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FCC RADIO TEST REPORT

Applicant's company	NETGEAR, Inc.
Applicant Address	350 East Plumeria Drive, San Jose, California 95134, USA
FCC ID	PY313300240

Product Name	Home Security Touchscreen
Brand Name	NETGEAR
Model No.	STS7000
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Aug. 08, 2013
Final Test Date	Nov. 05, 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 C63.10-2009, 47 CFR FCC Part 15 Subpart E, KDB 789033 D01 v01r03, KDB 662911 D01 v02

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



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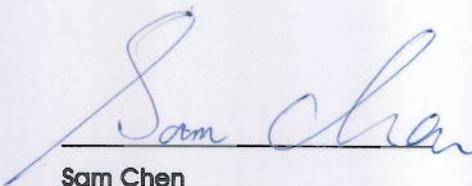
History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR391107AB	Rev. 01	Initial issue of report	Dec. 19, 2013

1. CERTIFICATE OF COMPLIANCE

Product Name : Home Security Touchscreen
Brand Name : NETGEAR
Model No. : STS7000
Applicant : NETGEAR, Inc.
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 Aug. 08, 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

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	8.57 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.01 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.08 dB
4.5	15.407(a)	Peak Excursion	Complies	2.37 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.42 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.07 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter and Lithium-Polymer (LIP) rechargeable battery
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): 18.24 MHz ; MCS0 (40MHz): 36.48 MHz
Maximum Conducted Output Power	Band 1: MCS0 (20MHz): 16.91 dBm ; MCS0 (40MHz): 16.86 dBm Band 2: MCS0 (20MHz): 17.98 dBm ; MCS0 (40MHz): 17.97 dBm Band 3: MCS0 (20MHz): 20.45 dBm ; MCS0 (40MHz): 20.32 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter and Lithium-Polymer (LIP) rechargeable battery
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%)	17.12 MHz
Maximum Conducted Output Power	Band 1: 16.99 dBm ; Band 2: 18.00 dBm ; Band 3: 20.27 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna and Band width

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

IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS0-15
802.11n (HT40)	2	MCS0-15

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput).

Then EUT support HT20 and HT40.

Note 2: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n

3.2. Accessories

Power	Brand	Model	P/N	Rating
Adapter 1	NETGEAR	SAL018F1 NA	332-10513-01	Input:100-120V~47-63Hz 0.6A Output:12.0V, 1.5A
Adapter 2	NETGEAR	MT18-9120150-A1	332-10359-01	Input:120V~60Hz 0.5A Output:12.0V, 1.5A
Lithium-Polymer (LIP) rechargeable battery	NETGEAR	TW01	-	Typical capacity: 4150mAh Minimum capacity: 4000mAh Nominal voltage: 3.7V Charge voltage: 4.2V
Others				
Mini USB2.0 Ethernet Dongle*1				
Charge Station*1				

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	WNC	-	PCB Antenna	I-PEX	2.4GHz	3.55
					5GHz B1	2.18
					5GHz B2	2.10
					5GHz B3	2.74
					5GHz B4	3.71
2	WNC	-	PCB Antenna	I-PEX	2.4GHz	4.31
					5GHz B1	3.65
					5GHz B2	3.25
					5GHz B3	3.98
					5GHz B4	4.81

Note:

For 2.4GHz

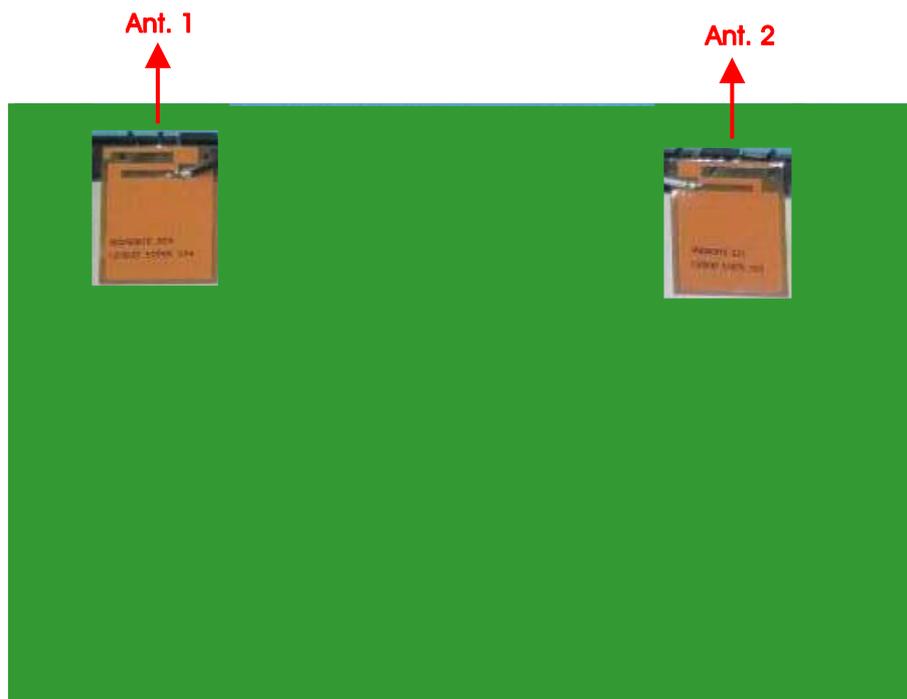
For IEEE 802.11b/g/n mode (2TX/2RX)

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

For 5GHz

For IEEE 802.11a/n mode (2TX/2RX):

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



3.4. Table for Carrier Frequencies

The EUT has two bandwidth system.

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

For 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 Product Information

Items	Description	
Communication Mode	<input checked="" type="checkbox"/> IP Based (Load Based)	<input type="checkbox"/> Frame Based
TPC Function	<input checked="" type="checkbox"/> With TPC	<input type="checkbox"/> Without TPC
Weather Band (5600~5650MHz)	<input type="checkbox"/> With 5600~5650MHz	<input checked="" type="checkbox"/> Without 5600~5650MHz
Beamforming Function	<input type="checkbox"/> With beamforming	<input checked="" type="checkbox"/> Without beamforming

3.6. 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	Normal Link		-	-	-
Max. Conducted Output Power	11n 20MHz	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2
	11n 40MHz	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1+2
Power Spectral Density	11n 20MHz	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2
	11n 40MHz	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1+2
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11n 20MHz	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2
	11n 40MHz	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1+2
Peak Excursion	11n 20MHz	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2
	11n 40MHz	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1+2
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11n 20MHz	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2
	11n 40MHz	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1+2

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

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. EUT + LAN + SD + Charge Station + Adapter 1

Mode 2. EUT + 2.4GHz + SD + Charge Station + Adapter 1

Mode 3. EUT + 5GHz + SD + Charge Station + Adapter 1

Mode 1 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.

Mode 4. EUT + LAN + SD + Adapter 1

Mode 5. EUT + LAN + SD + Charge Station + Adapter 2

Mode 6. EUT + 2.4GHz + SD + Charge Station + Adapter 2

Mode 7. EUT + 5GHz + SD + Charge Station + Adapter 2

Mode 5 has been evaluated to be the worst case among Mode 5~7, thus measurement for Mode 8 will follow this same test mode.

Mode 8. EUT + LAN + SD + Adapter 2

Mode 5 generated the worst test result, so it was recorded in this report.

For Radiated Emission test below 1GHz:

Mode 1. Stand of EUT + LAN + SD + Adapter 1

Mode 2. Laying of EUT + LAN + SD + Adapter 1

Mode 2 has been evaluated to be the worst case between Mode 1 and 2, thus measurement for Mode 3~4 will follow this same test mode.

Mode 3. Laying of EUT + 2.4GHz + SD + Adapter 1

Mode 4. Laying of EUT + 5GHz + SD + Adapter 1

Mode 3 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5~8 will follow this same test mode.

Mode 5. Laying of EUT + 2.4GHz + SD + Adapter 2

Mode 6. EUT + 2.4GHz + SD + Charge Station + Adapter 1

Mode 7. EUT + 2.4GHz + SD + Charge Station + Adapter 2

Mode 8. Laying of EUT + 2.4GHz + SD

Mode 7 is the worst case, so it was selected to record in this test report.

For Radiated Emission test above 1GHz:

Mode 1: Place EUT in X axis

Mode 2: Place EUT in Y axis

Mode 3: Place EUT in Z axis

Mode 3 is the worst case, so it was selected to record in this test report.

3.7. 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). Please refer section 6 for Test Site Address.

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2K4965AGNM
AP	Planex	GW-AP54SGX	N/A
Micro SD Card	TRANSCEND	TS8GSDHC6	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Micro SD Card	ADATA	G04G1202764519	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC

3.9. Table for Parameters of Test Software Setting

During testing, Channel and 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	ART2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 20MHz	13.5	13.5	14	16	16.5	16	17.5	19	14

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	ART2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 40MHz	13.5	14	16.5	12.5	11.5	19	14.5

Power Parameters of IEEE 802.11a

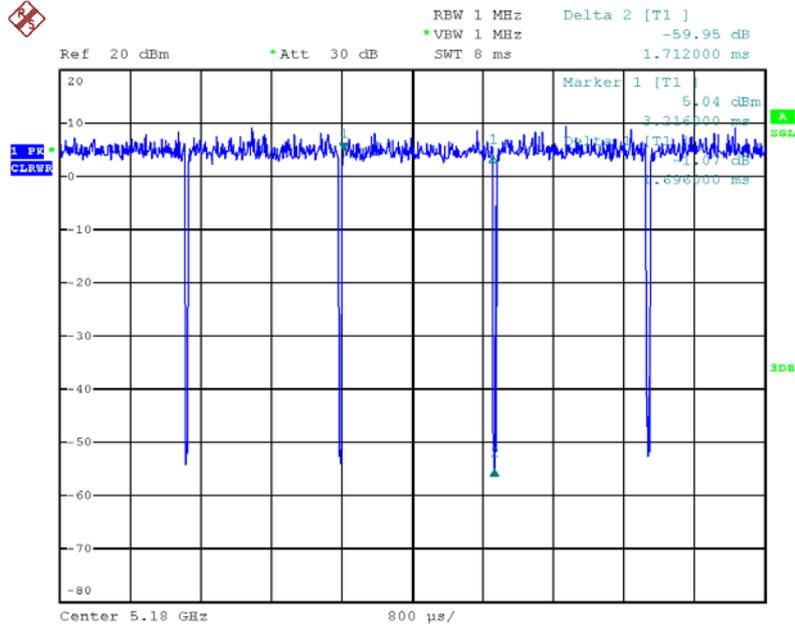
Test Software Version	ART2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	13.5	13.5	13.5	16	16	16	17.5	18.5	14

3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

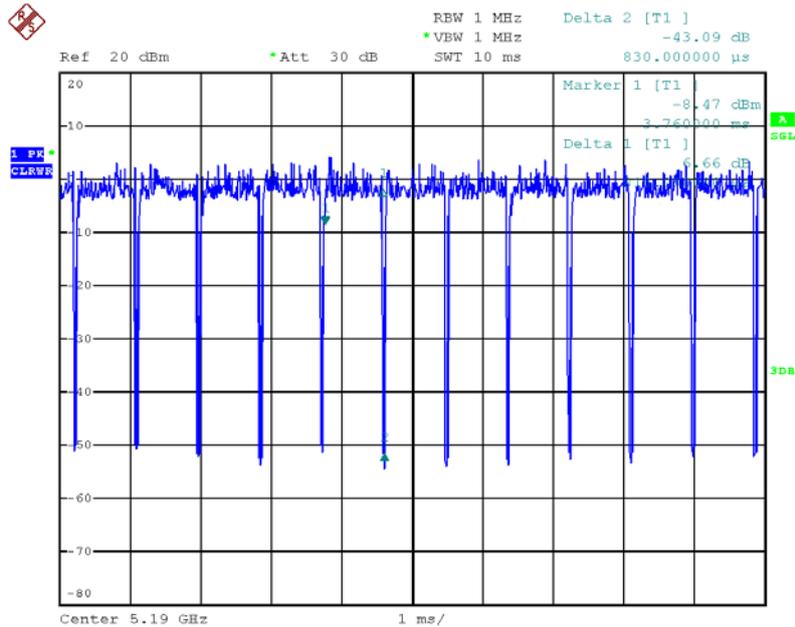
3.11. Duty Cycle

IEEE 802.11n MCS0 20MHz



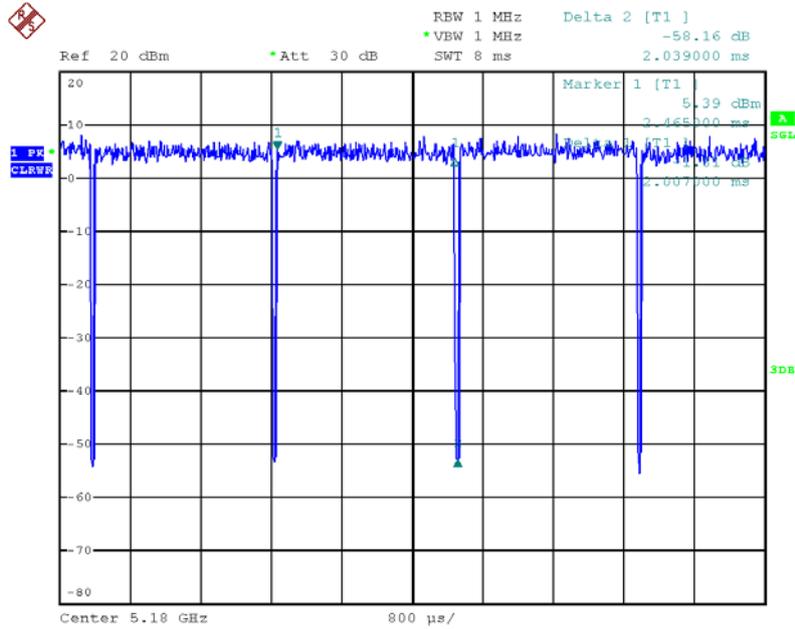
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IEEE 802.11n MCS0 40MHz



Date: 24.SEP.2013 01:20:00

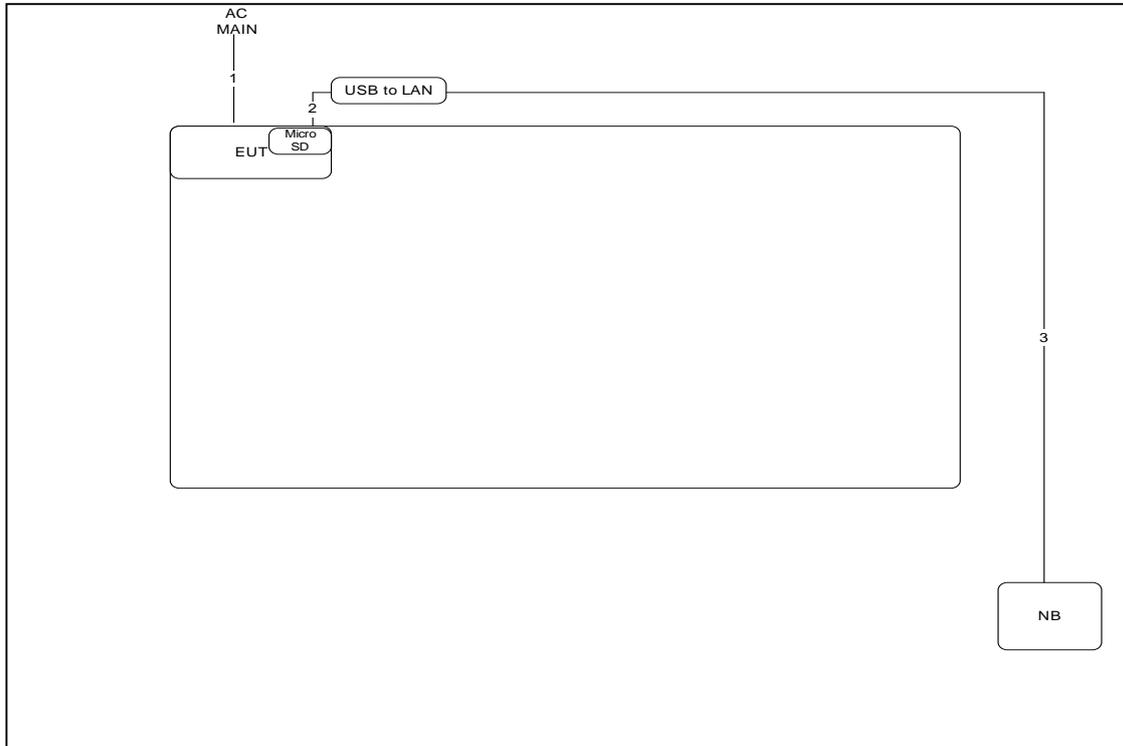
IEEE 802.11a



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3.12. Test Configurations

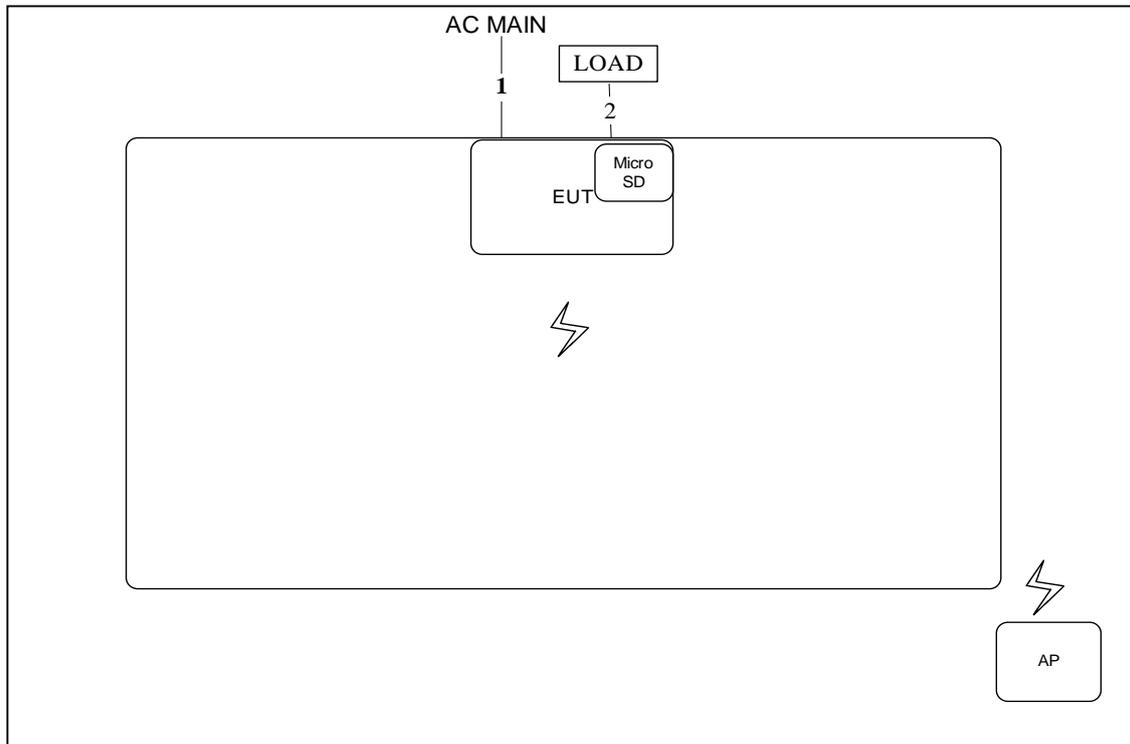
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	AC Power cable	No	3m
2	USB cable	No	0.2m
3	RJ-45 cable	No	10m

