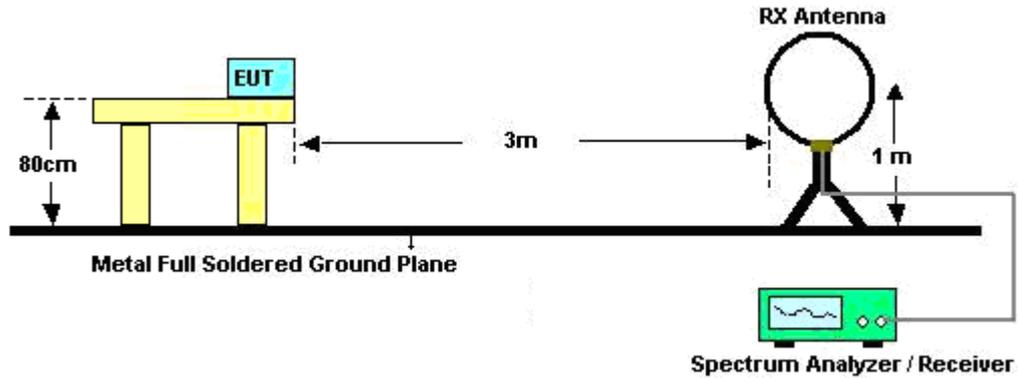
See list of measuring instruments of this test report.

#### 3.7.3 Test Procedures

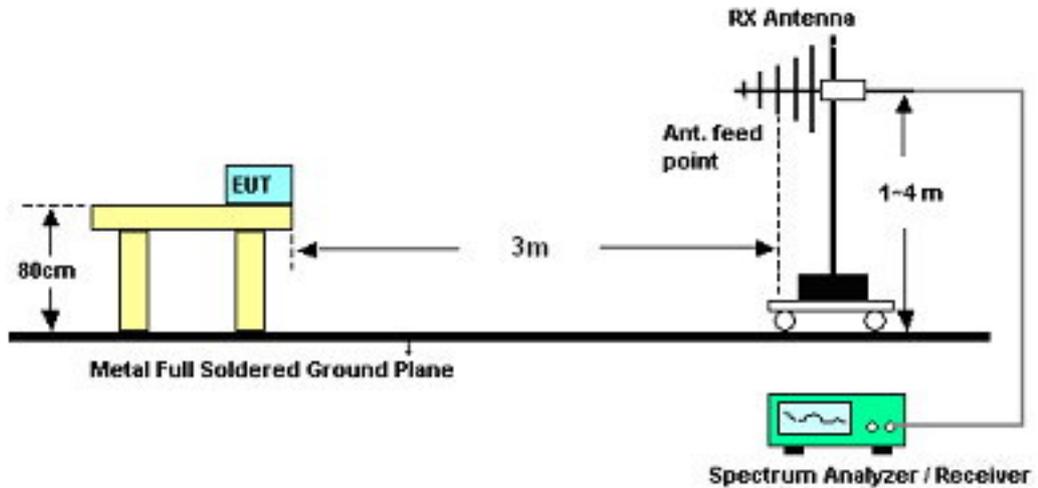
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
  - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
  - Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.  
Distance extrapolation factor =  $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$  (dB)
- Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

