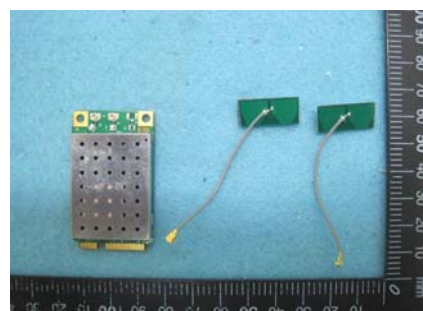


FCC RADIO TEST REPORT

Applicant's company	Alpha Networks Inc.
Applicant Address	No.8 Li-shing 7th Rd., Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
FCC ID	RRK-2012070022
Manufacturer's company	Alpha Networks Inc.
Manufacturer Address	No.8 Li-shing 7th Rd., Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
Manufacturer's company	Alpha Networks (Dongguan) Co., Ltd.
Manufacturer Address	Xin An District, Chang An Town, DongGuan City, GuangDong Province, China

Product Name	WIRELESS AC MODULE
Brand Name	ALPHA
Model Name	WMC-AC02
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Jan. 04, 2013
Final Test Date	Jan. 18, 2013
Submission Type	Class II Change
Operating Mode	Master



Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a/ac (5250 ~ 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 v01r02 and KDB 662911 D01 v01r02.

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

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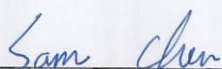
History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR310926-01	Rev. 01	Initial issue of report	Jan. 30, 2013

1. CERTIFICATE OF COMPLIANCE

Product Name : WIRELESS AC MODULE
Brand Name : ALPHA
Model Name : WMC-AC02
Applicant : Alpha Networks 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 Jan. 04, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Chen

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	10.70 dB
4.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.14 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.12 dB
4.5	15.407(a)	Peak Excursion	Complies	3.84 dB
4.6	15.407(b)	Radiated Emissions	Complies	4.13 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.11 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

Note: The module is Limited Module Approval and only limited to install to the Wireless AC1200 Dual Band Gigabit Cloud Router USB 3.0 (D-Link / DIR-860L).

It was install to the Wireless AC1200 Dual Band Gigabit Cloud Router USB 3.0 (D-Link / DIR-860L) performed for Co-location test and recorded in this report's APPENDIX C.

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11n OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) For 802.11ac
Data Rate (Mbps)	see the below table for IEEE 802.11n see the below table for IEEE 802.11ac
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	12 for 20MHz bandwidth ; 5 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	11n: MCS0 (20MHz): 18.08 MHz ; MCS0 (40MHz): 36.80 MHz 11ac: MCS0 (VHT 80MHz): 76.00 MHz
Maximum Conducted Output Power	11n: Band 2: MCS0 (20MHz): 22.71 dBm ; MCS0 (40MHz): 21.75 dBm Band 3: MCS0 (20MHz): 22.62 dBm ; MCS0 (40MHz): 23.81 dBm 11ac: Band 2: MCS0 (VHT 20MHz): 22.68 dBm ; MCS0 (VHT 40MHz): 23.18 dBm ; MCS0 (VHT 80MHz): 17.69 dBm Band 3: MCS0 (VHT 20MHz): 22.63 dBm ; MCS0 (VHT 40MHz): 23.86 dBm ; MCS0 (VHT 80MHz): 16.34 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 Host System
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	12
Channel Band Width (99%)	11a: 16.80 MHz
Maximum Conducted Output Power	Band 2: 22.26 dBm ; Band 3: 22.40 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Two (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X
IEEE 802.11n	V	V	X
IEEE 802.11ac	V	V	V

IEEE 802.11n spec

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

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

IEEE 802. 11a, 11n and 11ac Spec.

Worst Modulation Used for Conformance Testing				
IEEE 802.11 Protocol	Number of Transmit Chains (N _{TX})	Data Rate / MCS	Worst Data Rate / MCS	Worst Modulation Mode
a	2	6-54 Mbps	6Mbps	11A5.3G-20M / 11A5.6G-20M
n (HT20)	2	MCS 0-15	MCS 0	11N5.3G-20M / 11N5.6G-20M
n (HT40)	2	MCS 0-15	MCS 0	11N5.3G-40M / 11N5.6G-40M
ac (VHT20)	2	MCS 0-9	MCS 0-Nss1	11AC5.3G-20M / 11AC5.6G-20M
ac (VHT40)	2	MCS 0-9	MCS 0-Nss1	11AC5.3G-40M / 11AC5.6G-40M
ac (VHT80)	2	MCS 0-9	MCS 0-Nss1	11AC5.3G-80M / 11AC5.6G-80M
Note 1: IEEE 802.11 modulation consists of IEEE 802.11a.				
Note 2: IEEE 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Worst modulation mode of Guard Interval (GI) is 400ns.				
Note 3: IEEE 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160. Then EUT support VHT80. (VHT: Very High Throughput).				
Note 4: Modulation modes consist of 11A5.3G-20M, 11A5.6G-20M, 11N5.3G-20M, 11N5.6G-20M, 11N5.3G-40M, 11N5.6G-40M, 11AC5.3G-20M, 11AC5.6G-20M, 11AC5.3G-40M, 11AC5.6G-40M, 11AC5.3G-80M, 11AC5.6G-80M.				
Note 5: 11A: IEEE 802.11a, 11N: IEEE 802.11n, 11AC: IEEE 802.11ac. 5.3G: 5.25-5.35 GHz band, 5.6G: 5.47-5.725 GHz band.				
Note 6: 20M/40M/80M: Channel Bandwidth 20MHz/40MHz/80MHz				

3.2. Accessories

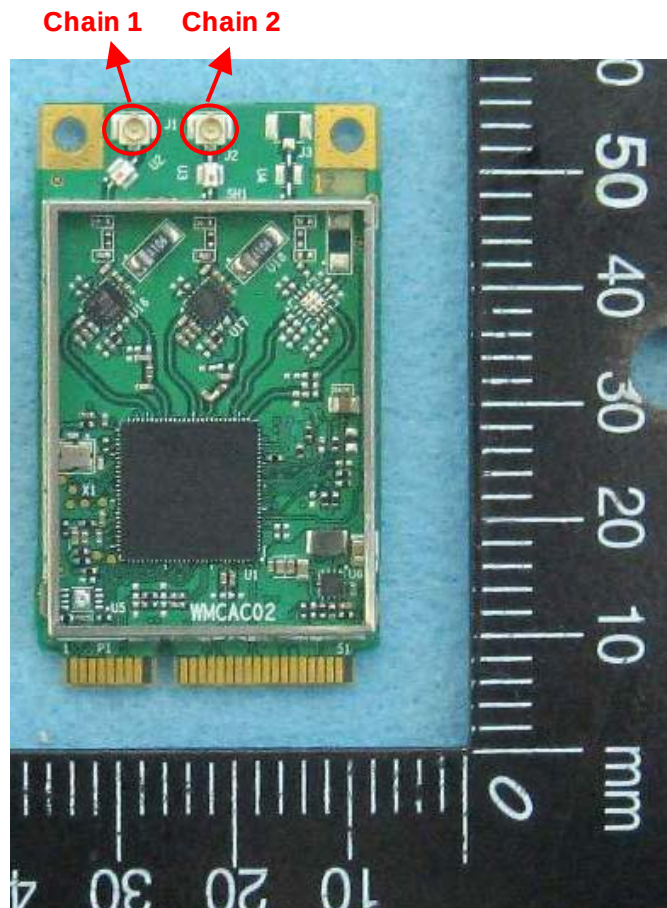
N/A

3.3. Table for Filed Antenna

Chain	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Loss of External Cable (dB)	True Gain (dBi)	Remark
1	WHA YU	SSR-30247	PCB Antenna	I-PEX	4	0.18	3.82	TX / RX
2	WHA YU	SSR-30247	PCB Antenna	I-PEX	4	0.18	3.82	TX / RX

Note: The EUT has two Chains.

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

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

There are two bandwidth systems for IEEE 802.11n.

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

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

For 80MHz bandwidth systems, use Channel 58, 106.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	58	5290 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	60	5300 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	112	5560 MHz
	102	5510MHz	116	5580 MHz
	104	5520 MHz	132	5660 MHz
	106	5530 MHz	134	5670 MHz
	108	5540 MHz	136	5680 MHz
	110	5550 MHz	140	5700 MHz

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	CTX/11a		6Mbps	-	1+2
Max. Conducted Output Power	MCS0/20MHz	Band 2	7.2Mbps	52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 2	14.4Mbps	54/62	1+2
		Band 3	14.4Mbps	102/134	1+2
	11ac 20MHz	Band 2	MCS0	52/60/64	1+2
		Band 3	MCS0	100/116/140	1+2
	11ac 40MHz	Band 2	MCS0	54/62	1+2
		Band 3	MCS0	102/134	1+2
	11ac 80MHz	Band 2	MCS0	58	1+2
		Band 3	MCS0	106	1+2
Power Spectral Density	MCS0/20MHz	Band 2	7.2Mbps	52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 2	14.4Mbps	54/62	1+2
		Band 3	14.4Mbps	102/134	1+2
	11ac 80MHz	Band 2	MCS0	58	1+2
		Band 3	MCS0	106	1+2
	11a/BPSK	Band 2	6Mbps	52/60/64	1+2
		Band 3	6Mbps	100/116/140	1+2
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Peak Excursion	MCS0/20MHz	Band 2	7.2Mbps	52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 2	14.4Mbps	54/62	1+2
		Band 3	14.4Mbps	102/134	1+2
	11a/BPSK	Band 2	6Mbps	52/60/64	1+2
		Band 3	6Mbps	100/116/140	1+2
Radiated Emission Below 1GHz	CTX/11a		6Mbps	-	1+2
Radiated Emission Above	MCS0/20MHz	Band 2	7.2Mbps	52/60/64	1+2

1GHz		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 2	14.4Mbps	54/62	1+2
		Band 3	14.4Mbps	102/ 134	1+2
	11a/BPSK	Band 2	6Mbps	52/60/64	1+2
		Band 3	6Mbps	100/116/140	1+2
Band Edge Emission	MCS0/20MHz	Band 2	7.2Mbps	52/60/64	1+2
		Band 3	7.2Mbps	100/116/140	1+2
	MCS0/40MHz	Band 2	14.4Mbps	54/62	1+2
		Band 3	14.4Mbps	102/134	1+2
	11ac 20MHz	Band 2	MCS0	52/60/64	1+2
		Band 3	MCS0	100/116/140	1+2
	11ac 40MHz	Band 2	MCS0	54/62	1+2
		Band 3	MCS0	102/134	1+2
	11ac 80MHz	Band 2	MCS0	58	1+2
		Band 3	MCS0	106	1+2
	11a/BPSK	Band 2	6Mbps	52/60/64	1+2
		Band 3	6Mbps	100/116/140	1+2
Frequency Stability	Un-modulation		-	60	N/A

3.6. Table for Testing Locations

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

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

Please refer section 6 for Test Site Address.

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR310926

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Add Band 2 and Band 3 (5250~5350 MHz, 5470~5725 MHz) for this device.	1. AC Power Line Conducted Emissions 2. 26dB Spectrum Bandwidth 3. Maximum Conducted Output Power 4. Power Spectral Density 5. Peak Excursion 6. Radiated Emissions Above 1GHz 7. Band Edge Emissions 8. Frequency Stability

3.8. Table for Supporting Units

<For Radiated Emissions, Band Edge Emissions and AC Power Line Conducted Emissions test:>

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	E2K4965AGNM

<For 26dB Spectrum Bandwidth, Maximum Conducted Output Power, Power Spectral Density and Peak Excursion test:>

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2KWM3945ABG

3.9. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters of IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Manual Tool Version:1.0.0.10					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 20MHz	79	68	66	56	75	62

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Manual Tool Version:1.0.0.10				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 40MHz	74	61	57	79	67

Power Parameters of IEEE 802.11ac MCS0 VHT 20MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Manual Tool Version:1.0.0.10					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 VHT 20MHz	79	62	61	56	75	64

Power Parameters of IEEE 802.11ac MCS0 VHT 40MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Manual Tool Version:1.0.0.10				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 VHT 40MHz	80	61	61	79	72

Power Parameters of IEEE 802.11ac MCS0 VHT 80MHz / Chain 1 + Chain 2 (2TX)

Test Software Version	Manual Tool Version:1.0.0.10			
Frequency	5290 MHz			5530
MCS0 VHT 80MHz	60			52

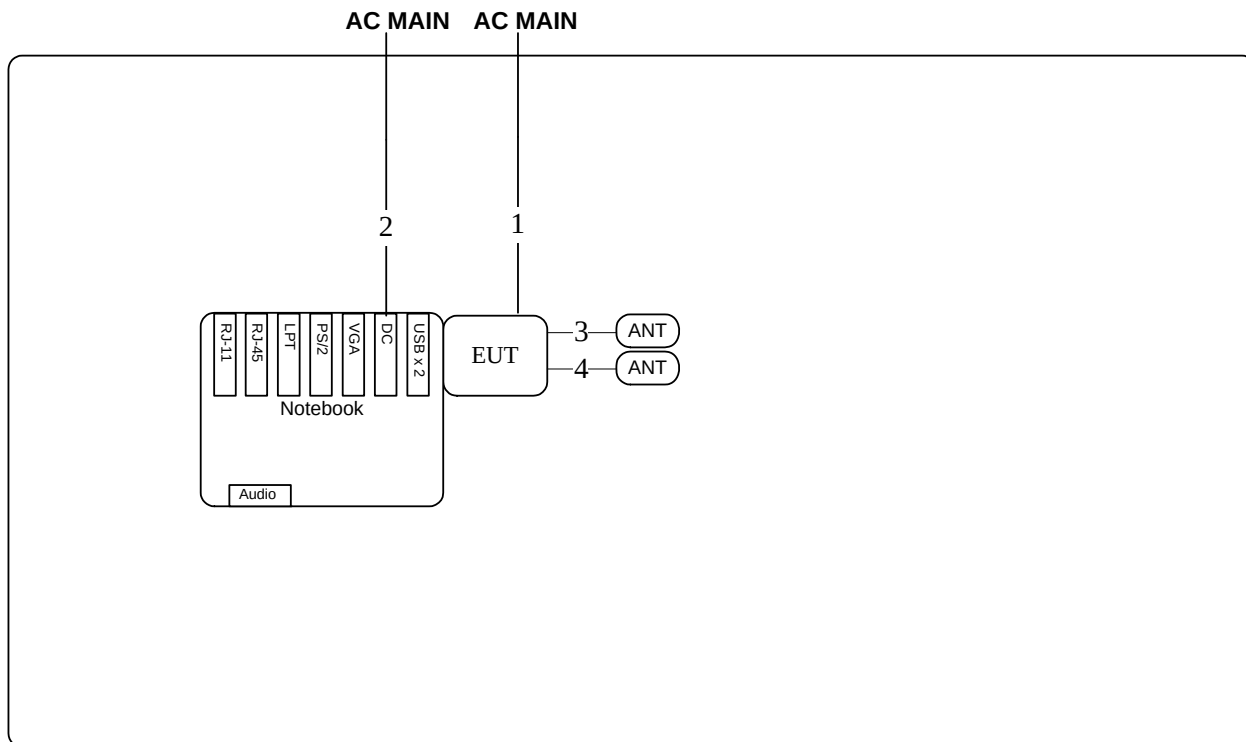
Power Parameters of IEEE 802.11a / Chain 1 + Chain 2 (2TX)

Test Software Version	Manual Tool Version:1.0.0.10					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
IEEE 802.11a	77	75	62	60	74	66

During the test, “Manual Tool Version:1.0.0.10” under WIN XP was executed the test program to control the EUT continuously transmit RF signal.

