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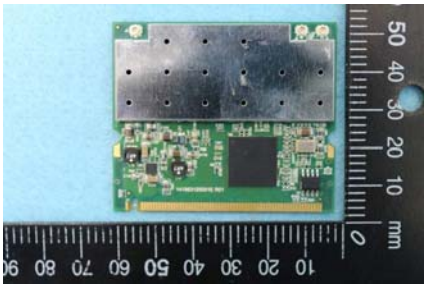
UPDATED FCC RADIO TEST REPORT

Applicant's company	**Motorola Solutions, Inc.**
Applicant Address	One Motorola Plaza Holtsville, NY 11742 USA
FCC ID	**UZ7AP7131**
Manufacturer's company	**Joy Technology (ShenZhen) Corporation**
Manufacturer Address	HengKeng Ind., Shangpai, Shangwu,Aiqun Rd., Shiyan Town,Shenzhen 518108 China

Product Name	11 a/b/g/n Access Point Module
Brand Name	Motorola
Model Name	AP-7131-MB82
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Oct. 17, 2012
Final Test Date	Dec. 14, 2012
Submission Type	Class II Change
Operating Mode	Master



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**, **47 CFR FCC Part 15 Subpart E** and **KDB 789033 D01 v01r02, KDB 662911 v01r02.**

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

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR821502-06	Rev. 01	Initial issue of report	Jan. 24, 2013
FR821502-06	Rev. 02	The test result of radiated emission is not fit client's request (under limit 3dB), it only under limit 1dB. Therefore, it verified radiated emission test.	Jan. 29, 2013

Certificate No.: CB10112201

1. CERTIFICATE OF COMPLIANCE

Product Name	:	**11 a/b/g/n Access Point Module**
Brand Name	:	**Motorola**
Model Name	:	**AP-7131-MB82**
Applicant	:	**Motorola Solutions, 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 Oct. 17, 2012 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.2	15.407(a)	Maximum Conducted Output Power	Complies	0.06 dB
4.3	15.407(a)	Power Spectral Density	Complies	0.03 dB
4.4	15.407(a)	Peak Excursion	Complies	0.95 dB
4.5	15.407(b)	Radiated Emissions	Complies	4.42 dB
4.6	15.407(b)	Band Edge Emissions	Complies	1.00 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	15.203	Antenna Requirements	Complies	-

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

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	19 for 20MHz bandwidth ; 9 for 40MHz bandwidth
Channel Band Width (99%)	MCS0 (20MHz): 18.24 MHz ; MCS0 (40MHz): 36.48 MHz ; MCS8 (20MHz): 18.08 MHz ; MCS8 (40MHz): 36.80 MHz
Maximum Conducted Output Power	Band 2: MCS0 (20MHz): 18.31 dBm ; MCS0 (40MHz): 20.85 dBm; MCS8 (20MHz): 20.82 dBm ; MCS8 (40MHz): 22.36 dBm Band 3: MCS0 (20MHz): 18.41 dBm ; MCS0 (40MHz): 20.91 dBm; MCS8 (20MHz): 20.79 dBm ; MCS8 (40MHz): 22.37 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 Host System
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	19
Channel Band Width (99%)	11a: 16.96 MHz
Maximum Conducted Output Power	Band 2: 17.64 dBm ; Band 3: 17.91 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

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

IEEE 802.11n spec

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

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
8	MOTOROLA	ML-2499-FHPA9-01R	Dipole Antenna	N-Male	10.5	-
9	MOTOROLA	ML-2499-BPNA3-01R	Panel Antenna	N-Type Female	15.5	-
10	MOTOROLA	ML-2452-PTA3M3-036	Patch Antenna	RP-SMA-Male	4.92	8.97
11	MOTOROLA	ML-5299-FHPA6-01R	Omni Antenna	N male	-	8.25

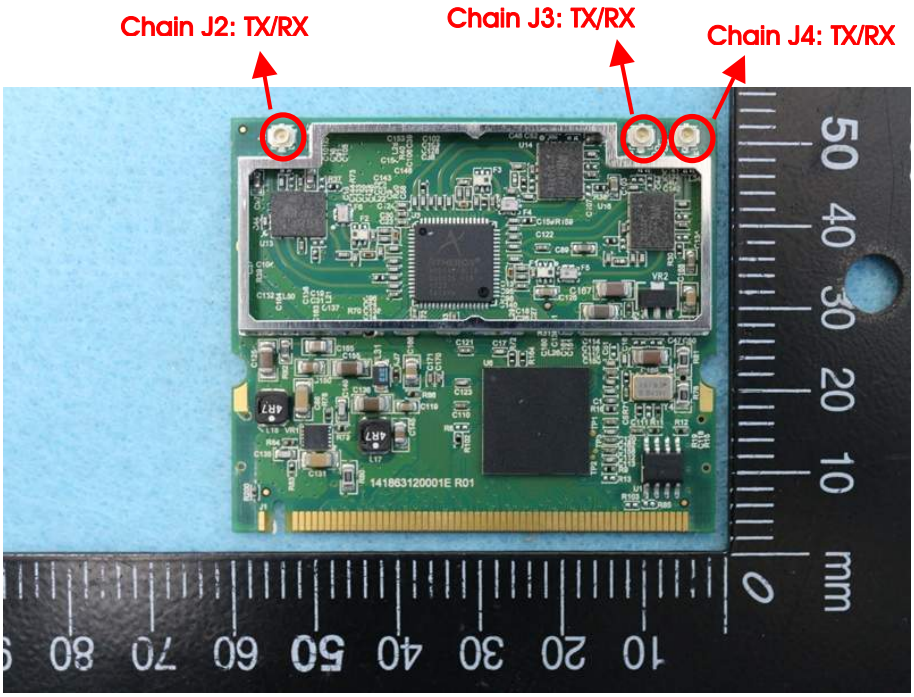
Ant.	Loss of External Cable (dB)		True Gain (dBi)		Remark
	2.4GHz	5GHz	2.4GHz	5GHz	
8	0.3	-	10.2	-	TX, RX
9	0.3	-	15.2	-	TX, RX
10	0.92	1.97	4	7	TX, RX
11	-	0.68	-	7.57	TX, RX

Note : Because Ant. 10 and original project's Ant. 6 (Model: ML-5299-WPNA1-01R) are the same type antennas, only the higher gain antenna original project's Ant. 6 (Model: ML-5299-WPNA1-01R) was tested and recorded in the Sporton project number: FR821502-02AA and FR821502-02AB.

The EUT has three Chains.

Chain J2, Chain J3 and Chain J4 could be used as transmitting/receiving simultaneously.

Ant. 10 and Ant. 11 could be used as transmitting/receiving antenna.



3.4. Table for Carrier Frequencies

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

There are two bandwidth systems for IEEE 802.11n.

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

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

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	Chain
Max. Conducted Output Power	MCS0/20MHz	Band 2	6.5 Mbps	52/60/64	J2/J3/J4/J2+J3+J4
		Band 3	6.5 Mbps	100/116/140	J2/J3/J4/J2+J3+J4
	MCS0/40MHz	Band 2	13.5 Mbps	54/62	J2/J3/J4/J2+J3+J4
		Band 3	13.5 Mbps	102/134	J2/J3/J4/J2+J3+J4
	MCS8/20MHz	Band 2	13 Mbps	52/60/64	J2/J3/J4/J2+J3+J4
		Band 3	13 Mbps	100/116/140	J2/J3/J4/J2+J3+J4
	MCS8/40MHz	Band 2	27 Mbps	54/62	J2/J3/J4/J2+J3+J4
		Band 3	27 Mbps	102/134	J2/J3/J4/J2+J3+J4
	11a/BPSK	Band 2	6 Mbps	52/60/64	J2/J3/J4/J2+J3+J4
		Band 3	6 Mbps	100/116/140	J2/J3/J4/J2+J3+J4
Power Spectral Density	MCS0/20MHz	Band 2	6.5 Mbps	52/60/64	J2+J3+J4
		Band 3	6.5 Mbps	100/116/140	J2+J3+J4
	MCS0/40MHz	Band 2	13.5 Mbps	54/62	J2+J3+J4
		Band 3	13.5 Mbps	102/134	J2+J3+J4
	MCS8/20MHz	Band 2	13 Mbps	52/60/64	J2+J3+J4
		Band 3	13 Mbps	100/116/140	J2+J3+J4
	MCS8/40MHz	Band 2	27 Mbps	54/62	J2+J3+J4
		Band 3	27 Mbps	102/134	J2+J3+J4
	11a/BPSK	Band 2	6 Mbps	52/60/64	J2+J3+J4
		Band 3	6 Mbps	100/116/140	J2+J3+J4
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Peak Excursion	MCS0/20MHz	Band 2	6.5 Mbps	52/60/64	J2+J3+J4
		Band 3	6.5 Mbps	100/116/140	J2+J3+J4
	MCS0/40MHz	Band 2	13.5 Mbps	54/62	J2+J3+J4
		Band 3	13.5 Mbps	102/134	J2+J3+J4
	MCS8/20MHz	Band 2	13 Mbps	52/60/64	J2+J3+J4
		Band 3	13 Mbps	100/116/140	J2+J3+J4
	MCS8/40MHz	Band 2	27 Mbps	54/62	J2+J3+J4
		Band 3	27 Mbps	102/134	J2+J3+J4
	11a/BPSK	Band 2	6 Mbps	52/60/64	J2+J3+J4
		Band 3	6 Mbps	100/116/140	J2+J3+J4
Peak Excursion	MCS0/20MHz	Band 2	6.5 Mbps	64	J2+J3+J4
		Band 3	6.5 Mbps	140	J2+J3+J4
	MCS0/40MHz	Band 2	13.5 Mbps	54	J2+J3+J4
		Band 3	13.5 Mbps	134	J2+J3+J4
	MCS8/20MHz	Band 2	13 Mbps	64	J2+J3+J4

		Band 3	13 Mbps	116	J2+J3+J4
	MCS8/40MHz	Band 2	27 Mbps	54	J2+J3+J4
		Band 3	27 Mbps	110	J2+J3+J4
	11a/BPSK	Band 2	6 Mbps	64	J2+J3+J4
		Band 3	6 Mbps	140	J2+J3+J4
Radiated Emission Below 1GHz	CTX		Auto	-	-
Radiated Emission Above 1GHz	MCS0/20MHz	Band 2	6.5 Mbps	52/60/64	J2+J3+J4
		Band 3	6.5 Mbps	100/116/140	J2+J3+J4
	MCS0/40MHz	Band 2	13.5 Mbps	54/62	J2+J3+J4
		Band 3	13.5 Mbps	102/134	J2+J3+J4
	MCS8/20MHz	Band 2	13 Mbps	52/60/64	J2+J3+J4
		Band 3	13 Mbps	100/116/140	J2+J3+J4
	MCS8/40MHz	Band 2	27 Mbps	54/62	J2+J3+J4
		Band 3	27 Mbps	102/134	J2+J3+J4
	11a/BPSK	Band 2	6 Mbps	52/60/64	J2+J3+J4
		Band 3	6 Mbps	100/116/140	J2+J3+J4
Band Edge Emission	MCS0/20MHz	Band 2	6.5 Mbps	52/60/64	J2+J3+J4
		Band 3	6.5 Mbps	100/116/140	J2+J3+J4
	MCS0/40MHz	Band 2	13.5 Mbps	54/62	J2+J3+J4
		Band 3	13.5 Mbps	102/134	J2+J3+J4
	MCS8/20MHz	Band 2	13 Mbps	52/60/64	J2+J3+J4
		Band 3	13 Mbps	100/116/140	J2+J3+J4
	MCS8/40MHz	Band 2	27 Mbps	54/62	J2+J3+J4
		Band 3	27 Mbps	102/134	J2+J3+J4
	11a/BPSK	Band 2	6 Mbps	52/60/64	J2+J3+J4
		Band 3	6 Mbps	100/116/140	J2+J3+J4
Frequency Stability	Un-modulation		-	60	N/A

The following test modes were performed for all tests:

For Radiated Emission test:

Mode 1. EUT + Ant. 11

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	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

Please refer section 6 for Test Site Address.

3.7. Table for Class II Change

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

FR821502-02AA and FR821502-02AB.

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

Modifications	Performance Checking
Increase four antennas.	1. 26dB Spectrum Bandwidth 2. Maximum Conducted Output Power 3. Power Spectral Density 4. Peak Excursion 5. Radiated Emissions 6. Band Edge Emissions 7. Frequency Stability

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D505	E2K24GBRL
Notebook	DELL	D420	E2KWM3945ABG
Modem	ACEEX	DM1414	IFAXDM1414
Wireless AP	BELKIN	WG7016G22-LF-AK	DoC

3.9. Table for Parameters of Test Software Setting

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

Power Parameters of IEEE 802.11n MCS0 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Test Software Version	ART Revision 0.5 BUILD #26 ART_11n					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 20MHz	12.5	12	13	12.5	13	13.5

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Test Software Version	ART Revision 0.5 BUILD #26 ART_11n				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 40MHz	16	13	11.5	16	16

Power Parameters of IEEE 802.11n MCS8 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Test Software Version	ART Revision 0.5 BUILD #26 ART_11n					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS8 20MHz	15.5	15	15.5	15.5	16	14.5

Power Parameters of IEEE 802.11n MCS8 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Test Software Version	ART Revision 0.5 BUILD #26 ART_11n				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS8 40MHz	17.5	13.5	13.5	17.5	16

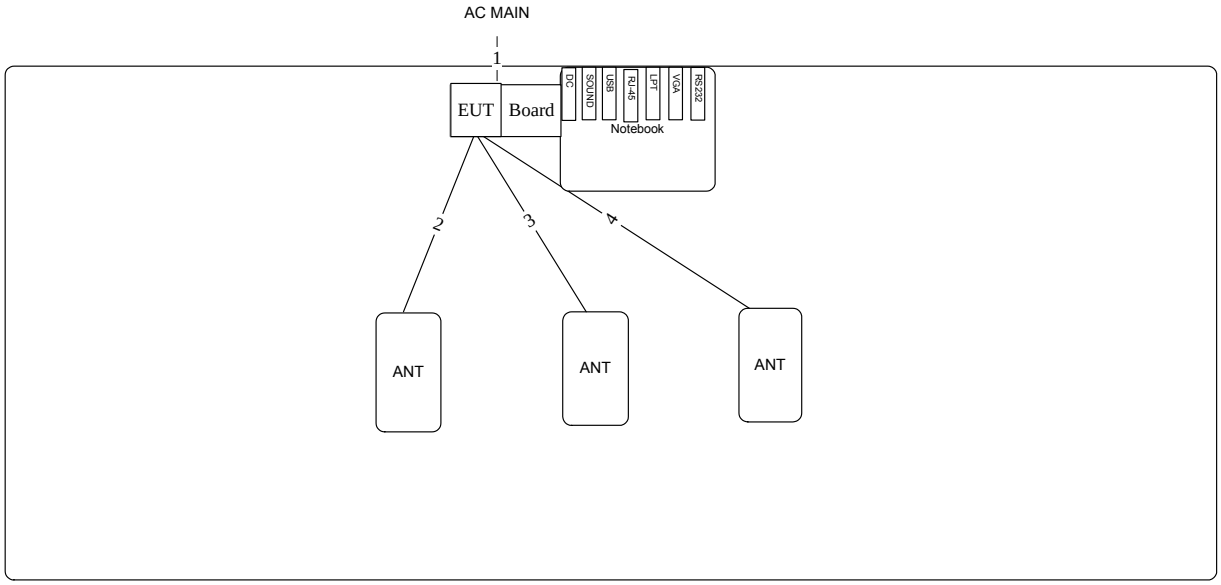
Power Parameters of IEEE 802.11a / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Test Software Version	ART Revision 0.5 BUILD #26 ART_11n					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
IEEE 802.11a	12	11.5	12.5	12.5	13	13

During the test, "ART Revision 0.5 BUILD #26 ART_11n" under WIN XP was executed the test program to control the EUT continuously transmit RF signal.

3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration



Item	Connection	Shield	Length
1	Power Cable	No	1.8m
2	Ant. Cable	Yes	0.65m
3	Ant. Cable	Yes	0.65m
4	Ant. Cable	Yes	0.65m

4. TEST RESULT

4.1. 99% Occupied Bandwidth Measurement

4.1.1. Limit

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

4.1.2. Measuring Instruments and Setting

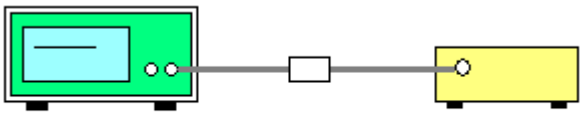
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	3000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.1.3. 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 3000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of 99% Occupied Bandwidth

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	23.68	18.08
60	5300 MHz	24.32	18.08
64	5320 MHz	23.52	18.08
100	5500 MHz	22.88	18.24
116	5580 MHz	22.56	17.92
140	5700 MHz	23.52	18.08

Configuration IEEE 802.11n MCS0 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	43.84	36.48
62	5310 MHz	42.88	36.48
102	5510MHz	43.20	36.48
110	5550 MHz	47.04	36.48
134	5670 MHz	44.48	36.48

Configuration IEEE 802.11n MCS8 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	23.68	18.08
60	5300 MHz	22.72	17.92
64	5320 MHz	22.56	17.92
100	5500 MHz	24.32	17.92
116	5580 MHz	22.56	18.08
140	5700 MHz	22.88	17.92

Configuration IEEE 802.11n MCS8 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

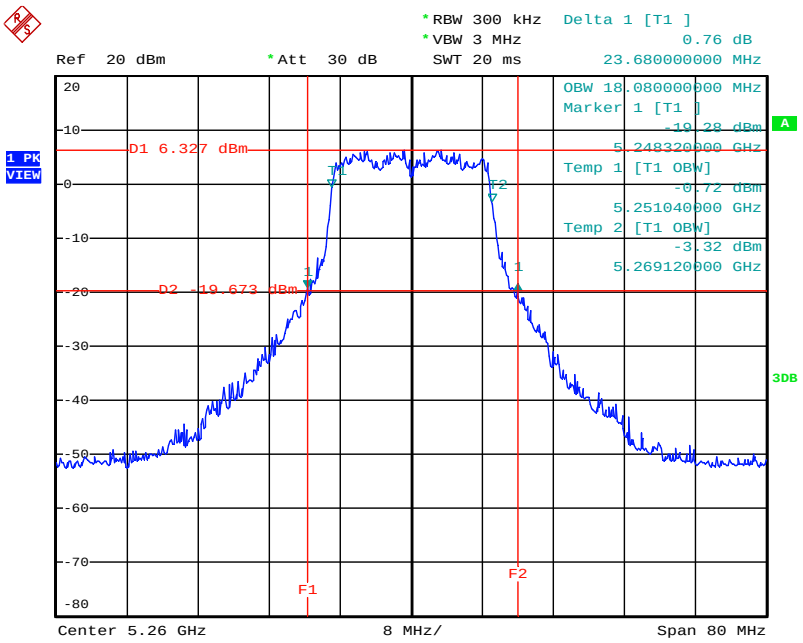
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	60.16	36.48
62	5310 MHz	42.24	36.48
102	5510MHz	43.52	36.48
110	5550 MHz	74.88	36.80
134	5670 MHz	43.84	36.48

