SPORTON International Inc.
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FCC RADIO TEST REPORT

Applicant's company	**Broadcom Corporation**
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	**QDS-BRCM1073**
Manufacturer's company	**Broadcom Corporation**
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	802.11a/b/g/n WLAN + Bluetooth Card
Brand Name	Broadcom
Model Name	BCM943241NG1630
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Mar. 04, 2013
Final Test Date	Mar. 19, 2013
Submission Type	Original Equipment
Operating Mode	Client (without radar detection function)

Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a (5150 ~ 5350MHz / 5470 ~ 5725MHz) of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003**, **47 CFR FCC Part 15 Subpart E, KDB 789033 D01 v01r02** and **KDB 662911 D01 v01r02**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

TAF
Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR330410AA	Rev. 01	Initial issue of report	Mar. 20, 2013

Certificate No.: CB10203065

1. CERTIFICATE OF COMPLIANCE

Product Name	:	802.11a/b/g/n WLAN + Bluetooth Card
Brand Name	:	Broadcom
Model Name	:	BCM943241NG1630
Applicant	:	Broadcom Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Mar. 04, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	11.88 dB
4.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.07 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.02 dB
4.5	15.407(a)	Peak Excursion	Complies	2.66 dB
4.6	15.407(b)	Radiated Emissions	Complies	3.01 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.08 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	$\pm 8.5\times10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (1TX/2TX, 1RX/2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	16 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Band Width (99%)	MCS0 (20MHz): 31.68 MHz For 1TX: MCS0 (40MHz): 69.44 MHz For 2TX: MCS0 (40MHz): 46.72 MHz
Maximum Conducted Output Power	Band 1: MCS0 (20MHz): 14.79 dBm For 1TX: MCS0 (40MHz): 16.78 dBm For 2TX: MCS0 (40MHz): 16.22 dBm Band 2: MCS0 (20MHz): 21.40 dBm For 1TX: MCS0 (40MHz): 19.14 dBm For 2TX: MCS0 (40MHz): 19.93 dBm Band 3: MCS0 (20MHz): 22.16 dBm For 1TX: MCS0 (40MHz): 17.32 dBm For 2TX: MCS0 (40MHz): 19.09 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	16
Channel Band Width (99%)	11a: 30.88 MHz
Maximum Conducted Output Power	Band 1: 16.93 dBm ; Band 2: 20.98 dBm ; Band 3: 20.26 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Single (TX)		Two (TX)	
Band width Mode	20 MHz	40 MHz	20 MHz	40 MHz
IEEE 802.11a	V	X	X	X
IEEE 802.11n	V	V	V	V

IEEE 802.11n spec

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Datarate(Mbps)			
									800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.444	30
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.889	60
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.333	90
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.778	120
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.667	180
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.556	240
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.000	270
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.444	300

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)		Remark
1	Hitachi Cable, Ltd	HMT05/HFT17-DL07	PIFA Antenna	I-PEX	5GHz-B1	5.6	ANT0 of board
					5GHz-B2	5.6	
					5GHz-B3	4.2	
2	Hitachi Cable, Ltd	HMT05/HFT17-DL07	PIFA Antenna	I-PEX	5GHz-B1	5.6	ANT1 of board
					5GHz-B2	5.6	
					5GHz-B3	4.2	

Note:

For IEEE 802.11a mode (1TX/1RX):

Only Ant. 1 can be use as transmit and receive antenna.

For IEEE 802.11n mode (1TX2TX/1RX2RX):

The EUT can support both 1TX and 2TX functions.

For 1TX

Only Ant. 1 can be use as transmit and receive antenna.

For 2TX

Both Ant. 1 and Ant. 2 can be used as transmitting/receiving antenna.

Ant. 1 and Ant. 2 could both transmit/receive simultaneously

3.4. Table for Carrier Frequencies

For IEEE 802.11a, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140.

There are two bandwidth systems for IEEE 802.11n.

For both 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140.

For both 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 134.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
5470~5725 MHz Band 3	100	5500 MHz	116	5580 MHz
	102	5510 MHz	132	5660 MHz
	104	5520 MHz	134	5670 MHz
	108	5540 MHz	136	5680 MHz
	110	5550 MHz	140	5700 MHz
	112	5560 MHz	-	-

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode		Data Rate	Channel	Antenna
AC Power Conducted Emission	CTX		-	-	-
Max. Conducted Output Power	MCS0/20MHz	Band 1~2	7.2Mbps	36/40/48/52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1
		Band 3	15Mbps	102/110 /134	1
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1+2
		Band 3	15Mbps	102/110 /134	1+2
	11a/BPSK	Band 1~2	6Mbps	36/40/48/52/60/64	1
		Band 3	6Mbps	100/116/140	1
Power Spectral Density	MCS0/20MHz	Band 1~2	7.2Mbps	36/40/48/52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1
		Band 3	15Mbps	102/110 /134	1
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1+2
		Band 3	15Mbps	102/110 /134	1+2
	11a/BPSK	Band 1~2	6Mbps	36/40/48/52/60/64	1
		Band 3	6Mbps	100/116/140	1
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Peak Excursion	MCS0/20MHz	Band 1~2	7.2Mbps	36/40/48/52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1
		Band 3	15Mbps	102/110 /134	1
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1+2
		Band 3	15Mbps	102/110 /134	1+2
	11a/BPSK	Band 1~2	6Mbps	36/40/48/52/60/64	1
		Band 3	6Mbps	100/116/140	1

Radiated Emission Below 1GHz	CTX		-	-	-
Radiated Emission Above 1GHz	MCS0/20MHz	Band 1~2	7.2Mbps	36/40/48/52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1
		Band 3	15Mbps	102/110 /134	1
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1+2
		Band 3	15Mbps	102/110 /134	1+2
	11a/BPSK	Band 1~2	6Mbps	36/40/48/52/60/64	1
		Band 3	6Mbps	100/116/140	1
Band Edge Emission	MCS0/20MHz	Band 1~2	7.2Mbps	36/40/48/52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1
		Band 3	15Mbps	102/110 /134	1
	MCS0/40MHz	Band 1~2	15Mbps	38/46/54/62	1+2
		Band 3	15Mbps	102/110 /134	1+2
	11a/BPSK	Band 1~2	6Mbps	36/40/48/52/60/64	1
		Band 3	6Mbps	100/116/140	1
Frequency Stability	Un-modulation		-	40/60	N/A

Note: The 1TX of 11a power could cover 1TX of 11an20.

<For MPE and Co-location Test>:

The EUT could be applied 2.4GHz / 5GHz with WLAN function and Bluetooth function; therefore Maximum Permissible Exposure (Please refer to Maximum Permissible Exposure Report) and Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz / 5GHz WLAN function and Bluetooth function.

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE

Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE

Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	E2K512ANHMW

3.8. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. 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.

Power Parameters of IEEE 802.11n MCS0 20MHz

Test Software Version	Manual Tool Version : 2.0.0.7								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 20MHz	45	48	48	76	74	63	65	81	57

For 1TX

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	Manual Tool Version : 2.0.0.7						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 40MHz	56	70	80	63	60	75	73

For 2TX

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	Manual Tool Version : 2.0.0.7						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 40MHz	50	54	71	54	54	70	61

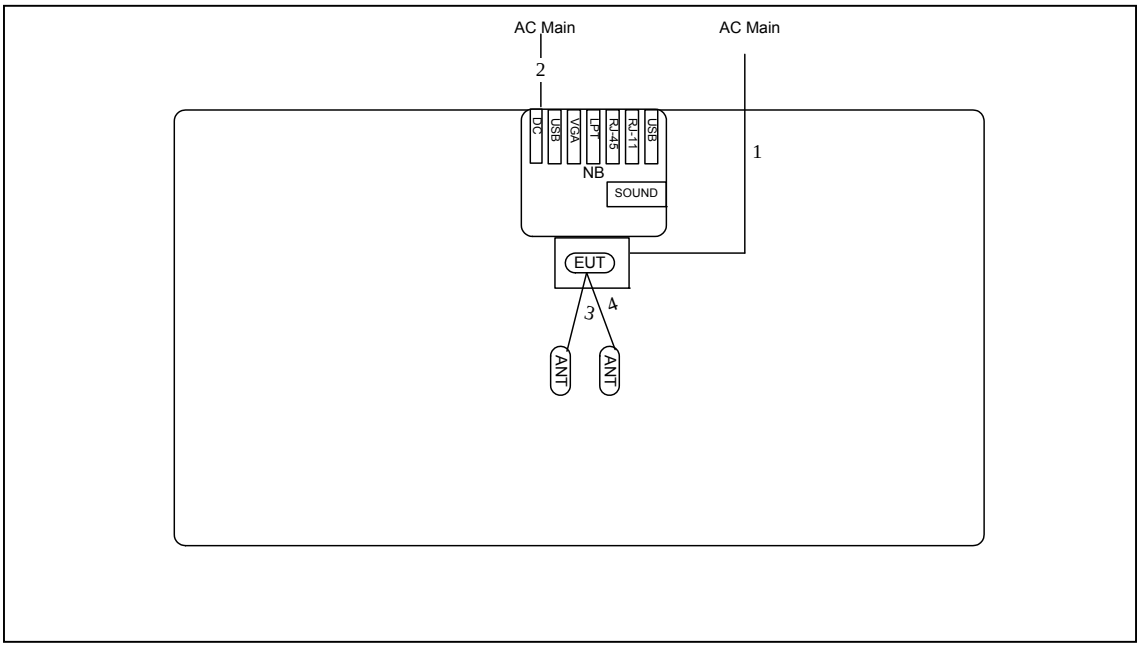
Power Parameters of IEEE 802.11a

Test Software Version	Manual Tool Version : 2.0.0.7								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
IEEE 802.11a	70	68	68	86	83	76	72	86	75

During the test, “Manual Tool Version : 2.0.0.7” under WIN XP was executed the test program to control the EUT continuously transmit RF signal.

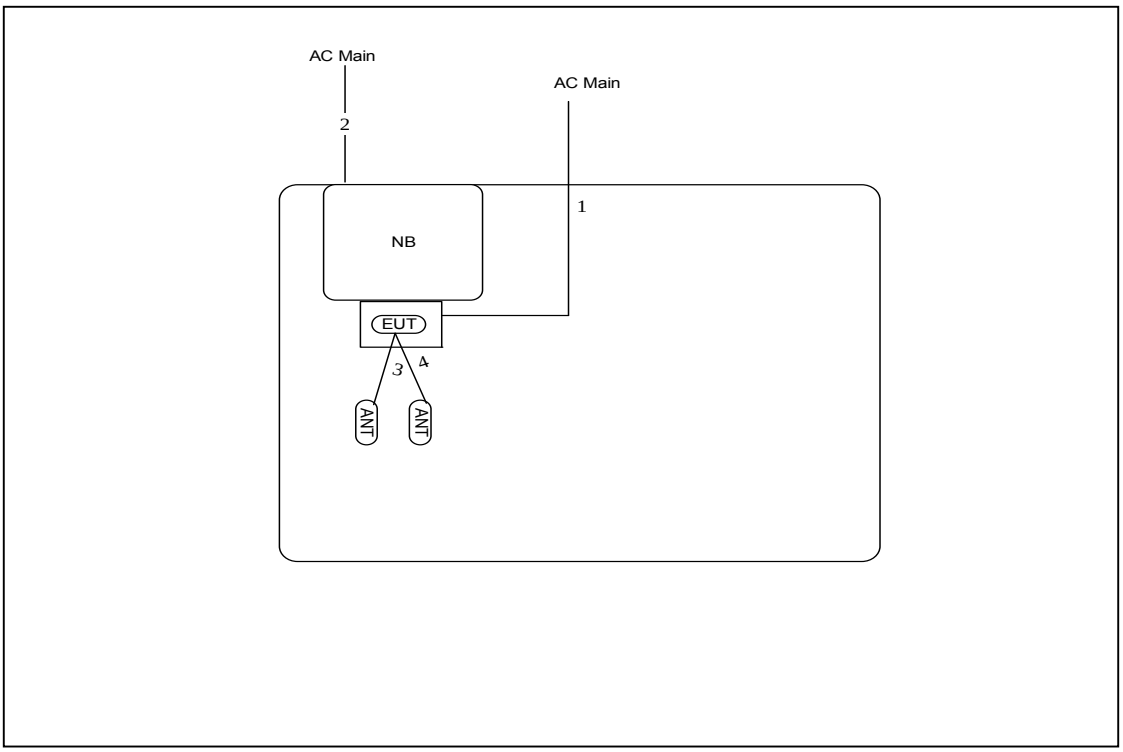
3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration



Item	Connection	Shield	Length
1	AC power cable	No	1.8m
2	AC power cable	No	0.75m
3	Antenna cable	No	0.2m
4	Antenna cable	No	0.2m

3.9.2. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	AC power cable	No	1.8m
2	AC power cable	No	0.75m
3	Antenna cable	No	0.2m
4	Antenna cable	No	0.2m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product that is designed to connect to the 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 below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

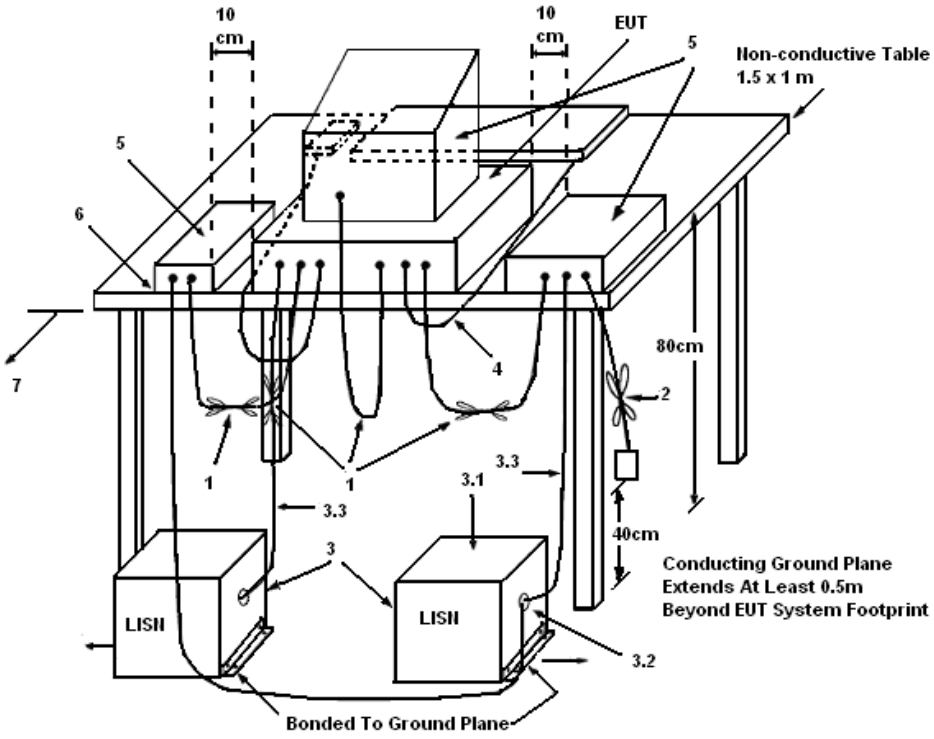
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

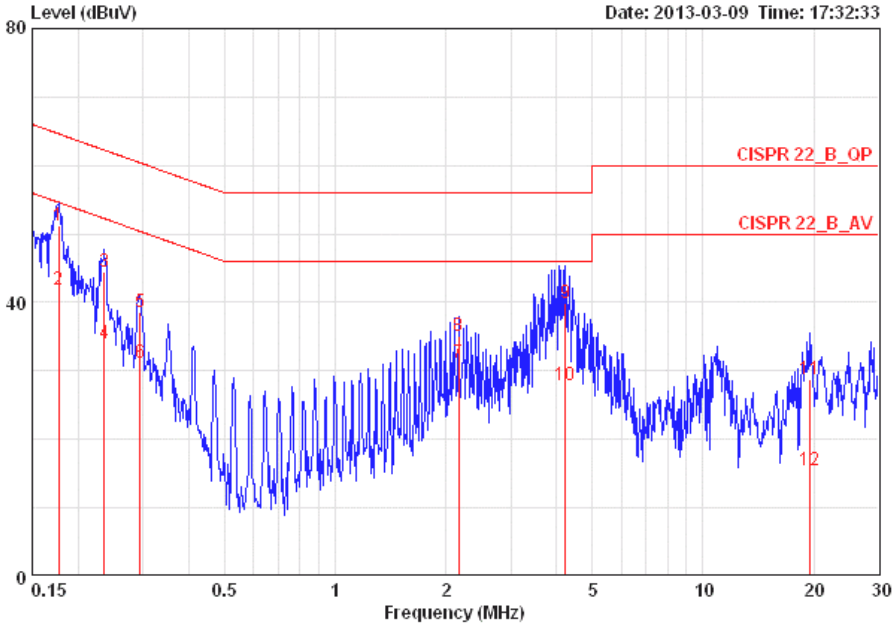
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

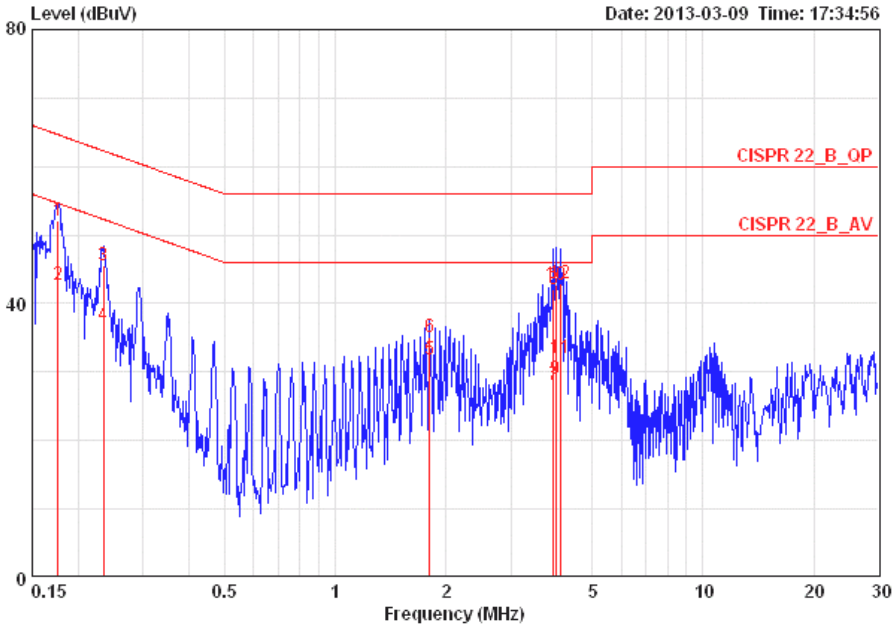
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25°C	Humidity	52%
Test Engineer	Kane Liu	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17678	51.27	-13.36	64.64	50.93	0.15	0.19	QP
2	0.17678	41.94	-12.69	54.64	41.60	0.15	0.19	AVERAGE
3	0.23533	44.44	-17.82	62.26	44.09	0.15	0.20	QP
4	0.23533	33.92	-18.34	52.26	33.57	0.15	0.20	AVERAGE
5	0.29398	38.54	-21.87	60.41	38.19	0.15	0.20	QP
6	0.29398	31.16	-19.25	50.41	30.81	0.15	0.20	AVERAGE
7	2.167	31.27	-14.73	46.00	30.84	0.19	0.23	AVERAGE
8	2.167	35.00	-21.00	56.00	34.57	0.19	0.23	QP
9	4.224	39.93	-16.07	56.00	39.40	0.22	0.30	QP
10	4.224	27.98	-18.02	46.00	27.45	0.22	0.30	AVERAGE
11	19.428	28.76	-31.24	60.00	27.79	0.47	0.50	QP
12	19.428	15.37	-34.63	50.00	14.40	0.47	0.50	AVERAGE

Temperature	25°C	Humidity	52%
Test Engineer	Kane Liu	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17584	52.09	-12.59	64.68	51.82	0.08	0.19	QP
2 @	0.17584	42.80	-11.88	54.68	42.53	0.08	0.19	AVERAGE
3	0.23409	45.62	-16.68	62.30	45.34	0.08	0.20	QP
4	0.23409	36.85	-15.45	52.30	36.57	0.08	0.20	AVERAGE
5	1.810	31.88	-14.12	46.00	31.55	0.11	0.23	AVERAGE
6	1.810	35.20	-20.80	56.00	34.87	0.11	0.23	QP
7	3.922	28.06	-17.94	46.00	27.63	0.13	0.30	AVERAGE
8	3.922	41.97	-14.03	56.00	41.54	0.13	0.30	QP
9	3.985	29.09	-16.91	46.00	28.66	0.13	0.30	AVERAGE
10	3.985	42.65	-13.35	56.00	42.22	0.13	0.30	QP
11	4.092	32.00	-14.00	46.00	31.57	0.13	0.30	AVERAGE
12	4.092	42.90	-13.10	56.00	42.47	0.13	0.30	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	Approximately 1% of the emission bandwidth
VB	VBW > RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.2.4. Test Setup Layout

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of 26dB Bandwidth

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	19.84	16.96
40	5200 MHz	19.36	17.12
48	5240 MHz	19.52	16.96
52	5260 MHz	43.36	29.92
60	5300 MHz	38.24	24.32
64	5320 MHz	29.92	17.28
100	5500 MHz	22.88	17.28
116	5580 MHz	45.28	31.68
140	5700 MHz	22.24	17.12

For 1TX.

