FCC RF Test Report

APPLICANT	:	CT Asia
EQUIPMENT	:	Mobile phone
BRAND NAME	:	BLU
MODEL NAME	:	Studio 5.3S
MARKETING NAME	:	Studio 5.3S
FCC ID	:	YHLBLUSTUDIO53S
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Mar. 07, 2013 and completely tested on Mar. 28, 2013. 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

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
FR330701B	Rev. 01	Initial issue of report	Mar. 29, 2013

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 2.79 dB at 2389.830 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 14.85 dB at 2.870 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

Beijing Benywave technology Co., Ltd.

NO 55, Jiachuang second road, zhongguancun science Park OPTO-Mechatronicd Industrial Park, Tongzhou District, Beijing, China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Mobile phone
Brand Name	BLU
Model Name	Studio 5.3S
Marketing Name	Studio 5.3S
FCC ID	YHLBLUSTUDIO53S
EUT supports Radios application	GSM/GPRS/WCDMA/HSPA/WLAN 11bgn/Bluetooth EDR
HW Version	P1.1
SW Version	593713_8742_V000005
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

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 : 17.01 dBm (0.0502 W) 802.11g : 20.76 dBm (0.1191 W) 802.11n HT20 : 20.05 dBm (0.1012 W)
Antenna Type	Chip Antenna type with gain -2.80 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 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

The test site complies with ANSI C63.4 2003 requirement.

1.6 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 v02
- ANSI C63.10-2009

Remark:

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

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 KHz to 30 MHz) and radiated emission (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (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 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	16.54	16.53	15.65	15.74
CH 06	2437 MHz	16.22	16.18	15.34	15.42
CH 11	2462 MHz	**17.01**	16.95	16.14	16.17

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	19.41	19.17	19.27	19.05	19.91	19.70	20.31	20.68
CH 06	2437 MHz	19.61	19.26	19.88	19.31	19.86	19.76	20.30	20.65
CH 11	2462 MHz	19.97	19.49	20.30	19.36	20.61	20.35	20.67	**20.76**

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	18.82	19.03	19.24	19.82	19.52	19.57	19.52	18.73
CH 06	2437 MHz	18.65	18.87	19.12	19.36	19.32	19.44	19.35	18.43
CH 11	2462 MHz	**20.05**	19.71	19.85	19.96	19.98	19.95	19.95	19.93

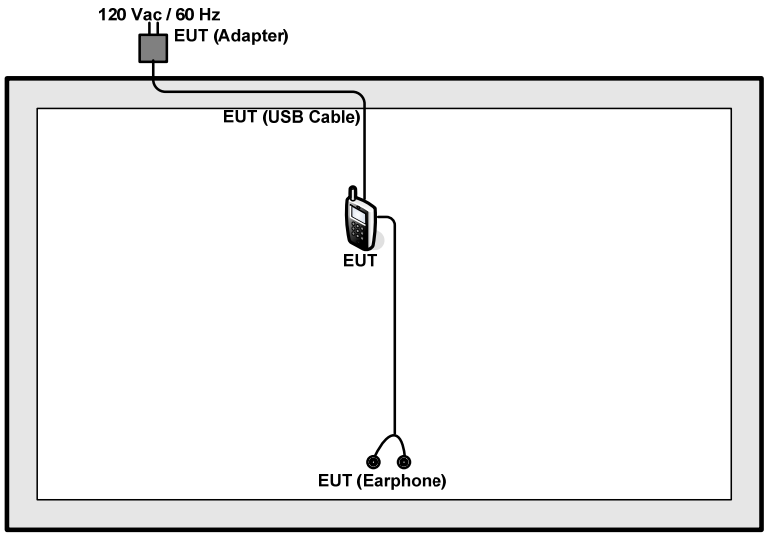
2.3 Test Mode

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

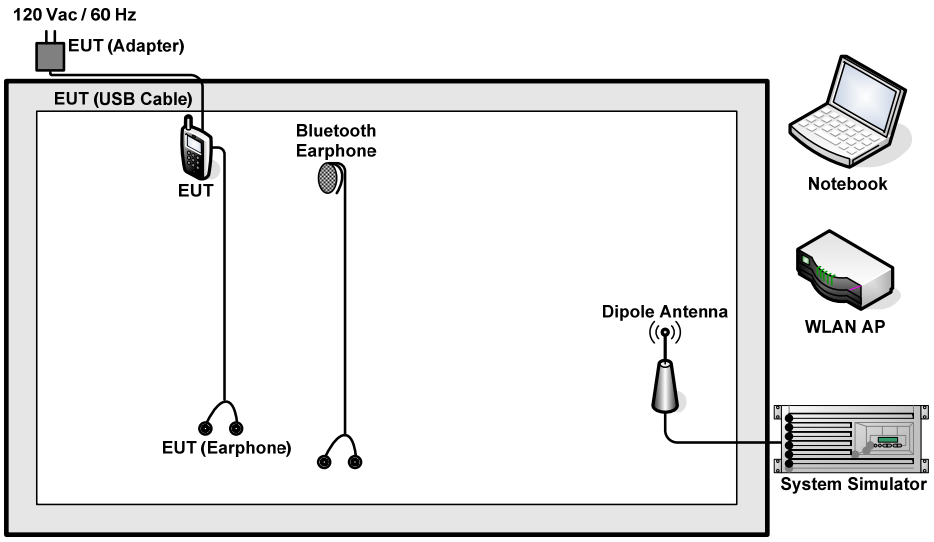
Test Cases				
	Test Items	**Mode**	**Data Rate**	**Test Channel**
Conducted TCs	**6dB BW Power Spectral Density**	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 Mbps**	**1/6/11**
		802.11n HT20	**6.5 Mbps**	**1/6/11**
	Output Power	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 Mbps**	**1/6/11**
		802.11n HT20	**6.5 Mbps**	**1/6/11**
	Conducted Band Edge	**802.11b**	**1 Mbps**	**1/11**
		802.11g	**54 Mbps**	**1/11**
		802.11n HT20	**6.5 Mbps**	**1/11**
	Conducted Spurious Emission	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 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	**54 Mbps**	**1/11**
		802.11n HT20	**6.5 Mbps**	**1/11**
	Radiated Spurious Emission	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 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) + Bluetooth Link + WLAN Link + Earphone			

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.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	N/A	N/A

2.6 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.

2.7 Measurement Results Explanation Example

For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and 10dB attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and 10dB attenuator factor.

Offset = RF cable loss + attenuator factor.

Following table shows an offset computation example with cable loss 7.50 dB.

Example :

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

= 7.50 + 10 = 17.50 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

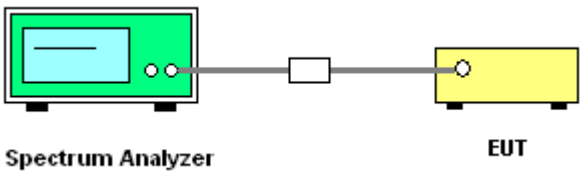
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup

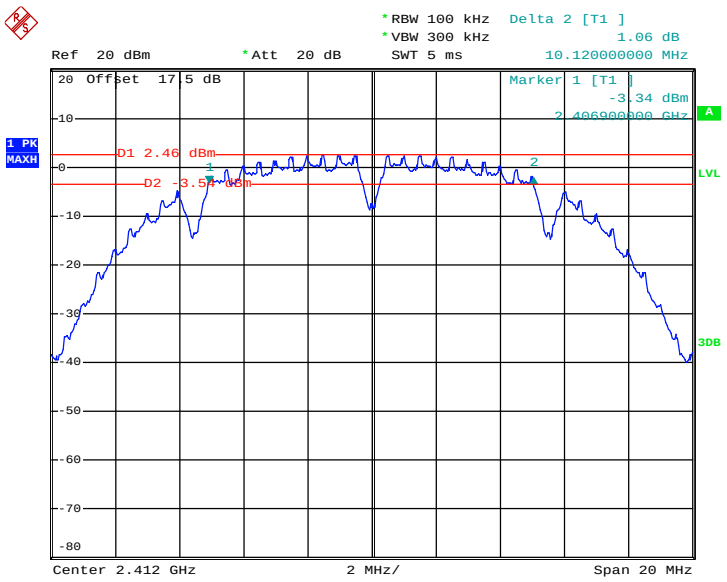


3.1.5 Test Result of 6dB Bandwidth

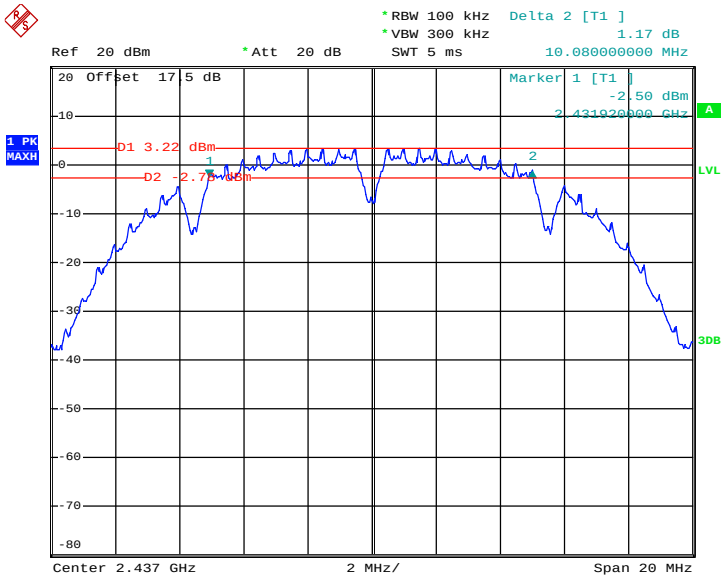
Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.12	0.5	Pass
06	2437	10.08	0.5	Pass
11	2462	10.08	0.5	Pass

6 dB Bandwidth Plot on 802.11b Channel 01



6 dB Bandwidth Plot on 802.11b Channel 06



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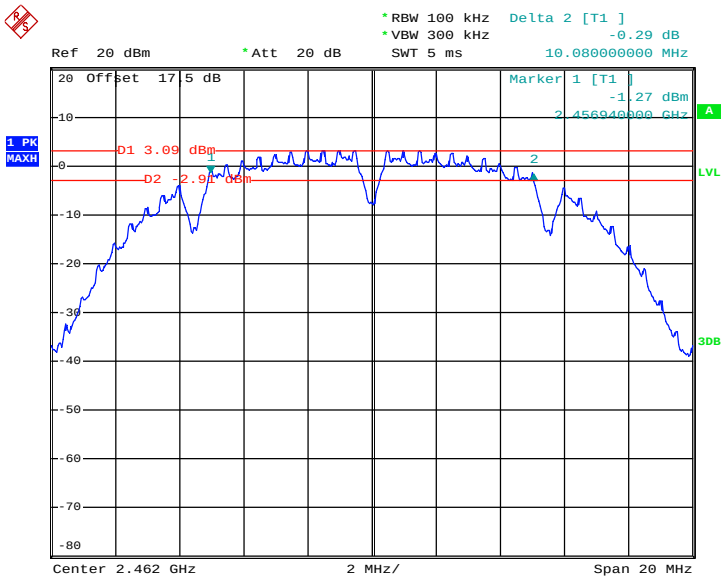
6 dB Bandwidth Plot on 802.11b Channel 11



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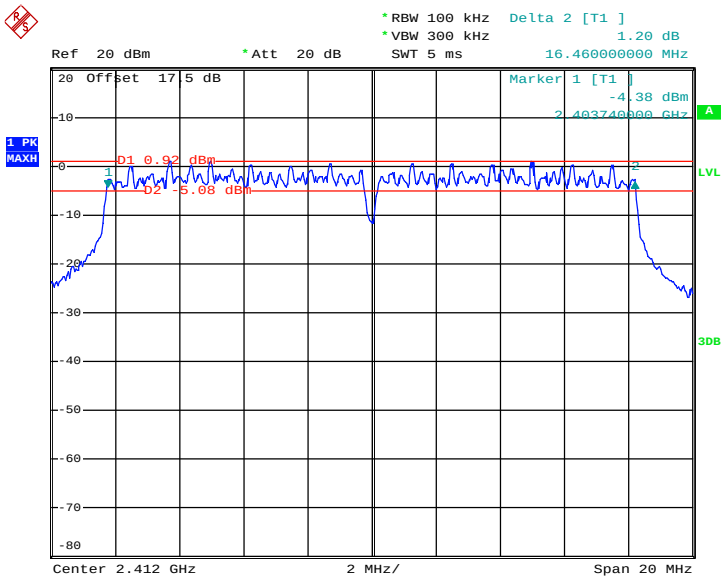
Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.46	0.5	Pass
06	2437	16.48	0.5	Pass
11	2462	16.48	0.5	Pass

6 dB Bandwidth Plot on 802.11g Channel 01



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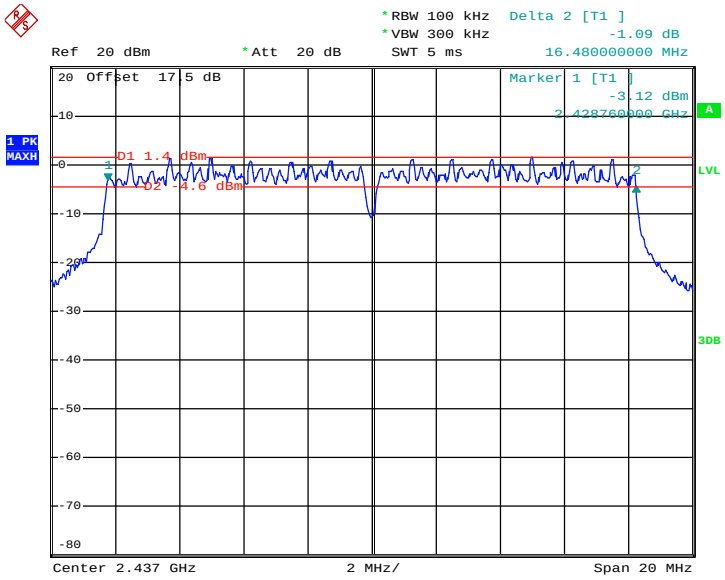
6 dB Bandwidth Plot on 802.11g Channel 06



