



FCC RF Test Report

APPLICANT : NetComm Wireless Limited
EQUIPMENT : OutDoor HSPA+ M2M WiFi Router
BRAND NAME : NetComm Wireless
MODEL NAME : NTC-30WV
FCC ID : XIA-NTC30WV
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on May 07, 2012 and completely tested on Jul. 24, 2012. 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



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



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	
			Conducted Spurious Emission		Pass	
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	
			Radiated Spurious Emission		Pass	Under limit 3.17 dB at 2389.200 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 5.60 dB at 3.758 MHz
3.6	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

NetComm Wireless Limited

Level 2, 18-20 Orion Road Lane Cove, NSW Australia

1.2 Manufacturer

NetComm Wireless Limited

Level 2, 18-20 Orion Road Lane Cove, NSW Australia

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	OutDoor HSPA+ M2M WiFi Router
Brand Name	NetComm Wireless
Model Name	NTC-30WV
FCC ID	XIA-NTC30WV
Radios application	GSM/EGPRS/WCDMA/HSPA/WLAN 11bgn
HW Version	V1.3
SW Version	1.9.81.0
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.



Product Specification subjective to this standard																							
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz																						
Maximum Output Power to Antenna	<Ant. 1> 802.11b : 15.97 dBm (0.0395 W) 802.11g : 20.70 dBm (0.1175 W) 802.11n HT-20 : 20.77 dBm (0.1194 W) 802.11n HT-40 : 20.83 dBm (0.1211 W) <Ant. 1+2> 802.11b : 15.65 dBm (0.0367 W) 802.11g : 20.21 dBm (0.1050 W) 802.11n HT-20 : 23.95 dBm (0.2483 W) 802.11n HT-40 : 23.52 dBm (0.2249 W)																						
99% Occupied Bandwidth	<Ant. 1> 802.11b : 15.05MHz 802.11g : 16.40MHz 802.11n HT-20 : 17.50MHz 802.11n HT-40 : 35.90MHz <Ant. 1+2(1)> 802.11b : 15.05MHz 802.11g : 16.40MHz 802.11n HT-20 : 17.50MHz 802.11n HT-40 : 35.90MHz <Ant. 1+2(2)> 802.11b : 15.10MHz 802.11g : 16.40MHz 802.11n HT-20 : 17.50MHz 802.11n HT-40 : 35.80MHz																						
Antenna Type	Fixed External Antenna with gain 4.00 dBi																						
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)																						
Antenna Function for Transmitter	<table border="1"><thead><tr><th></th><th>Ant. 1.</th><th>Ant. 2.</th></tr></thead><tbody><tr><td>802.11b SISO</td><td>V</td><td>-</td></tr><tr><td>802.11b MIMO</td><td>V</td><td>V</td></tr><tr><td>802.11g SISO</td><td>V</td><td>-</td></tr><tr><td>802.11g MIMO</td><td>V</td><td>V</td></tr><tr><td>802.11n SISO</td><td>V</td><td>-</td></tr><tr><td>802.11n MIMO</td><td>V</td><td>V</td></tr></tbody></table>			Ant. 1.	Ant. 2.	802.11b SISO	V	-	802.11b MIMO	V	V	802.11g SISO	V	-	802.11g MIMO	V	V	802.11n SISO	V	-	802.11n MIMO	V	V
	Ant. 1.	Ant. 2.																					
802.11b SISO	V	-																					
802.11b MIMO	V	V																					
802.11g SISO	V	-																					
802.11g MIMO	V	V																					
802.11n SISO	V	-																					
802.11n MIMO	V	V																					



1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st 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	03CH06-HY
			722060/4086B-1

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- TCB Workshop 2012, April
- ANSI C63.4-2003 and ANSI C63.10-2009
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark:

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



1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Phone	SAMPO	HT-B907WL	FCC DoC	N/A	N/A
5.	Adaptor	Amigo	AMS3-1201500FS	N/A	N/A	6.4m non-shielded cable



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 (Y 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 and 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.

SISO <Ant. 1>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	15.97	15.76	15.45	15.64

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	20.70	20.60	20.46	20.51	19.71	20.43	17.70	18.03

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.77	20.70	20.69	20.24	19.55	19.49	18.12	17.27
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	20.05	20.13	19.97	20.67	19.24	18.43	17.03	17.00

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.83	20.52	20.49	19.98	19.20	20.00	17.69	17.12
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	20.63	20.62	20.22	20.67	19.27	18.70	17.37	16.91



SISO <Ant. 2>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	15.91	15.85	15.81	15.88

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	20.06	19.72	19.86	19.68	18.74	19.82	16.51	17.54

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.34	20.22	19.59	19.23	18.49	18.74	17.30	16.70
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	19.58	19.50	19.24	20.24	18.33	18.42	16.37	16.24

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.35	19.67	19.48	19.44	18.73	19.33	17.10	16.12
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	19.88	19.83	19.44	19.22	18.07	17.44	16.05	15.88



MIMO <Ant. 1+2(1)>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	12.57	12.39	12.12	12.65

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	17.00	16.88	16.93	16.50	15.88	16.52	13.38	14.59

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.41	20.05	19.91	19.63	19.11	19.21	17.14	16.28
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	19.35	19.45	19.33	20.23	18.32	18.12	17.12	16.93

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.12	19.75	19.69	19.90	18.64	19.27	17.06	16.65
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	20.18	20.11	19.77	19.95	18.75	18.04	16.55	16.92



MIMO <Ant. 1+2(2)>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	12.70	12.66	12.36	12.51

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	17.39	17.00	17.04	17.10	16.30	17.40	14.40	14.71

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	21.42	20.87	20.68	20.24	19.16	19.42	17.69	17.23
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	20.04	20.35	20.25	21.37	19.62	18.93	17.25	17.12

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	20.87	20.42	20.37	20.48	19.23	19.98	17.69	16.95
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	20.72	20.74	20.17	20.42	19.30	18.60	17.06	16.57



MIMO <Ant. 1+2>

802.11b				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	15.65	15.54	15.25	15.59

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	20.21	19.95	20.00	19.82	19.11	19.99	16.93	17.66

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.95	23.49	23.32	22.96	22.15	22.33	20.43	19.79
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	22.72	22.93	22.82	23.85	22.03	21.55	20.20	20.04

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	23.52	23.11	23.05	23.21	21.96	22.65	20.40	19.81
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm)	23.47	23.45	22.98	23.20	22.04	21.34	19.82	19.76

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO. Ant. 2.



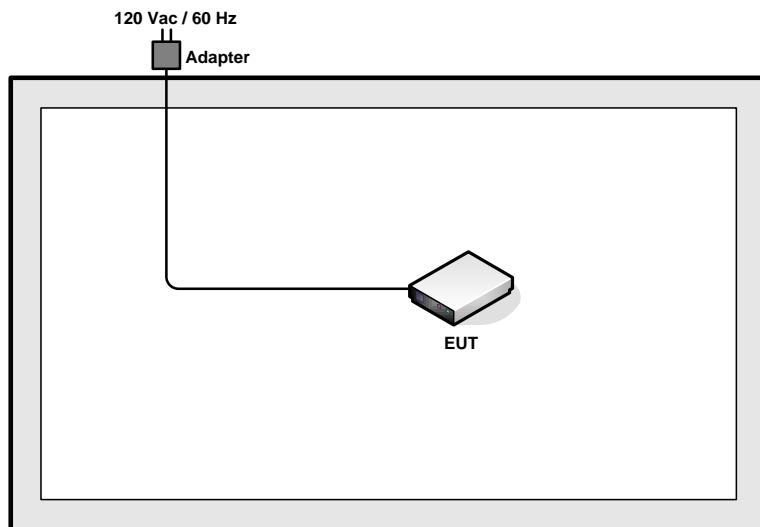
2.3 Test Mode

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

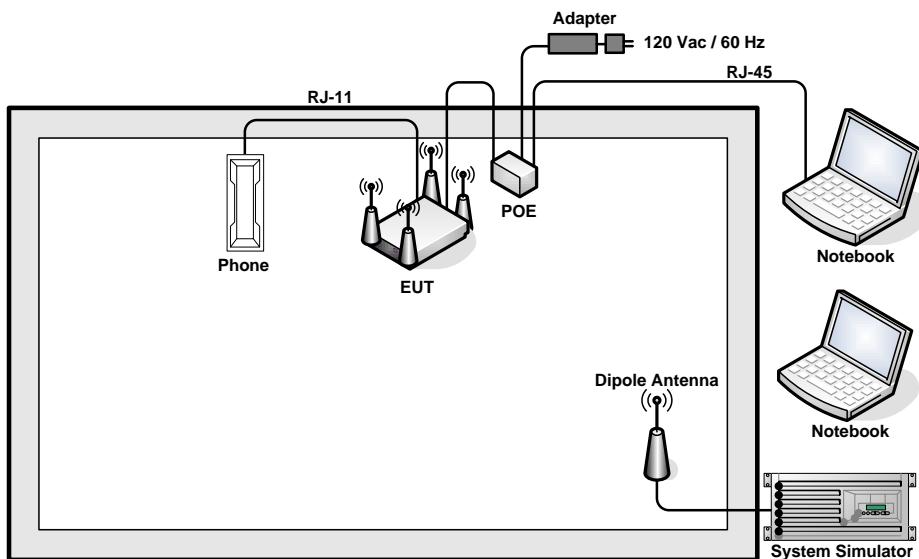
Test Cases					
Conducted TCs	Power Spectral Density	Test Items	Mode	Data Rate	Test Channel
		802.11b	1 Mbps	1/6/11	
		802.11g	6 Mbps	1/6/11	
		802.11n HT-20	6.5 Mbps	1/6/11	
		802.11n HT-40	13.5 Mbps	3/6/9	
	Output Power	802.11b	1 Mbps	1/6/11	
		802.11g	6 Mbps	1/6/11	
		802.11n HT-20	6.5 Mbps	1/6/11	
		802.11n HT-40	13.5 Mbps	3/6/9	
	Conducted Band EDGE	802.11b	1 Mbps	1/11	
		802.11g	6 Mbps	1/11	
		802.11n HT-20	6.5 Mbps	1/11	
		802.11n HT-40	13.5 Mbps	3/9	
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11	
		802.11g	6 Mbps	1/6/11	
		802.11n HT-20	6.5 Mbps	1/6/11	
		802.11n HT-40	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 HT-20	6.5 Mbps	1/11	
		802.11n HT-40	13.5 Mbps	3/9	
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11	
		802.11g	6 Mbps	1/6/11	
		802.11n HT-20	6.5 Mbps	1/6/11	
		802.11n HT-40	13.5 Mbps	3/6/9	
Test Cases					
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + WLAN Link + RJ-45 + RJ-11 + POE				

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>





2.5 RF Utility

Programmed RF utility, "at command" installed in notebook make the EUT provides functions like channel selection and power level for transmitting and receiving signals continuously.

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

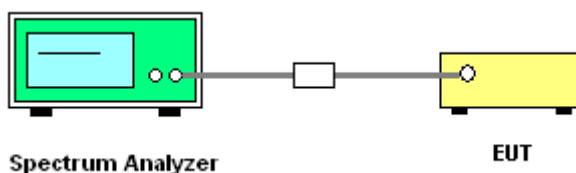
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW). Set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.

3.1.4 Test Setup





3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	24~26°C		
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%		

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)			6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>		
01	2412	12.16	12.16	12.16	0.5	Pass
06	2437	12.16	12.16	12.16	0.5	Pass
11	2462	12.12	12.12	12.12	0.5	Pass

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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)			6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>		
01	2412	16.32	16.32	16.32	0.5	Pass
06	2437	16.32	16.36	16.32	0.5	Pass
11	2462	16.32	16.32	16.28	0.5	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26°C		
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%		

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 6dB Bandwidth (MHz)			6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>		
01	2412	17.28	17.36	17.28	0.5	Pass
06	2437	17.28	17.28	17.32	0.5	Pass
11	2462	17.24	17.28	17.32	0.5	Pass



Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-40 6dB Bandwidth (MHz)			6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>		
03	2422	35.60	35.68	35.68	0.5	Pass
06	2437	36.08	35.92	35.60	0.5	Pass
09	2452	35.68	35.68	35.60	0.5	Pass



3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)			Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	
01	2412	15.05	15.05	15.05	Pass
06	2437	15.05	15.05	15.00	Pass
11	2462	15.05	15.05	15.10	Pass

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

Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)			Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	
01	2412	16.40	16.40	16.40	Pass
06	2437	16.35	16.35	16.35	Pass
11	2462	16.40	16.40	16.35	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 99% Occupied Bandwidth (MHz)			Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	
01	2412	17.40	17.40	17.45	Pass
06	2437	17.45	17.45	17.45	Pass
11	2462	17.50	17.50	17.50	Pass



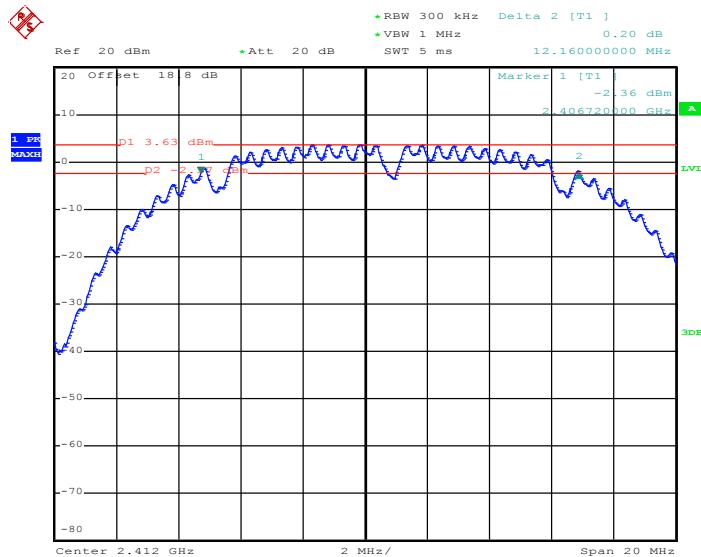
Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-40 99% Occupied Bandwidth (MHz)			Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	
03	2422	35.90	35.90	35.80	Pass
06	2437	35.80	35.90	35.80	Pass
09	2452	35.80	35.90	35.70	Pass

3.1.7 Test Result of 6dB Bandwidth Plots

802.11b – SISO Ant. 1

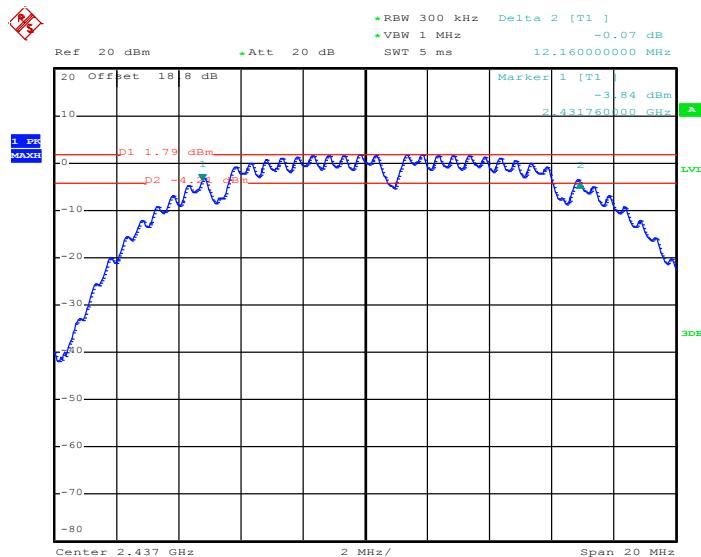
6 dB Bandwidth Plot on Channel 01



Date: 22.JUN.2012 22:29:03

802.11b – SISO Ant. 1

6 dB Bandwidth Plot on Channel 06

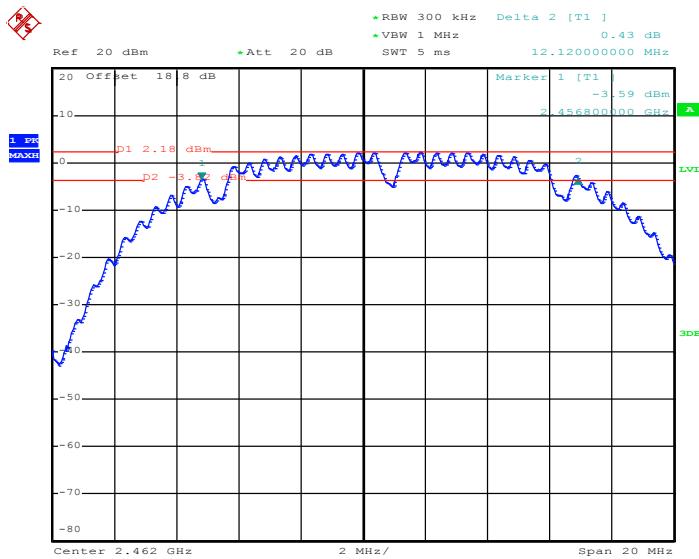


Date: 22.JUN.2012 22:37:19



802.11b – SISO Ant. 1

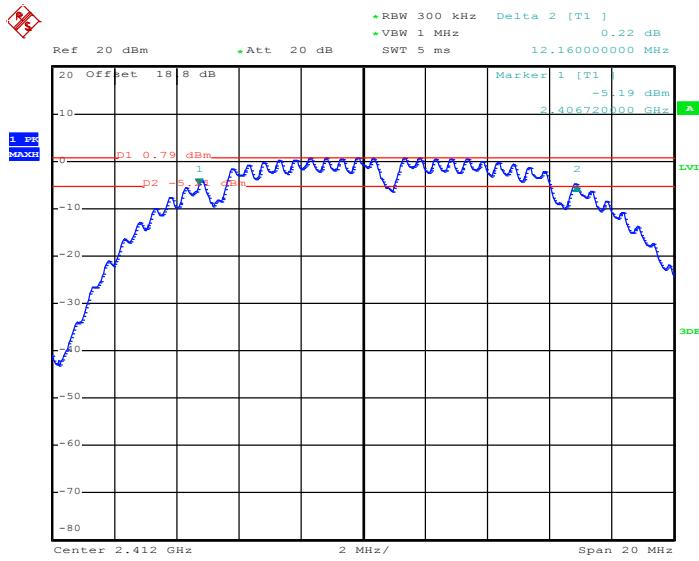
6 dB Bandwidth Plot on Channel 11



Date: 22.JUN.2012 22:39:49

802.11b – MIMO Ant. 1+2(1)

6 dB Bandwidth Plot on Channel 01

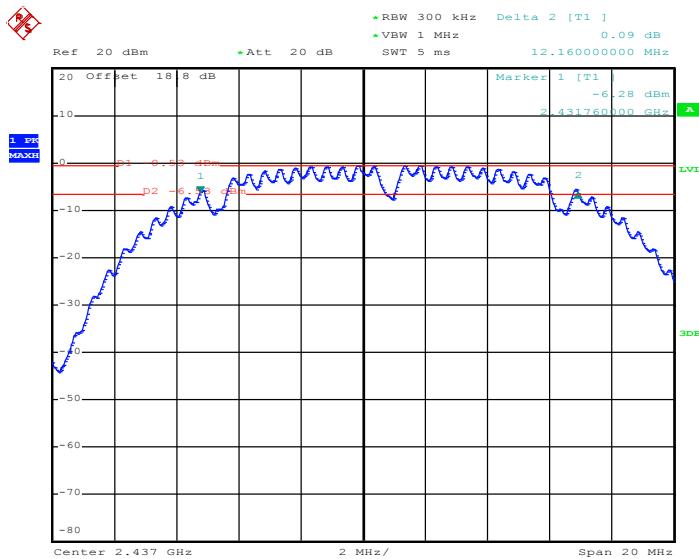


Date: 23.JUN.2012 00:24:17



802.11b – MIMO Ant. 1+2(1)

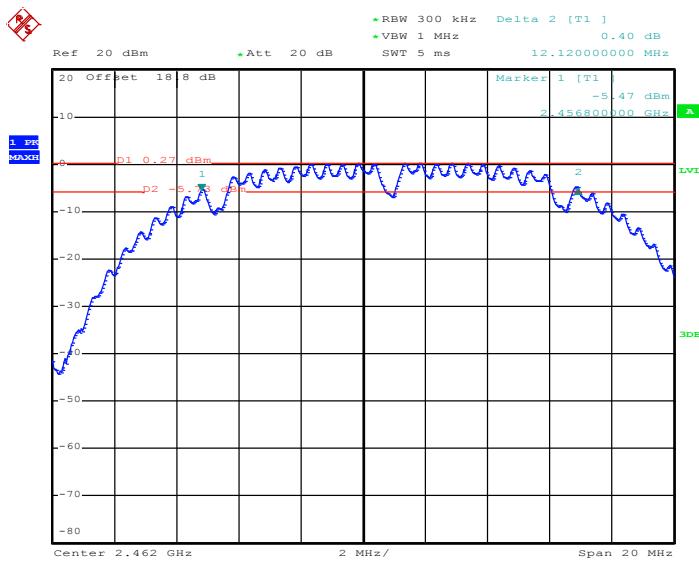
6 dB Bandwidth Plot on Channel 06



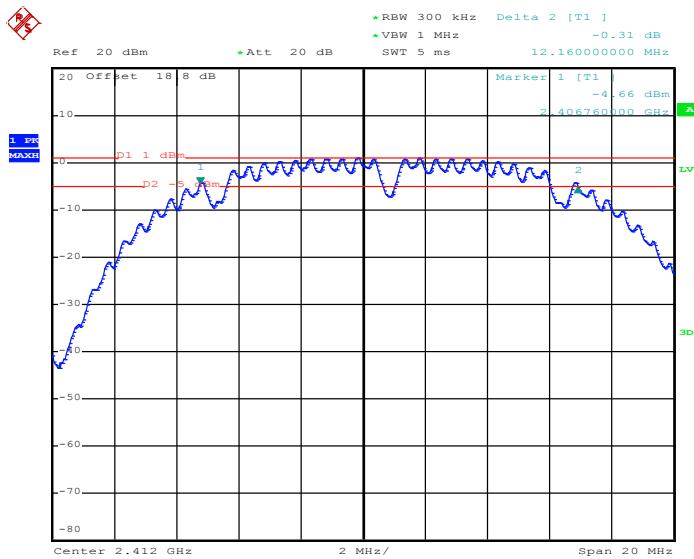
Date: 23.JUN.2012 00:22:02

802.11b – MIMO Ant. 1+2(1)

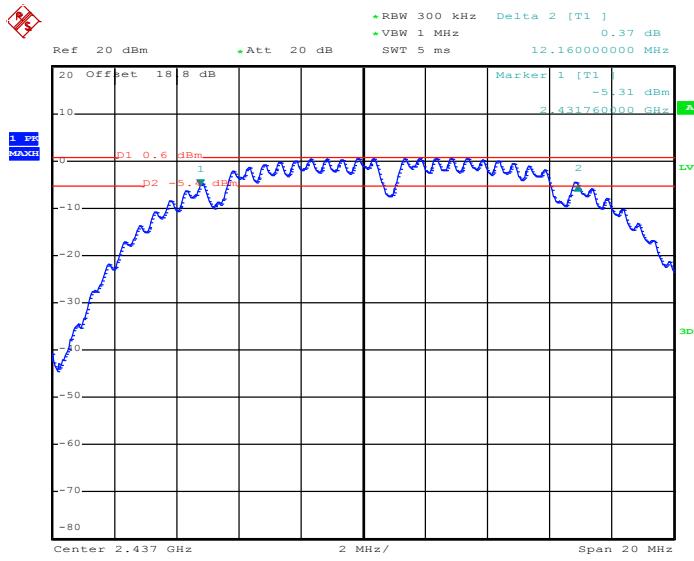
6 dB Bandwidth Plot on Channel 11



Date: 23.JUN.2012 00:19:27

802.11b – MIMO Ant. 1+2(2)
6 dB Bandwidth Plot on Channel 01


Date: 23.JUN.2012 00:42:18

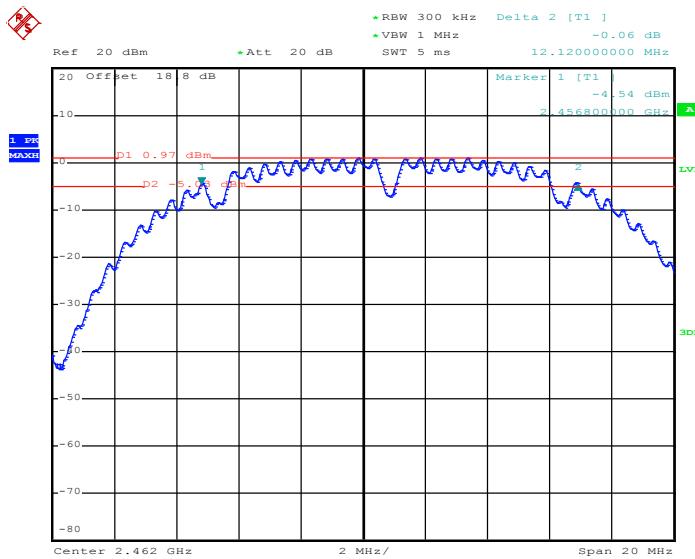
802.11b – MIMO Ant. 1+2(2)
6 dB Bandwidth Plot on Channel 06


Date: 23.JUN.2012 00:46:12



802.11b – MIMO Ant. 1+2(2)

6 dB Bandwidth Plot on Channel 11

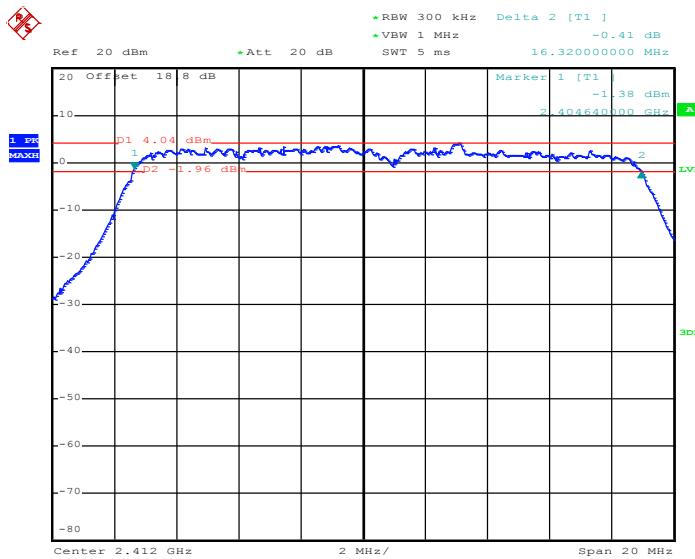


Date: 23.JUN.2012 00:49:07



802.11g – Ant. 1

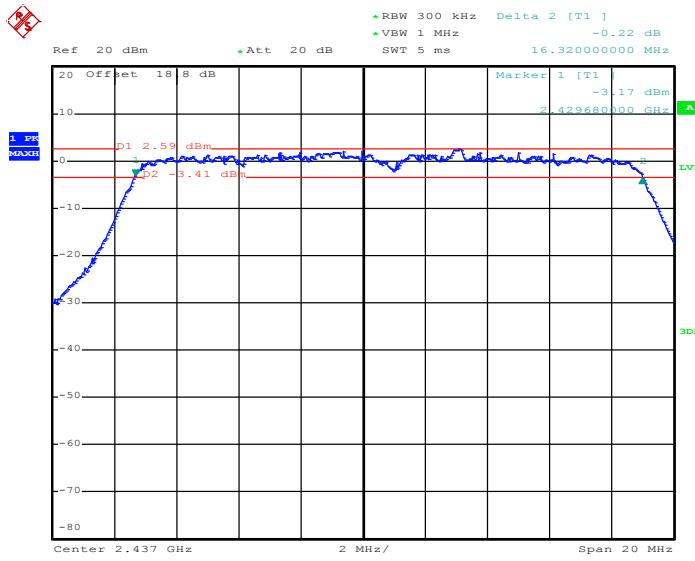
6 dB Bandwidth Plot on Channel 01



Date: 22.JUN.2012 22:50:19

802.11g – Ant. 1

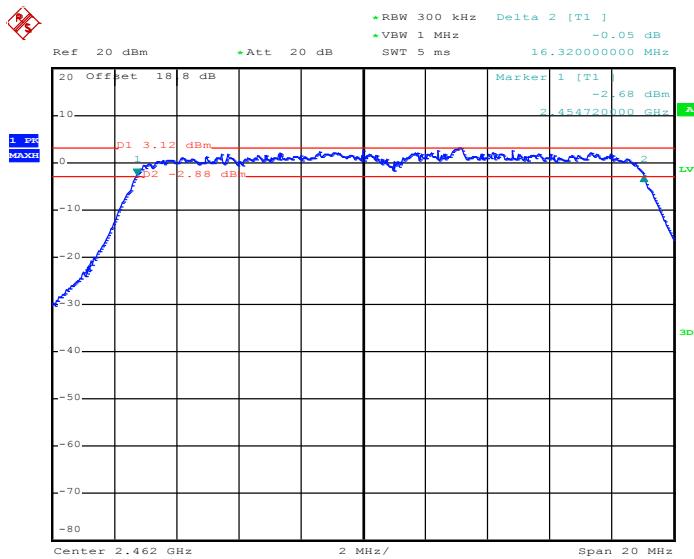
6 dB Bandwidth Plot on Channel 06



Date: 22.JUN.2012 22:48:27

802.11g – Ant. 1

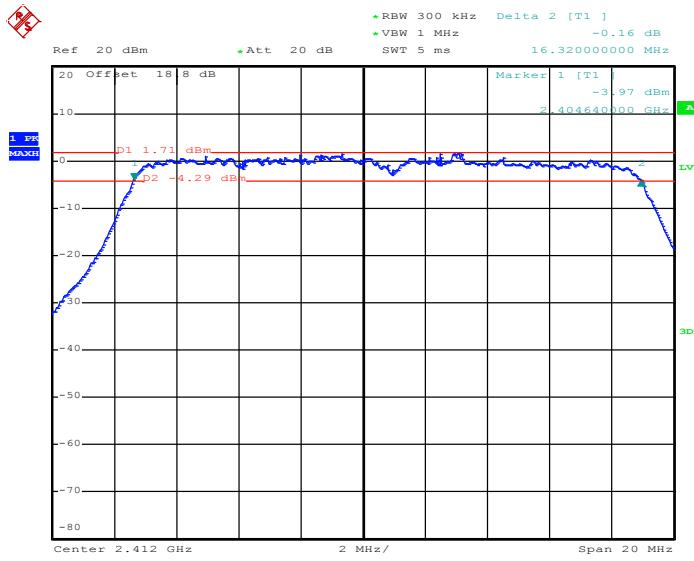
6 dB Bandwidth Plot Channel 11



Date: 22.JUN.2012 22:44:51

802.11g – MIMO Ant. 1+2(1)

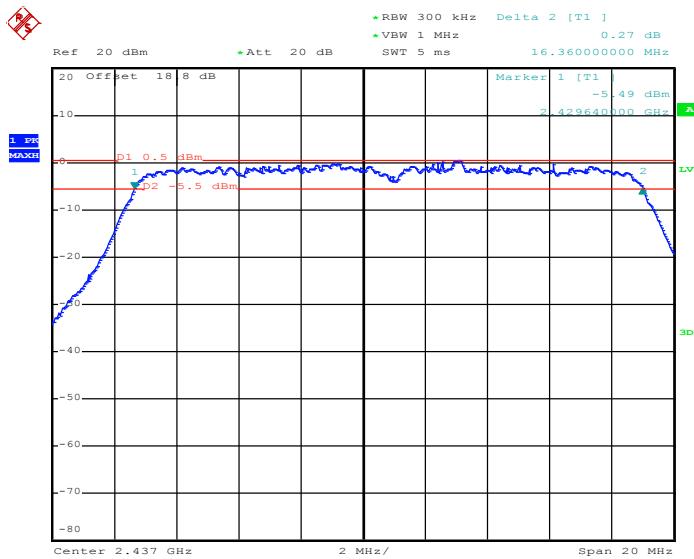
6 dB Bandwidth Plot on Channel 01



Date: 23.JUN.2012 00:11:53

802.11g – MIMO Ant. 1+2(1)

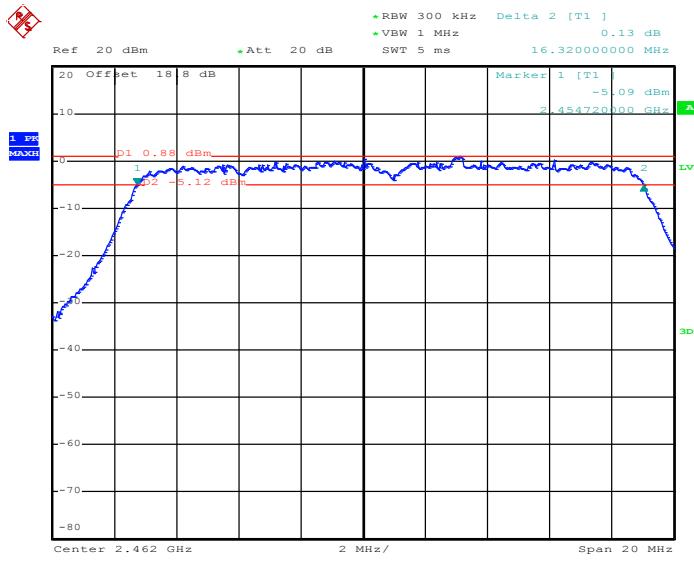
6 dB Bandwidth Plot on Channel 06



Date: 23.JUN.2012 00:14:30

802.11g – MIMO Ant. 1+2(1)

6 dB Bandwidth Plot on Channel 11

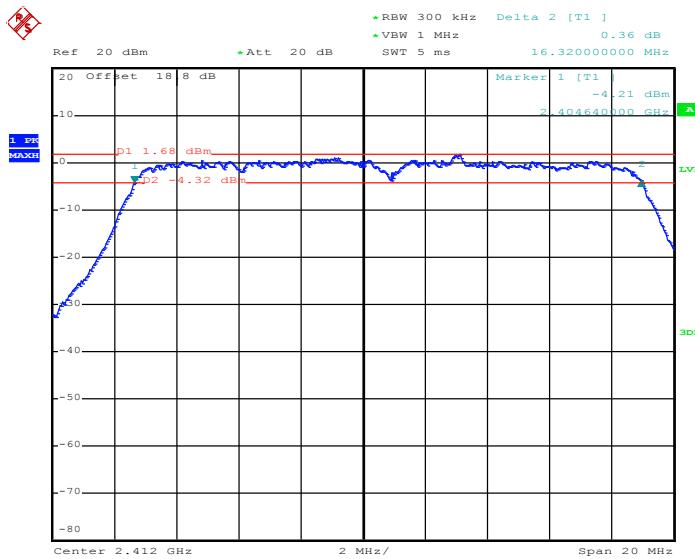


Date: 23.JUN.2012 00:16:53



802.11g – MIMO Ant. 1+2(2)

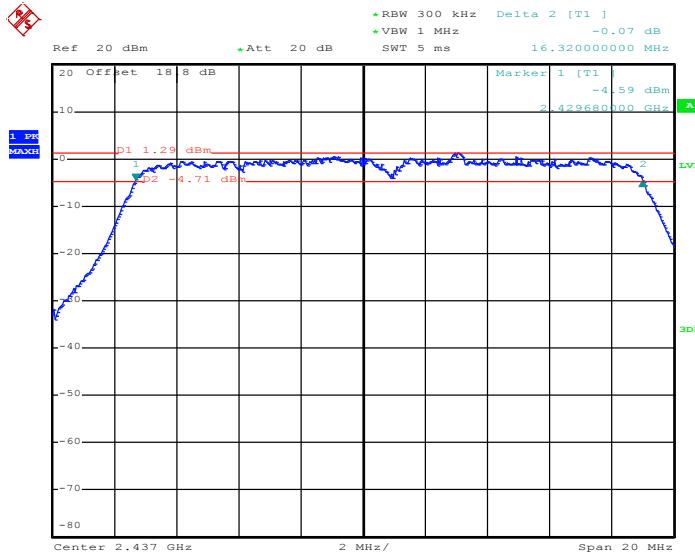
6 dB Bandwidth Plot on Channel 01



Date: 23.JUN.2012 00:58:24

802.11g – MIMO Ant. 1+2(2)

6 dB Bandwidth Plot on Channel 06

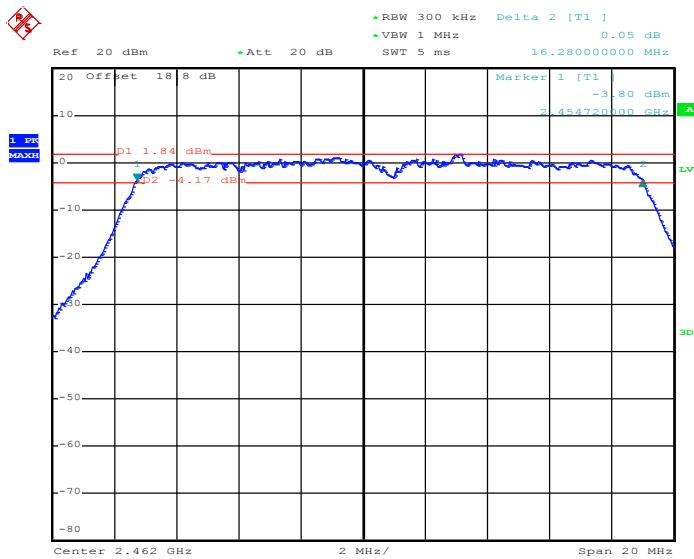


Date: 23.JUN.2012 00:56:02



802.11g – MIMO Ant. 1+2(2)

6 dB Bandwidth Plot on Channel 11

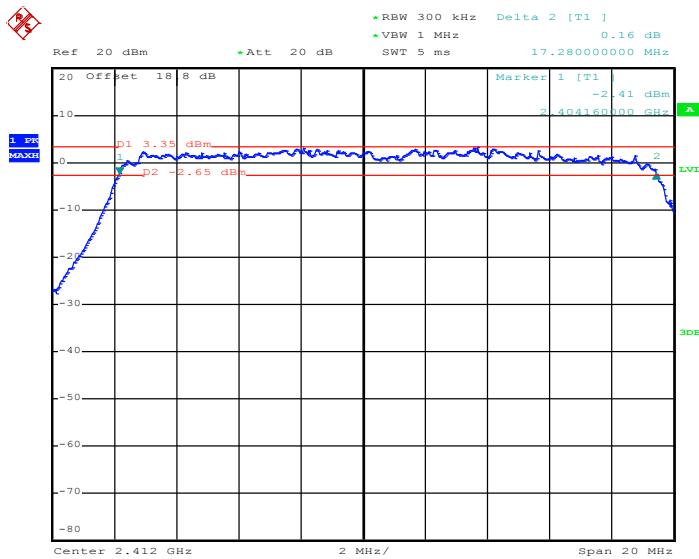


Date: 23.JUN.2012 00:52:34



802.11n HT-20 – SISO Ant. 1

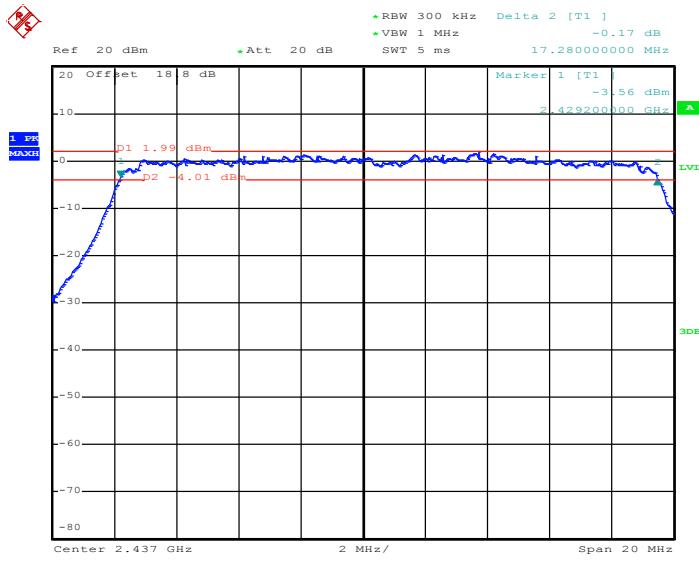
6 dB Bandwidth Plot on Channel 01



Date: 22.JUN.2012 22:53:21

802.11n HT-20 – SISO Ant. 1

6 dB Bandwidth Plot on Channel 06

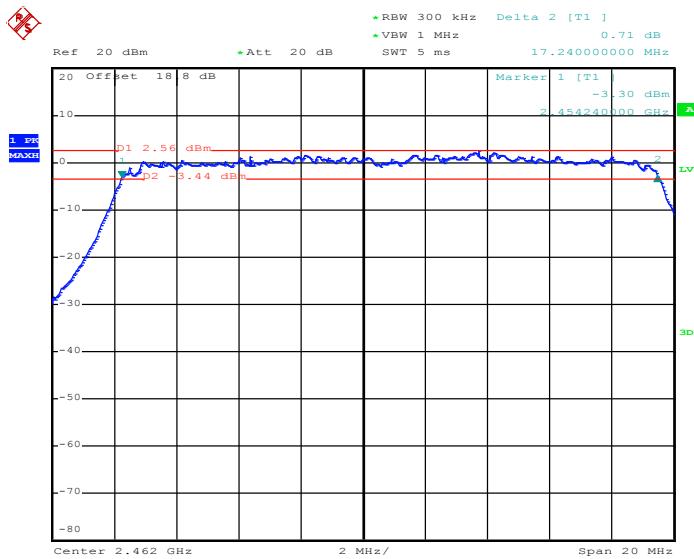


Date: 22.JUN.2012 22:56:03



802.11n HT-20 – SISO Ant. 1

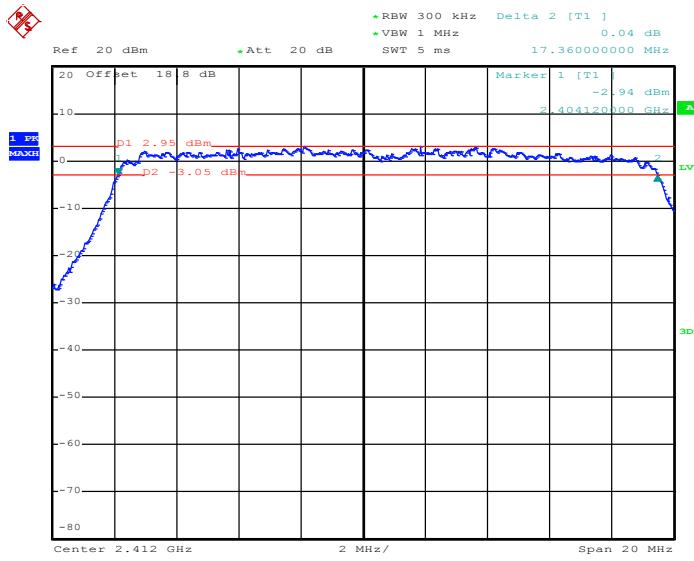
6 dB Bandwidth Plot on Channel 11



Date: 22.JUN.2012 22:58:45

802.11n HT-20 – MIMO Ant. 1+2(1)

6 dB Bandwidth Plot on Channel 01

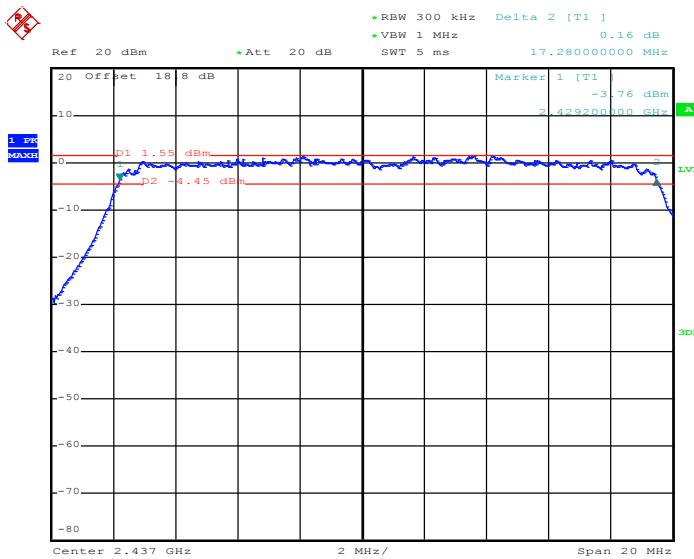


Date: 23.JUN.2012 00:09:03



802.11n HT-20 – MIMO Ant. 1+2(1)

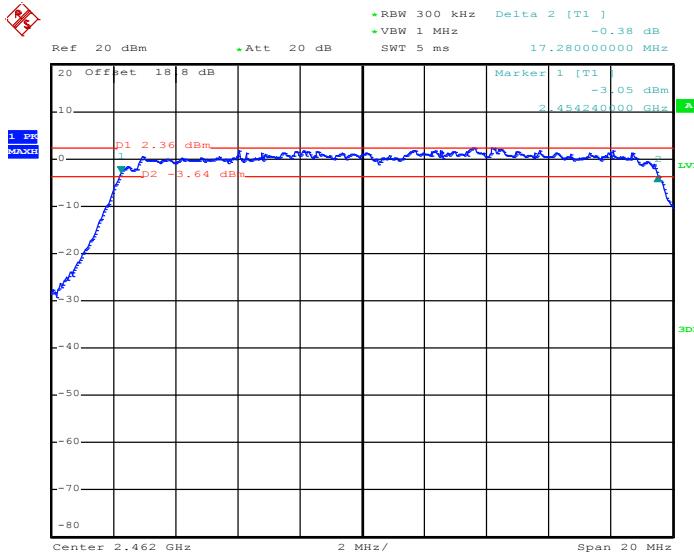
6 dB Bandwidth Plot on Channel 06



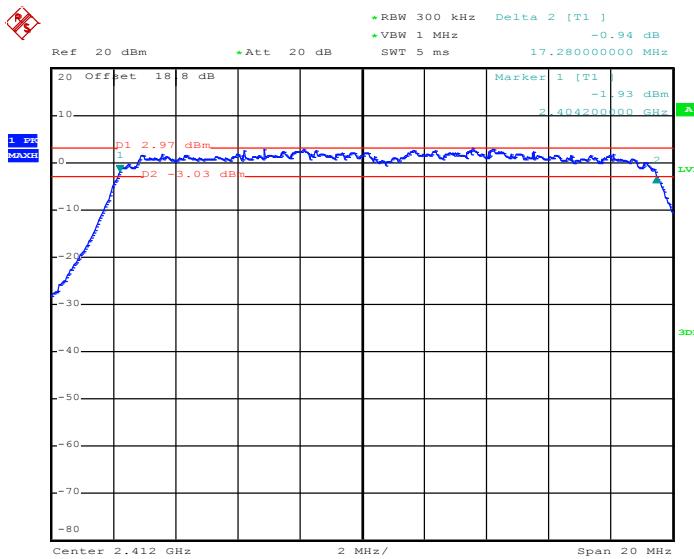
Date: 23.JUN.2012 00:06:51

802.11n HT-20 – MIMO Ant. 1+2(1)

