FCC RF Test Report

APPLICANT	:	Solnik S.A.
EQUIPMENT	:	Smart phone
BRAND NAME	:	HYUNDAI
MODEL NAME	:	HY2-6275AZ
FCC ID	:	2AFRUHY26275AZ
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product testing was completed on Mar. 27, 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.

James Huang

Prepared by: James Huang / Manager

Jones Tsai

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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR531002-01C	Rev. 01	This is a variant product of BLU STUDIO MINI LTE 2, the new FCC application change the application, brand name, model name, FCC ID and has been authorized to re-use the test data by original application. The test result is not affected, all test cases were performed on original report which can be referred to Sporton report number FR531002C (Model name: BLU STUDIO MINI LTE 2; FCC ID: YHLBLUSTMNLTE2).	Nov. 10, 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 10.29 dB at 691.540 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.78 dB at 0.550 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Solnik S.A.
Unit 01, 15/F, Seaview Centre, 139-141 Hoi bun road, Kwun Tong, Kowloon, Hongkong

1.2 Manufacturer

Beijing Benywave Wireless Communication Co. Ltd.
No 55, Jiachuang second road, Zhongguancun science Park OPTO－Mechatronics Industrial Park, Tongzhou District, Beijing, China 101111

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart phone
Brand Name	HYUNDAI
Model Name	HY2-6275AZ
FCC ID	2AFRUHY26275AZ
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/LTE/ WLAN 2.4GHz 802.11b/g/n HT20/ Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
IMEI Code	Conducted: 354033028148578/354033028148586 Conduction: 354033028150194/354033028150202 Radiation: 354033028148537/354033028148545
HW Version	TBW5726_P1.1_002
SW Version	572614_9823_V009010
EUT Stage	Pre-Production

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 : 15.39 dBm (0.0346 W) 802.11g : 20.94 dBm (0.1242 W) 802.11n HT20 : 20.91 dBm (0.1233 W)
Antenna Type/Gain	IFA Antenna with gain 2.10 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 (SHENZHEN) INC.	
Test Site Location	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	**Sporton Site No.**	
	TH01-SZ	CO01-SZ

Test Site	SPORTON INTERNATIONAL (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.**
	03CH01-KS	149928

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 v03r03
- 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. FCC permits the use of the 1.5 meter table as an alternative in C63.10-2013 through inquiry tracking number 961829.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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

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

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

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
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	Channel	2Mbps	5.5Mbps	11Mbps
		1Mbps				
CH 01	2412 MHz	11.28	CH 06	15.27	15.31	15.23
CH 06	2437 MHz	**15.39**				
CH 11	2462 MHz	12.50				

2.4GHz 802.11g RF Output Power (dBm)									
Power vs. Channel			Power vs. Data Rate						
Channel	Frequency (MHz)	Data Rate	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
		6Mbps								
CH 01	2412 MHz	17.56	CH 06	20.90	20.81	20.86	20.84	20.79	20.75	20.76
CH 06	2437 MHz	**20.94**								
CH 11	2462 MHz	19.02								

2.4GHz 802.11n HT20 RF Output Power (dBm)									
Power vs. Channel			Power vs. MCS Index						
Channel	Frequency (MHz)	MCS Index	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
		MCS0								
CH 01	2412 MHz	17.50	CH 06	20.81	20.85	20.89	20.76	20.73	20.72	20.69
CH 06	2437 MHz	**20.91**								
CH 11	2462 MHz	19.02								

2.3 Test Mode

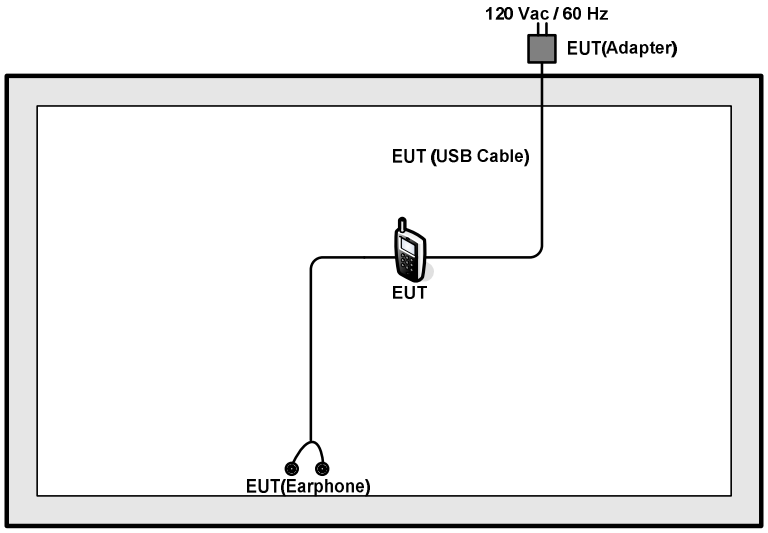
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

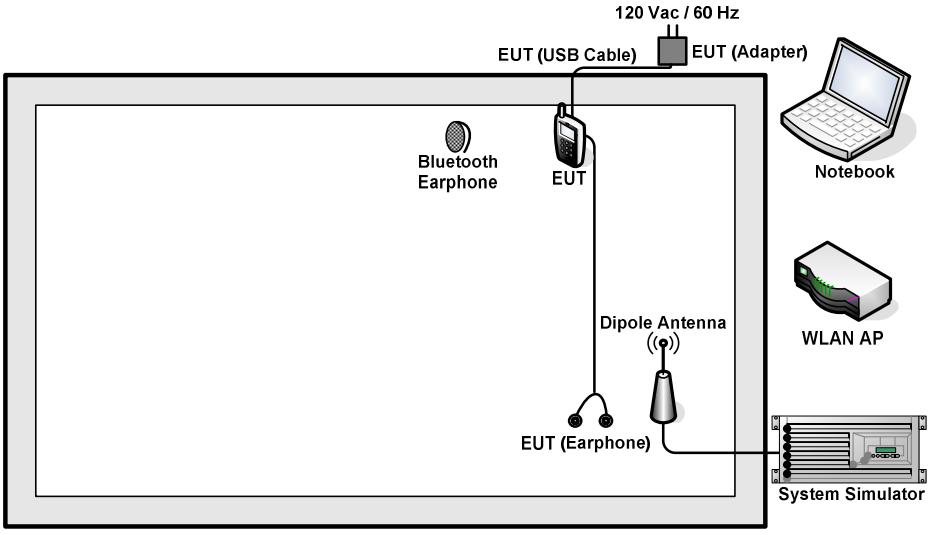
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)
Remark: For Radiated Test Cases, The tests were performance with Adapter, Earphone, and USB Cable.	

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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A

2.6 EUT Operation Test Setup

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

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

2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5.0 dB and 10dB attenuator.

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

= 5.0 + 10 = 15.0 (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.

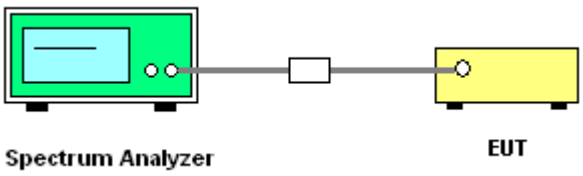
3.1.2 Measuring Instruments

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 v03r03.
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.

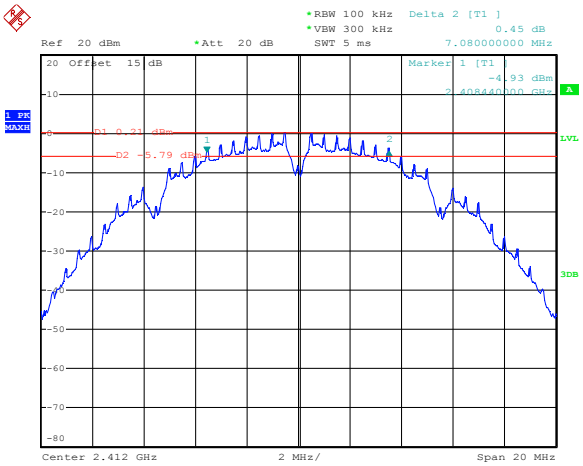
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A of this test report.

Minimum 6dB Bandwidth



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.

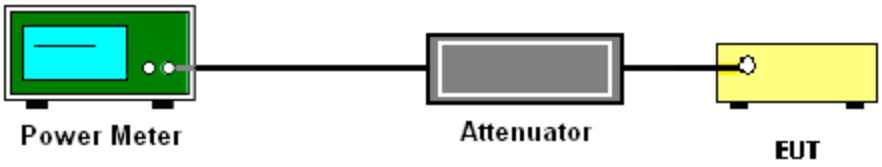
3.2.2 Measuring Instruments

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 v03r03.
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

Please refer to Appendix A of this test report.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A of this test report.

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.

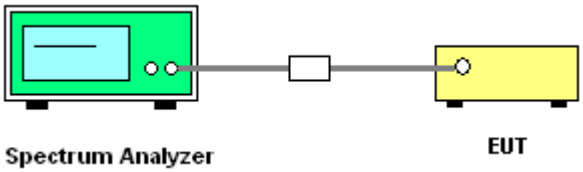
3.3.2 Measuring Instruments

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 v03r03
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.

