FCC RF Test Report

APPLICANT	:	Option nv
EQUIPMENT	:	GTM679W
BRAND NAME	:	Option
MODEL NAME	:	MO6792
MARKETING NAME	:	GTM679W
FCC ID	:	NCMOMO6792
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Jan. 02, 2013 and completely tested on Jan. 25, 2013. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR310215	Rev. 01	Initial issue of report	Jan. 31, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	RSS-210 A8.4	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	RSS-210 A8.5	Conducted Band Edges	≤ 20dBc	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 0.37 dB at 2390.000 MHz for Average
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 17.70 dB at 0.342 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Option nv
Gaston Geenslaan 14, 3001 Leuven, Belgium

1.2 Manufacturer

Option nv
Gaston Geenslaan 14, 3001 Leuven, Belgium

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	GTM679W
Brand Name	Option
Model Name	MO6792
Marketing Name	GTM679W
FCC ID	NCMOMO6792
EUT supports Radios application	CDMA/ GSM/EGPRS/WCDMA/HSPA/ WLAN 11bgn
HW Version	3.1
SW Version	2.2.10.0
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 : 13.89 dBm (0.0245 W) 802.11g : 19.93 dBm (0.0984 W) 802.11n HT20 : 20.15 dBm (0.1035 W) 802.11n HT40 : 19.14 dBm (0.0820 W)
Antenna Type	802.11b/g/n : Dipole Antenna with gain 2.90 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH07-HY	722060/4086B-1

1.6 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
- ANSI C63.4-2003 and ANSI C63.10-2009
- NOTICE 2012-DRS0126

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.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, " Receivers Excluded from Industry Canada Requirements", only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

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).

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.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	13.89	13.77	13.78	13.75

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	19.93	19.87	19.91	19.80	19.92	19.84	19.85	19.89

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.15	20.07	20.01	19.94	20.11	19.18	19.12	18.54

2.4GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	19.14	19.11	19.08	18.64	18.66	15.65	15.67	15.76

2.3 Test Mode

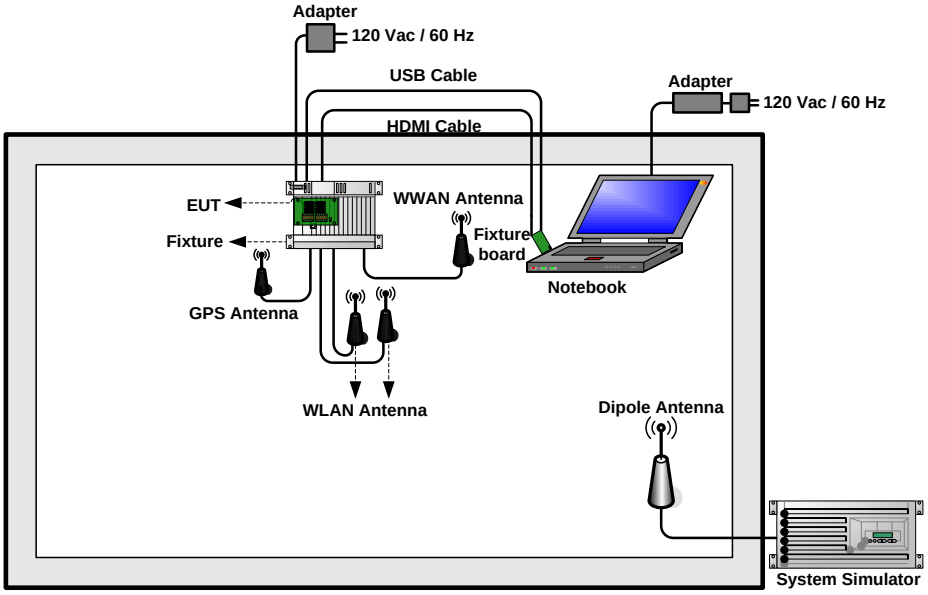
Final results of test modes, data rates and test channels are shown as following table.

Test Cases				
	Test Items	**Mode**	**Data Rate**	**Test Channel**
Conducted TCs	**6dB 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**

Test Cases	
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + WLAN Link + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + HDMI Cable plug in Fixture board with Notebook + USB Cable plug in Fixture board with Notebook + Adapter

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



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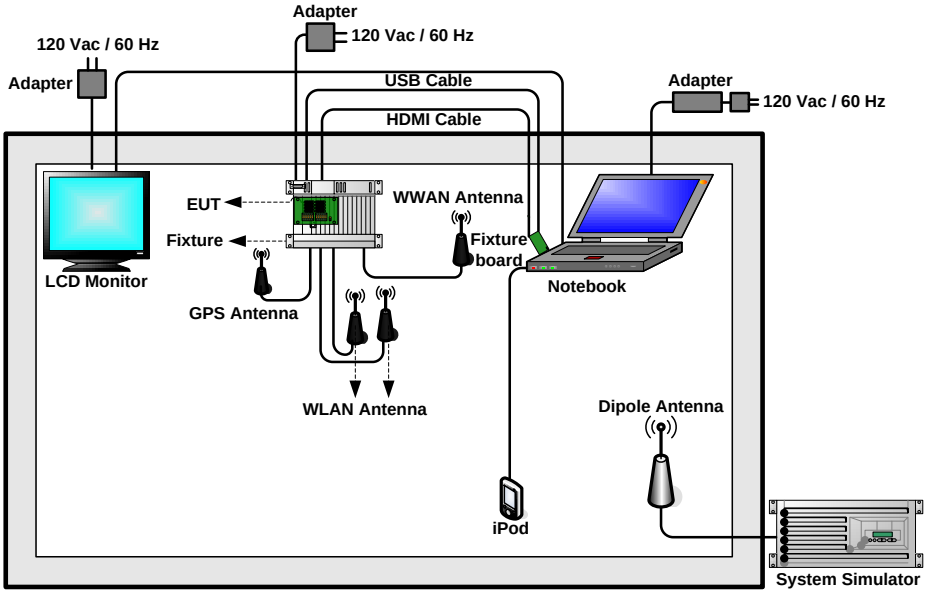


2.5 Support Unit used in test configuration and system

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.	Notebook	lenovo	769	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
6.	Adapter	Phihong	PSA15R-050P	N/A	N/A	Unshielded, 0.7m
7.	WWAN Antenna	TELSA	T01111975	N/A	N/A	N/A
8.	WLAN Antenna	Conceptronic	C04-260	N/A	N/A	N/A
9.	GPS Antenna	Galtronics	020806127-2063	N/A	N/A	N/A
10.	HDMI Cable	N/A	N/A	N/A	Unshielded, 1.8 m	N/A
11.	USB Cable	N/A	N/A	N/A	Unshielded, 0.5 m	N/A

2.6 Description of RF Function Operation Test Setup

For WLAN function, programmed RF utility, “art.exe” installed in the notebook make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals via HDMI Cable.

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.

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.

Example :

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

= 4.2 + 10 = 14.2 (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.

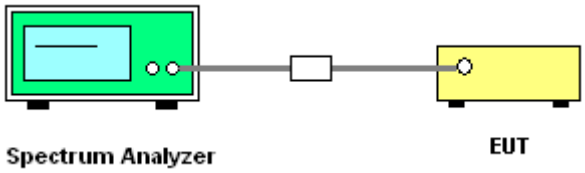
3.1.2 Measuring Instruments

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 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 :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	12.54	0.5	Pass
06	2437	12.55	0.5	Pass
11	2462	12.55	0.5	Pass

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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.31	0.5	Pass
06	2437	16.33	0.5	Pass
11	2462	16.35	0.5	Pass

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

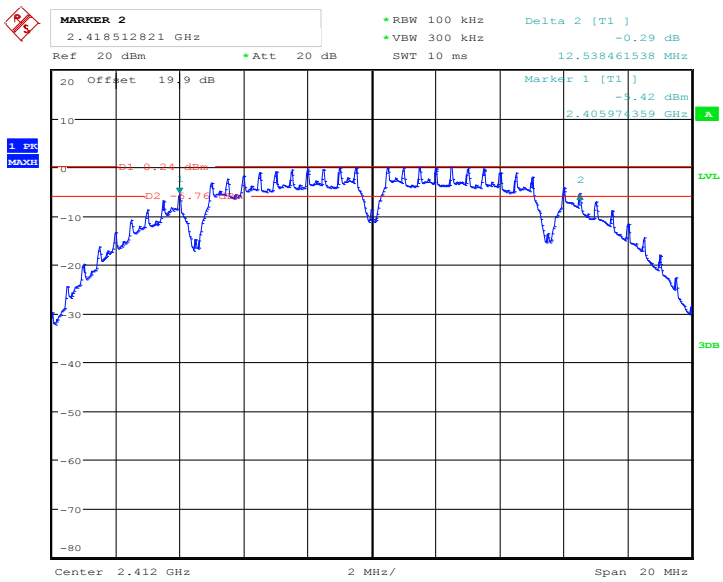
Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.56	0.5	Pass
06	2437	17.56	0.5	Pass
11	2462	17.56	0.5	Pass

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%

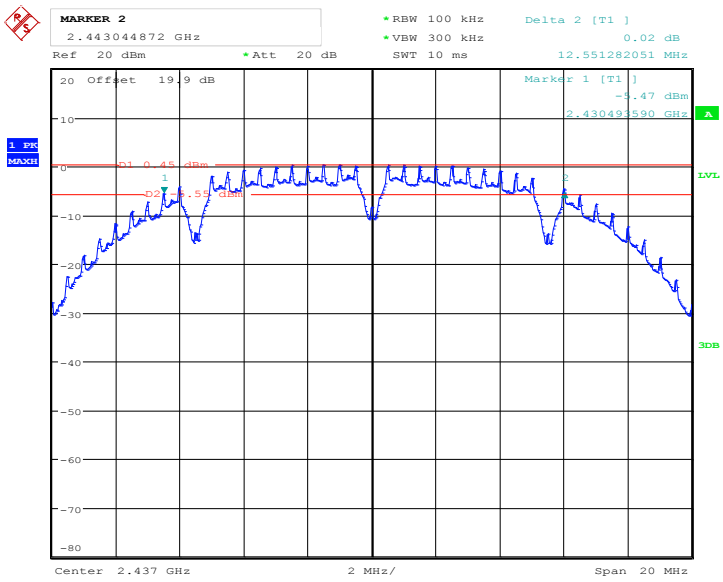
Channel	Frequency (MHz)	2.4GHz 802.11n HT40 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	35.90	0.5	Pass
06	2437	36.35	0.5	Pass
09	2452	36.08	0.5	Pass

3.1.6 Test Result of 6dB Bandwidth Plots

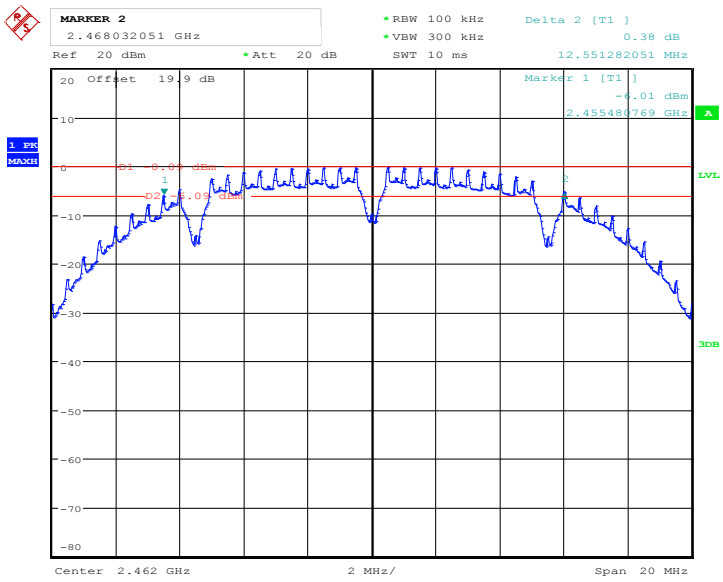
6 dB Bandwidth Plot on 802.11b Channel 01



6 dB Bandwidth Plot on 802.11b Channel 06



6 dB Bandwidth Plot on 802.11b Channel 11



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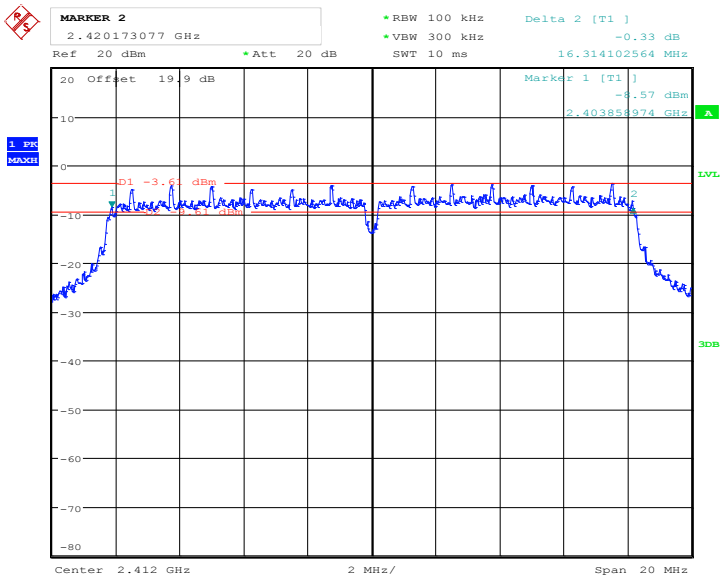
6 dB Bandwidth Plot on 802.11g Channel 01



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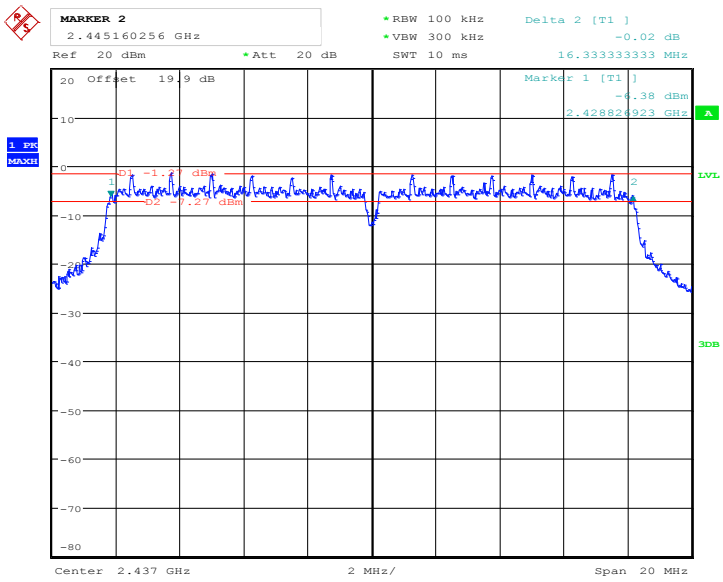
6 dB Bandwidth Plot on 802.11g Channel 06



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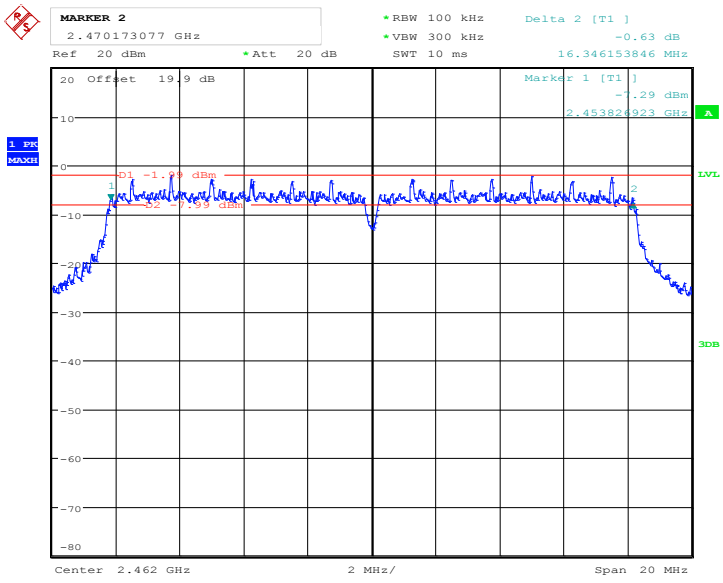
6 dB Bandwidth Plot on 802.11g Channel 11



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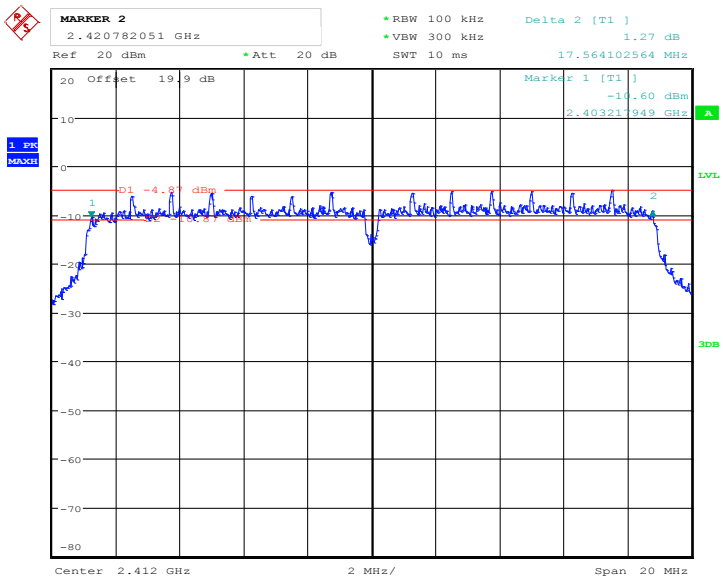
6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 01