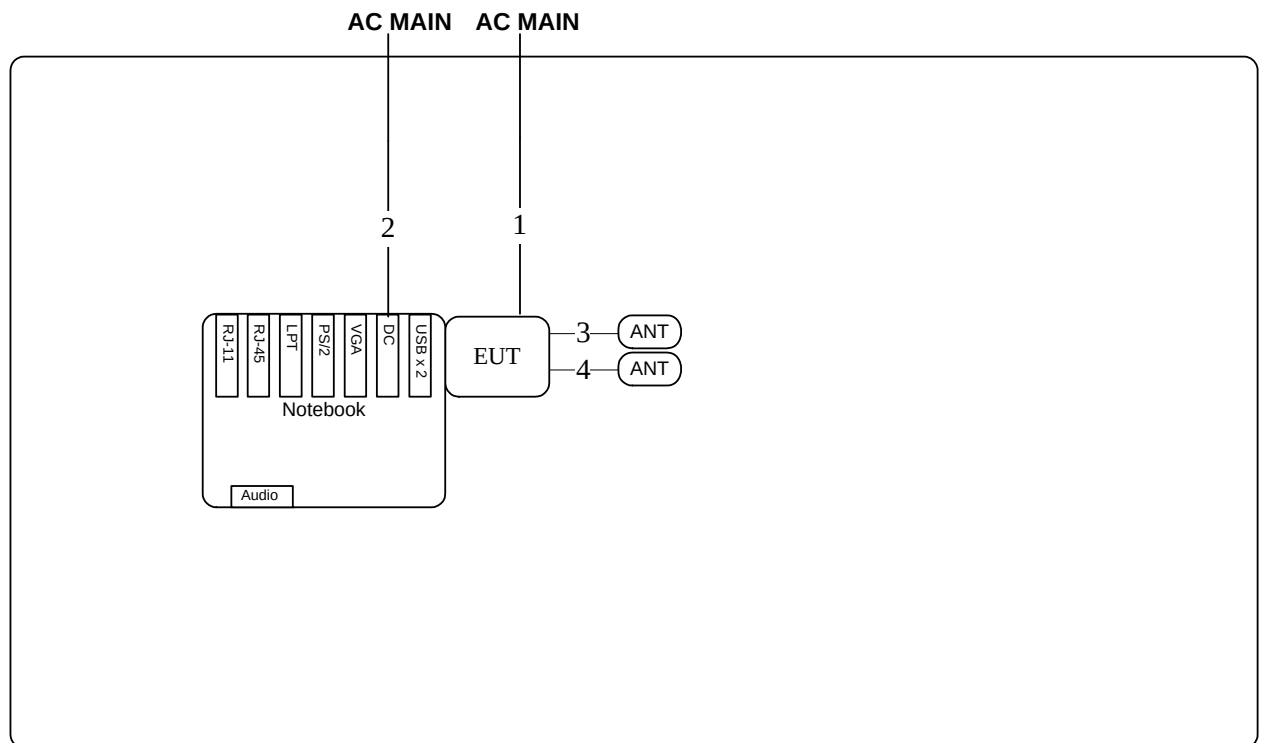
3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration



Item	Connection	Shield	Length
1	Power cable	No	1.5m
2	Power cable	No	2.6m
3	Antenna cable	No	0.09m
4	Antenna cable	No	0.13m

3.10.2. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	Power cable	No	1.5m
2	Power cable	No	2.6m
3	Antenna cable	No	0.09m
4	Antenna cable	No	0.13m

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

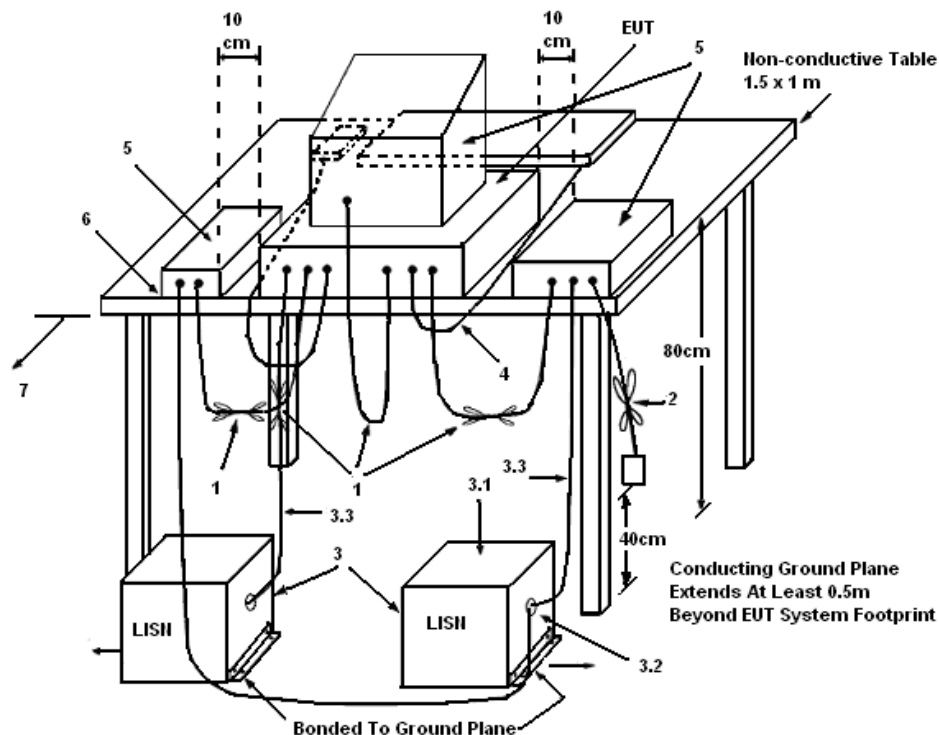
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

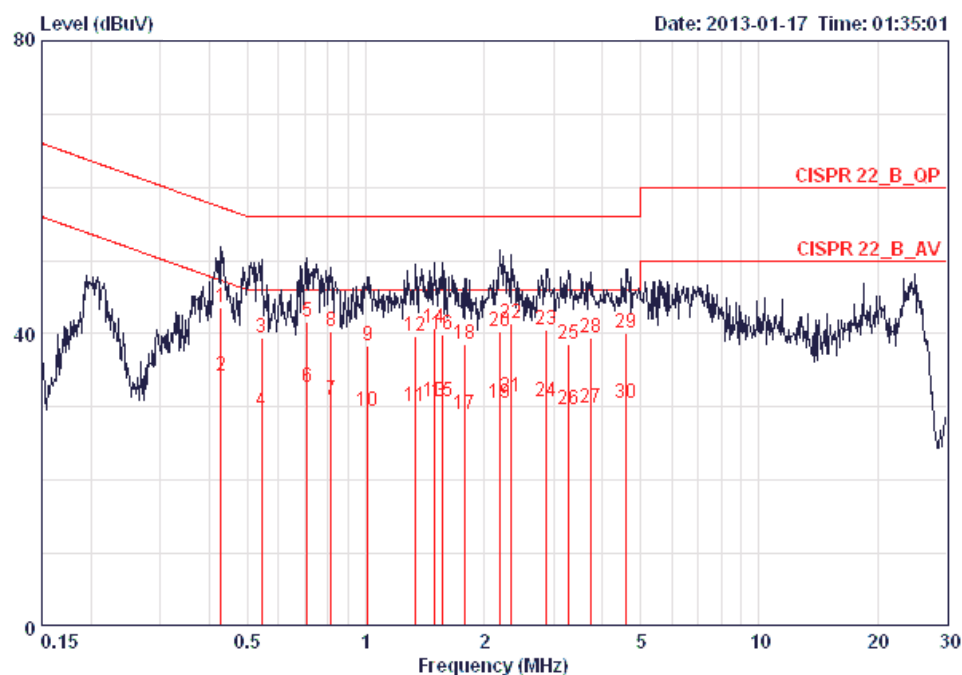
There is no deviation with the original standard.

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

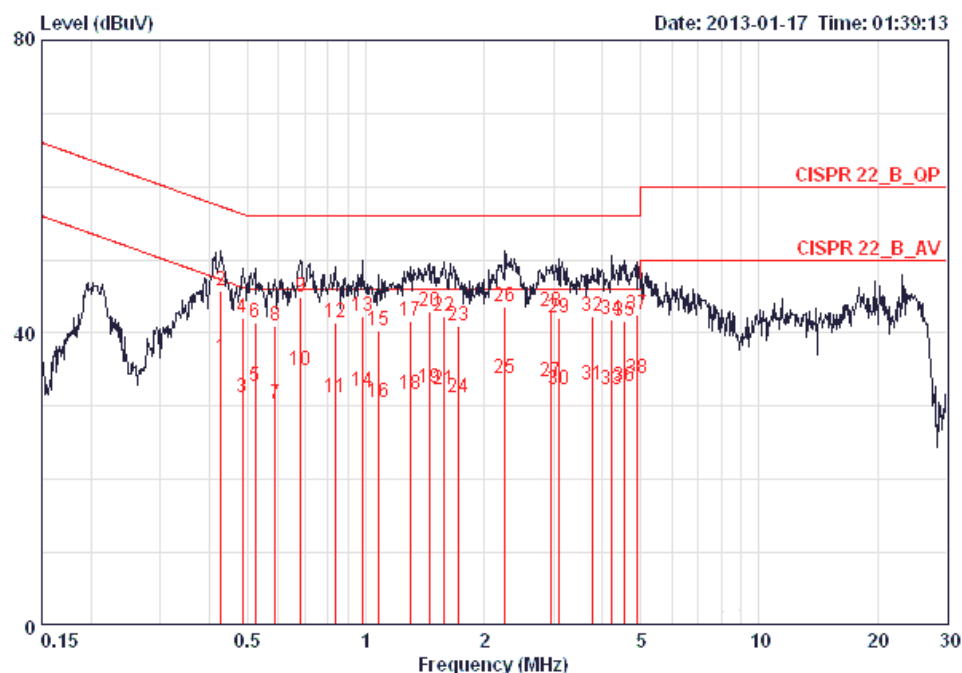
Temperature	24°C	Humidity	60%
Test Engineer	Simon Yang	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.42825	43.66	-13.63	57.29	43.38	0.08	0.20	QP
2	0.42825	34.32	-12.97	47.29	34.04	0.08	0.20	AVERAGE
3	0.54355	39.41	-16.59	56.00	39.13	0.08	0.20	QP
4	0.54355	29.42	-16.58	46.00	29.14	0.08	0.20	AVERAGE
5	0.70842	41.64	-14.37	56.00	41.35	0.09	0.20	QP
6	0.70842	32.63	-13.38	46.00	32.34	0.09	0.20	AVERAGE
7	0.81737	30.95	-15.05	46.00	30.66	0.09	0.20	AVERAGE
8	0.81737	40.41	-15.59	56.00	40.12	0.09	0.20	QP
9	1.010	38.26	-17.74	56.00	37.97	0.09	0.20	QP
10	1.010	29.49	-16.51	46.00	29.20	0.09	0.20	AVERAGE
11	1.338	30.08	-15.92	46.00	29.77	0.10	0.21	AVERAGE
12	1.338	39.70	-16.30	56.00	39.39	0.10	0.21	QP
13	1.487	30.75	-15.25	46.00	30.43	0.10	0.22	AVERAGE
14	1.487	40.71	-15.29	56.00	40.39	0.10	0.22	QP
15	1.568	30.70	-15.30	46.00	30.38	0.10	0.22	AVERAGE
16	1.568	39.97	-16.03	56.00	39.65	0.10	0.22	QP
17	1.781	28.96	-17.04	46.00	28.63	0.11	0.23	AVERAGE
18	1.781	38.56	-17.44	56.00	38.23	0.11	0.23	QP
19	2.190	30.44	-15.56	46.00	30.09	0.11	0.23	AVERAGE
20	2.190	40.30	-15.70	56.00	39.95	0.11	0.23	QP
21	2.346	31.40	-14.60	46.00	31.05	0.11	0.24	AVERAGE
22	2.346	41.44	-14.56	56.00	41.09	0.11	0.24	QP
23	2.884	40.51	-15.49	56.00	40.14	0.12	0.25	QP
24	2.884	30.65	-15.35	46.00	30.28	0.12	0.25	AVERAGE
25	3.276	38.66	-17.34	56.00	38.27	0.12	0.27	QP

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
26	3.276	29.59	-16.41	46.00	29.20	0.12	0.27	AVERAGE
27	3.740	29.76	-16.24	46.00	29.34	0.13	0.29	AVERAGE
28	3.740	39.42	-16.58	56.00	39.00	0.13	0.29	QP
29	4.598	40.12	-15.88	56.00	39.67	0.14	0.31	QP
30	4.598	30.62	-15.38	46.00	30.17	0.14	0.31	AVERAGE

Temperature	24°C	Humidity	60%
Test Engineer	Simon Yang	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.42825	36.59	-10.70	47.29	36.24	0.15	0.20	AVERAGE
2	0.42825	45.80	-11.49	57.29	45.45	0.15	0.20	QP
3	0.48632	31.14	-15.09	46.23	30.79	0.15	0.20	AVERAGE
4	0.48632	42.14	-14.09	56.23	41.79	0.15	0.20	QP
5	0.52376	32.62	-13.38	46.00	32.27	0.15	0.20	AVERAGE
6	0.52376	41.46	-14.54	56.00	41.11	0.15	0.20	QP
7	0.58851	30.29	-15.71	46.00	29.93	0.16	0.20	AVERAGE
8	0.58851	40.96	-15.04	56.00	40.60	0.16	0.20	QP
9	0.68263	44.86	-11.14	56.00	44.50	0.16	0.20	QP
10	0.68263	34.80	-11.20	46.00	34.44	0.16	0.20	AVERAGE
11	0.83488	31.16	-14.85	46.00	30.79	0.17	0.20	AVERAGE
12	0.83488	41.33	-14.68	56.00	40.96	0.17	0.20	QP
13	0.97871	42.21	-13.79	56.00	41.88	0.17	0.16	QP
14	0.97871	32.13	-13.87	46.00	31.80	0.17	0.16	AVERAGE
15	1.077	40.34	-15.66	56.00	39.96	0.17	0.20	QP
16	1.077	30.53	-15.47	46.00	30.15	0.17	0.20	AVERAGE
17	1.296	41.53	-14.47	56.00	41.14	0.18	0.21	QP
18	1.296	31.52	-14.48	46.00	31.13	0.18	0.21	AVERAGE
19	1.449	32.59	-13.41	46.00	32.19	0.18	0.22	AVERAGE
20	1.449	42.93	-13.07	56.00	42.53	0.18	0.22	QP
21	1.585	32.33	-13.67	46.00	31.93	0.18	0.22	AVERAGE
22	1.585	42.24	-13.76	56.00	41.84	0.18	0.22	QP
23	1.716	41.02	-14.98	56.00	40.61	0.18	0.22	QP
24	1.716	31.26	-14.74	46.00	30.85	0.18	0.22	AVERAGE
25	2.261	33.69	-12.31	46.00	33.26	0.19	0.24	AVERAGE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
26	2.261	43.50	-12.50	56.00	43.07	0.19	0.24	QP
27	2.946	33.32	-12.68	46.00	32.87	0.20	0.25	AVERAGE
28	2.946	42.84	-13.16	56.00	42.39	0.20	0.25	QP
29	3.090	42.07	-13.93	56.00	41.61	0.21	0.25	QP
30	3.090	32.25	-13.75	46.00	31.79	0.21	0.25	AVERAGE
31	3.759	33.02	-12.98	46.00	32.51	0.22	0.29	AVERAGE
32	3.759	42.31	-13.69	56.00	41.80	0.22	0.29	QP
33	4.224	32.34	-13.66	46.00	31.81	0.22	0.30	AVERAGE
34	4.224	41.81	-14.19	56.00	41.28	0.22	0.30	QP
35	4.525	41.58	-14.42	56.00	41.04	0.23	0.31	QP
36	4.525	32.70	-13.30	46.00	32.16	0.23	0.31	AVERAGE
37	4.900	42.46	-13.54	56.00	41.90	0.24	0.32	QP
38	4.900	33.70	-12.30	46.00	33.14	0.24	0.32	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

4.2.2. Measuring Instruments and Setting

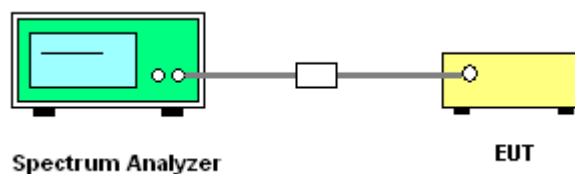
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 300 kHz and the video bandwidth of 1000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of 99% Occupied Bandwidth

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	30.24	18.08
60	5300 MHz	20.32	17.60
64	5320 MHz	20.32	17.60
100	5500 MHz	20.32	17.44
116	5580 MHz	27.68	17.60
140	5700 MHz	20.16	17.28

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	48.00	36.48
62	5310 MHz	39.36	36.48
102	5510MHz	39.04	36.48
110	5550 MHz	55.36	36.80
134	5670 MHz	39.24	36.72

Configuration IEEE 802.11ac MCS0 VHT 80MHz / Chain 1 + Chain 2 (2TX)

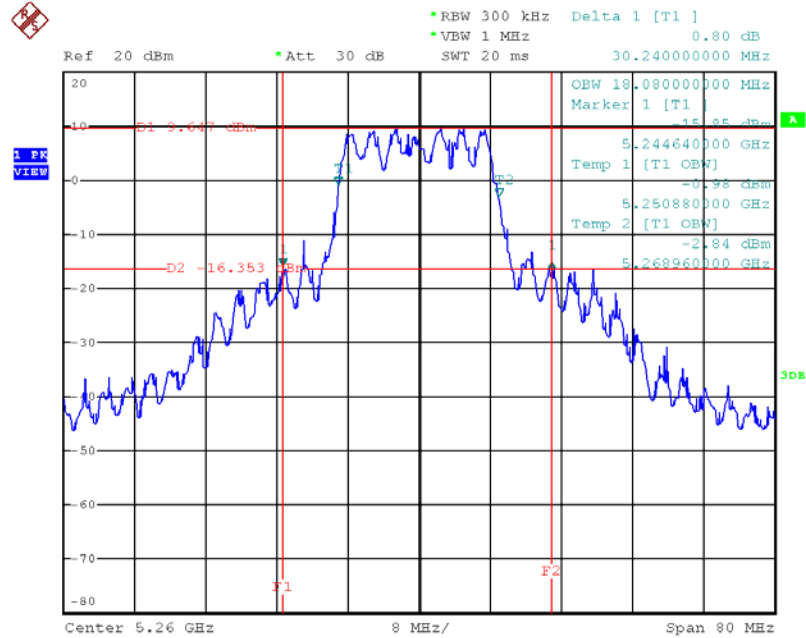
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
58	5290 MHz	79.80	76.00
106	5530 MHz	80.20	76.00

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Chain 1 + Chain 2 (2TX)

