FCC RF Test Report

APPLICANT	:	CT Asia
EQUIPMENT	:	Mobile phone
BRAND NAME	:	BLU
MODEL NAME	:	Dash3.5
FCC ID	:	YHLBLUDASH35
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Sep. 10, 2012 and completely tested on Sep. 26, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager

Testing Laboratory 1190

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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR291002B	Rev. 01	Initial issue of report	Sep. 26, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	≤ 20dBc	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	-
			Radiated Spurious Emission		Pass	Under limit 2.47 dB at 2390.000 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.93 dB at 0.350 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

CT Asia

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

1.2 Manufacturer

Ragentek Technology Group

Building D10-D11, No. 58-60, Lane 3188, Xiupu Road, PuDong District, Shanghai, P.R.C.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile phone
Brand Name	BLU
Model Name	Dash3.5
FCC ID	YHLBLUDASH35
EUT supports Radios application	GSM/GPRS/WCDMA/HSPA/WLAN 11bgn/Bluetooth
HW Version	Q106_MAIN_PCB_V1.1
SW Version	Q106_BLU_B1_V0.1.3._S0802
EUT Stage	Identical Prototype

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

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Maximum Output Power to Antenna	802.11b : 18.22 dBm (0.0664 W) 802.11g : 18.15 dBm (0.0653 W) 802.11n HT20 : 18.03 dBm (0.0635 W)
Antenna Type	PIFA Antenna with gain -4.00 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	CO01-KS	03CH01-KS	149928/4086E-1

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- FCC TCB Workshop 2012, April
- ANSI C63.4-2003 and ANSI C63.10-2009
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
4.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A

2 Test Configuration of Equipment Under Test

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

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

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

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	**18.22**	18.19	18.18	18.13
CH 06	2437 MHz	18.12	18.11	18.09	18.06
CH 11	2462 MHz	17.99	17.98	17.96	17.94

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	17.36	17.15	17.35	16.82	**18.15**	17.98	17.78	17.93
CH 06	2437 MHz	17.41	17.02	17.23	16.74	18.12	17.89	17.79	17.92
CH 11	2462 MHz	17.33	17.05	17.29	16.73	18.11	17.98	17.81	17.81

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	16.44	16.13	16.45	17.55	17.39	17.33	**18.03**	17.37
CH 06	2437 MHz	16.57	16.32	16.63	17.51	17.47	17.33	17.97	17.38
CH 11	2462 MHz	16.58	16.31	16.52	17.44	17.26	17.32	**18.03**	17.44

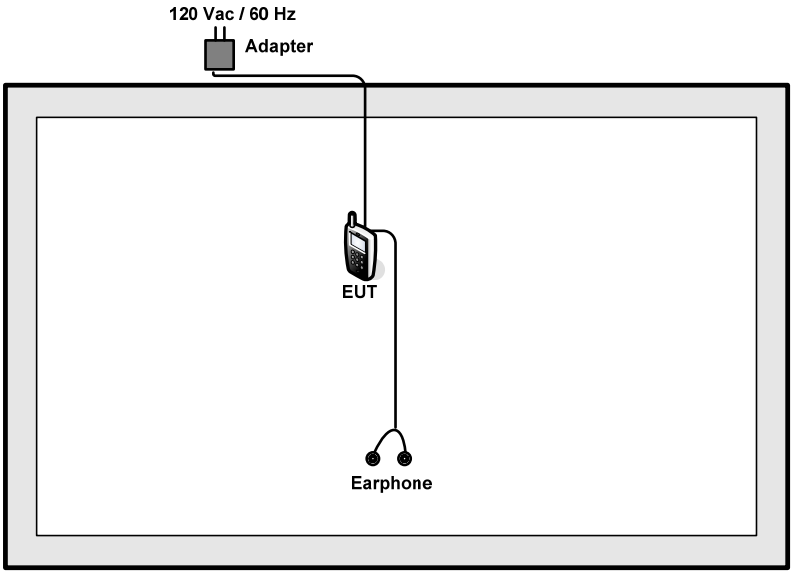
2.3 Test Mode

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

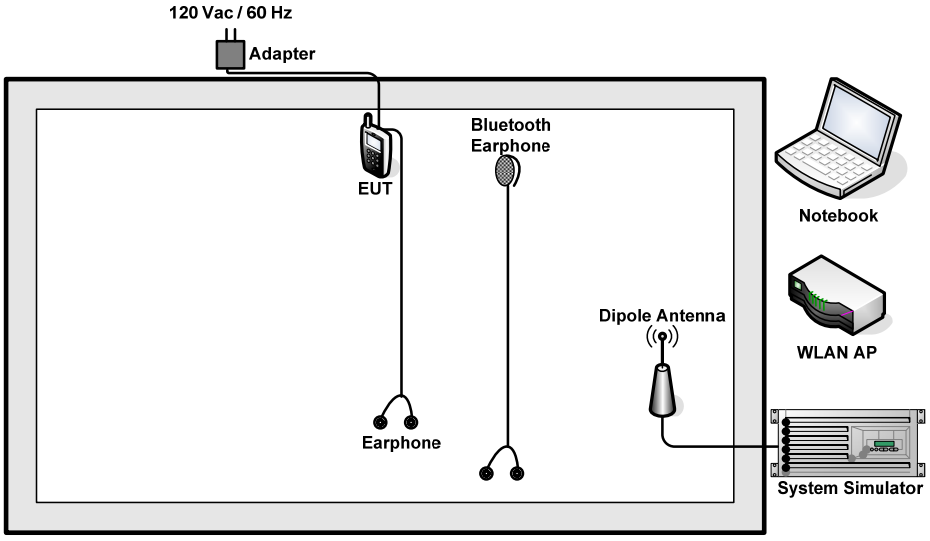
Test Cases				
	Test Items	**Mode**	**Data Rate**	**Test Channel**
Conducted TCs	**6dB BW Power Spectral Density**	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**6.5 Mbps**	**1/6/11**
	Output Power	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**6.5 Mbps**	**1/6/11**
	Conducted Band EDGE	**802.11b**	**1 Mbps**	**1/11**
		802.11g	**6 Mbps**	**1/11**
		802.11n HT20	**6.5 Mbps**	**1/11**
	Conducted Spurious Emission	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**6.5 Mbps**	**1/6/11**
Radiated TCs	**Radiated Band EDGE**	**802.11b**	**1 Mbps**	**1/11**
		802.11g	**6 Mbps**	**1/11**
		802.11n HT20	**6.5 Mbps**	**1/11**
	Radiated Spurious Emission	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**6.5 Mbps**	**1/6/11**
AC Conducted Emission	Mode 1 : GSM850 Idle + USB Cable (Charging from Adapter) + WLAN Link + Bluetooth Link + Earphone			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

For WLAN function, programmed RF utility, “ADB” installed in the PC make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

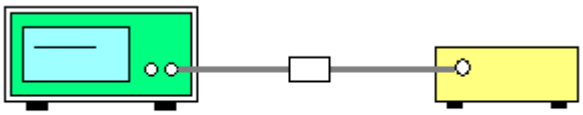
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. 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) = 1-5% of the emission bandwidth (EBW).Set the Video bandwidth (VBW) ≥ 3 * RBW. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.

3.1.4 Test Setup

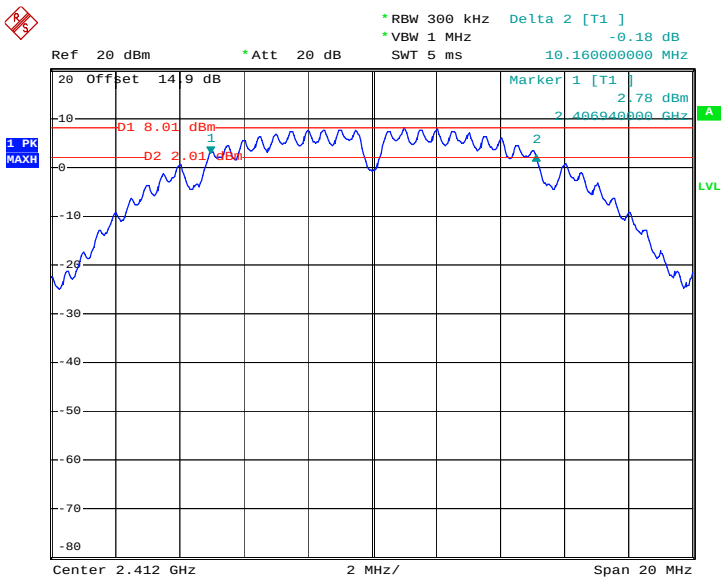


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.16	0.5	Pass
06	2437	10.22	0.5	Pass
11	2462	10.20	0.5	Pass

6 dB Bandwidth Plot on 802.11b Channel 01



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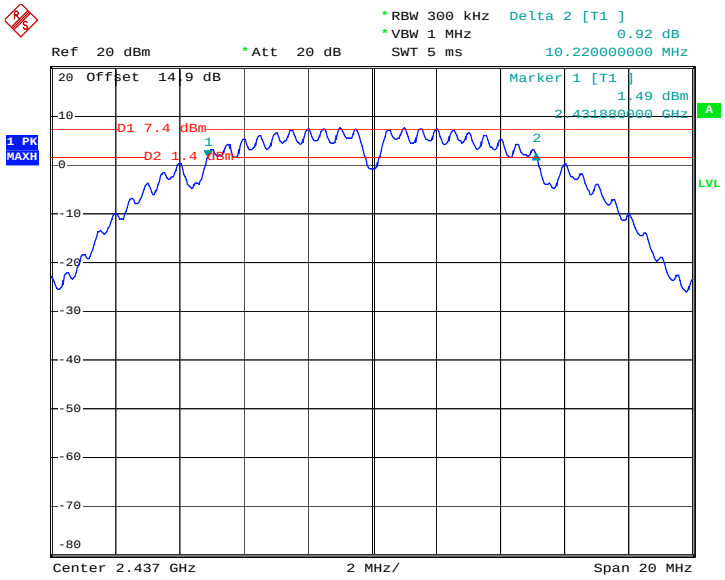
6 dB Bandwidth Plot on 802.11b Channel 06



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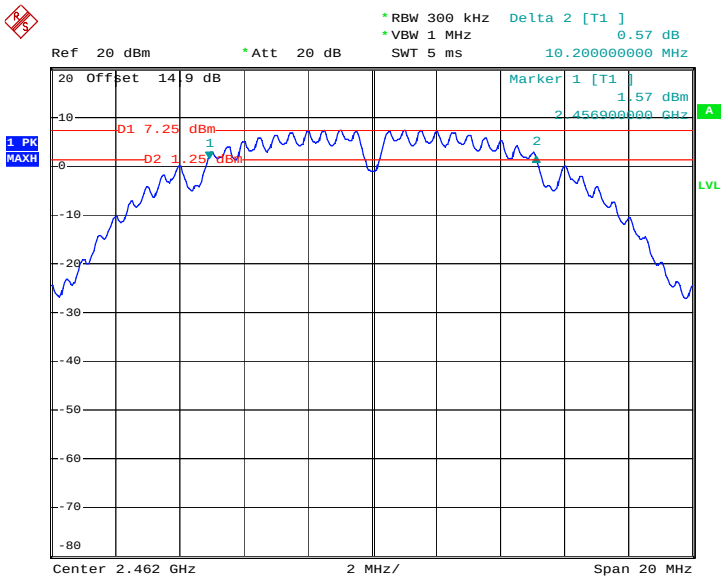
6 dB Bandwidth Plot on 802.11b Channel 11



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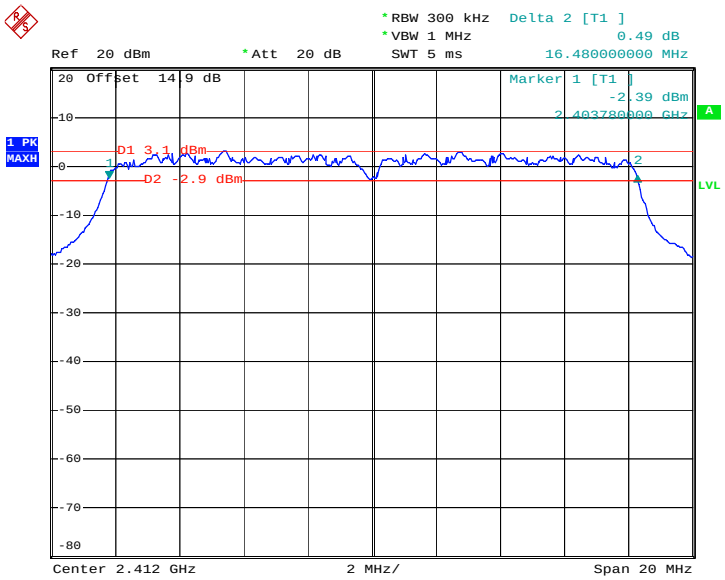
Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.48	0.5	Pass
06	2437	16.52	0.5	Pass
11	2462	16.56	0.5	Pass