### 3.7.4 Test Setup

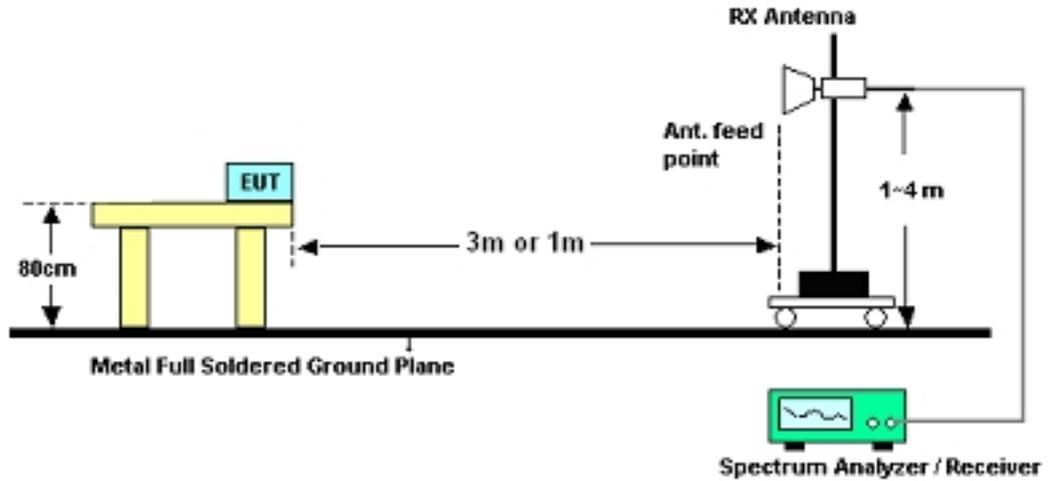
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	Jack Li	Temperature :	21~22°C	
		Relative Humidity :	41~42%	
Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

**Note:**

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.



3.7.6 Test Result of Radiated Emission (30 MHz ~ 10<sup>th</sup> Harmonic)

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.43	25.93	-14.07	40	39.74	16.04	0.24	30.09	100	360	Peak
120.99	26.04	-17.46	43.5	43.77	11.79	0.45	29.97	-	-	Peak
246	21.53	-24.47	46	38.85	11.84	0.67	29.83	-	-	Peak
860.7	24.21	-21.79	46	32.06	20.5	1.28	29.63	-	-	Peak
872.6	26.26	-19.74	46	34.07	20.48	1.29	29.58	-	-	Peak
946.8	32.44	-21.56	54	39.93	20.72	1.33	29.54	-	-	Peak
2334.13	55.11	-18.89	74	52.98	32.76	3.27	33.9	134	328	Peak
2334.13	41.93	-12.07	54	39.8	32.76	3.27	33.9	134	328	Average
2412	112.58	-	-	110.25	32.89	3.52	34.08	103	345	Peak
2412	69.24	-	-	66.91	32.89	3.52	34.08	103	345	Average
2494.68	60.41	-13.59	74	57.87	33.05	3.72	34.23	131	344	Peak
2494.68	43.94	-10.06	54	41.4	33.05	3.72	34.23	131	344	Average



Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
50.25	35.93	-4.07	40	58.38	7.4	0.28	30.13	200	344	Peak
112.89	31.61	-11.89	43.5	49.34	11.8	0.44	29.97	-	-	Peak
147.45	28.1	-15.4	43.5	47.37	10.21	0.5	29.98	-	-	Peak
792.1	23.18	-22.82	46	31.66	19.86	1.24	29.58	-	-	Peak
871.9	24.86	-21.14	46	32.67	20.49	1.29	29.59	-	-	Peak
946.8	31.69	-22.31	54	39.18	20.72	1.33	29.54	-	-	Peak
2334.13	55.12	-18.88	74	52.99	32.76	3.27	33.9	102	314	Peak
2334.13	41.24	-12.76	54	39.11	32.76	3.27	33.9	102	314	Average
2412	111.81	-	-	109.48	32.89	3.52	34.08	100	296	Peak
2412	69.2	-	-	66.87	32.89	3.52	34.08	100	296	Average
2495.44	56.65	-17.35	74	54.11	33.05	3.72	34.23	161	239	Peak
2495.44	41.78	-12.22	54	39.24	33.05	3.72	34.23	161	239	Average



Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.16	26.05	-13.95	40	39.35	16.55	0.24	30.09	177	243	Peak
122.88	27.29	-16.21	43.5	45.03	11.77	0.46	29.97	-	-	Peak
246	27.23	-18.77	46	44.55	11.84	0.67	29.83	-	-	Peak
832	23.21	-22.79	46	31.28	20.3	1.27	29.64	-	-	Peak
872.6	26.7	-19.3	46	34.51	20.48	1.29	29.58	-	-	Peak
946.8	31.33	-22.67	54	38.82	20.72	1.33	29.54	-	-	Peak
2358.26	55.43	-18.57	74	53.22	32.81	3.38	33.98	200	331	Peak
2358.26	42.64	-11.36	54	40.43	32.81	3.38	33.98	200	331	Average
2437	112.19	-	-	109.79	32.95	3.6	34.15	127	327	Peak
2437	69.51	-	-	67.11	32.95	3.6	34.15	127	327	Average
2484.8	51.01	-22.99	74	48.52	33.01	3.68	34.2	167	354	Peak
2484.8	37.59	-16.41	54	35.1	33.01	3.68	34.2	167	354	Average



Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
49.71	34.84	-5.16	40	56.94	7.75	0.28	30.13	120	339	Peak
113.7	32.22	-11.28	43.5	49.95	11.8	0.44	29.97	-	-	Peak
246	28.43	-17.57	46	45.75	11.84	0.67	29.83	-	-	Peak
749.4	22.62	-23.38	46	31.08	19.9	1.18	29.54	-	-	Peak
871.2	24.04	-21.96	46	31.85	20.49	1.29	29.59	-	-	Peak
946.8	32.3	-21.7	54	39.79	20.72	1.33	29.54	-	-	Peak
2357.88	55.76	-18.24	74	53.55	32.81	3.38	33.98	154	266	Peak
2357.88	41.59	-12.41	54	39.38	32.81	3.38	33.98	154	266	Average
2437	110.55	-	-	108.15	32.95	3.6	34.15	150	297	Peak
2437	67.94	-	-	65.54	32.95	3.6	34.15	150	297	Average
2489.55	49.65	-24.35	74	47.11	33.05	3.72	34.23	166	312	Peak
2489.55	37.44	-16.56	54	34.9	33.05	3.72	34.23	166	312	Average



Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.43	26.05	-13.95	40	39.86	16.04	0.24	30.09	103	347	Peak
122.88	27.65	-15.85	43.5	45.39	11.77	0.46	29.97	-	-	Peak
246	23.75	-22.25	46	41.07	11.84	0.67	29.83	-	-	Peak
855.1	22.79	-23.21	46	30.65	20.5	1.28	29.64	-	-	Peak
871.9	26.37	-19.63	46	34.18	20.49	1.29	29.59	-	-	Peak
946.8	31.57	-22.43	54	39.06	20.72	1.33	29.54	-	-	Peak
2383.91	57.84	-16.16	74	55.6	32.83	3.42	34.01	132	0	Peak
2383.91	42.62	-11.38	54	40.38	32.83	3.42	34.01	132	0	Average
2462	113.7	-	-	111.25	32.98	3.64	34.17	103	337	Peak
2462	70.32	-	-	67.87	32.98	3.64	34.17	103	337	Average
2483.66	58.78	-15.22	74	56.29	33.01	3.68	34.2	103	339	Peak
2483.66	40.76	-13.24	54	38.27	33.01	3.68	34.2	103	339	Average



Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
49.98	35.37	-4.63	40	57.82	7.4	0.28	30.13	119	354	Peak
114.24	32.25	-11.25	43.5	49.98	11.8	0.44	29.97	-	-	Peak
147.45	28.17	-15.33	43.5	47.44	10.21	0.5	29.98	-	-	Peak
368.6	25.6	-20.4	46	39.69	14.98	0.83	29.9	-	-	Peak
872.6	24.71	-21.29	46	32.52	20.48	1.29	29.58	-	-	Peak
946.8	32.04	-21.96	54	39.53	20.72	1.33	29.54	-	-	Peak
2384.48	57.77	-16.23	74	55.53	32.83	3.42	34.01	125	261	Peak
2384.48	42.44	-11.56	54	40.2	32.83	3.42	34.01	125	261	Average
2462	108.15	-	-	105.7	32.98	3.64	34.17	118	296	Peak
2462	69.06	-	-	66.61	32.98	3.64	34.17	118	296	Average
2483.5	52.09	-21.91	74	49.6	33.01	3.68	34.2	118	297	Peak
2483.5	40.65	-13.35	54	38.16	33.01	3.68	34.2	118	297	Average



