FCC RF Test Report

APPLICANT	:	Lenovo Mobile Communication Technology Ltd.
EQUIPMENT	:	Lenovo Mobile Phone
BRAND NAME	:	lenovo
MODEL NAME	:	Lenovo A6000-I
MID	:	60000031
FCC ID	:	YCNA6000L
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Nov. 10, 2014 and testing was completed on Jan. 16, 2015. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 2627

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

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APPENDIX A. RADIATED SPURIOUS EMISSION

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4N2609C	Rev. 01	Initial issue of report	Jan. 22, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.69 dB at 47.460 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.69 dB at 3.880 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Lenovo Mobile Communication Technology Ltd.
No.999, Qishan North 2nd Road, Information & Optoelectronics Park, Torch Hi-tech Industry Development Zone, Xiamen, P.R.China

1.2 Manufacturer

Lenovo PC HK Limited
23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Lenovo Mobile Phone
Brand Name	lenovo
Model Name	Lenovo A6000-I
MID	60000031
FCC ID	YCNA6000L
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/HSPA + (Downlink Only)/LTE WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0+EDR/ Bluetooth v4.0 LE
HW Version	H201
SW Version	Kraft-A6000-I_S012_141204
EUT Stage	Identical Prototype

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

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 17.13 dBm (0.0516 W) 802.11g : 20.05 dBm (0.1012 W) 802.11n HT20 : 20.03 dBm (0.1007 W)
Antenna Type	802.11b/g/n : PIFA Antenna with gain 2.00 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	**Sporton Site No.**		**FCC Registration No.**
	TH01-KS	CO01-KS	149928

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

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

1.7 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02
- ANSI C63.10-2009

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, 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)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-

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 shown in the following tables.

2.4GHz 802.11b RF Output Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate 1Mbps	Channel	2Mbps	5.5Mbps	11Mbps
CH 01	2412 MHz	14.94	CH 11	16.88	16.91	17.11
CH 06	2437 MHz	16.07				
CH 11	2462 MHz	**17.13**				

2.4GHz 802.11g 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 01	2412 MHz	19.47	CH 11	19.95	20.01	19.88	19.95	20.03	19.92	19.80
CH 06	2437 MHz	19.58								
CH 11	2462 MHz	**20.05**								

2.4GHz 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 01	2412 MHz	18.37	CH 11	19.58	19.57	20.01	19.88	19.75	19.35	19.38
CH 06	2437 MHz	19.40								
CH 11	2462 MHz	**20.03**								

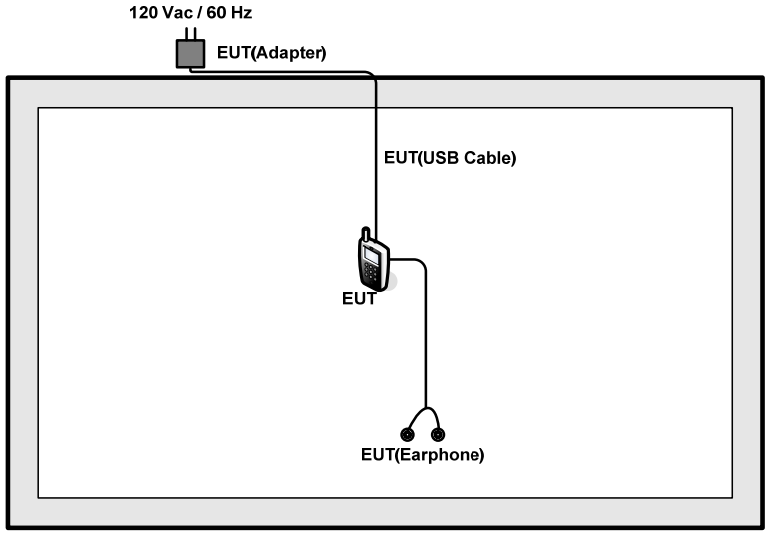
2.3 Test Mode

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

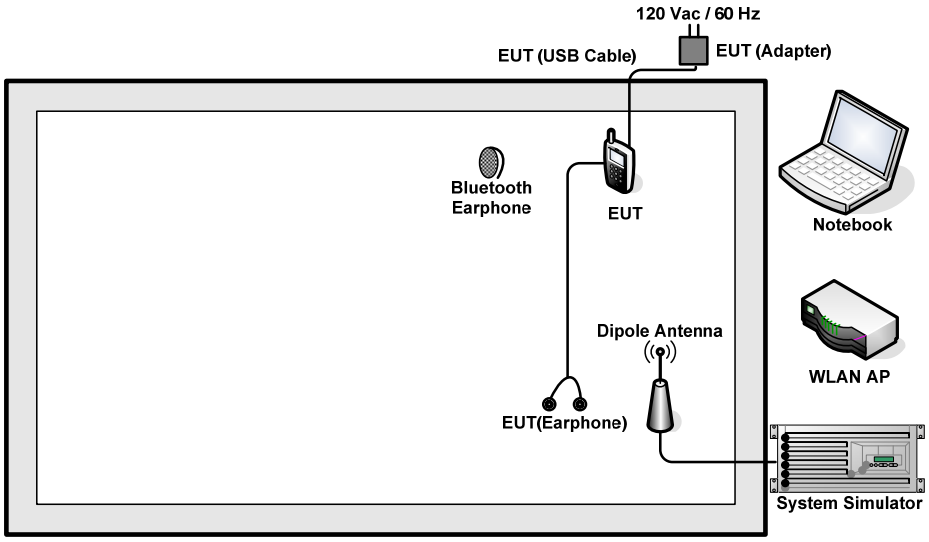
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone
Remark: For radiated test cases, the tests were performance with adapter, earphone and USB cable.	

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.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	Base Station	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Lenovo	LBH505	N/A	N/A	N/A
4.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m

2.6 EUT Operation Test Setup

For WLAN function, the 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 dB and 10dB attenuator.

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

= 6 + 10 = 16 (dB)

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.

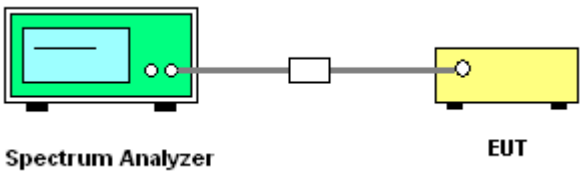
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup

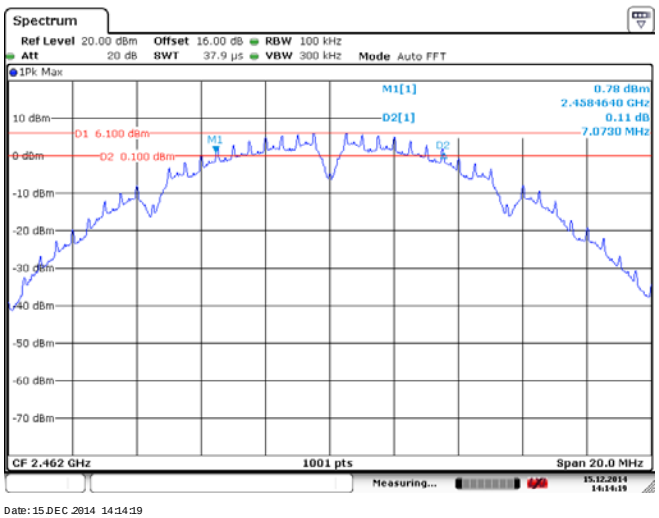


3.1.5 Test Result of 6dB Bandwidth

Test Band :	2.4GHz	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	7.55	0.50	Pass
11b	1Mbps	1	6	2437	7.53	0.50	Pass
11b	1Mbps	1	11	2462	7.07	0.50	Pass
11g	6Mbps	1	1	2412	16.32	0.50	Pass
11g	6Mbps	1	6	2437	16.34	0.50	Pass
11g	6Mbps	1	11	2462	16.34	0.50	Pass
HT20	MCS0	1	1	2412	17.54	0.50	Pass
HT20	MCS0	1	6	2437	17.56	0.50	Pass
HT20	MCS0	1	11	2462	17.56	0.50	Pass

Minimum 6dB Bandwidth



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

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.

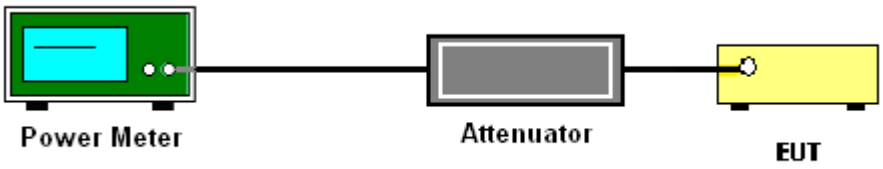
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v03r02.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	2.4GHz	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	14.94	30.00	2.00	Pass
11b	1Mbps	1	6	2437	16.07	30.00	2.00	Pass
11b	1Mbps	1	11	2462	17.13	30.00	2.00	Pass
11g	6Mbps	1	1	2412	19.47	30.00	2.00	Pass
11g	6Mbps	1	6	2437	19.58	30.00	2.00	Pass
11g	6Mbps	1	11	2462	20.05	30.00	2.00	Pass
HT20	MCS0	1	1	2412	18.37	30.00	2.00	Pass
HT20	MCS0	1	6	2437	19.40	30.00	2.00	Pass
HT20	MCS0	1	11	2462	20.03	30.00	2.00	Pass

Note: Measured power (dBm) has offset with cable loss.

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	2.4GHz	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	0.10	11.94	30	2.00	Pass
11b	1Mbps	1	6	2437	0.10	13.22	30	2.00	Pass
11b	1Mbps	1	11	2462	0.10	14.08	30	2.00	Pass
11g	6Mbps	1	1	2412	0.59	10.15	30	2.00	Pass
11g	6Mbps	1	6	2437	0.59	11.31	30	2.00	Pass
11g	6Mbps	1	11	2462	0.59	12.06	30	2.00	Pass
HT20	MCS0	1	1	2412	0.63	9.41	30	2.00	Pass
HT20	MCS0	1	6	2437	0.63	10.54	30	2.00	Pass
HT20	MCS0	1	11	2462	0.63	11.39	30	2.00	Pass

Note: Measured power (dBm) has offset with cable loss and duty factor.

