FCC RF Test Report

APPLICANT	:	MeeBoss Inc.
EQUIPMENT	:	MULTIMEDIA PLAYER
BRAND NAME	:	Meeboss
MODEL NAME	:	Mee-M100
		Mee-M100 Series
		Mee-M100X
		M100
		M100 Series
		M100X
		Mee-M100A
		Mee-M100B
		Mee-M10
		Mee-M10 Series
		Mee-M10X
		M10
		M10 Series
		M10X
FCC ID	:	SB5-13100R1
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Feb. 27, 2013 and completely tested on Apr. 09, 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: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

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
FR322731	Rev. 01	Initial issue of report	Apr. 12, 2013
FR322731	Rev. 02	Update report for revising applicant and manufacturer.	Apr. 18, 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 0.14 dB at 2483.920 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.10 dB at 0.478 MHz
3.7	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

MeeBoss Inc.
7F., No. 189, Gangqian Rd., Neihu Dist., Taipei City 11494, Taiwan, R.O.C

1.2 Manufacturer

MeeBoss Inc.
7F., No. 189, Gangqian Rd., Neihu Dist., Taipei City 11494, Taiwan, R.O.C

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	MULTIMEDIA PLAYER
Brand Name	Meeboss
Model Name	Mee-M100 Mee-M100 Series Mee-M100X M100 M100 Series M100X Mee-M100A Mee-M100B Mee-M10 Mee-M10 Series Mee-M10X M10 M10 Series M10X
FCC ID	SB5-13100R1
EUT supports Radios application	WLAN 11bgn
EUT Stage	Production Unit

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	2412 MHz ~ 2462 MHz
Maximum Output Power to Antenna	802.11b : 7.24 dBm (0.0053 W) 802.11g : 12.43 dBm (0.0175 W) 802.11n HT20 : 12.12 dBm (0.0163 W) 802.11n HT40 : 11.66 dBm (0.0147 W)
Antenna Type	DIPOLE Antenna type with gain 1.00 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Testing Site

Test Site	SPORTON INTERNATIONAL 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

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

1.6 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
- ANSI C63.10-2009

Remark:

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

2 Test Configuration of Equipment Under Test

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

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

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

2.1 Carrier Frequency Channel

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

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables. 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)	7.24	6.69	6.76	6.64

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)	12.43	11.69	11.43	11.31	11.02	10.85	11.03	12.06

2.4GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	12.12	11.65	12.03	11.91	11.52	11.44	11.89	11.21

2.4GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	11.66	11.51	11.02	11.41	11.23	10.21	9.57	8.92

2.3 Test Mode

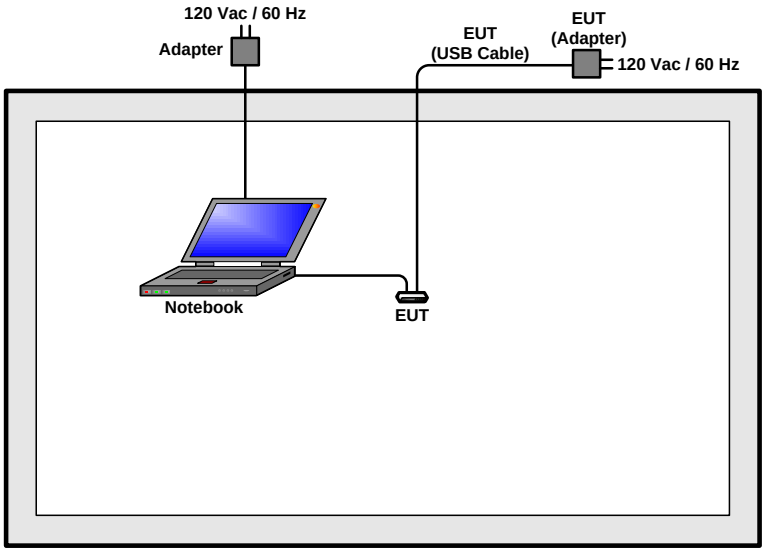
Final results of test modes, data rates and test channels are shown as following table.

Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB and 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 : WLAN Link + MPEG4 + USB Cable (Charging from Adapter) + Monitor + Keyboard

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



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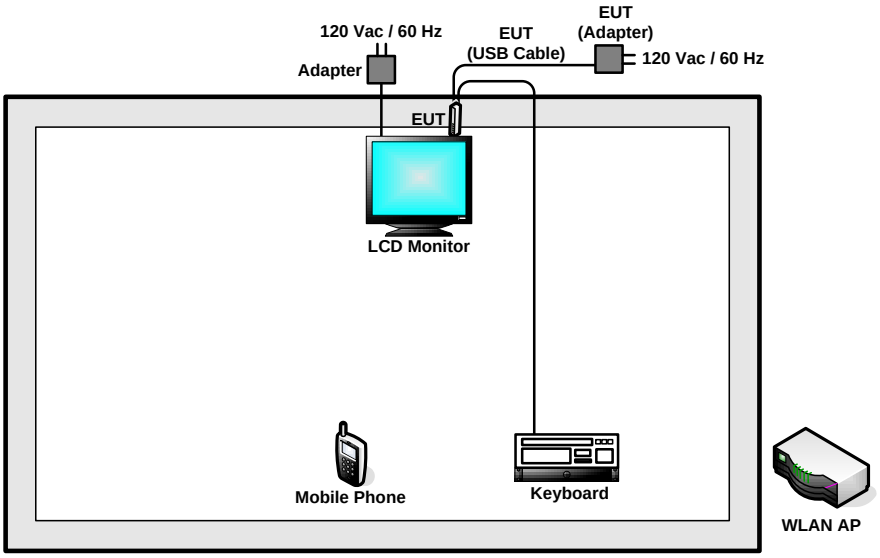


2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	(USB) Keyboard	DELL	SK-8115	FCC DoC	Shielded, 1.8 m	N/A
5.	Mobile Phone	HTC	Incredible	NM8PB31200	N/A	N/A

2.6 Description of RF Function Operation Test Setup

For WLAN function, programmed RF utility, “RT5x7xQA.exe” installed in the notebook make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

2.7 Measurement Results Explanation Example

For 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.

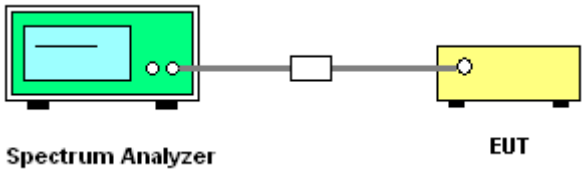
3.1.2 Measuring Instruments

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. 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.
4. Set to the maximum power setting and enable the EUT transmit continuously.
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 :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	12.03	0.5	Pass
06	2437	12.06	0.5	Pass
11	2462	12.09	0.5	Pass

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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.27	0.5	Pass
06	2437	16.33	0.5	Pass
11	2462	16.30	0.5	Pass

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

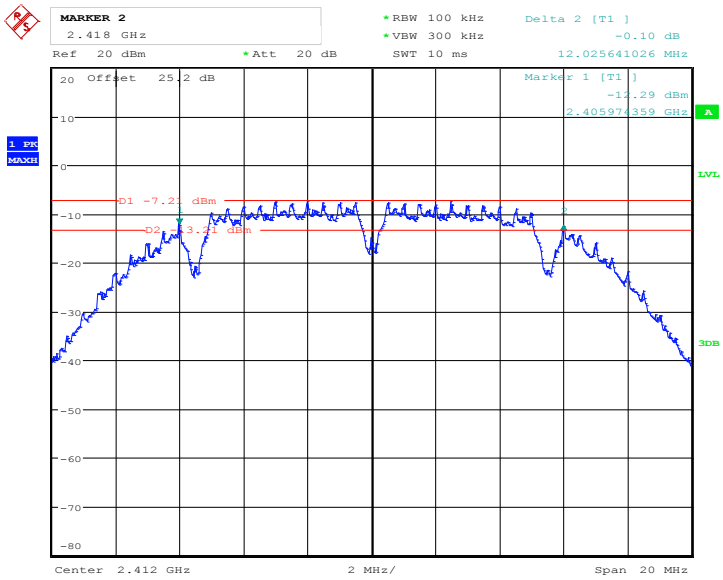
Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.63	0.5	Pass
06	2437	16.92	0.5	Pass
11	2462	16.67	0.5	Pass

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	35.13	0.5	Pass
06	2437	35.17	0.5	Pass
09	2452	35.17	0.5	Pass

3.1.6 Test Result of 6dB Bandwidth Plots

6 dB Bandwidth Plot on 802.11b Channel 01



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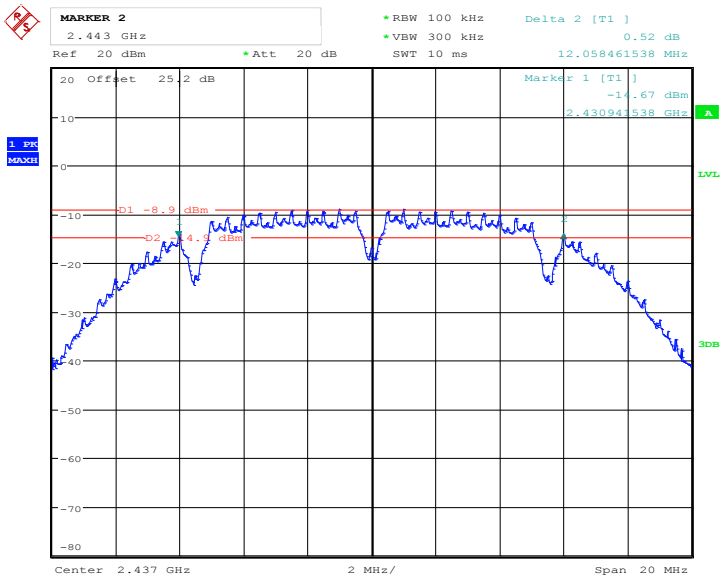
6 dB Bandwidth Plot on 802.11b Channel 06



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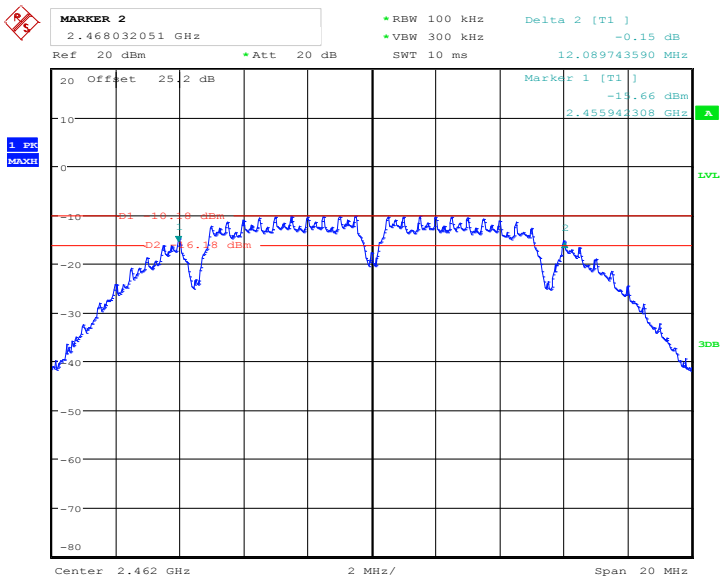
6 dB Bandwidth Plot on 802.11b Channel 11



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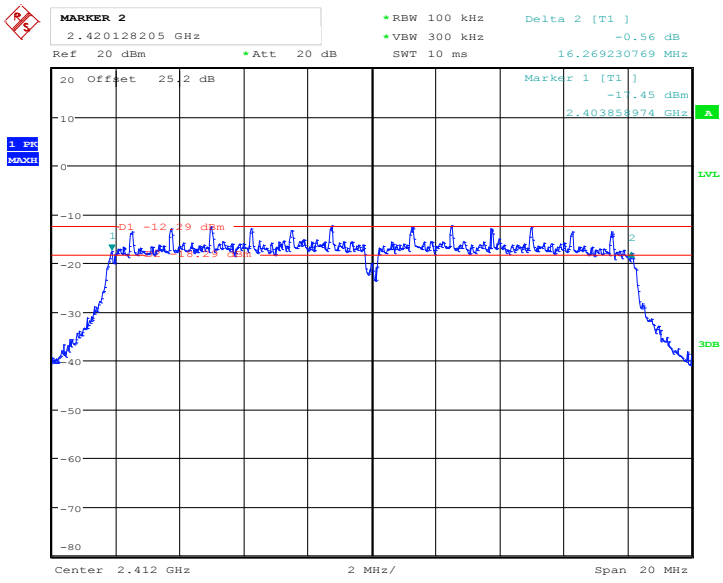
6 dB Bandwidth Plot on 802.11g Channel 01



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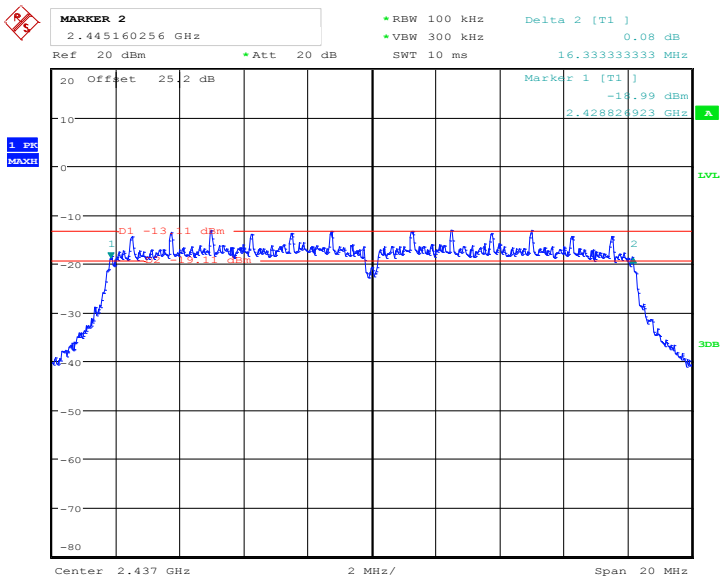
6 dB Bandwidth Plot on 802.11g Channel 06



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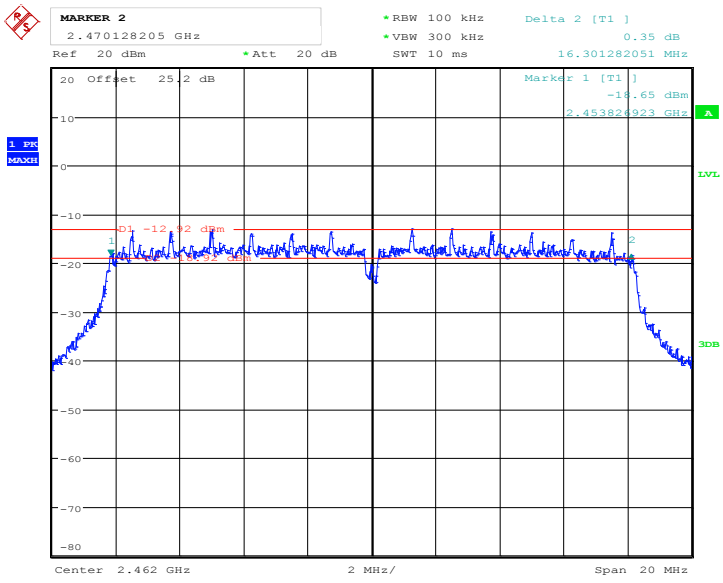
6 dB Bandwidth Plot on 802.11g Channel 11



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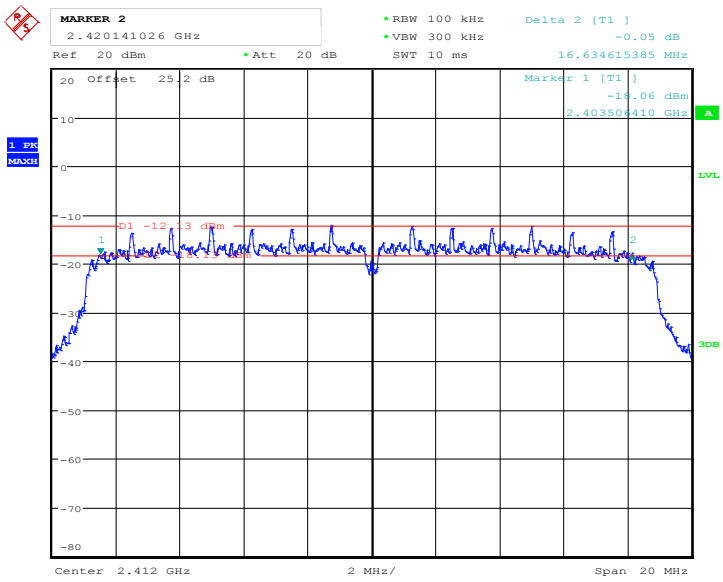
6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 01



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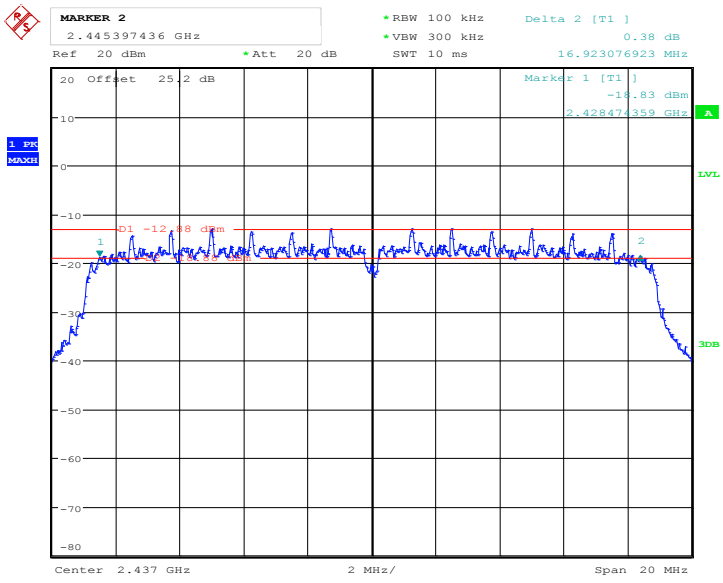
6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 06