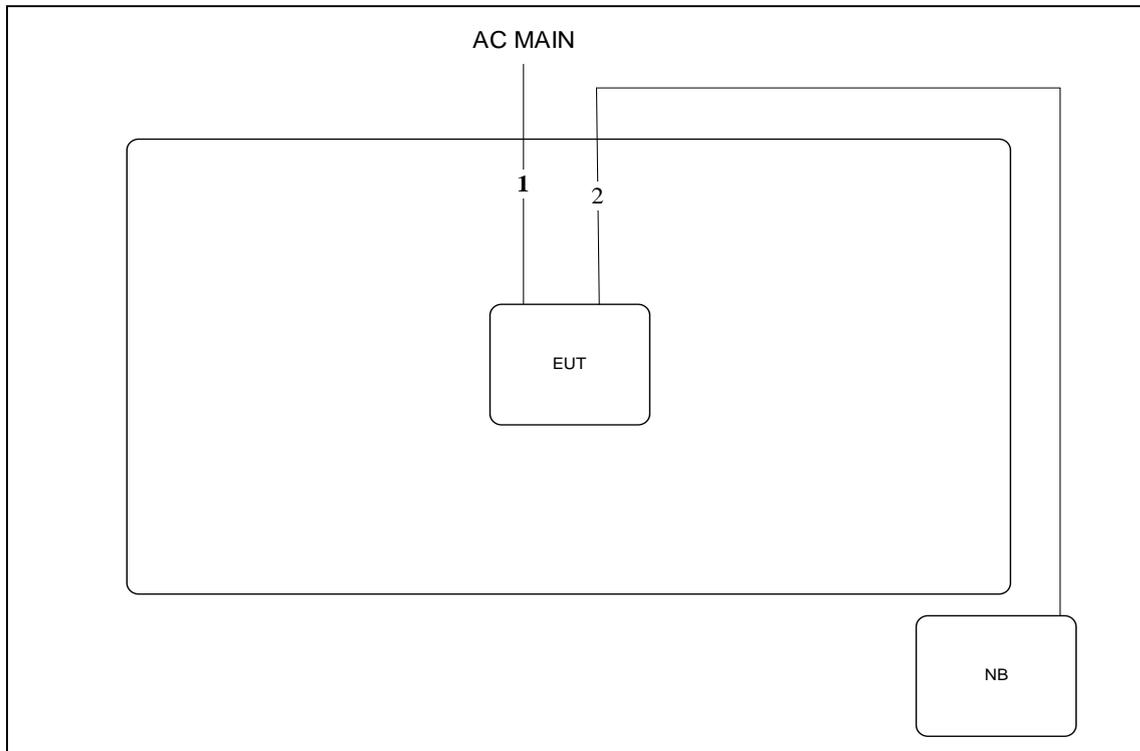
3.12.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz



Item	Connection	Shield	Length
1	AC power cable	No	3m
2	RJ-45 cable	No	1.8m

Test Configuration: above 1GHz



Item	Connection	Shield	Length
1	AC Power cable	No	3m
2	RJ-45 cable	No	10m

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

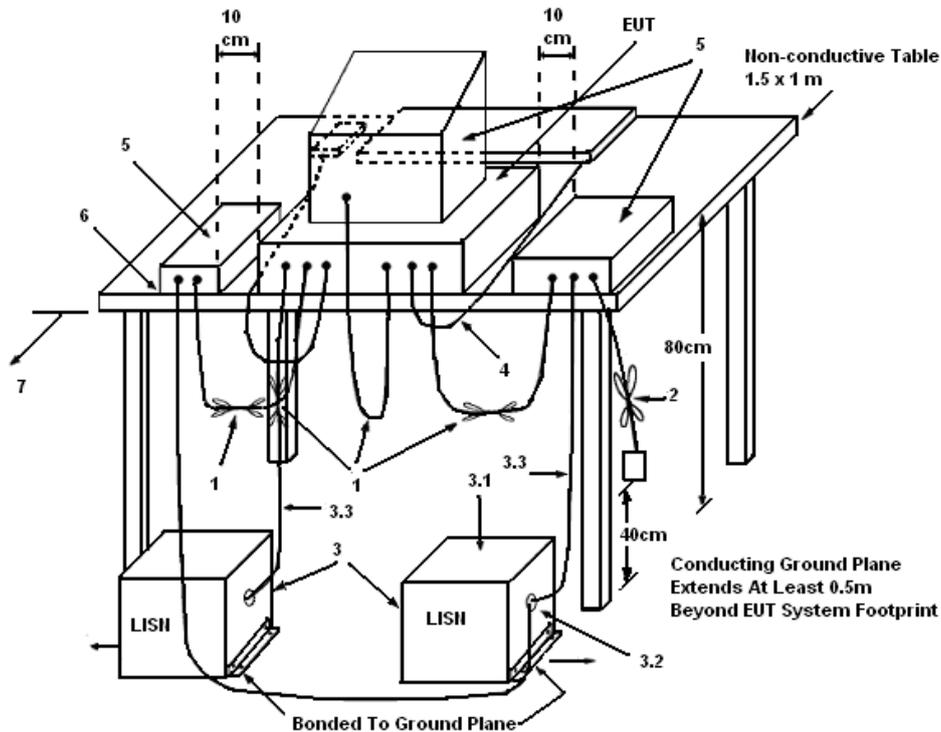
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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 C63.10. 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

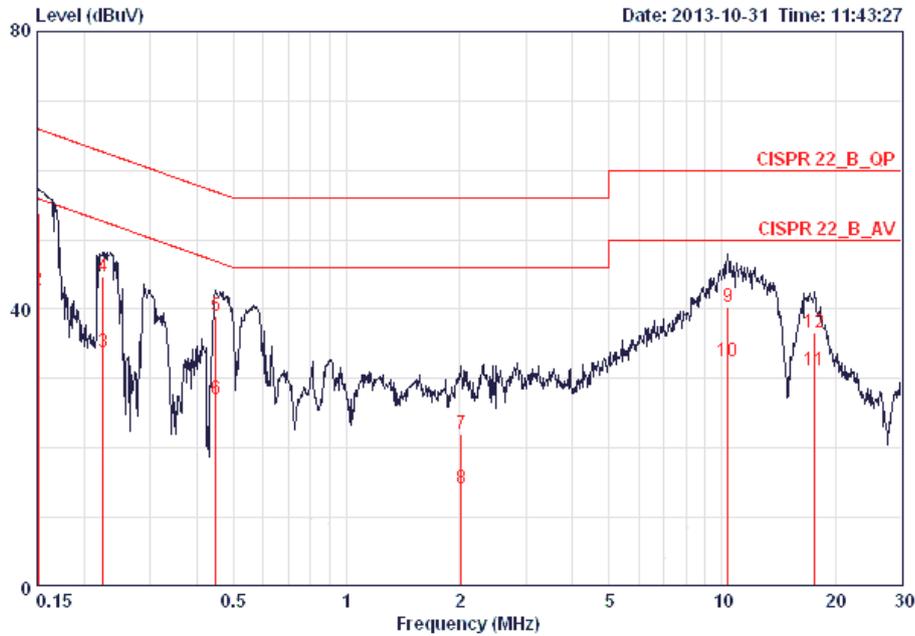
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

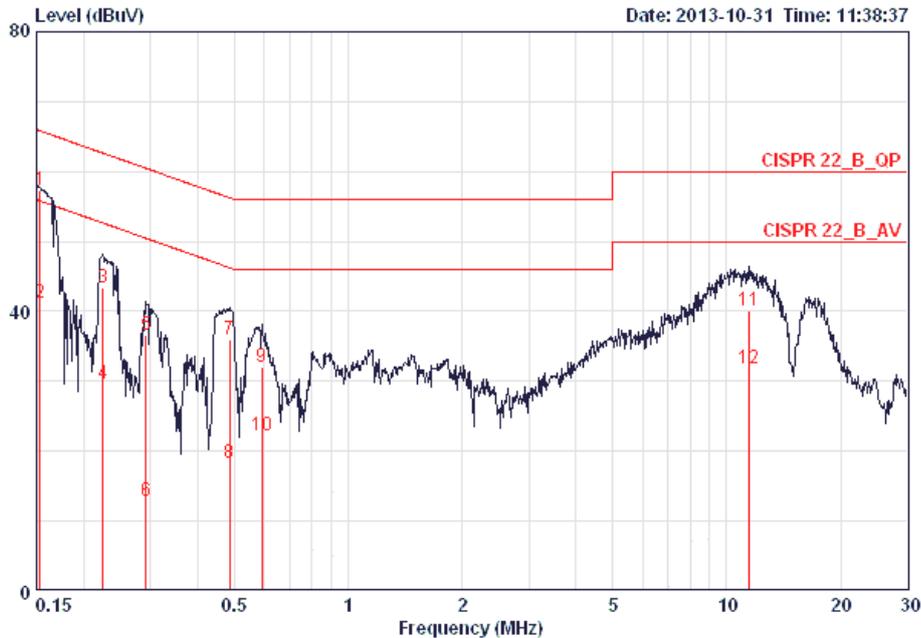
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25°C	Humidity	52%
Test Engineer	Kane Liu	Phase	Line
Configuration	Normal Link	Test Mode	Mode 5



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15080	53.78	-12.18	65.96	53.45	0.15	0.18	LINE	QP
2	0.15080	42.83	-13.13	55.96	42.50	0.15	0.18	LINE	AVERAGE
3	0.22437	33.68	-18.98	52.66	33.33	0.15	0.20	LINE	AVERAGE
4	0.22437	44.64	-18.02	62.66	44.29	0.15	0.20	LINE	QP
5	0.44916	38.96	-17.93	56.89	38.61	0.15	0.20	LINE	QP
6	0.44916	26.99	-19.90	46.89	26.64	0.15	0.20	LINE	AVERAGE
7	2.023	22.12	-33.88	56.00	21.70	0.19	0.23	LINE	QP
8	2.023	14.08	-31.92	46.00	13.66	0.19	0.23	LINE	AVERAGE
9	10.342	40.27	-19.73	60.00	39.53	0.38	0.36	LINE	QP
10	10.342	32.44	-17.56	50.00	31.70	0.38	0.36	LINE	AVERAGE
11	17.661	31.10	-18.90	50.00	30.09	0.55	0.47	LINE	AVERAGE
12	17.661	36.58	-23.42	60.00	35.57	0.55	0.47	LINE	QP

Temperature	25°C	Humidity	52%
Test Engineer	Kane Liu	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 5



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15321	57.25	-8.57	65.82	56.99	0.08	0.18	NEUTRAL	QP
2	0.15321	41.18	-14.64	55.82	40.92	0.08	0.18	NEUTRAL	AVERAGE
3	0.22437	43.30	-19.36	62.66	43.02	0.08	0.20	NEUTRAL	QP
4	0.22437	29.70	-22.96	52.66	29.42	0.08	0.20	NEUTRAL	AVERAGE
5	0.29243	36.60	-23.86	60.46	36.32	0.08	0.20	NEUTRAL	QP
6	0.29243	12.96	-37.50	50.46	12.68	0.08	0.20	NEUTRAL	AVERAGE
7	0.48632	36.07	-20.16	56.23	35.79	0.08	0.20	NEUTRAL	QP
8	0.48632	18.39	-27.84	46.23	18.11	0.08	0.20	NEUTRAL	AVERAGE
9	0.59164	32.06	-23.94	56.00	31.78	0.08	0.20	NEUTRAL	QP
10	0.59164	22.26	-23.74	46.00	21.98	0.08	0.20	NEUTRAL	AVERAGE
11	11.498	40.18	-19.82	60.00	39.53	0.26	0.39	NEUTRAL	QP
12	11.498	31.79	-18.21	50.00	31.14	0.26	0.39	NEUTRAL	AVERAGE

Note:

$$\text{Level} = \text{Read Level} + \text{LISN Factor} + \text{Cable Loss}$$

4.2. 26dB Bandwidth and 99% Occupied 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.

26dB Bandwidth	
Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RBW	Approximately 1% of the emission bandwidth
VBW	VBW > RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	Setting
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold

4.2.3. Test Procedures

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

1. The transmitter was radiated 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

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

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

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 and 99% Occupied Bandwidth

Temperature	22°C	Humidity	62%
Test Engineer	Nick 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	24.00	18.08
40	5200 MHz	24.00	18.24
48	5240 MHz	25.44	18.08
52	5260 MHz	24.48	18.08
60	5300 MHz	29.28	18.08
64	5320 MHz	24.64	18.08
100	5500 MHz	26.88	18.08
116	5580 MHz	30.56	18.08
140	5700 MHz	22.72	17.92

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

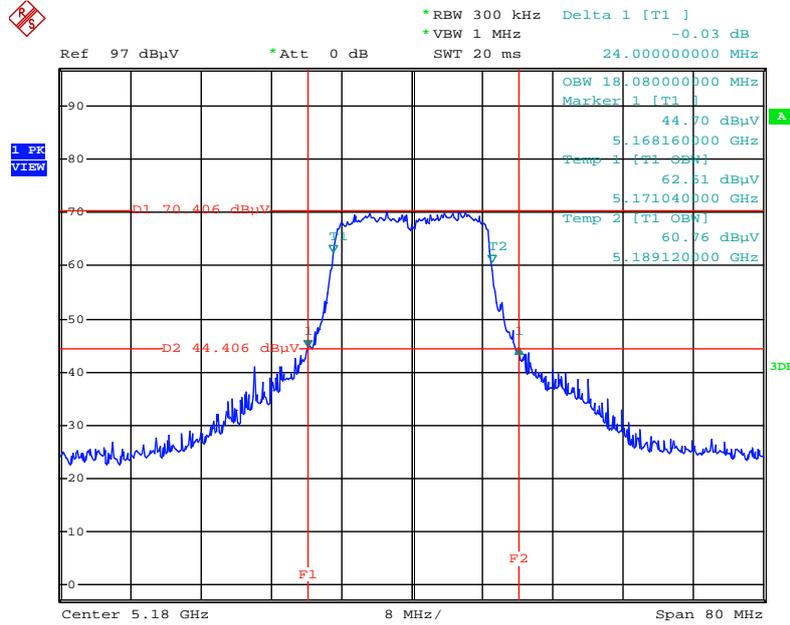
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	46.72	36.16
46	5230 MHz	46.40	36.16
54	5270 MHz	49.60	36.48
62	5310 MHz	43.20	36.48
102	5510 MHz	41.92	36.16
110	5550 MHz	53.44	36.48
134	5670 MHz	41.92	36.16

Temperature	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Ant. 1 + Ant. 2

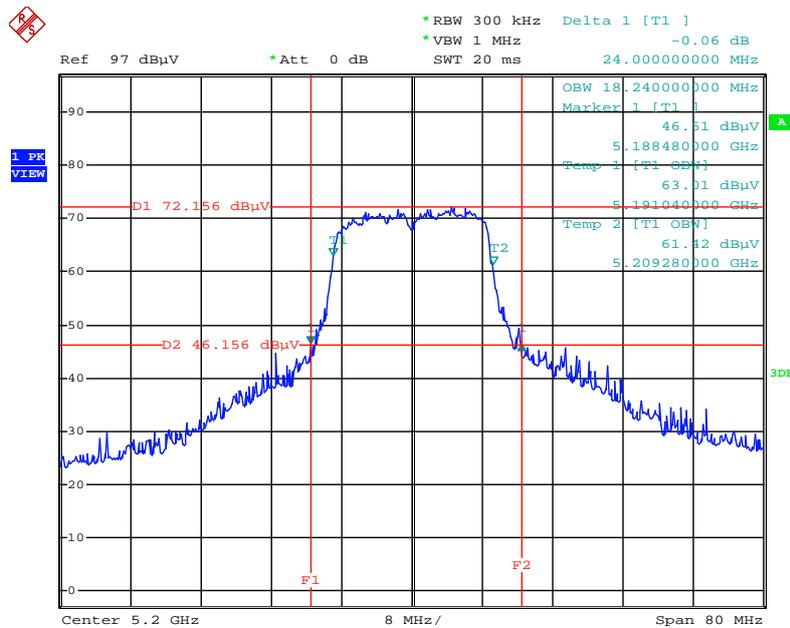
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	22.08	17.12
40	5200 MHz	22.72	16.80
48	5240 MHz	22.08	16.96
52	5260 MHz	25.44	17.12
60	5300 MHz	22.88	16.96
64	5320 MHz	23.36	16.80
100	5500 MHz	25.60	16.96
116	5580 MHz	30.72	16.96
140	5700 MHz	22.72	16.96

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5180 MHz



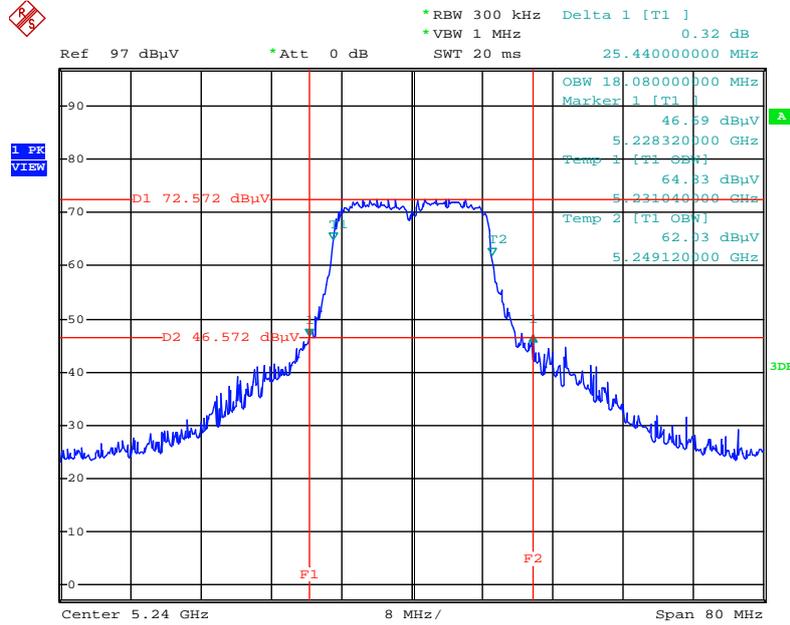
Date: 5.NOV.2013 14:48:21

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5200 MHz



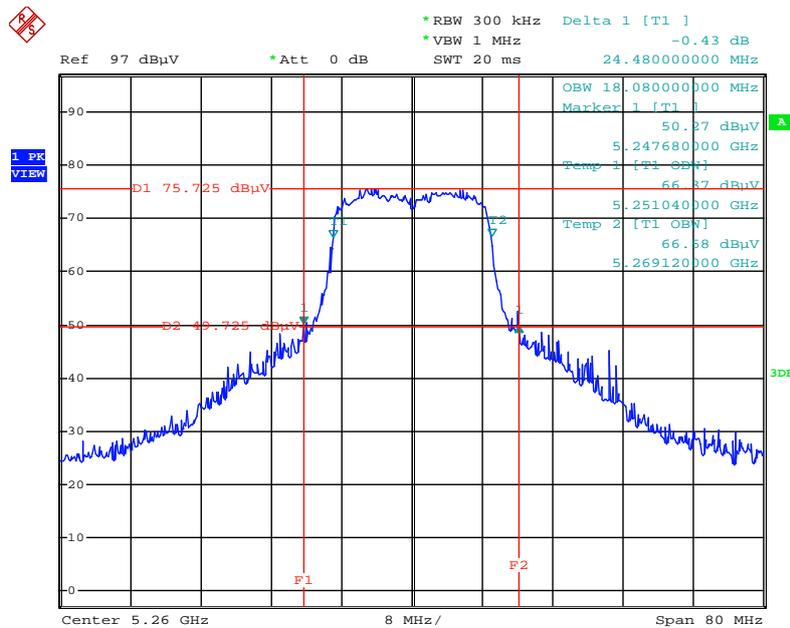
Date: 5.NOV.2013 14:49:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5240 MHz



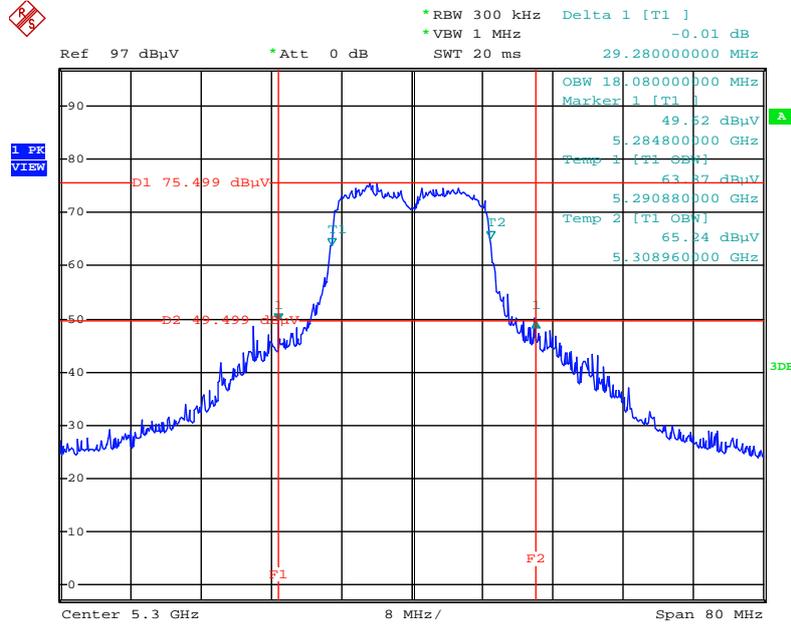
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5260 MHz