3.3 Power Spectral Density Measurement

3.3.1 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.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup

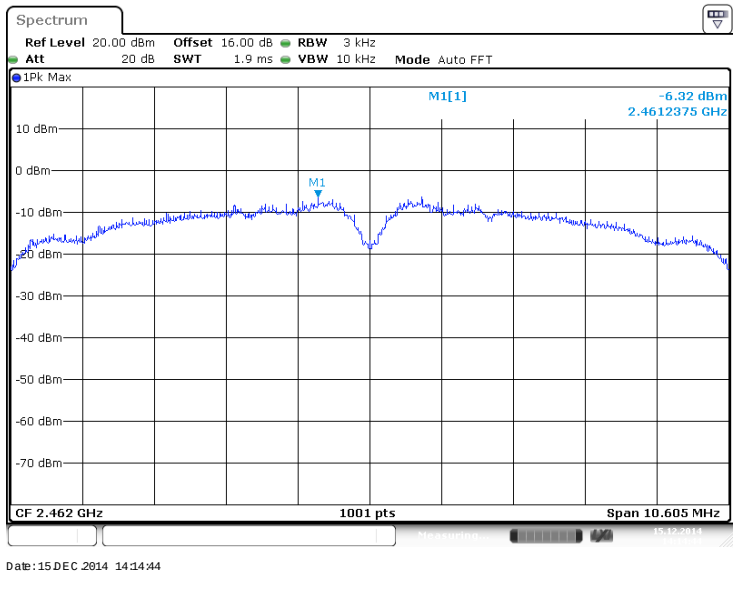
3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	24~25℃
Test Engineer :	Issac Song	Relative Humidity :	49~51%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	-7.86	8	2.00	Pass
11b	1Mbps	1	6	2437	-7.29	8	2.00	Pass
11b	1Mbps	1	11	2462	-6.32	8	2.00	Pass
11g	6Mbps	1	1	2412	-12.94	8	2.00	Pass
11g	6Mbps	1	6	2437	-11.84	8	2.00	Pass
11g	6Mbps	1	11	2462	-12.48	8	2.00	Pass
HT20	MCS0	1	1	2412	-13.61	8	2.00	Pass
HT20	MCS0	1	6	2437	-13.61	8	2.00	Pass
HT20	MCS0	1	11	2462	-12.68	8	2.00	Pass

Note: Measured power density (dBm) has offset with cable loss.

Worst Case Power Density (dBm/3kHz)



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

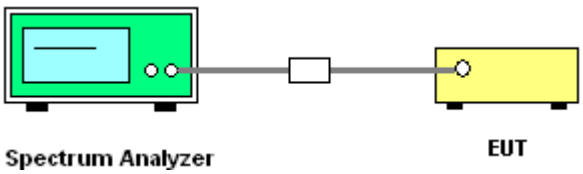
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

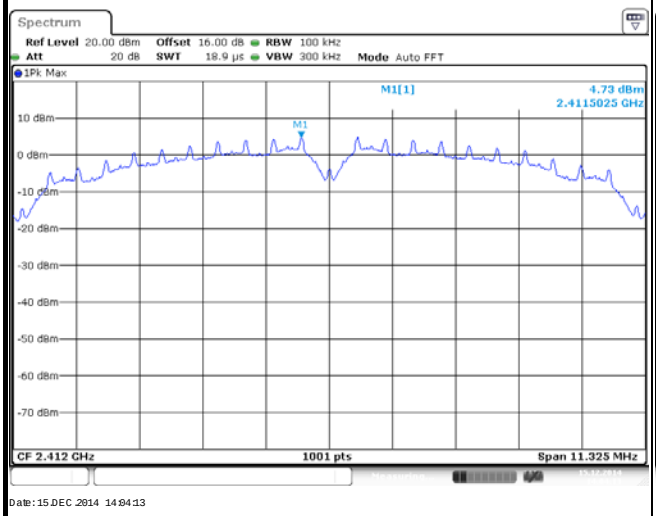


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

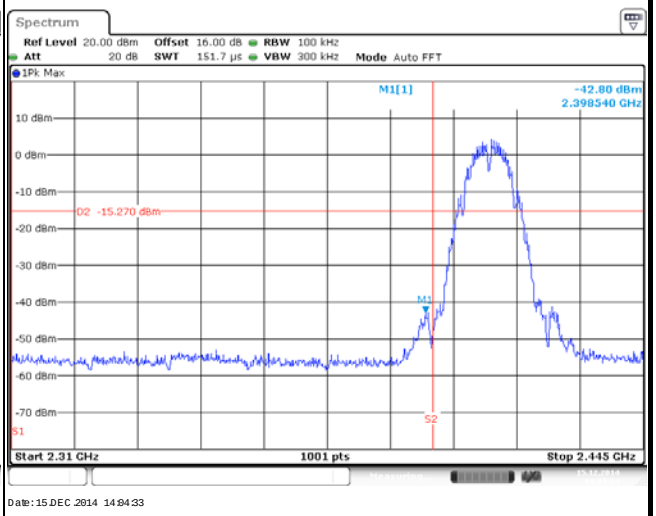
Test Mode :	802.11b	Temperature :	24~25℃
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

WLAN 802.11b Channel 01

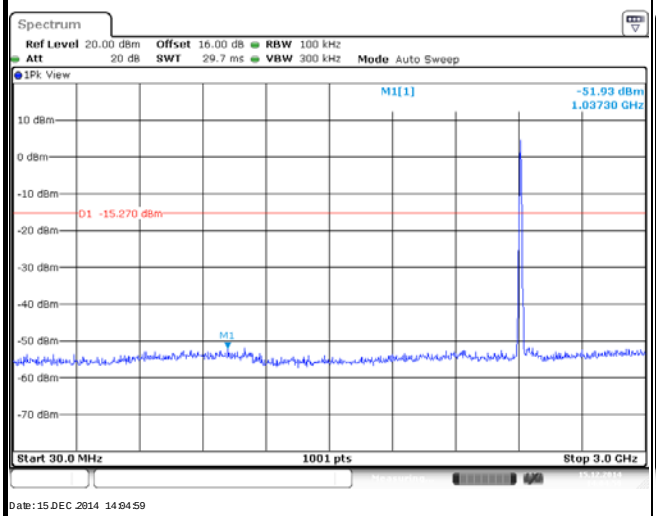
100kHz PSD reference Level



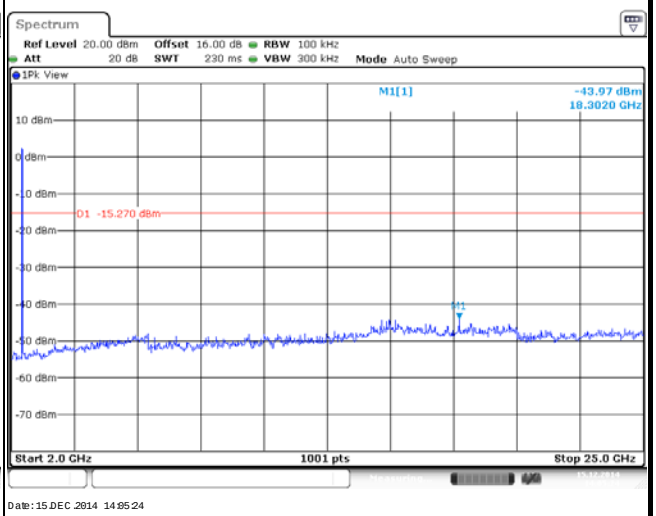
Low Channel Plot



Spurious Emission 30MHz~3GHz



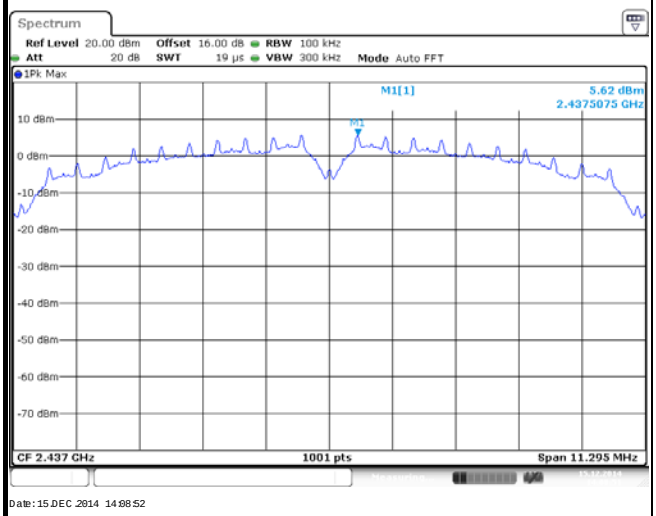
Spurious Emission 2GHz~25GHz



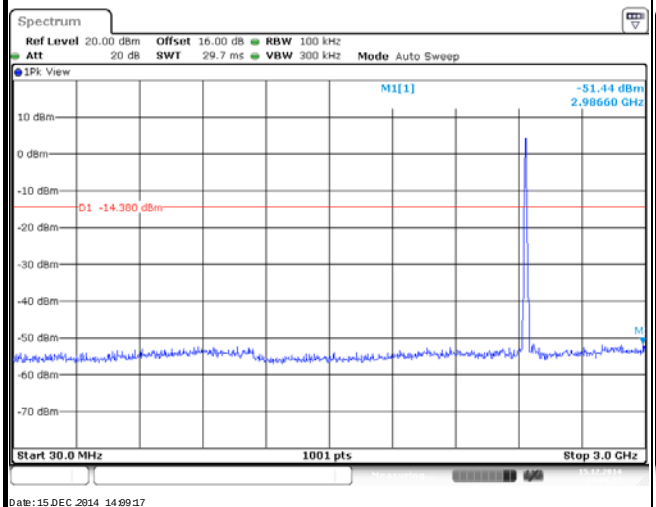
Test Mode :	802.11b	**Temperature :**	24~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	49~51%
Test Channel :	06	**Test Engineer :**	Issac Song

