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FCC RADIO TEST REPORT

Applicant's company	Aruba Networks, Inc.
Applicant Address	1344 Crossman Avenue Sunnyvale CA 94089, USA
FCC ID	Q9DAP134135
Manufacturer's company	Wistron NeWeb Corporation
Manufacturer Address	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

Product Name	ARUBA 134 WIRELESS ACCESS POINT, EXT ANTENNA / ARUBA 135 WIRELESS ACCESS POINT
Brand Name	Aruba
Model Name	AP-134 / AP-135
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Dec. 10, 2010
Final Test Date	Jun. 18, 2011
Submission Type	Class II Change
Operating Mode	Master
Multiple Listing & Class II Change	Please refer to section 3.7

Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a (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 and 47 CFR FCC Part 15 Subpart E.

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
FR0D2823-01	Rev. 01	Initial issue of report	Sep. 08, 2011



1. CERTIFICATE OF COMPLIANCE

Product Name : ARUBA 134 WIRELESS ACCESS POINT, EXT ANTENNA /
ARUBA 135 WIRELESS ACCESS POINT
Brand Name : Aruba
Model Name : AP-134 / AP-135
Applicant : Aruba 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 Dec. 10, 2010 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.

Jordan Hsiao

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	3.49 dB
4.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.09 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.22 dB
4.5	15.407(a)	Peak Excursion	Complies	6.46 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.97 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.03 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	±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

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From POE and Power Adapter
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	11 for 20MHz bandwidth ; 5 for 40MHz bandwidth
Channel Band Width (99%)	<For External Antenna / Ant. 5> MCS8 (20MHz): 23.68 MHz ; MCS8 (40MHz): 56.64 MHz <For External Antenna / Ant. 6> MCS8 (20MHz): 27.20 MHz ; MCS8 (40MHz): 57.60 MHz <For Internal Antenna / Ant. 8> MCS8 (20MHz): 23.36 MHz ; MCS8 (40MHz): 38.40 MHz
Conducted Output Power	<For External Antenna / Ant. 5> Band 2: MCS8 (20MHz): 23.49 dBm ; MCS8 (40MHz): 22.53 dBm Band 3: MCS8 (20MHz): 23.88 dBm ; MCS8 (40MHz): 23.52 dBm <For External Antenna / Ant. 6> Band 2: MCS8 (20MHz): 23.83 dBm ; MCS8 (40MHz): 23.12 dBm Band 3: MCS8 (20MHz): 23.88 dBm ; MCS8 (40MHz): 23.52 dBm <For Internal Antenna / Ant. 8> Band 2: MCS8 (20MHz): 23.15 dBm ; MCS8 (40MHz): 20.64 dBm Band 3: MCS8 (20MHz): 21.93 dBm ; MCS8 (40MHz): 21.00 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From POE and Power Adapter
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	11
Channel Band Width (99%)	<For External Antenna / Ant. 5> 11a: 28.80 MHz <For External Antenna / Ant. 6> 11a: 28.80 MHz <For Internal Antenna / Ant. 8> 11a: 23.04 MHz
Conducted Output Power	<For External Antenna / Ant. 5> Band 2: 23.46 dBm ; Band 3: 23.91 dBm <For External Antenna / Ant. 6> Band 2: 23.46 dBm ; Band 3: 23.91 dBm <For Internal Antenna / Ant. 8> Band 2: 22.23 dBm ; Band 3: 21.40 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

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

IEEE 802.11n spec

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

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

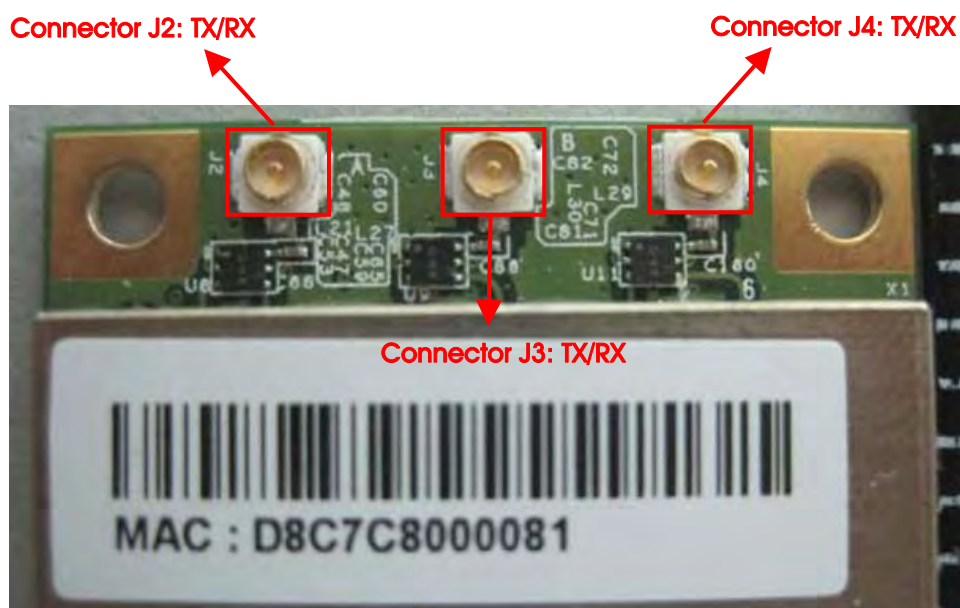
Ant.	Brand	Model Name	Antenna Type	Connector	Antenna Gain		Cable Loss		Test Antenna gain	
					2.4GHz Band	5GHz Band	2.4GHz Band	5GHz Band	2.4GHz Band	5GHz Band
1	ARUBA	AP-ANT-1B	Omni Antenna	RP-SMA	3.8	5.8	1.8	3.3	2	2.5
2	ARUBA	AP-ANT-13B	Omni Antenna	RP-SMA	4.4	3.3	1.8	3.3	2.6	0
3	ARUBA	AP-ANT-16	Omni Antenna	RP-SMA	3.9	4.7	1.8	3.3	2.1	1.4
4	ARUBA	AP-ANT-17	Directional Antenna	RP-SMA	6	5	1.8	3.3	4.2	1.7
5	ARUBA	AP-ANT-18	Directional Antenna	RP-SMA	7	7.5	1.8	3.3	5.2	4.2
6	ARUBA	AP-ANT-19	Omni Antenna	RP-SMA	3	6	1.8	3.3	1.2	2.7
7	ARUBA	AP-ANT-93	Directional Antenna	RP-SMA	-	13	-	3.3	-	9.7
8	WNC	-	Embedded Antenna	I-PEX	4.5	6	1.8	3.3	3.5	4.5

Note 1: There are two types of EUT, one will collocate with external antennas (Ant. 1 ~ Ant. 7) and another will collocate with internal antenna (Ant. 8).

Note 2: For IEEE 802.11a/n:

Ant. 5, Ant. 6 and Ant. 8 were selected to be tested and recorded in the report.

Note 3: The EUT has three antenna connectors (Connector J2, J3 and J4) that can be used for transmitting and receiving simultaneously as 3TX and 3RX.



3.4. Table for Carrier Frequencies

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

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

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

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Antenna
AC Power Conducted Emission	Normal Link		Auto	-	-
Max. Conducted Output Power	MCS8/20MHz	Band 2	13Mbps	52/60/64	J2/J3/J4/ J2+J3+J 4
		Band 3	13Mbps	100/116/140	
	MCS8/40MHz	Band 2	27Mbps	54/62	
		Band 3	27Mbps	102/110/134	
	11a/BPSK	Band 2	6Mbps	52/60/64	
		Band 3	6Mbps	100/116/140	
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion	MCS8/20MHz	Band 2	13Mbps	52/60/64	J2+J3+J 4
		Band 3	13Mbps	100/116/140	
	MCS8/40MHz	Band 2	27Mbps	54/62	
		Band 3	27Mbps	102/110/134	
	11a/BPSK	Band 2	6Mbps	52/60/64	
		Band 3	6Mbps	100/116/140	
Radiated Emission Below 1GHz	Normal Link		Auto	-	-
Radiated Emission Above 1GHz	MCS8/20MHz	Band 2	13Mbps	52/60/64	J2+J3+J 4
		Band 3	13Mbps	100/116/140	
	MCS8/40MHz	Band 2	27Mbps	54/62	
		Band 3	27Mbps	102/110/134	
	11a/BPSK	Band 2	6Mbps	52/60/64	
		Band 3	6Mbps	100/116/140	
Band Edge Emission	MCS8/20MHz	Band 2	13Mbps	52/60/64	J2+J3+J 4
		Band 3	13Mbps	100/116/140	
	MCS8/40MHz	Band 2	27Mbps	54/62	
		Band 3	27Mbps	102/110/134	
	11a/BPSK	Band 2	6Mbps	52/60/64	
		Band 3	6Mbps	100/116/140	
Frequency Stability	Un-modulation		-	60	N/A

All the test modes were listed as below:

Mode 1. EUT 1 with external antenna + Adapter

Mode 2. EUT 1 with external antenna + POE

Mode 3. EUT 2 with internal antenna + Adapter

Mode 4. EUT 2 with internal antenna + POE

<For Conducted Emissions Test>:

Due to Mode 1 and Mode 4 generated the worst test result, so both of them were recorded in this report.

<For Radiated Emissions Test Below 1GHz>:

Adapter Mode and POE Mode were performed at Horizontal and Vertical and the worst-case was found at Horizontal, thus measurement will follow this same test mode.

Due to Mode 2 and Mode 4 generated the worst test result, so both of them were recorded in this report.

<For Radiated Emissions Test Above 1GHz>:

Adapter Mode and POE Mode were performed at Horizontal and Vertical and the worst-case was found at Vertical, thus measurement will follow this same test mode.

Due to Mode 1 and Mode 3 generated the worst test result, so both of them were recorded in this report.

3.6. Table for Testing Locations

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

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

Please refer section 6 for Test Site Address.

3.7. Table for Multiple Listing & Class II Change

The model names in the following table are all refer to the identical product.

EUT	Product Name	Model No.	Description
1	ARUBA 134 WIRELESS ACCESS POINT, EXT ANTENNA	AP-134	EUT with external antenna
2	ARUBA 135 WIRELESS ACCESS POINT	AP-135	EUT with internal antenna

This product is an extension of original one reported under Sporton project number: 0D2823

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

Modifications	Performance Checking
Add DFS function testing and evaluation for IEEE 802.11a / IEEE 802.11an Band 2 and Band 3 (5250~5350MHz, 5470~5725MHz).	26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion Radiated Emission Above 1GHz Band Edge Emission

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D420	E2KWM3945ABG
Notebook	DELL	D420	E2KWM3945ABG
Notebook	DELL	1340	E2K4965AGNM
POE	HiPoE	N/A	9001G
Adaptor	LEI	IU18-2120150-WP	DOC
Notebook	DELL	D400	E2K24GBRL

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.

<For External Antenna / Ant. 5>

Power Parameters of IEEE 802.11n MCS8 20MHz

Test Software Version	ART2-GUI 2.13					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11n MCS8 20MHz	19.5	21	17	21	21	21

Power Parameters of IEEE 802.11n MCS8 40MHz

Test Software Version	ART2-GUI 2.13				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
802.11n MCS8 40MHz	19	14.5	16.5	21	21

Power Parameters of IEEE 802.11a

Refer to Appendix C for the actual test results in legacy mode based on KDB662911

<For External Antenna / Ant. 6>

Power Parameters of IEEE 802.11n MCS8 20MHz

Test Software Version	ART2-GUI 2.13					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11n MCS8 20MHz	20	20.5	17	18.5	21	21

Power Parameters of IEEE 802.11n MCS8 40MHz

Test Software Version	ART2-GUI 2.13				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
802.11n MCS8 40MHz	19.5	13.5	14	19.5	21

Power Parameters of IEEE 802.11a

Refer to Appendix C for the actual test results in legacy mode based on KDB662911

<For External Antenna / Ant. 8>

Power Parameters of IEEE 802.11n MCS8 20MHz

Test Software Version	ART2-GUI 2.13					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11n MCS8 20MHz	19	15	13	14.5	18	15.5

Power Parameters of IEEE 802.11n MCS8 40MHz

Test Software Version	ART2-GUI 2.13				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
802.11n MCS8 40MHz	16	10	11	17	16

Power Parameters of IEEE 802.11a

Refer to Appendix C for the actual test results in legacy mode based on KDB662911

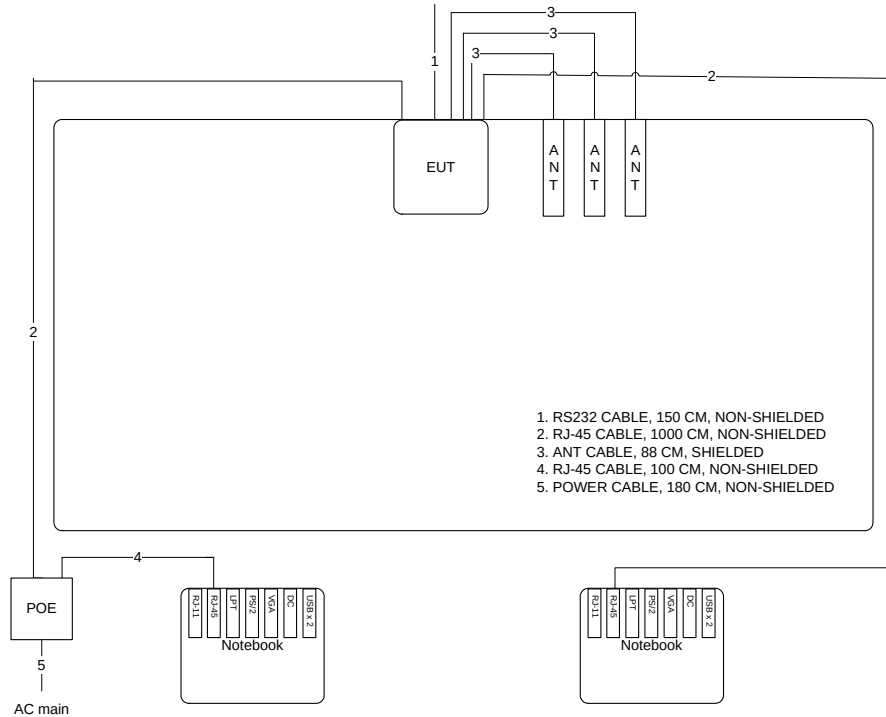
During the test, "ART2-GUI 2.13" under WIN XP was executed to control the EUT continuously transmit RF signal.

3.10. Test Configurations

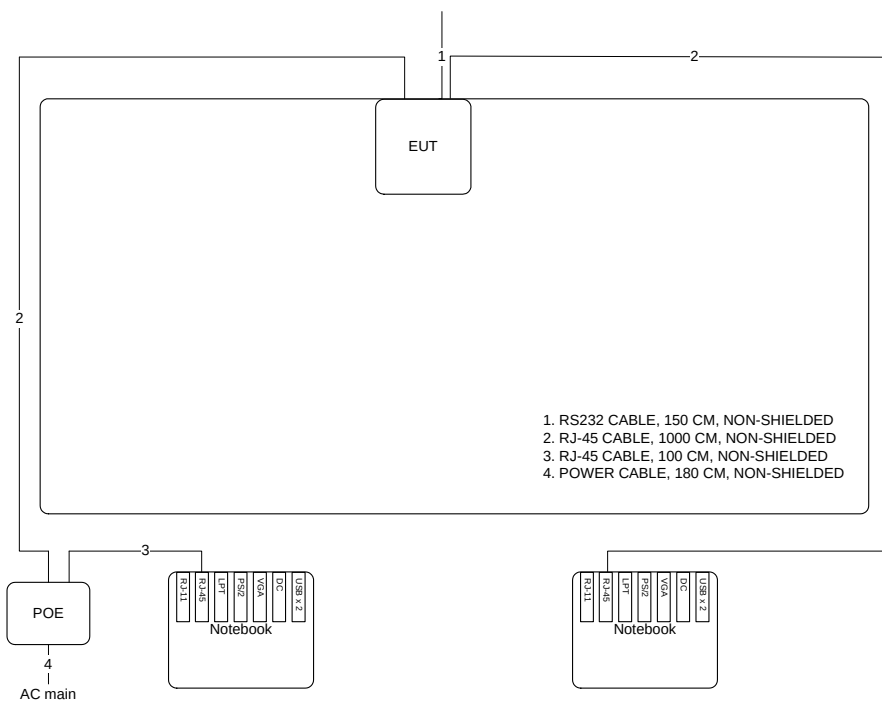
3.10.1. Radiation Emissions Test Configuration

Test Configuration: 9KHz~1GHz

Test Mode: Mode 2

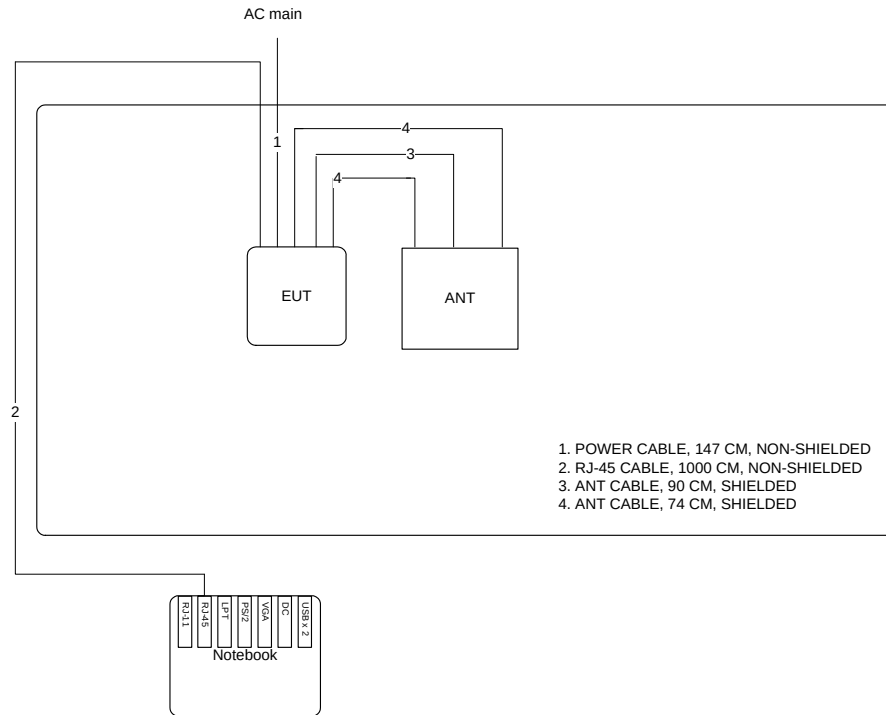


Test Mode: Mode 4

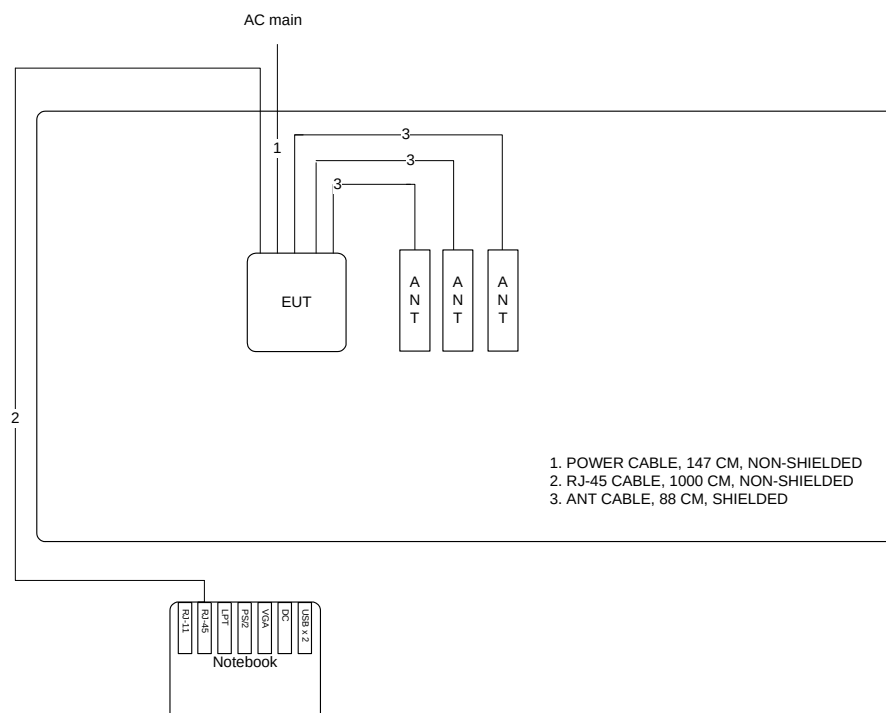


Test Configuration: above 1GHz

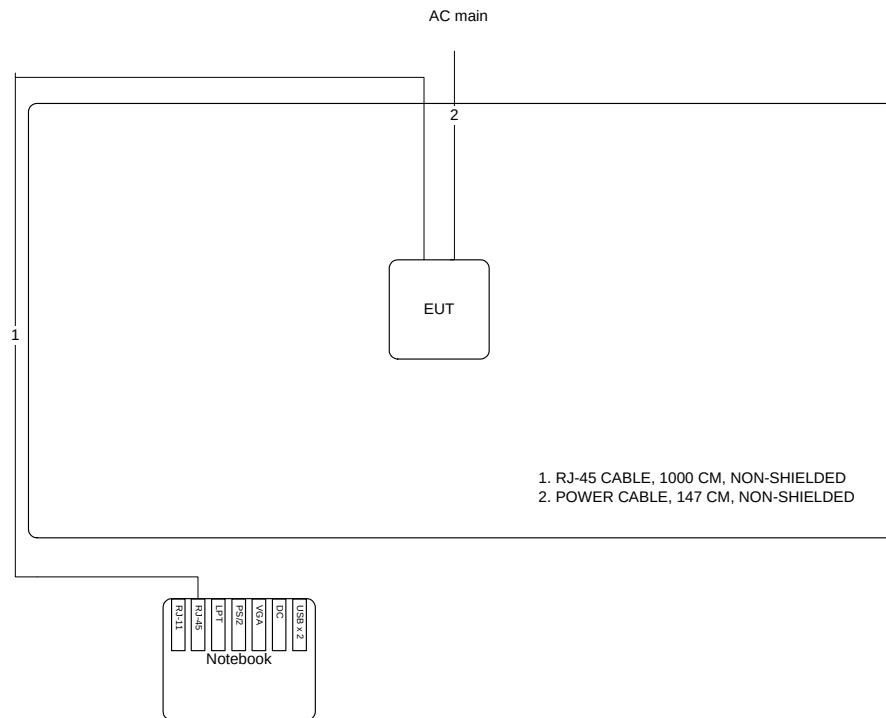
<For External Antenna / Ant. 5>



<For External Antenna / Ant. 6>

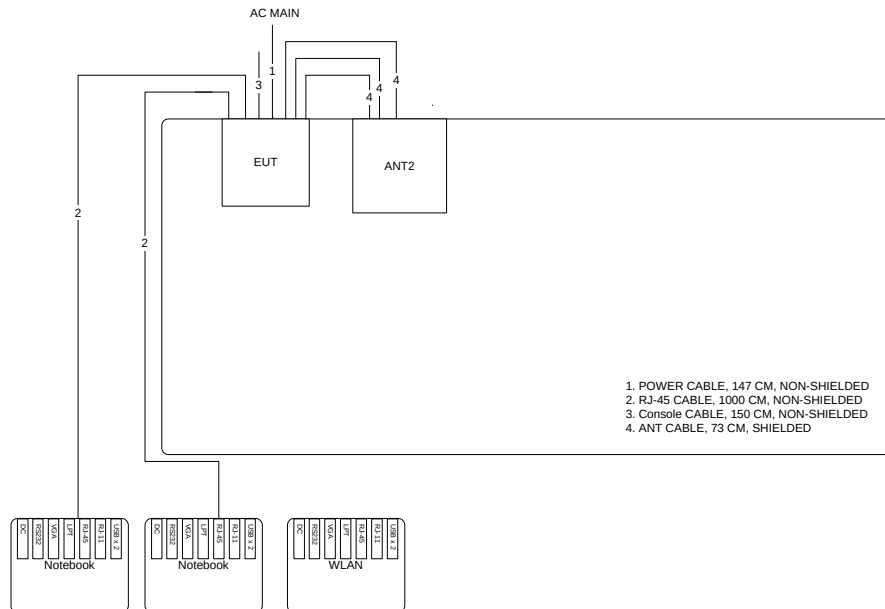


<For Internal Antenna / Ant. 8>

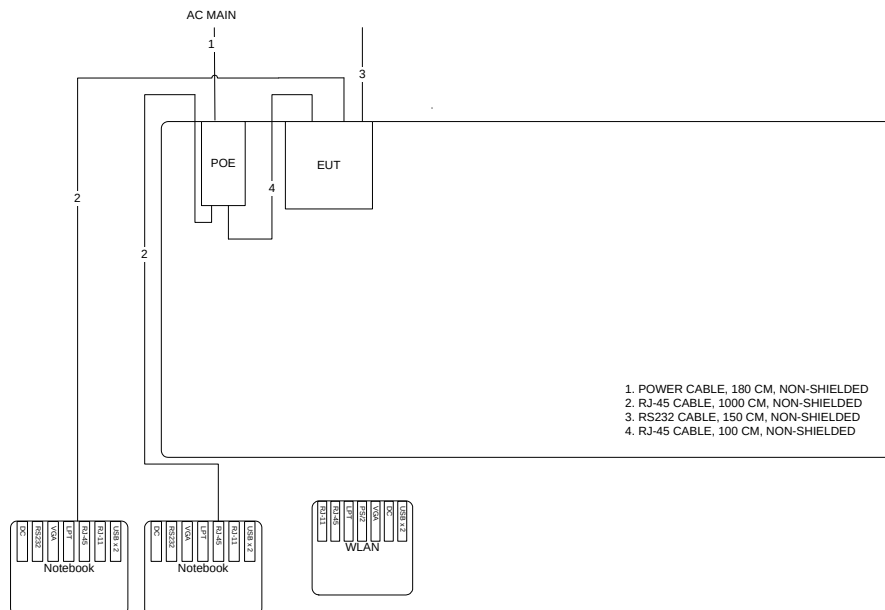


3.10.2. AC Power Line Conduction Emissions Test Configuration

Test Mode: Mode 1



Test Mode: Mode 4



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

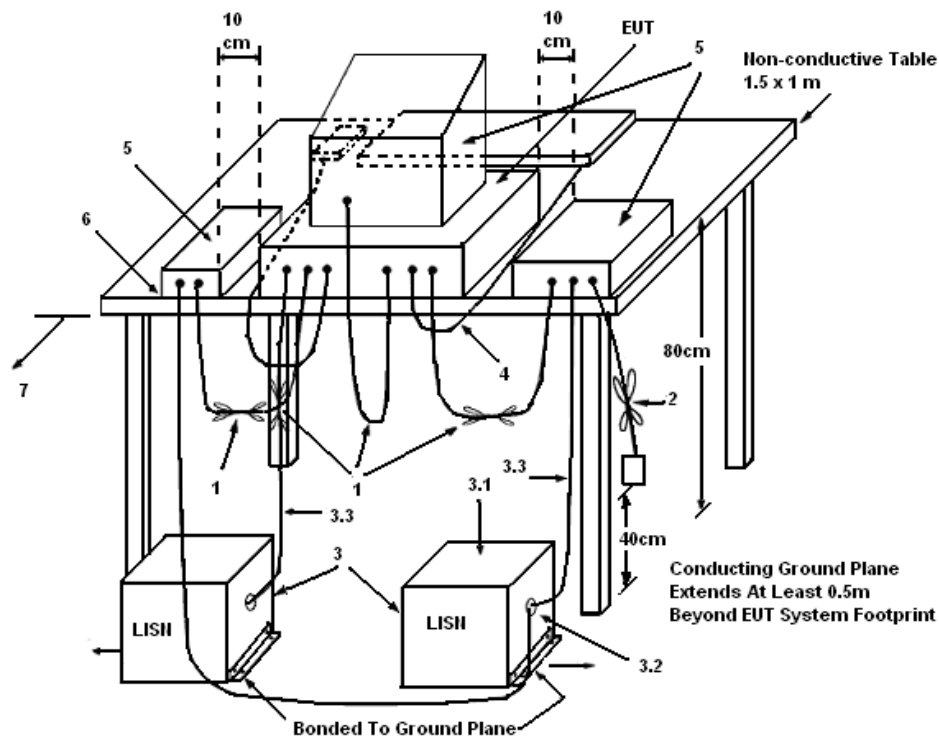
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

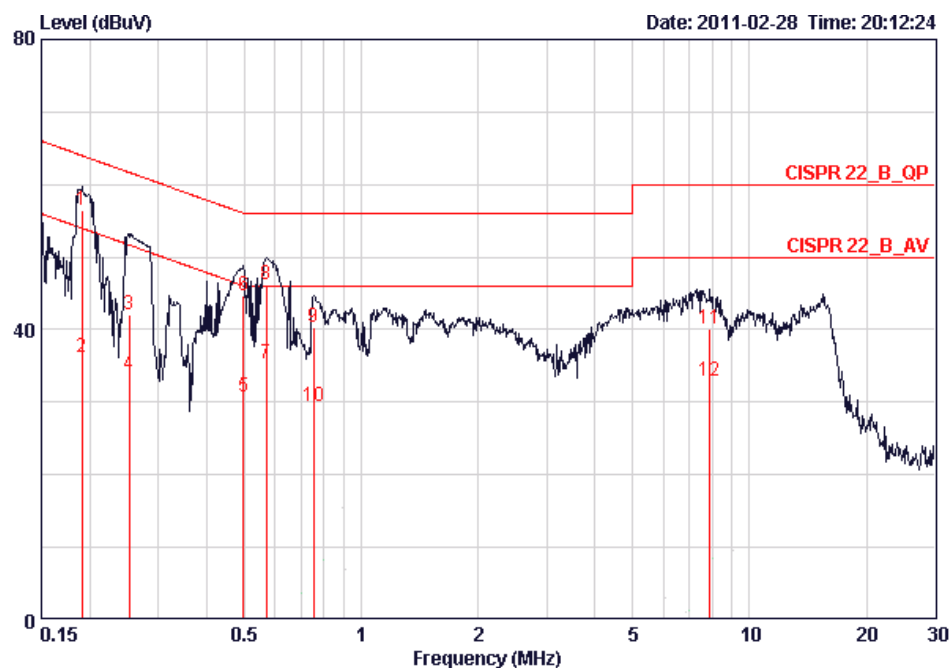
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

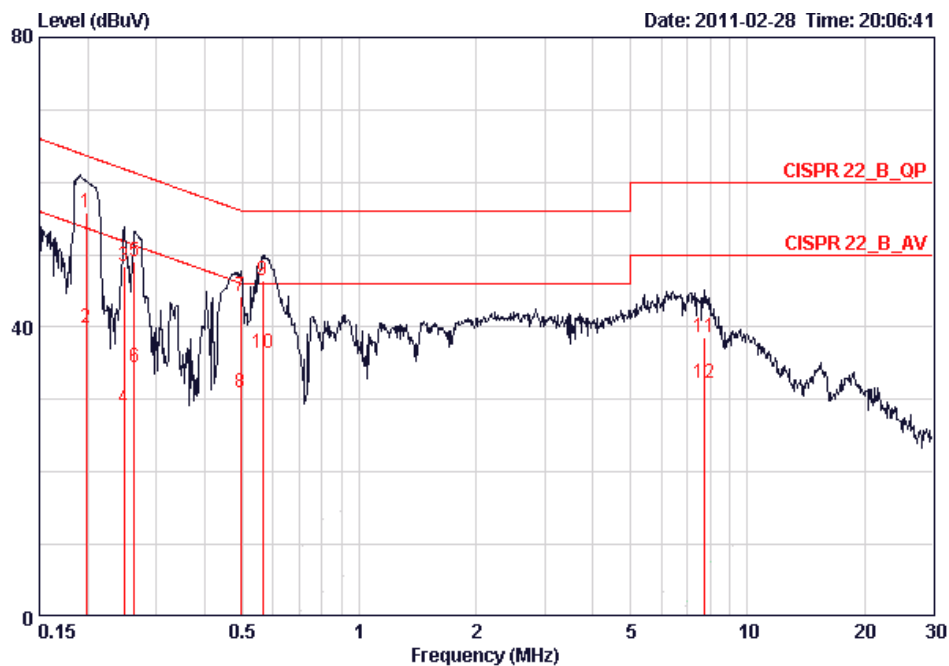
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	21°C	Humidity	58%
Test Engineer	Ryo Fan	Phase	Line
Configuration	Normal Link / Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19039	56.49	-7.53	64.02	56.24	0.05	0.20	QP
2	0.19039	36.18	-17.84	54.02	35.93	0.05	0.20	AVERAGE
3	0.25211	42.01	-19.67	61.69	41.77	0.04	0.20	QP
4	0.25211	33.81	-17.87	51.69	33.57	0.04	0.20	AVERAGE
5	0.49673	30.81	-15.25	46.05	30.60	0.03	0.18	AVERAGE
6	0.49673	44.67	-11.39	56.05	44.46	0.03	0.18	QP
7	0.57010	35.33	-10.67	46.00	35.10	0.03	0.20	AVERAGE
8	0.57010	46.24	-9.76	56.00	46.01	0.03	0.20	QP
9	0.75493	40.35	-15.65	56.00	40.12	0.03	0.20	QP
10	0.75493	29.40	-16.60	46.00	29.17	0.03	0.20	AVERAGE
11	7.893	40.05	-19.95	60.00	39.37	0.28	0.40	QP
12	7.893	32.93	-17.07	50.00	32.25	0.28	0.40	AVERAGE

Temperature	21°C	Humidity	58%
Test Engineer	Ryo Fan	Phase	Neutral
Configuration	Normal Link / Mode 1		

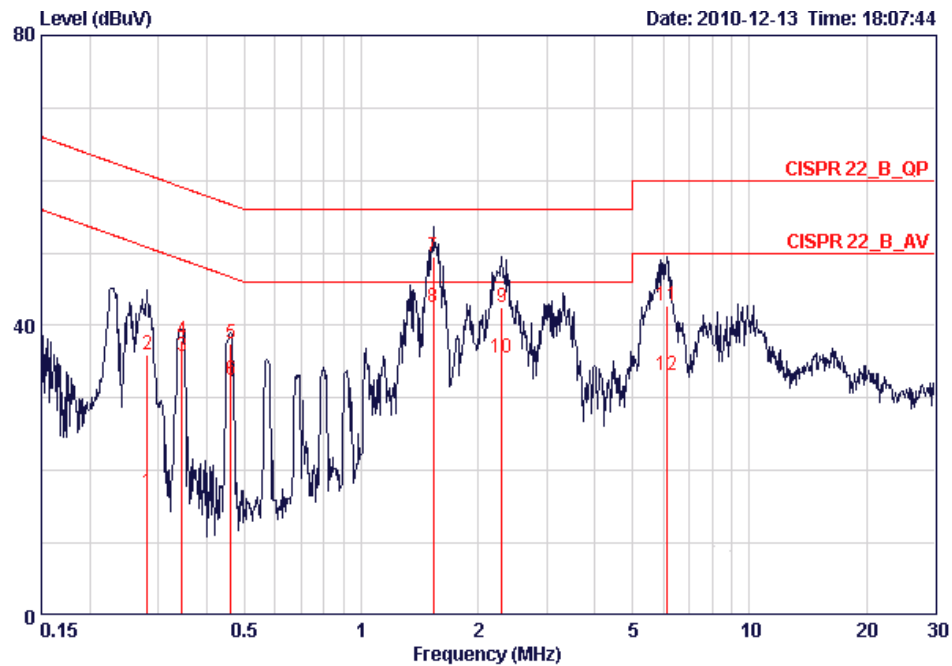


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19789	55.81	-7.89	63.70	55.53	0.08	0.20	QP
2	0.19789	39.98	-13.72	53.70	39.70	0.08	0.20	AVERAGE
3	0.24814	48.36	-13.46	61.82	48.08	0.08	0.20	QP
4	0.24814	28.80	-23.02	51.82	28.52	0.08	0.20	AVERAGE
5	0.26303	49.08	-12.26	61.34	48.80	0.08	0.20	QP
6	0.26303	34.40	-16.94	51.34	34.12	0.08	0.20	AVERAGE
7	0.49411	44.33	-11.77	56.10	44.08	0.07	0.18	QP
8	0.49411	31.00	-15.10	46.10	30.75	0.07	0.18	AVERAGE
9	0.56409	46.52	-9.48	56.00	46.25	0.07	0.20	QP
10	0.56409	36.48	-9.52	46.00	36.21	0.07	0.20	AVERAGE
11	7.769	38.51	-21.49	60.00	37.79	0.32	0.40	QP
12	7.769	32.22	-17.78	50.00	31.50	0.32	0.40	AVERAGE

Note:

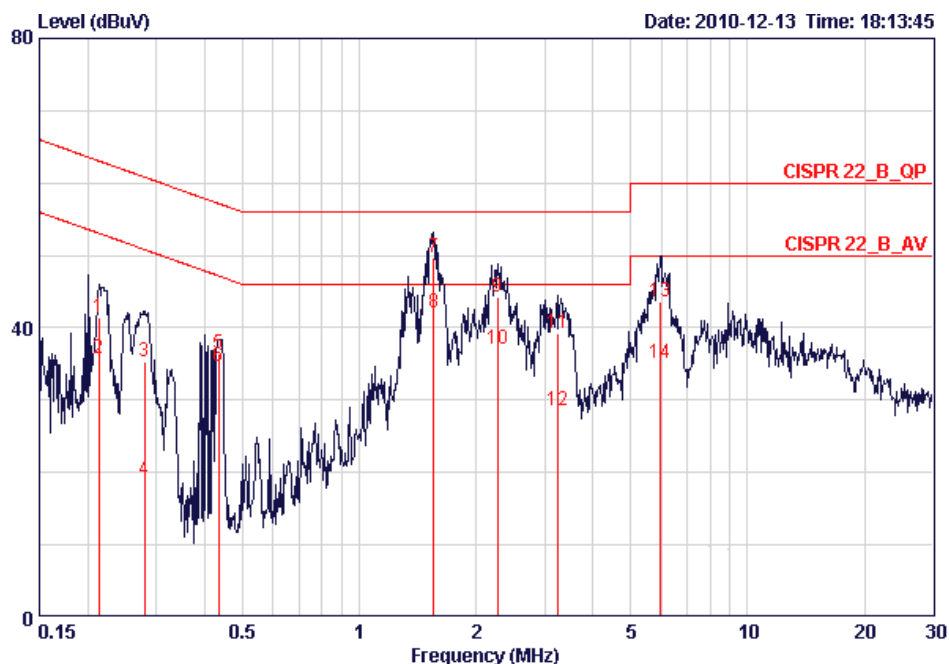
Level = Read Level + LISN Factor + Cable Loss.

