

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : LTE uFi
BRAND NAME : ZTE
MODEL NAME : 203Z / GL09P / MF98+
FCC ID : Q78-MF98PLUS
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Apr. 23, 2013 and completely tested on Jun. 06, 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 / Manager



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



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	
		Conducted Spurious Emission		Pass	
3.5	15.247(d)	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	Under limit 0.87 dB at 2483.530 MHz
		Radiated Spurious Emission			
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 4.21 dB at 0.470 MHz
3.7	15.203 & 15.247(b)	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	LTE uFi
Brand Name	ZTE
Model Name	203Z / GL09P / MF98+
FCC ID	Q78-MF98PLUS
EUT supports Radios application	WCDMA/HSPA/HSPA+/WLAN 11abgn
HW Version	xr4B
SW Version	Alpha4.0
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard																
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz															
Maximum Output Power to Antenna	<2400 MHz ~ 2483.5 MHz> 802.11b : 15.97 dBm (0.0395 W) 802.11g : 20.92 dBm (0.1236 W) 802.11n HT20 : 21.90 dBm (0.1548 W) 802.11n HT40 : 23.01 dBm (0.2000 W)															
Antenna Type	<Ant. 0> 802.11b/g/n : internal antenna with gain 1.60 dBi <Ant. 1> 802.11b/g/n : internal antenna with gain 2.40 dBi															
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)															
Antenna Function for Transmitter	<table border="1"> <thead> <tr> <th></th> <th>Ant.0</th> <th>Ant.1</th> </tr> </thead> <tbody> <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 n SISO</td> <td>V</td> <td>V</td> </tr> <tr> <td>802.11 n MIMO</td> <td>V</td> <td>V</td> </tr> </tbody> </table> <p>Note: MIMO mode is uncorrelated.</p>		Ant.0	Ant.1	802.11 b	V	V	802.11 g	V	V	802.11 n SISO	V	V	802.11 n MIMO	V	V
	Ant.0	Ant.1														
802.11 b	V	V														
802.11 g	V	V														
802.11 n SISO	V	V														
802.11 n MIMO	V	V														

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	03CH01-KS	149928/4086E-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		

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.

Channel	Frequency	Ant. Chain	2.4GHz 802.11b RF Power (dBm)			
			DSSS Data Rate			
			1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	Ant.0	15.52	15.46	15.57	15.32
CH 06	2437 MHz	Ant.0	15.97	15.75	15.82	15.84
CH 11	2462 MHz	Ant.0	15.51	15.46	15.54	15.57
CH 01	2412 MHz	Ant.1	15.76	15.73	15.73	15.72
CH 06	2437 MHz	Ant.1	15.73	15.76	15.74	15.75
CH 11	2462 MHz	Ant.1	15.38	15.43	15.45	15.47

Channel	Frequency	Ant. Chain	2.4GHz 802.11g RF Power (dBm)							
			OFDM Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	Ant.0	20.66	19.74	19.77	19.36	20.26	20.74	20.35	20.62
CH 06	2437 MHz	Ant.0	20.78	19.74	19.91	19.25	20.24	20.60	20.58	20.65
CH 11	2462 MHz	Ant.0	19.96	19.45	19.56	18.85	19.36	19.82	19.86	19.67
CH 01	2412 MHz	Ant.1	20.03	19.61	19.65	19.39	19.96	19.97	20.01	20.06
CH 06	2437 MHz	Ant.1	20.03	19.71	19.83	19.35	20.12	20.57	20.54	20.42
CH 11	2462 MHz	Ant.1	20.92	19.37	19.34	18.84	19.62	20.43	20.49	20.21



Ch.	Fre.	Ant. Chain	2.4GHz 802.11n HT-20 RF Power (dBm)							
			OFDM Data Rate							
			MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
			6.5 Mbps	13 Mbps	19.5 Mbps	26 Mbps	39 Mbps	52 Mbps	58.5 Mbps	65 Mbps
CH 01	2412 MHz	SISO Ant.0	18.64	18.37	19.02	18.56	18.42	18.87	20.44	19.04
CH 06	2437 MHz	SISO Ant.0	18.58	18.75	19.06	18.67	18.71	19.19	19.21	20.98
CH 11	2462 MHz	SISO Ant.0	17.91	18.28	18.47	18.37	18.26	18.57	19.96	18.76
CH 01	2412 MHz	SISO Ant.1	18.01	17.98	18.68	18.33	18.18	18.13	19.52	18.28
CH 06	2437 MHz	SISO Ant.1	18.52	18.61	19.18	18.71	18.96	19.15	19.18	20.68
CH 11	2462 MHz	SISO Ant.1	18.04	18.26	18.64	18.39	18.54	18.62	20.52	18.94
Ch.	Fre.	Ant. Chain	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 01	2412 MHz	MIMO Ant.0+1(0)	18.35	17.81	18.65	17.35	17.47	18.26	17.56	12.55
		MIMO Ant.0+1(1)	19.22	18.54	18.73	19.28	18.53	19.21	19.05	18.62
		MIMO Ant.0+1	21.82	21.20	21.70	21.43	21.04	21.77	21.38	19.58
CH 06	2437 MHz	MIMO Ant.0+1(0)	18.33	18.24	18.68	17.74	17.72	17.77	18.04	18.66
		MIMO Ant.0+1(1)	19.38	18.71	18.72	19.42	18.42	19.17	18.89	18.59
		MIMO Ant.0+1	21.90	21.49	21.71	21.67	21.09	21.54	21.50	21.64
CH 11	2462 MHz	MIMO Ant.0+1(0)	19.16	18.61	19.16	18.16	18.38	19.35	18.36	18.51
		MIMO Ant.0+1(1)	18.59	18.28	18.32	18.93	17.78	18.16	19.23	18.17
		MIMO Ant.0+1	21.89	21.46	21.77	21.57	21.10	21.81	21.83	21.35

Ch.	Fre.	Ant. Chain	2.4GHz 802.11n HT-40 RF Power (dBm)							
			OFDM Data Rate							
			MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
			13.5 Mbps	27 Mbps	40.5 Mbps	54 Mbps	81 Mbps	108 Mbps	121.5 Mbps	135 Mbps
CH 03	2422 MHz	SISO Ant.0	19.57	18.28	19.16	19.78	19.13	19.06	19.84	20.52
CH 06	2437 MHz	SISO Ant.0	19.37	17.85	18.97	19.72	18.92	18.77	20.15	19.43
CH 09	2452 MHz	SISO Ant.0	19.27	18.12	18.46	19.52	19.07	18.87	19.76	19.31
CH 03	2422 MHz	SISO Ant.1	18.96	18.27	19.15	19.68	18.95	19.13	19.68	20.08
CH 06	2437 MHz	SISO Ant.1	18.74	17.86	18.56	19.22	18.74	18.78	19.61	19.32
CH 09	2452 MHz	SISO Ant.1	18.87	18.42	18.87	19.78	19.35	19.32	19.97	19.67
Ch.	Fre.	Ant. Chain	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 03	2422 MHz	MIMO Ant.0+1(0)	18.47	18.68	18.27	18.46	19.13	19.33	20.13	20.27
		MIMO Ant.0+1(1)	18.76	18.59	18.44	18.84	19.34	19.81	19.62	19.58
		MIMO Ant.0+1	21.63	21.65	21.37	21.66	22.25	22.59	22.89	22.95
CH 06	2437 MHz	MIMO Ant.0+1(0)	18.57	18.45	18.43	18.53	19.31	19.25	19.35	20.12
		MIMO Ant.0+1(1)	18.51	18.21	18.03	18.15	19.12	18.89	19.52	19.06
		MIMO Ant.0+1	21.55	21.34	21.24	21.35	22.23	22.08	22.45	22.63
CH 09	2452 MHz	MIMO Ant.0+1(0)	18.95	18.97	18.38	19.18	19.67	19.59	19.66	20.73
		MIMO Ant.0+1(1)	18.62	18.42	18.28	18.76	19.52	19.22	19.73	19.12
		MIMO Ant.0+1	21.80	21.71	21.34	21.99	22.61	22.42	22.71	23.01

Remark:

- The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6 Mbps for 802.11g, 13 Mbps for 802.11n HT-20, and 130 Mbps for 802.11n HT-40 for all the test cases due to the highest RF output power.
- The EUT is programmed to transmit signals continuously for all testing



2.3 Test Mode

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

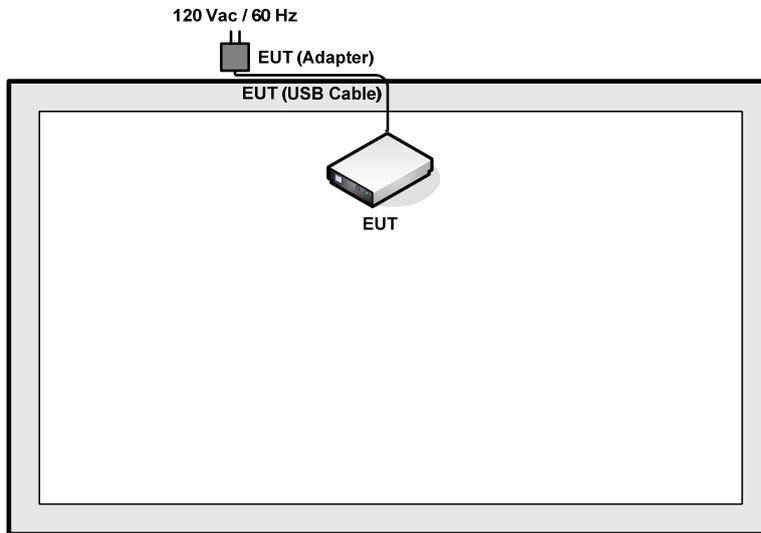
<2.4GHz>

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	13 Mbps	1/6/11
		802.11n HT40	270 Mbps	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	270Mbps	3/6/9
	Conducted Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	270 Mbps	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	270 Mbps	3/6/9
Radiated TCs	Radiated Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
		802.11n HT40	270 Mbps	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
		802.11n HT40	270 Mbps	3/6/9

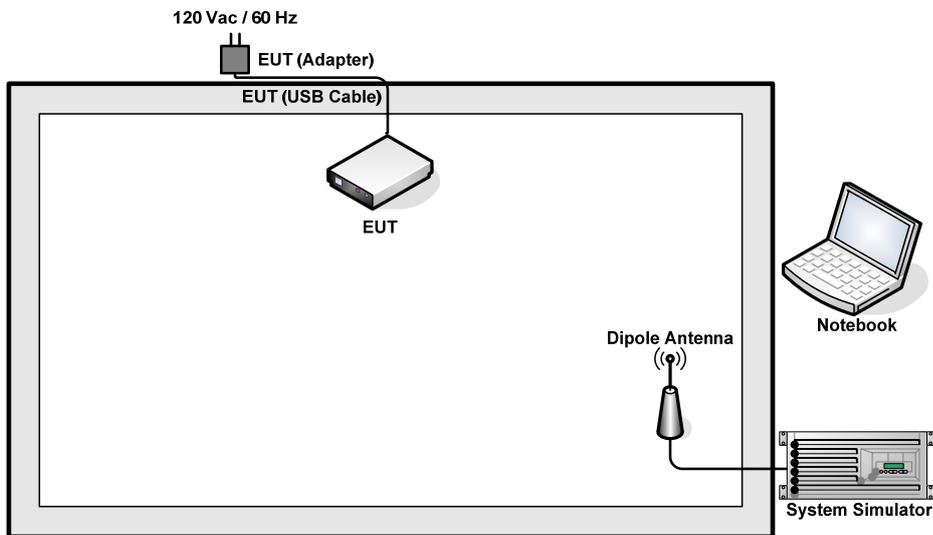
Test Case	
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + USB Cable (Charging from Adapter) + WLAN 2.4GHz Link

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 notebook make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

2.7 Measurement Results Explanation Example

For 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 4.2 dB.

Example :

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 24.2 \text{ (dB)} \end{aligned}$$

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.

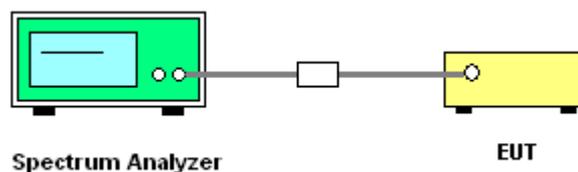
3.1.2 Measuring Instruments

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°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Ant.0		
01	2412	7.08	0.5	Pass
06	2437	7.12	0.5	Pass
11	2462	7.52	0.5	Pass

Test Mode :	802.11g	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Ant.1		
01	2412	15.92	0.5	Pass
06	2437	16.04	0.5	Pass
11	2462	16.04	0.5	Pass



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		MIMO Ant.0+1(0)	MIMO Ant.0+1(1)		
01	2412	16.36	17.52	0.5	Pass
06	2437	17.60	17.60	0.5	Pass
11	2462	17.64	17.56	0.5	Pass

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

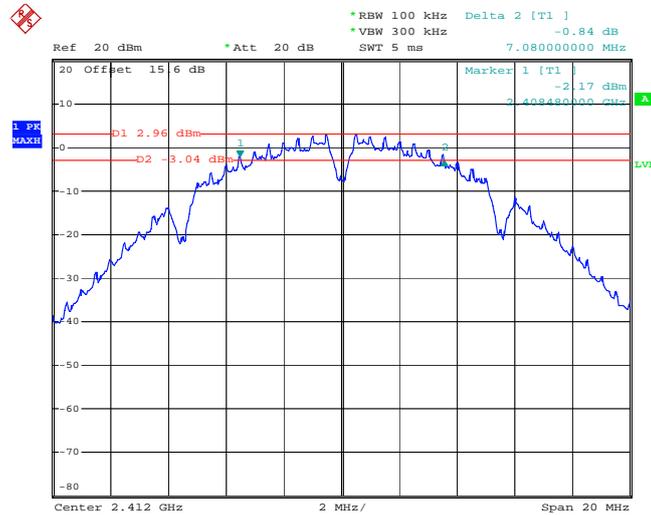
Channel	Frequency (MHz)	2.4GHz 802.11n HT40 6dB Bandwidth (MHz)		6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		MIMO Ant.0+1(0)	MIMO Ant.0+1(1)		
03	2422	35.76	35.68	0.5	Pass
06	2437	36.32	35.12	0.5	Pass
09	2452	35.76	35.28	0.5	Pass



3.1.6 Test Result of 6dB Bandwidth Plots

802.11b – Ant.0

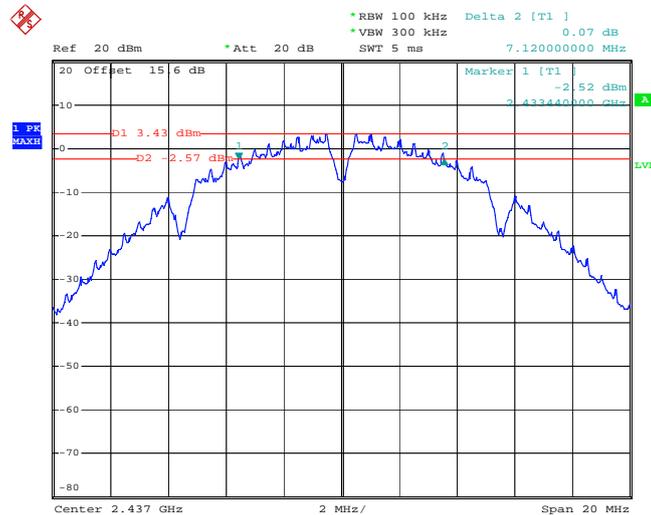
6 dB Bandwidth Plot on Channel 01



Date: 27.MAY.2013 18:53:33

802.11b – Ant.0

6 dB Bandwidth Plot on Channel 06

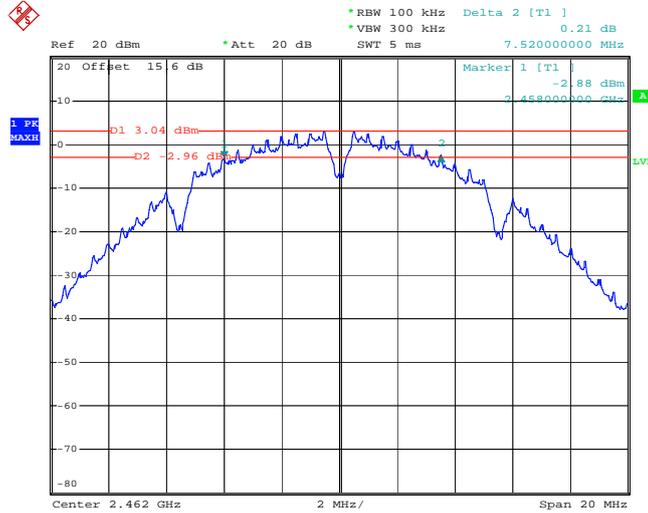


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802.11b – Ant.0

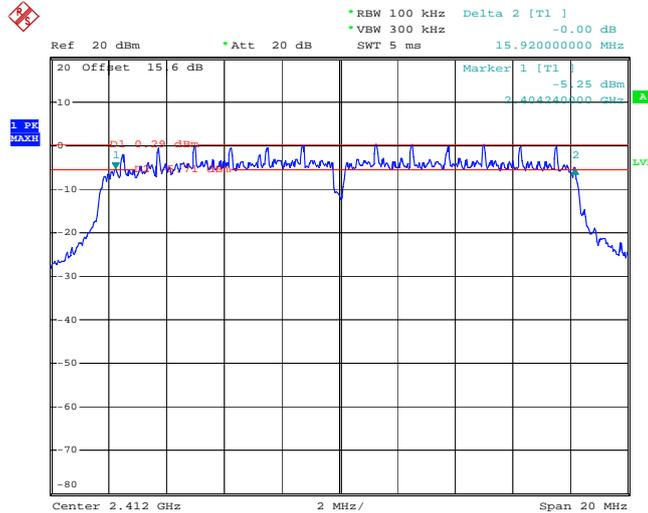
6 dB Bandwidth Plot on Channel 11



Date: 27.MAY.2013 18:59:59

802.11g – Ant.1

6 dB Bandwidth Plot on Channel 01

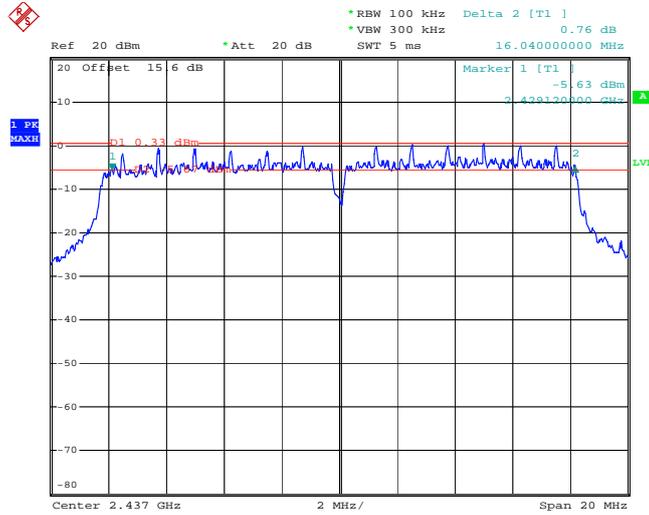


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802.11g – Ant.1

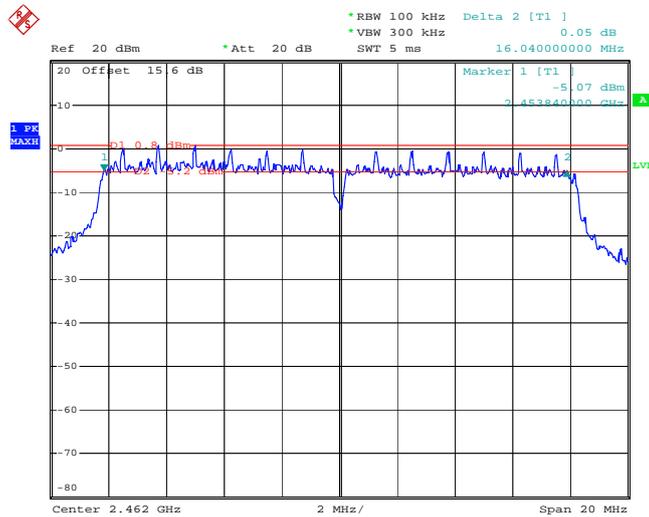
6 dB Bandwidth Plot on Channel 06



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802.11g – Ant.1

6 dB Bandwidth Plot Channel 11

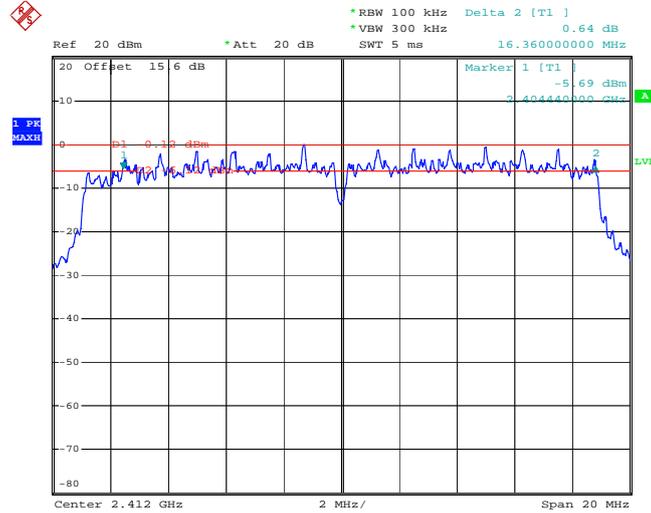


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802.11n HT20 –MIMO Ant.0+1(0)

