FCC RF Test Report

APPLICANT	:	**ZTE CORPORATION**
EQUIPMENT	:	**CDMA 1X/EV-DO Wireless data Terminal**
BRAND NAME	:	**ZTE**
MODEL NAME	:	**AC60**
FCC ID	:	**SRQ-AC60**
STANDARD	:	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	:	**(DTS) Digital Transmission System**

The product was received on Apr. 08, 2013 and completely tested on Jun. 13, 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

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
FR340802	Rev. 01	Initial issue of report	Jun. 18, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	Under limit 3.40 dB at 2399.000 MHz
		Radiated Spurious Emission			
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.83 dB at 0.450 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	CDMA 1X/EV-DO Wireless data Terminal
Brand Name	ZTE
Model Name	AC60
FCC ID	SRQ-AC60
EUT supports Radios application	CDMA/EV-DO/WLAN 11bgn
HW Version	dy7B
SW Version	VISAFONE_AC60_C21
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 : 15.32 dBm (0.0340 W) 802.11g : 18.35 dBm (0.0684 W) 802.11n HT20 : 16.28 dBm (0.0425 W)
Antenna Type	Fixed Internal Antenna with gain -1.00 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 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	03CH01-SZ	CO01-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 (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.

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	**15.32**	15.21	15.19	15.25
CH 06	2437 MHz	14.74	14.75	14.72	14.82
CH 11	2462 MHz	15.28	15.29	15.21	15.3

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	16.62	16.23	16.49	16.03	18.32	18.27	18.15	**18.35**
CH 06	2437 MHz	16.6	16.11	16.06	15.97	18.08	18.13	17.9	17.93
CH 11	2462 MHz	16.46	16.12	16.3	15.87	18.33	18.3	18.21	18.34

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	14.33	13.82	14.13	**16.28**	16.18	16.19	16.18	16.23
CH 06	2437 MHz	14.92	13.45	13.85	15.79	15.75	15.77	15.73	15.81
CH 11	2462 MHz	14.25	13.61	14.03	16.15	16.25	16.17	16.19	16.22

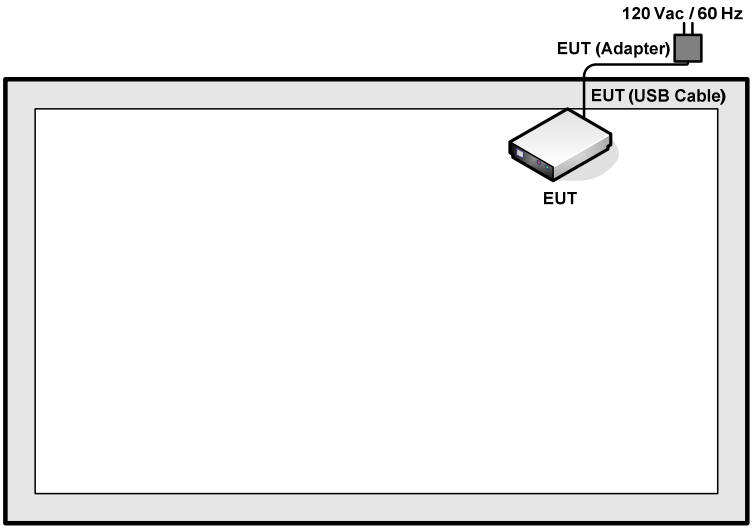
2.3 Test Mode

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

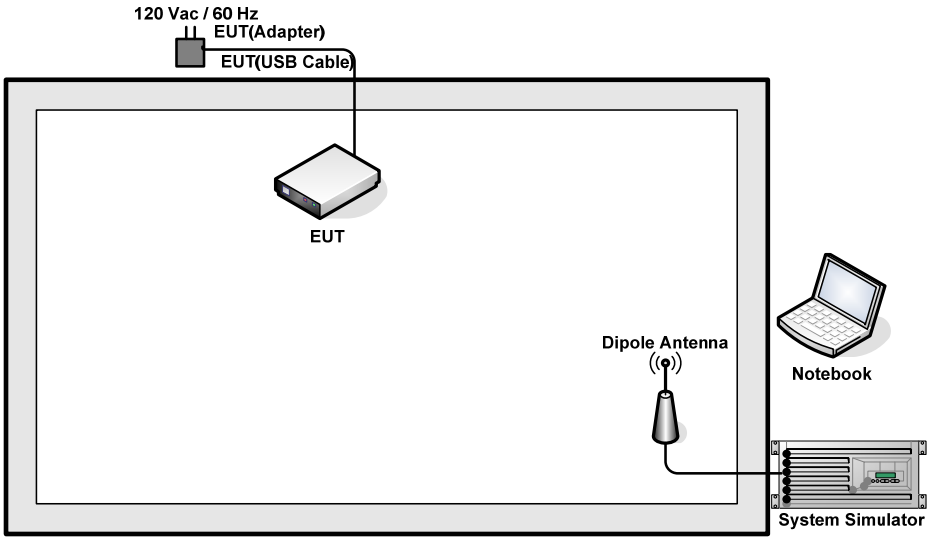
Test Cases				
	Test Items	**Mode**	**Data Rate**	**Test Channel**
Conducted TCs	**6dB BW Power Spectral Density**	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 Mbps**	**1/6/11**
		802.11n HT20	**26 Mbps**	**1/6/11**
	Output Power	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 Mbps**	**1/6/11**
		802.11n HT20	**26 Mbps**	**1/6/11**
	Conducted Band Edge	**802.11b**	**1 Mbps**	**1/11**
		802.11g	**54 Mbps**	**1/11**
		802.11n HT20	**26 Mbps**	**1/11**
	Conducted Spurious Emission	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 Mbps**	**1/6/11**
		802.11n HT20	**26 Mbps**	**1/6/11**
Radiated TCs	**Radiated Band Edge**	**802.11b**	**1 Mbps**	**1/11**
		802.11g	**54 Mbps**	**1/11**
		802.11n HT20	**26 Mbps**	**1/11**
	Radiated Spurious Emission	**802.11b**	**1 Mbps**	**1/6/11**
		802.11g	**54 Mbps**	**1/6/11**
		802.11n HT20	**26 Mbps**	**1/6/11**
AC Conducted Emission	Mode 1 : CDMA2000 BC0 Idle + WLAN Link + USB Cable(Charging from Adapter)			
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.				

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.	Notebook	DELL	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Notebook	DELL	VOSTRO1440	FCC DoC	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m

2.6 RF Utility

For WLAN function, programmed RF utility, “sscom” installed in the notebook 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 7.5 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.

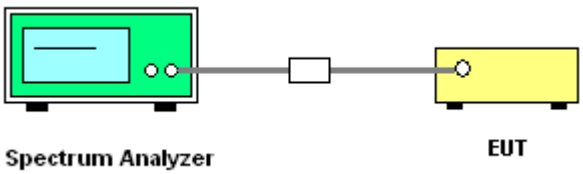
3.1.2 Measuring Instruments

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

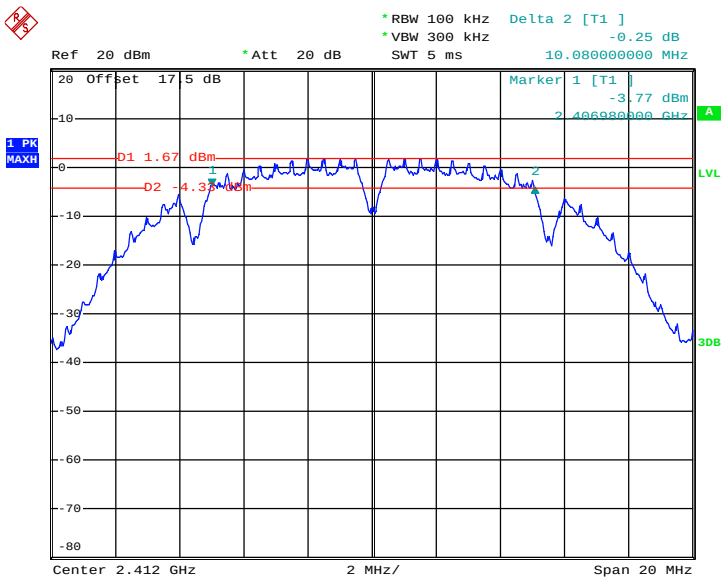


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Fly Liang	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	10.08	0.5	Pass
11	2462	10.06	0.5	Pass

6 dB Bandwidth Plot on 802.11b Channel 01



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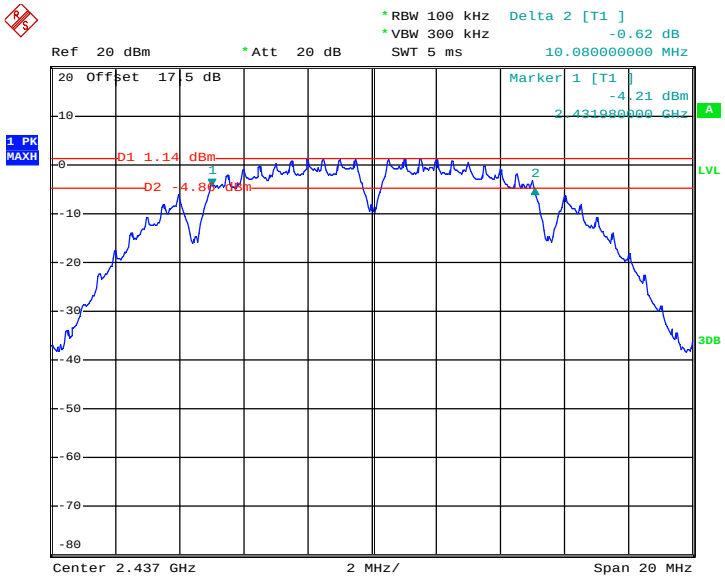
6 dB Bandwidth Plot on 802.11b Channel 06



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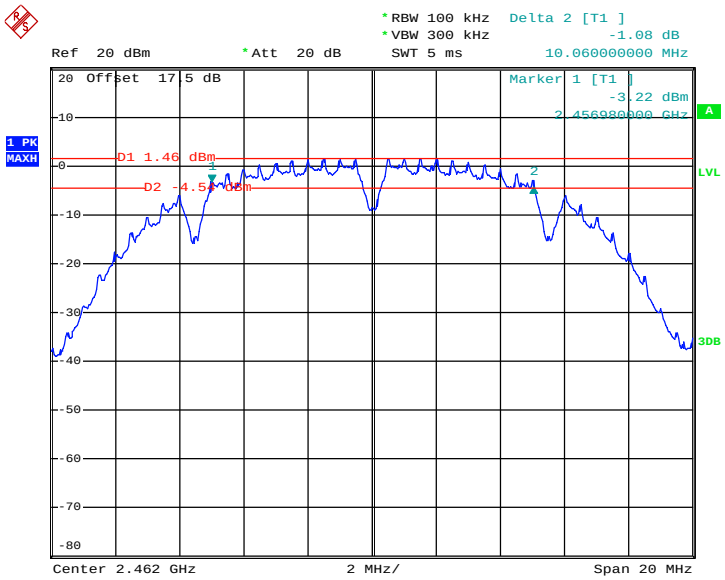
6 dB Bandwidth Plot on 802.11b Channel 11



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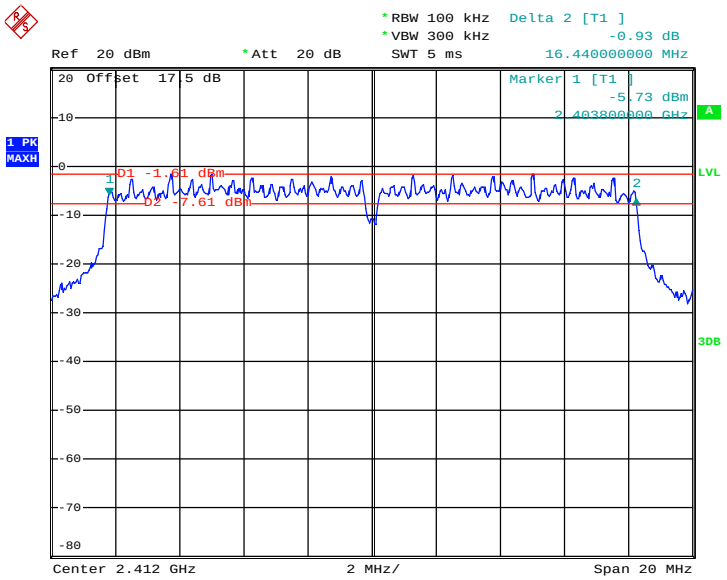
Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.44	0.5	Pass
06	2437	16.44	0.5	Pass
11	2462	16.48	0.5	Pass

6 dB Bandwidth Plot on 802.11g Channel 01



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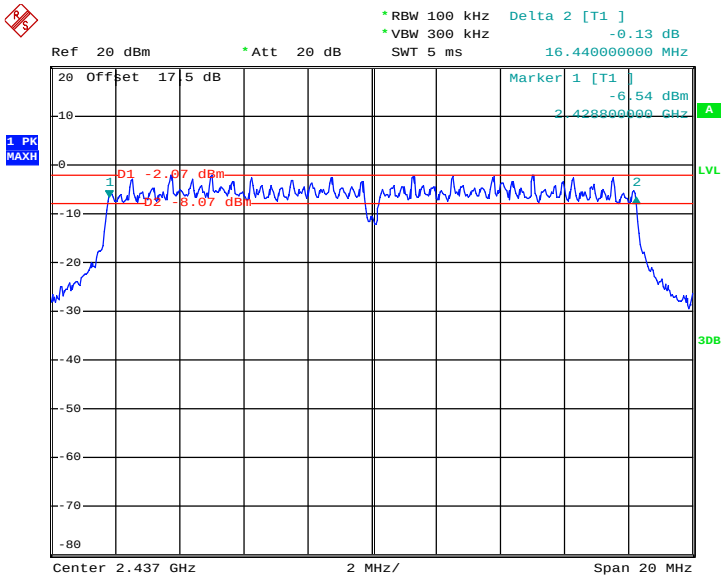
6 dB Bandwidth Plot on 802.11g Channel 06



