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FCC RADIO TEST REPORT

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

Product Name	ARUBA 134 WIRELESS ACCESS POINT, EXT ANTENNA / ARUBA 135 WIRELESS ACCESS POINT
Brand Name	Aruba
Model Name	AP-134 / AP-135
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Dec. 10, 2010
Final Test Date	Mar. 29, 2011
Submission Type	Original Equipment
Multiple Listing	Please refer to section 3.7

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g part and IEEE 802.11a (5725 ~ 5850MHz) of the product.

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

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

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

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





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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR0D2823AB	Rev. 01	Initial issue of report	Mar. 14, 2011



1. CERTIFICATE OF COMPLIANCE

Product Name : ARUBA 134 WIRELESS ACCESS POINT, EXT ANTENNA /
ARUBA 135 WIRELESS ACCESS POINT

Brand Name : Aruba

Model Name : AP-134 / AP-135

Applicant : Aruba Networks, Inc.

Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 10, 2010 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

A handwritten signature in blue ink that reads "Leo Huang".

Leo Huang
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	3.49 dB
4.2	15.247(b)(3)	Peak Output Power Measurement	Complies	0.02 dB
4.3	15.247(e)	Power Spectral Density	Complies	3.88 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	2.57 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.06 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From POE and Power Adapter
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth
Channel Band Width (99%)	<p>For 2.4GHz Band:</p> <p><For External Antenna / Ant. 2> MCS8 (20MHz): 17.68 MHz ; MCS8 (40MHz): 36.48 MHz</p> <p><For External Antenna / Ant. 5> MCS8 (20MHz): 17.68 MHz ; MCS8 (40MHz): 36.40 MHz</p> <p><For Internal Antenna / Ant. 8> MCS8 (20MHz): 17.68 MHz ; MCS8 (40MHz): 36.40 MHz</p> <p>For 5GHz Band:</p> <p><For External Antenna / Ant. 5> MCS8 (20MHz): 17.72 MHz ; MCS8 (40MHz): 36.40 MHz</p> <p><For External Antenna / Ant. 6> MCS8 (20MHz): 17.76 MHz ; MCS8 (40MHz): 36.40 MHz</p> <p><For External Antenna / Ant. 7> MCS8 (20MHz): 17.76 MHz ; MCS8 (40MHz): 36.40 MHz</p> <p><For Internal Antenna / Ant. 8> MCS8 (20MHz): 17.76 MHz ; MCS8 (40MHz): 36.48 MHz</p>



<p>Conducted Output Power</p>	<p>For 2.4GHz Band:</p> <p><For External Antenna / Ant. 2> MCS8 (20MHz): 29.49 dBm ; MCS8 (40MHz): 27.62 dBm</p> <p><For External Antenna / Ant. 5> MCS8 (20MHz): 29.98 dBm ; MCS8 (40MHz): 28.51 dBm</p> <p><For Internal Antenna / Ant. 8> MCS8 (20MHz): 29.79 dBm ; MCS8 (40MHz): 29.70 dBm</p> <p>For 5GHz Band:</p> <p><For External Antenna / Ant. 5> MCS8 (20MHz): 28.07 dBm ; MCS8 (40MHz): 27.48 dBm</p> <p><For External Antenna / Ant. 6> MCS8 (20MHz): 27.70 dBm ; MCS8 (40MHz): 27.59 dBm</p> <p><For External Antenna / Ant. 7> MCS8 (20MHz): 27.70 dBm ; MCS8 (40MHz): 27.59 dBm</p> <p><For Internal Antenna / Ant. 8> MCS8 (20MHz): 28.43 dBm ; MCS8 (40MHz): 28.12 dBm</p>
<p>Carrier Frequencies</p>	<p>Please refer to section 3.4</p>
<p>Antenna</p>	<p>Please refer to section 3.3</p>

802.11a/b/g

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From POE and Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	<p><For External Antenna / Ant. 2> 11b: 15.92 MHz ; 11g: 16.60 MHz</p> <p><For External Antenna / Ant. 5> 11b: 16.08 MHz ; 11g: 16.60 MHz ; 11a: 16.60 MHz</p> <p><For External Antenna / Ant. 6> 11a: 16.72 MHz</p> <p><For External Antenna / Ant. 7> 11a: 16.72 MHz</p> <p><For Internal Antenna / Ant. 8> 11b: 14.20 MHz ; 11g: 16.64 MHz ; 11a: 17.32 MHz</p>
Conducted Output Power	<p><For External Antenna / Ant. 2> 11b: 22.96 dBm ; 11g: 29.65 dBm</p> <p><For External Antenna / Ant. 5> 11b: 21.86 dBm ; 11g: 29.86 dBm ; 11a: 28.23 dBm</p> <p><For External Antenna / Ant. 6> 11a: 27.73 dBm</p> <p><For External Antenna / Ant. 7> 11a: 27.73 dBm</p> <p><For Internal Antenna / Ant. 8> 11b: 24.35 dBm ; 11g: 29.73 dBm ; 11a: 28.39 dBm</p>
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

