

FCC RF Test Report

APPLICANT : Toshiba Corporation
EQUIPMENT : Notebook PC and Tablet
BRAND NAME : TOSHIBA
MODEL NAME : Satellite U820, Satellite U825, Satellite U920t,
Satellite U925t and dynabook R822
FCC ID : CJ6UPSUL1PC1
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jul. 27, 2012 and completely tested on Aug. 22, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR272716-02C	Rev. 01	Initial issue of report	Aug. 23, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm/3kHz}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	
			Conducted Spurious Emission		Pass	
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	
			Radiated Spurious Emission		Pass	Under limit 1.19 dB at 12000.000 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 9.30 dB at 0.182 MHz
3.6	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Toshiba Corporation

Digital Products & Services Company 2-9, Suehiro-cho, Ome-shi Tokyo 198-8710 Japan

1.2 Manufacturer

Toshiba Information Equipment (Hangzhou) Co., Ltd.

M12-19-1 Hangzhou Export Processing Zone of Zhengjiang Hangzhou Zhejiang 310018

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Notebook PC and Tablet
Brand Name	TOSHIBA
Model Name	Satellite U820, Satellite U825, Satellite U920t, Satellite U925t and dynabook R822
FCC ID	CJ6UPSUL1PC1
Radios application	WLAN 11bgn / Bluetooth / Bluetooth 4.0 – LE
EUT Stage	Identical Prototype

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

Product Specification subjective to this standard			
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz		
Maximum Output Power to Antenna	<Legacy Ant 1> 802.11b : 18.33 dBm (0.0681 W) 802.11g : 22.28 dBm (0.1690 W) <Legacy Ant 2> 802.11b : 17.33 dBm (0.0541 W) 802.11g : 22.72 dBm (0.1871 W) <SISO Ant 1> 802.11 n HT-20 : 22.42 dBm (0.1746 W) 802.11 n HT-40 : 21.98 dBm (0.1578 W) <SISO Ant 2> 802.11 n HT-20 : 22.86 dBm (0.1932 W) 802.11 n HT-40 : 21.93 dBm (0.1560 W) <MIMO Ant 1+2> 802.11 n HT-20 : 24.55 dBm (0.2851 W) 802.11 n HT-40 : 23.48 dBm (0.2228 W)		
99% Occupied Bandwidth	<Legacy Ant 1> 802.11b : 15.00MHz <Legacy Ant 2> 802.11g : 17.35MHz <SISO Ant 1> 802.11n HT-40 : 36.50MHz <SISO Ant 2> 802.11n HT-20 : 18.45MHz <MIMO Ant 1> 802.11n HT-20 : 18.55MHz 802.11n HT-40 : 36.70MHz <MIMO Ant 2> 802.11n HT-20 : 18.50MHz 802.11n HT-40 : 36.70MHz		
Antenna Type	<Antenna 1> 802.11b/g/n : PIFA Antenna with gain 2.90 dBi <Antenna 2> 802.11b/g/n : PIFA Antenna with gain 1.68 dBi		
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)		
Antenna Function for Transmitter			
		Ant 1.	Ant 2.
	802.11 b	V	V
	802.11 g	V	V
	802.11 n SISO	V	V
802.11 n MIMO	V	V	
Note: MIMO mode is completely uncorrelated.			

1.4 Testing Site

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

1.5 Applied Standards

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

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

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.0 m	N/A
5.	USB3.0 HD	WD	WDBPCK5000ABK-PESN	FCC DoC	Unshielded, 0.5 m	N/A
6.	LCD Monitor	Dell	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 KHz to 30 MHz) and radiated emission (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

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

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

2.1 Carrier Frequency and Channel

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

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

<Legacy Ant 1>

802.11b								
Data Rate (MHz)	1M bps		2M bps		5.5M bps		11M bps	
Peak Power (dBm)	18.33		18.16		18.07		18.08	

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	22.28	22.20	22.03	21.95	22.21	21.95	22.23	22.12

<Legacy Ant 2>

802.11b								
Data Rate (MHz)	1M bps		2M bps		5.5M bps		11M bps	
Peak Power (dBm)	17.33		17.25		17.19		17.32	

802.11g								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	22.72	22.69	22.61	22.45	22.58	22.62	22.58	22.63

<SISO Ant 1>

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	22.42	22.06	22.17	22.03	21.96	21.91	22.25	22.13

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	21.98	21.65	21.53	21.79	21.62	21.88	21.92	21.75

<SISO Ant 2>

2.4GHz 802.11n HT-20								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	22.86	22.25	22.46	22.23	22.56	22.19	22.62	22.03

2.4GHz 802.11n HT-40								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	21.93	21.54	21.56	21.59	21.43	21.83	21.85	21.76

<MIMO Ant 1 + 2>

2.4GHz 802.11n HT-20 mode								
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Peak Power (dBm) MIMO – Ant 1	21.45	21.15	21.09	21.23	21.05	21.36	20.97	21.01
Peak Power (dBm) MIMO – Ant 2	21.63	21.34	21.88	21.41	21.55	21.48	21.95	21.83
MIMO Ant 1 + 2 (Measure and Sum)	24.55	24.26	24.51	24.33	24.32	24.43	24.50	24.45

2.4GHz 802.11n HT-40 mode								
Data Rate (MHz)	MCS8	MCS9	MCS10	MCS11	MCS12	MCS13	MCS14	MCS15
Power (dBm) MIMO – Ant 1	20.53	20.15	20.30	20.33	20.37	20.12	20.05	20.33
Power (dBm) MIMO – Ant 2	20.41	20.04	20.05	20.15	20.05	19.84	20.01	20.26
MIMO Ant 1 + 2 (Measure and Sum)	23.48	23.11	23.19	23.25	23.22	22.99	23.04	23.31

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

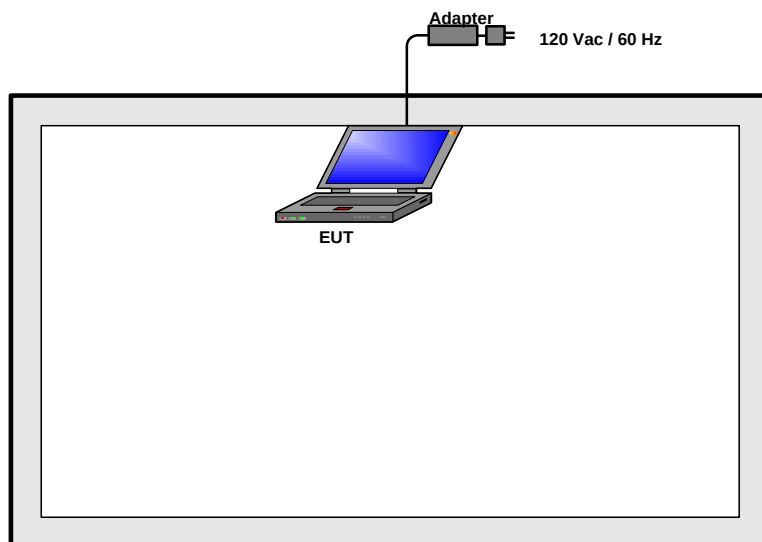
2.3 Test Mode

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

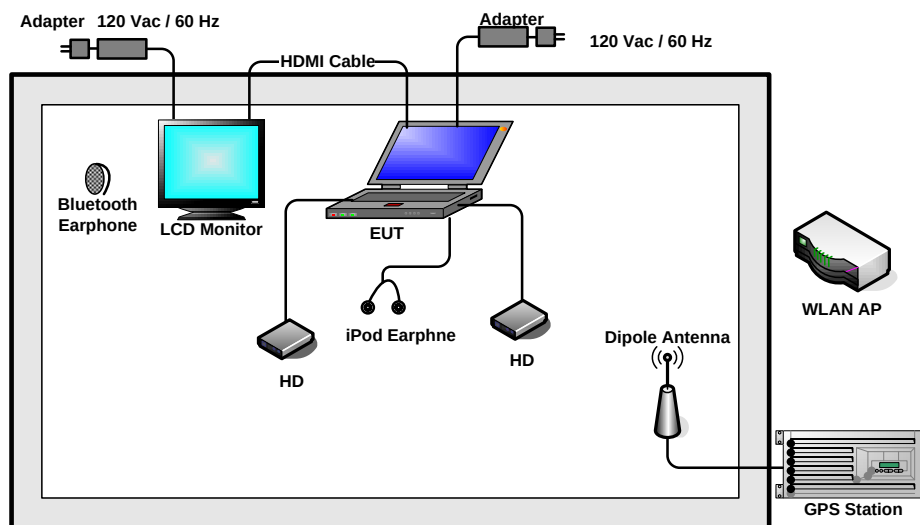
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB and 99% BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT-20	6.5 Mbps	1/6/11
		802.11n HT-40	13.5 Mbps	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT-20	6.5 Mbps	1/6/11
		802.11n HT-40	13.5 Mbps	3/6/9
	Conducted Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT-20	6.5 Mbps	1/11
		802.11n HT-40	13.5 Mbps	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT-20	6.5 Mbps	1/6/11
		802.11n HT-40	13.5 Mbps	3/6/9
Radiated TCs	Radiated Band EDGE	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT-20	6.5 Mbps	1/11
		802.11n HT-40	13.5 Mbps	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT-20	6.5 Mbps	1/6/11
		802.11n HT-40	13.5 Mbps	3/6/9
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN Link + Adapter + HDMI Cable + SD Card + Camera + iPod Earphone + H Pattern + MPEG4 + GPS Rx + USB 3.0 HD			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

The programmed RF utility "DRTU", is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

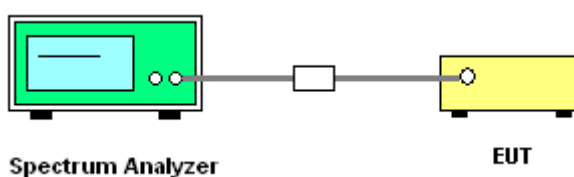
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Legacy Ant 1		
01	2412	12.24	0.5	Pass
06	2437	12.24	0.5	Pass
11	2462	12.24	0.5	Pass

Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		Legacy Ant 2		
01	2412	16.08	0.5	Pass
06	2437	16.04	0.5	Pass
11	2462	16.04	0.5	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 6dB Bandwidth (MHz)			6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		SISO Ant 2	MIMO Ant 1	MIMO Ant 2		
01	2412	17.68	17.64	17.76	0.5	Pass
06	2437	17.60	17.64	17.76	0.5	Pass
11	2462	17.56	17.60	17.76	0.5	Pass

Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-40 6dB Bandwidth (MHz)			6dB Bandwidth Min. Limit (MHz)	Pass/Fail
		SISO Ant 1	MIMO Ant 1	MIMO Ant 2		
03	2422	36.24	36.24	36.32	0.5	Pass
06	2437	36.16	36.24	36.24	0.5	Pass
09	2452	36.32	36.24	36.24	0.5	Pass

3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
		Legacy Ant 1	
01	2412	15.00	Pass
06	2437	15.00	Pass
11	2462	15.00	Pass

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
		Legacy Ant 2	
01	2412	17.25	Pass
06	2437	17.35	Pass
11	2462	17.35	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26℃
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	2.4GHz 802.11n HT-20 99% Occupied Bandwidth (MHz)			Pass/Fail
		SISO Ant 2	MIMO Ant 1	MIMO Ant 2	
01	2412	18.40	18.55	18.45	Pass
06	2437	18.45	18.55	18.50	Pass
11	2462	18.45	18.55	18.50	Pass

Test Mode :	802.11n HT-40	Temperature :	24~26℃
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

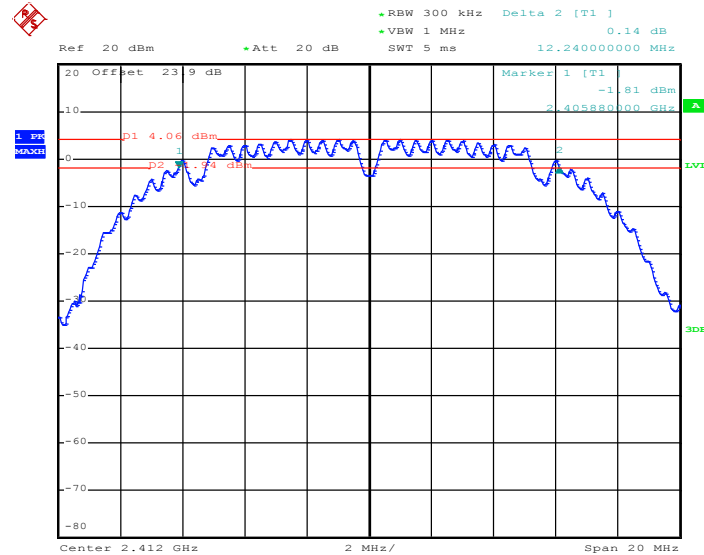
Channel	Frequency (MHz)	2.4GHz 802.11n HT-40 99% Occupied Bandwidth (MHz)			Pass/Fail
		SISO Ant 1	MIMO Ant 1	MIMO Ant 2	
03	2422	36.40	36.60	36.70	Pass
06	2437	36.50	36.70	36.60	Pass
09	2452	36.40	36.60	36.70	Pass

3.1.7 Test Result of 6dB Bandwidth Plots

<802.11b>

802.11b – Legacy Ant 1

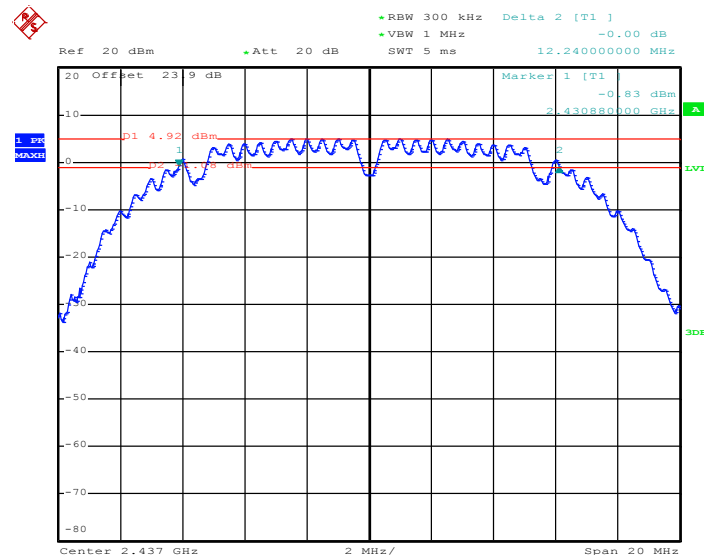
6 dB Bandwidth Plot on Channel 01



Date: 10.AUG.2012 15:58:13

802.11b – Legacy Ant 1

6 dB Bandwidth Plot on Channel 06

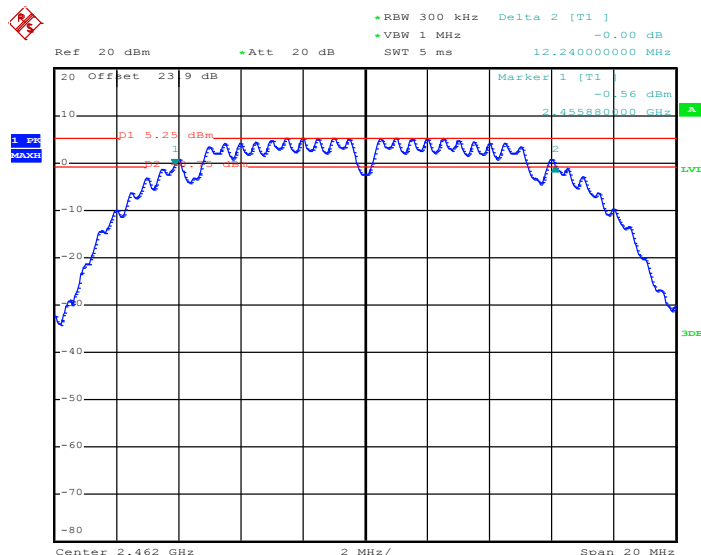


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802.11b – Legacy Ant 1

6 dB Bandwidth Plot on Channel 11

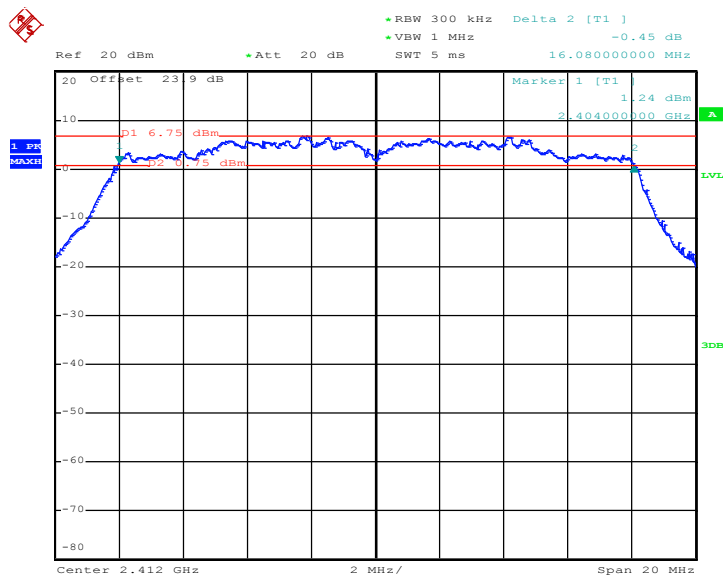


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<802.11g>

802.11g – Legacy Ant 2

6 dB Bandwidth Plot on Channel 01

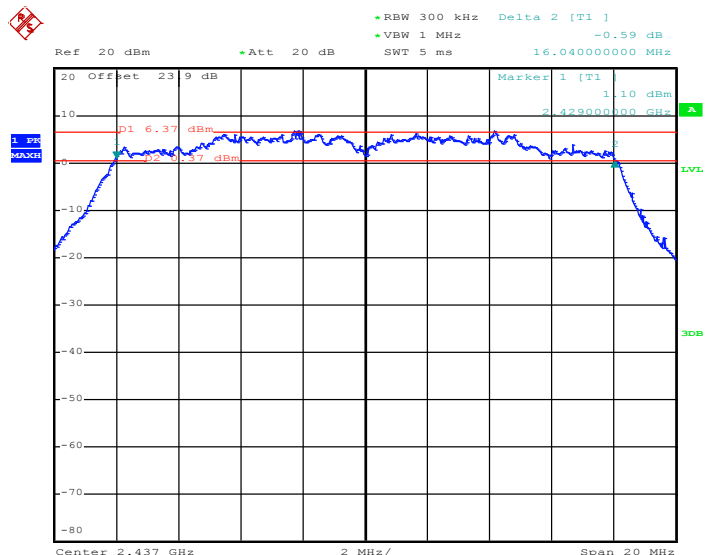


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802.11g – Legacy Ant 2

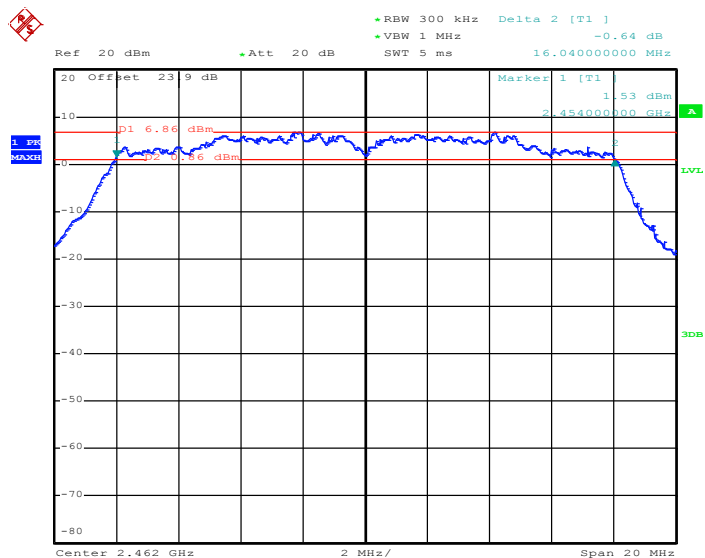
6 dB Bandwidth Plot on Channel 06



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802.11g – Legacy Ant 2

6 dB Bandwidth Plot Channel 11



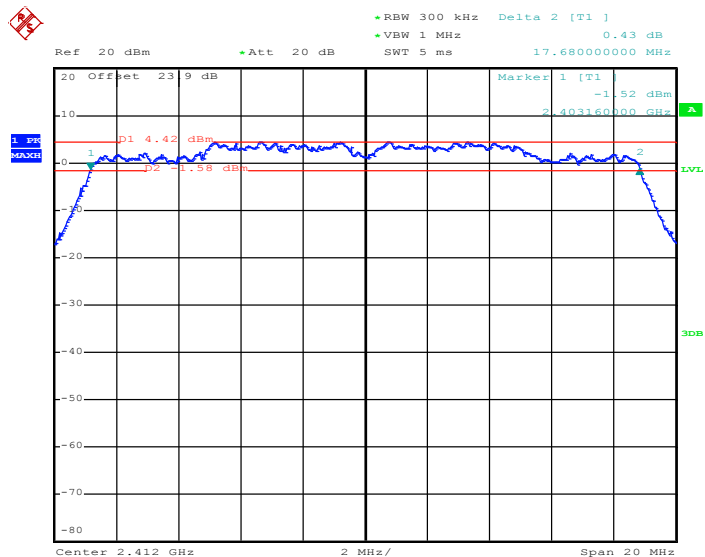
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<2.4GHz 802.11n HT-20>

802.11n HT-20 – SISO Ant 2

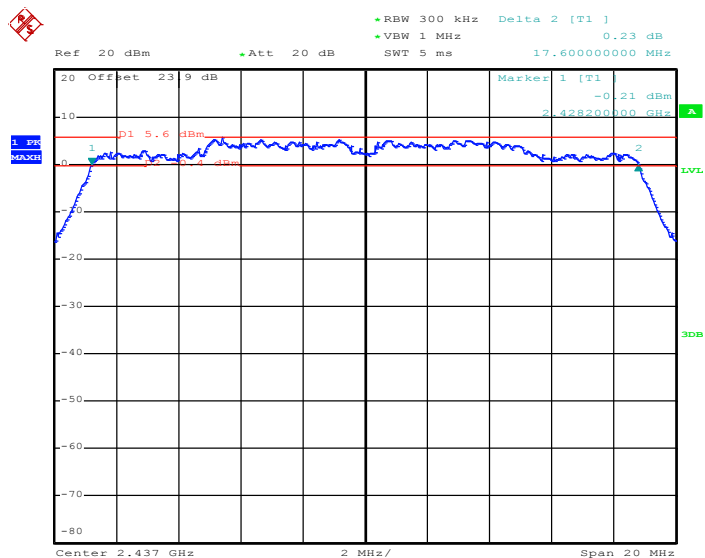
6 dB Bandwidth Plot on Channel 01



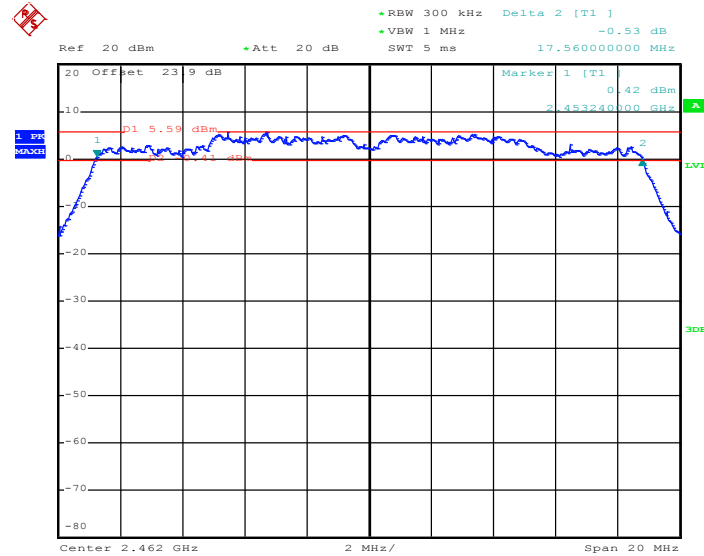
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802.11n HT-20 – SISO Ant 2

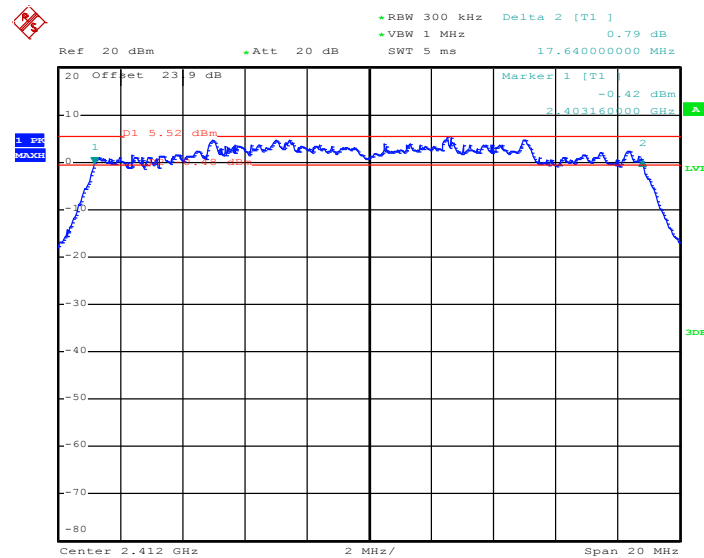
6 dB Bandwidth Plot on Channel 06



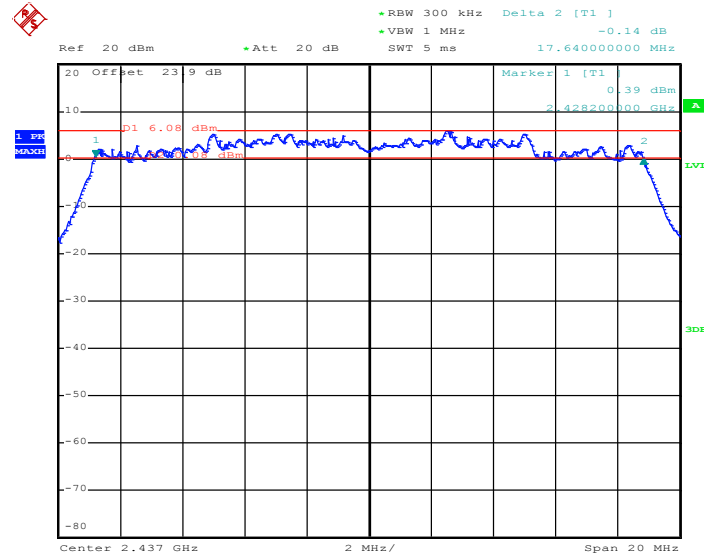
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802.11n HT-20 – SISO Ant 2
6 dB Bandwidth Plot on Channel 11


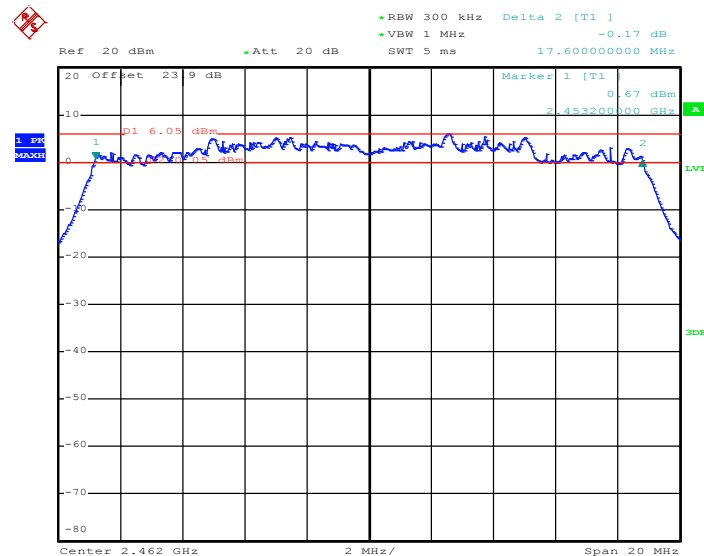
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802.11n HT-20 – MIMO Ant 1
6 dB Bandwidth Plot on Channel 01


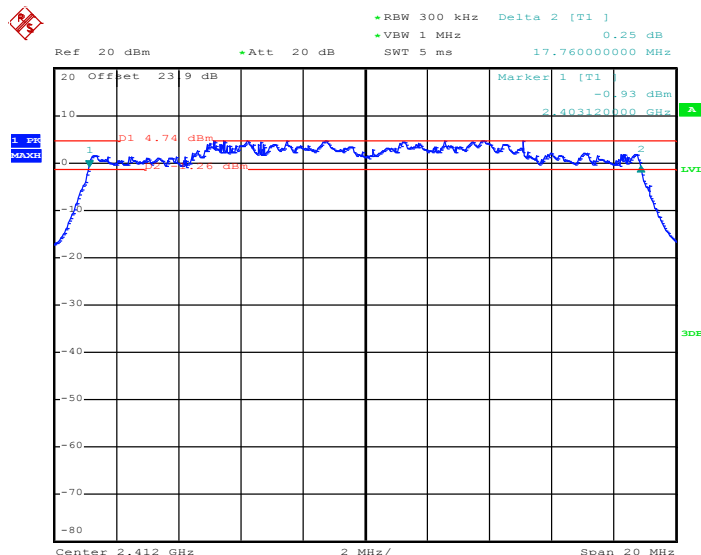
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802.11n HT-20 – MIMO Ant 1
6 dB Bandwidth Plot on Channel 06


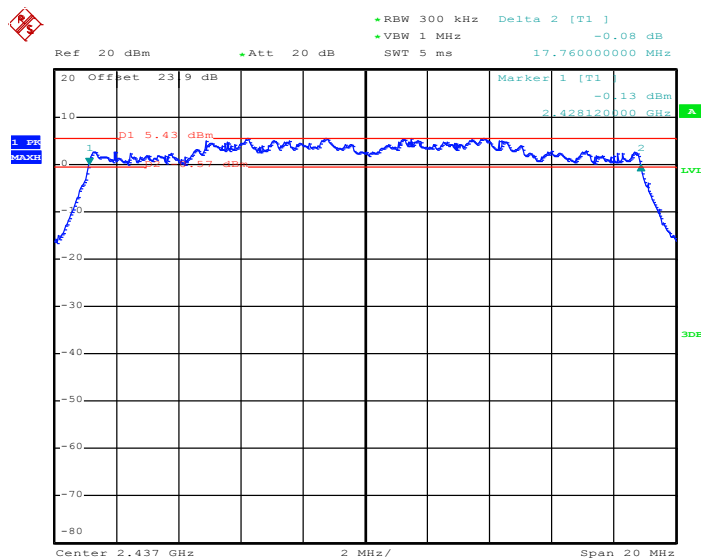
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802.11n HT-20 – MIMO Ant 1
6 dB Bandwidth Plot on Channel 11