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

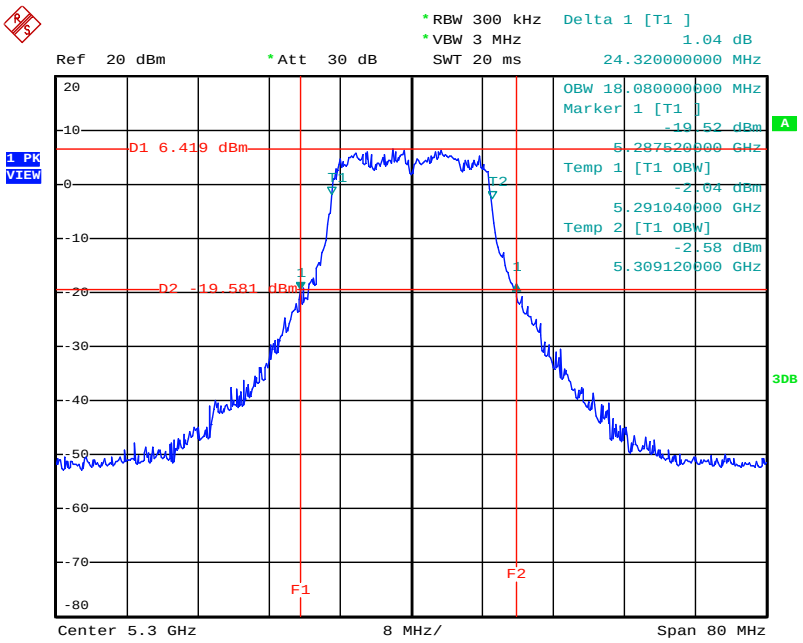
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	22.56	16.96
60	5300 MHz	22.24	16.80
64	5320 MHz	22.24	16.80
100	5500 MHz	21.92	16.64
116	5580 MHz	22.08	16.80
140	5700 MHz	22.88	16.96

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5260 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



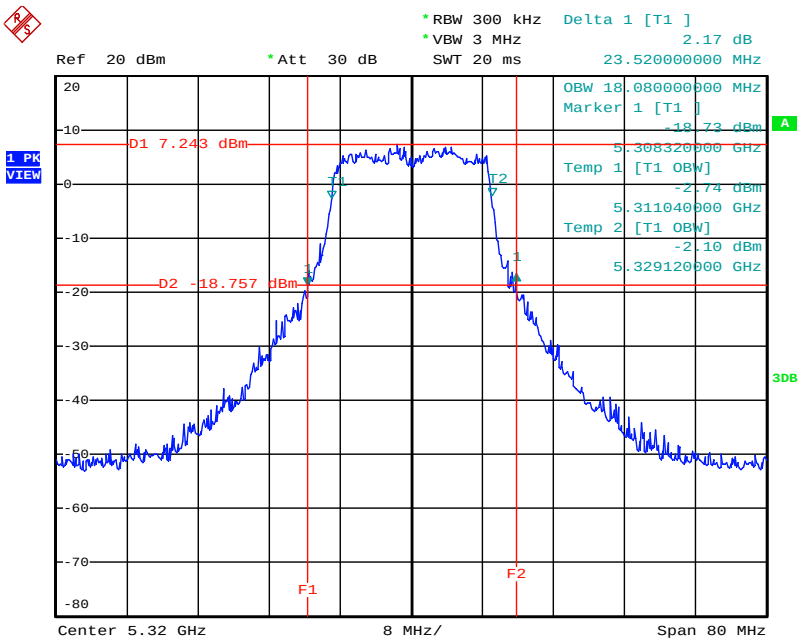
Date: 13.NOV.2012 06:44:26

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5300 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



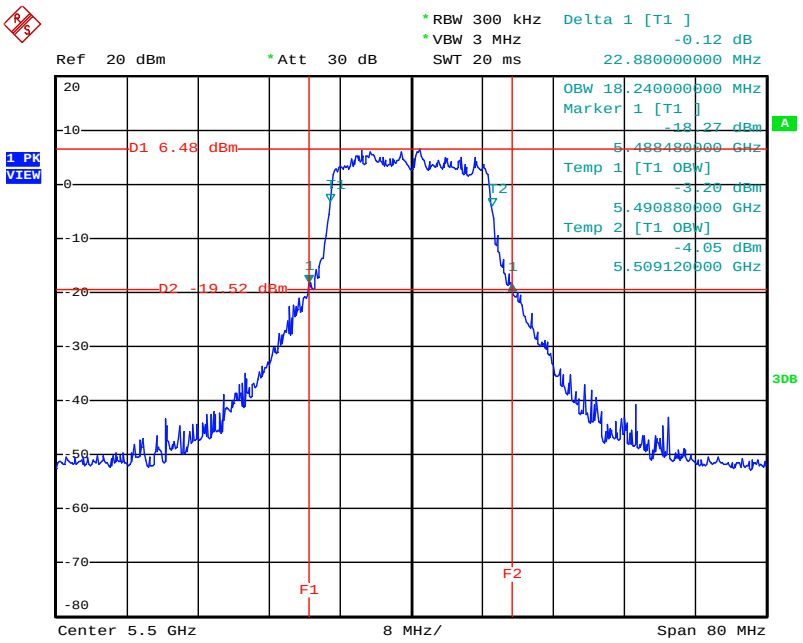
Date: 13.NOV.2012 06:44:04

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5320 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



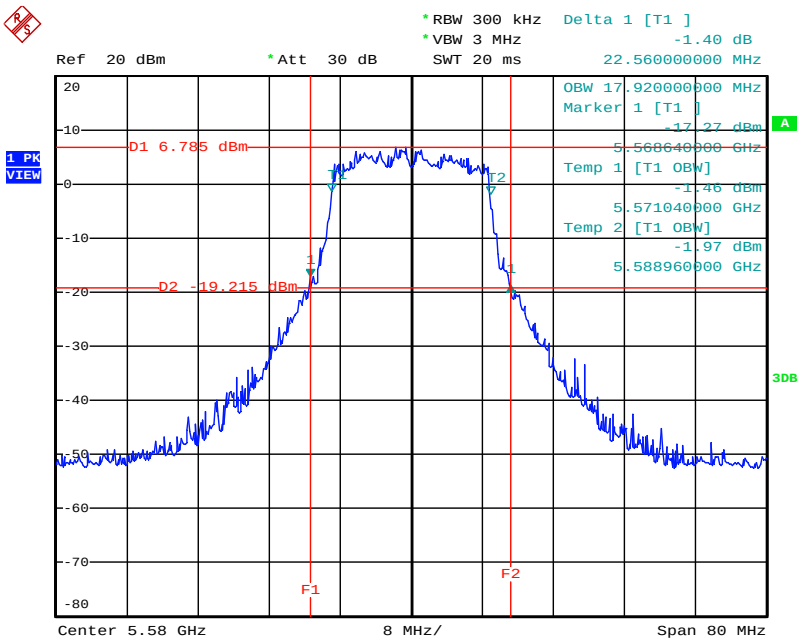
Date: 13.NOV.2012 06:43:44

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5500 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



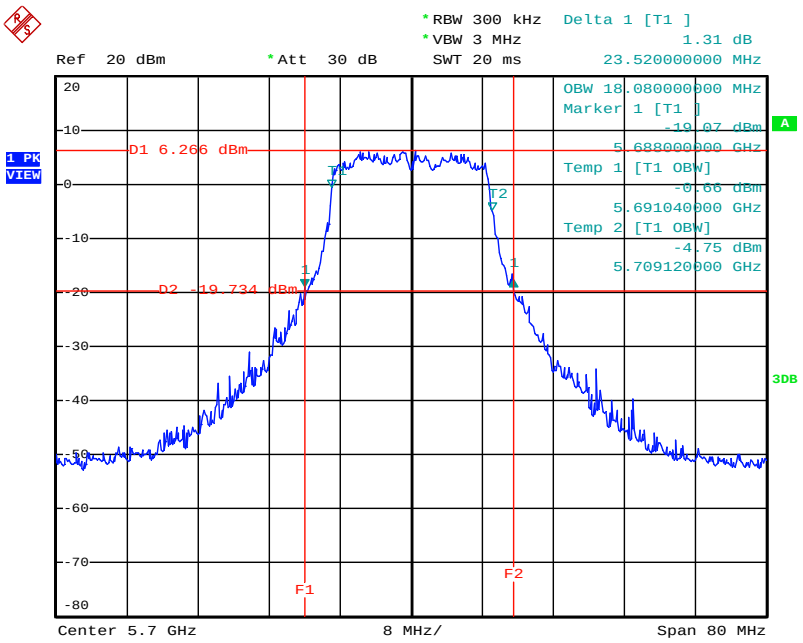
Date: 13.NOV.2012 06:43:14

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5580 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



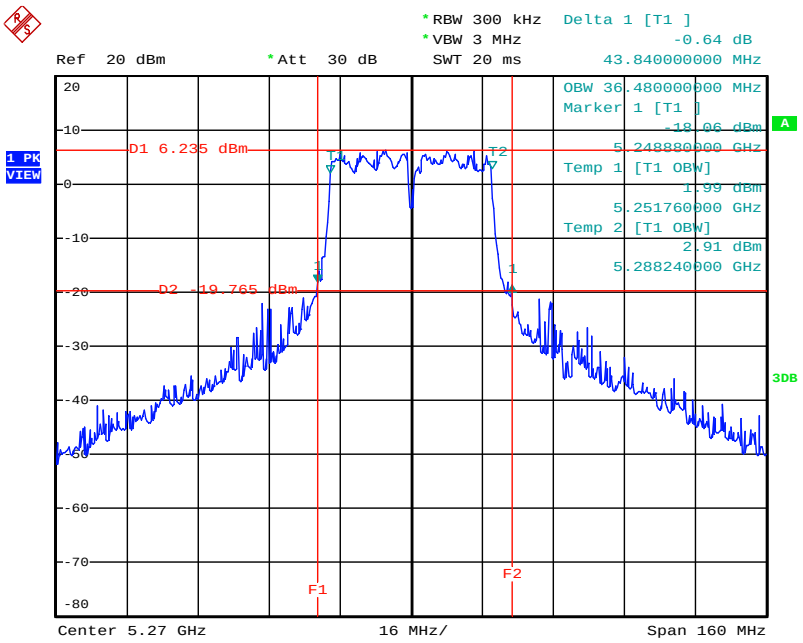
Date: 13.NOV.2012 06:42:22

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5700 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



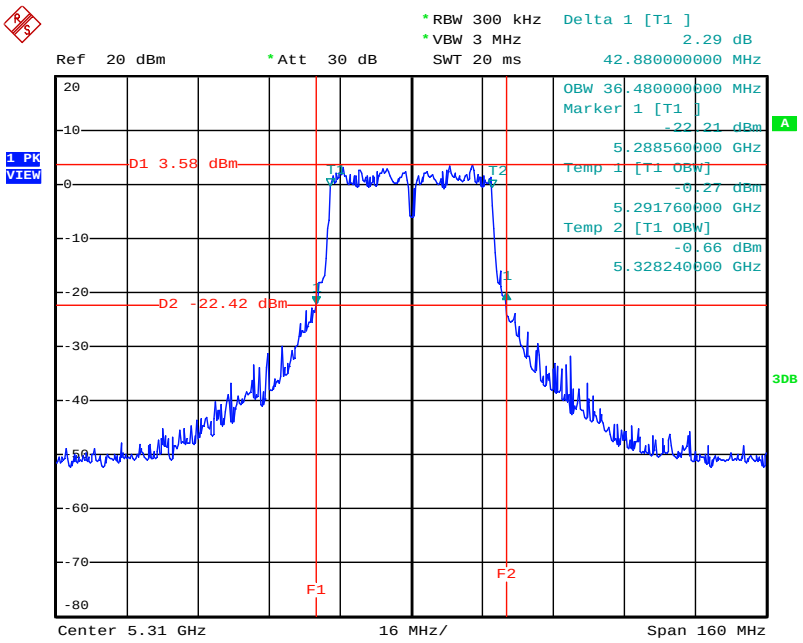
Date: 13.NOV.2012 06:41:46

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5270 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



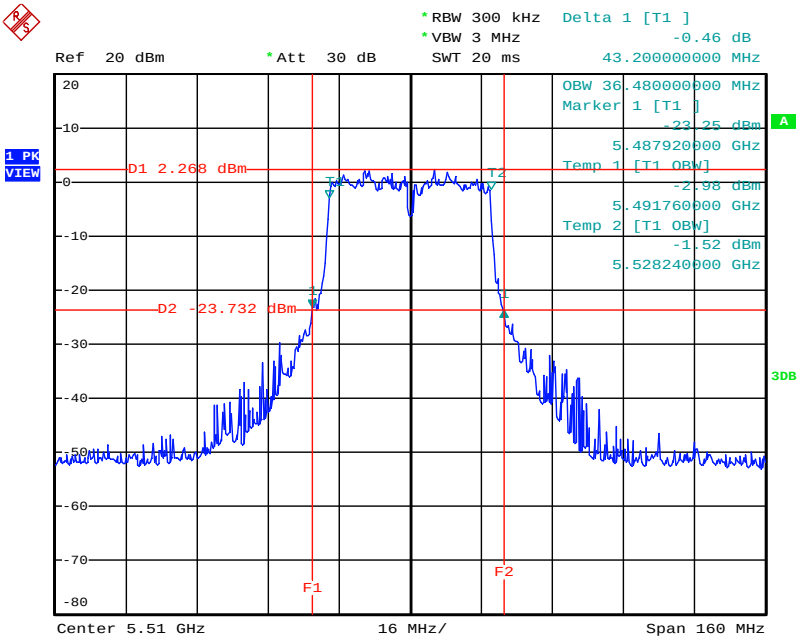
Date: 13.NOV.2012 07:05:14

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5310 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



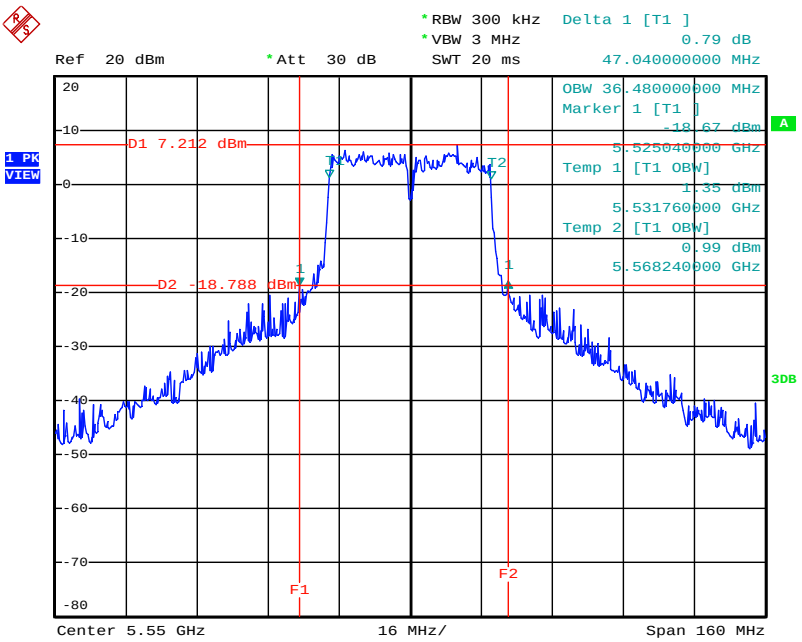
Date: 13.NOV.2012 07:05:39

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5510MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



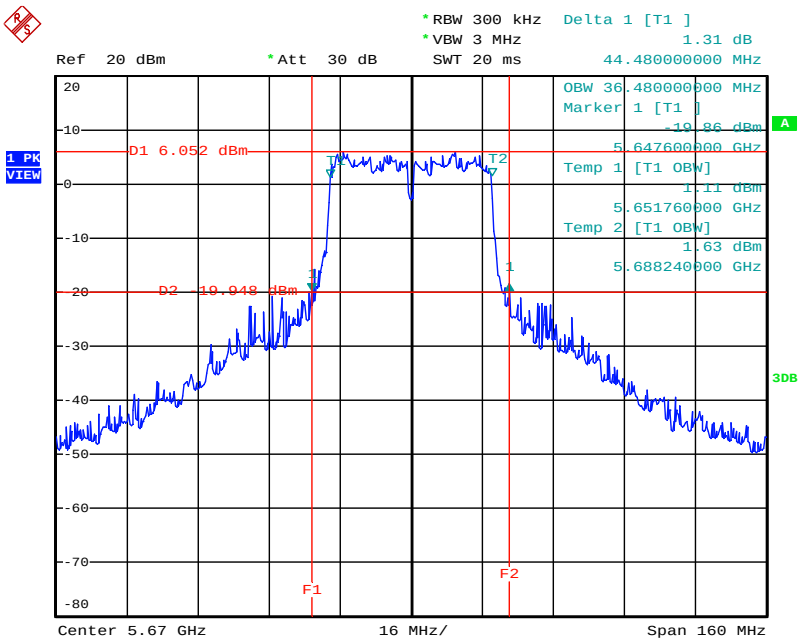
Date: 13.NOV.2012 07:06:03

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5550 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



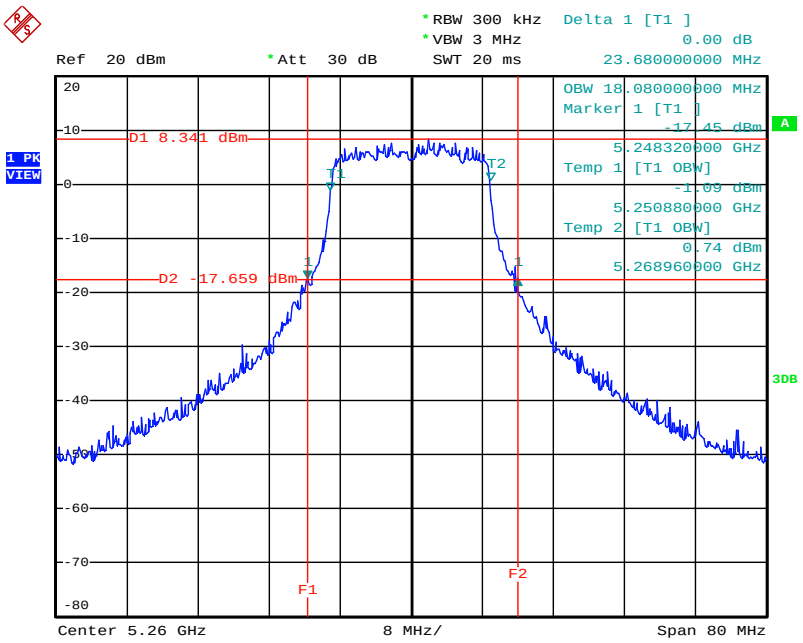
Date: 13.NOV.2012 07:06:30

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5670 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



