FCC RF Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	Vodafone Mobile Wi-Fi
BRAND NAME	:	ZTE
MODEL NAME	:	R212
FCC ID	:	Q78-R212
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Jan. 23, 2013 and completely tested on Apr. 22, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:

Jones Tsai

Jones Tsai / Manager

Testing Laboratory 2627

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

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APPENDIX A. PHOTOGRAPHS OF EUT

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR312313A	Rev. 01	Initial issue of report	Apr. 26, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	RSS-210 A8.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
0	15.247(b)	RSS-210 A8.4	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	RSS-210 A8.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.2.6	15.247(d)	RSS-210 A8.5	Conducted Band Edges	≤ 20dBc	Pass	
			Conducted Spurious Emission		Pass	
3.2.6	15.247(d)	RSS-210 A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	
			Radiated Spurious Emission		Pass	Under limit 1.06 dB at 4875.000 MHz
3.6	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 9.57 dB at 0.360 MHz
3.6	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

ZTE CORPORATION

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

1.2 Manufacturer

ZTE CORPORATION

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

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Vodafone Mobile Wi-Fi
Brand Name	ZTE
Model Name	R212
FCC ID	Q78-R212
EUT supports Radios application	GPRS/EGPRS/WCDMA/HSPA/HSPA+(Downlink Only)/ DC-HSDPA/LTE/WLAN 11abgn
HW Version	T3
SW Version	BD_R212V2.0
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>802.11b/g/n : 2412 MHz ~ 2462 MHz
802.11a/n: 5745~5825MHz.</td></tr>
<tr><td>Maximum Output Power to Antenna</td><td><2412 MHz ~ 2462 MHz>
802.11b : 19.88 dBm (0.0973 W)
802.11g : 22.98 dBm (0.1986 W)
802.11n HT20 : 24.10 dBm (0.2571 W)
802.11n HT40 : 24.36 dBm (0.2728 W)
<5745 MHz ~ 5825 MHz>
802.11a : 19.45 dBm (0.0881 W)
802.11n HT20 : 23.64 dBm (0.2312 W)
802.11n HT40 : 21.84 dBm (0.1527 W)</td></tr>
<tr><td>Antenna Type</td><td><Ant.1>
802.11b/g : Monopole Antenna with gain 2.20 dBi
802.11a: Monopole Antenna with gain 2.20 dBi
<Ant.2>
802.11b/g : Monopole Antenna with gain 1.90 dBi
802.11a: Monopole Antenna with gain 2.20 dBi
<Ant.1+2>
802.11n : Monopole Antenna with gain 5.06 dBi
802.11a/n : Monopole Antenna with gain 5.21 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11b : DSSS (DBPSK / DQPSK / CCK)
802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)</td></tr>
<tr><td>Antenna Function for Transmitter</td><td>
<table>
<tr><td></td><td>Ant.1</td><td>Ant.2</td></tr>
<tr><td>802.11 b</td><td>V</td><td>V</td></tr>
<tr><td>802.11 g</td><td>V</td><td>V</td></tr>
<tr><td>802.11 a</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n SISO</td><td>-</td><td>-</td></tr>
<tr><td>802.11 n MIMO</td><td>V</td><td>V</td></tr>
</table>
Note: MIMO mode is completely uncorrelated.
</td></tr>
</table>

1.5 Testing Site

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

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

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

1.6 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
- FCC KDB 662911 D01 Multiple Transmitter Output v01r02.
- ANSI C63.10-2009

Remark:

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

2 Test Configuration of Equipment Under Test

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

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

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

2.1 Carrier Frequency 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		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4	149	5745	159	5795
	151	5755	161	5805
	157	5785	165	5825

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.

Ch.	Freq. (MHz)	Ant. Chain	802.11b RF Power (dBm)			
			DSSS Data Rate			
			1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
01	2412	1	18.89	18.75	18.76	18.83
06	2437	1	18.59	18.52	18.56	18.61
11	2462	1	19.45	19.46	19.45	19.52
01	2412	2	19.41	19.28	19.37	19.39
06	2437	2	**19.88**	19.79	19.81	19.84
11	2462	2	19.80	19.69	19.77	19.76

Ch.	Freq. (MHz)	Ant. Chain	802.11g RF Power (dBm)							
			OFDM Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
01	2412	1	22.21	22.02	21.98	21.99	22.11	22.09	22.13	21.92
06	2437	1	22.01	21.89	21.92	21.82	21.94	21.65	21.77	21.79
11	2462	1	22.11	22.06	21.96	21.89	21.82	21.79	21.95	22.02
01	2412	2	22.63	22.52	22.46	22.29	22.55	22.46	22.51	22.39
06	2437	2	22.75	22.69	22.71	22.66	22.51	22.61	22.71	22.69
11	2462	2	**22.98**	22.85	22.75	22.69	22.69	22.69	22.66	22.66

Ch.	Freq. (MHz)	Ant. Chain	WLAN 2.4GHz 802.11n HT-20 RF Power (dBm)							
			OFDM Data Rate							
			MCS=8	MCS=9	MCS=10	MCS=11	MCS=12	MCS=13	MCS=14	MCS=15
			13 Mbps	26 Mbps	39 Mbps	52 Mbps	78 Mbps	104 Mbps	117 Mbps	130 Mbps
01	2412	MIMO Ant.1	18.92	18.46	20.25	18.32	18.42	18.36	18.77	18.45
		MIMO Ant.2	19.99	19.66	21.55	19.85	19.55	19.30	19.41	19.33
		MIMO Ant.1+2	22.50	22.11	23.96	22.16	22.03	21.87	22.11	21.92
06	2437	MIMO Ant.1	18.21	18.02	20.09	18.06	18.11	18.12	18.22	18.59
		MIMO Ant.2	19.85	19.72	21.80	20.11	19.65	19.82	19.72	19.69
		MIMO Ant.1+2	22.12	21.96	24.04	22.22	21.96	22.06	22.04	22.19
11	2462	MIMO Ant.1	18.26	18.21	20.41	18.22	18.52	18.43	18.42	18.31
		MIMO Ant.2	19.77	19.79	21.68	19.71	19.51	19.65	19.55	19.39
		MIMO Ant.1+2	22.09	22.08	**24.10**	22.04	22.05	22.09	22.03	21.89

Ch.	Freq. (MHz)	Ant. Chain	WLAN 2.4GHz 802.11n HT-40 RF Power (dBm)							
			OFDM Data Rate							
			MCS=8	MCS=9	MCS=10	MCS=11	MCS=12	MCS=13	MCS=14	MCS=15
			27 Mbps	54 Mbps	81 Mbps	108 Mbps	162 Mbps	216 Mbps	243 Mbps	270 Mbps
03	2422	MIMO Ant.1	21.02	20.77	20.85	20.89	20.78	20.65	20.37	20.01
		MIMO Ant.2	21.58	21.62	21.42	21.58	21.49	21.26	21.21	20.66
		MIMO Ant.1+2	24.32	24.23	24.15	24.26	24.16	23.98	23.82	23.36
06	2437	MIMO Ant.1	20.46	19.78	20.05	20.11	20.01	20.03	19.85	19.80
		MIMO Ant.2	21.62	21.44	21.39	21.18	21.15	21.21	21.28	20.79
		MIMO Ant.1+2	24.09	23.70	23.78	23.69	23.63	23.67	23.63	23.33
09	2452	MIMO Ant.1	20.78	20.68	20.42	20.42	20.29	20.32	20.32	20.02
		MIMO Ant.2	21.85	21.32	21.27	21.44	21.47	21.45	21.33	20.98
		MIMO Ant.1+2	**24.36**	24.02	23.88	23.97	23.93	23.93	23.86	23.54

Ch.	Freq. (MHz)	Ant. Chain	802.11a RF Power (dBm)							
			OFDM Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 149	5745	1	**19.45**	19.12	19.10	18.96	18.92	18.89	18.88	18.81
CH 157	5785	1	19.02	18.94	18.85	18.72	18.56	18.66	18.65	18.61
CH 165	5825	1	19.01	18.78	18.69	18.81	18.49	18.44	18.73	18.52
CH 149	5745	2	19.36	19.22	18.78	18.65	18.64	18.58	18.49	18.56
CH 157	5785	2	19.16	19.02	18.85	18.55	18.69	18.41	18.49	18.85
CH 165	5825	2	19.23	18.63	18.48	18.56	18.61	18.63	18.55	18.83

Ch.	Freq. (MHz)	Ant. Chain	WLAN 5.8GHz 802.11n HT-20 RF Power (dBm)							
			OFDM Data Rate							
			MCS=8	MCS=9	MCS=10	MCS=11	MCS=12	MCS=13	MCS=14	MCS=15
			13 Mbps	26 Mbps	39 Mbps	52 Mbps	78 Mbps	104 Mbps	117 Mbps	130 Mbps
CH 149	5745	MIMO Ant.1	20.06	19.85	20.98	19.98	19.78	19.93	19.83	19.93
		MIMO Ant.2	19.68	19.32	20.25	19.65	19.61	19.46	19.42	19.35
		MIMO Ant.1+2	22.88	22.60	**23.64**	22.83	22.71	22.71	22.64	22.66
CH 157	5785	MIMO Ant.1	20.01	19.59	20.68	19.64	19.61	19.56	19.75	19.56
		MIMO Ant.2	19.51	19.32	20.32	19.62	19.41	19.51	19.39	19.24
		MIMO Ant.1+2	22.78	22.47	23.51	22.64	22.52	22.55	22.58	22.41
CH 165	5825	MIMO Ant.1	19.89	19.31	20.92	19.65	19.52	19.35	19.78	19.35
		MIMO Ant.2	19.35	18.93	18.91	18.78	19.45	19.22	19.24	18.91
		MIMO Ant.1+2	22.64	22.13	23.04	22.25	22.50	22.30	22.53	22.15

Ch.	Freq. (MHz)	Ant. Chain	WLAN 5.8GHz 802.11n HT-40 RF Power (dBm)							
			OFDM Data Rate							
			MCS=8	MCS=9	MCS=10	MCS=11	MCS=12	MCS=13	MCS=14	MCS=15
			27 Mbps	54 Mbps	81 Mbps	108 Mbps	162 Mbps	216 Mbps	243 Mbps	270 Mbps
CH 151	5755	MIMO Ant.1	19.02	18.48	18.62	18.48	18.71	18.58	18.66	17.68
		MIMO Ant.2	18.63	18.61	18.56	18.18	18.11	17.89	18.13	17.49
		MIMO Ant.1+2	**21.84**	21.56	21.60	21.34	21.43	21.26	21.41	20.60
CH 159	5795	MIMO Ant.1	18.73	18.63	18.15	18.23	17.98	17.86	18.12	17.82
		MIMO Ant.2	18.49	18.02	18.11	18.15	17.96	17.95	17.82	17.23
		MIMO Ant.1+2	21.62	21.35	21.14	21.20	20.98	20.92	20.98	20.55

Remark: 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.

<2.4GHz>

Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	39 Mbps	1/6/11
		802.11n HT40	27 Mbps	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	39 Mbps	1/6/11
		802.11n HT40	27 Mbps	3/6/9
	Conducted Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	39 Mbps	1/11
		802.11n HT40	27 Mbps	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	39 Mbps	1/6/11
		802.11n HT40	27 Mbps	3/6/9
Radiated TCs	Radiated Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	39 Mbps	1/11
		802.11n HT40	27 Mbps	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	39 Mbps	1/6/11
		802.11n HT40	27 Mbps	3/6/9

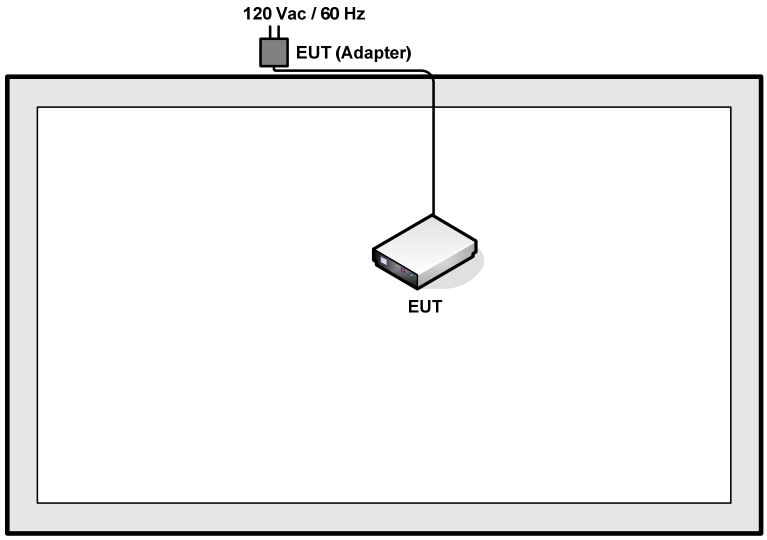
<5.8GHz>

Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB BW Power Spectral Density	802.11a	6 Mbps	149/157/165
		802.11n HT20	39 Mbps	149/157/165
		802.11n HT40	27 Mbps	151/159
	Output Power	802.11a	6 Mbps	149/157/165
		802.11n HT20	39 Mbps	149/157/165
		802.11n HT40	27 Mbps	151/159
	Conducted Band EDGE	802.11a	6 Mbps	149/165
		802.11n HT20	39 Mbps	149/165
		802.11n HT40	27 Mbps	151/159
	Conducted Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	39 Mbps	149/157/165
		802.11n HT40	27 Mbps	151/159
Radiated TCs	Radiated Band EDGE	802.11a	6 Mbps	149/165
		802.11n HT20	39 Mbps	149/165
		802.11n HT40	27 Mbps	151/159
	Radiated Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	39 Mbps	149/157/165
		802.11n HT40	27 Mbps	151/159

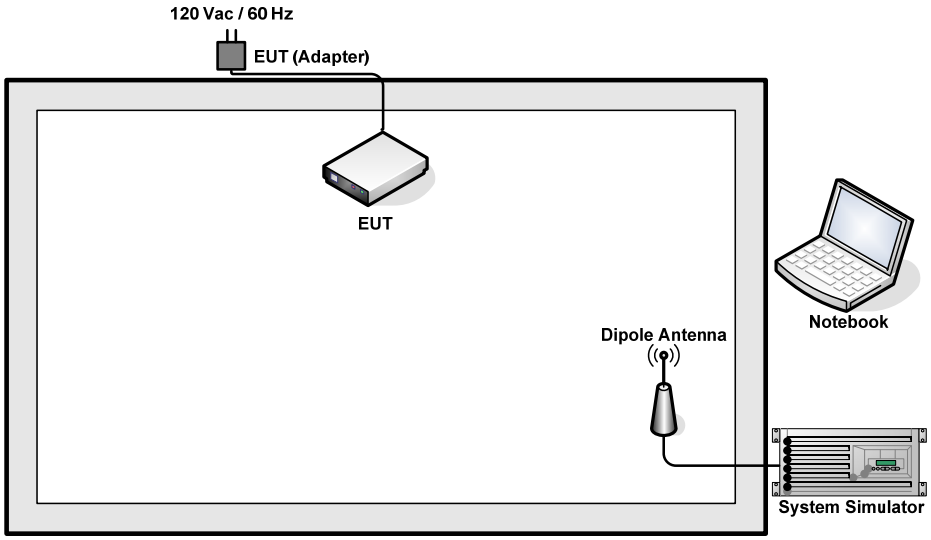
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + WLAN 2.4GHz Link + Adapter Mode 2 GSM850 Idle + WLAN 5GHz Link + Adapter
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

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

2.6 Description of RF Function Operation Test Setup

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

2.7 Measurement Results Explanation Example

For conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and 10dB attenuator between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and 10dB attenuator factor.
Offset = RF cable loss + attenuator factor.
Following table shows an offset computation example with cable loss 5.6 dB.

Example :
Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 5.6 + 10 = 25.6 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

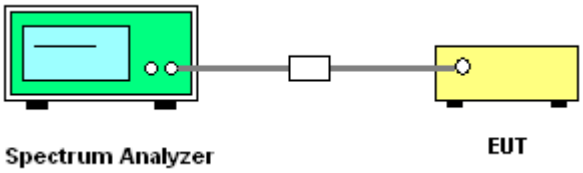
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

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

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Ant.2		
01	2412	7.60	0.5	Pass
06	2437	8.04	0.5	Pass
11	2462	7.60	0.5	Pass

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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Ant.2		
01	2412	15.12	0.5	Pass
06	2437	15.32	0.5	Pass
11	2462	15.28	0.5	Pass

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2		
01	2412	17.24	16.00	0.5	Pass
06	2437	16.32	16.36	0.5	Pass
11	2462	16.28	16.28	0.5	Pass

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-40 6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2		
03	2422	35.60	35.68	0.5	Pass
06	2437	36.40	36.32	0.5	Pass
09	2452	35.04	35.60	0.5	Pass

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

Channel	Frequency (MHz)	802.11a 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Ant.1		
149	5745	15.12	0.5	Pass
157	5785	15.12	0.5	Pass
165	5825	15.32	0.5	Pass

Test Mode :	5.8GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	5.8GHz 802.11n HT-20 6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2		
149	5745	15.12	15.52	0.5	Pass
157	5785	15.12	15.12	0.5	Pass
165	5825	15.12	15.12	0.5	Pass

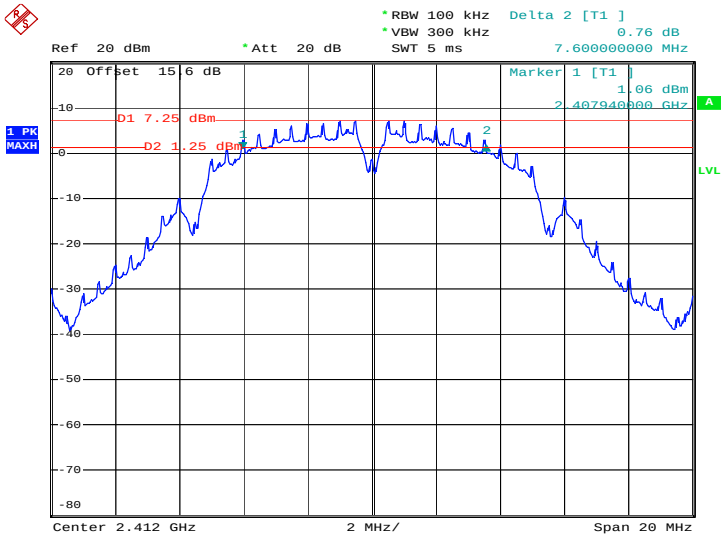
Test Mode :	5.8GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	5.8GHz 802.11n HT-40 6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2		
151	5755	35.52	36.32	0.5	Pass
159	5795	35.12	35.12	0.5	Pass