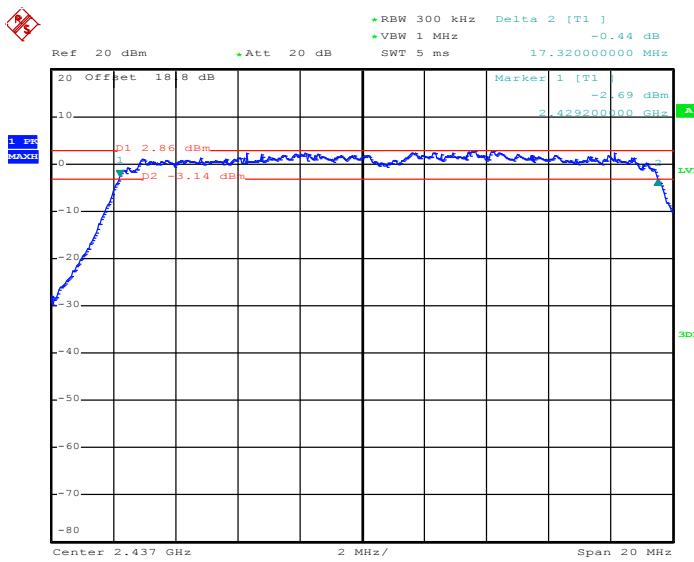
6 dB Bandwidth Plot on Channel 11



Date: 23.JUN.2012 00:03:42

802.11n HT-20 – MIMO Ant. 1+2(2)
6 dB Bandwidth Plot on Channel 01


Date: 23.JUN.2012 01:02:06

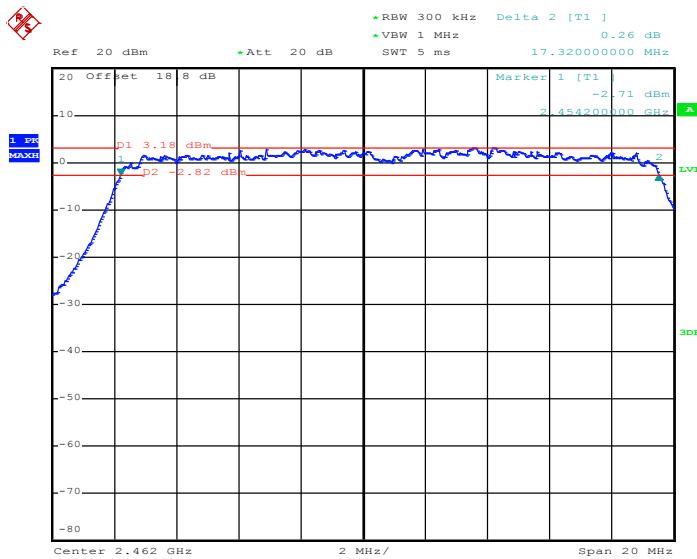
802.11n HT-20 – MIMO Ant. 1+2(2)
6 dB Bandwidth Plot on Channel 06


Date: 23.JUN.2012 01:05:15



802.11n HT-20 – MIMO Ant. 1+2(2)

6 dB Bandwidth Plot on Channel 11

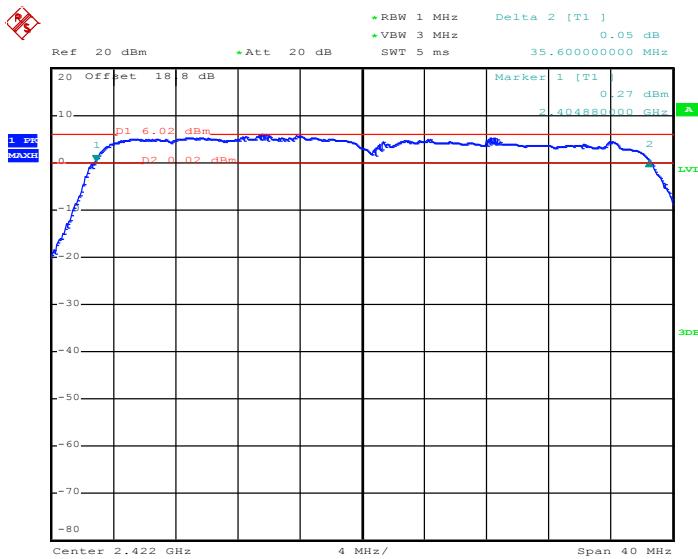


Date: 23.JUN.2012 01:09:10



802.11n HT-40 – SISO Ant. 1

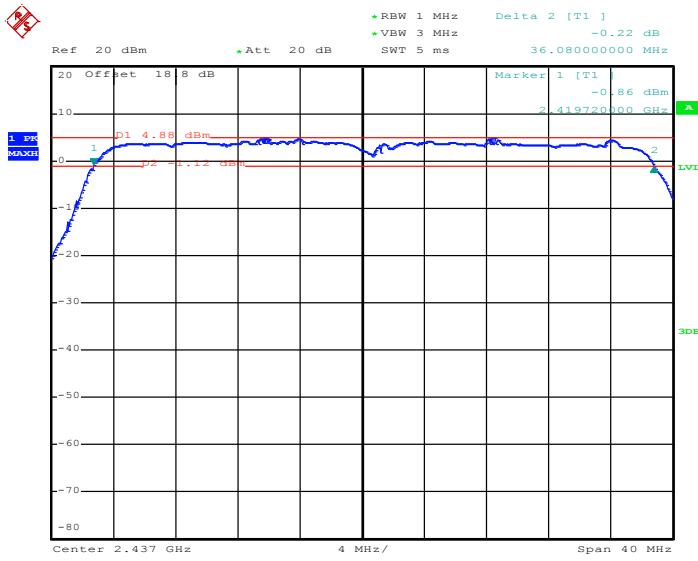
6 dB Bandwidth Plot on Channel 03



Date: 22.JUN.2012 23:09:43

802.11n HT-40 – SISO Ant. 1

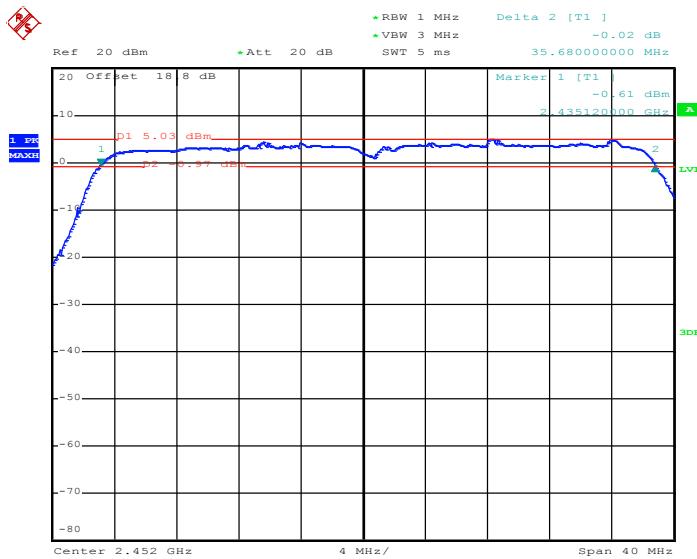
6 dB Bandwidth Plot on Channel 06



Date: 22.JUN.2012 23:07:28

802.11n HT-40 – SISO Ant. 1

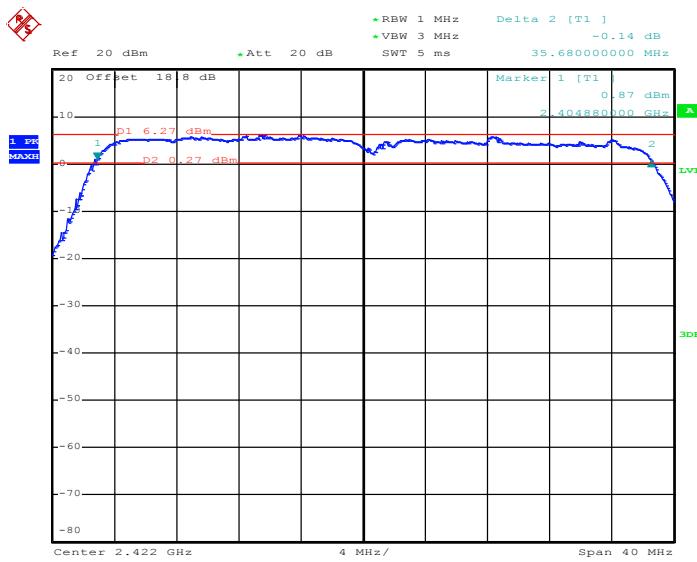
6 dB Bandwidth Plot on Channel 09



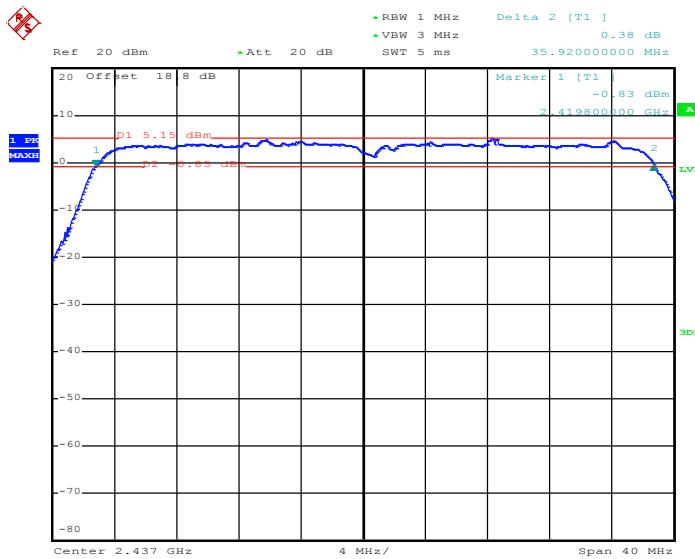
Date: 22.JUN.2012 23:02:11

802.11n HT-40 – MIMO Ant. 1+2(1)

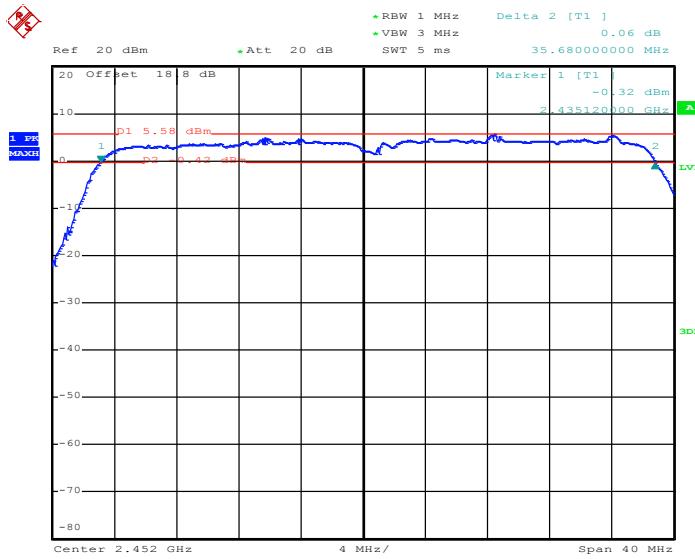
6 dB Bandwidth Plot on Channel 03



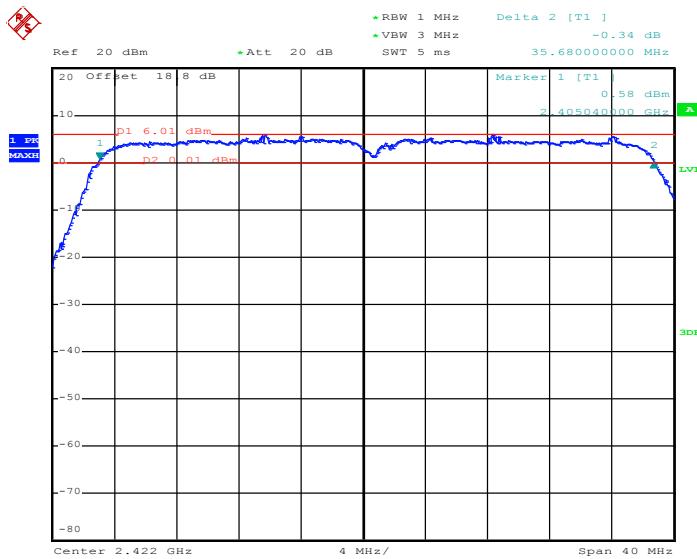
Date: 22.JUN.2012 23:48:24

802.11n HT-40 – MIMO Ant. 1+2(1)
6 dB Bandwidth Plot on Channel 06


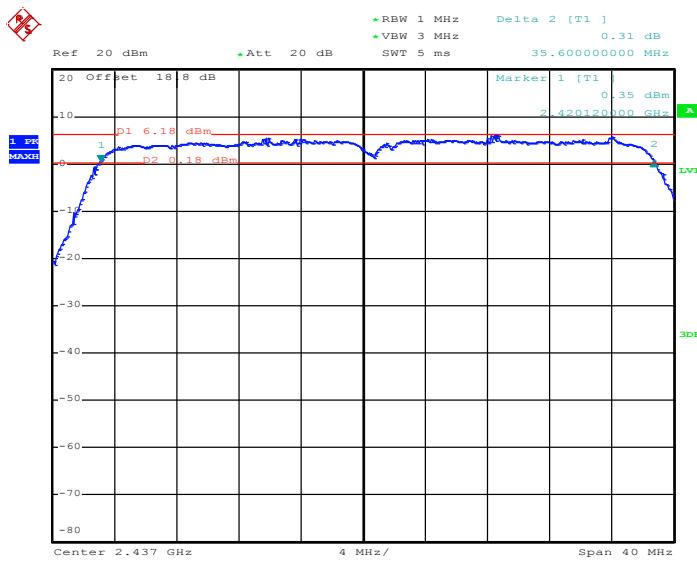
Date: 22.JUN.2012 23:52:20

802.11n HT-40 – MIMO Ant. 1+2(1)
6 dB Bandwidth Plot on Channel 09


Date: 22.JUN.2012 23:58:10

802.11n HT-40 – MIMO Ant. 1+2(2)
6 dB Bandwidth Plot on Channel 03


Date: 23.JUN.2012 01:11:37

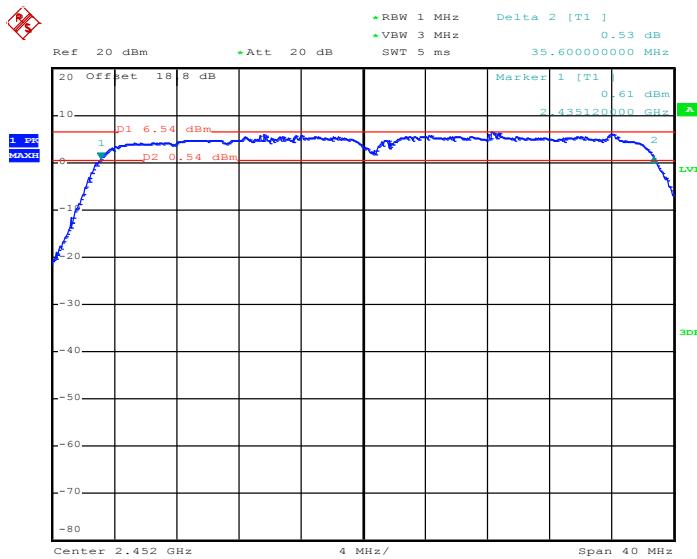
802.11n HT-40 – MIMO Ant. 1+2(2)
6 dB Bandwidth Plot on Channel 06


Date: 23.JUN.2012 01:14:43



802.11n HT-40 – MIMO Ant. 1+2(2)

6 dB Bandwidth Plot on Channel 09

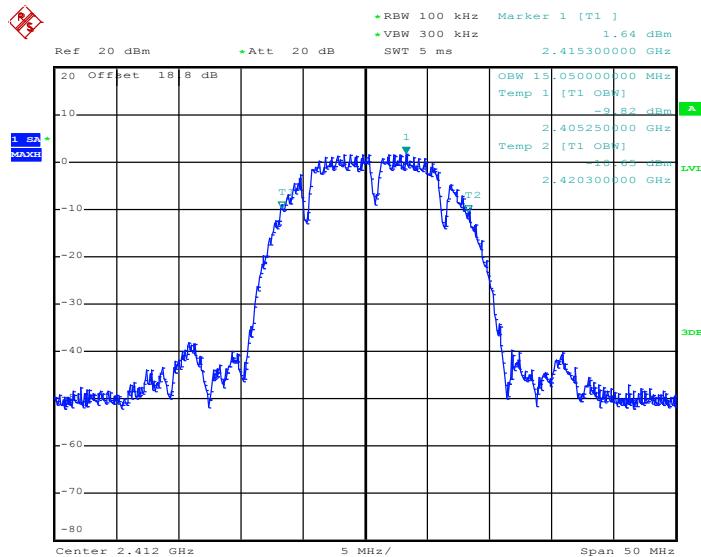


Date: 23.JUN.2012 01:17:22

3.1.8 Test Result of 99% Bandwidth Plots

802.11b – SISO Ant. 1

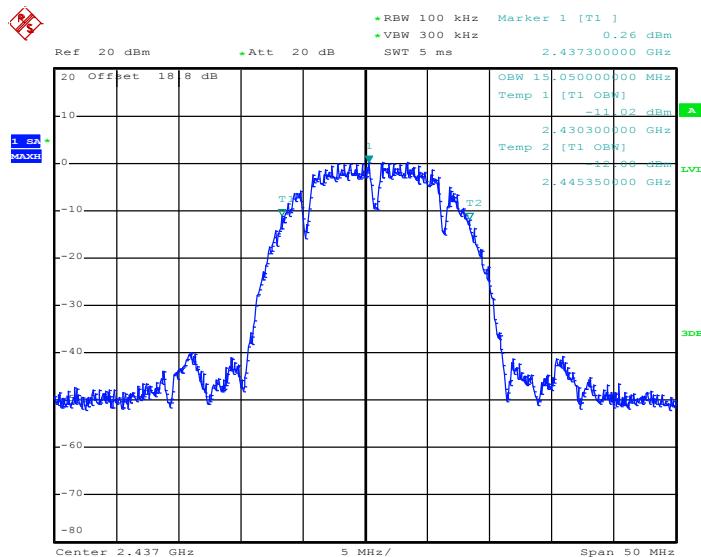
99% Occupied Bandwidth Plot on Channel 01



Date: 22.JUN.2012 22:31:30

802.11b – SISO Ant. 1

99% Occupied Bandwidth Plot on Channel 06

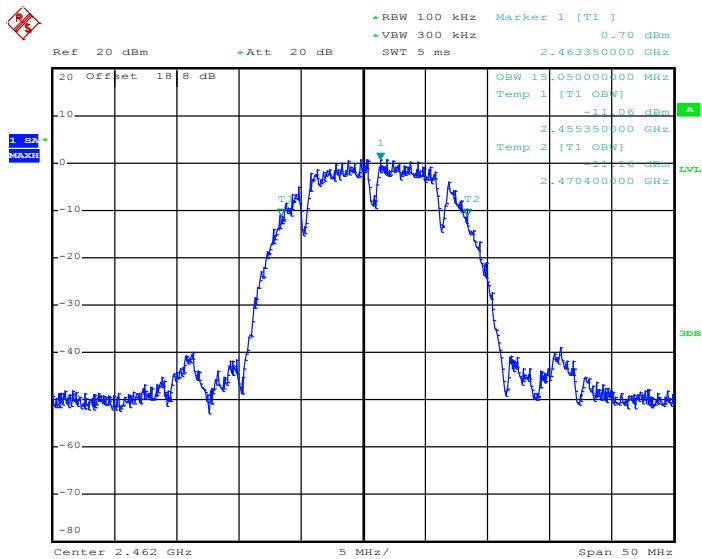


Date: 22.JUN.2012 22:38:26



802.11b – SISO Ant. 1

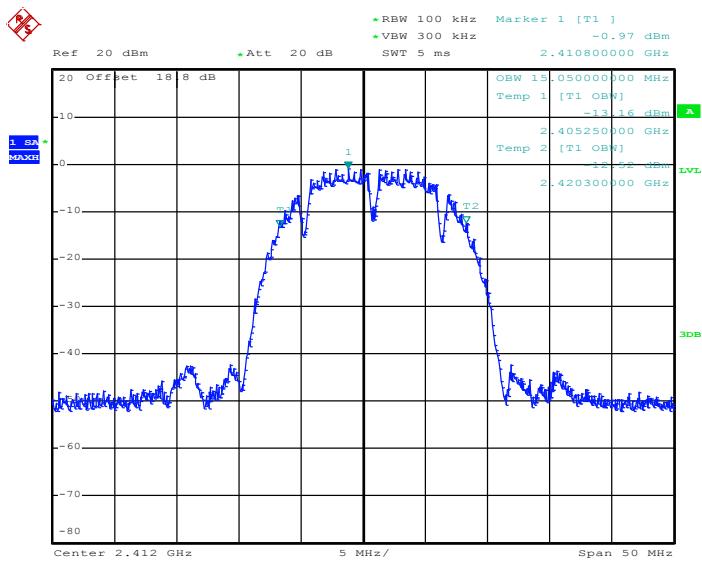
99% Occupied Bandwidth Plot on Channel 11



Date: 22.JUN.2012 22:41:20

802.11b – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 01

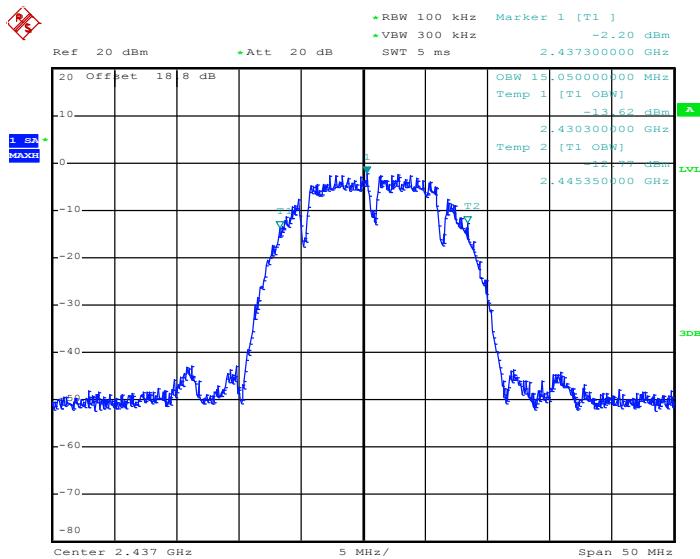


Date: 23.JUN.2012 00:25:38



802.11b – MIMO Ant. 1+2(1)

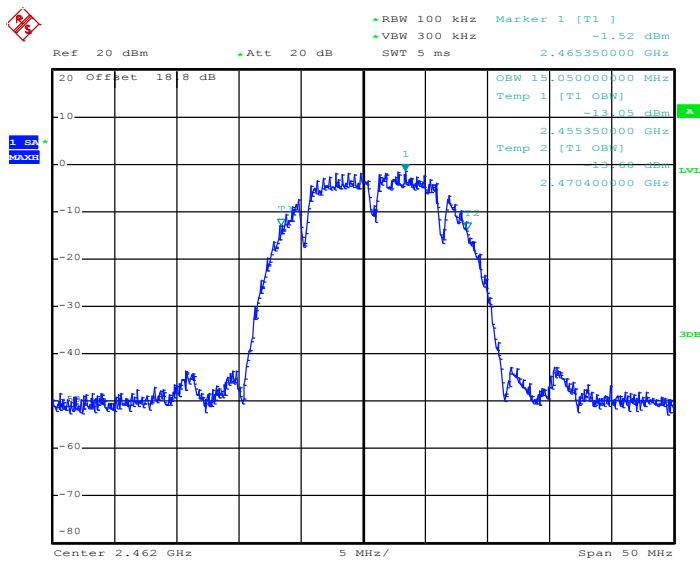
99% Occupied Bandwidth Plot on Channel 06



Date: 23.JUN.2012 00:23:07

802.11b – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 11

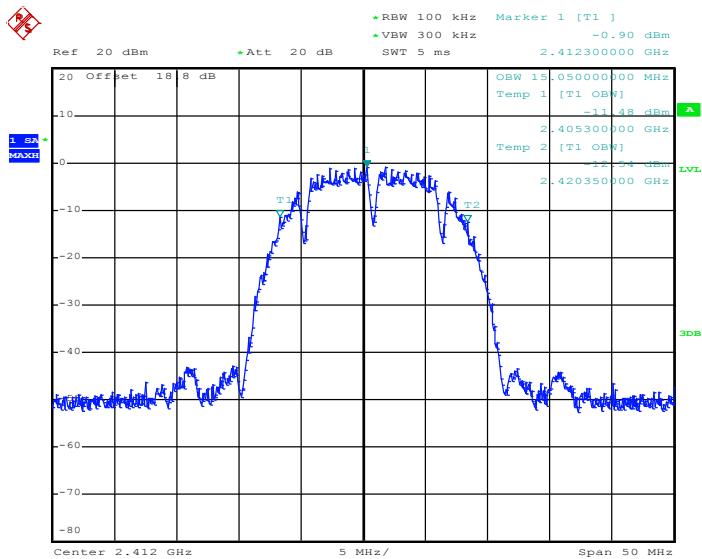


Date: 23.JUN.2012 00:20:48



802.11b – MIMO Ant. 1+2(2)

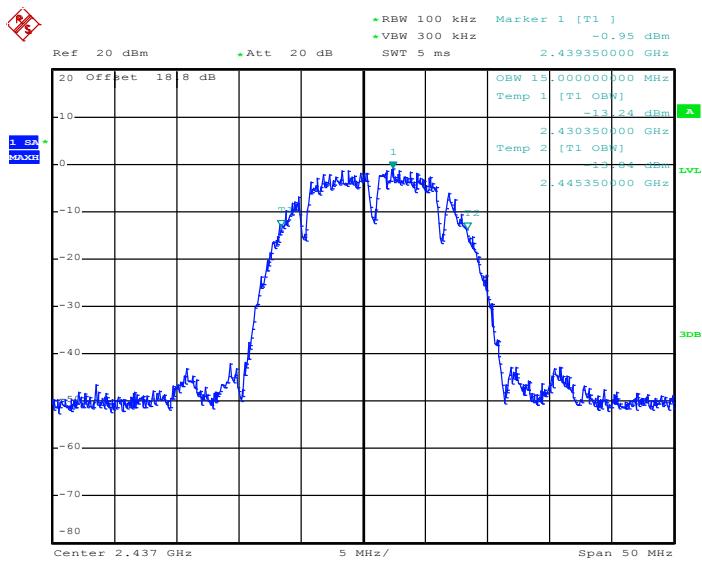
99% Occupied Bandwidth Plot on Channel 01



Date: 23.JUN.2012 00:44:27

802.11b – MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 06

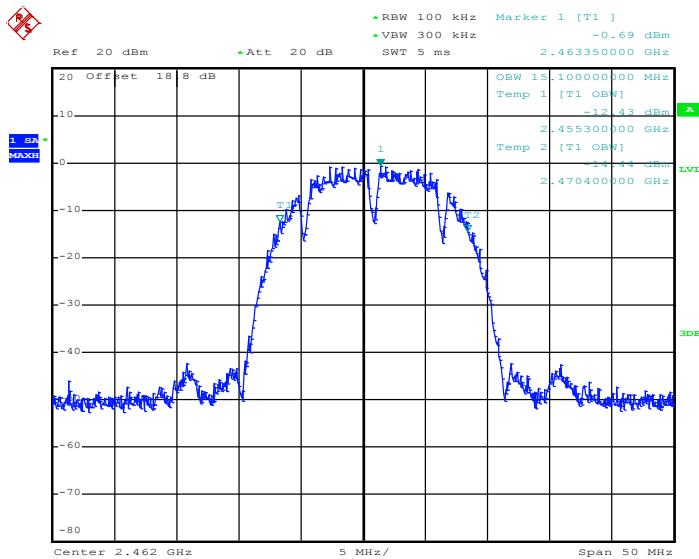


Date: 23.JUN.2012 00:47:40



802.11b – MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 11

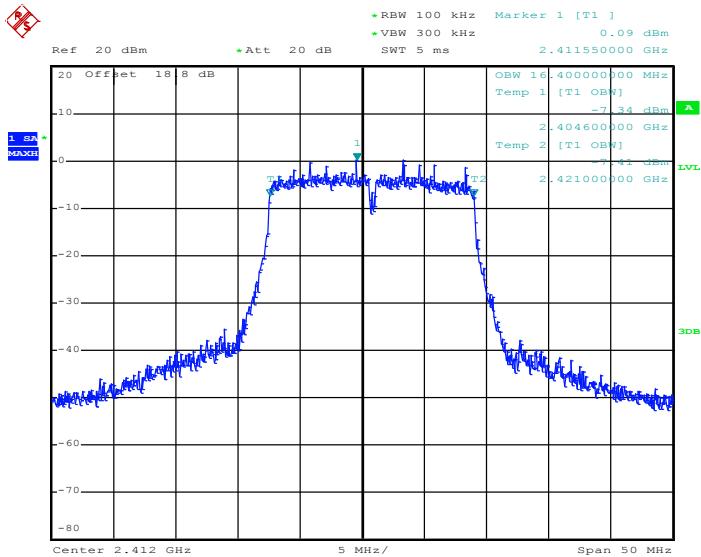


Date: 23.JUN.2012 00:50:30



802.11g – SISO Ant. 1

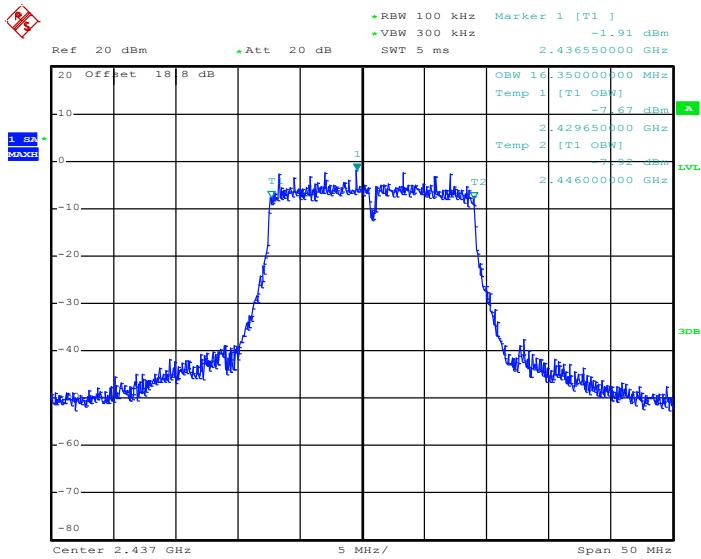
99% Occupied Bandwidth Plot on Channel 01



Date: 22.JUN.2012 22:51:40

802.11g – SISO Ant. 1

99% Occupied Bandwidth Plot on Channel 06

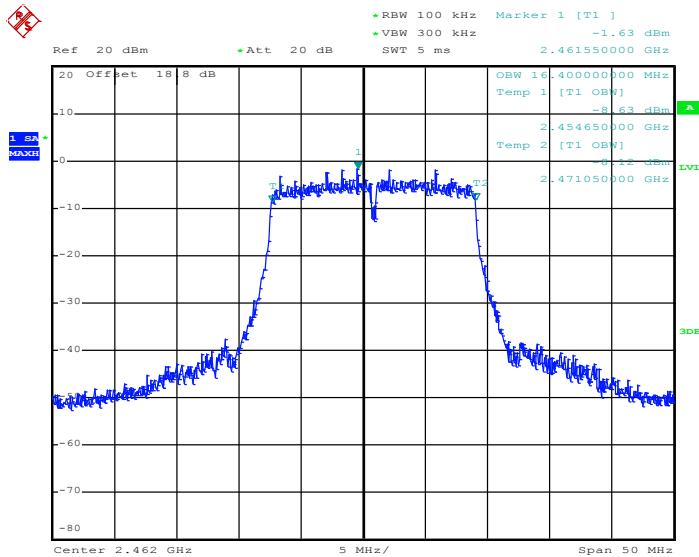


Date: 22.JUN.2012 22:49:34



802.11g – SISO Ant. 1

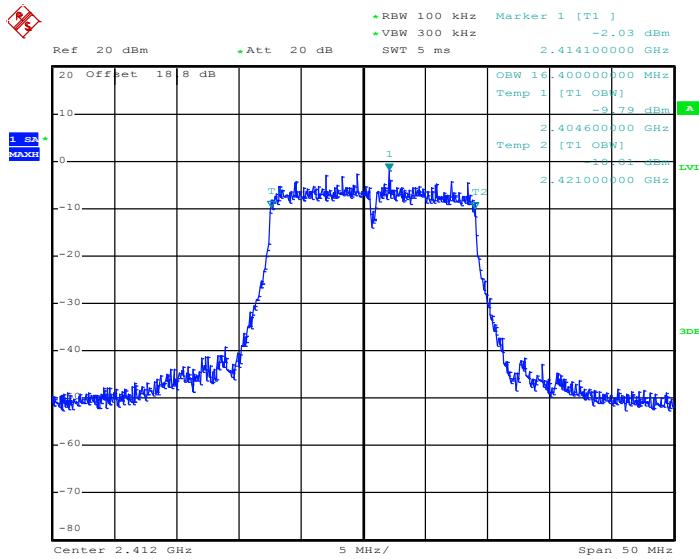
99% Occupied Bandwidth Plot Channel 11



Date: 22.JUN.2012 22:46:31

802.11g – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 01

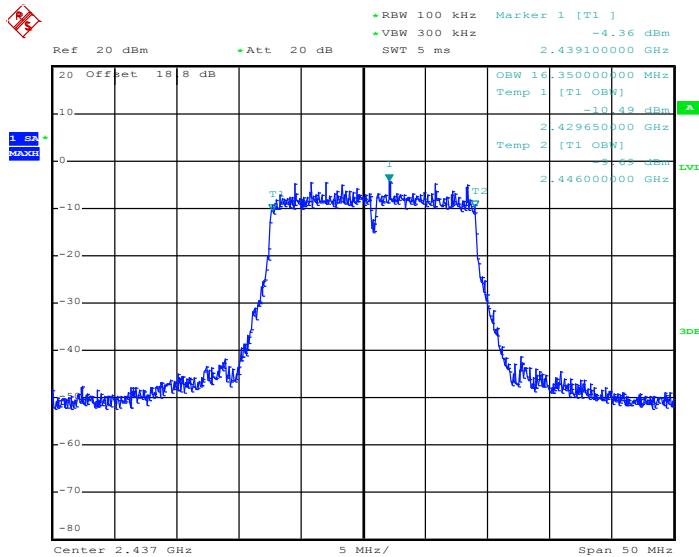


Date: 23.JUN.2012 00:13:14



802.11g – MIMO Ant. 1+2(1)

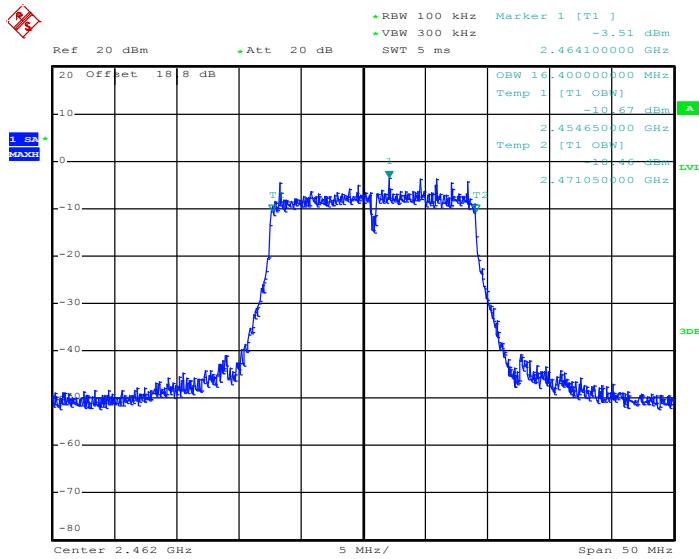
99% Occupied Bandwidth Plot on Channel 06



Date: 23.JUN.2012 00:15:42

802.11g – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 11

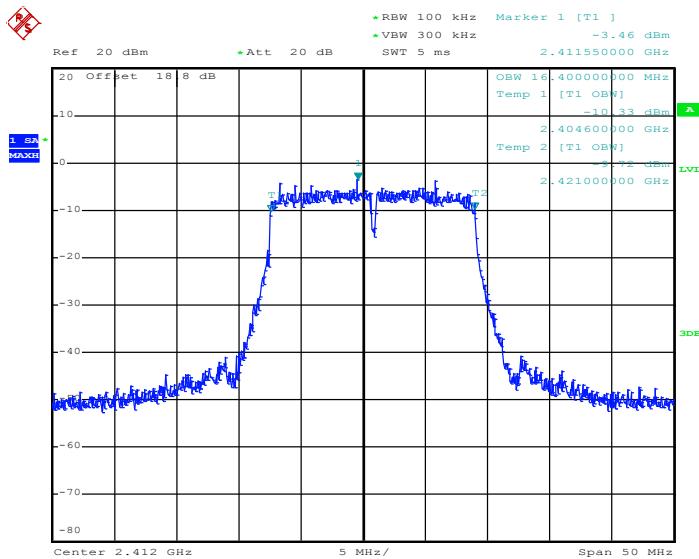


Date: 23.JUN.2012 00:18:18



802.11g – MIMO Ant. 1+2(2)

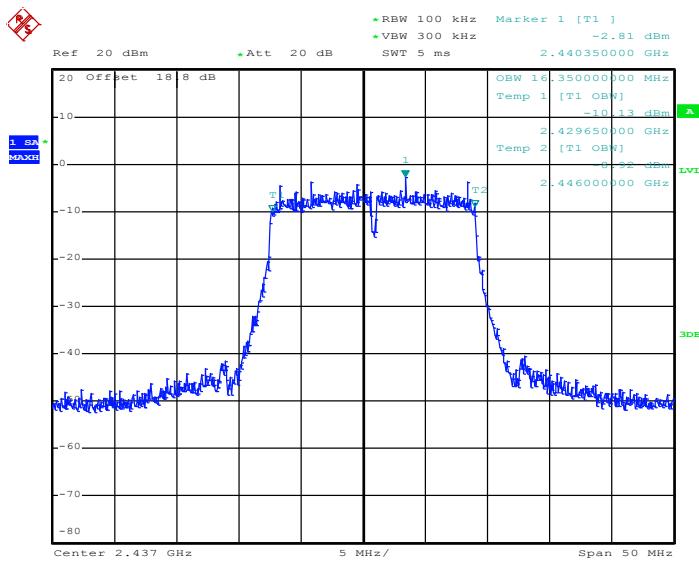
99% Occupied Bandwidth Plot on Channel 01



Date: 23.JUN.2012 01:00:16

802.11g – MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 06

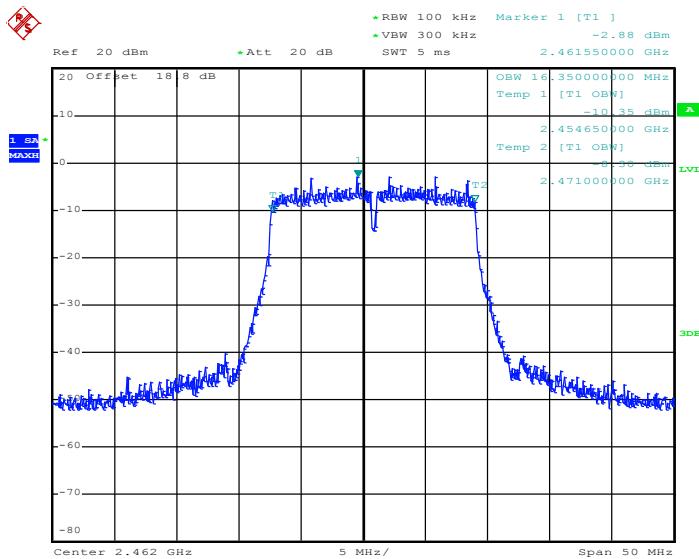


Date: 23.JUN.2012 00:57:10



802.11g – MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 11

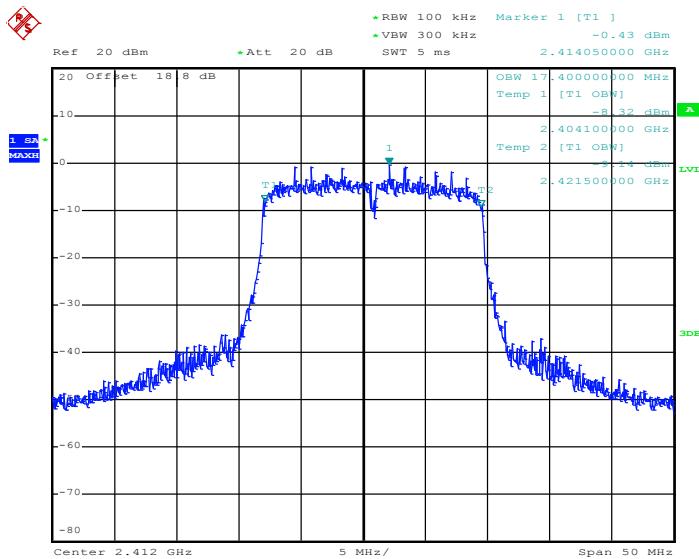


Date: 23.JUN.2012 00:54:11



802.11n HT-20 – SISO Ant. 1

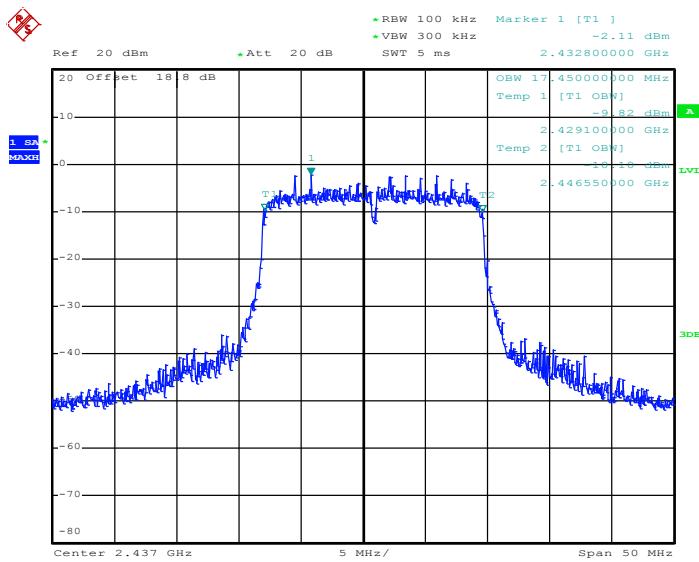
99% Occupied Bandwidth Plot on Channel 01



Date: 22.JUN.2012 22:54:42

802.11n HT-20 – SISO Ant. 1

99% Occupied Bandwidth Plot on Channel 06

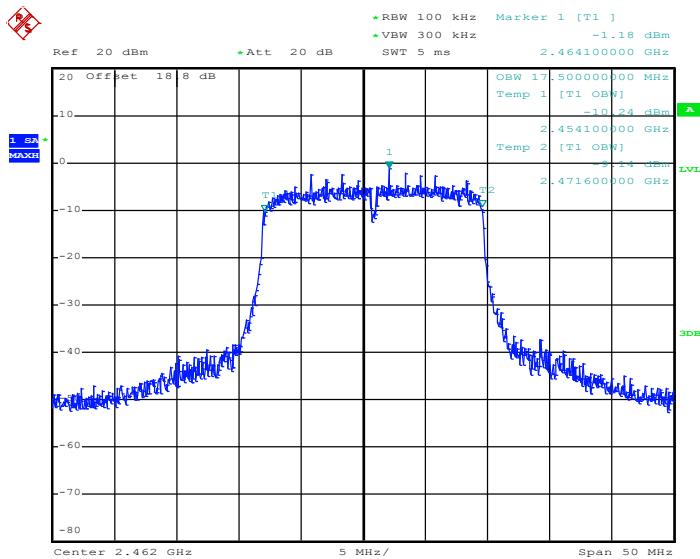


Date: 22.JUN.2012 22:57:08



802.11n HT-20 – SISO Ant. 1

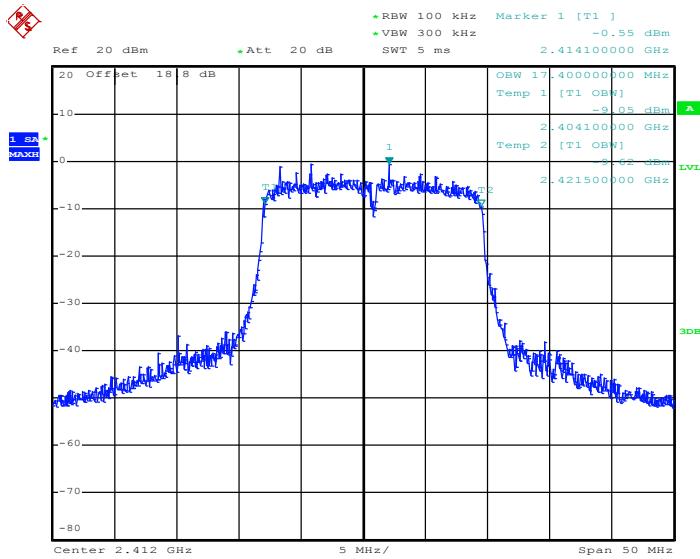
99% Occupied Bandwidth Plot on Channel 11



Date: 22.JUN.2012 23:00:06

802.11n HT-20 – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 01

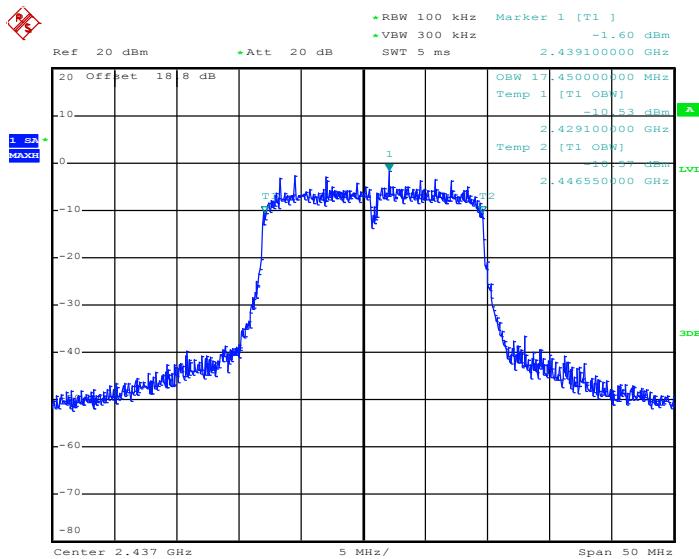


Date: 23.JUN.2012 00:10:34



802.11n HT-20 – MIMO Ant. 1+2(1)

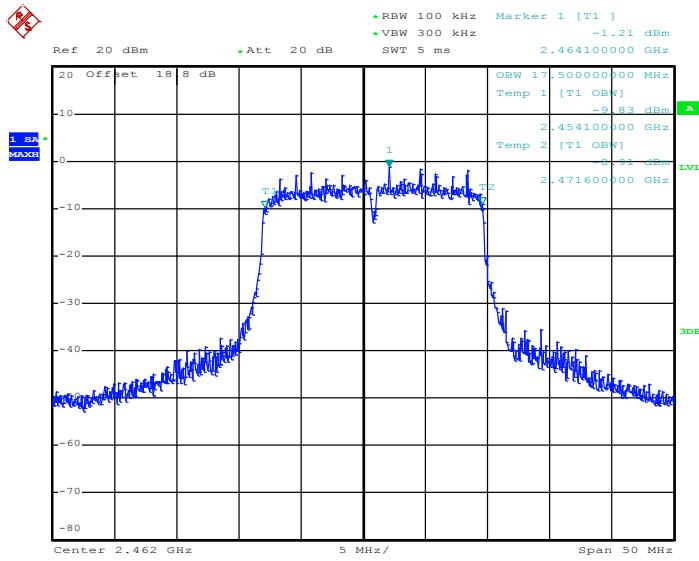
99% Occupied Bandwidth Plot on Channel 06