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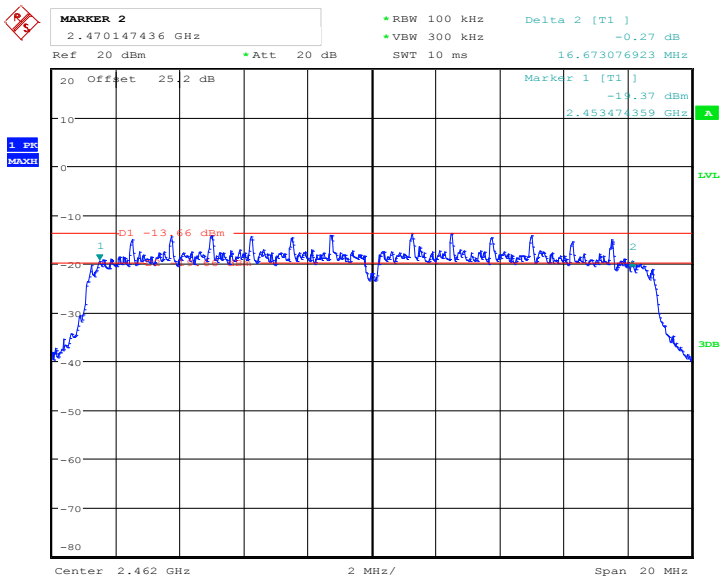
6 dB Bandwidth Plot on 2.4GHz 802.11n HT20 Channel 11



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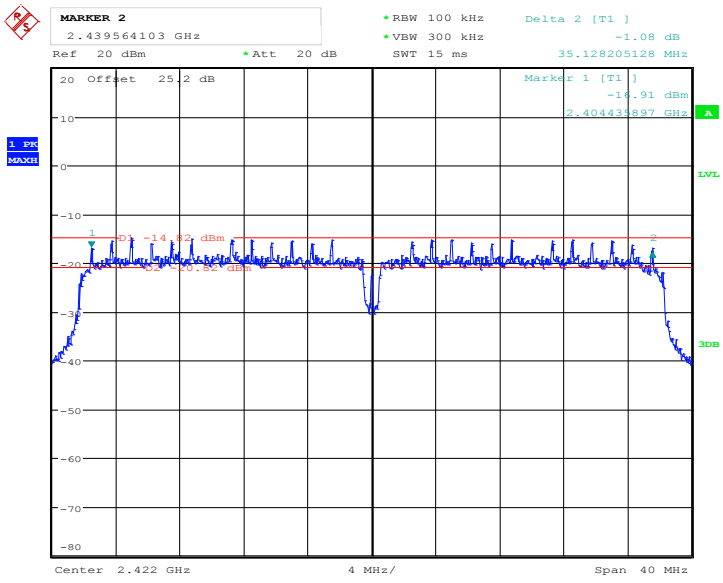
6 dB Bandwidth Plot on 2.4GHz 802.11n HT40 Channel 03



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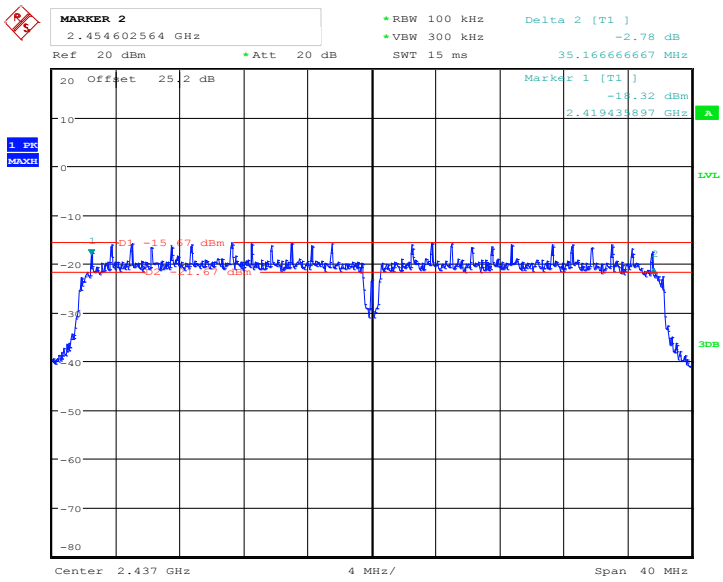
6 dB Bandwidth Plot on 2.4GHz 802.11n HT40 Channel 06



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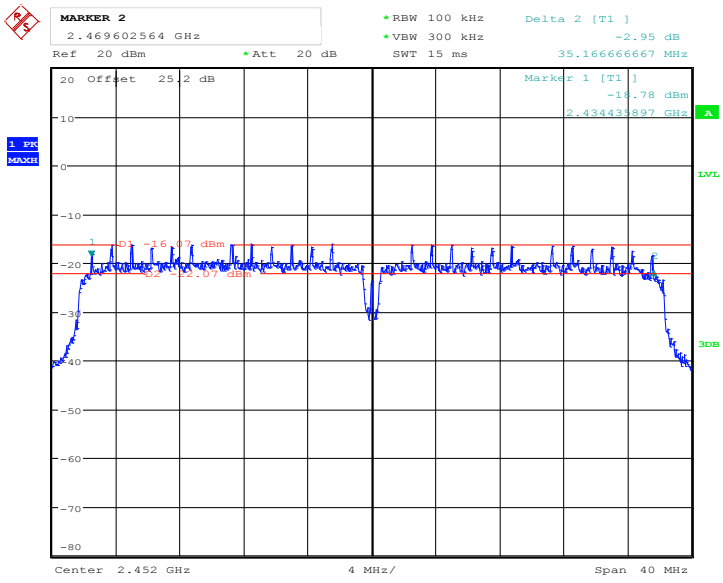
6 dB Bandwidth Plot on 2.4GHz 802.11n HT40 Channel 09



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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.

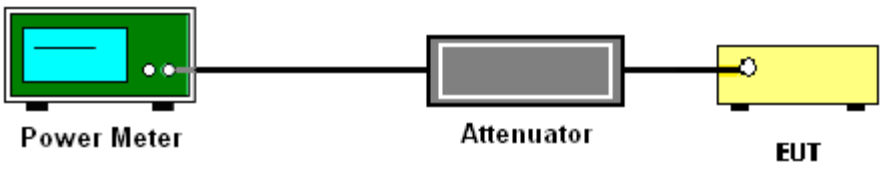
3.2.2 Measuring Instruments

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 :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	7.24	30	Pass
06	2437	6.22	30	Pass
11	2462	5.63	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	12.43	30	Pass
06	2437	10.48	30	Pass
11	2462	10.21	30	Pass

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	12.12	30	Pass
06	2437	10.84	30	Pass
11	2462	9.87	30	Pass

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

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	11.66	30	Pass
06	2437	10.55	30	Pass
09	2452	10.36	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

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

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	4.64
06	2437	3.52
11	2462	2.26

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	98.64%	Duty Factor:	0.06dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	1.50
06	2437	-0.62
11	2462	-0.77

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	98.54%	Duty Factor:	0.06dB

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Average Output Power (dBm)
01	2412	1.98
06	2437	-0.48
11	2462	-1.58

Test Mode :	802.11n HT40	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	96.55%	Duty Factor:	0.15dB

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Average Output Power (dBm)
03	2422	1.66
06	2437	1.44
09	2452	0.61

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.

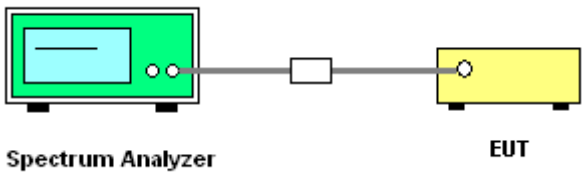
3.3.2 Measuring Instruments

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 :	Bill Kuo	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	-9.01	-22.91	8	Pass
06	2437	-9.72	-23.29	8	Pass
11	2462	-9.67	-25.22	8	Pass

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Bill Kuo	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	-12.95	-26.52	8	Pass
06	2437	-13.44	-26.89	8	Pass
11	2462	-14.36	-28.75	8	Pass

Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Bill Kuo	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	-12.84	-26.58	8	Pass
06	2437	-13.48	-27.19	8	Pass
11	2462	-14.72	-28.43	8	Pass

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

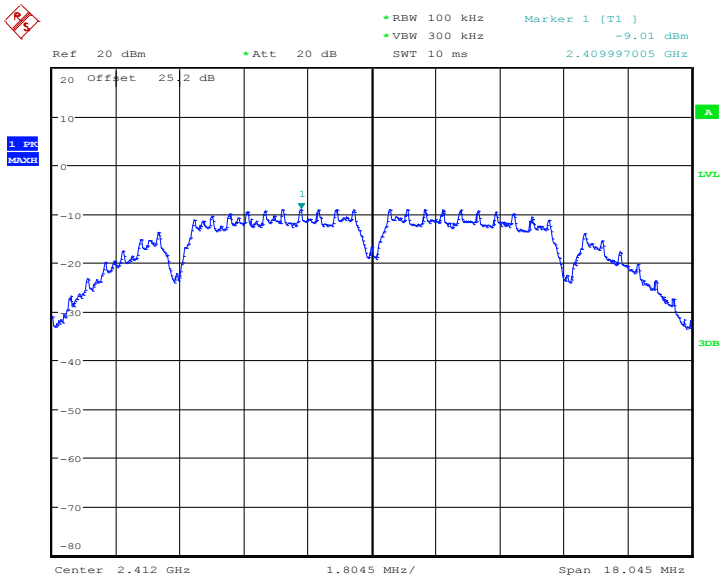
Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Power Density		Max. Limits (dBm/3kHz)	Pass/Fail
		PSD/100kHz (dBm)	PSD/3kHz (dBm)		
03	2422	-15.49	-27.35	8	Pass
06	2437	-16.15	-27.45	8	Pass
09	2452	-16.51	-27.90	8	Pass

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.*

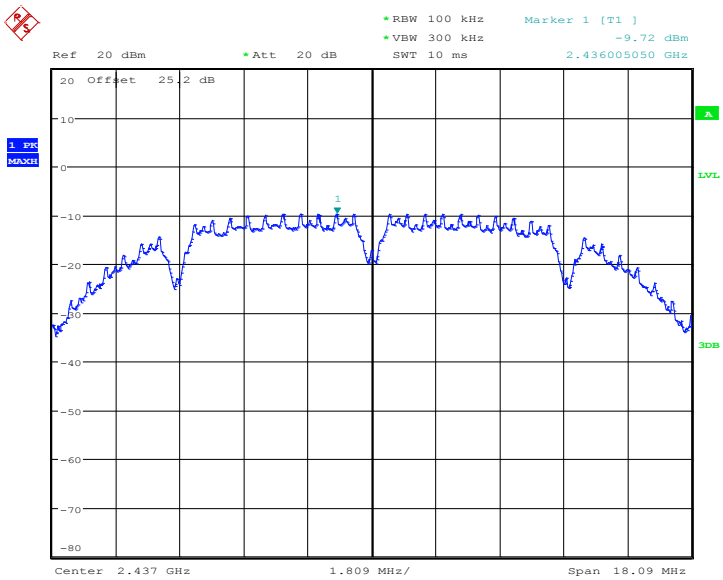
3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 802.11b Channel 01