<b>Test Mode :</b>	Mode 4	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Jack Li	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.43	26.72	-13.28	40	40.53	16.04	0.24	30.09	200	360	Peak
119.1	24.1	-19.4	43.5	41.82	11.8	0.45	29.97	-	-	Peak
246	29.84	-16.16	46	47.16	11.84	0.67	29.83	-	-	Peak
843.9	23.74	-22.26	46	31.66	20.45	1.28	29.65	-	-	Peak
872.6	26.84	-19.16	46	34.65	20.48	1.29	29.58	-	-	Peak
946.8	33.24	-20.76	54	40.73	20.72	1.33	29.54	-	-	Peak
2389.61	60.45	-13.55	74	58.17	32.86	3.47	34.05	161	333	Peak
2389.61	44.62	-9.38	54	42.34	32.86	3.47	34.05	161	333	Average
2412	104.73	-	-	102.4	32.89	3.52	34.08	159	332	Peak
2412	71.91	-	-	69.58	32.89	3.52	34.08	159	332	Average
2489.36	56.73	-17.27	74	54.19	33.05	3.72	34.23	100	338	Peak
2489.36	42.31	-11.69	54	39.77	33.05	3.72	34.23	100	338	Average



Test Mode :	Mode 4	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
49.17	36.42	-3.58	40	58.52	7.75	0.28	30.13	156	336	Peak
112.08	32.07	-11.43	43.5	49.8	11.8	0.44	29.97	-	-	Peak
143.4	27.54	-15.96	43.5	46.48	10.55	0.5	29.99	-	-	Peak
767.6	22.63	-23.37	46	31.09	19.89	1.2	29.55	-	-	Peak
871.2	25.83	-20.17	46	33.64	20.49	1.29	29.59	-	-	Peak
946.8	31.25	-22.75	54	38.74	20.72	1.33	29.54	-	-	Peak
2389.99	61.01	-12.99	74	58.73	32.86	3.47	34.05	126	266	Peak
2389.99	44.2	-9.8	54	41.92	32.86	3.47	34.05	126	266	Average
2412	103.99	-	-	101.66	32.89	3.52	34.08	129	261	Peak
2412	69.59	-	-	67.26	32.89	3.52	34.08	129	261	Average
2489.93	52.92	-21.08	74	50.38	33.05	3.72	34.23	118	273	Peak
2489.93	41.44	-12.56	54	38.9	33.05	3.72	34.23	118	273	Average



Test Mode :	Mode 5	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.16	25.52	-14.48	40	38.82	16.55	0.24	30.09	100	21	Peak
112.62	24.2	-19.3	43.5	41.93	11.8	0.44	29.97	-	-	Peak
246	28.87	-17.13	46	46.19	11.84	0.67	29.83	-	-	Peak
713	22.45	-23.55	46	31.57	19.43	1.14	29.69	-	-	Peak
871.9	25.85	-20.15	46	33.66	20.49	1.29	29.59	-	-	Peak
946.8	32.53	-21.47	54	40.02	20.72	1.33	29.54	-	-	Peak
2358.83	51.96	-22.04	74	49.75	32.81	3.38	33.98	198	334	Peak
2358.83	39.64	-14.36	54	37.43	32.81	3.38	33.98	198	334	Average
2437	104.76	-	-	102.36	32.95	3.6	34.15	104	342	Peak
2437	72.46	-	-	70.06	32.95	3.6	34.15	104	342	Average
2483.66	50.46	-23.54	74	47.97	33.01	3.68	34.2	122	301	Peak
2483.66	38.29	-15.71	54	35.8	33.01	3.68	34.2	122	301	Average