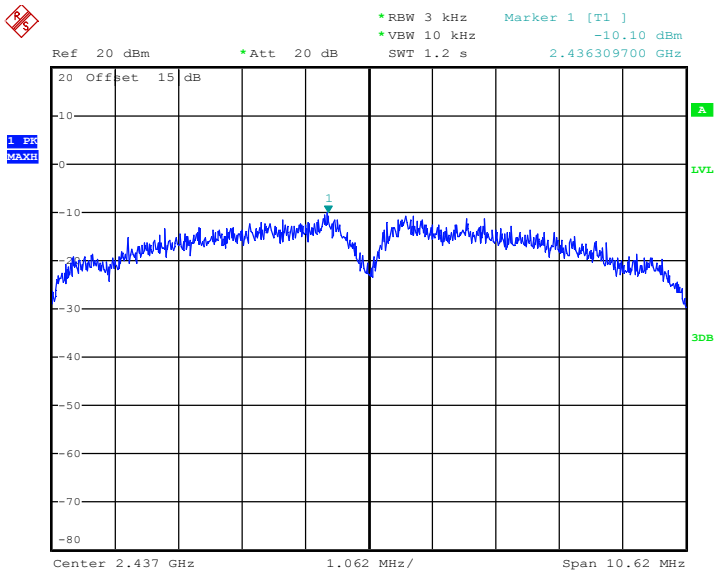
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A of this test report.

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).

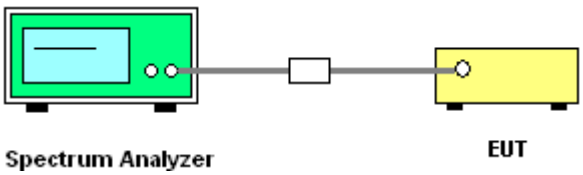
3.4.2 Measuring Instruments

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 v03r03.
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

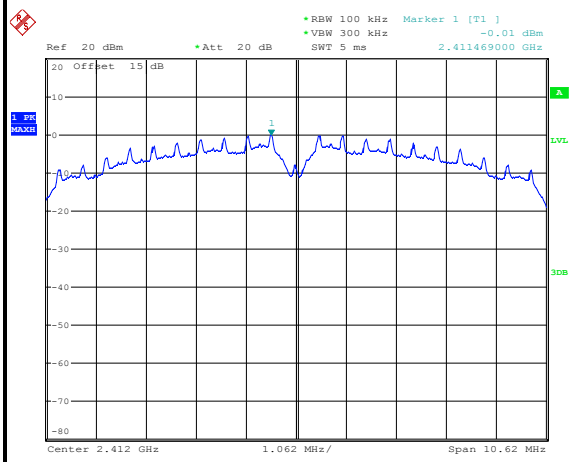


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Tiny You

WLAN 802.11b Channel 01

100kHz PSD reference Level



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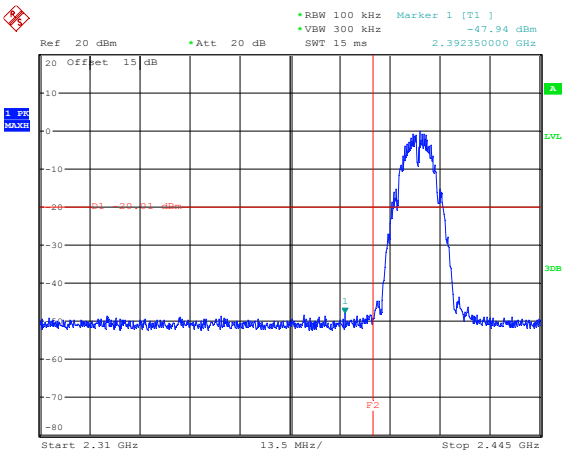
Low Channel Plot



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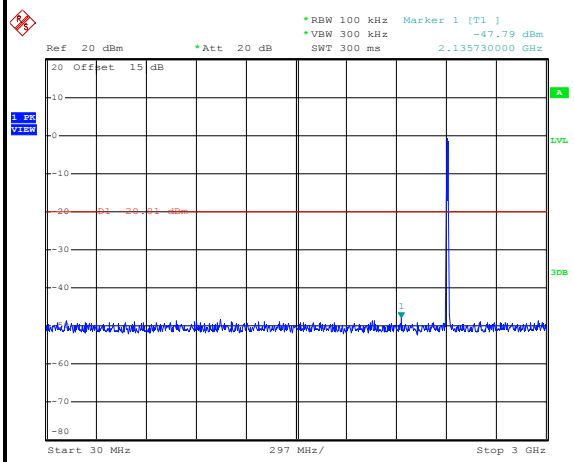
Spurious Emission 30MHz~3GHz



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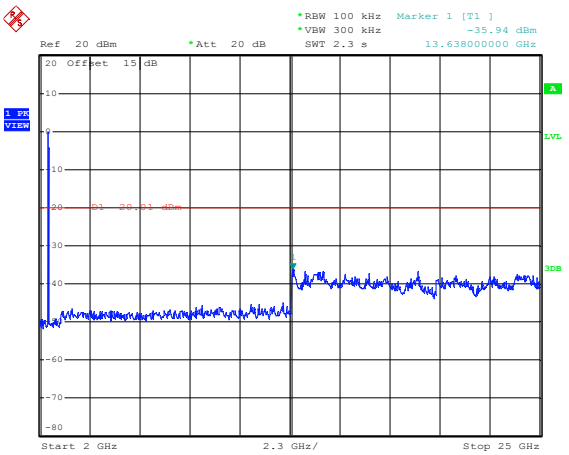
Spurious Emission 2GHz~25GHz



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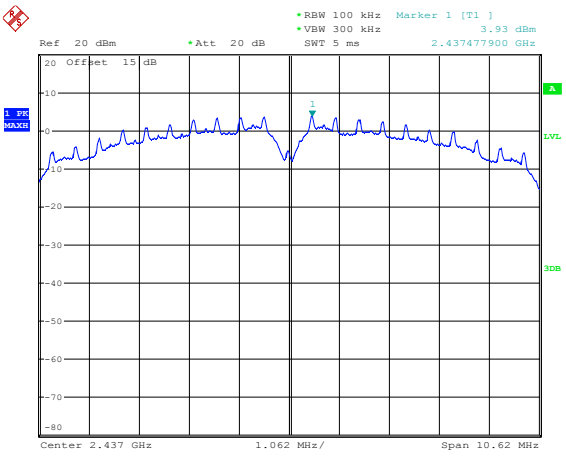
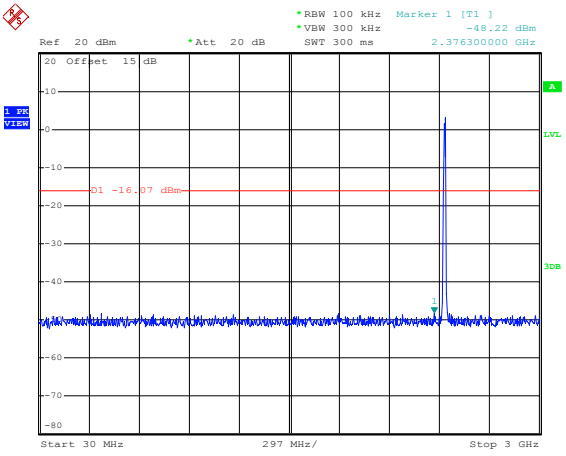
Test Mode :	802.11b	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Tiny You

WLAN 802.11b Channel 06

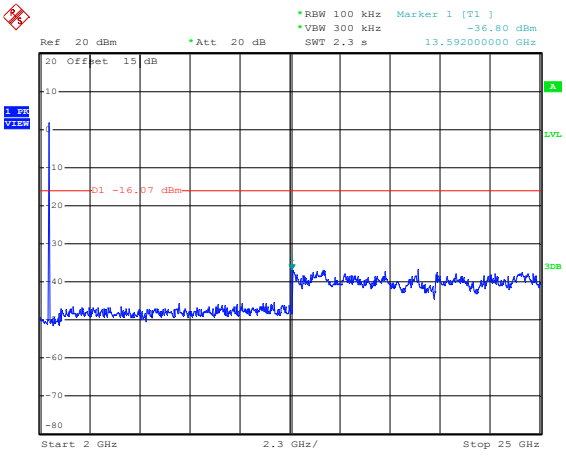
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



