FCC RF Test Report

APPLICANT	:	CT Asia
EQUIPMENT	:	Mobile phone
BRAND NAME	:	BLU
MODEL NAME	:	Studio 5.0 S
MARKETING NAME	:	Studio 5.0 S
FCC ID	:	YHLBLUSTUDIO50S
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Mar. 25, 2013 and completely tested on Apr. 17, 2013. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL (SHENZHEN) INC.
No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR332505B	Rev. 01	Initial issue of report	Apr. 19, 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 5.59 dB at 2399.000 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 15.79 dB at 27.270 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 5.0 S
Marketing Name	Studio 5.0 S
FCC ID	YHLBLUSTUDIO50S
EUT supports Radios application	GSM/GPRS/WCDMA/HSPA/WLAN 11bgn/Bluetooth EDR
HW Version	P1.1
SW Version	593318_8765_V006002
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 : 15.78 dBm (0.0378 W) 802.11g : 19.11 dBm (0.0815 W) 802.11n HT20 : 18.96 dBm (0.0787 W)
Antenna Type	Chip Antenna type with gain -1.60 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 (SHENZHEN) INC.			
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-SZ	CO01-SZ	03CH01-SZ	831040/4086F-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 v03r01
- 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 (Y plane) were recorded in this report.

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

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

2.1 Carrier Frequency Channel

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

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and 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	15.77	15.65	14.98	15.12
CH 06	2437 MHz	15.49	15.68	14.88	14.97
CH 11	2462 MHz	**15.78**	15.75	15.05	15.02

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	18.49	18.01	18.51	17.87	18.82	18.48	18.37	18.83
CH 06	2437 MHz	18.44	18.04	18.42	17.59	18.18	18.34	18.73	18.11
CH 11	2462 MHz	**19.11**	18.07	18.78	17.81	19.05	18.28	19.02	19.06

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	18.24	18.11	18.59	18.51	18.36	18.26	18.63	17.69
CH 06	2437 MHz	18.08	17.98	18.14	18.81	18.31	18.15	18.54	17.65
CH 11	2462 MHz	**18.96**	18.31	18.48	18.84	18.89	18.66	18.84	17.96

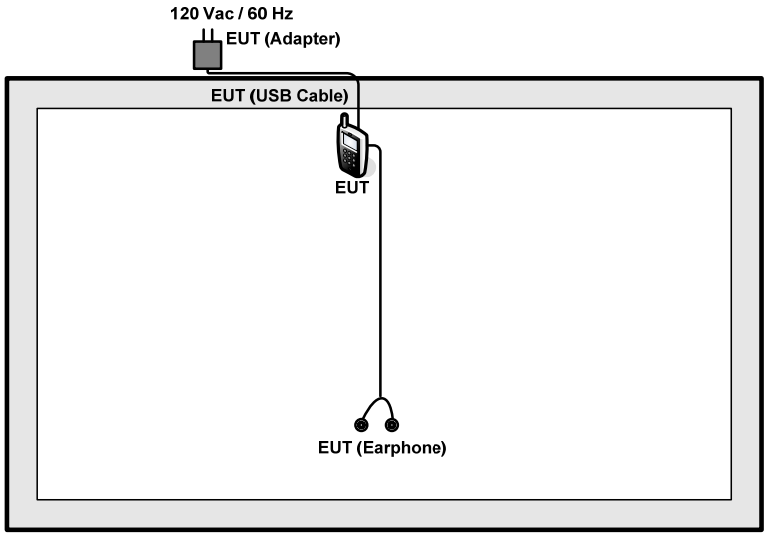
2.3 Test Mode

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

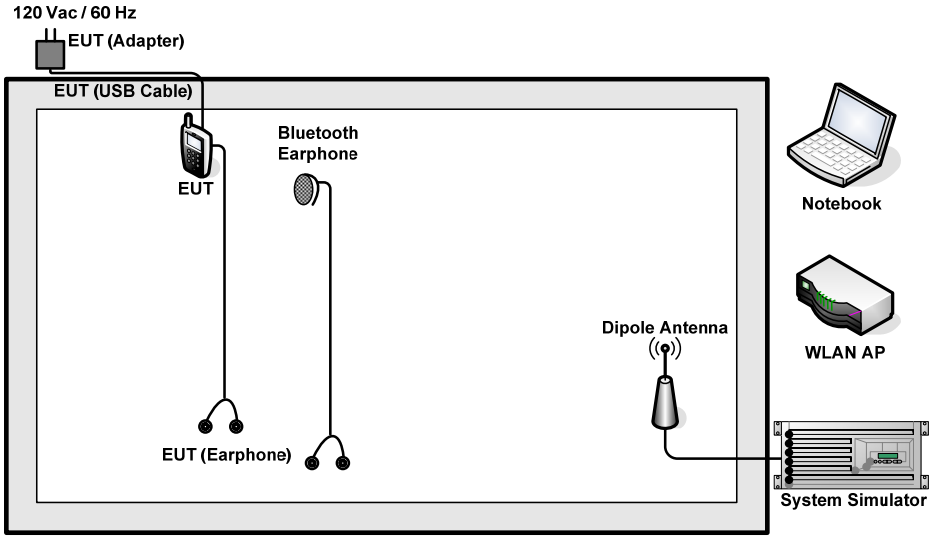
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Conducted Band Edge	802.11b	1 Mbps	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 + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + 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	Agilent	E5515C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	TOPWORD	3303DR	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	Hometek	NW616	N/A	N/A	Unshielded, 1.8 m with Core
4.	Bluetooth Earphone	Nokia	BH-108	N/A	N/A	N/A
5.	Notebook	Dell	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m

2.6 RF Utility

For WLAN function, key in "＊＃8924＃" on the EUT directly. Then, the EUT will get into the engineering modes to contact with WLAN AP 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 7.5 dB.

Example :

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

= 7.5 + 10 = 17.5 (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.

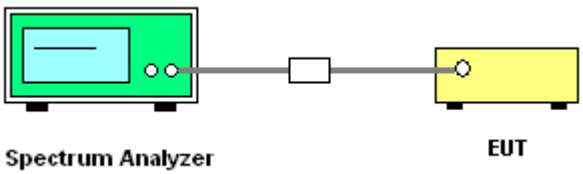
3.1.2 Measuring Instruments

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 D01 DTS Meas. Guidance v03r01.
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

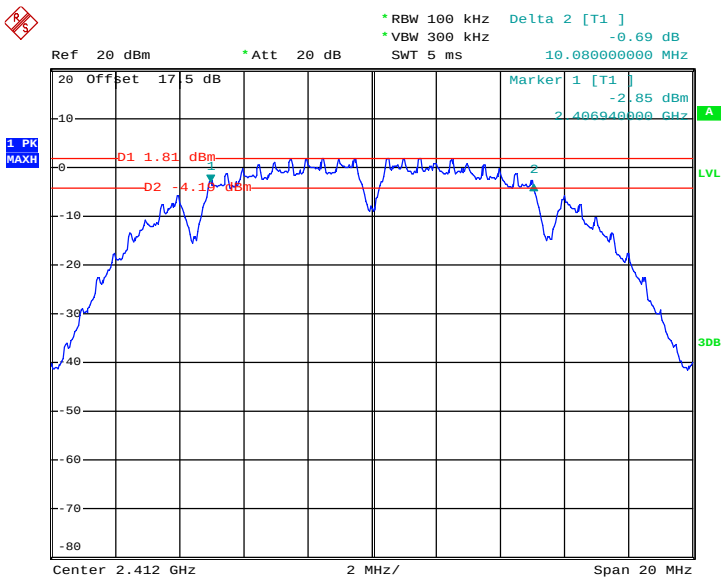


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

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

6 dB Bandwidth Plot on 802.11b Channel 01



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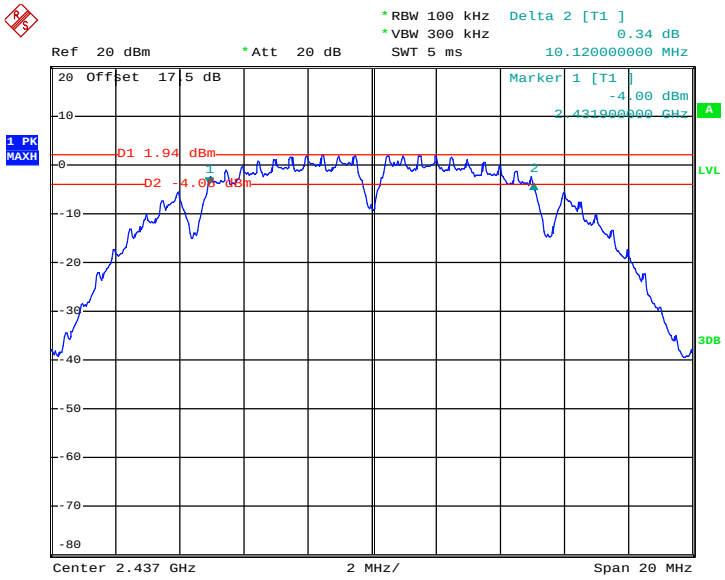
6 dB Bandwidth Plot on 802.11b Channel 06



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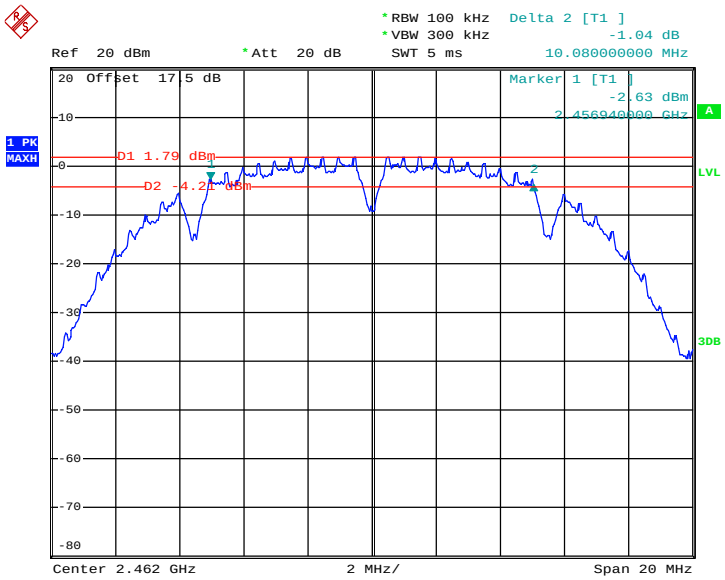
6 dB Bandwidth Plot on 802.11b Channel 11



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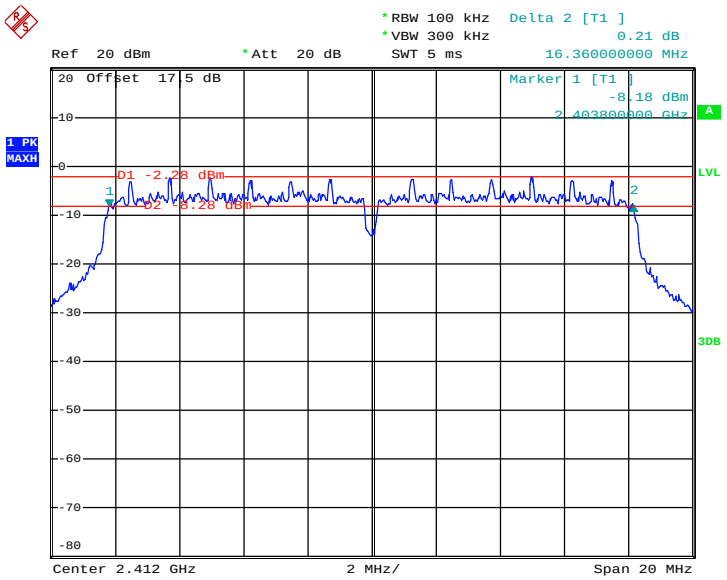
Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.36	0.5	Pass
06	2437	16.36	0.5	Pass
11	2462	16.34	0.5	Pass

6 dB Bandwidth Plot on 802.11g Channel 01



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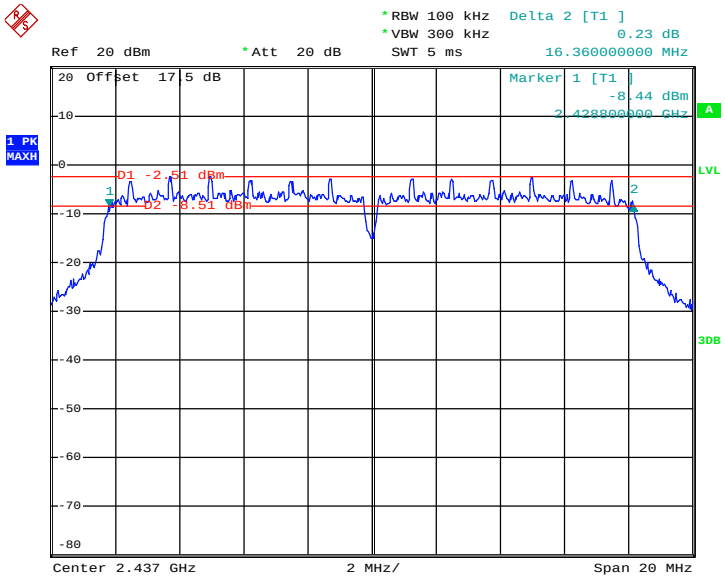
6 dB Bandwidth Plot on 802.11g Channel 06