6 dB Bandwidth Plot on 802.11g Channel 01



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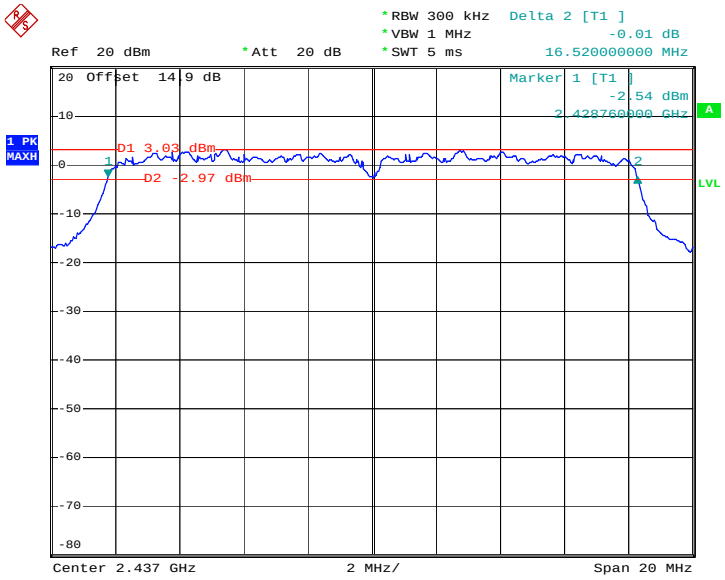
6 dB Bandwidth Plot on 802.11g Channel 06



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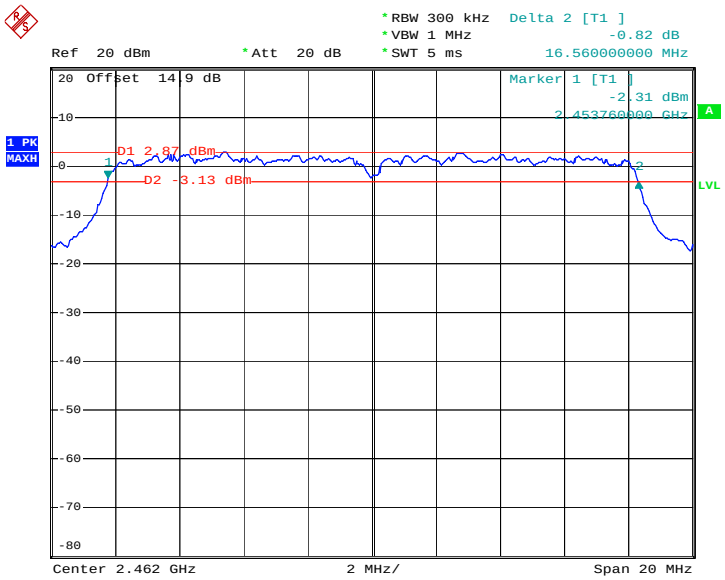
6 dB Bandwidth Plot on 802.11g Channel 11

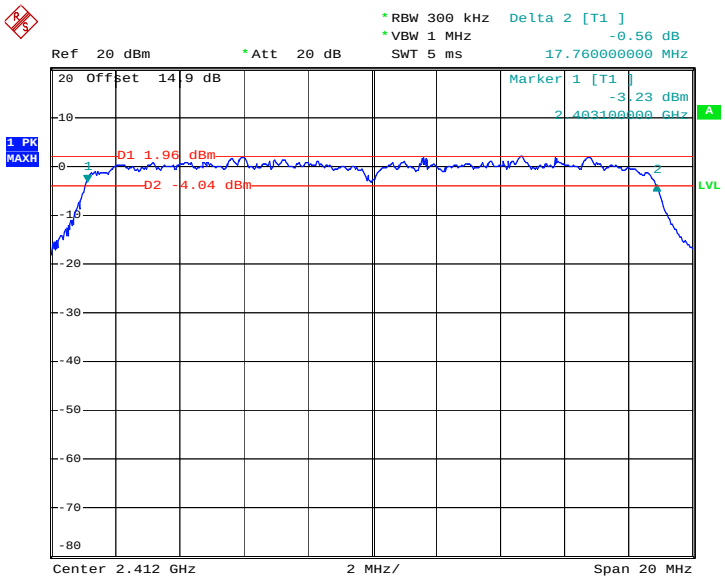


Date: 26.SEP.2012 15:32:01

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.76	0.5	Pass
06	2437	17.76	0.5	Pass
11	2462	17.76	0.5	Pass

6 dB Bandwidth Plot on 802.11n HT20 Channel 01



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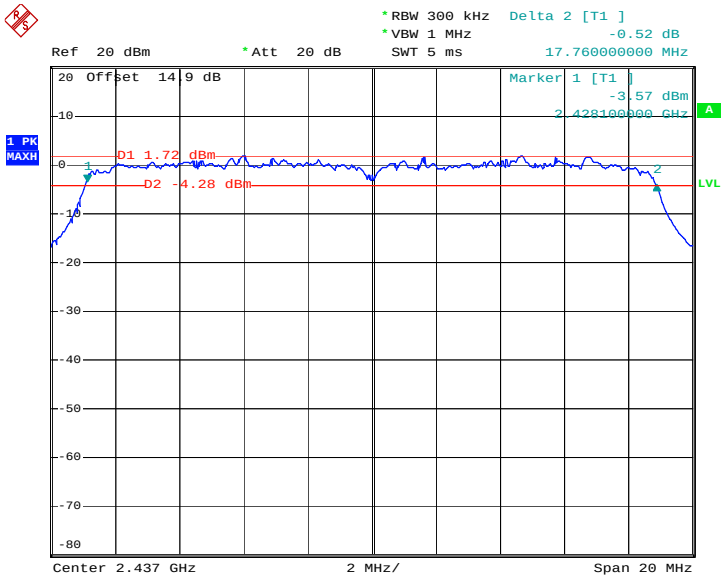
6 dB Bandwidth Plot on 802.11n HT20 Channel 06



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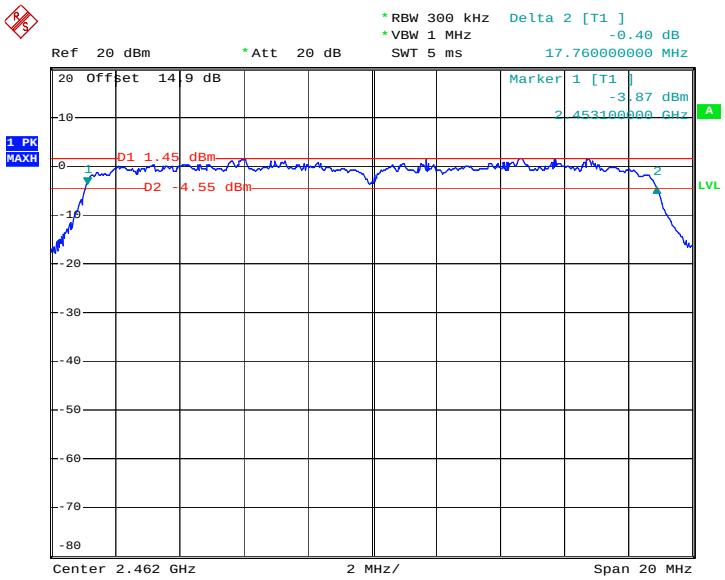
6 dB Bandwidth Plot on 802.11n HT20 Channel 11



Date: 25.SEP.2012 17:58:05

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

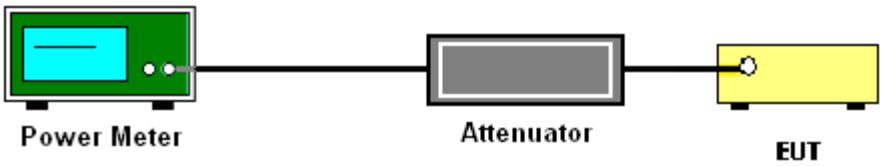
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.22	30	Pass
06	2437	18.12	30	Pass
11	2462	17.99	30	Pass

Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.15	30	Pass
06	2437	18.12	30	Pass
11	2462	18.11	30	Pass

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.03	30	Pass
06	2437	17.97	30	Pass
11	2462	18.03	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	16.26
06	2437	16.14
11	2462	15.99

Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	90.14%	Duty Factor:	0.45dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	10.34
06	2437	10.28
11	2462	10.26

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	85.25%	Duty Factor:	0.69dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	9.77
06	2437	9.73
11	2462	9.85

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.

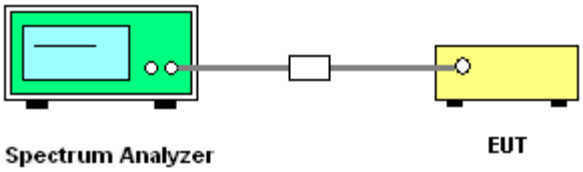
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 5.3.1 (Peak PSD) of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. 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. Video bandwidth (VBW) >= 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
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 in any 100 kHz band segment within the fundamental EBW.
6. Record the measurement data derived from spectrum analyzer.
7. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

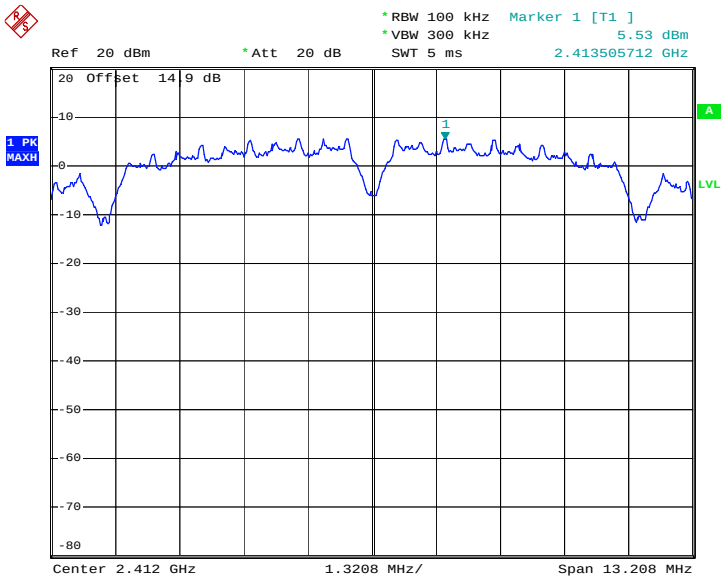
Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	5.53	-9.67	8	Pass
06	2437	5.40	-9.80	8	Pass
11	2462	5.23	-9.97	8	Pass

Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3kHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

PSD Plot on 802.11b Channel 01



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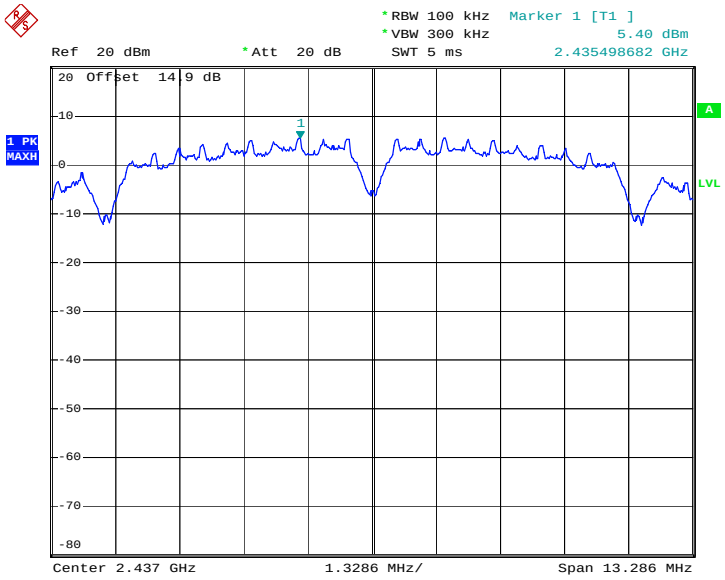
PSD Plot on 802.11b Channel 06



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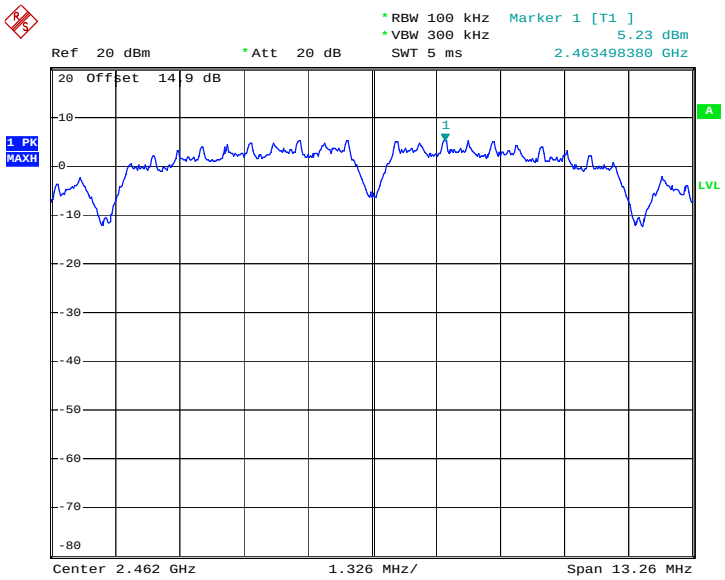
PSD Plot on 802.11b Channel 11