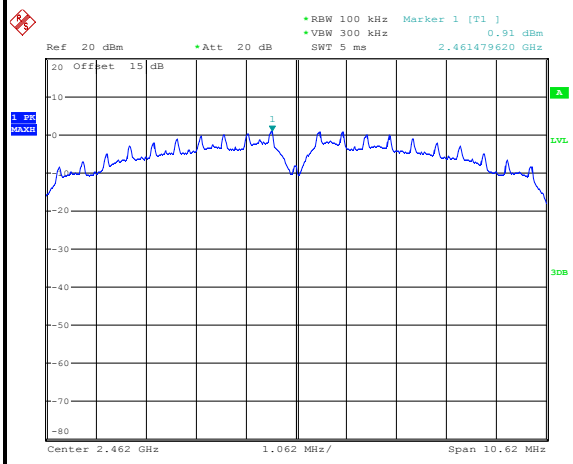
Spurious Emission 2GHz~25GHz



Test Mode :	802.11b	Temperature :	21~25℃
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Tiny You

WLAN 802.11b Channel 11

100kHz PSD reference Level



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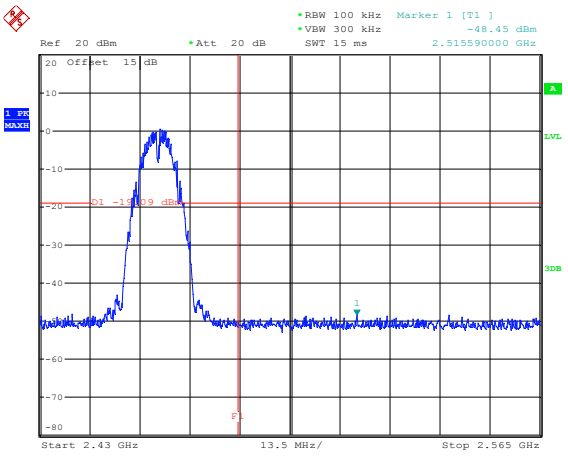
High Channel Plot



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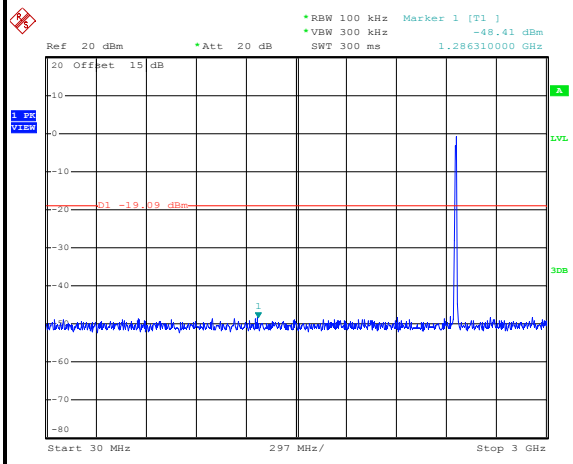
Spurious Emission 30MHz~3GHz



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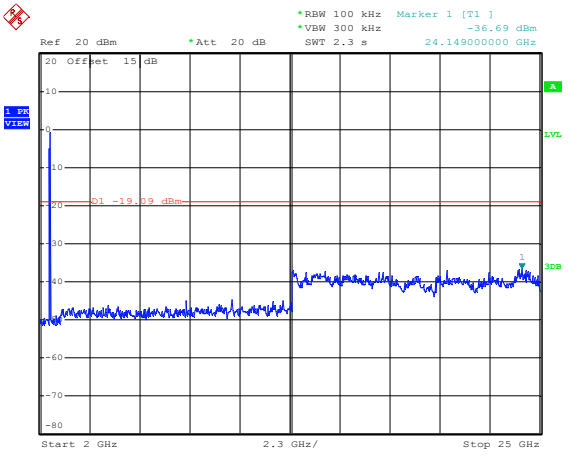
Spurious Emission 2GHz~25GHz



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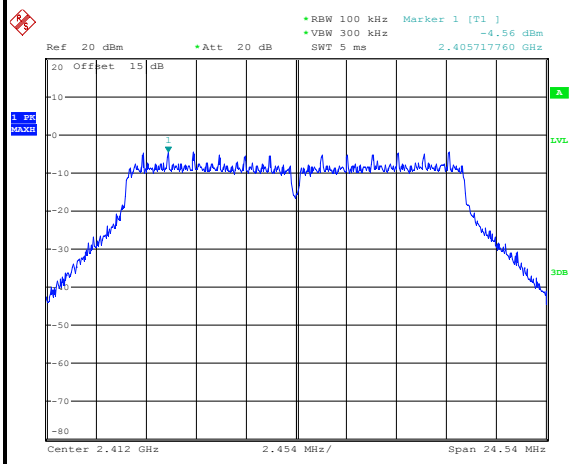
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Tiny You

WLAN 802.11g Channel 01

100kHz PSD reference Level



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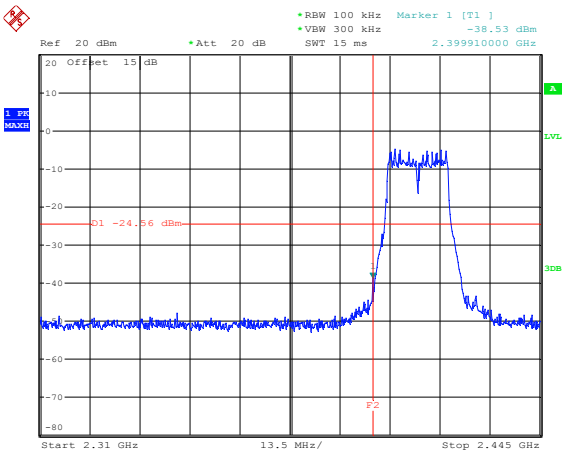
Low Channel Plot



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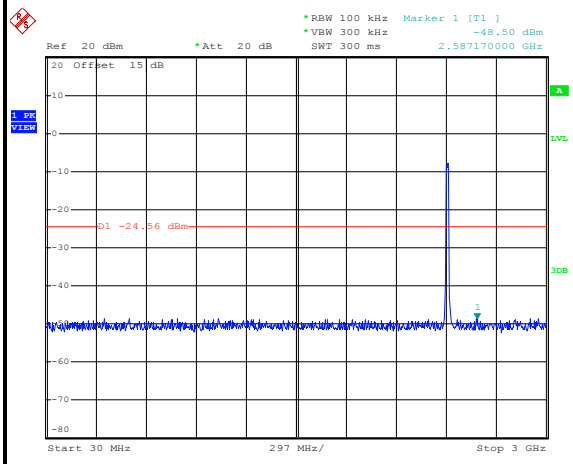
Spurious Emission 30MHz~3GHz



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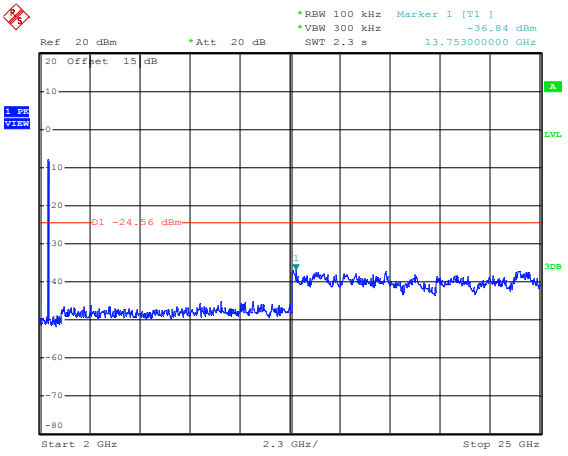
Spurious Emission 2GHz~25GHz



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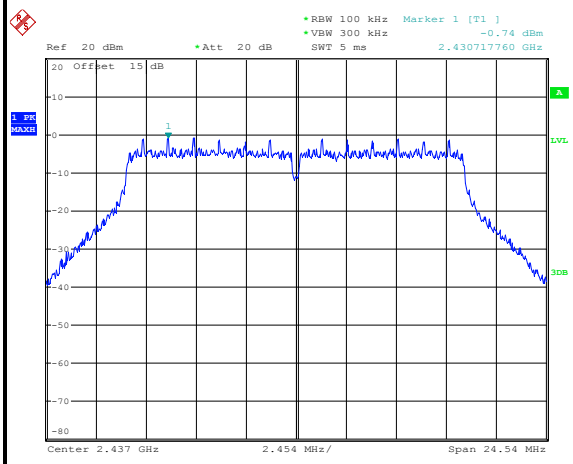
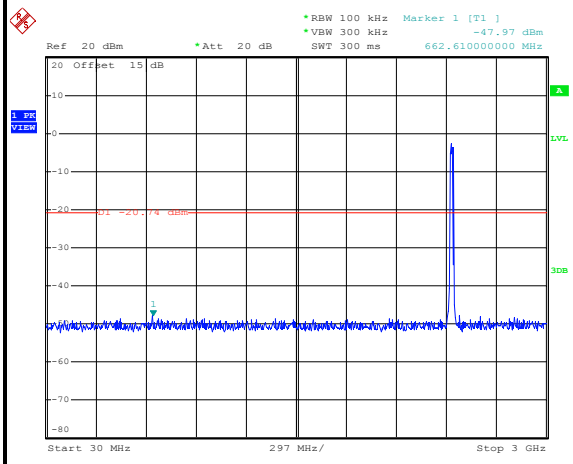
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Tiny You