Test Mode :	Mode 5	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
48.9	35.96	-4.04	40	57.69	8.12	0.28	30.13	100	297	Peak
111.27	32.2	-11.3	43.5	49.94	11.8	0.43	29.97	-	-	Peak
119.1	31.92	-11.58	43.5	49.64	11.8	0.45	29.97	-	-	Peak
589.1	22.31	-23.69	46	32.3	18.58	1.06	29.63	-	-	Peak
876.8	24.64	-21.36	46	32.43	20.48	1.29	29.56	-	-	Peak
937.7	32.37	-13.63	46	39.9	20.68	1.32	29.53	-	-	Peak
2355.22	51.69	-22.31	74	49.48	32.81	3.38	33.98	119	306	Peak
2355.22	38.81	-15.19	54	36.6	32.81	3.38	33.98	119	306	Average
2437	102.41	-	-	100.01	32.95	3.6	34.15	122	297	Peak
2437	71.09	-	-	68.69	32.95	3.6	34.15	122	297	Average
2484.61	49.12	-24.88	74	46.63	33.01	3.68	34.2	111	337	Peak
2484.61	35.89	-18.11	54	33.4	33.01	3.68	34.2	111	337	Average



<b>Test Mode :</b>	Mode 6	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Jack Li	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.16	25.88	-14.12	40	39.18	16.55	0.24	30.09	114	299	Peak
118.56	24	-19.5	43.5	41.72	11.8	0.45	29.97	-	-	Peak
246	23.67	-22.33	46	40.99	11.84	0.67	29.83	-	-	Peak
368.6	19.82	-26.18	46	33.91	14.98	0.83	29.9	-	-	Peak
872.6	24.92	-21.08	46	32.73	20.48	1.29	29.58	-	-	Peak
946.8	31.79	-22.21	54	39.28	20.72	1.33	29.54	-	-	Peak
2378.97	56.13	-17.87	74	53.89	32.83	3.42	34.01	200	331	Peak
2378.97	40.96	-13.04	54	38.72	32.83	3.42	34.01	200	331	Average
2462	107.39	-	-	104.94	32.98	3.64	34.17	154	328	Peak
2462	73	-	-	70.55	32.98	3.64	34.17	154	328	Average
2483.5	64.92	-9.08	74	62.43	33.01	3.68	34.2	107	61	Peak
2483.5	42.47	-11.53	54	39.98	33.01	3.68	34.2	107	61	Average



Test Mode :	Mode 6	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
48.9	34.7	-5.3	40	56.43	8.12	0.28	30.13	179	288	Peak
112.08	32.38	-11.12	43.5	50.11	11.8	0.44	29.97	-	-	Peak
143.4	29.12	-14.38	43.5	48.06	10.55	0.5	29.99	-	-	Peak
846.7	23.29	-22.71	46	31.19	20.48	1.28	29.66	-	-	Peak
871.9	25.24	-20.76	46	33.05	20.49	1.29	29.59	-	-	Peak
946.8	32.52	-21.48	54	40.01	20.72	1.33	29.54	-	-	Peak
2384.1	54.81	-19.19	74	52.57	32.83	3.42	34.01	100	261	Peak
2384.1	40.4	-13.6	54	38.16	32.83	3.42	34.01	100	261	Average
2462	72.55	-	-	70.1	32.98	3.64	34.17	123	296	Average
2462	105.39	-	-	102.94	32.98	3.64	34.17	123	296	Peak
2483.5	62.62	-11.38	74	60.13	33.01	3.68	34.2	122	261	Peak
2483.5	44.1	-9.9	54	41.61	33.01	3.68	34.2	122	261	Average



Test Mode :	Mode 7	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.16	22.15	-17.85	40	35.45	16.55	0.24	30.09	103	344	Peak
119.1	23.54	-19.96	43.5	41.26	11.8	0.45	29.97	-	-	Peak
246	24.3	-21.7	46	41.62	11.84	0.67	29.83	-	-	Peak
551.3	22.74	-23.26	46	32.92	18.5	1	29.68	-	-	Peak
871.9	26.68	-19.32	46	34.49	20.49	1.29	29.59	-	-	Peak
946.8	31.97	-22.03	54	39.46	20.72	1.33	29.54	-	-	Peak
2389.99	58.39	-15.61	74	56.11	32.86	3.47	34.05	100	353	Peak
2389.99	40.3	-13.7	54	38.02	32.86	3.47	34.05	100	353	Average
2412	99.76	-	-	97.43	32.89	3.52	34.08	101	8	Peak
2412	68.12	-	-	65.79	32.89	3.52	34.08	101	8	Average
2494.49	51.39	-22.61	74	48.85	33.05	3.72	34.23	108	12	Peak
2494.49	37.87	-16.13	54	35.33	33.05	3.72	34.23	108	12	Average