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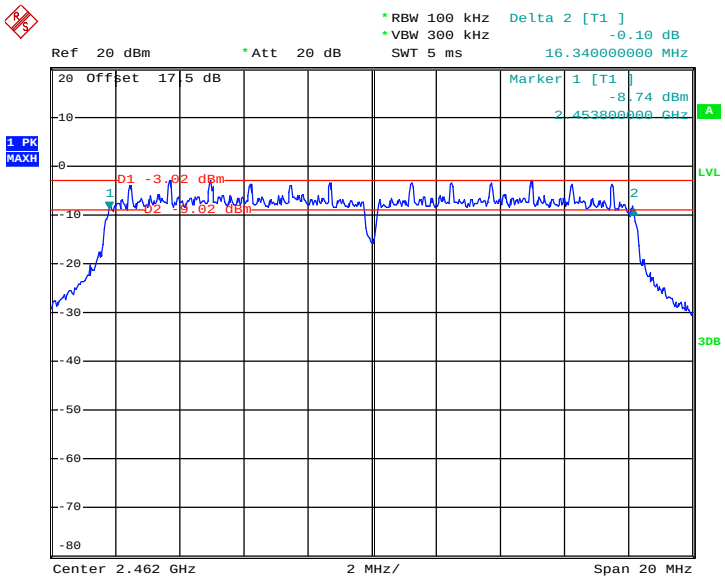
6 dB Bandwidth Plot on 802.11g Channel 11

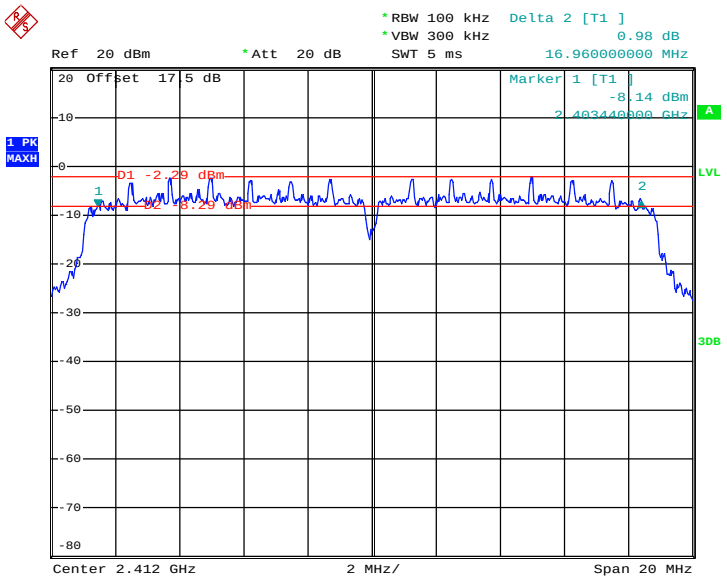


Date: 1.APR.2013 11:01:17

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.96	0.5	Pass
06	2437	16.92	0.5	Pass
11	2462	17.18	0.5	Pass

6 dB Bandwidth Plot on 802.11n HT20 Channel 01



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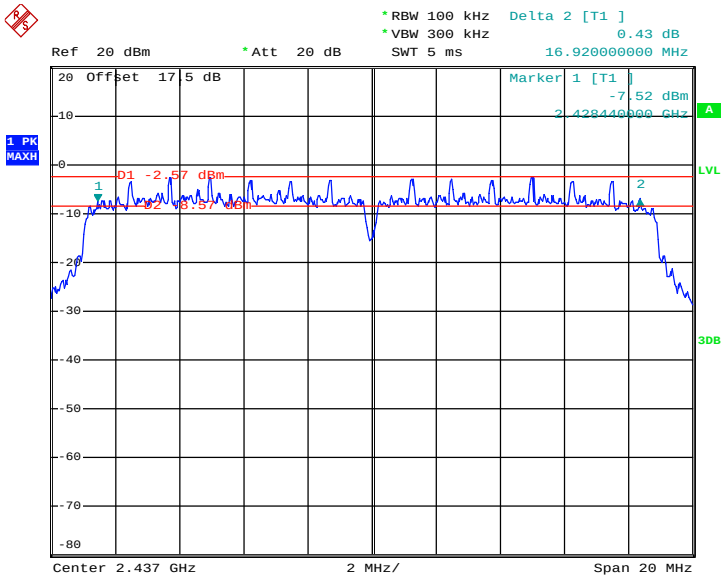
6 dB Bandwidth Plot on 802.11n HT20 Channel 06



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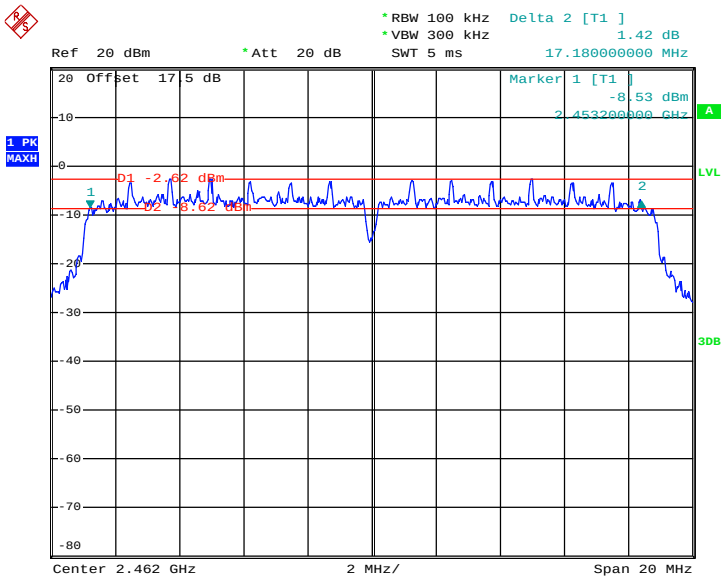
6 dB Bandwidth Plot on 802.11n HT20 Channel 11



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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.

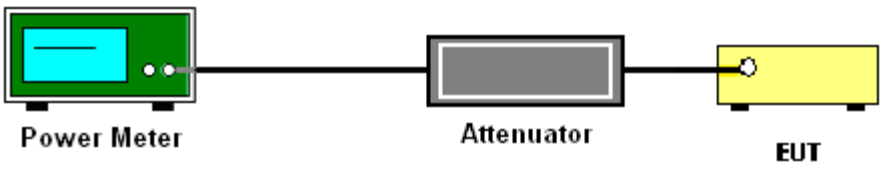
3.2.2 Measuring Instruments

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 D01 DTS Meas. Guidance v03r01.
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 :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	15.77	30	Pass
06	2437	15.49	30	Pass
11	2462	15.78	30	Pass

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.49	30	Pass
06	2437	18.44	30	Pass
11	2462	19.11	30	Pass

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.24	30	Pass
06	2437	18.08	30	Pass
11	2462	18.96	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%
Duty Cycle:	100.00%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	13.41
06	2437	13.27
11	2462	13.52

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%
Duty Cycle:	97.92%	Duty Factor:	0.09dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	9.40
06	2437	9.30
11	2462	9.54

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%
Duty Cycle:	97.95%	Duty Factor:	0.09dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	9.37
06	2437	9.18
11	2462	9.68

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.

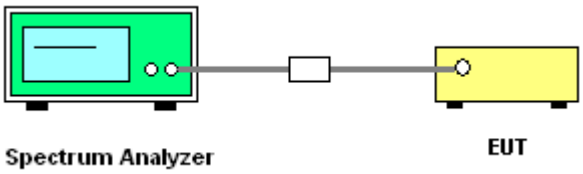
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
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 :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	1.77	-13.47	8	Pass
06	2437	1.89	-12.92	8	Pass
11	2462	1.75	-13.33	8	Pass

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-2.53	-18.01	8	Pass
06	2437	-2.61	-18.06	8	Pass
11	2462	-2.61	-18.36	8	Pass

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Blithe Li	Relative Humidity :	50~53%

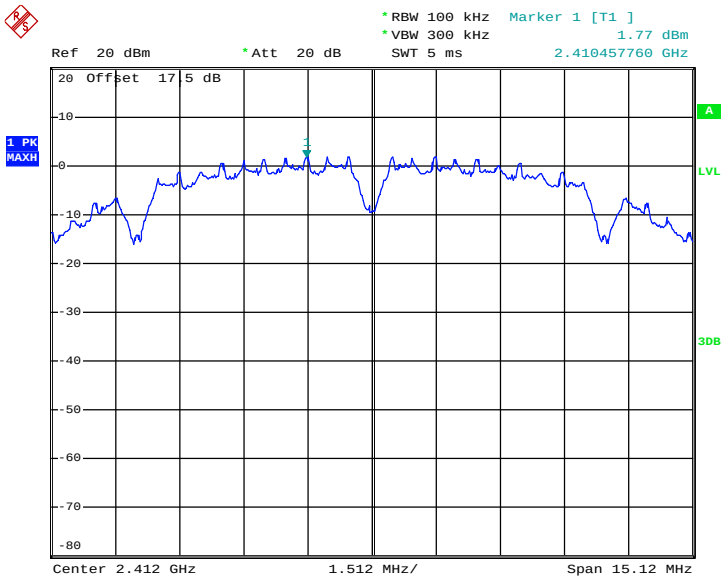
Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-2.36	-16.59	8	Pass
06	2437	-3.16	-18.09	8	Pass
11	2462	-2.66	-17.75	8	Pass

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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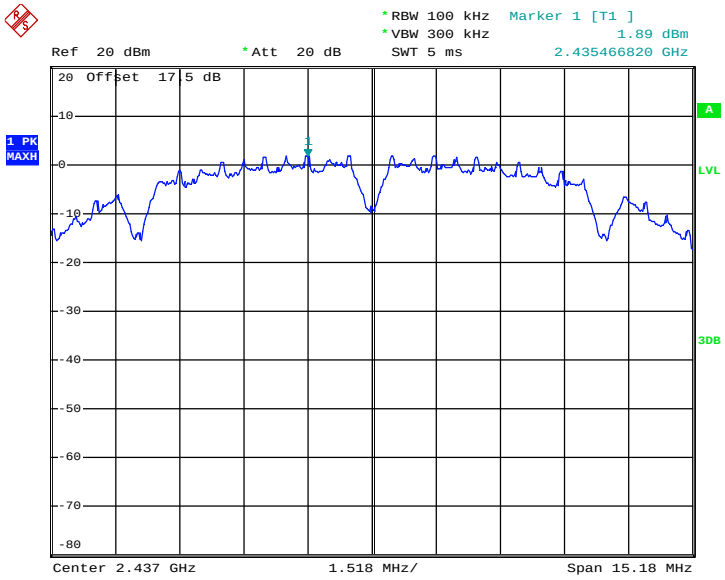
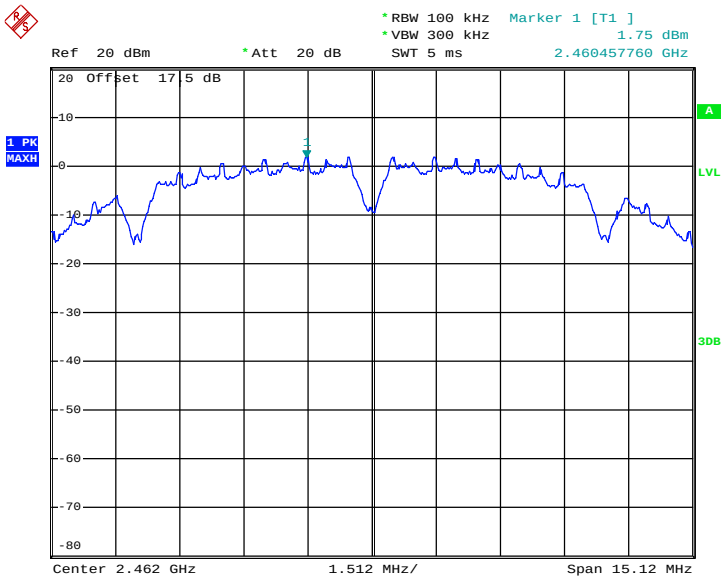
PSD 100kHz Plot on 802.11b Channel 06