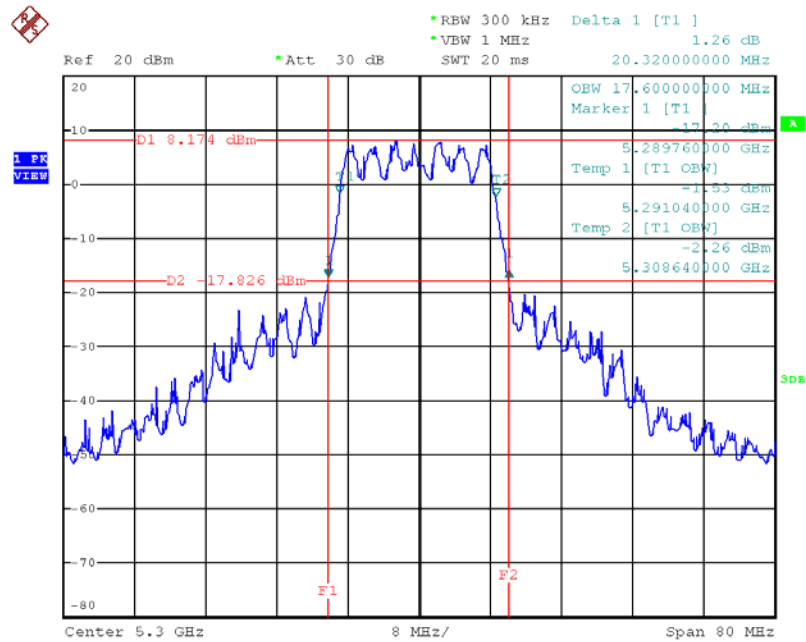
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	25.12	16.80
60	5300 MHz	20.80	16.48
64	5320 MHz	20.16	16.48
100	5500 MHz	20.00	16.48
116	5580 MHz	21.12	16.48
140	5700 MHz	20.32	16.48

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5260 MHz / Chain 1 + Chain 2 (2TX)



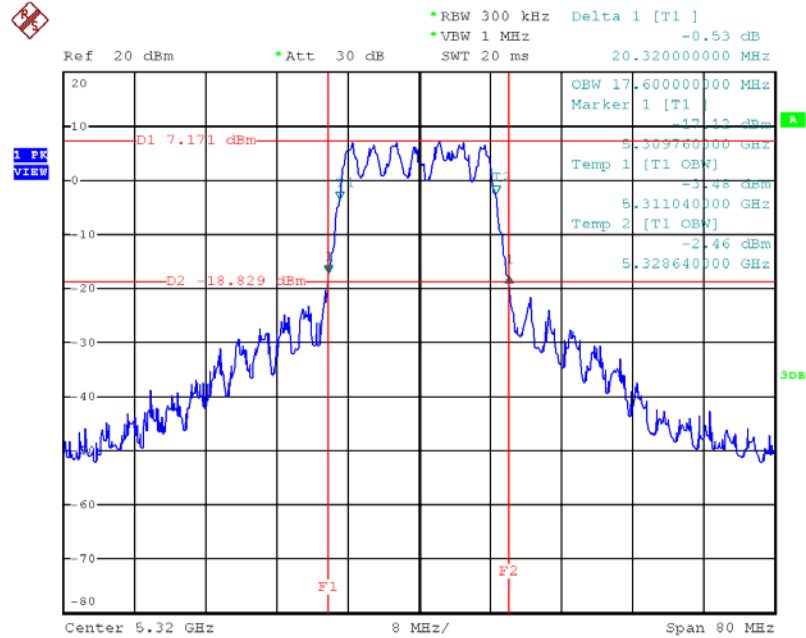
Date: 16.JAN.2013 20:57:49

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5300 MHz / Chain 1 + Chain 2 (2TX)



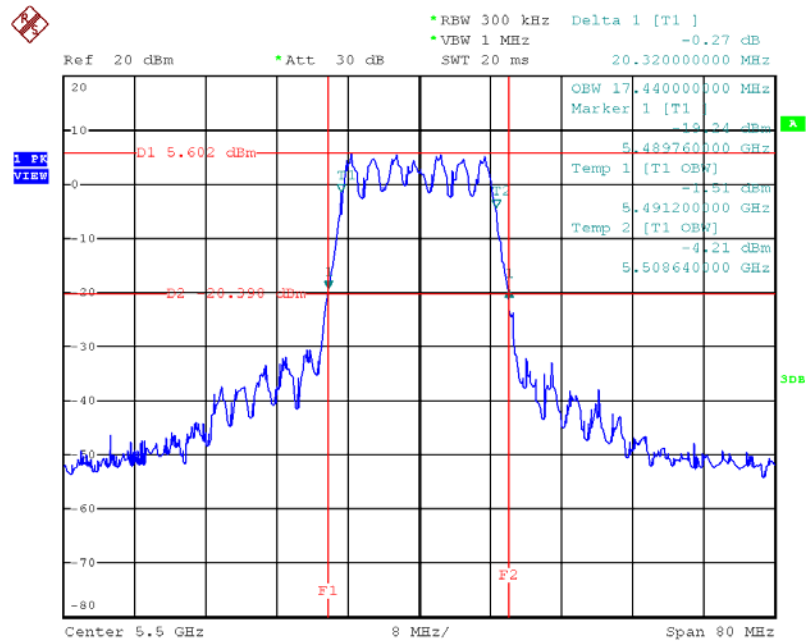
Date: 16.JAN.2013 20:59:38

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5320 MHz / Chain 1 + Chain 2 (2TX)



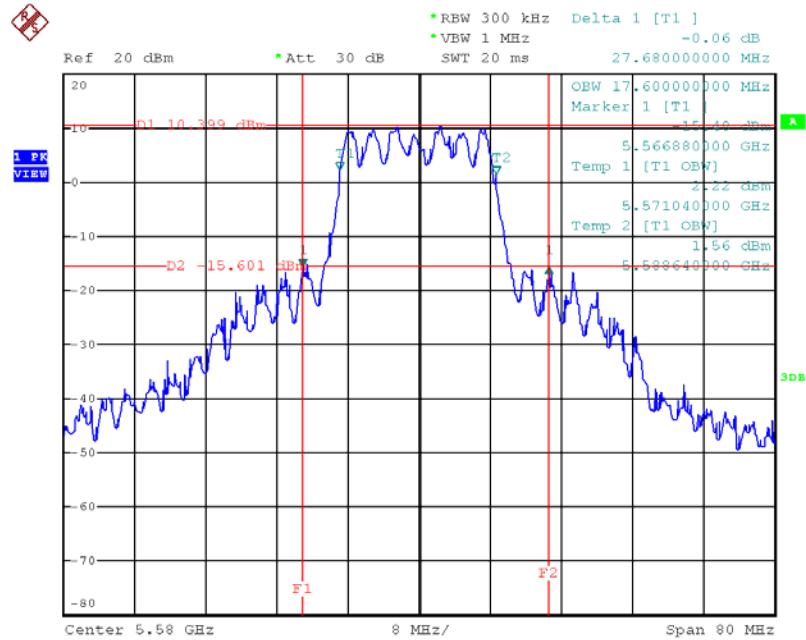
Date: 16.JAN.2013 21:00:45

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5500 MHz / Chain 1 + Chain 2 (2TX)



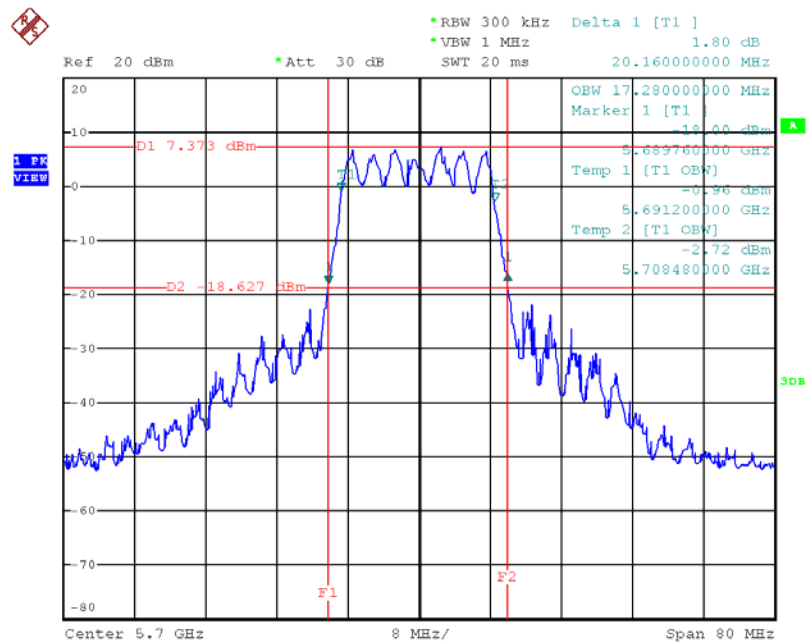
Date: 16.JAN.2013 21:01:57

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5580 MHz / Chain 1 + Chain 2 (2TX)



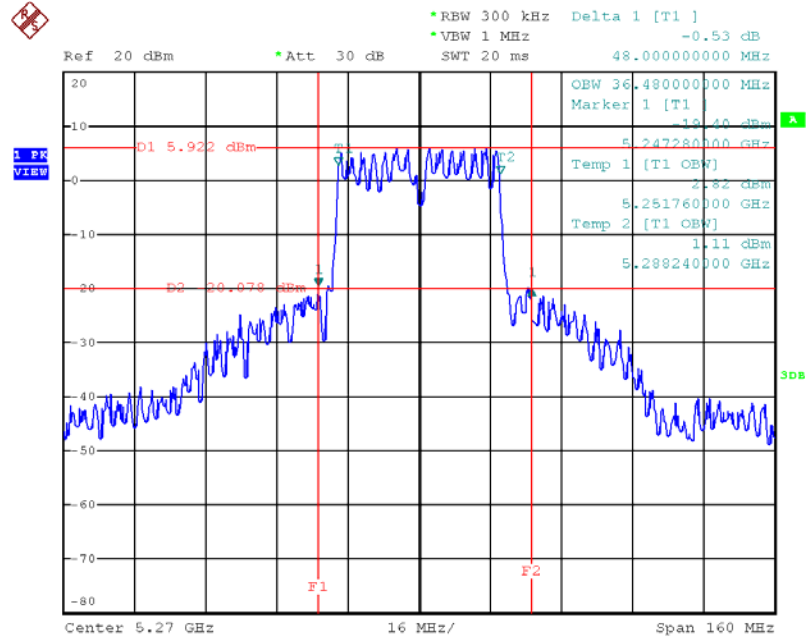
Date: 16.JAN.2013 21:03:29

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5700 MHz / Chain 1 + Chain 2 (2TX)



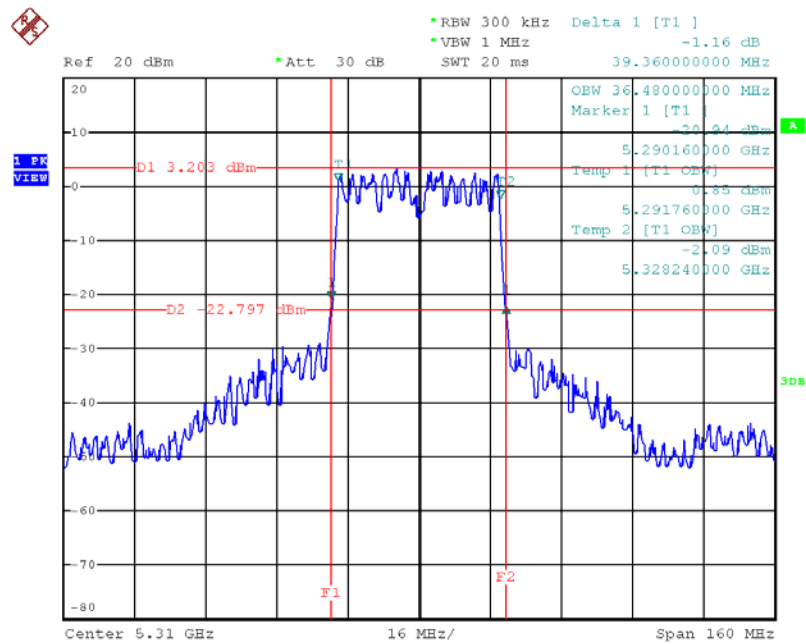
Date: 16.JAN.2013 21:04:13

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5270 MHz / Chain 1 + Chain 2 (2TX)



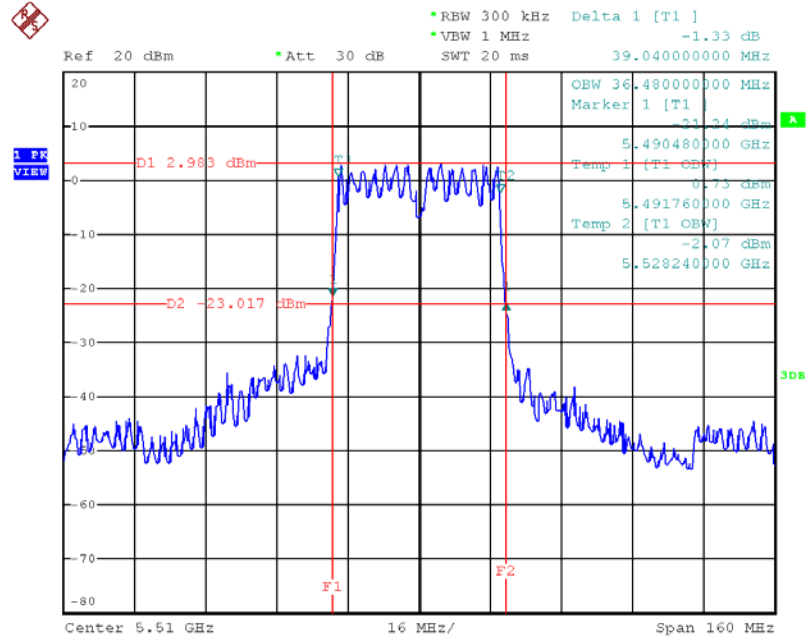
Date: 16.JAN.2013 21:08:41

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5310 MHz / Chain 1 + Chain 2 (2TX)



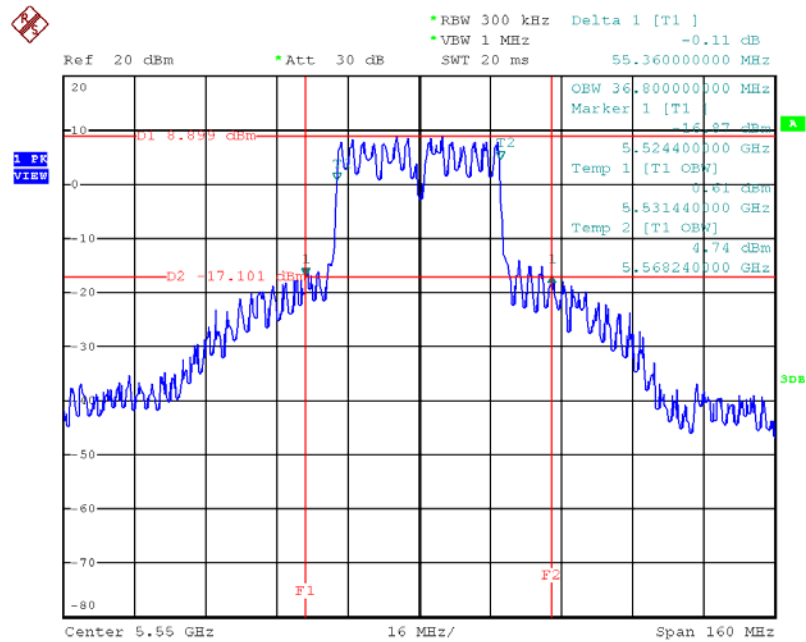
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5510 MHz / Chain 1 + Chain 2 (2TX)



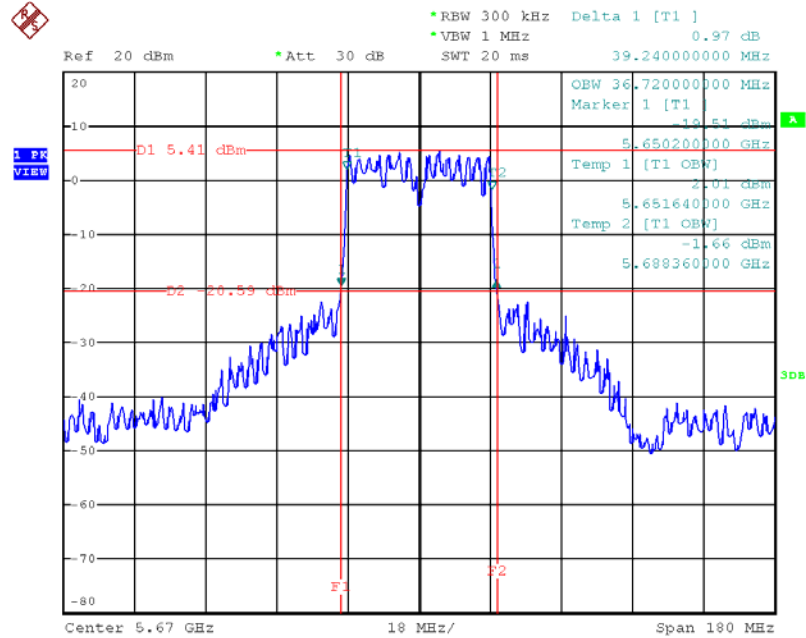
Date: 16.JAN.2013 21:10:43

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5550 MHz / Chain 1 + Chain 2 (2TX)



