

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone
BRAND NAME : ZTE
MODEL NAME : ZTE V970M/Grand X(M)
FCC ID : Q78-V970M
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Oct. 17, 2012 and completely tested on Nov. 08, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



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



TABLE OF CONTENTS

REVISION HISTORY..... 3

SUMMARY OF TEST RESULT 4

1 GENERAL DESCRIPTION 5

 1.1 Applicant 5

 1.2 Manufacturer 5

 1.3 Feature of Equipment Under Test 6

 1.4 Testing Site 7

 1.5 Applied Standards 7

 1.6 Ancillary Equipment List 7

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST 8

 2.1 Carrier Frequency Channel 8

 2.2 Pre-Scanned RF Power 9

 2.3 Test Mode 10

 2.4 Connection Diagram of Test System 11

 2.5 RF Utility 11

3 TEST RESULT 12

 3.1 6dB Bandwidth Measurement 12

 3.2 Output Power Measurement 21

 3.3 Power Spectral Density Measurement 24

 3.4 Conducted Band Edges and Spurious Emission Measurement 43

 3.5 Radiated Emission Measurement 60

 3.6 AC Conducted Emission Measurement 80

 3.7 Antenna Requirements 84

4 LIST OF MEASURING EQUIPMENT 85

5 UNCERTAINTY OF EVALUATION 86

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	-
			Radiated Spurious Emission		Pass	Under limit 0.4 dB at 2483.500 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 8.01 dB at 2.010 & 2.070 MHz
3.7	15.203 & 15.247(b)	A8.4	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	WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	ZTE V970M/Grand X(M)
FCC ID	Q78-V970M
EUT supports Radios application	GSM/ GPRS /EGPRS/WCDMA/HSPA/WLAN 11bgn/ Bluetooth 2.1 EDR/Bluetooth 3.0 EDR/Bluetooth 4.0 – LE
HW Version	WMAJ
SW Version	ZTE-CN-QB125D-P175A20V1.0.0
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two different types of EUT. They are sample 1 with dual SIM card and sample 2 with single SIM card and different flash. The others are the same including circuit design, PCB board, structure and all components. It is special to declare. After pre-scan the dual SIM card and single SIM card sample, we found test result with dual SIM card were the worse, so we choose the dual SIM card sample to perform all 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 : 18.36 dBm (0.0690 W) 802.11g : 19.98 dBm (0.1000 W) 802.11n HT20 : 19.75 dBm (0.0940 W) 802.11n HT40 : 18.28 dBm (0.0670 W)
Antenna Type	Monopole Antenna with gain -4.00 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Testing Site

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

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
- ♦ ANSI C63.4-2003 and ANSI C63.10-2009
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

Remark:

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

1.6 Ancillary Equipment List

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

2 Test Configuration of Equipment Under Test

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

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

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

2.1 Carrier Frequency Channel

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

2.2 Pre-Scanned RF Power

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

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	17.64	17.64	17.35	17.44
CH 06	2437 MHz	17.82	17.78	17.45	17.56
CH 11	2462 MHz	18.36	18.25	18.02	18.18

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	19.24	19.34	19.17	19.36	19.33	19.38	19.39	19.45
CH 06	2437 MHz	19.79	19.78	19.86	19.83	19.78	19.93	19.86	19.98
CH 11	2462 MHz	19.98	19.89	19.84	19.94	19.84	19.93	19.94	19.97

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
CH 01	2412 MHz	18.68	18.56	18.75	18.81	18.75	18.78	18.81	19.37
CH 06	2437 MHz	19.63	19.09	19.36	19.44	19.32	19.41	19.37	19.51
CH 11	2462 MHz	19.62	19.53	19.29	19.43	19.39	19.31	19.38	19.75

Channel	Frequency	2.4GHz 802.11n HT40 RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
CH 03	2422 MHz	18.16	17.11	17.03	17.05	17.18	17.23	17.26	17.91
CH 06	2437 MHz	18.19	17.26	17.21	17.15	17.23	17.19	17.25	18.01
CH 09	2452 MHz	18.26	17.23	17.18	17.23	17.26	17.29	17.05	18.28

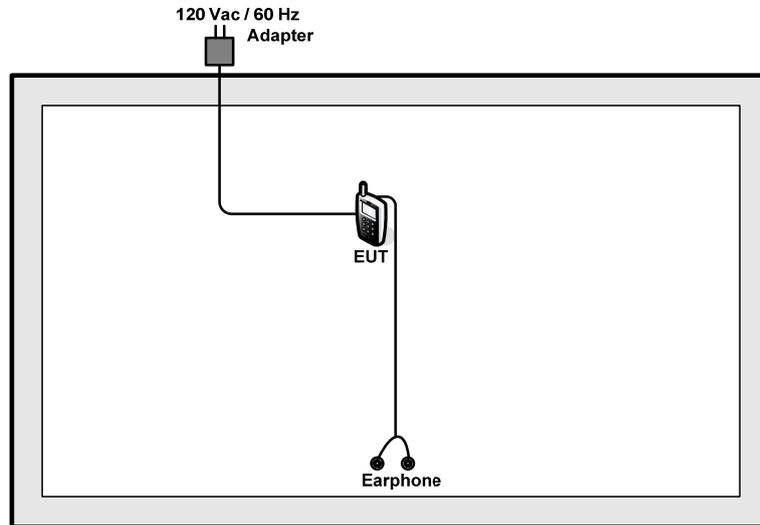
2.3 Test Mode

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

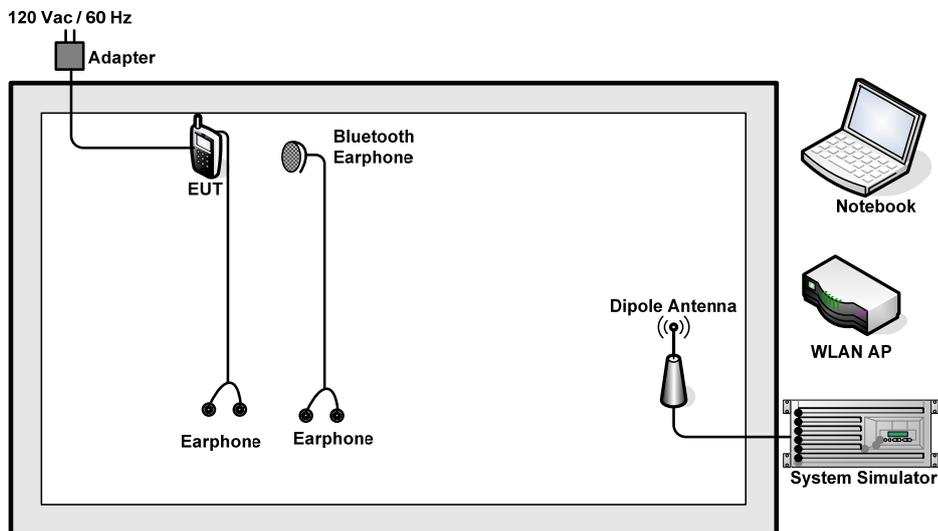
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
	Conducted Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	13.5 Mbps	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
Radiated TCs	Radiated Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	13.5 Mbps	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	13.5 Mbps	3/6/9
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link + Adapter + Earphone			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

For WLAN function, key in “*983*3640#” on the EUT directly. Then, the EUT will get into the engineering modes to contact with WLAN AP for continuous transmitting and receiving signals.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

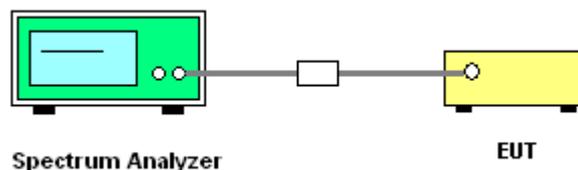
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



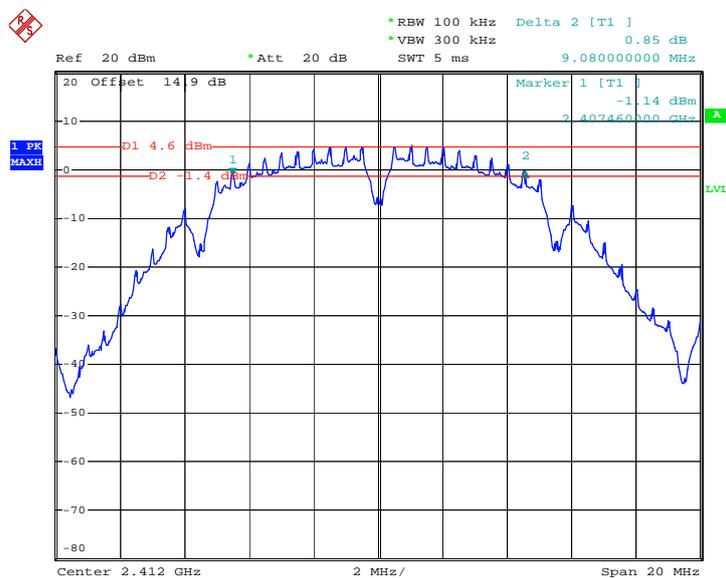


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.08	0.5	Pass
06	2437	9.04	0.5	Pass
11	2462	9.04	0.5	Pass

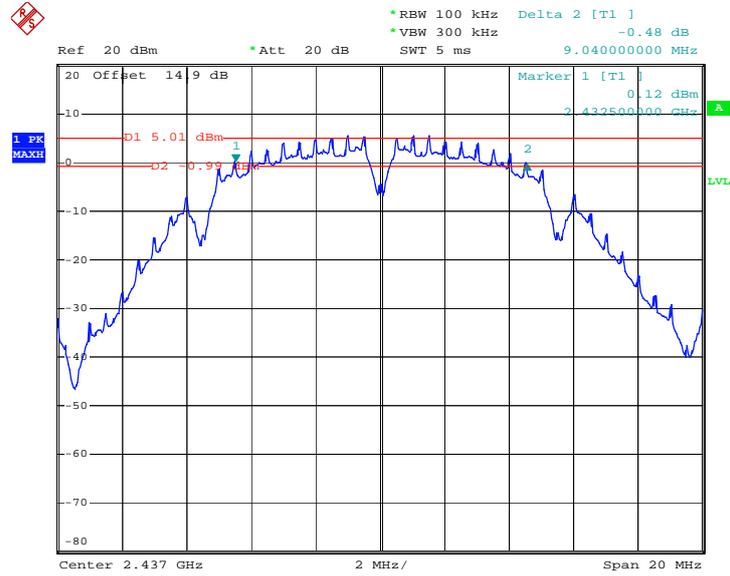
6 dB Bandwidth Plot on 802.11b Channel 01



Date: 8.NOV.2012 11:37:25

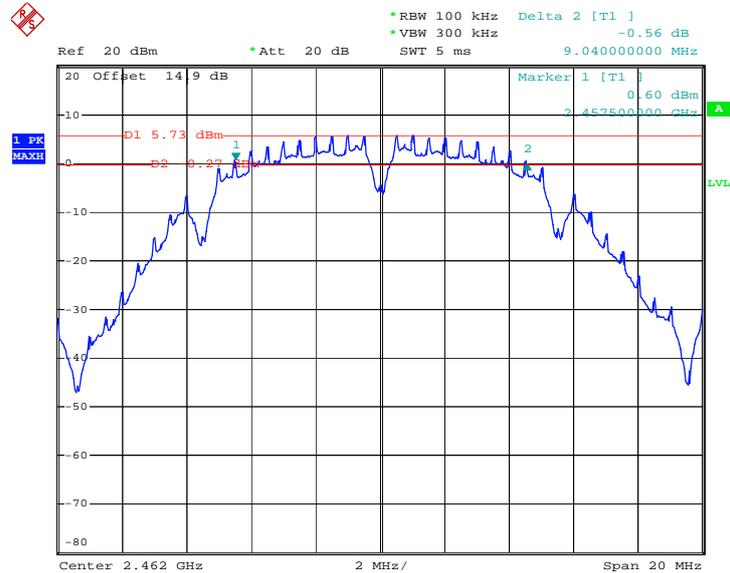


6 dB Bandwidth Plot on 802.11b Channel 06



Date: 8.NOV.2012 11:43:04

6 dB Bandwidth Plot on 802.11b Channel 11



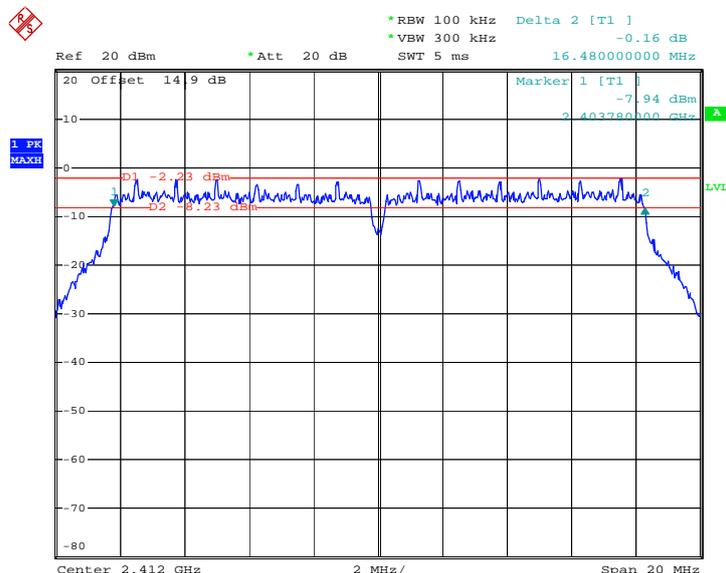
Date: 8.NOV.2012 11:46:06



Test Mode :	802.11g	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.48	0.5	Pass
06	2437	16.40	0.5	Pass
11	2462	16.52	0.5	Pass

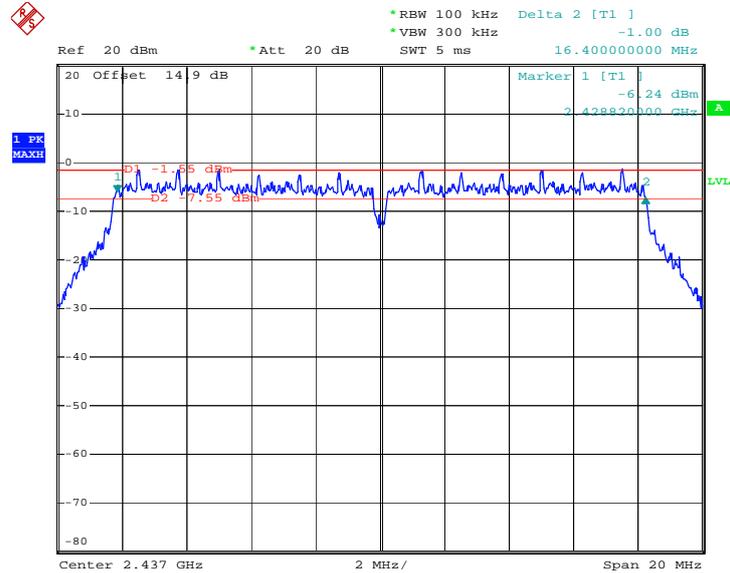
6 dB Bandwidth Plot on 802.11g Channel 01



Date: 8.NOV.2012 11:17:00

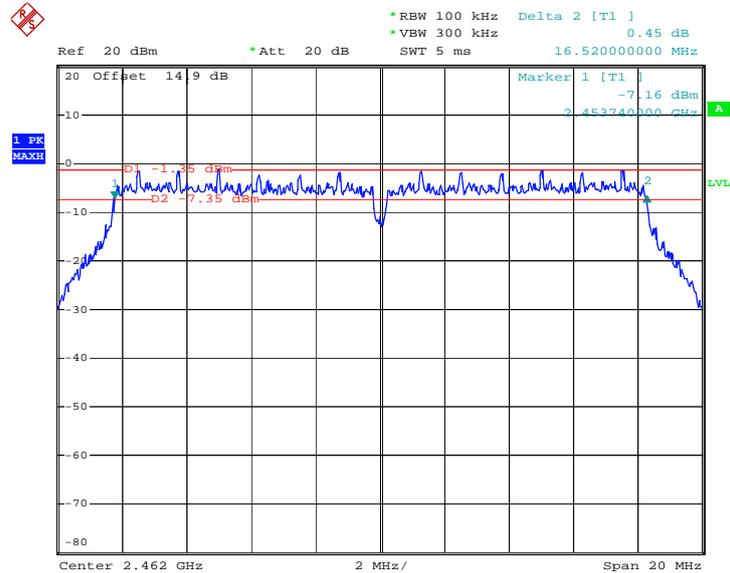


6 dB Bandwidth Plot on 802.11g Channel 06



Date: 8.NOV.2012 11:20:10

6 dB Bandwidth Plot on 802.11g Channel 11



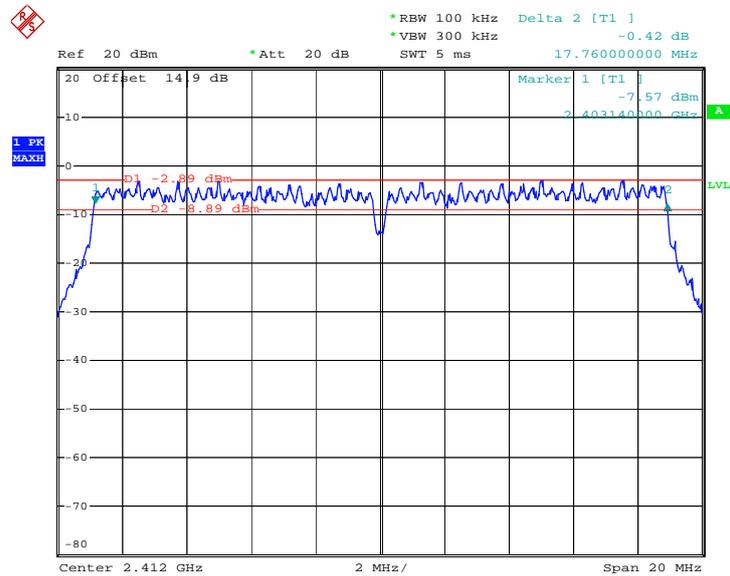
Date: 8.NOV.2012 11:25:09



Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.76	0.5	Pass
06	2437	17.76	0.5	Pass
11	2462	17.72	0.5	Pass