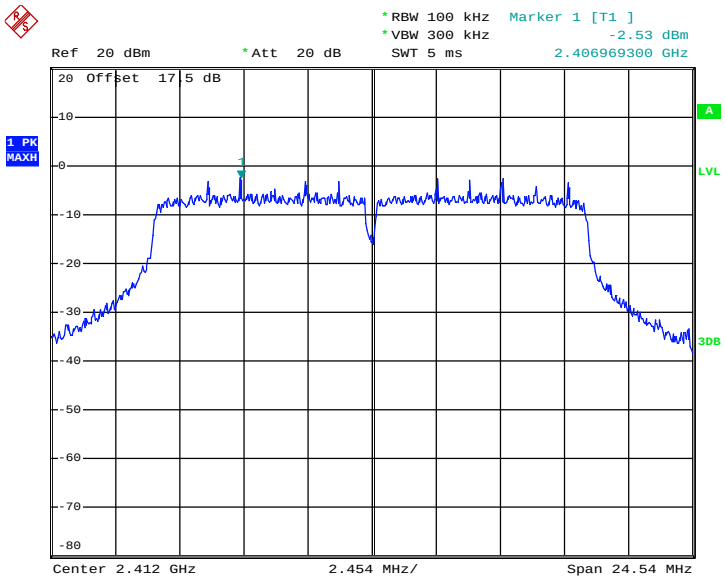
Date: 1.APR.2013 10:46:47

PSD 100kHz Plot on 802.11b Channel 11



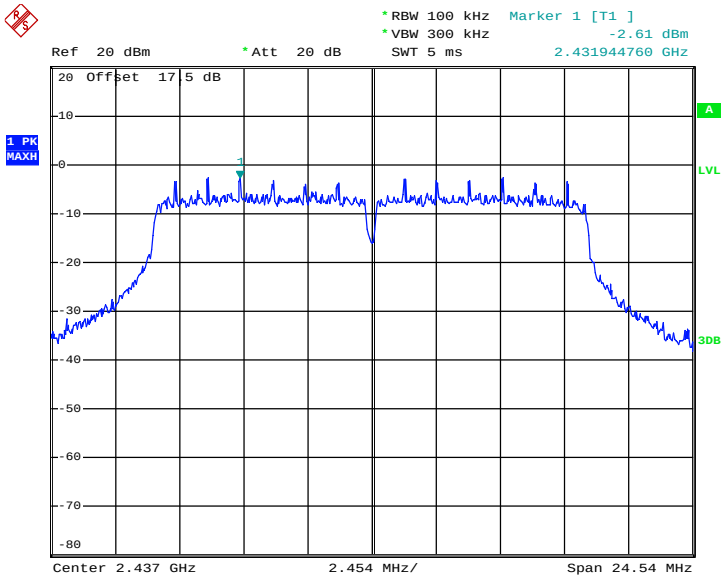
Date: 1.APR.2013 10:55:43

PSD 100kHz Plot on 802.11g Channel 01



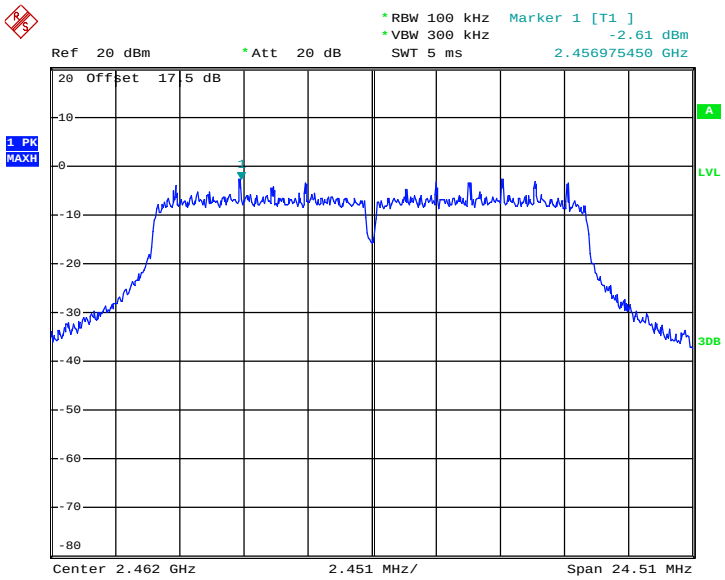
Date: 1.APR.2013 11:20:18

PSD 100kHz Plot on 802.11g Channel 06



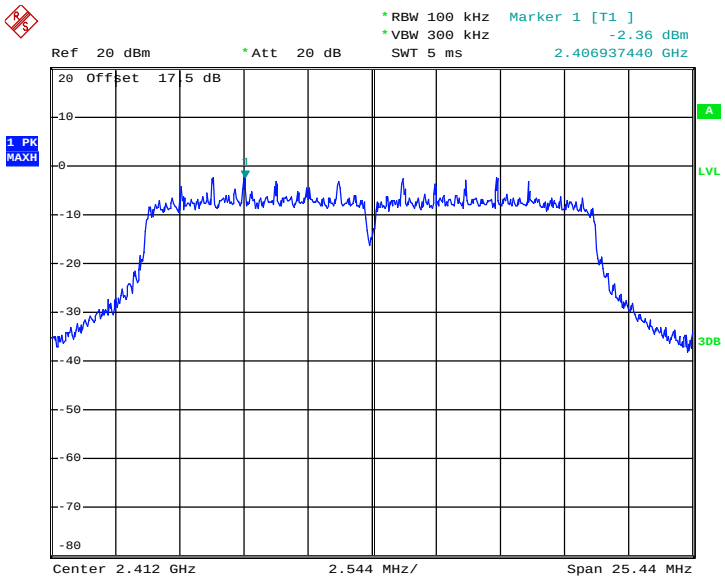
Date: 1.APR.2013 11:13:36

PSD 100kHz Plot on 802.11g Channel 11



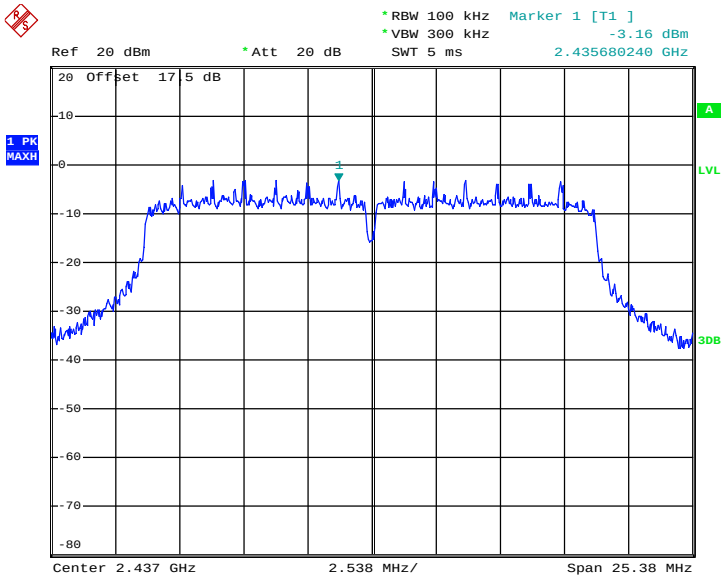
Date: 1.APR.2013 11:03:47

PSD 100kHz Plot on 802.11n HT20 Channel 01



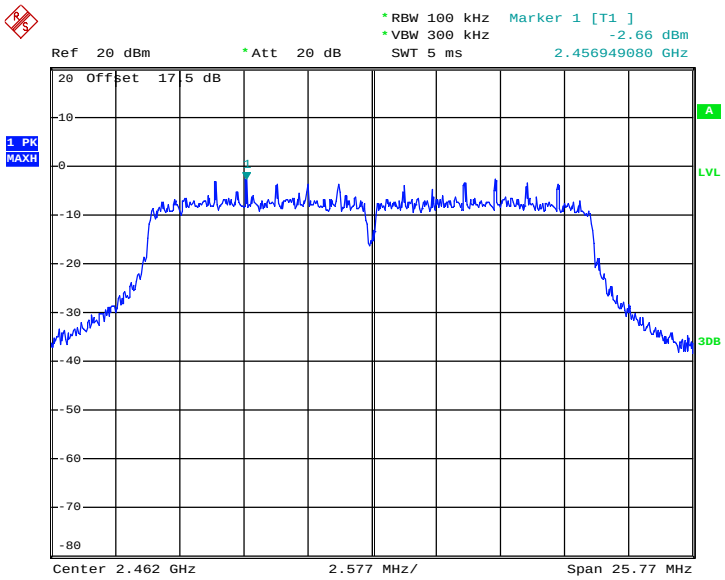
Date: 1.APR.2013 11:28:00

PSD 100kHz Plot on 802.11n HT20 Channel 06



Date: 1.APR.2013 11:32:51

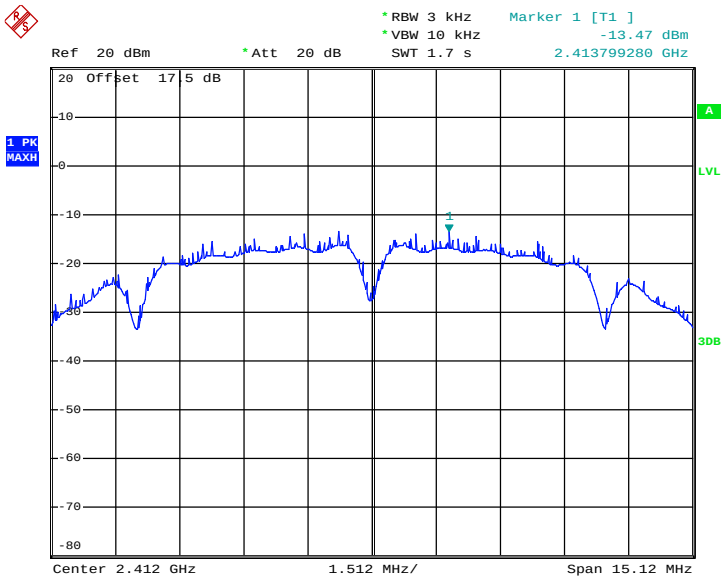
PSD 100kHz Plot on 802.11n HT20 Channel 11



Date: 1.APR.2013 11:37:43

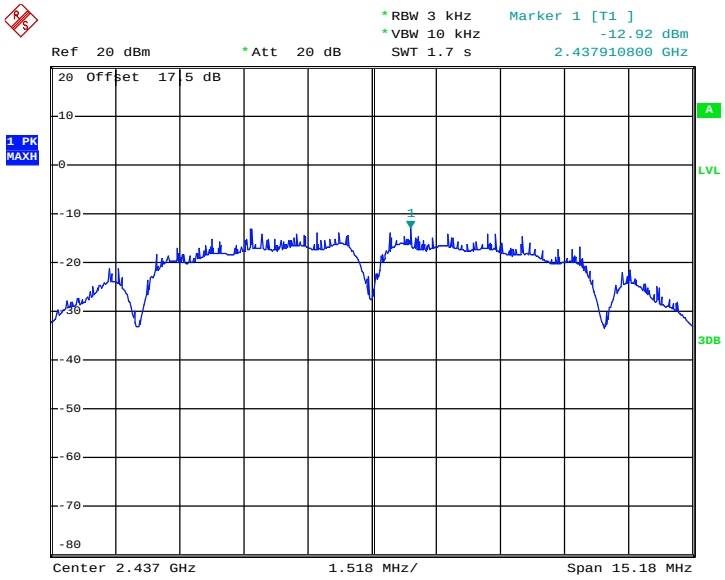
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