3.1.7 Test Result of 6dB Bandwidth Plots

802.11b – Ant.2

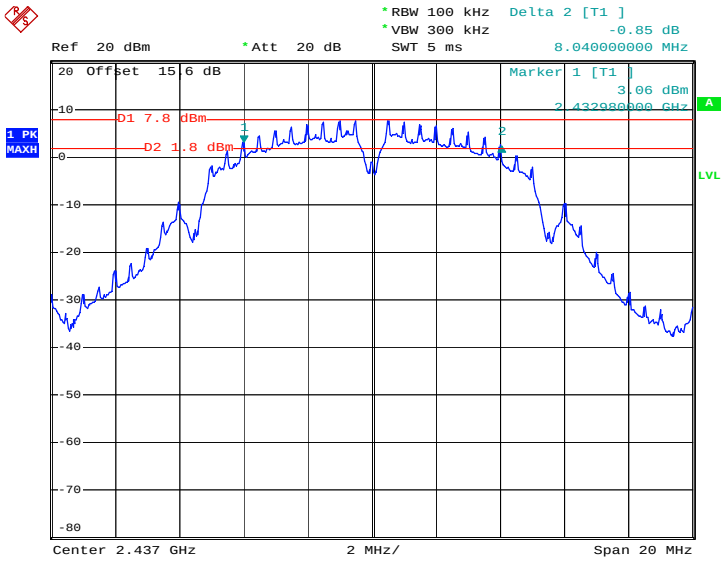
6 dB Bandwidth Plot on Channel 01



Date: 31.MAR.2013 08:12:34

802.11b – Ant.2

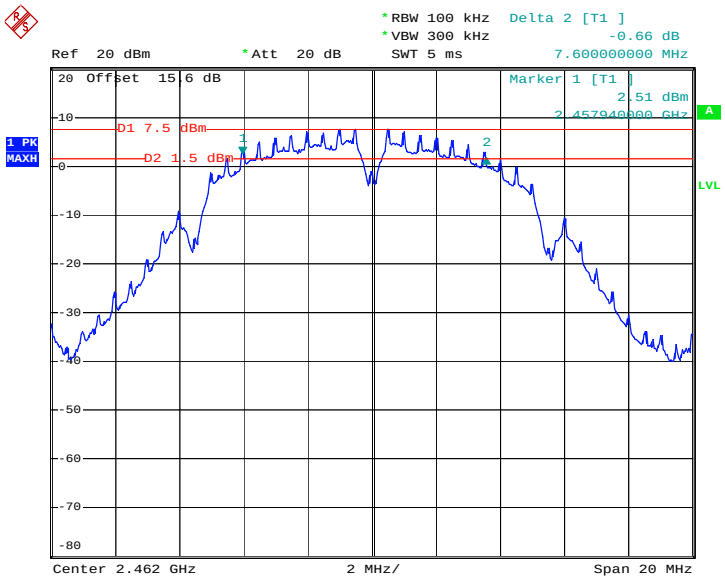
6 dB Bandwidth Plot on Channel 06



Date: 31.MAR.2013 08:17:01

802.11b – Ant.2

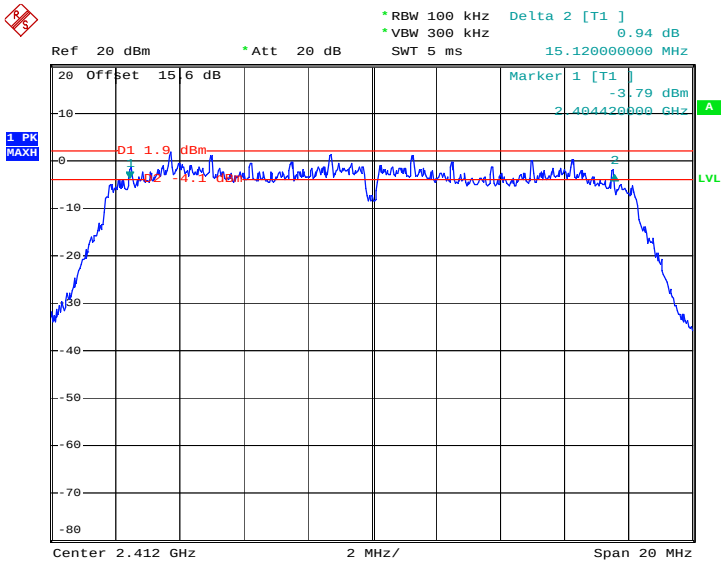
6 dB Bandwidth Plot on Channel 11



Date: 31.MAR.2013 08:19:37

802.11g – Ant.2

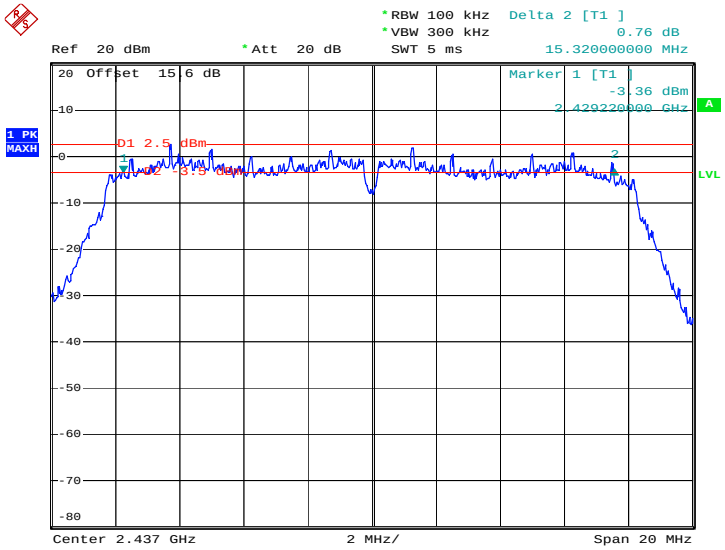
6 dB Bandwidth Plot on Channel 01



Date: 31.MAR.2013 08:23:38

802.11g – Ant.2

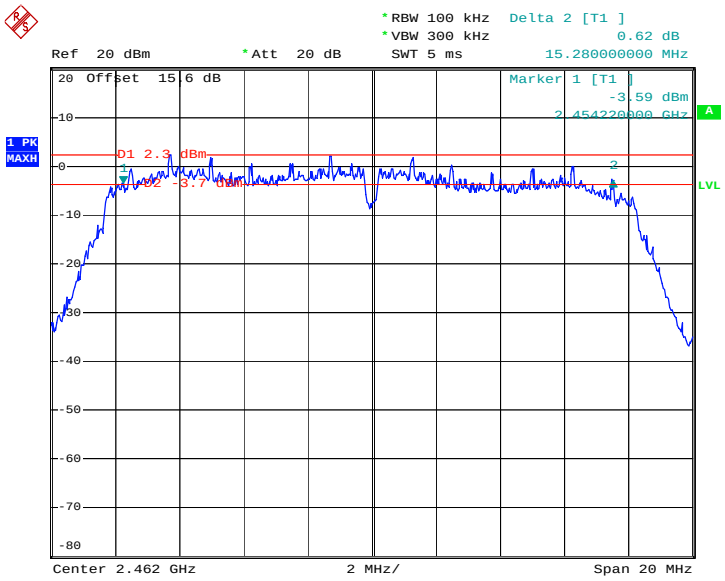
6 dB Bandwidth Plot on Channel 06



Date: 31.MAR.2013 08:27:50

802.11g – Ant.2

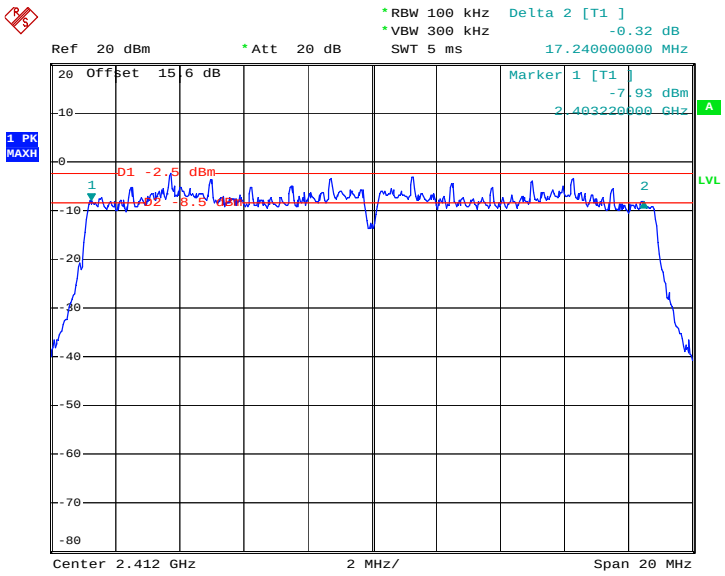
6 dB Bandwidth Plot Channel 11



Date: 31.MAR.2013 08:30:28

2.4GHz 802.11n HT20 – MIMO Ant.1

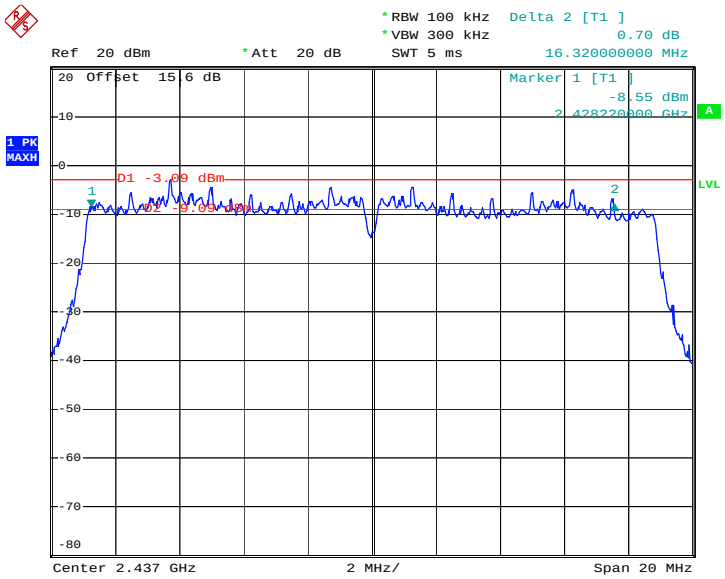
6 dB Bandwidth Plot on Channel 01



Date: 31.MAR.2013 08:51:13

2.4GHz 802.11n HT20 – MIMO Ant.1

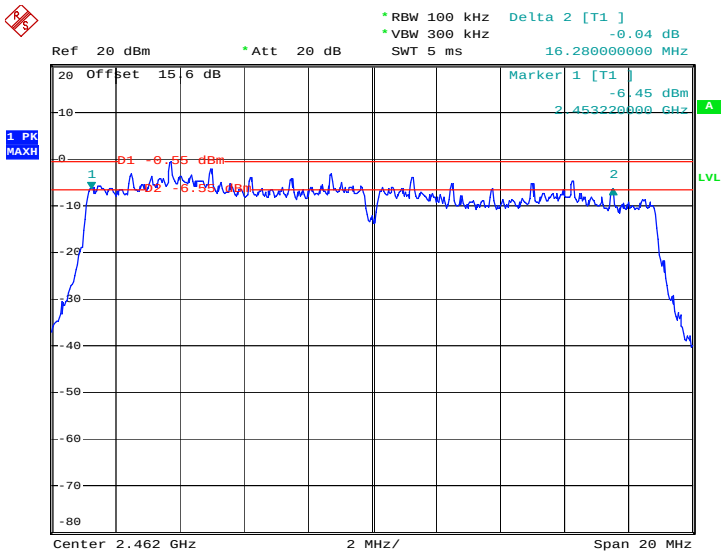
6 dB Bandwidth Plot on Channel 06



Date: 31.MAR.2013 08:58:10

2.4GHz 802.11n HT20 – MIMO Ant.1

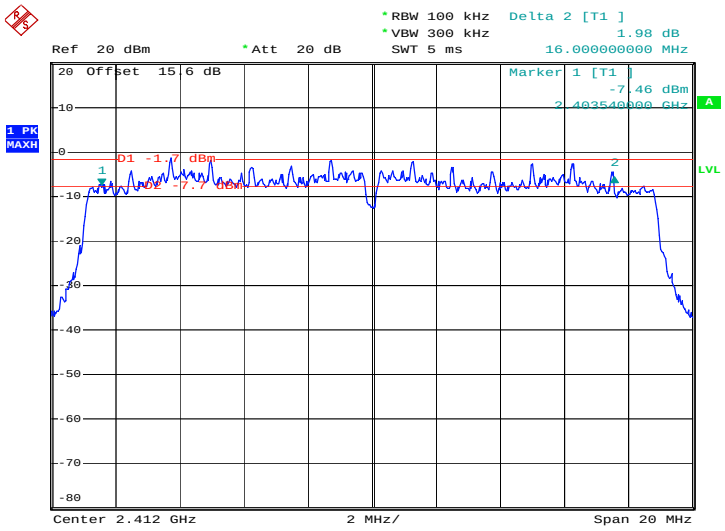
6 dB Bandwidth Plot on Channel 11



Date: 31.MAR.2013 08:47:32

2.4GHz 802.11n HT20 – MIMO Ant.2

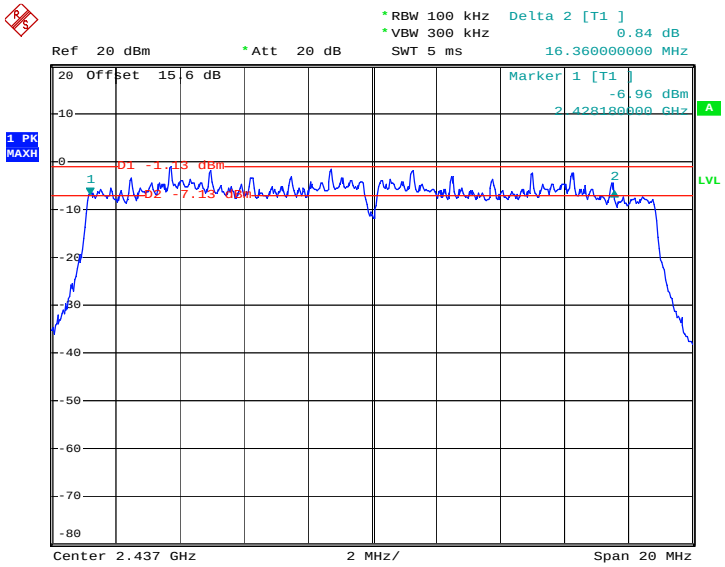
6 dB Bandwidth Plot on Channel 01



Date: 31.MAR.2013 08:36:18

2.4GHz 802.11n HT20 – MIMO Ant.2

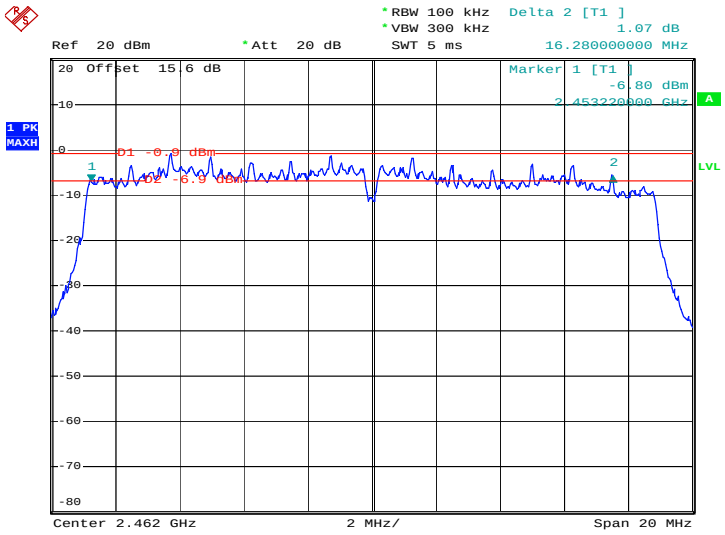
6 dB Bandwidth Plot on Channel 06



Date: 31.MAR.2013 08:40:23

2.4GHz 802.11n HT20 – MIMO Ant.2

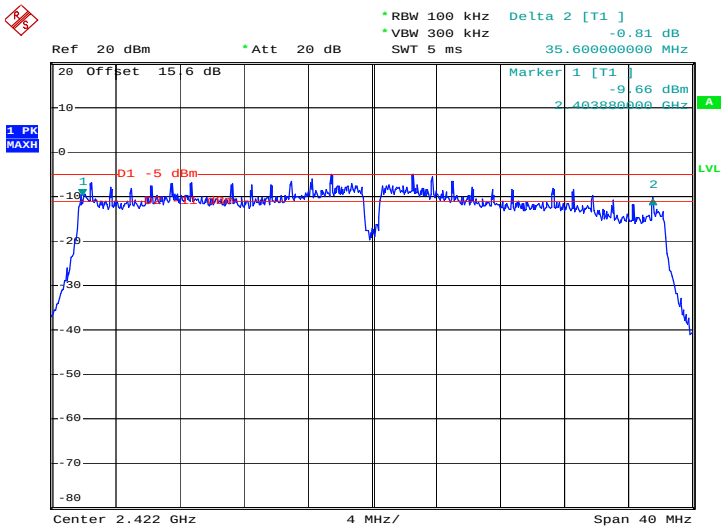
6 dB Bandwidth Plot on Channel 11



Date: 31.MAR.2013 08:44:30

2.4GHz 802.11n HT40 – MIMO Ant.1

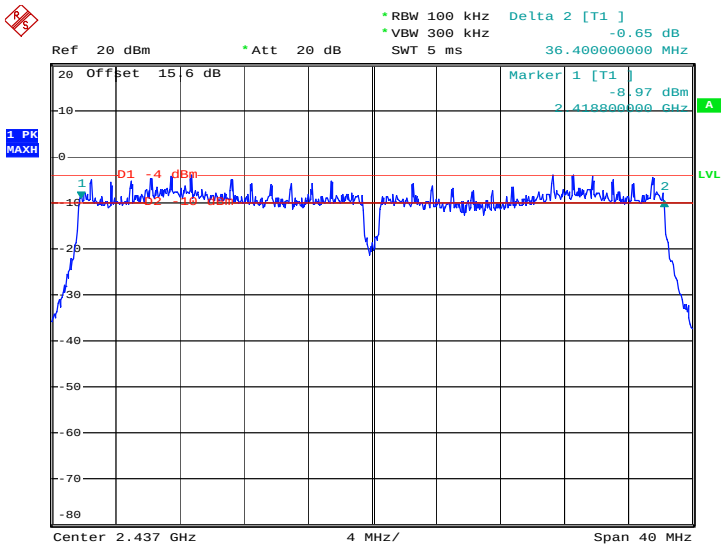
6 dB Bandwidth Plot on Channel 03



Date: 31.MAR.2013 09:08:44

2.4GHz 802.11n HT40 – MIMO Ant.1

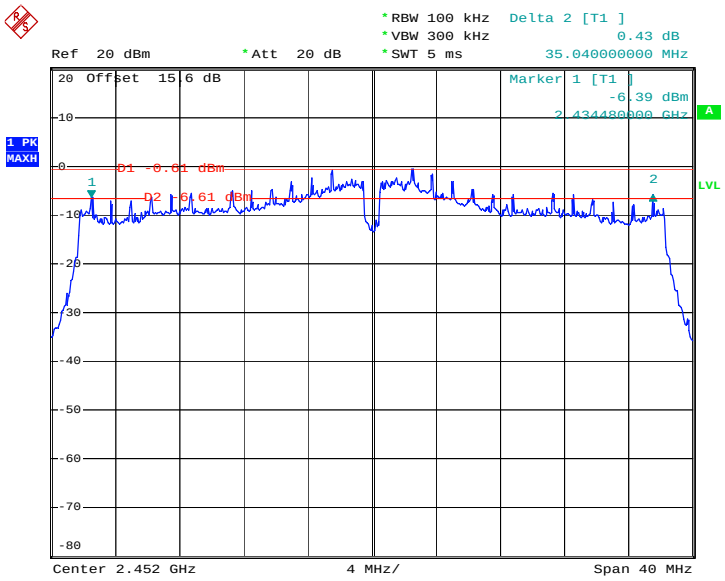
6 dB Bandwidth Plot on Channel 06



Date: 31.MAR.2013 09:11:56

2.4GHz 802.11n HT40 – MIMO Ant.1

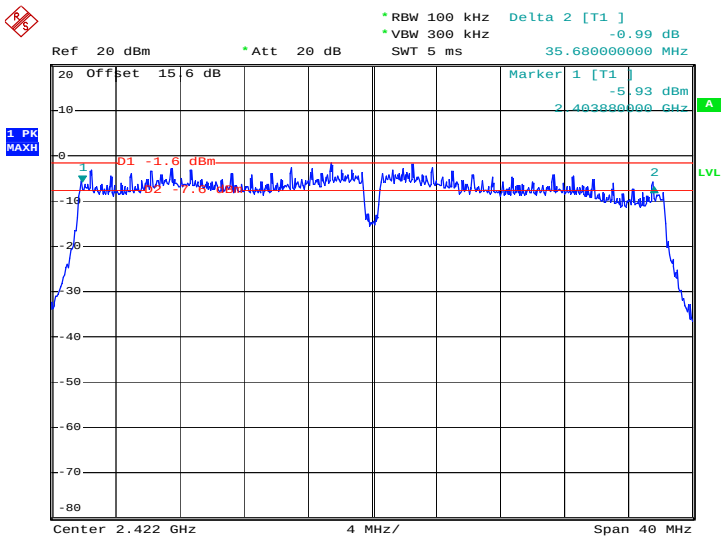
6 dB Bandwidth Plot on Channel 09



Date: 22.APR.2013 18:27:02

2.4GHz 802.11n HT40 – MIMO Ant.2

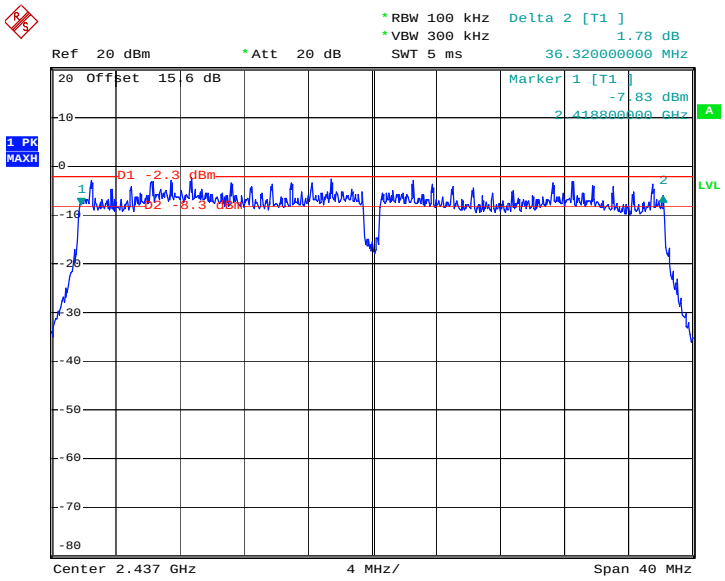
6 dB Bandwidth Plot on Channel 03



Date: 31.MAR.2013 09:39:19

2.4GHz 802.11n HT40 – MIMO Ant.2

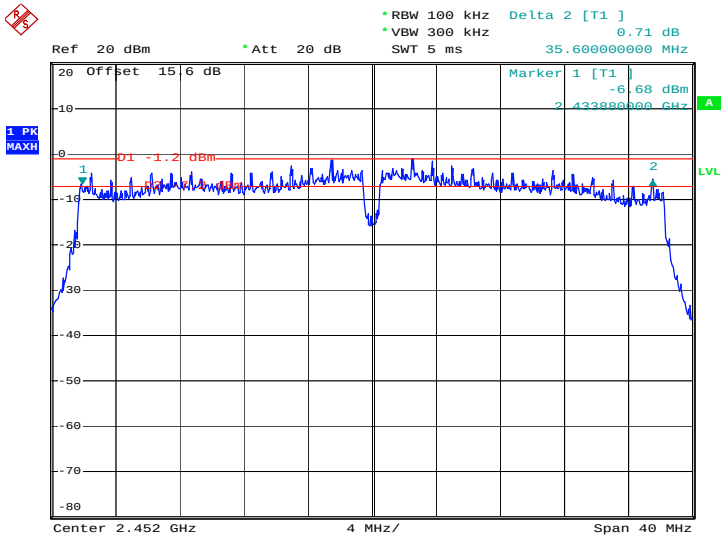
6 dB Bandwidth Plot on Channel 06



Date: 31.MAR.2013 10:01:26

2.4GHz 802.11n HT40 – MIMO Ant.2

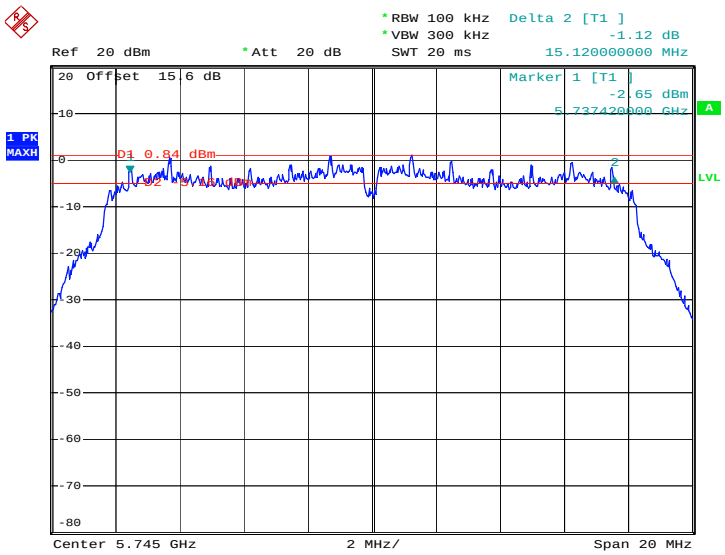
6 dB Bandwidth Plot on Channel 09



Date: 31.MAR.2013 09:34:42

802.11a – Ant.1

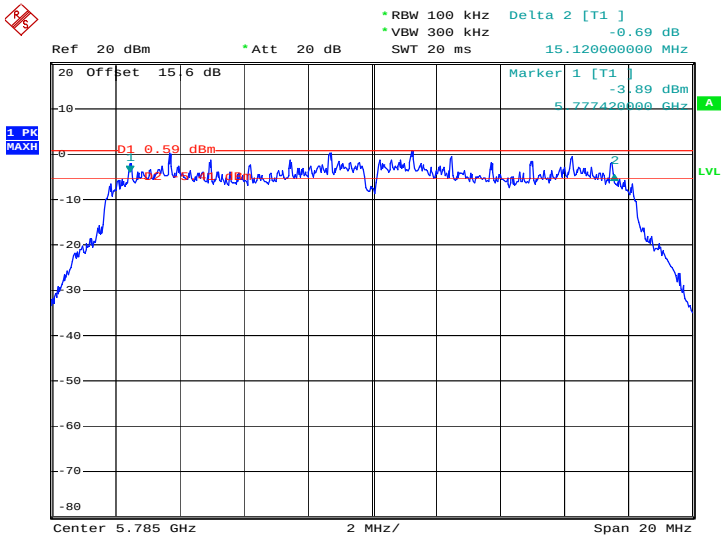
6 dB Bandwidth Plot on Channel 149



Date: 1.APR.2013 12:16:44

802.11a – Ant.1

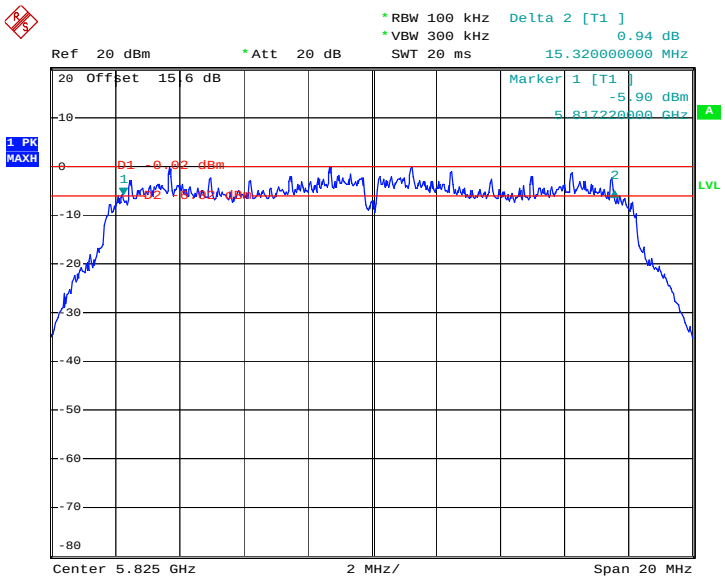
6 dB Bandwidth Plot on Channel 157



Date: 1.APR.2013 12:19:49

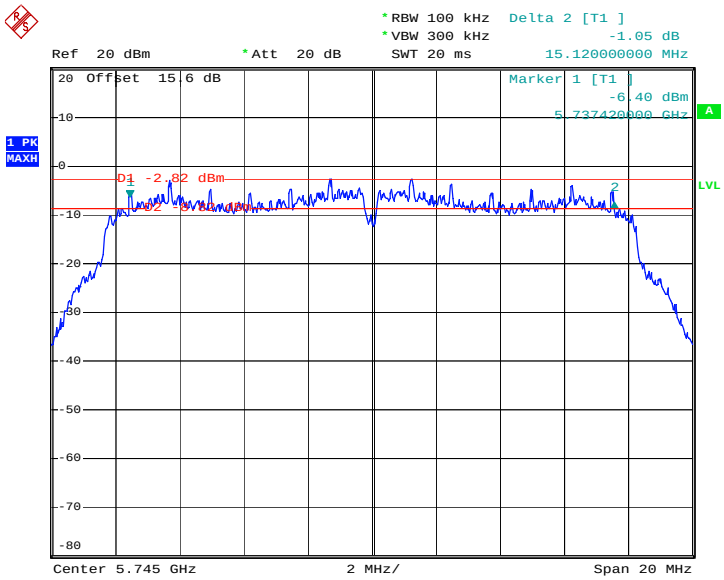
802.11a – Ant.1

6 dB Bandwidth Plot on Channel 165



5.8GHz 802.11n HT20 – MIMO Ant.1

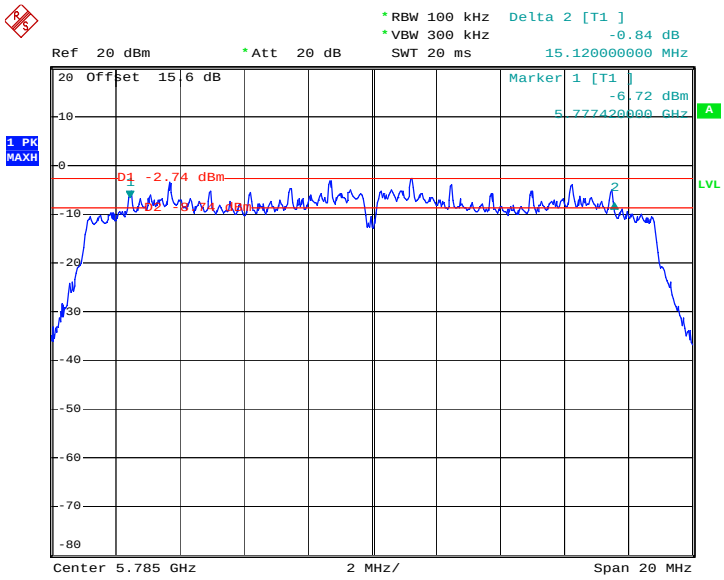
6 dB Bandwidth Plot on Channel 149



Date: 1.APR.2013 12:25:55

5.8GHz 802.11n HT20 – MIMO Ant.1

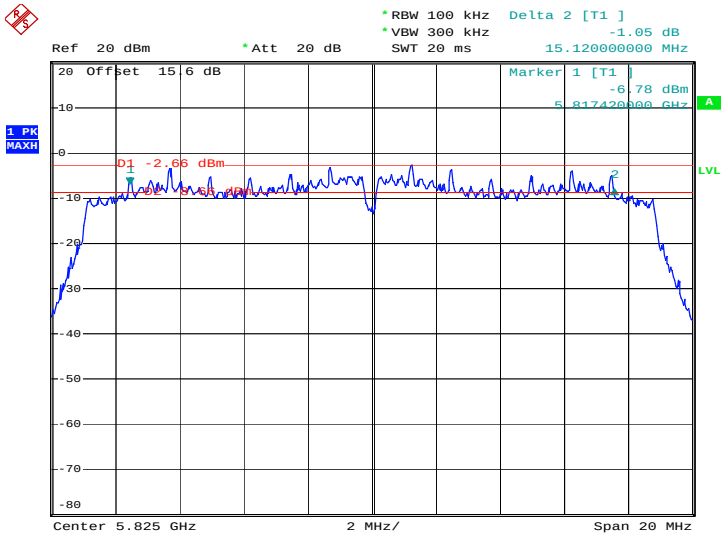
6 dB Bandwidth Plot on Channel 157



Date: 1.APR.2013 12:29:03

5.8GHz 802.11n HT20 – MIMO Ant.1

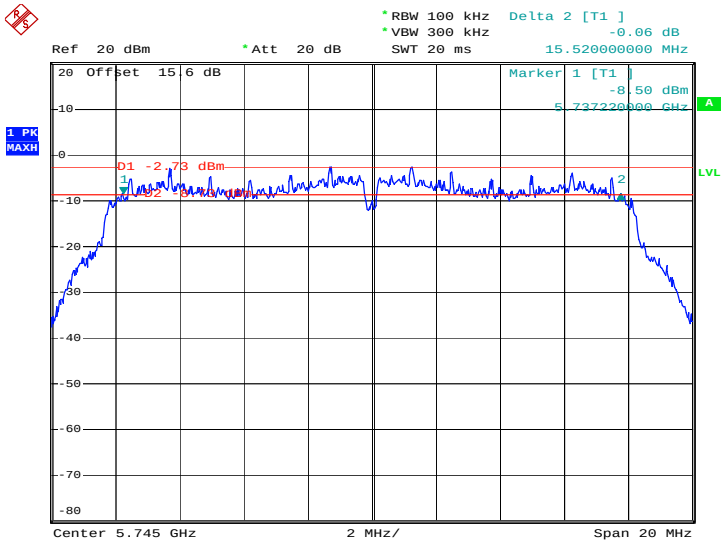
6 dB Bandwidth Plot on Channel 165



Date: 1.APR.2013 12:31:43

5.8GHz 802.11n HT20 – MIMO Ant.2

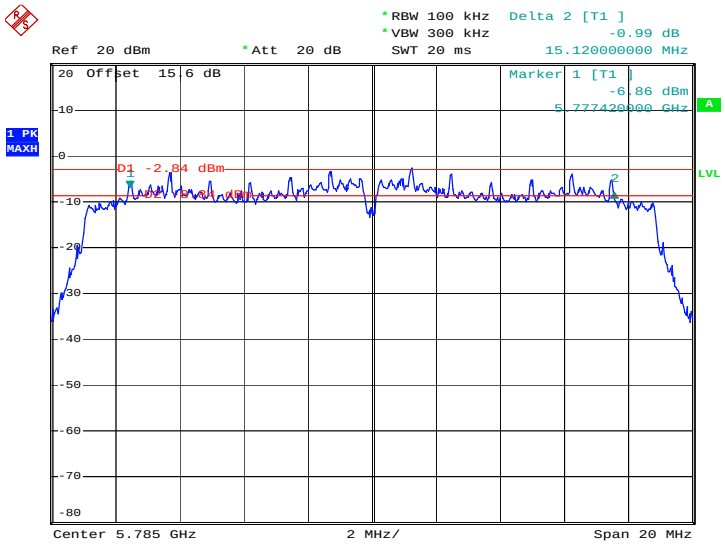
6 dB Bandwidth Plot on Channel 149



Date: 1.APR.2013 11:41:02

5.8GHz 802.11n HT20 – MIMO Ant.2

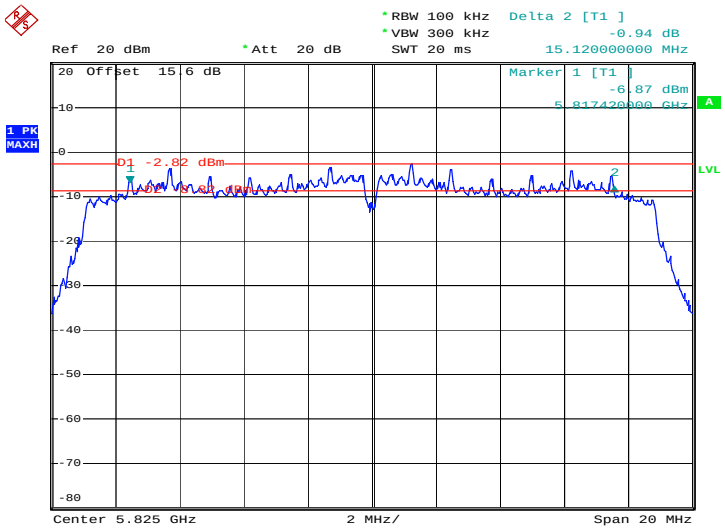
6 dB Bandwidth Plot on Channel 157



Date: 1.APR.2013 11:44:53

5.8GHz 802.11n HT20 – MIMO Ant.2

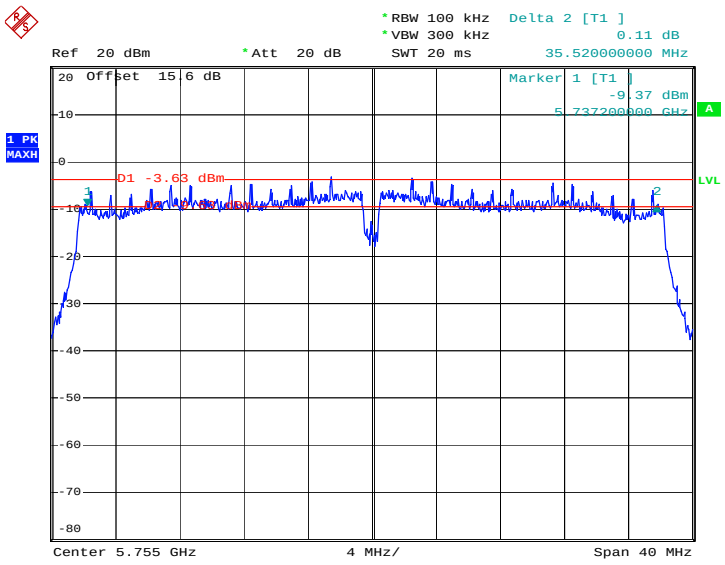
6 dB Bandwidth Plot on Channel 165



Date: 1.APR.2013 11:47:33

5.8GHz 802.11n HT40 – MIMO Ant.1

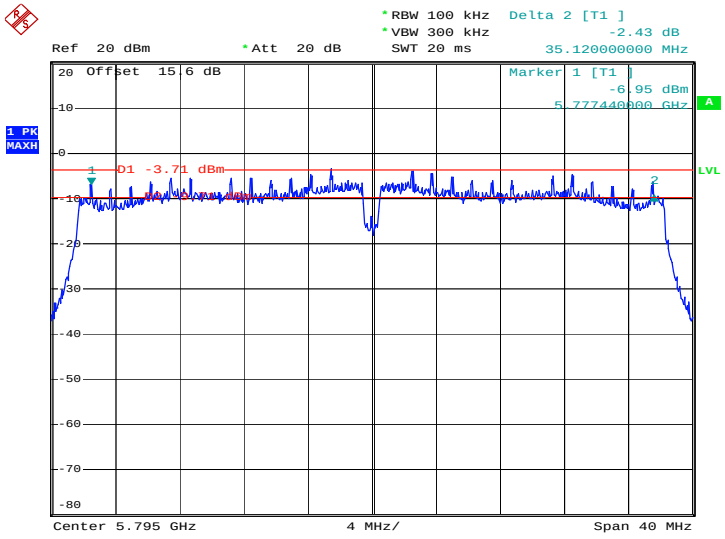
6 dB Bandwidth Plot on Channel 151



Date: 1.APR.2013 12:35:37

5.8GHz 802.11n HT40 – MIMO Ant.1

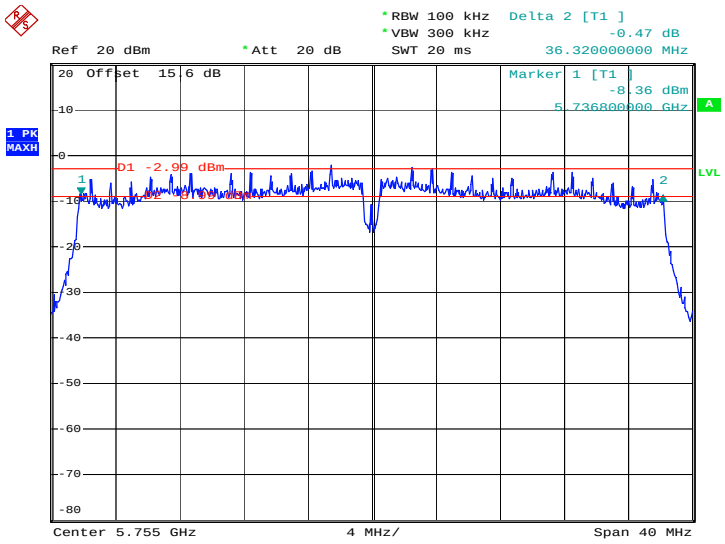
6 dB Bandwidth Plot on Channel 159



Date: 1.APR.2013 12:38:35

5.8GHz 802.11n HT40 – MIMO Ant.2

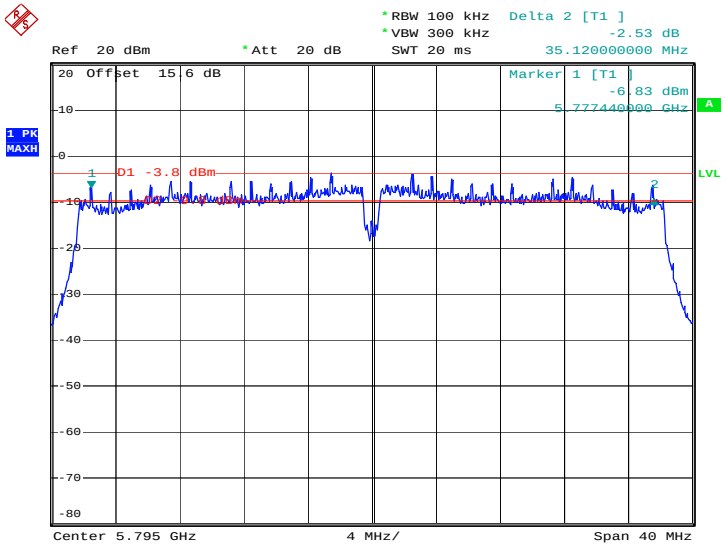
6 dB Bandwidth Plot on Channel 151



Date: 1.APR.2013 11:52:17

5.8GHz 802.11n HT40 – MIMO Ant.2

6 dB Bandwidth Plot on Channel 159



Date: 1.APR.2013 11:56:45

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak 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 with directional gain greater than 6dBi is 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.

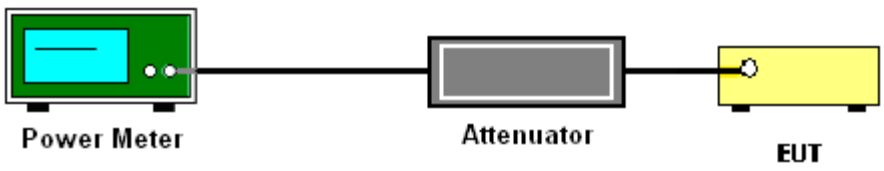
3.2.2 Measuring Instruments

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 D01 DTS Meas. Guidance v03r01.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. 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 v01r02.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

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

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Ant.1	Ant.2		
01	2412	18.83	19.41	30	Pass
06	2437	18.61	19.88	30	Pass
11	2462	19.52	19.80	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Ant.1	Ant.2		
01	2412	22.21	22.63	30	Pass
06	2437	22.01	22.75	30	Pass
11	2462	22.11	22.98	30	Pass

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)			Max. Limits (dBm)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2		
01	2412	20.25	21.55	23.96	30	Pass
06	2437	20.09	21.80	24.04	30	Pass
11	2462	20.41	21.68	24.10	30	Pass

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

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT40 Peak Output Power (dBm)			Max. Limits (dBm)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2		
03	2422	21.02	21.58	24.32	30	Pass
06	2437	20.46	21.62	24.09	30	Pass
09	2452	20.78	21.85	24.36	30	Pass

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

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

Channel	Frequency (MHz)	802.11a Measured Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Ant.1	Ant.2		
149	5745	19.45	19.36	30	Pass
157	5785	19.02	19.16	30	Pass
165	5825	19.01	19.23	30	Pass

Test Mode :	5.8GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	5.8GHz 802.11n HT20 Peak Output Power (dBm)			Max. Limits (dBm)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2		
149	5745	20.98	20.25	23.64	30	Pass
157	5785	20.68	20.32	23.51	30	Pass
165	5825	20.92	18.91	23.04	30	Pass

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

Test Mode :	5.8GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	5.8GHz 802.11n HT40 Peak Output Power (dBm)			Max. Limits (dBm)	Pass/Fail
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2		
151	5755	19.02	18.63	21.84	30	Pass
159	5795	18.73	18.49	21.62	30	Pass

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

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	92.86% for Ant.1 100% for Ant.2	Duty Factor:	0.32dB for Ant.1 0.00dB for Ant.2

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)	
		Ant.1	Ant.2
01	2412	15.27	15.88
06	2437	15.00	16.27
11	2462	15.94	16.25

Test Mode :	802.11g	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	95.39% for Ant.1 94.93% for Ant.2	Duty Factor:	0.20dB for Ant.1 0.23dB for Ant.2

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)	
		Ant.1	Ant.2
01	2412	12.16	13.07
06	2437	11.75	13.15
11	2462	12.01	13.18

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	66.67% for MIMIO Ant.1 89.91% for MIMO Ant.2	Duty Factor:	1.76dB for MIMIO Ant.1 0.46dB for MIMIO Ant.2

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Average Output Power (dBm)		
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2
01	2412	8.17	9.61	12.19
06	2437	7.79	9.76	11.97
11	2462	8.81	9.84	12.16

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	50.51% for MIMIO Ant.1 53.27% for MIMO Ant.2	Duty Factor:	2.97dB for MIMIO Ant.1 2.74dB for MIMIO Ant.2

Channel	Frequency (MHz)	2.4GHz 802.11n H40 Average Output Power (dBm)		
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2
03	2422	10.99	12.20	14.58
06	2437	10.46	11.80	14.31
09	2452	10.56	12.03	14.48

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 :	802.11a	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	95.39% for Ant.1 95.39% for Ant.2	Duty Factor:	0.20dB for Ant.1 0.20dB for Ant.2

Channel	Frequency (MHz)	802.11a Average Output Power (dBm)	
		Ant.1	Ant.2
149	5745	8.45	8.69
157	5785	7.93	8.45
165	5825	8.23	8.18

Test Mode :	5.8GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	59.68 % for MIMIO Ant.1 90.79% for MIMO Ant.2	Duty Factor:	2.24dB for MIMIO Ant.1 0.42dB for MIMIO Ant.2

Channel	Frequency (MHz)	5.8GHz 802.11n HT20 Average Output Power (dBm)		
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2
149	5745	9.61	9.60	12.60
157	5785	9.17	9.09	12.09
165	5825	8.86	8.77	11.92

Test Mode :	5.8GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%
Duty Cycle:	48.39% for MIMIO Ant.1 83.89% for MIMO Ant.2	Duty Factor:	3.15dB for MIMIO Ant.1 0.76dB for MIMIO Ant.2

Channel	Frequency (MHz)	5.8GHz 802.11n HT40 Average Output Power (dBm)		
		MIMO Ant.1	MIMO Ant.2	MIMO Ant.1+2
151	5755	8.64	8.32	11.56
159	5795	8.47	8.63	11.33

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 10.2 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v01r02.

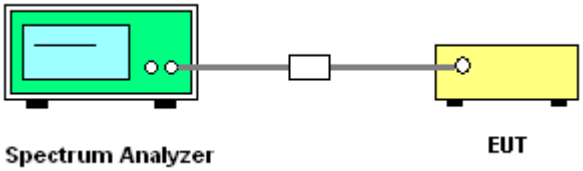
   If measurements performed using method (2) plus 10 log (N) exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

   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)
8. The Measured power density (dBm)/ 100KHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

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

Ch.	Freq. (MHz)	802.11b Power Density		Max. Limits (dBm/3KHz)	Pass /Fail
		Ant.2			
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	6.35	-7.46	8	Pass
06	2437	7.07	-6.29	8	Pass
11	2462	6.93	-6.06	8	Pass

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

Ch.	Freq. (MHz)	802.11g Power Density		Max. Limits (dBm/3KHz)	Pass /Fail
		Ant.2			
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	1.49	-13.20	8	Pass
06	2437	1.61	-12.58	8	Pass
11	2462	2.54	-12.80	8	Pass

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	2.4GHz 802.11n HT20 Power Density						Max. Limits (dBm/3KHz)	Pass /Fail
		MIMO Ant.1			MIMO Ant.2				
		PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2	PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2		
01	2412	-2.61	-18.27	-15.26	-1.93	-16.58	-13.57	8	Pass
06	2437	-3.21	-18.54	-15.53	-1.43	-16.70	-13.69	8	Pass
11	2462	-0.54	-16.96	-13.95	-1.17	-15.62	-12.61	8	Pass

Test Mode :	802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	2.4GHz 802.11n HT40 Power Density						Max. Limits (dBm/3KHz)	Pass /Fail
		MIMO Ant.1			MIMO Ant.2				
		PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2	PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2		
03	2422	-5.06	-20.20	-17.19	-1.74	-16.46	-13.45	8	Pass
06	2437	-4.11	-19.09	-16.08	-3.37	-17.34	-14.33	8	Pass
09	2452	-0.71	-15.98	-12.97	-2.04	-17.32	-14.31	8	Pass

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

Ch.	Freq. (MHz)	802.11a Power Density		Max. Limits (dBm/3KHz)	Pass /Fail
		Ant.1			
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
149	5745	0.66	-13.51	8	Pass
157	5785	-0.36	-13.64	8	Pass
165	5825	-0.05	-13.72	8	Pass

Test Mode :	5.8GHz 802.11n HT20	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	5.8GHz 802.11n HT20 Power Density						Max. Limits (dBm/3KHz)	Pass /Fail
		MIMO Ant.1			MIMO Ant.2				
		PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2	PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2		
149	5745	-2.60	-17.27	-14.26	-3.01	-15.94	-12.93	8	Pass
157	5785	-2.79	-17.40	-14.39	-2.85	-18.00	-14.99	8	Pass
165	5825	-2.28	-16.24	-13.23	-2.79	-16.59	-13.58	8	Pass

Test Mode :	5.8GHz 802.11n HT40	Temperature :	23~24℃
Test Engineer :	Lizy Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	5.8GHz 802.11n HT20 Power Density						Max. Limits (dBm/3KHz)	Pass /Fail
		MIMO Ant.1			MIMO Ant.2				
		PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2	PSD/ 100KHz (dBm)	PSD/ 3KHz (dBm)	PSD/3KHz (dBm) +10log2		
151	5755	-3.44	-17.86	-14.85	-2.74	-17.31	-14.30	8	Pass
159	5795	-3.65	-19.00	-15.99	-4.09	-17.67	-14.66	8	Pass

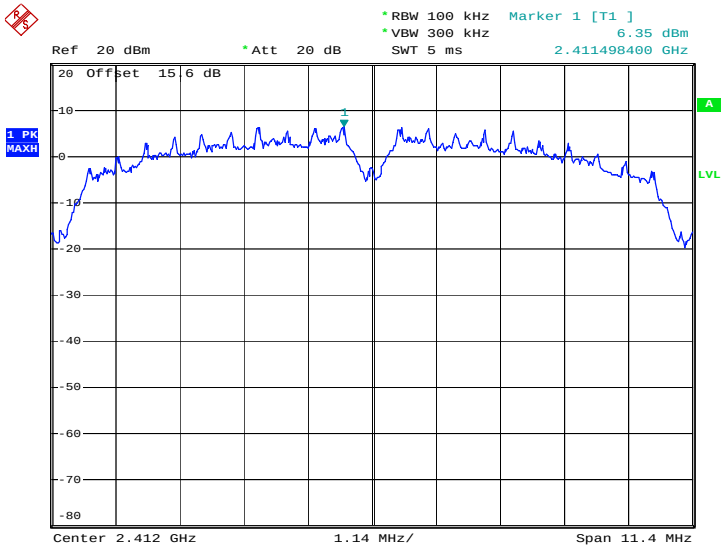
Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *The Measured power density (dBm)/ 100KHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.*