Date: 16.SEP.2012 22:21:04

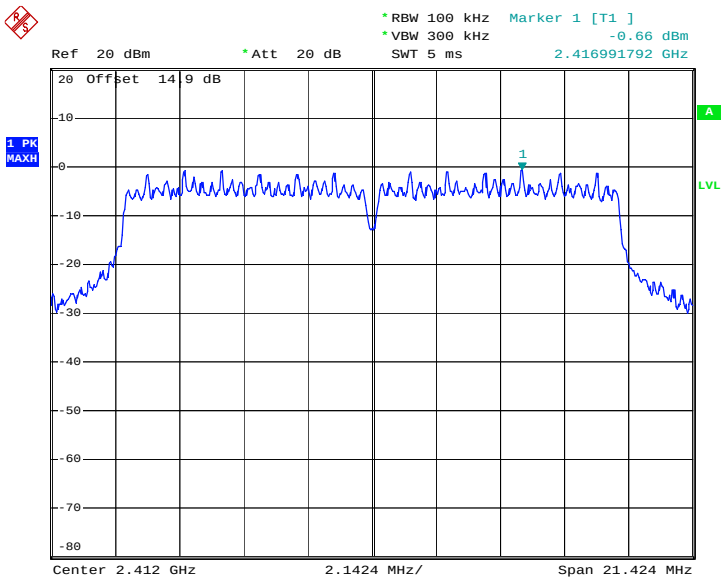
Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-0.66	-15.86	8	Pass
06	2437	-0.87	-16.07	8	Pass
11	2462	-1.00	-16.20	8	Pass

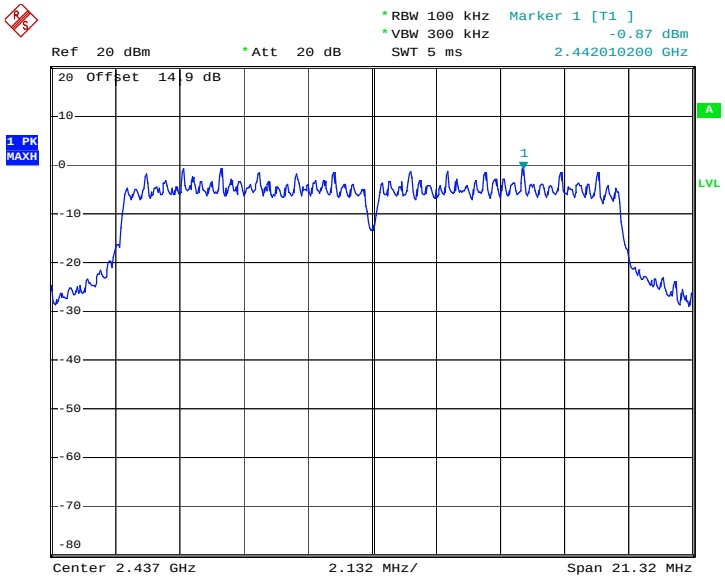
Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

PSD Plot on 802.11g Channel 01

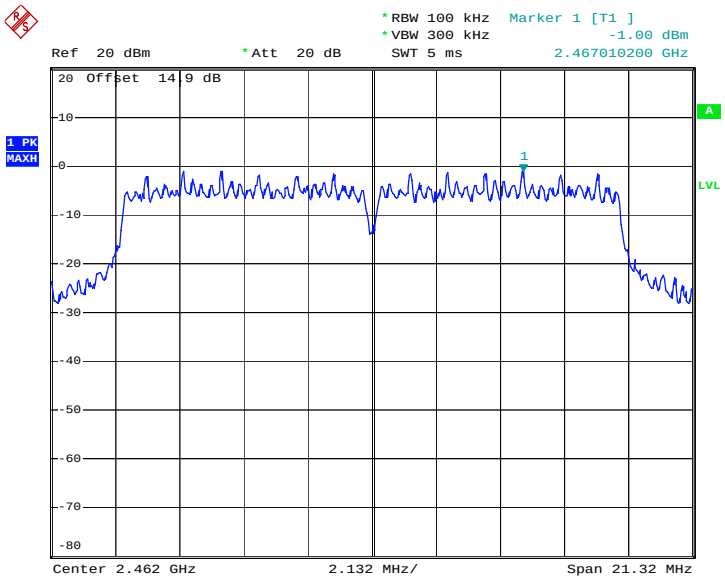


PSD Plot on 802.11g Channel 06



Date: 25.SEP.2012 17:45:17

PSD Plot on 802.11g Channel 11



Date: 25.SEP.2012 17:47:38

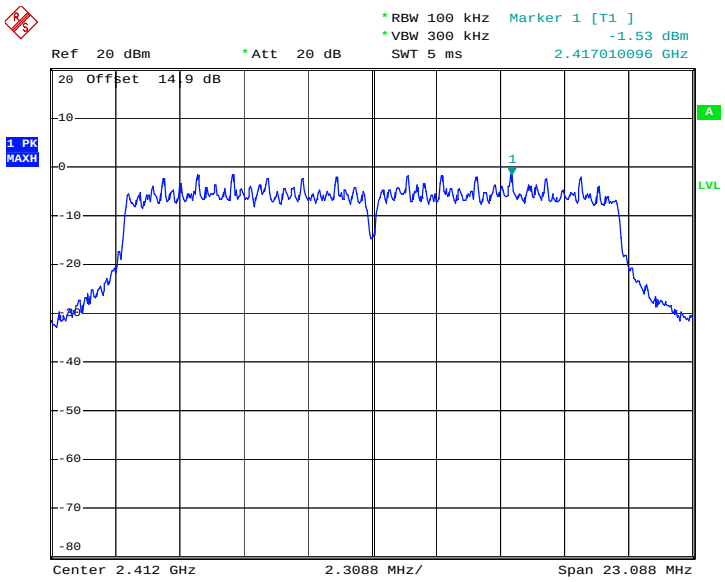
Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-1.53	-16.73	8	Pass
06	2437	-1.74	-16.94	8	Pass
11	2462	-1.85	-17.05	8	Pass

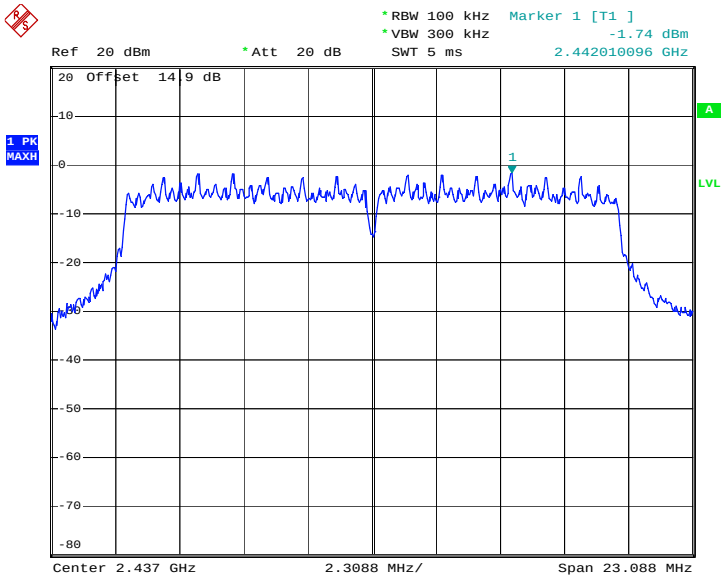
Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

PSD Plot on 802.11n HT20 Channel 01

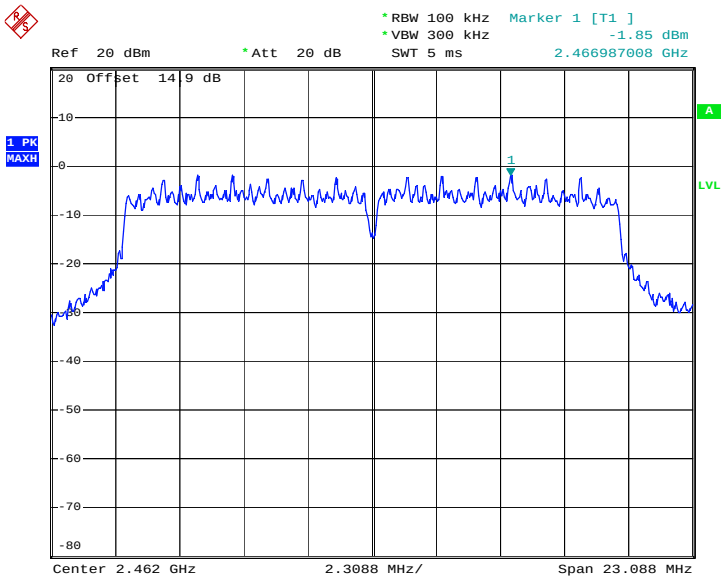


PSD Plot on 802.11n HT20 Channel 06



Date: 25.SEP.2012 17:56:13

PSD Plot on 802.11n HT20 Channel 11



Date: 25.SEP.2012 17:58:26

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

See list of measuring instruments of this test report.

3.4.3 Test Procedures

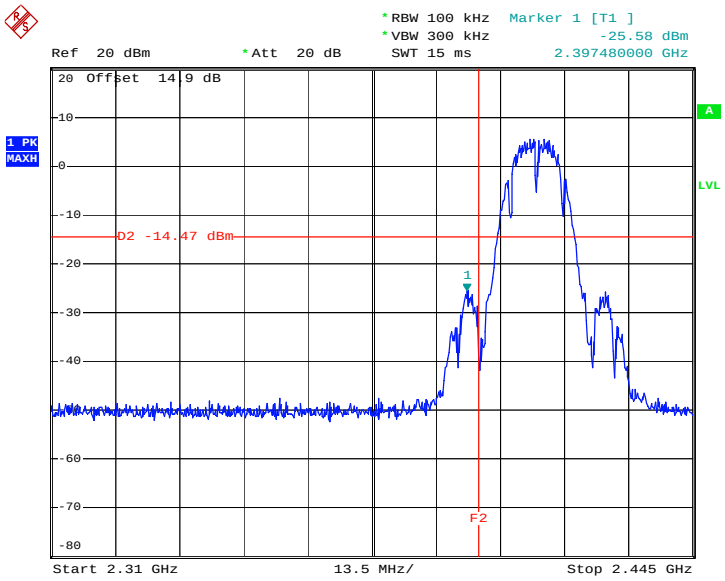
1. The testing follows the guidelines in the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions 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. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
4. Measure and record the results in the test report.