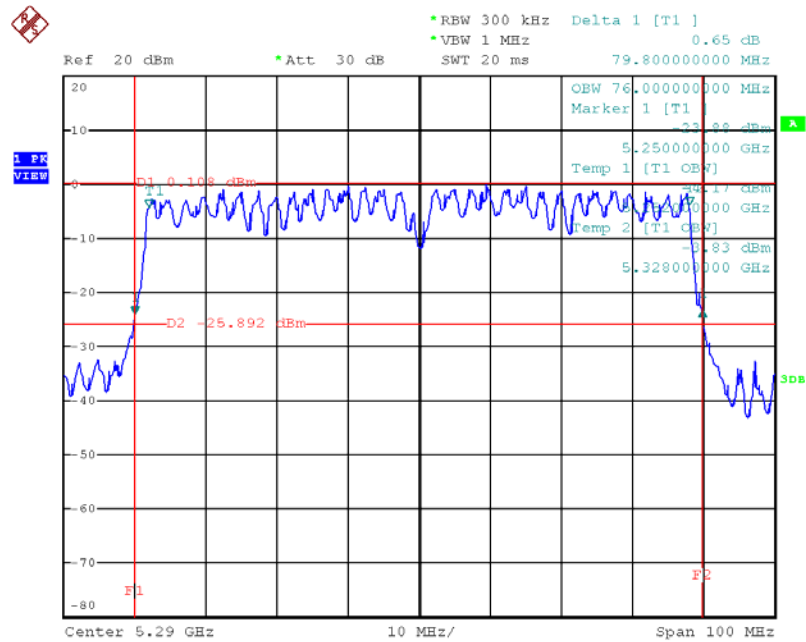
Date: 16.JAN.2013 21:11:56

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5670 MHz / Chain 1 + Chain 2 (2TX)



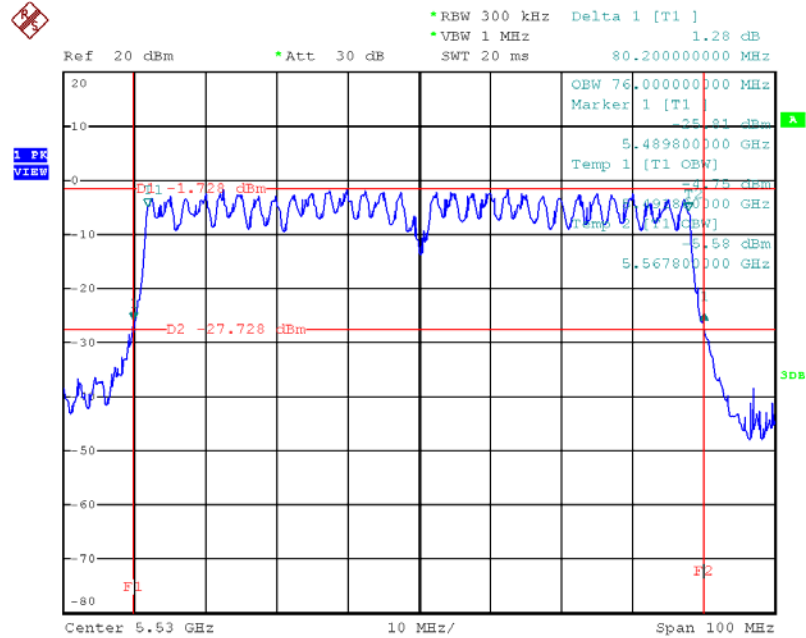
Date: 16.JAN.2013 22:16:03

26 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5290 MHz / Chain 1 + Chain 2 (2TX)



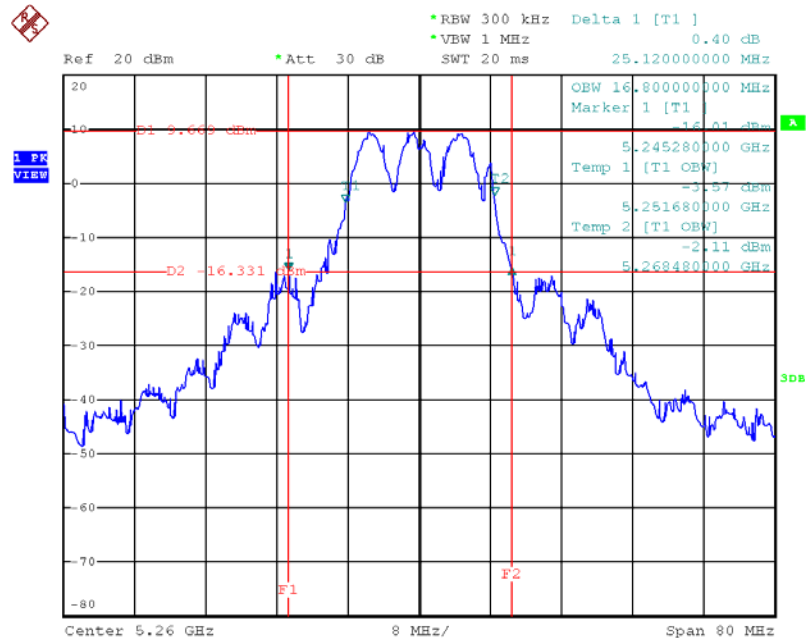
Date: 16.JAN.2013 21:52:00

26 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5530 MHz / Chain 1 + Chain 2 (2TX)



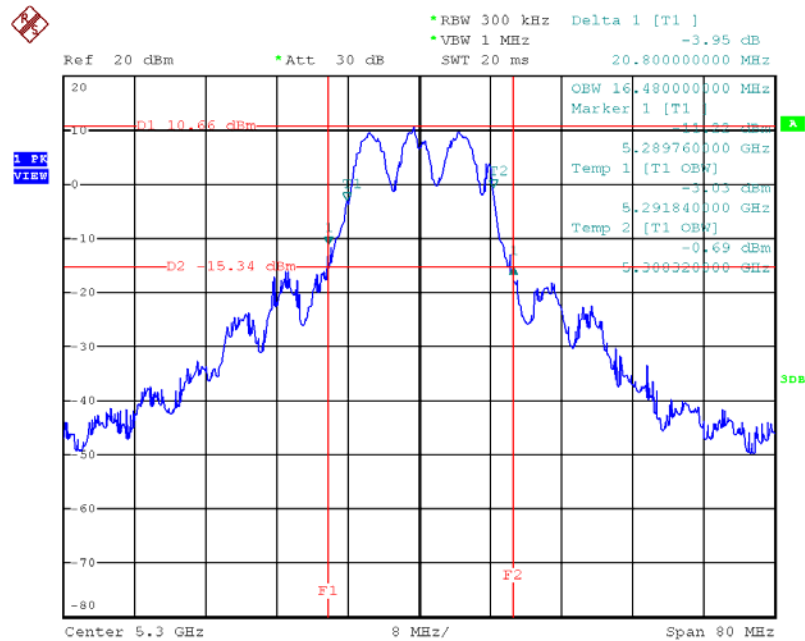
Date: 16.JAN.2013 21:53:28

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5260 MHz / Chain 1 + Chain 2 (2TX)



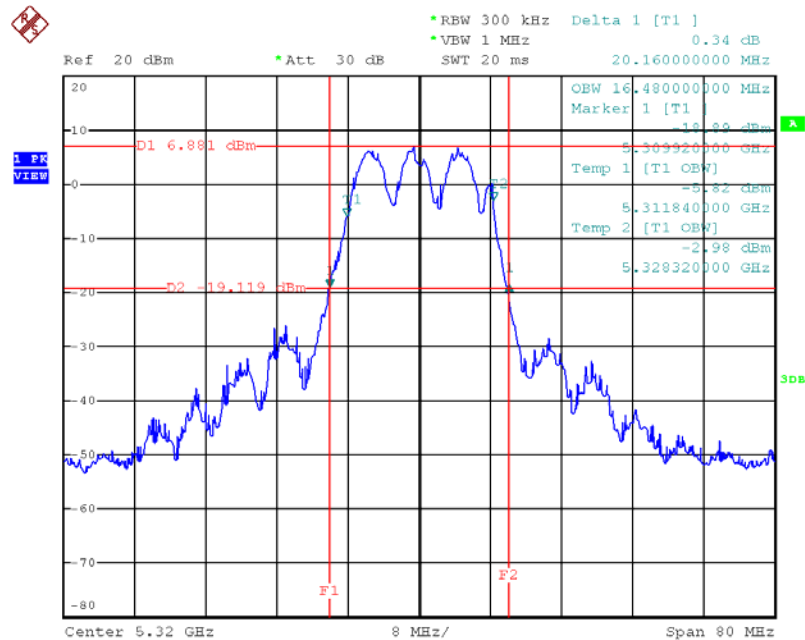
Date: 16.JAN.2013 20:43:52

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5300 MHz / Chain 1 + Chain 2 (2TX)



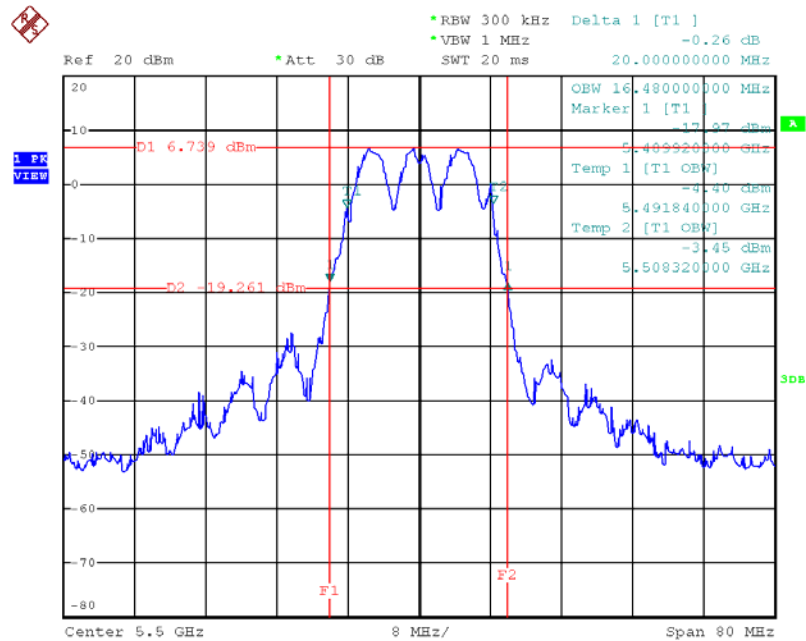
Date: 16.JAN.2013 20:44:58

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5320 MHz / Chain 1 + Chain 2 (2TX)



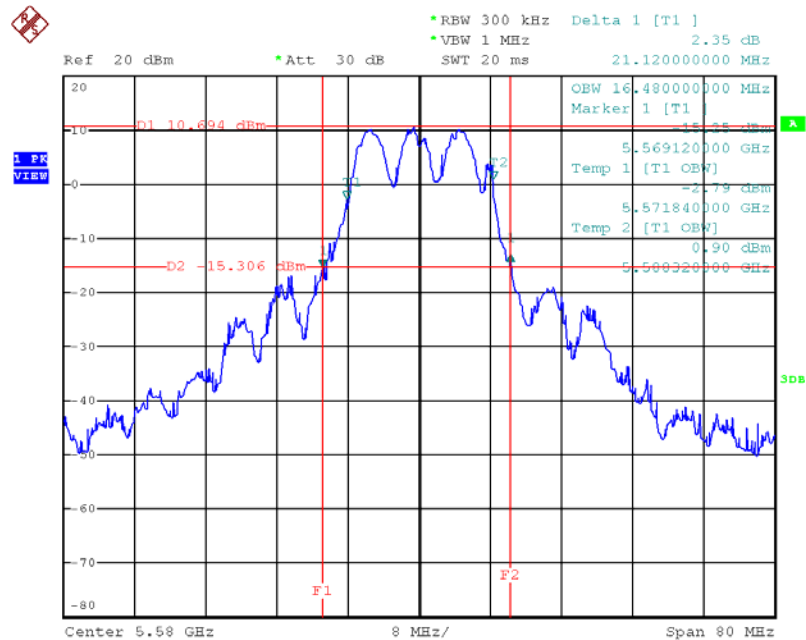
Date: 16.JAN.2013 20:47:53

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5500 MHz / Chain 1 + Chain 2 (2TX)

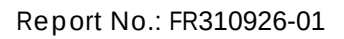


Date: 16.JAN.2013 20:49:49

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5580 MHz / Chain 1 + Chain 2 (2TX)



Date: 16.JAN.2013 20:50:42



Ref 20 dBm *Att 30 dB RBW 300 kHz Delta 1 [T1] 0.02 dB 20.320000000 MHz

VBW 1 MHz SWT 20 ms

Center 5.7 GHz 8 MHz/ Span 80 MHz

Marker 1 [T1] 5.689920000 GHz -3.54 dBm

Temp 1 [T1 OBW]

Marker 2 [T2] 5.691840000 GHz -3.07 dBm

Temp 2 [T1 OBW]

D1 8.046 dBm D2 -17.954 dBm

F1 F2

Date: 16.JAN.2013 20:51:43

4.3. Maximum Conducted Output Power Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

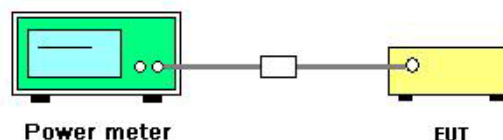
The following table is the setting of the peak power meter.

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

4.3.3. Test Procedures

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

4.3.4. 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	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac
Test Date	Jan. 16, 2013		

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
52	5260 MHz	19.89	19.50	22.71	24.00	Complies
60	5300 MHz	17.45	17.12	20.30	24.00	Complies
64	5320 MHz	16.82	16.62	19.73	24.00	Complies
100	5500 MHz	14.93	14.66	17.81	24.00	Complies
116	5580 MHz	19.53	19.68	22.62	24.00	Complies
140	5700 MHz	16.30	16.24	19.28	24.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
54	5270 MHz	18.94	18.54	21.75	24.00	Complies
62	5310 MHz	15.91	15.52	18.73	24.00	Complies
102	5510MHz	15.24	15.23	18.25	24.00	Complies
110	5550 MHz	20.61	20.98	23.81	24.00	Complies
134	5670 MHz	17.80	17.72	20.77	24.00	Complies

Configuration IEEE 802.11ac MCS0 VHT 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
52	5260 MHz	19.86	19.47	22.68	24.00	Complies
60	5300 MHz	15.97	15.65	18.82	24.00	Complies
64	5320 MHz	15.32	14.72	18.04	24.00	Complies
100	5500 MHz	15.02	14.81	17.93	24.00	Complies
116	5580 MHz	19.54	19.70	22.63	24.00	Complies
140	5700 MHz	16.86	16.80	19.84	24.00	Complies

Configuration IEEE 802.11ac MCS0 VHT 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
54	5270 MHz	20.31	20.03	23.18	24.00	Complies
62	5310 MHz	15.88	15.60	18.75	24.00	Complies
102	5510MHz	16.24	16.19	19.23	24.00	Complies
110	5550 MHz	20.70	21.00	23.86	24.00	Complies
134	5670 MHz	18.90	18.91	21.92	24.00	Complies

Configuration IEEE 802.11ac MCS0 VHT 80MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
58	5290 MHz	14.76	14.60	17.69	24.00	Complies
106	5530 MHz	13.40	13.25	16.34	24.00	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a
Test Date	Jan. 16, 2013		

Configuration IEEE 802.11a / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Conducted Power (dBm)		Total Conducted Output Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
52	5260 MHz	19.41	19.08	22.26	24.00	Complies
60	5300 MHz	19.16	18.73	21.96	24.00	Complies
64	5320 MHz	16.06	15.76	18.92	24.00	Complies
100	5500 MHz	15.46	15.23	18.36	24.00	Complies
116	5580 MHz	19.31	19.46	22.40	24.00	Complies
140	5700 MHz	17.31	17.25	20.29	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)
5.25-5.35 GHz	11
5470-5725	11

4.4.2. Measuring Instruments and Setting

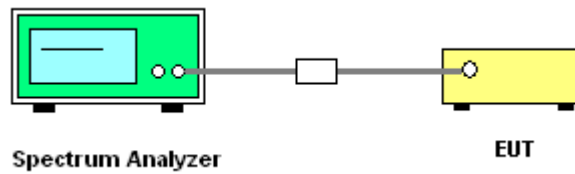
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac
Test Date	Jan. 16, 2013		

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	10.05	10.17	Complies
60	5300 MHz	7.73	10.17	Complies
64	5320 MHz	7.40	10.17	Complies
100	5500 MHz	5.41	10.17	Complies
116	5580 MHz	9.95	10.17	Complies
140	5700 MHz	6.18	10.17	Complies

Note: $Directional\ gain = G_{ANT} + 10 \log(N_{ANT}/N_{SS}) = 6.83\text{dBi} > 6\text{dBi}$, so Limit = $11 - (6.83 - 6) = 10.17\text{dBm/MHz}$.

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	6.21	10.17	Complies
62	5310 MHz	3.34	10.17	Complies
102	5510MHz	2.74	10.17	Complies
110	5550 MHz	8.36	10.17	Complies
134	5670 MHz	4.72	10.17	Complies

Note: $Directional\ gain = G_{ANT} + 10 \log(N_{ANT}/N_{SS}) = 6.83\text{dBi} > 6\text{dBi}$, so Limit = $11 - (6.83 - 6) = 10.17\text{dBm/MHz}$.

Configuration IEEE 802.11 ac MCS0 VHT 80MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	-0.78	10.17	Complies
106	5530 MHz	-2.28	10.17	Complies

Note: $Directional\ gain = G_{ANT} + 10 \log(N_{ANT}/N_{SS}) = 6.83\text{dBi} > 6\text{dBi}$, so Limit = $11 - (6.83 - 6) = 10.17\text{dBm/MHz}$.