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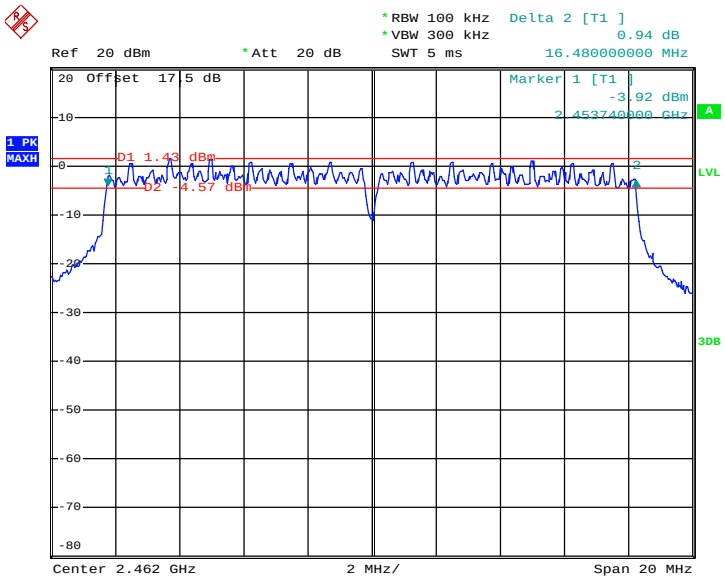
6 dB Bandwidth Plot on 802.11g Channel 11

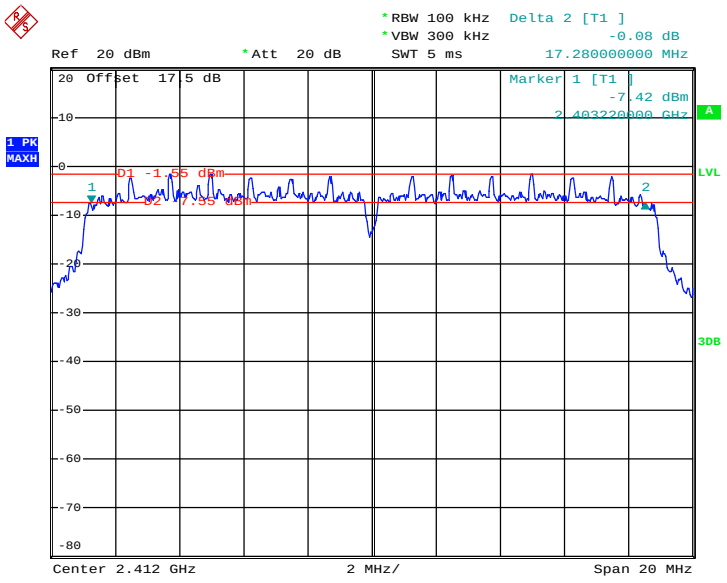


Date: 17.MAR.2013 11:08:04

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	17.28	0.5	Pass
06	2437	16.84	0.5	Pass
11	2462	17.16	0.5	Pass

6 dB Bandwidth Plot on 802.11n HT20 Channel 01



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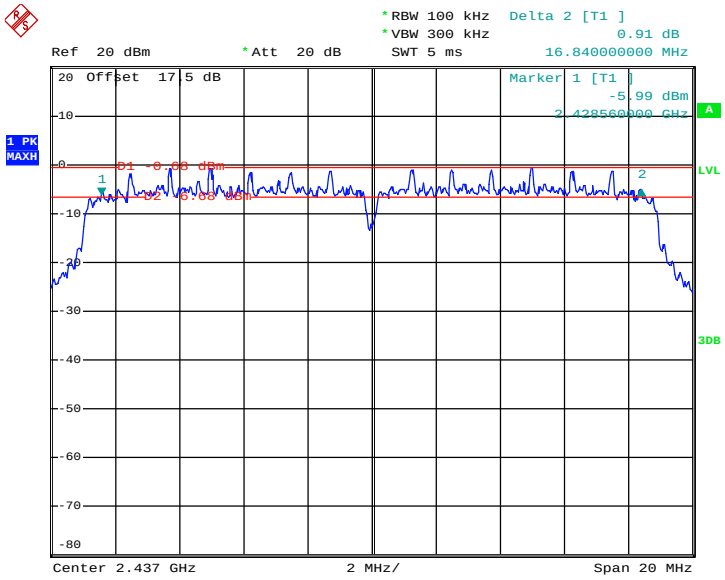
6 dB Bandwidth Plot on 802.11n HT20 Channel 06



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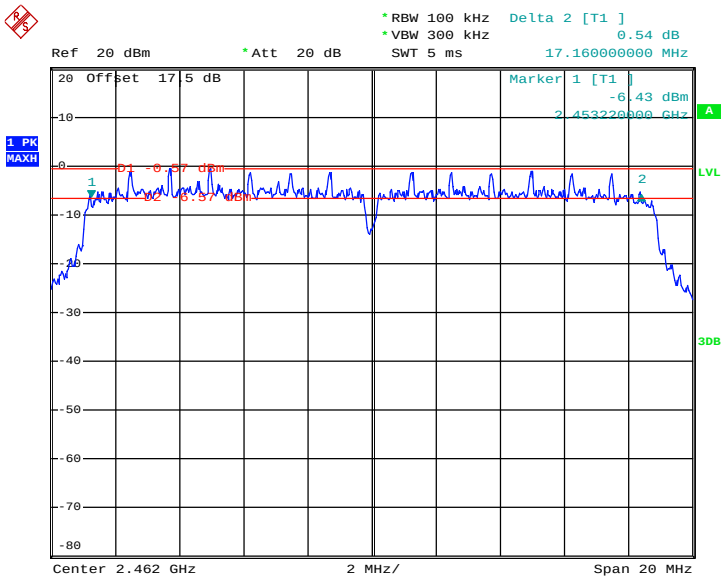
6 dB Bandwidth Plot on 802.11n HT20 Channel 11



Date: 17.MAR.2013 11:20:08

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.

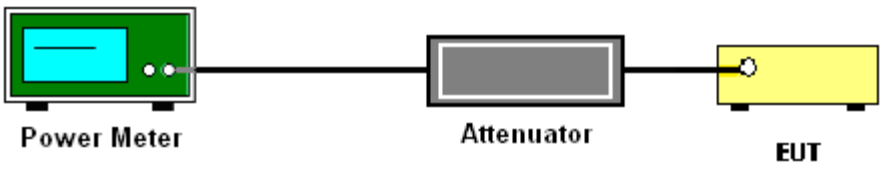
3.2.2 Measuring Instruments

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 v02.
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. 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	16.54	30	Pass
06	2437	16.22	30	Pass
11	2462	17.01	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	20.68	30	Pass
06	2437	20.65	30	Pass
11	2462	20.76	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	18.82	30	Pass
06	2437	18.65	30	Pass
11	2462	20.05	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:	100.00%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	14.31
06	2437	13.99
11	2462	14.78

Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	85.82%	Duty Factor:	0.66dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	11.14
06	2437	10.92
11	2462	11.18

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	98.47%	Duty Factor:	0.07dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	10.44
06	2437	10.13
11	2462	10.96

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.

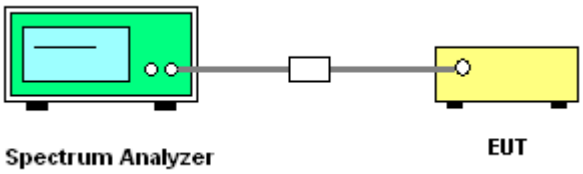
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

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

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	2.80	-12.64	8	Pass
06	2437	3.17	-11.83	8	Pass
11	2462	3.47	-12.57	8	Pass

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/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	0.92	-14.18	8	Pass
06	2437	1.35	-13.36	8	Pass
11	2462	1.41	-13.29	8	Pass

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

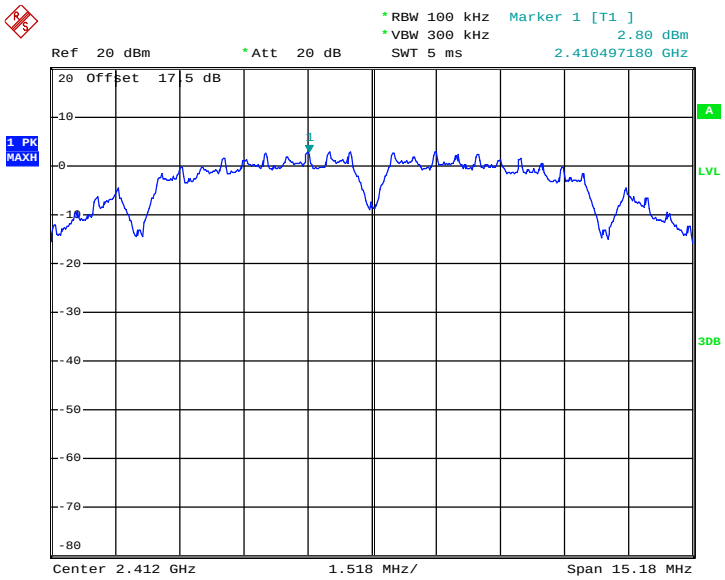
Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-2.00	-17.66	8	Pass
06	2437	-0.91	-15.40	8	Pass
11	2462	-0.65	-16.40	8	Pass

Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *The Measured power density (dBm)/ 100KHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.*

3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 802.11b Channel 01



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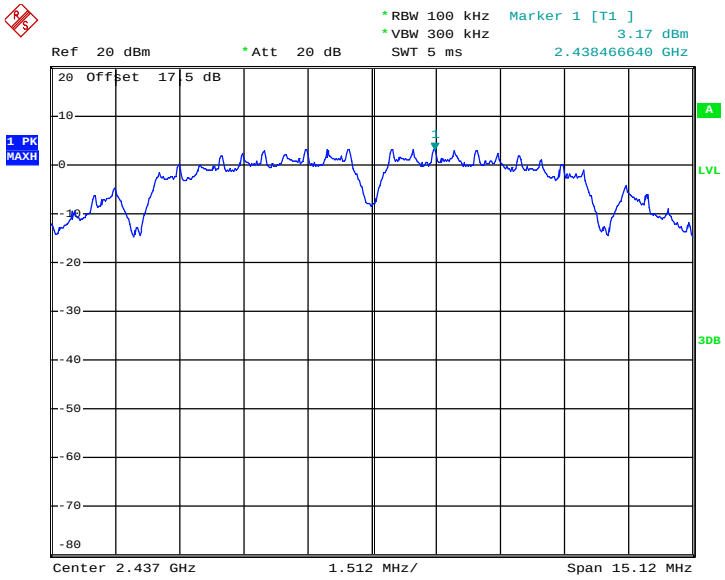
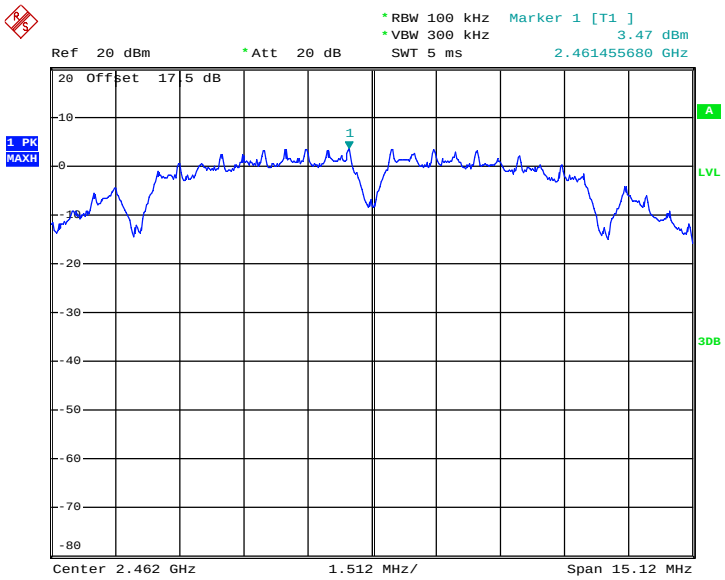
PSD 100kHz Plot on 802.11b Channel 06