3.4.4 Test Setup

3.4.5 Test Plots of Conducted Band Edges

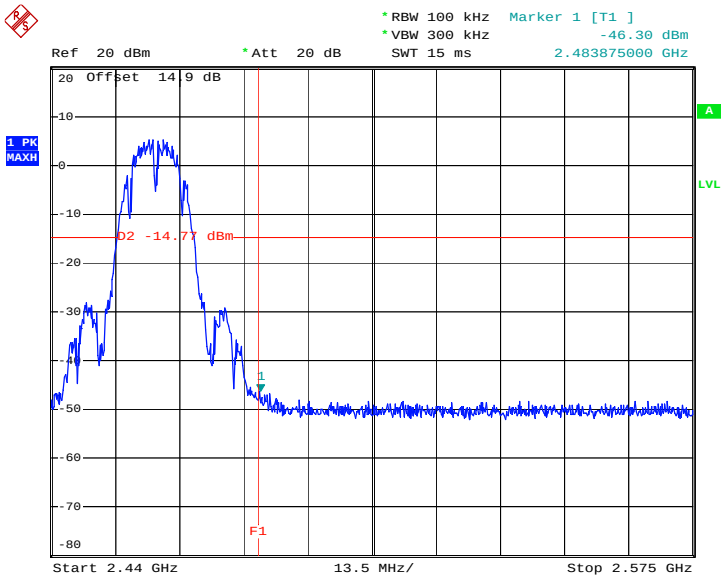
Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11b Channel 01



Date: 16.SEP.2012 16:54:23

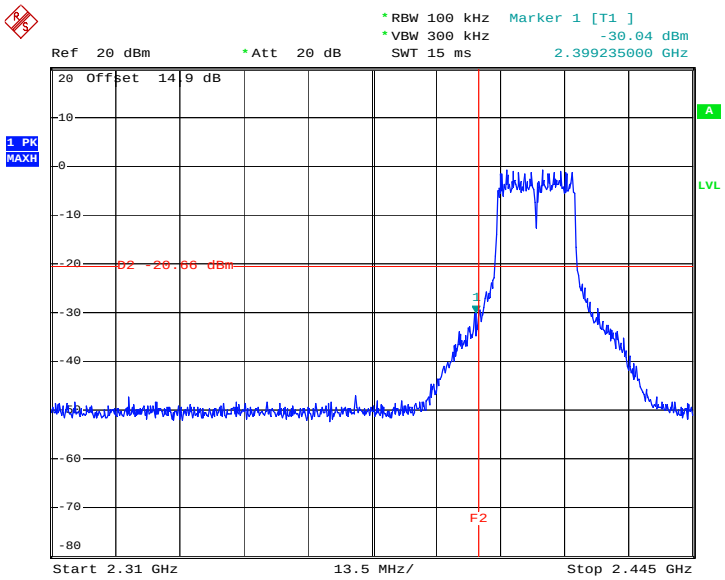
High Band Edge Plot on 802.11b Channel 11



Date: 16.SEP.2012 22:21:18

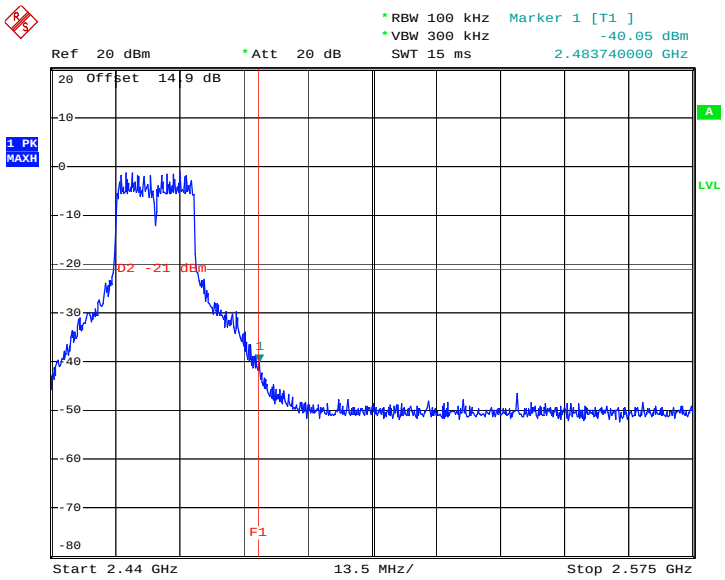
Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11g Channel 01



Date: 25.SEP.2012 17:40:55

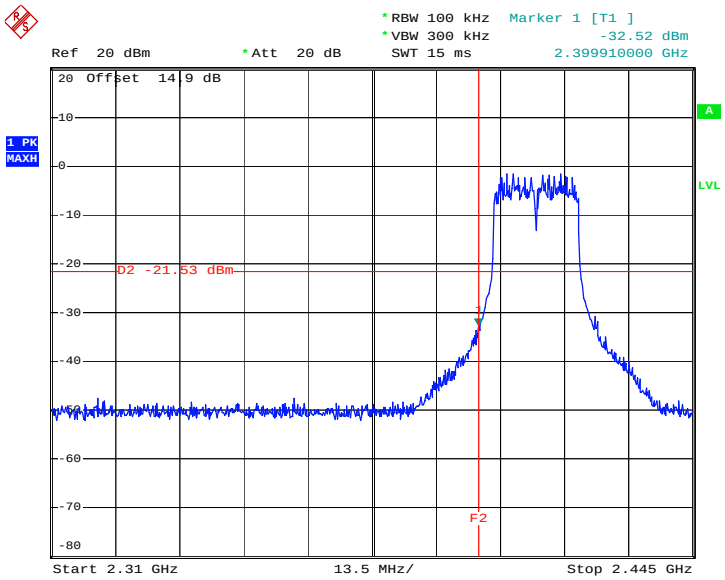
High Band Edge Plot on 802.11g Channel 11



Date: 25.SEP.2012 17:48:05

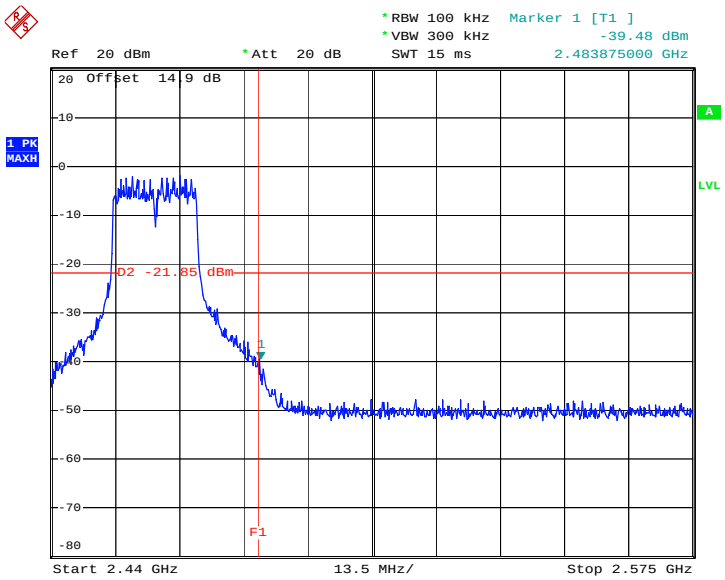
Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 25.SEP.2012 17:52:55

High Band Edge Plot on 802.11n HT20 Channel 11



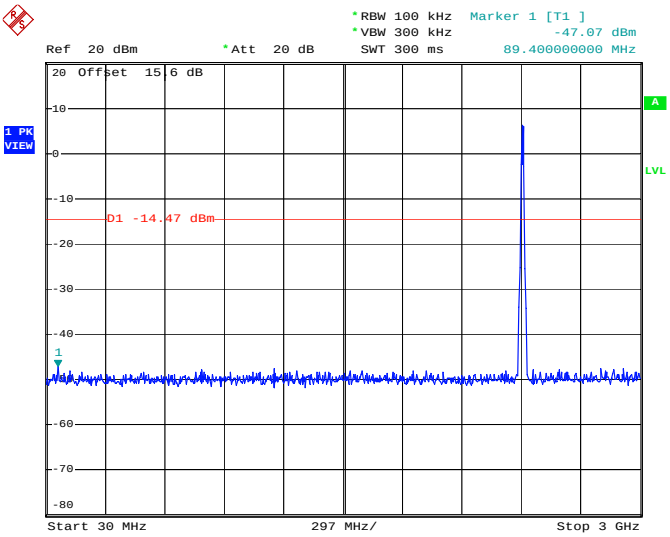
Date: 25.SEP.2012 17:58:41

3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	47~48%
Test Channel :	01, 06, 11	Test Engineer :	Lizy Li

802.11b 30 MHz~3 GHz

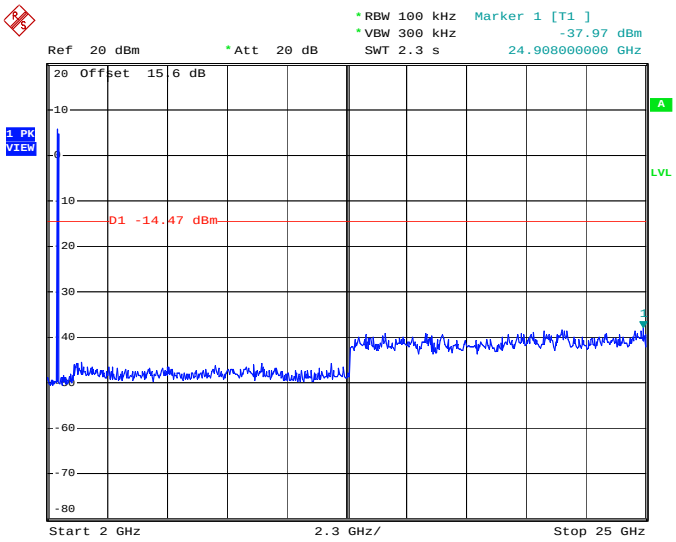
Conducted Spurious Emission Plot on Channel 01



Date: 16.SEP.2012 16:55:28

802.11b 2 GHz~25 GHz

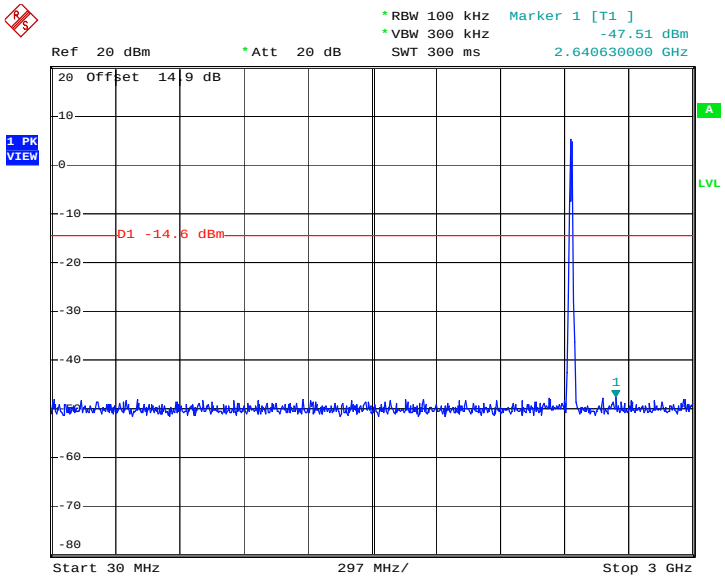
Conducted Spurious Emission Plot on Channel 01



Date: 16.SEP.2012 16:55:46

802.11b 30 MHz~3 GHz

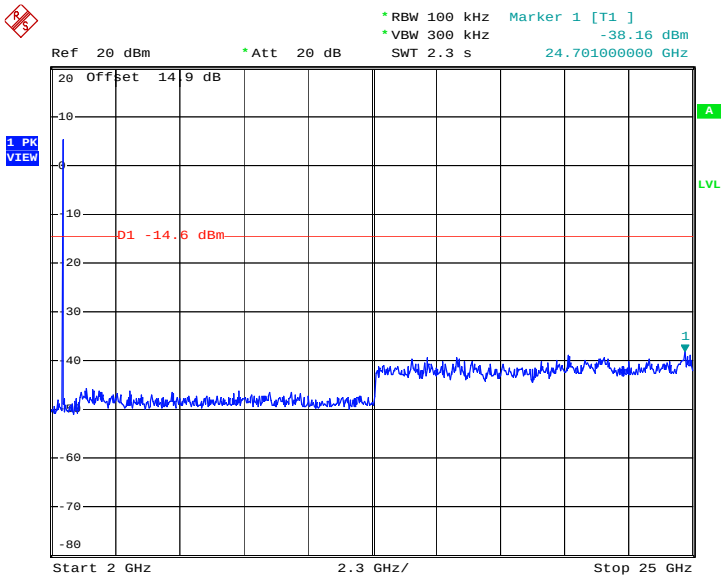
Conducted Spurious Emission Plot on Channel 06



Date: 16.SEP.2012 22:18:56

802.11b 2 GHz~25 GHz

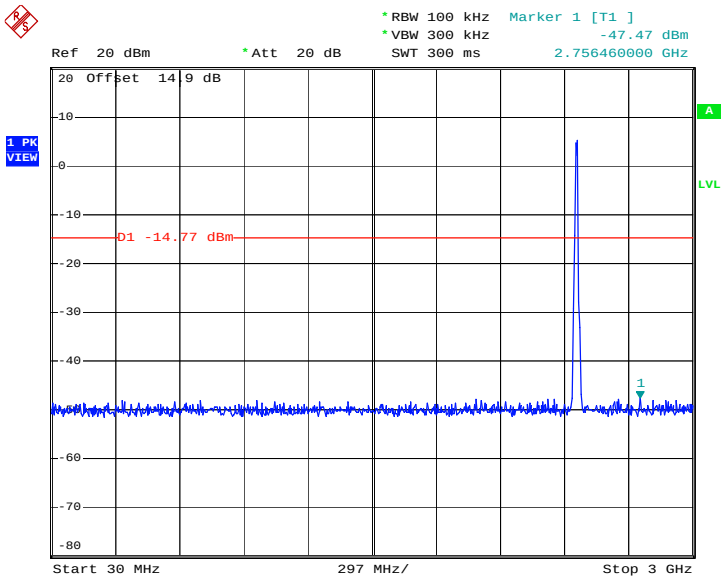
Conducted Spurious Emission Plot on Channel 06