Date: 23.JUN.2012 00:07:56

802.11n HT-20 – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 11

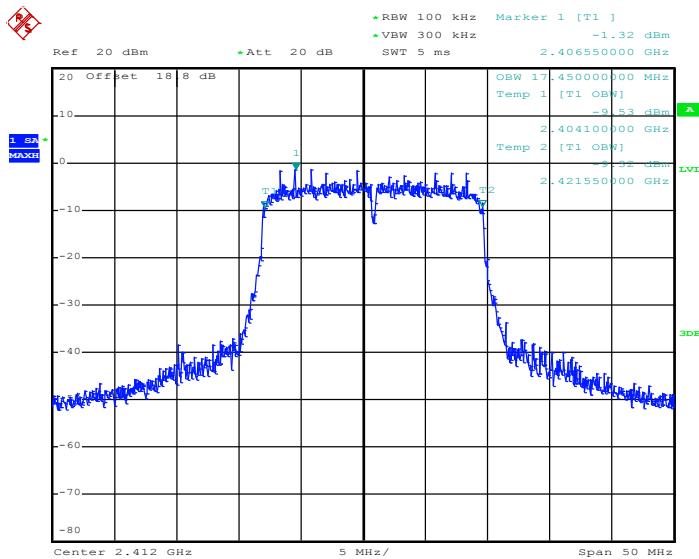


Date: 23.JUN.2012 00:05:08



802.11n HT-20 – MIMO Ant. 1+2(2)

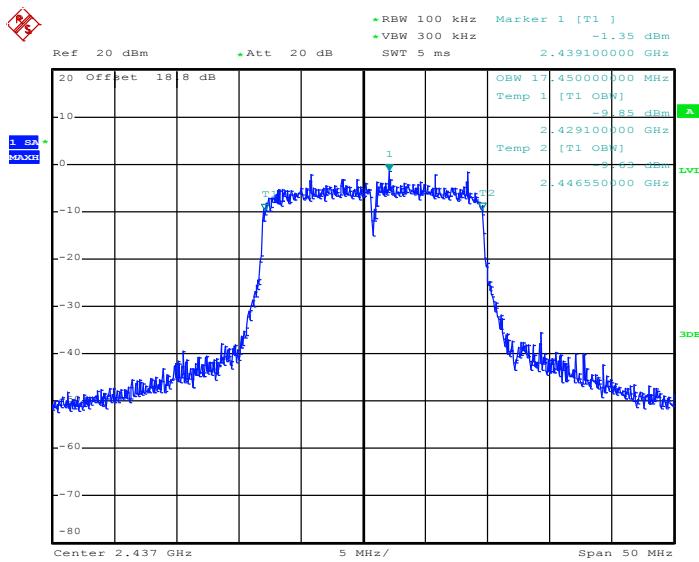
99% Occupied Bandwidth Plot on Channel 01



Date: 23.JUN.2012 01:03:37

802.11n HT-20 – MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 06

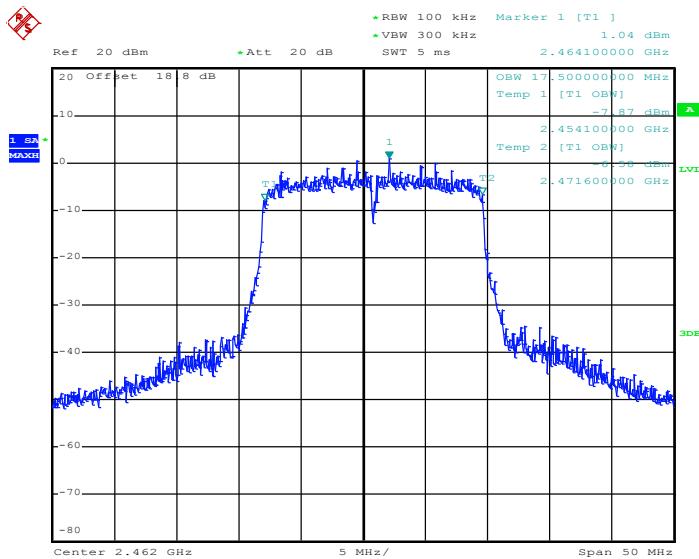


Date: 23.JUN.2012 01:06:20



802.11n HT-20 – MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 11

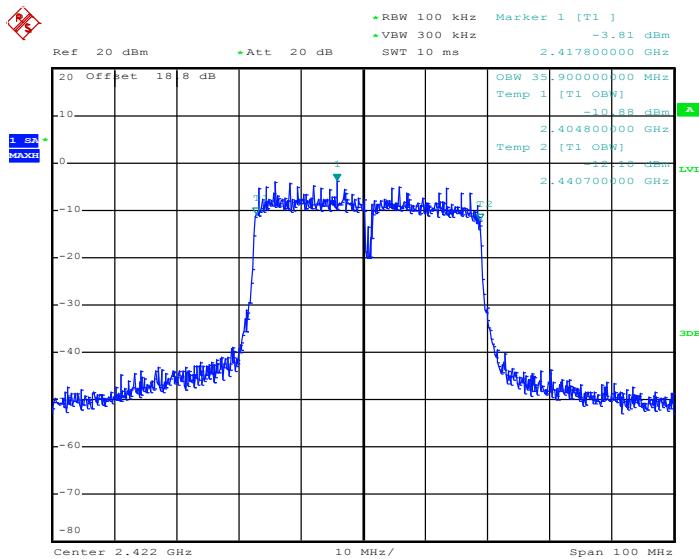


Date: 23.JUN.2012 18:00:06



802.11n HT-40 – SISO Ant. 1

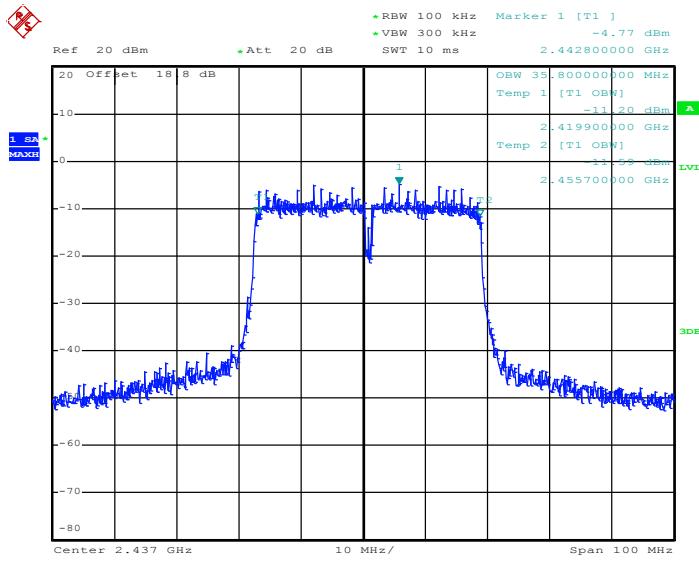
99% Occupied Bandwidth Plot on Channel 03



Date: 22.JUN.2012 23:11:49

802.11n HT-40 – SISO Ant. 1

99% Occupied Bandwidth Plot on Channel 06

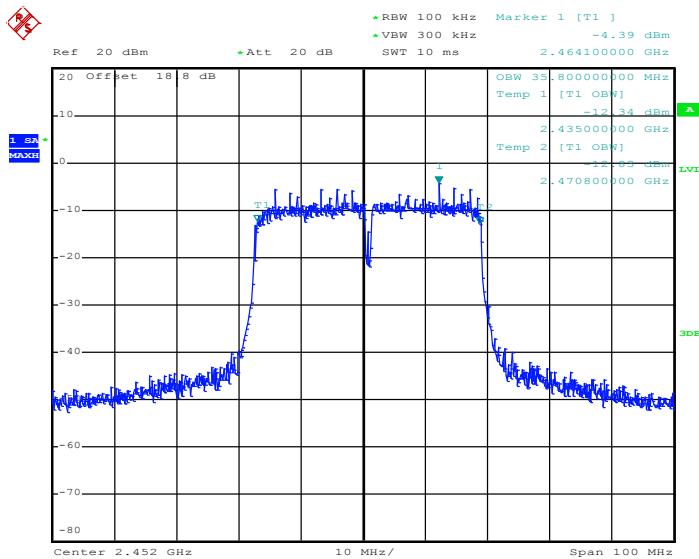


Date: 22.JUN.2012 23:08:36



802.11n HT-40 – SISO Ant. 1

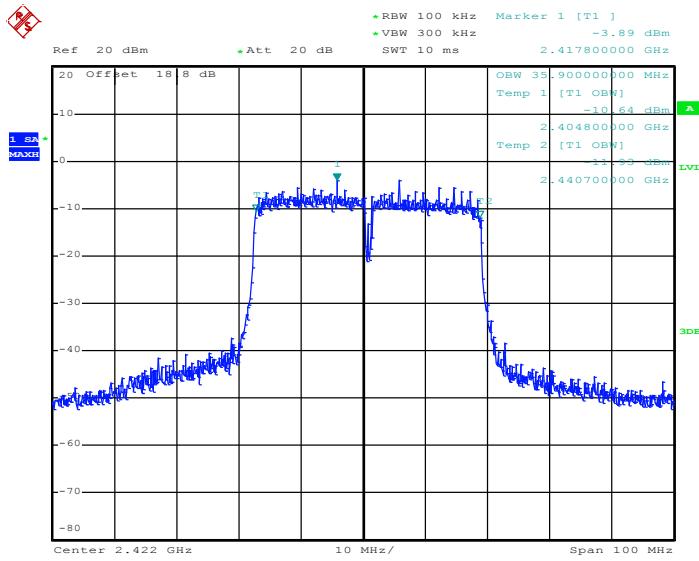
99% Occupied Bandwidth Plot on Channel 09



Date: 22.JUN.2012 23:05:43

802.11n HT-40 – MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 03

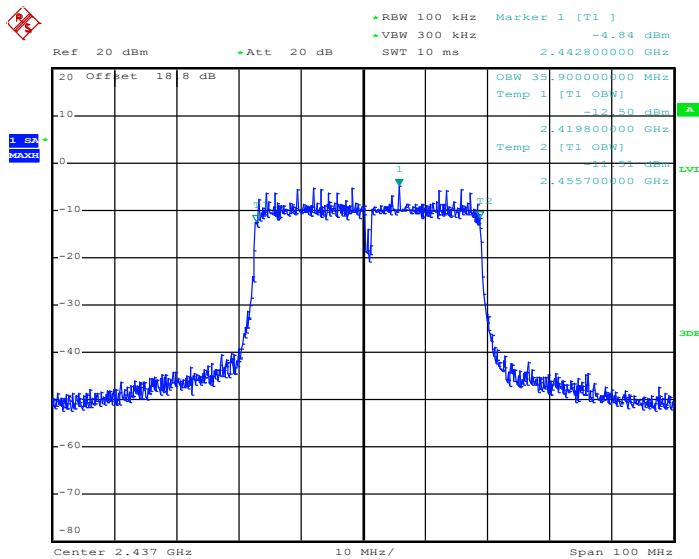


Date: 22.JUN.2012 23:50:00



802.11n HT-40 -MIMO Ant. 1+2(1)

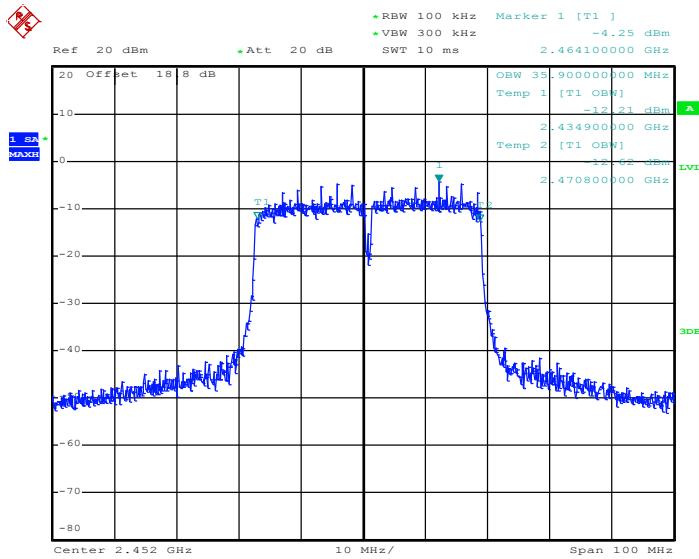
99% Occupied Bandwidth Plot on Channel 06



Date: 22.JUN.2012 23:56:40

802.11n HT-40 -MIMO Ant. 1+2(1)

99% Occupied Bandwidth Plot on Channel 09

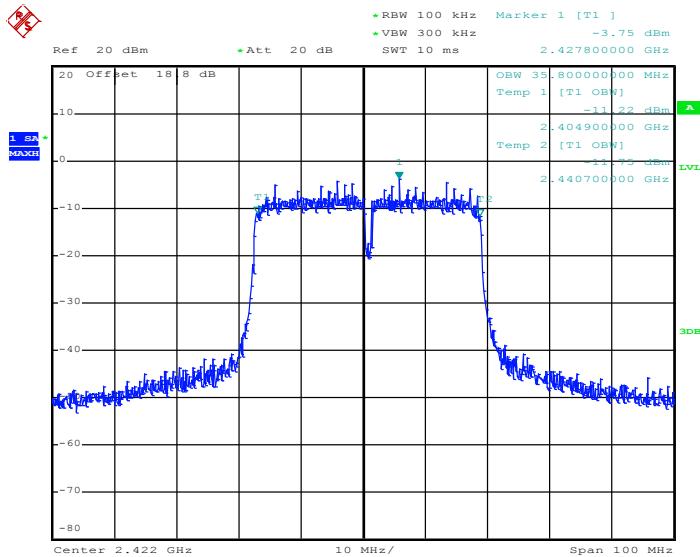


Date: 22.JUN.2012 23:59:11



802.11n HT-40 -MIMO Ant. 1+2(2)

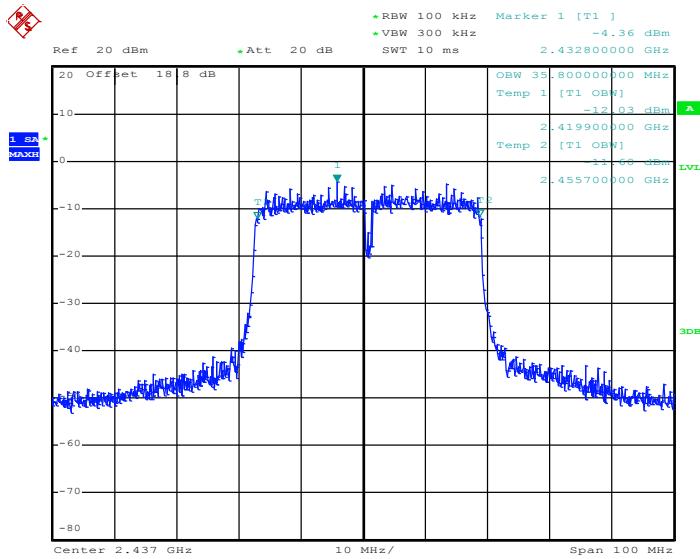
99% Occupied Bandwidth Plot on Channel 03



Date: 23.JUN.2012 01:13:41

802.11n HT-40 -MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 06

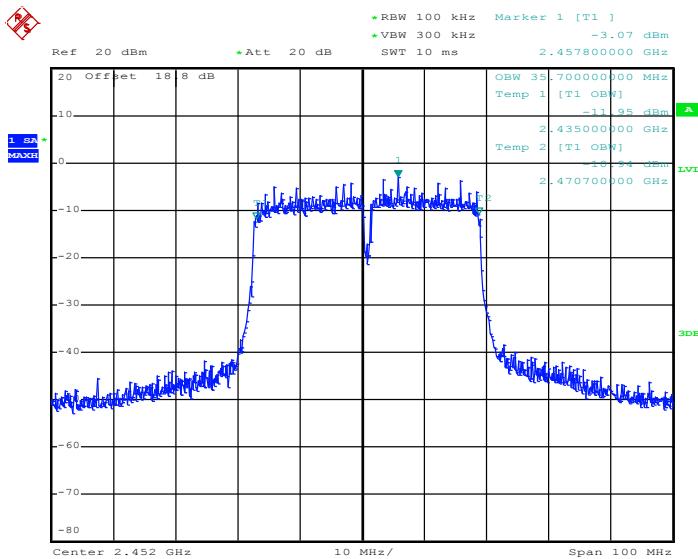


Date: 23.JUN.2012 01:16:25



802.11n HT-40 -MIMO Ant. 1+2(2)

99% Occupied Bandwidth Plot on Channel 09



Date: 23.JUN.2012 01:19:20

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, 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.

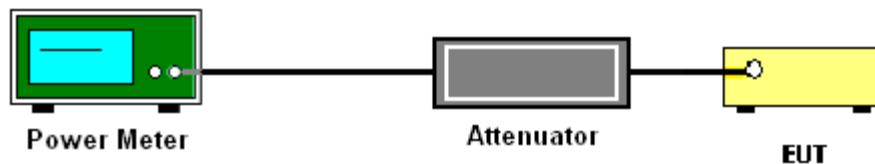
3.2.2 Measuring Instruments

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 and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v01r01.

3.2.4 Test Setup





3.2.5 Test Result of Peak Output Power

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Ch.	Frequency (MHz)	802.11b Peak Output Power (dBm)				Max. Limits (dBm)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>		
01	2412	15.97	12.82	12.39	15.62	SISO < 30.00 MIMO < 28.99	Pass
06	2437	15.45	12.22	12.47	15.36	SISO < 30.00 MIMO < 28.99	Pass
11	2462	15.26	12.57	12.70	15.65	SISO < 30.00 MIMO < 28.99	Pass

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

Ch.	Frequency (MHz)	802.11g Peak Output Power (dBm)				Max. Limits (dBm)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>		
01	2412	20.70	17.00	17.39	20.21	SISO < 30.00 MIMO < 28.99	Pass
06	2437	20.37	16.66	17.22	19.96	SISO < 30.00 MIMO < 28.99	Pass
11	2462	20.15	16.12	17.24	19.73	SISO < 30.00 MIMO < 28.99	Pass



Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Ch.	Frequency (MHz)	802.11n HT-20 Peak Output Power (dBm)				Max. Limits (dBm)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>		
01	2412	20.77	20.01	20.92	23.50	SISO < 30.00 MIMO < 28.99	Pass
06	2437	20.33	20.30	20.88	23.61	SISO < 30.00 MIMO < 28.99	Pass
11	2462	20.11	20.41	21.42	23.95	SISO < 30.00 MIMO < 28.99	Pass

Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Ch.	Frequency (MHz)	802.11n HT-40 Peak Output Power (dBm)				Max. Limits (dBm)	Pass/Fail
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>		
03	2422	20.83	20.02	20.27	23.16	SISO < 30.00 MIMO < 28.99	Pass
06	2437	20.43	20.37	20.59	23.49	SISO < 30.00 MIMO < 28.99	Pass
09	2452	20.00	20.12	20.87	23.52	SISO < 30.00 MIMO < 28.99	Pass



3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	97.69% for SISO Ant. 1 97.61% for MIMO <Ant. 1+2(1)> 97.91% for MIMO <Ant. 1+2(2)>	Duty Factor:	0.10dB for SISO Ant. 1 0.10dB for MIMO <Ant. 1+2(1)> 0.09dB for MIMO <Ant 1+2(2)>

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)			
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>
01	2412	13.65	10.39	10.48	13.47
06	2437	13.17	10.37	10.46	13.37
11	2462	13.03	10.59	10.68	13.70

Note :

1. MIMO ANT 1+2 is a calculated result from sum of the power MIMO ANT 1 and MIMO ANT 2.
2. The average power is measured by power meter with average power sensor and is reporting only.



Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	87.28% for SISO Ant. 1 87.84% for MIMO <Ant 1+2(1)> 87.27% for MIMO <Ant 1+2(2)>	Duty Factor:	0.59dB for SISO Ant. 1 0.56dB for MIMO <Ant 1+2(1)> 0.59dB for MIMO <Ant 1+2(2)>

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)			
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>
01	2412	12.16	8.12	8.80	11.49
06	2437	11.81	7.68	8.71	11.24
11	2462	11.62	7.53	9.01	11.35

Note :

1. MIMO ANT 1+2 is a calculated result from sum of the power MIMO ANT 1 and MIMO ANT 2.
2. The average power is measured by power meter with average power sensor and is reporting only.



Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	86.20% for SISO Ant. 1 86.53% for MIMO <Ant 1+2(1)> 86.64% for MIMO <Ant 1+2(2)>	Duty Factor:	0.64dB for SISO Ant. 1 0.63dB for MIMO <Ant 1+2(1)> 0.62dB for MIMO <Ant 1+2(2)>

Channel	Frequency (MHz)	802.11n HT-20 Average Output Power (dBm)			
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>
01	2412	11.60	10.58	11.48	14.06
06	2437	11.18	11.03	11.45	14.26
11	2462	10.92	11.19	11.49	14.35

Note :

1. MIMO ANT 1+2 is a calculated result from sum of the power MIMO ANT 1 and MIMO ANT 2.
2. The average power is measured by power meter with average power sensor and is reporting only.



Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%
Duty Cycle:	76.11% for SISO Ant. 1 75.99% for MIMO <Ant 1+2(1)> 76.64% for MIMO <Ant 1+2(2)>	Duty Factor:	1.19dB for SISO Ant. 1 1.19dB for MIMO <Ant 1+2(1)> 1.16dB for MIMO <Ant 1+2(2)>

Channel	Frequency (MHz)	802.11n HT-40 Average Output Power (dBm)			
		SISO Ant. 1	MIMO <Ant. 1+2(1)>	MIMO <Ant. 1+2(2)>	MIMO <Ant. 1+2>
03	2422	11.64	10.91	11.10	14.02
06	2437	11.19	10.78	11.26	14.04
09	2452	10.73	10.97	11.65	14.33

Note :

1. MIMO ANT 1+2 is a calculated result from sum of the power MIMO ANT 1 and MIMO ANT 2.
2. The average power is measured by power meter with average power sensor and is reporting only.



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 5.3.1 (Peak PSD) of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) \geq 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
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 in any 100 kHz band segment within the fundamental EBW.
6. Record the measurement data derived from spectrum analyzer.
7. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3 \text{ kHz}/100 \text{ kHz}) = -15.2 \text{ dB}$).
8. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v01r01.

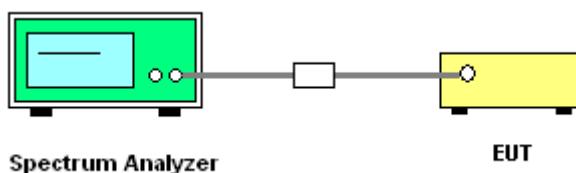
If measurements performed using method (2) plus $10 \log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

Method (2): Measure and add $10 \log(N)$ dB, where N is the number of outputs. (N=2)

3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Test Mode :	802.11b		Temperature :	24~26°C	
Test Engineer :	Bill Kuo		Relative Humidity :	50~53%	

Ch.	Freq. (MHz)	802.11b Power Density						Max. Limits (dBm)	Pass /Fail		
		SISO Ant. 1		MIMO <Ant. 1+2(1)>		MIMO <Ant. 1+2(2)>					
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2				
01	2412	2.38	-12.82	-0.30	-15.50	-0.45	-15.65	SISO < 8.00 MIMO < 6.99	Pass		
06	2437	0.65	-14.55	-1.78	-16.98	-0.58	-15.78	SISO < 8.00 MIMO < 6.99	Pass		
11	2462	1.10	-14.10	-1.17	-16.37	-0.25	-15.45	SISO < 8.00 MIMO < 6.99	Pass		

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

Ch.	Freq. (MHz)	802.11g Power Density						Max. Limits (dBm)	Pass /Fail		
		SISO Ant. 1		MIMO <Ant. 1+2(1)>		MIMO <Ant. 1+2(2)>					
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2				
01	2412	0.31	-14.89	-2.10	-17.30	-2.10	-17.30	SISO < 8.00 MIMO < 6.99	Pass		
06	2437	-1.44	-16.64	-3.39	-18.59	-2.42	-17.62	SISO < 8.00 MIMO < 6.99	Pass		
11	2462	-0.65	-15.85	-2.90	-18.10	-1.90	-17.10	SISO < 8.00 MIMO < 6.99	Pass		



Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Ch.	Freq. (MHz)	802.11n HT-20 Power Density						Max. Limits (dBm)	Pass /Fail		
		SISO Ant. 1		MIMO <Ant. 1+2(1)>		MIMO <Ant. 1+2(2)>					
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2				
01	2412	-0.15	-15.35	-0.43	-15.63	-0.46	-15.66	SISO < 8.00 MIMO < 6.99	Pass		
06	2437	-1.68	-16.88	-1.84	-17.04	-0.58	-15.78	SISO < 8.00 MIMO < 6.99	Pass		
11	2462	-1.12	-16.32	-0.95	-16.15	-0.06	-15.26	SISO < 8.00 MIMO < 6.99	Pass		

Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Ch.	Freq. (MHz)	802.11n HT-40 Power Density						Max. Limits (dBm)	Pass /Fail		
		SISO Ant. 1		MIMO <Ant. 1+2(1)>		MIMO <Ant. 1+2(2)>					
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2				
03	2422	-3.58	-18.78	-3.44	-18.64	-3.75	-18.95	SISO < 8.00 MIMO < 6.99	Pass		
06	2437	-4.62	-19.82	-4.73	-19.93	-3.55	-18.75	SISO < 8.00 MIMO < 6.99	Pass		
09	2452	-4.64	-19.84	-4.06	-19.26	-3.41	-18.61	SISO < 8.00 MIMO < 6.99	Pass		

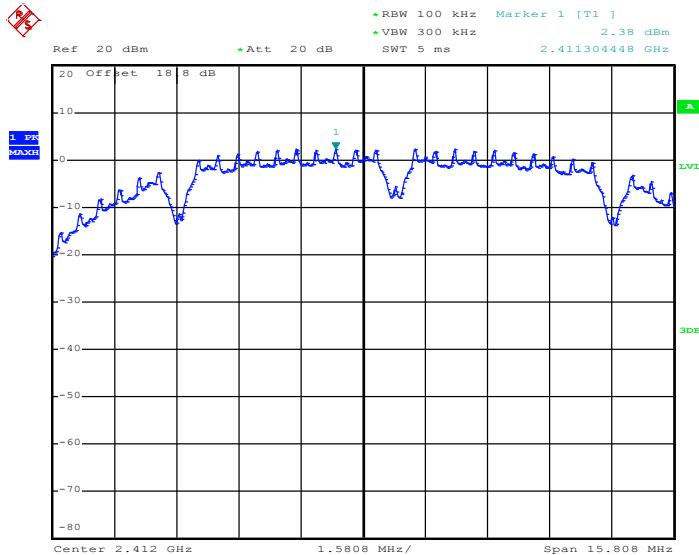
Note:

1. Measured power density (dBm) has offset with cable loss.
2. BWCF (dB) = $10 \log (3k/100k) = -15.2 \text{ dB}$
3. Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)
4. MIMO Power Density/ 3KHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB) + $10\log(N=2)$, where N=2 transmitters.

3.3.6 Test Result of Power Spectral Density Plots

802.11b -SISO Ant. 1

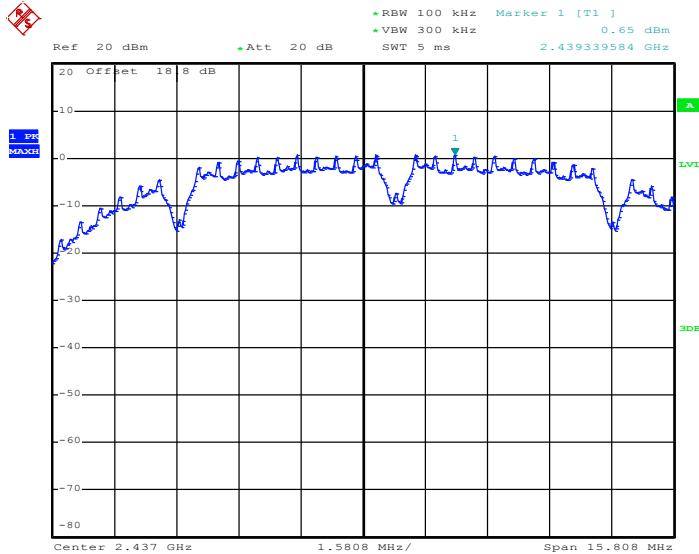
PSD Plot on Channel 01



Date: 22.JUN.2012 22:29:23

802.11b -SISO Ant. 1

PSD Plot on Channel 06

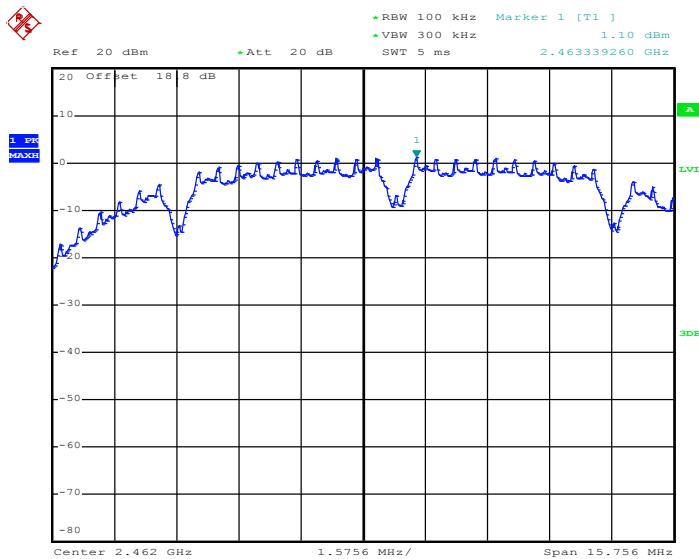


Date: 22.JUN.2012 22:37:38



802.11b -SISO Ant. 1

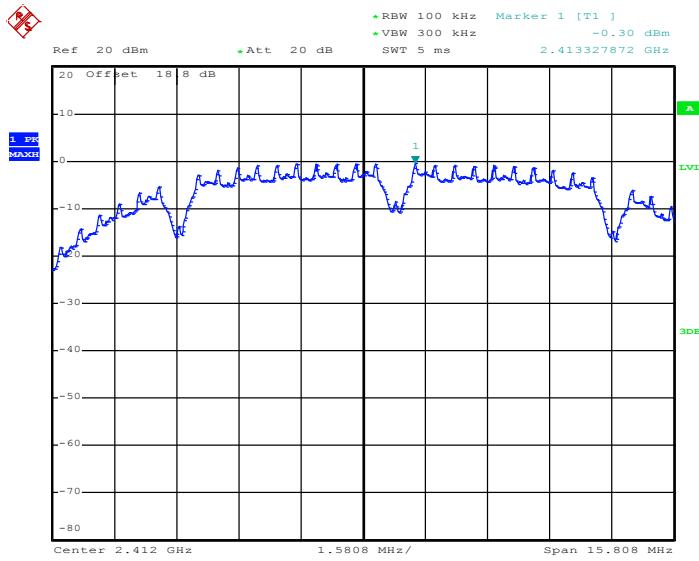
PSD Plot on Channel 11



Date: 22.JUN.2012 22:40:08

802.11b -MIMO Ant. 1+2(1)

PSD Plot on Channel 01

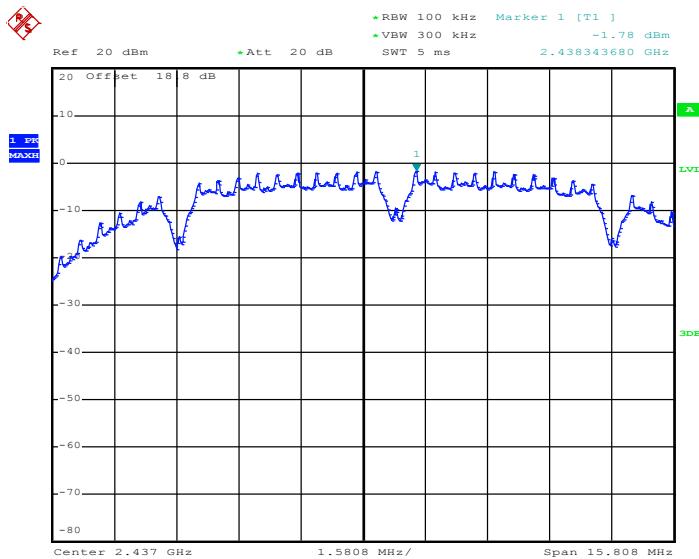


Date: 23.JUN.2012 00:24:36



802.11b -MIMO Ant. 1+2(1)

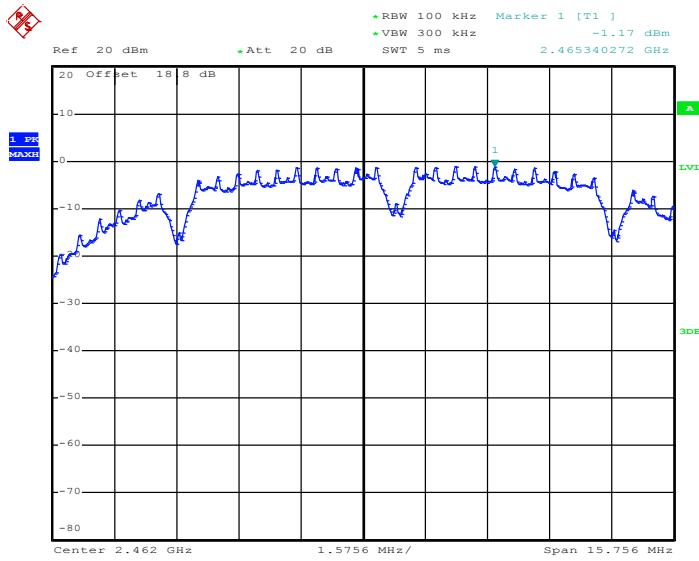
PSD Plot on Channel 06



Date: 23.JUN.2012 00:22:20

802.11b -MIMO Ant. 1+2(1)

PSD Plot on Channel 11

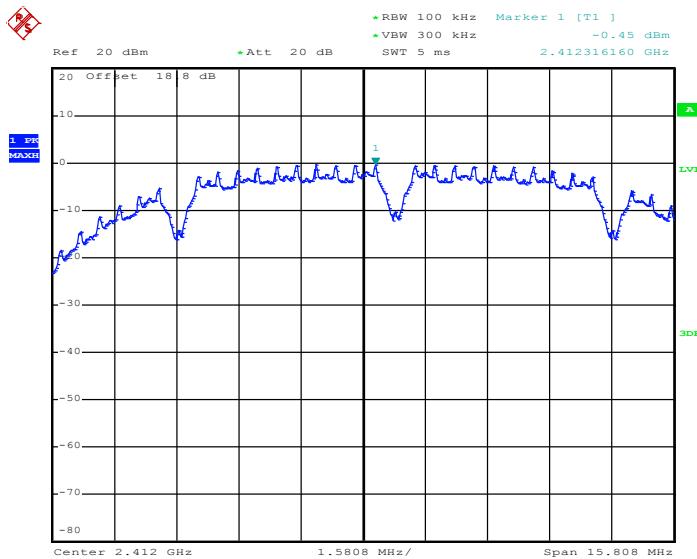


Date: 23.JUN.2012 00:19:46



802.11b -MIMO Ant. 1+2(2)

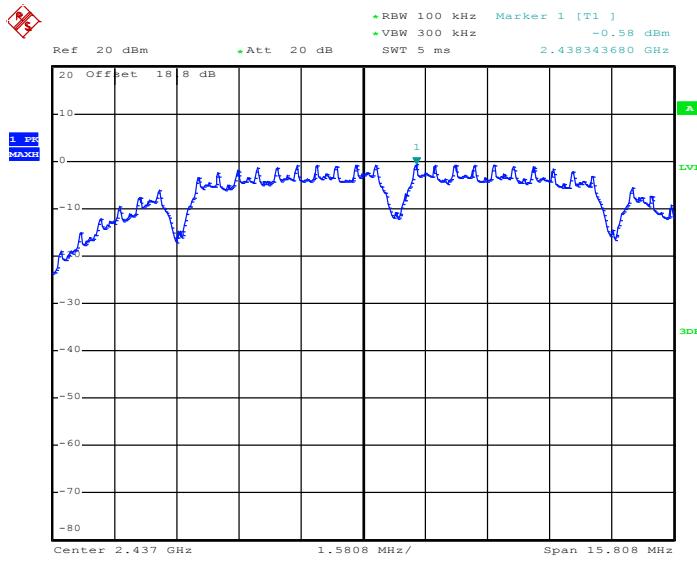
PSD Plot on Channel 01



Date: 23.JUN.2012 00:42:37

802.11b -MIMO Ant. 1+2(2)

PSD Plot on Channel 06

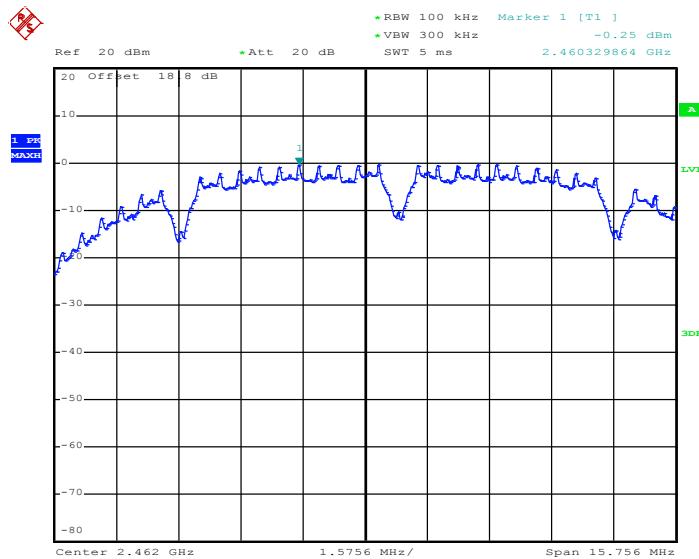


Date: 23.JUN.2012 00:46:31



802.11b -MIMO Ant. 1+2(2)

PSD Plot on Channel 11

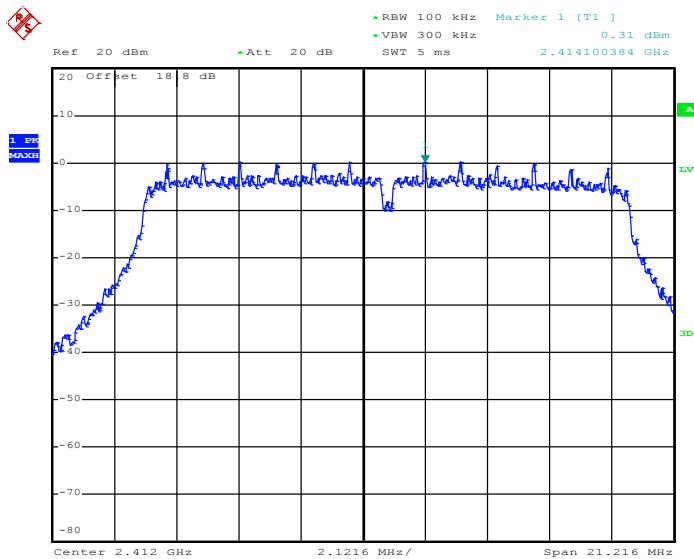


Date: 23.JUN.2012 00:49:26



802.11g -SISO Ant. 1

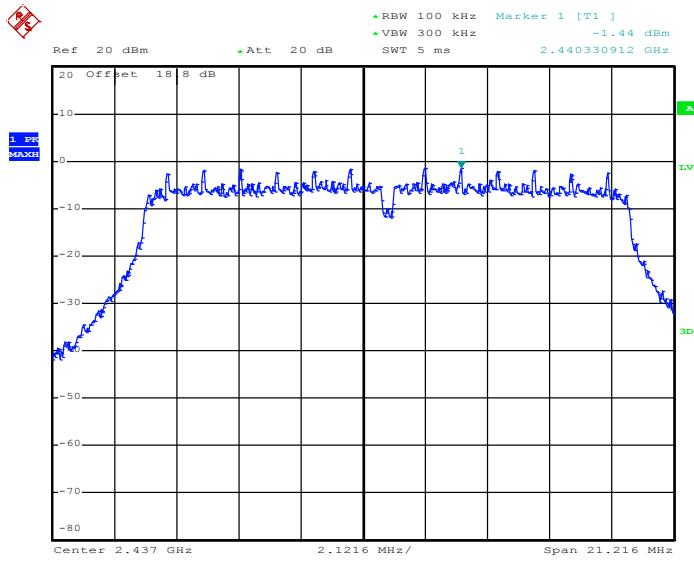
PSD Plot on Channel 01



Date: 22.JUN.2012 22:50:37

802.11g -SISO Ant. 1

PSD Plot on Channel 06

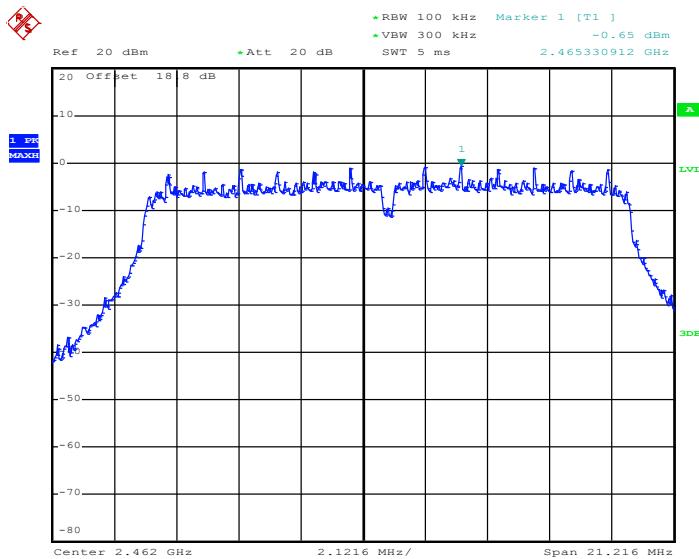


Date: 22.JUN.2012 22:48:46



802.11g -SISO Ant. 1

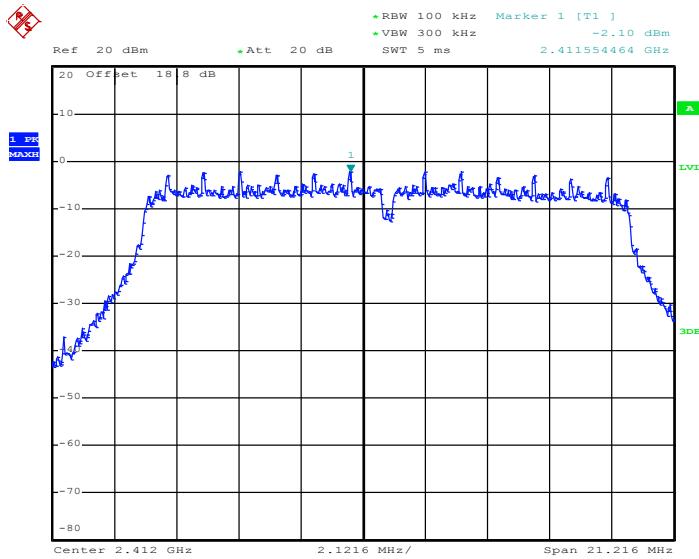
PSD Plot Channel 11



Date: 22.JUN.2012 22:45:09

802.11g -MIMO Ant. 1+2(1)

PSD Plot on Channel 01

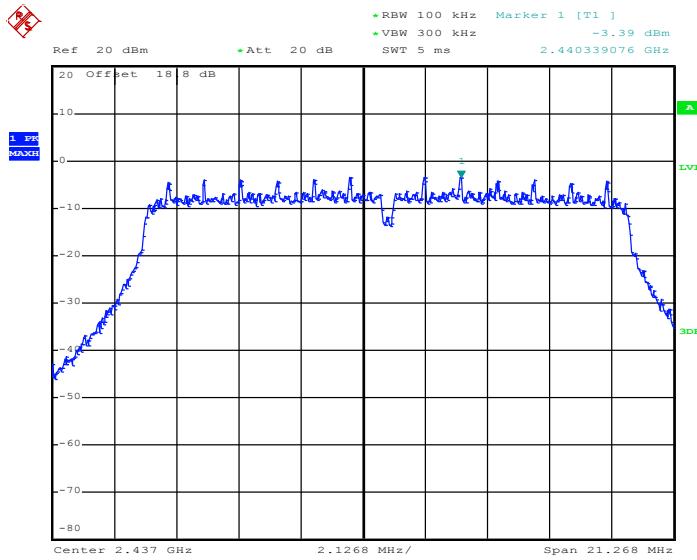


Date: 23.JUN.2012 00:12:12



802.11g -MIMO Ant. 1+2(1)

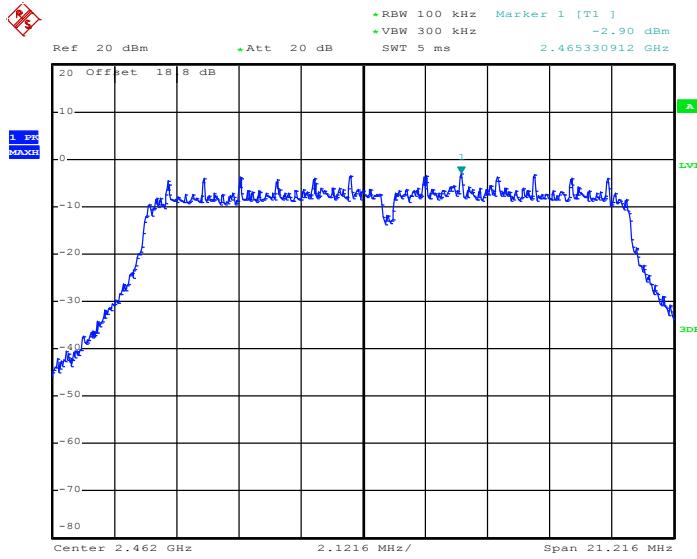
PSD Plot on Channel 06



Date: 23.JUN.2012 00:14:49

802.11g -MIMO Ant. 1+2(1)

PSD Plot on Channel 11

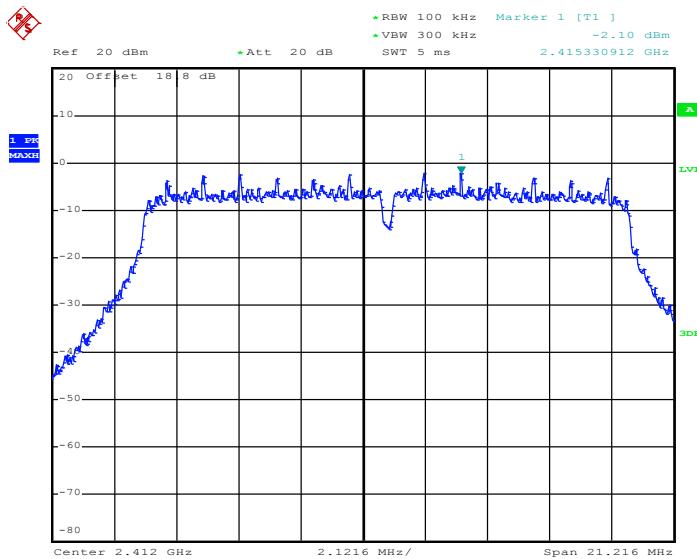


Date: 23.JUN.2012 00:17:13



802.11g -MIMO Ant. 1+2(2)