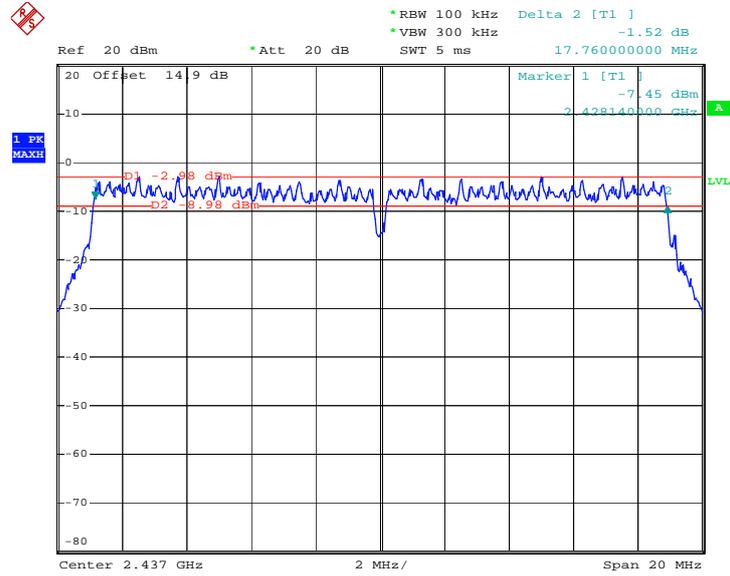
6 dB Bandwidth Plot on 802.11n HT20 Channel 01



Date: 8.NOV.2012 11:52:03

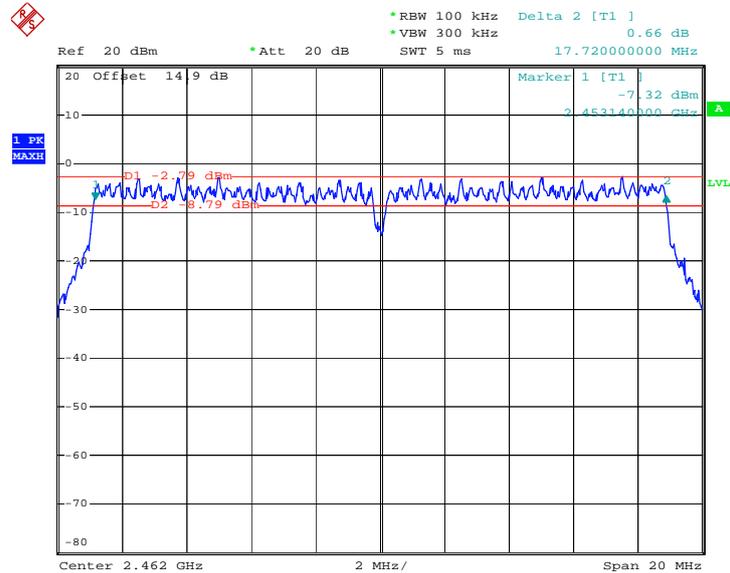


6 dB Bandwidth Plot on 802.11n HT20 Channel 06



Date: 8.NOV.2012 11:55:02

6 dB Bandwidth Plot on 802.11n HT20 Channel 11



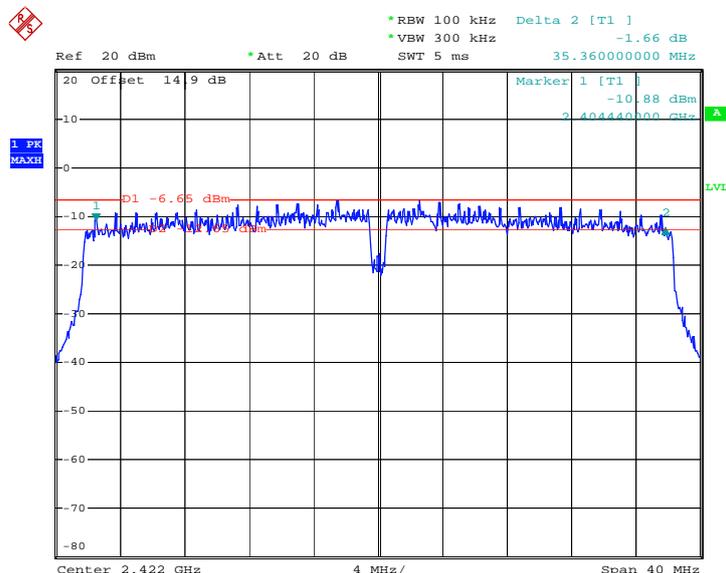
Date: 8.NOV.2012 11:57:19



Test Mode :	802.11n HT40	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11n HT40 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	35.36	0.5	Pass
06	2437	35.12	0.5	Pass
09	2452	35.92	0.5	Pass

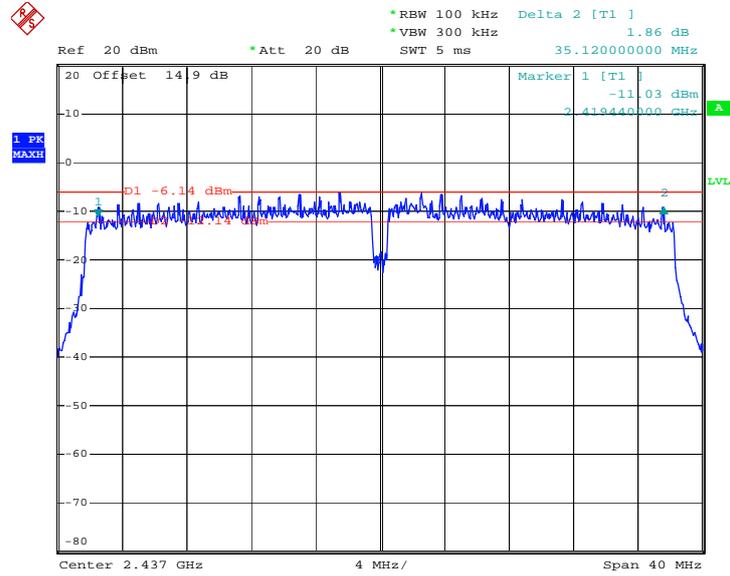
6 dB Bandwidth Plot on 802.11n HT40 Channel 03



Date: 8.NOV.2012 12:00:27

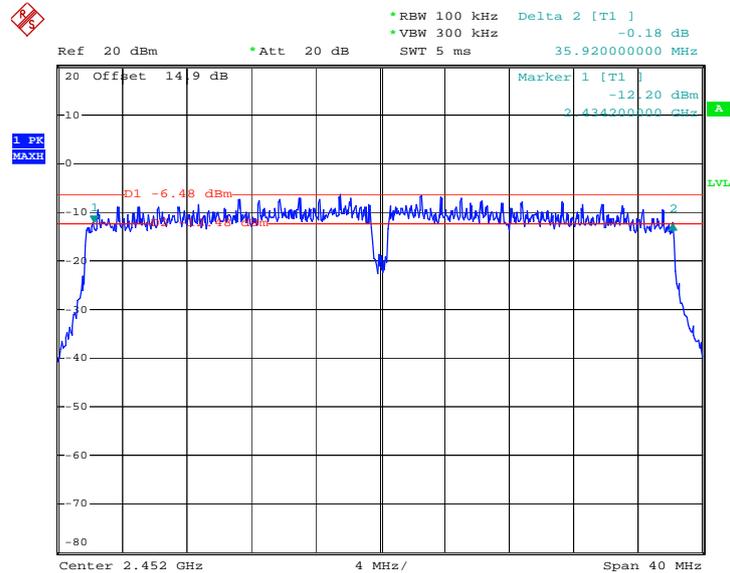


6 dB Bandwidth Plot on 802.11n HT40 Channel 06



Date: 8.NOV.2012 12:02:57

6 dB Bandwidth Plot on 802.11n HT40Channel 09



Date: 8.NOV.2012 13:13:03

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

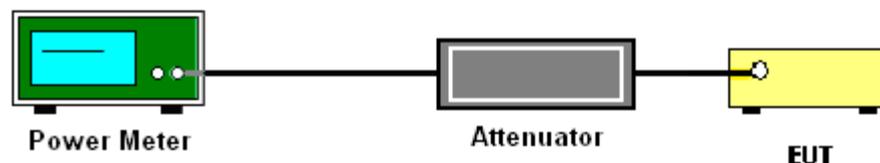
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	802.11b	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.64	30	Pass
06	2437	17.82	30	Pass
11	2462	18.36	30	Pass

Test Mode :	802.11g	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.24	30	Pass
06	2437	19.79	30	Pass
11	2462	19.98	30	Pass

Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.37	30	Pass
06	2437	19.51	30	Pass
11	2462	19.75	30	Pass

Test Mode :	2.4GHz 802.11n HT40	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	17.91	30	Pass
06	2437	18.01	30	Pass
09	2452	18.28	30	Pass



3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%
Duty Cycle:	98.60%	Duty Factor:	0.06dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	14.61
06	2437	14.75
11	2462	15.40

Test Mode :	802.11g	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%
Duty Cycle:	92.67%	Duty Factor:	0.33dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	10.26
06	2437	9.22
11	2462	11.29

Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%
Duty Cycle:	56.62%	Duty Factor:	2.47dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	9.68
06	2437	9.38
11	2462	10.03

Test Mode :	802.11n HT40	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%
Duty Cycle:	44.66%	Duty Factor:	3.50dB

Channel	Frequency (MHz)	802.11n HT40 Average Output Power (dBm)
03	2422	8.06
06	2437	8.27
09	2452	8.36

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

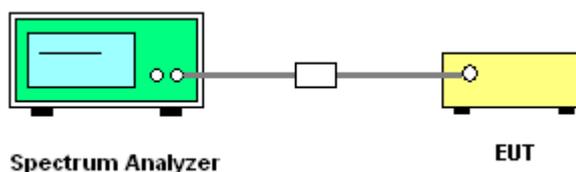
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 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. Record the measurement data derived from spectrum analyzer.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	802.11b	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	4.71	-8.89	8	Pass
06	2437	5.54	-8.80	8	Pass
11	2462	5.85	-8.42	8	Pass

Test Mode :	802.11g	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-2.19	-16.70	8	Pass
06	2437	-1.53	-15.53	8	Pass
11	2462	-1.26	-13.92	8	Pass



Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-2.85	-17.81	8	Pass
06	2437	-3.03	-19.40	8	Pass
11	2462	-2.79	-16.01	8	Pass

Test Mode :	802.11n HT40	Temperature :	21~22°C
Test Engineer :	Cloud Peng	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11n HT40 Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-6.63	-22.06	8	Pass
06	2437	-6.18	-22.76	8	Pass
11	2462	-6.53	-23.12	8	Pass

Note:

- 1. Measured power density (dBm) has offset with cable loss.
- 2. Measured power density (dBm)/ 100KHz is for 20dBc reference only



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

<802.11b>

PSD 100KHz Plot on 802.11b Channel 01



Date: 8.NOV.2012 11:37:44

PSD 100KHz Plot on 802.11b Channel 06



Date: 8.NOV.2012 11:43:26



PSD 100KHz Plot on 802.11b Channel 11

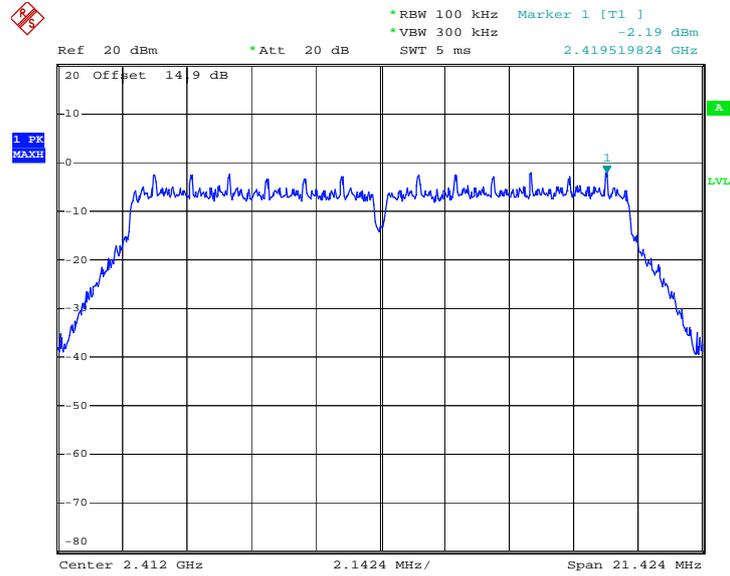


Date: 8.NOV.2012 11:46:27



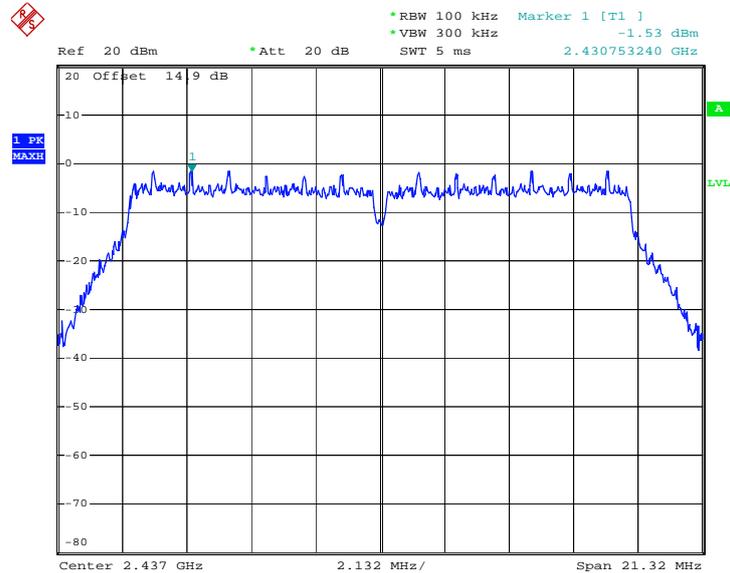
<802.11g>

PSD 100KHz Plot on 802.11g Channel 01



Date: 8.NOV.2012 11:17:19

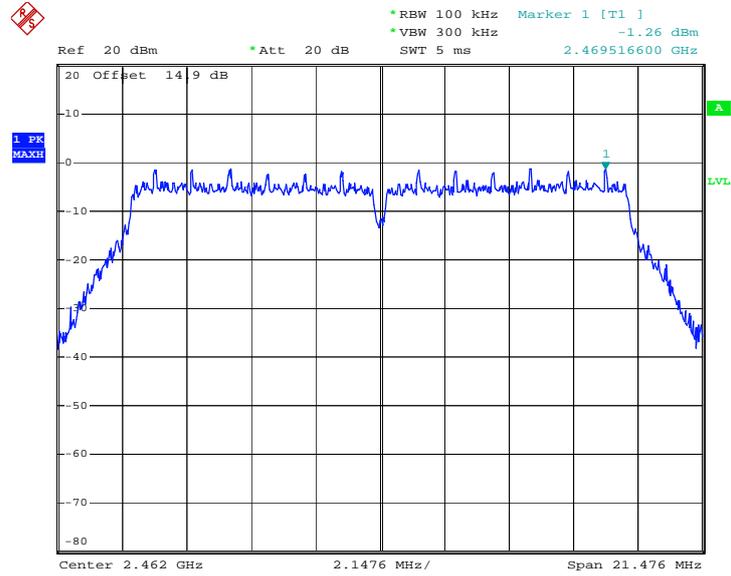
PSD 100KHz Plot on 802.11g Channel 06



Date: 8.NOV.2012 11:20:30



PSD 100KHz Plot on 802.11g Channel 11

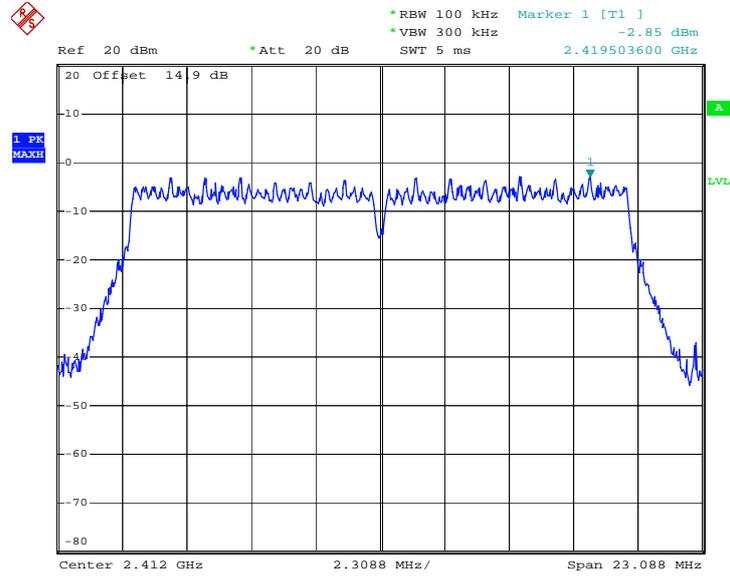


Date: 8.NOV.2012 11:25:30



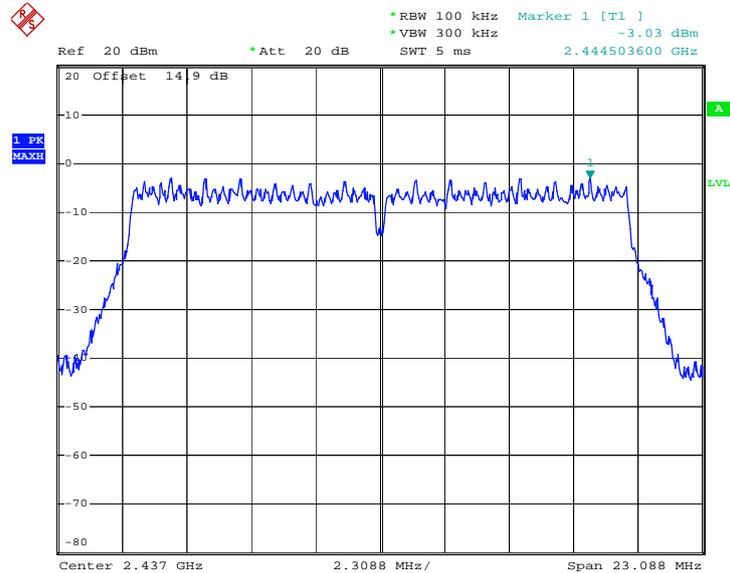
<2.4GHz 802.11n HT-20>

PSD 100KHz Plot on 2.4G 802.11n HT20 Channel 01



Date: 8.NOV.2012 11:52:22

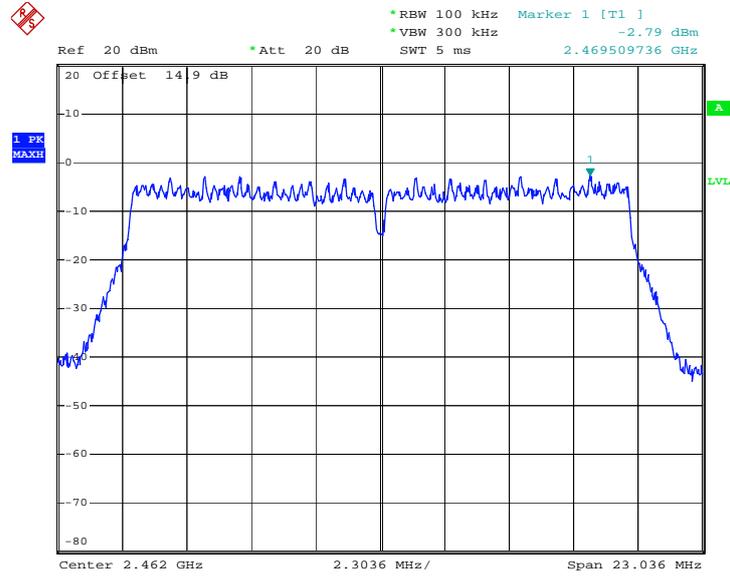
PSD 100KHz Plot on 2.4G 802.11n HT20 Channel 06



