FCC RF Test Report

APPLICANT	:	CT Asia (HK) Ltd
EQUIPMENT	:	Smartphone
BRAND NAME	:	BLU
MODEL NAME	:	STUDIO 7.0 LTE
MARKETING NAME	:	STUDIO 7.0 LTE
FCC ID	:	YHLBLUST70LTE
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on May 19, 2015 and testing was completed on Jun. 30, 2015. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

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APPENDIX A. CONDUCTED TEST RESULTS

APPENDIX B. RADIATED TEST RESULTS

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR551902C	Rev. 01	Initial issue of report	Jul. 30, 2015

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-247 5.2(1)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	RSS-Gen 6.6	99% Bandwidth	-	Pass	-
3.2	15.247(b)	RSS-247 A5.4(4)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	RSS-247 5.2(2)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	RSS-247 5.5	Conducted Band Edges	≤ 20dBc	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-247 5.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.72 dB at 44.310 MHz
3.6	15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 11.3 dB at 0.590 MHz
3.6.5	15.203 & 15.247(b)	N/A	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

CT Asia (HK) Ltd
Unit1309-11, 13th Floor 9 Wing Hong Street Cheung Sha Wan Kowloon, Hong Kong

1.2 Manufacturer

QUANTA COMPUTER INC.
211, Wen Hwa 2nd Rd., Guishan Dist., Tao Yuan City 33377, Taiwan

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Brand Name	BLU
Model Name	STUDIO 7.0 LTE
Marketing Name	STUDIO 7.0 LTE
FCC ID	YHLBLUST70LTE
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
IMEI Code	Conducted: N/A Radiation: 357264048640024 Conduction: 357264048640362/ 357264048642368
HW Version	C
SW Version	BLU-S0010QU 05-29-2015 14:11
EUT Stage	Production Unit

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

1.4 Product Specification 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 : 15.78 dBm (0.0378 W) 802.11g : 21.62 dBm (0.1452 W) 802.11n HT20 : 20.29 dBm (0.1069 W)
99% Occupied Bandwidth	802.11b : 12.40MHz 802.11g : 18.20MHz 802.11n HT20 : 18.95MHz
Antenna Type/Gain	802.11b/g/n : PIFA Antenna with gain -1.00 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 INC.			
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH05-HY	CO05-HY	03CH12-HY	TW1022/4086B

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 C63.10-2013
- IC RSS-247 Issue 1
- IC RSS-Gen Issue 4

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 (Z 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	15.70	CH 11	15.67	15.63	15.75
CH 06	2437 MHz	15.47				
CH 11	2462 MHz	**15.78**				

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	20.89	CH 11	21.53	21.52	21.60	21.55	21.57	21.60	21.61
CH 06	2437 MHz	21.30								
CH 11	2462 MHz	**21.62**								

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	19.44	CH 11	20.17	20.12	19.86	20.20	19.84	19.84	20.12
CH 06	2437 MHz	20.27								
CH 11	2462 MHz	**20.29**								

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.

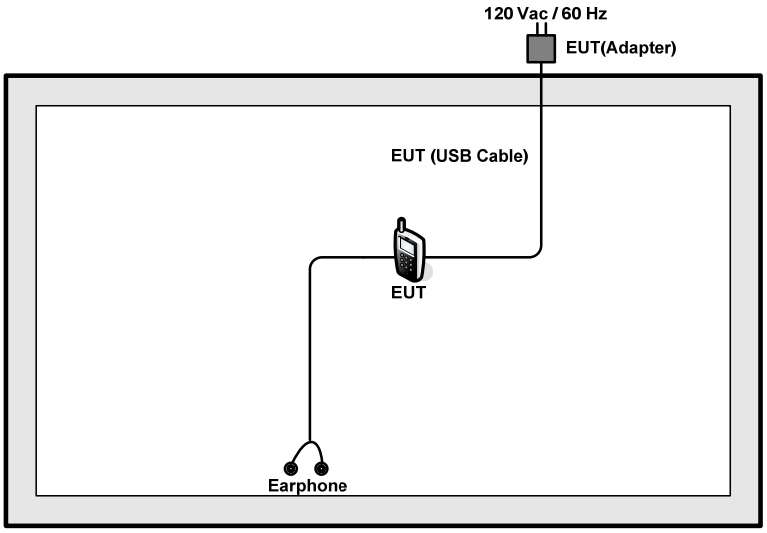
<2.4GHz>

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

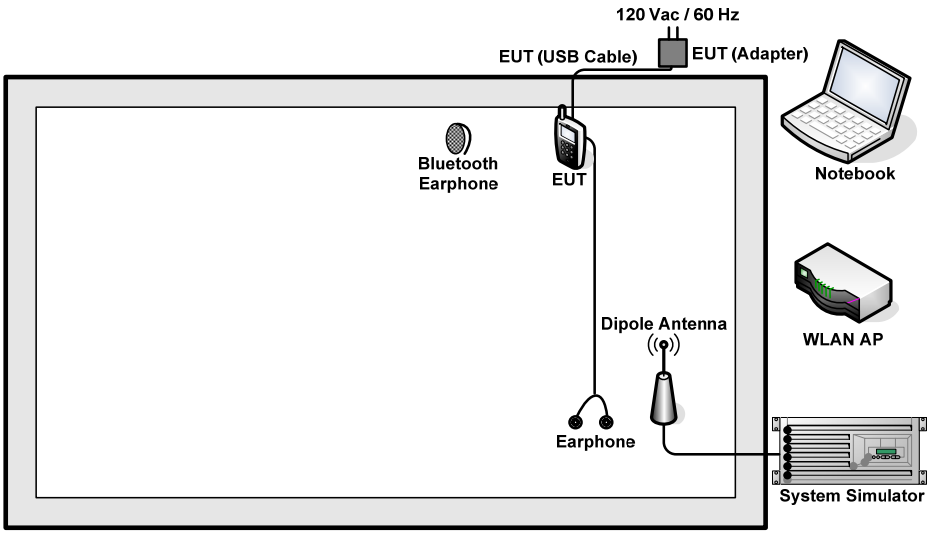
Test Cases	
AC Conducted Emission	Mode 1: GSM850 Link + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)
Remark: For Radiated Test Cases, The tests were performance with Adapter, Earphone, and USB Cable.	

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.	Bluetooth Earphone	SonyErricsson	MW600	PY700A2029	N/A	N/A
3.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded,1.8m
4.	NOTE BOOK	Dell	Latitude E6320	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
5.	Earphone	Lenovo	SH100	N/A	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 5.5 dB and 20dB attenuator.

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

= 5.5 + 20 = 25.5 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

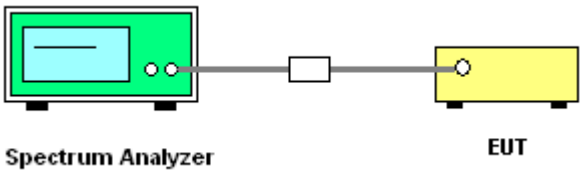
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

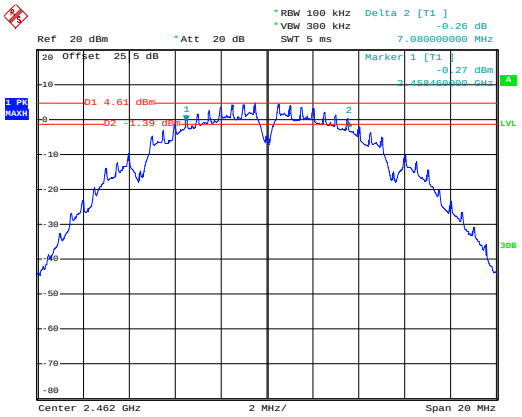
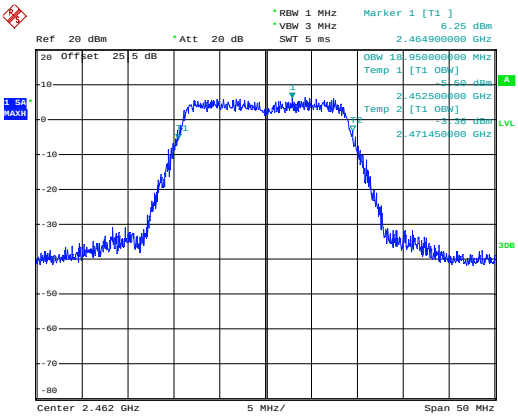
1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r03.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A of this test report.

Minimum 6dB Bandwidth	Maximum 99% Occupied Bandwidth
	
Date: 30.JUN.2015 00:35:09	Date: 4.JUN.2015 19:25:56

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.

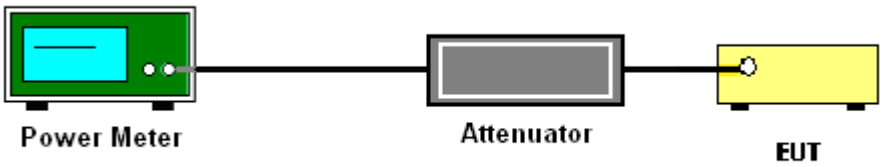
3.2.2 Measuring Instruments

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 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.

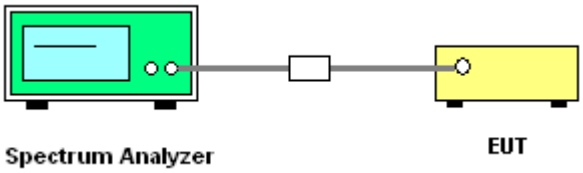
3.3.2 Measuring Instruments

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.

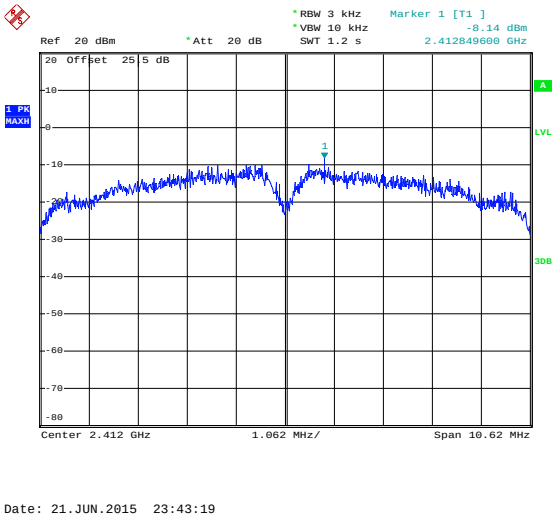
3.3.4 Test Setup



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).