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

IEEE 802.11n spec

MCS Index	Nss	Modulation	R	NBPS	NCBPS		NDBPS		Datarate(Mbps)			
					20MHz	40MHz	20MHz	40MHz	800nsGI		400nsGI	
									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
NBPS	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

3.2. Accessories

N/A

3.3. Table for Filed Antenna

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

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

Note 2: Ant. 7 only for IEEE 802.11a/n Band 4 uses.

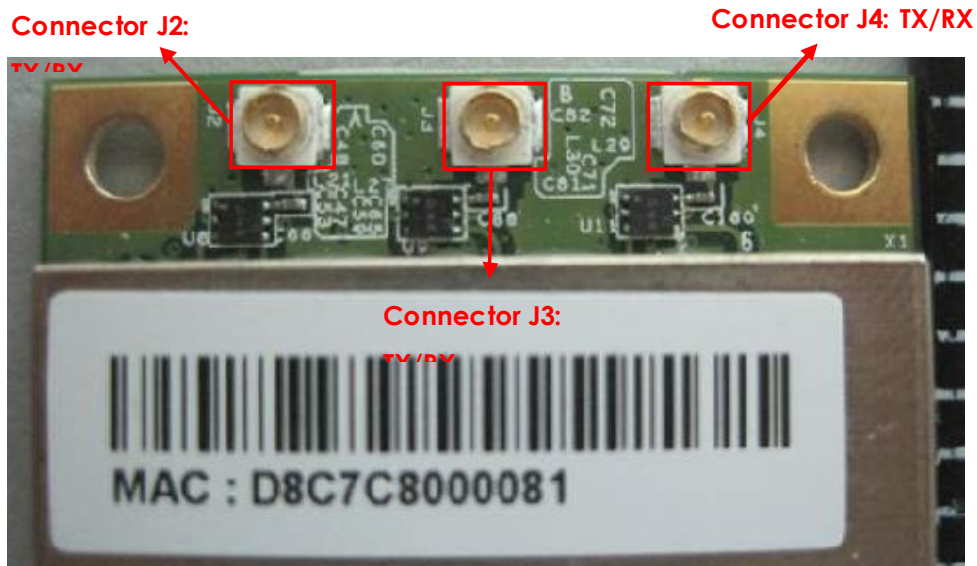
Note 3: **For IEEE 802.11b/g/n:**

Ant. 2, Ant. 5 and Ant. 8 were selected to be tested and recorded in the report.

For IEEE 802.11a/n Band 4:

Ant. 5, Ant. 6, Ant. 7 and Ant. 8 were selected to be tested and recorded in the report.

Note 4: The EUT has three antenna connectors (Connector J2, J3 and J4) that can be used for transmitting and receiving simultaneously as 3TX and 3RX.



3.4. Table for Carrier Frequencies

For 2.4GHz Band

For IEEE 802.11b/g, use Channel 1~Channel 11.

There are two bandwidth systems for IEEE 802.11n.

For both 20MHz bandwidth systems, use Channel 1~Channel 11.

For both 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

For 5GHz Band

For IEEE 802.11a, use Channel 149, 153, 157, 161, 165.

There are two bandwidth systems for IEEE 802.11n.

For 20MHz bandwidth systems, use Channel 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 151, 159.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz Band 4	149	5745 MHz	159	5795 MHz
	151	5755 MHz	161	5805 MHz
	153	5765 MHz	165	5825 MHz
	157	5785 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.

