FCC RF Test Report

APPLICANT	**:**	**ZTE CORPORATION**
EQUIPMENT	**:**	**HSPA+ uFi**
BRAND NAME	**:**	**ZTE**
MODEL NAME	**:**	**R206-Z**
FCC ID	**:**	**SRQR206-Z**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DTS) Digital Transmission System**

The product was received on Jun. 14, 2013 and completely tested on Jun. 26, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
2627

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

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR361407	Rev. 01	Initial issue of report	Jul. 03, 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 and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.59 dB at 2390.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 8.71 dB at 1.730 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, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	HSPA+ uFi
Brand Name	ZTE
Model Name	R206-Z
FCC ID	SRQR206-Z
EUT supports Radios application	GPRS/EGPRS/WLAN 11bgn
HW Version	T01
SW Version	BD_R206V1.0
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 Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz
Maximum Output Power to Antenna	802.11b : 16.59 dBm (0.0456 W) 802.11g : 21.31 dBm (0.1352 W) 802.11n HT20 : 21.76 dBm (0.1500 W)
Antenna Type	PCB Antenna with gain 2.40 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

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

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

1.7 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 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	13.75	13.98	13.10	12.7
CH 06	2437 MHz	**16.59**	16.09	15.53	14.61
CH 11	2462 MHz	15.55	16.54	15.53	14.81

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	19.86	19.42	19.68	19.54	20.03	19.74	20.85	20.23
CH 06	2437 MHz	21.13	20.82	21.04	20.62	21.12	20.81	21.28	**21.31**
CH 11	2462 MHz	20.74	20.37	20.63	20.21	21.12	20.42	21.24	20.85

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	20.28	19.95	19.62	21.57	20.54	20.87	21.03	20.61
CH 06	2437 MHz	21.28	20.96	20.38	**21.76**	20.62	21.04	20.42	20.73
CH 11	2462 MHz	20.93	20.62	20.15	21.43	19.72	19.62	20.61	19.82

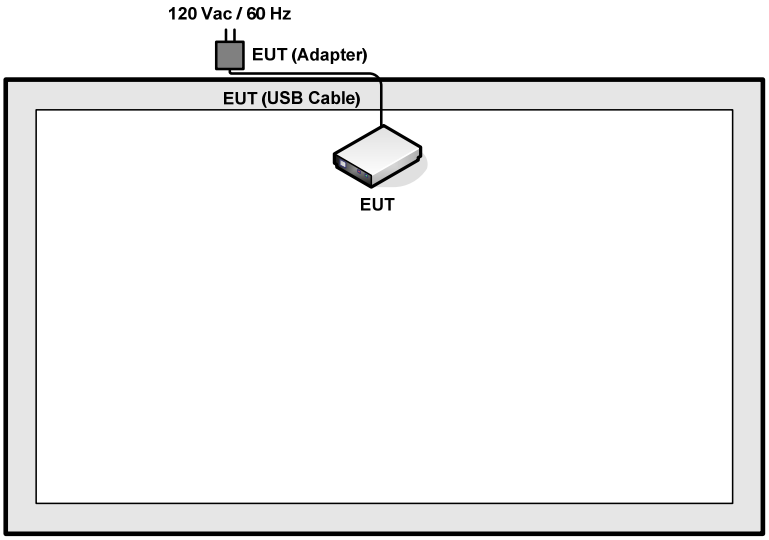
2.3 Test Mode

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

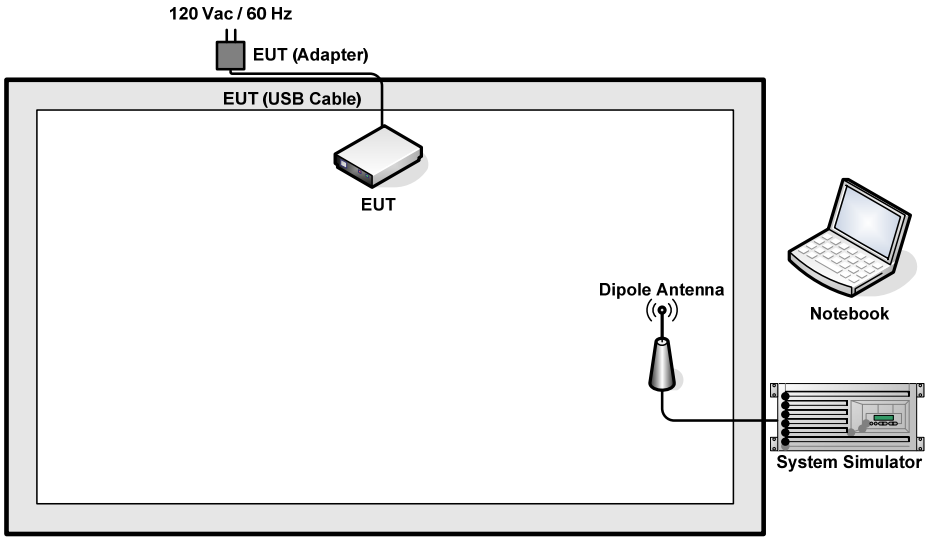
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	54 Mbps	1/6/11
		802.11n HT20	26 Mbps	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	54 Mbps	1/6/11
		802.11n HT20	26 Mbps	1/6/11
	Conducted Band Edge	802.11b	1 Mbps	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 : GSM850 Idle + WLAN Link + USB Cable (Charging from Adapter)			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 0.9 m

2.6 EUT Operation Test Setup

For WLAN function, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

2.7 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

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

= 5.6 + 10 = 15.6 (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.

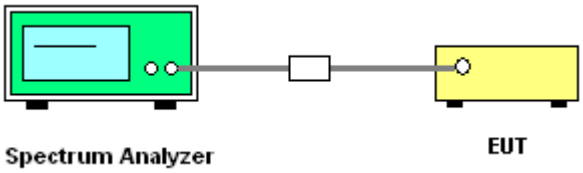
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 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 :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

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	10.08	0.5	Pass

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

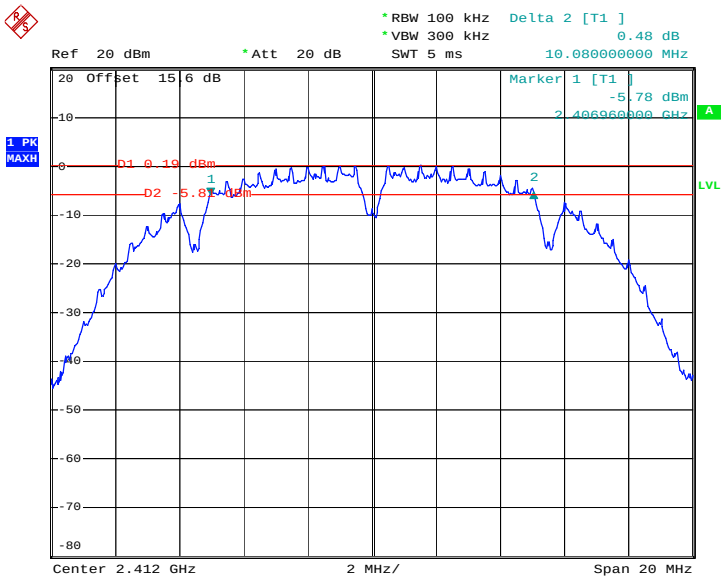
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.44	0.5	Pass
06	2437	16.48	0.5	Pass
11	2462	16.48	0.5	Pass

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

Channel	Frequency (MHz)	802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.60	0.5	Pass
06	2437	17.60	0.5	Pass
11	2462	17.64	0.5	Pass

3.1.6 Test Result of 6dB Bandwidth Plots

6 dB Bandwidth Plot on 802.11b Channel 01



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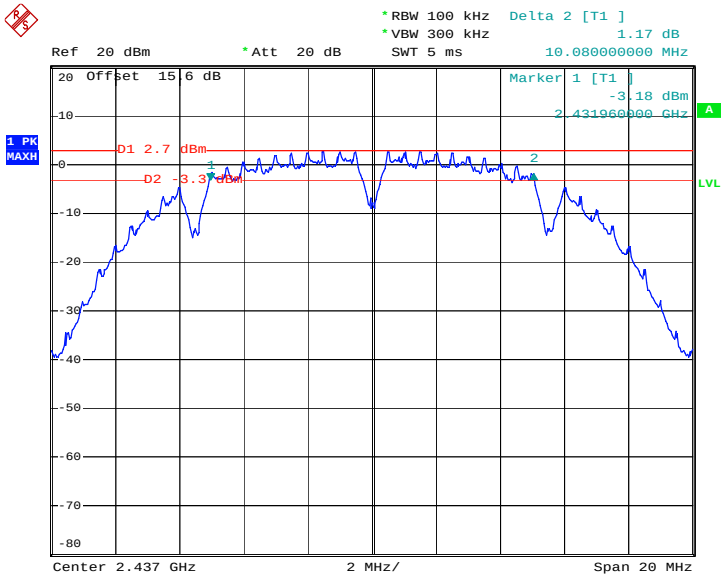
6 dB Bandwidth Plot on 802.11b Channel 06



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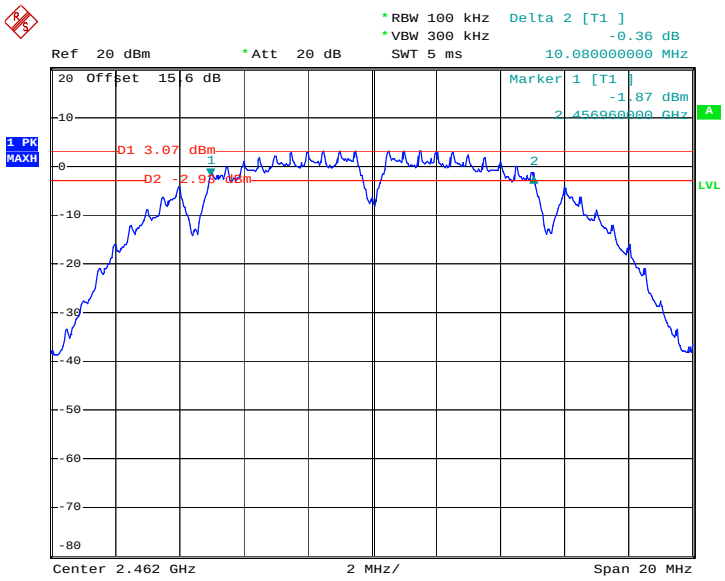
6 dB Bandwidth Plot on 802.11b Channel 11



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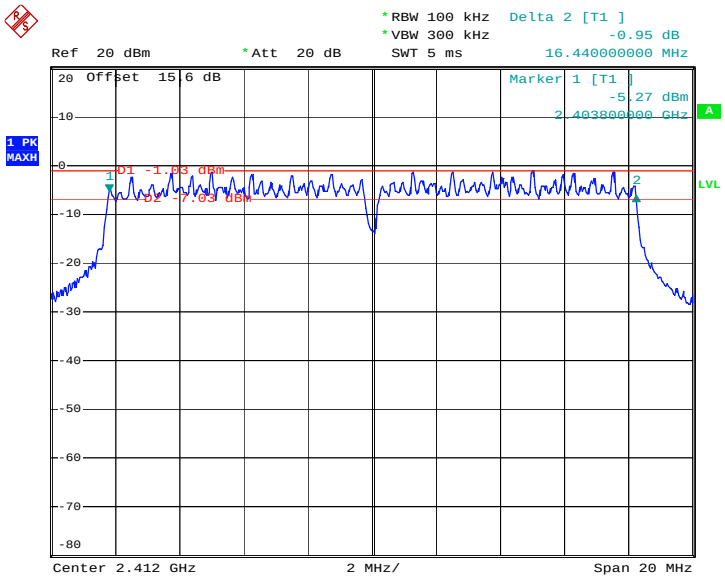
6 dB Bandwidth Plot on 802.11g Channel 01



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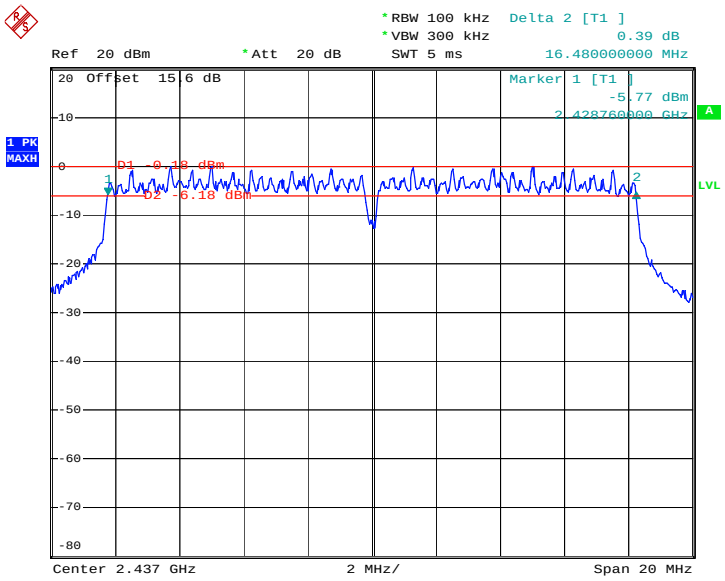
6 dB Bandwidth Plot on 802.11g Channel 06