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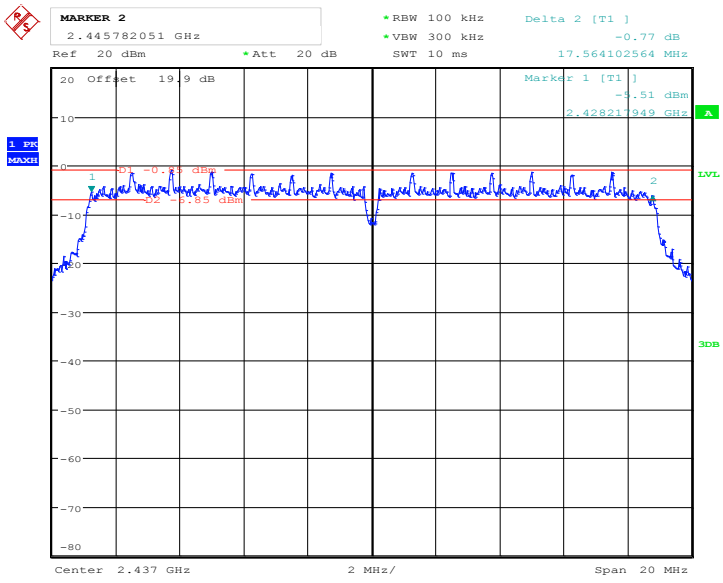
6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 06



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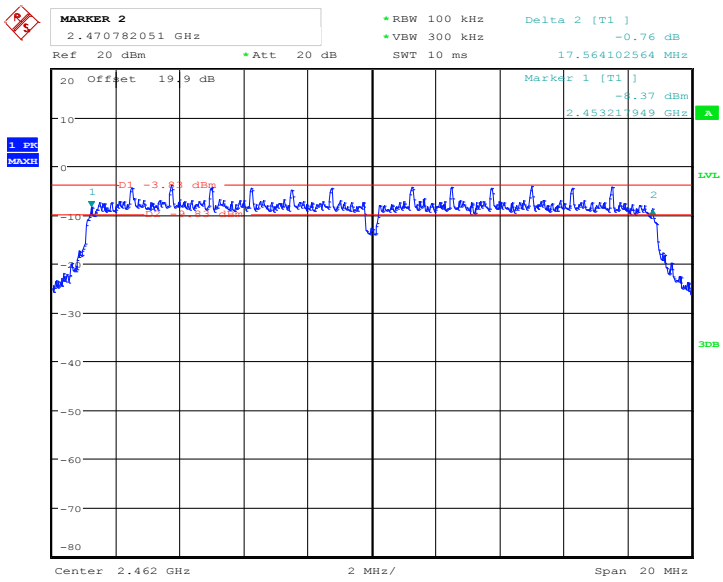
6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 11



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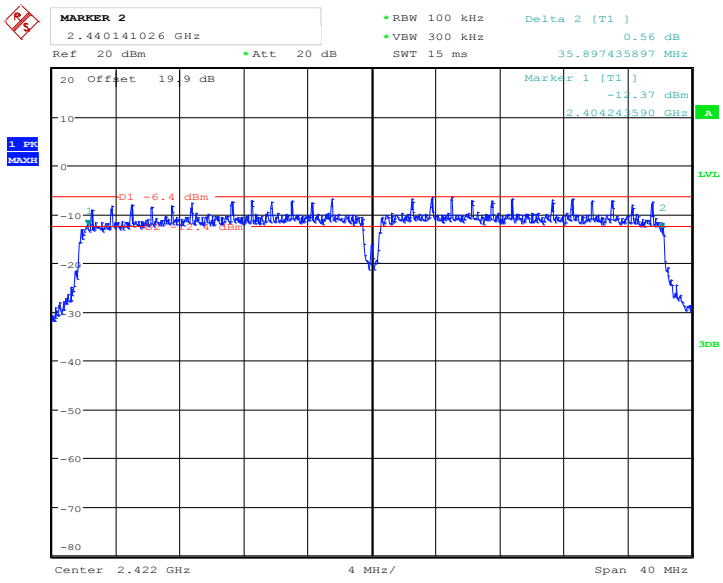
6 dB Bandwidth Plot on 2.4GHz 802.11n HT40 Channel 03



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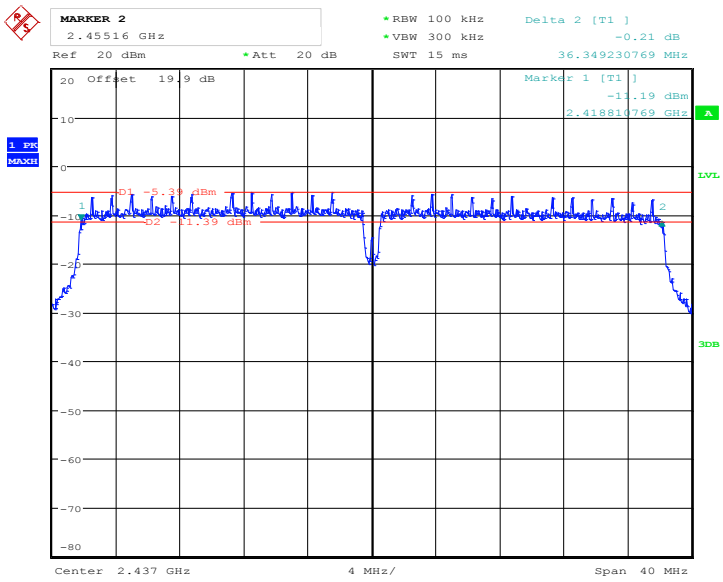
6 dB Bandwidth Plot on 2.4GHz 802.11n HT40 Channel 06



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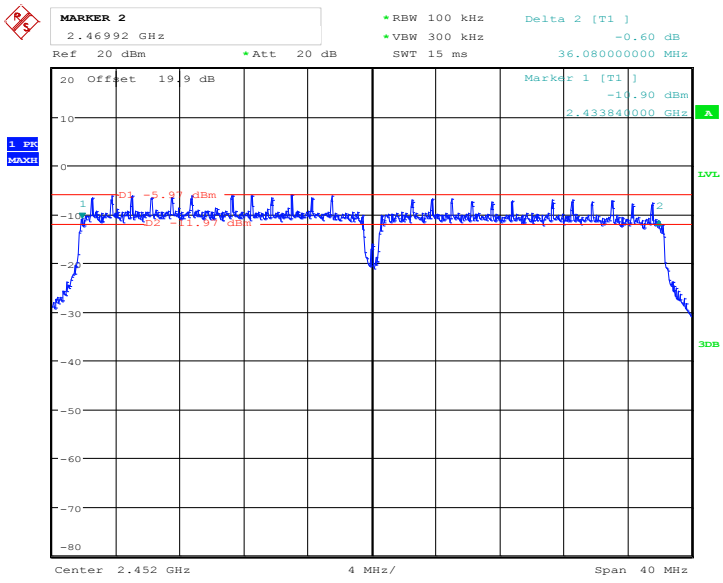
6 dB Bandwidth Plot on 2.4GHz 802.11n HT40 Channel 09



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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.

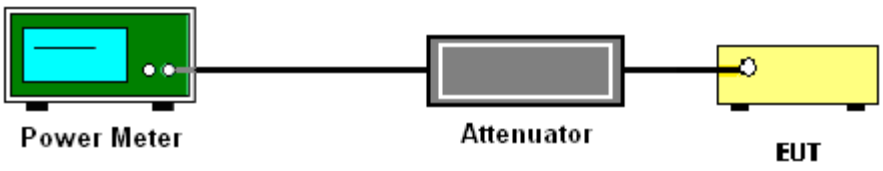
3.2.2 Measuring Instruments

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 v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

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

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	13.11	30	Pass
06	2437	13.89	30	Pass
11	2462	13.18	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.26	30	Pass
06	2437	19.93	30	Pass
11	2462	18.45	30	Pass

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	16.31	30	Pass
06	2437	20.15	30	Pass
11	2462	17.80	30	Pass

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	17.69	30	Pass
06	2437	19.14	30	Pass
09	2452	18.41	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

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

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	10.76
06	2437	11.48
11	2462	10.83

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%
Duty Cycle:	100%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	8.17
06	2437	11.02
11	2462	9.48

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%
Duty Cycle:	99.07%	Duty Factor:	0.04dB

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Average Output Power (dBm)
01	2412	6.67
06	2437	11.02
11	2462	8.27

Test Mode :	802.11n HT40	**Temperature :**	24~26℃
Test Engineer :	Jeff Chou	**Relative Humidity :**	50~53%
Duty Cycle:	98.39%	**Duty Factor:**	0.07dB

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Average Output Power (dBm)
03	2422	7.72
06	2437	9.33
09	2452	8.44

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

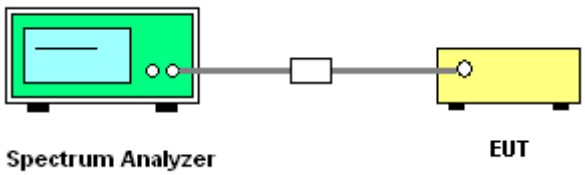
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
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 :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	0.06	-14.43	8	Pass
06	2437	0.33	-13.80	8	Pass
11	2462	-0.36	-14.32	8	Pass

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

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-3.68	-17.36	8	Pass
06	2437	-1.88	-15.98	8	Pass
11	2462	-3.15	-15.86	8	Pass

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-5.18	-18.60	8	Pass
06	2437	-1.17	-15.28	8	Pass
11	2462	-4.11	-18.70	8	Pass

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Engineer :	Jeff Chou	Relative Humidity :	50~53%

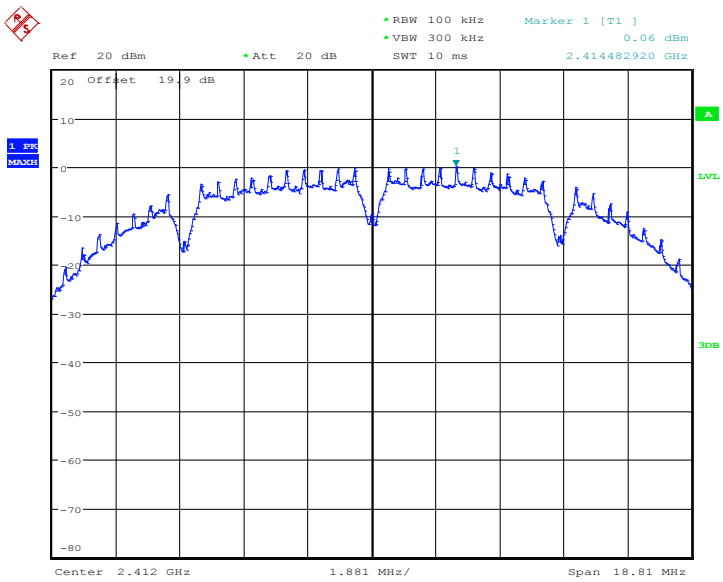
Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
03	2422	-6.38	-20.01	8	Pass
06	2437	-5.46	-20.01	8	Pass
09	2452	-6.16	-20.90	8	Pass

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.*

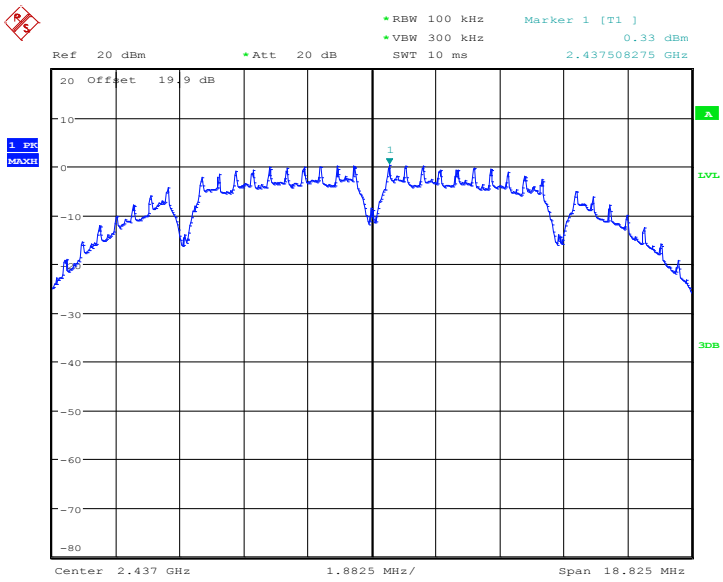
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 802.11b Channel 01