WLAN 802.11b Channel 06

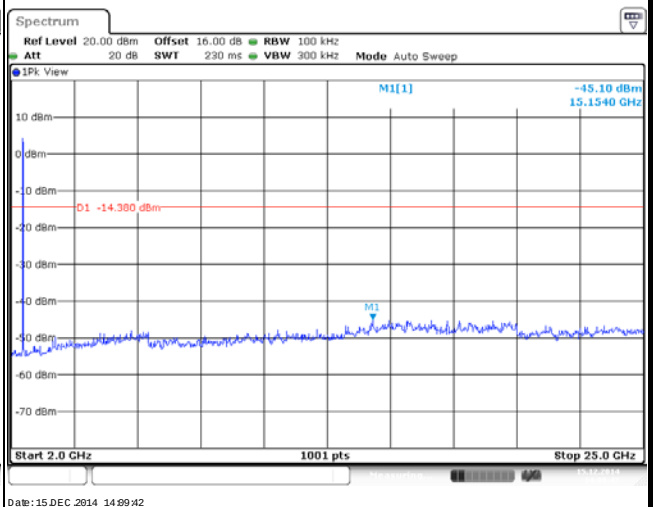
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



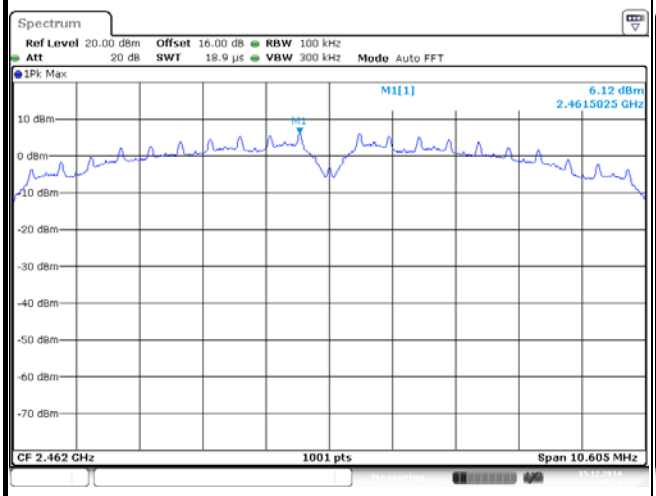
Spurious Emission 2GHz~25GHz



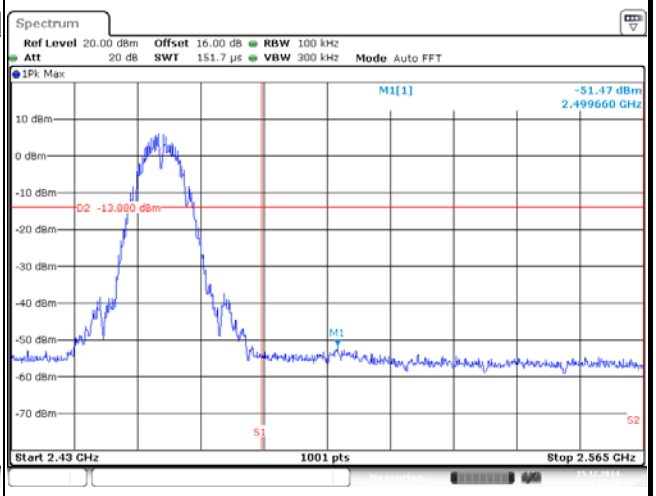
Test Mode :	802.11b	Temperature :	24~25℃
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song

WLAN 802.11b Channel 11

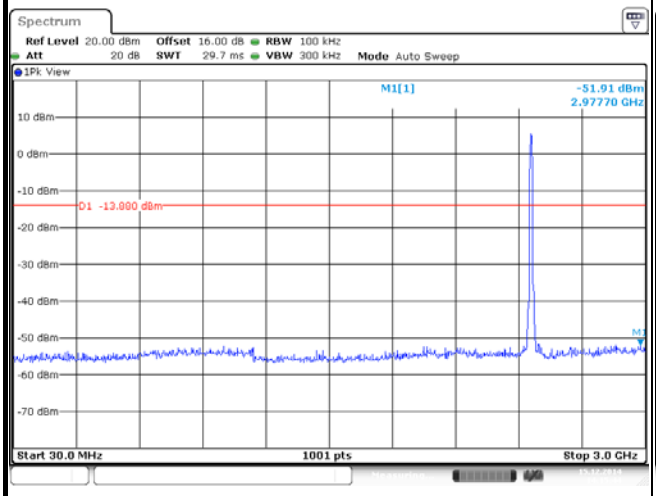
100kHz PSD reference Level



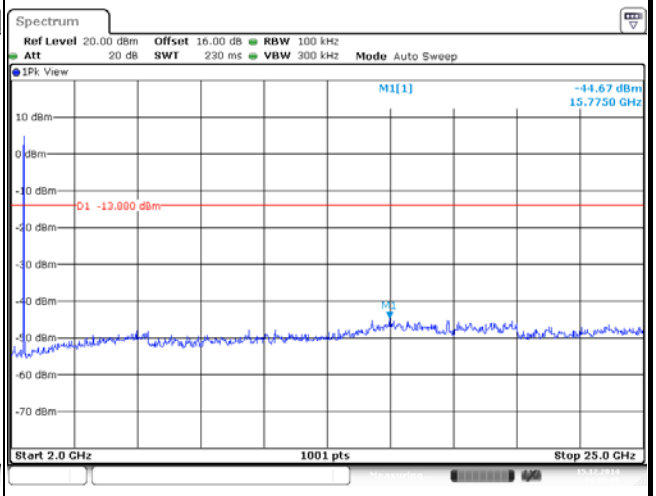
High Channel Plot



Spurious Emission 30MHz~3GHz



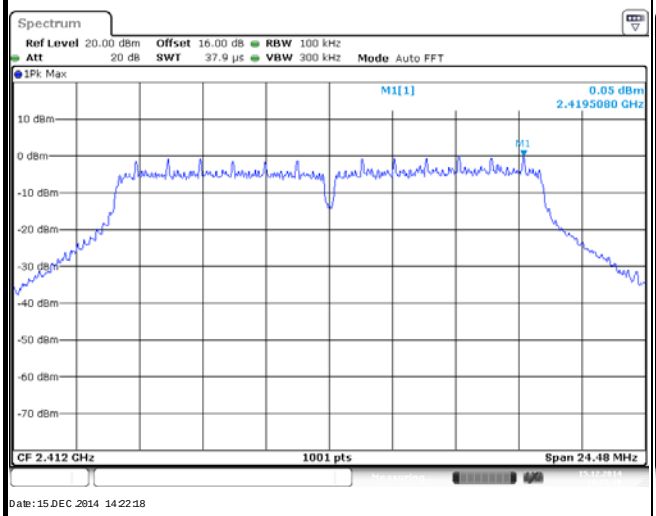
Spurious Emission 2GHz~25GHz



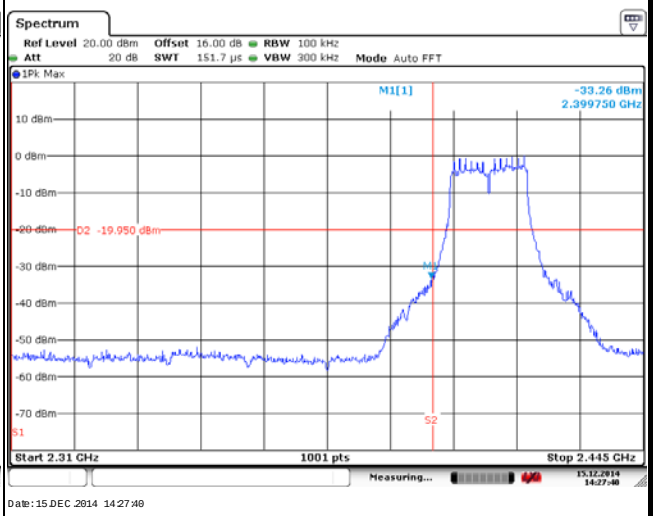
Test Mode :	802.11g	**Temperature :**	24~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	49~51%
Test Channel :	01	**Test Engineer :**	Issac Song