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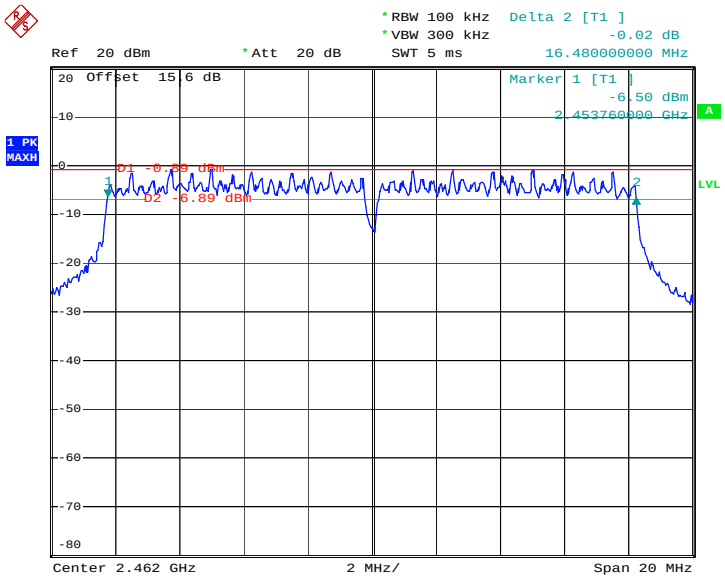
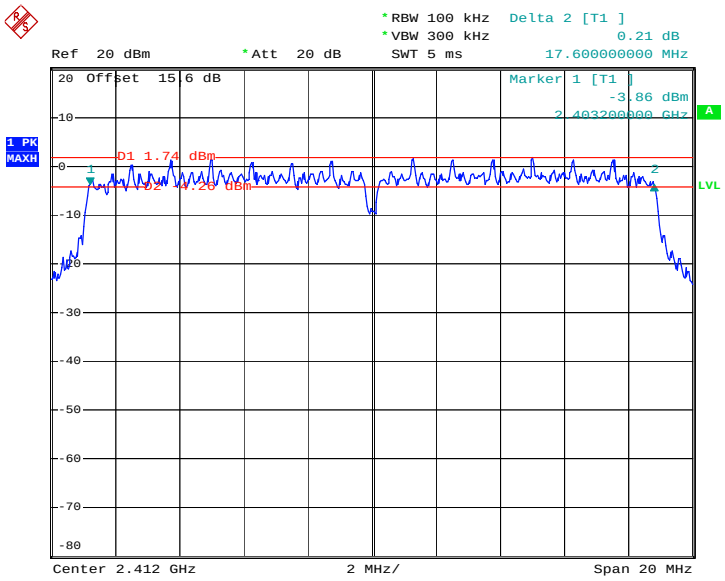
6 dB Bandwidth Plot on 802.11g Channel 11



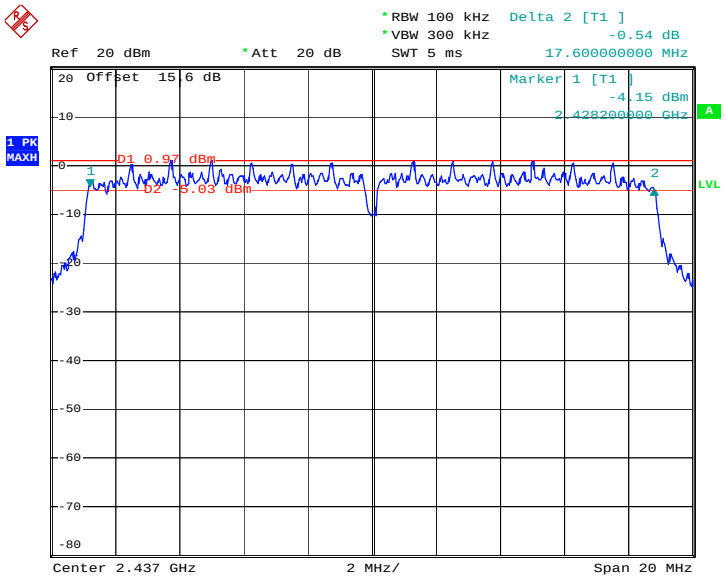
Date: 20.JUN.2013 22:29:56

6 dB Bandwidth Plot on 802.11n HT20 Channel 01



Date: 20.JUN.2013 22:33:48

6 dB Bandwidth Plot on 802.11n HT20 Channel 06



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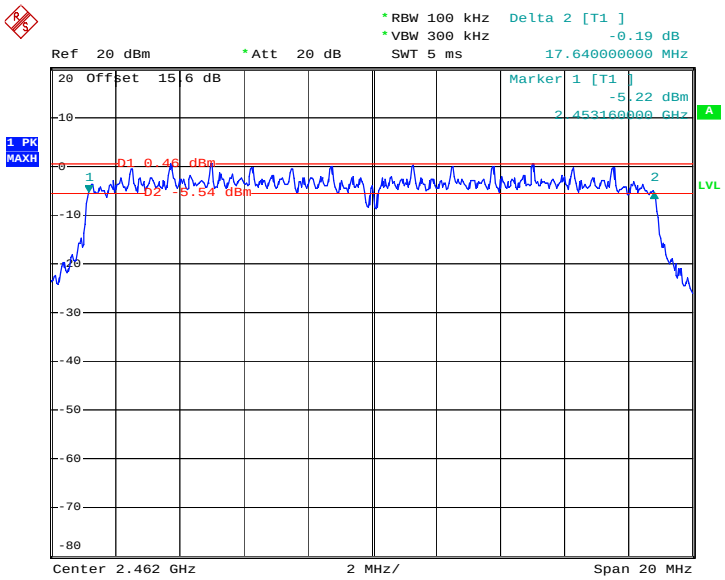
6 dB Bandwidth Plot on 802.11n HT20 Channel 11



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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.

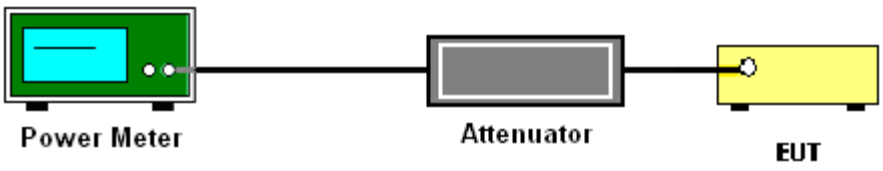
3.2.2 Measuring Instruments

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 DTS D01 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 :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	13.75	30	Pass
06	2437	16.59	30	Pass
11	2462	15.55	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.23	30	Pass
06	2437	21.31	30	Pass
11	2462	20.85	30	Pass

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

Channel	Frequency (MHz)	802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	21.57	30	Pass
06	2437	21.76	30	Pass
11	2462	21.43	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	100.00%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	11.33
06	2437	13.62
11	2462	14.38

Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	98.10%	Duty Factor:	0.08dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	10.62
06	2437	12.36
11	2462	11.52

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	92.70%	Duty Factor:	0.33dB

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Average Output Power (dBm)
01	2412	12.81
06	2437	13.31
11	2462	12.46

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.

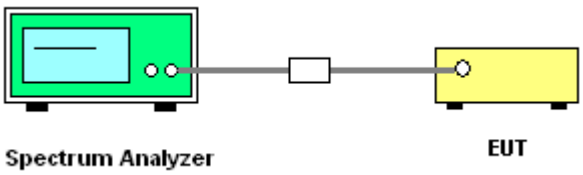
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD 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.
7. The Measured power density (dBm)/ 100KHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

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

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3kHz)	Pass/Fail
		PSD/100kHz (dBm)	PSD/3kHz (dBm)		
01	2412	0.04	-14.64	8	Pass
06	2437	2.65	-12.04	8	Pass
11	2462	3.00	-11.75	8	Pass

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

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm/3kHz)	Pass/Fail
		PSD/100kHz (dBm)	PSD/3kHz (dBm)		
01	2412	-1.16	-15.80	8	Pass
06	2437	-0.20	-14.82	8	Pass
11	2462	-0.89	-15.57	8	Pass

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

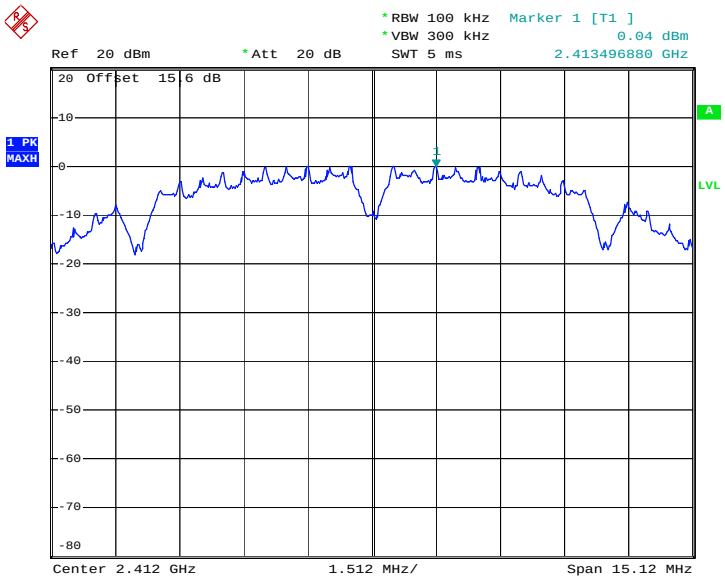
Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm/3kHz)	Pass/Fail
		PSD/100kHz (dBm)	PSD/3kHz (dBm)		
01	2412	1.65	-13.74	8	Pass
06	2437	1.06	-12.55	8	Pass
11	2462	0.34	-7.32	8	Pass

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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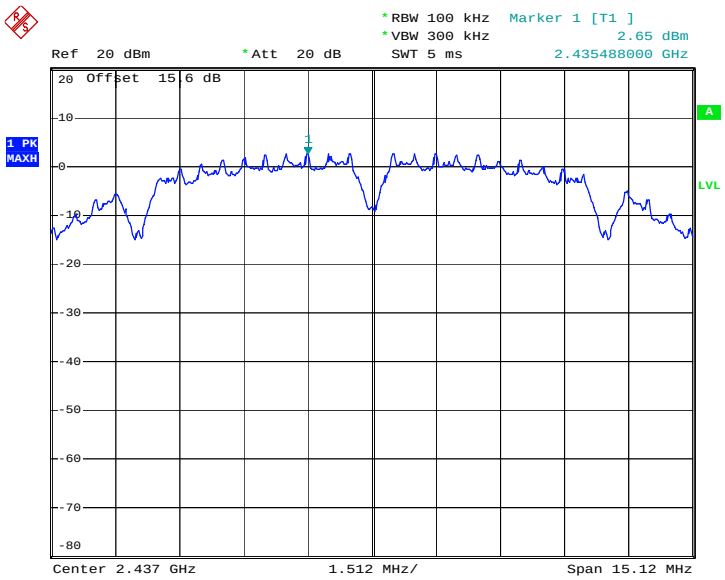
PSD 100kHz Plot on 802.11b Channel 06



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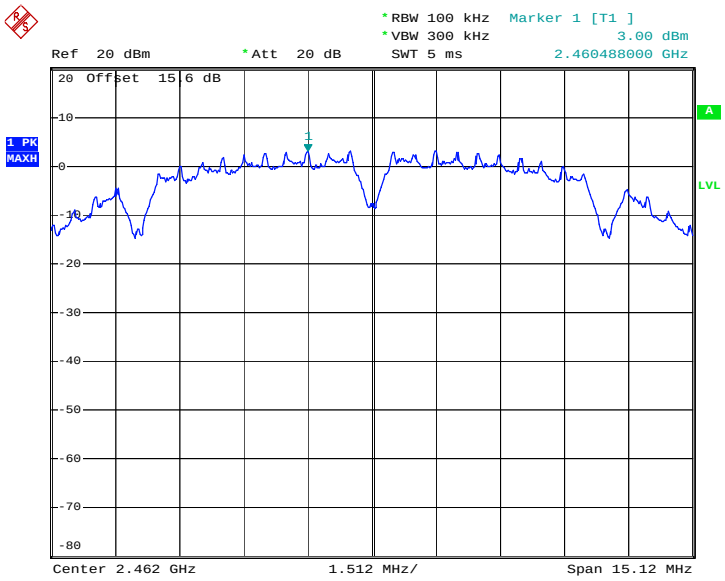
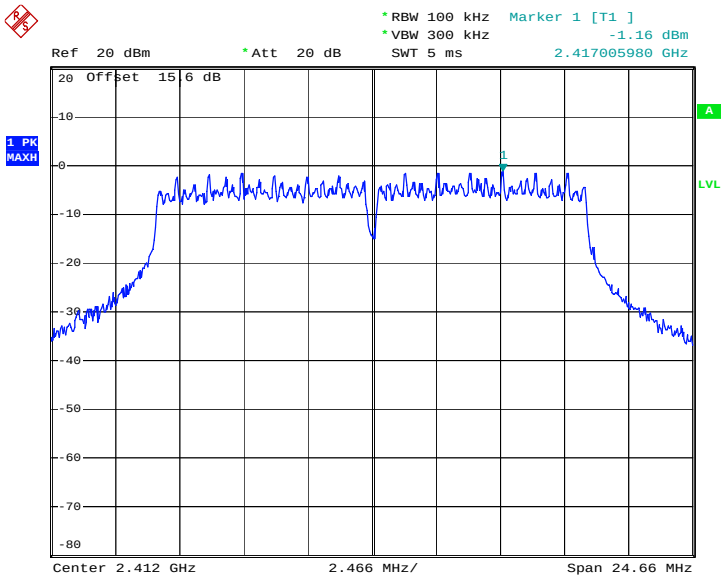
PSD 100kHz Plot on 802.11b Channel 11