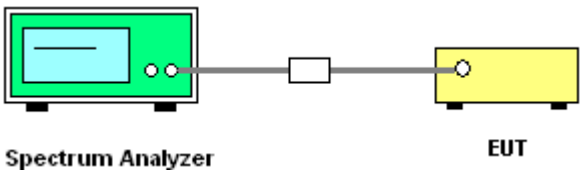
3.4.2 Measuring Instruments

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

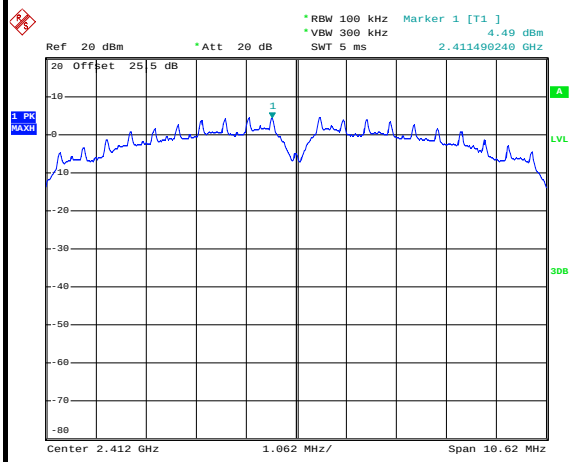


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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

WLAN 802.11b Channel 01

100kHz PSD reference Level



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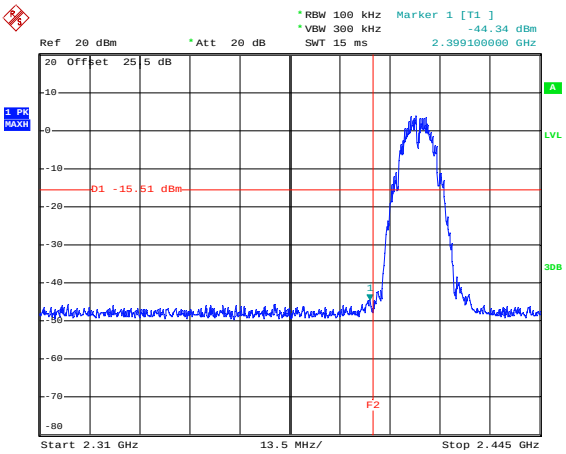
Low Channel Plot



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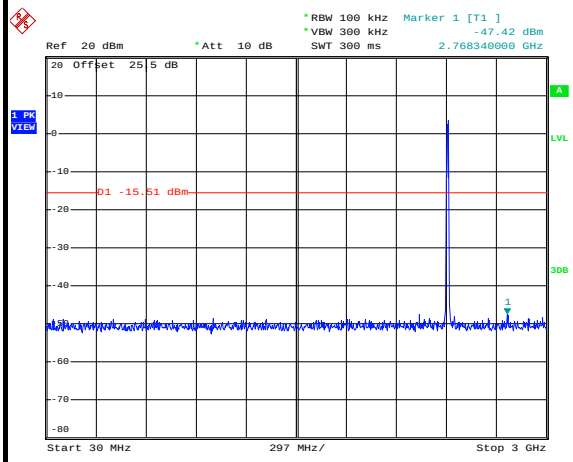
Spurious Emission 30MHz~3GHz



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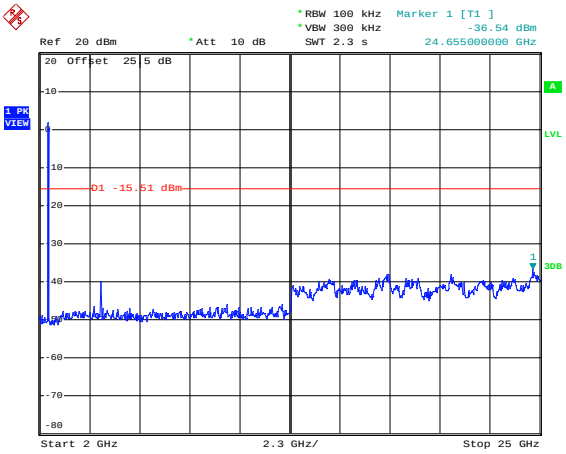
Spurious Emission 2GHz~25GHz

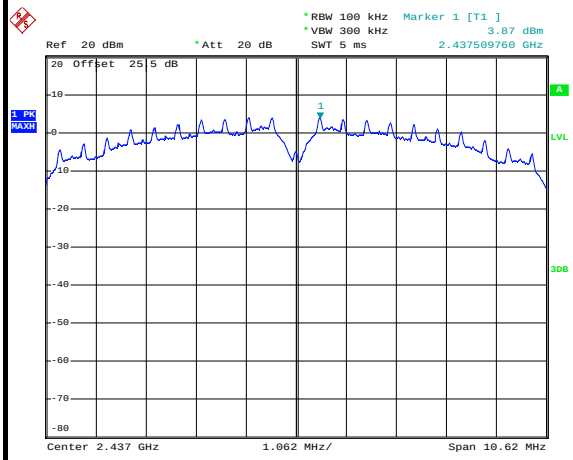


Date: 30.JUN.2015 00:26:57

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

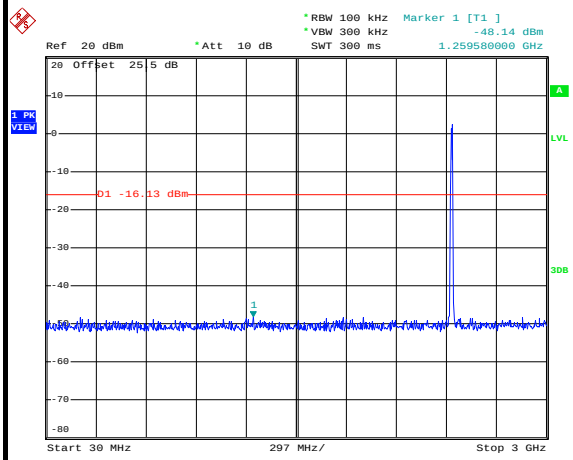
WLAN 802.11b Channel 06

100kHz PSD reference Level



Date: 30.JUN.2015 00:30:50

Spurious Emission 30MHz~3GHz



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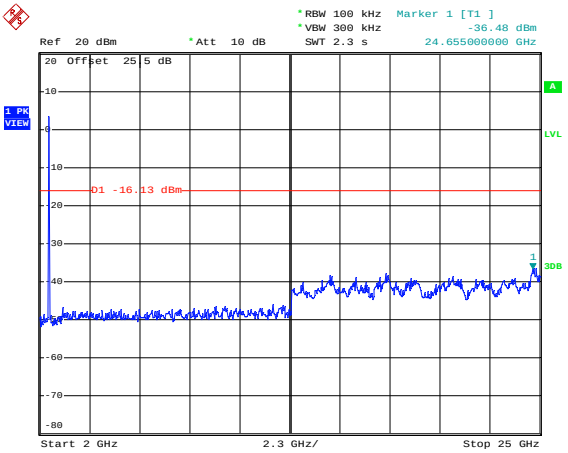
Spurious Emission 2GHz~25GHz

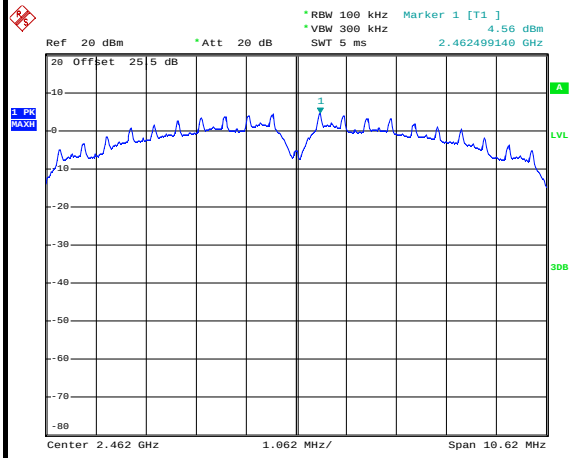


Date: 30.JUN.2015 00:31:29

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

WLAN 802.11b Channel 11

100kHz PSD reference Level



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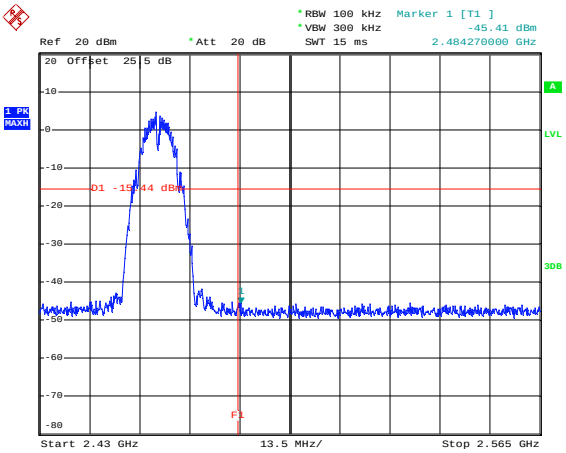
High Channel Plot



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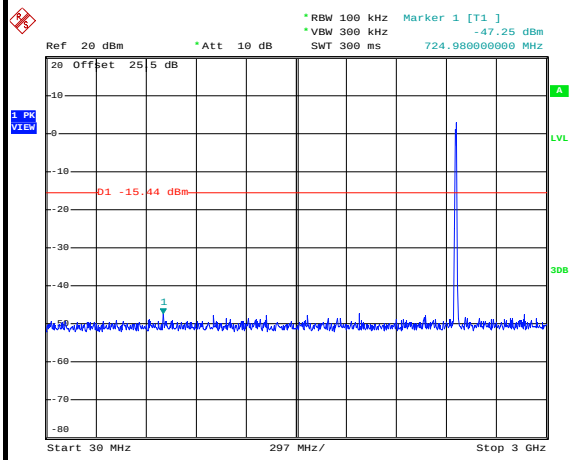
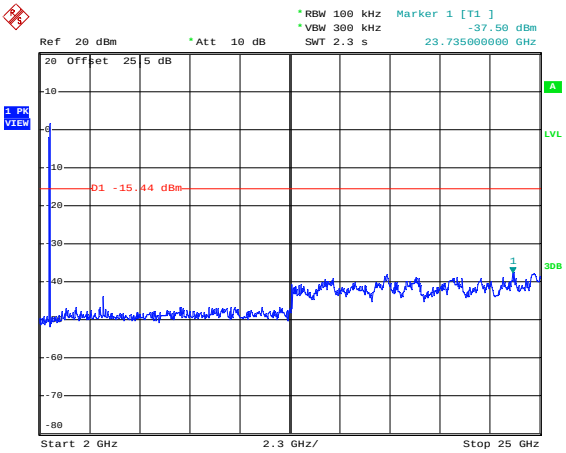
Spurious Emission 30MHz~3GHz