WLAN 802.11g Channel 06

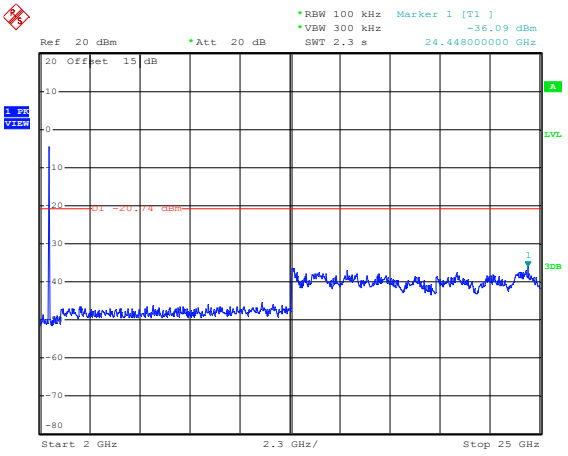
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



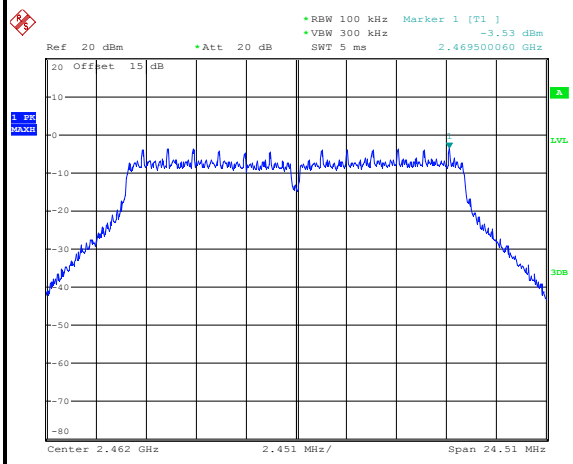
Spurious Emission 2GHz~25GHz



Test Mode :	802.11g	Temperature :	21~25℃
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Tiny You

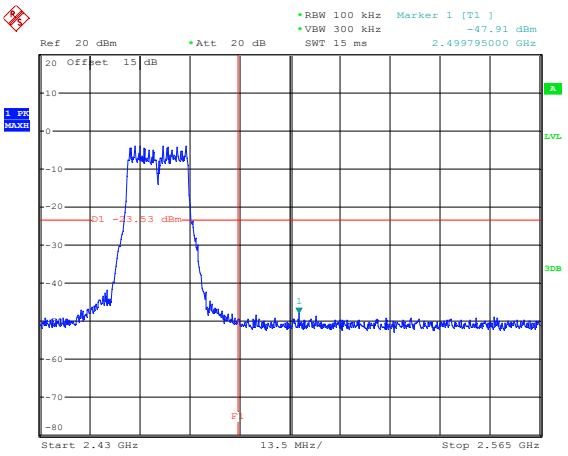
WLAN 802.11g Channel 11

100kHz PSD reference Level



Date: 19.MAR.2015 17:33:00

High Channel Plot



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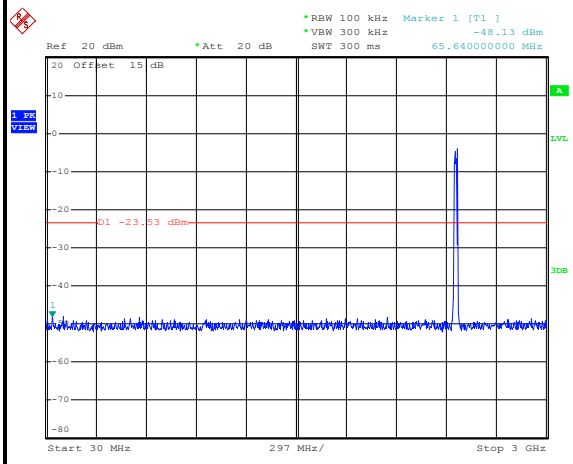
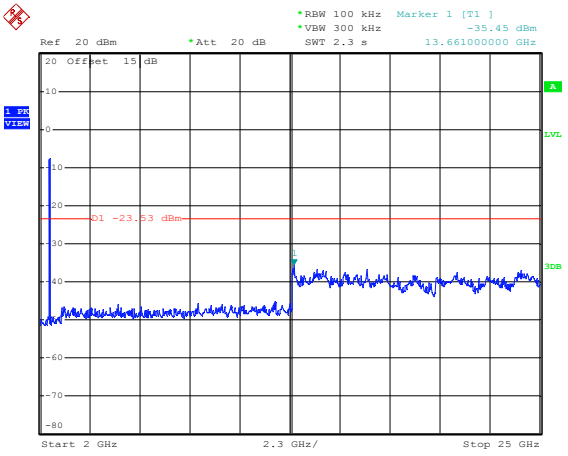
Spurious Emission 30MHz~3GHz



Date: 19.MAR.2015 17:33:52

Spurious Emission 2GHz~25GHz

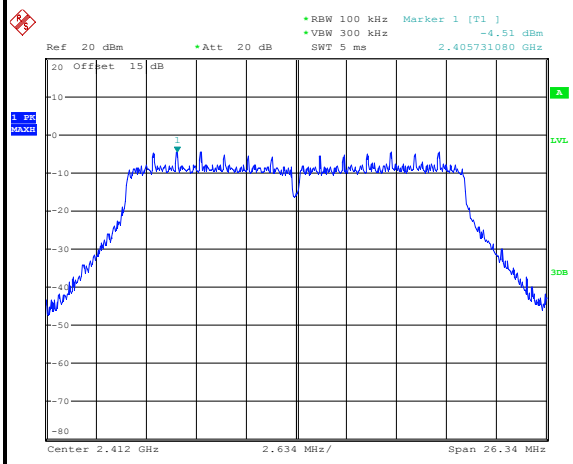


Date: 19.MAR.2015 17:34:10

Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Low	**Relative Humidity :**	51~54%
Test Channel :	01	**Test Engineer :**	Tiny You

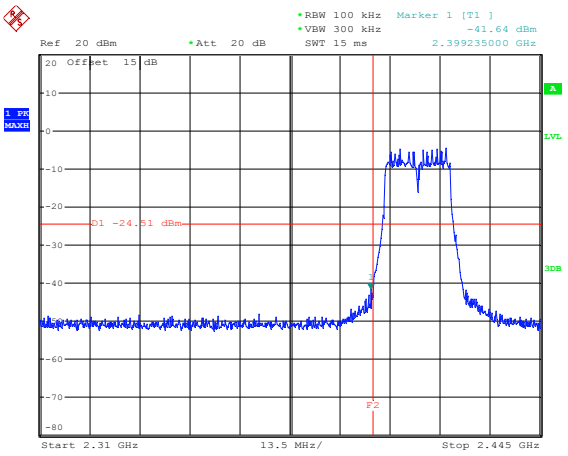
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



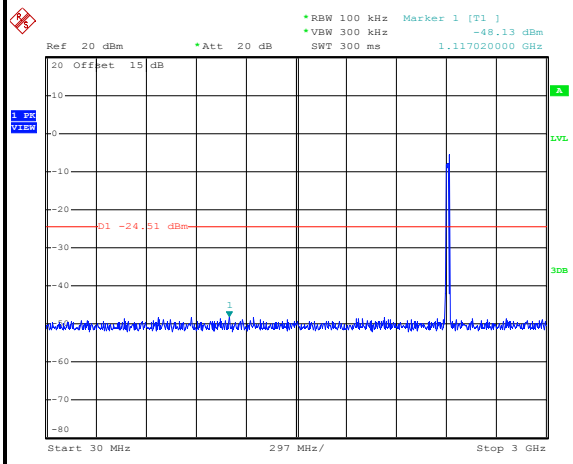
Date: 19.MAR.2015 17:51:03

Low Channel Plot



Date: 19.MAR.2015 17:51:42

Spurious Emission 30MHz~3GHz



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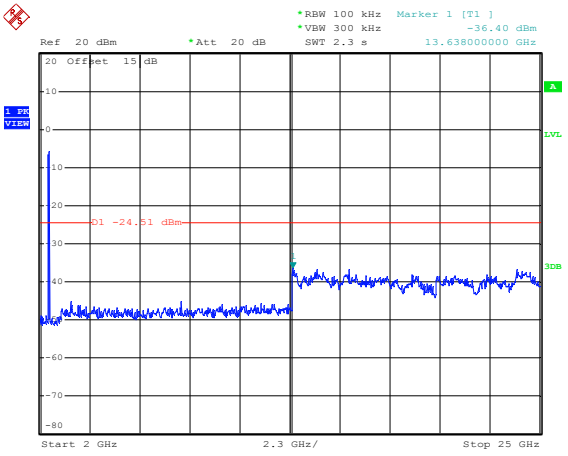
Spurious Emission 2GHz~25GHz