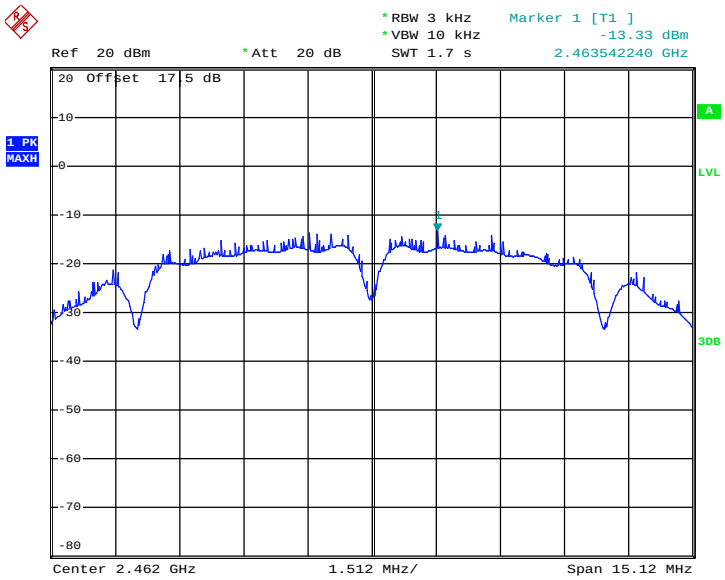
Date: 1.APR.2013 10:41:28

PSD 3kHz Plot on 802.11b Channel 06



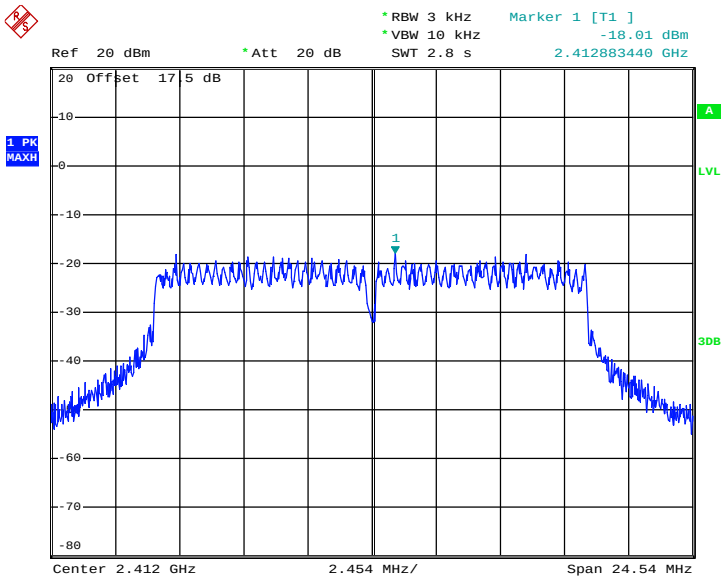
Date: 1.APR.2013 10:46:15

PSD 3kHz Plot on 802.11b Channel 11



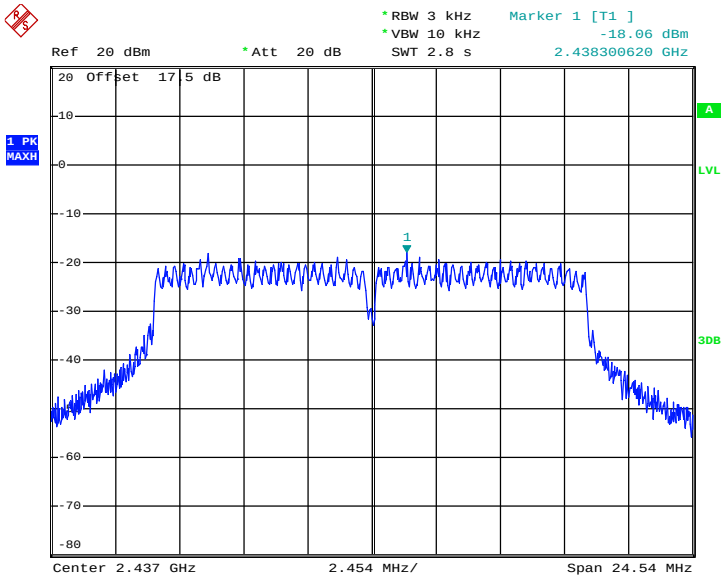
Date: 1.APR.2013 10:55:04

PSD 3kHz Plot on 802.11g Channel 01



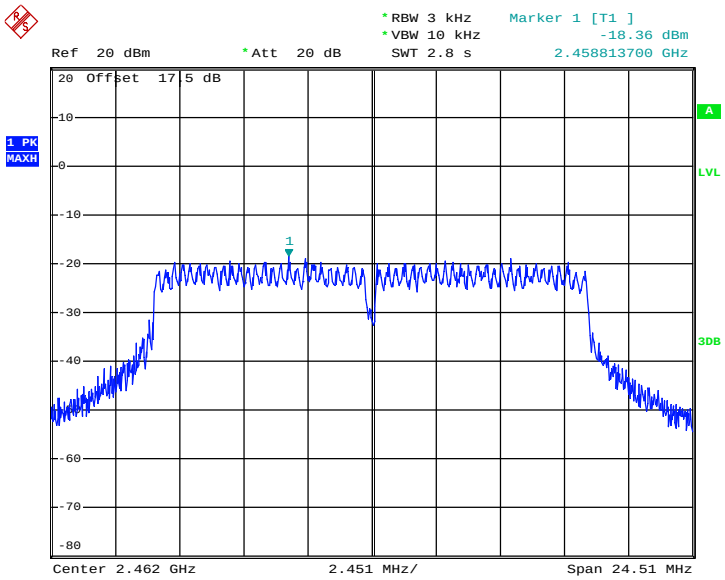
Date: 1.APR.2013 11:19:55

PSD 3kHz Plot on 802.11g Channel 06



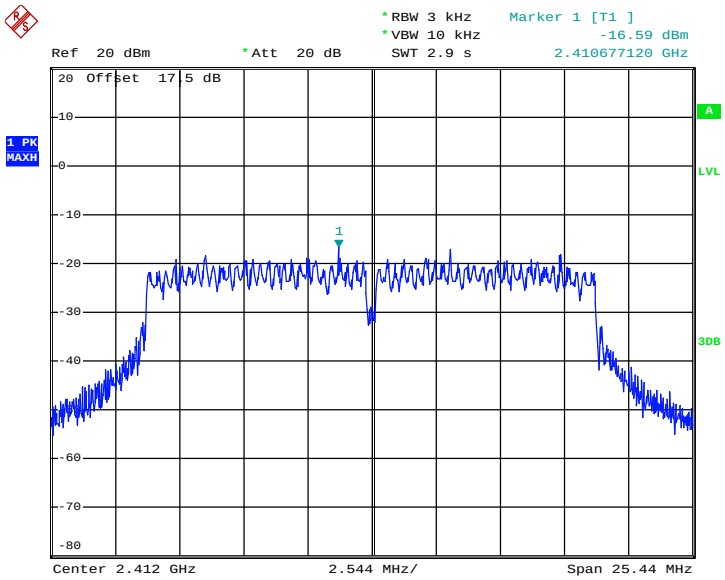
Date: 1.APR.2013 11:12:42

PSD 3kHz Plot on 802.11g Channel 11



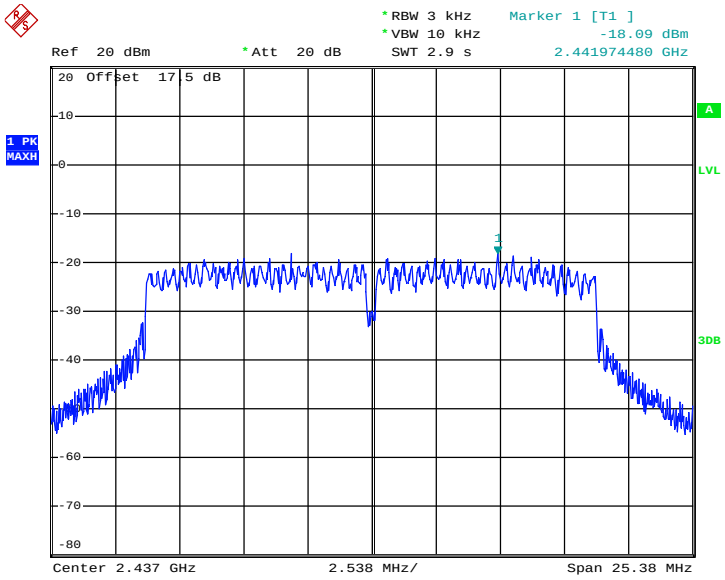
Date: 1.APR.2013 11:03:33

PSD 3kHz Plot on 802.11n HT20 Channel 01



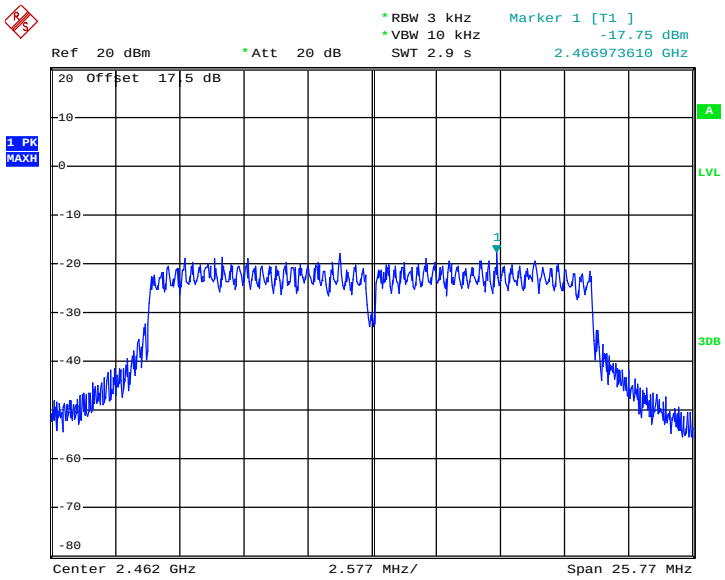
Date: 1.APR.2013 11:27:29

PSD 3kHz Plot on 802.11n HT20 Channel 06



Date: 1.APR.2013 11:32:33

PSD 3kHz Plot on 802.11n HT20 Channel 11



Date: 1.APR.2013 11:37:19

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).

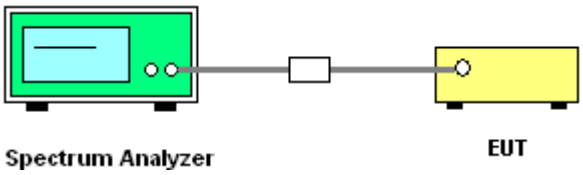
3.4.2 Measuring Instruments

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 D01 DTS Meas. Guidance v03r01.
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.

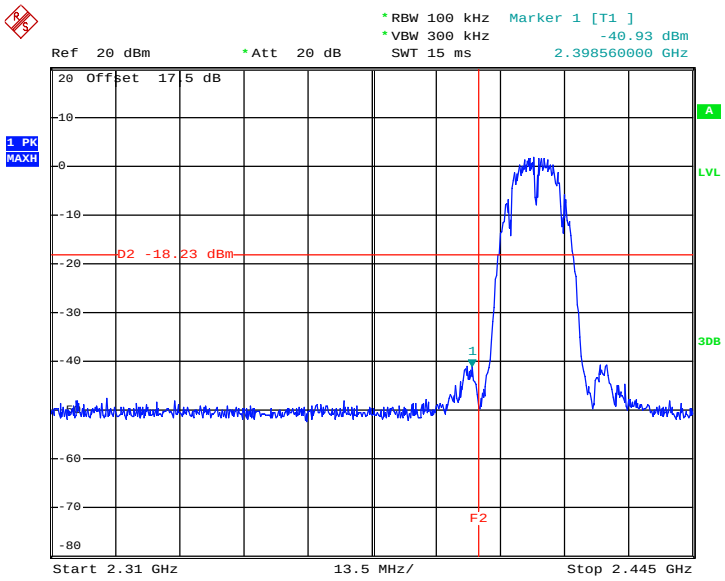
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

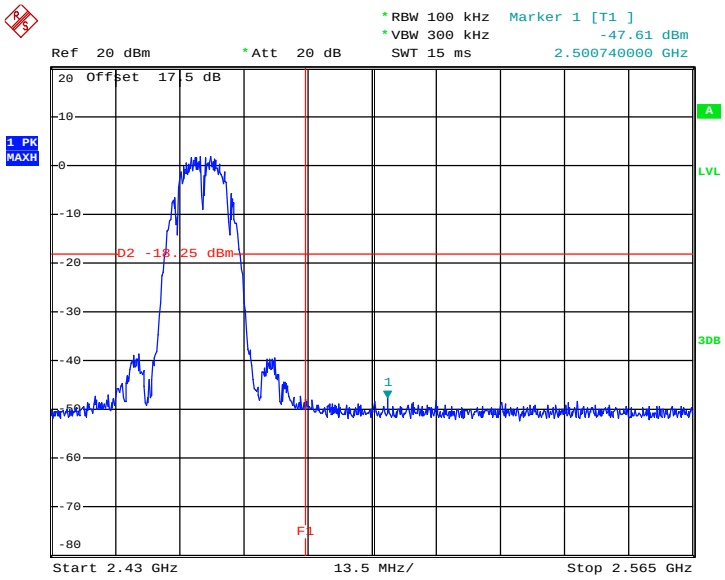
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Blithe Li

Low Band Edge Plot on 802.11b Channel 01



Date: 1.APR.2013 10:42:03

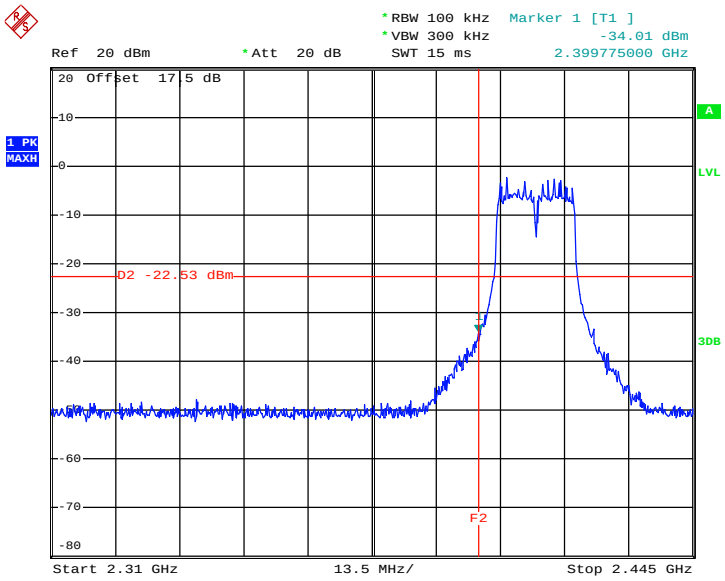
High Band Edge Plot on 802.11b Channel 11



Date: 1.APR.2013 10:56:37

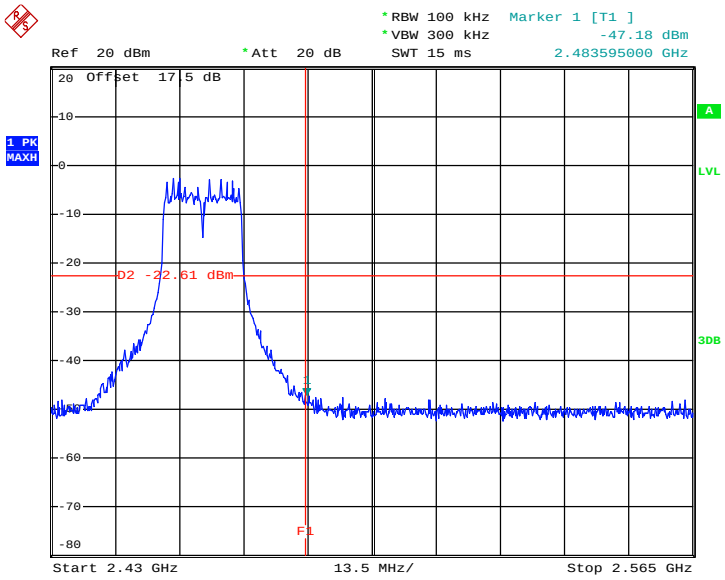
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Blithe Li

Low Band Edge Plot on 802.11g Channel 01



Date: 1.APR.2013 11:21:01

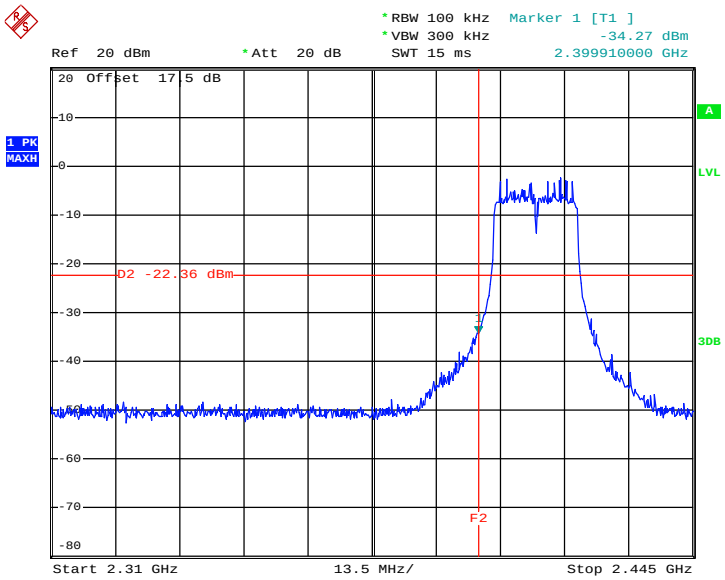
High Band Edge Plot on 802.11g Channel 11