For 2.4GHz Band

Test Items	Mode	Data Rate	Channel	Connector
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Peak Output Power Measurement	MCS8/20MHz	13 Mbps	1/6/11	J2/J3/J4/J2+J3+J4
	MCS8/40MHz	27 Mbps	3/6/9	J2/J3/J4/J2+J3+J4
	11b/CCK	1 Mbps	1/6/11	J2/J3/J4/J2+J3+J4
	11g/BPSK	6 Mbps	1/6/11	J2/J3/J4/J2+J3+J4
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	1/6/11	J2+J3+J4
	MCS8/40MHz	27 Mbps	3/6/9	J2+J3+J4
	11b/CCK	1 Mbps	1/6/11	J2+J3+J4
	11g/BPSK	6 Mbps	1/6/11	J2+J3+J4
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS8/20MHz	13 Mbps	1/6/11	J2+J3+J4
	MCS8/40MHz	27 Mbps	3/6/9	J2+J3+J4
	11b/CCK	1 Mbps	1/6/11	J2+J3+J4
	11g/BPSK	6 Mbps	1/6/11	J2+J3+J4
Band Edge Emissions	MCS8/20MHz	13 Mbps	1/11	J2+J3+J4
	MCS8/40MHz	27 Mbps	3/9	J2+J3+J4
	11b/CCK	1 Mbps	1/11	J2+J3+J4
	11g/BPSK	6 Mbps	1/11	J2+J3+J4

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Peak Output Power Measurement	MCS8/20MHz	13 Mbps	149/157/165	J2/J3/J4/J2+J3+J4
	MCS8/40MHz	27 Mbps	151/159	J2/J3/J4/J2+J3+J4
	11a/BPSK	6 Mbps	149/157/165	J2/J3/J4/J2+J3+J4
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	149/157/165	J2+J3+J4
	MCS8/40MHz	27 Mbps	151/159	J2+J3+J4
	11a/BPSK	6 Mbps	149/157/165	J2+J3+J4
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS8/20MHz	13 Mbps	149/157/165	J2+J3+J4
	MCS8/40MHz	27 Mbps	151/159	J2+J3+J4
	11a/BPSK	6 Mbps	149/157/165	J2+J3+J4
Band Edge Emissions	MCS8/20MHz	13 Mbps	149/157/165	J2+J3+J4
	MCS8/40MHz	27 Mbps	151/159	J2+J3+J4
	11a/BPSK	6 Mbps	149/157/165	J2+J3+J4

All the test modes were listed as below:

Mode 1. EUT 1 with external antenna + Adapter

Mode 2. EUT 1 with external antenna + POE

Mode 3. EUT 2 with internal antenna + Adapter

Mode 4. EUT 2 with internal antenna + POE

<For Conducted Emissions Test>:

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

<For Radiated Emissions Test Below 1GHz>:

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

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

<For Radiated Emissions Test Above 1GHz>:

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

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

<For MPE and Co-location Test>

For Co-location Test, Ant. 5 and Ant. 8 were selected to be tested and recorded in the report.

The EUT could be applied with wireless LAN function 2.4GHz Band and wireless LAN function 5GHz Band; therefore Maximum Permissible Exposure (please refer to Appendix B) and Co-location (please refer to Appendix C) tests are added for simultaneously transmit between wireless LAN function 2.4GHz Band and wireless LAN function 5GHz Band.

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	187376	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	187376	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

Please refer section 6 for Test Site Address.

3.7. Table for Multiple Listing

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

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

3.8. Table for Supporting Units

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

3.9. Table for Parameters of Test Software Setting

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

For 2.4GHz Band

<For External Antenna / Ant. 2>

Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 1.7		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS8 20MHz	13	17.5	14.5
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS8 40MHz	10.5	14.5	11

Power Parameters of IEEE 802.11b/g

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

<For External Antenna / Ant. 5>

Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 2.13		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS8 20MHz	14.5	18	15.5
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS8 40MHz	11	14.5	12.5

Power Parameters of IEEE 802.11b/g

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

<For Internal Antenna / Ant. 8>
Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 1.7		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS8 20MHz	16.5	23.5	16.5
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS8 40MHz	13	17	15

Power Parameters of IEEE 802.11b/g

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

For 5GHz Band
<For External Antenna / Ant. 5>
Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 1.7		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	19	18	18
Frequency	5755 MHz	5795 MHz	-
MCS8 40MHz	19	18	-

Power Parameters of IEEE 802.11a

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

<For External Antenna / Ant. 6>
Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 1.7		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	20	20	20
Frequency	5755 MHz	5795 MHz	-
MCS8 40MHz	20	20	-

Power Parameters of IEEE 802.11a

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

<For External Antenna / Ant. 7>
Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 1.7		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	20	20	20
Frequency	5755 MHz	5795 MHz	-
MCS8 40MHz	20	20	-

Power Parameters of IEEE 802.11a

Test Software Version	ART2-GUI 1.7		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	20	20	20