Date: 30.JUN.2015 00:36:44

Spurious Emission 2GHz~25GHz

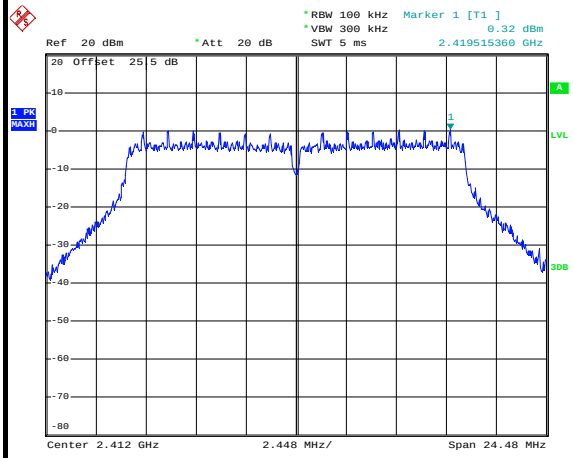


Date: 30.JUN.2015 00:37:02

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

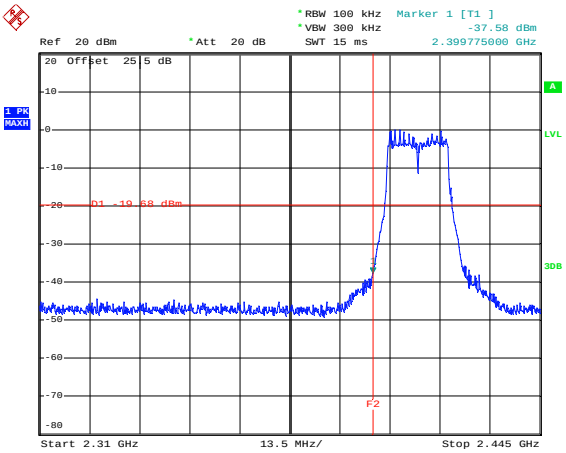
WLAN 802.11g Channel 01

100kHz PSD reference Level



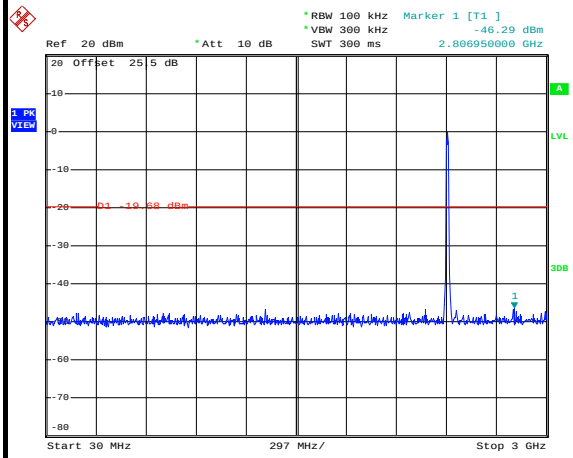
Date: 4.JUN.2015 18:58:51

Low Channel Plot



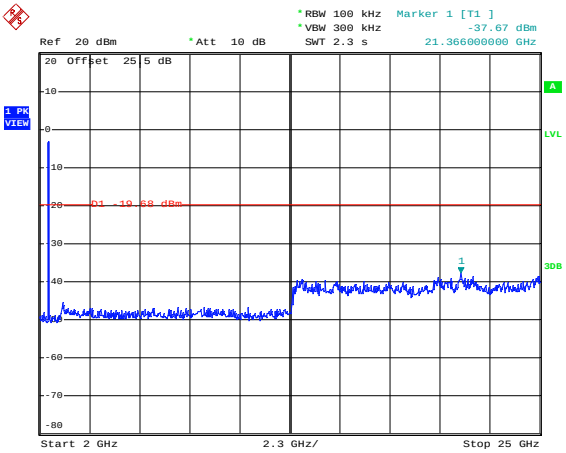
Date: 4.JUN.2015 18:59:42

Spurious Emission 30MHz~3GHz



Date: 4.JUN.2015 19:00:03

Spurious Emission 2GHz~25GHz

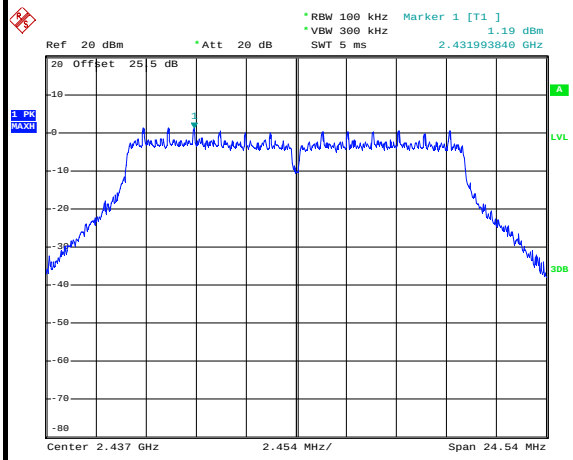


Date: 4.JUN.2015 19:00:21

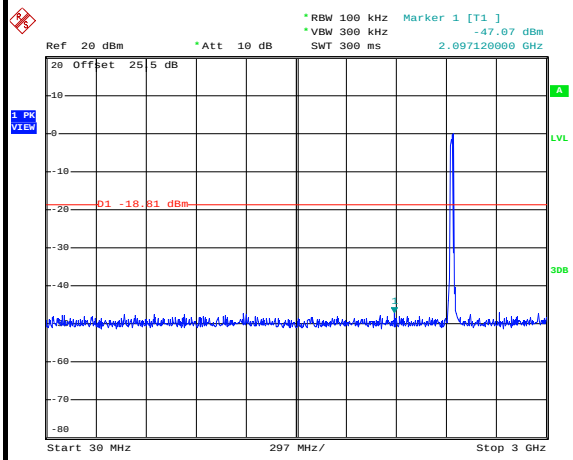
Test Mode :	802.11g	**Temperature :**	21~25℃
Test Band :	2.4GHz Mid	**Relative Humidity :**	51~54%
Test Channel :	06	**Test Engineer :**	Derek Hsu