Date: 8.NOV.2012 11:55:22



PSD 100KHz Plot on 2.4G 802.11n HT20 Channel 11

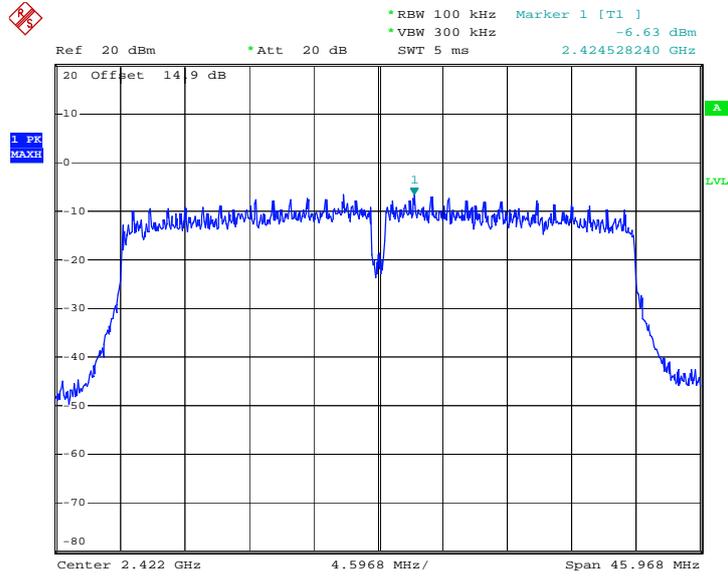


Date: 8.NOV.2012 11:57:39



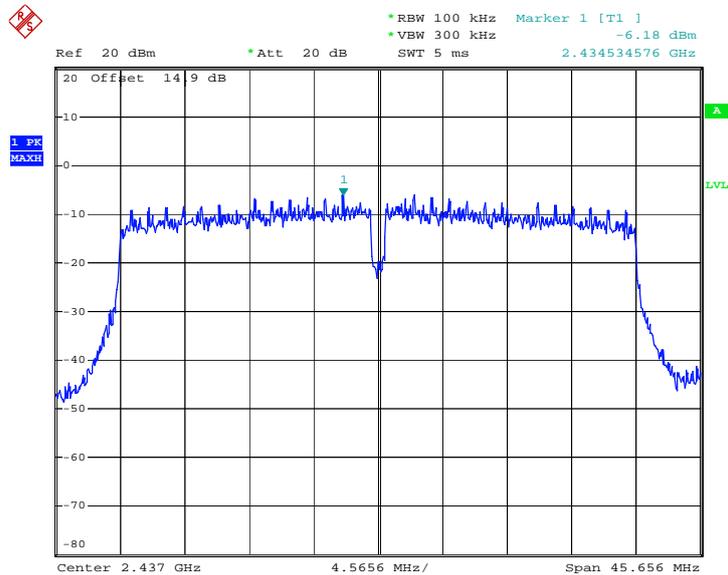
<2.4GHz 802.11n HT-40>

PSD 100KHz Plot on 2.4G 802.11n HT40 Channel 03



Date: 8.NOV.2012 12:00:47

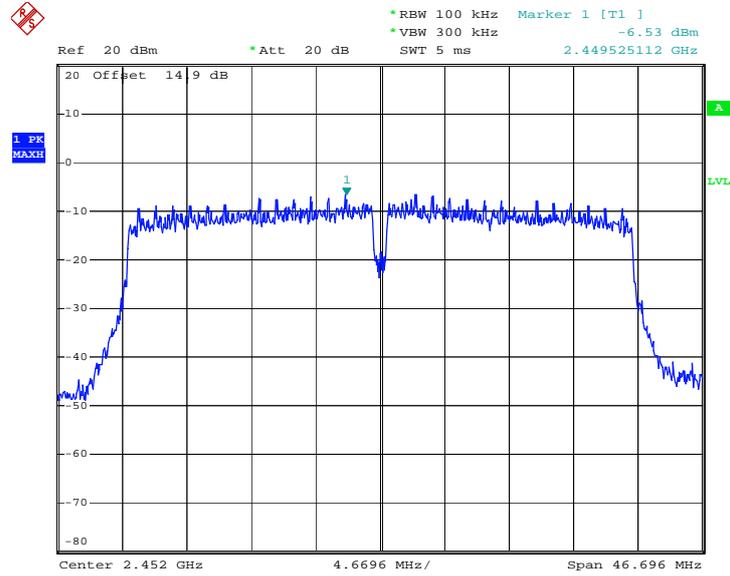
PSD 100KHz Plot on 2.4G 802.11n HT40 Channel 06



Date: 8.NOV.2012 12:03:17



PSD 100KHz Plot on 2.4G 802.11n HT40 Channel 09



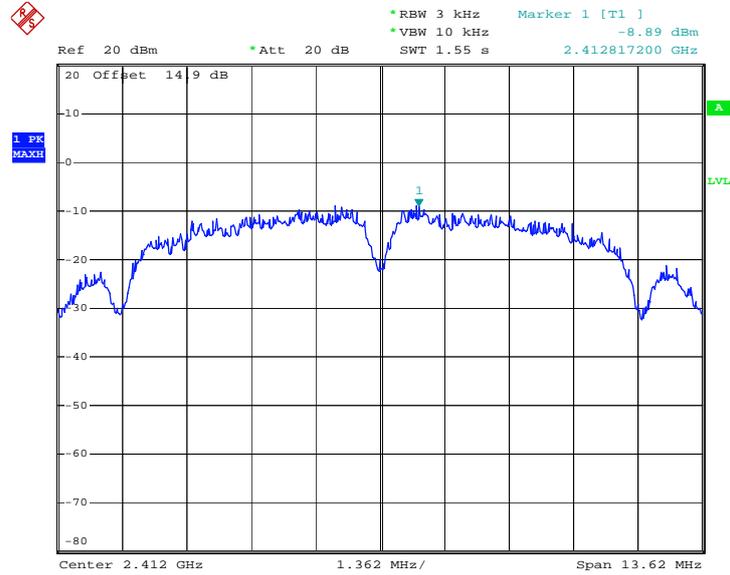
Date: 8.NOV.2012 13:13:23



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

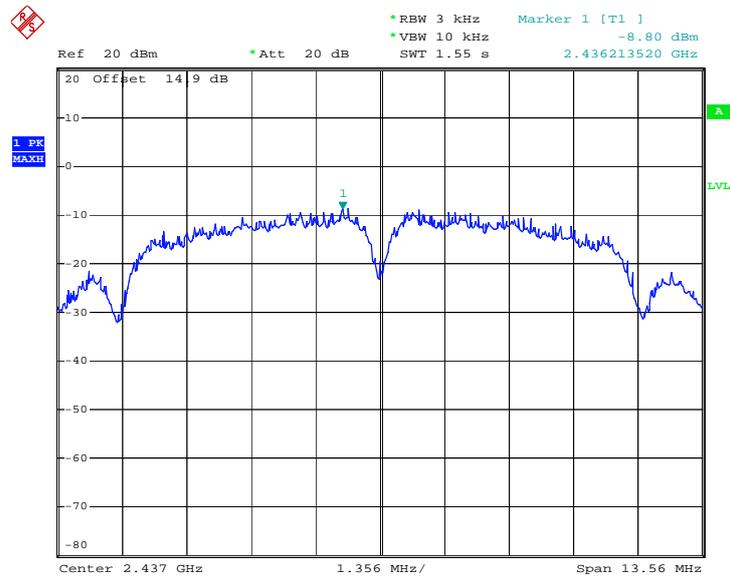
<802.11b>

PSD 3KHz Plot on 802.11b Channel 01



Date: 8.NOV.2012 13:29:32

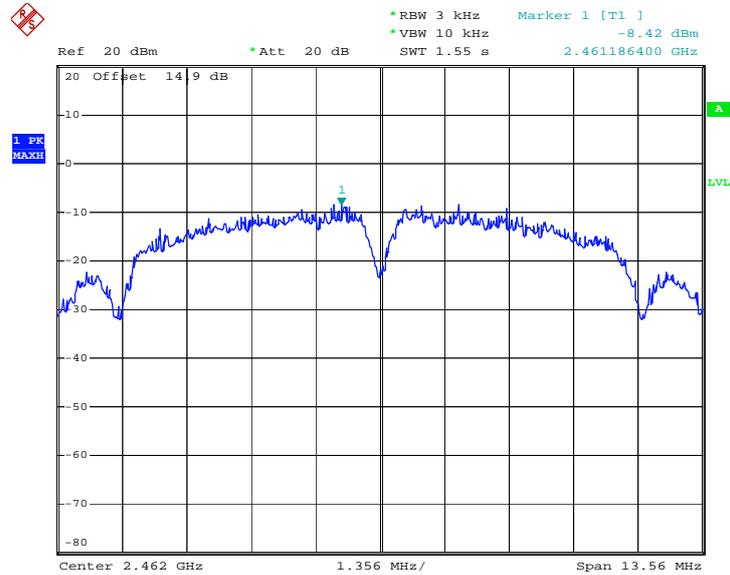
PSD 3KHz Plot on 802.11b Channel 06



Date: 8.NOV.2012 13:30:22



PSD 3KHz Plot on 802.11b Channel 11

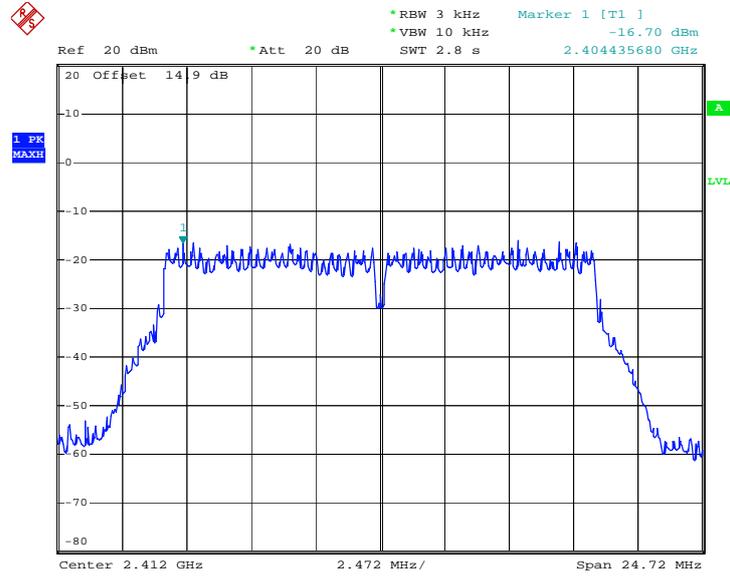


Date: 8.NOV.2012 13:31:09



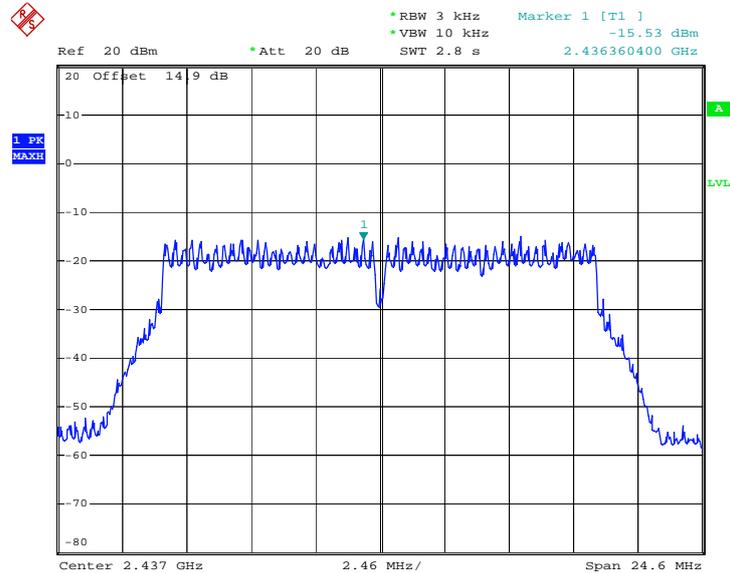
<802.11g>

PSD 3KHz Plot on 802.11g Channel 01



Date: 8.NOV.2012 13:32:26

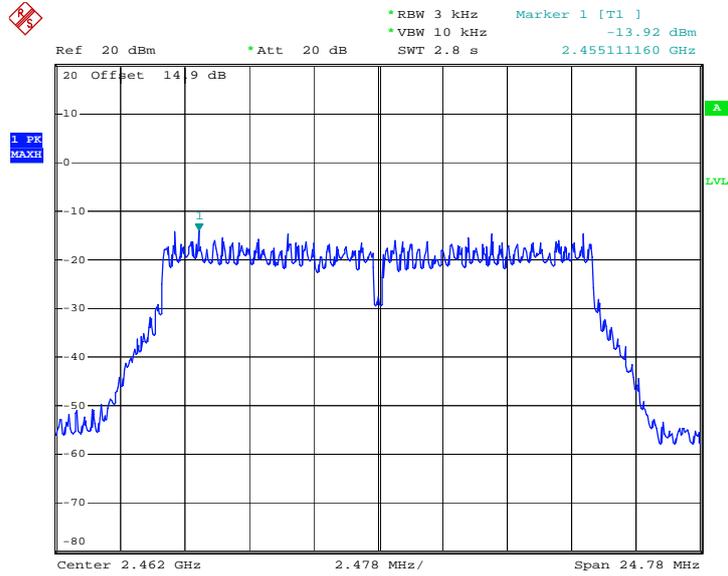
PSD 3KHz Plot on 802.11g Channel 06



Date: 8.NOV.2012 13:33:25



PSD 3KHz Plot on 802.11g Channel 11

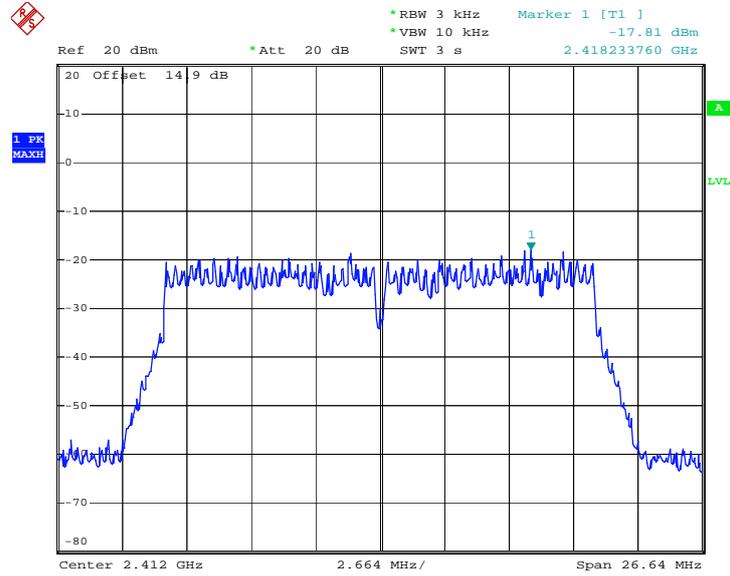


Date: 8.NOV.2012 13:34:26



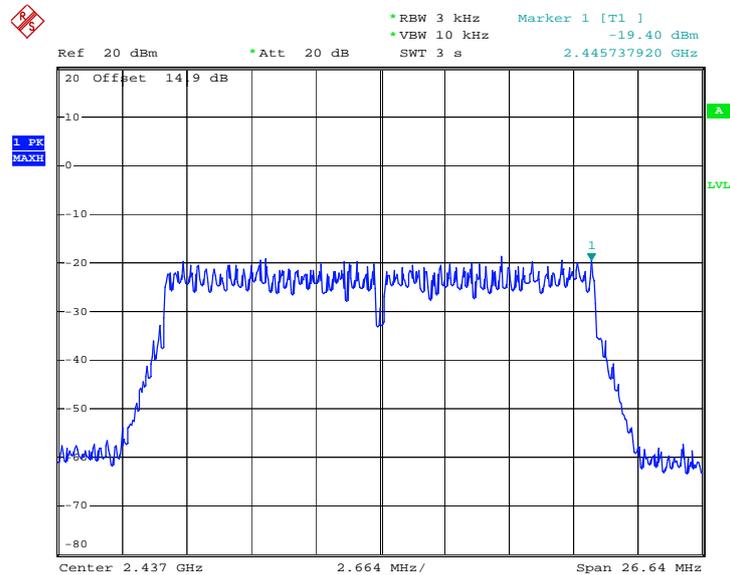
<2.4GHz 802.11n HT-20>

PSD 3KHz Plot on 2.4G 802.11n HT20 Channel 01



Date: 8.NOV.2012 13:36:09

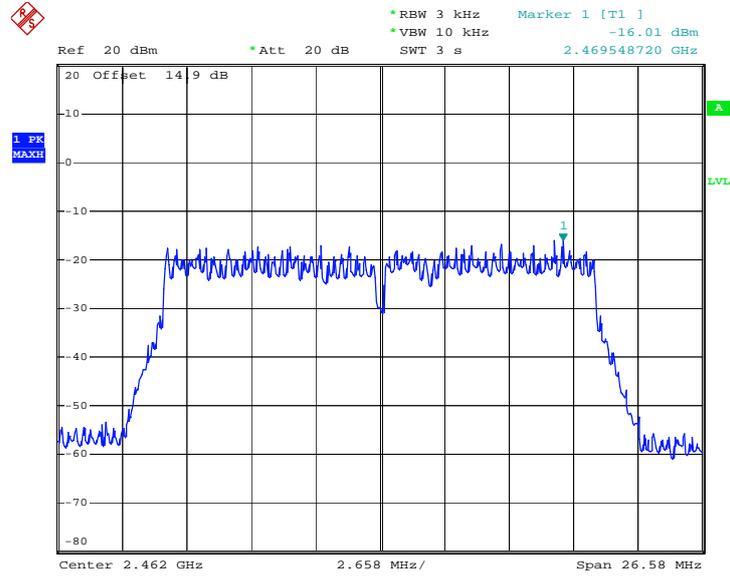
PSD 3KHz Plot on 2.4G 802.11n HT20 Channel 06