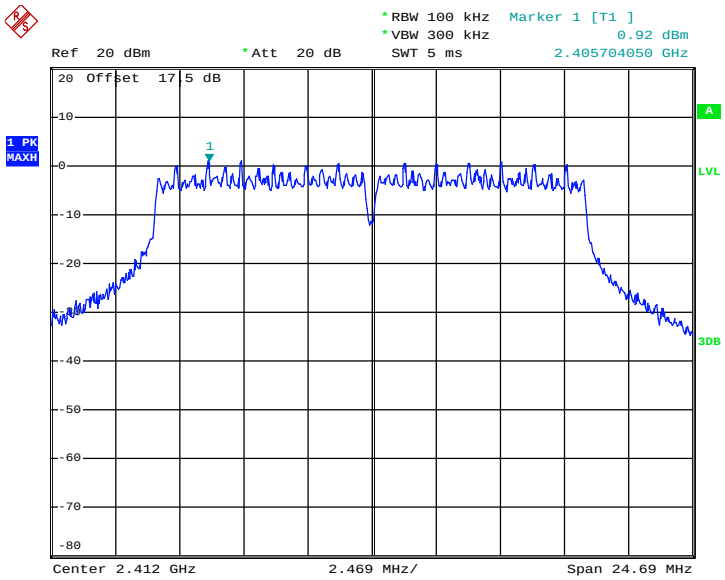
Date: 17.MAR.2013 10:54:30

PSD 100kHz Plot on 802.11b Channel 11



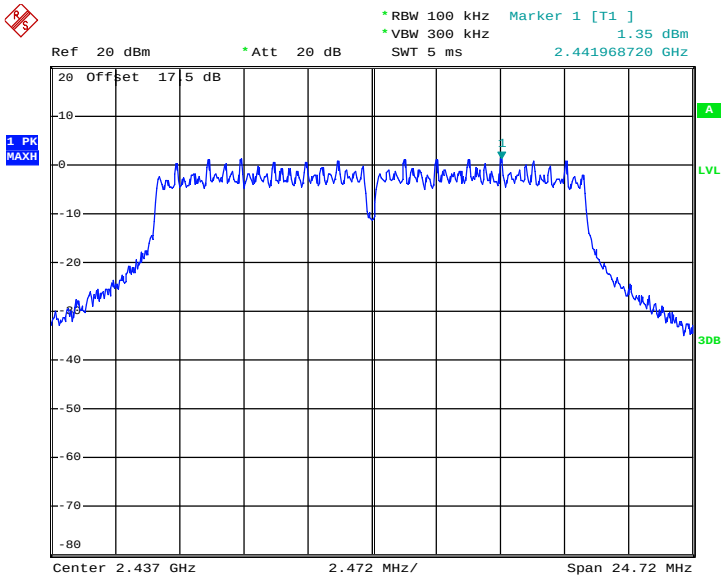
Date: 17.MAR.2013 10:57:35

PSD 100kHz Plot on 802.11g Channel 01



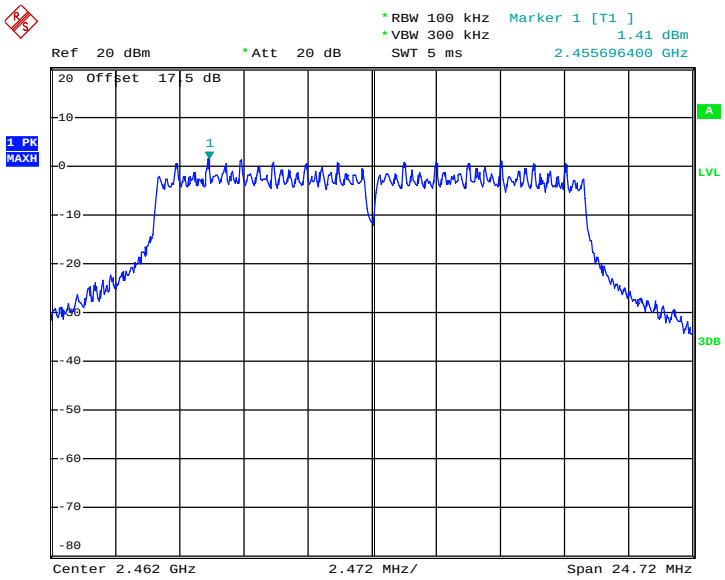
Date: 17.MAR.2013 11:01:56

PSD 100kHz Plot on 802.11g Channel 06



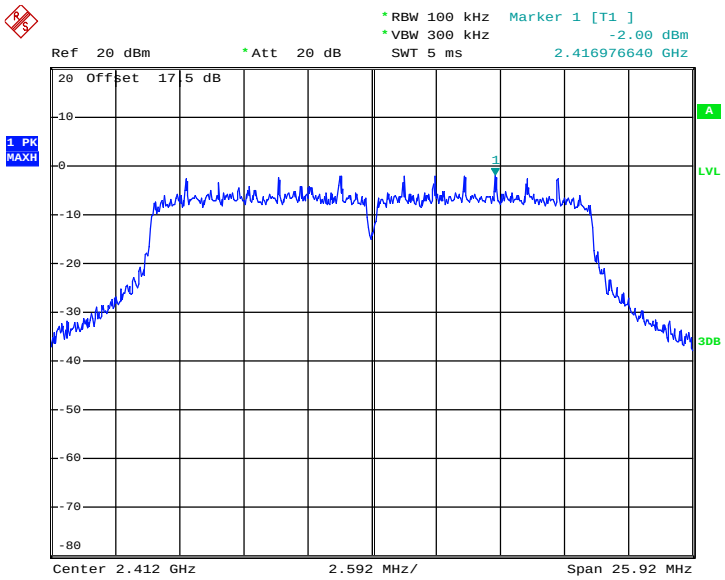
Date: 17.MAR.2013 11:05:43

PSD 100kHz Plot on 802.11g Channel 11



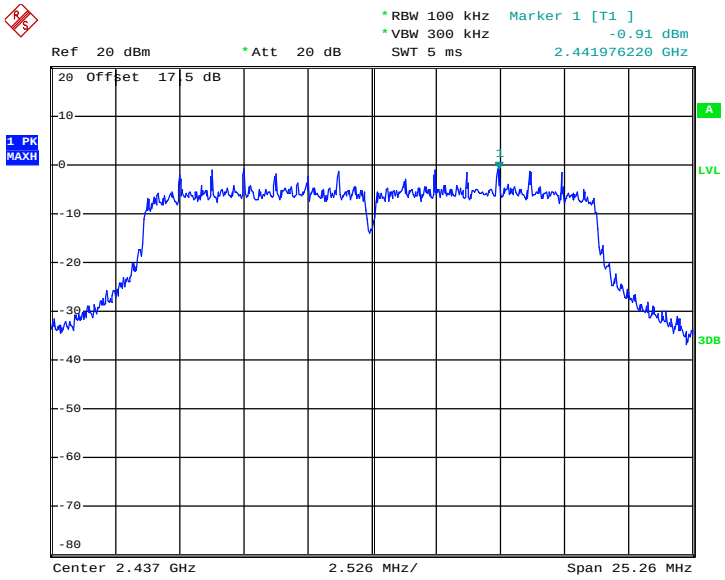
Date: 17.MAR.2013 11:08:47

PSD 100kHz Plot on 802.11n HT20 Channel 01



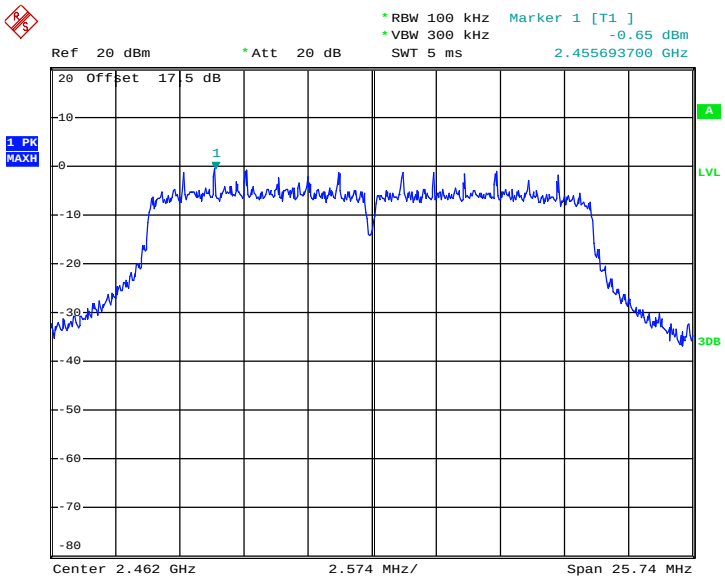
Date: 17.MAR.2013 11:14:07

PSD 100kHz Plot on 802.11n HT20 Channel 06



Date: 17.MAR.2013 11:18:18

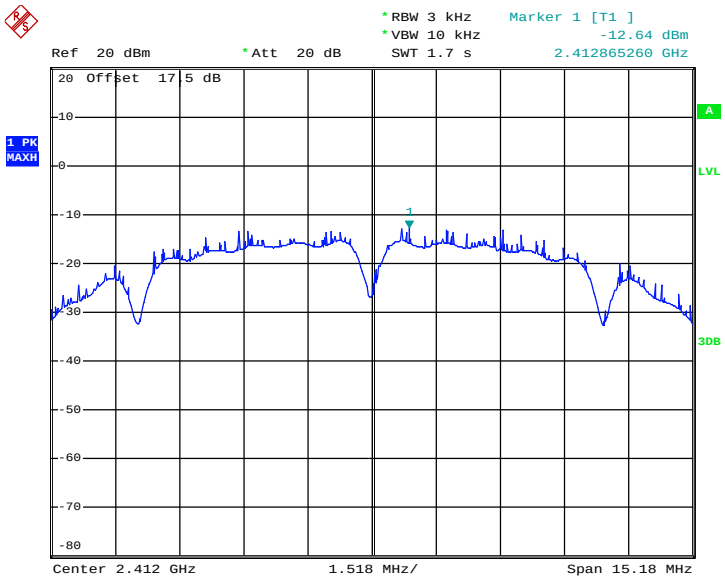
PSD 100kHz Plot on 802.11n HT20 Channel 11



Date: 17.MAR.2013 11:20:47

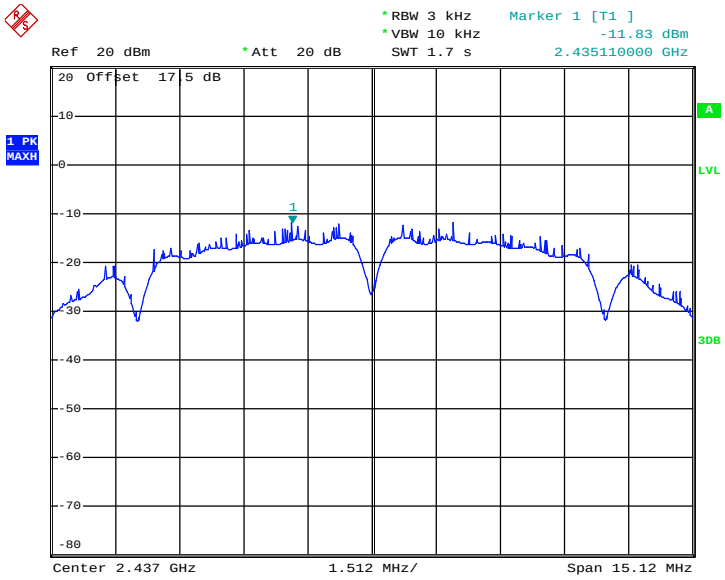
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