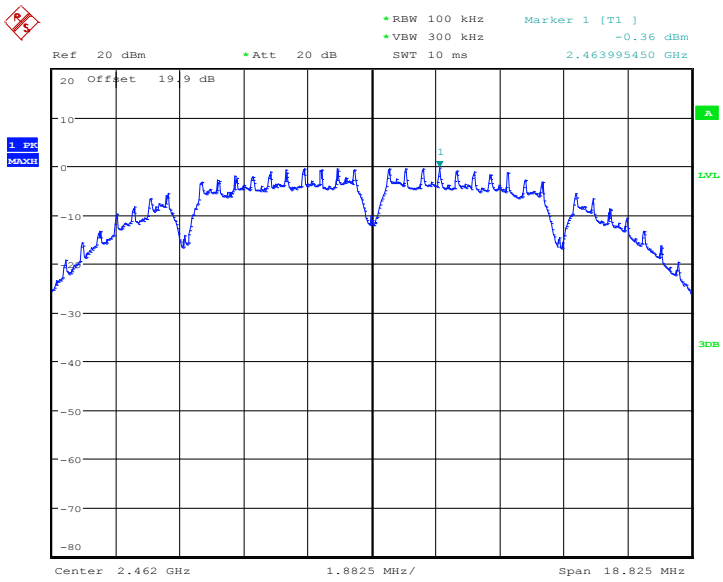
Date: 23.JAN.2013 21:29:19

PSD 100kHz Plot on 802.11b Channel 06



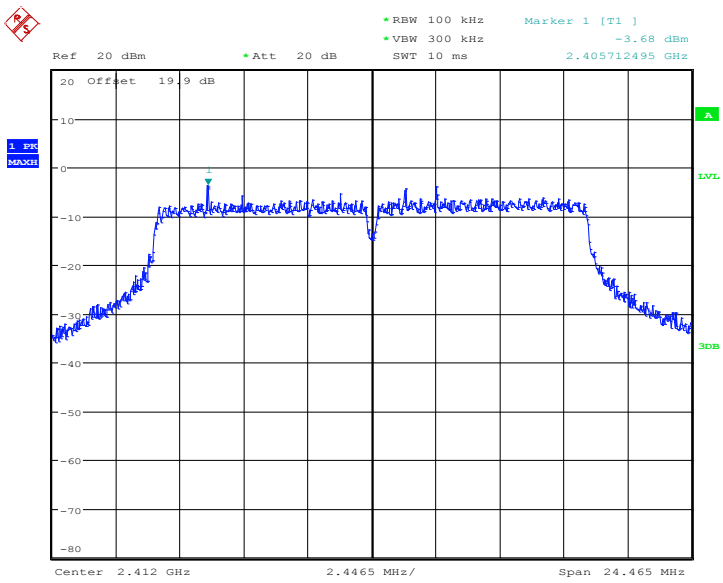
Date: 23.JAN.2013 20:01:05

PSD 100kHz Plot on 802.11b Channel 11



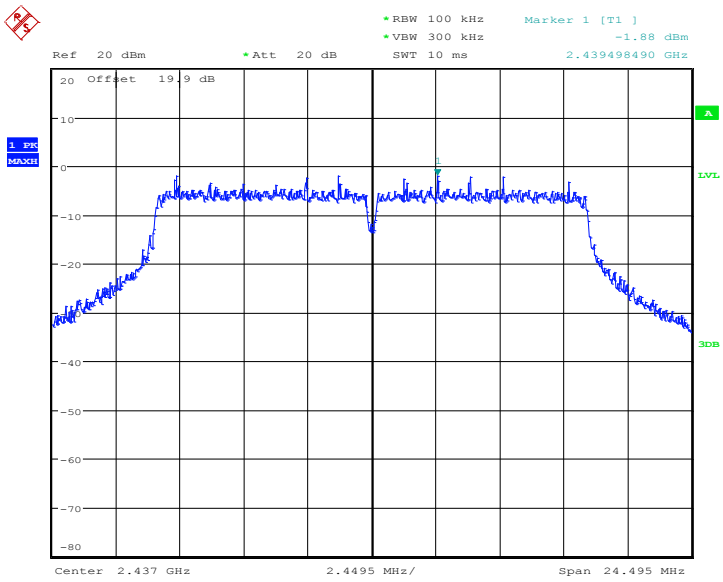
Date: 23.JAN.2013 20:08:22

PSD 100kHz Plot on 802.11g Channel 01



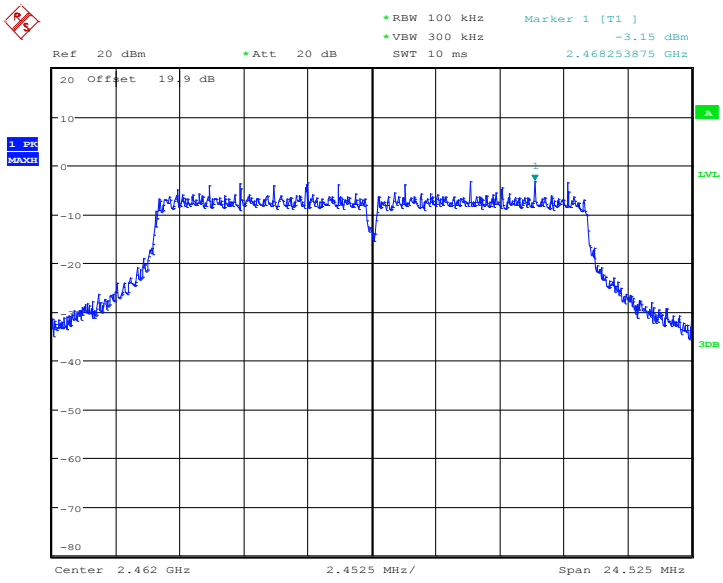
Date: 23.JAN.2013 20:42:13

PSD 100kHz Plot 802.11g Channel 06



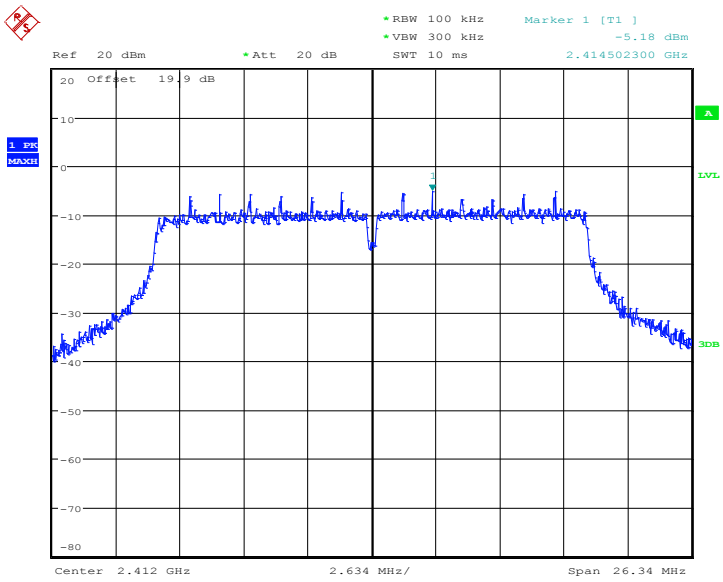
Date: 23.JAN.2013 20:30:18

PSD 100kHz Plot 802.11g Channel 11



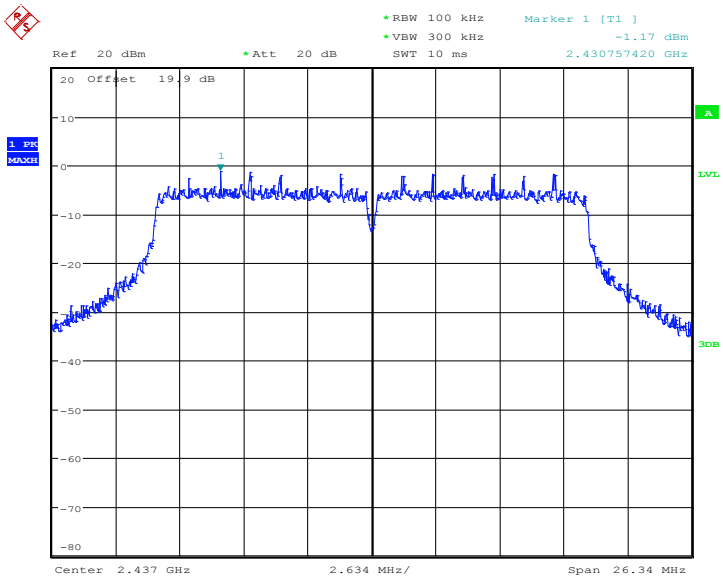
Date: 23.JAN.2013 20:14:00

PSD 100kHz Plot on 2.4GHz 802.11n HT20 Channel 01



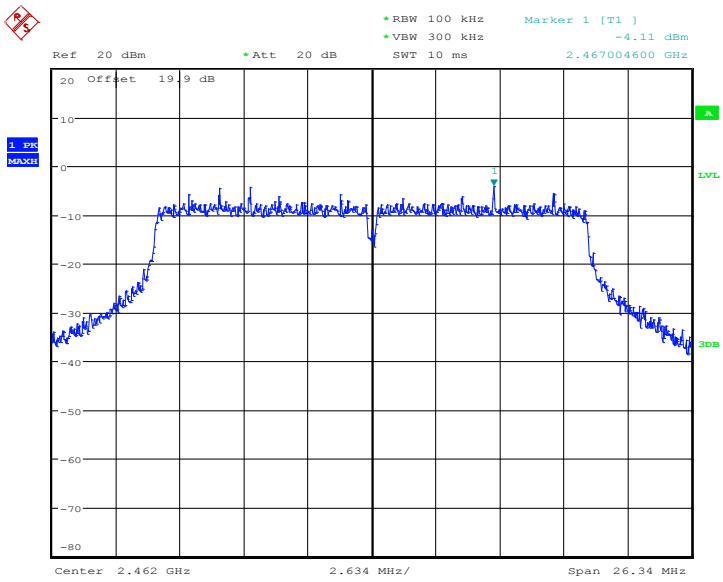
Date: 23.JAN.2013 20:48:52

PSD 100kHz Plot on 2.4GHz 802.11n HT20 Channel 06



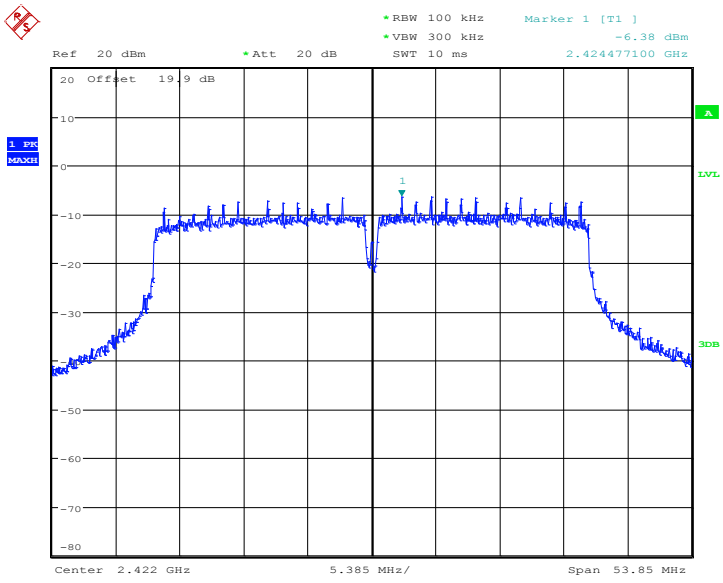
Date: 23.JAN.2013 20:53:19

PSD 100kHz Plot on 2.4GHz 802.11n HT20 Channel 11



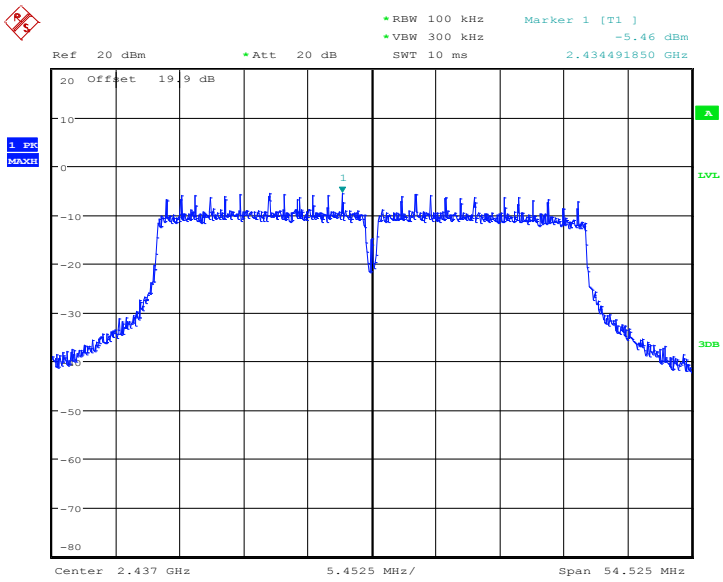
Date: 23.JAN.2013 20:57:34

PSD 100kHz Plot on 2.4GHz 802.11n HT40 Channel 03



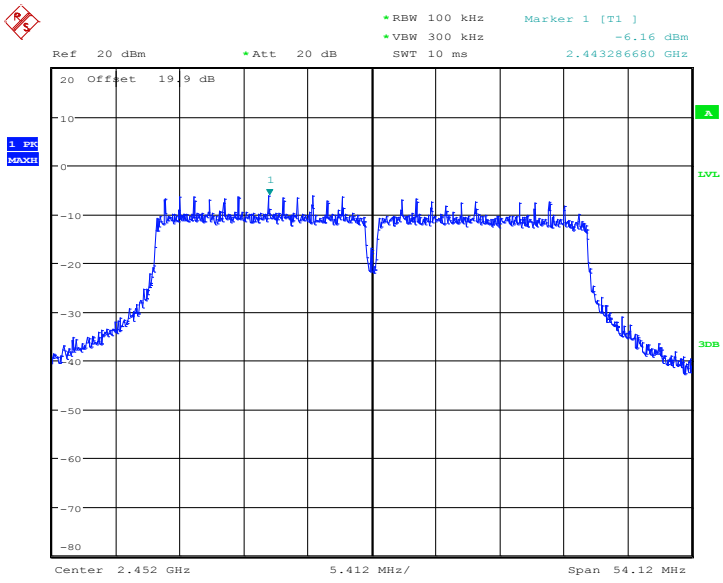
Date: 23.JAN.2013 21:05:04

PSD 100kHz Plot on 2.4GHz 802.11n HT40 Channel 06



Date: 23.JAN.2013 21:17:11

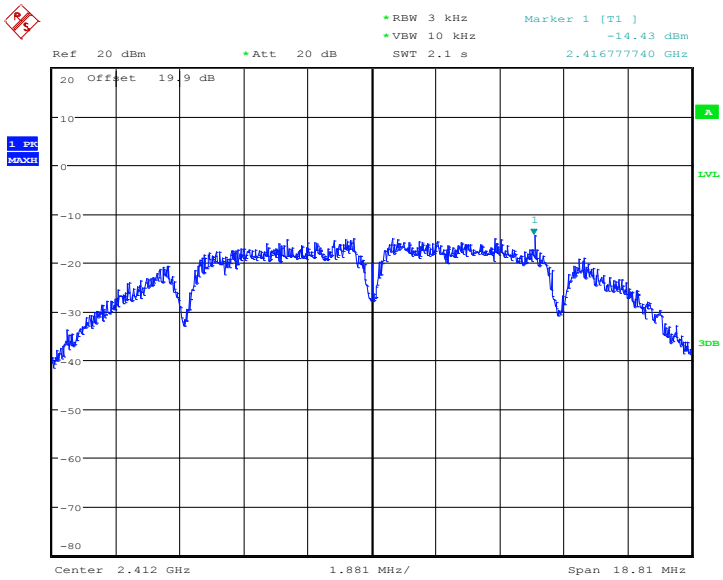
PSD 100kHz Plot on 2.4GHz 802.11n HT40 Channel 09



Date: 23.JAN.2013 21:22:32

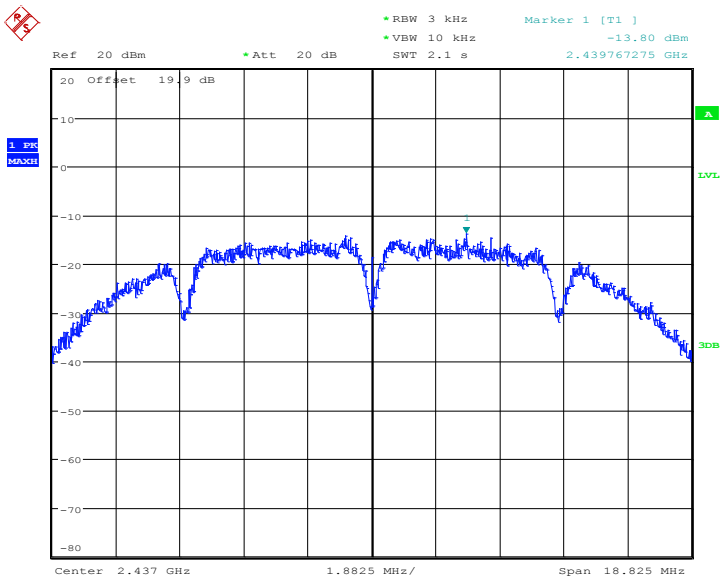
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