WLAN 802.11g Channel 06

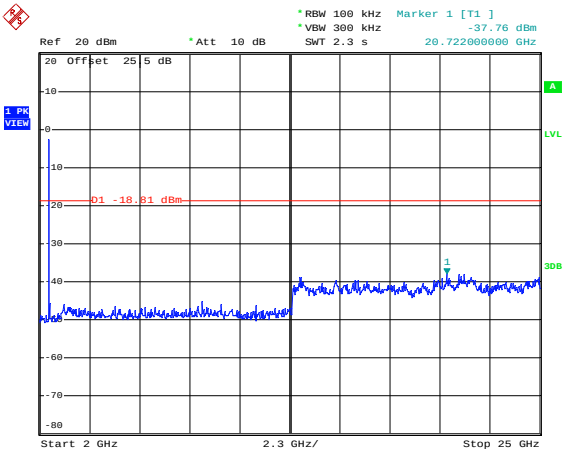
100kHz PSD reference Level



Spurious Emission 30MHz~3GHz



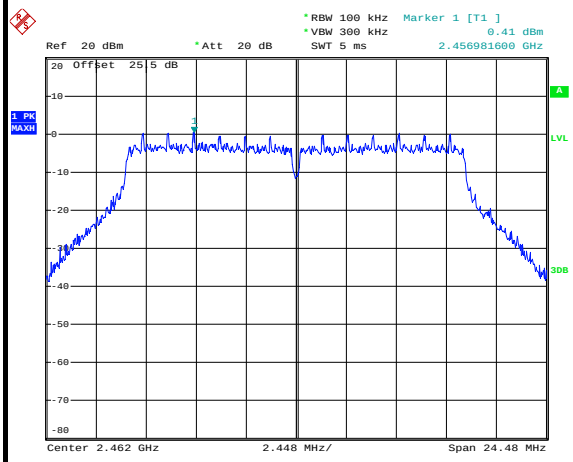
Spurious Emission 2GHz~25GHz



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

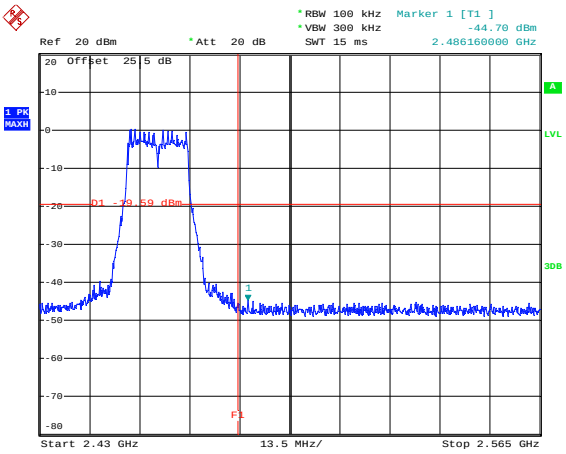
WLAN 802.11g Channel 11

100kHz PSD reference Level



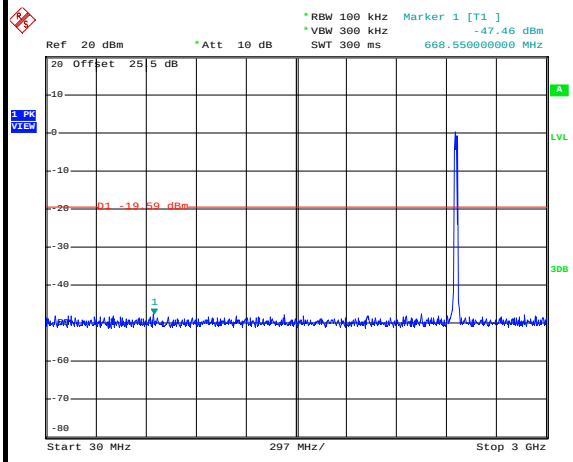
Date: 4.JUN.2015 19:09:05

High Channel Plot



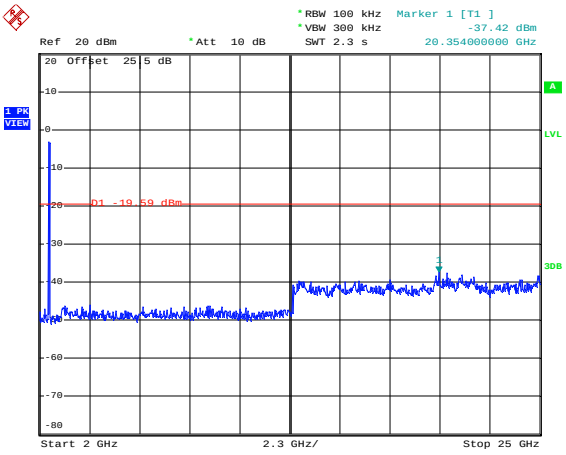
Date: 4.JUN.2015 19:09:26

Spurious Emission 30MHz~3GHz



Date: 4.JUN.2015 19:09:50

Spurious Emission 2GHz~25GHz

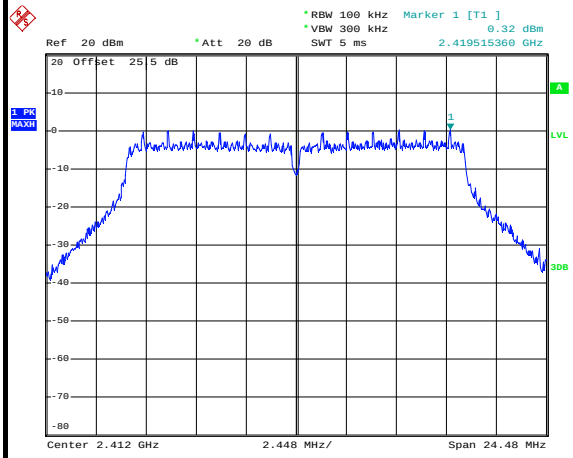


Date: 4.JUN.2015 19:10:08

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

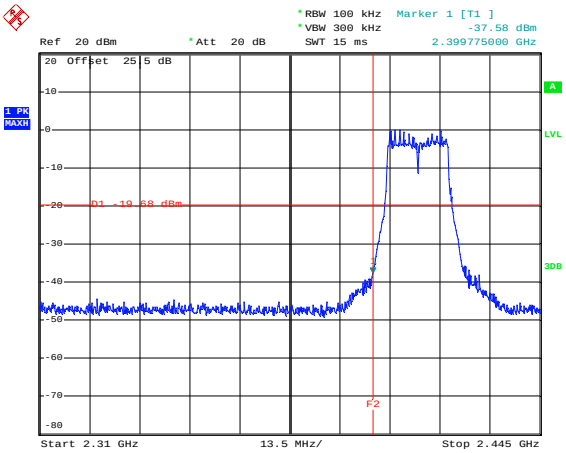
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



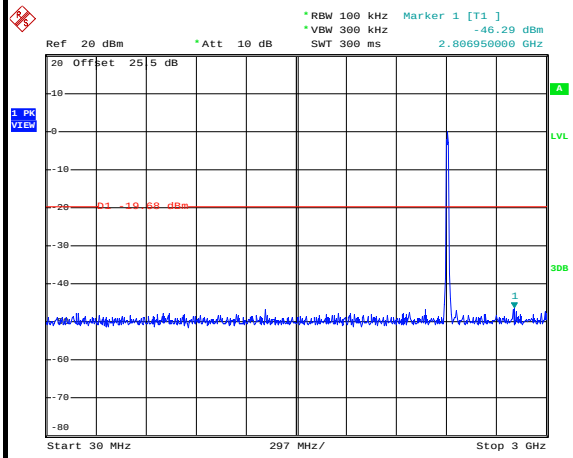
Date: 4.JUN.2015 18:58:51

Low Channel Plot



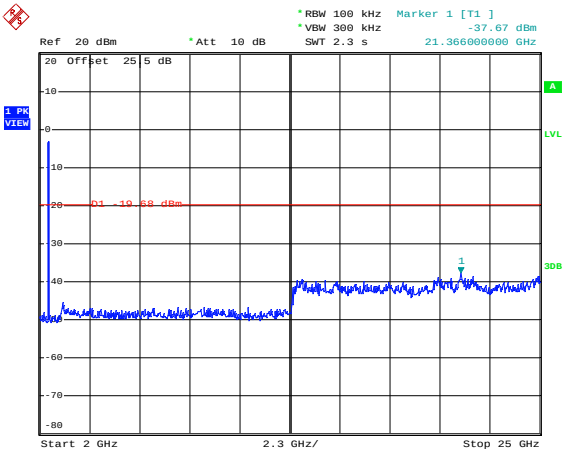
Date: 4.JUN.2015 18:59:42

Spurious Emission 30MHz~3GHz



Date: 4.JUN.2015 19:00:03

Spurious Emission 2GHz~25GHz

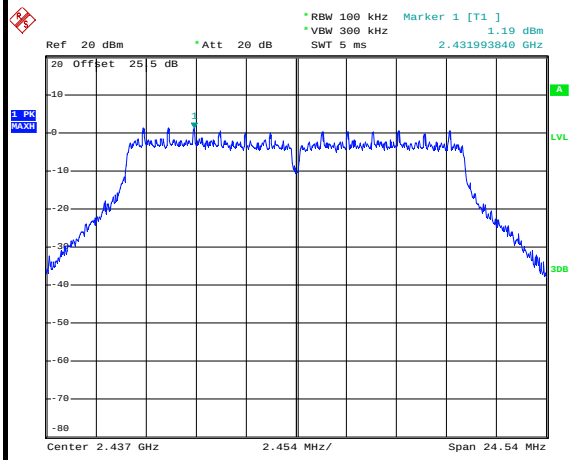


Date: 4.JUN.2015 19:00:21

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

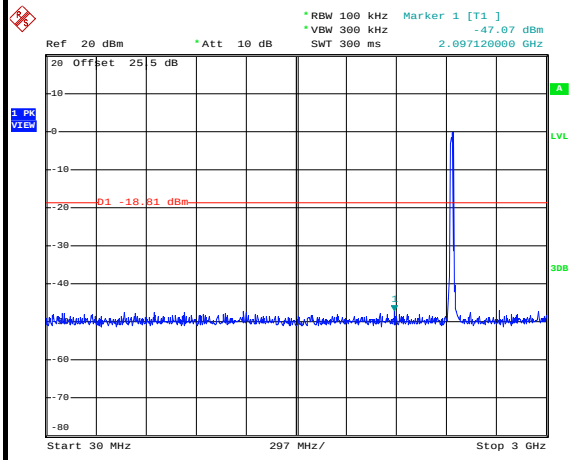
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



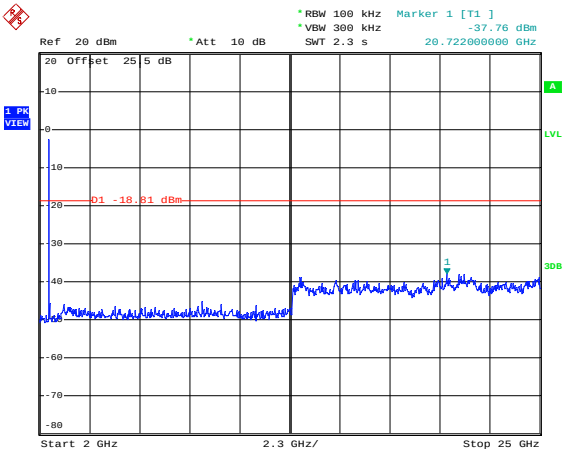
Date: 4.JUN.2015 19:03:03

Spurious Emission 30MHz~3GHz



Date: 4.JUN.2015 19:06:15

Spurious Emission 2GHz~25GHz

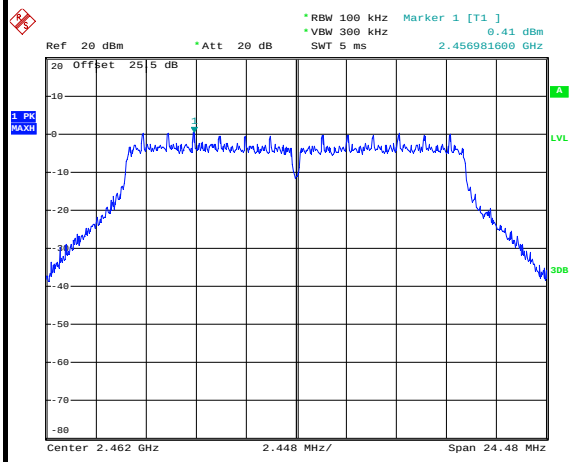


Date: 4.JUN.2015 19:06:33

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

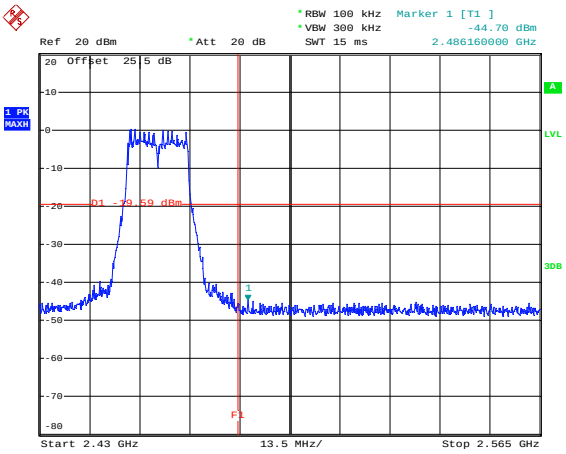
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



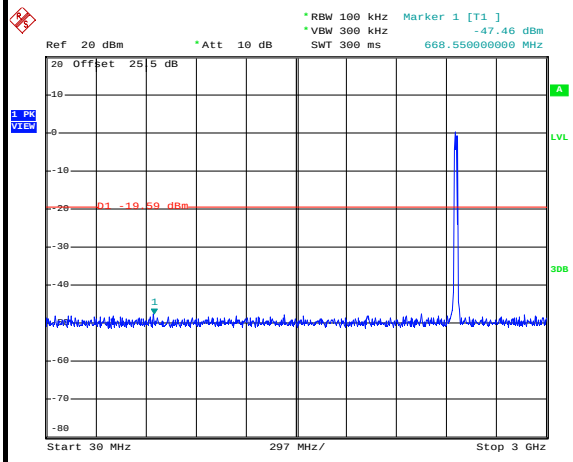
Date: 4.JUN.2015 19:09:05

High Channel Plot



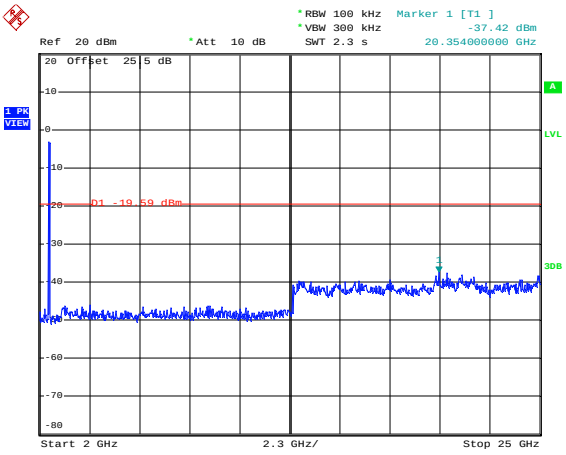
Date: 4.JUN.2015 19:09:26

Spurious Emission 30MHz~3GHz



Date: 4.JUN.2015 19:09:50

Spurious Emission 2GHz~25GHz



Date: 4.JUN.2015 19:10:08

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.