Temperature	21°C	Humidity	58%
Test Engineer	Ryo Fan	Phase	Line
Configuration	Normal Link / Mode 4		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.28178	17.03	-33.73	50.76	16.79	0.04	0.20	AVERAGE
2	0.28178	35.99	-24.77	60.76	35.75	0.04	0.20	QP
3	0.34463	35.74	-13.35	49.09	35.51	0.03	0.20	AVERAGE
4	0.34463	37.87	-21.22	59.09	37.64	0.03	0.20	QP
5	0.46122	37.59	-19.08	56.67	37.36	0.03	0.20	QP
6	0.46122	32.48	-14.19	46.67	32.25	0.03	0.20	AVERAGE
7 B	1.535	49.55	-6.45	56.00	49.40	0.04	0.11	QP
8 B	1.535	42.51	-3.49	46.00	42.36	0.04	0.11	AVERAGE
9	2.297	42.47	-13.53	56.00	42.21	0.06	0.20	QP
10	2.297	35.50	-10.50	46.00	35.24	0.06	0.20	AVERAGE
11	6.153	42.76	-17.24	60.00	42.21	0.22	0.34	QP
12	6.153	33.23	-16.77	50.00	32.68	0.22	0.34	AVERAGE

Temperature	21°C	Humidity	58%
Test Engineer	Ryo Fan	Phase	Neutral
Configuration	Normal Link / Mode 4		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21392	41.52	-21.53	63.05	41.24	0.08	0.20	QP
2	0.21392	35.72	-17.33	53.05	35.44	0.08	0.20	AVERAGE
3	0.28029	35.35	-25.46	60.81	35.07	0.08	0.20	QP
4	0.28029	19.03	-31.78	50.81	18.75	0.08	0.20	AVERAGE
5	0.43511	36.47	-20.68	57.15	36.20	0.07	0.20	QP
6	0.43511	34.62	-12.53	47.15	34.35	0.07	0.20	AVERAGE
7 B	1.552	49.76	-6.24	56.00	49.57	0.08	0.11	QP
8 B	1.552	42.04	-3.96	46.00	41.85	0.08	0.11	AVERAGE
9	2.273	44.24	-11.76	56.00	43.94	0.10	0.20	QP
10	2.273	37.14	-8.86	46.00	36.84	0.10	0.20	AVERAGE
11	3.241	39.34	-16.66	56.00	38.96	0.12	0.25	QP
12	3.241	28.54	-17.46	46.00	28.16	0.12	0.25	AVERAGE
13	5.961	43.65	-16.35	60.00	43.10	0.25	0.30	QP
14	5.961	35.01	-14.99	50.00	34.46	0.25	0.30	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

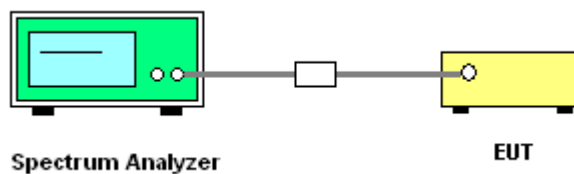
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	1000 kHz
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. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

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

<For External Antenna / Ant. 5>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 5

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	36.16	20.00
60	5300 MHz	40.96	23.20
64	5320 MHz	27.52	18.72
100	5500 MHz	40.80	21.28
116	5580 MHz	40.64	23.68
140	5700 MHz	40.96	23.04

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	75.84	38.40
62	5310 MHz	45.12	36.48
102	5510MHz	55.36	37.12
110	5550 MHz	76.16	50.56
134	5670 MHz	82.24	56.64

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 5

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	41.76	28.80
60	5300 MHz	35.68	18.40
64	5320 MHz	35.36	18.24
100	5500 MHz	33.76	23.52
116	5580 MHz	42.40	26.08
140	5700 MHz	37.12	20.32

<For External Antenna / Ant. 6>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 6

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	40.96	25.44
60	5300 MHz	41.44	27.20
64	5320 MHz	27.52	18.72
100	5500 MHz	39.20	19.04
116	5580 MHz	40.64	23.68
140	5700 MHz	40.96	23.04

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	84.16	57.60
62	5310 MHz	46.72	36.80
102	5510MHz	48.32	37.12
110	5550 MHz	79.36	49.92
134	5670 MHz	82.24	56.64

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 6

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	41.76	28.80
60	5300 MHz	37.12	20.32
64	5320 MHz	32.64	19.04
100	5500 MHz	32.80	21.76
116	5580 MHz	42.40	26.08
140	5700 MHz	37.12	21.44

<For Internal Antenna / Ant. 8>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 8

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	40.00	23.36
60	5300 MHz	24.64	18.40
64	5320 MHz	23.04	17.76
100	5500 MHz	24.16	17.92
116	5580 MHz	34.08	18.56
140	5700 MHz	25.60	18.72

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	75.52	37.44
62	5310 MHz	46.40	36.80
102	5510MHz	45.76	36.80
110	5550 MHz	63.68	38.40
134	5670 MHz	69.12	37.44

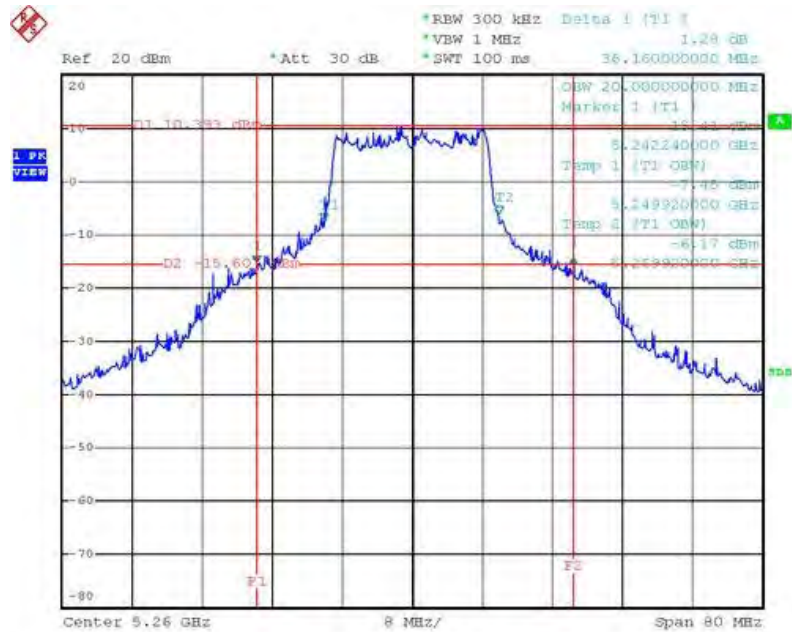
Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 8

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	33.44	23.04
60	5300 MHz	22.24	17.44
64	5320 MHz	23.84	17.12
100	5500 MHz	22.40	16.80
116	5580 MHz	32.32	19.04
140	5700 MHz	26.56	17.60

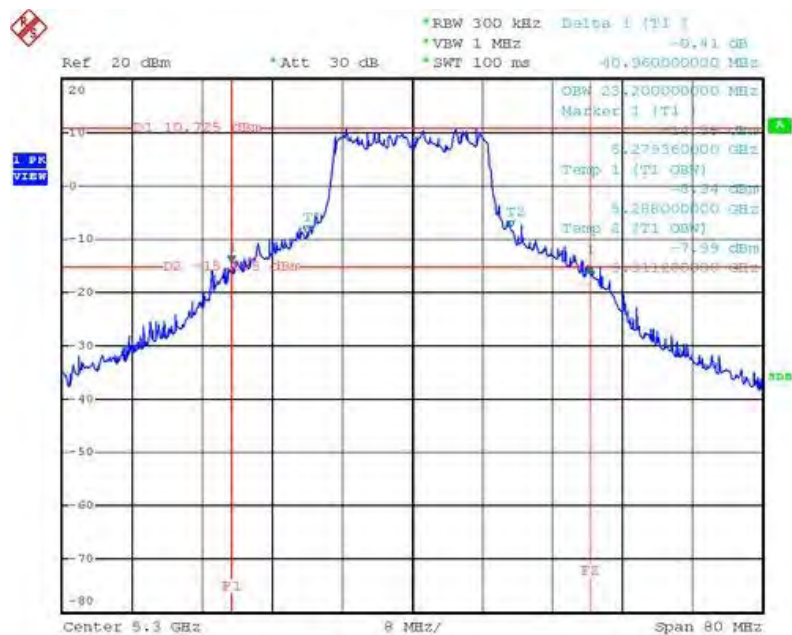
<For External Antenna / Ant. 5>

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 /
5260 MHz



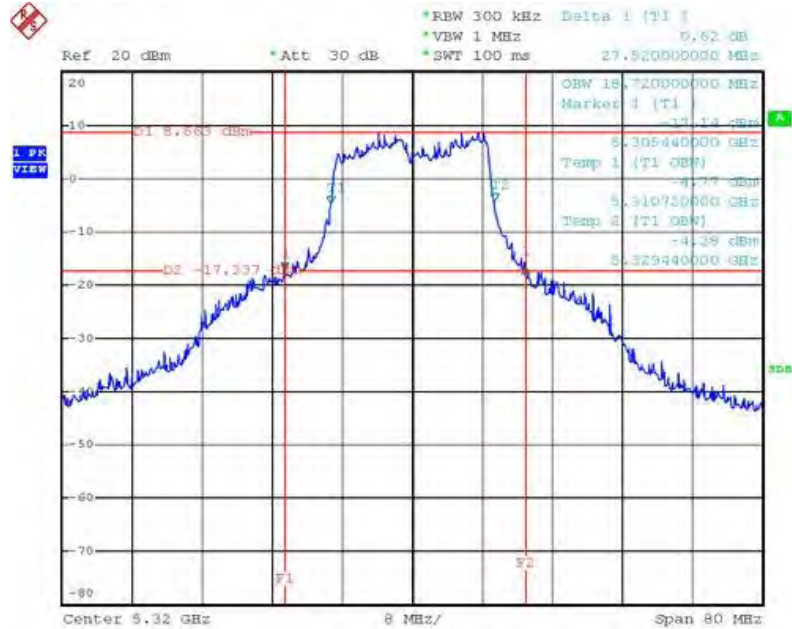
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 /
5300 MHz



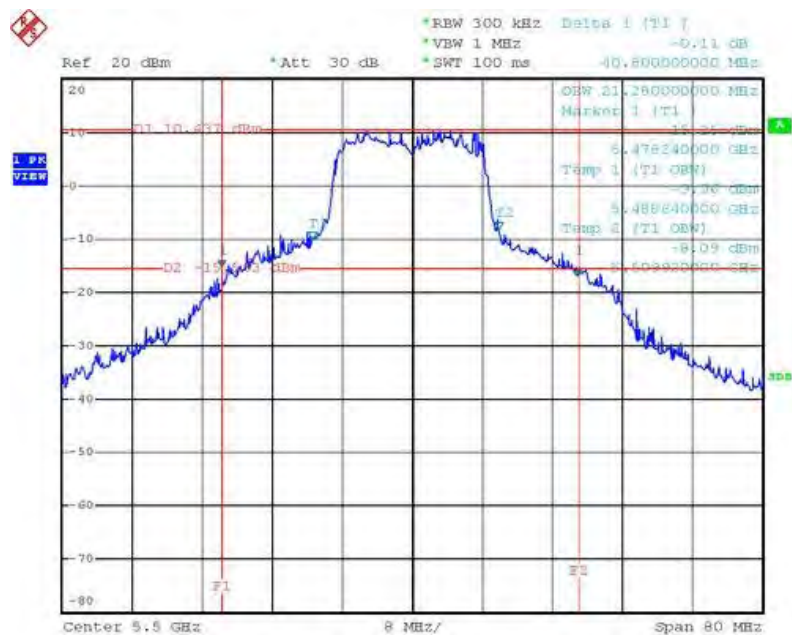
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5320 MHz



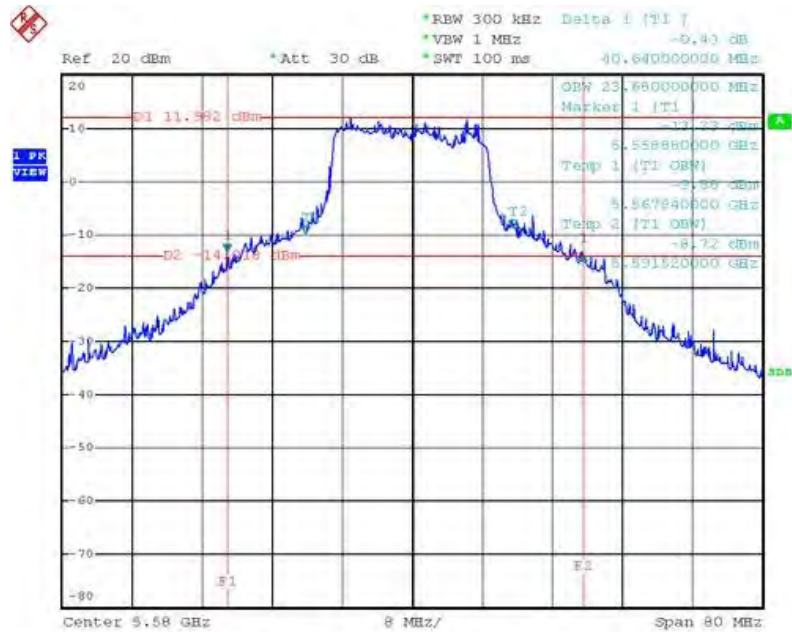
Date: 6.APR.2011 20:00:11

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5500 MHz



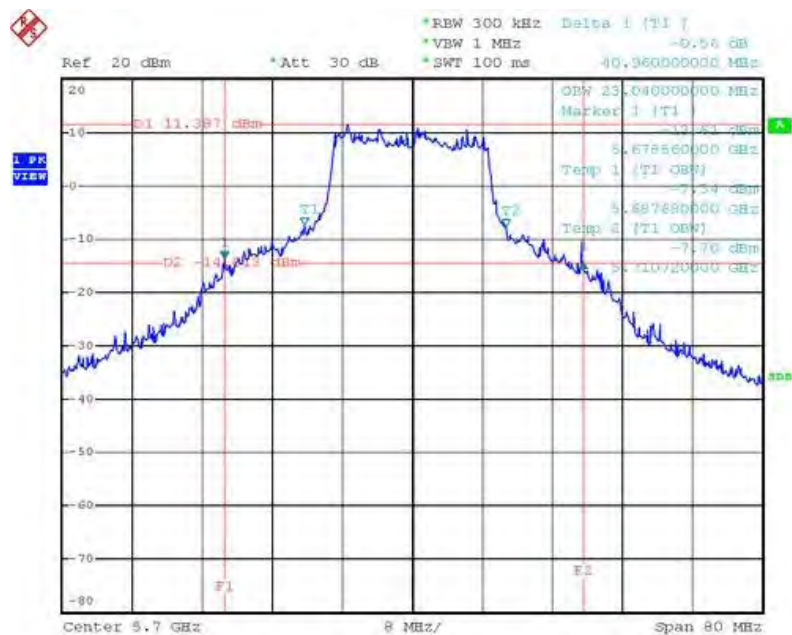
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5580 MHz



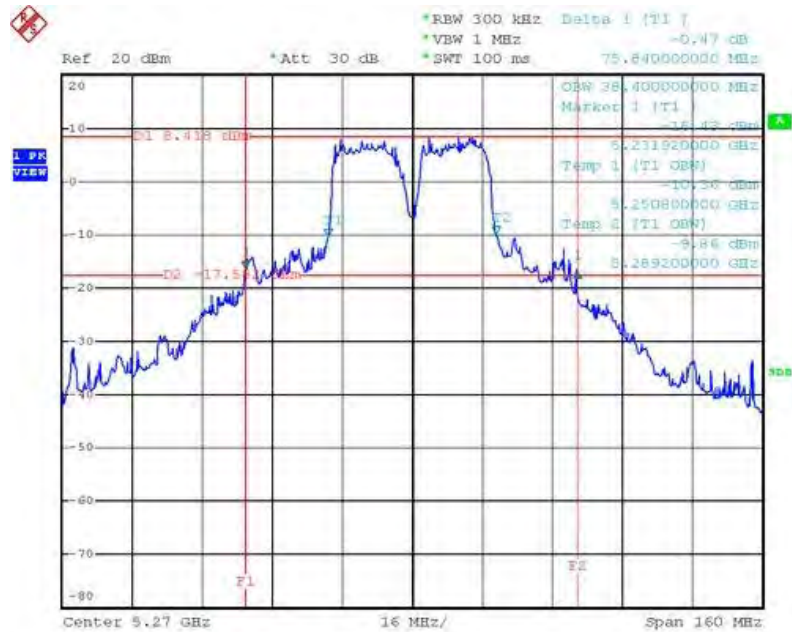
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5700 MHz



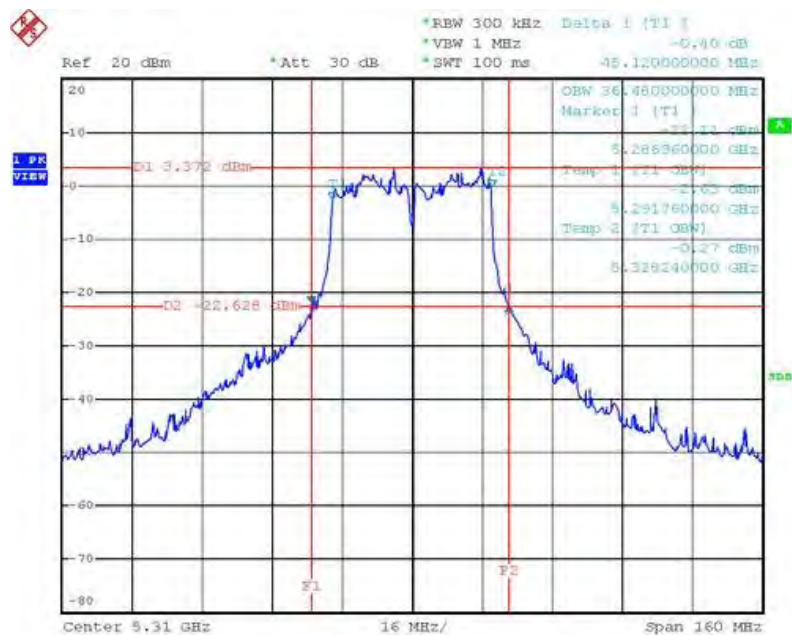
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5270 MHz



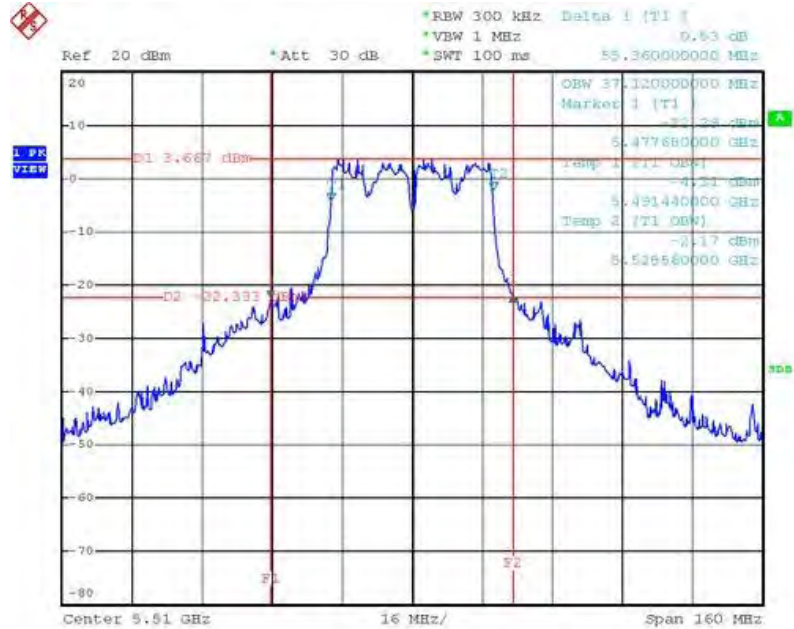
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5310 MHz



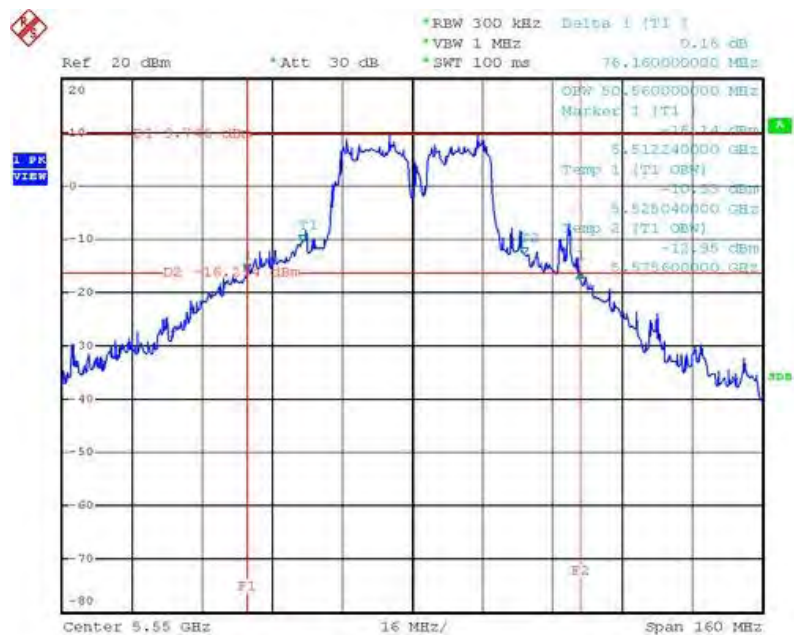
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5510MHz



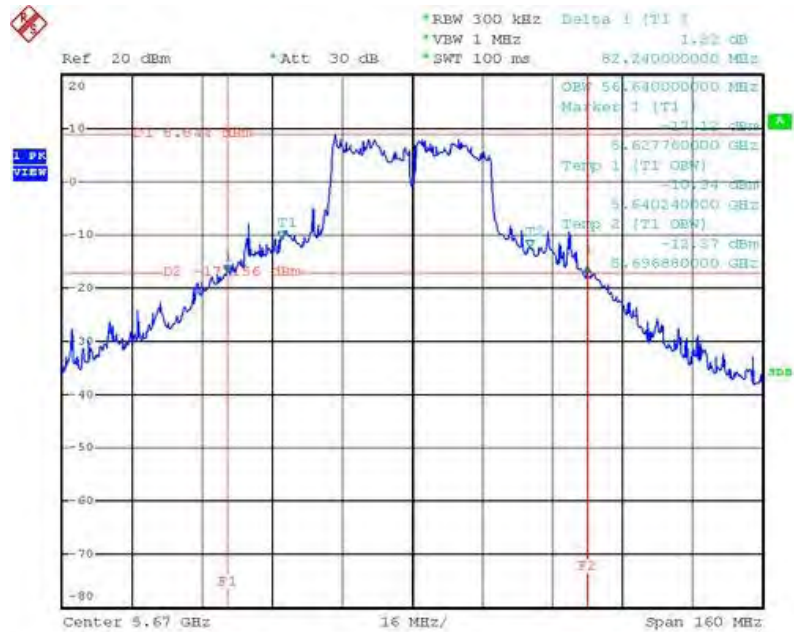
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5550 MHz



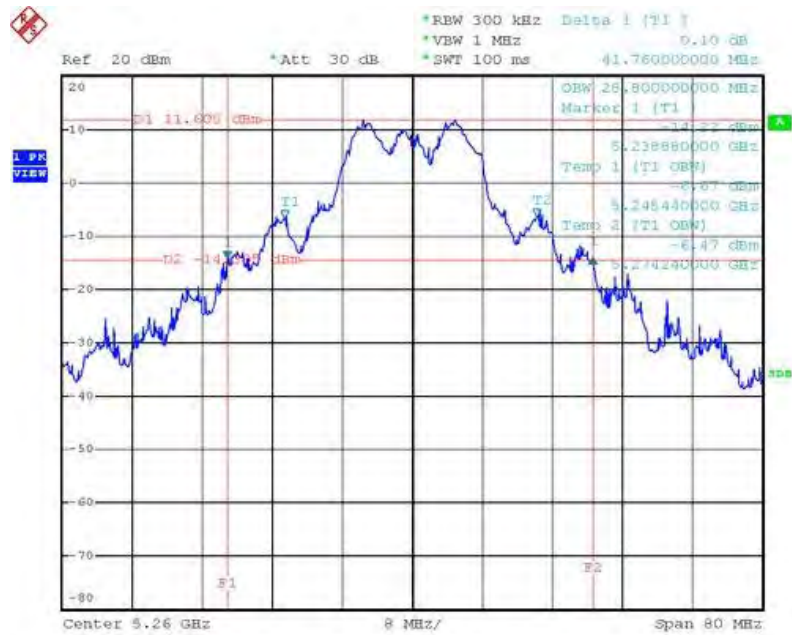
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5670 MHz



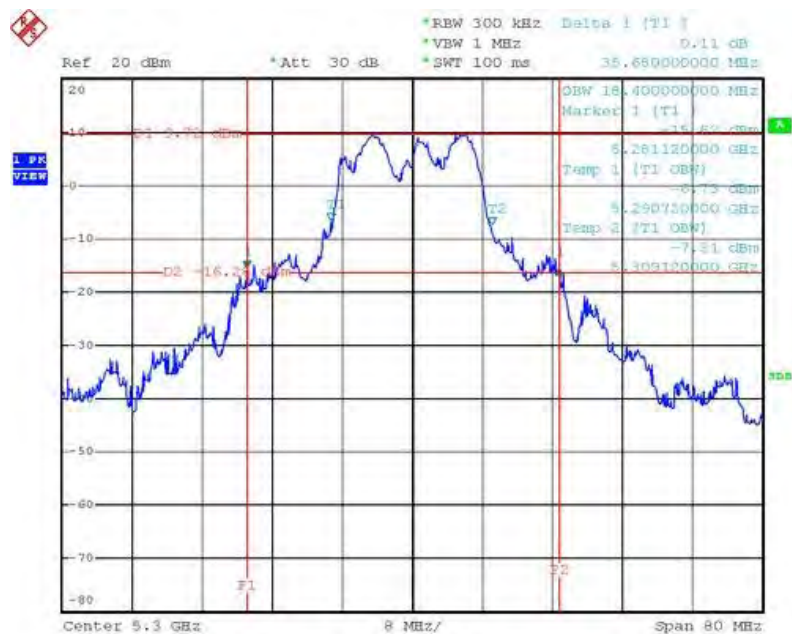
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26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5260 MHz



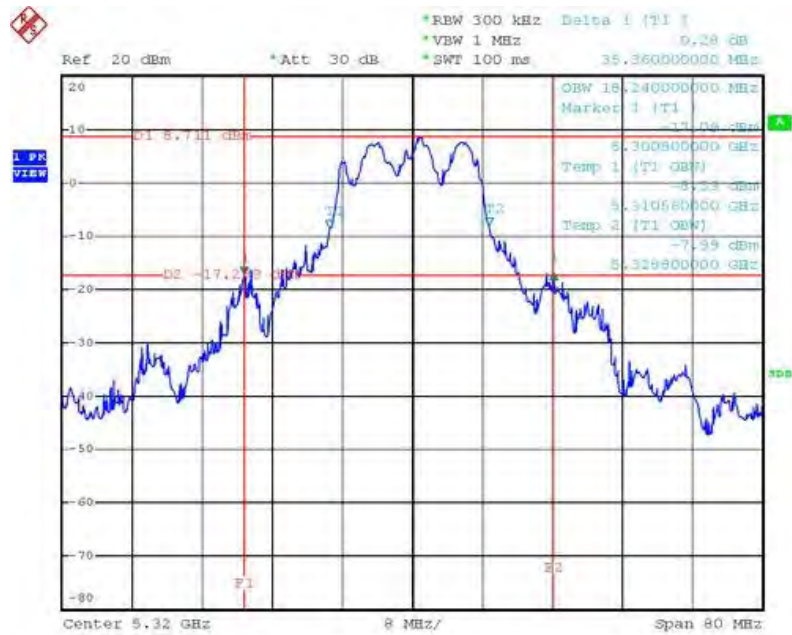
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26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5300 MHz



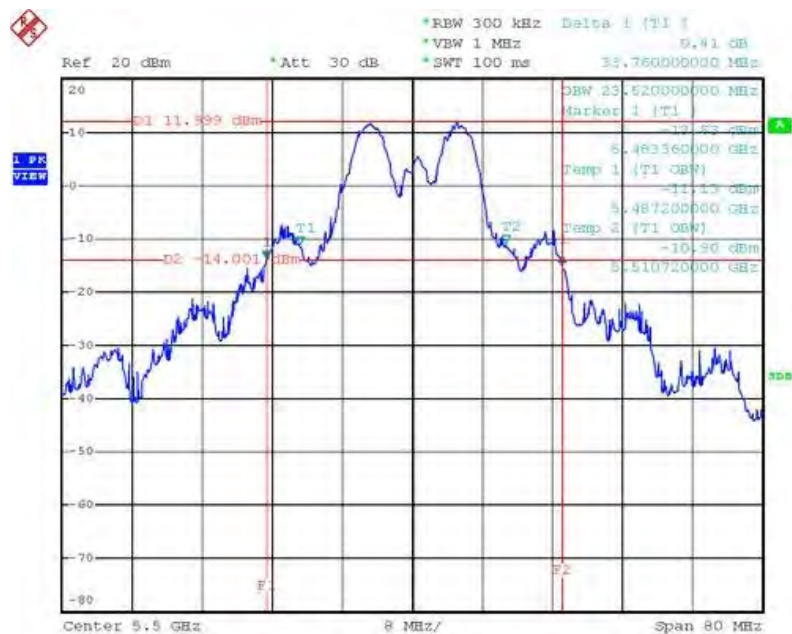
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26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5320 MHz



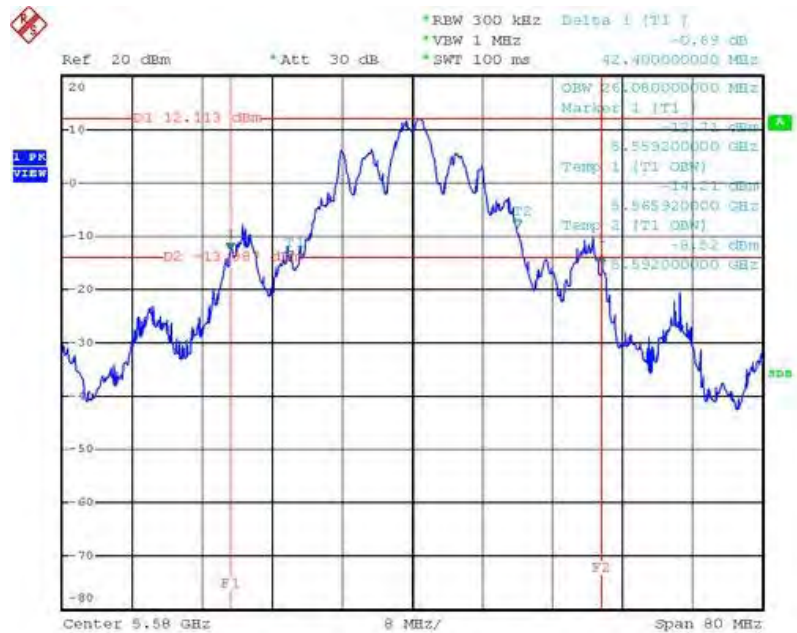
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26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5500 MHz



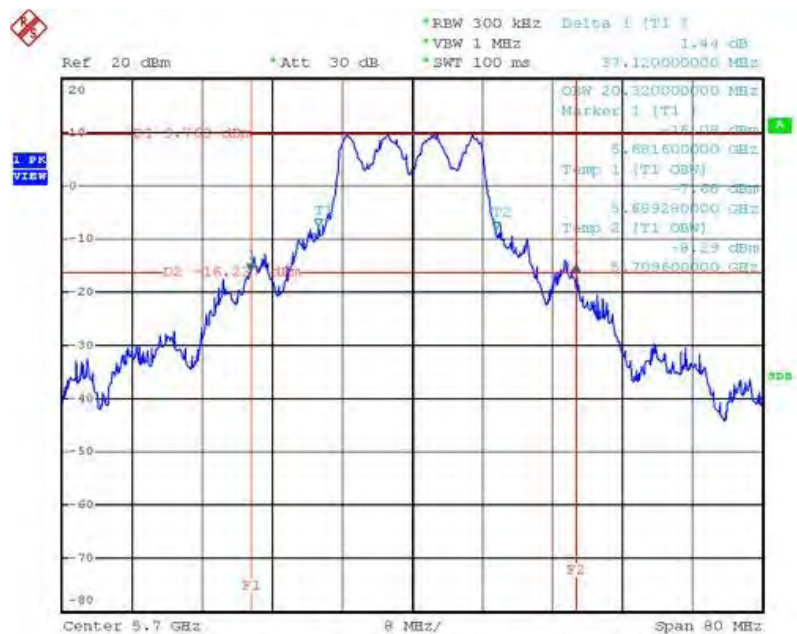
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26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5580 MHz



Date: 10.APR.2011 11:25:19

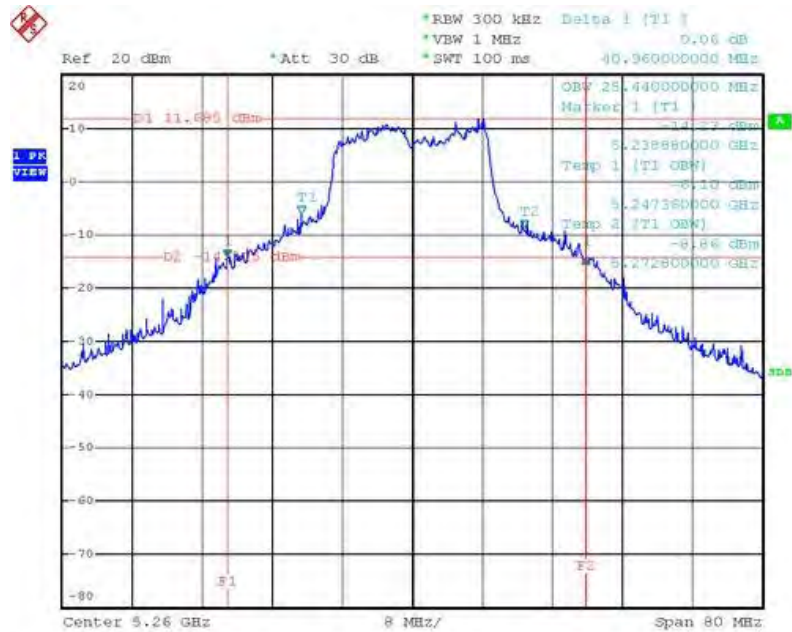
26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5700 MHz