Date: 16.SEP.2012 22:19:14

802.11b 30 MHz~3 GHz

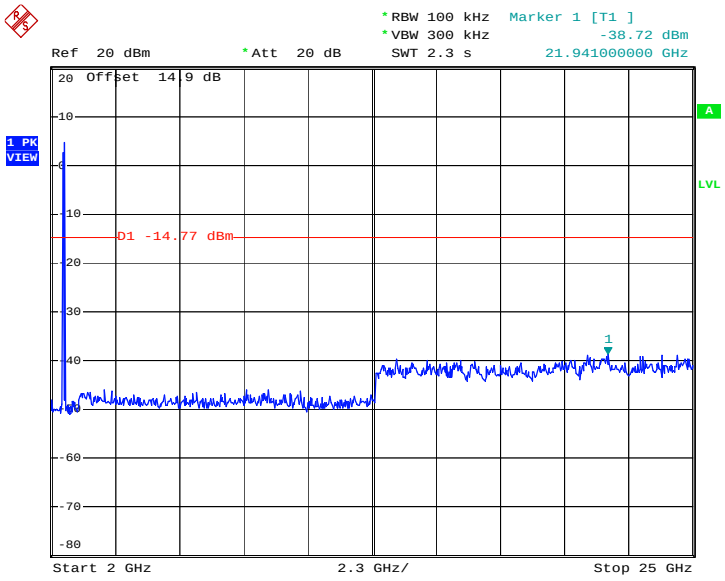
Conducted Spurious Emission Plot on Channel 11



Date: 16.SEP.2012 22:21:48

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

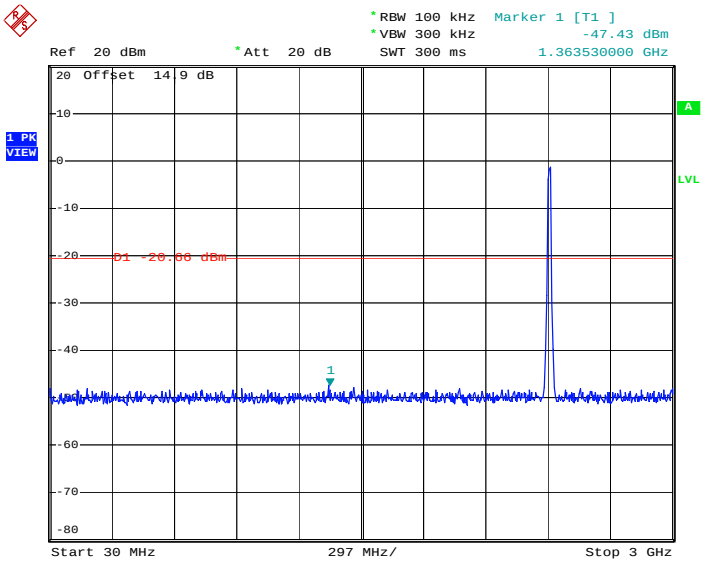


Date: 16.SEP.2012 22:22:06

Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	47~48%
Test Channel :	01, 06, 11	Test Engineer :	Lizy Li

802.11g 30 MHz~3 GHz

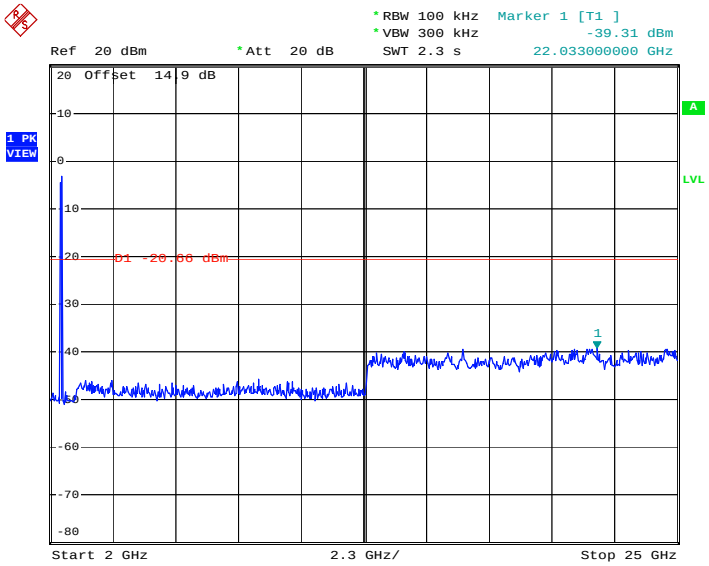
Conducted Spurious Emission Plot on Channel 01



Date: 25.SEP.2012 17:41:29

802.11g 2 GHz~25 GHz

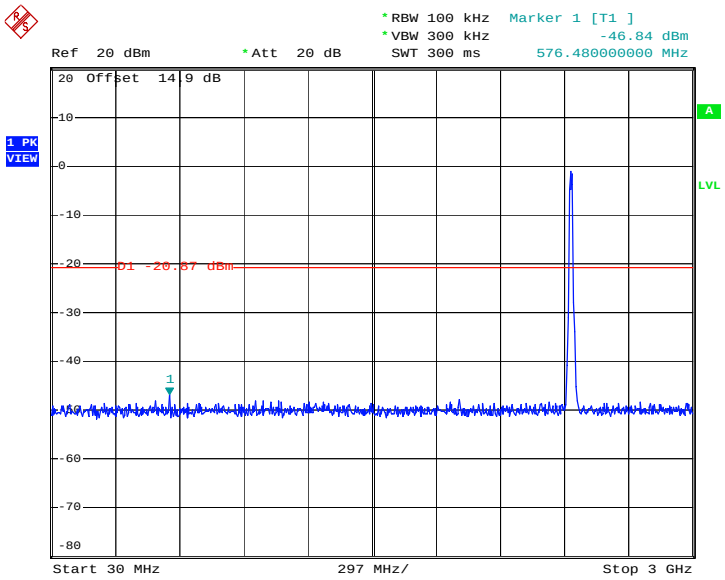
Conducted Spurious Emission Plot on Channel 01



Date: 25.SEP.2012 17:41:47

802.11g 30 MHz~3 GHz

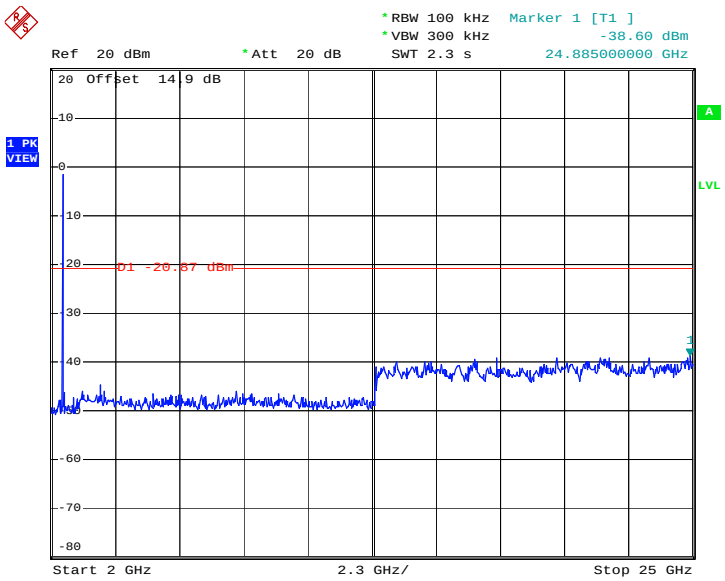
Conducted Spurious Emission Plot on Channel 06



Date: 25.SEP.2012 17:45:42

802.11g 2 GHz~25 GHz

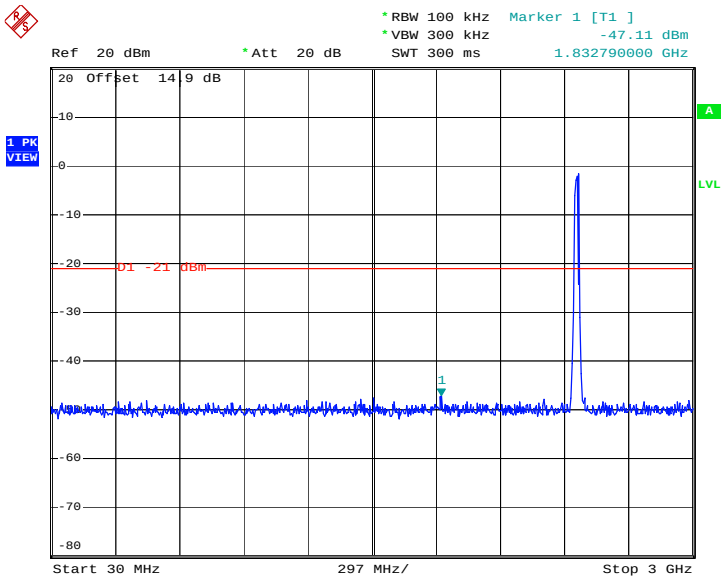
Conducted Spurious Emission Plot on Channel 06



Date: 25.SEP.2012 17:46:00

802.11g 30 MHz~3 GHz

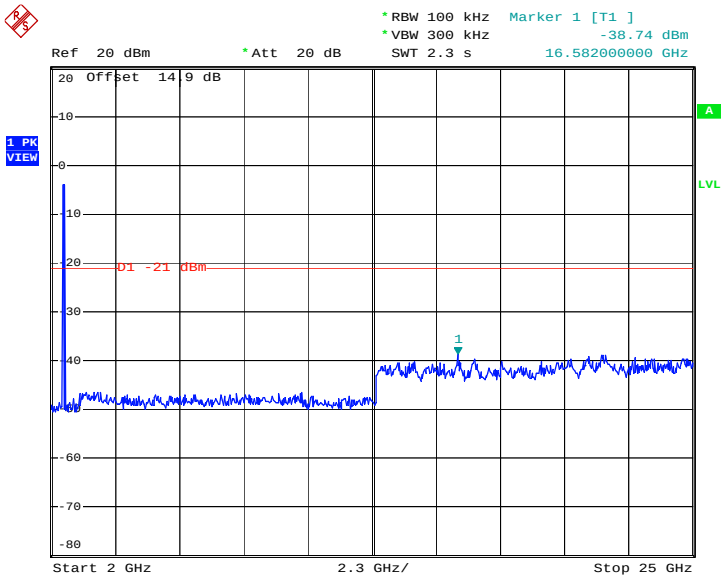
Conducted Spurious Emission Plot on Channel 11



Date: 25.SEP.2012 17:49:07

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

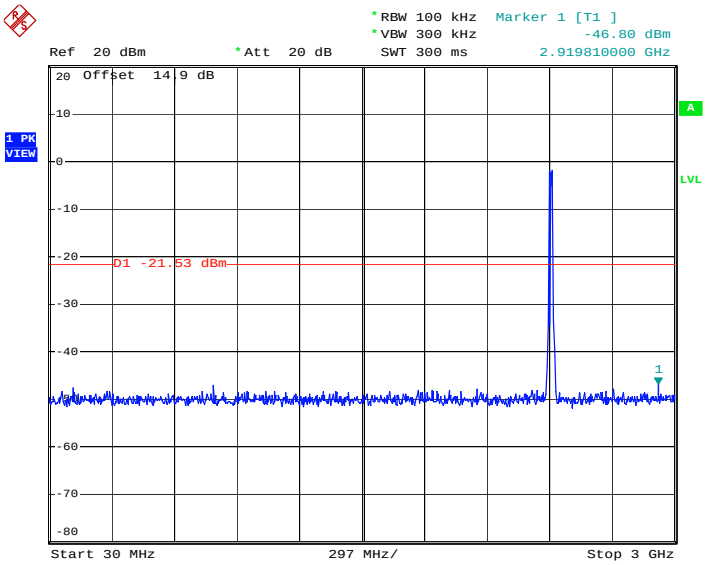


Date: 25.SEP.2012 17:49:26

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	47~48%
Test Channel :	01, 06, 11	Test Engineer :	Lizy Li

802.11n HT20 30 MHz~3 GHz

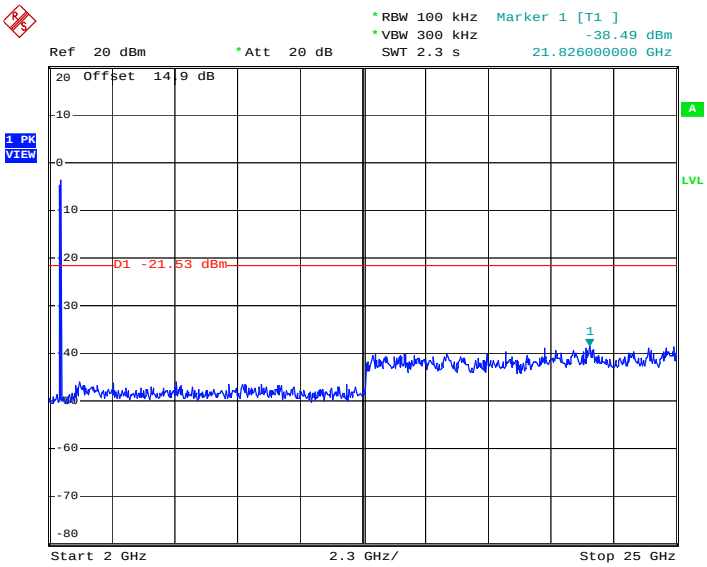
Conducted Spurious Emission Plot on Channel 01