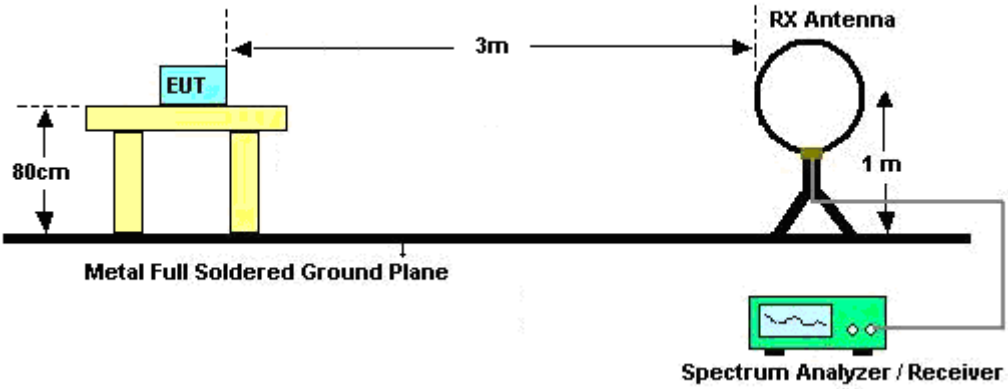
3.5.3 Test Procedures

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.

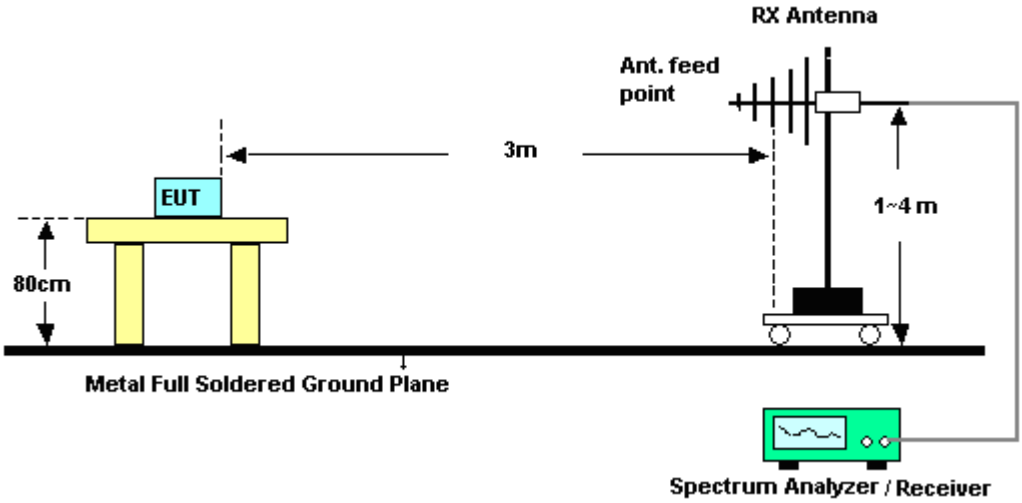
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.63	8.24	0.12	300Hz
802.11g	87.18	1.36	0.74	1kHz
2.4GHz 802.11n HT20	85.23	1.27	0.79	1kHz

3.5.4 Test Setup

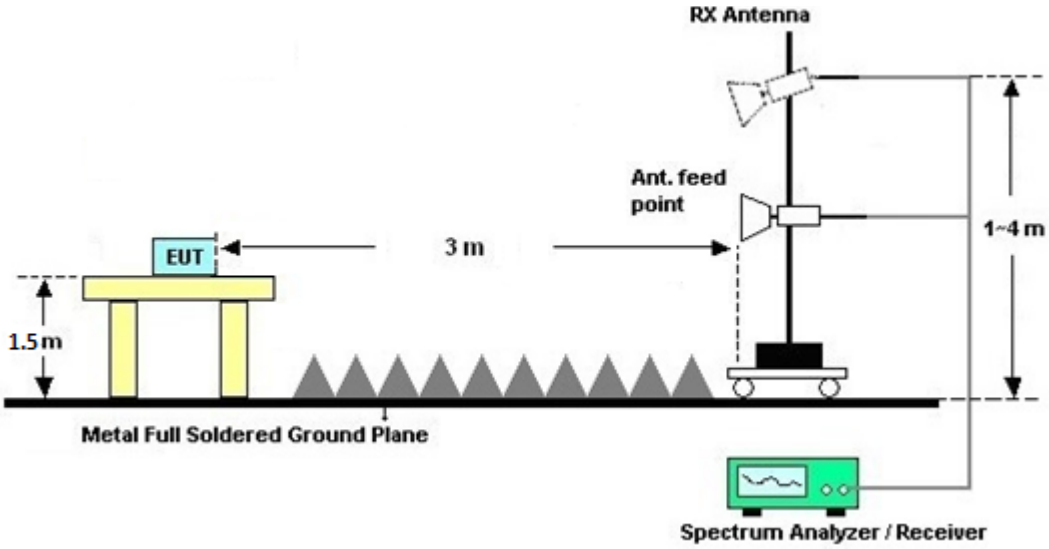
For radiated emissions below 30MHz



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.

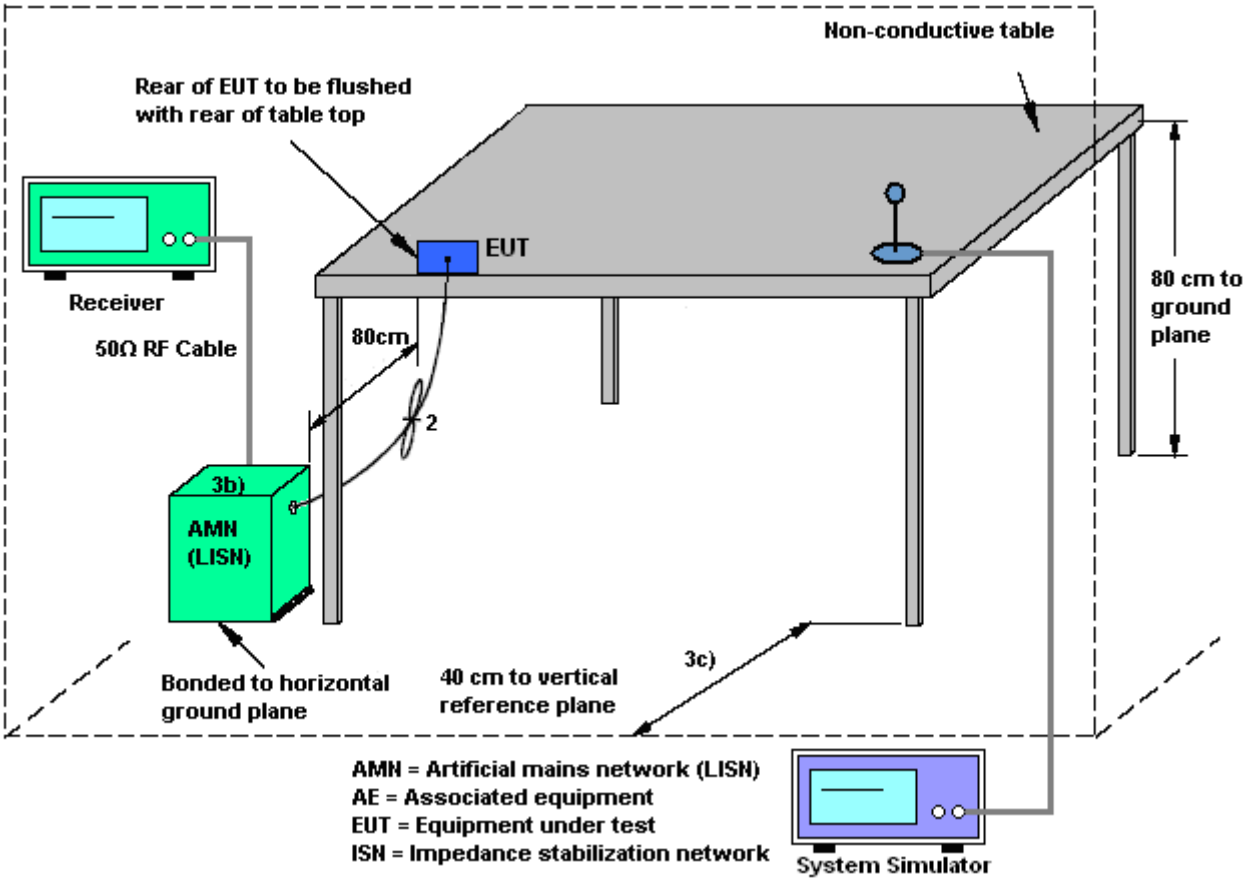
3.6.2 Measuring Instruments

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.