<For Internal Antenna / Ant. 8>
Power Parameters of IEEE 802.11n

Test Software Version	ART2-GUI 1.7		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	21	20.5	20
Frequency	5755 MHz	5795 MHz	-
MCS8 40MHz	20.5	20	-

Power Parameters of IEEE 802.11a

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



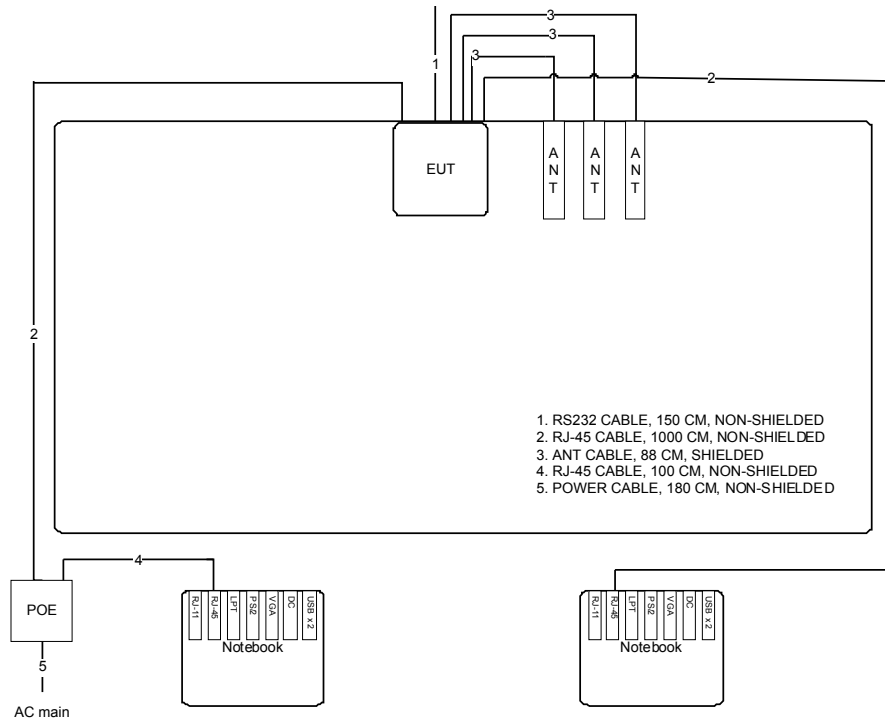
During the test, "ART2-GUI 1.7" and "ART2-GUI 2.13" under WIN XP was executed to control the EUT continuously transmit RF signal.

3.10. Test Configurations

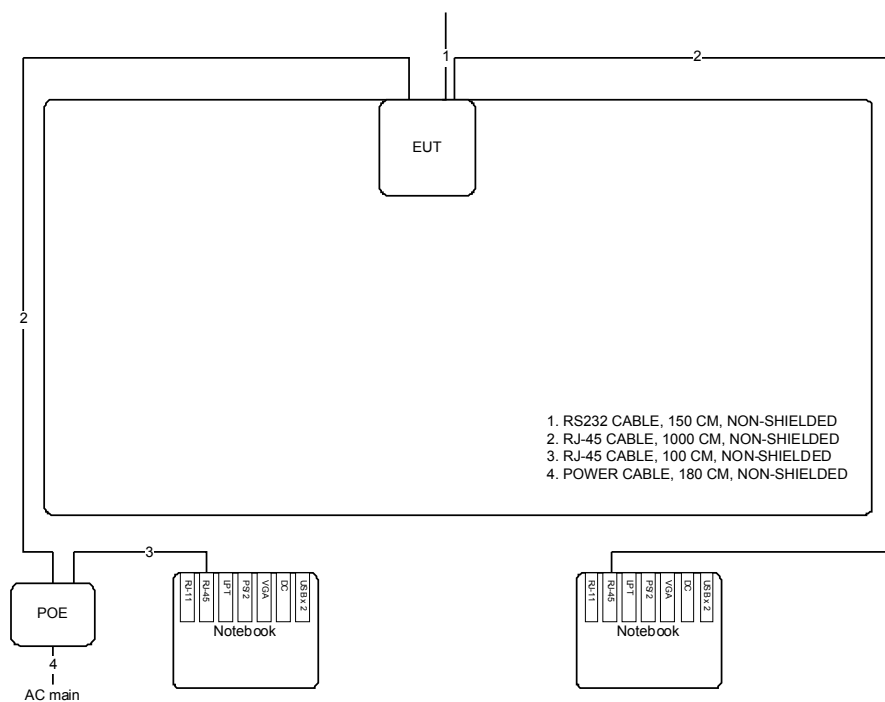
3.10.1. Radiation Emissions Test Configuration