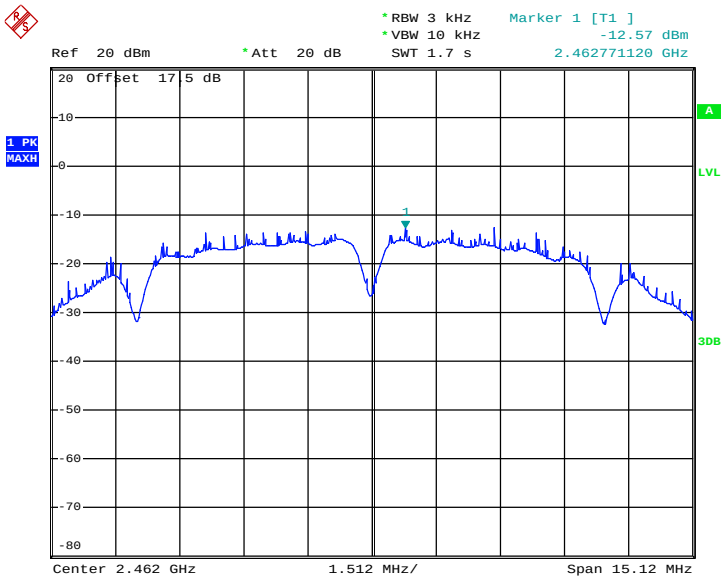
Date: 17.MAR.2013 10:51:19

PSD 3kHz Plot on 802.11b Channel 06



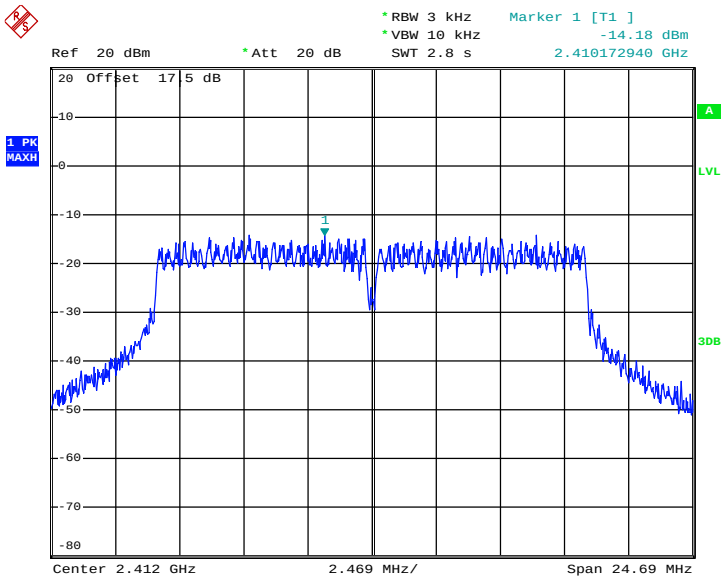
Date: 17.MAR.2013 10:54:18

PSD 3kHz Plot on 802.11b Channel 11

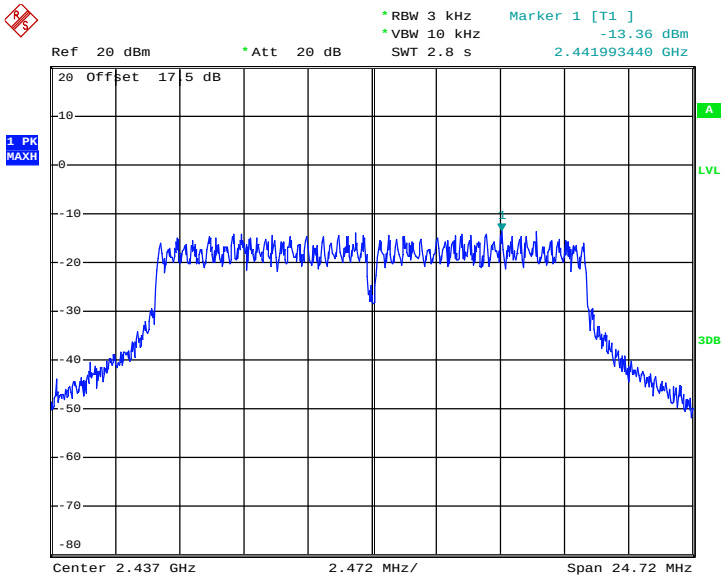


Date: 17.MAR.2013 10:57:20

PSD 3kHz Plot on 802.11g Channel 01

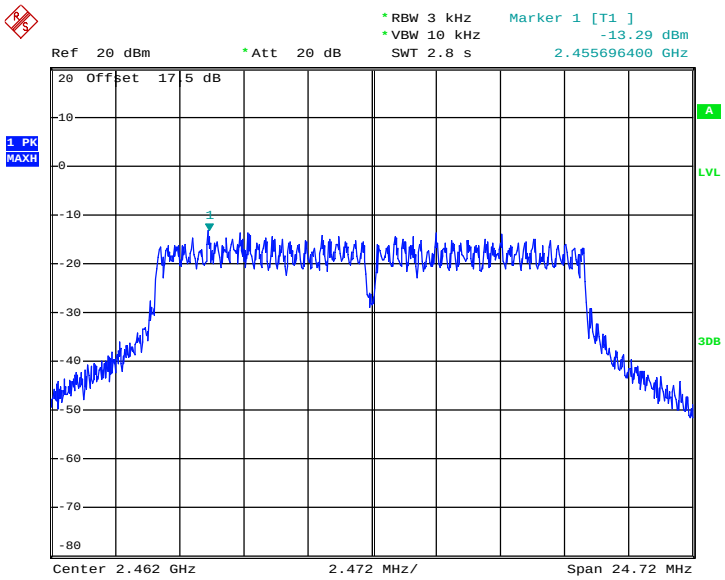


PSD 3kHz Plot on 802.11g Channel 06



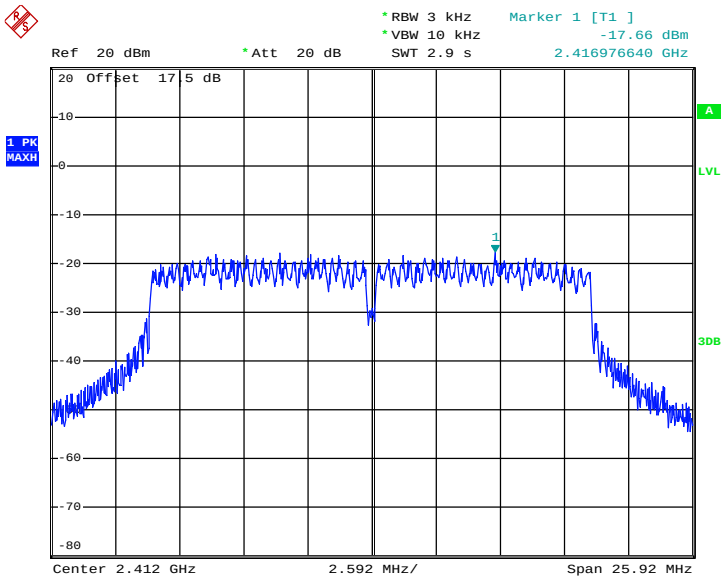
Date: 17.MAR.2013 11:05:29

PSD 3kHz Plot on 802.11g Channel 11



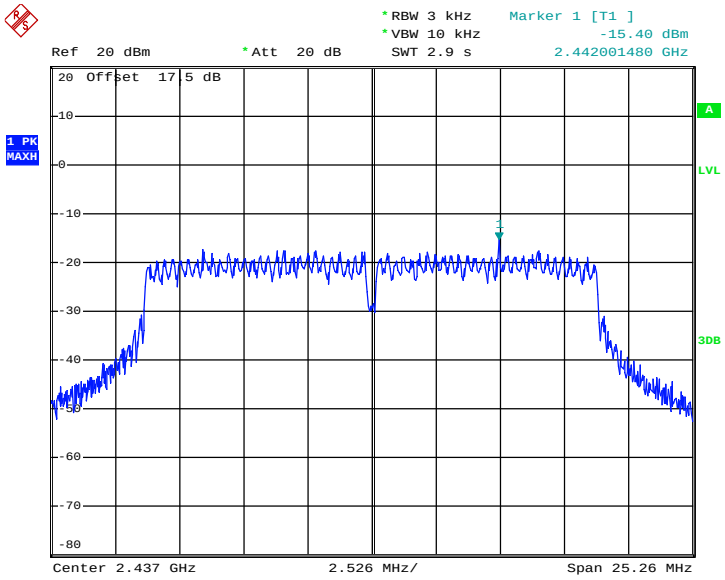
Date: 17.MAR.2013 11:08:33

PSD 3kHz Plot on 802.11n HT20 Channel 01



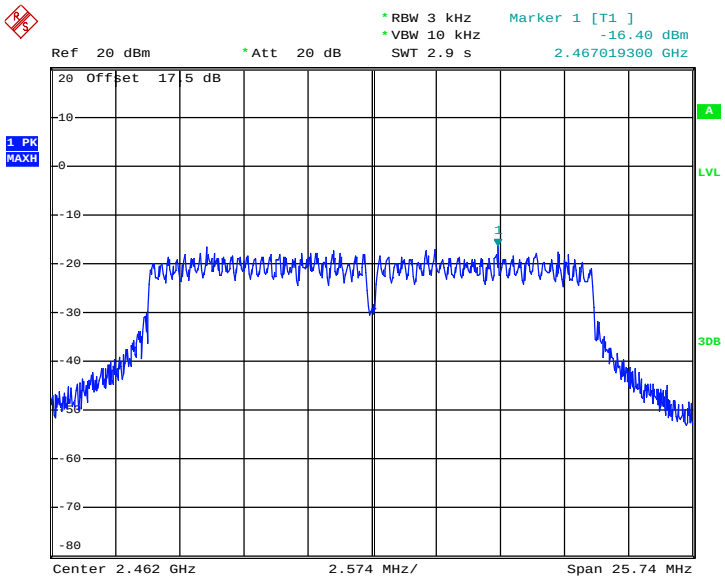
Date: 17.MAR.2013 11:13:52

PSD 3kHz Plot on 802.11n HT20 Channel 06



Date: 17.MAR.2013 11:17:56

PSD 3kHz Plot on 802.11n HT20 Channel 11



Date: 17.MAR.2013 11:20:34

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).

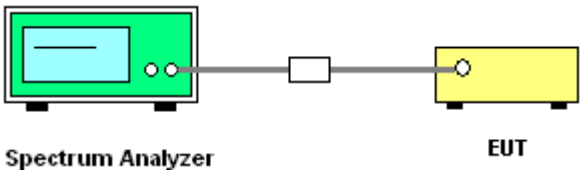
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
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. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
5. Measure and record the results in the test report.

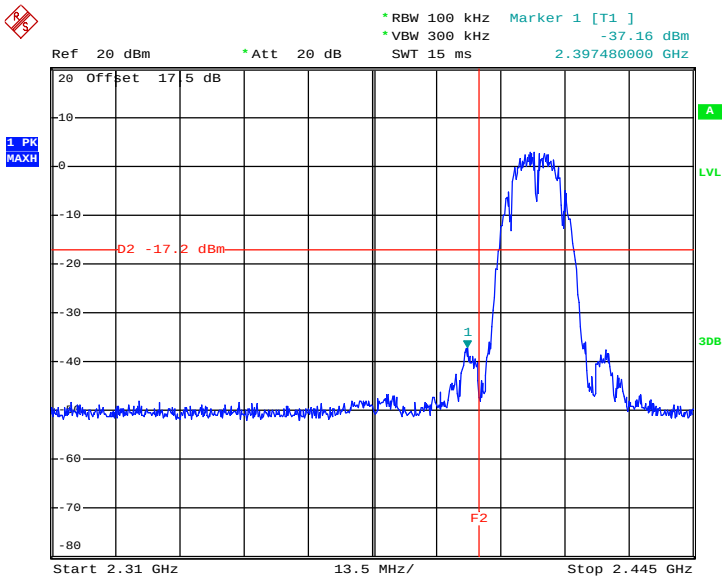
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

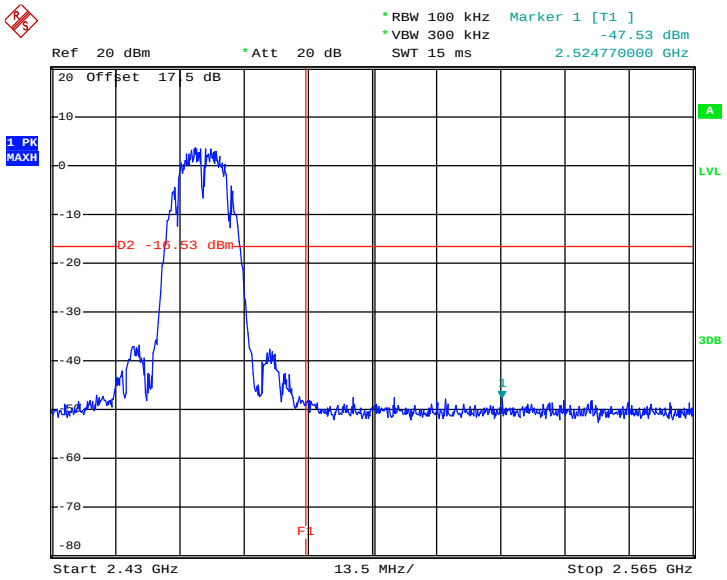
Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11b Channel 01



Date: 17.MAR.2013 10:51:55

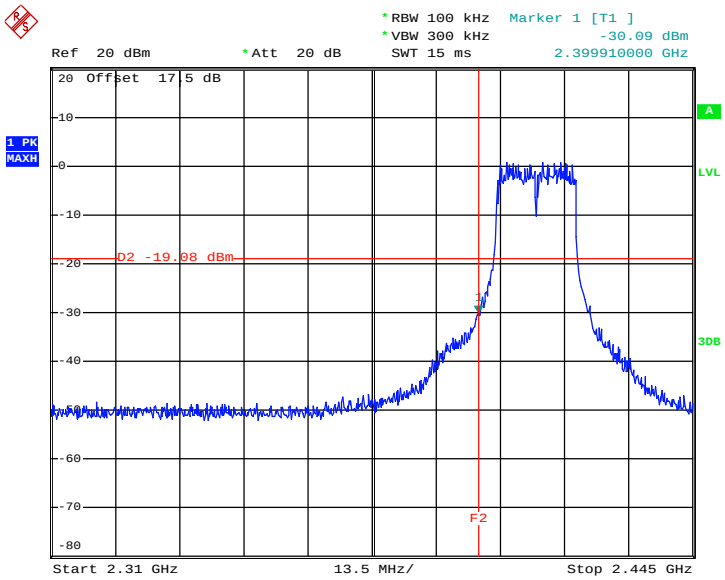
High Band Edge Plot on 802.11b Channel 11



Date: 17.MAR.2013 10:58:27

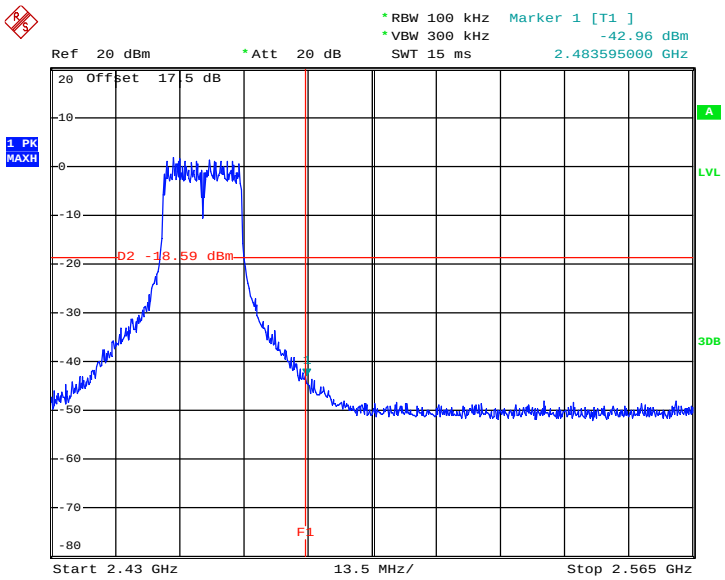
Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11g Channel 01



Date: 17.MAR.2013 11:02:47

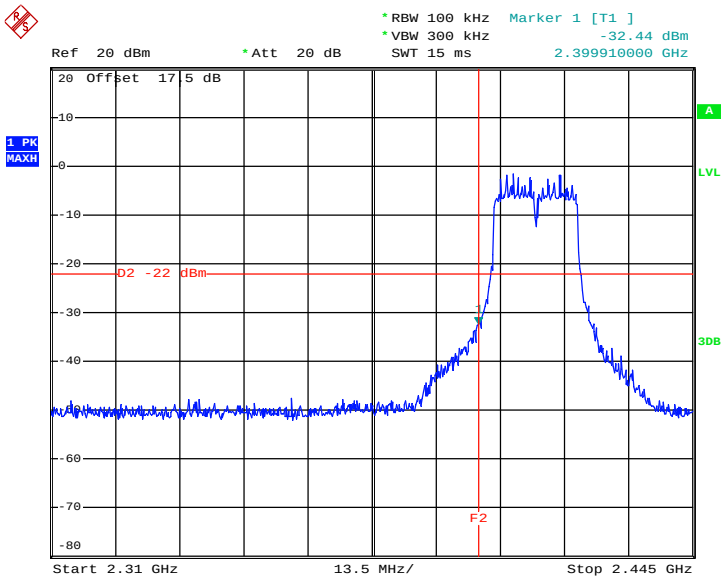
High Band Edge Plot on 802.11g Channel 11