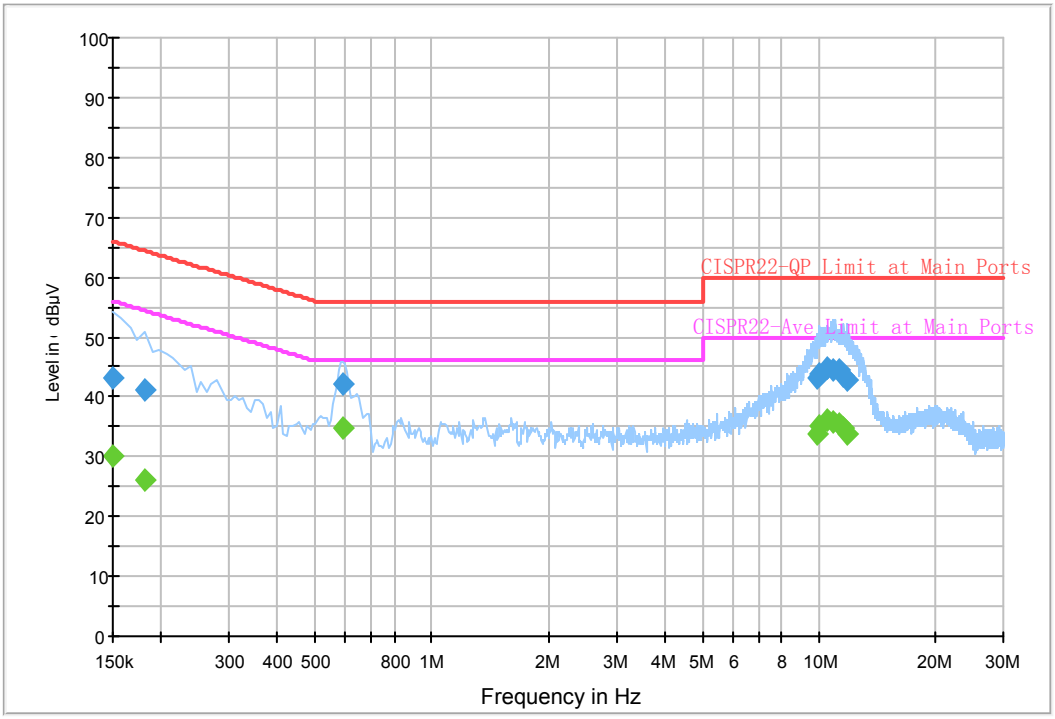
3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Jacky Yang	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Link + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)		

ENV216 Auto Test

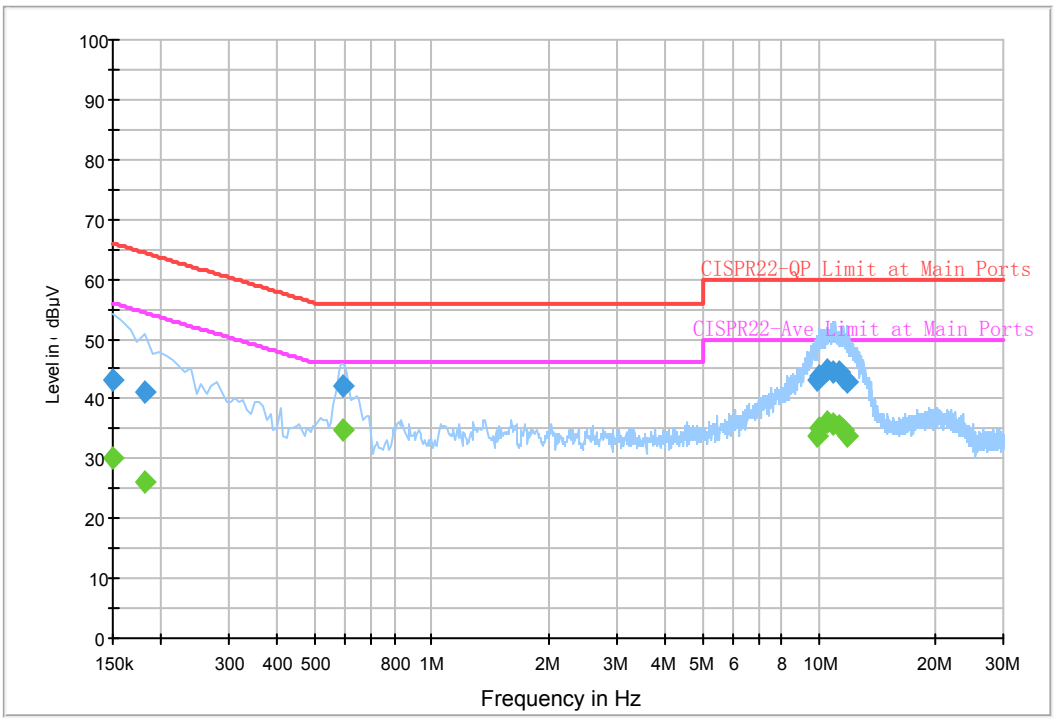


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	43.1	Off	L1	19.5	22.9	66.0
0.182000	41.0	Off	L1	19.5	23.4	64.4
0.590000	42.1	Off	L1	19.5	13.9	56.0
9.878000	43.0	Off	L1	19.9	17.0	60.0
10.078000	43.8	Off	L1	19.9	16.2	60.0
10.542000	44.9	Off	L1	19.9	15.1	60.0
10.910000	44.4	Off	L1	19.8	15.6	60.0
11.310000	44.3	Off	L1	19.9	15.7	60.0
11.638000	43.4	Off	L1	19.9	16.6	60.0
11.886000	42.7	Off	L1	19.9	17.3	60.0

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Jacky Yang	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Link + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)		

ENV216 Auto Test

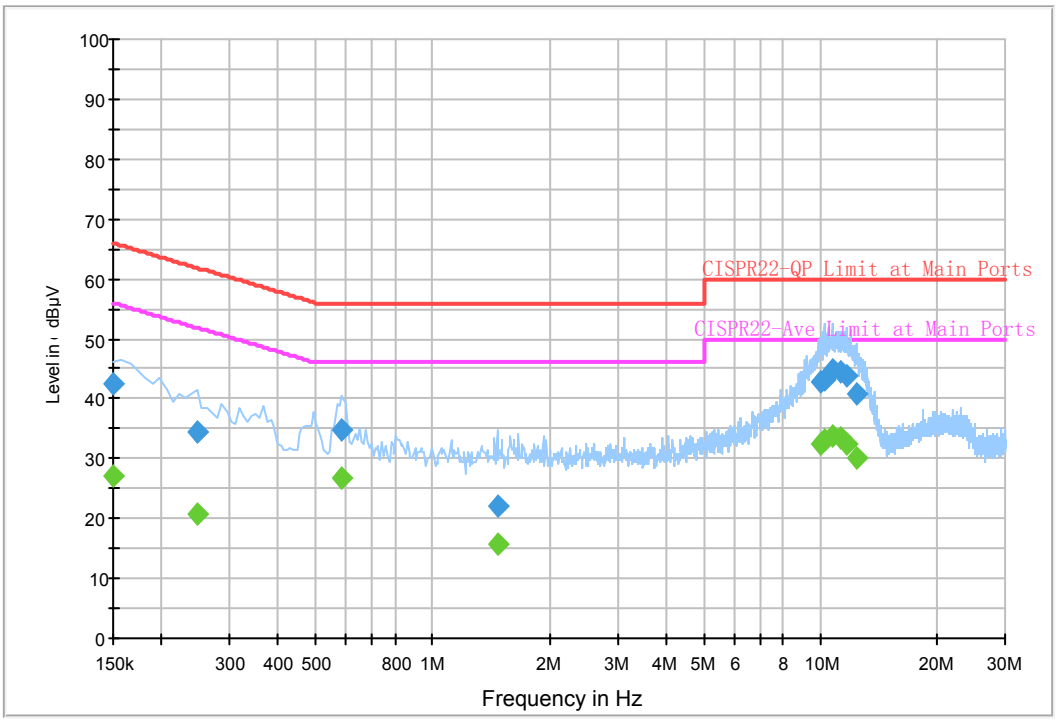


Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	30.0	Off	L1	19.5	26.0	56.0
0.182000	26.1	Off	L1	19.5	28.3	54.4
0.590000	34.7	Off	L1	19.5	11.3	46.0
9.878000	33.9	Off	L1	19.9	16.1	50.0
10.078000	35.1	Off	L1	19.9	14.9	50.0
10.542000	36.0	Off	L1	19.9	14.0	50.0
10.910000	35.6	Off	L1	19.8	14.4	50.0
11.310000	35.5	Off	L1	19.9	14.5	50.0
11.638000	34.7	Off	L1	19.9	15.3	50.0
11.886000	33.9	Off	L1	19.9	16.1	50.0

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Jacky Yang	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	GSM850 Link + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)		

ENV216 Auto Test

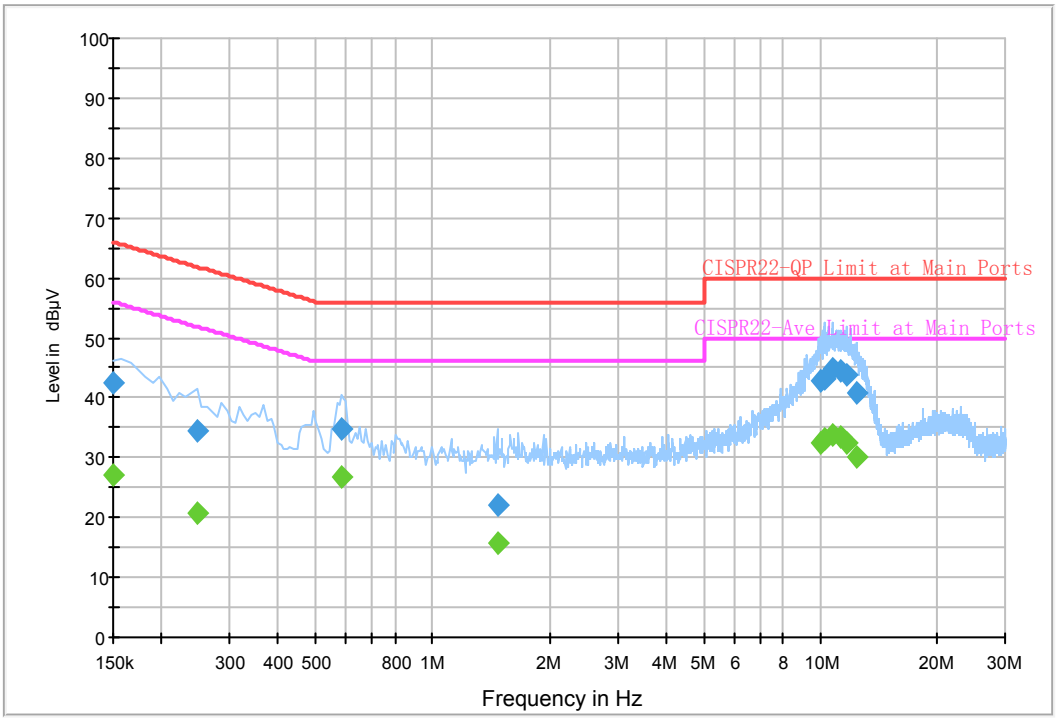


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	42.5	Off	N	19.5	23.5	66.0
0.246000	34.3	Off	N	19.5	27.6	61.9
0.582000	34.9	Off	N	19.4	21.1	56.0
1.470000	22.1	Off	N	19.6	33.9	56.0
10.030000	42.7	Off	N	19.9	17.3	60.0
10.318000	43.2	Off	N	19.8	16.8	60.0
10.766000	44.8	Off	N	19.8	15.2	60.0
11.262000	44.5	Off	N	20.0	15.5	60.0
11.758000	43.7	Off	N	19.9	16.3	60.0
12.406000	40.9	Off	N	20.0	19.1	60.0