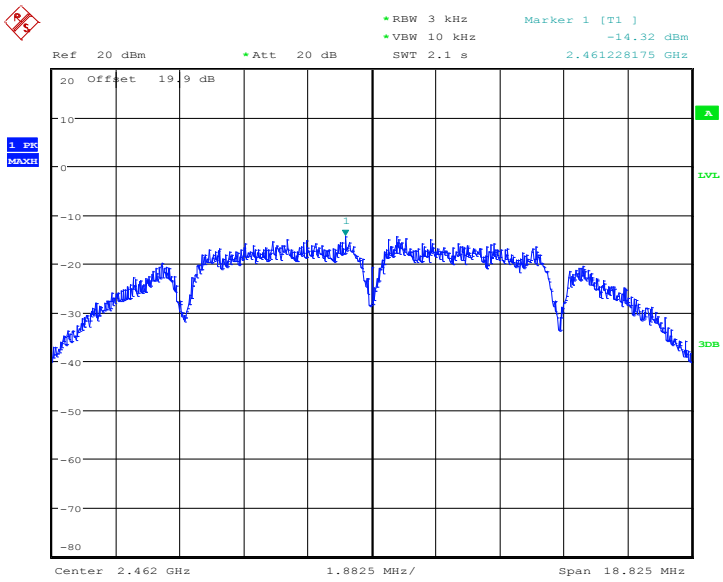
Date: 23.JAN.2013 21:29:05

PSD 3kHz Plot on 802.11b Channel 06



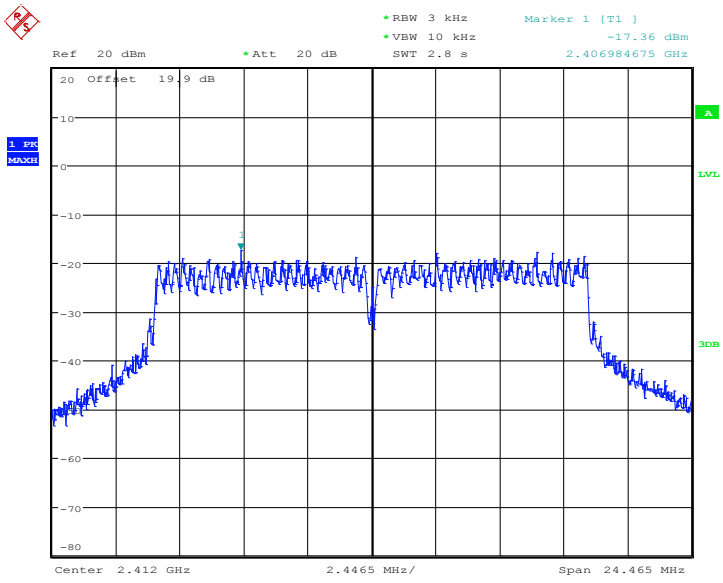
Date: 23.JAN.2013 20:00:51

PSD 3kHz Plot on 802.11b Channel 11



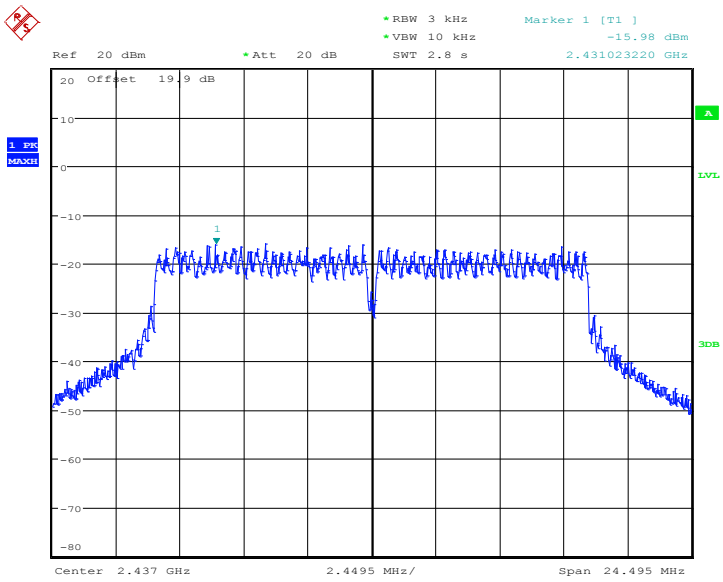
Date: 23.JAN.2013 20:08:12

PSD 3kHz Plot on 802.11g Channel 01



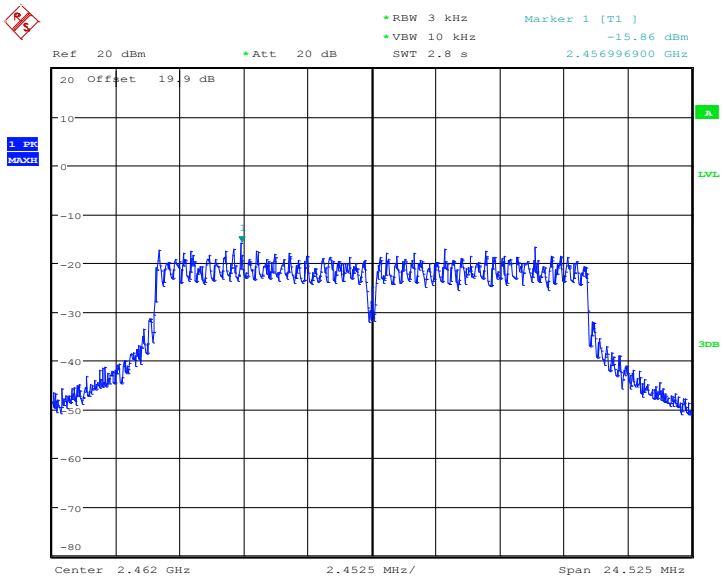
Date: 23.JAN.2013 20:42:02

PSD 3kHz Plot on 802.11g Channel 06



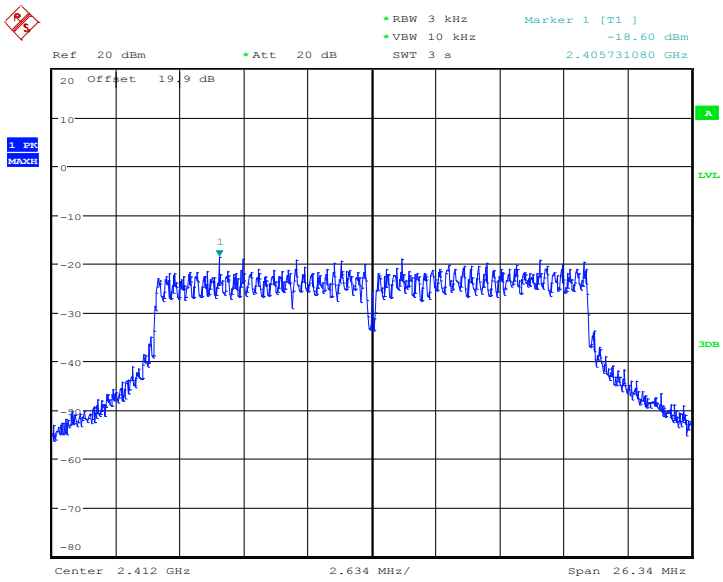
Date: 23.JAN.2013 20:30:06

PSD 3kHz Plot on 802.11g Channel 11



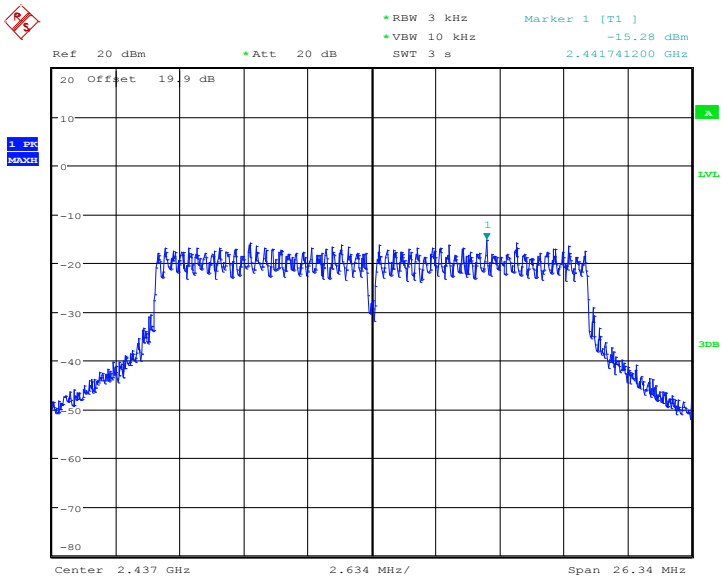
Date: 23.JAN.2013 20:13:48

PSD 3kHz Plot on 2.4GHz 802.11n HT20 Channel 01



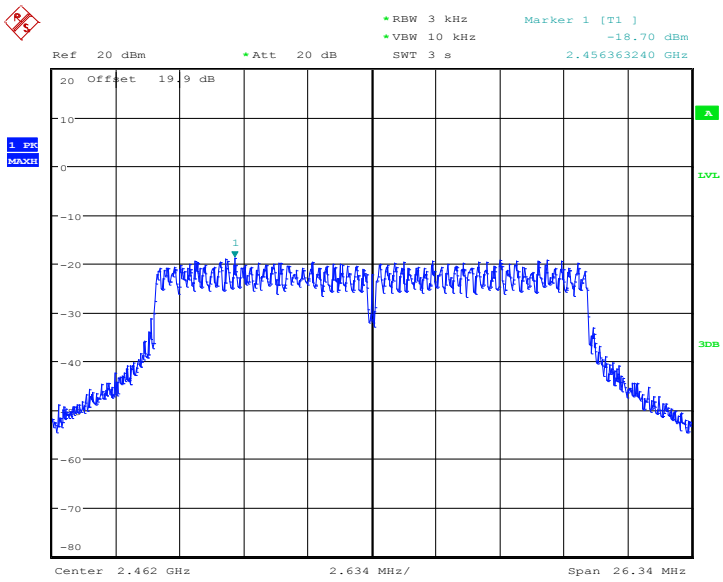
Date: 23.JAN.2013 20:48:27

PSD 3kHz Plot on 2.4GHz 802.11n HT20 Channel 06



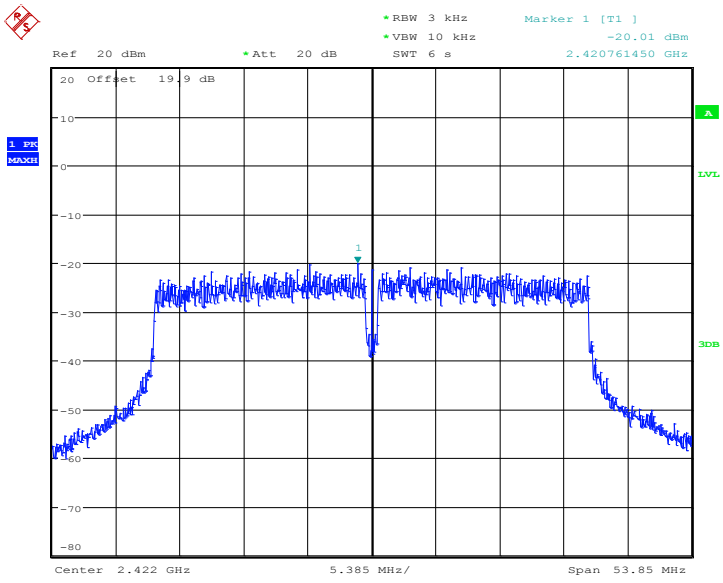
Date: 23.JAN.2013 20:53:07

PSD 3kHz Plot on 2.4GHz 802.11n HT20 Channel 11



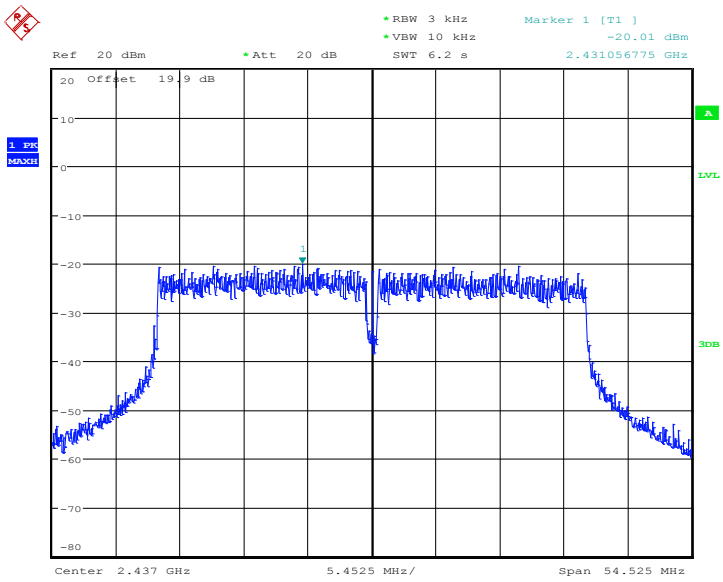
Date: 23.JAN.2013 20:57:24

PSD 3kHz Plot on 2.4GHz 802.11n HT40 Channel 03



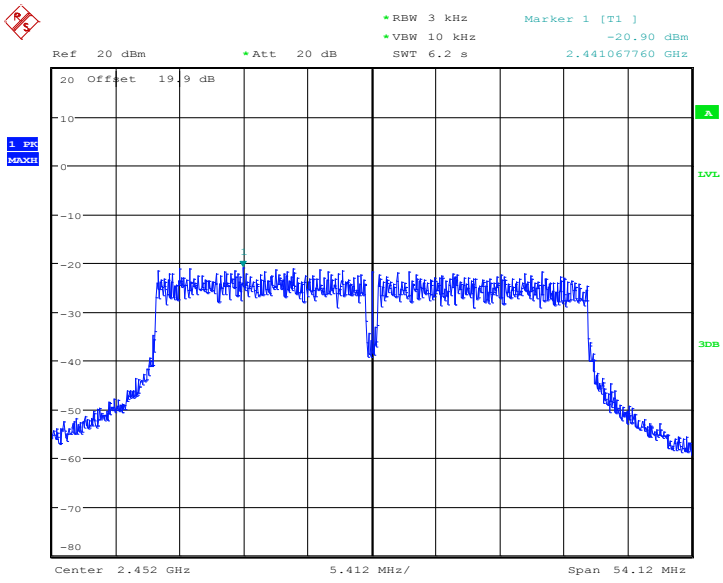
Date: 23.JAN.2013 21:04:02

PSD 3kHz Plot on 2.4GHz 802.11n HT40 Channel 06



Date: 23.JAN.2013 21:17:01

PSD 3kHz Plot on 2.4GHz 802.11n HT40 Channel 09



Date: 23.JAN.2013 21:22:23

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).

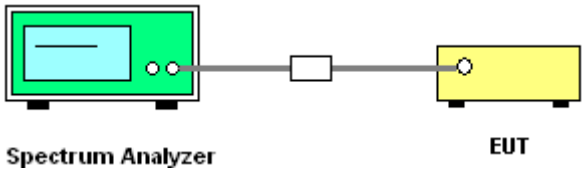
3.4.2 Measuring Instruments

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 v02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. 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.

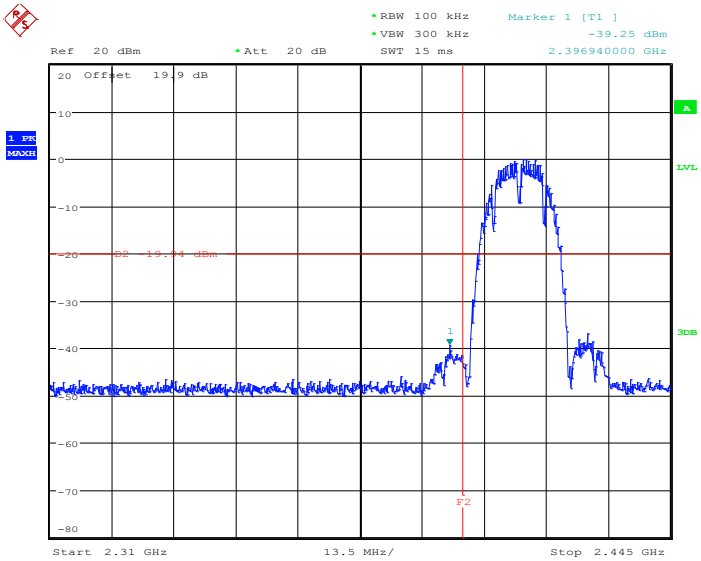
3.4.4 Test Setup



3.4.6 Test Result of Conducted Spurious at Band Edges

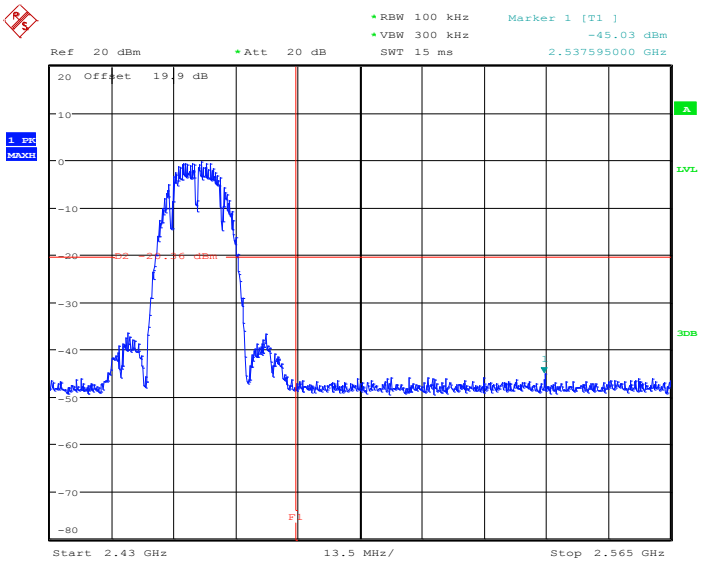
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Jeff Chou

Low Band Edge Plot on 802.11b Channel 01



Date: 23.JAN.2013 21:29:33

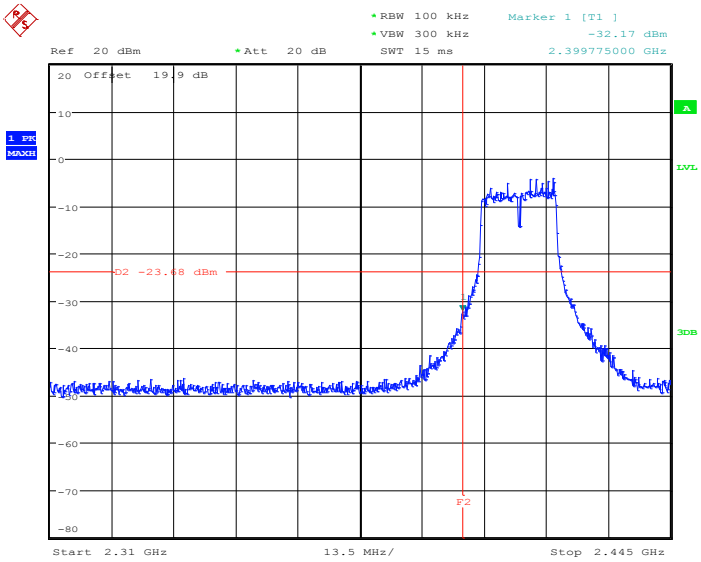
High Band Edge Plot on 802.11b Channel 11



Date: 23.JAN.2013 20:08:38

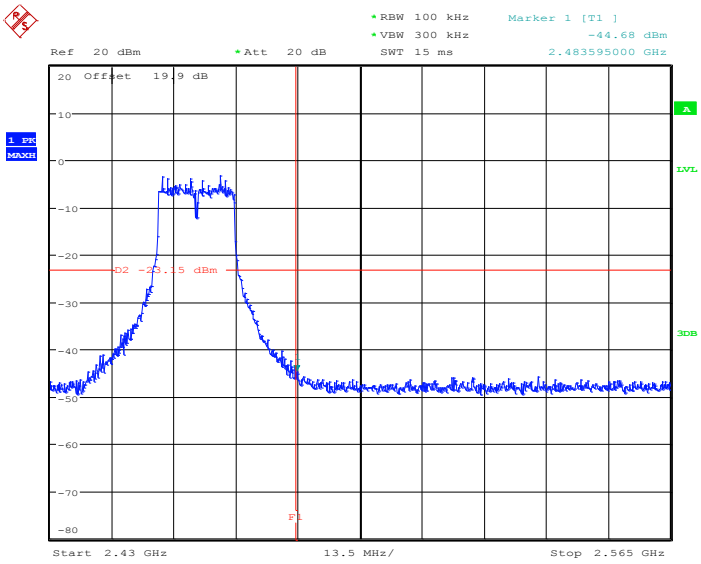
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Jeff Chou

Low Band Edge Plot on 802.11g Channel 01



Date: 23.JAN.2013 20:42:42

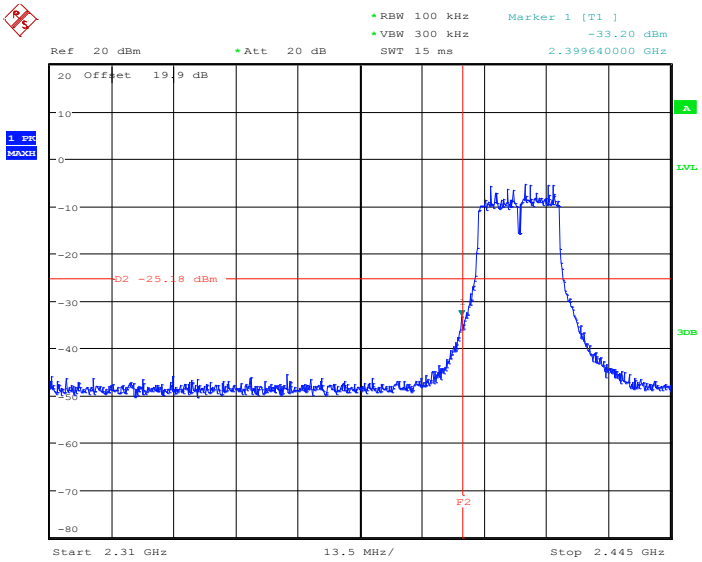
High Band Edge Plot on 802.11g Channel 11



Date: 23.JAN.2013 20:14:15

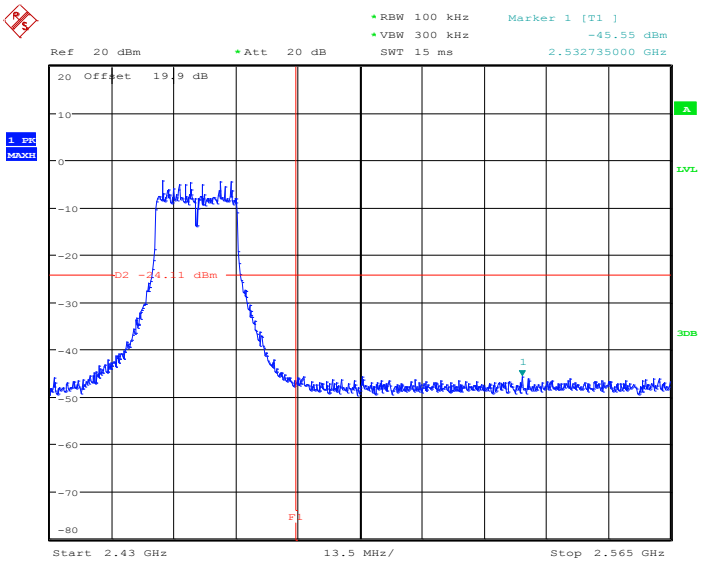
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Jeff Chou