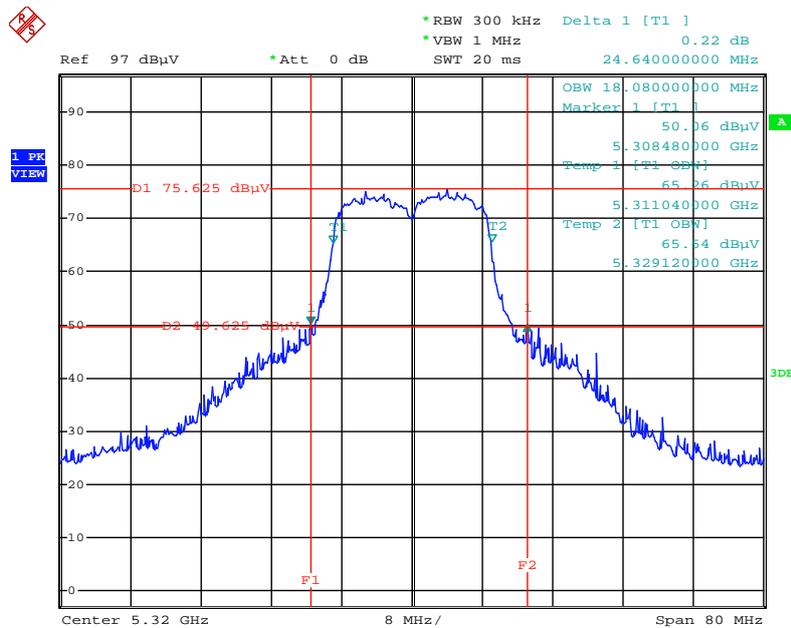
Date: 5.NOV.2013 14:50:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5300 MHz



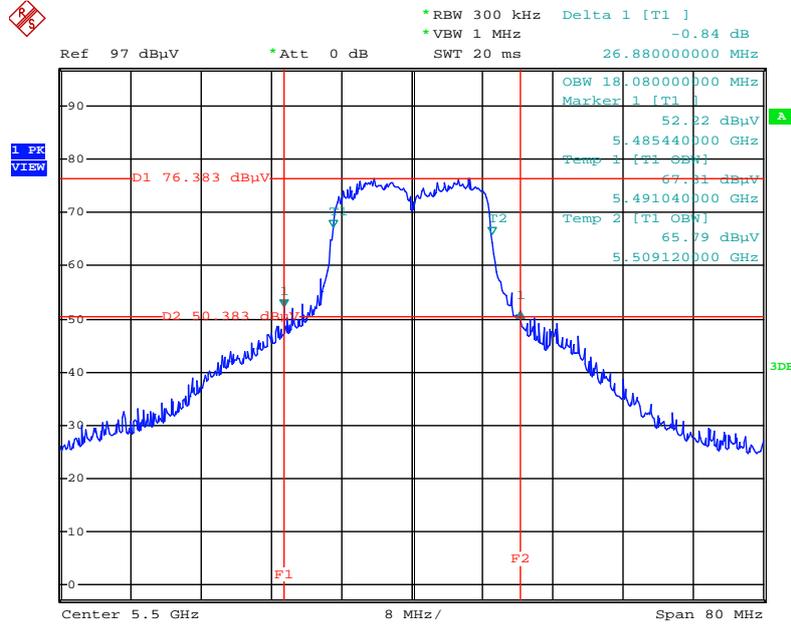
Date: 5.NOV.2013 14:51:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5320 MHz



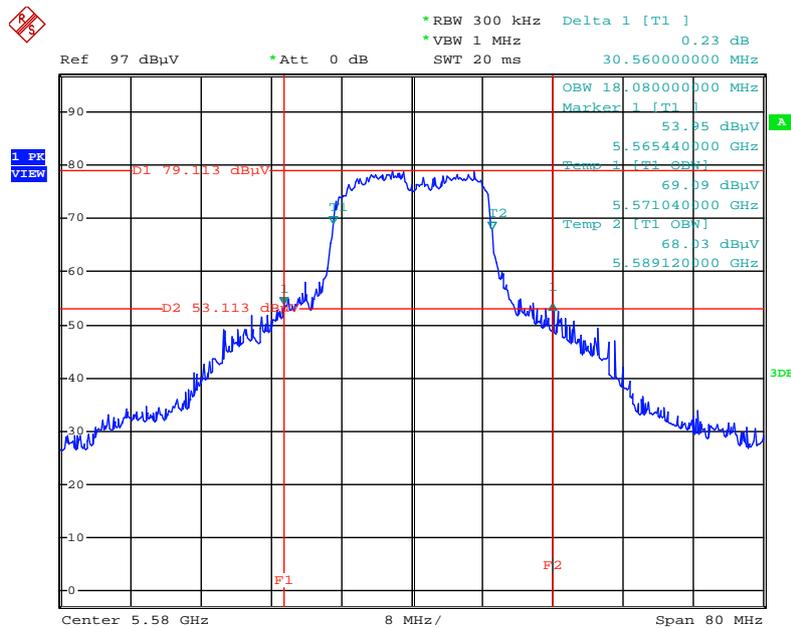
Date: 5.NOV.2013 14:52:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5500 MHz



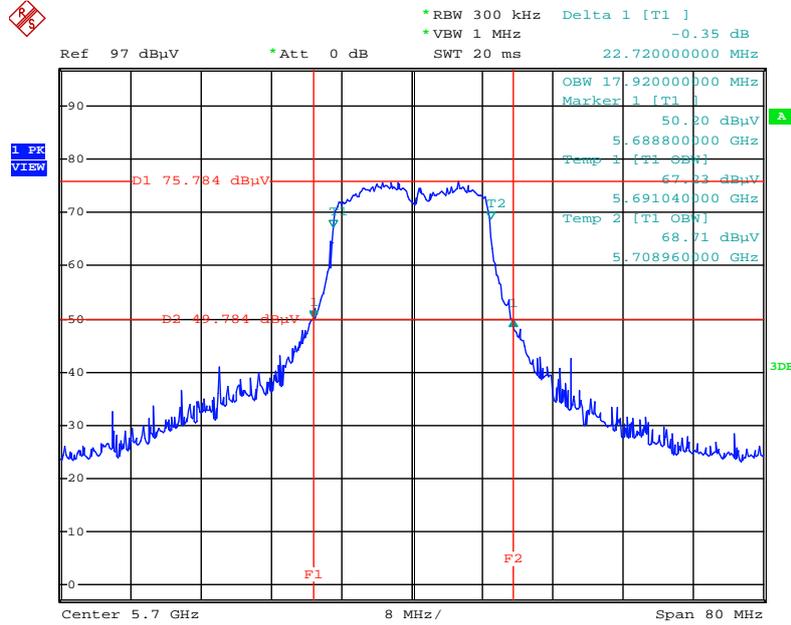
Date: 5.NOV.2013 15:12:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5580 MHz



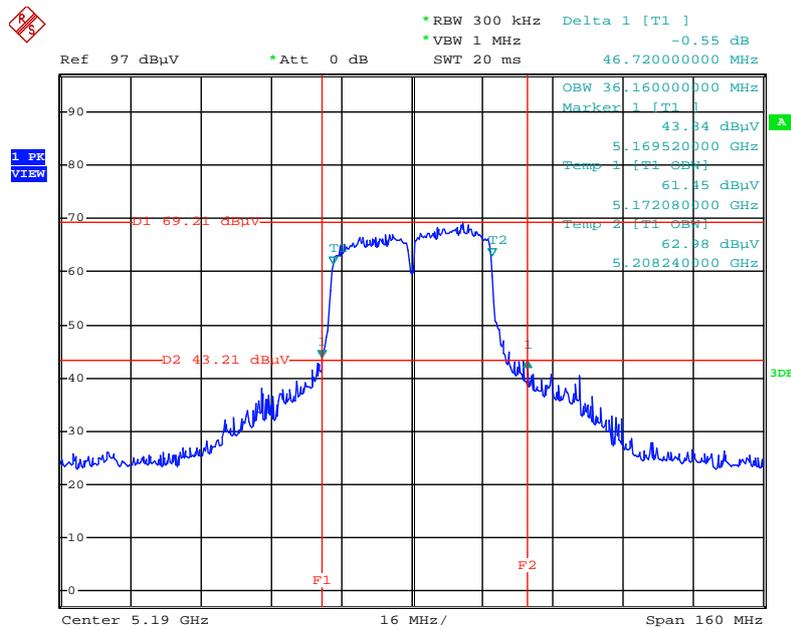
Date: 5.NOV.2013 15:13:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant.1 + Ant. 2 / 5700 MHz



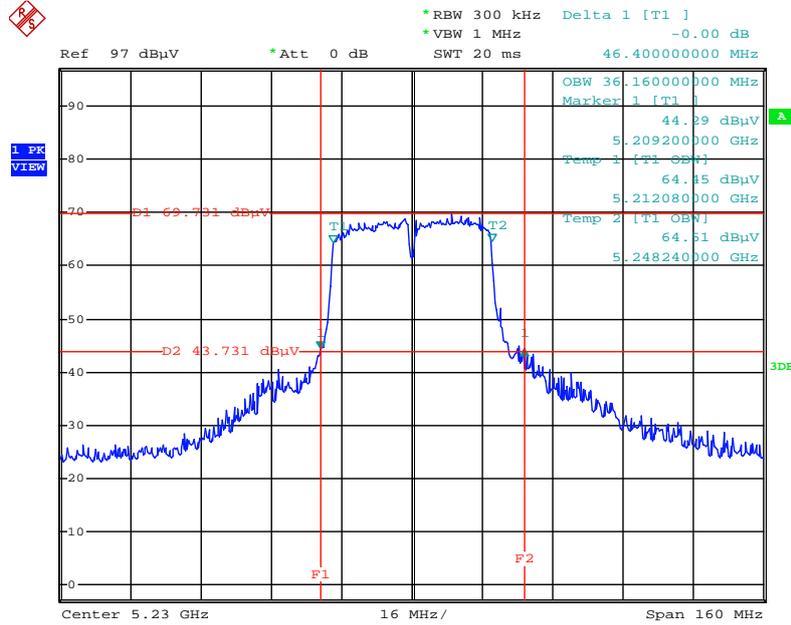
Date: 5.NOV.2013 15:14:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5190 MHz



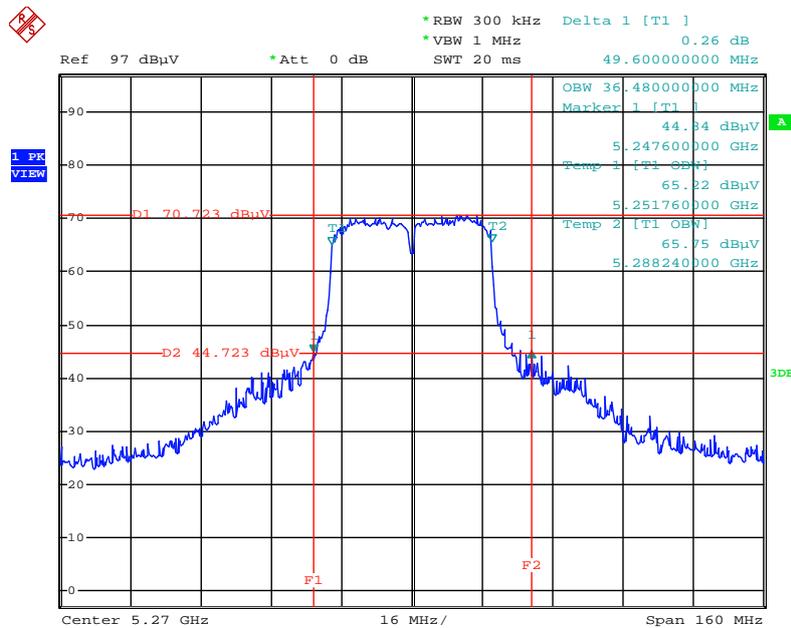
Date: 5.NOV.2013 15:17:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5230 MHz



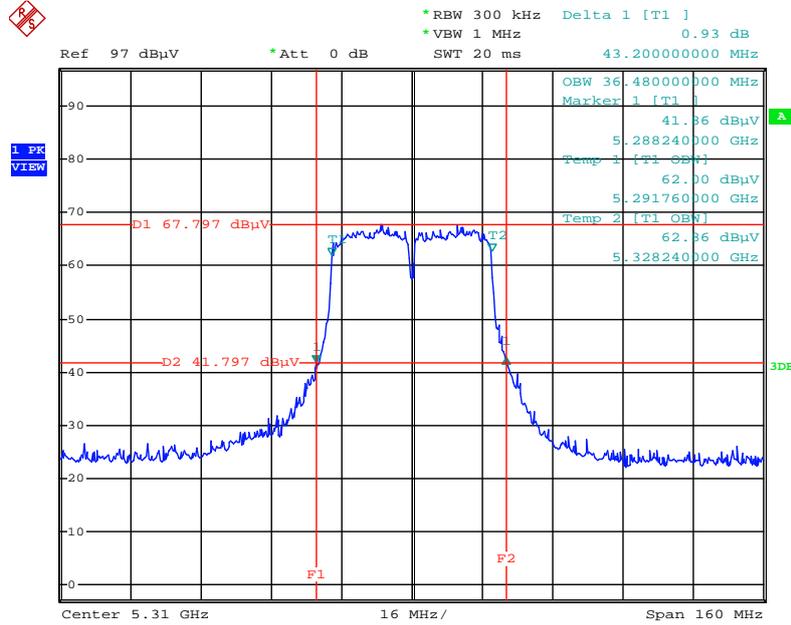
Date: 5.NOV.2013 15:16:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5270 MHz



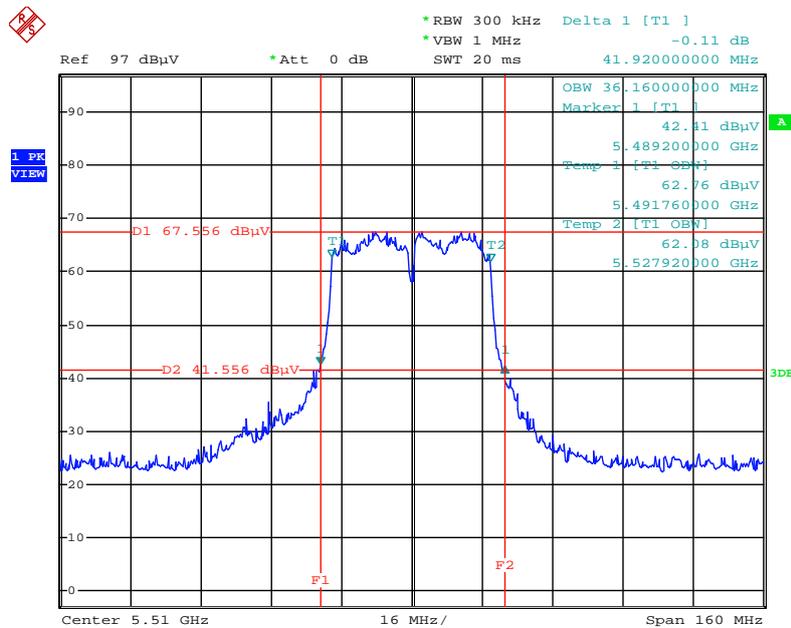
Date: 5.NOV.2013 15:18:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5310 MHz



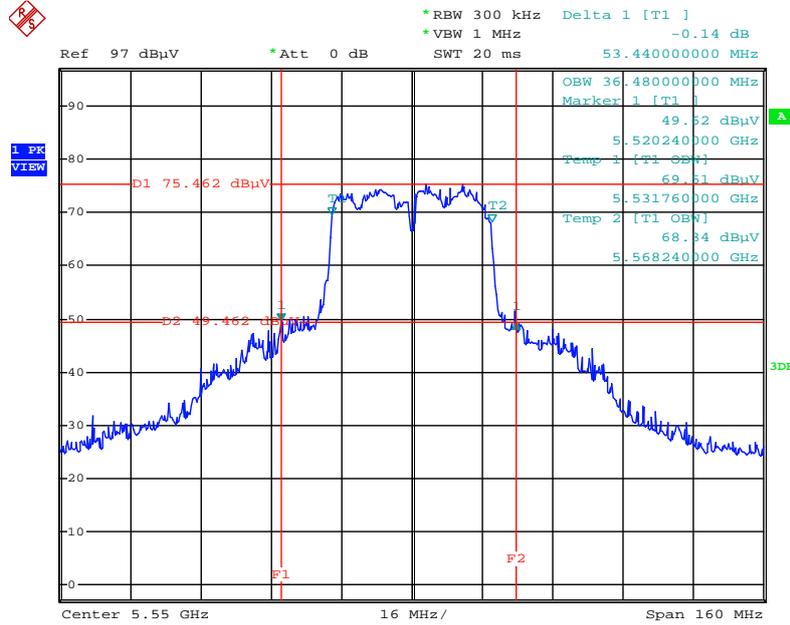
Date: 5.NOV.2013 15:19:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5510 MHz



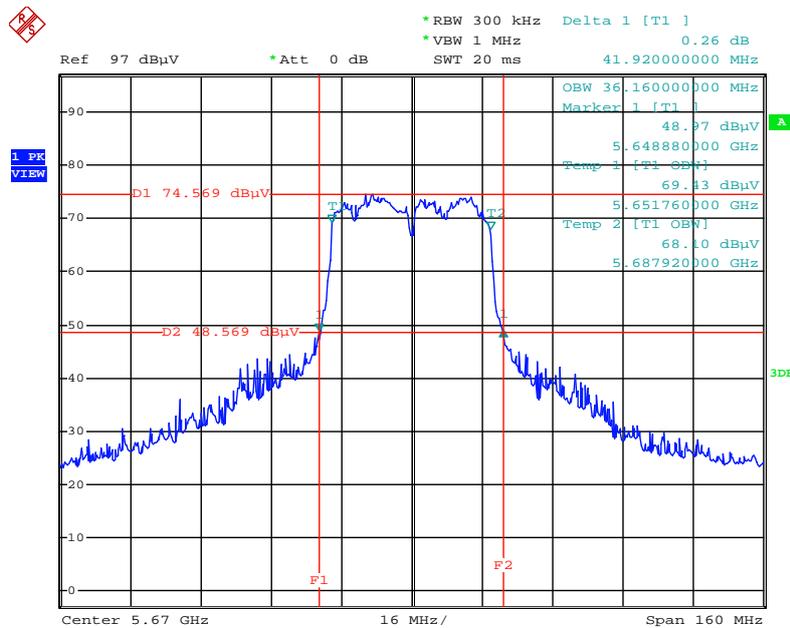
Date: 5.NOV.2013 15:20:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5550 MHz