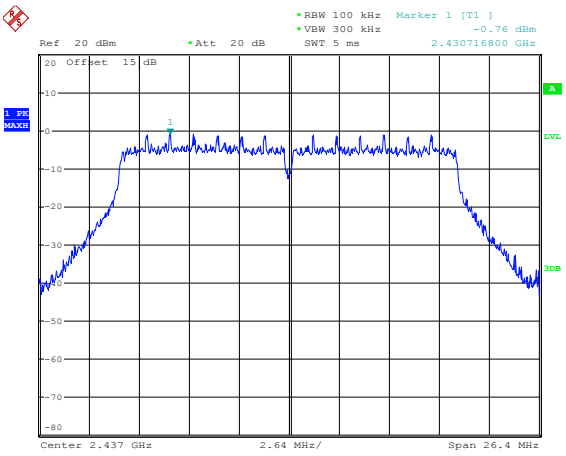


Date: 19.MAR.2015 17:53:07

Test Mode :	802.11n HT20	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Tiny You

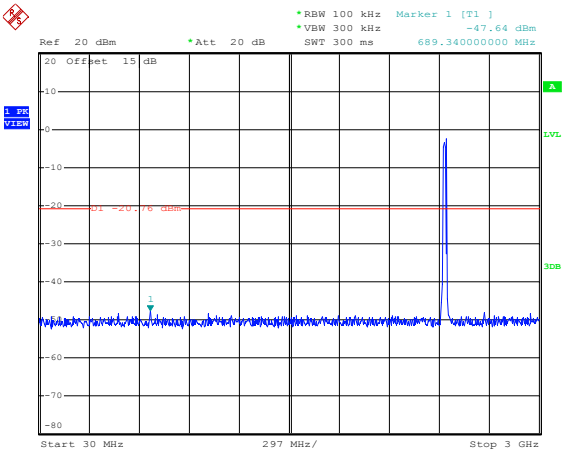
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



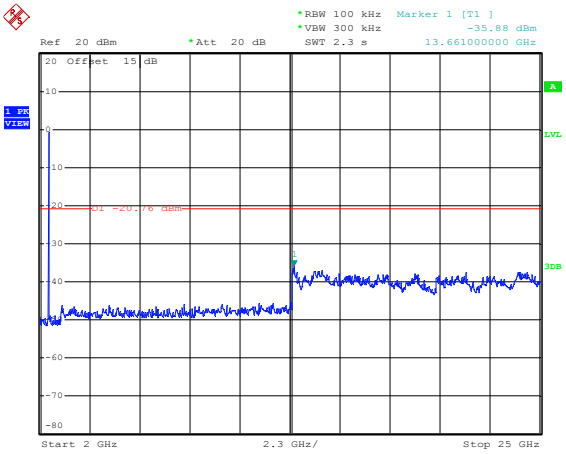
Date: 19.MAR.2015 17:55:53

Spurious Emission 30MHz~3GHz



Date: 19.MAR.2015 17:56:21

Spurious Emission 2GHz~25GHz

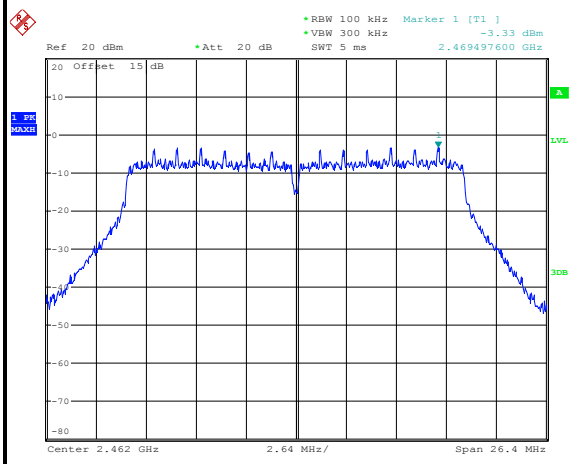


Date: 19.MAR.2015 17:56:39

Test Mode :	802.11n HT20	Temperature :	21~25℃
Test Band :	2.4GHz High	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Tiny You

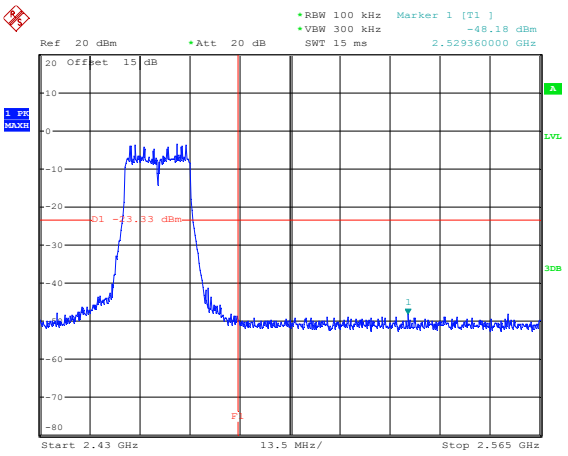
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



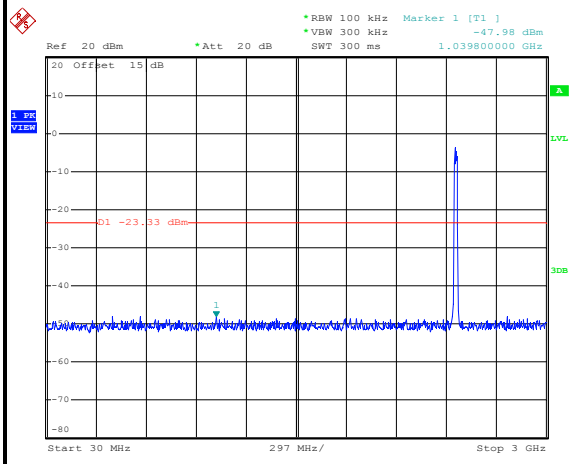
Date: 19.MAR.2015 18:00:36

High Channel Plot



Date: 19.MAR.2015 18:01:01

Spurious Emission 30MHz~3GHz



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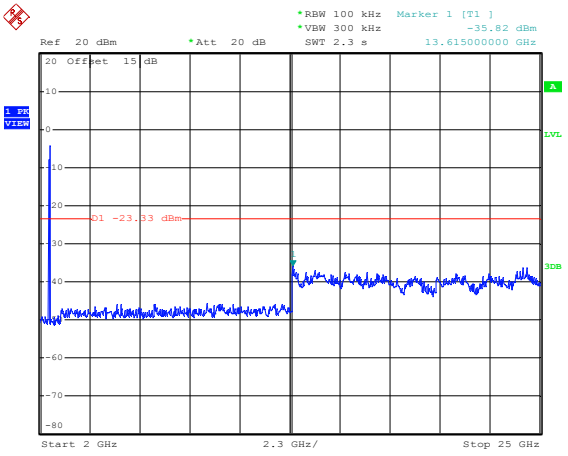
Spurious Emission 2GHz~25GHz



Date: 19.MAR.2015 18:01:41

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.

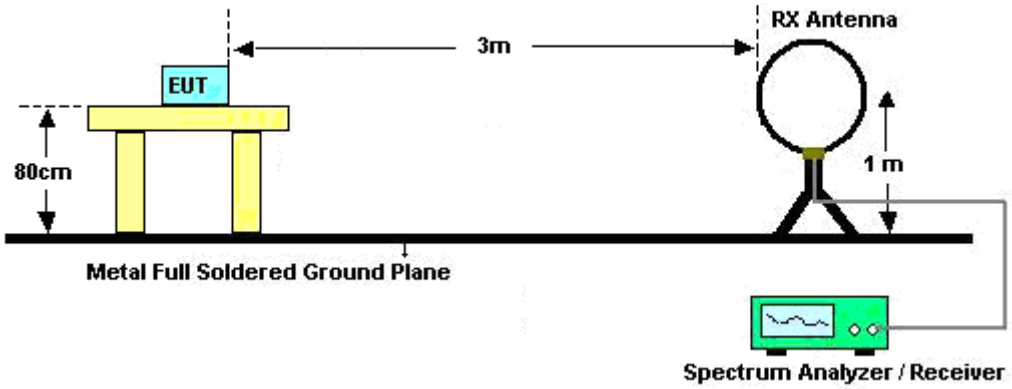
3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r03.
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 for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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.