Date: 8.NOV.2012 13:37:00



PSD 3KHz Plot on 2.4G 802.11n HT20 Channel 11

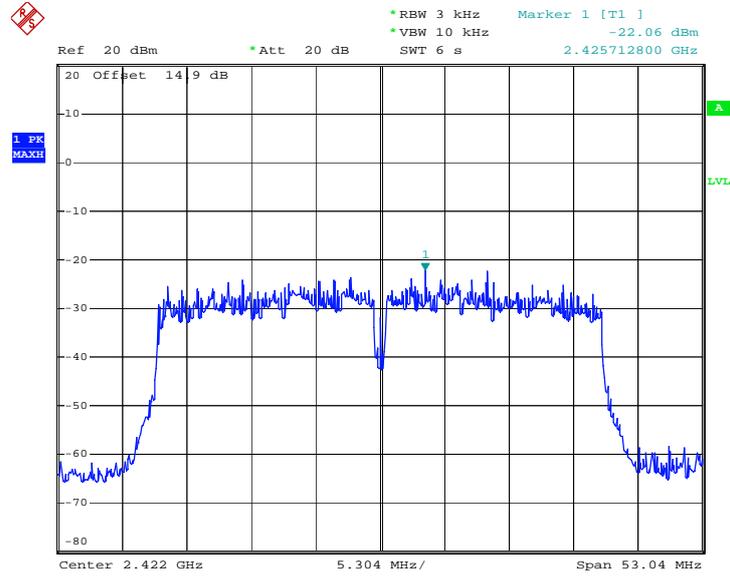


Date: 8.NOV.2012 13:37:48



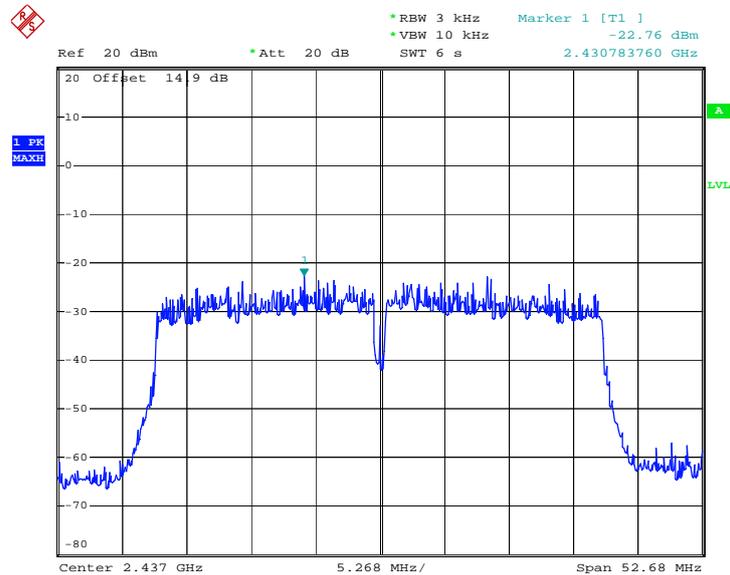
<2.4GHz 802.11n HT-40>

PSD 3KHz Plot on 2.4G 802.11n HT40 Channel 03



Date: 8.NOV.2012 13:28:17

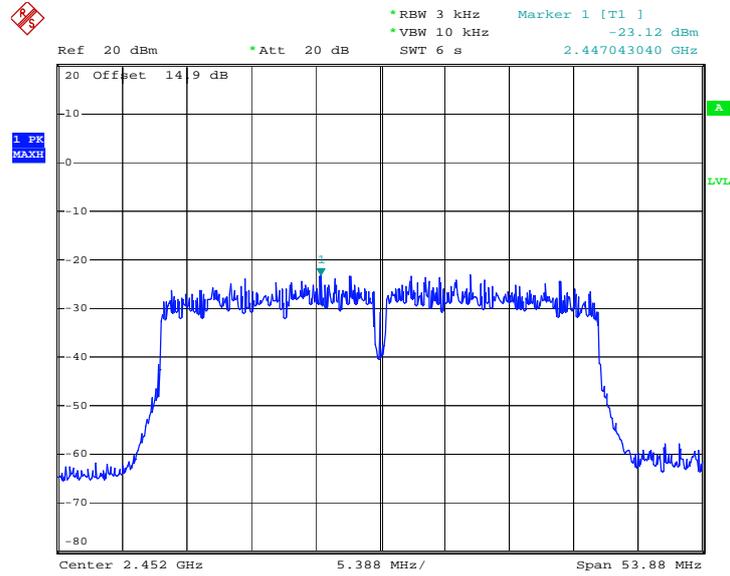
PSD 3KHz Plot on 2.4G 802.11n HT40 Channel 06



Date: 8.NOV.2012 13:27:22



PSD 3KHz Plot on 2.4G 802.11n HT40 Channel 09



Date: 8.NOV.2012 13:26:08

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

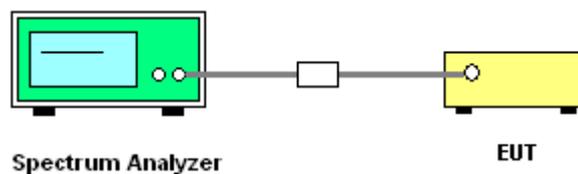
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the guidelines in the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
4. Measure and record the results in the test report.

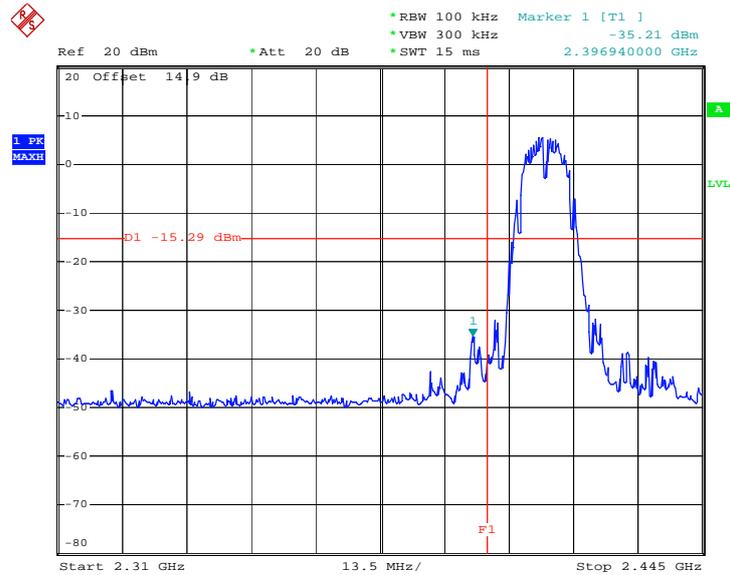
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

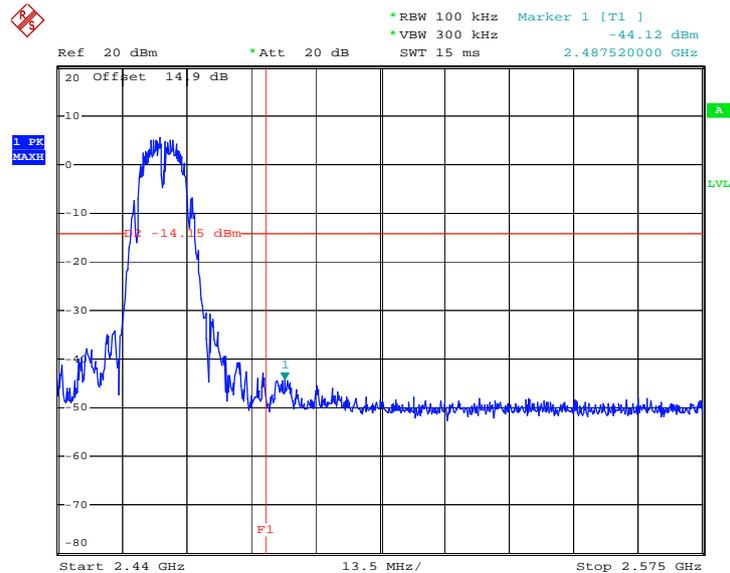
Test Mode :	802.11b	Temperature :	21~22°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	01 and 11	Test Engineer :	Cloud Peng

Low Band Edge Plot on 802.11b Channel 01



Date: 9.NOV.2012 21:57:24

High Band Edge Plot on 802.11b Channel 11

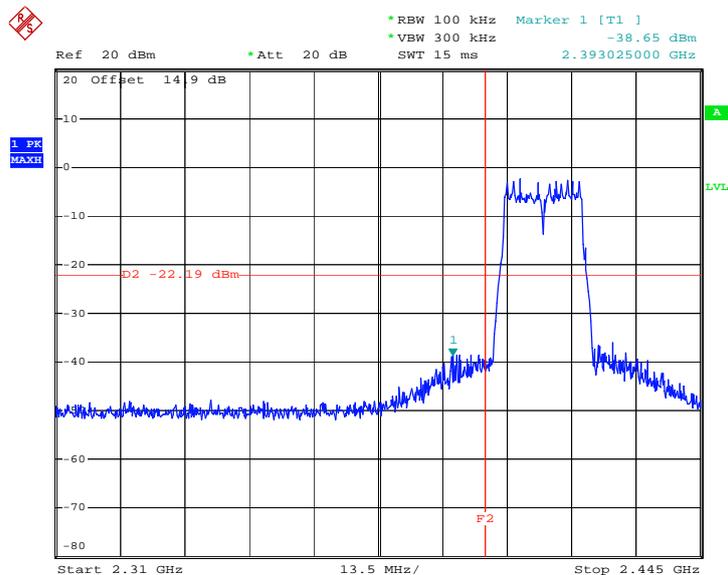


Date: 8.NOV.2012 11:46:46



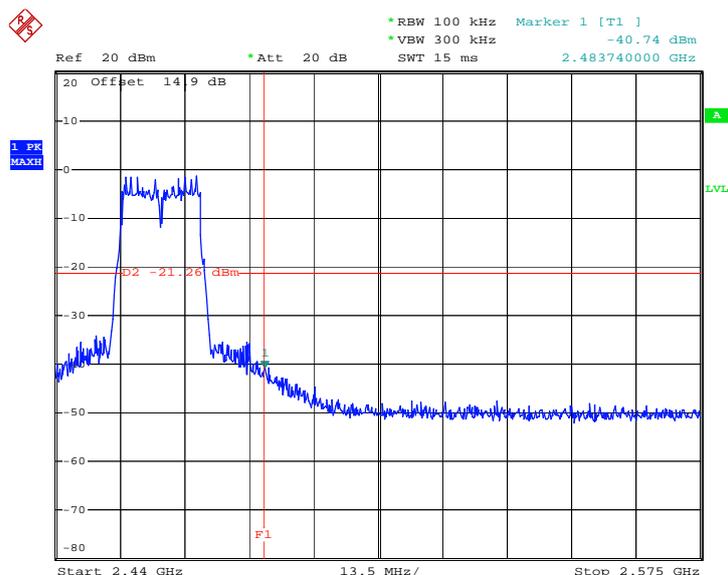
Test Mode :	802.11g	Temperature :	21~22°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	01 and 11	Test Engineer :	Cloud Peng

Low Band Edge Plot on 802.11g Channel 01



Date: 8.NOV.2012 11:17:35

High Band Edge Plot on 802.11g Channel 11

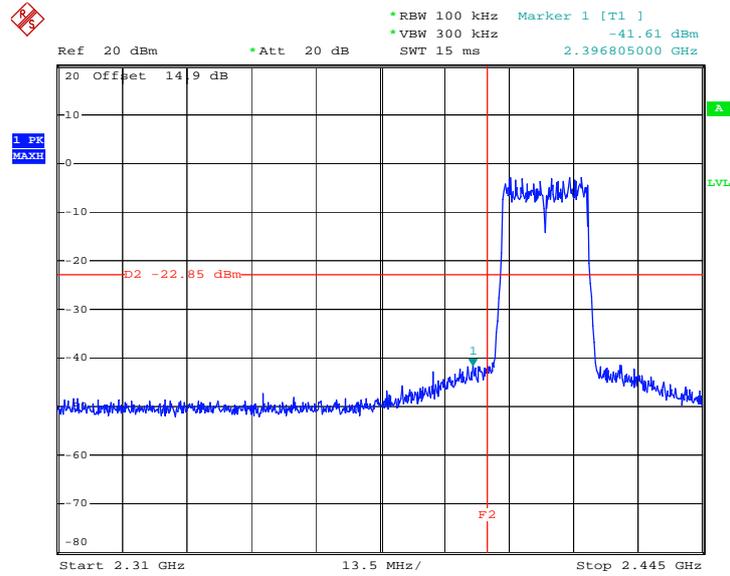


Date: 8.NOV.2012 11:25:51



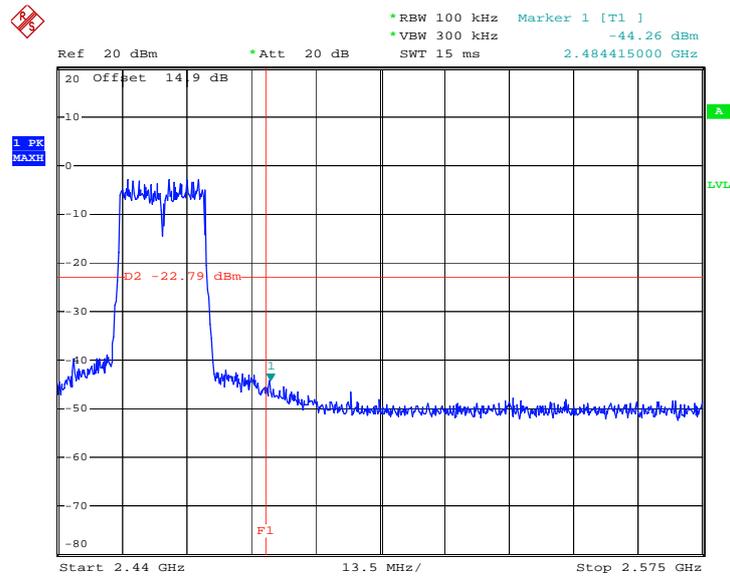
Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	01 and 11	Test Engineer :	Cloud Peng

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 8.NOV.2012 11:52:39

High Band Edge Plot on 802.11n HT20 Channel 11

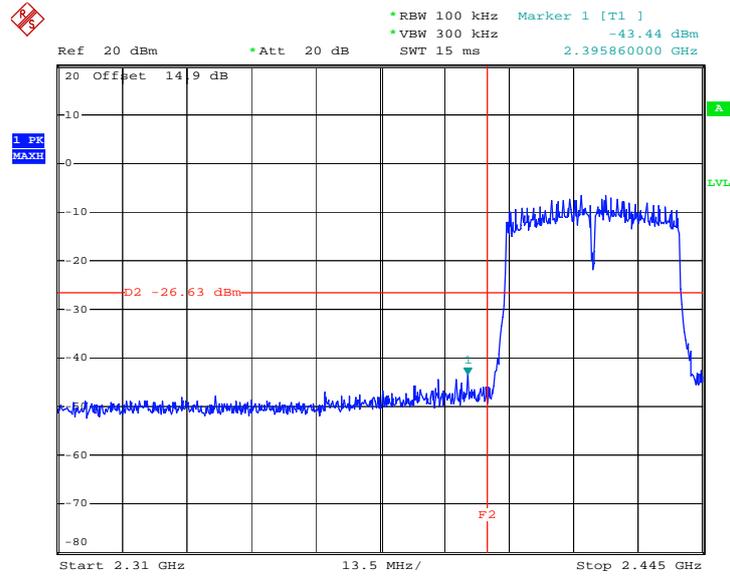


Date: 8.NOV.2012 11:57:56



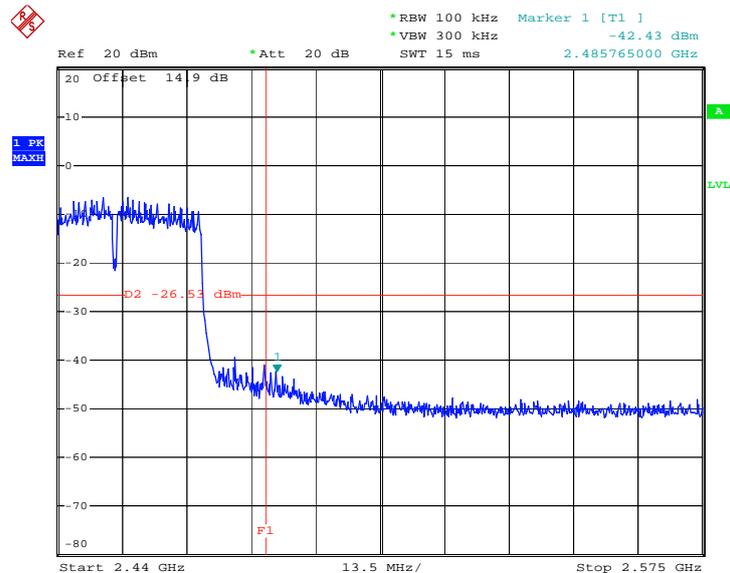
Test Mode :	802.11n HT40	Temperature :	21~22°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	03 and 09	Test Engineer :	Cloud Peng