Date: 17.MAR.2013 11:30:25

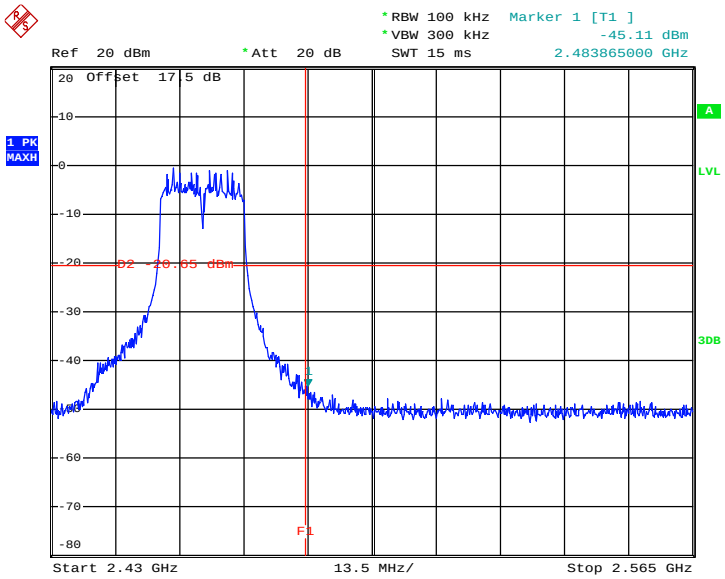
Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 17.MAR.2013 11:14:29

High Band Edge Plot on 802.11n HT20 Channel 11



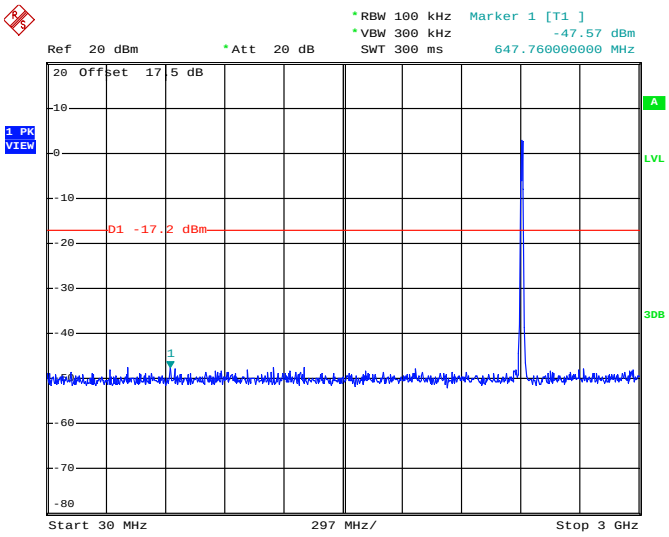
Date: 17.MAR.2013 11:21:06

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

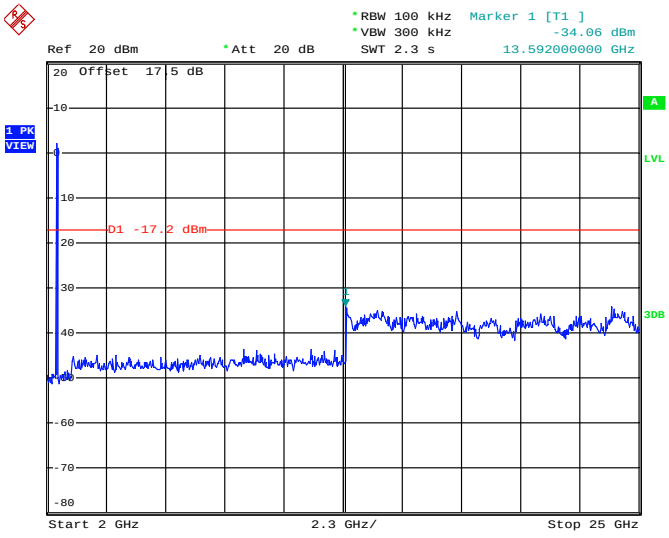
Conducted Spurious Emission Plot on Channel 01



Date: 17.MAR.2013 10:52:17

802.11b 2 GHz~25 GHz

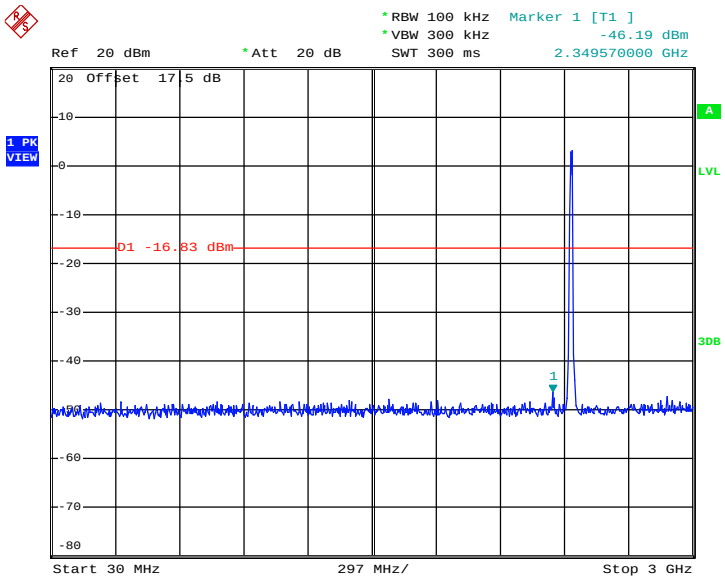
Conducted Spurious Emission Plot on Channel 01



Date: 17.MAR.2013 10:52:36

802.11b 30 MHz~3 GHz

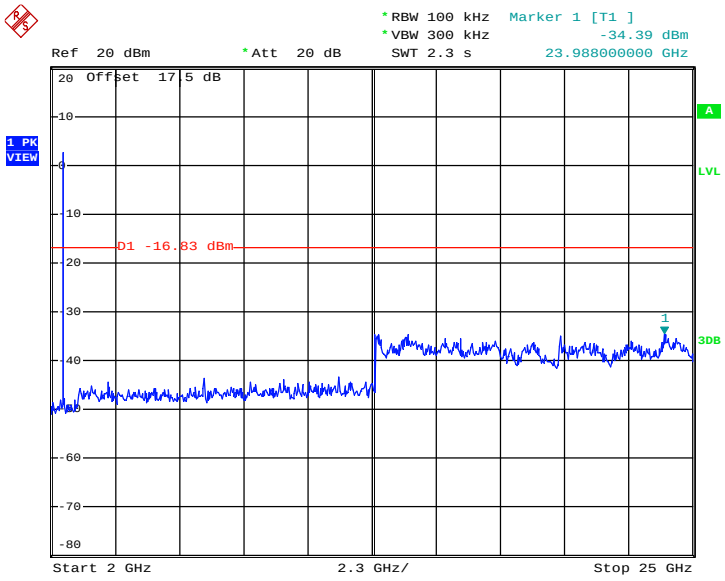
Conducted Spurious Emission Plot on Channel 06



Date: 17.MAR.2013 10:55:09

802.11b 2 GHz~25 GHz

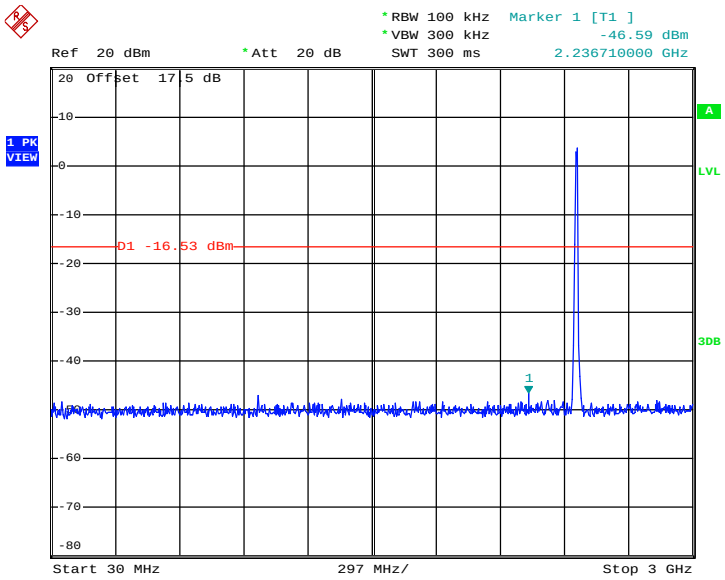
Conducted Spurious Emission Plot on Channel 06



Date: 17.MAR.2013 10:55:28

802.11b 30 MHz~3 GHz

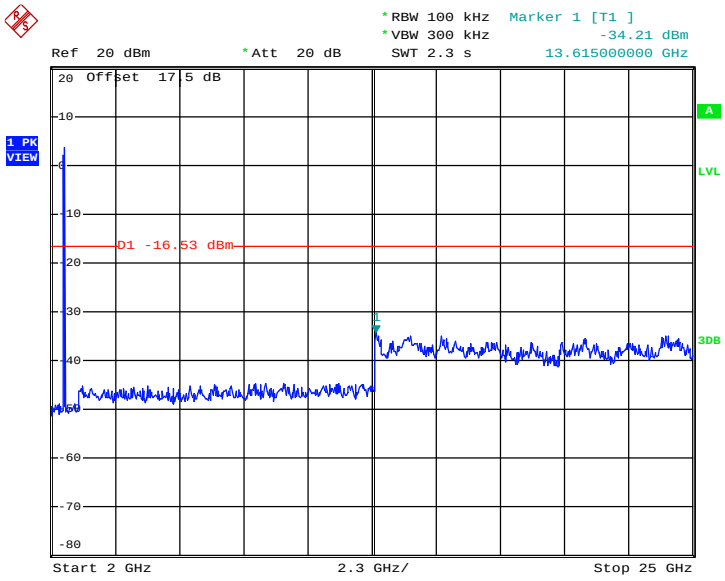
Conducted Spurious Emission Plot on Channel 11



Date: 17.MAR.2013 10:58:51

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

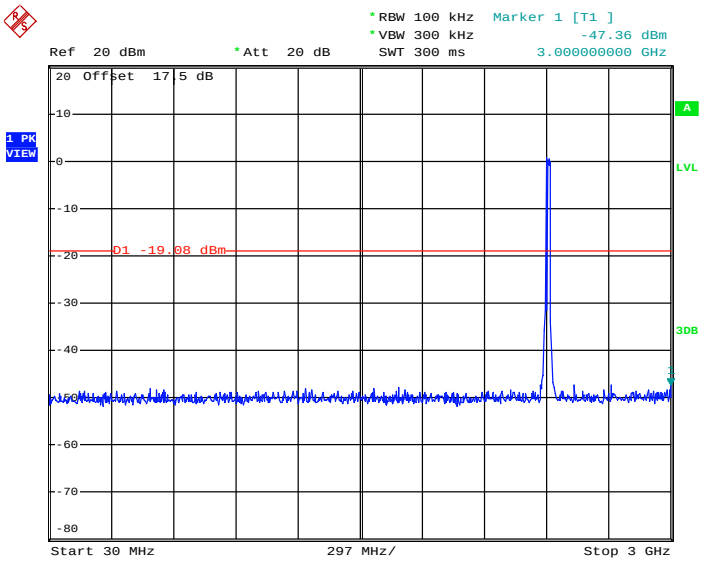


Date: 17.MAR.2013 10:59:10

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

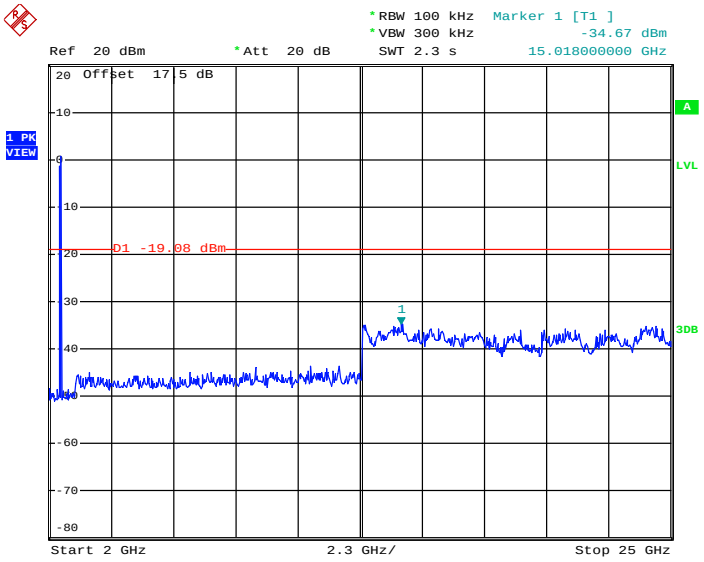
Conducted Spurious Emission Plot on Channel 01