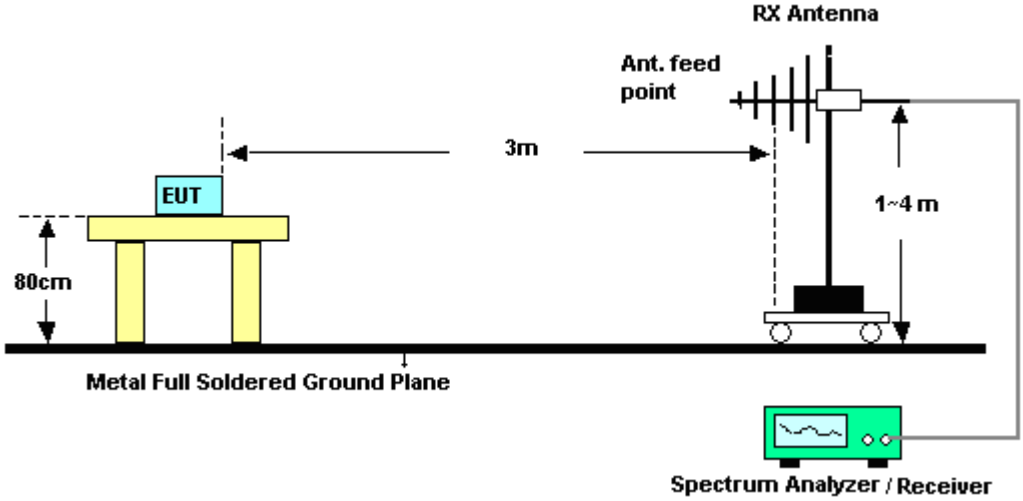
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.64	8.27	0.12	300Hz
802.11g	87.26	1.37	0.73	1kHz
2.4GHz 802.11n HT20	87.09	1.28	0.78	1kHz

3.5.4 Test Setup

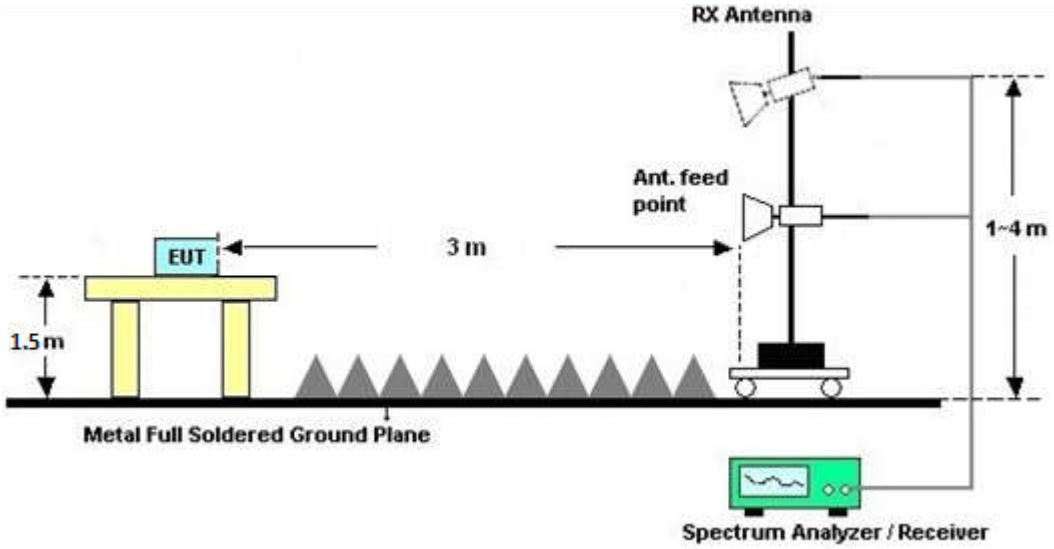
For radiated emissions below 30MHz



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 B.

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

Please refer to Appendix B.

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.

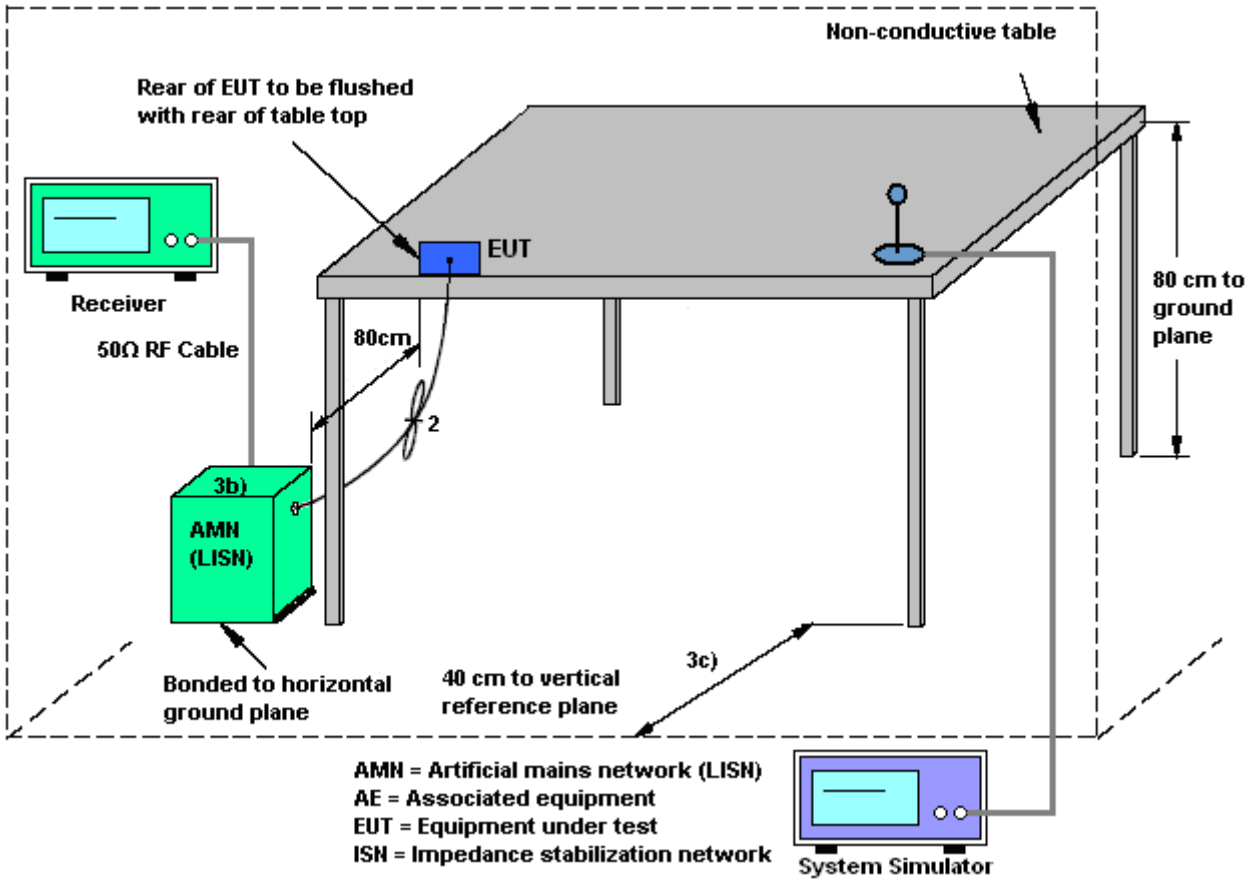
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

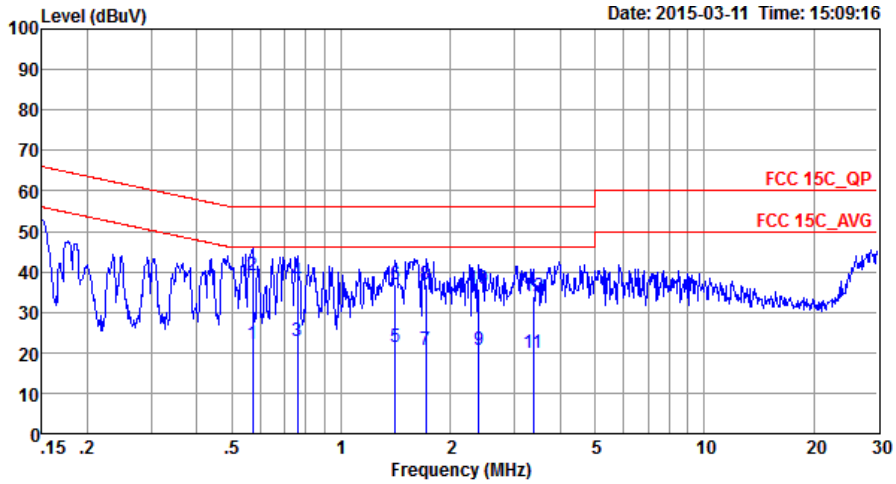
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)		