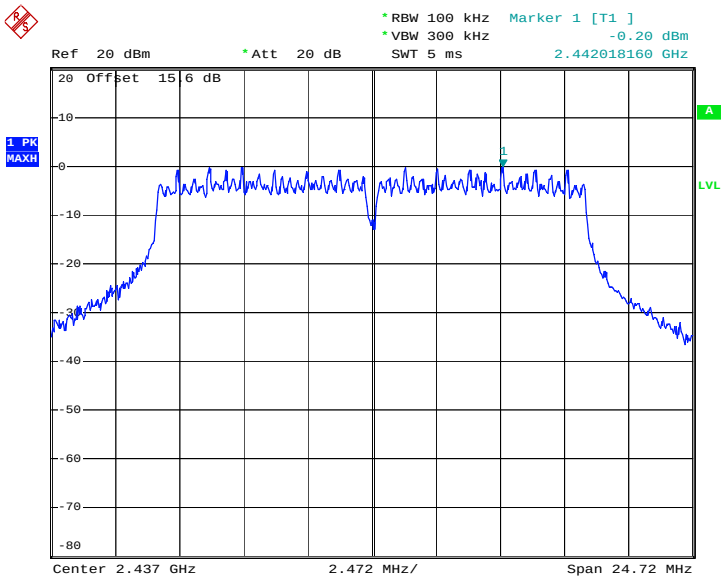
Date: 19.JUN.2013 19:59:40

PSD 100kHz Plot on 802.11g Channel 01



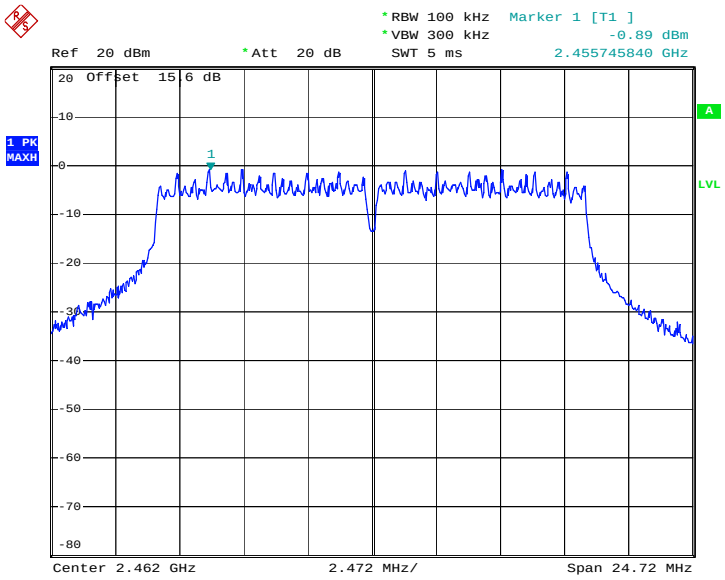
Date: 20.JUN.2013 22:16:33

PSD 100kHz Plot on 802.11g Channel 06



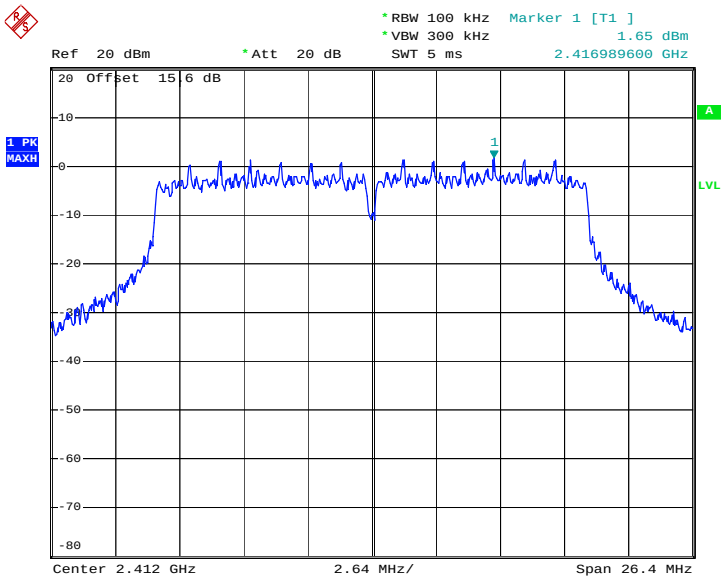
Date: 20.JUN.2013 22:27:59

PSD 100kHz Plot on 802.11g Channel 11



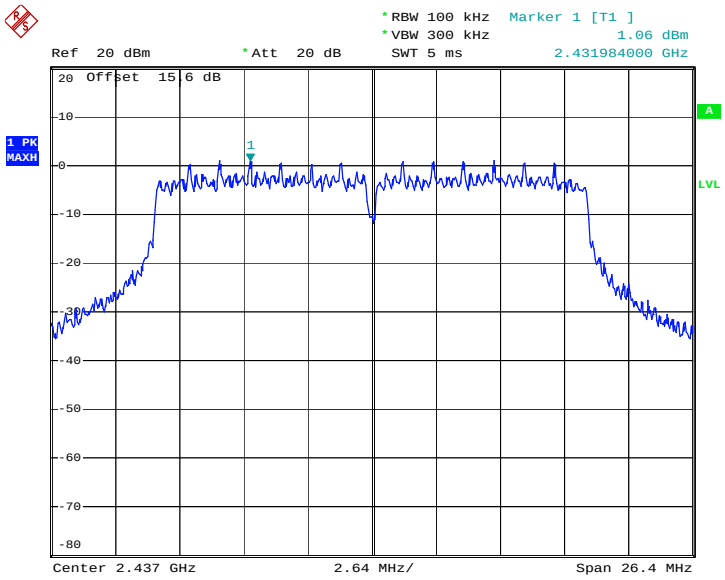
Date: 20.JUN.2013 22:30:29

PSD 100kHz Plot on 802.11n HT20 Channel 01



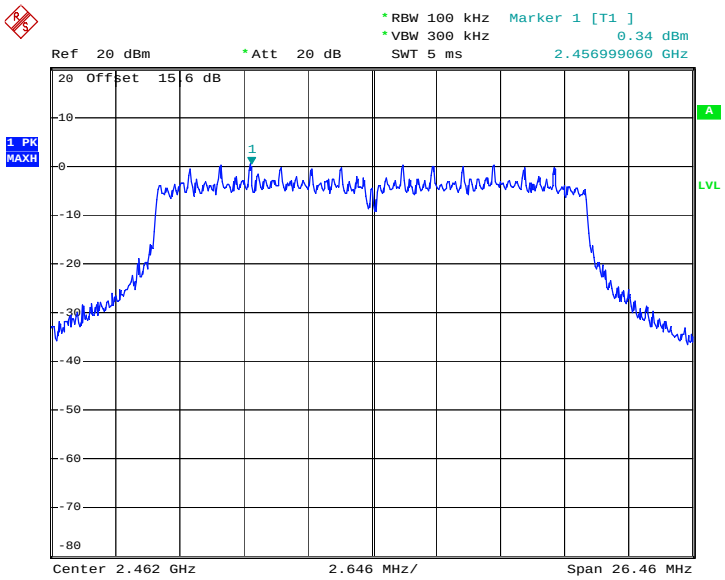
Date: 20.JUN.2013 22:34:21

PSD 100kHz Plot on 802.11n HT20 Channel 06



Date: 20.JUN.2013 22:40:15

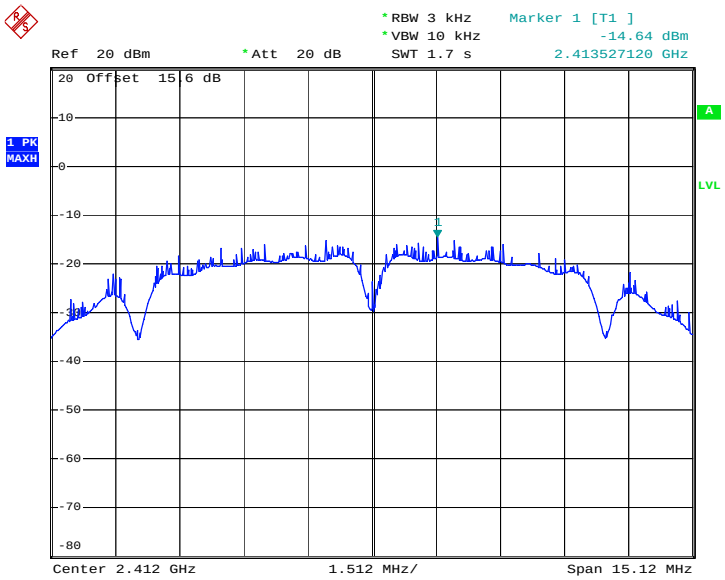
PSD 100kHz Plot on 802.11n HT20 Channel 11



Date: 20.JUN.2013 22:44:18

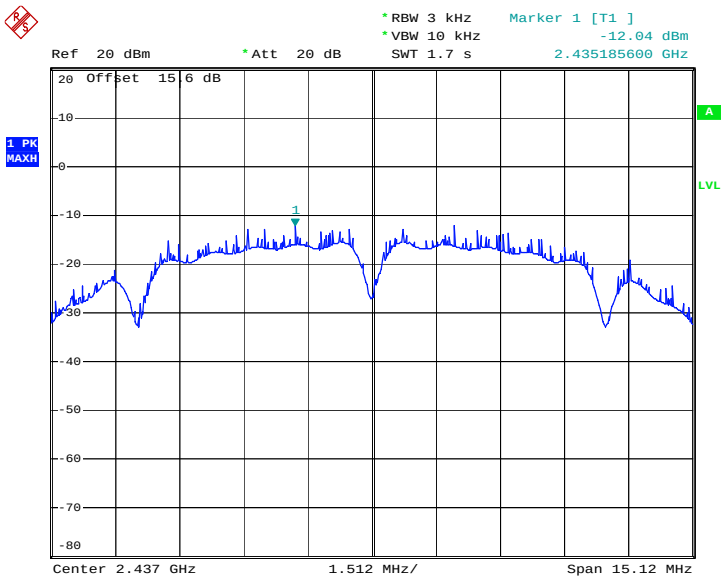
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