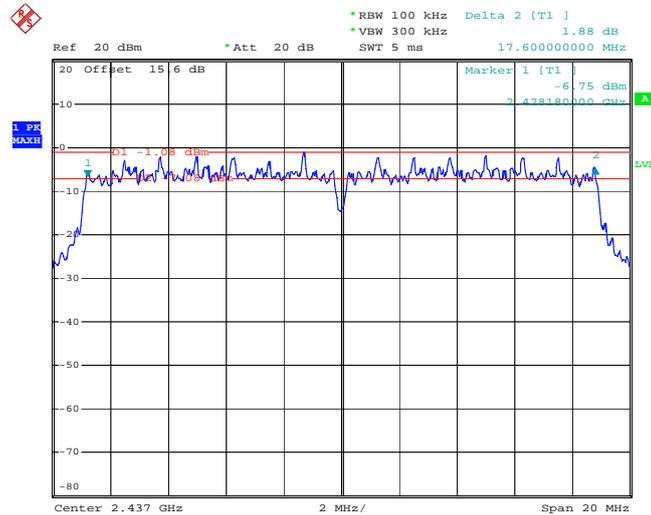
6 dB Bandwidth Plot on Channel 01



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802.11n HT20 –MIMO Ant.0+1(0)

6 dB Bandwidth Plot on Channel 06

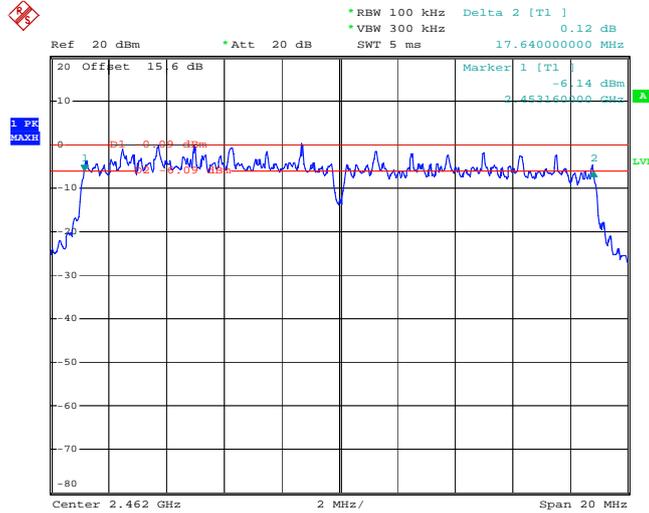


Date: 27.MAY.2013 19:28:44



802.11n HT20 –MIMO Ant.0+1(0)

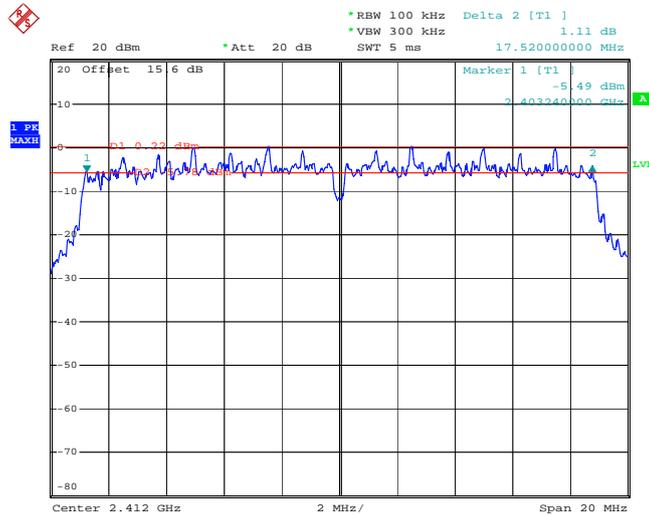
6 dB Bandwidth Plot on Channel 11



Date: 27.MAY.2013 19:25:58

802.11n HT20 –MIMO Ant.0+1(1)

6 dB Bandwidth Plot on Channel 01

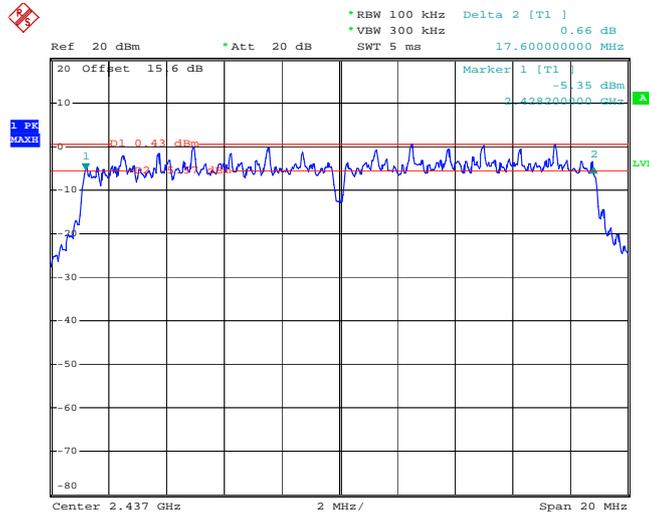


Date: 27.MAY.2013 19:33:03



802.11n HT20 –MIMO Ant.0+1(1)

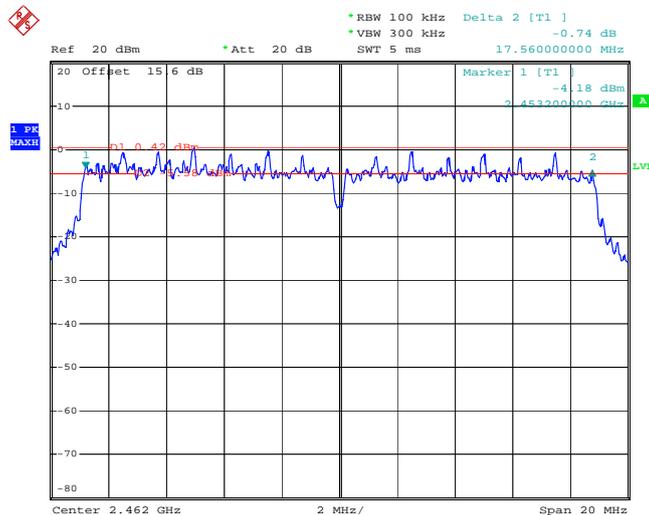
6 dB Bandwidth Plot on Channel 06



Date: 27.MAY.2013 19:36:21

802.11n HT20 –MIMO Ant.0+1(1)

6 dB Bandwidth Plot on Channel 11

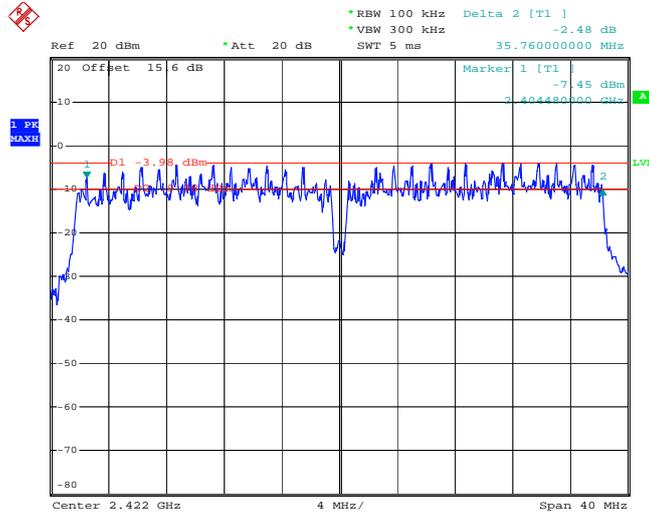


Date: 27.MAY.2013 19:39:38



802.11n HT40 –MIMO Ant.0+1(0)

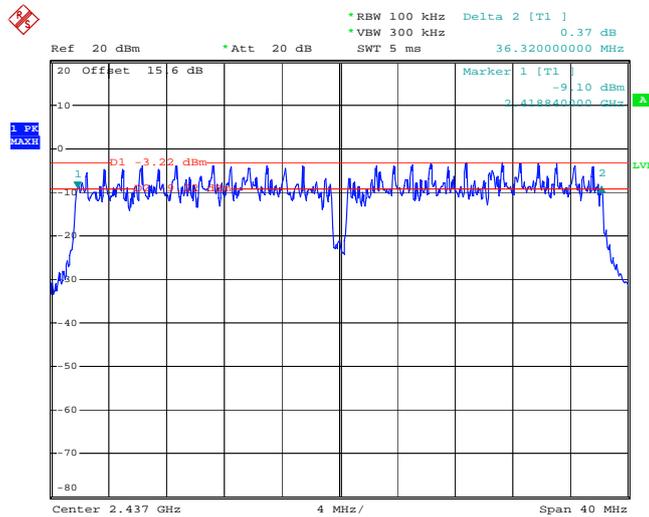
6 dB Bandwidth Plot on Channel 03



Date: 27.MAY.2013 20:46:58

802.11n HT40 –MIMO Ant.0+1(0)

6 dB Bandwidth Plot on Channel 06

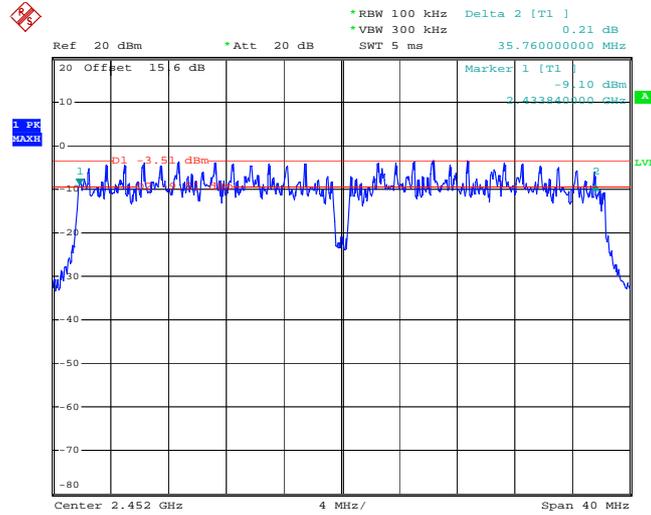


Date: 27.MAY.2013 20:52:33



802.11n HT40 –MIMO Ant.0+1(0)

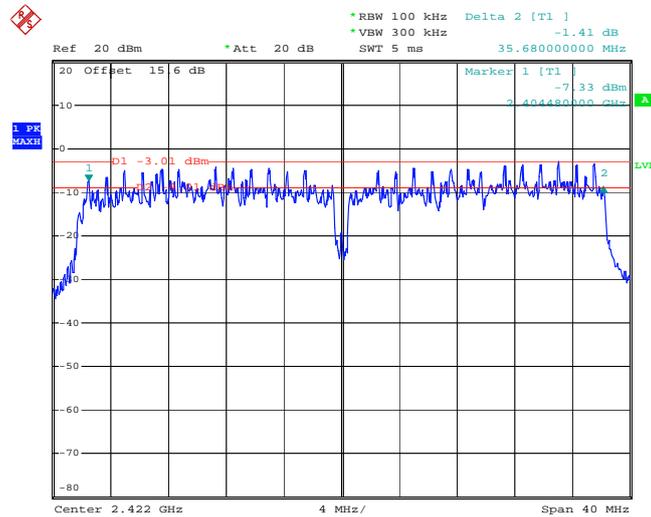
6 dB Bandwidth Plot on Channel 09



Date: 27.MAY.2013 20:56:30

802.11n HT40 –MIMO Ant.0+1(1)

6 dB Bandwidth Plot on Channel 03

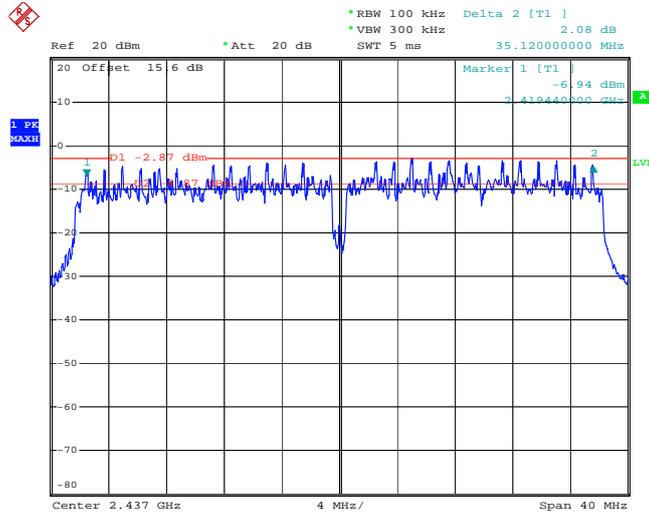


Date: 27.MAY.2013 20:34:34



802.11n HT40 –MIMO Ant.0+1(1)

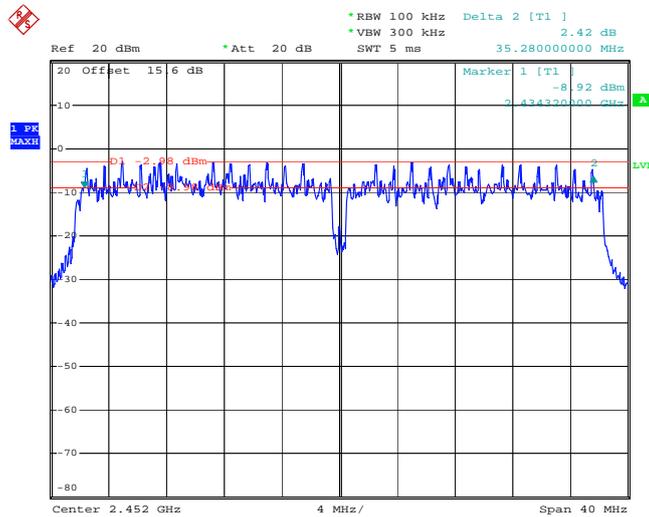
6 dB Bandwidth Plot on Channel 06



Date: 27.MAY.2013 20:39:25

802.11n HT40 –MIMO Ant.0+1(1)

6 dB Bandwidth Plot on Channel 09



Date: 27.MAY.2013 20:42:16

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.

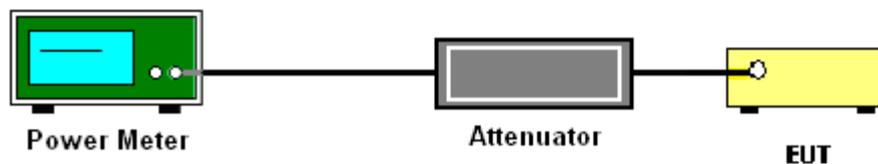
3.2.2 Measuring Instruments

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 power meter 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°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Ant.0	Ant.1		
01	2412	15.52	15.76	30	Pass
06	2437	15.97	15.73	30	Pass
11	2462	15.51	15.38	30	Pass

Test Mode :	802.11g	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Ant.0	Ant.1		
01	2412	20.66	20.03	30	Pass
06	2437	20.78	20.03	30	Pass
11	2462	19.96	20.92	30	Pass

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11n HT20 Peak Output Power (dBm)					Max. Limits (dBm)	Pass/Fail
		SISO Ant.0	SISO Ant.1	MIMO Ant.0+1(0)	MIMO Ant.0+1(1)	MIMO Ant.0+1		
01	2412	19.04	18.28	18.35	19.22	21.82	30	Pass
06	2437	20.98	20.68	18.33	19.38	21.90	30	Pass
11	2462	18.76	18.94	19.16	18.59	21.89	30	Pass

Note : MIMO Ant.0+1 is a calculated result from sum of the power MIMO Ant.0+1(0) and MIMO Ant.0+1(1).



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11n HT40 Peak Output Power (dBm)					Max. Limits (dBm)	Pass/Fail
		SISO Ant.0	SISO Ant.1	MIMO Ant.0+1(0)	MIMO Ant.0+1(1)	MIMO Ant.0+1		
03	2422	20.52	20.08	20.27	19.58	22.95	30	Pass
06	2437	19.43	19.32	20.12	19.06	22.63	30	Pass
09	2452	19.31	19.67	20.73	19.12	23.01	30	Pass

Note : MIMO Ant.0+1 is a calculated result from sum of the power MIMO Ant.0+1(0) and MIMO Ant.0+1(1)

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	100% for Ant.0 100% for Ant.1	Duty Factor:	0.00dB for Ant.0 0.00dB for Ant.1

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)	
		Ant.0	Ant.1
01	2412	12.26	12.62
06	2437	12.93	12.86
11	2462	12.52	12.48

Test Mode :	802.11g	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	96.71% for Ant.0 96.80% for Ant.1	Duty Factor:	0.15dB for Ant.0 0.14dB for Ant.1

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)	
		Ant.0	Ant.1
01	2412	11.27	11.35
06	2437	11.12	11.41
11	2462	11.08	11.31

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	96.46% for SISO Ant. 0 96.56% for SISO Ant. 1 94.23% for MIMO Ant. 0 95.19% for MIMO Ant. 1	Duty Factor:	0.16dB for SISO Ant. 0 0.15dB for SISO Ant. 1 0.26dB for MIMO Ant.0 0.21dB for MIMO Ant.1

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)				
		SISO Ant.0	SISO Ant.1	MIMO Ant.0+1(0)	MIMO Ant.0+1(1)	MIMO Ant.0+1
01	2412	10.14	10.04	9.62	10.67	13.19
06	2437	10.42	10.43	9.94	10.57	13.28
11	2462	10.10	10.37	10.77	10.59	13.69



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%
Duty Cycle:	97.08% for SISO Ant. 0 97.08% for SISO Ant. 1 89.96% for MIMO Ant. 0 89.89% for MIMO Ant. 1	Duty Factor:	0.13dB for SISO Ant. 0 0.13dB for SISO Ant. 1 0.46dB for MIMO Ant.0 0.46dB for MIMO Ant.1

Channel	Frequency (MHz)	802.11n HT40 Average Output Power (dBm)				
		SISO Ant.0	SISO Ant.1	MIMO Ant.0+1(0)	MIMO Ant.0+1(1)	MIMO Ant.0+1
03	2422	10.34	10.15	10.12	10.52	13.34
06	2437	10.15	9.85	10.44	10.31	13.39
09	2452	10.02	10.25	10.58	10.41	13.51

Note :

1. MIMO Ant.0+1 is a calculated result from sum of the power MIMO Ant.0+1(0) and MIMO Ant.0+1(1).
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.

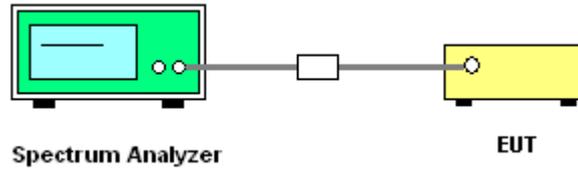
Method (1): Measure and sum the spectra across the outputs.

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°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm/3 KHz)	Pass /Fail
		Ant.0			
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	3.31	-12.60	8	Pass
06	2437	3.38	-12.24	8	Pass
11	2462	3.01	-12.82	8	Pass

Test Mode :	802.11g	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	802.11g Power Density		Max. Limits (dBm/3 KHz)	Pass /Fail
		Ant.1			
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	0.23	-16.30	8	Pass
06	2437	0.27	-16.69	8	Pass
11	2462	-0.77	-16.49	8	Pass

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	802.11n HT20 Power Density						Max. Limits (dBm/3KHz)	Pass /Fail
		MIMO Ant.0+1(0)			MIMO Ant.0+1(1)				
		PSD/100KHz (dBm)	PSD/3KHz (dBm)	PSD/3KHz (dBm) +10log2	PSD/100KHz (dBm)	PSD/3KHz (dBm)	PSD/3KHz (dBm) +10log2		
01	2412	-0.80	-16.08	-13.07	0.09	-14.85	-11.84	8	Pass
06	2437	-1.37	-17.21	-14.20	0.39	-14.65	-11.64	8	Pass
11	2462	-0.51	-17.36	-14.35	0.41	-16.57	-13.56	8	Pass



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Ch.	Freq. (MHz)	802.11n HT40 Power Density						Max. Limits (dBm/3KHz)	Pass /Fail
		MIMO Ant.0+1(0)			MIMO Ant.0+1(1)				
		PSD/100KHz (dBm)	PSD/3KHz (dBm)	PSD/3KHz (dBm) +10log2	PSD/100KHz (dBm)	PSD/3KHz (dBm)	PSD/3KHz (dBm) +10log2		
03	2422	-3.94	-17.73	-14.72	-3.02	-15.39	-12.38	8	Pass
06	2437	-3.35	-17.21	-14.20	-2.76	-16.53	-13.52	8	Pass
09	2452	-3.49	-18.03	-15.02	-2.90	-15.91	-12.90	8	Pass

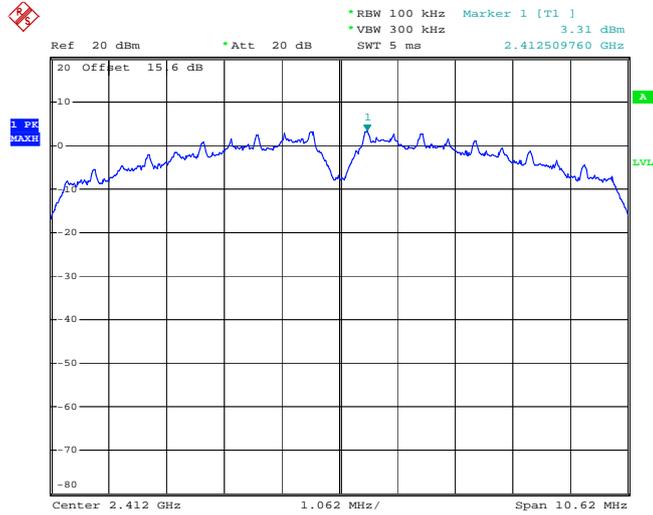
Note:

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

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

802.11b – Ant.0

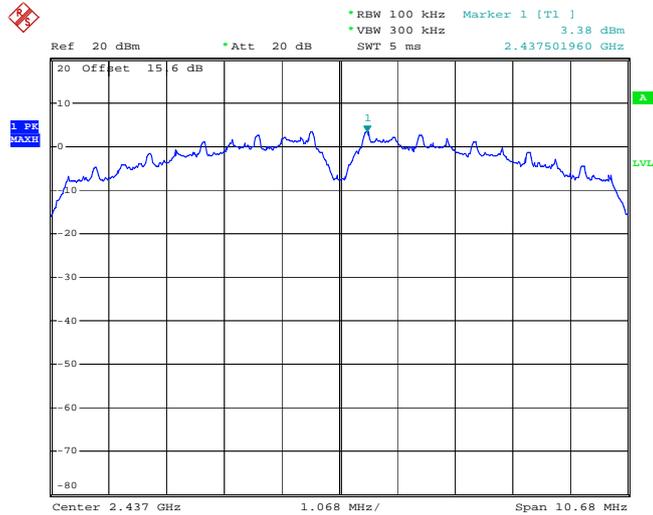
PSD 100kHz Plot on Channel 01



Date: 27.MAY.2013 18:54:05

802.11b – Ant.0

PSD 100kHz Plot on Channel 06

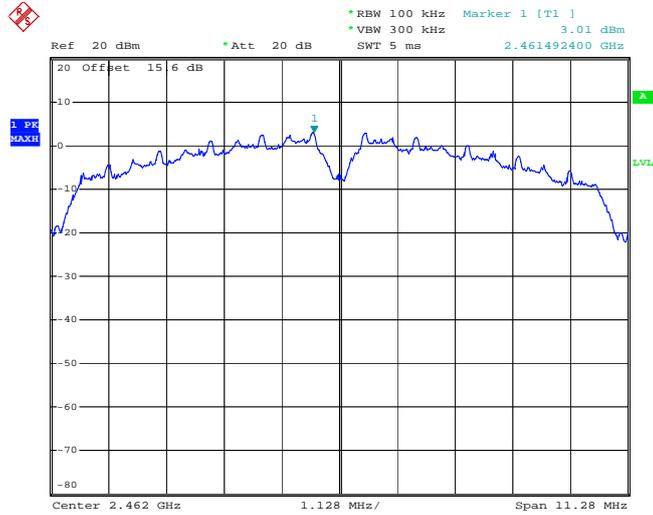


Date: 27.MAY.2013 18:57:38



802.11b – Ant.0

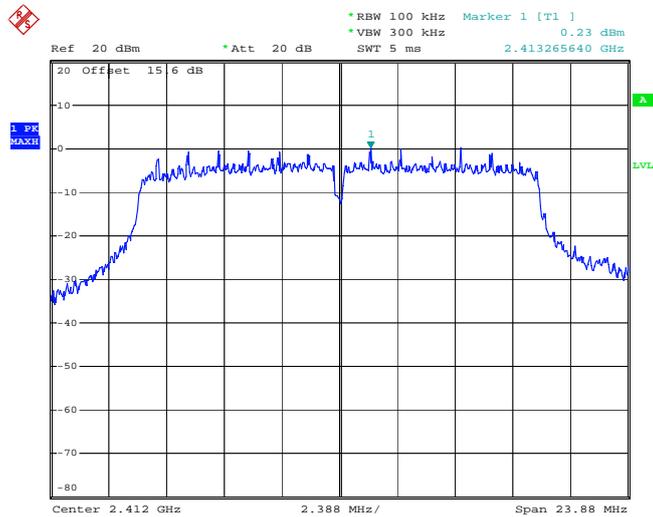
PSD 100kHz Plot on Channel 11



Date: 27.MAY.2013 19:00:31

802.11g – Ant.1

PSD 100kHz Plot on Channel 01

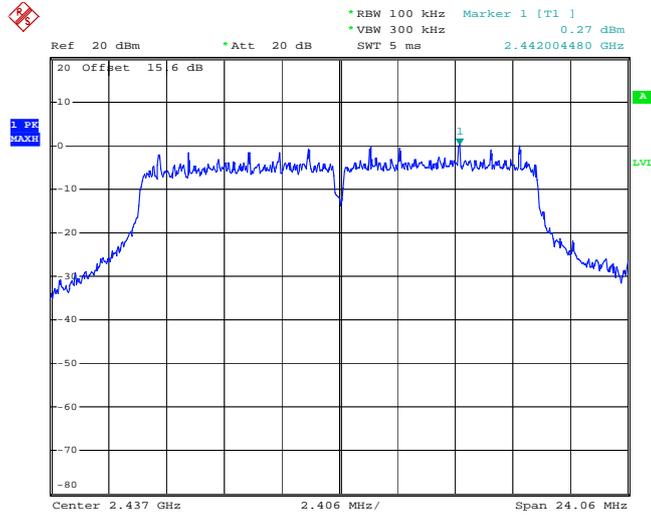


Date: 27.MAY.2013 19:05:18



802.11g – Ant.1

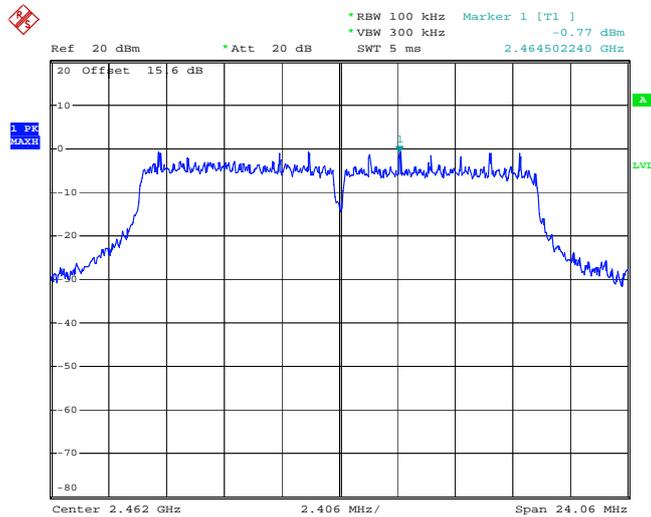
PSD 100kHz Plot on Channel 06



Date: 27.MAY.2013 19:08:11

802.11g – Ant.1

PSD 100kHz Plot on Channel 11

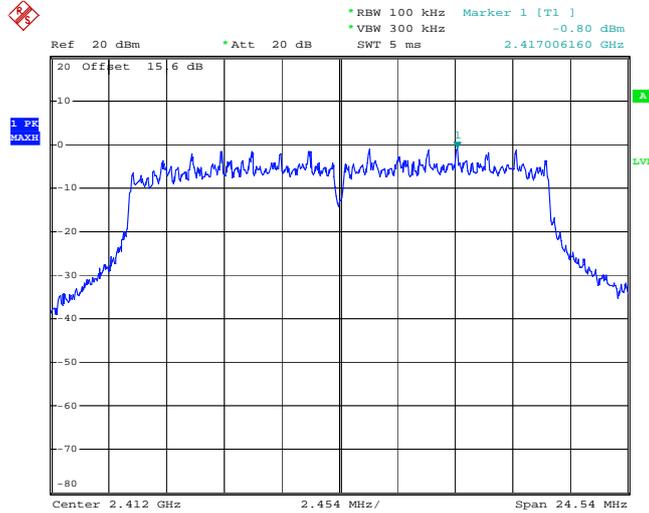


Date: 27.MAY.2013 19:14:56



802.11n HT20 –MIMO Ant.0+1(0)

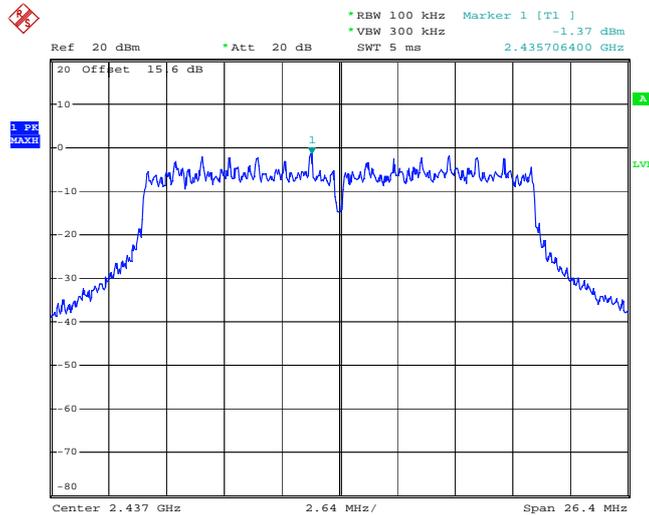
PSD 100kHz Plot on Channel 01



Date: 27.MAY.2013 19:19:41

802.11n HT20 –MIMO Ant.0+1(0)

PSD 100kHz Plot on Channel 06

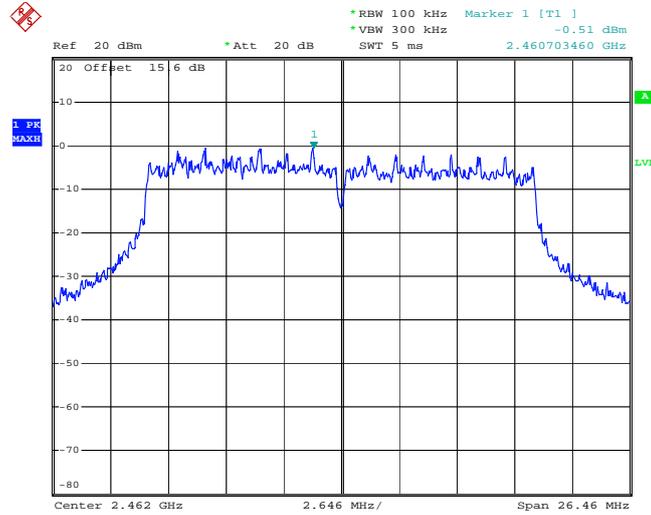


Date: 27.MAY.2013 19:29:18



802.11n HT20 –MIMO Ant.0+1(0)

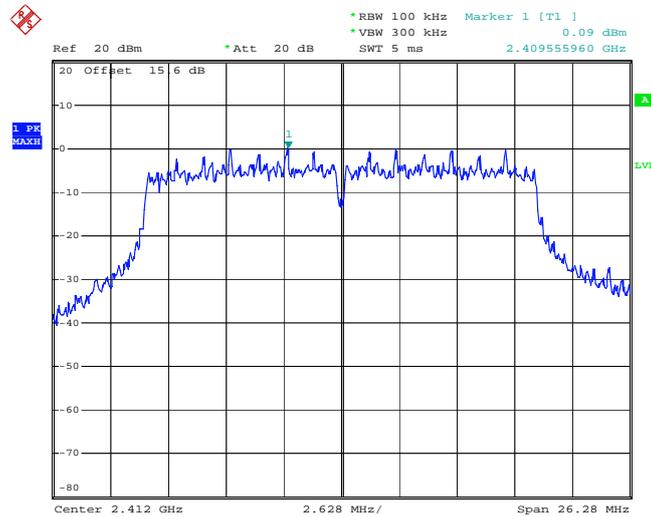
PSD 100kHz Plot on Channel 11



Date: 27.MAY.2013 19:26:31

802.11n HT20 –MIMO Ant.0+1(1)

PSD 100kHz Plot on Channel 01

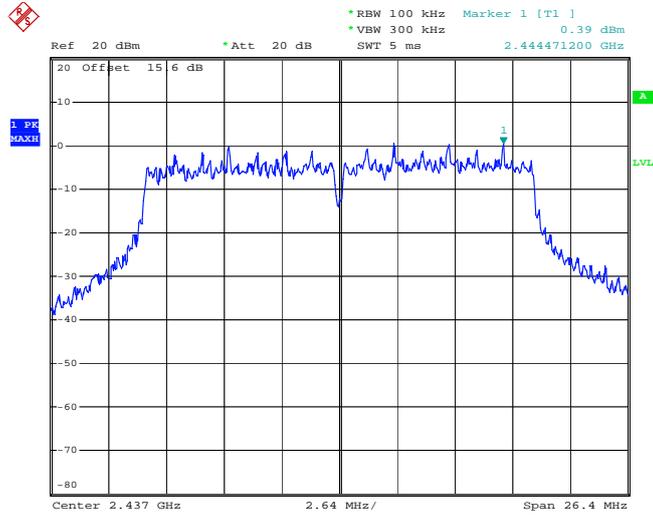


Date: 27.MAY.2013 19:33:36



802.11n HT20 –MIMO Ant.0+1(1)

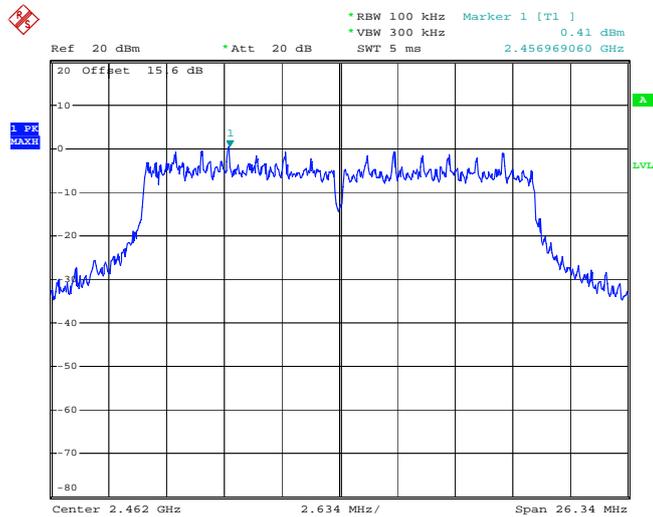
PSD 100kHz Plot on Channel 06



Date: 27.MAY.2013 19:36:54

802.11n HT20 –MIMO Ant.0+1(1)

PSD 100kHz Plot on Channel 11

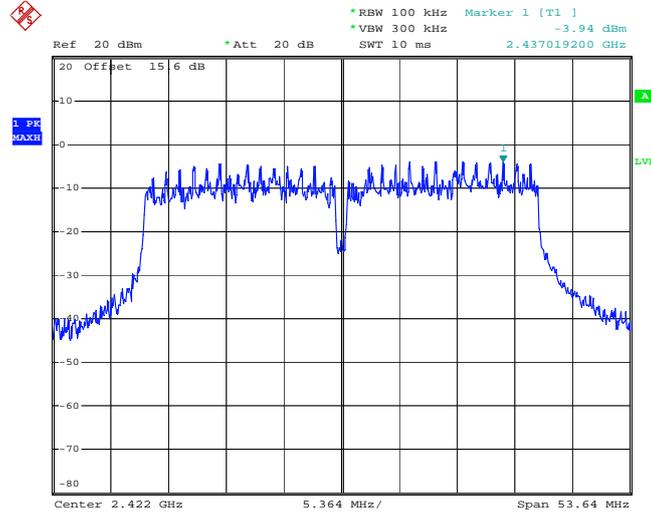


Date: 27.MAY.2013 19:40:11



802.11n HT40 –MIMO Ant.0+1(0)

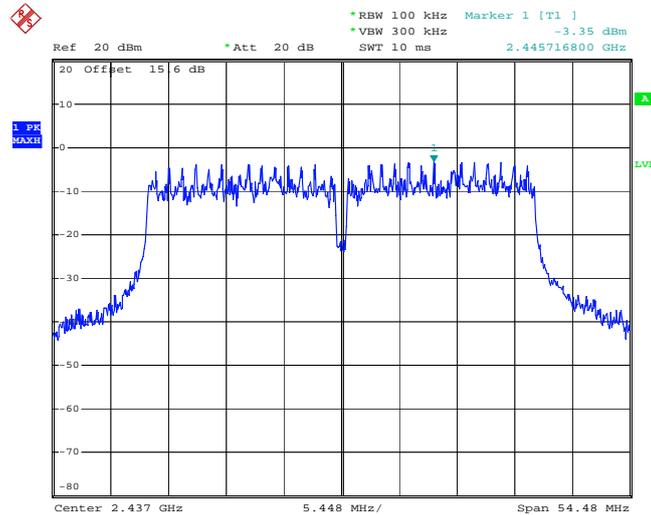
PSD 100kHz Plot on Channel 03



Date: 27.MAY.2013 20:47:34

802.11n HT40 –MIMO Ant.0+1(0)

PSD 100kHz Plot on Channel 06

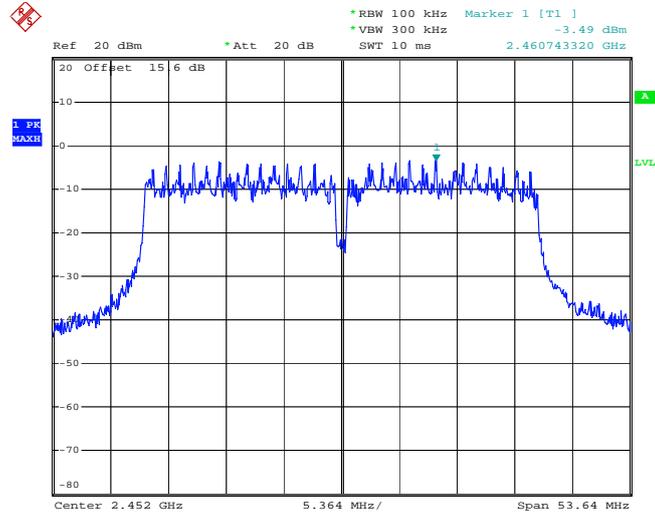


Date: 27.MAY.2013 20:53:10



802.11n HT40 –MIMO Ant.0+1(0)

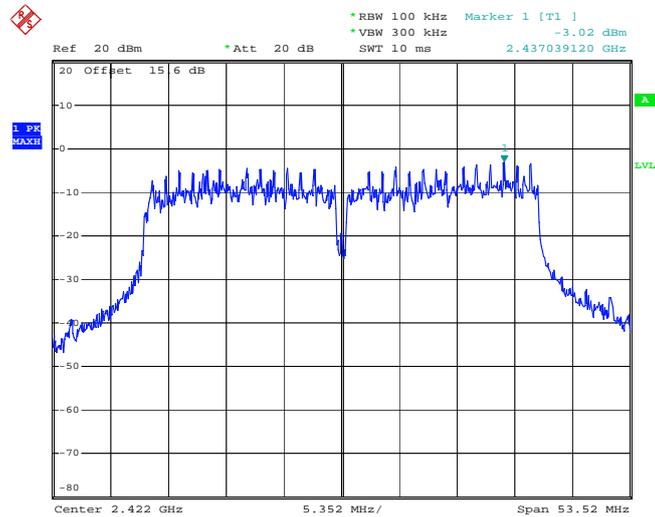
PSD 100kHz Plot on Channel 09



Date: 27.MAY.2013 20:57:06

802.11n HT40 –MIMO Ant.0+1(1)

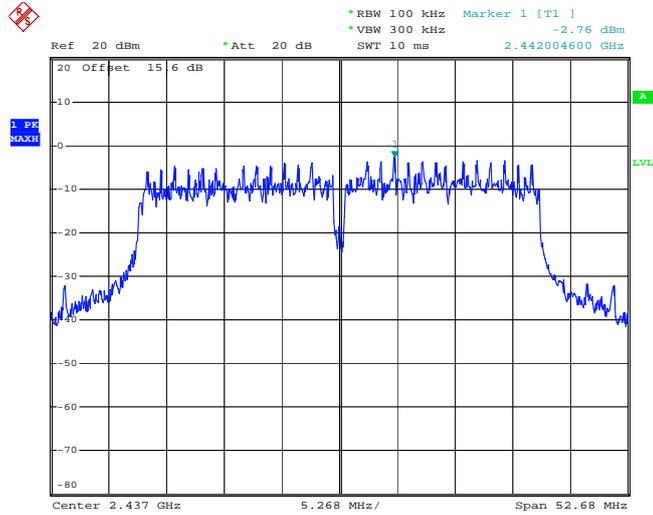
PSD 100kHz Plot on Channel 03



Date: 27.MAY.2013 20:35:11

802.11n HT40 –MIMO Ant.0+1(1)

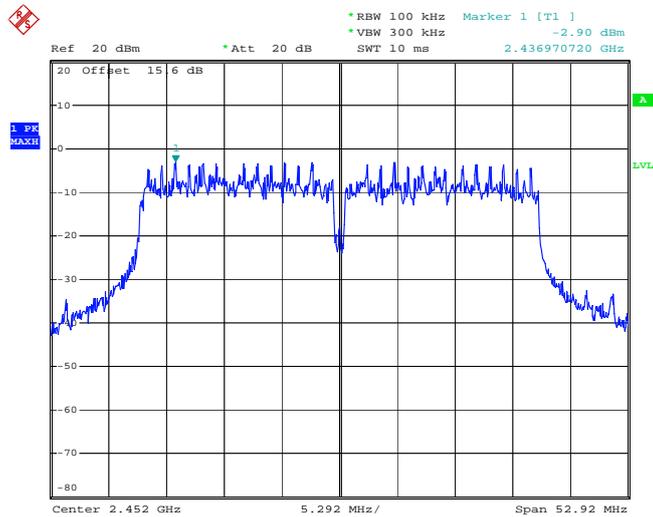
PSD 100kHz Plot on Channel 06



Date: 27.MAY.2013 20:40:01

802.11n HT40 –MIMO Ant.0+1(1)