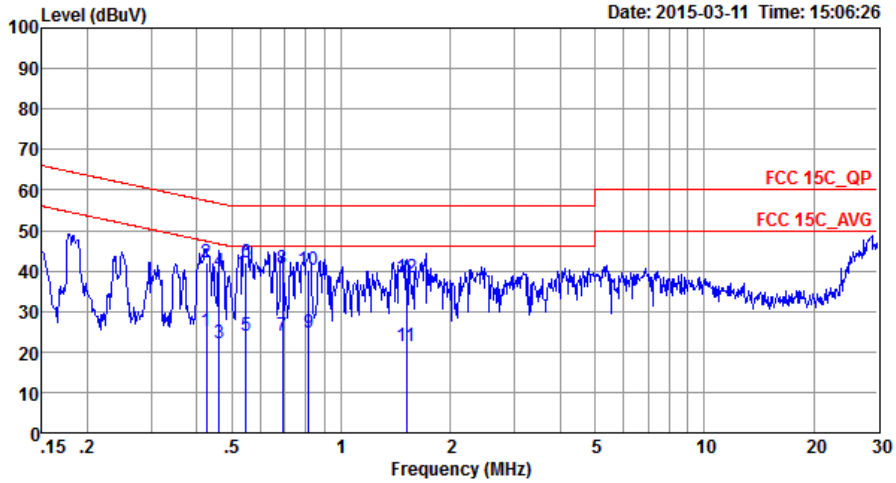


Site : CO01-SZ
Condition: FCC 15C_QP LISN_L_20140304 LINE

Mode : Mode 1
IMEI : 354033028150194/354033028150202

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.57	22.21	-23.79	46.00	11.81	0.25	10.15	Average
2	*	0.57	39.21	-16.79	56.00	28.81	0.25	10.15	QP
3		0.76	22.75	-23.25	46.00	12.40	0.20	10.15	Average
4		0.76	37.55	-18.45	56.00	27.20	0.20	10.15	QP
5		1.41	21.31	-24.69	46.00	10.90	0.24	10.17	Average
6		1.41	36.81	-19.19	56.00	26.40	0.24	10.17	QP
7		1.71	20.71	-25.29	46.00	10.30	0.23	10.18	Average
8		1.71	36.81	-19.19	56.00	26.40	0.23	10.18	QP
9		2.40	20.76	-25.24	46.00	10.30	0.26	10.20	Average
10		2.40	35.66	-20.34	56.00	25.20	0.26	10.20	QP
11		3.38	19.75	-26.25	46.00	9.19	0.34	10.22	Average
12		3.38	34.05	-21.95	56.00	23.49	0.34	10.22	QP

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_N_20140304 NEUTRAL

Mode : Mode 1
IMEI : 354033028150194/354033028150202

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.43	25.06	-22.27	47.33	14.50	0.39	10.17	Average
2		0.43	41.96	-15.37	57.33	31.40	0.39	10.17	QP
3		0.46	22.26	-24.41	46.67	11.70	0.40	10.16	Average
4		0.46	39.96	-16.71	56.67	29.40	0.40	10.16	QP
5		0.55	23.82	-22.18	46.00	13.30	0.37	10.15	Average
6	*	0.55	42.22	-13.78	56.00	31.70	0.37	10.15	QP
7		0.69	24.01	-21.99	46.00	13.60	0.26	10.15	Average
8		0.69	40.41	-15.59	56.00	30.00	0.26	10.15	QP
9		0.81	24.63	-21.37	46.00	14.20	0.28	10.15	Average
10		0.81	40.33	-15.67	56.00	29.90	0.28	10.15	QP
11		1.51	21.43	-24.57	46.00	10.91	0.35	10.17	Average
12		1.51	38.23	-17.77	56.00	27.71	0.35	10.17	QP

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	FSP30	101400	9kHz~30GHz	Jan. 28, 2015	Mar. 19, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power meter	Anritsu	ML2495A	1218010	10Hz~40GHz	Jan. 28, 2015	Mar. 19, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	0.3GHz~40GHz	Jan. 28, 2015	Mar. 19, 2015	Jan. 27, 2016	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Oct. 25, 2014	Mar. 27, 2015	Oct. 24, 2015	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Mar. 27, 2015	May 03, 2015	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 13, 2014	Mar. 27, 2015	Nov. 12, 2015	Radiation (03CH01-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	25Mhz-2Ghz	Jan. 17, 2015	Mar. 27, 2015	Jan. 16, 2016	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 17, 2015	Mar. 27, 2015	Jan. 16, 2016	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 08, 2014	Mar. 27, 2015	Nov. 07, 2015	Radiation (03CH01-KS)
SHF-EHF Horn	com-power	AH-840	101070	18Ghz-40Ghz	Sep. 04, 2014	Mar. 27, 2015	Sep. 03, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz /32dB	May 04, 2014	Mar. 27, 2015	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02371	1GHz~26.5GHz	Oct. 28, 2014	Mar. 27, 2015	Oct. 27, 2015	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 27, 2015	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Mar. 27, 2015	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Mar. 27, 2015	NCR	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100724	9kHz~3GHz	Jan. 28, 2015	Mar. 11, 2015	Jan. 27, 2016	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Feb. 02, 2015	Mar. 11, 2015	Feb. 01, 2016	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Feb. 02, 2015	Mar. 11, 2015	Feb. 01, 2016	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Sep. 29, 2014	Mar. 11, 2015	Sep. 28, 2015	Conduction (CO01-SZ)
Pulse Limiter	COM-POWER	LIT-153 Transient Limiter	53139	150kHz~30MHz	Oct. 24, 2014	Mar. 11, 2015	Oct. 23, 2015	Conduction (CO01-SZ)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Appendix A. Conducted Test Results

Test Engineer:	Tiny You	Temperature:	21~25	°C
Test Date:	2015/3/19	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.30	7.08	0.50	Pass
11b	1Mbps	1	6	2437	12.20	7.08	0.50	Pass
11b	1Mbps	1	11	2462	12.25	7.08	0.50	Pass
11g	6Mbps	1	1	2412	18.25	16.36	0.50	Pass
11g	6Mbps	1	6	2437	18.15	16.36	0.50	Pass
11g	6Mbps	1	11	2462	18.25	16.34	0.50	Pass
HT20	MCS0	1	1	2412	19.00	17.56	0.50	Pass
HT20	MCS0	1	6	2437	18.75	17.60	0.50	Pass
HT20	MCS0	1	11	2462	18.95	17.60	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	11.28	30.00	2.10	13.38	36.00	Pass
11b	1Mbps	1	6	2437	15.39	30.00	2.10	17.49	36.00	Pass
11b	1Mbps	1	11	2462	12.50	30.00	2.10	14.60	36.00	Pass
11g	6Mbps	1	1	2412	17.56	30.00	2.10	19.66	36.00	Pass
11g	6Mbps	1	6	2437	20.94	30.00	2.10	23.04	36.00	Pass
11g	6Mbps	1	11	2462	19.02	30.00	2.10	21.12	36.00	Pass
HT20	MCS0	1	1	2412	17.50	30.00	2.10	19.60	36.00	Pass
HT20	MCS0	1	6	2437	20.91	30.00	2.10	23.01	36.00	Pass
HT20	MCS0	1	11	2462	19.02	30.00	2.10	21.12	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.10	8.18
11b	1Mbps	1	6	2437	0.10	12.15
11b	1Mbps	1	11	2462	0.10	9.51
11g	6Mbps	1	1	2412	0.59	7.42
11g	6Mbps	1	6	2437	0.59	11.24
11g	6Mbps	1	11	2462	0.59	8.46
HT20	MCS0	1	1	2412	0.60	7.31
HT20	MCS0	1	6	2437	0.60	11.18
HT20	MCS0	1	11	2462	0.60	8.39

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-14.88	2.10	8.00	Pass
11b	1Mbps	1	6	2437	-10.10	2.10	8.00	Pass
11b	1Mbps	1	11	2462	-13.81	2.10	8.00	Pass
11g	6Mbps	1	1	2412	-18.66	2.10	8.00	Pass
11g	6Mbps	1	6	2437	-14.68	2.10	8.00	Pass
11g	6Mbps	1	11	2462	-17.51	2.10	8.00	Pass
HT20	MCS0	1	1	2412	-18.44	2.10	8.00	Pass
HT20	MCS0	1	6	2437	-14.52	2.10	8.00	Pass
HT20	MCS0	1	11	2462	-17.18	2.10	8.00	Pass