Date: 1.APR.2013 11:04:43

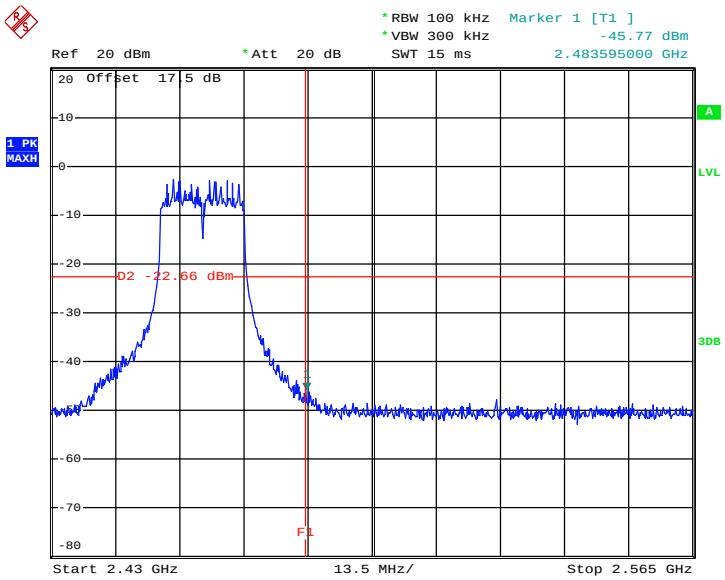
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Blithe Li

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 1.APR.2013 11:28:22

High Band Edge Plot on 802.11n HT20 Channel 11



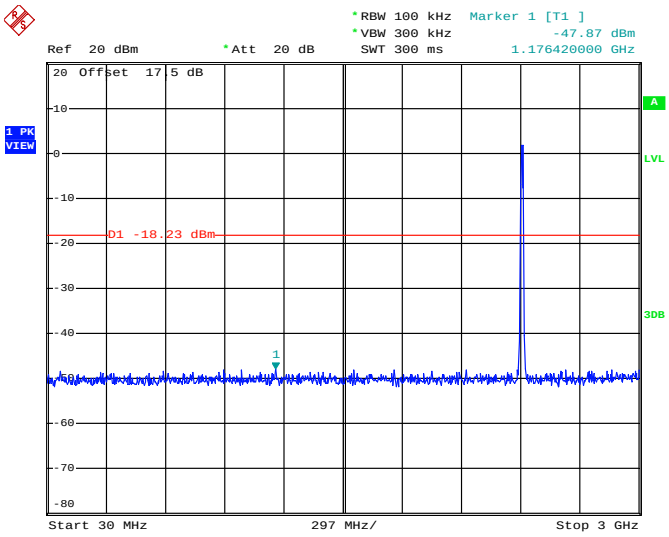
Date: 1.APR.2013 11:38:31

3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Blithe Li

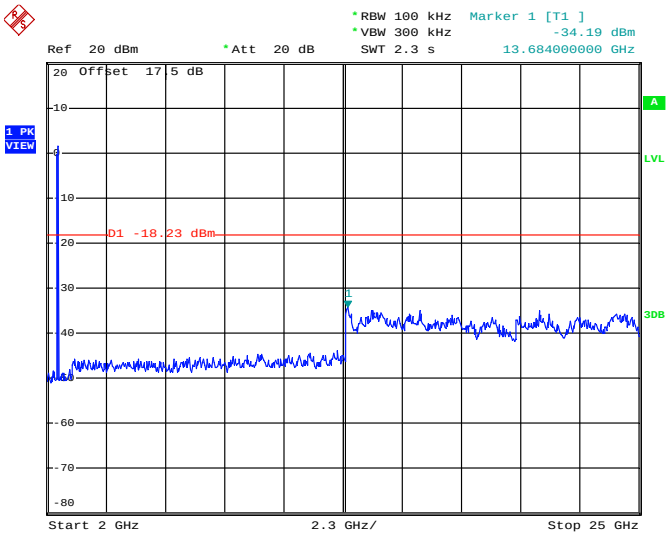
802.11b 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 01



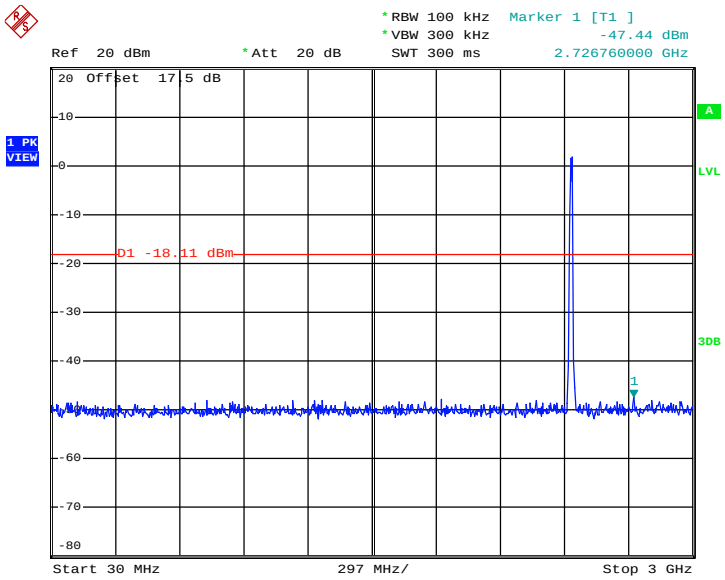
802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01



802.11b 30 MHz~3 GHz

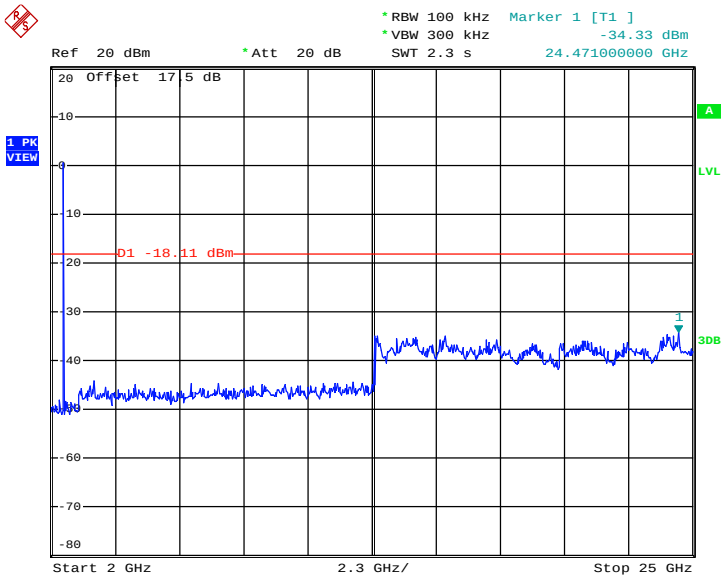
Conducted Spurious Emission Plot on Channel 06



Date: 1.APR.2013 10:47:22

802.11b 2 GHz~25 GHz

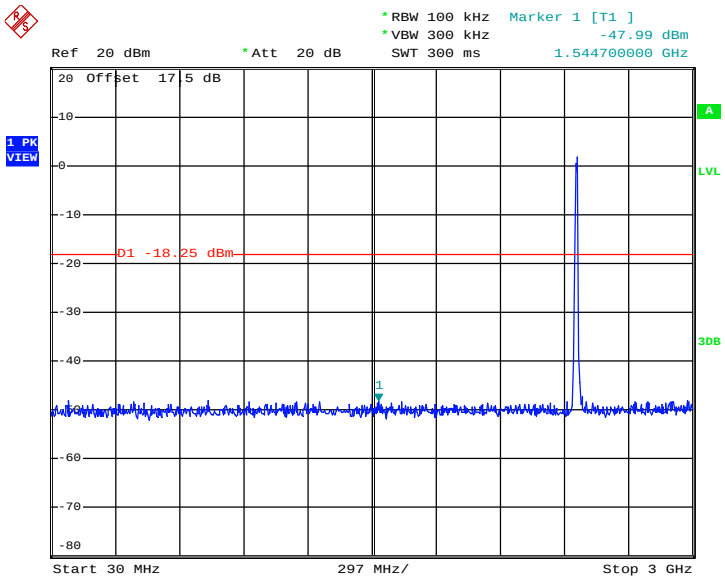
Conducted Spurious Emission Plot on Channel 06



Date: 1.APR.2013 10:47:40

802.11b 30 MHz~3 GHz

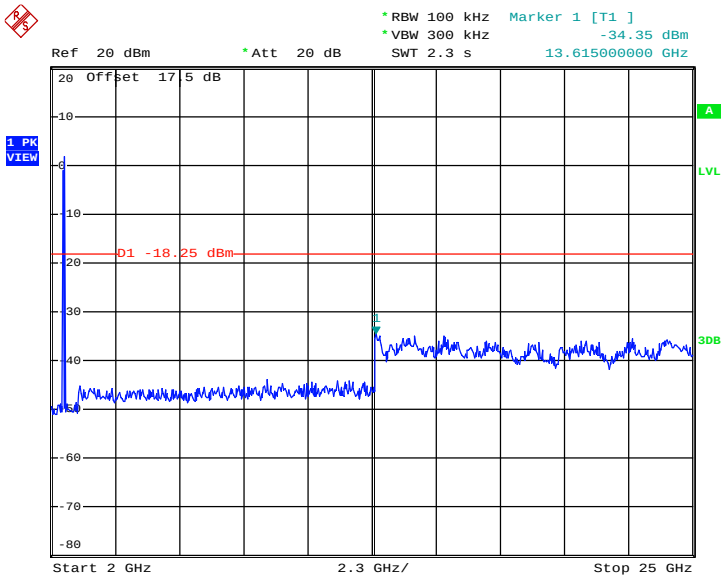
Conducted Spurious Emission Plot on Channel 11



Date: 1.APR.2013 10:57:05

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

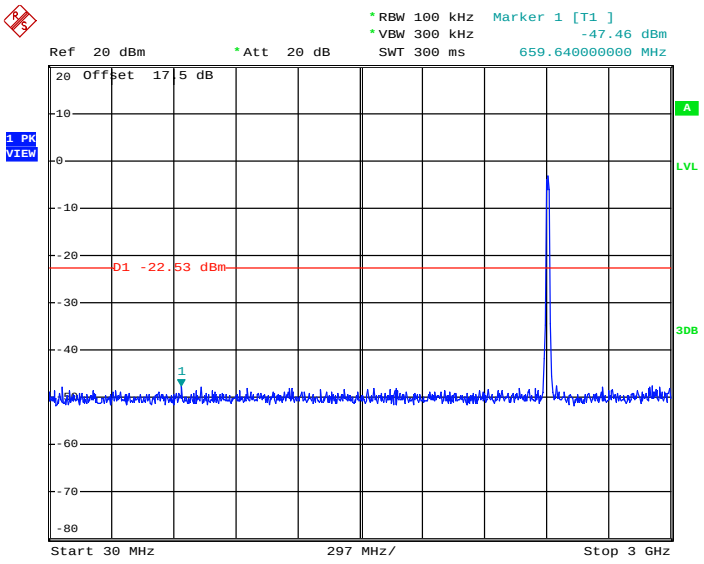


Date: 1.APR.2013 10:57:23

Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Blithe Li

802.11g 30 MHz~3 GHz

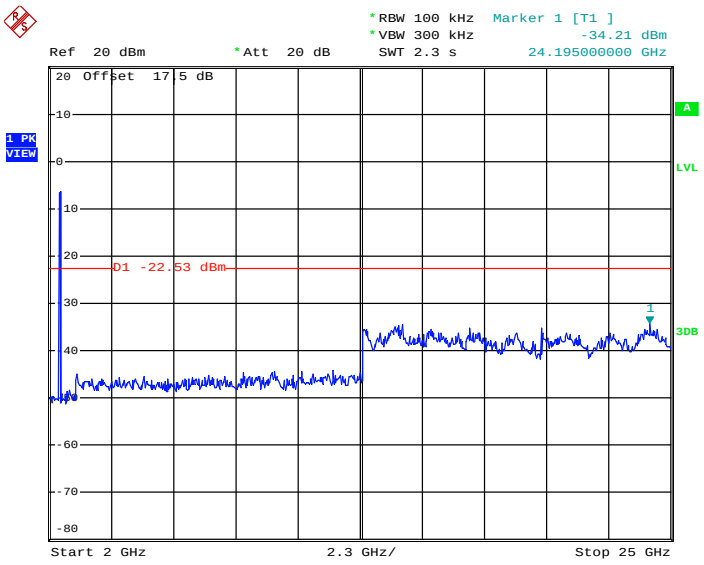
Conducted Spurious Emission Plot on Channel 01



Date: 1.APR.2013 11:22:07

802.11g 2 GHz~25 GHz

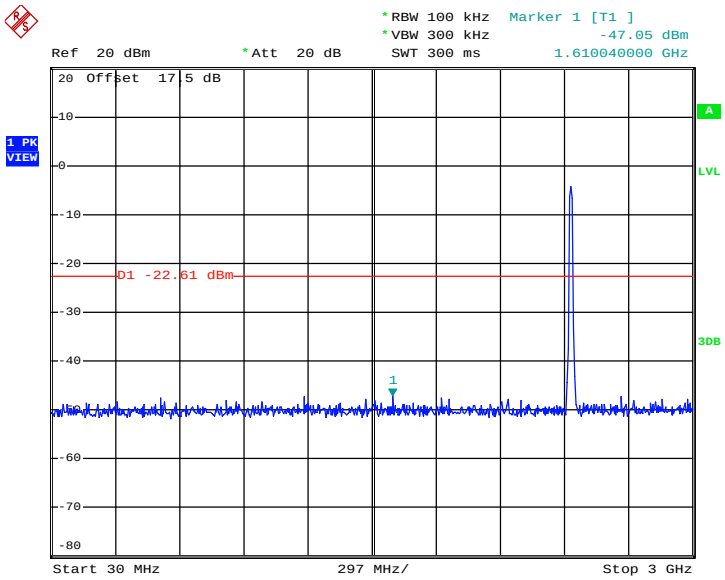
Conducted Spurious Emission Plot on Channel 01