PSD 100kHz Plot on Channel 09

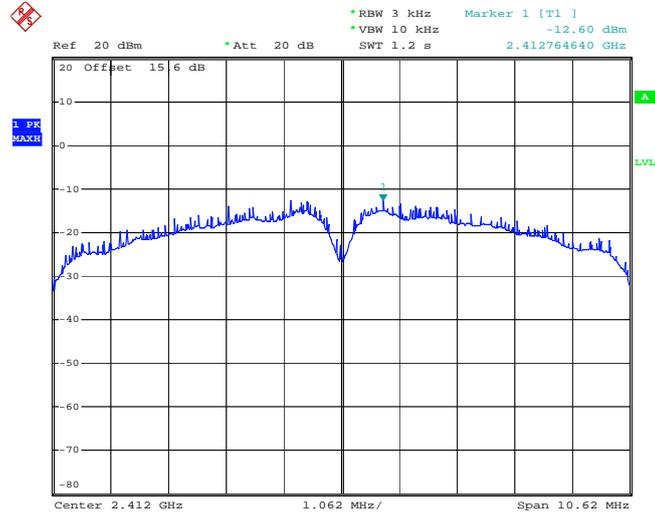


Date: 27.MAY.2013 20:42:52

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

802.11b – Ant.0

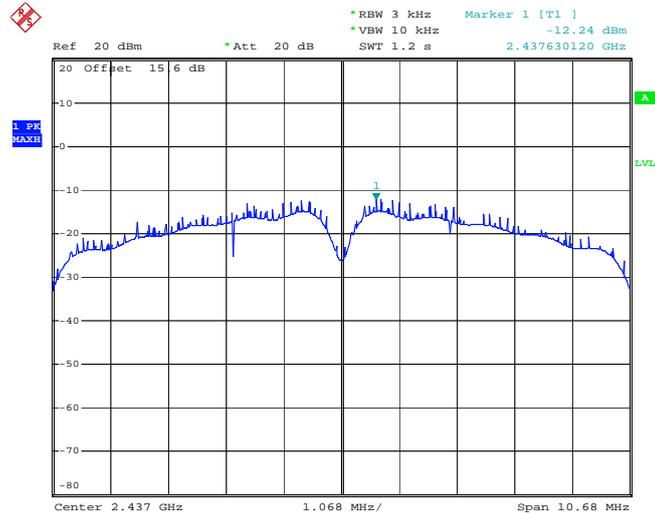
PSD 3kHz Plot on Channel 01



Date: 27.MAY.2013 18:53:55

802.11b – Ant.0

PSD 3kHz Plot on Channel 06

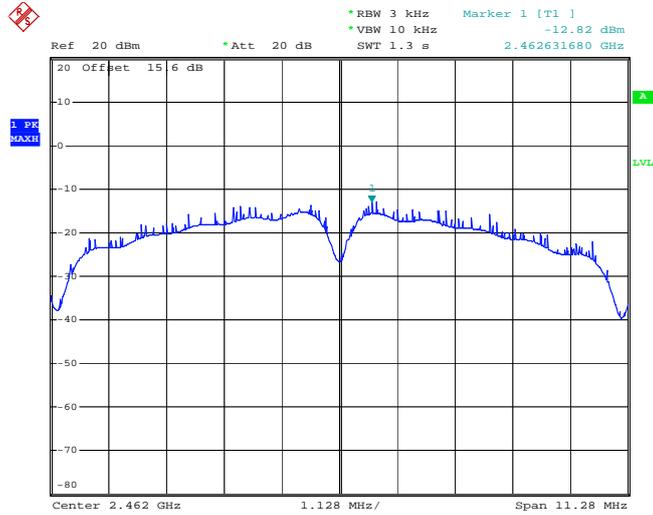


Date: 27.MAY.2013 18:57:29



802.11b – Ant.0

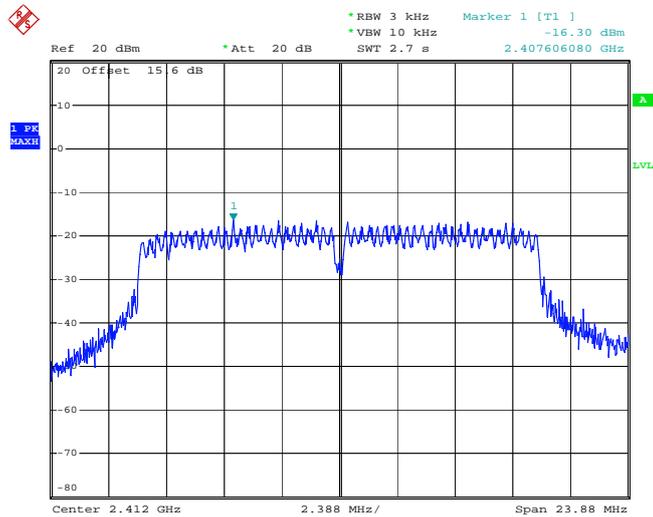
PSD 3kHz Plot on Channel 11



Date: 27.MAY.2013 19:00:21

802.11g – Ant.1

PSD 3kHz Plot on Channel 01

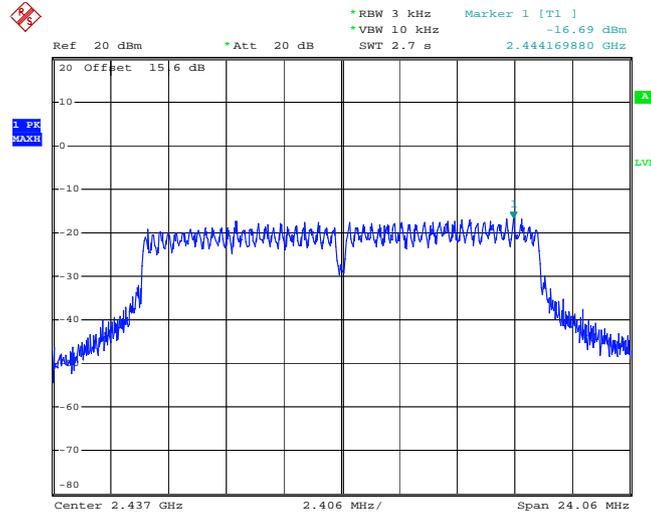


Date: 27.MAY.2013 19:05:08



802.11g – Ant.1

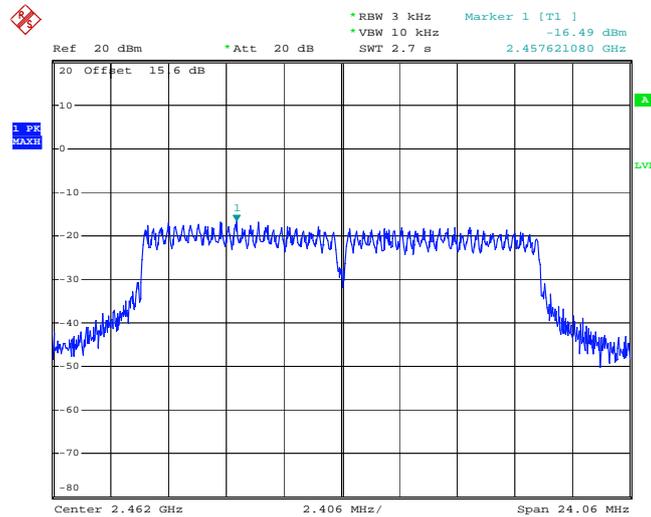
PSD 3kHz Plot on Channel 06



Date: 27.MAY.2013 19:08:01

802.11g – Ant.1

PSD 3kHz Plot on Channel 11

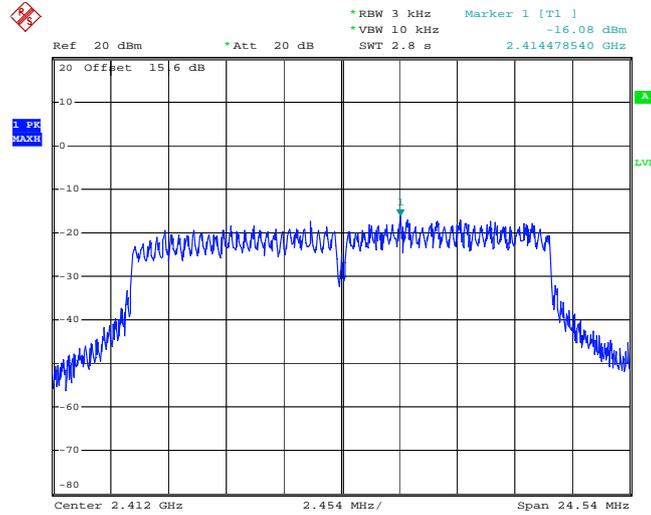


Date: 27.MAY.2013 19:14:46



802.11n HT20 –MIMO Ant.0+1(0)

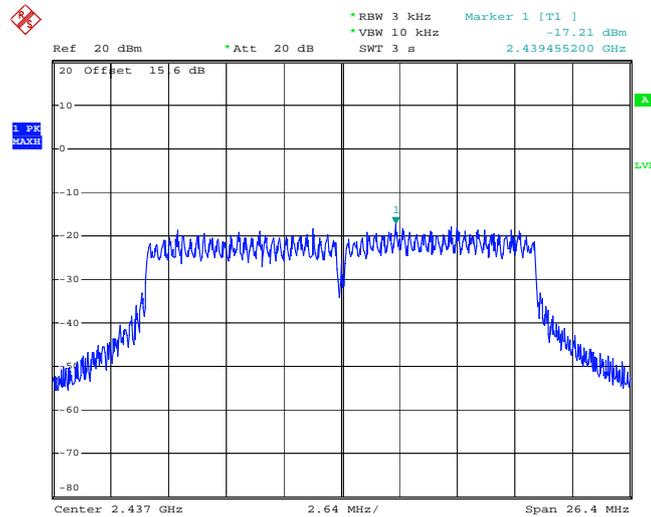
PSD 3kHz Plot on Channel 01



Date: 27.MAY.2013 19:19:32

802.11n HT20 –MIMO Ant.0+1(0)

PSD 3kHz Plot on Channel 06

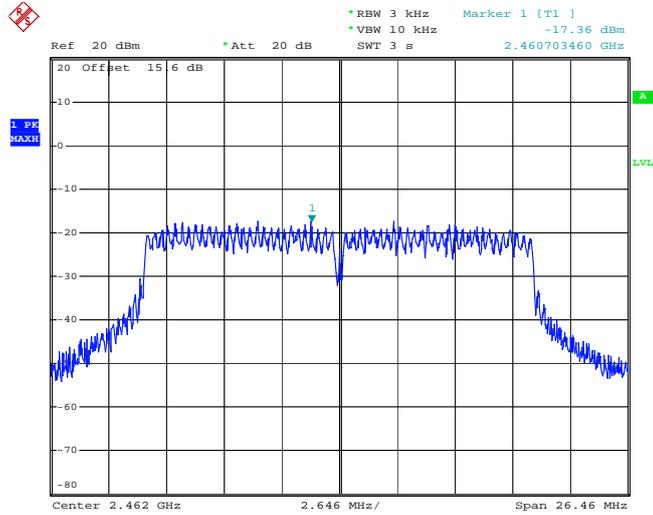


Date: 27.MAY.2013 19:29:08



802.11n HT20 –MIMO Ant.0+1(0)

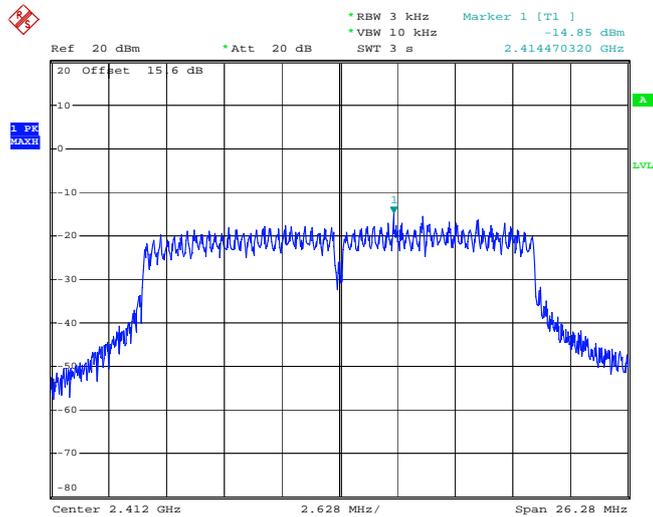
PSD 3kHz Plot on Channel 11



Date: 27.MAY.2013 19:26:21

802.11n HT20 –MIMO Ant.0+1(1)

PSD 3kHz Plot on Channel 01

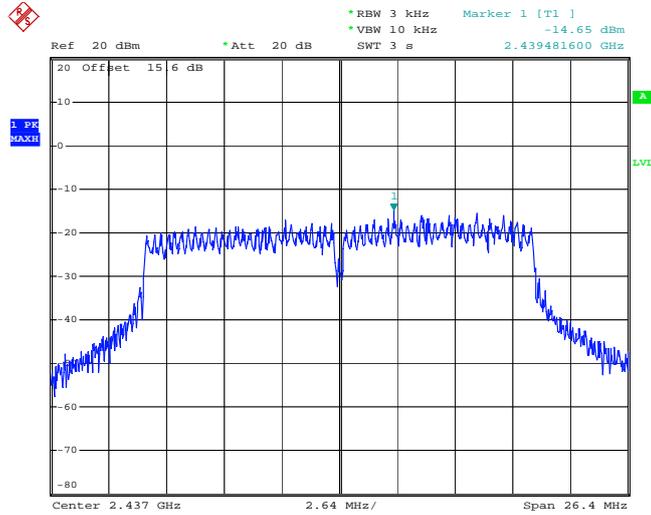


Date: 27.MAY.2013 19:33:26



802.11n HT20 –MIMO Ant.0+1(1)

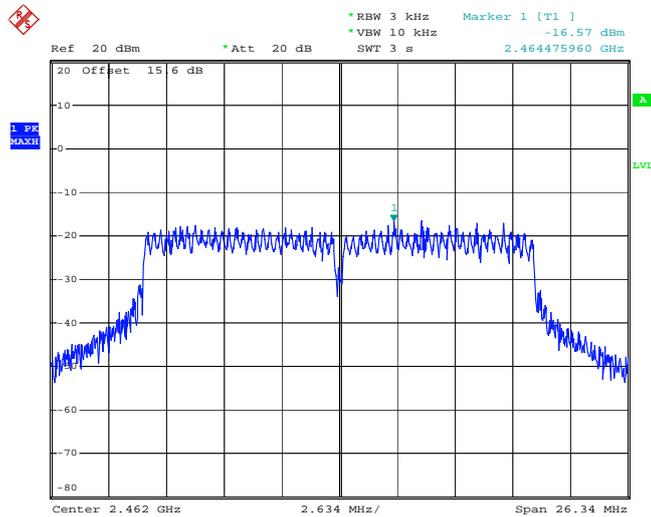
PSD 3kHz Plot on Channel 06



Date: 27.MAY.2013 19:36:44

802.11n HT20 –MIMO Ant.0+1(1)

PSD 3kHz Plot on Channel 11

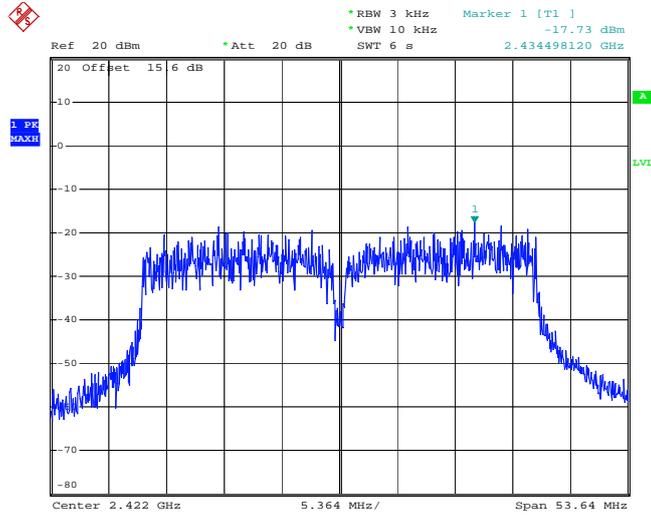


Date: 27.MAY.2013 19:40:01



802.11n HT40 –MIMO Ant.0+1(0)

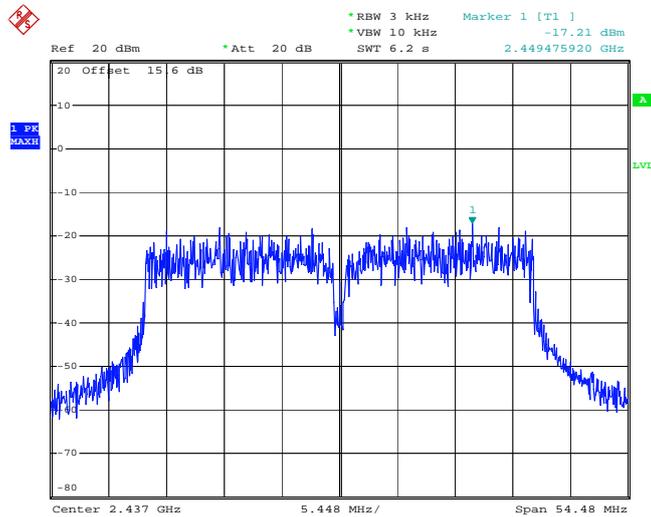
PSD 3kHz Plot on Channel 03



Date: 27.MAY.2013 20:47:24

802.11n HT40 –MIMO Ant.0+1(0)

PSD 3kHz Plot on Channel 06

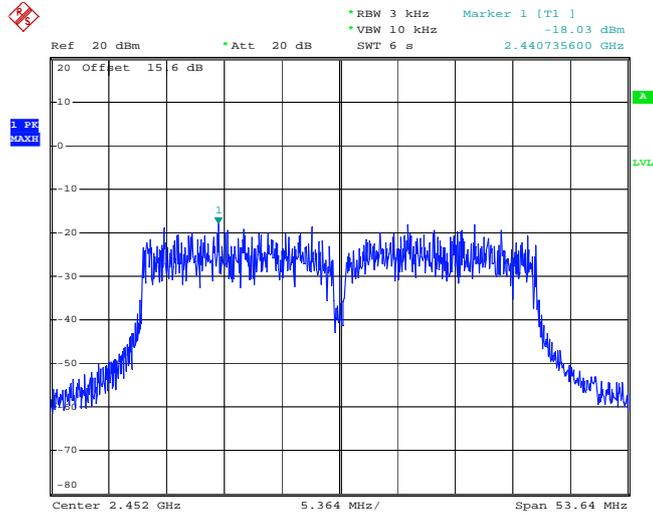


Date: 27.MAY.2013 20:53:00



802.11n HT40 –MIMO Ant.0+1(0)

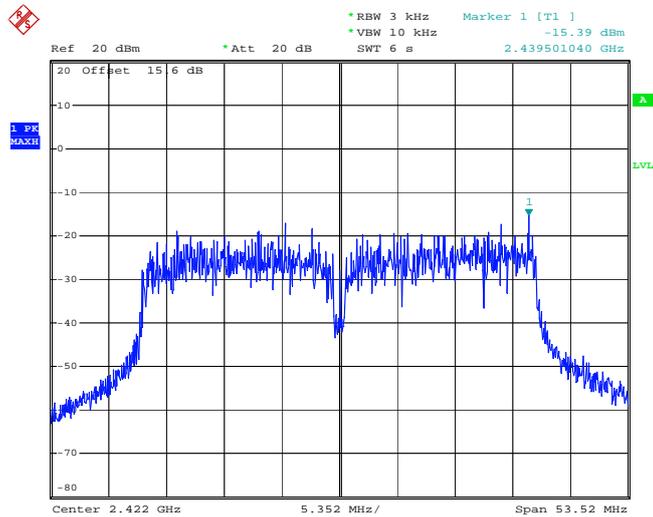
PSD 3kHz Plot on Channel 09



Date: 27.MAY.2013 20:56:56

802.11n HT40 –MIMO Ant.0+1(1)

PSD 3kHz Plot on Channel 03

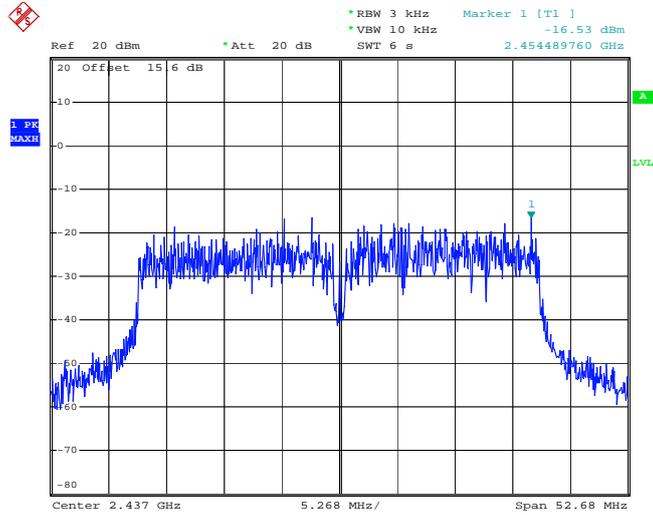


Date: 27.MAY.2013 20:35:01



802.11n HT40 –MIMO Ant.0+1(1)

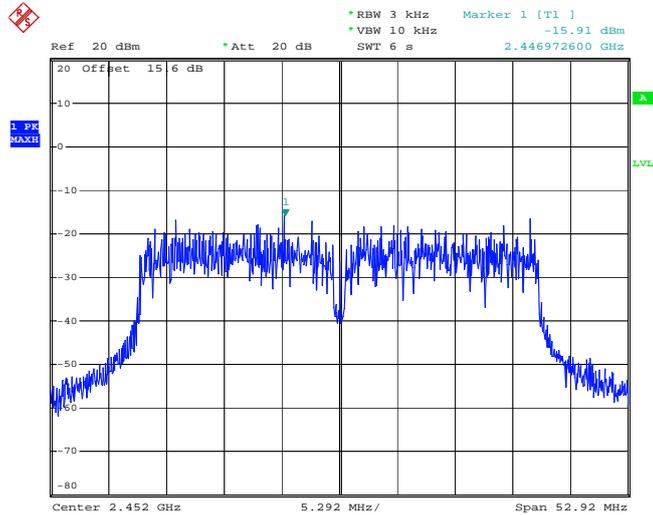
PSD 3kHz Plot on Channel 06



Date: 27.MAY.2013 20:39:51

802.11n HT40 –MIMO Ant.0+1(1)

PSD 3kHz Plot on Channel 09



Date: 27.MAY.2013 20:42:42

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).