Test Mode :	Mode 1	**Temperature :**	21~23℃
Test Engineer :	Jacky Yang	**Relative Humidity :**	41~43%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	GSM850 Link + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter)		

ENV216 Auto Test



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	27.0	Off	N	19.5	29.0	56.0
0.246000	20.6	Off	N	19.5	31.3	51.9
0.582000	26.6	Off	N	19.4	19.4	46.0
1.470000	15.7	Off	N	19.6	30.3	46.0
10.030000	32.3	Off	N	19.9	17.7	50.0
10.318000	33.0	Off	N	19.8	17.0	50.0
10.766000	33.6	Off	N	19.8	16.4	50.0
11.262000	33.3	Off	N	20.0	16.7	50.0
11.758000	32.6	Off	N	19.9	17.4	50.0
12.406000	30.0	Off	N	20.0	20.0	50.0

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
Power Meter	Anritsu	ML2495A	1218006	300MHz~40GHz	Oct. 18, 2014	Jun. 04, 2015~ Jun. 30, 2015	Oct. 17, 2015	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Oct. 18, 2014	Jun. 04, 2015~ Jun. 30, 2015	Oct. 17, 2015	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Oct. 17, 2014	Jun. 04, 2015~ Jun. 30, 2015	Oct. 16, 2015	Conducted (TH05-HY)
EMI Test Receiver	Rohde & Schwarz	ESU26	100472	20Hz~26.5GHz	Jan. 19, 2015	Jun. 18, 2015	Jan. 18, 2016	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103A	161075	10MHz~1GHz	Apr. 09, 2015	Jun. 18, 2015	Apr. 08, 2016	Radiation (03CH12-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	Jul. 07, 2014	Jun. 18, 2015	Jul. 06, 2015	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	Jan. 15, 2015	Jun. 18, 2015	Jan. 14, 2016	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D	37059	30MHz~1GHz	Sep. 27, 2014	Jun. 18, 2015	Sep. 26, 2015	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Apr. 22, 2015	Jun. 18, 2015	Apr. 21, 2016	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0-360 degree	N/A	Jun. 18, 2015	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 18, 2015	N/A	Radiation (03CH12-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Dec. 01, 2014	Jun. 09, 2015	Nov. 30, 2015	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 08, 2014	Jun. 09, 2015	Dec. 07, 2015	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 02, 2014	Jun. 09, 2015	Dec. 01, 2015	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 09, 2015	N/A	Conduction (CO05-HY)

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))	5.4dB

Appendix A. Conducted Test Results

Report Number :FR551902C

A1 - DTS Part

Test Engineer:	Derek Hsu	Temperature:	21~25	℃
Test Date:	2015/6/4 ~ 2015/6/30	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.40	7.08	0.50	Pass
11b	1Mbps	1	6	2437	12.30	7.08	0.50	Pass
11b	1Mbps	1	11	2462	12.10	7.08	0.50	Pass
11g	6Mbps	1	1	2412	18.10	16.32	0.50	Pass
11g	6Mbps	1	6	2437	18.15	16.36	0.50	Pass
11g	6Mbps	1	11	2462	18.20	16.32	0.50	Pass
HT20	MCS0	1	1	2412	18.85	17.56	0.50	Pass
HT20	MCS0	1	6	2437	18.90	17.58	0.50	Pass
HT20	MCS0	1	11	2462	18.95	17.56	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	N_{TX}	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	15.70	30.00	-1.00	14.70	36.00	Pass
11b	1Mbps	1	6	2437	15.47	30.00	-1.00	14.47	36.00	Pass
11b	1Mbps	1	11	2462	15.78	30.00	-1.00	14.78	36.00	Pass
11g	6Mbps	1	1	2412	20.89	30.00	-1.00	19.89	36.00	Pass
11g	6Mbps	1	6	2437	21.30	30.00	-1.00	20.30	36.00	Pass
11g	6Mbps	1	11	2462	21.62	30.00	-1.00	20.62	36.00	Pass
HT20	MCS0	1	1	2412	19.44	30.00	-1.00	18.44	36.00	Pass
HT20	MCS0	1	6	2437	20.27	30.00	-1.00	19.27	36.00	Pass
HT20	MCS0	1	11	2462	20.29	30.00	-1.00	19.29	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.10	12.46
11b	1Mbps	1	6	2437	0.10	12.32
11b	1Mbps	1	11	2462	0.10	12.48
11g	6Mbps	1	1	2412	0.60	11.61
11g	6Mbps	1	6	2437	0.60	11.88
11g	6Mbps	1	11	2462	0.60	11.98
HT20	MCS0	1	1	2412	0.69	9.71
HT20	MCS0	1	6	2437	0.69	9.84
HT20	MCS0	1	11	2462	0.69	9.85

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-8.14	-1.00	8.00	Pass
11b	1Mbps	1	6	2437	-9.25	-1.00	8.00	Pass
11b	1Mbps	1	11	2462	-8.31	-1.00	8.00	Pass
11g	6Mbps	1	1	2412	-12.58	-1.00	8.00	Pass
11g	6Mbps	1	6	2437	-12.52	-1.00	8.00	Pass
11g	6Mbps	1	11	2462	-14.17	-1.00	8.00	Pass
HT20	MCS0	1	1	2412	-15.10	-1.00	8.00	Pass
HT20	MCS0	1	6	2437	-15.34	-1.00	8.00	Pass
HT20	MCS0	1	11	2462	-16.39	-1.00	8.00	Pass

Appendix B. Radiated Spurious Emission

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		2363.46	56.64	-17.36	74	56.25	27.04	7.31	33.96	111	235	P	H
		2390	43.56	-10.44	54	43.05	27.13	7.38	34	111	235	A	H
	*	2412	102.79	-	-	102.18	27.18	7.44	34.01	111	235	P	H
	*	2412	98.23	-	-	97.62	27.18	7.44	34.01	111	235	A	H
		2382.9	56.44	-17.56	74	55.95	27.09	7.38	33.98	186	84	P	V
		2377.32	43.52	-10.48	54	43.03	27.09	7.38	33.98	186	84	A	V
	*	2412	106.6	-	-	105.99	27.18	7.44	34.01	186	84	P	V
	*	2412	101.91	-	-	101.3	27.18	7.44	34.01	186	84	A	V
802.11b CH 06 2437MHz		2365.08	57.46	-16.54	74	57.07	27.04	7.31	33.96	100	234	P	H
		2384.34	43.58	-10.42	54	43.09	27.09	7.38	33.98	100	234	A	H
	*	2435	97.95	-	-	97.32	27.22	7.44	34.03	100	234	P	H
	*	2435	93.77	-	-	93.14	27.22	7.44	34.03	100	234	A	H
		2496.68	57.37	-16.63	74	56.51	27.4	7.56	34.1	100	234	P	H
		2496.24	43.71	-10.29	54	42.85	27.4	7.56	34.1	100	234	A	H
		2374.71	56.85	-17.15	74	56.36	27.09	7.38	33.98	179	85	P	V
		2378.4	43.58	-10.42	54	43.09	27.09	7.38	33.98	179	85	A	V
	*	2435	102.34	-	-	101.71	27.22	7.44	34.03	179	85	P	V
	*	2435	98.03	-	-	97.4	27.22	7.44	34.03	179	85	A	V
		2486.28	57.42	-16.58	74	56.64	27.36	7.5	34.08	179	85	P	V
		2483.52	43.75	-10.25	54	42.97	27.36	7.5	34.08	179	85	A	V