Date: 10.AUG.2012 16:49:09

802.11n HT-20 – MIMO Ant 2
6 dB Bandwidth Plot on Channel 01


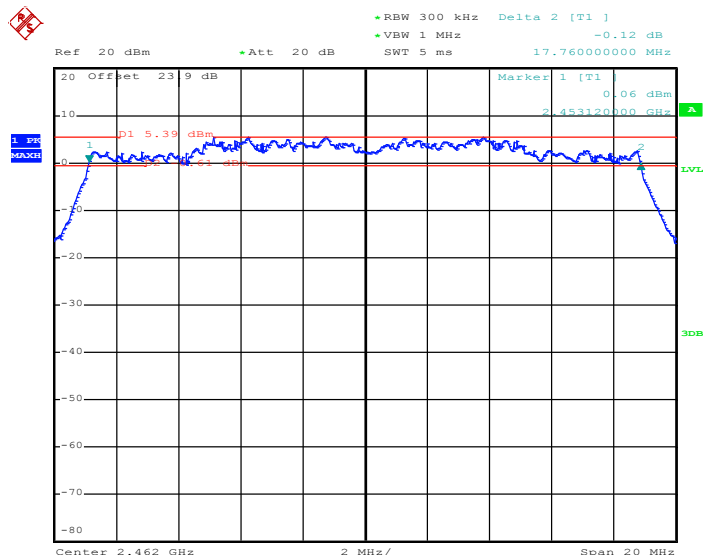
Date: 10.AUG.2012 16:58:43

802.11n HT-20 – MIMO Ant 2
6 dB Bandwidth Plot on Channel 06


Date: 10.AUG.2012 16:54:42



6 dB Bandwidth Plot on Channel 11

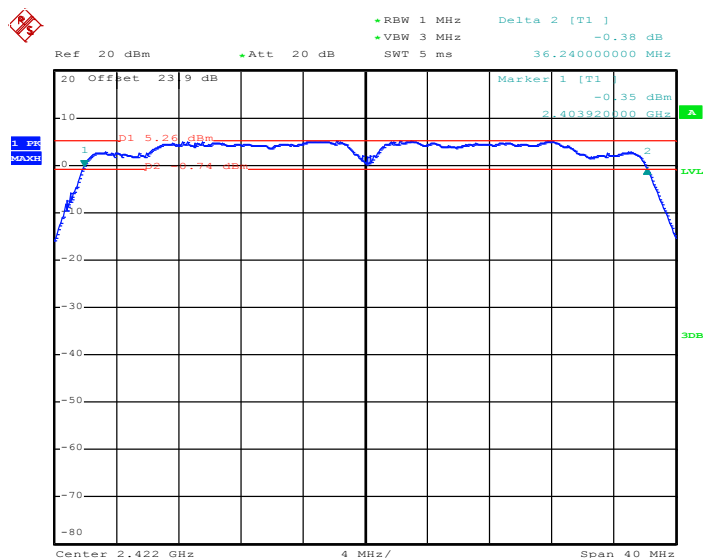


Date: 10.AUG.2012 16:46:30

<2.4GHz 802.11n HT-40>

802.11n HT-40 – SISO Ant 1

6 dB Bandwidth Plot on Channel 03

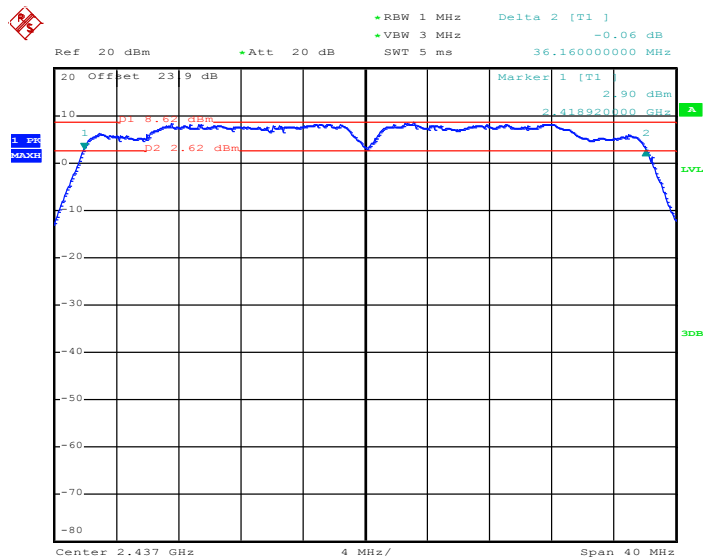


Date: 10.AUG.2012 17:08:51



802.11n HT-40 – SISO Ant 1

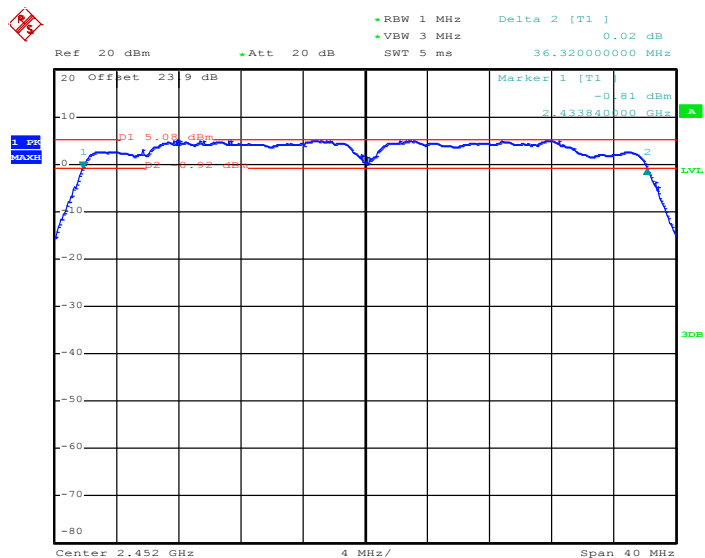
6 dB Bandwidth Plot on Channel 06



Date: 10.AUG.2012 17:15:37

802.11n HT-40 – SISO Ant 1

6 dB Bandwidth Plot on Channel 09

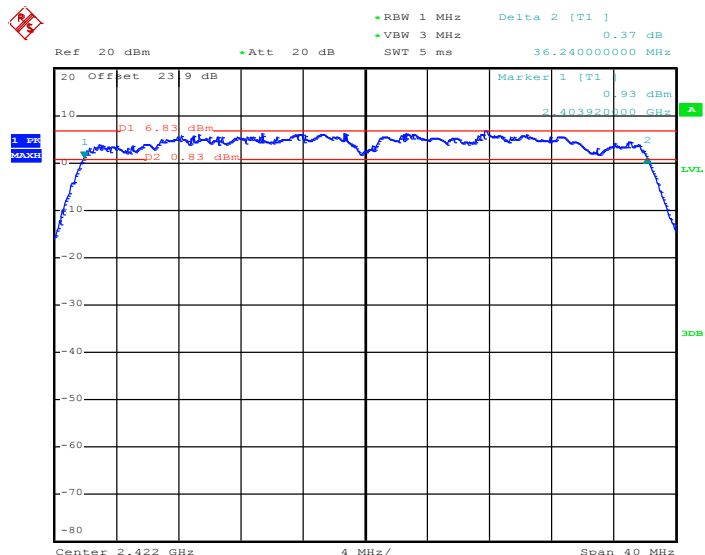


Date: 10.AUG.2012 17:12:04



802.11n HT-40 – MIMO Ant 1

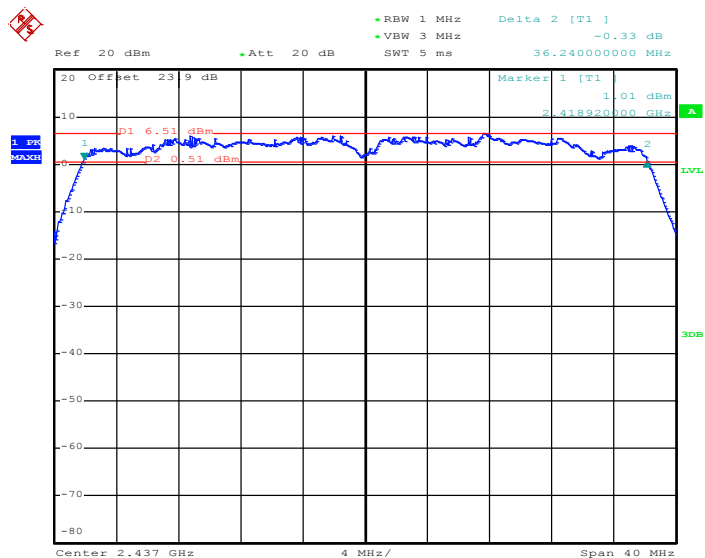
6 dB Bandwidth Plot on Channel 03



Date: 10.AUG.2012 17:34:22

802.11n HT-40 – MIMO Ant 1

6 dB Bandwidth Plot on Channel 06

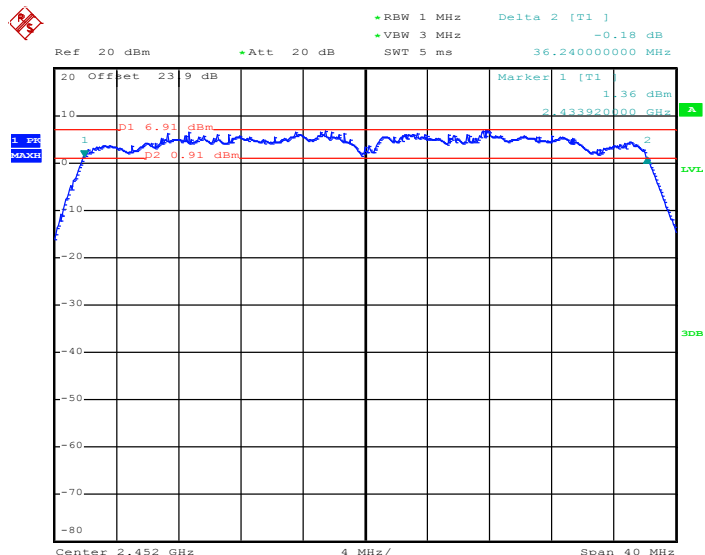


Date: 10.AUG.2012 17:21:19



802.11n HT-40 – MIMO Ant 1

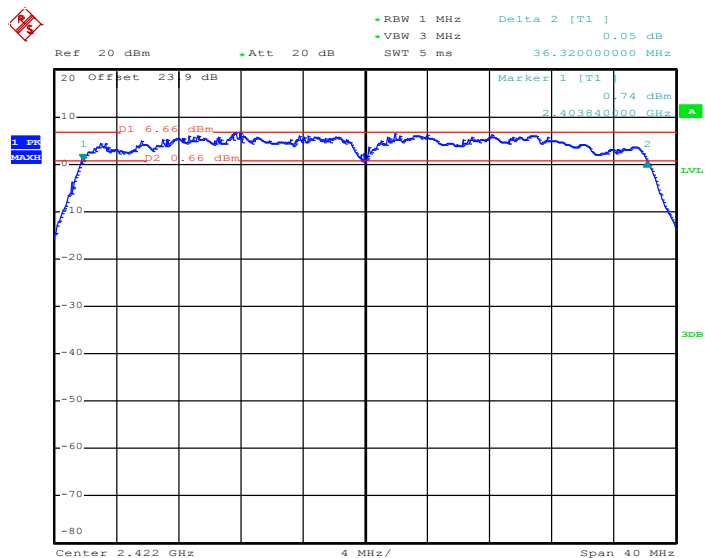
6 dB Bandwidth Plot on Channel 09



Date: 10.AUG.2012 17:37:44

802.11n HT-40 – MIMO Ant 2

6 dB Bandwidth Plot on Channel 03

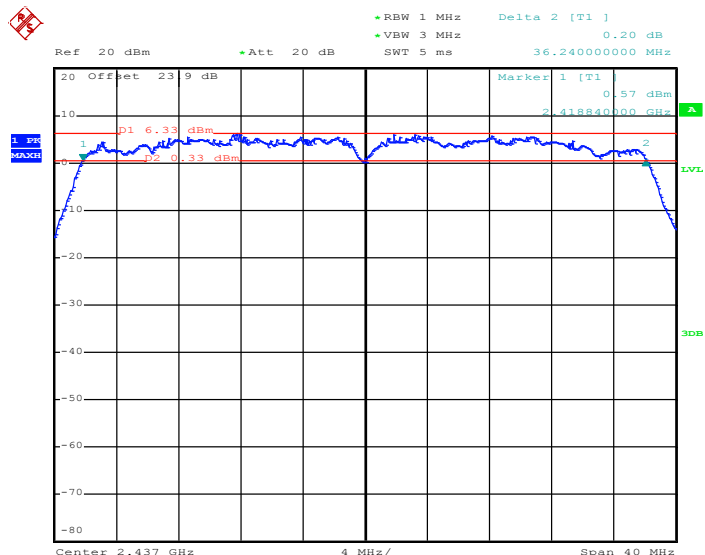


Date: 10.AUG.2012 17:30:50



802.11n HT-40 – MIMO Ant 2

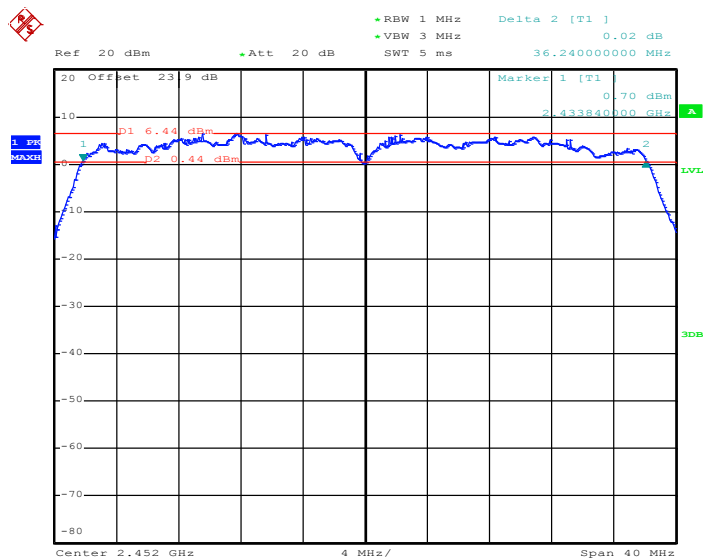
6 dB Bandwidth Plot on Channel 06



Date: 10.AUG.2012 17:27:41

802.11n HT-40 – MIMO Ant 2

6 dB Bandwidth Plot on Channel 09



Date: 10.AUG.2012 17:40:47

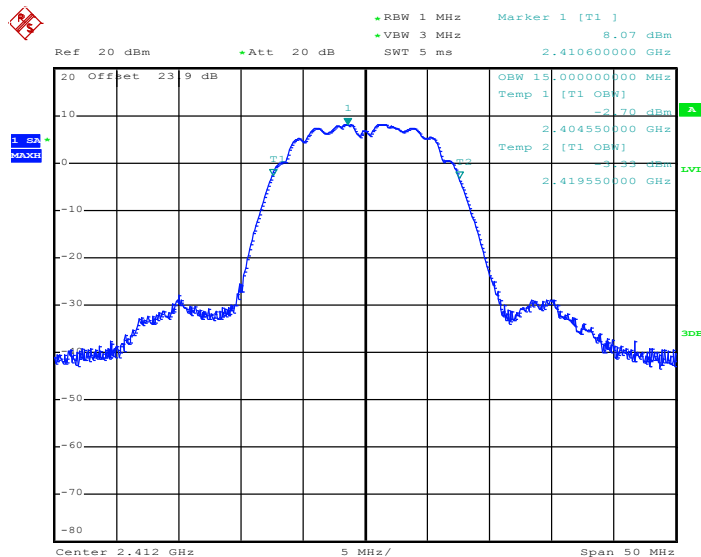


3.1.8 Test Result of 99% Bandwidth Plots

<802.11b>

802.11b – Legacy Ant 1

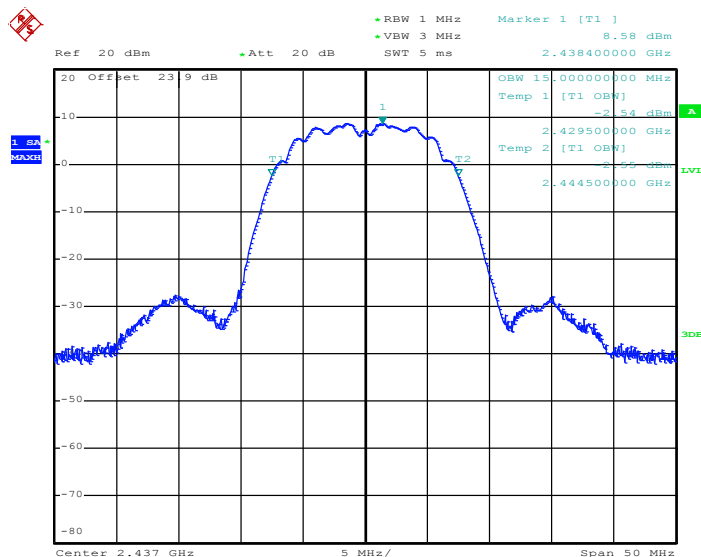
99% Occupied Bandwidth Plot on Channel 01



Date: 10.AUG.2012 16:01:31

802.11b – Legacy Ant 1

99% Occupied Bandwidth Plot on Channel 06

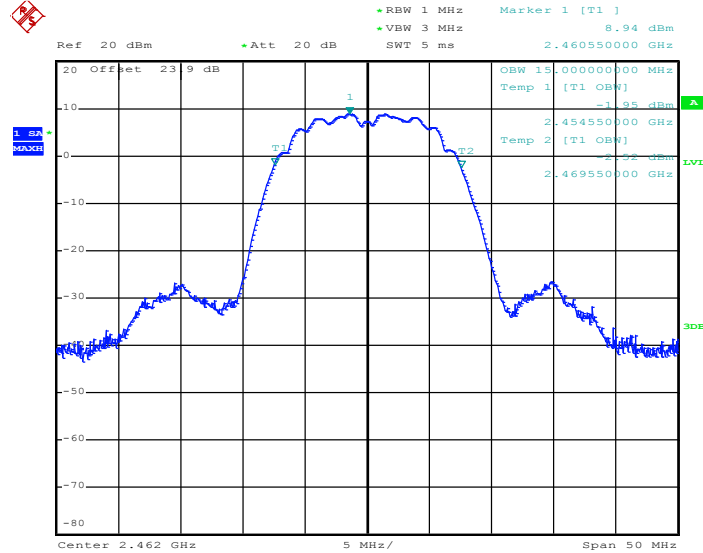


Date: 10.AUG.2012 16:03:35



802.11b – Legacy Ant 1

99% Occupied Bandwidth Plot on Channel 11

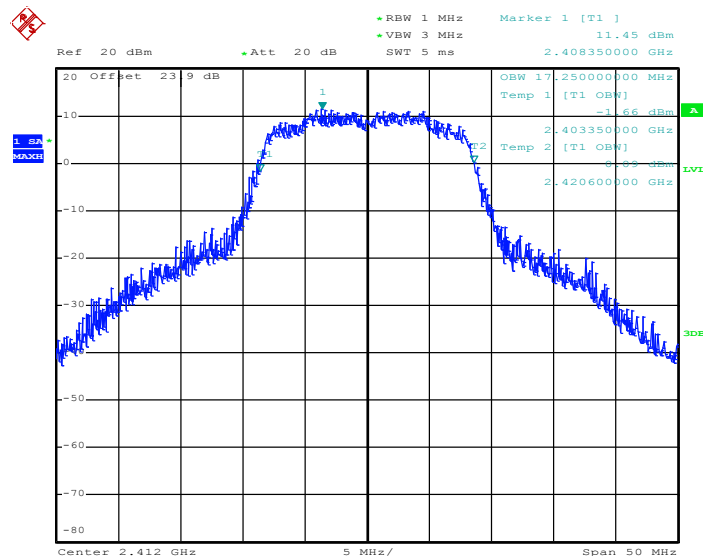


Date: 10.AUG.2012 16:06:40

<802.11g>

802.11g – Legacy Ant 2

99% Occupied Bandwidth Plot on Channel 01

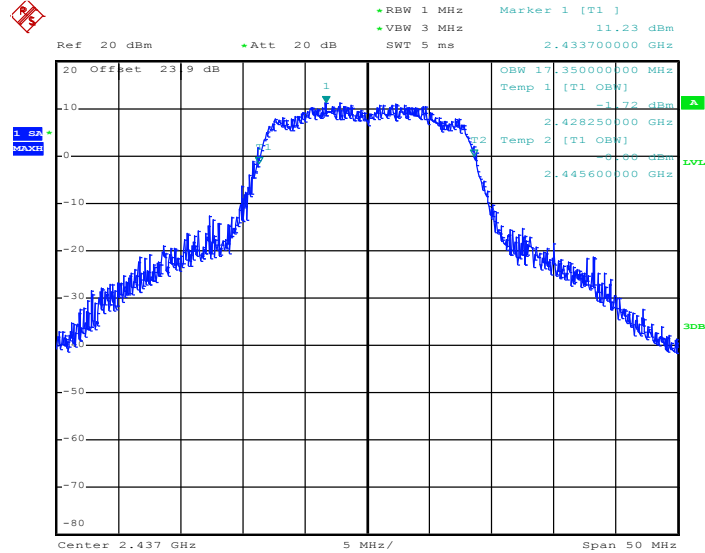


Date: 10.AUG.2012 16:17:57



802.11g – Legacy Ant 2

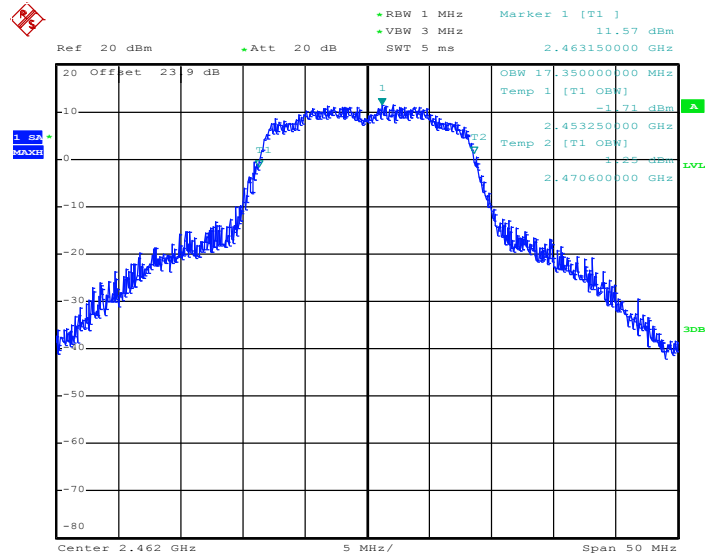
99% Occupied Bandwidth Plot on Channel 06



Date: 10.AUG.2012 16:20:08

802.11g – Legacy Ant 2

99% Occupied Bandwidth Plot Channel 11



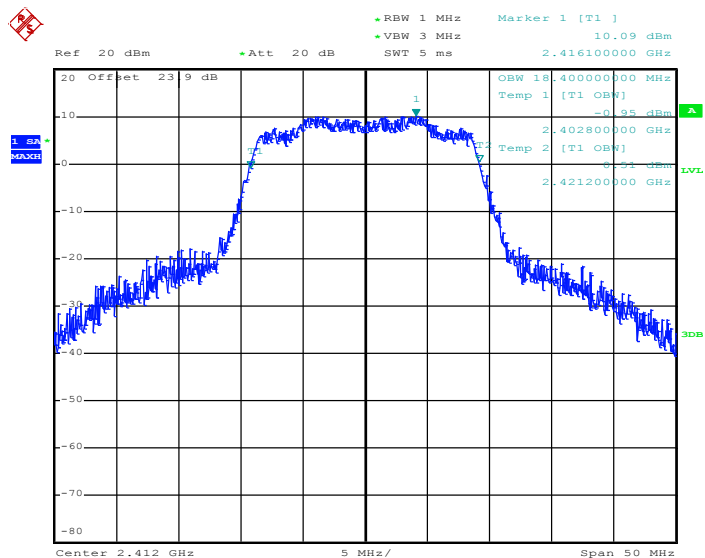
Date: 10.AUG.2012 16:24:03



<2.4GHz 802.11n HT-20>

802.11n HT-20 – SISO Ant 2

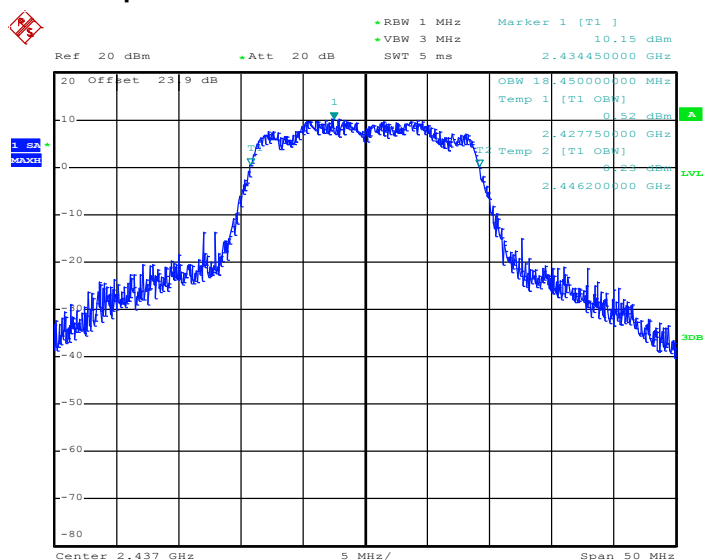
99% Occupied Bandwidth Plot on Channel 01



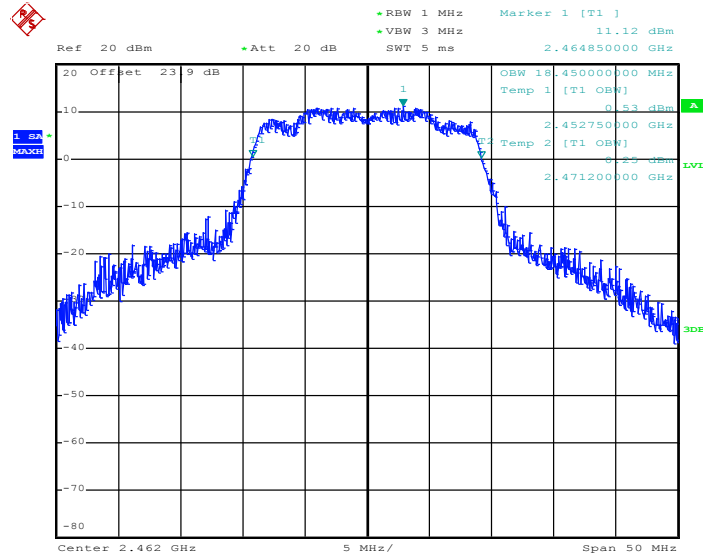
Date: 10.AUG.2012 16:42:02

802.11n HT-20 – SISO Ant 2

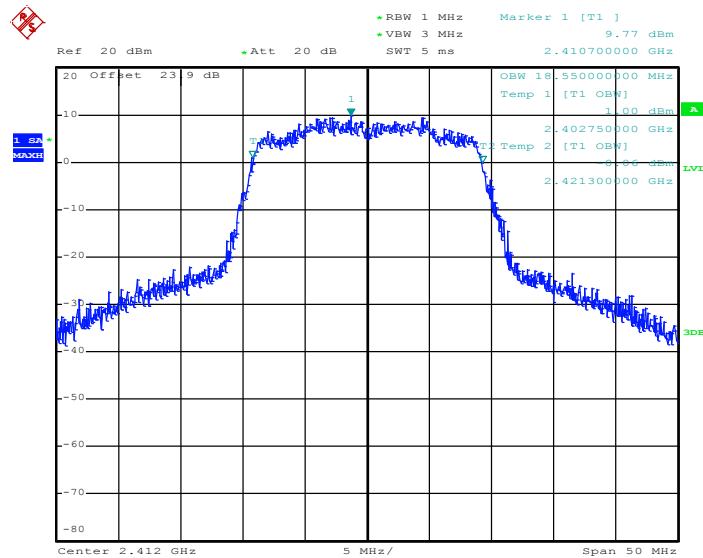
99% Occupied Bandwidth Plot on Channel 06



Date: 10.AUG.2012 16:38:02

802.11n HT-20 – SISO Ant 2
99% Occupied Bandwidth Plot on Channel 11


Date: 10.AUG.2012 16:35:44

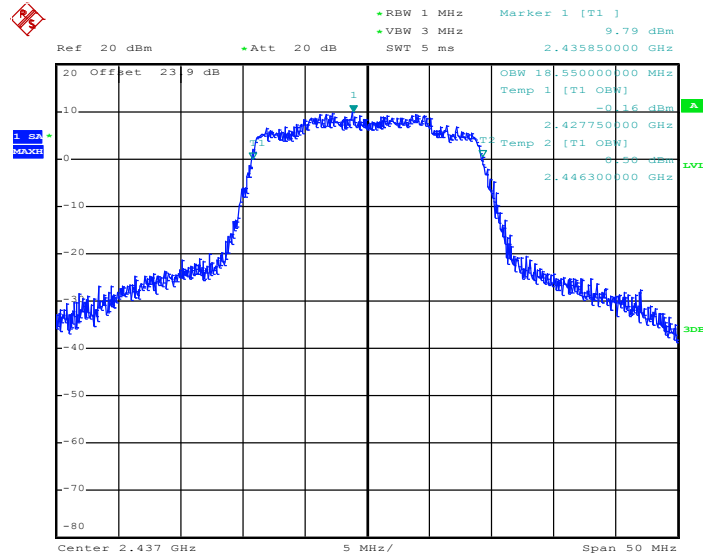
802.11n HT-20 – MIMO Ant 1
99% Occupied Bandwidth Plot on Channel 01


Date: 10.AUG.2012 17:03:52



802.11n HT-20 – MIMO Ant 1

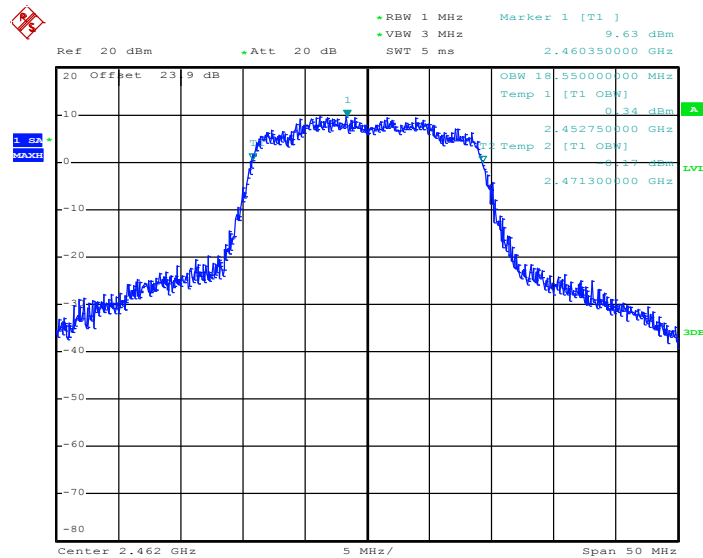
99% Occupied Bandwidth Plot on Channel 06



Date: 10.AUG.2012 16:53:59

802.11n HT-20 – MIMO Ant 1

99% Occupied Bandwidth Plot on Channel 11

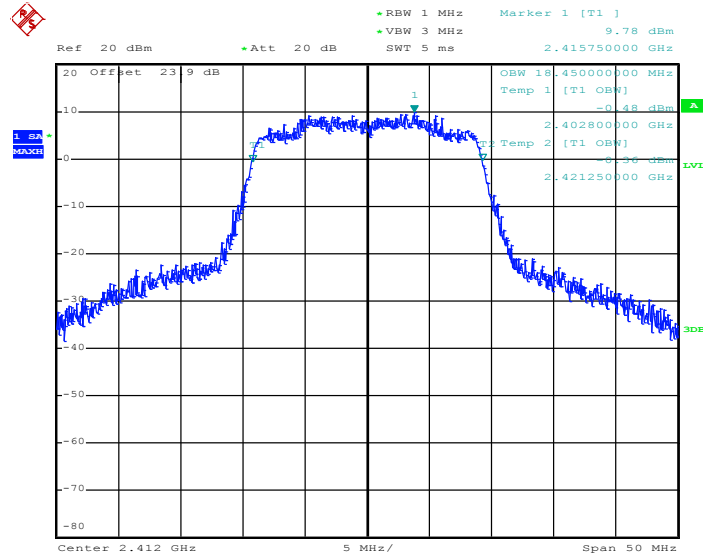


Date: 10.AUG.2012 16:50:56



802.11n HT-20 – MIMO Ant 2

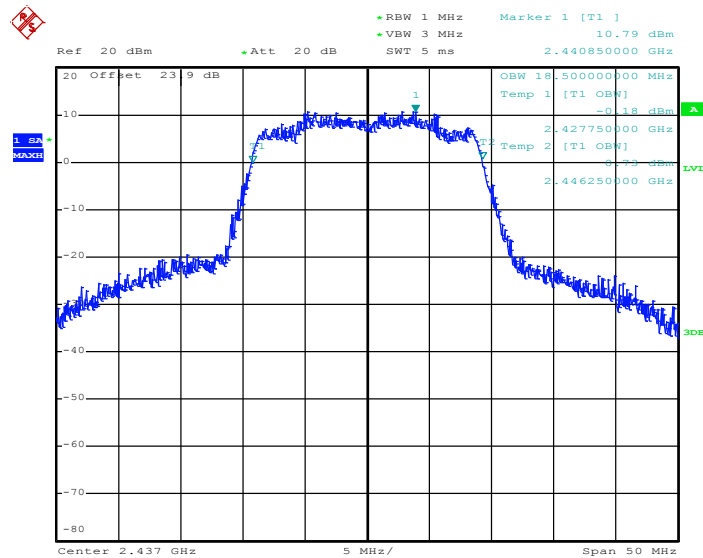
99% Occupied Bandwidth Plot on Channel 01



Date: 10.AUG.2012 17:00:30

802.11n HT-20 – MIMO Ant 2

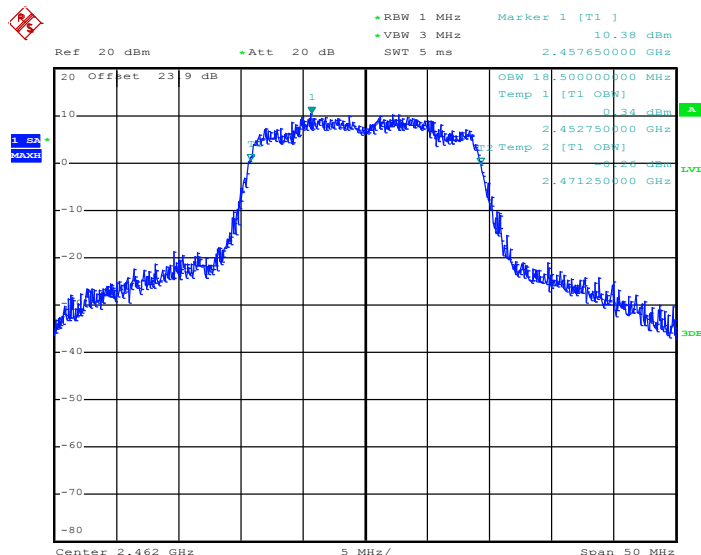
99% Occupied Bandwidth Plot on Channel 06