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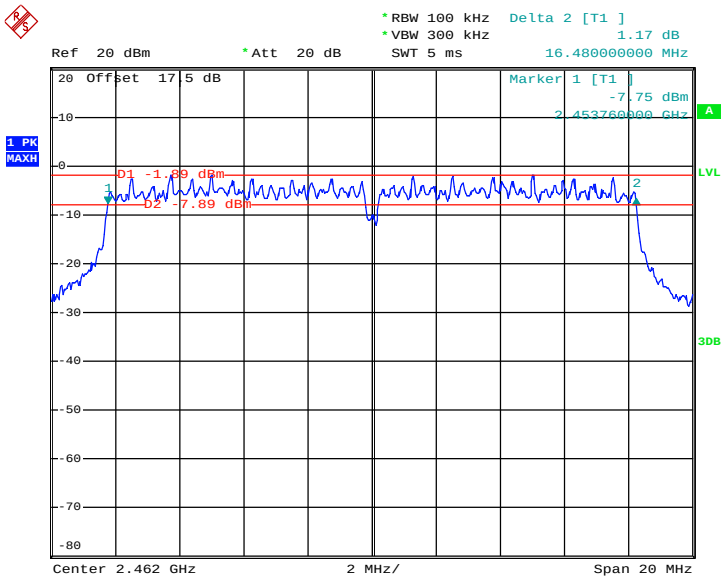
6 dB Bandwidth Plot on 802.11g Channel 11

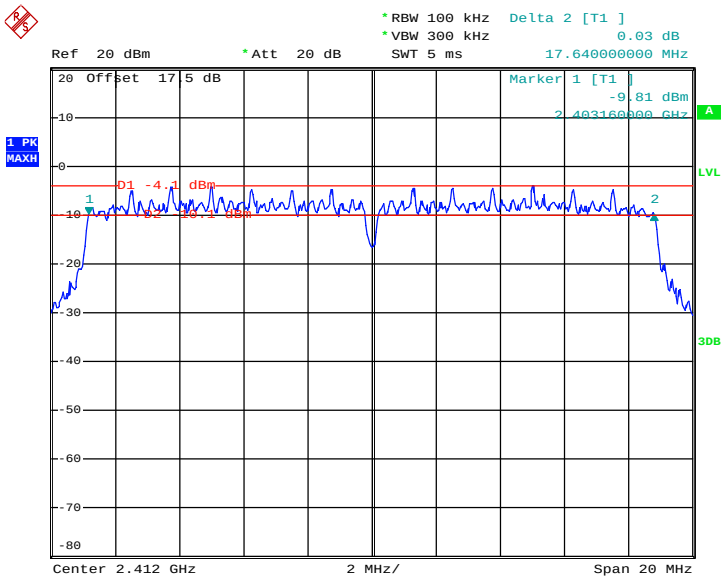


Date: 9.JUN.2013 04:21:02

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.64	0.5	Pass
06	2437	17.64	0.5	Pass
11	2462	17.64	0.5	Pass

6 dB Bandwidth Plot on 802.11n HT20 Channel 01



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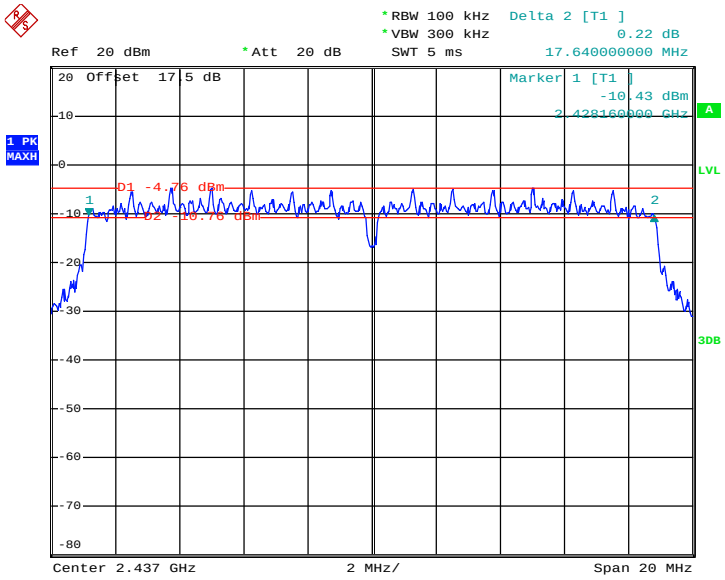
6 dB Bandwidth Plot on 802.11n HT20 Channel 06



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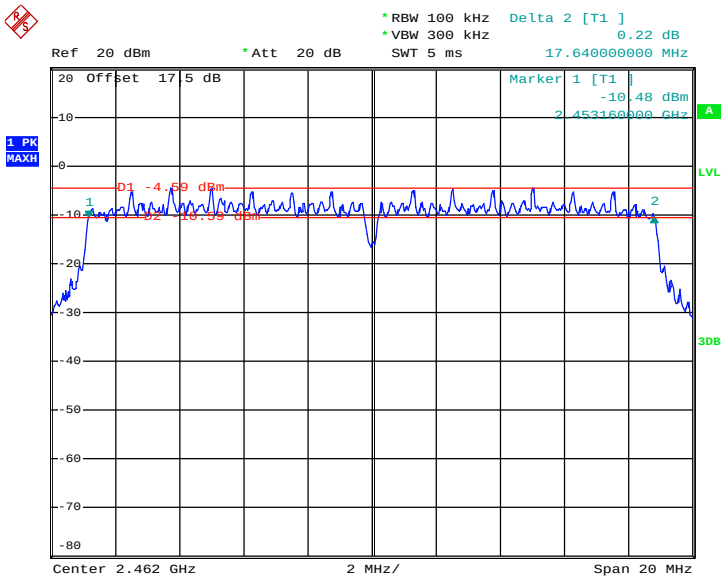
6 dB Bandwidth Plot on 802.11n HT20 Channel 11



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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.

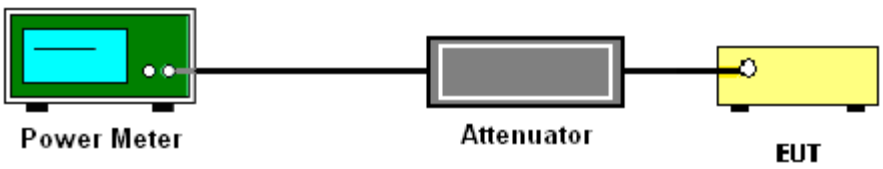
3.2.2 Measuring Instruments

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 power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

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

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	15.32	30	Pass
06	2437	14.74	30	Pass
11	2462	15.28	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.35	30	Pass
06	2437	17.93	30	Pass
11	2462	18.34	30	Pass

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	16.28	30	Pass
06	2437	15.79	30	Pass
11	2462	16.15	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	13.03
06	2437	12.31
11	2462	13.01

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%
Duty Cycle:	87.86%	Duty Factor:	0.56dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	9.98
06	2437	9.42
11	2462	9.91

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%
Duty Cycle:	94.10%	Duty Factor:	0.26dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	7.43
06	2437	6.99
11	2462	7.32

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.

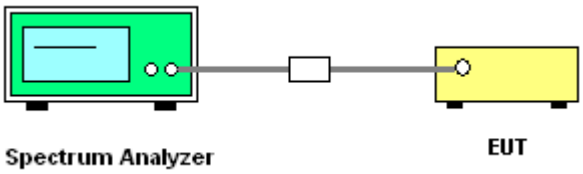
3.3.2 Measuring Instruments

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 :	Fly Liang	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	1.67	-12.90	8	Pass
06	2437	1.15	-13.09	8	Pass
11	2462	1.46	-13.01	8	Pass

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Fly Liang	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	-1.63	-16.12	8	Pass
06	2437	-2.22	-16.92	8	Pass
11	2462	-1.97	-15.58	8	Pass

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

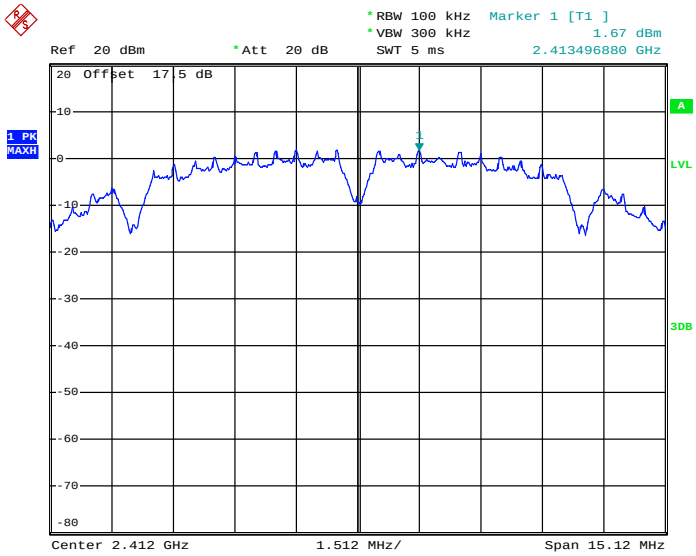
Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-4.14	-18.71	8	Pass
06	2437	-4.84	-19.14	8	Pass
11	2462	-4.65	-19.21	8	Pass

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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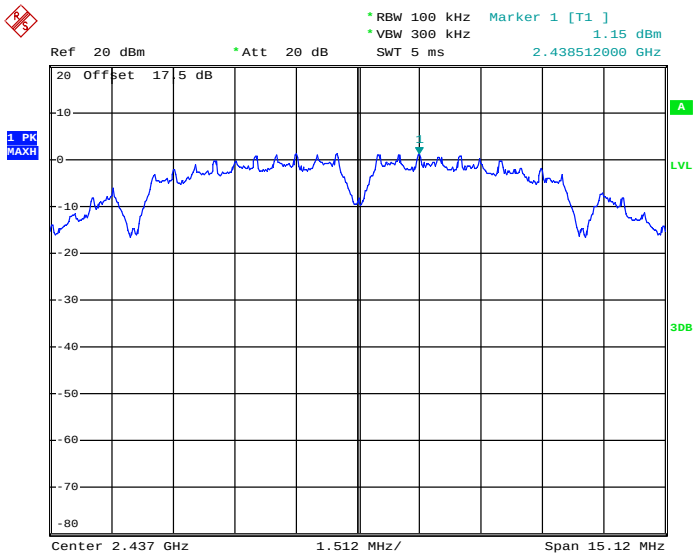
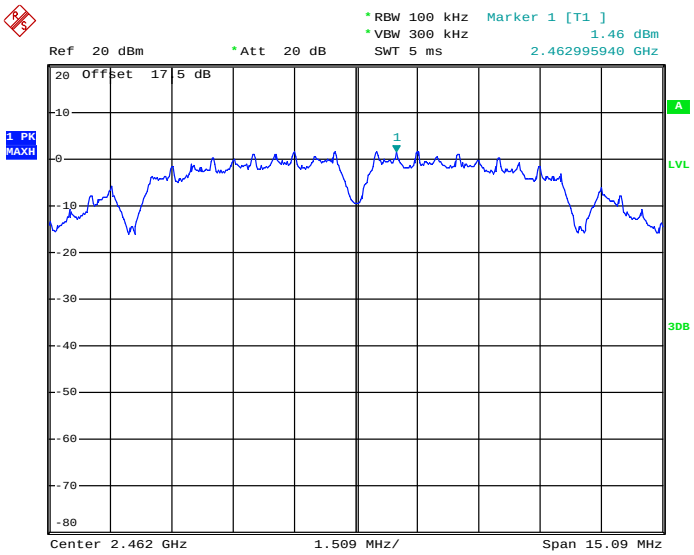
PSD 100kHz Plot on 802.11b Channel 06