Low Band Edge Plot on 2.4GHz 802.11n HT20 Channel 01



Date: 23.JAN.2013 20:49:41

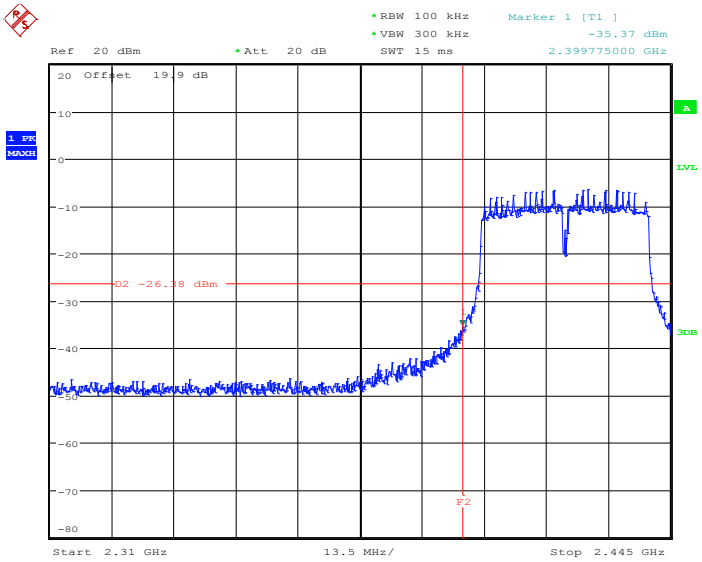
High Band Edge Plot on 2.4GHz 802.11n HT20 Channel 11



Date: 23.JAN.2013 20:58:39

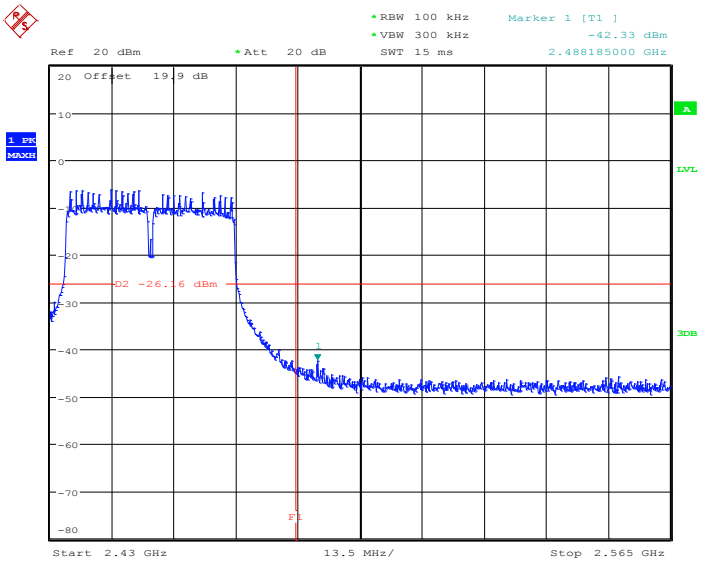
Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	03 and 09	Test Engineer :	Jeff Chou

Low Band Edge Plot on 2.4GHz 802.11n HT40 Channel 03



Date: 23.JAN.2013 21:05:37

High Band Edge Plot on 2.4GHz 802.11n HT40 Channel 09



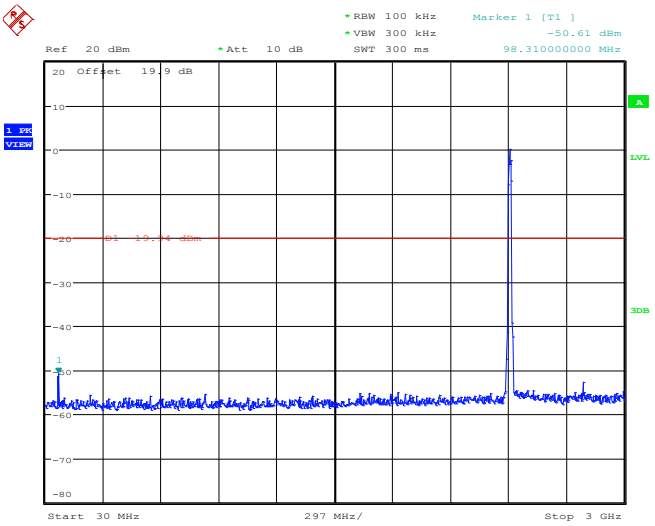
Date: 23.JAN.2013 21:22:47

3.4.7 Test Result of Conducted Spurious Emission

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

802.11b 30 MHz~3 GHz

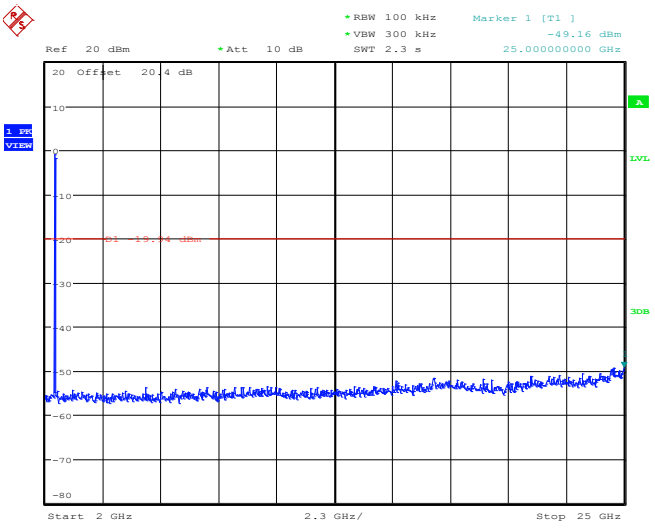
Conducted Spurious Emission Plot on Channel 01



Date: 23.JAN.2013 21:29:53

802.11b 2 GHz~25 GHz

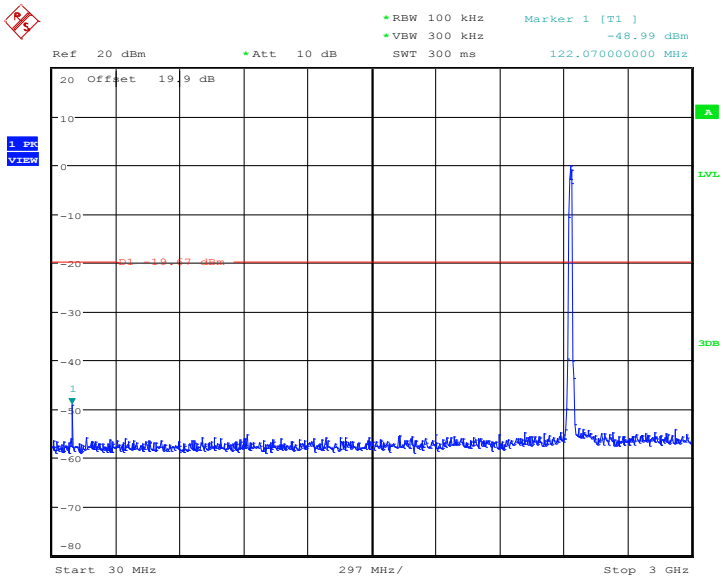
Conducted Spurious Emission Plot on Channel 01



Date: 23.JAN.2013 21:30:11

802.11b 30 MHz~3 GHz

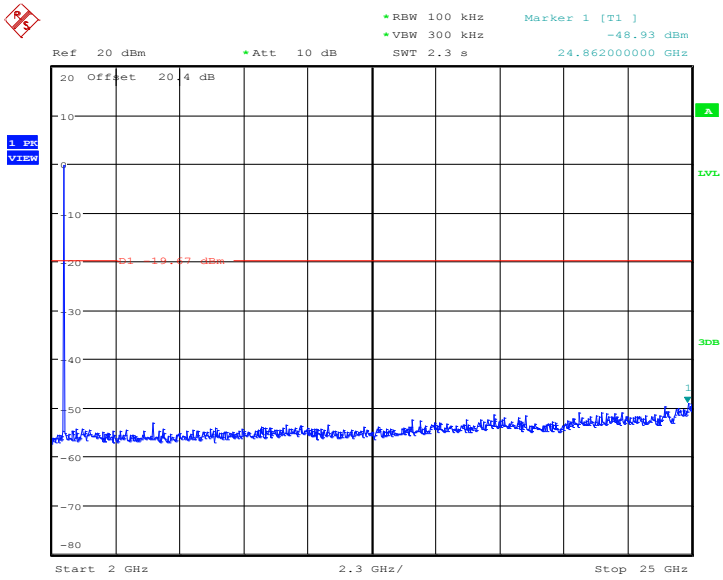
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 20:01:27

802.11b 2 GHz~25 GHz

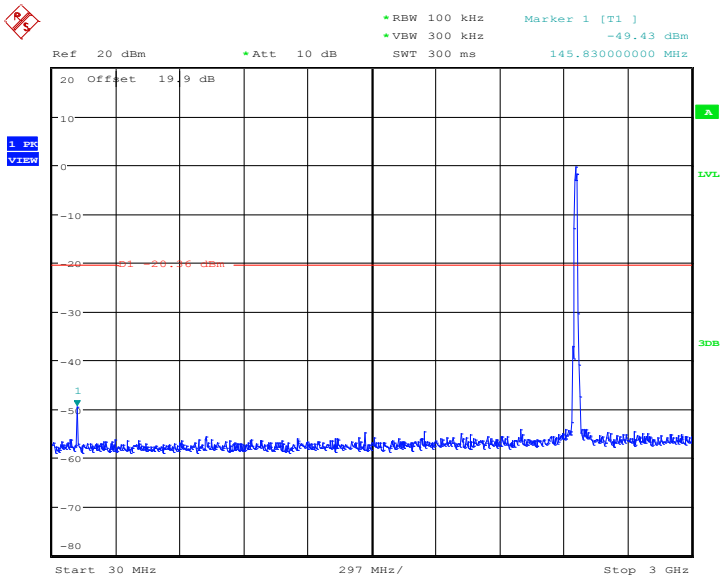
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 20:01:45

802.11b 30 MHz~3 GHz

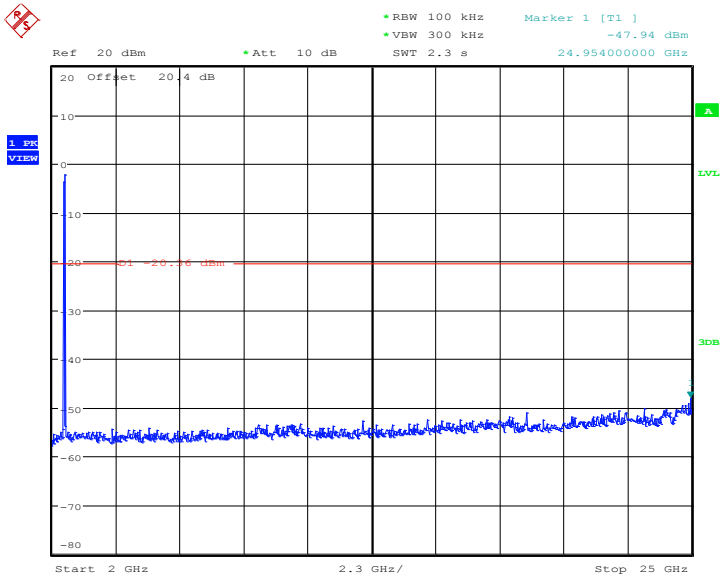
Conducted Spurious Emission Plot on Channel 11



Date: 23.JAN.2013 20:09:00

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

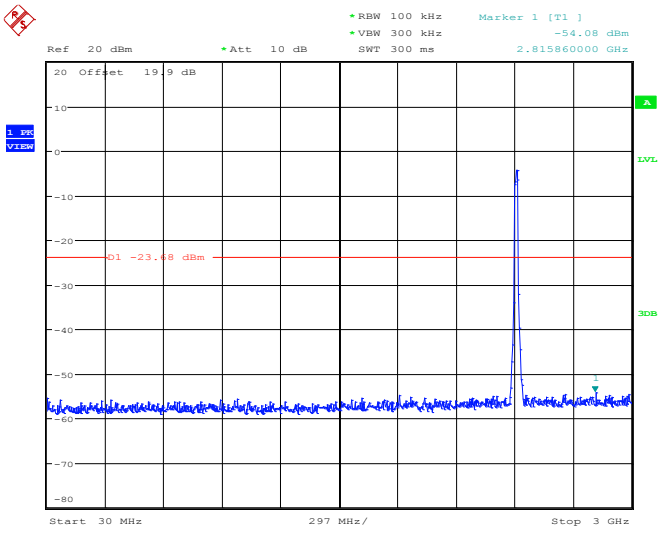


Date: 23.JAN.2013 20:09:18

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

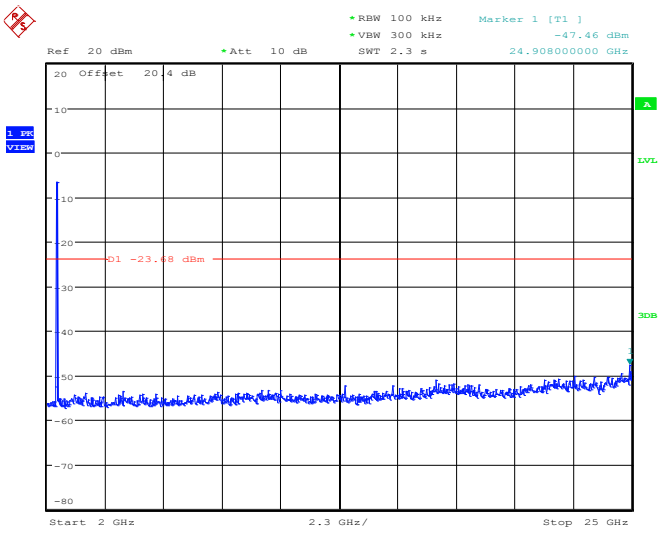
802.11g 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 01



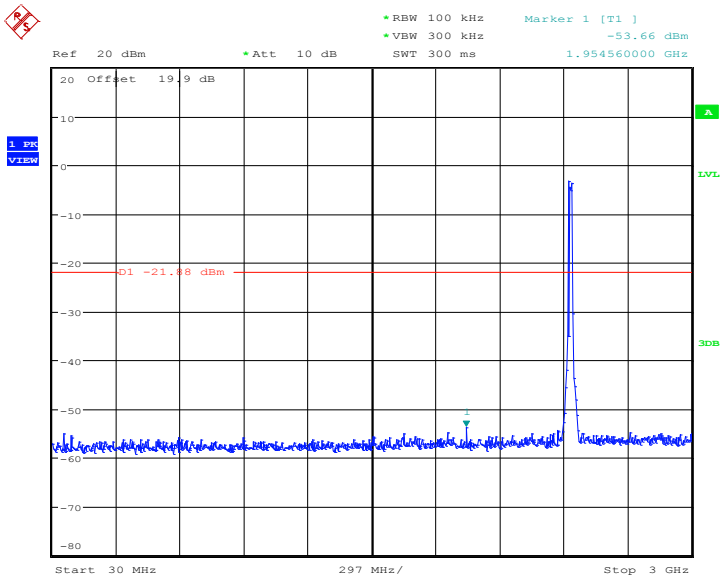
802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01



802.11g 30 MHz~3 GHz

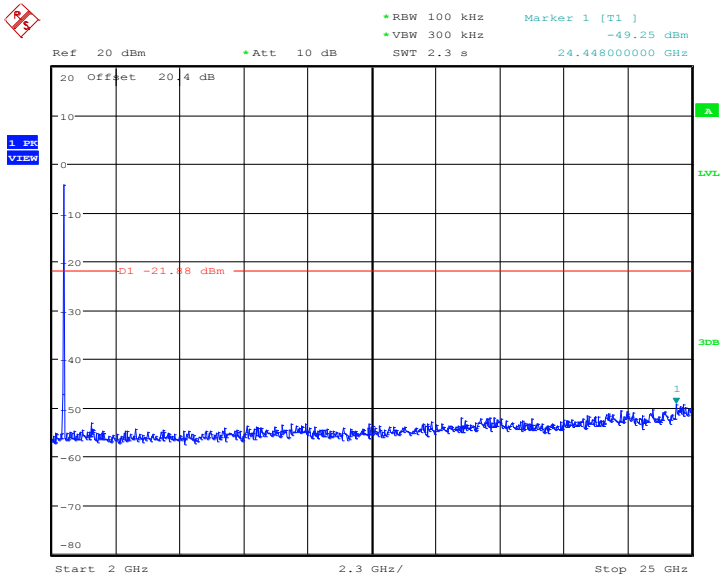
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 20:37:33

802.11g 2 GHz~25 GHz

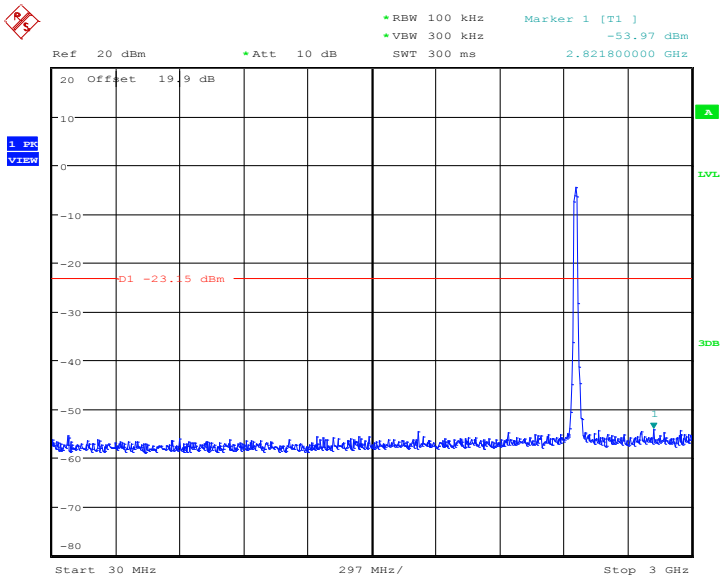
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 20:37:51