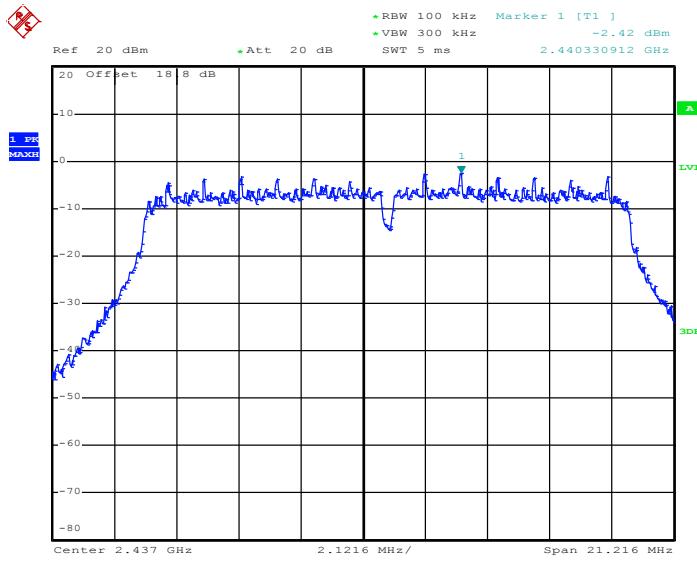
PSD Plot on Channel 01



Date: 23.JUN.2012 00:58:42

802.11g -MIMO Ant. 1+2(2)

PSD Plot on Channel 06

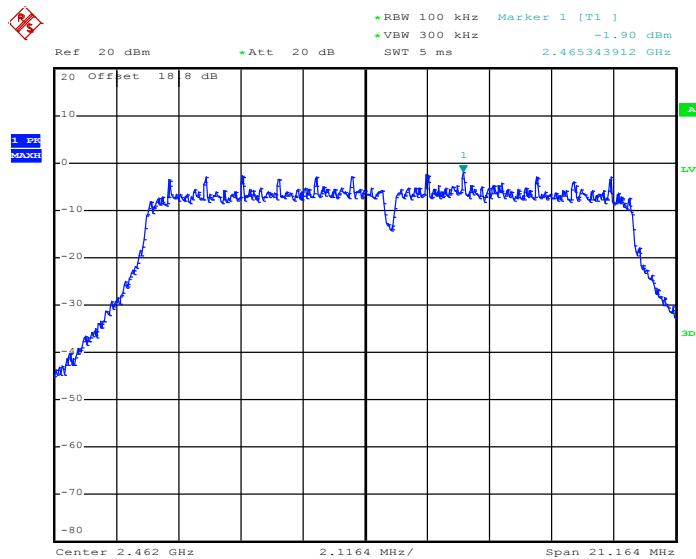


Date: 23.JUN.2012 00:56:20



802.11g -MIMO Ant. 1+2(2)

PSD Plot on Channel 11

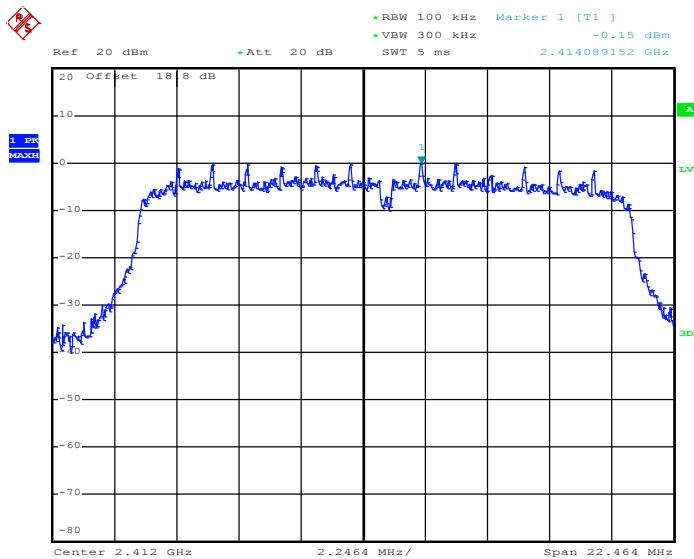


Date: 23.JUN.2012 00:52:52



802.11n HT-20 – SISO Ant. 1

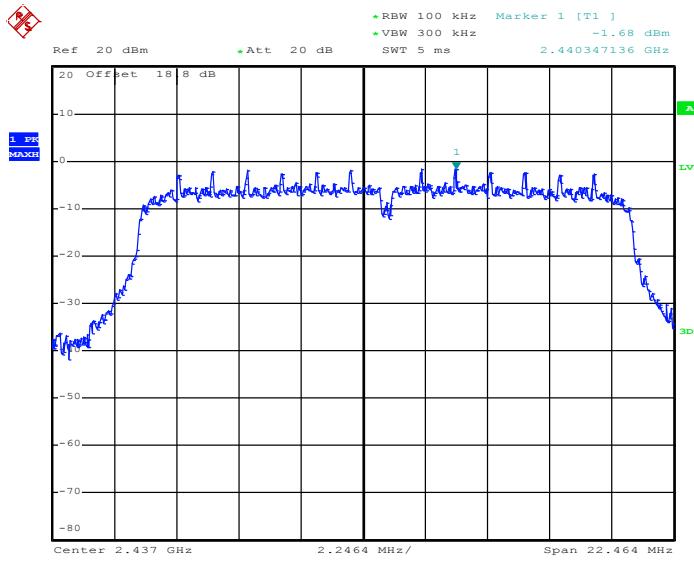
PSD Plot on Channel 01



Date: 22.JUN.2012 22:53:39

802.11n HT-20 – SISO Ant. 1

PSD Plot on Channel 06

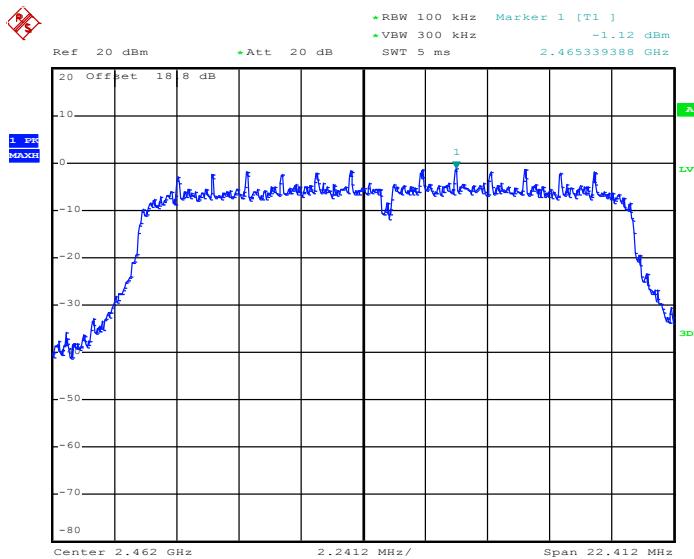


Date: 22.JUN.2012 22:56:21



802.11n HT-20 – SISO Ant. 1

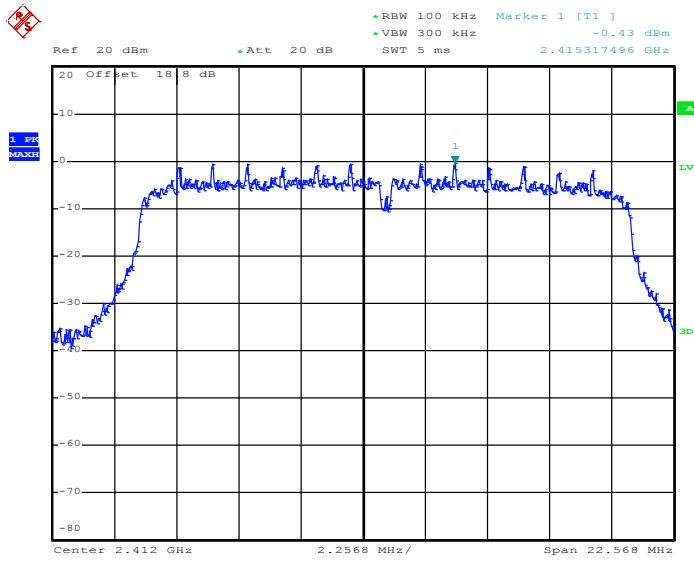
PSD Plot on Channel 11



Date: 22.JUN.2012 22:59:04

802.11n HT-20 – MIMO Ant. 1+2(1)

PSD Plot on Channel 01

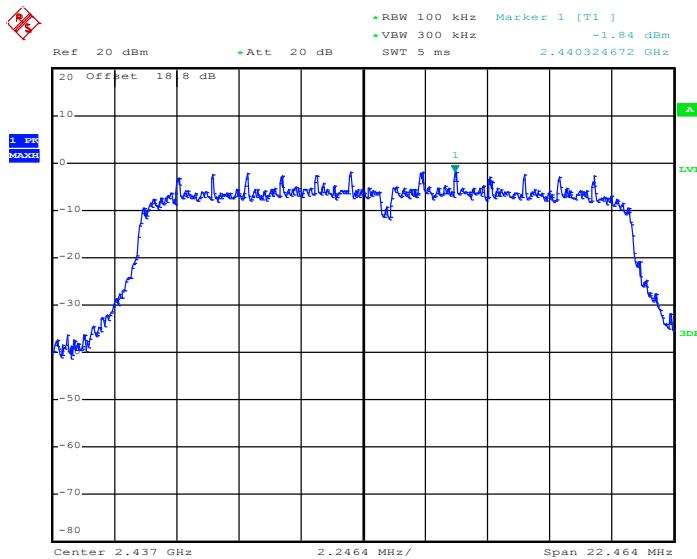


Date: 23.JUN.2012 00:09:21



802.11n HT-20 -MIMO Ant. 1+2(1)

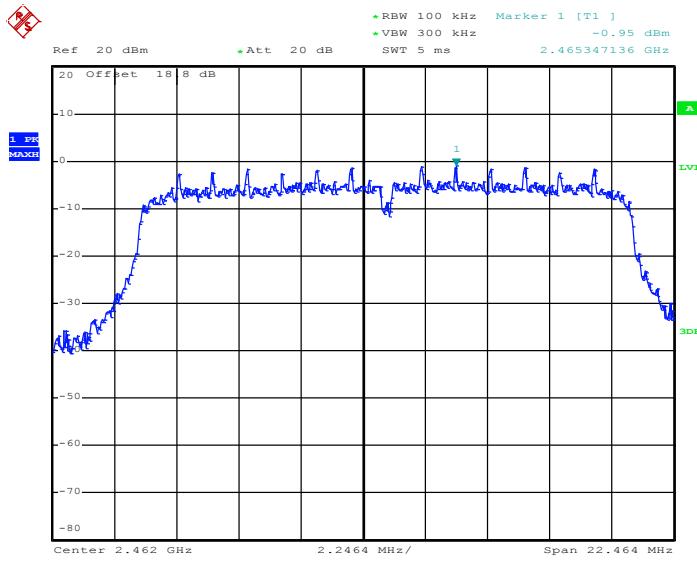
PSD Plot on Channel 06



Date: 23.JUN.2012 00:07:09

802.11n HT-20 -MIMO Ant. 1+2(1)

PSD Plot on Channel 11

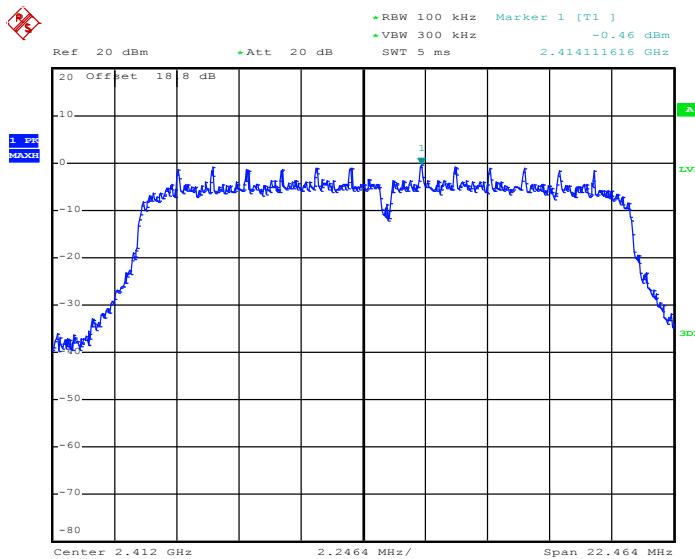


Date: 23.JUN.2012 00:04:01



802.11n HT-20 -MIMO Ant. 1+2(2)

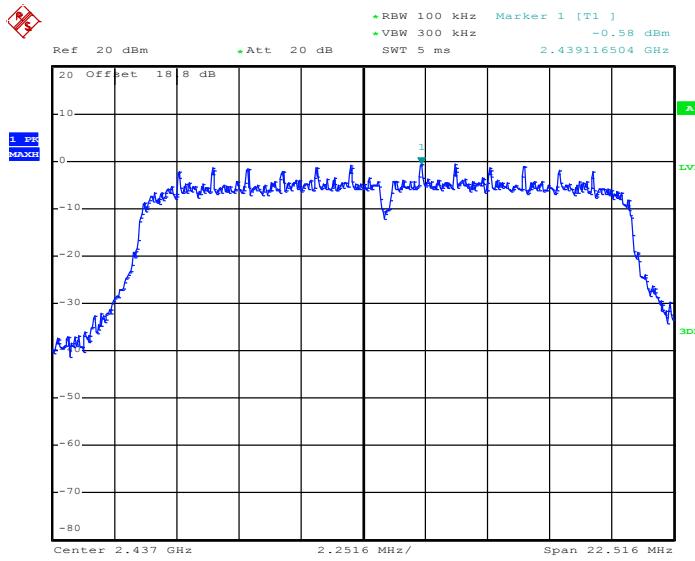
PSD Plot on Channel 01



Date: 23.JUN.2012 01:02:24

802.11n HT-20 -MIMO Ant. 1+2(2)

PSD Plot on Channel 06

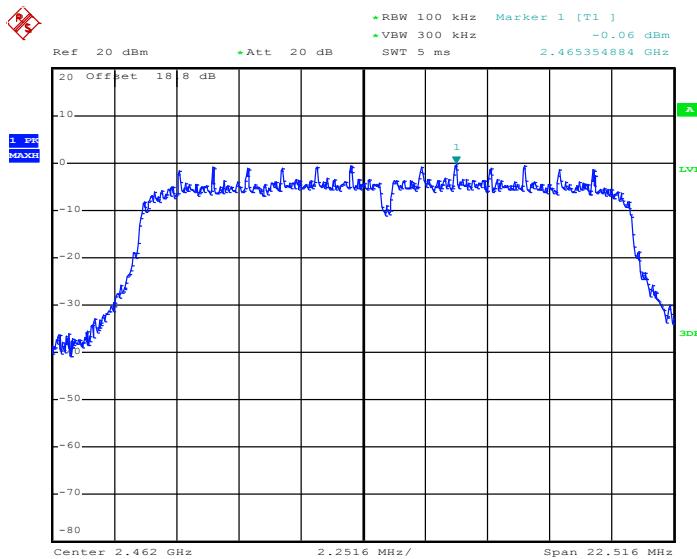


Date: 23.JUN.2012 01:05:33



802.11n HT-20 -MIMO Ant. 1+2(2)

PSD Plot on Channel 11

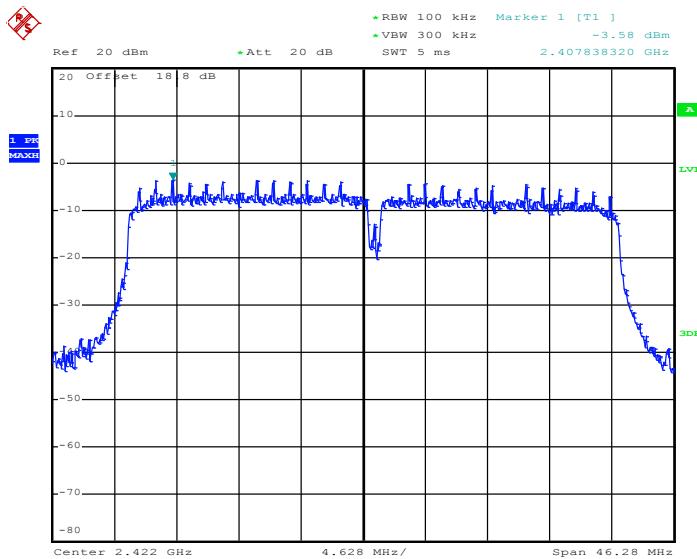


Date: 23.JUN.2012 01:09:29



802.11n HT-40 – SISO Ant. 1

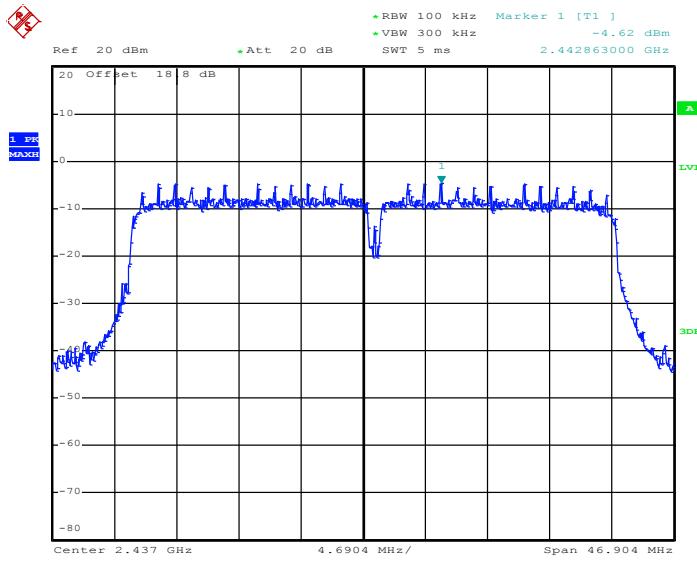
PSD Plot on Channel 03



Date: 22.JUN.2012 23:10:23

802.11n HT-40 – SISO Ant. 1

PSD Plot on Channel 06

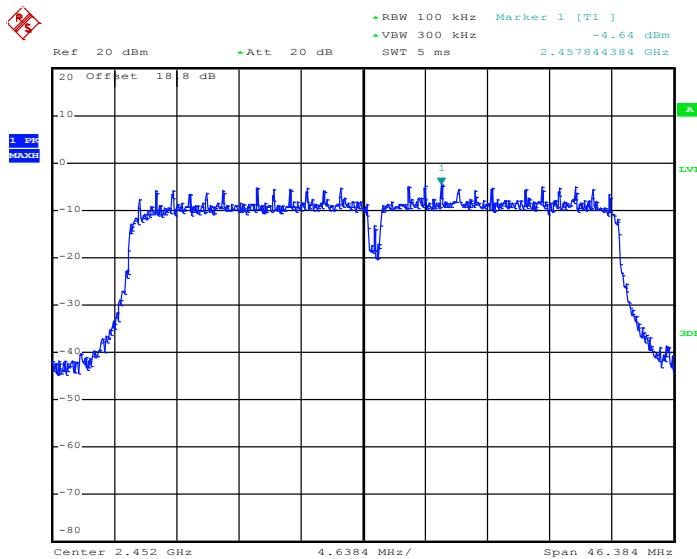


Date: 22.JUN.2012 23:07:47



802.11n HT-40 – SISO Ant. 1

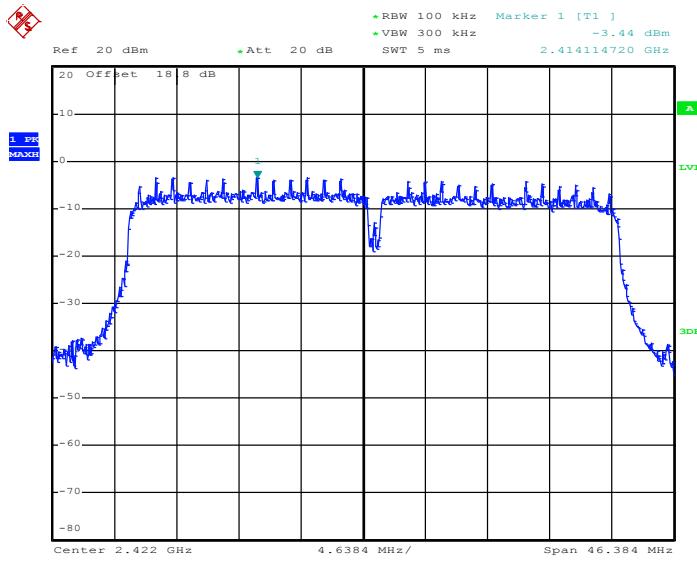
PSD Plot on Channel 09



Date: 22.JUN.2012 23:02:30

802.11n HT-40 – MIMO Ant. 1+2(1)

PSD Plot on Channel 03

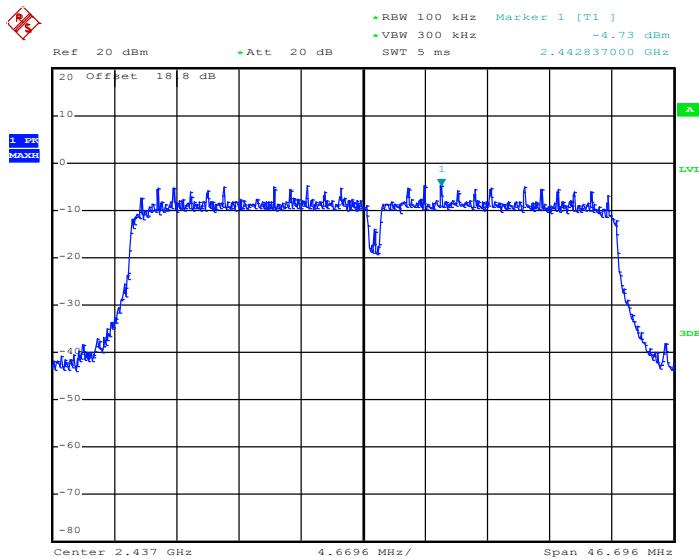


Date: 22.JUN.2012 23:48:43



802.11n HT-40 -MIMO Ant. 1+2(1)

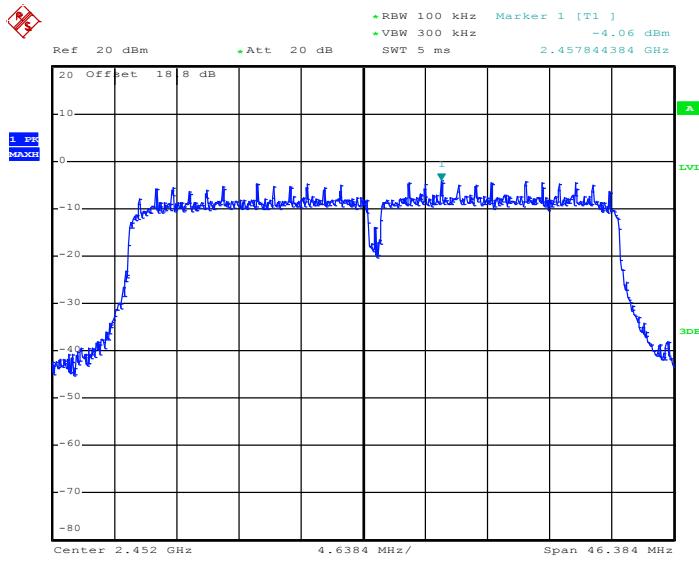
PSD Plot on Channel 06



Date: 22.JUN.2012 23:52:42

802.11n HT-40 -MIMO Ant. 1+2(1)

PSD Plot on Channel 09

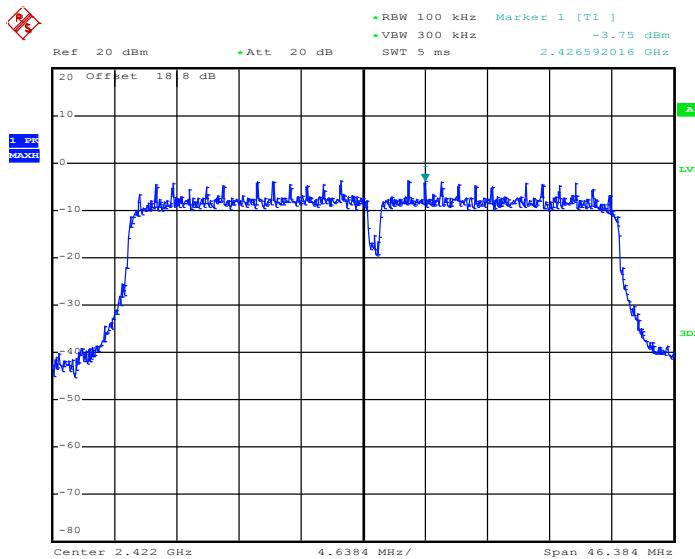


Date: 22.JUN.2012 23:58:28



802.11n HT-40 -MIMO Ant. 1+2(2)

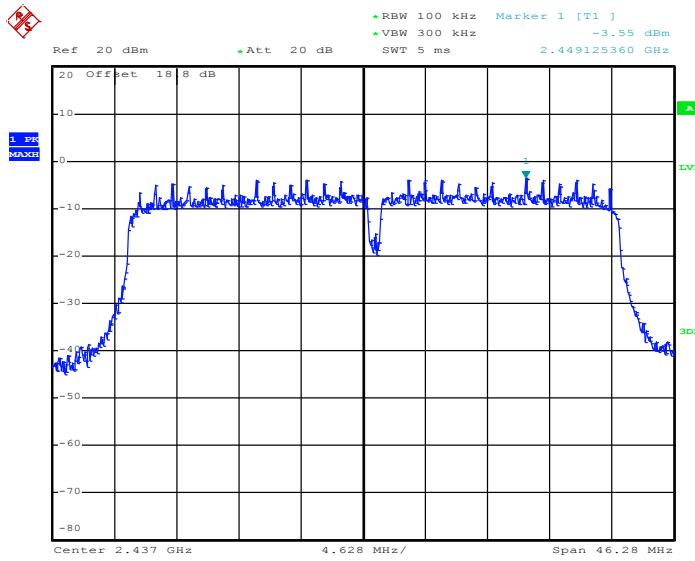
PSD Plot on Channel 03



Date: 23.JUN.2012 01:11:56

802.11n HT-40 -MIMO Ant. 1+2(2)

PSD Plot on Channel 06

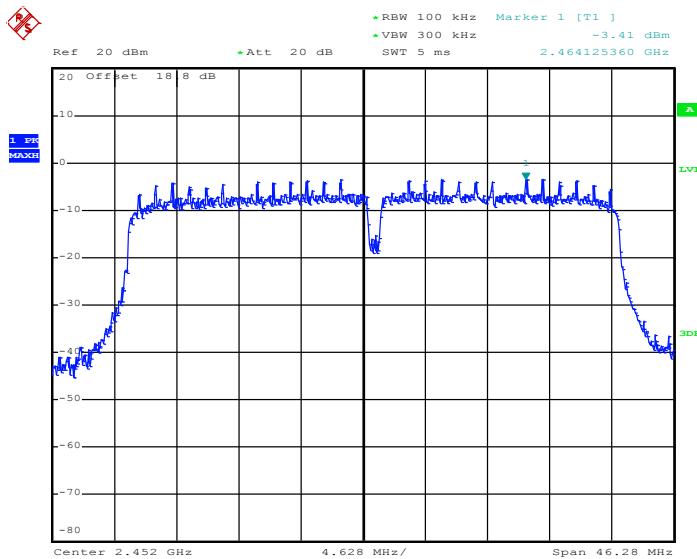


Date: 23.JUN.2012 01:15:02



802.11n HT-40 -MIMO Ant. 1+2(2)

PSD Plot on Channel 09



Date: 23.JUN.2012 01:17:41

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

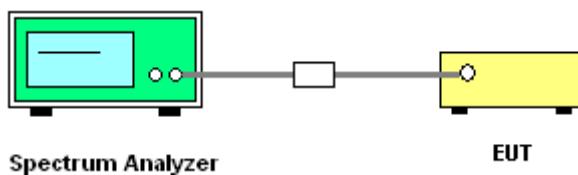
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the guidelines in the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance, ANSI C63.4-2003, and ANSI C63.10-2009.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.
4. Measure and record the results in the test report.

3.4.4 Test Setup

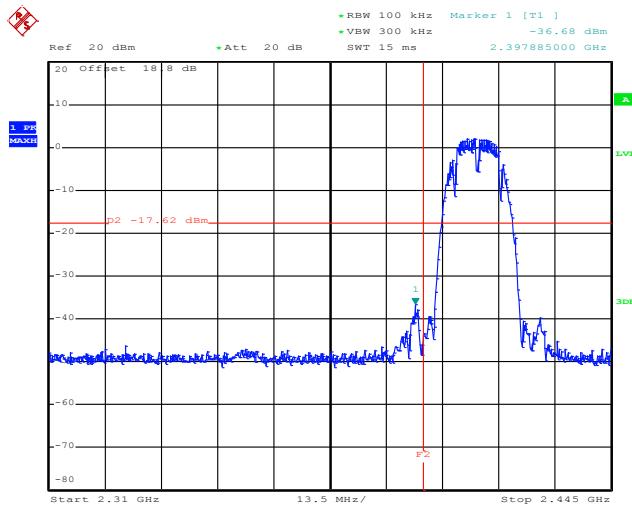


3.4.5 Test Result of Conducted Spurious at Band Edges

Test Mode :	802.11b (SISO Ant. 1)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

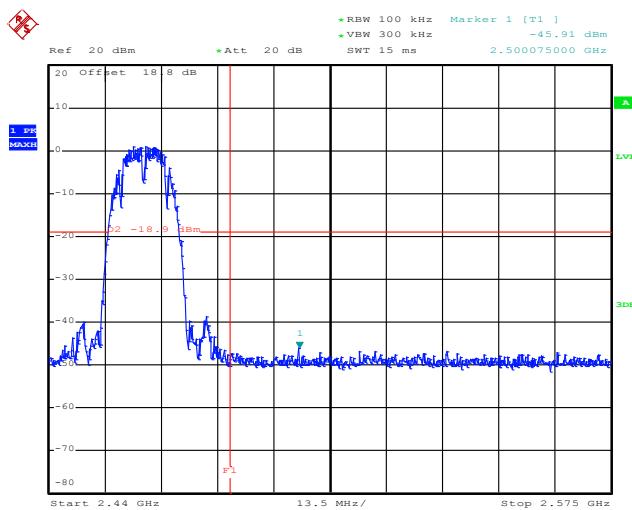
802.11b

Low Band Edge Plot on Channel 01



802.11b

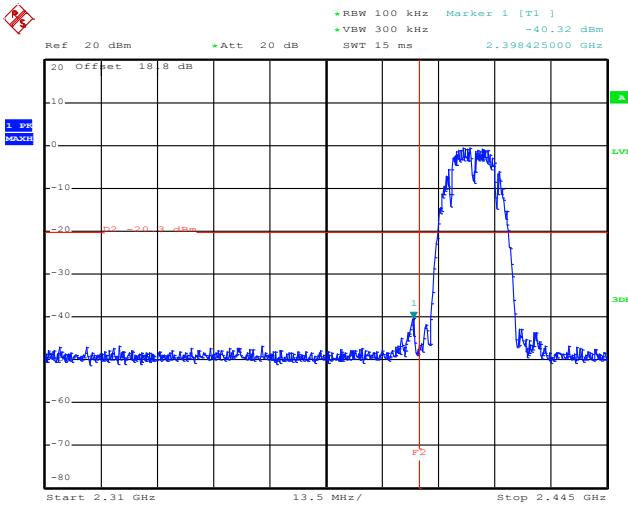
High Band Edge Plot on Channel 11



Test Mode :	802.11b MIMO Ant. 1+2(1)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11b

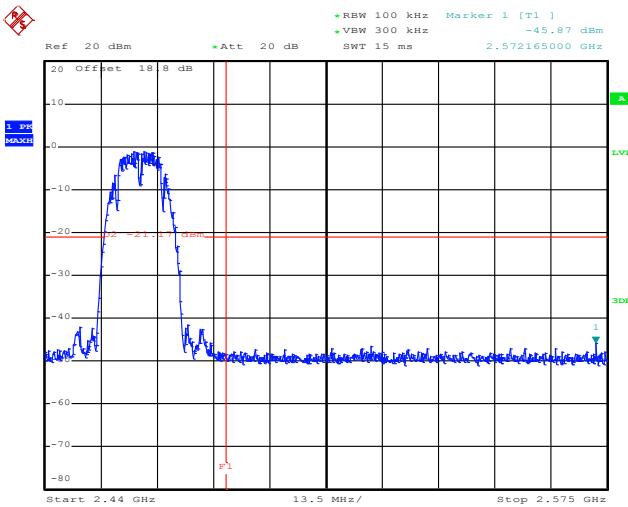
Low Band Edge Plot on Channel 01



Date: 23.JUN.2012 00:24:49

802.11b

High Band Edge Plot on Channel 11

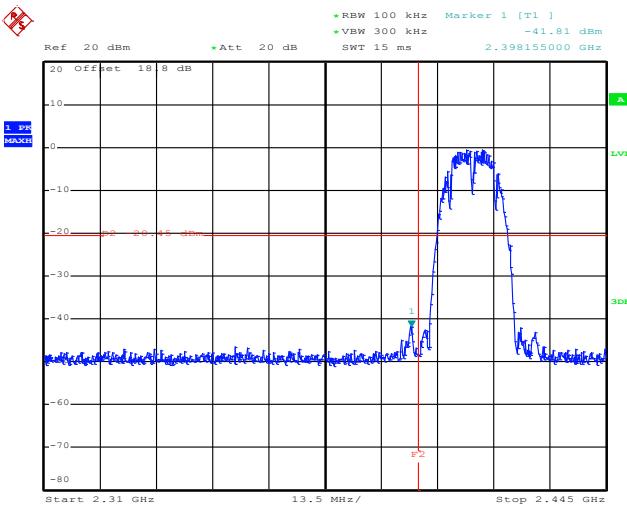


Date: 23.JUN.2012 00:20:00

Test Mode :	802.11b MIMO Ant. 1+2(2)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11b

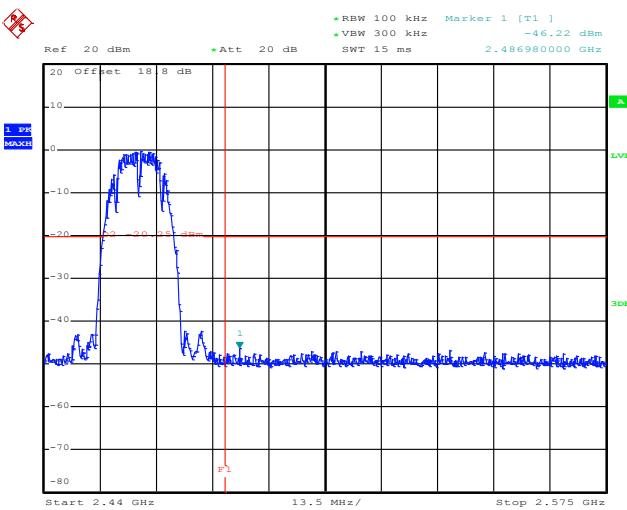
Low Band Edge Plot on Channel 01



Date: 23.JUN.2012 00:43:35

802.11b

High Band Edge Plot on Channel 11

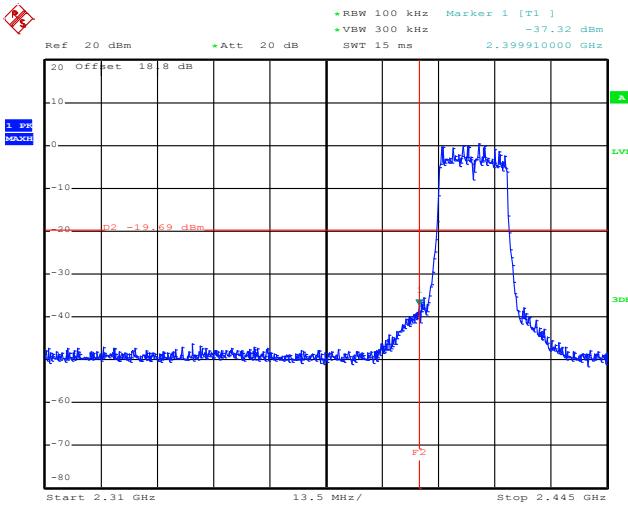


Date: 23.JUN.2012 00:49:40

Test Mode :	802.11g (SISO Ant. 1)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11g

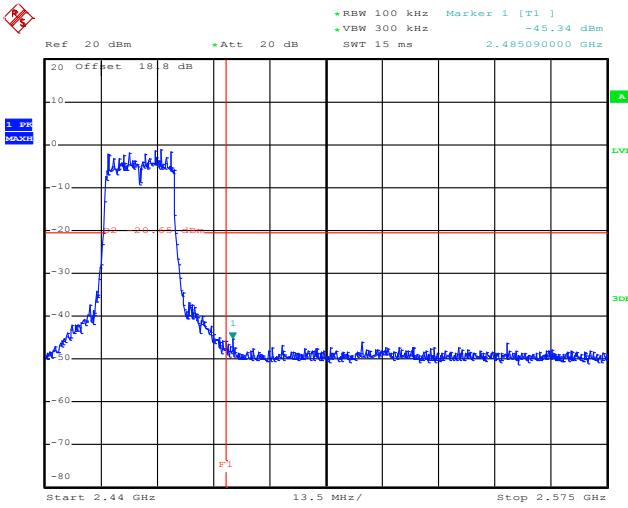
Low Band Edge Plot on Channel 01



Date: 22.JUN.2012 22:50:51

802.11g

High Band Edge Plot on Channel 11

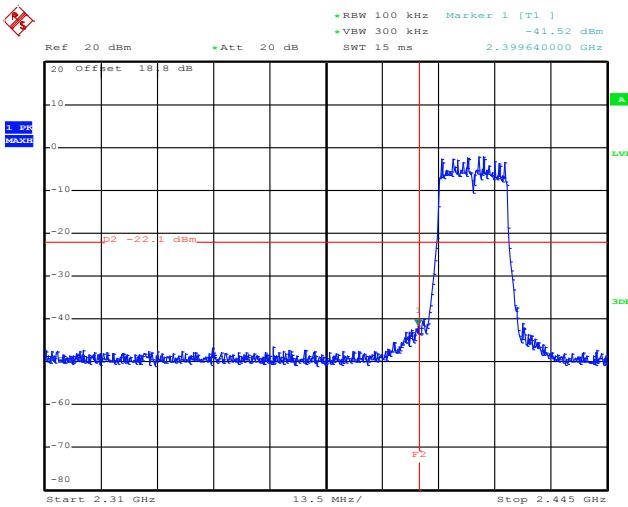


Date: 22.JUN.2012 22:45:27

Test Mode :	802.11g MIMO Ant. 1+2(1)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11g

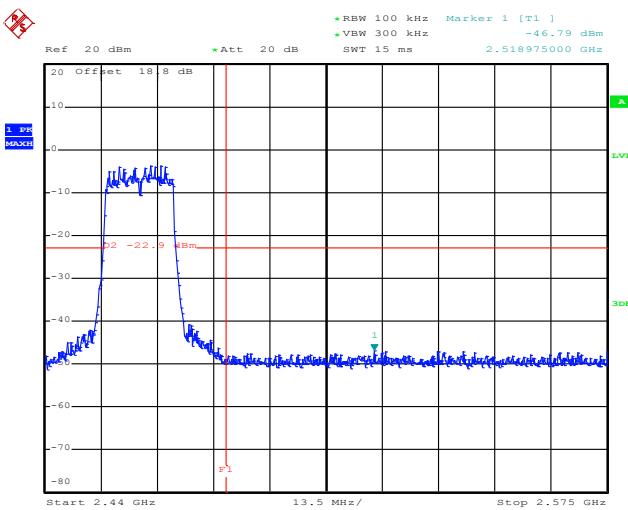
Low Band Edge Plot on Channel 01



Date: 23.JUN.2012 00:12:26

802.11g

High Band Edge Plot on Channel 11

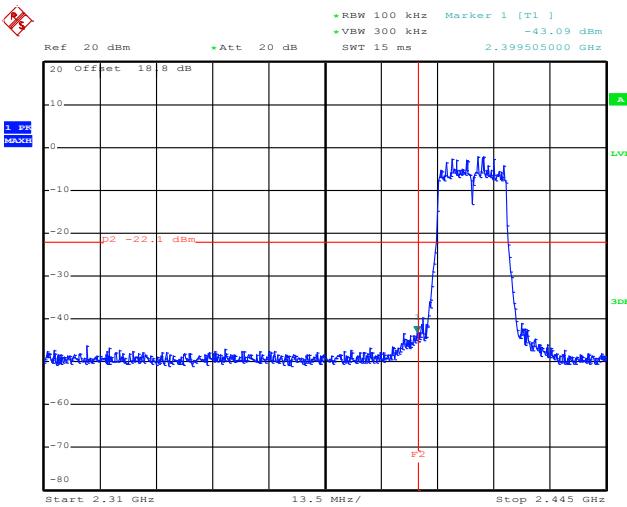


Date: 23.JUN.2012 00:17:28

Test Mode :	802.11g MIMO Ant. 1+2(2)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11g

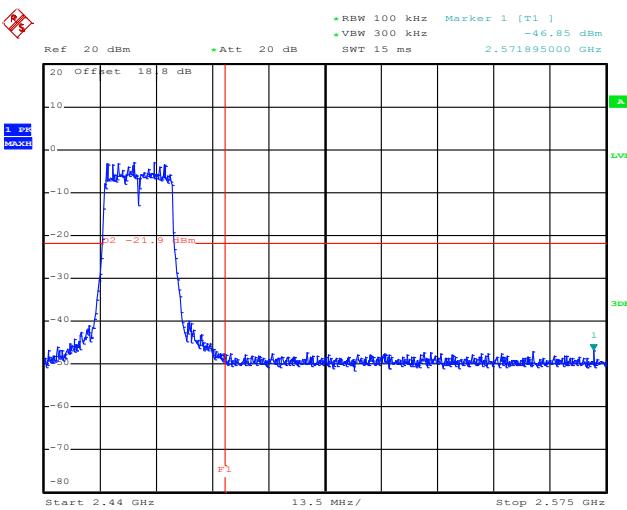
Low Band Edge Plot on Channel 01



Date: 23.JUN.2012 00:58:56

802.11g

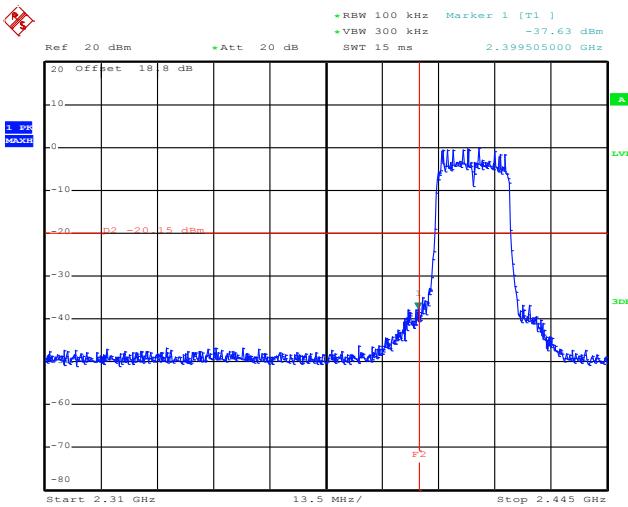
High Band Edge Plot on Channel 11



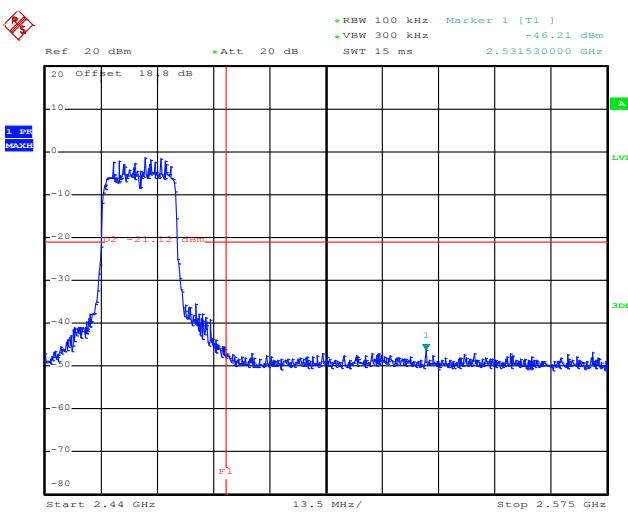
Date: 23.JUN.2012 00:53:09



Test Mode :	802.11n HT-20 SISO Ant. 1	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11n HT-20**Low Band Edge Plot on Channel 01**

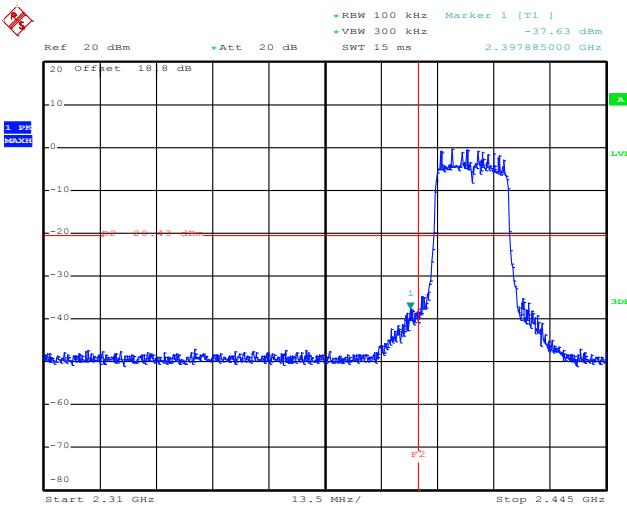
Date: 22.JUN.2012 22:53:52

802.11n HT-20**High Band Edge Plot on Channel 11**

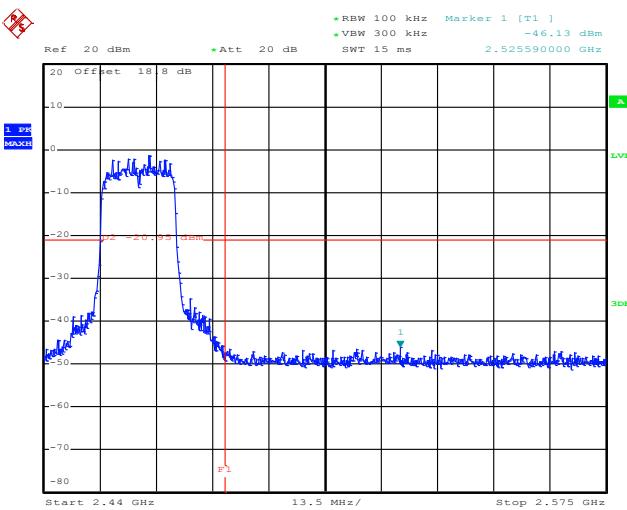
Date: 22.JUN.2012 22:59:18



Test Mode :	802.11n HT-20 MIMO Ant. 1+2(1)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11n HT-20**Low Band Edge Plot on Channel 01**

Date: 23.JUN.2012 00:09:37

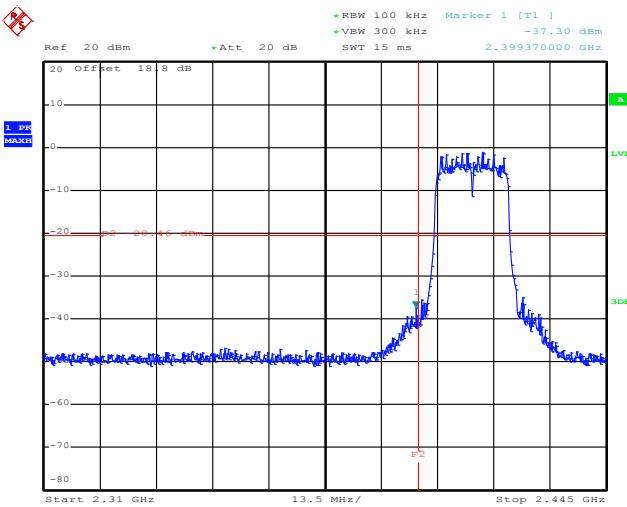
802.11n HT-20**High Band Edge Plot on Channel 11**

Date: 23.JUN.2012 00:04:14

Test Mode :	802.11n HT-20 MIMO Ant. 1+2(2)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