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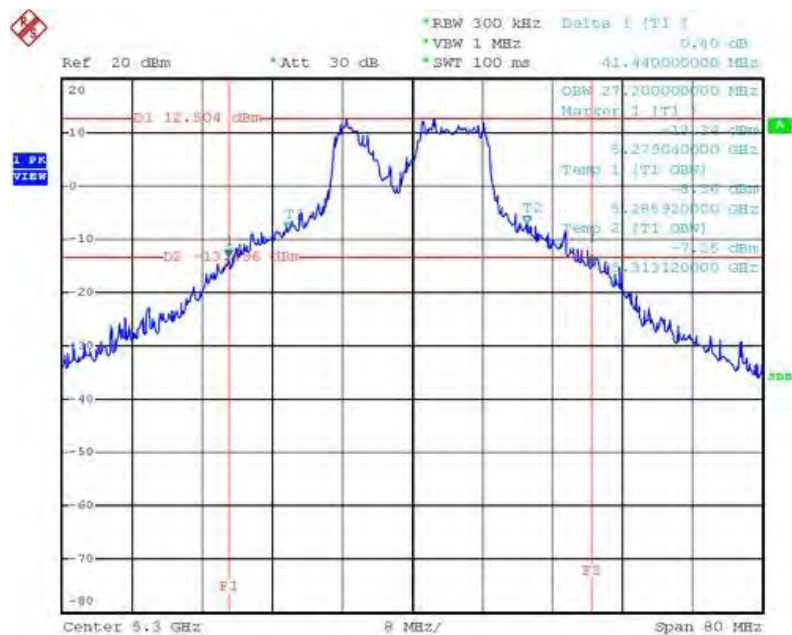
<For External Antenna / Ant. 6>

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 /
5260 MHz



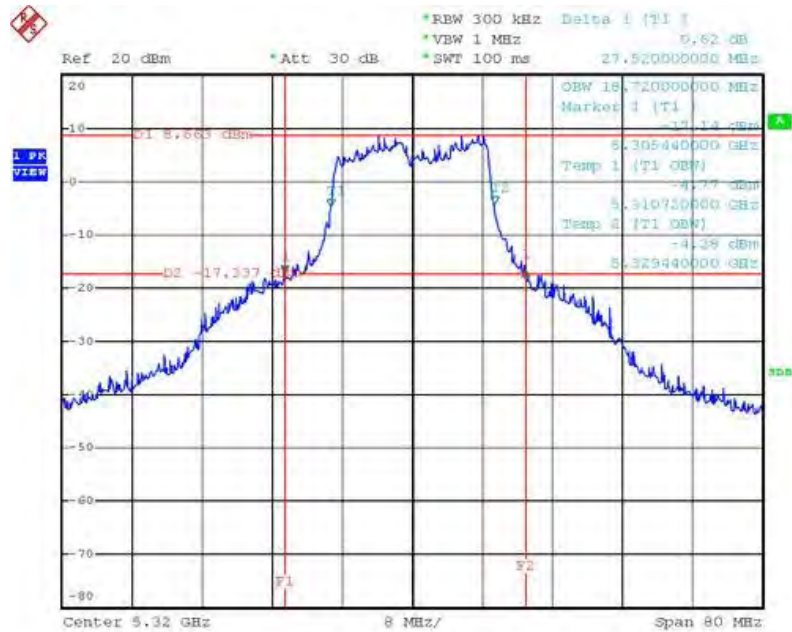
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 /
5300 MHz



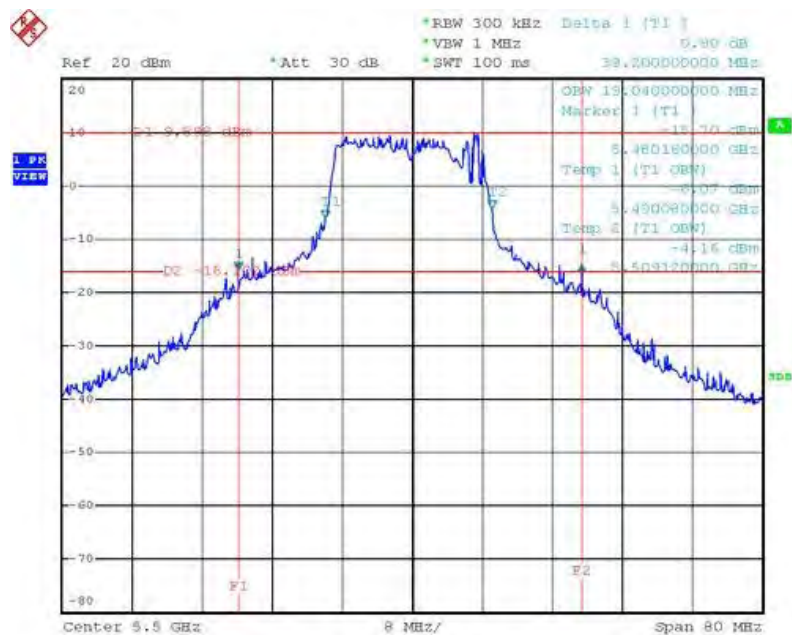
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5320 MHz



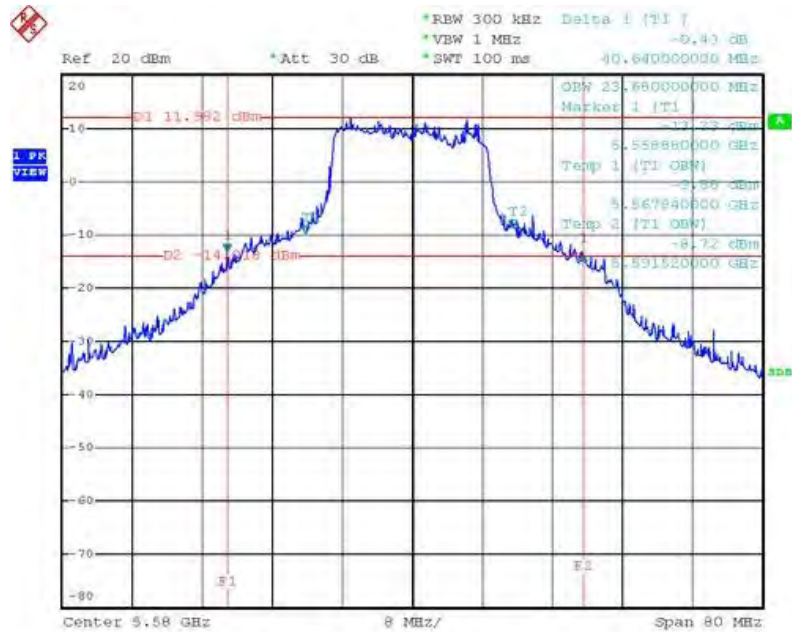
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5500 MHz



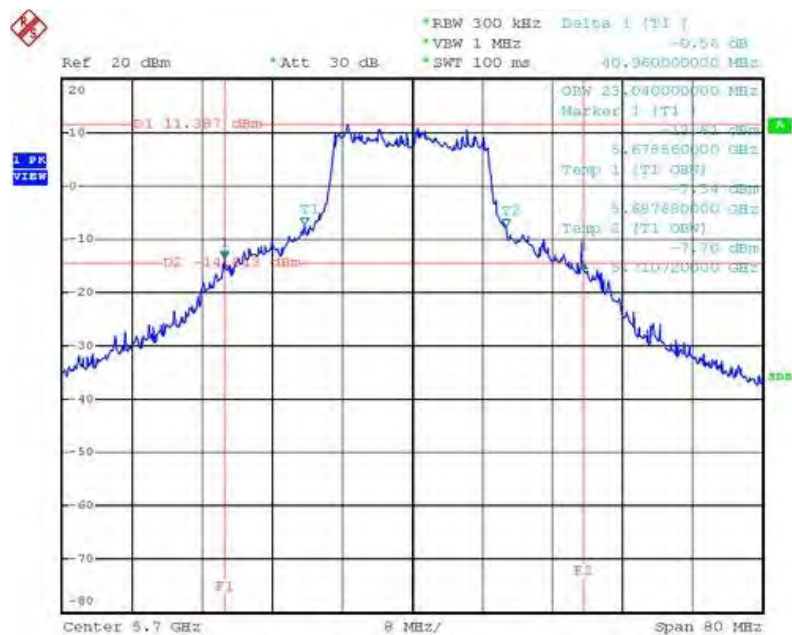
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5580 MHz



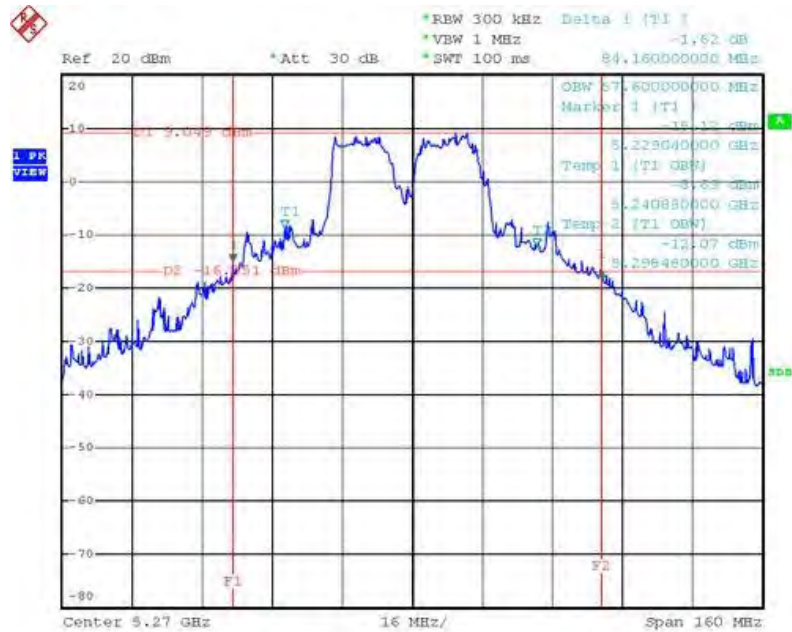
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5700 MHz



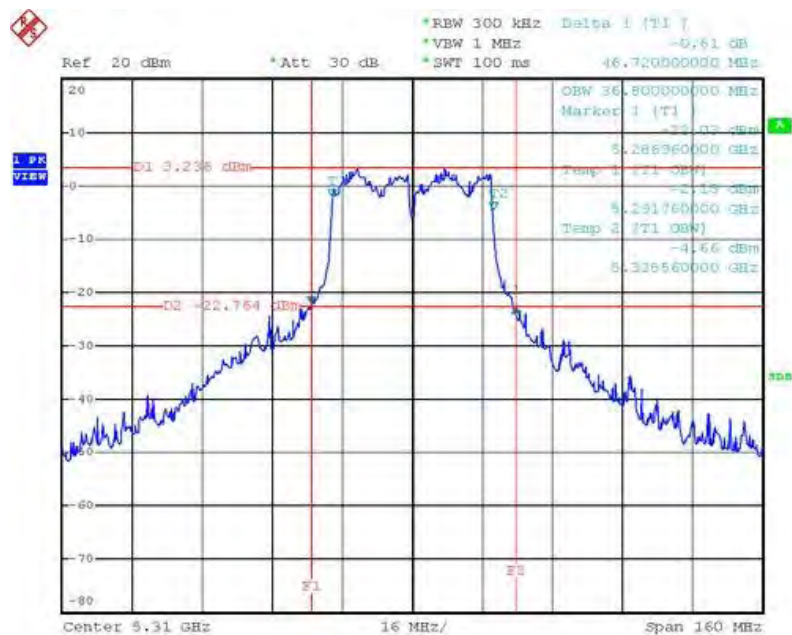
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5270 MHz



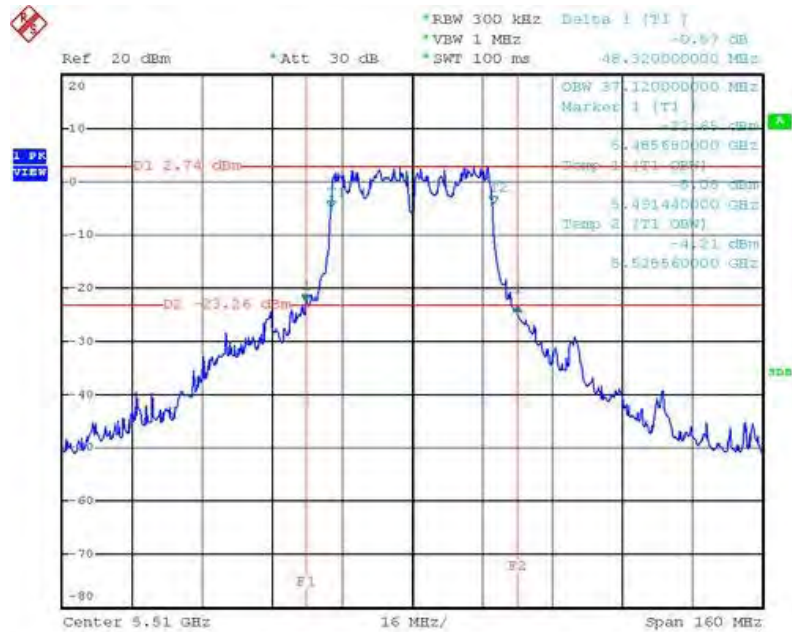
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5310 MHz



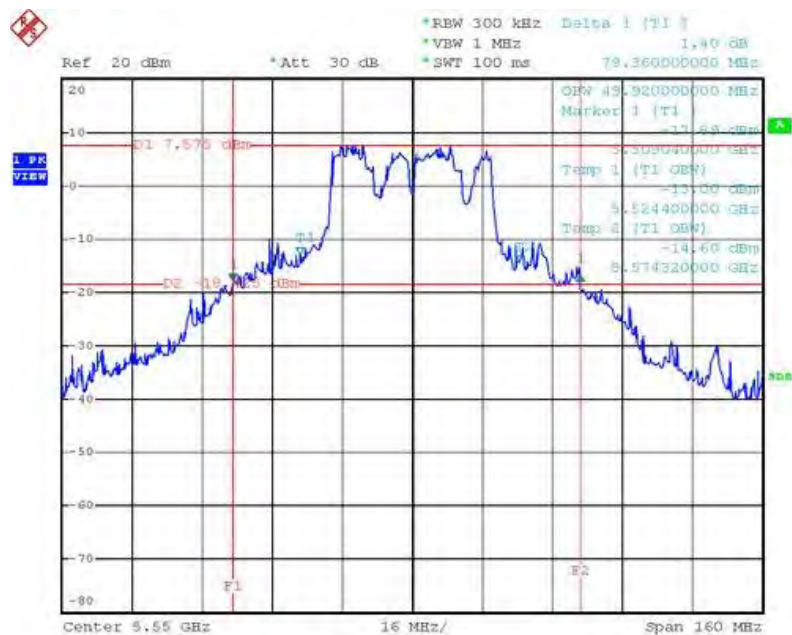
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5510MHz



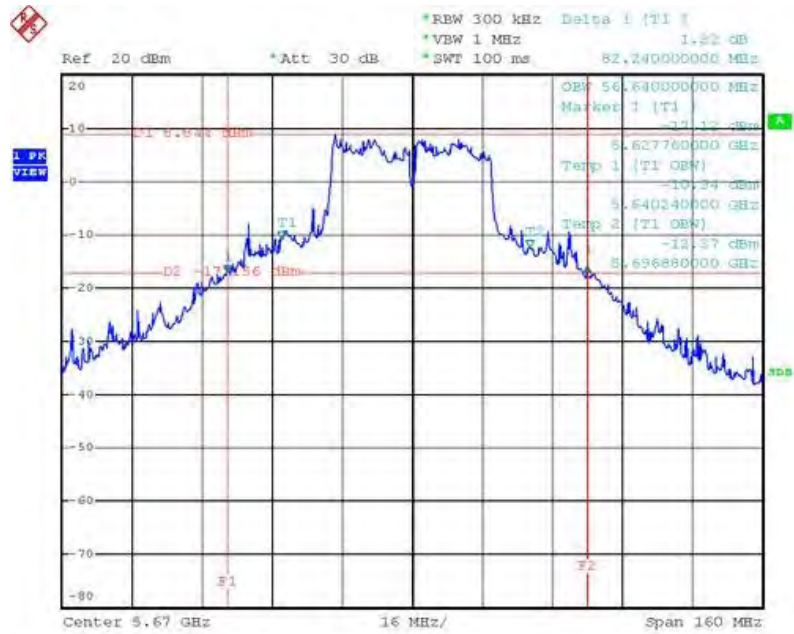
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5550 MHz



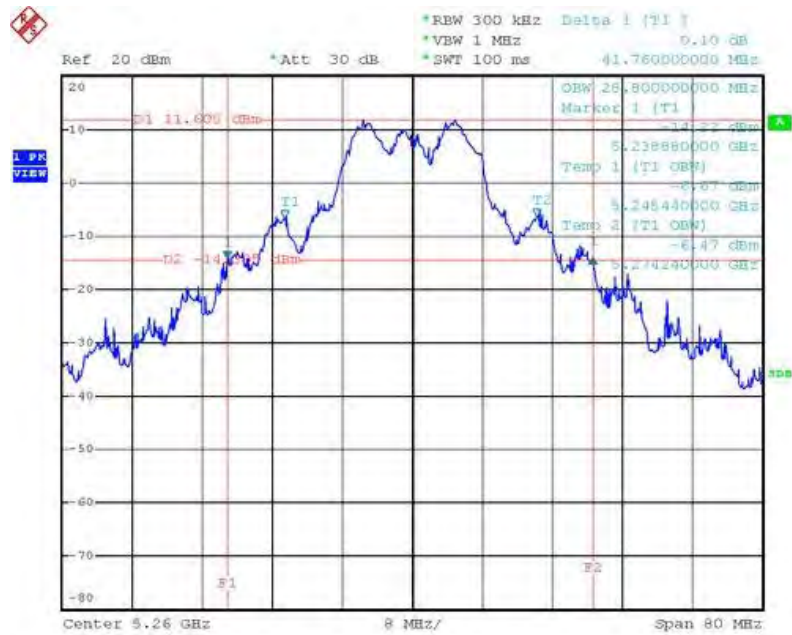
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26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5670 MHz



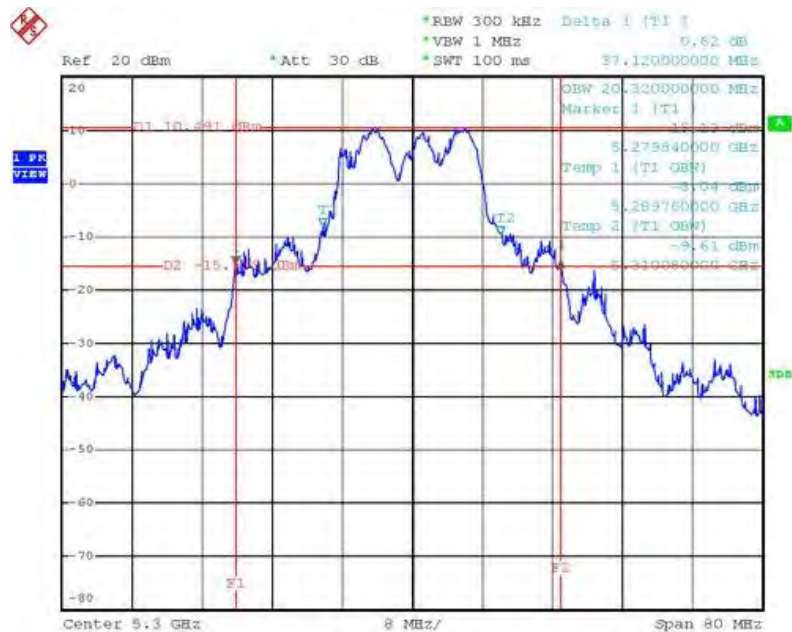
Date: 6.APR.2011 20:20:19

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5260 MHz



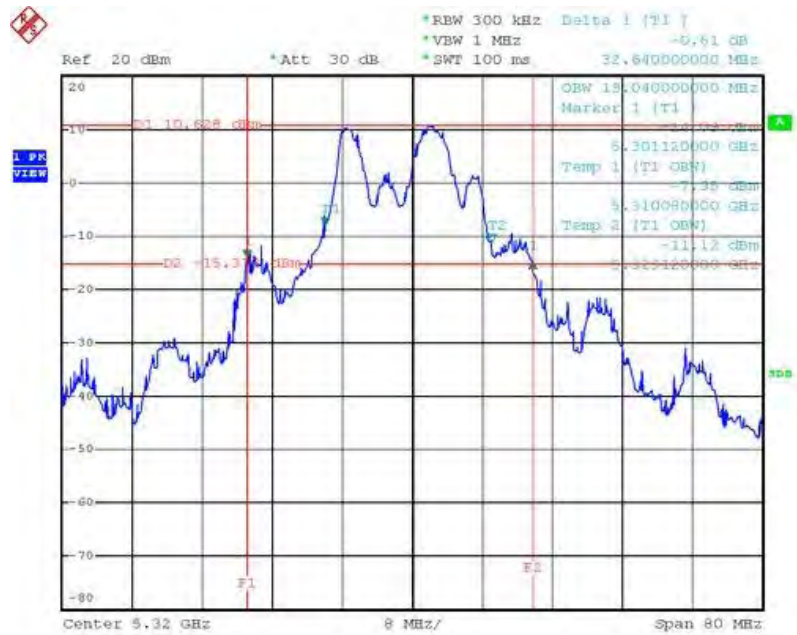
Date: 6.APR.2011 19:32:48

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5300 MHz



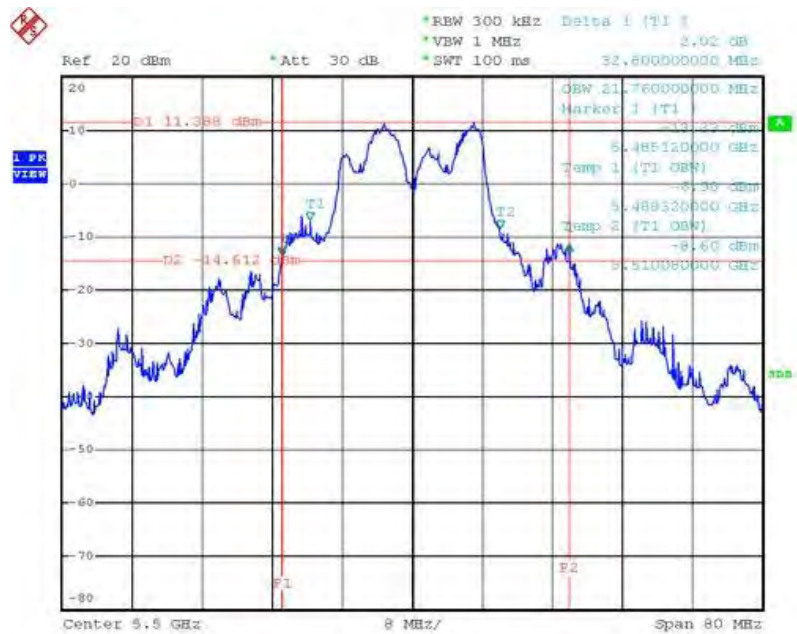
Date: 10.APR.2011 11:22:24

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5320 MHz



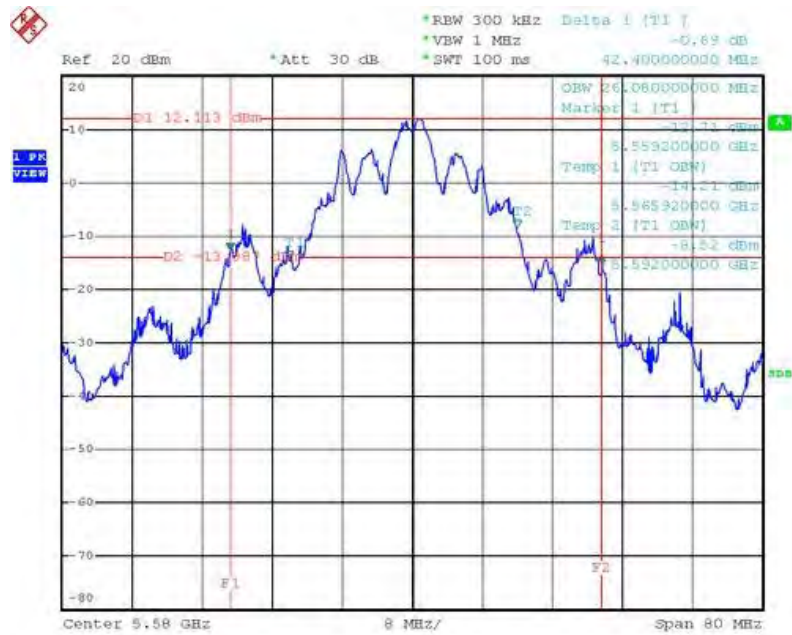
Date: 6.APR.2011 19:36:56

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5500 MHz



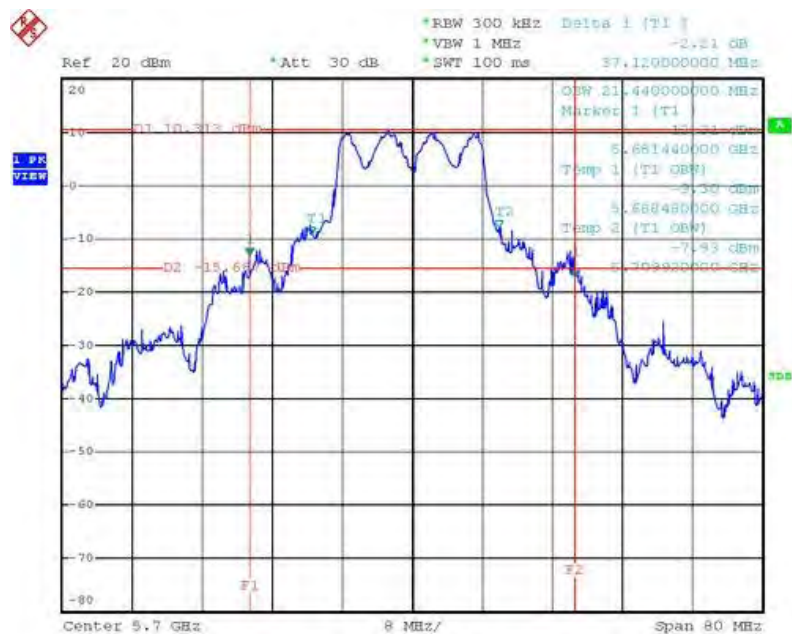
Date: 6.APR.2011 19:38:01

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5580 MHz



Date: 10.APR.2011 11:25:19

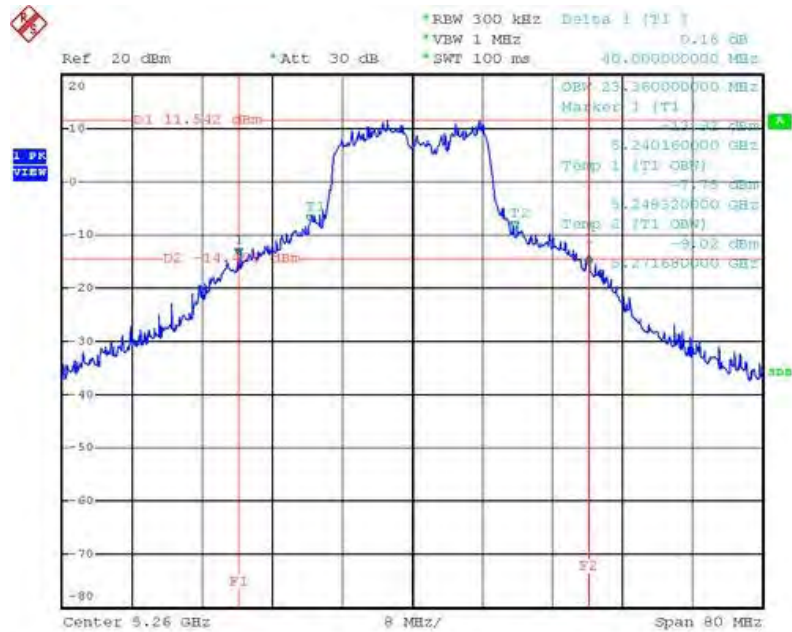
26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5700 MHz



Date: 10.APR.2011 11:36:57

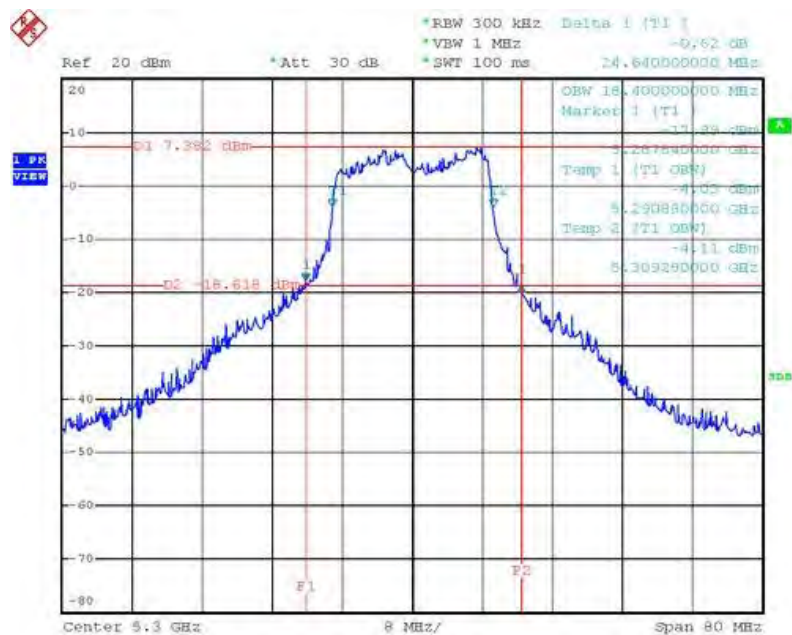
<For Internal Antenna / Ant. 8>

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 /
5260 MHz



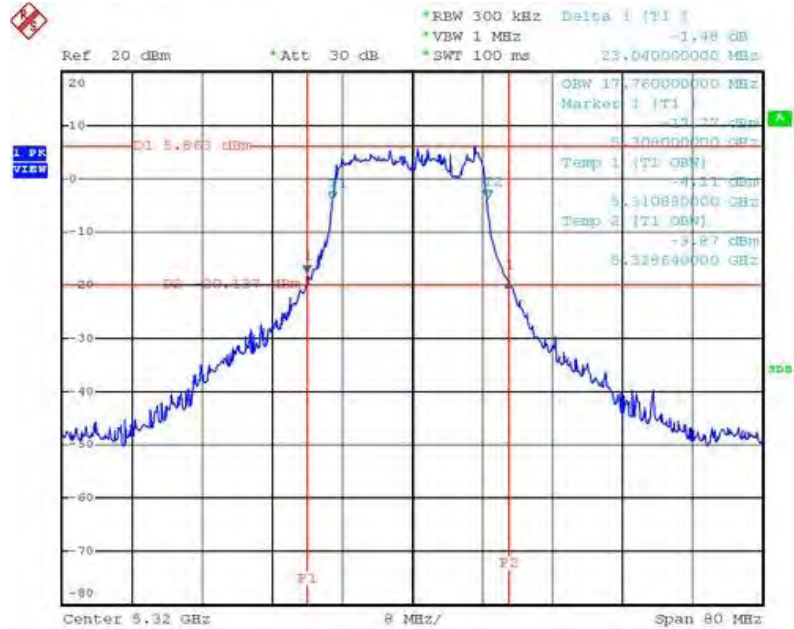
Date: 6.APR.2011 21:36:04

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 /
5300 MHz



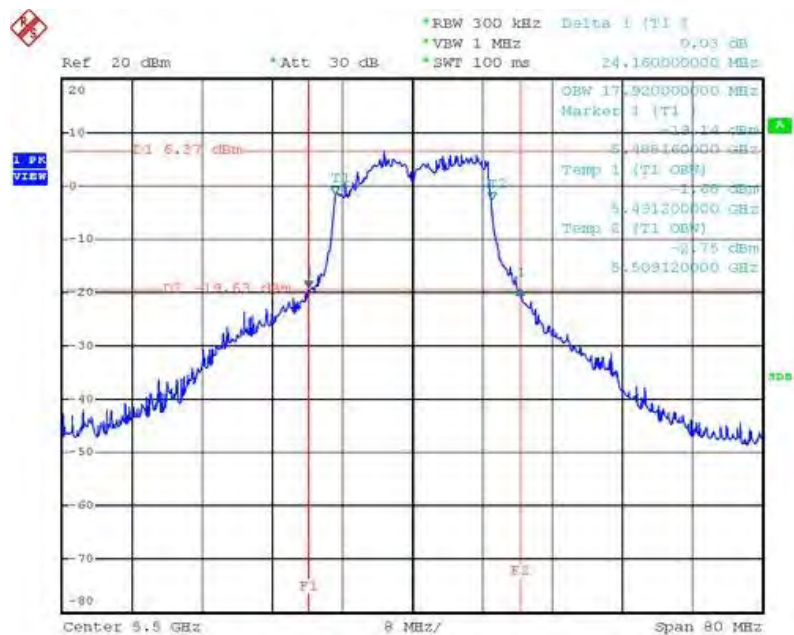
Date: 6.APR.2011 21:37:04

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5320 MHz



Date: 6.APR.2011 21:38:06

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5500 MHz



Date: 6.APR.2011 21:40:11



Ref 20 dBm *Att 30 dB

*RBW 300 kHz Delta 1 (T1)
 *VBW 1 MHz 0.14 GHz
 *SWT 100 ms 34.08000000 MHz

20
 10
 0
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80

5.48 5.52 5.56 5.60 5.64

Center 5.58 GHz 8 MHz/ Span 80 MHz

Marker 1 (T1)
 5.560800000 GHz
 Temp 1 (T1 RBW)
 5.570800000 GHz
 Temp 2 (T1 RBW)
 -4.06 dBm
 5.585800000 GHz

Date: 6.APR.2011 21:41:18

Ref 20 dBm *Att 30 dB *RBW 300 kHz Delta 1 (T1) 1.47 dB
 *VBW 1 MHz *SWT 100 ms 25.60000000 MHz

1 PR VIEW

Center 5.7 GHz 8 MHz/ Span 80 MHz

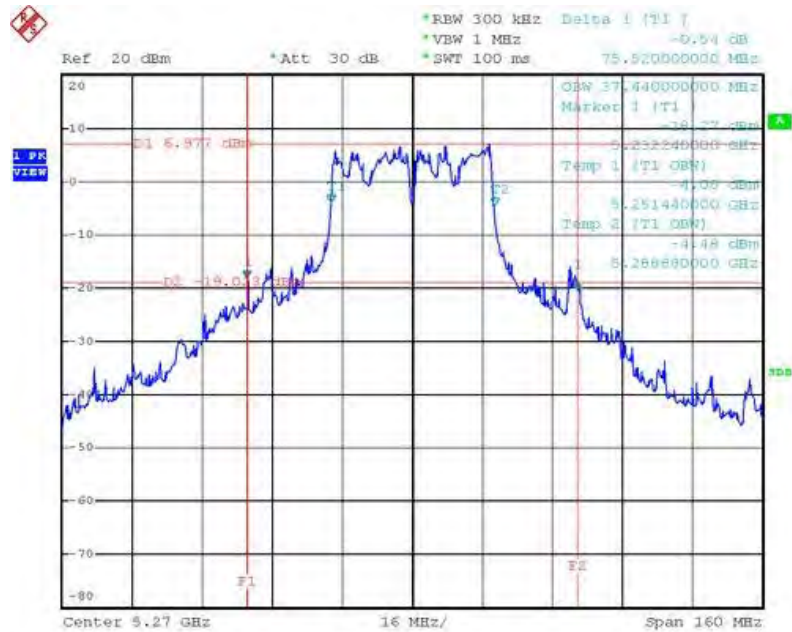
OBW 18.72000000 MHz
 Marked 1 (T1)
 Temp 1 (T1 OBW)
 Temp 2 (T1 OBW)