Date: 17.MAR.2013 11:03:13

802.11g 2 GHz~25 GHz

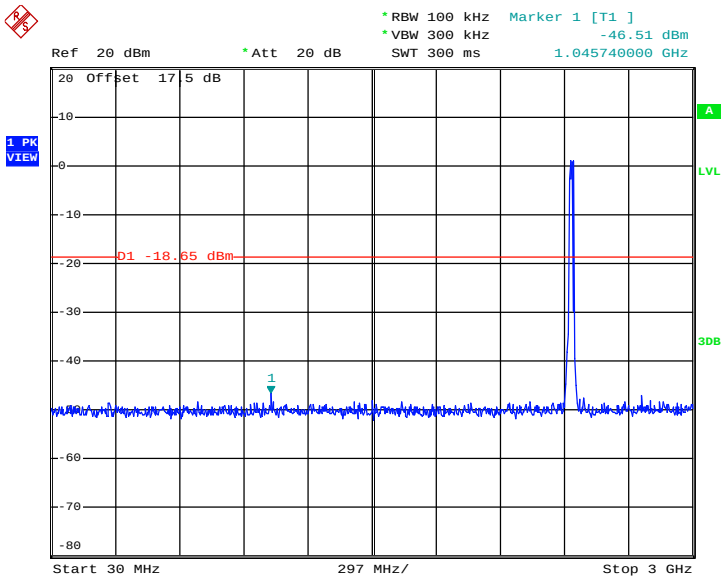
Conducted Spurious Emission Plot on Channel 01



Date: 17.MAR.2013 11:03:32

802.11g 30 MHz~3 GHz

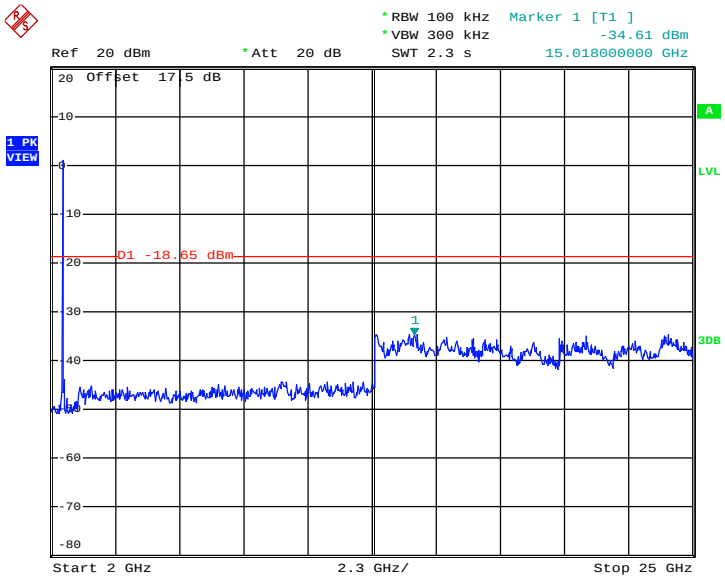
Conducted Spurious Emission Plot on Channel 06



Date: 17.MAR.2013 11:06:05

802.11g 2 GHz~25 GHz

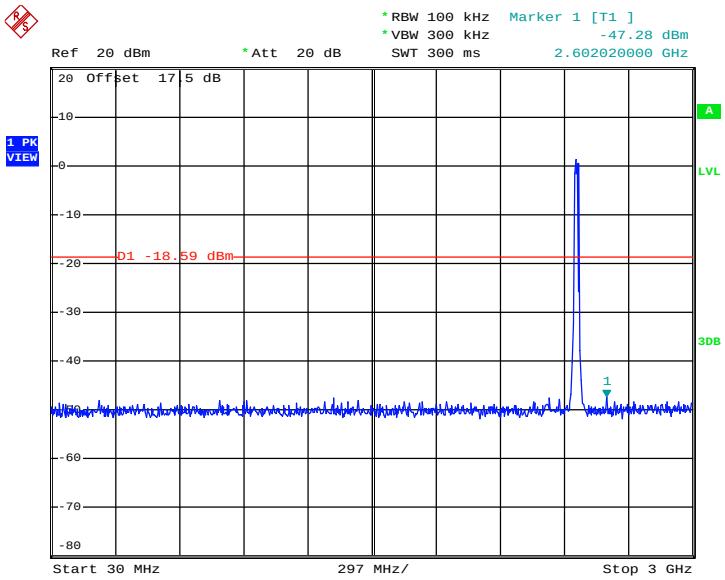
Conducted Spurious Emission Plot on Channel 06



Date: 17.MAR.2013 11:06:24

802.11g 30 MHz~3 GHz

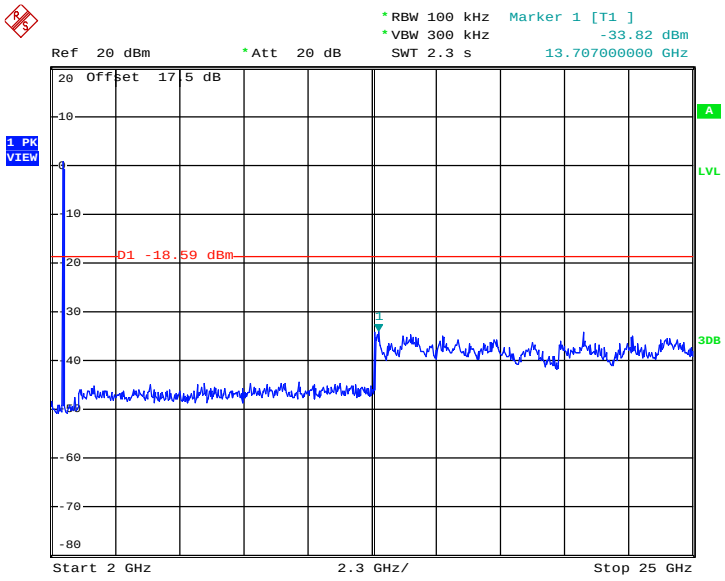
Conducted Spurious Emission Plot on Channel 11



Date: 17.MAR.2013 11:09:39

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

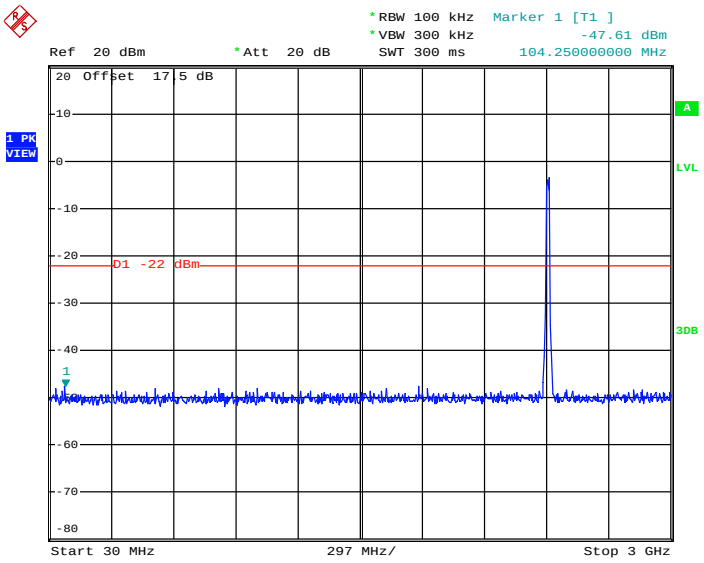


Date: 17.MAR.2013 11:09:58

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

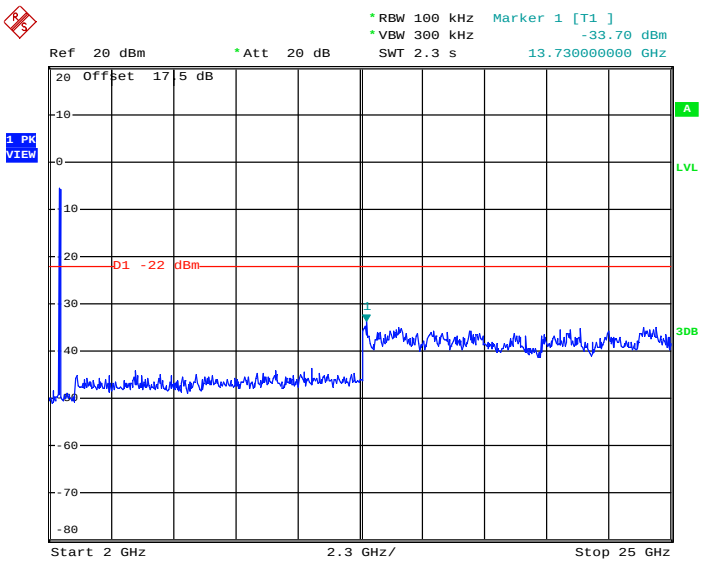
Conducted Spurious Emission Plot on Channel 01



Date: 17.MAR.2013 11:14:57

802.11n HT20 2 GHz~25 GHz

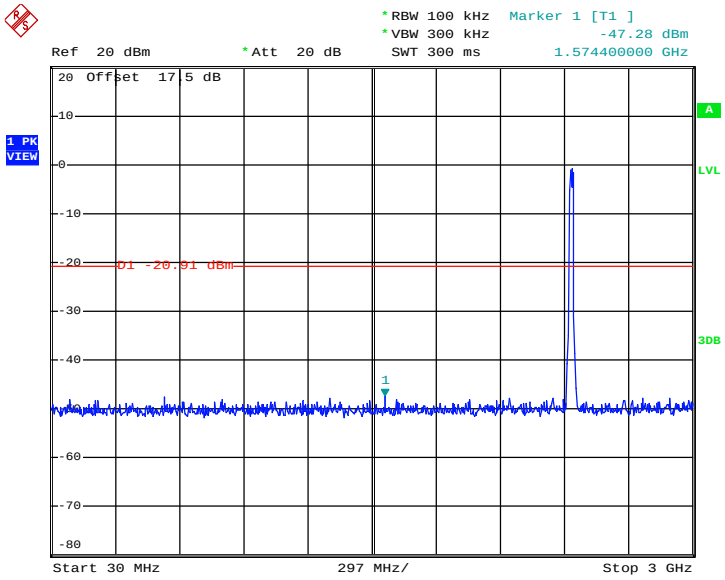
Conducted Spurious Emission Plot on Channel 01



Date: 17.MAR.2013 11:15:16

802.11n HT20 30 MHz~3 GHz

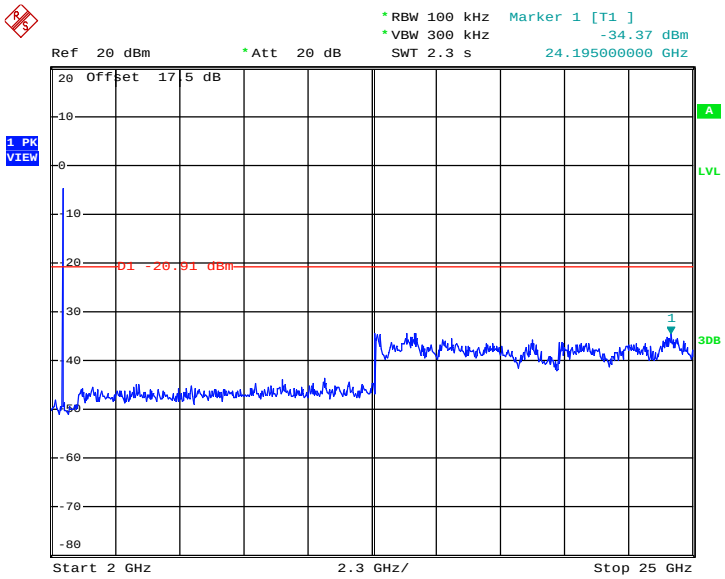
Conducted Spurious Emission Plot on Channel 06



Date: 17.MAR.2013 11:18:41

802.11n HT20 2 GHz~25 GHz

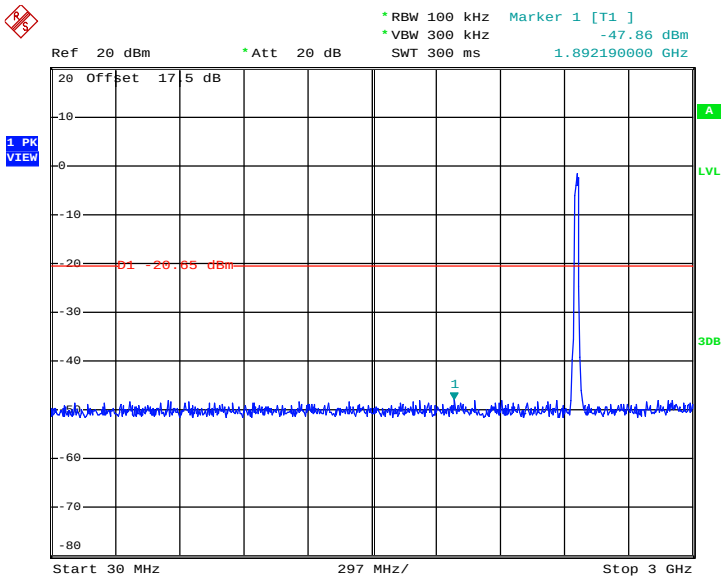
Conducted Spurious Emission Plot on Channel 06



Date: 17.MAR.2013 11:19:00

802.11n HT20 30 MHz~3 GHz

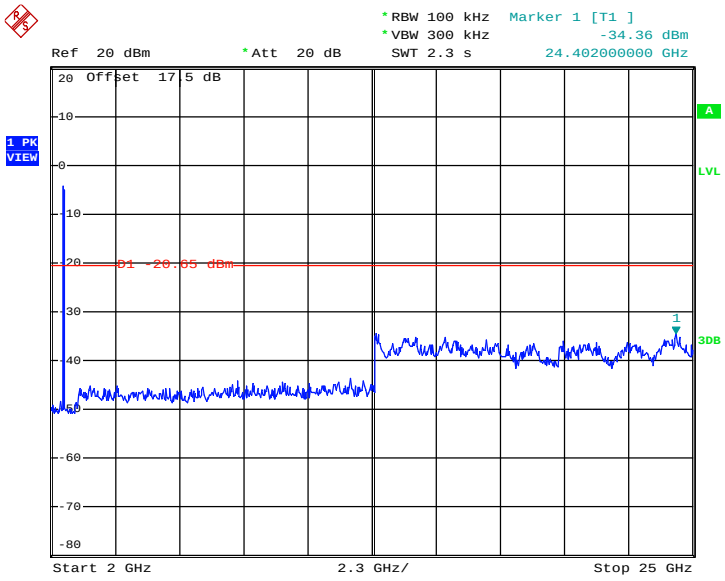
Conducted Spurious Emission Plot on Channel 11