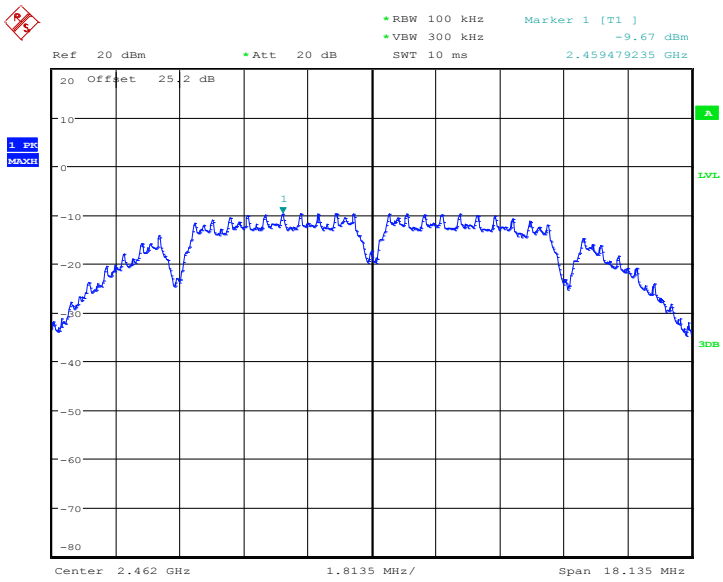
Date: 9.APR.2013 22:12:32

PSD 100kHz Plot on 802.11b Channel 06



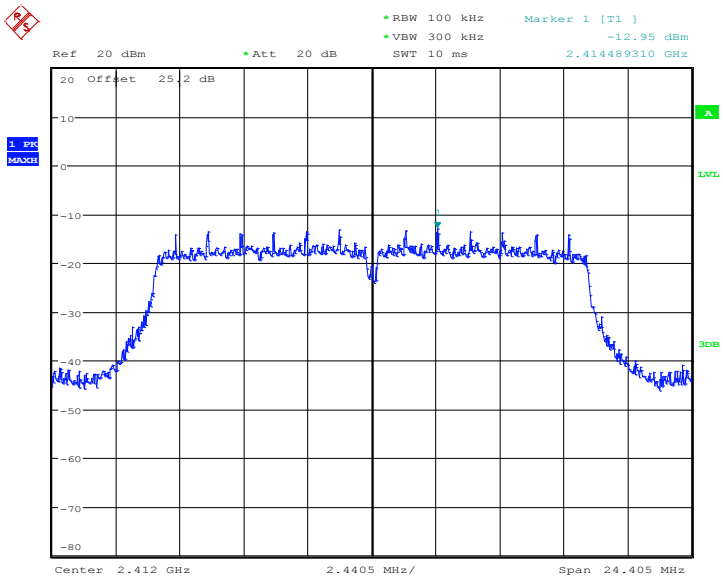
Date: 9.APR.2013 22:16:16

PSD 100kHz Plot on 802.11b Channel 11



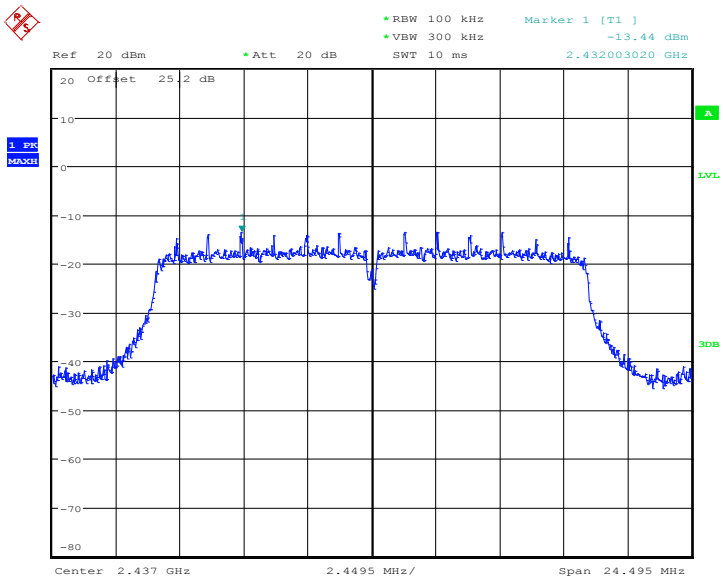
Date: 9.APR.2013 22:22:41

PSD 100kHz Plot on 802.11g Channel 01



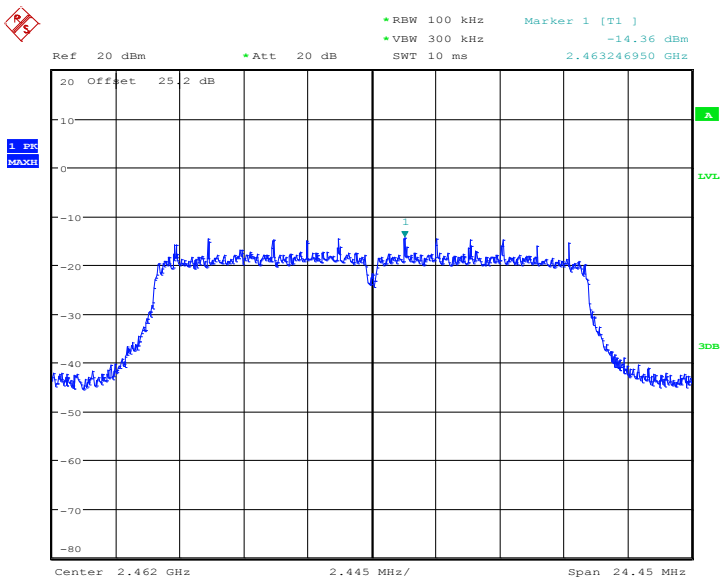
Date: 9.APR.2013 22:40:39

PSD 100kHz Plot 802.11g Channel 06



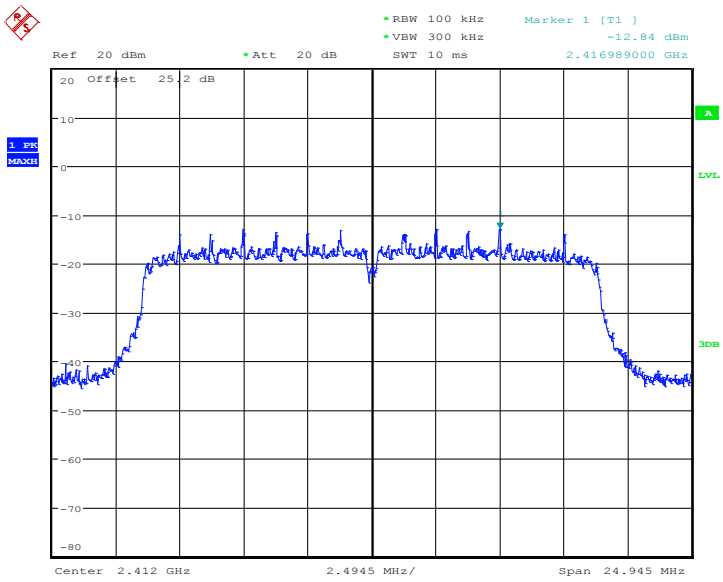
Date: 9.APR.2013 22:31:08

PSD 100kHz Plot 802.11g Channel 11



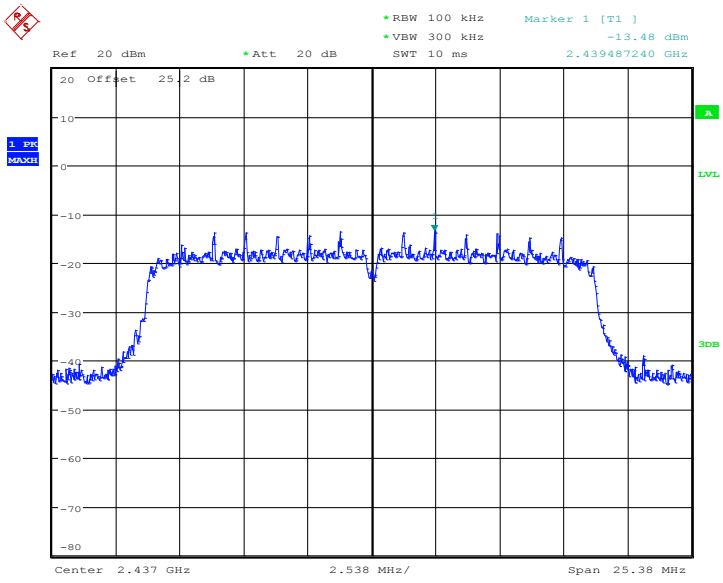
Date: 9.APR.2013 22:27:52

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



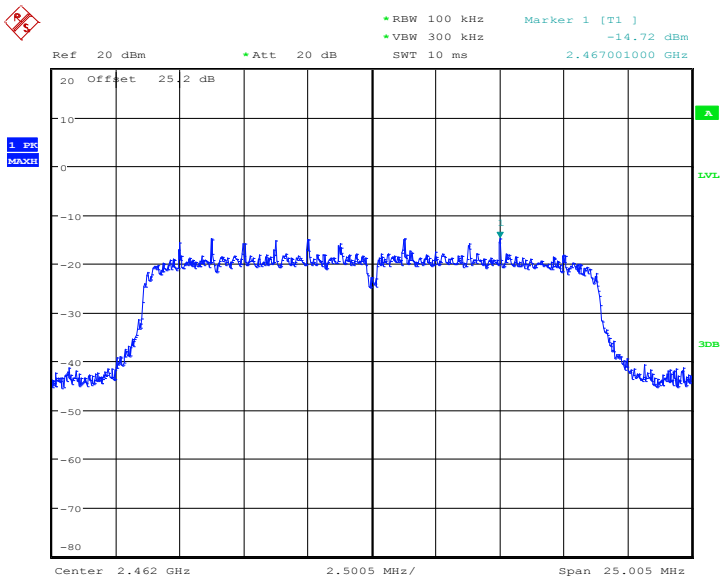
Date: 9.APR.2013 22:44:45

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



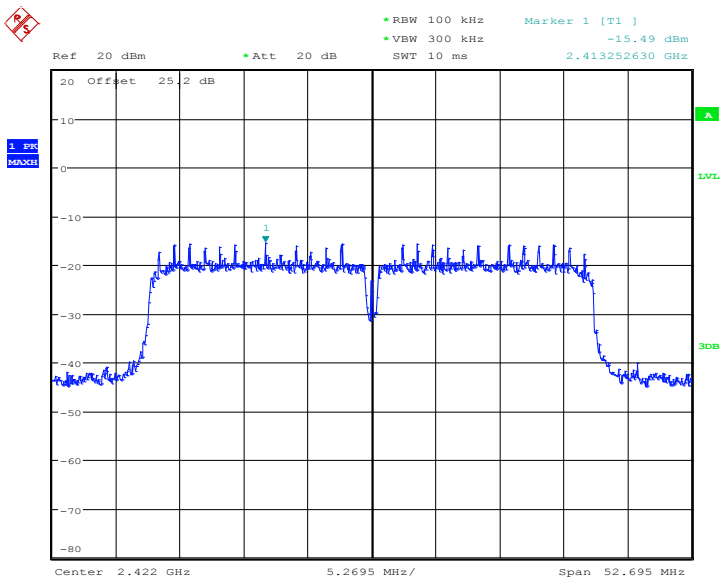
Date: 9.APR.2013 22:47:32

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



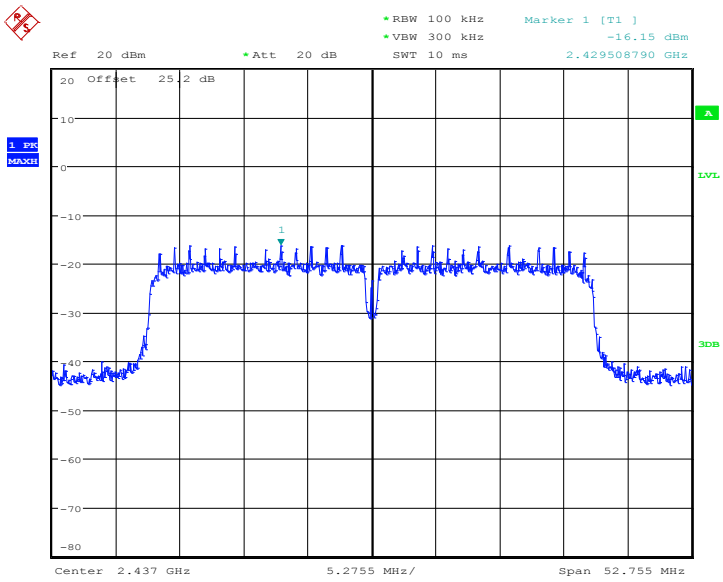
Date: 9.APR.2013 22:51:02

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



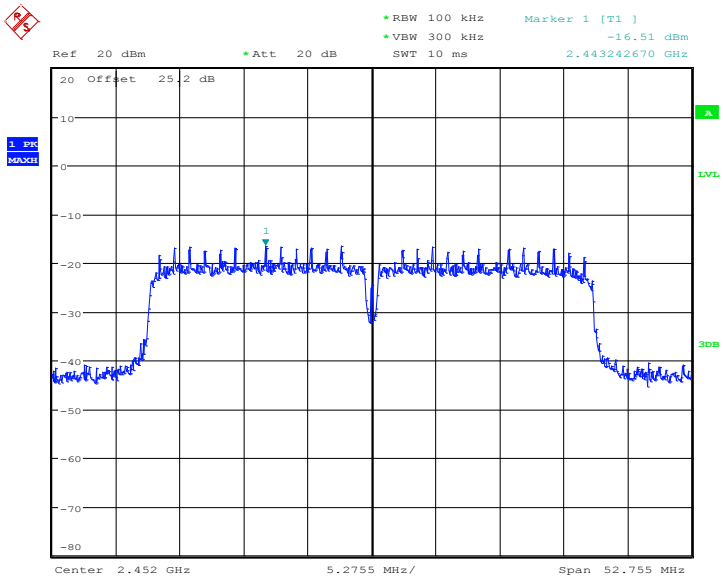
Date: 9.APR.2013 23:30:31

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



Date: 9.APR.2013 23:09:11

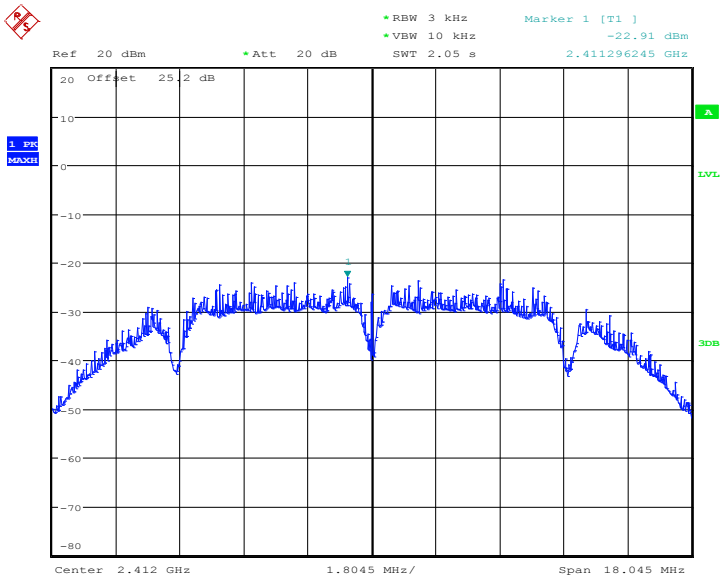
PSD 100kHz Plot on 2.4GHz 802.11n HT40 Channel 09



Date: 9.APR.2013 23:00:01

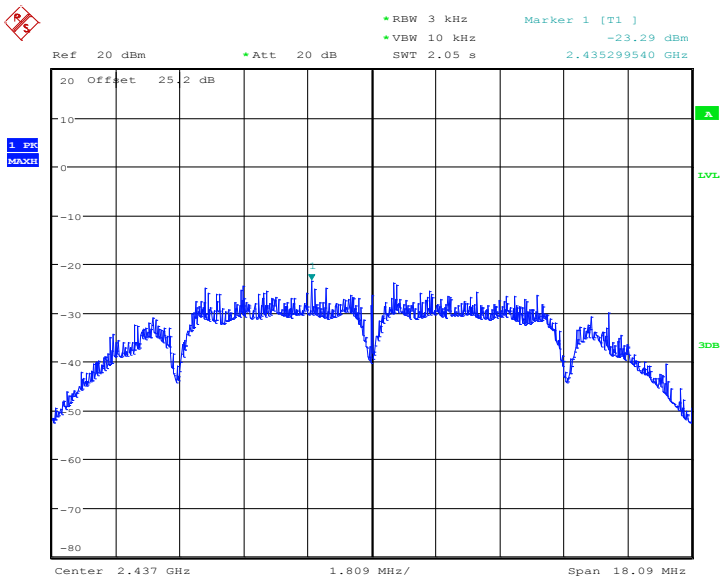
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01