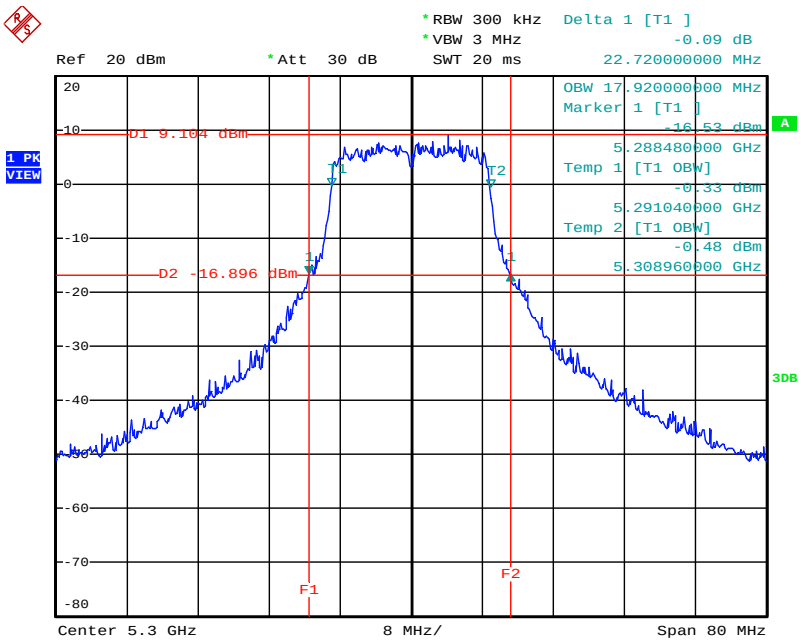
Date: 13.NOV.2012 07:06:53

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5260 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



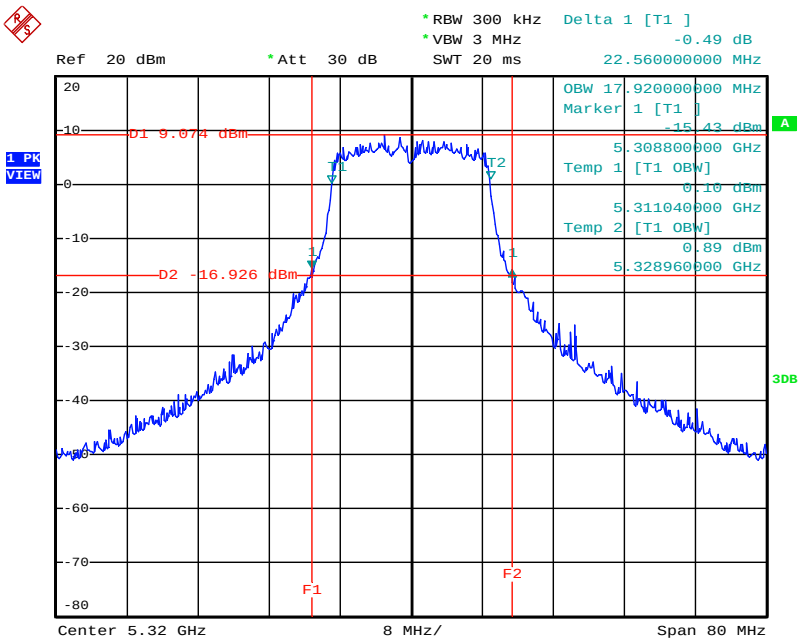
Date: 13.NOV.2012 06:47:42

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5300 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



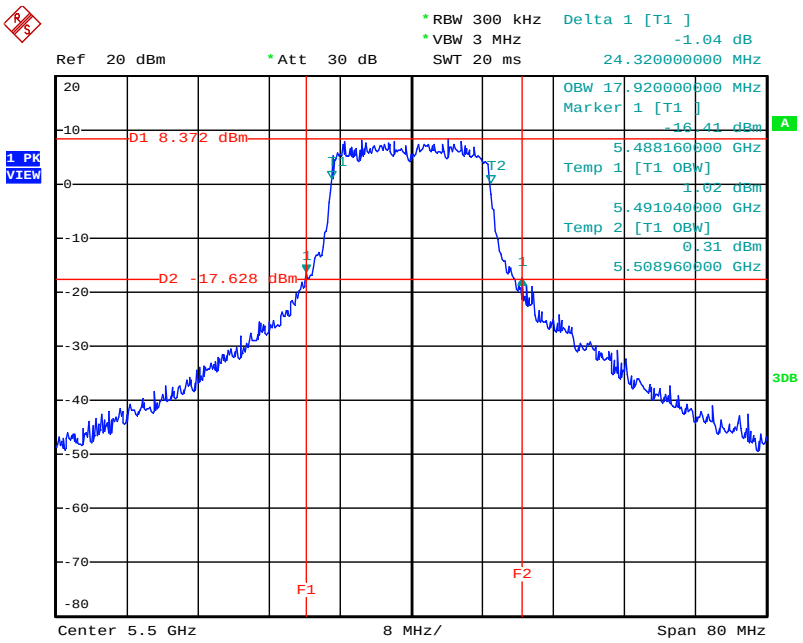
Date: 13.NOV.2012 06:48:35

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5320 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



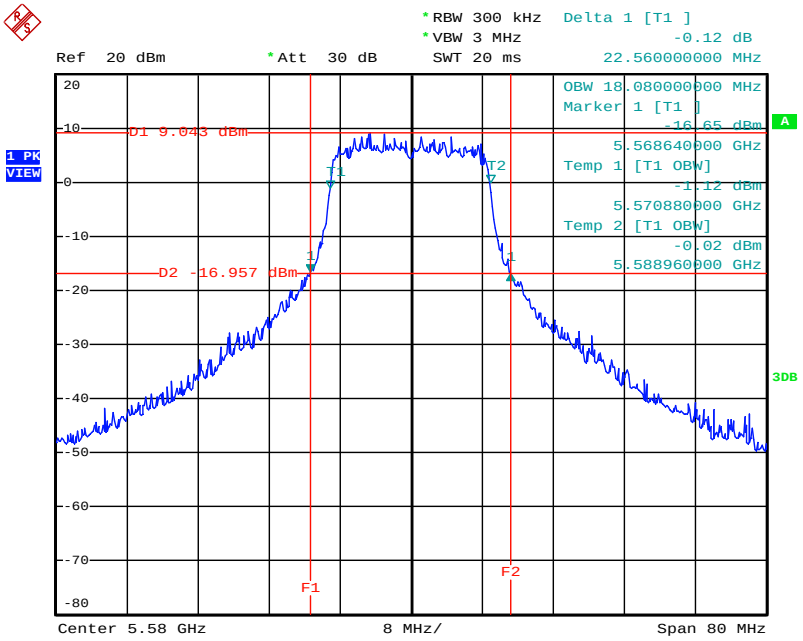
Date: 13.NOV.2012 06:49:03

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5500 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



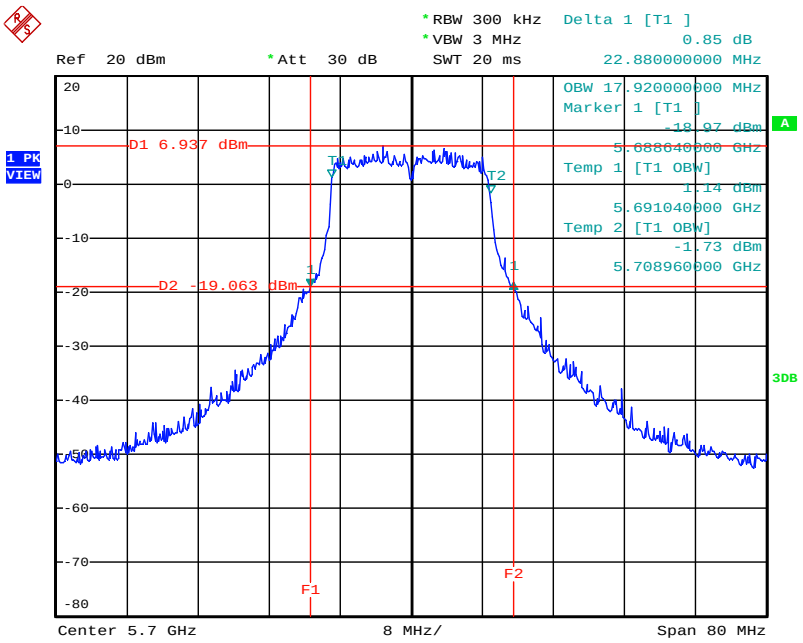
Date: 13.NOV.2012 06:50:04

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5580 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



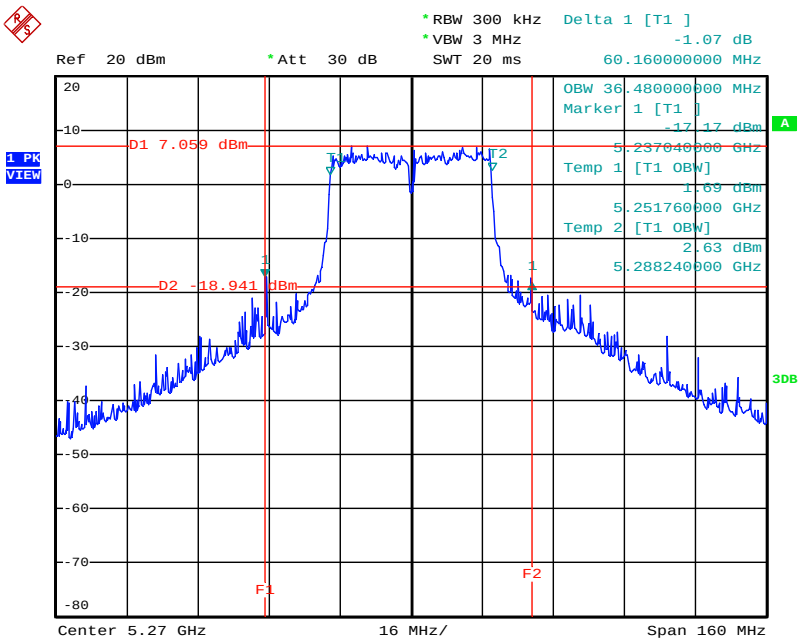
Date: 13.NOV.2012 06:50:51

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5700 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



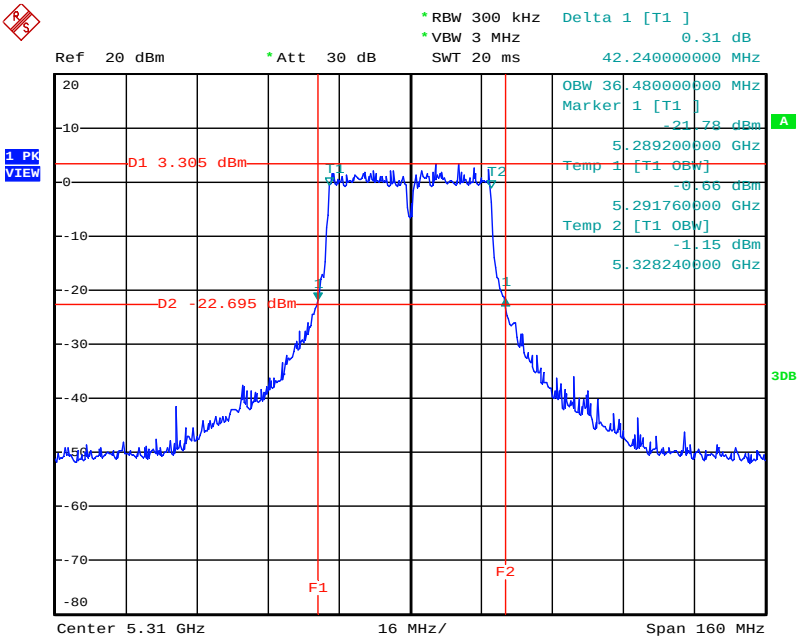
Date: 13.NOV.2012 06:51:14

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5270 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



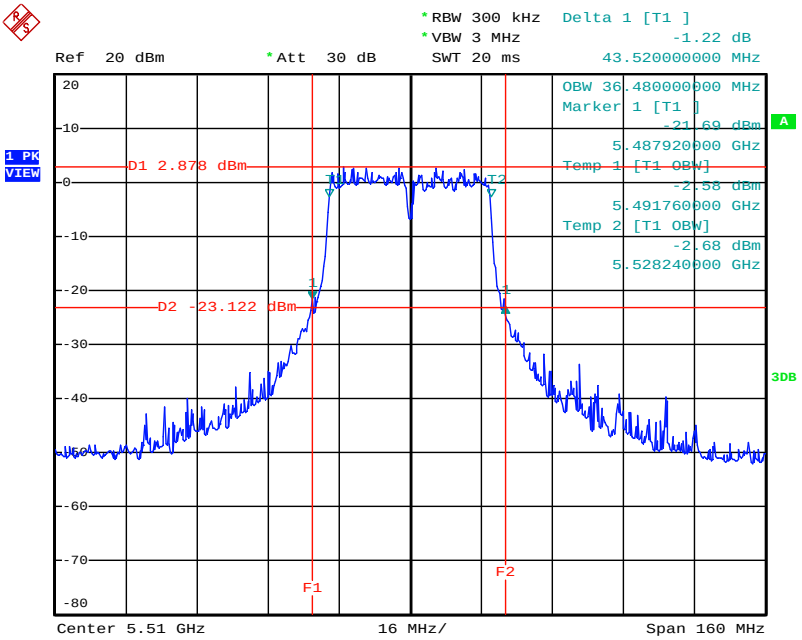
Date: 13.NOV.2012 07:02:51

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5310 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



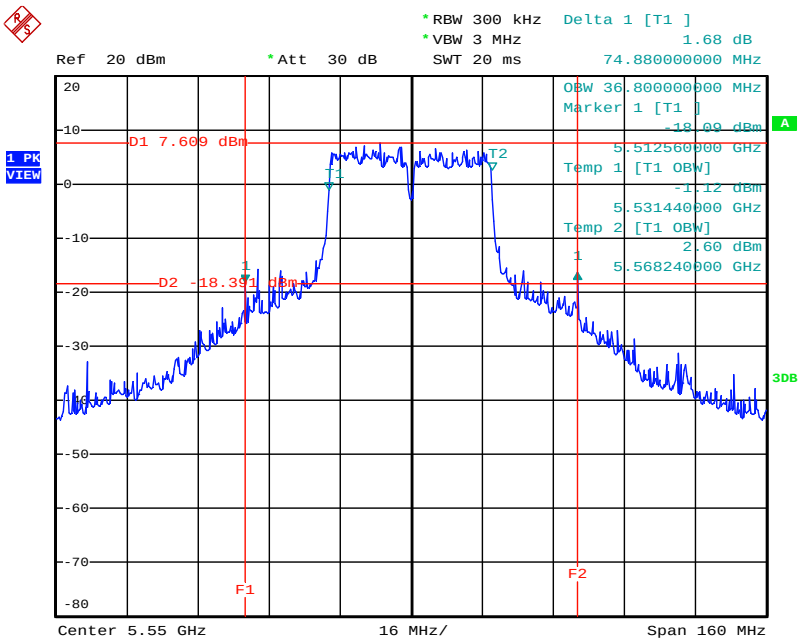
Date: 13.NOV.2012 07:00:41

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5510MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



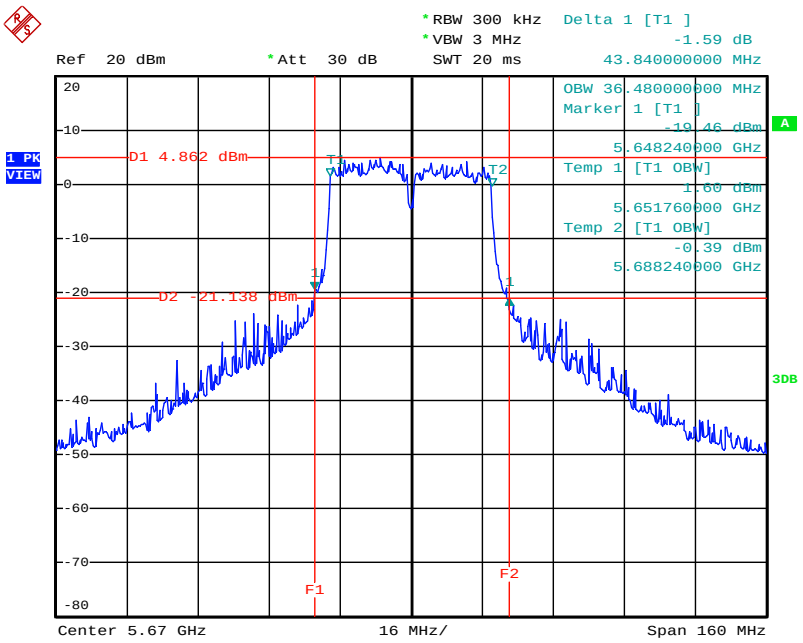
Date: 13.NOV.2012 07:00:09

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5550 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



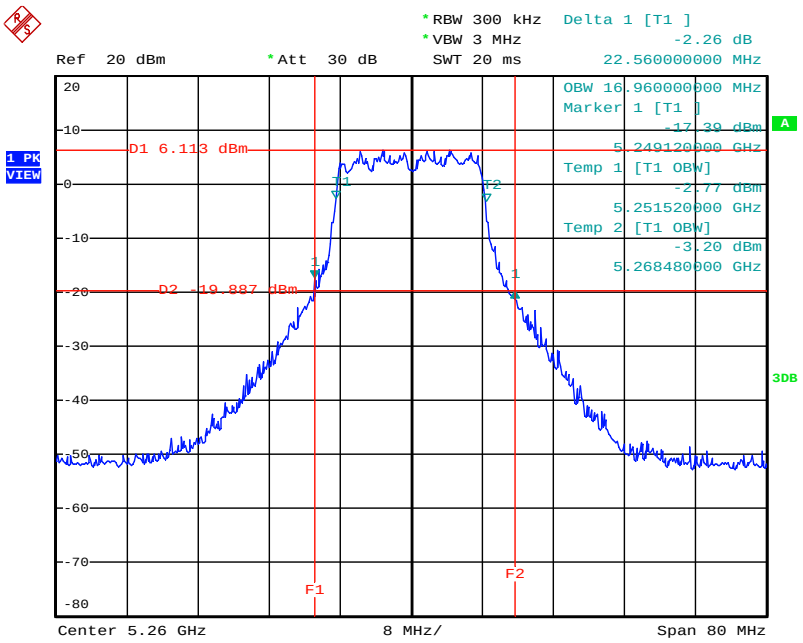
Date: 13.NOV.2012 06:59:40

26 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5670 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