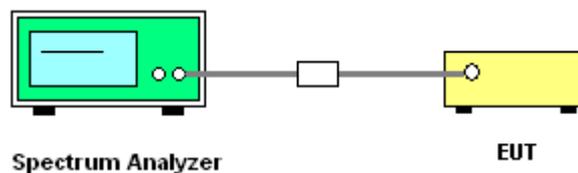
3.4.2 Measuring Instruments

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

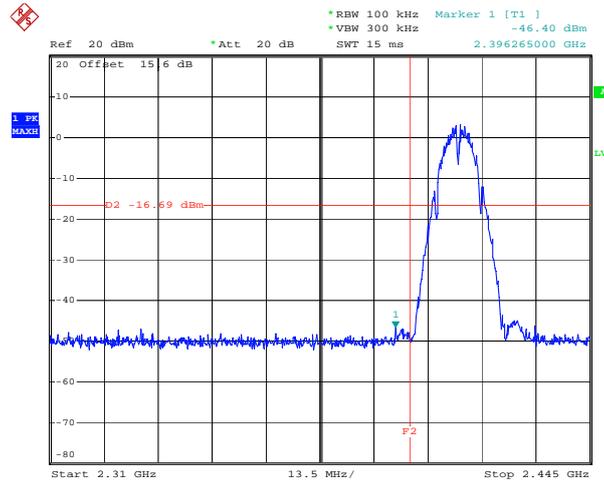


3.4.5 Test Result of Conducted Spurious at Band Edges

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

802.11b-Ant.0

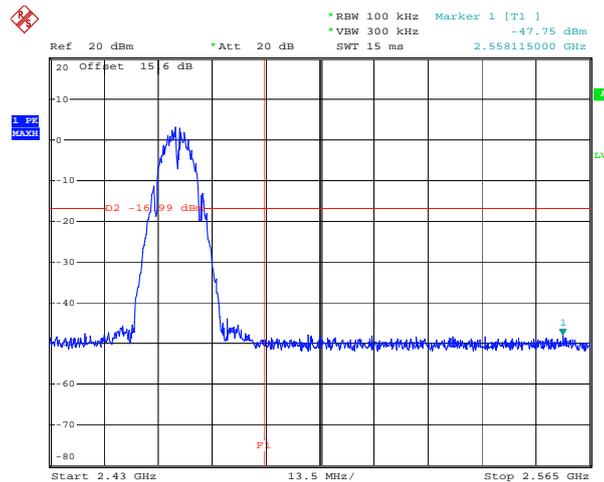
Low Band Edge Plot on Channel 01



Date: 27.MAY.2013 18:54:20

802.11b-Ant.0

High Band Edge Plot on Channel 11



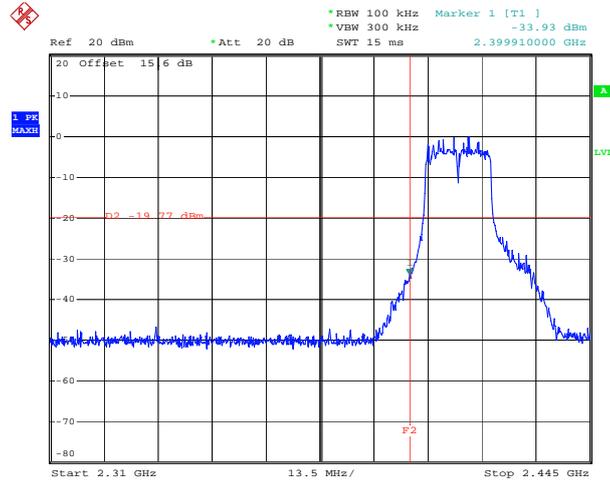
Date: 27.MAY.2013 19:00:46



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

802.11g-Ant.1

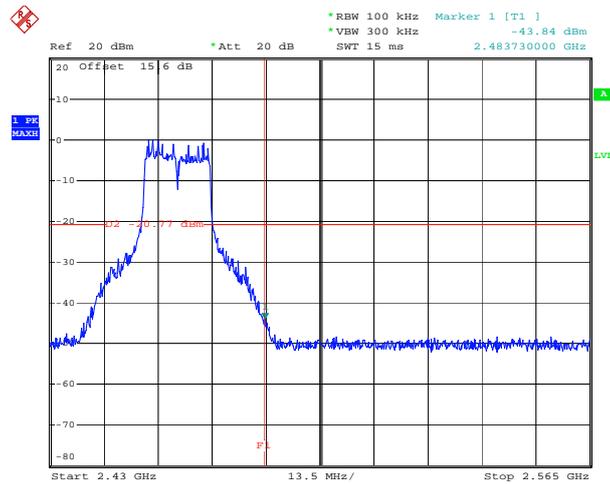
Low Band Edge Plot on Channel 01



Date: 27.MAY.2013 19:05:33

802.11g-Ant.1

High Band Edge Plot on Channel 11



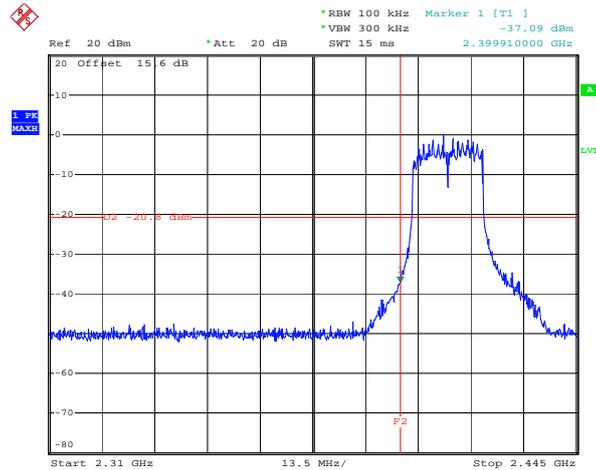
Date: 27.MAY.2013 19:15:12



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Adonis Li

802.11n HT20- MIMO Ant.0+1(0)

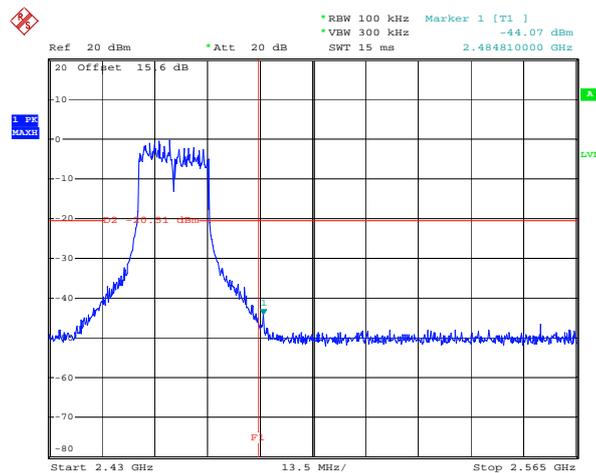
Low Band Edge Plot on Channel 01



Date: 27.MAY.2013 19:19:57

802.11n HT20- MIMO Ant.0+1(0)

High Band Edge Plot on Channel 11

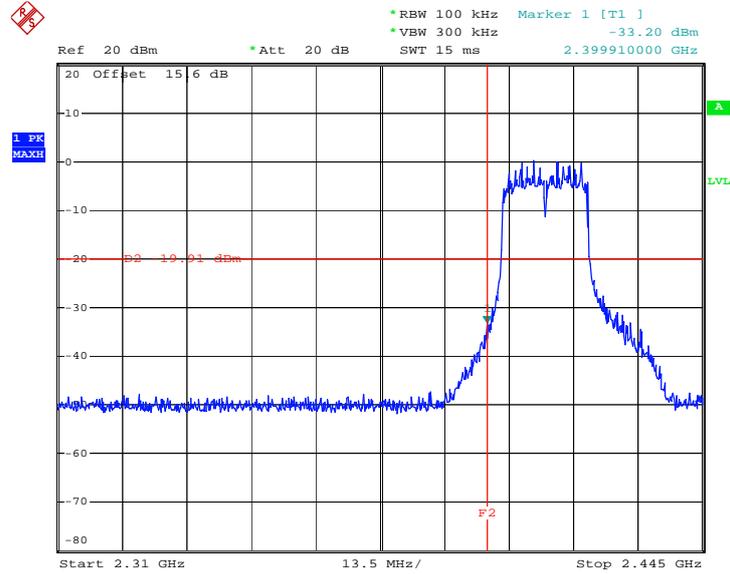


Date: 27.MAY.2013 19:26:46



802.11n HT20- MIMO Ant.0+1(1)

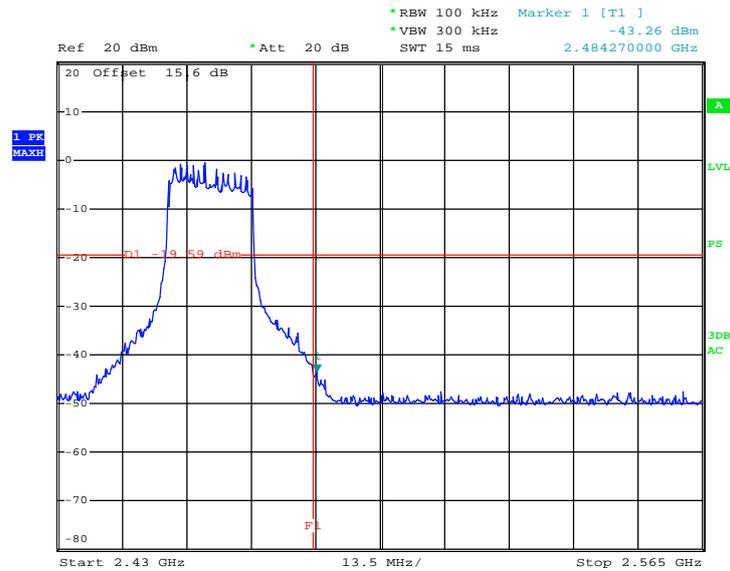
Low Band Edge Plot on Channel 01



Date: 27.MAY.2013 19:33:52

802.11n HT20- MIMO Ant.0+1(1)

High Band Edge Plot on Channel 11



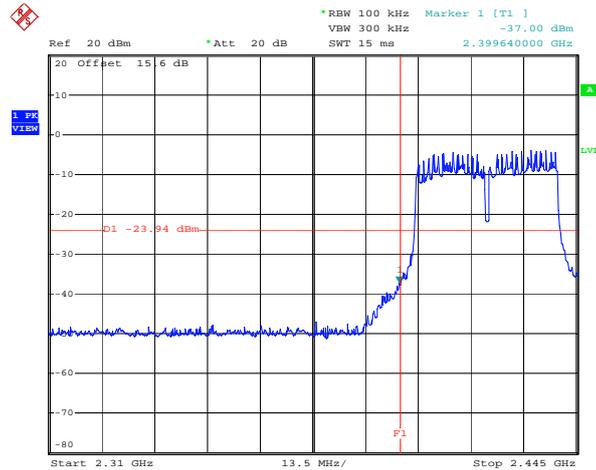
Date: 6.JUN.2013 17:54:29



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	Low and High	Relative Humidity :	47~48%
Test Channel :	03 and 09	Test Engineer :	Adonis Li

802.11n HT40- MIMO Ant.0+1(0)

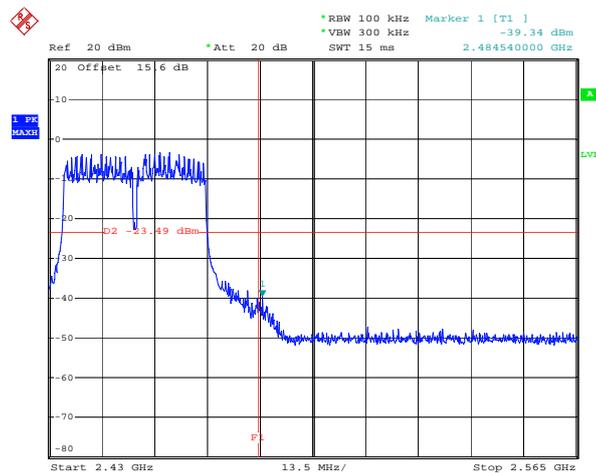
Low Band Edge Plot on Channel 03



Date: 27.MAY.2013 20:50:01

802.11n HT40- MIMO Ant.0+1(0)

High Band Edge Plot on Channel 09

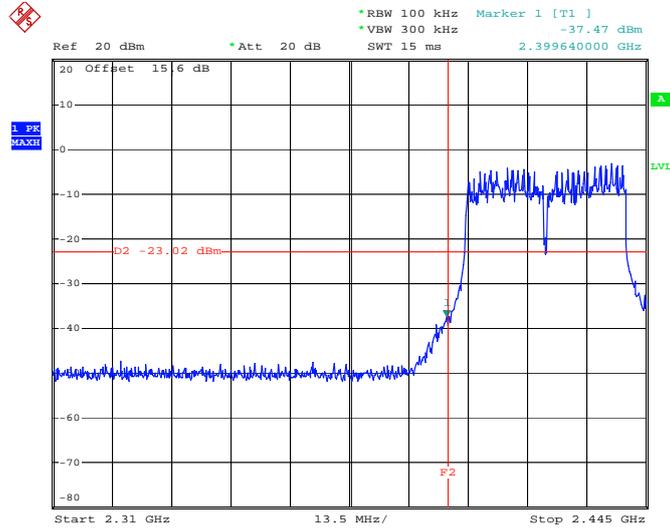


Date: 27.MAY.2013 20:57:21



802.11n HT40- MIMO Ant.0+1(1)

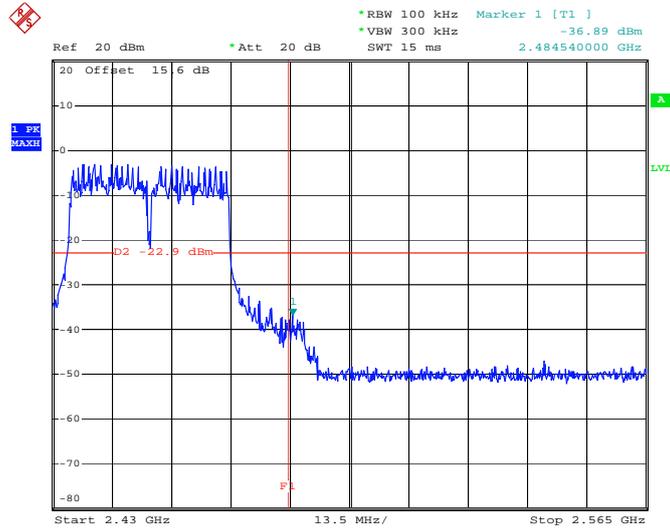
Low Band Edge Plot on Channel 03



Date: 27.MAY.2013 20:35:26

802.11n HT40- MIMO Ant.0+1(1)

High Band Edge Plot on Channel 09



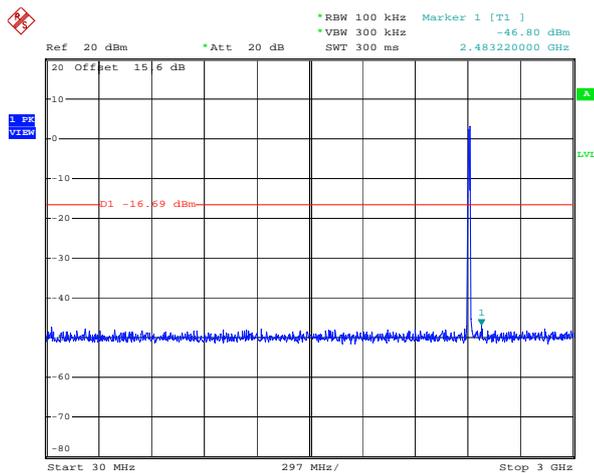
Date: 27.MAY.2013 20:43:07

3.4.5 Test Result of Conducted Spurious Emission

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

802.11b 30 MHz~3 GHz-Ant.0

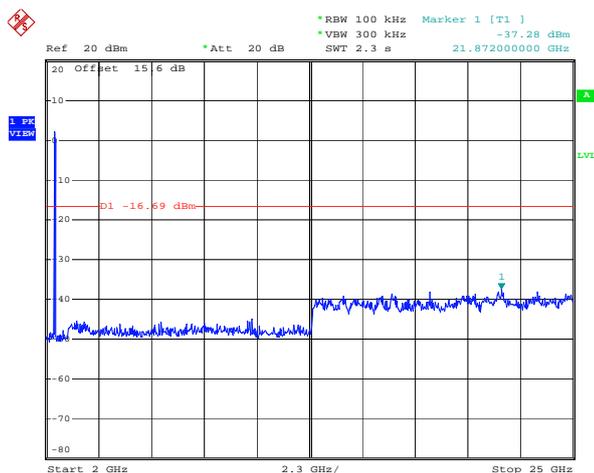
Conducted Spurious Emission Plot on Channel 01



Date: 27.MAY.2013 18:54:40

802.11b 2 GHz~25 GHz-Ant.0

Conducted Spurious Emission Plot on Channel 01

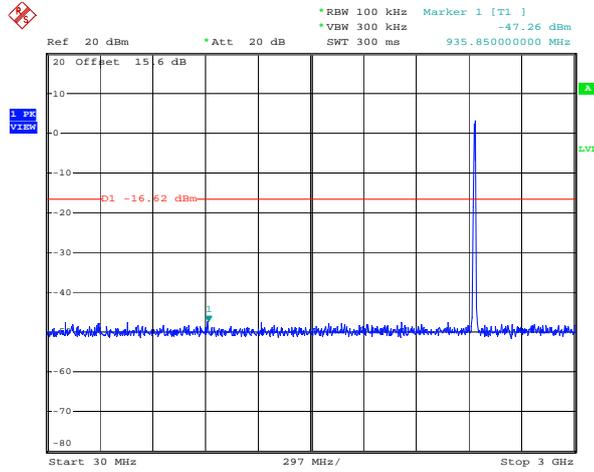


Date: 27.MAY.2013 18:55:00



802.11b 30 MHz~3 GHz-Ant.0

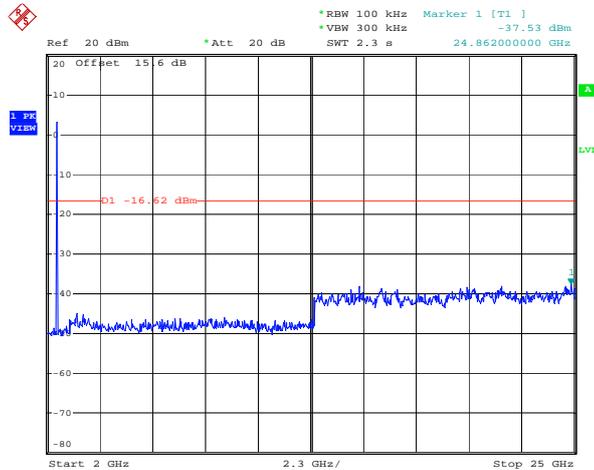
Conducted Spurious Emission Plot on Channel 06



Date: 27.MAY.2013 18:57:59

802.11b 2 GHz~25 GHz-Ant.0

Conducted Spurious Emission Plot on Channel 06

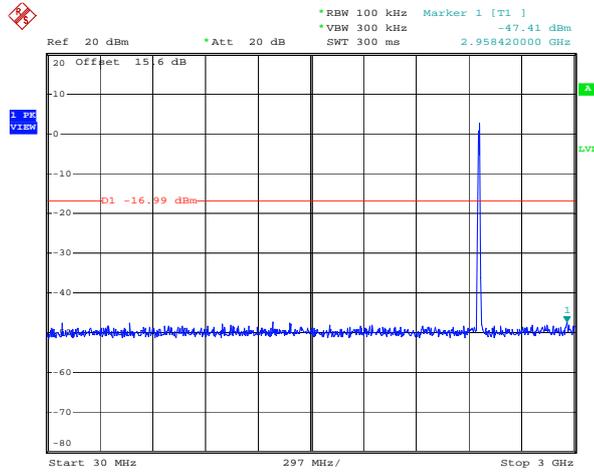


Date: 27.MAY.2013 18:58:18



802.11b 30 MHz~3 GHz-Ant.0

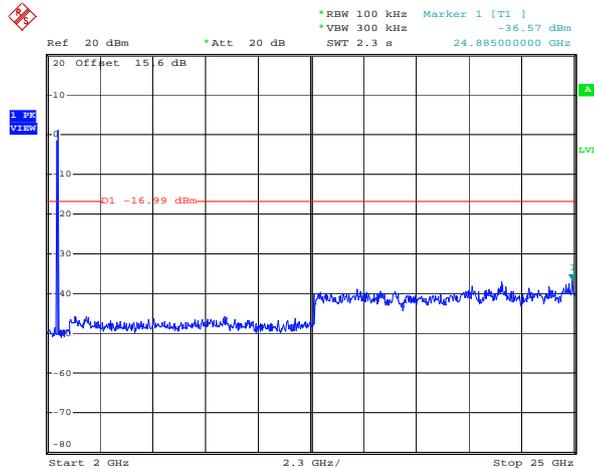
Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 19:01:07

802.11b 2 GHz~25 GHz-Ant.0

Conducted Spurious Emission Plot on Channel 11



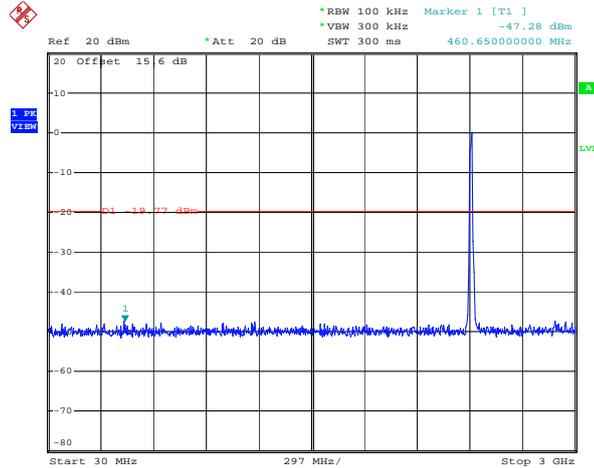
Date: 27.MAY.2013 19:01:26



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

802.11g 30 MHz~3 GHz-Ant.1

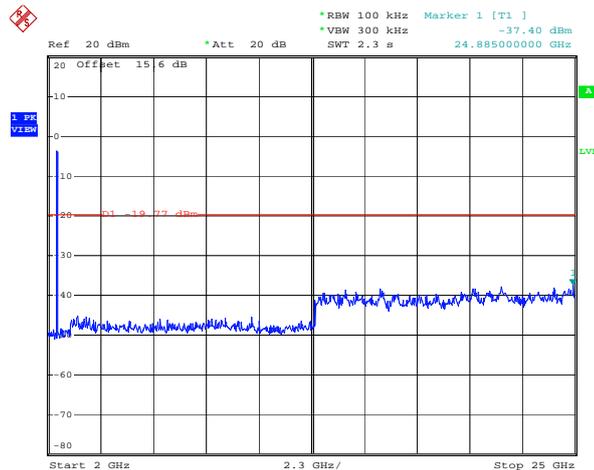
Conducted Spurious Emission Plot on Channel 01