Appendix B. Radiated Test Results

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		2386.05	48.71	-25.29	74	45.59	31.3	6.17	34.35	194	243	P	H
		2383.08	33.93	-20.07	54	30.84	31.28	6.17	34.36	194	243	A	H
	*	2411.94	94.74	-	-	91.55	31.31	6.22	34.34	194	243	P	H
	*	2412.107	89.28	-	-	86.09	31.31	6.22	34.34	194	243	A	H
		2358.78	48.21	-25.79	74	45.2	31.26	6.12	34.37	229	58	P	V
		2386.32	33.97	-20.03	54	30.85	31.3	6.17	34.35	229	58	A	V
	*	2411.94	90.85	-	-	87.66	31.31	6.22	34.34	229	58	P	V
	*	2412.107	84.61	-	-	81.42	31.31	6.22	34.34	229	58	A	V
802.11b CH 06 2437MHz	*	2435.655	106.56	-	-	103.34	31.33	6.22	34.33	169	129	P	H
	*	2435.237	101.45	-	-	98.23	31.33	6.22	34.33	169	129	A	H
	*	2436.99	106.11	-	-	102.87	31.34	6.22	34.32	150	58	P	V
	*	2437.992	101.06	-	-	97.82	31.34	6.22	34.32	150	58	A	V
802.11b CH 11 2462MHz	*	2462.041	97.26	-	-	93.93	31.36	6.28	34.31	251	99	P	H
	*	2462.542	91.43	-	-	88.1	31.36	6.28	34.31	251	99	A	H
		2484.28	48.82	-25.18	74	45.42	31.37	6.33	34.3	251	99	P	H
		2483.6	35.05	-18.95	54	31.65	31.37	6.33	34.3	251	99	A	H
	*	2462.041	90.96	-	-	87.63	31.36	6.28	34.31	179	270	P	V
	*	2462.124	85.42	-	-	82.09	31.36	6.28	34.31	179	270	A	V
		2494.76	49.35	-24.65	74	45.92	31.39	6.33	34.29	179	270	P	V
		2497.4	34.41	-19.59	54	30.98	31.39	6.33	34.29	179	270	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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	47.9	-26.1	74	37.43	34.89	8.73	33.15	162	0	P	H
		4824	48.99	-25.01	74	38.52	34.89	8.73	33.15	215	320	P	V
802.11b CH 06 2437MHz		4875	49.4	-24.6	74	38.86	34.92	8.76	33.14	187	168	P	H
		7311	45.96	-28.04	74	33.78	35.56	10.84	34.22	201	0	P	H
		4875	48.21	-25.79	74	37.67	34.92	8.76	33.14	185	268	P	V
		7311	45.39	-28.61	74	33.21	35.56	10.84	34.22	251	302	P	V
802.11b CH 11 2462MHz		4923	47.52	-26.48	74	36.9	34.95	8.79	33.12	188	0	P	H
		7386	46.76	-27.24	74	34.9	35.58	10.89	34.61	148	261	P	H
		4923	47.58	-26.42	74	36.96	34.95	8.79	33.12	214	130	P	V
		7386	45.74	-28.26	74	33.88	35.58	10.89	34.61	175	285	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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		2371.02	48.63	-25.37	74	45.54	31.28	6.17	34.36	176	246	P	H
		2386.77	34.47	-19.53	54	31.35	31.3	6.17	34.35	176	246	A	H
	*	2406.346	95.62	-	-	92.43	31.31	6.22	34.34	176	246	P	H
	*	2408.016	83.46	-	-	80.27	31.31	6.22	34.34	176	246	A	H
		2352.12	48.62	-25.38	74	45.61	31.26	6.12	34.37	100	58	P	V
		2368.95	34.46	-19.54	54	31.37	31.28	6.17	34.36	100	58	A	V
	*	2405.26	93.59	-	-	90.4	31.31	6.22	34.34	100	58	P	V
	*	2406.93	80.87	-	-	77.68	31.31	6.22	34.34	100	58	A	V
802.11g CH 06 2437MHz	*	2434.903	101.97	-	-	98.75	31.33	6.22	34.33	296	50	P	H
	*	2443.086	89.89	-	-	86.59	31.34	6.28	34.32	296	50	A	H
	*	2439.496	99.7	-	-	96.4	31.34	6.28	34.32	113	165	P	V
	*	2441.249	87.43	-	-	84.13	31.34	6.28	34.32	113	165	A	V
802.11g CH 11 2462MHz	*	2466.466	100.37	-	-	97.04	31.36	6.28	34.31	110	232	P	H
	*	2467.719	87.98	-	-	84.65	31.36	6.28	34.31	110	232	A	H
		2483.56	52.78	-21.22	74	49.38	31.37	6.33	34.3	110	232	P	H
		2483.52	36.81	-17.19	54	33.41	31.37	6.33	34.3	110	232	A	H
	*	2466.383	92.95	-	-	89.62	31.36	6.28	34.31	100	0	P	V
	*	2466.132	81.34	-	-	78.01	31.36	6.28	34.31	100	0	A	V
		2483.88	49.5	-24.5	74	46.1	31.37	6.33	34.3	100	0	P	V
		2483.92	35.1	-18.9	54	31.7	31.37	6.33	34.3	100	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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	47.92	-26.08	74	37.45	34.89	8.73	33.15	188	130	P	H
		4824	46.76	-27.24	74	36.29	34.89	8.73	33.15	198	236	P	V
802.11g CH 06 2437MHz		4875	47.59	-26.41	74	37.05	34.92	8.76	33.14	184	210	P	H
		7311	47.46	-26.54	74	35.28	35.56	10.84	34.22	168	54	P	H
		4875	47.24	-26.76	74	36.7	34.92	8.76	33.14	251	0	P	V
		7311	46.68	-27.32	74	34.5	35.56	10.84	34.22	177	141	P	V
802.11g CH 11 2462MHz		4923	48.1	-25.9	74	37.48	34.95	8.79	33.12	154	203	P	H
		7386	46.18	-27.82	74	34.32	35.58	10.89	34.61	158	269	P	H
		4923	48.56	-25.44	74	37.94	34.95	8.79	33.12	143	305	P	V
		7386	46.45	-27.55	74	34.59	35.58	10.89	34.61	128	43	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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)
		2374.89	48.41	-25.59	74	45.32	31.28	6.17	34.36	182	10	P	H
		2389.92	34.41	-19.59	54	31.29	31.3	6.17	34.35	182	10	A	H
802.11n	*	2408.434	95.28	-	-	92.09	31.31	6.22	34.34	182	10	P	H
HT20	*	2407.264	83.37	-	-	80.18	31.31	6.22	34.34	182	10	A	H
CH 01		2388.12	48.35	-25.65	74	45.23	31.3	6.17	34.35	152	358	P	V
2412MHz		2389.92	34.42	-19.58	54	31.3	31.3	6.17	34.35	152	358	A	V
	*	2408.601	93.41	-	-	90.22	31.31	6.22	34.34	152	358	P	V
	*	2408.517	81.78	-	-	78.59	31.31	6.22	34.34	152	358	A	V
802.11n	*	2434.068	100.98	-	-	97.76	31.33	6.22	34.33	194	358	P	H
HT20	*	2434.152	88.94	-	-	85.72	31.33	6.22	34.33	194	358	A	H
CH 06	*	2440.665	99.91	-	-	96.61	31.34	6.28	34.32	241	24	P	V
2437MHz	*	2444.004	88.14	-	-	84.84	31.34	6.28	34.32	241	24	A	V
	*	2459.285	99.39	-	-	96.06	31.36	6.28	34.31	208	329	P	H
	*	2457.615	87.73	-	-	84.4	31.36	6.28	34.31	208	329	A	H
802.11n		2483.52	54.32	-19.68	74	50.92	31.37	6.33	34.3	208	329	P	H
HT20		2483.76	37.28	-16.72	54	33.88	31.37	6.33	34.3	208	329	A	H
CH 11	*	2468.971	97.84	-	-	94.51	31.36	6.28	34.31	150	309	P	V
2462MHz	*	2468.136	86.28	-	-	82.95	31.36	6.28	34.31	150	309	A	V
		2483.88	51.09	-22.91	74	47.69	31.37	6.33	34.3	150	309	P	V
		2483.72	35.94	-18.06	54	32.54	31.37	6.33	34.3	150	309	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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	47.52	-26.48	74	37.05	34.89	8.73	33.15	186	224	P	H
		4824	46.85	-27.15	74	36.38	34.89	8.73	33.15	167	206	P	V
802.11n HT20 CH 06 2437MHz		4875	46.45	-27.55	74	35.91	34.92	8.76	33.14	163	241	P	H
		7311	46.45	-27.55	74	34.27	35.56	10.84	34.22	178	64	P	H
		4875	46.71	-27.29	74	36.17	34.92	8.76	33.14	189	203	P	V
		7311	46.22	-27.78	74	34.04	35.56	10.84	34.22	203	67	P	V
802.11n HT20 CH 11 2462MHz		4923	47.89	-26.11	74	37.27	34.95	8.79	33.12	196	224	P	H
		7386	46	-28	74	34.14	35.58	10.89	34.61	234	102	P	H
		4923	47.12	-26.88	74	36.5	34.95	8.79	33.12	175	221	P	V
		7386	46.01	-27.99	74	34.15	35.58	10.89	34.61	169	221	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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		30	18.96	-21.04	40	31.63	19.2	0.79	32.66	-	-	P	H
		101.78	21.56	-21.94	43.5	41.83	11.32	1.04	32.63	-	-	P	H
		191.99	26.8	-16.7	43.5	47.56	10.1	1.61	32.47	-	-	P	H
		307.42	30.39	-15.61	46	47.45	13.31	2.02	32.39	-	-	P	H
		384.05	30.2	-15.8	46	44.34	16.03	2.15	32.32	-	-	P	H
		691.54	33.38	-12.62	46	42.35	19.9	3.05	31.92	100	68	P	H
		30	24.84	-15.16	40	37.51	19.2	0.79	32.66	-	-	P	V
		153.19	29.93	-13.57	43.5	49.46	11.59	1.44	32.56	-	-	P	V
		172.59	30.29	-13.21	43.5	50.51	10.84	1.44	32.5	-	-	P	V
		421.88	28.51	-17.49	46	41.64	16.85	2.28	32.26	-	-	P	V
		652.74	31.05	-14.95	46	40.71	19.43	2.92	32.01	-	-	P	V
		691.54	35.71	-10.29	46	44.68	19.9	3.05	31.92	200	187	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

5GHz WIFI 802.11a (LF)

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. 1		(MHz)	(dBμV/m)	Limit (dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (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".