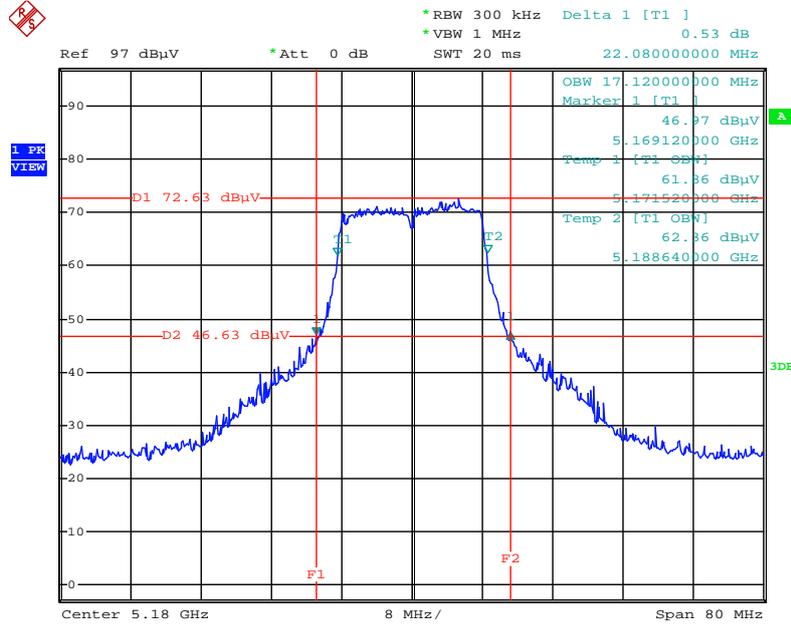
Date: 5.NOV.2013 15:22:28

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant.1 + Ant. 2 / 5670 MHz



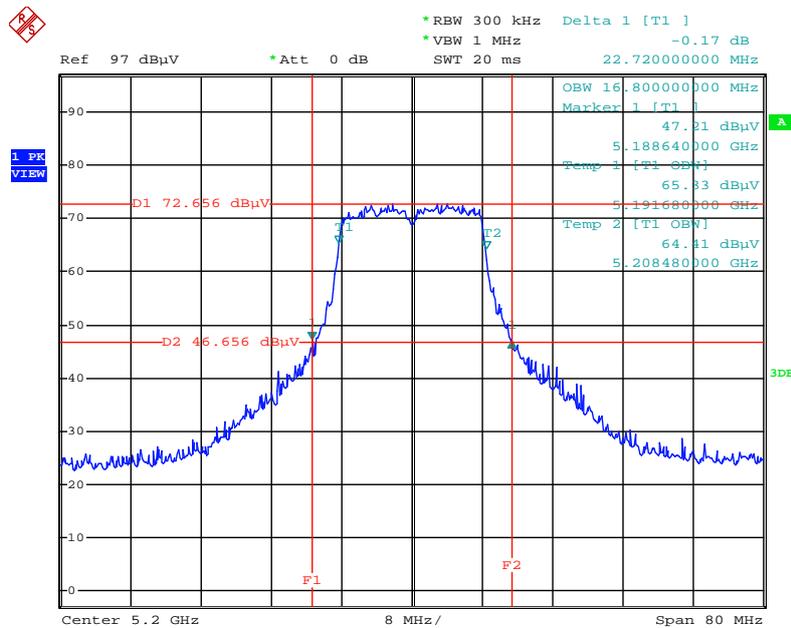
Date: 5.NOV.2013 15:27:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5180 MHz



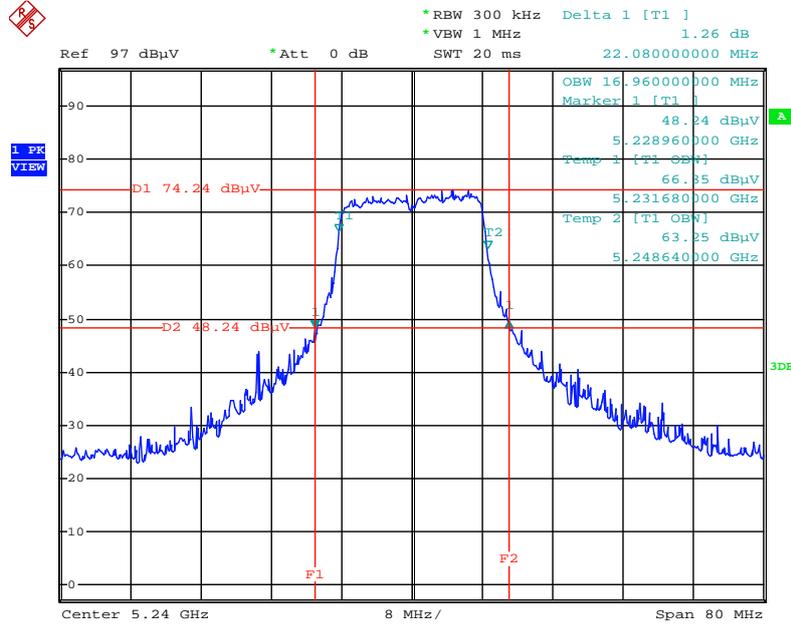
Date: 5.NOV.2013 14:38:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5200 MHz



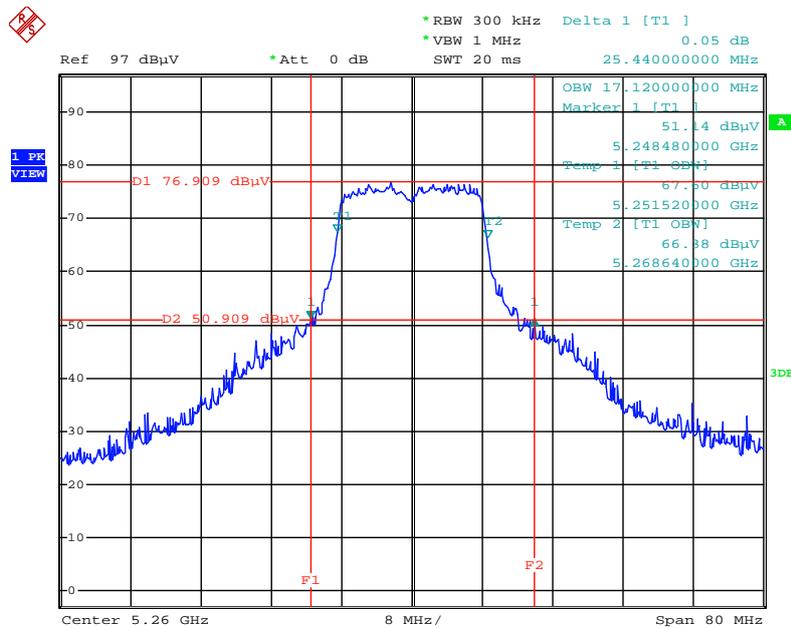
Date: 5.NOV.2013 14:39:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5240 MHz



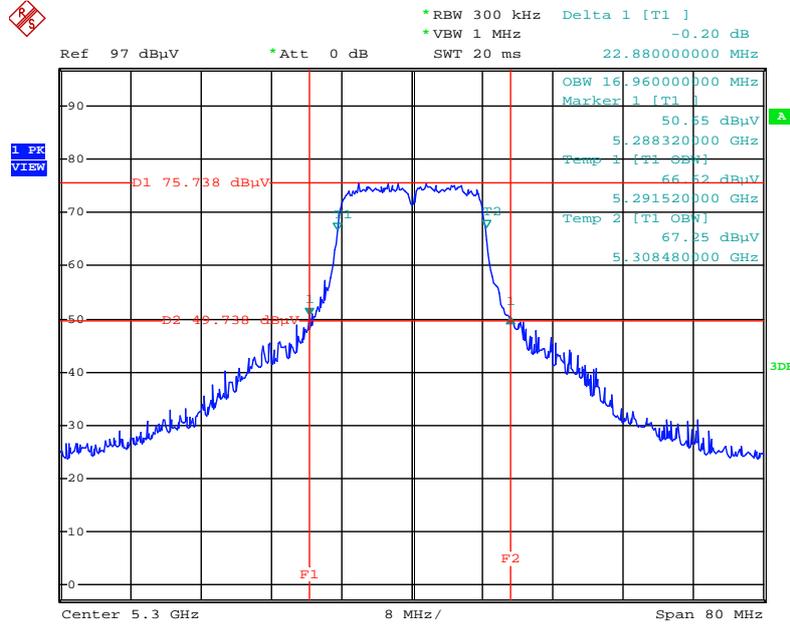
Date: 5.NOV.2013 14:40:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5260 MHz



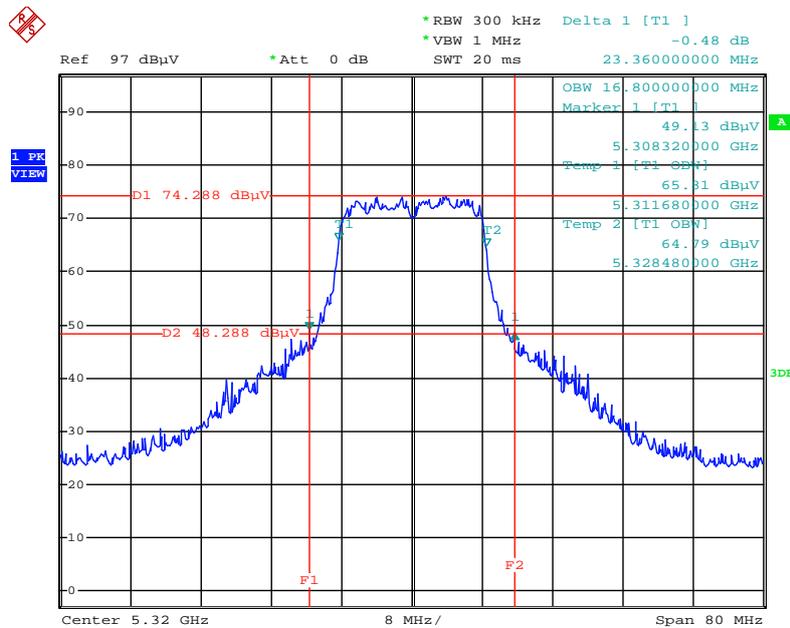
Date: 5.NOV.2013 14:42:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5300 MHz



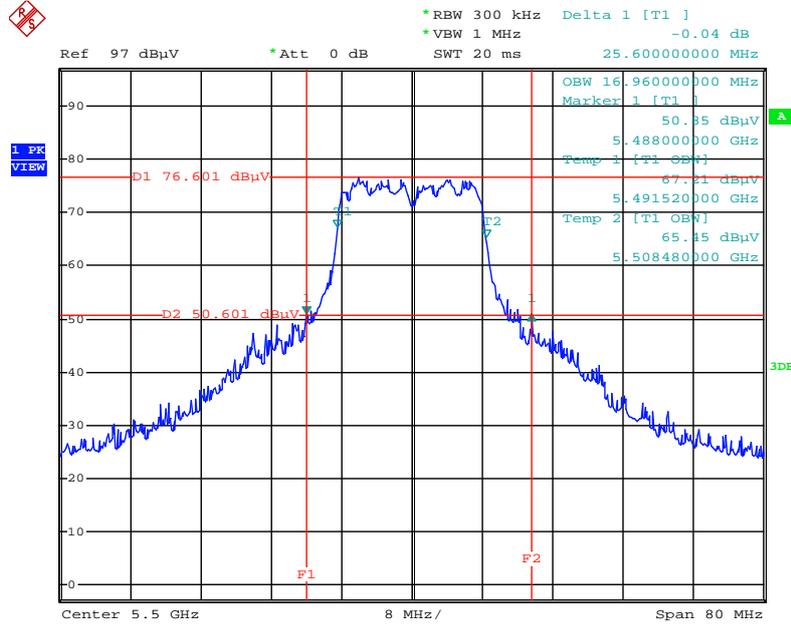
Date: 5.NOV.2013 14:43:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5320 MHz



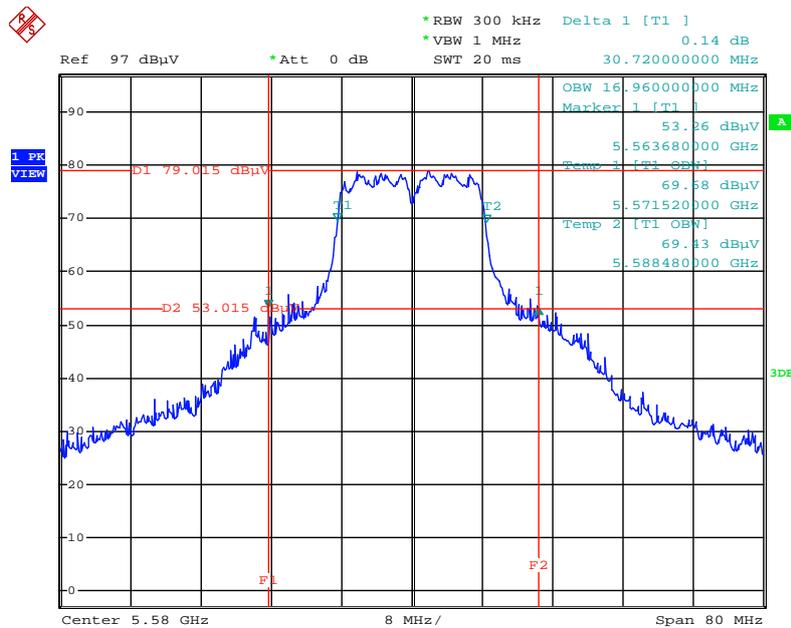
Date: 5.NOV.2013 14:44:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5500 MHz



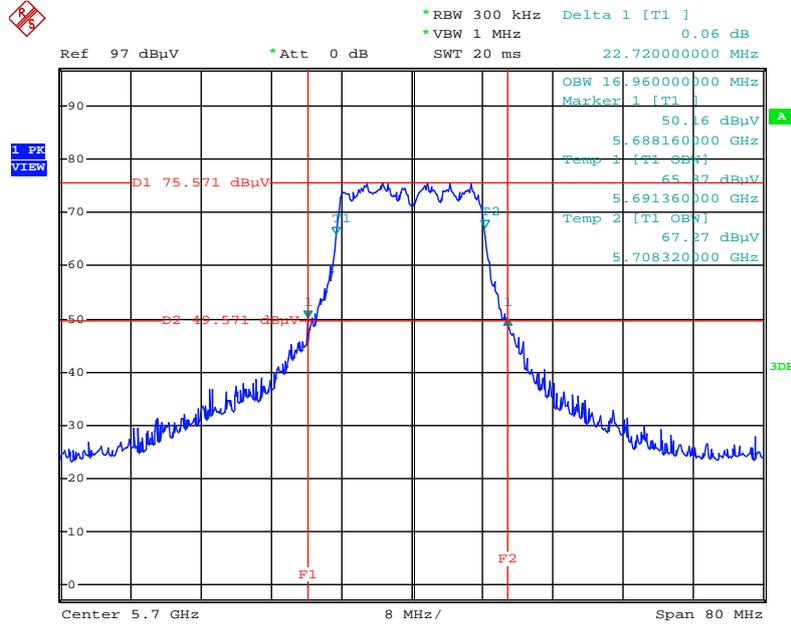
Date: 5.NOV.2013 14:45:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5580 MHz



Date: 5.NOV.2013 14:46:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant.1 + Ant. 2 / 5700 MHz



Date: 5.NOV.2013 14:47:06

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 $4 \text{ dBm} + 10\log B$, 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 $11 \text{ dBm} + 10\log B$, 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.

4.3.2. Measuring Instruments and Setting

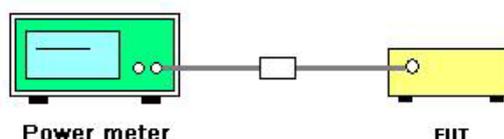
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB 789033 D01 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, section (E) Maximum conducted output power =>(3) Method PM (Measurement using an RF average power meter) Multiple antenna systems was performed in accordance with KDB 662911 D01 v02 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.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Maximum Conducted Output Power

Temperature	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n
Test Date	Sep. 23, 2013		

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
36	5180 MHz	14.23	13.43	16.86	17.00	Complies
40	5200 MHz	14.14	13.41	16.80	17.00	Complies
48	5240 MHz	13.95	13.84	16.91	17.00	Complies
52	5260 MHz	15.01	14.92	17.98	24.00	Complies
60	5300 MHz	15.03	14.52	17.79	24.00	Complies
64	5320 MHz	15.02	14.39	17.73	24.00	Complies
100	5500 MHz	16.12	16.07	19.11	24.00	Complies
116	5580 MHz	17.79	17.05	20.45	24.00	Complies
140	5700 MHz	13.86	12.81	16.38	24.00	Complies

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
38	5190 MHz	14.18	13.36	16.80	17.00	Complies
46	5230 MHz	13.87	13.83	16.86	17.00	Complies
54	5270 MHz	15.14	14.78	17.97	24.00	Complies
62	5310 MHz	12.05	11.51	14.80	24.00	Complies
102	5510 MHz	10.62	10.44	13.54	24.00	Complies
110	5550 MHz	17.69	16.89	20.32	24.00	Complies
134	5670 MHz	14.07	12.75	16.47	24.00	Complies

Temperature	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a
Test Date	Sep. 23, 2013		

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
36	5180 MHz	14.19	13.75	16.99	17.00	Complies
40	5200 MHz	14.25	13.68	16.98	17.00	Complies
48	5240 MHz	13.82	13.51	16.68	17.00	Complies
52	5260 MHz	15.02	14.95	18.00	24.00	Complies
60	5300 MHz	14.93	14.31	17.64	24.00	Complies
64	5320 MHz	14.88	14.13	17.53	24.00	Complies
100	5500 MHz	16.25	16.06	19.17	24.00	Complies
116	5580 MHz	17.57	16.93	20.27	24.00	Complies
140	5700 MHz	13.87	12.78	16.37	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
5.470-5.725 GHz	11

4.4.2. Measuring Instruments and Setting

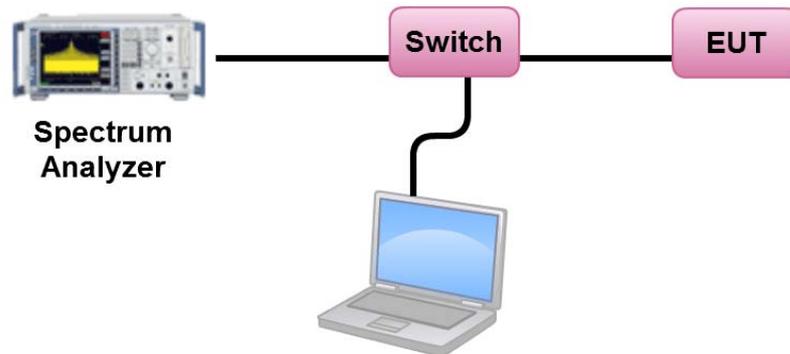
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz
VBW	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 D01 v01r03 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 KDB 662911 D01 v02 in-Band Power Spectral Density (PSD) Measurements (a) 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	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n
Test Date	Sep. 23, 2013		

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

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	3.60	4.00	Complies
40	5200 MHz	3.42	4.00	Complies
48	5240 MHz	3.56	4.00	Complies
52	5260 MHz	4.67	11.00	Complies
60	5300 MHz	4.59	11.00	Complies
64	5320 MHz	4.19	11.00	Complies
100	5500 MHz	5.57	10.59	Complies
116	5580 MHz	7.32	10.59	Complies
140	5700 MHz	2.61	10.59	Complies

Note:

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.99\text{dBi} < 6\text{dBi}, \text{ so Band 1 limit} = 4\text{dBm/MHz}.$$

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.72\text{dBi} < 6\text{dBi}, \text{ so Band 2 limit} = 11\text{dBm/MHz}.$$

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 6.41\text{dBi} > 6\text{dBi}, \text{ so Band 3 limit} = 11 - (6.41 - 6) = 10.59\text{dBm/MHz}.$$

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

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	0.63	4.00	Complies
46	5230 MHz	0.49	4.00	Complies
54	5270 MHz	2.01	11.00	Complies
62	5310 MHz	-1.37	11.00	Complies
102	5510 MHz	-2.53	10.59	Complies
110	5550 MHz	4.32	10.59	Complies
134	5670 MHz	-0.50	10.59	Complies

Note:

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.99\text{dBi} < 6\text{dBi}, \text{ so Band 1 limit} = 4\text{dBm/MHz}.$$

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.72\text{dBi} < 6\text{dBi}, \text{ so Band 2 limit} = 11\text{dBm/MHz}.$$

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 6.41\text{dBi} > 6\text{dBi}, \text{ so Band 3 limit} = 11 - (6.41 - 6) = 10.59\text{dBm/MHz}.$$

Temperature	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a
Test Date	Sep. 23, 2013		