802.11n HT-20

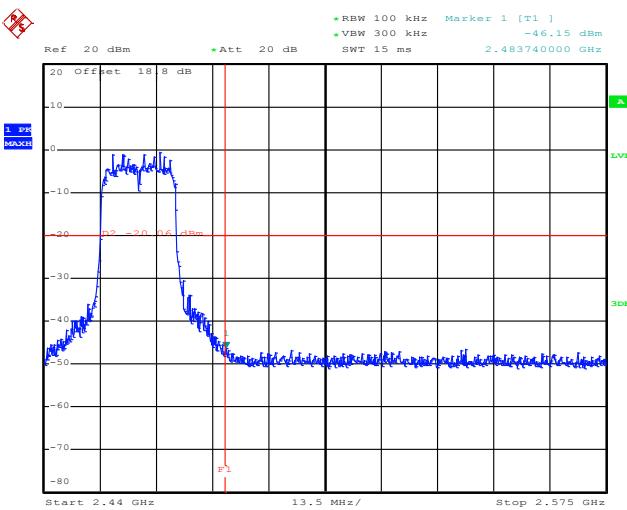
Low Band Edge Plot on Channel 01



Date: 23.JUN.2012 01:02:37

802.11n HT-20

High Band Edge Plot on Channel 11

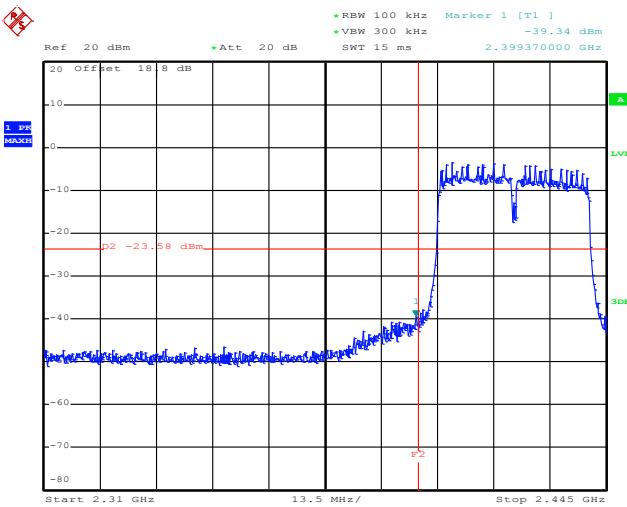


Date: 23.JUN.2012 01:09:48

Test Mode :	802.11n HT-40 SISO Ant. 1	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	03 and 09	Test Engineer :	Bill Kuo

802.11n HT-40

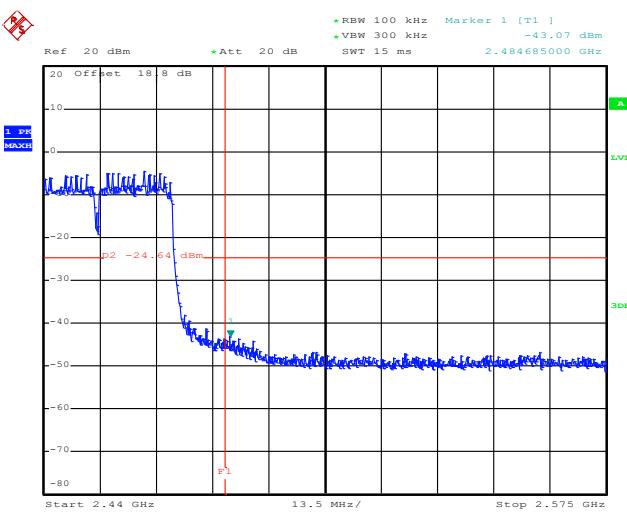
Low Band Edge Plot on Channel 03



Date: 22.JUN.2012 23:10:36

802.11n HT-40

High Band Edge Plot on Channel 09

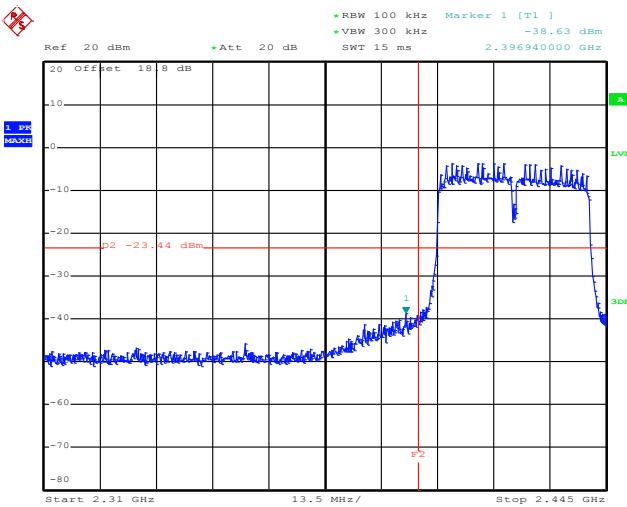


Date: 22.JUN.2012 23:02:43

Test Mode :	802.11n HT-40 MIMO Ant. 1+2(1)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	03 and 09	Test Engineer :	Bill Kuo

802.11n HT-40

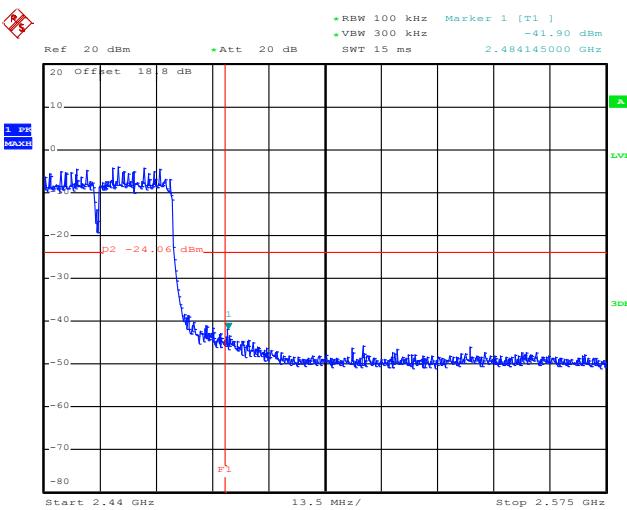
Low Band Edge Plot on Channel 03



Date: 22.JUN.2012 23:48:58

802.11n HT-40

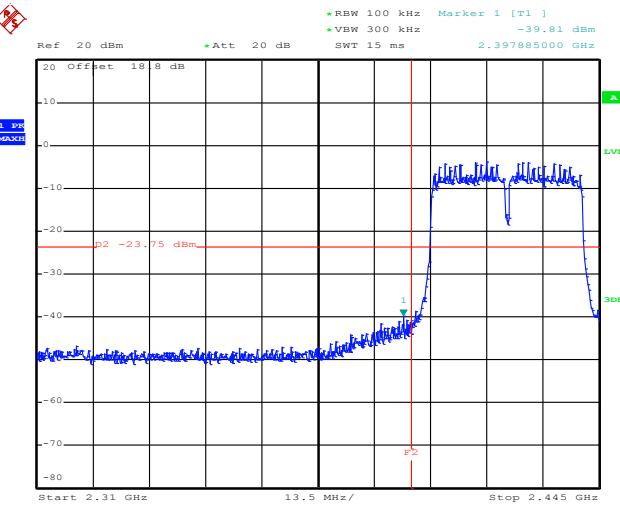
High Band Edge Plot on Channel 09



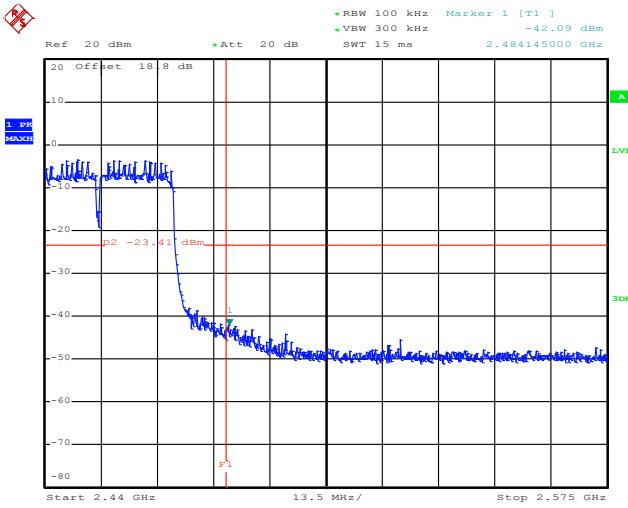
Date: 22.JUN.2012 23:58:44



Test Mode :	802.11n HT-40 MIMO Ant. 1+2(2)	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	03 and 09	Test Engineer :	Bill Kuo

802.11n HT-40**Low Band Edge Plot on Channel 03**

Date: 23.JUN.2012 01:12:09

802.11n HT-40**High Band Edge Plot on Channel 09**

Date: 23.JUN.2012 01:18:21

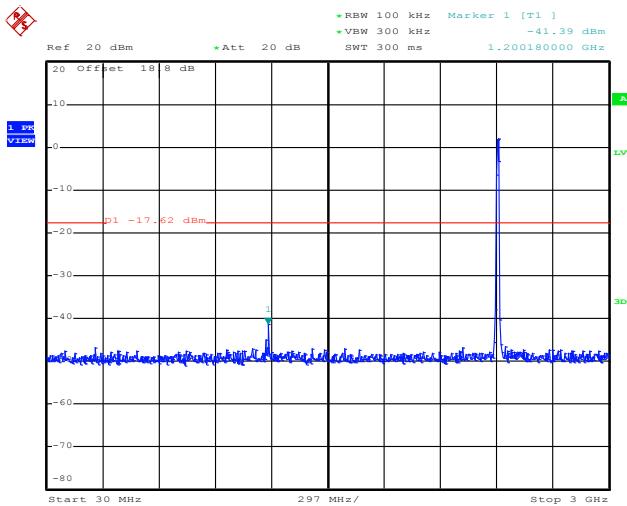


3.4.5 Test Result of Conducted Spurious Emission

Test Mode :	802.11b SISO Ant. 1	Temperature :	24~26°C
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

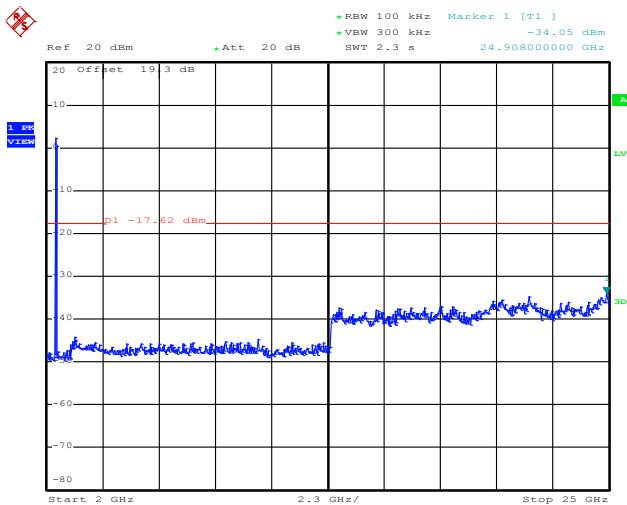
Conducted Spurious Emission Plot on Channel 01



Date: 22.JUN.2012 22:30:47

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

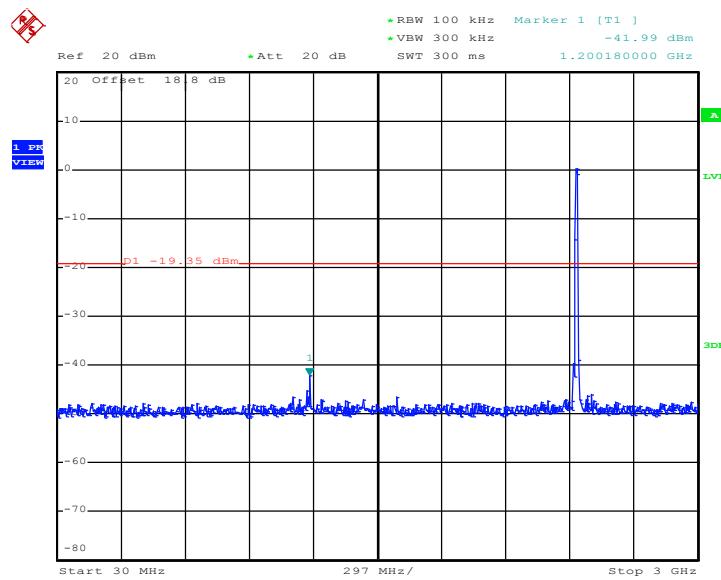


Date: 22.JUN.2012 22:31:04



802.11b 30 MHz~3 GHz

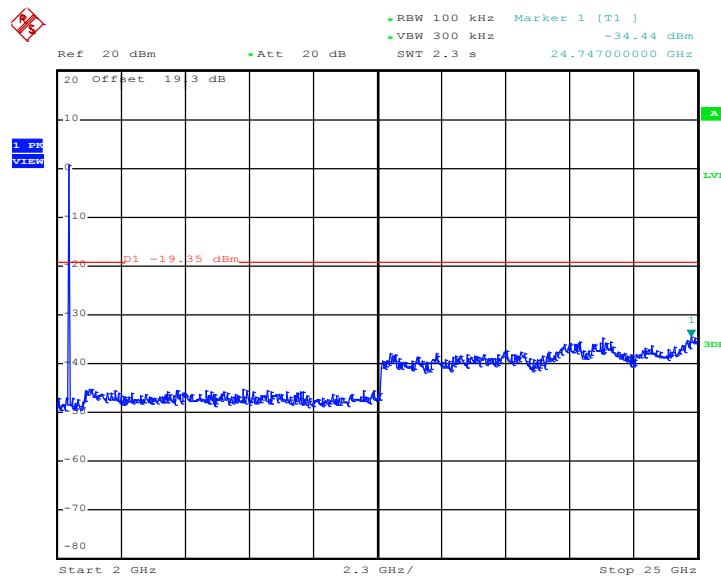
Conducted Spurious Emission Plot on Channel 06



Date: 22.JUN.2012 22:37:56

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

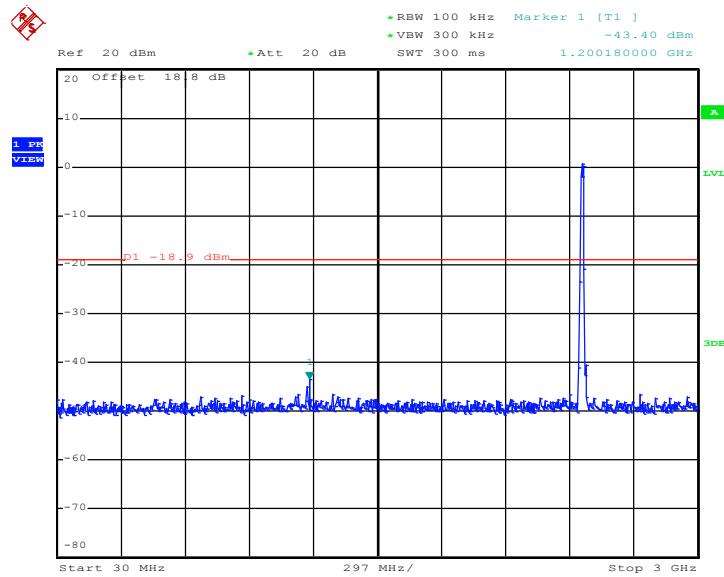


Date: 22.JUN.2012 22:38:14



802.11b 30 MHz~3 GHz

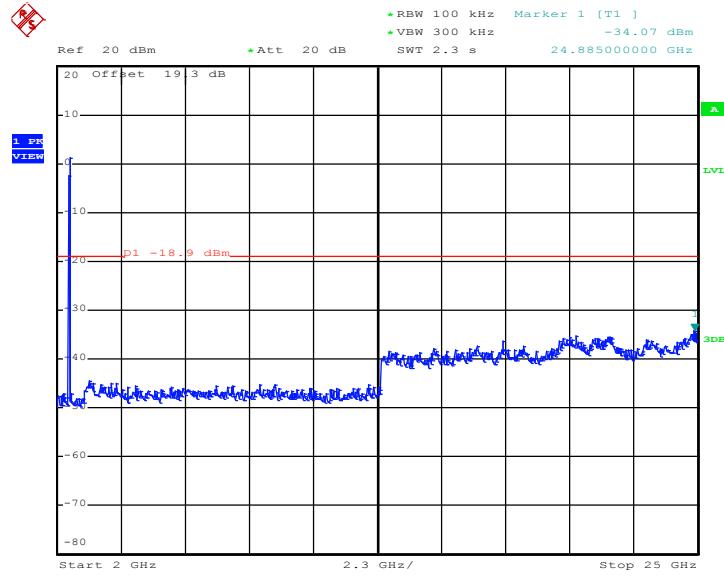
Conducted Spurious Emission Plot on Channel 11



Date: 22.JUN.2012 22:40:41

802.11b 2 GHz~25 GHz

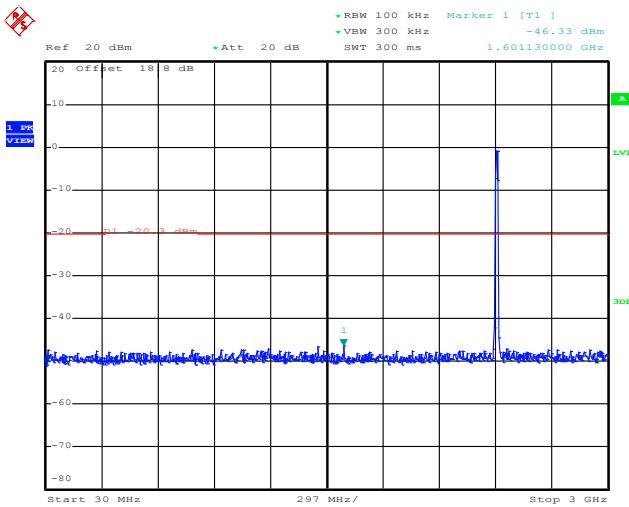
Conducted Spurious Emission Plot on Channel 11



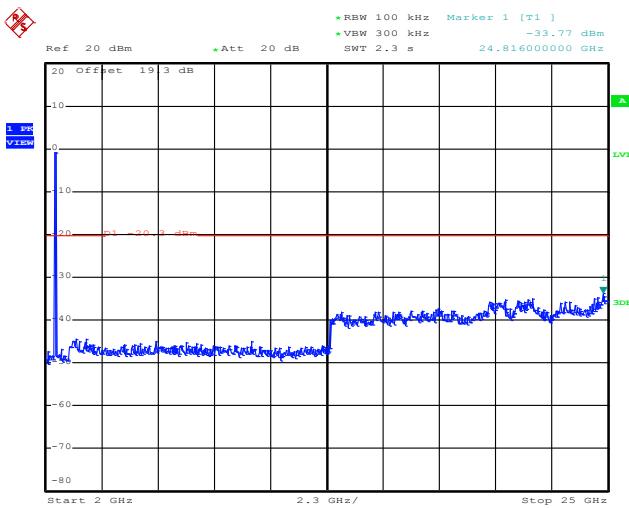
Date: 22.JUN.2012 22:40:59



Test Mode :	802.11b MIMO Ant. 1+2(1)	Temperature :	24~26°C
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**

Date: 23.JUN.2012 00:25:08

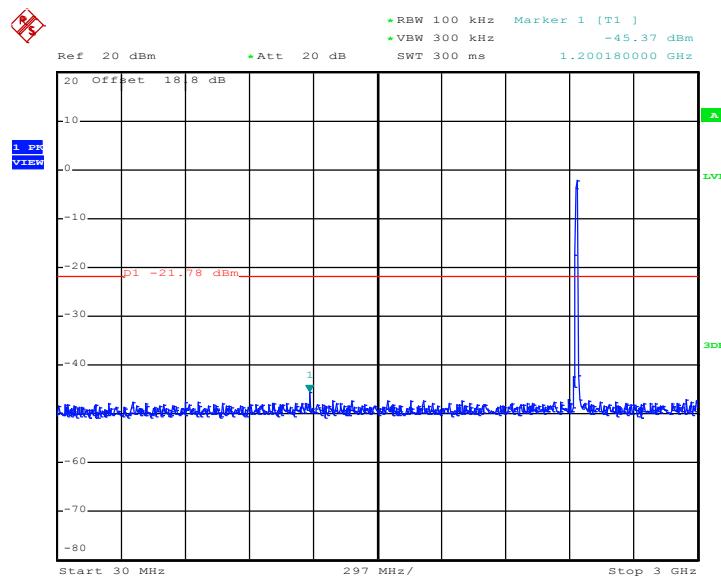
802.11b 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 00:25:26



802.11b 30 MHz~3 GHz

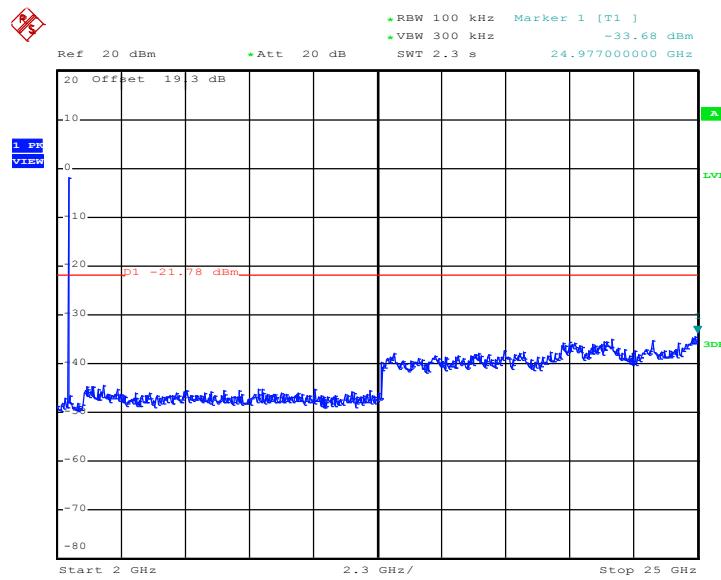
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 00:22:39

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

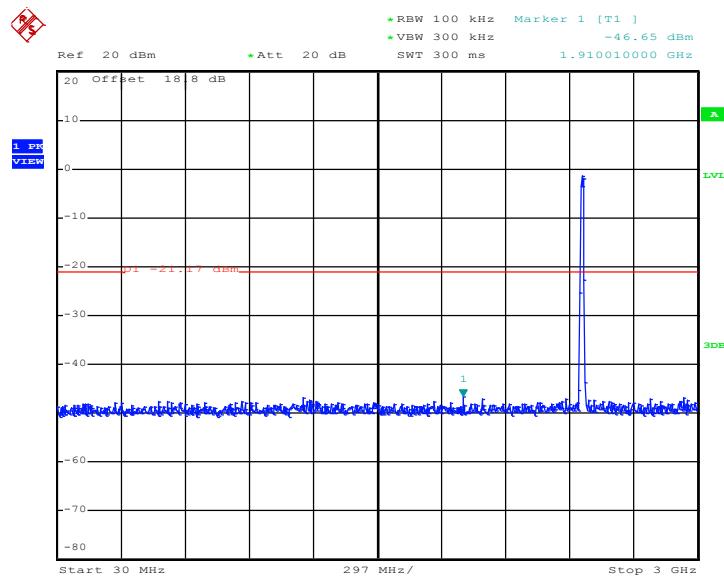


Date: 23.JUN.2012 00:22:57



802.11b 30 MHz~3 GHz

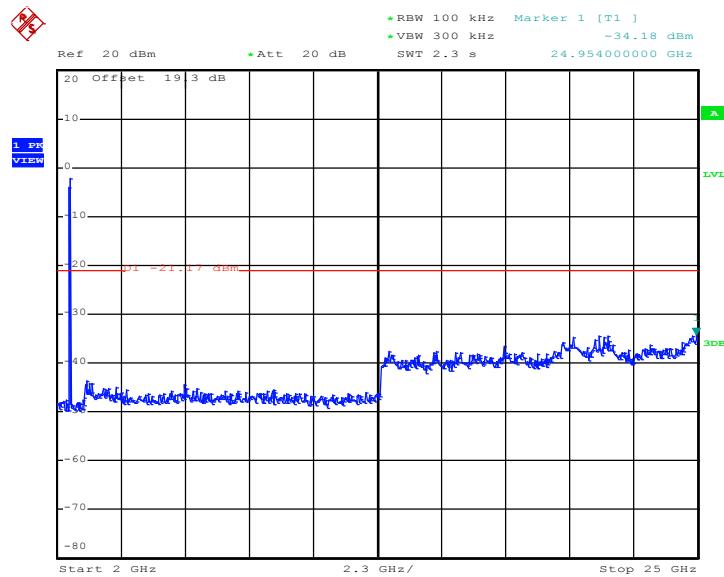
Conducted Spurious Emission Plot on Channel 11



Date: 23.JUN.2012 00:20:19

802.11b 2 GHz~25 GHz

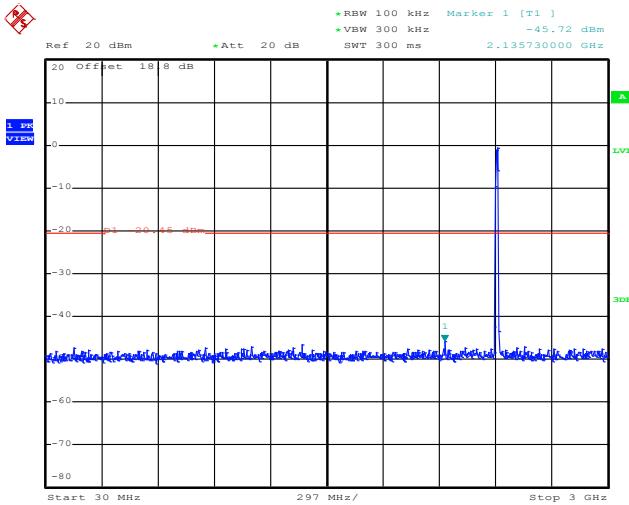
Conducted Spurious Emission Plot on Channel 11



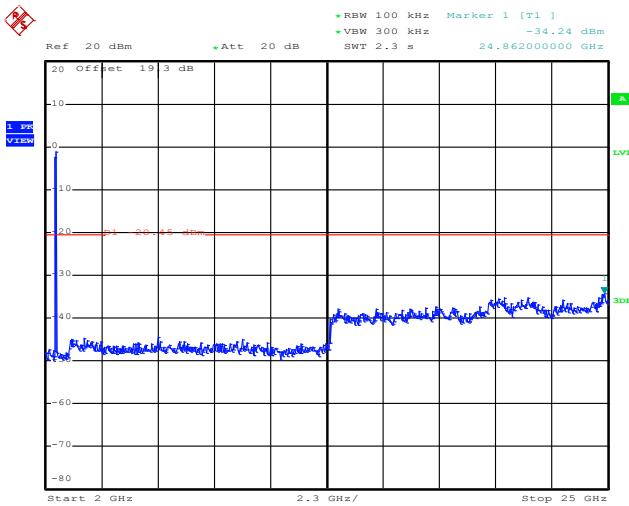
Date: 23.JUN.2012 00:20:37



Test Mode :	802.11b MIMO Ant. 1+2(2)	Temperature :	24~26°C
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**

Date: 23.JUN.2012 00:43:57

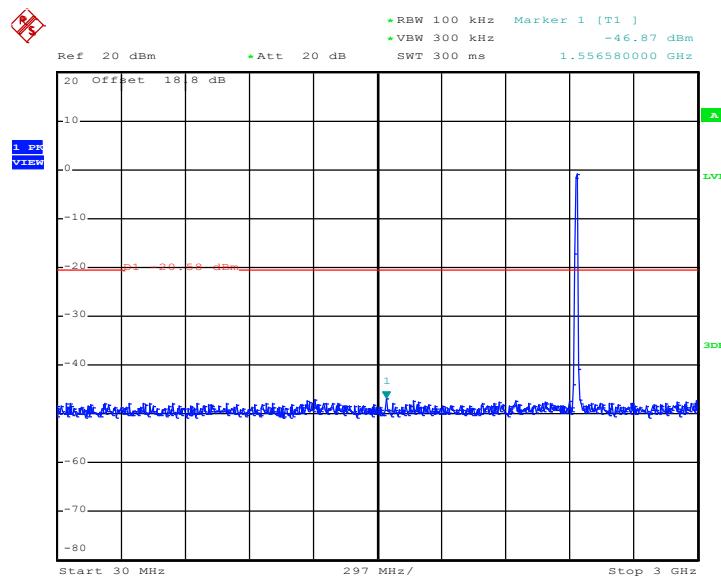
802.11b 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 00:44:14



802.11b 30 MHz~3 GHz

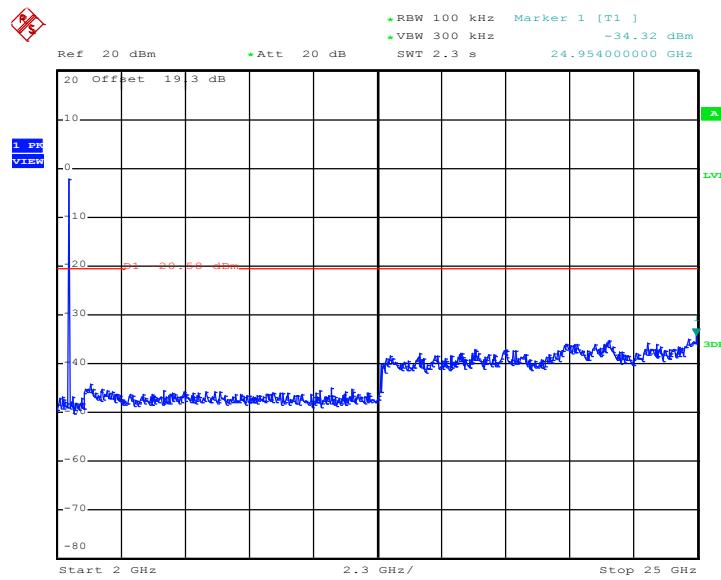
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 00:46:58

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

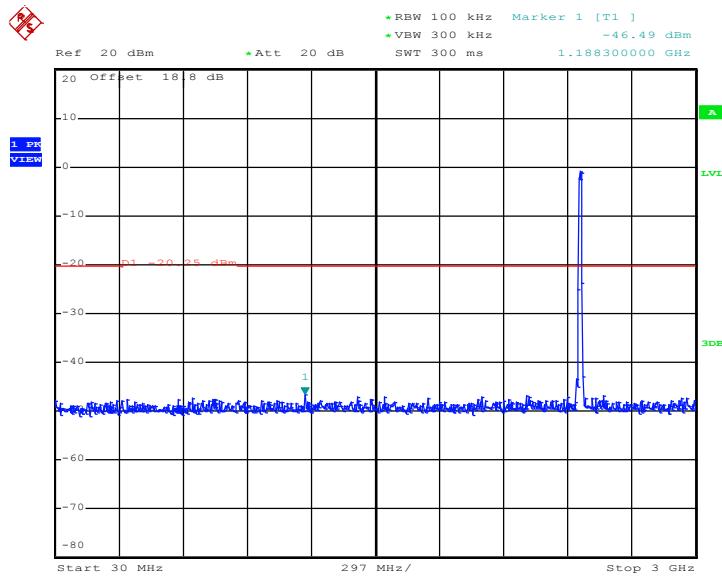


Date: 23.JUN.2012 00:47:16



802.11b 30 MHz~3 GHz

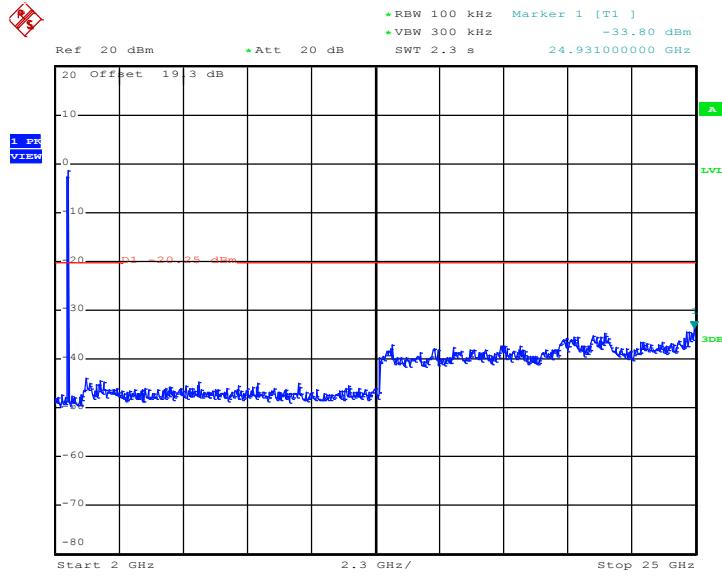
Conducted Spurious Emission Plot on Channel 11



Date: 23.JUN.2012 00:50:00

802.11b 2 GHz~25 GHz

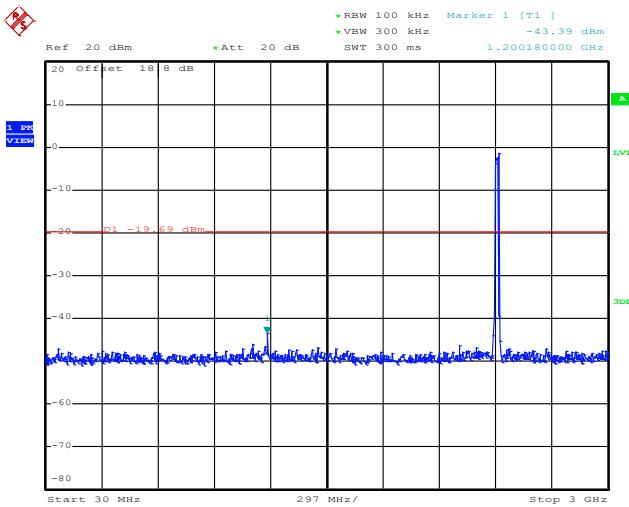
Conducted Spurious Emission Plot on Channel 11



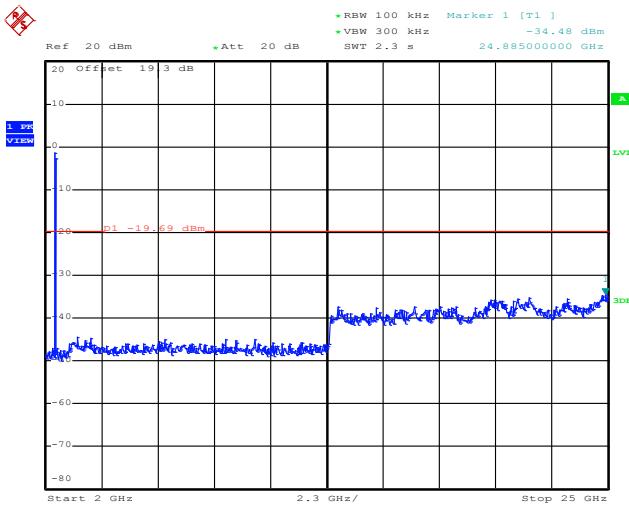
Date: 23.JUN.2012 00:50:17



Test Mode :	802.11g SISO Ant. 1	Temperature :	24~26°C
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: 22.JUN.2012 22:51:12

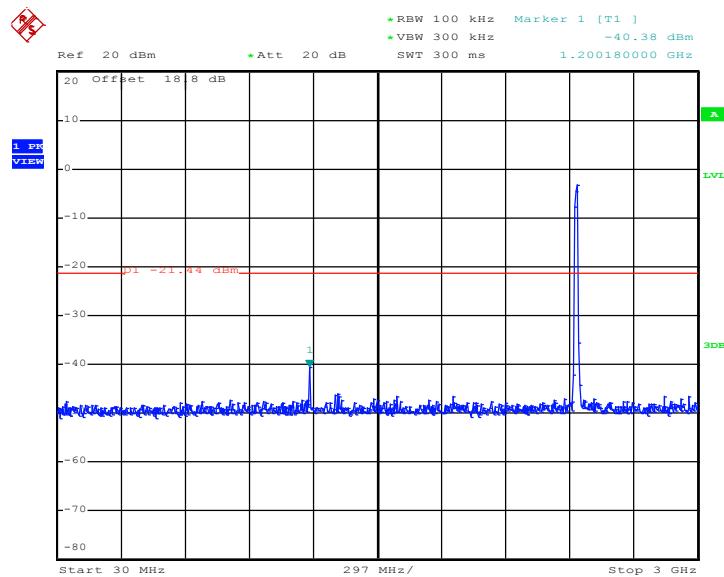
802.11g 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 22.JUN.2012 22:51:29



802.11g 30 MHz~3 GHz

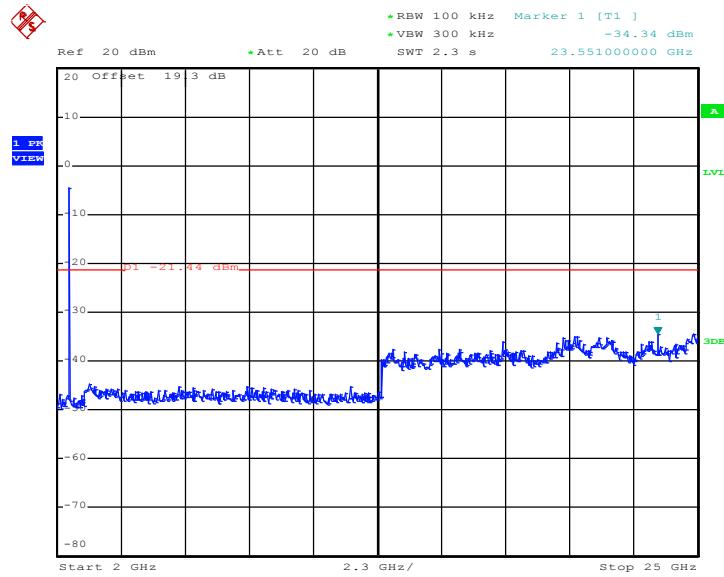
Conducted Spurious Emission Plot on Channel 06



Date: 22.JUN.2012 22:49:05

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

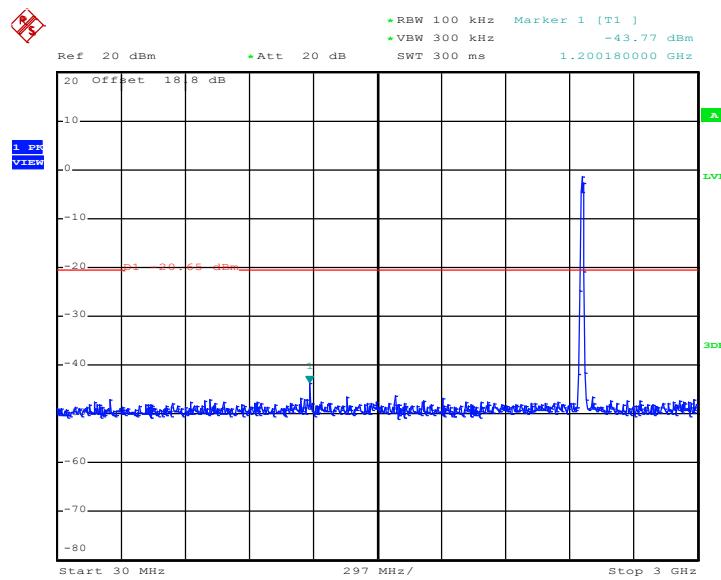


Date: 22.JUN.2012 22:49:23



802.11g 30 MHz~3 GHz

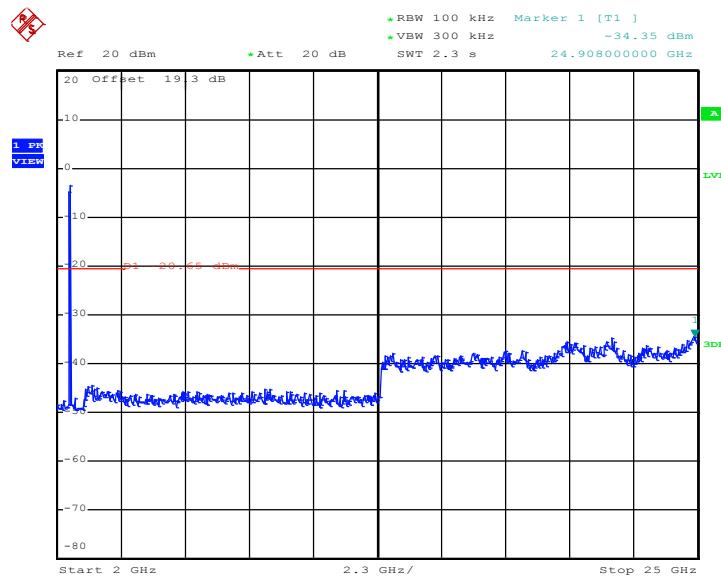
Conducted Spurious Emission Plot on Channel 11



Date: 22.JUN.2012 22:45:58

802.11g 2 GHz~25 GHz

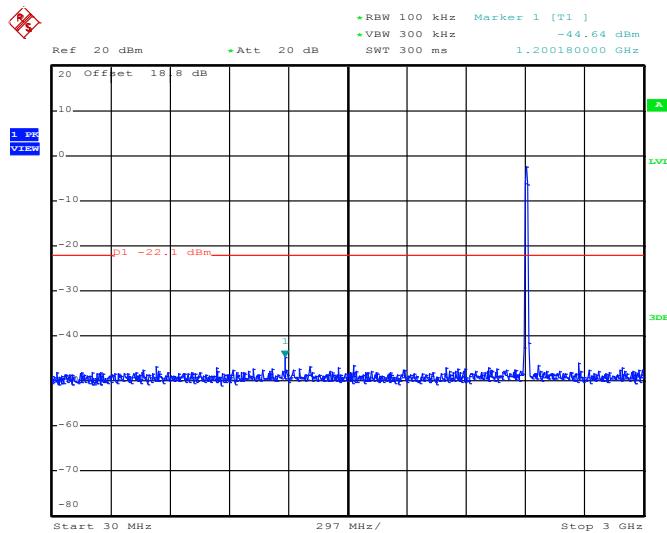
Conducted Spurious Emission Plot on Channel 11



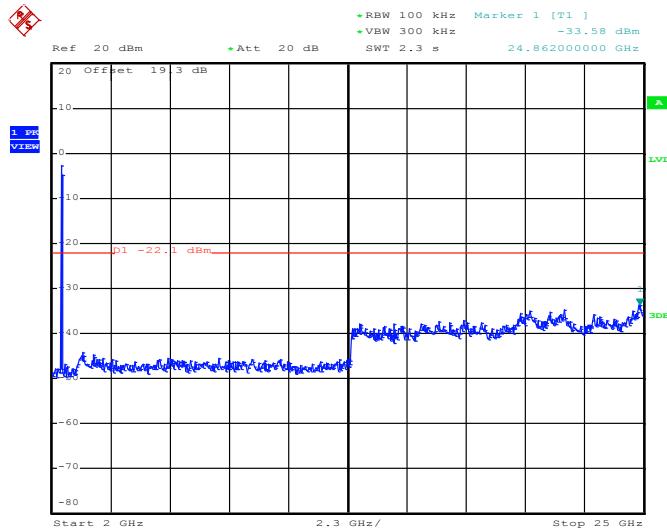
Date: 22.JUN.2012 22:46:15



Test Mode :	802.11g MIMO Ant. 1+2(1)	Temperature :	24~26°C
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: 23.JUN.2012 00:12:45

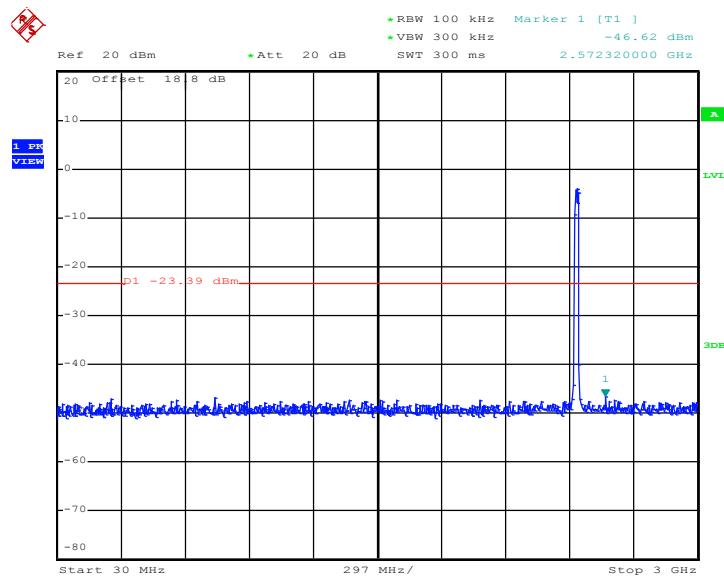
802.11g 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 00:13:03



802.11g 30 MHz~3 GHz

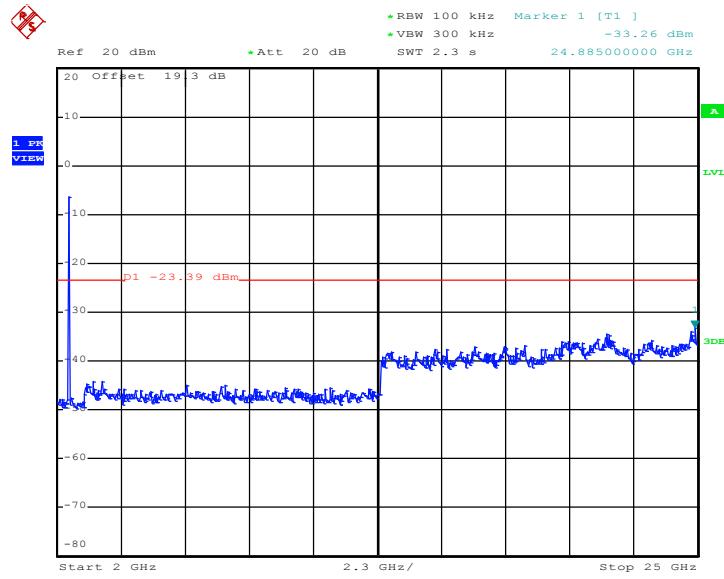
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 00:15:11

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

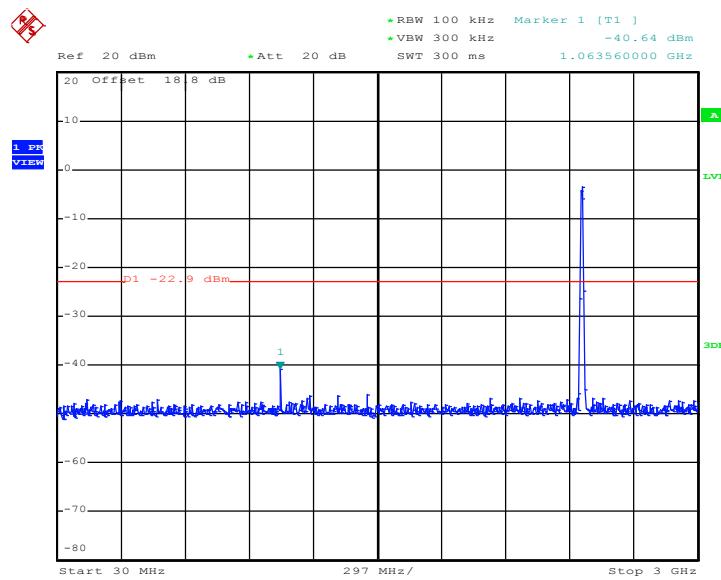


Date: 23.JUN.2012 00:15:28



802.11g 30 MHz~3 GHz

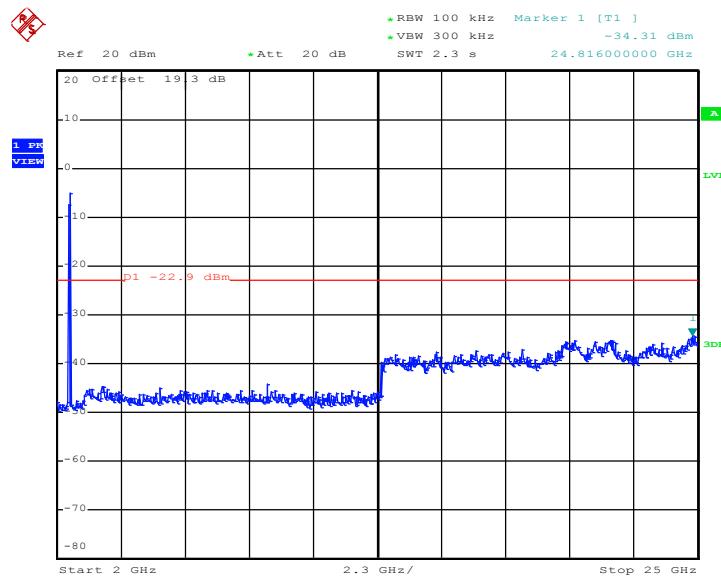
Conducted Spurious Emission Plot on Channel 11