D1 8.553 dBm
 D2 -17.447 dBm

F1 F2

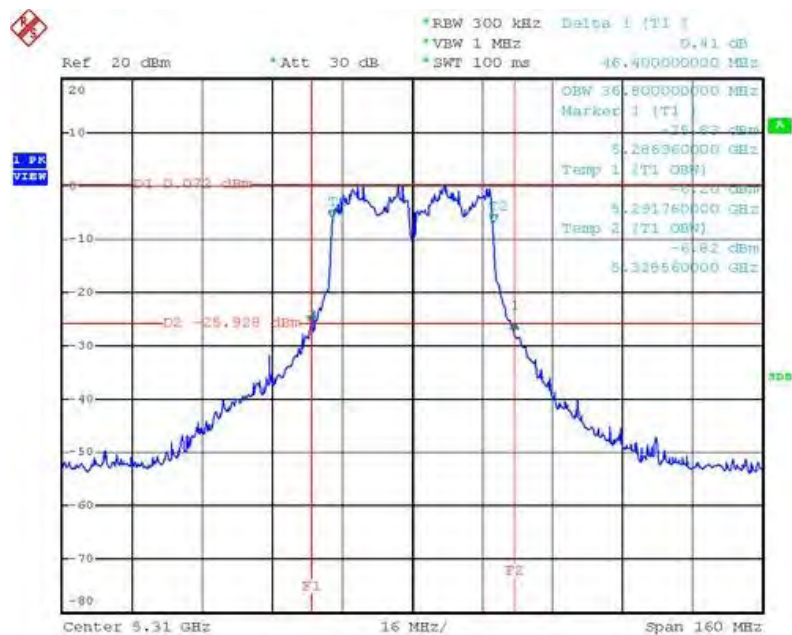
Date: 6.APR.2011 21:42:23

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5270 MHz



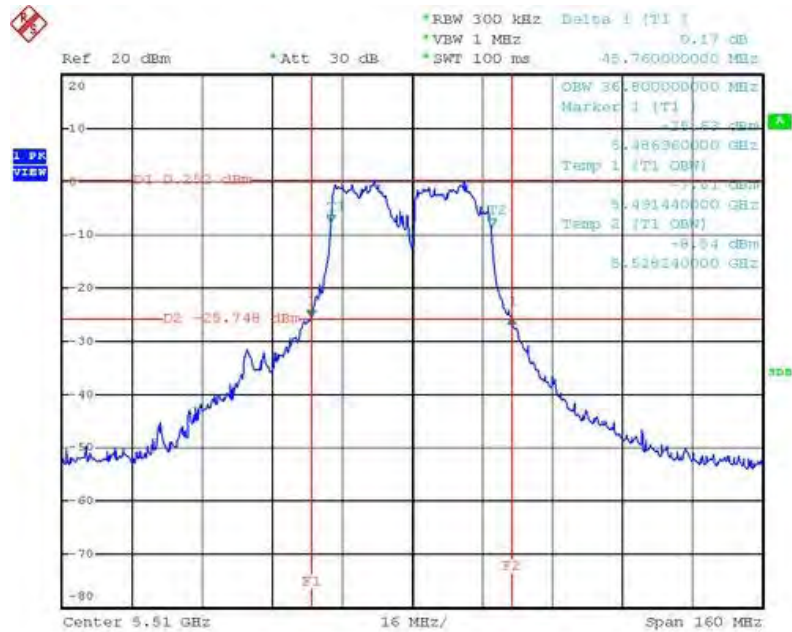
Date: 6.APR.2011 21:43:43

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5310 MHz



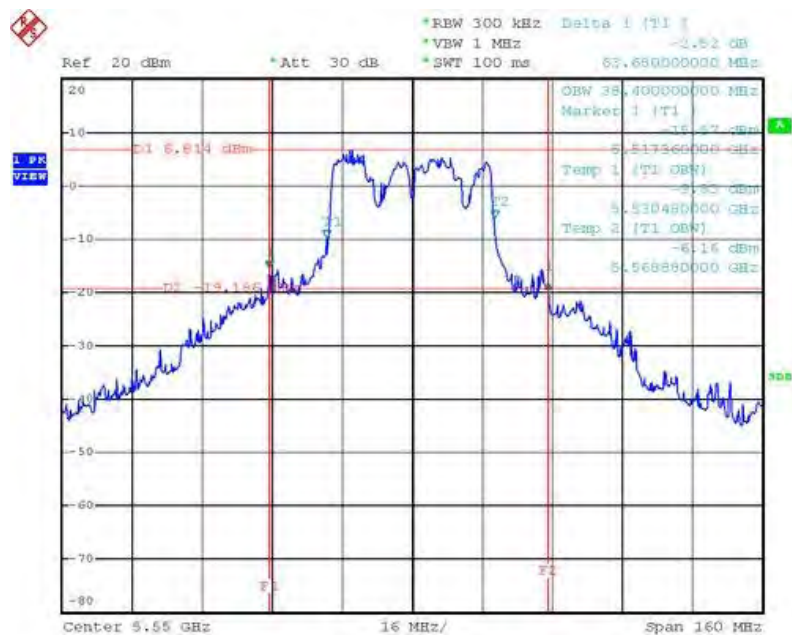
Date: 6.APR.2011 21:44:45

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5510MHz



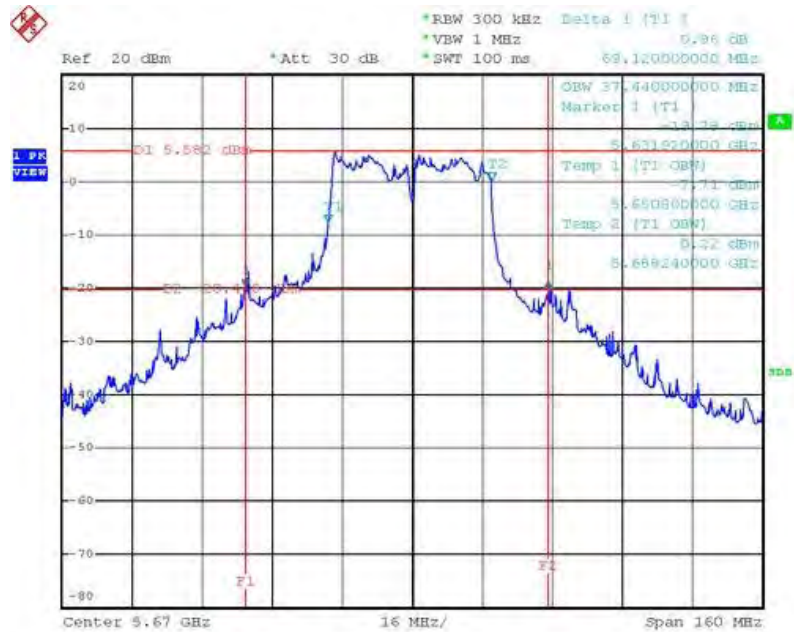
Date: 6.APR.2011 21:45:50

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5550 MHz



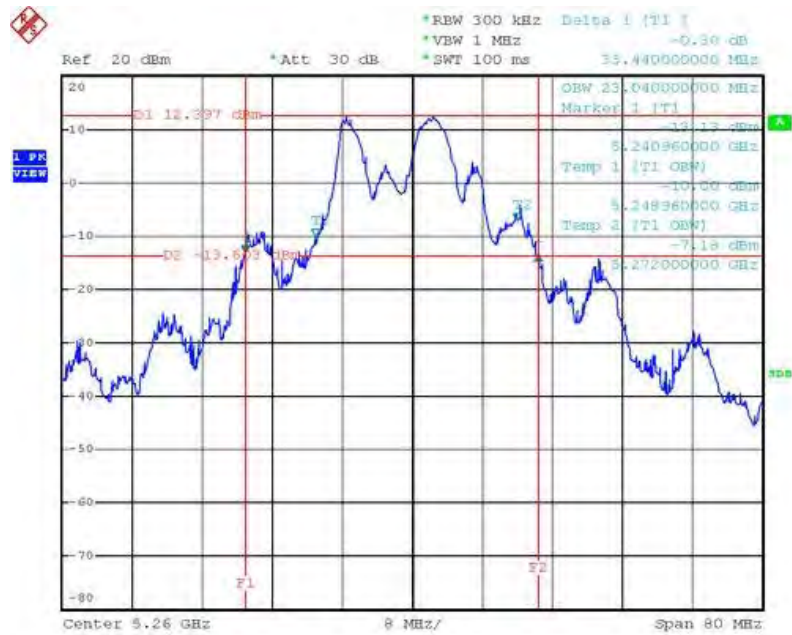
Date: 6.APR.2011 21:46:51

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4 / 5670 MHz



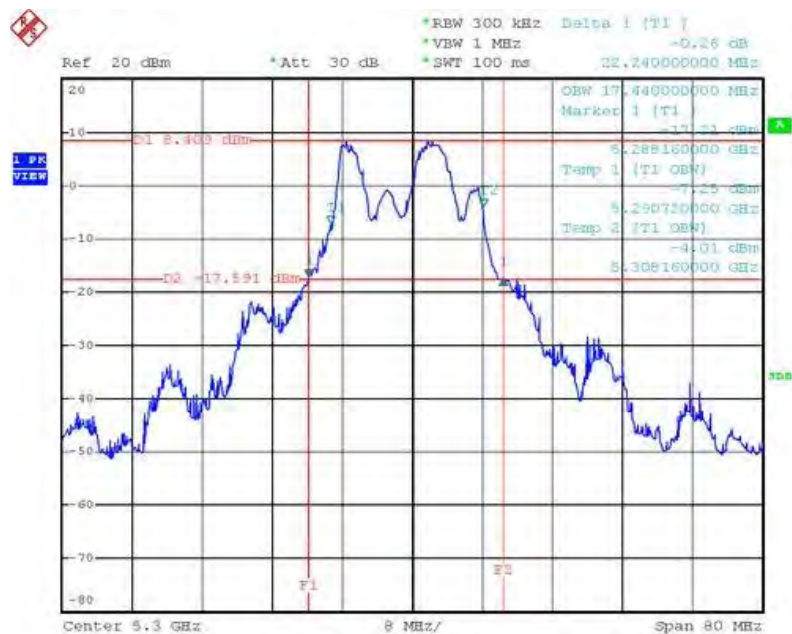
Date: 6.APR.2011 21:47:58

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5260 MHz



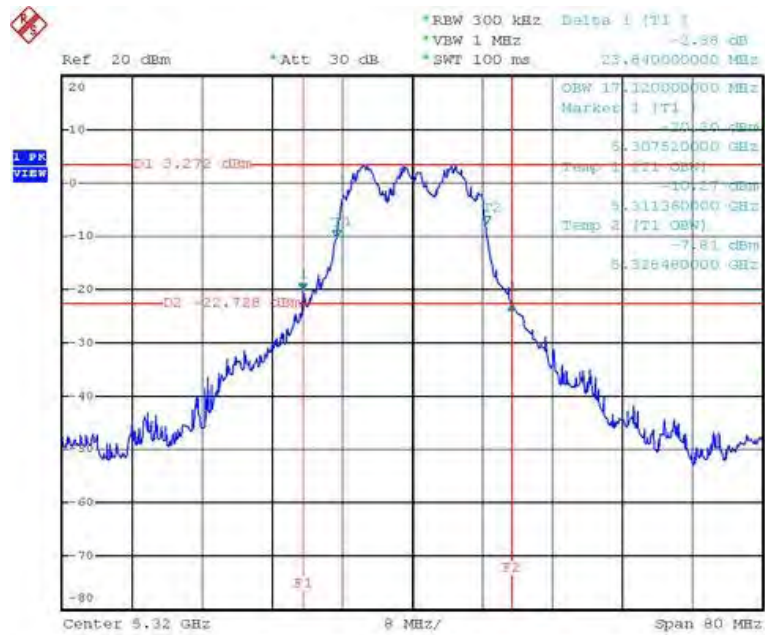
Date: 6.APR.2011 21:24:35

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5300 MHz



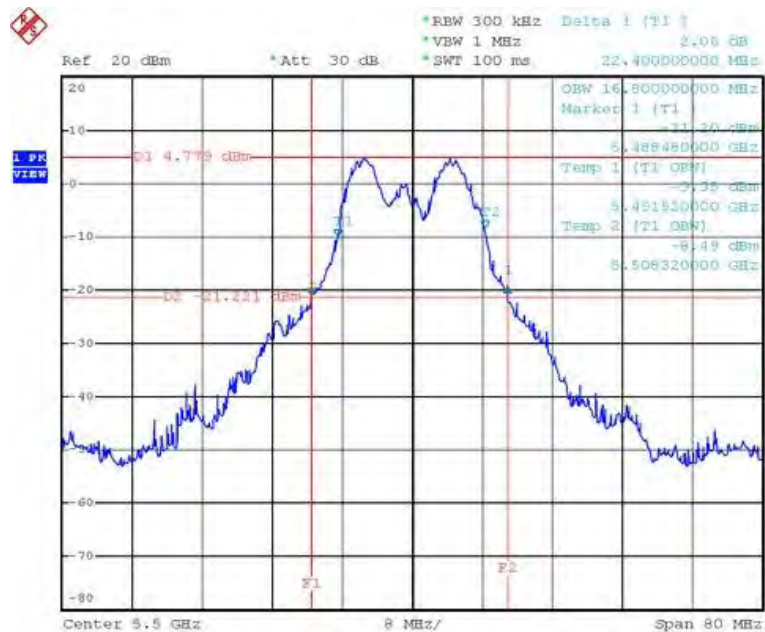
Date: 6.APR.2011 21:25:40

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5320 MHz



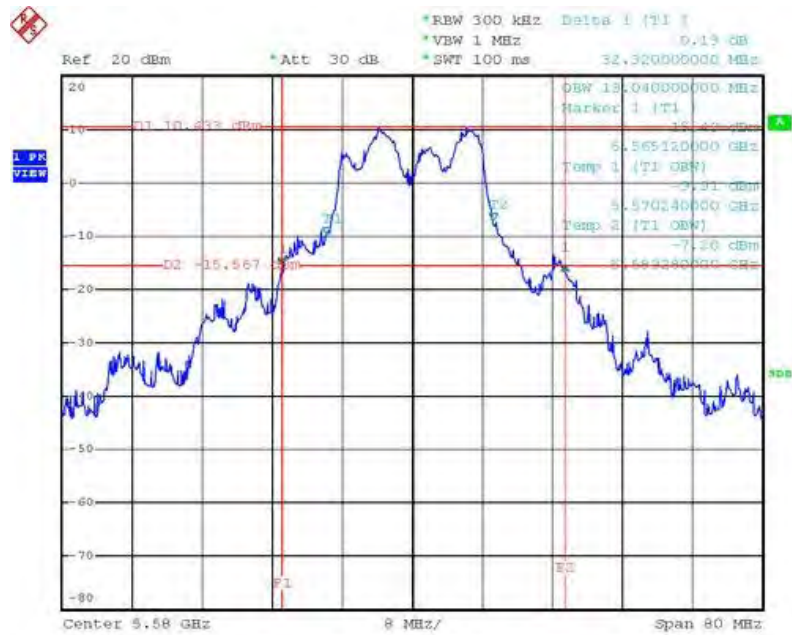
Date: 6.APR.2011 21:26:39

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5500 MHz



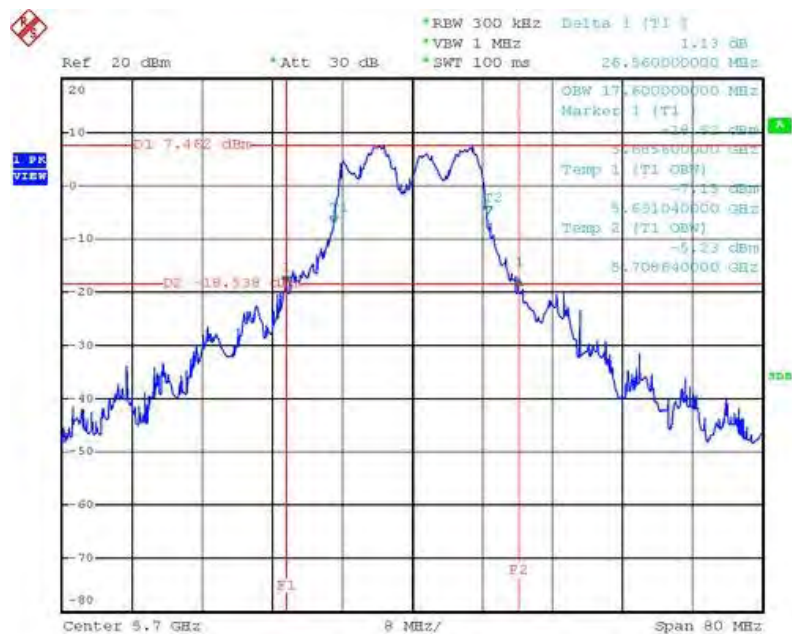
Date: 6.APR.2011 21:28:50

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5580 MHz



Date: 6.APR.2011 21:33:27

26 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5700 MHz



Date: 6.APR.2011 21:34:31

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 $11 \text{ dBm} + 10\log B$. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3.2. Measuring Instruments and Setting

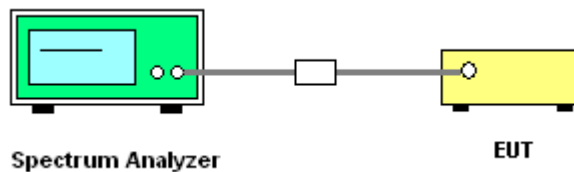
Please refer to section 5 of equipments list in this report. The following table is the setting of the peak power meter

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

4.3.3. Test Procedures

Spectrum Parameter	Setting
RF Output Power Method	☒ ANSI C63.10 clause 6.10.2.1 (a) power meter method
RF Output Power Method	☐ ANSI C63.10 clause 6.10.2.1 (b) channel integration method
RF Output Power Method	☐ ANSI C63.10 clause 6.10.3.1 Method 1 - spectral trace averaging
RF Output Power Method	☐ ANSI C63.10 clause 6.10.3.2 Method 2 - zero-span mode with trace averaging
Note: 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

<For External Antenna / Ant. 5>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 5
Test Date	Mar. 08, 2011		

Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	17.97	24.00	Complies
60	5300 MHz	18.23	24.00	Complies
64	5320 MHz	14.97	24.00	Complies
100	5500 MHz	17.95	24.00	Complies
116	5580 MHz	18.74	24.00	Complies
140	5700 MHz	19.04	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.26	24.00	Complies
60	5300 MHz	18.52	24.00	Complies
64	5320 MHz	14.69	24.00	Complies
100	5500 MHz	18.51	24.00	Complies
116	5580 MHz	18.80	24.00	Complies
140	5700 MHz	18.97	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.43	24.00	Complies
60	5300 MHz	19.33	24.00	Complies
64	5320 MHz	15.51	24.00	Complies
100	5500 MHz	18.94	24.00	Complies
116	5580 MHz	19.18	24.00	Complies
140	5700 MHz	19.31	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	23.00	24.00	Complies
60	5300 MHz	23.49	24.00	Complies
64	5320 MHz	19.84	24.00	Complies
100	5500 MHz	23.26	24.00	Complies
116	5580 MHz	23.68	24.00	Complies
140	5700 MHz	23.88	24.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	17.64	24.00	Complies
62	5310 MHz	13.06	24.00	Complies
102	5510MHz	13.67	24.00	Complies
110	5550 MHz	17.98	24.00	Complies
134	5670 MHz	18.60	24.00	Complies

Configuration IEEE 802.11nMCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	17.69	24.00	Complies
62	5310 MHz	12.74	24.00	Complies
102	5510MHz	14.60	24.00	Complies
110	5550 MHz	18.50	24.00	Complies
134	5670 MHz	18.51	24.00	Complies

Configuration IEEE 802.11nMCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	17.93	24.00	Complies
62	5310 MHz	14.00	24.00	Complies
102	5510MHz	14.81	24.00	Complies
110	5550 MHz	19.01	24.00	Complies
134	5670 MHz	19.12	24.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	22.53	24.00	Complies
62	5310 MHz	18.07	24.00	Complies
102	5510MHz	19.16	24.00	Complies
110	5550 MHz	23.29	24.00	Complies
134	5670 MHz	23.52	24.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 5
Test Date	Mar. 08, 2011		

Configuration IEEE 802.11a Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.43	24.00	Complies
60	5300 MHz	16.94	24.00	Complies
64	5320 MHz	16.27	24.00	Complies
100	5500 MHz	18.01	24.00	Complies
116	5580 MHz	18.89	24.00	Complies
140	5700 MHz	17.91	24.00	Complies

Configuration IEEE 802.11a Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.77	24.00	Complies
60	5300 MHz	17.00	24.00	Complies
64	5320 MHz	16.32	24.00	Complies
100	5500 MHz	18.54	24.00	Complies
116	5580 MHz	19.15	24.00	Complies
140	5700 MHz	17.88	24.00	Complies

Configuration IEEE 802.11a Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.86	24.00	Complies
60	5300 MHz	17.78	24.00	Complies
64	5320 MHz	16.93	24.00	Complies
100	5500 MHz	18.97	24.00	Complies
116	5580 MHz	19.37	24.00	Complies
140	5700 MHz	18.21	24.00	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	23.46	24.00	Complies
60	5300 MHz	22.03	24.00	Complies
64	5320 MHz	21.29	24.00	Complies
100	5500 MHz	23.30	24.00	Complies
116	5580 MHz	23.91	24.00	Complies
140	5700 MHz	22.77	24.00	Complies

<For External Antenna / Ant. 6>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 6
Test Date	Mar. 08, 2011		

Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.71	24.00	Complies
60	5300 MHz	18.09	24.00	Complies
64	5320 MHz	14.97	24.00	Complies
100	5500 MHz	15.58	24.00	Complies
116	5580 MHz	18.74	24.00	Complies
140	5700 MHz	19.04	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	19.36	24.00	Complies
60	5300 MHz	18.33	24.00	Complies
64	5320 MHz	14.69	24.00	Complies
100	5500 MHz	16.36	24.00	Complies
116	5580 MHz	18.80	24.00	Complies
140	5700 MHz	18.97	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	19.08	24.00	Complies
60	5300 MHz	18.92	24.00	Complies
64	5320 MHz	15.51	24.00	Complies
100	5500 MHz	16.44	24.00	Complies
116	5580 MHz	19.18	24.00	Complies
140	5700 MHz	19.31	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	23.83	24.00	Complies
60	5300 MHz	23.23	24.00	Complies
64	5320 MHz	19.84	24.00	Complies
100	5500 MHz	20.91	24.00	Complies
116	5580 MHz	23.68	24.00	Complies
140	5700 MHz	23.88	24.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	18.19	24.00	Complies
62	5310 MHz	12.04	24.00	Complies
102	5510MHz	11.77	24.00	Complies
110	5550 MHz	16.95	24.00	Complies
134	5670 MHz	18.6	24.00	Complies

Configuration IEEE 802.11nMCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	18.32	24.00	Complies
62	5310 MHz	11.64	24.00	Complies
102	5510MHz	12.16	24.00	Complies
110	5550 MHz	17.51	24.00	Complies
134	5670 MHz	18.51	24.00	Complies

Configuration IEEE 802.11nMCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	18.52	24.00	Complies
62	5310 MHz	12.92	24.00	Complies
102	5510MHz	12.74	24.00	Complies
110	5550 MHz	18.24	24.00	Complies
134	5670 MHz	19.12	24.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	23.12	24.00	Complies
62	5310 MHz	17.00	24.00	Complies
102	5510MHz	17.01	24.00	Complies
110	5550 MHz	22.37	24.00	Complies
134	5670 MHz	23.52	24.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 6
Test Date	Mar. 08, 2011		

Configuration IEEE 802.11a Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.43	24.00	Complies
60	5300 MHz	17.76	24.00	Complies
64	5320 MHz	15.21	24.00	Complies
100	5500 MHz	15.88	24.00	Complies
116	5580 MHz	18.89	24.00	Complies
140	5700 MHz	18.68	24.00	Complies

Configuration IEEE 802.11a Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.77	24.00	Complies
60	5300 MHz	17.64	24.00	Complies
64	5320 MHz	15.04	24.00	Complies
100	5500 MHz	16.85	24.00	Complies
116	5580 MHz	19.15	24.00	Complies
140	5700 MHz	18.76	24.00	Complies

Configuration IEEE 802.11a Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.86	24.00	Complies
60	5300 MHz	18.37	24.00	Complies
64	5320 MHz	16.05	24.00	Complies
100	5500 MHz	16.96	24.00	Complies
116	5580 MHz	19.37	24.00	Complies
140	5700 MHz	18.91	24.00	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	23.46	24.00	Complies
60	5300 MHz	22.71	24.00	Complies
64	5320 MHz	20.23	24.00	Complies
100	5500 MHz	21.36	24.00	Complies
116	5580 MHz	23.91	24.00	Complies
140	5700 MHz	23.56	24.00	Complies

<For Internal Antenna / Ant. 8>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 8
Test Date	Mar. 08, 2011		

Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	17.81	24.00	Complies
60	5300 MHz	14.20	24.00	Complies
64	5320 MHz	12.25	24.00	Complies
100	5500 MHz	14.18	24.00	Complies
116	5580 MHz	17.07	24.00	Complies
140	5700 MHz	15.56	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.67	24.00	Complies
60	5300 MHz	14.94	24.00	Complies
64	5320 MHz	12.89	24.00	Complies
100	5500 MHz	13.77	24.00	Complies
116	5580 MHz	17.06	24.00	Complies
140	5700 MHz	15.39	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	18.60	24.00	Complies
60	5300 MHz	15.24	24.00	Complies
64	5320 MHz	13.13	24.00	Complies
100	5500 MHz	13.82	24.00	Complies
116	5580 MHz	17.34	24.00	Complies
140	5700 MHz	15.32	24.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	23.15	24.00	Complies
60	5300 MHz	19.59	24.00	Complies
64	5320 MHz	17.54	24.00	Complies
100	5500 MHz	18.70	24.00	Complies
116	5580 MHz	21.93	24.00	Complies
140	5700 MHz	20.20	24.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	15.25	24.00	Complies
62	5310 MHz	9.43	24.00	Complies
102	5510MHz	10.25	24.00	Complies
110	5550 MHz	16.39	24.00	Complies
134	5670 MHz	15.64	24.00	Complies

Configuration IEEE 802.11nMCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	16.30	24.00	Complies
62	5310 MHz	9.67	24.00	Complies
102	5510MHz	10.39	24.00	Complies
110	5550 MHz	16.2	24.00	Complies
134	5670 MHz	15.8	24.00	Complies

Configuration IEEE 802.11nMCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	15.99	24.00	Complies
62	5310 MHz	10.47	24.00	Complies
102	5510MHz	10.7	24.00	Complies
110	5550 MHz	16.1	24.00	Complies
134	5670 MHz	15.65	24.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
54	5270 MHz	20.64	24.00	Complies
62	5310 MHz	14.65	24.00	Complies
102	5510MHz	15.22	24.00	Complies
110	5550 MHz	21.00	24.00	Complies
134	5670 MHz	20.47	24.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 8
Test Date	Mar. 08, 2011		

Configuration IEEE 802.11a Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	16.51	24.00	Complies
60	5300 MHz	13.35	24.00	Complies
64	5320 MHz	11.13	24.00	Complies
100	5500 MHz	11.58	24.00	Complies
116	5580 MHz	16.50	24.00	Complies
140	5700 MHz	15.07	24.00	Complies

Configuration IEEE 802.11a Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	17.96	24.00	Complies
60	5300 MHz	13.88	24.00	Complies
64	5320 MHz	11.62	24.00	Complies
100	5500 MHz	11.69	24.00	Complies
116	5580 MHz	16.49	24.00	Complies
140	5700 MHz	14.34	24.00	Complies

Configuration IEEE 802.11a Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	17.78	24.00	Complies
60	5300 MHz	14.21	24.00	Complies
64	5320 MHz	11.72	24.00	Complies
100	5500 MHz	12.12	24.00	Complies
116	5580 MHz	16.88	24.00	Complies
140	5700 MHz	14.73	24.00	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
52	5260 MHz	22.23	24.00	Complies
60	5300 MHz	18.60	24.00	Complies
64	5320 MHz	16.27	24.00	Complies
100	5500 MHz	16.57	24.00	Complies
116	5580 MHz	21.40	24.00	Complies
140	5700 MHz	19.49	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 GHz	11

4.4.2. Measuring Instruments and Setting

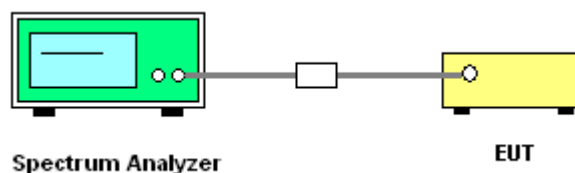
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 3000kHz. Set Detector to Peak, Trace to Max Hold. Mark the frequency with maximum peak power as the center of the display of the spectrum.
3. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

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

<For External Antenna / Ant. 5>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 5

Configuration IEEE 802.11n MCS8 20MHz

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5260 MHz	0.63	1.01	0.78	5.58	11.00	Complies
5300 MHz	1.57	1.64	2.04	6.53	11.00	Complies
5320 MHz	-2.11	-0.88	0.04	3.88	11.00	Complies
5500 MHz	1.09	1.08	1.88	6.14	11.00	Complies
5580 MHz	1.52	0.89	1.48	6.08	11.00	Complies
5700 MHz	0.72	0.58	1.40	5.69	11.00	Complies

Configuration IEEE 802.11n MCS8 40MHz

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5270 MHz	-1.72	-3.16	-3.33	2.10	11.00	Complies
5310 MHz	-7.47	-7.30	-7.08	-2.51	11.00	Complies
5510MHz	-7.41	-7.55	-6.80	-2.47	11.00	Complies
5550 MHz	-2.45	-2.51	-1.46	2.66	11.00	Complies
5670 MHz	-3.34	-3.50	-2.95	1.51	11.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 5

Configuration IEEE 802.11a

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5260 MHz	3.13	3.00	2.97	7.81	8.03	Complies
5300 MHz	3.04	2.26	2.22	7.29	8.03	Complies
5320 MHz	1.79	0.82	0.87	5.95	8.03	Complies
5500 MHz	2.50	3.46	2.97	7.77	8.03	Complies
5580 MHz	2.95	2.96	2.97	7.73	8.03	Complies
5700 MHz	1.16	1.48	0.70	5.90	8.03	Complies

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

For plots, only the worse case of OFDM modulation was listed in the report.

<For External Antenna / Ant. 6>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 6

Configuration IEEE 802.11n MCS8 20MHz

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5260 MHz	1.25	1.40	1.28	6.08	11.00	Complies
5300 MHz	1.51	1.41	1.23	6.16	11.00	Complies
5320 MHz	-2.11	-0.88	0.04	3.88	11.00	Complies
5500 MHz	-1.22	-0.59	-0.12	4.15	11.00	Complies
5580 MHz	1.52	0.89	1.48	6.08	11.00	Complies
5700 MHz	0.72	0.58	1.40	5.69	11.00	Complies

Configuration IEEE 802.11n MCS8 40MHz

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5270 MHz	-2.21	-2.20	-3.90	2.07	11.00	Complies
5310 MHz	-8.52	-8.70	-8.46	-3.79	11.00	Complies
5510MHz	-8.03	-8.09	-7.16	-2.97	11.00	Complies
5550 MHz	-2.61	-3.51	-2.27	2.01	11.00	Complies
5670 MHz	-3.34	-3.50	-2.95	1.51	11.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 6

Configuration IEEE 802.11a

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5260 MHz	3.13	3.00	2.97	7.81	9.53	Complies
5300 MHz	2.72	2.61	2.30	7.32	9.53	Complies
5320 MHz	-0.39	0.40	0.87	5.10	9.53	Complies
5500 MHz	0.46	1.52	1.33	5.90	9.53	Complies
5580 MHz	2.95	2.96	2.97	7.73	9.53	Complies
5700 MHz	1.10	1.64	1.99	6.36	9.53	Complies

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

For plots, only the worse case of OFDM modulation was listed in the report.

<For Internal Antenna / Ant. 8>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 8

Configuration IEEE 802.11n MCS8 20MHz

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5260 MHz	0.43	0.41	0.38	5.18	11.00	Complies
5300 MHz	-3.50	-3.11	-3.18	1.51	11.00	Complies
5320 MHz	-5.04	-5.89	-5.47	-0.68	11.00	Complies
5500 MHz	-3.65	-3.57	-3.32	1.26	11.00	Complies
5580 MHz	-1.18	-0.89	0.03	4.12	11.00	Complies
5700 MHz	-3.67	-3.82	-3.81	1.01	11.00	Complies

Configuration IEEE 802.11n MCS8 40MHz

Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5270 MHz	-5.02	-5.67	-4.95	-0.43	11.00	Complies
5310 MHz	-9.94	-11.24	-10.53	-5.77	11.00	Complies
5510MHz	-10.79	-11.35	-9.90	-5.87	11.00	Complies
5550 MHz	-5.41	-4.47	-3.74	0.28	11.00	Complies
5670 MHz	-6.59	-7.63	-6.48	-2.10	11.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 8

Configuration IEEE 802.11a

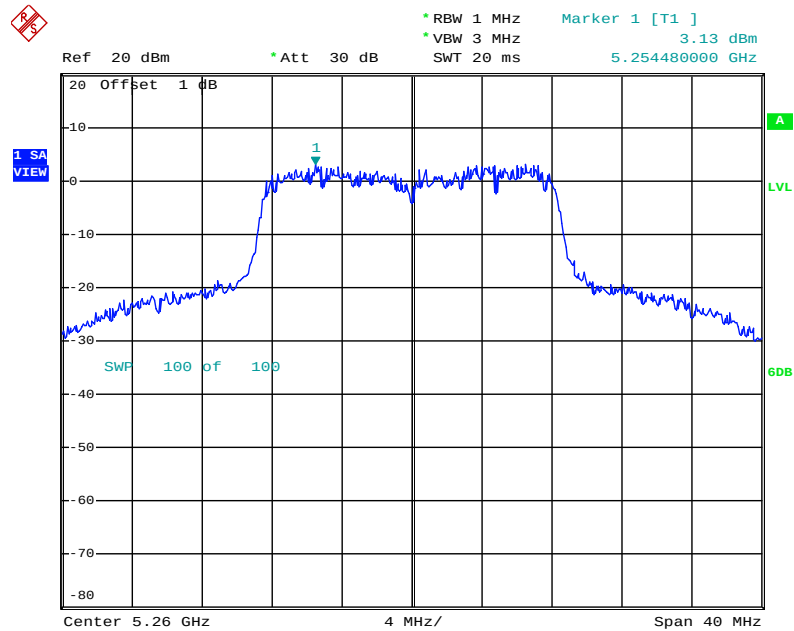
Frequency	Power Density (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Result
	Connector J2	Connector J3	Connector J4			
5260 MHz	0.47	1.28	1.32	5.81	7.73	Complies
5300 MHz	-3.15	-3.57	-2.76	1.62	7.73	Complies
5320 MHz	-4.15	-4.66	-4.38	0.38	7.73	Complies
5500 MHz	-4.76	-4.95	-5.10	-0.16	7.73	Complies
5580 MHz	0.50	1.23	0.92	5.66	7.73	Complies
5700 MHz	-2.30	-2.43	-2.81	2.26	7.73	Complies

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

For plots, only the worse case of OFDM modulation was listed in the report.