Date: 1.APR.2013 11:22:25

802.11g 30 MHz~3 GHz

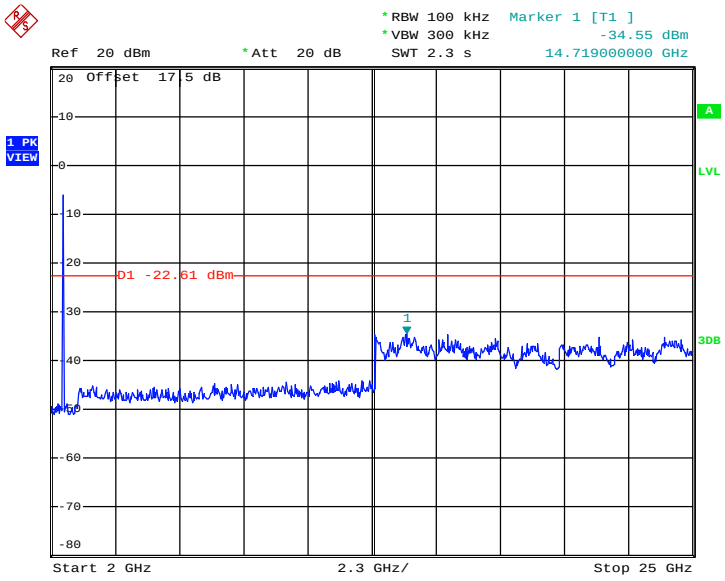
Conducted Spurious Emission Plot on Channel 06



Date: 1.APR.2013 11:14:40

802.11g 2 GHz~25 GHz

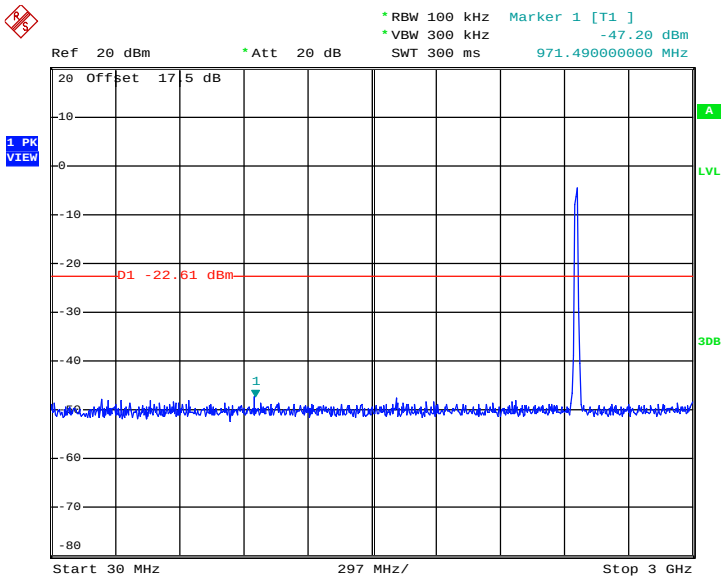
Conducted Spurious Emission Plot on Channel 06



Date: 1.APR.2013 11:14:59

802.11g 30 MHz~3 GHz

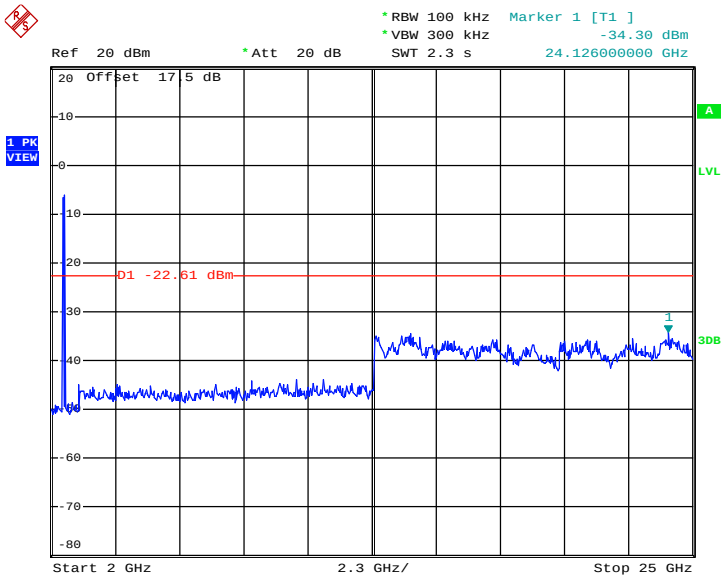
Conducted Spurious Emission Plot on Channel 11



Date: 1.APR.2013 11:05:35

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

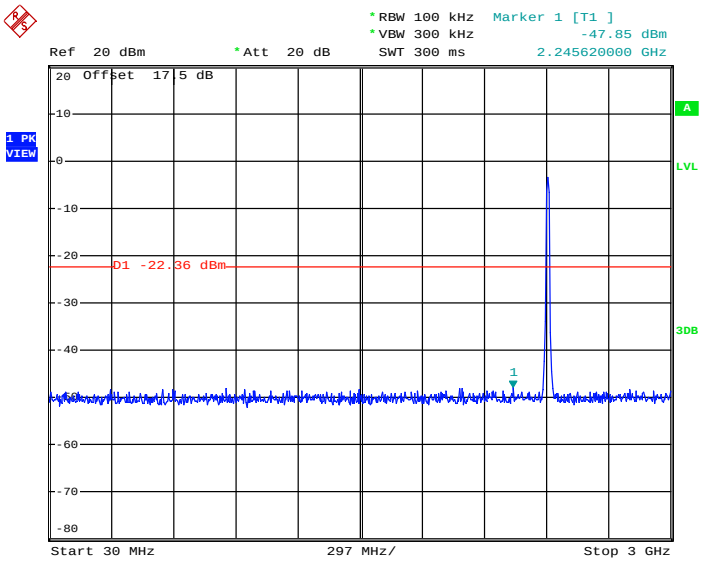


Date: 1.APR.2013 11:05:54

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Blithe Li

802.11n HT20 30 MHz~3 GHz

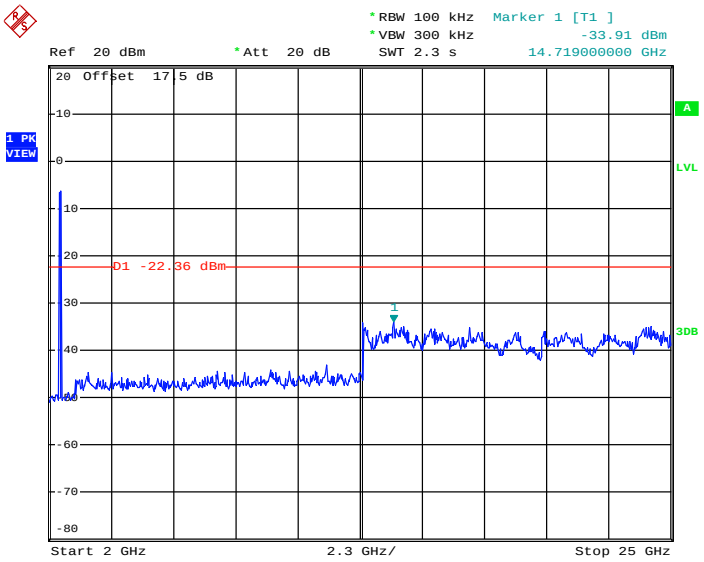
Conducted Spurious Emission Plot on Channel 01



Date: 1.APR.2013 11:29:01

802.11n HT20 2 GHz~25 GHz

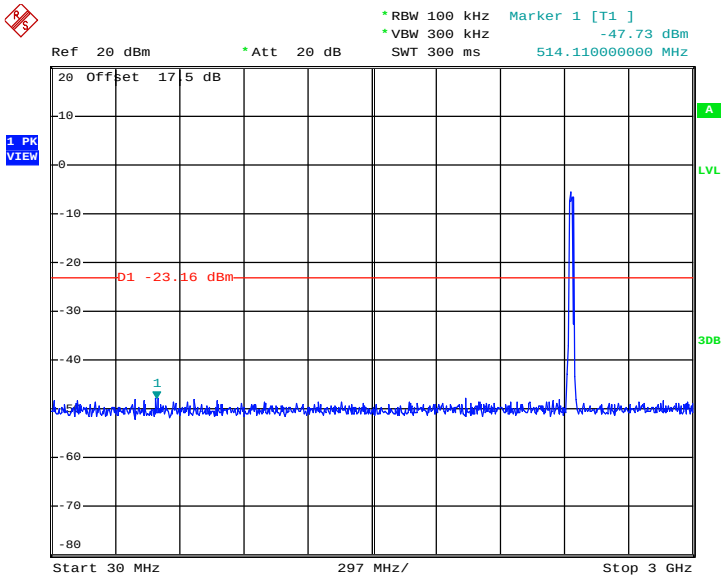
Conducted Spurious Emission Plot on Channel 01



Date: 1.APR.2013 11:29:19

802.11n HT20 30 MHz~3 GHz

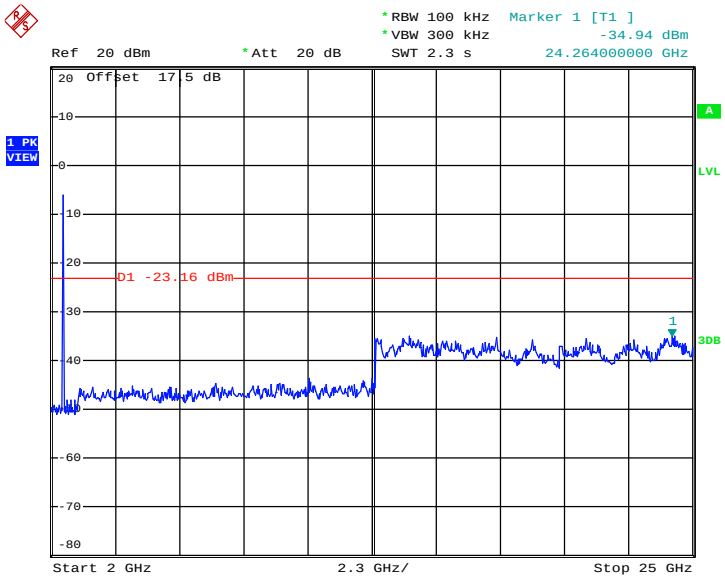
Conducted Spurious Emission Plot on Channel 06



Date: 1.APR.2013 11:33:23

802.11n HT20 2 GHz~25 GHz

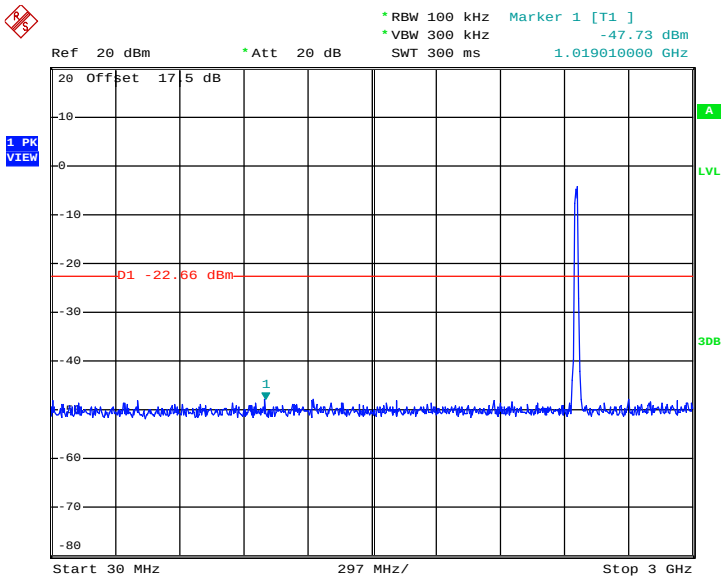
Conducted Spurious Emission Plot on Channel 06



Date: 1.APR.2013 11:33:42

802.11n HT20 30 MHz~3 GHz

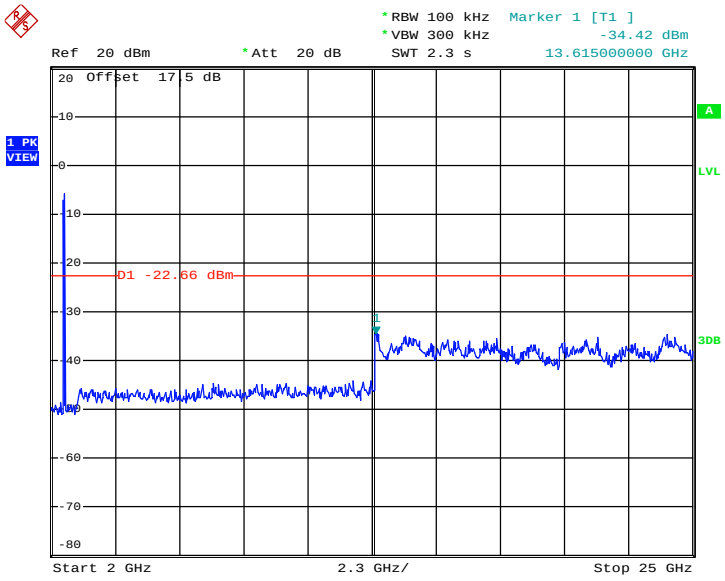
Conducted Spurious Emission Plot on Channel 11