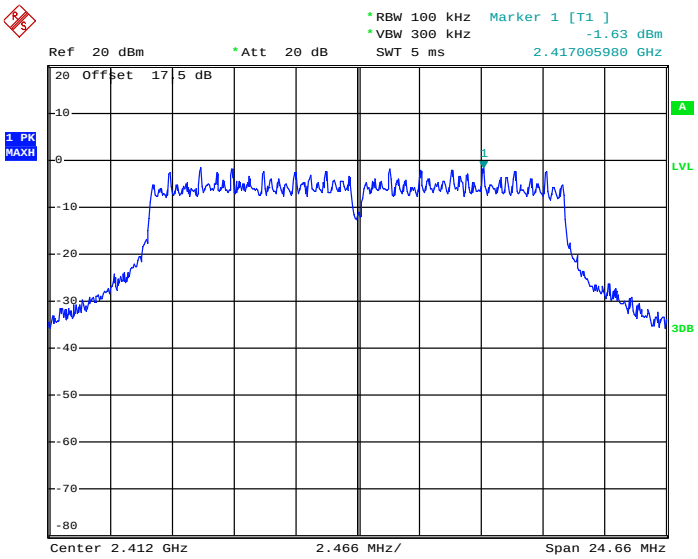
Date: 13.JUN.2013 12:57:37

PSD 100kHz Plot on 802.11b Channel 11



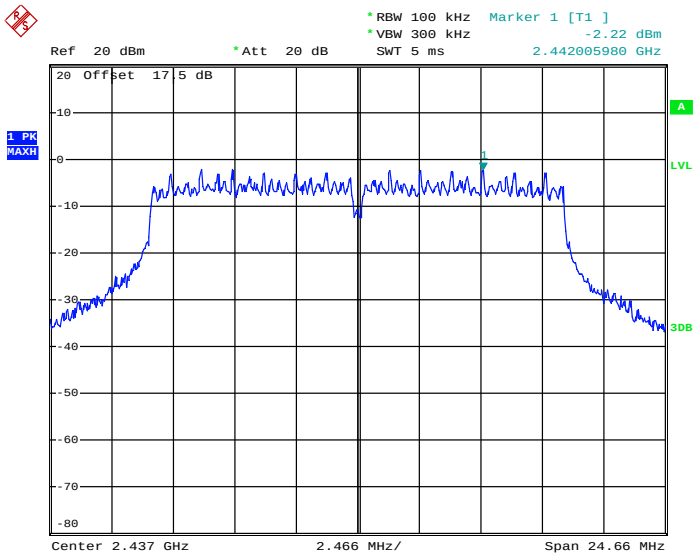
Date: 13.JUN.2013 13:00:31

PSD 100kHz Plot on 802.11g Channel 01



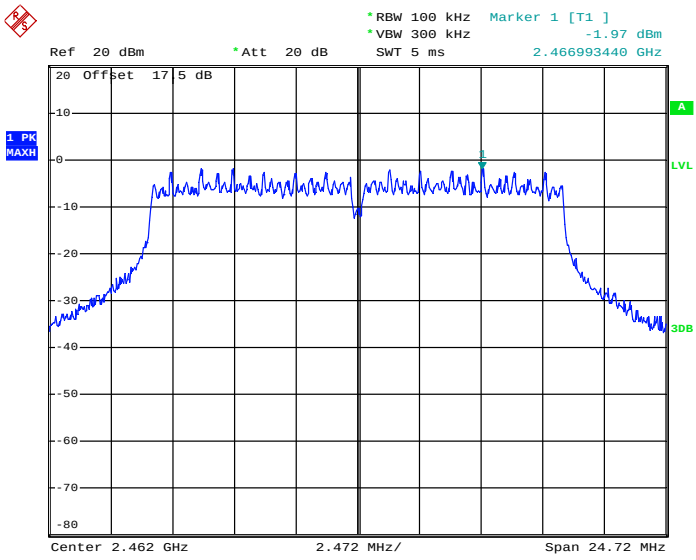
Date: 9.JUN.2013 04:35:44

PSD 100kHz Plot on 802.11g Channel 06



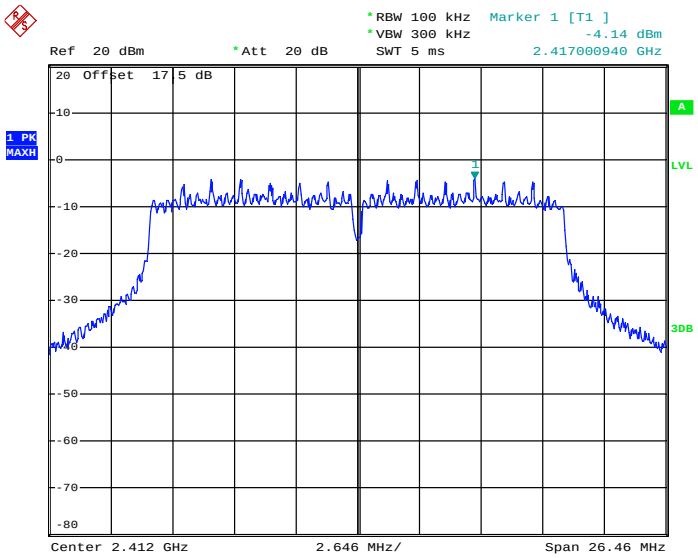
Date: 9.JUN.2013 04:12:40

PSD 100kHz Plot on 802.11g Channel 11



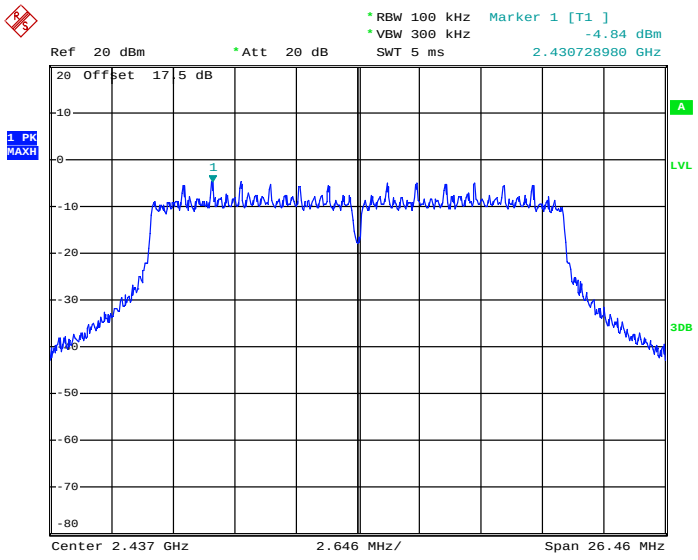
Date: 9.JUN.2013 04:22:20

PSD 100kHz Plot on 802.11n HT20 Channel 01



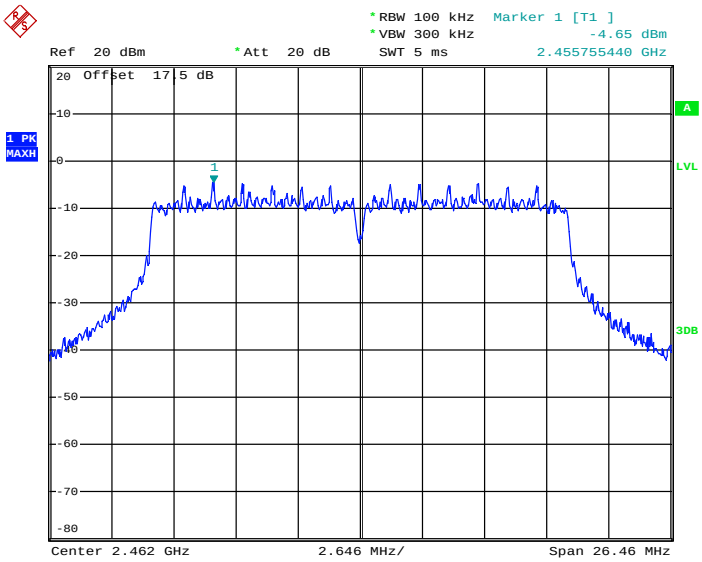
Date: 13.JUN.2013 13:04:05

PSD 100kHz Plot on 802.11n HT20 Channel 06



Date: 13.JUN.2013 13:07:00

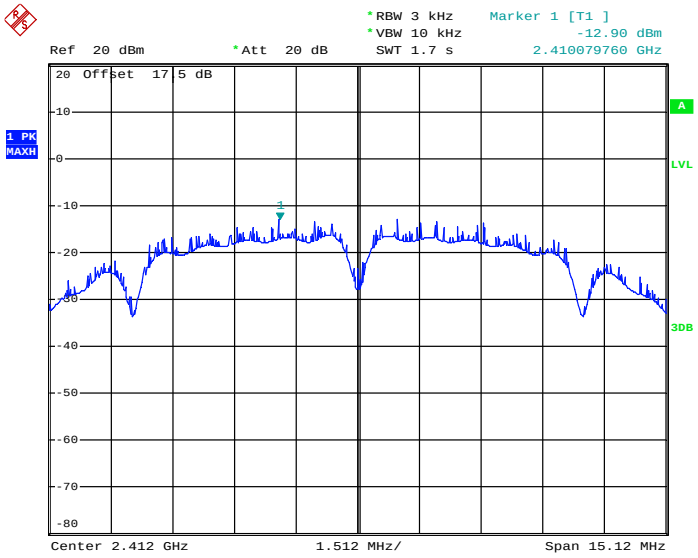
PSD 100kHz Plot on 802.11n HT20 Channel 11



Date: 13.JUN.2013 13:09:42

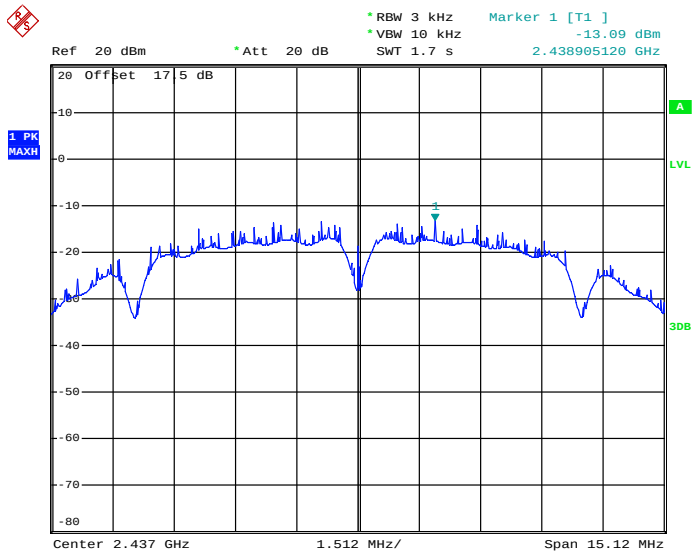
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