Low Band Edge Plot on 802.11n HT40 Channel 03



Date: 8.NOV.2012 12:01:03

High Band Edge Plot on 802.11n HT40 Channel 09



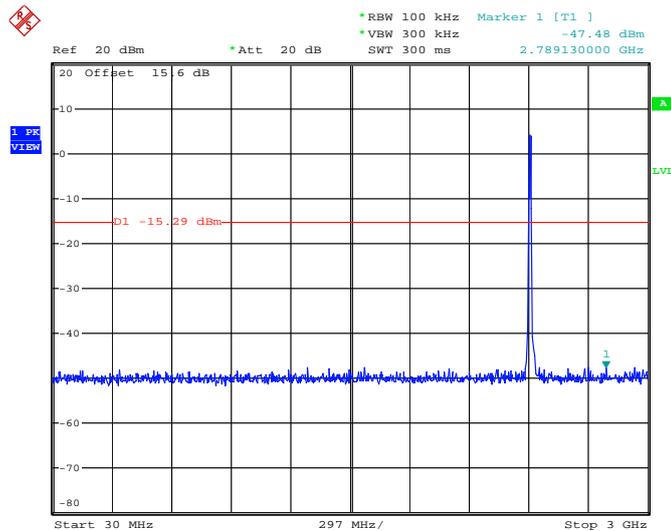
Date: 8.NOV.2012 13:13:39

3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	Temperature :	21~22°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42%
Test Channel :	01, 06, 11	Test Engineer :	Cloud Peng

802.11b 30 MHz~3 GHz

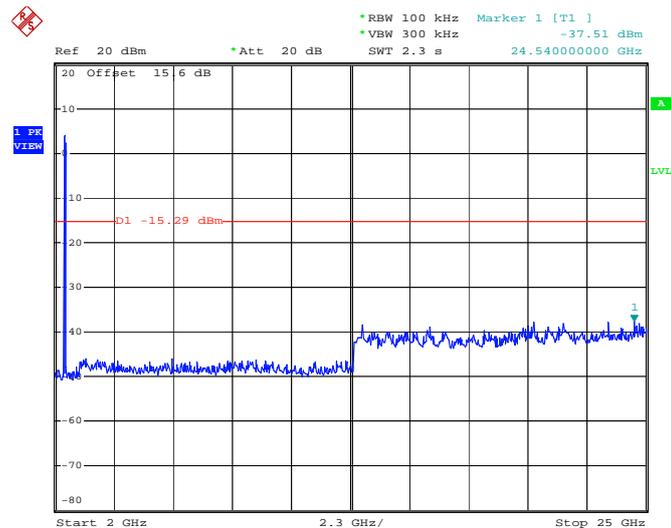
Conducted Spurious Emission Plot on Channel 01



Date: 8.NOV.2012 11:41:05

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

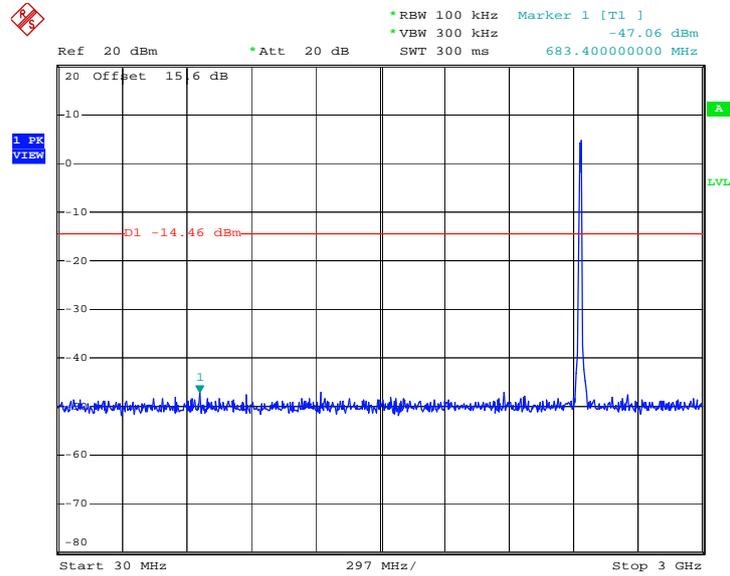


Date: 8.NOV.2012 11:41:24



802.11b 30 MHz~3 GHz

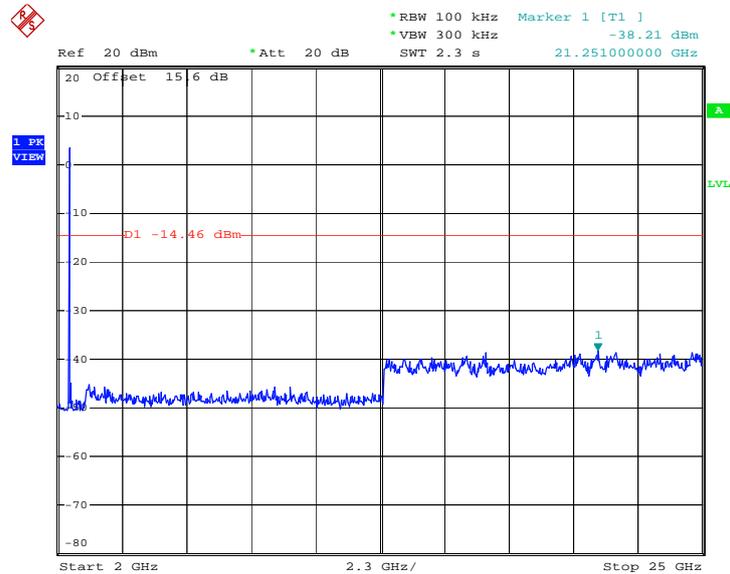
Conducted Spurious Emission Plot on Channel 06



Date: 8.NOV.2012 11:44:30

802.11b 2 GHz~25 GHz

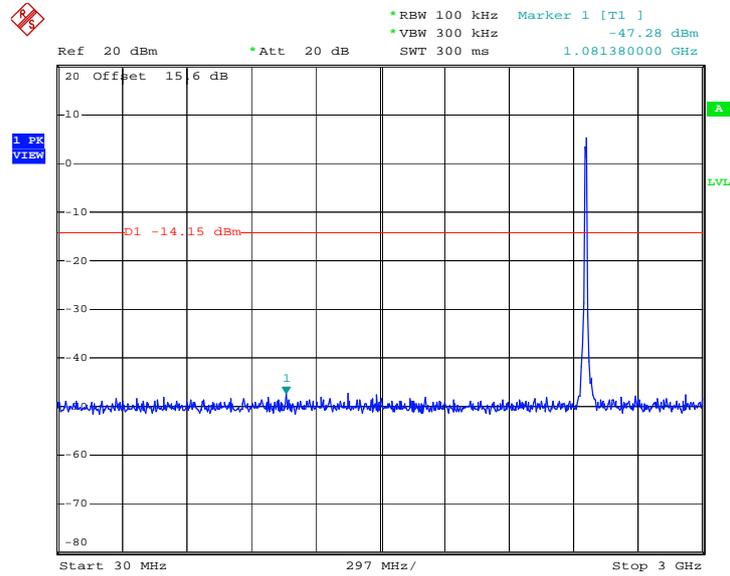
Conducted Spurious Emission Plot on Channel 06



Date: 8.NOV.2012 11:44:48

802.11b 30 MHz~3 GHz

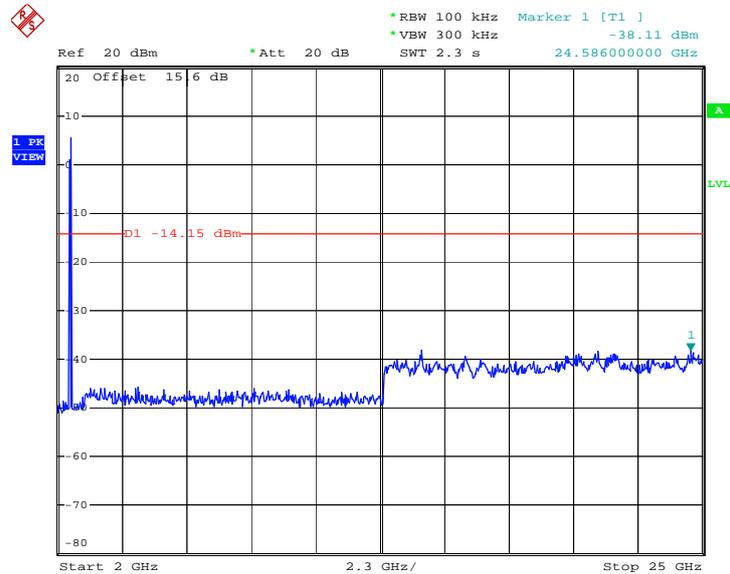
Conducted Spurious Emission Plot on Channel 11



Date: 8.NOV.2012 11:47:10

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



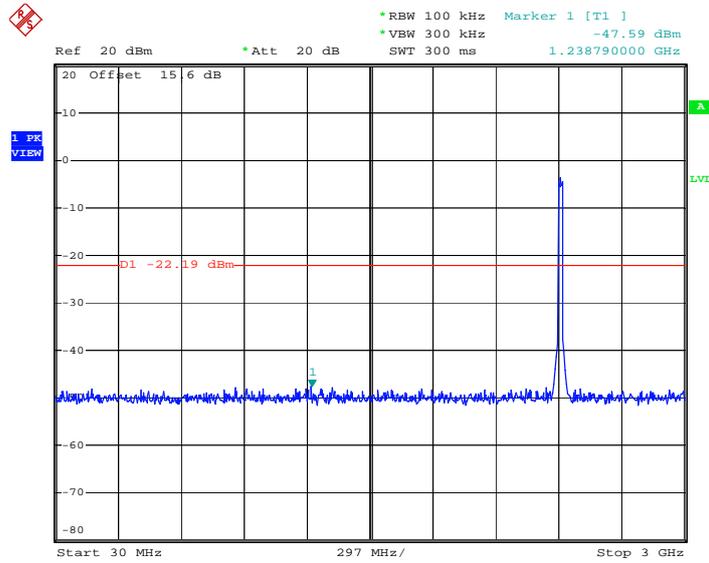
Date: 8.NOV.2012 11:47:28



Test Mode :	802.11g	Temperature :	21~22°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42%
Test Channel :	01, 06, 11	Test Engineer :	Cloud Peng

802.11g 30 MHz~3 GHz

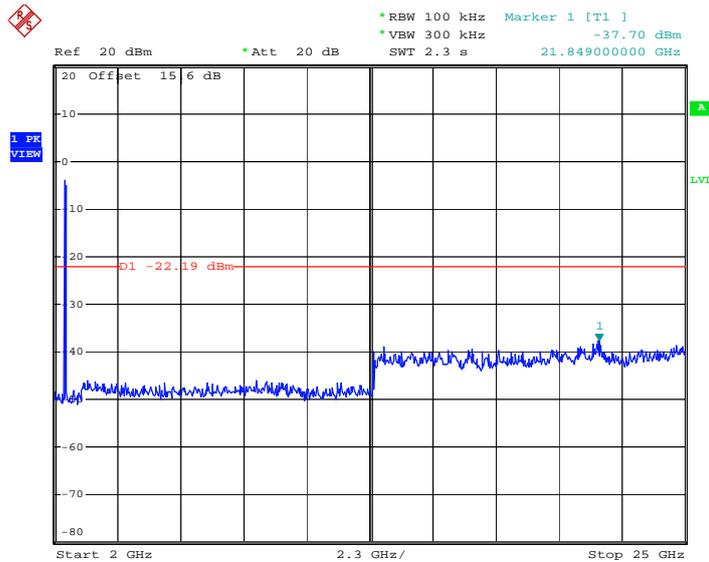
Conducted Spurious Emission Plot on Channel 01



Date: 8.NOV.2012 11:17:56

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

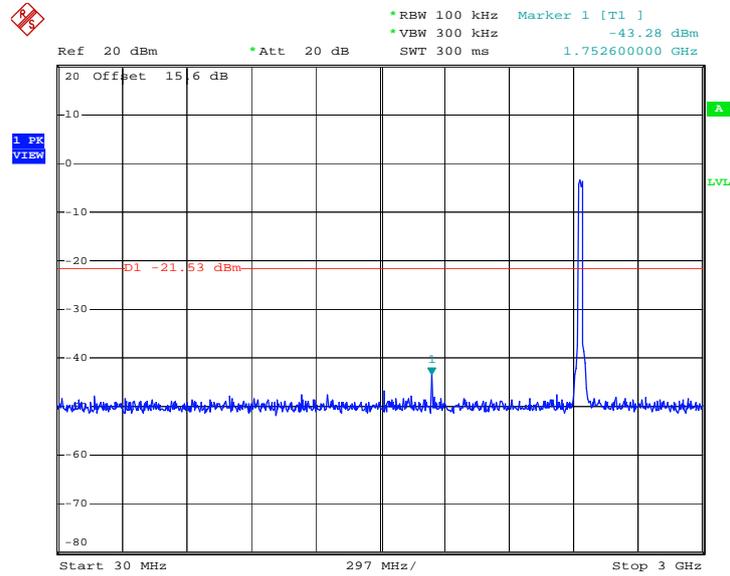


Date: 8.NOV.2012 11:18:14



802.11g 30 MHz~3 GHz

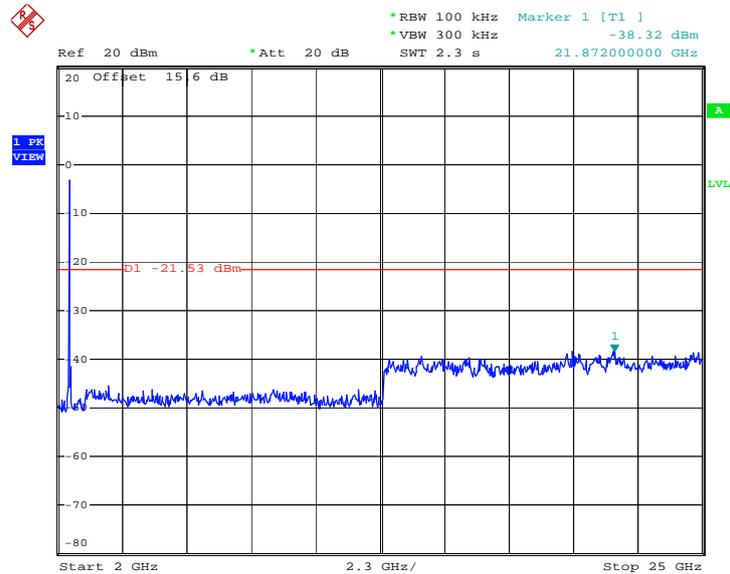
Conducted Spurious Emission Plot on Channel 06



Date: 8.NOV.2012 11:20:55

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

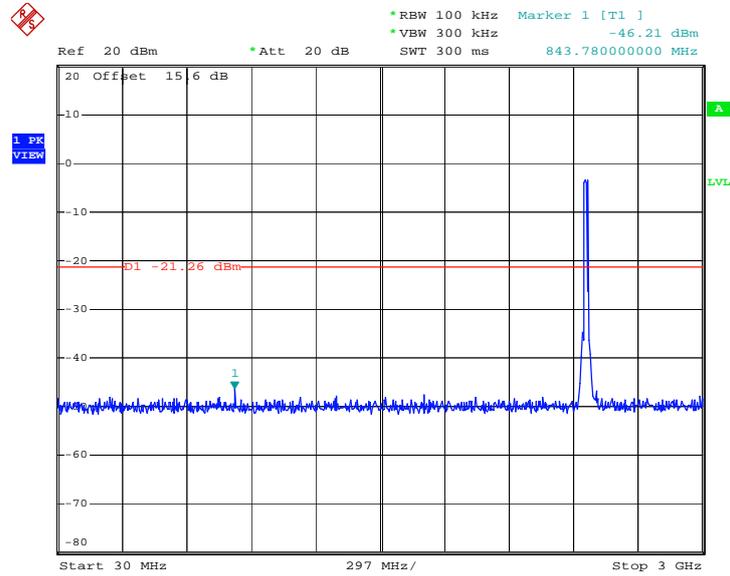


Date: 8.NOV.2012 11:21:14



802.11g 30 MHz~3 GHz

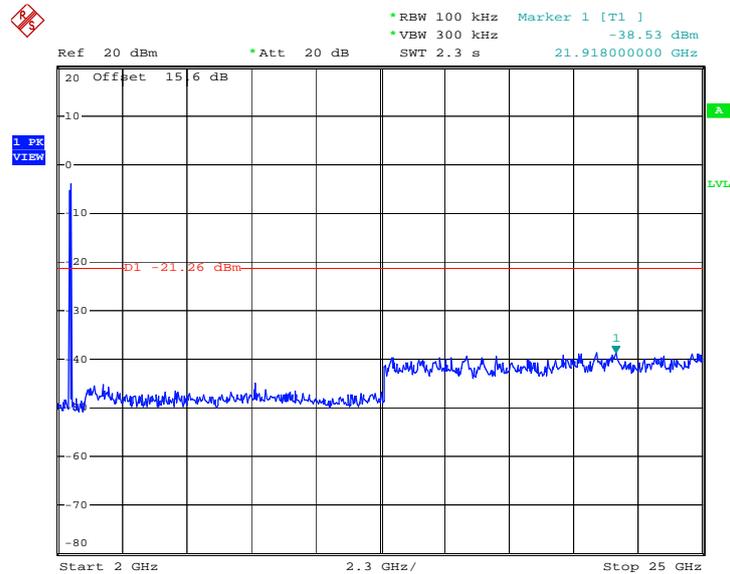
Conducted Spurious Emission Plot on Channel 11



Date: 8.NOV.2012 11:26:15

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



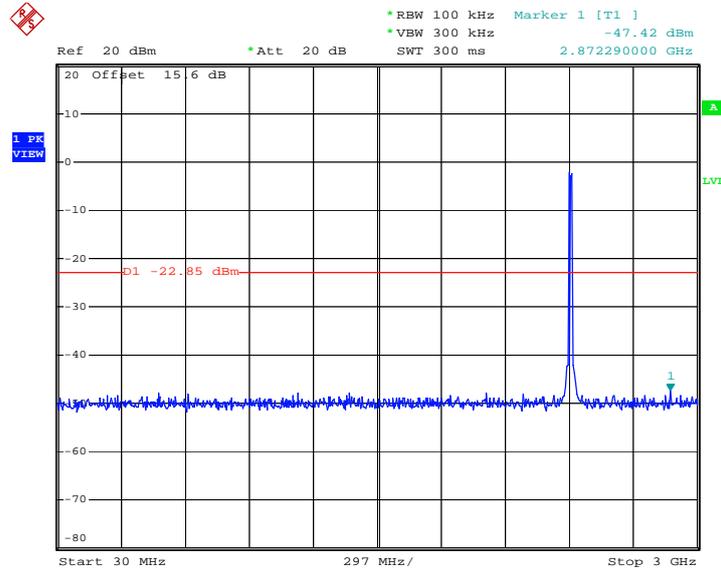
Date: 8.NOV.2012 11:26:34



Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42%
Test Channel :	01, 06, 11	Test Engineer :	Cloud Peng