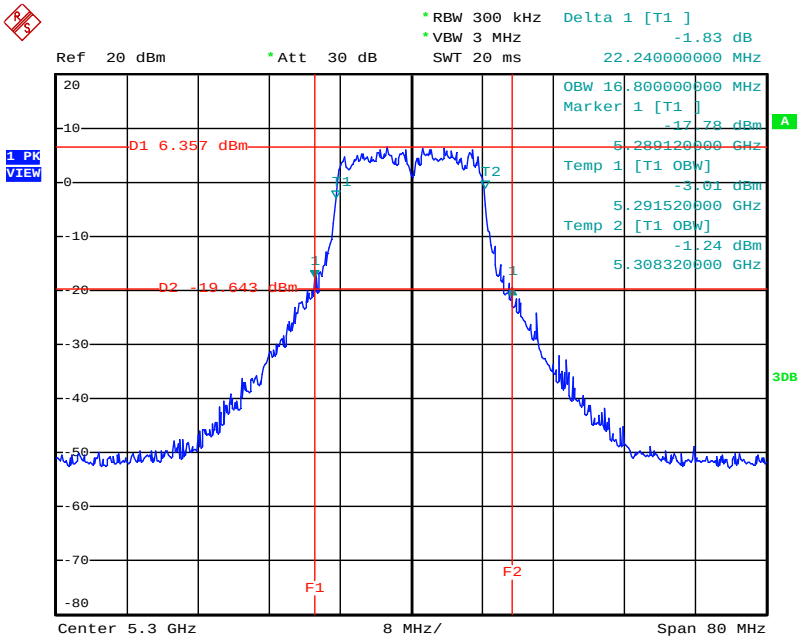
Date: 13.NOV.2012 06:59:07

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5260 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



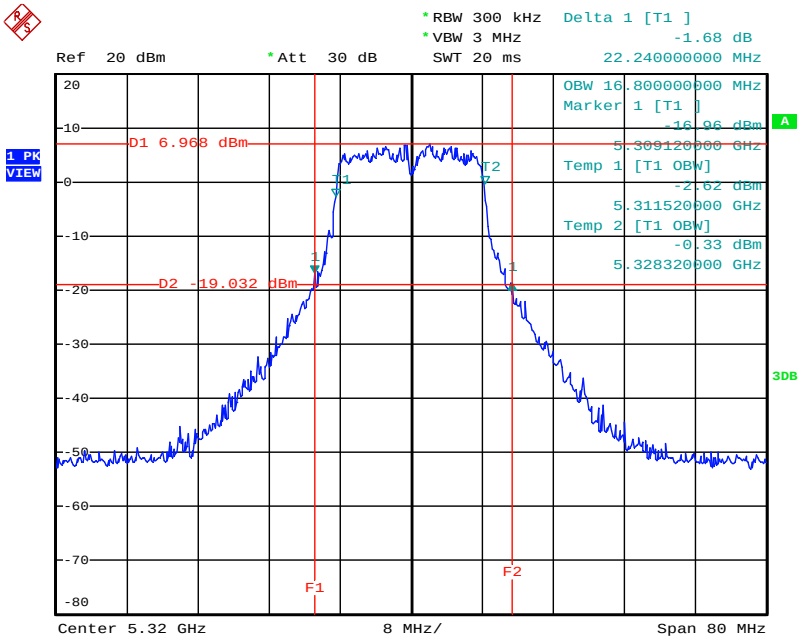
Date: 13.NOV.2012 06:38:30

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5300 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



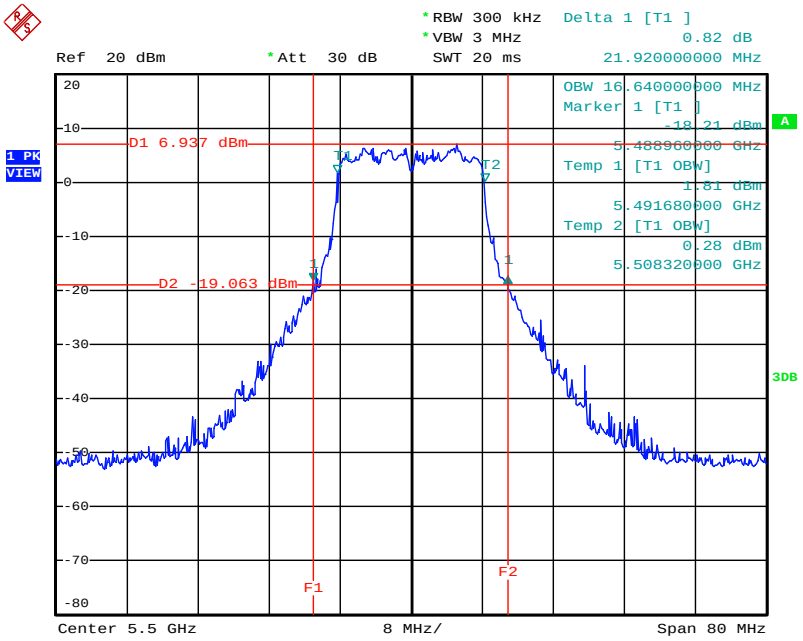
Date: 13.NOV.2012 06:39:03

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5320 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



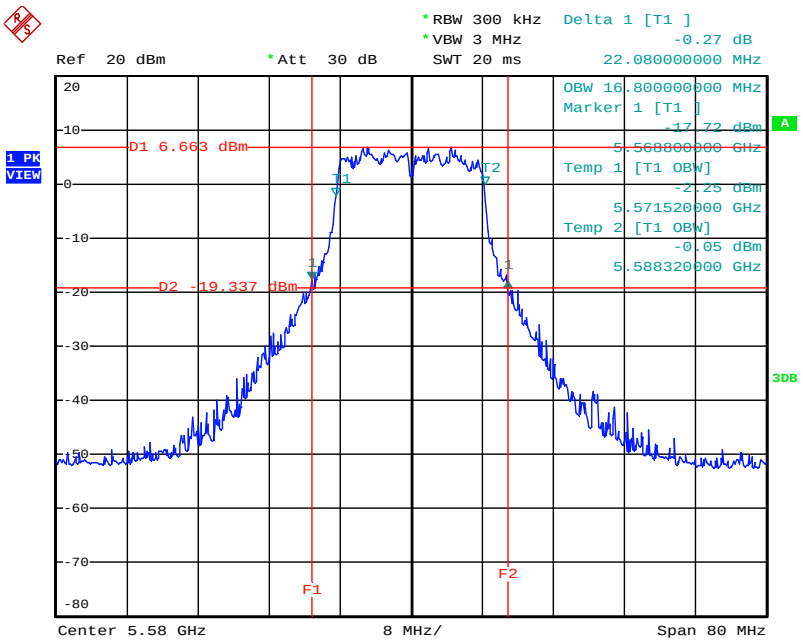
Date: 13.NOV.2012 06:39:37

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5500 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



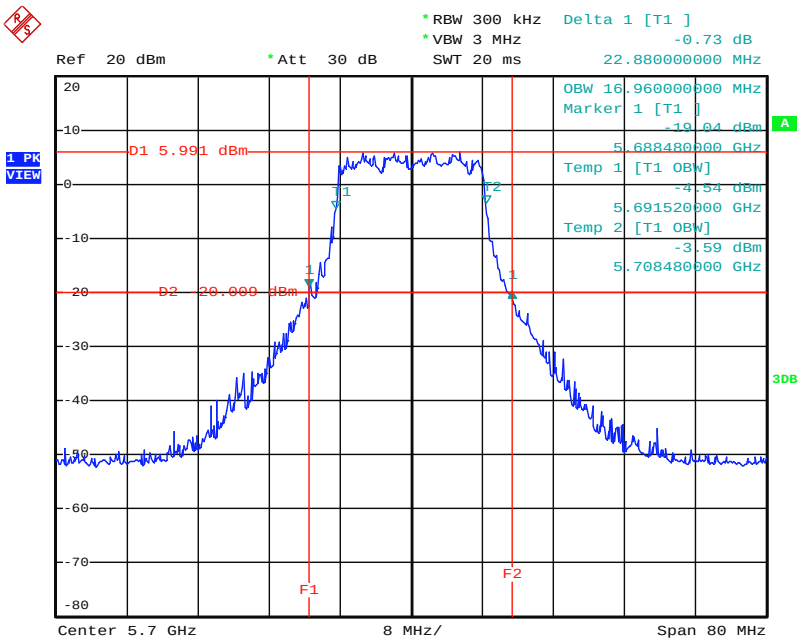
Date: 13.NOV.2012 06:40:19

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5580 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



Date: 13.NOV.2012 06:40:42

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5700 MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



Date: 13.NOV.2012 06:41:04

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

For the 5.25-5.35 GHz and 5.470-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B, where B is the 26-dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For the band 5.725~5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1ŔMHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

4.2.2. Measuring Instruments and Setting

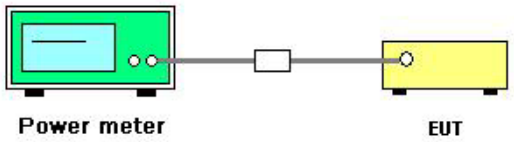
The following table is the setting of the peak power meter.

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

4.2.3. Test Procedures

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

4.2.4. 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 Maximum Conducted Output Power

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain J2	Chain J3	Chain J4			
52	5260 MHz	13.01	12.86	13.29	17.83	22.43	Complies
60	5300 MHz	13.16	12.41	13.09	17.67	22.43	Complies
64	5320 MHz	13.26	13.38	13.94	18.31	22.43	Complies
100	5500 MHz	13.22	12.27	12.81	17.56	22.43	Complies
116	5580 MHz	13.61	12.53	12.85	17.79	22.43	Complies
140	5700 MHz	14.29	13.34	13.22	18.41	22.43	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain J2	Chain J3	Chain J4			
54	5270 MHz	16.16	15.70	16.35	20.85	22.43	Complies
62	5310 MHz	12.89	13.13	13.48	17.94	22.43	Complies
102	5510MHz	11.85	11.32	11.22	16.24	22.43	Complies
110	5550 MHz	16.38	15.46	16.11	20.77	22.43	Complies
134	5670 MHz	16.53	15.99	15.88	20.91	22.43	Complies

Configuration IEEE 802.11n MCS8 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain J2	Chain J3	Chain J4			
52	5260 MHz	15.19	15.11	15.33	19.98	22.43	Complies
60	5300 MHz	15.90	15.19	16.09	20.51	22.43	Complies
64	5320 MHz	15.82	15.96	16.36	20.82	22.43	Complies
100	5500 MHz	16.47	15.18	16.15	20.74	22.43	Complies
116	5580 MHz	16.33	15.72	15.98	20.79	22.43	Complies
140	5700 MHz	15.18	14.19	14.01	19.26	22.43	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain J2	Chain J3	Chain J4			
54	5270 MHz	17.50	17.47	17.80	22.36	22.43	Complies
62	5310 MHz	13.22	13.41	13.76	18.24	22.43	Complies
102	5510MHz	13.73	12.83	13.44	18.12	22.43	Complies
110	5550 MHz	18.17	16.74	17.75	22.37	22.43	Complies
134	5670 MHz	16.37	15.69	15.82	20.74	22.43	Complies

Note: Ant. Gain is 7.57dBi >6dBi, so the Limit = 24-(7.57-6)=22.43 dBm

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain J2	Chain J3	Chain J4			
52	5260 MHz	12.72	12.29	12.58	17.30	22.43	Complies
60	5300 MHz	12.94	11.79	12.75	17.29	22.43	Complies
64	5320 MHz	13.10	12.55	12.94	17.64	22.43	Complies
100	5500 MHz	13.37	12.15	12.82	17.58	22.43	Complies
116	5580 MHz	13.42	12.74	12.77	17.76	22.43	Complies
140	5700 MHz	13.90	12.81	12.60	17.91	22.43	Complies

Note: Ant. Gain is 7.57dBi >6dBi, so the Limit = 24-(7.57-6)=22.43 dBm

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

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

4.3.2. Measuring Instruments and Setting

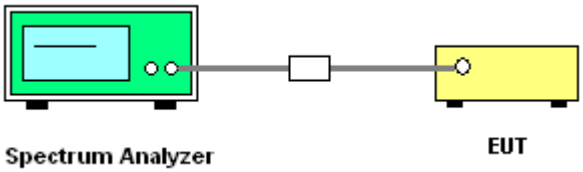
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

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

4.3.4. 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 Power Spectral Density

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11n
Test Date	Nov. 13, 2012		

Configuration IEEE 802.11n MCS0 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	4.62	4.66	Complies
60	5300 MHz	4.44	4.66	Complies
64	5320 MHz	4.62	4.66	Complies
100	5500 MHz	4.49	4.66	Complies
116	5580 MHz	4.58	4.66	Complies
140	5700 MHz	4.46	4.66	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	4.44	4.66	Complies
62	5310 MHz	1.33	4.66	Complies
102	5510MHz	-0.14	4.66	Complies
110	5550 MHz	4.63	4.66	Complies
134	5670 MHz	4.12	4.66	Complies

Note: $Directional\ gain = G_{ANT} + 10\ log(N_{ANT}/N_{SS})$ =12.34dBi > 6dBi,So Band2 Limit =11-(12.34-6) =4.66dBm/MHz

Configuration IEEE 802.11n MCS8 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	7.47	7.67	Complies
60	5300 MHz	7.46	7.67	Complies
64	5320 MHz	7.53	7.67	Complies
100	5500 MHz	7.63	7.67	Complies
116	5580 MHz	7.62	7.67	Complies
140	5700 MHz	5.48	7.67	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	7.43	7.67	Complies
62	5310 MHz	1.66	7.67	Complies
102	5510MHz	1.86	7.67	Complies
110	5550 MHz	6.22	7.67	Complies
134	5670 MHz	3.94	7.67	Complies

Note: $Directional\ gain = G_{ANT} + 10\ log(N_{ANT}/N_{SS})$ =9.33dBi > 6dBi,So Band2 Limit =11-(9.33-6) =7.67dBm/MHz

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11a
Test Date	Nov. 13, 2012		

Configuration IEEE 802.11a / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

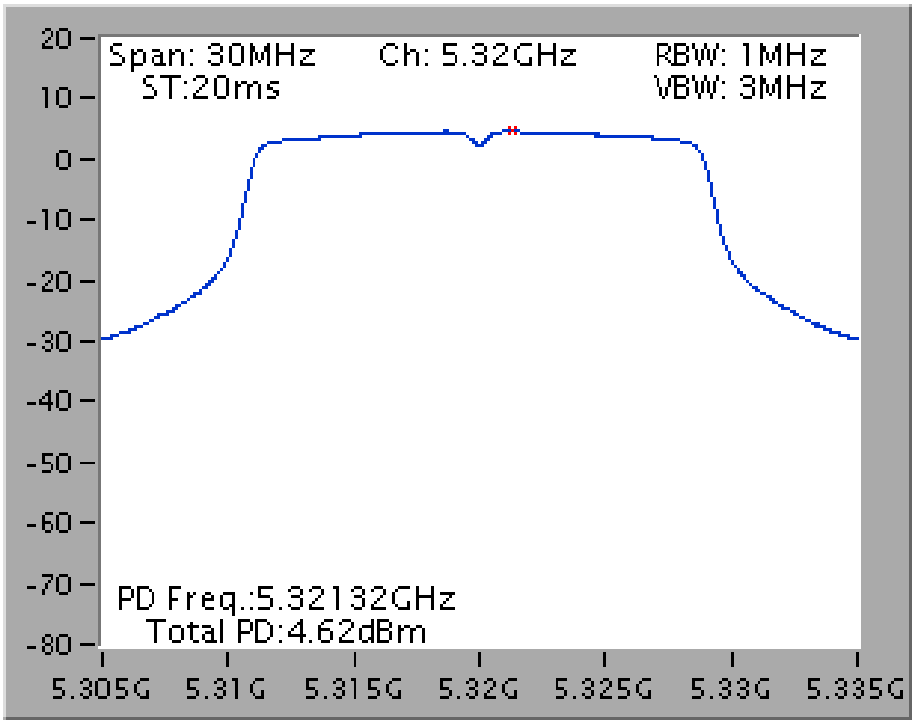
Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	4.49	4.66	Complies
60	5300 MHz	4.39	4.66	Complies
64	5320 MHz	4.64	4.66	Complies
100	5500 MHz	4.62	4.66	Complies
116	5580 MHz	4.57	4.66	Complies
140	5700 MHz	4.45	4.66	Complies

Note: $Directional\ gain = G_{ANT} + 10\ log(N_{ANT}/N_{SS})$ =12.34dBi > 6dBi,So Band2 Limit =11-(12.34-6) =4.66dBm/MHz

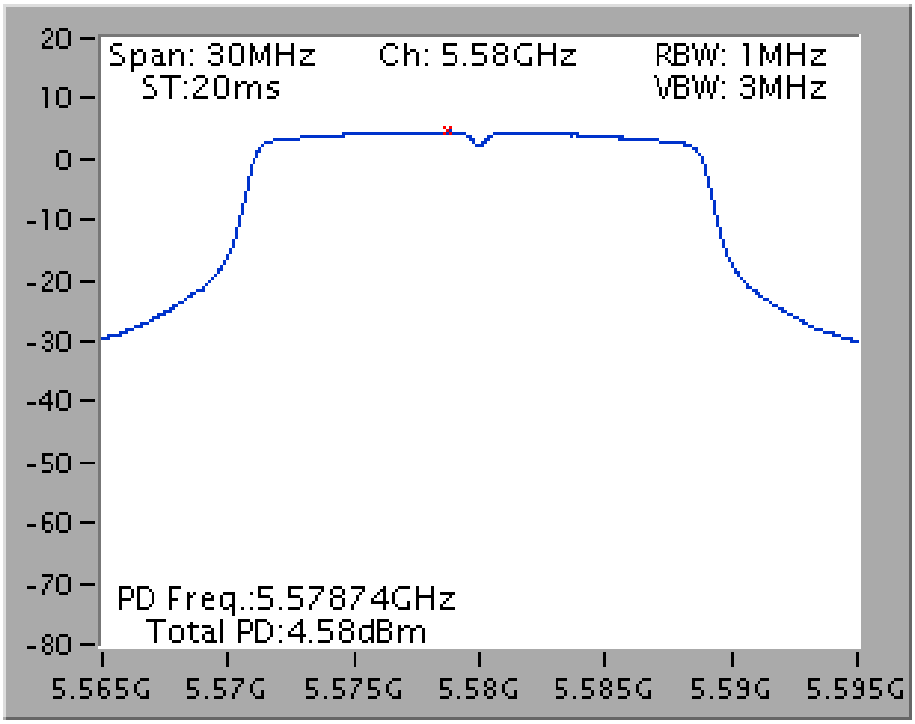
Note: All the test values were listed in the report.