802.11b CH 11 2462MHz	*	2460	98.37	-	-	97.63	27.31	7.5	34.07	100	235	P	H
	*	2460	93.94	-	-	93.2	27.31	7.5	34.07	100	235	A	H
		2494.04	57.36	-16.64	74	56.5	27.4	7.56	34.1	100	235	P	H
		2488.68	43.68	-10.32	54	42.82	27.4	7.56	34.1	100	235	A	H
	*	2460	102	-	-	101.26	27.31	7.5	34.07	221	85	P	V
	*	2460	97.42	-	-	96.68	27.31	7.5	34.07	221	85	A	V
		2495.48	57.04	-16.96	74	56.18	27.4	7.56	34.1	221	85	P	V
		2496.24	43.7	-10.3	54	42.84	27.4	7.56	34.1	221	85	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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		3666	49.51	-24.49	74	70.15	29.04	9.23	58.91	100	0	P	H
		4824	47.03	-26.97	74	63.67	31.32	10.65	58.61	100	0	P	H
		3666	47.85	-26.15	74	68.49	29.04	9.23	58.91	100	0	P	V
		4824	43.56	-30.44	74	60.2	31.32	10.65	58.61	100	0	P	V
802.11b CH 06 2437MHz		3657	52.41	-21.59	74	73.06	29.01	9.23	58.89	100	0	P	H
		4875	46.85	-27.15	74	63.28	31.41	10.68	58.52	100	0	P	H
		7311	44.22	-29.78	74	52.88	36.22	13.28	58.16	100	0	P	H
		3657	50.34	-23.66	74	70.99	29.01	9.23	58.89	100	0	P	V
		4875	42.8	-31.2	74	59.23	31.41	10.68	58.52	100	0	P	V
		7311	43.55	-30.45	74	52.21	36.22	13.28	58.16	100	0	P	V
802.11b CH 11 2462MHz		3693	49.48	-24.52	74	70.06	29.08	9.27	58.93	100	0	P	H
		4926	52.55	-21.45	74	68.78	31.49	10.7	58.42	100	0	P	H
		7386	45.97	-28.03	74	54.57	36.39	13.32	58.31	100	0	P	H
		3693	47.14	-26.86	74	67.72	29.08	9.27	58.93	100	0	P	V
		4926	46.55	-27.45	74	62.78	31.49	10.7	58.42	100	0	P	V
		7386	45.39	-28.61	74	53.99	36.39	13.32	58.31	100	0	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		2383.62	56.97	-17.03	74	56.48	27.09	7.38	33.98	104	234	P	H
		2389.74	43.96	-10.04	54	43.45	27.13	7.38	34	104	234	A	H
	*	2414	102.28	-	-	101.67	27.18	7.44	34.01	104	234	P	H
	*	2414	91.97	-	-	91.36	27.18	7.44	34.01	104	234	A	H
		2389.92	58.8	-15.2	74	58.29	27.13	7.38	34	191	82	P	V
		2390	44.61	-9.39	54	44.1	27.13	7.38	34	191	82	A	V
	*	2414	106.65	-	-	106.04	27.18	7.44	34.01	191	82	P	V
	*	2414	96.16	-	-	95.55	27.18	7.44	34.01	191	82	A	V
802.11g CH 06 2437MHz		2364.81	58.15	-15.85	74	57.76	27.04	7.31	33.96	100	235	P	H
		2361.3	43.94	-10.06	54	43.55	27.04	7.31	33.96	100	235	A	H
	*	2435	98.89	-	-	98.26	27.22	7.44	34.03	100	235	P	H
	*	2435	88.46	-	-	87.83	27.22	7.44	34.03	100	235	A	H
		2494	56.93	-17.07	74	56.07	27.4	7.56	34.1	100	235	P	H
		2486.04	44.07	-9.93	54	43.29	27.36	7.5	34.08	100	235	A	H
		2388.48	58.61	-15.39	74	58.1	27.13	7.38	34	154	80	P	V
		2376.06	44.01	-9.99	54	43.52	27.09	7.38	33.98	154	80	A	V
	*	2435	103.06	-	-	102.43	27.22	7.44	34.03	154	80	P	V
	*	2435	92.55	-	-	91.92	27.22	7.44	34.03	154	80	A	V
		2483.92	57.56	-16.44	74	56.78	27.36	7.5	34.08	154	80	P	V
		2486.2	44.43	-9.57	54	43.65	27.36	7.5	34.08	154	80	A	V

802.11g CH 11 2462MHz	*	2460	101.18	-	-	100.44	27.31	7.5	34.07	100	235	P	H
	*	2460	90.97	-	-	90.23	27.31	7.5	34.07	100	235	A	H
		2484.36	59.21	-14.79	74	58.43	27.36	7.5	34.08	100	235	P	H
		2483.64	44.3	-9.7	54	43.52	27.36	7.5	34.08	100	235	A	H
	*	2460	104.09	-	-	103.35	27.31	7.5	34.07	119	59	P	V
	*	2460	93.96	-	-	93.22	27.31	7.5	34.07	119	59	A	V
		2483.68	61.3	-12.7	74	60.52	27.36	7.5	34.08	119	59	P	V
		2483.52	44.94	-9.06	54	44.16	27.36	7.5	34.08	119	59	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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		3672	48.58	-25.42	74	69.22	29.04	9.23	58.91	100	0	P	H
		4824	46.7	-27.3	74	63.34	31.32	10.65	58.61	100	0	P	H
		3669	46.5	-27.5	74	67.14	29.04	9.23	58.91	100	0	P	V
		4824	42.95	-31.05	74	59.59	31.32	10.65	58.61	100	0	P	V
802.11g CH 06 2437MHz		3678	50.7	-23.3	74	71.32	29.08	9.23	58.93	100	0	P	H
		4875	43.17	-30.83	74	59.6	31.41	10.68	58.52	100	0	P	H
		7311	43.87	-30.13	74	52.53	36.22	13.28	58.16	100	0	P	H
		3678	49.24	-24.76	74	69.86	29.08	9.23	58.93	100	0	P	V
		4869	40.85	-33.15	74	57.28	31.41	10.68	58.52	100	0	P	V
		7311	43.89	-30.11	74	52.55	36.22	13.28	58.16	100	0	P	V
802.11g CH 11 2462MHz		3672	48.85	-25.15	74	69.49	29.04	9.23	58.91	100	0	P	H
		4924	46.35	-27.65	74	62.58	31.49	10.7	58.42	100	0	P	H
		7386	44.64	-29.36	74	53.24	36.39	13.32	58.31	100	0	P	H
		3672	47.19	-26.81	74	67.83	29.04	9.23	58.91	100	0	P	V
		4926	42.53	-31.47	74	58.76	31.49	10.7	58.42	100	0	P	V
		7386	44.3	-29.7	74	52.9	36.39	13.32	58.31	100	0	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 Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2371.29	57.29	-16.71	74	56.8	27.09	7.38	33.98	111	234	P	H
		2379.57	44.05	-9.95	54	43.56	27.09	7.38	33.98	111	234	A	H
	*	2414	100.65	-	-	100.04	27.18	7.44	34.01	111	234	P	H
	*	2414	90.2	-	-	89.59	27.18	7.44	34.01	111	234	A	H
		2348.43	56.91	-17.09	74	56.54	27	7.31	33.94	191	83	P	V
		2390	44	-10	54	43.49	27.13	7.38	34	191	83	A	V
	*	2414	104.58	-	-	103.97	27.18	7.44	34.01	191	83	P	V
	*	2414	94.29	-	-	93.68	27.18	7.44	34.01	191	83	A	V
802.11n HT20 CH 06 2437MHz		2381.1	57.8	-16.2	74	57.31	27.09	7.38	33.98	100	233	P	H
		2376.42	43.93	-10.07	54	43.44	27.09	7.38	33.98	100	233	A	H
	*	2435	97.05	-	-	96.42	27.22	7.44	34.03	100	233	P	H
	*	2435	86.85	-	-	86.22	27.22	7.44	34.03	100	233	A	H
		2487.24	57.27	-16.73	74	56.49	27.36	7.5	34.08	100	233	P	H
		2486.16	44.17	-9.83	54	43.39	27.36	7.5	34.08	100	233	A	H
		2343.03	57.22	-16.78	74	56.85	27	7.31	33.94	151	82	P	V
		2368.23	44.02	-9.98	54	43.63	27.04	7.31	33.96	151	82	A	V
	*	2435	101.33	-	-	100.7	27.22	7.44	34.03	151	82	P	V
	*	2435	90.94	-	-	90.31	27.22	7.44	34.03	151	82	A	V
		2499.6	57.03	-16.97	74	56.17	27.4	7.56	34.1	151	82	P	V
		2486.56	44.51	-9.49	54	43.73	27.36	7.5	34.08	151	82	A	V

802.11n HT20 CH 11 2462MHz	*	2460	99.43	-	-	98.69	27.31	7.5	34.07	100	235	P	H
	*	2460	88.91	-	-	88.17	27.31	7.5	34.07	100	235	A	H
		2491.72	57.46	-16.54	74	56.6	27.4	7.56	34.1	100	235	P	H
		2483.92	44.08	-9.92	54	43.3	27.36	7.5	34.08	100	235	A	H
	*	2460	102.73	-	-	101.99	27.31	7.5	34.07	183	82	P	V
	*	2460	92.45	-	-	91.71	27.31	7.5	34.07	183	82	A	V
		2484.08	58.33	-15.67	74	57.55	27.36	7.5	34.08	183	82	P	V
		2483.52	44.58	-9.42	54	43.8	27.36	7.5	34.08	183	82	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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		3666	51.34	-22.66	74	71.98	29.04	9.23	58.91	100	0	P	H
		4824	41.53	-32.47	74	58.17	31.32	10.65	58.61	100	0	P	H
		3666	49.67	-24.33	74	70.31	29.04	9.23	58.91	100	0	P	V
		4821	40.76	-33.24	74	57.4	31.32	10.65	58.61	100	0	P	V
802.11n HT20 CH 06 2437MHz		3675	50.16	-23.84	74	70.8	29.04	9.23	58.91	100	0	P	H
		4866	41.69	-32.31	74	58.18	31.38	10.68	58.55	100	0	P	H
		7311	43.14	-30.86	74	51.8	36.22	13.28	58.16	100	0	P	H
		3675	49.42	-24.58	74	70.06	29.04	9.23	58.91	100	0	P	V
		4872	40.33	-33.67	74	56.76	31.41	10.68	58.52	100	0	P	V
		7311	43.14	-30.86	74	51.8	36.22	13.28	58.16	100	0	P	V
802.11n HT20 CH 11 2462MHz		3669	47.6	-26.4	74	68.24	29.04	9.23	58.91	100	0	P	H
		4923	44.57	-29.43	74	60.8	31.49	10.7	58.42	100	0	P	H
		7386	44.9	-29.1	74	53.5	36.39	13.32	58.31	100	0	P	H
		3669	48.21	-25.79	74	68.85	29.04	9.23	58.91	100	0	P	V
		4923	40.91	-33.09	74	57.14	31.49	10.7	58.42	100	0	P	V
		7386	44.4	-29.6	74	53	36.39	13.32	58.31	100	0	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 802.11g (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11g LF		66.45	29.84	-10.16	40	52.63	6.27	1.39	30.45	-	-	P	H
		102.9	30.21	-13.29	43.5	48.57	10.41	1.64	30.41	-	-	P	H
		205.77	35.77	-7.73	43.5	54.88	9.09	2.09	30.29	100	0	P	H
		308.4	37.08	-8.92	46	51.36	13.3	2.56	30.14	-	-	P	H
		411.3	22.98	-23.02	46	34.33	15.63	3.03	30.01	-	-	P	H
		620.6	25.42	-20.58	46	31.29	20.04	3.72	29.63	-	-	P	H
		44.31	36.28	-3.72	40	54.83	10.82	1.03	30.4	100	0	P	V
		76.98	28.41	-11.59	40	50.37	7.09	1.39	30.44	-	-	P	V
		205.77	32.86	-10.64	43.5	51.97	9.09	2.09	30.29	-	-	P	V
		308.4	32.78	-13.22	46	47.06	13.3	2.56	30.14	-	-	P	V
		411.3	21.16	-24.84	46	32.51	15.63	3.03	30.01	-	-	P	V
		442.1	20.75	-25.25	46	30.68	16.98	3.03	29.94	-	-	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.
!	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 Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (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”.