Configuration IEEE 802.11a / Ant. 1 + Ant. 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	3.90	4.00	Complies
40	5200 MHz	3.92	4.00	Complies
48	5240 MHz	3.42	4.00	Complies
52	5260 MHz	5.09	11.00	Complies
60	5300 MHz	4.44	11.00	Complies
64	5320 MHz	4.75	11.00	Complies
100	5500 MHz	6.15	10.59	Complies
116	5580 MHz	7.24	10.59	Complies
140	5700 MHz	2.89	10.59	Complies

Note:

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.99 \text{dBi} < 6 \text{dBi}, \text{ so Band 1 limit} = 4 \text{dBm/MHz}.$$

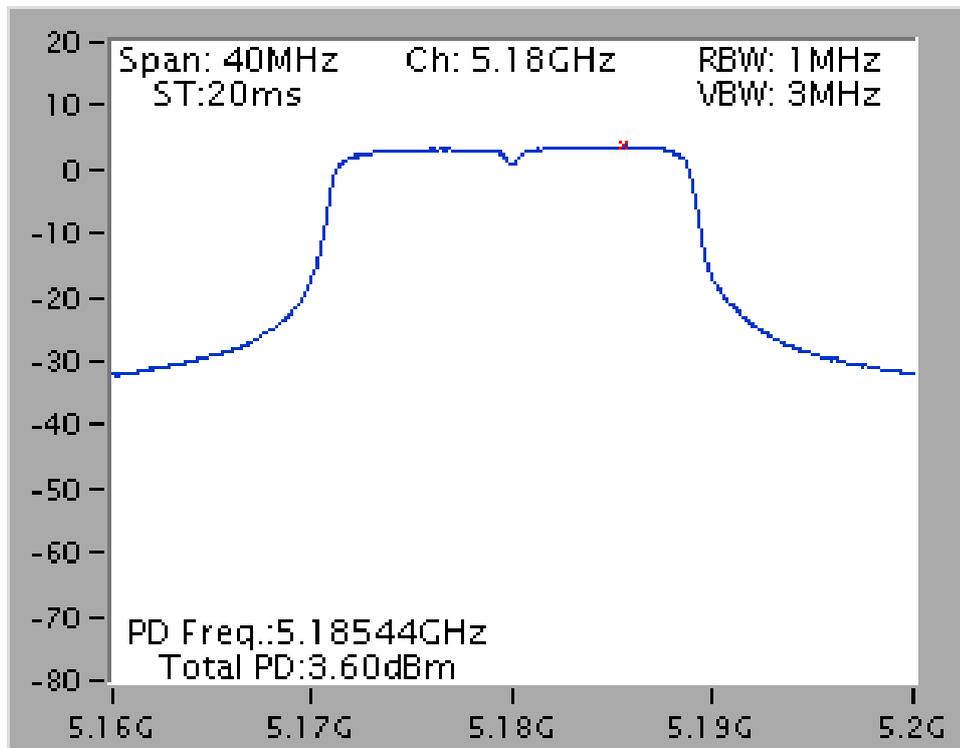
$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 5.72 \text{dBi} < 6 \text{dBi}, \text{ so Band 2 limit} = 11 \text{dBm/MHz}.$$

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 6.41 \text{dBi} > 6 \text{dBi}, \text{ so Band 3 limit} = 11 - (6.41 - 6) = 10.59 \text{dBm/MHz}.$$

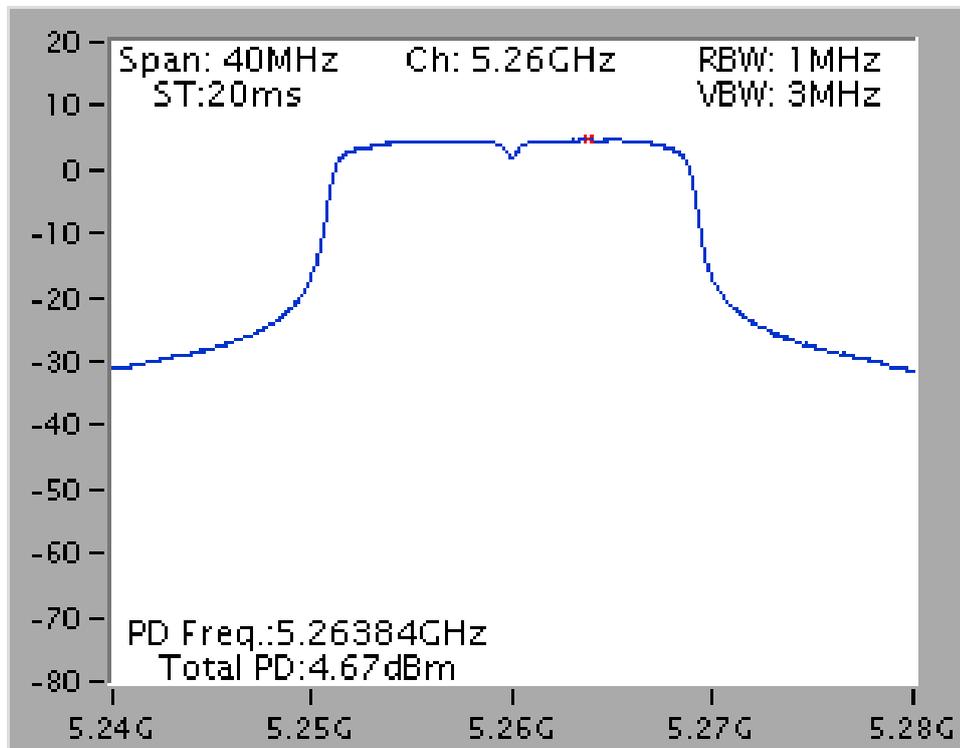
Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

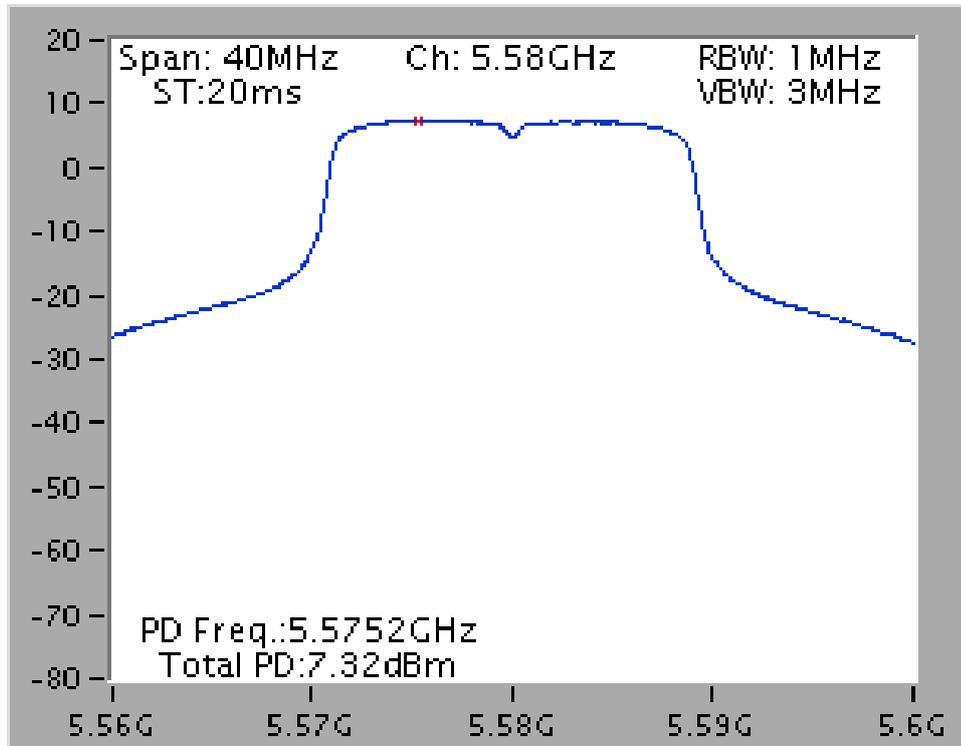
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5180 MHz



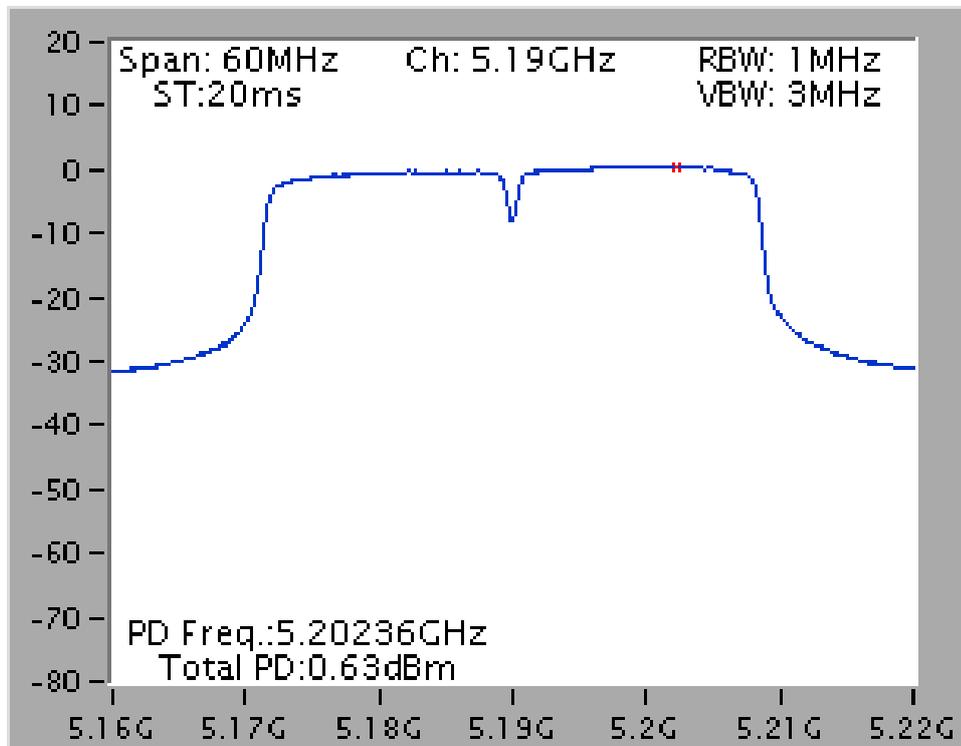
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5260 MHz



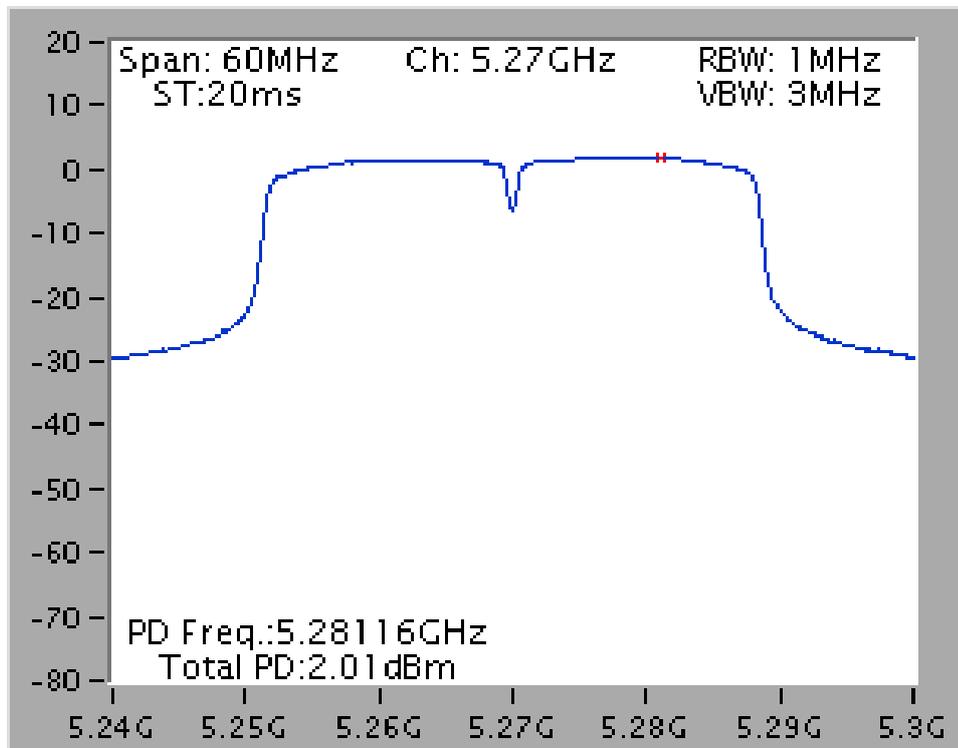
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 + Ant. 2 / 5580 MHz



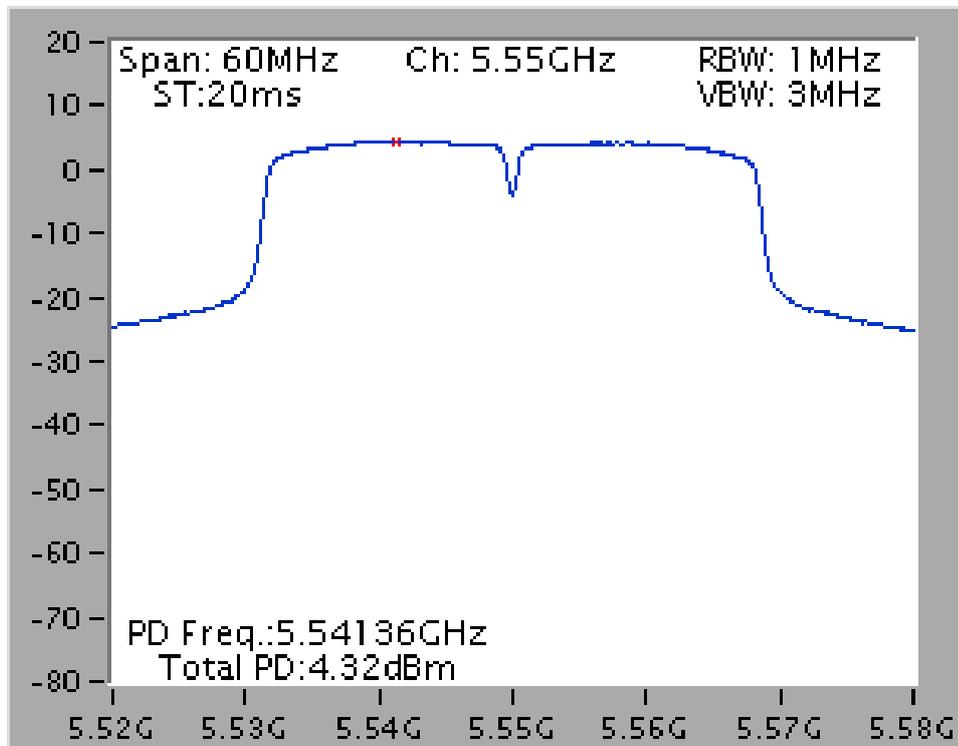
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5190 MHz



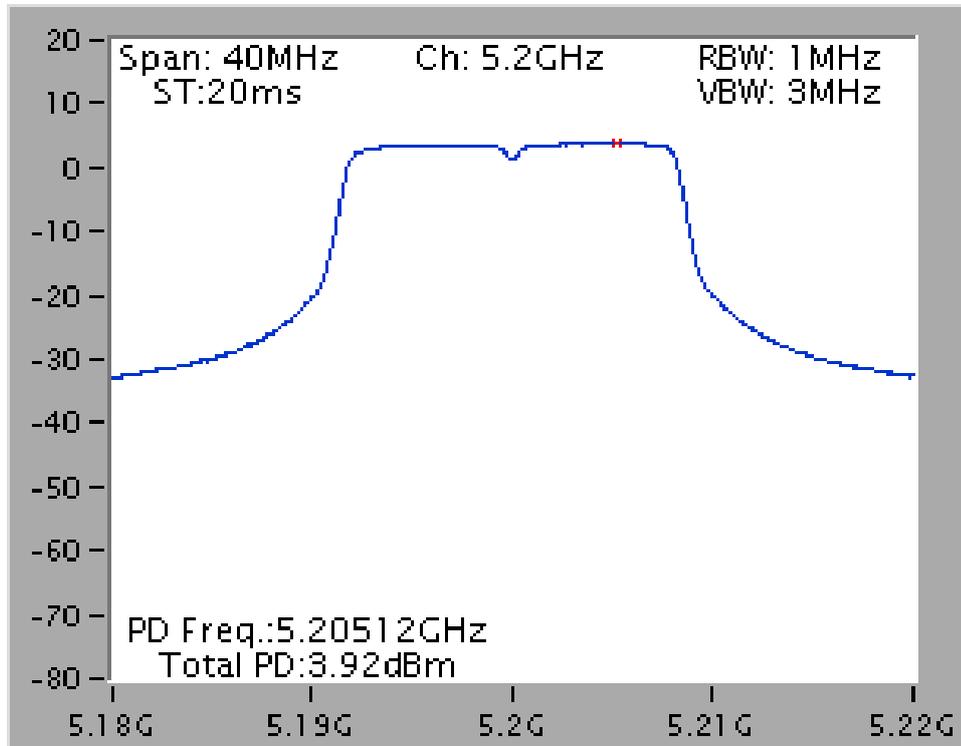
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5270 MHz



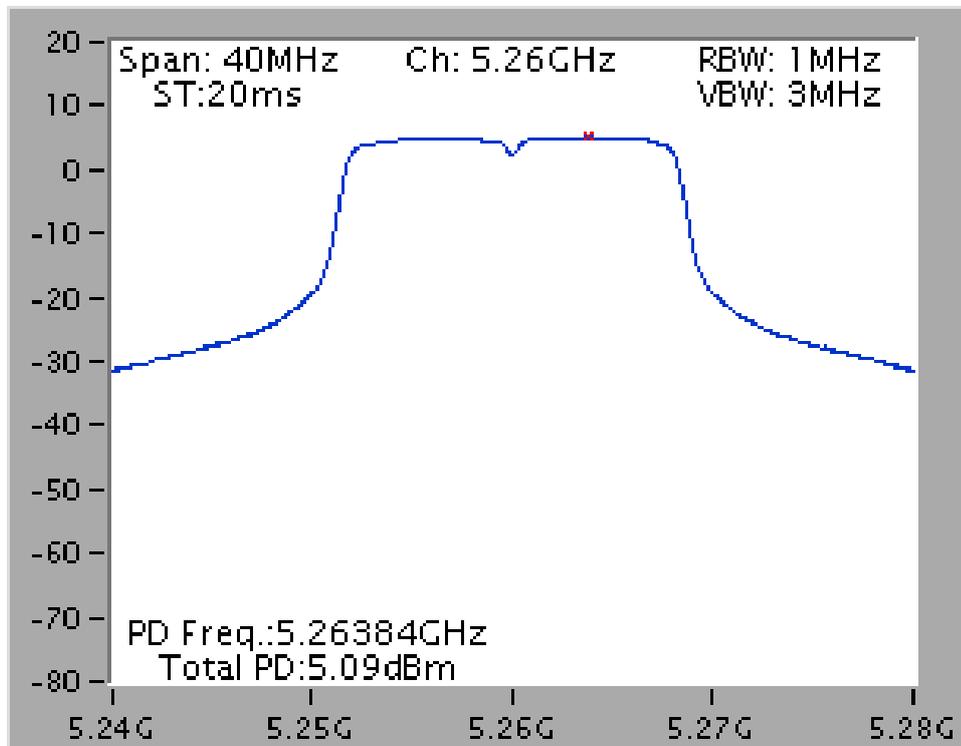
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 + Ant. 2 / 5550 MHz



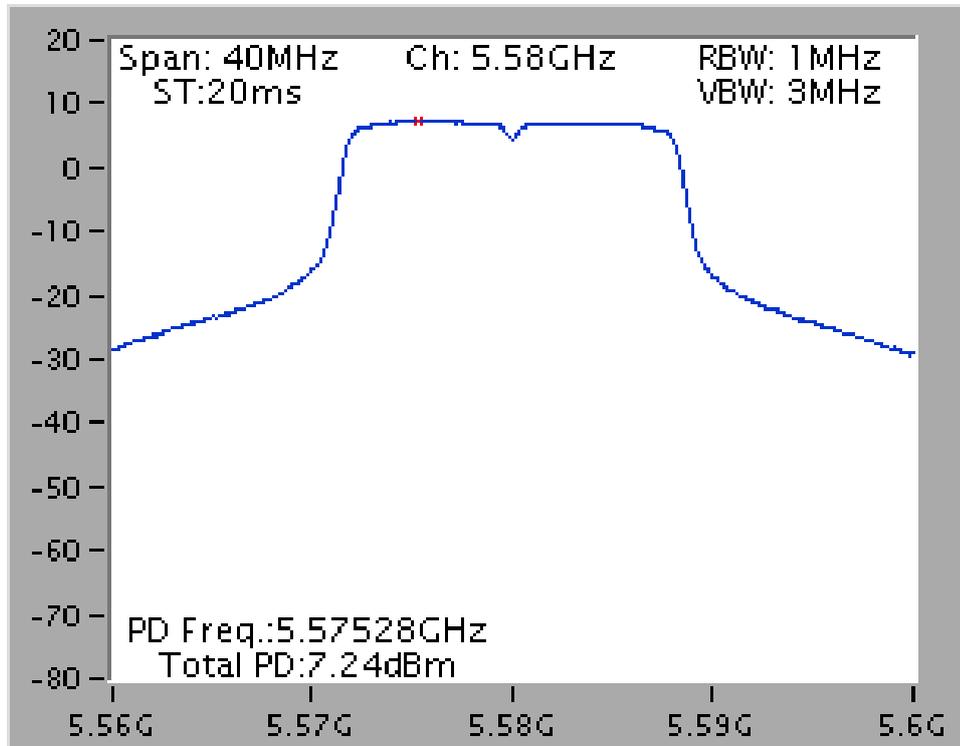
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5200 MHz



Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5260 MHz



Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 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
RBW	1 MHz (Peak Trace) / 1 MHz (Average Trace)
VBW	≥ 3 MHz (Peak Trace) / ≥ 3 MHz (Average Trace)
Detector	Peak (Peak Trace) / RMS (Average Trace)
Trace	Trace: Max hold (Peak Trace) / Trace Average Sweep Count 100 (Average Trace)
Sweep Time	AUTO

4.5.3. Test Procedures

1. Trace A, Set RBW = 1MHz, VBW = 3MHz, Span >26dB bandwidth, Max. hold.
2. Delta Mark trace A Maximum frequency and trace B same frequency.
3. Repeat the above procedure until measurements for all frequencies were complete.
4. Testing each modulation mode on a single channel in single operating band at single output port.
All signal types need test (DSSS, OFDM). All modulation types need test (BPSK, QPSK, 16-QAM, 64-QAM). All bandwidth modes need test.