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

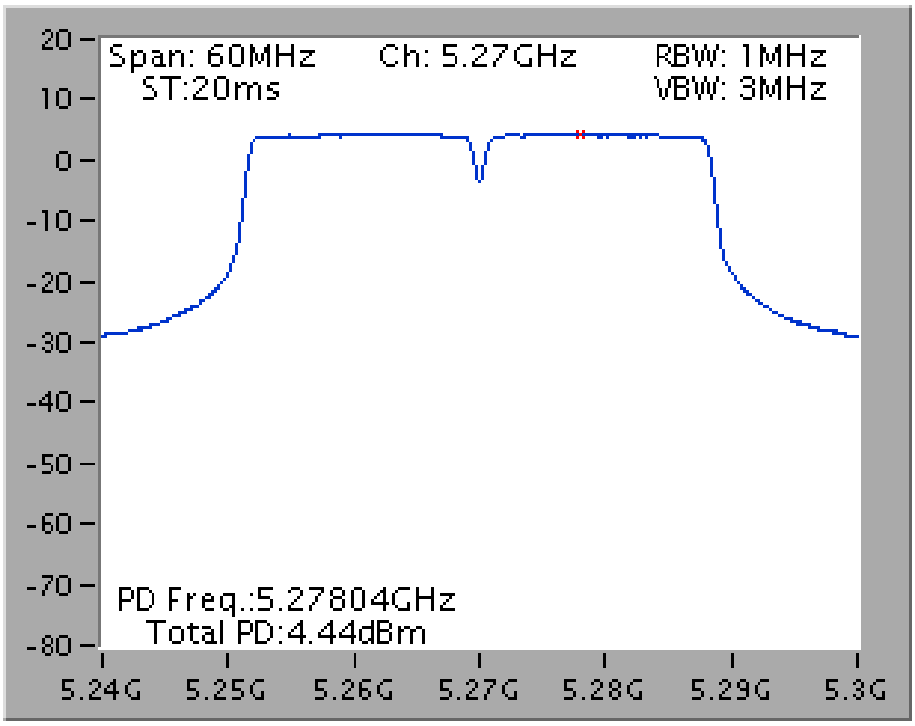
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 5320MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



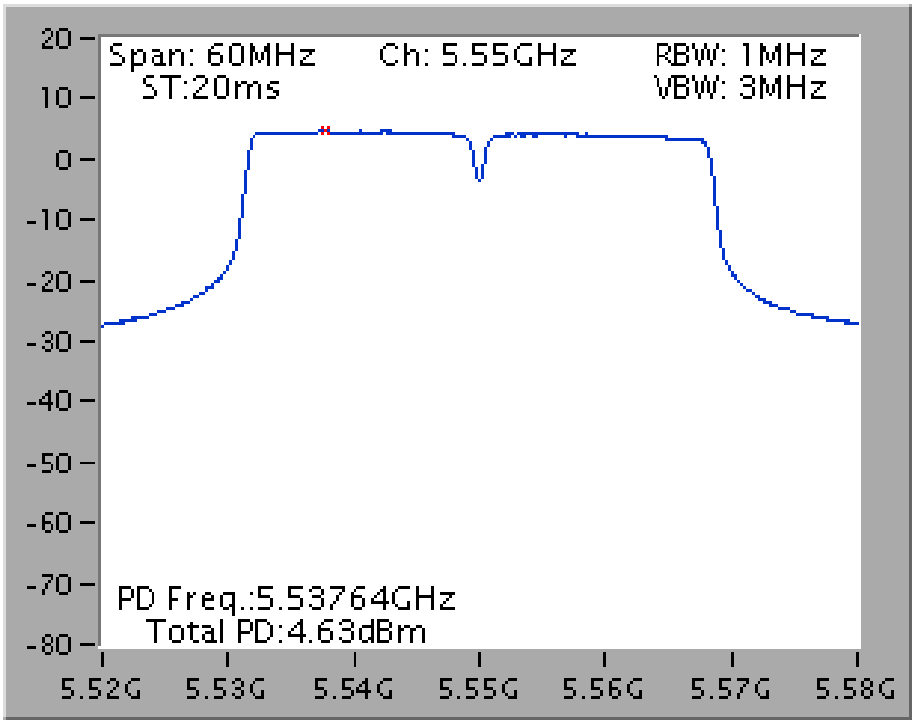
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 5580MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



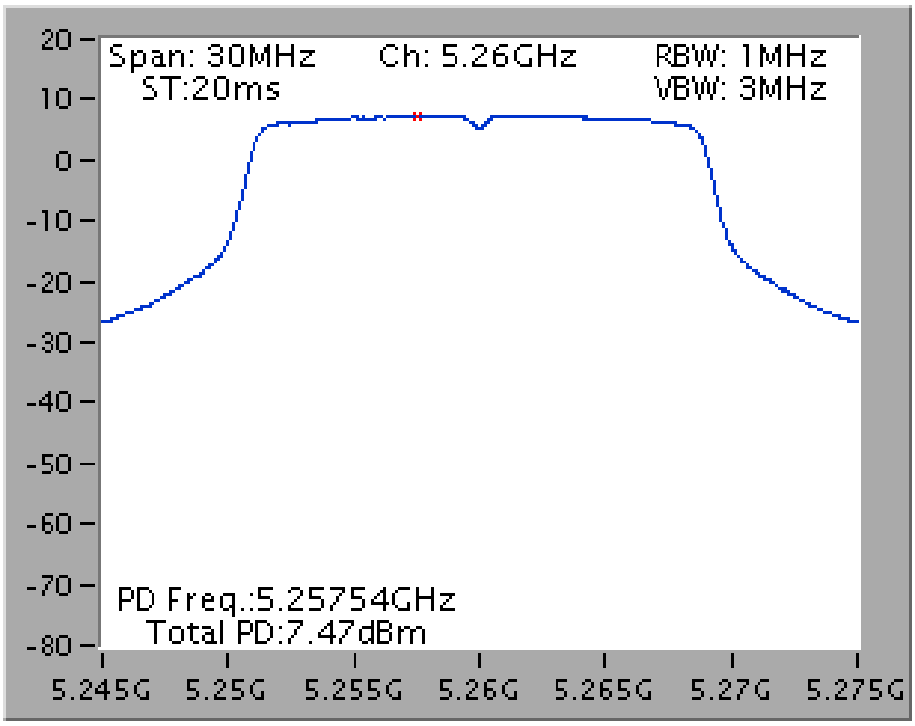
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 5270MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



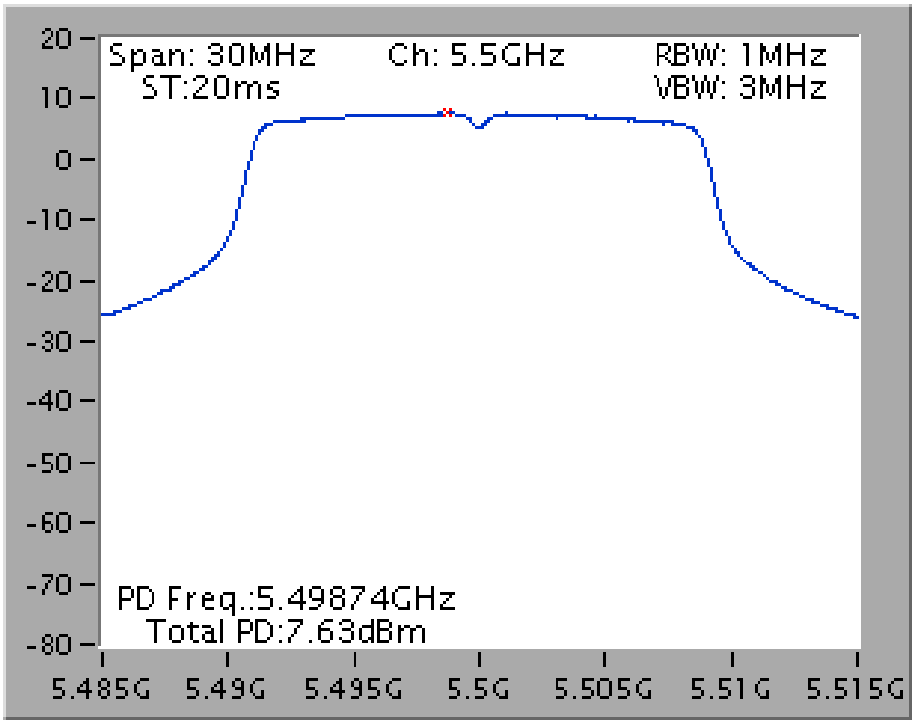
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 5550MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



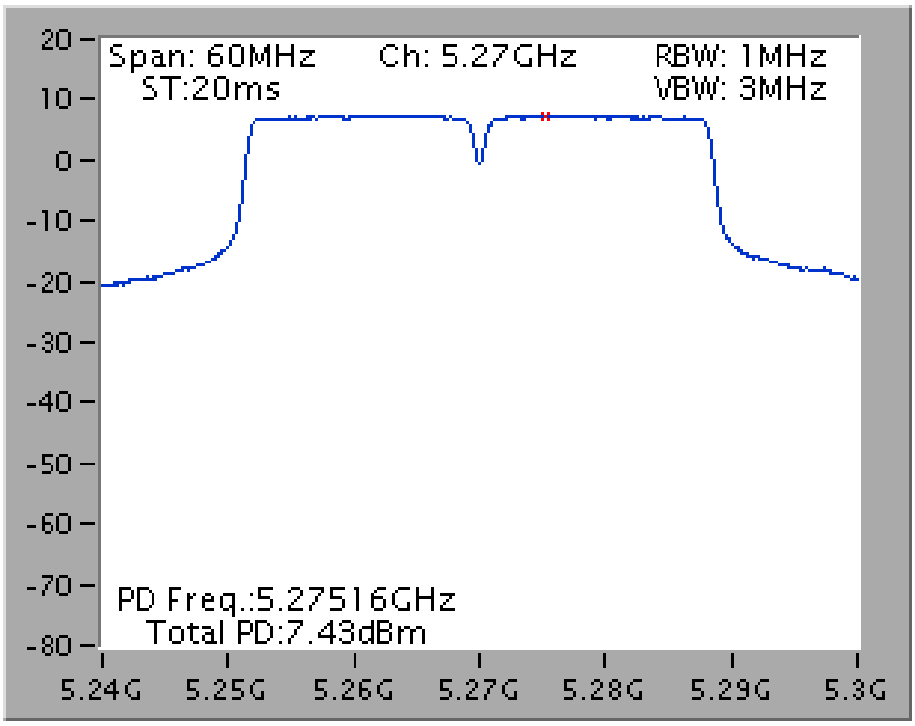
Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 5260MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



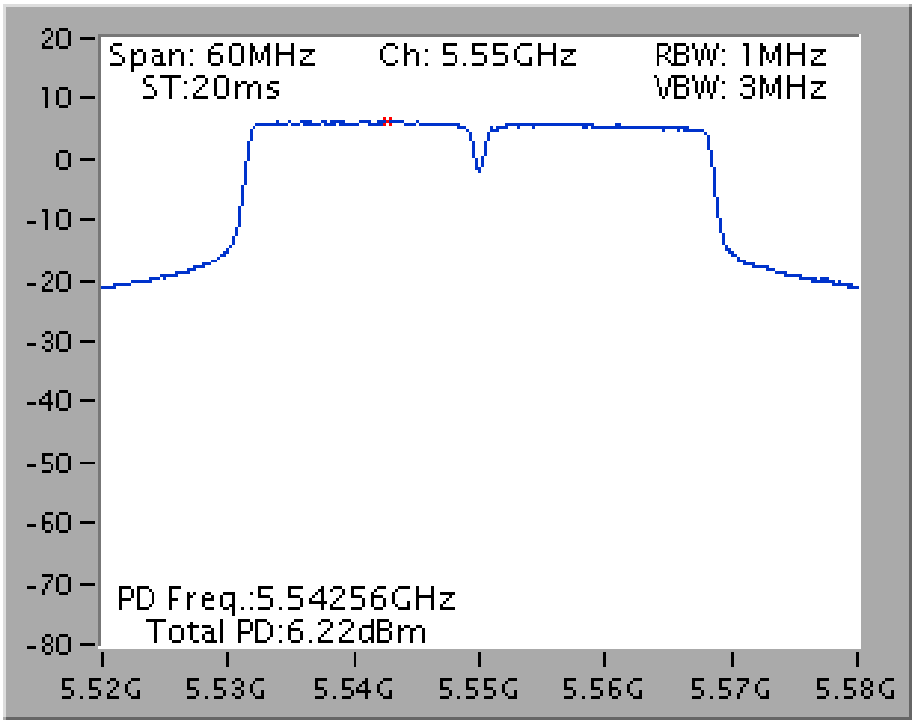
Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 5500MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 5270MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

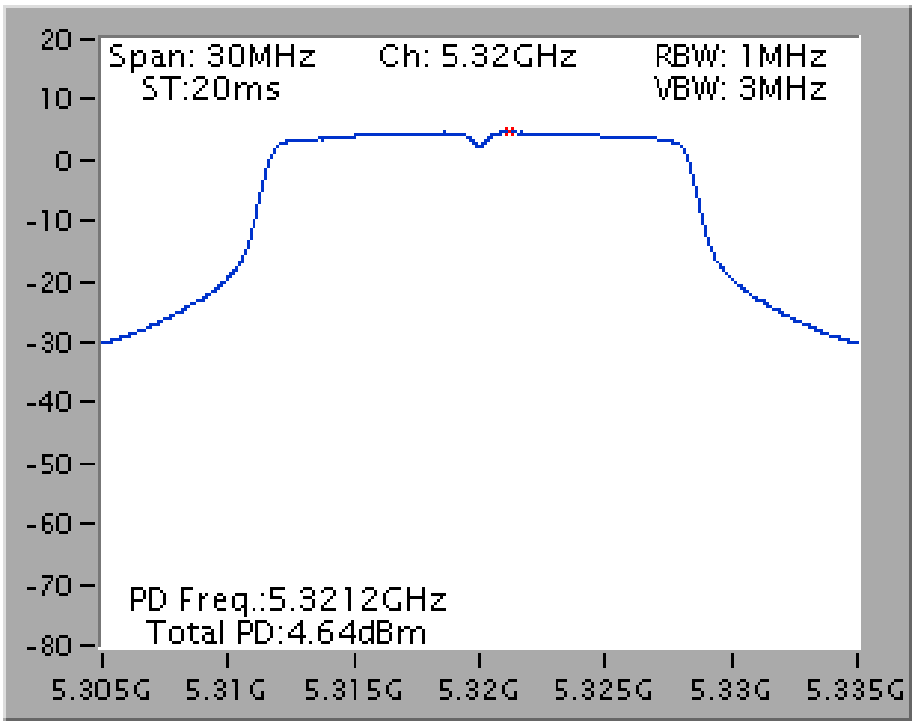


Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 5550MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



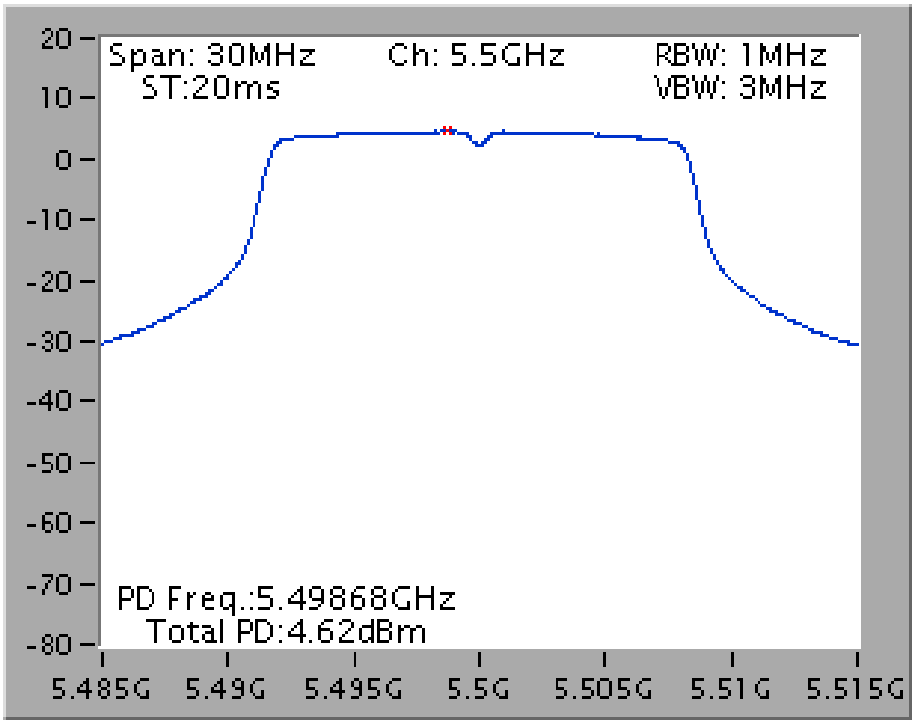
Power Density Plot on Configuration IEEE 802.11a / 5320MHz /

Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



Power Density Plot on Configuration IEEE 802.11a / 5500MHz /

Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



4.4. Peak Excursion Measurement

4.4.1. 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.