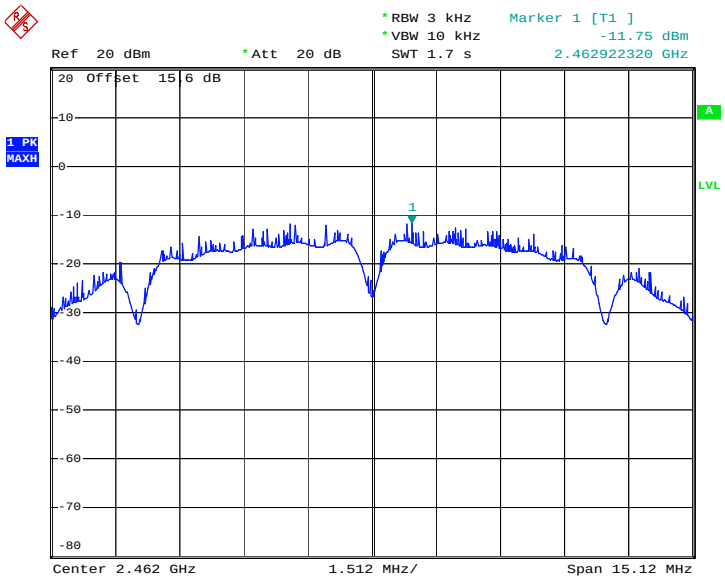
Date: 19.JUN.2013 19:51:47

PSD 3kHz Plot on 802.11b Channel 06



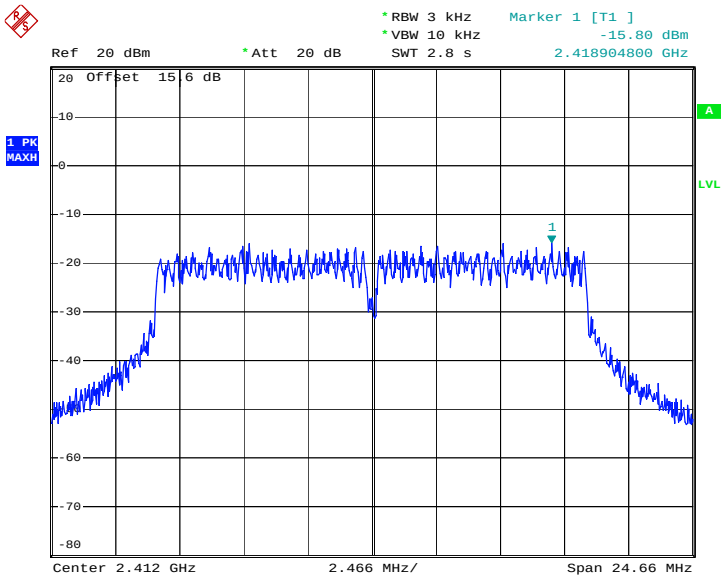
Date: 19.JUN.2013 19:56:45

PSD 3kHz Plot on 802.11b Channel 11



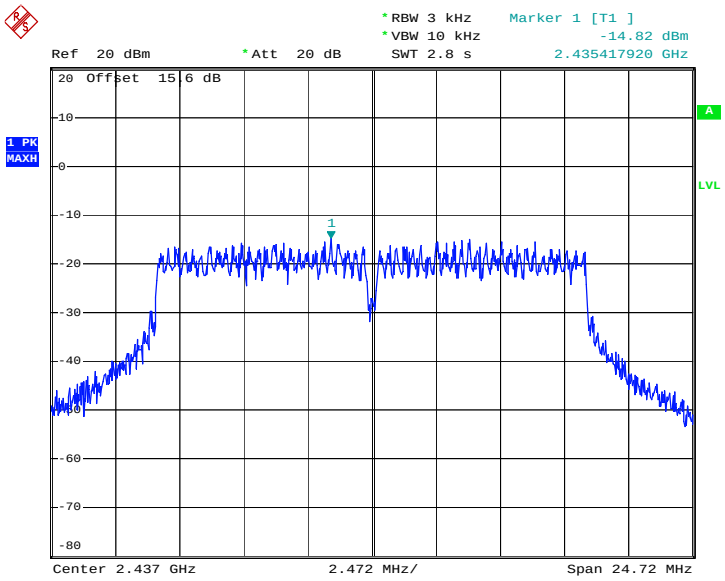
Date: 19.JUN.2013 19:59:31

PSD 3kHz Plot on 802.11g Channel 01



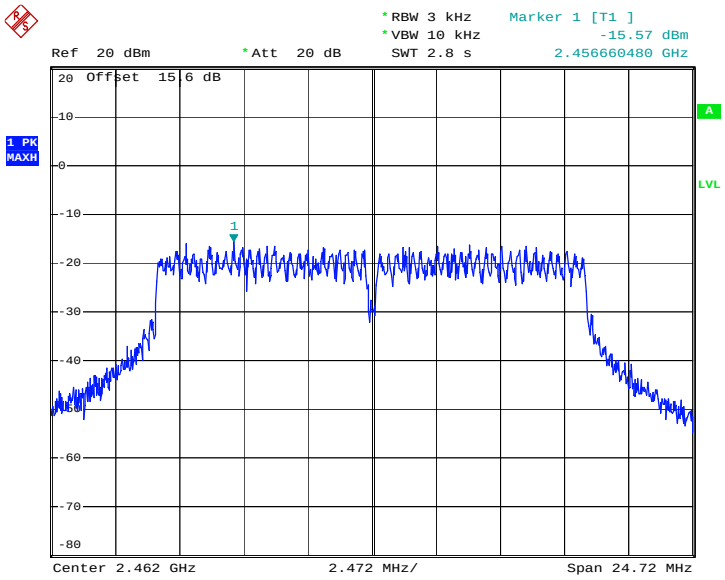
Date: 20.JUN.2013 22:16:23

PSD 3kHz Plot on 802.11g Channel 06



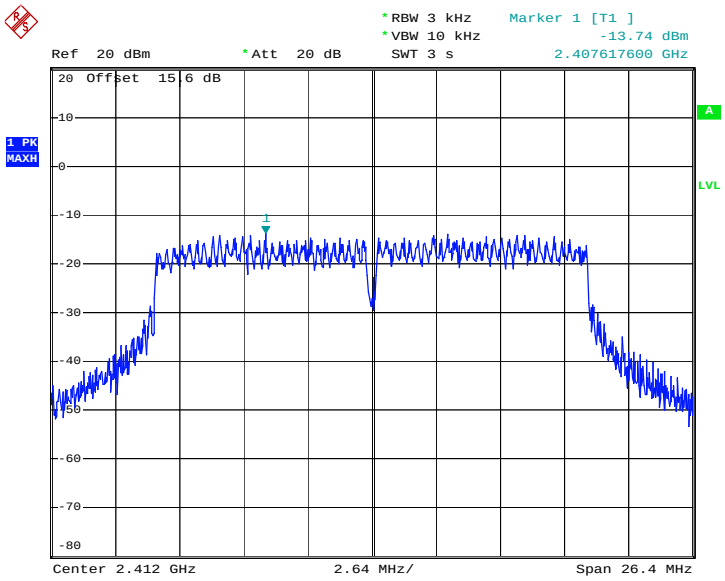
Date: 20.JUN.2013 22:27:49

PSD 3kHz Plot on 802.11g Channel 11



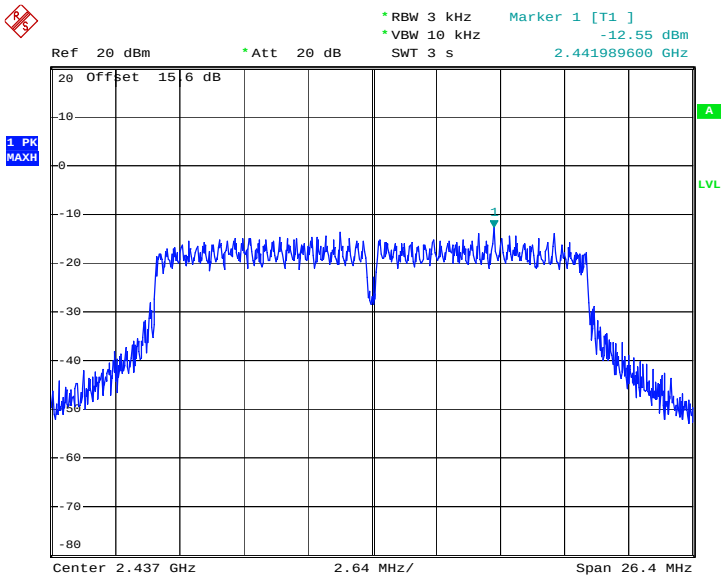
Date: 20.JUN.2013 22:30:19

PSD 3kHz Plot on 802.11n HT20 Channel 01



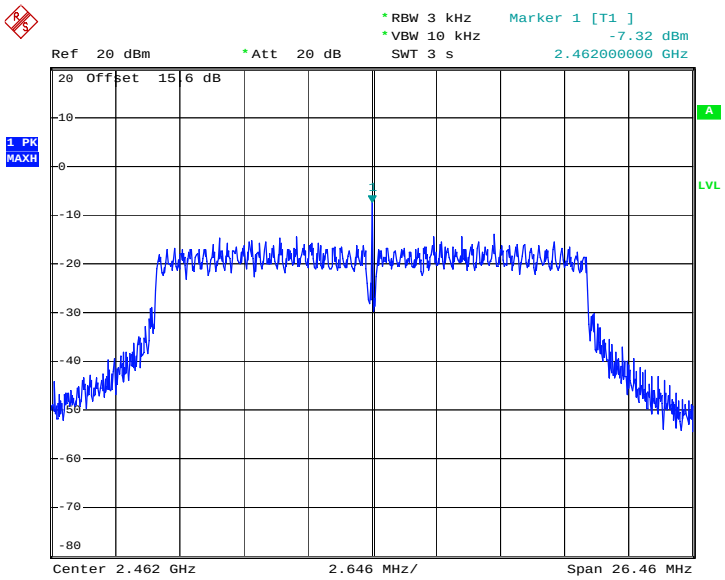
Date: 20.JUN.2013 22:34:11

PSD 3kHz Plot on 802.11n HT20 Channel 06



Date: 20.JUN.2013 22:40:05

PSD 3kHz Plot on 802.11n HT20 Channel 11



Date: 20.JUN.2013 22:44:07

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

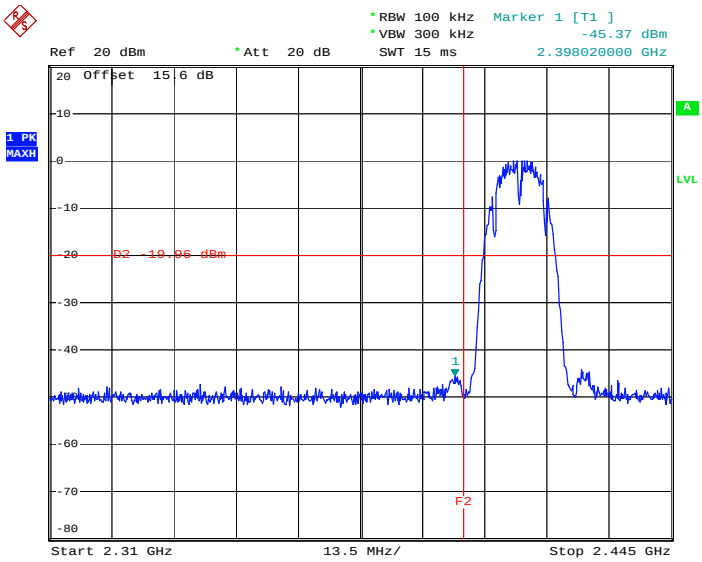
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

2.4.5 Test Result of Conducted Spurious at Band Edges

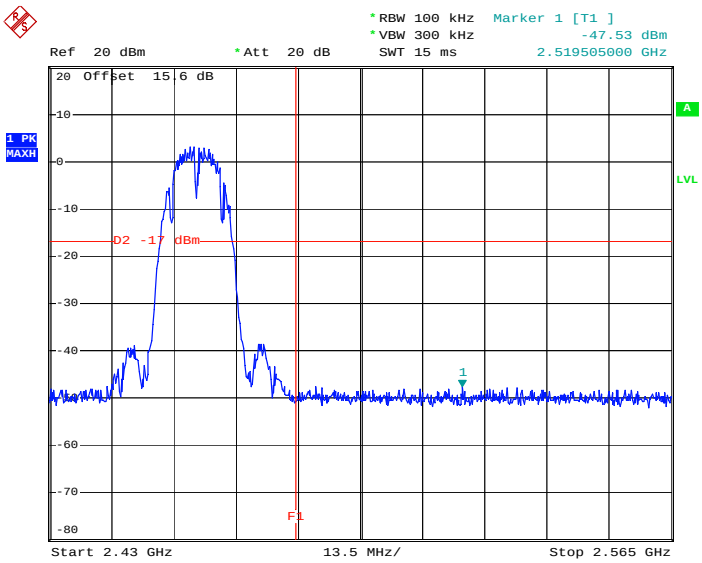
Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Adonis Li

Low Band Edge Plot on 802.11b Channel 01



Date: 19.JUN.2013 19:52:12

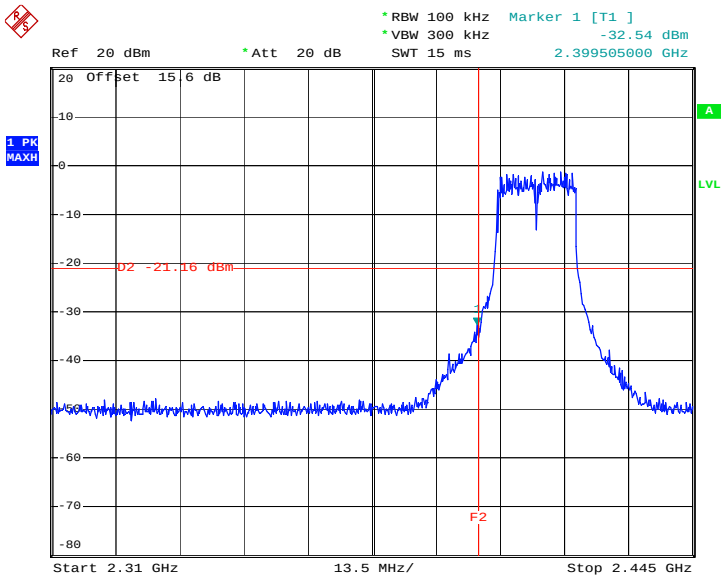
High Band Edge Plot on 802.11b Channel 11



Date: 19.JUN.2013 19:59:55

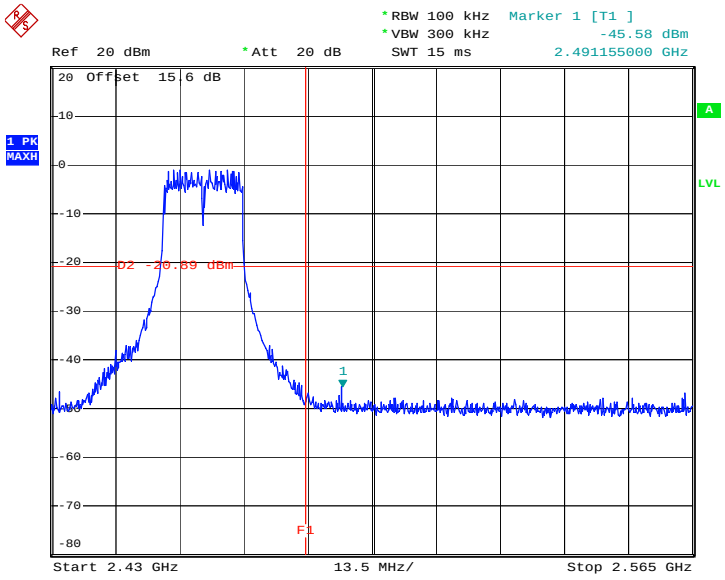
Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Adonis Li

Low Band Edge Plot on 802.11g Channel 01



Date: 20.JUN.2013 22:16:48

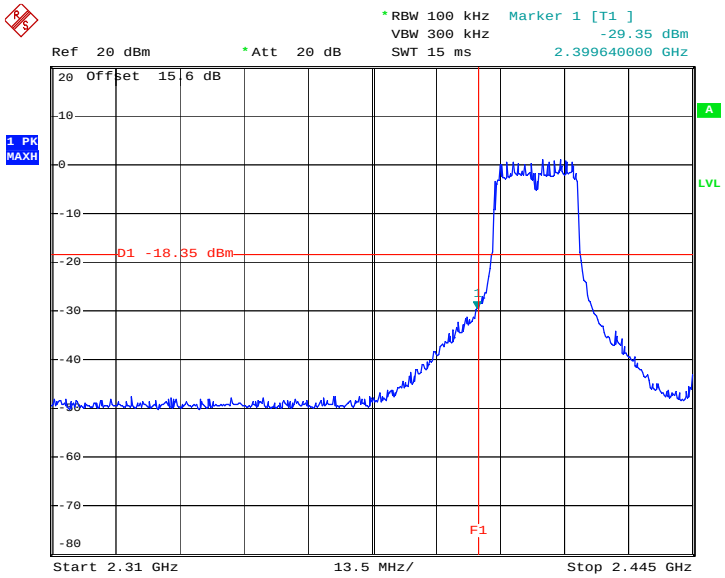
High Band Edge Plot on 802.11g Channel 11



Date: 20.JUN.2013 22:30:44

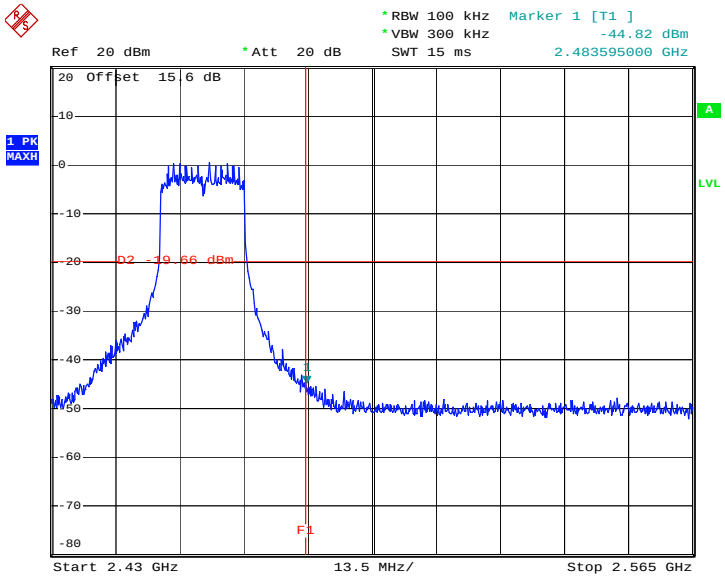
Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Adonis Li