Date: 10.AUG.2012 16:55:58



99% Occupied Bandwidth Plot on Channel 11

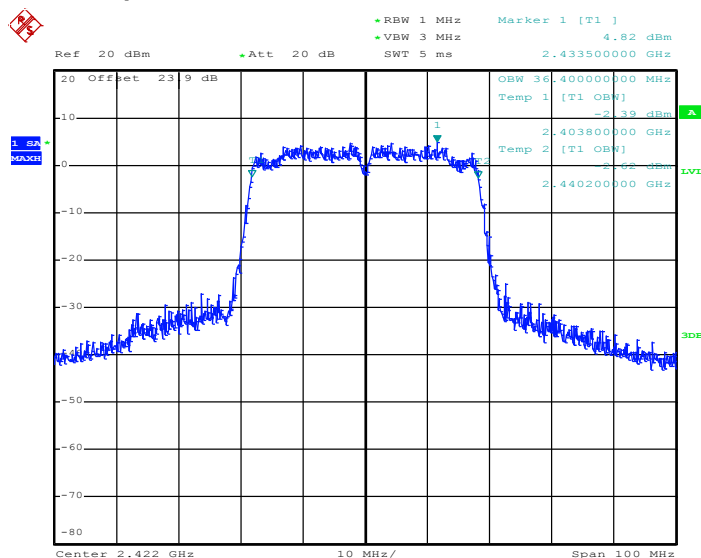


Date: 10.AUG.2012 16:48:21

<2.4GHz 802.11n HT-40>

802.11n HT-40 – SISO Ant 1

99% Occupied Bandwidth Plot on Channel 03

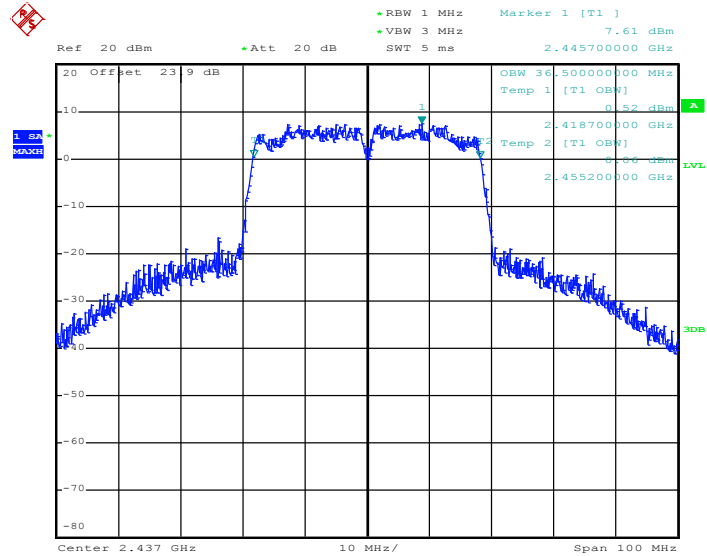


Date: 10.AUG.2012 17:10:39



802.11n HT-40 – SISO Ant 1

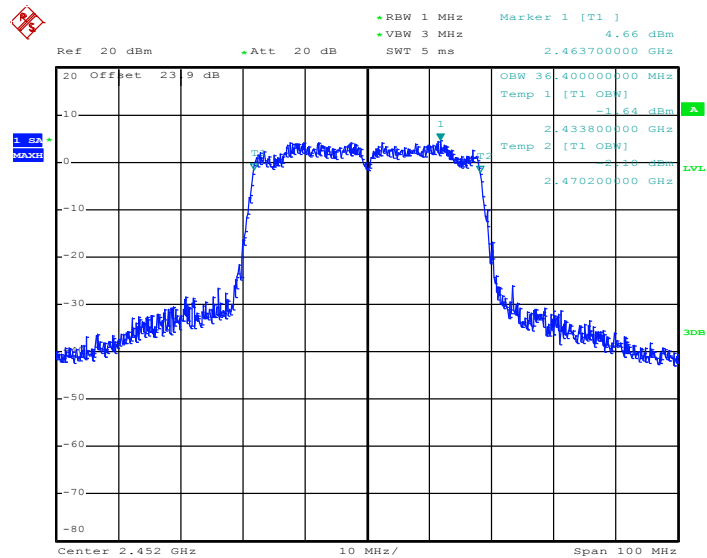
99% Occupied Bandwidth Plot on Channel 06



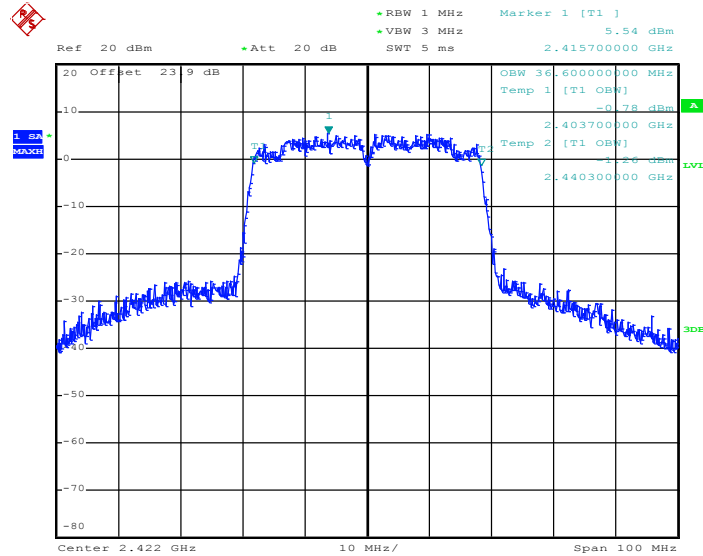
Date: 10.AUG.2012 17:17:17

802.11n HT-40 – SISO Ant 1

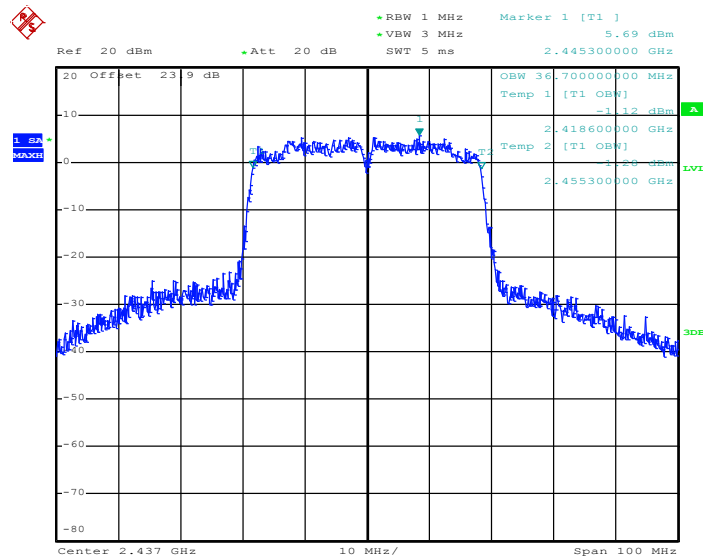
99% Occupied Bandwidth Plot on Channel 09



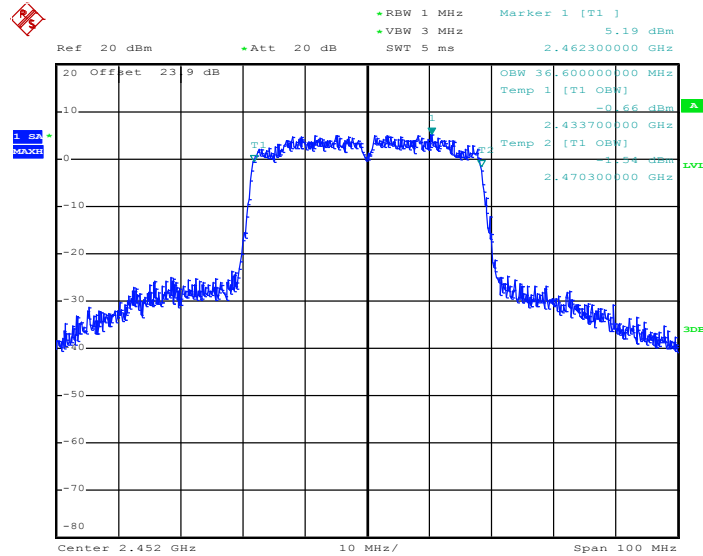
Date: 10.AUG.2012 17:14:04

802.11n HT-40 – MIMO Ant 1
99% Occupied Bandwidth Plot on Channel 03


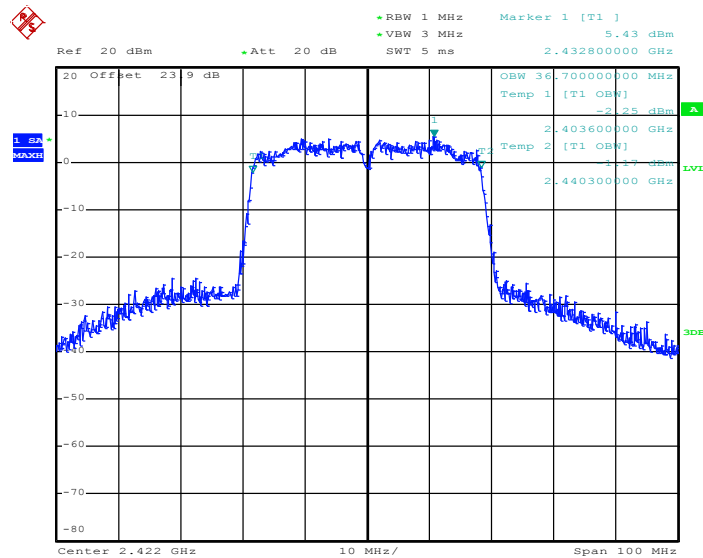
Date: 10.AUG.2012 17:36:25

802.11n HT-40 – MIMO Ant 1
99% Occupied Bandwidth Plot on Channel 06


Date: 10.AUG.2012 17:23:01

802.11n HT-40 – MIMO Ant 1
99% Occupied Bandwidth Plot on Channel 09


Date: 10.AUG.2012 17:39:46

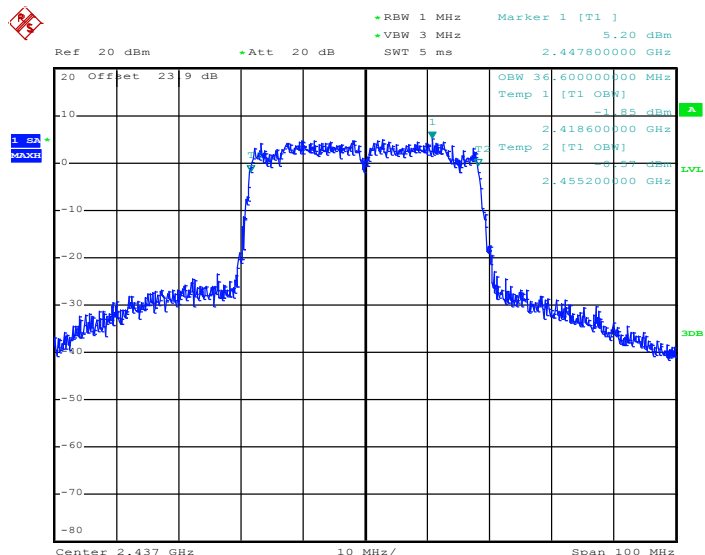
802.11n HT-40 – MIMO Ant 2
99% Occupied Bandwidth Plot on Channel 03


Date: 10.AUG.2012 17:32:35



802.11n HT-40 – MIMO Ant 2

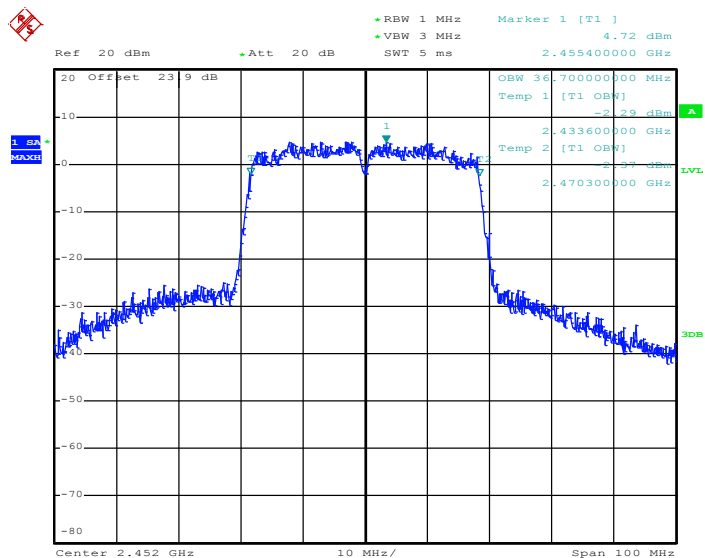
99% Occupied Bandwidth Plot on Channel 06



Date: 10.AUG.2012 17:29:38

802.11n HT-40 – MIMO Ant 2

99% Occupied Bandwidth Plot on Channel 09



Date: 10.AUG.2012 17:42:32

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, the limit for peak output power is 30dBm. If transmitting Antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the Antenna exceeds 6dBi.

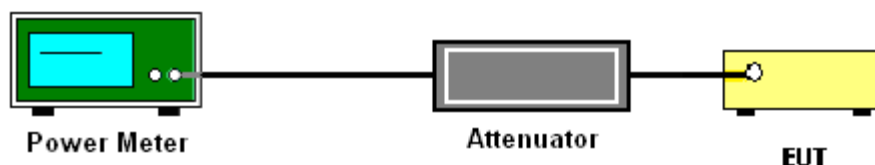
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v01r01.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Legacy Ant 1	Legacy Ant 2		
01	2412	17.35	17.33	30	Pass
06	2437	18.02	17.25	30	Pass
11	2462	18.33	17.25	30	Pass

Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)		Max. Limits (dBm)	Pass/Fail
		Legacy Ant 1	Legacy Ant 2		
01	2412	22.24	22.22	30	Pass
06	2437	22.25	22.51	30	Pass
11	2462	22.28	22.72	30	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11n HT-20 Peak Output Power (dBm)					Max. Limits (dBm)	Pass/Fail
		SISO Ant 1	SISO Ant 2	MIMO Ant 1	MIMO Ant 2	MIMO Ant 1+2		
01	2412	22.29	21.62	16.73	16.86	19.81	30	Pass
06	2437	22.33	22.65	21.45	21.63	24.55	30	Pass
11	2462	22.42	22.86	20.22	20.58	23.41	30	Pass

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



Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11n HT-40 Peak Output Power (dBm)					Max. Limits (dBm)	Pass/Fail
		SISO Ant 1	SISO Ant 2	MIMO Ant 1	MIMO Ant 2	MIMO Ant 1+2		
03	2422	20.17	17.88	17.92	16.02	20.08	30	Pass
06	2437	21.98	21.93	20.53	20.41	23.48	30	Pass
09	2452	20.32	20.36	17.19	15.80	19.56	30	Pass

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

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%
Duty Cycle:	99.16% for Ant. 1 98.82% for Ant. 2	Duty Factor:	0.04dB for Ant. 1 0.05dB for Ant. 2

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)	
		Legacy Ant 1	Legacy Ant 2
01	2412	14.66	14.70
06	2437	15.38	14.59
11	2462	15.72	14.66

Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%
Duty Cycle:	98.58% for Ant. 1 98.82% for Ant. 2	Duty Factor:	0.06dB for Ant. 1 0.05dB for Ant. 2

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)	
		Legacy Ant 1	Legacy Ant 2
01	2412	14.19	13.73
06	2437	14.29	13.94
11	2462	14.37	14.44

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%
Duty Cycle:	98.98% for SISO Ant. 1 98.48% for SISO Ant. 2 97.64% for MIMO Ant. 1 97.65% for MIMO Ant. 2	Duty Factor:	0.04dB for SISO Ant. 1 0.07dB for SISO Ant. 2 0.10dB for MIMO Ant. 1 0.10dB for MIMO Ant. 2

Channel	Frequency (MHz)	802.11n HT-20 Average Output Power (dBm)				
		SISO Ant 1	SISO Ant 2	MIMO Ant 1	MIMO Ant 2	MIMO Ant 1+2
01	2412	13.16	10.50	7.68	7.66	10.68
06	2437	13.26	13.27	12.28	12.31	15.31
11	2462	13.53	13.51	10.63	11.11	13.89

Note :

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

Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%
Duty Cycle:	97.55% for SISO Ant. 1 97.55% for SISO Ant. 2 95.42% for MIMO Ant. 1 95.42% for MIMO Ant. 2	Duty Factor:	0.11dB for SISO Ant. 1 0.11dB for SISO Ant. 2 0.20dB for MIMO Ant. 1 0.20dB for MIMO Ant. 2

Channel	Frequency (MHz)	802.11n HT-40 Average Output Power (dBm)				
		SISO Ant 1	SISO Ant 2	MIMO Ant 1	MIMO Ant 2	MIMO Ant 1+2
03	2422	10.76	7.87	7.95	7.23	10.62
06	2437	13.86	12.42	11.22	10.73	14.00
09	2452	10.86	10.71	7.29	6.92	10.12

Note :

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

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

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

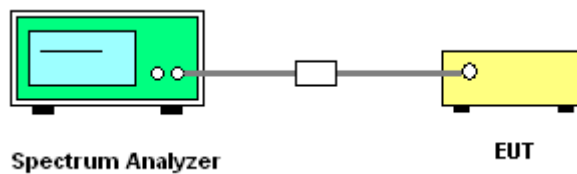
If measurements performed using method (2) plus $10\log(N)$ exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

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

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

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

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	802.11b	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass /Fail
		Legacy Ant 1			
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	2.57	-12.63	8	Pass
06	2437	3.10	-12.10	8	Pass
11	2462	4.64	-10.56	8	Pass

Test Mode :	802.11g	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass /Fail
		Legacy Ant 2			
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	3.38	-11.82	8	Pass
06	2437	3.04	-12.16	8	Pass
11	2462	3.16	-12.04	8	Pass

Test Mode :	802.11n HT-20	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Ch.	Freq. (MHz)	802.11n HT-20 Power Density						Max. Limits (dBm)	Pass /Fail
		SISO Ant 2		MIMO Ant 1		MIMO Ant 2			
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2		
01	2412	1.83	-13.37	1.64	-10.55	2.05	-10.14	8	Pass
06	2437	2.70	-12.50	2.08	-10.11	2.97	-9.22	8	Pass
11	2462	2.51	-12.69	2.12	-10.07	2.70	-9.49	8	Pass

Note:

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

Test Mode :	802.11n HT-40	Temperature :	24~26°C
Test Engineer :	Kenny Chen	Relative Humidity :	55~58%

Ch.	Freq. (MHz)	802.11n HT-40 Power Density						Max. Limits (dBm)	Pass /Fail
		SISO Ant 1		MIMO Ant 1		MIMO Ant 2			
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2	Measured PSD/100KHz (dBm)	PSD/3KHz (dBm) +10log2		
03	2422	-3.43	-18.63	-3.66	-15.85	-3.98	-16.17	8	Pass
06	2437	-1.27	-16.47	-3.43	-15.62	-3.67	-15.86	8	Pass
09	2452	-4.47	-19.67	-3.63	-15.82	-4.22	-16.41	8	Pass

Note:

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



802.11b – Legacy Ant 1

RBW 100 kHz Marker 1 [T1] 2.57 dBm
 VBW 300 kHz
 Att 20 dB SWT 5 ms 2.412986544 GHz

20 Offset 23.9 dB

1.5912 MHz/ Span 15.912 MHz

Center 2.412 GHz

802.11b – Legacy Ant 1

Ref 20 dBm Att 20 dB RBW 100 kHz VBW 300 kHz SWT 5 ms Marker 1 [T1] 3.10 dBm 2.434485904 GHz

20 Offset 23.9 dB

1.500 MHz

1

20 dBm

10 dBm

0 dBm

-10 dBm

-20 dBm

-30 dBm

-40 dBm

-50 dBm

-60 dBm

-70 dBm

-80 dBm

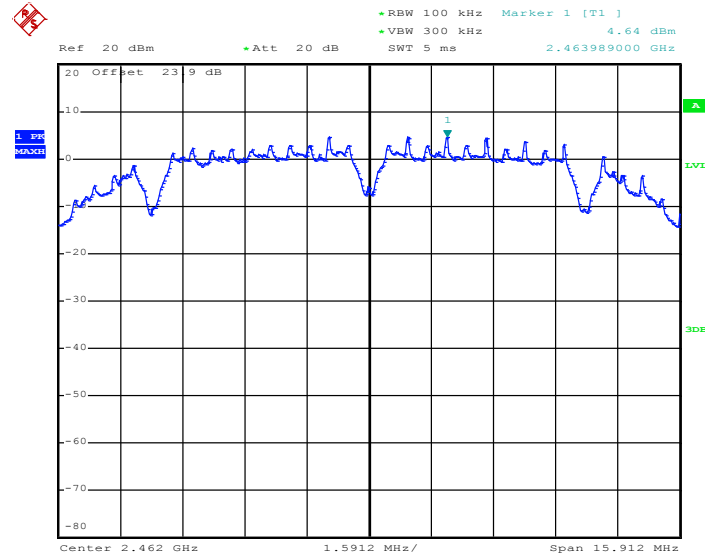
Center 2.437 GHz 1.5912 MHz/ Span 15.912 MHz

SPORTON INTERNATIONAL INC.