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	46.08	36.48
46	5230 MHz	85.76	38.40
54	5270 MHz	101.12	69.44
62	5310 MHz	51.20	36.80
102	5510 MHz	46.40	36.48
110	5550 MHz	65.92	36.80
134	5670 MHz	72.96	36.80

For 2TX

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2

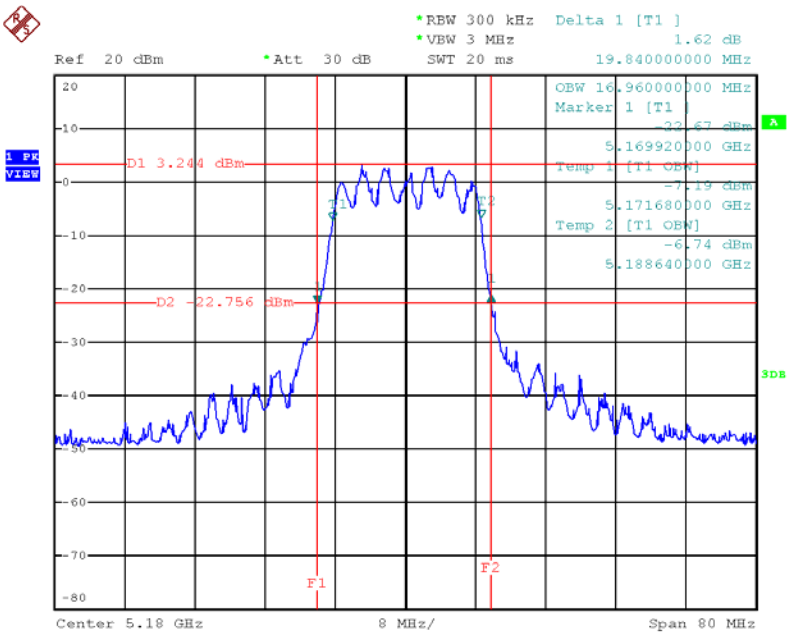
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	45.44	36.80
46	5230 MHz	45.44	36.80
54	5270 MHz	82.24	46.72
62	5310 MHz	45.76	36.80
102	5510 MHz	45.44	36.48
110	5550 MHz	65.28	37.12
134	5670 MHz	50.56	36.48

Temperature	23℃	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Ant. 1

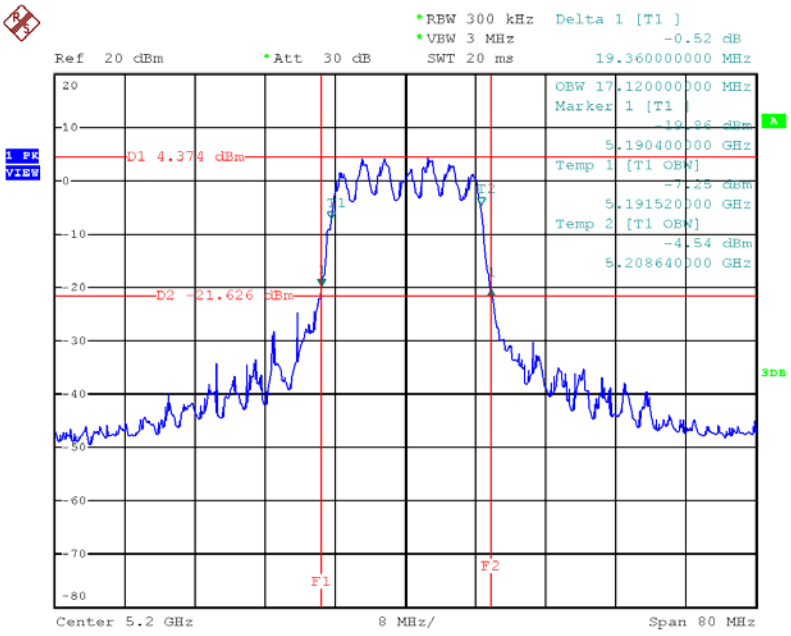
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	34.40	17.92
40	5200 MHz	32.16	17.60
48	5240 MHz	35.20	18.72
52	5260 MHz	43.20	29.92
60	5300 MHz	42.24	29.76
64	5320 MHz	39.52	24.00
100	5500 MHz	31.04	17.28
116	5580 MHz	42.40	30.88
140	5700 MHz	40.00	23.52