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 20.JUN.2013 22:37:12

High Band Edge Plot on 802.11n HT20 Channel 11



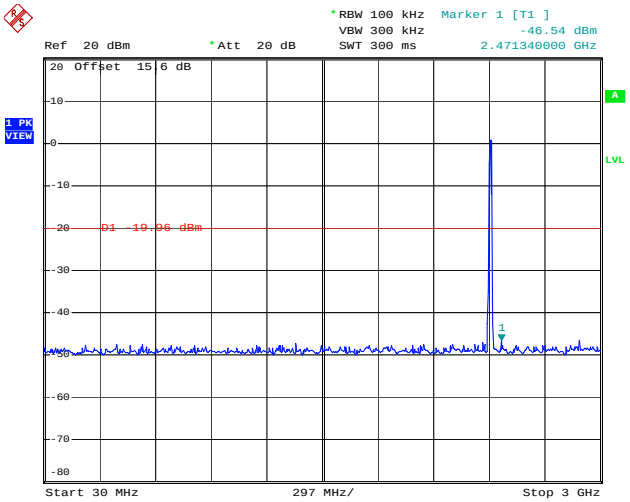
Date: 20.JUN.2013 22:44:33

3.4.5 Test Result of Conducted Spurious Emission

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

802.11b 30 MHz~3 GHz

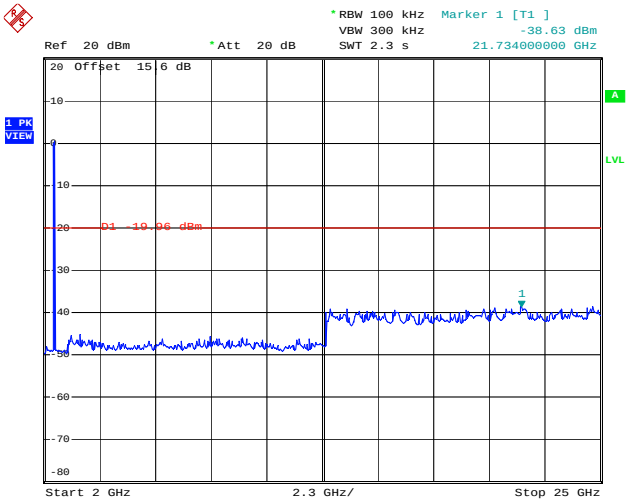
Conducted Spurious Emission Plot on Channel 01



Date: 26.JUN.2013 09:09:28

802.11b 2 GHz~25 GHz

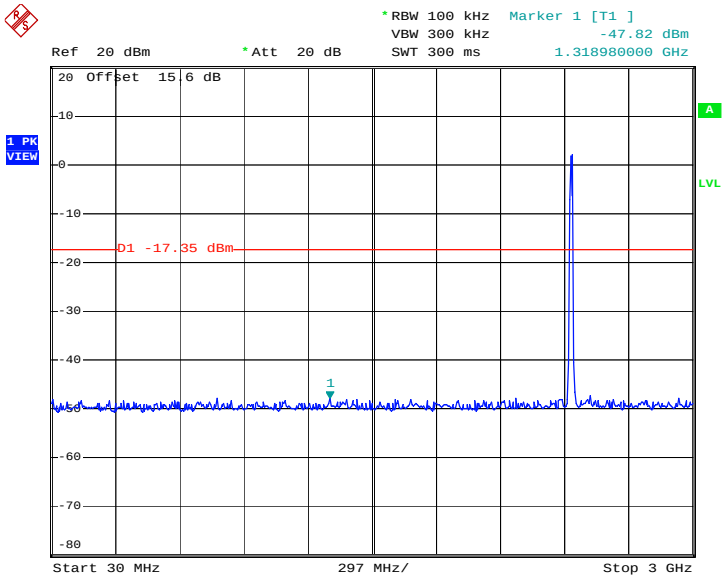
Conducted Spurious Emission Plot on Channel 01



Date: 26.JUN.2013 09:10:10

802.11b 30 MHz~3 GHz

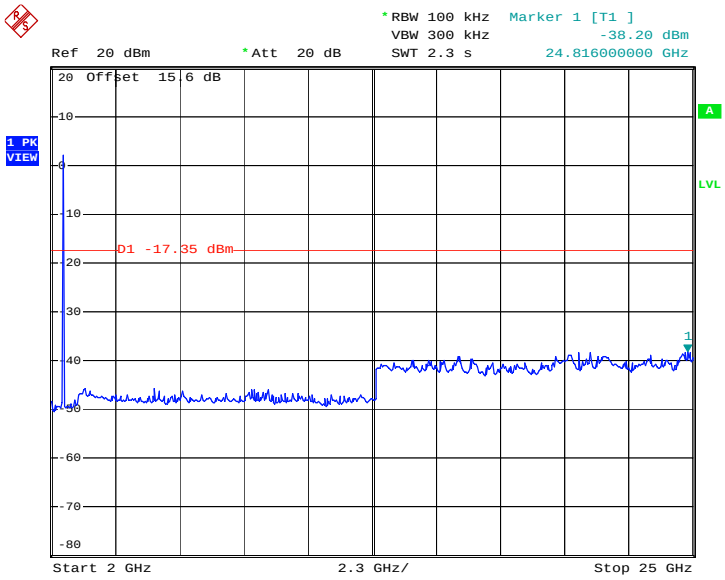
Conducted Spurious Emission Plot on Channel 06



Date: 26.JUN.2013 09:11:25

802.11b 2 GHz~25 GHz

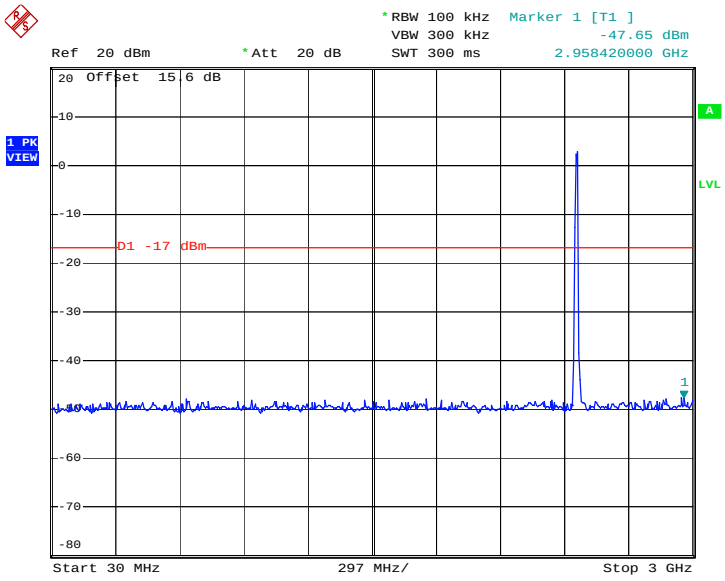
Conducted Spurious Emission Plot on Channel 06



Date: 26.JUN.2013 09:12:02

802.11b 30 MHz~3 GHz

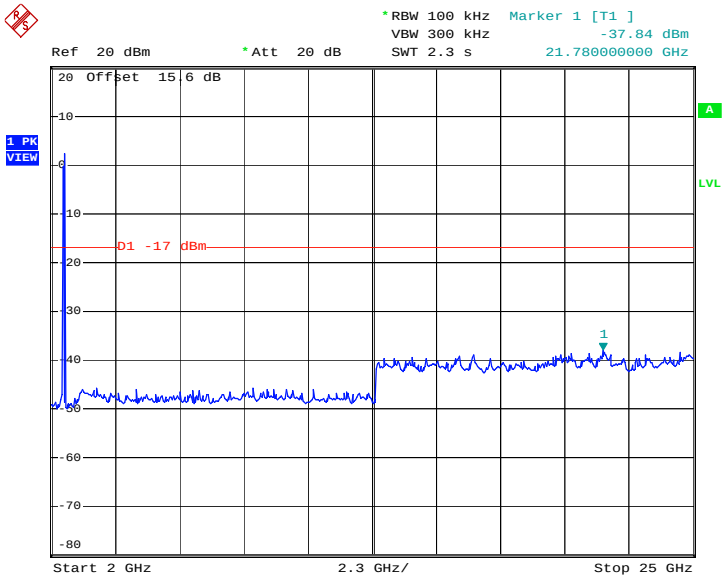
Conducted Spurious Emission Plot on Channel 11



Date: 26.JUN.2013 09:13:16

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

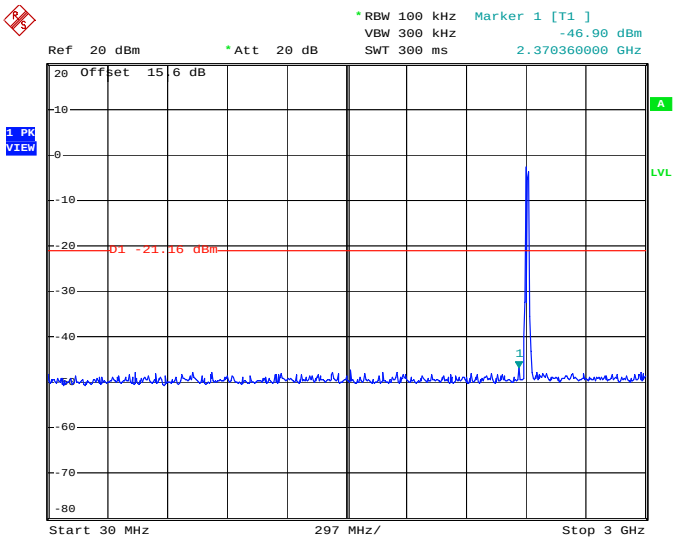


Date: 26.JUN.2013 09:13:55

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

802.11g 30 MHz~3 GHz

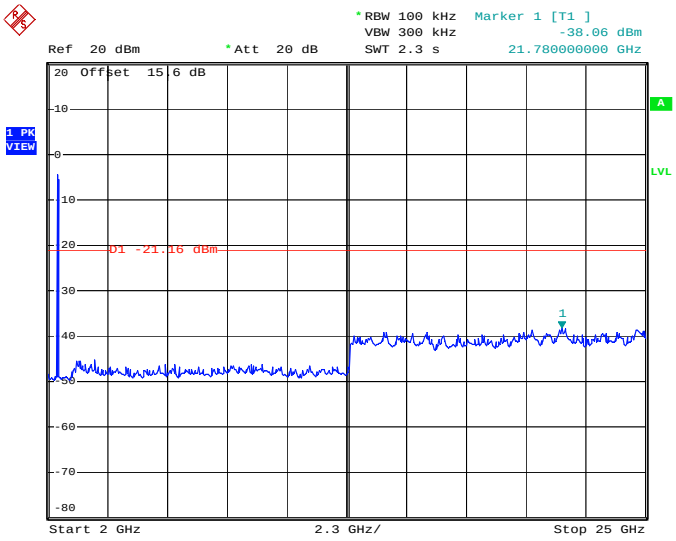
Conducted Spurious Emission Plot on Channel 01



Date: 26.JUN.2013 09:16:58

802.11g 2 GHz~25 GHz

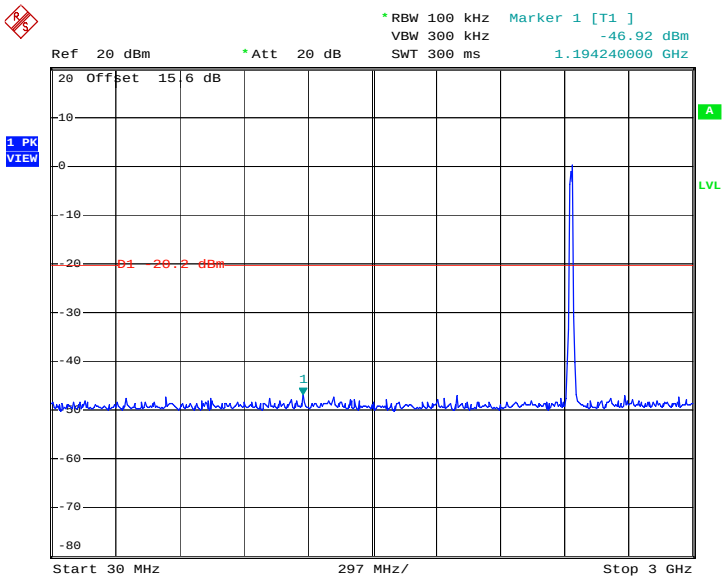
Conducted Spurious Emission Plot on Channel 01



Date: 26.JUN.2013 09:17:33

802.11g 30 MHz~3 GHz

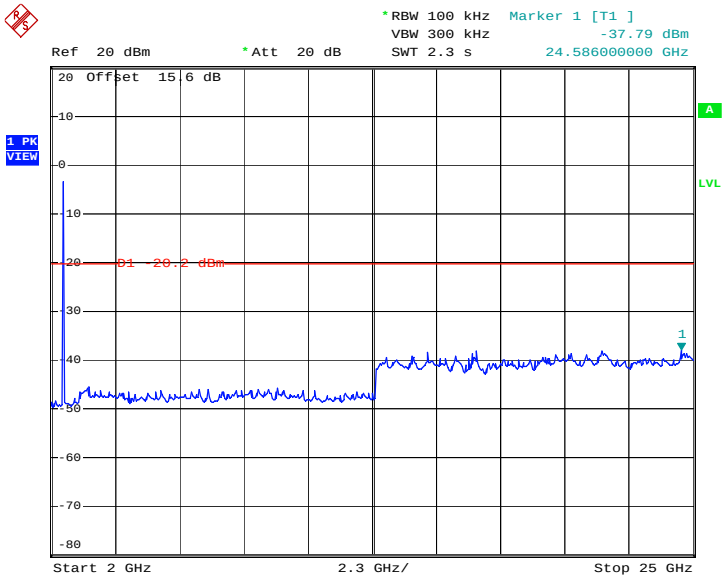
Conducted Spurious Emission Plot on Channel 06