802.11b – Legacy Ant 1

PSD Plot on Channel 11

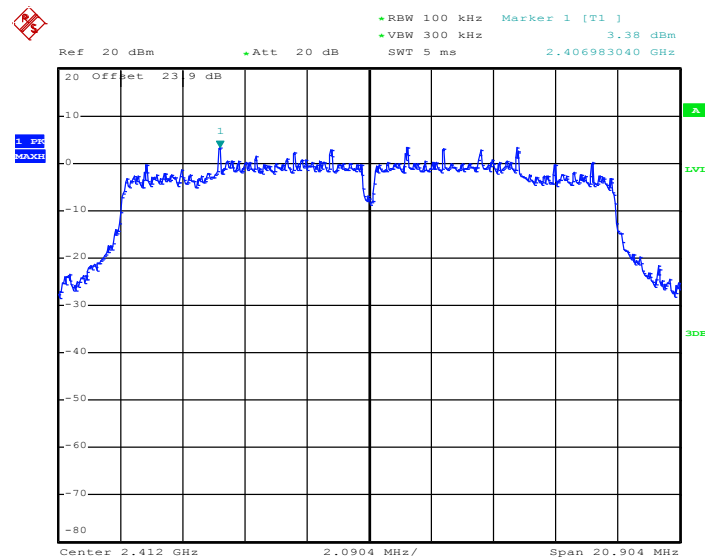


Date: 10.AUG.2012 16:04:50

<802.11g>

802.11g – Legacy Ant 2

PSD Plot on Channel 01

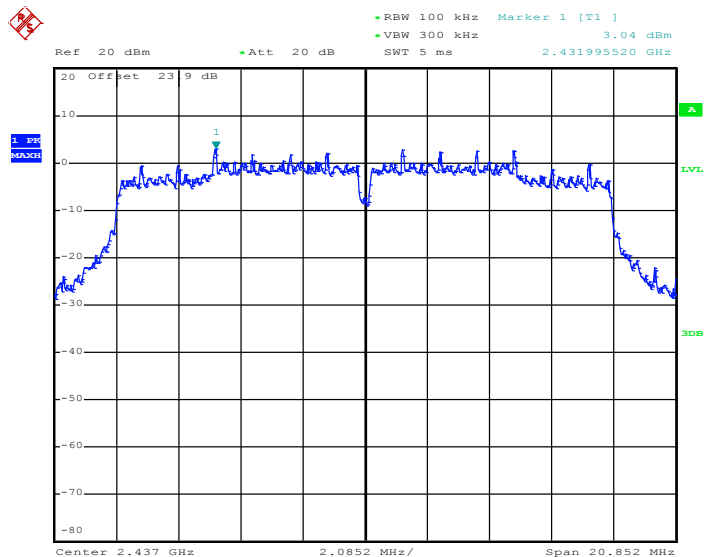


Date: 10.AUG.2012 16:16:48



802.11g – Legacy Ant 2

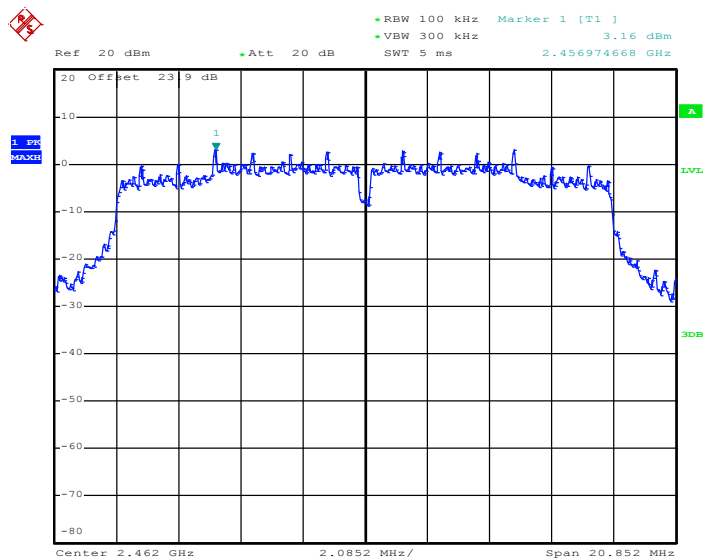
PSD Plot on Channel 06



Date: 10.AUG.2012 16:19:16

802.11g – Legacy Ant 2

PSD Plot Channel 11



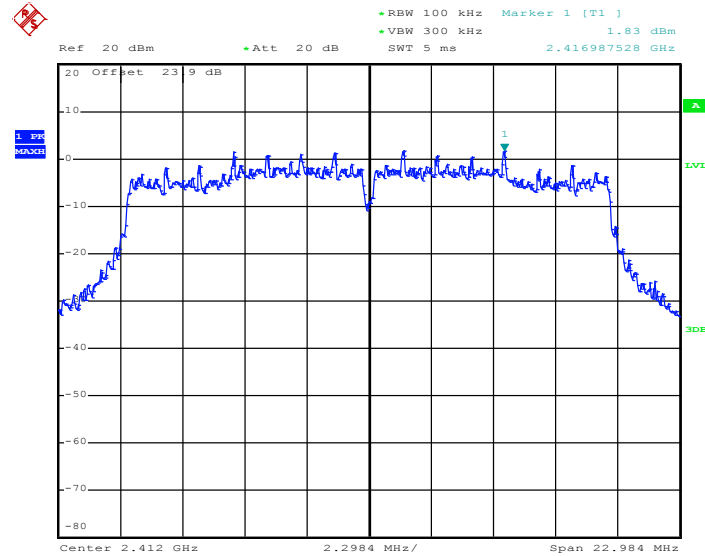
Date: 10.AUG.2012 16:22:25



<802.11n HT-20>

802.11n HT-20 – SISO Ant 2

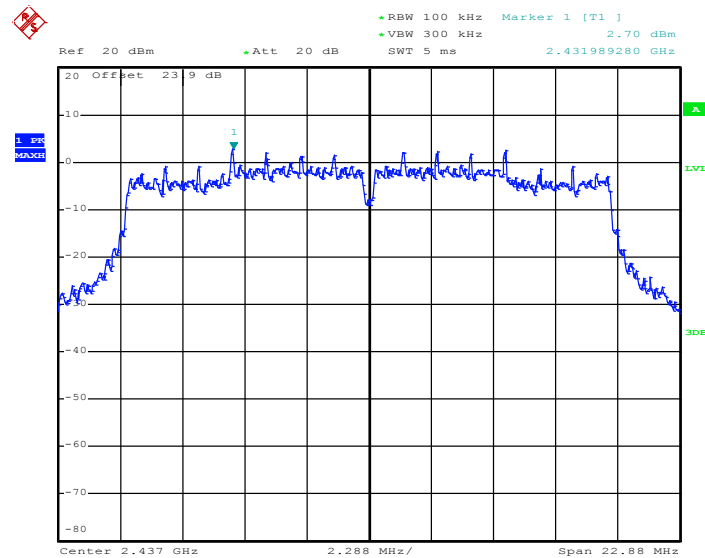
PSD Plot on Channel 01



Date: 10.AUG.2012 16:39:13

802.11n HT-20 – SISO Ant 2

PSD Plot on Channel 06

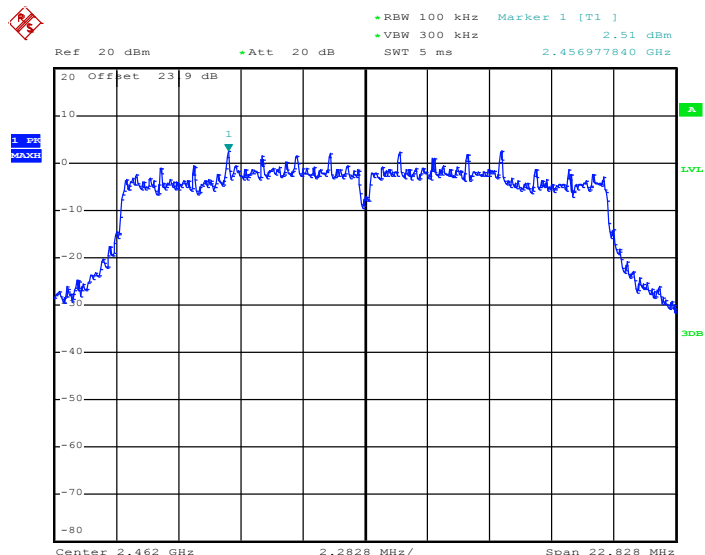


Date: 10.AUG.2012 16:37:08



802.11n HT-20 – SISO Ant 2

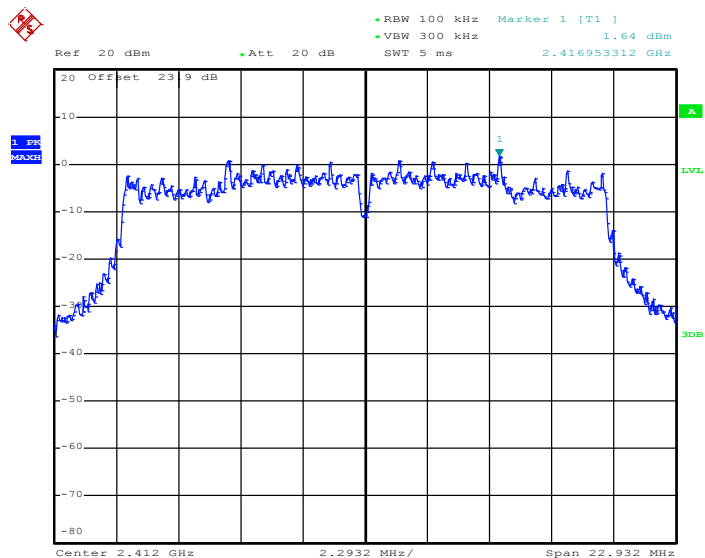
PSD Plot on Channel 11



Date: 10.AUG.2012 16:34:24

802.11n HT-20 – MIMO Ant 1

PSD Plot on Channel 01

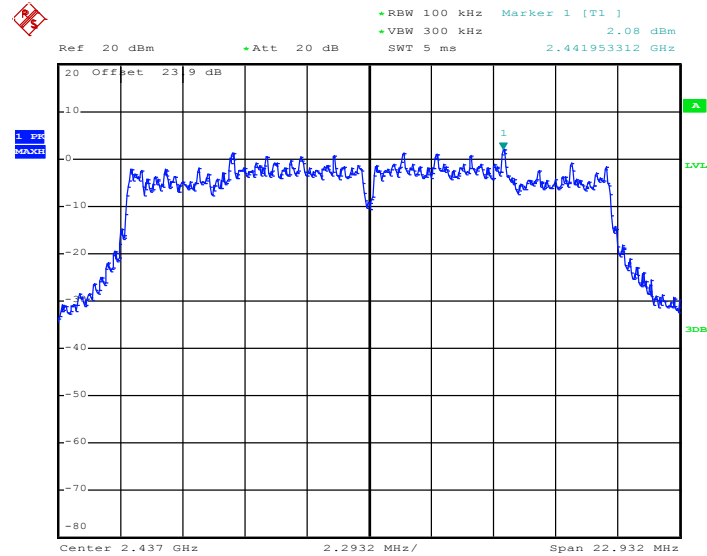


Date: 10.AUG.2012 17:02:08



802.11n HT-20 – MIMO Ant 1

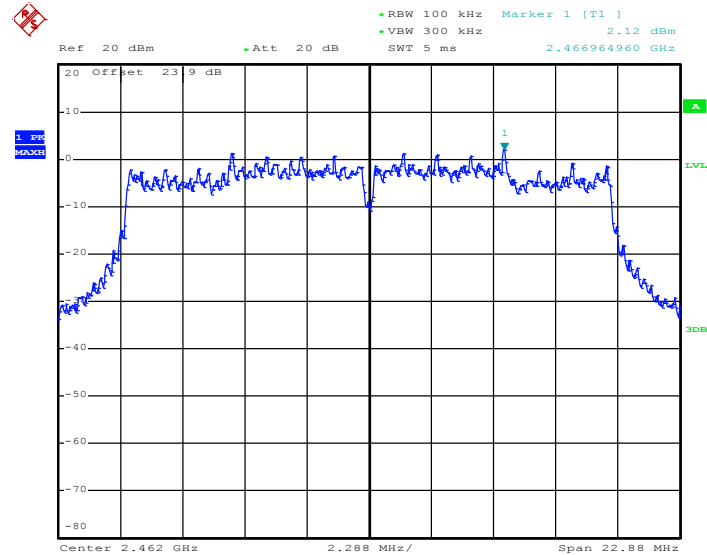
PSD Plot on Channel 06



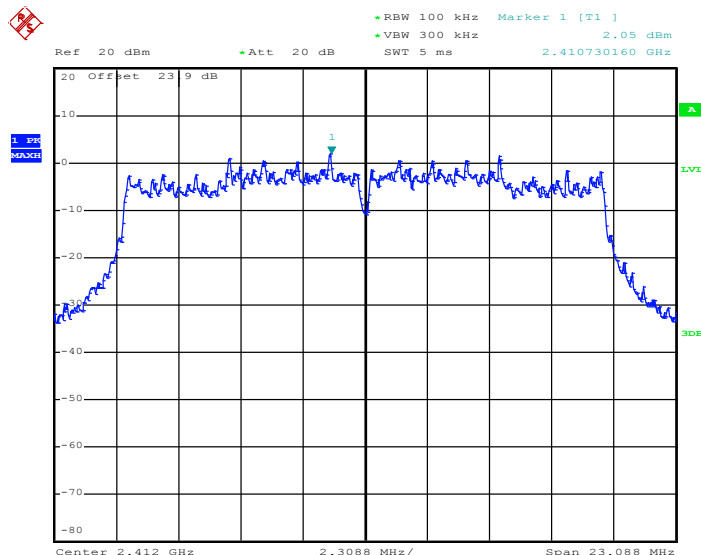
Date: 10.AUG.2012 16:52:56

802.11n HT-20 – MIMO Ant 1

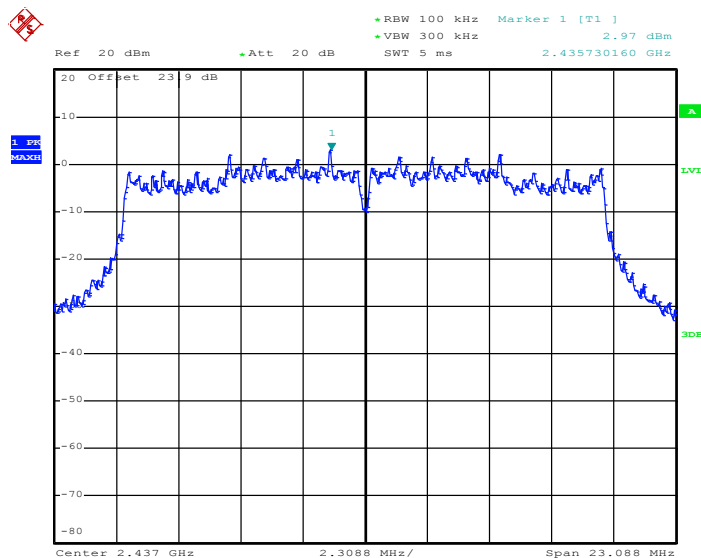
PSD Plot on Channel 11



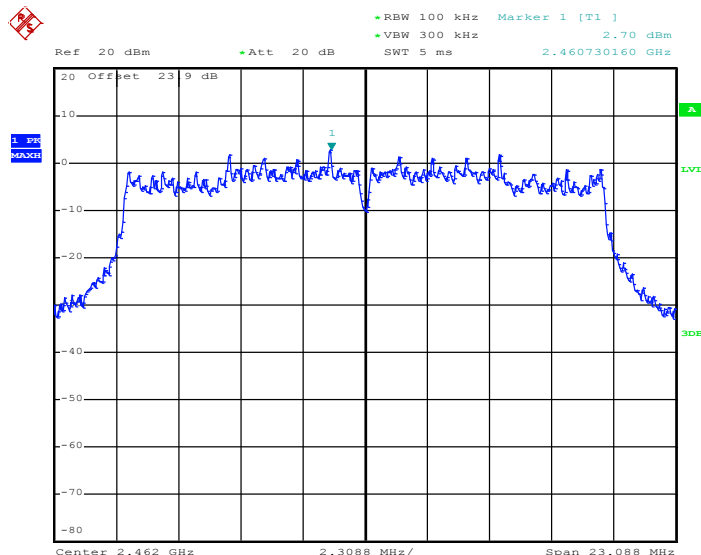
Date: 10.AUG.2012 16:49:31

802.11n HT-20 – MIMO Ant 2
PSD Plot on Channel 01


Date: 10.AUG.2012 16:59:04

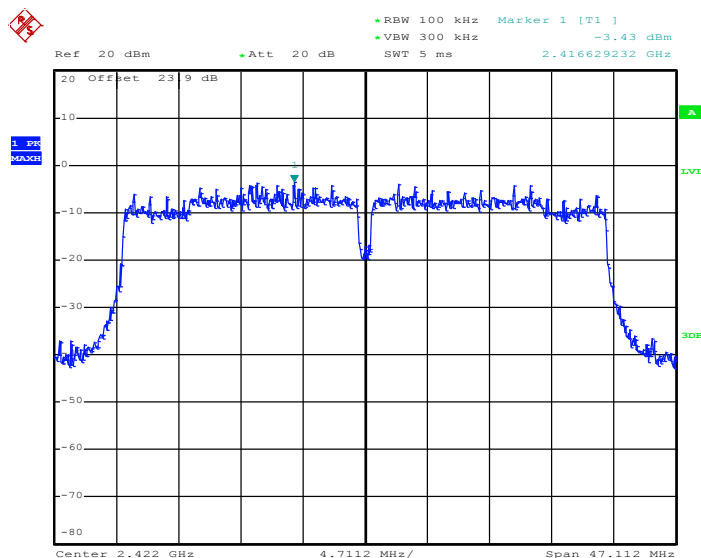
802.11n HT-20 – MIMO Ant 2
PSD Plot on Channel 06


Date: 10.AUG.2012 16:55:03

802.11n HT-20 – MIMO Ant 2
PSD Plot on Channel 11


Date: 10.AUG.2012 16:46:53

<802.11n HT-40>

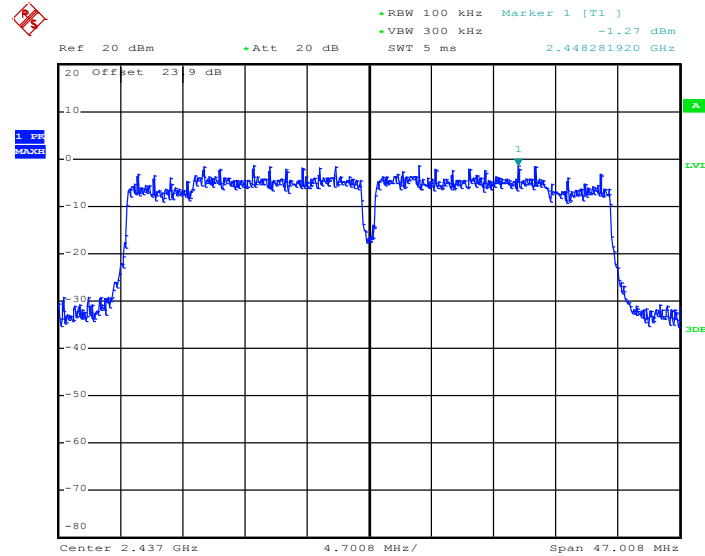
802.11n HT-40 – SISO Ant 1
PSD Plot on Channel 03


Date: 10.AUG.2012 17:09:12



802.11n HT-40 – SISO Ant 1

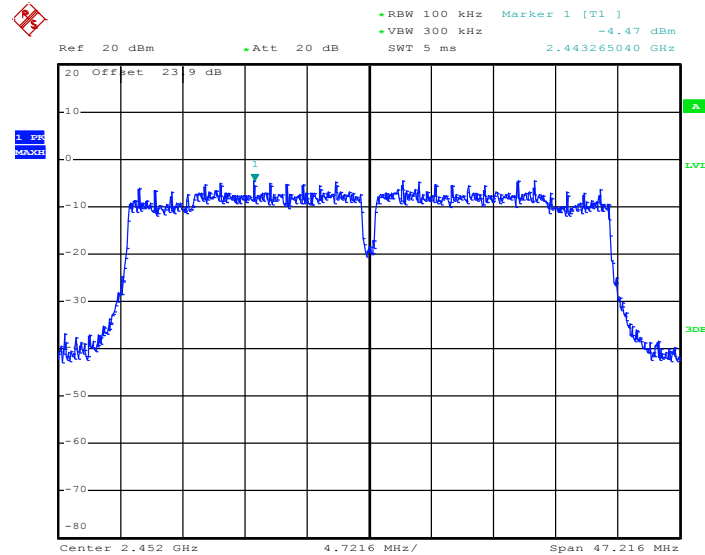
PSD Plot on Channel 06



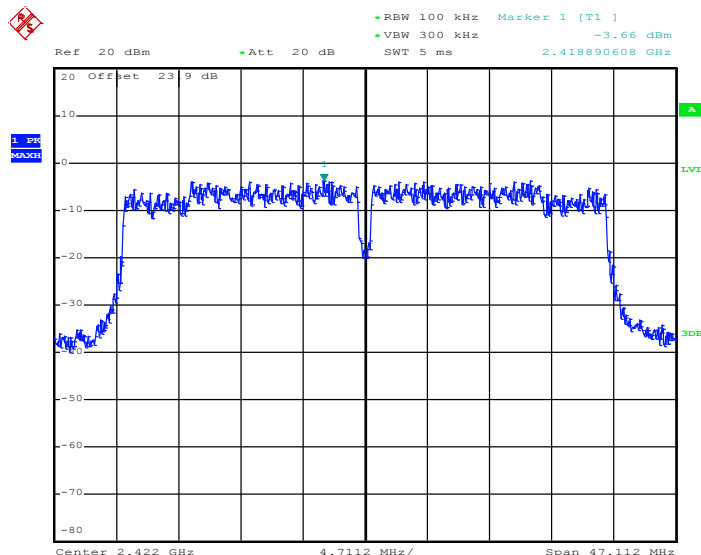
Date: 10.AUG.2012 17:15:59

802.11n HT-40 – SISO Ant 1

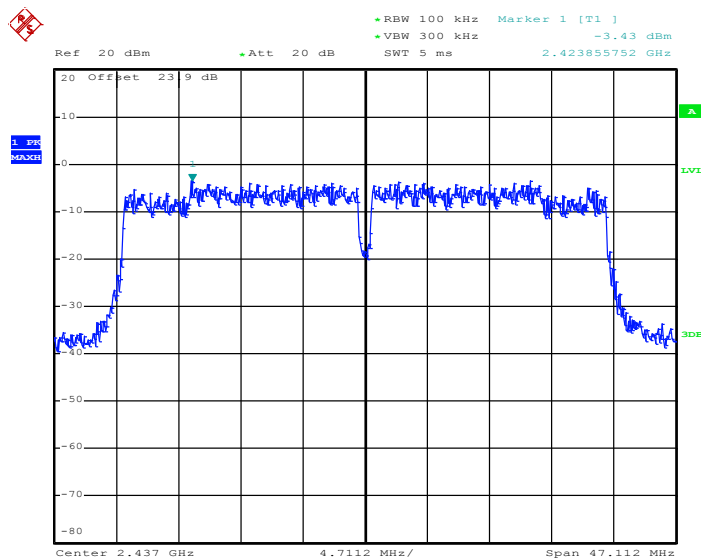
PSD Plot on Channel 09



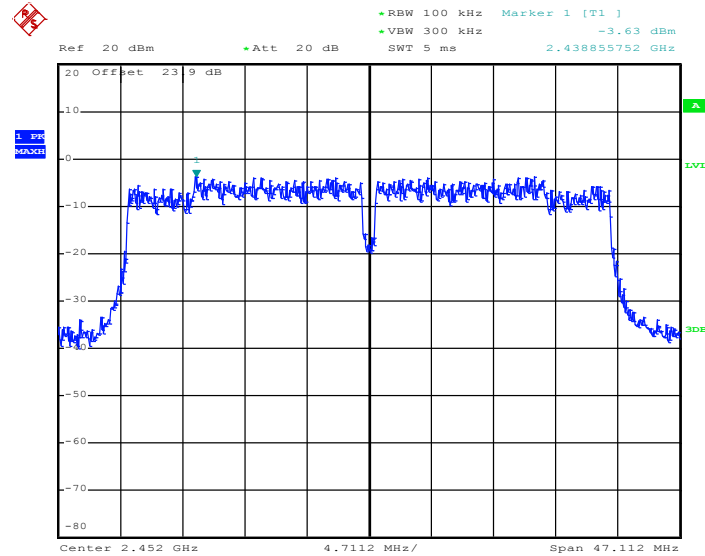
Date: 10.AUG.2012 17:12:46

802.11n HT-40 – MIMO Ant 1
PSD Plot on Channel 03


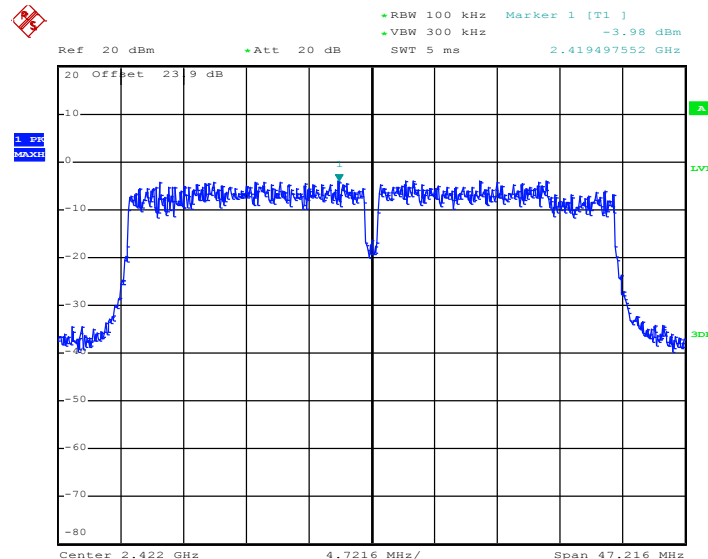
Date: 10.AUG.2012 17:34:42

802.11n HT-40 – MIMO Ant 1
PSD Plot on Channel 06


Date: 10.AUG.2012 17:22:02

802.11n HT-40 – MIMO Ant 1
PSD Plot on Channel 09


Date: 10.AUG.2012 17:38:05

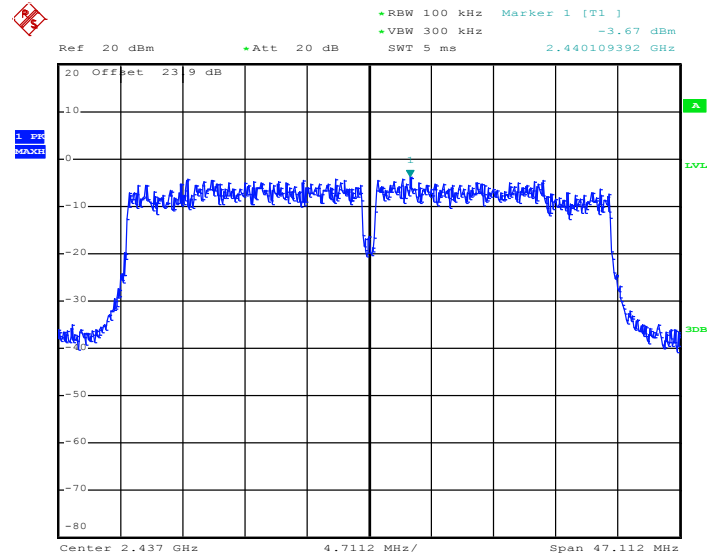
802.11n HT-40 – MIMO Ant 2
PSD Plot on Channel 03


Date: 10.AUG.2012 17:31:11



802.11n HT-40 – MIMO Ant 2

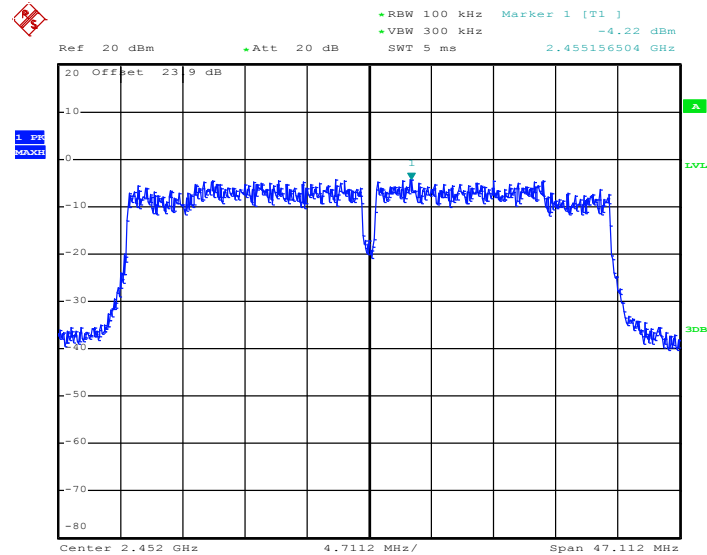
PSD Plot on Channel 06



Date: 10.AUG.2012 17:28:10

802.11n HT-40 – MIMO Ant 2

PSD Plot on Channel 09



Date: 10.AUG.2012 17:41:07

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

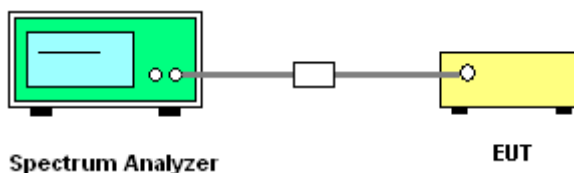
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

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

3.4.4 Test Setup

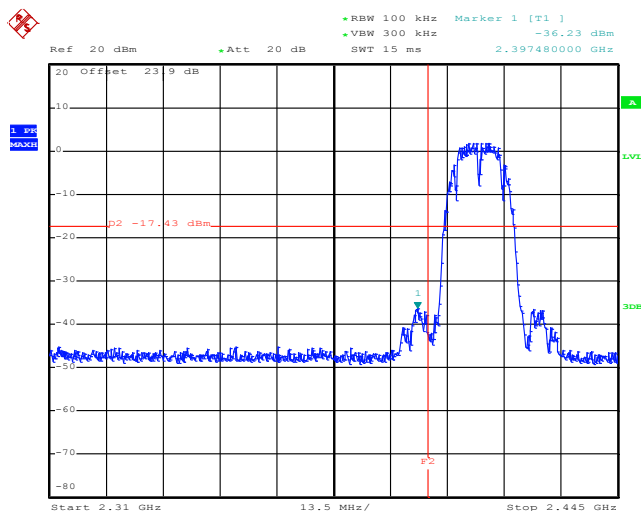


3.4.5 Test Result of Conducted Spurious at Band Edges

Test Mode :	802.11b – Legacy Ant 1	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	01 and 11	Test Engineer :	Kenny Chen

802.11b - Legacy Ant 1

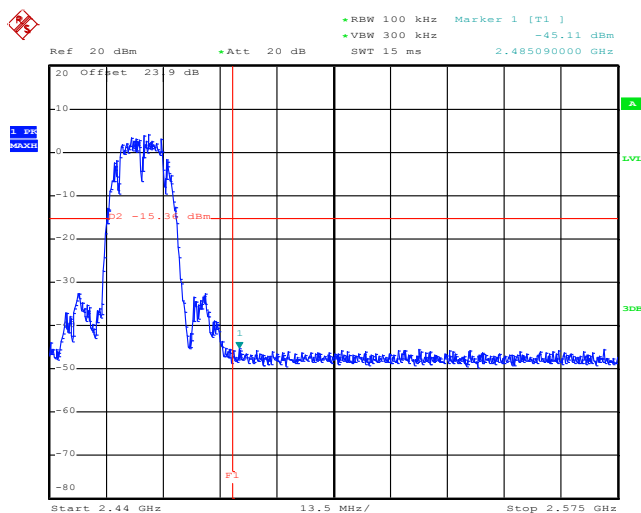
Low Band Edge Plot on Channel 01



Date: 10.AUG.2012 15:59:05

802.11b - Legacy Ant 1

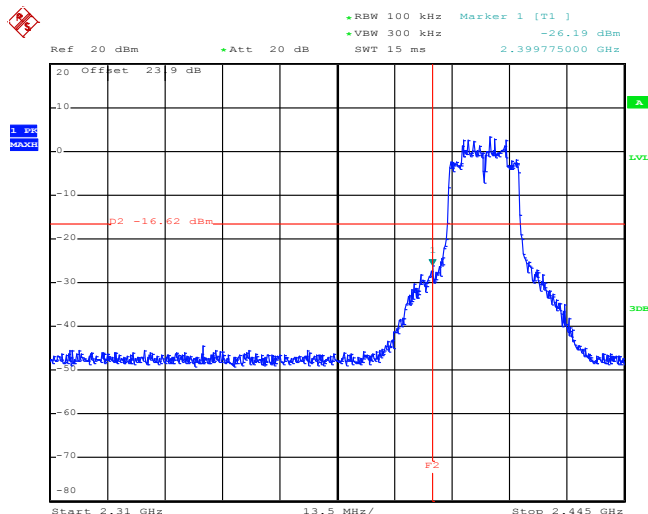
High Band Edge Plot on Channel 11



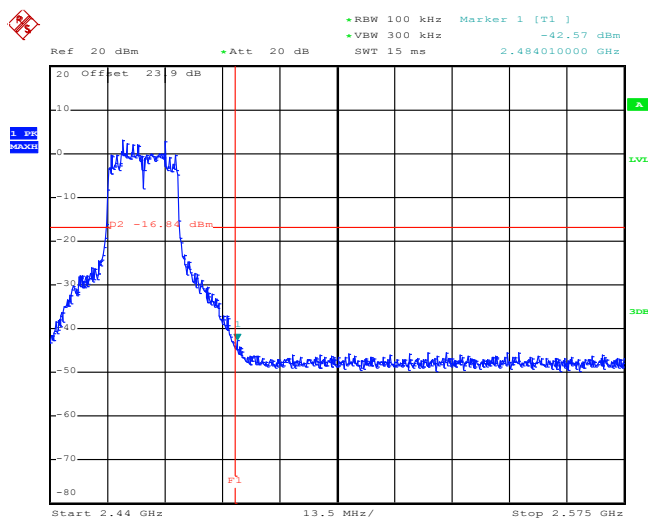
Date: 10.AUG.2012 16:05:06



Test Mode :	802.11g – Legacy Ant 2	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	01 and 11	Test Engineer :	Kenny Chen

802.11g - Legacy Ant 2**Low Band Edge Plot on Channel 01**

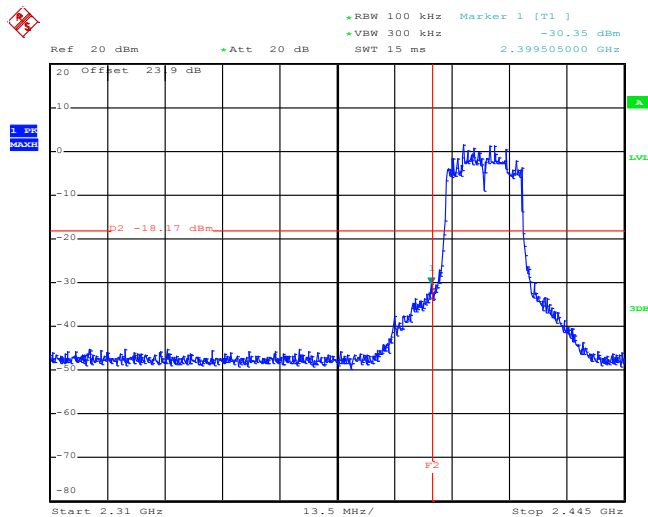
Date: 10.AUG.2012 16:17:07

802.11g - Legacy Ant 2**High Band Edge Plot on Channel 11**

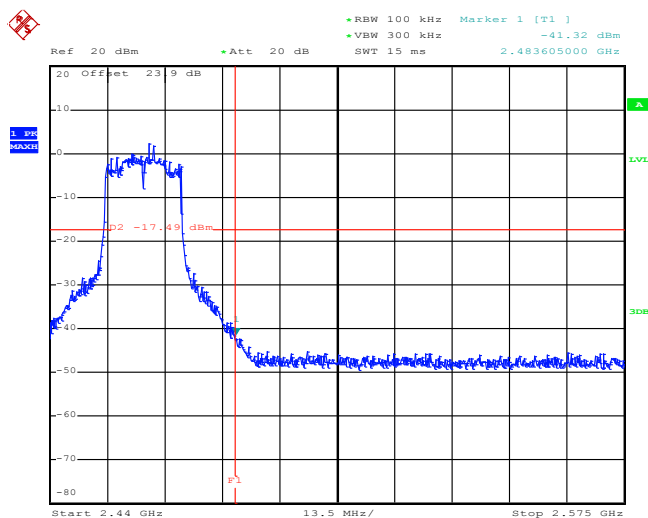
Date: 10.AUG.2012 16:23:32



Test Mode :	802.11n HT-20 - SISO Ant 2	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	01 and 11	Test Engineer :	Kenny Chen

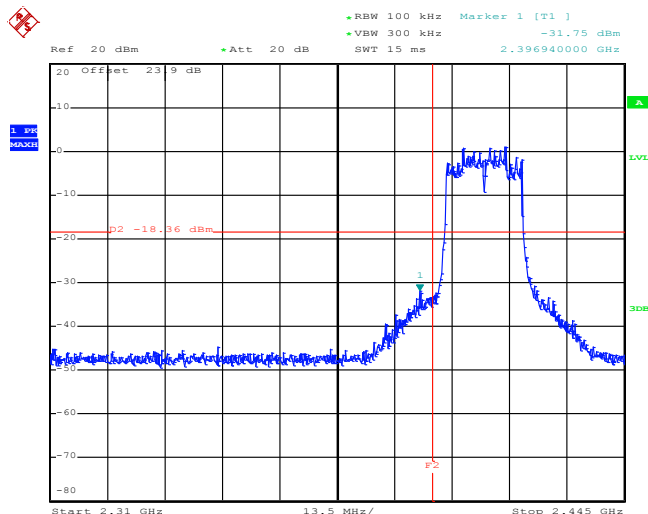
802.11n HT-20 - SISO Ant 2**Low Band Edge Plot on Channel 01**

Date: 10.AUG.2012 16:39:36

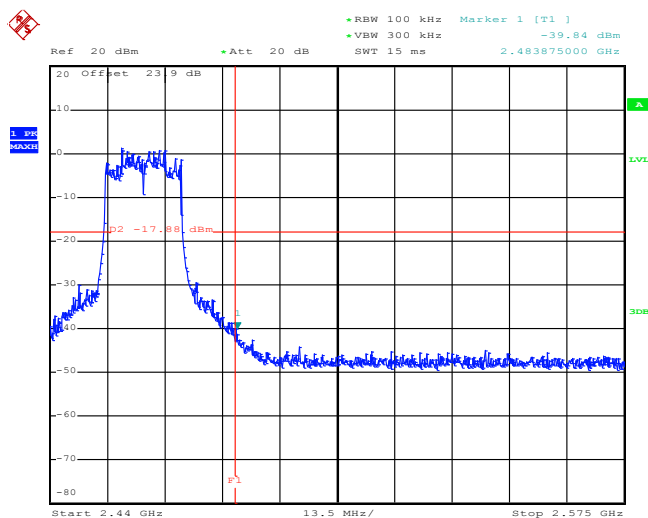
802.11n HT-20 - SISO Ant 2**High Band Edge Plot on Channel 11**

Date: 10.AUG.2012 16:34:45

Test Mode :	802.11n HT-20 - MIMO Ant 1	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	01 and 11	Test Engineer :	Kenny Chen

802.11n HT-20 - MIMO Ant 1
Low Band Edge Plot on Channel 01


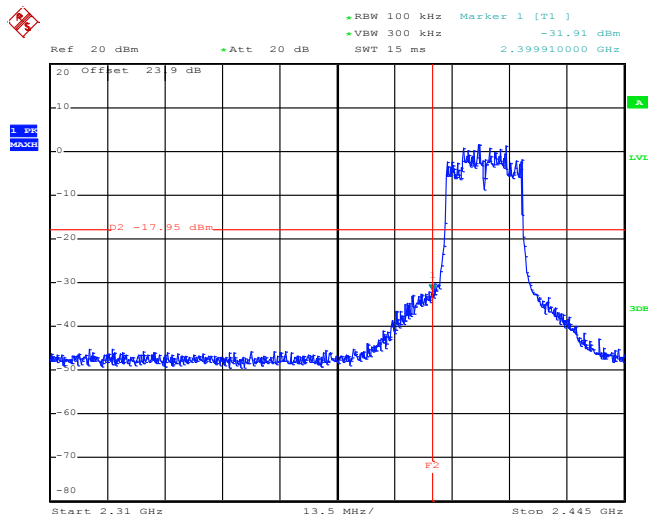
Date: 10.AUG.2012 17:02:26

802.11n HT-20 - MIMO Ant 1
High Band Edge Plot on Channel 11


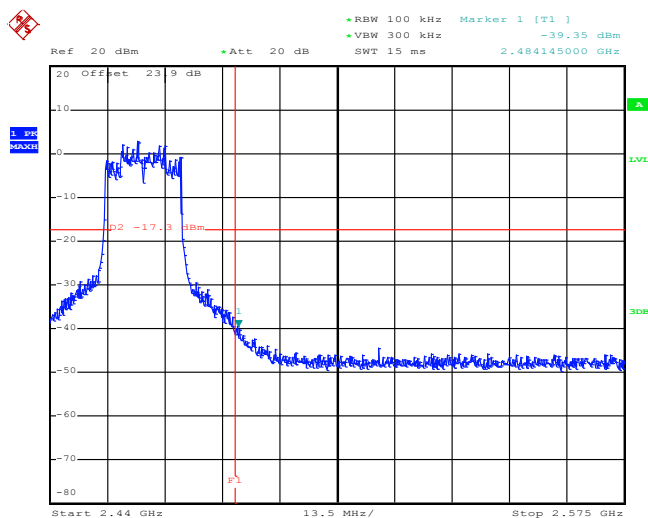
Date: 10.AUG.2012 16:49:49



Test Mode :	802.11n HT-20 - MIMO Ant 2	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	01 and 11	Test Engineer :	Kenny Chen

802.11n HT-20 - MIMO Ant 2**Low Band Edge Plot on Channel 01**

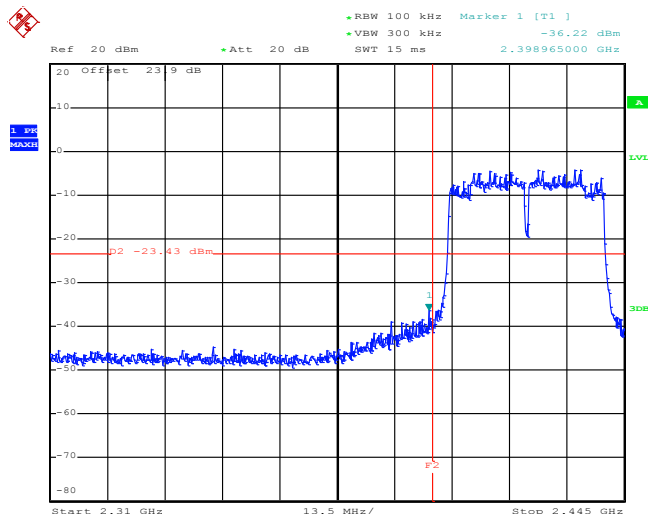
Date: 10.AUG.2012 16:59:27

802.11n HT-20 - MIMO Ant 2**High Band Edge Plot on Channel 11**

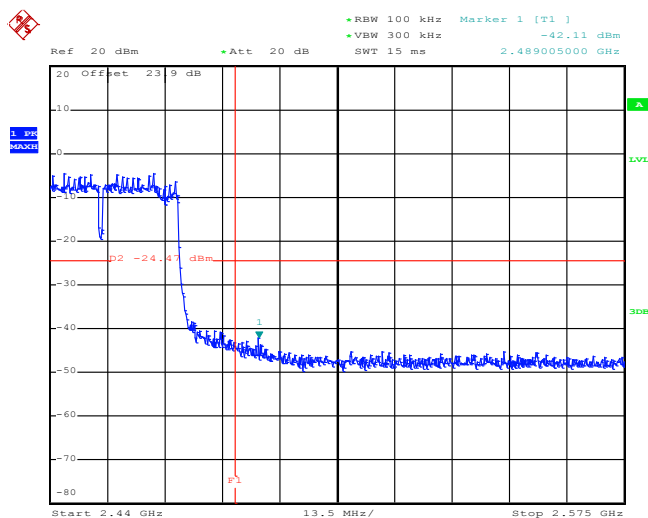
Date: 10.AUG.2012 16:47:14



Test Mode :	802.11n HT-40 - SISO Ant 1	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	03 and 09	Test Engineer :	Kenny Chen