Date: 1.APR.2013 11:39:01

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 1.APR.2013 11:39:19

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

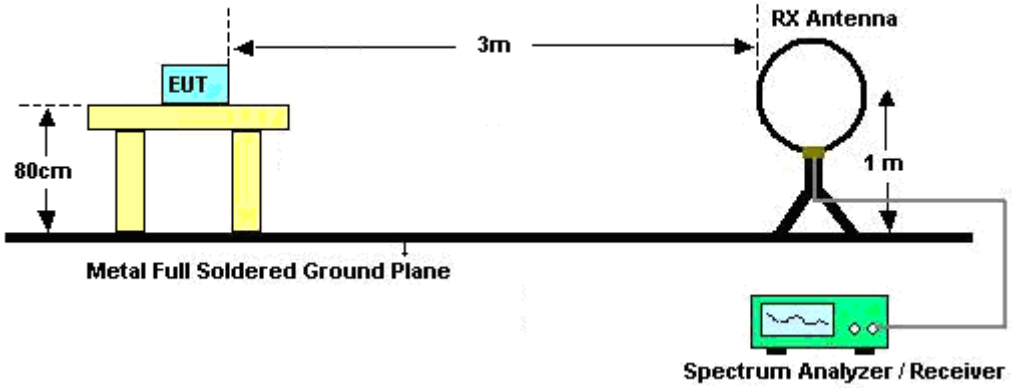
1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better 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	-	-	10Hz
802.11g	97.917	2.068	0.484	1KHz
802.11n HT20	97.949	1.910	0.524	1KHz

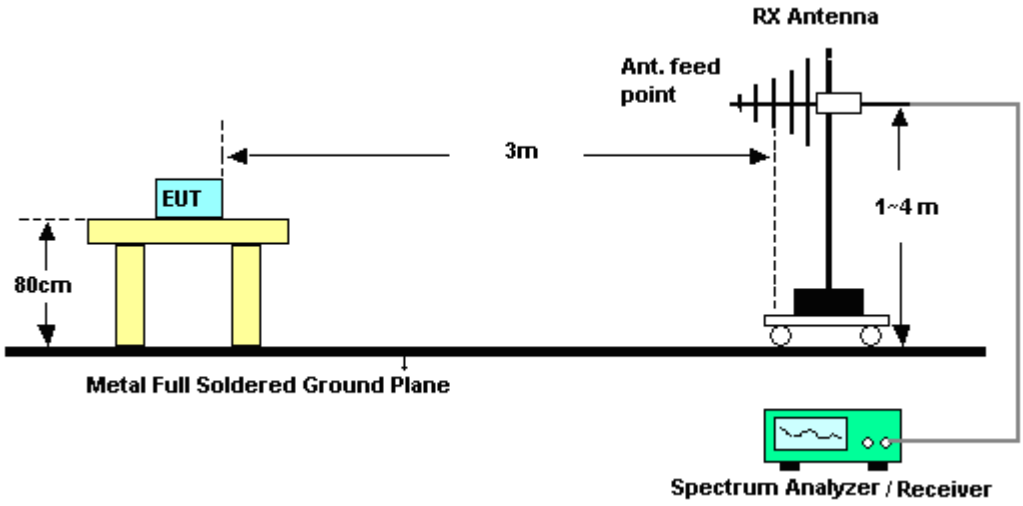
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

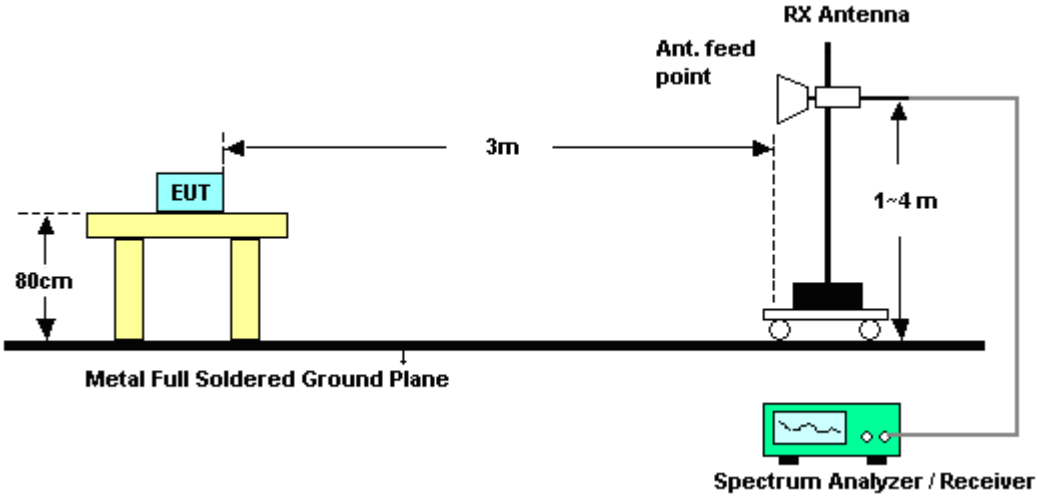
For radiated emissions below 30MHz



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 :	24~25℃
Test Band :	Low	Relative Humidity :	54~56%
Test Channel :	01	Test Engineer :	John Zheng

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
2354.64	52.51	-21.49	74	46.91	32.1	4.38	30.88	159	110	Peak
2390	41.34	-12.66	54	35.64	32.14	4.42	30.86	159	110	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
2388.84	52.54	-21.46	74	46.84	32.14	4.42	30.86	157	109	Peak
2390	41.35	-12.65	54	35.65	32.14	4.42	30.86	157	109	Average

Test Mode :	802.11b	Temperature :	24~25℃
Test Band :	High	Relative Humidity :	54~56%
Test Channel :	11	Test Engineer :	John Zheng

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
2484.58	54.95	-19.05	74	48.99	32.27	4.47	30.78	127	106	Peak
2483.5	43.54	-10.46	54	37.58	32.27	4.47	30.78	127	106	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
2483.53	54.96	-19.04	74	49	32.27	4.47	30.78	100	108	Peak
2483.5	43.82	-10.18	54	37.86	32.27	4.47	30.78	100	108	Average

Test Mode :	802.11g	Temperature :	24~25℃
Test Band :	Low	Relative Humidity :	54~56%
Test Channel :	01	Test Engineer :	John Zheng

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
2371.65	52.89	-21.11	74	47.26	32.12	4.38	30.87	121	348	Peak
2390	40.85	-13.15	54	35.15	32.14	4.42	30.86	121	348	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
2368.05	53.15	-20.85	74	47.54	32.1	4.38	30.87	133	151	Peak
2389.92	40.8	-13.2	54	35.1	32.14	4.42	30.86	133	151	Average

Test Mode :	802.11g	Temperature :	24~25℃
Test Band :	High	Relative Humidity :	54~56%
Test Channel :	11	Test Engineer :	John Zheng

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
2483.62	61.91	-12.09	74	55.95	32.27	4.47	30.78	102	348	Peak
2483.5	44.48	-9.52	54	38.52	32.27	4.47	30.78	102	348	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	60.12	-13.88	74	54.16	32.27	4.47	30.78	132	346	Peak
2483.5	43.29	-10.71	54	37.33	32.27	4.47	30.78	132	146	Average

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Band :	Low	Relative Humidity :	54~56%
Test Channel :	01	Test Engineer :	John Zheng

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	57.27	-16.73	74	51.57	32.14	4.42	30.86	100	360	Peak
2390	41.2	-12.8	54	35.5	32.14	4.42	30.86	100	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
2389.92	57.88	-16.12	74	52.18	32.14	4.42	30.86	134	131	Peak
2390	41.55	-12.45	54	35.85	32.14	4.42	30.86	134	131	Average

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Band :	High	Relative Humidity :	54~56%
Test Channel :	11	Test Engineer :	John Zheng

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
2483.53	64.69	-9.31	74	58.73	32.27	4.47	30.78	127	96	Peak
2483.5	45.35	-8.65	54	39.39	32.27	4.47	30.78	127	96	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	65.85	-8.15	74	59.89	32.27	4.47	30.78	152	95	Peak
2483.68	46.15	-7.85	54	40.19	32.27	4.47	30.78	152	95	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 :**	24~25℃
Test Channel :	01	**Relative Humidity :**	54~56%
Test Engineer :	John Zheng	**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, 101.11dBuV/m - 20dB = 81.11 dBuV/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	53.1	-28.01	81.11	47.39	32.14	4.42	30.85	159	110	Peak
2412	96.09	-	-	90.31	32.17	4.44	30.83	159	110	Average
2412	101.11	-	-	95.33	32.17	4.44	30.83	159	110	Peak
4824	47.9	-26.1	74	36.33	33.68	5.95	28.06	100	177	Peak
7236	50.09	-31.02	81.11	35.36	35.29	7.58	28.14	100	115	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	53.78	-27.48	81.26	48.07	32.14	4.42	30.85	157	109	Peak
2412	96.24	-	-	90.46	32.17	4.44	30.83	157	109	Average
2412	101.26	-	-	95.48	32.17	4.44	30.83	157	109	Peak
4824	47.62	-26.38	74	36.05	33.68	5.95	28.06	100	179	Peak
7236	50.07	-31.19	81.26	35.34	35.29	7.58	28.14	100	311	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	98.21	-	-	92.36	32.22	4.45	30.82	154	343	Average
2437	103.15	-	-	97.3	32.22	4.45	30.82	154	343	Peak
4874	47.7	-26.3	74	35.68	33.8	6.02	27.8	100	128	Peak
7311	50.87	-23.13	74	35.79	35.31	7.8	28.03	100	102	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	98.61	-	-	92.76	32.22	4.45	30.82	156	68	Average
2437	103.55	-	-	97.7	32.22	4.45	30.82	156	68	Peak
4874	47.64	-26.36	74	35.62	33.8	6.02	27.8	100	298	Peak
7311	51.48	-22.52	74	36.4	35.31	7.8	28.03	100	179	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	100.72	-	-	94.81	32.24	4.47	30.8	127	106	Average
2462	105.69	-	-	99.78	32.24	4.47	30.8	127	106	Peak
4924	47.99	-26.01	74	35.59	33.92	6.1	27.62	100	173	Peak
7386	50.65	-23.35	74	35.09	35.35	8.12	27.91	100	236	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	100.21	-	-	94.3	32.24	4.47	30.8	100	108	Average
2462	105.58	-	-	99.67	32.24	4.47	30.8	100	108	Peak
4924	48.12	-25.88	74	35.72	33.92	6.1	27.62	100	312	Peak
7386	51.07	-22.93	74	35.51	35.35	8.12	27.91	100	221	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	71.71	-8.36	80.07	66	32.14	4.42	30.85	121	348	Peak
2412	89.84	-	-	84.06	32.17	4.44	30.83	121	348	Average
2412	100.07	-	-	94.29	32.17	4.44	30.83	121	348	Peak
4824	46.77	-27.23	74	35.2	33.68	5.95	28.06	100	327	Peak
7236	50.05	-30.02	80.07	35.32	35.29	7.58	28.14	127	36	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	71.79	-6.47	78.26	66.08	32.14	4.42	30.85	133	151	Peak
2412	87.91	-	-	82.13	32.17	4.44	30.83	133	151	Average
2412	98.26	-	-	92.48	32.17	4.44	30.83	133	151	Peak
4824	47.47	-26.53	74	35.9	33.68	5.95	28.06	122	178	Peak
7236	49.45	-28.81	78.26	34.72	35.29	7.58	28.14	100	316	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	89.87	-	-	84.02	32.22	4.45	30.82	100	22	Average
2437	99.84	-	-	93.99	32.22	4.45	30.82	100	22	Peak
4874	48.03	-25.97	74	36.01	33.8	6.02	27.8	100	177	Peak
7311	51.89	-22.11	74	36.81	35.31	7.8	28.03	100	121	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	89.82	-	-	83.97	32.22	4.45	30.82	131	153	Average
2437	100.25	-	-	94.4	32.22	4.45	30.82	131	153	Peak
4874	47.89	-26.11	74	35.87	33.8	6.02	27.8	100	193	Peak
7311	50.74	-23.26	74	35.66	35.31	7.8	28.03	100	92	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	93.25	-	-	87.34	32.24	4.47	30.8	102	348	Average
2462	102.28	-	-	96.37	32.24	4.47	30.8	102	348	Peak
4924	47.98	-26.02	74	35.58	33.92	6.1	27.62	100	344	Peak
7386	51.31	-22.69	74	35.75	35.35	8.12	27.91	100	321	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	91.69	-	-	85.78	32.24	4.47	30.8	132	346	Average
2462	101.02	-	-	95.11	32.24	4.47	30.8	132	346	Peak
4924	48.4	-25.6	74	36	33.92	6.1	27.62	100	179	Peak
7386	50.95	-23.05	74	35.39	35.35	8.12	27.91	123	75	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	71.69	-5.59	77.28	65.98	32.14	4.42	30.85	100	360	Peak
2412	87.33	-	-	81.55	32.17	4.44	30.83	100	360	Average
2412	97.28	-	-	91.5	32.17	4.44	30.83	100	360	Peak
4824	48.99	-25.01	74	37.42	33.68	5.95	28.06	200	125	Peak
7236	50.58	-26.7	77.28	35.85	35.29	7.58	28.14	100	255	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	72.98	-6.58	79.56	67.27	32.14	4.42	30.85	134	131	Peak
2412	88.86	-	-	83.08	32.17	4.44	30.83	134	131	Average
2412	99.56	-	-	93.78	32.17	4.44	30.83	134	131	Peak
4824	47	-27	74	35.43	33.68	5.95	28.06	100	253	Peak
7236	50.35	-29.21	79.56	35.62	35.29	7.58	28.14	125	36	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	92.07	-	-	86.22	32.22	4.45	30.82	132	28	Average
2437	101.33	-	-	95.48	32.22	4.45	30.82	132	28	Peak
4874	48.16	-25.84	74	36.14	33.8	6.02	27.8	152	100	Peak
7311	50.19	-23.81	74	35.11	35.31	7.8	28.03	120	332	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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	91.22	-	-	85.37	32.22	4.45	30.82	113	344	Average
2437	100.06	-	-	94.21	32.22	4.45	30.82	113	344	Peak
4874	47.86	-26.14	74	35.84	33.8	6.02	27.8	100	156	Peak
7311	51.46	-22.54	74	36.38	35.31	7.8	28.03	123	220	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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
30	27.12	-12.88	40	42.64	14.1	0.96	30.58	-	-	Peak
32.91	23.72	-16.28	40	39.86	13.5	0.93	30.57	-	-	Peak
57.16	23.26	-16.74	40	47.85	5.1	0.83	30.52	-	-	Peak
85.29	27.68	-12.32	40	48.7	8.5	1.1	30.62	100	127	Peak
139.61	28.33	-15.17	43.5	46.02	11.6	1.24	30.53	-	-	Peak
221.09	19.83	-26.17	46	38.87	9.67	1.55	30.26	-	-	Peak
2462	91.79	-	-	85.88	32.24	4.47	30.8	127	96	Average
2462	102.31	-	-	96.4	32.24	4.47	30.8	127	96	Peak
4924	48.87	-25.13	74	36.47	33.92	6.1	27.62	100	224	Peak
7386	51.82	-22.18	74	36.26	35.35	8.12	27.91	112	37	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	54~56%
Test Engineer :	John Zheng	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
42.61	24.74	-15.26	40	44.71	9.7	0.87	30.54	100	278	Peak
52.31	23.77	-16.23	40	47.1	6.3	0.87	30.5	-	-	Peak
90.14	25.35	-18.15	43.5	44.87	10	1.12	30.64	-	-	Peak
179.38	20.72	-22.78	43.5	41.04	8.8	1.28	30.4	-	-	Peak
186.17	19.16	-24.34	43.5	39.21	9	1.33	30.38	-	-	Peak
260.86	21.66	-24.34	46	36.41	13.7	1.68	30.13	-	-	Peak
2462	92.06	-	-	86.15	32.24	4.47	30.8	152	95	Average
2462	102.45	-	-	96.54	32.24	4.47	30.8	152	95	Peak
4924	47.87	-26.13	74	35.47	33.92	6.1	27.62	127	35	Peak
7386	50.08	-23.92	74	34.52	35.35	8.12	27.91	122	125	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.