Date: 26.JUN.2013 09:19:03

802.11g 2 GHz~25 GHz

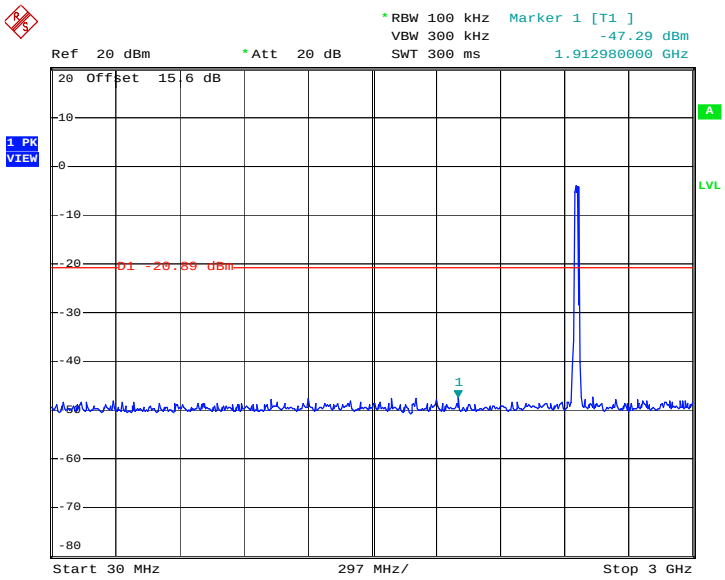
Conducted Spurious Emission Plot on Channel 06



Date: 26.JUN.2013 09:19:57

802.11g 30 MHz~3 GHz

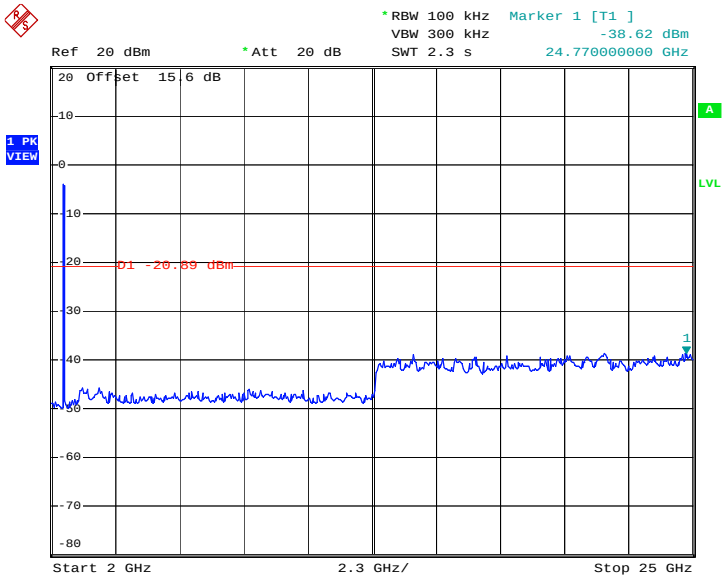
Conducted Spurious Emission Plot on Channel 11



Date: 26.JUN.2013 09:21:29

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

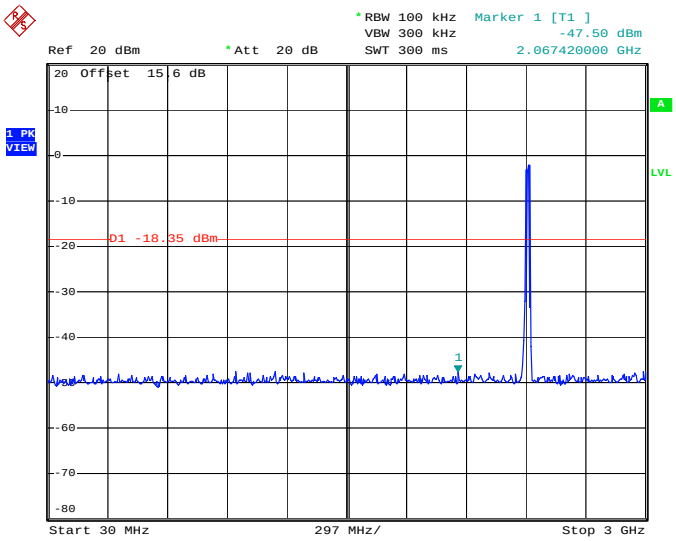


Date: 26.JUN.2013 09:22:14

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

802.11n HT20 30 MHz~3 GHz

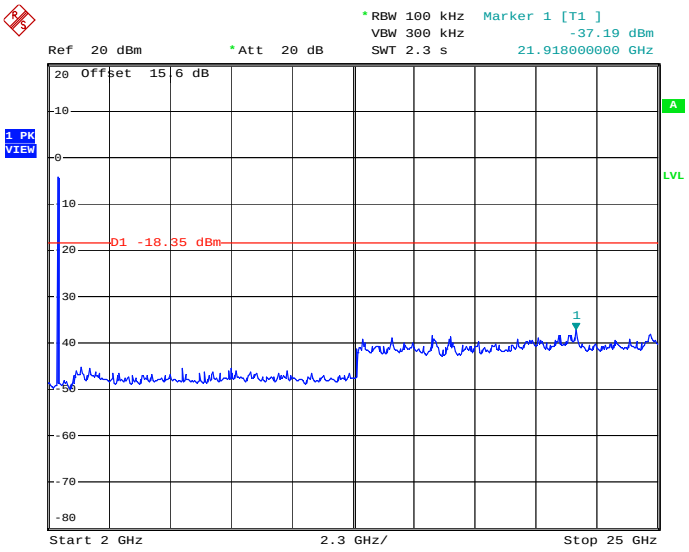
Conducted Spurious Emission Plot on Channel 01



Date: 26.JUN.2013 09:29:46

802.11n HT20 2 GHz~25 GHz

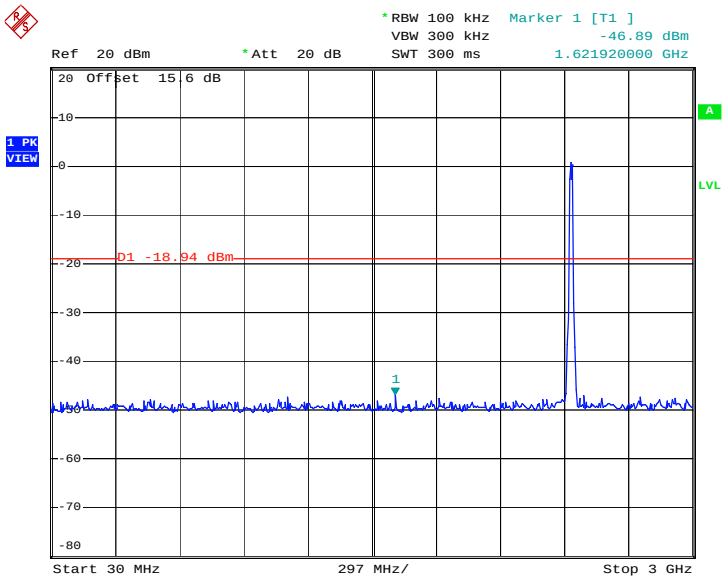
Conducted Spurious Emission Plot on Channel 01



Date: 26.JUN.2013 09:30:27

802.11n HT20 30 MHz~3 GHz

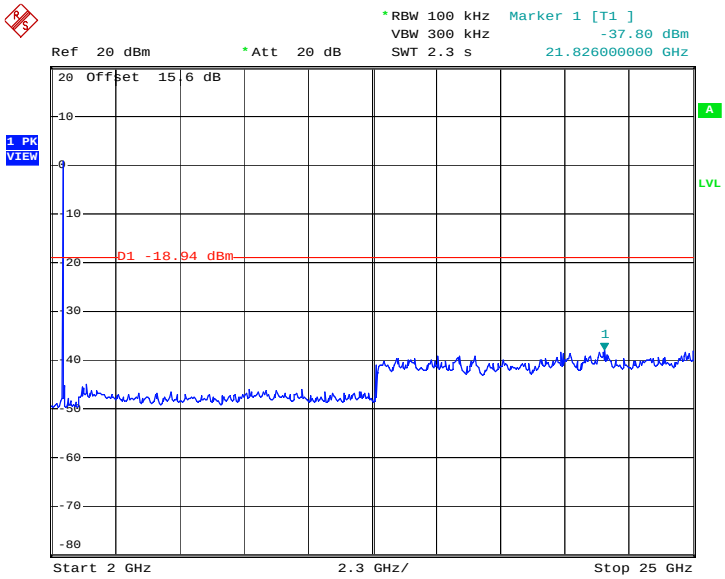
Conducted Spurious Emission Plot on Channel 06



Date: 26.JUN.2013 09:31:38

802.11n HT20 2 GHz~25 GHz

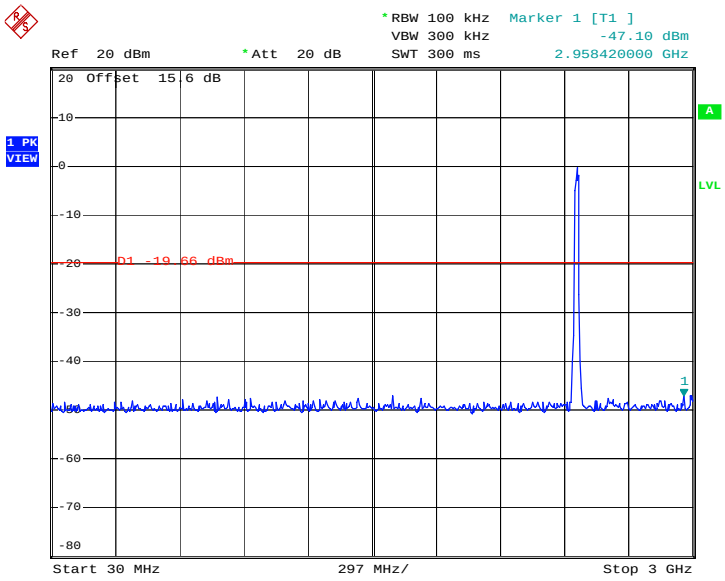
Conducted Spurious Emission Plot on Channel 06



Date: 26.JUN.2013 09:32:16

802.11n HT20 30 MHz~3 GHz

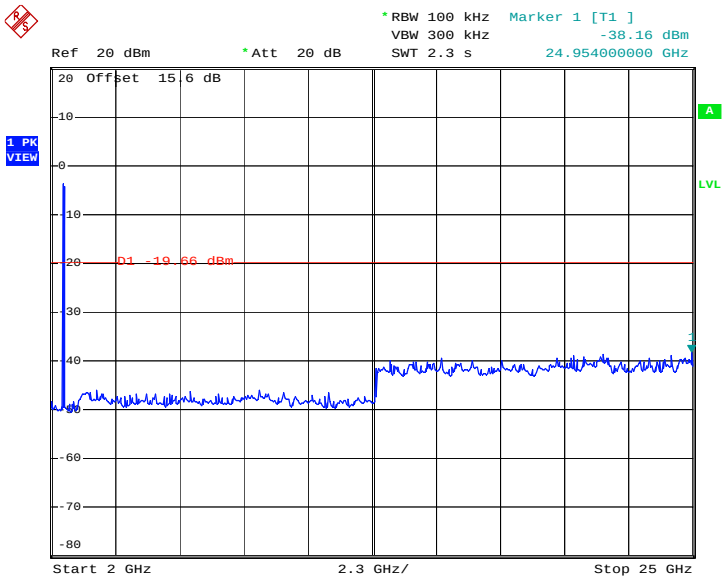
Conducted Spurious Emission Plot on Channel 11



Date: 26.JUN.2013 09:33:20

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 26.JUN.2013 09:34:17

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

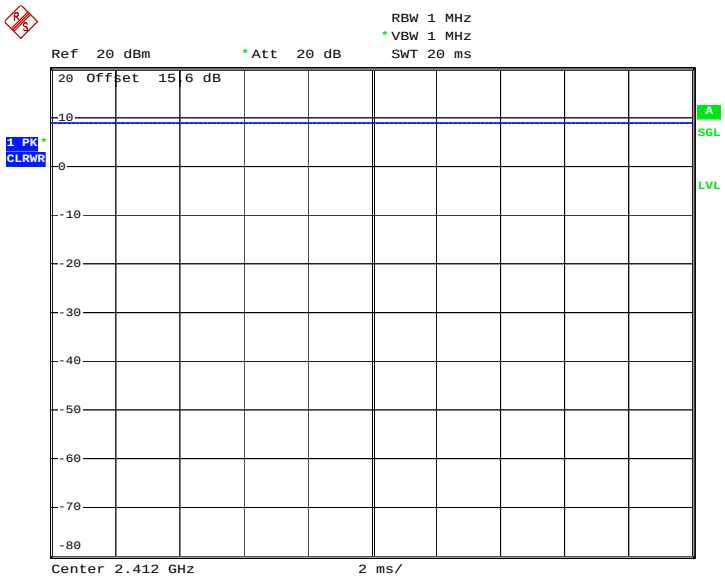
3.5.3 Test Procedures

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

Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	88.65	0.25	4.00	10KHz
802.11n HT20	97.85	1.91	0.52	1KHz

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

802.11b Duty Cycle

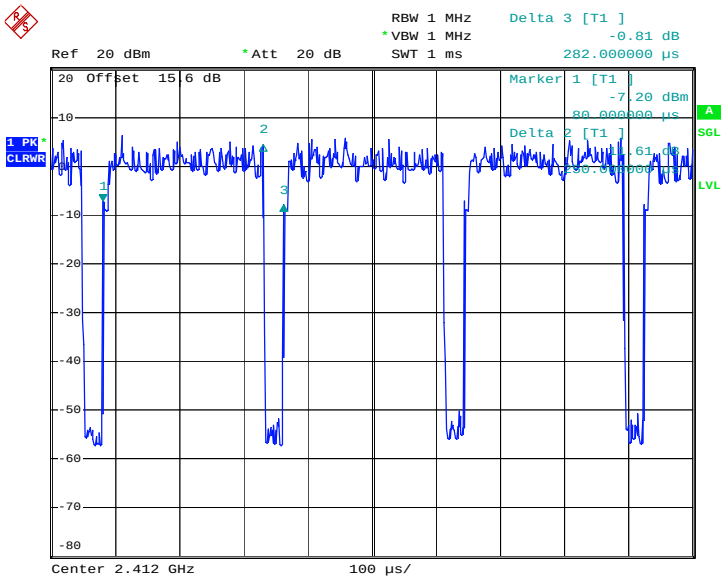


Date: 13.JUN.2013 22:33:38

Note:

The total loss is 15.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11g Duty Cycle

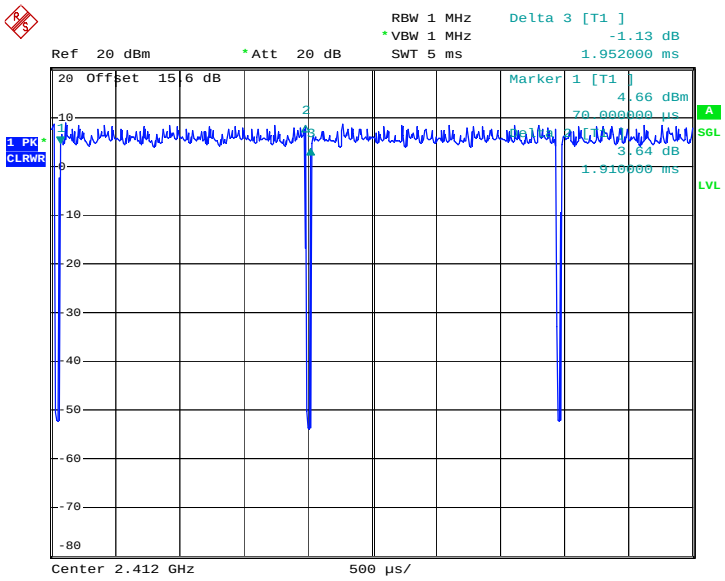


Date: 13.JUN.2013 23:04:03

Note:

The total loss is 15.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 Duty Cycle



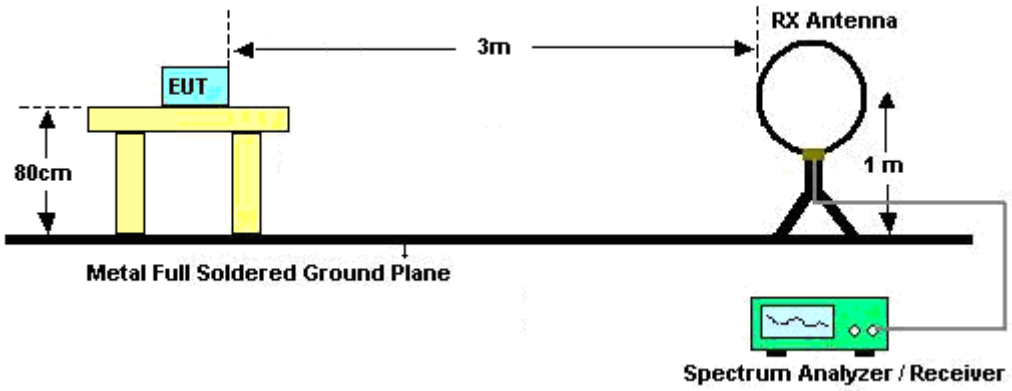
Date: 13.JUN.2013 23:05:03

Note:

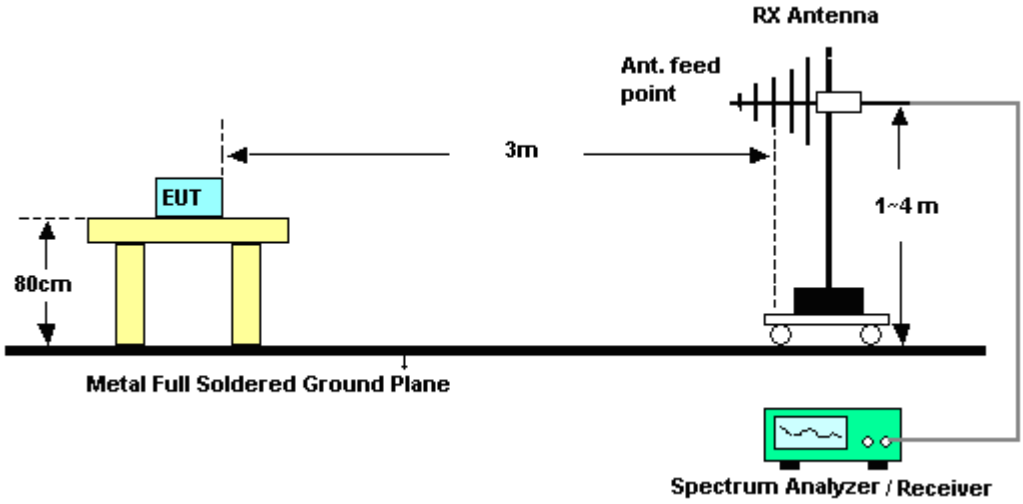
The total loss is 15.6dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

3.5.4 Test Setup

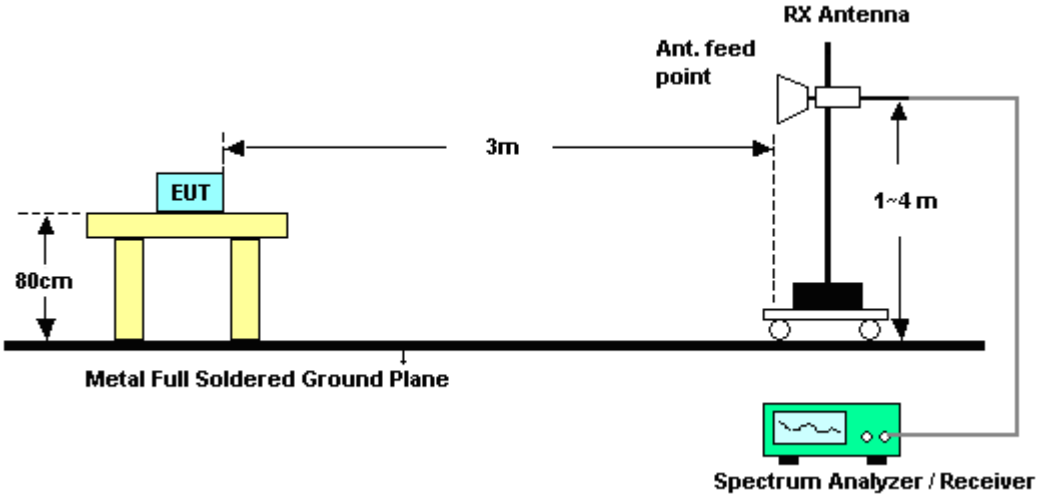
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Steven Hao

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
2382.54	52.31	-21.69	74	48.09	32.83	2.9	31.51	106	33	Peak
2389.11	40.16	-13.84	54	35.91	32.86	2.9	31.51	106	33	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
2385.6	51.66	-22.34	74	47.41	32.86	2.9	31.51	100	112	Peak
2388.84	38.41	-15.59	54	34.16	32.86	2.9	31.51	100	112	Average

Test Mode :	802.11b	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Steven Hao

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
2487.19	56.52	-17.48	74	52.06	33.01	2.96	31.51	102	37	Peak
2486.83	43.28	-10.72	54	38.82	33.01	2.96	31.51	102	37	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.97	53.4	-20.6	74	48.94	33.01	2.96	31.51	100	21	Peak
2483.56	39.69	-14.31	54	35.23	33.01	2.96	31.51	100	21	Average

Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Steven Hao

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
2389.29	67.23	-6.77	74	62.98	32.86	2.9	31.51	111	193	Peak
2390	52.41	-1.59	54	48.15	32.86	2.91	31.51	111	193	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	68.29	-5.71	74	64.03	32.86	2.91	31.51	114	76	Peak
2390	52.05	-1.95	54	47.79	32.86	2.91	31.51	114	76	Average

Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	66.28	-7.72	74	61.82	33.01	2.96	31.51	100	68	Peak
2483.5	50.36	-3.64	54	45.9	33.01	2.96	31.51	100	68	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	64.31	-9.69	74	59.85	33.01	2.96	31.51	100	343	Peak
2483.5	48.03	-5.97	54	43.57	33.01	2.96	31.51	100	343	Average

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Steven Hao

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	69.63	-4.37	74	65.38	32.86	2.9	31.51	108	69	Peak
2389.92	49.35	-4.65	54	45.09	32.86	2.91	31.51	100	70	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	68.95	-5.05	74	64.69	32.86	2.91	31.51	100	40	Peak
2390	48.26	-5.74	54	44	32.86	2.91	31.51	100	40	Average

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Steven Hao

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	67.85	-6.15	74	63.39	33.01	2.96	31.51	102	66	Peak
2483.5	49.99	-4.01	54	45.53	33.01	2.96	31.51	102	66	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	62.6	-11.4	74	58.14	33.01	2.96	31.51	100	336	Peak
2483.71	46.86	-7.14	54	42.4	33.01	2.96	31.51	100	336	Average

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

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2397.84 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 105.01dBμV/m - 20dB =85.01dBμV/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
2397.84	61.12	-23.89	85.01	56.86	32.86	2.91	31.51	106	33	Peak
2412	105.01	-	-	100.72	32.89	2.91	31.51	103	34	Peak
2412	100.07	-	-	95.78	32.89	2.91	31.51	103	34	Average
4824	50.63	-23.37	74	42.76	35.17	4.23	31.53	154	87	Peak
7236	52.62	-32.39	85.01	42	36.18	5.39	30.95	132	82	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2397.57 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
2397.57	57.81	-24.42	82.23	53.55	32.86	2.91	31.51	100	112	Peak
2412	102.23	-	-	97.94	32.89	2.91	31.51	101	112	Peak
2412	96.62	-	-	92.33	32.89	2.91	31.51	101	112	Average
4824	49.93	-24.07	74	42.06	35.17	4.23	31.53	100	321	Peak
7236	52.8	-29.43	82.23	42.18	36.18	5.39	30.95	128	66	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	107.23	-	-	102.86	32.95	2.93	31.51	100	35	Peak
2437	102.16	-	-	97.79	32.95	2.93	31.51	100	35	Average
4874	50.37	-23.63	74	42.45	35.18	4.26	31.52	127	48	Peak
7311	52.47	-21.53	74	41.77	36.2	5.44	30.94	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	104.79	-	-	100.42	32.95	2.93	31.51	100	20	Peak
2437	99.58	-	-	95.21	32.95	2.93	31.51	100	20	Average
4874	50.05	-23.95	74	42.13	35.18	4.26	31.52	121	64	Peak
7311	53.73	-20.27	74	43.03	36.2	5.44	30.94	154	67	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	108.98	-	-	104.57	32.98	2.94	31.51	103	36	Peak
2462	103.94	-	-	99.53	32.98	2.94	31.51	103	36	Average
4924	50.16	-23.84	74	42.2	35.19	4.28	31.51	100	0	Peak
7386	52.93	-21.07	74	42.11	36.24	5.51	30.93	100	37	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	104.98	-	-	100.57	32.98	2.94	31.51	100	24	Peak
2462	100.25	-	-	95.84	32.98	2.94	31.51	100	24	Average
4924	50.91	-23.09	74	42.95	35.19	4.28	31.51	100	235	Peak
7386	53.29	-20.71	74	42.47	36.24	5.51	30.93	124	53	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2398.92 MHz and 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	20.14	-19.86	40	35.37	18	0.34	33.57	100	16	Peak
92.08	20.91	-22.59	43.5	44.62	9.35	0.56	33.62	-	-	Peak
161.92	17.95	-25.55	43.5	41.25	9.53	0.75	33.58	-	-	Peak
260.86	22.05	-23.95	46	42.38	12.17	0.93	33.43	-	-	Peak
553.8	20.09	-25.91	46	33.26	18.51	1.33	33.01	-	-	Peak
941.8	24.09	-21.91	46	34.08	20.7	1.75	32.44	-	-	Peak
2398.92	80.97	-4.74	85.71	76.71	32.86	2.91	31.51	111	193	Peak
2412	105.71	-	-	101.42	32.89	2.91	31.51	100	75	Peak
2412	95.16	-	-	90.87	32.89	2.91	31.51	100	75	Average
4824	50.3	-23.7	74	42.43	35.17	4.23	31.53	100	57	Peak
7236	51.73	-33.98	85.71	41.11	36.18	5.39	30.95	100	64	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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
43.58	23.33	-16.67	40	46.51	10.03	0.41	33.62	100	26	Peak
100.81	18.6	-24.9	43.5	41.01	10.62	0.58	33.61	-	-	Peak
549.92	19.7	-26.3	46	32.88	18.5	1.33	33.01	-	-	Peak
636.25	20.23	-25.77	46	32.9	18.83	1.45	32.95	-	-	Peak
842.86	21.8	-24.2	46	32.45	20.44	1.63	32.72	-	-	Peak
957.32	24.13	-21.87	46	34.04	20.77	1.76	32.44	-	-	Peak
2399	80.35	-3.04	83.39	76.09	32.86	2.91	31.51	114	76	Peak
2412	103.39	-	-	99.1	32.89	2.91	31.51	100	212	Peak
2412	92.71	-	-	88.42	32.89	2.91	31.51	100	212	Average
4824	49.64	-24.36	74	41.77	35.17	4.23	31.53	100	64	Peak
7236	53.81	-29.58	83.39	43.19	36.18	5.39	30.95	100	26	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	109.31	-	-	104.94	32.95	2.93	31.51	104	30	Peak
2437	98.97	-	-	94.6	32.95	2.93	31.51	104	30	Average
4874	50.32	-23.68	74	42.4	35.18	4.26	31.52	100	256	Peak
7311	52.14	-21.86	74	41.44	36.2	5.44	30.94	100	49	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	106.11	-	-	101.74	32.95	2.93	31.51	100	20	Peak
2437	95.19	-	-	90.82	32.95	2.93	31.51	100	20	Average
4874	50.22	-23.78	74	42.3	35.18	4.26	31.52	100	59	Peak
7311	52.68	-21.32	74	41.98	36.2	5.44	30.94	100	266	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	107.85	-	-	103.44	32.98	2.94	31.51	100	65	Peak
2462	97.2	-	-	92.79	32.98	2.94	31.51	100	65	Average
4924	50.92	-23.08	74	42.96	35.19	4.28	31.51	100	95	Peak
7386	52.94	-21.06	74	42.12	36.24	5.51	30.93	100	56	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	104.93	-	-	100.52	32.98	2.94	31.51	100	340	Peak
2462	94.28	-	-	89.87	32.98	2.94	31.51	100	340	Average
4924	50.03	-23.97	74	42.07	35.19	4.28	31.51	100	26	Peak
7386	53.57	-20.43	74	42.75	36.24	5.51	30.93	100	46	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	80.2	-4.58	84.78	75.94	32.86	2.91	31.51	108	69	Peak
2412	104.78	-	-	100.49	32.89	2.91	31.51	200	69	Peak
2412	94.12	-	-	89.83	32.89	2.91	31.51	200	69	Average
4824	50.88	-23.12	74	43.01	35.17	4.23	31.53	120	355	Peak
7236	53.39	-31.39	84.78	42.77	36.18	5.39	30.95	103	78	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	77.8	-6	83.8	73.54	32.86	2.91	31.51	100	40	Peak
2412	103.8	-	-	99.51	32.89	2.91	31.51	100	40	Peak
2412	92.34	-	-	88.05	32.89	2.91	31.51	100	40	Average
4824	50.43	-23.57	74	42.56	35.17	4.23	31.53	100	234	Peak
7236	52.92	-30.88	83.8	42.3	36.18	5.39	30.95	100	57	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	108.78	-	-	104.41	32.95	2.93	31.51	103	45	Peak
2437	97.8	-	-	93.43	32.95	2.93	31.51	103	45	Average
4874	50.09	-23.91	74	42.17	35.18	4.26	31.52	120	32	Peak
7311	53.57	-20.43	74	42.87	36.2	5.44	30.94	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	105.56	-	-	101.19	32.95	2.93	31.51	100	316	Peak
2437	94.99	-	-	90.62	32.95	2.93	31.51	100	316	Average
4874	50.68	-23.32	74	42.76	35.18	4.26	31.52	132	69	Peak
7311	54	-20	74	43.3	36.2	5.44	30.94	132	120	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	107.35	-	-	102.94	32.98	2.94	31.51	105	68	Peak
2462	97.45	-	-	93.04	32.98	2.94	31.51	105	68	Average
4924	50.23	-23.77	74	42.27	35.19	4.28	31.51	100	23	Peak
7386	53.19	-20.81	74	42.37	36.24	5.51	30.93	126	58	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Steven Hao	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	104.75	-	-	100.34	32.98	2.94	31.51	118	46	Peak
2462	95.12	-	-	90.71	32.98	2.94	31.51	118	46	Average
4924	50.5	-23.5	74	42.54	35.19	4.28	31.51	124	56	Peak
7386	52.39	-21.61	74	41.57	36.24	5.51	30.93	123	99	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 (dBμV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