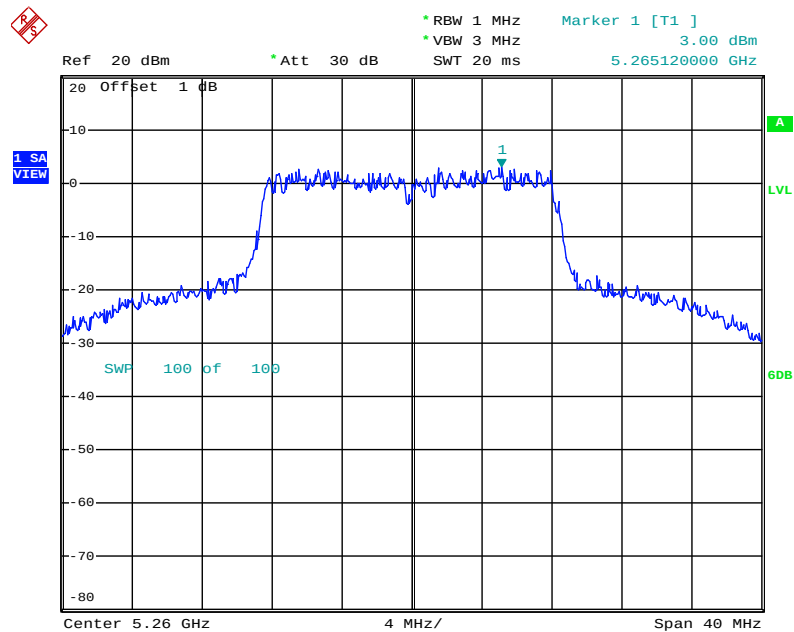
<For External Antenna / Ant. 5>

Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5260 MHz



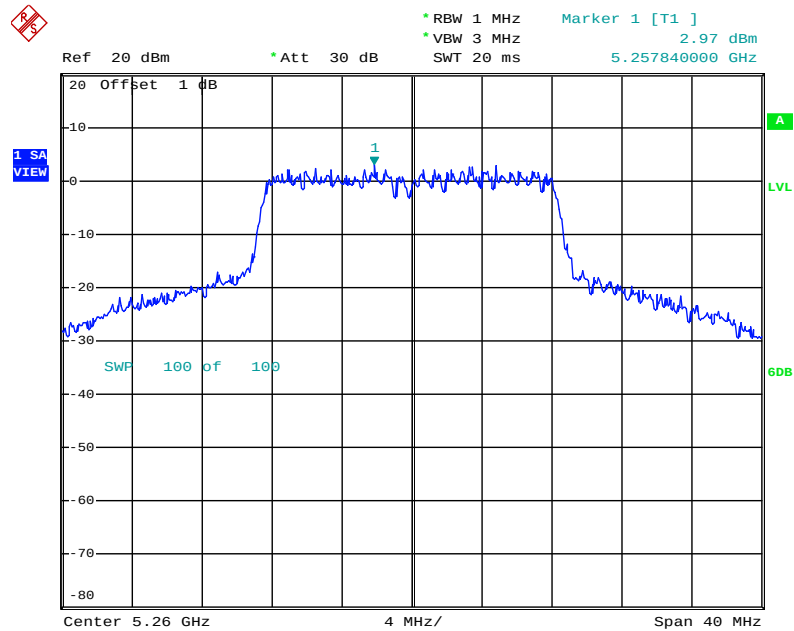
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5260 MHz



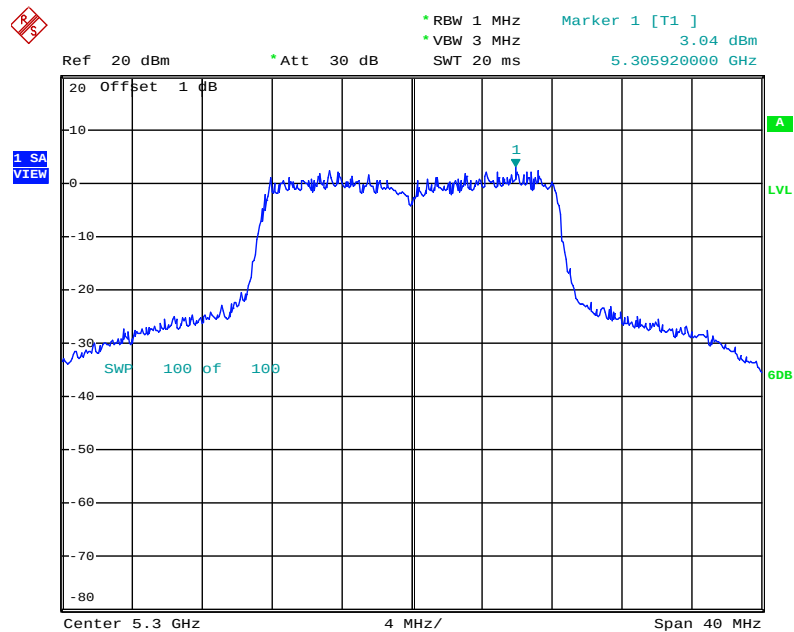
Date: 18.JUN.2011 15:02:42

Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5260 MHz



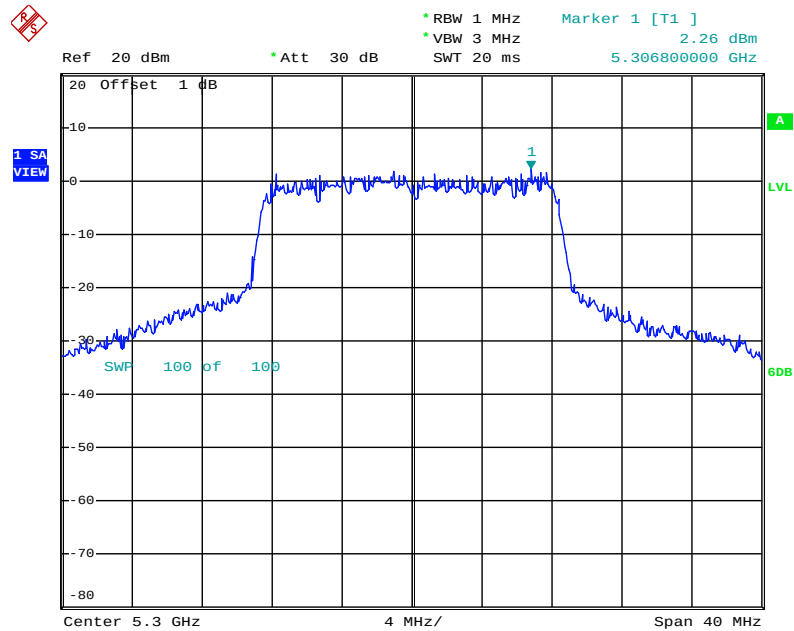
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Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5300 MHz



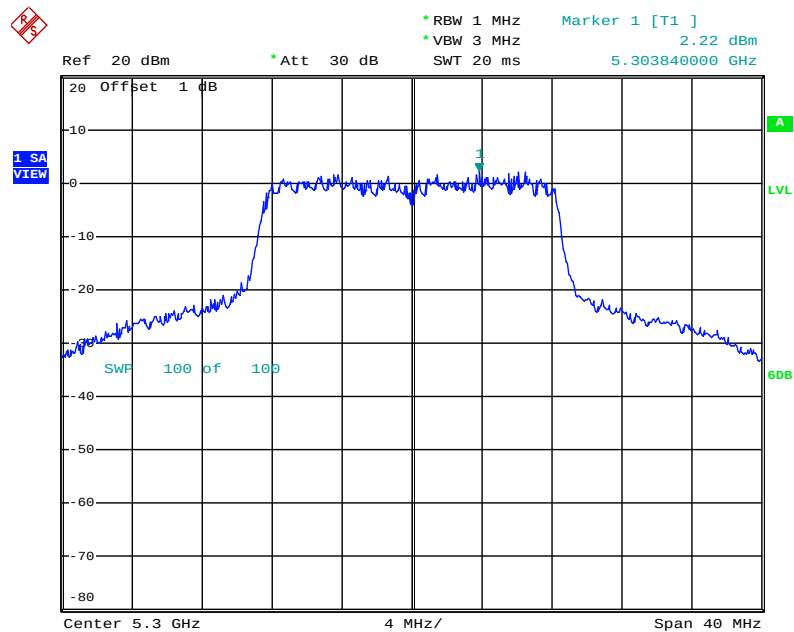
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5300 MHz



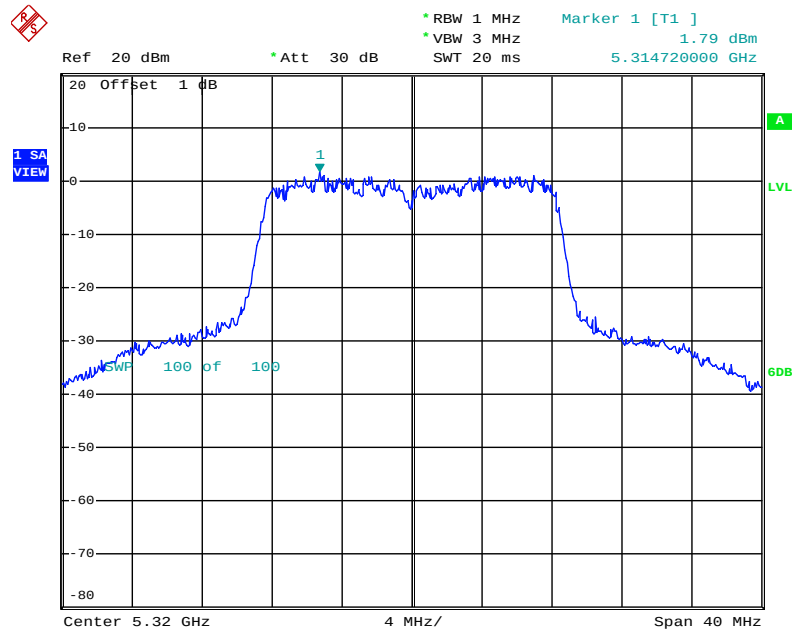
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Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5300 MHz



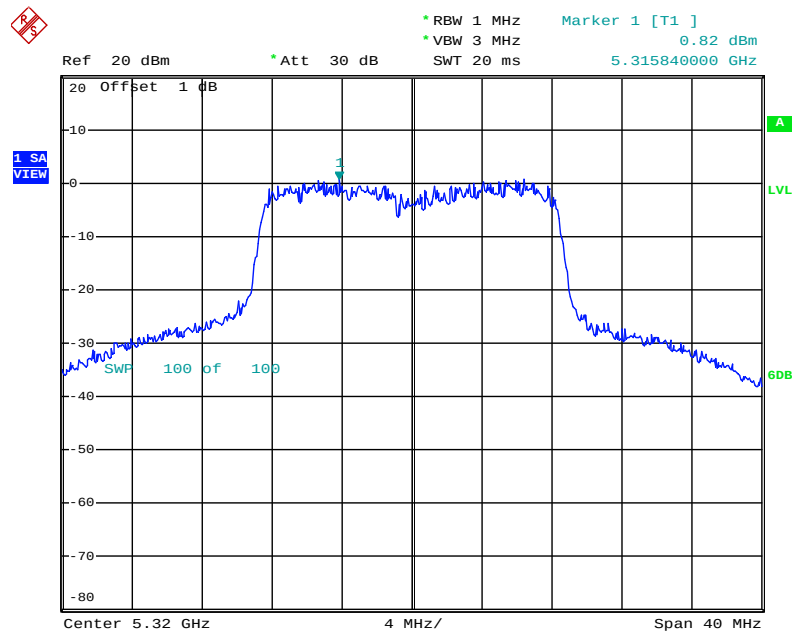
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Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5320 MHz



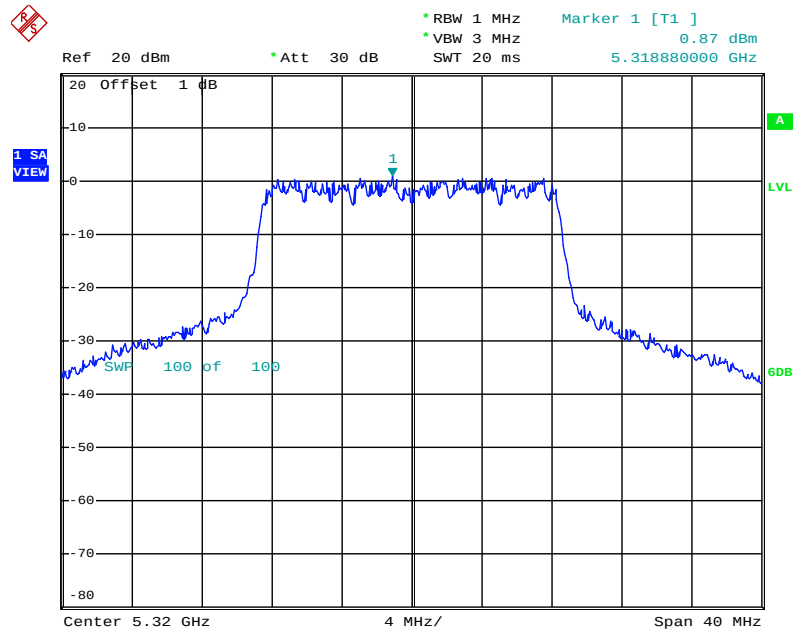
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5320 MHz



Date: 18.JUN.2011 15:08:42

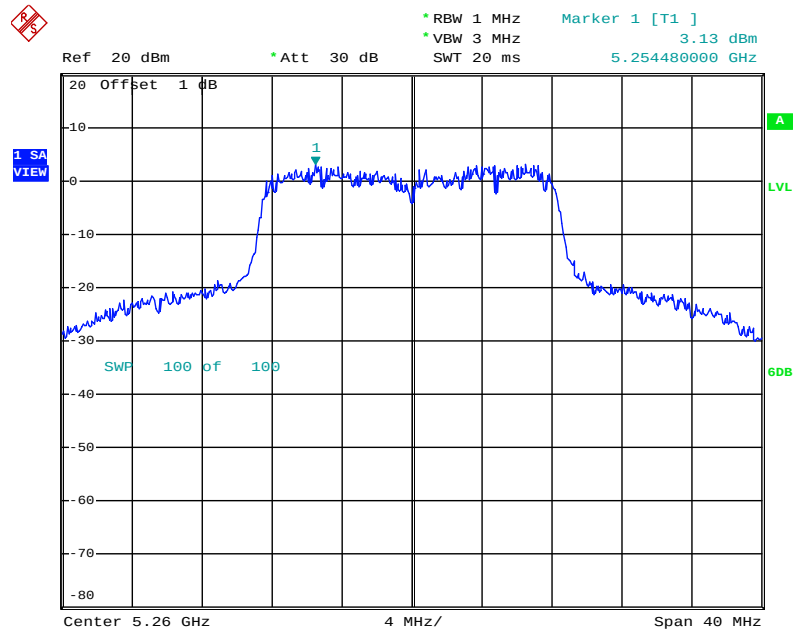
Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5320 MHz



Date: 18.JUN.2011 15:08:19

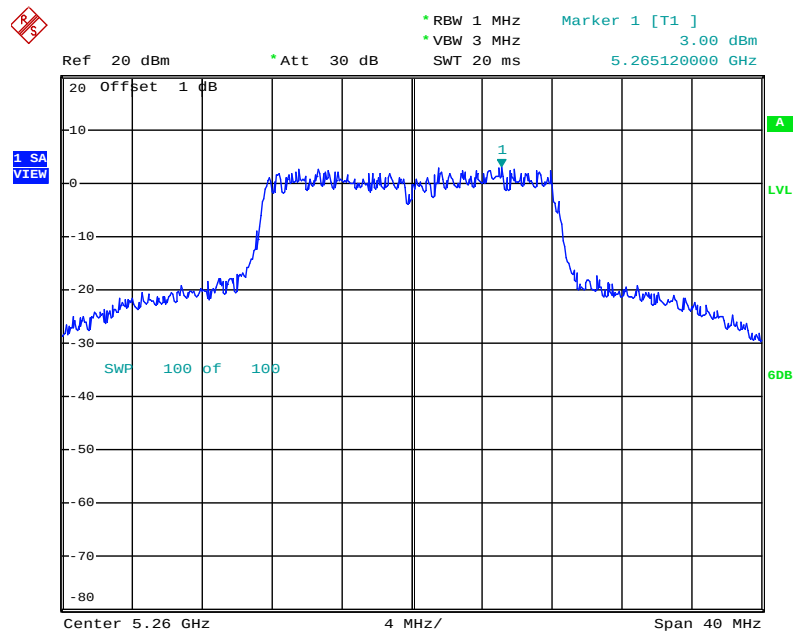
<For External Antenna / Ant. 6>

Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5260 MHz



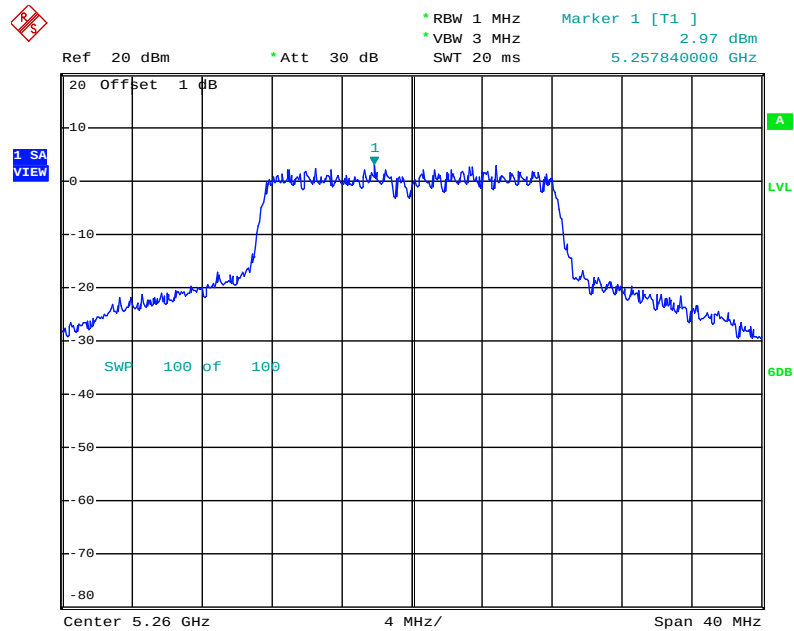
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5260 MHz



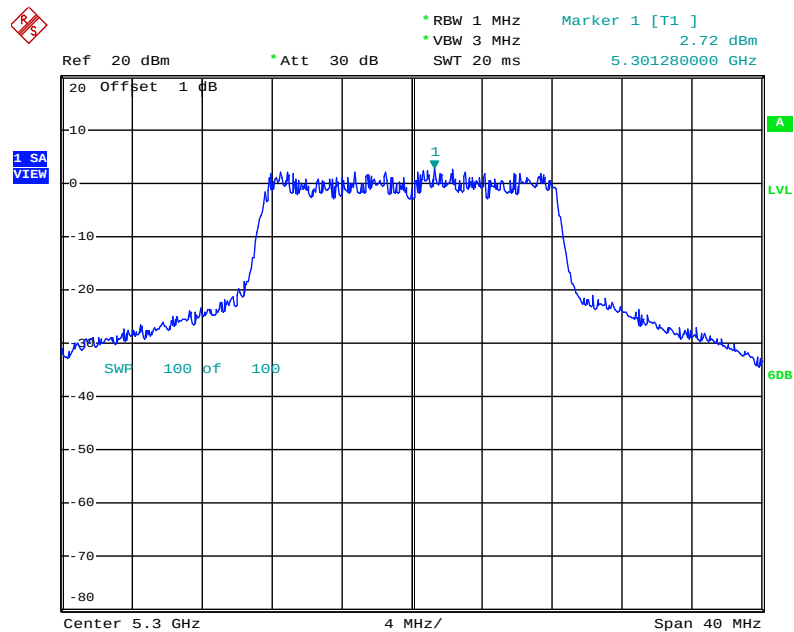
Date: 18.JUN.2011 15:02:42

Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5260 MHz



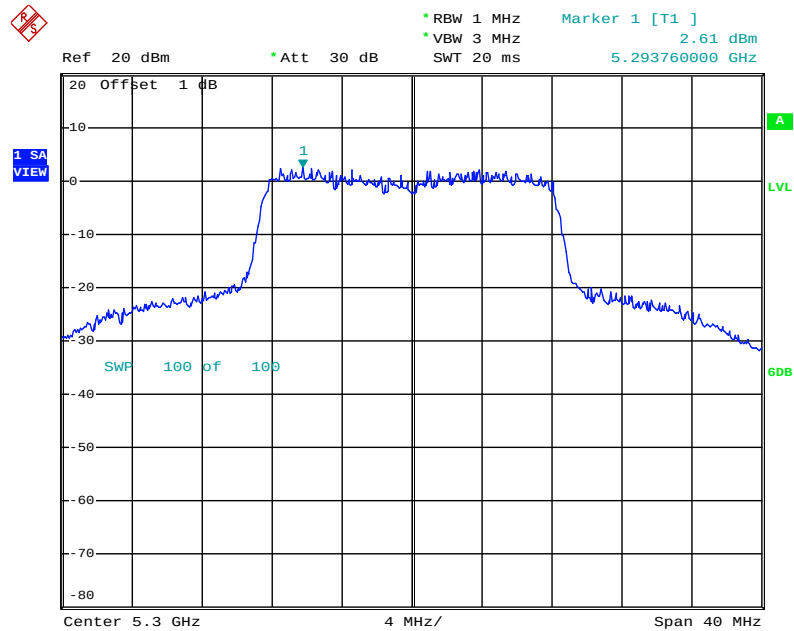
Date: 18.JUN.2011 15:02:09

Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5300 MHz



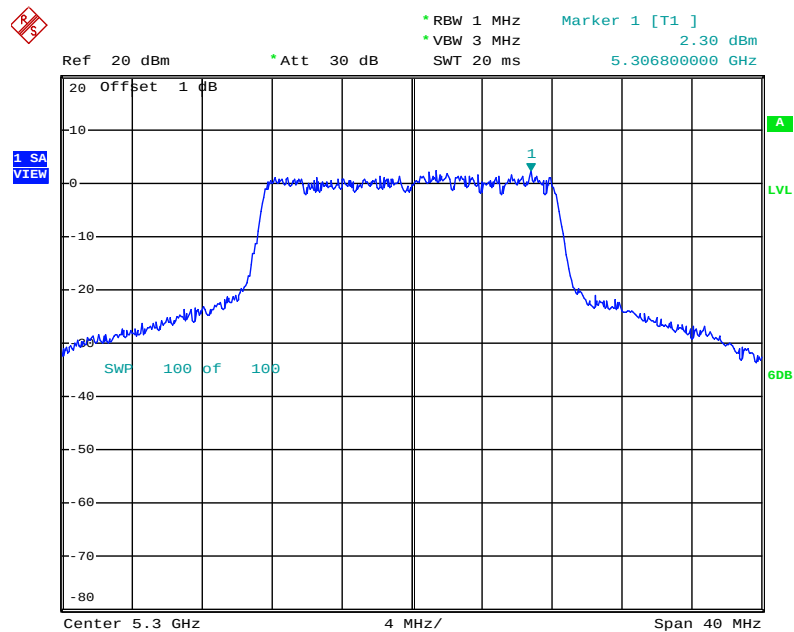
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5300 MHz



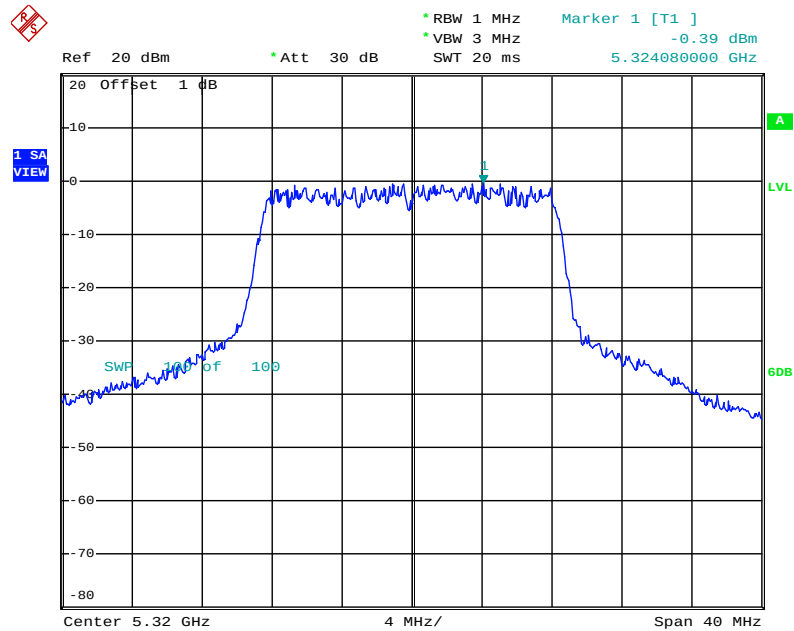
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Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5300 MHz



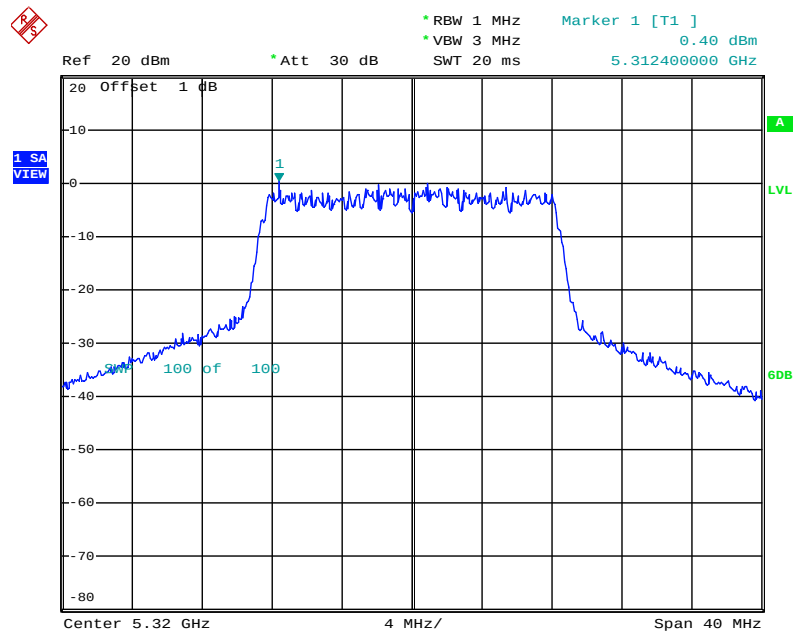
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Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5320 MHz



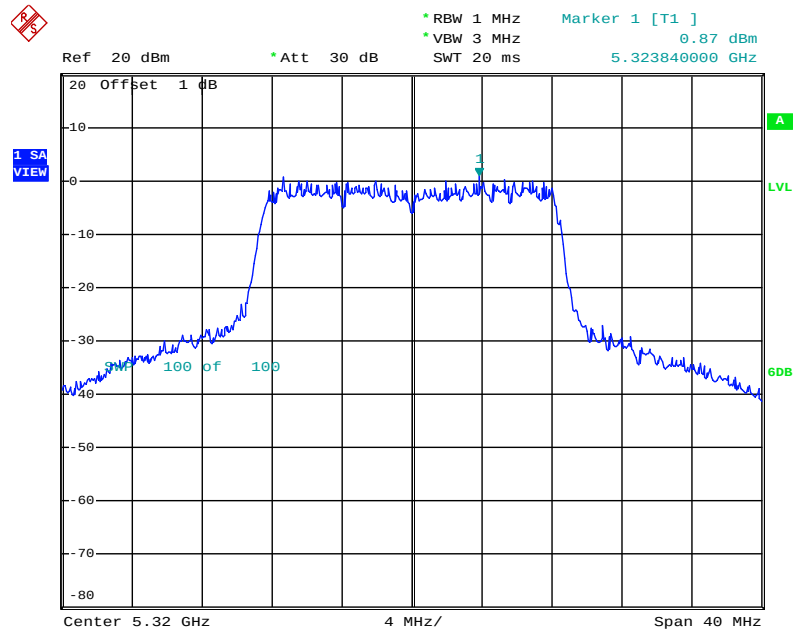
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5320 MHz



Date: 18.JUN.2011 16:40:05

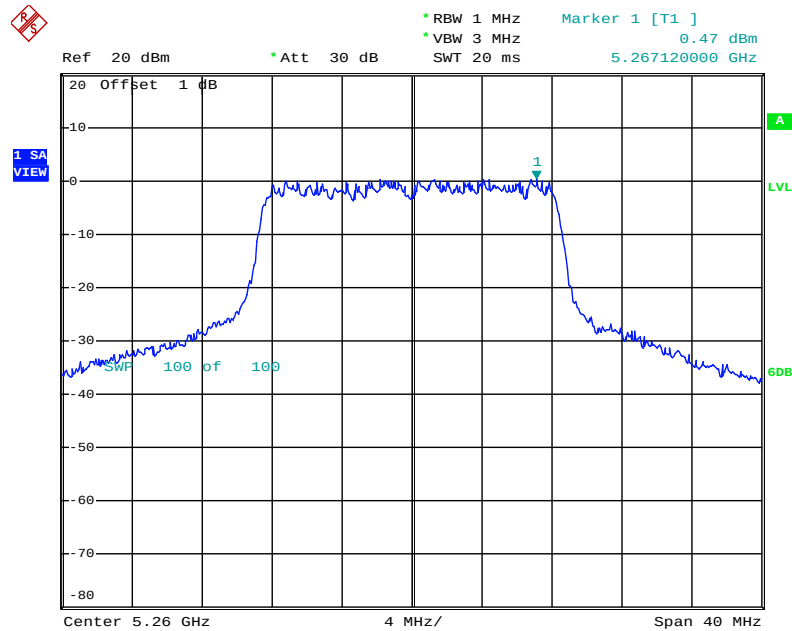
Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5320 MHz



Date: 18.JUN.2011 16:40:24

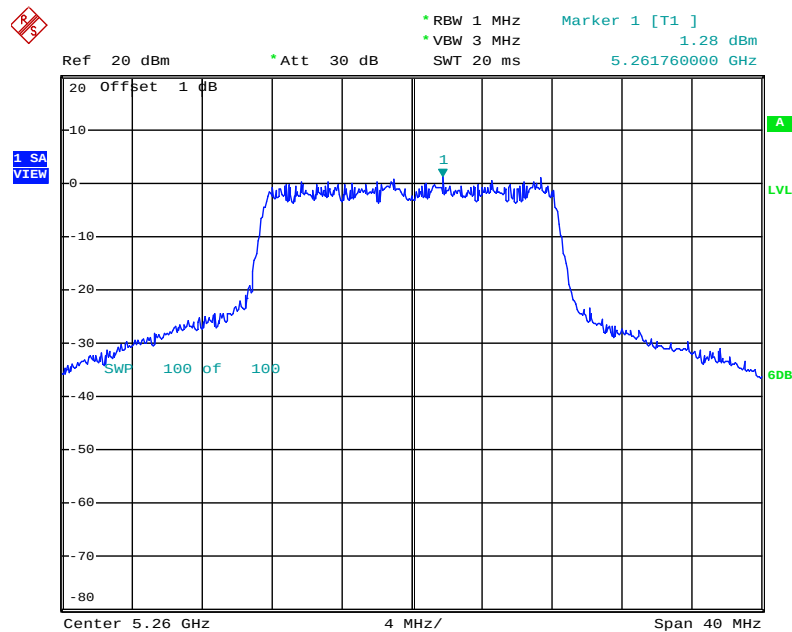
<For Internal Antenna / Ant. 8>

Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5260 MHz



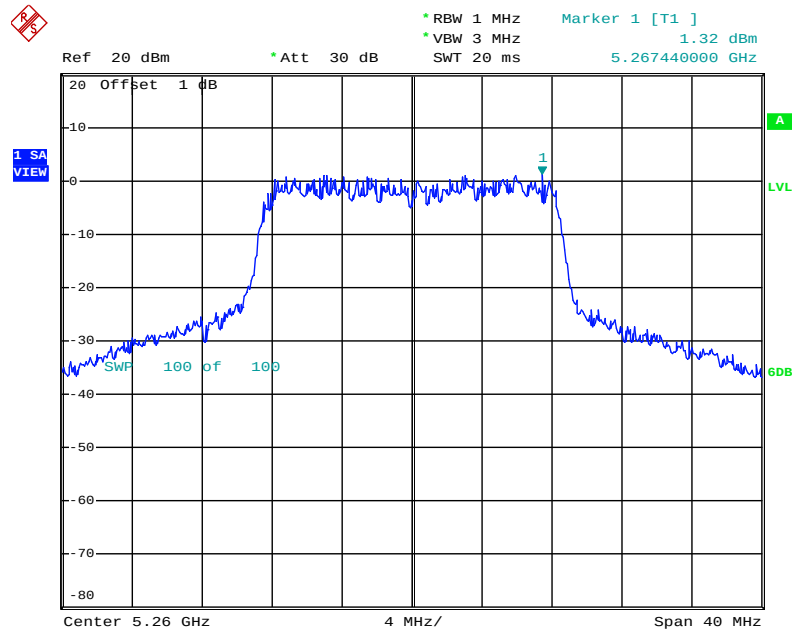
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5260 MHz



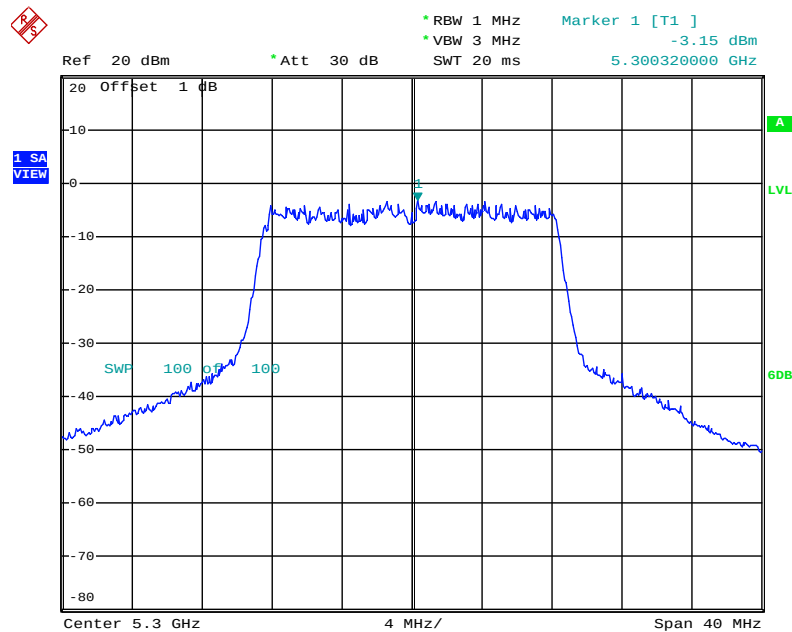
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Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5260 MHz



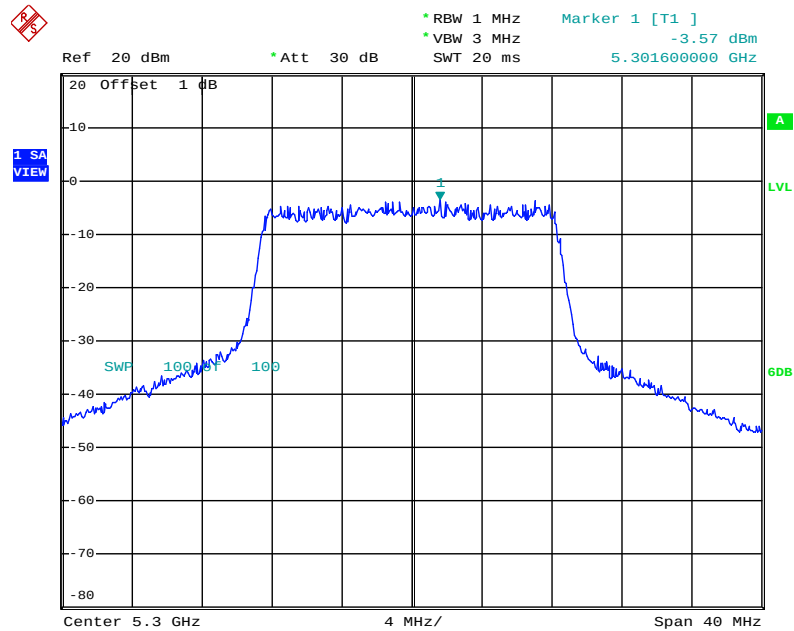
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Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5300 MHz



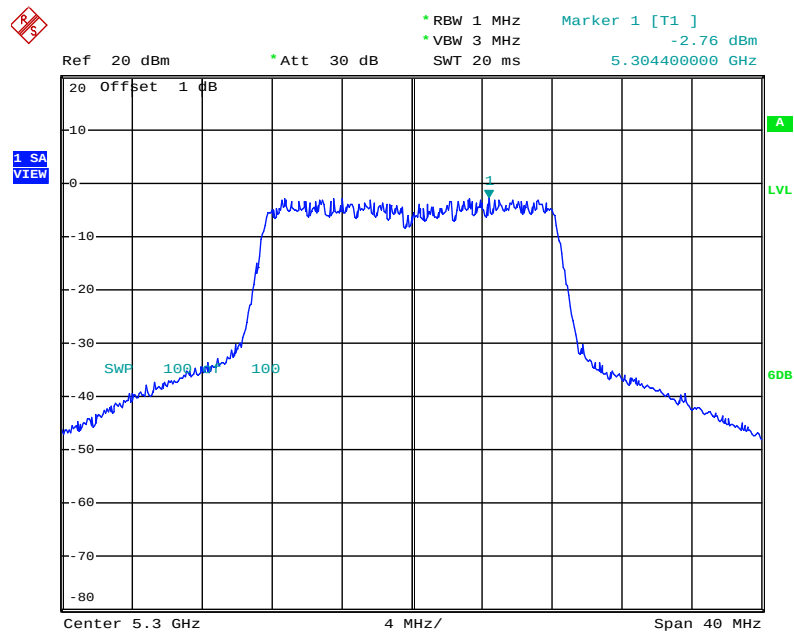
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Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5300 MHz



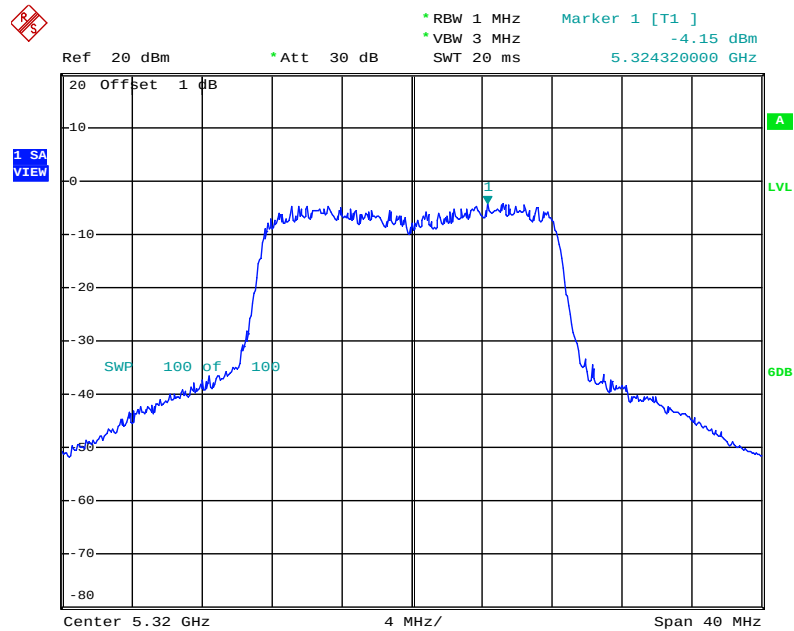
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Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5300 MHz



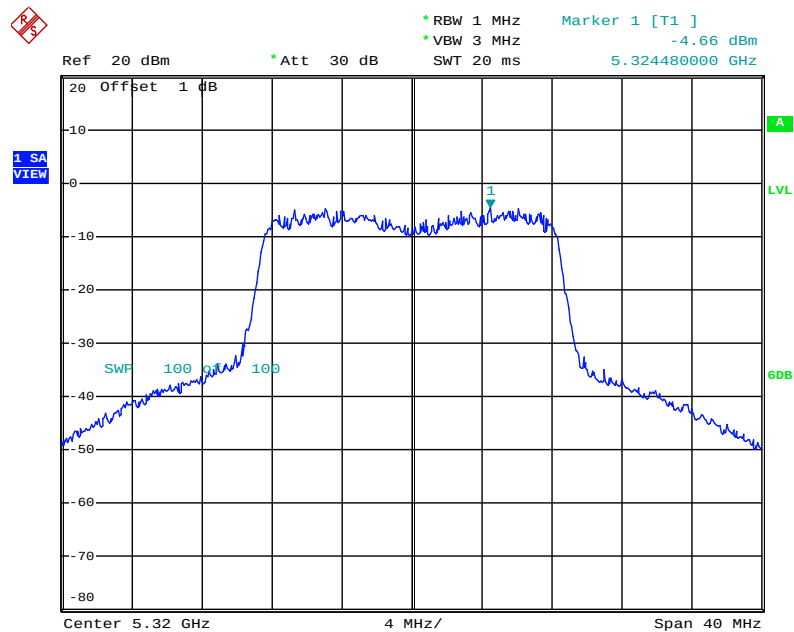
Date: 18.JUN.2011 16:56:32

Power Density Plot on Configuration IEEE 802.11a Connector J2 / 5320 MHz



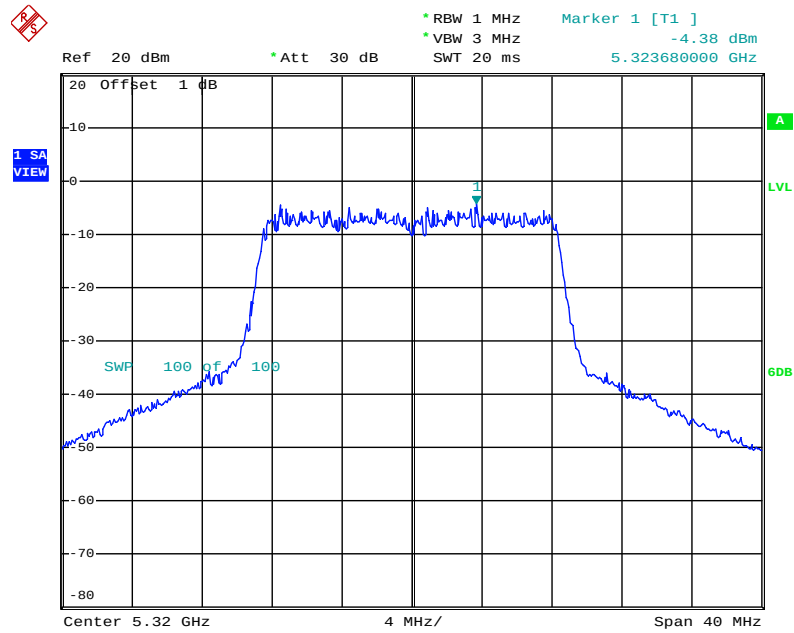
Date: 18.JUN.2011 16:55:35

Power Density Plot on Configuration IEEE 802.11a Connector J3 / 5320 MHz



Date: 18.JUN.2011 16:55:06

Power Density Plot on Configuration IEEE 802.11a Connector J4 / 5320 MHz



Date: 18.JUN.2011 16:55:57

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

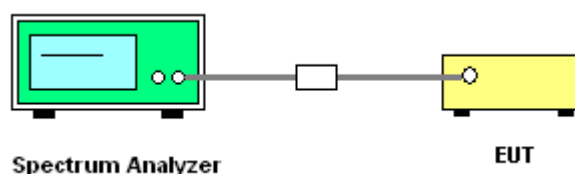
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz (Peak Trace) / 1000 kHz (Average Trace)
VB	3000 kHz (Peak Trace) / 300 kHz (Average Trace)
Detector	Peak (Peak Trace) / Sample (Average Trace)
Trace	Max Hold
Sweep Time	60s

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emissions bandwidth. The largest difference between the following two traces (Peak Trace and Average Trace) must be ≤ 13 dB for all frequencies across the emissions bandwidth. Submit a plot.
3. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and max-hold settings.
4. Average Trace: Method #3—video averaging with max hold--and sum power across the band. Set span to encompass the entire emissions bandwidth (EBW) of the signal. Set sweep trigger to "free run". Set RBW = 1 MHz. Set VBW $\geq 1/T$ (IEEE 802.11nVBW = 300kHz $\geq 1/4\mu$ s). Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode. Set max hold. Allow max hold to run for 60 seconds.
5. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

4.5.4. Test Setup Layout



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

<For External Antenna / Ant. 5>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 5

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	5.17	13	Complies
60	5300 MHz	4.86	13	Complies
64	5320 MHz	4.20	13	Complies
100	5500 MHz	5.20	13	Complies
116	5580 MHz	6.21	13	Complies
140	5700 MHz	5.45	13	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
54	5270 MHz	6.10	13	Complies
62	5310 MHz	6.09	13	Complies
102	5510MHz	5.73	13	Complies
110	5550 MHz	4.78	13	Complies
134	5670 MHz	5.65	13	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 5

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	6.20	13	Complies
60	5300 MHz	5.81	13	Complies
64	5320 MHz	6.36	13	Complies
100	5500 MHz	6.05	13	Complies
116	5580 MHz	5.91	13	Complies
140	5700 MHz	4.73	13	Complies

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

For plots, only the worse case of OFDM modulation was listed in the report.