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5180 MHz



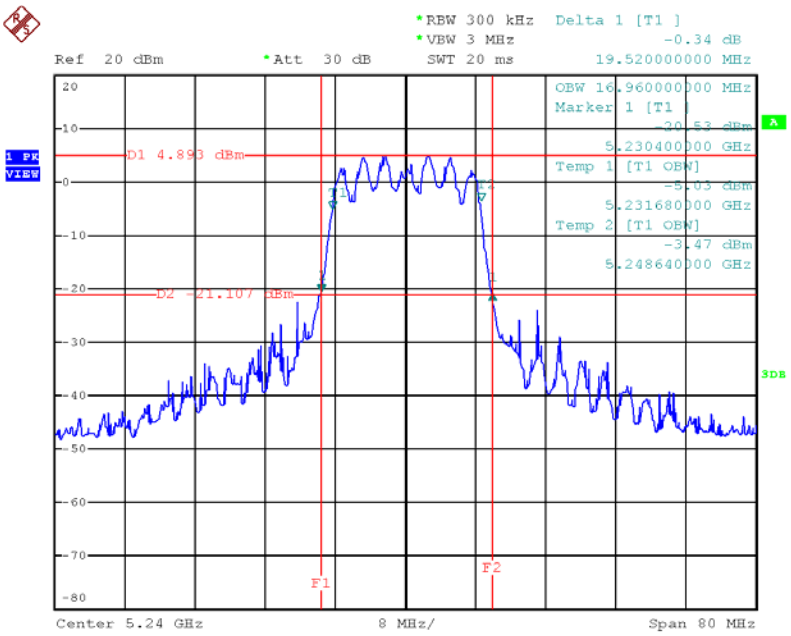
Date: 10.MAR.2013 14:33:31

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5200 MHz



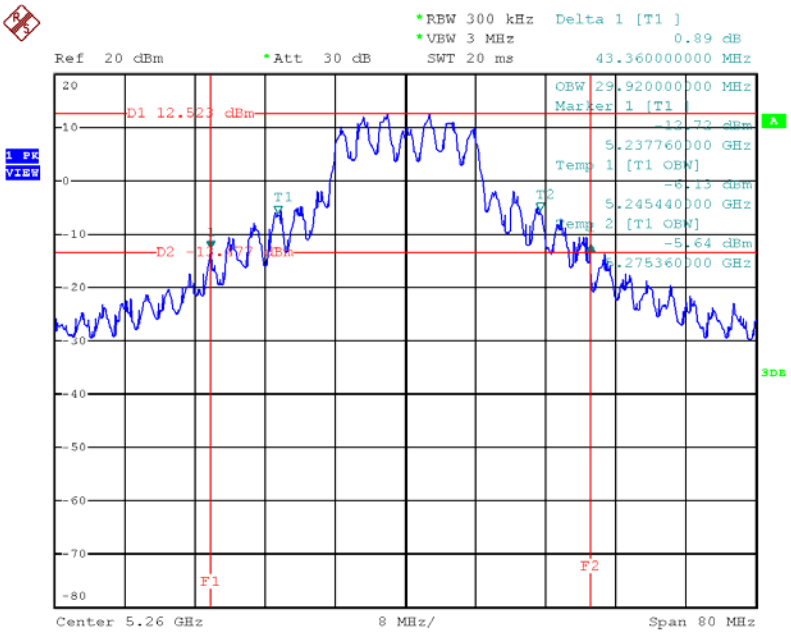
Date: 10.MAR.2013 14:36:45

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5240 MHz



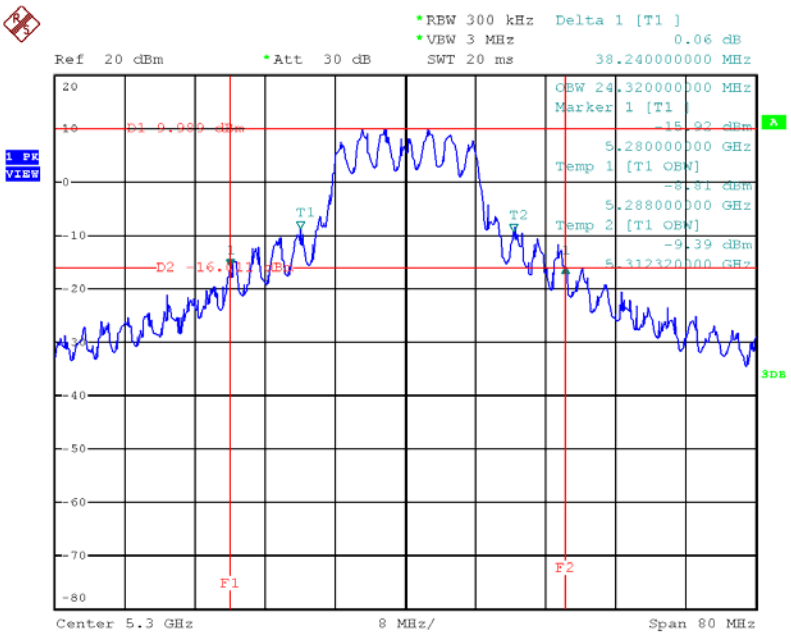
Date: 10.MAR.2013 14:38:15

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5260 MHz



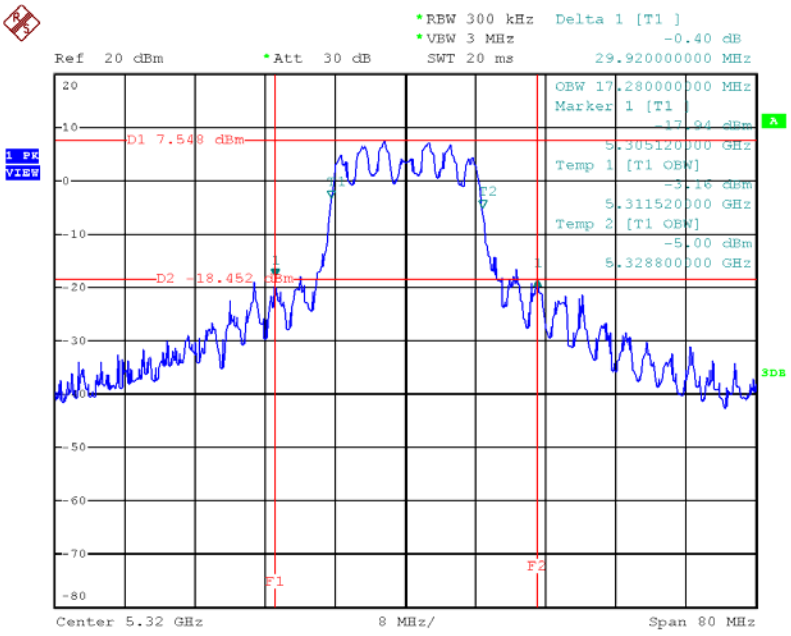
Date: 10.MAR.2013 14:47:12

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5300 MHz



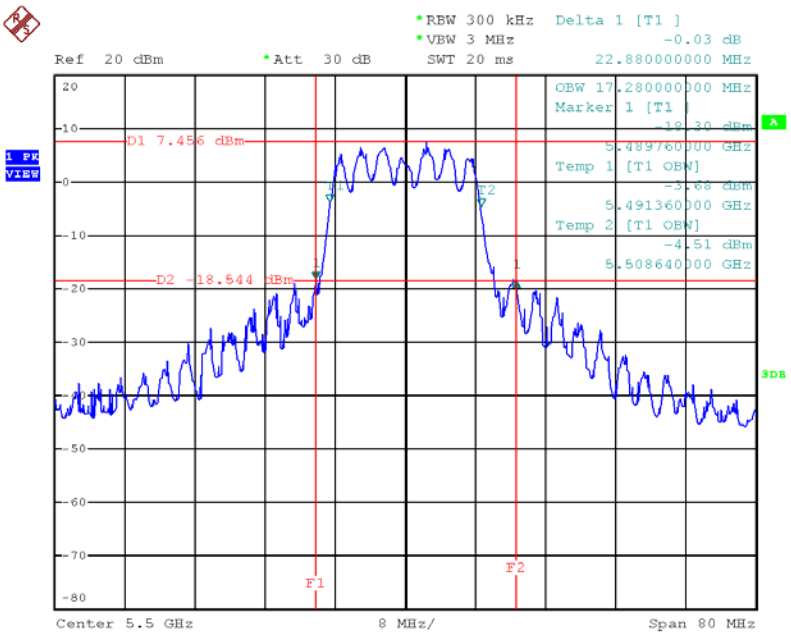
Date: 10.MAR.2013 14:42:55

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5320 MHz



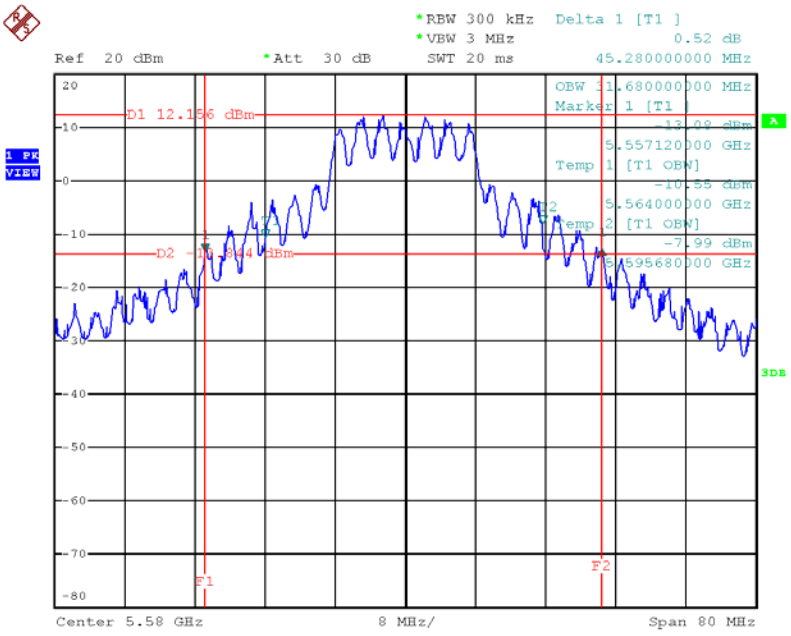
Date: 10.MAR.2013 14:44:12

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5500 MHz



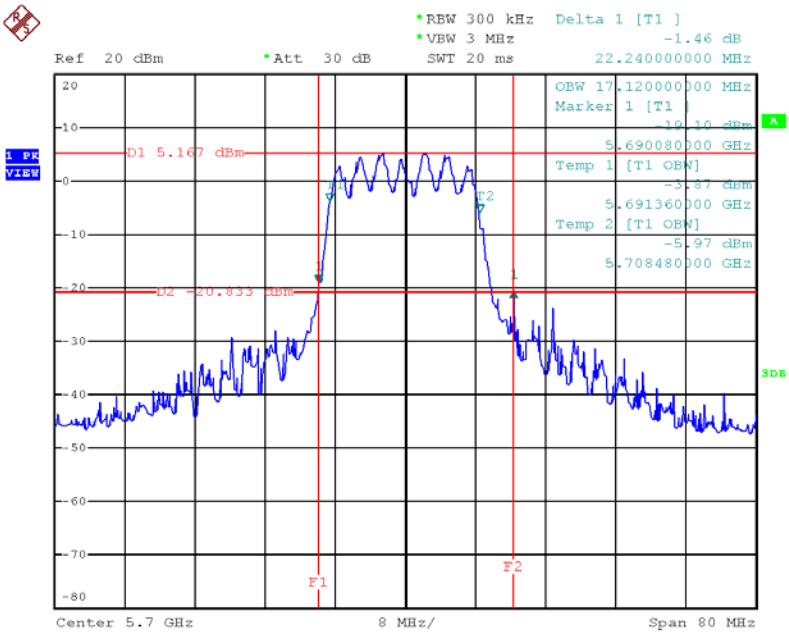
Date: 10.MAR.2013 14:48:41

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5580 MHz



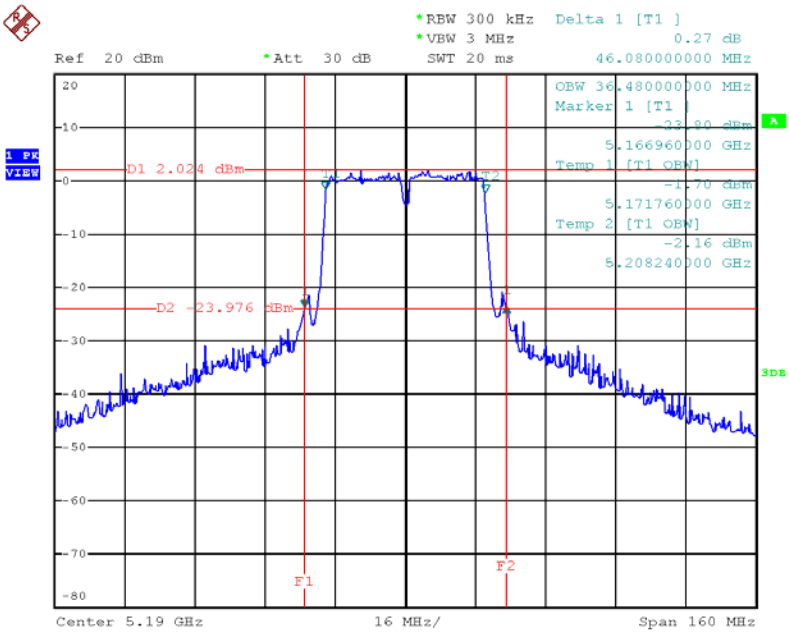
Date: 10.MAR.2013 14:49:56

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5700 MHz



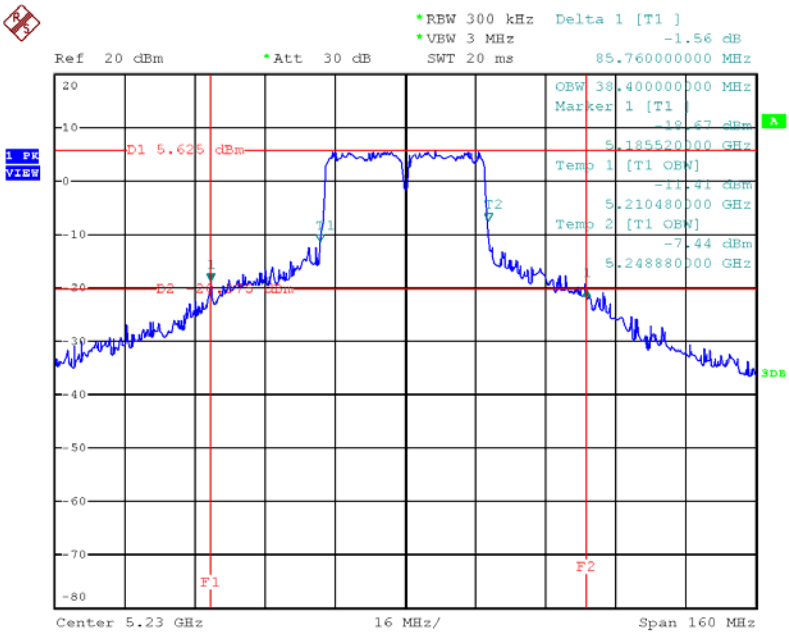
Date: 10.MAR.2013 15:49:18

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5190 MHz / For 1TX



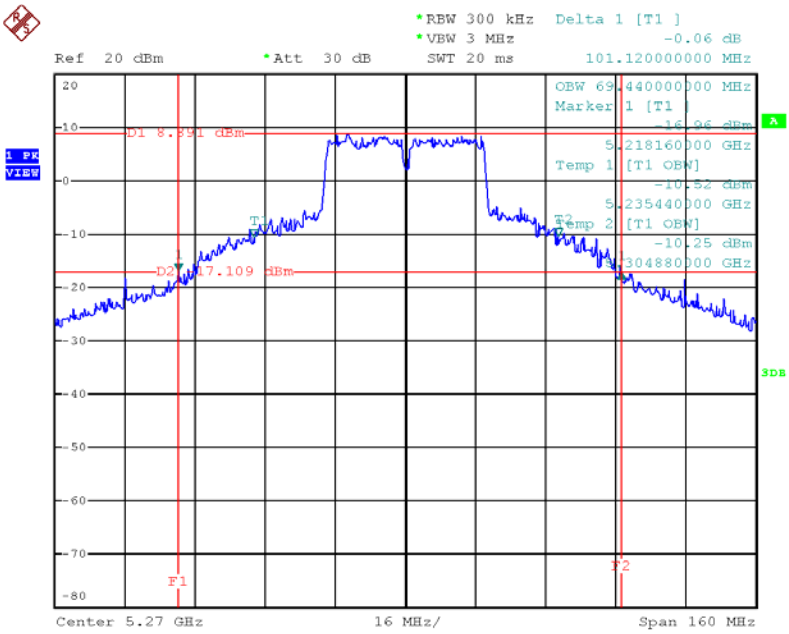
Date: 10.MAR.2013 15:21:59

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5230 MHz / For 1TX



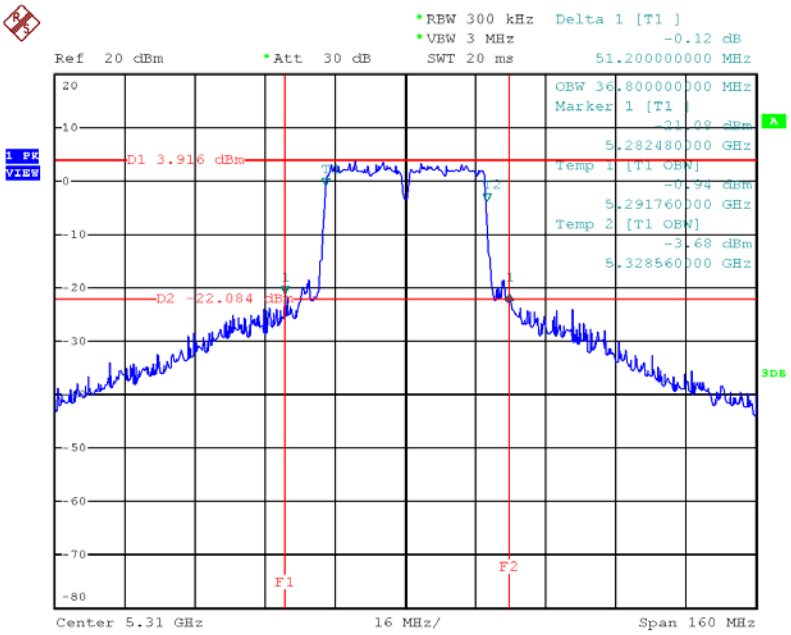
Date: 10.MAR.2013 15:23:41

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5270 MHz / For 1TX



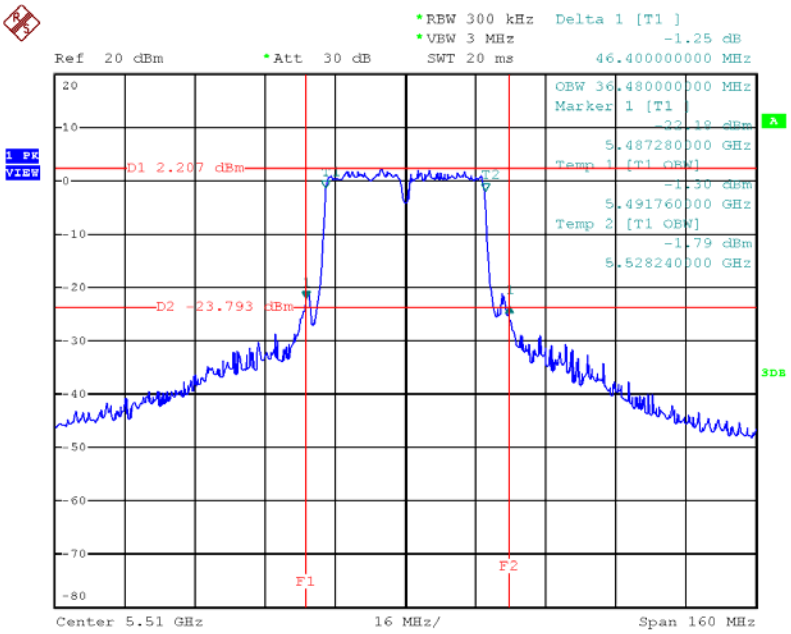
Date: 10.MAR.2013 15:19:30

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5310 MHz / For 1TX



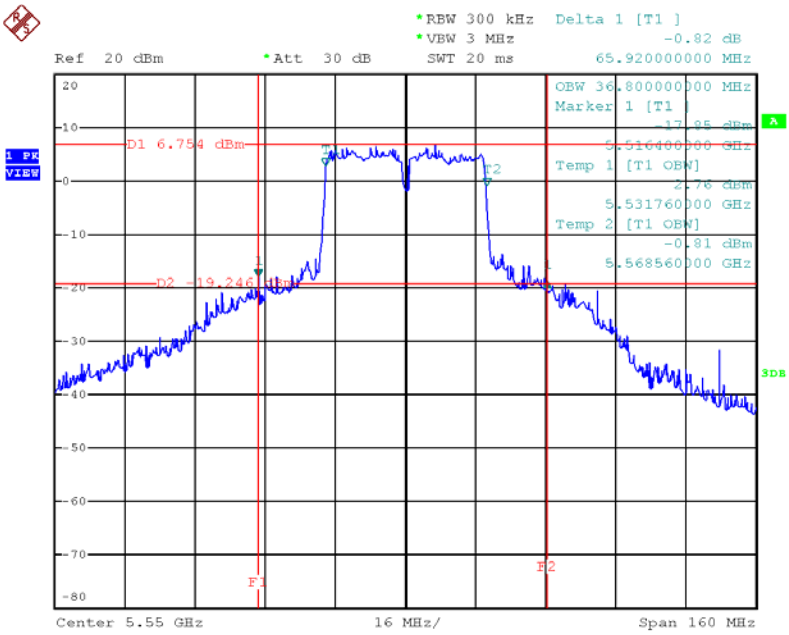
Date: 10.MAR.2013 15:16:55

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5510 MHz / For 1TX



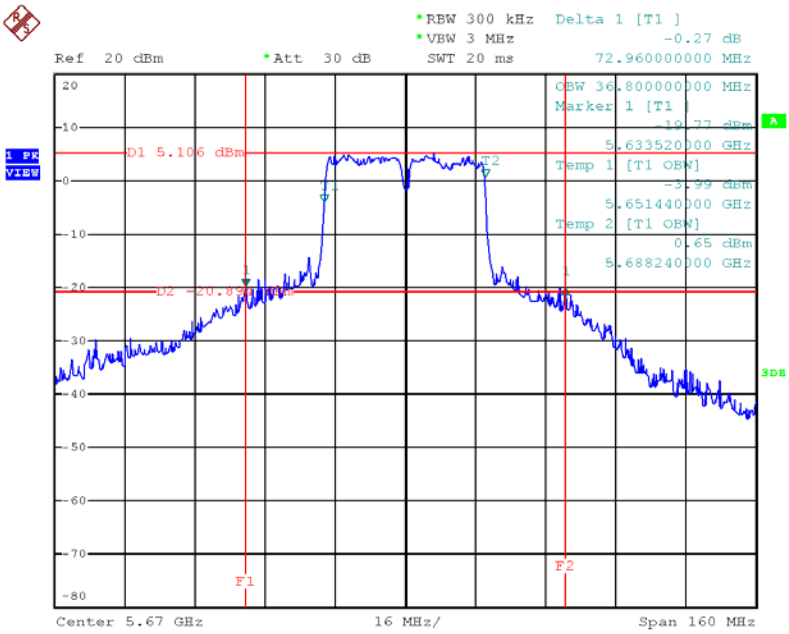
Date: 10.MAR.2013 15:15:37

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5550 MHz / For 1TX



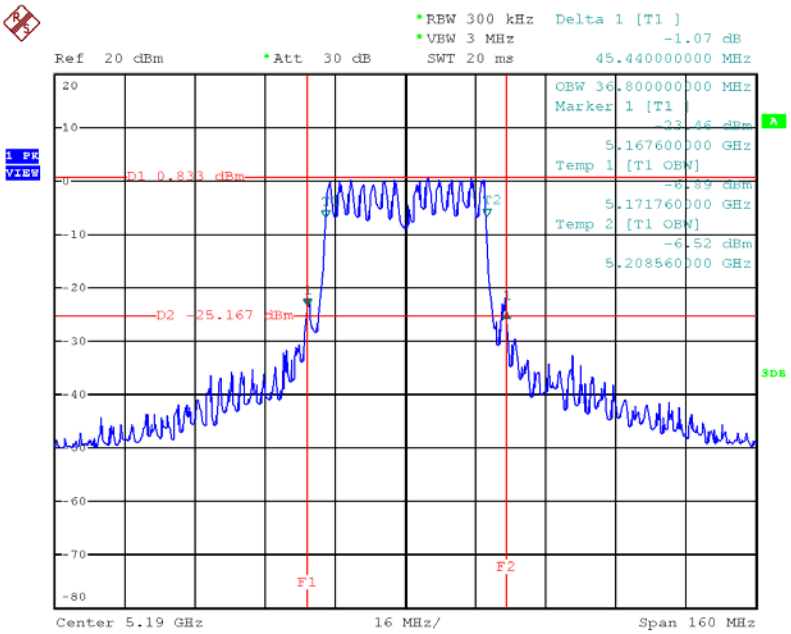
Date: 10.MAR.2013 15:14:24

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5670 MHz / For 1TX



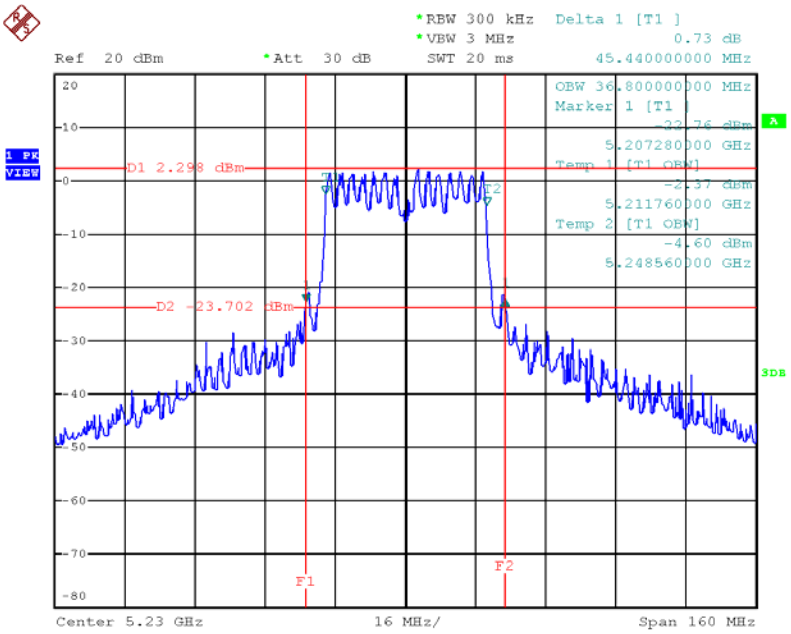
Date: 10.MAR.2013 15:12:32

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5190 MHz / For 2TX



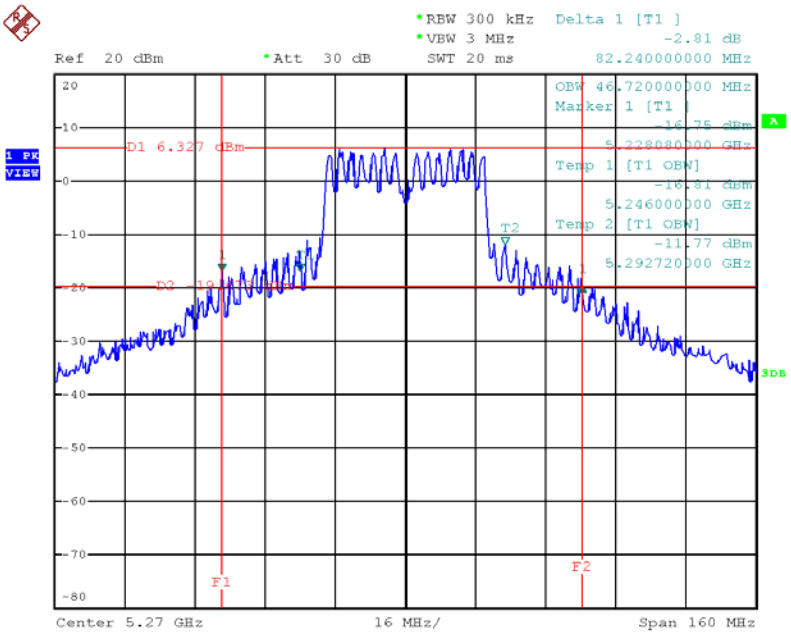
Date: 10.MAR.2013 14:53:11

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5230 MHz / For 2TX



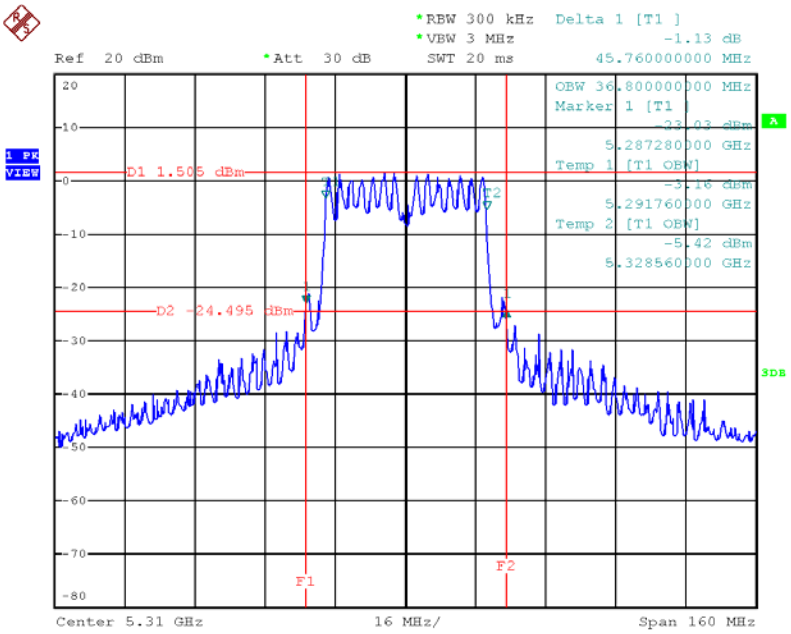
Date: 10.MAR.2013 14:54:57

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5270 MHz / For 2TX



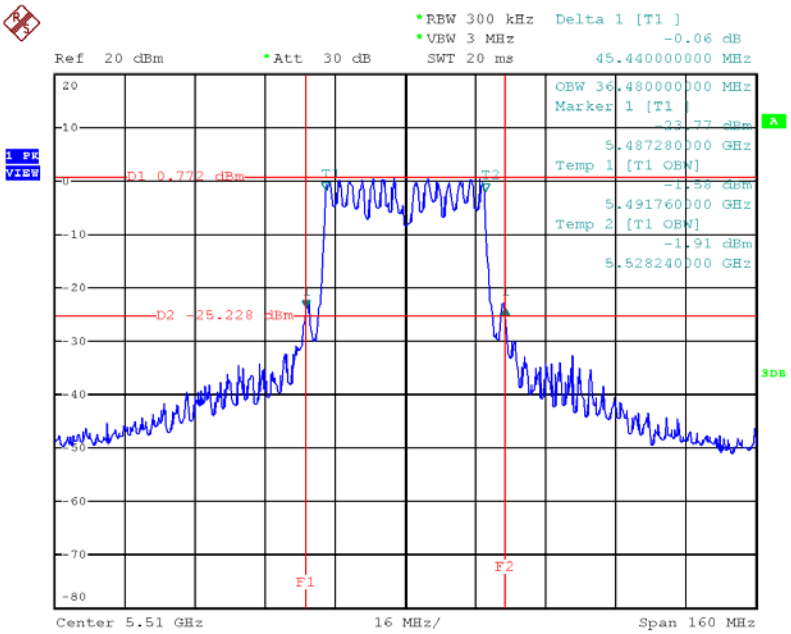
Date: 10.MAR.2013 14:57:15

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5310 MHz / For 2TX



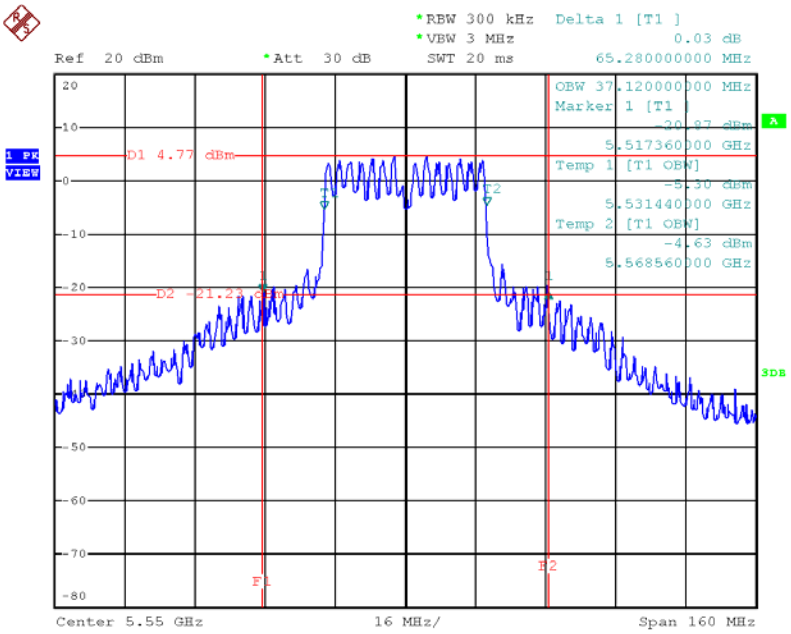
Date: 10.MAR.2013 14:58:35

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5510 MHz / For 2TX



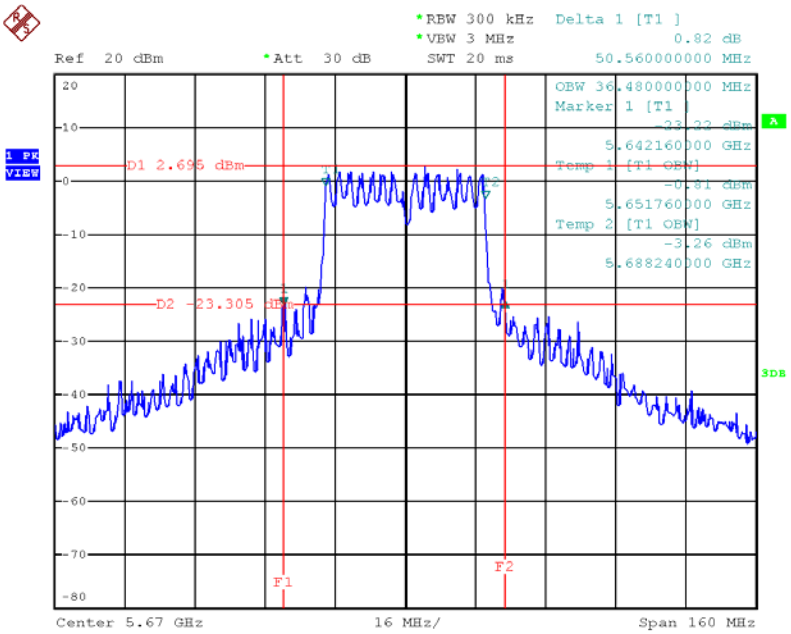
Date: 10.MAR.2013 14:59:46

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5550 MHz / For 2TX



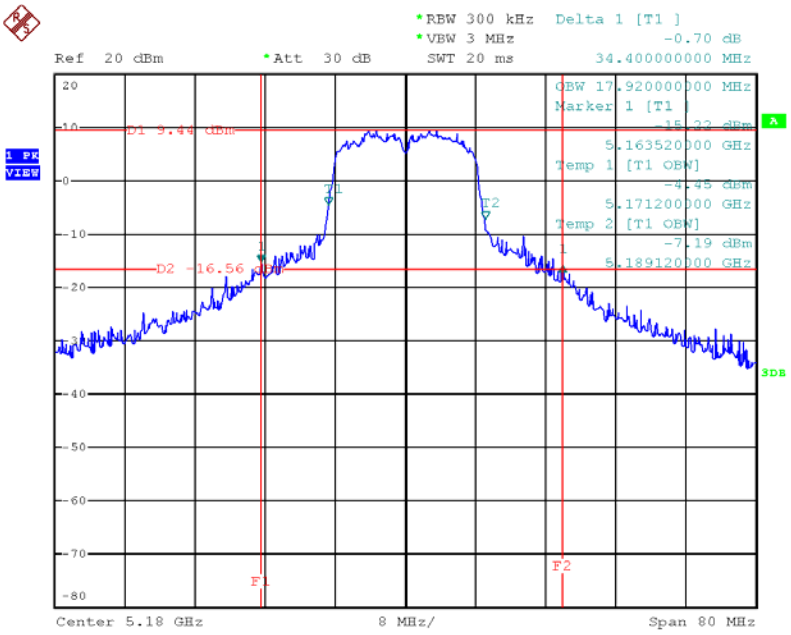
Date: 10.MAR.2013 15:01:14

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5670 MHz / For 2TX



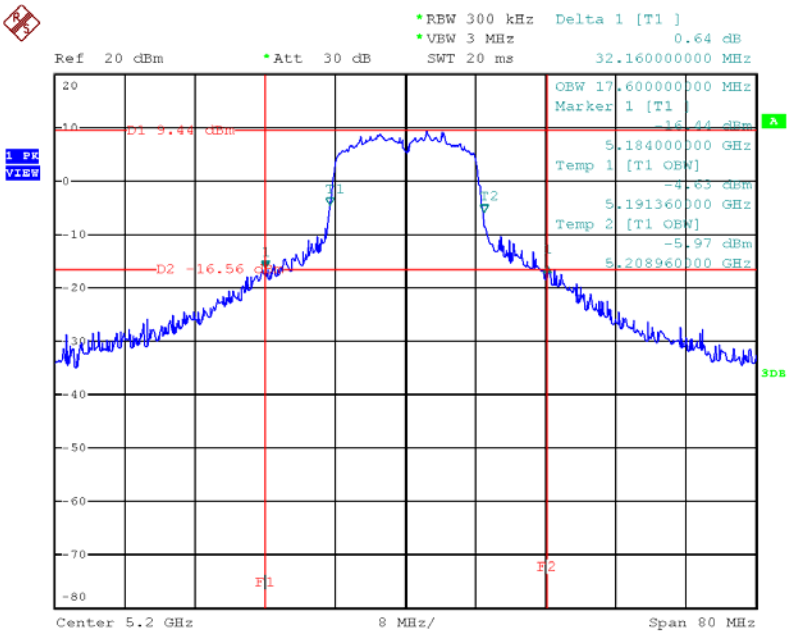
Date: 10.MAR.2013 15:02:57

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5180 MHz



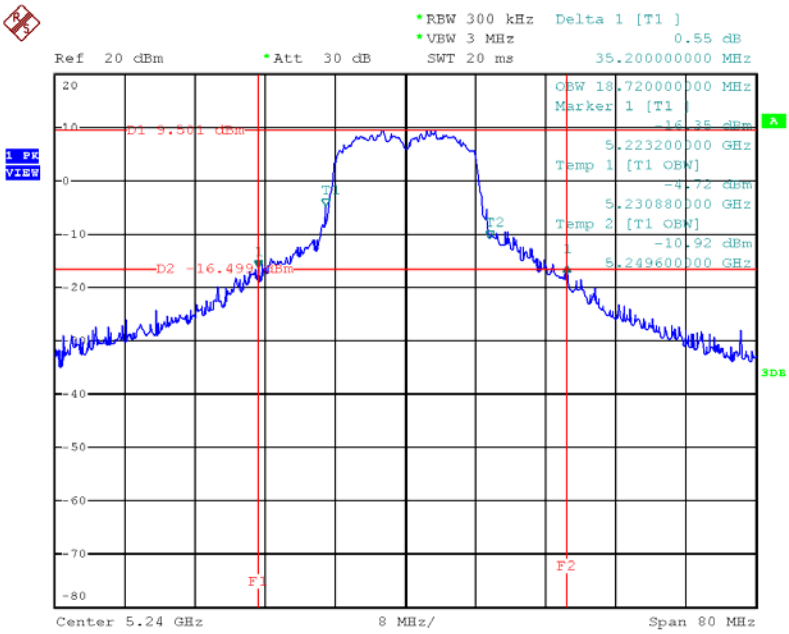
Date: 10.MAR.2013 15:29:51

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5200 MHz



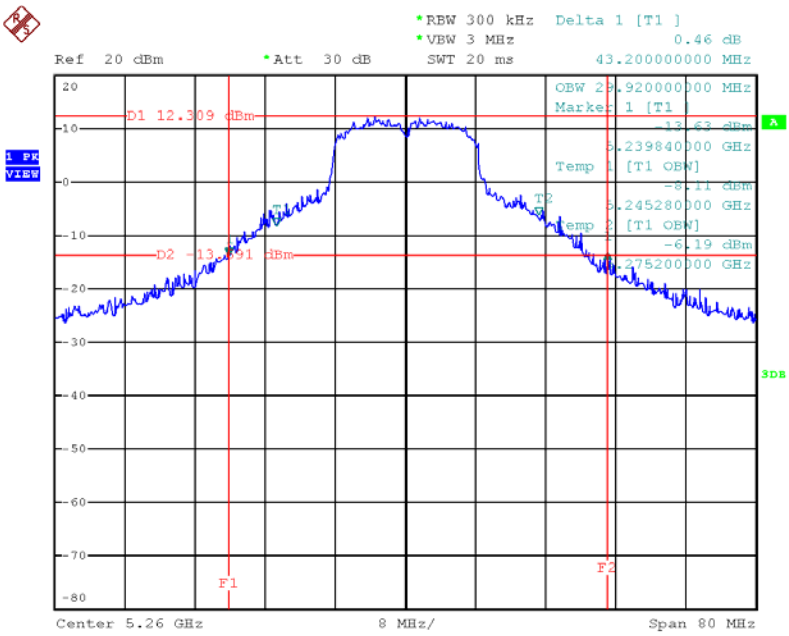
Date: 10.MAR.2013 15:31:06

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5240 MHz



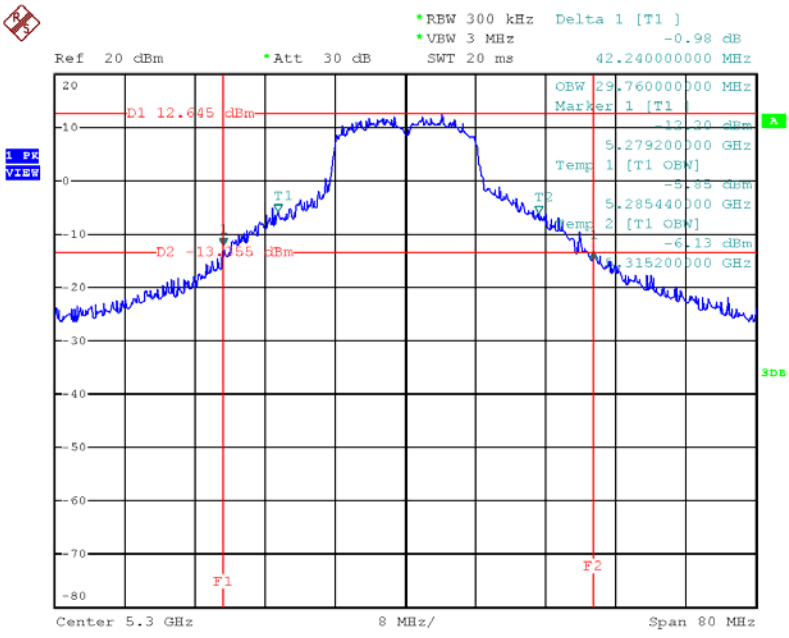
Date: 10.MAR.2013 15:32:06

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5260 MHz



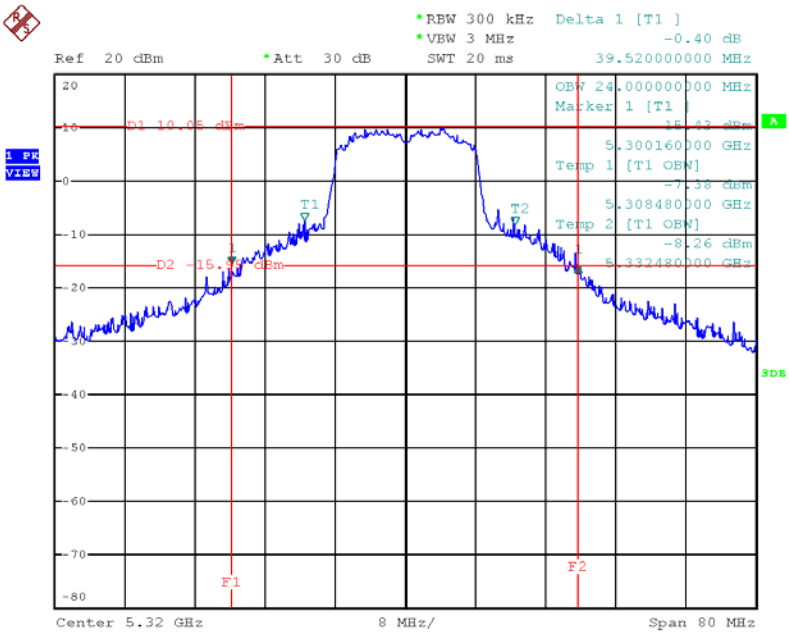
Date: 10.MAR.2013 15:33:16

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5300 MHz



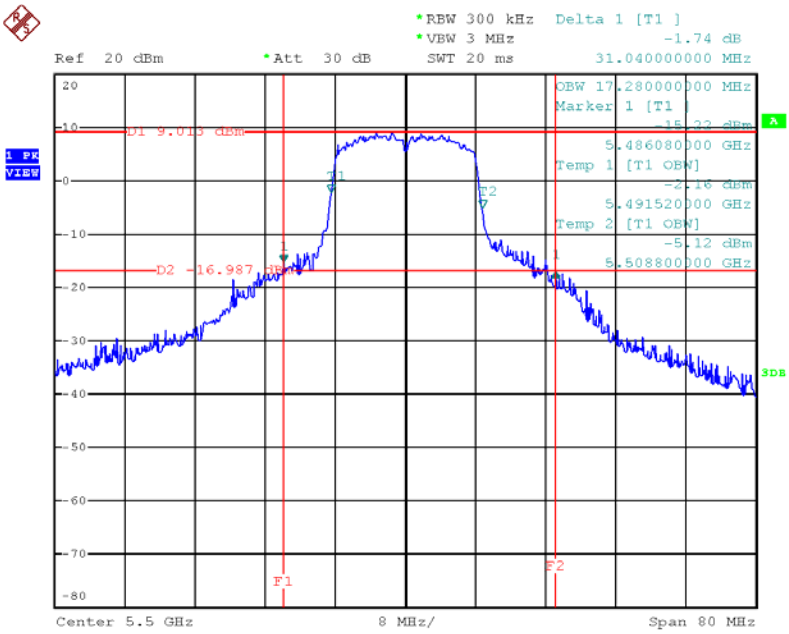
Date: 10.MAR.2013 15:34:24

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5320 MHz



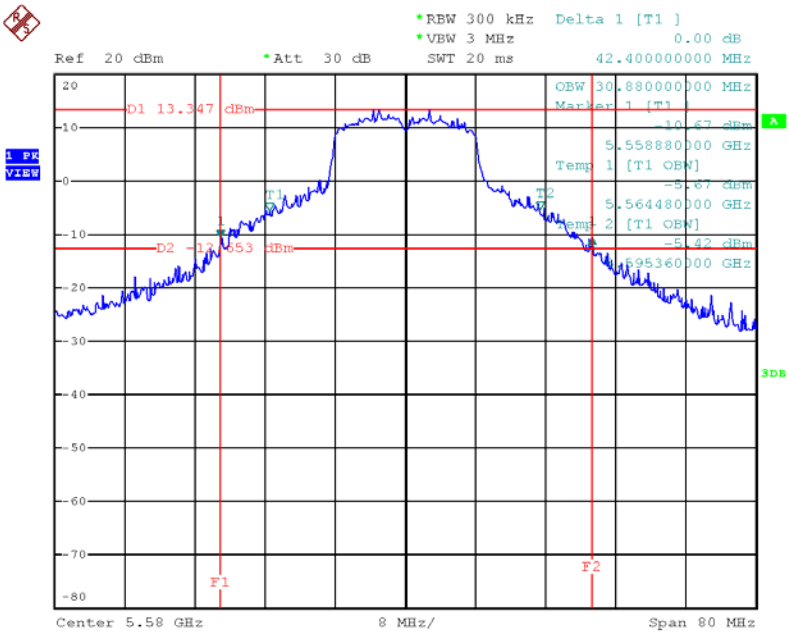
Date: 10.MAR.2013 15:35:28

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5500 MHz



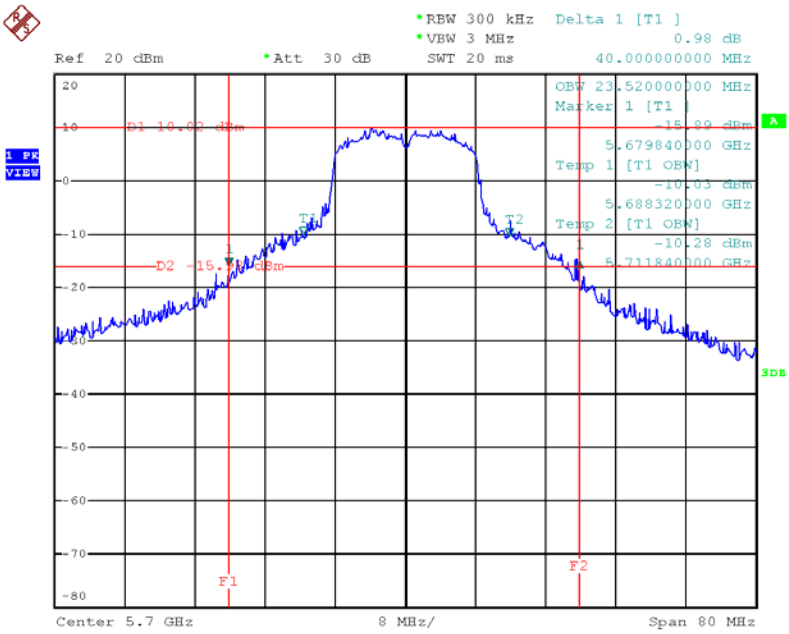
Date: 10.MAR.2013 15:36:38

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5580 MHz



Date: 10.MAR.2013 15:37:44

26 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5700 MHz



Date: 10.MAR.2013 15:38:55

4.3. Maximum Conducted Output Power Measurement

4.3.1. Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.470-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725~5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1ŕMHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

4.3.2. Measuring Instruments and Setting

The following table is the setting of the peak power meter.

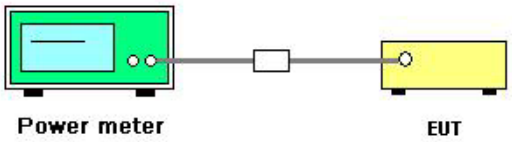
Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	AVERAGE

4.3.3.

4.3.4. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB 789033 Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E,section (C) Maximum conducted output power =>(4) Method PM (Measurement using an RF average power meter) Multiple antenna systems was performed in accordance with KDB 662911 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. When measuring maximum conducted output power with multiple antenna systems,add every result of the values by mathematic formula.

4.3.5. Test Setup Layout



4.3.6. Test Deviation