802.11g 30 MHz~3 GHz

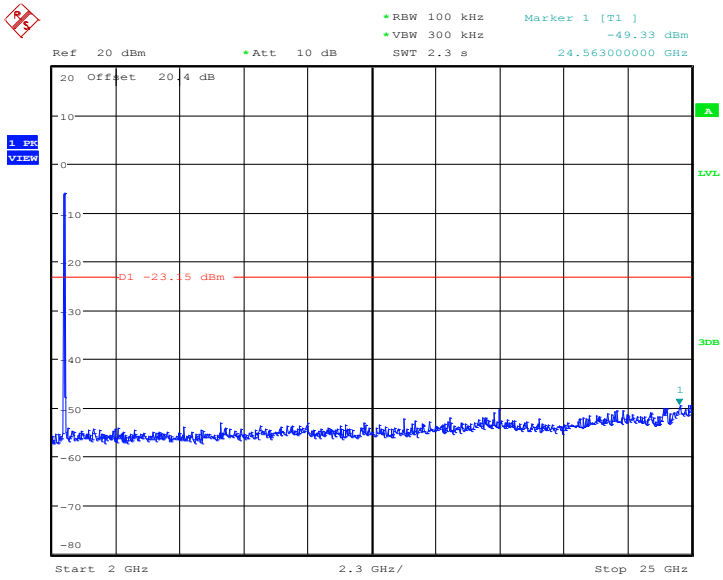
Conducted Spurious Emission Plot on Channel 11



Date: 23.JAN.2013 20:14:54

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

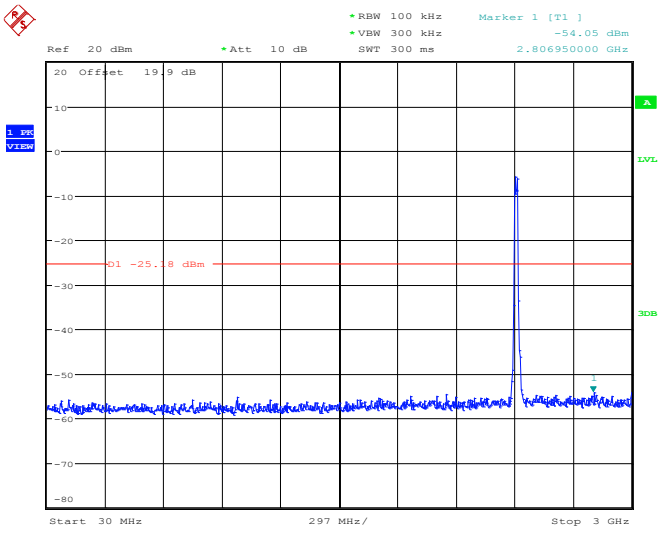


Date: 23.JAN.2013 20:15:12

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

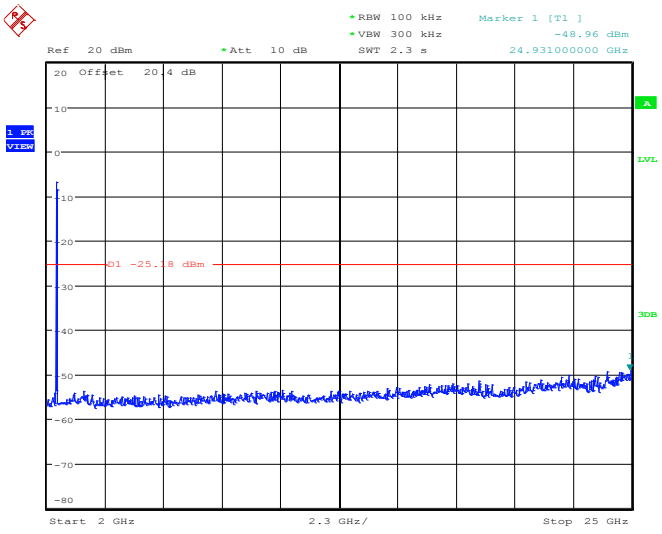
2.4GHz 802.11n HT20 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 01



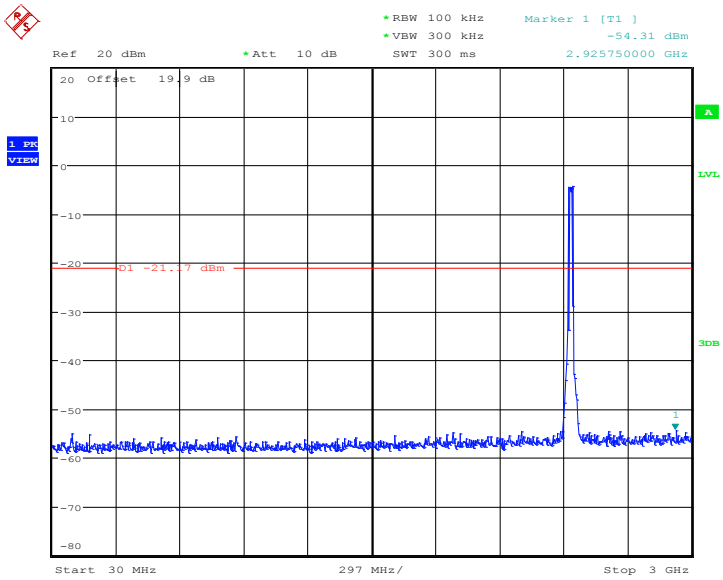
2.4GHz 802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01



2.4GHz 802.11n HT20 30 MHz~3 GHz

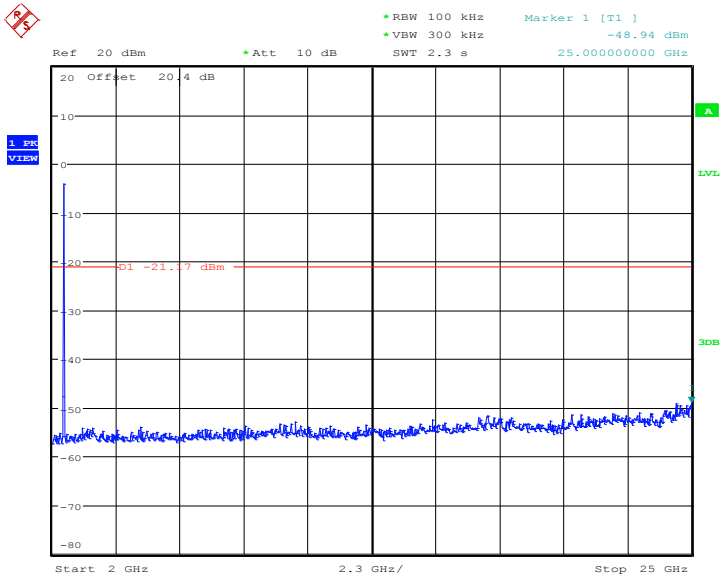
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 20:53:54

2.4GHz 802.11n HT20 2 GHz~25 GHz

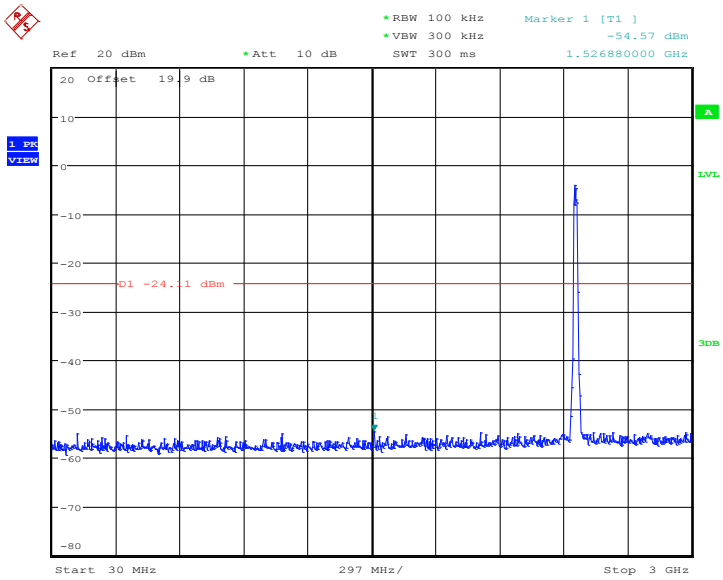
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 20:54:12

2.4GHz 802.11n HT20 30 MHz~3 GHz

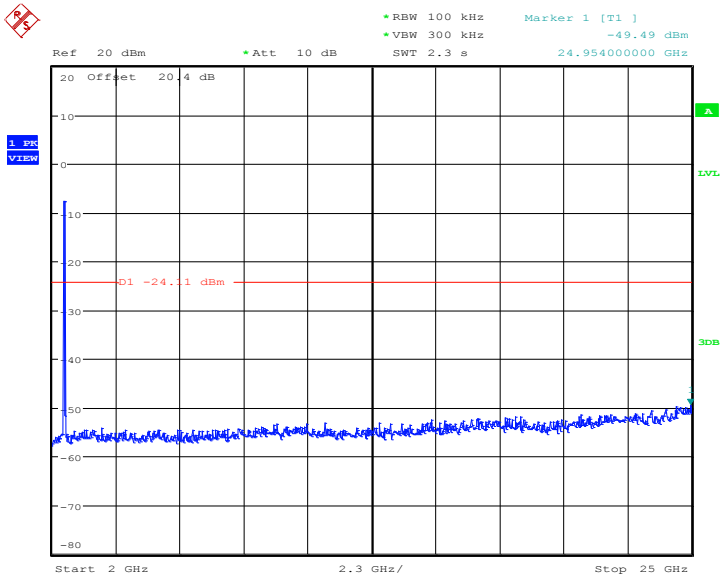
Conducted Spurious Emission Plot on Channel 11



Date: 23.JAN.2013 20:59:02

2.4GHz 802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

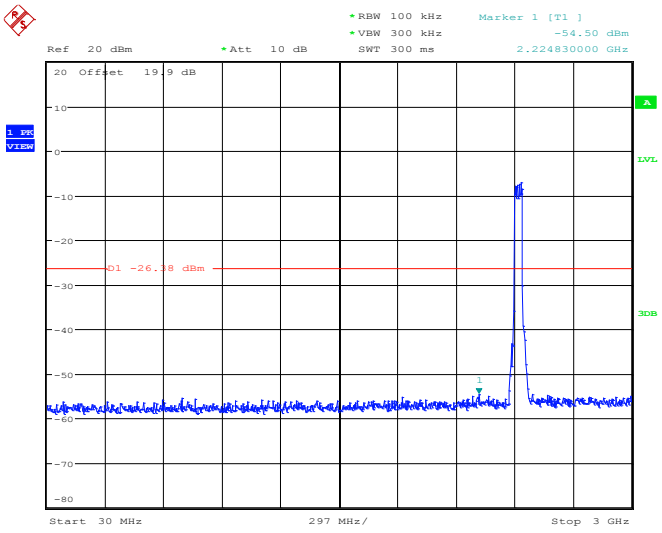


Date: 23.JAN.2013 20:59:20

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	03, 06, 09	Test Engineer :	Jeff Chou

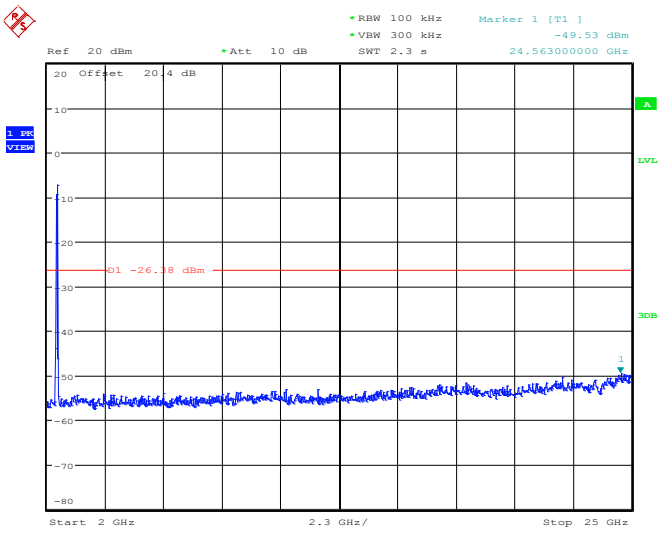
2.4GHz 802.11n HT40 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 03



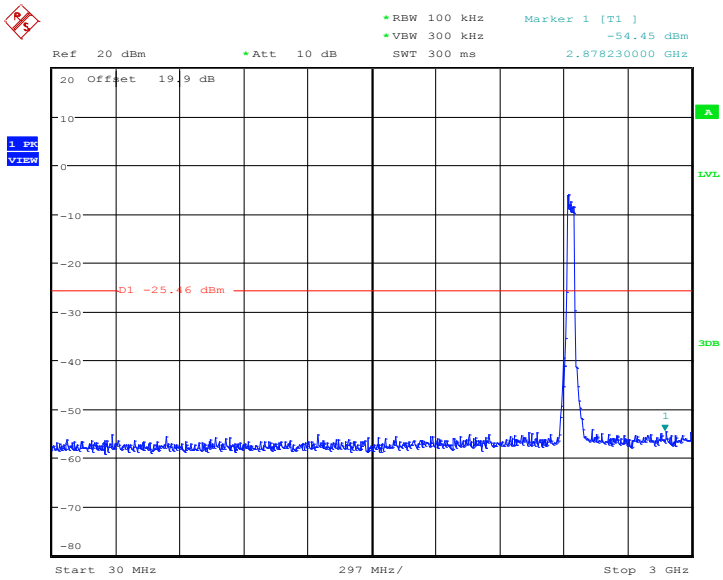
2.4GHz 802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 03



2.4GHz 802.11n HT40 30 MHz~3 GHz

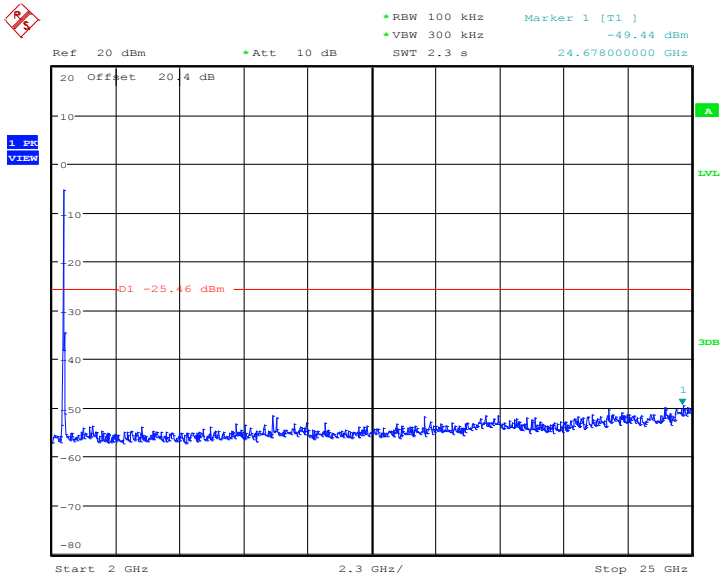
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 21:18:11

2.4GHz 802.11n HT40 2 GHz~25 GHz

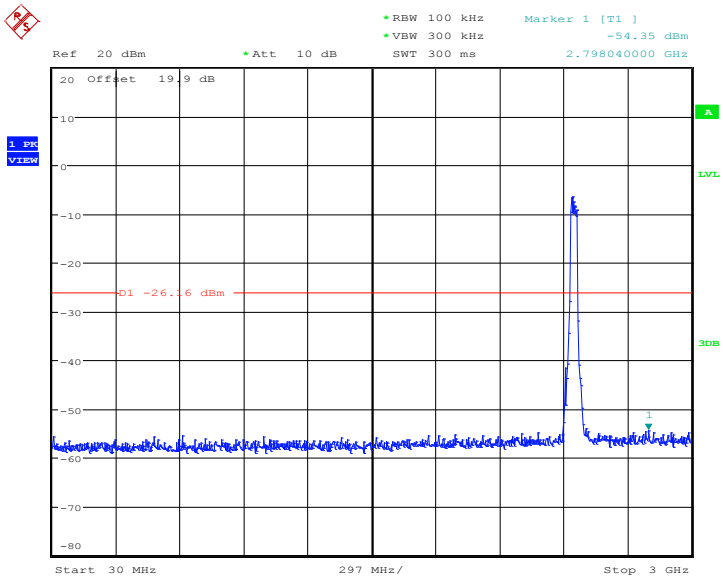
Conducted Spurious Emission Plot on Channel 06