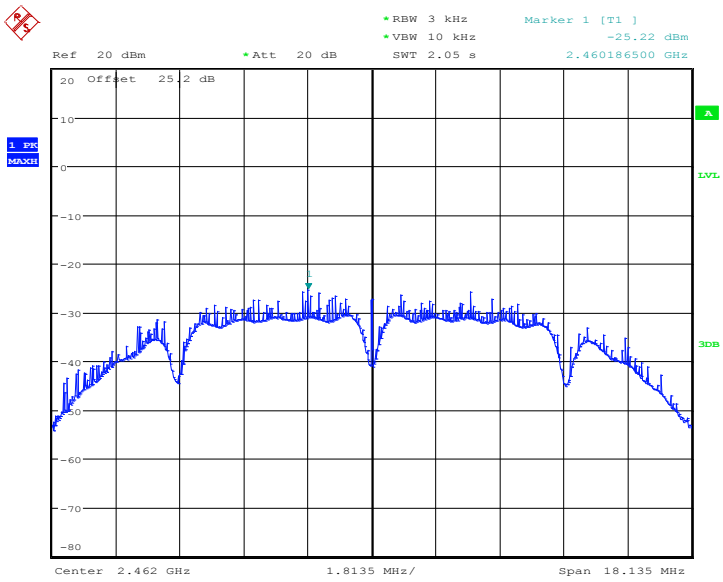
Date: 9.APR.2013 22:12:24

PSD 3kHz Plot on 802.11b Channel 06



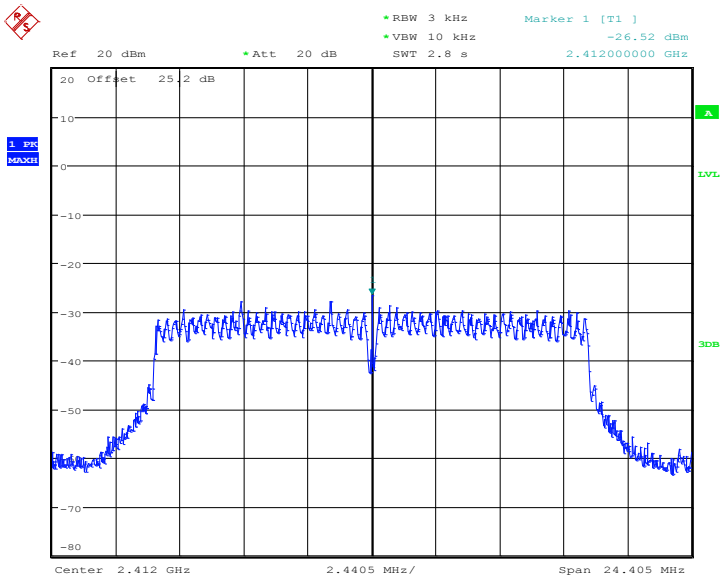
Date: 9.APR.2013 22:16:08

PSD 3kHz Plot on 802.11b Channel 11



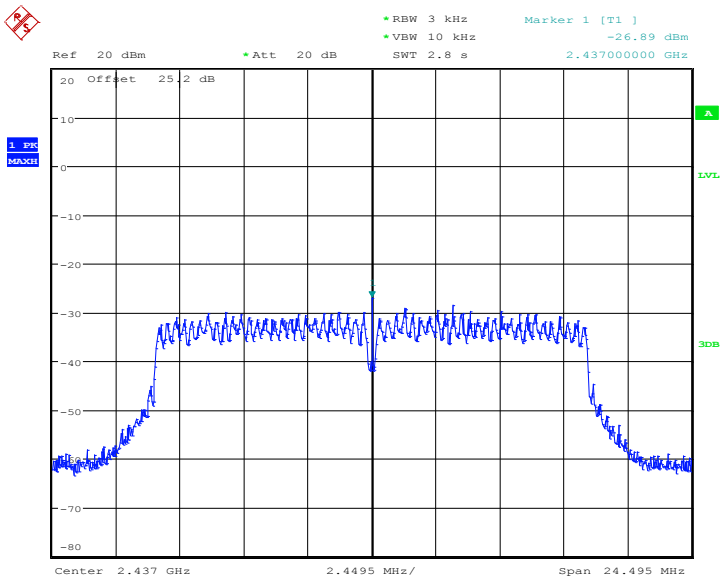
Date: 9.APR.2013 22:24:33

PSD 3kHz Plot on 802.11g Channel 01



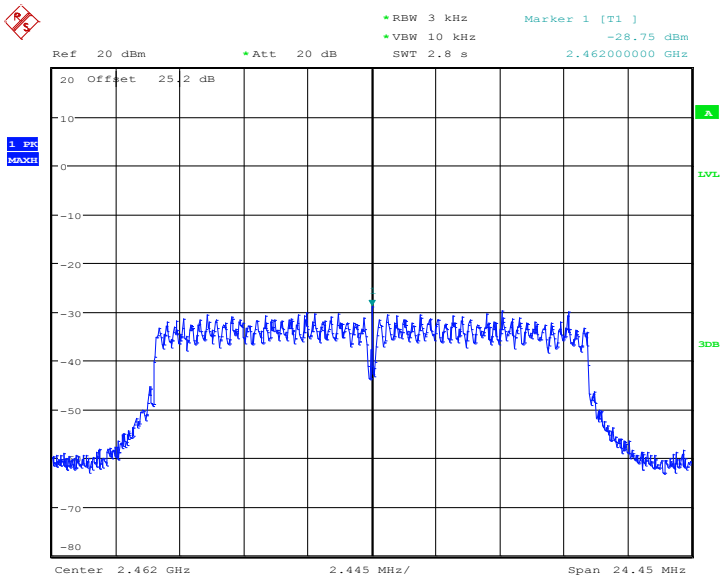
Date: 9.APR.2013 22:40:31

PSD 3kHz Plot on 802.11g Channel 06



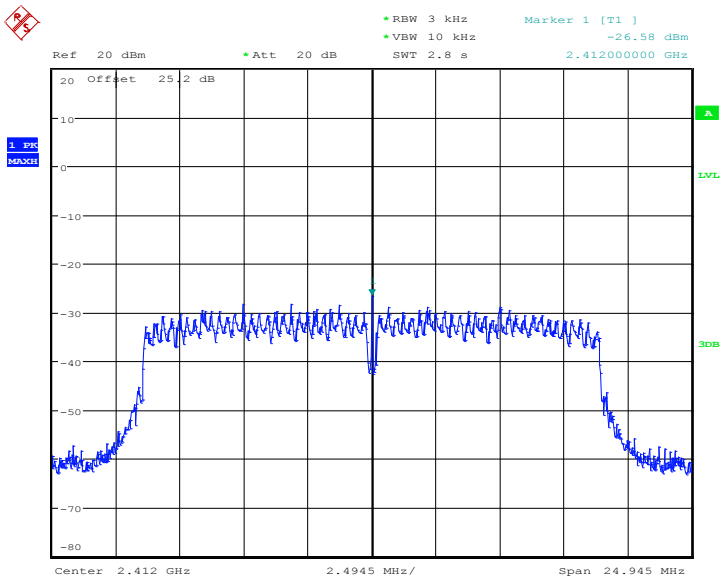
Date: 9.APR.2013 22:31:00

PSD 3kHz Plot on 802.11g Channel 11



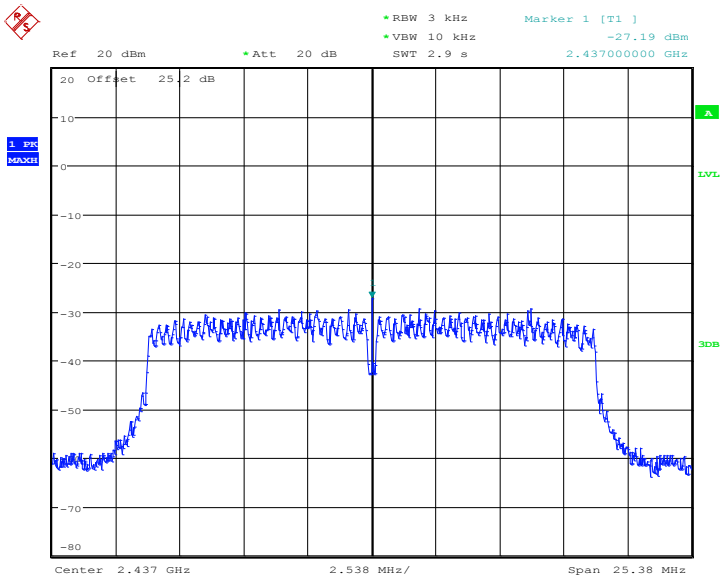
Date: 9.APR.2013 22:27:44

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



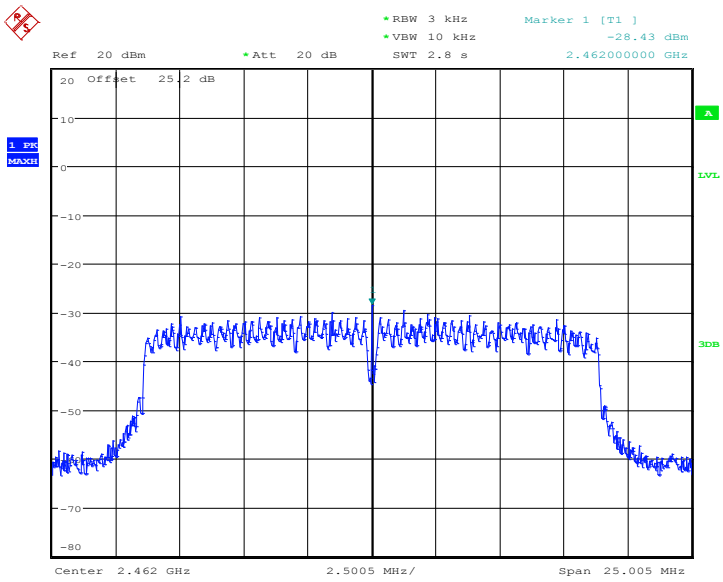
Date: 9.APR.2013 22:44:37

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



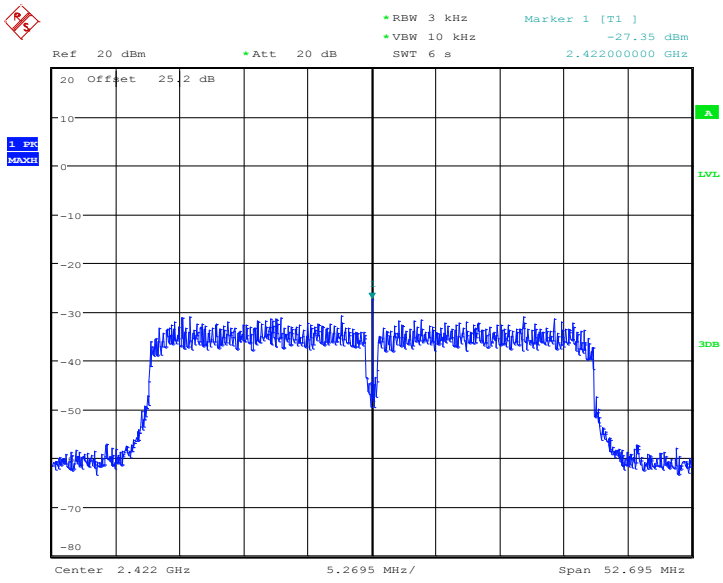
Date: 9.APR.2013 22:47:24

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



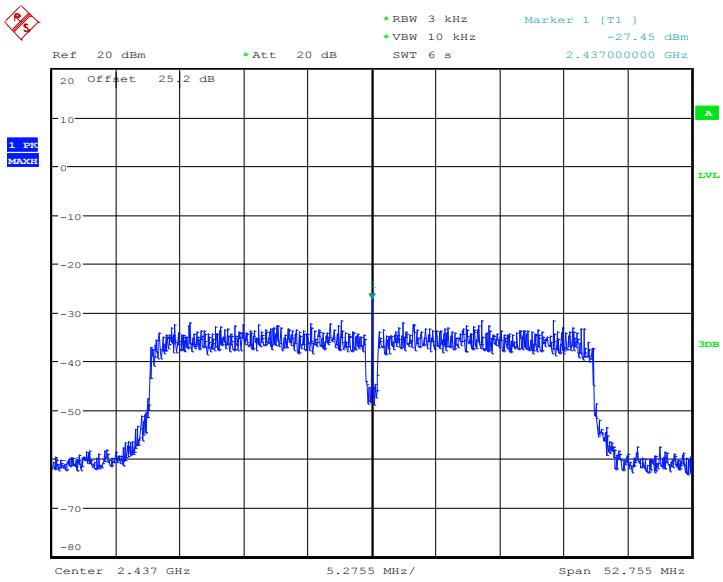
Date: 9.APR.2013 22:50:54

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



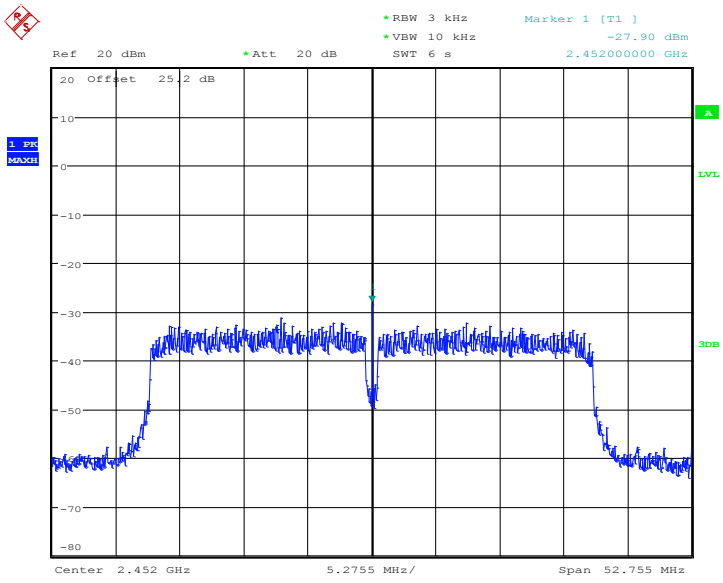
Date: 9.APR.2013 23:30:23

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



Date: 9.APR.2013 23:09:03

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



Date: 9.APR.2013 22:59:53

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).

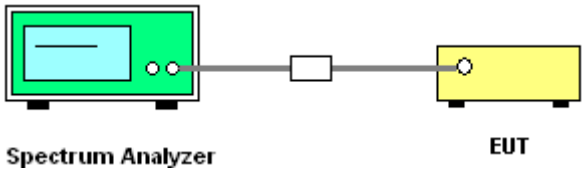
3.4.2 Measuring Instruments

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.

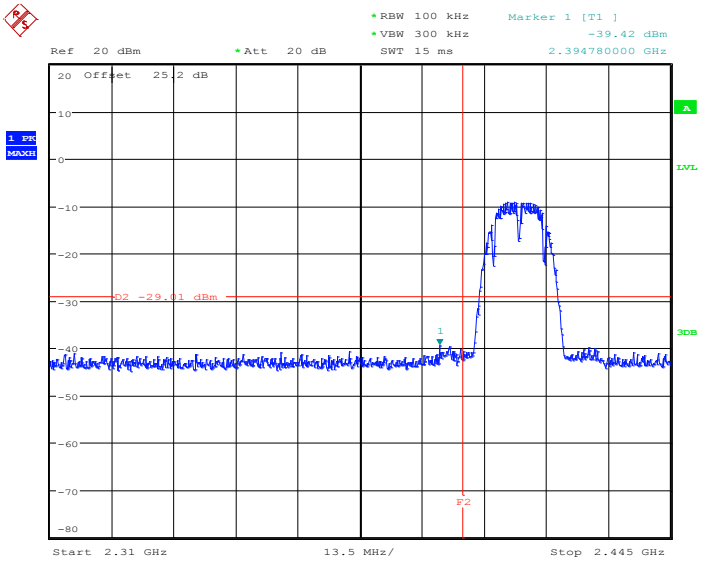
3.4.4 Test Setup



2.4.5 Test Result of Conducted Spurious at Band Edges

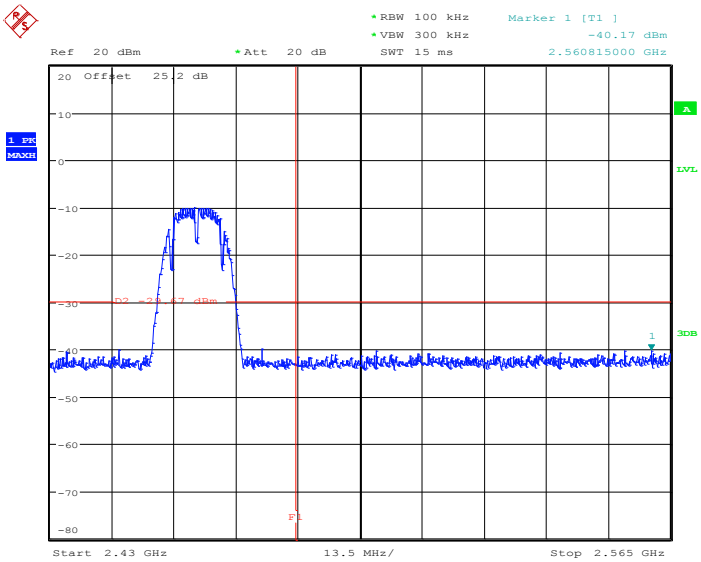
Test Mode :	802.11b	**Temperature :**	24~26℃
Test Band :	Low and High	**Relative Humidity :**	50~53%
Test Channel :	01 and 11	**Test Engineer :**	Bill Kuo

Low Band Edge Plot on 802.11b Channel 01



Date: 9.APR.2013 22:12:44

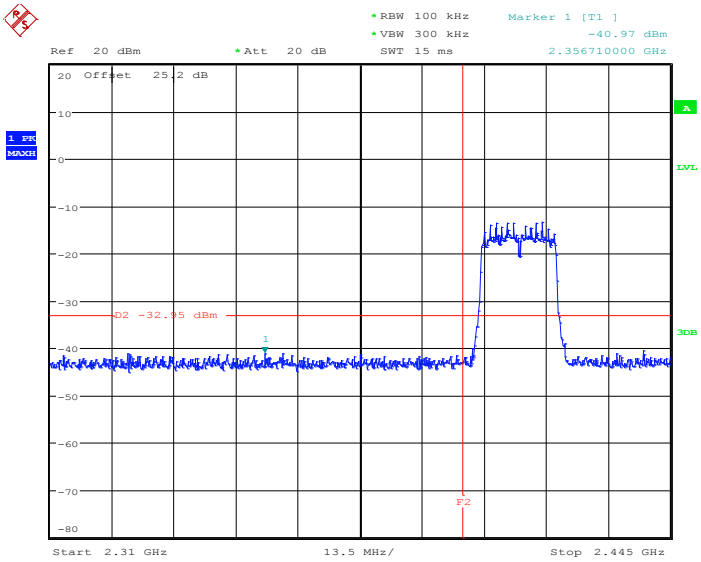
High Band Edge Plot on 802.11b Channel 11



Date: 9.APR.2013 22:22:54

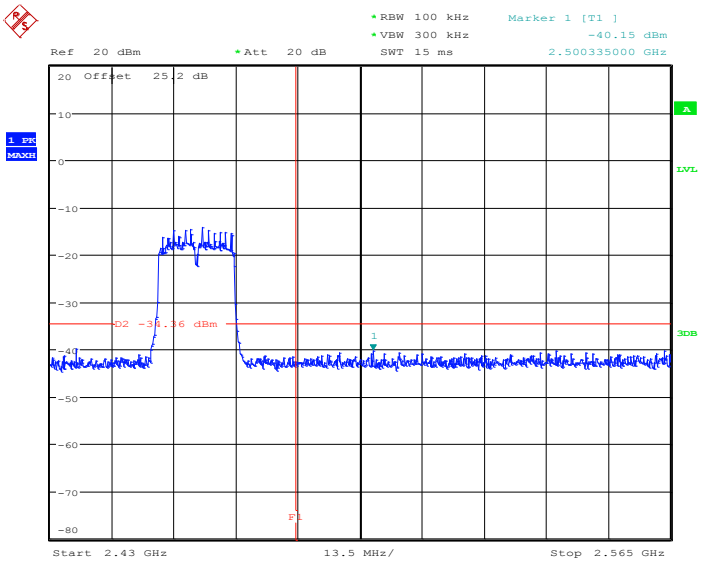
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

Low Band Edge Plot on 802.11g Channel 01



Date: 9.APR.2013 22:40:51

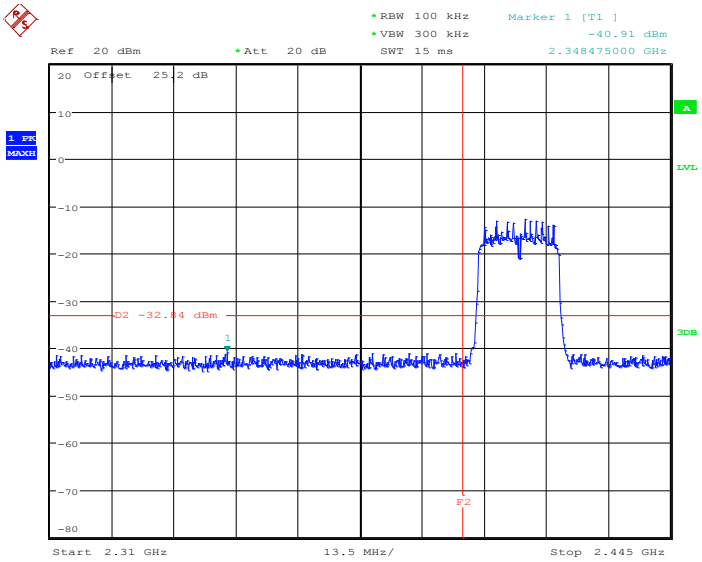
High Band Edge Plot on 802.11g Channel 11



Date: 9.APR.2013 22:28:05

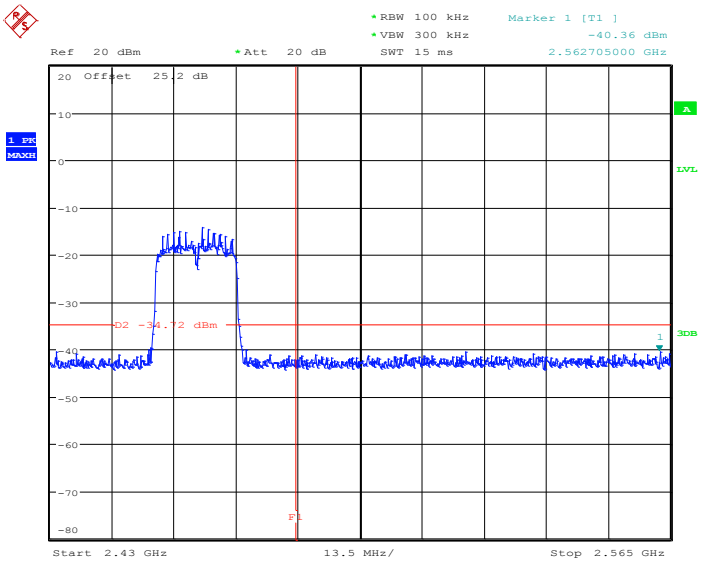
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

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



Date: 9.APR.2013 22:44:57

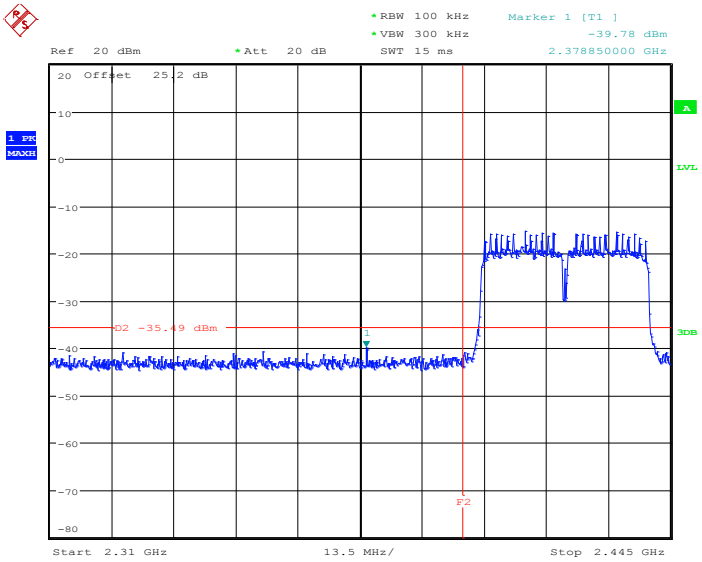
High Band Edge Plot on 2.4GHz 802.11n HT20 Channel 11