There is no deviation with the original standard.

4.3.7. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.8. Test Result of Maximum Conducted Output Power

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n
Test Date	Mar. 10, 2013		

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2			
36	5180 MHz	11.57	11.50	14.55	16.98	Complies
40	5200 MHz	12.33	11.16	14.79	16.87	Complies
48	5240 MHz	12.04	11.01	14.57	16.90	Complies
52	5260 MHz	18.92	17.79	21.40	24.00	Complies
60	5300 MHz	17.57	16.32	20.00	24.00	Complies
64	5320 MHz	15.52	14.74	18.16	24.00	Complies
100	5500 MHz	15.27	14.82	18.06	24.00	Complies
116	5580 MHz	19.25	19.04	22.16	24.00	Complies
140	5700 MHz	13.56	14.55	17.09	24.00	Complies

For 1TX

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	14.11	17.00	Complies
46	5230 MHz	16.78	17.00	Complies
54	5270 MHz	19.14	24.00	Complies
62	5310 MHz	15.19	24.00	Complies
102	5510 MHz	13.68	24.00	Complies
110	5550 MHz	17.32	24.00	Complies
134	5670 MHz	17.21	24.00	Complies

For 2TX

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2			
38	5190 MHz	12.72	12.41	15.58	17.00	Complies
46	5230 MHz	13.55	12.83	16.22	17.00	Complies
54	5270 MHz	17.56	16.17	19.93	24.00	Complies
62	5310 MHz	13.31	12.53	15.95	24.00	Complies
102	5510 MHz	12.43	12.32	15.39	24.00	Complies
110	5550 MHz	16.23	15.93	19.09	24.00	Complies
134	5670 MHz	14.24	15.14	17.72	24.00	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a
Test Date	Mar. 10, 2013		

Configuration IEEE 802.11a / Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	16.67	17.00	Complies
40	5200 MHz	16.92	17.00	Complies
48	5240 MHz	16.93	17.00	Complies
52	5260 MHz	20.98	24.00	Complies
60	5300 MHz	19.94	24.00	Complies
64	5320 MHz	18.49	24.00	Complies
100	5500 MHz	16.83	24.00	Complies
116	5580 MHz	20.26	24.00	Complies
140	5700 MHz	17.62	24.00	Complies

4.4. Power Spectral Density Measurement

4.4.1. Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5470-5725	11

4.4.2. Measuring Instruments and Setting

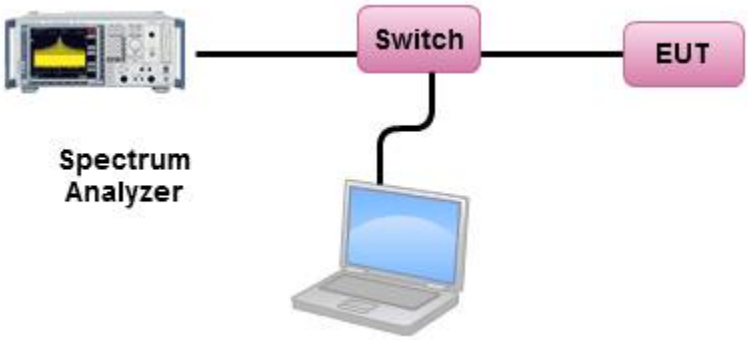
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	RMS
Trace	AVERAGE
Sweep Time	Auto
Trace Average	100 times

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB 789033 Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E,section (C) Maximum conducted output power => (d) Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).
3. Multiple antenna systems was performed in accordance with KDB 662911 in-Band Power Spectral Density (PSD) Measurements (1) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Power Spectral Density

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n
Test Date	Mar. 10, 2013		

Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	1.37	1.39	Complies
40	5200 MHz	1.25	1.39	Complies
48	5240 MHz	1.13	1.39	Complies
52	5260 MHz	8.32	8.39	Complies
60	5300 MHz	7.48	8.39	Complies
64	5320 MHz	5.10	8.39	Complies
100	5500 MHz	5.36	9.79	Complies
116	5580 MHz	9.65	9.79	Complies
140	5700 MHz	4.39	9.79	Complies

Note:

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =8.61dBi >6dBi, so Band 1 limit =4–(8.61–6) =1.39 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =8.61dBi >6dBi, so Band 2 limit =11–(8.61–6)=8.39 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =7.21dBi >6dBi, so Band 3 limit =11–(7.21–6)=9.79 dBm/MHz

For 1TX

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-2.01	4.00	Complies
46	5230 MHz	1.24	4.00	Complies
54	5270 MHz	3.56	11.00	Complies
62	5310 MHz	-1.36	11.00	Complies
102	5510 MHz	-2.50	11.00	Complies
110	5550 MHz	1.41	11.00	Complies
134	5670 MHz	0.83	11.00	Complies

Note:

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =5.60dBi <6dBi, so Band 1 limit =4 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =5.60dBi <6dBi, so Band 2 limit =11 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =4.20dBi <6dBi, so Band 3 limit =11 dBm/MHz

For 2TX

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-0.78	1.39	Complies
46	5230 MHz	0.16	1.39	Complies
54	5270 MHz	3.93	8.39	Complies
62	5310 MHz	-0.48	8.39	Complies
102	5510 MHz	-0.61	9.79	Complies
110	5550 MHz	3.57	9.79	Complies
134	5670 MHz	1.70	9.79	Complies

Note:

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =8.61dBi >6dBi, so Band 1 limit =4–(8.61–6) =1.39 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =8.61dBi >6dBi, so Band 2 limit =11–(8.61–6)=8.39 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =7.21dBi >6dBi, so Band 3 limit =11–(7.21–6)=9.79 dBm/MHz

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a
Test Date	Mar. 10, 2013		

Configuration IEEE 802.11a / Ant. 1

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	3.73	4.00	Complies
40	5200 MHz	3.90	4.00	Complies
48	5240 MHz	3.92	4.00	Complies
52	5260 MHz	8.32	11.00	Complies
60	5300 MHz	7.19	11.00	Complies
64	5320 MHz	5.46	11.00	Complies
100	5500 MHz	4.00	11.00	Complies
116	5580 MHz	7.98	11.00	Complies
140	5700 MHz	4.60	11.00	Complies

Note:

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =5.60dBi <6dBi, so Band 1 limit =4 dBm/MHz

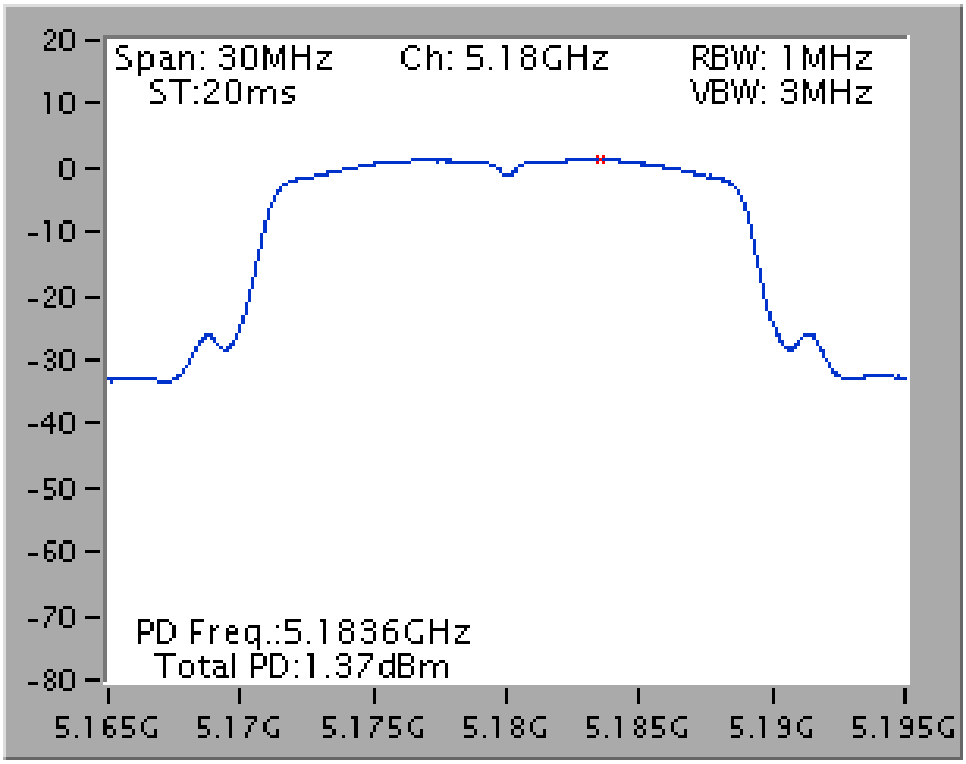
Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =5.60dBi <6dBi, so Band 2 limit =11 dBm/MHz

Directional gain=G_{ANT}+10log(N_{ANT}/Nss) =4.20dBi <6dBi, so Band 3 limit =11 dBm/MHz

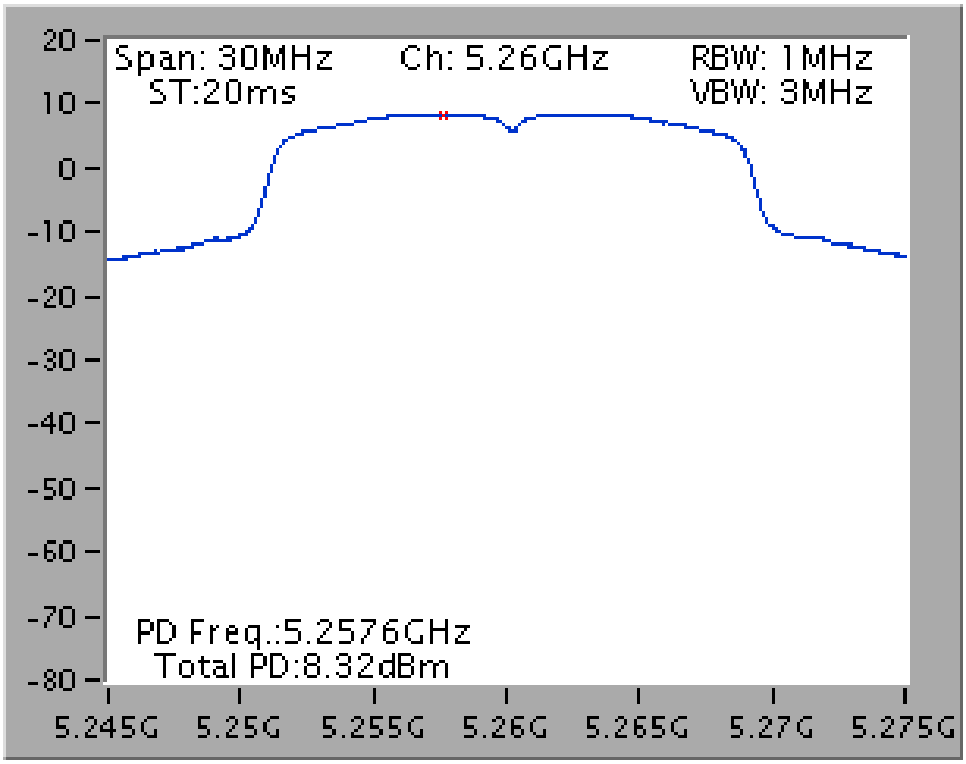
Note: All the test values were listed in the report.

For plots, only the channel with maximum results was shown.