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

802.11b – Ant.2

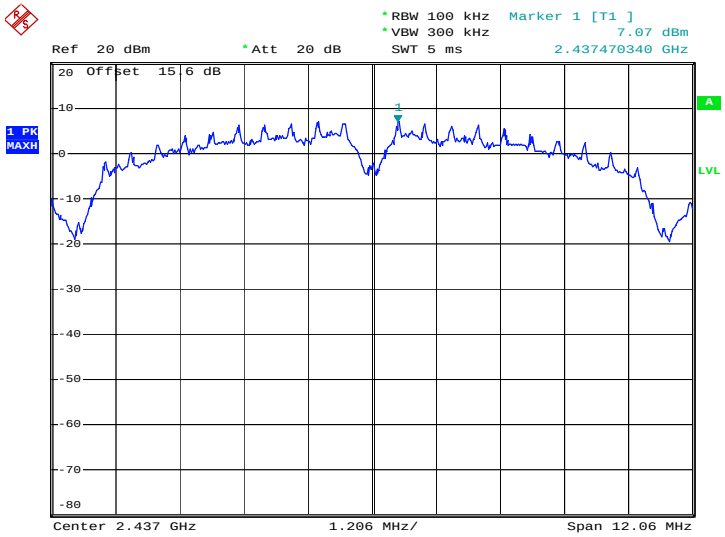
PSD 100kHz Plot on Channel 01



Date: 31.MAR.2013 08:13:03

802.11b – Ant.2

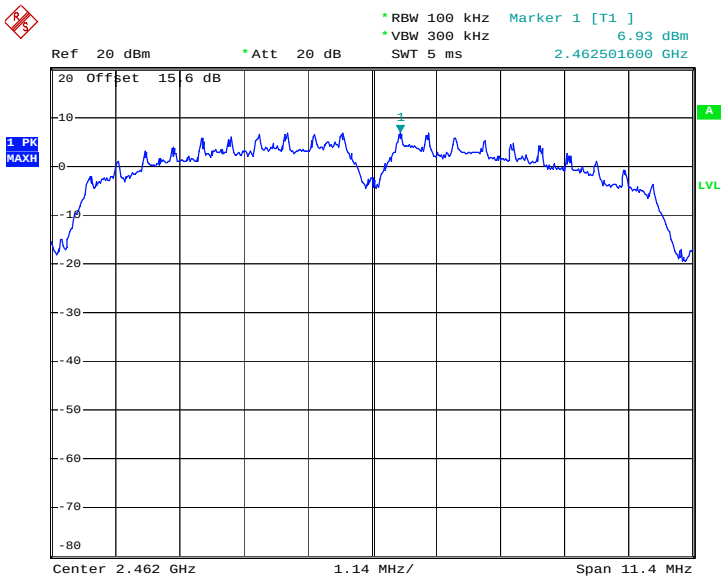
PSD 100kHz Plot on Channel 06



Date: 31.MAR.2013 08:17:30

802.11b – Ant.2

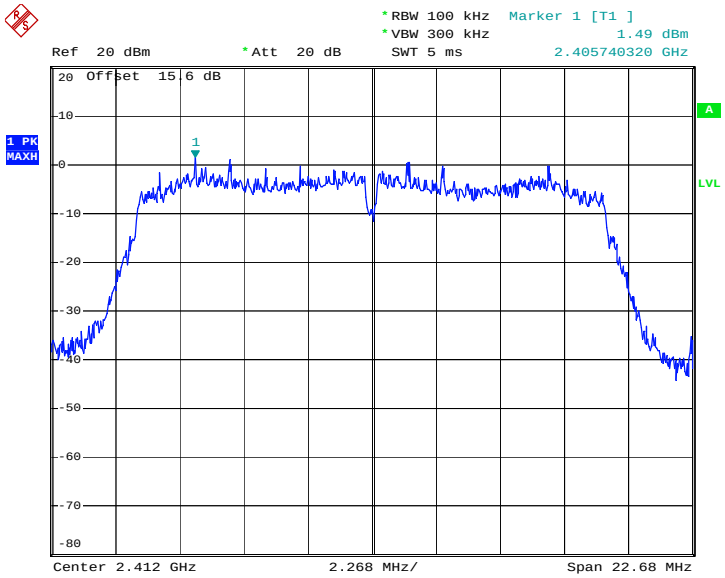
PSD 100kHz Plot on Channel 11



Date: 31.MAR.2013 08:20:06

802.11g – Ant.2

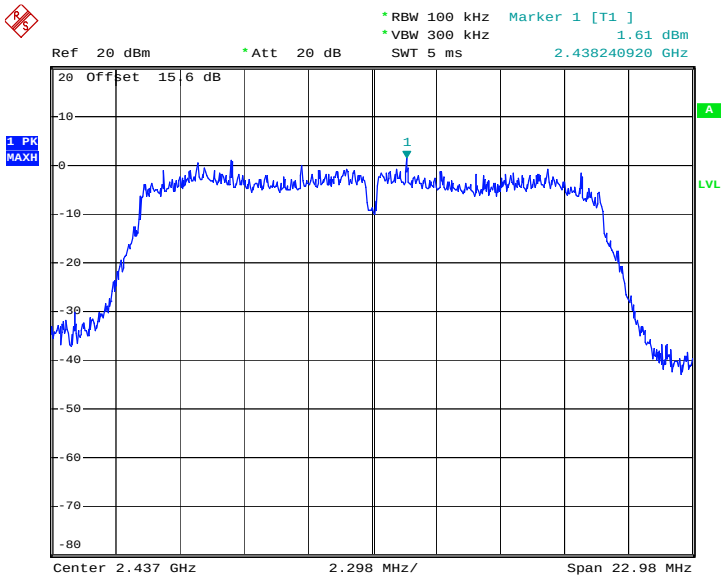
PSD 100kHz Plot on Channel 01



Date: 31.MAR.2013 08:24:08

802.11g – Ant.2

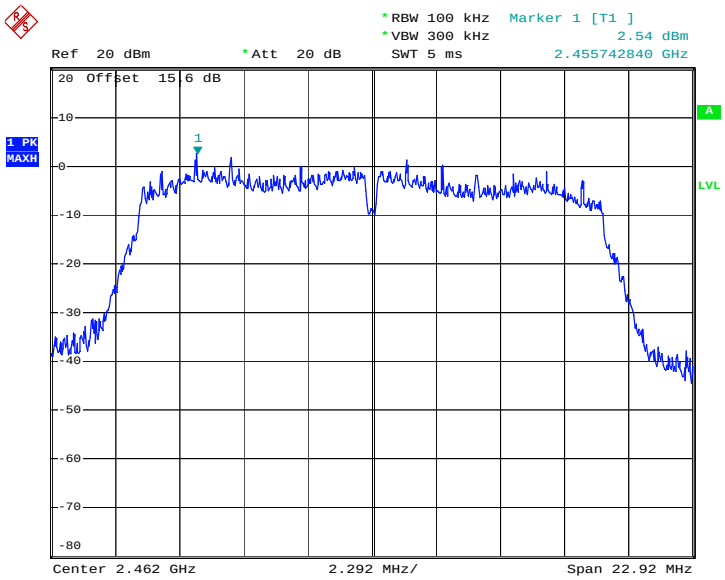
PSD 100kHz Plot on Channel 06



Date: 31.MAR.2013 08:28:20

802.11g – Ant.2

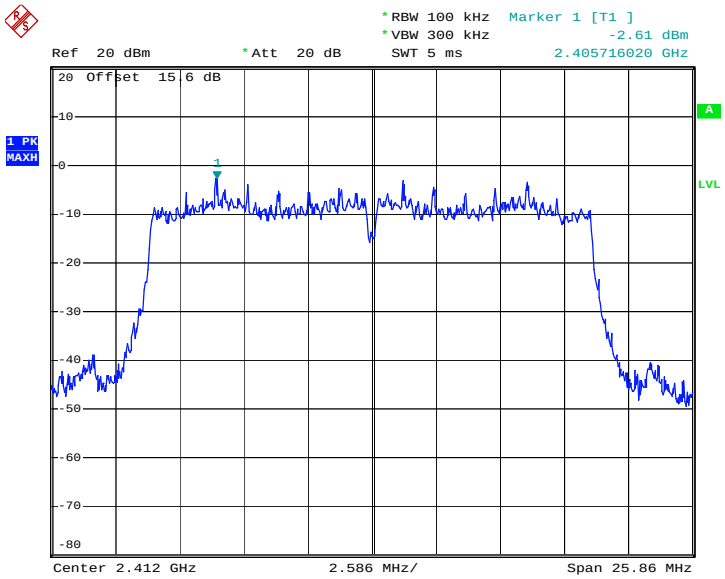
PSD 100kHz Plot on Channel 11



Date: 31.MAR.2013 08:30:58

2.4GHz 802.11n HT20 – MIMO Ant.1

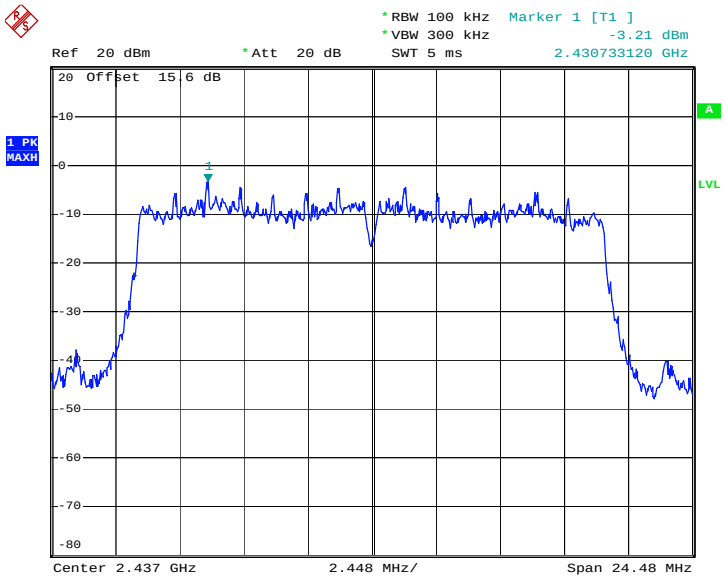
PSD 100kHz Plot on Channel 01



Date: 31.MAR.2013 08:51:44

2.4GHz 802.11n HT20 – MIMO Ant.1

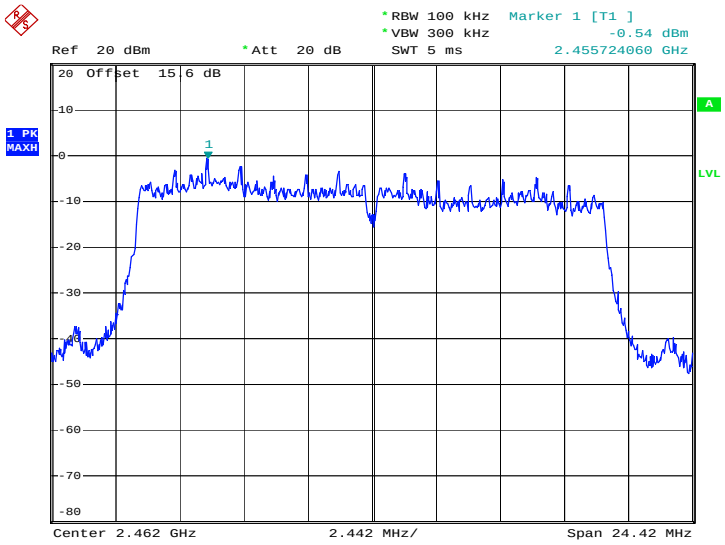
PSD 100kHz Plot on Channel 06



Date: 31.MAR.2013 08:58:40

2.4GHz 802.11n HT20 – MIMO Ant.1

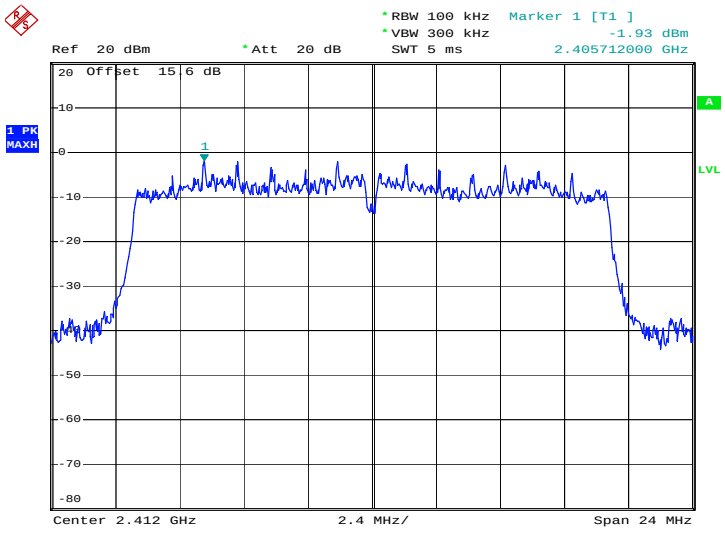
PSD 100kHz Plot on Channel 11



Date: 31.MAR.2013 08:48:03

2.4GHz 802.11n HT20 – MIMO Ant.2

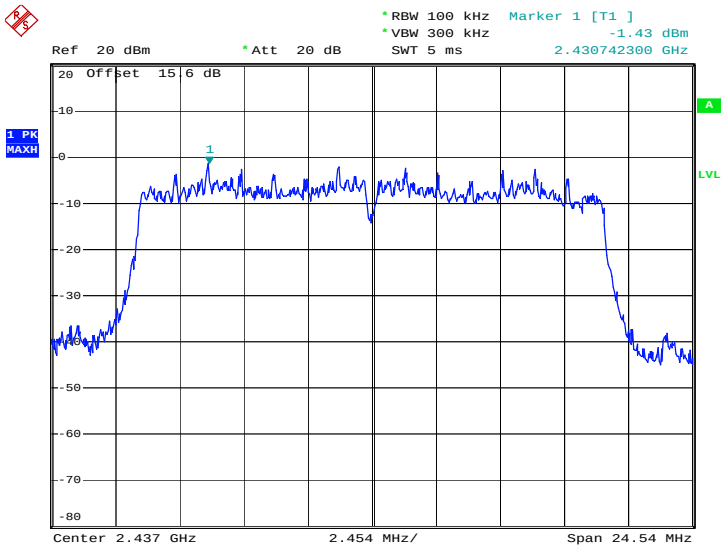
PSD 100kHz Plot on Channel 01



Date: 31.MAR.2013 08:36:49

2.4GHz 802.11n HT20 – MIMO Ant.2

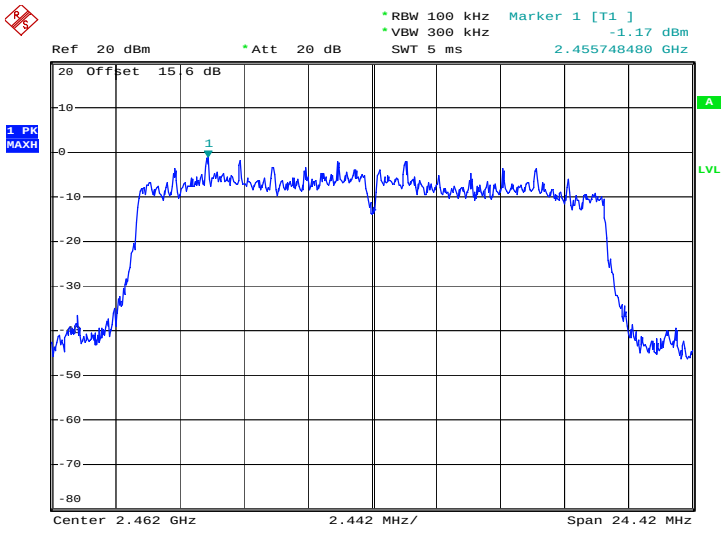
PSD 100kHz Plot on Channel 06



Date: 31.MAR.2013 08:40:54

2.4GHz 802.11n HT20 – MIMO Ant.2

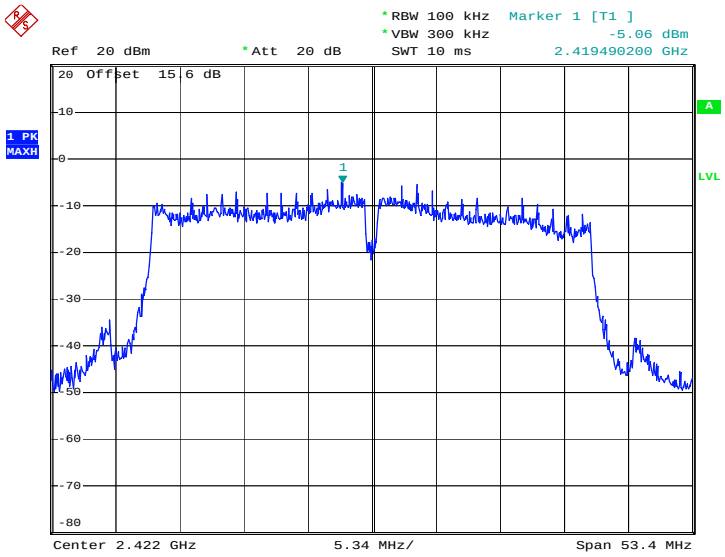
PSD 100kHz Plot on Channel 11



Date: 31.MAR.2013 08:45:01

2.4GHz 802.11n HT40 – MIMO Ant.1

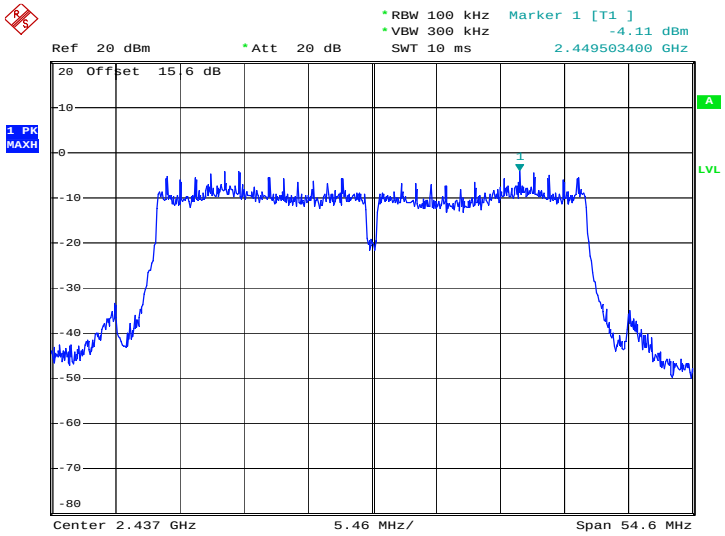
PSD 100kHz Plot on Channel 03



Date: 31.MAR.2013 09:09:18

2.4GHz 802.11n HT40 – MIMO Ant.1

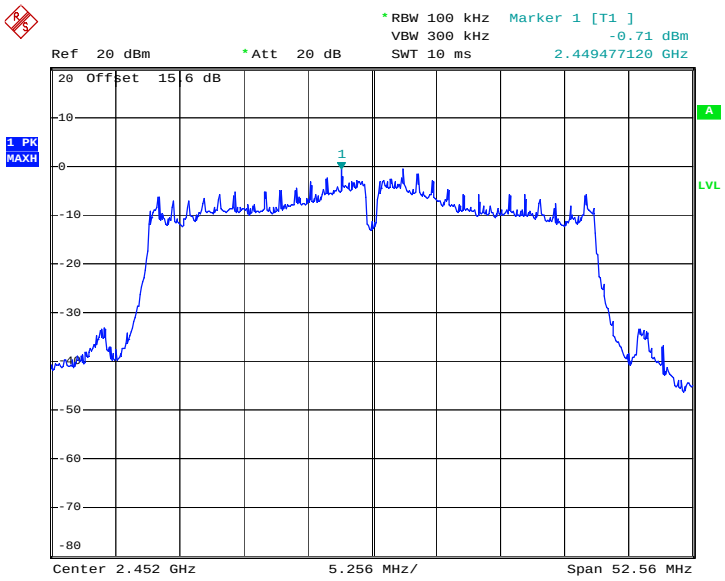
PSD 100kHz Plot on Channel 06



Date: 31.MAR.2013 09:12:30

2.4GHz 802.11n HT40 – MIMO Ant.1

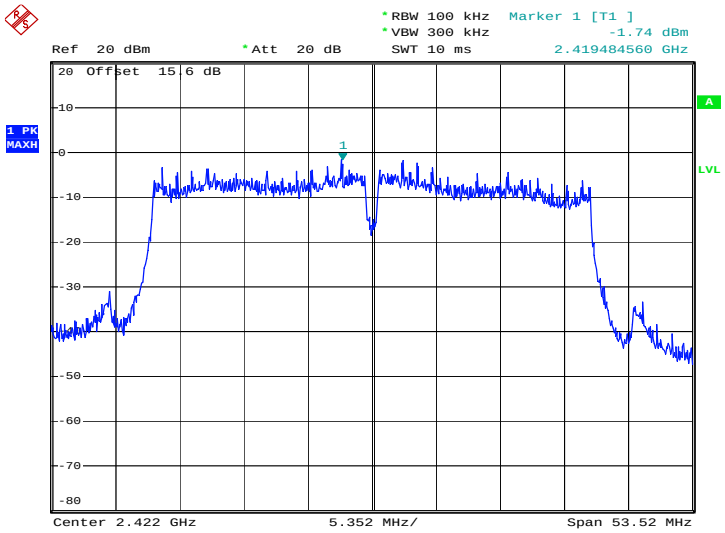
PSD 100kHz Plot on Channel 09



Date: 22.APR.2013 18:29:59

2.4GHz 802.11n HT40 – MIMO Ant.2

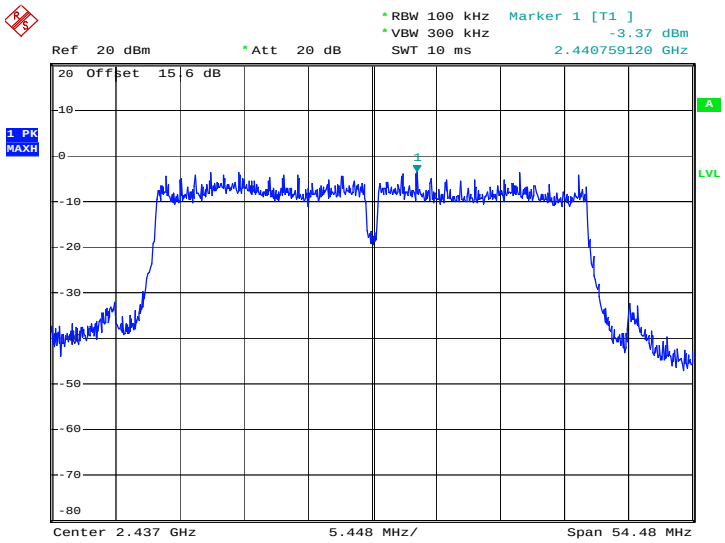
PSD 100kHz Plot on Channel 03



Date: 31.MAR.2013 09:39:53

2.4GHz 802.11n HT40 – MIMO Ant.2

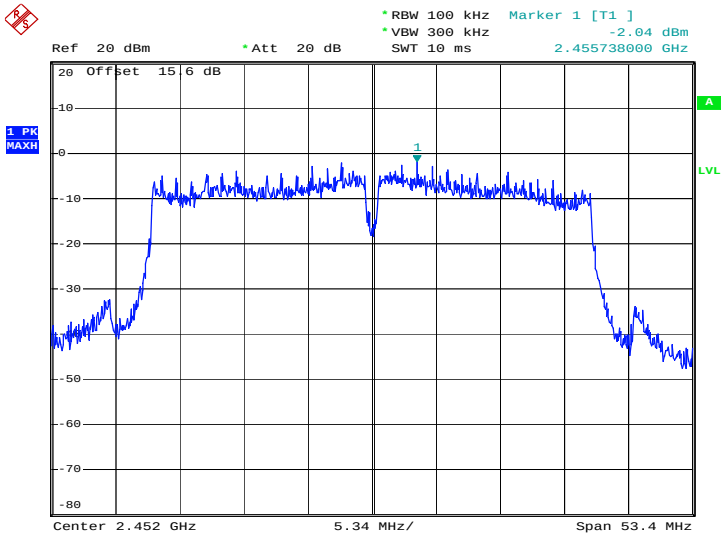
PSD 100kHz Plot on Channel 06



Date: 31.MAR.2013 10:02:01

2.4GHz 802.11n HT40 – MIMO Ant.2

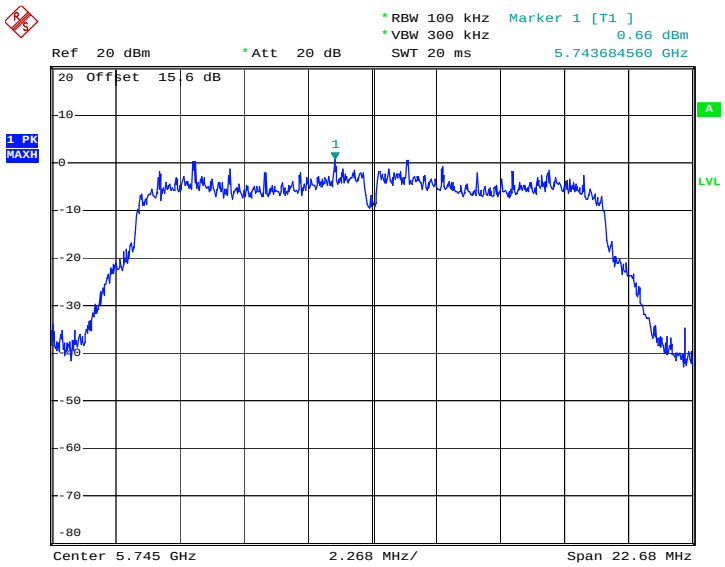
PSD 100kHz Plot on Channel 09



Date: 31.MAR.2013 09:35:16

802.11a – Ant.1

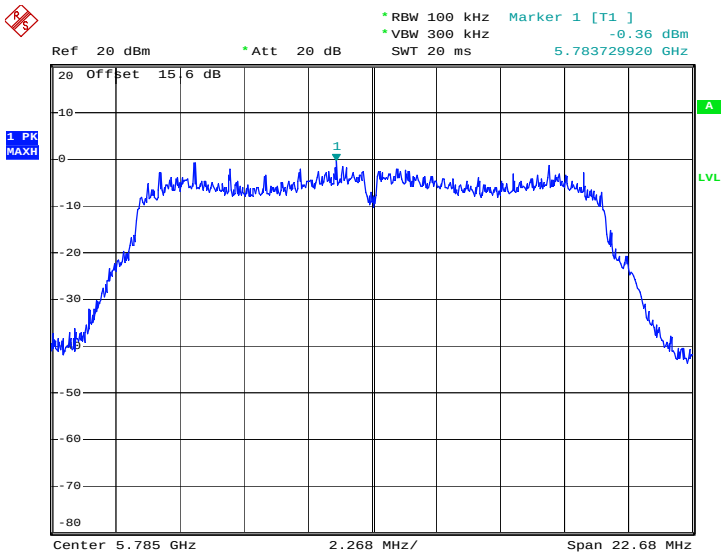
PSD 100kHz Plot on Channel 149



Date: 1.APR.2013 12:17:14

802.11a – Ant.1

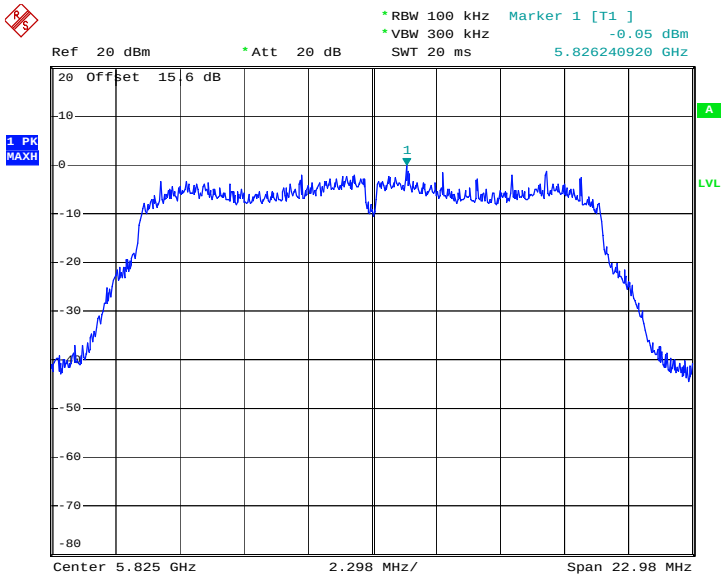
PSD 100kHz Plot on Channel 157



Date: 1.APR.2013 12:20:19

802.11a – Ant.1

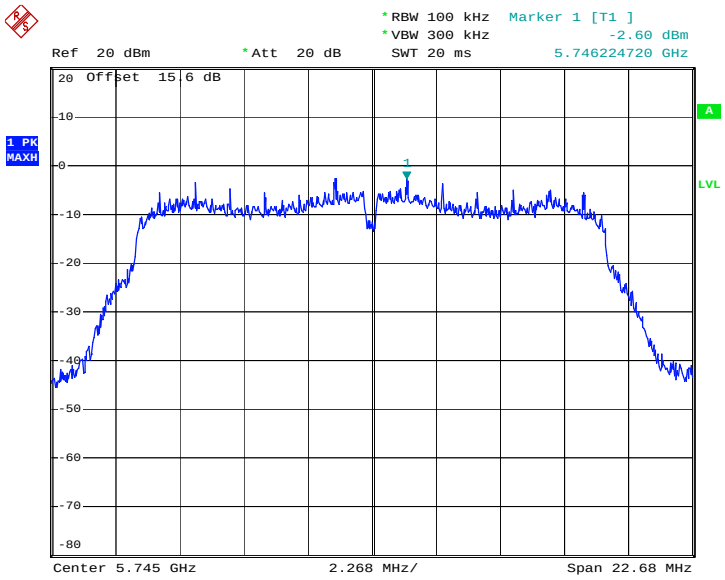
PSD 100kHz Plot on Channel 165



Date: 1.APR.2013 12:22:39

5.8GHz 802.11n HT20 – MIMO Ant.1

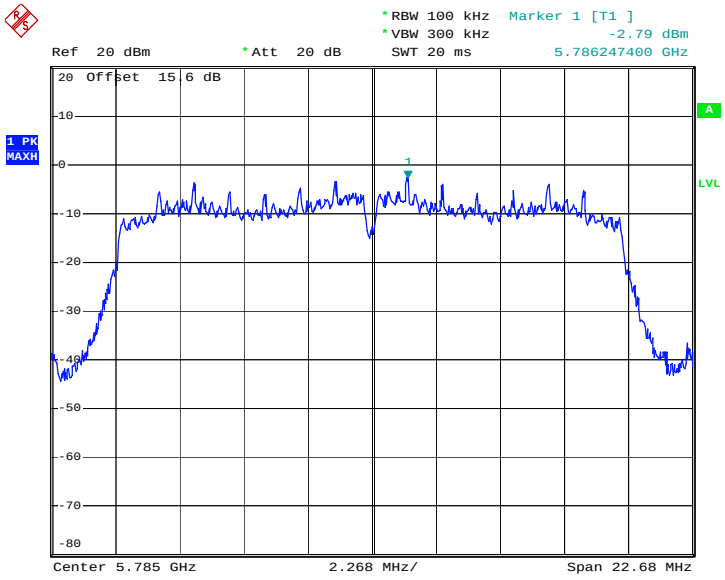
PSD 100kHz Plot on Channel 149



Date: 1.APR.2013 12:26:25

5.8GHz 802.11n HT20 – MIMO Ant.1

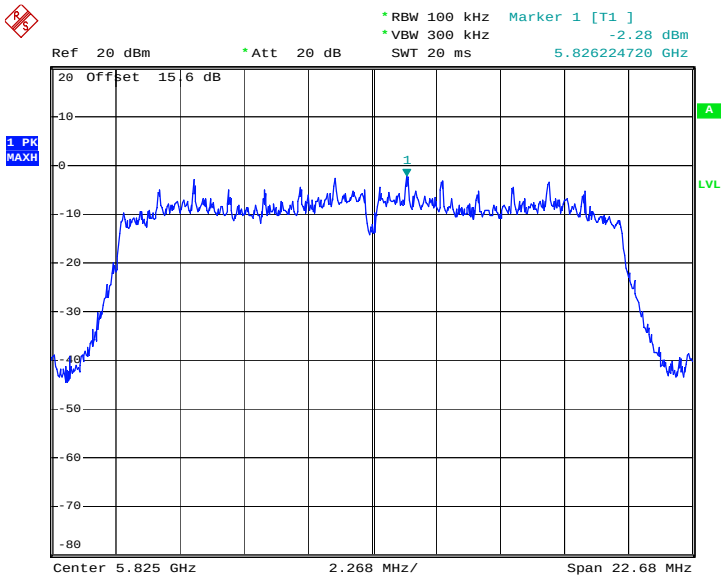
PSD 100kHz Plot on Channel 157



Date: 1.APR.2013 12:29:33

5.8GHz 802.11n HT20 – MIMO Ant.1

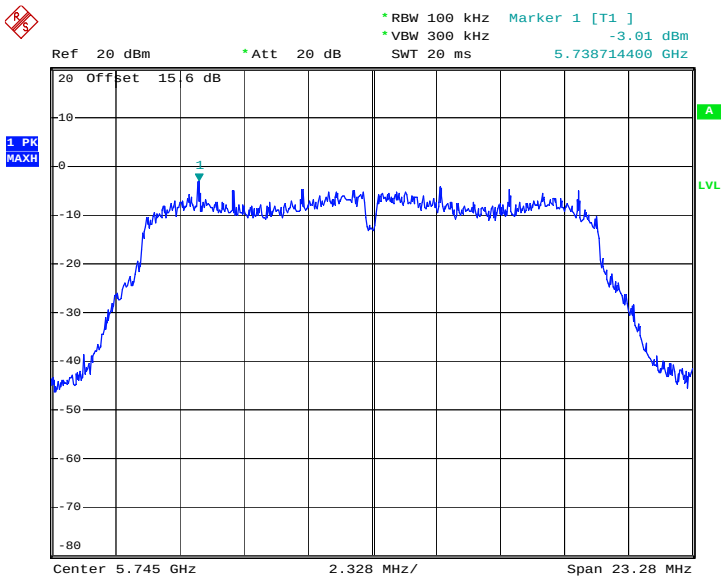
PSD 100kHz Plot on Channel 165



Date: 1.APR.2013 12:32:13

5.8GHz 802.11n HT20 – MIMO Ant.2

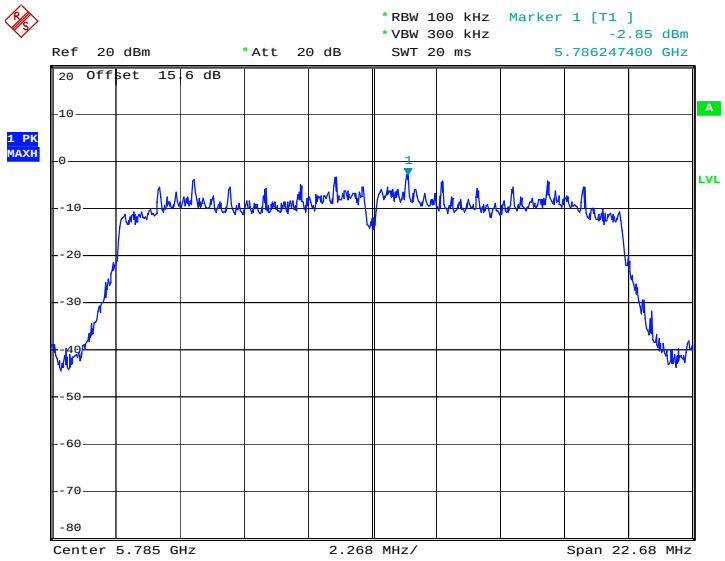
PSD 100kHz Plot on Channel 149



Date: 1.APR.2013 11:41:32

5.8GHz 802.11n HT20 – MIMO Ant.2

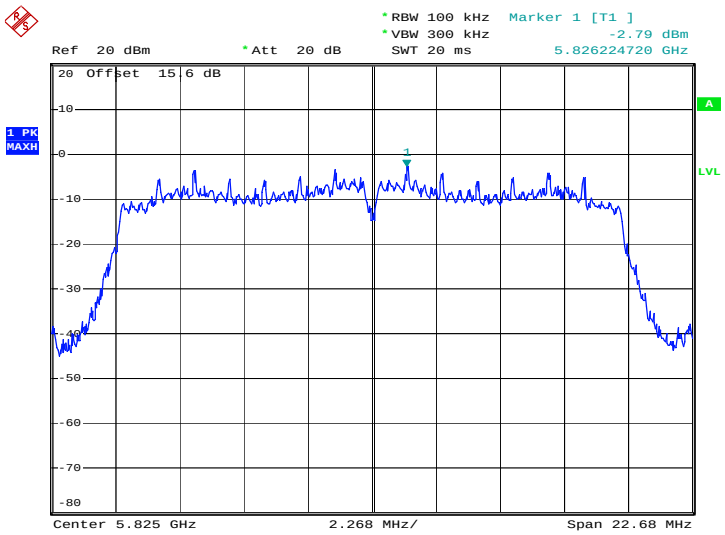
PSD 100kHz Plot on Channel 157



Date: 1.APR.2013 11:45:24

5.8GHz 802.11n HT20 – MIMO Ant.2

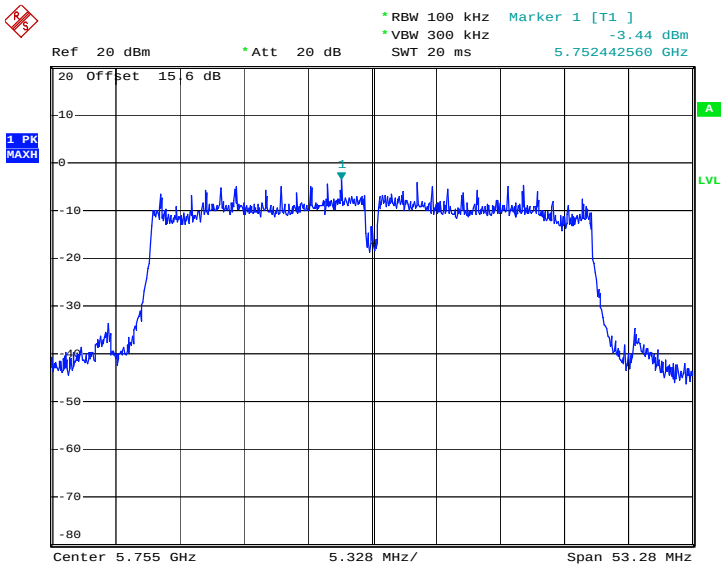
PSD 100kHz Plot on Channel 165



Date: 1.APR.2013 11:48:03

5.8GHz 802.11n HT40 – MIMO Ant.1

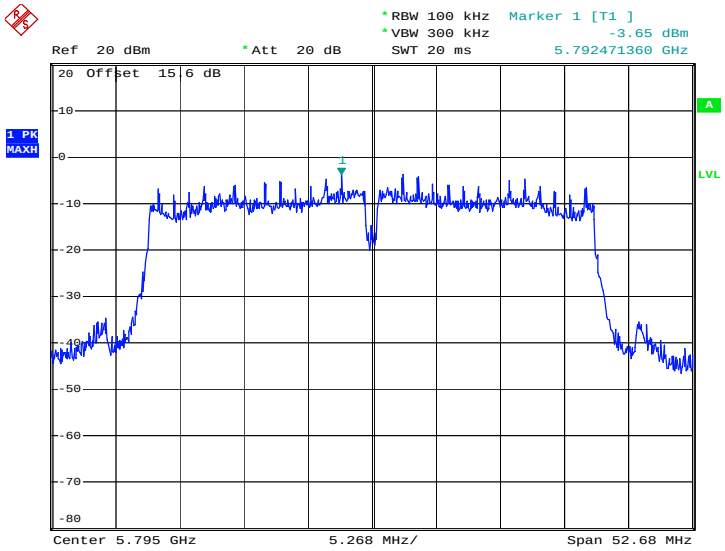
PSD 100kHz Plot on Channel 151



Date: 1.APR.2013 12:36:11

5.8GHz 802.11n HT40 – MIMO Ant.1

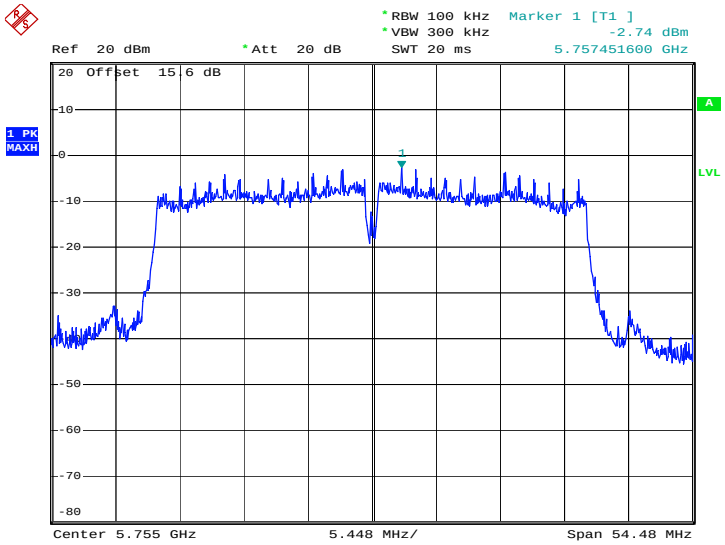
PSD 100kHz Plot on Channel 159



Date: 1.APR.2013 12:39:09

5.8GHz 802.11n HT40 – MIMO Ant.2

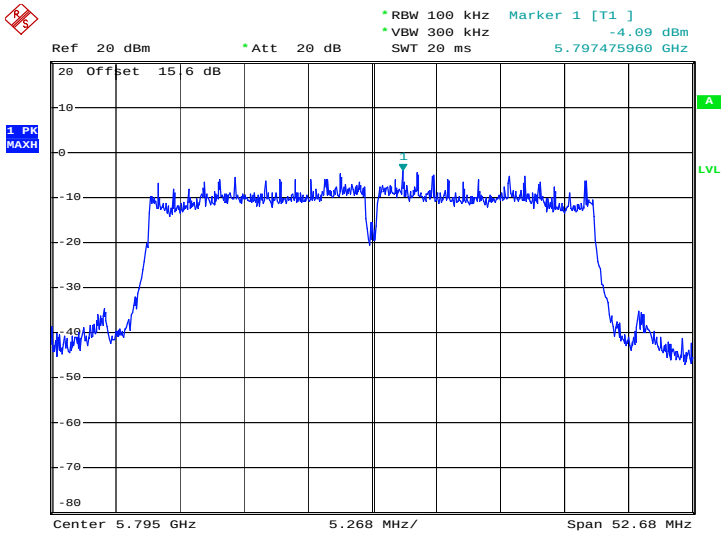
PSD 100kHz Plot on Channel 151



Date: 1.APR.2013 11:52:51

5.8GHz 802.11n HT40 – MIMO Ant.2

PSD 100kHz Plot on Channel 159

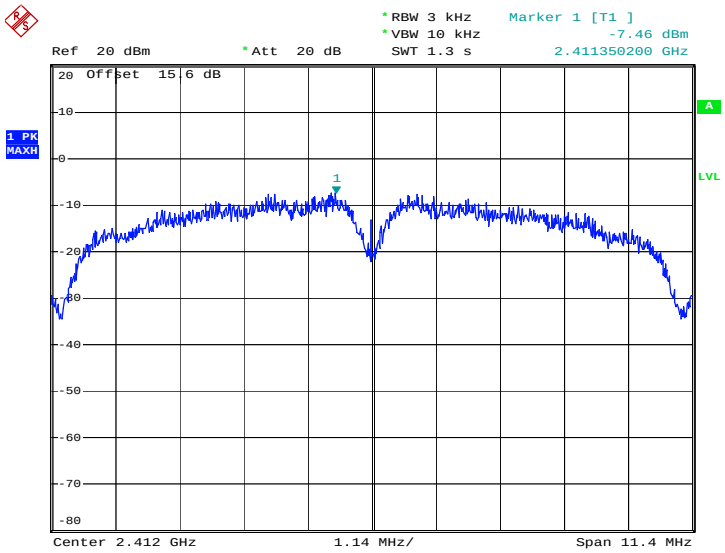


Date: 1.APR.2013 11:57:18

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

802.11b – Ant.2

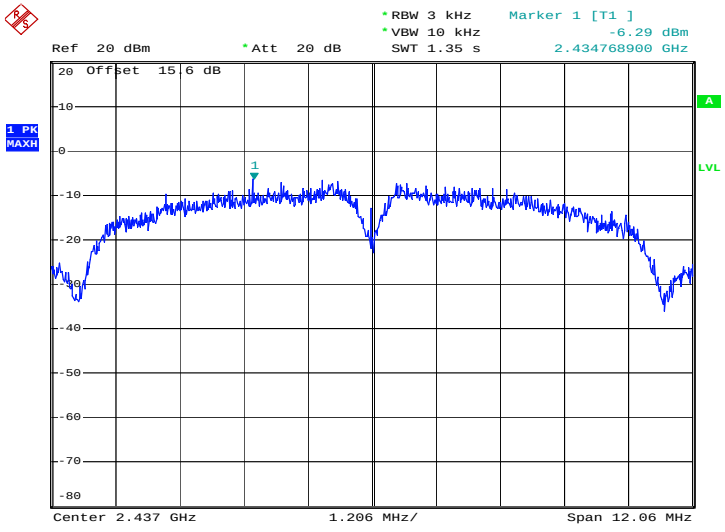
PSD 3kHz Plot on Channel 01



Date: 31.MAR.2013 08:12:53

802.11b – Ant.2

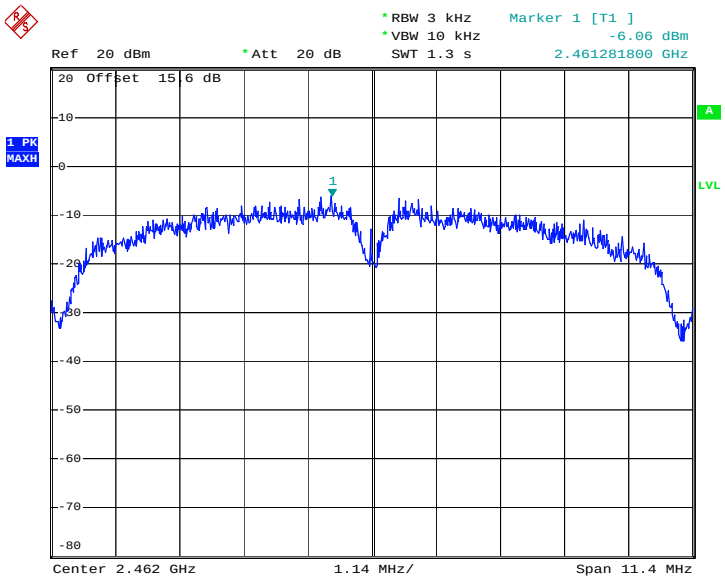
PSD 3kHz Plot on Channel 06



Date: 31.MAR.2013 08:17:20

802.11b – Ant.2

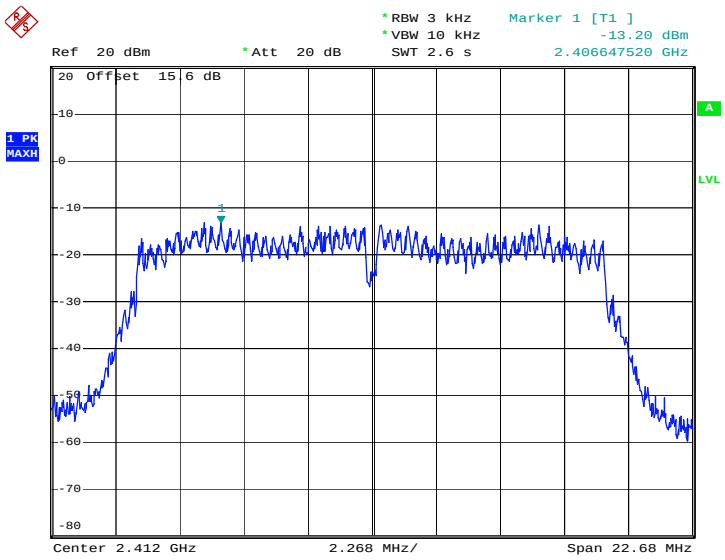
PSD 3kHz Plot on Channel 11



Date: 31.MAR.2013 08:19:56

802.11g – Ant.2