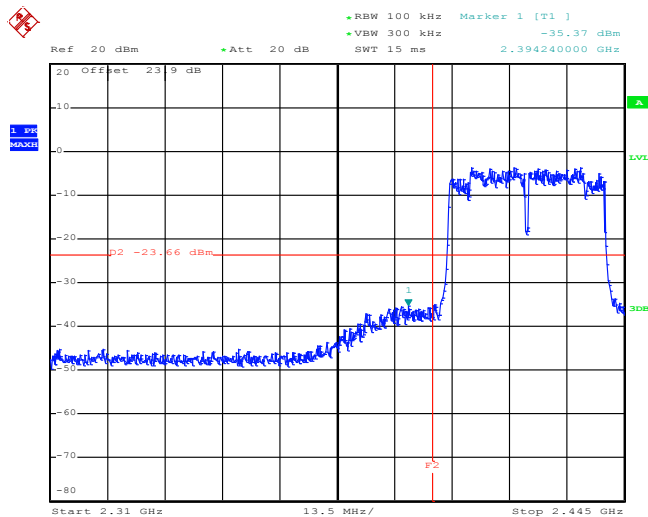
802.11n HT-40 - SISO Ant 1**Low Band Edge Plot on Channel 03**

Date: 10.AUG.2012 17:09:37

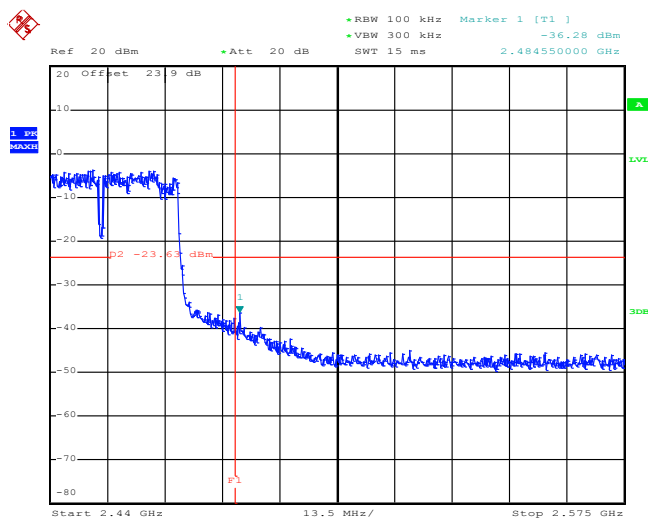
802.11n HT-40 - SISO Ant 1**High Band Edge Plot on Channel 09**

Date: 10.AUG.2012 17:13:04

Test Mode :	802.11n HT-40 - MIMO Ant 1	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	03 and 09	Test Engineer :	Kenny Chen

802.11n HT-40 - MIMO Ant 1
Low Band Edge Plot on Channel 03


Date: 10.AUG.2012 17:35:03

802.11n HT-40 - MIMO Ant 1
High Band Edge Plot on Channel 09


Date: 10.AUG.2012 17:38:23

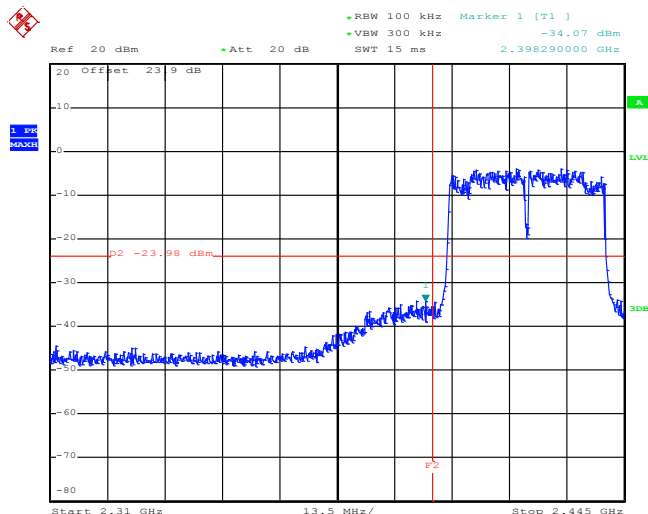


Test Mode :	802.11n HT-40 - MIMO Ant 2	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	55~58%
Test Channel :	03 and 09	Test Engineer :	Kenny Chen

1.

802.11n HT-40 - MIMO Ant 2

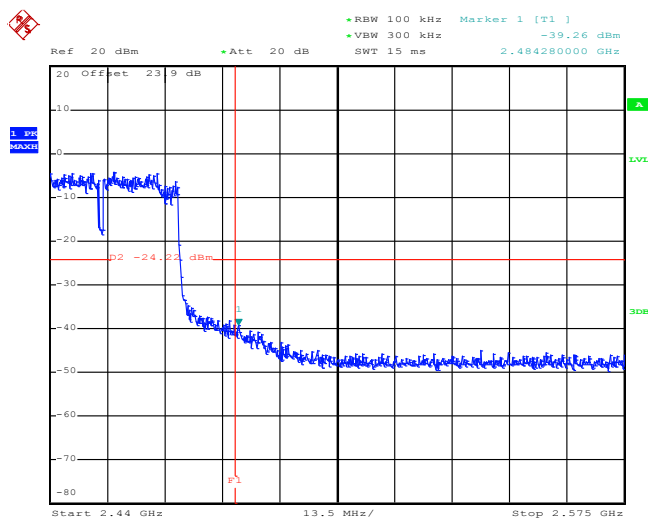
Low Band Edge Plot on Channel 03



Date: 10.AUG.2012 17:31:30

802.11n HT-40 - MIMO Ant 2

High Band Edge Plot on Channel 09



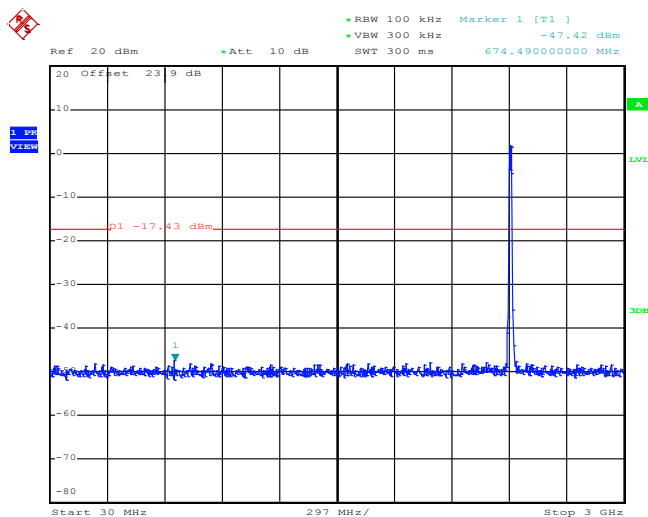
Date: 10.AUG.2012 17:41:25

3.4.5 Test Result of Conducted Spurious Emission

Test Mode :	802.11b – Legacy Ant 1	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	01, 06, 11	Test Engineer :	Kenny Chen

802.11b 30 MHz~3 GHz

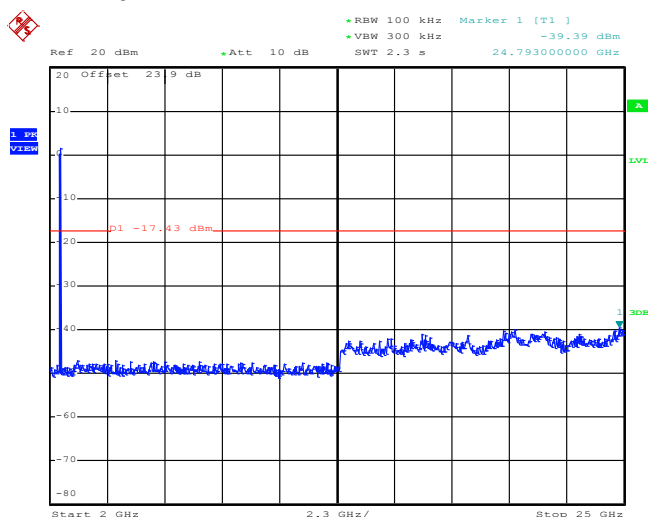
Conducted Spurious Emission Plot on Channel 01



Date: 10.AUG.2012 16:01:02

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

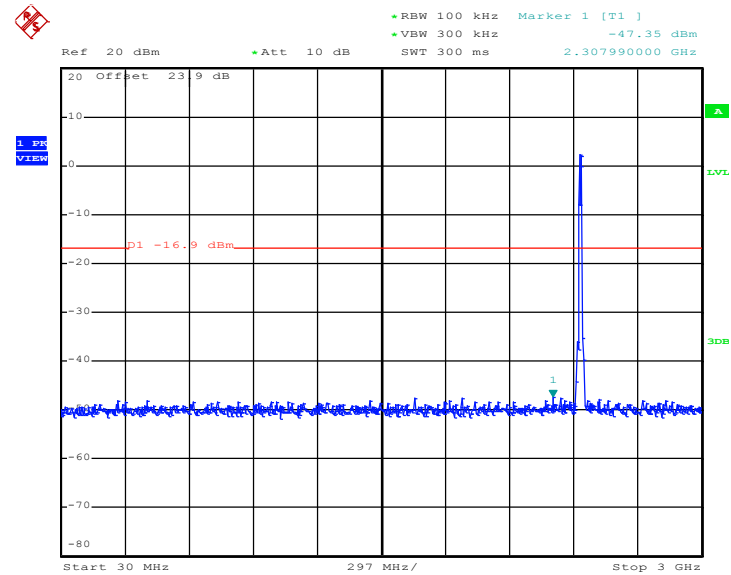


Date: 10.AUG.2012 16:01:20



802.11b 30 MHz~3 GHz

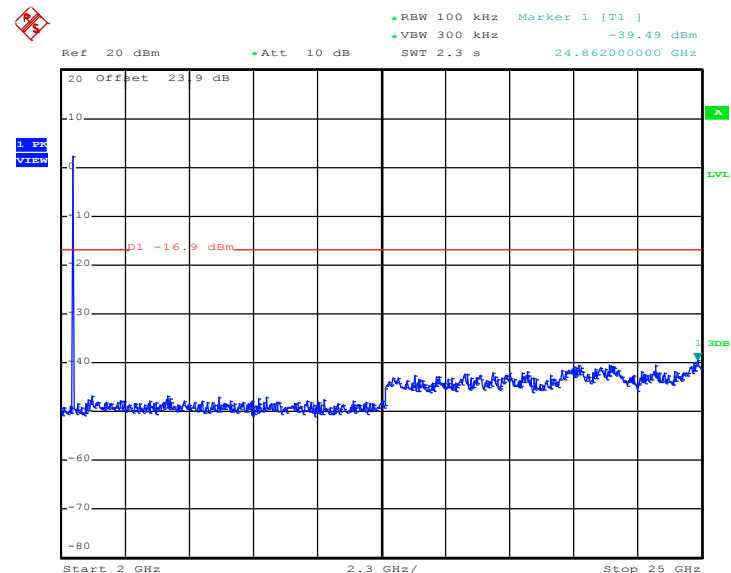
Conducted Spurious Emission Plot on Channel 06



Date: 10.AUG.2012 16:03:04

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

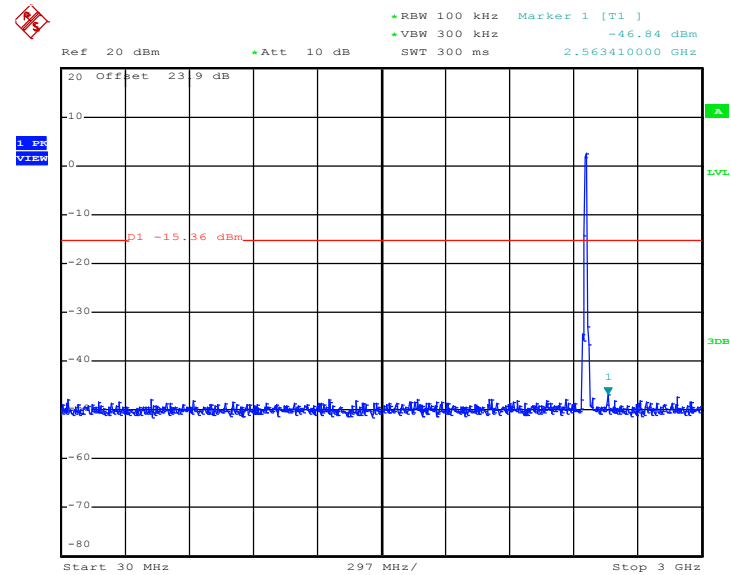


Date: 10.AUG.2012 16:03:22



802.11b 30 MHz~3 GHz

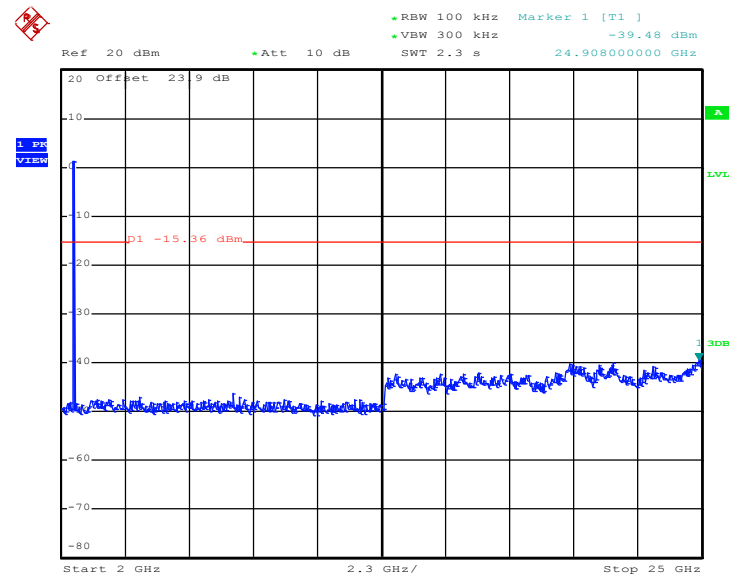
Conducted Spurious Emission Plot on Channel 11



Date: 10.AUG.2012 16:05:46

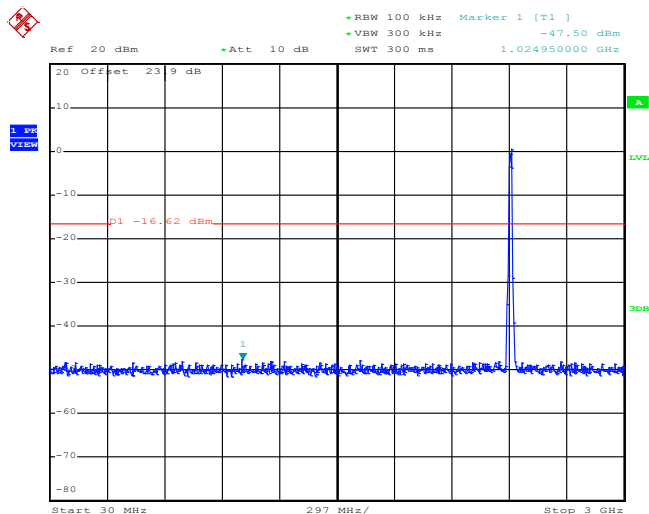
802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

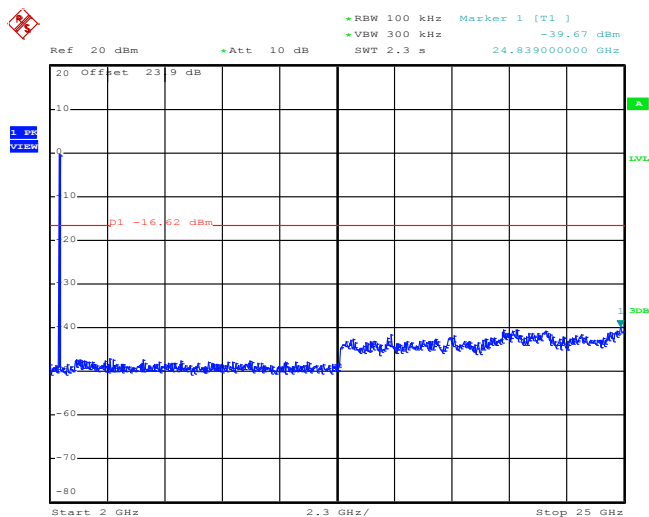


Date: 10.AUG.2012 16:06:03

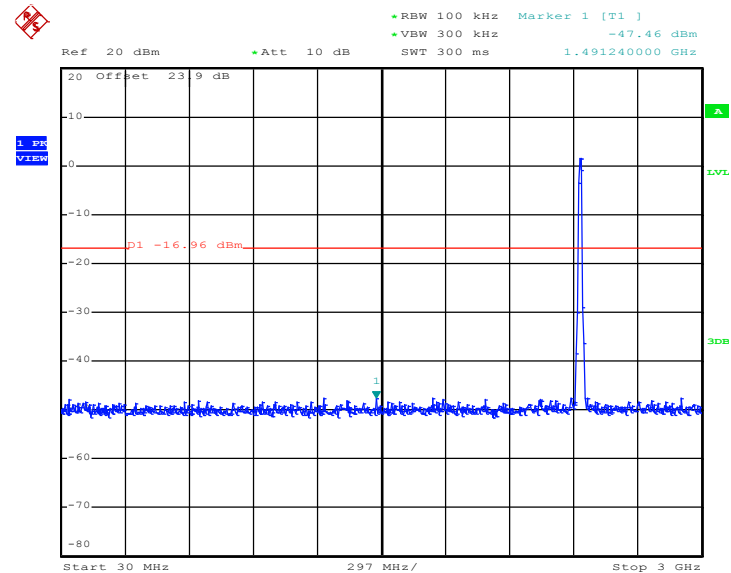
Test Mode :	802.11g - Legacy Ant 2	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	01, 06, 11	Test Engineer :	Kenny Chen

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 01


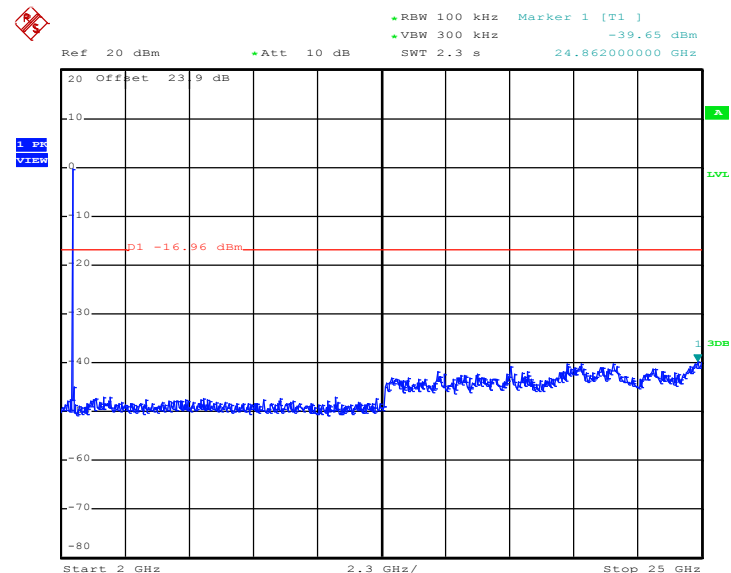
Date: 10.AUG.2012 16:17:27

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


Date: 10.AUG.2012 16:17:45

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 16:19:40

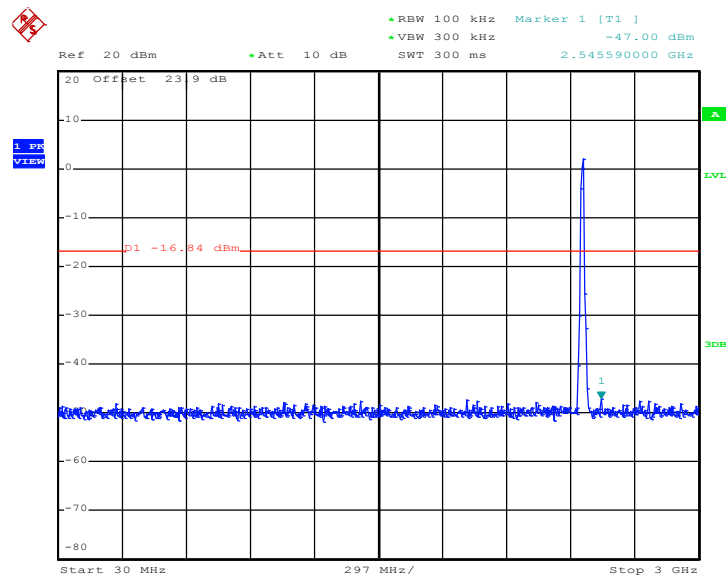
802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 16:19:58



802.11g 30 MHz~3 GHz

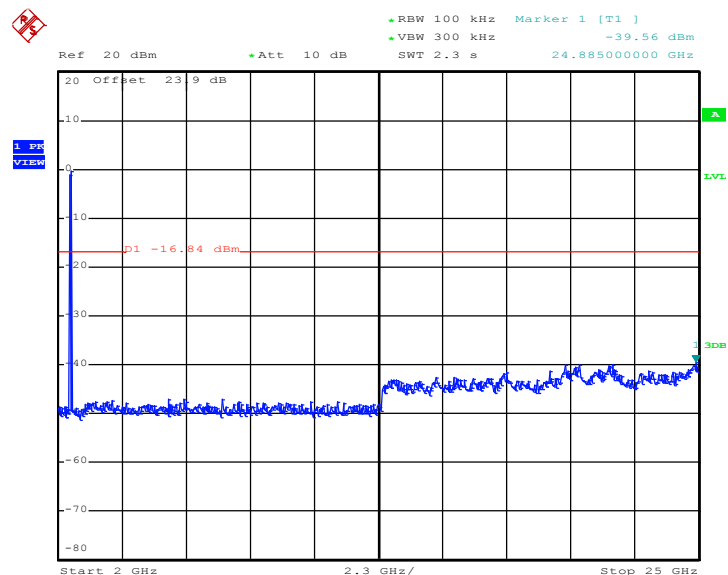
Conducted Spurious Emission Plot on Channel 11



Date: 10.AUG.2012 16:22:55

802.11g 2 GHz~25 GHz

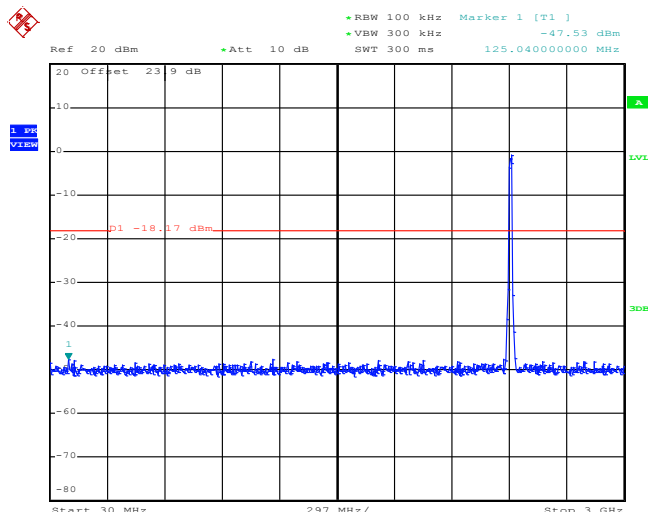
Conducted Spurious Emission Plot on Channel 11



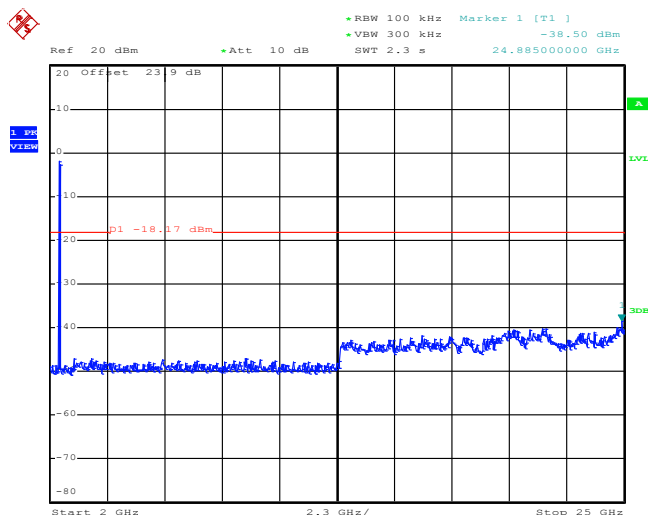
Date: 10.AUG.2012 16:23:13



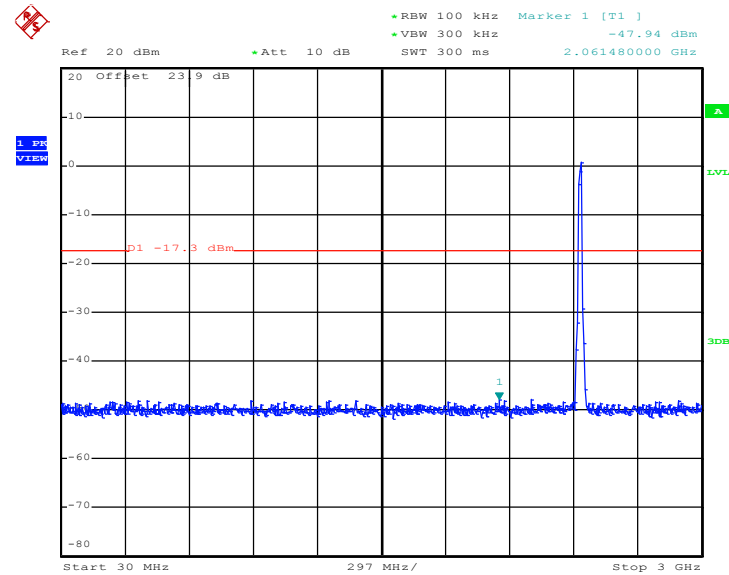
Test Mode :	802.11n HT-20 – SISO Ant 2	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	01, 06, 11	Test Engineer :	Kenny Chen

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

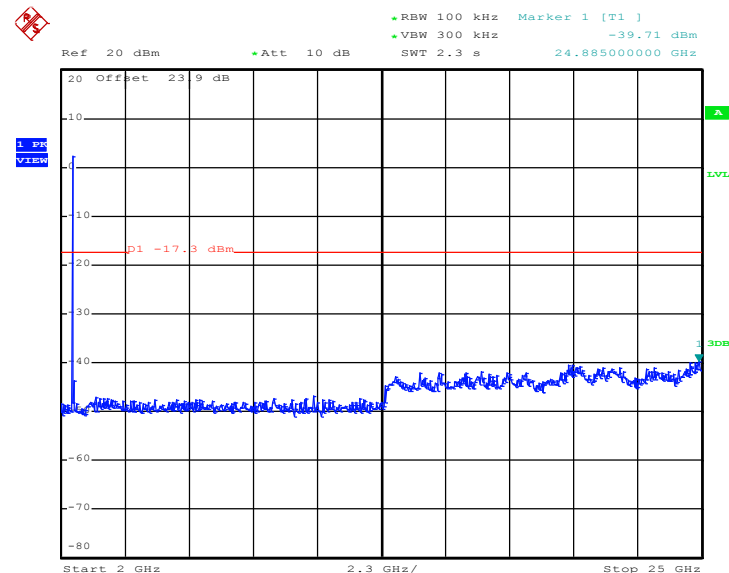
Date: 10.AUG.2012 16:40:10

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

Date: 10.AUG.2012 16:40:28

802.11n HT-20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 16:37:31

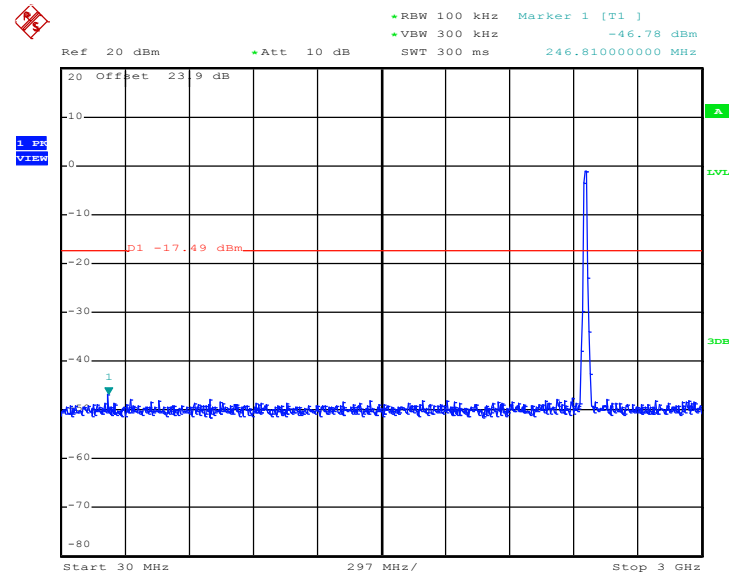
802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 16:37:49



802.11n HT-20 30 MHz~3 GHz

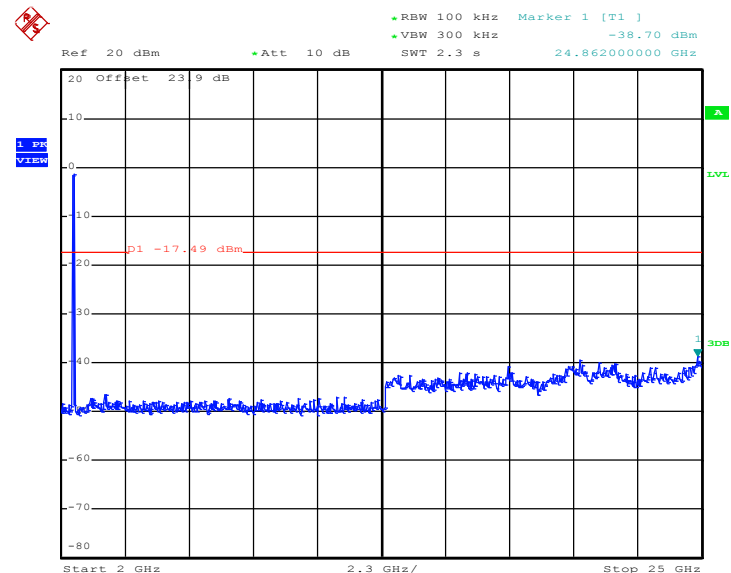
Conducted Spurious Emission Plot on Channel 11



Date: 10.AUG.2012 16:35:11

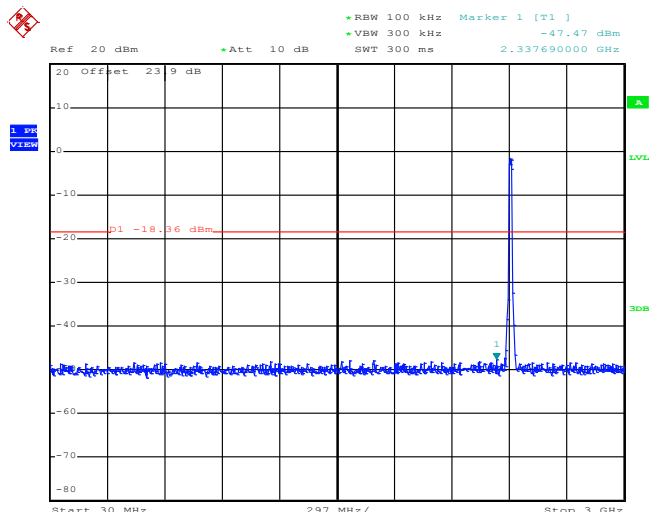
802.11n HT-20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