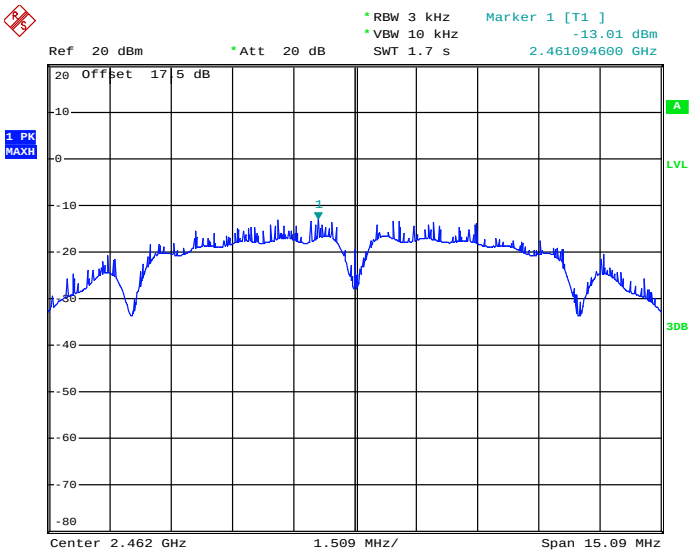
Date: 13.JUN.2013 12:53:43

PSD 3kHz Plot on 802.11b Channel 06



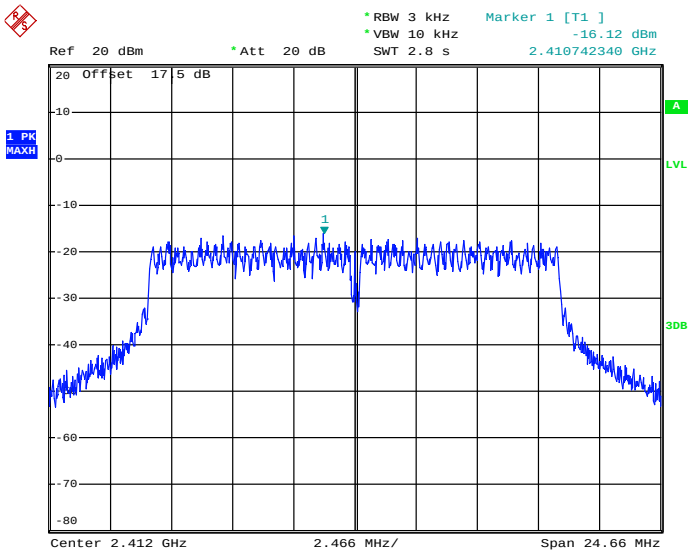
Date: 13.JUN.2013 12:57:23

PSD 3kHz Plot on 802.11b Channel 11



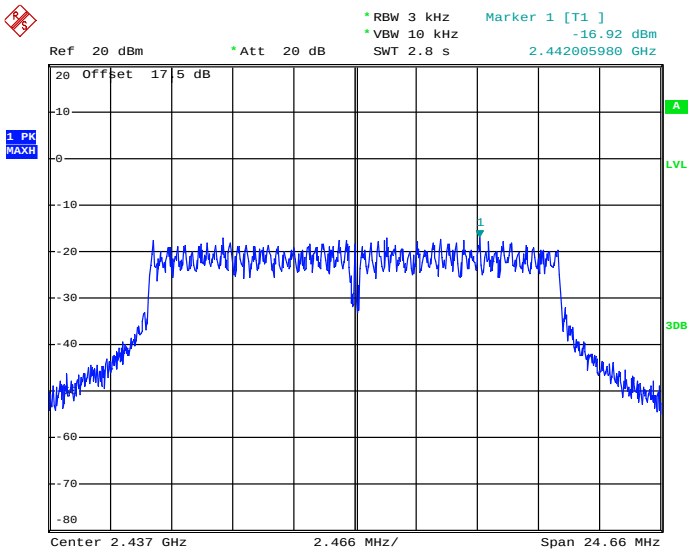
Date: 13.JUN.2013 13:00:18

PSD 3kHz Plot on 802.11g Channel 01



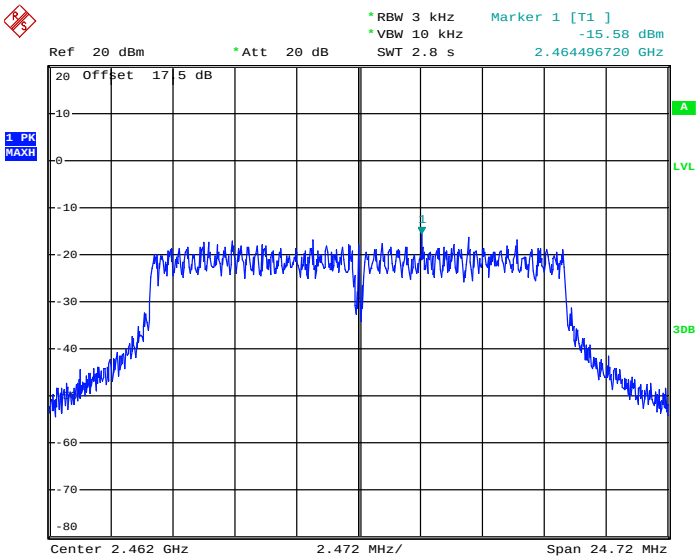
Date: 9.JUN.2013 04:35:29

PSD 3kHz Plot on 802.11g Channel 06



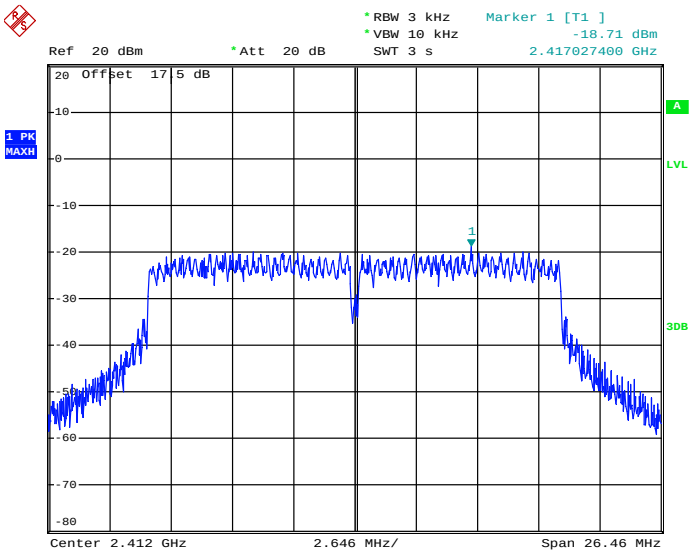
Date: 9.JUN.2013 04:12:27

PSD 3kHz Plot on 802.11g Channel 11



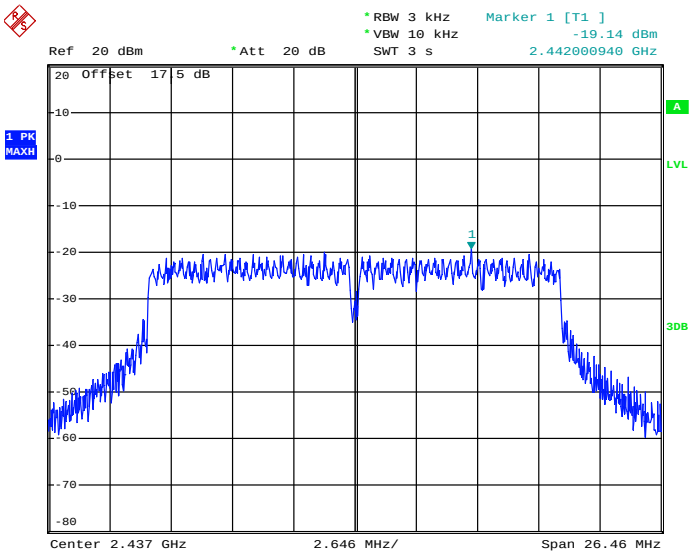
Date: 9.JUN.2013 04:21:32

PSD 3kHz Plot on 802.11n HT20 Channel 01



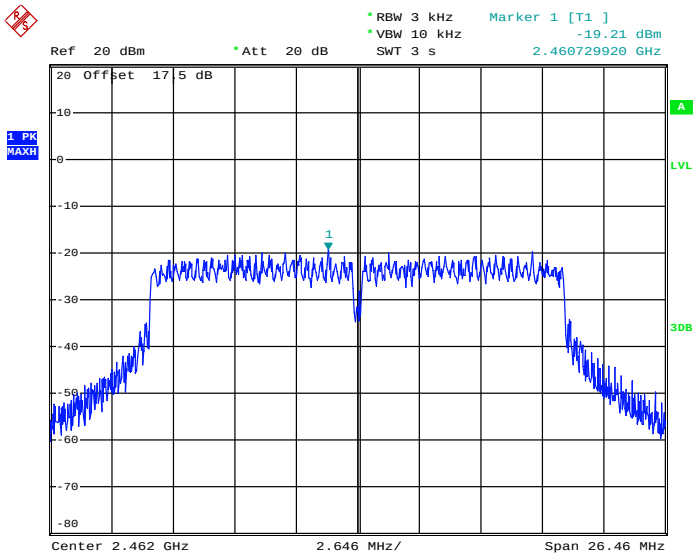
Date: 13.JUN.2013 13:03:52

PSD 3kHz Plot on 802.11n HT20 Channel 06



Date: 13.JUN.2013 13:06:46

PSD 3kHz Plot on 802.11n HT20 Channel 11



Date: 13.JUN.2013 13:09:29

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).

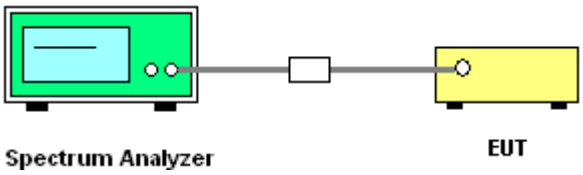
3.4.2 Measuring Instruments

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.

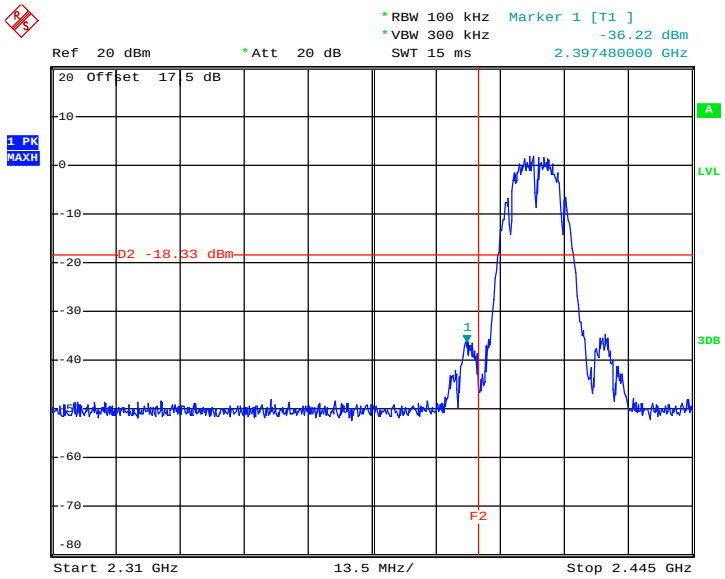
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

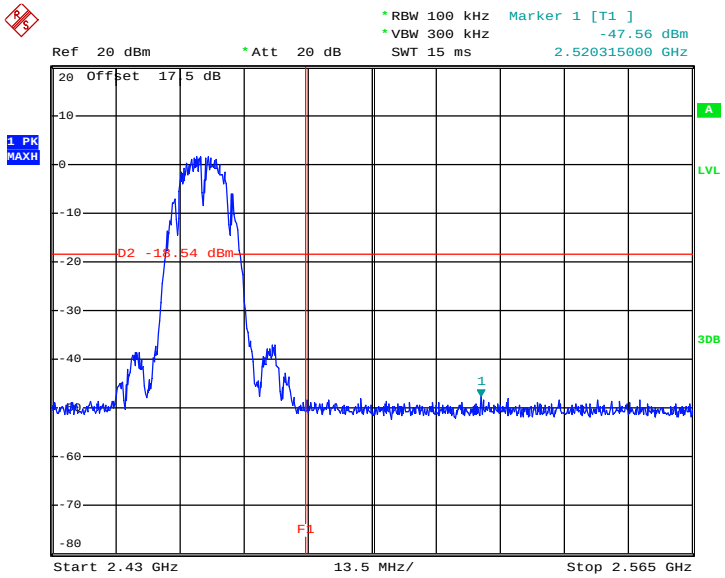
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	Low and High	**Relative Humidity :**	50~53%
Test Channel :	01 and 11	**Test Engineer :**	Fly Liang

Low Band Edge Plot on 802.11b Channel 01



Date: 13.JUN.2013 12:54:44

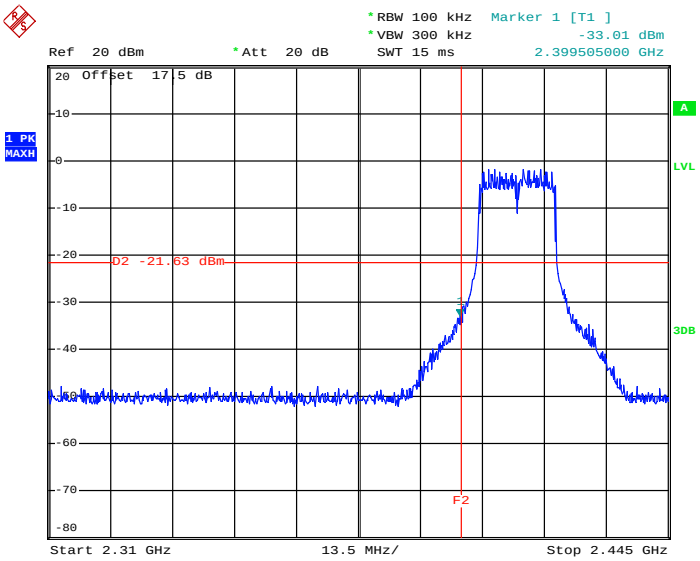
High Band Edge Plot on 802.11b Channel 11



Date: 13.JUN.2013 13:00:52

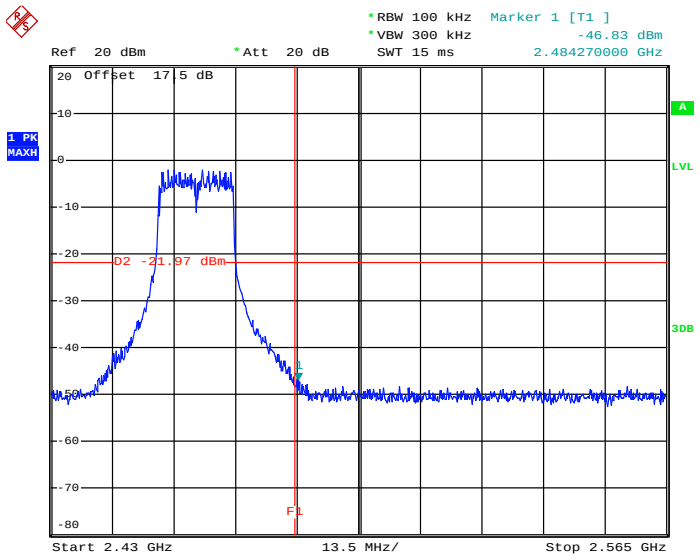
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Fly Liang

Low Band Edge Plot on 802.11g Channel 01



Date: 9.JUN.2013 04:36:44

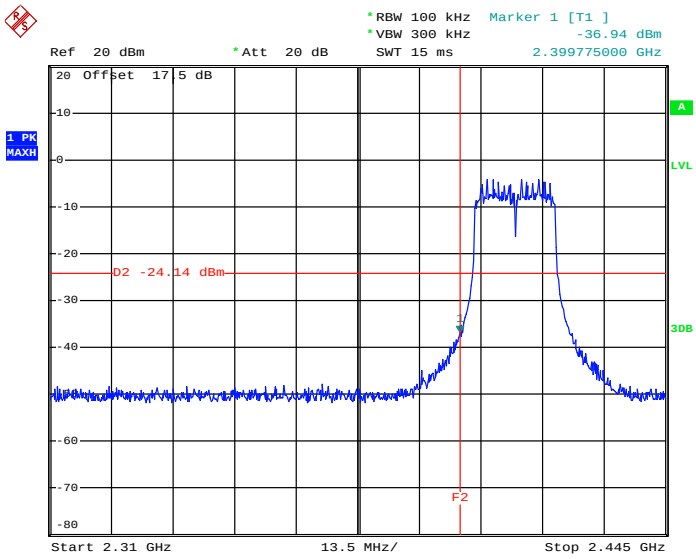
High Band Edge Plot on 802.11g Channel 11



Date: 9.JUN.2013 04:23:25

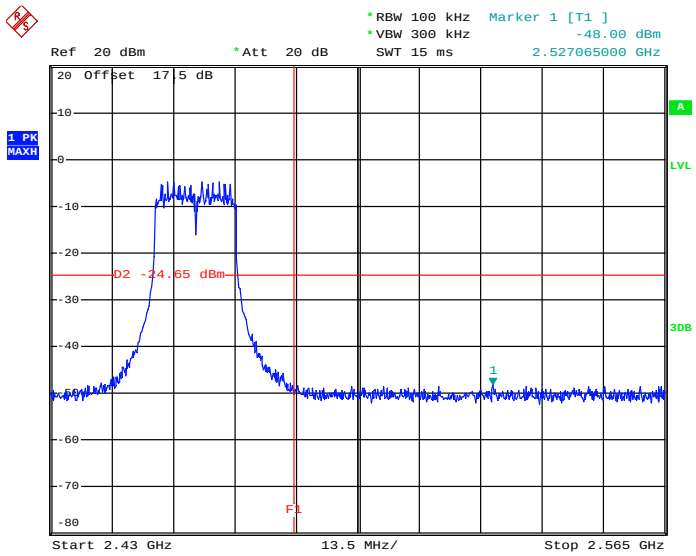
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Fly Liang