<For External Antenna / Ant. 6>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 6

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	5.98	13	Complies
60	5300 MHz	4.33	13	Complies
64	5320 MHz	4.20	13	Complies
100	5500 MHz	5.03	13	Complies
116	5580 MHz	6.21	13	Complies
140	5700 MHz	5.45	13	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
54	5270 MHz	5.13	13	Complies
62	5310 MHz	5.89	13	Complies
102	5510MHz	4.97	13	Complies
110	5550 MHz	6.06	13	Complies
134	5670 MHz	5.65	13	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 6

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	6.20	13	Complies
60	5300 MHz	4.80	13	Complies
64	5320 MHz	5.09	13	Complies
100	5500 MHz	5.44	13	Complies
116	5580 MHz	5.91	13	Complies
140	5700 MHz	4.78	13	Complies

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

For plots, only the worse case of OFDM modulation was listed in the report.

<For Internal Antenna / Ant. 8>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 8

Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	5.10	13	Complies
60	5300 MHz	5.73	13	Complies
64	5320 MHz	3.27	13	Complies
100	5500 MHz	6.51	13	Complies
116	5580 MHz	6.54	13	Complies
140	5700 MHz	5.21	13	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
54	5270 MHz	4.62	13	Complies
62	5310 MHz	5.98	13	Complies
102	5510MHz	3.97	13	Complies
110	5550 MHz	5.39	13	Complies
134	5670 MHz	5.49	13	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 8

Configuration IEEE 802.11a Connector J2 + J3 + J4

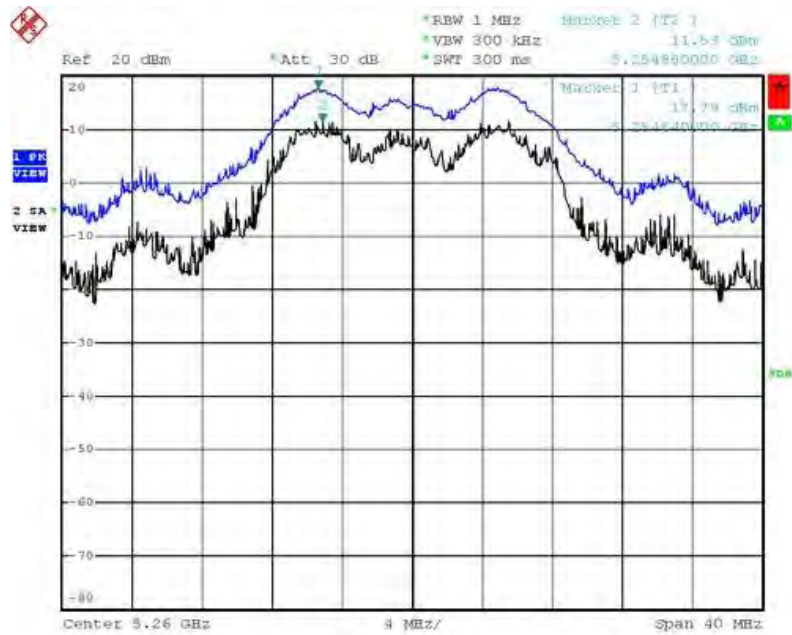
Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
52	5260 MHz	5.18	13	Complies
60	5300 MHz	5.39	13	Complies
64	5320 MHz	5.30	13	Complies
100	5500 MHz	5.85	13	Complies
116	5580 MHz	5.00	13	Complies
140	5700 MHz	5.55	13	Complies

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

For plots, only the worse case of OFDM modulation was listed in the report.

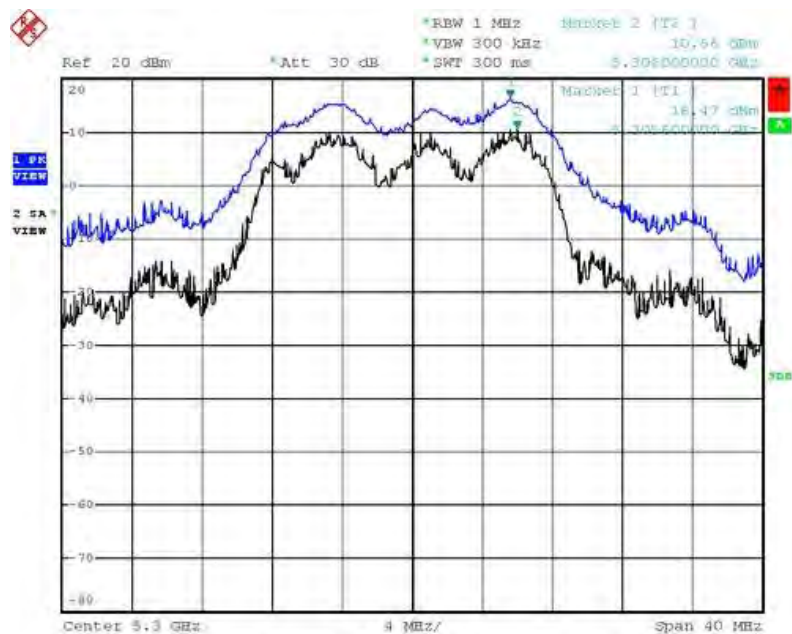
<For External Antenna / Ant. 5>

Peak Excursion Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5260 MHz



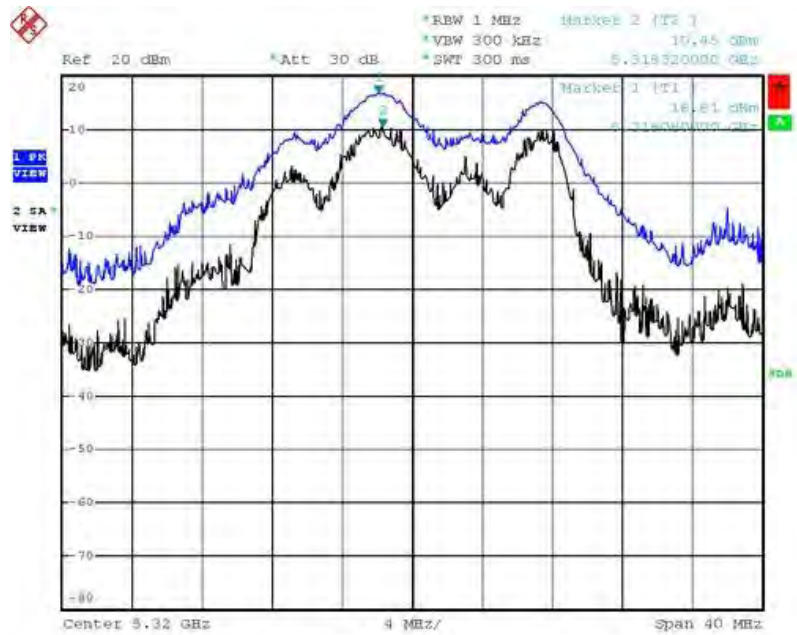
Date: 5.APR.2011 19:33:11

Peak Excursion Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5300 MHz



Date: 10.APR.2011 11:23:37

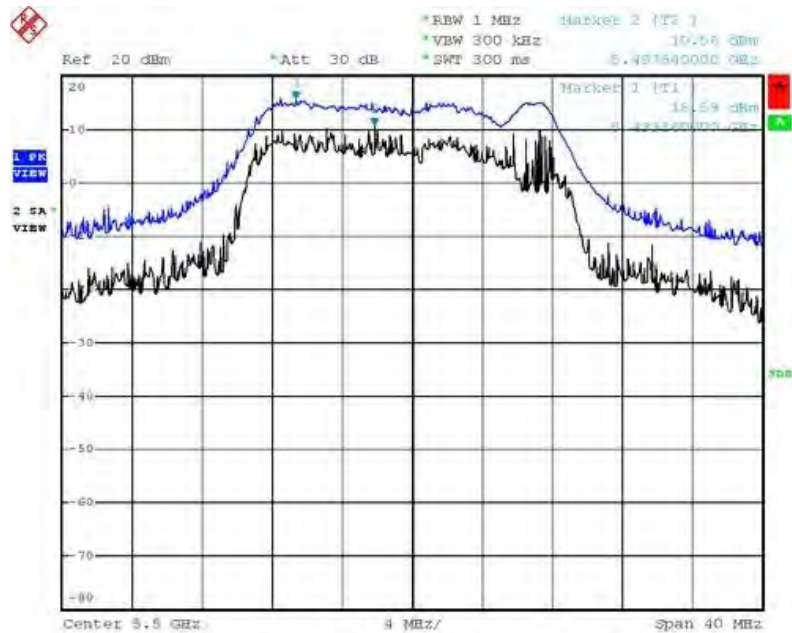
Peak Excursion Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5320 MHz



Date: 10.APR.2011 12:21:09

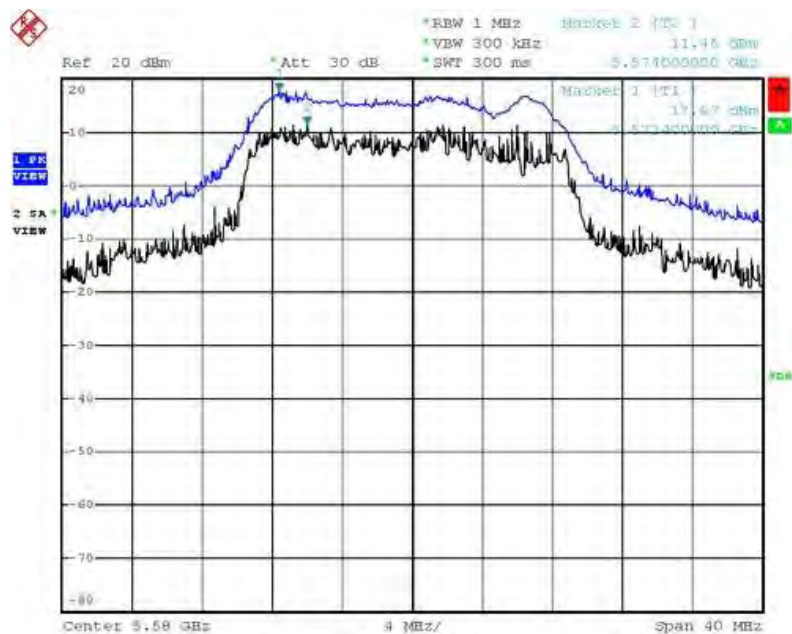
<For External Antenna / Ant. 6>

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5500 MHz



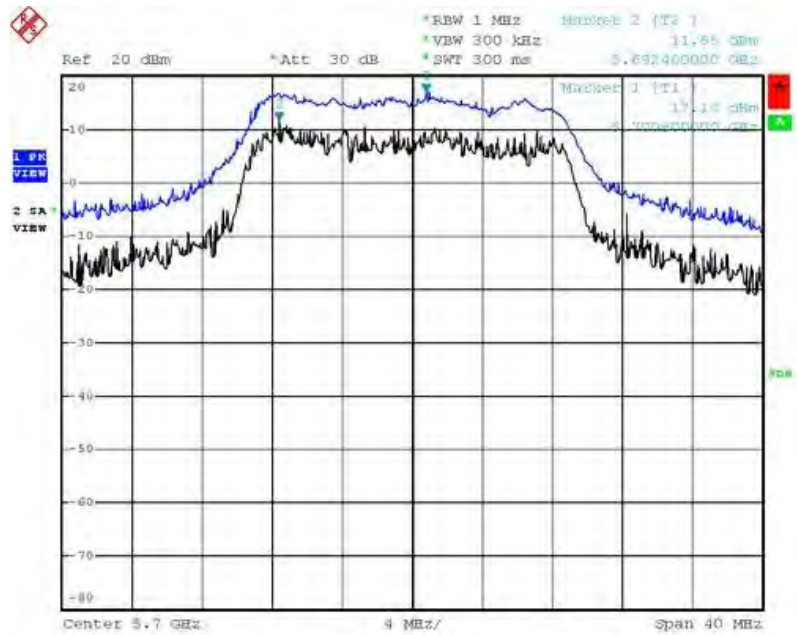
Date: 5.APR.2011 20:03:31

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5580 MHz



Date: 5.APR.2011 20:05:11

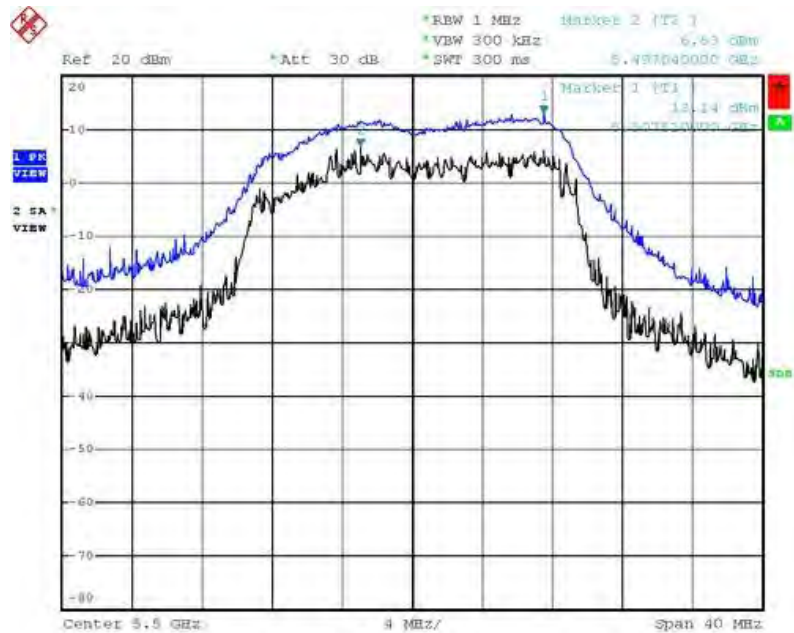
Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5700 MHz



Date: 5.APR.2011 20:06:21

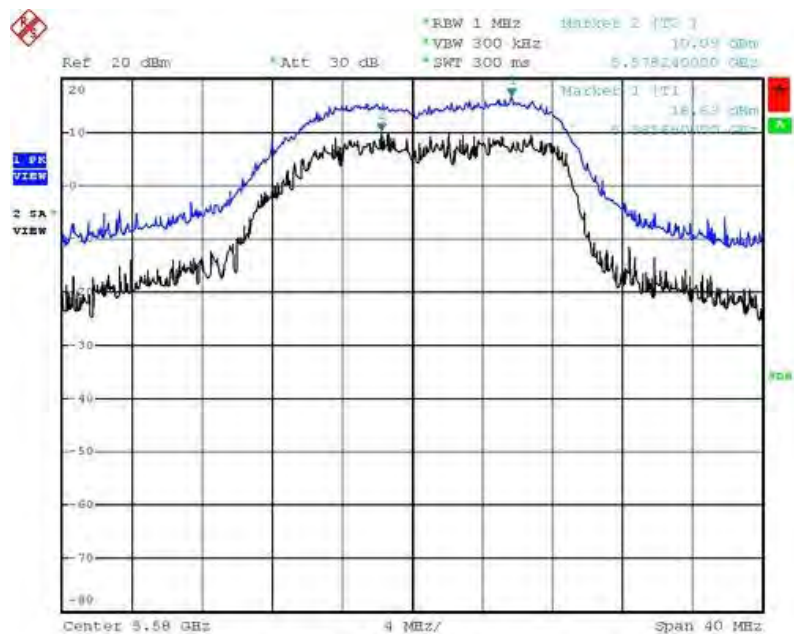
<For Internal Antenna / Ant. 8>

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5500 MHz



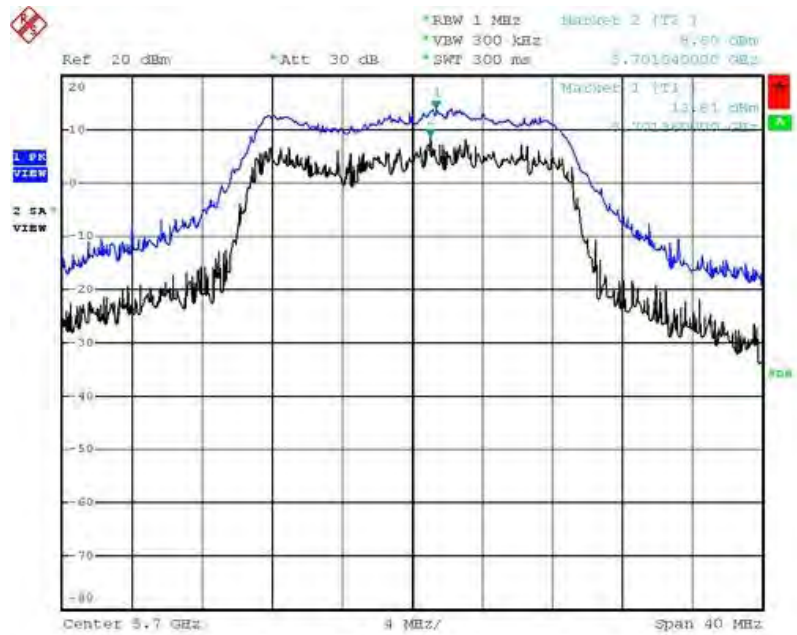
Date: 5.APR.2011 21:40:37

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5580 MHz



Date: 5.APR.2011 21:41:44

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 5700 MHz



Date: 5.APR.2011 21:42:48

4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.25-5.35 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). 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	1 000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

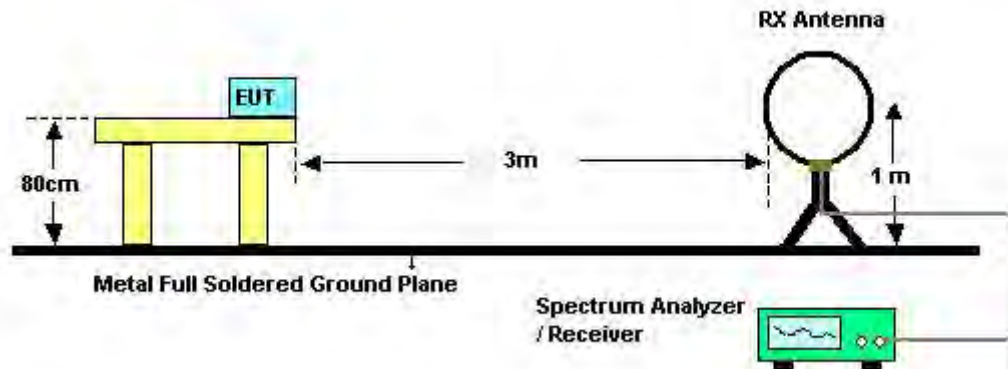
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.6.3. Test Procedures

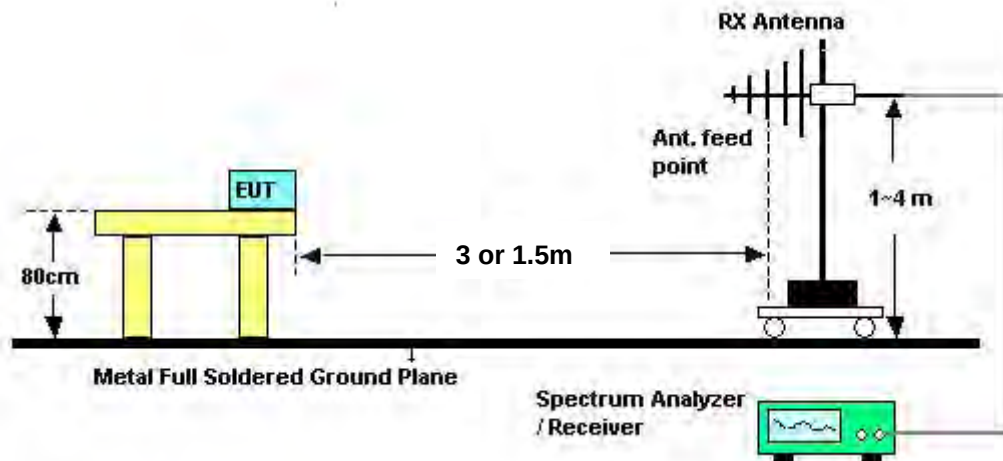
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 30MHz



For radiated emissions above 30MHz



Above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

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	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	Normal Link
Test Date	Mar. 09, 2011		

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.

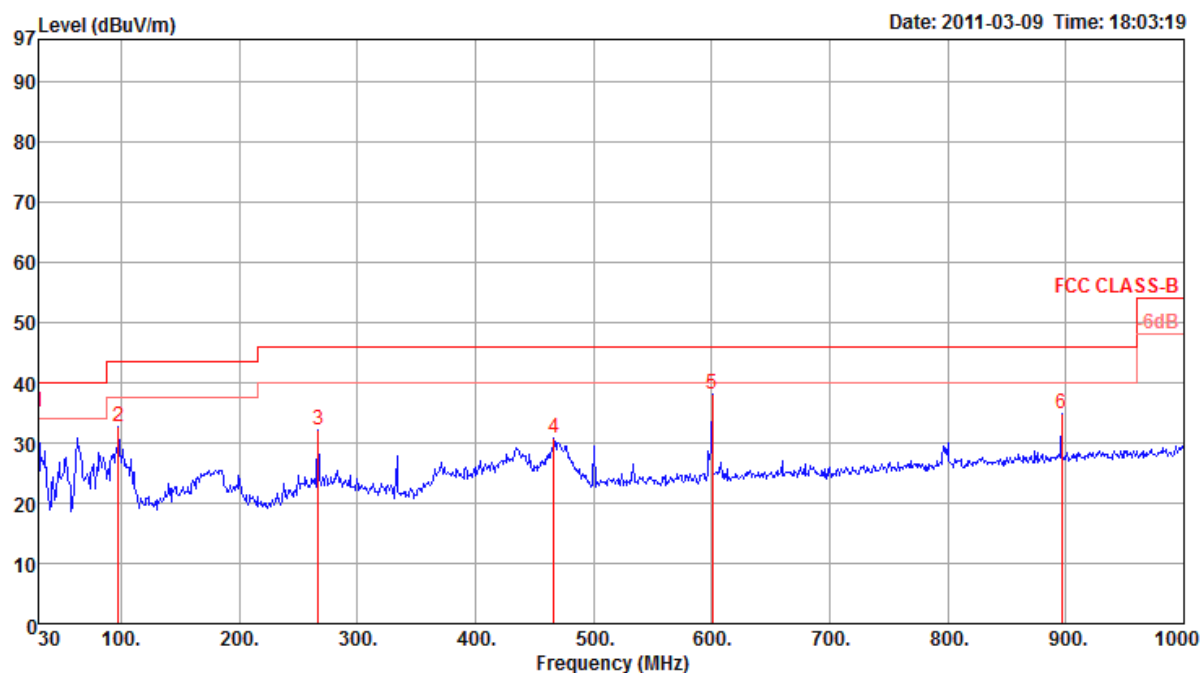
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

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

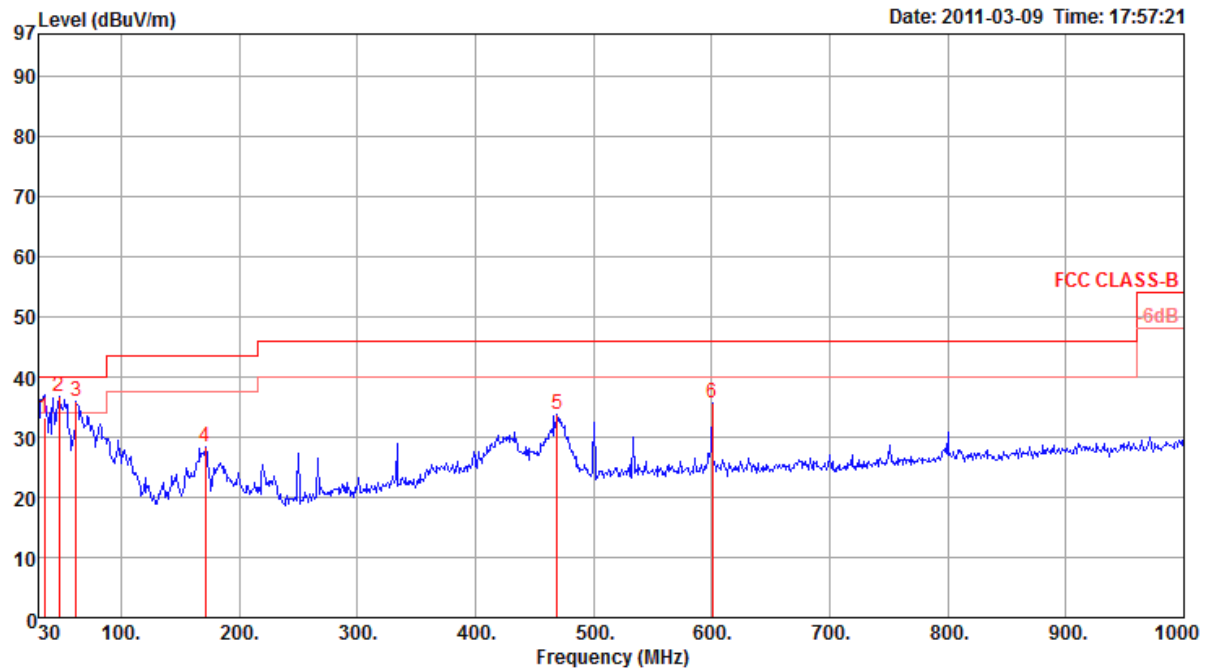
Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	Normal Link / Mode 2

Horizontal



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	30.00	35.03	40.00	-4.97	43.92	0.50	27.80	18.41	0	100	Peak	HORIZONTAL
2	97.90	32.74	43.50	-10.76	48.76	1.16	27.61	10.43	0	100	Peak	HORIZONTAL
3	266.68	32.16	46.00	-13.84	44.23	1.97	26.97	12.93	0	100	Peak	HORIZONTAL
4	466.50	30.81	46.00	-15.19	38.99	2.63	27.93	17.12	0	100	Peak	HORIZONTAL
5	600.36	38.12	46.00	-7.88	44.50	2.90	28.10	18.82	0	100	Peak	HORIZONTAL
6	896.21	34.84	46.00	-11.16	37.53	3.58	27.41	21.14	0	100	Peak	HORIZONTAL

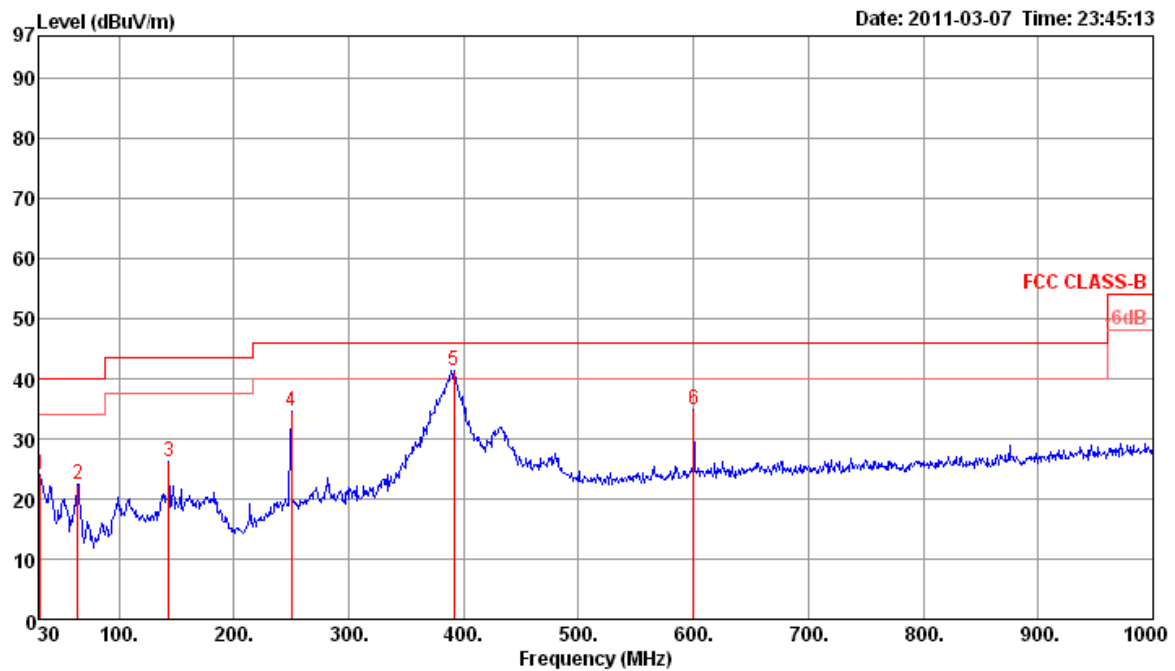
Vertical



		Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	deg	cm		
1	q	34.85	33.30	40.00	-6.70	45.27	0.50	27.80	15.33	256	135	QP	VERTICAL
2	p	47.46	36.87	40.00	-3.13	55.47	0.70	27.80	8.50	0	400	Peak	VERTICAL
3	!	62.01	36.03	40.00	-3.97	56.67	0.84	27.75	6.27	0	400	Peak	VERTICAL
4		171.62	28.37	43.50	-15.13	44.73	1.56	27.24	9.32	0	400	Peak	VERTICAL
5		469.41	33.86	46.00	-12.14	42.01	2.64	27.95	17.16	0	400	Peak	VERTICAL
6		600.36	35.78	46.00	-10.22	42.16	2.90	28.10	18.82	0	400	Peak	VERTICAL

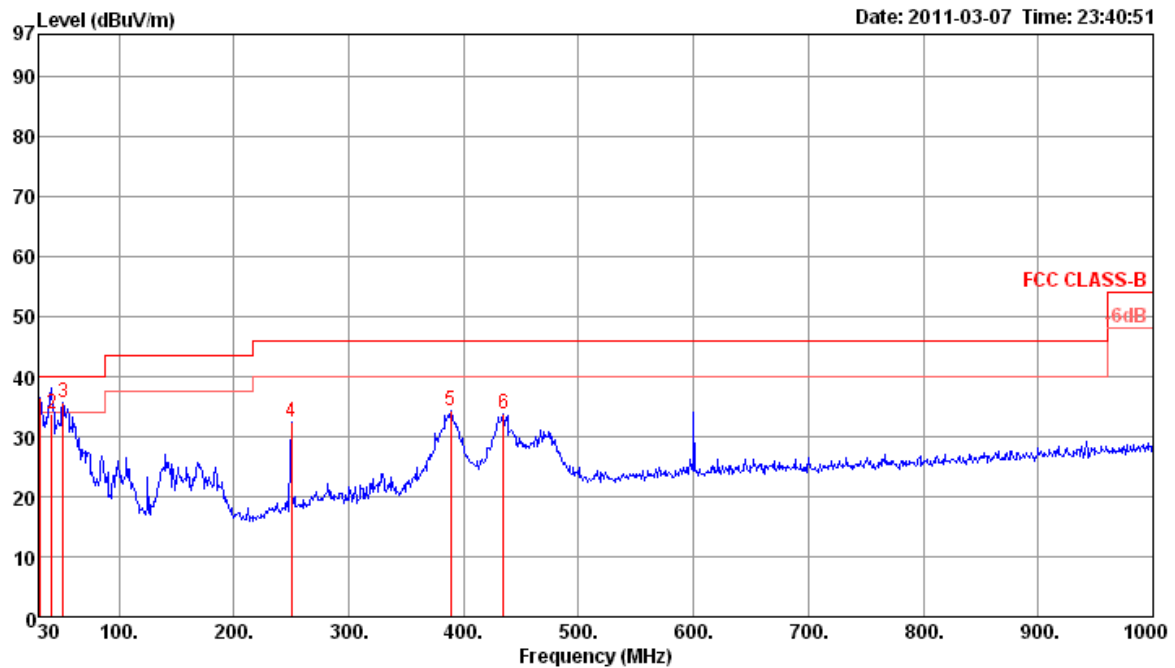
Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	Normal Link / Mode 4