Date: 23.JAN.2013 21:18:29

2.4GHz 802.11n HT40 30 MHz~3 GHz

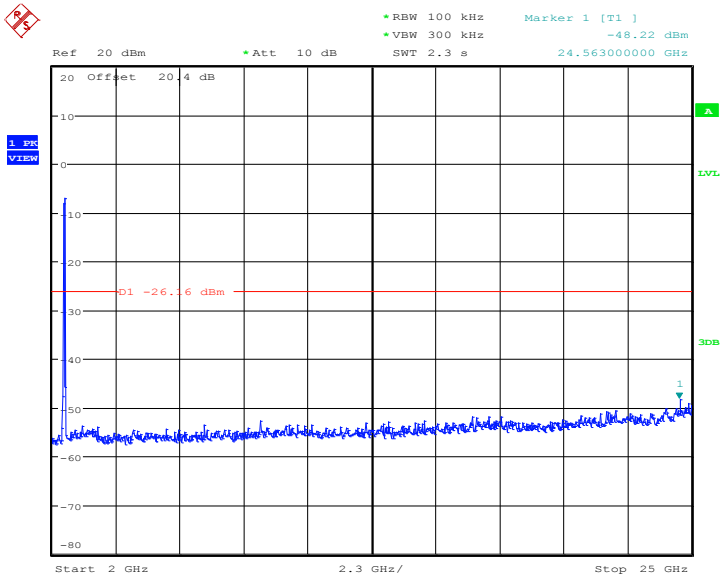
Conducted Spurious Emission Plot on Channel 09



Date: 23.JAN.2013 21:23:11

2.4GHz 802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 09



Date: 23.JAN.2013 21:23:29

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

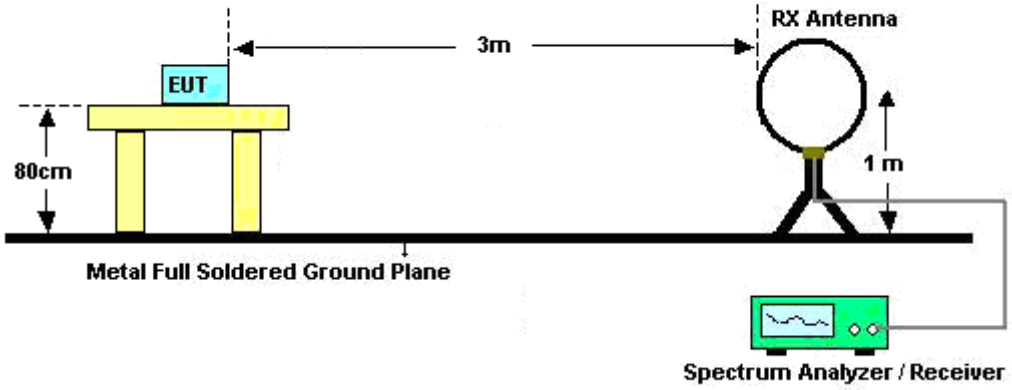
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in 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(us)	1/T(KHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	100.00	-	-	10Hz
2.4GHz 802.11n HT20	99.07	-	-	10Hz
2.4GHz 802.11n HT40	98.39	-	-	10Hz

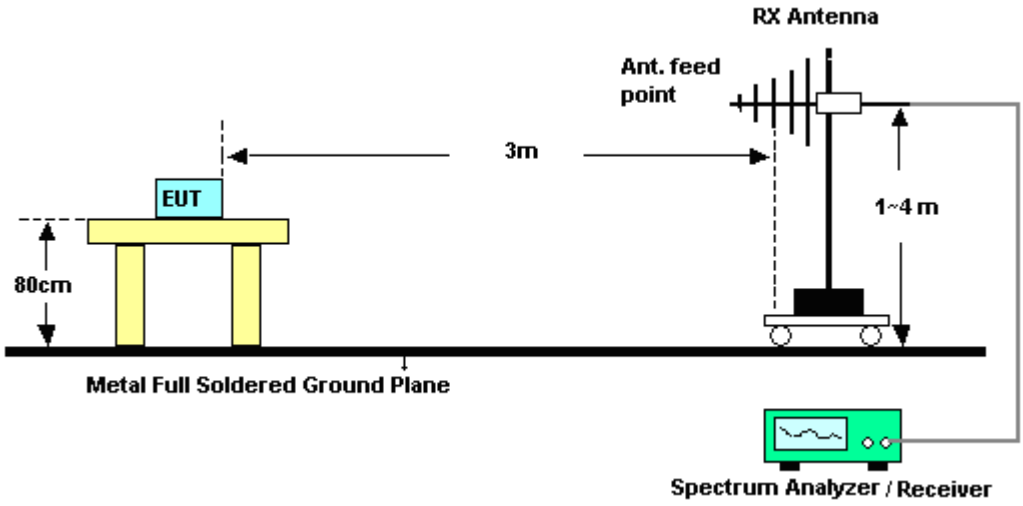
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

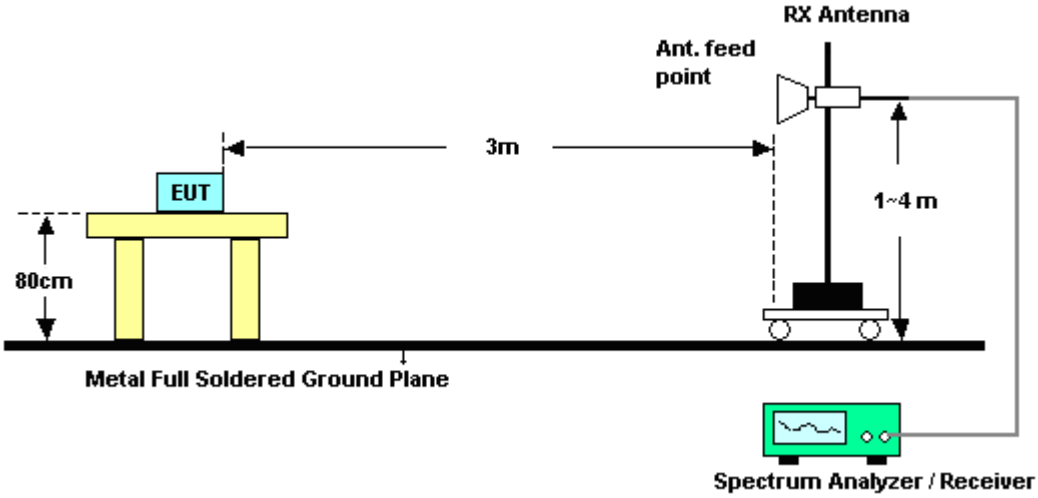
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (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 :**	22~24°C
Test Band :	Low	**Relative Humidity :**	51~53%
Test Channel :	01	**Test Engineer :**	Marlboro Hsu and Gavin Wu

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**
2383.53	56.62	-17.38	74	51.7	32.28	6.91	34.27	168	78	Peak
2389.29	39.42	-14.58	54	34.48	32.3	6.91	34.27	168	78	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	**Level (dBµV/m)**	**Over Limit (dB)**	**Limit Line (dBµV/m)**	**Read Level (dBµV)**	**Antenna Factor (dB)**	**Cable Loss (dB)**	**Preamp Factor (dB)**	**Ant Pos (cm)**	**Table Pos (deg)**	**Remark**
2388.75	51.35	-22.65	74	46.41	32.3	6.91	34.27	103	32	Peak
2389.74	41.03	-12.97	54	36.09	32.3	6.91	34.27	103	32	Average

Test Mode :	802.11b	**Temperature :**	22~24°C
Test Band :	High	**Relative Humidity :**	51~53%
Test Channel :	11	**Test Engineer :**	Marlboro Hsu and Gavin Wu

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**
2493.67	49.97	-24.03	74	44.99	32.4	7.06	34.48	163	97	Peak
2492.86	34.72	-19.28	54	29.74	32.4	7.06	34.48	163	97	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**
2486.11	51.22	-22.78	74	46.21	32.38	7.06	34.43	100	71	Peak
2483.5	37.44	-16.56	54	32.43	32.38	7.06	34.43	100	71	Average

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Marlboro Hsu and Gavin Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	73.53	-0.47	74	68.62	32.3	6.91	34.3	142	95	Peak
2390	53.57	-0.43	54	48.66	32.3	6.91	34.3	142	95	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	73.61	-0.39	74	68.7	32.3	6.91	34.3	100	33	Peak
2390	53.63	-0.37	54	48.72	32.3	6.91	34.3	100	31	Average

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Marlboro Hsu and Gavin Wu

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	62.52	-11.48	74	57.51	32.38	7.06	34.43	164	4	Peak
2483.5	42.18	-11.82	54	37.17	32.38	7.06	34.43	164	4	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
2484.13	71.31	-2.69	74	66.3	32.38	7.06	34.43	100	31	Peak
2483.5	50.06	-3.94	54	45.05	32.38	7.06	34.43	100	31	Average

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Marlboro Hsu and Gavin Wu

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
2388.48	71.39	-2.61	74	66.45	32.3	6.91	34.27	147	208	Peak
2390	51.58	-2.42	54	46.67	32.3	6.91	34.3	147	208	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.93	72.5	-1.5	74	67.56	32.3	6.91	34.27	100	31	Peak
2390	53.43	-0.57	54	48.52	32.3	6.91	34.3	100	31	Average

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Marlboro Hsu and Gavin Wu

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
2483.71	66.19	-7.81	74	61.18	32.38	7.06	34.43	161	62	Peak
2483.5	44.9	-9.1	54	39.89	32.38	7.06	34.43	161	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
2484.37	71.11	-2.89	74	66.1	32.38	7.06	34.43	100	123	Peak
2483.5	50.57	-3.43	54	45.56	32.38	7.06	34.43	100	123	Average

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	03	Test Engineer :	Marlboro Hsu and Gavin Wu

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
2382.09	58.47	-15.53	74	53.55	32.28	6.91	34.27	130	62	Peak
2390	42.47	-11.53	54	37.56	32.3	6.91	34.3	130	62	Average
2495.2	47.53	-26.47	74	42.55	32.4	7.06	34.48	130	62	Peak
2494.87	34.07	-19.93	54	29.09	32.4	7.06	34.48	130	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
2389.11	68.53	-5.47	74	63.59	32.3	6.91	34.27	102	117	Peak
2390	53.17	-0.83	54	48.26	32.3	6.91	34.3	102	117	Average
2498.89	49.87	-24.13	74	44.89	32.4	7.06	34.48	102	117	Peak
2497.54	35.44	-18.56	54	30.46	32.4	7.06	34.48	102	117	Average

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	09	Test Engineer :	Marlboro Hsu and Gavin Wu

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
2387.67	51.66	-22.34	74	46.72	32.3	6.91	34.27	168	81	Peak
2386.41	36.05	-17.95	54	31.11	32.3	6.91	34.27	168	81	Average
2484.01	62.21	-11.79	74	57.2	32.38	7.06	34.43	168	81	Peak
2483.5	45.02	-8.98	54	40.01	32.38	7.06	34.43	168	81	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
2386.68	51.62	-22.38	74	46.68	32.3	6.91	34.27	100	159	Peak
2390	36.06	-17.94	54	31.15	32.3	6.91	34.3	100	159	Average
2483.77	70.24	-3.76	74	65.23	32.38	7.06	34.43	100	159	Peak
2483.53	53.23	-0.77	54	48.22	32.38	7.06	34.43	100	159	Average