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 13.JUN.2013 13:04:25

High Band Edge Plot on 802.11n HT20 Channel 11



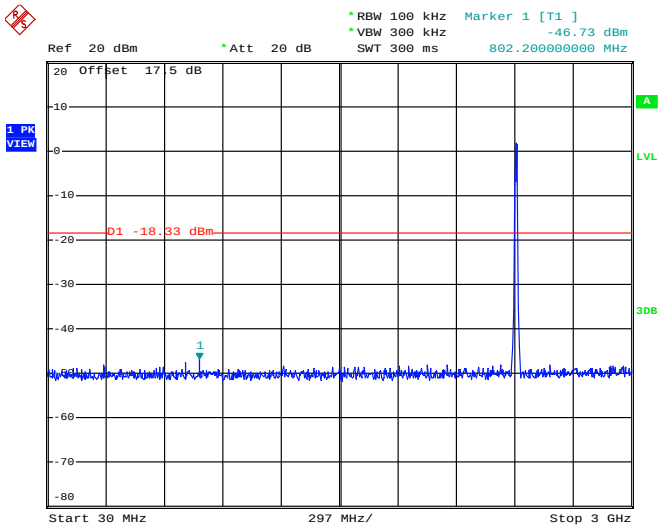
Date: 13.JUN.2013 13:10:09

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 :	Fly Liang

802.11b 30 MHz~3 GHz

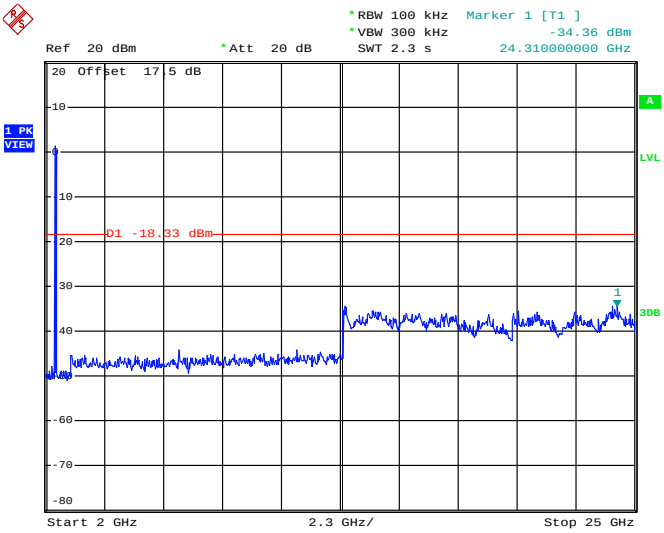
Conducted Spurious Emission Plot on Channel 01



Date: 13.JUN.2013 12:55:23

802.11b 2 GHz~25 GHz

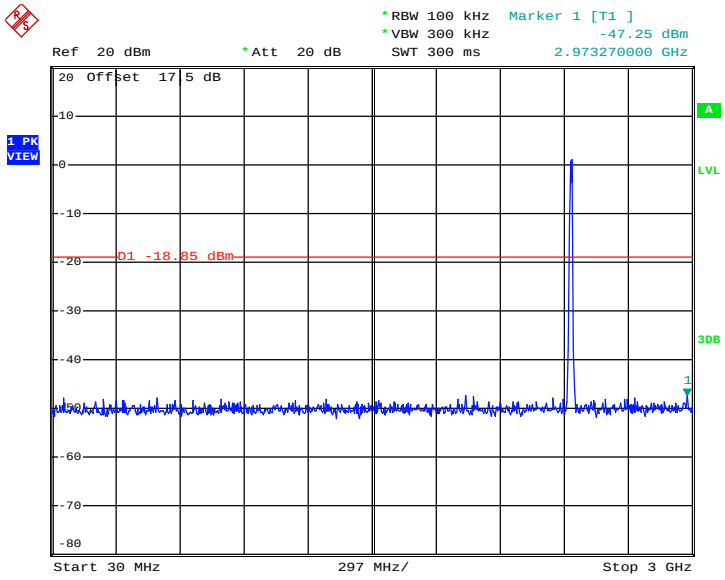
Conducted Spurious Emission Plot on Channel 01



Date: 13.JUN.2013 12:55:42

802.11b 30 MHz~3 GHz

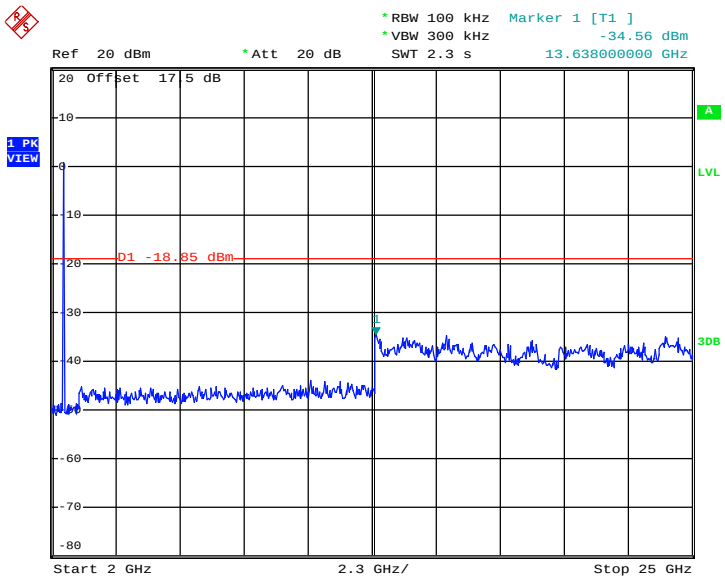
Conducted Spurious Emission Plot on Channel 06



Date: 13.JUN.2013 12:58:11

802.11b 2 GHz~25 GHz

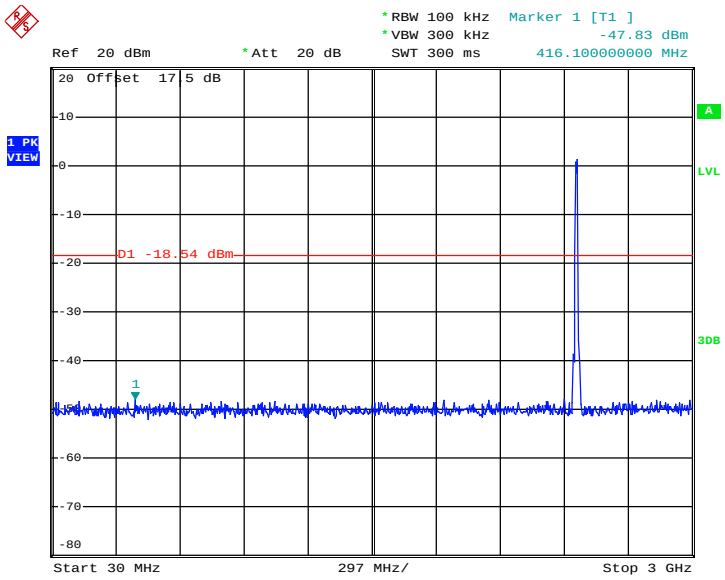
Conducted Spurious Emission Plot on Channel 06



Date: 13.JUN.2013 12:58:30

802.11b 30 MHz~3 GHz

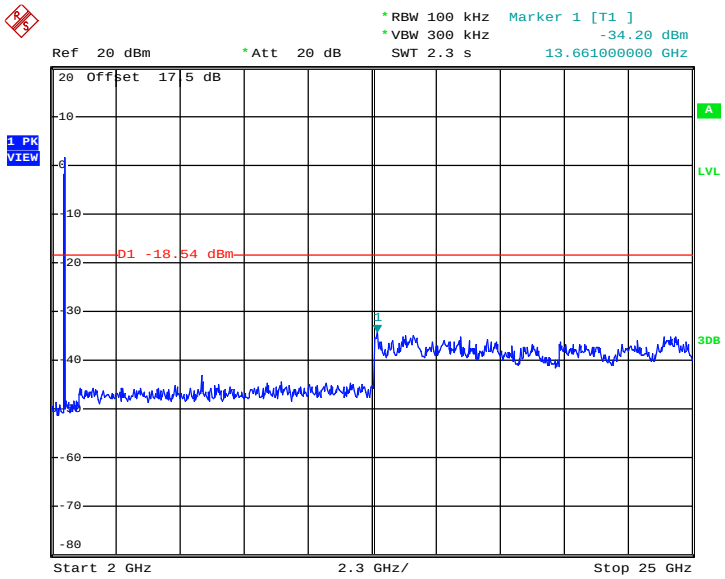
Conducted Spurious Emission Plot on Channel 11



Date: 13.JUN.2013 13:01:15

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

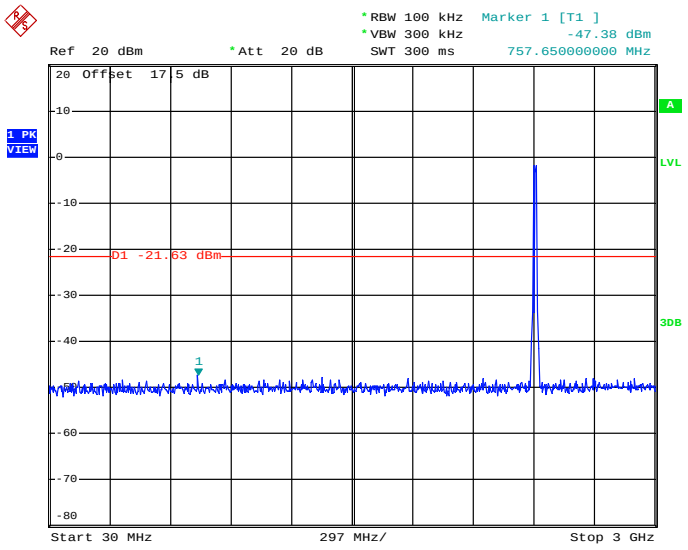


Date: 13.JUN.2013 13:01:33

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 :	Fly Liang

802.11g 30 MHz~3 GHz

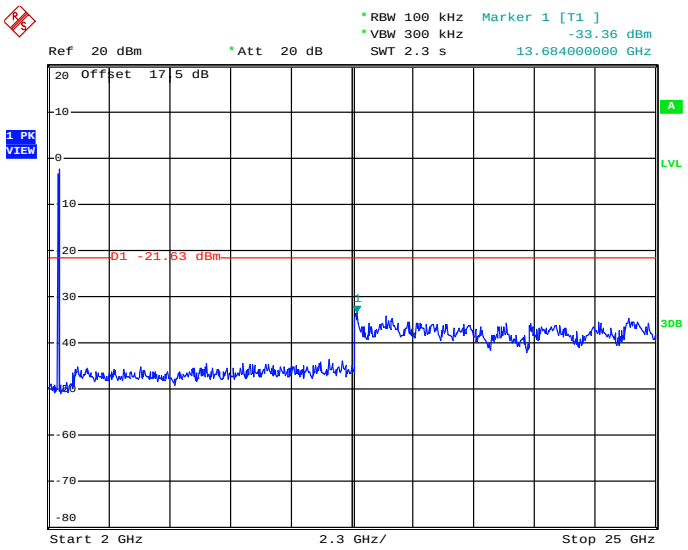
Conducted Spurious Emission Plot on Channel 01



Date: 9.JUN.2013 04:42:49

802.11g 2 GHz~25 GHz

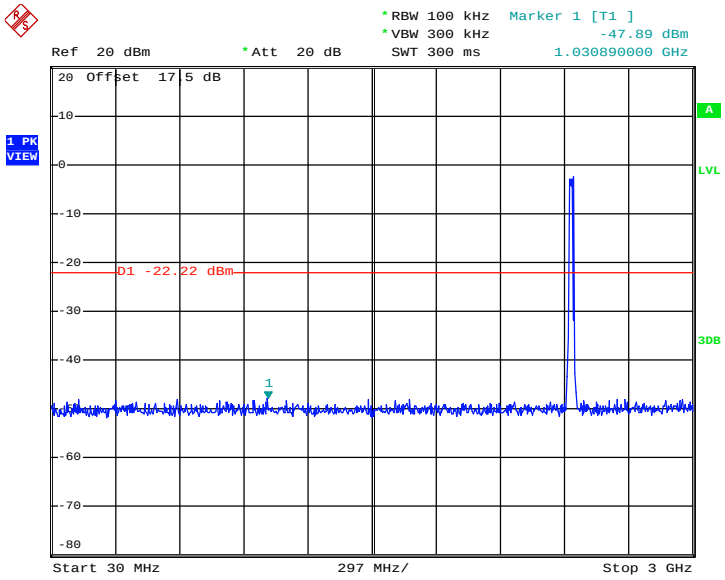
Conducted Spurious Emission Plot on Channel 01



Date: 9.JUN.2013 04:43:08

802.11g 30 MHz~3 GHz

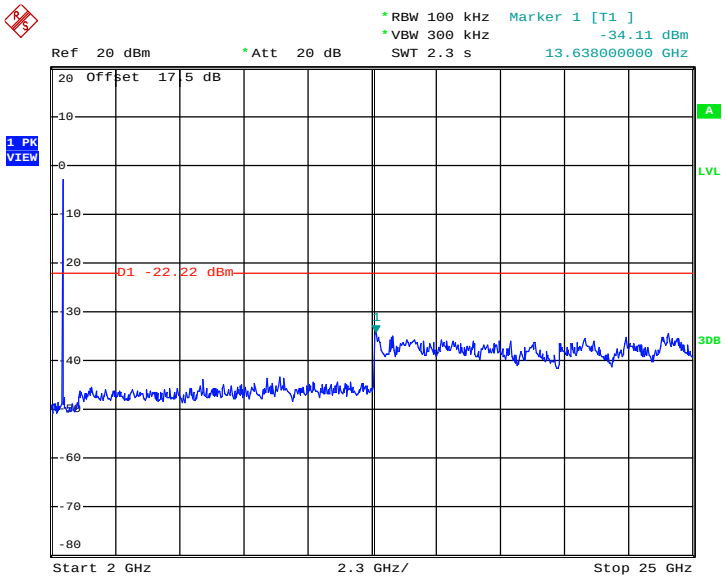
Conducted Spurious Emission Plot on Channel 06