Date: 27.MAY.2013 19:05:54

802.11g 2 GHz~25 GHz-Ant.1

Conducted Spurious Emission Plot on Channel 01

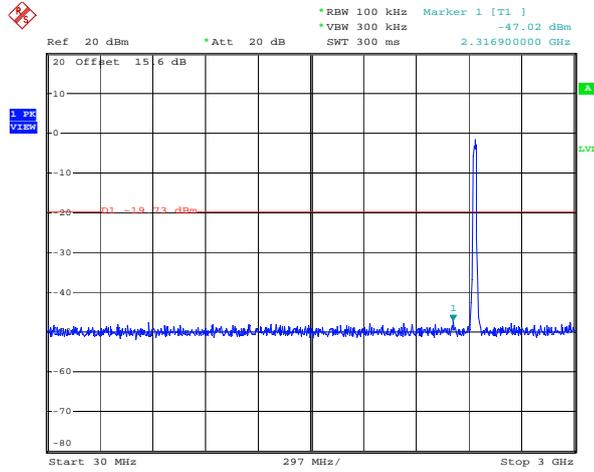


Date: 27.MAY.2013 19:06:13



802.11g 30 MHz~3 GHz-Ant.1

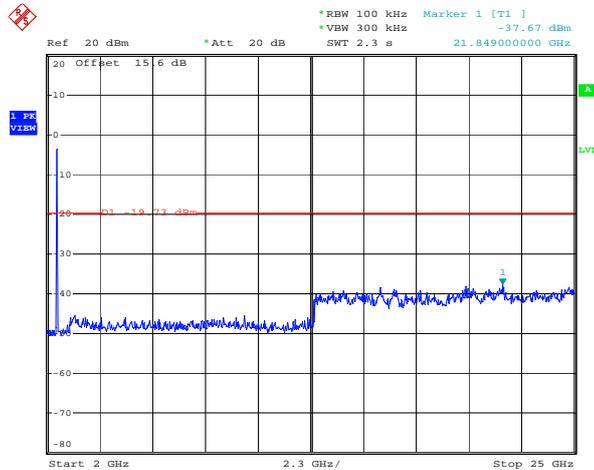
Conducted Spurious Emission Plot on Channel 06



Date: 27.MAY.2013 19:08:32

802.11g 2 GHz~25 GHz-Ant.1

Conducted Spurious Emission Plot on Channel 06

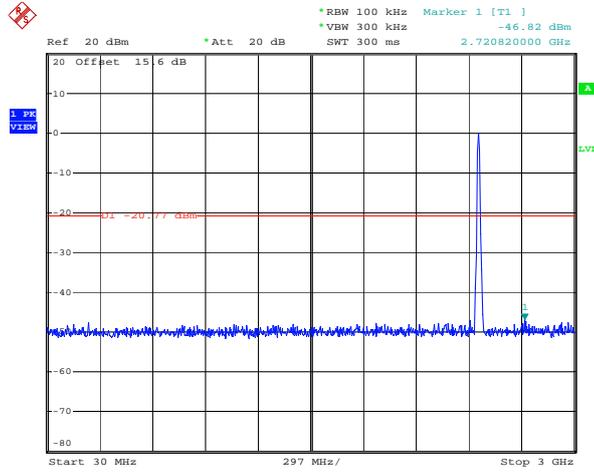


Date: 27.MAY.2013 19:08:51



802.11g 30 MHz~3 GHz-Ant.1

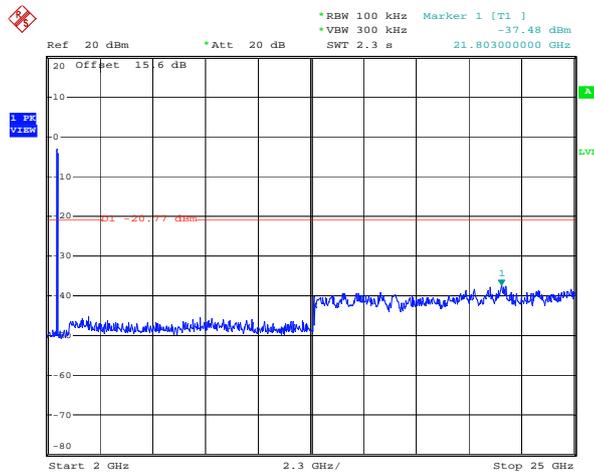
Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 19:15:32

802.11g 2 GHz~25 GHz-Ant.1

Conducted Spurious Emission Plot on Channel 11



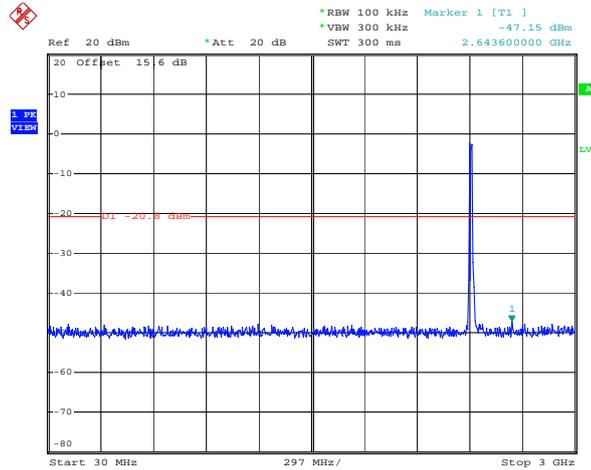
Date: 27.MAY.2013 19:15:51



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Band :	30MHz-3GHz and 3G-25GHz	Relative Humidity :	47~48%
Test Channel :	01, 06, 11	Test Engineer :	Adonis Li

802.11n HT20 30 MHz~3 GHz- MIMO Ant.0+1(0)

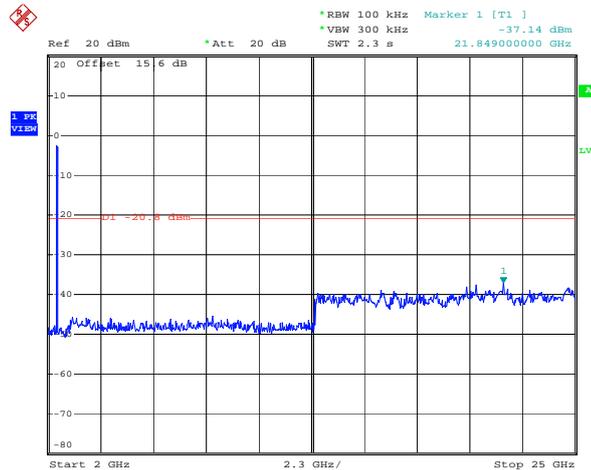
Conducted Spurious Emission Plot on Channel 01



Date: 27.MAY.2013 19:20:17

802.11n HT20 2 GHz~25 GHz- MIMO Ant.0+1(0)

Conducted Spurious Emission Plot on Channel 01

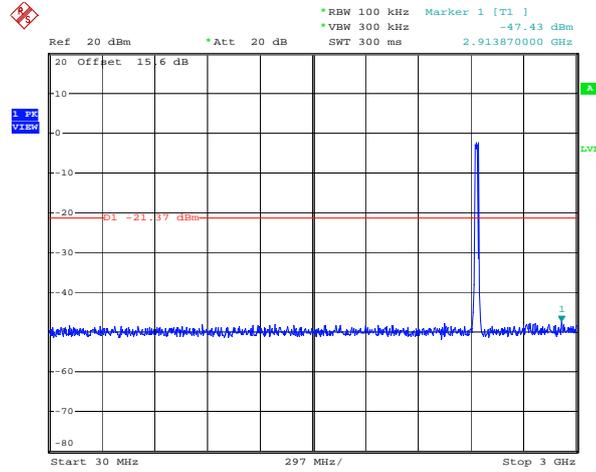


Date: 27.MAY.2013 19:20:36



802.11n HT20 30 MHz~3 GHz- MIMO Ant.0+1(0)

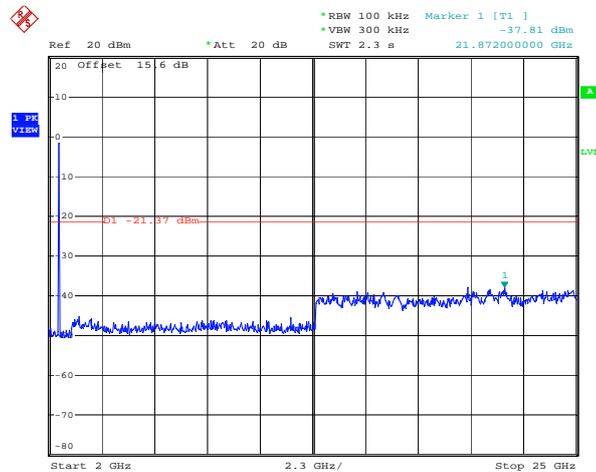
Conducted Spurious Emission Plot on Channel 06



Date: 27.MAY.2013 19:29:38

802.11n HT20 2 GHz~25 GHz- MIMO Ant.0+1(0)

Conducted Spurious Emission Plot on Channel 06

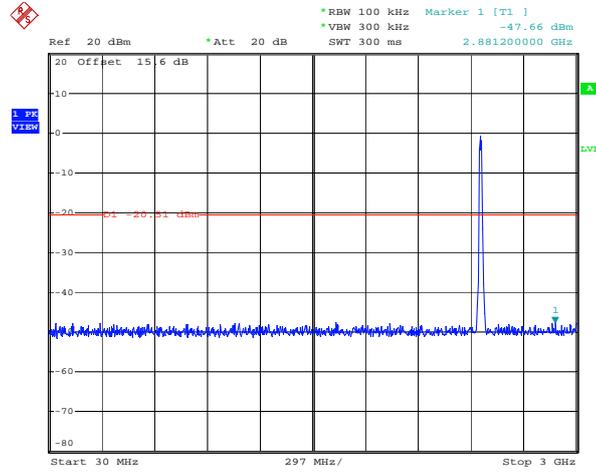


Date: 27.MAY.2013 19:29:58



802.11n HT20 30 MHz~3 GHz- MIMO Ant.0+1(0)

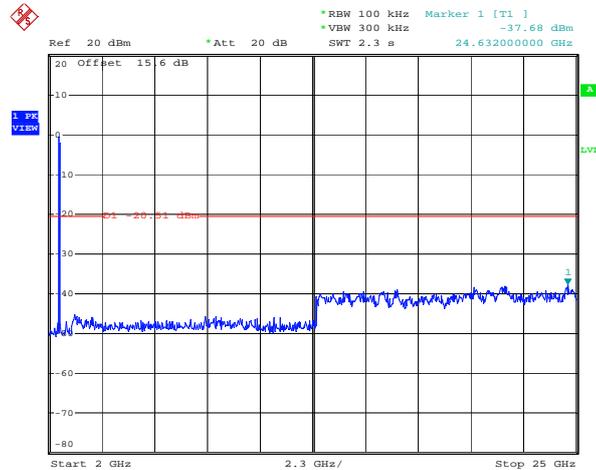
Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 19:27:07

802.11n HT20 2 GHz~25 GHz- MIMO Ant.0+1(0)

Conducted Spurious Emission Plot on Channel 11

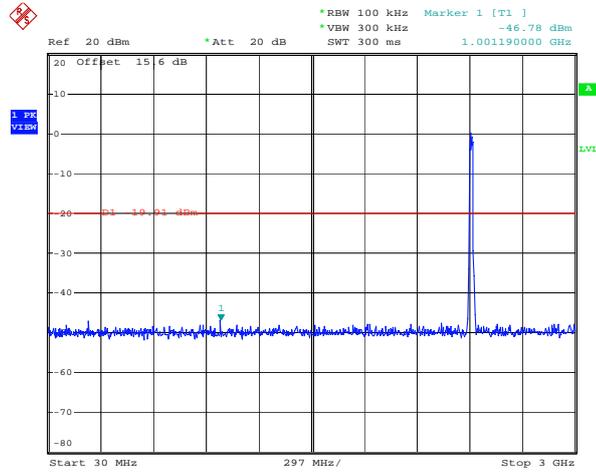


Date: 27.MAY.2013 19:27:26



802.11n HT20 30 MHz~3 GHz- MIMO Ant.0+1(1)

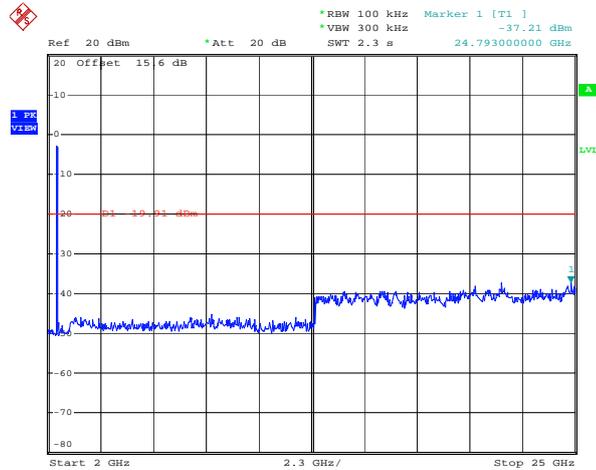
Conducted Spurious Emission Plot on Channel 01



Date: 27.MAY.2013 19:34:12

802.11n HT20 2 GHz~25 GHz- MIMO Ant.0+1(1)

Conducted Spurious Emission Plot on Channel 01

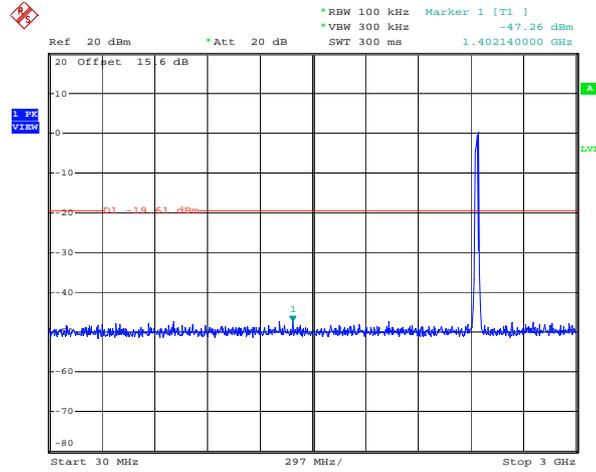


Date: 27.MAY.2013 19:34:31



802.11n HT20 30 MHz~3 GHz- MIMO Ant.0+1(1)

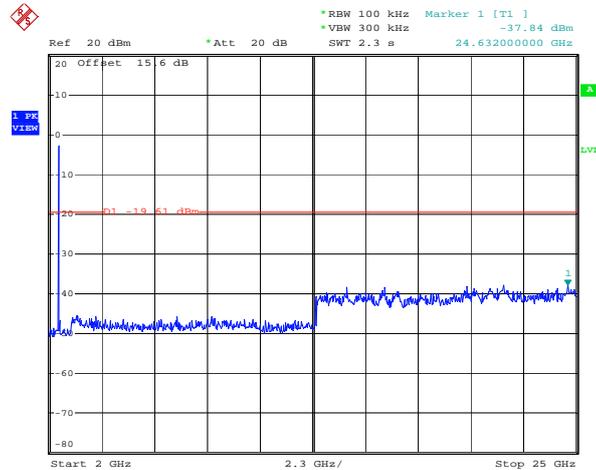
Conducted Spurious Emission Plot on Channel 06



Date: 27.MAY.2013 19:37:14

802.11n HT20 2 GHz~25 GHz- MIMO Ant.0+1(1)

Conducted Spurious Emission Plot on Channel 06

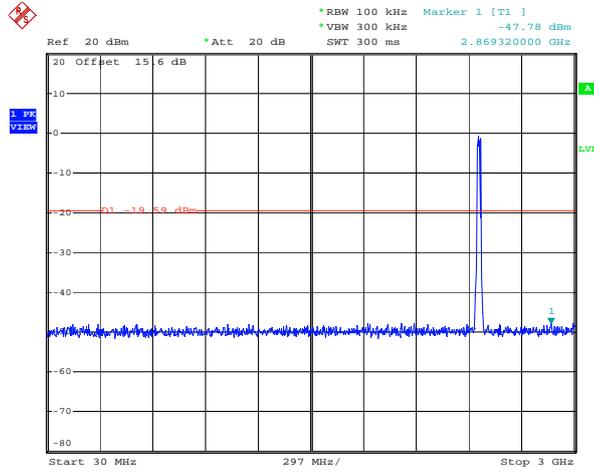


Date: 27.MAY.2013 19:37:34



802.11n HT20 30 MHz~3 GHz- MIMO Ant.0+1(1)

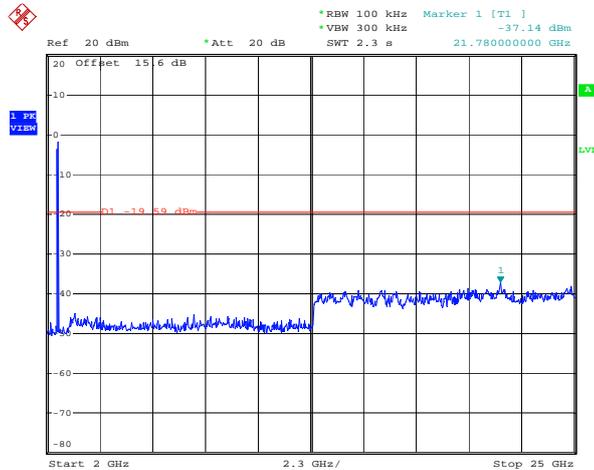
Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 19:40:47

802.11n HT20 2 GHz~25 GHz- MIMO Ant.0+1(1)

Conducted Spurious Emission Plot on Channel 11



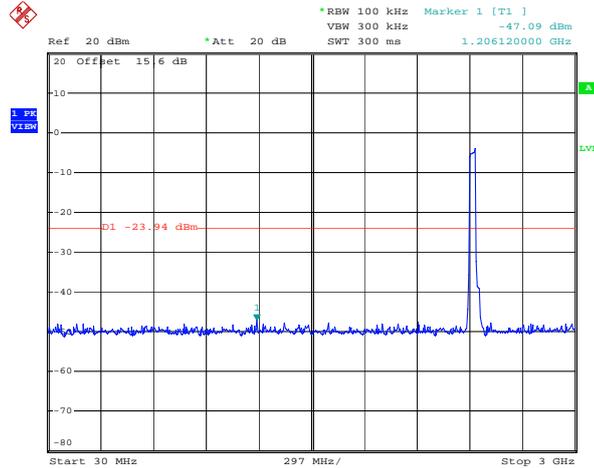
Date: 27.MAY.2013 19:41:06



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Band :	30MHz-3GHz and 3G-25GHz	Relative Humidity :	47~48%
Test Channel :	03, 06, 09	Test Engineer :	Adonis Li

802.11n HT40 30 MHz~3 GHz- MIMO Ant.0+1(0)

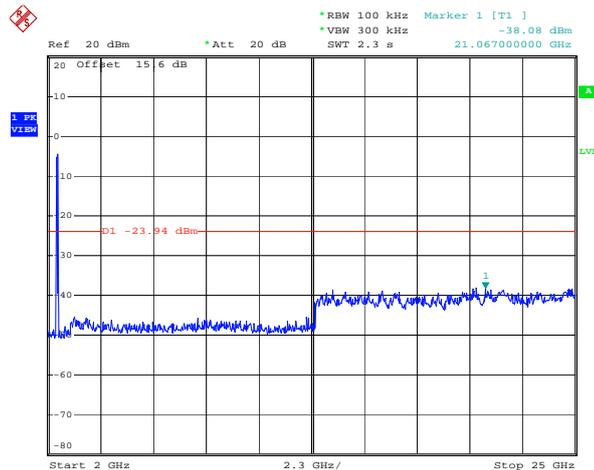
Conducted Spurious Emission Plot on Channel 01



Date: 27.MAY.2013 20:50:48

802.11n HT40 2 GHz~25 GHz- MIMO Ant.0+1(0)

Conducted Spurious Emission Plot on Channel 01

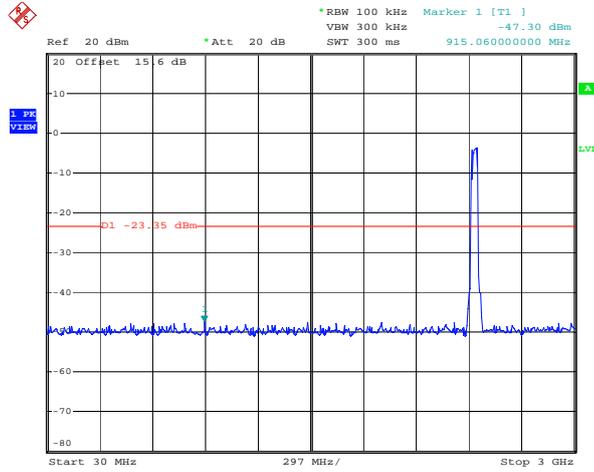


Date: 27.MAY.2013 20:48:29



802.11n HT40 30 MHz~3 GHz- MIMO Ant.0+1(0)

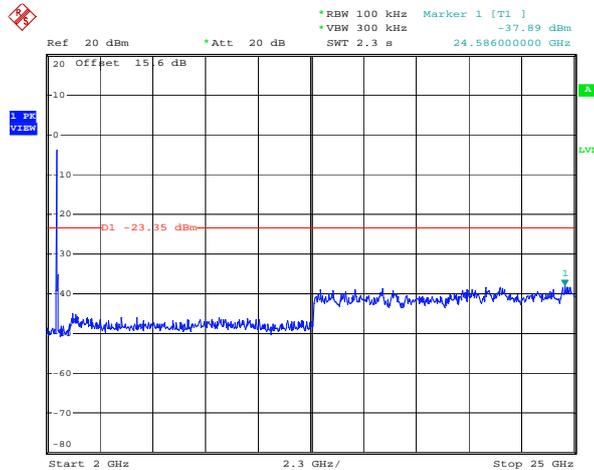
Conducted Spurious Emission Plot on Channel 06



Date: 27.MAY.2013 20:55:05

802.11n HT40 2 GHz~25 GHz- MIMO Ant.0+1(0)

Conducted Spurious Emission Plot on Channel 06

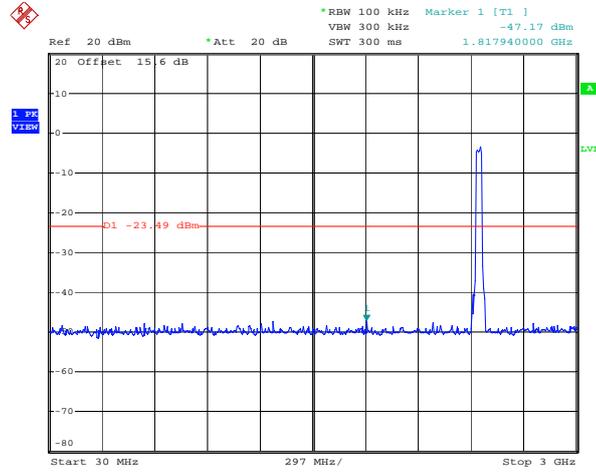


Date: 27.MAY.2013 20:53:49



802.11n HT40 30 MHz~3 GHz- MIMO Ant.0+1(0)