Date: 23.JUN.2012 00:17:49

802.11g 2 GHz~25 GHz

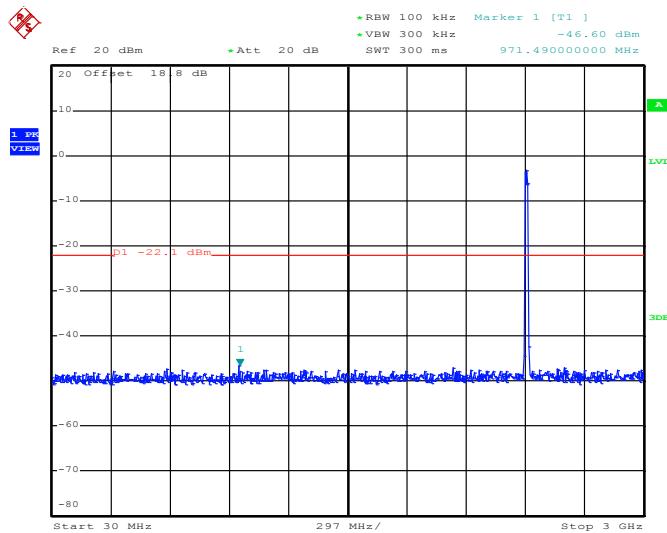
Conducted Spurious Emission Plot on Channel 11



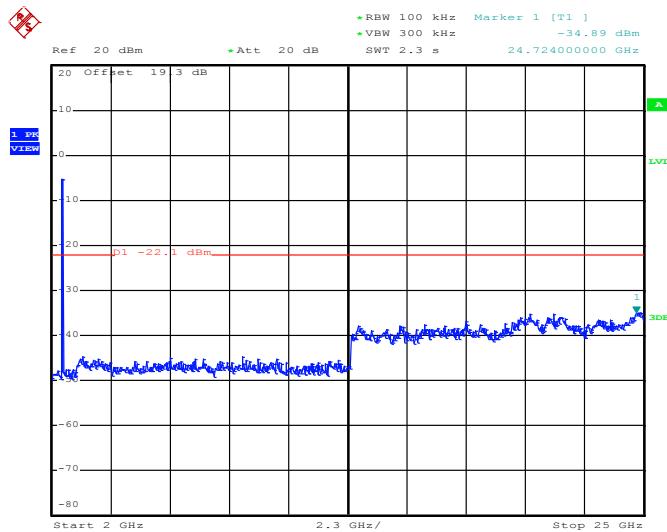
Date: 23.JUN.2012 00:18:07



Test Mode :	802.11g MIMO Ant. 1+2(2)	Temperature :	24~26°C
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: 23.JUN.2012 00:59:34

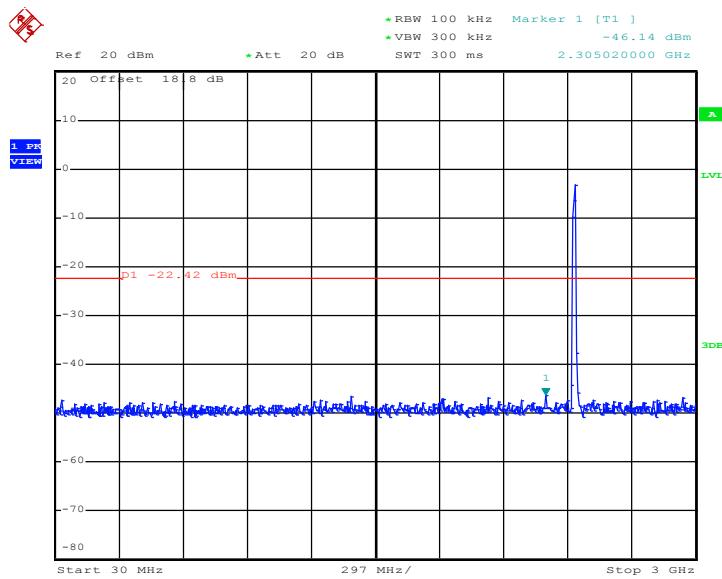
802.11g 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 00:59:52



802.11g 30 MHz~3 GHz

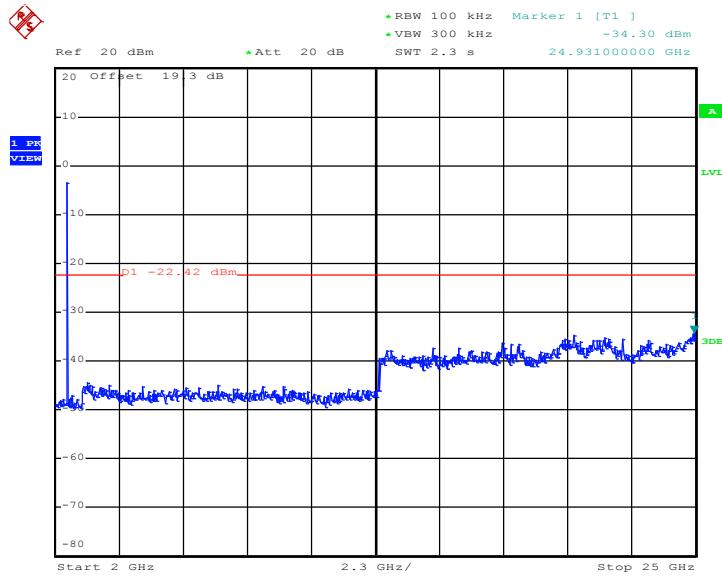
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 00:56:40

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

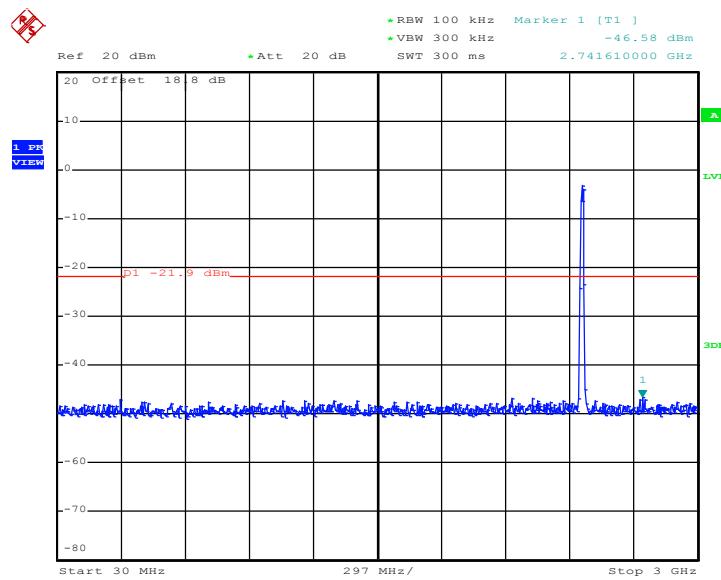


Date: 23.JUN.2012 00:56:57



802.11g 30 MHz~3 GHz

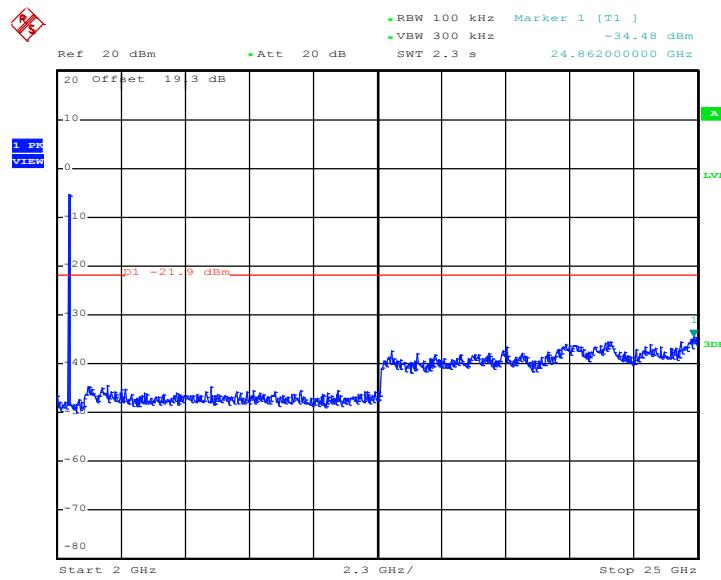
Conducted Spurious Emission Plot on Channel 11



Date: 23.JUN.2012 00:53:34

802.11g 2 GHz~25 GHz

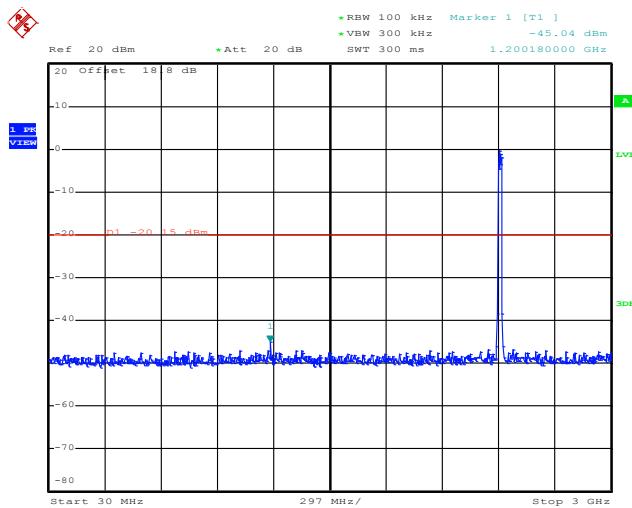
Conducted Spurious Emission Plot on Channel 11



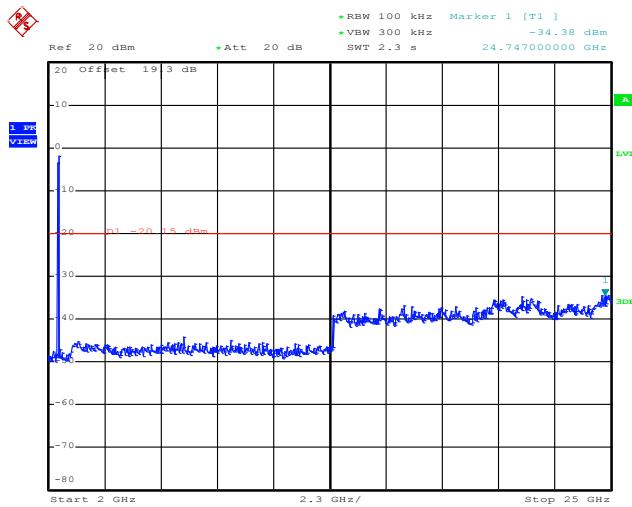
Date: 23.JUN.2012 00:53:51



Test Mode :	802.11n HT-20 SISO Ant. 1	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Bill Kuo

802.11n HT-20 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 22.JUN.2012 22:54:14

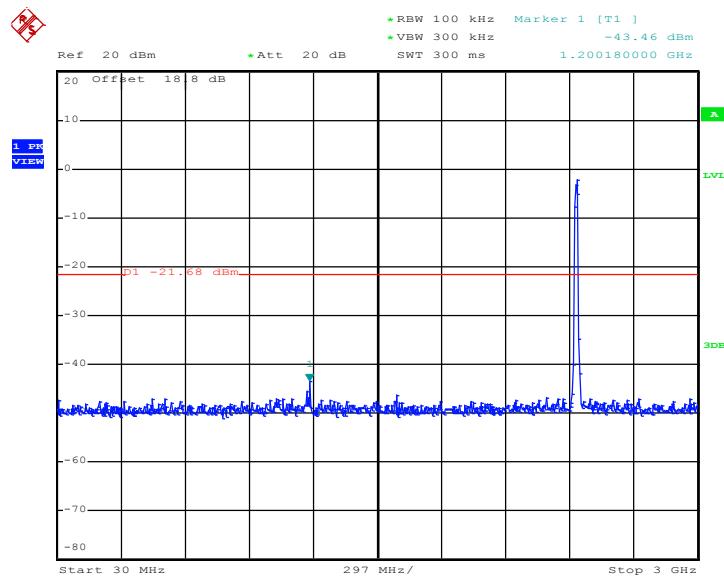
802.11n HT-20 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 22.JUN.2012 22:54:31



802.11n HT-20 30 MHz~3 GHz

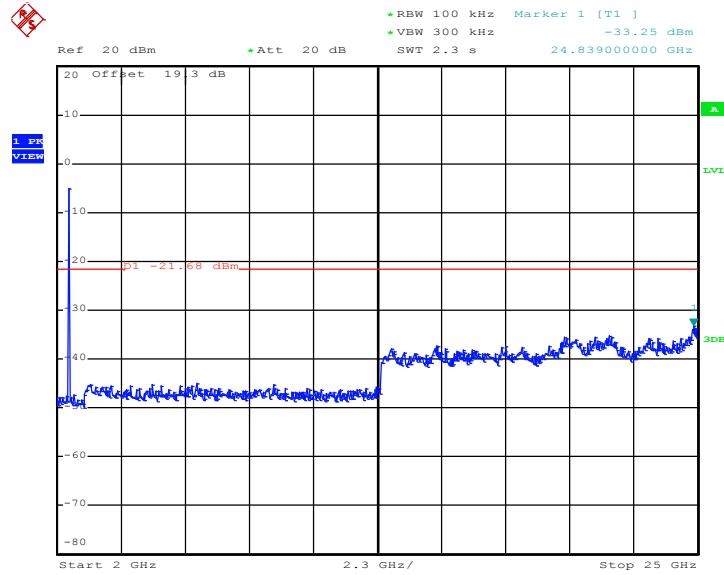
Conducted Spurious Emission Plot on Channel 06



Date: 22.JUN.2012 22:56:40

802.11n HT-20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

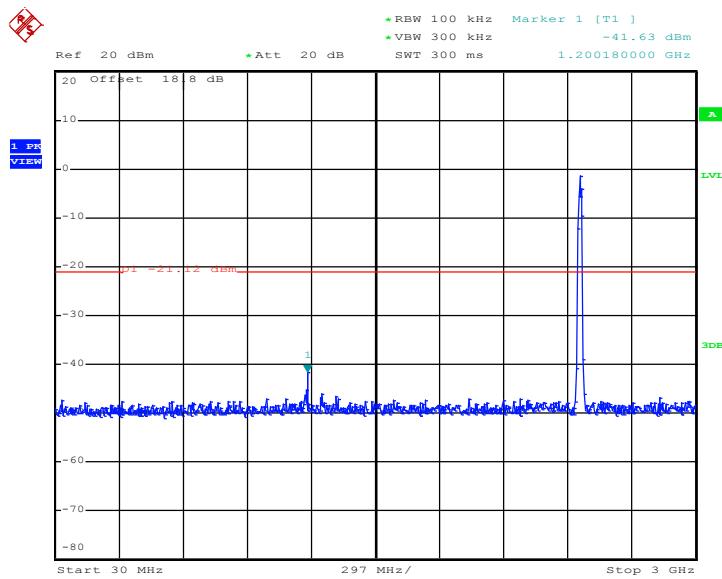


Date: 22.JUN.2012 22:56:58



802.11n HT-20 30 MHz~3 GHz

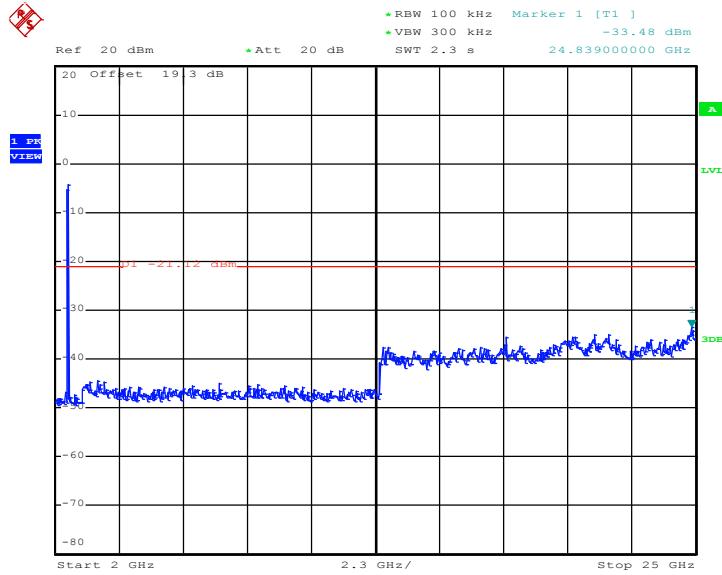
Conducted Spurious Emission Plot on Channel 11



Date: 22.JUN.2012 22:59:37

802.11n HT-20 2 GHz~25 GHz

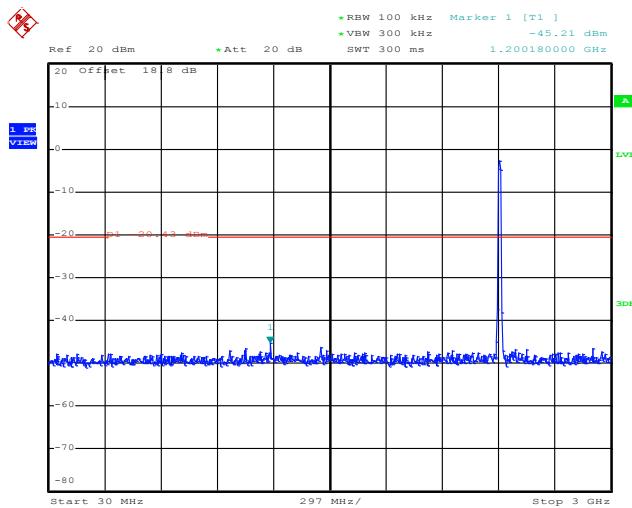
Conducted Spurious Emission Plot on Channel 11



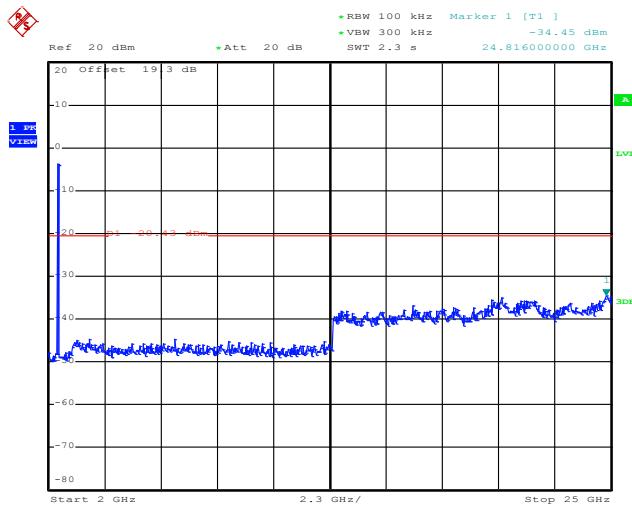
Date: 22.JUN.2012 22:59:55



Test Mode :	802.11n HT-20 MIMO Ant. 1+2(1)	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Bill Kuo

802.11n HT-20 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 00:09:59

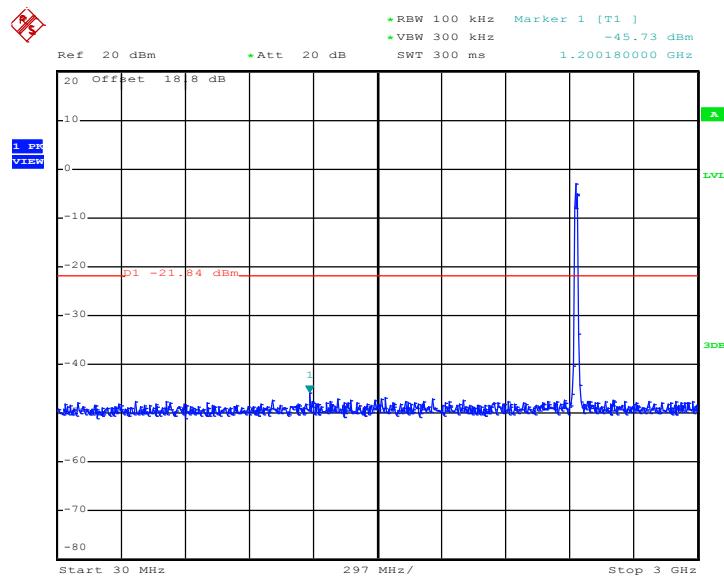
802.11n HT-20 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 00:10:17



802.11n HT-20 30 MHz~3 GHz

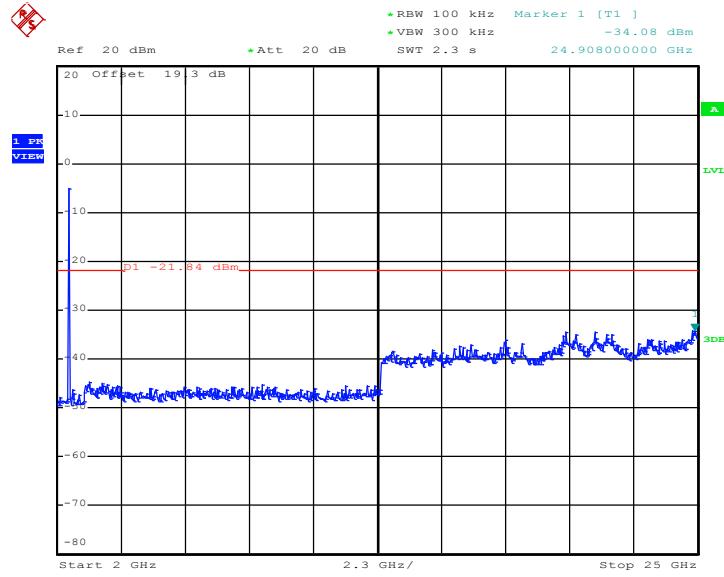
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 00:07:28

802.11n HT-20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

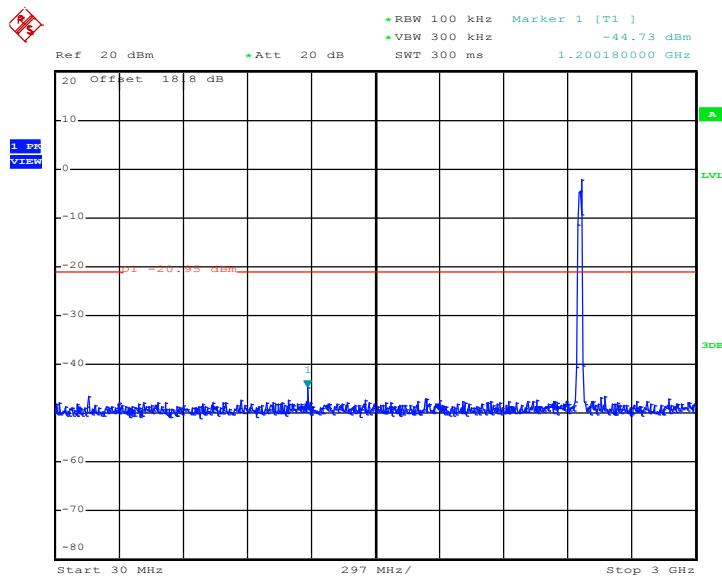


Date: 23.JUN.2012 00:07:46



802.11n HT-20 30 MHz~3 GHz

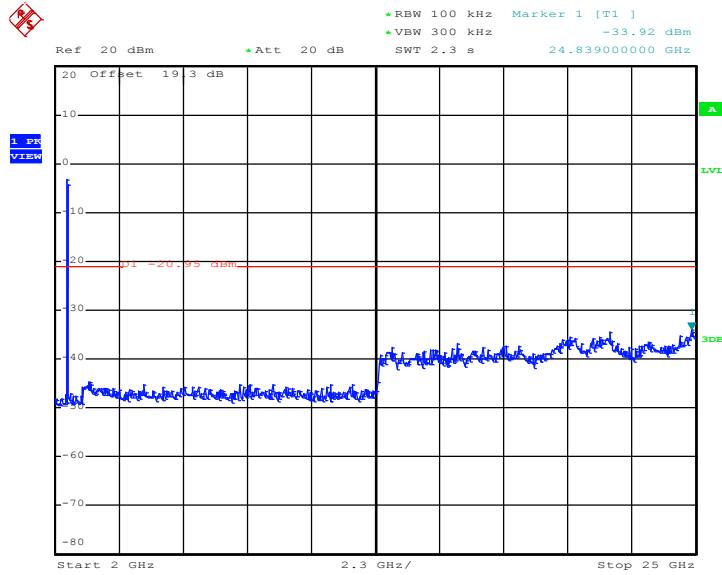
Conducted Spurious Emission Plot on Channel 11



Date: 23.JUN.2012 00:04:34

802.11n HT-20 2 GHz~25 GHz

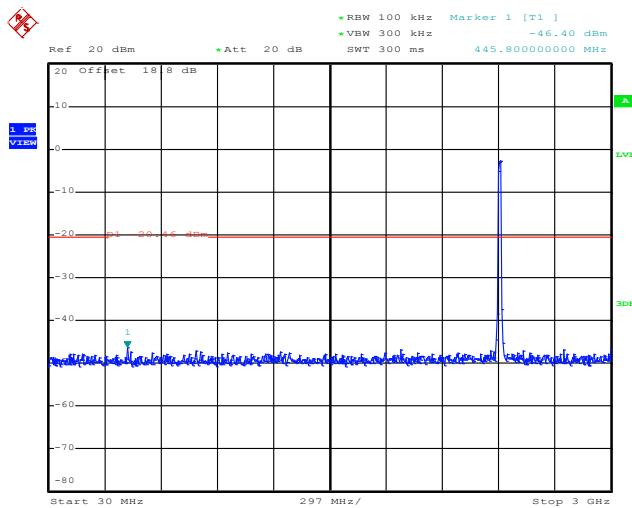
Conducted Spurious Emission Plot on Channel 11



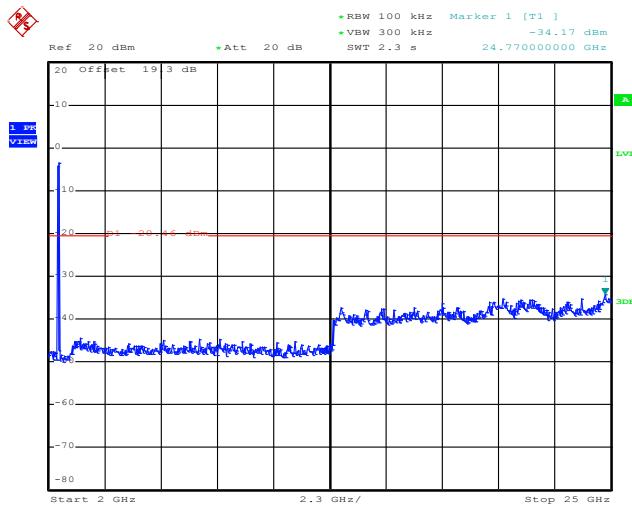
Date: 23.JUN.2012 00:04:52



Test Mode :	802.11n HT-20 MIMO Ant. 1+2(2)	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Bill Kuo

802.11n HT-20 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 01:03:01

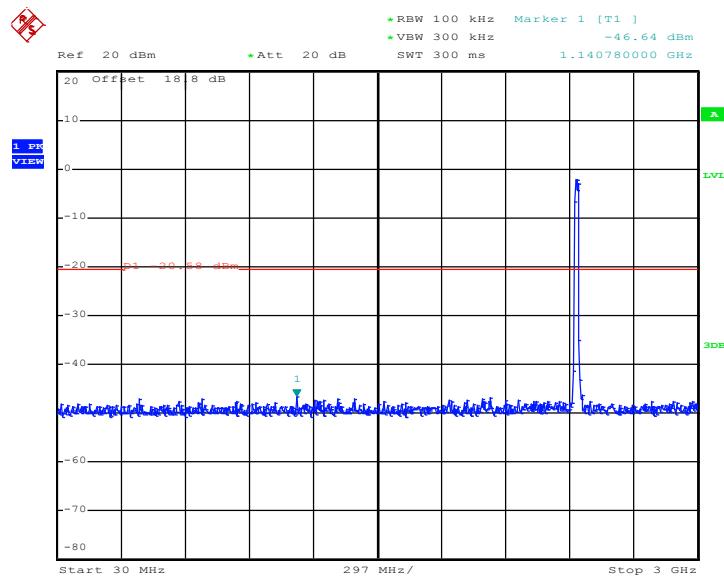
802.11n HT-20 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

Date: 23.JUN.2012 01:03:18



802.11n HT-20 30 MHz~3 GHz

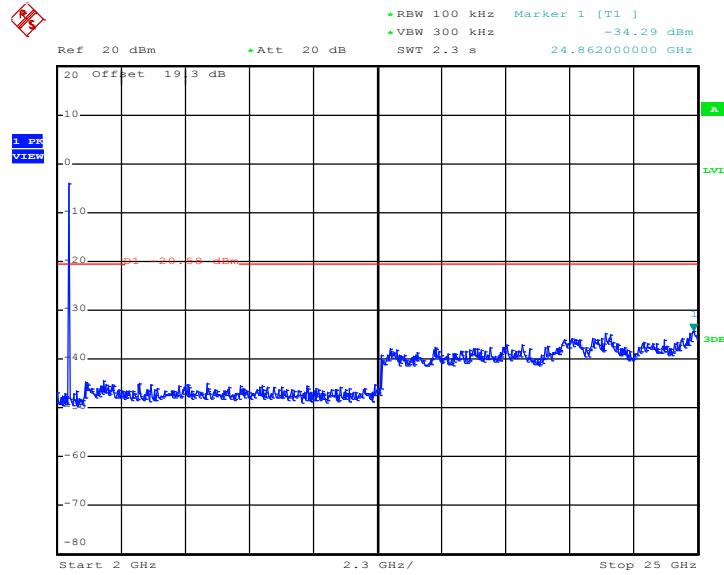
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 01:05:52

802.11n HT-20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

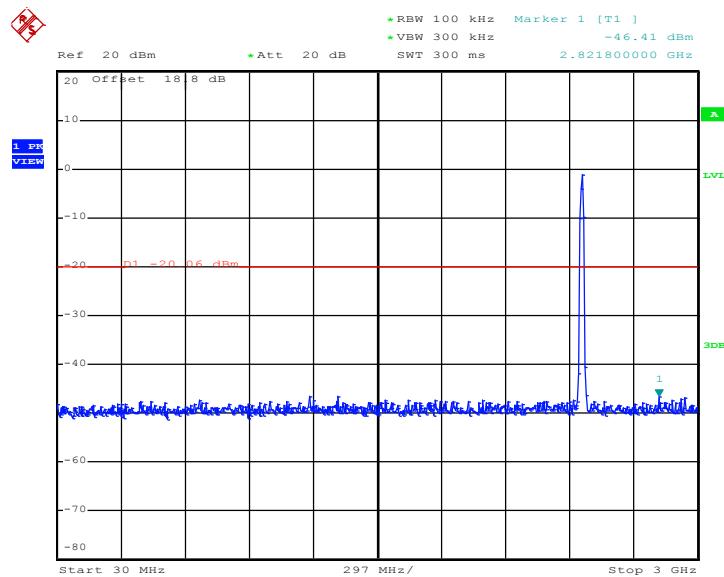


Date: 23.JUN.2012 01:06:09



802.11n HT-20 30 MHz~3 GHz

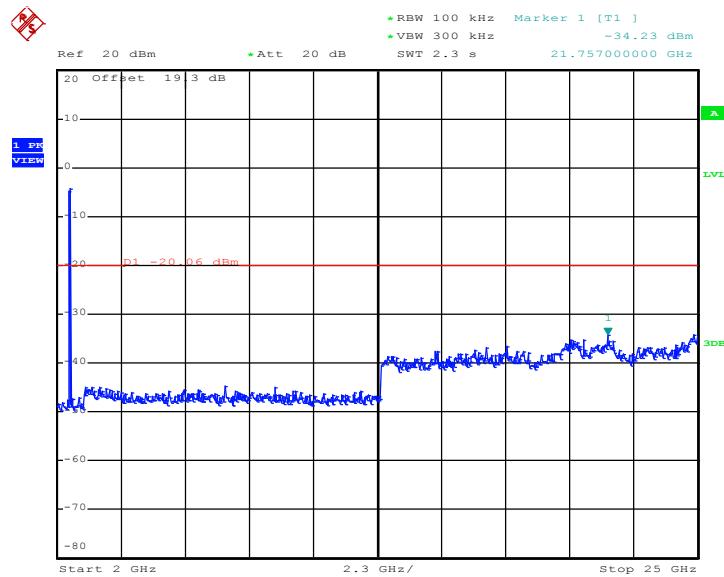
Conducted Spurious Emission Plot on Channel 11



Date: 23.JUN.2012 01:10:07

802.11n HT-20 2 GHz~25 GHz

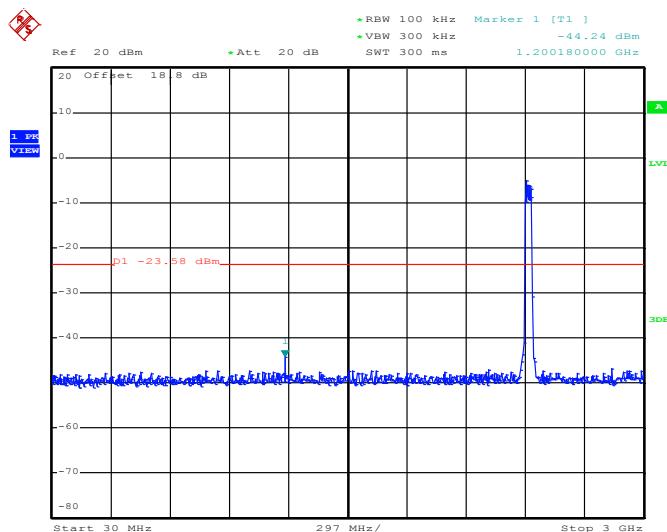
Conducted Spurious Emission Plot on Channel 11



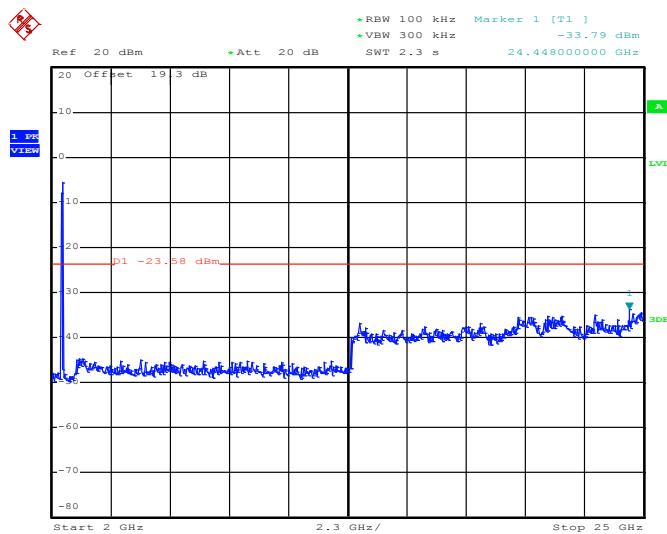
Date: 23.JUN.2012 01:10:24



Test Mode :	802.11n HT-40 SISO Ant. 1	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	03, 06, 09	Test Engineer :	Bill Kuo

802.11n HT-40 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 03**

Date: 23.JUN.2012 00:30:59

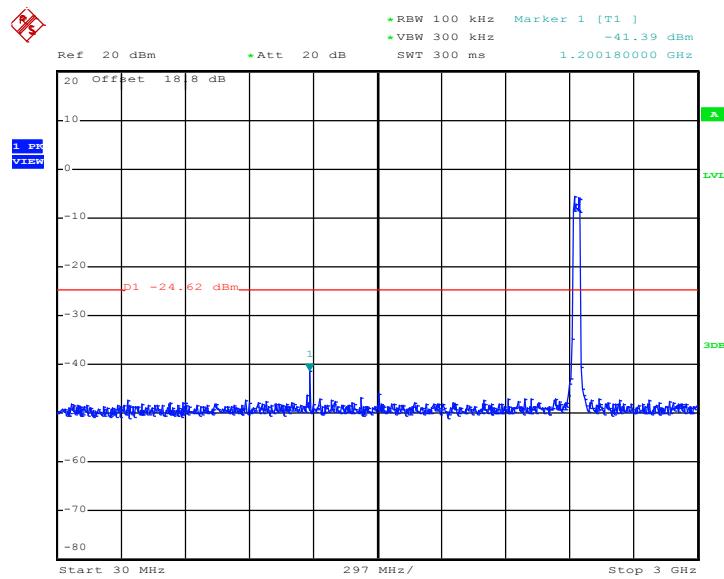
802.11n HT-40 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 03**

Date: 23.JUN.2012 00:31:16



802.11n HT-40 30 MHz~3 GHz

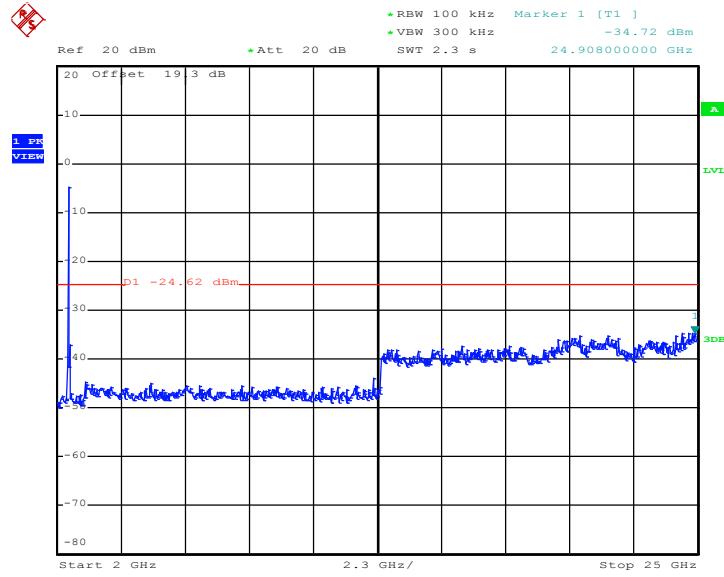
Conducted Spurious Emission Plot on Channel 06



Date: 22.JUN.2012 23:08:08

802.11n HT-40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

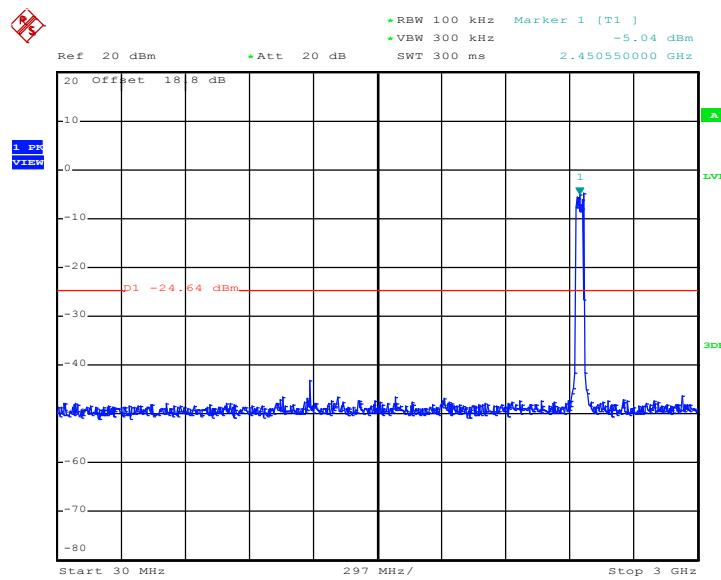


Date: 22.JUN.2012 23:08:26



802.11n HT-40 30 MHz~3 GHz

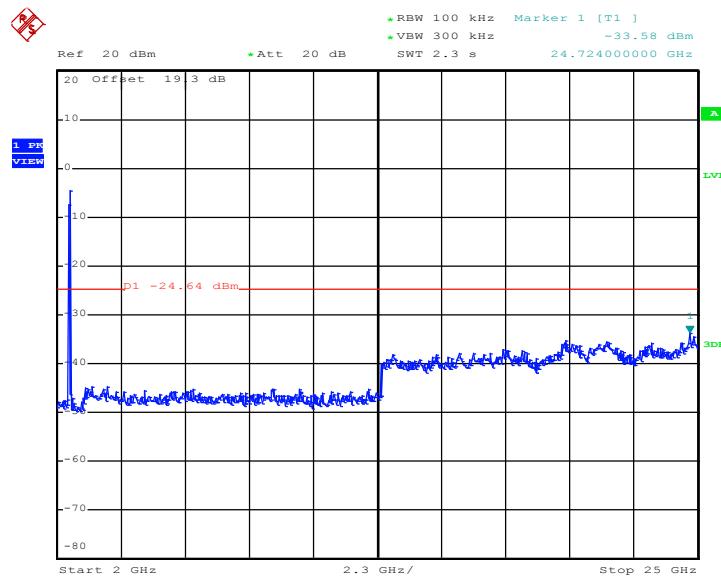
Conducted Spurious Emission Plot on Channel 09



Date: 22.JUN.2012 23:05:07

802.11n HT-40 2 GHz~25 GHz

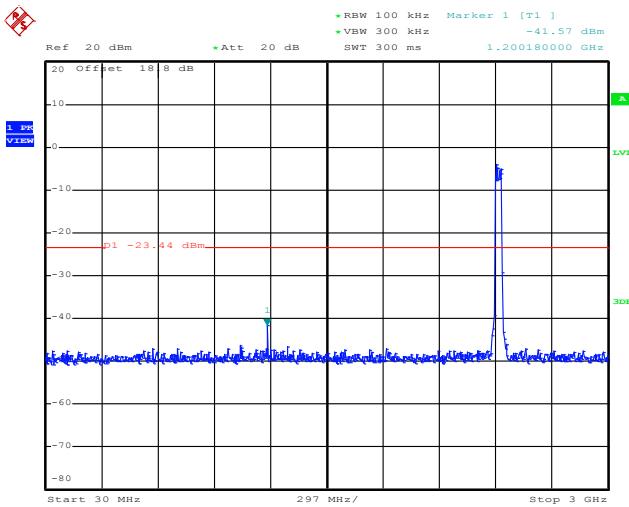
Conducted Spurious Emission Plot on Channel 09



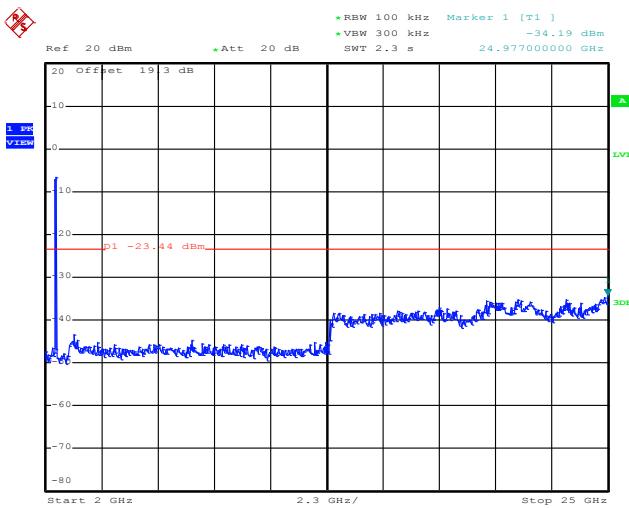
Date: 22.JUN.2012 23:05:24



Test Mode :	802.11n HT-40 MIMO Ant. 1+2(1)	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	03, 06, 09	Test Engineer :	Bill Kuo

802.11n HT-40 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 03**

Date: 22.JUN.2012 23:49:29

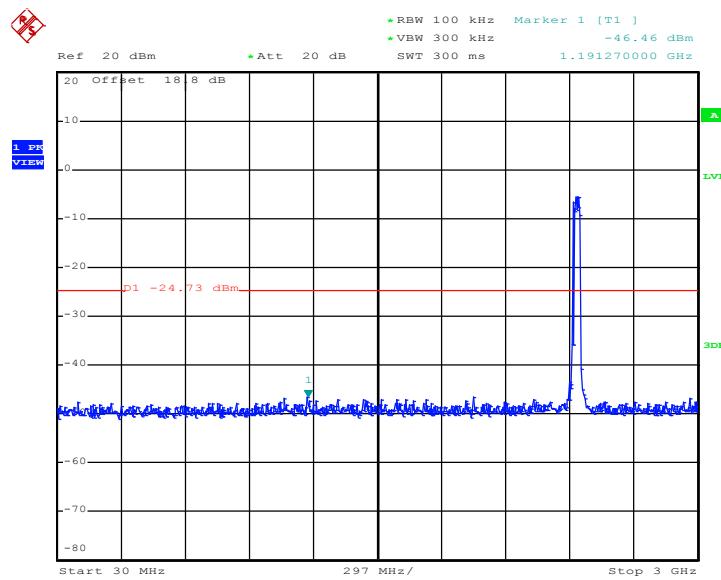
802.11n HT-40 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 03**

Date: 22.JUN.2012 23:49:47



802.11n HT-40 30 MHz~3 GHz

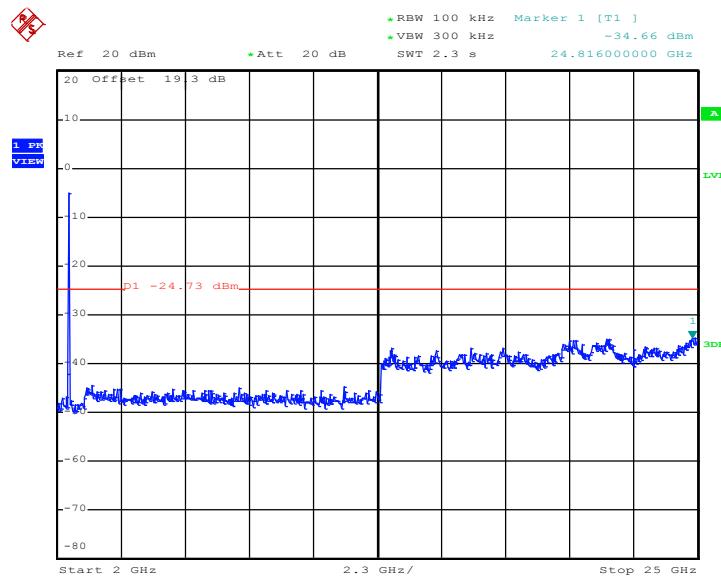
Conducted Spurious Emission Plot on Channel 06