Date: 9.JUN.2013 04:13:53

802.11g 2 GHz~25 GHz

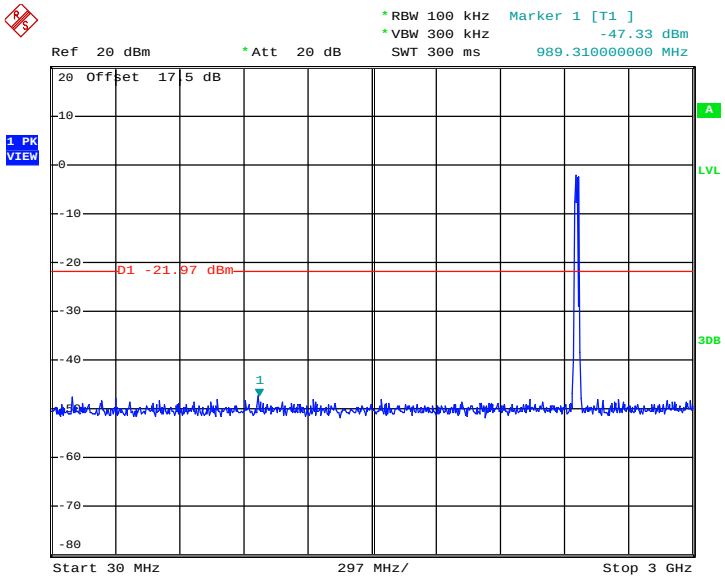
Conducted Spurious Emission Plot on Channel 06



Date: 9.JUN.2013 04:14:12

802.11g 30 MHz~3 GHz

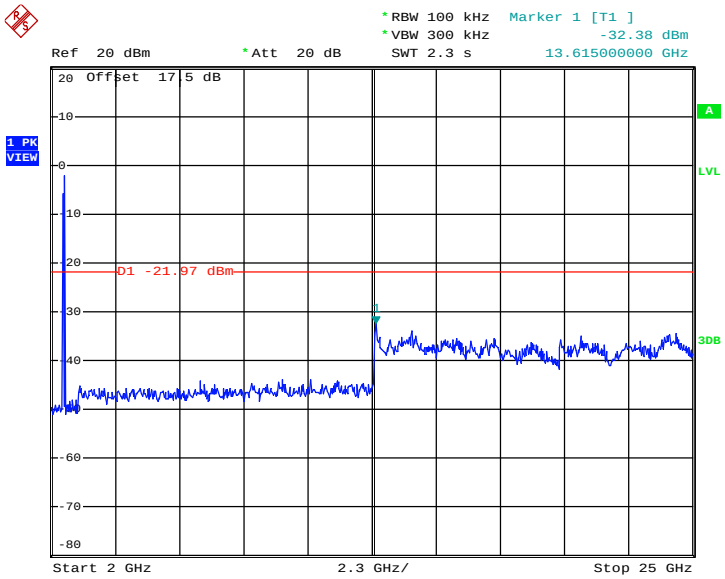
Conducted Spurious Emission Plot on Channel 11



Date: 9.JUN.2013 04:24:59

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

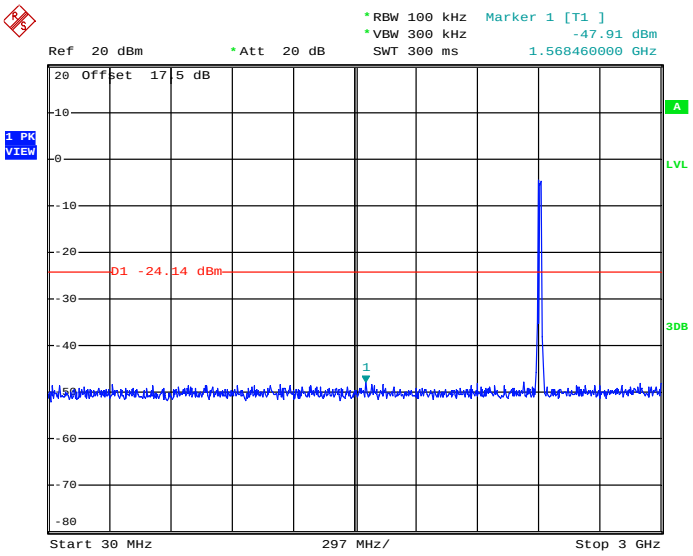


Date: 9.JUN.2013 04:25:18

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 :	Fly Liang

802.11n HT20 30 MHz~3 GHz

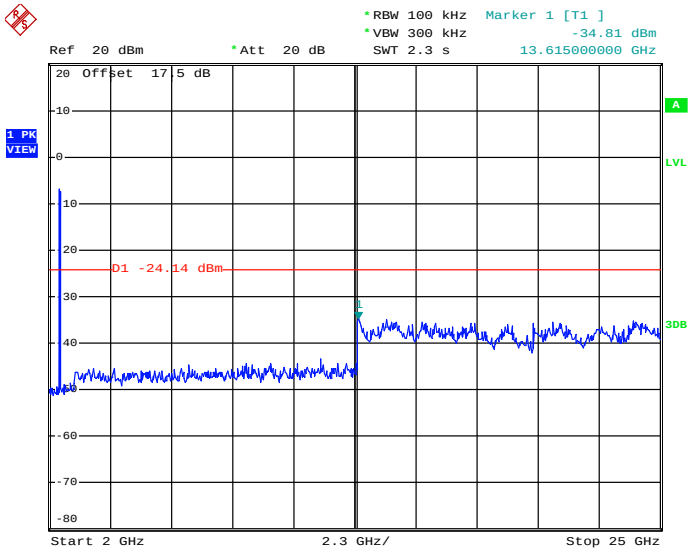
Conducted Spurious Emission Plot on Channel 01



Date: 13.JUN.2013 13:04:51

802.11n HT20 2 GHz~25 GHz

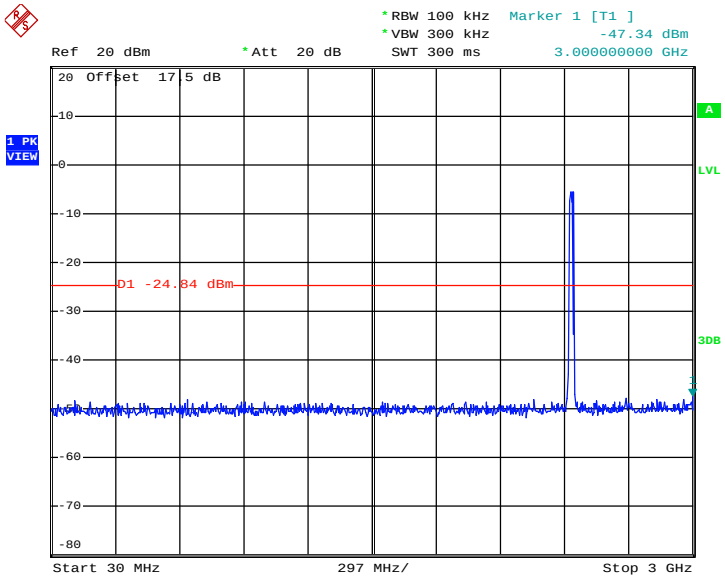
Conducted Spurious Emission Plot on Channel 01



Date: 13.JUN.2013 13:05:09

802.11n HT20 30 MHz~3 GHz

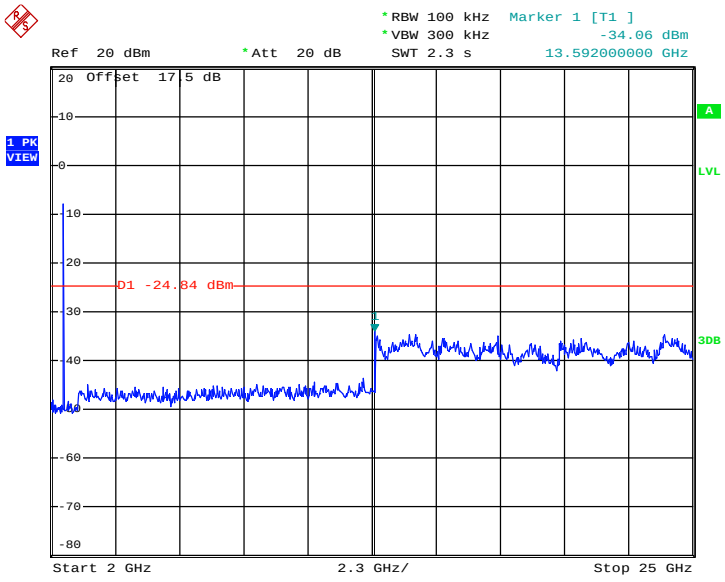
Conducted Spurious Emission Plot on Channel 06



Date: 13.JUN.2013 13:07:28

802.11n HT20 2 GHz~25 GHz

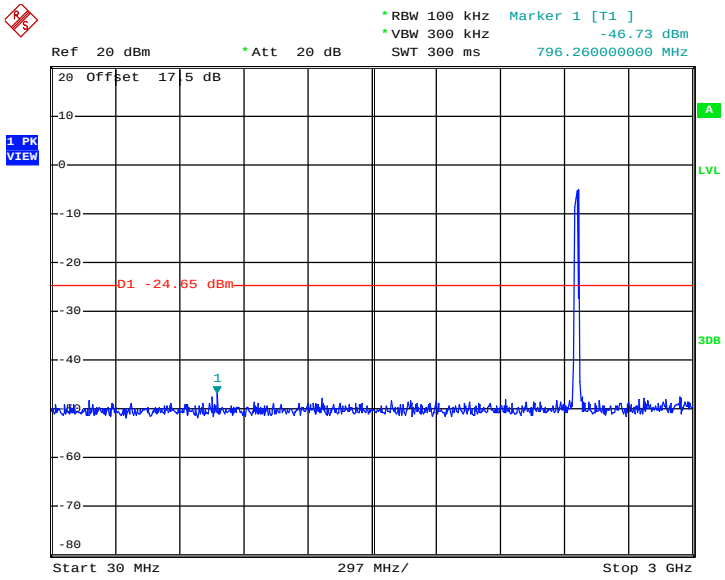
Conducted Spurious Emission Plot on Channel 06



Date: 13.JUN.2013 13:07:46

802.11n HT20 30 MHz~3 GHz

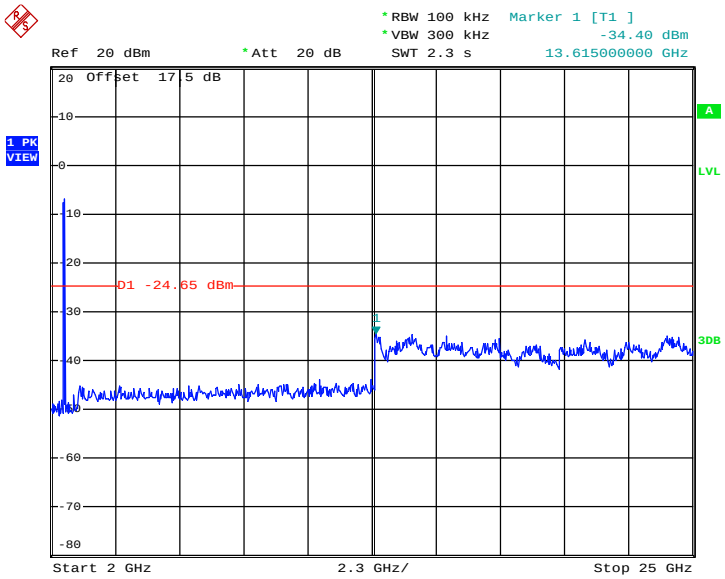
Conducted Spurious Emission Plot on Channel 11



Date: 13.JUN.2013 13:10:39

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 13.JUN.2013 13:10:58

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious 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

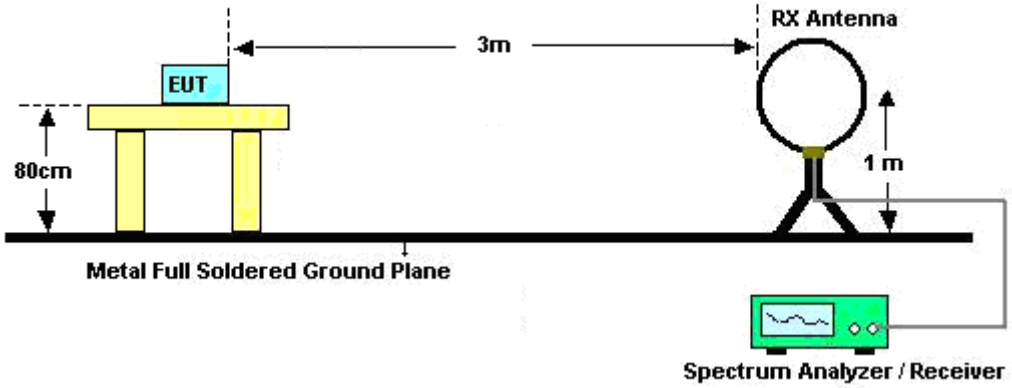
1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better 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	100.000	-	-	10hz
802.11g	87.857	0.246	4.065	10Khz
2.4G 802.11n HT20	94.096	0.510	1.961	3Khz