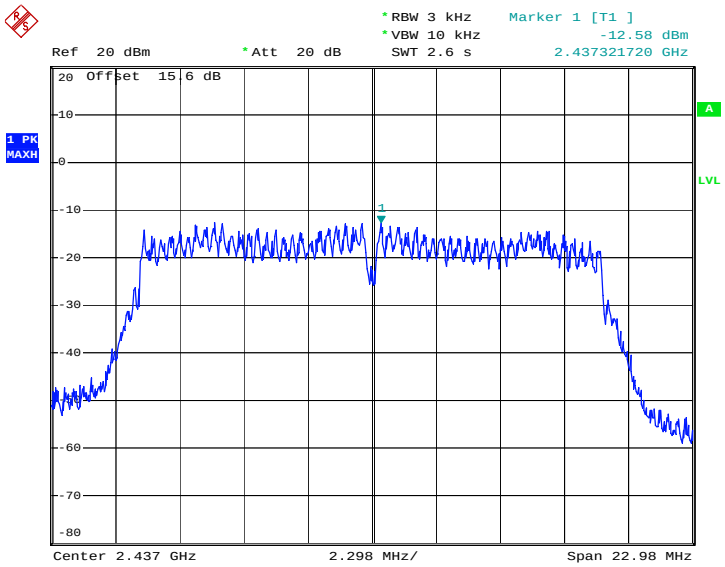
PSD 3kHz Plot on Channel 01



Date: 31.MAR.2013 08:23:59

802.11g – Ant.2

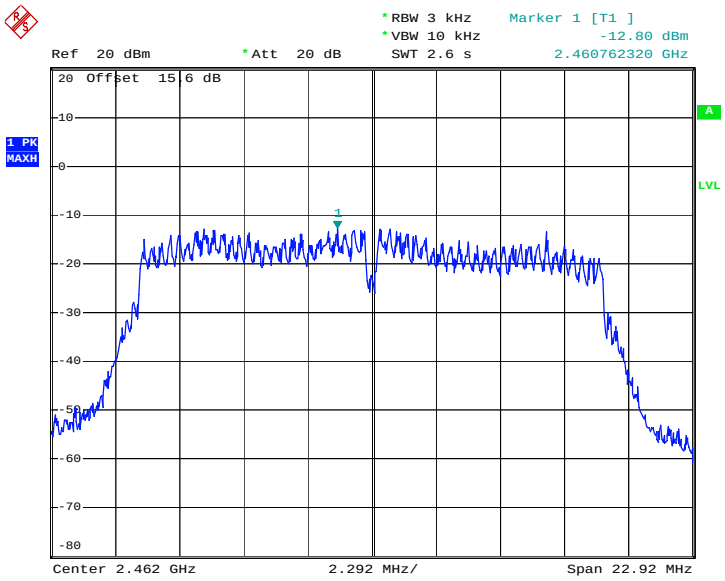
PSD 3kHz Plot on Channel 06



Date: 31.MAR.2013 08:28:10

802.11g – Ant.2

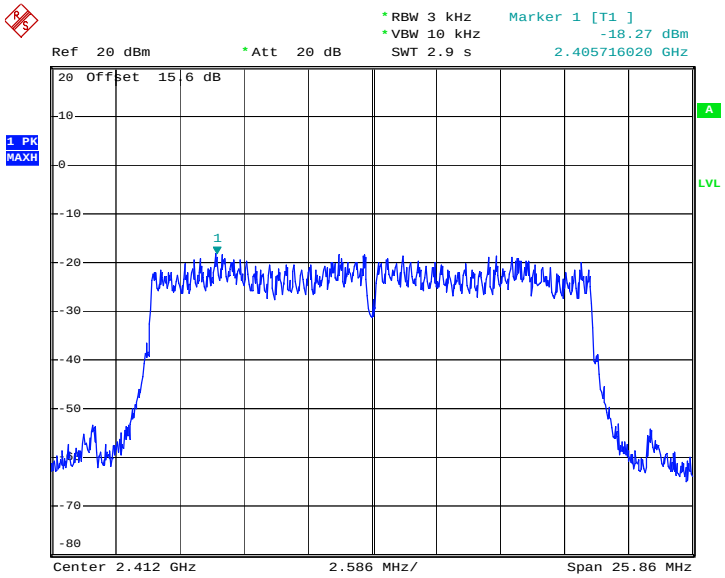
PSD 3kHz Plot on Channel 11



Date: 31.MAR.2013 08:30:48

2.4GHz 802.11n HT20 – MIMO Ant.1

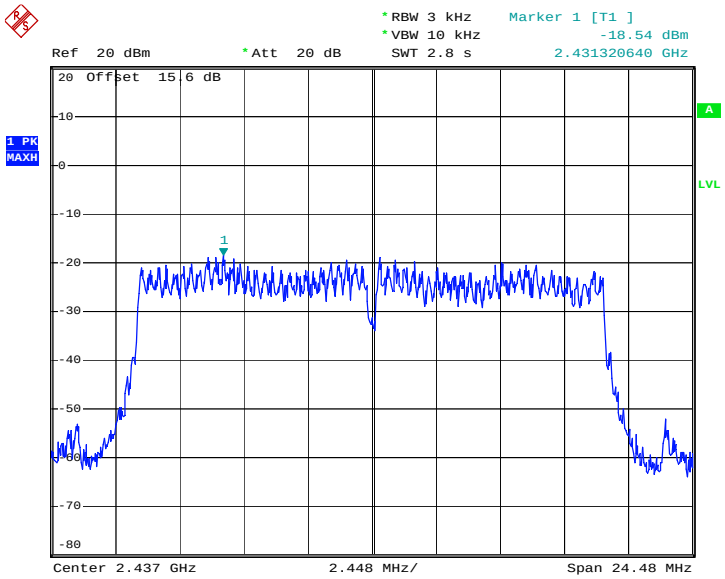
PSD 3kHz Plot on Channel 01



Date: 31.MAR.2013 08:51:34

2.4GHz 802.11n HT20 – MIMO Ant.1

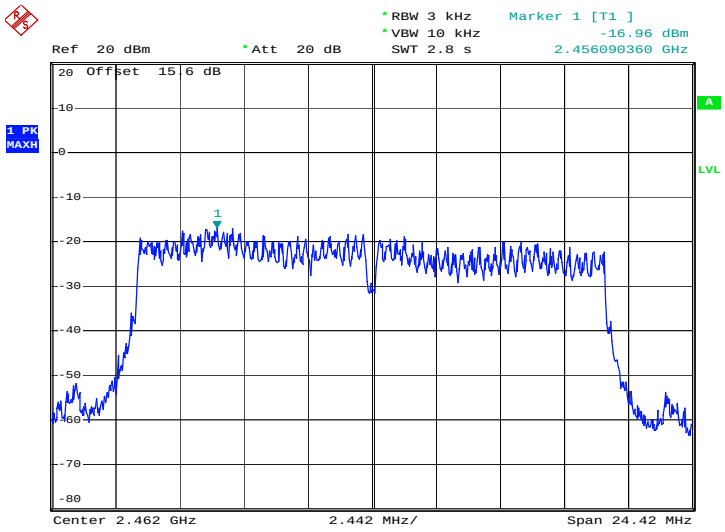
PSD 3kHz Plot on Channel 06



Date: 31.MAR.2013 08:58:30

2.4GHz 802.11n HT20 – MIMO Ant.1

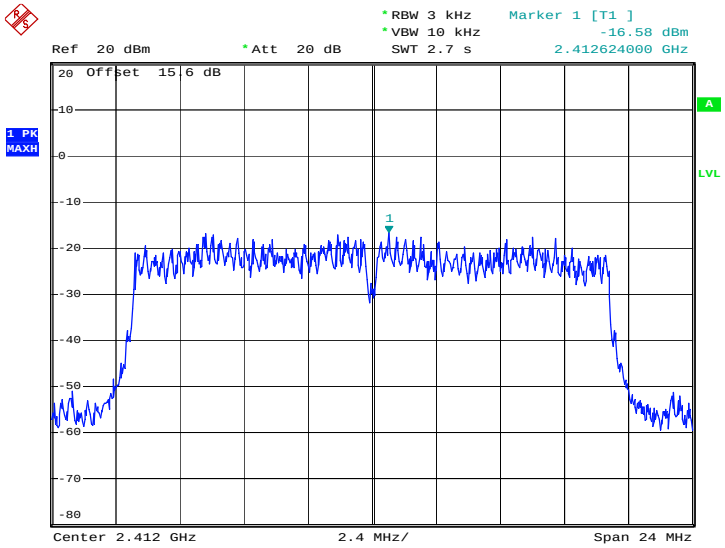
PSD 3kHz Plot on Channel 11



Date: 31.MAR.2013 08:47:53

2.4GHz 802.11n HT20 – MIMO Ant.2

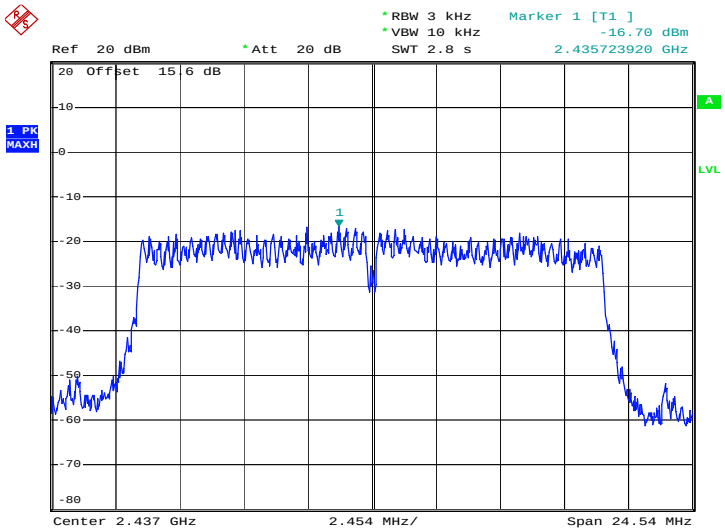
PSD 3kHz Plot on Channel 01



Date: 31.MAR.2013 08:36:39

2.4GHz 802.11n HT20 – MIMO Ant.2

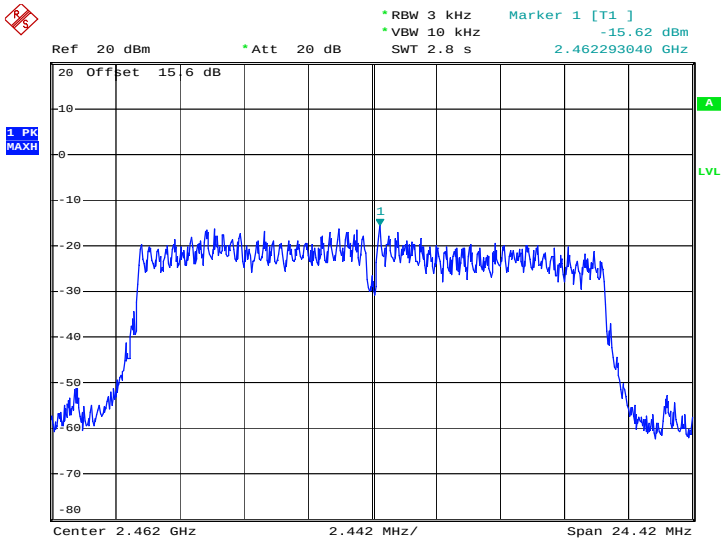
PSD 3kHz Plot on Channel 06



Date: 31.MAR.2013 08:40:44

2.4GHz 802.11n HT20 – MIMO Ant.2

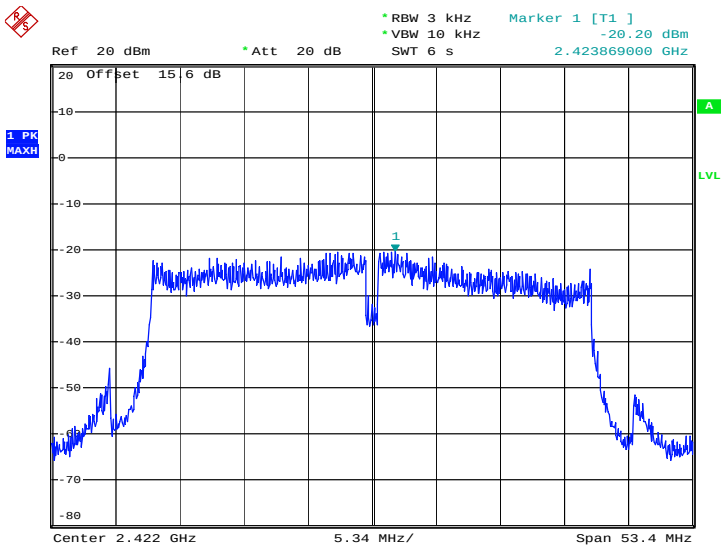
PSD 3kHz Plot on Channel 11



Date: 31.MAR.2013 08:44:51

2.4GHz 802.11n HT40 – MIMO Ant.1

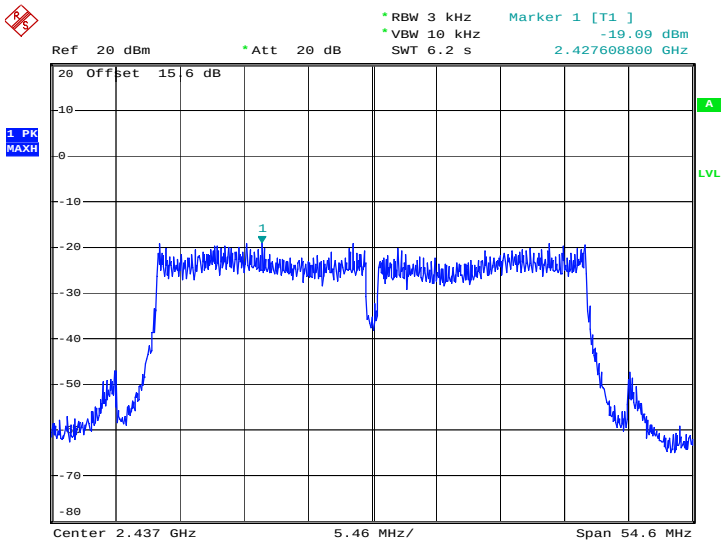
PSD 3kHz Plot on Channel 03



Date: 31.MAR.2013 09:09:08

2.4GHz 802.11n HT40 – MIMO Ant.1

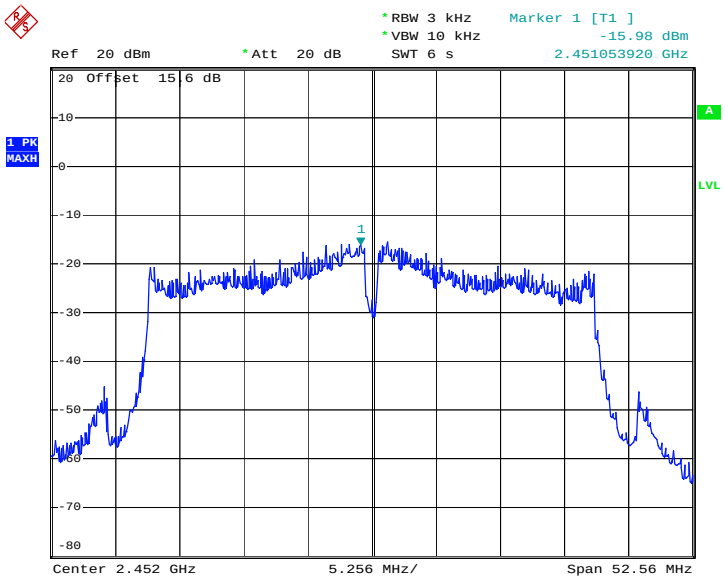
PSD 3kHz Plot on Channel 06



Date: 31.MAR.2013 09:12:20

2.4GHz 802.11n HT40 – MIMO Ant.1

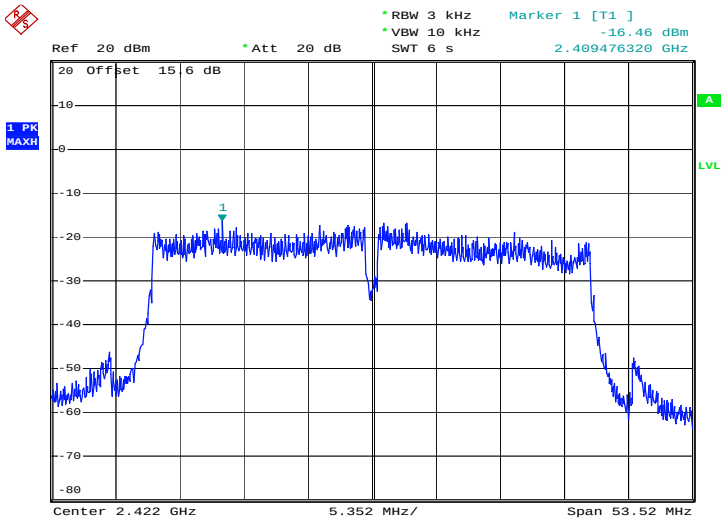
PSD 3kHz Plot on Channel 09



Date: 22.APR.2013 18:30:41

2.4GHz 802.11n HT40 – MIMO Ant.2

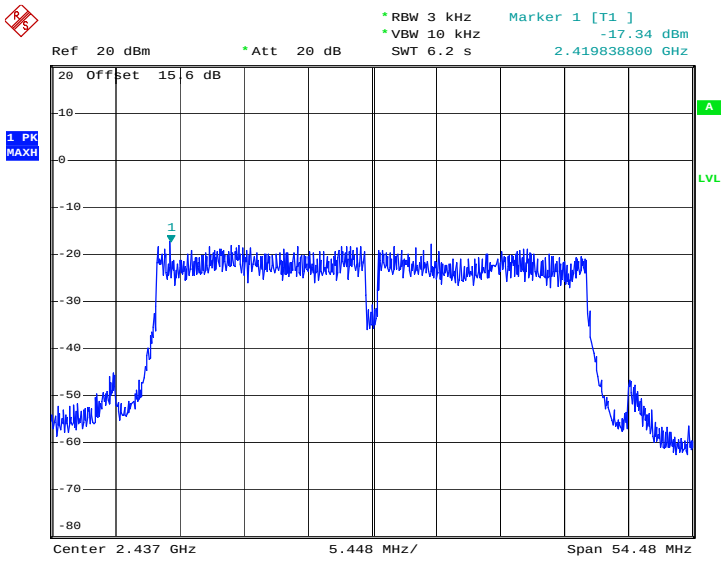
PSD 3kHz Plot on Channel 03



Date: 31.MAR.2013 09:39:43

2.4GHz 802.11n HT40 – MIMO Ant.2

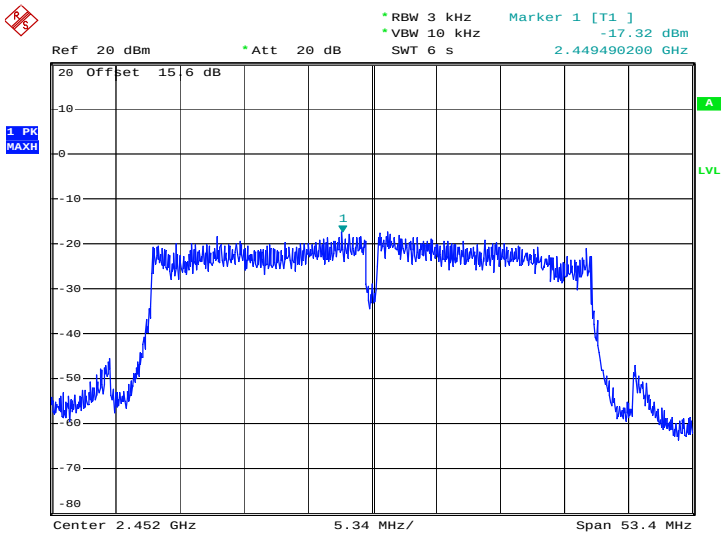
PSD 3kHz Plot on Channel 06



Date: 31.MAR.2013 10:01:51

2.4GHz 802.11n HT40 – MIMO Ant.2

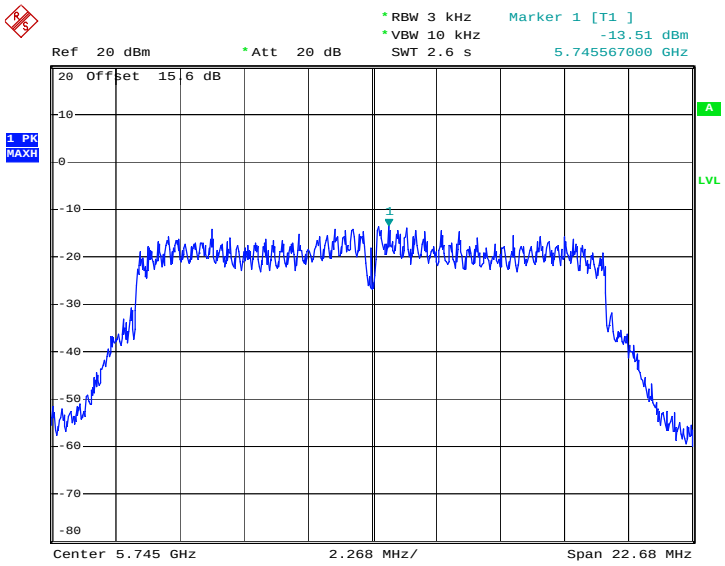
PSD 3kHz Plot on Channel 09



Date: 31.MAR.2013 09:35:06

802.11a – Ant.1

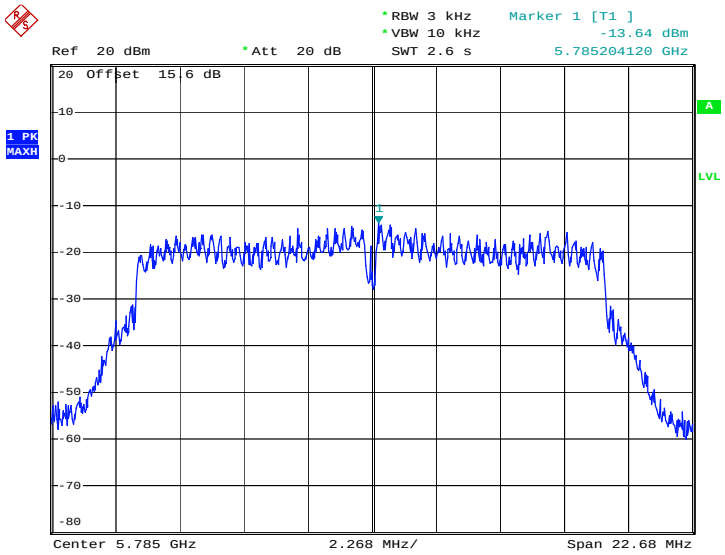
PSD 3kHz Plot on Channel 149



Date: 1.APR.2013 12:17:05

802.11a – Ant.1

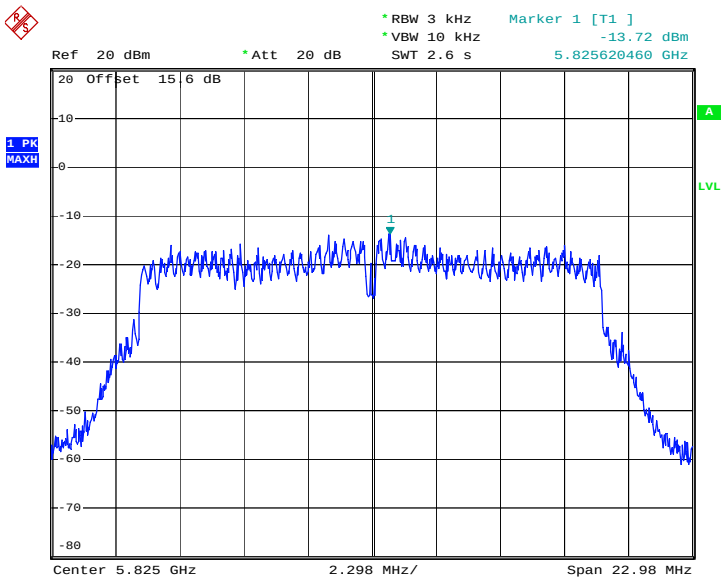
PSD 3kHz Plot on Channel 157



Date: 1.APR.2013 12:20:09

802.11a – Ant.1

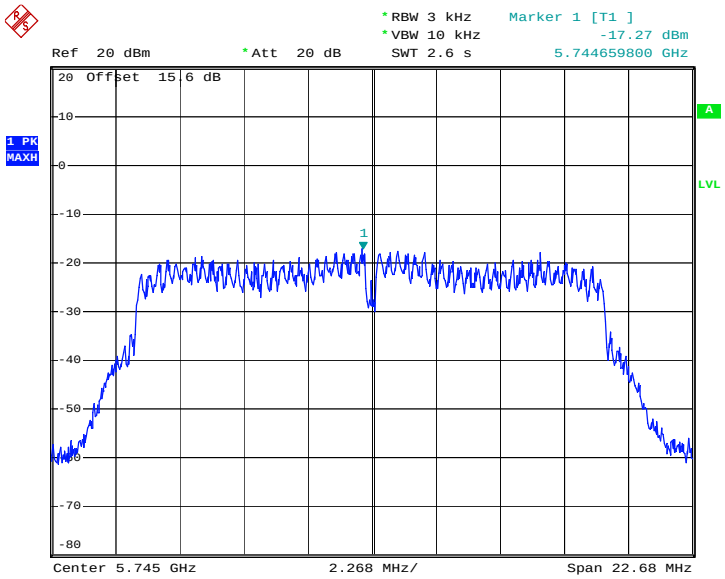
PSD 3kHz Plot on Channel 165



Date: 1.APR.2013 12:22:29

5.8GHz 802.11n HT20 – MIMO Ant.1

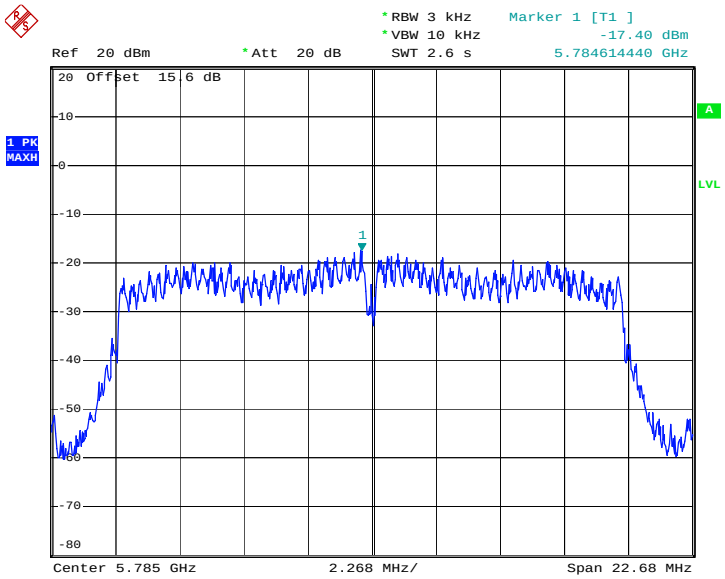
PSD 3kHz Plot on Channel 149



Date: 1.APR.2013 12:26:15

5.8GHz 802.11n HT20 – MIMO Ant.1

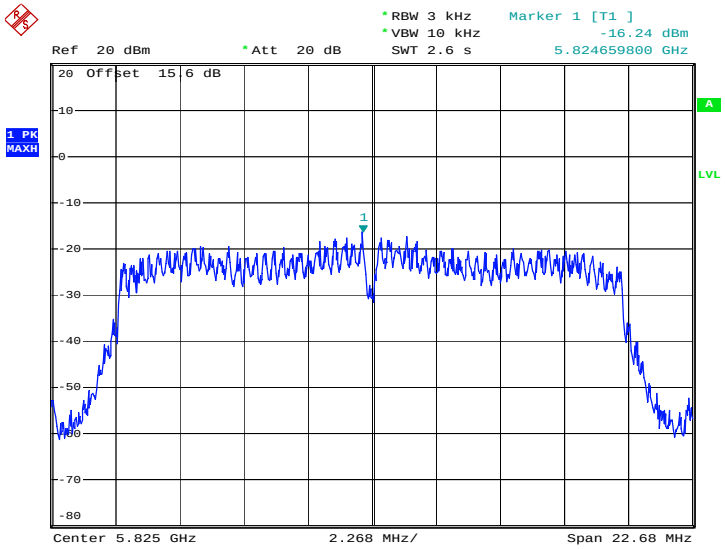
PSD 3kHz Plot on Channel 157



Date: 1.APR.2013 12:29:23

5.8GHz 802.11n HT20 – MIMO Ant.1

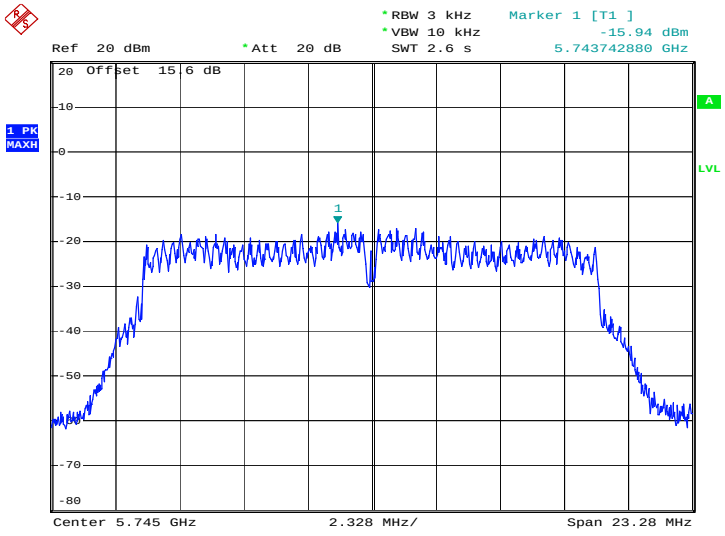
PSD 3kHz Plot on Channel 165



Date: 1.APR.2013 12:32:03

5.8GHz 802.11n HT20 – MIMO Ant.2

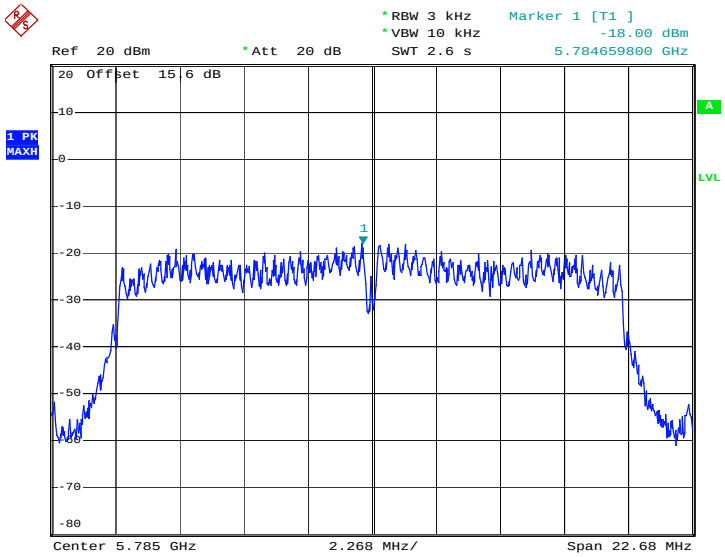
PSD 3kHz Plot on Channel 149



Date: 1.APR.2013 11:41:22

5.8GHz 802.11n HT20 – MIMO Ant.2

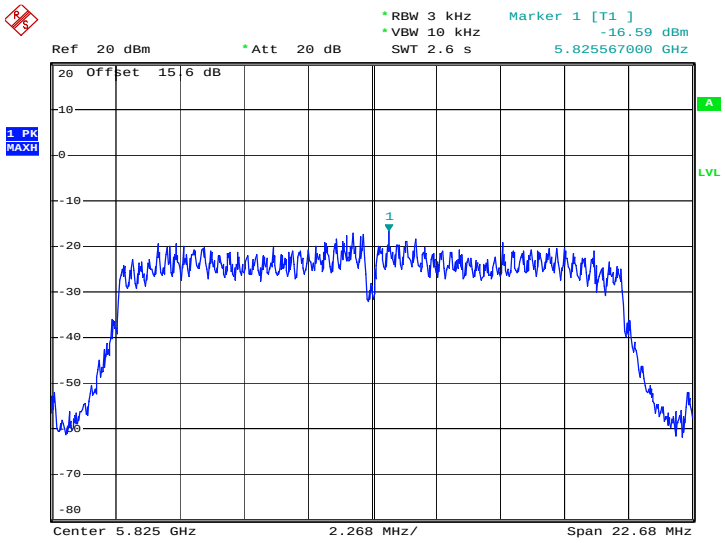
PSD 3kHz Plot on Channel 157



Date: 1.APR.2013 11:45:14

5.8GHz 802.11n HT20 – MIMO Ant.2

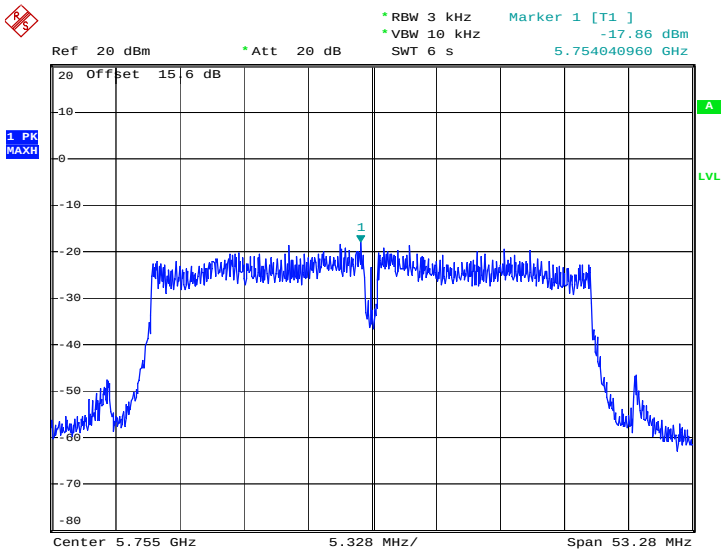
PSD 3kHz Plot on Channel 165



Date: 1.APR.2013 11:47:54

5.8GHz 802.11n HT40 – MIMO Ant.1

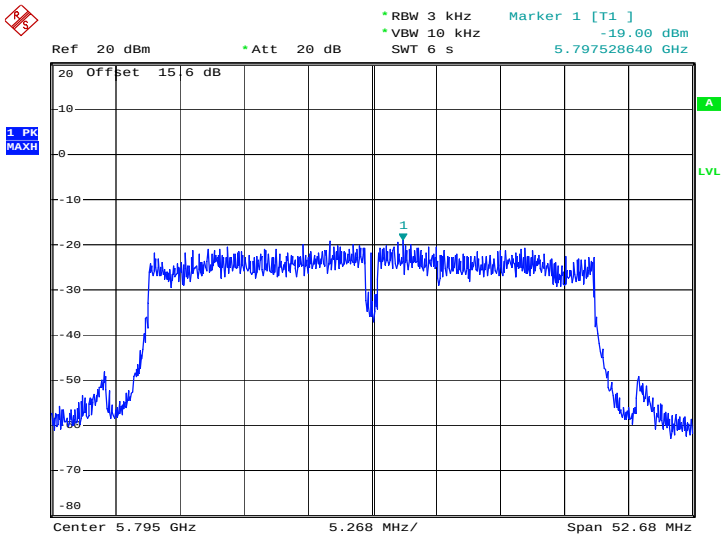
PSD 3kHz Plot on Channel 151



Date: 1.APR.2013 12:36:01

5.8GHz 802.11n HT40 – MIMO Ant.1

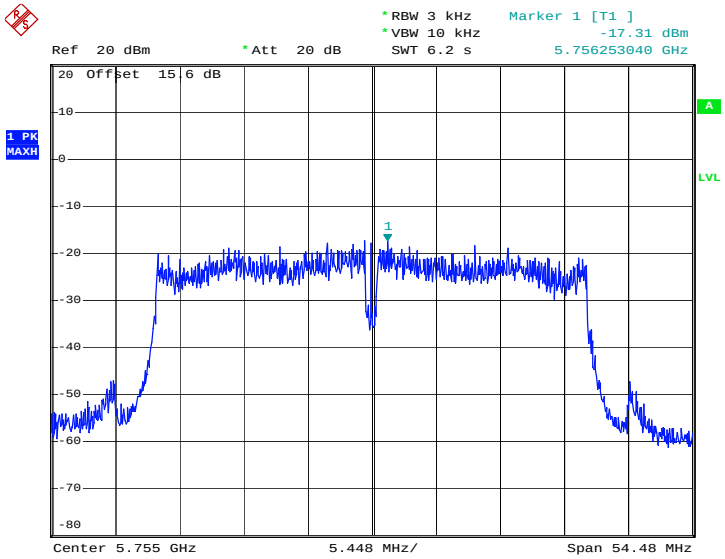
PSD 3kHz Plot on Channel 159



Date: 1.APR.2013 12:38:59

5.8GHz 802.11n HT40 – MIMO Ant.2

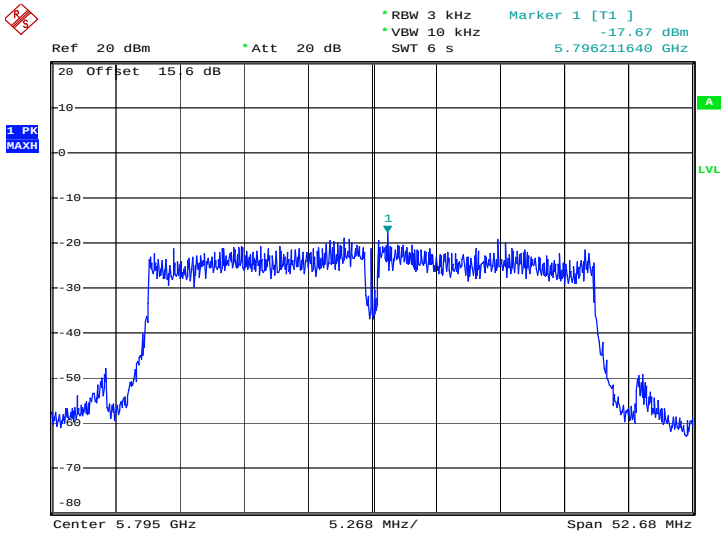
PSD 3kHz Plot on Channel 151



Date: 1.APR.2013 11:52:41

5.8GHz 802.11n HT40 – MIMO Ant.2

PSD 3kHz Plot on Channel 159



Date: 1.APR.2013 11:57:09

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

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

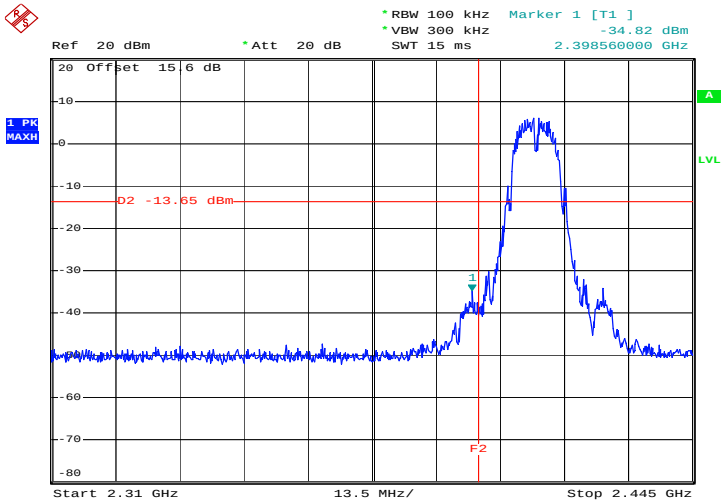
3.4.4 Test Setup

3.4.5 Test Result of Conducted Spurious at Band Edges

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

802.11b – Ant 2

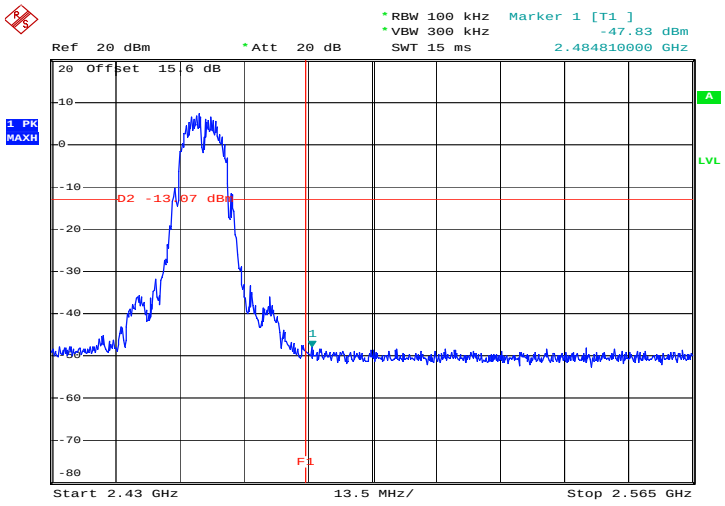
Low Band Edge Plot on Channel 01



Date: 31.MAR.2013 08:13:19

802.11b – Ant 2

High Band Edge Plot on Channel 11

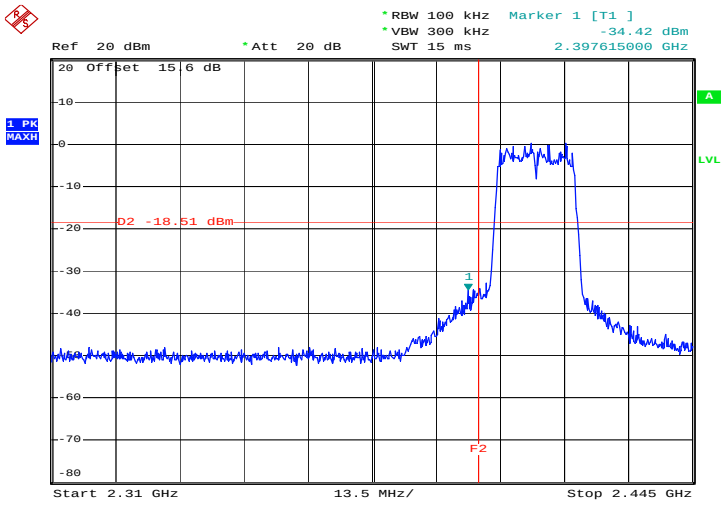


Date: 31.MAR.2013 08:20:22

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

802.11g – Ant 2

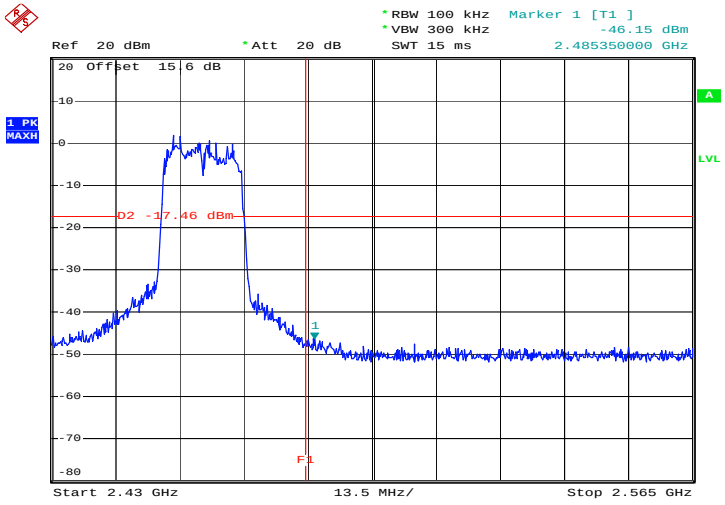
Low Band Edge Plot on Channel 01



Date: 31.MAR.2013 08:24:25

802.11g – Ant 2

High Band Edge Plot on Channel 11

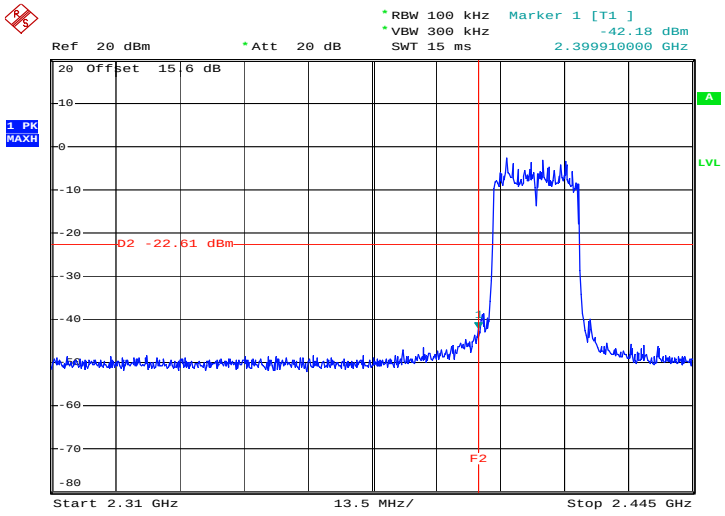


Date: 31.MAR.2013 08:31:14

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Lizy Li

2.4GHz 802.11n HT20 – MIMO Ant 1