Date: 22.JUN.2012 23:55:52

802.11n HT-40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

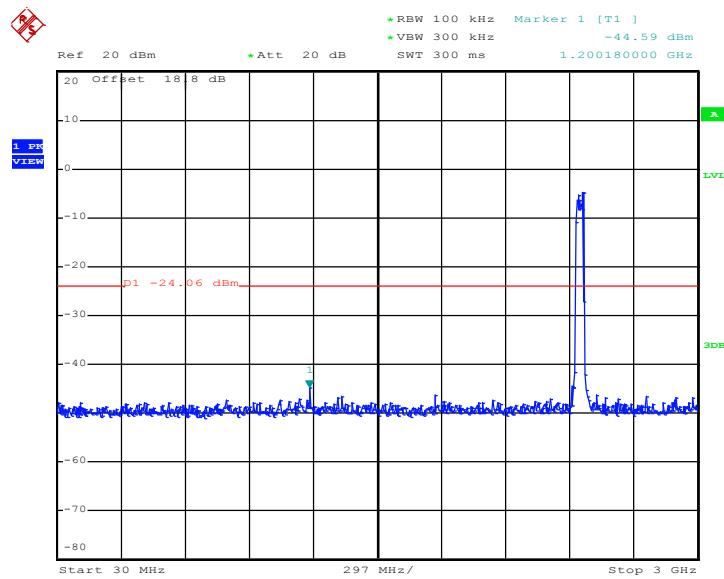


Date: 22.JUN.2012 23:56:10



802.11n HT-40 30 MHz~3 GHz

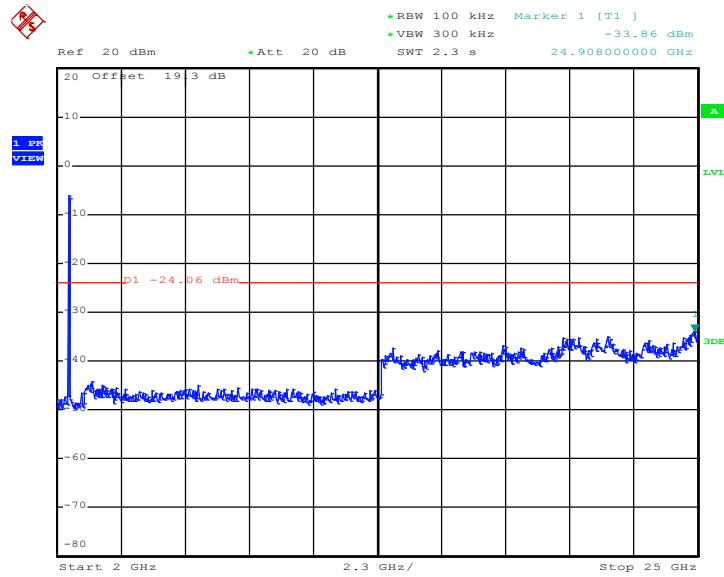
Conducted Spurious Emission Plot on Channel 09



Date: 23.JUN.2012 00:01:14

802.11n HT-40 2 GHz~25 GHz

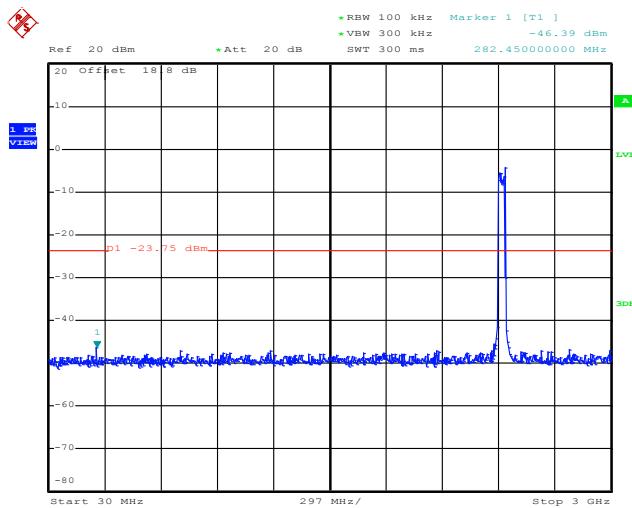
Conducted Spurious Emission Plot on Channel 09



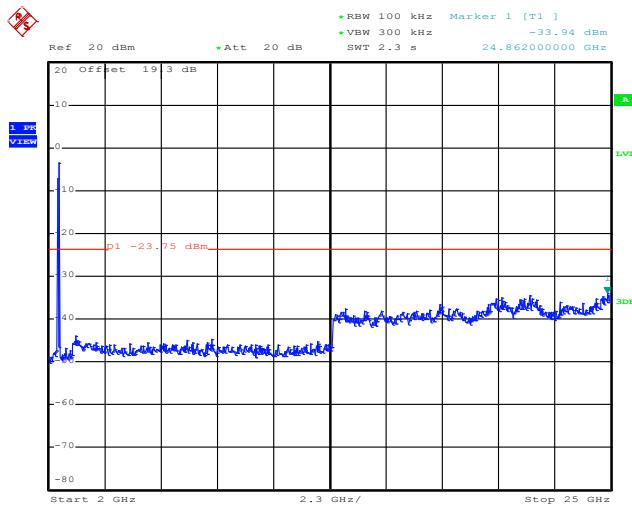
Date: 23.JUN.2012 00:01:32



Test Mode :	802.11n HT-40 MIMO Ant. 1+2(2)	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	03, 06, 09	Test Engineer :	Bill Kuo

802.11n HT-40 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 03**

Date: 23.JUN.2012 01:13:12

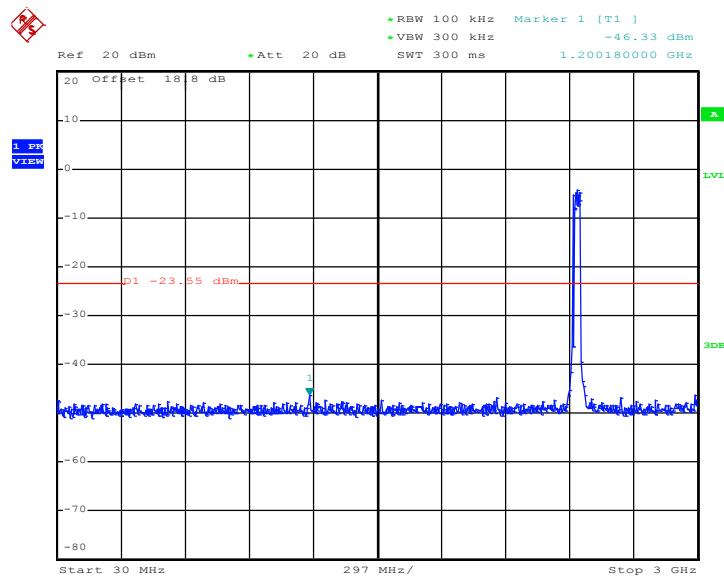
802.11n HT-40 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 03**

Date: 23.JUN.2012 01:13:30



802.11n HT-40 30 MHz~3 GHz

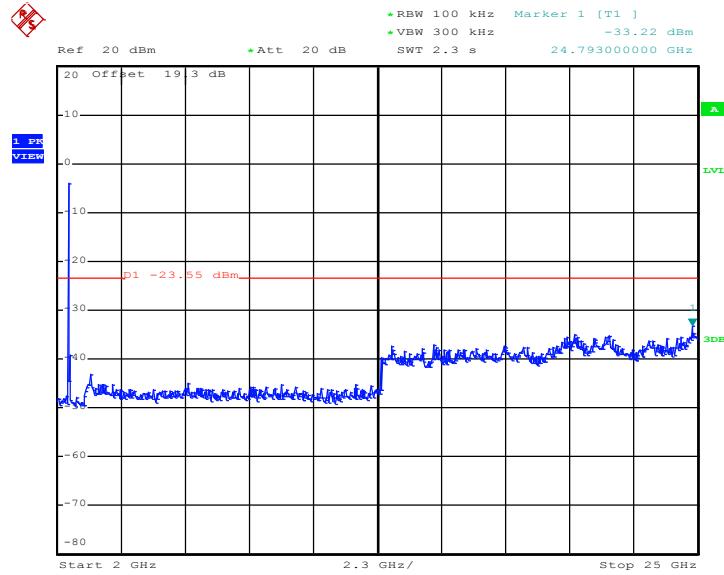
Conducted Spurious Emission Plot on Channel 06



Date: 23.JUN.2012 01:15:57

802.11n HT-40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

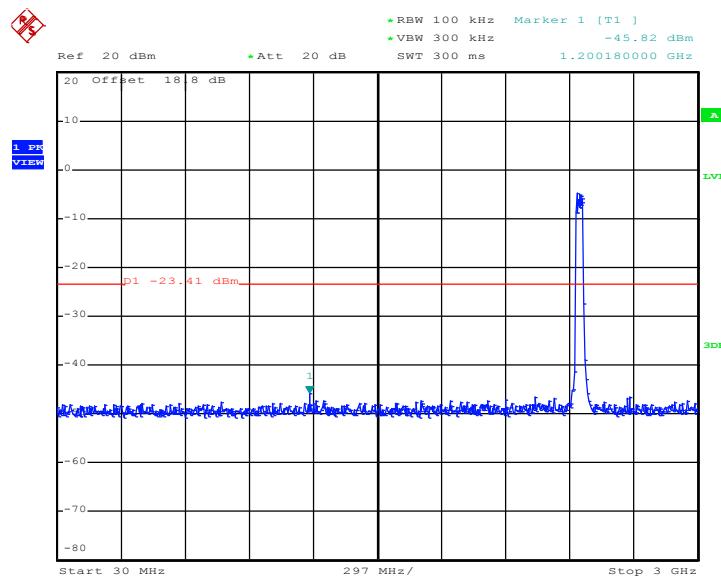


Date: 23.JUN.2012 01:16:15



802.11n HT-40 30 MHz~3 GHz

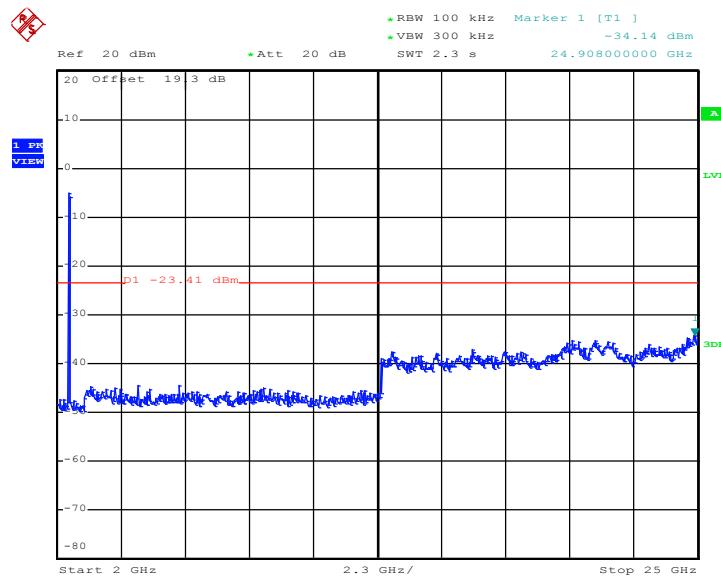
Conducted Spurious Emission Plot on Channel 09



Date: 23.JUN.2012 01:18:43

802.11n HT-40 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 09



Date: 23.JUN.2012 01:19:00



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 Procedure

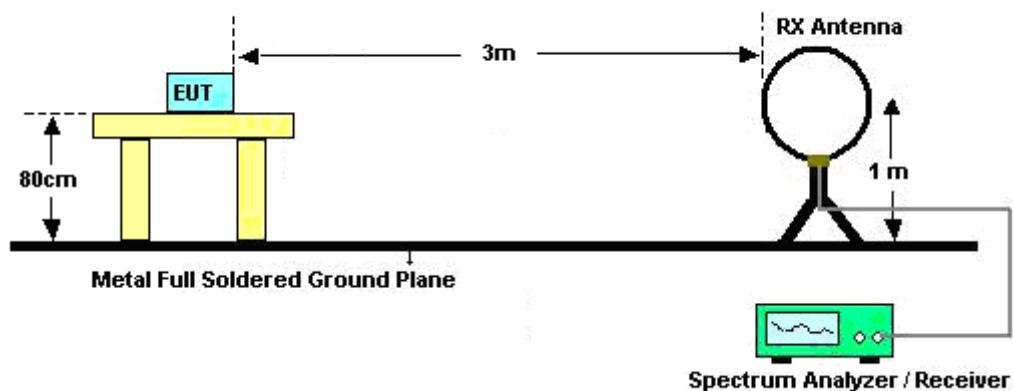
1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better 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 \geq RBW; Sweep = auto; Detector function = peak;
Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent 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.

Antenna	Band	Duty Cycle(%)	T(us)	1/T(KHz)	VBW Setting
1	802.11b	97.69	8440.00	0.118	300Hz
1+2	802.11b for Ant1	97.61	8428.00	0.119	300Hz
1+2	802.11b for Ant2	97.91	8416.00	0.119	300Hz
1	802.11g	87.28	1400.00	0.714	1KHz
1+2	802.11g for Ant1	87.84	1402.00	0.713	1KHz
1+2	802.11g for Ant2	87.27	1398.00	0.715	1KHz
1	802.11n (BW 20MHz)	86.20	1312.00	0.762	1KHz
1+2	802.11n (BW 20MHz) for Ant1	86.53	1310.00	0.763	1KHz
1+2	802.11n (BW 20MHz) for Ant2	86.64	1310.00	0.763	1KHz
1	802.11n (BW 40MHz)	76.11	650.00	1.538	3KHz
1+2	802.11n (BW 40MHz) for Ant1	75.99	652.00	1.534	3KHz
1+2	802.11n (BW 40MHz) for Ant2	76.64	656.00	1.524	3KHz

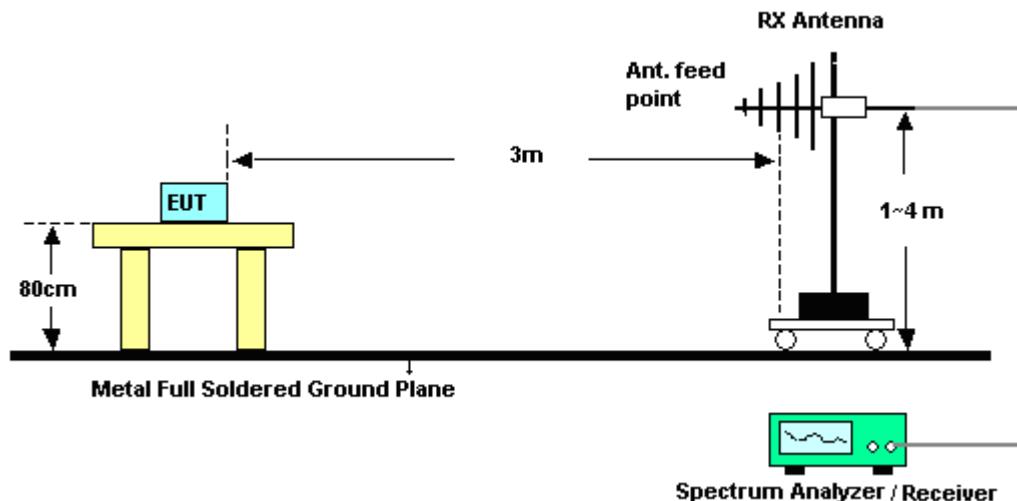
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

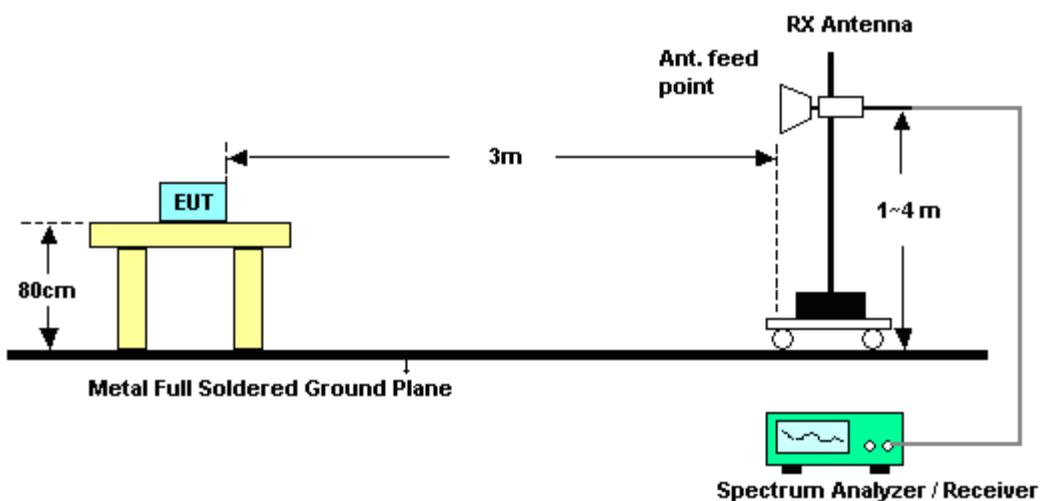
For radiated emissions below 30MHz



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 Spurious at Band Edges

Test Mode :	802.11b Ant. 1			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	01			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2355.09	50.86	-23.14	74	48.2	31.86	5.34	34.54	100	243	Peak
2357.16	38.81	-15.19	54	36.12	31.86	5.37	34.54	100	243	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.56	48.1	-25.9	74	45.34	31.9	5.4	34.54	100	254	Peak
2390	35.15	-18.85	54	32.39	31.9	5.4	34.54	100	254	Average

Test Mode :	802.11b Ant. 1			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	11			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.66	52.4	-21.6	74	49.43	31.98	5.52	34.53	107	170	Peak
2484.8	43.65	-10.35	54	40.68	31.98	5.52	34.53	107	170	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.78	49.16	-24.84	74	46.19	31.98	5.52	34.53	102	82	Peak
2484.6	39.51	-14.49	54	36.54	31.98	5.52	34.53	102	82	Average



Test Mode :	802.11b Ant. 2			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	01			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	54.41	-19.59	74	51.65	31.9	5.4	34.54	116	357	Peak
2357.43	42.78	-11.22	54	40.09	31.86	5.37	34.54	116	357	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2333.67	48.61	-25.39	74	45.98	31.83	5.34	34.54	100	260	Peak
2390	36.92	-17.08	54	34.16	31.9	5.4	34.54	100	260	Average

Test Mode :	802.11b Ant. 2			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	11			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.98	57.22	-16.78	74	54.25	31.98	5.52	34.53	116	360	Peak
2484.7	46.61	-7.39	54	43.64	31.98	5.52	34.53	116	360	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.58	51.26	-22.74	74	48.29	31.98	5.52	34.53	100	277	Peak
2484.7	39.24	-14.76	54	36.27	31.98	5.52	34.53	100	277	Average



Test Mode :	802.11g Ant. 1			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	01			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	59.88	-14.12	74	57.12	31.9	5.4	34.54	112	357	Peak
2351.85	46.16	-7.84	54	43.5	31.86	5.34	34.54	112	357	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2351.94	47.86	-26.14	74	45.2	31.86	5.34	34.54	102	272	Peak
2353.56	37.01	-16.99	54	34.35	31.86	5.34	34.54	102	272	Average

Test Mode :	802.11g Ant. 1			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	11			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.64	65.1	-8.9	74	62.13	31.98	5.52	34.53	200	356	Peak
2483.56	47.38	-6.62	54	44.41	31.98	5.52	34.53	200	356	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.72	52.89	-21.11	74	49.92	31.98	5.52	34.53	132	273	Peak
2483.56	38.14	-15.86	54	35.17	31.98	5.52	34.53	132	273	Average



Test Mode :	802.11g Ant. 2			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	01			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	58.78	-15.22	74	56.02	31.9	5.4	34.54	120	184	Peak
2351.85	42.13	-11.87	54	39.47	31.86	5.34	34.54	120	184	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	51.83	-22.17	74	49.07	31.9	5.4	34.54	107	268	Peak
2351.76	36.52	-17.48	54	33.86	31.86	5.34	34.54	107	268	Average

Test Mode :	802.11g Ant. 2			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	11			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.54	64.19	-9.81	74	61.22	31.98	5.52	34.53	118	2	Peak
2483.5	42.05	-11.95	54	39.08	31.98	5.52	34.53	118	2	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.72	58.32	-15.68	74	55.35	31.98	5.52	34.53	100	272	Peak
2483.5	38.26	-15.74	54	35.29	31.98	5.52	34.53	100	272	Average



Test Mode :	802.11n HT-20 Ant. 1			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	01			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	67.31	-6.69	74	64.55	31.9	5.4	34.54	142	356	Peak
2390	47.56	-6.44	54	44.8	31.9	5.4	34.54	142	356	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2350.86	46.94	-27.06	74	44.3	31.84	5.34	34.54	102	272	Peak
2353.74	33.73	-20.27	54	31.07	31.86	5.34	34.54	102	272	Average

Test Mode :	802.11n HT-20 Ant. 1			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	11			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	67.24	-6.76	74	64.27	31.98	5.52	34.53	200	357	Peak
2483.56	47.84	-6.16	54	44.87	31.98	5.52	34.53	200	357	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.6	57.8	-16.2	74	54.83	31.98	5.52	34.53	188	268	Peak
2483.5	38.62	-15.38	54	35.65	31.98	5.52	34.53	188	268	Average



Test Mode :	802.11n HT-20 Ant. 2			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	01			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	61.63	-12.37	74	58.87	31.9	5.4	34.54	143	174	Peak
2354.19	41.96	-12.04	54	39.3	31.86	5.34	34.54	143	174	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	55.37	-18.63	74	52.61	31.9	5.4	34.54	108	268	Peak
2351.76	36.27	-17.73	54	33.61	31.86	5.34	34.54	108	268	Average

Test Mode :	802.11n HT-20 Ant. 2			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	11			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.52	65.28	-8.72	74	62.31	31.98	5.52	34.53	118	2	Peak
2483.5	41.67	-12.33	54	38.7	31.98	5.52	34.53	118	2	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.54	61.31	-12.69	74	58.34	31.98	5.52	34.53	131	3	Peak
2483.5	38.35	-15.65	54	35.38	31.98	5.52	34.53	131	3	Average



Test Mode :	802.11n HT-20 MIMO Ant. 1+2				Temperature :		23~24°C		
Test Band :	Low				Relative Humidity :		45~46%		
Test Channel :	01				Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	69.05	-4.95	74	66.29	31.9	5.4	34.54	200	6	Peak
2360.94	44.93	-9.07	54	42.24	31.86	5.37	34.54	200	6	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.74	53.84	-20.16	74	51.08	31.9	5.4	34.54	136	266	Peak
2361.12	36.19	-17.81	54	33.5	31.86	5.37	34.54	136	266	Average

Test Mode :	802.11n HT-20 MIMO Ant. 1+2				Temperature :		23~24°C		
Test Band :	High				Relative Humidity :		45~46%		
Test Channel :	11				Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.62	70.04	-3.96	74	67.07	31.98	5.52	34.53	200	356	Peak
2483.56	43.63	-10.37	54	40.66	31.98	5.52	34.53	200	356	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.58	64.48	-9.52	74	61.51	31.98	5.52	34.53	200	266	Peak
2483.6	38.84	-15.16	54	35.87	31.98	5.52	34.53	200	266	Average



Test Mode :	802.11n HT-40 Ant. 1			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	03			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.31	54.91	-19.09	74	52.15	31.9	5.4	34.54	110	269	Peak
2389.92	37.57	-16.43	54	34.81	31.9	5.4	34.54	110	269	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.58	64.12	-9.88	74	61.36	31.9	5.4	34.54	200	178	Peak
2390	43.56	-10.44	54	40.8	31.9	5.4	34.54	200	178	Average

Test Mode :	802.11n HT-40 Ant. 1			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	09			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2486.42	66.93	-7.07	74	63.96	31.98	5.52	34.53	200	360	Peak
2483.62	44.78	-9.22	54	41.81	31.98	5.52	34.53	200	360	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.64	56.81	-17.19	74	53.84	31.98	5.52	34.53	108	268	Peak
2483.5	37.78	-16.22	54	34.81	31.98	5.52	34.53	108	268	Average



Test Mode :	802.11n HT-40 Ant. 2			Temperature :		23~24°C		
Test Band :	Low			Relative Humidity :		45~46%		
Test Channel :	03			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	69.69	-4.31	74	66.93	31.9	5.4	34.54	118	357	Peak
2390	45.95	-8.05	54	43.19	31.9	5.4	34.54	118	357	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	58.56	-15.44	74	55.8	31.9	5.4	34.54	100	262	Peak
2390	38	-16	54	35.24	31.9	5.4	34.54	100	262	Average

Test Mode :	802.11n HT-40 Ant. 2			Temperature :		23~24°C		
Test Band :	High			Relative Humidity :		45~46%		
Test Channel :	09			Test Engineer :		Timberland, Kai Wang and Ivan Chiang		

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.56	70.29	-3.71	74	67.32	31.98	5.52	34.53	117	360	Peak
2483.86	46.92	-7.08	54	43.95	31.98	5.52	34.53	117	360	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.92	63.44	-10.56	74	60.47	31.98	5.52	34.53	100	259	Peak
2483.68	40.17	-13.83	54	37.2	31.98	5.52	34.53	100	259	Average



Test Mode :	802.11n HT-40 MIMO Ant. 1+2			Temperature :	23~24°C			
Test Band :	Low			Relative Humidity :	45~46%			
Test Channel :	03			Test Engineer :	Timberland, Kai Wang and Ivan Chiang			

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.2	70.83	-3.17	74	68.07	31.9	5.4	34.54	200	5	Peak
2390	49.13	-4.87	54	46.37	31.9	5.4	34.54	200	5	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.93	58.69	-15.31	74	55.93	31.9	5.4	34.54	110	90	Peak
2389.56	38.75	-15.25	54	35.99	31.9	5.4	34.54	110	90	Average

Test Mode :	802.11n HT-40 MIMO Ant. 1+2			Temperature :	23~24°C			
Test Band :	High			Relative Humidity :	45~46%			
Test Channel :	09			Test Engineer :	Timberland, Kai Wang and Ivan Chiang			

ANTENNA POLARITY : HORIZONTAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.52	70.66	-3.34	74	67.69	31.98	5.52	34.53	200	6	Peak
2483.76	46.6	-7.4	54	43.63	31.98	5.52	34.53	200	6	Average

ANTENNA POLARITY : VERTICAL

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.62	63.65	-10.35	74	60.68	31.98	5.52	34.53	110	90	Peak
2483.56	40.86	-13.14	54	37.89	31.98	5.52	34.53	110	90	Average



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

Test Mode :	802.11b Ant. 1				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2355.09	50.86	-23.14	74	48.2	31.86	5.34	34.54	100	243	Peak
2357.16	38.81	-15.19	54	36.12	31.86	5.37	34.54	100	243	Average
2412	97.7	-	-	94.89	31.91	5.43	34.53	100	243	Average
2412	101.51	-	-	98.7	31.91	5.43	34.53	100	243	Peak
2488	35.31	-18.69	54	32.32	32	5.52	34.53	100	243	Average
2488	47.22	-26.78	74	44.23	32	5.52	34.53	100	243	Peak
4824	47.51	-6.49	54	61	34.4	7.96	55.85	200	0	Average
4824	53.32	-20.68	74	66.81	34.4	7.96	55.85	200	0	Peak

Test Mode :	802.11b Ant. 1				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2412 MHz is Fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.56	48.1	-25.9	74	45.34	31.9	5.4	34.54	100	254	Peak
2390	35.15	-18.85	54	32.39	31.9	5.4	34.54	100	254	Average
2412	89.84	-	-	87.03	31.91	5.43	34.53	100	254	Average
2412	95.3	-	-	92.49	31.91	5.43	34.53	100	254	Peak
2492	34.27	-19.73	54	31.28	32	5.52	34.53	100	254	Average
2492	46.69	-27.31	74	43.7	32	5.52	34.53	100	254	Peak
4824	48.07	-25.93	74	61.56	34.4	7.96	55.85	100	0	Peak



Test Mode :	802.11b Ant. 1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental signal which can be ignored. 2. 2128 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 101.85 dBuV/m - 20dB = 81.85 dBuV/m.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
71.85	23.55	-16.45	40	47.99	6.48	0.78	31.7	-	-	Peak
250.05	40.23	-5.77	46	57.2	12.4	2.28	31.65	-	-	Peak
267.06	38.32	-7.68	46	54.67	13.14	2.2	31.69	-	-	Peak
650	36.07	-9.93	46	45.43	19.2	3.41	31.97	-	-	Peak
749.4	39.62	-6.38	46	48.36	19.8	3.57	32.11	-	-	Peak
933.5	42.66	-3.34	46	49.41	20.73	3.8	31.28	100	129	Peak
1468	50.85	-23.15	74	54.04	27.8	4.08	35.07	100	239	Peak
2128	51.96	-29.89	81.85	49.81	31.62	5.08	34.55	100	239	Peak
2376	37.2	-16.8	54	34.49	31.88	5.37	34.54	100	239	Average
2376	48.85	-25.15	74	46.14	31.88	5.37	34.54	100	239	Peak
2437	98.03	-	-	95.15	31.95	5.46	34.53	100	239	Average
2437	101.85	-	-	98.97	31.95	5.46	34.53	100	239	Peak
2486	34.64	-19.36	54	31.67	31.98	5.52	34.53	100	239	Average
2486	48.08	-25.92	74	45.11	31.98	5.52	34.53	100	239	Peak
4874	47.69	-6.31	54	61.19	34.37	8	55.87	102	86	Average
4874	48.05	-25.95	74	61.55	34.37	8	55.87	102	86	Peak



Test Mode :	802.11b Ant. 1				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2437 MHz is Fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.75	29.58	-10.42	40	46.8	14.02	0.46	31.7	-	-	Peak
53.76	30.76	-9.24	40	54.29	7.5	0.66	31.69	-	-	Peak
267.06	33.94	-12.06	46	50.29	13.14	2.2	31.69	-	-	Peak
650	37.08	-8.92	46	46.44	19.2	3.41	31.97	102	79	Peak
749.4	36.86	-9.14	46	45.6	19.8	3.57	32.11	-	-	Peak
933.5	36.8	-9.2	46	43.55	20.73	3.8	31.28	-	-	Peak
2344	34.1	-19.9	54	31.46	31.84	5.34	34.54	100	293	Average
2344	46.78	-27.22	74	44.14	31.84	5.34	34.54	100	293	Peak
2437	89.92	-	-	87.04	31.95	5.46	34.53	100	293	Average
2437	95.3	-	-	92.42	31.95	5.46	34.53	100	293	Peak
2500	34.55	-19.45	54	31.56	32	5.52	34.53	100	293	Average
2500	46.93	-27.07	74	43.94	32	5.52	34.53	100	293	Peak
4874	50.03	-23.97	74	63.53	34.37	8	55.87	100	0	Peak



FCC RF Test Report

Report No. : FR250712

Test Mode :	802.11b Ant. 1				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 2132 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1466	50.31	-23.69	74	53.55	27.8	4.05	35.09	107	170	Peak
2132	53.23	-29.68	82.91	51.06	31.64	5.08	34.55	107	170	Peak
2386	39.37	-14.63	54	36.61	31.9	5.4	34.54	107	170	Average
2386	48.69	-25.31	74	45.93	31.9	5.4	34.54	107	170	Peak
2462	99.37	-	-	96.44	31.97	5.49	34.53	107	170	Average
2462	102.91	-	-	99.98	31.97	5.49	34.53	107	170	Peak
2484.66	52.4	-21.6	74	49.43	31.98	5.52	34.53	107	170	Peak
2484.8	43.65	-10.35	54	40.68	31.98	5.52	34.53	107	170	Average
4924	47.69	-26.31	74	61.21	34.34	8.04	55.9	100	0	Peak

Test Mode :	802.11b Ant. 1				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1192	50.25	-23.75	74	54.11	27.8	3.66	35.32	102	82	Peak
2390	36.54	-17.46	54	33.78	31.9	5.4	34.54	102	82	Average
2390	47.06	-26.94	74	44.3	31.9	5.4	34.54	102	82	Peak
2462	93.2	-	-	90.27	31.97	5.49	34.53	102	82	Average
2462	96.89	-	-	93.96	31.97	5.49	34.53	102	82	Peak
2484.6	39.51	-14.49	54	36.54	31.98	5.52	34.53	102	82	Average
2485.78	49.16	-24.84	74	46.19	31.98	5.52	34.53	102	82	Peak
4924	47.64	-26.36	74	61.16	34.34	8.04	55.9	100	0	Peak



Test Mode :	802.11b Ant. 2				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 1992 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1192	50.42	-23.58	74	54.28	27.8	3.66	35.32	116	357	Peak
1992	53.7	-32.87	86.57	52.01	31.38	4.89	34.58	116	357	Peak
2357.43	42.78	-11.22	54	40.09	31.86	5.37	34.54	116	357	Average
2389.83	54.41	-19.59	74	51.65	31.9	5.4	34.54	116	357	Peak
2412	100.94	-	-	98.13	31.91	5.43	34.53	116	357	Average
2412	106.57	-	-	103.76	31.91	5.43	34.53	116	357	Peak
2490	41.25	-12.75	54	38.26	32	5.52	34.53	116	357	Average
2490	53.02	-20.98	74	50.03	32	5.52	34.53	116	357	Peak

Test Mode :	802.11b Ant. 2				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2412 MHz is Fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2333.67	48.61	-25.39	74	45.98	31.83	5.34	34.54	100	260	Peak
2390	36.92	-17.08	54	34.16	31.9	5.4	34.54	100	260	Average
2412	92.78	-	-	89.97	31.91	5.43	34.53	100	260	Average
2412	97.49	-	-	94.68	31.91	5.43	34.53	100	260	Peak
2494	36.26	-17.74	54	33.27	32	5.52	34.53	100	260	Average
2494	49.05	-24.95	74	46.06	32	5.52	34.53	100	260	Peak



Test Mode :	802.11b Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2437 MHz is Fundamental signal which can be ignored. 2. 1996 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1996	52.41	-34.38	86.79	50.54	31.5	4.93	34.56	116	358	Peak
2380	43.05	-10.95	54	40.31	31.88	5.4	34.54	116	358	Average
2380	52.87	-21.13	74	50.13	31.88	5.4	34.54	116	358	Peak
2437	101.09	-	-	98.21	31.95	5.46	34.53	116	358	Average
2437	106.79	-	-	103.91	31.95	5.46	34.53	116	358	Peak
2494	46.18	-7.82	54	43.19	32	5.52	34.53	116	358	Average
2494	55.53	-18.47	74	52.54	32	5.52	34.53	116	358	Peak
4874	48.99	-5.01	54	62.49	34.37	8	55.87	103	10	Average
4874	53.83	-20.17	74	67.33	34.37	8	55.87	103	10	Peak

Test Mode :	802.11b Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2437 MHz is Fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2354	34.04	-19.96	54	31.38	31.86	5.34	34.54	100	262	Average
2354	47.07	-26.93	74	44.41	31.86	5.34	34.54	100	262	Peak
2437	94.29	-	-	91.41	31.95	5.46	34.53	100	262	Average
2437	99.97	-	-	97.09	31.95	5.46	34.53	100	262	Peak
2494	40.31	-13.69	54	37.32	32	5.52	34.53	100	262	Average
2494	50.41	-23.59	74	47.42	32	5.52	34.53	100	262	Peak
4874	50.75	-23.25	74	64.24	34.37	8.01	55.87	100	0	Peak



Test Mode :	802.11b Ant. 2	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	50.02	-23.98	74	53.88	27.8	3.66	35.32	116	360	Peak
2000	56.28	-31.89	88.17	54.41	31.5	4.93	34.56	116	360	Peak
2350	38.12	-15.88	54	35.48	31.84	5.34	34.54	116	360	Average
2350	51.15	-22.85	74	48.51	31.84	5.34	34.54	116	360	Peak
2462	103.8	-	-	100.87	31.97	5.49	34.53	116	360	Average
2462	108.17	-	-	105.24	31.97	5.49	34.53	116	360	Peak
2483.98	57.22	-16.78	74	54.25	31.98	5.52	34.53	116	360	Peak
2484.7	46.61	-7.39	54	43.64	31.98	5.52	34.53	116	360	Average

Test Mode :	802.11b Ant. 2	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2376	33.88	-20.12	54	31.17	31.88	5.37	34.54	100	277	Average
2376	46.68	-27.32	74	43.97	31.88	5.37	34.54	100	277	Peak
2462	93.38	-	-	90.45	31.97	5.49	34.53	100	277	Average
2462	98.81	-	-	95.88	31.97	5.49	34.53	100	277	Peak
2483.58	51.26	-22.74	74	48.29	31.98	5.52	34.53	100	277	Peak
2484.7	39.24	-14.76	54	36.27	31.98	5.52	34.53	100	277	Average



Test Mode :	802.11g Ant. 1				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2351	46.16	-7.84	54	43.52	31.84	5.34	34.54	112	357	Average
2390	59.88	-14.12	74	57.12	31.9	5.4	34.54	112	357	Peak
2412	88.69	-	-	85.88	31.91	5.43	34.53	112	357	Average
2412	107.55	-	-	104.74	31.91	5.43	34.53	112	357	Peak
2498	36.88	-17.12	54	33.89	32	5.52	34.53	112	357	Average
2498	51.25	-22.75	74	48.26	32	5.52	34.53	112	357	Peak
4824	46.71	-27.29	74	60.18	34.4	7.98	55.85	100	0	Peak

Test Mode :	802.11g Ant. 1				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2351.94	47.86	-26.14	74	45.2	31.86	5.34	34.54	102	272	2351.94
2353.56	37.01	-16.99	54	34.35	31.86	5.34	34.54	102	272	2353.56
2412	79.36	-	-	76.55	31.91	5.43	34.53	102	272	2412
2412	100.02	-	-	97.21	31.91	5.43	34.53	102	272	2412
2488	30.75	-23.25	54	27.76	32	5.52	34.53	102	272	2488
2488	46.9	-27.1	74	43.91	32	5.52	34.53	102	272	2488



Test Mode :	802.11g Ant. 1				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Horizontal		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
200.1	33.62	-9.88	43.5	54.03	9.3	1.94	31.65	-	-	Peak
250.05	42.26	-3.74	46	59.23	12.4	2.28	31.65	114	257	Peak
267.06	41.19	-4.81	46	57.54	13.14	2.2	31.69	-	-	Peak
359.5	37.27	-8.73	46	51.84	14.6	2.39	31.56	-	-	Peak
399.4	37.52	-8.48	46	51.04	15.9	2.37	31.79	-	-	Peak
933.5	40.46	-5.54	46	47.21	20.73	3.8	31.28	-	-	Peak
2376	41.85	-12.15	54	39.14	31.88	5.37	34.54	110	358	Average
2376	55.17	-18.83	74	52.46	31.88	5.37	34.54	110	358	Peak
2437	88.52	-	-	85.64	31.95	5.46	34.53	110	358	Average
2437	107.32	-	-	104.44	31.95	5.46	34.53	110	358	Peak
2498	42.13	-11.87	54	39.14	32	5.52	34.53	110	358	Average
2498	54.82	-19.18	74	51.83	32	5.52	34.53	110	358	Peak



Test Mode :	802.11g Ant. 1				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
38.64	30.16	-9.84	40	48.23	13.14	0.49	31.7	-	-	Peak
56.46	31.73	-8.27	40	55.95	6.78	0.67	31.67	-	-	Peak
250.05	33.1	-12.9	46	50.07	12.4	2.28	31.65	-	-	Peak
550.6	39.5	-6.5	46	49.3	19.1	2.98	31.88	100	133	Peak
849.5	35.79	-10.21	46	43.39	20.4	3.91	31.91	-	-	Peak
933.5	38.36	-7.64	46	45.11	20.73	3.8	31.28	-	-	Peak
2376	37.53	-16.47	54	34.82	31.88	5.37	34.54	198	268	Average
2376	49.92	-24.08	74	47.21	31.88	5.37	34.54	198	268	Peak
2437	81.06	-	-	78.18	31.95	5.46	34.53	198	268	Average
2437	99.08	-	-	96.2	31.95	5.46	34.53	198	268	Peak
2500	34.53	-19.47	54	31.54	32	5.52	34.53	198	268	Average
2500	47.25	-26.75	74	44.26	32	5.52	34.53	198	268	Peak



Test Mode :	802.11g Ant. 1				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	36.12	-17.88	54	33.36	31.9	5.4	34.54	200	356	Average
2390	49.32	-24.68	74	46.56	31.9	5.4	34.54	200	356	Peak
2462	88.06	-	-	85.13	31.97	5.49	34.53	200	356	Average
2462	107	-	-	104.07	31.97	5.49	34.53	200	356	Peak
2483.56	47.38	-6.62	54	44.41	31.98	5.52	34.53	200	356	Average
2483.64	65.1	-8.9	74	62.13	31.98	5.52	34.53	200	356	Peak
4924	46.66	-27.34	74	60.18	34.34	8.04	55.9	100	0	Peak

Test Mode :	802.11g Ant. 1				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384	33.92	-20.08	54	31.18	31.88	5.4	34.54	132	273	Average
2384	47.38	-26.62	74	44.64	31.88	5.4	34.54	132	273	Peak
2462	80.44	-	-	77.51	31.97	5.49	34.53	132	273	Average
2462	98.38	-	-	95.45	31.97	5.49	34.53	132	273	Peak
2483.56	38.14	-15.86	54	35.17	31.98	5.52	34.53	132	273	Average
2483.72	52.89	-21.11	74	49.92	31.98	5.52	34.53	132	273	Peak



Test Mode :	802.11g Ant. 2				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1466	49.99	-24.01	74	53.23	27.8	4.05	35.09	120	184	Peak
2000	56.48	-31.69	88.17	54.61	31.5	4.93	34.56	120	184	Peak
2351.85	42.13	-11.87	54	39.47	31.86	5.34	34.54	120	184	Average
2389.92	58.78	-15.22	74	56.02	31.9	5.4	34.54	120	184	Peak
2412	89.96	-	-	87.15	31.91	5.43	34.53	120	184	Average
2412	108.17	-	-	105.36	31.91	5.43	34.53	120	184	Peak
2496	36.94	-17.06	54	33.95	32	5.52	34.53	120	184	Average
2496	49.41	-24.59	74	46.42	32	5.52	34.53	120	184	Peak

Test Mode :	802.11g Ant. 2				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2351.76	36.52	-17.48	54	33.86	31.86	5.34	34.54	107	268	Average
2390.01	51.83	-22.17	74	49.19	31.84	5.34	34.54	107	268	Peak
2412	83.98	-	-	81.17	31.91	5.43	34.53	107	268	Average
2412	101.41	-	-	98.6	31.91	5.43	34.53	107	268	Peak
2494	34.07	-19.93	54	31.08	32	5.52	34.53	107	268	Average
2494	47.26	-26.74	74	44.27	32	5.52	34.53	107	268	Peak



Test Mode :	802.11g Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2004 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1466	47.51	-26.49	74	50.75	27.8	4.05	35.09	122	169	Peak
2004	56.73	-31.05	87.78	54.86	31.5	4.93	34.56	122	169	Peak
2380	43.09	-10.91	54	40.35	31.88	5.4	34.54	122	169	Average
2380	55.56	-18.44	74	52.82	31.88	5.4	34.54	122	169	Peak
2437	89.55	-	-	86.67	31.95	5.46	34.53	122	169	Average
2437	107.78	-	-	104.92	31.93	5.46	34.53	122	169	Peak
2500	40.1	-13.9	54	37.11	32	5.52	34.53	122	169	Average
2500	52.89	-21.11	74	49.9	32	5.52	34.53	122	169	Peak
4874	48.05	-25.95	74	61.54	34.37	8.01	55.87	100	0	Peak

Test Mode :	802.11g Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2366	34.29	-19.71	54	31.6	31.86	5.37	34.54	116	78	Average
2366	46.47	-27.53	74	43.78	31.86	5.37	34.54	116	78	Peak
2437	83.8	-	-	80.92	31.95	5.46	34.53	116	78	Average
2437	101.04	-	-	98.18	31.93	5.46	34.53	116	78	Peak
2498	35.44	-18.56	54	32.45	32	5.52	34.53	116	78	Average
2498	47.85	-26.15	74	44.86	32	5.52	34.53	116	78	Peak



Test Mode :	802.11g Ant. 2				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2000	54.02	-34.33	88.35	52.15	31.5	4.93	34.56	118	2	Peak
2386	36.85	-17.15	54	34.09	31.9	5.4	34.54	118	2	Average
2386	49.34	-24.66	74	46.58	31.9	5.4	34.54	118	2	Peak
2462	90.41	-	-	87.48	31.97	5.49	34.53	118	2	Average
2462	108.35	-	-	105.42	31.97	5.49	34.53	118	2	Peak
2483.5	42.05	-11.95	54	39.08	31.98	5.52	34.53	118	2	Average
2483.54	64.19	-9.81	74	61.22	31.98	5.52	34.53	118	2	Peak

Test Mode :	802.11g Ant. 2				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2336	34.28	-19.72	54	31.64	31.84	5.34	34.54	100	272	Average
2336	46.55	-27.45	74	43.91	31.84	5.34	34.54	100	272	Peak
2462	85.08	-	-	82.15	31.97	5.49	34.53	100	272	Average
2462	101.41	-	-	98.48	31.97	5.49	34.53	100	272	Peak
2483.5	38.26	-15.74	54	35.29	31.98	5.52	34.53	100	272	Average
2483.72	58.32	-15.68	74	55.35	31.98	5.52	34.53	100	272	Peak



Test Mode :	802.11n-HT20 Ant. 1				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	67.31	-6.69	74	64.55	31.9	5.4	34.54	142	356	Peak
2390	47.56	-6.44	54	44.8	31.9	5.4	34.54	142	356	Average
2412	88.14	-	-	85.33	31.91	5.43	34.53	142	356	Average
2412	107.35	-	-	104.54	31.91	5.43	34.53	142	356	Peak
2488	36	-18	54	33.01	32	5.52	34.53	142	356	Average
2488	50.06	-23.94	74	47.07	32	5.52	34.53	142	356	Peak
4824	49.09	-24.91	74	62.58	34.4	7.96	55.85	100	0	Peak

Test Mode :	802.11n-HT20 Ant. 1				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2350.86	46.94	-27.06	74	44.3	31.84	5.34	34.54	102	272	Peak
2353.74	33.73	-40.27	74	31.07	31.86	5.34	34.54	102	272	Average
2412	80.35	-	-	77.54	31.91	5.43	34.53	102	272	Average
2412	98.83	-	-	96.02	31.91	5.43	34.53	102	272	Peak
2486	33.84	-40.16	74	30.87	31.98	5.52	34.53	102	272	Average
2486	46.9	-27.1	74	43.93	31.98	5.52	34.53	102	272	Peak

**FCC RF Test Report**

Report No. : FR250712

Test Mode :	802.11n-HT20 Ant. 1				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Horizontal		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
200.1	33.67	-9.83	43.5	54.08	9.3	1.94	31.65	-	-	Peak
250.05	42.3	-3.7	46	59.27	12.4	2.28	31.65	120	333	Peak
267.06	41.36	-4.64	46	57.71	13.14	2.2	31.69	-	-	Peak
350.4	35.73	-10.27	46	50.6	14.3	2.39	31.56	-	-	Peak
399.4	36.19	-9.81	46	49.71	15.9	2.37	31.79	-	-	Peak
933.5	37.62	-8.38	46	44.37	20.73	3.8	31.28	-	-	Peak
2380	42.18	-11.82	54	39.44	31.88	5.4	34.54	111	358	Average
2380	56.07	-17.93	74	53.33	31.88	5.4	34.54	111	358	Peak
2437	87.13	-	-	84.25	31.95	5.46	34.53	111	358	Average
2437	106.76	-	-	103.88	31.95	5.46	34.53	111	358	Peak
2500	41.25	-12.75	54	38.26	32	5.52	34.53	111	358	Average
2500	54.88	-19.12	74	51.89	32	5.52	34.53	111	358	Peak
4874	48.22	-25.78	74	61.72	34.37	8	55.87	100	0	Peak