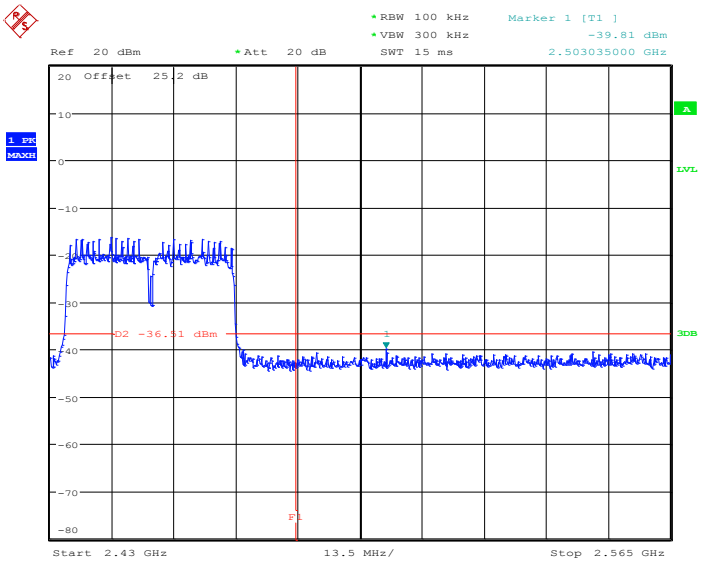
Date: 9.APR.2013 22:51:15

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

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



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

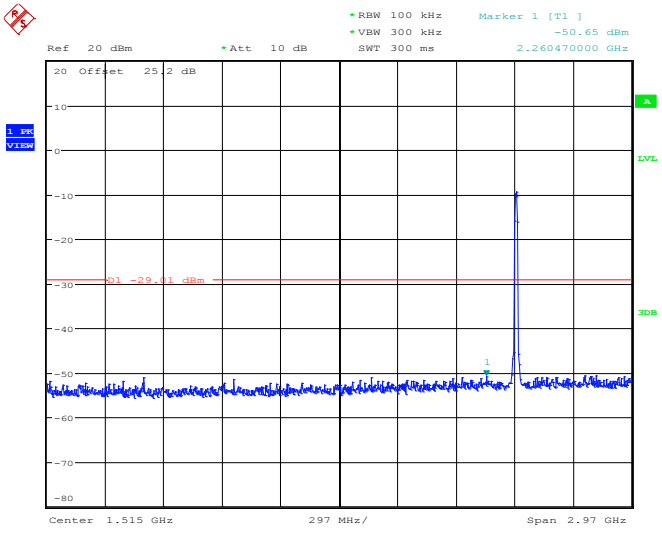


3.4.6 Test Result of Conducted Spurious Emission

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 :	Bill Kuo

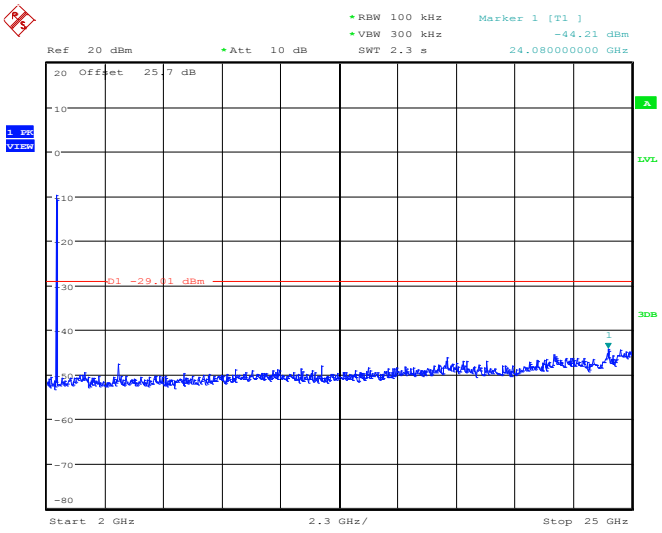
802.11b 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 01



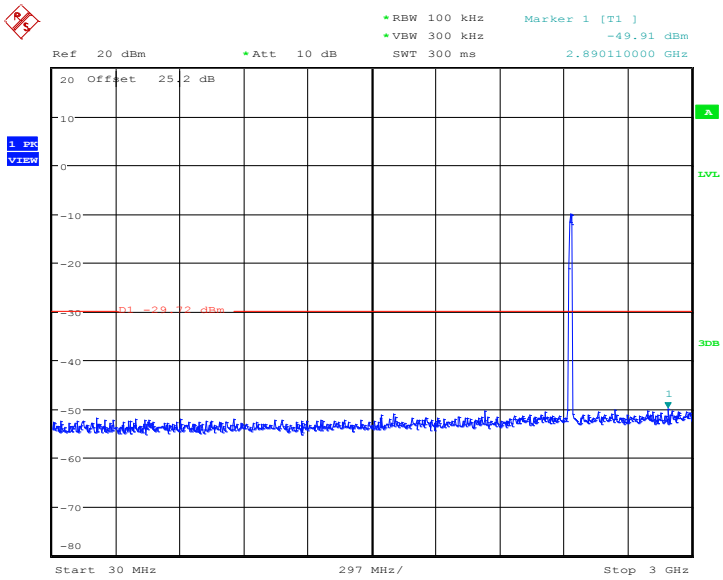
802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01



802.11b 30 MHz~3 GHz

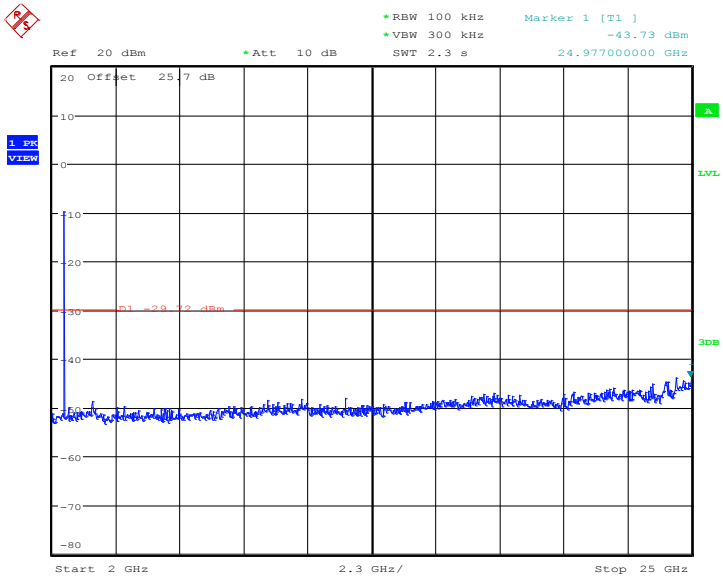
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 22:16:35

802.11b 2 GHz~25 GHz

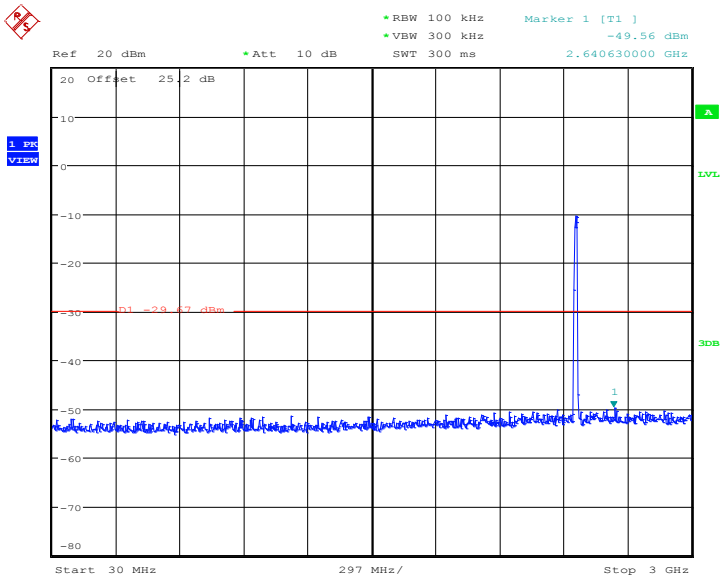
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 22:16:53

802.11b 30 MHz~3 GHz

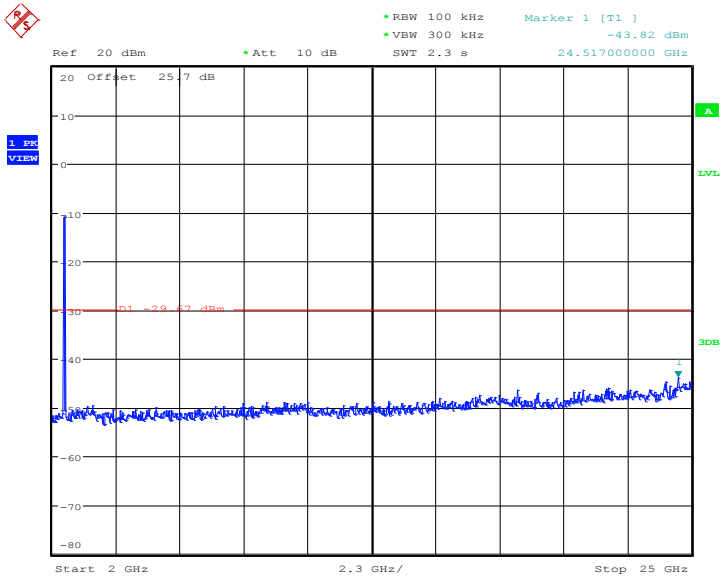
Conducted Spurious Emission Plot on Channel 11



Date: 9.APR.2013 22:23:12

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

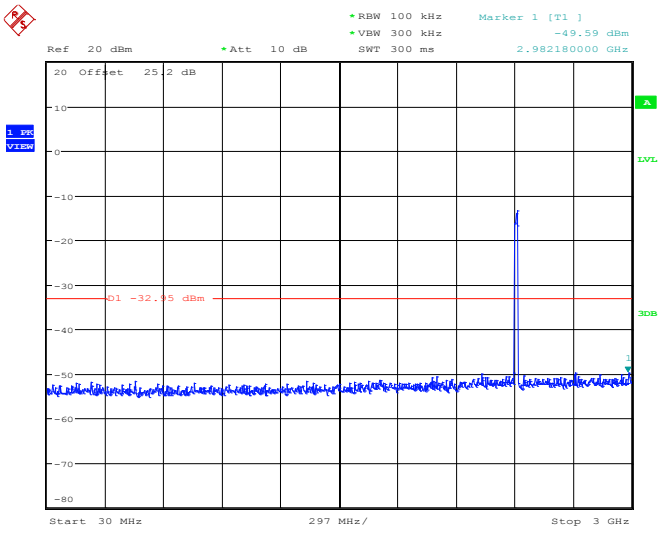


Date: 9.APR.2013 22:23:30

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 :	Bill Kuo

802.11g 30 MHz~3 GHz

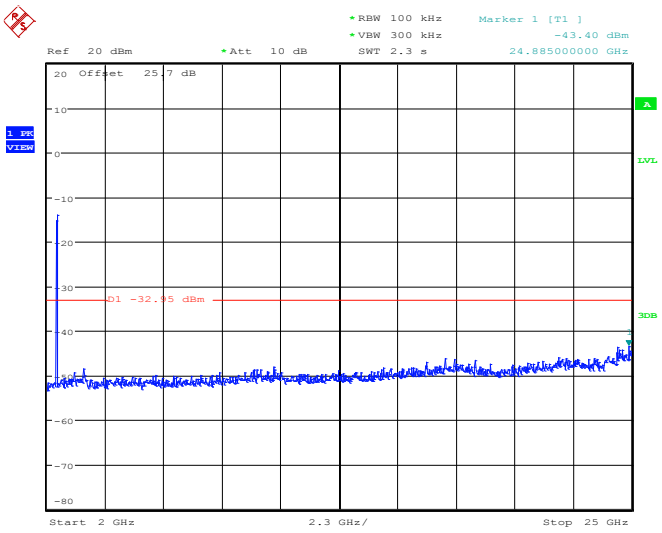
Conducted Spurious Emission Plot on Channel 01



Date: 9.APR.2013 22:41:10

802.11g 2 GHz~25 GHz

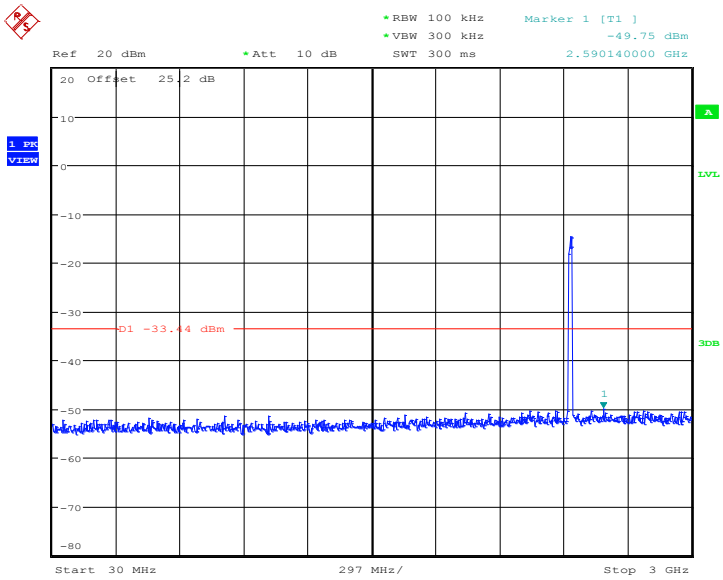
Conducted Spurious Emission Plot on Channel 01



Date: 9.APR.2013 22:41:28

802.11g 30 MHz~3 GHz

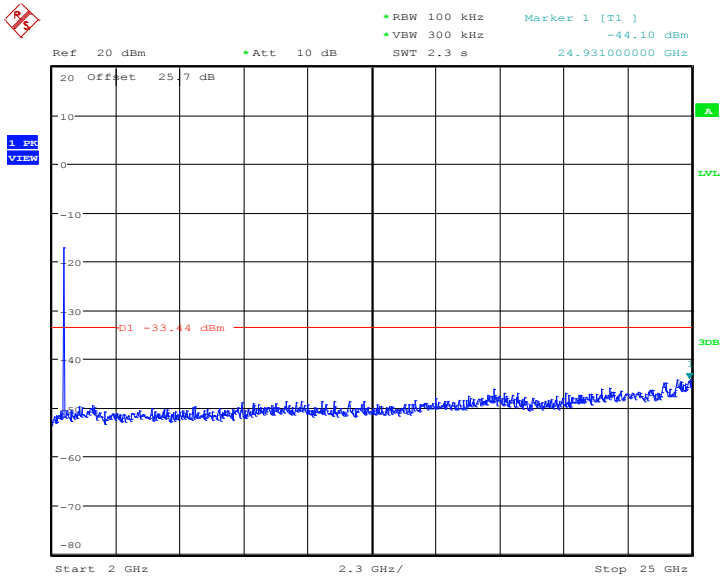
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 22:31:27

802.11g 2 GHz~25 GHz

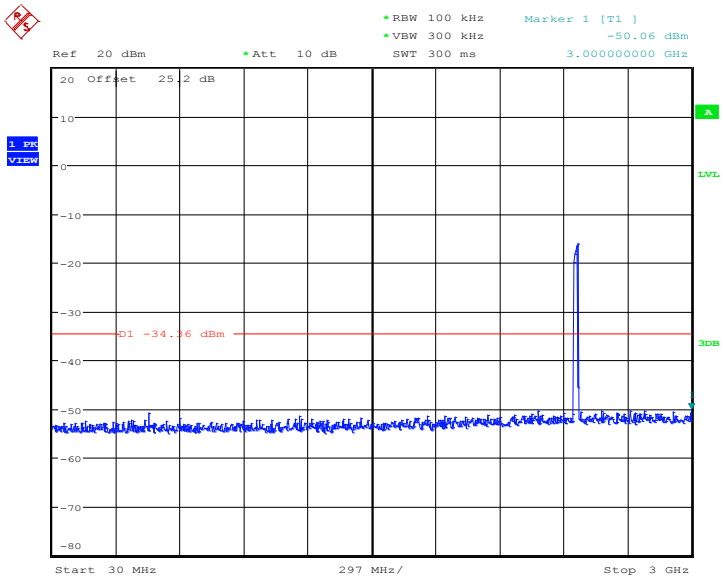
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 22:31:45

802.11g 30 MHz~3 GHz

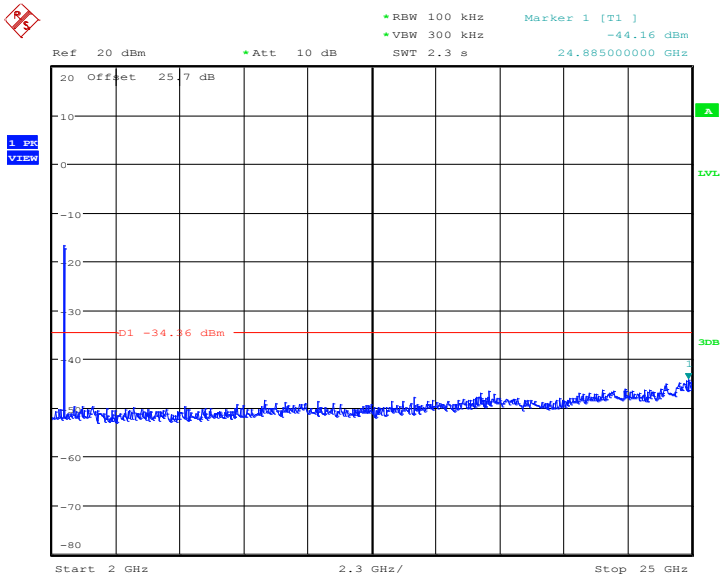
Conducted Spurious Emission Plot on Channel 11