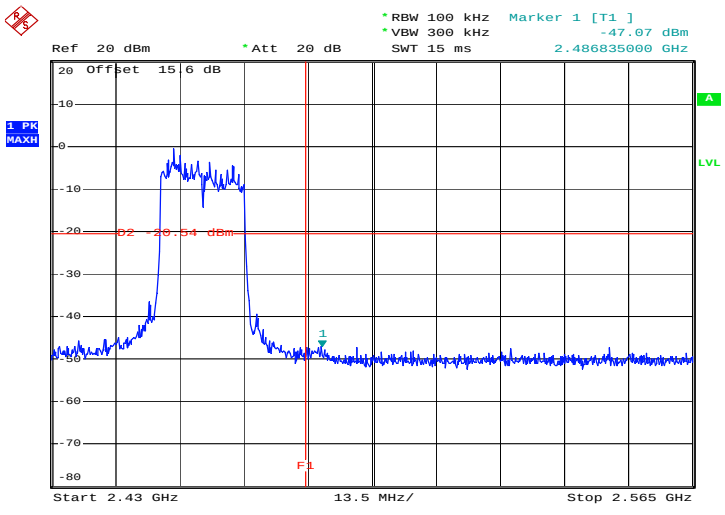
Low Band Edge Plot on Channel 01



Date: 31.MAR.2013 08:52:00

2.4GHz 802.11n HT20 – MIMO Ant 1

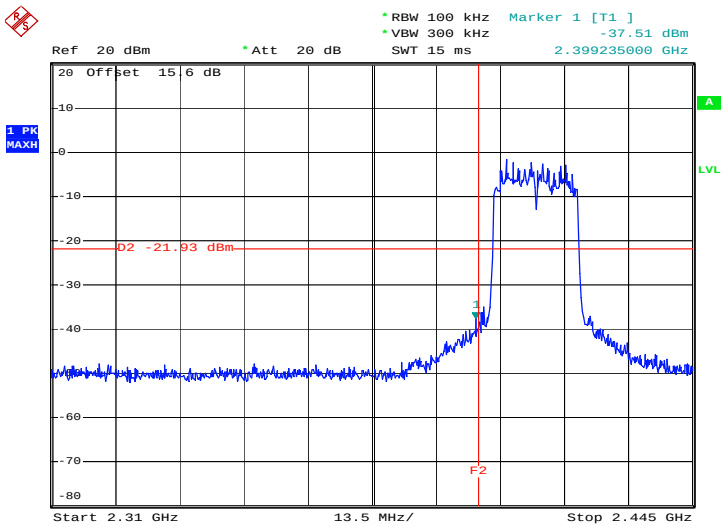
High Band Edge Plot on Channel 11



Date: 31.MAR.2013 08:48:19

2.4GHz 802.11n HT20 – MIMO Ant 2

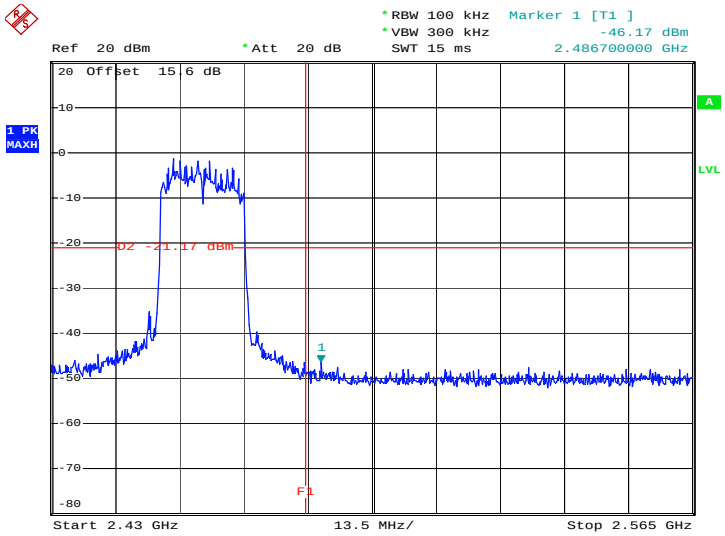
Low Band Edge Plot on Channel 01



Date: 31.MAR.2013 08:38:20

2.4GHz 802.11n HT20 – MIMO Ant 2

High Band Edge Plot on Channel 11

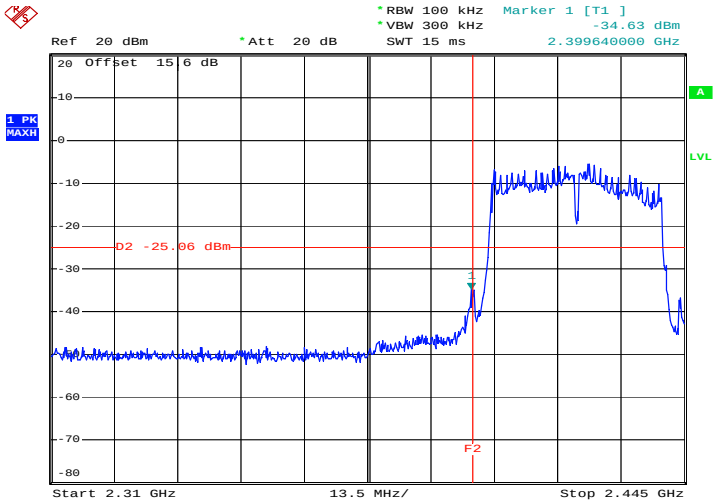


Date: 31.MAR.2013 08:45:17

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	03 and 09	Test Engineer :	Lizy Li

2.4GHz 802.11n HT40 – MIMO Ant 1

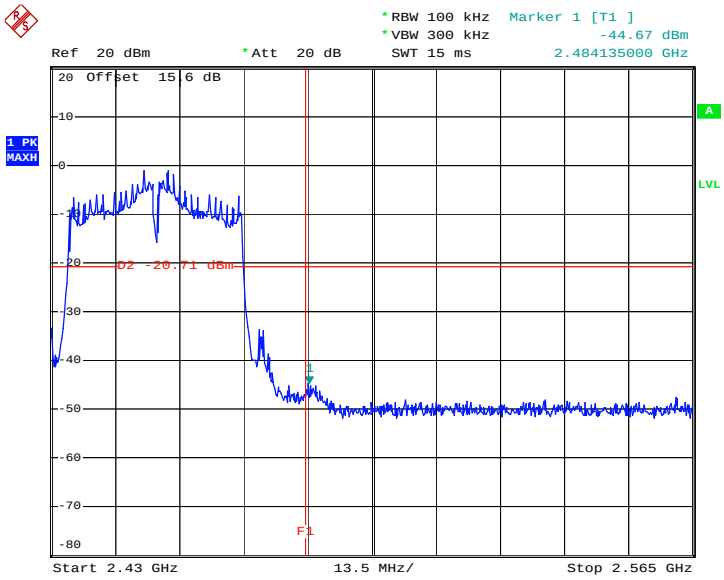
Low Band Edge Plot on Channel 03



Date: 31.MAR.2013 09:11:00

2.4GHz 802.11n HT40 – MIMO Ant 1

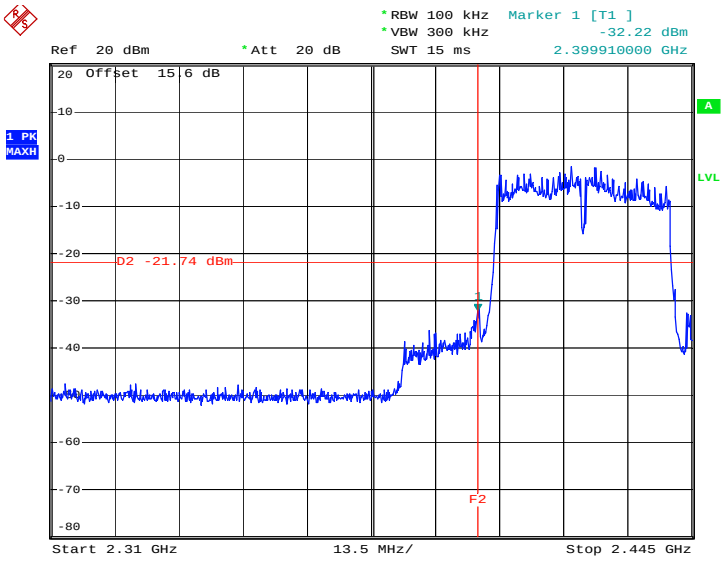
High Band Edge Plot on Channel 09



Date: 22.APR.2013 18:34:24

2.4GHz 802.11n HT40 – MIMO Ant 2

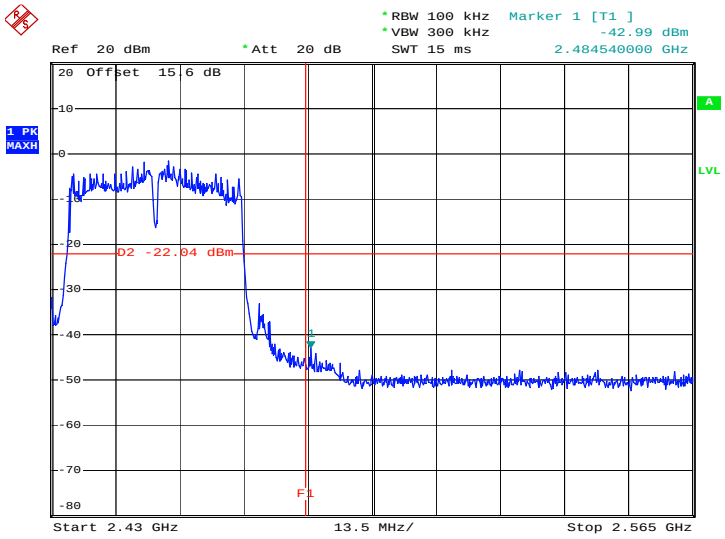
Low Band Edge Plot on Channel 03



Date: 31.MAR.2013 09:40:09

2.4GHz 802.11n HT40 – MIMO Ant 2

High Band Edge Plot on Channel 09

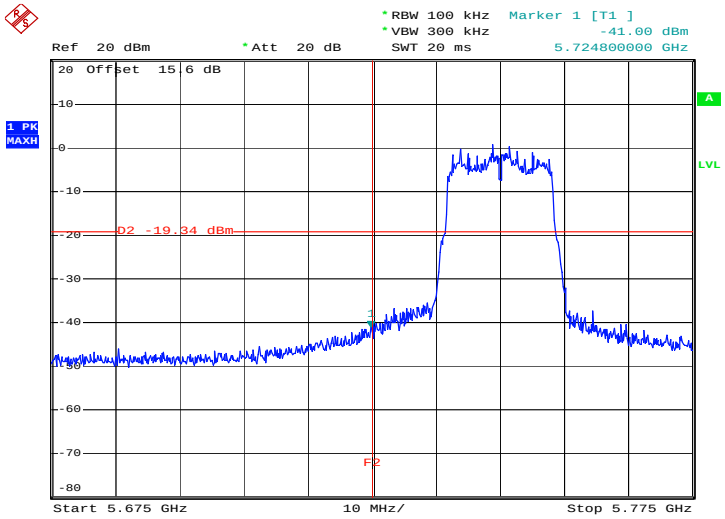


Date: 31.MAR.2013 09:35:32

Test Mode :	802.11a	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	149 and 165	Test Engineer :	Lizy Li

802.11a – Ant 1

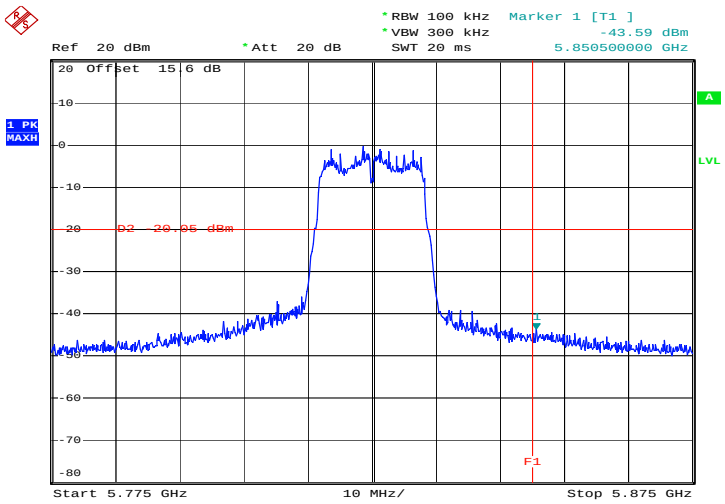
Low Band Edge Plot on Channel 149



Date: 1.APR.2013 12:17:30

802.11a – Ant 1

High Band Edge Plot on Channel 165

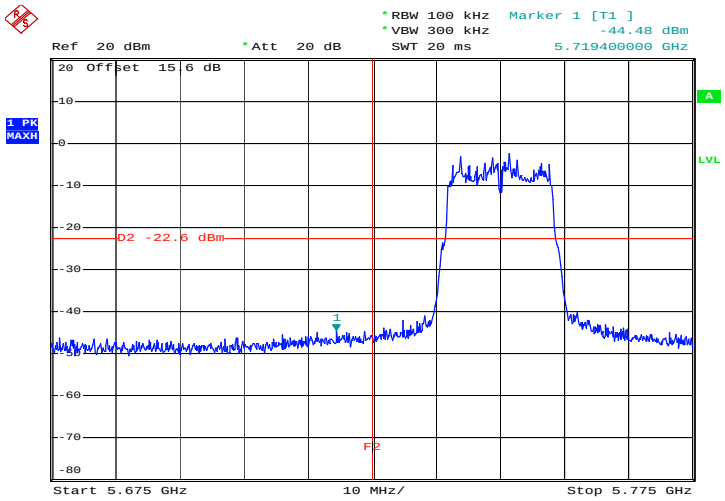


Date: 1.APR.2013 12:22:55

Test Mode :	5.8GHz 802.11n HT20	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	149 and 165	Test Engineer :	Lizy Li

5.8GHz 802.11n HT20 – MIMO Ant 1

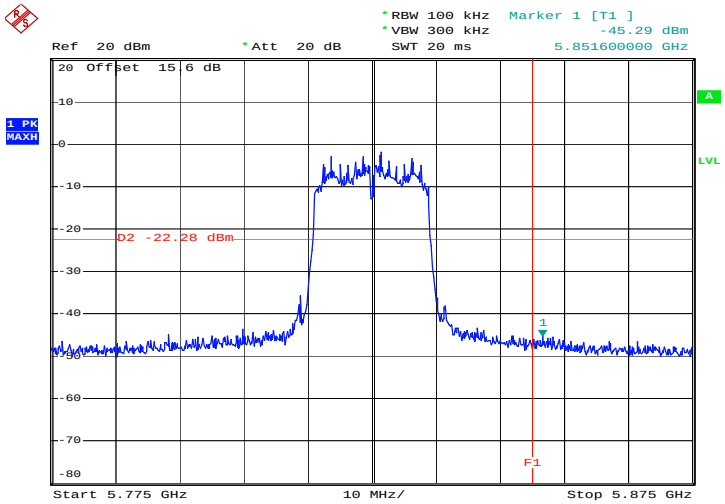
Low Band Edge Plot on Channel 149



Date: 1.APR.2013 12:26:41

5.8GHz 802.11n HT20 – MIMO Ant 1

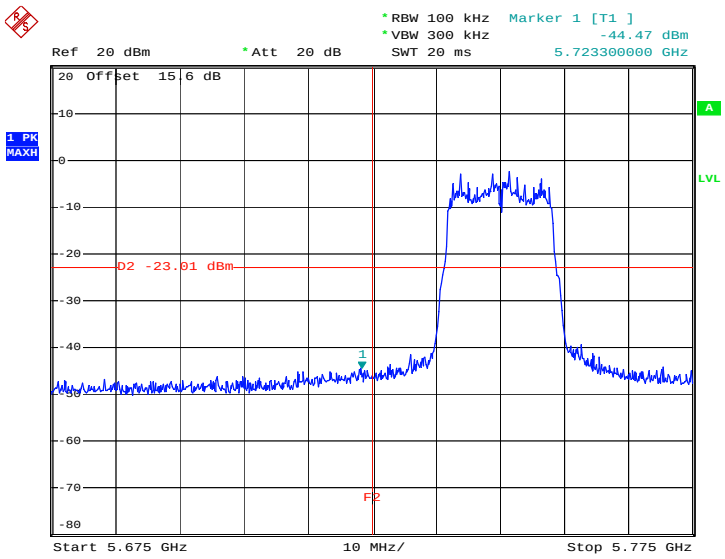
High Band Edge Plot on Channel 165



Date: 1.APR.2013 12:32:29

5.8GHz 802.11n HT20 – MIMO Ant 2

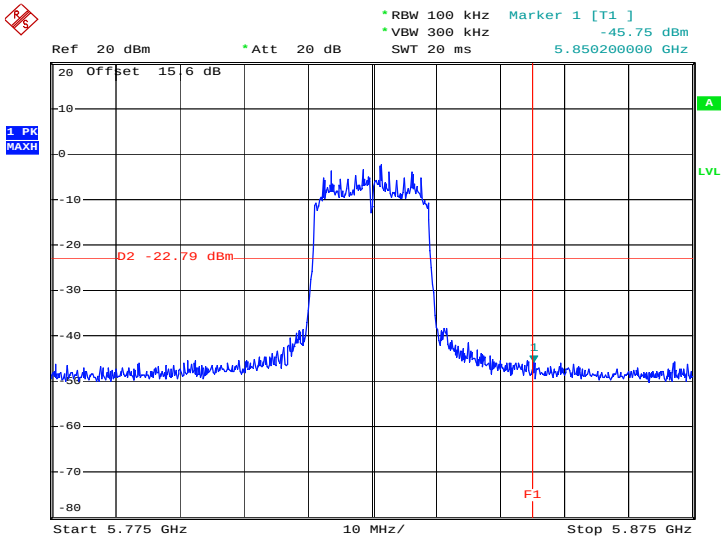
Low Band Edge Plot on Channel 149



Date: 1.APR.2013 11:41:48

5.8GHz 802.11n HT20 – MIMO Ant 2

High Band Edge Plot on Channel 165

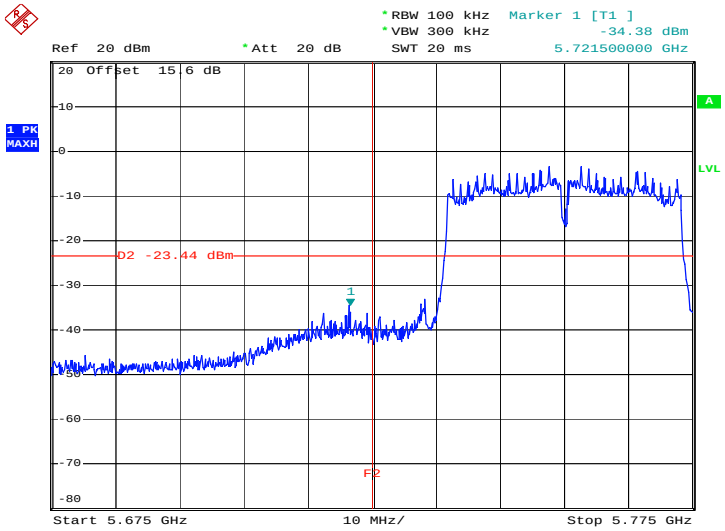


Date: 1.APR.2013 11:48:19

Test Mode :	5.8GHz 802.11n HT40	Temperature :	23~24℃
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	151 and 159	Test Engineer :	Lizy Li

5.8GHz 802.11n HT40 – MIMO Ant 1

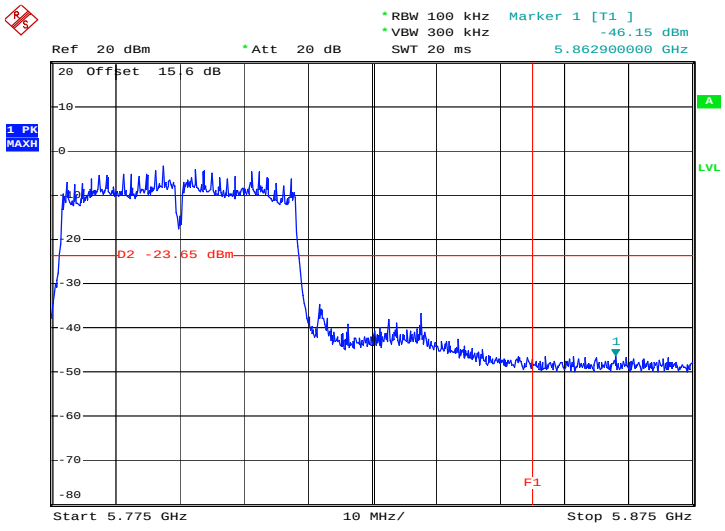
Low Band Edge Plot on Channel 151



Date: 1.APR.2013 12:36:27

5.8GHz 802.11n HT40 – MIMO Ant 1

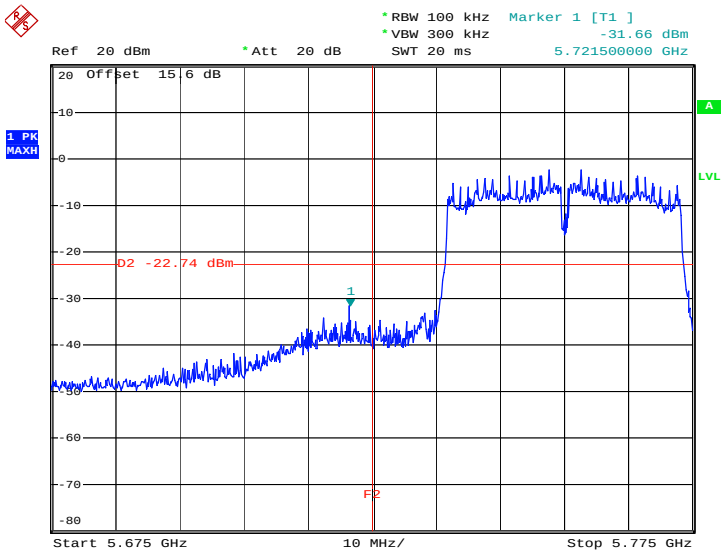
High Band Edge Plot on Channel 159



Date: 1.APR.2013 12:39:25

5.8GHz 802.11n HT40 – MIMO Ant 2

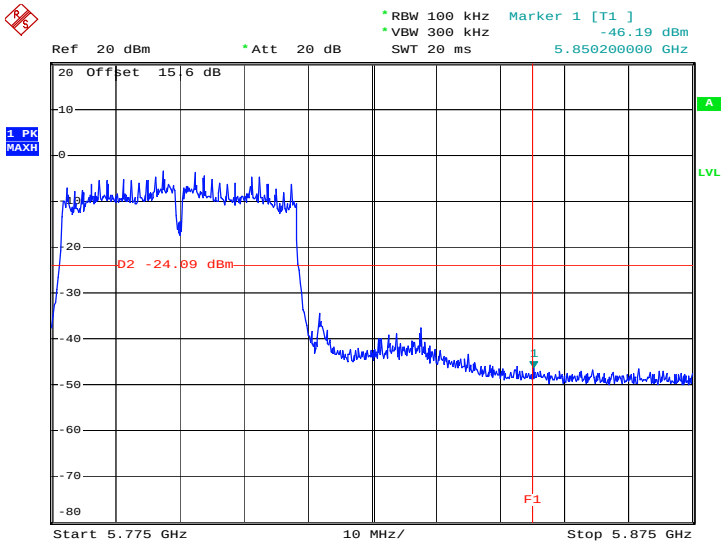
Low Band Edge Plot on Channel 151



Date: 1.APR.2013 11:53:07

5.8GHz 802.11n HT40 – MIMO Ant 2

High Band Edge Plot on Channel 159



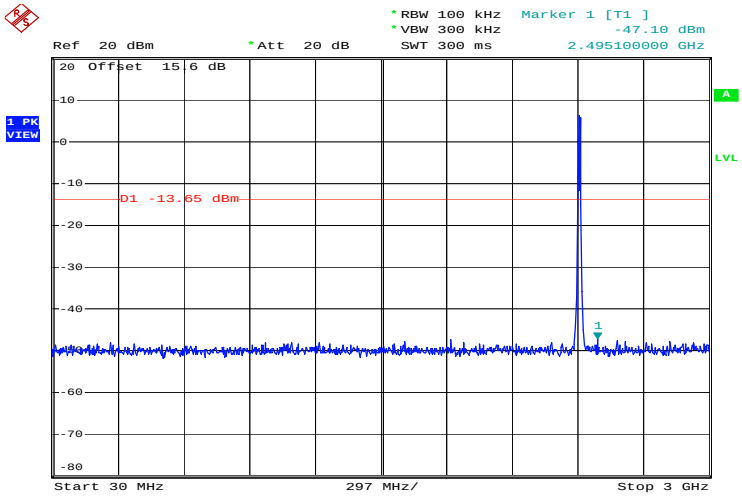
Date: 1.APR.2013 11:57:34

3.4.5 Test Result of Conducted Spurious Emission

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

802.11b 30 MHz~3 GHz – Ant 2

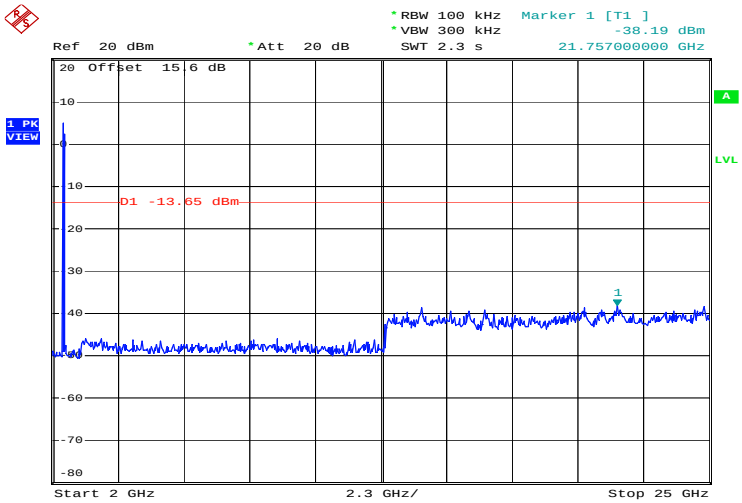
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:14:53

802.11b 2 GHz~25 GHz – Ant 2

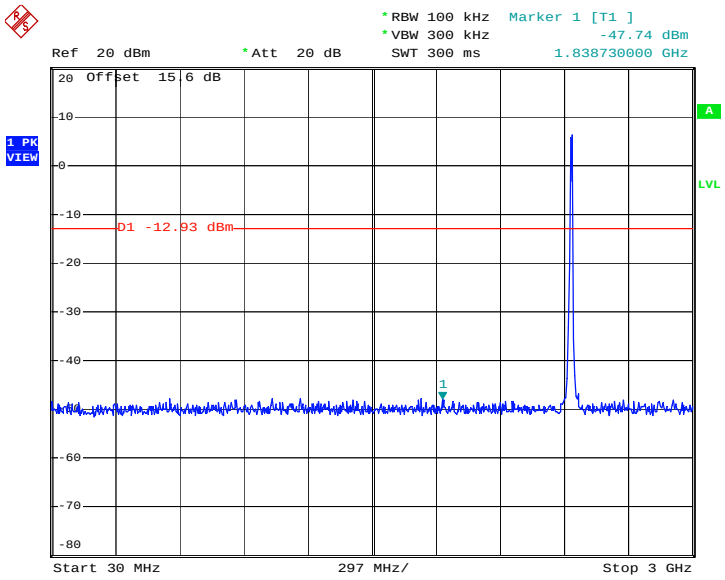
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:15:12

802.11b 30 MHz~3 GHz – Ant 2

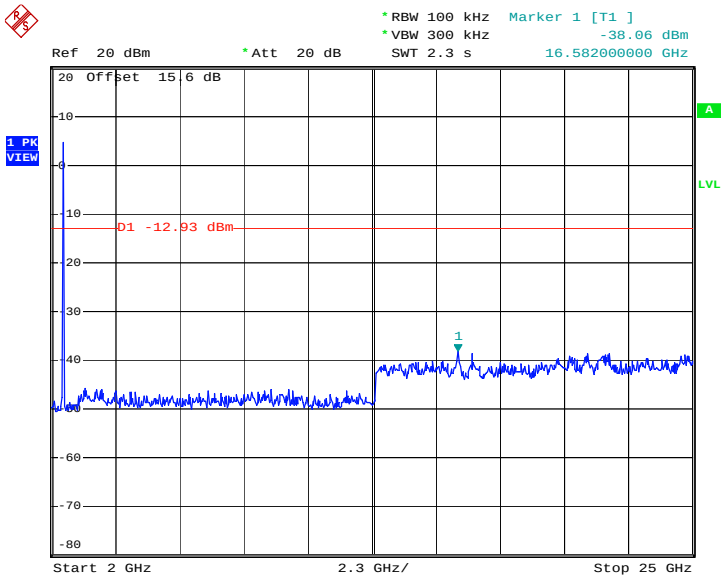
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:17:51

802.11b 2 GHz~25 GHz – Ant 2

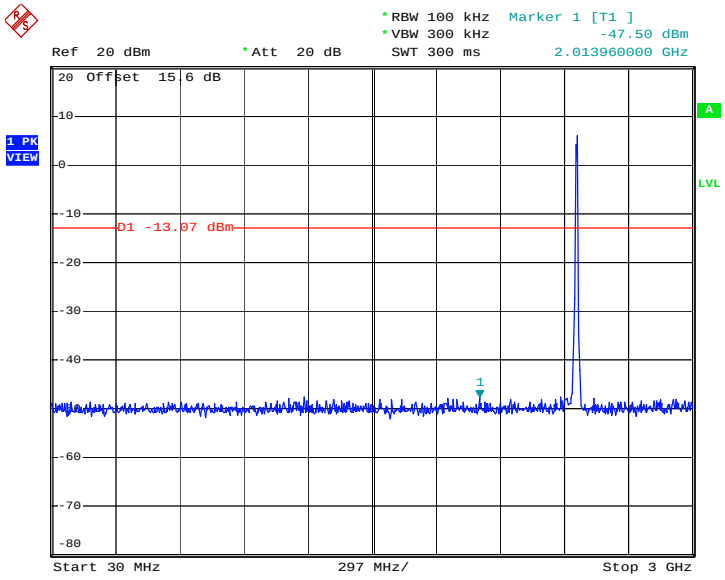
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:18:10

802.11b 30 MHz~3 GHz – Ant 2

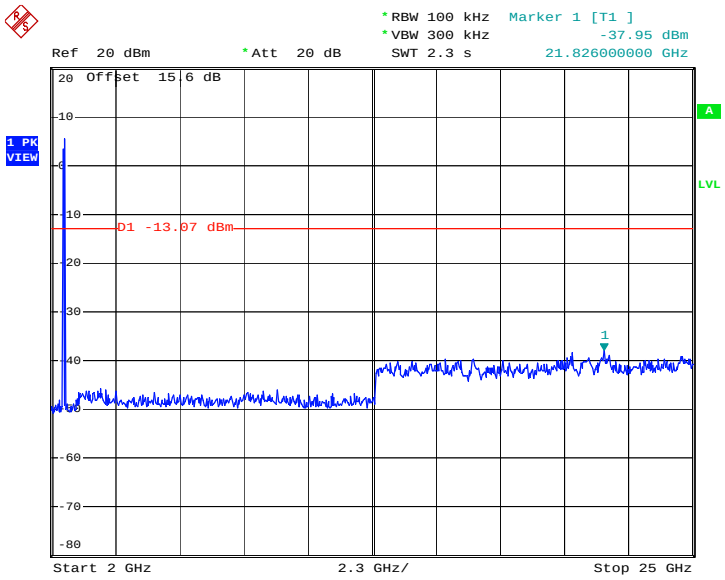
Conducted Spurious Emission Plot on Channel 11



Date: 31.MAR.2013 08:20:40

802.11b 2 GHz~25 GHz – Ant 2

Conducted Spurious Emission Plot on Channel 11

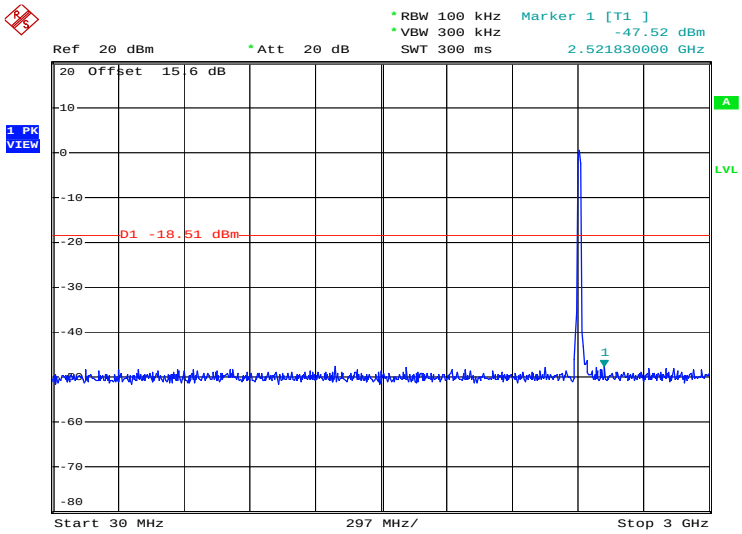


Date: 31.MAR.2013 08:20:59

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

802.11g 30 MHz~3 GHz – Ant 2

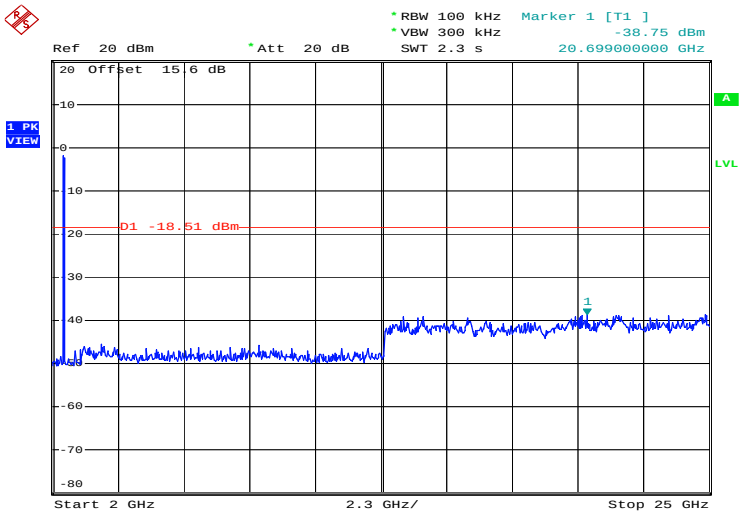
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:24:43

802.11g 2 GHz~25 GHz – Ant 2

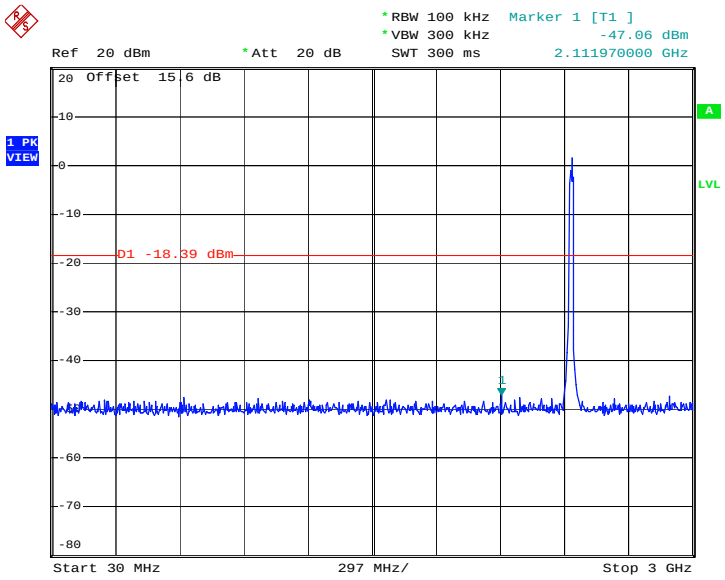
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:25:01

802.11g 30 MHz~3 GHz – Ant 2

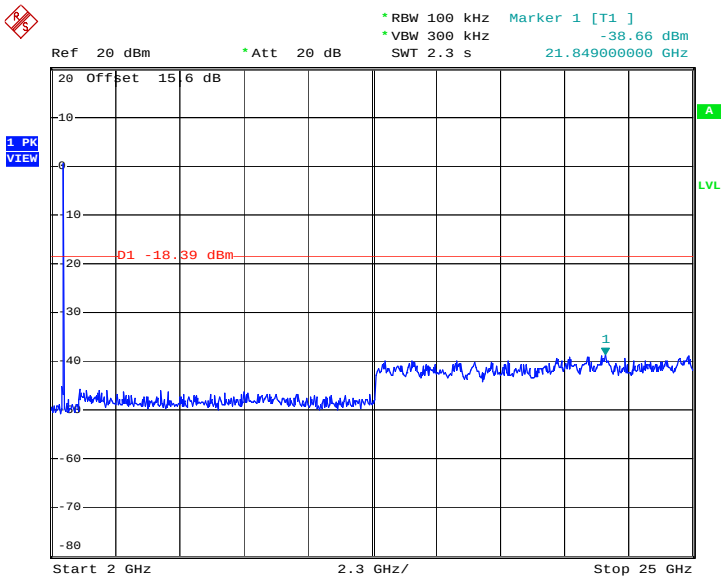
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:28:41

802.11g 2 GHz~25 GHz – Ant 2

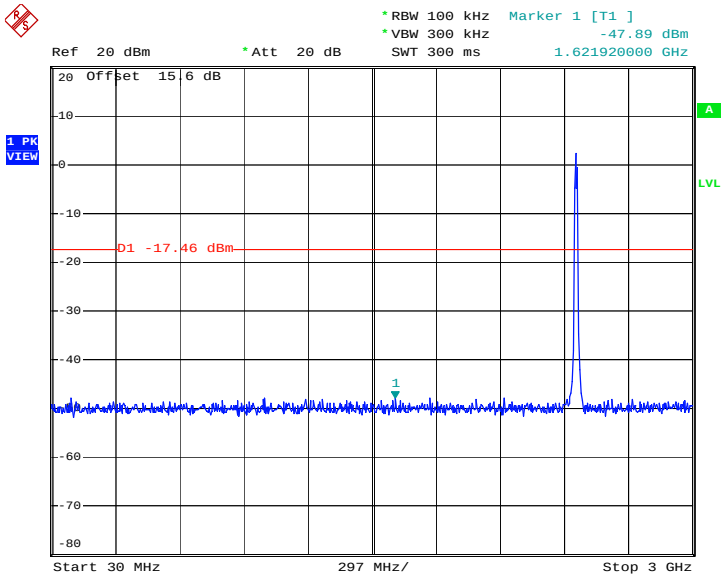
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:29:00

802.11g 30 MHz~3 GHz – Ant 2

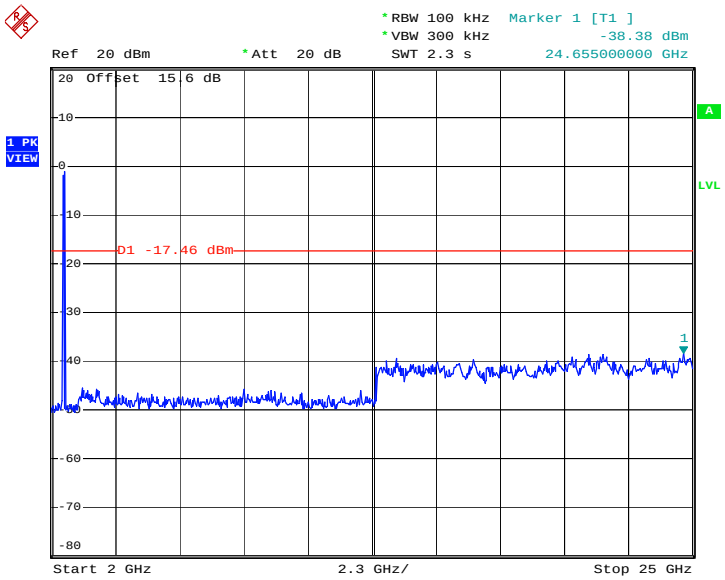
Conducted Spurious Emission Plot on Channel 11