4.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.4.4.

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	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n

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

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5240 MHz	8.67	13	Complies
QPSK (MCS1)	5240 MHz	9.71	13	Complies
16QAM (MCS3)	5240 MHz	9.51	13	Complies
64QAM (MCS5)	5240 MHz	9.92	13	Complies
BPSK (MCS0)	5260 MHz	8.64	13	Complies
QPSK (MCS1)	5260 MHz	9.29	13	Complies
16QAM (MCS3)	5260 MHz	8.96	13	Complies
64QAM (MCS5)	5260 MHz	9.06	13	Complies
BPSK (MCS0)	5580 MHz	9.04	13	Complies
QPSK (MCS1)	5580 MHz	9.26	13	Complies
16QAM (MCS3)	5580 MHz	9.41	13	Complies
64QAM (MCS5)	5580 MHz	9.69	13	Complies

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

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5230 MHz	10.05	13	Complies
QPSK (MCS1)	5230 MHz	9.33	13	Complies
16QAM (MCS3)	5230 MHz	10.13	13	Complies
64QAM (MCS5)	5230 MHz	9.81	13	Complies
BPSK (MCS0)	5270 MHz	9.63	13	Complies
QPSK (MCS1)	5270 MHz	9.20	13	Complies
16QAM (MCS3)	5270 MHz	9.32	13	Complies
64QAM (MCS5)	5270 MHz	9.61	13	Complies
BPSK (MCS0)	5550 MHz	9.84	13	Complies
QPSK (MCS1)	5550 MHz	9.42	13	Complies
16QAM (MCS3)	5550 MHz	9.61	13	Complies
64QAM (MCS5)	5550 MHz	10.08	13	Complies

Temperature	22°C	Humidity	62%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a

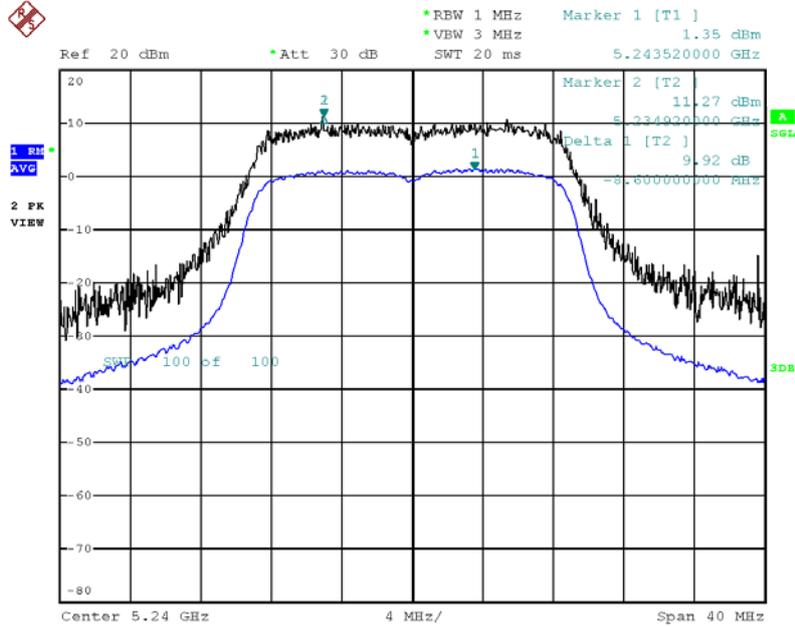
Configuration IEEE 802.11a / Ant. 1 + Ant. 2

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (6Mbps)	5180 MHz	8.38	13	Complies
QPSK (12Mbps)	5180 MHz	9.24	13	Complies
16QAM (24Mbps)	5180 MHz	9.21	13	Complies
64QAM (48Mbps)	5180 MHz	10.08	13	Complies
BPSK (6Mbps)	5260 MHz	8.85	13	Complies
QPSK (12Mbps)	5260 MHz	9.32	13	Complies
16QAM (24Mbps)	5260 MHz	8.47	13	Complies
64QAM (48Mbps)	5260 MHz	9.36	13	Complies
BPSK (6Mbps)	5580 MHz	9.01	13	Complies
QPSK (12Mbps)	5580 MHz	9.59	13	Complies
16QAM (24Mbps)	5580 MHz	9.53	13	Complies
64QAM (48Mbps)	5580 MHz	10.63	13	Complies

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

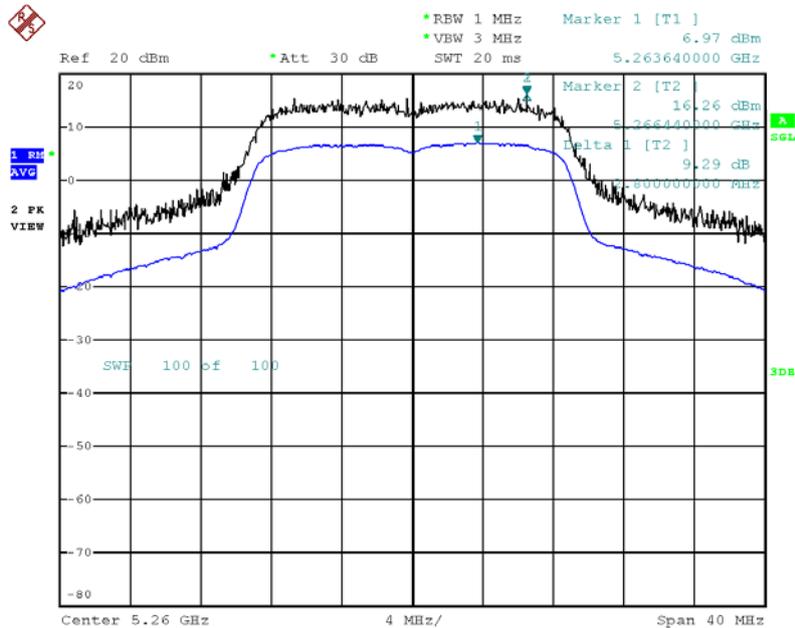
For plots, only the modulation with worse result was shown.

Peak Excursion Plot on Configuration IEEE 802.11n 20MHz / Ant. 1 + Ant. 2 / 64QAM (MCS5) / 5240 MHz



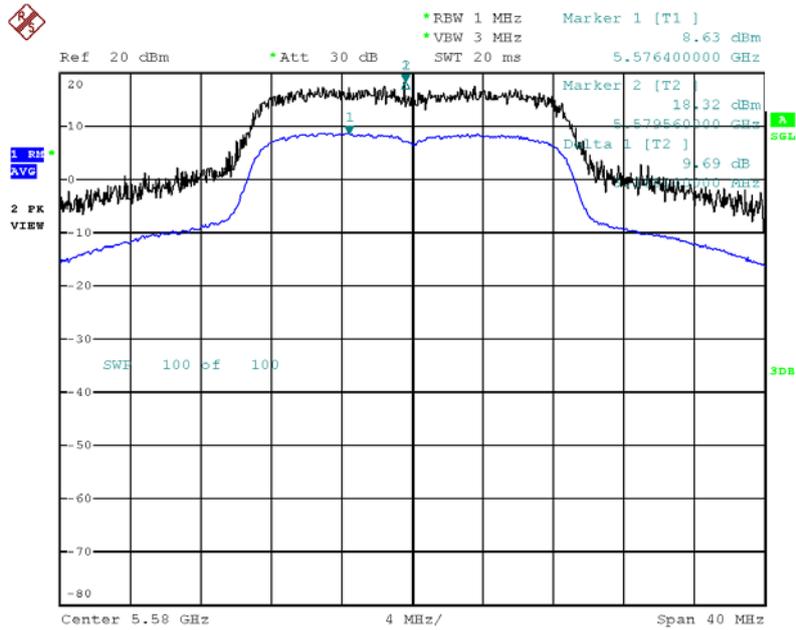
Date: 24.SEP.2013 00:30:15

Peak Excursion Plot on Configuration IEEE 802.11n 20MHz / Ant. 1 + Ant. 2 / QPSK (MCS1) / 5260 MHz



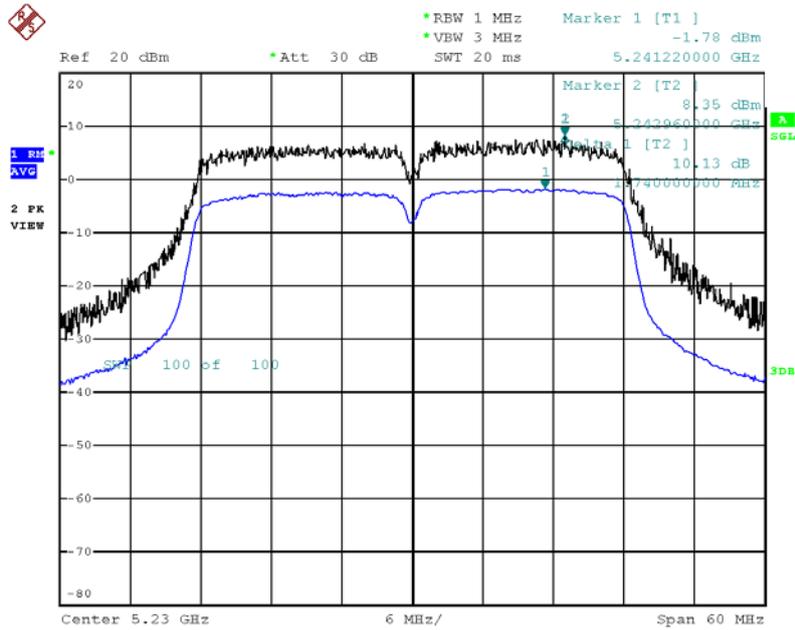
Date: 24.SEP.2013 00:33:12

Peak Excursion Plot on Configuration IEEE 802.11n 20MHz / Ant. 1 + Ant. 2 / 64QAM (MCS5) / 5580 MHz



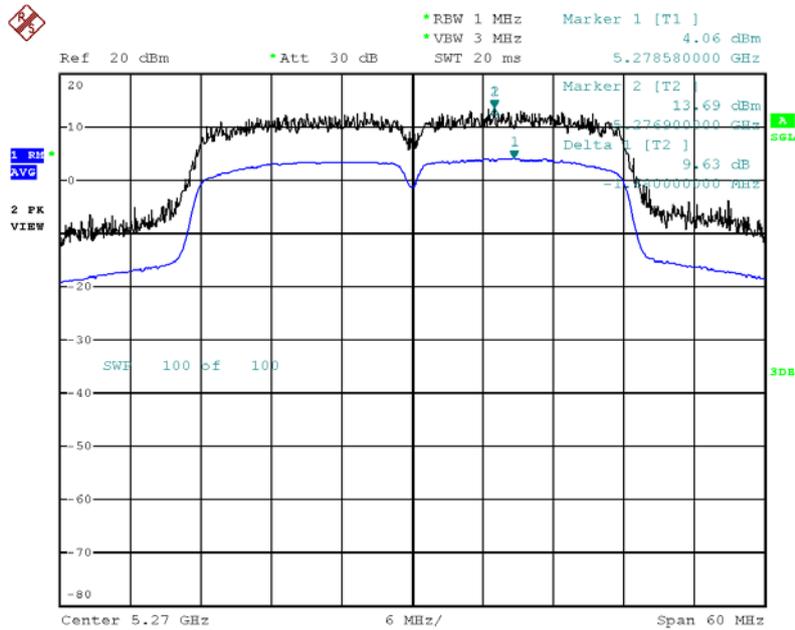
Date: 24.SEP.2013 00:41:24

Peak Excursion Plot on Configuration IEEE 802.11n 40MHz / Ant. 1 + Ant. 2 / 16QAM (MCS3) / 5230 MHz



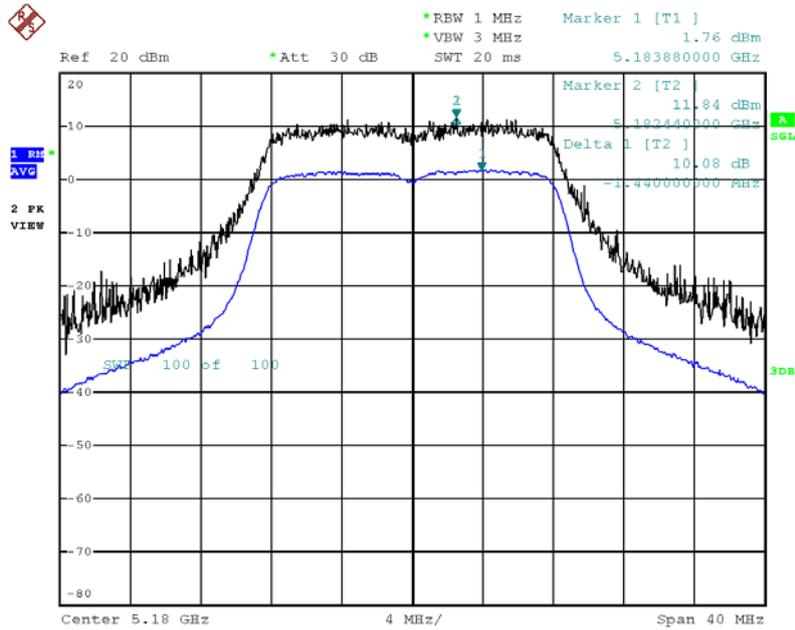
Date: 24.SEP.2013 00:55:23

Peak Excursion Plot on Configuration IEEE 802.11n 40MHz / Ant. 1 + Ant. 2 / BPSK (MCS0) / 5270 MHz



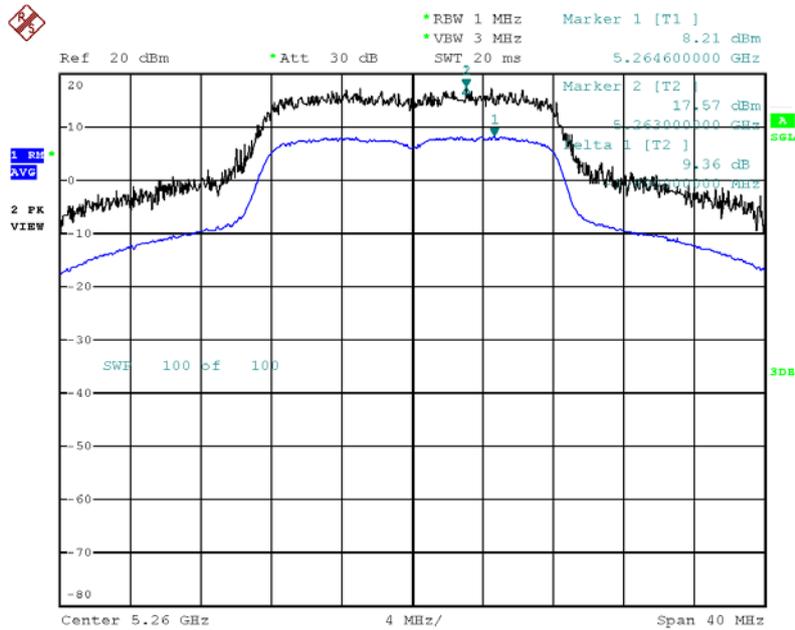
Date: 24.SEP.2013 00:48:31

Peak Excursion Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 64QAM (48Mbps) / 5180 MHz



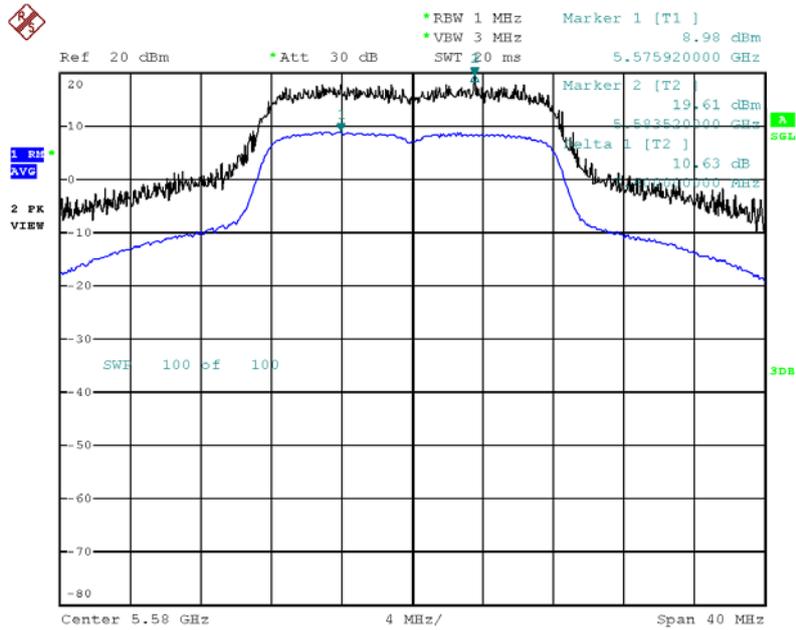
Date: 24.SEP.2013 00:01:15

Peak Excursion Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 64QAM (48Mbps) / 5260 MHz



Date: 24.SEP.2013 00:07:09

Peak Excursion Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 64QAM (48Mbps) / 5580 MHz



Date: 24.SEP.2013 00:22:28

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 a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. 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 a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. 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
RBW / VBW (Emission in restricted band)	1 MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	1 MHz / 3MHz for peak

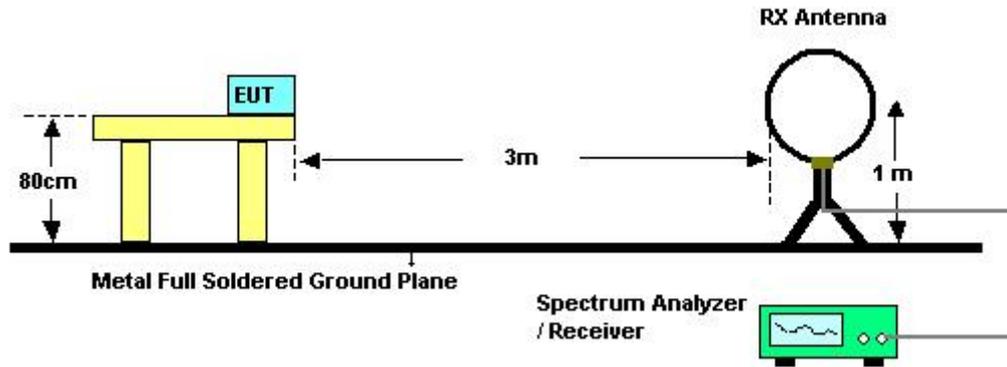
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