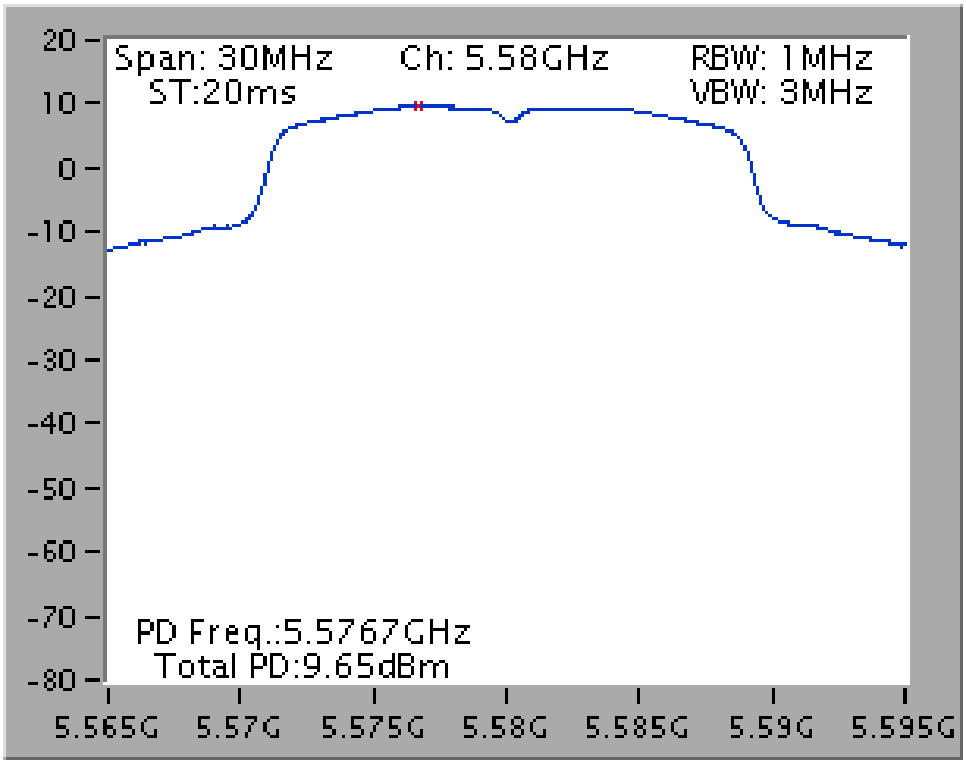
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Chan 1+ Ant. 2 / 5180 MHz



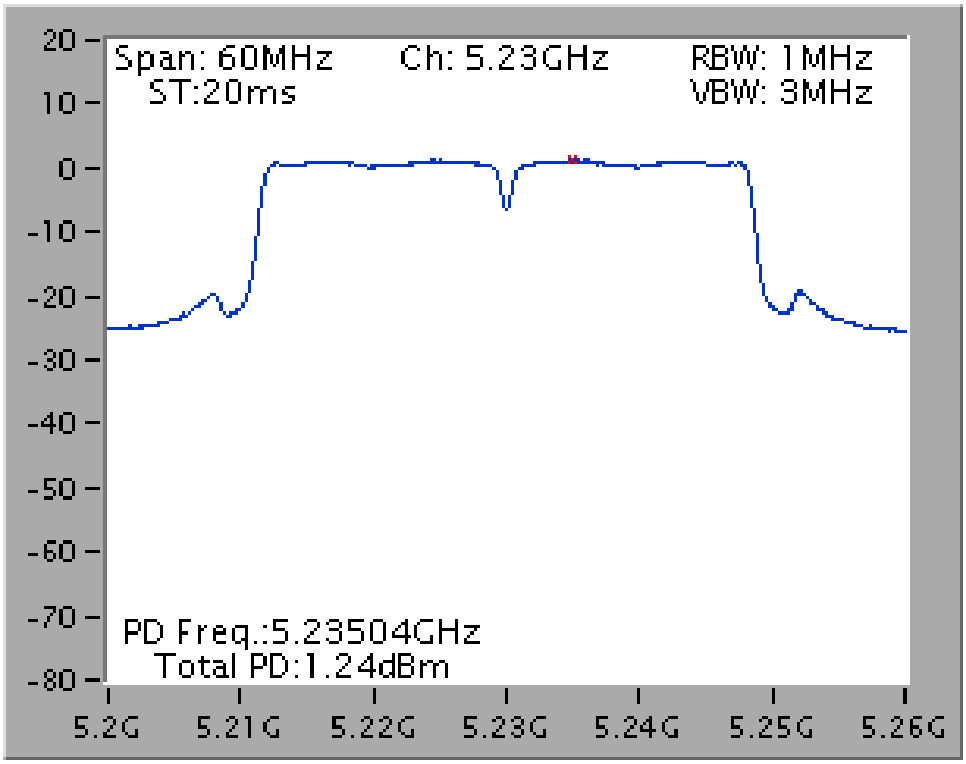
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5260 MHz



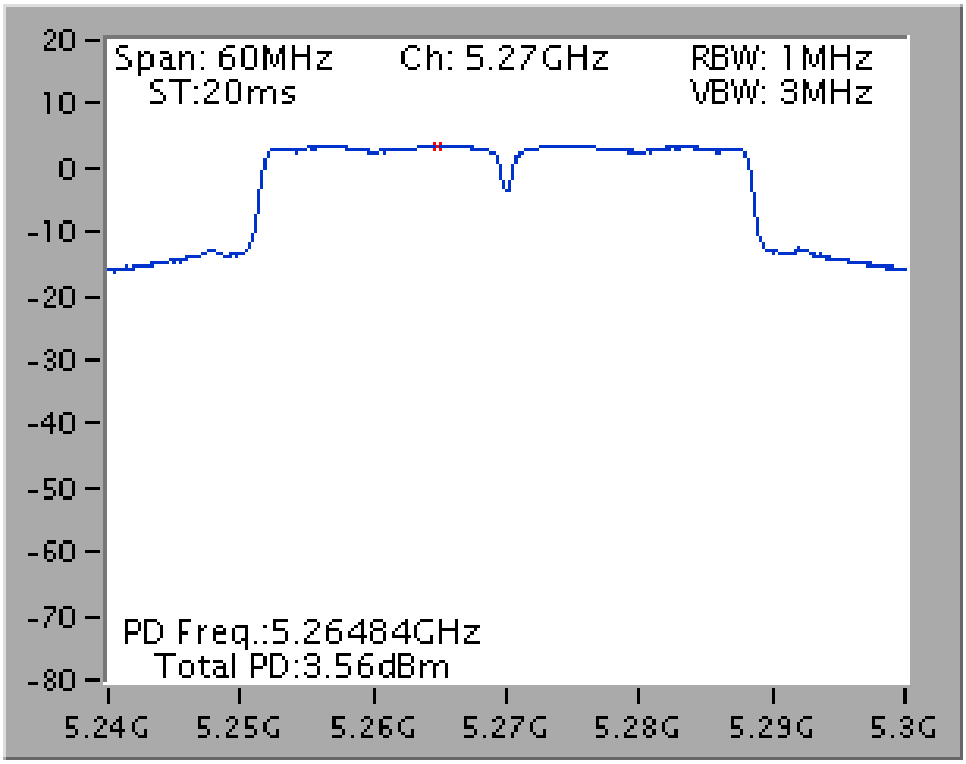
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5580 MHz



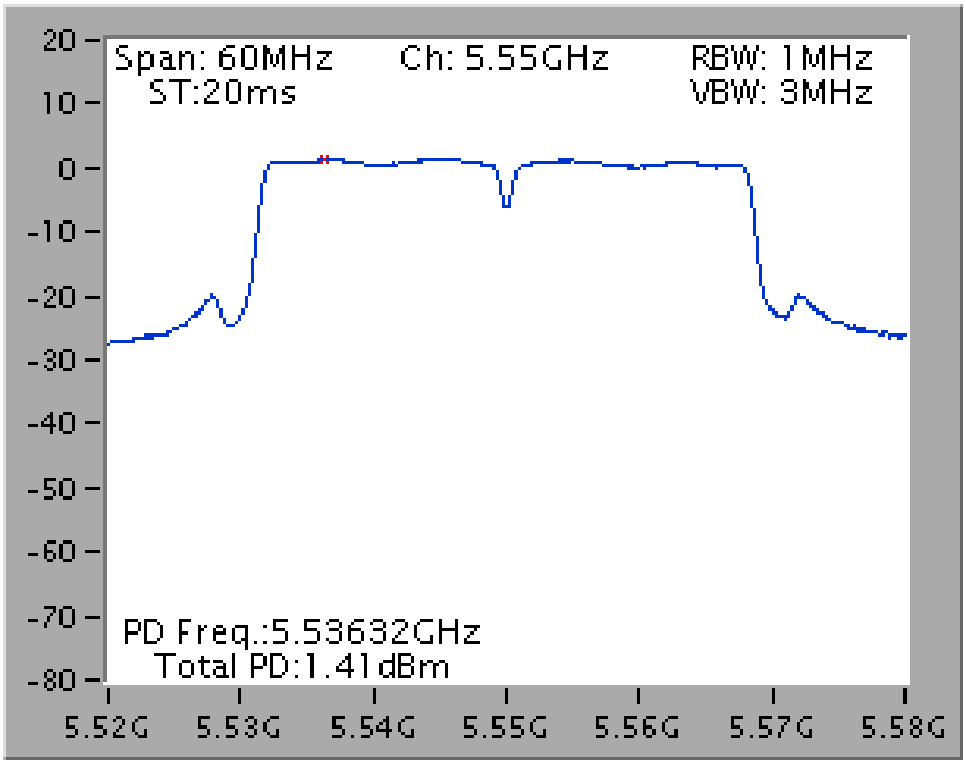
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5230 MHz / For 1TX



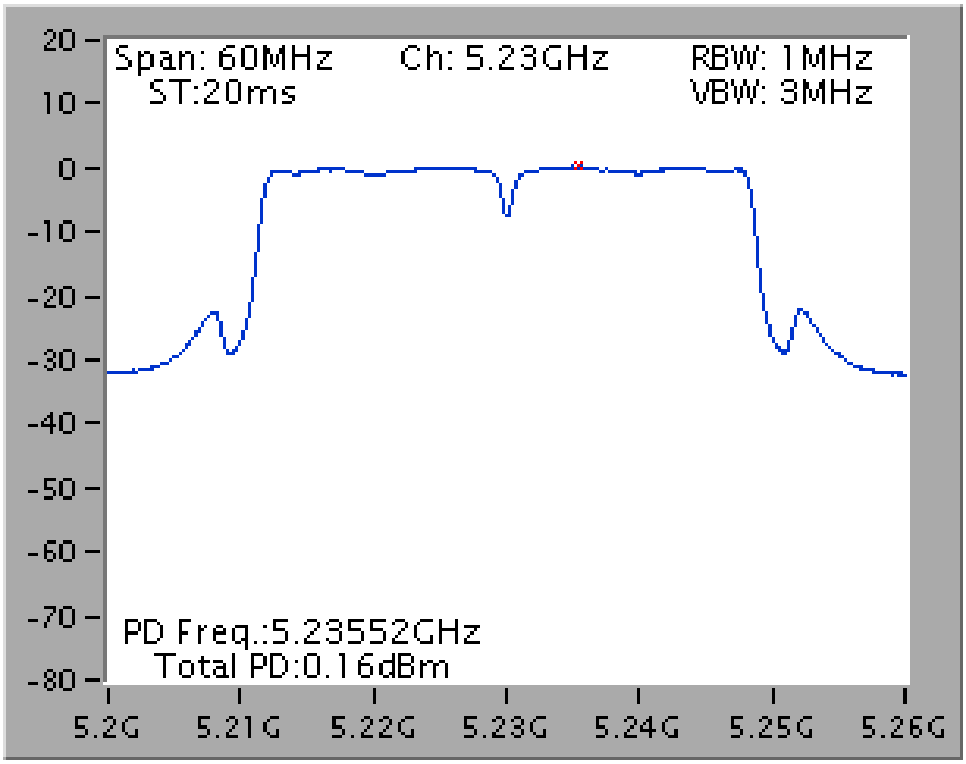
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5270 MHz / For 1TX



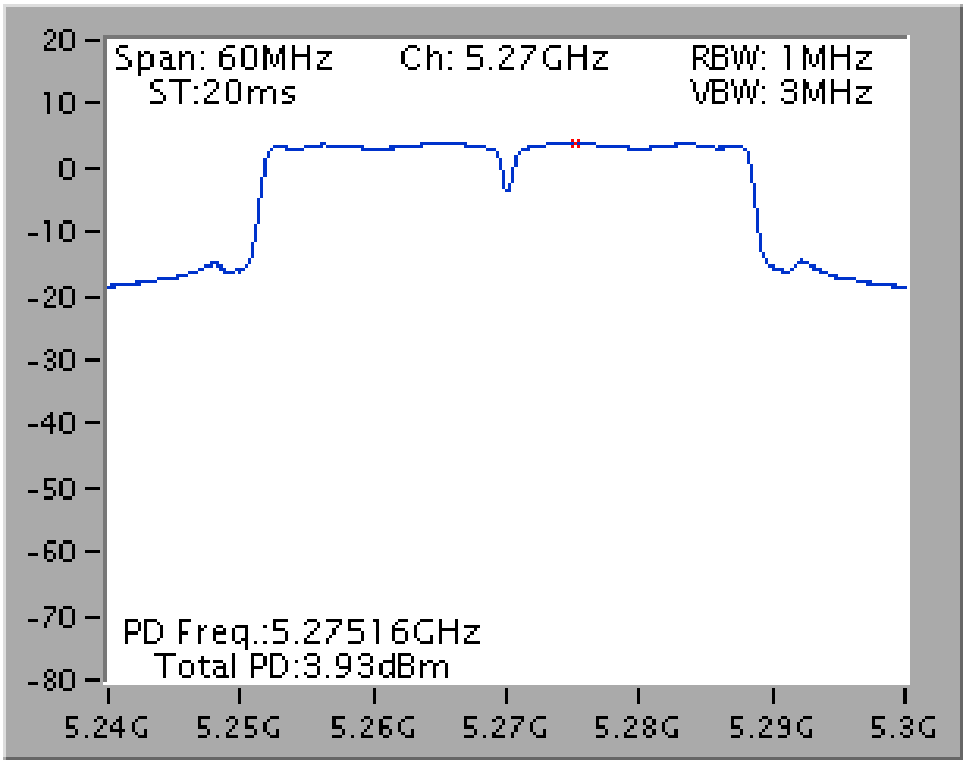
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5550 MHz / For 1TX



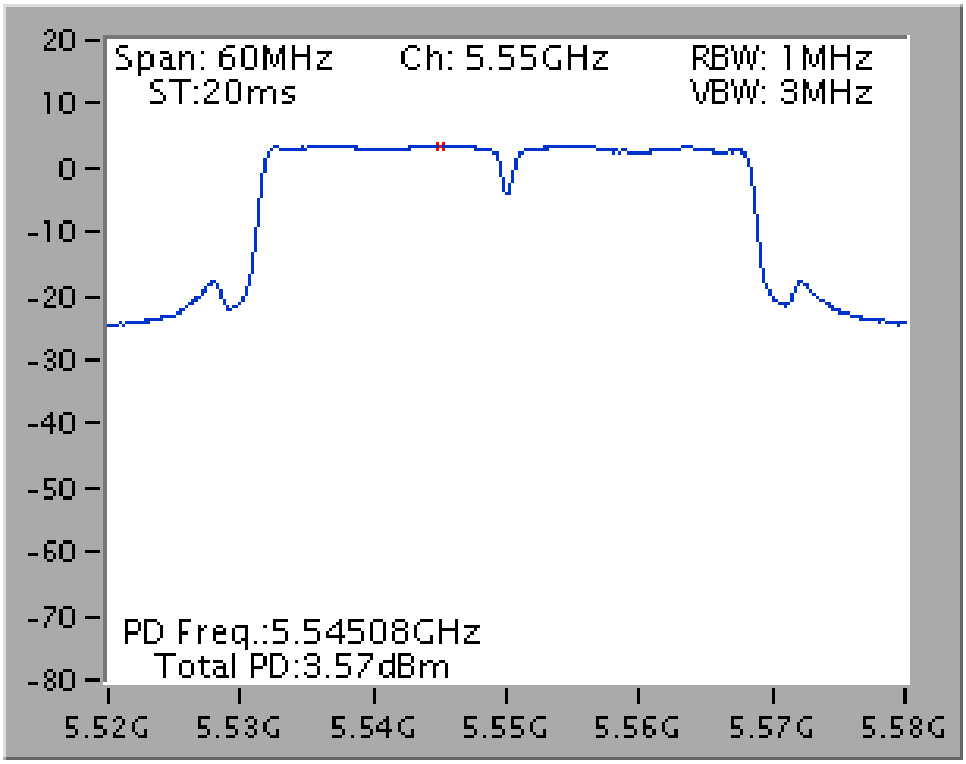
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5230 MHz / For 2TX



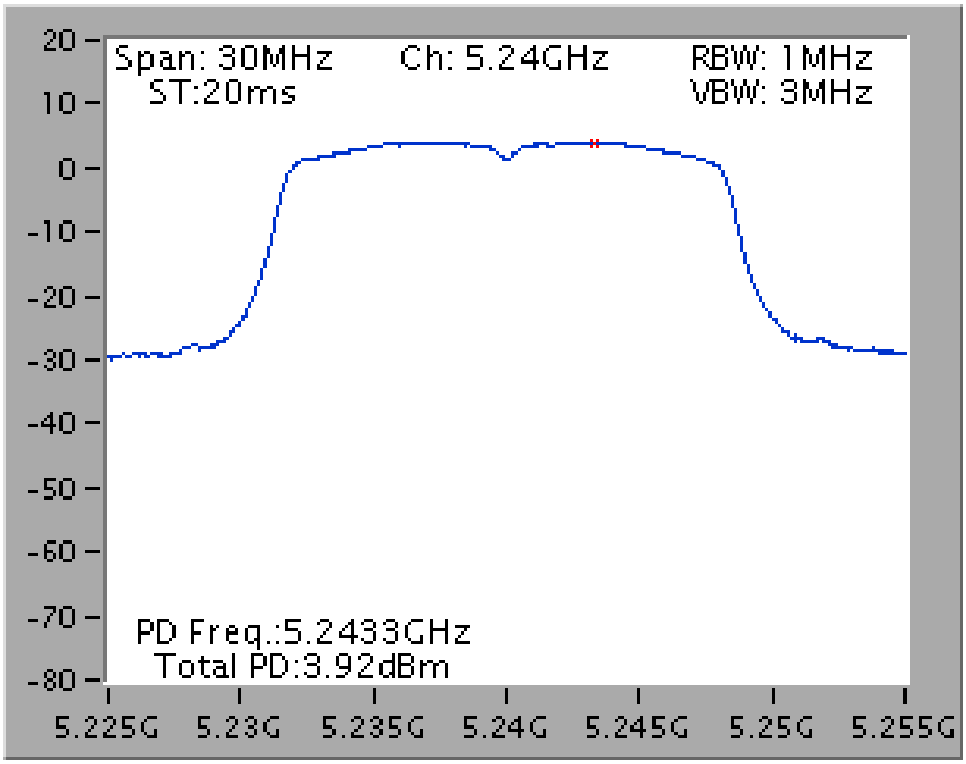
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5270 MHz / For 2TX



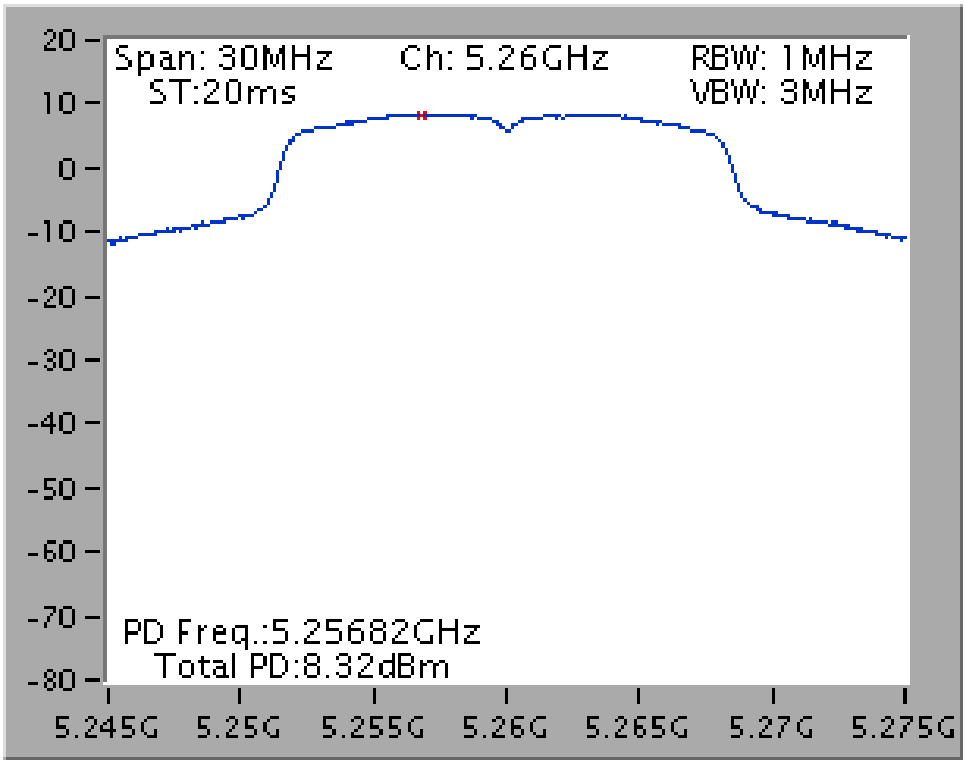
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5550 MHz / For 2TX



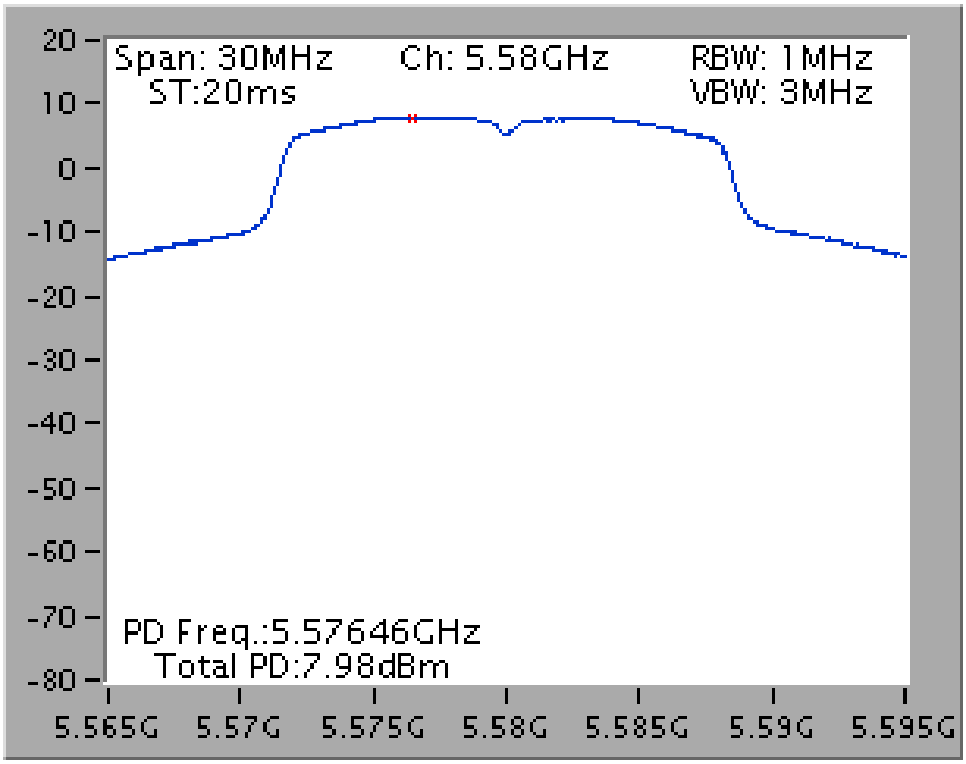
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5240 MHz



Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5260 MHz



Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5580 MHz



4.5. Peak Excursion Measurement

4.5.1. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

4.5.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1MHz (Peak Trace) / 1MHz (Average Trace)
VB	3MHz (Peak Trace) / 3MHz (Average Trace)
Detector	Peak (Peak Trace) / RMS (Average Trace)
Trace	Peak : Trace :Max hold/Average: Trace Average Sweep Count 100
Sweep Time	AUTO

4.5.3. Test Procedures

1. The test procedure is the same as section 4.6.3.
2. Trace A, Set RBW =1MHz, VBW = 3MHz, Span >26dB bandwidth, Max. hold.
3. Delta Mark trace A Maximum frequency and trace B same frequency.
4. Repeat the above procedure until measurements for all frequencies were complete.