Date: 31.MAR.2013 08:31:32

802.11g 2 GHz~25 GHz – Ant 2

Conducted Spurious Emission Plot on Channel 11

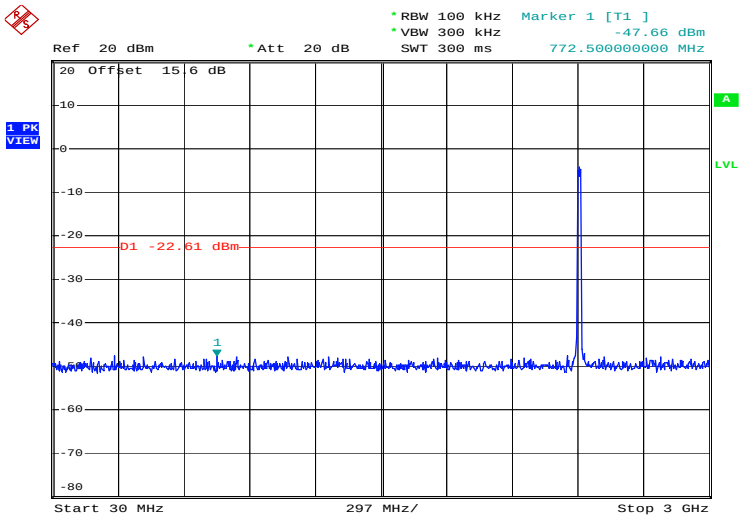


Date: 31.MAR.2013 08:31:51

Test Mode :	2.4GHz 802.11n HT20	Temperature :	23~24℃
Test Band :	30MHz-3GHz and 2GHz -25GHz	Relative Humidity :	47~48%
Test Channel :	01, 06, 11	Test Engineer :	Lizy Li

2.4GHz 802.11n HT20 30 MHz~3 GHz – MIMO Ant 1

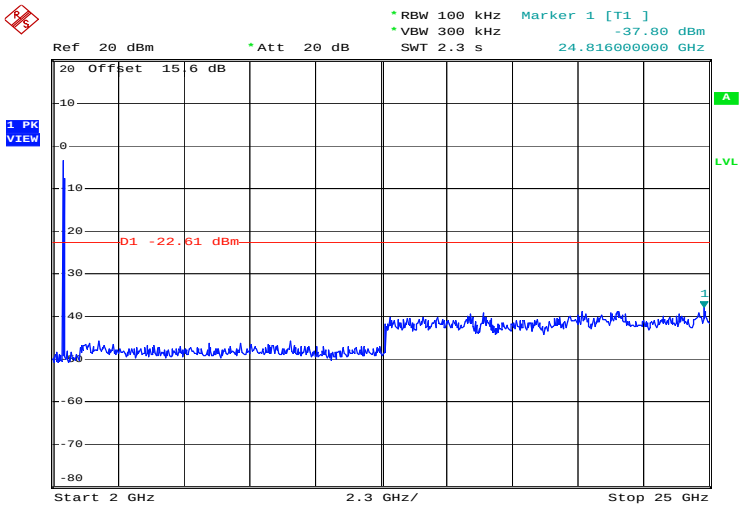
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:52:19

2.4GHz 802.11n HT20 2 GHz~25 GHz – MIMO Ant 1

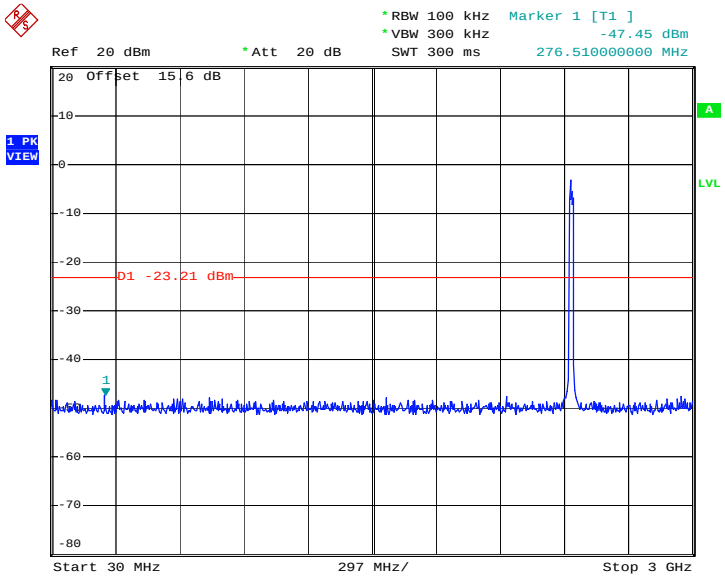
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:52:37

2.4GHz 802.11n HT20 30 MHz~3 GHz – MIMO Ant 1

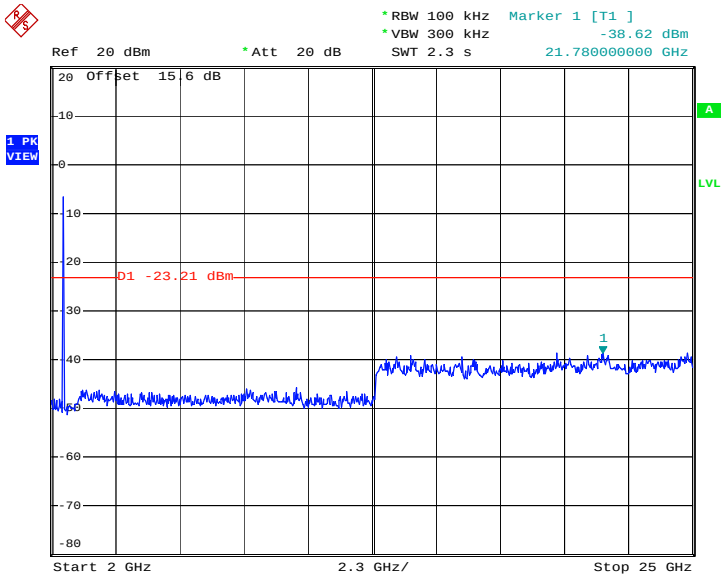
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:59:02

2.4GHz 802.11n HT20 2 GHz~25 GHz – MIMO Ant 1

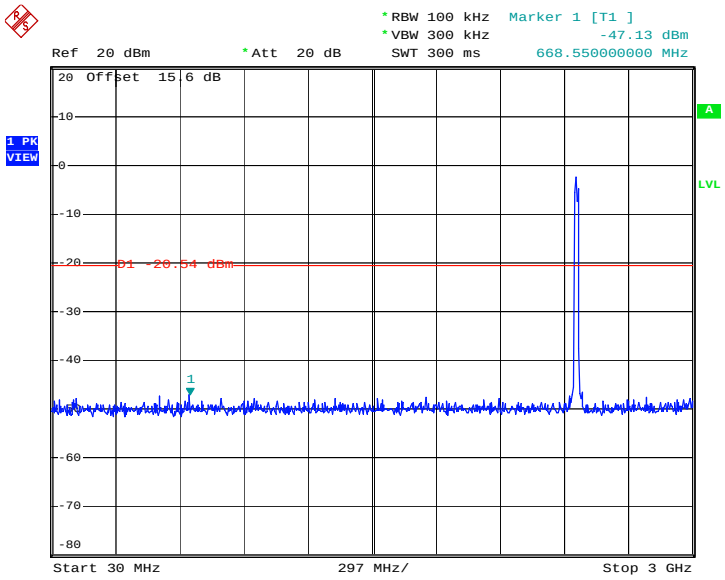
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:59:20

2.4GHz 802.11n HT20 30 MHz~3 GHz – MIMO Ant 1

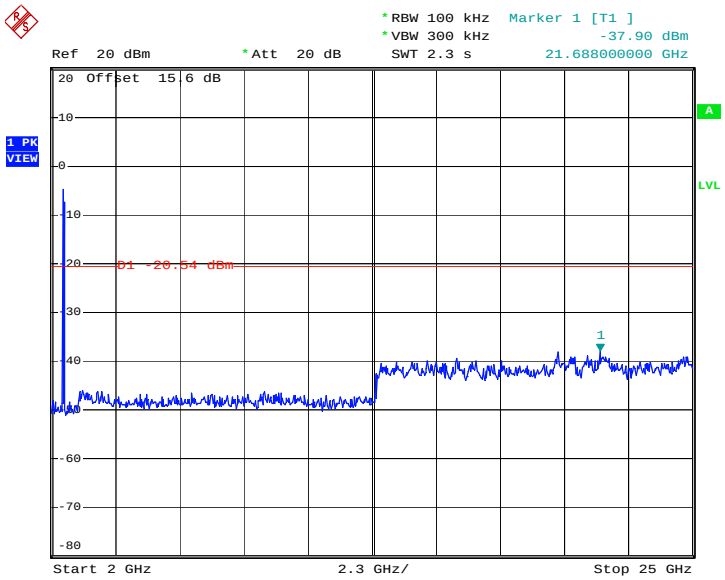
Conducted Spurious Emission Plot on Channel 11



Date: 31.MAR.2013 08:49:39

2.4GHz 802.11n HT20 2 GHz~25 GHz – MIMO Ant 1

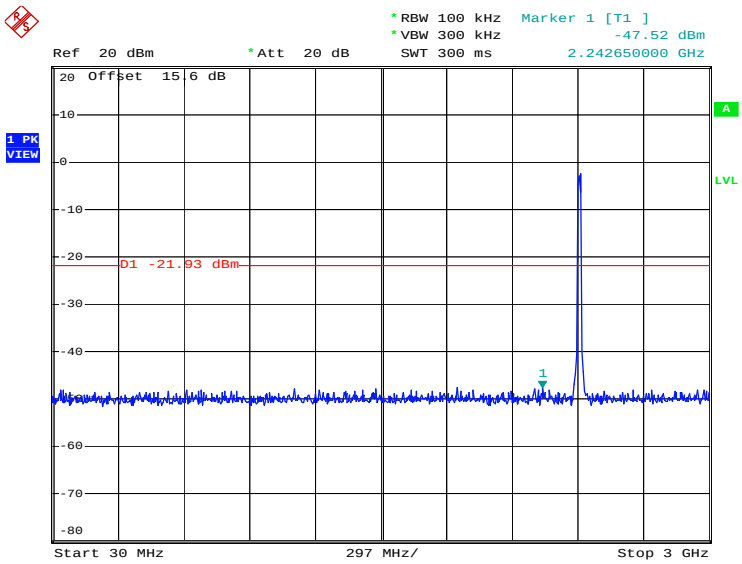
Conducted Spurious Emission Plot on Channel 11



Date: 31.MAR.2013 08:49:57

2.4GHz 802.11n HT20 30 MHz~3 GHz – MIMO Ant 2

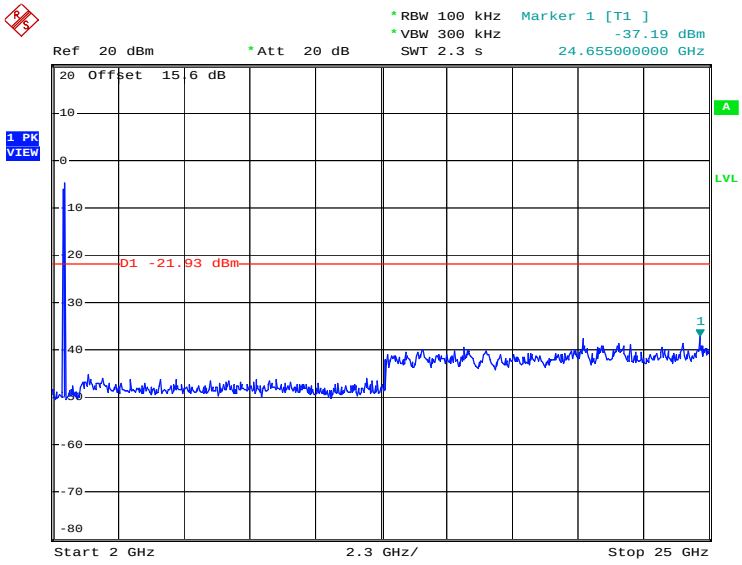
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:37:23

2.4GHz 802.11n HT20 2 GHz~25 GHz – MIMO Ant 2

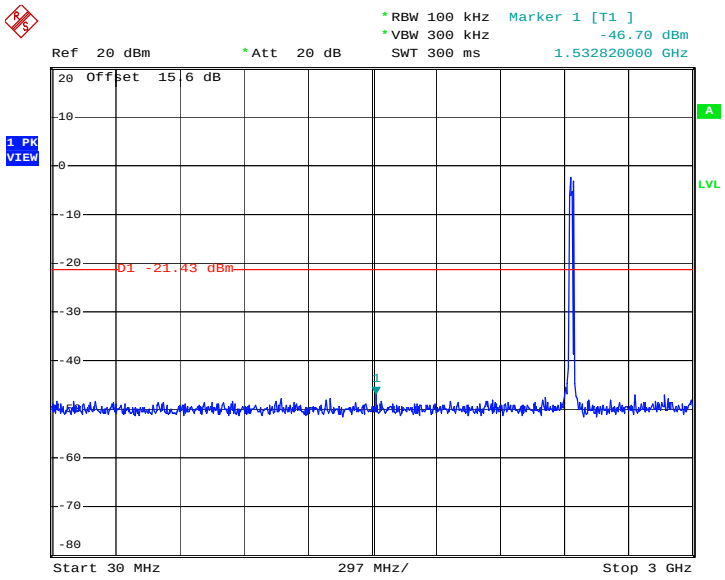
Conducted Spurious Emission Plot on Channel 01



Date: 31.MAR.2013 08:37:41

2.4GHz 802.11n HT20 30 MHz~3 GHz – MIMO Ant 2

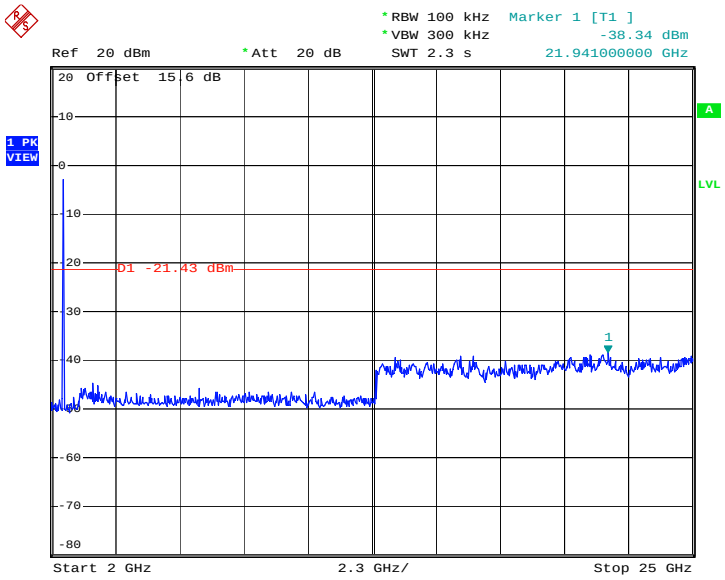
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:41:15

2.4GHz 802.11n HT20 2 GHz~25 GHz – MIMO Ant 2

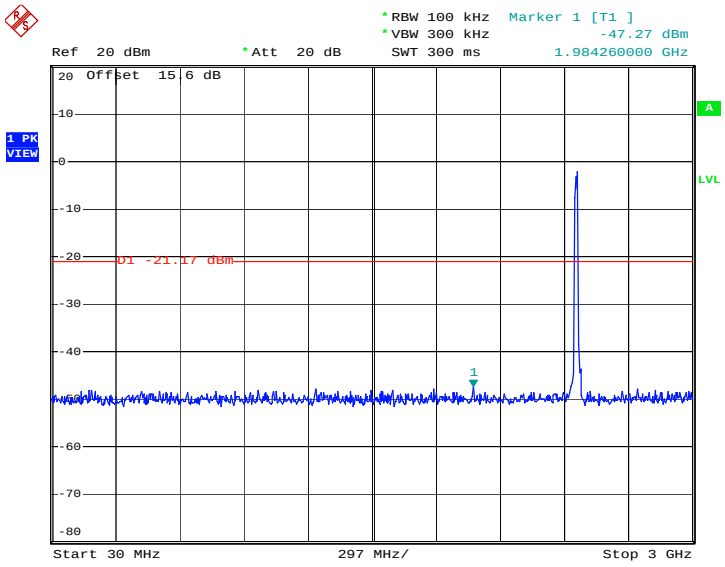
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 08:41:34

2.4GHz 802.11n HT20 30 MHz~3 GHz – MIMO Ant 2

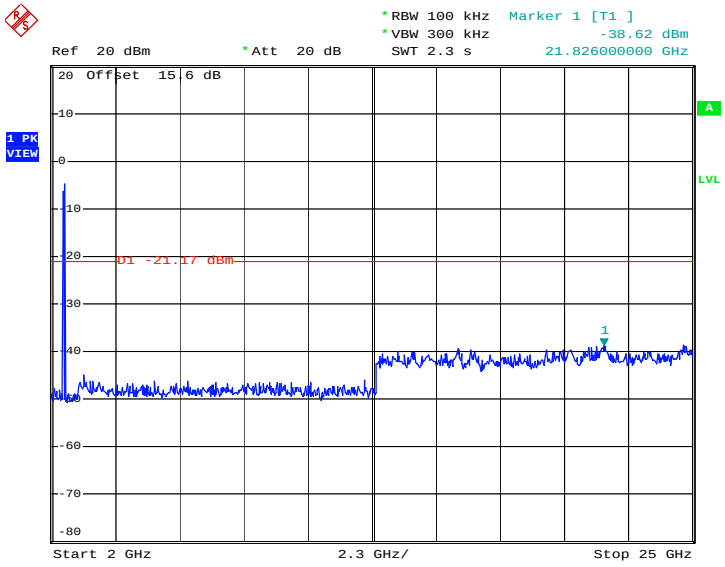
Conducted Spurious Emission Plot on Channel 11



Date: 31.MAR.2013 08:45:35

2.4GHz 802.11n HT20 2 GHz~25 GHz – MIMO Ant 2

Conducted Spurious Emission Plot on Channel 11

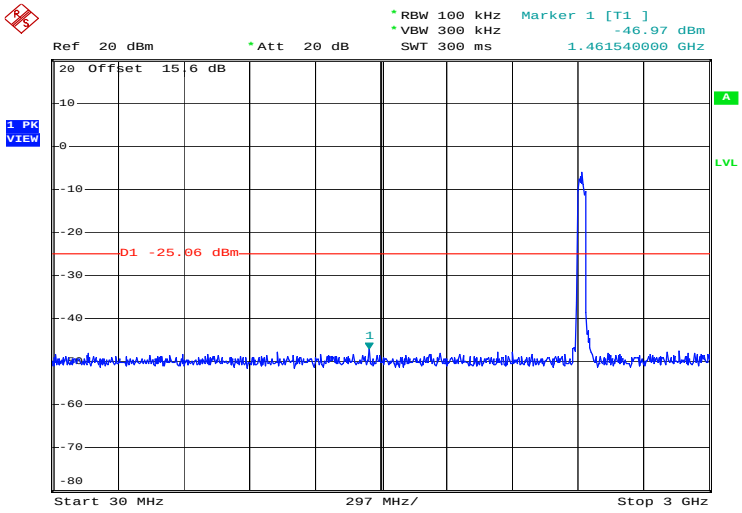


Date: 31.MAR.2013 08:45:53

Test Mode :	2.4GHz 802.11n HT40	Temperature :	23~24℃
Test Band :	30MHz-3GHz and 2GHz -25GHz	Relative Humidity :	47~48%
Test Channel :	03, 06, 09	Test Engineer :	Lizy Li

2.4GHz 802.11n HT40 30 MHz~3 GHz – MIMO Ant 1

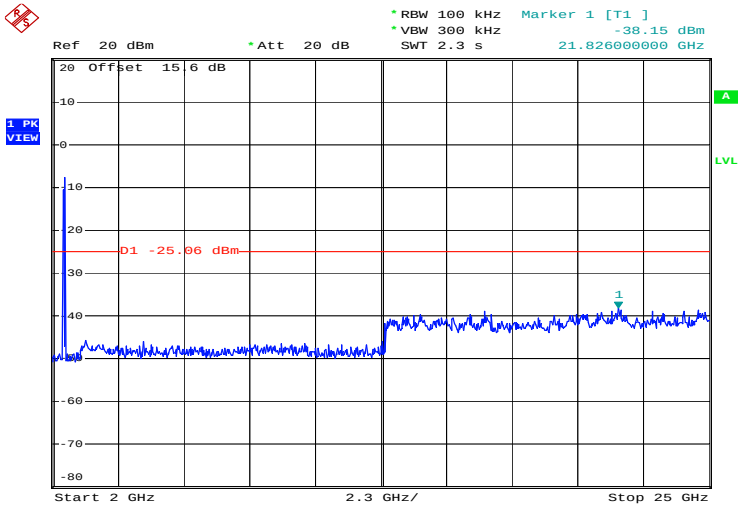
Conducted Spurious Emission Plot on Channel 03



Date: 31.MAR.2013 09:09:52

2.4GHz 802.11n HT40 2 GHz~25 GHz – MIMO Ant 1

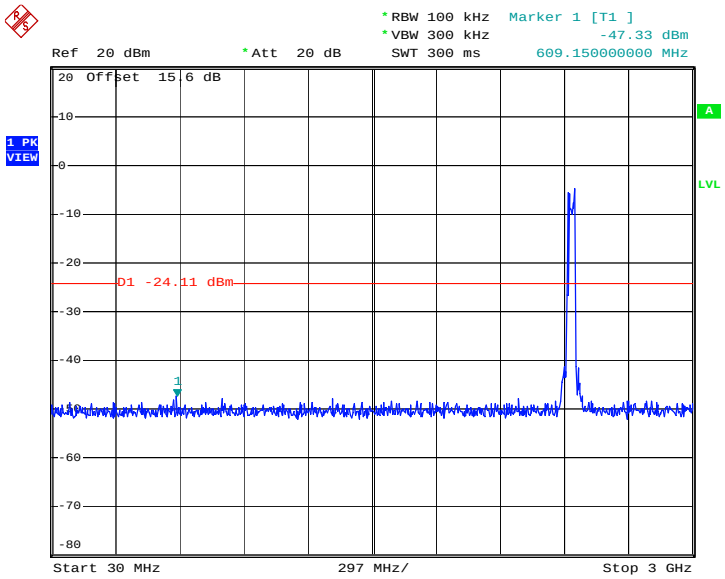
Conducted Spurious Emission Plot on Channel 03



Date: 31.MAR.2013 09:10:11

2.4GHz 802.11n HT40 30 MHz~3 GHz – MIMO Ant 1

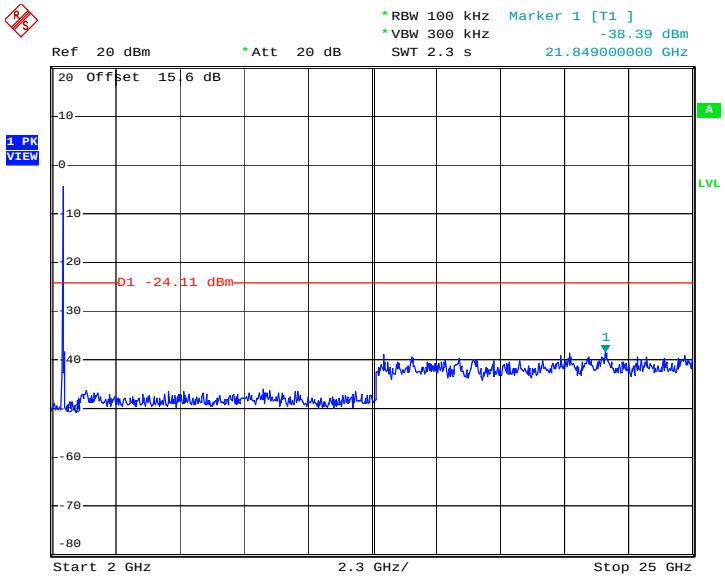
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 09:15:50

2.4GHz 802.11n HT40 2 GHz~25 GHz – MIMO Ant 1

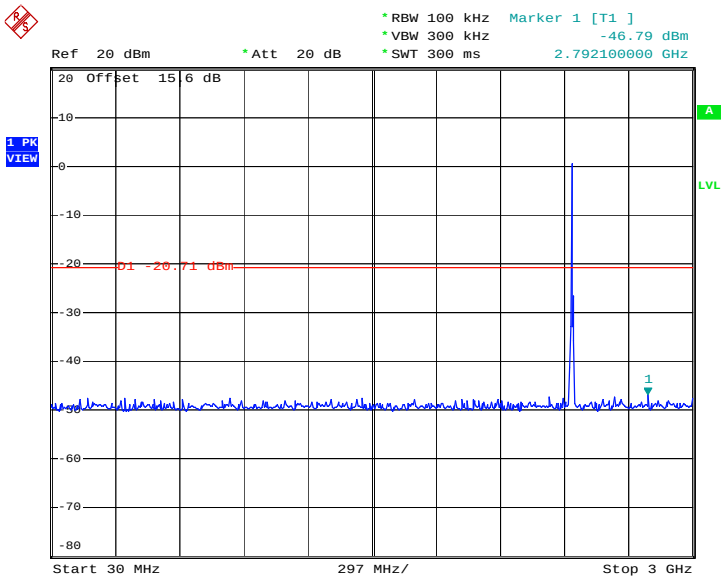
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 09:14:40

2.4GHz 802.11n HT40 30 MHz~3 GHz – MIMO Ant 1

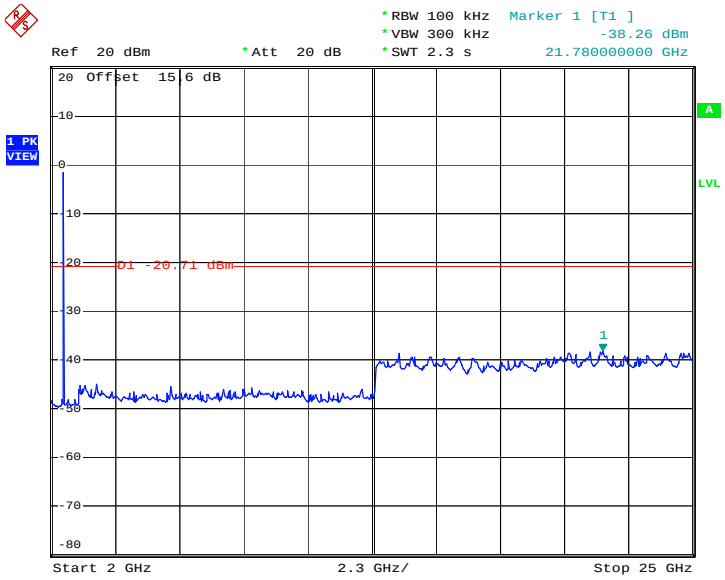
Conducted Spurious Emission Plot on Channel 09



Date: 22.APR.2013 18:54:05

2.4GHz 802.11n HT40 2 GHz~25 GHz – MIMO Ant 1

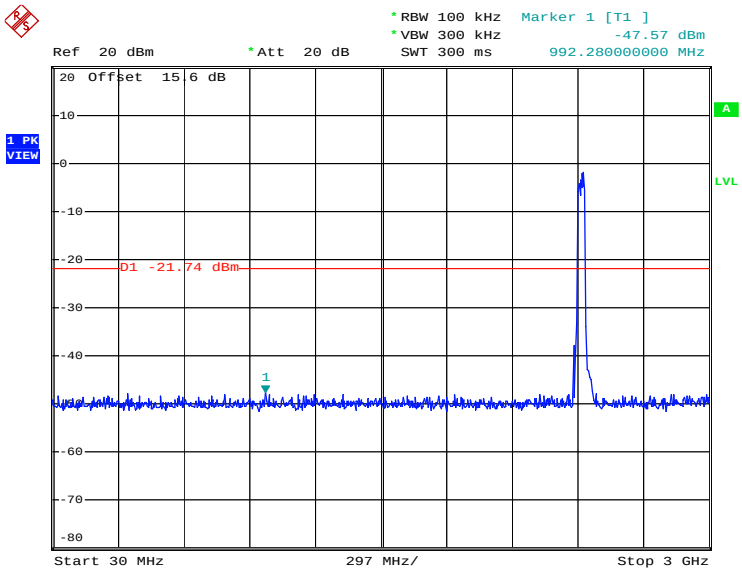
Conducted Spurious Emission Plot on Channel 09



Date: 22.APR.2013 18:55:04

2.4GHz 802.11n HT40 30 MHz~3 GHz – MIMO Ant 2

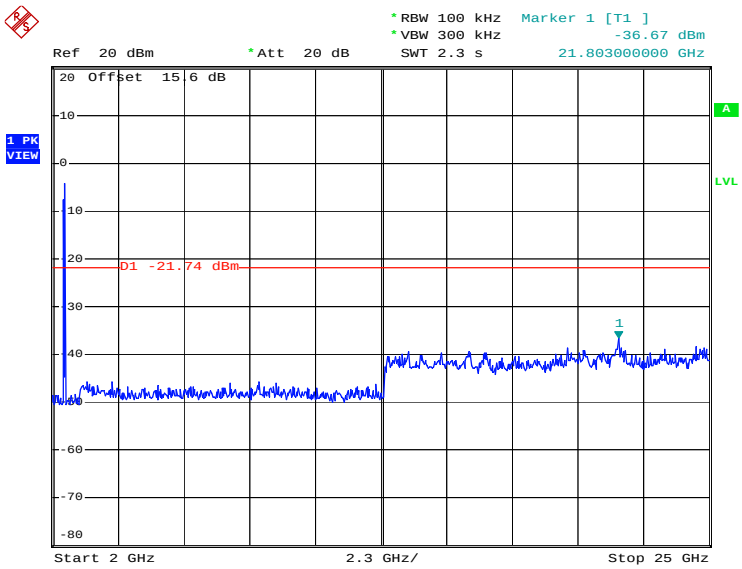
Conducted Spurious Emission Plot on Channel 03



Date: 31.MAR.2013 09:40:27

2.4GHz 802.11n HT40 2 GHz~25 GHz – MIMO Ant 2

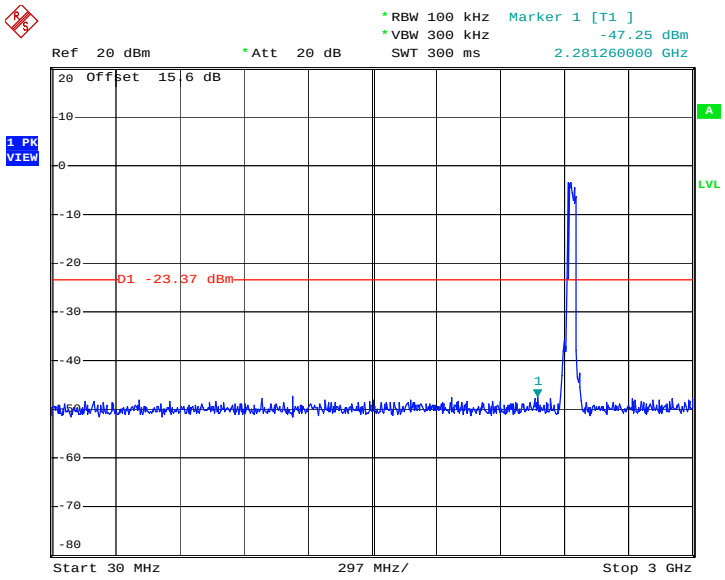
Conducted Spurious Emission Plot on Channel 03



Date: 31.MAR.2013 09:40:46

2.4GHz 802.11n HT40 30 MHz~3 GHz – MIMO Ant 2

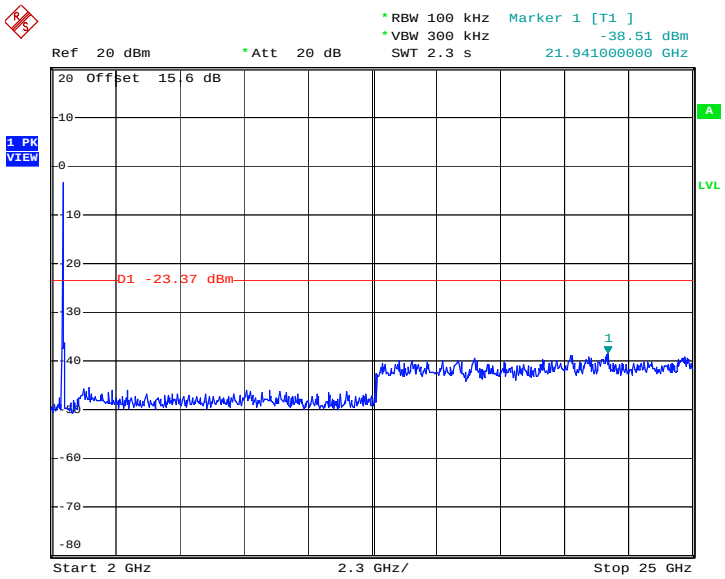
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 10:02:23

2.4GHz 802.11n HT40 2 GHz~25 GHz – MIMO Ant 2

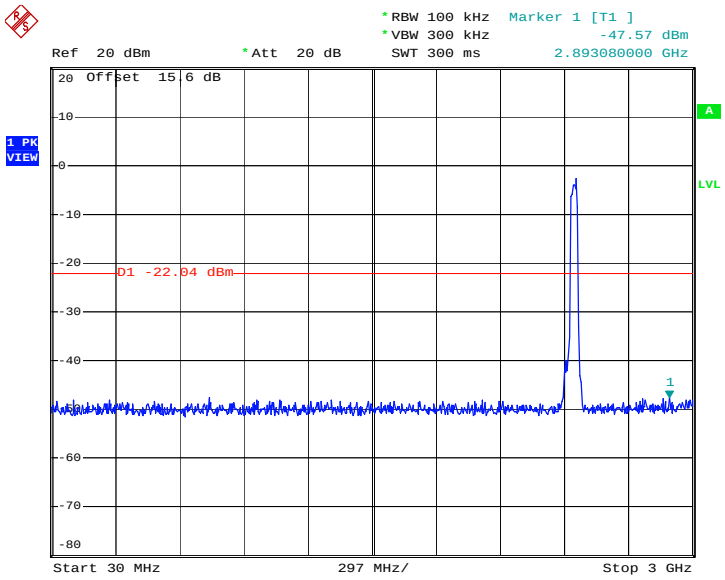
Conducted Spurious Emission Plot on Channel 06



Date: 31.MAR.2013 10:02:41

2.4GHz 802.11n HT40 30 MHz~3 GHz – MIMO Ant 2

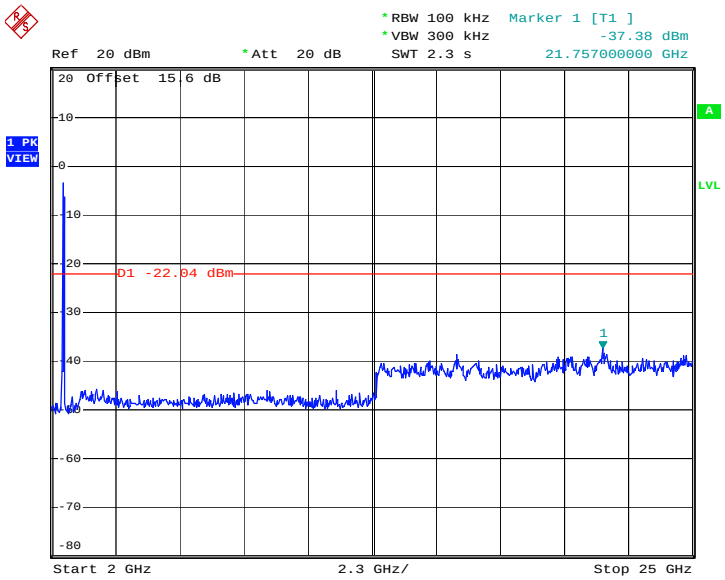
Conducted Spurious Emission Plot on Channel 09



Date: 31.MAR.2013 09:36:44

2.4GHz 802.11n HT40 2 GHz~25 GHz – MIMO Ant 2

Conducted Spurious Emission Plot on Channel 09

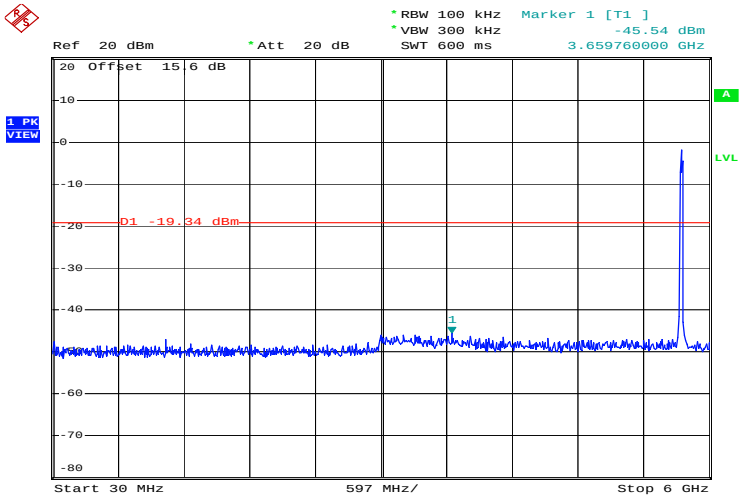


Date: 31.MAR.2013 09:37:02

Test Mode :	802.11a	Temperature :	23~24℃
Test Band :	30MHz-6GHz and 5GHz-40GHz	Relative Humidity :	47~48%
Test Channel :	149, 157, 165	Test Engineer :	Lizy Li

802.11a 30 MHz~6 GHz – Ant 1

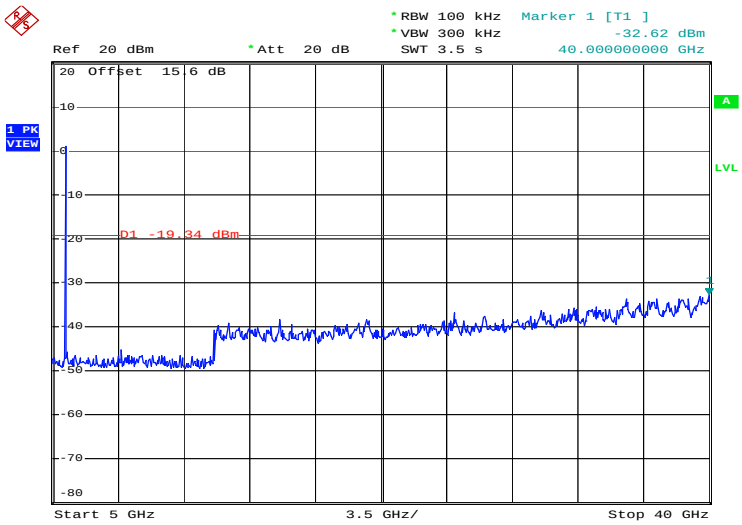
Conducted Spurious Emission Plot on Channel 149



Date: 1.APR.2013 12:17:49

802.11a 5 GHz~40 GHz – Ant 1

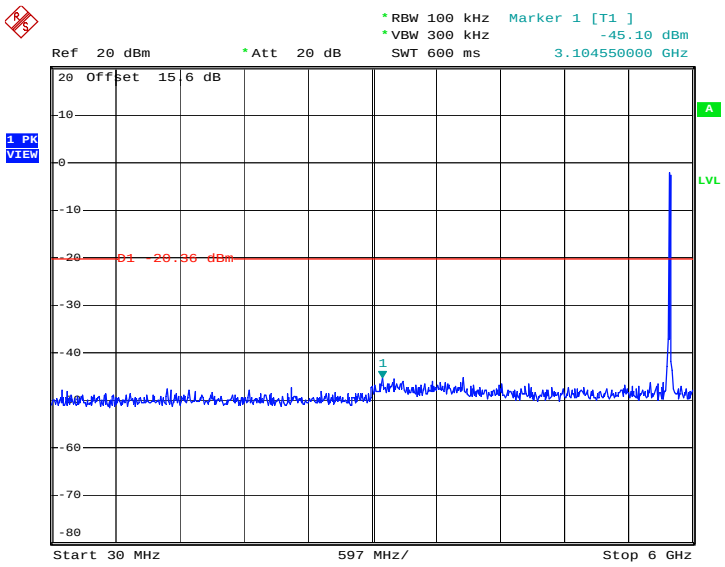
Conducted Spurious Emission Plot on Channel 149