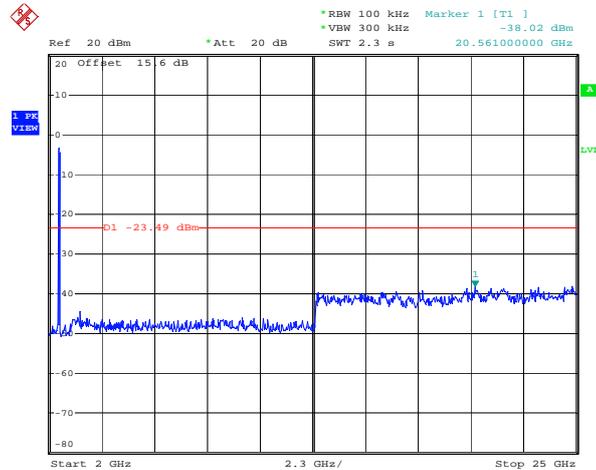
Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 20:59:10

802.11n HT40 2 GHz~25 GHz- MIMO Ant.0+1(0)

Conducted Spurious Emission Plot on Channel 11

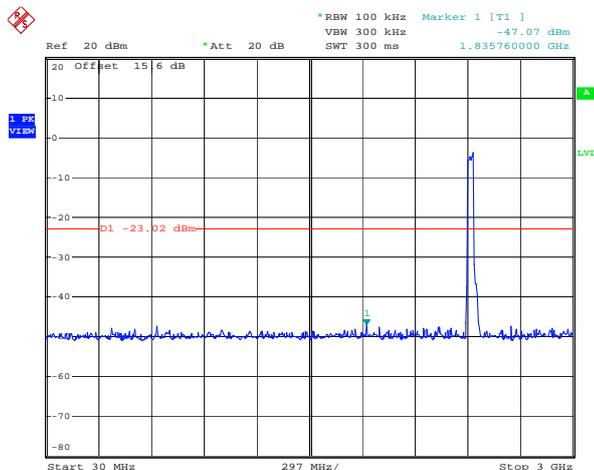


Date: 27.MAY.2013 20:58:01



802.11n HT40 30 MHz~3 GHz- MIMO Ant.0+1(1)

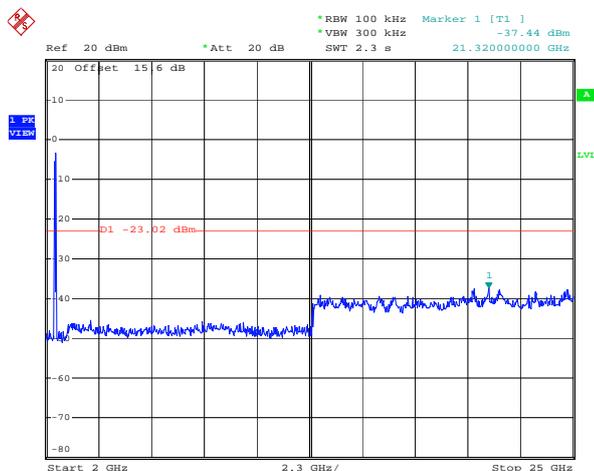
Conducted Spurious Emission Plot on Channel 01



Date: 27.MAY.2013 20:37:37

802.11n HT40 2 GHz~25 GHz- MIMO Ant.0+1(1)

Conducted Spurious Emission Plot on Channel 01

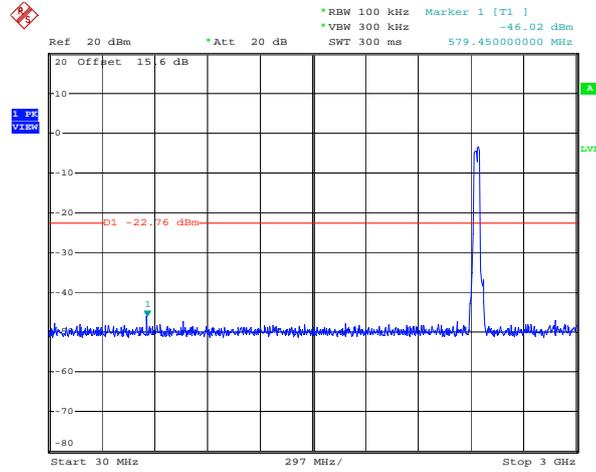


Date: 27.MAY.2013 20:36:06



802.11n HT40 30 MHz~3 GHz- MIMO Ant.0+1(1)

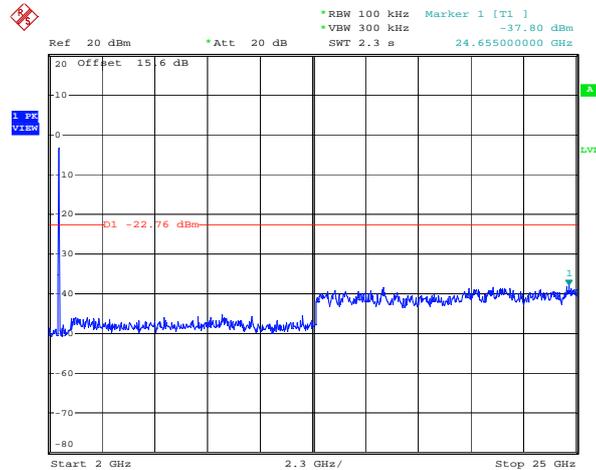
Conducted Spurious Emission Plot on Channel 06



Date: 27.MAY.2013 20:40:22

802.11n HT40 2 GHz~25 GHz- MIMO Ant.0+1(1)

Conducted Spurious Emission Plot on Channel 06

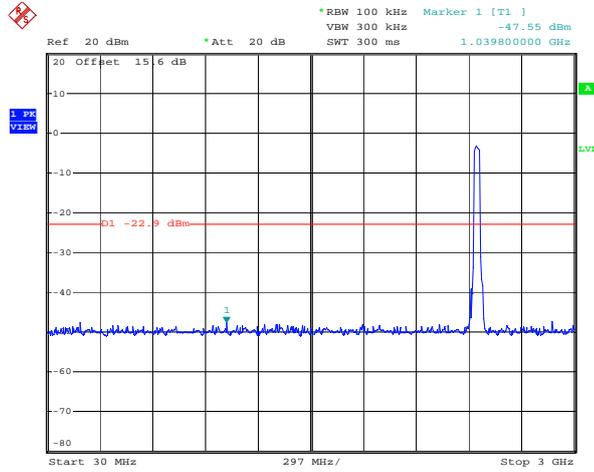


Date: 27.MAY.2013 20:40:41



802.11n HT40 30 MHz~3 GHz- MIMO Ant.0+1(1)

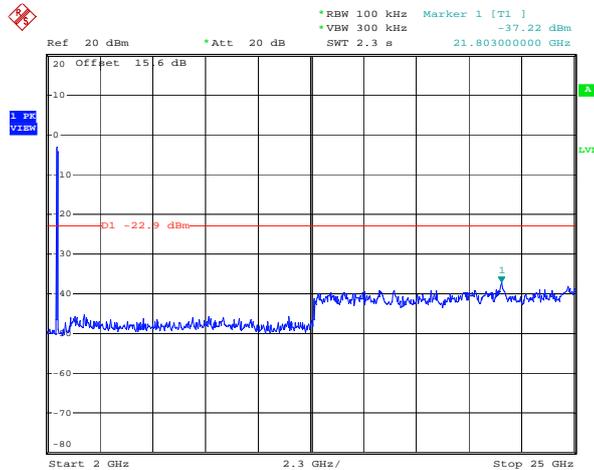
Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 20:45:01

802.11n HT40 2 GHz~25 GHz- MIMO Ant.0+1(1)

Conducted Spurious Emission Plot on Channel 11



Date: 27.MAY.2013 20:43:47

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

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

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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedure

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

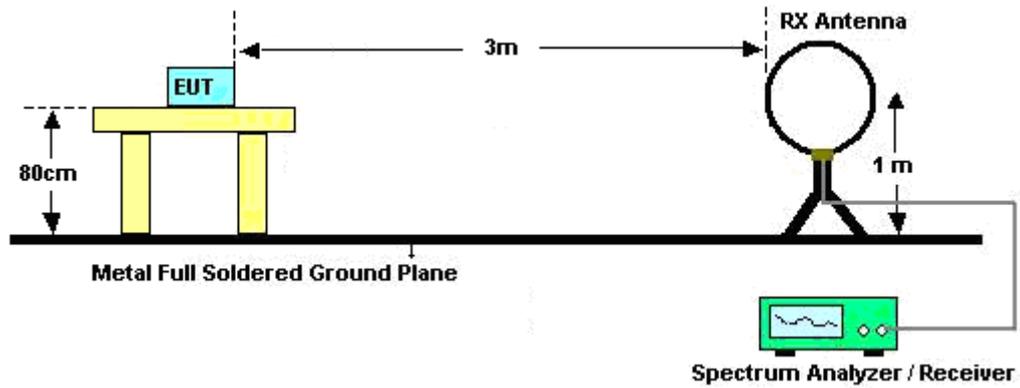


Antenna	Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
Ant.0	802.11b	100.000	-	-	10Hz
Ant.1	802.11g	96.802	2.058	0.486	1KHz
MIMO Ant.0+1	2.4G 802.11n HT20	95.192	0.990	1.010	3 KHz
MIMO Ant.0+1	2.4G 802.11n HT40	62.500	0.090	11.111	10 KHz

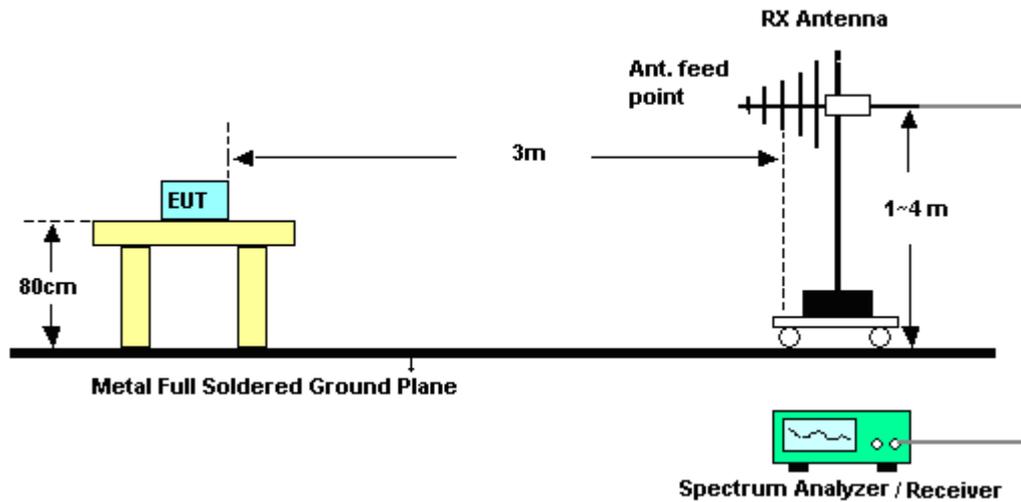
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

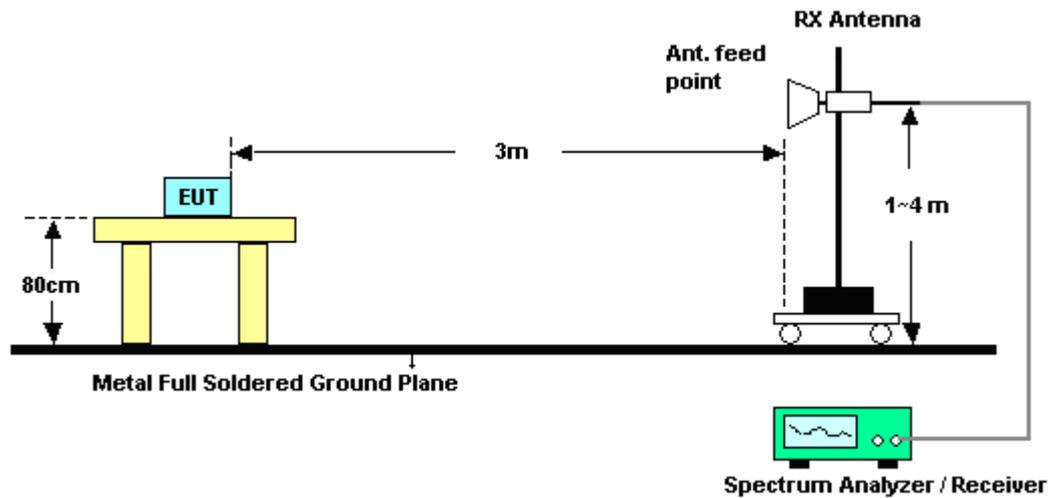
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Spurious Emission (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.0	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Stone Gu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.56	53.1	-20.9	74	48.85	32.86	2.9	31.51	106	11	Peak
2390	36.12	-17.88	54	31.86	32.86	2.91	31.51	106	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
2389.65	51.16	-22.84	74	46.91	32.86	2.9	31.51	103	36	Peak
2390	36.18	-17.82	54	31.92	32.86	2.91	31.51	103	36	Average

Test Mode :	802.11b-Ant.0	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Stone Gu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.31	64.34	-9.66	74	59.88	33.01	2.96	31.51	111	309	Peak
2483.68	39.32	-14.68	54	34.86	33.01	2.96	31.51	111	309	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
2483.83	54.14	-19.86	74	49.68	33.01	2.96	31.51	102	278	Peak
2483.83	37.14	-16.86	54	32.68	33.01	2.96	31.51	102	278	Average



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Stone Gu

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	55.18	-18.82	74	50.92	32.86	2.91	31.51	100	24	Peak
2390	39.46	-14.54	54	35.2	32.86	2.91	31.51	100	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
2390	51.63	-22.37	74	47.37	32.86	2.91	31.51	182	176	Peak
2390	38.85	-15.15	54	34.59	32.86	2.91	31.51	182	176	Average

Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Stone Gu

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
2483.62	72.16	-1.84	74	67.7	33.01	2.96	31.51	111	301	Peak
2483.53	53.13	-0.87	54	48.67	33.01	2.96	31.51	112	301	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
2483.53	67.73	-6.27	74	63.27	33.01	2.96	31.51	170	62	Peak
2483.5	49.24	-4.76	54	44.78	33.01	2.96	31.51	170	62	Average



Test Mode :	802.11n HT20-Ant.0+1	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Stone Gu

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	57.37	-16.63	74	53.11	32.86	2.91	31.51	107	311	Peak
2390	43.19	-10.81	54	38.93	32.86	2.91	31.51	107	311	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
2389.38	55.5	-18.5	74	51.25	32.86	2.9	31.51	124	167	Peak
2390	41.63	-12.37	54	37.37	32.86	2.91	31.51	124	167	Average

Test Mode :	802.11n HT20-Ant.0+1	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Stone Gu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	67.78	-6.22	74	63.32	33.01	2.96	31.51	110	302	Peak
2483.62	51.34	-2.66	54	46.88	33.01	2.96	31.51	110	301	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
2483.92	65.3	-8.7	74	60.84	33.01	2.96	31.51	100	51	Peak
2483.53	47.59	-6.41	54	43.13	33.01	2.96	31.51	100	51	Average



Test Mode :	802.11n HT40-Ant.0+1	Temperature :	23~24°C
Test Band :	Low	Relative Humidity :	43~44%
Test Channel :	03	Test Engineer :	Stone Gu

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	57.58	-16.42	74	53.32	32.86	2.91	31.51	106	306	Peak
2390	44.75	-9.25	54	40.49	32.86	2.91	31.51	106	306	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	56.97	-17.03	74	52.71	32.86	2.91	31.51	153	164	Peak
2390	42.44	-11.56	54	38.18	32.86	2.91	31.51	153	164	Average

Test Mode :	802.11n HT40-Ant.0+1	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	43~44%
Test Channel :	09	Test Engineer :	Stone Gu

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
2483.53	68.75	-5.25	74	64.29	33.01	2.96	31.51	138	310	Peak
2483.86	52.25	-1.75	54	47.79	33.01	2.96	31.51	138	310	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
2483.59	60.01	-13.99	74	55.55	33.01	2.96	31.51	131	277	Peak
2483.56	44.54	-9.46	54	40.08	33.01	2.96	31.51	131	277	Average

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.0	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	<ol style="list-style-type: none"> 2412 MHz is fundamental signal which can be ignored. 2399MHz and 7236MHz are not within a restricted band, and their limit line is 20dB below the highest emission level. For example, 110.69dBuV/m - 20dB = 90.69dBuV/m. 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
2399	66.58	-24.11	90.69	62.32	32.86	2.91	31.51	106	11	Peak
2412	110.69	-	-	106.4	32.89	2.91	31.51	106	11	Peak
2412	105.33	-	-	101.04	32.89	2.91	31.51	106	11	Average
4824	50.51	-23.49	74	42.64	35.17	4.23	31.53	100	0	Peak
7236	52.44	-38.25	90.69	41.82	36.18	5.39	30.95	200	0	Peak



Test Mode :	802.11b-Ant.0	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental signal which can be ignored. 2. 2399MHz and 7236MHz are not within a restricted band, and their 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
2399	64.59	-23.74	88.33	60.33	32.86	2.91	31.51	103	38	Peak
2412	108.33	-	-	104.04	32.89	2.91	31.51	103	38	Peak
2412	103.55	-	-	99.26	32.89	2.91	31.51	103	38	Average
4824	50.26	-23.74	74	42.39	35.17	4.23	31.53	200	0	Peak
7236	51.87	-36.46	88.33	41.25	36.18	5.39	30.95	100	236	Peak



Test Mode :	802.11b-Ant.0	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2437 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
2437	110.36	-	-	105.99	32.95	2.93	31.51	106	307	Peak
2437	105.28	-	-	100.91	32.95	2.93	31.51	106	307	Average
4874	50.6	-23.4	74	42.68	35.18	4.26	31.52	100	0	Peak
7312	52.67	-21.33	74	41.95	36.2	5.46	30.94	200	0	Peak



Test Mode :	802.11b-Ant.0	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2437 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
2437	109.25	-	-	104.88	32.95	2.93	31.51	139	236	Peak
2437	104.33	-	-	99.96	32.95	2.93	31.51	139	236	Average
4874	50.77	-23.23	74	42.85	35.18	4.26	31.52	200	0	Peak
7312	52.4	-21.6	74	41.68	36.2	5.46	30.94	110	0	Peak



Test Mode :	802.11b-Ant.0	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	111.68	-	-	107.27	32.98	2.94	31.51	111	309	Peak
2462	106.57	-	-	102.16	32.98	2.94	31.51	111	309	Average
4924	56.37	-17.63	74	48.41	35.19	4.28	31.51	117	292	Peak
4924	48.51	-5.49	54	40.55	35.19	4.28	31.51	117	292	Average
7386	52.6	-21.4	74	41.78	36.24	5.51	30.93	100	0	Peak



Test Mode :	802.11b-Ant.0	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	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	104.1	-	-	99.69	32.98	2.94	31.51	104	278	Peak
2462	99.17	-	-	94.76	32.98	2.94	31.51	104	278	Average
4924	55.3	-18.7	74	47.34	35.19	4.28	31.51	121	109	Peak
4924	45.44	-8.56	54	37.48	35.19	4.28	31.51	121	109	Average
7386	53.21	-20.79	74	42.39	36.24	5.51	30.93	200	0	Peak



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399MHz and 7236MHz are not within a restricted band, and their 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
2399	73.57	-17.67	91.24	69.31	32.86	2.91	31.51	100	24	Peak
2412	111.24	-	-	106.95	32.89	2.91	31.51	195	315	Peak
2412	100.87	-	-	96.58	32.89	2.91	31.51	195	315	Average
4824	50.53	-23.47	74	42.66	35.17	4.23	31.53	100	25	Peak
7236	51.05	-40.19	91.24	40.43	36.18	5.39	30.95	100	115	Peak



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399MHz and 7236MHz are not within a restricted band, and their 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
2399	72.54	-15.66	88.2	68.28	32.86	2.91	31.51	182	176	Peak
2412	108.2	-	-	103.91	32.89	2.91	31.51	122	168	Peak
2412	97.66	-	-	93.37	32.89	2.91	31.51	122	168	Average
4824	49.39	-24.61	74	41.52	35.17	4.23	31.53	100	68	Peak
7236	51.4	-36.8	88.2	40.78	36.18	5.39	30.95	116	256	Peak



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2437 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
2437	110.54	-	-	106.17	32.95	2.93	31.51	106	317	Peak
2437	100.32	-	-	95.95	32.95	2.93	31.51	106	317	Average
4874	49.77	-24.23	74	41.85	35.18	4.26	31.52	100	69	Peak
7311	52.27	-21.73	74	41.57	36.2	5.44	30.94	100	29	Peak



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2437 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
2437	109.33	-	-	104.96	32.95	2.93	31.51	140	257	Peak
2437	98.57	-	-	94.2	32.95	2.93	31.51	140	257	Average
4874	50.38	-23.62	74	42.46	35.18	4.26	31.52	100	59	Peak
7311	52.07	-21.93	74	41.37	36.2	5.44	30.94	100	56	Peak



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
83.35	31	-9	40	56.72	7.34	0.55	33.61	200	0	Peak
99.84	30.44	-13.06	43.5	52.98	10.5	0.58	33.62	-	-	Peak
227.88	31.28	-14.72	46	53.14	10.75	0.88	33.49	-	-	Peak
329.73	32.55	-13.45	46	50.91	13.95	1.06	33.37	-	-	Peak
401.51	31.74	-14.26	46	47.89	16.01	1.15	33.31	-	-	Peak
951.5	28.37	-17.63	46	38.32	20.74	1.75	32.44	-	-	Peak
2462	110.79	-	-	106.38	32.98	2.94	31.51	111	301	Peak
2462	99.43	-	-	95.02	32.98	2.94	31.51	111	301	Average
4924	50.58	-23.42	74	42.62	35.19	4.28	31.51	110	319	Peak
7386	52.4	-21.6	74	41.58	36.24	5.51	30.93	120	0	Peak