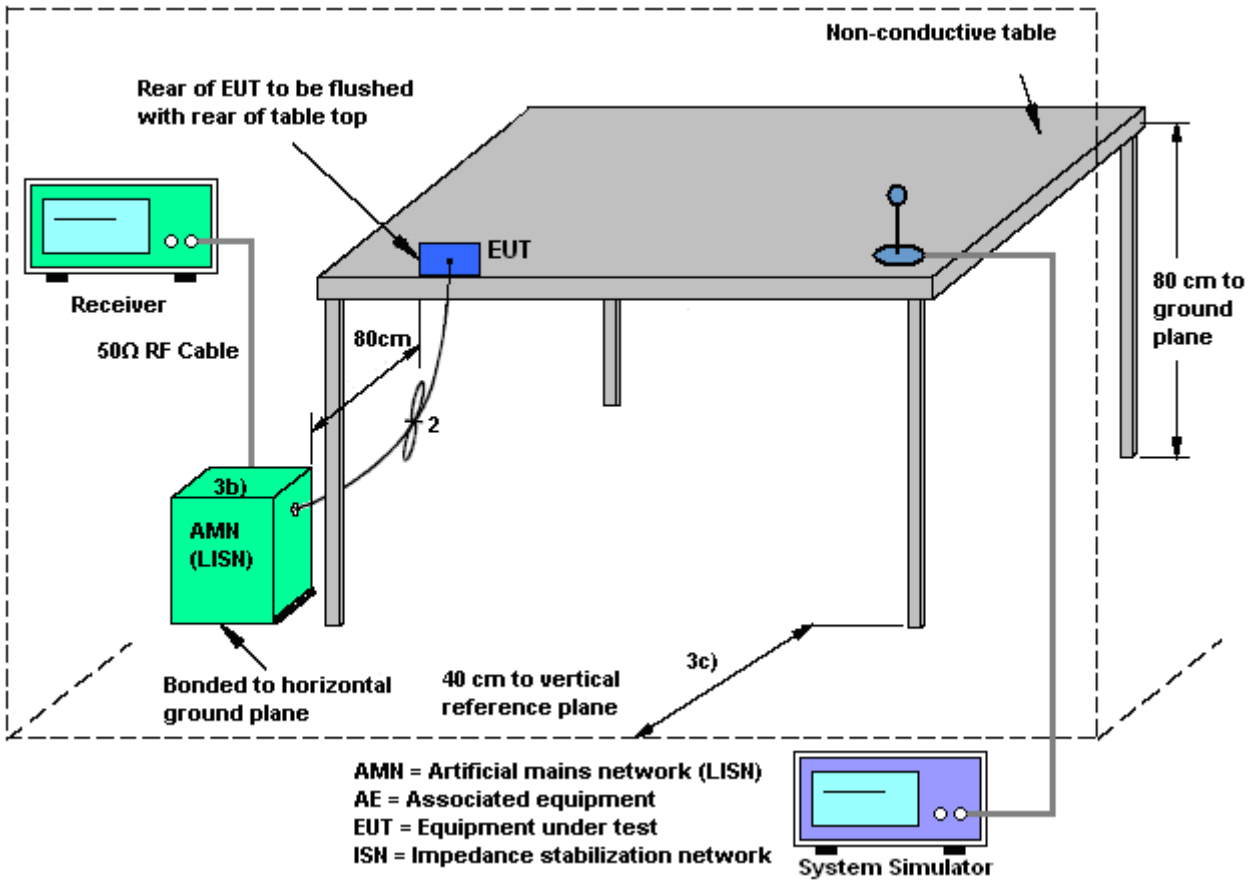
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

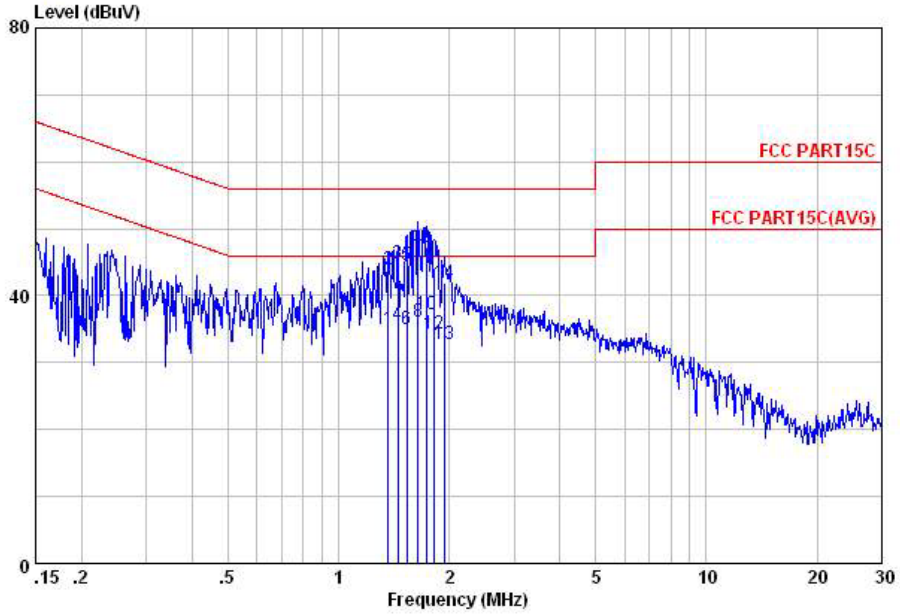
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

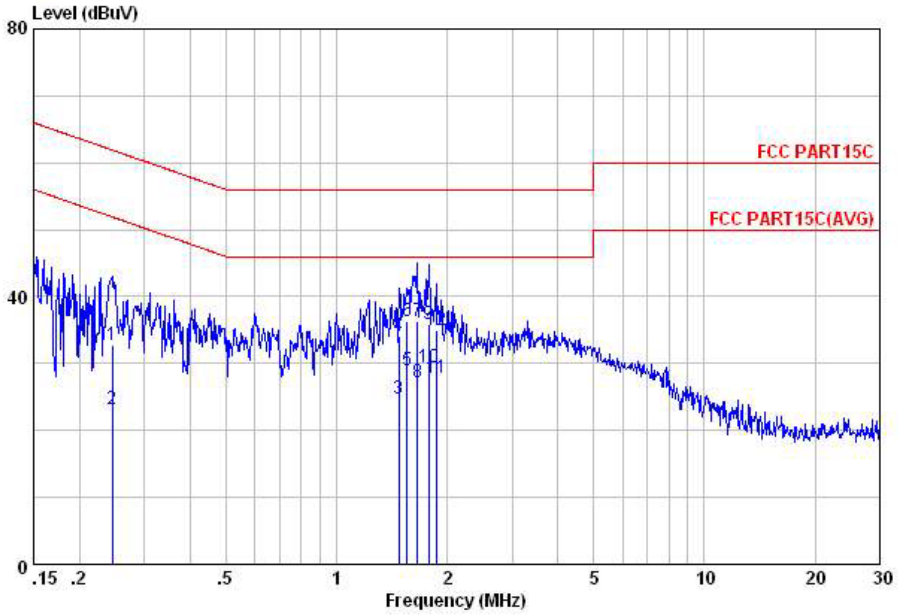
Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN Link + USB Cable (Charging from Adapter)		



Site : C001-KS
Condition: FCC PART15C LISN-L20130306 LINE
Project : (FR) 361407
mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	1.37	34.98	-11.02	46.00	24.70	0.10	10.18	Average
2	1.37	43.98	-12.02	56.00	33.70	0.10	10.18	QP
3	1.45	44.69	-11.31	56.00	34.40	0.10	10.19	QP
4	1.45	35.59	-10.41	46.00	25.30	0.10	10.19	Average
5	1.54	44.59	-11.41	56.00	34.30	0.10	10.19	QP
6	1.54	34.99	-11.01	46.00	24.70	0.10	10.19	Average
7	1.64	45.79	-10.21	56.00	35.50	0.10	10.19	QP
8	1.64	36.19	-9.81	46.00	25.90	0.10	10.19	Average
9	1.73	47.19	-8.81	56.00	36.90	0.10	10.19	QP
10	1.73	37.29	-8.71	46.00	27.00	0.10	10.19	Average
11	1.82	44.09	-11.91	56.00	33.80	0.10	10.19	QP
12	1.82	34.39	-11.61	46.00	24.10	0.10	10.19	Average
13	1.94	32.69	-13.31	46.00	22.40	0.10	10.19	Average
14	1.94	41.79	-14.21	56.00	31.50	0.10	10.19	QP

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN Link + USB Cable (Charging from Adapter)		



Site : C001-KS
Condition: FCC PART15C LISN-N20130306 NEUTRAL
Project : (FR) 361407
mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.25	32.71	-29.20	61.91	21.30	0.90	10.51	QP
2	0.25	23.11	-28.80	51.91	11.70	0.90	10.51	Average
3	1.48	24.79	-21.21	46.00	14.50	0.10	10.19	Average
4	1.48	33.99	-22.01	56.00	23.70	0.10	10.19	QP
5	1.55	28.89	-17.11	46.00	18.60	0.10	10.19	Average
6	1.55	36.39	-19.61	56.00	26.10	0.10	10.19	QP
7	1.66	36.39	-19.61	56.00	26.10	0.10	10.19	QP
8	1.66	27.29	-18.71	46.00	17.00	0.10	10.19	Average
9	1.78	35.79	-20.21	56.00	25.50	0.10	10.19	QP
10	1.78	29.49	-16.51	46.00	19.20	0.10	10.19	Average
11	1.87	27.79	-18.21	46.00	17.50	0.10	10.19	Average
12	1.87	34.89	-21.11	56.00	24.60	0.10	10.19	QP

3.7 Antenna Requirements

3.7.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9KHz~40GHz	Dec. 29, 2012	Jun. 19, 2013~ Jun. 26, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Jun. 19, 2013~ Jun. 26, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Jun. 19, 2013~ Jun. 26, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Jun. 19, 2013~ Jun. 26, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9KHz~3GHz	Nov. 08, 2012	Jun. 13, 2013~ Jun. 22, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	100400	9KHz~30GHz	May 23, 2013	Jun. 13, 2013~ Jun. 22, 2013	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Jun. 13, 2013~ Jun. 22, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9KHz-30MHz	Oct. 22, 2012	Jun. 13, 2013~ Jun. 22, 2013	Oct. 21, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2013	Jun. 13, 2013~ Jun. 22, 2013	Jan. 05, 2014	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	May 23, 2013	Jun. 13, 2013~ Jun. 22, 2013	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Jun. 13, 2013~ Jun. 22, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2012	Jun. 13, 2013~ Jun. 22, 2013	Nov. 06, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Jun. 13, 2013~ Jun. 22, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9KHz~7GHz	May 23, 2013	Jun. 18, 2013	May 22, 2014	Conduction (CO01-KS)
LISN (for auxiliary equipment)	MessTec	AN3016	60103	9KHz~30MHz	Dec. 29, 2012	Jun. 18, 2013	Dec. 28, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9KHz~30MHz	Dec. 29, 2012	Jun. 18, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 15, 2012	Jun. 18, 2013	Nov. 14, 2013	Conduction (CO01-KS)

5 Uncertainty of Evaluation

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

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

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

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

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

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 EP361407 as below.