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a
Test Date	Jan. 16, 2013		

Configuration IEEE 802.11a / Chain 1 + Chain 2 (2TX)

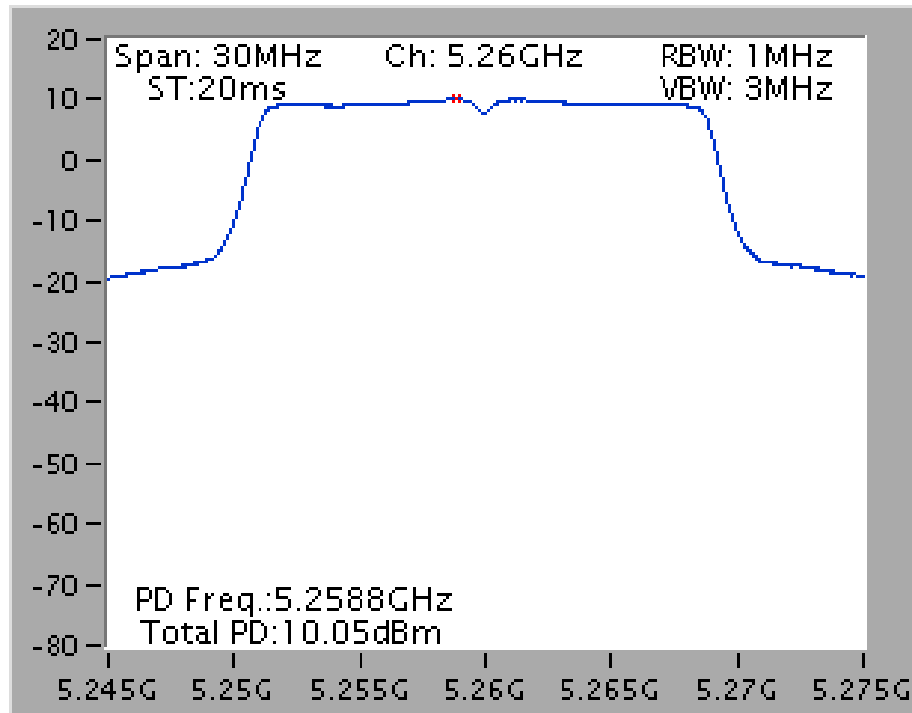
Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	9.98	10.17	Complies
60	5300 MHz	9.69	10.17	Complies
64	5320 MHz	6.71	10.17	Complies
100	5500 MHz	5.17	10.17	Complies
116	5580 MHz	9.92	10.17	Complies
140	5700 MHz	7.57	10.17	Complies

Note: $Directional\ gain = G_{ANT} + 10 \log(N_{ANT}/N_{SS}) = 6.83\text{dBi} > 6\text{dBi}$, so Limit = $11 - (6.83 - 6)$
= 10.17 dBm/MHz.

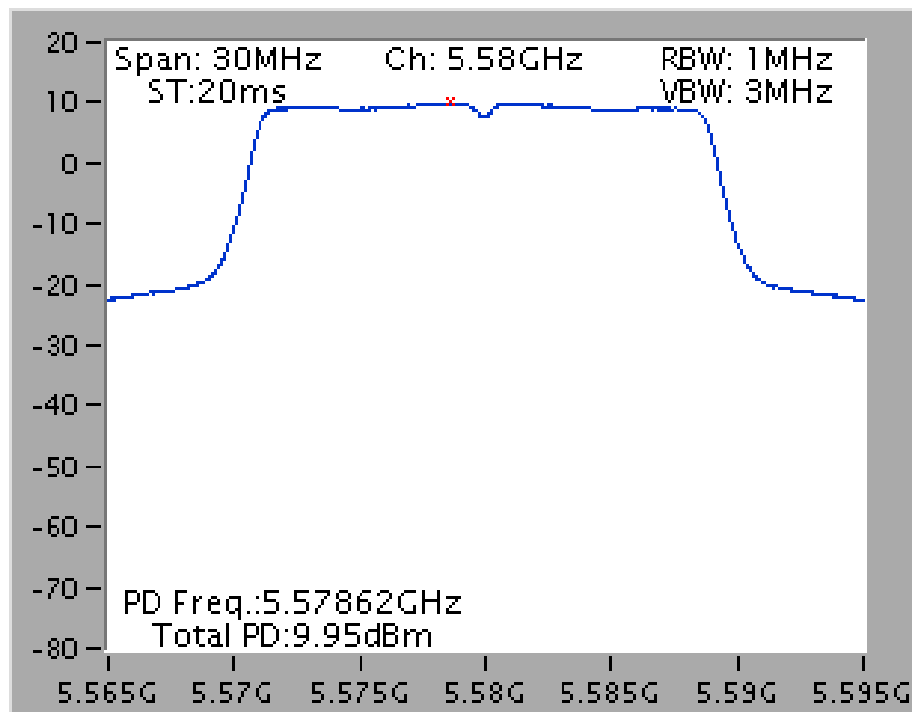
Note: All the test values were listed in the report.

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

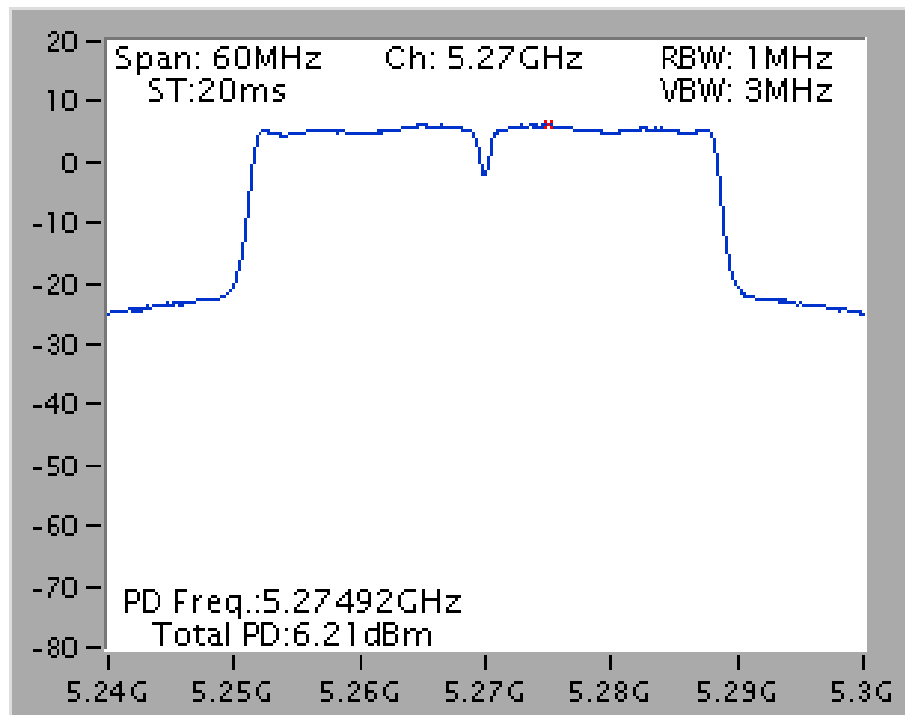
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 5260 MHz / Chain 1 + Chain 2 (2TX)



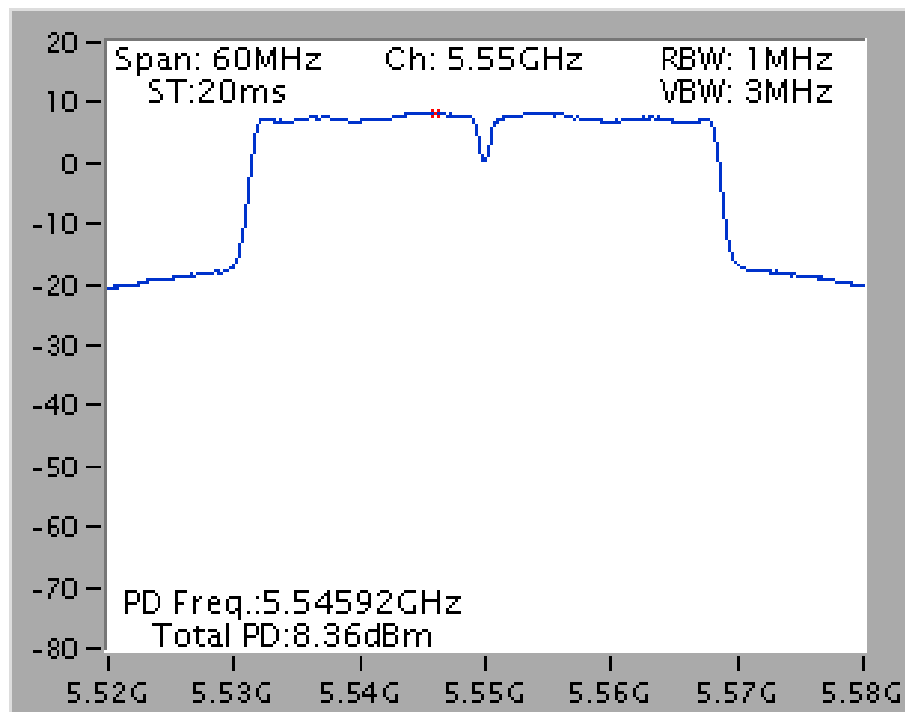
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 5580 MHz / Chain 1 + Chain 2 (2TX)



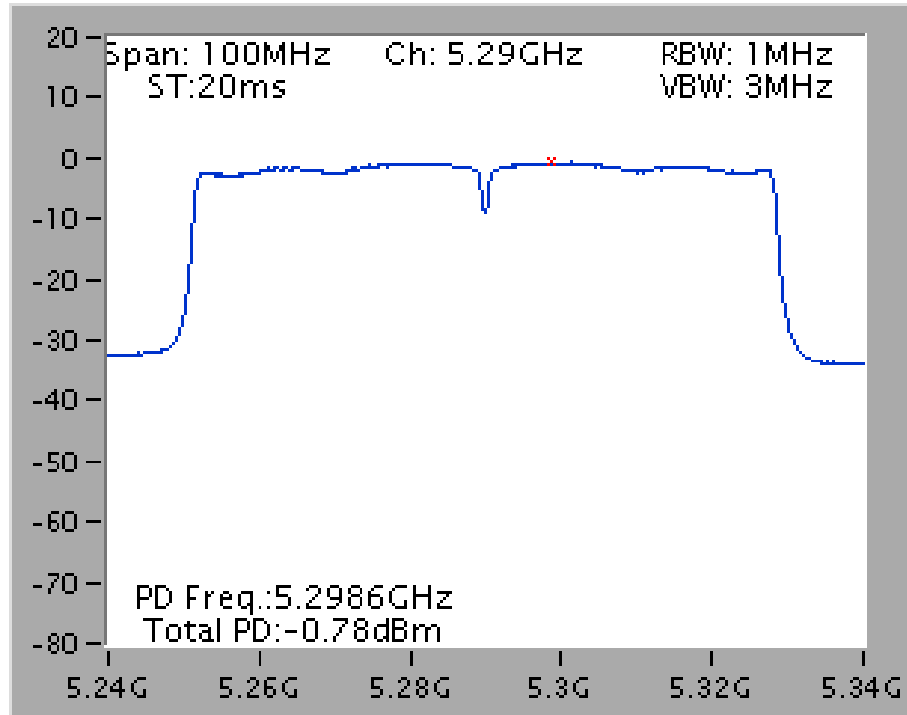
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 5270 MHz / Chain 1 + Chain 2 (2TX)



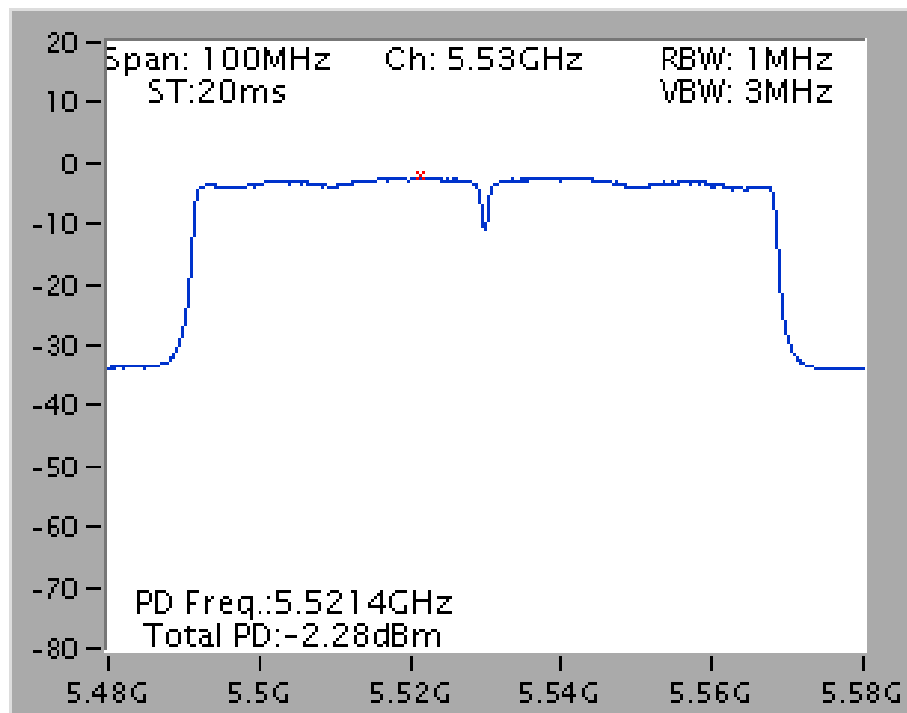
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 5550 MHz / Chain 1 + Chain 2 (2TX)



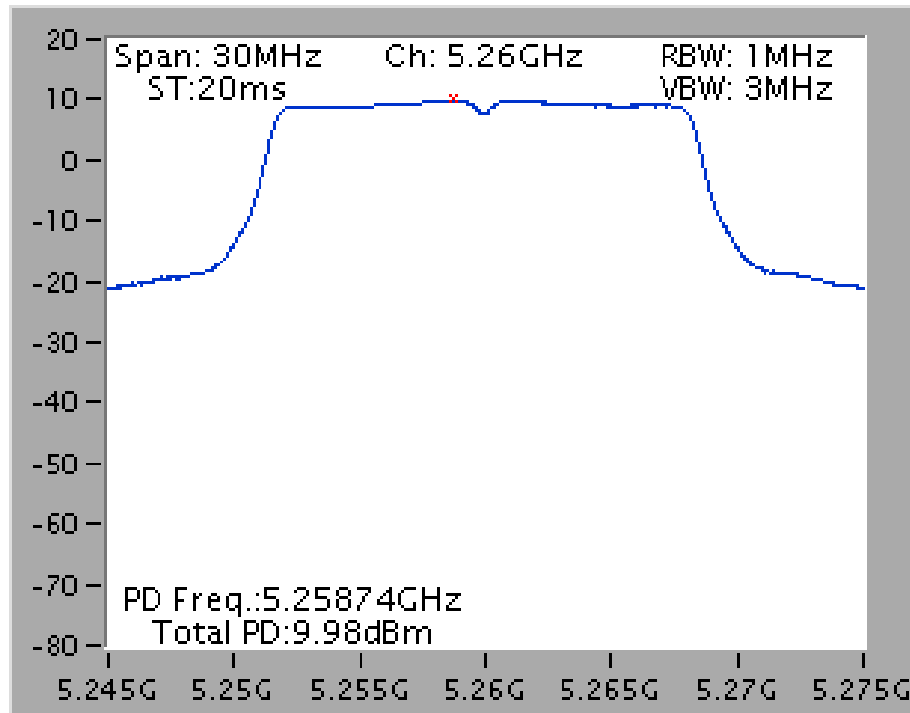
**Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5290 MHz /
Chain 1 + Chain 2 (2TX)**



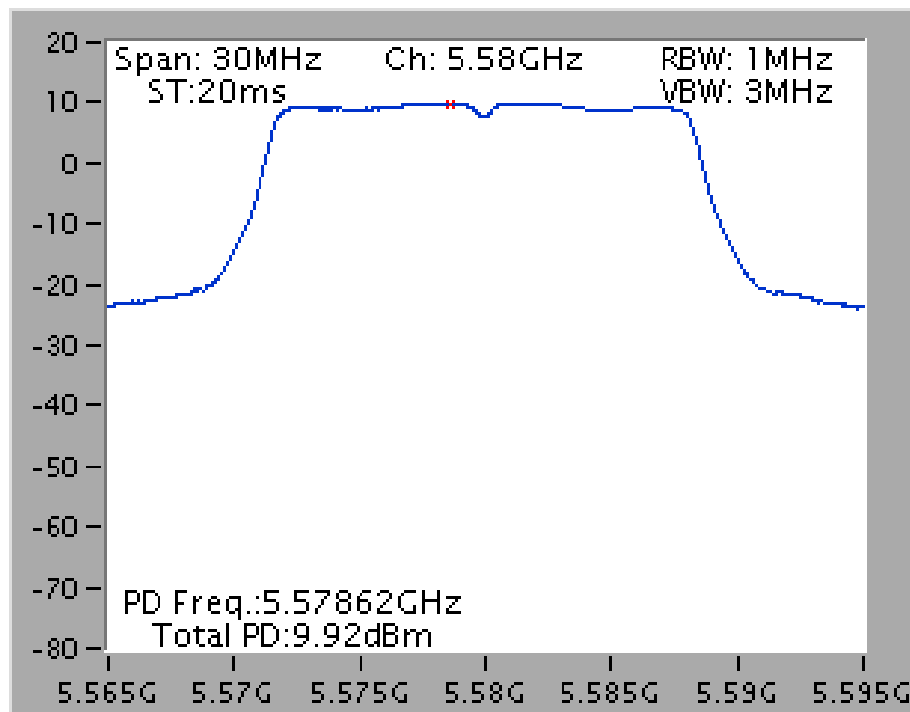
**Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5530 MHz /
Chain 1 + Chain 2 (2TX)**