WLAN 802.11g Channel 01

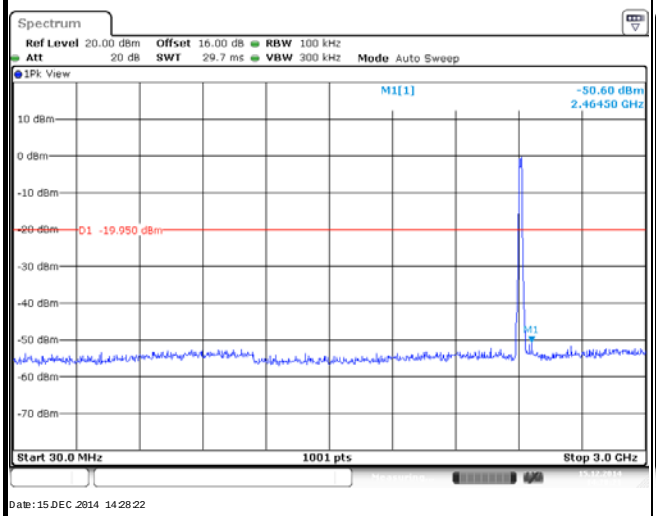
100kHz PSD reference Level



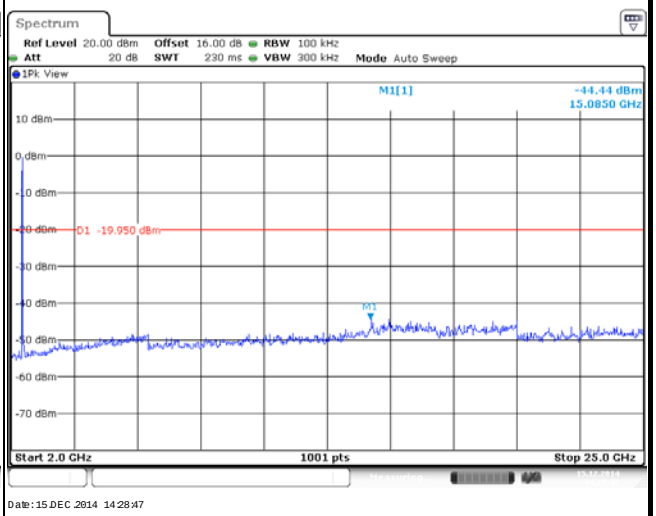
Low Channel Plot



Spurious Emission 30MHz~3GHz



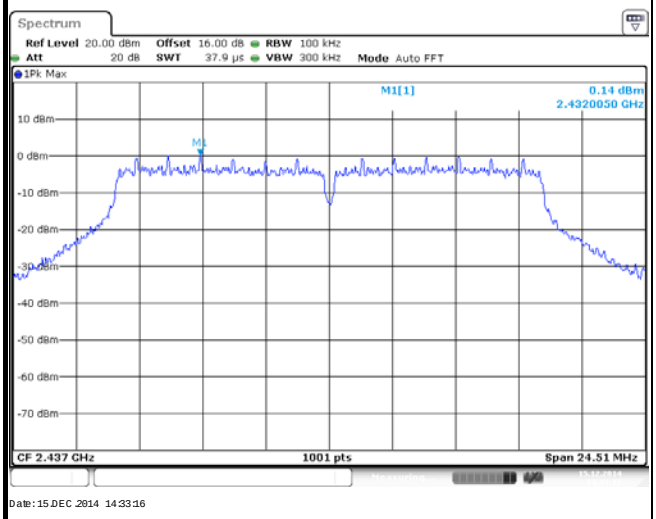
Spurious Emission 2GHz~25GHz



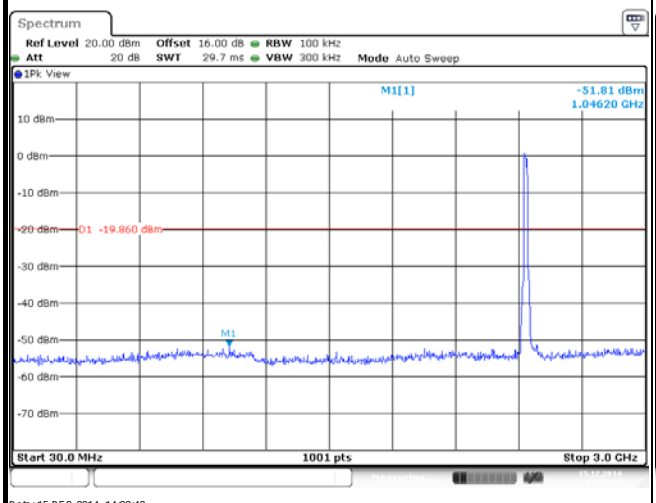
Test Mode :	802.11g	Temperature :	24~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	49~51%
Test Channel :	06	Test Engineer :	Issac Song

WLAN 802.11g Channel 06

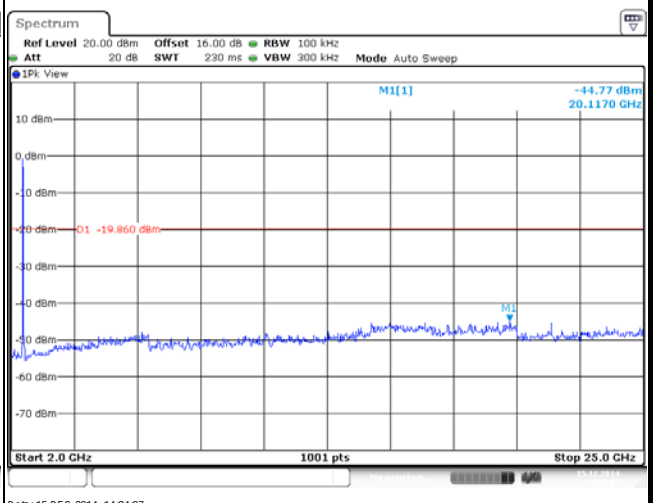
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



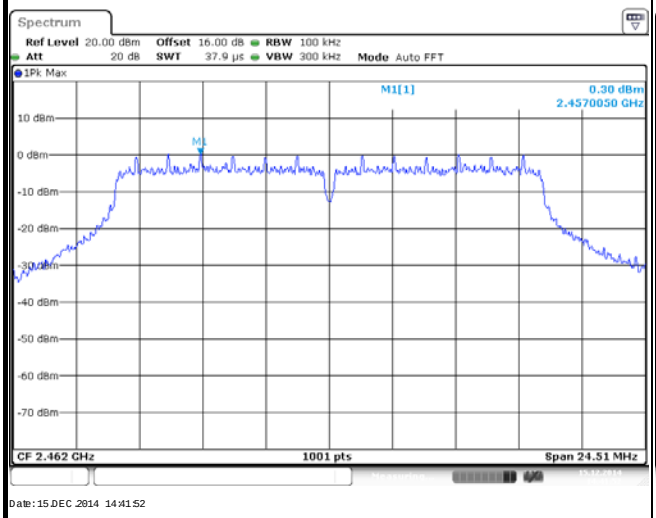
Spurious Emission 2GHz~25GHz



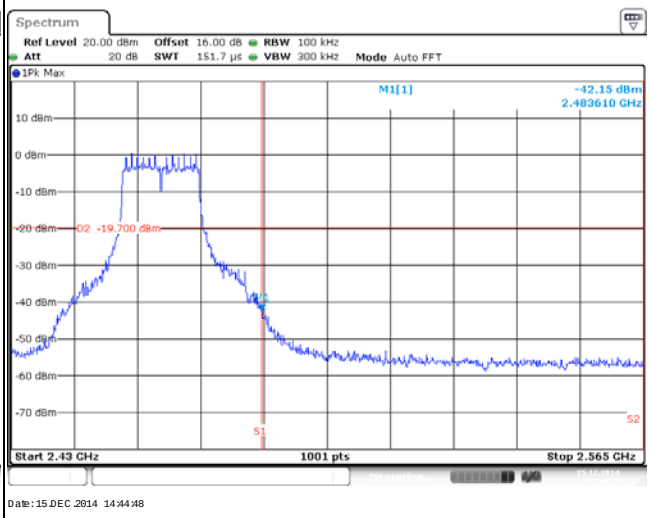
Test Mode :	802.11g	**Temperature :**	24~25℃
Test Band :	2.4GHz High	**Relative Humidity :**	49~51%
Test Channel :	11	**Test Engineer :**	Issac Song