Date: 25.SEP.2012 17:53:22

802.11n HT20 2 GHz~25 GHz

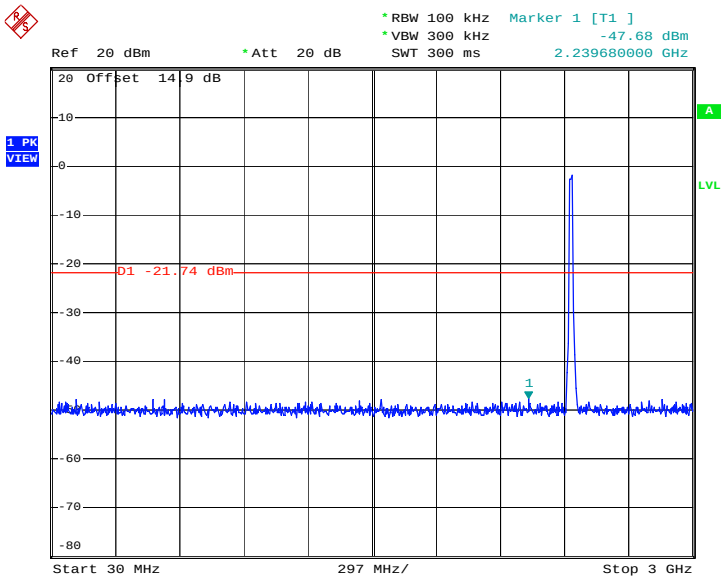
Conducted Spurious Emission Plot on Channel 01



Date: 25.SEP.2012 17:53:40

802.11n HT20 30 MHz~3 GHz

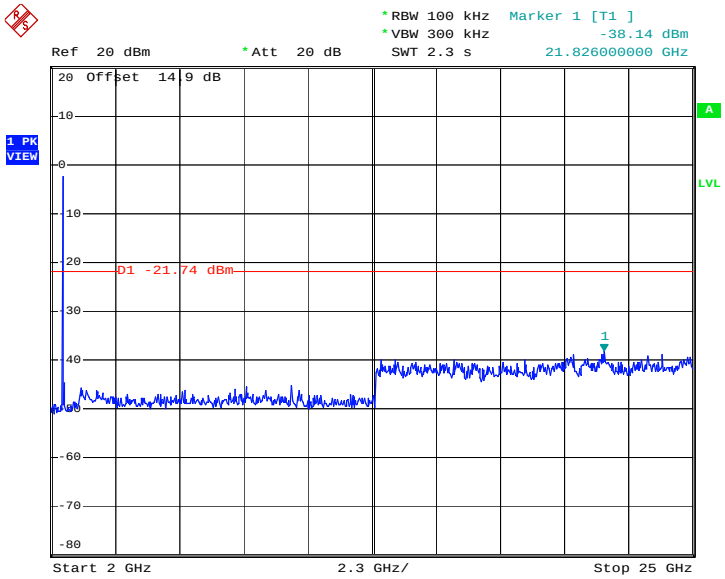
Conducted Spurious Emission Plot on Channel 06



Date: 25.SEP.2012 17:56:37

802.11n HT20 2 GHz~25 GHz

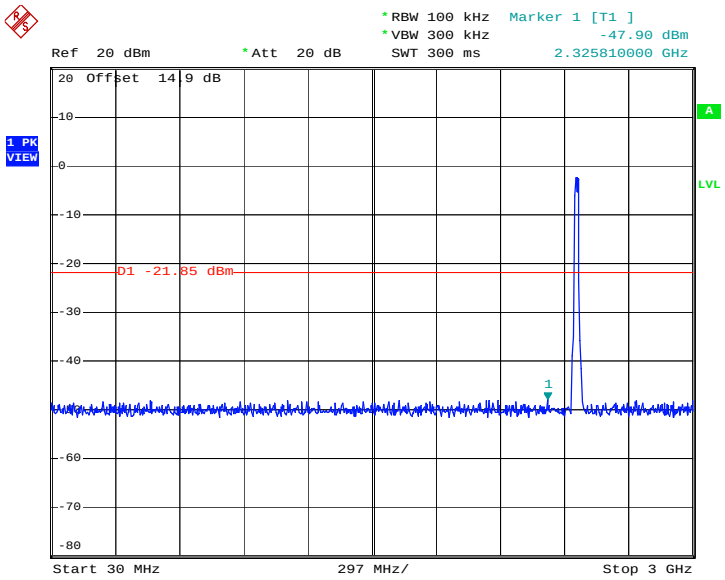
Conducted Spurious Emission Plot on Channel 06



Date: 25.SEP.2012 17:56:55

802.11n HT20 30 MHz~3 GHz

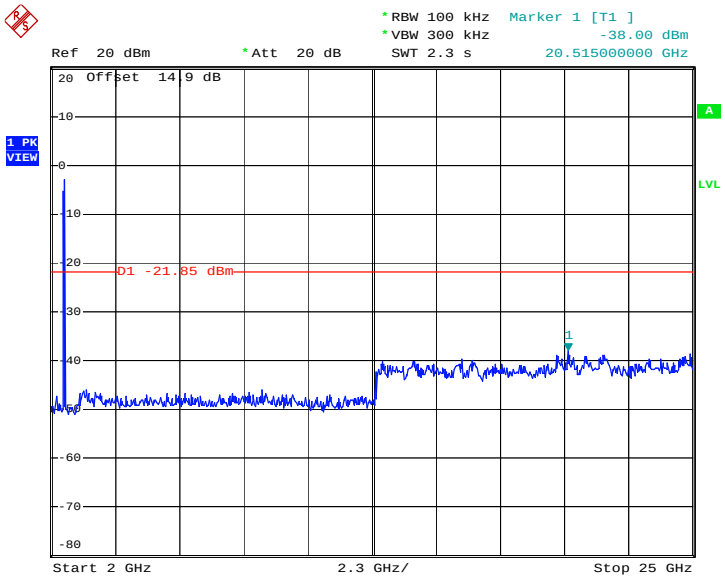
Conducted Spurious Emission Plot on Channel 11



Date: 25.SEP.2012 17:59:03

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 25.SEP.2012 17:59:22

3.5 Radiated Emission Measurement

3.5.1 Limit of Radiated Emission

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(KHz)	300
0.490 – 1.705	24000/F(KHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

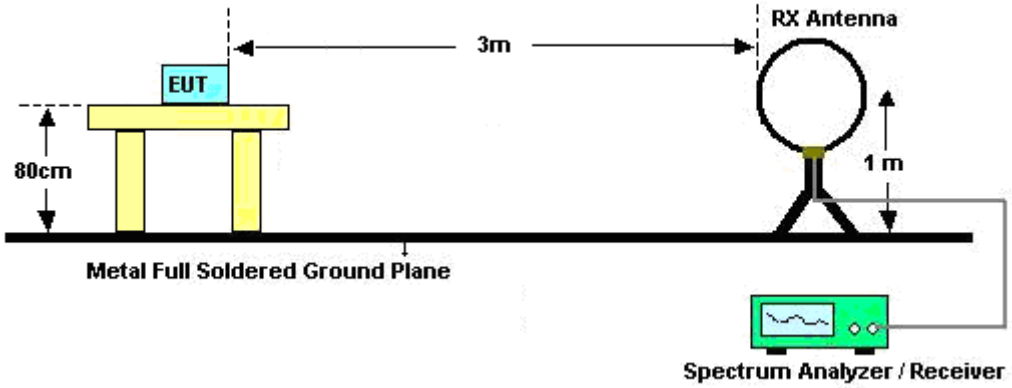
1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) 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 to comply with the guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent while maintaining all of the other instrument settings for Average measurement.

Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	82.979	0.234	4.274	10KHz
2.4G 802.11n HT20	85.252	0.237	4.219	10KHz

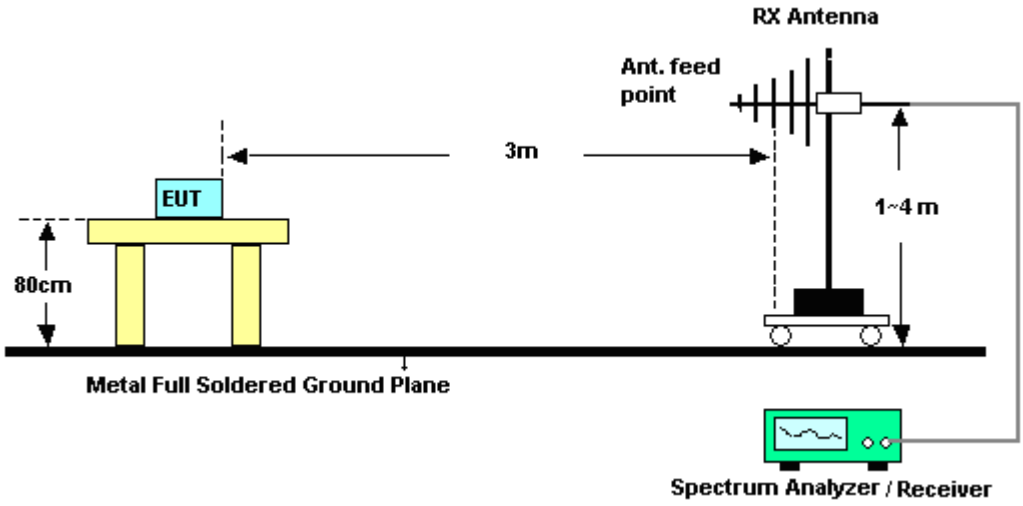
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. If the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be reported by using the quasi-peak detector.

3.5.4 Test Setup

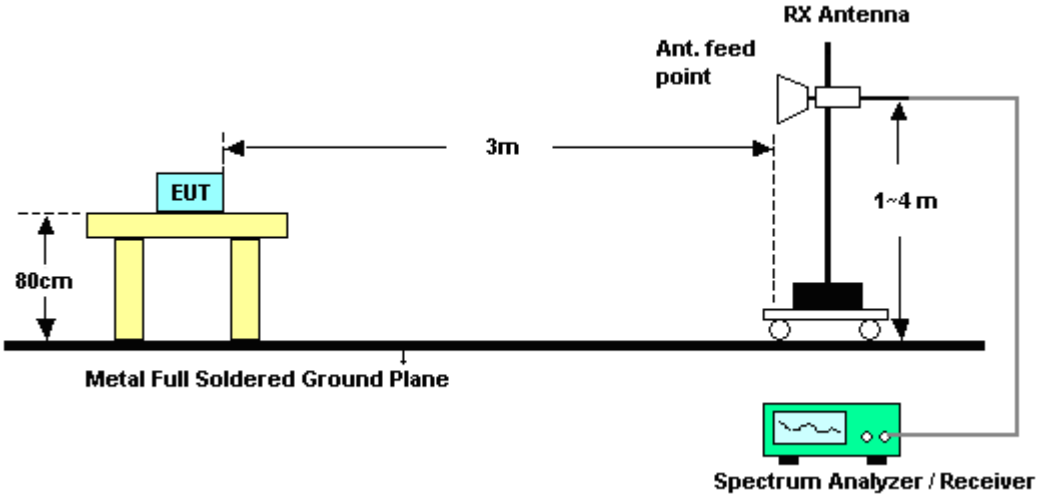
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11b	Temperature :	19~21℃
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2337.09	53.72	-20.28	74	45.91	32.78	4.2	29.17	102	3	Peak
2390	45.93	-8.07	54	37.92	32.86	4.23	29.08	102	3	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	53.95	-20.05	74	45.94	32.86	4.23	29.08	120	65	Peak
2390	42.63	-11.37	54	34.62	32.86	4.23	29.08	120	65	Average

Test Mode :	802.11b	Temperature :	19~21℃
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	55.96	-18.04	74	47.66	33.01	4.29	29	101	3	Peak
2483.5	45.52	-8.48	54	37.22	33.01	4.29	29	101	3	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.42	54.33	-19.67	74	46.03	33.01	4.29	29	114	68	Peak
2483.5	43.57	-10.43	54	35.27	33.01	4.29	29	114	38	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	66.51	-7.49	74	58.5	32.86	4.23	29.08	103	14	Peak
2390	50.16	-3.84	54	42.15	32.86	4.23	29.08	103	14	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	58.41	-15.59	74	50.4	32.86	4.23	29.08	100	52	Peak
2390	45.46	-8.54	54	37.45	32.86	4.23	29.08	100	52	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	63.08	-10.92	74	54.78	33.01	4.29	29	176	352	Peak
2483.5	46.48	-7.52	54	38.18	33.01	4.29	29	176	352	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484	58.17	-15.83	74	49.87	33.01	4.29	29	168	329	Peak
2483.74	43.85	-10.15	54	35.55	33.01	4.29	29	168	329	Average