Power Density Plot on Configuration IEEE 802.11a / 5260 MHz / Chain 1 + Chain 2 (2TX)



Power Density Plot on Configuration IEEE 802.11a / 5580 MHz / Chain 1 + Chain 2 (2TX)



4.5. Peak Excursion Measurement

4.5.1. Limit

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

4.5.2. Measuring Instruments and Setting

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

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

4.5.3. Test Procedures

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

4.5.4. Test Setup Layout

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

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Peak Excursion

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	8.26	13	Complies
116	5580 MHz	8.75	13	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
54	5270 MHz	8.35	13	Complies
110	5550 MHz	8.50	13	Complies

Configuration IEEE 802.11ac MCS0 VHT 80MHz / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
58	5290 MHz	9.16	13	Complies
106	5530 MHz	8.89	13	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a

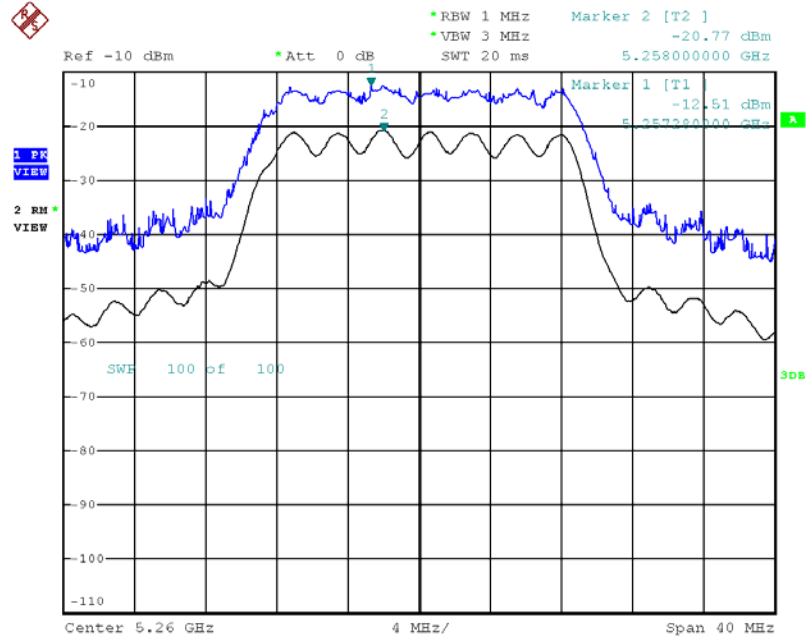
Configuration IEEE 802.11a / Chain 1 + Chain 2 (2TX)

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	8.57	13	Complies
116	5580 MHz	8.14	13	Complies

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

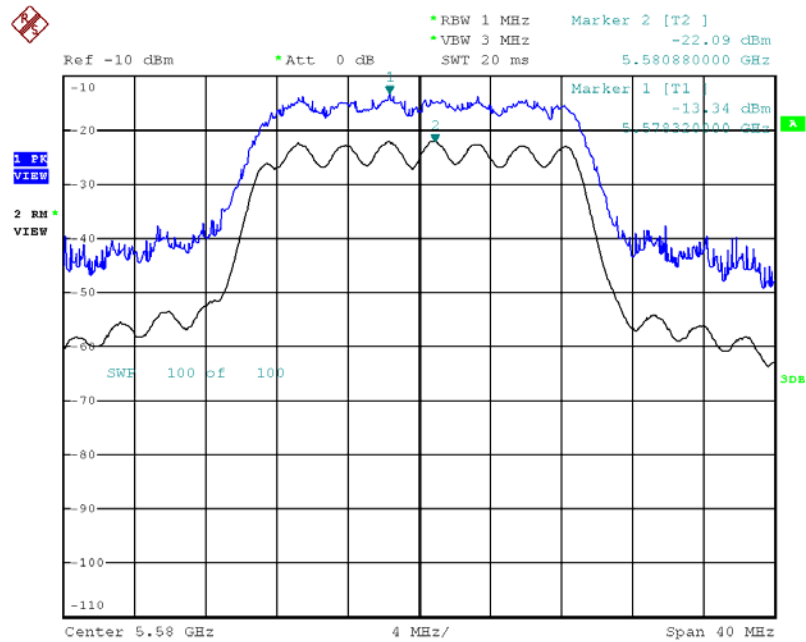
For plots, only the channel with maximum results was shown.

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / 5260 MHz / Chain 1 + Chain 2 (2TX)



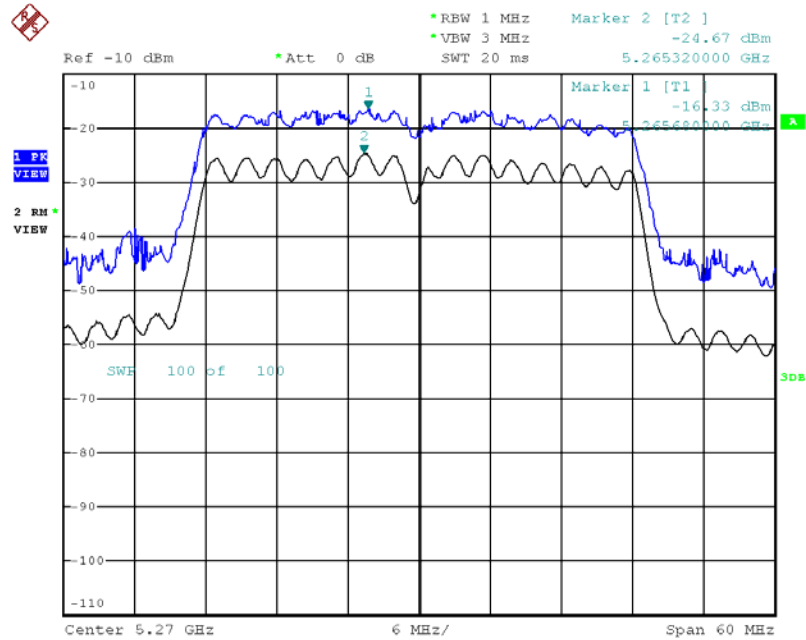
Date: 16.JAN.2013 22:54:48

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / 5580 MHz / Chain 1 + Chain 2 (2TX)



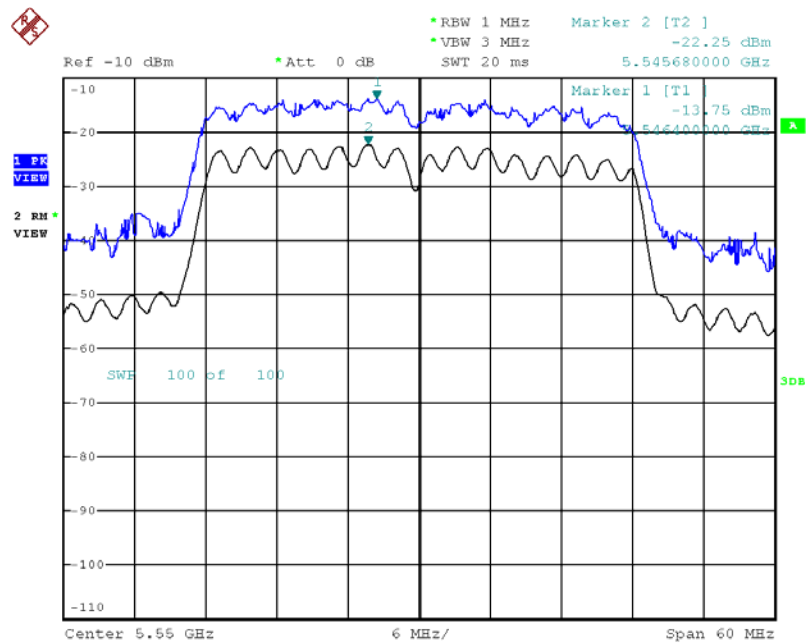
Date: 16.JAN.2013 22:56:18

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / 5270 MHz / Chain 1 + Chain 2 (2TX)



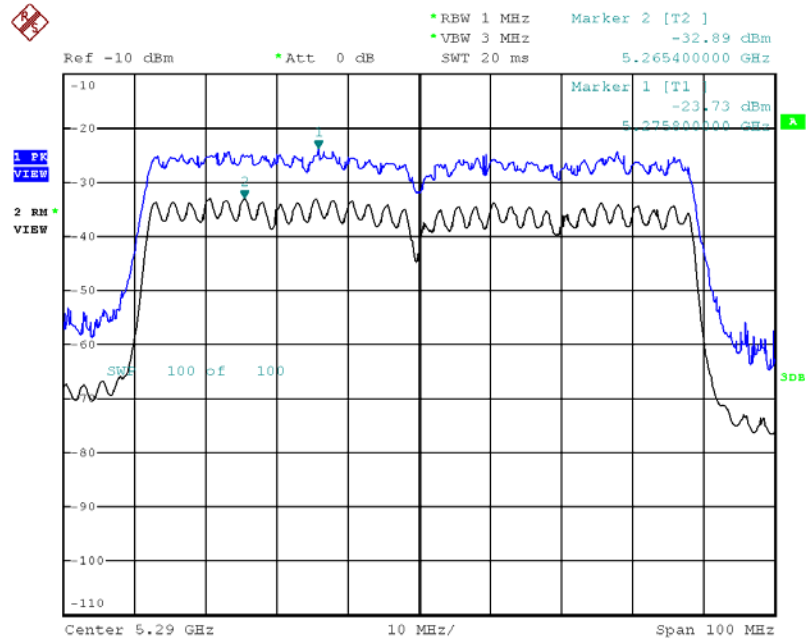
Date: 16.JAN.2013 22:59:41

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / 5550 MHz / Chain 1 + Chain 2 (2TX)



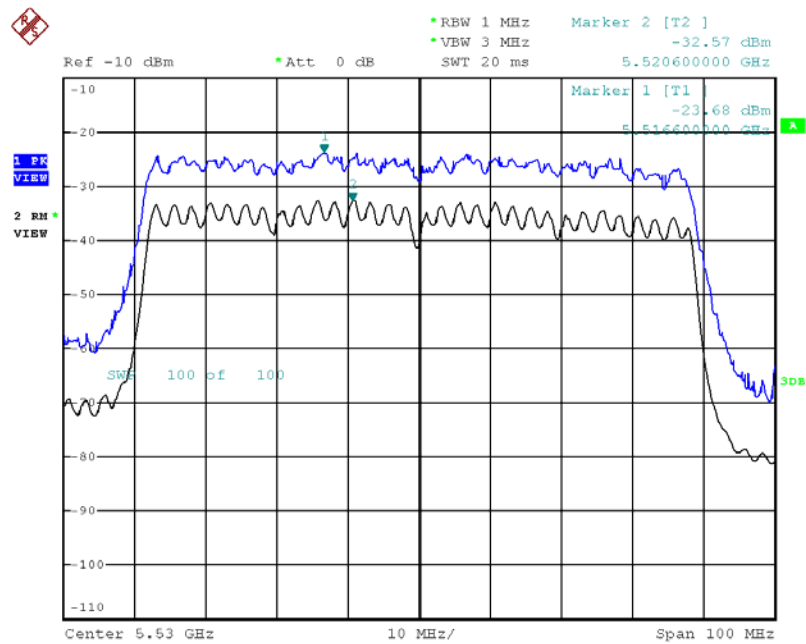
Date: 16.JAN.2013 23:01:52

Peak Excursion Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5290 MHz / Chain 1 + Chain 2 (2TX)



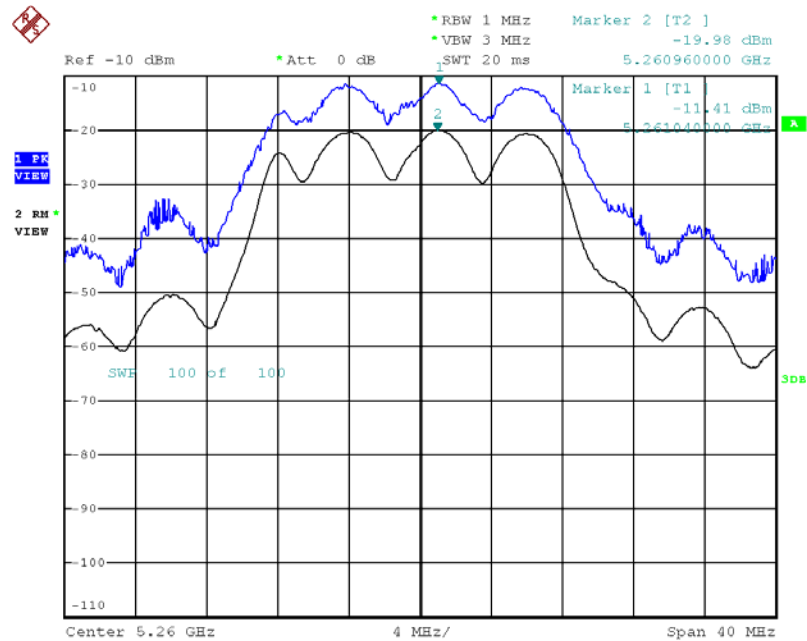
Date: 16.JAN.2013 23:05:39

Peak Excursion Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5530 MHz / Chain 1 + Chain 2 (2TX)



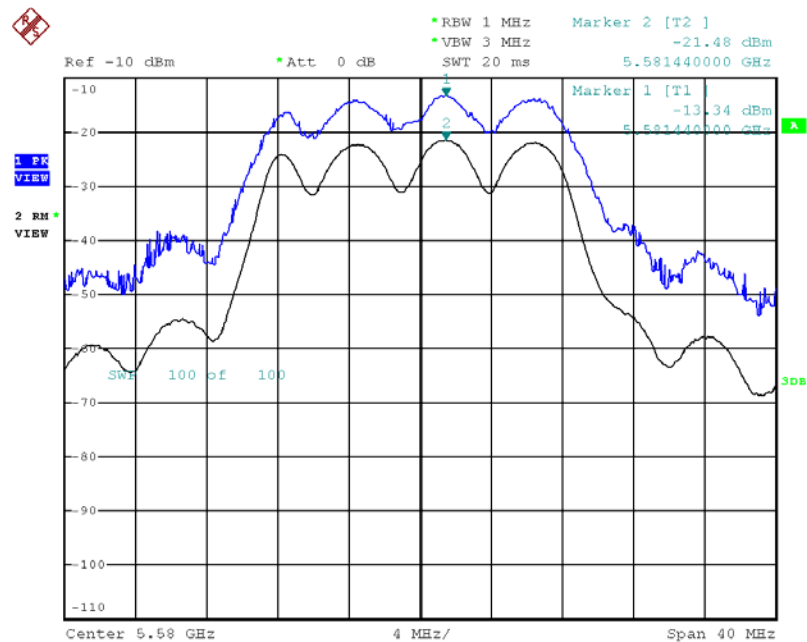
Date: 16.JAN.2013 23:06:58

Peak Excursion Plot on Configuration IEEE 802.11a / 5260 MHz / Chain 1 + Chain 2 (2TX)



Date: 16.JAN.2013 22:50:06

Peak Excursion Plot on Configuration IEEE 802.11a / 5580 MHz / Chain 1 + Chain 2 (2TX)



Date: 16.JAN.2013 22:51:12

4.6. Radiated Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

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

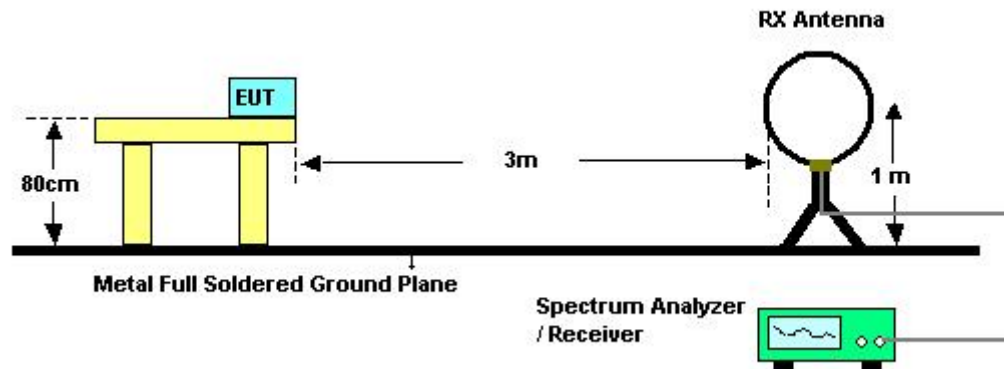
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.6.3. Test Procedures

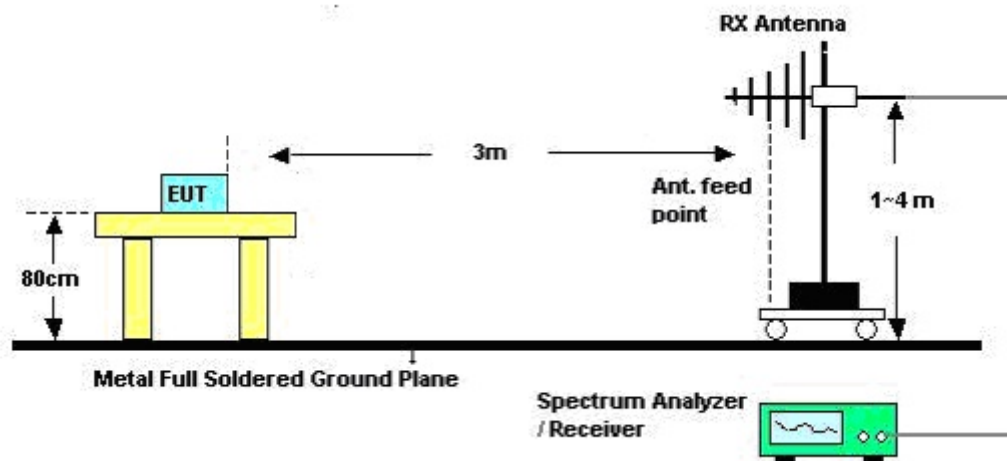
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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