Test Mode :	802.11g-Ant.1	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	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
93.05	29.99	-13.51	43.5	53.54	9.51	0.56	33.62	-	-	Peak
225.94	29.41	-16.59	46	51.45	10.59	0.87	33.5	-	-	Peak
319.06	28.24	-17.76	46	47.07	13.51	1.03	33.37	-	-	Peak
489.78	27.15	-18.85	46	41.93	17.05	1.31	33.14	-	-	Peak
612.97	32.53	-13.47	46	45.41	18.66	1.41	32.95	100	0	Peak
939.86	28.57	-17.43	46	38.57	20.69	1.75	32.44	-	-	Peak
2462	104.52	-	-	100.11	32.98	2.94	31.51	170	62	Peak
2462	93.64	-	-	89.23	32.98	2.94	31.51	170	62	Average
4924	50.23	-23.77	74	42.27	35.19	4.28	31.51	110	236	Peak
7386	52.31	-21.69	74	41.49	36.24	5.51	30.93	136	258	Peak



Test Mode :	802.11n-HT20-Ant.0+1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399MHz and 7236MHz are not within a restricted band, and their 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
2399	76.33	-8.9	85.23	72.07	32.86	2.91	31.51	107	311	Peak
2412	105.23	-	-	100.94	32.89	2.91	31.51	104	315	Peak
2412	94.94	-	-	90.65	32.89	2.91	31.51	104	315	Average
4824	49.54	-24.46	74	41.67	35.17	4.23	31.53	100	129	Peak
7236	51.91	-33.32	85.23	41.29	36.18	5.39	30.95	140	15	Peak



Test Mode :	802.11n-HT20-Ant.0+1	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 2399MHz and 7236MHz are not within a restricted band, and their 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
2399	73.91	-9.86	83.77	69.65	32.86	2.91	31.51	124	167	Peak
2412	103.77	-	-	99.48	32.89	2.91	31.51	123	164	Peak
2412	92.18	-	-	87.89	32.89	2.91	31.51	123	164	Average
4824	49.2	-24.8	74	41.33	35.17	4.23	31.53	114	159	Peak
7236	52.09	-31.68	83.77	41.47	36.18	5.39	30.95	119	69	Peak



Test Mode :	802.11n-HT20-Ant.0+1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2437 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
2437	108.45	-	-	104.08	32.95	2.93	31.51	106	310	Peak
2437	97.33	-	-	92.96	32.95	2.93	31.51	106	310	Average
4874	50.5	-23.5	74	42.58	35.18	4.26	31.52	110	125	Peak
7311	52.63	-21.37	74	41.93	36.2	5.44	30.94	100	28	Peak



Test Mode :	802.11n-HT20-Ant.0+1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2437 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
2437	104.05	-	-	99.68	32.95	2.93	31.51	122	169	Peak
2437	91.59	-	-	87.22	32.95	2.93	31.51	122	169	Average
4874	49.66	-24.34	74	41.74	35.18	4.26	31.52	100	69	Peak
7311	52.34	-21.66	74	41.64	36.2	5.44	30.94	100	26	Peak



Test Mode :	802.11n-HT20-Ant.0+1	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	108.61	-	-	104.2	32.98	2.94	31.51	143	301	Peak
2462	96.93	-	-	92.52	32.98	2.94	31.51	143	301	Average
4924	50.09	-23.91	74	42.13	35.19	4.28	31.51	200	0	Peak
7386	52.32	-21.68	74	41.5	36.24	5.51	30.93	100	0	Peak



Test Mode :	802.11n-HT20-Ant.0+1	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	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	102.31	-	-	97.9	32.98	2.94	31.51	100	51	Peak
2462	90.88	-	-	86.47	32.98	2.94	31.51	100	51	Average
4924	50.04	-23.96	74	42.08	35.19	4.28	31.51	100	0	Peak
7386	52.44	-21.56	74	41.62	36.24	5.51	30.93	200	0	Peak



Test Mode :	802.11n-HT40-Ant.0+1	Temperature :	23~24°C
Test Channel :	03	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 2399MHz 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
2399	76.24	-9.64	85.88	71.98	32.86	2.91	31.51	106	306	Peak
2422	105.88	-	-	101.54	32.92	2.93	31.51	107	307	Peak
2422	96.83	-	-	92.49	32.92	2.93	31.51	107	307	Average
4844	50.74	-23.26	74	42.84	35.18	4.25	31.53	100	9	Peak
7266	52.63	-21.37	74	41.98	36.19	5.41	30.95	100	26	Peak



Test Mode :	802.11n-HT40-Ant.0+1	Temperature :	23~24°C
Test Channel :	03	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 2399MHz 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
2399	71.63	-9.67	81.3	67.37	32.86	2.91	31.51	153	164	Peak
2422	101.3	-	-	96.96	32.92	2.93	31.51	200	269	Peak
2422	90.67	-	-	86.33	32.92	2.93	31.51	200	269	Average
4844	49.56	-24.44	74	41.66	35.18	4.25	31.53	100	98	Peak
7266	51.82	-22.18	74	41.17	36.19	5.41	30.95	120	168	Peak



Test Mode :	802.11n-HT40-Ant.0+1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2437 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
2437	105.36	-	-	100.99	32.95	2.93	31.51	102	306	Peak
2437	94.36	-	-	89.99	32.95	2.93	31.51	102	306	Average
4874	50.01	-23.99	74	42.09	35.18	4.26	31.52	100	89	Peak
7311	52.88	-21.12	74	42.18	36.2	5.44	30.94	100	26	Peak



Test Mode :	802.11n-HT40-Ant.0+1	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 2437 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
2437	101.24	-	-	96.87	32.95	2.93	31.51	197	258	Peak
2437	90.45	-	-	86.08	32.95	2.93	31.51	197	258	Average
4874	50.8	-23.2	74	42.88	35.18	4.26	31.52	100	59	Peak
7311	52.29	-21.71	74	41.59	36.2	5.44	30.94	100	85	Peak



Test Mode :	802.11n-HT40-Ant.0+1	Temperature :	23~24°C
Test Channel :	09	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2452	106.3	-	-	101.92	32.95	2.94	31.51	138	310	Peak
2452	94.51	-	-	90.13	32.95	2.94	31.51	138	310	Average
4904	50.95	-23.05	74	43.01	35.19	4.27	31.52	200	0	Peak
7356	52.71	-21.29	74	41.93	36.22	5.49	30.93	200	0	Peak



Test Mode :	802.11n-HT40-Ant.0+1	Temperature :	23~24°C
Test Channel :	09	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
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	96.63	-	-	92.22	32.98	2.94	31.51	131	277	Peak
2452	85.27	-	-	80.86	32.98	2.94	31.51	131	277	Average
4904	50.96	-23.04	74	43.02	35.19	4.27	31.52	100	0	Peak
7358	52.93	-21.07	74	42.15	36.22	5.49	30.93	200	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.

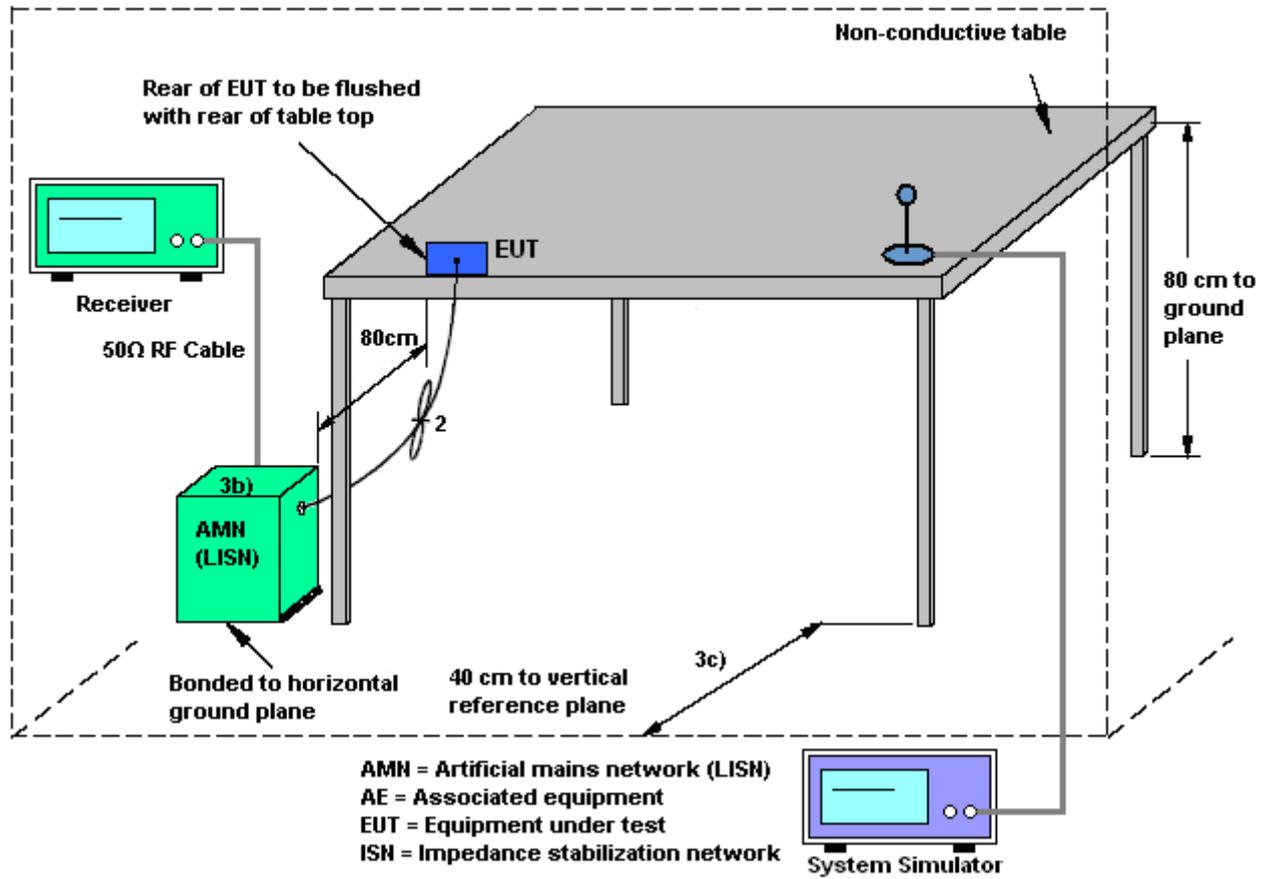
3.6.2 Measuring Instruments

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.

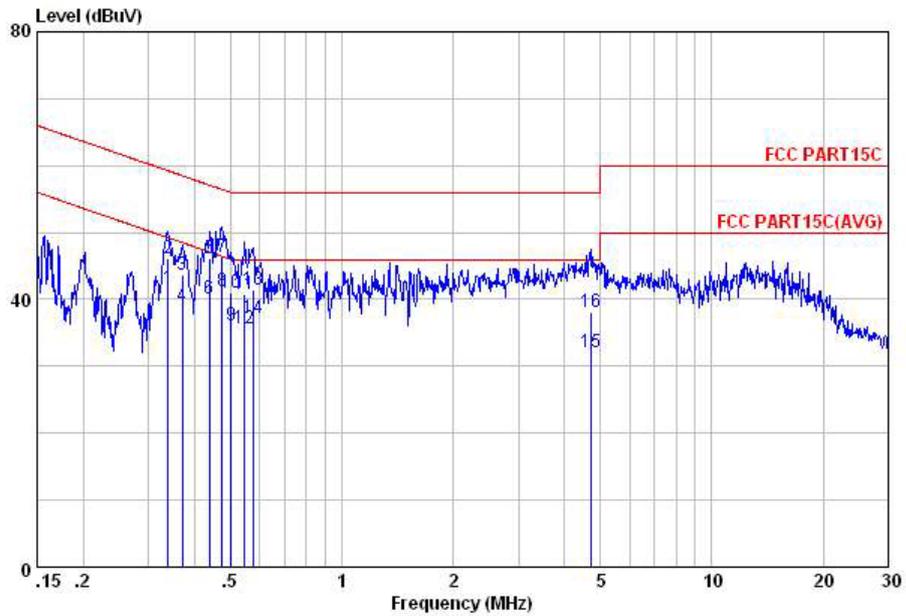
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + USB Cable (Charging from Adapter) + WLAN 2.4GHz Link		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

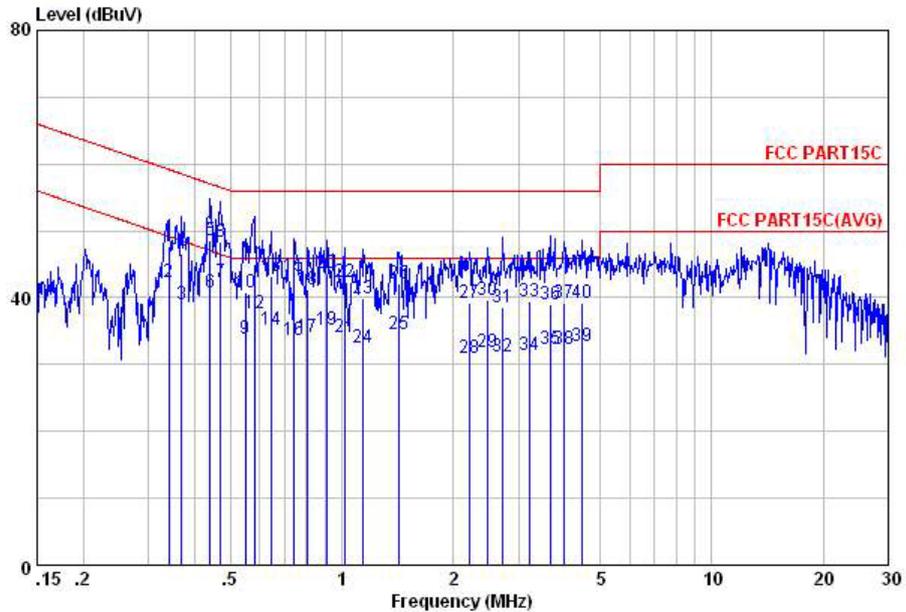


Site : C001-KS
 Condition: FCC PART15C LISN-L20130306 LINE
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.34	41.72	-7.50	49.22	31.00	0.47	10.25	Average
2	0.34	46.02	-13.20	59.22	35.30	0.47	10.25	QP
3	0.37	43.72	-14.75	58.47	33.09	0.38	10.25	QP
4	0.37	38.92	-9.55	48.47	28.29	0.38	10.25	Average
5	0.44	46.12	-10.99	57.11	35.61	0.26	10.25	QP
6	0.44	40.22	-6.89	47.11	29.71	0.26	10.25	Average
7	0.47	46.38	-10.07	56.45	35.91	0.22	10.25	QP
8	0.47	41.18	-5.27	46.45	30.71	0.22	10.25	Average
9	0.50	36.15	-9.85	46.00	25.70	0.20	10.25	Average
10	0.50	41.05	-14.95	56.00	30.60	0.20	10.25	QP
11	0.55	40.86	-15.14	56.00	30.40	0.20	10.26	QP
12	0.55	35.76	-10.24	46.00	25.30	0.20	10.26	Average
13	0.58	41.56	-14.44	56.00	31.10	0.20	10.26	QP
14	0.58	37.16	-8.84	46.00	26.70	0.20	10.26	Average
15	4.70	32.13	-13.87	46.00	21.60	0.20	10.33	Average
16	4.70	38.03	-17.97	56.00	27.50	0.20	10.33	QP



Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + USB Cable (Charging from Adapter) + WLAN 2.4GHz Link		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

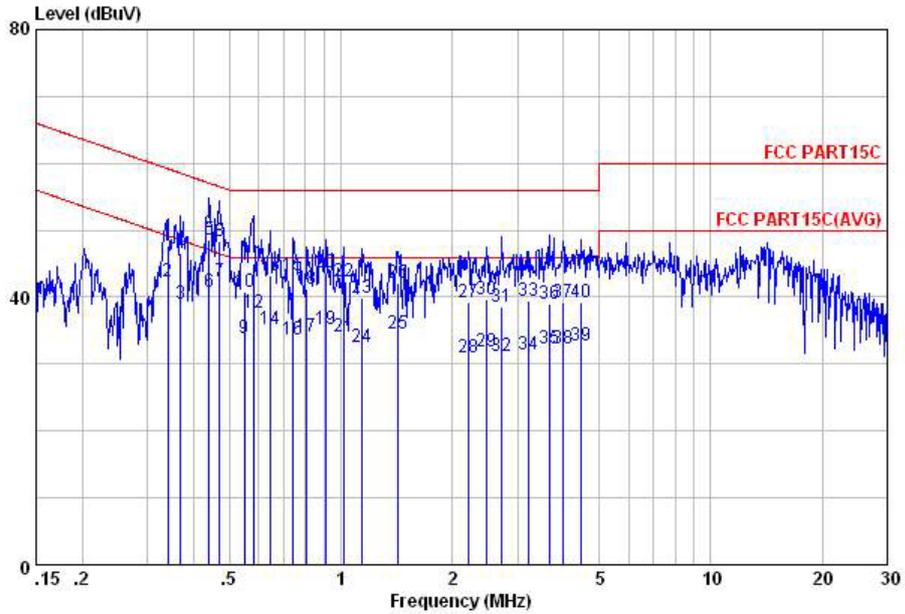


Site : C001-KS
 Condition: FCC PART15C LISN-N20130306 NEUTRAL
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
		dBuV	dB	dBuV	dBuV	dB	dB	
1	0.34	47.68	-11.50	59.18	36.90	0.53	10.25	QP
2	0.34	42.28	-6.90	49.18	31.50	0.53	10.25	Average
3	0.37	39.01	-9.51	48.52	28.30	0.46	10.25	Average
4	0.37	46.51	-12.01	58.52	35.80	0.46	10.25	QP
5	0.44	48.50	-8.57	57.07	37.90	0.35	10.25	QP
6	0.44	40.70	-6.37	47.07	30.10	0.35	10.25	Average
7	0.47	42.28	-4.21	46.49	31.71	0.32	10.25	Average
8	0.47	48.38	-8.11	56.49	37.81	0.32	10.25	QP
9	0.55	33.84	-12.16	46.00	23.30	0.28	10.26	Average
10	0.55	40.84	-15.16	56.00	30.30	0.28	10.26	QP
11	0.58	45.12	-10.88	56.00	34.60	0.26	10.26	QP
12	0.58	37.62	-8.38	46.00	27.10	0.26	10.26	Average
13	0.65	43.18	-12.82	56.00	32.69	0.22	10.27	QP
14	0.65	35.28	-10.72	46.00	24.79	0.22	10.27	Average
15	0.74	43.26	-12.74	56.00	32.80	0.19	10.27	QP
16	0.74	33.66	-12.34	46.00	23.20	0.19	10.27	Average
17	0.81	34.04	-11.96	46.00	23.60	0.16	10.28	Average
18	0.81	41.24	-14.76	56.00	30.80	0.16	10.28	QP
19	0.91	35.30	-10.70	46.00	24.90	0.12	10.28	Average
20	0.91	43.60	-12.40	56.00	33.20	0.12	10.28	QP
21	1.02	34.08	-11.92	46.00	23.70	0.10	10.28	Average
22	1.02	42.28	-13.72	56.00	31.90	0.10	10.28	QP
23	1.14	39.88	-16.12	56.00	29.50	0.10	10.28	QP
24	1.14	32.48	-13.52	46.00	22.10	0.10	10.28	Average
25	1.43	34.59	-11.41	46.00	24.20	0.10	10.29	Average
26	1.43	42.19	-13.81	56.00	31.80	0.10	10.29	QP
27	2.21	39.31	-16.69	56.00	28.90	0.11	10.30	QP



Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + USB Cable (Charging from Adapter) + WLAN 2.4GHz Link		
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	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
28	2.21	31.01	-14.99	46.00	20.60	0.11	10.30	Average
29	2.47	31.92	-14.08	46.00	21.50	0.11	10.31	Average
30	2.47	39.72	-16.28	56.00	29.30	0.11	10.31	QP
31	2.72	38.54	-17.46	56.00	28.11	0.12	10.31	QP
32	2.72	31.14	-14.86	46.00	20.71	0.12	10.31	Average
33	3.21	39.38	-16.62	56.00	28.91	0.15	10.32	QP
34	3.21	31.48	-14.52	46.00	21.01	0.15	10.32	Average
35	3.66	32.20	-13.80	46.00	21.69	0.18	10.33	Average
36	3.66	39.10	-16.90	56.00	28.59	0.18	10.33	QP
37	3.99	39.21	-16.79	56.00	28.70	0.18	10.33	QP
38	3.99	32.21	-13.79	46.00	21.70	0.18	10.33	Average
39	4.45	32.82	-13.18	46.00	22.30	0.19	10.33	Average
40	4.45	39.32	-16.68	56.00	28.80	0.19	10.33	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.

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	May 28, 2013~ Jun. 06, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	May 28, 2013~ Jun. 06, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	May 28, 2013~ Jun. 06, 2013	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	May 28, 2013~ Jun. 06, 2013	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 29, 2012	May 28, 2013~ Jun. 06, 2013	Dec. 28, 2013	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Jun. 05, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	100400	9kHz~30GHz	May 23, 2013	Jun. 05, 2013	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Jun. 05, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
HFH2-Z2 Loop Antenna	R&S	HFH2-Z2	100321	9KHZ-30MHZ	Oct. 22, 2012	Jun. 05, 2013	Oct. 21, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Dec. 07, 2012	Jun. 05, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	May 23, 2013	Jun. 05, 2013	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Jun. 05, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2012	Jun. 05, 2013	Nov. 06, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Jun. 05, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	May 23, 2013	May 28, 2013	May 22, 2014	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 29, 2012	May 28, 2013	Dec. 28, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 29, 2012	May 28, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 15, 2012	May 28, 2013	Nov. 14, 2013	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 29, 2012	May 28, 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
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Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54
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Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP342301 as below.