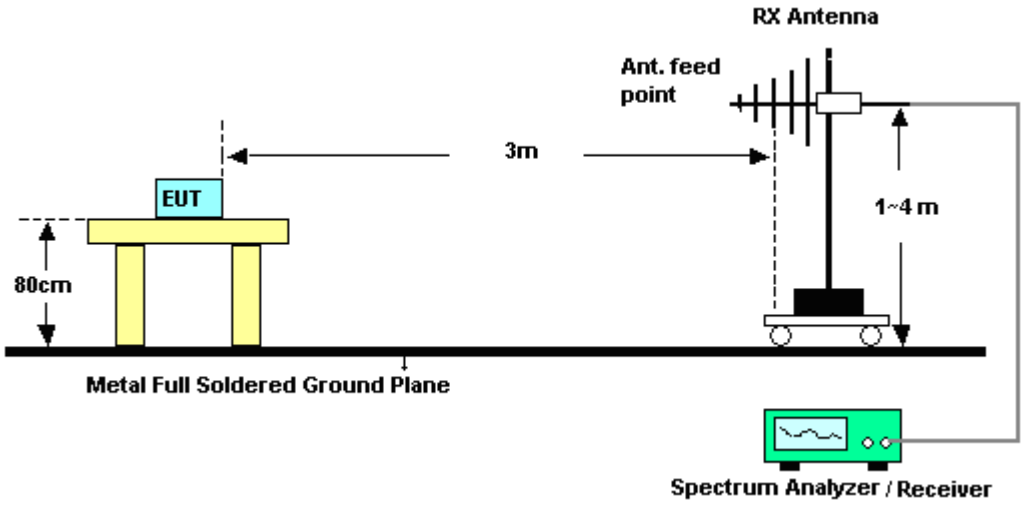
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

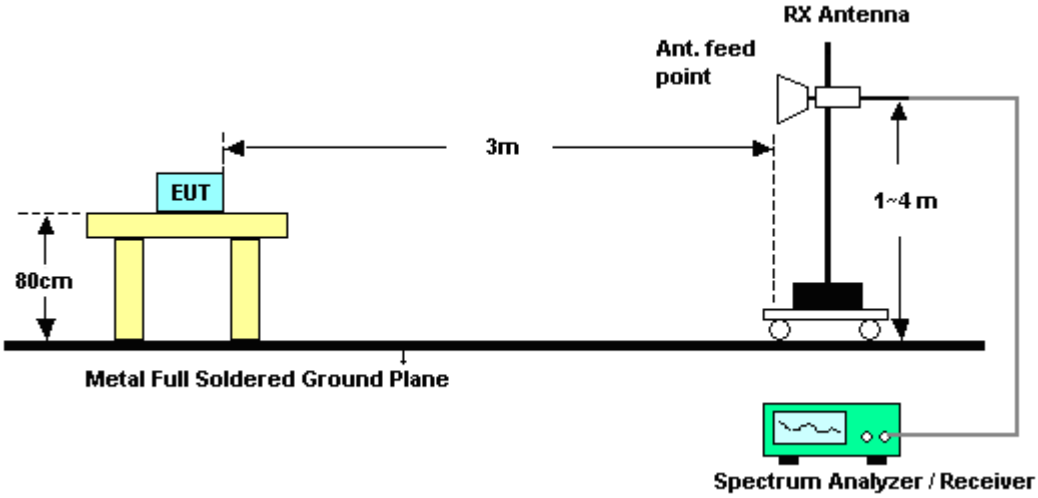
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emission (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 :	49~50%
Test Channel :	01	Test Engineer :	Robin Luo

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
2389.65	56.17	-17.83	74	49.4	32.14	4.42	29.79	100	274	Peak
2390	46.52	-7.48	54	39.74	32.14	4.42	29.78	100	274	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
2389.83	55.52	-18.48	74	48.74	32.14	4.42	29.78	139	316	Peak
2390	45.74	-8.26	54	38.96	32.14	4.42	29.78	139	316	Average

Test Mode :	802.11b	Temperature :	24~25℃
Test Band :	High	Relative Humidity :	49~50%
Test Channel :	11	Test Engineer :	Robin Luo

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
2484.4	48.14	-25.86	74	41.16	32.27	4.47	29.76	100	19	Peak
2485.51	35.35	-18.65	54	28.37	32.27	4.47	29.76	100	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
2489.11	51.22	-22.78	74	44.2	32.29	4.49	29.76	134	38	Peak
2485.12	38.58	-15.42	54	31.6	32.27	4.47	29.76	134	38	Average

Test Mode :	802.11g	Temperature :	24~25℃
Test Band :	Low	Relative Humidity :	49~50%
Test Channel :	01	Test Engineer :	Robin Luo

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
2389.65	66.69	-7.31	74	59.92	32.14	4.42	29.79	134	119	Peak
2390	48.9	-5.1	54	42.12	32.14	4.42	29.78	134	119	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.65	68.44	-5.56	74	61.67	32.14	4.42	29.79	100	259	Peak
2389.83	50.08	-3.92	54	43.3	32.14	4.42	29.78	100	259	Average

Test Mode :	802.11g	Temperature :	24~25℃
Test Band :	High	Relative Humidity :	49~50%
Test Channel :	11	Test Engineer :	Robin Luo

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	58.88	-15.12	74	51.9	32.27	4.47	29.76	100	240	Peak
2483.56	40.9	-13.1	54	33.92	32.27	4.47	29.76	100	240	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	60.88	-13.12	74	53.9	32.27	4.47	29.76	135	322	Peak
2483.53	45.66	-8.34	54	38.68	32.27	4.47	29.76	135	322	Average

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Band :	Low	Relative Humidity :	49~50%
Test Channel :	01	Test Engineer :	Robin Luo

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	66.23	-7.77	74	59.45	32.14	4.42	29.78	100	261	Peak
2389.92	46.83	-7.17	54	40.05	32.14	4.42	29.78	100	261	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	66.25	-7.75	74	59.47	32.14	4.42	29.78	107	347	Peak
2390	46.98	-7.02	54	40.2	32.14	4.42	29.78	107	347	Average

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Band :	High	Relative Humidity :	49~50%
Test Channel :	11	Test Engineer :	Robin Luo

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	56.59	-17.41	74	49.61	32.27	4.47	29.76	119	258	Peak
2483.59	41.37	-12.63	54	34.39	32.27	4.47	29.76	119	258	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
2483.65	53.46	-20.54	74	46.48	32.27	4.47	29.76	135	300	Peak
2483.71	39.37	-14.63	54	32.39	32.27	4.47	29.76	135	300	Average

3.5.7 Test Result of Radiated Spurious 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 :**	49~50%
Test Engineer :	Robin Luo	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 20dB below the highest emission level. For example, 106.49 dBuV/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	72.1	-14.39	86.49	65.32	32.14	4.42	29.78	100	274	Peak
2412	106.49	-	-	99.66	32.17	4.44	29.78	100	274	Peak
2412	101.62	-	-	94.79	32.17	4.44	29.78	100	274	Average
4824	38.65	-35.35	74	56.63	33.68	5.95	57.61	100	360	Peak
7236	40.13	-46.36	86.49	55.24	35.29	7.58	57.98	100	320	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 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	72.44	-15.6	88.04	65.66	32.14	4.42	29.78	139	311	Peak
2412	108.04	-	-	101.21	32.17	4.44	29.78	139	311	Peak
2412	103.06	-	-	96.23	32.17	4.44	29.78	139	311	Average
4824	38.52	-35.48	74	56.5	33.68	5.95	57.61	200	360	Peak
7236	39.75	-48.29	88.04	54.86	35.29	7.58	57.98	100	21	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	105.16	-	-	98.26	32.22	4.45	29.77	200	0	Peak
2437	96.9	-	-	90	32.22	4.45	29.77	200	0	Average
4874	38.67	-35.33	74	56.25	33.8	6.02	57.4	100	320	Peak
7311	40.18	-33.82	74	55.04	35.31	7.8	57.97	200	210	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	105.84	-	-	98.94	32.22	4.45	29.77	100	0	Peak
2437	92.9	-	-	86	32.22	4.45	29.77	100	0	Average
4874	38.43	-35.57	74	56.01	33.8	6.02	57.4	100	320	Peak
7311	38.8	-35.2	74	53.66	35.31	7.8	57.97	200	360	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	102.46	-	-	95.51	32.24	4.47	29.76	100	14	Peak
2462	96.52	-	-	89.57	32.24	4.47	29.76	100	14	Average
4924	38.51	-35.49	74	55.68	33.92	6.1	57.19	200	360	Peak
7386	40.09	-33.91	74	54.56	35.35	8.12	57.94	100	320	Peak

Test Mode :	802.11b	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	107.53	-	-	100.58	32.24	4.47	29.76	133	38	Peak
2462	102.59	-	-	95.64	32.24	4.47	29.76	133	38	Average
4924	38.17	-35.83	74	27.5	33.92	6.1	29.35	100	258	Peak
7386	39.53	-34.47	74	54	35.35	8.12	57.94	200	360	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 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
97.77	29.38	-14.12	43.5	48.22	10.67	1.16	30.67	-	-	Peak
145.02	33.11	-10.39	43.5	51.18	11.2	1.25	30.52	100	360	Peak
290.55	35.49	-10.51	46	50.23	13.6	1.69	30.03	-	-	Peak
303.5	23.27	-22.73	46	38.52	13.04	1.7	29.99	-	-	Peak
414.1	26.88	-19.12	46	37.75	16.82	1.93	29.62	-	-	Peak
852.3	25.04	-20.96	46	29.82	21.36	2.72	28.86	-	-	Peak
2399	77.67	-3.4	81.07	70.89	32.14	4.42	29.78	134	119	Peak
2412	101.07	-	-	94.24	32.17	4.44	29.78	134	119	Peak
2412	91.63	-	-	84.8	32.17	4.44	29.78	134	119	Average
4824	38.65	-35.35	74	56.63	33.68	5.95	57.61	100	360	Peak
7236	40.13	-40.94	81.07	55.24	35.29	7.58	57.98	100	320	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 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
87.24	30.91	-9.09	40	51.28	9.15	1.11	30.63	200	360	Peak
131.79	33.23	-10.27	43.5	50.3	12.25	1.24	30.56	-	-	Peak
160.41	33.59	-9.91	43.5	52.89	9.9	1.27	30.47	-	-	Peak
358.1	28.61	-17.39	46	41.56	15.02	1.84	29.81	-	-	Peak
402.2	29.37	-16.63	46	40.54	16.58	1.91	29.66	-	-	Peak
899.2	25.15	-20.85	46	30.02	21.22	2.71	28.8	-	-	Peak
2399	81.95	-3.88	85.83	75.17	32.14	4.42	29.78	100	259	Peak
2412	105.83	-	-	99	32.17	4.44	29.78	100	259	Peak
2412	95.64	-	-	88.81	32.17	4.44	29.78	100	259	Average
4824	38.52	-35.48	74	56.5	33.68	5.95	57.61	200	360	Peak
7236	39.75	-46.08	85.83	54.86	35.29	7.58	57.98	100	21	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	108.07	-	-	101.17	32.22	4.45	29.77	100	280	Peak
2437	98.11	-	-	91.21	32.22	4.45	29.77	100	280	Average
4874	38.67	-35.33	74	56.25	33.8	6.02	57.4	200	360	Peak
7311	40.18	-33.82	74	55.04	35.31	7.8	57.97	100	320	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	111.43	-	-	104.53	32.22	4.45	29.77	162	318	Peak
2437	99.95	-	-	93.05	32.22	4.45	29.77	162	318	Average
4874	38.43	-35.57	74	56.01	33.8	6.02	57.4	200	360	Peak
7311	38.8	-35.2	74	53.66	35.31	7.8	57.97	200	123	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	105.25	-	-	98.3	32.24	4.47	29.76	100	240	Peak
2462	96.95	-	-	90	32.24	4.47	29.76	100	240	Average
4924	38.51	-35.49	74	55.68	33.92	6.1	57.19	100	320	Peak
7386	39.09	-34.91	74	53.56	35.35	8.12	57.94	200	360	Peak

Test Mode :	802.11g	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	110.44	-	-	103.49	32.24	4.47	29.76	135	322	Peak
2462	99.73	-	-	92.78	32.24	4.47	29.76	135	322	Average
4924	38.17	-35.83	74	55.34	33.92	6.1	57.19	200	360	Peak
7386	39.53	-34.47	74	54	35.35	8.12	57.94	100	320	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 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	79.85	-3.84	83.69	73.07	32.14	4.42	29.78	100	264	Peak
2412	103.69	-	-	96.86	32.17	4.44	29.78	100	264	Peak
2412	93.06	-	-	86.23	32.17	4.44	29.78	100	264	Average
4824	38.65	-35.35	74	56.63	33.68	5.95	57.61	100	360	Peak
7236	40.13	-43.56	83.69	55.24	35.29	7.58	57.98	100	320	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	01	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399 MHz and 7236 MHz are not within restricted bands, and their limit lines are 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	80.05	-3.83	83.88	73.27	32.14	4.42	29.78	107	347	Peak
2412	103.88	-	-	97.05	32.17	4.44	29.78	107	347	Peak
2412	93	-	-	86.17	32.17	4.44	29.78	107	347	Average
4824	38.52	-35.48	74	56.5	33.68	5.95	57.61	200	360	Peak
7236	39.75	-44.13	83.88	54.86	35.29	7.58	57.98	100	21	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	99.03	-	-	92.13	32.22	4.45	29.77	200	0	Peak
2437	88.9	-	-	82	32.22	4.45	29.77	200	0	Average
4874	37.67	-36.33	74	55.25	33.8	6.02	57.4	100	360	Peak
7311	40.18	-33.82	74	55.04	35.31	7.8	57.97	200	360	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	06	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	100.15	-	-	93.25	32.22	4.45	29.77	100	0	Peak
2437	90.3	-	-	83.4	32.22	4.45	29.77	100	0	Average
4874	38.43	-35.57	74	56.01	33.8	6.02	57.4	100	258	Peak
7311	37.8	-36.2	74	52.66	35.31	7.8	57.97	300	321	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	102.22	-	-	95.27	32.24	4.47	29.76	118	258	Peak
2462	91.25	-	-	84.3	32.24	4.47	29.76	118	258	Average
4924	38.51	-35.49	74	55.68	33.92	6.1	57.19	100	360	Peak
7386	41.09	-32.91	74	55.56	35.35	8.12	57.94	100	360	Peak

Test Mode :	802.11n HT20	Temperature :	24~25℃
Test Channel :	11	Relative Humidity :	49~50%
Test Engineer :	Robin Luo	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	101.3	-	-	94.35	32.24	4.47	29.76	135	299	Peak
2462	90.04	-	-	83.09	32.24	4.47	29.76	135	299	Average
4924	38.17	-35.83	74	55.34	33.92	6.1	57.19	200	360	Peak
7386	39.53	-34.47	74	54	35.35	8.12	57.94	100	254	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.