Test Mode :	802.11n HT20	Temperature :	19~21℃
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	66.9	-7.1	74	58.89	32.86	4.23	29.08	191	360	Peak
2390	51.53	-2.47	54	43.52	32.86	4.23	29.08	191	360	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.65	59.04	-14.96	74	51.03	32.86	4.23	29.08	187	0	Peak
2390	44.9	-9.1	54	36.89	32.86	4.23	29.08	187	0	Average

Test Mode :	802.11n HT20	Temperature :	19~21℃
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.72	62.17	-11.83	74	53.87	33.01	4.29	29	176	11	Peak
2483.54	47.61	-6.39	54	39.31	33.01	4.29	29	176	11	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.46	60.21	-13.79	74	51.91	33.01	4.29	29	116	70	Peak
2483.62	47.07	-6.93	54	38.77	33.01	4.29	29	116	70	Average

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

Test Mode :	802.11b	Temperature :	19~21℃
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.531	17.91	-22.09	40	30.45	17.29	0.25	30.08	-	-	Peak
34.76	17.43	-22.57	40	32.19	15.1	0.23	30.09	-	-	Peak
112.131	17.29	-26.21	43.5	35.02	11.8	0.44	29.97	-	-	Peak
199.986	19.68	-23.82	43.5	40.1	9	0.59	30.01	-	-	Peak
390.723	22.85	-23.15	46	36.07	15.79	0.84	29.85	-	-	Peak
942.131	31.83	-14.17	46	39.33	20.7	1.33	29.53	100	20	Peak
2412	111.33	-	-	103.25	32.89	4.24	29.05	103	0	Peak
2412	101.56	-	-	93.48	32.89	4.24	29.05	103	0	Average

Test Mode :	802.11b	Temperature :	19~21℃
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.071	19.65	-20.35	40	32.19	17.29	0.25	30.08	-	-	Peak
41.86	16.76	-23.24	40	35.63	10.95	0.26	30.08	-	-	Peak
48.332	21.86	-18.14	40	43.59	8.12	0.28	30.13	-	-	Peak
88.964	20.98	-22.52	43.5	41.97	8.61	0.39	29.99	-	-	Peak
187.753	16.29	-27.21	43.5	37.17	8.48	0.57	29.93	-	-	Peak
942.131	32.74	-13.26	46	40.24	20.7	1.33	29.53	100	198	Peak
2412	105.95	-	-	97.87	32.89	4.24	29.05	119	64	Peak
2412	101.02	-	-	92.94	32.89	4.24	29.05	119	64	Average

Test Mode :	802.11b	Temperature :	19~21℃
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.51	19.01	-20.99	40	32.31	16.55	0.24	30.09	-	-	Peak
34.76	17.6	-22.4	40	32.36	15.1	0.23	30.09	-	-	Peak
119.436	19.97	-23.53	43.5	37.69	11.8	0.45	29.97	-	-	Peak
189.074	20.09	-23.41	43.5	40.97	8.49	0.57	29.94	-	-	Peak
392.095	23.53	-22.47	46	36.71	15.82	0.84	29.84	-	-	Peak
942.131	32.36	-13.64	46	39.86	20.7	1.33	29.53	100	96	Peak
2437	109.97	-	-	101.8	32.95	4.25	29.03	103	4	Peak
2437	104.84	-	-	96.67	32.95	4.25	29.03	103	4	Average

Test Mode :	802.11b	Temperature :	19~21℃
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.562	20.62	-19.38	40	34.92	15.56	0.23	30.09	-	-	Peak
65.573	22.21	-17.79	40	46.76	5.22	0.33	30.1	-	-	Peak
83.23	28.52	-11.48	40	50.85	7.34	0.36	30.03	-	-	Peak
151.067	20.58	-22.92	43.5	40.08	9.96	0.51	29.97	-	-	Peak
242.525	19.84	-26.16	46	37.35	11.66	0.66	29.83	-	-	Peak
942.131	32.25	-13.75	46	39.75	20.7	1.33	29.53	100	132	Peak
2437	105.55	-	-	97.38	32.95	4.25	29.03	116	65	Peak
2437	100.61	-	-	92.44	32.95	4.25	29.03	116	65	Average

Test Mode :	802.11b	Temperature :	19~21℃
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.445	19.8	-20.2	40	34.1	15.56	0.23	30.09	-	-	Peak
35.499	20.54	-19.46	40	35.74	14.65	0.23	30.08	-	-	Peak
175.652	26.74	-16.76	43.5	47.28	8.8	0.55	29.89	-	-	Peak
216.024	21.65	-24.35	46	41.2	9.83	0.61	29.99	-	-	Peak
394.855	24.1	-21.9	46	37.21	15.89	0.84	29.84	-	-	Peak
942.131	31.35	-14.65	46	38.85	20.7	1.33	29.53	100	153	Peak
2462	109.57	-	-	101.33	32.98	4.27	29.01	100	2	Peak
2462	104.67	-	-	96.43	32.98	4.27	29.01	100	2	Average

Test Mode :	802.11b	Temperature :	19~21℃
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.517	17.35	-22.65	40	32.11	15.1	0.23	30.09	-	-	Peak
61.778	26.19	-13.81	40	50.73	5.27	0.32	30.13	100	0	Peak
70.337	27.13	-12.87	40	51.49	5.38	0.34	30.08	-	-	Peak
88.964	20.17	-23.33	43.5	41.16	8.61	0.39	29.99	-	-	Peak
739.661	24.04	-21.96	46	32.63	19.81	1.17	29.57	-	-	Peak
942.131	31.98	-14.02	46	39.48	20.7	1.33	29.53	-	-	Peak
2462	103.36	-	-	95.12	32.98	4.27	29.01	113	48	Peak
2462	98.32	-	-	90.08	32.98	4.27	29.01	113	48	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.399	21.12	-18.88	40	33.66	17.29	0.25	30.08	-	-	Peak
114.917	16.54	-26.96	43.5	34.27	11.8	0.44	29.97	-	-	Peak
176.888	28.37	-15.13	43.5	48.99	8.71	0.56	29.89	-	-	Peak
190.405	19.88	-23.62	43.5	40.74	8.5	0.58	29.94	-	-	Peak
396.242	22.52	-23.48	46	35.57	15.94	0.84	29.83	-	-	Peak
942.131	32.92	-13.08	46	40.42	20.7	1.33	29.53	100	161	Peak
2412	112.15	-	-	104.07	32.89	4.24	29.05	102	2	Peak
2412	102.02	-	-	93.94	32.89	4.24	29.05	102	2	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.095	21.19	-18.81	40	35	16.04	0.24	30.09	-	-	Peak
37.548	20.7	-19.3	40	36.82	13.7	0.24	30.06	-	-	Peak
88.964	19.53	-23.97	43.5	40.52	8.61	0.39	29.99	-	-	Peak
129.015	20	-23.5	43.5	37.8	11.71	0.47	29.98	-	-	Peak
689.565	25.37	-20.63	46	34.74	19.23	1.12	29.72	-	-	Peak
942.131	31.72	-14.28	46	39.22	20.7	1.33	29.53	100	86	Peak
2412	104.18	-	-	96.1	32.89	4.24	29.05	192	231	Peak
2412	93.42	-	-	85.34	32.89	4.24	29.05	192	231	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.18	17.56	-22.44	40	30.1	17.29	0.25	30.08	-	-	Peak
120.277	17.63	-25.87	43.5	35.35	11.8	0.45	29.97	-	-	Peak
196.51	20.52	-22.98	43.5	41.06	8.86	0.59	29.99	-	-	Peak
399.03	23.24	-22.76	46	36.25	15.98	0.84	29.83	-	-	Peak
679.96	25.98	-20.02	46	35.41	19.15	1.12	29.7	-	-	Peak
942.131	31.89	-14.11	46	39.39	20.7	1.33	29.53	100	215	Peak
2437	109.38	-	-	101.21	32.95	4.25	29.03	101	3	Peak
2437	96.95	-	-	88.78	32.95	4.25	29.03	101	3	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.18	18.43	-21.57	40	30.97	17.29	0.25	30.08	-	-	Peak
46.016	28.01	-11.99	40	48.99	8.88	0.27	30.13	100	50	Peak
67.675	23.28	-16.72	40	47.77	5.27	0.33	30.09	-	-	Peak
88.964	19.52	-23.98	43.5	40.51	8.61	0.39	29.99	-	-	Peak
197.2	17.69	-25.81	43.5	38.23	8.86	0.59	29.99	-	-	Peak
942.131	31.62	-14.38	46	39.12	20.7	1.33	29.53	-	-	Peak
2437	106.39	-	-	98.22	32.95	4.25	29.03	189	245	Peak
2437	95.92	-	-	87.75	32.95	4.25	29.03	189	245	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.882	17.39	-22.61	40	32.15	15.1	0.23	30.09	-	-	Peak
118.186	23.2	-20.3	43.5	40.92	11.8	0.45	29.97	-	-	Peak
183.201	19.67	-23.83	43.5	40.58	8.43	0.56	29.9	-	-	Peak
397.633	22.65	-23.35	46	35.68	15.96	0.84	29.83	-	-	Peak
689.565	25.2	-20.8	46	34.57	19.23	1.12	29.72	-	-	Peak
945.44	30.68	-15.32	46	38.18	20.71	1.33	29.54	100	306	Peak
2462	97.57	-	-	89.33	32.98	4.27	29.01	181	13	Peak
2462	87.31	-	-	79.07	32.98	4.27	29.01	181	13	Average

Test Mode :	802.11g	Temperature :	19~21℃
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.328	19.5	-20.5	40	33.31	16.04	0.24	30.09	-	-	Peak
45.217	15.54	-24.46	40	36.15	9.25	0.27	30.13	-	-	Peak
88.964	20.92	-22.58	43.5	41.91	8.61	0.39	29.99	-	-	Peak
194.453	15.81	-27.69	43.5	36.46	8.75	0.58	29.98	-	-	Peak
872.183	23.8	-22.2	46	31.61	20.49	1.29	29.59	-	-	Peak
942.131	31.27	-14.73	46	38.77	20.7	1.33	29.53	100	12	Peak
2462	97.13	-	-	88.89	32.98	4.27	29.01	185	348	Peak
2462	85.58	-	-	77.34	32.98	4.27	29.01	185	348	Average

Test Mode :	802.11n-HT20	Temperature :	19~21℃
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.962	17.2	-22.8	40	29.74	17.29	0.25	30.08	-	-	Peak
33.562	17.46	-22.54	40	31.76	15.56	0.23	30.09	-	-	Peak
117.36	16.77	-26.73	43.5	34.49	11.8	0.45	29.97	-	-	Peak
197.2	20.11	-23.39	43.5	40.65	8.86	0.59	29.99	-	-	Peak
400.432	22.84	-23.16	46	35.83	16	0.84	29.83	-	-	Peak
942.131	31.54	-14.46	46	39.04	20.7	1.33	29.53	100	310	Peak
2412	105.32	-	-	97.24	32.89	4.24	29.05	100	348	Peak
2412	95.82	-	-	87.74	32.89	4.24	29.05	100	348	Average

Test Mode :	802.11n-HT20	Temperature :	19~21℃
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.562	19.21	-20.79	40	33.51	15.56	0.23	30.09	-	-	Peak
42.007	16.31	-23.69	40	35.18	10.95	0.26	30.08	-	-	Peak
88.964	20.26	-23.24	43.5	41.25	8.61	0.39	29.99	-	-	Peak
197.2	16.62	-26.88	43.5	37.16	8.86	0.59	29.99	-	-	Peak
742.259	25.7	-20.3	46	34.26	19.83	1.17	29.56	-	-	Peak
942.131	33.73	-12.27	46	41.23	20.7	1.33	29.53	100	98	Peak
2412	102.34	-	-	94.26	32.89	4.24	29.05	181	23	Peak
2412	92.71	-	-	84.63	32.89	4.24	29.05	181	23	Average

Test Mode :	802.11n-HT20	Temperature :	19~21℃
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
76.781	27.71	-12.29	40	51.35	6.06	0.35	30.05	100	251	Peak
99.878	22.61	-20.89	43.5	41.66	10.5	0.41	29.96	-	-	Peak
136.939	21.93	-21.57	43.5	40.32	11.13	0.48	30	-	-	Peak
170.195	20.42	-23.08	43.5	40.64	9.14	0.55	29.91	-	-	Peak
393.472	23.4	-22.6	46	36.53	15.87	0.84	29.84	-	-	Peak
942.131	30.98	-15.02	46	38.48	20.7	1.33	29.53	-	-	Peak
2437	106.29	-	-	98.12	32.95	4.25	29.03	181	0	Peak
2437	96.85	-	-	88.68	32.95	4.25	29.03	181	0	Average