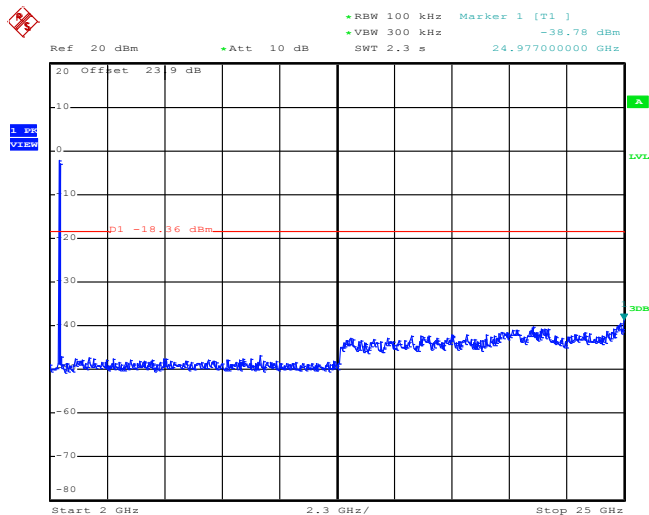


Date: 10.AUG.2012 16:35:28

Test Mode :	802.11n HT-20 – MIMO Ant 1	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	01, 06, 11	Test Engineer :	Kenny Chen

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


Date: 10.AUG.2012 17:03:19

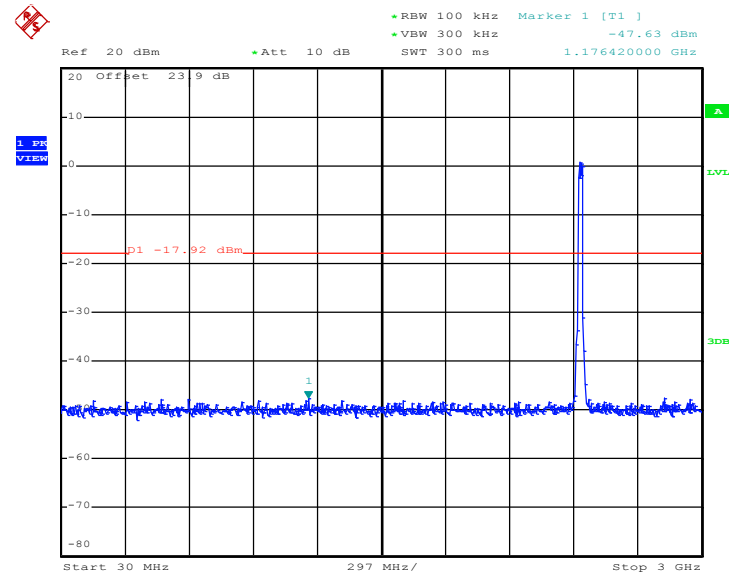
802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 01


Date: 10.AUG.2012 17:03:37



802.11n HT-20 30 MHz~3 GHz

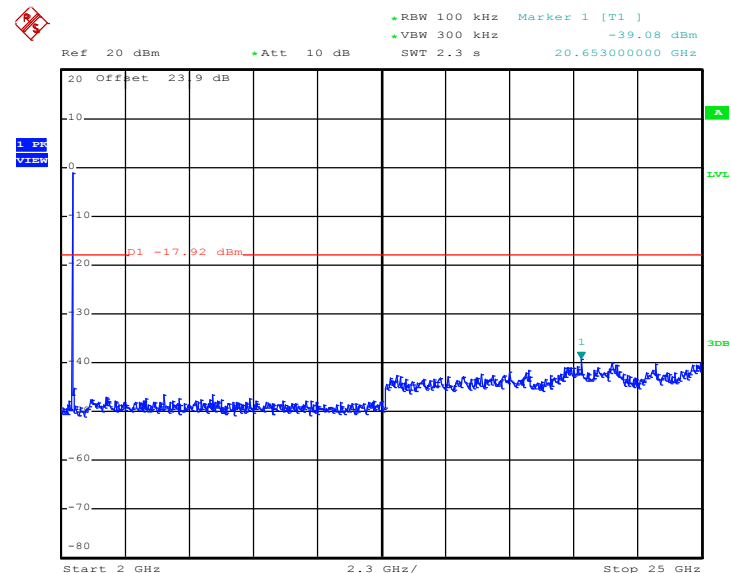
Conducted Spurious Emission Plot on Channel 06



Date: 10.AUG.2012 16:53:22

802.11n HT-20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

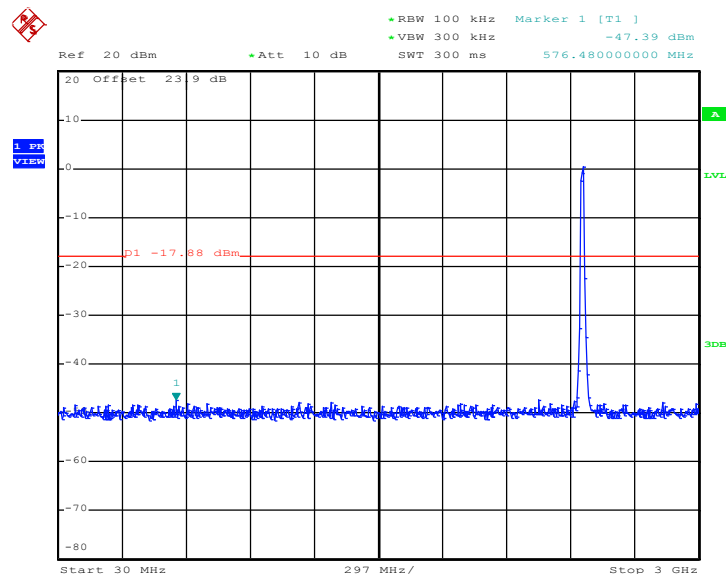


Date: 10.AUG.2012 16:53:40



802.11n HT-20 30 MHz~3 GHz

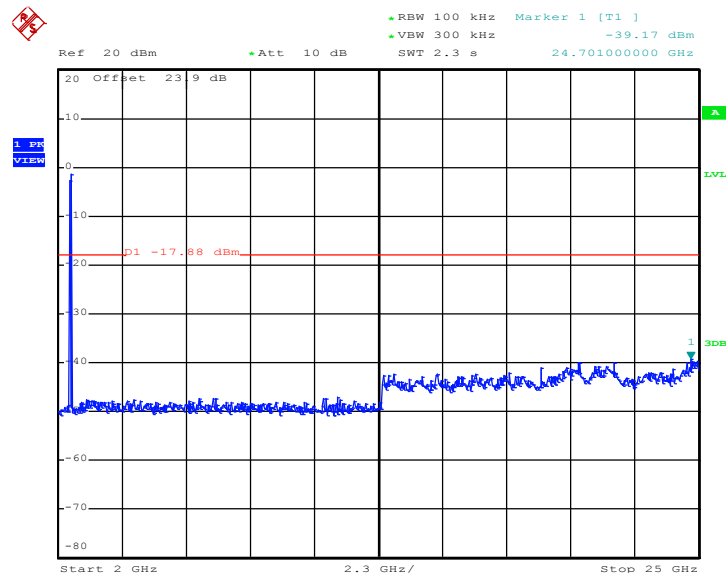
Conducted Spurious Emission Plot on Channel 11



Date: 10.AUG.2012 16:50:25

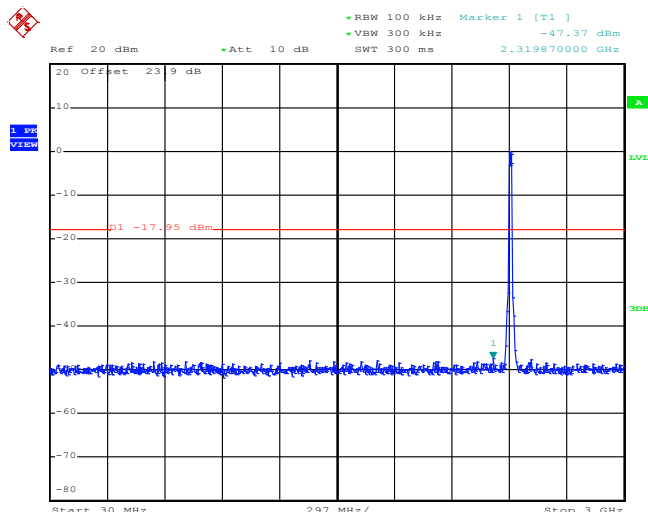
802.11n HT-20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11

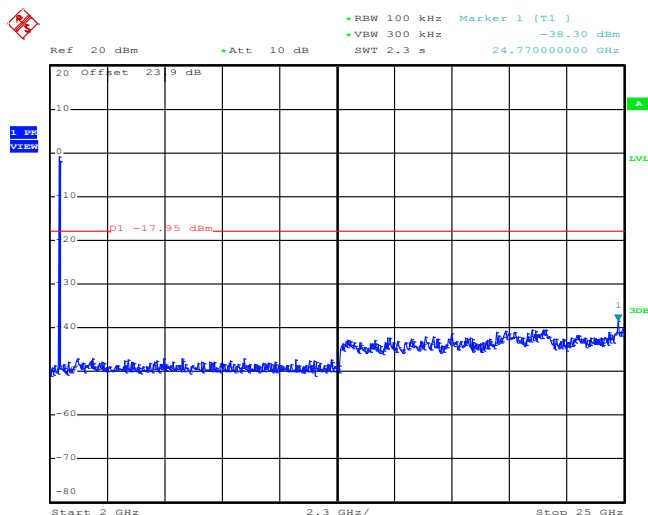


Date: 10.AUG.2012 16:50:42

Test Mode :	802.11n HT-20 – MIMO Ant 2	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	01, 06, 11	Test Engineer :	Kenny Chen

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


Date: 10.AUG.2012 16:59:59

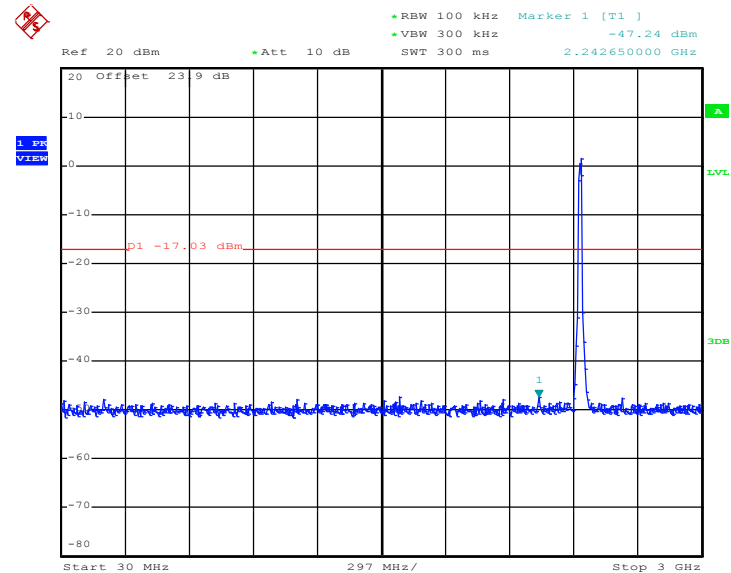
802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 01


Date: 10.AUG.2012 17:00:17



802.11n HT-20 30 MHz~3 GHz

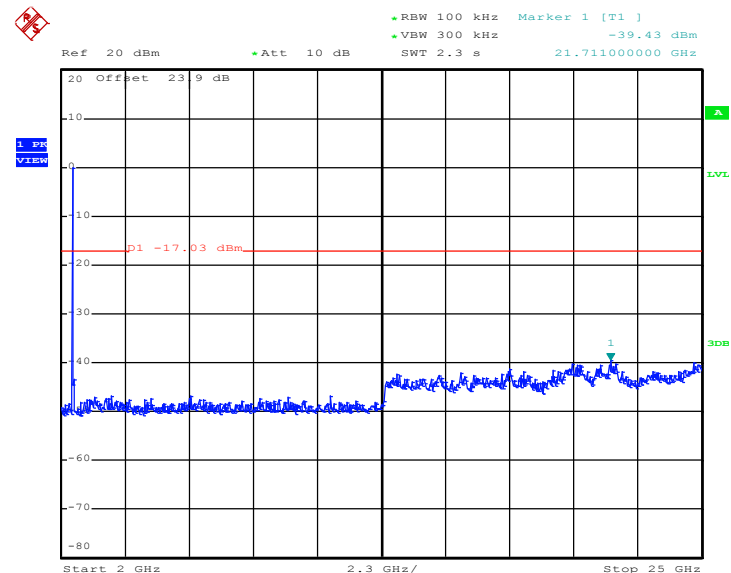
Conducted Spurious Emission Plot on Channel 06



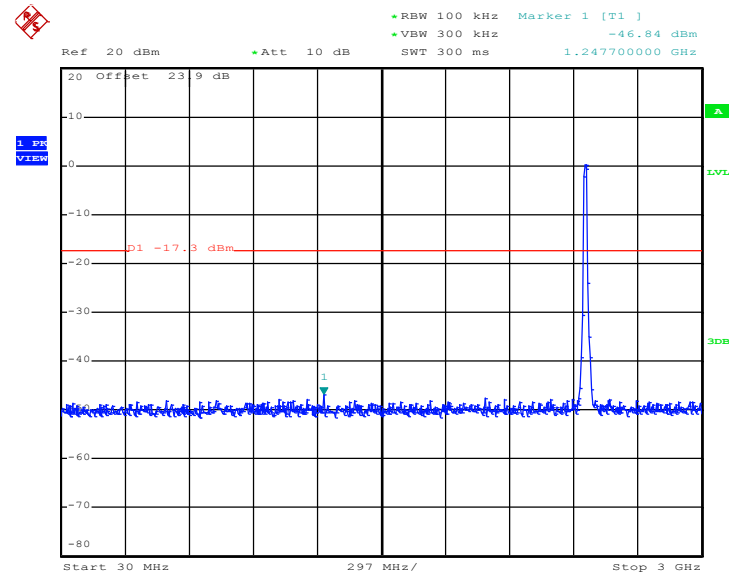
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802.11n HT-20 2 GHz~25 GHz

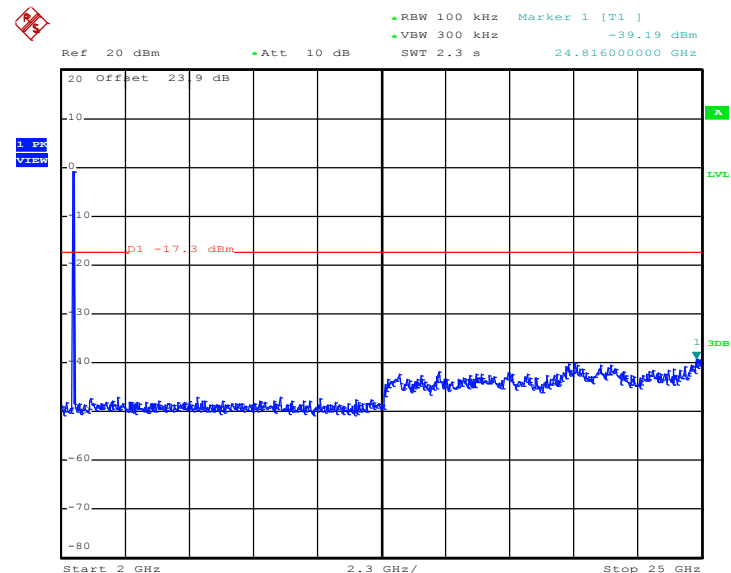
Conducted Spurious Emission Plot on Channel 06



Date: 10.AUG.2012 16:55:45

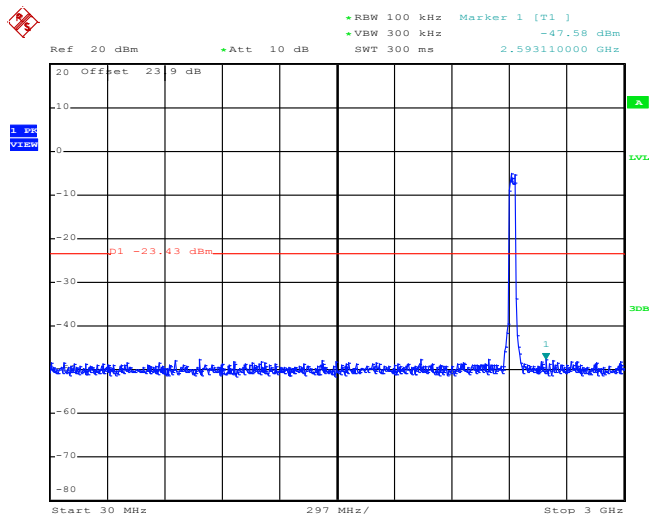
802.11n HT-20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 10.AUG.2012 16:47:51

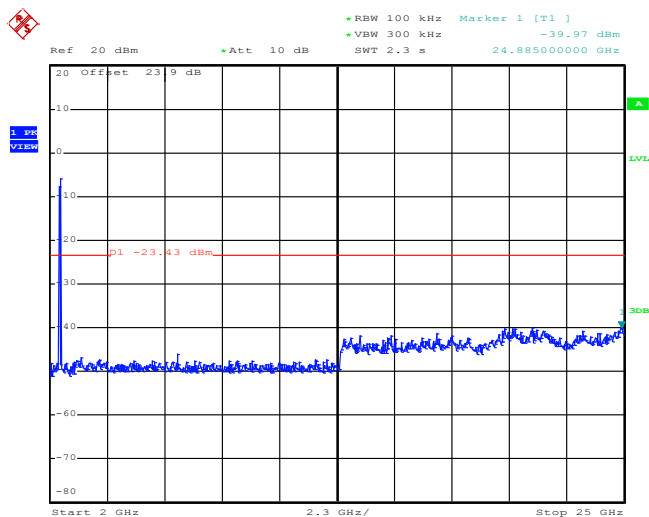
802.11n HT-20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 10.AUG.2012 16:48:08

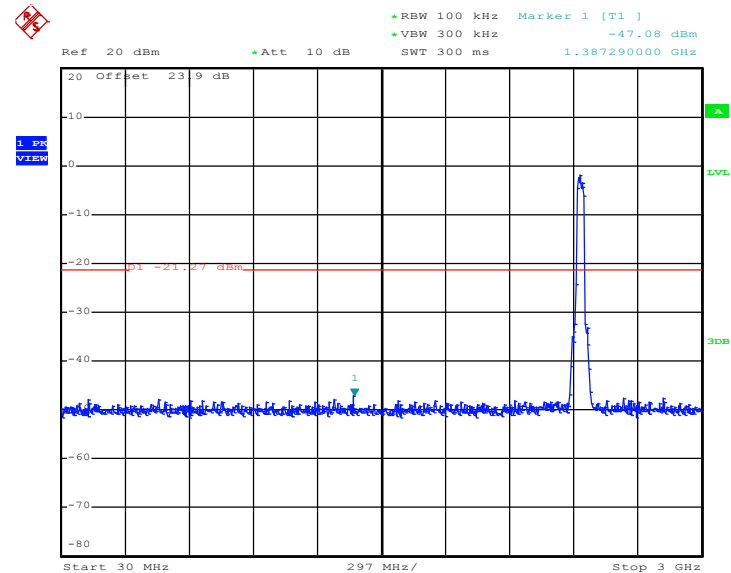
Test Mode :	802.11n HT-40 – SISO Ant 1	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	03, 06, 09	Test Engineer :	Kenny Chen

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


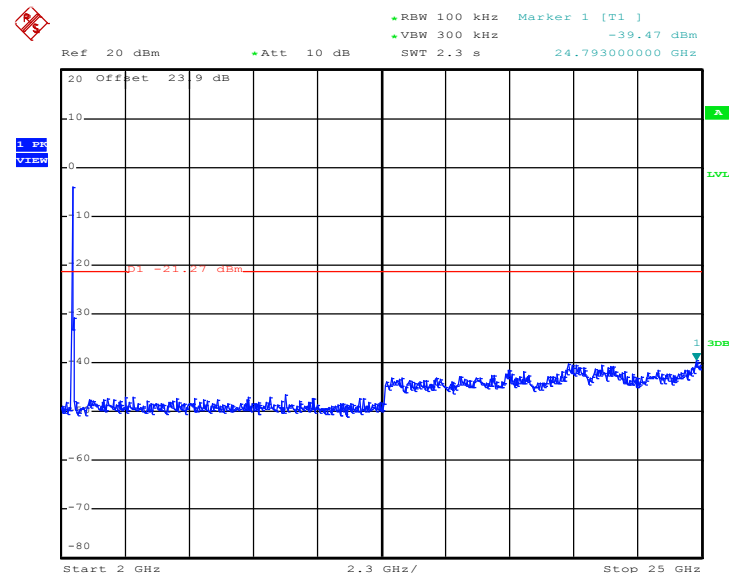
Date: 10.AUG.2012 17:10:06

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


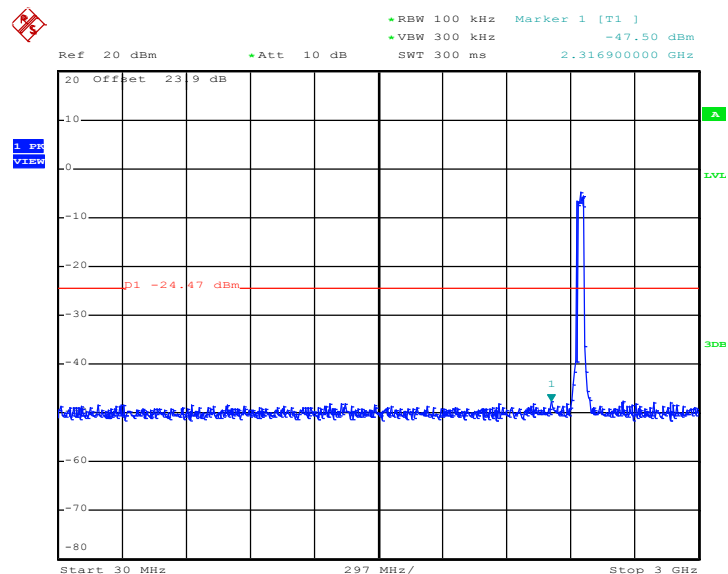
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802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


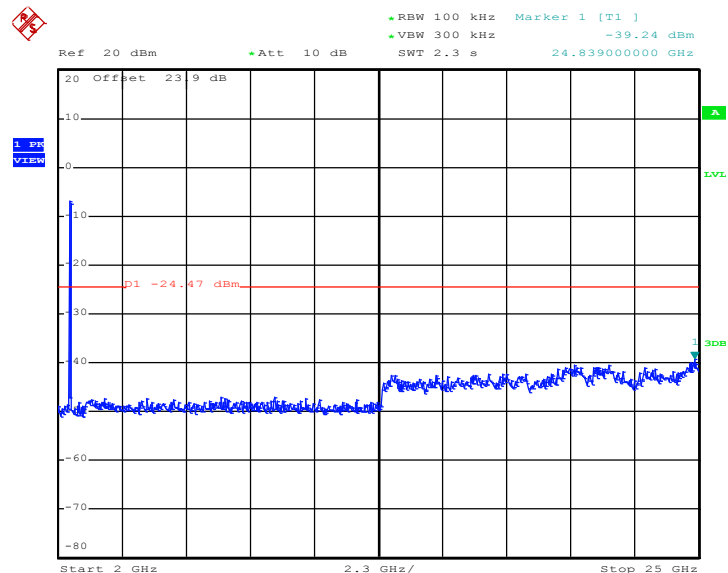
Date: 10.AUG.2012 17:16:23

802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 17:16:40

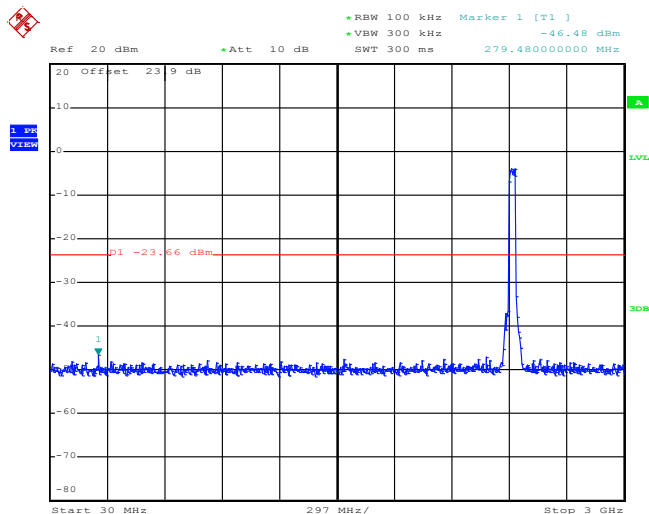
802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 09


Date: 10.AUG.2012 17:13:33

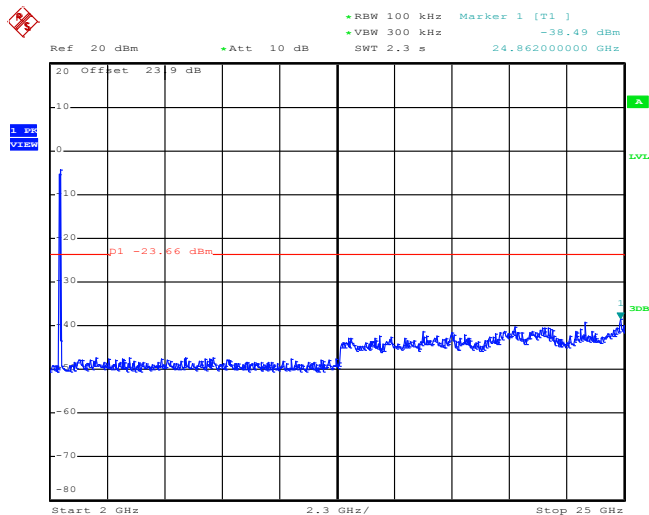
802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 09


Date: 10.AUG.2012 17:13:50

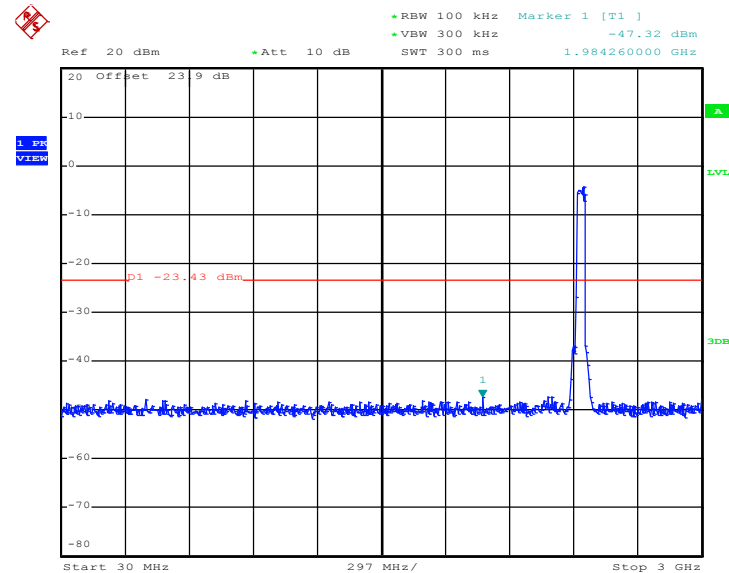
Test Mode :	802.11n HT-40 – MIMO Ant 1	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	03, 06, 09	Test Engineer :	Kenny Chen

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


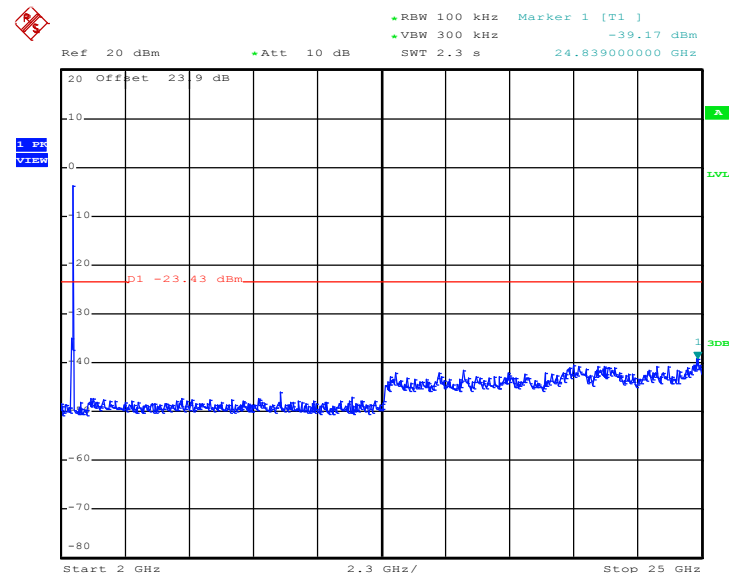
Date: 10.AUG.2012 17:35:38

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


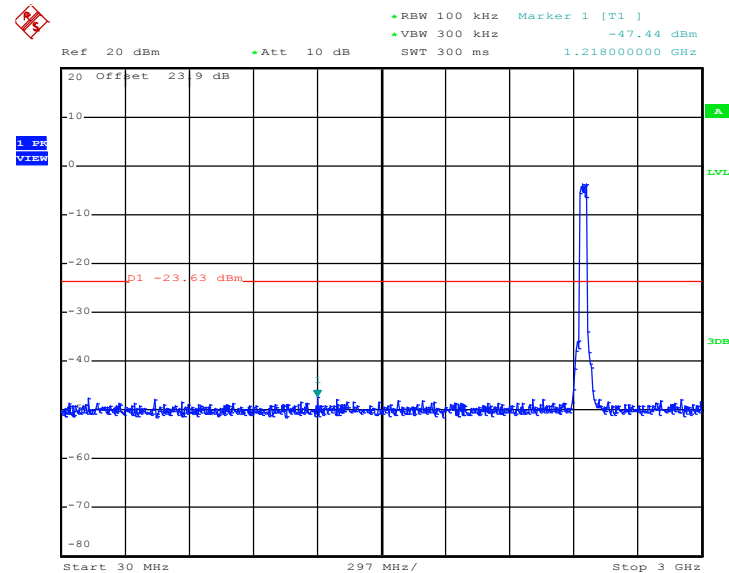
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802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


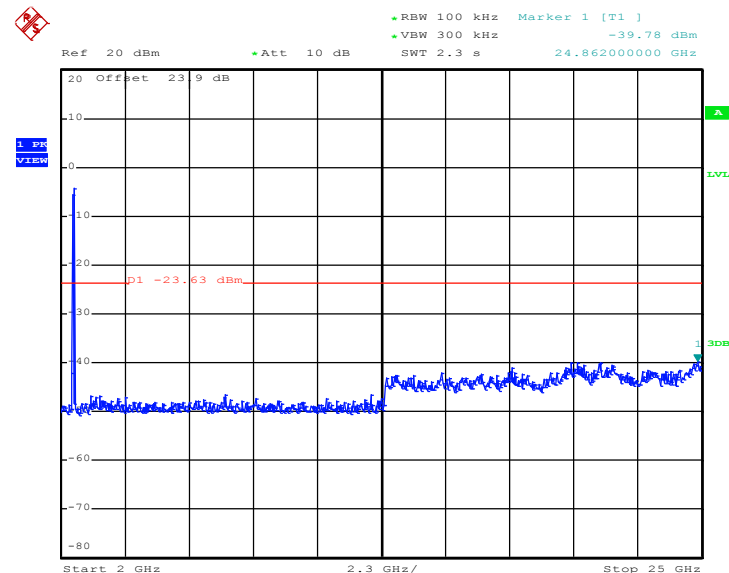
Date: 10.AUG.2012 17:22:28

802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 17:22:46

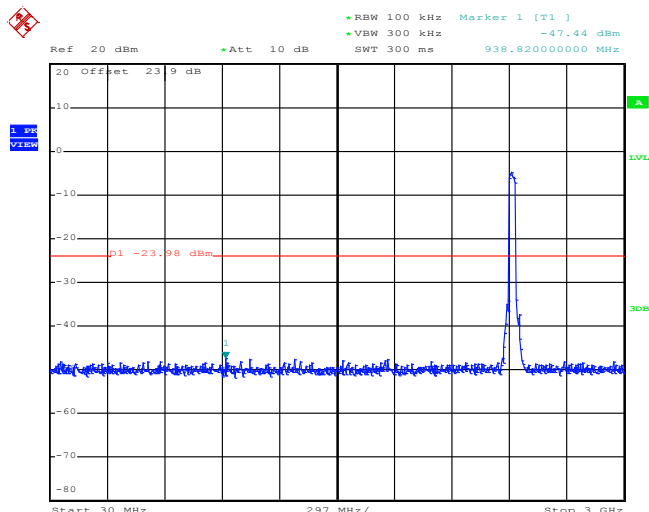
802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 09