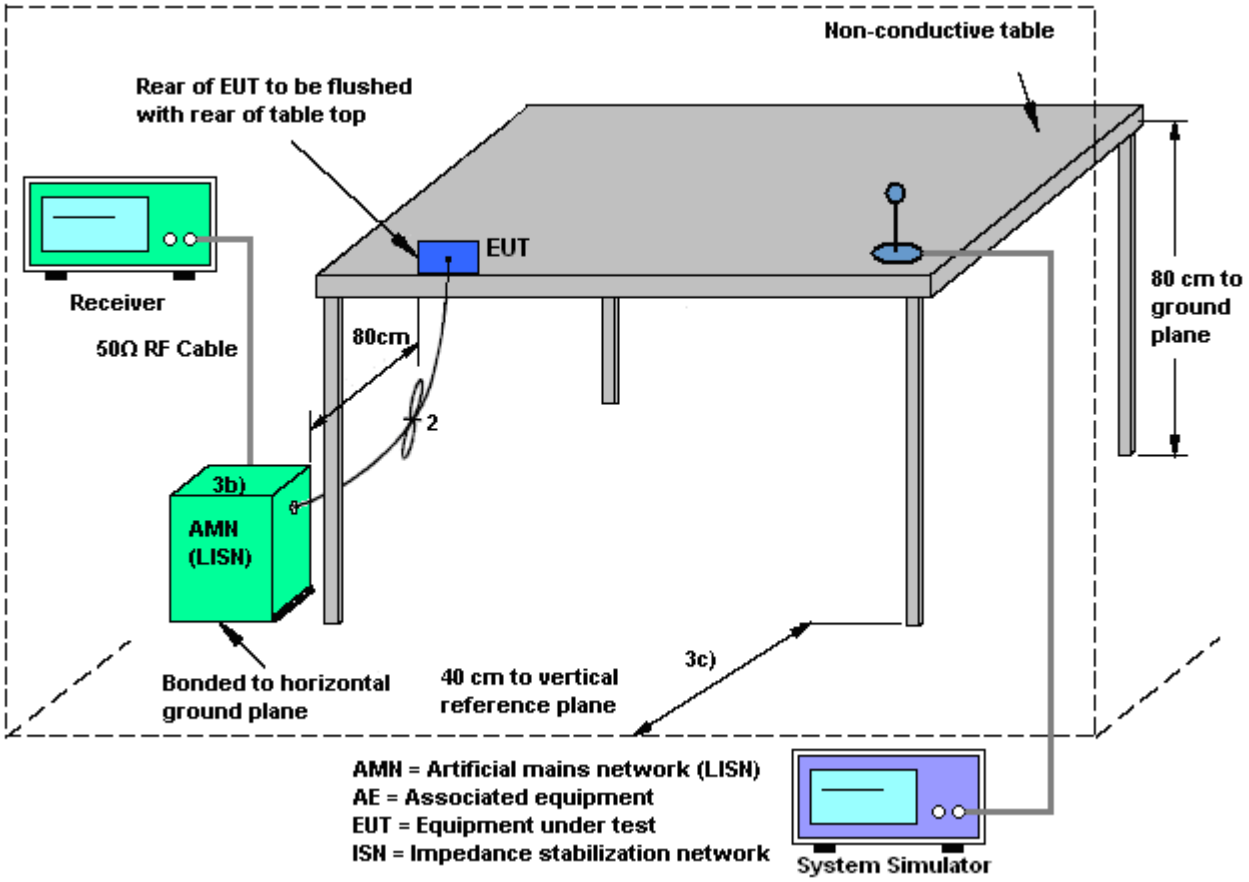
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

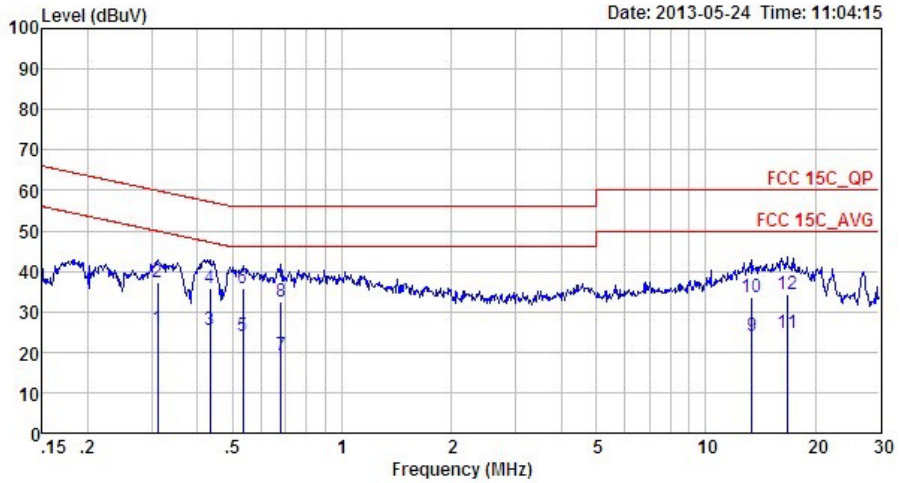
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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

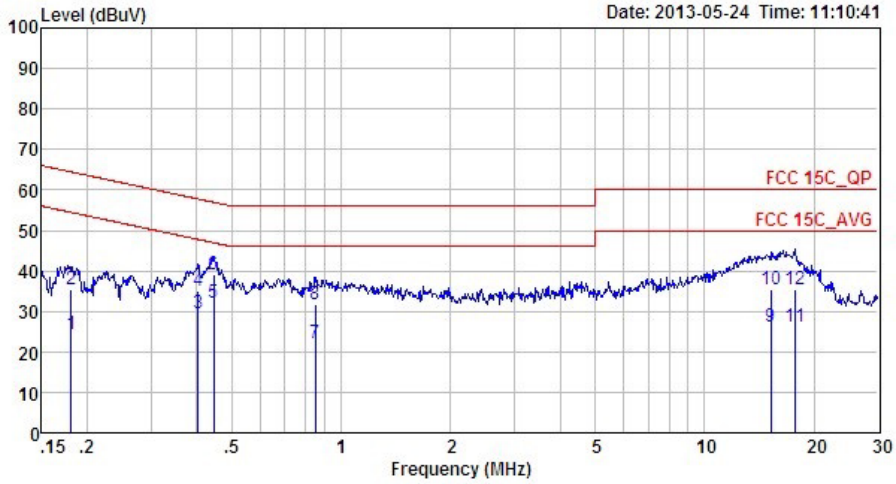
Test Mode :	Mode 1	Temperature :	24~25℃
Test Engineer :	Leo Liao	Relative Humidity :	48~49%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	CDMA2000 BC0 Idle + WLAN Link + USB Cable(Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_L_2000601 LINE
Project : (FR) 340802
Mode : Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.31	25.99	-23.94	49.93	15.91	0.02	10.06	Average
2		0.31	37.29	-22.64	59.93	27.21	0.02	10.06	QP
3		0.43	25.50	-21.70	47.20	15.40	0.02	10.08	Average
4		0.43	35.70	-21.50	57.20	25.60	0.02	10.08	QP
5		0.53	23.91	-22.09	46.00	13.80	0.02	10.09	Average
6	*	0.53	35.61	-20.39	56.00	25.50	0.02	10.09	QP
7		0.68	19.32	-26.68	46.00	9.20	0.02	10.10	Average
8		0.68	32.42	-23.58	56.00	22.30	0.02	10.10	QP
9		13.41	23.94	-26.06	50.00	13.30	0.25	10.39	Average
10		13.41	33.74	-26.26	60.00	23.10	0.25	10.39	QP
11		16.75	24.77	-25.23	50.00	14.00	0.28	10.49	Average
12		16.75	34.37	-25.63	60.00	23.60	0.28	10.49	QP

Test Mode :	Mode 1	Temperature :	24~25℃
Test Engineer :	Leo Liao	Relative Humidity :	48~49%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	CDMA2000 BC0 Idle + WLAN Link + USB Cable(Charging from Adapter)		
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
Project : (FR) 340802
Mode : Mode 1

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.18	24.27	-30.19	54.46	14.20	0.02	10.05	Average
2		0.18	35.47	-28.99	64.46	25.40	0.02	10.05	QP
3		0.40	29.69	-18.08	47.77	19.59	0.02	10.08	Average
4		0.40	35.09	-22.68	57.77	24.99	0.02	10.08	QP
5	*	0.45	32.10	-14.83	46.93	22.00	0.02	10.08	Average
6		0.45	39.10	-17.83	56.93	29.00	0.02	10.08	QP
7		0.85	22.03	-23.97	46.00	11.90	0.02	10.11	Average
8		0.85	31.73	-24.27	56.00	21.60	0.02	10.11	QP
9		15.23	26.29	-23.71	50.00	15.50	0.35	10.44	Average
10		15.23	35.59	-24.41	60.00	24.80	0.35	10.44	QP
11		17.75	26.17	-23.83	50.00	15.20	0.42	10.55	Average
12		17.75	35.37	-24.63	60.00	24.40	0.42	10.55	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	Mar. 28, 2013	Jun. 09, 2013~ Jun. 13, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	N/A	Mar. 28, 2013	Jun. 09, 2013~ Jun. 13, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Power Sensor	Anritsu	MA2411B	1207253	N/A	Mar. 28, 2013	Jun. 09, 2013~ Jun. 13, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
DC Power Supply	TOPWORD	3303DR	N/A714621	N/A	Mar. 28, 2013	Jun. 09, 2013~ Jun. 13, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
Thermal Chamber	Hongzhan	LP-150U	HD20120425	N/A	Mar. 28, 2013	Jun. 09, 2013~ Jun. 13, 2013	Mar. 27, 2014	Conducted (TH01-SZ)
ESCI TEST Receiver	R&S	ESCI	100724	9K-3GHz	Mar. 28, 2013	Jun. 11, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Spectrum Analyzer	R&S	FSP30	101362	9kHz~30GHz	Oct. 11, 2012	Jun. 11, 2013	Oct. 10, 2013	Radiation (03CH01-SZ)
Double Ridge Horn Amtenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 12, 2012	Jun. 11, 2013	Oct. 11, 2013	Radiation (03CH01-SZ)
Bilog Antenna	SCHAFFNER	CBL6112B	2614	30Mhz~2Ghz	Nov. 03, 2012	Jun. 11, 2013	Nov. 02, 2013	Radiation (03CH01-SZ)
Amplifier	ADVANTEST	BB525C	E9007003	9K-3000MHz GAIN 30db	Mar. 28, 2013	Jun. 11, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
Amplifier	Yiai	AV3860B	04030	2GHz~26.5GHz	Mar. 28, 2013	Jun. 11, 2013	Mar. 27, 2014	Radiation (03CH01-SZ)
SHF-EHF-Horn	Schwarzbeck	BBHA9170	BBHA9170249	14Ghz~40Ghz	Nov. 23, 2012	Jun. 11, 2013	Nov. 22, 2013	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100321	9KHZ-30MHZ	Oct. 22, 2012	Jun. 11, 2013	Oct. 21, 2013	Radiation (03CH01-SZ)
ESCIO TEST Receiver	R&S	1142.8007.03	100724	9kHz~3GHz	Mar. 28, 2013	May 24, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 28, 2013	May 24, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 28, 2013	May 24, 2013	Mar. 27, 2014	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	N/A	Nov. 20, 2012	May 24, 2013	Nov. 19, 2013	Conduction (CO01-SZ)
AC Filter	ETS-LINDGREN	LRE-2030/PEN 256260	00093783	N/A	N/A	May 24, 2013	N/A	Conduction (CO01-SZ)
AC Filter	ETS-LINDGREN	LRE-2030/PEN 256260	00097973	N/A	N/A	May 24, 2013	N/A	Conduction (CO01-SZ)
System Simulator	Agilent	E5515C	MY50264168	GSM/WCDMA /CDMA2000	Oct. 09, 2012	May 24, 2013~ Jun. 13, 2013	Oct. 08, 2013	-

5 Uncertainty of Evaluation

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

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

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

Appendix A. Photographs of EUT

Please refer to Sporton report number EP342801 as below.