Test Mode :	Mode 7	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
49.44	32.93	-7.07	40	55.03	7.75	0.28	30.13	198	31	Peak
111.54	31.89	-11.61	43.5	49.63	11.8	0.43	29.97	-	-	Peak
119.1	30.7	-12.8	43.5	48.42	11.8	0.45	29.97	-	-	Peak
807.5	23.84	-22.16	46	32.26	19.93	1.25	29.6	-	-	Peak
872.6	27.07	-18.93	46	34.88	20.48	1.29	29.58	-	-	Peak
946.8	32.31	-21.69	54	39.8	20.72	1.33	29.54	-	-	Peak
2389.8	53.8	-20.2	74	51.52	32.86	3.47	34.05	130	266	Peak
2389.8	39.1	-14.9	54	36.82	32.86	3.47	34.05	130	266	Average
2412	98.38	-	-	96.05	32.89	3.52	34.08	129	297	Peak
2412	67.38	-	-	65.05	32.89	3.52	34.08	129	297	Average
2495.63	51.47	-22.53	74	48.93	33.05	3.72	34.23	112	288	Peak
2495.63	37.09	-16.91	54	34.55	33.05	3.72	34.23	112	288	Average



Test Mode :	Mode 8	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.43	23.63	-16.37	40	37.44	16.04	0.24	30.09	177	225	Peak
119.1	23.4	-20.1	43.5	41.12	11.8	0.45	29.97	-	-	Peak
246	23.05	-22.95	46	40.37	11.84	0.67	29.83	-	-	Peak
773.2	22.5	-23.5	46	30.97	19.88	1.21	29.56	-	-	Peak
872.6	25.42	-20.58	46	33.23	20.48	1.29	29.58	-	-	Peak
946.8	32.16	-21.84	54	39.65	20.72	1.33	29.54	-	-	Peak
2356.55	49.93	-24.07	74	47.72	32.81	3.38	33.98	122	104	Peak
2356.55	36.91	-17.09	54	34.7	32.81	3.38	33.98	122	104	Average
2437	101.24	-	-	98.84	32.95	3.6	34.15	107	17	Peak
2437	69.77	-	-	67.37	32.95	3.6	34.15	107	17	Average
2493.92	49.23	-24.77	74	46.69	33.05	3.72	34.23	100	31	Peak
2493.92	36.51	-17.49	54	33.97	33.05	3.72	34.23	100	31	Average



Test Mode :	Mode 8	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
49.98	35.19	-4.81	40	57.64	7.4	0.28	30.13	200	333	Peak
112.35	31.36	-12.14	43.5	49.09	11.8	0.44	29.97	-	-	Peak
144.21	27.72	-15.78	43.5	46.76	10.45	0.5	29.99	-	-	Peak
834.1	25.57	-20.43	46	33.61	20.33	1.27	29.64	-	-	Peak
872.6	26.29	-19.71	46	34.1	20.48	1.29	29.58	-	-	Peak
937.7	33.21	-12.79	46	40.74	20.68	1.32	29.53	-	-	Peak
2359.97	50.84	-23.16	74	48.63	32.81	3.38	33.98	157	303	Peak
2359.97	37.34	-16.66	54	35.13	32.81	3.38	33.98	157	303	Average
2437	101.11	-	-	98.71	32.95	3.6	34.15	100	297	Peak
2437	67.97	-	-	65.57	32.95	3.6	34.15	100	297	Average
2498.1	49.94	-24.06	74	47.4	33.05	3.72	34.23	144	310	Peak
2498.1	36.84	-17.16	54	34.3	33.05	3.72	34.23	144	310	Average