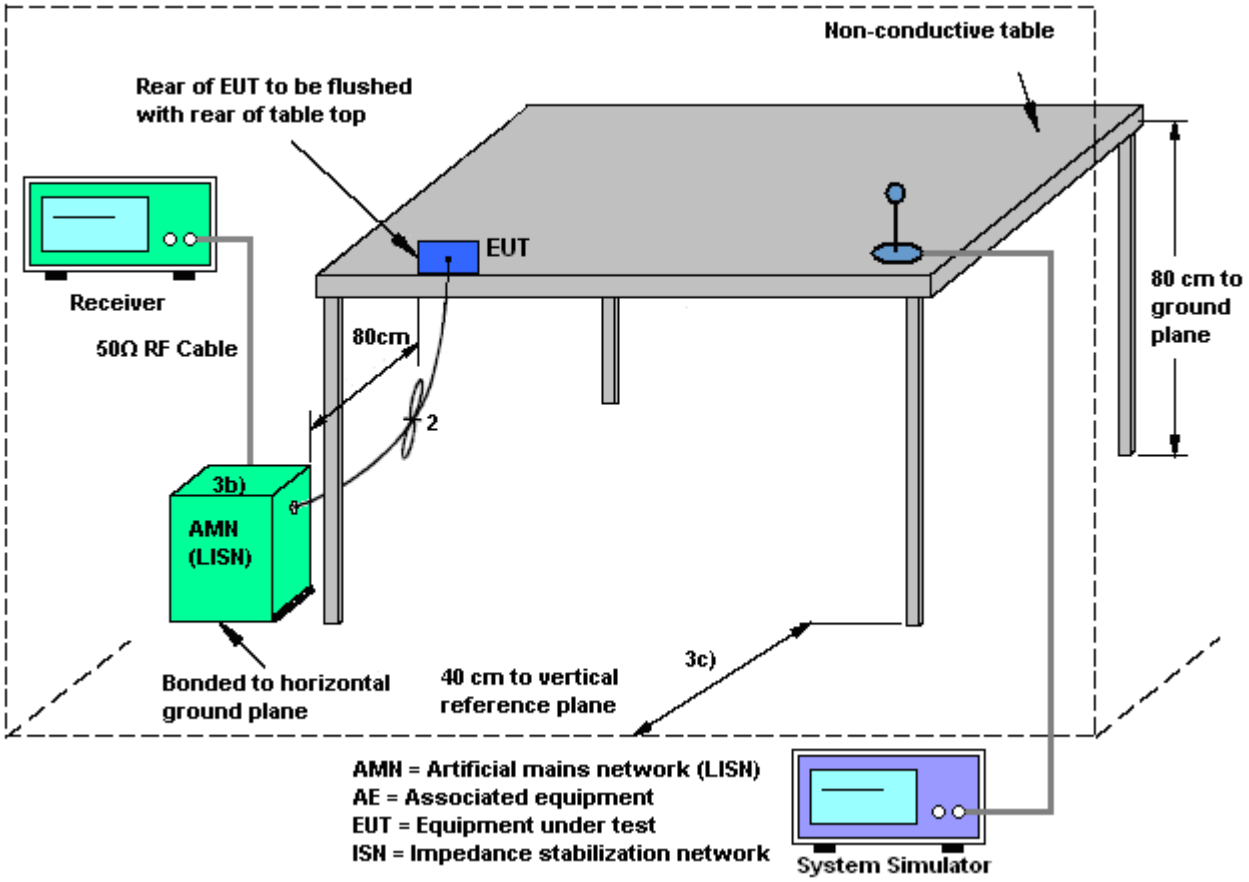
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

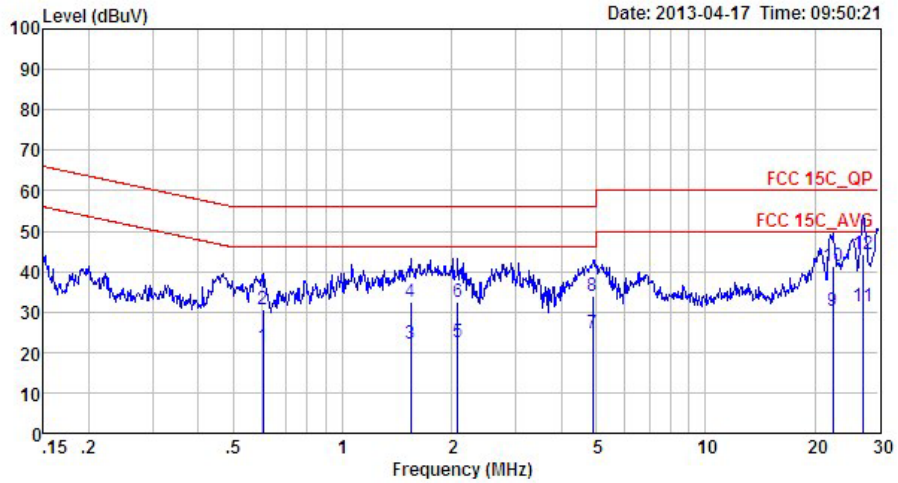
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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

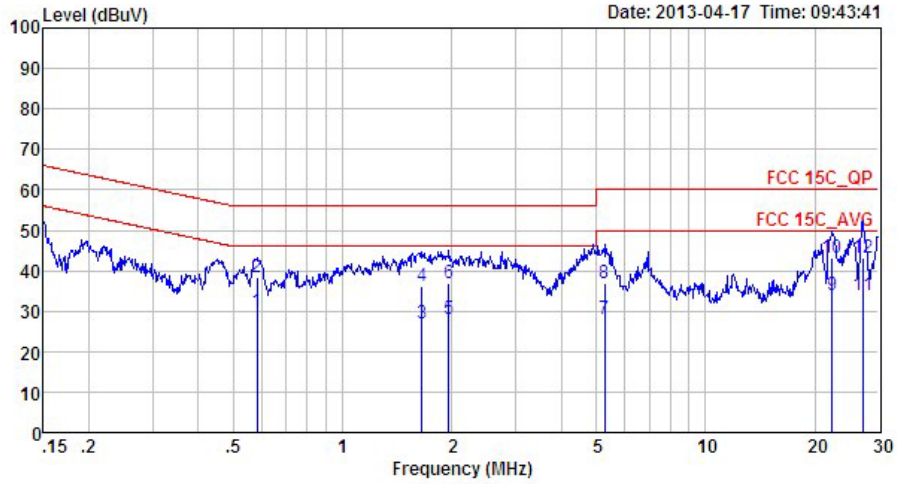
Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Leo Liao	Relative Humidity :	48~49%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_L_2000601 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.60	21.52	-24.48	46.00	11.41	0.02	10.09	Average
2	0.60	30.72	-25.28	56.00	20.61	0.02	10.09	QP
3	1.54	22.06	-23.94	46.00	11.90	0.03	10.13	Average
4	1.54	32.56	-23.44	56.00	22.40	0.03	10.13	QP
5	2.08	22.69	-23.31	46.00	12.49	0.04	10.16	Average
6	2.08	32.29	-23.71	56.00	22.09	0.04	10.16	QP
7	4.90	24.66	-21.34	46.00	14.40	0.07	10.19	Average
8	4.90	34.06	-21.94	56.00	23.80	0.07	10.19	QP
9	22.42	30.09	-19.91	50.00	19.20	0.43	10.46	Average
10	22.42	41.39	-18.61	60.00	30.50	0.43	10.46	QP
11	27.27	31.51	-18.49	50.00	20.50	0.58	10.43	Average
12 *	27.27	44.21	-15.79	60.00	33.20	0.58	10.43	QP

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Leo Liao	Relative Humidity :	48~49%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + USB Cable (Charging from Adapter) + Earphone		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_N_2000601 NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.58	29.71	-16.29	46.00	19.60	0.02	10.09	Average
2		0.58	38.51	-17.49	56.00	28.40	0.02	10.09	QP
3		1.65	26.76	-19.24	46.00	16.60	0.03	10.13	Average
4		1.65	36.06	-19.94	56.00	25.90	0.03	10.13	QP
5		1.96	27.98	-18.02	46.00	17.80	0.03	10.15	Average
6		1.96	36.98	-19.02	56.00	26.80	0.03	10.15	QP
7		5.28	28.17	-21.83	50.00	17.90	0.09	10.18	Average
8		5.28	36.97	-23.03	60.00	26.70	0.09	10.18	QP
9	*	22.30	34.10	-15.90	50.00	23.01	0.63	10.46	Average
10		22.30	43.30	-16.70	60.00	32.21	0.63	10.46	QP
11		27.13	33.93	-16.07	50.00	22.60	0.90	10.43	Average
12		27.13	43.33	-16.67	60.00	32.00	0.90	10.43	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	FSP30	101400	9kHz~30GHz	Jun. 01, 2012	Apr. 01, 2013	May 31, 2013	Conducted (TH01-SZ)
DC Power Supply	TOPWORD	3303DR	714621	N/A	Nov. 19, 2012	Apr. 01, 2013	Nov. 18, 2013	Conducted (TH01-SZ)
Thermal Chamber	Hongzhan	LP-150U	HD20120425	N/A	Jun. 11, 2012	Apr. 01, 2013	Jun. 10, 2013	Conducted (TH01-SZ)
ESCI TEST Receiver	R&S	ESCI	100724	9K-3GHz	Mar. 28, 2013	Apr. 03, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP30	101362	9kHz~30GHz	Mar. 28, 2013	Apr. 03, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Double Ridge Horn Amtenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 12, 2012	Apr. 03, 2013	Oct. 11, 2013	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30Mhz~2Ghz	Nov. 03, 2012	Apr. 03, 2013	Nov. 02, 2013	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9K-3000MHz GAIN 30db	Mar. 28, 2013	Apr. 03, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	Mar. 28, 2013	Apr. 03, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
SHF-EHF-Horn	Schwarzbeck	BBHA9170	BBHA9170249	14Ghz~40Ghz	Nov. 23, 2012	Apr. 03, 2013	Nov. 22, 2013	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100321	9KHZ-30MHZ	Jul. 03, 2012	Apr. 03, 2013	Jul. 02, 2013	Radiation (03CH01-SZ)
System Simulator	R&S	CMU200	100954	GSM	Jun. 14, 2012	Apr. 03, 2013	Jun. 13, 2013	Radiation (03CH01-SZ)
ESCIO TEST Receiver	R&S	1142.8007.03	100724	9K-3GHz	Mar. 28, 2013	Apr. 17, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	ETS-LINDGREN	3816/2SH	00103912	9KHz~30MHz	Mar. 28, 2013	Apr. 17, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	ETS-LINDGREN	3816/2SH	00103892	9KHz~30MHz	Mar. 28, 2013	Apr. 17, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AVR	Throma	61602	616020000891	N/A	Nov. 20, 2013	Apr. 17, 2013	Nov. 19, 2013	Conduction (CO01-SZ)
System Simulator	Agilent	E5515C	MY50264168	GSM/WCDMA /CDMA2000	Oct. 09, 2012	Apr. 17, 2013	Oct. 08, 2013	-

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 EP332505 as below.