Date: 1.APR.2013 12:18:07

802.11a 30 MHz~6 GHz – Ant 1

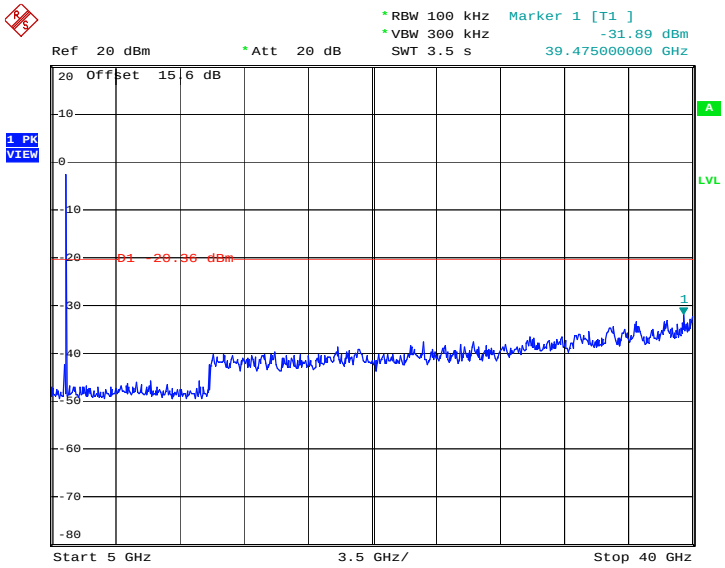
Conducted Spurious Emission Plot on Channel 157



Date: 1.APR.2013 12:20:41

802.11a 5 GHz~40 GHz – Ant 1

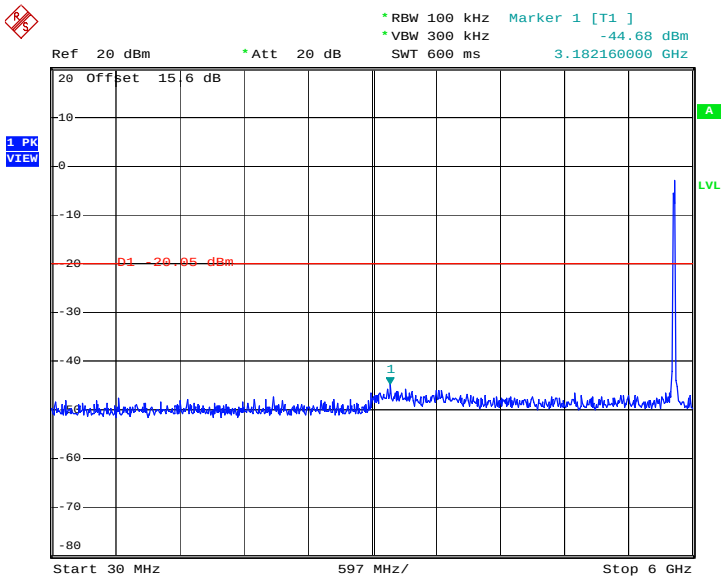
Conducted Spurious Emission Plot on Channel 157



Date: 1.APR.2013 12:20:59

802.11a 30 MHz~6 GHz – Ant 1

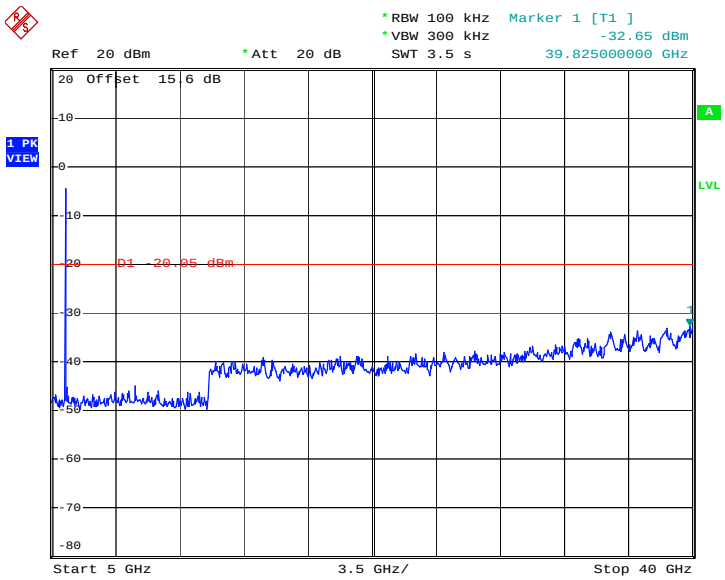
Conducted Spurious Emission Plot on Channel 165



Date: 1.APR.2013 12:23:14

802.11a 5 GHz~40 GHz – Ant 1

Conducted Spurious Emission Plot on Channel 165

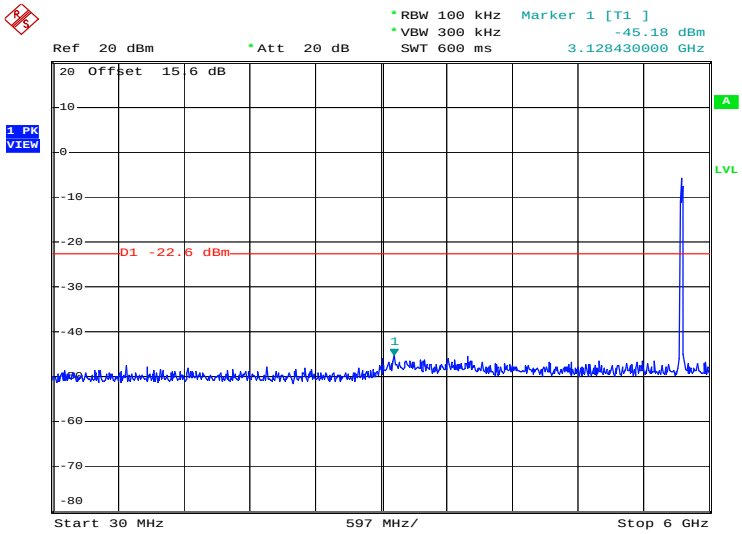


Date: 1.APR.2013 12:23:32

Test Mode :	5.8GHz 802.11n HT20	Temperature :	23~24℃
Test Band :	30MHz-6GHz and 5GHz-40GHz	Relative Humidity :	47~48%
Test Channel :	149, 157, 165	Test Engineer :	Lizy Li

5.8GHz 802.11n HT20 30 MHz~6 GHz – MIMO Ant.1

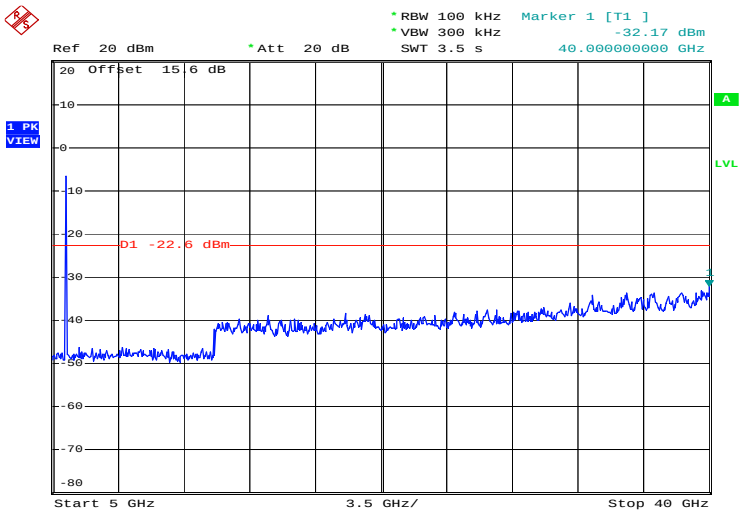
Conducted Spurious Emission Plot on Channel 149



Date: 1.APR.2013 12:27:00

5.8GHz 802.11n HT20 5 GHz~40 GHz – MIMO Ant.1

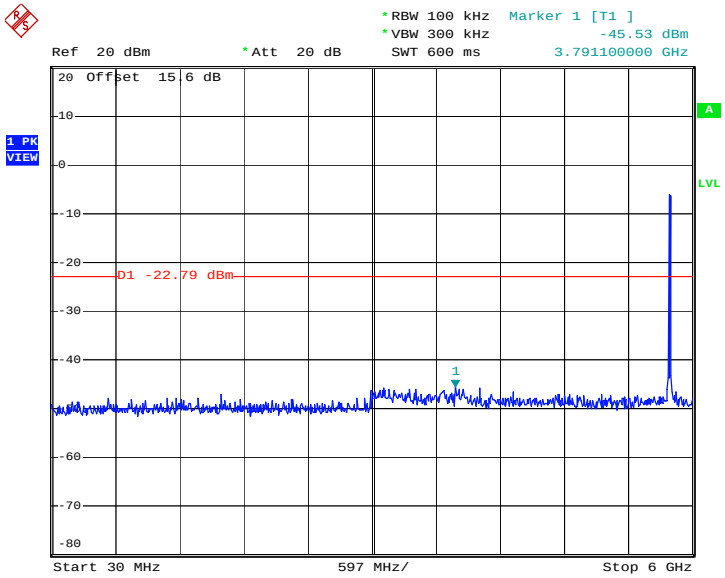
Conducted Spurious Emission Plot on Channel 149



Date: 1.APR.2013 12:27:18

5.8GHz 802.11n HT20 30 MHz~6 GHz – MIMO Ant.1

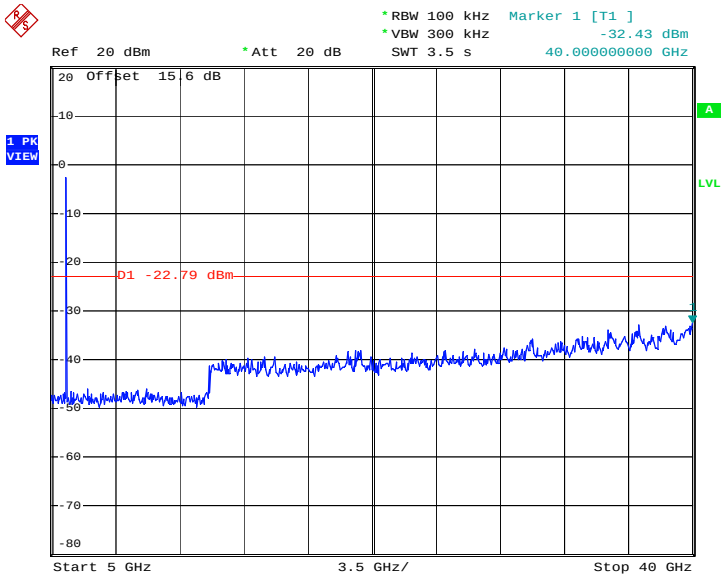
Conducted Spurious Emission Plot on Channel 157



Date: 1.APR.2013 12:29:55

5.8GHz 802.11n HT20 5 GHz~40 GHz – MIMO Ant.1

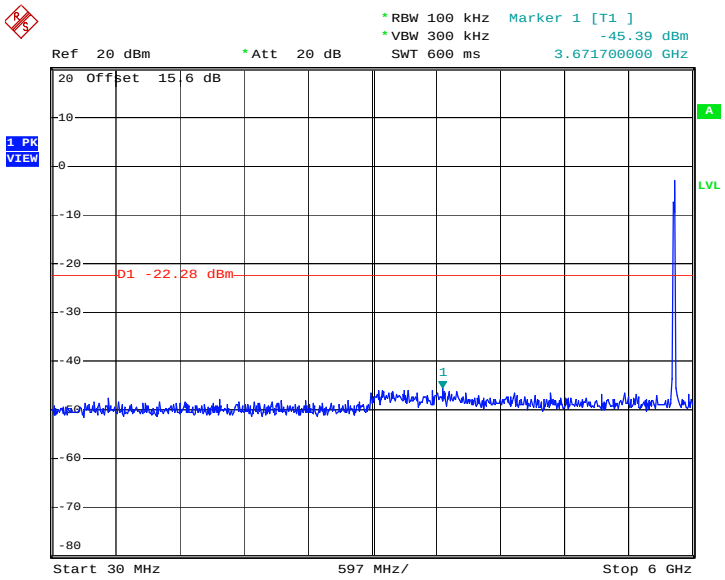
Conducted Spurious Emission Plot on Channel 157



Date: 1.APR.2013 12:30:13

5.8GHz 802.11n HT20 30 MHz~6 GHz – MIMO Ant.1

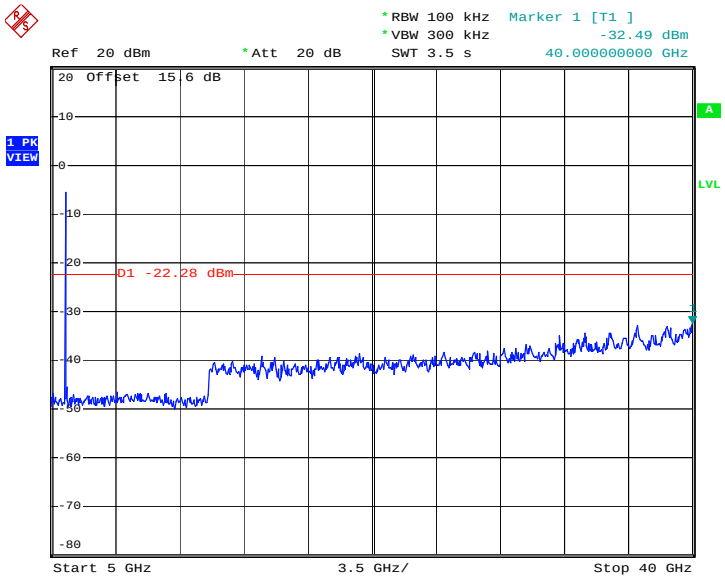
Conducted Spurious Emission Plot on Channel 165



Date: 1.APR.2013 12:32:48

5.8GHz 802.11n HT20 5 GHz~40 GHz – MIMO Ant.1

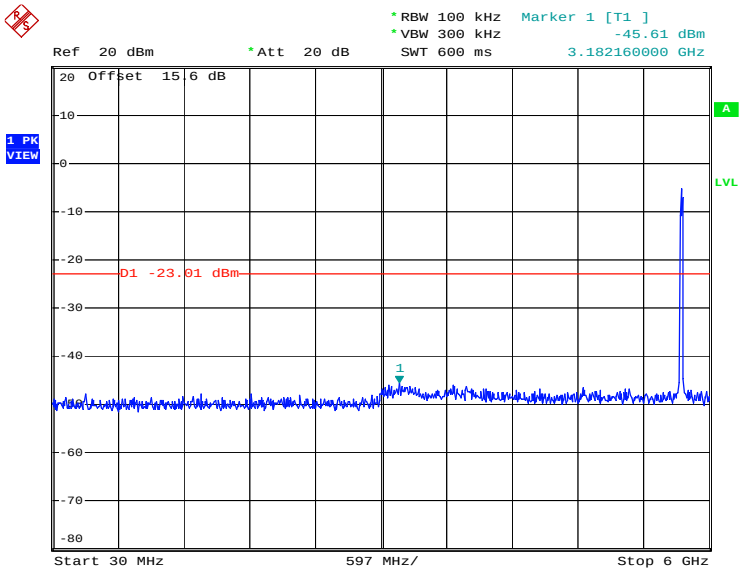
Conducted Spurious Emission Plot on Channel 165



Date: 1.APR.2013 12:33:06

5.8GHz 802.11n HT20 30 MHz~6 GHz – MIMO Ant.2

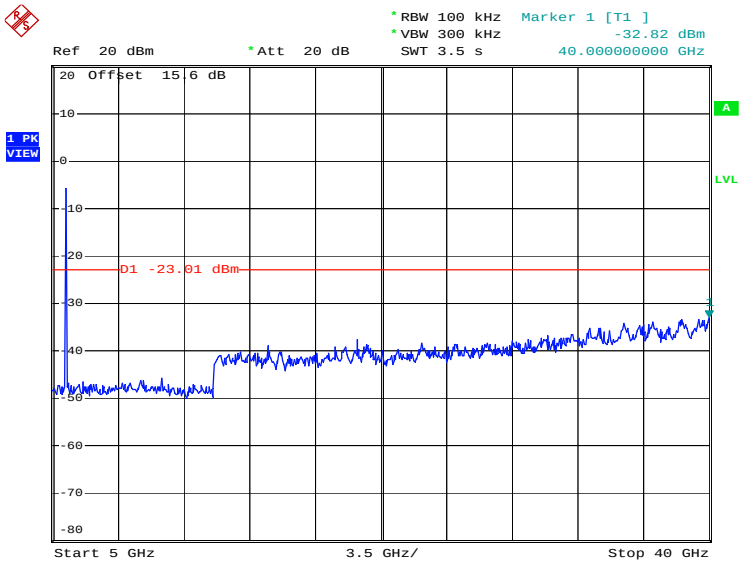
Conducted Spurious Emission Plot on Channel 149



Date: 1.APR.2013 11:42:06

5.8GHz 802.11n HT20 5 GHz~40 GHz – MIMO Ant.2

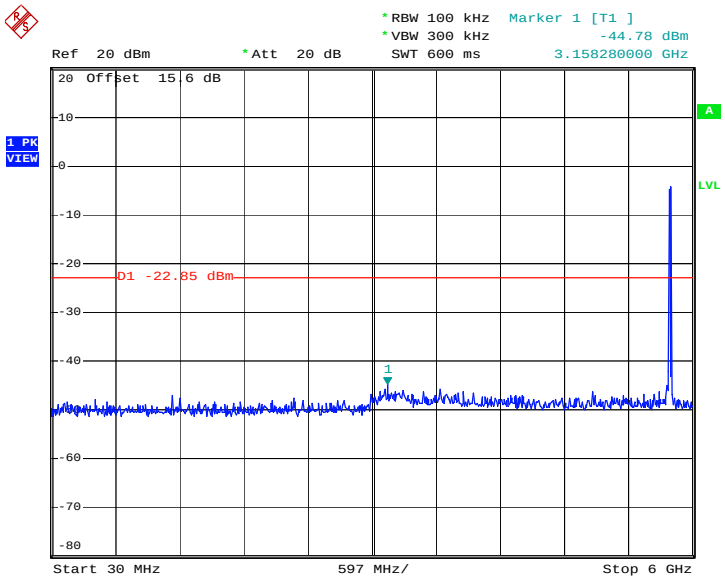
Conducted Spurious Emission Plot on Channel 149



Date: 1.APR.2013 11:42:25

5.8GHz 802.11n HT20 30 MHz~6 GHz – MIMO Ant.2

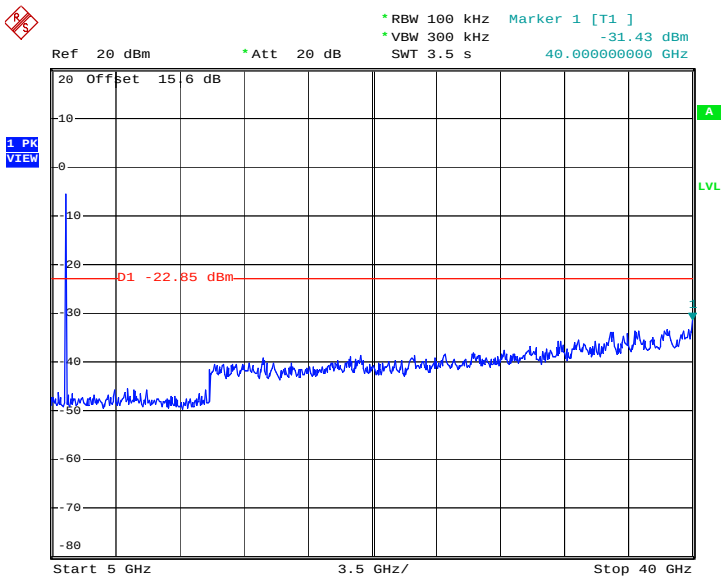
Conducted Spurious Emission Plot on Channel 157



Date: 1.APR.2013 11:45:45

5.8GHz 802.11n HT20 5 GHz~40 GHz – MIMO Ant.2

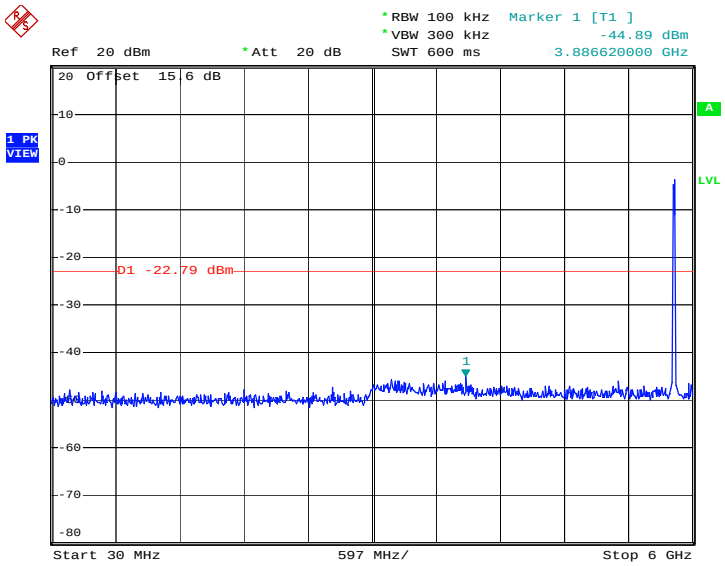
Conducted Spurious Emission Plot on Channel 157



Date: 1.APR.2013 11:46:03

5.8GHz 802.11n HT20 30 MHz~6 GHz – MIMO Ant.2

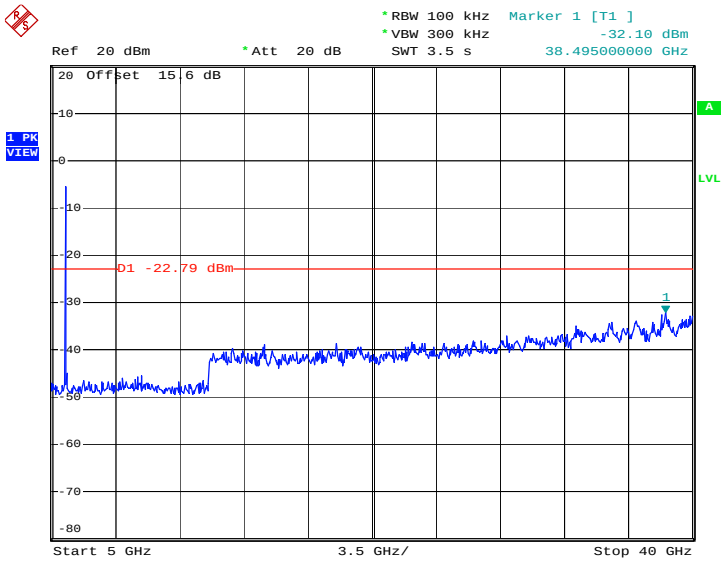
Conducted Spurious Emission Plot on Channel 165



Date: 1.APR.2013 11:48:38

5.8GHz 802.11n HT20 5 GHz~40 GHz – MIMO Ant.2

Conducted Spurious Emission Plot on Channel 165

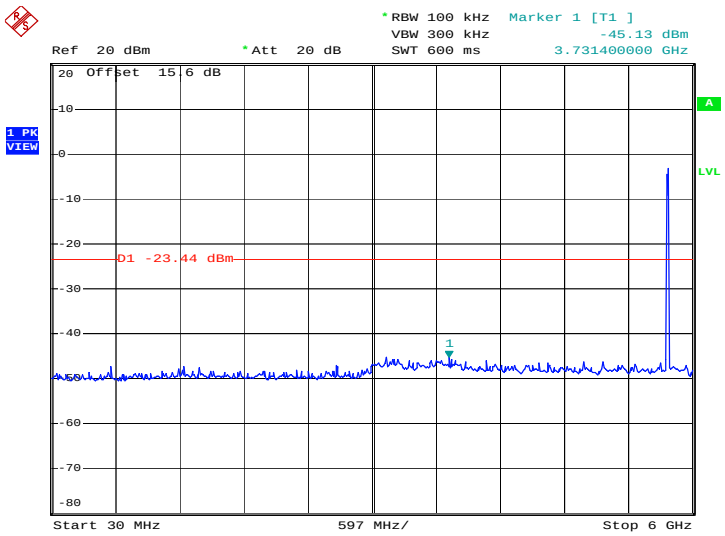


Date: 1.APR.2013 11:48:56

Test Mode :	5.8GHz 802.11n HT40	Temperature :	23~24℃
Test Band :	30MHz-6GHz and 5GHz -40GHz	Relative Humidity :	47~48%
Test Channel :	151 and 159	Test Engineer :	Lizy Li

5.8GHz 802.11n HT40 30 MHz~6 GHz – MIMO Ant.1

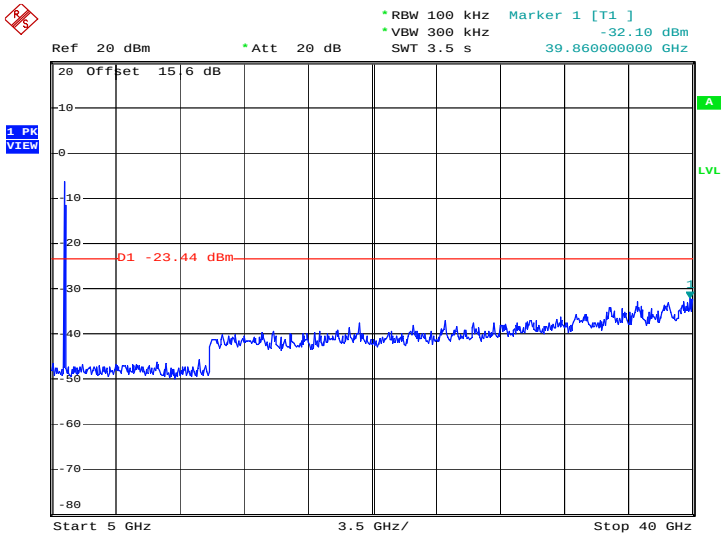
Conducted Spurious Emission Plot on Channel 151



Date: 17.APR.2013 01:29:42

5.8GHz 802.11n HT40 5 GHz~40 GHz – MIMO Ant.1

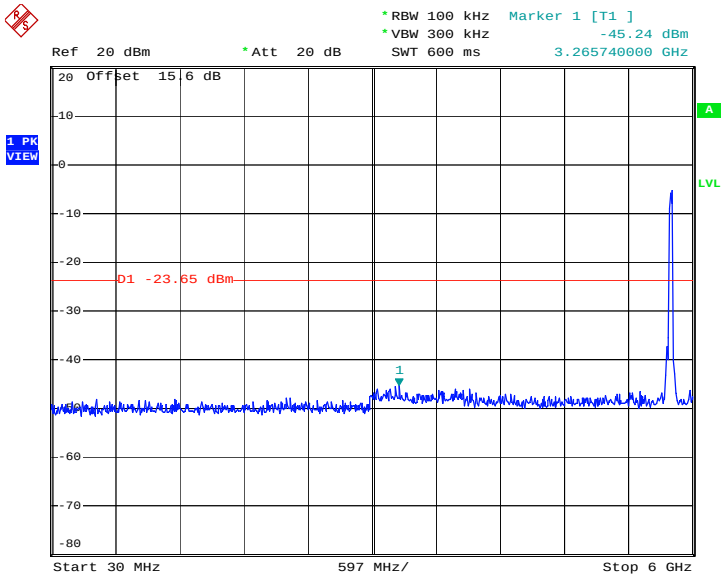
Conducted Spurious Emission Plot on Channel 151



Date: 1.APR.2013 12:37:04

5.8GHz 802.11n HT40 30 MHz~6 GHz – MIMO Ant.1

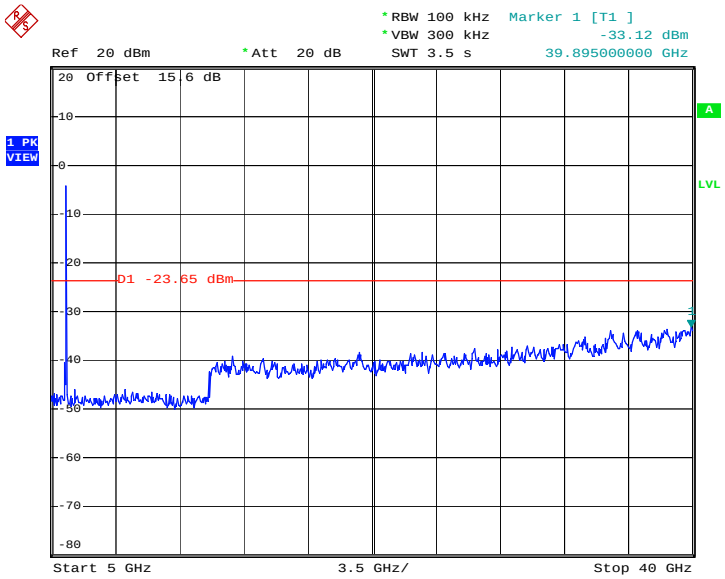
Conducted Spurious Emission Plot on Channel 159



Date: 1.APR.2013 12:39:44

5.8GHz 802.11n HT40 5 GHz~40 GHz – MIMO Ant.1

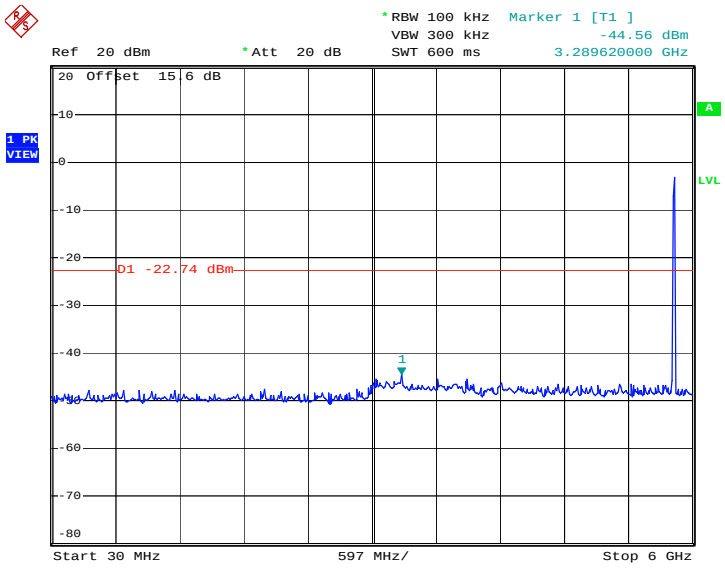
Conducted Spurious Emission Plot on Channel 159



Date: 1.APR.2013 12:40:02

5.8GHz 802.11n HT40 30 MHz~6 GHz – MIMO Ant.2

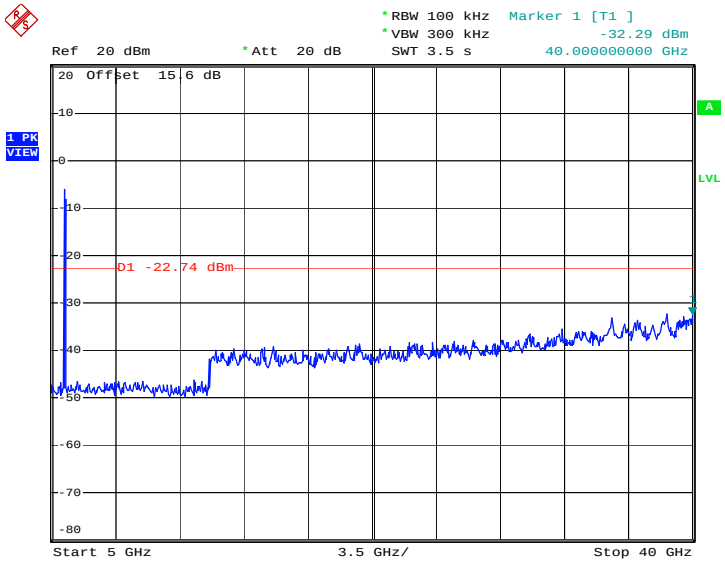
Conducted Spurious Emission Plot on Channel 151



Date: 17.APR.2013 01:52:15

5.8GHz 802.11n HT40 5 GHz~40 GHz – MIMO Ant.2

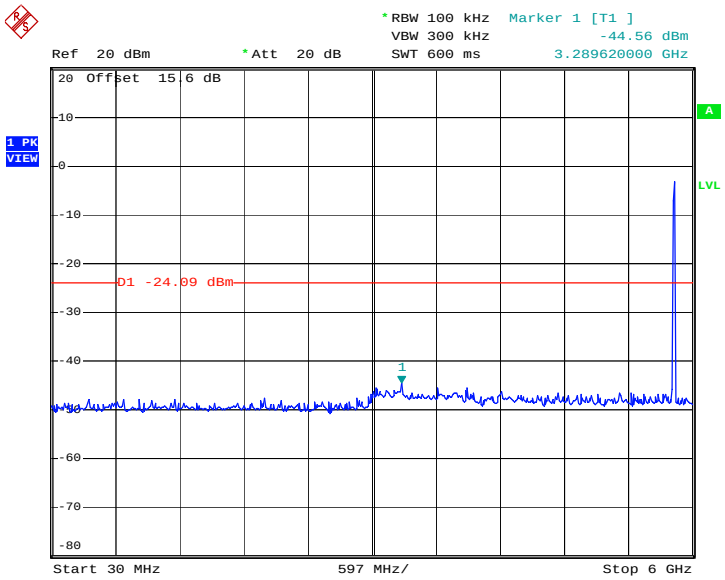
Conducted Spurious Emission Plot on Channel 151



Date: 1.APR.2013 11:53:43

5.8GHz 802.11n HT40 30 MHz~6 GHz – MIMO Ant.2

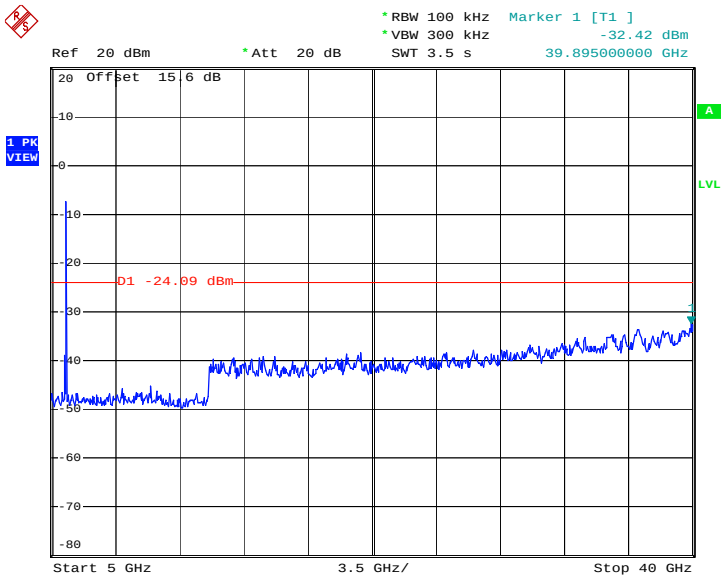
Conducted Spurious Emission Plot on Channel 159



Date: 17.APR.2013 01:52:40

5.8GHz 802.11n HT40 5 GHz~40 GHz – MIMO Ant.2

Conducted Spurious Emission Plot on Channel 159



Date: 1.APR.2013 11:58:11

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

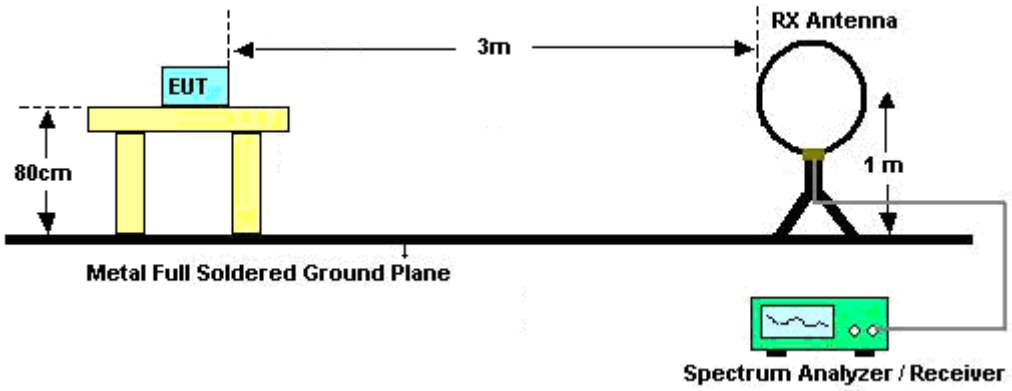
1. The testing follows the guidelines in ANSI C63.10-2009.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better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

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
Ant.2	802.11b	100.00	-	-	10Hz
Ant.2	802.11g	94.93	2.06	0.49	1K
MIMO Ant.1+2	2.4GHz 802.11n HT20	79.30	0.36	2.78	3K
MIMO Ant.1+2	2.4GHz 802.11n HT40	83.89	0.50	2.00	3K

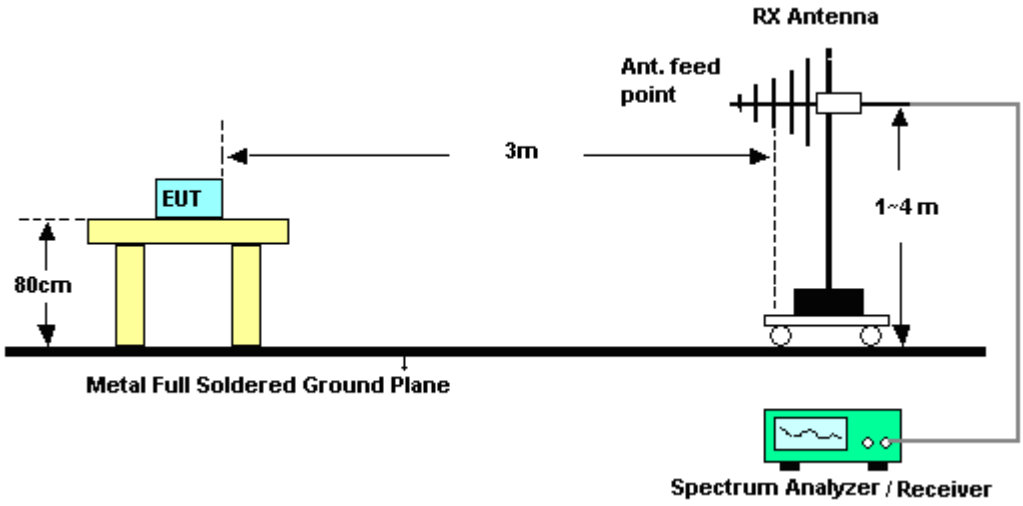
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

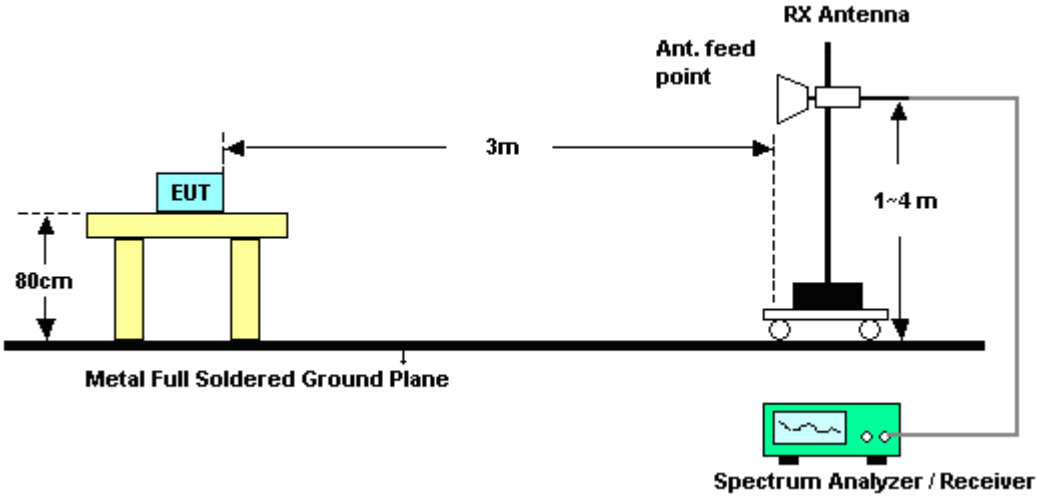
For radiated emissions below 30MHz



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.2	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	59.96	-14.04	74	56.65	32.3	6.91	35.9	135	19	Peak
2390	49.5	-4.5	54	46.19	32.3	6.91	35.9	135	19	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	50.1	-23.9	74	46.79	32.3	6.91	35.9	191	81	Peak
2390	39.87	-14.13	54	36.56	32.3	6.91	35.9	191	81	Average

Test Mode :	802.11b - Ant.2	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.68	60.84	-13.16	74	57.23	32.38	7.06	35.83	106	15	Peak
2483.5	50.95	-3.05	54	47.34	32.38	7.06	35.83	106	15	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.74	50.99	-23.01	74	47.38	32.38	7.06	35.83	151	82	Peak
2483.5	41.12	-12.88	54	37.51	32.38	7.06	35.83	151	82	Average

Test Mode :	802.11g - Ant.2	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	70.83	-3.17	74	67.52	32.3	6.91	35.9	104	14	Peak
2390	52.88	-1.12	54	49.57	32.3	6.91	35.9	104	14	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	62.91	-11.09	74	59.6	32.3	6.91	35.9	100	82	Peak
2390	46.43	-7.57	54	43.12	32.3	6.91	35.9	100	82	Average

Test Mode :	802.11g - Ant.2	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.59	67.33	-6.67	74	63.72	32.38	7.06	35.83	106	55	Peak
2485.54	50.33	-3.67	54	46.72	32.38	7.06	35.83	106	55	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.4	57.1	-16.9	74	53.49	32.38	7.06	35.83	152	138	Peak
2485.39	42.02	-11.98	54	38.41	32.38	7.06	35.83	152	138	Average

Test Mode :	2.4GHz 802.11n HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	01	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.29	67.32	-6.68	74	64.03	32.3	6.91	35.92	105	18	Peak
2389.65	51.35	-2.65	54	48.06	32.3	6.91	35.92	105	18	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.47	57.09	-16.91	74	53.8	32.3	6.91	35.92	100	80	Peak
2389.29	42.42	-11.58	54	39.13	32.3	6.91	35.92	100	80	Average

Test Mode :	2.4GHz 802.11n HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	11	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.95	62.93	-11.07	74	59.32	32.38	7.06	35.83	156	118	Peak
2483.53	47.98	-6.02	54	44.37	32.38	7.06	35.83	156	118	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.86	55.25	-18.75	74	51.64	32.38	7.06	35.83	152	148	Peak
2485.3	40.5	-13.5	54	36.89	32.38	7.06	35.83	152	148	Average

Test Mode :	2.4GHz 802.11n HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	03	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.11	64.44	-9.56	74	61.15	32.3	6.91	35.92	105	20	Peak
2389.92	50.47	-3.53	54	47.16	32.3	6.91	35.9	105	20	Average
2484.28	51.87	-22.13	74	48.26	32.38	7.06	35.83	105	20	Peak
2483.74	39.23	-14.77	54	35.62	32.38	7.06	35.83	105	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.84	55.96	-18.04	74	52.67	32.3	6.91	35.92	125	83	Peak
2389.11	41.62	-12.38	54	38.33	32.3	6.91	35.92	125	83	Average
2483.53	45.29	-28.71	74	41.68	32.38	7.06	35.83	125	83	Peak
2483.62	33.32	-20.68	54	29.71	32.38	7.06	35.83	125	83	Average

Test Mode :	2.4GHz 802.11n HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	09	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.65	48	-26	74	44.71	32.3	6.91	35.92	104	24	Peak
2390	36.5	-17.5	54	33.19	32.3	6.91	35.9	104	24	Average
2483.95	57.77	-16.23	74	54.16	32.38	7.06	35.83	104	24	Peak
2484.07	46.09	-7.91	54	42.48	32.38	7.06	35.83	104	24	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2382	44.78	-29.22	74	41.51	32.28	6.91	35.92	158	134	Peak
2388.21	33.4	-20.6	54	30.11	32.3	6.91	35.92	158	134	Average
2484.73	50.59	-23.41	74	46.98	32.38	7.06	35.83	158	134	Peak
2484.04	38.79	-15.21	54	35.18	32.38	7.06	35.83	158	134	Average

Test Mode :	802.11a - Ant.1	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	149	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	64.83	-19.54	84.37	53.61	35.33	10.04	34.15	164	11	Peak
5743	104.37	-	-	93.14	35.34	10.06	34.17	164	11	Peak
5743	94.4	-	-	83.17	35.34	10.06	34.17	164	11	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	61.26	-19.08	80.34	50.04	35.33	10.04	34.15	108	338	Peak
5747	100.34	-	-	89.11	35.34	10.06	34.17	108	338	Peak
5747	90.8	-	-	79.57	35.34	10.06	34.17	108	338	Average

Remark: 5725 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.