<b>Test Mode :</b>	Mode 9	<b>Temperature :</b>	21~22°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	41~42%
<b>Test Engineer :</b>	Jack Li	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
32.16	23.01	-16.99	40	36.31	16.55	0.24	30.09	-	-	Peak
112.62	22.82	-20.68	43.5	40.55	11.8	0.44	29.97	-	-	Peak
246	23.15	-22.85	46	40.47	11.84	0.67	29.83	-	-	Peak
845.3	25.8	-20.2	46	33.71	20.47	1.28	29.66	-	-	Peak
872.6	26.07	-19.93	46	33.88	20.48	1.29	29.58	-	-	Peak
937.7	32.89	-13.11	46	40.42	20.68	1.32	29.53	100	0	Peak
2318.55	56.21	-17.79	74	54.08	32.76	3.27	33.9	178	135	Peak
2318.55	37.03	-16.97	54	34.9	32.76	3.27	33.9	178	135	Average
2462	95.02	-	-	92.57	32.98	3.64	34.17	191	22	Peak
2462	65.49	-	-	63.04	32.98	3.64	34.17	191	22	Average
2483.5	51.5	-22.5	74	49.01	33.01	3.68	34.2	182	67	Peak
2483.5	39.59	-14.41	54	37.1	33.01	3.68	34.2	182	67	Average



Test Mode :	Mode 9	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
49.44	35.41	-4.59	40	57.51	7.75	0.28	30.13	120	100	Peak
112.08	31.1	-12.4	43.5	48.83	11.8	0.44	29.97	-	-	Peak
144.21	28.23	-15.27	43.5	47.27	10.45	0.5	29.99	-	-	Peak
813.8	25.44	-20.56	46	33.8	19.99	1.26	29.61	-	-	Peak
872.6	26.43	-19.57	46	34.24	20.48	1.29	29.58	-	-	Peak
946.8	32.83	-21.17	54	40.32	20.72	1.33	29.54	-	-	Peak
2384.29	49.89	-24.11	74	47.65	32.83	3.42	34.01	133	295	Peak
2384.29	36.35	-17.65	54	34.11	32.83	3.42	34.01	133	295	Average
2462	96.94	-	-	94.49	32.98	3.64	34.17	124	275	Peak
2462	65.72	-	-	63.27	32.98	3.64	34.17	124	275	Average
2483.66	54.58	-19.42	74	52.09	33.01	3.68	34.2	100	301	Peak
2483.66	42.69	-11.31	54	40.2	33.01	3.68	34.2	100	301	Average



## **3.8 Antenna Requirements**

### **3.8.1 Standard Applicable**

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### **3.8.2 Antenna Connected Construction**

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

### **3.8.3 Antenna Gain**

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



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 07, 2011	Jan. 06, 2012	Conducted (TH01-KS)
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 07, 2011	Jan. 06, 2012	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-3030D	E1884515	N/A	Aug. 23, 2011	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Jan. 17, 2011	Jan. 16, 2012	Conducted (TH01-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz	Jun. 02, 2011	Jun. 01, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Jan. 07, 2011	Jan. 06, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Jan. 07, 2011	Jan. 06, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000811	N/A	Nov. 10, 2010	Nov. 09, 2011	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 07, 2011	Jan. 06, 2012	Conduction (CO01-KS)
Signal Generator	R&S	SMR40	100455	10MHz~40GHz	Jan. 06, 2011	Jan. 05, 2012	Conduction (CO01-KS)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 16, 2010	Nov. 15, 2011	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2010	Dec. 06, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 09, 2010	Dec. 08, 2011	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz -18GHz	Nov. 09, 2010	Nov. 08, 2011	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz -40GHz	Oct. 15, 2010	Oct.14, 2011	Radiation (03CH01-KS)

## 5 Uncertainty of Evaluation

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

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.13</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.26</b>		

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

Contribution	Uncertainty of $X_i$		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)**

Contribution	Uncertainty of $X_i$		$u(X_i)$	$C_i$	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>4.72</b>				



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP192604 as below.