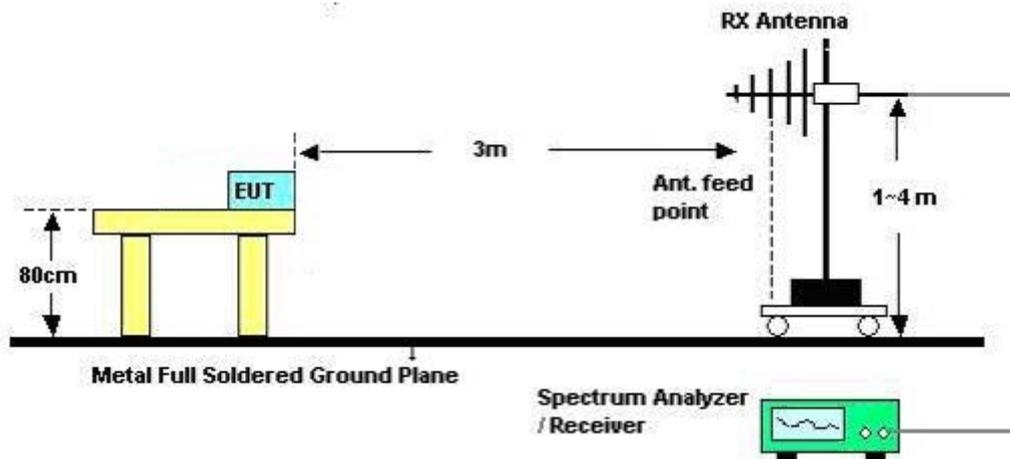
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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

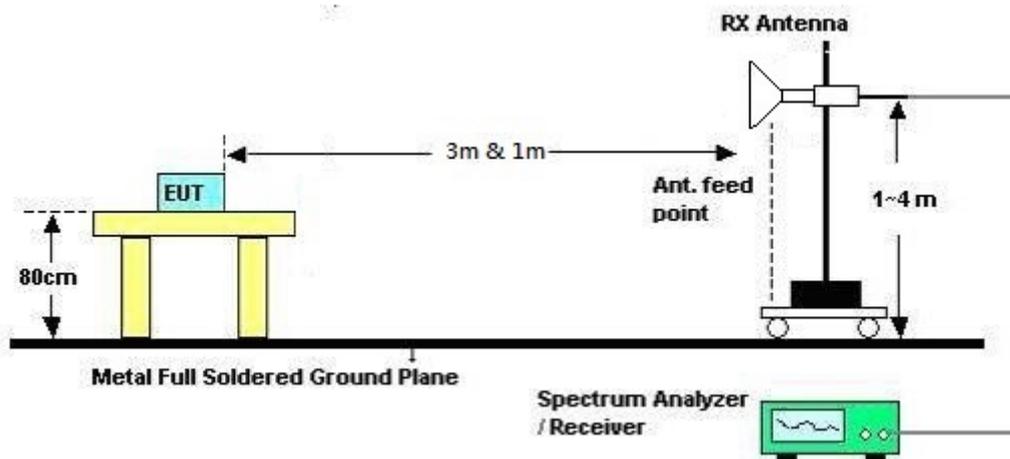
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~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°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Date	Oct. 28, 2013 ~ Oct. 30, 2013	Test Mode	Mode 7

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.

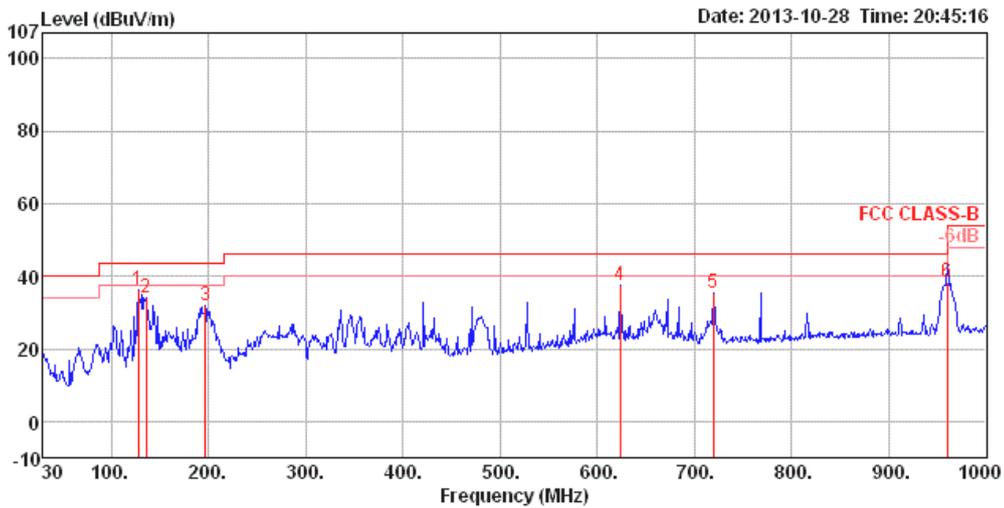
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

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

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

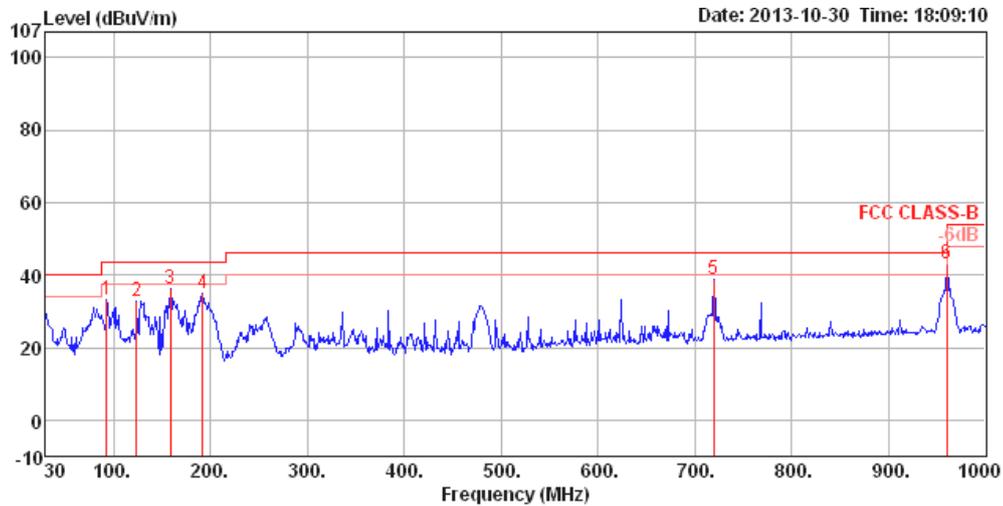
Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Mode	Mode 7		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	127.97	36.07	43.50	-7.43	54.60	1.35	11.69	31.57	300	360	HORIZONTAL Peak
2	135.73	34.21	43.50	-9.29	53.17	1.38	11.20	31.54	200	210	HORIZONTAL Peak
3	196.84	31.69	43.50	-11.81	52.77	1.69	8.74	31.51	150	14	HORIZONTAL Peak
4	623.64	37.58	46.00	-8.42	47.19	3.18	18.61	31.40	150	166	HORIZONTAL Peak
5	719.67	35.28	46.00	-10.72	43.79	3.45	19.28	31.24	150	310	HORIZONTAL Peak
6	960.00	38.35	46.00	-7.65	44.29	4.10	21.05	31.09	150	203	HORIZONTAL QP

Vertical



	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBUV/m	dBUV/m	dB	dBUV	dB	dB/m	dB	cm	deg		
1	93.05	33.31	43.50	-10.19	54.46	1.15	9.28	31.58	150	212	VERTICAL	Peak
2	124.09	32.89	43.50	-10.61	51.43	1.32	11.70	31.56	100	77	VERTICAL	Peak
3	159.01	36.26	43.50	-7.24	56.72	1.52	9.59	31.57	125	227	VERTICAL	Peak
4	191.99	34.97	43.50	-8.53	56.24	1.67	8.56	31.50	100	258	VERTICAL	Peak
5	719.67	38.59	46.00	-7.41	47.10	3.45	19.28	31.24	100	165	VERTICAL	Peak
6	960.00	42.91	46.00	-3.09	48.85	4.10	21.05	31.09	100	169	VERTICAL	Peak

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°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 36 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15540.16	43.35	54.00	-10.65	30.05	10.77	38.12	35.59	Average	100	120	HORIZONTAL
2	15540.45	56.01	74.00	-17.99	42.71	10.77	38.12	35.59	Peak	100	120	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15539.84	43.44	54.00	-10.56	30.14	10.77	38.12	35.59	Average	100	242	VERTICAL
2	15540.30	56.80	74.00	-17.20	43.50	10.77	38.12	35.59	Peak	100	242	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 40 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

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	15600.52	57.50	74.00	-16.50	44.26	10.78	38.04	35.58	Peak	101	257	HORIZONTAL
2	15600.70	44.49	54.00	-9.51	31.25	10.78	38.04	35.58	Average	101	257	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	15599.59	43.36	54.00	-10.64	30.12	10.78	38.04	35.58	Average	100	283	VERTICAL
2	15600.34	56.27	74.00	-17.73	43.03	10.78	38.04	35.58	Peak	100	283	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 48 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

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	15722.44	58.77	74.00	-15.23	45.69	10.79	37.85	35.56	Peak	100	214	HORIZONTAL
2	15722.91	44.69	54.00	-9.31	31.61	10.79	37.85	35.56	Average	100	214	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	15719.62	56.63	74.00	-17.37	43.55	10.79	37.85	35.56	Peak	100	133	VERTICAL
2	15720.47	44.16	54.00	-9.84	31.08	10.79	37.85	35.56	Average	100	133	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 52 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

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	10518.30	60.26	74.00	-13.74	46.91	8.57	39.98	35.20	Peak	100	65	HORIZONTAL
2	10520.80	46.07	54.00	-7.93	32.72	8.57	39.98	35.20	Average	100	65	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	10518.65	53.58	54.00	-0.42	40.23	8.57	39.98	35.20	Average	129	2	VERTICAL
2	10519.07	68.05	74.00	-5.95	54.70	8.57	39.98	35.20	Peak	129	2	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 60 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	10595.19	60.12	74.00	-13.88	46.73	8.62	39.91	35.14	Peak	100	206	HORIZONTAL
2	10599.13	45.90	54.00	-8.10	32.50	8.64	39.90	35.14	Average	100	206	HORIZONTAL
3	15895.48	40.28	54.00	-13.72	27.40	10.81	37.59	35.52	Average	103	280	HORIZONTAL
4	15899.49	54.61	74.00	-19.39	41.76	10.81	37.56	35.52	Peak	103	280	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	10599.33	67.24	74.00	-6.76	53.84	8.64	39.90	35.14	Peak	100	18	VERTICAL
2	10600.90	53.41	54.00	-0.59	40.01	8.64	39.90	35.14	Average	100	18	VERTICAL
3	15891.76	55.43	74.00	-18.57	42.55	10.81	37.59	35.52	Peak	114	200	VERTICAL
4	15896.99	41.30	54.00	-12.70	28.45	10.81	37.56	35.52	Average	114	200	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 64 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	10635.90	57.38	74.00	-16.62	43.95	8.66	39.86	35.09	Peak	100	262	HORIZONTAL
2	10639.07	43.07	54.00	-10.93	29.64	8.66	39.86	35.09	Average	100	262	HORIZONTAL
3	15957.98	41.04	54.00	-12.96	28.25	10.82	37.48	35.51	Average	100	276	HORIZONTAL
4	15962.37	53.78	74.00	-20.22	40.99	10.82	37.48	35.51	Peak	100	276	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	10639.07	63.39	74.00	-10.61	49.96	8.66	39.86	35.09	Peak	127	351	VERTICAL
2	10639.17	49.61	54.00	-4.39	36.18	8.66	39.86	35.09	Average	127	351	VERTICAL
3	15953.11	54.90	74.00	-19.10	42.11	10.82	37.48	35.51	Peak	100	276	VERTICAL
4	15956.12	41.39	54.00	-12.61	28.60	10.82	37.48	35.51	Average	100	276	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 100 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	10992.47	42.69	54.00	-11.31	29.06	8.93	39.50	34.80	Average	136	212	HORIZONTAL
2	11005.67	54.77	74.00	-19.23	41.13	8.94	39.50	34.80	Peak	136	212	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	11000.99	47.96	54.00	-6.04	34.33	8.93	39.50	34.80	Average	178	353	VERTICAL
2	11001.67	61.83	74.00	-12.17	48.20	8.93	39.50	34.80	Peak	178	353	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 116 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11161.06	57.91	74.00	-16.09	44.26	9.04	39.50	34.89	Peak	100	128	HORIZONTAL
2	11163.43	43.60	54.00	-10.40	29.96	9.04	39.50	34.90	Average	100	128	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11151.06	65.95	74.00	-8.05	52.31	9.03	39.50	34.89	Peak	151	0	VERTICAL
2	11153.81	51.39	54.00	-2.61	37.75	9.03	39.50	34.89	Average	151	0	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 140 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	11396.09	41.62	54.00	-12.38	27.97	9.19	39.50	35.04	Average	100	320	HORIZONTAL
2	11396.86	54.39	74.00	-19.61	40.74	9.19	39.50	35.04	Peak	100	320	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	11400.45	43.89	54.00	-10.11	30.24	9.19	39.50	35.04	Average	106	359	VERTICAL
2	11412.44	55.87	74.00	-18.13	42.22	9.19	39.50	35.04	Peak	106	359	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 38 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

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	15570.32	56.97	74.00	-17.03	43.68	10.78	38.09	35.58	Peak	100	95	HORIZONTAL
2	15570.49	43.22	54.00	-10.78	29.93	10.78	38.09	35.58	Average	100	95	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	15570.09	56.77	74.00	-17.23	43.48	10.78	38.09	35.58	Peak	100	171	VERTICAL
2	15570.49	43.38	54.00	-10.62	30.09	10.78	38.09	35.58	Average	100	171	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 46 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

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	15690.02	57.38	74.00	-16.62	44.24	10.79	37.91	35.56	Peak	100	214	HORIZONTAL
2	15690.38	44.02	54.00	-9.98	30.88	10.79	37.91	35.56	Average	100	214	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	15689.88	56.52	74.00	-17.48	43.38	10.79	37.91	35.56	Peak	100	135	VERTICAL
2	15690.21	44.03	54.00	-9.97	30.89	10.79	37.91	35.56	Average	100	135	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 54 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	PoL/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10538.53	45.49	54.00	-8.51	32.11	8.59	39.97	35.18	Average	135	68 HORIZONTAL
2	10539.94	59.31	74.00	-14.69	45.93	8.59	39.97	35.18	Peak	135	68 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	PoL/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10544.87	67.01	74.00	-6.99	53.63	8.59	39.97	35.18	Peak	100	8 VERTICAL
2	10546.15	52.64	54.00	-1.36	39.27	8.60	39.95	35.18	Average	100	8 VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 62 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10621.54	41.38	54.00	-12.62	27.97	8.65	39.88	35.12	Average	115	46 HORIZONTAL
2	10652.44	54.27	74.00	-19.73	40.83	8.67	39.84	35.07	Peak	115	46 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10621.86	54.20	74.00	-19.80	40.79	8.65	39.88	35.12	Peak	112	137 VERTICAL
2	10632.37	41.68	54.00	-12.32	28.25	8.66	39.86	35.09	Average	112	137 VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 102 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11001.67	40.53	54.00	-13.47	26.90	8.93	39.50	34.80	Average	112	84 HORIZONTAL
2	11015.32	53.84	74.00	-20.16	40.21	8.94	39.50	34.81	Peak	112	84 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11014.26	41.41	54.00	-12.59	27.78	8.94	39.50	34.81	Average	100	27 VERTICAL
2	11019.58	54.51	74.00	-19.49	40.88	8.94	39.50	34.81	Peak	100	27 VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 110 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

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	11099.28	56.22	74.00	-17.78	42.59	8.99	39.50	34.86	Peak	100	280	HORIZONTAL
2	11100.80	41.72	54.00	-12.28	28.09	8.99	39.50	34.86	Average	100	280	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	11100.96	48.05	54.00	-5.95	34.42	8.99	39.50	34.86	Average	128	353	VERTICAL
2	11102.16	62.14	74.00	-11.86	48.51	8.99	39.50	34.86	Peak	128	353	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 134 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11341.15	55.32	74.00	-18.68	41.67	9.14	39.50	34.99	Peak	104	360	HORIZONTAL
2	11347.92	42.15	54.00	-11.85	28.51	9.15	39.50	35.01	Average	104	360	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11336.71	57.07	74.00	-16.93	43.42	9.14	39.50	34.99	Peak	100	15	VERTICAL
2	11338.32	43.35	54.00	-10.65	29.70	9.14	39.50	34.99	Average	100	15	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°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	I IEEE 802.11a CH 36 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15539.91	43.44	54.00	-10.56	30.14	10.77	38.12	35.59	Average	100	277	HORIZONTAL
2	15540.49	55.69	74.00	-18.31	42.39	10.77	38.12	35.59	Peak	100	277	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15539.57	43.02	54.00	-10.98	29.72	10.77	38.12	35.59	Average	100	148	VERTICAL
2	15539.82	55.74	74.00	-18.26	42.44	10.77	38.12	35.59	Peak	100	148	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 40 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15599.81	58.77	74.00	-15.23	45.53	10.78	38.04	35.58	Peak	100	250	HORIZONTAL
2	15599.91	44.67	54.00	-9.33	31.43	10.78	38.04	35.58	Average	100	250	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15599.67	43.33	54.00	-10.67	30.09	10.78	38.04	35.58	Average	100	81	VERTICAL
2	15600.23	55.76	74.00	-18.24	42.52	10.78	38.04	35.58	Peak	100	81	VERTICAL



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	I IEEE 802.11a CH 48 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15719.89	59.01	74.00	-14.99	45.93	10.79	37.85	35.56	Peak	100	252	HORIZONTAL
2	15720.03	44.54	54.00	-9.46	31.46	10.79	37.85	35.56	Average	100	252	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	15719.55	57.07	74.00	-16.93	43.99	10.79	37.85	35.56	Peak	135	166	VERTICAL
2	15720.31	42.97	54.00	-11.03	29.89	10.79	37.85	35.56	Average	135	166	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 52 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	10519.92	35.41	54.00	-18.59	22.06	8.57	39.98	35.20	Average	100	42	HORIZONTAL
2	10520.16	49.56	74.00	-24.44	36.21	8.57	39.98	35.20	Peak	100	42	HORIZONTAL
3	15780.13	55.12	74.00	-18.88	42.11	10.80	37.75	35.54	Peak	104	42	HORIZONTAL
4	15784.42	42.47	54.00	-11.53	29.46	10.80	37.75	35.54	Average	104	42	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	10520.88	42.91	54.00	-11.09	29.56	8.57	39.98	35.20	Average	100	5	VERTICAL
2	10521.20	56.26	74.00	-17.74	42.91	8.57	39.98	35.20	Peak	100	5	VERTICAL
3	15772.02	55.25	74.00	-18.75	42.22	10.80	37.77	35.54	Peak	100	62	VERTICAL
4	15777.60	43.40	54.00	-10.60	30.39	10.80	37.75	35.54	Average	100	62	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 60 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