WLAN 802.11g Channel 11

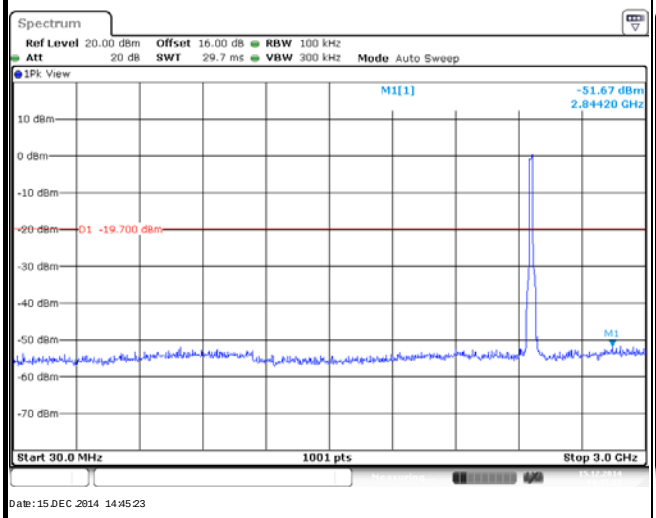
100kHz PSD reference Level



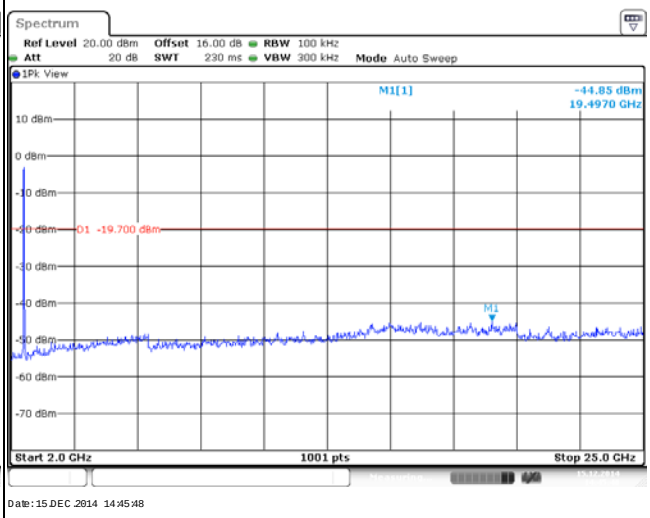
High Channel Plot



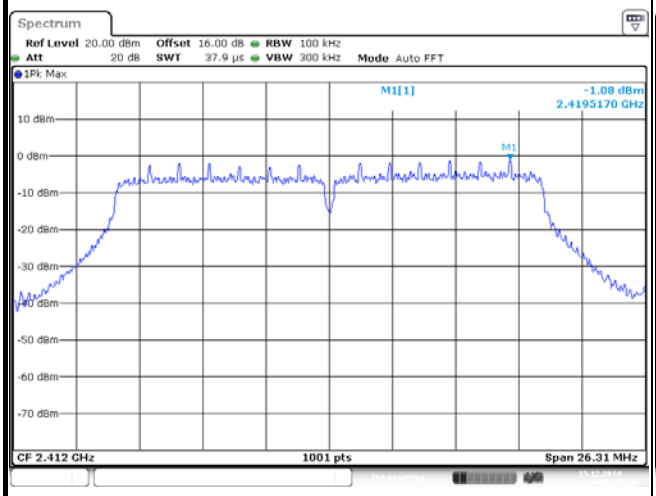
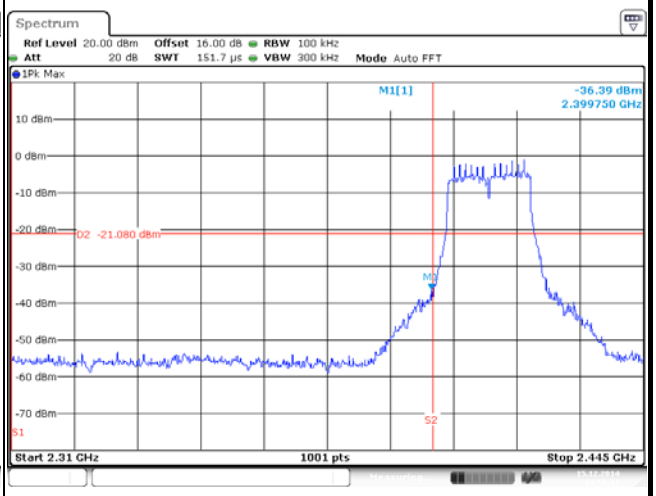
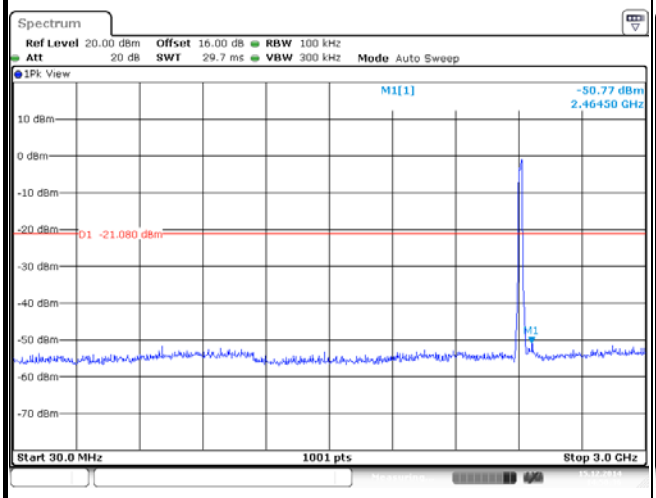
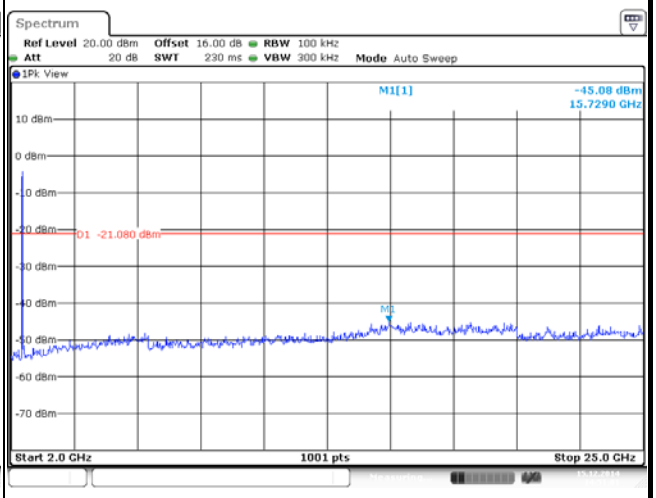
Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



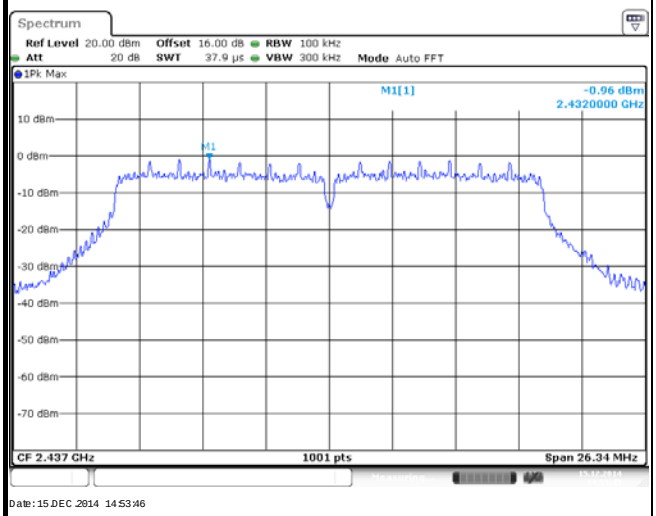
Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Band :	2.4GHz Low	Relative Humidity :	49~51%
Test Channel :	01	Test Engineer :	Issac Song

WLAN 802.11n HT20 Channel 01	
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

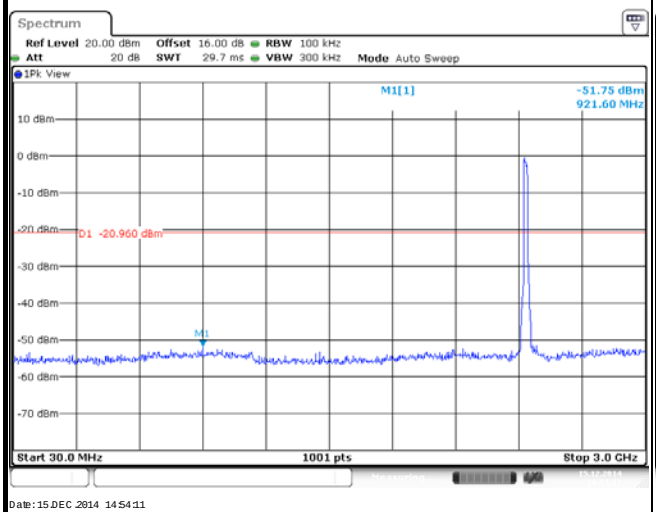
Test Mode :	802.11n HT20	**Temperature :**	24~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	49~51%
Test Channel :	06	**Test Engineer :**	Issac Song

WLAN 802.11n HT20 Channel 06

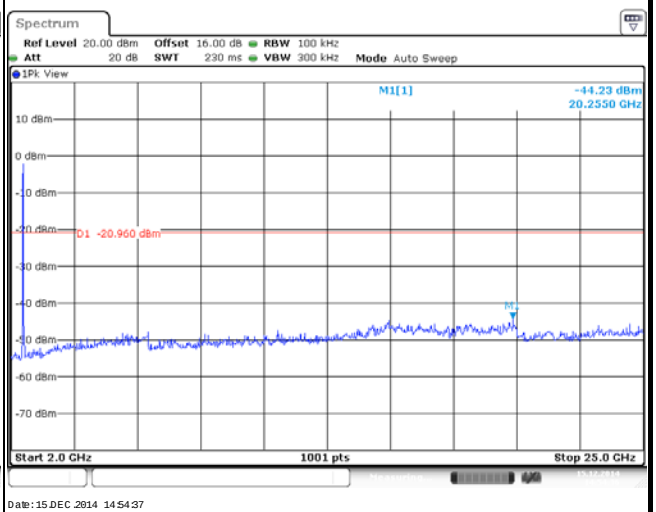
100kHz PSD reference Level



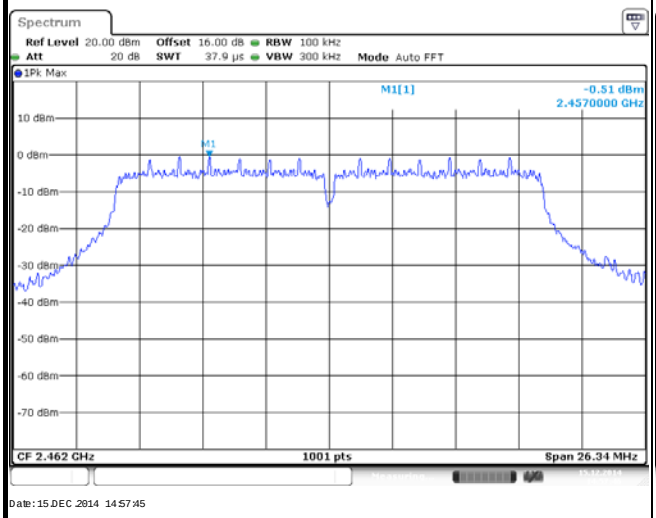
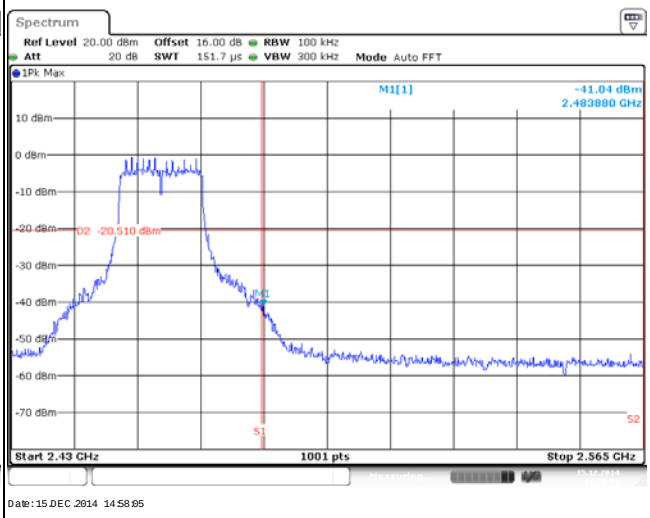
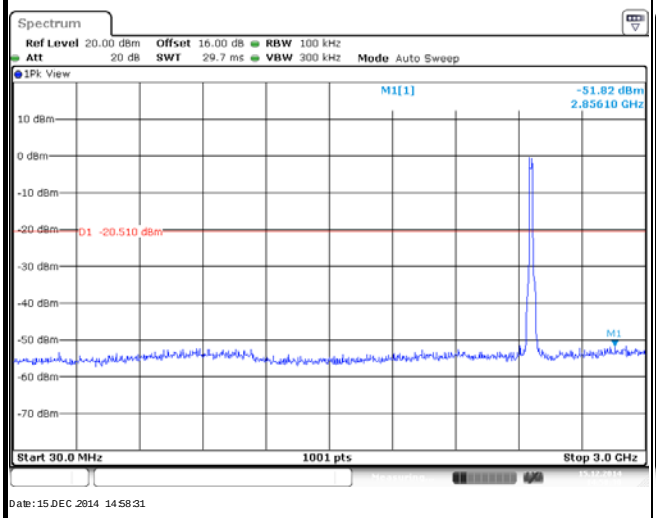
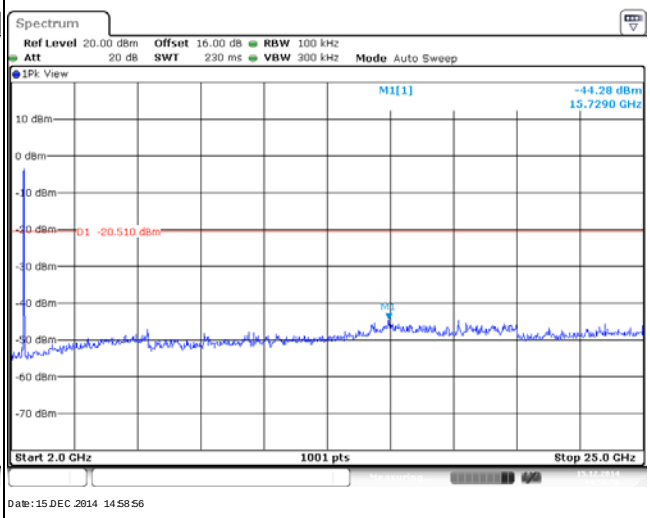
Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Band :	2.4GHz High	Relative Humidity :	49~51%
Test Channel :	11	Test Engineer :	Issac Song