Test Mode :	802.11n-HT20	Temperature :	19~21℃
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
37.285	18.27	-21.73	40	34.39	13.7	0.24	30.06	-	-	Peak
65.114	17.22	-22.78	40	41.81	5.2	0.32	30.11	-	-	Peak
88.964	22.33	-21.17	43.5	43.32	8.61	0.39	29.99	-	-	Peak
108.267	19.75	-23.75	43.5	37.6	11.68	0.43	29.96	-	-	Peak
588.905	21.55	-24.45	46	31.54	18.58	1.06	29.63	-	-	Peak
942.131	32.05	-13.95	46	39.55	20.7	1.33	29.53	100	287	Peak
2437	104.6	-	-	96.43	32.95	4.25	29.03	100	86	Peak
2437	94.83	-	-	86.66	32.95	4.25	29.03	100	86	Average

Test Mode :	802.11n-HT20	Temperature :	19~21℃
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.731	18.51	-21.49	40	31.81	16.55	0.24	30.09	-	-	Peak
34.76	17.61	-22.39	40	32.37	15.1	0.23	30.09	-	-	Peak
124.133	16.96	-26.54	43.5	34.72	11.76	0.46	29.98	-	-	Peak
197.2	20.99	-22.51	43.5	41.53	8.86	0.59	29.99	-	-	Peak
396.242	22.94	-23.06	46	35.99	15.94	0.84	29.83	-	-	Peak
942.131	31.51	-14.49	46	39.01	20.7	1.33	29.53	100	0	Peak
2462	103.97	-	-	95.73	32.98	4.27	29.01	179	22	Peak
2462	94.42	-	-	86.18	32.98	4.27	29.01	179	22	Average

Test Mode :	802.11n-HT20	Temperature :	19~21℃
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.51	21.13	-18.87	40	34.43	16.55	0.24	30.09	-	-	Peak
35.624	19.01	-20.99	40	34.21	14.65	0.23	30.08	-	-	Peak
41.713	19.31	-20.69	40	38.18	10.95	0.26	30.08	-	-	Peak
88.964	21.27	-22.23	43.5	42.26	8.61	0.39	29.99	-	-	Peak
672.845	22.53	-23.47	46	32.03	19.08	1.11	29.69	-	-	Peak
942.131	31.45	-14.55	46	38.95	20.7	1.33	29.53	100	312	Peak
2462	98.98	-	-	90.74	32.98	4.27	29.01	186	0	Peak
2462	88.97	-	-	80.73	32.98	4.27	29.01	186	0	Average

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

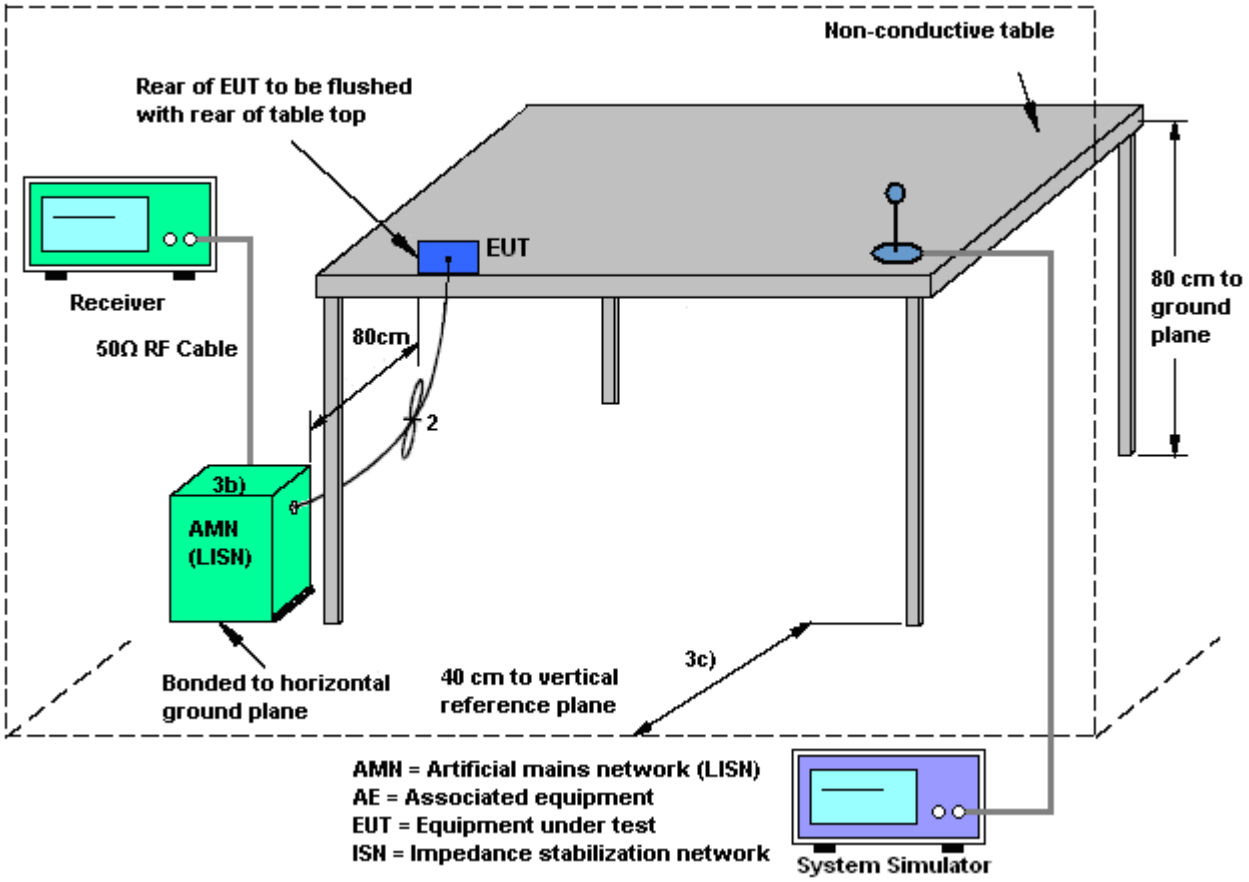
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

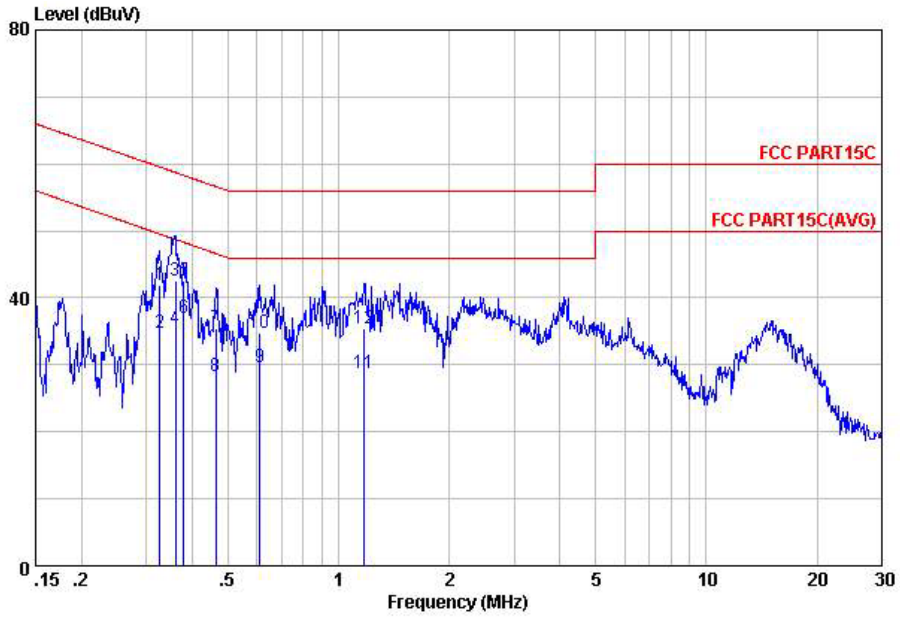
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 KHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

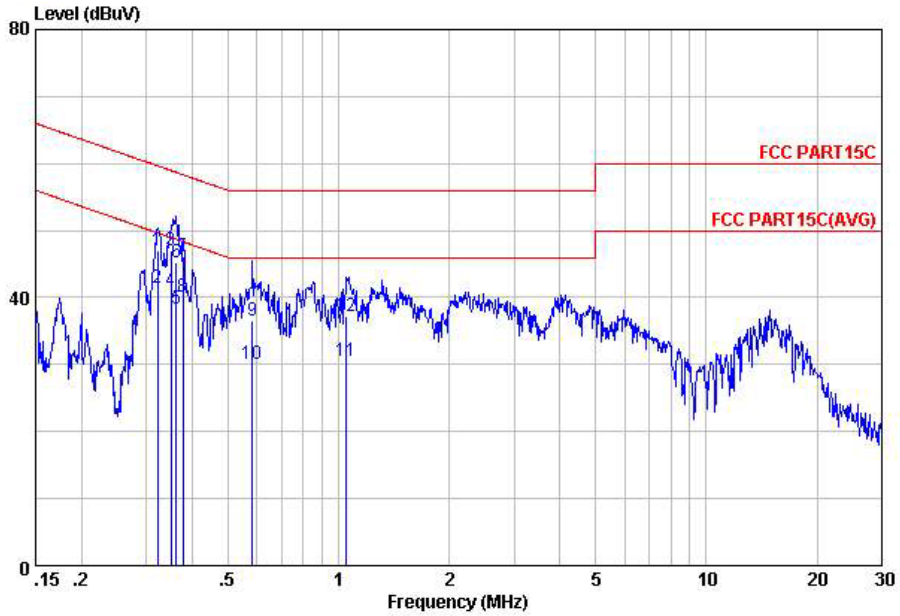
Test Mode :	Mode 1	**Temperature :**	19~20℃
Test Engineer :	Tom Wang	**Relative Humidity :**	39~40%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + USB Cable (Charging from Adapter) + WLAN Link + Bluetooth Link + Earphone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-111230 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.33	41.82	-17.71	59.53	31.30	-0.08	10.60	QP
2	0.33	34.72	-14.81	49.53	24.20	-0.08	10.60	Average
3	0.36	42.63	-16.11	58.74	32.10	-0.08	10.61	QP
4	0.36	35.33	-13.41	48.74	24.80	-0.08	10.61	Average
5	0.38	42.64	-15.66	58.30	32.11	-0.08	10.61	QP
6	0.38	36.94	-11.36	48.30	26.41	-0.08	10.61	Average
7	0.46	35.44	-21.19	56.63	24.90	-0.08	10.62	QP
8	0.46	28.34	-18.29	46.63	17.80	-0.08	10.62	Average
9	0.61	29.75	-16.25	46.00	19.21	-0.09	10.63	Average
10	0.61	34.75	-21.25	56.00	24.21	-0.09	10.63	QP
11	1.17	28.66	-17.34	46.00	18.10	-0.10	10.66	Average
12	1.17	35.46	-20.54	56.00	24.90	-0.10	10.66	QP

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + USB Cable (Charging from Adapter) + WLAN Link + Bluetooth Link + Earphone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-111230 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.32	47.02	-12.64	59.66	36.51	-0.08	10.59	QP
2	0.32	41.52	-8.14	49.66	31.01	-0.08	10.59	Average
3	0.35	47.03	-11.93	58.96	36.50	-0.08	10.61	QP
4	0.35	41.03	-7.93	48.96	30.50	-0.08	10.61	Average
5	0.36	38.33	-10.36	48.69	27.80	-0.08	10.61	Average
6	0.36	45.13	-13.56	58.69	34.60	-0.08	10.61	QP
7	0.38	46.24	-12.10	58.34	35.71	-0.08	10.61	QP
8	0.38	40.04	-8.30	48.34	29.51	-0.08	10.61	Average
9	0.58	36.65	-19.35	56.00	26.10	-0.08	10.63	QP
10	0.58	30.05	-15.95	46.00	19.50	-0.08	10.63	Average
11	1.05	30.56	-15.44	46.00	20.00	-0.09	10.65	Average
12	1.05	37.16	-18.84	56.00	26.60	-0.09	10.65	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 Connected Construction

Non-standard connector 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	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Sep. 16, 2012~ Sep. 26, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Sep. 16, 2012~ Sep. 26, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Sep. 16, 2012~ Sep. 26, 2012	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Sep. 16, 2012~ Sep. 26, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Sep. 16, 2012~ Sep. 26, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Sep. 20, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Sep. 20, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Sep. 20, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/ 001	9 kHz~30 MHz	Jul. 03, 2012	Sep. 20, 2012	Jul. 02, 2014	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Sep. 20, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Sep. 20, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Sep. 20, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Sep. 20, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Sep. 20, 2012	Oct.10, 2012	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Sep. 12, 2012	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	Sep. 12, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	Sep. 12, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	Sep. 12, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Sep. 12, 2012~ Sep. 26, 2012	Dec. 29, 2012	-

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**

Appendix A. Photographs of EUT

Please refer to Sporton report number EP291002 as below.