4.4.2. 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	1MHz (Peak Trace) / 1MHz (Average Trace)
VB	3MHz (Peak Trace) / 3MHz (Average Trace)
Detector	Peak (Peak Trace) / RMS
Trace	Peak : Trace :Max hold/Average: Trace Average Sweep Count 100
Sweep Time	AUTO

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout

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

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 Peak Excursion

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
64	5320 MHz	12.00	13	Complies
140	5700 MHz	11.46	13	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
54	5270 MHz	12.05	13	Complies
134	5670 MHz	10.64	13	Complies

Configuration IEEE 802.11n MCS8 20MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
64	5320 MHz	11.87	13	Complies
116	5580 MHz	10.91	13	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
54	5270 MHz	11.61	13	Complies
110	5550 MHz	11.51	13	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Denis Su	Configurations	IEEE 802.11a

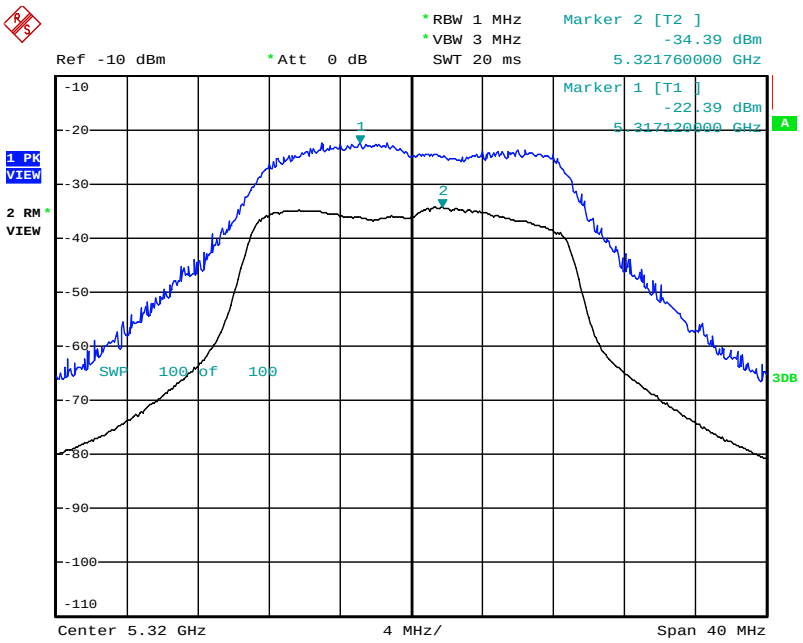
Configuration IEEE 802.11a / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
64	5320 MHz	11.74	13	Complies
140	5700 MHz	11.33	13	Complies

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

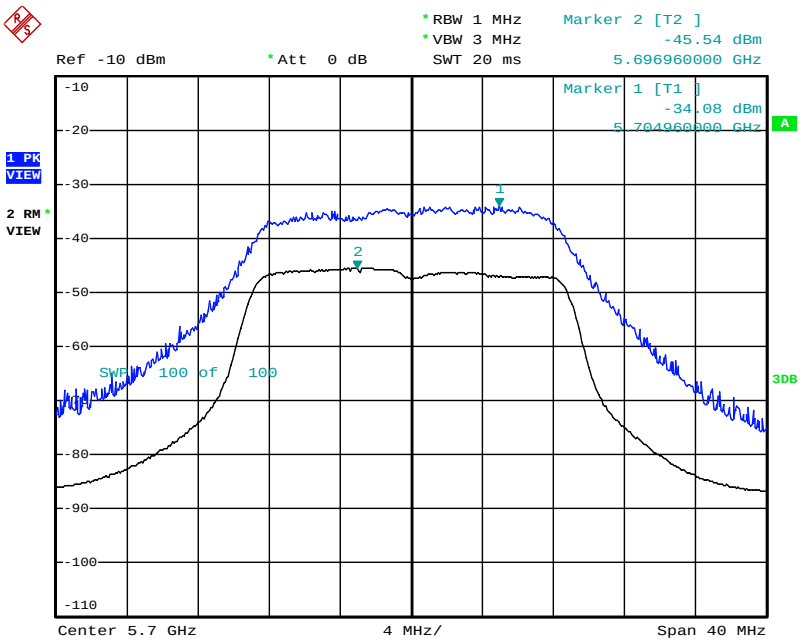
For plots, only the channel with maximum results was shown.

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / 5320MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



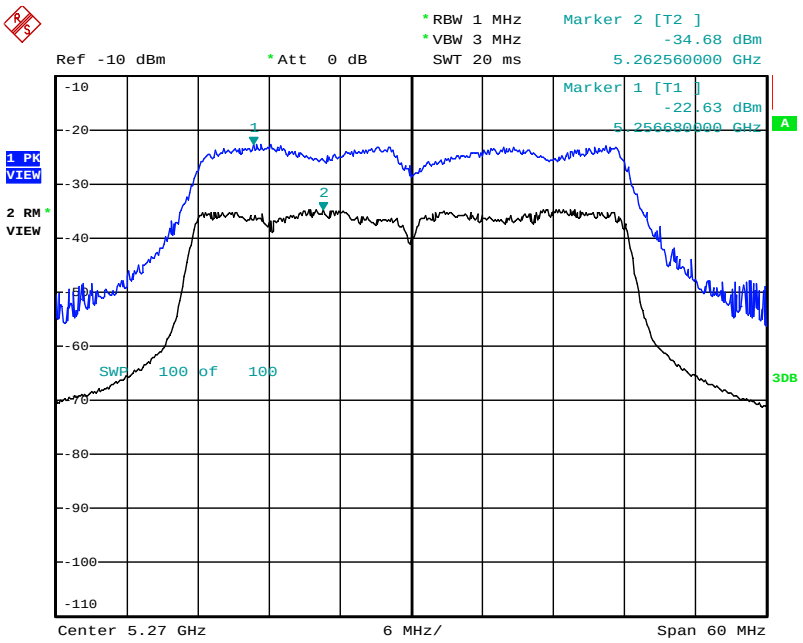
Date: 13.NOV.2012 12:34:50

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 20MHz / 5700MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



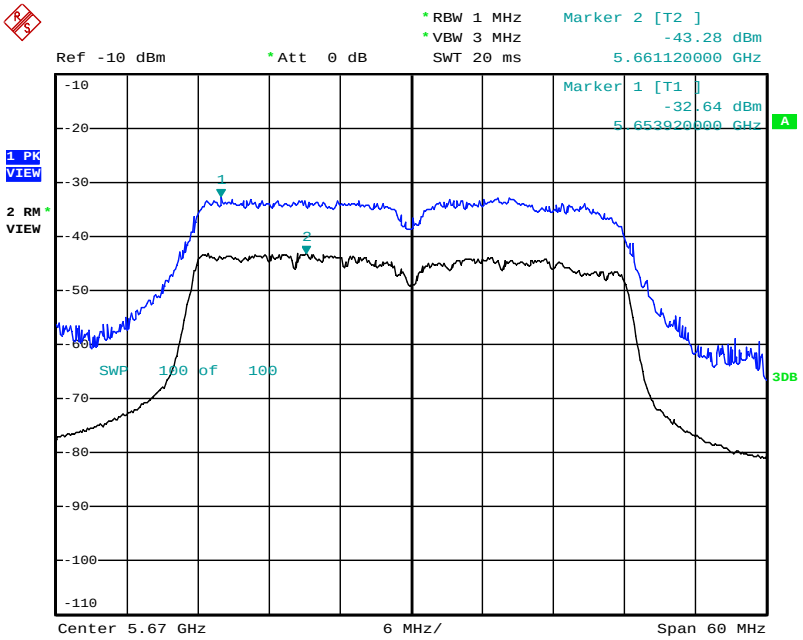
Date: 13.NOV.2012 12:34:09

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / 5270MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



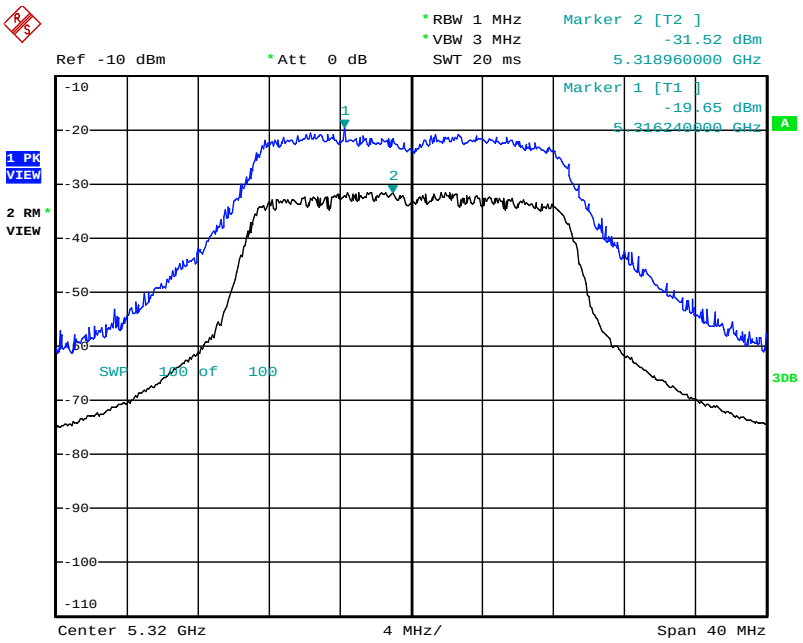
Date: 13.NOV.2012 12:30:19

Peak Excursion Plot on Configuration IEEE 802.11n MCS0 40MHz / 5670MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



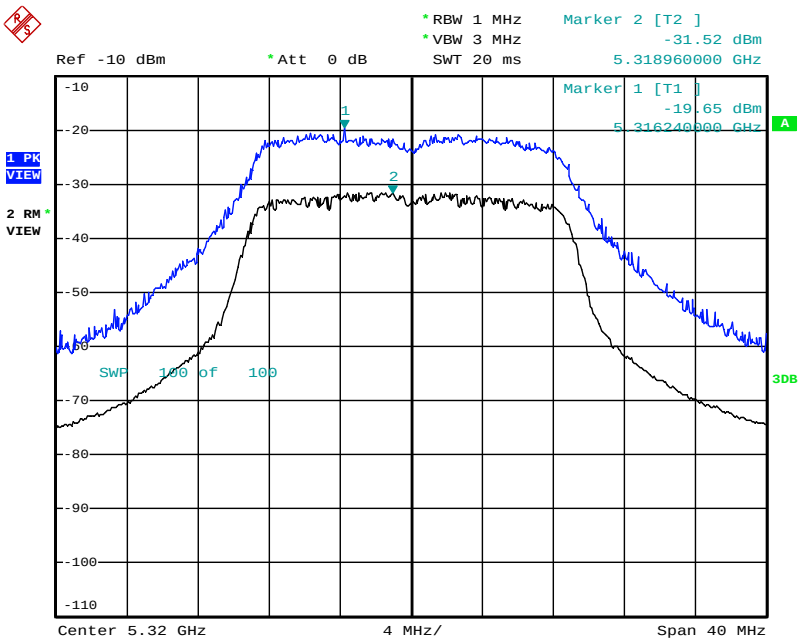
Date: 13.NOV.2012 12:29:27

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz / 5320MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



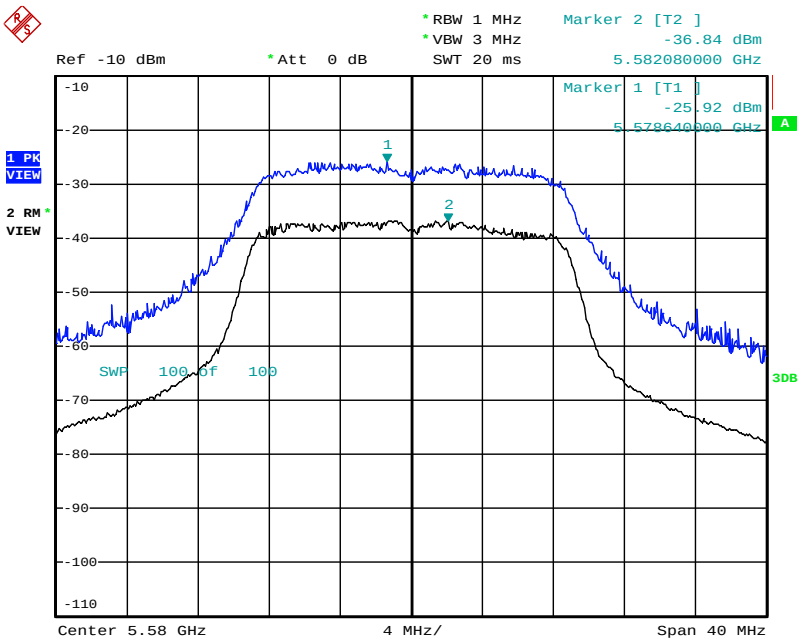
Date: 13.NOV.2012 12:36:46

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz / 5320MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



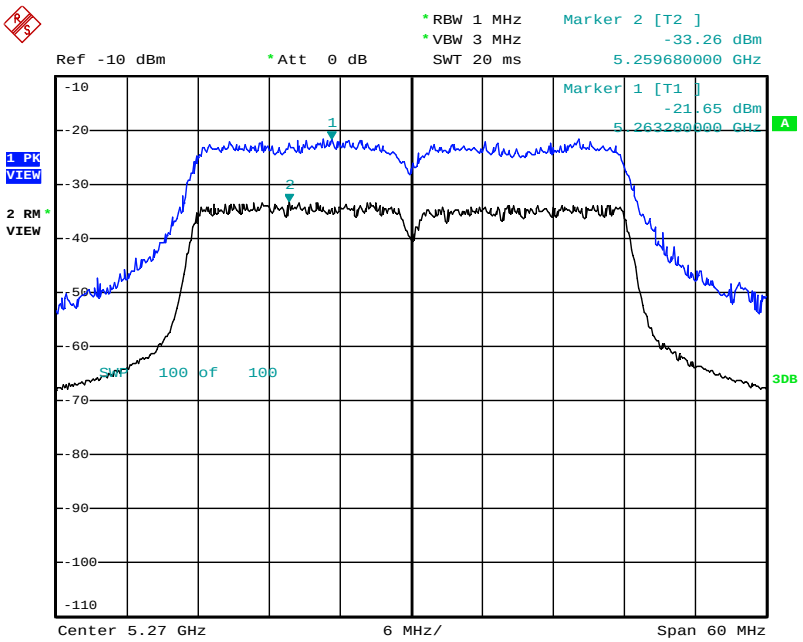
Date: 13.NOV.2012 12:36:46

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 20MHz / 5580MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



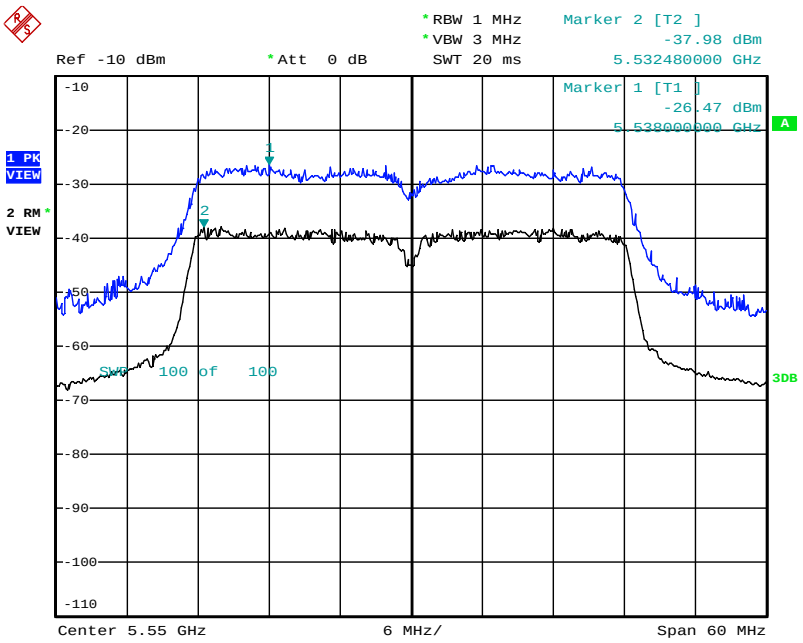
Date: 13.NOV.2012 12:37:28

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 40MHz / 5270MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



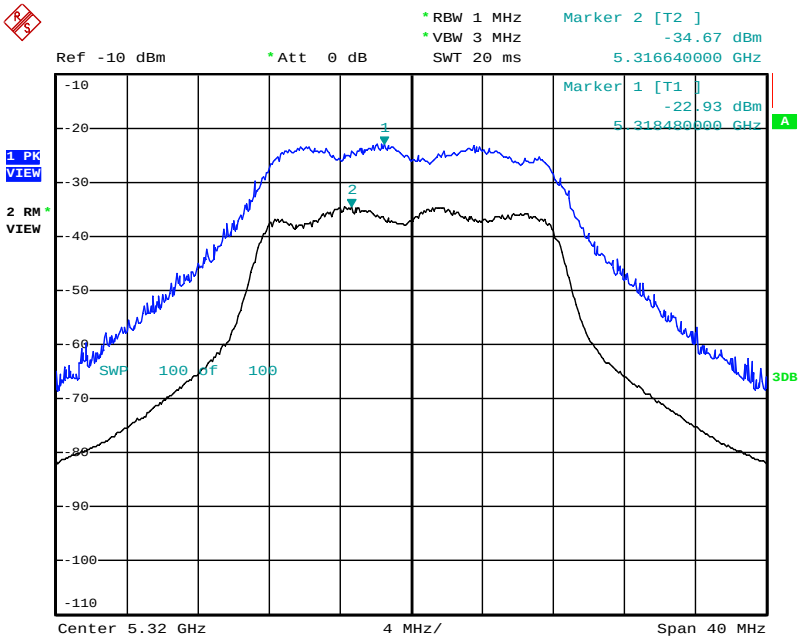
Date: 13.NOV.2012 12:25:10

Peak Excursion Plot on Configuration IEEE 802.11n MCS8 40MHz / 5550MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



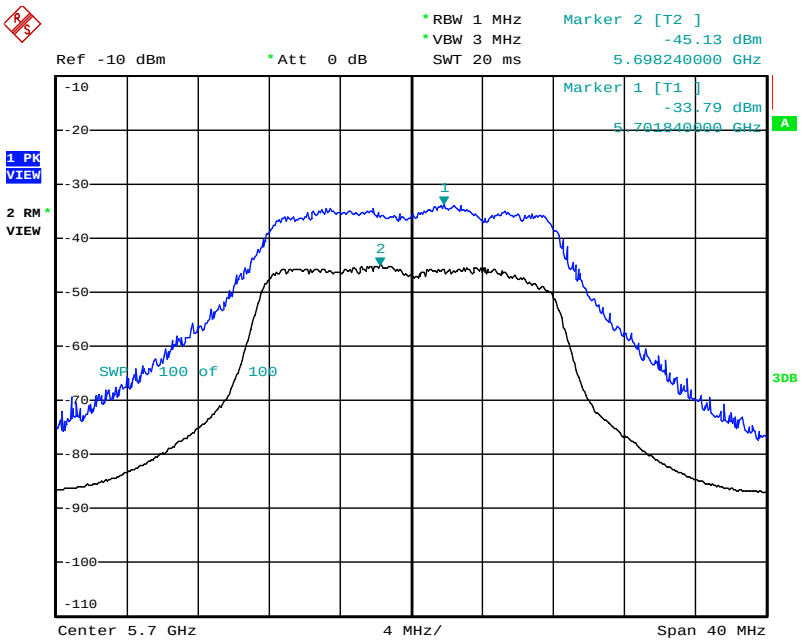
Date: 13.NOV.2012 12:28:03

Peak Excursion Plot on Configuration IEEE 802.11a / 5320MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



Date: 13.NOV.2012 12:32:37

Peak Excursion Plot on Configuration IEEE 802.11a / 5700MHz / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11



Date: 13.NOV.2012 12:33:11

4.5. Radiated Emissions Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

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

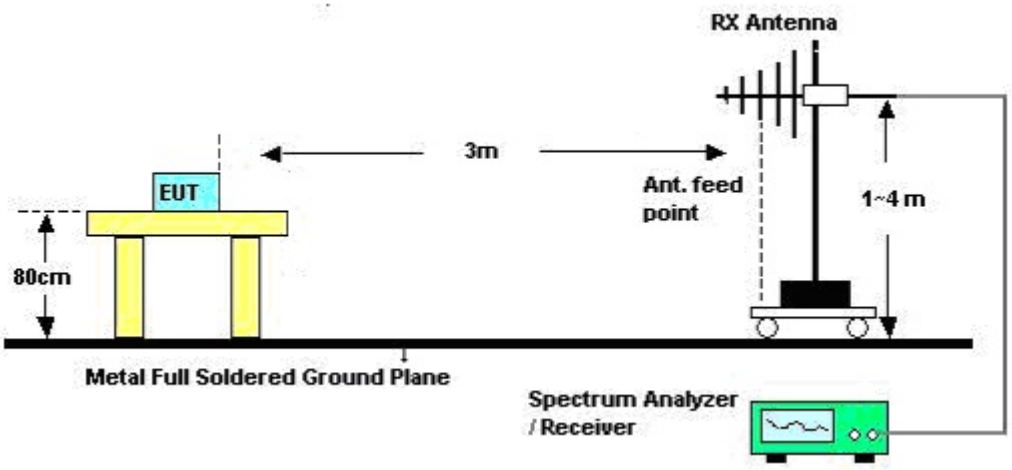
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 3MHz for peak

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

4.5.3. Test Procedures

5. 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.
6. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
7. 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.
8. 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.
9. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
10. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
11. 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.
12. 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.
13. 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.
14. 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.