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	10598.72	60.43	74.00	-13.57	47.03	8.64	39.90	35.14	Peak	139	43	HORIZONTAL
2	10598.94	47.65	54.00	-6.35	34.25	8.64	39.90	35.14	Average	139	43	HORIZONTAL
3	15890.83	41.99	54.00	-12.01	29.11	10.81	37.59	35.52	Average	100	42	HORIZONTAL
4	15899.23	54.55	74.00	-19.45	41.70	10.81	37.56	35.52	Peak	100	42	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	10599.33	67.24	54.00	13.24	53.84	8.64	39.90	35.14	Average	100	3	VERTICAL
2	10599.68	53.16	54.00	-0.84	39.76	8.64	39.90	35.14	Average	100	3	VERTICAL
3	15890.00	40.93	54.00	-13.07	28.05	10.81	37.59	35.52	Average	100	43	VERTICAL
4	15904.68	55.23	74.00	-18.77	42.38	10.81	37.56	35.52	Peak	100	43	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 64 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

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	10635.13	57.50	74.00	-16.50	44.07	8.66	39.86	35.09	Peak	167	44	HORIZONTAL
2	10639.39	44.88	54.00	-9.12	31.45	8.66	39.86	35.09	Average	167	44	HORIZONTAL
3	15950.10	42.26	54.00	-11.74	29.48	10.81	37.48	35.51	Average	100	50	HORIZONTAL
4	15969.36	54.87	74.00	-19.13	42.11	10.82	37.45	35.51	Peak	100	50	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	10639.10	64.61	74.00	-9.39	51.18	8.66	39.86	35.09	Peak	100	351	VERTICAL
2	10639.55	50.02	54.00	-3.98	36.59	8.66	39.86	35.09	Average	100	351	VERTICAL
3	15950.32	42.22	54.00	-11.78	29.44	10.81	37.48	35.51	Average	100	4	VERTICAL
4	15965.29	55.21	74.00	-18.79	42.45	10.82	37.45	35.51	Peak	100	4	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 100 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10996.09	43.49	54.00	-10.51	29.86	8.93	39.50	34.80	Average	131	326 HORIZONTAL
2	10996.51	56.56	74.00	-17.44	42.93	8.93	39.50	34.80	Peak	131	326 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10996.35	51.02	54.00	-2.98	37.39	8.93	39.50	34.80	Average	172	354 VERTICAL
2	10996.35	63.89	74.00	-10.11	50.26	8.93	39.50	34.80	Peak	172	354 VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 116 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

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	11156.30	60.49	74.00	-13.51	46.85	9.03	39.50	34.89	Peak	100	34	HORIZONTAL
2	11156.52	46.42	54.00	-7.58	32.78	9.03	39.50	34.89	Average	100	34	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	11157.93	53.25	54.00	-0.75	39.60	9.04	39.50	34.89	Average	100	347	VERTICAL
2	11157.96	55.84	74.00	-18.16	42.19	9.04	39.50	34.89	Peak	100	347	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 140 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11400.42	42.96	54.00	-11.04	29.31	9.19	39.50	35.04	Average	134	99	HORIZONTAL
2	11400.93	56.51	74.00	-17.49	42.86	9.19	39.50	35.04	Peak	134	99	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11398.14	46.84	54.00	-7.16	33.19	9.19	39.50	35.04	Average	147	358	VERTICAL
2	11403.81	61.79	74.00	-12.21	48.14	9.19	39.50	35.04	Peak	147	358	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 a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. 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 a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. 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
RBW / VBW (Emission in restricted band)	1 MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	1 MHz / 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°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	5148.80	69.33	74.00	-4.67	29.19	6.13	34.01	0.00	Peak	115	268	VERTICAL
2	5150.00	53.82	54.00	-0.18	13.68	6.13	34.01	0.00	Average	115	268	VERTICAL
3	5182.40	115.43			75.20	6.15	34.08	0.00	Peak	115	268	VERTICAL
4	5183.60	106.15			65.92	6.15	34.08	0.00	Average	115	268	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	5147.00	73.46	74.00	-0.54	33.32	6.13	34.01	0.00	Peak	100	275	VERTICAL
2	5150.00	53.44	54.00	-0.56	13.30	6.13	34.01	0.00	Average	100	275	VERTICAL
3	5202.40	118.21			77.94	6.16	34.11	0.00	Peak	100	275	VERTICAL
4	5203.60	106.52			66.25	6.16	34.11	0.00	Average	100	275	VERTICAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	5149.00	59.58	74.00	-14.42	19.44	6.13	34.01	0.00	Peak	101	268	VERTICAL
2	5150.00	46.66	54.00	-7.34	6.52	6.13	34.01	0.00	Average	101	268	VERTICAL
3	5242.00	109.20			68.82	6.20	34.18	0.00	Average	101	268	VERTICAL
4	5243.00	119.32			78.94	6.20	34.18	0.00	Peak	101	268	VERTICAL
5	5350.00	47.57	54.00	-6.43	6.89	6.26	34.42	0.00	Average	101	268	VERTICAL
6	5359.00	59.43	74.00	-14.57	18.75	6.26	34.42	0.00	Peak	101	268	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 52, 60, 64 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	5140.87	61.27	74.00	-12.73	21.16	6.13	33.98	0.00	Peak	106	0	VERTICAL
2	5150.00	51.43	54.00	-2.57	11.29	6.13	34.01	0.00	Average	106	0	VERTICAL
3	5256.64	105.14			64.72	6.20	34.22	0.00	Average	106	0	VERTICAL
4	5258.56	118.23			77.80	6.21	34.22	0.00	Peak	106	0	VERTICAL
5	5350.00	51.96	54.00	-2.04	11.28	6.26	34.42	0.00	Average	106	0	VERTICAL
6	5350.48	60.01	74.00	-13.99	19.33	6.26	34.42	0.00	Peak	106	0	VERTICAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	5299.04	103.16			62.61	6.23	34.32	0.00	Average	100	271	VERTICAL
2	5301.28	115.24			74.69	6.23	34.32	0.00	Peak	100	271	VERTICAL
3	5350.00	52.15	54.00	-1.85	11.47	6.26	34.42	0.00	Average	100	271	VERTICAL
4	5356.41	62.06	74.00	-11.94	21.38	6.26	34.42	0.00	Peak	100	271	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	5315.19	100.20			59.60	6.24	34.36	0.00	Average	100	360	VERTICAL
2	5317.44	113.20			72.60	6.24	34.36	0.00	Peak	100	360	VERTICAL
3	5350.00	53.33	54.00	-0.67	12.65	6.26	34.42	0.00	Average	100	360	VERTICAL
4	5350.64	70.46	74.00	-3.54	29.78	6.26	34.42	0.00	Peak	100	360	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 20MHz CH 100, 140 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Channel 100

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5459.52	65.23	74.00	-8.77	24.27	6.33	34.63	0.00 Peak	100	26	VERTICAL
2	5460.00	52.54	54.00	-1.46	11.58	6.33	34.63	0.00 Average	100	26	VERTICAL
3	5465.51	68.83	74.00	-5.17	27.86	6.34	34.63	0.00 Peak	100	26	VERTICAL
4	5470.00	53.92	54.00	-0.08	12.91	6.34	34.67	0.00 Average	100	26	VERTICAL
5	5502.72	101.66			60.59	6.36	34.71	0.00 Average	100	26	VERTICAL
6	5505.77	115.38			74.31	6.36	34.71	0.00 Peak	100	26	VERTICAL

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

Channel 140

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5694.39	97.62			56.33	6.43	34.86	0.00 Average	100	319	VERTICAL
2	5697.12	111.10			69.81	6.43	34.86	0.00 Peak	100	319	VERTICAL
3	5725.00	53.55	54.00	-0.45	12.21	6.45	34.89	0.00 Average	100	319	VERTICAL
4	5725.48	71.36	74.00	-2.64	30.02	6.45	34.89	0.00 Peak	100	319	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 38, 46 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

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	5149.60	53.57	54.00	-0.43	13.43	6.13	34.01	0.00	Average	100	274	VERTICAL
2	5150.00	73.81	74.00	-0.19	33.67	6.13	34.01	0.00	Peak	100	274	VERTICAL
3	5201.60	94.20			53.93	6.16	34.11	0.00	Average	100	274	VERTICAL
4	5201.60	109.12			68.85	6.16	34.11	0.00	Peak	100	274	VERTICAL

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	5149.40	70.81	74.00	-3.19	30.67	6.13	34.01	0.00	Peak	112	267	VERTICAL
2	5150.00	53.46	54.00	-0.54	13.32	6.13	34.01	0.00	Average	112	267	VERTICAL
3	5234.20	105.04			64.68	6.18	34.18	0.00	Average	112	267	VERTICAL
4	5234.20	114.85			74.49	6.18	34.18	0.00	Peak	112	267	VERTICAL

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



Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 54, 62 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5281.86	112.75			72.24	6.22	34.29	0.00	Peak	100	360	VERTICAL
2	5284.74	98.60			58.09	6.22	34.29	0.00	Average	100	360	VERTICAL
3	5350.00	53.45	54.00	-0.55	12.77	6.26	34.42	0.00	Average	100	360	VERTICAL
4	5350.32	65.78	74.00	-8.22	25.10	6.26	34.42	0.00	Peak	100	360	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	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5299.74	108.01			67.46	6.23	34.32	0.00	Peak	116	360	VERTICAL
2	5301.99	93.93			53.38	6.23	34.32	0.00	Average	116	360	VERTICAL
3	5350.00	53.37	54.00	-0.63	12.69	6.26	34.42	0.00	Average	116	360	VERTICAL
4	5350.00	72.15	74.00	-1.85	31.47	6.26	34.42	0.00	Peak	116	360	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 40MHz CH 102, 110, 134 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

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	52.34	54.00	-1.66	11.38	6.33	34.63	0.00	Average	100	19	VERTICAL
2	5460.00	61.50	74.00	-12.50	20.54	6.33	34.63	0.00	Peak	100	19	VERTICAL
3	5469.36	66.68	74.00	-7.32	25.67	6.34	34.67	0.00	Peak	100	19	VERTICAL
4	5470.00	53.75	54.00	-0.25	12.74	6.34	34.67	0.00	Average	100	19	VERTICAL
5	5501.35	106.11			65.04	6.36	34.71	0.00	Peak	100	19	VERTICAL
6	5503.91	92.09			51.02	6.36	34.71	0.00	Average	100	19	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	5460.00	52.88	54.00	-1.12	11.92	6.33	34.63	0.00	Average	100	19	VERTICAL
2	5460.00	64.34	74.00	-9.66	23.38	6.33	34.63	0.00	Peak	100	19	VERTICAL
3	5467.76	64.89	74.00	-9.11	23.88	6.34	34.67	0.00	Peak	100	19	VERTICAL
4	5470.00	53.21	54.00	-0.79	12.20	6.34	34.67	0.00	Average	100	19	VERTICAL
5	5539.42	99.35			58.24	6.37	34.74	0.00	Average	100	19	VERTICAL
6	5542.31	113.60			72.49	6.37	34.74	0.00	Peak	100	19	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	5661.99	110.06			68.81	6.42	34.83	0.00	Peak	100	323	VERTICAL
2	5663.27	96.05			54.80	6.42	34.83	0.00	Average	100	323	VERTICAL
3	5725.00	53.80	54.00	-0.20	12.46	6.45	34.89	0.00	Average	100	323	VERTICAL
4	5729.49	67.28	74.00	-6.72	25.94	6.45	34.89	0.00	Peak	100	323	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°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Aug. 20, 2013	Test Mode	Mode 3

Channel 36

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.30	67.66	74.00	-6.34	28.65	5.99	33.02	0.00	113	262	VERTICAL	Peak
2	5150.00	53.22	54.00	-0.78	14.21	5.99	33.02	0.00	113	262	VERTICAL	Average
3	5184.70	105.67			66.62	6.01	33.04	0.00	113	262	VERTICAL	Average
4	5185.20	115.16			76.11	6.01	33.04	0.00	113	262	VERTICAL	Peak

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

Channel 40

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.40	71.70	74.00	-2.30	31.56	6.13	34.01	0.00	112	276	VERTICAL	Peak
2	5150.00	53.44	54.00	-0.56	13.30	6.13	34.01	0.00	112	276	VERTICAL	Average
3	5202.40	107.04			66.77	6.16	34.11	0.00	112	276	VERTICAL	Average
4	5205.40	119.67			79.40	6.16	34.11	0.00	112	276	VERTICAL	Peak

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

Channel 48

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.00	47.31	54.00	-6.69	7.17	6.13	34.01	0.00	100	276	VERTICAL	Average
2	5149.00	60.65	74.00	-13.35	20.51	6.13	34.01	0.00	100	276	VERTICAL	Peak
3	5243.00	119.22			78.84	6.20	34.18	0.00	100	276	VERTICAL	Peak
4	5245.00	109.90			69.52	6.20	34.18	0.00	100	276	VERTICAL	Average
5	5350.00	47.91	54.00	-6.09	7.23	6.26	34.42	0.00	100	276	VERTICAL	Average
6	5356.00	60.44	74.00	-13.56	19.76	6.26	34.42	0.00	100	276	VERTICAL	Peak

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

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 52, 60, 64 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Channel 52

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.04	61.06	74.00	-12.94	20.92	6.13	34.01	0.00	Peak	117	360	VERTICAL
2	5150.00	51.65	54.00	-2.35	11.51	6.13	34.01	0.00	Average	117	360	VERTICAL
3	5264.33	107.61			67.15	6.21	34.25	0.00	Average	117	360	VERTICAL
4	5264.81	119.96			79.50	6.21	34.25	0.00	Peak	117	360	VERTICAL
5	5350.00	52.33	54.00	-1.67	11.65	6.26	34.42	0.00	Average	117	360	VERTICAL
6	5350.00	61.81	74.00	-12.19	21.13	6.26	34.42	0.00	Peak	117	360	VERTICAL

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

Channel 60

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5294.87	103.70			63.18	6.23	34.29	0.00	Average	100	271	VERTICAL
2	5297.44	114.91			74.36	6.23	34.32	0.00	Peak	100	271	VERTICAL
3	5350.00	52.07	54.00	-1.93	11.39	6.26	34.42	0.00	Average	100	271	VERTICAL
4	5350.00	60.35	74.00	-13.65	19.67	6.26	34.42	0.00	Peak	100	271	VERTICAL

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

Channel 64

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5322.56	115.94			75.34	6.24	34.36	0.00	Peak	103	0	VERTICAL
2	5324.33	104.50			63.90	6.24	34.36	0.00	Average	103	0	VERTICAL
3	5350.00	53.72	54.00	-0.28	13.04	6.26	34.42	0.00	Average	103	0	VERTICAL
4	5350.32	70.93	74.00	-3.07	30.25	6.26	34.42	0.00	Peak	103	0	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 100, 140 / Ant. 1 + Ant. 2
Test Date	Sep. 14, 2013	Test Mode	Mode 3

Channel 100

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	5454.23	66.27	74.00	-7.73	25.31	6.33	34.63	0.00	Peak	100	28	VERTICAL
2	5460.00	52.51	54.00	-1.49	11.55	6.33	34.63	0.00	Average	100	28	VERTICAL
3	5469.04	69.10	74.00	-4.90	28.09	6.34	34.67	0.00	Peak	100	28	VERTICAL
4	5469.68	53.93	54.00	-0.07	12.92	6.34	34.67	0.00	Average	100	28	VERTICAL
5	5504.01	103.76			62.69	6.36	34.71	0.00	Average	100	28	VERTICAL
6	5504.33	115.30			74.23	6.36	34.71	0.00	Peak	100	28	VERTICAL

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

Channel 140

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor		cm	deg	
1	5696.47	98.92			57.63	6.43	34.86	0.00	Average	110	171	VERTICAL
2	5704.33	111.93			70.63	6.44	34.86	0.00	Peak	110	171	VERTICAL
3	5725.00	53.70	54.00	-0.30	12.36	6.45	34.89	0.00	Average	110	171	VERTICAL
4	5725.32	71.61	74.00	-2.39	30.27	6.45	34.89	0.00	Peak	110	171	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

In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

4.8.2. Measuring Instruments and Setting

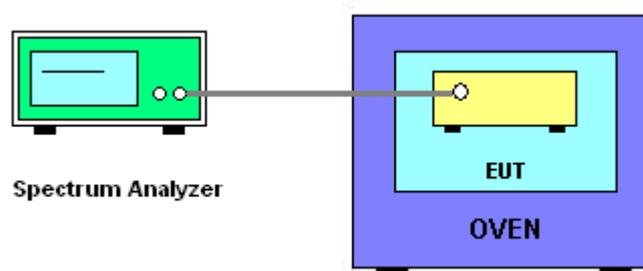
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	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. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-30^\circ\text{C} \sim 50^\circ\text{C}$.

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

Temperature	22°C	Humidity	62%
Test Engineer	Nick Peng	Test Date	Sep. 23, 2013

Voltage vs. Frequency Stability

Voltage (V)	Measurement Frequency (MHz)		
	5200 MHz	5300 MHz	5500 MHz
126.50	5199.9812	5299.9441	5499.9732
110.00	5199.9874	5299.9766	5499.9820
93.50	5199.9966	5299.9712	5499.9966
Max. Deviation (MHz)	0.018800	0.055900	0.026800
Max. Deviation (ppm)	3.62	10.55	4.87

Temperature vs. Frequency Stability

Temperature (°C)	Measurement Frequency (MHz)		
	5200 MHz	5300 MHz	5500 MHz
-30	5200.0750	5300.0768	5500.0810
-20	5200.0312	5300.0768	5500.0810
-10	5199.9911	5300.0768	5499.9986
0	5199.9878	5299.9912	5499.9916
10	5199.9878	5299.9766	5499.9820
20	5199.9874	5299.9766	5499.9820
30	5199.9880	5300.0024	5500.0114
40	5199.9778	5299.9736	5499.9676
50	5199.9634	5299.9622	5499.9640
Max. Deviation (MHz)	0.075000	0.076800	0.081000
Max. Deviation (ppm)	14.42	14.49	14.73

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	100355	9 kHz ~ 2.75 GHz	Apr. 12, 2013	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150 kHz ~ 100 MHz	Nov. 26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127478	9 kHz ~ 30MHz	Jul. 17, 2013	Conduction (CO01-CB)
Impulsbegrenzer Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9 kHz~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	Apr. 16, 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	Oct. 24, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9kHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Nov. 26, 2012	Radiation (03CH01-CB)
Turn Table	INN CO	CO2000	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)
Spectrum analyzer	R&S	FSP40	100304	9kHz ~ 40GHz	Nov. 27, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 04, 2013	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)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
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	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	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 2 nd 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

7. MEASUREMENT UNCERTAINTY

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

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.026	dB	normal(k=2)	0.013
Cable loss	0.002	dB	normal(k=2)	0.001
AMN/LISN specification	1.200	dB	normal(k=2)	0.600
Mismatch				
Receiver VSWR 1 =	-0.080	dB	U-shaped	0.060
AMN/LISN VSWR 2 =				
Combined standard uncertainty $U_c(y)$				1.2
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				2.4

Uncertainty of Radiated Emission Measurement (30MHz ~ 1,000MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	± 0.173	dB	K=1	0.086
Cable loss	± 0.174	dB	K=2	0.087
Antenna gain	± 0.169	dB	K=2	0.084
Site imperfection	± 0.433	dB	Triangular	0.214
Pre-amplifier gain	± 0.366	dB	K=2	0.183
Transmitter antenna	± 1.200	dB	Rectangular	0.600
Signal generator	± 0.461	dB	Rectangular	0.231
Mismatch	± 0.080	dB	U-shape	0.040
Spectrum analyzer	± 0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				1.778
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				3.555

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.191	dB	K=1	0.095
Cable loss	±0.169	dB	K=2	0.084
Antenna gain	±0.191	dB	K=2	0.096
Site imperfection	±0.582	dB	Triangular	0.291
Pre-amplifier gain	±0.304	dB	K=2	0.152
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				1.839
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				3.678

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.186	dB	K=1	0.093
Cable loss	±0.167	dB	K=2	0.083
Antenna gain	±0.190	dB	K=2	0.095
Site imperfection	±0.488	dB	Triangular	0.244
Pre-amplifier gain	±0.269	dB	K=2	0.134
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				1.771
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				3.541

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Cable loss	±0.038	dB	K=2	0.019
Attenuator	±0.047	dB	K=2	0.024
Power Meter specification	±0.300	dB	Triangular	0.150
Power Sensor specification	±0.300	dB	Rectangular	0.150
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				0.863
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				1.726