Date: 17.MAR.2013 11:21:31

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 17.MAR.2013 11:21:50

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

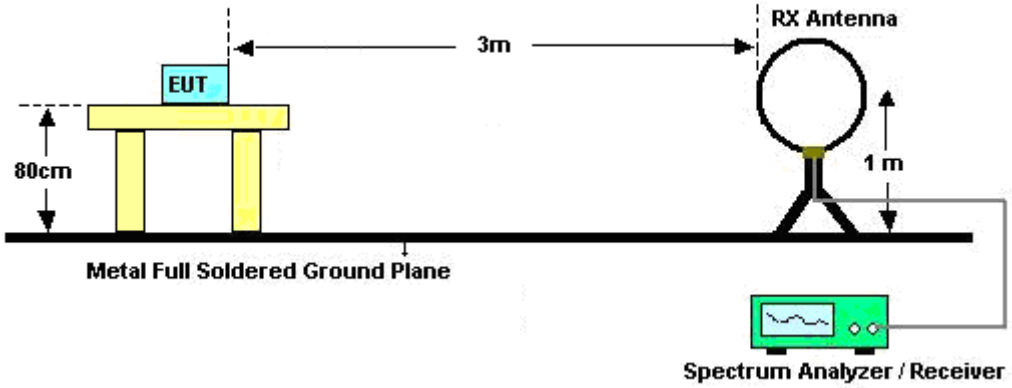
1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 KHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	85.816	0.242	4.132	10KHz
802.11n HT20	98.471	-	-	10Hz

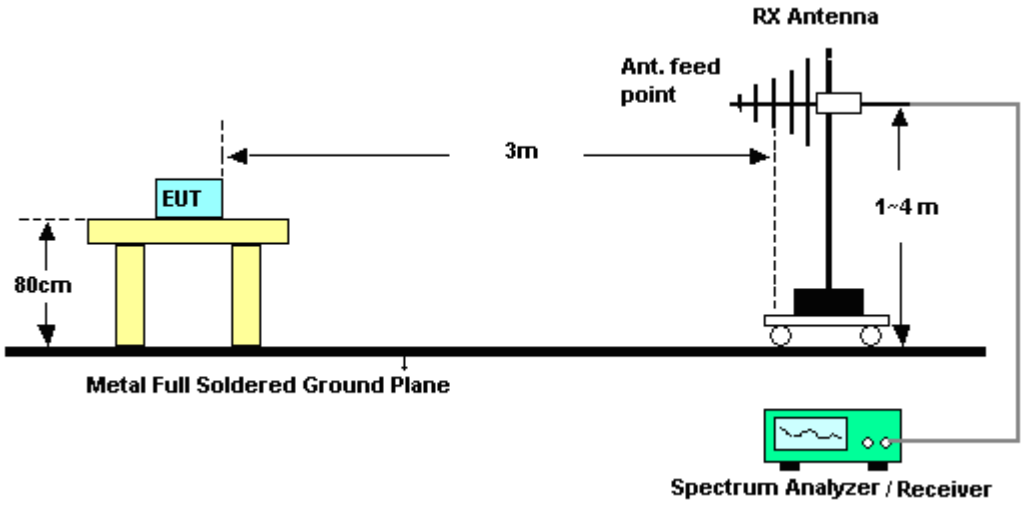
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

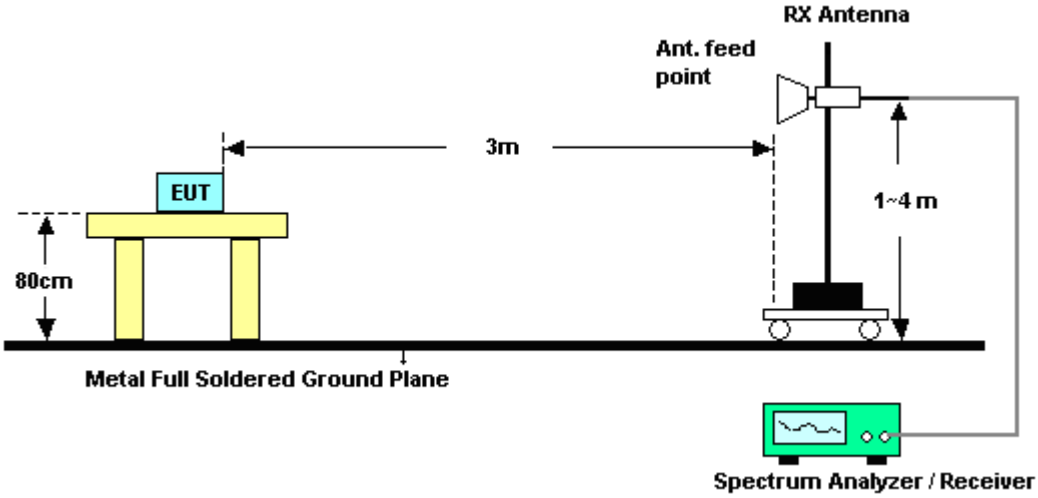
For radiated emissions below 30MHz



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 :	21~23℃
Test Band :	Low	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Jun Liu

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
2389.92	54.43	-19.57	74	50.99	32.85	2.1	31.51	113	232	Peak
2390	44.59	-9.41	54	41.15	32.85	2.1	31.51	113	232	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
2390	53.31	-20.69	74	49.87	32.85	2.1	31.51	168	247	Peak
2390	41.86	-12.14	54	38.42	32.85	2.1	31.51	168	247	Average

Test Mode :	802.11b	Temperature :	21~23℃
Test Band :	High	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Jun Liu

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	55.16	-18.84	74	51.51	33.01	2.15	31.51	190	353	Peak
2483.5	45.29	-8.71	54	41.64	33.01	2.15	31.51	190	353	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
2483.5	54.16	-19.84	74	50.51	33.01	2.15	31.51	100	302	Peak
2483.5	44.28	-9.72	54	40.63	33.01	2.15	31.51	100	302	Average

Test Mode :	802.11g	Temperature :	21~23℃
Test Band :	Low	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Jun Liu

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	67.21	-6.79	74	63.77	32.85	2.1	31.51	110	2	Peak
2389.83	50.9	-3.1	54	47.46	32.85	2.1	31.51	110	2	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
2390	66.17	-7.83	74	62.73	32.85	2.1	31.51	101	265	Peak
2389.83	51.21	-2.79	54	47.77	32.85	2.1	31.51	101	265	Average

Test Mode :	802.11g	Temperature :	21~23℃
Test Band :	High	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Jun Liu

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
2483.65	61.29	-12.71	74	57.64	33.01	2.15	31.51	101	131	Peak
2483.56	50.75	-3.25	54	47.1	33.01	2.15	31.51	101	131	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
2483.59	65.26	-8.74	74	61.61	33.01	2.15	31.51	100	255	Peak
2483.56	48.14	-5.86	54	44.49	33.01	2.15	31.51	100	255	Average

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Band :	Low	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Jun Liu

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
2389.74	69.86	-4.14	74	66.42	32.85	2.1	31.51	109	237	Peak
2390	49.8	-4.2	54	46.36	32.85	2.1	31.51	109	237	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
2389.92	70.13	-3.87	74	66.69	32.85	2.1	31.51	120	85	Peak
2390	50.35	-3.65	54	46.91	32.85	2.1	31.51	120	85	Average

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Band :	High	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Jun Liu

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	69.29	-4.71	74	65.64	33.01	2.15	31.51	162	19	Peak
2483.53	49.65	-4.35	54	46	33.01	2.15	31.51	162	19	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
2483.5	69.08	-4.92	74	65.43	33.01	2.15	31.51	119	89	Peak
2483.5	49.76	-4.24	54	46.11	33.01	2.15	31.51	119	89	Average

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

NOTE: Below 1GHz for radiated emission measurement, pre-scanned all test modes and only choose the worst case mode was recorded in the report.

Test Mode :	802.11b	**Temperature :**	21~23℃
Test Channel :	01	**Relative Humidity :**	41~42%
Test Engineer :	Jun Liu	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 106.49dBuV/m - 20dB = 86.49dBuV/m. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
2399	63.49	-23	86.49	60.05	32.85	2.1	31.51	113	232	Peak
2412	101.52	-	-	98.04	32.88	2.11	31.51	113	232	Average
2412	106.49	-	-	103.01	32.88	2.11	31.51	113	232	Peak
4824	49.49	-24.51	74	42.79	35.16	3.08	31.54	122	35	Peak
7236	49.05	-37.44	86.49	40.62	36.16	3.22	30.95	100	198	Peak

Test Mode :	802.11b	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
2399	60.55	-23.05	83.6	57.11	32.85	2.1	31.51	168	247	Peak
2412	100.95	-	-	97.47	32.88	2.11	31.51	168	247	Average
2412	103.6	-	-	100.12	32.88	2.11	31.51	168	247	Peak
4824	49.63	-24.37	74	42.93	35.16	3.08	31.54	122	71	Peak
7236	51.05	-32.55	83.6	42.62	36.16	3.22	30.95	100	127	Peak

Test Mode :	802.11b	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	100.96	-	-	97.4	32.94	2.13	31.51	162	53	Average
2437	105.75	-	-	102.19	32.94	2.13	31.51	162	53	Peak
4874	49.77	-24.23	74	43	35.18	3.11	31.52	100	128	Peak
7311	50.16	-23.84	74	41.71	36.19	3.2	30.94	100	112	Peak

Test Mode :	802.11b	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	100.41	-	-	96.85	32.94	2.13	31.51	119	77	Average
2437	105.15	-	-	101.59	32.94	2.13	31.51	119	77	Peak
4874	48.49	-25.51	74	41.72	35.18	3.11	31.52	125	336	Peak
7311	51.32	-22.68	74	42.87	36.19	3.2	30.94	100	223	Peak

Test Mode :	802.11b	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	100.73	-	-	97.12	32.98	2.14	31.51	190	353	Average
2462	105.58	-	-	101.97	32.98	2.14	31.51	190	353	Peak
4924	46.91	-27.09	74	40.1	35.18	3.14	31.51	100	147	Peak
7386	50.71	-23.29	74	42.23	36.23	3.18	30.93	100	229	Peak

Test Mode :	802.11b	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	100.4	-	-	96.79	32.98	2.14	31.51	100	302	Average
2462	104.99	-	-	101.38	32.98	2.14	31.51	100	302	Peak
4924	45.84	-28.16	74	39.03	35.18	3.14	31.51	100	116	Peak
7386	51.36	-22.64	74	42.88	36.23	3.18	30.93	100	176	Peak

Test Mode :	802.11g	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
39.994	25.63	-14.37	40	46.6	12.29	0.38	33.64	-	-	Peak
59.859	26.99	-13.01	40	54.81	5.29	0.47	33.58	120	30	Peak
129.468	24.67	-18.83	43.5	45.89	11.69	0.67	33.58	-	-	Peak
199.286	28.45	-15.05	43.5	52.2	8.99	0.81	33.55	-	-	Peak
239.147	27.83	-18.17	46	48.89	11.5	0.89	33.45	-	-	Peak
247.682	27.86	-18.14	46	48.54	11.86	0.9	33.44	-	-	Peak
2399	80.14	-6.57	86.71	76.7	32.85	2.1	31.51	110	3	Peak
2412	95.87	-	-	92.39	32.88	2.11	31.51	110	3	Average
2412	106.71	-	-	103.23	32.88	2.11	31.51	110	3	Peak
4824	48.52	-25.48	74	41.82	35.16	3.08	31.54	154	206	Peak
7236	51.86	-34.85	86.71	43.43	36.16	3.22	30.95	200	322	Peak

Test Mode :	802.11g	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

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	31.55	-8.45	40	46.79	17.99	0.33	33.56	-	-	Peak
39.994	30.38	-9.62	40	51.35	12.29	0.38	33.64	-	-	Peak
59.859	31.91	-8.09	40	59.73	5.29	0.47	33.58	100	360	Peak
99.878	30.38	-13.12	43.5	52.93	10.49	0.57	33.61	-	-	Peak
115.321	30.92	-12.58	43.5	52.11	11.79	0.61	33.59	-	-	Peak
159.784	30.12	-13.38	43.5	53.37	9.59	0.73	33.57	-	-	Peak
2399	78.93	-6.92	85.85	75.49	32.85	2.1	31.51	100	264	Peak
2412	94.71	-	-	91.23	32.88	2.11	31.51	100	264	Average
2412	105.85	-	-	102.37	32.88	2.11	31.51	100	264	Peak
4824	48.35	-25.65	74	41.65	35.16	3.08	31.54	200	0	Peak
7236	50.75	-35.1	85.85	42.32	36.16	3.22	30.95	100	144	Peak

Test Mode :	802.11g	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	98.05	-	-	94.49	32.94	2.13	31.51	106	2	Average
2437	109.02	-	-	105.46	32.94	2.13	31.51	106	2	Peak
4874	49.12	-24.88	74	42.35	35.18	3.11	31.52	105	10	Peak
7311	51.18	-22.82	74	42.73	36.19	3.2	30.94	136	204	Peak

Test Mode :	802.11g	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	96.92	-	-	93.36	32.94	2.13	31.51	100	266	Average
2437	108.11	-	-	104.55	32.94	2.13	31.51	100	266	Peak
4874	48.79	-25.21	74	42.02	35.18	3.11	31.52	200	144	Peak
7311	50.65	-23.35	74	42.2	36.19	3.2	30.94	162	274	Peak