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

Test Mode :	802.11b	**Temperature :**	22~24°C
Test Channel :	01	**Relative Humidity :**	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	**Polarization :**	Horizontal
Remark :	1. 2410 MHz is fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 100.39 dBμV/m - 20dB = 80.39 dBμV/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
99.93	39.43	-4.07	43.5	60.3	9.8	0.99	31.66	-	-	Peak
199.29	39.97	-3.53	43.5	60.86	9.1	1.32	31.31	-	-	Peak
298.92	44.22	-1.78	46	60.46	13.29	1.76	31.29	100	346	Peak
298.92	43.38	-2.62	46	59.62	13.29	1.76	31.29	100	346	QP
499.5	42.94	-3.06	46	53.3	18.08	2.45	30.89	-	-	Peak
664	40.9	-5.1	46	48.11	20.31	2.87	30.39	-	-	Peak
696.9	37.63	-8.37	46	44.6	20.58	2.93	30.48	-	-	Peak
2410	95.57	-	-	90.61	32.31	6.95	34.3	168	78	Average
2410	100.39	-	-	95.43	32.31	6.95	34.3	168	78	Peak
4824	41.99	-32.01	74	56.72	33.97	8.77	57.47	100	0	Peak
7236	40.7	-39.69	80.39	52.3	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2410 MHz is fundamental signal which can be ignored. 2. 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
36.21	34.02	-5.98	40	49.47	15.82	0.59	31.86	-	-	Peak
199.83	34.35	-9.15	43.5	55.24	9.1	1.32	31.31	-	-	Peak
300	42.36	-3.64	46	58.56	13.3	1.77	31.27	-	-	Peak
499.5	42.62	-3.38	46	52.98	18.08	2.45	30.89	101	196	Peak
664	38.41	-7.59	46	45.62	20.31	2.87	30.39	-	-	Peak
956.6	42.21	-3.79	46	45.58	23.94	3.47	30.78	-	-	Peak
2410	99.14	-	-	94.18	32.31	6.95	34.3	103	32	Average
2410	104.2	-	-	99.24	32.31	6.95	34.3	103	32	Peak
4824	39.38	-34.62	74	56.63	33.97	8.77	59.99	100	0	Peak
7236	40.55	-43.65	84.2	53.56	35.55	10.83	59.39	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2440 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
2440	94.58	-	-	89.59	32.35	6.99	34.35	106	96	Average
2440	99.56	-	-	94.57	32.35	6.99	34.35	106	96	Peak
4875	42.01	-31.99	74	56.72	33.95	8.82	57.48	100	0	Peak
7311	42.39	-31.61	74	53.96	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2436 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
2436	98.65	-	-	93.68	32.33	6.99	34.35	100	35	Average
2436	103.37	-	-	98.4	32.33	6.99	34.35	100	35	Peak
4875	42.57	-31.43	74	57.28	33.95	8.82	57.48	100	0	Peak
7311	42.06	-31.94	74	53.63	35.54	10.91	58.02	200	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	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	91.85	-	-	86.85	32.37	7.02	34.39	163	97	Average
2462	96.23	-	-	91.23	32.37	7.02	34.39	163	97	Peak
4923	41.26	-32.74	74	55.94	33.93	8.87	57.48	100	0	Peak
7386	41.84	-32.16	74	53.41	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	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	96.73	-	-	91.73	32.37	7.02	34.39	100	71	Average
2462	101.18	-	-	96.18	32.37	7.02	34.39	100	71	Peak
4923	39.14	-34.86	74	55.92	33.93	8.87	59.58	100	0	Peak
7386	41	-33	74	54.01	35.52	10.99	59.52	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2414 MHz is fundamental signal which can be ignored. 2. 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
99.93	40.15	-3.35	43.5	61.02	9.8	0.99	31.66	-	-	Peak
199.83	39.64	-3.86	43.5	60.53	9.1	1.32	31.31	-	-	Peak
298.92	43.67	-2.33	46	59.91	13.29	1.76	31.29	100	315	Peak
298.92	43.05	-2.95	46	59.29	13.29	1.76	31.29	100	315	QP
300	39.76	-6.24	46	55.96	13.3	1.77	31.27	-	-	Peak
499.5	44.68	-1.32	46	55.04	18.08	2.45	30.89	100	76	Peak
499.5	43.84	-2.16	46	54.2	18.08	2.45	30.89	100	76	QP
666.1	39.86	-6.14	46	47.05	20.33	2.87	30.39	-	-	Peak
2414	90.87	-	-	85.91	32.31	6.95	34.3	142	95	Average
2414	101.66	-	-	96.7	32.31	6.95	34.3	142	95	Peak
4824	41.74	-32.26	74	56.47	33.97	8.77	57.47	100	0	Peak
7236	42.37	-39.29	81.66	53.97	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2408 MHz is fundamental signal which can be ignored. 2. 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
34.59	33.51	-6.49	40	48.41	16.4	0.58	31.88	-	-	Peak
99.93	34.27	-9.23	43.5	55.14	9.8	0.99	31.66	-	-	Peak
299.73	41.79	-4.21	46	57.99	13.3	1.77	31.27	-	-	Peak
499.5	42.37	-3.63	46	52.73	18.08	2.45	30.89	102	163	Peak
549.2	33.78	-12.22	46	43.55	18.93	2.55	31.25	-	-	Peak
666.1	38.73	-7.27	46	45.92	20.33	2.87	30.39	-	-	Peak
2408	93.02	-	-	88.06	32.31	6.95	34.3	100	33	Average
2408	103.6	-	-	98.64	32.31	6.95	34.3	100	33	Peak
4824	39.28	-34.72	74	56.53	33.97	8.77	59.99	100	0	Peak
7236	40.96	-42.64	83.6	53.97	35.55	10.83	59.39	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2433 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
2433	91.68	-	-	86.71	32.33	6.99	34.35	136	96	Average
2433	102.56	-	-	97.59	32.33	6.99	34.35	136	96	Peak
4875	40.85	-33.15	74	55.56	33.95	8.82	57.48	100	0	Peak
7311	40.99	-33.01	74	52.56	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2434 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
2434	94.61	-	-	89.64	32.33	6.99	34.35	100	35	Average
2434	105.62	-	-	100.65	32.33	6.99	34.35	100	35	Peak
4875	39.84	-34.16	74	56.85	33.95	8.82	59.78	100	0	Peak
7311	39.99	-34.01	74	52.99	35.54	10.91	59.45	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2458 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
2458	86.71	-	-	81.71	32.37	7.02	34.39	164	4	Average
2458	97.01	-	-	92.01	32.37	7.02	34.39	164	4	Peak
4923	41.88	-32.12	74	56.56	33.93	8.87	57.48	100	0	Peak
7386	41.6	-32.4	74	53.17	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2458 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
2458	92.77	-	-	87.77	32.37	7.02	34.39	100	31	Average
2458	103.69	-	-	98.69	32.37	7.02	34.39	100	31	Peak
4923	40	-34	74	56.78	33.93	8.87	59.58	100	0	Peak
7386	40.1	-33.9	74	53.11	35.52	10.99	59.52	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2413 MHz is fundamental signal which can be ignored. 2. 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
99.93	39.34	-4.16	43.5	60.21	9.8	0.99	31.66	-	-	Peak
199.29	39.11	-4.39	43.5	60	9.1	1.32	31.31	-	-	Peak
298.92	43.92	-2.08	46	60.16	13.29	1.76	31.29	100	326	Peak
298.92	42.78	-3.22	46	59.02	13.29	1.76	31.29	100	326	QP
499.5	44.45	-1.55	46	54.81	18.08	2.45	30.89	100	52	Peak
499.5	43.52	-2.48	46	53.88	18.08	2.45	30.89	100	52	QP
666.1	39.14	-6.86	46	46.33	20.33	2.87	30.39	-	-	Peak
699.7	36.46	-9.54	46	43.42	20.59	2.94	30.49	-	-	Peak
2413	88.95	-	-	83.99	32.31	6.95	34.3	147	208	Average
2413	99.78	-	-	94.82	32.31	6.95	34.3	147	208	Peak
4824	41.1	-32.9	74	55.83	33.97	8.77	57.47	100	0	Peak
7236	41.99	-37.79	79.78	53.59	35.55	10.83	57.98	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20	**Temperature :**	22~24°C
Test Channel :	01	**Relative Humidity :**	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	**Polarization :**	Vertical
Remark :	1. 2413 MHz is fundamental signal which can be ignored. 2. 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
34.59	34.92	-5.08	40	49.82	16.4	0.58	31.88	-	-	Peak
99.66	33.86	-9.64	43.5	54.73	9.8	0.99	31.66	-	-	Peak
300	41.79	-4.21	46	57.99	13.3	1.77	31.27	-	-	Peak
499.5	42.63	-3.37	46	52.99	18.08	2.45	30.89	102	158	Peak
547.8	33.63	-12.37	46	43.42	18.91	2.55	31.25	-	-	Peak
666.1	35.33	-10.67	46	42.52	20.33	2.87	30.39	-	-	Peak
2413	92.54	-	-	87.58	32.31	6.95	34.3	100	31	Average
2413	103.05	-	-	98.09	32.31	6.95	34.3	100	31	Peak
4824	38.6	-35.4	74	55.85	33.97	8.77	59.99	100	0	Peak
7236	39.78	-43.27	83.05	52.79	35.55	10.83	59.39	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2435 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
2435	90.66	-	-	85.69	32.33	6.99	34.35	137	96	Average
2435	101.39	-	-	96.42	32.33	6.99	34.35	137	96	Peak
4875	41.67	-32.33	74	56.38	33.95	8.82	57.48	100	0	Peak
7311	41.14	-32.86	74	52.71	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2436 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
2436	94.93	-	-	89.96	32.33	6.99	34.35	100	33	Average
2436	106.77	-	-	101.8	32.33	6.99	34.35	100	33	Peak
4875	39.43	-34.57	74	56.44	33.95	8.82	59.78	100	0	Peak
7311	40.26	-33.74	74	53.26	35.54	10.91	59.45	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2461 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
2461	85.14	-	-	80.14	32.37	7.02	34.39	161	62	Average
2461	95.77	-	-	90.77	32.37	7.02	34.39	161	62	Peak
4923	41.64	-32.36	74	56.32	33.93	8.87	57.48	100	0	Peak
7386	41.51	-32.49	74	53.08	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2460 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
2460	92.66	-	-	87.66	32.37	7.02	34.39	100	123	Average
2460	102.69	-	-	97.69	32.37	7.02	34.39	100	123	Peak
4923	38.77	-35.23	74	55.55	33.93	8.87	59.58	100	0	Peak
7386	40.9	-33.1	74	53.91	35.52	10.99	59.52	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2424 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
2424	84.93	-	-	80	32.33	6.95	34.35	130	62	Average
2424	95.79	-	-	90.86	32.33	6.95	34.35	130	62	Peak
4845	41.68	-32.32	74	56.39	33.96	8.8	57.47	100	0	Peak
7266	42.2	-31.8	74	53.8	35.54	10.86	58	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2424 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
2424	89.9	-	-	84.97	32.33	6.95	34.35	102	117	Average
2424	101.26	-	-	96.33	32.33	6.95	34.35	102	117	Peak
4845	39.47	-34.53	74	56.63	33.96	8.8	59.92	100	0	Peak
7266	40.31	-33.69	74	53.33	35.54	10.86	59.42	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Horizontal
Remark :	1. 2436 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
2436	85.45	-	-	80.48	32.33	6.99	34.35	164	29	Average
2436	96.04	-	-	91.07	32.33	6.99	34.35	164	29	Peak
4875	42.19	-31.81	74	56.9	33.95	8.82	57.48	100	0	Peak
7311	41.44	-32.56	74	53.01	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	Polarization :	Vertical
Remark :	1. 2436 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
2436	90.42	-	-	85.45	32.33	6.99	34.35	100	159	Average
2436	102.14	-	-	97.17	32.33	6.99	34.35	100	159	Peak
4875	42.12	-31.88	74	56.83	33.95	8.82	57.48	100	0	Peak
7311	42.19	-31.81	74	53.76	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	**Temperature :**	22~24°C
Test Channel :	09	**Relative Humidity :**	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	**Polarization :**	Horizontal
Remark :	1. 2450 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
99.93	39.3	-4.2	43.5	60.17	9.8	0.99	31.66	-	-	Peak
199.83	39	-4.5	43.5	59.89	9.1	1.32	31.31	-	-	Peak
299.73	44.22	-1.78	46	60.42	13.3	1.77	31.27	100	315	Peak
299.73	43.69	-2.31	46	59.89	13.3	1.77	31.27	100	315	QP
498.1	44.95	-1.05	46	55.35	18.06	2.44	30.9	102	65	Peak
498.1	43.86	-2.14	46	54.26	18.06	2.44	30.9	102	65	QP
662.6	35.5	-10.5	46	42.72	20.3	2.87	30.39	-	-	Peak
699.7	36.36	-9.64	46	43.32	20.59	2.94	30.49	-	-	Peak
2450	85.44	-	-	80.49	32.35	6.99	34.39	168	81	Average
2450	95.73	-	-	90.78	32.35	6.99	34.39	168	81	Peak
4905	42.22	-31.78	74	56.9	33.93	8.87	57.48	100	0	Peak
7356	42.39	-31.61	74	53.96	35.53	10.96	58.06	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	**Temperature :**	22~24°C
Test Channel :	09	**Relative Humidity :**	51~53%
Test Engineer :	Marlboro Hsu and Gavin Wu	**Polarization :**	Vertical
Remark :	1. 2450 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
35.67	34.13	-5.87	40	49.58	15.82	0.59	31.86	-	-	Peak
99.93	34.12	-9.38	43.5	54.99	9.8	0.99	31.66	-	-	Peak
300	42.05	-3.95	46	58.25	13.3	1.77	31.27	-	-	Peak
499.5	42.71	-3.29	46	53.07	18.08	2.45	30.89	105	116	Peak
547.8	33.87	-12.13	46	43.66	18.91	2.55	31.25	-	-	Peak
662.6	34.57	-11.43	46	41.79	20.3	2.87	30.39	-	-	Peak
2450	89.87	-	-	84.92	32.35	6.99	34.39	100	159	Average
2450	100.37	-	-	95.42	32.35	6.99	34.39	100	159	Peak
4905	42.19	-31.81	74	56.87	33.93	8.87	57.48	100	0	Peak
7356	41.79	-32.21	74	53.36	35.53	10.96	58.06	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 (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.

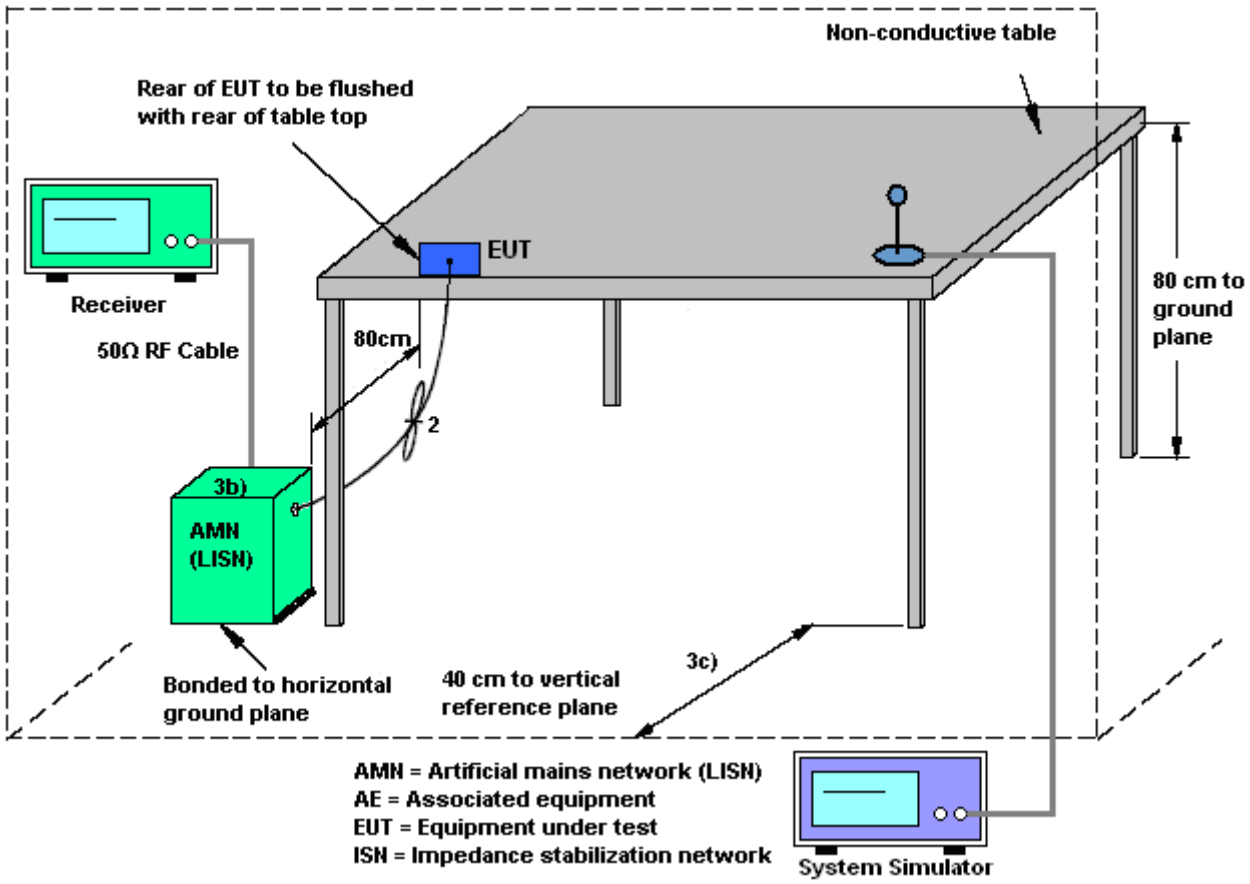
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

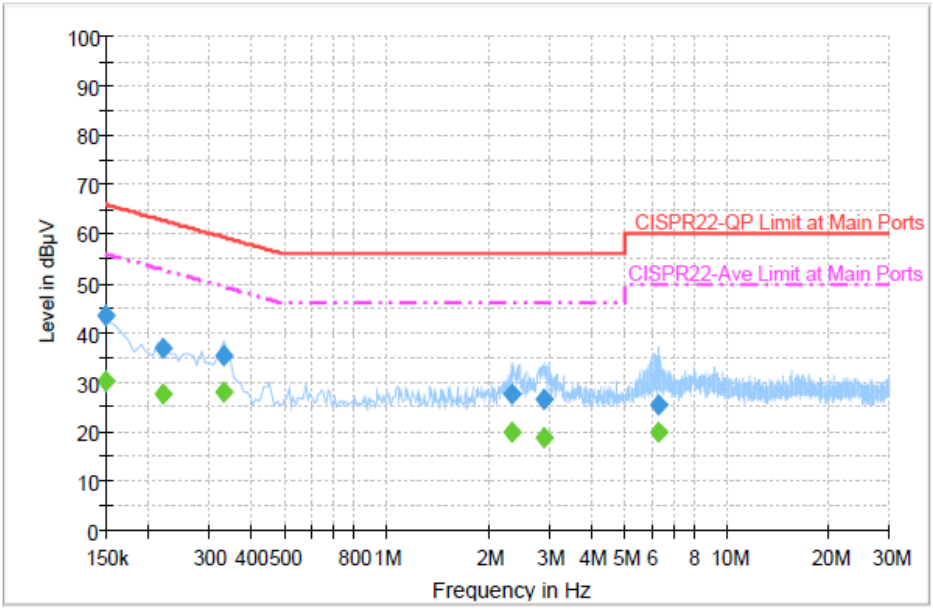
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance 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 :**	20~22℃
Test Engineer :	Slash Huang	**Relative Humidity :**	40~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA Band V Idle + WLAN Link + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + HDMI Cable plug in Fixture board with Notebook + USB Cable plug in Fixture board with Notebook + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



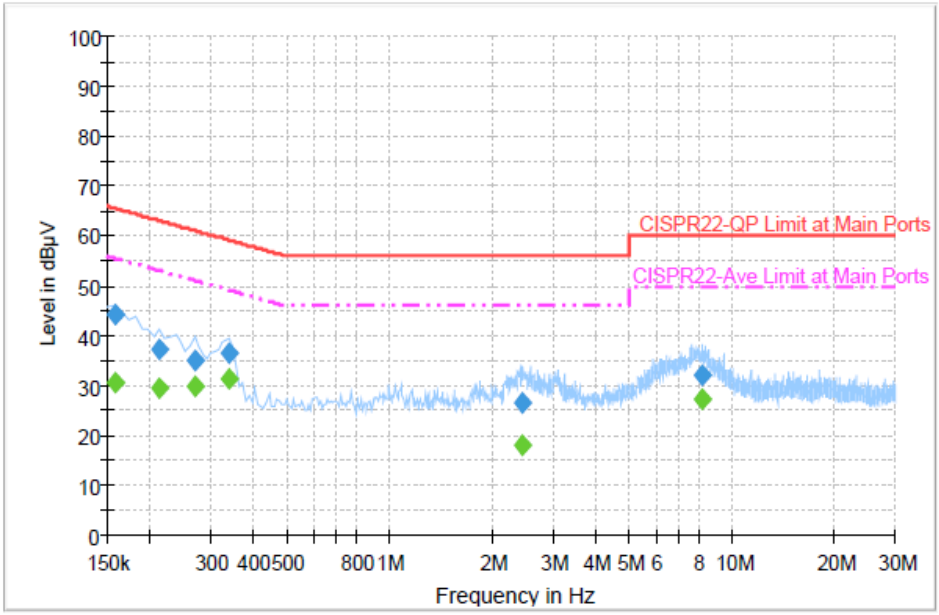
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	43.4	Off	L1	19.4	22.6	66.0
0.222000	36.9	Off	L1	19.3	25.8	62.7
0.334000	35.3	Off	L1	19.3	24.1	59.4
2.326000	27.5	Off	L1	19.6	28.5	56.0
2.886000	26.6	Off	L1	19.6	29.4	56.0
6.270000	25.4	Off	L1	19.6	34.6	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	30.3	Off	L1	19.4	25.7	56.0
0.222000	27.6	Off	L1	19.3	25.1	52.7
0.334000	28.0	Off	L1	19.3	21.4	49.4
2.326000	19.7	Off	L1	19.6	26.3	46.0
2.886000	19.0	Off	L1	19.6	27.0	46.0
6.270000	19.8	Off	L1	19.6	30.2	50.0

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Slash Huang	**Relative Humidity :**	40~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WCDMA Band V Idle + WLAN Link + WWAN Antenna + WLAN Antenna + GPS Antenna + Fixture + HDMI Cable plug in Fixture board with Notebook + USB Cable plug in Fixture board with Notebook + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	44.3	Off	N	19.4	21.3	65.6
0.214000	37.2	Off	N	19.4	25.8	63.0
0.270000	34.9	Off	N	19.4	26.2	61.1
0.342000	36.6	Off	N	19.3	22.6	59.2
2.454000	26.5	Off	N	19.7	29.5	56.0
8.174000	32.1	Off	N	19.8	27.9	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	30.5	Off	N	19.4	25.1	55.6
0.214000	29.5	Off	N	19.4	23.5	53.0
0.270000	29.8	Off	N	19.4	21.3	51.1
0.342000	31.5	Off	N	19.3	17.7	49.2
2.454000	18.1	Off	N	19.7	27.9	46.0
8.174000	27.4	Off	N	19.8	22.6	50.0

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	100055	9kHz~40GHz	Jun. 06, 2012	Jan. 12, 2013 ~ Jan. 23, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Jan. 12, 2013 ~ Jan. 23, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Jan. 12, 2013 ~ Jan. 23, 2013	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9KHz – 2.75GHz	Nov. 13, 2012	Jan. 18, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100081	9KHz ~ 30MHz	Dec. 12, 2012	Jan. 18, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9KHz ~ 30MHz	Dec. 06, 2012	Jan. 18, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jan. 18, 2013	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Jan. 18, 2013	Jul. 27, 2013	Conduction (CO05-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz ~ 30GHz	Nov. 30, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 22, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 01, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159088	1GHz ~ 18GHz	Mar. 10, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Mar. 09, 2013	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz. 32dB.GAIN	Feb. 27, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Feb. 26, 2013	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Sep. 02, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Jan. 24, 2013 ~ Jan. 25, 2013	Jul. 02, 2013	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

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

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**

Appendix A. Photographs of EUT

Please refer to Sporton report number EP310215 as below.