Horizontal



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1	31.94	24.02	40.00	-15.98	33.63	0.50	27.80	17.69	0	100	Peak	HORIZONTAL
2	63.95	22.54	40.00	-17.46	42.68	0.88	27.74	6.72	0	100	Peak	HORIZONTAL
3	143.49	26.10	43.50	-17.40	39.89	1.42	27.38	12.17	0	100	Peak	HORIZONTAL
4	250.19	34.53	46.00	-11.47	46.86	1.90	27.00	12.77	0	100	Peak	HORIZONTAL
5 p	391.81	41.35	46.00	-4.65	50.77	2.28	27.55	15.85	0	100	Peak	HORIZONTAL
6	600.36	34.72	46.00	-11.28	41.15	2.90	28.10	18.77	0	100	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit	Over	Read	Cable	Preamp	Antenna	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm		
1 p	30.97	36.59	40.00	-3.41	45.67	0.50	27.80	18.22	0	400	Peak	VERTICAL
2 q	41.63	33.89	40.00	-6.11	49.00	0.70	27.80	11.99	178	100	QP	VERTICAL
3 !	51.34	35.66	40.00	-4.34	54.38	0.72	27.79	8.35	0	400	Peak	VERTICAL
4	250.19	32.53	46.00	-13.47	44.86	1.90	27.00	12.77	0	400	Peak	VERTICAL
5	388.90	34.33	46.00	-11.67	43.80	2.28	27.52	15.77	0	400	Peak	VERTICAL
6	434.49	33.70	46.00	-12.30	42.36	2.51	27.77	16.60	0	400	Peak	VERTICAL

Note:

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

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

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

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

<For External Antenna / Ant. 5>

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 52 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	15779.93	61.11	80.00	-18.89	52.98	6.14	37.41	35.42	239	100 Peak	HORIZONTAL
2	15780.50	49.22	60.00	-10.78	41.09	6.14	37.41	35.42	239	100 Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	15780.10	57.78	80.00	-22.22	49.65	6.14	37.41	35.42	204	100 Peak	VERTICAL
2	15780.44	45.13	60.00	-14.87	37.00	6.14	37.41	35.42	204	100 Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 60 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10600.00	56.62	60.00	-3.38	48.65	5.01	38.38	35.42	293	100 Average	HORIZONTAL
2	10600.00	68.72	80.00	-11.28	60.75	5.01	38.38	35.42	293	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10600.00	53.91	60.00	-6.09	45.94	5.01	38.38	35.42	293	104 Average	VERTICAL
2	10600.00	65.61	80.00	-14.39	57.64	5.01	38.38	35.42	293	104 Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 64 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10639.59	50.23	60.00	-9.77	42.24	5.01	38.37	35.39	293	100 Average	HORIZONTAL
2	10640.32	64.28	80.00	-15.72	56.29	5.01	38.37	35.39	293	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10639.69	59.77	80.00	-20.23	51.78	5.01	38.37	35.39	293	100 Peak	VERTICAL
2	10640.07	46.09	60.00	-13.91	38.10	5.01	38.37	35.39	293	100 Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 100 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.83	62.66	80.00	-17.34	54.43	5.01	38.32	35.10	240	100	Peak	HORIZONTAL
2	10999.85	46.12	60.00	-13.88	37.89	5.01	38.32	35.10	240	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.53	40.76	60.00	-19.24	32.55	5.01	38.30	35.10	289	100	Average	VERTICAL
2	11000.38	53.89	80.00	-26.11	45.68	5.01	38.30	35.10	289	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 116 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11159.74	53.99	60.00	-6.01	45.65	5.04	38.47	35.17	232	100	Average	HORIZONTAL
2	11159.79	65.63	80.00	-14.37	57.29	5.04	38.47	35.17	232	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11159.92	65.49	80.00	-14.51	57.15	5.04	38.47	35.17	287	100	Peak	VERTICAL
2	11160.41	52.69	60.00	-7.31	44.35	5.04	38.47	35.17	287	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 140 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11400.37	55.14	60.00	-4.86	46.59	5.10	38.70	35.25	291	100	Average	HORIZONTAL
2	11400.47	68.48	80.00	-11.52	59.93	5.10	38.70	35.25	291	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.91	63.56	80.00	-16.44	55.01	5.10	38.70	35.25	240	100	Peak	VERTICAL
2	11400.15	51.02	60.00	-8.98	42.47	5.10	38.70	35.25	240	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 54 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15810.08	42.16	60.00	-17.84	34.06	6.14	37.39	35.43	238	100	Average	HORIZONTAL
2	15810.50	54.41	80.00	-25.59	46.33	6.14	37.37	35.43	238	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15809.67	51.88	80.00	-28.12	43.78	6.14	37.39	35.43	230	100	Peak	VERTICAL
2	15809.92	39.85	60.00	-20.15	31.75	6.14	37.39	35.43	230	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 62 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10619.59	44.21	60.00	-15.79	36.24	5.01	38.38	35.42	293	100	Average	HORIZONTAL
2	10619.99	58.77	80.00	-21.23	50.80	5.01	38.38	35.42	293	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10619.83	54.57	80.00	-25.43	46.60	5.01	38.38	35.42	260	100	Peak	VERTICAL
2	10620.30	40.33	60.00	-19.67	32.36	5.01	38.38	35.42	260	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 102 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11019.55	42.05	60.00	-17.95	33.81	5.02	38.33	35.11	240	100	Average	HORIZONTAL
2	11019.96	59.40	80.00	-20.60	51.16	5.02	38.33	35.11	240	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11019.57	38.54	60.00	-21.46	30.31	5.02	38.32	35.11	152	100	Average	VERTICAL
2	11019.80	52.39	80.00	-27.61	44.16	5.02	38.32	35.11	152	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 110 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11099.64	59.59	80.00	-20.41	51.30	5.03	38.40	35.14	245	100	Peak	HORIZONTAL
2	11100.50	46.44	60.00	-13.56	38.15	5.03	38.40	35.14	245	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11099.82	59.23	80.00	-20.77	50.94	5.03	38.40	35.14	154	150	Peak	VERTICAL
2	11100.31	42.77	60.00	-17.23	34.48	5.03	38.40	35.14	154	150	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 134 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11339.78	66.93	80.00	-13.07	58.46	5.08	38.63	35.24	124	103	Peak	HORIZONTAL
2	11340.08	52.26	60.00	-7.74	43.79	5.08	38.63	35.24	124	103	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11339.87	62.59	80.00	-17.41	54.12	5.08	38.63	35.24	290	100	Peak	VERTICAL
2	11340.29	48.07	60.00	-11.93	39.59	5.09	38.63	35.24	290	100	Average	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.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 52 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15780.27	65.01	80.00	-14.99	56.88	6.14	37.41	35.42	240	105	Peak	HORIZONTAL
2	15780.42	51.62	60.00	-8.38	43.49	6.14	37.41	35.42	240	105	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15779.80	60.15	80.00	-19.85	52.02	6.14	37.41	35.42	230	114	Peak	VERTICAL
2	15780.19	47.28	60.00	-12.72	39.15	6.14	37.41	35.42	230	114	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 60 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.43	74.30	80.00	-5.70	66.33	5.01	38.38	35.42	294	100	Peak	HORIZONTAL
2	10600.45	59.03	60.00	-0.97	51.06	5.01	38.38	35.42	294	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.45	71.41	80.00	-8.59	63.44	5.01	38.38	35.42	293	100	Peak	VERTICAL
2	10600.46	57.13	60.00	-2.87	49.16	5.01	38.38	35.42	293	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 64 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10640.22	69.26	80.00	-10.74	61.27	5.01	38.37	35.39	295	100	Peak	HORIZONTAL
2	10640.47	55.60	60.00	-4.40	47.61	5.01	38.37	35.39	295	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10640.42	64.83	80.00	-15.17	56.84	5.01	38.37	35.39	294	100	Peak	VERTICAL
2	10640.48	51.20	60.00	-8.80	43.21	5.01	38.37	35.39	294	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 100 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11000.45	59.68	80.00	-20.32	51.45	5.01	38.32	35.10	294	100	Peak	HORIZONTAL
2	11000.47	47.41	60.00	-12.59	39.18	5.01	38.32	35.10	294	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11000.32	45.47	60.00	-14.53	37.26	5.01	38.30	35.10	270	100	Average	VERTICAL
2	11000.45	58.35	80.00	-21.65	50.14	5.01	38.30	35.10	270	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 116 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	11159.78	58.11	60.00	-1.89	49.77	5.04	38.47	35.17	246	100 Average	HORIZONTAL
2	11160.21	72.29	80.00	-7.71	63.95	5.04	38.47	35.17	246	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	11159.62	68.64	80.00	-11.36	60.30	5.04	38.47	35.17	288	100 Peak	VERTICAL
2	11159.85	55.53	60.00	-4.47	47.19	5.04	38.47	35.17	288	100 Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 140 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.51	58.22	60.00	-1.78	49.67	5.10	38.70	35.25	292	100	Average	HORIZONTAL
2	11399.65	73.04	80.00	-6.96	64.49	5.10	38.70	35.25	292	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.50	54.40	60.00	-5.60	45.85	5.10	38.70	35.25	295	100	Average	VERTICAL
2	11399.64	68.22	80.00	-11.78	59.67	5.10	38.70	35.25	295	100	Peak	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.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

<For External Antenna / Ant. 6>

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 52 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10518.70	53.49	74.00	-20.51	45.58	5.01	38.40	35.50	33	100	Average	HORIZONTAL
2	10519.91	70.19	94.00	-23.81	62.28	5.01	38.40	35.50	33	100	Peak	HORIZONTAL
3	15778.78	61.90	80.00	-18.10	53.77	6.14	37.41	35.42	295	107	Peak	HORIZONTAL
4	15782.32	47.51	60.00	-12.49	39.38	6.14	37.41	35.42	295	107	Average	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10519.94	66.80	94.00	-27.20	58.90	5.01	38.39	35.50	67	100	Peak	VERTICAL
2	10520.78	50.23	74.00	-23.77	42.33	5.01	38.39	35.50	67	100	Average	VERTICAL
3	15782.20	51.69	60.00	-8.31	43.56	6.14	37.41	35.42	322	112	Average	VERTICAL
4	15782.87	66.82	80.00	-13.18	58.69	6.14	37.41	35.42	322	112	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 60 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.87	51.61	60.00	-8.39	43.64	5.01	38.38	35.42	4	100	Average	HORIZONTAL
2	10601.08	67.02	80.00	-12.98	59.05	5.01	38.38	35.42	4	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.00	63.32	80.00	-16.68	55.35	5.01	38.38	35.42	66	100	Peak	VERTICAL
2	10600.39	48.14	60.00	-11.86	40.17	5.01	38.38	35.42	66	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 64 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10639.19	64.28	80.00	-15.72	56.29	5.01	38.37	35.39	5	100	Peak	HORIZONTAL
2	10640.78	48.68	60.00	-11.32	40.69	5.01	38.37	35.39	5	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10641.14	59.73	80.00	-20.27	51.74	5.01	38.37	35.39	300	100	Peak	VERTICAL
2	10642.39	45.01	60.00	-14.99	37.02	5.01	38.37	35.39	300	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 100 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10996.18	60.15	80.00	-19.85	51.92	5.01	38.32	35.10	52	100	Peak	HORIZONTAL
2	10998.64	45.57	60.00	-14.43	37.34	5.01	38.32	35.10	52	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10998.45	42.00	60.00	-18.00	33.79	5.01	38.30	35.10	305	113	Average	VERTICAL
2	10999.88	56.99	80.00	-23.01	48.78	5.01	38.30	35.10	305	113	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 116 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11158.52	52.54	60.00	-7.46	44.20	5.04	38.47	35.17	295	100	Average	HORIZONTAL
2	11159.33	67.94	80.00	-12.06	59.60	5.04	38.47	35.17	295	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11158.51	49.43	60.00	-10.57	41.09	5.04	38.47	35.17	301	100	Average	VERTICAL
2	11161.38	63.54	80.00	-16.46	55.20	5.04	38.47	35.17	301	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 140 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11398.68	58.83	60.00	-1.17	50.28	5.10	38.70	35.25	278	104	Average	HORIZONTAL
2	11399.00	75.27	80.00	-4.73	66.72	5.10	38.70	35.25	278	104	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11396.19	50.79	60.00	-9.21	42.26	5.10	38.68	35.25	274	100	Average	VERTICAL
2	11397.45	65.95	80.00	-14.05	57.40	5.10	38.70	35.25	274	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 54 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10539.88	66.24	94.00	-27.76	58.32	5.01	38.39	35.48	5	100	Peak	HORIZONTAL
2	10540.59	48.66	74.00	-25.34	40.74	5.01	38.39	35.48	5	100	Average	HORIZONTAL
3	15803.03	41.44	60.00	-18.56	33.34	6.14	37.39	35.43	307	107	Average	HORIZONTAL
4	15803.63	55.08	80.00	-24.92	46.98	6.14	37.39	35.43	307	107	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10540.98	45.21	74.00	-28.79	37.29	5.01	38.39	35.48	299	100	Average	VERTICAL
2	10541.01	61.46	94.00	-32.54	53.54	5.01	38.39	35.48	299	100	Peak	VERTICAL
3	15802.97	44.70	60.00	-15.30	36.60	6.14	37.39	35.43	320	110	Average	VERTICAL
4	15803.58	58.80	80.00	-21.20	50.70	6.14	37.39	35.43	320	110	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 62 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10619.84	59.20	80.00	-20.80	51.23	5.01	38.38	35.42	35	100	Peak	HORIZONTAL
2	10620.86	42.76	60.00	-17.24	34.79	5.01	38.38	35.42	35	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10621.13	40.46	60.00	-19.54	32.49	5.01	38.38	35.42	301	100	Average	VERTICAL
2	10621.29	56.68	80.00	-23.32	48.71	5.01	38.38	35.42	301	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 102 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11018.47	39.35	60.00	-20.65	31.11	5.02	38.33	35.11	57	100 Average	HORIZONTAL
2	11019.80	53.08	80.00	-26.92	44.84	5.02	38.33	35.11	57	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11022.72	38.15	60.00	-21.85	29.91	5.02	38.33	35.11	169	100 Average	VERTICAL
2	11026.37	50.43	80.00	-29.57	42.19	5.02	38.33	35.11	169	100 Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 110 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11098.68	60.56	80.00	-19.44	52.27	5.03	38.40	35.14	137	100	Peak	HORIZONTAL
2	11104.73	45.55	60.00	-14.45	37.26	5.03	38.40	35.14	137	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11098.02	40.76	60.00	-19.24	32.47	5.03	38.40	35.14	232	100	Average	VERTICAL
2	11099.96	56.16	80.00	-23.84	47.87	5.03	38.40	35.14	232	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 134 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11339.88	75.26	80.00	-4.74	66.79	5.08	38.63	35.24	278	102	Peak	HORIZONTAL
2	11340.87	56.55	60.00	-3.45	48.07	5.09	38.63	35.24	278	102	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11338.58	48.05	60.00	-11.95	39.58	5.08	38.63	35.24	276	100	Average	VERTICAL
2	11339.83	65.86	80.00	-14.14	57.39	5.08	38.63	35.24	276	100	Peak	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.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 52 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10521.13	55.54	74.00	-18.46	47.63	5.01	38.40	35.50	360	100	Average	HORIZONTAL
2	10521.16	69.85	94.00	-24.15	61.94	5.01	38.40	35.50	360	100	Peak	HORIZONTAL
3	15781.94	51.39	60.00	-8.61	43.26	6.14	37.41	35.42	300	106	Average	HORIZONTAL
4	15782.11	64.90	80.00	-15.10	56.77	6.14	37.41	35.42	300	106	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10520.67	65.76	94.00	-28.24	57.86	5.01	38.39	35.50	72	100	Peak	VERTICAL
2	10521.53	52.06	74.00	-21.94	44.16	5.01	38.39	35.50	72	100	Average	VERTICAL
3	15781.19	68.77	80.00	-11.23	60.64	6.14	37.41	35.42	321	111	Peak	VERTICAL
4	15781.25	54.36	60.00	-5.64	46.23	6.14	37.41	35.42	321	111	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 60 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.96	72.00	80.00	-8.00	64.03	5.01	38.38	35.42	5	100	Peak	HORIZONTAL
2	10600.98	57.39	60.00	-2.61	49.42	5.01	38.38	35.42	5	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10601.33	52.70	60.00	-7.30	44.73	5.01	38.38	35.42	66	100	Average	VERTICAL
2	10601.68	67.36	80.00	-12.64	59.39	5.01	38.38	35.42	66	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 64 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10640.62	52.08	60.00	-7.92	44.09	5.01	38.37	35.39	0	100 Average	HORIZONTAL
2	10640.74	67.33	80.00	-12.67	59.34	5.01	38.37	35.39	0	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10640.39	50.24	60.00	-9.76	42.25	5.01	38.37	35.39	295	100 Average	VERTICAL
2	10640.52	63.85	80.00	-16.15	55.86	5.01	38.37	35.39	295	100 Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 100 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10998.52	62.13	80.00	-17.87	53.90	5.01	38.32	35.10	129	100	Peak	HORIZONTAL
2	11000.26	47.93	60.00	-12.07	39.70	5.01	38.32	35.10	129	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11003.65	43.58	60.00	-16.42	35.37	5.01	38.30	35.10	302	100	Average	VERTICAL
2	11004.37	57.28	80.00	-22.72	49.07	5.01	38.30	35.10	302	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 116 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	11158.61	55.84	60.00	-4.16	47.50	5.04	38.47	35.17	136	100 Average	HORIZONTAL
2	11159.07	73.15	80.00	-6.85	64.81	5.04	38.47	35.17	136	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	11158.84	68.20	80.00	-11.80	59.86	5.04	38.47	35.17	300	112 Peak	VERTICAL
2	11159.45	51.56	60.00	-8.44	43.22	5.04	38.47	35.17	300	112 Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 140 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11401.33	75.07	80.00	-4.93	66.52	5.10	38.70	35.25	279	100	Peak	HORIZONTAL
2	11402.32	59.68	60.00	-0.32	51.13	5.10	38.70	35.25	279	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11398.03	69.46	80.00	-10.54	60.91	5.10	38.70	35.25	196	100	Peak	VERTICAL
2	11398.12	52.83	60.00	-7.17	44.28	5.10	38.70	35.25	196	100	Average	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.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

<For Internal Antenna / Ant. 8>

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 52 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15779.68	56.69	80.00	-23.31	48.56	6.14	37.41	35.42	344	100	Peak	HORIZONTAL
2	15779.69	43.81	60.00	-16.19	35.68	6.14	37.41	35.42	344	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15779.61	57.78	80.00	-22.22	49.65	6.14	37.41	35.42	337	105	Peak	VERTICAL
2	15779.93	44.67	60.00	-15.33	36.54	6.14	37.41	35.42	337	105	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 60 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.04	44.51	60.00	-15.49	36.54	5.01	38.38	35.42	59	106	Average	HORIZONTAL
2	10600.04	58.51	80.00	-21.49	50.54	5.01	38.38	35.42	59	106	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.03	41.93	60.00	-18.07	33.96	5.01	38.38	35.42	275	100	Average	VERTICAL
2	10600.04	55.66	80.00	-24.34	47.69	5.01	38.38	35.42	275	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 64 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10640.17	53.84	80.00	-26.16	45.85	5.01	38.37	35.39	73	100	Peak	HORIZONTAL
2	10640.42	40.44	60.00	-19.56	32.45	5.01	38.37	35.39	73	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10639.88	53.10	80.00	-26.90	45.11	5.01	38.37	35.39	287	100	Peak	VERTICAL
2	10640.28	38.61	60.00	-21.39	30.62	5.01	38.37	35.39	287	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 100 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10999.79	45.96	60.00	-14.04	37.73	5.01	38.32	35.10	293	100 Average	HORIZONTAL
2	10999.88	60.92	80.00	-19.08	52.69	5.01	38.32	35.10	293	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11000.04	53.19	80.00	-26.81	44.98	5.01	38.30	35.10	82	100 Peak	VERTICAL
2	11000.44	39.61	60.00	-20.39	31.40	5.01	38.30	35.10	82	100 Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 116 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11160.07	61.99	80.00	-18.01	53.65	5.04	38.47	35.17	62	100	Peak	HORIZONTAL
2	11160.22	46.52	60.00	-13.48	38.18	5.04	38.47	35.17	62	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11159.50	44.01	60.00	-15.99	35.67	5.04	38.47	35.17	30	100	Average	VERTICAL
2	11159.86	59.98	80.00	-20.02	51.64	5.04	38.47	35.17	30	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 140 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.92	62.34	80.00	-17.66	53.79	5.10	38.70	35.25	302	100	Peak	HORIZONTAL
2	11400.17	45.50	60.00	-14.50	36.95	5.10	38.70	35.25	302	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.50	53.44	80.00	-26.56	44.89	5.10	38.70	35.25	90	100	Peak	VERTICAL
2	11400.42	40.17	60.00	-19.83	31.62	5.10	38.70	35.25	90	100	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 54 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15809.59	52.23	80.00	-27.77	44.13	6.14	37.39	35.43	205	100	Peak	HORIZONTAL
2	15810.45	39.98	60.00	-20.02	31.90	6.14	37.37	35.43	205	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15809.77	41.09	60.00	-18.91	32.99	6.14	37.39	35.43	122	100	Average	VERTICAL
2	15810.01	53.04	80.00	-26.96	44.94	6.14	37.39	35.43	122	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 62 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10619.61	37.38	60.00	-22.62	29.41	5.01	38.38	35.42	220	100	Average	HORIZONTAL
2	10619.88	50.17	80.00	-29.83	42.20	5.01	38.38	35.42	220	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10619.89	37.74	60.00	-22.26	29.77	5.01	38.38	35.42	146	100	Average
2	10620.04	49.41	80.00	-30.59	41.44	5.01	38.38	35.42	146	100	Peak

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 102 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor			
			dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11019.64	38.01	60.00	-21.99	29.77	5.02	38.33	35.11	233	100 Average	HORIZONTAL
2	11019.99	51.84	80.00	-28.16	43.60	5.02	38.33	35.11	233	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor			
			dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11019.64	37.83	60.00	-22.17	29.60	5.02	38.32	35.11	157	100 Average	VERTICAL
2	11020.10	50.05	80.00	-29.95	41.82	5.02	38.32	35.11	157	100 Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 110 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11099.97	61.44	80.00	-18.56	53.15	5.03	38.40	35.14	51	100	Peak	HORIZONTAL
2	11100.36	43.56	60.00	-16.44	35.27	5.03	38.40	35.14	51	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11099.52	41.11	60.00	-18.89	32.82	5.03	38.40	35.14	25	100	Average	VERTICAL
2	11099.86	58.16	80.00	-21.84	49.87	5.03	38.40	35.14	25	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 134 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11339.85	56.89	80.00	-23.11	48.42	5.08	38.63	35.24	140	100	Peak	HORIZONTAL
2	11339.97	41.99	60.00	-18.01	33.52	5.08	38.63	35.24	140	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11339.60	41.88	60.00	-18.12	33.41	5.08	38.63	35.24	179	100	Average	VERTICAL
2	11340.00	55.99	80.00	-24.01	47.52	5.08	38.63	35.24	179	100	Peak	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.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 52 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	15778.63	57.91	80.00	-22.09	49.78	6.14	37.41	35.42	342	100 Peak	HORIZONTAL
2	15779.00	43.70	60.00	-16.30	35.57	6.14	37.41	35.42	342	100 Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	15783.52	44.70	60.00	-15.30	36.57	6.14	37.41	35.42	14	102 Average	VERTICAL
2	15783.78	58.93	80.00	-21.07	50.80	6.14	37.41	35.42	14	102 Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 60 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor			
			dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10600.80	45.38	60.00	-14.62	37.41	5.01	38.38	35.42	58	100 Average	HORIZONTAL
2	10600.80	57.90	80.00	-22.10	49.93	5.01	38.38	35.42	58	100 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor			
			dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10600.44	41.50	60.00	-18.50	33.53	5.01	38.38	35.42	76	101 Average	VERTICAL
2	10600.44	53.82	80.00	-26.18	45.85	5.01	38.38	35.42	76	101 Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 64 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10640.02	54.99	80.00	-25.01	47.00	5.01	38.37	35.39	61	100	Peak	HORIZONTAL
2	10640.37	41.66	60.00	-18.34	33.67	5.01	38.37	35.39	61	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10640.02	39.13	60.00	-20.87	31.14	5.01	38.37	35.39	79	100	Average	VERTICAL
2	10640.26	52.13	80.00	-27.87	44.14	5.01	38.37	35.39	79	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 100 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.59	57.47	80.00	-22.53	49.24	5.01	38.32	35.10	297	100	Peak	HORIZONTAL
2	11000.21	44.26	60.00	-15.74	36.03	5.01	38.32	35.10	297	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.54	51.06	80.00	-28.94	42.85	5.01	38.30	35.10	34	104	Peak	VERTICAL
2	10999.77	39.43	60.00	-20.57	31.22	5.01	38.30	35.10	34	104	Average	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 116 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11159.94	60.95	80.00	-19.05	52.61	5.04	38.47	35.17	303	100	Peak	HORIZONTAL
2	11160.30	47.72	60.00	-12.28	39.38	5.04	38.47	35.17	303	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11159.52	43.50	60.00	-16.50	35.16	5.04	38.47	35.17	342	100	Average	VERTICAL
2	11159.63	57.72	80.00	-22.28	49.38	5.04	38.47	35.17	342	100	Peak	VERTICAL

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 140 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.58	48.38	60.00	-11.62	39.83	5.10	38.70	35.25	285	100	Average	HORIZONTAL
2	11399.67	62.69	80.00	-17.31	54.14	5.10	38.70	35.25	285	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.72	54.45	80.00	-25.55	45.90	5.10	38.70	35.25	183	100	Peak	VERTICAL
2	11399.82	41.24	60.00	-18.76	32.69	5.10	38.70	35.25	183	100	Average	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.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

4.7. Band Edge Emissions Measurement

4.7.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.25-5.35 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). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.7.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1 MHz / 1 MHz 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.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

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

<For External Antenna / Ant. 5>

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 52, 60, 64 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.60	54.53	60.00	-5.47	17.49	3.43	33.61	0.00	63	100	Average	VERTICAL
2	5119.60	67.38	80.00	-12.62	30.34	3.43	33.61	0.00	63	100	Peak	VERTICAL
3	5263.62	119.23	94.00			3.46	33.88	0.00	63	100	Peak	VERTICAL
4	5267.96	107.64	74.00			3.46	33.88	0.00	63	100	Average	VERTICAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5298.84	107.33	74.00			3.48	33.94	0.00	360	115	Average	VERTICAL
2	5305.79	119.61	94.00			3.48	33.94	0.00	360	115	Peak	VERTICAL
3	5350.00	59.83	60.00	-0.17	22.31	3.49	34.03	0.00	360	115	Average	VERTICAL
4	5350.29	75.72	80.00	-4.28	38.20	3.49	34.03	0.00	360	115	Peak	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5312.04	104.40	74.00			3.48	33.94	0.00	19	137	Average	HORIZONTAL
2	5312.33	117.31	94.00			3.48	33.94	0.00	19	137	Peak	HORIZONTAL
3	5350.00	59.31	60.00	-0.69	21.79	3.49	34.03	0.00	19	137	Average	HORIZONTAL
4	5351.59	75.00	80.00	-5.00	37.48	3.49	34.03	0.00	19	137	Peak	HORIZONTAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 100, 116, 140 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5457.54	74.66	80.00	-5.34	36.93	3.52	34.21	0.00	53	121	Peak	VERTICAL
2	5460.00	59.38	60.00	-0.62	21.65	3.52	34.21	0.00	53	121	Average	VERTICAL
3	5505.79	114.62	94.00			3.54	34.28	0.00	53	121	Peak	VERTICAL
4	5507.09	102.65	74.00			3.54	34.28	0.00	53	121	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5120.40	55.01	60.00	-4.99	17.97	3.43	33.61	0.00	0	118	Average	VERTICAL
2	5120.40	66.50	80.00	-13.50	29.46	3.43	33.61	0.00	0	118	Peak	VERTICAL
3	5578.60	120.46	94.00			3.56	34.31	0.00	0	118	Peak	VERTICAL
4	5581.40	109.28	74.00			3.56	34.31	0.00	0	118	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.60	54.38	60.00	-5.62	17.34	3.43	33.61	0.00	6	100	Average	HORIZONTAL
2	5119.60	66.24	80.00	-13.76	29.20	3.43	33.61	0.00	6	100	Peak	HORIZONTAL
3	5704.30	116.31	94.00			3.59	34.34	0.00	6	100	Peak	HORIZONTAL
4	5706.50	104.96	74.00			3.60	34.34	0.00	6	100	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5700 MHz.

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 54, 62 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5277.24	101.70	74.00			3.47	33.88	0.00	0	154 Average	VERTICAL
2	5280.42	115.57	94.00			3.47	33.91	0.00	0	154 Peak	VERTICAL
3	5350.00	59.93	60.00	-0.07	22.41	3.49	34.03	0.00	0	154 Average	VERTICAL
4	5350.29	73.34	80.00	-6.66	35.82	3.49	34.03	0.00	0	154 Peak	VERTICAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5305.66	98.84	74.00			3.48	33.94	0.00	-1	117 Average	VERTICAL
2	5305.66	112.95	94.00			3.48	33.94	0.00	-1	117 Peak	VERTICAL
3	5350.00	59.19	60.00	-0.81	21.67	3.49	34.03	0.00	-1	117 Average	VERTICAL
4	5350.00	74.68	80.00	-5.32	37.16	3.49	34.03	0.00	-1	117 Peak	VERTICAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 102, 110, 134 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5460.00	59.44	60.00	-0.56	21.71	3.52	34.21	0.00	358	149	Average	VERTICAL
2	5460.00	74.46	80.00	-5.54	36.73	3.52	34.21	0.00	358	149	Peak	VERTICAL
3	5507.40	110.39	94.00			3.54	34.28	0.00	358	149	Peak	VERTICAL
4	5525.92	96.17	74.00			3.54	34.30	0.00	358	149	Average	VERTICAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5457.40	75.17	80.00	-4.83	37.44	3.52	34.21	0.00	355	112	Peak	VERTICAL
2	5460.00	59.96	60.00	-0.04	22.23	3.52	34.21	0.00	355	112	Average	VERTICAL
3	5545.08	101.60	74.00			3.55	34.31	0.00	355	112	Average	VERTICAL
4	5546.24	115.39	94.00			3.55	34.31	0.00	355	112	Peak	VERTICAL

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4921.10	56.19	60.00	-3.81	19.61	3.35	33.23	0.00	18	140	Average	VERTICAL
2	4921.10	66.36	80.00	-13.64	29.78	3.35	33.23	0.00	18	140	Peak	VERTICAL
3	5663.50	115.72	94.00			3.59	34.33	0.00	18	140	Peak	VERTICAL
4	5685.20	102.61	74.00			3.59	34.33	0.00	18	140	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5670 MHz.

Note:

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

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

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 52, 60, 64 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5119.62	56.44	60.00	-3.56	19.40	3.43	33.61	0.00	351	140 Average	VERTICAL
2	5119.72	67.19	80.00	-12.81	30.15	3.43	33.61	0.00	351	140 Peak	VERTICAL
3	5262.17	119.39	94.00			3.46	33.85	0.00	351	140 Peak	VERTICAL
4	5262.89	109.50	74.00			3.46	33.88	0.00	351	140 Average	VERTICAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5306.66	122.11	94.00			3.48	33.94	0.00	0	118 Peak	VERTICAL
2	5306.95	112.49	74.00			3.48	33.94	0.00	0	118 Average	VERTICAL
3	5350.00	59.91	60.00	-0.09	22.39	3.49	34.03	0.00	0	118 Average	VERTICAL
4	5356.95	76.49	80.00	-3.51	38.97	3.49	34.03	0.00	0	118 Peak	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5317.54	115.85	94.00			3.48	33.97	0.00	297	104 Peak	HORIZONTAL
2	5327.67	105.55	74.00			3.49	33.97	0.00	297	104 Average	HORIZONTAL
3	5350.00	59.85	60.00	-0.15	22.33	3.49	34.03	0.00	297	104 Average	HORIZONTAL
4	5350.43	79.69	80.00	-0.31	42.17	3.49	34.03	0.00	297	104 Peak	HORIZONTAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 100, 116, 140 / Ant. 5 / Connector J2 + J3 + J4
Test Date	Mar. 30, 2011		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5458.41	76.28	80.00	-3.72	38.57	3.52	34.19	0.00	14	138	Peak	HORIZONTAL
2	5459.71	59.47	60.00	-0.53	21.76	3.52	34.19	0.00	14	138	Average	HORIZONTAL
3	5498.41	105.13	74.00			3.53	34.23	0.00	14	138	Average	HORIZONTAL
4	5499.13	115.52	94.00			3.53	34.23	0.00	14	138	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.80	54.90	60.00	-5.10	17.86	3.43	33.61	0.00	0	115	Average	VERTICAL
2	5119.80	66.28	80.00	-13.72	29.24	3.43	33.61	0.00	0	115	Peak	VERTICAL
3	5572.80	121.80	94.00			3.55	34.31	0.00	0	115	Peak	VERTICAL
4	5582.90	111.53	74.00			3.56	34.31	0.00	0	115	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5079.90	54.41	60.00	-5.59	17.45	3.41	33.55	0.00	4	100	Average	VERTICAL
2	5079.90	66.09	80.00	-13.91	29.13	3.41	33.55	0.00	4	100	Peak	VERTICAL
3	5693.50	112.53	74.00			3.59	34.34	0.00	4	100	Average	VERTICAL
4	5695.70	122.27	94.00			3.59	34.34	0.00	4	100	Peak	VERTICAL

Item 3, 4 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

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

<For External Antenna / Ant. 6>

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 52, 60, 64 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5119.62	67.68	80.00	-12.32	30.64	3.43	33.61	0.00	351	100 Peak	VERTICAL
2	5119.89	58.02	60.00	-1.98	20.98	3.43	33.61	0.00	351	100 Average	VERTICAL
3	5265.79	110.61	74.00			3.46	33.88	0.00	351	100 Average	VERTICAL
4	5265.79	121.56	94.00			3.46	33.88	0.00	351	100 Peak	VERTICAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5292.19	109.01	94.00			3.47	33.91	0.00	141	100 Peak	VERTICAL
2	5292.76	122.36	74.00			3.47	33.91	0.00	141	100 Average	VERTICAL
3	5350.00	59.75	60.00	-0.25	22.23	3.49	34.03	0.00	141	100 Average	VERTICAL
4	5350.29	73.81	80.00	-6.19	36.29	3.49	34.03	0.00	141	100 Peak	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5326.80	105.07	74.00			3.49	33.97	0.00	142	100 Average	VERTICAL
2	5327.53	118.60	94.00			3.49	33.97	0.00	142	100 Peak	VERTICAL
3	5350.00	59.79	60.00	-0.21	22.27	3.49	34.03	0.00	142	100 Average	VERTICAL
4	5350.16	77.02	80.00	-2.98	39.50	3.49	34.03	0.00	142	100 Peak	VERTICAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 100, 116, 140 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5459.71	77.11	80.00	-2.89	39.38	3.52	34.21	0.00	221	100	Peak	VERTICAL
2	5460.00	59.55	60.00	-0.45	21.82	3.52	34.21	0.00	221	100	Average	VERTICAL
3	5507.09	105.43	74.00			3.54	34.28	0.00	221	100	Average	VERTICAL
4	5507.24	119.49	94.00			3.54	34.28	0.00	221	100	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.80	67.75	80.00	-12.25	30.71	3.43	33.61	0.00	351	100	Peak	VERTICAL
2	5119.83	57.81	60.00	-2.19	20.77	3.43	33.61	0.00	351	100	Average	VERTICAL
3	5585.80	109.98	74.00			3.56	34.31	0.00	351	100	Average	VERTICAL
4	5585.80	121.07	94.00			3.56	34.31	0.00	351	100	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.46	67.80	80.00	-12.20	30.76	3.43	33.61	0.00	358	100	Peak	VERTICAL
2	5119.79	55.16	60.00	-4.84	18.12	3.43	33.61	0.00	358	100	Average	VERTICAL
3	5697.80	116.77	94.00			3.59	34.34	0.00	358	100	Peak	VERTICAL
4	5700.00	105.92	74.00			3.59	34.34	0.00	358	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5700 MHz.