WLAN 802.11n HT20 Channel 11	
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

3.5.2 Measuring Instruments

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

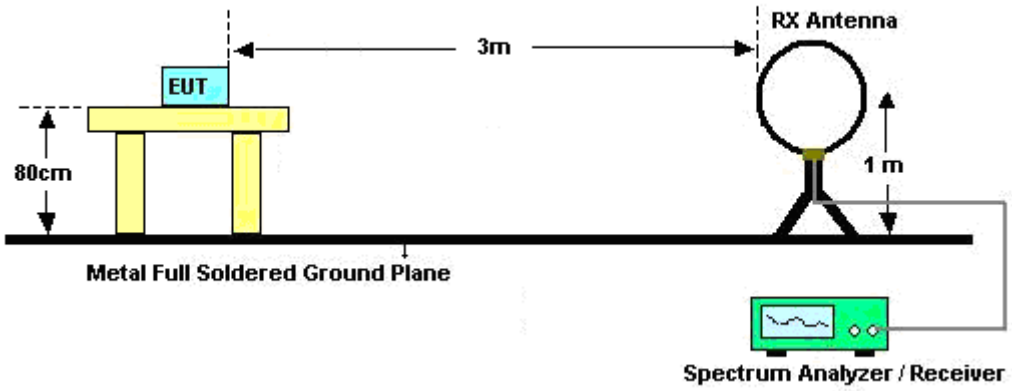
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

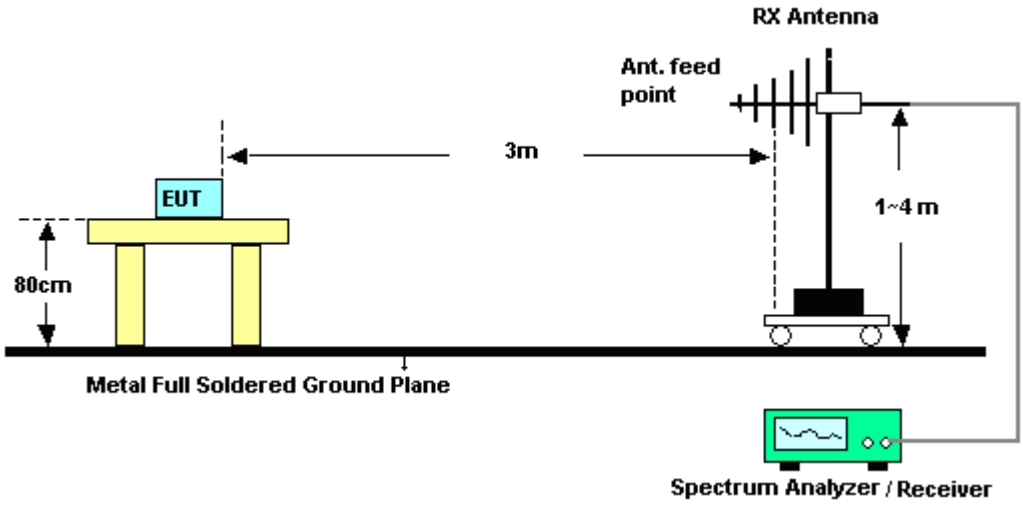
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.63	8.24	0.12	300Hz
802.11g	87.26	1.37	0.73	1kHz
2.4GHz 802.11n HT20	86.50	1.28	0.78	1kHz

3.5.4 Test Setup

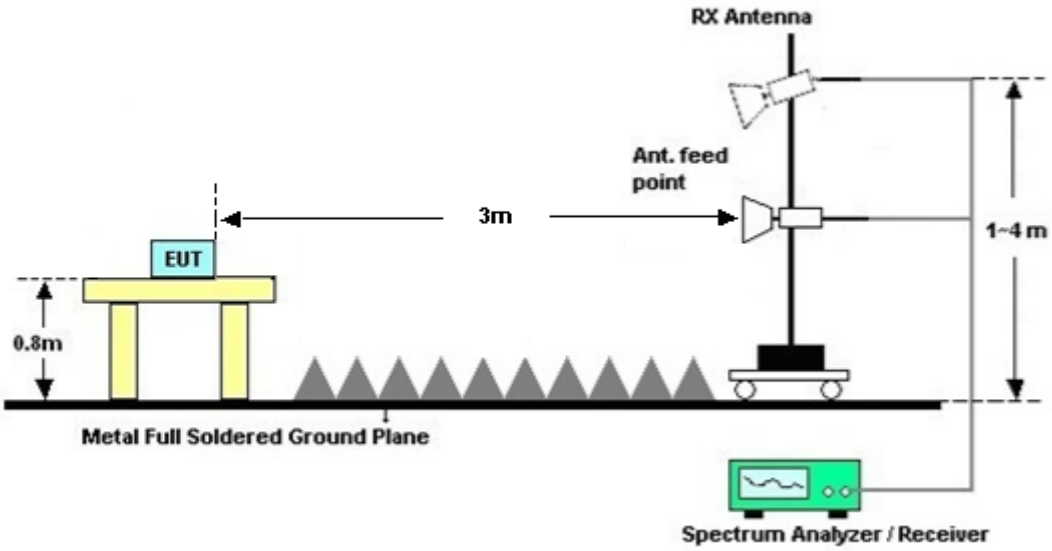
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A.

3.5.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix A.

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 (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

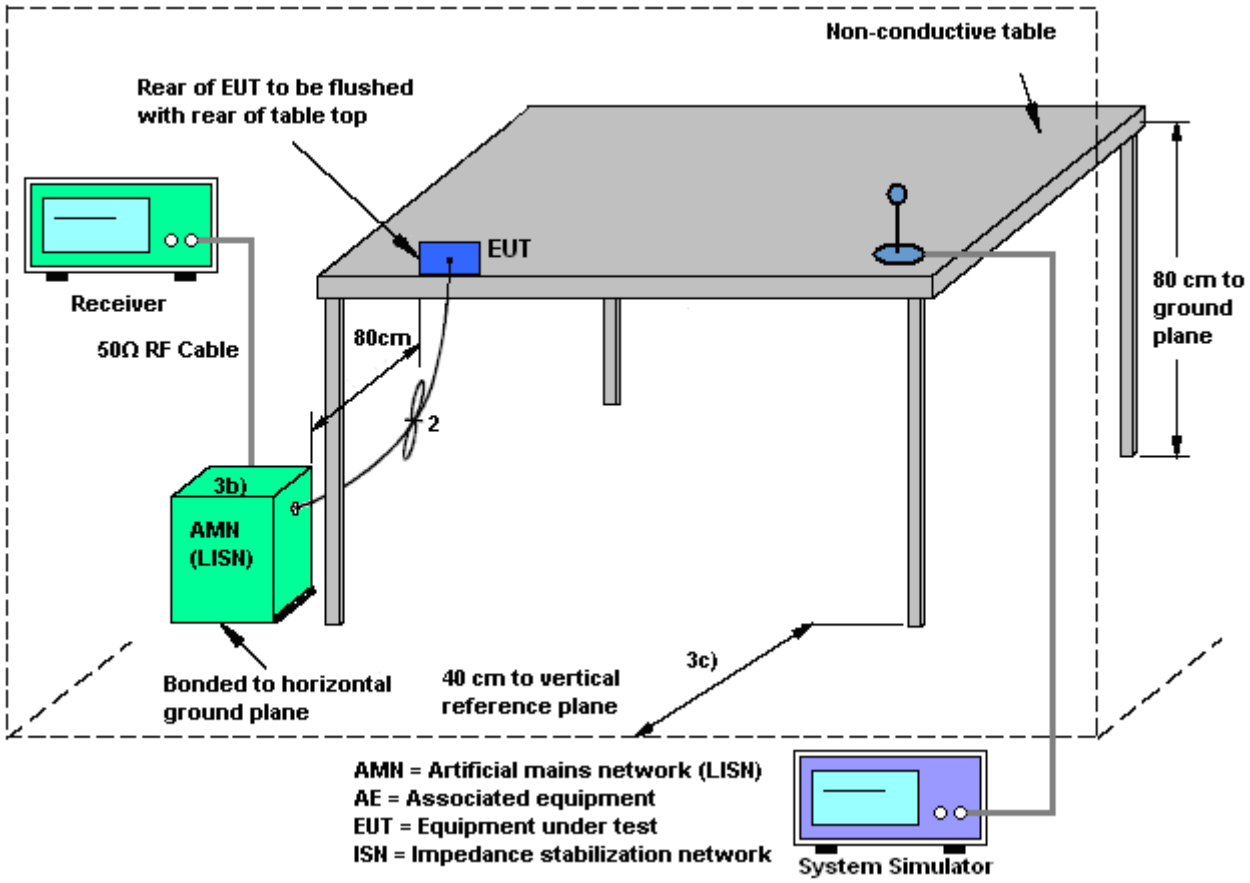
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