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

Temperature	24.5℃	Humidity	60%
Test Engineer	David Tseng	Configurations	CTX
Test Date	Dec. 14, 2012		

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

Note:

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

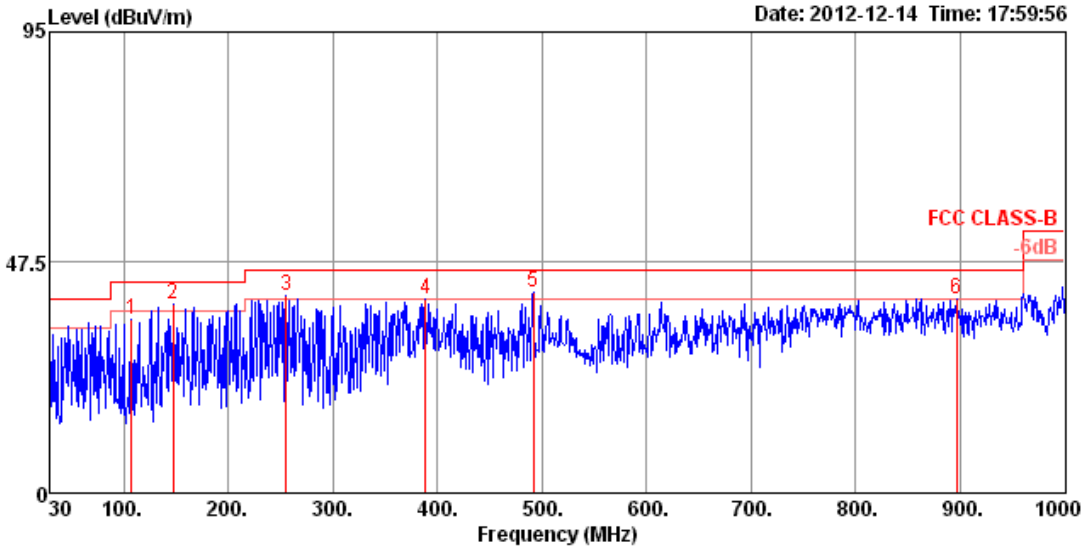
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

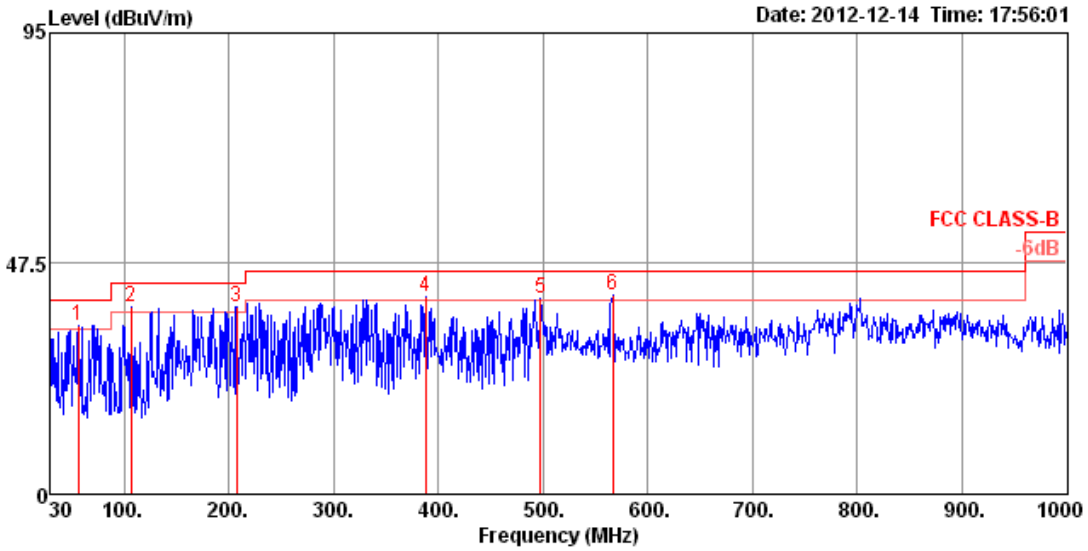
Temperature	24.5°C	Humidity	60%
Test Engineer	David Tseng	Configurations	CTX
Test Mode	Mode 1. EUT + Ant. 11		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	107.60	35.78	43.50	-7.72	49.79	1.23	12.32	27.56	100	262	HORIZONTAL	Peak
2 pp	147.37	39.08	43.50	-4.42	53.56	1.45	11.43	27.36	100	329	HORIZONTAL	Peak
3 !	255.04	40.50	46.00	-5.50	52.31	1.92	13.26	26.99	100	28	HORIZONTAL	Peak
4	388.90	39.97	46.00	-6.03	48.79	2.47	16.23	27.52	100	126	HORIZONTAL	Peak
5 !	491.72	41.44	46.00	-4.56	49.07	2.77	17.66	28.06	100	287	HORIZONTAL	Peak
6 !	896.21	40.07	46.00	-5.93	42.03	3.97	21.48	27.41	100	266	HORIZONTAL	Peak

Vertical



		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	!	56.19	34.87	40.00	-5.13	54.19	0.87	7.59	27.78	100	308	VERTICAL	Peak
2	!	106.63	38.44	43.50	-5.06	52.57	1.23	12.21	27.57	100	353	VERTICAL	Peak
3	pp	207.51	38.59	43.50	-4.91	53.37	1.75	10.55	27.08	100	78	VERTICAL	Peak
4	!	387.93	40.49	46.00	-5.51	49.33	2.47	16.21	27.52	100	34	VERTICAL	Peak
5	!	497.54	40.21	46.00	-5.79	47.73	2.81	17.76	28.09	100	26	VERTICAL	Peak
6	!	566.41	41.03	46.00	-4.97	47.18	2.99	18.96	28.10	100	350	VERTICAL	Peak

Note:

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

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

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

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 52 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15774.26	54.12	74.00	-19.88	41.24	10.65	37.77	35.54	Peak	100	179	HORIZONTAL
2	15777.12	41.33	54.00	-12.67	28.47	10.65	37.75	35.54	Average	100	179	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15771.89	41.23	54.00	-12.77	28.35	10.65	37.77	35.54	Average	100	246	VERTICAL
2	15781.96	53.05	74.00	-20.95	40.19	10.65	37.75	35.54	Peak	100	246	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 60 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15898.21	53.35	74.00	-20.65	40.63	10.68	37.56	35.52	Peak	100	83	HORIZONTAL
2	15898.81	41.37	54.00	-12.63	28.65	10.68	37.56	35.52	Average	100	83	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15893.43	53.83	74.00	-20.17	41.08	10.68	37.59	35.52	Peak	100	21	VERTICAL
2	15906.25	41.36	54.00	-12.64	28.64	10.68	37.56	35.52	Average	100	21	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 64 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15955.05	40.80	54.00	-13.20	28.13	10.70	37.48	35.51	Average	100	159	HORIZONTAL
2	15963.97	53.59	74.00	-20.41	40.95	10.70	37.45	35.51	Peak	100	159	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15955.42	54.35	74.00	-19.65	41.68	10.70	37.48	35.51	Peak	100	94	VERTICAL
2	15957.90	40.27	54.00	-13.73	27.60	10.70	37.48	35.51	Average	100	94	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 100 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10997.16	41.13	54.00	-12.87	27.32	9.11	39.50	34.80	Average	100	268	HORIZONTAL
2	10997.40	53.89	74.00	-20.11	40.08	9.11	39.50	34.80	Peak	100	268	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10998.22	54.17	74.00	-19.83	40.36	9.11	39.50	34.80	Peak	100	306	VERTICAL
2	11001.60	42.53	54.00	-11.47	28.72	9.11	39.50	34.80	Average	100	306	VERTICAL

Temperature	25.6°C	Humidity	56%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS0 20MHz Ch 116 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Jan. 23, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11160.00	35.74	54.00	-18.26	27.40	5.04	38.47	35.17	Average	117	192	HORIZONTAL
2	11160.00	46.63	74.00	-27.37	38.29	5.04	38.47	35.17	Peak	117	192	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11160.00	35.91	54.00	-18.09	27.57	5.04	38.47	35.17	Average	101	249	VERTICAL
2	11160.00	47.56	74.00	-26.44	39.22	5.04	38.47	35.17	Peak	101	249	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 140 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11399.76	53.82	74.00	-20.18	39.77	9.59	39.50	35.04	Peak	100	62	HORIZONTAL
2	11404.50	41.89	54.00	-12.11	27.84	9.59	39.50	35.04	Average	100	62	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11402.34	41.69	54.00	-12.31	27.64	9.59	39.50	35.04	Average	100	208	VERTICAL
2	11402.64	53.93	74.00	-20.07	39.88	9.59	39.50	35.04	Peak	100	208	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 54 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15811.28	53.34	74.00	-20.66	40.53	10.66	37.69	35.54	Peak	100	49	HORIZONTAL
2	15812.04	41.09	54.00	-12.91	28.27	10.66	37.69	35.53	Average	100	49	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15810.91	41.17	54.00	-12.83	28.36	10.66	37.69	35.54	Average	100	115	VERTICAL
2	15811.11	53.94	74.00	-20.06	41.13	10.66	37.69	35.54	Peak	100	115	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 62 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15928.22	40.89	54.00	-13.11	28.18	10.69	37.53	35.51	Average	100	180	HORIZONTAL
2	15929.21	54.37	74.00	-19.63	41.66	10.69	37.53	35.51	Peak	100	180	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15927.77	41.29	54.00	-12.71	28.58	10.69	37.53	35.51	Average	100	260	VERTICAL
2	15931.14	54.17	74.00	-19.83	41.48	10.69	37.51	35.51	Peak	100	260	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 102 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11018.83	41.11	54.00	-12.89	27.28	9.14	39.50	34.81	Average	100	72	HORIZONTAL
2	11023.27	53.04	74.00	-20.96	39.21	9.14	39.50	34.81	Peak	100	72	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11016.41	43.19	54.00	-10.81	29.36	9.14	39.50	34.81	Average	100	3	VERTICAL
2	11016.46	53.78	74.00	-20.22	39.95	9.14	39.50	34.81	Peak	100	3	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 110 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11091.89	41.07	54.00	-12.93	27.20	9.23	39.50	34.86	Average	100	267	HORIZONTAL
2	11104.07	54.13	74.00	-19.87	40.26	9.23	39.50	34.86	Peak	100	267	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11092.72	42.38	54.00	-11.62	28.51	9.23	39.50	34.86	Average	100	357	VERTICAL
2	11095.87	53.46	74.00	-20.54	39.59	9.23	39.50	34.86	Peak	100	357	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 134 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11341.57	53.65	74.00	-20.35	39.61	9.53	39.50	34.99	Peak	100	47	HORIZONTAL
2	11344.13	41.34	54.00	-12.66	27.32	9.53	39.50	35.01	Average	45	47	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11335.75	53.47	74.00	-20.53	39.46	9.50	39.50	34.99	Peak	100	123	VERTICAL
2	11336.73	41.27	54.00	-12.73	27.26	9.50	39.50	34.99	Average	100	123	VERTICAL

Note:

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

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

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

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 52 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15778.18	53.71	74.00	-20.29	40.85	10.65	37.75	35.54	Peak	100	104	HORIZONTAL
2	15781.79	41.12	54.00	-12.88	28.26	10.65	37.75	35.54	Average	100	104	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15777.89	53.86	74.00	-20.14	41.00	10.65	37.75	35.54	Peak	100	207	VERTICAL
2	15780.72	41.31	54.00	-12.69	28.45	10.65	37.75	35.54	Average	100	207	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 60 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15901.55	54.02	74.00	-19.98	41.30	10.68	37.56	35.52	Peak	100	297	HORIZONTAL
2	15902.10	41.73	54.00	-12.27	29.01	10.68	37.56	35.52	Average	100	297	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15898.49	53.76	74.00	-20.24	41.04	10.68	37.56	35.52	Peak	100	188	VERTICAL
2	15902.16	41.51	54.00	-12.49	28.79	10.68	37.56	35.52	Average	100	188	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 64 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15958.48	40.66	54.00	-13.34	27.99	10.70	37.48	35.51	Average	100	84	HORIZONTAL
2	15962.00	52.73	74.00	-21.27	40.06	10.70	37.48	35.51	Peak	100	84	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15958.25	40.84	54.00	-13.16	28.17	10.70	37.48	35.51	Average	100	4	VERTICAL
2	15959.66	52.79	74.00	-21.21	40.12	10.70	37.48	35.51	Peak	100	4	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 100 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10999.28	40.86	54.00	-13.14	27.05	9.11	39.50	34.80	Average	100	47	HORIZONTAL
2	11002.10	53.00	74.00	-21.00	39.19	9.11	39.50	34.80	Peak	100	47	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10998.74	53.98	74.00	-20.02	40.17	9.11	39.50	34.80	Peak	100	126	VERTICAL
2	10999.17	40.84	54.00	-13.16	27.03	9.11	39.50	34.80	Average	100	126	VERTICAL

Temperature	25.6°C	Humidity	56%
Test Engineer	Andre Tak	Configurations	IEEE 802.11n MCS8 20MHz Ch 116 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Jan. 23, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11160.00	35.89	54.00	-18.11	27.55	5.04	38.47	35.17	Average	101	208	HORIZONTAL
2	11160.00	46.22	74.00	-27.78	37.88	5.04	38.47	35.17	Peak	101	208	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11160.00	35.97	54.00	-18.03	27.63	5.04	38.47	35.17	Average	110	305	VERTICAL
2	11160.00	45.87	74.00	-28.13	37.53	5.04	38.47	35.17	Peak	110	305	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 140 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11387.42	54.34	74.00	-19.66	40.30	9.56	39.50	35.02	Peak	100	99	HORIZONTAL
2	11414.58	41.68	54.00	-12.32	27.60	9.62	39.50	35.04	Average	100	99	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11419.23	41.79	54.00	-12.21	27.73	9.62	39.50	35.06	Average	100	194	VERTICAL
2	11420.43	53.56	74.00	-20.44	39.50	9.62	39.50	35.06	Peak	100	194	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 54 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15810.22	54.18	74.00	-19.82	41.34	10.66	37.72	35.54	Peak	100	259	HORIZONTAL
2	15810.79	41.13	54.00	-12.87	28.32	10.66	37.69	35.54	Average	100	259	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15812.36	41.41	54.00	-12.59	28.59	10.66	37.69	35.53	Average	100	329	VERTICAL
2	15812.37	53.81	74.00	-20.19	40.99	10.66	37.69	35.53	Peak	100	329	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 62 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15927.81	41.57	54.00	-12.43	28.86	10.69	37.53	35.51	Average	100	1	HORIZONTAL
2	15932.01	53.68	74.00	-20.32	40.99	10.69	37.51	35.51	Peak	100	1	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15929.49	54.45	74.00	-19.55	41.74	10.69	37.53	35.51	Peak	100	90	VERTICAL
2	15930.13	41.55	54.00	-12.45	28.86	10.69	37.51	35.51	Average	100	90	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 102 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11019.03	53.71	74.00	-20.29	39.88	9.14	39.50	34.81	Peak	100	250	HORIZONTAL
2	11021.43	40.62	54.00	-13.38	26.79	9.14	39.50	34.81	Average	100	250	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11019.78	53.10	74.00	-20.90	39.27	9.14	39.50	34.81	Peak	100	360	VERTICAL
2	11022.44	40.76	54.00	-13.24	26.93	9.14	39.50	34.81	Average	100	360	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 110 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11099.89	53.34	74.00	-20.66	39.47	9.23	39.50	34.86	Peak	100	164	HORIZONTAL
2	11101.43	40.87	54.00	-13.13	27.00	9.23	39.50	34.86	Average	100	164	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11097.97	40.77	54.00	-13.23	26.90	9.23	39.50	34.86	Average	100	46	VERTICAL
2	11098.57	53.55	74.00	-20.45	39.68	9.23	39.50	34.86	Peak	100	46	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 134 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11338.59	53.58	74.00	-20.42	39.54	9.53	39.50	34.99	Peak	100	119	HORIZONTAL
2	11339.83	41.12	54.00	-12.88	27.08	9.53	39.50	34.99	Average	100	119	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11339.21	53.74	74.00	-20.26	39.70	9.53	39.50	34.99	Peak	100	17	VERTICAL
2	11340.95	41.04	54.00	-12.96	27.00	9.53	39.50	34.99	Average	100	17	VERTICAL

Note:

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

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

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

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 52 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15777.36	42.44	54.00	-11.56	29.58	10.65	37.75	35.54	Average	100	144	HORIZONTAL
2	15779.82	54.21	74.00	-19.79	41.35	10.65	37.75	35.54	Peak	100	144	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15776.88	45.17	54.00	-8.83	32.31	10.65	37.75	35.54	Average	100	3	VERTICAL
2	15776.97	53.50	74.00	-20.50	40.64	10.65	37.75	35.54	Peak	100	3	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 60 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15900.16	54.67	74.00	-19.33	41.95	10.68	37.56	35.52	Peak	100	156	HORIZONTAL
2	15901.86	41.63	54.00	-12.37	28.91	10.68	37.56	35.52	Average	100	156	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15900.05	41.54	54.00	-12.46	28.82	10.68	37.56	35.52	Average	100	81	VERTICAL
2	15902.58	54.65	74.00	-19.35	41.93	10.68	37.56	35.52	Peak	100	81	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 64 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10641.33	53.17	74.00	-20.83	39.34	9.06	39.86	35.09	Peak	100	357	HORIZONTAL
2	10642.10	41.66	54.00	-12.34	27.83	9.06	39.86	35.09	Average	100	357	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10643.48	54.00	74.00	-20.00	40.17	9.06	39.86	35.09	Peak	100	312	VERTICAL
2	10644.31	41.46	54.00	-12.54	27.63	9.06	39.86	35.09	Average	100	312	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 100 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10996.25	53.98	74.00	-20.02	40.17	9.11	39.50	34.80	Peak	100	88	HORIZONTAL
2	10998.14	43.71	54.00	-10.29	29.90	9.11	39.50	34.80	Average	100	88	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10991.57	55.08	74.00	-18.92	41.27	9.11	39.50	34.80	Peak	100	43	VERTICAL
2	10995.96	42.60	54.00	-11.40	28.79	9.11	39.50	34.80	Average	100	43	VERTICAL

Temperature	25.6°C	Humidity	56%
Test Engineer	Andre Tak	Configurations	IEEE 802.11a Ch 116 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Jan. 23, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11163.21	36.49	54.00	-17.51	28.14	5.05	38.47	35.17	Average	163	203	HORIZONTAL
2	11165.58	49.08	74.00	-24.92	40.73	5.05	38.47	35.17	Peak	163	203	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11163.72	37.42	54.00	-16.58	29.07	5.05	38.47	35.17	Average	136	360	VERTICAL
2	11164.46	49.51	74.00	-24.49	41.16	5.05	38.47	35.17	Peak	136	360	VERTICAL

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 140 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 11, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11399.40	41.75	54.00	-12.25	27.70	9.59	39.50	35.04	Average	100	222	HORIZONTAL
2	11401.32	53.64	74.00	-20.36	39.59	9.59	39.50	35.04	Peak	100	222	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11397.60	54.62	74.00	-19.38	40.57	9.59	39.50	35.04	Peak	100	283	VERTICAL
2	11400.21	41.64	54.00	-12.36	27.59	9.59	39.50	35.04	Average	100	283	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. Band Edge Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

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

4.6.3. Test Procedures

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

4.6.4. Test Setup Layout

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

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. Test Result of Band Edge and Fundamental Emissions

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 52, 60, 64 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	46.54	54.00	-7.46	6.04	6.49	34.01	0.00	Average	100	295	VERTICAL
2	5150.00	58.14	74.00	-15.86	17.64	6.49	34.01	0.00	Peak	100	295	VERTICAL
3	5255.19	110.74			69.96	6.56	34.22	0.00	Average	100	295	VERTICAL
4	5256.64	122.46			81.68	6.56	34.22	0.00	Peak	100	295	VERTICAL
5	5350.00	46.71	54.00	-7.29	5.67	6.62	34.42	0.00	Average	100	295	VERTICAL
6	5350.96	60.02	74.00	-13.98	18.98	6.62	34.42	0.00	Peak	100	295	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	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5297.76	122.09			81.18	6.59	34.32	0.00	Peak	100	294	VERTICAL
2	5302.56	110.85			69.94	6.59	34.32	0.00	Average	100	294	VERTICAL
3	5350.64	52.69	54.00	-1.31	11.65	6.62	34.42	0.00	Average	100	294	VERTICAL
4	5351.60	72.99	74.00	-1.01	31.95	6.62	34.42	0.00	Peak	100	294	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5317.60	118.58			77.62	6.60	34.36	0.00	Peak	100	296	VERTICAL
2	5318.08	107.05			66.09	6.60	34.36	0.00	Average	100	296	VERTICAL
3	5350.00	51.29	54.00	-2.71	10.25	6.62	34.42	0.00	Average	100	296	VERTICAL
4	5352.40	72.66	74.00	-1.34	31.62	6.62	34.42	0.00	Peak	100	296	VERTICAL

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 100, 140 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5460.00	46.67	54.00	-7.33	5.36	6.68	34.63	0.00	Average	100	280	VERTICAL
2	5460.00	64.54	74.00	-9.46	23.23	6.68	34.63	0.00	Peak	100	280	VERTICAL
3	5469.36	72.79	74.00	-1.21	31.43	6.69	34.67	0.00	Peak	100	280	VERTICAL
4	5470.00	52.27	54.00	-1.73	10.91	6.69	34.67	0.00	Average	100	280	VERTICAL
5	5498.24	118.33			76.92	6.71	34.70	0.00	Peak	100	280	VERTICAL
6	5498.56	107.33			65.92	6.71	34.70	0.00	Average	100	280	VERTICAL

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5696.64	103.31			61.72	6.73	34.86	0.00	Average	100	290	VERTICAL
2	5698.56	116.52			74.93	6.73	34.86	0.00	Peak	100	290	VERTICAL
3	5725.32	52.55	54.00	-1.45	10.92	6.74	34.89	0.00	Average	100	290	VERTICAL
4	5725.80	72.49	74.00	-1.51	30.86	6.74	34.89	0.00	Peak	100	290	VERTICAL

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

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 54, 62 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5257.50	117.73			76.95	6.56	34.22	0.00	Peak	100	294	VERTICAL
2	5283.78	104.50			63.64	6.57	34.29	0.00	Average	100	294	VERTICAL
3	5351.28	52.79	54.00	-1.21	11.75	6.62	34.42	0.00	Average	100	294	VERTICAL
4	5351.92	72.90	74.00	-1.10	31.86	6.62	34.42	0.00	Peak	100	294	VERTICAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5297.82	99.44			58.53	6.59	34.32	0.00	Average	100	295	VERTICAL
2	5302.63	112.11			71.20	6.59	34.32	0.00	Peak	100	295	VERTICAL
3	5350.00	52.93	54.00	-1.07	11.89	6.62	34.42	0.00	Average	100	295	VERTICAL
4	5350.32	72.44	74.00	-1.56	31.40	6.62	34.42	0.00	Peak	100	295	VERTICAL

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 102, 110, 134 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5459.36	60.43	74.00	-13.57	19.12	6.68	34.63	0.00	Peak	100	300	VERTICAL
2	5460.00	45.52	54.00	-8.48	4.21	6.68	34.63	0.00	Average	100	300	VERTICAL
3	5469.04	72.71	74.00	-1.29	31.35	6.69	34.67	0.00	Peak	100	300	VERTICAL
4	5470.00	48.83	54.00	-5.17	7.47	6.69	34.67	0.00	Average	100	300	VERTICAL
5	5498.14	98.90			57.49	6.71	34.70	0.00	Average	100	300	VERTICAL
6	5499.42	111.57			70.16	6.71	34.70	0.00	Peak	100	300	VERTICAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5460.00	50.06	54.00	-3.94	8.75	6.68	34.63	0.00	Average	100	298	VERTICAL
2	5460.00	65.14	74.00	-8.86	23.83	6.68	34.63	0.00	Peak	100	298	VERTICAL
3	5470.00	52.66	54.00	-1.34	11.30	6.69	34.67	0.00	Average	100	298	VERTICAL
4	5470.00	71.34	74.00	-2.66	29.98	6.69	34.67	0.00	Peak	100	298	VERTICAL
5	5544.55	118.49			77.03	6.72	34.74	0.00	Peak	100	298	VERTICAL
6	5545.51	103.03			61.57	6.72	34.74	0.00	Average	100	298	VERTICAL

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5653.97	102.57			61.02	6.73	34.82	0.00	Average	100	300	VERTICAL
2	5663.91	115.58			74.02	6.73	34.83	0.00	Peak	100	300	VERTICAL
3	5725.00	52.92	54.00	-1.08	11.29	6.74	34.89	0.00	Average	100	300	VERTICAL
4	5726.92	72.93	74.00	-1.07	31.30	6.74	34.89	0.00	Peak	100	300	VERTICAL

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

Note:

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

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 52, 60, 64 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	46.63	54.00	-7.37	6.13	6.49	34.01	0.00	Average	100	292	VERTICAL
2	5150.00	59.94	74.00	-14.06	19.44	6.49	34.01	0.00	Peak	100	292	VERTICAL
3	5254.23	109.20			68.42	6.56	34.22	0.00	Average	100	292	VERTICAL
4	5255.19	121.33			80.55	6.56	34.22	0.00	Peak	100	292	VERTICAL
5	5350.00	46.51	54.00	-7.49	5.47	6.62	34.42	0.00	Average	100	292	VERTICAL
6	5350.00	57.90	74.00	-16.10	16.86	6.62	34.42	0.00	Peak	100	292	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	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5299.36	109.03			68.12	6.59	34.32	0.00	Average	100	293	VERTICAL
2	5301.28	120.13			79.22	6.59	34.32	0.00	Peak	100	293	VERTICAL
3	5350.00	52.61	54.00	-1.39	11.57	6.62	34.42	0.00	Average	100	293	VERTICAL
4	5350.00	69.69	74.00	-4.31	28.65	6.62	34.42	0.00	Peak	100	293	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5318.56	117.08			76.12	6.60	34.36	0.00	Peak	100	295	VERTICAL
2	5319.20	104.99			64.03	6.60	34.36	0.00	Average	100	295	VERTICAL
3	5350.00	53.00	54.00	-1.00	11.96	6.62	34.42	0.00	Average	100	295	VERTICAL
4	5350.00	72.34	74.00	-1.66	31.30	6.62	34.42	0.00	Peak	100	295	VERTICAL

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 20MHz Ch 100, 140 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5460.00	46.94	54.00	-7.06	5.63	6.68	34.63	0.00	Average	100	298	VERTICAL
2	5460.00	65.73	74.00	-8.27	24.42	6.68	34.63	0.00	Peak	100	298	VERTICAL
3	5470.00	52.97	54.00	-1.03	11.61	6.69	34.67	0.00	Average	100	298	VERTICAL
4	5470.00	68.49	74.00	-5.51	27.13	6.69	34.67	0.00	Peak	100	298	VERTICAL
5	5498.88	106.14			64.73	6.71	34.70	0.00	Average	100	298	VERTICAL
6	5501.12	118.69			77.28	6.71	34.70	0.00	Peak	100	298	VERTICAL

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5698.08	115.29			73.70	6.73	34.86	0.00	Peak	100	308	VERTICAL
2	5698.72	103.41			61.82	6.73	34.86	0.00	Average	100	308	VERTICAL
3	5725.00	52.54	54.00	-1.46	10.91	6.74	34.89	0.00	Average	100	308	VERTICAL
4	5725.16	70.72	74.00	-3.28	29.09	6.74	34.89	0.00	Peak	100	308	VERTICAL

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

Temperature	24.5°C	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 54, 62 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5256.22	117.23			76.45	6.56	34.22	0.00	Peak	100	291	VERTICAL
2	5276.41	104.01			63.19	6.57	34.25	0.00	Average	100	291	VERTICAL
3	5350.00	52.70	54.00	-1.30	11.66	6.62	34.42	0.00	Average	100	291	VERTICAL
4	5350.00	68.54	74.00	-5.46	27.50	6.62	34.42	0.00	Peak	100	291	VERTICAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5314.49	110.54			69.58	6.60	34.36	0.00	Peak	100	298	VERTICAL
2	5317.69	98.26			57.30	6.60	34.36	0.00	Average	100	298	VERTICAL
3	5350.00	52.74	54.00	-1.26	11.70	6.62	34.42	0.00	Average	100	298	VERTICAL
4	5354.17	69.69	74.00	-4.31	28.65	6.62	34.42	0.00	Peak	100	298	VERTICAL

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS8 40MHz Ch 102, 110, 134 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5457.12	69.45	74.00	-4.55	28.14	6.68	34.63	0.00	Peak	100	298	VERTICAL
2	5460.00	48.53	54.00	-5.47	7.22	6.68	34.63	0.00	Average	100	298	VERTICAL
3	5470.00	52.61	54.00	-1.39	11.25	6.69	34.67	0.00	Average	100	298	VERTICAL
4	5470.00	72.25	74.00	-1.75	30.89	6.69	34.67	0.00	Peak	100	298	VERTICAL
5	5500.06	99.49			58.08	6.71	34.70	0.00	Average	100	298	VERTICAL
6	5502.31	112.31			70.89	6.71	34.71	0.00	Peak	100	298	VERTICAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5457.12	70.73	74.00	-3.27	29.42	6.68	34.63	0.00	Peak	100	298	VERTICAL
2	5460.00	50.53	54.00	-3.47	9.22	6.68	34.63	0.00	Average	100	298	VERTICAL
3	5467.44	69.77	74.00	-4.23	28.41	6.69	34.67	0.00	Peak	100	298	VERTICAL
4	5470.00	52.69	54.00	-1.31	11.33	6.69	34.67	0.00	Average	100	298	VERTICAL
5	5534.62	103.48			62.04	6.71	34.73	0.00	Average	100	298	VERTICAL
6	5553.53	115.45			73.98	6.72	34.75	0.00	Peak	100	298	VERTICAL

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

Channel 134

: 3TX

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5676.09	112.85			71.27	6.73	34.85	0.00	Peak	100	301	VERTICAL
2	5677.69	101.06			59.48	6.73	34.85	0.00	Average	100	301	VERTICAL
3	5725.00	52.66	54.00	-1.34	11.03	6.74	34.89	0.00	Average	100	301	VERTICAL
4	5727.24	69.21	74.00	-4.79	27.58	6.74	34.89	0.00	Peak	100	301	VERTICAL

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

Note:

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

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 52, 60, 64 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	46.35	54.00	-7.65	5.85	6.49	34.01	0.00	Average	100	296	VERTICAL
2	5150.00	58.41	74.00	-15.59	17.91	6.49	34.01	0.00	Peak	100	296	VERTICAL
3	5255.67	122.73			81.95	6.56	34.22	0.00	Peak	100	296	VERTICAL
4	5266.25	112.07			71.25	6.57	34.25	0.00	Average	100	296	VERTICAL
5	5350.00	46.74	54.00	-7.26	5.70	6.62	34.42	0.00	Average	100	296	VERTICAL
6	5350.96	57.73	74.00	-16.27	16.69	6.62	34.42	0.00	Peak	100	296	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	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5294.23	110.54			69.66	6.59	34.29	0.00	Average	100	293	VERTICAL
2	5301.60	122.30			81.39	6.59	34.32	0.00	Peak	100	293	VERTICAL
3	5350.00	50.25	54.00	-3.75	9.21	6.62	34.42	0.00	Average	100	293	VERTICAL
4	5350.00	72.81	74.00	-1.19	31.77	6.62	34.42	0.00	Peak	100	293	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5318.24	118.84			77.88	6.60	34.36	0.00	Peak	100	297	VERTICAL
2	5320.96	106.51			65.55	6.60	34.36	0.00	Average	100	297	VERTICAL
3	5350.00	52.04	54.00	-1.96	11.00	6.62	34.42	0.00	Average	100	297	VERTICAL
4	5352.40	73.00	74.00	-1.00	31.96	6.62	34.42	0.00	Peak	100	297	VERTICAL

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

Temperature	24.5℃	Humidity	57%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a Ch 100, 140 / Chain J2 + Chain J3 + Chain J4 (3TX) with Ant. 11
Test Date	Nov. 10, 2012		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5460.00	46.98	54.00	-7.02	5.67	6.68	34.63	0.00	Average	100	133	VERTICAL
2	5460.00	64.34	74.00	-9.66	23.03	6.68	34.63	0.00	Peak	100	133	VERTICAL
3	5469.36	71.11	74.00	-2.89	29.75	6.69	34.67	0.00	Peak	100	133	VERTICAL
4	5470.00	52.99	54.00	-1.01	11.63	6.69	34.67	0.00	Average	100	133	VERTICAL
5	5500.80	108.34			66.93	6.71	34.70	0.00	Average	100	133	VERTICAL
6	5501.76	119.19			77.77	6.71	34.71	0.00	Peak	100	133	VERTICAL

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5696.15	106.23			64.64	6.73	34.86	0.00	Average	100	308	VERTICAL
2	5696.15	116.81			75.22	6.73	34.86	0.00	Peak	100	308	VERTICAL
3	5725.00	52.76	54.00	-1.24	11.13	6.74	34.89	0.00	Average	100	308	VERTICAL
4	5725.00	69.95	74.00	-4.05	28.32	6.74	34.89	0.00	Peak	100	308	VERTICAL

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

Note:

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

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

4.7. Frequency Stability Measurement

4.7.1. Limit

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

4.7.2. Measuring Instruments and Setting

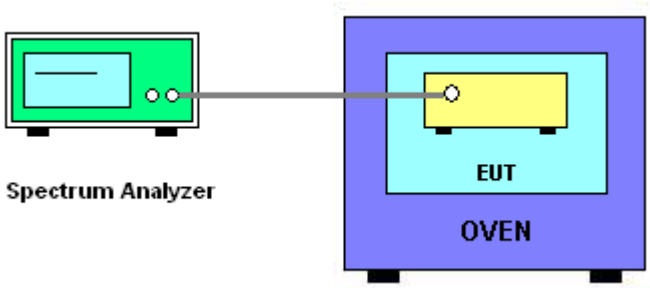
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.7.3. Test Procedures

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

4.7.4. Test Setup Layout



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 un-modulation transmitting mode.

4.7.7. Test Result of Frequency Stability

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	**5300**
126.50	5299.9790
110.00	5299.9790
93.50	5299.9790
Max. Deviation (MHz)	**0.021000**
Max. Deviation (ppm)	**3.96**

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	**5300**
-30	5299.9790
-20	5299.9786
-10	5299.9790
0	5299.9788
10	5299.9790
20	5299.9778
30	5299.9792
40	5299.9792
50	5299.9786
Max. Deviation (MHz)	**0.022200**
Max. Deviation (ppm)	**4.1887**

4.8. Antenna Requirements

4.8.1. 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.

4.8.2. 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
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2012	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 25, 2011	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 22, 2011	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 29, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 03, 2011	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Nov. 22, 2011	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N.C.R	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N.C.R	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N.C.R	Conducted (TH01-CB)
Signal generator	R&S	SMU200A	102782	10MHz-40GHz	Sep. 26, 2012	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	May 09, 2012	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071042	1GHz – 18GHz	Nov. 01, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one 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 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

7. TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-110702

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 Road, 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 Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : July 02, 2011

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