Date: 9.APR.2013 22:28:23

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

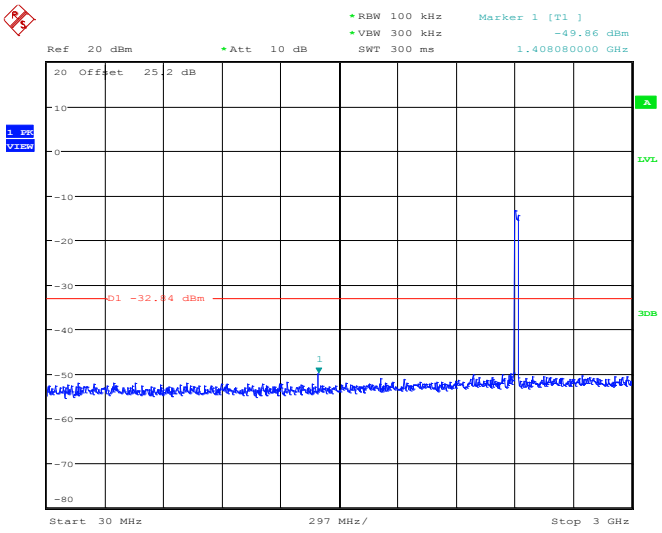


Date: 9.APR.2013 22:28:41

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 :	Bill Kuo

2.4GHz 802.11n HT20 30 MHz~3 GHz

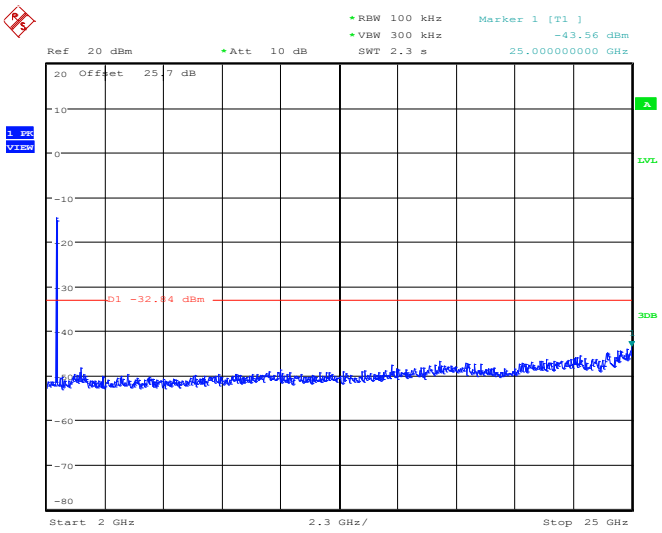
Conducted Spurious Emission Plot on Channel 01



Date: 9.APR.2013 22:45:16

2.4GHz 802.11n HT20 2 GHz~25 GHz

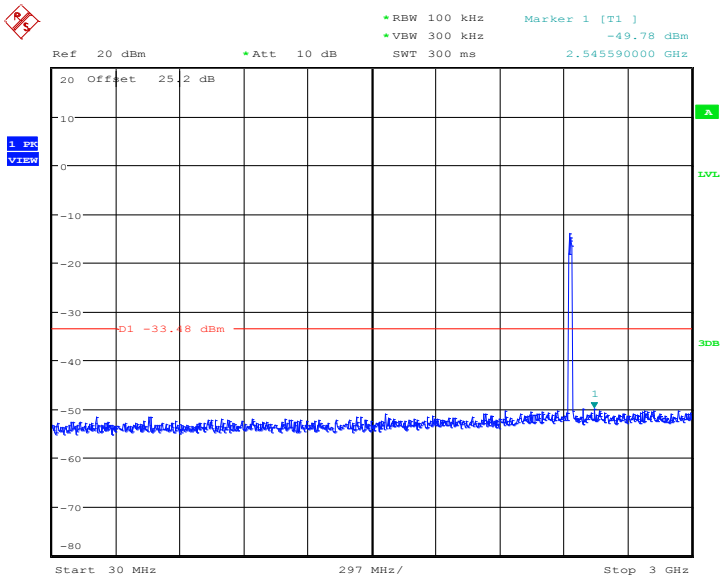
Conducted Spurious Emission Plot on Channel 01



Date: 9.APR.2013 22:45:34

2.4GHz 802.11n HT20 30 MHz~3 GHz

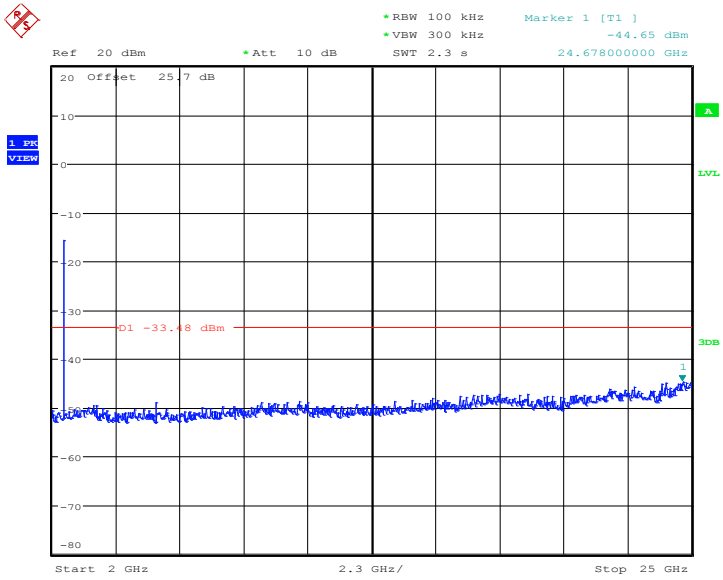
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 22:47:51

2.4GHz 802.11n HT20 2 GHz~25 GHz

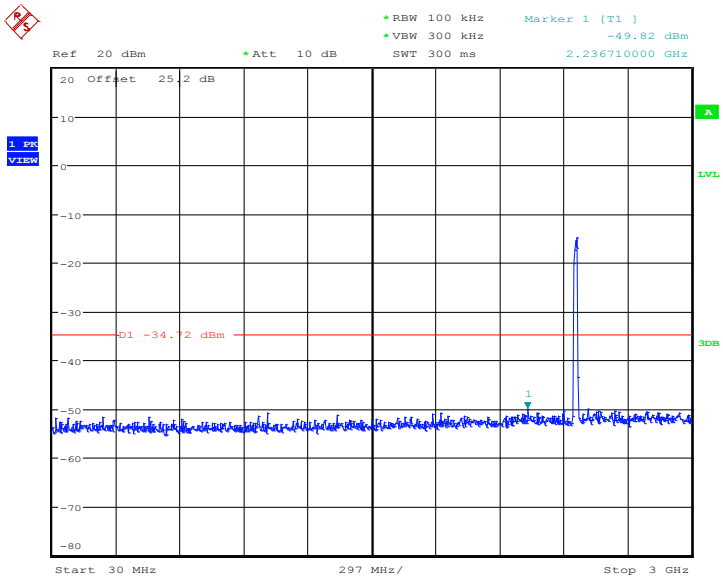
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 22:48:09

2.4GHz 802.11n HT20 30 MHz~3 GHz

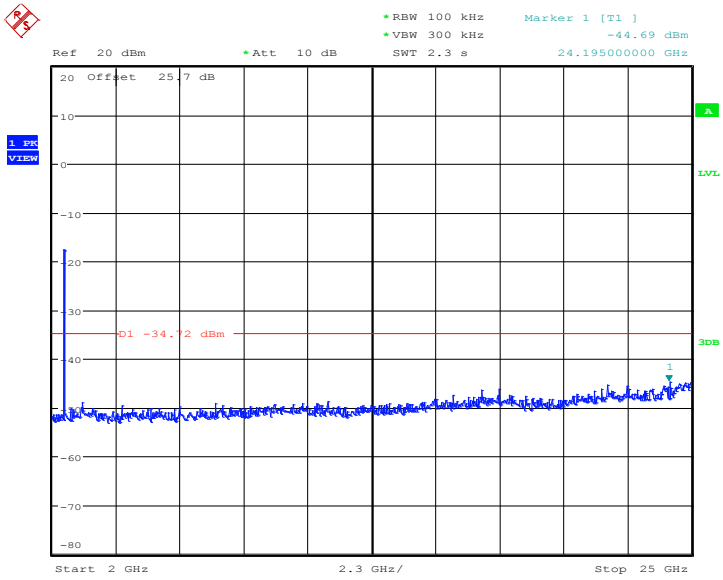
Conducted Spurious Emission Plot on Channel 11



Date: 9.APR.2013 22:51:33

2.4GHz 802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

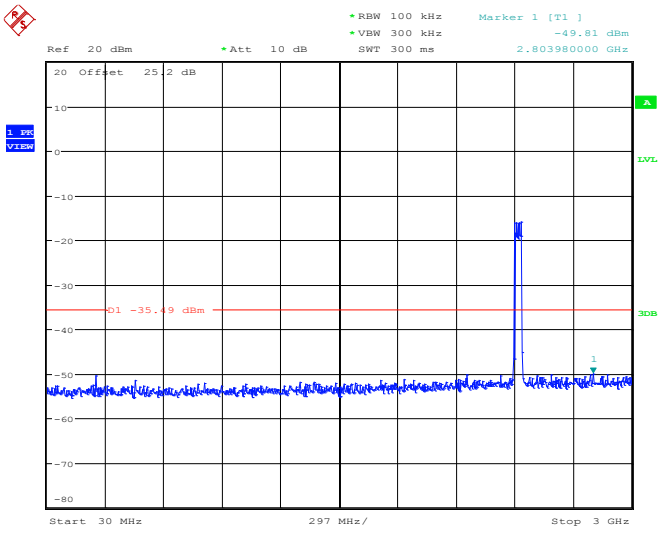


Date: 9.APR.2013 22:51:51

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 :	Bill Kuo

2.4GHz 802.11n HT40 30 MHz~3 GHz

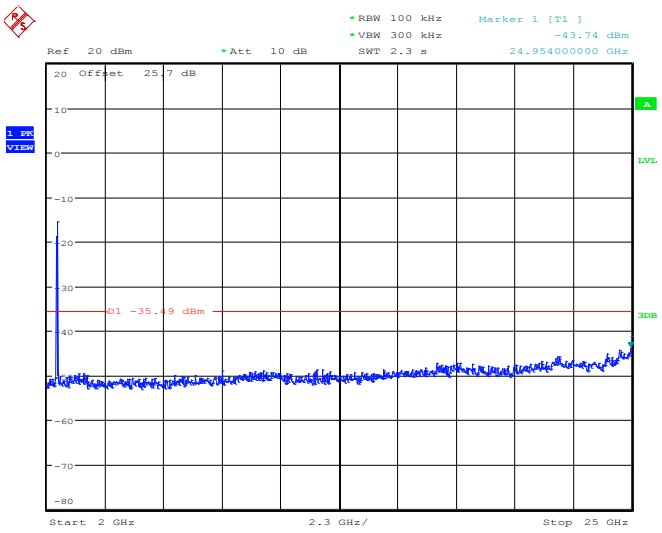
Conducted Spurious Emission Plot on Channel 03



Date: 9.APR.2013 23:33:08

2.4GHz 802.11n HT40 2 GHz~25 GHz

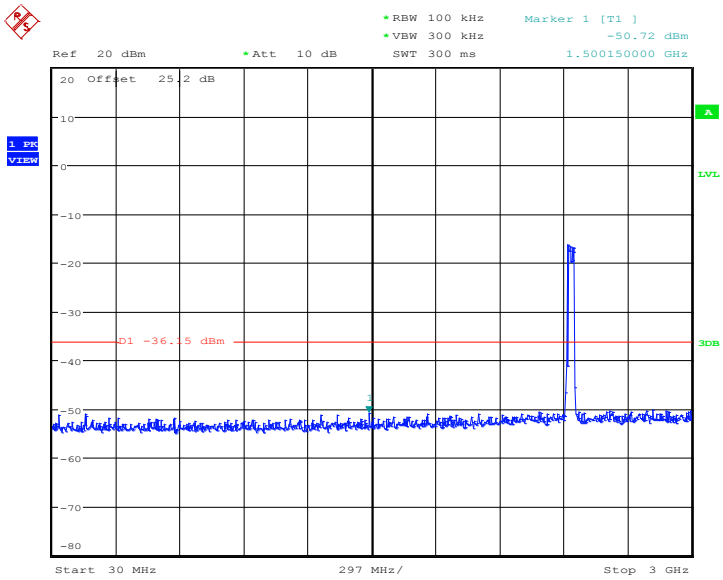
Conducted Spurious Emission Plot on Channel 03



Date: 9.APR.2013 23:32:32

2.4GHz 802.11n HT40 30 MHz~3 GHz

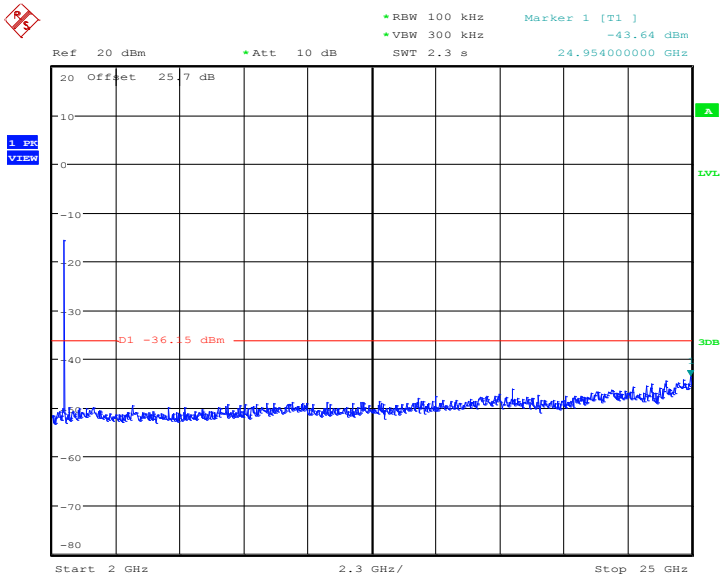
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 23:35:38

2.4GHz 802.11n HT40 2 GHz~25 GHz

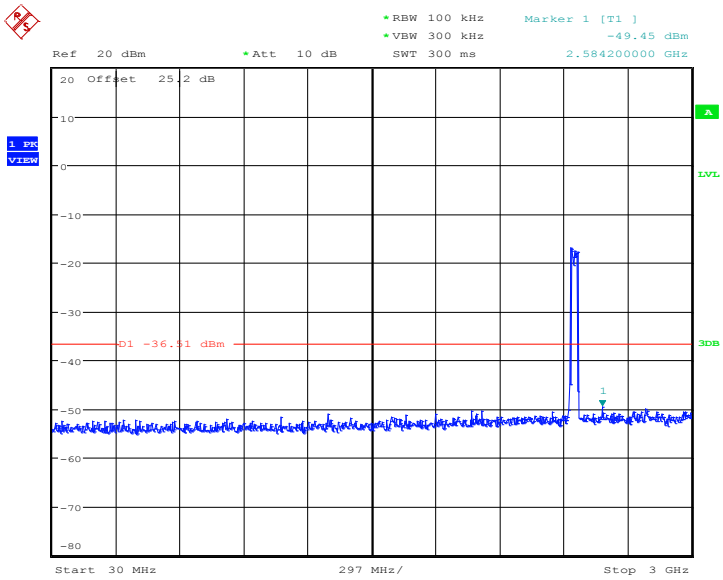
Conducted Spurious Emission Plot on Channel 06



Date: 9.APR.2013 23:34:51

2.4GHz 802.11n HT40 30 MHz~3 GHz

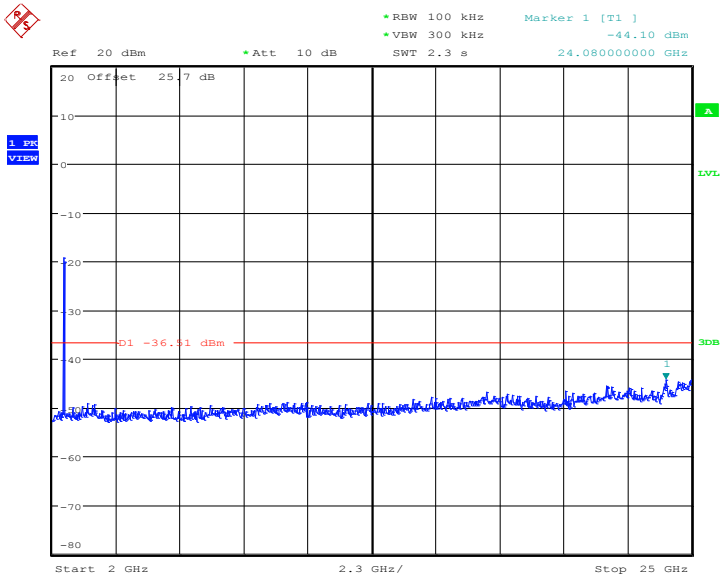
Conducted Spurious Emission Plot on Channel 09