Date: 10.AUG.2012 17:38:57

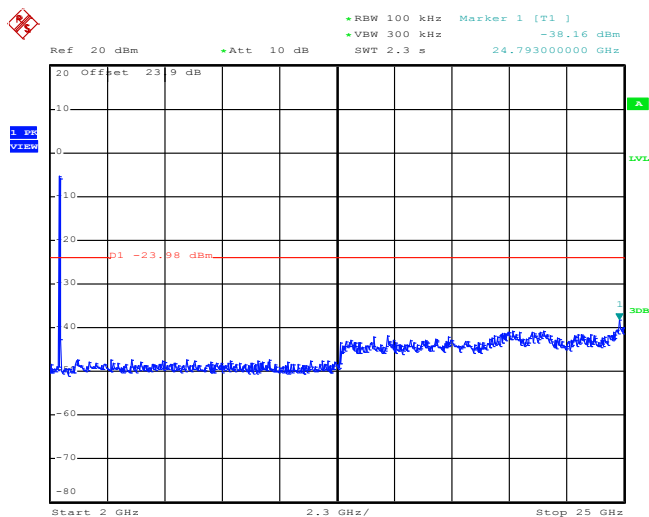
802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 09


Date: 10.AUG.2012 17:39:15

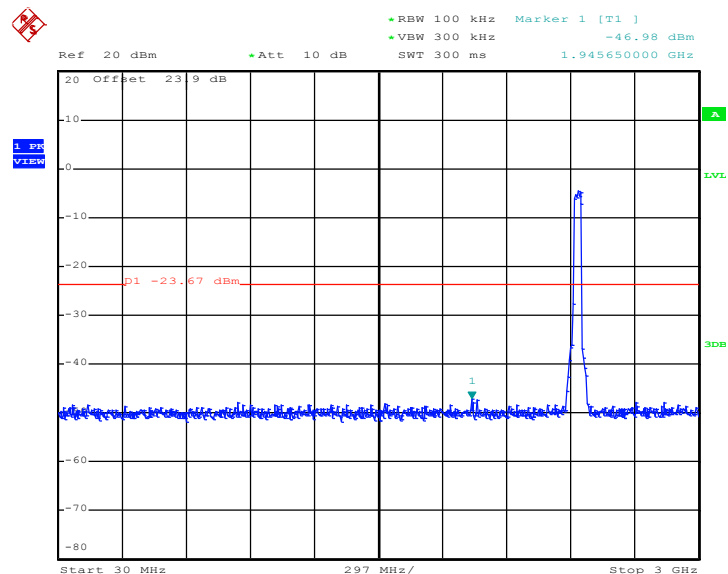
Test Mode :	802.11n HT-40 – MIMO Ant 2	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	55~58%
Test Channel :	03, 06, 09	Test Engineer :	Kenny Chen

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


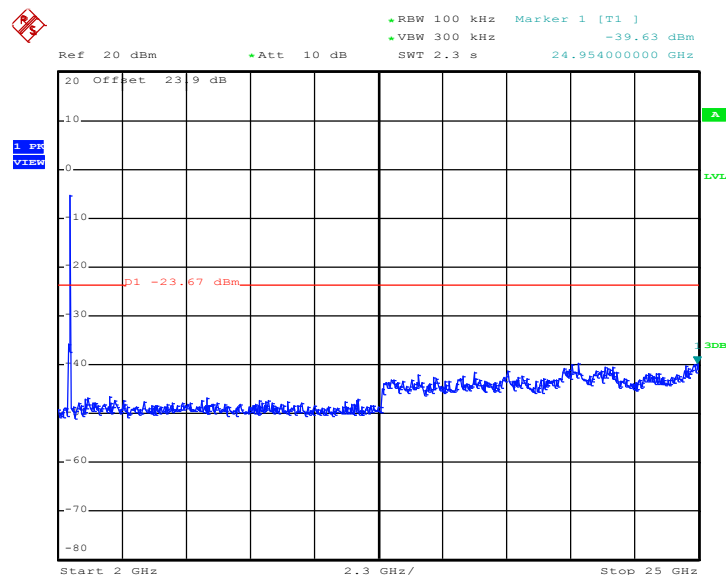
Date: 10.AUG.2012 17:32:02

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


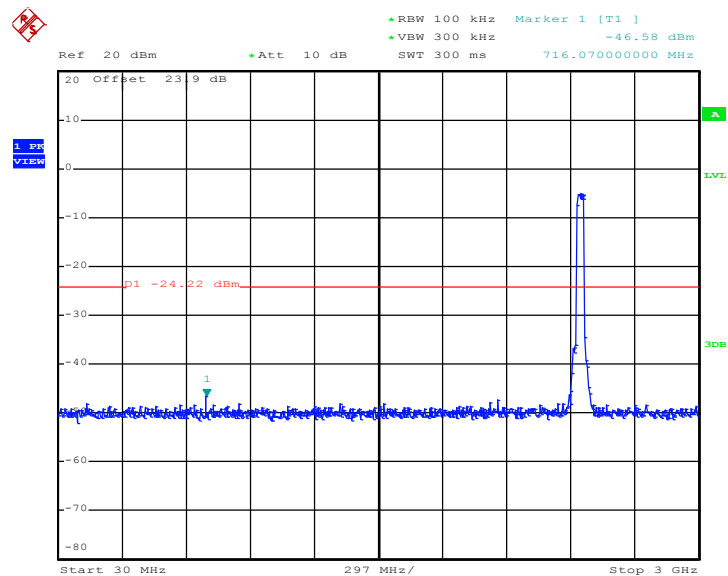
Date: 10.AUG.2012 17:32:20

802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


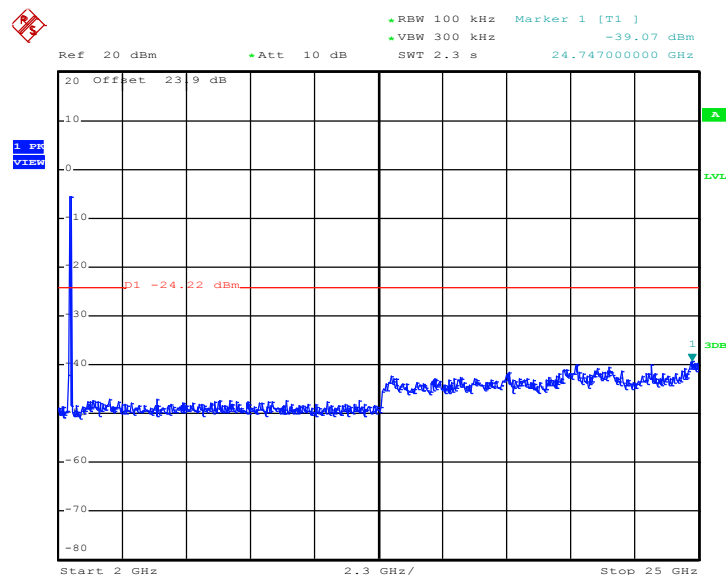
Date: 10.AUG.2012 17:28:42

802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 10.AUG.2012 17:28:59

802.11n HT-40 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 09


Date: 10.AUG.2012 17:42:00

802.11n HT-40 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 09


Date: 10.AUG.2012 17:42:17

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

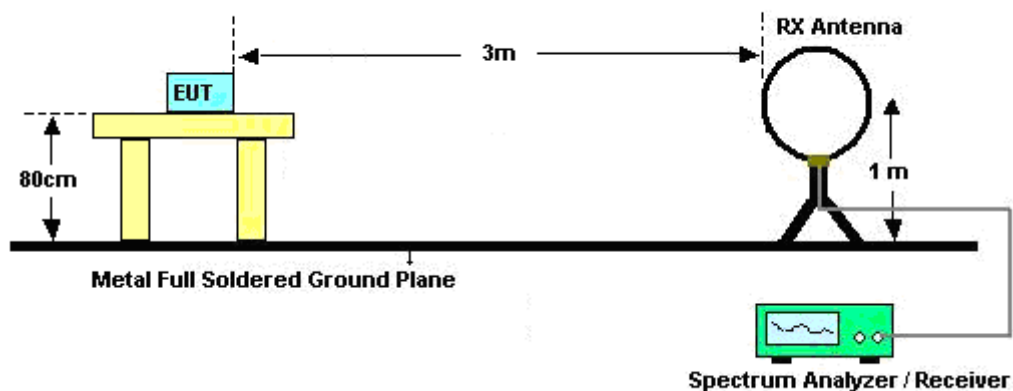
See list of measuring instruments of this test report.

3.5.3 Test Procedure

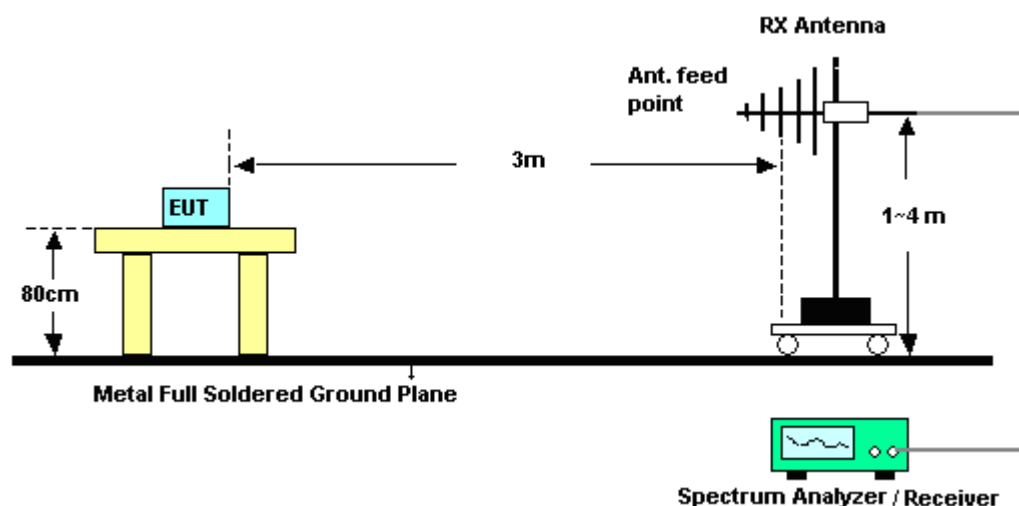
1. The testing follows TCB Workshop 2012, April and the guidelines in ANSI C63.10-2009 and fulfills ANSI C63.4-2003 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) 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 to comply with the guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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, and then set VBW=10Hz, while maintaining all of the other instrument settings for Average measurement.
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. If the emission level of the EUT measured by the peak detector is more than 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.

3.5.4 Test Setup

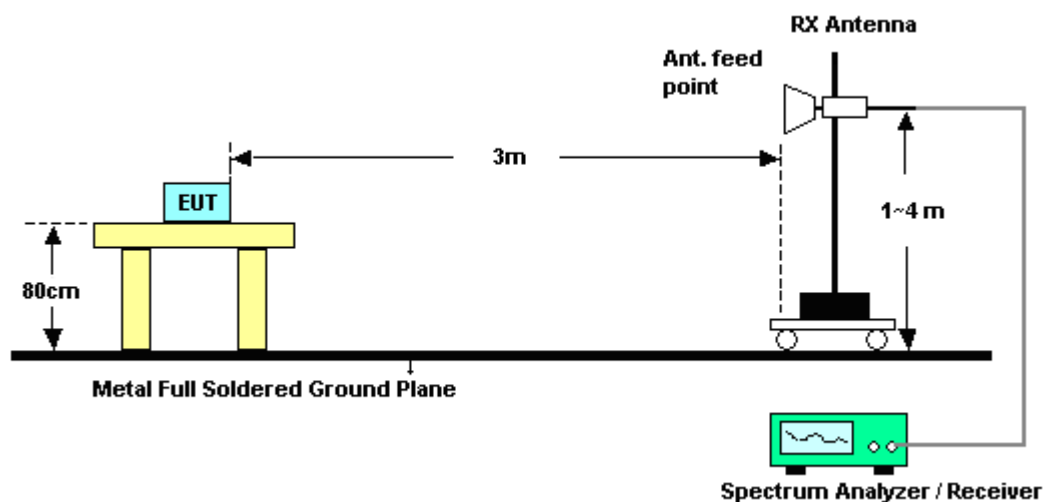
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (9KHz ~ 30MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.38	50.48	-23.52	74	49.56	32.22	4.58	35.88	117	66	Peak
2389.74	39.48	-14.52	54	38.56	32.22	4.58	35.88	117	66	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
2389.74	51.18	-22.82	74	50.26	32.22	4.58	35.88	105	136	Peak
2389.74	37.68	-16.32	54	36.76	32.22	4.58	35.88	105	136	Average

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

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	52.66	-21.34	74	51.54	32.29	4.64	35.81	118	67	Peak
2483.5	41.33	-12.67	54	40.21	32.29	4.64	35.81	118	67	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	50.74	-23.26	74	49.62	32.29	4.64	35.81	101	136	Peak
2483.5	39.59	-14.41	54	38.47	32.29	4.64	35.81	101	136	Average



Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

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
2329.35	52.44	-21.56	74	51.65	32.16	4.53	35.9	114	336	Peak
2386.05	40.57	-13.43	54	39.65	32.22	4.58	35.88	114	336	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
2384.07	47.67	-26.33	74	46.77	32.2	4.58	35.88	197	321	Peak
2390	35.62	-18.38	54	34.68	32.22	4.58	35.86	197	321	Average

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

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
2483.52	57.41	-16.59	74	56.29	32.29	4.64	35.81	110	323	Peak
2483.5	47.74	-6.26	54	46.62	32.29	4.64	35.81	110	323	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
2488.4	51.49	-22.51	74	50.36	32.3	4.64	35.81	200	293	Peak
2487.68	40.67	-13.33	54	39.54	32.3	4.64	35.81	200	293	Average



Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	64.76	-9.24	74	63.82	32.22	4.58	35.86	116	62	Peak
2390	44.73	-9.27	54	43.79	32.22	4.58	35.86	116	62	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	60.71	-13.29	74	59.77	32.22	4.58	35.86	106	131	Peak
2390	41.7	-12.3	54	40.76	32.22	4.58	35.86	106	131	Average

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

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
2483.54	64.93	-9.07	74	63.81	32.29	4.64	35.81	109	287	Peak
2483.5	44.27	-9.73	54	43.15	32.29	4.64	35.81	109	287	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
2483.66	60.9	-13.1	74	59.78	32.29	4.64	35.81	100	135	Peak
2483.5	40.99	-13.01	54	39.87	32.29	4.64	35.81	100	135	Average



Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

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
2389.83	70.62	-3.38	74	69.68	32.22	4.58	35.86	109	330	Peak
2390	49.48	-4.52	54	48.54	32.22	4.58	35.86	109	330	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	61.52	-12.48	74	60.58	32.22	4.58	35.86	200	304	Peak
2390	41.41	-12.59	54	40.47	32.22	4.58	35.86	200	304	Average

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.68	70.66	-3.34	74	69.54	32.29	4.64	35.81	110	332	Peak
2483.5	50.05	-3.95	54	48.93	32.29	4.64	35.81	110	332	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
2483.84	62.53	-11.47	74	61.41	32.29	4.64	35.81	200	41	Peak
2483.5	42.65	-11.35	54	41.53	32.29	4.64	35.81	200	41	Average



Test Mode :	802.11n HT-20 <SISO Ant 1>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

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	68.52	-5.48	74	67.58	32.22	4.58	35.86	116	63	Peak
2390	45.7	-8.3	54	44.76	32.22	4.58	35.86	116	63	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	64.92	-9.08	74	63.98	32.22	4.58	35.86	105	135	Peak
2390	42.68	-11.32	54	41.74	32.22	4.58	35.86	105	135	Average

Test Mode :	802.11n HT-20 < SISO Ant 1>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

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
2484.1	63.9	-10.1	74	62.78	32.29	4.64	35.81	146	62	Peak
2483.5	44.33	-9.67	54	43.21	32.29	4.64	35.81	146	62	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.86	62.9	-11.1	74	61.78	32.29	4.64	35.81	102	219	Peak
2483.5	42.68	-11.32	54	41.56	32.29	4.64	35.81	102	219	Average

Test Mode :	802.11n HT-20 <SISO Ant 2>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

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
2389.83	70.2	-3.8	74	69.26	32.22	4.58	35.86	176	346	Peak
2390	47.21	-6.79	54	46.27	32.22	4.58	35.86	176	346	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	59.83	-14.17	74	58.89	32.22	4.58	35.86	200	307	Peak
2390	39.31	-14.69	54	38.37	32.22	4.58	35.86	200	307	Average

Test Mode :	802.11n HT-20 < SISO Ant 2>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

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
2483.52	69.63	-4.37	74	68.51	32.29	4.64	35.81	174	327	Peak
2483.5	49.92	-4.08	54	48.8	32.29	4.64	35.81	174	327	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
2483.56	63.5	-10.5	74	62.38	32.29	4.64	35.81	200	51	Peak
2483.5	44.62	-9.38	54	43.5	32.29	4.64	35.81	200	51	Average

Test Mode :	802.11n HT-20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	David Yang

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
2389.2	56.7	-17.3	74	55.78	32.22	4.58	35.88	114	323	Peak
2390	41.85	-12.15	54	40.91	32.22	4.58	35.86	114	323	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	54.97	-19.03	74	54.03	32.22	4.58	35.86	100	124	Peak
2390	38.96	-15.04	54	38.02	32.22	4.58	35.86	100	124	Average

Test Mode :	802.11n HT-20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	David Yang

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	67.78	-6.22	74	66.66	32.29	4.64	35.81	142	345	Peak
2483.52	50.25	-3.75	54	49.13	32.29	4.64	35.81	142	345	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
2483.76	59.32	-14.68	74	58.2	32.29	4.64	35.81	200	253	Peak
2483.5	44.05	-9.95	54	42.93	32.29	4.64	35.81	200	253	Average



Test Mode :	802.11n HT-40 <SISO Ant 1>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	03	Test Engineer :	David Yang

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
2389.74	64.23	-9.77	74	63.31	32.22	4.58	35.88	114	66	Peak
2390	45.06	-8.94	54	44.12	32.22	4.58	35.86	114	66	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
2389.56	62.31	-11.69	74	61.39	32.22	4.58	35.88	100	134	Peak
2389.92	43.4	-10.6	54	42.46	32.22	4.58	35.86	100	134	Average

Test Mode :	802.11n HT-40 <SISO Ant 1>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	09	Test Engineer :	David Yang

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
2484.64	68.56	-5.44	74	67.44	32.29	4.64	35.81	141	63	Peak
2483.56	43.92	-10.08	54	42.8	32.29	4.64	35.81	141	63	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.86	60.23	-13.77	74	59.11	32.29	4.64	35.81	100	135	Peak
2483.5	41.92	-12.08	54	40.8	32.29	4.64	35.81	100	135	Average



Test Mode :	802.11n HT-40 < SISO Ant 2>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	03	Test Engineer :	David Yang

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
2386.95	59.6	-14.4	74	58.68	32.22	4.58	35.88	117	341	Peak
2390	41.55	-12.45	54	40.61	32.22	4.58	35.86	117	341	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
2385.06	51.78	-22.22	74	50.88	32.2	4.58	35.88	200	323	Peak
2389.83	36.71	-17.29	54	35.77	32.22	4.58	35.86	200	323	Average

Test Mode :	802.11n HT-40 < SISO Ant 2>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	09	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.2	68.92	-5.08	74	67.8	32.29	4.64	35.81	170	319	Peak
2483.56	50.85	-3.15	54	49.73	32.29	4.64	35.81	170	319	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
2485.38	61.56	-12.44	74	60.44	32.29	4.64	35.81	200	323	Peak
2483.5	44.33	-9.67	54	43.21	32.29	4.64	35.81	200	323	Average

Test Mode :	802.11n HT-40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	03	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.11	69.46	-4.54	74	68.54	32.22	4.58	35.88	145	346	Peak
2390	50.06	-3.94	54	49.12	32.22	4.58	35.86	145	346	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	61.58	-12.42	74	60.64	32.22	4.58	35.86	100	126	Peak
2390	43.45	-10.55	54	42.51	32.22	4.58	35.86	100	126	Average

Test Mode :	802.11n HT-40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	09	Test Engineer :	David Yang

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
2483.52	66.03	-7.97	74	64.91	32.29	4.64	35.81	141	343	Peak
2484.16	46.87	-7.13	54	45.75	32.29	4.64	35.81	141	343	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.26	58.48	-15.52	74	57.36	32.29	4.64	35.81	100	126	Peak
2483.72	41.33	-12.67	54	40.21	32.29	4.64	35.81	100	126	Average

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

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 103.35 dBuV/m - 20dB = 83.35 dBuV/m.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	97.74	-	-	96.78	32.23	4.59	35.86	117	66	Average
2412	103.35	-	-	102.39	32.23	4.59	35.86	117	66	Peak
3198	47.13	-36.22	83.35	67.4	32.76	5.56	58.59	100	0	Peak
12000	49.6	-24.4	74	55.99	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	95.24	-	-	94.28	32.23	4.59	35.86	105	136	Average
2412	100.95	-	-	99.99	32.23	4.59	35.86	105	136	Peak
3186	47.34	-33.61	80.95	67.62	32.76	5.55	58.59	100	0	Peak
4782	46.95	-27.05	74	65.34	34.26	6.5	59.15	100	0	Peak
12000	52.63	-1.37	54	59.02	38.9	10.6	55.89	135	181	Average
12000	54.28	-19.72	74	60.67	38.9	10.6	55.89	135	181	Peak

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.05	27.99	-12.01	40	41.81	17.08	0.73	31.63	-	-	Peak
104.52	28.91	-14.59	43.5	48.58	10.7	1.12	31.49	-	-	Peak
174.99	28.9	-14.6	43.5	49.45	9.1	1.38	31.03	-	-	Peak
317.5	31.41	-14.59	46	47.06	13.44	1.82	30.91	-	-	Peak
701.1	29.14	-16.86	46	35.97	20.73	2.65	30.21	-	-	Peak
799.8	34.18	-11.82	46	39.06	22.1	2.83	29.81	133	195	Peak
2437	98.24	-	-	97.21	32.26	4.61	35.84	119	65	Average
2437	103.89	-	-	102.86	32.26	4.61	35.84	119	65	Peak
3186	45.79	-38.1	83.89	66.07	32.76	5.55	58.59	100	0	Peak
12000	49.81	-24.19	74	56.2	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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
32.97	31.6	-8.4	40	44.75	17.76	0.72	31.63	100	301	Peak
104.52	32.74	-10.76	43.5	52.41	10.7	1.12	31.49	-	-	Peak
173.91	33.22	-10.28	43.5	53.72	9.18	1.37	31.05	-	-	Peak
592.6	32.79	-13.21	46	41.05	19.83	2.41	30.5	-	-	Peak
797.7	36.73	-9.27	46	41.68	22.04	2.83	29.82	-	-	Peak
952.4	34.11	-11.89	46	36.31	24.83	3.07	30.1	-	-	Peak
2437	94.62	-	-	93.59	32.26	4.61	35.84	104	138	Average
2437	100	-	-	98.97	32.26	4.61	35.84	104	138	Peak
3189	47.5	-32.5	80	67.78	32.76	5.55	58.59	100	0	Peak
12000	52.81	-1.19	54	59.2	38.9	10.6	55.89	135	181	Average
12000	54.32	-19.68	74	60.71	38.9	10.6	55.89	135	181	Peak

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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	98.23	-	-	97.17	32.27	4.62	35.83	118	67	Average
2462	103.24	-	-	102.18	32.27	4.62	35.83	118	67	Peak
3195	43.55	-39.69	83.24	63.83	32.76	5.55	58.59	100	0	Peak
12000	48.12	-25.88	74	54.51	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11b <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	95.32	-	-	94.26	32.27	4.62	35.83	101	136	Average
2462	100.85	-	-	99.79	32.27	4.62	35.83	101	136	Peak
3192	45.95	-34.9	80.85	66.23	32.76	5.55	58.59	100	0	Peak
4794	46.6	-27.4	74	64.95	34.26	6.5	59.11	100	0	Peak
12000	52.3	-1.7	54	58.69	38.9	10.6	55.89	133	180	Average
12000	54	-20	74	60.39	38.9	10.6	55.89	133	180	Peak

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	101.03	-	-	100.07	32.23	4.59	35.86	114	336	Average
2412	106.81	-	-	105.85	32.23	4.59	35.86	114	336	Peak
3192	45.75	-41.06	86.81	66.03	32.76	5.55	58.59	100	0	Peak
12000	46.98	-27.02	74	53.37	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	93.49	-	-	92.53	32.23	4.59	35.86	197	321	Average
2412	98.95	-	-	97.99	32.23	4.59	35.86	197	321	Peak
3186	45.5	-33.45	78.95	65.78	32.76	5.55	58.59	100	0	Peak
4794	45.6	-28.4	74	63.95	34.26	6.5	59.11	100	0	Peak
12000	52.21	-1.79	54	58.6	38.9	10.6	55.89	133	180	Average
12000	53.45	-20.55	74	59.84	38.9	10.6	55.89	133	180	Peak

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	93.77	-	-	92.74	32.26	4.61	35.84	168	331	Average
2437	99.39	-	-	98.36	32.26	4.61	35.84	168	331	Peak
3192	44.94	-34.45	79.39	65.22	32.76	5.55	58.59	100	0	Peak
12000	47.69	-26.31	74	54.08	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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	101.12	-	-	100.09	32.26	4.61	35.84	111	319	Average
2437	107.01	-	-	106	32.24	4.61	35.84	111	319	Peak
3195	45.56	-41.45	87.01	65.84	32.76	5.55	58.59	100	0	Peak
4779	45.61	-28.39	74	64.01	34.26	6.49	59.15	100	0	Peak
12000	52.24	-1.76	54	58.63	38.9	10.6	55.89	129	180	Average
12000	53.32	-20.68	74	59.71	38.9	10.6	55.89	129	180	Peak

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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	102.59	-	-	101.53	32.27	4.62	35.83	110	323	Average
2462	108.1	-	-	107.04	32.27	4.62	35.83	110	323	Peak
3186	45.76	-42.34	88.1	66.04	32.76	5.55	58.59	100	0	Peak
12000	46.79	-27.21	74	53.18	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11b <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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	94.72	-	-	93.66	32.27	4.62	35.83	200	293	Average
2462	100.07	-	-	99.01	32.27	4.62	35.83	200	293	Peak
3186	45.45	-34.62	80.07	65.73	32.76	5.55	58.59	100	0	Peak
4791	45.61	-28.39	74	63.96	34.26	6.5	59.11	100	0	Peak
12000	52.37	-1.63	54	58.76	38.9	10.6	55.89	133	182	Average
12000	54.14	-19.86	74	60.53	38.9	10.6	55.89	133	182	Peak

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	95.16	-	-	94.2	32.23	4.59	35.86	116	62	Average
2412	106.67	-	-	105.71	32.23	4.59	35.86	116	62	Peak
3186	45.35	-41.32	86.67	65.63	32.76	5.55	58.59	100	0	Peak
12000	49.34	-24.66	74	55.73	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	91.86	-	-	90.9	32.23	4.59	35.86	106	131	Average
2412	103.45	-	-	102.49	32.23	4.59	35.86	106	131	Peak
3195	46.2	-37.25	83.45	66.48	32.76	5.55	58.59	100	0	Peak
4794	46.14	-27.86	74	64.49	34.26	6.5	59.11	100	0	Peak
12000	52.63	-1.37	54	59.02	38.9	10.6	55.89	134	182	Average
12000	54.34	-19.66	74	60.73	38.9	10.6	55.89	134	182	Peak

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.86	28.9	-11.1	40	43.39	16.4	0.74	31.63	-	-	Peak
104.25	28.58	-14.92	43.5	48.24	10.7	1.12	31.48	-	-	Peak
178.77	28.94	-14.56	43.5	49.56	8.97	1.39	30.98	-	-	Peak
310.5	31.53	-14.47	46	47.34	13.3	1.81	30.92	-	-	Peak
799.8	35.03	-10.97	46	39.91	22.1	2.83	29.81	140	274	Peak
915.3	33.21	-12.79	46	36.45	23.76	3.03	30.03	-	-	Peak
2437	93.14	-	-	92.11	32.26	4.61	35.84	113	61	Average
2437	104.68	-	-	103.65	32.26	4.61	35.84	113	61	Peak
3195	44.46	-40.22	84.68	64.74	32.76	5.55	58.59	100	0	Peak
12000	47.96	-26.04	74	54.35	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.24	31.66	-8.34	40	44.81	17.76	0.72	31.63	103	88	Peak
104.52	31.13	-12.37	43.5	50.8	10.7	1.12	31.49	-	-	Peak
173.1	33.04	-10.46	43.5	53.55	9.18	1.37	31.06	-	-	Peak
598.2	32.38	-13.62	46	40.51	19.88	2.42	30.43	-	-	Peak
797	36.35	-9.65	46	41.31	22.04	2.83	29.83	-	-	Peak
922.3	34.25	-11.75	46	37.31	23.96	3.03	30.05	-	-	Peak
2437	90.17	-	-	89.13	32.26	4.61	35.83	103	136	Average
2437	102.06	-	-	101.02	32.26	4.61	35.83	103	136	Peak
3189	46.06	-36	82.06	66.34	32.76	5.55	58.59	100	0	Peak
4785	45.95	-28.05	74	64.3	34.26	6.5	59.11	100	0	Peak
12000	52.25	-1.75	54	58.64	38.9	10.6	55.89	133	179	Average
12000	53.73	-20.27	74	60.12	38.9	10.6	55.89	133	179	Peak

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2642 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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	93.85	-	-	92.79	32.27	4.62	35.83	109	287	Average
2462	105.76	-	-	104.7	32.27	4.62	35.83	109	287	Peak
3195	44.52	-41.24	85.76	64.8	32.76	5.55	58.59	100	0	Peak
12000	47.87	-26.13	74	54.26	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11g <Legacy Ant 1>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2642 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band.		