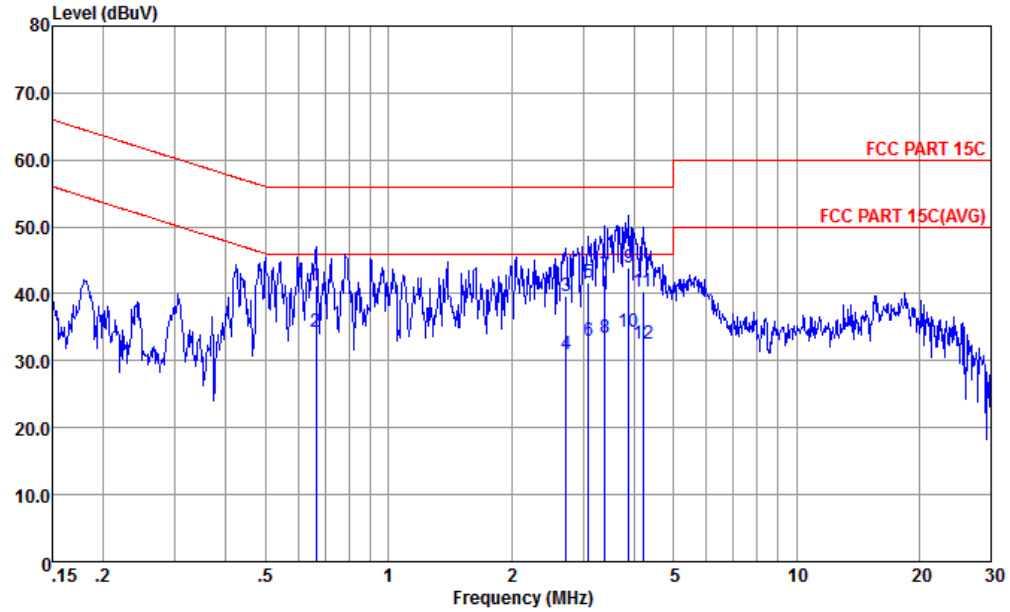
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

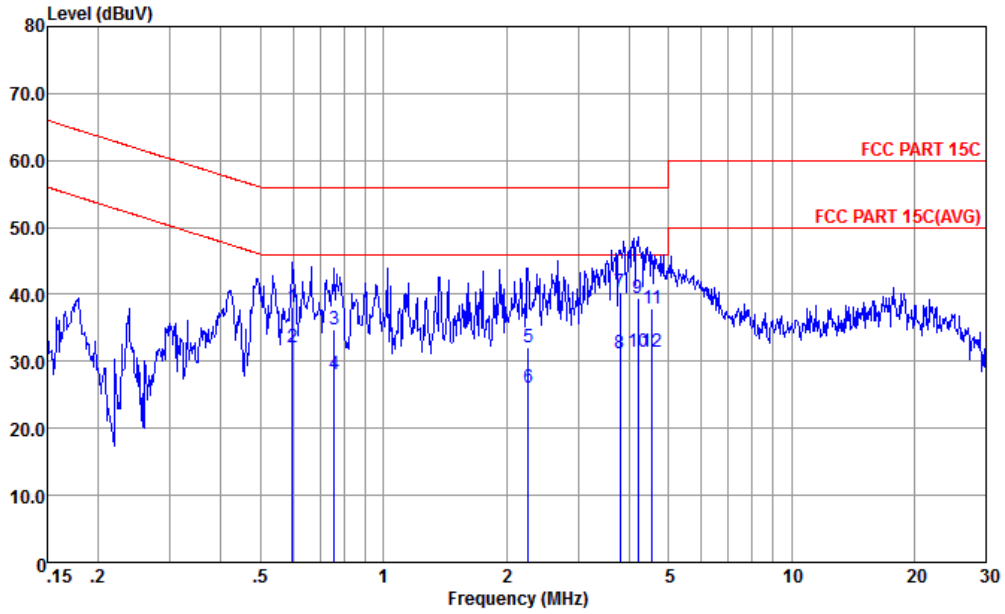
Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Eligan Wang	**Relative Humidity :**	33~35%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		



Site : CO01-KS
Condition : FCC PART 15C LISN-L20140306 LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.66	41.14	-14.86	56.00	30.30	0.20	10.64	QP
2		0.66	34.24	-11.76	46.00	23.40	0.20	10.64	Average
3		2.72	39.77	-16.23	56.00	28.90	0.12	10.75	QP
4		2.72	30.97	-15.03	46.00	20.10	0.12	10.75	Average
5		3.09	41.64	-14.36	56.00	30.71	0.14	10.79	QP
6		3.09	33.04	-12.96	46.00	22.11	0.14	10.79	Average
7		3.40	42.88	-13.12	56.00	31.90	0.17	10.81	QP
8		3.40	33.48	-12.52	46.00	22.50	0.17	10.81	Average
9		3.88	43.81	-12.19	56.00	32.80	0.18	10.83	QP
10	*	3.88	34.31	-11.69	46.00	23.30	0.18	10.83	Average
11		4.20	40.32	-15.68	56.00	29.30	0.19	10.83	QP
12		4.20	32.52	-13.48	46.00	21.50	0.19	10.83	Average

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Eligan Wang	Relative Humidity :	33~35%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		



Site : CO01-KS
Condition : FCC PART 15C LISN-N20140306 NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.60	38.18	-17.82	56.00	27.30	0.25	10.63	QP
2	*	0.60	32.18	-13.82	46.00	21.30	0.25	10.63	Average
3		0.76	34.73	-21.27	56.00	23.91	0.18	10.64	QP
4		0.76	28.13	-17.87	46.00	17.31	0.18	10.64	Average
5		2.26	32.12	-23.88	56.00	21.30	0.11	10.71	QP
6		2.26	26.12	-19.88	46.00	15.30	0.11	10.71	Average
7		3.80	40.40	-15.60	56.00	29.40	0.18	10.82	QP
8		3.80	31.30	-14.70	46.00	20.30	0.18	10.82	Average
9		4.20	39.42	-16.58	56.00	28.40	0.19	10.83	QP
10		4.20	31.32	-14.68	46.00	20.30	0.19	10.83	Average
11		4.55	37.83	-18.17	56.00	26.80	0.19	10.84	QP
12		4.55	31.33	-14.67	46.00	20.30	0.19	10.84	Average

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV30	101338	9kHz~30GHz	May 04, 2014	Dec. 15, 2014	May 03, 2015	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	30MHz~40GHz	Feb. 27, 2014	Dec. 15, 2014	Feb. 26, 2015	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Feb. 27, 2014	Dec. 15, 2014	Feb. 26, 2015	Conducted (TH01-KS)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Jan. 16, 2015	Feb. 20, 2015	Radiation (03CH01-SZ)
Spectrum Analyzer	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2014	Jan. 16, 2015	May 25, 2015	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 09, 2014	Jan. 16, 2015	May 08, 2015	Radiation (03CH01-SZ)
Bilog Antenna	TESEQ	CBL 6112D	37877	30MHz~2GHz	Oct. 15, 2014	Jan. 16, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 15, 2014	Jan. 16, 2015	Oct. 14, 2015	Radiation (03CH01-SZ)
Double Ridged Horn Antenna	COM-POWER	AH-840	101073	18GHz~40GHz	Jan. 27, 2014	Jan. 16, 2015	Jan. 26, 2015	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9kHz~3000MHz	Feb. 21, 2014	Jan. 16, 2015	Feb. 20, 2015	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	May 08, 2014	Jan. 16, 2015	May 07, 2015	Radiation (03CH01-SZ)
AC Source(AVR)	Chroma	61601	61601000 1985	100Vac~250Vac	Mar. 25, 2014	Jan. 16, 2015	Mar. 24, 2015	Radiation (03CH01-SZ)
Turn Table	EM Electronics	EM 1000	N/A	0~360 degree	NCR	Jan. 16, 2015	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM Electronics	EM 1000	N/A	1 m~4 m	NCR	Jan. 16, 2015	NCR	Radiation (03CH01-SZ)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2014	Dec. 15, 2014	May 03, 2015	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 25, 2014	Dec. 15, 2014	Oct. 24, 2015	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 25, 2014	Dec. 15, 2014	Oct. 24, 2015	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 25, 2014	Dec. 15, 2014	Oct. 24, 2015	Conduction (CO01-KS)

5 Uncertainty of Evaluation

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

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

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

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

Appendix A. Radiated Spurious Emission

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2389.38	48.77	-25.23	74	46.79	27.25	11.19	36.46	139	84	P	H
		2389.47	32.83	-21.17	54	30.85	27.25	11.19	36.46	139	84	A	H
	*	2412	97.3	-	-	95.26	27.31	11.19	36.46	139	84	P	H
	*	2412	93	-	-	90.96	27.31	11.19	36.46	139	84	A	H
		2388.03	44.54	-29.46	74	42.56	27.25	11.19	36.46	100	88	P	V
		2389.83	31.74	-22.26	54	29.76	27.25	11.19	36.46	100	88	A	V
	*	2412	92.36	-	-	90.32	27.31	11.19	36.46	100	88	P	V
	*	2412	87.96	-	-	85.92	27.31	11.19	36.46	100	88	A	V
802.11b CH 06 2437MHz		2322.33	44.56	-29.44	74	43.08	27.01	10.94	36.47	136	80	P	H
		2389.83	31.58	-22.42	54	29.6	27.25	11.19	36.46	136	80	A	H
	*	2437	95.33	-	-	93.05	27.42	11.31	36.45	136	80	P	H
	*	2437	90.92	-	-	88.64	27.42	11.31	36.45	136	80	A	H
		2492.36	47.09	-26.91	74	44.5	27.6	11.43	36.44	136	80	P	H
		2492.8	33.13	-20.87	54	30.54	27.6	11.43	36.44	136	80	A	H
		2389.11	45.74	-28.26	74	43.76	27.25	11.19	36.46	108	91	P	V
		2382.09	31.29	-22.71	54	29.49	27.19	11.07	36.46	108	91	A	V
	*	2437	89.95	-	-	87.67	27.42	11.31	36.45	108	91	P	V
	*	2437	85.57	-	-	83.29	27.42	11.31	36.45	108	91	A	V
		2494.32	45.87	-28.13	74	43.28	27.6	11.43	36.44	108	91	P	V
		2492.68	32.42	-21.58	54	29.83	27.6	11.43	36.44	108	91	A	V