4.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.6.4.

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Peak Excursion

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
40	5200 MHz	8.87	13	Complies
52	5260 MHz	8.27	13	Complies
116	5580 MHz	8.84	13	Complies

For 1TX

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
46	5230 MHz	10.34	13	Complies
54	5270 MHz	9.36	13	Complies
110	5550 MHz	9.96	13	Complies

For 2TX

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2

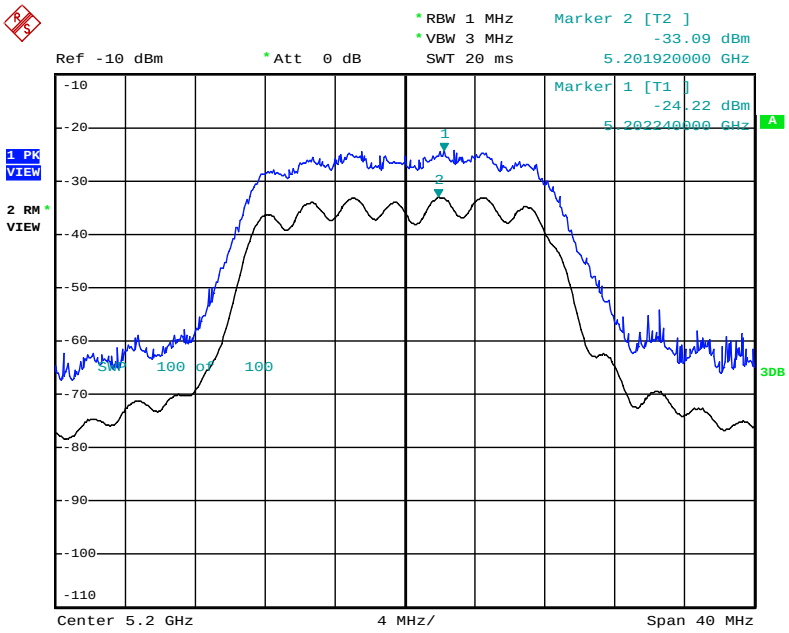
Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
46	5230 MHz	9.13	13	Complies
54	5270 MHz	8.51	13	Complies
110	5550 MHz	8.87	13	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Ant. 1

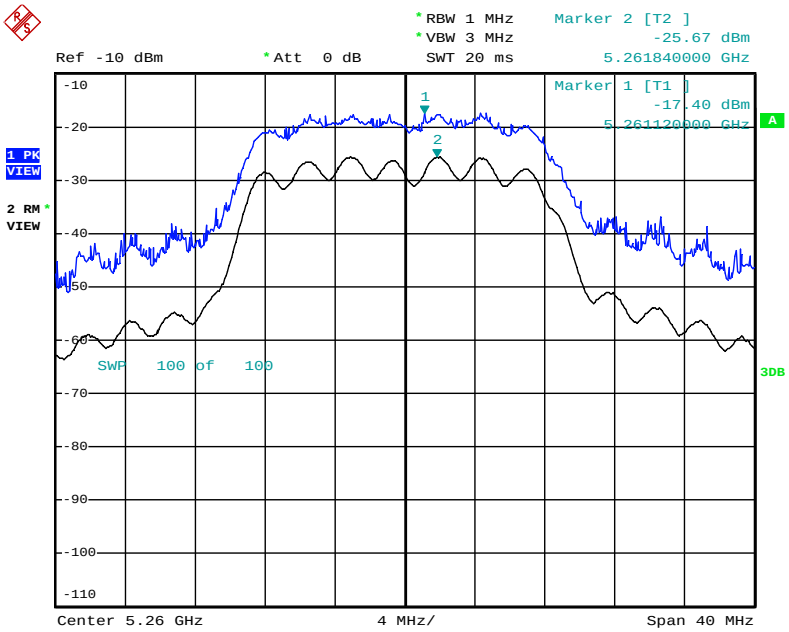
Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
48	5240 MHz	9.56	13	Complies
52	5260 MHz	8.76	13	Complies
116	5580 MHz	8.87	13	Complies

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5200 MHz



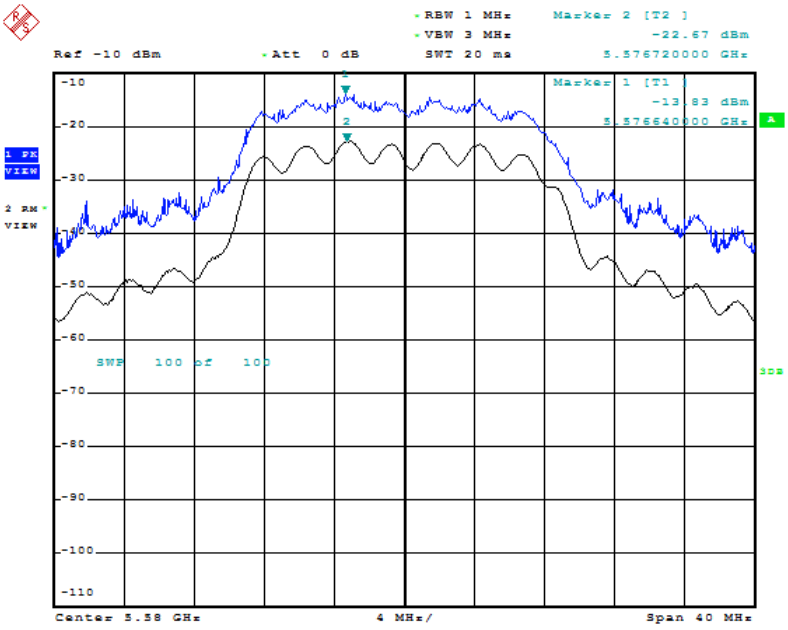
Date: 11.MAR.2013 16:19:11

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5260 MHz



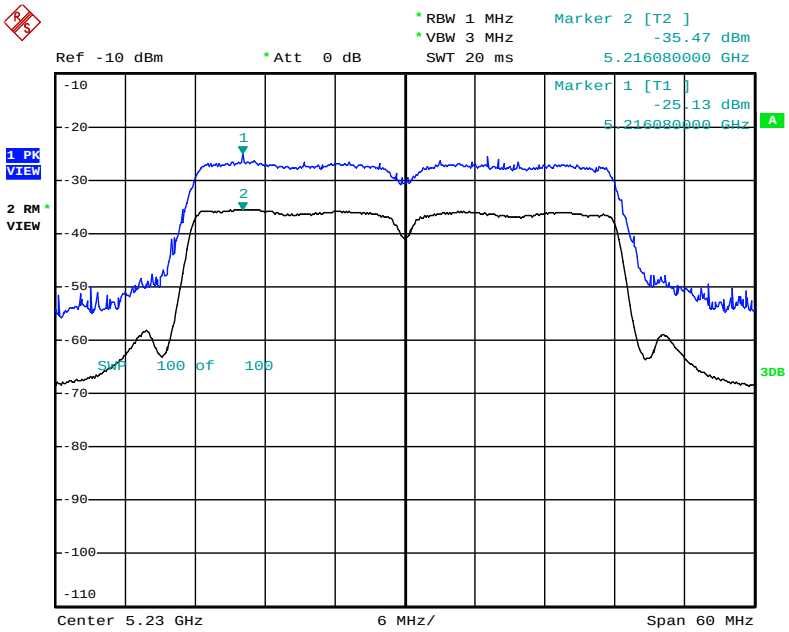
Date: 11.MAR.2013 16:19:58

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5580 MHz



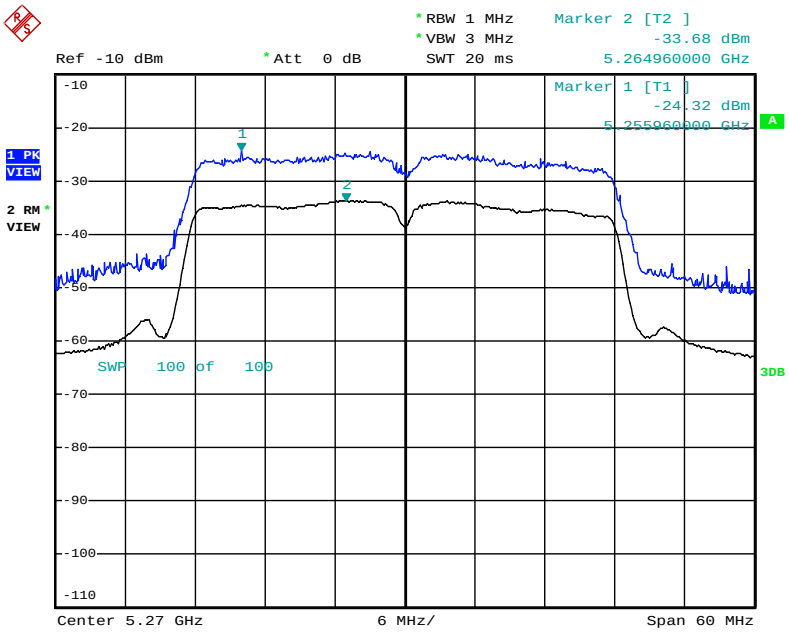
Date: 11.MAR.2013 16:20:48

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5230 MHz / For 1TX



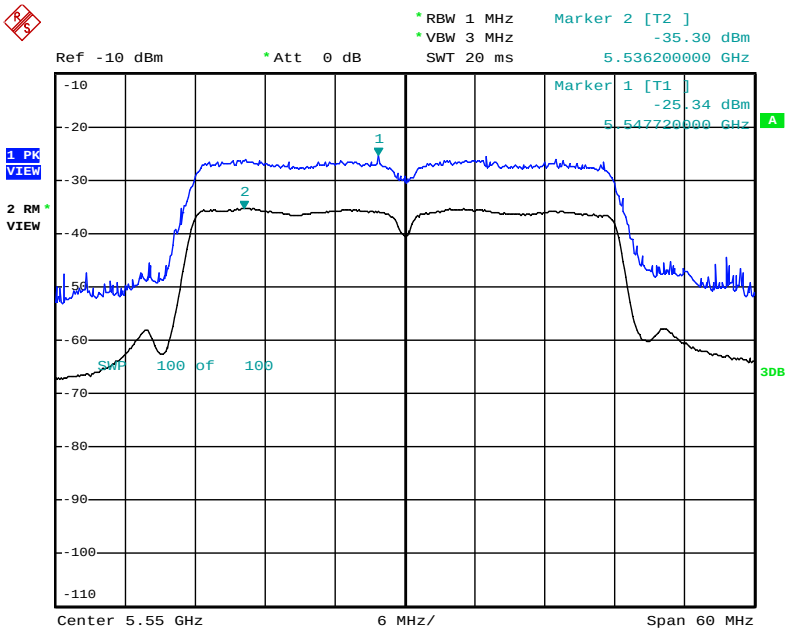
Date: 11.MAR.2013 13:48:55

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5270 MHz / For 1TX



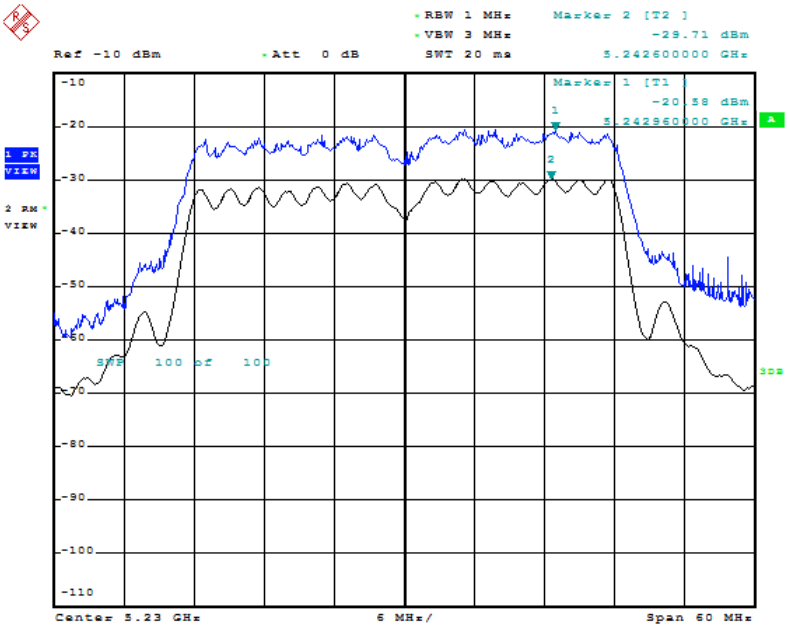
Date: 11.MAR.2013 13:49:40

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 5550 MHz / For 1TX



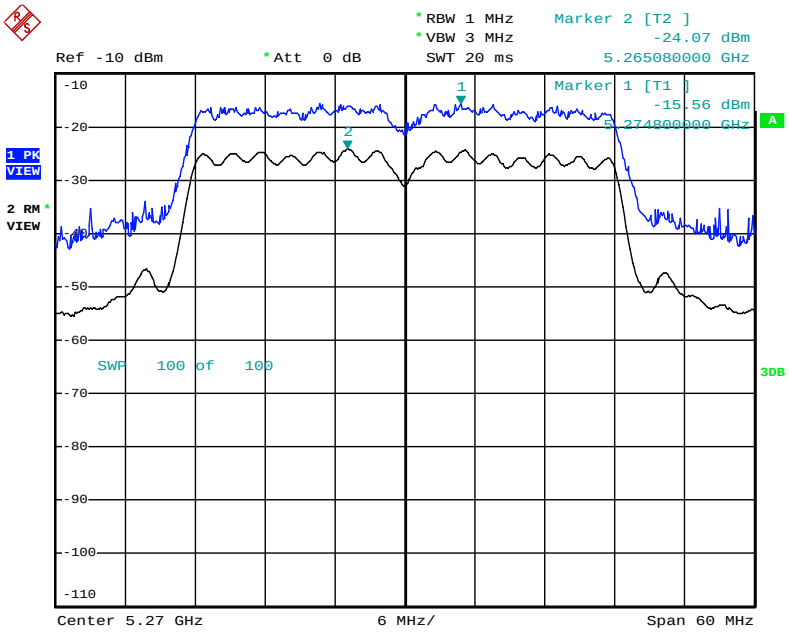
Date: 11.MAR.2013 13:50:18

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5230 MHz / For 2TX



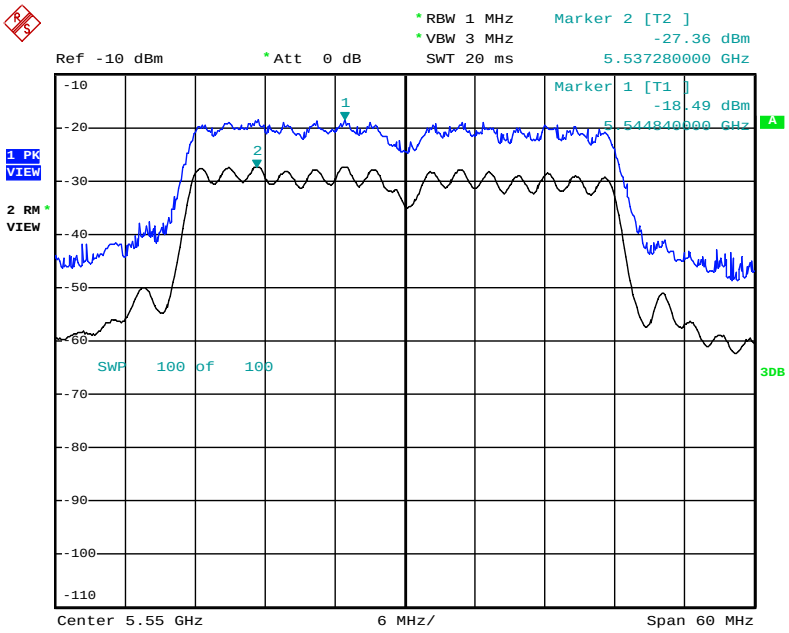
Date: 11.MAR.2013 13:53:07

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5270 MHz / For 2TX



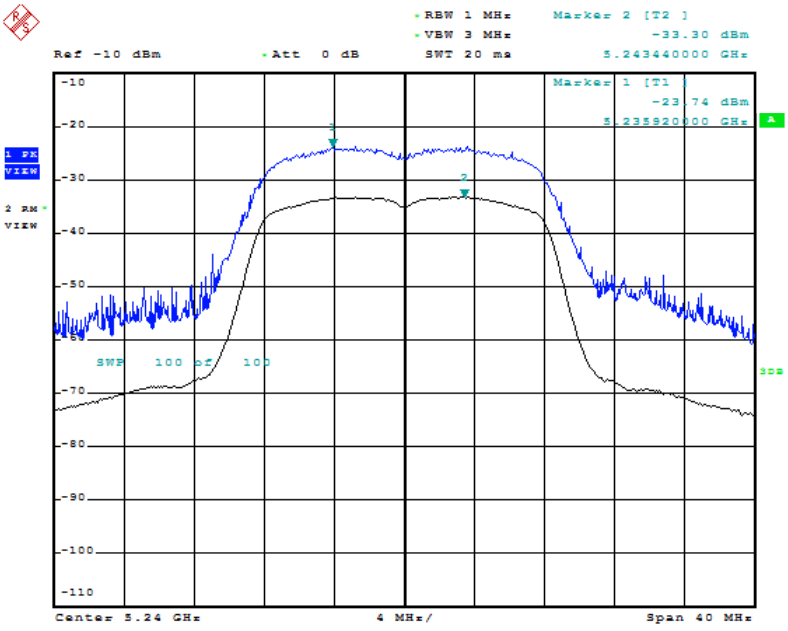
Date: 11.MAR.2013 13:52:21

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5550 MHz / For 2TX



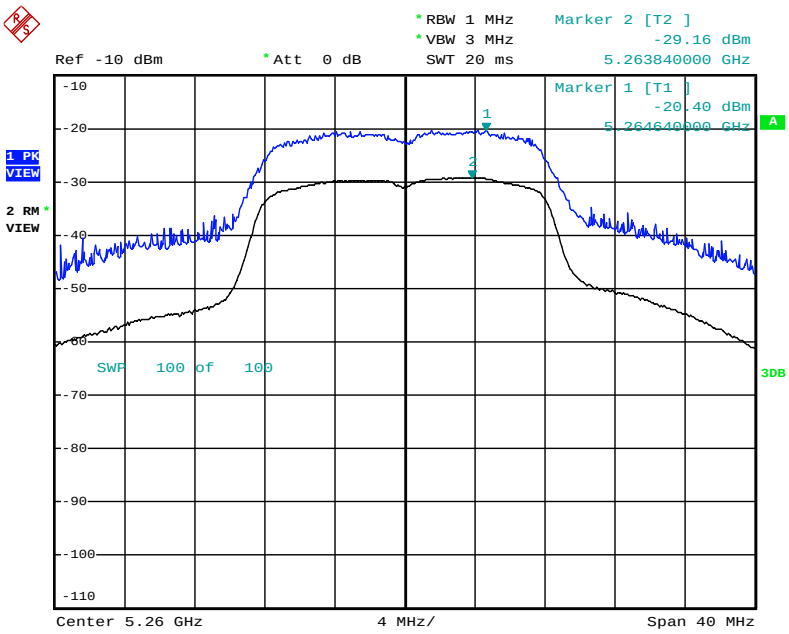
Date: 11.MAR.2013 13:51:22

Peak Excursion Plot on Configuration IEEE 802.11a / Ant. 1 / 5240 MHz



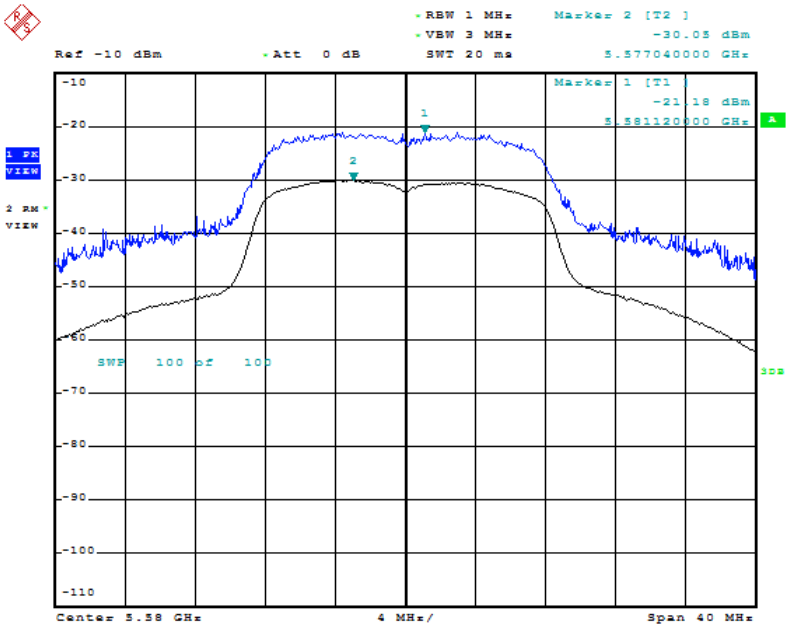
Date: 11.MAR.2013 13:45:59

Peak Excursion Plot on Configuration IEEE 802.11a / Ant. 1 / 5260 MHz



Date: 11.MAR.2013 13:46:40

Peak Excursion Plot on Configuration IEEE 802.11a / Ant. 1 / 5580 MHz



Date: 11.MAR.2013 13:47:24

4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m). For frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 3MHz for peak

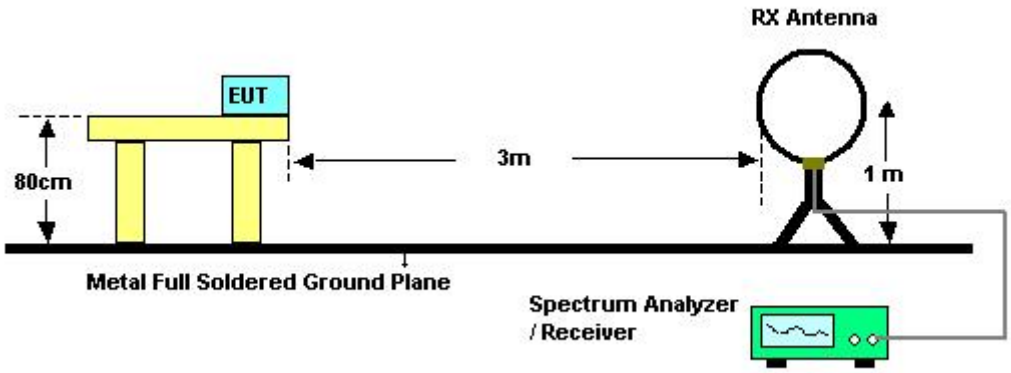
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.6.3. Test Procedures