802.11n HT20 30 MHz~3 GHz

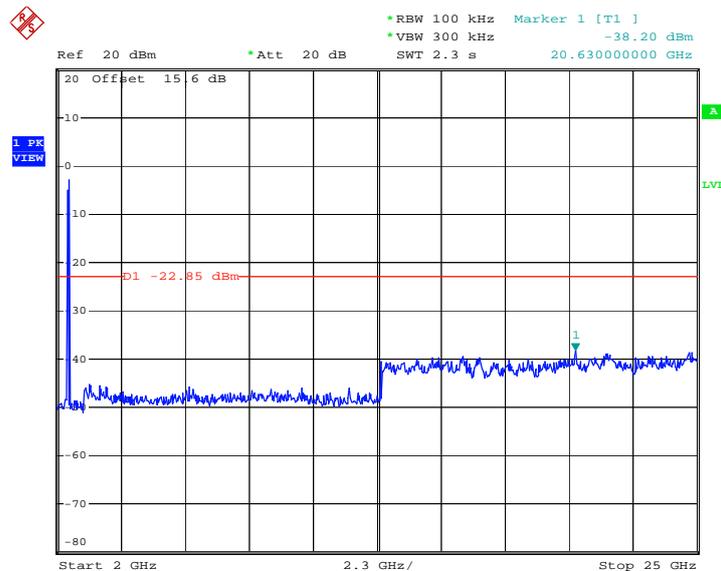
Conducted Spurious Emission Plot on Channel 01



Date: 8.NOV.2012 11:53:05

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

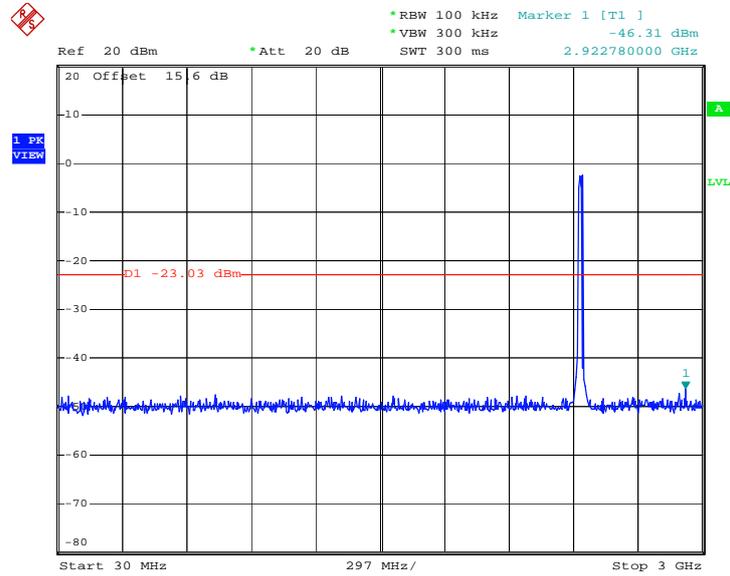


Date: 8.NOV.2012 11:53:24



802.11n HT20 30 MHz~3 GHz

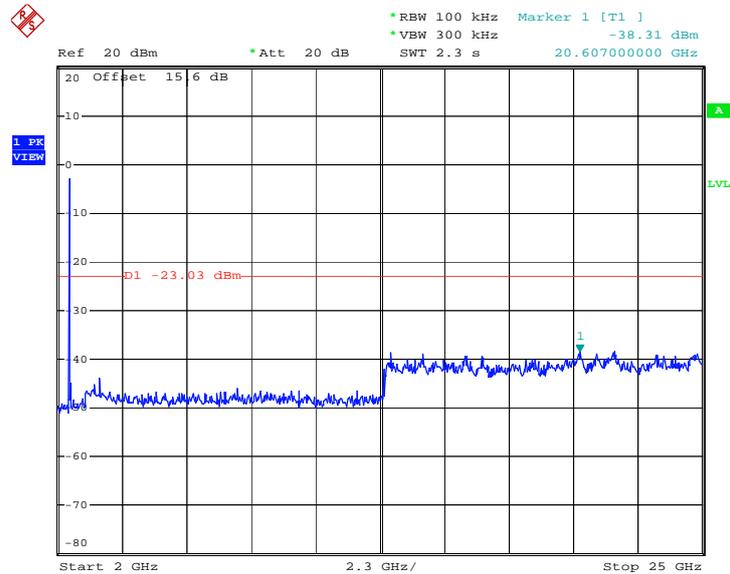
Conducted Spurious Emission Plot on Channel 06



Date: 8.NOV.2012 11:55:49

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

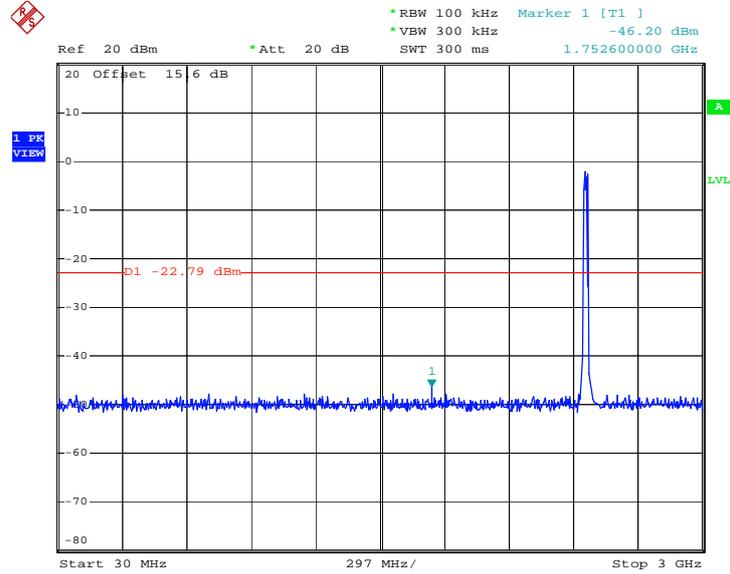


Date: 8.NOV.2012 11:56:07



802.11n HT20 30 MHz~3 GHz

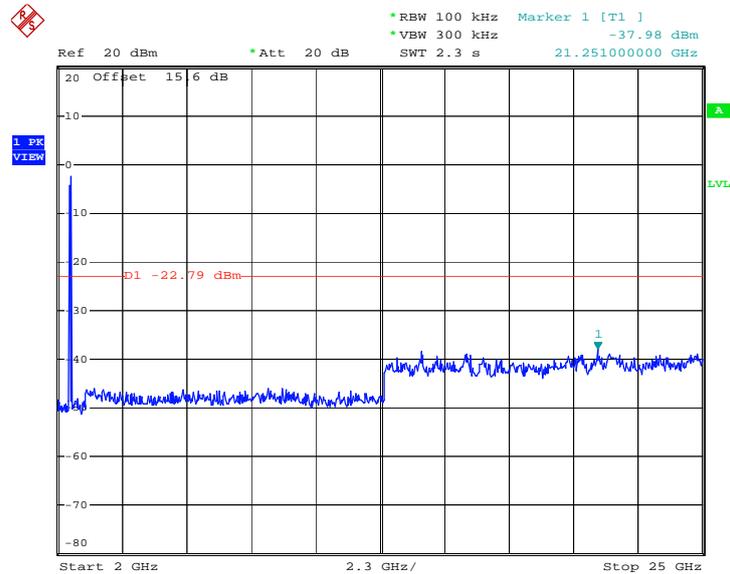
Conducted Spurious Emission Plot on Channel 11



Date: 8.NOV.2012 11:58:20

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



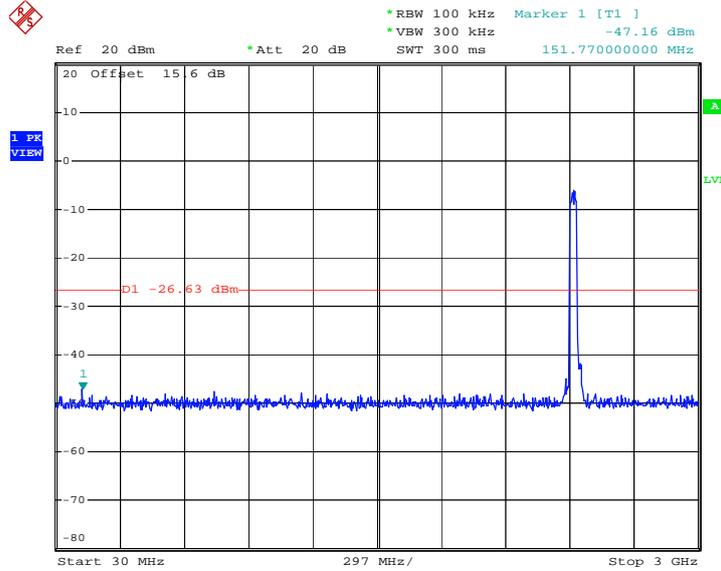
Date: 8.NOV.2012 11:58:38



Test Mode :	802.11n HT40	Temperature :	21~22
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42
Test Channel :	03, 06, 09	Test Engineer :	Cloud Peng

802.11n HT40 30 MHz~3 GHz

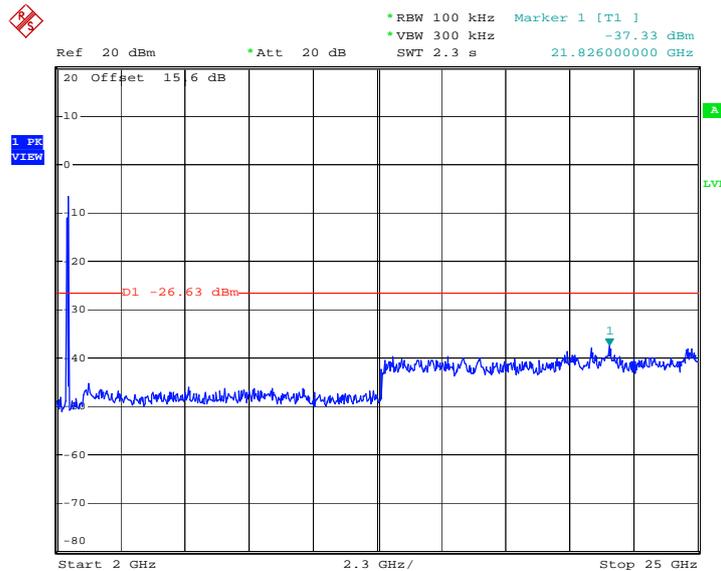
Conducted Spurious Emission Plot on Channel 01



Date: 8.NOV.2012 12:01:25

802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

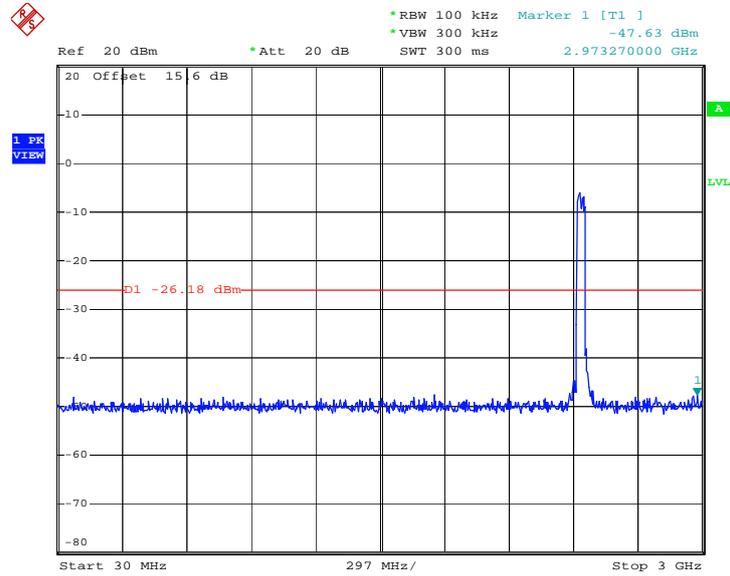


Date: 8.NOV.2012 12:01:43



802.11n HT40 30 MHz~3 GHz

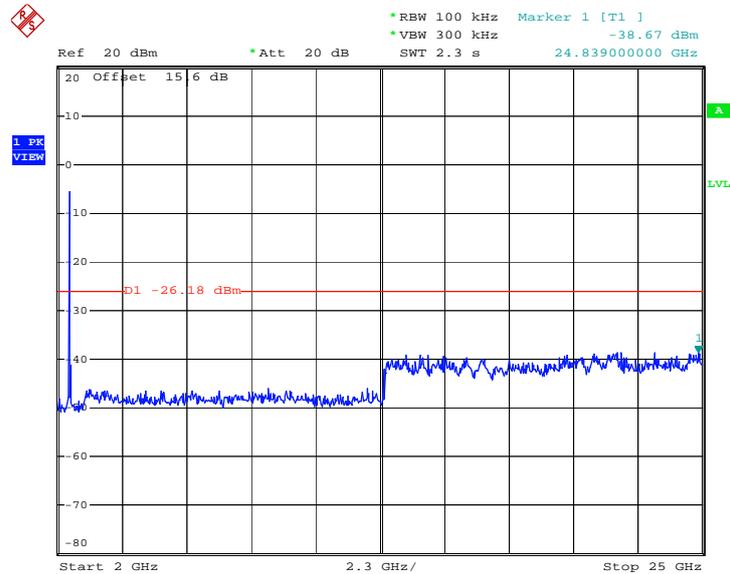
Conducted Spurious Emission Plot on Channel 06



Date: 8.NOV.2012 12:05:13

802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

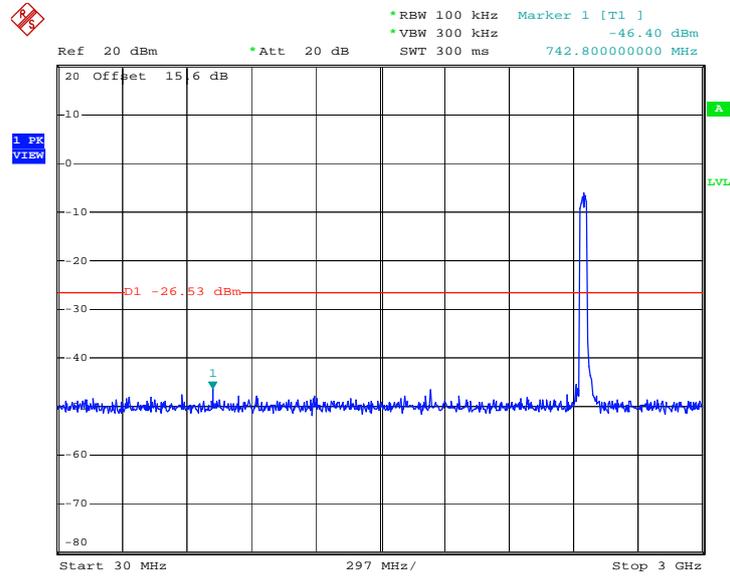


Date: 8.NOV.2012 12:05:31



802.11n HT40 30 MHz~3 GHz

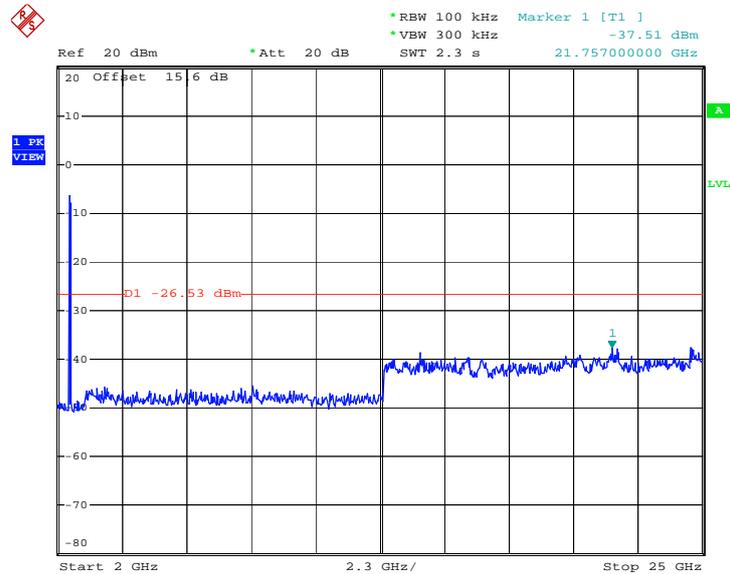
Conducted Spurious Emission Plot on Channel 11



Date: 8.NOV.2012 13:14:02

802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 8.NOV.2012 13:14:20

3.5 Radiated Emission Measurement

3.5.1 Limit of Radiated Emission

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

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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

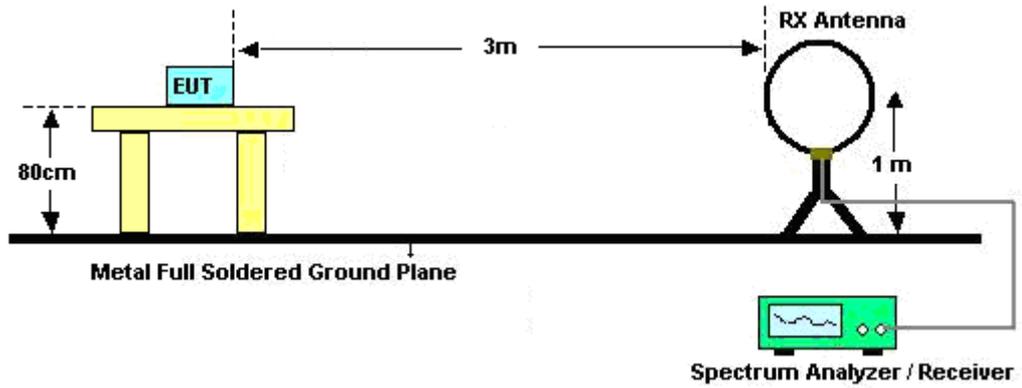
1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 KHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for Peak measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent while maintaining all of the other instrument settings for Average measurement.

Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
802.11b	98.591549	8.4	0.11904762	10Hz
802.11g	92.553191	1.392	0.7183908	1KHZ
2.4G 802.11n HT20	56.617647	0.154	6.49350649	10KHz
2.4G 802.11n HT40	44.660194	0.1	10	10KHz

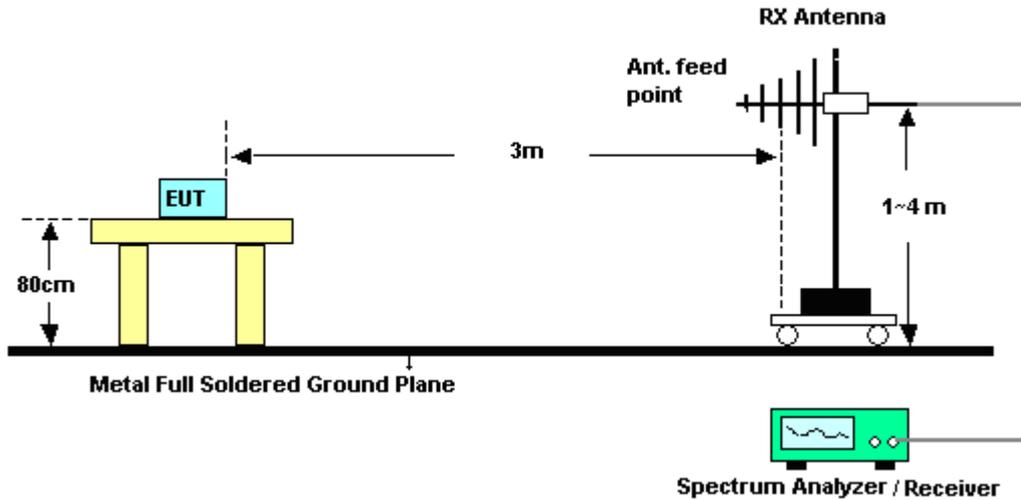
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. If the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be reported by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

3.5.4 Test Setup

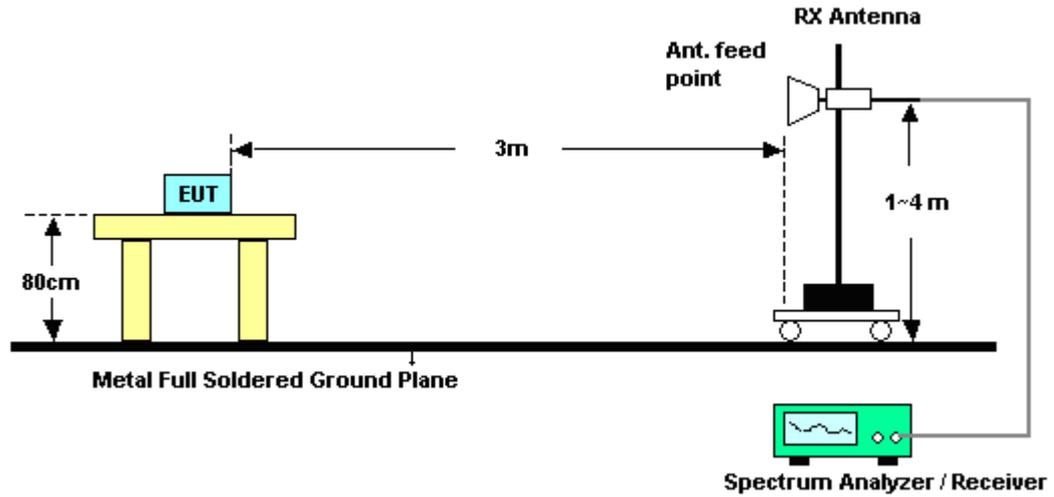
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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



3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11b	Temperature :	21~22°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2386.05	58.26	-15.74	74	50.26	32.86	4.22	29.08	100	36	Peak
2387.22	47.41	-6.59	54	39.4	32.86	4.23	29.08	120	0	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
2386.5	57.27	-16.73	74	49.27	32.86	4.22	29.08	190	0	Peak
2387.04	43.6	-10.4	54	35.59	32.86	4.23	29.08	190	0	Average

Test Mode :	802.11b	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2487.52	63.46	-10.54	74	55.12	33.05	4.29	29	120	0	Peak
2483.5	53.6	-0.4	54	47.43	33.01	4.91	31.75	100	0	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
2487.9	58.92	-15.08	74	50.58	33.05	4.29	29	100	21	Peak
2487.08	48.12	-5.88	54	39.82	33.01	4.29	29	100	156	Average



Test Mode :	802.11g	Temperature :	21~22°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2389.56	68.66	-5.34	74	65.2	32.86	2.11	31.51	100	360	Peak
2390	47.37	-6.63	54	43.91	32.86	2.11	31.51	100	360	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.2	69.5	-4.5	74	66.04	32.86	2.11	31.51	100	360	Peak
2390	46.91	-7.09	54	43.45	32.86	2.11	31.51	100	360	Average

Test Mode :	802.11g	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2484.08	69.6	-4.4	74	65.94	33.01	2.16	31.51	175	360	Peak
2483.54	49.93	-4.07	54	46.27	33.01	2.16	31.51	175	360	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.78	66.9	-7.1	74	63.24	33.01	2.16	31.51	132	83	Peak
2483.5	46.59	-7.41	54	42.93	33.01	2.16	31.51	132	83	Average



Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2388.03	70	-4	74	66.54	32.86	2.11	31.51	100	12	Peak
2390	53.16	-0.84	54	49.7	32.86	2.11	31.51	100	0	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	58.35	-15.65	74	54.89	32.86	2.11	31.51	100	36	Peak
2390	45.63	-8.37	54	42.17	32.86	2.11	31.51	100	221	Average

Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2483.86	70.23	-3.77	74	66.57	33.01	2.16	31.51	100	21	Peak
2483.74	52.34	-1.66	54	48.68	33.01	2.16	31.51	100	62	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
2483.98	64.33	-9.67	74	60.67	33.01	2.16	31.51	100	101	Peak
2483.56	46.19	-7.81	54	42.53	33.01	2.16	31.51	100	161	Average



Test Mode :	802.11n HT40	Temperature :	21~22°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	03	Test Engineer :	Chenmy Cheng

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
2387.76	62.66	-11.34	74	59.2	32.86	2.11	31.51	100	56	Peak
2390	50.72	-3.28	54	47.26	32.86	2.11	31.51	100	122	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
2389.02	54.32	-19.68	74	50.86	32.86	2.11	31.51	100	151	Peak
2390	44.59	-9.41	54	41.13	32.86	2.11	31.51	100	0	Average

Test Mode :	802.11n HT40	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	09	Test Engineer :	Chenmy Cheng

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
2486.06	61.75	-12.25	74	58.09	33.01	2.16	31.51	100	83	Peak
2483.54	51.01	-2.99	54	47.35	33.01	2.16	31.51	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
2484.24	55	-19	74	51.34	33.01	2.16	31.51	100	181	Peak
2484.96	44.44	-9.56	54	40.78	33.01	2.16	31.51	100	98	Average



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

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.105	19.28	-20.72	40	34.51	18	0.34	33.57	-	-	Peak
84.999	20.77	-19.23	40	46.13	7.7	0.55	33.61	-	-	Peak
119.856	24.1	-19.4	43.5	45.27	11.8	0.63	33.6	-	-	Peak
162.041	17.17	-26.33	43.5	40.47	9.53	0.75	33.58	-	-	Peak
229.293	18.4	-27.6	46	40.18	10.83	0.88	33.49	-	-	Peak
945.44	34.5	-11.5	46	44.48	20.71	1.75	32.44	100	251	Peak
2412	104.28	-	-	96.2	32.89	4.24	29.05	100	0	Average
2412	109.19	-	-	101.11	32.89	4.24	29.05	100	0	Peak

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.211	21.36	-18.64	40	36.59	18	0.34	33.57	-	-	Peak
39.715	17.86	-22.14	40	38.82	12.3	0.39	33.65	-	-	Peak
65.114	17.14	-22.86	40	45.03	5.2	0.5	33.59	-	-	Peak
80.362	19.79	-20.21	40	46.24	6.6	0.55	33.6	-	-	Peak
121.123	24.24	-19.26	43.5	45.41	11.79	0.64	33.6	-	-	Peak
945.44	34.73	-11.27	46	44.71	20.71	1.75	32.44	100	0	Peak
2412	98.26	-	-	90.18	32.89	4.24	29.05	200	0	Average
2412	103.63	-	-	95.55	32.89	4.24	29.05	200	0	Peak



Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.18	19.26	-20.74	40	35.21	17.29	0.34	33.58	-	-	Peak
83.816	14.42	-25.58	40	40.14	7.34	0.55	33.61	-	-	Peak
123.699	24.16	-19.34	43.5	45.35	11.76	0.65	33.6	-	-	Peak
163.182	16.88	-26.62	43.5	40.22	9.49	0.75	33.58	-	-	Peak
249.425	15.81	-30.19	46	36.37	11.96	0.92	33.44	-	-	Peak
945.44	33.84	-12.16	46	43.82	20.71	1.75	32.44	100	102	Peak
2437	106.96	-	-	98.79	32.95	4.25	29.03	100	0	Average
2437	112.31	-	-	104.14	32.95	4.25	29.03	100	0	Peak

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.399	21.5	-18.5	40	37.45	17.29	0.34	33.58	-	-	Peak
40.135	19.17	-20.83	40	40.13	12.3	0.39	33.65	-	-	Peak
81.212	19.63	-20.37	40	45.82	6.87	0.55	33.61	-	-	Peak
118.601	23.7	-19.8	43.5	44.87	11.8	0.63	33.6	-	-	Peak
704.226	20	-26	46	32.03	19.33	1.51	32.87	-	-	Peak
945.44	34.36	-11.64	46	44.34	20.71	1.75	32.44	100	98	Peak
2437	99.69	-	-	91.52	32.95	4.25	29.03	190	6	Average
2437	104.57	-	-	96.4	32.95	4.25	29.03	190	6	Peak



Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.211	19.44	-20.56	40	34.67	18	0.34	33.57	-	-	Peak
80.927	13.97	-26.03	40	40.16	6.87	0.55	33.61	-	-	Peak
121.123	23.49	-20.01	43.5	44.66	11.79	0.64	33.6	-	-	Peak
162.611	17.3	-26.2	43.5	40.64	9.49	0.75	33.58	-	-	Peak
263.819	16.13	-29.87	46	36.39	12.23	0.94	33.43	-	-	Peak
945.44	34.09	-11.91	46	44.07	20.71	1.75	32.44	100	65	Peak
2462	109.75	-	-	101.51	32.98	4.27	29.01	100	112	Average
2462	114.81	-	-	106.57	32.98	4.27	29.01	100	112	Peak

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.293	19.16	-20.84	40	35.84	16.55	0.35	33.58	-	-	Peak
91.175	18.4	-25.1	43.5	42.35	9.12	0.55	33.62	-	-	Peak
110.957	27.68	-15.82	43.5	48.89	11.8	0.6	33.61	-	-	Peak
123.699	23.99	-19.51	43.5	45.18	11.76	0.65	33.6	-	-	Peak
261.975	18.08	-27.92	46	38.39	12.19	0.93	33.43	-	-	Peak
945.44	34.68	-11.32	46	44.66	20.71	1.75	32.44	100	0	Peak
2462	101.42	-	-	93.18	32.98	4.27	29.01	100	92	Average
2462	106.25	-	-	98.01	32.98	4.27	29.01	100	92	Peak



Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.105	19.28	-20.72	40	34.51	18	0.34	33.57	-	-	Peak
84.999	20.77	-19.23	40	46.13	7.7	0.55	33.61	-	-	Peak
119.856	24.1	-19.4	43.5	45.27	11.8	0.63	33.6	-	-	Peak
162.041	17.17	-26.33	43.5	40.47	9.53	0.75	33.58	-	-	Peak
229.293	18.4	-27.6	46	40.18	10.83	0.88	33.49	-	-	Peak
945.44	34.5	-11.5	46	44.48	20.71	1.75	32.44	100	251	Peak
2412	91.68	-	-	88.18	32.89	2.12	31.51	189	75	Average
2412	100.29	-	-	96.79	32.89	2.12	31.51	189	75	Peak

Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.211	21.36	-18.64	40	36.59	18	0.34	33.57	-	-	Peak
39.715	17.86	-22.14	40	38.82	12.3	0.39	33.65	-	-	Peak
65.114	17.14	-22.86	40	45.03	5.2	0.5	33.59	-	-	Peak
80.362	19.79	-20.21	40	46.24	6.6	0.55	33.6	-	-	Peak
121.123	24.24	-19.26	43.5	45.41	11.79	0.64	33.6	-	-	Peak
945.44	34.73	-11.27	46	44.71	20.71	1.75	32.44	100	0	Peak
2412	97.51	-	-	94.01	32.89	2.12	31.51	145	360	Average
2412	107.69	-	-	104.19	32.89	2.12	31.51	145	360	Peak



Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.18	19.26	-20.74	40	35.21	17.29	0.34	33.58	-	-	Peak
83.816	14.42	-25.58	40	40.14	7.34	0.55	33.61	-	-	Peak
123.699	24.16	-19.34	43.5	45.35	11.76	0.65	33.6	-	-	Peak
163.182	16.88	-26.62	43.5	40.22	9.49	0.75	33.58	-	-	Peak
249.425	15.81	-30.19	46	36.37	11.96	0.92	33.44	-	-	Peak
945.44	33.84	-12.16	46	43.82	20.71	1.75	32.44	100	102	Peak
2437	97.37	-	-	93.79	32.95	2.14	31.51	147	6	Average
2437	108.15	-	-	104.57	32.95	2.14	31.51	147	6	Peak

Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.399	21.5	-18.5	40	37.45	17.29	0.34	33.58	-	-	Peak
40.135	19.17	-20.83	40	40.13	12.3	0.39	33.65	-	-	Peak
81.212	19.63	-20.37	40	45.82	6.87	0.55	33.61	-	-	Peak
118.601	23.7	-19.8	43.5	44.87	11.8	0.63	33.6	-	-	Peak
704.226	20	-26	46	32.03	19.33	1.51	32.87	-	-	Peak
945.44	34.36	-11.64	46	44.34	20.71	1.75	32.44	100	98	Peak
2437	93.14	-	-	89.56	32.95	2.14	31.51	162	138	Average
2437	103.21	-	-	99.63	32.95	2.14	31.51	162	138	Peak



Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.749	18.26	-21.74	40	35.46	16.04	0.35	33.59	-	-	Peak
50.232	24.92	-15.08	40	50.66	7.4	0.44	33.58	-	-	Peak
123.699	24	-19.5	43.5	45.19	11.76	0.65	33.6	-	-	Peak
162.041	17.5	-26	43.5	40.8	9.53	0.75	33.58	-	-	Peak
273.234	17.37	-28.63	46	37.36	12.47	0.95	33.41	-	-	Peak
945.44	33.58	-12.42	46	43.56	20.71	1.75	32.44	120	61	Peak
2462	96.29	-	-	92.67	32.98	2.15	31.51	177	360	Average
2462	106.21	-	-	102.59	32.98	2.15	31.51	177	360	Peak

Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.424	23.05	-16.95	40	38.28	18	0.34	33.57	-	-	Peak
39.299	19.09	-20.91	40	40.05	12.3	0.39	33.65	-	-	Peak
71.33	21.45	-18.55	40	49.05	5.46	0.53	33.59	-	-	Peak
82.648	25.29	-14.71	40	51.2	7.15	0.55	33.61	-	-	Peak
121.549	23.81	-19.69	43.5	44.98	11.79	0.64	33.6	-	-	Peak
945.44	34.08	-11.92	46	44.06	20.71	1.75	32.44	100	185	Peak
2462	91.23	-	-	87.61	32.98	2.15	31.51	144	0	Average
2462	101.98	-	-	98.36	32.98	2.15	31.51	144	0	Peak



Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
52.208	20.88	-19.12	40	47	7.01	0.45	33.58	-	-	Peak
117.36	22.69	-20.81	43.5	43.87	11.8	0.62	33.6	-	-	Peak
160.346	20.9	-22.6	43.5	44.14	9.6	0.74	33.58	-	-	Peak
239.987	22.48	-23.52	46	43.53	11.51	0.9	33.46	-	-	Peak
280.024	18.59	-27.41	46	38.36	12.66	0.97	33.4	-	-	Peak
945.44	33.52	-12.48	46	43.5	20.71	1.75	32.44	100	100	Peak
2412	100.33	-	-	96.83	32.89	2.12	31.51	100	0	Average
2412	110.63	-	-	107.13	32.89	2.12	31.51	100	0	Peak

Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.211	33.17	-6.83	40	48.4	18	0.34	33.57	100	155	Peak
35.005	27.42	-12.58	40	45.56	15.1	0.37	33.61	-	-	Peak
117.773	21.14	-22.36	43.5	42.32	11.8	0.62	33.6	-	-	Peak
141.33	26.34	-17.16	43.5	48.48	10.73	0.71	33.58	-	-	Peak
239.987	22.28	-23.72	46	43.33	11.51	0.9	33.46	-	-	Peak
945.44	33.74	-12.26	46	43.72	20.71	1.75	32.44	-	-	Peak
2412	89.02	-	-	85.52	32.89	2.12	31.51	100	102	Average
2412	99.36	-	-	95.86	32.89	2.12	31.51	100	102	Peak



Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
53.318	24.94	-15.06	40	51.27	6.8	0.45	33.58	-	-	Peak
123.266	22.72	-20.78	43.5	43.9	11.77	0.65	33.6	-	-	Peak
160.346	20.97	-22.53	43.5	44.21	9.6	0.74	33.58	-	-	Peak
239.987	24.24	-21.76	46	45.29	11.51	0.9	33.46	-	-	Peak
280.024	19.31	-26.69	46	39.08	12.66	0.97	33.4	-	-	Peak
945.44	33.74	-12.26	46	43.72	20.71	1.75	32.44	100	166	Peak
2437	100.4	-	-	96.82	32.95	2.14	31.51	100	166	Average
2437	110.52	-	-	106.94	32.95	2.14	31.51	100	166	Peak

Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	34.14	-5.86	40	49.37	18	0.34	33.57	100	189	Peak
32.52	31.96	-8.04	40	49.16	16.04	0.35	33.59	-	-	Peak
57.191	24.01	-15.99	40	51.37	5.75	0.47	33.58	-	-	Peak
124.569	22.31	-21.19	43.5	43.5	11.76	0.65	33.6	-	-	Peak
239.987	23.15	-22.85	46	44.2	11.51	0.9	33.46	-	-	Peak
945.44	33.89	-12.11	46	43.87	20.71	1.75	32.44	-	-	Peak
2437	90.73	-	-	87.15	32.95	2.14	31.51	100	26	Average
2437	101.19	-	-	97.61	32.95	2.14	31.51	100	26	Peak



Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
57.392	21.91	-18.09	40	49.27	5.75	0.47	33.58	-	-	Peak
95.427	26.15	-17.35	43.5	49.41	9.8	0.56	33.62	-	-	Peak
124.133	22.74	-20.76	43.5	43.93	11.76	0.65	33.6	-	-	Peak
160.346	22.19	-21.31	43.5	45.43	9.6	0.74	33.58	-	-	Peak
239.987	23.4	-22.6	46	44.45	11.51	0.9	33.46	-	-	Peak
945.44	34.1	-11.9	46	44.08	20.71	1.75	32.44	100	112	Peak
2462	99.81	-	-	96.19	32.98	2.15	31.51	100	201	Average
2462	110.28	-	-	106.66	32.98	2.15	31.51	100	201	Peak

Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.399	21.03	-18.97	40	36.98	17.29	0.34	33.58	-	-	Peak
45.855	18.26	-21.74	40	42.21	9.25	0.41	33.61	-	-	Peak
116.95	21.39	-22.11	43.5	42.57	11.8	0.62	33.6	-	-	Peak
160.346	15.8	-27.7	43.5	39.04	9.6	0.74	33.58	-	-	Peak
239.987	22.76	-23.24	46	43.81	11.51	0.9	33.46	-	-	Peak
945.44	34.47	-11.53	46	44.45	20.71	1.75	32.44	100	109	Peak
2462	89.51	-	-	85.89	32.98	2.15	31.51	100	18	Average
2462	100.18	-	-	96.56	32.98	2.15	31.51	100	18	Peak



Test Mode :	802.11n-HT40	Temperature :	21~22°C
Test Channel :	03	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
97.456	26.44	-17.06	43.5	49.34	10.15	0.57	33.62	-	-	Peak
122.834	22.82	-20.68	43.5	44	11.77	0.65	33.6	-	-	Peak
145.351	26.66	-16.84	43.5	49.15	10.37	0.72	33.58	-	-	Peak
160.346	21.94	-21.56	43.5	45.18	9.6	0.74	33.58	-	-	Peak
240.83	23.25	-22.75	46	44.24	11.56	0.91	33.46	-	-	Peak
945.44	33.71	-12.29	46	43.69	20.71	1.75	32.44	100	96	Peak
2422	93.66	-	-	90.12	32.92	2.13	31.51	100	0	Average
2422	103.05	-	-	99.51	32.92	2.13	31.51	100	0	Peak

Test Mode :	802.11n-HT40	Temperature :	21~22°C
Test Channel :	03	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
43.812	28.29	-11.71	40	51.47	10.03	0.41	33.62	-	-	Peak
51.121	28.53	-11.47	40	54.46	7.21	0.44	33.58	-	-	Peak
117.773	21.95	-21.55	43.5	43.13	11.8	0.62	33.6	-	-	Peak
125.007	21.54	-21.96	43.5	42.74	11.75	0.65	33.6	-	-	Peak
239.987	21.89	-24.11	46	42.94	11.51	0.9	33.46	-	-	Peak
945.44	35.2	-10.8	46	45.18	20.71	1.75	32.44	100	182	Peak
2422	84.5	-	-	80.96	32.92	2.13	31.51	100	122	Average
2422	94.89	-	-	91.35	32.92	2.13	31.51	100	122	Peak



Test Mode :	802.11n-HT40	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
50.942	23.15	-16.85	40	49.08	7.21	0.44	33.58	-	-	Peak
122.404	24.73	-18.77	43.5	45.91	11.78	0.64	33.6	-	-	Peak
160.346	21.83	-21.67	43.5	45.07	9.6	0.74	33.58	-	-	Peak
239.987	23.03	-22.97	46	44.08	11.51	0.9	33.46	-	-	Peak
824.597	31.58	-14.42	46	42.46	20.16	1.64	32.68	-	-	Peak
945.44	33.25	-12.75	46	43.23	20.71	1.75	32.44	100	155	Peak
2437	92.24	-	-	88.66	32.95	2.14	31.51	100	110	Average
2437	102.23	-	-	98.65	32.95	2.14	31.51	100	110	Peak

Test Mode :	802.11n-HT40	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	29.3	-10.7	40	44.53	18	0.34	33.57	100	295	Peak
33.917	26.12	-13.88	40	43.8	15.56	0.36	33.6	-	-	Peak
123.699	22.24	-21.26	43.5	43.43	11.76	0.65	33.6	-	-	Peak
163.182	30.17	-13.33	43.5	53.51	9.49	0.75	33.58	-	-	Peak
239.987	22.71	-23.29	46	43.76	11.51	0.9	33.46	-	-	Peak
945.44	33.48	-12.52	46	43.46	20.71	1.75	32.44	-	-	Peak
2437	83.68	-	-	80.1	32.95	2.14	31.51	100	0	Average
2437	93.33	-	-	89.75	32.95	2.14	31.51	100	0	Peak



Test Mode :	802.11n-HT40	Temperature :	21~22°C
Test Channel :	09	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.293	20.44	-19.56	40	37.12	16.55	0.35	33.58	-	-	Peak
115.321	23.74	-19.76	43.5	44.93	11.8	0.62	33.61	-	-	Peak
124.133	23.15	-20.35	43.5	44.34	11.76	0.65	33.6	-	-	Peak
160.346	20.65	-22.85	43.5	43.89	9.6	0.74	33.58	-	-	Peak
239.987	24.17	-21.83	46	45.22	11.51	0.9	33.46	-	-	Peak
945.44	34.08	-11.92	46	44.06	20.71	1.75	32.44	100	186	Peak
2452	93.1	-	-	89.52	32.95	2.14	31.51	100	210	Average
2452	103.25	-	-	99.67	32.95	2.14	31.51	100	210	Peak

Test Mode :	802.11n-HT40	Temperature :	21~22°C
Test Channel :	09	Relative Humidity :	40~41%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.179	27.32	-12.68	40	44	16.55	0.35	33.58	-	-	Peak
34.517	27.39	-12.61	40	45.53	15.1	0.37	33.61	-	-	Peak
133.151	20.32	-23.18	43.5	41.75	11.47	0.69	33.59	-	-	Peak
193.773	28.52	-14.98	43.5	52.57	8.7	0.81	33.56	-	-	Peak
239.987	22.53	-23.47	46	43.58	11.51	0.9	33.46	-	-	Peak
945.44	34.39	-11.61	46	44.37	20.71	1.75	32.44	100	21	Peak
2452	84.63	-	-	81.05	32.95	2.14	31.51	100	0	Average
2452	94.86	-	-	91.28	32.95	2.14	31.51	100	0	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.

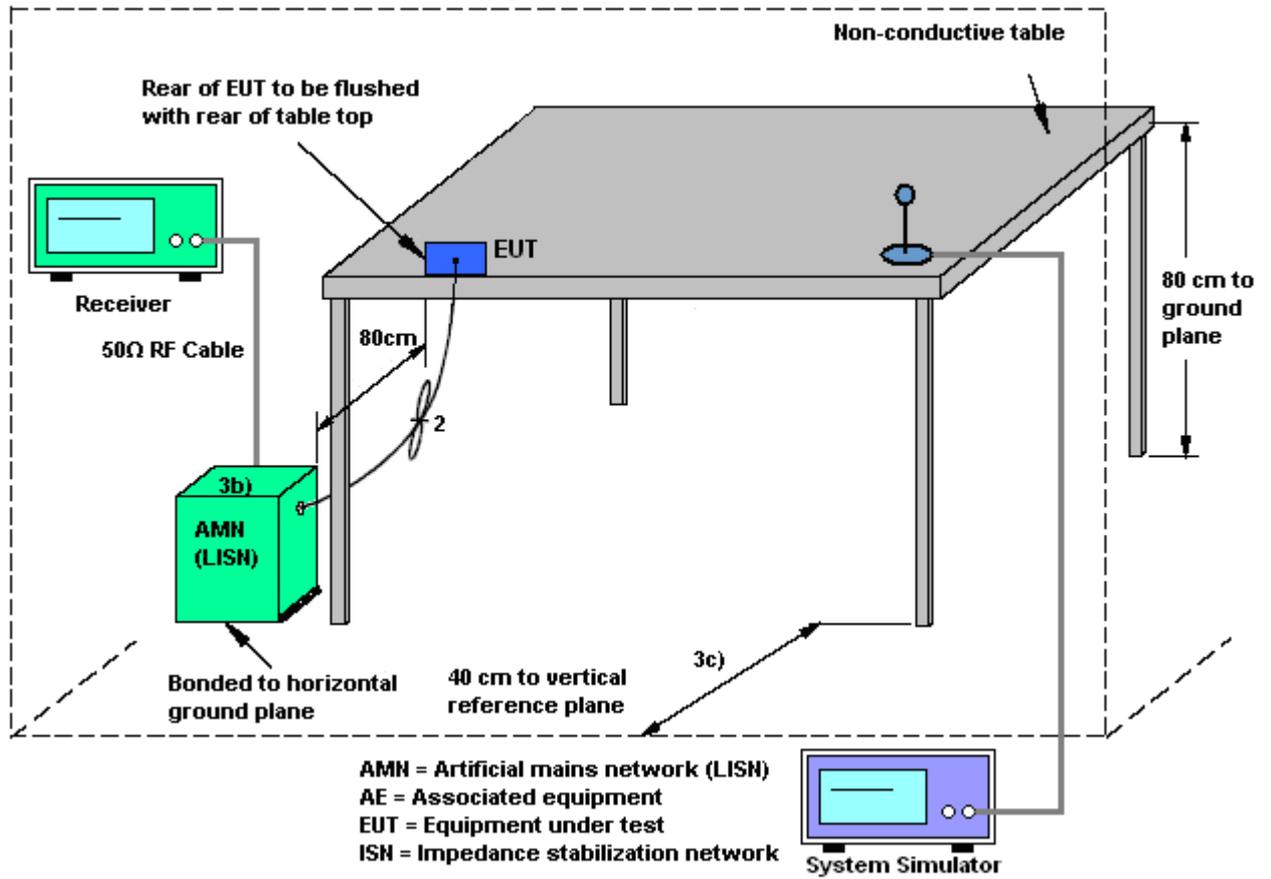
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The testing follows the guidelines in FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. ANSI C63.4-2003 and ANSI C63.10-2009.
3. 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.
4. Connect EUT to the power mains through a line impedance stabilization network (LISN).
5. All the support units are connecting to the other LISN.
6. The LISN provides 50 ohm coupling impedance for the measuring instrument.
7. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
8. Both sides of AC line were checked for maximum conducted interference.
9. The frequency range from 150 KHz to 30 MHz was searched.
10. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

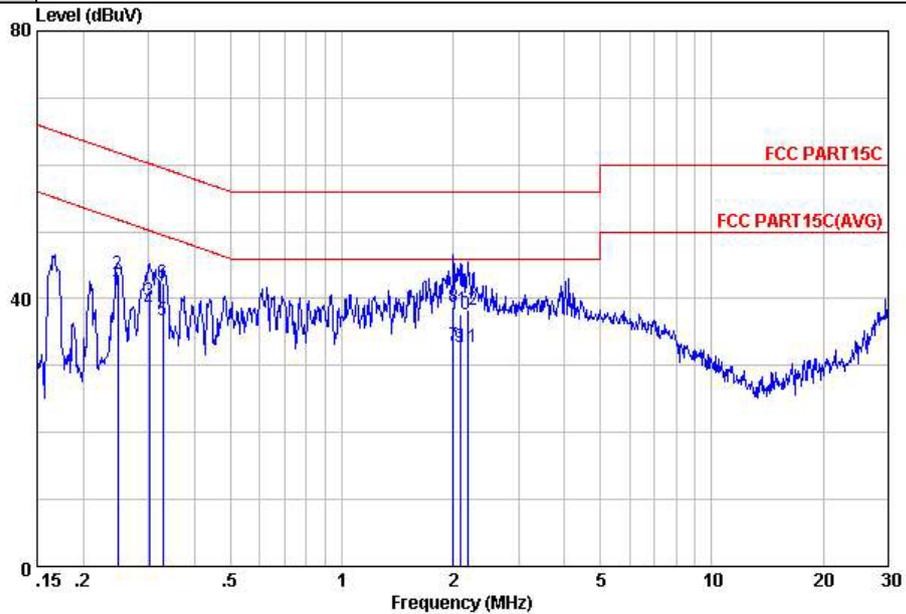
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

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

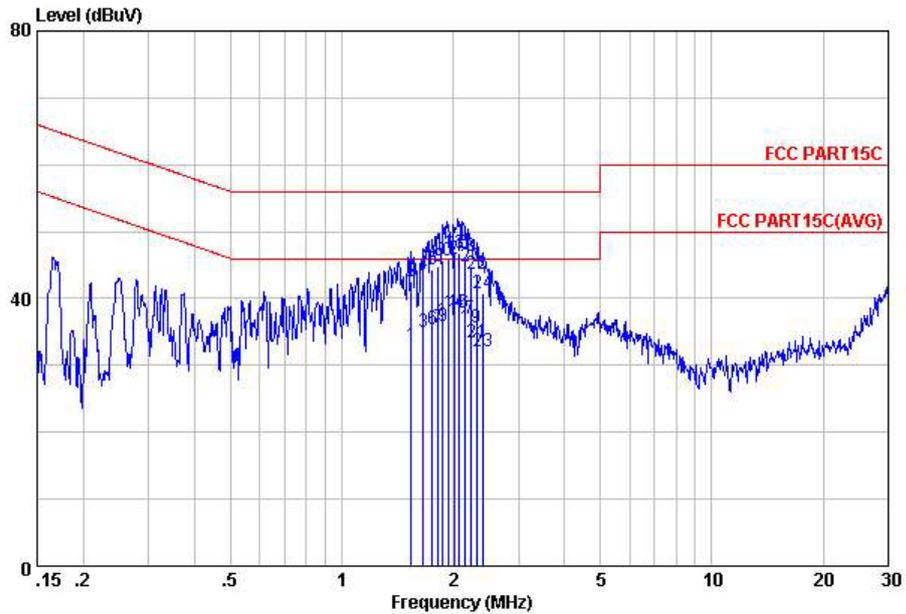


Site : C001-KS
 Condition: FCC PART15C LISN-111230 LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.25	41.25	-10.57	51.82	30.79	-0.07	10.53	Average
2	0.25	43.65	-18.17	61.82	33.19	-0.07	10.53	QP
3	0.30	39.61	-20.58	60.19	29.10	-0.07	10.58	QP
4	0.30	38.31	-11.88	50.19	27.80	-0.07	10.58	Average
5	0.33	36.72	-12.77	49.49	26.20	-0.08	10.60	Average
6	0.33	42.32	-17.17	59.49	31.80	-0.08	10.60	QP
7	2.00	33.09	-12.91	46.00	22.50	-0.11	10.70	Average
8	2.00	38.79	-17.21	56.00	28.20	-0.11	10.70	QP
9	2.09	32.79	-13.21	46.00	22.20	-0.11	10.70	Average
10	2.09	37.69	-18.31	56.00	27.10	-0.11	10.70	QP
11	2.20	32.70	-13.30	46.00	22.10	-0.11	10.71	Average
12	2.20	38.40	-17.60	56.00	27.80	-0.11	10.71	QP



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



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

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	1.54	33.08	-12.92	46.00	22.49	-0.10	10.69	Average
2	1.54	42.58	-13.42	56.00	31.99	-0.10	10.69	QP
3	1.66	34.88	-11.12	46.00	24.30	-0.11	10.69	Average
4	1.66	43.78	-12.22	56.00	33.20	-0.11	10.69	QP
5	1.75	44.39	-11.61	56.00	33.81	-0.11	10.69	QP
6	1.75	35.39	-10.61	46.00	24.81	-0.11	10.69	Average
7	1.82	35.59	-10.41	46.00	25.00	-0.11	10.70	Average
8	1.82	44.79	-11.21	56.00	34.20	-0.11	10.70	QP
9	1.88	35.79	-10.21	46.00	25.20	-0.11	10.70	Average
10	1.88	45.79	-10.21	56.00	35.20	-0.11	10.70	QP
11	1.95	36.79	-9.21	46.00	26.20	-0.11	10.70	Average
12	1.95	45.89	-10.11	56.00	35.30	-0.11	10.70	QP
13	2.01	46.79	-9.21	56.00	36.20	-0.11	10.70	QP
14	2.01	37.99	-8.01	46.00	27.40	-0.11	10.70	Average
15	2.07	46.69	-9.31	56.00	36.10	-0.11	10.70	QP
16	2.07	37.99	-8.01	46.00	27.40	-0.11	10.70	Average
17	2.14	37.00	-9.00	46.00	26.40	-0.11	10.71	Average
18	2.14	46.30	-9.70	56.00	35.70	-0.11	10.71	QP
19	2.24	35.60	-10.40	46.00	25.00	-0.11	10.71	Average
20	2.24	44.80	-11.20	56.00	34.20	-0.11	10.71	QP
21	2.32	33.41	-12.59	46.00	22.80	-0.11	10.72	Average
22	2.32	43.61	-12.39	56.00	33.00	-0.11	10.72	QP
23	2.41	32.01	-13.99	46.00	21.40	-0.11	10.72	Average
24	2.41	40.81	-15.19	56.00	30.20	-0.11	10.72	QP



3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 Antenna Gain

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



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Nov. 08, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Nov. 08, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Nov. 08, 2012	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Nov. 08, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Nov. 08, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Nov. 08, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Nov. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Nov. 08, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 03, 2012	Nov. 08, 2012	Jul. 02, 2014	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Nov. 08, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Nov. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Nov. 08, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 06, 2012	Nov. 08, 2012	Nov. 05, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 10, 2012	Nov. 08, 2012	Oct. 09, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Oct. 22, 2012	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	Oct. 22, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	Oct. 22, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	Oct. 22, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Oct. 22, 2012	Dec. 29, 2012	Conduction (CO01-KS)



5 Uncertainty of Evaluation

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

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

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

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

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

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



Appendix A. Photographs of EUT

Please refer to Sporton report number EP2O1701 as below.