Test Mode :	802.11n-HT20 Ant. 1				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
57	31.34	-8.66	40	55.7	6.66	0.66	31.68	-	-	Peak
121.8	31.49	-12.01	43.5	50.01	11.86	1.33	31.71	-	-	Peak
250.05	33.11	-12.89	46	50.08	12.4	2.28	31.65	-	-	Peak
550.6	39.3	-6.7	46	49.1	19.1	2.98	31.88	144	100	Peak
849.5	35.35	-10.65	46	42.95	20.4	3.91	31.91	-	-	Peak
933.5	39.1	-6.9	46	45.85	20.73	3.8	31.28	-	-	Peak
2378	36.26	-17.74	54	33.55	31.88	5.37	34.54	195	267	Average
2378	47.97	-26.03	74	45.26	31.88	5.37	34.54	195	267	Peak
2437	80.22	-	-	77.34	31.95	5.46	34.53	195	267	Average
2437	98.28	-	-	95.4	31.95	5.46	34.53	195	267	Peak
2498	36.85	-17.15	54	33.86	32	5.52	34.53	195	267	Average
2498	49.35	-24.65	74	46.36	32	5.52	34.53	195	267	Peak



Test Mode :	802.11n-HT20 Ant. 1				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	35.89	-18.11	54	33.13	31.9	5.4	34.54	200	357	Average
2390	49.26	-24.74	74	46.5	31.9	5.4	34.54	200	357	Peak
2462	86.72	-	-	83.79	31.97	5.49	34.53	200	357	Average
2462	106.86	-	-	103.93	31.97	5.49	34.53	200	357	Peak
2483.5	67.24	-6.76	74	64.27	31.98	5.52	34.53	200	357	Peak
2483.56	47.84	-6.16	54	44.87	31.98	5.52	34.53	200	357	Average

Test Mode :	802.11n-HT20 Ant. 1				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2354	33.66	-20.34	54	31	31.86	5.34	34.54	188	268	Average
2354	46.4	-27.6	74	43.74	31.86	5.34	34.54	188	268	Peak
2462	79.88	-	-	76.95	31.97	5.49	34.53	188	268	Average
2462	98.33	-	-	95.4	31.97	5.49	34.53	188	268	Peak
2483.5	38.62	-15.38	54	35.65	31.98	5.52	34.53	188	268	Average
2483.6	57.8	-16.2	74	54.83	31.98	5.52	34.53	188	268	Peak



Test Mode :	802.11n-HT20 Ant. 2				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2000	55.8	-32.29	88.09	53.93	31.5	4.93	34.56	143	174	Peak
2354.19	41.96	-12.04	54	39.3	31.86	5.34	34.54	143	174	Average
2389.74	61.63	-12.37	74	58.87	31.9	5.4	34.54	143	174	Peak
2412	89.47	-	-	86.66	31.91	5.43	34.53	143	174	Average
2412	108.09	-	-	105.28	31.91	5.43	34.53	143	174	Peak
2498	38.61	-15.39	54	35.62	32	5.52	34.53	143	174	Average
2498	50.2	-23.8	74	47.21	32	5.52	34.53	143	174	Peak

Test Mode :	802.11n-HT20 Ant. 2				Temperature :			23~24°C		
Test Channel :	01				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2412 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2351.76	36.27	-17.73	54	33.61	31.86	5.34	34.54	108	268	Average
2389.83	55.37	-18.63	74	52.61	31.9	5.4	34.54	108	268	Peak
2412	82.67	-	-	79.86	31.91	5.43	34.53	108	268	Average
2412	100.34	-	-	97.53	31.91	5.43	34.53	108	268	Peak
2494	33.78	-20.22	54	30.79	32	5.52	34.53	108	268	Average
2494	47.7	-26.3	74	44.71	32	5.52	34.53	108	268	Peak



Test Mode :	802.11n-HT20 Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2002 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1466	47.76	-26.24	74	51	27.8	4.05	35.09	121	169	Peak
2002	58.18	-29.11	87.29	56.31	31.5	4.93	34.56	121	169	Peak
2380	42.42	-11.58	54	39.68	31.88	5.4	34.54	121	169	Average
2380	55.93	-18.07	74	53.19	31.88	5.4	34.54	121	169	Peak
2437	88.64	-	-	85.76	31.95	5.46	34.53	121	169	Average
2437	107.29	-	-	104.43	31.93	5.46	34.53	121	169	Peak
2494	40.19	-13.81	54	37.2	32	5.52	34.53	121	169	Average
2494	53.54	-20.46	74	50.55	32	5.52	34.53	121	169	Peak
4874	48.09	-25.91	74	61.59	34.37	8	55.87	100	0	Peak

Test Mode :	802.11n-HT20 Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2378	35.52	-18.48	54	32.81	31.88	5.37	34.54	106	254	Average
2378	47.26	-26.74	74	44.55	31.88	5.37	34.54	106	254	Peak
2437	81.74	-	-	78.86	31.95	5.46	34.53	106	254	Average
2437	100.02	-	-	97.14	31.95	5.46	34.53	106	254	Peak
2496	36.14	-17.86	54	33.15	32	5.52	34.53	106	254	Average
2496	47.95	-26.05	74	44.96	32	5.52	34.53	106	254	Peak



Test Mode :	802.11n-HT20 Ant. 2				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	49.26	-24.74	74	53.12	27.8	3.66	35.32	118	2	Peak
2000	54.63	-33.39	88.02	52.76	31.5	4.93	34.56	118	2	Peak
2366	35.93	-18.07	54	33.24	31.86	5.37	34.54	118	2	Average
2366	48.38	-25.62	74	45.69	31.86	5.37	34.54	118	2	Peak
2462	88.47	-	-	85.54	31.97	5.49	34.53	118	2	Average
2462	108.02	-	-	105.09	31.97	5.49	34.53	118	2	Peak
2483.52	65.28	-8.72	74	62.31	31.98	5.52	34.53	118	2	Peak
2483.58	41.67	-12.33	54	38.7	31.98	5.52	34.53	118	2	Average

Test Mode :	802.11n-HT20 Ant. 2				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2348	33.87	-20.13	54	31.23	31.84	5.34	34.54	131	3	Average
2348	46.56	-27.44	74	43.92	31.84	5.34	34.54	131	3	Peak
2462	81.28	-	-	78.35	31.97	5.49	34.53	131	3	Average
2462	99.89	-	-	96.96	31.97	5.49	34.53	131	3	Peak
2483.5	38.35	-15.65	54	35.38	31.98	5.52	34.53	131	3	Average
2483.54	61.31	-12.69	74	58.34	31.98	5.52	34.53	131	3	Peak



Test Mode :	802.11n-HT20 Ant. 1+2	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2004 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	38.35	-15.65	54	42.21	27.8	3.66	35.32	200	158	Average
1200	52.86	-21.14	74	56.72	27.8	3.66	35.32	200	158	Peak
2004	50.7	-39.3	90	48.83	31.5	4.93	34.56	200	6	Peak
2360.94	44.93	-9.07	54	42.24	31.86	5.37	34.54	200	158	Average
2389.83	69.05	-4.95	74	66.29	31.9	5.4	34.54	200	158	Peak
2412	90.88	-	-	88.07	31.91	5.43	34.53	200	6	Average
2412	110	-	-	107.19	31.91	5.43	34.53	200	6	Peak
2488	40.62	-13.38	54	37.63	32	5.52	34.53	200	6	Average
2488	51.08	-22.92	74	48.09	32	5.52	34.53	200	6	Peak
4824	50.61	-23.39	74	64.1	34.4	7.96	55.85	100	0	Peak



Test Mode :	802.11n-HT20 Ant. 1+2	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2002 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	47.81	-26.19	74	51.67	27.8	3.66	35.32	136	266	Peak
2002	51.38	-30.38	81.76	49.51	31.5	4.93	34.56	136	266	Peak
2361.12	36.19	-17.81	54	33.5	31.86	5.37	34.54	136	266	Average
2389.74	53.84	-20.16	74	51.08	31.9	5.4	34.54	136	266	Peak
2412	82.46	-	-	79.65	31.91	5.43	34.53	136	266	Average
2412	101.76	-	-	98.95	31.91	5.43	34.53	136	266	Peak
2486	34.63	-19.37	54	31.66	31.98	5.52	34.53	136	266	Average
2486	47.5	-26.5	74	44.53	31.98	5.52	34.53	136	266	Peak
4824	47.86	-26.14	74	61.33	34.4	7.98	55.85	100	0	Peak



Test Mode :	802.11n-HT20 Ant. 1+2	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
200.1	33.51	-9.99	43.5	53.92	9.3	1.94	31.65	-	-	Peak
250.05	42.09	-3.91	46	59.06	12.4	2.28	31.65	100	109	Peak
267.06	39.41	-6.59	46	55.76	13.14	2.2	31.69	-	-	Peak
359.5	38.19	-7.81	46	52.76	14.6	2.39	31.56	-	-	Peak
399.4	37.53	-8.47	46	51.05	15.9	2.37	31.79	-	-	Peak
933.5	37.64	-8.36	46	44.39	20.73	3.8	31.28	-	-	Peak
1200	41.28	-12.72	54	45.14	27.8	3.66	35.32	200	204	Average
1200	56.94	-17.06	74	60.8	27.8	3.66	35.32	200	204	Peak
1466	50.15	-23.85	74	53.39	27.8	4.05	35.09	200	184	Peak
2000	50.43	-40.42	90.85	48.56	31.5	4.93	34.56	200	184	Peak
2380	44.07	-9.93	54	41.33	31.88	5.4	34.54	200	204	Average
2380	59.49	-14.51	74	56.75	31.88	5.4	34.54	200	184	Peak
2437	90.71	-	-	87.83	31.95	5.46	34.53	200	204	Average
2437	110.85	-	-	107.97	31.95	5.46	34.53	200	184	Peak
2498	43.17	-10.83	54	40.18	32	5.52	34.53	200	204	Average
2498	56.3	-17.7	74	53.31	32	5.52	34.53	200	184	Peak
4874	50.92	-23.08	74	64.41	34.37	8.01	55.87	100	0	Peak



Test Mode :	802.11n-HT20 Ant. 1+2	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2008 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
56.46	30.82	-9.18	40	55.04	6.78	0.67	31.67	-	-	Peak
121.26	31.23	-12.27	43.5	49.74	11.88	1.32	31.71	-	-	Peak
250.05	32.83	-13.17	46	49.8	12.4	2.28	31.65	-	-	Peak
399.4	36.35	-9.65	46	49.87	15.9	2.37	31.79	-	-	Peak
550.6	39.28	-6.72	46	49.08	19.1	2.98	31.88	112	236	Peak
933.5	37.83	-8.17	46	44.58	20.73	3.8	31.28	-	-	Peak
2008	51.6	-40.23	91.83	49.73	31.5	4.93	34.56	200	276	Peak
2376	35.47	-18.53	54	32.76	31.88	5.37	34.54	200	276	Average
2376	48.45	-25.55	74	45.74	31.88	5.37	34.54	200	276	Peak
2437	81.69	-	-	78.81	31.95	5.46	34.53	200	276	Average
2437	101.83	-	-	98.95	31.95	5.46	34.53	200	276	Peak
2496	37.63	-16.37	54	34.64	32	5.52	34.53	200	276	Average
2496	51.12	-22.88	74	48.13	32	5.52	34.53	200	276	Peak
4874	47.9	-26.1	74	61.39	34.37	8.01	55.87	100	0	Peak



Test Mode :	802.11n-HT20 Ant. 1+2				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	2462 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	40.35	-13.65	54	44.21	27.8	3.66	35.32	200	202	Average
1200	54.33	-19.67	74	58.19	27.8	3.66	35.32	200	202	Peak
2350	39.26	-14.74	54	36.62	31.84	5.34	34.54	200	356	Average
2350	51.62	-22.38	74	48.98	31.84	5.34	34.54	200	356	Peak
2462	88.93	-	-	86	31.97	5.49	34.53	200	356	Average
2462	110.66	-	-	107.73	31.97	5.49	34.53	200	356	Peak
2483.56	43.63	-10.37	54	40.66	31.98	5.52	34.53	200	356	Average
2483.62	70.04	-3.96	74	67.07	31.98	5.52	34.53	200	356	Peak
4924	49.71	-24.29	74	63.23	34.34	8.04	55.9	100	0	Peak

Test Mode :	802.11n-HT20 Ant. 1+2				Temperature :			23~24°C		
Test Channel :	11				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 2008 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2008	53.85	-28.43	82.28	51.98	31.5	4.93	34.56	200	266	Peak
2354	34.34	-19.66	54	31.68	31.86	5.34	34.54	200	266	Average
2354	46.19	-27.81	74	43.53	31.86	5.34	34.54	200	266	Peak
2462	83.49	-	-	80.56	31.97	5.49	34.53	200	266	Average
2462	102.28	-	-	99.35	31.97	5.49	34.53	200	266	Peak
2483.58	64.48	-9.52	74	61.51	31.98	5.52	34.53	200	266	Peak
2483.6	38.84	-15.16	54	35.87	31.98	5.52	34.53	200	266	Average
4924	48.12	-25.88	74	61.64	34.34	8.04	55.9	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1				Temperature :			23~24°C		
Test Channel :	03				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 2124 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2124	54.69	-29.29	83.98	52.54	31.62	5.08	34.55	200	178	Peak
2387.58	64.12	-9.88	74	61.36	31.9	5.4	34.54	200	178	Peak
2389.92	37.57	-16.43	54	34.81	31.9	5.4	34.54	200	178	Average
2422	80.25	-	-	77.42	31.93	5.43	34.53	200	178	Average
2422	103.98	-	-	101.15	31.93	5.43	34.53	200	178	Peak
2486	37.82	-16.18	54	34.85	31.98	5.52	34.53	200	178	Average
2486	54.27	-19.73	74	51.3	31.98	5.52	34.53	200	178	Peak
4844	48.78	-25.22	74	62.27	34.39	7.98	55.86	100	0	Peak

Test Mode :	802.11n-HT40 Ant. 1				Temperature :			23~24°C		
Test Channel :	03				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2422 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2387.31	54.91	-19.09	74	52.15	31.9	5.4	34.54	110	269	Peak
2389.92	37.57	-16.43	54	34.81	31.9	5.4	34.54	110	269	Average
2422	73.62	-	-	70.79	31.93	5.43	34.53	110	269	Average
2422	96.17	-	-	93.31	31.93	5.46	34.53	110	269	Peak
2488	33.67	-20.33	54	30.68	32	5.52	34.53	110	269	Average
2488	46.31	-27.69	74	43.32	32	5.52	34.53	110	269	Peak



Test Mode :	802.11n-HT40 Ant. 1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2138 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
200.1	33.26	-10.24	43.5	53.67	9.3	1.94	31.65	-	-	Peak
250.05	42.43	-3.57	46	59.4	12.4	2.28	31.65	106	182	Peak
267.06	40.35	-5.65	46	56.7	13.14	2.2	31.69	-	-	Peak
359.5	41.5	-4.5	46	56.07	14.6	2.39	31.56	-	-	Peak
399.4	41.62	-4.38	46	55.14	15.9	2.37	31.79	-	-	Peak
933.5	39.04	-6.96	46	45.79	20.73	3.8	31.28	-	-	Peak
2138	55.98	-28.31	84.29	53.81	31.64	5.08	34.55	200	176	Peak
2390	41.11	-12.89	54	38.35	31.9	5.4	34.54	200	176	Average
2390	55.39	-18.61	74	52.63	31.9	5.4	34.54	200	176	Peak
2437	80.2	-	-	77.32	31.95	5.46	34.53	200	176	Average
2437	104.29	-	-	101.46	31.93	5.43	34.53	200	176	Peak
2484	37.78	-16.22	54	34.81	31.98	5.52	34.53	200	176	Average
2484	57.24	-16.76	74	54.27	31.98	5.52	34.53	200	176	Peak
4874	47.27	-26.73	74	60.77	34.37	8	55.87	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
56.46	31.39	-8.61	40	55.61	6.78	0.67	31.67	-	-	Peak
122.34	31.66	-11.84	43.5	50.18	11.86	1.33	31.71	-	-	Peak
250.05	32.94	-13.06	46	49.91	12.4	2.28	31.65	-	-	Peak
399.4	33.18	-12.82	46	46.7	15.9	2.37	31.79	-	-	Peak
550.6	39.05	-6.95	46	48.85	19.1	2.98	31.88	100	223	Peak
933.5	35.83	-10.17	46	42.58	20.73	3.8	31.28	-	-	Peak
2336	35.4	-18.6	54	32.76	31.84	5.34	34.54	167	280	Average
2336	47.77	-26.23	74	45.13	31.84	5.34	34.54	167	280	Peak
2437	73.8	-	-	70.92	31.95	5.46	34.53	167	280	Average
2437	96.1	-	-	93.22	31.95	5.46	34.53	167	280	Peak
2488	33.59	-20.41	54	30.6	32	5.52	34.53	167	280	Average
2488	47.16	-26.84	74	44.17	32	5.52	34.53	167	280	Peak



Test Mode :	802.11n-HT40 Ant. 1				Temperature :			23~24°C		
Test Channel :	09				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 2134 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2134	51.18	-32.72	83.9	49.01	31.64	5.08	34.55	200	360	Peak
2386	38.4	-15.6	54	35.64	31.9	5.4	34.54	200	360	Average
2386	51.36	-22.64	74	48.6	31.9	5.4	34.54	200	360	Peak
2452	78.86	-	-	75.98	31.95	5.46	34.53	200	360	Average
2452	103.9	-	-	100.97	31.97	5.49	34.53	200	360	Peak
2483.62	44.78	-9.22	54	41.81	31.98	5.52	34.53	200	360	Average
2486.42	66.93	-7.07	74	63.96	31.98	5.52	34.53	200	360	Peak
4904	46.48	-27.52	74	59.99	34.35	8.03	55.89	100	0	Peak

Test Mode :	802.11n-HT40 Ant. 1				Temperature :			23~24°C		
Test Channel :	09				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2452 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2352	34.63	-19.37	54	31.97	31.86	5.34	34.54	108	268	Average
2352	47.32	-26.68	74	44.66	31.86	5.34	34.54	108	268	Peak
2452	73.33	-	-	70.45	31.95	5.46	34.53	108	268	Average
2452	95.55	-	-	92.67	31.95	5.46	34.53	108	268	Peak
2483.64	37.78	-16.22	54	34.81	31.98	5.52	34.53	108	268	Average
2483.64	56.81	-17.19	74	53.84	31.98	5.52	34.53	108	268	Peak



Test Mode :	802.11n-HT40 Ant. 2				Temperature :			23~24°C		
Test Channel :	03				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 1996 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1192	50.89	-23.11	74	54.75	27.8	3.66	35.32	118	357	Peak
1996	53.42	-30.67	84.09	51.55	31.5	4.93	34.56	118	357	Peak
2389.83	69.69	-4.31	74	66.93	31.9	5.4	34.54	118	357	Peak
2390	45.95	-8.05	54	43.19	31.9	5.4	34.54	118	357	Average
2422	80.05	-	-	77.22	31.93	5.43	34.53	118	357	Average
2422	104.09	-	-	101.26	31.93	5.43	34.53	118	357	Peak
2486	37.61	-16.39	54	34.64	31.98	5.52	34.53	118	357	Average
2486	61.25	-12.75	74	58.28	31.98	5.52	34.53	118	357	Peak

Test Mode :	802.11n-HT40 Ant. 2				Temperature :			23~24°C		
Test Channel :	03				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2422 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	38	-16	54	35.24	31.9	5.4	34.54	100	262	Average
2390	58.56	-15.44	74	55.8	31.9	5.4	34.54	100	262	Peak
2422	73.35	-	-	70.52	31.93	5.43	34.53	100	262	Average
2422	95.8	-	-	92.97	31.93	5.43	34.53	100	262	Peak
2490	35.36	-18.64	54	32.37	32	5.52	34.53	100	262	Average
2490	55.39	-18.61	74	52.4	32	5.52	34.53	100	262	Peak



Test Mode :	802.11n-HT40 Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 1994 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	50.74	-23.26	74	54.6	27.8	3.66	35.32	117	360	Peak
1994	55.67	-28.9	84.57	53.98	31.38	4.89	34.58	117	360	Peak
2390	38.7	-15.3	54	35.94	31.9	5.4	34.54	117	360	Average
2390	62.96	-11.04	74	60.2	31.9	5.4	34.54	117	360	Peak
2437	79.67	-	-	76.79	31.95	5.46	34.53	117	360	Average
2437	104.57	-	-	101.69	31.95	5.46	34.53	117	360	Peak
2484	40.01	-13.99	54	37.04	31.98	5.52	34.53	117	360	Average
2484	65.82	-8.18	74	62.85	31.98	5.52	34.53	117	360	Peak
4874	46.43	-27.57	74	59.93	34.37	8	55.87	100	0	Peak

Test Mode :	802.11n-HT40 Ant. 2				Temperature :			23~24°C		
Test Channel :	06				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	34.73	-19.27	54	31.97	31.9	5.4	34.54	100	261	Average
2390	54.71	-19.29	74	51.95	31.9	5.4	34.54	100	261	Peak
2437	73.8	-	-	70.92	31.95	5.46	34.53	100	261	Average
2437	96.3	-	-	93.42	31.95	5.46	34.53	100	261	Peak
2484	35.98	-18.02	54	33.01	31.98	5.52	34.53	100	261	Average
2484	59.05	-14.95	74	56.08	31.98	5.52	34.53	100	261	Peak



Test Mode :	802.11n-HT40 Ant. 2				Temperature :			23~24°C		
Test Channel :	09				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Horizontal		
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 2000 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	50.1	-23.9	74	53.96	27.8	3.66	35.32	117	360	Peak
2000	56.61	-27.98	84.59	54.74	31.5	4.93	34.56	117	360	Peak
2390	37.51	-16.49	54	34.75	31.9	5.4	34.54	117	360	Average
2390	59.84	-14.16	74	57.08	31.9	5.4	34.54	117	360	Peak
2452	80.62	-	-	77.74	31.95	5.46	34.53	117	360	Average
2452	104.59	-	-	101.71	31.95	5.46	34.53	117	360	Peak
2483.56	70.29	-3.71	74	67.32	31.98	5.52	34.53	117	360	Peak
2483.86	46.92	-7.08	54	43.95	31.98	5.52	34.53	117	360	Average

Test Mode :	802.11n-HT40 Ant. 2				Temperature :			23~24°C		
Test Channel :	09				Relative Humidity :			45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :			Vertical		
Remark :	2452 MHz is fundamental signal which can be ignored.									

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388	34.18	-19.82	54	31.42	31.9	5.4	34.54	100	259	Average
2388	50.75	-23.25	74	47.99	31.9	5.4	34.54	100	259	Peak
2452	73.25	-	-	70.37	31.95	5.46	34.53	100	259	Average
2452	95.13	-	-	92.25	31.95	5.46	34.53	100	259	Peak
2483.68	40.17	-13.83	54	37.2	31.98	5.52	34.53	100	259	Average
2483.92	63.44	-10.56	74	60.47	31.98	5.52	34.53	100	259	Peak



Test Mode :	802.11n-HT40 Ant. 1+2			Temperature :		23~24°C		
Test Channel :	03			Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang			Polarization :		Horizontal		
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 2050 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level							

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
200.1	33.9	-9.6	43.5	54.31	9.3	1.94	31.65	-	-	Peak
250.05	40.12	-5.88	46	57.09	12.4	2.28	31.65	-	-	Peak
271.65	37.18	-8.82	46	53.75	12.9	2.22	31.69	-	-	Peak
359.5	37.26	-8.74	46	51.83	14.6	2.39	31.56	-	-	Peak
725.6	34.8	-11.2	46	43.84	19.46	3.56	32.06	-	-	Peak
933.5	40.25	-5.75	46	47	20.73	3.8	31.28	103	198	Peak
1200	39.52	-14.48	54	43.38	27.8	3.66	35.32	200	188	Average
1200	53.57	-20.43	74	57.43	27.8	3.66	35.32	200	188	Peak
2050	50.96	-36.04	87	48.98	31.55	4.99	34.56	200	5	Peak
2389.2	70.83	-3.17	74	68.07	31.9	5.4	34.54	200	5	Peak
2390	49.13	-4.87	54	46.37	31.9	5.4	34.54	200	5	Average
2422	81.21	-	-	78.38	31.93	5.43	34.53	200	5	Average
2422	107	-	-	104.17	31.93	5.43	34.53	200	5	Peak
2484	37.9	-16.1	54	34.93	31.98	5.52	34.53	200	5	Average
2484	60.16	-13.84	74	57.19	31.98	5.52	34.53	200	5	Peak
4844	50.24	-23.76	74	63.73	34.39	7.98	55.86	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1+2				Temperature :		23~24°C		
Test Channel :	03				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2422 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
38.1	29.03	-10.97	40	46.68	13.58	0.47	31.7	-	-	Peak
128.55	28.59	-14.91	43.5	47.11	11.8	1.38	31.7	-	-	Peak
267.06	28.79	-17.21	46	45.14	13.14	2.2	31.69	-	-	Peak
394.5	31.35	-14.65	46	45.18	15.6	2.35	31.78	-	-	Peak
550.6	37.98	-8.02	46	47.78	19.1	2.98	31.88	100	231	Peak
849.5	34.84	-11.16	46	42.44	20.4	3.91	31.91	-	-	Peak
1198	47.82	-26.18	74	51.68	27.8	3.66	35.32	123	90	Peak
2388.93	58.69	-15.31	74	55.93	31.9	5.4	34.54	123	90	Peak
2389.56	38.75	-15.25	54	35.99	31.9	5.4	34.54	123	90	Average
2422	73.61	-	-	70.78	31.93	5.43	34.53	123	90	Average
2422	99.29	-	-	96.46	31.93	5.43	34.53	123	90	Peak
2484	34.62	-19.38	54	31.65	31.98	5.52	34.53	123	90	Average
2484	52.44	-21.56	74	49.47	31.98	5.52	34.53	123	90	Peak
4844	47.24	-26.76	74	60.73	34.39	7.98	55.86	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1+2				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Horizontal		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
40.26	28.99	-11.01	40	48.05	12.12	0.52	31.7	-	-	Peak
250.05	42.12	-3.88	46	59.09	12.4	2.28	31.65	100	188	Peak
267.06	39.86	-6.14	46	56.21	13.14	2.2	31.69	-	-	Peak
333.6	40.27	-5.73	46	55.71	13.77	2.37	31.58	-	-	Peak
359.5	37.26	-8.74	46	51.83	14.6	2.39	31.56	-	-	Peak
933.5	41.25	-4.75	46	48	20.73	3.8	31.28	-	-	Peak
1200	39.11	-14.89	54	42.97	27.8	3.66	35.32	200	190	Average
1200	52.66	-21.34	74	56.52	27.8	3.66	35.32	200	190	Peak
2390	41.6	-12.4	54	38.84	31.9	5.4	34.54	200	7	Average
2390	56.6	-17.4	74	53.84	31.9	5.4	34.54	200	7	Peak
2437	80.95	-	-	78.07	31.95	5.46	34.53	200	7	Average
2437	107.32	-	-	104.44	31.95	5.46	34.53	200	7	Peak
2488	38.11	-15.89	54	35.12	32	5.52	34.53	200	7	Average
2488	62.66	-11.34	74	59.67	32	5.52	34.53	200	7	Peak
4874	49.64	-24.36	74	63.13	34.37	8.01	55.87	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1+2				Temperature :		23~24°C		
Test Channel :	06				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2437 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
56.46	30.91	-9.09	40	55.13	6.78	0.67	31.67	-	-	Peak
121.8	31.58	-11.92	43.5	50.1	11.86	1.33	31.71	-	-	Peak
250.05	33.02	-12.98	46	49.99	12.4	2.28	31.65	-	-	Peak
399.4	35.14	-10.86	46	48.66	15.9	2.37	31.79	-	-	Peak
550.6	38.98	-7.02	46	48.78	19.1	2.98	31.88	100	312	Peak
933.5	36.83	-9.17	46	43.58	20.73	3.8	31.28	-	-	Peak
1200	49.67	-24.33	74	53.53	27.8	3.66	35.32	110	90	Peak
2390	35.13	-18.87	54	32.37	31.9	5.4	34.54	110	90	Average
2390	50.13	-23.87	74	47.37	31.9	5.4	34.54	110	90	Peak
2437	74.42	-	-	71.54	31.95	5.46	34.53	110	90	Average
2437	99.05	-	-	96.17	31.95	5.46	34.53	110	90	Peak
2486	35.26	-18.74	54	32.29	31.98	5.52	34.53	110	90	Average
2486	55.35	-18.65	74	52.38	31.98	5.52	34.53	110	90	Peak
4874	47.4	-26.6	74	60.9	34.37	8	55.87	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1+2	Temperature :	23~24°C
Test Channel :	09	Relative Humidity :	45~46%
Test Engineer :	Timberland, Kai Wang and Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 2190 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	40.13	-13.87	54	43.99	27.8	3.66	35.32	200	174	Average
1200	53.38	-20.62	74	57.24	27.8	3.66	35.32	200	174	Peak
2190	52.76	-34.59	87.35	50.45	31.69	5.17	34.55	200	6	Peak
2348	41.84	-12.16	54	39.2	31.84	5.34	34.54	200	6	Average
2348	56.64	-17.36	74	54	31.84	5.34	34.54	200	6	Peak
2452	80.24	-	-	77.36	31.95	5.46	34.53	200	6	Average
2452	107.35	-	-	104.47	31.95	5.46	34.53	200	6	Peak
2483.52	70.66	-3.34	74	67.69	31.98	5.52	34.53	200	6	Peak
2483.76	46.6	-7.4	54	43.63	31.98	5.52	34.53	200	6	Average
4904	49.36	-24.64	74	62.87	34.35	8.03	55.89	100	0	Peak



Test Mode :	802.11n-HT40 Ant. 1+2				Temperature :		23~24°C		
Test Channel :	09				Relative Humidity :		45~46%		
Test Engineer :	Timberland, Kai Wang and Ivan Chiang				Polarization :		Vertical		
Remark :	2452 MHz is fundamental signal which can be ignored.								

Frequency (MHz)	Level (dB μ V/m)	Over Limit (dB)	Limit Line (dB μ V/m)	Read Level (dB μ V)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
1200	49.96	-24.04	74	53.82	27.8	3.66	35.32	110	90	Peak
2350	35.77	-18.23	54	33.13	31.84	5.34	34.54	110	90	Average
2350	48.08	-25.92	74	45.44	31.84	5.34	34.54	110	90	Peak
2452	74.73	-	-	71.85	31.95	5.46	34.53	110	90	Average
2452	99.63	-	-	96.75	31.95	5.46	34.53	110	90	Peak
2483.56	40.86	-13.14	54	37.89	31.98	5.52	34.53	110	90	Average
2483.62	63.65	-10.35	74	60.68	31.98	5.52	34.53	110	90	Peak
4904	48.75	-25.25	74	62.26	34.35	8.03	55.89	100	0	Peak



3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 KHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

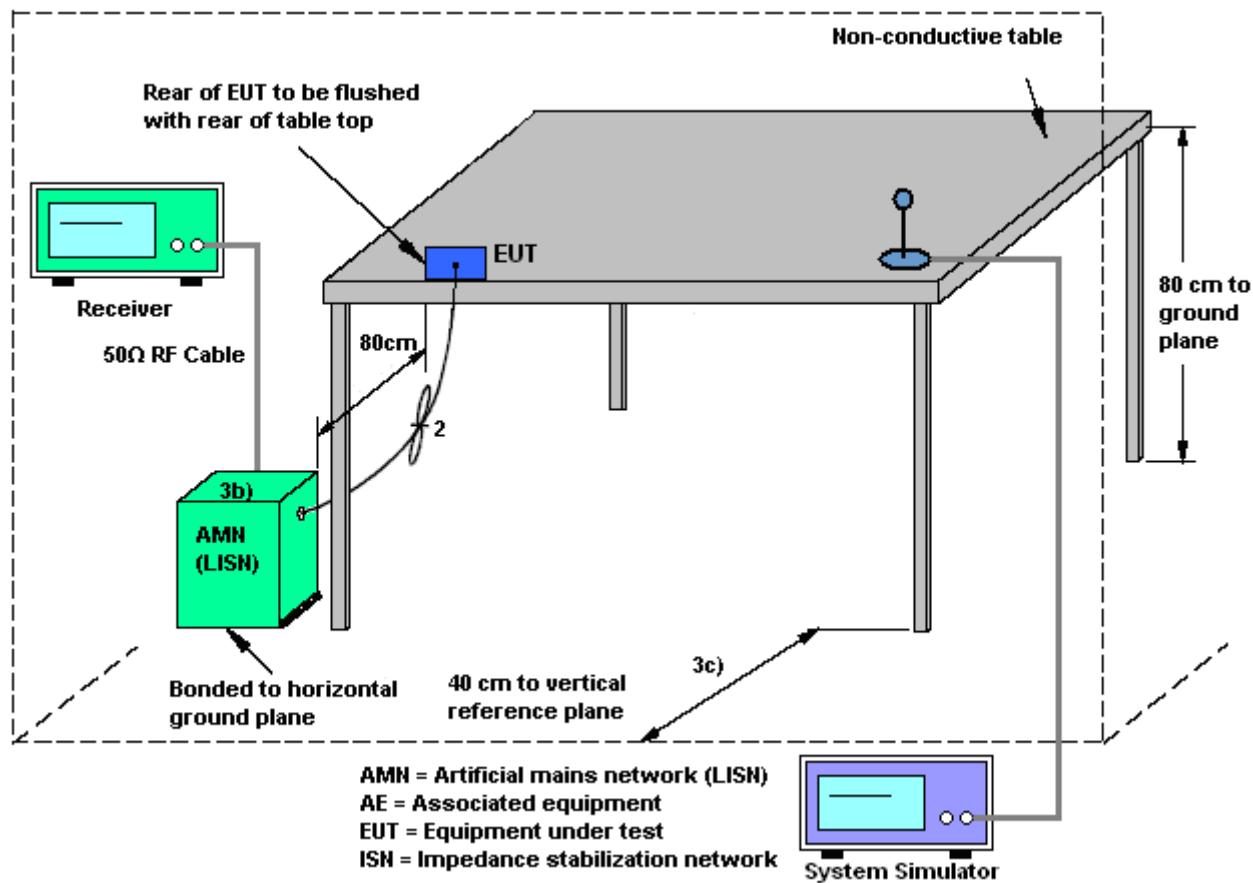
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

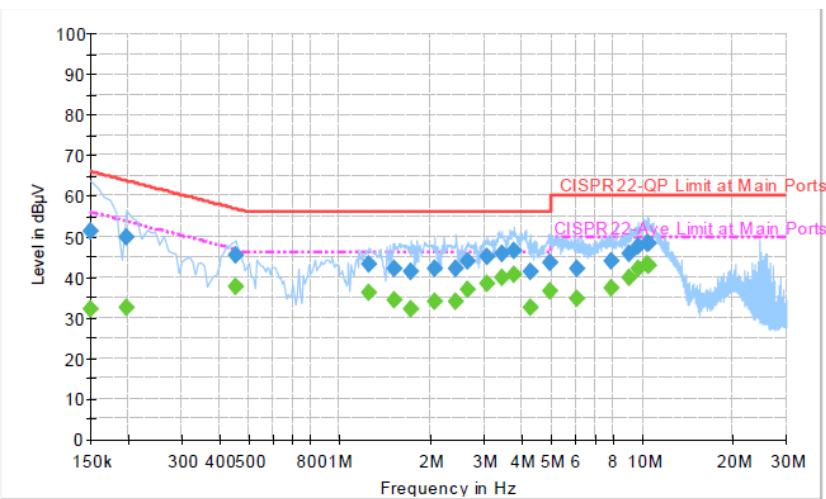
1. The testing follows the guidelines in ANSI C63.10-2009 and fulfills ANSI C63.4-2003 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power 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°C
Test Engineer :	Slash Huang	Relative Humidity :	20~45%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + WLAN Link + RJ-45 + RJ-11 + POE		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

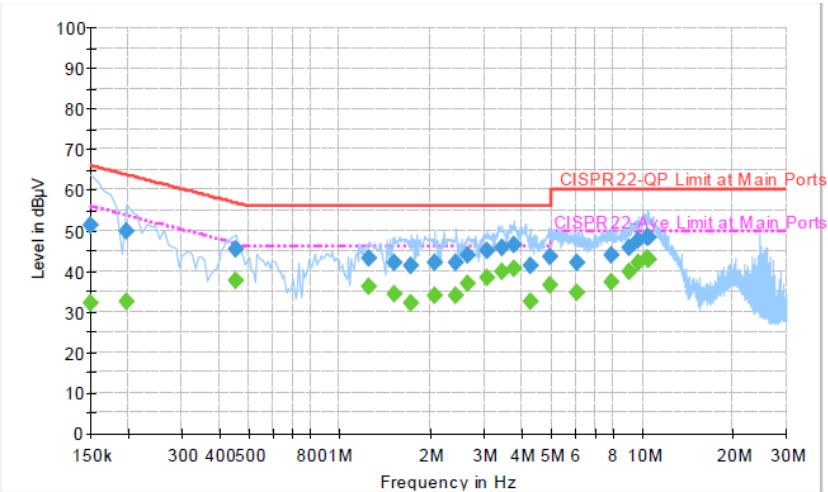


Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	51.2	Off	L1	19.4	14.8	66.0
0.198000	49.9	Off	L1	19.3	13.8	63.7
0.454000	45.2	Off	L1	19.3	11.6	56.8
1.254000	43.3	Off	L1	19.5	12.7	56.0
1.510000	42.0	Off	L1	19.4	14.0	56.0
1.726000	41.2	Off	L1	19.5	14.8	56.0
2.062000	42.0	Off	L1	19.6	14.0	56.0
2.430000	42.1	Off	L1	19.7	13.9	56.0
2.662000	43.8	Off	L1	19.5	12.2	56.0
3.070000	45.0	Off	L1	19.6	11.0	56.0
3.454000	45.7	Off	L1	19.6	10.3	56.0
3.758000	46.7	Off	L1	19.6	9.3	56.0
4.254000	41.4	Off	L1	19.6	14.6	56.0
4.982000	43.7	Off	L1	19.7	12.3	56.0
6.102000	42.2	Off	L1	19.6	17.8	60.0
7.878000	43.9	Off	L1	19.6	16.1	60.0
9.054000	45.7	Off	L1	19.8	14.3	60.0
9.678000	47.4	Off	L1	19.7	12.6	60.0
10.374000	48.3	Off	L1	19.7	11.7	60.0
10.518000	48.3	Off	L1	19.7	11.7	60.0



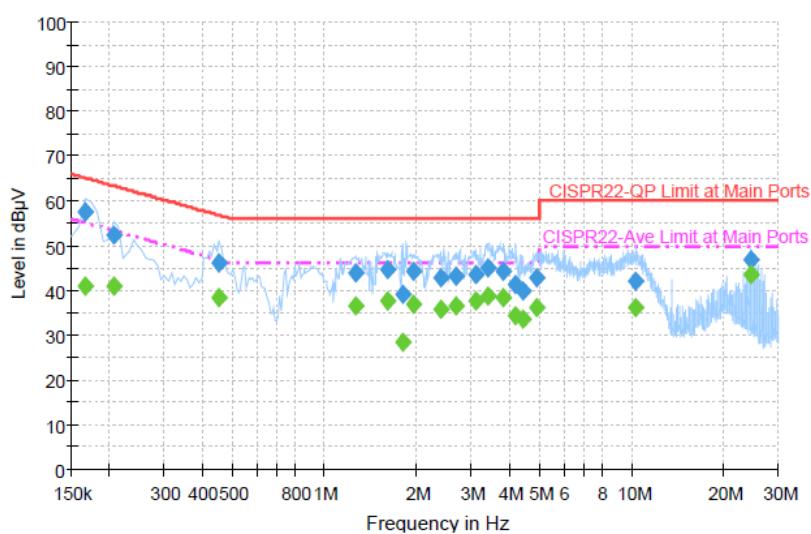
Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	20~45%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + WLAN Link + RJ-45 + RJ-11 + POE		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

**Final Result : Average**

Frequency (MHz)	Average (dB μ V)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	32.2	Off	L1	19.4	23.8	56.0
0.198000	32.5	Off	L1	19.3	21.2	53.7
0.454000	37.5	Off	L1	19.3	9.3	46.8
1.254000	36.2	Off	L1	19.5	9.8	46.0
1.510000	34.3	Off	L1	19.4	11.7	46.0
1.726000	32.1	Off	L1	19.5	13.9	46.0
2.062000	34.0	Off	L1	19.6	12.0	46.0
2.430000	33.9	Off	L1	19.7	12.1	46.0
2.662000	37.1	Off	L1	19.5	8.9	46.0
3.070000	38.4	Off	L1	19.6	7.6	46.0
3.454000	39.8	Off	L1	19.6	6.2	46.0
3.758000	40.4	Off	L1	19.6	5.6	46.0
4.254000	32.3	Off	L1	19.6	13.7	46.0
4.982000	36.5	Off	L1	19.7	9.5	46.0
6.102000	34.7	Off	L1	19.6	15.3	50.0
7.878000	37.1	Off	L1	19.6	12.9	50.0
9.054000	39.9	Off	L1	19.8	10.1	50.0
9.678000	41.9	Off	L1	19.7	8.1	50.0
10.374000	43.2	Off	L1	19.7	6.8	50.0
10.518000	42.9	Off	L1	19.7	7.1	50.0



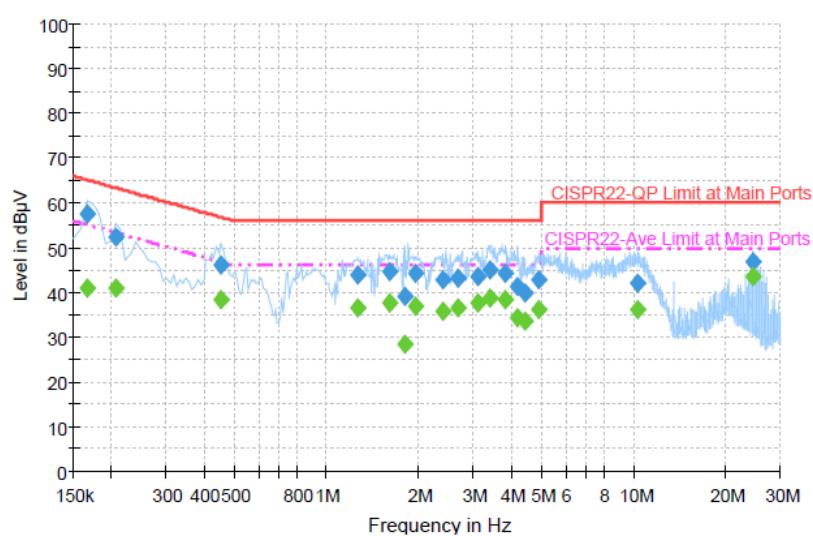
Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	20~45%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + WLAN Link + RJ-45 + RJ-11 + POE		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

**Final Result : QuasiPeak**

Frequency (MHz)	QuasiPeak (dB μ V)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.166000	57.4	Off	N	19.4	7.8	65.2
0.206000	52.3	Off	N	19.4	11.1	63.4
0.454000	46.1	Off	N	19.3	10.7	56.8
1.270000	43.8	Off	N	19.5	12.2	56.0
1.598000	44.5	Off	N	19.5	11.5	56.0
1.790000	39.1	Off	N	19.5	16.9	56.0
1.958000	44.3	Off	N	19.5	11.7	56.0
2.390000	42.9	Off	N	19.7	13.1	56.0
2.670000	43.3	Off	N	19.6	12.7	56.0
3.094000	43.7	Off	N	19.6	12.3	56.0
3.422000	45.1	Off	N	19.6	10.9	56.0
3.822000	44.4	Off	N	19.6	11.6	56.0
4.198000	41.4	Off	N	19.6	14.6	56.0
4.430000	39.7	Off	N	19.6	16.3	56.0
4.902000	43.0	Off	N	19.7	13.0	56.0
10.278000	42.2	Off	N	19.8	17.8	60.0
24.534000	46.9	Off	N	20.0	13.1	60.0



Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	20~45%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + WLAN Link + RJ-45 + RJ-11 + POE		
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)
0.166000	41.0	Off	N	19.4	14.2	55.2
0.206000	41.0	Off	N	19.4	12.4	53.4
0.454000	38.5	Off	N	19.3	8.3	46.8
1.270000	36.5	Off	N	19.5	9.5	46.0
1.598000	37.5	Off	N	19.5	8.5	46.0
1.790000	28.5	Off	N	19.5	17.5	46.0
1.958000	37.0	Off	N	19.5	9.0	46.0
2.390000	35.7	Off	N	19.7	10.3	46.0
2.670000	36.5	Off	N	19.6	9.5	46.0
3.094000	37.8	Off	N	19.6	8.2	46.0
3.422000	38.8	Off	N	19.6	7.2	46.0
3.822000	38.2	Off	N	19.6	7.8	46.0
4.198000	34.2	Off	N	19.6	11.8	46.0
4.430000	33.6	Off	N	19.6	12.4	46.0
4.902000	36.1	Off	N	19.7	9.9	46.0
10.278000	36.2	Off	N	19.8	13.8	50.0
24.534000	43.4	Off	N	20.0	6.6	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 EUT supports correlated MIMO mode. The composite antenna gain for 2.4GHz is 7.01 dBi. The antenna peak gain of EUT is over than 6 dBi. Therefore, it is necessary to reduce maximum peak output power and power density limit 1.01dB.

	2.4GHz
ANT. 1 GAIN (dBi)	4
ANT. 2 GAIN (dBi)	4
COMPOSITE GAIN (dBi)	7.01

FCC KDB 662911 D01 Multiple Transmitter Output v01r01

Unequal antenna gains, with equal transmit powers.

For antenna gains given by G_1, G_2, \dots, G_N dBi.

If transmit signals are *correlated*, then

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})/N] \text{ dBi}$$



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	Jun. 17, 2012~ Jun. 23, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Jun. 17, 2012~ Jun. 23, 2012	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Jun. 17, 2012~ Jun. 23, 2012	Sep. 17, 2012	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Jun. 15, 2012~ Jul. 24, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Jun. 15, 2012~ Jul. 24, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Jun. 15, 2012~ Jul. 24, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 15, 2012~ Jul. 24, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Jun. 15, 2012~ Jul. 24, 2012	Jul. 27, 2013	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY442110 30	9KHz ~ 26.5GHz	Nov. 23, 2011	Jun. 27, 2012~ Jul. 02, 2012	Nov. 22, 2012	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz-30GHz	Nov. 03, 2011	Jun. 27, 2012~ Jul. 02, 2012	Nov. 02, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/00 3	20MHz ~ 1000MHz	May 04, 2012	Jun. 27, 2012~ Jul. 02, 2012	May. 03, 2013	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 22, 2011	Jun. 27, 2012~ Jul. 02, 2012	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2011	Jun. 27, 2012~ Jul. 02, 2012	Jul. 31, 2012	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170 251	BBHA9170 251	15GHz ~ 40GHz	Oct. 20, 2011	Jun. 27, 2012~ Jul. 02, 2012	Oct. 19, 2012	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A019 17	1GHz ~ 26.5GHz	Apr. 13, 2012	Jun. 27, 2012~ Jul. 02, 2012	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 11, 2012	Jun. 27, 2012~ Jul. 02, 2012	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2011	Jun. 27, 2012~ Jul. 02, 2012	Jul. 17, 2012	Radiation (03CH06-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Jun. 27, 2012~ Jul. 02, 2012	Feb. 26, 2013	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9 kHz~30 MHz	Jul. 29, 2010	Jun. 27, 2012~ Jul. 02, 2012	Jul. 28, 2012	Radiation (03CH06-HY)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	2.26
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Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	2.54
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Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_{C(y)}$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP250712 as below.