802.11b CH 11 2462MHz	*	2462	96.45	-	-	94.11	27.48	11.31	36.45	118	84	P	H
	*	2462	92.09	-	-	89.75	27.48	11.31	36.45	118	84	A	H
		2483.8	54.29	-19.71	74	51.77	27.54	11.43	36.45	118	84	P	H
		2487.92	33.5	-20.5	54	30.92	27.6	11.43	36.45	118	84	A	H
	*	2462	91.26	-	-	88.92	27.48	11.31	36.45	100	93	P	V
	*	2462	87.15	-	-	84.81	27.48	11.31	36.45	100	93	A	V
		2483.84	47.79	-26.21	74	45.27	27.54	11.43	36.45	100	93	P	V
		2491.04	32.68	-21.32	54	30.1	27.6	11.43	36.45	100	93	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		4824	41.08	-32.92	74	29.59	31.26	16.17	35.94	105	198	P	H
		4824	40.97	-33.03	74	29.48	31.26	16.17	35.94	105	198	P	V
802.11b CH 06 2437MHz		4874	40.5	-33.5	74	28.8	31.36	16.26	35.92	145	265	P	H
		7311	50.04	-23.96	74	29.6	35.96	21.01	36.53	174	321	P	H
		4874	39.28	-34.72	74	27.58	31.36	16.26	35.92	145	265	P	V
		7311	49.63	-24.37	74	29.19	35.96	21.01	36.53	174	321	P	V
802.11b CH 11 2462MHz		4924	40.32	-33.68	74	28.33	31.46	16.43	35.9	146	347	P	H
		7386	49.94	-24.06	74	29.49	36.08	20.96	36.59	145	274	P	H
		4924	40.81	-33.19	74	28.82	31.46	16.43	35.9	146	347	P	V
		7386	49.43	-24.57	74	28.98	36.08	20.96	36.59	145	274	P	V
Remark	1. Average measurement was not performed if peak level went lower than the average limit. 2. All results are PASS against limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		2387.94	51.16	-22.84	74	49.18	27.25	11.19	36.46	118	83	P	H
		2389.92	34.5	-19.5	54	32.52	27.25	11.19	36.46	118	83	A	H
	*	2412	98.34	-	-	96.3	27.31	11.19	36.46	118	83	P	H
	*	2412	88.11	-	-	86.07	27.31	11.19	36.46	118	83	A	H
		2388.66	48.99	-25.01	74	47.01	27.25	11.19	36.46	104	91	P	V
		2389.92	34	-20	54	32.02	27.25	11.19	36.46	104	91	A	V
	*	2412	96.52	-	-	94.48	27.31	11.19	36.46	104	91	P	V
	*	2412	86.44	-	-	84.4	27.31	11.19	36.46	104	91	A	V
802.11g CH 06 2437MHz		2360.76	44.36	-29.64	74	42.62	27.13	11.07	36.46	100	83	P	H
		2389.83	32.32	-21.68	54	30.34	27.25	11.19	36.46	100	83	A	H
	*	2437	96.95	-	-	94.67	27.42	11.31	36.45	100	83	P	H
	*	2437	86.67	-	-	84.39	27.42	11.31	36.45	100	83	A	H
		2486.88	49.24	-24.76	74	46.72	27.54	11.43	36.45	100	83	P	H
		2489.24	36.09	-17.91	54	33.51	27.6	11.43	36.45	100	83	A	H
		2347.98	44.72	-29.28	74	43.04	27.07	11.07	36.46	100	98	P	V
		2389.2	31.71	-22.29	54	29.73	27.25	11.19	36.46	100	98	A	V
	*	2437	93.9	-	-	91.62	27.42	11.31	36.45	100	98	P	V
	*	2437	82.85	-	-	80.57	27.42	11.31	36.45	100	98	A	V
		2490.48	46.2	-27.8	74	43.62	27.6	11.43	36.45	100	98	P	V
		2489.64	34.6	-19.4	54	32.02	27.6	11.43	36.45	100	98	A	V

802.11g CH 11 2462MHz	*	2462	95.49	-	-	93.15	27.48	11.31	36.45	100	84	P	H
	*	2462	87	-	-	84.66	27.48	11.31	36.45	100	84	A	H
		2484	54.71	-19.29	74	52.19	27.54	11.43	36.45	100	84	P	H
		2483.52	36.89	-17.11	54	34.37	27.54	11.43	36.45	100	84	A	H
	*	2462	92.17	-	-	89.83	27.48	11.31	36.45	100	92	P	V
	*	2462	82.07	-	-	79.73	27.48	11.31	36.45	100	92	A	V
		2483.68	52.82	-21.18	74	50.3	27.54	11.43	36.45	100	92	P	V
		2483.56	34.05	-19.95	54	31.53	27.54	11.43	36.45	100	92	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11g CH 01 2412MHz		4824	40.55	-33.45	74	29.06	31.26	16.17	35.94	105	198	P	H
		4824	39.43	-34.57	74	27.94	31.26	16.17	35.94	105	198	P	V
802.11g CH 06 2437MHz		4874	40.3	-33.7	74	28.6	31.36	16.26	35.92	145	265	P	H
		7311	49.59	-24.41	74	29.15	35.96	21.01	36.53	174	321	P	H
		4874	39.37	-34.63	74	27.67	31.36	16.26	35.92	145	265	P	V
		7311	49.37	-24.63	74	28.93	35.96	21.01	36.53	174	321	P	V
802.11g CH 11 2462MHz		4924	40.76	-33.24	74	28.77	31.46	16.43	35.9	146	347	P	H
		7386	49.14	-24.86	74	28.69	36.08	20.96	36.59	145	274	P	H
		4924	38.87	-35.13	74	26.88	31.46	16.43	35.9	146	347	P	V
		7386	48.51	-25.49	74	28.06	36.08	20.96	36.59	145	274	P	V
Remark	1. Average measurement was not performed if peak level went lower than the average limit. 2. All results are PASS against limit line.												

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		2389.83	52.42	-21.58	74	50.44	27.25	11.19	36.46	121	83	P	H
		2389.92	35.97	-18.03	54	33.99	27.25	11.19	36.46	121	83	A	H
802.11n	*	2412	98.14	-	-	96.1	27.31	11.19	36.46	121	83	P	H
HT20	*	2412	88.1	-	-	86.06	27.31	11.19	36.46	121	83	A	H
CH 01		2389.83	48.92	-25.08	74	46.94	27.25	11.19	36.46	100	88	P	V
2412MHz		2389.92	33.36	-20.64	54	31.38	27.25	11.19	36.46	100	88	A	V
	*	2412	92.93	-	-	90.89	27.31	11.19	36.46	100	88	P	V
	*	2412	82.8	-	-	80.76	27.31	11.19	36.46	100	88	A	V
		2388.48	45.1	-28.9	74	43.12	27.25	11.19	36.46	100	82	P	H
		2389.65	32.01	-21.99	54	30.03	27.25	11.19	36.46	100	82	A	H
	*	2437	95.94	-	-	93.66	27.42	11.31	36.45	100	82	P	H
	*	2437	85.74	-	-	83.46	27.42	11.31	36.45	100	82	A	H
802.11n		2490	47.92	-26.08	74	45.34	27.6	11.43	36.45	100	82	P	H
HT20		2489.16	36	-18	54	33.42	27.6	11.43	36.45	100	82	A	H
CH 06		2389.2	46.29	-27.71	74	44.31	27.25	11.19	36.46	100	90	P	V
2437MHz		2332.77	31.52	-22.48	54	30.04	27.01	10.94	36.47	100	90	A	V
	*	2437	91.61	-	-	89.33	27.42	11.31	36.45	100	90	P	V
	*	2437	81.12	-	-	78.84	27.42	11.31	36.45	100	90	A	V
		2494.6	46.34	-27.66	74	43.75	27.6	11.43	36.44	100	90	P	V
		2488.88	33.89	-20.11	54	31.31	27.6	11.43	36.45	100	90	A	V

802.11n HT20 CH 11 2462MHz	*	2462	97.2	-	-	94.86	27.48	11.31	36.45	152	82	P	H
	*	2462	86.7	-	-	84.36	27.48	11.31	36.45	152	82	A	H
		2484.04	56.1	-17.9	74	53.58	27.54	11.43	36.45	152	82	P	H
		2483.68	38.02	-15.98	54	35.5	27.54	11.43	36.45	152	82	A	H
	*	2462	91.53	-	-	89.19	27.48	11.31	36.45	100	89	P	V
	*	2462	81.57	-	-	79.23	27.48	11.31	36.45	100	89	A	V
		2484.96	52.13	-21.87	74	49.61	27.54	11.43	36.45	100	89	P	V
		2483.52	34.94	-19.06	54	32.42	27.54	11.43	36.45	100	89	A	V

Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.

15C 2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 01 2412MHz		4824	39.6	-34.4	74	28.11	31.26	16.17	35.94	105	198	P	H
		4824	38.97	-35.03	74	27.48	31.26	16.17	35.94	105	198	P	V
802.11n HT20 CH 06 2437MHz		4874	39.79	-34.21	74	28.09	31.36	16.26	35.92	145	265	P	H
		7311	49.09	-24.91	74	28.65	35.96	21.01	36.53	174	321	P	H
		4874	39.05	-34.95	74	27.35	31.36	16.26	35.92	145	265	P	V
		7311	48.84	-25.16	74	28.4	35.96	21.01	36.53	174	321	P	V
802.11n HT20 CH 11 2462MHz		4924	42.44	-31.56	74	30.45	31.46	16.43	35.9	146	347	P	H
		7386	50.71	-23.29	74	30.26	36.08	20.96	36.59	145	274	P	H
		4924	42.39	-31.61	74	30.4	31.46	16.43	35.9	146	347	P	V
		7386	50.03	-23.97	74	29.58	36.08	20.96	36.59	145	274	P	V
Remark	1. Average measurement was not performed if peak level went lower than the average limit. 2. All results are PASS against limit line.												

15C Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT20 LF		116.33	20.45	-23.05	43.5	36.27	12.75	1.93	30.5	-	-	P	H
		245.34	28.05	-17.95	46	43.71	11.79	2.91	30.36	159	56	P	H
		384.05	25.17	-20.83	46	36.05	15.64	3.62	30.14	-	-	P	H
		618.79	22.55	-23.45	46	28.36	19.35	4.59	29.75	-	-	P	H
		815.7	26.82	-19.18	46	29.5	21.15	5.56	29.39	-	-	P	H
		886.51	26.29	-19.71	46	28.01	21.81	5.73	29.26	-	-	P	H
		47.46	35.31	-4.69	40	54.93	9.7	1.23	30.55	150	268	P	V
		184.23	25.29	-18.21	43.5	42.19	11.02	2.52	30.44	-	-	P	V
		245.34	24.77	-21.23	46	40.43	11.79	2.91	30.36	-	-	P	V
		490.75	23.14	-22.86	46	31.16	17.75	4.19	29.96	-	-	P	V
		780.78	25.73	-20.27	46	29.28	20.67	5.24	29.46	-	-	P	V
		988.36	26.75	-27.25	54	27.41	22.46	5.96	29.08	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(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".