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 54, 62 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5281.00	104.36	74.00			3.47	33.91	0.00	137	100 Average	VERTICAL
2	5282.16	119.15	94.00			3.47	33.91	0.00	137	100 Peak	VERTICAL
3	5350.00	59.97	60.00	-0.03	22.45	3.49	34.03	0.00	137	100 Average	VERTICAL
4	5350.29	75.46	80.00	-4.54	37.94	3.49	34.03	0.00	137	100 Peak	VERTICAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5305.66	99.01	74.00			3.48	33.94	0.00	136	100 Average	VERTICAL
2	5305.66	114.90	94.00			3.48	33.94	0.00	136	100 Peak	VERTICAL
3	5350.00	59.69	60.00	-0.31	22.17	3.49	34.03	0.00	136	100 Average	VERTICAL
4	5355.50	74.39	80.00	-5.61	36.87	3.49	34.03	0.00	136	100 Peak	VERTICAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 102, 110, 134 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5459.42	76.59	80.00	-3.41	38.86	3.52	34.21	0.00	189	100	Peak	VERTICAL
2	5460.00	59.40	60.00	-0.60	21.67	3.52	34.21	0.00	189	100	Average	VERTICAL
3	5499.87	113.05	94.00			3.53	34.26	0.00	189	100	Peak	VERTICAL
4	5521.00	98.44	74.00			3.54	34.30	0.00	189	100	Average	VERTICAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5458.84	77.47	80.00	-2.53	39.74	3.52	34.21	0.00	221	100	Peak	VERTICAL
2	5460.00	59.74	60.00	-0.26	22.01	3.52	34.21	0.00	221	100	Average	VERTICAL
3	5553.47	104.17	74.00			3.55	34.31	0.00	221	100	Average	VERTICAL
4	5553.47	119.19	94.00			3.55	34.31	0.00	221	100	Peak	VERTICAL

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4919.85	58.24	60.00	-1.76	21.66	3.35	33.23	0.00	101	108	Average	VERTICAL
2	4920.03	69.63	80.00	-10.37	33.05	3.35	33.23	0.00	101	108	Peak	VERTICAL
3	4999.81	68.41	80.00	-11.59	31.62	3.39	33.40	0.00	353	100	Peak	VERTICAL
4	4999.89	57.85	60.00	-2.15	21.06	3.39	33.40	0.00	353	100	Average	VERTICAL
5	5663.50	107.08	74.00			3.59	34.33	0.00	101	108	Average	VERTICAL
6	5665.70	118.01	94.00			3.59	34.33	0.00	101	108	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5670 MHz.

Note:

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

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

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 52, 60, 64 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.54	68.37	80.00	-11.63	31.33	3.43	33.61	0.00	350	100	Peak	VERTICAL
2	5119.86	59.73	60.00	-0.27	22.69	3.43	33.61	0.00	350	100	Average	VERTICAL
3	5254.93	111.02	74.00			3.46	33.85	0.00	350	100	Average	VERTICAL
4	5254.93	121.16	94.00			3.46	33.85	0.00	350	100	Peak	VERTICAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5295.08	113.54	74.00			3.47	33.91	0.00	220	100	Average	VERTICAL
2	5295.08	124.05	94.00			3.47	33.91	0.00	220	100	Peak	VERTICAL
3	5350.00	59.60	60.00	-0.40	22.08	3.49	34.03	0.00	220	100	Average	VERTICAL
4	5356.95	78.87	80.00	-1.13	41.35	3.49	34.03	0.00	220	100	Peak	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5317.97	120.29	94.00			3.48	33.97	0.00	141	100	Peak	VERTICAL
2	5318.41	109.96	74.00			3.48	33.97	0.00	141	100	Average	VERTICAL
3	5350.00	59.22	60.00	-0.78	21.70	3.49	34.03	0.00	141	100	Average	VERTICAL
4	5350.00	75.08	80.00	-4.92	37.56	3.49	34.03	0.00	141	100	Peak	VERTICAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 100, 116, 140 / Ant. 6 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5459.96	59.86	60.00	-0.14	22.13	3.52	34.21	0.00	124	100	Average	VERTICAL
2	5460.00	79.36	80.00	-0.64	41.63	3.52	34.21	0.00	124	100	Peak	VERTICAL
3	5498.70	118.15	94.00			3.53	34.26	0.00	124	100	Peak	VERTICAL
4	5499.28	107.71	74.00			3.53	34.26	0.00	124	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5119.84	56.97	60.00	-3.03	19.93	3.43	33.61	0.00	351	100	Average	VERTICAL
2	5120.05	69.46	80.00	-10.54	32.42	3.43	33.61	0.00	351	100	Peak	VERTICAL
3	5581.40	111.33	74.00			3.56	34.31	0.00	351	100	Average	VERTICAL
4	5582.90	120.44	94.00			3.56	34.31	0.00	351	100	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4999.87	59.14	60.00	-0.86	22.35	3.39	33.40	0.00	233	100	Average	VERTICAL
2	4999.90	68.86	80.00	-11.14	32.07	3.39	33.40	0.00	233	100	Peak	VERTICAL
3	5697.80	112.86	74.00			3.59	34.34	0.00	233	100	Average	VERTICAL
4	5706.50	121.73	94.00			3.60	34.34	0.00	233	100	Peak	VERTICAL

Item 3, 4 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

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

<For Internal Antenna / Ant. 8>

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 52, 60, 64 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5040.03	59.15	60.00	-0.85	22.30	3.40	33.45	0.00	295	100	Average	HORIZONTAL
2	5137.70	68.45	80.00	-11.55	31.38	3.43	33.64	0.00	295	100	Peak	HORIZONTAL
3	5254.93	115.93	74.00			3.46	33.85	0.00	295	100	Average	HORIZONTAL
4	5267.96	127.14	94.00			3.46	33.88	0.00	295	100	Peak	HORIZONTAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5296.24	124.04	94.00			3.47	33.91	0.00	296	100	Peak	HORIZONTAL
2	5297.11	109.61	74.00			3.48	33.94	0.00	296	100	Average	HORIZONTAL
3	5352.32	72.26	80.00	-7.74	34.74	3.49	34.03	0.00	296	100	Peak	HORIZONTAL
4	5359.84	59.31	60.00	-0.69	21.79	3.49	34.03	0.00	296	100	Average	HORIZONTAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5313.63	122.18	94.00			3.48	33.94	0.00	61	100	Peak	HORIZONTAL
2	5315.95	107.37	74.00			3.48	33.97	0.00	61	100	Average	HORIZONTAL
3	5353.33	71.87	80.00	-8.13	34.35	3.49	34.03	0.00	61	100	Peak	HORIZONTAL
4	5359.84	59.48	60.00	-0.52	21.96	3.49	34.03	0.00	61	100	Average	HORIZONTAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 20MHz Ch 100, 116, 140 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5460.00	59.71	60.00	-0.29	22.00	3.52	34.19	0.00	299	100	Average	HORIZONTAL
2	5460.00	74.05	80.00	-5.95	36.34	3.52	34.19	0.00	299	100	Peak	HORIZONTAL
3	5497.11	108.76	74.00			3.53	34.23	0.00	299	100	Average	HORIZONTAL
4	5498.70	123.01	94.00			3.53	34.23	0.00	299	100	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5360.00	69.35	80.00	-10.65	31.83	3.49	34.03	0.00	301	100	Peak	HORIZONTAL
2	5360.14	59.69	60.00	-0.31	22.17	3.49	34.03	0.00	301	100	Average	HORIZONTAL
3	5587.24	114.28	74.00			3.56	34.32	0.00	301	100	Average	HORIZONTAL
4	5587.24	125.11	94.00			3.56	34.32	0.00	301	100	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5360.00	69.78	80.00	-10.22	32.26	3.49	34.03	0.00	306	100	Peak	HORIZONTAL
2	5360.10	59.47	60.00	-0.53	21.95	3.49	34.03	0.00	306	100	Average	HORIZONTAL
3	5691.30	112.13	74.00			3.59	34.34	0.00	306	100	Average	HORIZONTAL
4	5692.80	122.80	94.00			3.59	34.34	0.00	306	100	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5700 MHz.

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 54, 62 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5268.00	123.69	94.00			3.46	33.88	0.00	300	100 Peak	HORIZONTAL
2	5287.20	107.46	74.00			3.47	33.91	0.00	300	100 Average	HORIZONTAL
3	5357.20	73.79	80.00	-6.21	36.27	3.49	34.03	0.00	300	100 Peak	HORIZONTAL
4	5360.40	59.74	60.00	-0.26	22.22	3.49	34.03	0.00	300	100 Average	HORIZONTAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	deg	cm		
1	5298.00	118.32	94.00			3.48	33.94	0.00	303	100 Peak	HORIZONTAL
2	5298.40	101.48	74.00			3.48	33.94	0.00	303	100 Average	HORIZONTAL
3	5350.00	59.76	60.00	-0.24	22.24	3.49	34.03	0.00	303	100 Average	HORIZONTAL
4	5350.00	73.04	80.00	-6.96	35.52	3.49	34.03	0.00	303	100 Peak	HORIZONTAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n MCS8 40MHz Ch 102, 110, 134 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5460.00	59.88	60.00	-0.12	22.17	3.52	34.19	0.00	300	100	Average	HORIZONTAL
2	5460.00	75.71	80.00	-4.29	38.00	3.52	34.19	0.00	300	100	Peak	HORIZONTAL
3	5525.20	102.43	74.00			3.54	34.27	0.00	300	100	Average	HORIZONTAL
4	5526.00	119.34	94.00			3.54	34.27	0.00	300	100	Peak	HORIZONTAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5360.00	59.74	60.00	-0.26	22.22	3.49	34.03	0.00	298	100	Average	HORIZONTAL
2	5360.00	69.16	80.00	-10.84	31.64	3.49	34.03	0.00	298	100	Peak	HORIZONTAL
3	5534.10	109.75	74.00			3.55	34.27	0.00	298	100	Average	HORIZONTAL
4	5557.20	122.34	94.00			3.55	34.31	0.00	298	100	Peak	HORIZONTAL

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5360.00	59.59	60.00	-0.41	22.07	3.49	34.03	0.00	300	100	Average	HORIZONTAL
2	5360.00	69.18	80.00	-10.82	31.66	3.49	34.03	0.00	300	100	Peak	HORIZONTAL
3	5665.70	109.54	74.00			3.59	34.33	0.00	300	100	Average	HORIZONTAL
4	5665.70	122.93	94.00			3.59	34.33	0.00	300	100	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5670 MHz.

Note:

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

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

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 52, 60, 64 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5000.00	59.41	60.00	-0.59	22.63	3.39	33.39	0.00	294	100	Average	HORIZONTAL
2	5000.00	68.62	80.00	-11.38	31.84	3.39	33.39	0.00	294	100	Peak	HORIZONTAL
3	5258.60	116.76	74.00			3.46	33.85	0.00	294	100	Average	HORIZONTAL
4	5258.60	126.43	94.00			3.46	33.85	0.00	294	100	Peak	HORIZONTAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5302.03	113.54	74.00			3.48	33.94	0.00	298	100	Average	HORIZONTAL
2	5302.32	125.78	94.00			3.48	33.94	0.00	298	100	Peak	HORIZONTAL
3	5350.00	71.33	80.00	-8.67	33.81	3.49	34.03	0.00	298	100	Peak	HORIZONTAL
4	5351.45	59.51	60.00	-0.49	21.99	3.49	34.03	0.00	298	100	Average	HORIZONTAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5320.72	121.75	94.00			3.48	33.97	0.00	59	100	Peak	HORIZONTAL
2	5321.30	109.49	74.00			3.48	33.97	0.00	59	100	Average	HORIZONTAL
3	5361.74	71.78	80.00	-8.22	34.26	3.49	34.03	0.00	59	100	Peak	HORIZONTAL
4	5364.91	59.16	60.00	-0.84	21.61	3.49	34.06	0.00	59	100	Average	HORIZONTAL

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

Temperature	23°C	Humidity	61%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a Ch 100, 116, 140 / Ant. 8 / Connector J2 + J3 + J4
Test Date	Mar. 29, 2011		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5454.60	59.86	60.00	-0.14	22.15	3.52	34.19	0.00	65	100	Average	HORIZONTAL
2	5454.80	71.91	80.00	-8.09	34.20	3.52	34.19	0.00	65	100	Peak	HORIZONTAL
3	5499.00	108.99	74.00			3.53	34.23	0.00	65	100	Average	HORIZONTAL
4	5499.40	121.31	94.00			3.53	34.23	0.00	65	100	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5500 MHz.

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5360.00	59.31	60.00	-0.69	21.79	3.49	34.03	0.00	301	100	Average	HORIZONTAL
2	5360.00	70.18	80.00	-9.82	32.66	3.49	34.03	0.00	301	100	Peak	HORIZONTAL
3	5581.45	125.57	94.00			3.56	34.31	0.00	301	100	Peak	HORIZONTAL
4	5582.17	115.93	74.00			3.56	34.31	0.00	301	100	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5358.00	59.62	60.00	-0.38	22.10	3.49	34.03	0.00	308	100	Average	HORIZONTAL
2	5400.00	67.31	80.00	-12.69	29.68	3.51	34.12	0.00	308	100	Peak	HORIZONTAL
3	5696.00	110.27	74.00			3.59	34.34	0.00	308	100	Average	HORIZONTAL
4	5696.00	121.54	94.00			3.59	34.34	0.00	308	100	Peak	HORIZONTAL

Item 3, 4 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

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

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 802.11 specification).

4.8.2. Measuring Instruments and Setting

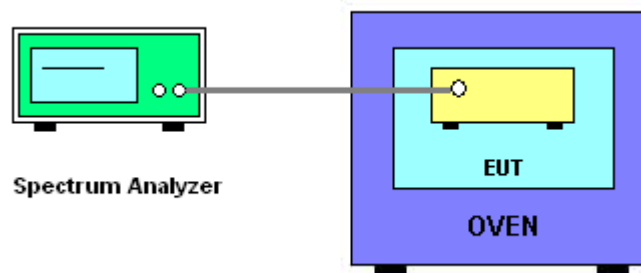
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
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 $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than $\pm 20\text{ppm}$ (IEEE 802.11 specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is $-30^\circ\text{C} \sim 50^\circ\text{C}$.
8. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

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

<For External Antenna / Ant. 5>

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5300
126.50	5300.021100
110.00	5300.013200
93.50	5300.020000
Max. Deviation (MHz)	0.021100
Max. Deviation (ppm)	3.98

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5300
-30	5300.048710
-20	5300.041210
-10	5300.039410
0	5300.012320
10	5300.002310
20	5299.991120
30	5299.987320
40	5299.986742
50	5299.978310
Max. Deviation (MHz)	0.048710
Max. Deviation (ppm)	9.1906

<For External Antenna / Ant. 6>

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5300
126.50	5300.021100
110.00	5300.013200
93.50	5300.020000
Max. Deviation (MHz)	0.021100
Max. Deviation (ppm)	3.98

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5300
-30	5300.048710
-20	5300.041210
-10	5300.039410
0	5300.012320
10	5300.002310
20	5299.991120
30	5299.987320
40	5299.986742
50	5299.978310
Max. Deviation (MHz)	0.048710
Max. Deviation (ppm)	9.1906

<For Internal Antenna / Ant. 8>

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5300
126.50	5300.021100
110.00	5300.013200
93.50	5300.020000
Max. Deviation (MHz)	0.021100
Max. Deviation (ppm)	3.98

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5300
-30	5300.048710
-20	5300.041210
-10	5300.039410
0	5300.012320
10	5300.002310
20	5299.991120
30	5299.987320
40	5299.986742
50	5299.978310
Max. Deviation (MHz)	0.048710
Max. Deviation (ppm)	9.1906

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	Sep. 01, 2010	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Apr. 24, 2010	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Oct. 30, 2010	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Jan. 04, 2010	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Jan. 04, 2011	Conduction (CO01-CB)
COND Cable	-	Cable	-	0.15MHz~30MHz	Dec. 01, 2010	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2010	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 13, 2010	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Oct. 08, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 06, 2010	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP	100304	9kHz ~ 40GHz	Nov. 06, 2010	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 06, 2011	Radiation (03CH01-CB)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Sep. 09, 2010*	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	-	30 MHz - 1 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	-	1 GHz - 40 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	-	1 GHz - 40 GHz	Nov. 17, 2010	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP30	100023	9KHz~30GHz	Mar. 05, 2011	Conducted (TH01-CB)
Temp. and Humidity Chamber	TEN BILLION	TTH-D3SP	TBN-931011	-30~100°C	May 21, 2010	Conducted (TH01-CB)
Temp. and Humidity Chamber	TEN BILLION	TTH-D3SP	TBN-931011	-30~100°C	May 21, 2011	Conducted (TH01-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Mar. 09, 2011	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
Signal generator	R&S	SMU200A	102782	10MHz-40GHz	Mar. 09, 2011	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	Apr. 16, 2010	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	Apr. 16, 2011	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071042	1GHz – 18GHz	Oct. 14, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 13, 2010	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 08, 2010	Conducted (TH01-CB)

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

* Calibration Interval of instruments listed above is two year.

NCR means Non-Calibration required.

6. TEST LOCATION

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

7. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-091230

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2010 to January 09, 2013
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities



Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 30, 2009

P1, total 22 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

Appendix A. Test Photos

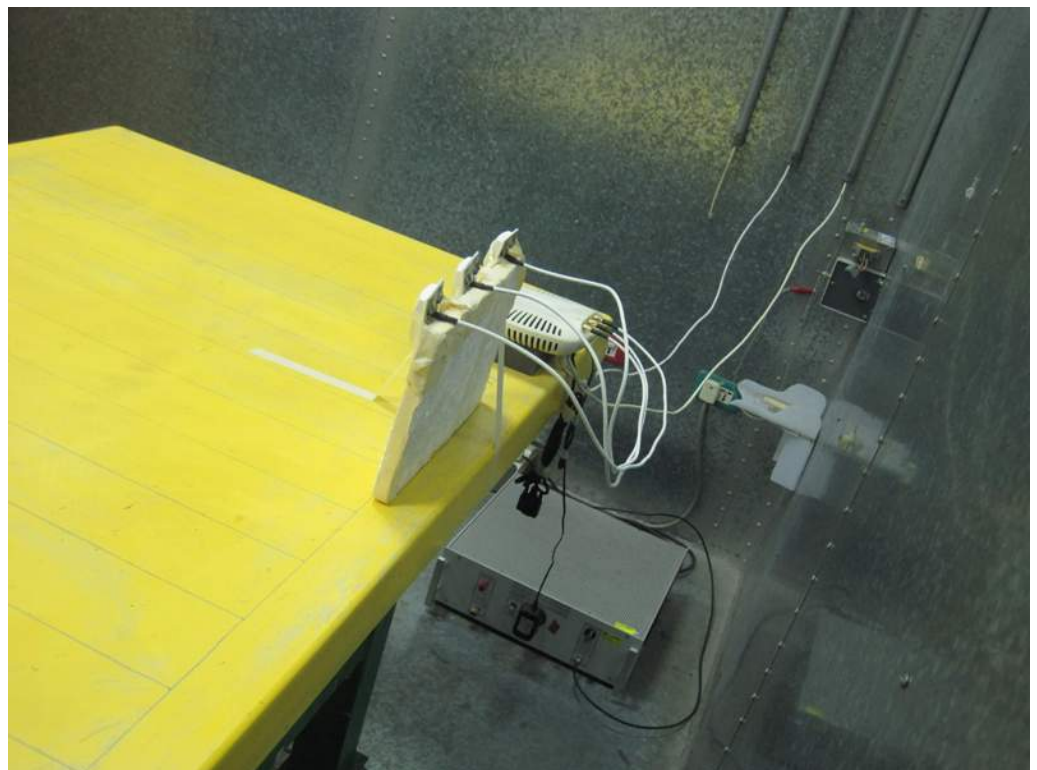
1. Photographs of Conducted Emissions Test Configuration

Test Mode: Mode 1

FRONT VIEW



REAR VIEW



SIDE VIEW

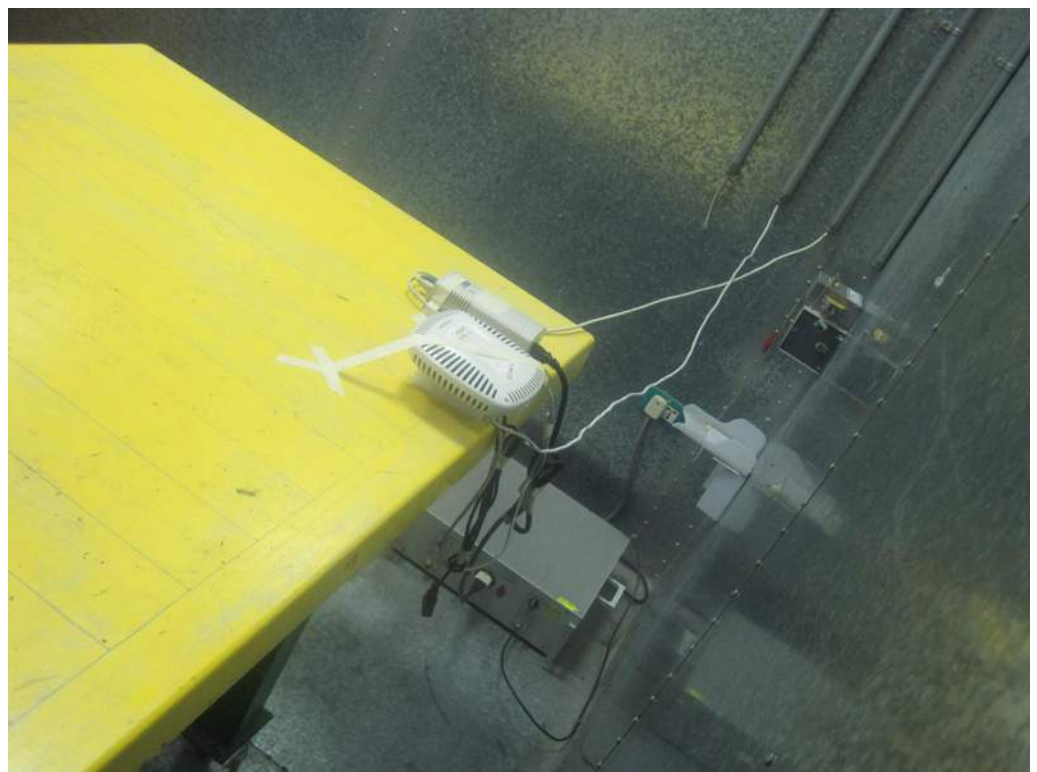


Test Mode: Mode 4

FRONT VIEW



REAR VIEW



SIDE VIEW



2. Photographs of Radiated Emissions Test Configuration

Test Configuration: 9kHz ~30MHz

FRONT VIEW



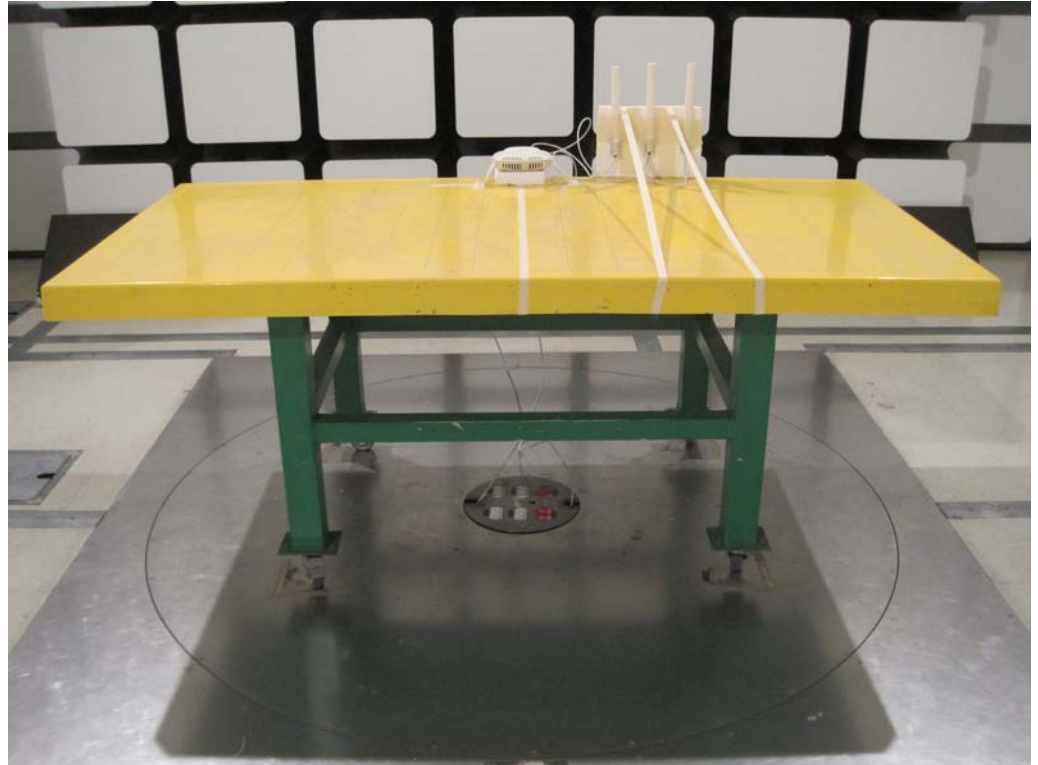
REAR VIEW



Test Configuration: 30MHz~1GHz

Test Mode: Mode 2

FRONT VIEW



REAR VIEW



Test Mode: Mode 4

FRONT VIEW



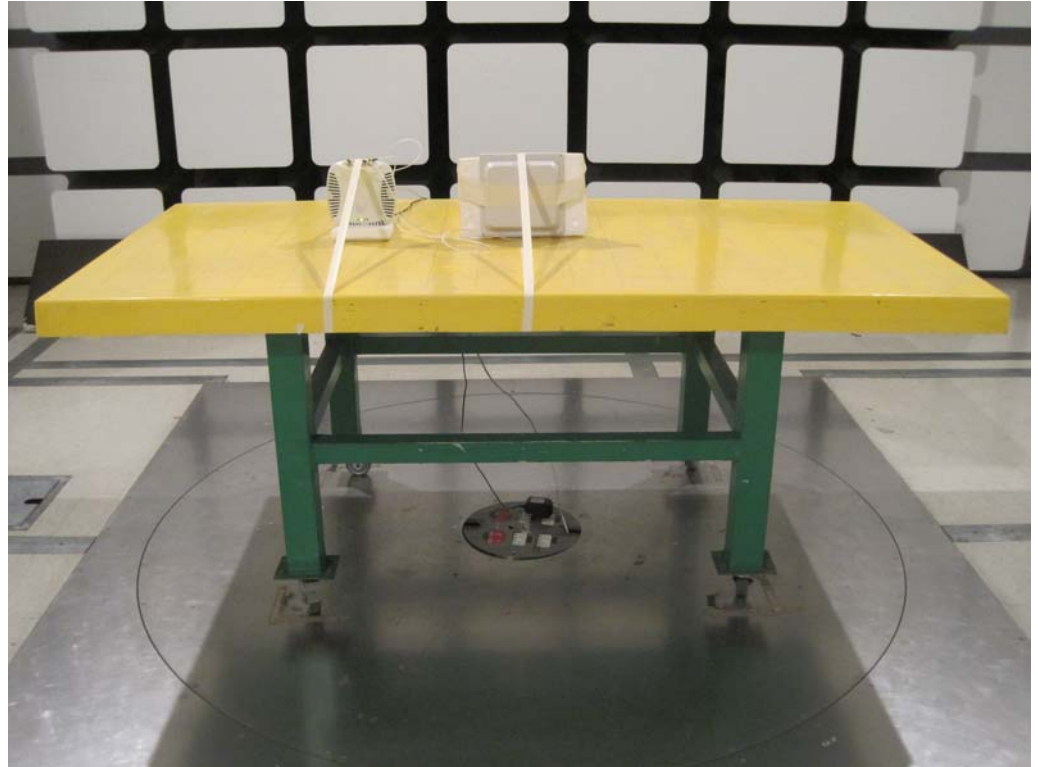
REAR VIEW



Test Configuration: Above 1GHz

<For External Antenna / Ant. 5>

FRONT VIEW

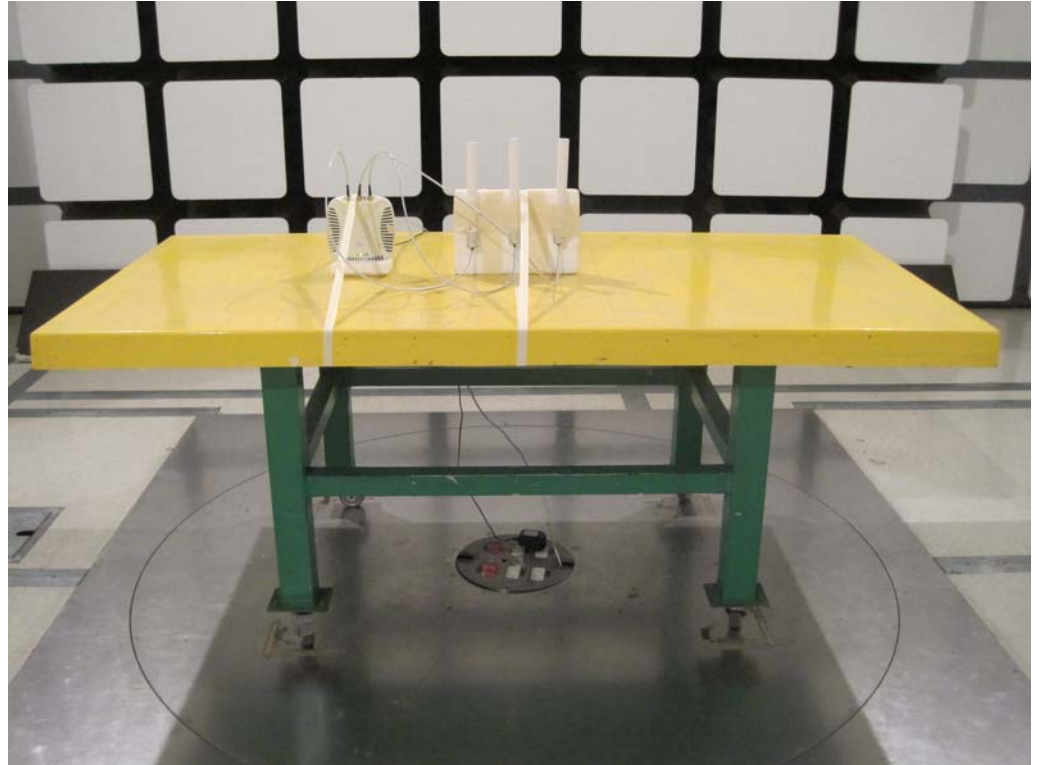


REAR VIEW



<For External Antenna / Ant. 6>

FRONT VIEW

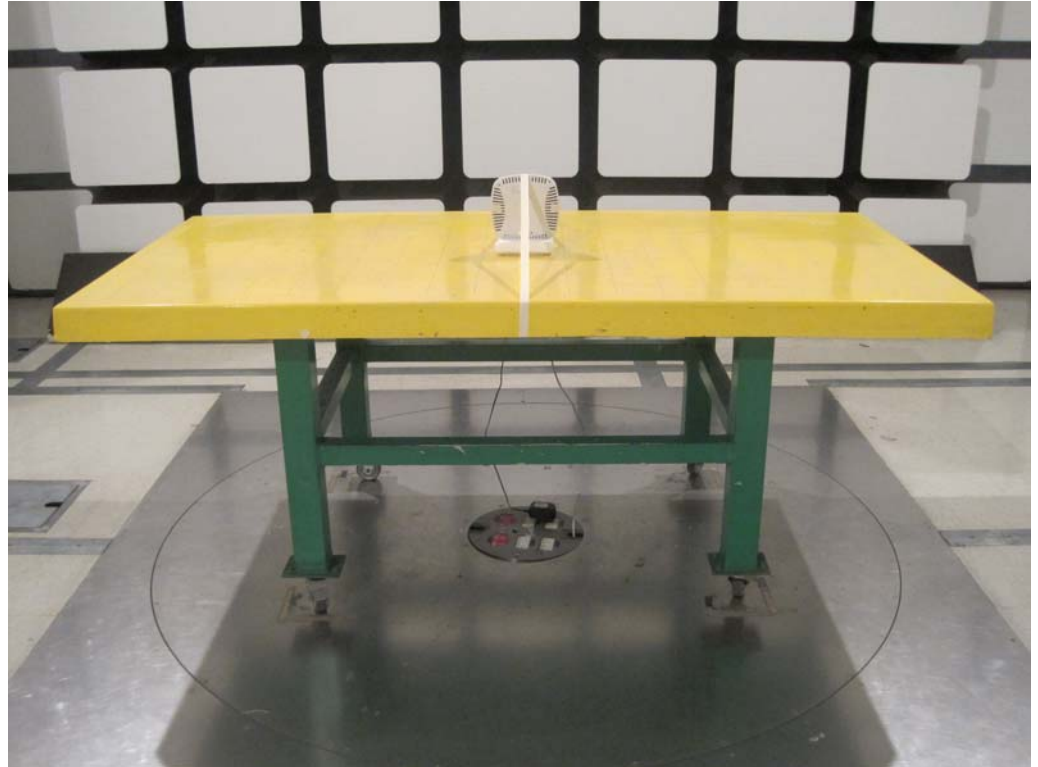


REAR VIEW



<For Internal Antenna / Ant. 8>

FRONT VIEW



REAR VIEW



Appendix B. Maximum Permissible Exposure

1. Maximum Permissible Exposure

1.1. Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.25 m normally can be maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

1.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.4m, as well as the gain of the used antenna, the RF power density can be obtained.

1.3. Calculated Result and Limit

<For External Antenna / Ant. 5>

Antenna Type : Directional Antenna

Max Conducted Power for IEEE 802.11a / Connector J2 + J3 + J4: 23.91dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.20	2.6303	23.9123	246.1672	0.032220	1	Complies

<For External Antenna / Ant. 6>

Antenna Type : Omni Antenna

Max Conducted Power for IEEE 802.11a / Connector J2 + J3 + J4: 23.91dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2.70	1.8621	23.9123	246.1672	0.022810	1	Complies

<For Internal Antenna / Ant. 8>

Antenna Type : Embedded Antenna

Max Conducted Power for IEEE 802.11n MCS8 20MHz / Connector J2 + J3 + J4: 23.15dBm

Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4.50	2.8184	23.1483	206.4592	0.028955	1	Complies

Appendix C. New Power Measurement for MIMO Device

1. New Power Measurement for MIMO Device

In order to comply with latest FCC regulations(KDB662911) the RF power in legacy modes (802.11 a/b/g) must be added the additional antenna gain by 4.77 dB ($10\log(N)$, $N=3$). It is re-calculated the RF output power in legacy mode in below table. For the In-band PSD and out -Band Measurement, it is measured by original power value so that it is over -estimated so it is not measured again.

1.1 Test Result of Maximum Conducted Output Power for legacy mode

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 5
Test Date	May. 08, 2011 & April 29, 2011		

Power Parameters of IEEE 802.11a

Test Software Version	ART2-GUI 2.13					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	17.5	18	18	18	18	17.5

Configuration IEEE 802.11a

Channel	Frequency	Power output (dBm)			Total power (dBm)	Max. Limit (dBm)	Result
		Connector J2	Connector J3	Connector J4			
52	5260 MHz	16.3	15.36	16.28	20.77	21.03	Complies
60	5300 MHz	15.61	15.05	16.36	20.48	21.03	Complies
64	5320 MHz	15.7	15.55	16.21	20.60	21.03	Complies
100	5500 MHz	15.22	15.62	16.02	20.40	21.03	Complies
116	5580 MHz	16.13	15.99	16.39	20.94	21.03	Complies
140	5700 MHz	16.02	15.65	16.44	20.82	21.03	Complies

Directional gain = $4.2\text{dBi} + 10\log(3) = 8.97\text{dBi} > 6\text{dBi}$, so the conducted output power limit should be reduced to $24 - (8.97 - 6) = 21.03\text{dBm}$

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 6
Test Date	Mar. 08, 2011 & April 29, 2011		

Power Parameters of IEEE 802.11a

Test Software Version	ART2-GUI 2.13					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	19.5	19.5	17	18.5	19.5	19

Configuration IEEE 802.11a

Channel	Frequency	Power output (dBm)			Total power (dBm)	Max. Limit (dBm)	Result
		Connector J2	Connector J3	Connector J4			
52	5260 MHz	17.46	17.82	17.71	22.44	22.53	Complies
60	5300 MHz	17.25	17	17.9	22.17	22.53	Complies
64	5320 MHz	15.21	15.04	16.05	20.23	22.53	Complies
100	5500 MHz	15.88	16.85	16.96	21.36	22.53	Complies
116	5580 MHz	17.53	17.78	17.91	22.51	22.53	Complies
140	5700 MHz	17.17	16.7	17.53	21.92	22.53	Complies

Directional gain = $2.7\text{dBi} + 10\log(3) = 7.47\text{dBi} > 6\text{dBi}$, so the conducted output power limit should be reduced to $24 - (7.47 - 6) = 22.53\text{dBm}$

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 8
Test Date	Mar. 08, 2011 & April 29, 2011		

Power Parameters of IEEE 802.11a

Test Software Version	ART2-GUI 2.13					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	16	14	12	12	16.5	14.5

Configuration IEEE 802.11a

Channel	Frequency	Power output (dBm)			Total power (dBm)	Max. Limit (dBm)	Result
		Connector J2	Connector J3	Connector J4			
52	5260 MHz	14.86	16.28	16.04	20.54	20.73	Complies
60	5300 MHz	13.35	13.88	14.21	18.60	20.73	Complies
64	5320 MHz	11.13	11.62	11.72	16.27	20.73	Complies
100	5500 MHz	11.58	11.69	12.12	16.57	20.73	Complies
116	5580 MHz	15.81	15.77	15.67	20.52	20.73	Complies
140	5700 MHz	15.07	14.34	14.73	19.49	20.73	Complies

Directional gain = $4.5\text{dBi} + 10\log(3) = 9.27\text{dBi} > 6\text{dBi}$, so the conducted output power limit should be reduced to $24 - (9.27 - 6) = 20.73\text{dBm}$