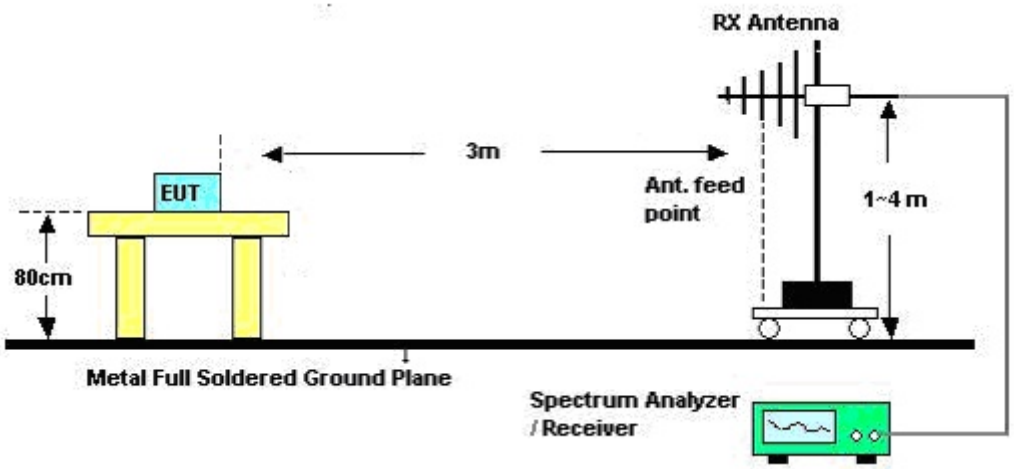
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.6.4. Test Setup Layout

For radiated emissions below 1GHz



For radiated emissions above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	CTX
Test Date	Mar. 19, 2013		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

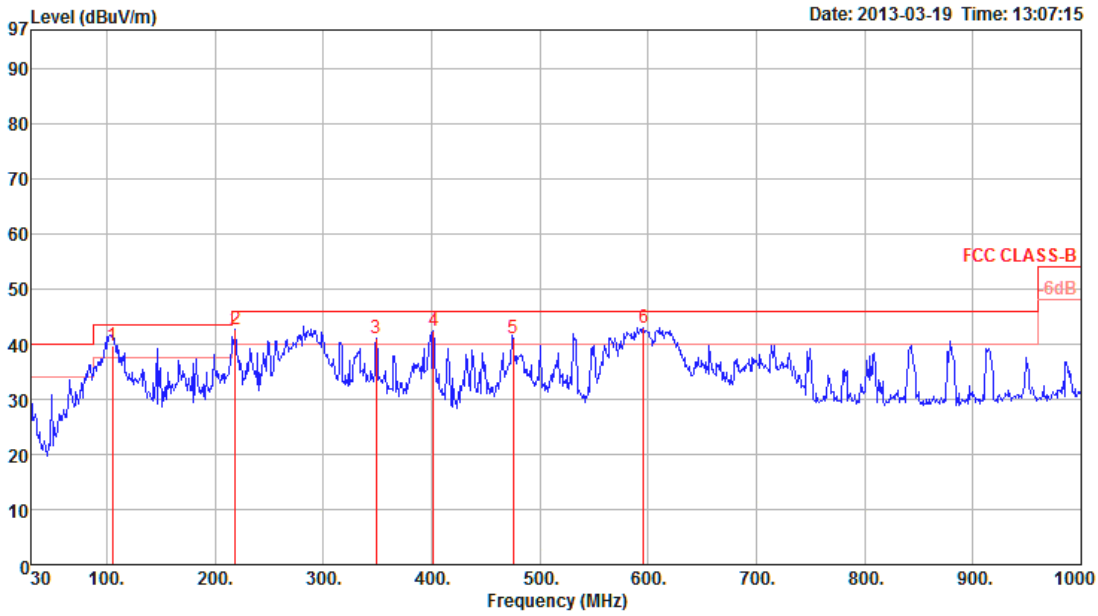
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.6.8. Results of Radiated Emissions (30MHz~1GHz)

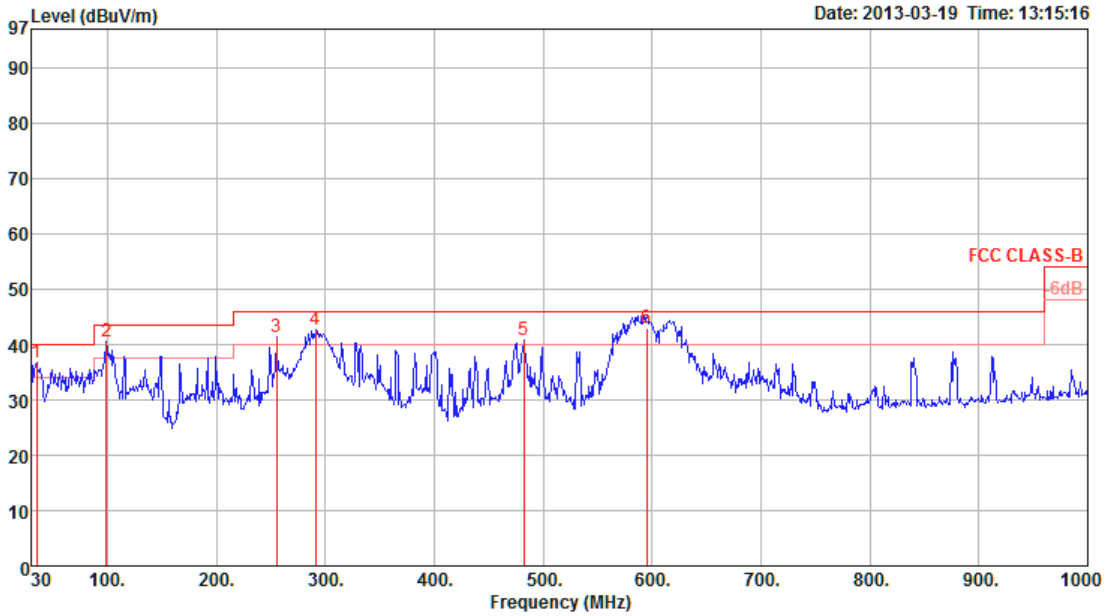
Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	CTX

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1 q	105.00	39.76	43.50	-3.74	54.00	1.53	27.77	12.00	QP	115	100	HORIZONTAL
2 !	219.15	42.69	46.00	-3.31	56.96	2.25	27.12	10.60	Peak	0	100	HORIZONTAL
3 !	349.13	40.96	46.00	-5.04	49.97	2.79	27.07	15.27	Peak	0	100	HORIZONTAL
4 !	401.51	42.41	46.00	-3.59	50.38	2.99	27.48	16.52	Peak	0	100	HORIZONTAL
5 !	475.23	41.19	46.00	-4.81	48.37	3.31	27.89	17.40	Peak	0	100	HORIZONTAL
6 p	595.51	42.96	46.00	-3.04	47.63	3.71	27.63	19.25	Peak	0	100	HORIZONTAL

Vertical



		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	!	34.85	36.63	40.00	-3.37	46.81	0.92	28.00	16.90	Peak	0	400	VERTICAL
2	p	98.87	40.49	43.50	-3.01	55.63	1.49	27.82	11.19	Peak	0	400	VERTICAL
3	!	255.04	41.42	46.00	-4.58	52.70	2.41	26.94	13.25	Peak	0	400	VERTICAL
4	!	290.93	42.70	46.00	-3.30	53.23	2.52	26.85	13.80	Peak	0	400	VERTICAL
5	!	482.02	40.73	46.00	-5.27	47.79	3.33	27.90	17.51	Peak	0	400	VERTICAL
6	q	595.00	42.94	46.00	-3.06	47.62	3.71	27.63	19.24	QP	143	100	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.6.9. Results for Radiated Emissions (1GHz~40GHz)

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 36 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15516.04	39.21	54.00	-14.79	30.69	6.13	37.68	35.29	Average	100	89	HORIZONTAL
2	15544.81	51.93	74.00	-22.07	43.46	6.13	37.65	35.31	Peak	100	89	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15536.15	41.90	54.00	-12.10	33.33	6.13	37.73	35.29	Average	100	184	VERTICAL
2	15537.60	53.08	74.00	-20.92	44.51	6.13	37.73	35.29	Peak	100	184	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 40 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15597.60	50.24	74.00	-23.76	41.85	6.13	37.60	35.34	Peak	100	233	HORIZONTAL
2	15600.10	38.08	54.00	-15.92	29.69	6.13	37.60	35.34	Average	100	233	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15595.67	54.76	74.00	-19.24	46.37	6.13	37.60	35.34	Peak	100	163	VERTICAL
2	15600.83	42.54	54.00	-11.46	34.15	6.13	37.60	35.34	Average	100	163	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 48 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15722.21	40.94	54.00	-13.06	32.71	6.14	37.48	35.39	Average	101	237	HORIZONTAL
2	15724.78	54.09	74.00	-19.91	45.86	6.14	37.48	35.39	Peak	101	237	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15717.21	60.28	74.00	-13.72	52.05	6.14	37.48	35.39	Peak	100	202	VERTICAL
2	15719.62	46.53	54.00	-7.47	38.30	6.14	37.48	35.39	Average	100	202	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 52 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15777.37	42.11	54.00	-11.89	33.98	6.14	37.41	35.42	Average	100	236	HORIZONTAL
2	15781.47	53.78	74.00	-20.22	45.65	6.14	37.41	35.42	Peak	100	236	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15781.76	46.32	54.00	-7.68	38.19	6.14	37.41	35.42	Average	100	154	VERTICAL
2	15786.96	61.23	74.00	-12.77	53.10	6.14	37.41	35.42	Peak	100	154	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 60 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10600.16	49.23	74.00	-24.77	41.26	5.01	38.38	35.42	Peak	100	244	HORIZONTAL
2	10600.48	37.03	54.00	-16.97	29.06	5.01	38.38	35.42	Average	100	244	HORIZONTAL
3	15900.62	50.26	74.00	-23.74	42.26	6.15	37.29	35.44	Peak	100	242	HORIZONTAL
4	15901.25	39.26	54.00	-14.74	31.26	6.15	37.29	35.44	Average	100	242	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10600.58	38.32	54.00	-15.68	30.35	5.01	38.38	35.42	Average	100	260	VERTICAL
2	10600.58	51.55	74.00	-22.45	43.58	5.01	38.38	35.42	Peak	100	260	VERTICAL
3	15900.74	44.02	54.00	-9.98	36.02	6.15	37.29	35.44	Average	100	192	VERTICAL
4	15902.34	55.97	74.00	-18.03	47.97	6.15	37.29	35.44	Peak	100	192	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 64 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10639.87	48.59	74.00	-25.41	40.60	5.01	38.37	35.39	Peak	100	182	HORIZONTAL
2	10642.69	36.08	54.00	-17.92	28.09	5.01	38.37	35.39	Average	100	182	HORIZONTAL
3	15958.97	49.38	74.00	-24.62	41.44	6.15	37.23	35.44	Peak	100	86	HORIZONTAL
4	15964.55	38.19	54.00	-15.81	30.26	6.15	37.22	35.44	Average	100	86	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10624.74	49.39	74.00	-24.61	41.39	5.01	38.38	35.39	Peak	100	276	VERTICAL
2	10641.22	36.24	54.00	-17.76	28.25	5.01	38.37	35.39	Average	100	276	VERTICAL
3	15961.79	41.66	54.00	-12.34	33.72	6.15	37.23	35.44	Average	100	155	VERTICAL
4	15962.05	55.16	74.00	-18.84	47.22	6.15	37.23	35.44	Peak	100	155	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 100 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10997.18	36.36	54.00	-17.64	28.13	5.01	38.32	35.10	Average	100	109	HORIZONTAL
2	10997.69	49.48	74.00	-24.52	41.25	5.01	38.32	35.10	Peak	100	109	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10996.99	49.32	74.00	-24.68	41.11	5.01	38.30	35.10	Peak	100	228	VERTICAL
2	11005.19	36.62	54.00	-17.38	28.39	5.01	38.32	35.10	Average	100	228	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 116 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11157.02	38.22	54.00	-15.78	29.89	5.04	38.45	35.16	Average	100	281	HORIZONTAL
2	11159.68	47.75	74.00	-26.25	39.41	5.04	38.47	35.17	Peak	100	281	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11159.13	55.52	74.00	-18.48	47.18	5.04	38.47	35.17	Peak	100	92	VERTICAL
2	11161.54	42.84	54.00	-11.16	34.50	5.04	38.47	35.17	Average	100	92	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 140 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11383.72	49.13	74.00	-24.87	40.61	5.09	38.68	35.25	Peak	100	170	HORIZONTAL
2	11417.24	37.16	54.00	-16.84	28.60	5.10	38.72	35.26	Average	100	170	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11400.26	37.52	54.00	-16.48	28.97	5.10	38.70	35.25	Average	100	289	VERTICAL
2	11416.47	50.75	74.00	-23.25	42.19	5.10	38.72	35.26	Peak	100	289	VERTICAL

For 1TX

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 38 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15568.09	36.36	54.00	-17.64	27.93	6.13	37.63	35.33	Average	100	210	HORIZONTAL
2	15572.05	49.22	74.00	-24.78	40.81	6.13	37.61	35.33	Peak	100	210	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15566.54	48.85	74.00	-25.15	40.40	6.13	37.65	35.33	Peak	100	112	VERTICAL
2	15570.11	36.69	54.00	-17.31	28.24	6.13	37.65	35.33	Average	100	112	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 46 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15689.90	37.00	54.00	-17.00	28.72	6.14	37.51	35.37	Average	100	232	HORIZONTAL
2	15690.26	49.42	74.00	-24.58	41.14	6.14	37.51	35.37	Peak	100	232	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15690.18	39.08	54.00	-14.92	30.80	6.14	37.51	35.37	Average	100	259	VERTICAL
2	15690.27	52.00	74.00	-22.00	43.72	6.14	37.51	35.37	Peak	100	259	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 54 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15809.98	37.16	54.00	-16.84	29.06	6.14	37.39	35.43	Average	100	233	HORIZONTAL
2	15810.34	49.26	74.00	-24.74	41.16	6.14	37.39	35.43	Peak	100	233	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15809.44	39.39	54.00	-14.61	31.29	6.14	37.39	35.43	Average	100	154	VERTICAL
2	15810.24	52.37	74.00	-21.63	44.27	6.14	37.39	35.43	Peak	100	154	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 62 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10619.33	35.66	54.00	-18.34	27.69	5.01	38.38	35.42	Average	100	255	HORIZONTAL
2	10619.52	48.53	74.00	-25.47	40.56	5.01	38.38	35.42	Peak	100	255	HORIZONTAL
3	15929.39	34.95	54.00	-19.05	26.97	6.15	37.27	35.44	Average	100	266	HORIZONTAL
4	15929.90	48.37	74.00	-25.63	40.41	6.15	37.25	35.44	Peak	100	266	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10620.13	35.95	54.00	-18.05	27.98	5.01	38.38	35.42	Average	100	220	VERTICAL
2	10620.27	47.40	74.00	-26.60	39.43	5.01	38.38	35.42	Peak	100	220	VERTICAL
3	15928.21	36.32	54.00	-17.68	28.34	6.15	37.27	35.44	Average	100	147	VERTICAL
4	15929.62	48.72	74.00	-25.28	40.74	6.15	37.27	35.44	Peak	100	147	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 102 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11018.61	48.92	74.00	-25.08	40.68	5.02	38.33	35.11	Peak	100	193	HORIZONTAL
2	11022.21	36.34	54.00	-17.66	28.09	5.02	38.34	35.11	Average	100	193	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11017.68	36.28	54.00	-17.72	28.05	5.02	38.32	35.11	Average	100	68	VERTICAL
2	11019.58	49.02	74.00	-24.98	40.79	5.02	38.32	35.11	Peak	100	68	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 110 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11101.25	36.57	54.00	-17.43	28.28	5.03	38.40	35.14	Average	100	243	HORIZONTAL
2	11102.15	50.39	74.00	-23.61	42.10	5.03	38.40	35.14	Peak	100	243	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11095.51	49.67	74.00	-24.33	41.38	5.03	38.40	35.14	Peak	100	312	VERTICAL
2	11100.16	36.87	54.00	-17.13	28.58	5.03	38.40	35.14	Average	100	312	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 134 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11340.24	48.13	74.00	-25.87	39.66	5.08	38.63	35.24	Peak	100	101	HORIZONTAL
2	11342.07	36.88	54.00	-17.12	28.40	5.09	38.63	35.24	Average	100	101	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11339.76	49.78	74.00	-24.22	41.31	5.08	38.63	35.24	Peak	100	256	VERTICAL
2	11341.86	38.07	54.00	-15.93	29.59	5.09	38.63	35.24	Average	100	256	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

For 2TX

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 38 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15568.08	49.56	74.00	-24.44	41.13	6.13	37.63	35.33	Peak	100	109	HORIZONTAL
2	15593.40	36.85	54.00	-17.15	28.46	6.13	37.60	35.34	Average	100	109	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15545.00	36.72	54.00	-17.28	28.21	6.13	37.69	35.31	Average	100	52	VERTICAL
2	15553.48	49.02	74.00	-24.98	40.51	6.13	37.69	35.31	Peak	100	52	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 46 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15690.32	37.00	54.00	-17.00	28.72	6.14	37.51	35.37	Average	100	250	HORIZONTAL
2	15690.87	49.34	74.00	-24.66	41.07	6.14	37.51	35.38	Peak	100	250	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15691.70	39.46	54.00	-14.54	31.21	6.14	37.49	35.38	Average	100	155	VERTICAL
2	15691.92	51.50	74.00	-22.50	43.25	6.14	37.49	35.38	Peak	100	155	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 54 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15807.53	50.18	74.00	-23.82	42.08	6.14	37.39	35.43	Peak	100	233	HORIZONTAL
2	15809.52	37.54	54.00	-16.46	29.44	6.14	37.39	35.43	Average	100	233	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15809.46	52.54	74.00	-21.46	44.44	6.14	37.39	35.43	Peak	100	153	VERTICAL
2	15809.78	40.83	54.00	-13.17	32.73	6.14	37.39	35.43	Average	100	153	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 62 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10613.43	49.02	74.00	-24.98	41.05	5.01	38.38	35.42	Peak	100	151	HORIZONTAL
2	10617.60	35.91	54.00	-18.09	27.94	5.01	38.38	35.42	Average	100	151	HORIZONTAL
3	15926.71	36.65	54.00	-17.35	28.67	6.15	37.27	35.44	Average	100	203	HORIZONTAL
4	15936.52	48.48	74.00	-25.52	40.52	6.15	37.25	35.44	Peak	100	203	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10602.69	36.22	54.00	-17.78	28.25	5.01	38.38	35.42	Average	100	123	VERTICAL
2	10610.71	49.12	74.00	-24.88	41.15	5.01	38.38	35.42	Peak	100	123	VERTICAL
3	15919.18	49.82	74.00	-24.18	41.84	6.15	37.27	35.44	Peak	100	284	VERTICAL
4	15923.27	36.79	54.00	-17.21	28.81	6.15	37.27	35.44	Average	100	284	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 102 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11009.74	36.16	54.00	-17.84	27.92	5.02	38.33	35.11	Average	100	116	HORIZONTAL
2	11034.66	49.00	74.00	-25.00	40.76	5.02	38.34	35.12	Peak	100	116	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11017.20	49.40	74.00	-24.60	41.17	5.02	38.32	35.11	Peak	100	236	VERTICAL
2	11031.86	36.21	54.00	-17.79	27.98	5.02	38.33	35.12	Average	100	236	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 110 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11097.75	36.45	54.00	-17.55	28.16	5.03	38.40	35.14	Average	100	148	HORIZONTAL
2	11099.29	49.07	74.00	-24.93	40.78	5.03	38.40	35.14	Peak	100	148	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11099.07	37.03	54.00	-16.97	28.74	5.03	38.40	35.14	Average	100	293	VERTICAL
2	11099.42	48.21	74.00	-25.79	39.92	5.03	38.40	35.14	Peak	100	293	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 134 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11321.25	50.12	74.00	-23.88	41.65	5.08	38.62	35.23	Peak	100	151	HORIZONTAL
2	11357.79	36.14	54.00	-17.86	27.64	5.09	38.65	35.24	Average	100	151	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11351.30	50.29	74.00	-23.71	41.79	5.09	38.65	35.24	Peak	100	230	VERTICAL
2	11356.03	37.16	54.00	-16.84	28.66	5.09	38.65	35.24	Average	100	230	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 36 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15537.88	37.83	54.00	-16.17	29.36	6.13	37.65	35.31	Average	100	297	HORIZONTAL
2	15538.46	50.97	74.00	-23.03	42.50	6.13	37.65	35.31	Peak	100	237	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15536.38	51.05	74.00	-22.95	42.48	6.13	37.73	35.29	Peak	100	192	VERTICAL
2	15539.13	39.64	54.00	-14.36	31.13	6.13	37.69	35.31	Average	100	192	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 40 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15595.05	50.88	74.00	-23.12	42.49	6.13	37.60	35.34	Peak	100	233	HORIZONTAL
2	15598.03	38.27	54.00	-15.73	29.88	6.13	37.60	35.34	Average	100	233	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15599.20	54.79	74.00	-19.21	46.40	6.13	37.60	35.34	Peak	100	260	VERTICAL
2	15600.56	42.32	54.00	-11.68	33.93	6.13	37.60	35.34	Average	100	260	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 48 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15720.18	39.55	54.00	-14.45	31.32	6.14	37.48	35.39	Average	100	235	HORIZONTAL
2	15722.13	54.41	74.00	-19.59	46.18	6.14	37.48	35.39	Peak	100	235	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15717.48	56.94	74.00	-17.06	48.71	6.14	37.48	35.39	Peak	100	260	VERTICAL
2	15719.65	44.35	54.00	-9.65	36.12	6.14	37.48	35.39	Average	100	260	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 52 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15781.67	39.50	54.00	-14.50	31.37	6.14	37.41	35.42	Average	100	236	HORIZONTAL
2	15784.10	52.56	74.00	-21.44	44.43	6.14	37.41	35.42	Peak	100	236	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15778.54	57.23	74.00	-16.77	49.10	6.14	37.41	35.42	Peak	100	194	VERTICAL
2	15779.20	43.94	54.00	-10.06	35.81	6.14	37.41	35.42	Average	100	194	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 60 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10600.21	36.22	54.00	-17.78	28.25	5.01	38.38	35.42	Average	100	243	HORIZONTAL
2	10600.24	49.63	74.00	-24.37	41.66	5.01	38.38	35.42	Peak	100	243	HORIZONTAL
3	15900.64	38.63	54.00	-15.37	30.63	6.15	37.29	35.44	Average	100	233	HORIZONTAL
4	15902.66	50.89	74.00	-23.11	42.89	6.15	37.29	35.44	Peak	100	233	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10600.32	38.26	54.00	-15.74	30.29	5.01	38.38	35.42	Average	100	264	VERTICAL
2	10600.35	50.42	74.00	-23.58	42.45	5.01	38.38	35.42	Peak	100	264	VERTICAL
3	15899.97	56.03	74.00	-17.97	48.03	6.15	37.29	35.44	Peak	100	191	VERTICAL
4	15901.99	43.55	54.00	-10.45	35.55	6.15	37.29	35.44	Average	100	191	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 64 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10630.87	49.14	74.00	-24.86	41.15	5.01	38.37	35.39	Peak	100	195	HORIZONTAL
2	10635.32	35.88	54.00	-18.12	27.89	5.01	38.37	35.39	Average	100	195	HORIZONTAL
3	15955.83	48.48	74.00	-25.52	40.54	6.15	37.23	35.44	Peak	100	97	HORIZONTAL
4	15964.23	35.88	54.00	-18.12	27.95	6.15	37.22	35.44	Average	100	97	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10637.82	36.37	54.00	-17.63	28.38	5.01	38.37	35.39	Average	100	270	VERTICAL
2	10646.57	48.75	74.00	-25.25	40.76	5.01	38.37	35.39	Peak	100	270	VERTICAL
3	15956.44	52.84	74.00	-21.16	44.90	6.15	37.23	35.44	Peak	100	196	VERTICAL
4	15959.29	39.73	54.00	-14.27	31.79	6.15	37.23	35.44	Average	100	196	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 100 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10993.27	36.29	54.00	-17.71	28.06	5.01	38.32	35.10	Average	100	110	HORIZONTAL
2	10999.26	48.66	74.00	-25.34	40.43	5.01	38.32	35.10	Peak	100	110	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11001.99	36.57	54.00	-17.43	28.36	5.01	38.30	35.10	Average	100	209	VERTICAL
2	11009.20	49.42	74.00	-24.58	41.19	5.02	38.32	35.11	Peak	100	209	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 116 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11158.37	38.23	54.00	-15.77	29.91	5.04	38.45	35.17	Average	100	289	HORIZONTAL
2	11167.85	51.47	74.00	-22.53	43.12	5.05	38.47	35.17	Peak	100	289	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11158.46	40.84	54.00	-13.16	32.50	5.04	38.47	35.17	Average	100	237	VERTICAL
2	11161.70	54.78	74.00	-19.22	46.44	5.04	38.47	35.17	Peak	100	237	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 140 / Ant. 1
Test Date	Mar. 09, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11399.10	49.40	74.00	-24.60	40.85	5.10	38.70	35.25	Peak	100	152	HORIZONTAL
2	11406.76	36.88	54.00	-17.12	28.33	5.10	38.70	35.25	Average	100	152	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11400.32	49.73	74.00	-24.27	41.18	5.10	38.70	35.25	Peak	100	317	VERTICAL
2	11407.98	36.86	54.00	-17.14	28.31	5.10	38.70	35.25	Average	100	317	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.7. Band Edge Emissions Measurement