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	90	-	-	88.94	32.27	4.62	35.83	100	135	Average
2462	101.58	-	-	100.52	32.27	4.62	35.83	100	135	Peak
3198	46.18	-35.4	81.58	66.45	32.76	5.56	58.59	100	0	Peak
4794	46.34	-27.66	74	64.69	34.26	6.5	59.11	100	0	Peak
12000	52.33	-1.67	54	58.72	38.9	10.6	55.89	132	182	Average
12000	53.86	-20.14	74	60.25	38.9	10.6	55.89	132	182	Peak

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	96.84	-	-	95.88	32.23	4.59	35.86	109	330	Average
2412	108.34	-	-	107.38	32.23	4.59	35.86	109	330	Peak
3195	44.69	-43.65	88.34	64.97	32.76	5.55	58.59	100	0	Peak
12000	46.86	-27.14	74	53.25	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	90.08	-	-	89.12	32.23	4.59	35.86	200	304	Average
2412	101.57	-	-	100.61	32.23	4.59	35.86	200	304	Peak
3195	44.94	-36.63	81.57	65.22	32.76	5.55	58.59	100	0	Peak
4794	45.83	-28.17	74	64.18	34.26	6.5	59.11	100	0	Peak
12000	52.55	-1.45	54	58.94	38.9	10.6	55.89	132	183	Average
12000	54.22	-19.78	74	60.61	38.9	10.6	55.89	132	183	Peak
12057	49.7	-24.3	74	56.1	38.94	10.6	55.94	100	0	Peak

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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	96.12	-	-	95.09	32.26	4.61	35.84	123	21	Average
2437	107.88	-	-	106.85	32.26	4.61	35.84	123	21	Peak
3189	44.96	-42.92	87.88	65.24	32.76	5.55	58.59	100	0	Peak
12000	47.32	-26.68	74	53.71	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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	90.22	-	-	89.19	32.26	4.61	35.84	178	47	Average
2437	101.75	-	-	100.72	32.26	4.61	35.84	178	47	Peak
3195	45.85	-35.9	81.75	66.13	32.76	5.55	58.59	100	0	Peak
4800	45.35	-28.65	74	63.65	34.26	6.5	59.06	100	0	Peak
12000	52.28	-1.72	54	58.67	38.9	10.6	55.89	131	180	Average
12000	53.78	-20.22	74	60.17	38.9	10.6	55.89	131	180	Peak

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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	98.03	-	-	96.97	32.27	4.62	35.83	110	332	Average
2462	109.65	-	-	108.59	32.27	4.62	35.83	110	332	Peak
3186	44.49	-45.16	89.65	64.77	32.76	5.55	58.59	100	0	Peak
12000	46.77	-27.23	74	53.16	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11g <Legacy Ant 2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	91.08	-	-	90.02	32.27	4.62	35.83	200	41	Average
2462	102.76	-	-	101.7	32.27	4.62	35.83	200	41	Peak
3192	45.84	-36.92	82.76	66.12	32.76	5.55	58.59	100	0	Peak
4785	47.18	-26.82	74	65.53	34.26	6.5	59.11	100	0	Peak
12000	52.45	-1.55	54	58.84	38.9	10.6	55.89	132	183	Average
12000	53.6	-20.4	74	59.99	38.9	10.6	55.89	132	183	Peak

Test Mode :	802.11n-HT20 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	93.51	-	-	92.53	32.23	4.59	35.84	116	63	Average
2412	105.34	-	-	104.36	32.23	4.59	35.84	116	63	Peak
3189	44.55	-40.79	85.34	64.83	32.76	5.55	58.59	100	0	Peak
12000	47.65	-26.35	74	54.04	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	90.42	-	-	89.44	32.23	4.59	35.84	105	135	Average
2412	102.3	-	-	101.32	32.23	4.59	35.84	105	135	Peak
3189	45.16	-37.14	82.3	65.44	32.76	5.55	58.59	100	0	Peak
4800	45.75	-28.25	74	64.05	34.26	6.5	59.06	100	0	Peak
12000	52.52	-1.48	54	58.91	38.9	10.6	55.89	134	181	Average
12000	53.54	-20.46	74	59.93	38.9	10.6	55.89	134	181	Peak

Test Mode :	802.11n-HT20 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.24	31.09	-8.91	40	44.24	17.76	0.72	31.63	122	173	Peak
104.52	28.78	-14.72	43.5	48.45	10.7	1.12	31.49	-	-	Peak
174.18	28.39	-15.11	43.5	48.96	9.1	1.38	31.05	-	-	Peak
309.1	31.53	-14.47	46	47.34	13.31	1.8	30.92	-	-	Peak
694.1	30.2	-15.8	46	37.11	20.65	2.64	30.2	-	-	Peak
799.8	33.05	-12.95	46	37.93	22.1	2.83	29.81	-	-	Peak
2437	92.83	-	-	91.8	32.26	4.61	35.84	115	64	Average
2437	104.88	-	-	103.85	32.26	4.61	35.84	115	64	Peak
3186	46.45	-38.43	84.88	66.73	32.76	5.55	58.59	100	0	Peak
12000	47.21	-26.79	74	53.6	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	32.04	-7.96	40	43.85	19.12	0.71	31.64	100	306	Peak
104.25	31.19	-12.31	43.5	50.85	10.7	1.12	31.48	-	-	Peak
170.67	32.98	-10.52	43.5	53.3	9.42	1.36	31.1	-	-	Peak
630.4	32.85	-13.15	46	39.95	20.6	2.52	30.22	-	-	Peak
797.7	37.36	-8.64	46	42.31	22.04	2.83	29.82	-	-	Peak
952.4	34.97	-11.03	46	37.17	24.83	3.07	30.1	-	-	Peak
2437	89.18	-	-	88.17	32.24	4.61	35.84	100	45	Average
2437	101.55	-	-	100.54	32.24	4.61	35.84	100	45	Peak
3186	45.71	-35.84	81.55	65.99	32.76	5.55	58.59	100	0	Peak
4782	45.48	-28.52	74	63.87	34.26	6.5	59.15	100	0	Peak
12000	52.38	-1.62	54	58.77	38.9	10.6	55.89	135	180	Average
12000	53.89	-20.11	74	60.28	38.9	10.6	55.89	135	180	Peak

Test Mode :	802.11n-HT20 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	93.27	-	-	92.21	32.27	4.62	35.83	146	62	Average
2462	105.3	-	-	104.24	32.27	4.62	35.83	146	62	Peak
3192	45.26	-40.04	85.3	65.54	32.76	5.55	58.59	100	0	Peak
12000	47.93	-26.07	74	54.32	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	90.07	-	-	89.01	32.27	4.62	35.83	102	219	Average
2462	101.77	-	-	100.71	32.27	4.62	35.83	102	219	Peak
3192	45.46	-36.31	81.77	65.74	32.76	5.55	58.59	100	0	Peak
4785	45.95	-28.05	74	64.3	34.26	6.5	59.11	100	0	Peak
12000	52.23	-1.77	54	58.62	38.9	10.6	55.89	133	184	Average
12000	54.57	-19.43	74	60.96	38.9	10.6	55.89	133	184	Peak

Test Mode :	802.11n-HT20 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	94.24	-	-	93.28	32.23	4.59	35.86	176	346	Average
2412	105.95	-	-	104.99	32.23	4.59	35.86	176	346	Peak
3195	43.99	-41.96	85.95	64.27	32.76	5.55	58.59	100	0	Peak
12000	46.89	-27.11	74	53.28	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	87.13	-	-	86.17	32.23	4.59	35.86	200	307	Average
2412	98.89	-	-	97.93	32.23	4.59	35.86	200	307	Peak
3195	44.29	-34.6	78.89	64.57	32.76	5.55	58.59	100	0	Peak
4788	46.8	-27.2	74	65.15	34.26	6.5	59.11	100	0	Peak
12000	52.34	-1.66	54	58.73	38.9	10.6	55.89	136	176	Average
12000	54.28	-19.72	74	60.67	38.9	10.6	55.89	136	176	Peak

Test Mode :	802.11n-HT20 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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	95.98	-	-	94.95	32.26	4.61	35.84	119	324	Average
2437	107.97	-	-	106.94	32.26	4.61	35.84	119	324	Peak
3186	44.51	-43.46	87.97	64.79	32.76	5.55	58.59	100	0	Peak
12000	47.04	-26.96	74	53.43	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band.		

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	89.93	-	-	88.9	32.26	4.61	35.84	179	41	Average
2437	101.67	-	-	100.64	32.26	4.61	35.84	179	41	Peak
3198	46.05	-35.62	81.67	66.32	32.76	5.56	58.59	100	0	Peak
4794	46.64	-27.36	74	64.99	34.26	6.5	59.11	100	0	Peak
12000	52.54	-1.46	54	58.93	38.9	10.6	55.89	139	178	Average
12000	54	-20	74	60.39	38.9	10.6	55.89	139	178	Peak

Test Mode :	802.11n-HT20 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	96.15	-	-	95.09	32.27	4.62	35.83	174	327	Average
2462	107.95	-	-	106.89	32.27	4.62	35.83	174	327	Peak
3189	46.36	-41.59	87.95	66.64	32.76	5.55	58.59	100	0	Peak
12000	46.61	-27.39	74	53	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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	90.97	-	-	89.91	32.27	4.62	35.83	200	51	Average
2462	102.81	-	-	101.75	32.27	4.62	35.83	200	51	Peak
3195	44.68	-38.13	82.81	64.96	32.76	5.55	58.59	100	0	Peak
4779	46.85	-27.15	74	65.25	34.26	6.49	59.15	100	0	Peak
12000	52.59	-1.41	54	58.98	38.9	10.6	55.89	140	180	Average
12000	53.58	-20.42	74	59.97	38.9	10.6	55.89	140	180	Peak

Test Mode :	802.11n-HT20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	89.85	-	-	88.89	32.23	4.59	35.86	114	323	Average
2412	103.19	-	-	102.23	32.23	4.59	35.86	114	323	Peak
3186	44.26	-38.93	83.19	64.54	32.76	5.55	58.59	100	0	Peak
12000	47.68	-26.32	74	54.07	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	84.95	-	-	83.99	32.23	4.59	35.86	100	124	Average
2412	97.85	-	-	96.87	32.23	4.59	35.84	100	124	Peak
3198	45.21	-32.64	77.85	65.48	32.76	5.56	58.59	100	0	Peak
4782	46.75	-27.25	74	65.14	34.26	6.5	59.15	100	0	Peak
12000	52.32	-1.68	54	58.71	38.9	10.6	55.89	137	178	Average
12000	53.98	-20.02	74	60.37	38.9	10.6	55.89	137	178	Peak

Test Mode :	802.11n-HT20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.24	30.33	-9.67	40	43.48	17.76	0.72	31.63	-	-	Peak
104.52	28.46	-15.04	43.5	48.13	10.7	1.12	31.49	-	-	Peak
174.18	29.07	-14.43	43.5	49.64	9.1	1.38	31.05	-	-	Peak
309.8	31.67	-14.33	46	47.48	13.31	1.8	30.92	-	-	Peak
799.8	37.3	-8.7	46	42.18	22.1	2.83	29.81	157	233	Peak
942.6	32.35	-13.65	46	34.73	24.66	3.05	30.09	-	-	Peak
2437	96.79	-	-	95.76	32.26	4.61	35.84	113	324	Average
2437	110.68	-	-	109.65	32.26	4.61	35.84	113	324	Peak
3195	43.51	-47.17	90.68	63.79	32.76	5.55	58.59	100	0	Peak

Test Mode :	802.11n-HT20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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
37.56	33.11	-6.89	40	49.43	14.54	0.75	31.61	107	336	Peak
104.52	30.97	-12.53	43.5	50.64	10.7	1.12	31.49	-	-	Peak
172.83	33.05	-10.45	43.5	53.48	9.26	1.37	31.06	-	-	Peak
600.3	32.15	-13.85	46	40.23	19.9	2.42	30.4	-	-	Peak
799.8	37.29	-8.71	46	42.17	22.1	2.83	29.81	-	-	Peak
919.5	34.46	-11.54	46	37.6	23.87	3.03	30.04	-	-	Peak
2437	89.06	-	-	88.03	32.26	4.61	35.84	200	326	Average
2437	102.16	-	-	101.15	32.24	4.61	35.84	200	326	Peak
3186	46.29	-35.87	82.16	66.57	32.76	5.55	58.59	100	0	Peak
4791	47.7	-26.3	74	66.05	34.26	6.5	59.11	100	0	Peak
12000	52.73	-1.27	54	59.12	38.9	10.6	55.89	140	181	Average
12000	53.44	-20.56	74	59.83	38.9	10.6	55.89	140	181	Peak

Test Mode :	802.11n-HT20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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	94.14	-	-	93.08	32.27	4.62	35.83	142	345	Average
2462	107.73	-	-	106.67	32.27	4.62	35.83	142	345	Peak
3186	44.89	-42.84	87.73	65.17	32.76	5.55	58.59	100	0	Peak
12000	46.93	-27.07	74	53.32	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT20 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	87.68	-	-	86.62	32.27	4.62	35.83	200	253	Average
2462	101.98	-	-	100.92	32.27	4.62	35.83	200	253	Peak
3192	45.63	-36.35	81.98	65.91	32.76	5.55	58.59	100	0	Peak
4782	47.34	-26.66	74	65.73	34.26	6.5	59.15	100	0	Peak
12000	52.74	-1.26	54	59.13	38.9	10.6	55.89	135	177	Average
12000	54.3	-19.7	74	60.69	38.9	10.6	55.89	135	177	Peak

Test Mode :	802.11n-HT40 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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
2422	83.04	-	-	82.05	32.24	4.59	35.84	114	66	Average
2422	99.95	-	-	98.96	32.24	4.59	35.84	114	66	Peak
3189	45.98	-33.97	79.95	66.26	32.76	5.55	58.59	100	0	Peak
12000	46.6	-27.4	74	52.99	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 3186 MHz is not within a restricted band.		

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
2422	80.95	-	-	79.96	32.24	4.59	35.84	100	134	Average
2422	96.97	-	-	95.98	32.24	4.59	35.84	100	134	Peak
3186	44.65	-32.32	76.97	64.93	32.76	5.55	58.59	100	0	Peak
4779	46.09	-27.91	74	64.49	34.26	6.49	59.15	100	0	Peak
12000	52.57	-1.43	54	58.96	38.9	10.6	55.89	132	177	Average
12000	54.02	-19.98	74	60.41	38.9	10.6	55.89	132	177	Peak

Test Mode :	802.11n-HT40 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band.		

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
32.97	29.57	-10.43	40	42.72	17.76	0.72	31.63	117	125	Peak
104.52	28.88	-14.62	43.5	48.55	10.7	1.12	31.49	-	-	Peak
176.07	29.01	-14.49	43.5	49.61	9.03	1.39	31.02	-	-	Peak
315.4	30.54	-15.46	46	46.23	13.4	1.82	30.91	-	-	Peak
699	30.63	-15.37	46	37.5	20.69	2.65	30.21	-	-	Peak
798.4	33.8	-12.2	46	38.73	22.06	2.83	29.82	-	-	Peak
2437	85.33	-	-	84.3	32.26	4.61	35.84	118	66	Average
2437	102.38	-	-	101.35	32.26	4.61	35.84	118	66	Peak
3198	44.16	-38.22	82.38	64.43	32.76	5.56	58.59	100	0	Peak
12000	47.45	-26.55	74	53.84	38.9	10.6	55.89	100	0	Peak



Test Mode :	802.11n-HT40 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.54	31.61	-8.39	40	43.42	19.12	0.71	31.64	100	308	Peak
104.25	30.93	-12.57	43.5	50.59	10.7	1.12	31.48	-	-	Peak
174.45	33.24	-10.26	43.5	53.81	9.1	1.38	31.05	-	-	Peak
605.2	31.52	-14.48	46	39.4	20.05	2.44	30.37	-	-	Peak
799.8	37.47	-8.53	46	42.35	22.1	2.83	29.81	-	-	Peak
920.2	34.25	-11.75	46	37.36	23.9	3.03	30.04	-	-	Peak
2437	83.3	-	-	82.27	32.26	4.61	35.84	100	136	Average
2437	99.98	-	-	98.95	32.26	4.61	35.84	100	136	Peak
3189	45.13	-34.85	79.98	65.41	32.76	5.55	58.59	100	0	Peak
4788	45.77	-28.23	74	64.12	34.26	6.5	59.11	100	0	Peak
12000	52.54	-1.46	54	58.93	38.9	10.6	55.89	135	183	Average
12000	54.06	-19.94	74	60.45	38.9	10.6	55.89	135	183	Peak

Test Mode :	802.11n-HT40 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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	82.53	-	-	81.49	32.26	4.61	35.83	141	63	Average
2452	98.77	-	-	97.73	32.26	4.61	35.83	141	63	Peak
3189	44.36	-34.41	78.77	64.64	32.76	5.55	58.59	100	0	Peak
12000	45.89	-28.11	74	52.28	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <SISO Ant 1>	Temperature :	23~25°C
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	80.46	-	-	79.42	32.26	4.61	35.83	100	135	Average
2452	96.39	-	-	95.35	32.26	4.61	35.83	100	135	Peak
3192	45.64	-30.75	76.39	65.92	32.76	5.55	58.59	100	0	Peak
4785	45.7	-28.3	74	64.05	34.26	6.5	59.11	100	0	Peak
12000	52.57	-1.43	54	58.96	38.9	10.6	55.89	136	183	Average
12000	53.63	-20.37	74	60.02	38.9	10.6	55.89	136	183	Peak

Test Mode :	802.11n-HT40 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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
2422	86.36	-	-	85.37	32.24	4.59	35.84	117	341	Average
2422	98.42	-	-	97.43	32.24	4.59	35.84	117	341	Peak
3189	43.09	-35.33	78.42	63.37	32.76	5.55	58.59	100	0	Peak
12000	46.85	-27.15	74	53.24	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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
2422	79.59	-	-	78.6	32.24	4.59	35.84	200	323	Average
2422	91.61	-	-	90.62	32.24	4.59	35.84	200	323	Peak
3195	45.9	-25.71	71.61	66.18	32.76	5.55	58.59	100	0	Peak
4779	47.04	-26.96	74	65.44	34.26	6.49	59.15	100	0	Peak
12000	52.49	-1.51	54	58.88	38.9	10.6	55.89	138	177	Average
12000	54.33	-19.67	74	60.72	38.9	10.6	55.89	138	177	Peak

Test Mode :	802.11n-HT40 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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	91.66	-	-	90.63	32.26	4.61	35.84	174	347	Average
2437	103.77	-	-	102.76	32.24	4.61	35.84	174	347	Peak
3195	44.13	-39.64	83.77	64.41	32.76	5.55	58.59	100	0	Peak
12000	46.58	-27.42	74	52.97	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	86.33	-	-	85.3	32.26	4.61	35.84	200	325	Average
2437	98.92	-	-	97.91	32.24	4.61	35.84	200	325	Peak
3192	45.07	-33.85	78.92	65.35	32.76	5.55	58.59	100	0	Peak
4788	46.72	-27.28	74	65.07	34.26	6.5	59.11	100	0	Peak
12000	52.81	-1.19	54	59.2	38.9	10.6	55.89	140	177	Average
12000	54.63	-19.37	74	61.02	38.9	10.6	55.89	140	177	Peak

Test Mode :	802.11n-HT40 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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	90.52	-	-	89.48	32.26	4.61	35.83	170	319	Average
2452	102.66	-	-	101.62	32.26	4.61	35.83	170	319	Peak
3189	44.71	-37.95	82.66	64.99	32.76	5.55	58.59	100	0	Peak
12000	45.35	-28.65	74	51.74	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <SISO Ant 2>	Temperature :	23~25°C
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 3189 MHz is not within a restricted band.		

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	83.1	-	-	82.06	32.26	4.61	35.83	200	323	Average
2452	95.09	-	-	94.05	32.26	4.61	35.83	200	323	Peak
3189	46.6	-28.49	75.09	66.88	32.76	5.55	58.59	100	0	Peak
4785	47.55	-26.45	74	65.9	34.26	6.5	59.11	100	0	Peak
12000	52.52	-1.48	54	58.91	38.9	10.6	55.89	135	175	Average
12000	54.09	-19.91	74	60.48	38.9	10.6	55.89	135	175	Peak

Test Mode :	802.11n-HT40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 3195 MHz is not within a restricted band.		

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
2422	87.51	-	-	86.52	32.24	4.59	35.84	145	346	Average
2422	102.34	-	-	101.38	32.23	4.59	35.86	145	346	Peak
3195	44.58	-37.76	82.34	64.86	32.76	5.55	58.59	100	0	Peak
12000	47.11	-26.89	74	53.5	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	03	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2422 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band.		

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
2422	81.1	-	-	80.11	32.24	4.59	35.84	100	126	Average
2422	95.09	-	-	94.1	32.24	4.59	35.84	100	126	Peak
3198	45.48	-29.61	75.09	65.75	32.76	5.56	58.59	100	0	Peak
4791	47.01	-26.99	74	65.36	34.26	6.5	59.11	100	0	Peak
12000	52.56	-1.44	54	58.95	38.9	10.6	55.89	140	179	Average
12000	54.56	-19.44	74	60.95	38.9	10.6	55.89	140	179	Peak

Test Mode :	802.11n-HT40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3162 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.35	28.9	-11.1	40	40.71	19.12	0.71	31.64	-	-	Peak
104.25	27.99	-15.51	43.5	47.65	10.7	1.12	31.48	-	-	Peak
176.61	29	-14.5	43.5	49.6	9.03	1.39	31.02	-	-	Peak
309.8	31.41	-14.59	46	47.22	13.31	1.8	30.92	-	-	Peak
799.8	35.72	-10.28	46	40.6	22.1	2.83	29.81	122	186	Peak
912.5	32.76	-13.24	46	36.09	23.68	3.02	30.03	-	-	Peak
2437	87.13	-	-	86.1	32.26	4.61	35.84	110	344	Average
2437	100.85	-	-	99.84	32.24	4.61	35.84	110	344	Peak
3162	44.31	-36.54	80.85	64.55	32.77	5.54	58.55	100	0	Peak
12000	45.93	-28.07	74	52.32	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.4	32.04	-7.96	40	47.14	15.78	0.74	31.62	100	107	Peak
104.52	30.92	-12.58	43.5	50.59	10.7	1.12	31.49	-	-	Peak
170.67	33.36	-10.14	43.5	53.68	9.42	1.36	31.1	-	-	Peak
603.1	32.88	-13.12	46	40.84	19.99	2.43	30.38	-	-	Peak
798.4	35.73	-10.27	46	40.66	22.06	2.83	29.82	-	-	Peak
936.3	34.4	-11.6	46	36.99	24.44	3.05	30.08	-	-	Peak
2437	80.91	-	-	79.88	32.26	4.61	35.84	100	127	Average
2437	95.09	-	-	94.05	32.26	4.61	35.83	100	127	Peak
3192	46.06	-29.03	75.09	66.34	32.76	5.55	58.59	100	0	Peak
4785	46.33	-27.67	74	64.68	34.26	6.5	59.11	100	0	Peak
12000	52.47	-1.53	54	58.86	38.9	10.6	55.89	137	182	Average
12000	54.19	-19.81	74	60.58	38.9	10.6	55.89	137	182	Peak

Test Mode :	802.11n-HT40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 3192 MHz is not within a restricted band.		

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	86.83	-	-	85.79	32.26	4.61	35.83	141	343	Average
2452	101.52	-	-	100.48	32.26	4.61	35.83	141	343	Peak
3192	45.47	-36.05	81.52	65.75	32.76	5.55	58.59	100	0	Peak
12000	46.57	-27.43	74	52.96	38.9	10.6	55.89	100	0	Peak

Test Mode :	802.11n-HT40 <MIMO Ant 1+2>	Temperature :	23~25°C
Test Channel :	09	Relative Humidity :	50~52%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. 3198 MHz is not within a restricted band.		

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	81.56	-	-	80.52	32.26	4.61	35.83	100	126	Average
2452	95.12	-	-	94.08	32.26	4.61	35.83	100	126	Peak
3198	45.24	-29.88	75.12	65.51	32.76	5.56	58.59	100	0	Peak
4782	48.39	-25.61	74	66.78	34.26	6.5	59.15	100	0	Peak
12000	52.79	-1.21	54	59.18	38.9	10.6	55.89	138	181	Average
12000	54.18	-19.82	74	60.57	38.9	10.6	55.89	138	181	Peak

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

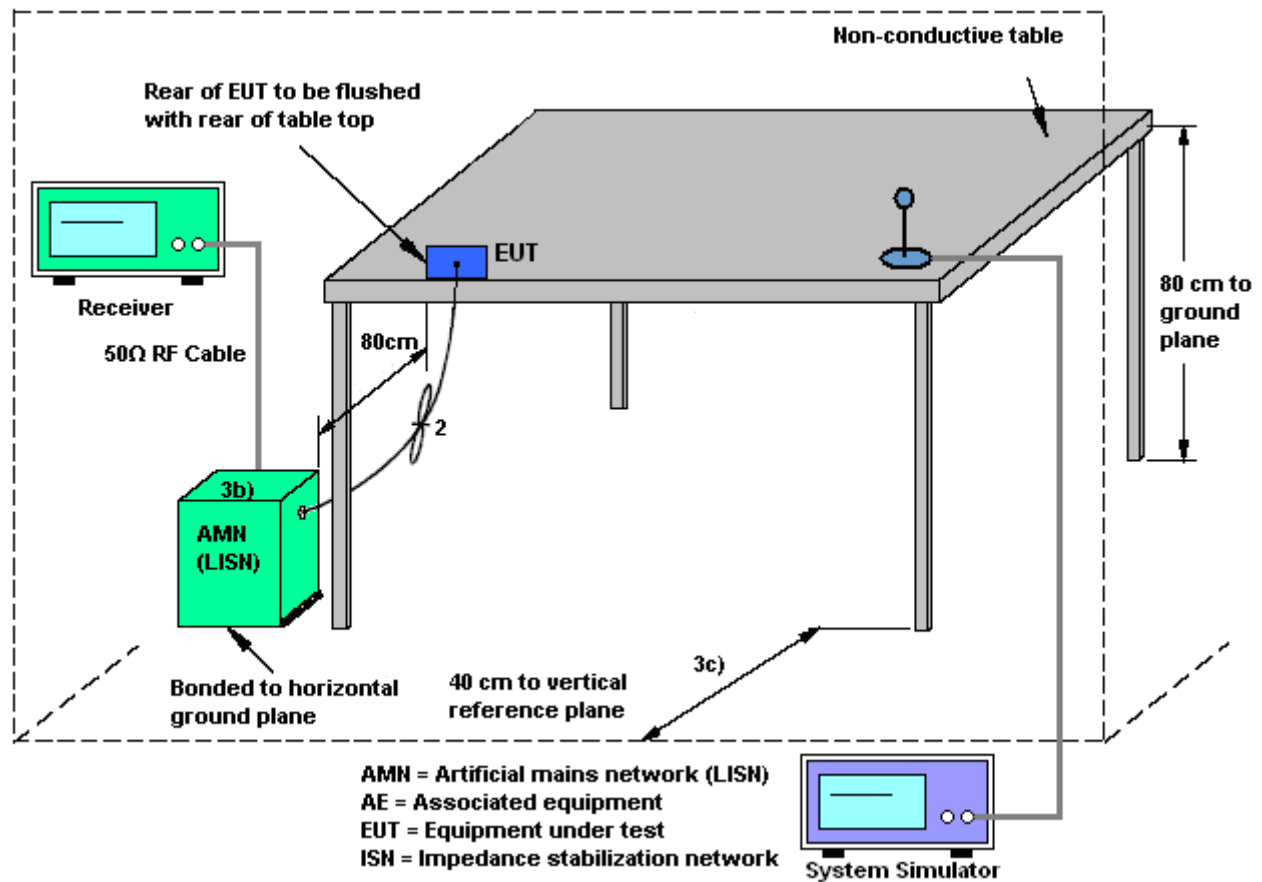
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

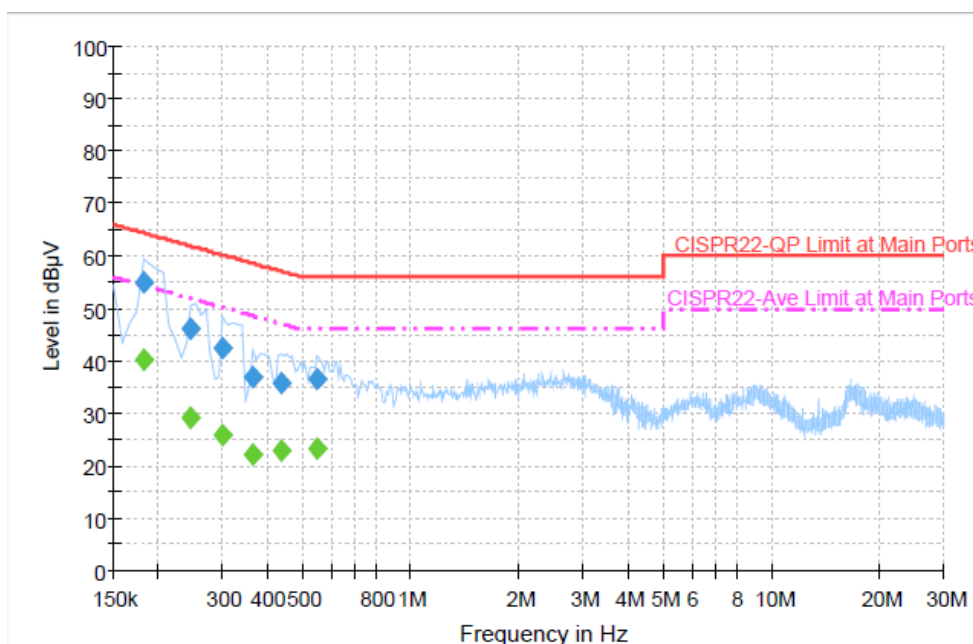
1. The testing follows the guidelines in ANSI C63.10-2009 and fulfills ANSI C63.4-2003 test site requirement.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 KHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	50~51%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN Link + Adapter + HDMI Cable + SD Card + Camera + iPod Earphone + H Pattern + MPEG4 + GPS Rx + USB 3.0 HD		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



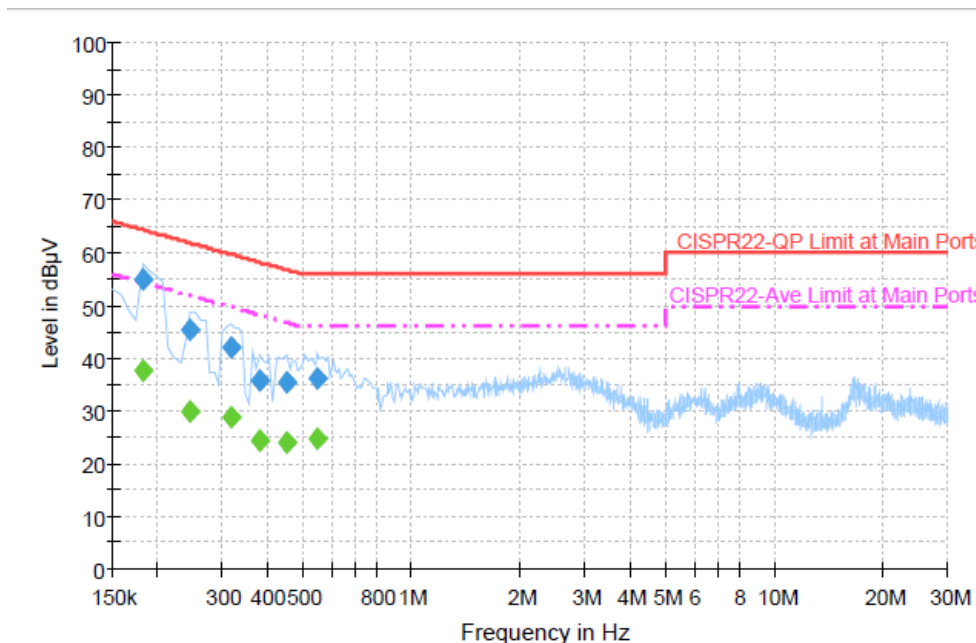
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	55.0	Off	L1	19.4	9.4	64.4
0.246000	46.1	Off	L1	19.4	15.8	61.9
0.302000	42.4	Off	L1	19.4	17.8	60.2
0.366000	37.0	Off	L1	19.4	21.6	58.6
0.438000	35.8	Off	L1	19.4	21.3	57.1
0.550000	36.4	Off	L1	19.4	19.6	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	40.1	Off	L1	19.4	14.3	54.4
0.246000	29.2	Off	L1	19.4	22.7	51.9
0.302000	25.8	Off	L1	19.4	24.4	50.2
0.366000	22.2	Off	L1	19.4	26.4	48.6
0.438000	22.7	Off	L1	19.4	24.4	47.1
0.550000	23.2	Off	L1	19.4	22.8	46.0

Test Mode :	Mode 1	Temperature :	20~21℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	50~51%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN Link + Adapter + HDMI Cable + SD Card + Camera + iPod Earphone + H Pattern + MPEG4 + GPS Rx + USB 3.0 HD		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	55.1	Off	N	19.4	9.3	64.4
0.246000	45.4	Off	N	19.4	16.5	61.9
0.318000	42.2	Off	N	19.3	17.6	59.8
0.382000	35.8	Off	N	19.4	22.4	58.2
0.454000	35.6	Off	N	19.4	21.2	56.8
0.550000	36.3	Off	N	19.4	19.7	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.182000	37.7	Off	N	19.4	16.7	54.4
0.246000	29.9	Off	N	19.4	22.0	51.9
0.318000	28.6	Off	N	19.3	21.2	49.8
0.382000	24.4	Off	N	19.4	23.8	48.2
0.454000	23.9	Off	N	19.4	22.9	46.8
0.550000	24.8	Off	N	19.4	21.2	46.0

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit. The EUT supports completely uncorrelated MIMO mode. The composite antenna gain for 2.4GHz is 2.33 dBi.

	2.4GHz
ANT 1 GAIN (dBi)	2.90
ANT 2 GAIN (dBi)	1.68
COMPOSITE GAIN (dBi)	2.33

FCC KDB 662911 D01 Multiple Transmitter Output v01r01

Unequal antenna gains, with equal transmit powers.

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

If transmit signals are *correlated*, then

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})/N]$ dBi

If all transmit signals are *completely uncorrelated*, then

Directional gain = $10 \log[(10^{G_1/10} + 10^{G_2/10} + \dots + 10^{G_N/10})/N]$ dBi

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Aug. 04, 2012 ~ Aug. 10, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Aug. 04, 2012 ~ Aug. 10, 2012	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Aug. 04, 2012 ~ Aug. 10, 2012	Sep. 17, 2012	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Aug. 22, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Aug. 22, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Aug. 22, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Aug. 22, 2012	N/A	Conduction (CO05-HY)
GPS Station	Pendulum	GSG-54	N/A	N/A	N/A	Aug. 22, 2012	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Aug. 10, 2012 ~ Aug. 16, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	Aug. 10, 2012 ~ Aug. 16, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Aug. 10, 2012 ~ Aug. 16, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Aug. 10, 2012 ~ Aug. 16, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Aug. 10, 2012 ~ Aug. 16, 2012	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103A	161075	10Hz ~ 1000MHz Gain:32dB	Feb. 27, 2012	Aug. 10, 2012 ~ Aug. 16, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Aug. 10, 2012 ~ Aug. 16, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1GHz~26.5GHz	Aug. 30, 2011	Aug. 10, 2012 ~ Aug. 16, 2012	Aug. 29, 2012	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 251	15GHz ~ 40GHz	Oct. 21, 2011	Aug. 10, 2012 ~ Aug. 16, 2012	Oct. 20, 2012	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9KHz ~ 30MHz	Jul. 03, 2012	Aug. 10, 2012 ~ Aug. 16, 2012	Jul. 02, 2014	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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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 EP272716-02 as below.