Date: 9.APR.2013 23:05:37

2.4GHz 802.11n HT40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 09



Date: 9.APR.2013 23:05:55

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

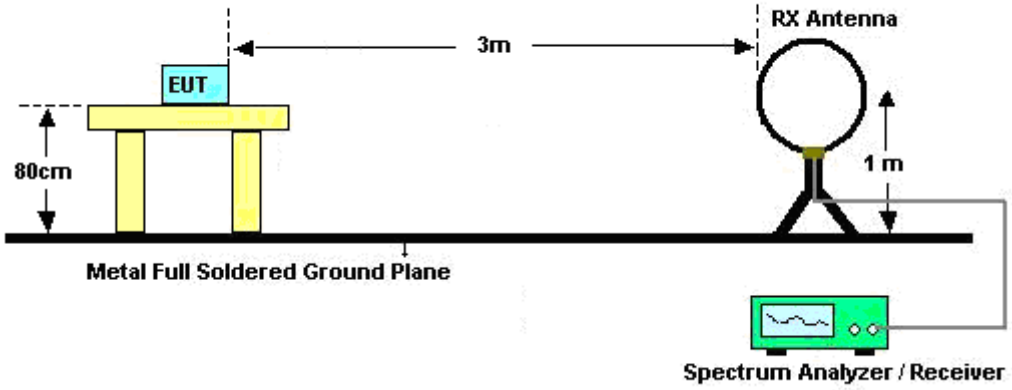
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better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

Band	Duty Cycle(%)	T(μs)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	98.64	-	-	10Hz
2.4GHz 802.11n HT20	98.54	-	-	10Hz
2.4GHz 802.11n HT40	96.55	672.000	1.488	3kHz

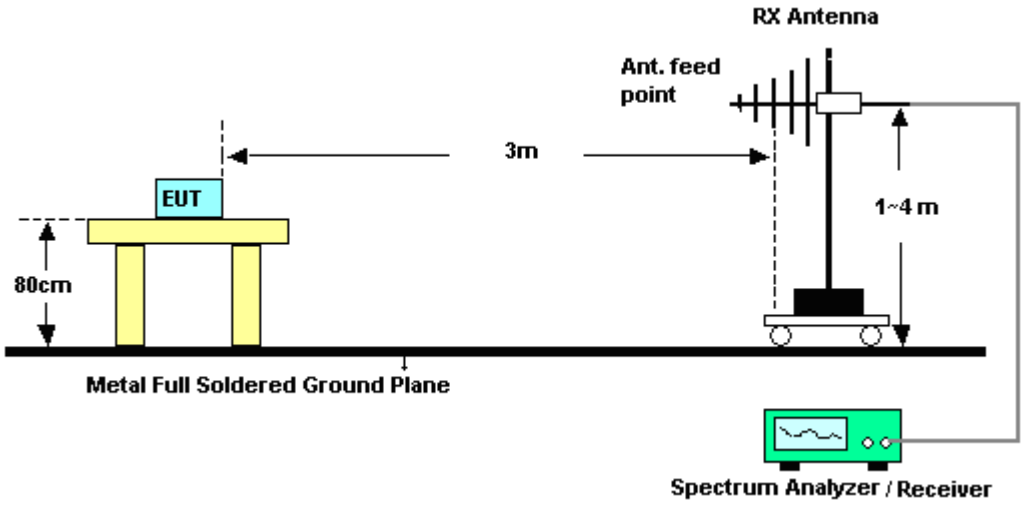
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

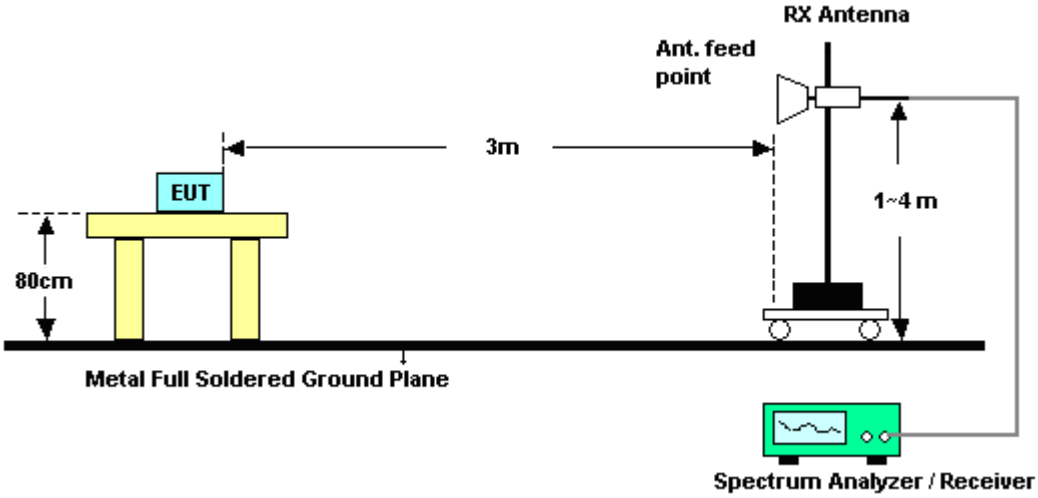
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated 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 :**	21~23°C
Test Band :	Low	**Relative Humidity :**	51~53%
Test Channel :	01	**Test Engineer :**	Eric Shih

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**
2380.11	51.92	-22.08	74	47	32.28	6.91	34.27	136	185	Peak
2390	40.3	-13.70	54	35.39	32.3	6.91	34.3	136	185	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**
2353.83	48.22	-25.78	74	43.37	32.26	6.84	34.25	119	262	Peak
2334.84	34.91	-19.09	54	30.05	32.24	6.84	34.22	119	262	Average

Test Mode :	802.11b	**Temperature :**	21~23°C
Test Band :	High	**Relative Humidity :**	51~53%
Test Channel :	11	**Test Engineer :**	Eric Shih

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**
2483.98	54.96	-19.04	74	49.95	32.38	7.06	34.43	106	184	Peak
2483.71	44.93	-9.07	54	39.92	32.38	7.06	34.43	106	184	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**
2484.43	48.53	-25.47	74	43.52	32.38	7.06	34.43	160	94	Peak
2483.59	36.14	-17.86	54	31.13	32.38	7.06	34.43	160	94	Average

Test Mode :	802.11g	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Eric Shih

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.65	59.4	-14.60	74	54.46	32.3	6.91	34.27	136	187	Peak
2359.77	41.81	-12.19	54	36.92	32.26	6.88	34.25	136	187	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	48.14	-25.86	74	43.23	32.3	6.91	34.3	167	156	Peak
2390	34.99	-19.01	54	30.08	32.3	6.91	34.3	167	156	Average

Test Mode :	802.11g	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Eric Shih

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.65	73.69	-0.31	74	68.68	32.38	7.06	34.43	106	186	Peak
2483.5	46.72	-7.28	54	41.71	32.38	7.06	34.43	106	186	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.65	61.32	-12.68	74	56.31	32.38	7.06	34.43	160	113	Peak
2483.5	37.64	-16.36	54	32.63	32.38	7.06	34.43	160	113	Average

Test Mode :	802.11n HT20	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Eric Shih

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
2388.93	62.05	-11.95	74	57.11	32.3	6.91	34.27	166	184	Peak
2390	42.01	-11.99	54	37.1	32.3	6.91	34.3	166	184	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	49.66	-24.34	74	44.75	32.3	6.91	34.3	168	96	Peak
2390	34.85	-19.15	54	29.94	32.3	6.91	34.3	168	96	Average

Test Mode :	802.11n HT20	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Eric Shih

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
2485.93	73.38	-0.62	74	68.37	32.38	7.06	34.43	106	186	Peak
2483.5	46.13	-7.87	54	41.12	32.38	7.06	34.43	106	186	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
2484.34	58.41	-15.59	74	53.4	32.38	7.06	34.43	151	229	Peak
2483.5	34.94	-19.06	54	29.93	32.38	7.06	34.43	151	229	Average

Test Mode :	802.11n HT40	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	03	Test Engineer :	Eric Shih

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
2389.38	66.64	-7.36	74	61.7	32.3	6.91	34.27	133	183	Peak
2389.92	49.67	-4.33	54	44.76	32.3	6.91	34.3	133	183	Average
2487.61	56.77	-17.23	74	51.74	32.4	7.06	34.43	133	183	Peak
2494.84	40.02	-13.98	54	35.04	32.4	7.06	34.48	133	183	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
2377.77	52.01	-21.99	74	47.12	32.28	6.88	34.27	119	258	Peak
2384.88	37.38	-16.62	54	32.46	32.28	6.91	34.27	119	258	Average
2487.07	47.7	-26.3	74	42.69	32.38	7.06	34.43	119	258	Peak
2484.52	35.71	-18.29	54	30.7	32.38	7.06	34.43	119	258	Average

Test Mode :	802.11n HT40	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	09	Test Engineer :	Eric Shih

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
2388.3	56.36	-17.64	74	51.42	32.3	6.91	34.27	106	184	Peak
2349.78	40.79	-13.21	54	35.96	32.24	6.84	34.25	106	184	Average
2483.92	73.86	-0.14	74	68.85	32.38	7.06	34.43	106	184	Peak
2483.8	53.1	-0.9	54	48.09	32.38	7.06	34.43	106	184	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
2372.37	47.42	-26.58	74	42.53	32.28	6.88	34.27	189	231	Peak
2385.51	36.45	-17.55	54	31.51	32.3	6.91	34.27	189	231	Average
2484.07	59.32	-14.68	74	54.31	32.38	7.06	34.43	189	231	Peak
2483.77	40.42	-13.58	54	35.41	32.38	7.06	34.43	189	231	Average

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

Test Mode :	802.11b	**Temperature :**	21~23°C
Test Channel :	01	**Relative Humidity :**	51~53%
Test Engineer :	Eric Shih	**Polarization :**	Horizontal
Remark :	1. 2412 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, 103.23 dBμV/m - 20dB = 83.23 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
2412	98.46	-	-	93.5	32.31	6.95	34.3	136	185	Average
2412	103.23	-	-	98.27	32.31	6.95	34.3	136	185	Peak
4824	45.67	-28.33	74	60.4	33.97	8.77	57.47	100	0	Peak
7236	40.99	-42.24	83.23	52.59	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11b	**Temperature :**	21~23°C
Test Channel :	01	**Relative Humidity :**	51~53%
Test Engineer :	Eric Shih	**Polarization :**	Vertical
Remark :	1. 2411 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
2411	87.14	-	-	82.18	32.31	6.95	34.3	119	262	Average
2411	91.3	-	-	86.34	32.31	6.95	34.3	119	262	Peak
4824	41.9	-32.1	74	56.63	33.97	8.77	57.47	100	0	Peak
7236	41.04	-30.26	71.3	52.64	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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	98.72	-	-	93.75	32.33	6.99	34.35	135	186	Average
2436	103.43	-	-	98.46	32.33	6.99	34.35	135	186	Peak
4875	46.04	-27.96	74	60.75	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 :	802.11b	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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	87.19	-	-	82.22	32.33	6.99	34.35	163	97	Average
2436	91.42	-	-	86.45	32.33	6.99	34.35	163	97	Peak
4875	42.8	-31.2	74	57.51	33.95	8.82	57.48	100	0	Peak
7311	40.48	-33.52	74	52.05	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2463 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
2463	99.38	-	-	94.38	32.37	7.02	34.39	106	184	Average
2463	104.01	-	-	99.01	32.37	7.02	34.39	106	184	Peak
4926	43.86	-30.14	74	58.51	33.93	8.9	57.48	100	0	Peak
7386	42.07	-31.93	74	53.64	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11b	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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	89.23	-	-	84.23	32.37	7.02	34.39	160	94	Average
2462	93.62	-	-	88.62	32.37	7.02	34.39	160	94	Peak
4923	41.23	-32.77	74	55.91	33.93	8.87	57.48	100	0	Peak
7386	41.38	-32.62	74	52.95	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2411 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
2411	93.68	-	-	88.72	32.31	6.95	34.3	136	187	Average
2411	105.82	-	-	100.86	32.31	6.95	34.3	136	187	Peak
4824	41.92	-32.08	74	56.65	33.97	8.77	57.47	100	0	Peak
7236	41.12	-44.7	85.82	52.72	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	1. 2418 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
2418	81.69	-	-	76.78	32.31	6.95	34.35	167	156	Average
2418	92.56	-	-	87.65	32.31	6.95	34.35	167	156	Peak
4824	40.66	-33.34	74	55.39	33.97	8.77	57.47	100	0	Peak
7236	41.01	-31.55	72.56	52.61	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2438 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
119.91	41.33	-2.17	43.5	60.15	11.7	1.1	31.62	126	163	Peak
168.24	35.83	-7.67	43.5	56.24	9.66	1.23	31.3	-	-	Peak
240.06	41.11	-4.89	46	58.85	11.93	1.53	31.2	-	-	Peak
359.5	42.14	-3.86	46	56.56	14.93	2.06	31.41	-	-	Peak
600.3	39.78	-6.22	46	47.83	19.8	2.69	30.54	-	-	Peak
780.2	41.04	-4.96	46	46.45	21.79	3.11	30.31	-	-	Peak
2438	93.34	-	-	88.35	32.35	6.99	34.35	164	181	Average
2438	104.81	-	-	99.82	32.35	6.99	34.35	164	181	Peak
4875	41.51	-32.49	74	56.22	33.95	8.82	57.48	100	0	Peak
7311	40.72	-33.28	74	52.29	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	1. 2438 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
33.51	32.58	-7.42	40	46.77	17.12	0.57	31.88	-	-	Peak
120.18	41.2	-2.3	43.5	60.02	11.7	1.1	31.62	147	282	Peak
240.06	32.77	-13.23	46	50.51	11.93	1.53	31.2	-	-	Peak
359.5	43.25	-2.75	46	57.67	14.93	2.06	31.41	-	-	Peak
780.9	33.75	-12.25	46	39.13	21.81	3.11	30.3	-	-	Peak
864.2	36.19	-9.81	46	40.78	22.74	3.29	30.62	-	-	Peak
2438	82.03	-	-	77.04	32.35	6.99	34.35	138	90	Average
2438	92.5	-	-	87.51	32.35	6.99	34.35	138	90	Peak
4875	41.44	-32.56	74	56.15	33.95	8.82	57.48	100	0	Peak
7311	41.23	-32.77	74	52.8	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2463 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
2463	93.71	-	-	88.71	32.37	7.02	34.39	106	186	Average
2463	103.97	-	-	98.97	32.37	7.02	34.39	106	186	Peak
4923	41.02	-32.98	74	55.7	33.93	8.87	57.48	100	0	Peak
7386	41.63	-32.37	74	53.2	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11g	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
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	83.36	-	-	78.36	32.37	7.02	34.39	160	113	Average
2461	93.65	-	-	88.65	32.37	7.02	34.39	160	113	Peak
4923	41.63	-32.37	74	56.31	33.93	8.87	57.48	100	0	Peak
7386	40.92	-33.08	74	52.49	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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
2413	91.49	-	-	86.53	32.31	6.95	34.3	166	184	Average
2413	103.03	-	-	98.07	32.31	6.95	34.3	166	184	Peak
4821	44.09	-29.91	74	58.82	33.97	8.77	57.47	100	0	Peak
7236	42.06	-40.97	83.03	53.66	35.55	10.83	57.98	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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
2413	80.13	-	-	75.17	32.31	6.95	34.3	168	96	Average
2413	91.65	-	-	86.69	32.31	6.95	34.3	168	96	Peak
4824	41.84	-32.16	74	56.57	33.97	8.77	57.47	100	0	Peak
7236	41.4	-30.25	71.65	53	35.55	10.83	57.98	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2438 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
2438	91.26	-	-	86.27	32.35	6.99	34.35	164	184	Average
2438	102.76	-	-	97.77	32.35	6.99	34.35	164	184	Peak
4875	41.35	-32.65	74	56.06	33.95	8.82	57.48	100	0	Peak
7311	40.22	-33.78	74	51.79	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	1. 2438 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
2438	80.6	-	-	75.61	32.35	6.99	34.35	189	232	Average
2438	92.31	-	-	87.32	32.35	6.99	34.35	189	232	Peak
4875	41.2	-32.8	74	55.91	33.95	8.82	57.48	100	0	Peak
7311	40.33	-33.67	74	51.9	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2463 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
2463	91.97	-	-	86.97	32.37	7.02	34.39	106	186	Average
2463	104.2	-	-	99.2	32.37	7.02	34.39	106	186	Peak
4923	41.41	-32.59	74	56.09	33.93	8.87	57.48	100	0	Peak
7386	40.89	-33.11	74	52.46	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	1. 2466 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
2466	80.82	-	-	75.82	32.37	7.02	34.39	151	229	Average
2466	92.01	-	-	87.01	32.37	7.02	34.39	151	229	Peak
4923	41.56	-32.44	74	56.24	33.93	8.87	57.48	100	0	Peak
7386	41.31	-32.69	74	52.88	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	21~23°C
Test Channel :	03	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2423 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
2423	90.95	-	-	86.02	32.33	6.95	34.35	133	183	Average
2423	100.49	-	-	95.56	32.33	6.95	34.35	133	183	Peak
4845	42.05	-31.95	74	56.76	33.96	8.8	57.47	100	0	Peak
7266	41.04	-32.96	74	52.64	35.54	10.86	58	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	21~23°C
Test Channel :	03	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	1. 2421 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
2421	79.79	-	-	74.86	32.33	6.95	34.35	119	258	Average
2421	89.61	-	-	84.68	32.33	6.95	34.35	119	258	Peak
4845	41.78	-32.22	74	56.49	33.96	8.8	57.47	100	0	Peak
7266	41.12	-32.88	74	52.72	35.54	10.86	58	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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	91.47	-	-	86.5	32.33	6.99	34.35	134	184	Average
2436	101.26	-	-	96.29	32.33	6.99	34.35	134	184	Peak
4875	41.43	-32.57	74	56.14	33.95	8.82	57.48	100	0	Peak
7311	40.62	-33.38	74	52.19	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	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	79.82	-	-	74.85	32.33	6.99	34.35	109	98	Average
2436	89.63	-	-	84.66	32.33	6.99	34.35	109	98	Peak
4875	41.17	-32.83	74	55.88	33.95	8.82	57.48	100	0	Peak
7311	40.38	-33.62	74	51.95	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	Temperature :	21~23°C
Test Channel :	09	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	1. 2453 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
2453	90.5	-	-	85.52	32.35	7.02	34.39	106	184	Average
2453	99.89	-	-	94.91	32.35	7.02	34.39	106	184	Peak
4905	40.73	-33.27	74	55.41	33.93	8.87	57.48	100	0	Peak
7356	40.93	-33.07	74	52.5	35.53	10.96	58.06	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40	Temperature :	21~23°C
Test Channel :	09	Relative Humidity :	51~53%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	1. 2451 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
2451	78.98	-	-	74.03	32.35	6.99	34.39	189	231	Average
2451	88.71	-	-	83.76	32.35	6.99	34.39	189	231	Peak
4905	40.67	-33.33	74	55.35	33.93	8.87	57.48	100	0	Peak
7356	40.49	-33.51	74	52.06	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.