For radiated emissions above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	24.5°C	Humidity	60%
Test Engineer	Serway Li	Configurations	CTX
Test Date	Jan. 17, 2013		

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

Note:

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

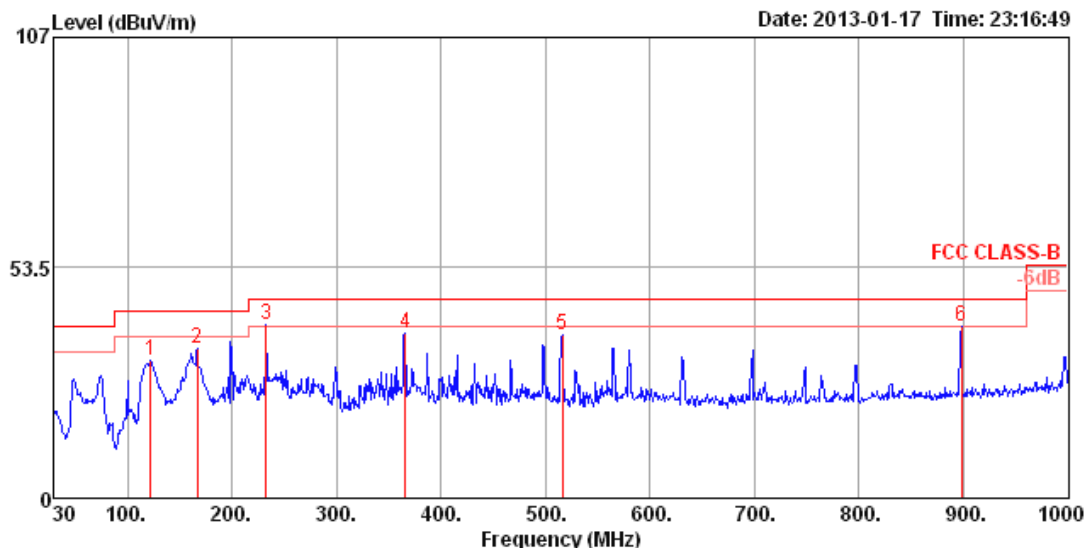
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

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

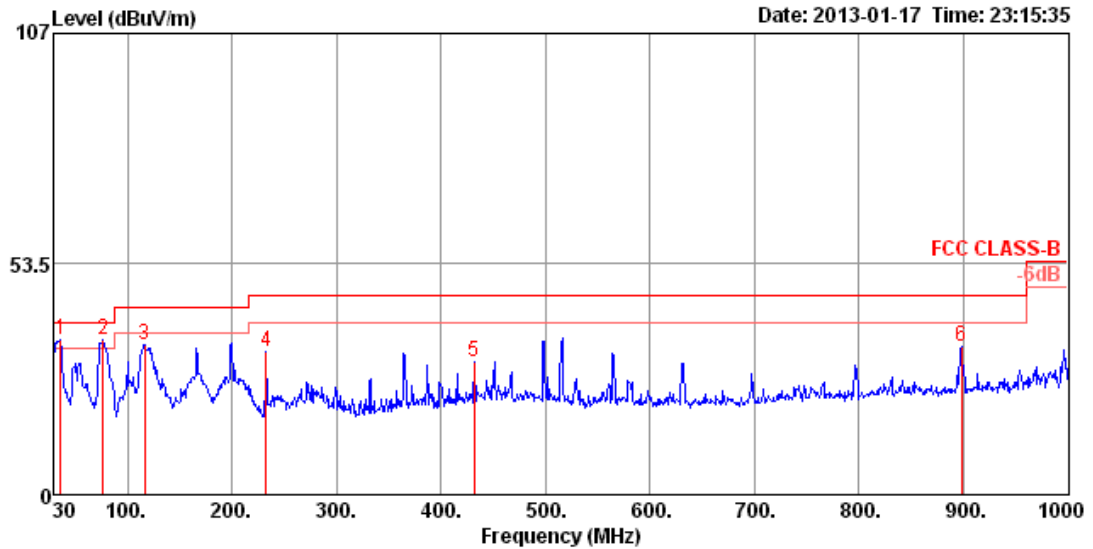
Temperature	24.5°C	Humidity	60%
Test Engineer	Serway Li	Configurations	CTX

Horizontal



	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	122.15	31.81	43.50	-11.69	50.41	1.31	11.65	31.56	150	339	HORIZONTAL	Peak
2	166.77	34.90	43.50	-8.60	55.55	1.57	9.32	31.54	200	296	HORIZONTAL	Peak
3 pp	232.73	40.20	46.00	-5.80	59.79	1.84	10.02	31.45	150	117	HORIZONTAL	Peak
4	365.62	38.43	46.00	-7.57	52.66	2.39	14.75	31.37	100	156	HORIZONTAL	Peak
5	515.97	37.76	46.00	-8.24	49.00	2.86	17.31	31.41	150	142	HORIZONTAL	Peak
6	898.15	39.97	46.00	-6.03	46.57	3.97	20.63	31.20	100	264	HORIZONTAL	Peak

Vertical



	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	pp	35.82	35.87	40.00	-4.13	52.43	0.70	14.62	31.88	100	1 VERTICAL Peak
2	!	76.56	35.84	40.00	-4.16	60.18	1.03	6.32	31.69	150	318 VERTICAL Peak
3		116.33	34.84	43.50	-8.66	53.60	1.28	11.51	31.55	125	330 VERTICAL Peak
4		232.73	33.16	46.00	-12.84	52.75	1.84	10.02	31.45	200	146 VERTICAL Peak
5		431.58	30.96	46.00	-15.04	43.32	2.59	16.21	31.16	125	265 VERTICAL Peak
6		898.15	34.29	46.00	-11.71	40.89	3.97	20.63	31.20	100	129 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	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 52 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15785.42	52.01	74.00	-21.99	43.88	6.14	37.41	35.42	Peak	100	129 VERTICAL
2	15788.21	38.36	54.00	-15.64	30.23	6.14	37.41	35.42	Average	100	129 VERTICAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15785.42	52.01	74.00	-21.99	43.88	6.14	37.41	35.42	Peak	100	129 VERTICAL
2	15788.21	38.36	54.00	-15.64	30.23	6.14	37.41	35.42	Average	100	129 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 60 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamplifier Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10599.81	40.04	54.00	-13.96	32.07	5.01	38.38	35.42	Average	100	334 VERTICAL
2	10604.49	52.52	74.00	-21.48	44.55	5.01	38.38	35.42	Peak	100	334 VERTICAL
3	15898.88	38.24	54.00	-15.76	30.24	6.15	37.29	35.44	Average	100	221 VERTICAL
4	15907.28	51.78	74.00	-22.22	43.78	6.15	37.29	35.44	Peak	100	221 VERTICAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamplifier Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10603.81	50.96	74.00	-23.04	42.99	5.01	38.38	35.42	Peak	100	275 HORIZONTAL
2	10605.58	38.14	54.00	-15.86	30.17	5.01	38.38	35.42	Average	100	275 HORIZONTAL
3	15899.90	51.38	74.00	-22.62	43.38	6.15	37.29	35.44	Peak	100	147 HORIZONTAL
4	15908.97	38.28	54.00	-15.72	30.28	6.15	37.29	35.44	Average	100	147 HORIZONTAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 64 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10640.08	36.05	54.00	-17.95	28.06	5.01	38.37	35.39 Average	143	263	HORIZONTAL
2	10640.08	47.08	74.00	-26.92	39.09	5.01	38.37	35.39 Peak	143	263	HORIZONTAL
3	15960.08	37.98	54.00	-16.02	30.04	6.15	37.23	35.44 Average	100	243	HORIZONTAL
4	15960.08	48.41	74.00	-25.59	40.47	6.15	37.23	35.44 Peak	100	243	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10639.92	36.75	54.00	-17.25	28.76	5.01	38.37	35.39 Average	100	178	VERTICAL
2	10639.92	47.51	74.00	-26.49	39.52	5.01	38.37	35.39 Peak	100	178	VERTICAL
3	15960.00	38.43	54.00	-15.57	30.49	6.15	37.23	35.44 Average	124	273	VERTICAL
4	15960.00	49.44	74.00	-24.56	41.50	6.15	37.23	35.44 Peak	124	273	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 100 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11000.16	36.15	54.00	-17.85	27.92	5.01	38.32	35.10	Average	100	257	HORIZONTAL
2	11000.16	47.32	74.00	-26.68	39.09	5.01	38.32	35.10	Peak	100	257	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	10998.64	36.76	54.00	-17.24	28.55	5.01	38.30	35.10	Average	100	107	VERTICAL
2	10998.64	46.91	74.00	-27.09	38.70	5.01	38.30	35.10	Peak	100	107	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 116 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss Factor	Factor	Remark			Pol/Phase
			dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	11159.68	37.40	54.00	-16.60	29.06	5.04	38.47	35.17	Average	100	231 HORIZONTAL
2	11162.82	51.64	74.00	-22.36	43.29	5.05	38.47	35.17	Peak	100	231 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss Factor	Factor	Remark			Pol/Phase
			dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	11155.06	53.79	74.00	-20.21	45.46	5.04	38.45	35.16	Peak	100	333 VERTICAL
2	11160.06	41.48	54.00	-12.52	33.14	5.04	38.47	35.17	Average	100	333 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 140 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11399.92	37.83	54.00	-16.17	29.28	5.10	38.70	35.25	Average	100	235 HORIZONTAL
2	11399.92	48.08	74.00	-25.92	39.53	5.10	38.70	35.25	Peak	100	235 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11399.60	42.72	54.00	-11.28	34.17	5.10	38.70	35.25	Average	127	238 VERTICAL
2	11399.60	55.58	74.00	-18.42	47.03	5.10	38.70	35.25	Peak	127	238 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 40MHz Ch 54 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	15806.99	51.76	74.00	-22.24	43.66	6.14	37.39	35.43	Peak	100	263 HORIZONTAL
2	15810.32	38.52	54.00	-15.48	30.42	6.14	37.39	35.43	Average	100	263 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	15790.06	38.60	54.00	-15.40	30.47	6.14	37.41	35.42	Average	100	86 VERTICAL
2	15815.71	51.72	74.00	-22.28	43.64	6.14	37.37	35.43	Peak	100	86 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 40MHz Ch 62 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	10620.00	36.10	54.00	-17.90	28.13	5.01	38.38	35.42	Average	100	220 HORIZONTAL
2	10620.00	47.57	74.00	-26.43	39.60	5.01	38.38	35.42	Peak	100	220 HORIZONTAL
3	15930.16	38.11	54.00	-15.89	30.15	6.15	37.25	35.44	Average	100	335 HORIZONTAL
4	15930.16	48.38	74.00	-25.62	40.42	6.15	37.25	35.44	Peak	100	335 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	10620.00	36.68	54.00	-17.32	28.71	5.01	38.38	35.42	Average	100	45 VERTICAL
2	10620.00	47.72	74.00	-26.28	39.75	5.01	38.38	35.42	Peak	100	45 VERTICAL
3	15930.24	38.35	54.00	-15.65	30.39	6.15	37.25	35.44	Average	100	224 VERTICAL
4	15930.24	50.38	74.00	-23.62	42.42	6.15	37.25	35.44	Peak	100	224 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 40MHz Ch 102 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamplifier Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11020.16	36.16	54.00	-17.84	27.92	5.02	38.33	35.11	Average	100	243 HORIZONTAL
2	11020.16	48.04	74.00	-25.96	39.80	5.02	38.33	35.11	Peak	100	243 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamplifier Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11020.16	36.27	54.00	-17.73	28.04	5.02	38.32	35.11	Average	100	303 VERTICAL
2	11020.16	47.54	74.00	-26.46	39.31	5.02	38.32	35.11	Peak	100	303 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 40MHz Ch 110 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11103.21	38.16	54.00	-15.84	29.87	5.03	38.40	35.14	Average	100	314	HORIZONTAL
2	11115.32	51.50	74.00	-22.50	43.19	5.04	38.42	35.15	Peak	100	314	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11099.49	53.97	74.00	-20.03	45.68	5.03	38.40	35.14	Peak	100	302	VERTICAL
2	11101.03	40.70	54.00	-13.30	32.41	5.03	38.40	35.14	Average	100	302	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 40MHz Ch 134 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11340.08	36.80	54.00	-17.20	28.33	5.08	38.63	35.24	Average	100	275	HORIZONTAL
2	11340.08	47.06	74.00	-26.94	38.59	5.08	38.63	35.24	Peak	100	275	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11338.72	53.97	74.00	-20.03	45.50	5.08	38.63	35.24	Peak	125	226	VERTICAL
2	11339.60	40.02	54.00	-13.98	31.55	5.08	38.63	35.24	Average	125	226	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11ac MCS0 VHT 80MHz Ch 58 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

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	15870.16	34.32	54.00	-19.68	26.30	6.14	37.32	35.44	Average	100	286	HORIZONTAL
2	15870.16	45.96	74.00	-28.04	37.94	6.14	37.32	35.44	Peak	100	286	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	15870.16	34.66	54.00	-19.34	26.64	6.14	37.32	35.44	Average	100	332	VERTICAL
2	15870.16	44.72	74.00	-29.28	36.70	6.14	37.32	35.44	Peak	100	332	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11ac MCS0 VHT 80MHz Ch 106 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11060.16	36.51	54.00	-17.49	28.24	5.03	38.37	35.13	100	210	HORIZONTAL
2	11060.16	47.37	74.00	-26.63	39.10	5.03	38.37	35.13	100	210	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11060.00	47.25	74.00	-26.75	38.98	5.03	38.37	35.13	100	289	VERTICAL
2	11060.16	36.45	54.00	-17.55	28.18	5.03	38.37	35.13	100	289	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 52 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15786.79	52.21	74.00	-21.79	44.08	6.14	37.41	35.42	Peak	100	143 HORIZONTAL
2	15789.58	38.67	54.00	-15.33	30.54	6.14	37.41	35.42	Average	100	143 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15777.34	47.04	74.00	-26.96	38.91	6.14	37.41	35.42	Peak	100	211 VERTICAL
2	15789.90	38.84	54.00	-15.16	30.71	6.14	37.41	35.42	Average	100	211 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 60 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	10593.56	38.14	54.00	-15.86	30.19	5.01	38.38	35.44	Average	100	224	HORIZONTAL
2	10598.75	51.40	74.00	-22.60	43.43	5.01	38.38	35.42	Peak	100	224	HORIZONTAL
3	15891.35	38.37	54.00	-15.63	30.36	6.15	37.30	35.44	Average	100	311	HORIZONTAL
4	15908.53	51.39	74.00	-22.61	43.39	6.15	37.29	35.44	Peak	100	311	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	10601.83	41.88	54.00	-12.12	33.91	5.01	38.38	35.42	Average	100	305	VERTICAL
2	10602.56	56.31	74.00	-17.69	48.34	5.01	38.38	35.42	Peak	100	305	VERTICAL
3	15899.97	38.60	54.00	-15.40	30.60	6.15	37.29	35.44	Average	100	186	VERTICAL
4	15905.54	51.80	74.00	-22.20	43.80	6.15	37.29	35.44	Peak	100	186	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 64 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	10640.08	35.56	54.00	-18.44	27.57	5.01	38.37	35.39	Average	100	281 HORIZONTAL
2	10640.08	46.46	74.00	-27.54	38.47	5.01	38.37	35.39	Peak	100	281 HORIZONTAL
3	15960.00	37.08	54.00	-16.92	29.14	6.15	37.23	35.44	Average	100	301 HORIZONTAL
4	15960.00	48.00	74.00	-26.00	40.06	6.15	37.23	35.44	Peak	100	301 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	10640.08	36.37	54.00	-17.63	28.38	5.01	38.37	35.39	Average	100	281 VERTICAL
2	10640.08	48.61	74.00	-25.39	40.62	5.01	38.37	35.39	Peak	100	281 VERTICAL
3	15960.00	37.32	54.00	-16.68	29.38	6.15	37.23	35.44	Average	100	323 VERTICAL
4	15960.00	47.22	74.00	-26.78	39.28	6.15	37.23	35.44	Peak	100	323 VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 100 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11000.08	36.08	54.00	-17.92	27.85	5.01	38.32	35.10 Average	100	238	HORIZONTAL
2	11000.08	47.09	74.00	-26.91	38.86	5.01	38.32	35.10 Peak	100	238	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11000.00	37.04	54.00	-16.96	28.83	5.01	38.30	35.10 Average	100	284	VERTICAL
2	11000.00	47.48	74.00	-26.52	39.27	5.01	38.30	35.10 Peak	100	284	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 116 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11161.47	38.05	54.00	-15.95	29.71	5.04	38.47	35.17	Average	100	200	HORIZONTAL
2	11162.92	51.94	74.00	-22.06	43.59	5.05	38.47	35.17	Peak	100	200	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11157.60	55.23	74.00	-18.77	46.90	5.04	38.45	35.16	Peak	100	307	VERTICAL
2	11157.76	42.98	54.00	-11.02	34.65	5.04	38.45	35.16	Average	100	307	VERTICAL

Temperature	25.6°C	Humidity	62%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 140 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11400.00	37.67	54.00	-16.33	29.12	5.10	38.70	35.25	Average	100	237	HORIZONTAL
2	11400.00	47.83	74.00	-26.17	39.28	5.10	38.70	35.25	Peak	100	237	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	11399.76	40.08	54.00	-13.92	31.53	5.10	38.70	35.25	Average	100	240	VERTICAL
2	11399.76	49.45	74.00	-24.55	40.90	5.10	38.70	35.25	Peak	100	240	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m).