For example, 104.37 dBµV/m - 20dB = 84.37 dBµV/m.

Test Mode :	802.11a - Ant.1	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	165	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5850	59.97	-25.7	85.67	48.74	35.41	10.13	34.31	150	10	Peak
5827	105.67	-	-	94.43	35.4	10.11	34.27	150	10	Peak
5827	95.38	-	-	84.14	35.4	10.11	34.27	150	10	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5850	55.02	-24.7	79.72	43.79	35.41	10.13	34.31	146	45	Peak
5825	99.72	-	-	88.48	35.4	10.11	34.27	146	45	Peak
5825	89.69	-	-	78.45	35.4	10.11	34.27	146	45	Average

Remark: 5850 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.

Test Mode :	5.8GHz 802.11n HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	149	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	71.45	-13.8	85.25	60.23	35.33	10.04	34.15	164	21	Peak
5743	105.25	-	-	94.02	35.34	10.06	34.17	164	21	Peak
5743	95.33	-	-	84.1	35.34	10.06	34.17	164	21	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	65.77	-19.11	84.88	54.55	35.33	10.04	34.15	134	338	Peak
5743	104.88	-	-	93.65	35.34	10.06	34.17	134	338	Peak
5743	93.39	-	-	82.16	35.34	10.06	34.17	134	338	Average

Remark: 5725 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.

Test Mode :	5.8GHz 802.11n HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	165	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5850	63.55	-23.16	86.71	52.32	35.41	10.13	34.31	149	4	Peak
5823	106.71	-	-	95.47	35.4	10.11	34.27	149	4	Peak
5823	94.97	-	-	83.73	35.4	10.11	34.27	149	4	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5850	60.8	-21.58	82.38	49.57	35.41	10.13	34.31	145	52	Peak
5827	102.38	-	-	91.14	35.4	10.11	34.27	145	52	Peak
5827	91.22	-	-	79.98	35.4	10.11	34.27	145	52	Average

Remark: 5850 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.

Test Mode :	5.8GHz 802.11n HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	Low	Relative Humidity :	51~53%
Test Channel :	151	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	62.82	-17.94	80.76	51.6	35.33	10.04	34.15	152	8	Peak
5850	53.72	-27.04	80.76	42.49	35.41	10.13	34.31	152	8	Peak
5757	100.76	-	-	89.54	35.36	10.06	34.2	152	8	Peak
5757	90.55	-	-	79.33	35.36	10.06	34.2	152	8	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	58.9	-19.04	77.94	47.68	35.33	10.04	34.15	168	331	Peak
5850	51.49	-26.45	77.94	40.26	35.41	10.13	34.31	168	331	Peak
5757	97.94	-	-	86.72	35.36	10.06	34.2	168	331	Peak
5757	88.09	-	-	76.87	35.36	10.06	34.2	168	331	Average

Remark: 5725 MHz and 5850 MHz are not within restricted banda, and their limit lines are 20dB below the highest emission level.

Test Mode :	5.8GHz 802.11n HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Band :	High	Relative Humidity :	51~53%
Test Channel :	159	Test Engineer :	Marlboro Chang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	53.31	-27.55	80.86	42.09	35.33	10.04	34.15	165	20	Peak
5850	52.6	-28.26	80.86	41.37	35.41	10.13	34.31	165	20	Peak
5797	100.86	-	-	89.62	35.38	10.09	34.23	165	20	Peak
5797	90.89	-	-	79.65	35.38	10.09	34.23	165	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5725	51.44	-25.21	76.65	40.22	35.33	10.04	34.15	147	47	Peak
5850	52.68	-23.97	76.65	41.45	35.41	10.13	34.31	147	47	Peak
5797	96.65	-	-	85.41	35.38	10.09	34.23	147	47	Peak
5797	85.48	-	-	74.24	35.38	10.09	34.23	147	47	Average

Remark: 5725 MHz and 5850 MHz are not within restricted banda, and their limit lines are 20dB below the highest emission level.

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

Note: Below 1GHz for radiated emission measurement, pre-scanned all test modes and only choose the worst case mode was recorded in the report.

Test Mode :	802.11b – Ant.2	**Temperature :**	21~23°C
Test Channel :	01	**Relative Humidity :**	51~53%
Test Engineer :	Marlboro Chang	**Polarization :**	Horizontal
Remark :	1. 2413 MHz is fundamental signal which can be ignored. 2. 7233 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 109.32 dBuV/m - 20dB = 89.32 dBuV/m. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2413	103.7	-	-	100.34	32.31	6.95	35.9	135	19	Average
2413	109.32	-	-	105.96	32.31	6.95	35.9	135	19	Peak
4824	51.24	-2.76	54	65.97	33.97	8.77	57.47	100	331	Average
4824	53.75	-20.25	74	68.48	33.97	8.77	57.47	100	331	Peak
7233	44.87	-44.45	89.32	56.47	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11b – Ant.2	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2413 MHz is Fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2413	93.99	-	-	90.63	32.31	6.95	35.9	191	81	Average
2413	99.18	-	-	95.82	32.31	6.95	35.9	191	81	Peak
4824	49.32	-24.68	74	64.05	33.97	8.77	57.47	100	0	Peak
7236	45.27	-33.91	79.18	56.87	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11b – Ant.2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2438 MHz is Fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	19.22	-20.78	40	30.56	20	0.53	31.87	100	46	Peak
132.6	11.49	-32.01	43.5	30.33	11.54	1.16	31.54	-	-	Peak
266.52	19.95	-26.05	46	36.79	12.83	1.62	31.29	-	-	Peak
384	17.3	-28.7	46	30.95	15.58	2.11	31.34	-	-	Peak
602.4	20.33	-25.67	46	28.34	19.82	2.7	30.53	-	-	Peak
774.6	22.9	-23.1	46	28.43	21.72	3.1	30.35	-	-	Peak
2438	101.29	-	-	97.83	32.35	6.99	35.88	160	108	Average
2438	107.04	-	-	103.58	32.35	6.99	35.88	160	108	Peak
4875	52.94	-1.06	54	67.65	33.95	8.82	57.48	100	331	Average
4875	56.37	-17.63	74	71.08	33.95	8.82	57.48	100	331	Peak
7314	43.92	-30.08	74	55.49	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11b – Ant.2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2436 MHz is Fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.89	20.91	-19.09	40	33.67	18.56	0.55	31.87	100	58	Peak
88.05	21.37	-22.13	43.5	43.69	8.42	0.93	31.67	-	-	Peak
242.49	12.89	-33.11	46	30.49	12.06	1.53	31.19	-	-	Peak
500.2	18.59	-27.41	46	28.93	18.1	2.45	30.89	-	-	Peak
813.8	23.86	-22.14	46	28.71	22.24	3.18	30.27	-	-	Peak
960.1	25.01	-28.99	54	28.3	24	3.47	30.76	-	-	Peak
2436	94.95	-	-	91.51	32.33	6.99	35.88	196	83	Average
2436	99.98	-	-	96.54	32.33	6.99	35.88	196	83	Peak
4875	50.25	-3.75	54	64.96	33.95	8.82	57.48	100	87	Average
4875	52.48	-21.52	74	67.19	33.95	8.82	57.48	100	87	Peak
7311	45.95	-28.05	74	57.52	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11b – Ant.2	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2463 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2463	103.93	-	-	100.39	32.37	7.02	35.85	106	15	Average
2463	109.1	-	-	105.56	32.37	7.02	35.85	106	15	Peak
4923	51.25	-2.75	54	65.93	33.93	8.87	57.48	137	349	Average
4923	53.31	-20.69	74	67.99	33.93	8.87	57.48	137	349	Peak
7386	43.28	-30.72	74	54.85	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11b – Ant.2	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	95.34	-	-	91.8	32.37	7.02	35.85	151	82	Average
2462	100.33	-	-	96.79	32.37	7.02	35.85	151	82	Peak
4923	50.1	-23.9	74	64.78	33.93	8.87	57.48	100	0	Peak
7389	46.84	-27.16	74	58.41	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11g – Ant.2	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2413 MHz is Fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
42.96	13.43	-26.57	40	32.84	11.7	0.64	31.75	-	-	Peak
154.74	11.54	-31.96	43.5	30.86	10.85	1.22	31.39	-	-	Peak
192	13.11	-30.39	43.5	34.12	9.02	1.29	31.32	-	-	Peak
426.7	16.91	-29.09	46	29.32	16.57	2.23	31.21	-	-	Peak
680.1	21.5	-24.5	46	28.59	20.44	2.9	30.43	-	-	Peak
797	23.63	-22.37	46	28.61	22.06	3.14	30.18	100	146	Peak
2413	99.49	-	-	96.13	32.31	6.95	35.9	104	14	Average
2413	108.9	-	-	105.54	32.31	6.95	35.9	104	14	Peak
4827	49.62	-24.38	74	64.35	33.97	8.77	57.47	100	0	Peak
7236	42.26	-46.64	88.9	53.86	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11g – Ant.2	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2413 MHz is Fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.35	19.97	-20.03	40	32.02	19.28	0.54	31.87	100	87	Peak
75.9	11.39	-28.61	40	35.21	7.06	0.86	31.74	-	-	Peak
162.3	11.1	-32.4	43.5	30.94	10.31	1.22	31.37	-	-	Peak
465.9	17.2	-28.8	46	28.59	17.37	2.34	31.1	-	-	Peak
630.4	21.21	-24.79	46	28.82	20.04	2.78	30.43	-	-	Peak
761.3	22.87	-23.13	46	28.72	21.52	3.08	30.45	-	-	Peak
2413	91.69	-	-	88.33	32.31	6.95	35.9	100	82	Average
2413	101.03	-	-	97.67	32.31	6.95	35.9	100	82	Peak
4824	46.58	-27.42	74	61.31	33.97	8.77	57.47	100	0	Peak
7236	42.65	-38.38	81.03	54.25	35.55	10.83	57.98	100	0	Peak

Test Mode :	802.11g – Ant.2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	97.59	-	-	94.13	32.35	6.99	35.88	193	14	Average
2438	106.91	-	-	103.45	32.35	6.99	35.88	193	14	Peak
4874	49.95	-24.05	74	64.63	33.95	8.85	57.48	100	0	Peak
7311	42.02	-31.98	74	53.59	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11g – Ant.2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	91.57	-	-	88.11	32.35	6.99	35.88	189	89	Average
2438	100.42	-	-	96.96	32.35	6.99	35.88	189	89	Peak
4872	46.86	-27.14	74	61.57	33.95	8.82	57.48	100	0	Peak
7311	43.51	-30.49	74	55.08	35.54	10.91	58.02	100	0	Peak

Test Mode :	802.11g – Ant.2	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	99.64	-	-	96.1	32.37	7.02	35.85	106	55	Average
2461	109.17	-	-	105.63	32.37	7.02	35.85	106	55	Peak
4923	47.43	-26.57	74	62.11	33.93	8.87	57.48	100	0	Peak
7386	41.78	-32.22	74	53.35	35.52	10.99	58.08	100	0	Peak

Test Mode :	802.11g – Ant.2	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	91.9	-	-	88.36	32.37	7.02	35.85	152	138	Average
2461	100.96	-	-	97.42	32.37	7.02	35.85	152	138	Peak
4923	43.79	-30.21	74	58.47	33.93	8.87	57.48	100	0	Peak
7386	41.9	-32.1	74	53.47	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2413 MHz is Fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
73.47	8.45	-31.55	40	32.56	6.81	0.85	31.77	-	-	Peak
132.6	12.57	-30.93	43.5	31.41	11.54	1.16	31.54	-	-	Peak
278.67	15.76	-30.24	46	32.51	13	1.64	31.39	-	-	Peak
325.9	17.17	-28.83	46	32.54	14.01	1.83	31.21	-	-	Peak
587	20.32	-25.68	46	28.83	19.57	2.65	30.73	-	-	Peak
780.2	22.65	-23.35	46	28.06	21.79	3.11	30.31	100	146	Peak
2413	96.88	-	-	93.52	32.31	6.95	35.9	105	18	Average
2413	105.38	-	-	102.02	32.31	6.95	35.9	105	18	Peak
4824	41.56	-32.44	74	56.29	33.97	8.77	57.47	100	0	Peak
7236	41.82	-43.56	85.38	53.42	35.55	10.83	57.98	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	01	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2413 MHz is Fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
62.94	13.56	-26.44	40	38.39	6.16	0.78	31.77	-	-	Peak
134.49	10.78	-32.72	43.5	29.64	11.5	1.17	31.53	-	-	Peak
228.45	12.13	-33.87	46	30.75	11.12	1.47	31.21	-	-	Peak
363.7	16.44	-29.56	46	30.73	15.03	2.07	31.39	-	-	Peak
510	18.9	-27.1	46	29.12	18.27	2.47	30.96	-	-	Peak
767.6	23.19	-22.81	46	28.9	21.6	3.09	30.4	100	74	Peak
2413	89.73	-	-	86.37	32.31	6.95	35.9	100	80	Average
2413	99.25	-	-	95.89	32.31	6.95	35.9	100	80	Peak
4824	41.19	-32.81	74	55.92	33.97	8.77	57.47	100	0	Peak
7236	41.73	-37.52	79.25	53.33	35.55	10.83	57.98	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	96.05	-	-	92.61	32.33	6.99	35.88	106	112	Average
2436	105.6	-	-	102.16	32.33	6.99	35.88	106	112	Peak
4875	40.82	-33.18	74	55.53	33.95	8.82	57.48	100	0	Peak
7311	40.4	-33.6	74	51.97	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	88.29	-	-	84.85	32.33	6.99	35.88	153	152	Average
2436	97.65	-	-	94.21	32.33	6.99	35.88	153	152	Peak
4875	41.59	-32.41	74	56.3	33.95	8.82	57.48	100	0	Peak
7311	40.17	-33.83	74	51.74	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	98.11	-	-	94.57	32.37	7.02	35.85	156	118	Average
2461	107.15	-	-	103.61	32.37	7.02	35.85	156	118	Peak
4923	40.94	-33.06	74	55.62	33.93	8.87	57.48	100	0	Peak
7386	40.13	-33.87	74	51.7	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT20 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	11	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	88.81	-	-	85.27	32.37	7.02	35.85	152	148	Average
2461	98.89	-	-	95.35	32.37	7.02	35.85	152	148	Peak
4923	40.81	-33.19	74	55.49	33.93	8.87	57.48	100	0	Peak
7386	40.39	-33.61	74	51.96	35.52	10.99	58.08	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	03	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2422 MHz is Fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
82.38	9.85	-30.15	40	32.8	7.88	0.89	31.72	-	-	Peak
154.74	12.26	-31.24	43.5	31.58	10.85	1.22	31.39	-	-	Peak
273.81	16.65	-29.35	46	33.42	12.93	1.64	31.34	-	-	Peak
416.9	16.96	-29.04	46	29.69	16.36	2.2	31.29	-	-	Peak
625.5	21.73	-24.27	46	29.4	20	2.77	30.44	-	-	Peak
783	22.8	-23.2	46	28.14	21.84	3.11	30.29	100	29	Peak
2422	94.48	-	-	91.08	32.33	6.95	35.88	105	20	Average
2422	102.49	-	-	99.09	32.33	6.95	35.88	105	20	Peak
4845	41.86	-32.14	74	56.57	33.96	8.8	57.47	100	0	Peak
7266	40.61	-33.39	74	52.21	35.54	10.86	58	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	03	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2422 MHz is Fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
65.91	19.35	-20.65	40	44.09	6.22	0.81	31.77	100	77	Peak
106.68	12.47	-31.03	43.5	32.73	10.43	1.03	31.72	-	-	Peak
258.15	16.12	-29.88	46	33.07	12.71	1.58	31.24	-	-	Peak
417.6	16.21	-29.79	46	28.91	16.38	2.2	31.28	-	-	Peak
589.1	20.85	-25.15	46	29.29	19.6	2.66	30.7	-	-	Peak
822.2	23.96	-22.04	46	28.77	22.32	3.2	30.33	-	-	Peak
2422	86.56	-	-	83.16	32.33	6.95	35.88	125	83	Average
2422	96.78	-	-	93.38	32.33	6.95	35.88	125	83	Peak
4845	40.81	-33.19	74	55.52	33.96	8.8	57.47	100	0	Peak
7266	41.07	-32.93	74	52.67	35.54	10.86	58	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	92.7	-	-	89.24	32.35	6.99	35.88	103	23	Average
2438	103.39	-	-	99.93	32.35	6.99	35.88	103	23	Peak
4875	41.11	-32.89	74	55.82	33.95	8.82	57.48	100	0	Peak
7311	40.85	-33.15	74	52.42	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	06	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2438 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2438	85.42	-	-	81.96	32.35	6.99	35.88	159	132	Average
2438	94.48	-	-	91.02	32.35	6.99	35.88	159	132	Peak
4875	42.61	-31.39	74	57.32	33.95	8.82	57.48	100	0	Peak
7311	40.37	-33.63	74	51.94	35.54	10.91	58.02	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	09	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2452	94.1	-	-	90.61	32.35	6.99	35.85	104	24	Average
2452	102.81	-	-	99.32	32.35	6.99	35.85	104	24	Peak
4905	40.98	-33.02	74	55.66	33.93	8.87	57.48	100	0	Peak
7356	40.03	-33.97	74	51.6	35.53	10.96	58.06	100	0	Peak

Test Mode :	2.4GHz 802.11n-HT40 - MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	09	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 2451 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2451	86.26	-	-	82.77	32.35	6.99	35.85	158	134	Average
2451	95.38	-	-	91.89	32.35	6.99	35.85	158	134	Peak
4905	41.37	-32.63	74	56.05	33.93	8.87	57.48	100	0	Peak
7356	40.67	-33.33	74	52.24	35.53	10.96	58.06	100	0	Peak

Test Mode :	802.11a – Ant.1	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5743 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
115.59	11.82	-31.68	43.5	31.16	11.25	1.08	31.67	-	-	Peak
154.74	12.88	-30.62	43.5	32.2	10.85	1.22	31.39	-	-	Peak
259.77	13.46	-32.54	46	30.39	12.74	1.59	31.26	-	-	Peak
547.1	18.99	-27.01	46	28.8	18.89	2.54	31.24	-	-	Peak
796.3	23.41	-22.59	46	28.43	22.04	3.13	30.19	-	-	Peak
868.4	24.63	-21.37	46	29.19	22.78	3.3	30.64	100	64	Peak
5743	94.4	-	-	83.17	35.34	10.06	34.17	164	11	Average
5743	104.37	-	-	93.14	35.34	10.06	34.17	164	11	Peak
11490	44.03	-29.97	74	49.86	38.38	14.33	58.54	100	0	Peak

Test Mode :	802.11a – Ant.1	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5747 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
49.17	13.06	-26.94	40	35.5	8.5	0.69	31.63	-	-	Peak
106.95	13.59	-29.91	43.5	33.85	10.43	1.03	31.72	-	-	Peak
219.81	11.77	-34.23	46	31.06	10.51	1.42	31.22	-	-	Peak
504.4	18.78	-27.22	46	29.07	18.17	2.46	30.92	-	-	Peak
762.7	22.39	-23.61	46	28.21	21.53	3.08	30.43	-	-	Peak
844.6	24.22	-21.78	46	28.91	22.55	3.26	30.5	100	50	Peak
5747	90.8	-	-	79.57	35.34	10.06	34.17	108	338	Average
5747	100.34	-	-	89.11	35.34	10.06	34.17	108	338	Peak
11490	44.68	-29.32	74	50.51	38.38	14.33	58.54	100	0	Peak

Test Mode :	802.11a – Ant.1	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5787 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5787	94.68	-	-	83.46	35.38	10.07	34.23	165	10	Average
5787	105.1	-	-	93.88	35.38	10.07	34.23	165	10	Peak
11571	43.07	-30.93	74	48.78	38.46	14.41	58.58	100	0	Peak

Test Mode :	802.11a – Ant.1	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5783 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5783	89.27	-	-	78.06	35.37	10.07	34.23	107	337	Average
5783	101.24	-	-	90.03	35.37	10.07	34.23	107	337	Peak
11571	42.91	-31.09	74	48.62	38.46	14.41	58.58	100	0	Peak

Test Mode :	802.11a – Ant.1	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5827 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5827	95.38	-	-	84.14	35.4	10.11	34.27	150	10	Average
5827	105.67	-	-	94.43	35.4	10.11	34.27	150	10	Peak
11649	44.09	-29.91	74	49.67	38.51	14.52	58.61	100	0	Peak

Test Mode :	802.11a – Ant.1	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5825 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5825	89.69	-	-	78.45	35.4	10.11	34.27	146	45	Average
5825	99.72	-	-	88.48	35.4	10.11	34.27	146	45	Peak
11649	44.14	-29.86	74	49.72	38.51	14.52	58.61	100	0	Peak

Test Mode :	5.8GHz 802.11n HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5743 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
154.74	12.98	-30.52	43.5	32.3	10.85	1.22	31.39	-	-	Peak
204.69	12.72	-30.78	43.5	33.3	9.44	1.34	31.36	-	-	Peak
280.02	18.28	-27.72	46	35.01	13.03	1.64	31.4	-	-	Peak
324.5	16.46	-29.54	46	31.83	13.98	1.83	31.18	-	-	Peak
687.1	21.88	-24.12	46	28.93	20.49	2.91	30.45	-	-	Peak
830.6	25.47	-20.53	46	30.25	22.4	3.22	30.4	100	40	Peak
5743	95.33	-	-	84.1	35.34	10.06	34.17	164	21	Average
5743	105.25	-	-	94.02	35.34	10.06	34.17	164	21	Peak
11490	43.4	-30.6	74	49.23	38.38	14.33	58.54	100	0	Peak

Test Mode :	5.8GHz 802.11n HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	149	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5743 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
43.23	13	-27	40	33.01	11.1	0.64	31.75	-	-	Peak
106.95	11.97	-31.53	43.5	32.23	10.43	1.03	31.72	-	-	Peak
141.78	14.04	-29.46	43.5	32.93	11.36	1.2	31.45	-	-	Peak
416.9	17.12	-28.88	46	29.85	16.36	2.2	31.29	-	-	Peak
636.7	21.43	-24.57	46	28.94	20.09	2.8	30.4	-	-	Peak
796.3	24.29	-21.71	46	29.31	22.04	3.13	30.19	100	19	Peak
5743	93.39	-	-	82.16	35.34	10.06	34.17	134	338	Average
5743	104.88	-	-	93.65	35.34	10.06	34.17	134	338	Peak
11490	43.75	-30.25	74	49.58	38.38	14.33	58.54	100	0	Peak

Test Mode :	5.8GHz 802.11n HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5783 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5783	96.43	-	-	85.22	35.37	10.07	34.23	152	17	Average
5783	106.21	-	-	95	35.37	10.07	34.23	152	17	Peak
11571	42.5	-31.5	74	48.21	38.46	14.41	58.58	100	0	Peak

Test Mode :	5.8GHz 802.11n HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	157	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5783 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5783	91.04	-	-	79.83	35.37	10.07	34.23	148	339	Average
5783	101.78	-	-	90.57	35.37	10.07	34.23	148	339	Peak
11571	42.7	-31.3	74	48.41	38.46	14.41	58.58	100	0	Peak

Test Mode :	5.8GHz 802.11n HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5823 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5823	94.97	-	-	83.73	35.4	10.11	34.27	149	4	Average
5823	106.71	-	-	95.47	35.4	10.11	34.27	149	4	Peak
11649	43.32	-30.68	74	48.9	38.51	14.52	58.61	100	0	Peak

Test Mode :	5.8GHz 802.11n HT20 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	165	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5827 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5827	91.22	-	-	79.98	35.4	10.11	34.27	145	52	Average
5827	102.38	-	-	91.14	35.4	10.11	34.27	145	52	Peak
11649	43.8	-30.2	74	49.38	38.51	14.52	58.61	100	0	Peak

Test Mode :	5.8GHz 802.11n HT40 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	151	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5757 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
105.87	9.5	-34	43.5	29.84	10.34	1.03	31.71	-	-	Peak
154.74	12.71	-30.79	43.5	32.03	10.85	1.22	31.39	-	-	Peak
275.43	15.27	-30.73	46	32.02	12.96	1.64	31.35	-	-	Peak
440	17.92	-28.08	46	29.92	16.85	2.28	31.13	-	-	Peak
735.4	22.26	-23.74	46	28.64	21.12	3.02	30.52	-	-	Peak
876.8	24.18	-21.82	46	28.7	22.87	3.31	30.7	100	74	Peak
5757	90.55	-	-	79.33	35.36	10.06	34.2	152	8	Average
5757	100.76	-	-	89.54	35.36	10.06	34.2	152	8	Peak
11511	43.92	-30.08	74	49.71	38.4	14.35	58.54	100	0	Peak

Test Mode :	5.8GHz 802.11n HT40 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	151	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5757 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
48.63	13.09	-26.91	40	35.14	8.9	0.68	31.63	-	-	Peak
99.39	11.86	-31.64	43.5	32.73	9.8	0.99	31.66	-	-	Peak
291.63	13.28	-32.72	46	29.78	13.19	1.71	31.4	-	-	Peak
434.4	17.83	-28.17	46	30.01	16.73	2.26	31.17	-	-	Peak
665.4	22.07	-23.93	46	29.27	20.32	2.87	30.39	-	-	Peak
854.4	23.86	-22.14	46	28.5	22.64	3.28	30.56	100	56	Peak
5757	88.09	-	-	76.87	35.36	10.06	34.2	168	331	Average
5757	97.94	-	-	86.72	35.36	10.06	34.2	168	331	Peak
11511	43.38	-30.62	74	49.17	38.4	14.35	58.54	100	0	Peak

Test Mode :	5.8GHz 802.11n HT40 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	159	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Horizontal
Remark :	1. 5797 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5797	90.89	-	-	79.65	35.38	10.09	34.23	165	20	Average
5797	100.86	-	-	89.62	35.38	10.09	34.23	165	20	Peak
11589	43.8	-30.2	74	49.47	38.47	14.44	58.58	100	0	Peak

Test Mode :	5.8GHz 802.11n HT40 – MIMO Ant.1+2	Temperature :	21~23°C
Test Channel :	159	Relative Humidity :	51~53%
Test Engineer :	Marlboro Chang	Polarization :	Vertical
Remark :	1. 5797 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5797	85.48	-	-	74.24	35.38	10.09	34.23	147	47	Average
5797	96.65	-	-	85.41	35.38	10.09	34.23	147	47	Peak
11589	43.37	-30.63	74	49.04	38.47	14.44	58.58	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.

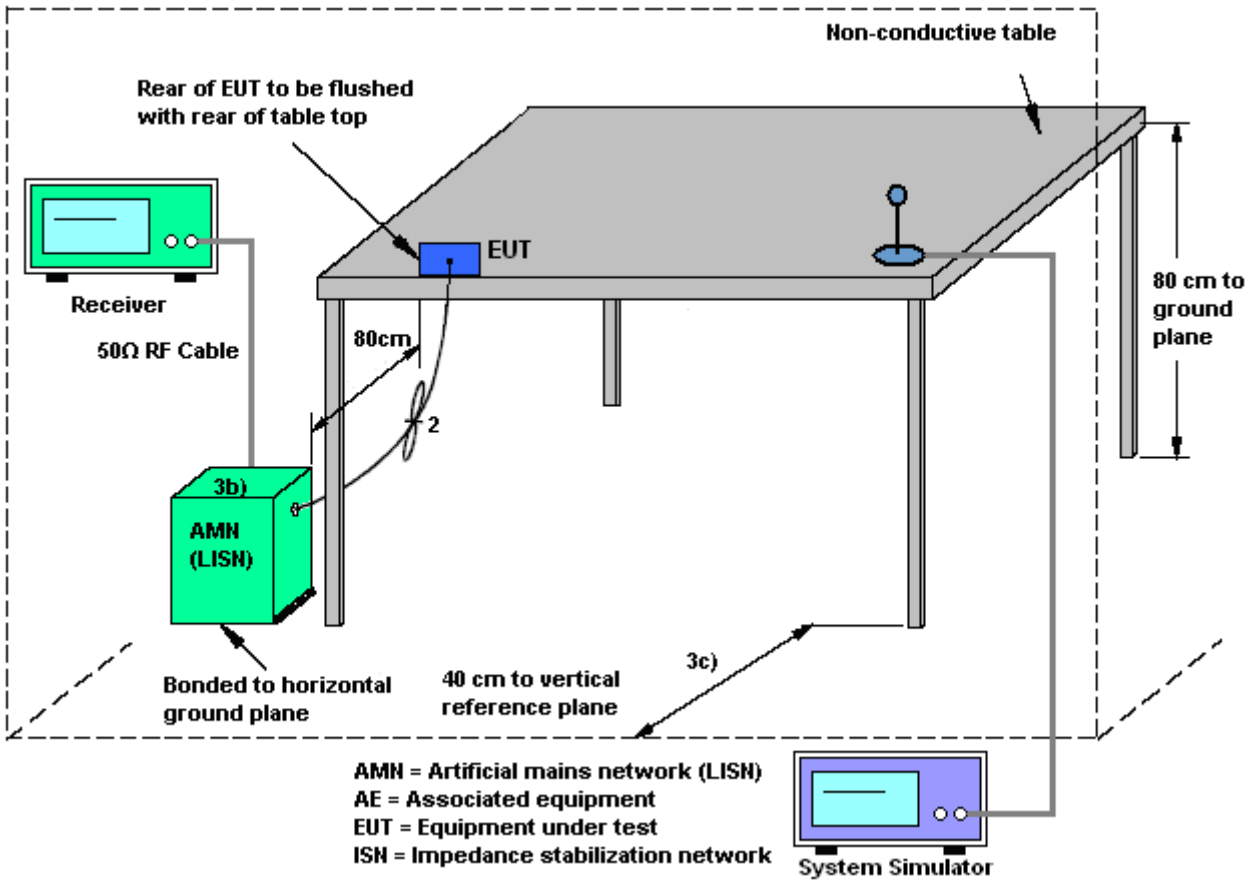
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

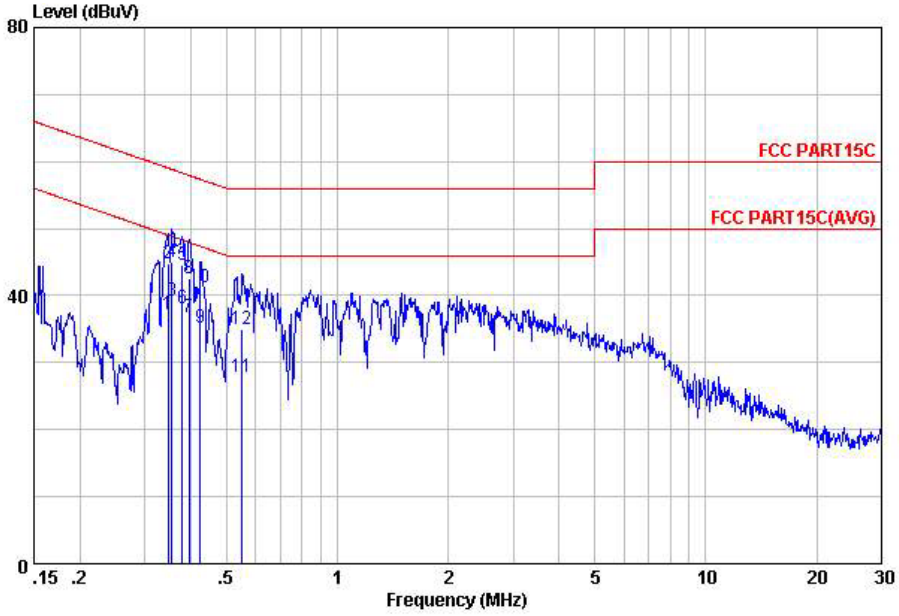
1. The testing follows the guidelines in ANSI C63.10-2009 and ANSI C63.4-2003 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through 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 :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN 2.4GHz Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

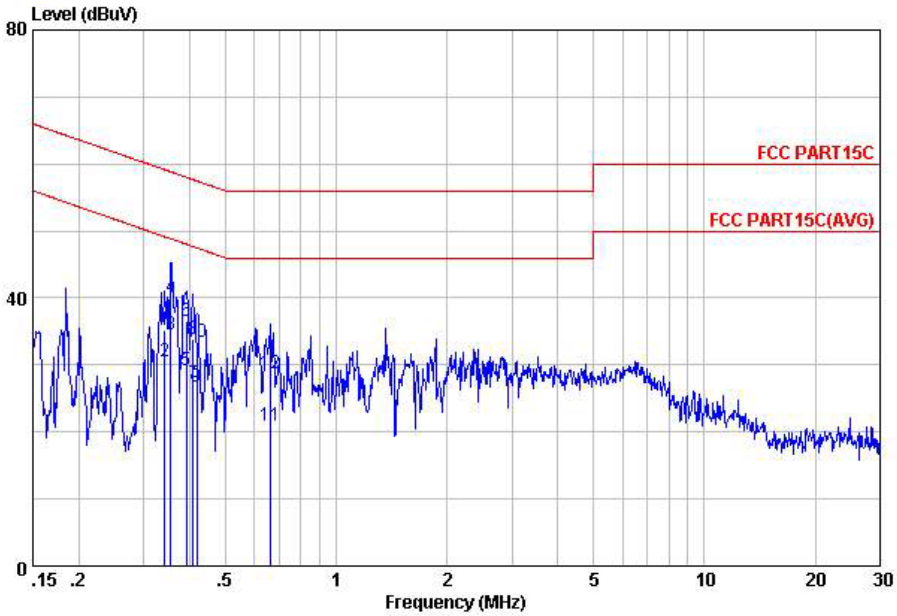


Site : C001-KS
Condition: FCC PART15C LISN-L20130306 LINE

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.35	37.29	-11.76	49.05	26.59	0.45	10.25	Average
2	0.35	44.79	-14.26	59.05	34.09	0.45	10.25	QP
3	0.36	39.26	-9.57	48.83	28.59	0.42	10.25	Average
4	0.36	44.96	-13.87	58.83	34.29	0.42	10.25	QP
5	0.38	44.51	-13.79	58.30	33.90	0.36	10.25	QP
6	0.38	38.11	-10.19	48.30	27.50	0.36	10.25	Average
7	0.40	36.88	-11.07	47.95	26.30	0.33	10.25	Average
8	0.40	42.58	-15.37	57.95	32.00	0.33	10.25	QP
9	0.42	35.23	-12.14	47.37	24.70	0.28	10.25	Average
10	0.42	41.23	-16.14	57.37	30.70	0.28	10.25	QP
11	0.55	27.96	-18.04	46.00	17.50	0.20	10.26	Average
12	0.55	34.96	-21.04	56.00	24.50	0.20	10.26	QP

Test Mode :	Mode 1	Temperature :	19~20℃
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN 2.4GHz Link + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-N20130306 NEUTRAL

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.34	35.27	-23.86	59.13	24.49	0.53	10.25	QP
2	0.34	30.57	-18.56	49.13	19.79	0.53	10.25	Average
3	0.36	34.54	-14.29	48.83	23.80	0.49	10.25	Average
4	0.36	40.04	-18.79	58.83	29.30	0.49	10.25	QP
5	0.39	29.17	-18.86	48.03	18.50	0.42	10.25	Average
6	0.39	36.47	-21.56	58.03	25.80	0.42	10.25	QP
7	0.41	27.14	-20.54	47.68	16.50	0.39	10.25	Average
8	0.41	33.84	-23.84	57.68	23.20	0.39	10.25	QP
9	0.42	26.83	-20.63	47.46	16.20	0.38	10.25	Average
10	0.42	33.53	-23.93	57.46	22.90	0.38	10.25	QP
11	0.66	20.88	-25.12	46.00	10.40	0.21	10.27	Average
12	0.66	28.68	-27.32	56.00	18.20	0.21	10.27	QP

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Connected Construction

Non-standard connector is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit. The EUT supports MIMO mode. The composite antenna gain is as following table.

FCC KDB 662911 D01 Multiple Transmitter Output v01r02

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(N_{ANT}/N_{SS}=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 29, 2012	Mar. 31, 2013~ Apr. 22, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV30	100845	9kHz~30GHz	Nov. 06, 2012	Mar. 31, 2013~ Apr. 22, 2013	Nov. 05, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Mar. 31, 2013~ Apr. 22, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Mar. 31, 2013~ Apr. 22, 2013	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Mar. 31, 2013~ Apr. 22, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	Mar. 31, 2013~ Apr. 22, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	Apr. 04, 2013~ Apr. 06, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz ~ 30GHz	Nov. 30, 2012	Apr. 04, 2013~ Apr. 06, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 22, 2012	Apr. 04, 2013~ Apr. 06, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 01, 2012	Apr. 04, 2013~ Apr. 06, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	159088	1GHz ~ 18GHz	Feb. 27, 2013	Apr. 04, 2013~ Apr. 06, 2013	Feb. 26, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10-1000MHz. 32dB.GAIN	Feb. 26, 2013	Apr. 04, 2013~ Apr. 06, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	Apr. 04, 2013~ Apr. 06, 2013	Sep. 02, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Apr. 04, 2013~ Apr. 06, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 03, 2012	Apr. 04, 2013~ Apr. 06, 2013	Jul. 02, 2013	Radiation (03CH07-HY)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Apr. 18, 2013	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 29, 2012	Apr. 18, 2013	Dec. 28, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 29, 2012	Apr. 18, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 15, 2012	Apr. 18, 2013	Nov. 14, 2013	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 29, 2012	Apr. 18, 2013	Dec. 28, 2013	Conduction (CO01-KS)

5 Uncertainty of Evaluation

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

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

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

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

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

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

Appendix A. Photographs of EUT

Please refer to Sporton report number EP312313 as below.