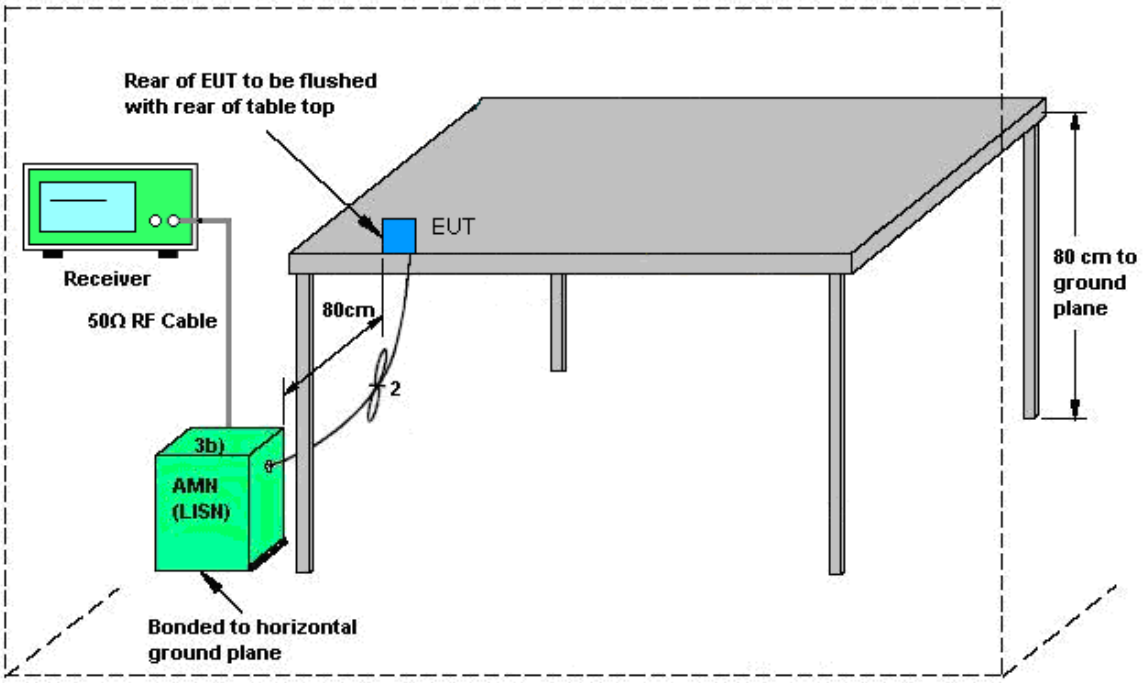
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.10-2009.
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.

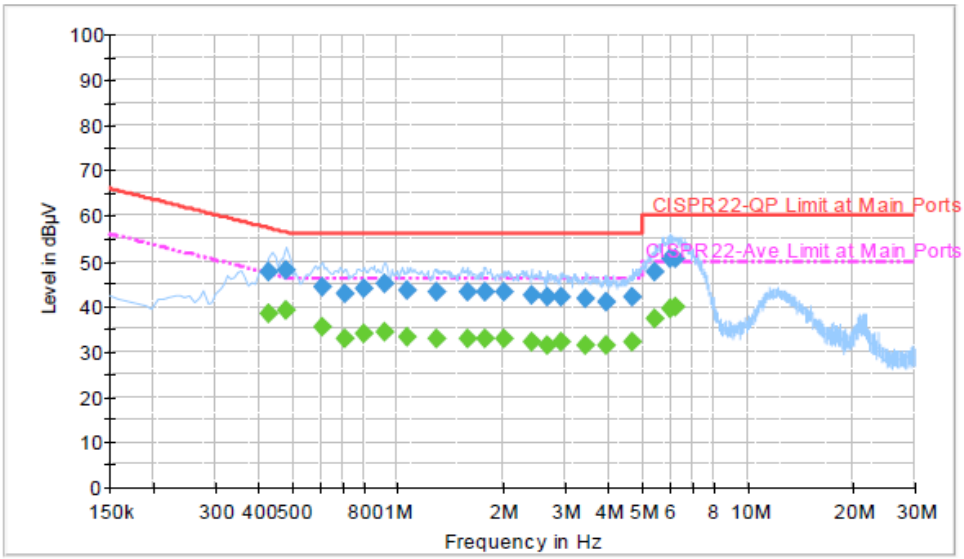
3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

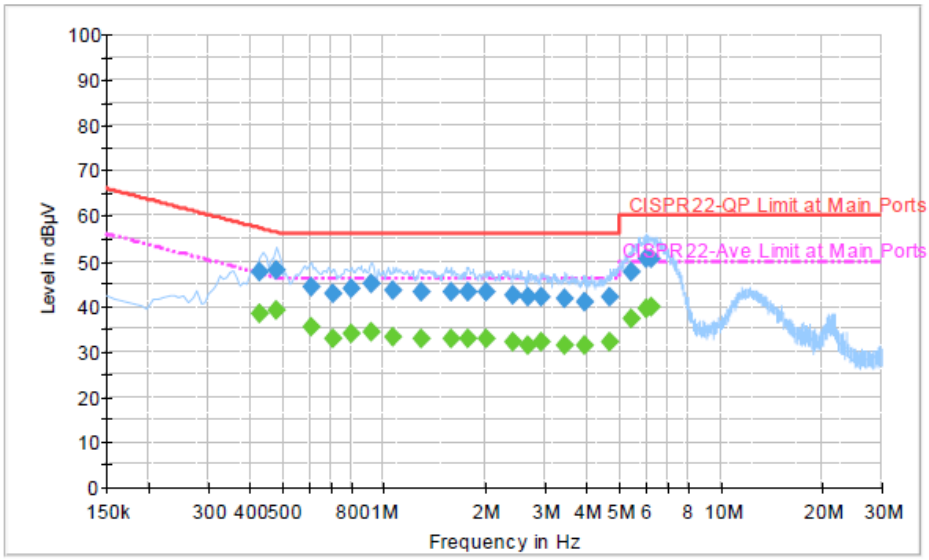
Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + MPEG4 + USB Cable (Charging from Adapter) + Monitor + Keyboard		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.430000	47.5	Off	L1	19.4	9.8	57.3
0.478000	48.1	Off	L1	19.4	8.3	56.4
0.606000	44.3	Off	L1	19.4	11.7	56.0
0.710000	42.8	Off	L1	19.5	13.2	56.0
0.798000	43.7	Off	L1	19.5	12.3	56.0
0.918000	44.8	Off	L1	19.4	11.2	56.0
1.070000	43.6	Off	L1	19.4	12.4	56.0
1.294000	43.1	Off	L1	19.5	12.9	56.0
1.582000	43.1	Off	L1	19.4	12.9	56.0
1.782000	43.2	Off	L1	19.5	12.8	56.0
2.006000	43.1	Off	L1	19.5	12.9	56.0
2.422000	42.3	Off	L1	19.6	13.7	56.0
2.670000	41.9	Off	L1	19.5	14.1	56.0
2.950000	42.2	Off	L1	19.5	13.8	56.0
3.446000	41.7	Off	L1	19.6	14.3	56.0
3.942000	41.1	Off	L1	19.6	14.9	56.0
4.702000	42.0	Off	L1	19.6	14.0	56.0
5.446000	47.7	Off	L1	19.6	12.3	60.0
5.990000	50.5	Off	L1	19.6	9.5	60.0
6.214000	50.6	Off	L1	19.6	9.4	60.0

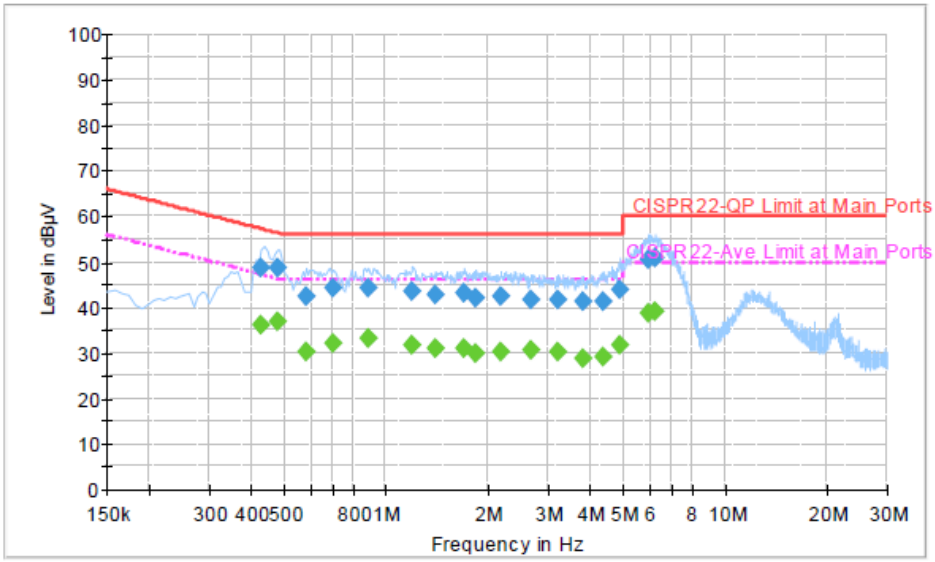
Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link + MPEG4 + USB Cable (Charging from Adapter) + Monitor + Keyboard		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.430000	38.2	Off	L1	19.4	9.1	47.3
0.478000	39.3	Off	L1	19.4	7.1	46.4
0.606000	35.4	Off	L1	19.4	10.6	46.0
0.710000	33.0	Off	L1	19.5	13.0	46.0
0.798000	34.1	Off	L1	19.5	11.9	46.0
0.918000	34.1	Off	L1	19.4	11.9	46.0
1.070000	33.1	Off	L1	19.4	12.9	46.0
1.294000	32.8	Off	L1	19.5	13.2	46.0
1.582000	33.0	Off	L1	19.4	13.0	46.0
1.782000	33.0	Off	L1	19.5	13.0	46.0
2.006000	32.9	Off	L1	19.5	13.1	46.0
2.422000	32.0	Off	L1	19.6	14.0	46.0
2.670000	31.5	Off	L1	19.5	14.5	46.0
2.950000	32.0	Off	L1	19.5	14.0	46.0
3.446000	31.2	Off	L1	19.6	14.8	46.0
3.942000	31.4	Off	L1	19.6	14.6	46.0
4.702000	32.2	Off	L1	19.6	13.8	46.0
5.446000	37.1	Off	L1	19.6	12.9	50.0
5.990000	39.6	Off	L1	19.6	10.4	50.0
6.214000	39.9	Off	L1	19.6	10.1	50.0

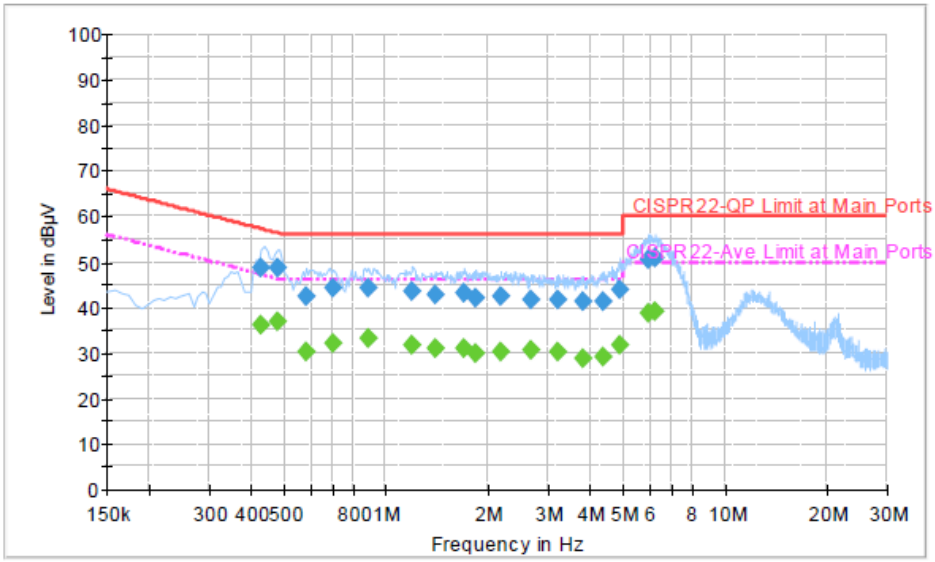
Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + MPEG4 + USB Cable (Charging from Adapter) + Monitor + Keyboard		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.430000	48.7	Off	N	19.4	8.6	57.3
0.478000	48.9	Off	N	19.4	7.5	56.4
0.582000	42.5	Off	N	19.4	13.5	56.0
0.702000	44.1	Off	N	19.5	11.9	56.0
0.886000	44.3	Off	N	19.4	11.7	56.0
1.198000	43.7	Off	N	19.5	12.3	56.0
1.398000	42.7	Off	N	19.5	13.3	56.0
1.702000	43.2	Off	N	19.5	12.8	56.0
1.846000	42.1	Off	N	19.5	13.9	56.0
2.182000	42.4	Off	N	19.6	13.6	56.0
2.686000	41.8	Off	N	19.6	14.2	56.0
3.230000	41.6	Off	N	19.6	14.4	56.0
3.822000	41.2	Off	N	19.6	14.8	56.0
4.398000	41.4	Off	N	19.7	14.6	56.0
4.902000	44.0	Off	N	19.7	12.0	56.0
5.918000	50.5	Off	N	19.7	9.5	60.0
6.238000	50.8	Off	N	19.7	9.2	60.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link + MPEG4 + USB Cable (Charging from Adapter) + Monitor + Keyboard		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.430000	36.0	Off	N	19.4	11.3	47.3
0.478000	36.8	Off	N	19.4	9.6	46.4
0.582000	30.2	Off	N	19.4	15.8	46.0
0.702000	32.1	Off	N	19.5	13.9	46.0
0.886000	33.2	Off	N	19.4	12.8	46.0
1.198000	31.7	Off	N	19.5	14.3	46.0
1.398000	31.0	Off	N	19.5	15.0	46.0
1.702000	31.1	Off	N	19.5	14.9	46.0
1.846000	29.9	Off	N	19.5	16.1	46.0
2.182000	30.4	Off	N	19.6	15.6	46.0
2.686000	30.5	Off	N	19.6	15.5	46.0
3.230000	30.1	Off	N	19.6	15.9	46.0
3.822000	28.8	Off	N	19.6	17.2	46.0
4.398000	29.2	Off	N	19.7	16.8	46.0
4.902000	31.7	Off	N	19.7	14.3	46.0
5.918000	38.7	Off	N	19.7	11.3	50.0
6.238000	39.2	Off	N	19.7	10.8	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	Mar. 21, 2013 ~ Apr. 09, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Mar. 21, 2013 ~ Apr. 09, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Mar. 21, 2013 ~ Apr. 09, 2013	Sep. 07, 2013	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	300MHz~40GHz	Feb. 05, 2013	Mar. 21, 2013 ~ Apr. 09, 2013	Feb. 04, 2014	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Feb. 05, 2013	Mar. 21, 2013 ~ Apr. 09, 2013	Feb. 04, 2014	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9KHz – 2.75GHz	Nov. 13, 2012	Mar. 28, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100081	9KHz ~ 30MHz	Dec. 12, 2012	Mar. 28, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9KHz ~ 30MHz	Dec. 06, 2012	Mar. 28, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Mar. 28, 2013	N/A	Conduction (CO05-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	Mar. 29, 2013 ~ Apr. 03, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz ~ 30GHz	Nov. 30, 2012	Mar. 29, 2013 ~ Apr. 03, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 22, 2012	Mar. 29, 2013 ~ Apr. 03, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 01, 2012	Mar. 29, 2013 ~ Apr. 03, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	159088	1GHz ~ 18GHz	Feb. 27, 2013	Mar. 29, 2013 ~ Apr. 03, 2013	Feb. 26, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10-1000MHz. 32dB.GAIN	Feb. 26, 2013	Mar. 29, 2013 ~ Apr. 03, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	Mar. 29, 2013 ~ Apr. 03, 2013	Sep. 02, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Mar. 29, 2013 ~ Apr. 03, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Mar. 29, 2013 ~ Apr. 03, 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 EP322731 as below.