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

4.7.2. Measuring Instruments and Setting

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

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

4.7.3. Test Procedures

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

4.7.4. Test Setup Layout

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

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11n MCS0 20MHz Ch 52, 60, 64 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 52

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	
1	5134.71	55.80	74.00	-18.20	18.73	3.43	33.64	0.00	Peak	166	242	HORIZONTAL
2	5137.50	44.74	54.00	-9.26	7.67	3.43	33.64	0.00	Average	166	242	HORIZONTAL
3	5257.84	106.67			69.36	3.46	33.85	0.00	Average	166	242	HORIZONTAL
4	5257.84	116.92			79.61	3.46	33.85	0.00	Peak	166	242	HORIZONTAL
5	5373.08	46.98	54.00	-7.02	9.43	3.49	34.06	0.00	Average	166	242	HORIZONTAL
6	5377.89	58.13	74.00	-15.87	20.57	3.50	34.06	0.00	Peak	166	242	HORIZONTAL

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

Channel 60

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	
1	5301.92	103.66			66.24	3.48	33.94	0.00	Average	191	263	HORIZONTAL
2	5301.92	113.88			76.46	3.48	33.94	0.00	Peak	191	263	HORIZONTAL
3	5376.86	64.30	74.00	-9.70	26.74	3.50	34.06	0.00	Peak	191	263	HORIZONTAL
4	5379.49	53.89	54.00	-0.11	16.33	3.50	34.06	0.00	Average	191	263	HORIZONTAL

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

Channel 64

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	
1	5318.00	101.09			63.64	3.48	33.97	0.00	Average	166	289	HORIZONTAL
2	5318.00	112.35			74.90	3.48	33.97	0.00	Peak	166	289	HORIZONTAL
3	5398.00	53.42	54.00	-0.58	15.83	3.50	34.09	0.00	Average	166	289	HORIZONTAL
4	5398.00	64.01	74.00	-9.99	26.42	3.50	34.09	0.00	Peak	166	289	HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11n MCS0 20MHz Ch 100, 140 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5411.80	53.37	54.00	-0.63	15.74	3.51	34.12	0.00	Average	177	211	HORIZONTAL
2	5426.80	64.61	74.00	-9.39	26.94	3.52	34.15	0.00	Peak	177	211	HORIZONTAL
3	5469.20	67.70	74.00	-6.30	29.97	3.52	34.21	0.00	Peak	177	211	HORIZONTAL
4	5469.60	47.22	54.00	-6.78	9.49	3.52	34.21	0.00	Average	177	211	HORIZONTAL
5	5501.60	113.61			75.82	3.54	34.25	0.00	Peak	177	211	HORIZONTAL
6	5502.00	102.90			65.11	3.54	34.25	0.00	Average	177	211	HORIZONTAL

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5698.40	104.51			66.58	3.59	34.34	0.00	Average	154	100	HORIZONTAL
2	5700.40	115.20			77.27	3.59	34.34	0.00	Peak	154	100	HORIZONTAL
3	5725.40	67.43	68.30	-0.87	29.49	3.60	34.34	0.00	Peak	154	100	HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11n MCS0 40MHz Ch 54, 62 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 54

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5265.36	101.27			63.93	3.46	33.88	0.00	Average	190	241 HORIZONTAL
2	5275.92	113.01			75.66	3.47	33.88	0.00	Peak	190	241 HORIZONTAL
3	5352.89	64.33	74.00	-9.67	26.81	3.49	34.03	0.00	Peak	190	241 HORIZONTAL
4	5353.21	53.66	54.00	-0.34	16.14	3.49	34.03	0.00	Average	190	241 HORIZONTAL

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

Channel 62

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5303.20	109.58			72.16	3.48	33.94	0.00	Peak	186	271 HORIZONTAL
2	5305.60	98.00			60.58	3.48	33.94	0.00	Average	186	271 HORIZONTAL
3	5350.80	53.82	54.00	-0.18	16.30	3.49	34.03	0.00	Average	186	271 HORIZONTAL
4	5350.80	72.59	74.00	-1.41	35.07	3.49	34.03	0.00	Peak	186	271 HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11n MCS0 40MHz Ch 102, 110, 134 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 102

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5426.00	50.73	54.00	-3.27	13.06	3.52	34.15	0.00	Average	182	261 HORIZONTAL
2	5458.40	64.66	74.00	-9.34	26.95	3.52	34.19	0.00	Peak	182	261 HORIZONTAL
3	5466.40	71.18	74.00	-2.82	33.47	3.52	34.19	0.00	Peak	182	261 HORIZONTAL
4	5513.60	97.96			60.17	3.54	34.25	0.00	Average	182	261 HORIZONTAL
5	5513.60	109.63			71.84	3.54	34.25	0.00	Peak	182	261 HORIZONTAL

Item 4, 5 are the fundamental frequency at 5510MHz.

Channel 110

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5458.40	53.76	54.00	-0.24	16.05	3.52	34.19	0.00	Average	187	238 HORIZONTAL
2	5458.72	65.27	74.00	-8.73	27.56	3.52	34.19	0.00	Peak	187	238 HORIZONTAL
3	5545.83	102.89			65.05	3.55	34.29	0.00	Average	187	238 HORIZONTAL
4	5548.72	113.84			76.00	3.55	34.29	0.00	Peak	187	238 HORIZONTAL

Item 4, 5 are the fundamental frequency at 5550 MHz.

Channel 134

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5665.60	100.49			62.57	3.59	34.33	0.00	Average	164	265 HORIZONTAL
2	5680.40	111.54			73.62	3.59	34.33	0.00	Peak	164	265 HORIZONTAL
3	5735.80	53.74	54.00	-0.26	15.79	3.61	34.34	0.00	Average	164	265 HORIZONTAL
4	5735.80	65.03	74.00	-8.97	27.08	3.61	34.34	0.00	Peak	164	265 HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0 VHT 20MHz Ch 52, 60, 64 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 52

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss Factor	Factor	Remark	cm	deg	Pol/Phase
			dBuV/m	dB	dBuV	dB	dB/m	dB			
1	5141.35	41.88	54.00	-12.12	4.81	3.43	33.64	0.00 Average	183	72	HORIZONTAL
2	5145.67	53.76	74.00	-20.24	16.66	3.43	33.67	0.00 Peak	183	72	HORIZONTAL
3	5258.56	101.33			64.02	3.46	33.85	0.00 Average	183	72	HORIZONTAL
4	5262.40	111.70			74.39	3.46	33.85	0.00 Peak	183	72	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss Factor	Factor	Remark	cm	deg	Pol/Phase
			dBuV/m	dB	dBuV	dB	dB/m	dB			
1	5300.96	102.02			64.60	3.48	33.94	0.00 Average	173	285	HORIZONTAL
2	5306.41	112.25			74.83	3.48	33.94	0.00 Peak	173	285	HORIZONTAL
3	5378.53	53.72	54.00	-0.28	16.16	3.50	34.06	0.00 Average	173	285	HORIZONTAL
4	5378.85	63.39	74.00	-10.61	25.83	3.50	34.06	0.00 Peak	173	285	HORIZONTAL

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

Channel 64

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss Factor	Factor	Remark	cm	deg	Pol/Phase
			dBuV/m	dB	dBuV	dB	dB/m	dB			
1	5321.20	101.50			64.05	3.48	33.97	0.00 Average	165	279	HORIZONTAL
2	5327.20	111.95			74.49	3.49	33.97	0.00 Peak	165	279	HORIZONTAL
3	5399.20	63.69	74.00	-10.31	26.06	3.51	34.12	0.00 Peak	165	279	HORIZONTAL
4	5401.20	53.67	54.00	-0.33	16.04	3.51	34.12	0.00 Average	165	279	HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0 VHT 20MHz Ch 100, 140 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 100

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor		cm	deg	
1	5417.60	53.66	54.00	-0.34	16.00	3.51	34.15	0.00 Average	153	235	HORIZONTAL
2	5417.60	63.96	74.00	-10.04	26.30	3.51	34.15	0.00 Peak	153	235	HORIZONTAL
3	5470.00	48.91	54.00	-5.09	11.18	3.52	34.21	0.00 Average	153	235	HORIZONTAL
4	5470.00	63.50	74.00	-10.50	25.77	3.52	34.21	0.00 Peak	153	235	HORIZONTAL
5	5502.40	114.67			76.88	3.54	34.25	0.00 Peak	153	235	HORIZONTAL
6	5502.80	103.22			65.43	3.54	34.25	0.00 Average	153	235	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5500 MHz.

Channel 140

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor		cm	deg	
1	5698.40	113.92			75.99	3.59	34.34	0.00 Peak	149	269	HORIZONTAL
2	5700.80	103.39			65.46	3.59	34.34	0.00 Average	149	269	HORIZONTAL
3	5725.00	67.85	68.30	-0.45	29.91	3.60	34.34	0.00 Peak	149	269	HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0 VHT 40MHz Ch 54, 62 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 54

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5274.17	102.68			65.33	3.47	33.88	0.00	Average	169	249 HORIZONTAL
2	5277.05	113.99			76.64	3.47	33.88	0.00	Peak	169	249 HORIZONTAL
3	5353.85	53.82	54.00	-0.18	16.30	3.49	34.03	0.00	Average	169	249 HORIZONTAL
4	5354.17	65.68	74.00	-8.32	28.16	3.49	34.03	0.00	Peak	169	249 HORIZONTAL

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

Channel 62

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5305.20	98.17			60.75	3.48	33.94	0.00	Average	186	270 HORIZONTAL
2	5306.00	108.98			71.56	3.48	33.94	0.00	Peak	186	270 HORIZONTAL
3	5350.40	53.78	54.00	-0.22	16.26	3.49	34.03	0.00	Average	186	270 HORIZONTAL
4	5350.40	72.85	74.00	-1.15	35.33	3.49	34.03	0.00	Peak	186	270 HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0 VHT 40MHz Ch 102, 110, 134 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	5433.60	51.09	54.00	-2.91	13.40	3.52	34.17	0.00 Average	182	284	HORIZONTAL
2	5468.80	73.86	74.00	-0.14	36.13	3.52	34.21	0.00 Peak	182	284	HORIZONTAL
3	5514.00	99.11			61.32	3.54	34.25	0.00 Average	182	284	HORIZONTAL
4	5514.00	110.56			72.77	3.54	34.25	0.00 Peak	182	284	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5510MHz.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	5458.08	53.34	54.00	-0.66	15.63	3.52	34.19	0.00 Average	179	277	HORIZONTAL
2	5458.08	64.88	74.00	-9.12	27.17	3.52	34.19	0.00 Peak	179	277	HORIZONTAL
3	5553.53	103.34			65.48	3.55	34.31	0.00 Average	179	277	HORIZONTAL
4	5553.53	115.06			77.20	3.55	34.31	0.00 Peak	179	277	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5550 MHz.

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg
1	5675.60	112.78			74.86	3.59	34.33	0.00 Peak	163	273	HORIZONTAL
2	5676.00	101.59			63.67	3.59	34.33	0.00 Average	163	273	HORIZONTAL
3	5735.40	67.96	68.30	-0.34	30.01	3.61	34.34	0.00 Peak	163	273	HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11ac MCS0 VHT 80MHz Ch 58, 106 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 58

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5295.00	92.82			55.44	3.47	33.91	0.00	Average	179	269 HORIZONTAL
2	5295.00	105.02			67.64	3.47	33.91	0.00	Peak	179	269 HORIZONTAL
3	5350.00	53.70	54.00	-0.30	16.18	3.49	34.03	0.00	Average	179	269 HORIZONTAL
4	5351.00	69.98	74.00	-4.02	32.46	3.49	34.03	0.00	Peak	179	269 HORIZONTAL

Item 1, 2 are the fundamental frequency at 5290 MHz.

Channel 106

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5457.00	68.01	74.00	-5.99	30.30	3.52	34.19	0.00	Peak	177	267 HORIZONTAL
2	5459.00	52.91	54.00	-1.09	15.20	3.52	34.19	0.00	Average	177	267 HORIZONTAL
3	5462.00	68.29	74.00	-5.71	30.58	3.52	34.19	0.00	Peak	177	267 HORIZONTAL
4	5469.00	53.26	54.00	-0.74	15.53	3.52	34.21	0.00	Average	177	267 HORIZONTAL
5	5539.00	91.98			54.14	3.55	34.29	0.00	Average	177	267 HORIZONTAL
6	5542.00	104.52			66.68	3.55	34.29	0.00	Peak	177	267 HORIZONTAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11a Ch 52, 60, 64 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5135.58	55.60	74.00	-18.40	18.53	3.43	33.64	0.00 Peak	167	238	HORIZONTAL
2	5140.87	45.32	54.00	-8.68	8.25	3.43	33.64	0.00 Average	167	238	HORIZONTAL
3	5260.96	118.38			81.07	3.46	33.85	0.00 Peak	167	238	HORIZONTAL
4	5261.20	107.90			70.59	3.46	33.85	0.00 Average	167	238	HORIZONTAL
5	5376.44	47.56	54.00	-6.44	10.00	3.50	34.06	0.00 Average	167	238	HORIZONTAL
6	5380.96	58.69	74.00	-15.31	21.13	3.50	34.06	0.00 Peak	167	238	HORIZONTAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5300.80	102.38			64.96	3.48	33.94	0.00 Average	185	78	VERTICAL
2	5305.44	112.50			75.08	3.48	33.94	0.00 Peak	185	78	VERTICAL
3	5381.09	53.88	54.00	-0.12	16.32	3.50	34.06	0.00 Average	185	78	VERTICAL
4	5385.61	63.94	74.00	-10.06	26.35	3.50	34.09	0.00 Peak	185	78	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5321.20	102.64			65.19	3.48	33.97	0.00 Average	167	276	HORIZONTAL
2	5321.20	113.35			75.90	3.48	33.97	0.00 Peak	167	276	HORIZONTAL
3	5401.20	53.87	54.00	-0.13	16.24	3.51	34.12	0.00 Average	167	276	HORIZONTAL
4	5401.20	64.88	74.00	-9.12	27.25	3.51	34.12	0.00 Peak	167	276	HORIZONTAL

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

Temperature	25.6°C	Humidity	62%
Test Engineer	David Tseng	Configurations	IEEE 802.11a Ch 100, 140 / Chain 1 + Chain 2 (2TX)
Test Date	Jan. 04, 2013		

Channel 100

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	5418.40	64.42	74.00	-9.58	26.76	3.51	34.15	0.00	Peak	158	256	HORIZONTAL
2	5418.80	53.69	54.00	-0.31	16.03	3.51	34.15	0.00	Average	158	256	HORIZONTAL
3	5470.00	44.02	54.00	-9.98	6.29	3.52	34.21	0.00	Average	158	256	HORIZONTAL
4	5470.00	62.77	74.00	-11.23	25.04	3.52	34.21	0.00	Peak	158	256	HORIZONTAL
5	5498.80	113.48			75.72	3.53	34.23	0.00	Peak	158	256	HORIZONTAL
6	5499.20	103.11			65.35	3.53	34.23	0.00	Average	158	256	HORIZONTAL

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

Channel 140

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	5698.40	106.40			68.47	3.59	34.34	0.00	Average	166	30	HORIZONTAL
2	5698.40	117.39			79.46	3.59	34.34	0.00	Peak	166	30	HORIZONTAL
3	5779.00	67.40	68.30	-0.90	29.42	3.62	34.36	0.00	Peak	166	30	HORIZONTAL

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

Note:

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

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

4.8. Frequency Stability Measurement

4.8.1. Limit

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

4.8.2. Measuring Instruments and Setting

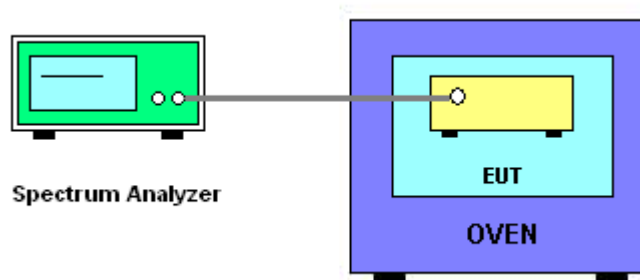
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

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

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

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5300
126.50	5299.9602
110.00	5299.9520
93.50	5299.9542
Max. Deviation (MHz)	0.048000
Max. Deviation (ppm)	9.06

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5300
-30	5300.0354
-20	5300.0150
-10	5300.0030
0	5299.9784
10	5299.9520
20	5299.9382
30	5299.9376
40	5299.9310
50	5300.0354
Max. Deviation (MHz)	0.069000
Max. Deviation (ppm)	13.0189

4.9. Antenna Requirements

4.9.1. Limit

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

4.9.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Oct. 23, 2012	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov.26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9kHz ~ 30MHz	Jun. 22, 2012	Conduction (CO01-CB)
Coupling and Decoupling Network	TESEQ	ISN PLC 25-25	26476	0.15MHz~30MHz	Feb. 09, 2012	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 4, 2012	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-----	-----	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2012	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz ~ 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz ~ 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	4 Way	0120A04056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz ~ 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz ~ 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz ~ 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz ~ 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz ~ 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)

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

N.C.R. 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