Test Mode :	802.11g	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	93.03	-	-	89.42	32.98	2.14	31.51	100	131	Average
2462	104.24	-	-	100.63	32.98	2.14	31.51	100	131	Peak
4924	49.56	-24.44	74	42.75	35.18	3.14	31.51	100	123	Peak
7386	52.52	-21.48	74	44.04	36.23	3.18	30.93	105	241	Peak

Test Mode :	802.11g	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	94.61	-	-	91	32.98	2.14	31.51	100	254	Average
2462	105.53	-	-	101.92	32.98	2.14	31.51	100	254	Peak
4924	49.46	-24.54	74	42.65	35.18	3.14	31.51	136	337	Peak
7386	51.34	-22.66	74	42.86	36.23	3.18	30.93	200	0	Peak

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
2399	78.33	-4.32	82.65	74.89	32.85	2.1	31.51	109	237	Peak
2412	92.76	-	-	89.28	32.88	2.11	31.51	109	237	Average
2412	102.65	-	-	99.17	32.88	2.11	31.51	109	237	Peak
4824	48.5	-25.5	74	41.8	35.16	3.08	31.54	100	130	Peak
7236	50.61	-32.04	82.65	42.18	36.16	3.22	30.95	100	229	Peak

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
2399	79.45	-4.21	83.66	76.01	32.85	2.1	31.51	120	85	Peak
2412	93.67	-	-	90.19	32.88	2.11	31.51	120	85	Average
2412	103.66	-	-	100.18	32.88	2.11	31.51	120	85	Peak
4824	48.16	-25.84	74	41.46	35.16	3.08	31.54	100	312	Peak
7236	51.12	-32.54	83.66	42.69	36.16	3.22	30.95	100	286	Peak

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	95.29	-	-	91.73	32.94	2.13	31.51	135	11	Average
2437	105.39	-	-	101.83	32.94	2.13	31.51	135	11	Peak
4874	48.86	-25.14	74	42.09	35.18	3.11	31.52	100	229	Peak
7311	51.18	-22.82	74	42.73	36.19	3.2	30.94	122	33	Peak

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	93.06	-	-	89.5	32.94	2.13	31.51	125	78	Average
2437	103.04	-	-	99.48	32.94	2.13	31.51	125	78	Peak
4874	48.53	-25.47	74	41.76	35.18	3.11	31.52	100	105	Peak
7311	51.13	-22.87	74	42.68	36.19	3.2	30.94	100	25	Peak

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	94.73	-	-	91.12	32.98	2.14	31.51	162	19	Average
2462	104.53	-	-	100.92	32.98	2.14	31.51	162	19	Peak
4924	49	-25	74	42.19	35.18	3.14	31.51	100	193	Peak
7386	51.59	-22.41	74	43.11	36.23	3.18	30.93	122	38	Peak

Test Mode :	802.11n HT20	Temperature :	21~23℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	94.83	-	-	91.22	32.98	2.14	31.51	119	89	Average
2462	104.87	-	-	101.26	32.98	2.14	31.51	119	89	Peak
4924	48.91	-25.09	74	42.1	35.18	3.14	31.51	100	193	Peak
7386	50.59	-23.41	74	42.11	36.23	3.18	30.93	100	227	Peak

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.

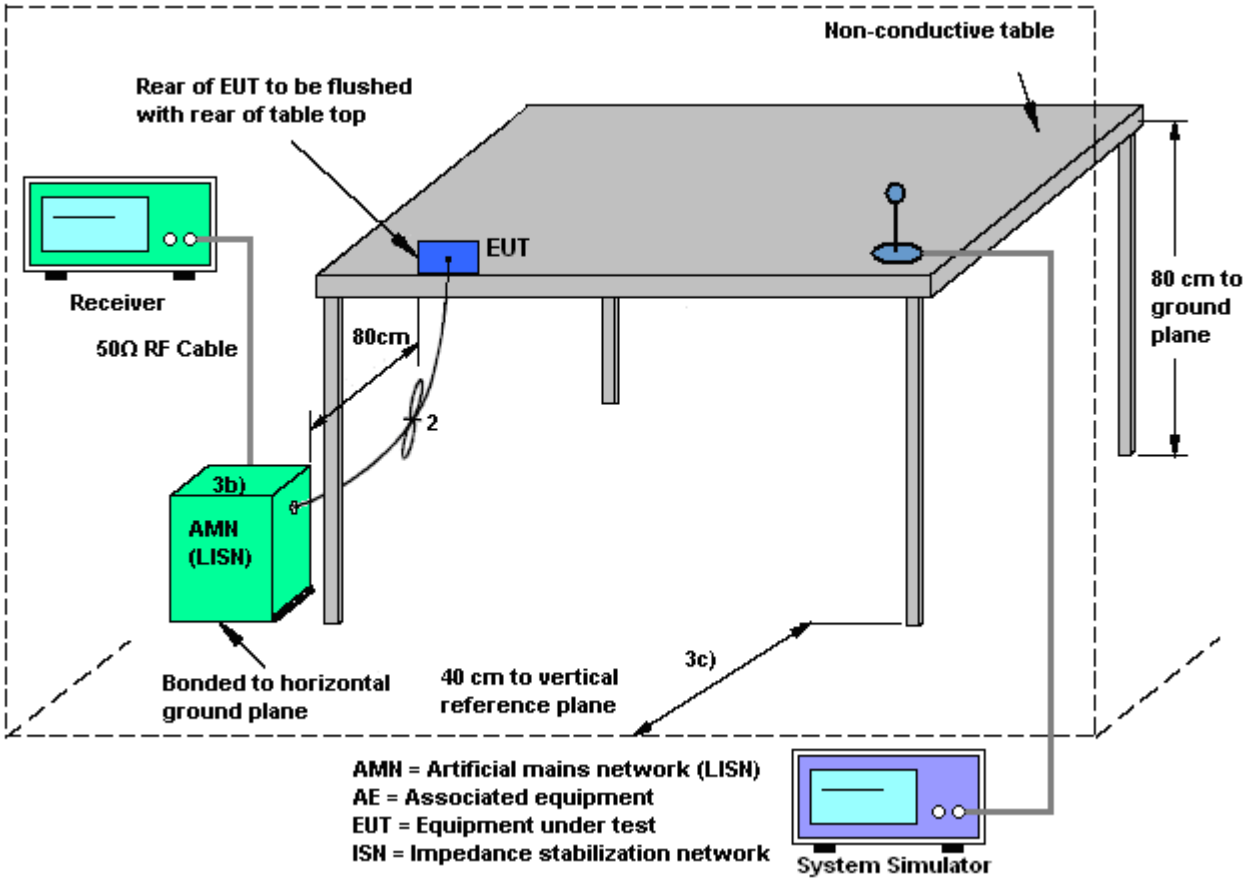
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

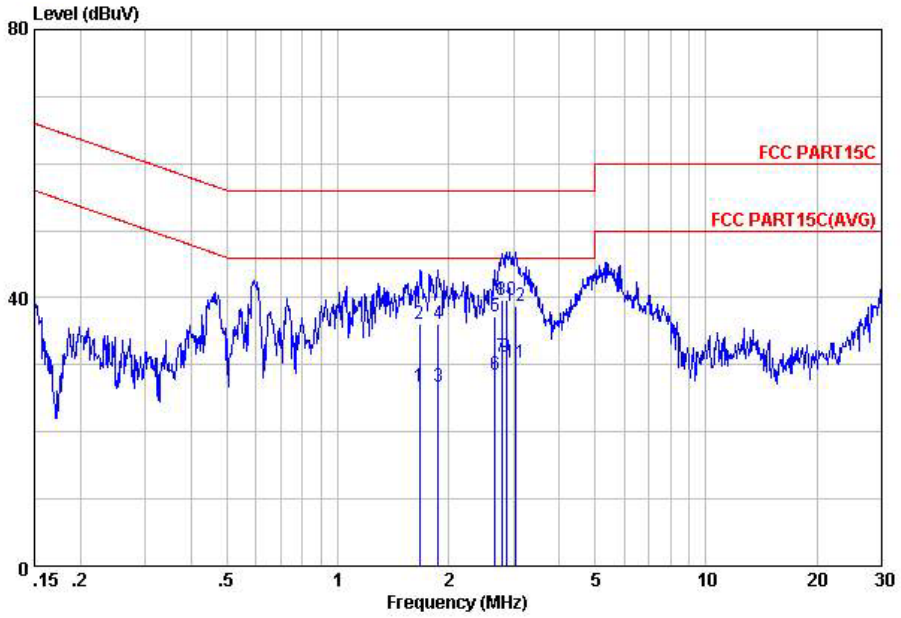
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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

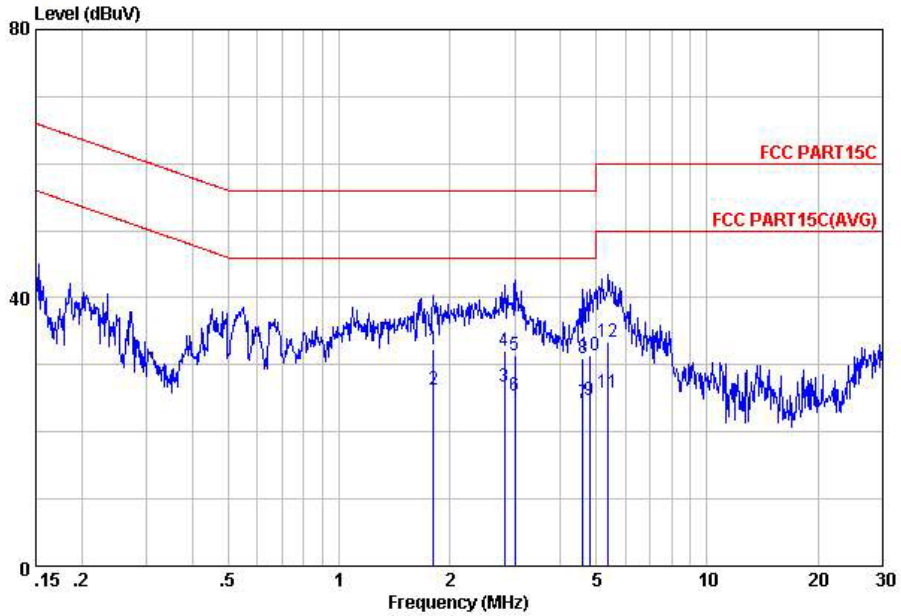
Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + USB Cable (Charging from Adapter) + Bluetooth Link + WLAN Link + Earphone		
Remark :	All emissions not reported here are more than 10 dB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



Site : C001-KS
Condition: FCC PART15C LISN-L20130306 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	1.67	26.80	-19.20	46.00	16.40	0.10	10.30	Average
2	1.67	36.10	-19.90	56.00	25.70	0.10	10.30	QP
3	1.88	26.70	-19.30	46.00	16.30	0.10	10.30	Average
4	1.88	36.00	-20.00	56.00	25.60	0.10	10.30	QP
5	2.68	37.13	-18.87	56.00	26.70	0.12	10.31	QP
6	2.68	28.53	-17.47	46.00	18.10	0.12	10.31	Average
7	2.79	31.14	-14.86	46.00	20.70	0.13	10.31	Average
8	2.79	39.64	-16.36	56.00	29.20	0.13	10.31	QP
9	2.87	31.15	-14.85	46.00	20.70	0.13	10.32	Average
10	2.87	39.75	-16.25	56.00	29.30	0.13	10.32	QP
11	3.04	30.26	-15.74	46.00	19.80	0.14	10.32	Average
12	3.04	38.76	-17.24	56.00	28.30	0.14	10.32	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) + Bluetooth Link + WLAN Link + Earphone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-N20130306 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	1.81	32.30	-23.70	56.00	21.90	0.10	10.30	QP
2	1.81	26.20	-19.80	46.00	15.80	0.10	10.30	Average
3	2.81	26.74	-19.26	46.00	16.30	0.13	10.31	Average
4	2.81	32.14	-23.86	56.00	21.70	0.13	10.31	QP
5	3.01	31.46	-24.54	56.00	21.00	0.14	10.32	QP
6	3.01	25.46	-20.54	46.00	15.00	0.14	10.32	Average
7	4.60	24.33	-21.67	46.00	13.80	0.20	10.33	Average
8	4.60	30.93	-25.07	56.00	20.40	0.20	10.33	QP
9	4.80	24.63	-21.37	46.00	14.10	0.20	10.33	Average
10	4.80	31.53	-24.47	56.00	21.00	0.20	10.33	QP
11	5.39	25.94	-24.06	50.00	15.40	0.20	10.34	Average
12	5.39	33.54	-26.46	60.00	23.00	0.20	10.34	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. 29, 2012	Mar. 17, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Mar. 17, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Mar. 17, 2013	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Mar. 17, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Mar. 17, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Mar. 28, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	100400	9kHz~30GHz	Jun. 01, 2012	Mar. 28, 2013	May 31, 2013	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Mar. 28, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/ 001	9 kHz~30 MHz	Jul. 03, 2012	Mar. 28, 2013	Jul. 02, 2014	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	1908/7/13	00075957	1GHz~18GHz	Dec. 07, 2012	Mar. 28, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	Jun. 01, 2012	Mar. 28, 2013	May 31, 2013	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Mar. 28, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2012	Mar. 28, 2013	Nov. 06, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Mar. 28, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Mar. 19, 2013	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 29, 2012	Mar. 19, 2013	Dec. 28, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 29, 2012	Mar. 19, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 15, 2012	Mar. 19, 2013	Nov. 14, 2013	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 29, 2012	Mar. 19, 2013	Dec. 28, 2013	Conduction (CO01-KS)

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 EP330701 as below.