4.7.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m). For frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

4.7.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 3MHz for Peak

4.7.3. Test Procedures

1. The test procedure is the same as section 4.6.3, only the frequency range investigated is limited to 100MHz around bandedges.

4.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.6.4.

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5148.72	53.84	54.00	-0.16	16.74	3.43	33.67	0.00	Average	100	299	HORIZONTAL
2	5148.72	73.27	74.00	-0.73	36.17	3.43	33.67	0.00	Peak	100	299	HORIZONTAL
3	5183.53	101.38			64.21	3.44	33.73	0.00	Average	100	299	HORIZONTAL
4	5183.85	112.09			74.92	3.44	33.73	0.00	Peak	100	299	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5144.87	69.57	74.00	-4.43	32.47	3.43	33.67	0.00	Peak	100	301	HORIZONTAL
2	5150.00	53.76	54.00	-0.24	16.66	3.43	33.67	0.00	Average	100	301	HORIZONTAL
3	5202.24	104.04			66.83	3.45	33.76	0.00	Average	100	301	HORIZONTAL
4	5202.24	114.54			77.33	3.45	33.76	0.00	Peak	100	301	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5149.04	45.50	54.00	-8.50	8.40	3.43	33.67	0.00	Average	100	302	HORIZONTAL
2	5150.00	59.75	74.00	-14.25	22.65	3.43	33.67	0.00	Peak	100	302	HORIZONTAL
3	5237.12	106.32			69.04	3.46	33.82	0.00	Average	100	302	HORIZONTAL
4	5242.89	117.29			80.01	3.46	33.82	0.00	Peak	100	302	HORIZONTAL
5	5385.10	41.98	54.00	-12.02	4.39	3.50	34.09	0.00	Average	100	302	HORIZONTAL
6	5385.10	52.17	74.00	-21.83	14.58	3.50	34.09	0.00	Peak	100	302	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 52, 60, 64 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5112.50	42.93	54.00	-11.07	5.90	3.42	33.61	0.00	Average	100	302	HORIZONTAL
2	5112.50	53.10	74.00	-20.90	16.07	3.42	33.61	0.00	Peak	100	302	HORIZONTAL
3	5257.12	106.98			69.67	3.46	33.85	0.00	Average	100	302	HORIZONTAL
4	5257.12	118.23			80.92	3.46	33.85	0.00	Peak	100	302	HORIZONTAL
5	5350.00	45.99	54.00	-8.01	8.47	3.49	34.03	0.00	Average	100	302	HORIZONTAL
6	5350.00	62.94	74.00	-11.06	25.42	3.49	34.03	0.00	Peak	100	302	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5296.47	102.85			65.47	3.47	33.91	0.00	Average	100	87	VERTICAL
2	5303.85	114.69			77.27	3.48	33.94	0.00	Peak	100	87	VERTICAL
3	5350.64	68.95	74.00	-5.05	31.43	3.49	34.03	0.00	Peak	100	87	VERTICAL
4	5351.28	53.76	54.00	-0.24	16.24	3.49	34.03	0.00	Average	100	87	VERTICAL

Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5323.69	102.77			65.31	3.49	33.97	0.00	Average	100	291	HORIZONTAL
2	5324.01	113.90			76.44	3.49	33.97	0.00	Peak	100	291	HORIZONTAL
3	5351.12	53.63	54.00	-0.37	16.11	3.49	34.03	0.00	Average	100	291	HORIZONTAL
4	5351.60	72.76	74.00	-1.24	35.24	3.49	34.03	0.00	Peak	100	291	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 20MHz Ch 100,140 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5457.60	67.59	74.00	-6.41	29.86	3.52	34.21	0.00	Peak	199	261	VERTICAL
2	5460.00	50.69	54.00	-3.31	12.96	3.52	34.21	0.00	Average	199	261	VERTICAL
3	5469.84	69.94	74.00	-4.06	32.18	3.52	34.24	0.00	Peak	199	261	VERTICAL
4	5470.00	53.92	54.00	-0.08	16.16	3.52	34.24	0.00	Average	199	261	VERTICAL
5	5497.76	113.59			75.80	3.53	34.26	0.00	Peak	199	261	VERTICAL
6	5502.89	102.50			64.68	3.54	34.28	0.00	Average	199	261	VERTICAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5696.31	99.98			62.05	3.59	34.34	0.00	Average	100	339	VERTICAL
2	5696.31	111.39			73.46	3.59	34.34	0.00	Peak	100	339	VERTICAL
3	5725.48	69.61	74.00	-4.39	31.67	3.60	34.34	0.00	Peak	100	339	VERTICAL
4	5725.96	53.40	54.00	-0.60	15.46	3.60	34.34	0.00	Average	100	339	VERTICAL

Item 1, 2 are the fundamental frequency at 5700 MHz.

For 1TX

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 38, 46 / Ant. 1
Test Date	Mar. 09, 2013		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5144.55	71.49	74.00	-2.51	34.39	3.43	33.67	0.00	Peak	114	303	HORIZONTAL
2	5150.00	53.68	54.00	-0.32	16.58	3.43	33.67	0.00	Average	114	303	HORIZONTAL
3	5194.17	105.11			67.94	3.44	33.73	0.00	Peak	114	303	HORIZONTAL
4	5203.46	93.62			56.41	3.45	33.76	0.00	Average	114	303	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5145.51	68.54	74.00	-5.46	31.44	3.43	33.67	0.00	Peak	114	300	HORIZONTAL
2	5150.00	53.48	54.00	-0.52	16.38	3.43	33.67	0.00	Average	114	300	HORIZONTAL
3	5216.54	109.96			72.72	3.45	33.79	0.00	Peak	114	300	HORIZONTAL
4	5224.87	98.21			60.96	3.46	33.79	0.00	Average	114	300	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 54, 62 / Ant. 1
Test Date	Mar. 09, 2013		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5255.58	111.22			73.91	3.46	33.85	0.00	Peak	112	303	HORIZONTAL
2	5264.87	99.56			62.22	3.46	33.88	0.00	Average	112	303	HORIZONTAL
3	5350.00	53.39	54.00	-0.61	15.87	3.49	34.03	0.00	Average	112	303	HORIZONTAL
4	5350.00	70.70	74.00	-3.30	33.18	3.49	34.03	0.00	Peak	112	303	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5270 MHz.

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5297.18	106.36			68.94	3.48	33.94	0.00	Peak	100	300	HORIZONTAL
2	5315.13	94.70			57.25	3.48	33.97	0.00	Average	100	300	HORIZONTAL
3	5350.00	53.78	54.00	-0.22	16.26	3.49	34.03	0.00	Average	100	300	HORIZONTAL
4	5351.60	72.66	74.00	-1.34	35.14	3.49	34.03	0.00	Peak	100	300	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5310 MHz.

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 102, 110, 134 / Ant. 1
Test Date	Mar. 09, 2013		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5460.00	51.22	54.00	-2.78	13.51	3.52	34.19	0.00	Average	100	308	HORIZONTAL
2	5460.00	65.42	74.00	-8.58	27.71	3.52	34.19	0.00	Peak	100	308	HORIZONTAL
3	5470.00	53.50	54.00	-0.50	15.77	3.52	34.21	0.00	Average	100	308	HORIZONTAL
4	5470.00	70.46	74.00	-3.54	32.73	3.52	34.21	0.00	Peak	100	308	HORIZONTAL
5	5506.80	104.52			66.73	3.54	34.25	0.00	Peak	100	308	HORIZONTAL
6	5514.81	92.45			54.66	3.54	34.25	0.00	Average	100	308	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5510 MHz.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5455.51	65.54	74.00	-8.46	27.81	3.52	34.21	0.00	Peak	100	320	VERTICAL
2	5460.00	49.43	54.00	-4.57	11.70	3.52	34.21	0.00	Average	100	320	VERTICAL
3	5469.36	69.26	74.00	-4.74	31.50	3.52	34.24	0.00	Peak	100	320	VERTICAL
4	5470.00	53.42	54.00	-0.58	15.66	3.52	34.24	0.00	Average	100	320	VERTICAL
5	5543.91	96.17			58.31	3.55	34.31	0.00	Average	100	320	VERTICAL
6	5546.15	107.35			69.49	3.55	34.31	0.00	Peak	100	320	VERTICAL

Item 5, 6 are the fundamental frequency at 5550 MHz.

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5665.19	94.70			56.78	3.59	34.33	0.00	Average	100	53	HORIZONTAL
2	5673.21	106.25			68.33	3.59	34.33	0.00	Peak	100	53	HORIZONTAL
3	5725.00	53.89	54.00	-0.11	15.95	3.60	34.34	0.00	Average	100	53	HORIZONTAL
4	5725.32	68.72	74.00	-5.28	30.78	3.60	34.34	0.00	Peak	100	53	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5670 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

For 2TX

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 38, 46 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5148.40	53.79	54.00	-0.21	16.69	3.43	33.67	0.00	Average	104	296	HORIZONTAL
2	5149.04	69.74	74.00	-4.26	32.64	3.43	33.67	0.00	Peak	104	296	HORIZONTAL
3	5185.83	94.05			56.88	3.44	33.73	0.00	Average	104	296	HORIZONTAL
4	5196.09	105.43			68.22	3.45	33.76	0.00	Peak	104	296	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5147.76	69.78	74.00	-4.22	32.68	3.43	33.67	0.00	Peak	100	303	HORIZONTAL
2	5150.00	53.75	54.00	-0.25	16.65	3.43	33.67	0.00	Average	100	303	HORIZONTAL
3	5217.18	110.16			72.92	3.45	33.79	0.00	Peak	100	303	HORIZONTAL
4	5224.87	100.20			62.95	3.46	33.79	0.00	Average	100	303	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 54, 62 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5256.54	98.42			61.11	3.46	33.85	0.00	Average	124	84	VERTICAL
2	5266.47	109.72			72.38	3.46	33.88	0.00	Peak	124	84	VERTICAL
3	5350.00	68.72	74.00	-5.28	31.20	3.49	34.03	0.00	Peak	124	84	VERTICAL
4	5351.28	53.76	54.00	-0.24	16.24	3.49	34.03	0.00	Average	124	84	VERTICAL

Item 1, 2 are the fundamental frequency at 5270 MHz.

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5313.85	108.31			70.86	3.48	33.97	0.00	Peak	100	293	HORIZONTAL
2	5316.09	95.99			58.54	3.48	33.97	0.00	Average	100	293	HORIZONTAL
3	5350.00	73.04	74.00	-0.96	35.52	3.49	34.03	0.00	Peak	100	293	HORIZONTAL
4	5351.28	53.88	54.00	-0.12	16.36	3.49	34.03	0.00	Average	100	293	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5310 MHz.

Temperature	24.5℃	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11n MCS0 40MHz Ch 102, 110, 134 / Ant. 1 + Ant. 2
Test Date	Mar. 09, 2013		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5460.00	51.66	54.00	-2.34	13.93	3.52	34.21	0.00	Average	201	262	VERTICAL
2	5460.00	70.05	74.00	-3.95	32.32	3.52	34.21	0.00	Peak	201	262	VERTICAL
3	5469.68	70.79	74.00	-3.21	33.03	3.52	34.24	0.00	Peak	201	262	VERTICAL
4	5470.00	53.89	54.00	-0.11	16.13	3.52	34.24	0.00	Average	201	262	VERTICAL
5	5494.94	107.79			70.00	3.53	34.26	0.00	Peak	201	262	VERTICAL
6	5505.51	95.92			58.10	3.54	34.28	0.00	Average	201	262	VERTICAL

Item 5, 6 are the fundamental frequency at 5510 MHz.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5456.47	66.45	74.00	-7.55	28.74	3.52	34.19	0.00	Peak	105	303	HORIZONTAL
2	5460.00	50.97	54.00	-3.03	13.26	3.52	34.19	0.00	Average	105	303	HORIZONTAL
3	5469.36	69.08	74.00	-4.92	31.35	3.52	34.21	0.00	Peak	105	303	HORIZONTAL
4	5470.00	53.57	54.00	-0.43	15.84	3.52	34.21	0.00	Average	105	303	HORIZONTAL
5	5536.54	98.15			60.31	3.55	34.29	0.00	Average	105	303	HORIZONTAL
6	5554.17	109.59			71.73	3.55	34.31	0.00	Peak	105	303	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5550 MHz.

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5683.78	95.91			57.99	3.59	34.33	0.00	Average	100	339	VERTICAL
2	5683.78	107.59			69.67	3.59	34.33	0.00	Peak	100	339	VERTICAL
3	5725.32	65.60	74.00	-8.40	27.66	3.60	34.34	0.00	Peak	100	339	VERTICAL
4	5725.96	53.79	54.00	-0.21	15.85	3.60	34.34	0.00	Average	100	339	VERTICAL

Item 1, 2 are the fundamental frequency at 5670 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 36, 40, 48 / Ant. 1
Test Date	Mar. 09, 2013		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	53.74	54.00	-0.26	16.64	3.43	33.67	0.00	Average	100	296	HORIZONTAL
2	5150.00	72.70	74.00	-1.30	35.60	3.43	33.67	0.00	Peak	100	296	HORIZONTAL
3	5183.53	99.80			62.63	3.44	33.73	0.00	Average	100	296	HORIZONTAL
4	5185.45	110.84			73.67	3.44	33.73	0.00	Peak	100	296	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5148.72	70.59	74.00	-3.41	33.49	3.43	33.67	0.00	Peak	113	304	HORIZONTAL
2	5150.00	53.51	54.00	-0.49	16.41	3.43	33.67	0.00	Average	113	304	HORIZONTAL
3	5203.21	103.01			65.80	3.45	33.76	0.00	Average	113	304	HORIZONTAL
4	5203.85	113.70			76.49	3.45	33.76	0.00	Peak	113	304	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5147.60	61.30	74.00	-12.70	24.20	3.43	33.67	0.00	Peak	114	302	HORIZONTAL
2	5150.00	44.27	54.00	-9.73	7.17	3.43	33.67	0.00	Average	114	302	HORIZONTAL
3	5236.64	104.78			67.50	3.46	33.82	0.00	Average	114	302	HORIZONTAL
4	5236.64	115.84			78.56	3.46	33.82	0.00	Peak	114	302	HORIZONTAL
5	5350.00	40.70	54.00	-13.30	3.18	3.49	34.03	0.00	Average	114	302	HORIZONTAL
6	5350.00	53.72	74.00	-20.28	16.20	3.49	34.03	0.00	Peak	114	302	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 52, 60, 64 / Ant. 1
Test Date	Mar. 09, 2013		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	40.75	54.00	-13.25	3.65	3.43	33.67	0.00	Average	111	301	HORIZONTAL
2	5150.00	51.82	74.00	-22.18	14.72	3.43	33.67	0.00	Peak	111	301	HORIZONTAL
3	5262.40	116.42			79.11	3.46	33.85	0.00	Peak	111	301	HORIZONTAL
4	5262.89	105.29			67.95	3.46	33.88	0.00	Average	111	301	HORIZONTAL
5	5350.00	43.97	54.00	-10.03	6.45	3.49	34.03	0.00	Average	111	301	HORIZONTAL
6	5350.48	60.47	74.00	-13.53	22.95	3.49	34.03	0.00	Peak	111	301	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5296.80	104.06			66.64	3.48	33.94	0.00	Average	111	302	HORIZONTAL
2	5297.44	114.78			77.36	3.48	33.94	0.00	Peak	111	302	HORIZONTAL
3	5350.00	53.52	54.00	-0.48	16.00	3.49	34.03	0.00	Average	111	302	HORIZONTAL
4	5350.00	69.90	74.00	-4.10	32.38	3.49	34.03	0.00	Peak	111	302	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5317.76	110.85			73.40	3.48	33.97	0.00	Peak	100	289	HORIZONTAL
2	5323.53	99.57			62.11	3.49	33.97	0.00	Average	100	289	HORIZONTAL
3	5350.00	53.84	54.00	-0.16	16.32	3.49	34.03	0.00	Average	100	289	HORIZONTAL
4	5350.16	72.31	74.00	-1.69	34.79	3.49	34.03	0.00	Peak	100	289	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	24.5°C	Humidity	57%
Test Engineer	David Tesng	Configurations	IEEE 802.11a Ch 100, 140 / Ant. 1
Test Date	Mar. 09, 2013		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5459.84	71.06	74.00	-2.94	33.33	3.52	34.21	0.00	Peak	102	264	VERTICAL
2	5460.00	50.98	54.00	-3.02	13.25	3.52	34.21	0.00	Average	102	264	VERTICAL
3	5469.68	71.37	74.00	-2.63	33.61	3.52	34.24	0.00	Peak	102	264	VERTICAL
4	5470.00	53.43	54.00	-0.57	15.67	3.52	34.24	0.00	Average	102	264	VERTICAL
5	5503.21	101.21			63.39	3.54	34.28	0.00	Average	102	264	VERTICAL
6	5503.21	113.63			75.81	3.54	34.28	0.00	Peak	102	264	VERTICAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5695.35	109.42			71.49	3.59	34.34	0.00	Peak	107	265	VERTICAL
2	5696.47	98.47			60.54	3.59	34.34	0.00	Average	107	265	VERTICAL
3	5725.00	53.78	54.00	-0.22	15.84	3.60	34.34	0.00	Average	107	265	VERTICAL
4	5725.96	70.41	74.00	-3.59	32.47	3.60	34.34	0.00	Peak	107	265	VERTICAL

Item 1, 2 are the fundamental frequency at 5700 MHz.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

4.8. Frequency Stability Measurement

4.8.1. Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emissions is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or ±20ppm (IEEE 802.11nspecification).

4.8.2. Measuring Instruments and Setting

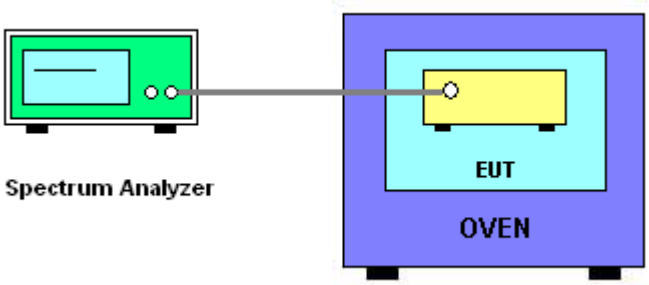
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	10 kHz
VB	10 kHz
Sweep Time	Auto

4.8.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -30°C~50°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

4.8.7. Test Result of Frequency Stability

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	**5200**	**5300**
126.50	5200.0078	5300.0060
110.00	5200.0064	5300.0062
93.50	5200.0082	5300.0088
Max. Deviation (MHz)	0.008200	0.008800
Max. Deviation (ppm)	1.58	1.66

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(°C)	**5200**	**5300**
-30	5199.9950	5299.9962
-20	5199.9948	5299.9950
-10	5199.9932	5299.9980
0	5199.9952	5299.9964
10	5199.9938	5299.9958
20	5199.9946	5299.9942
30	5200.0240	5300.0238
40	5200.0242	5300.0224
50	5200.0238	5300.0250
Max. Deviation (MHz)	0.024200	0.025000
Max. Deviation (ppm)	4.65	4.72

4.9. Antenna Requirements

4.9.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.9.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Oct. 23, 2012	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9kHz ~ 30MHz	Jun. 22, 2012	Conduction (CO01-CB)
Impulsbegrenzer Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz~30MHz	Feb. 21, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 04, 2012	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	-	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	4 Way	0120A04056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

"*" Calibration Interval of instruments listed above is two years.

NCR means Non-Calibration required.

6. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085