Test Configuration: 9kHz~1GHz

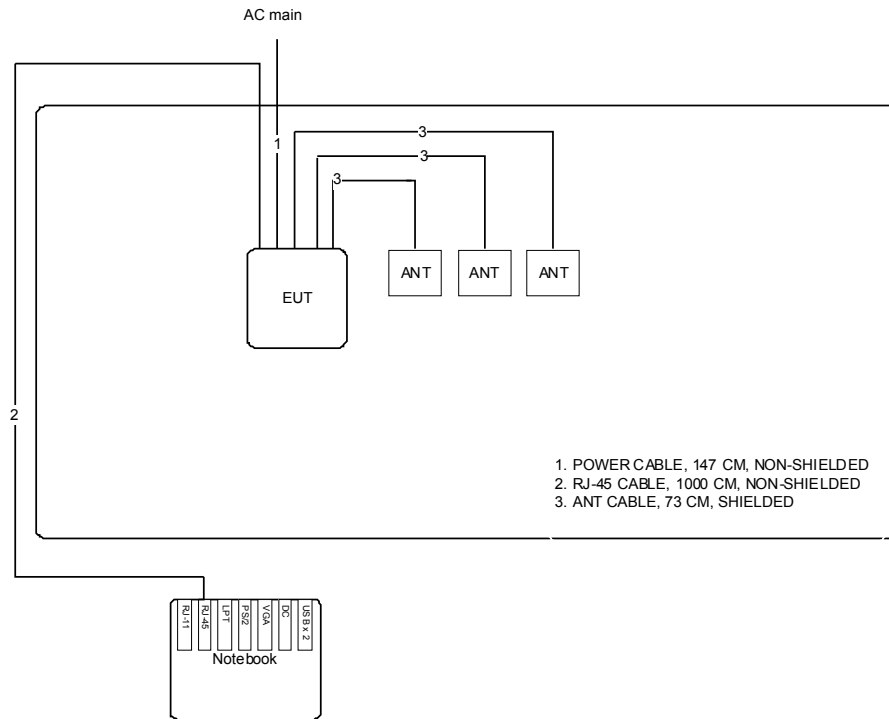
Test Mode: Mode 2



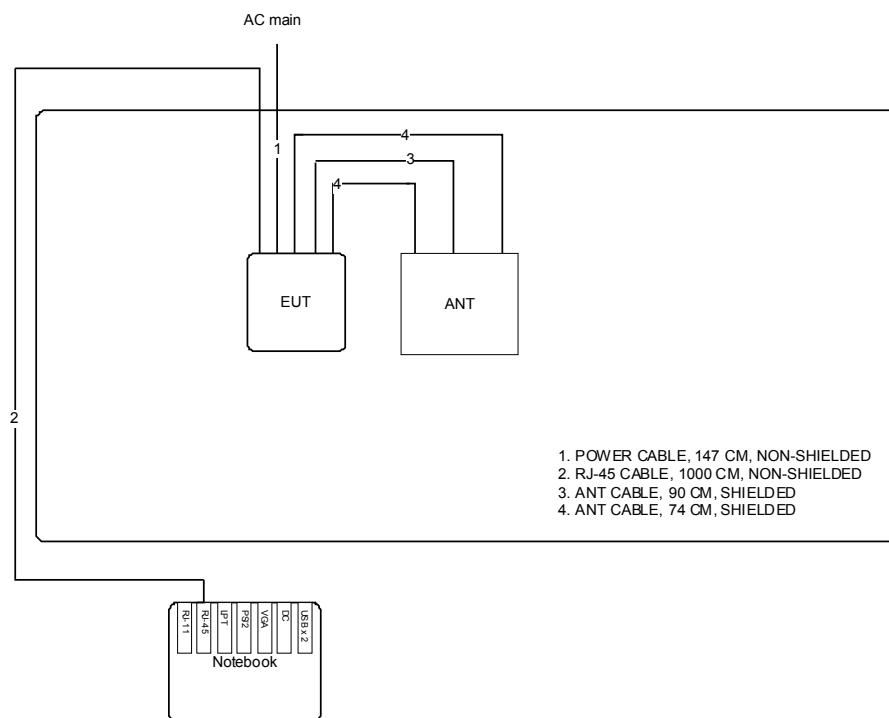
Test Mode: Mode 4



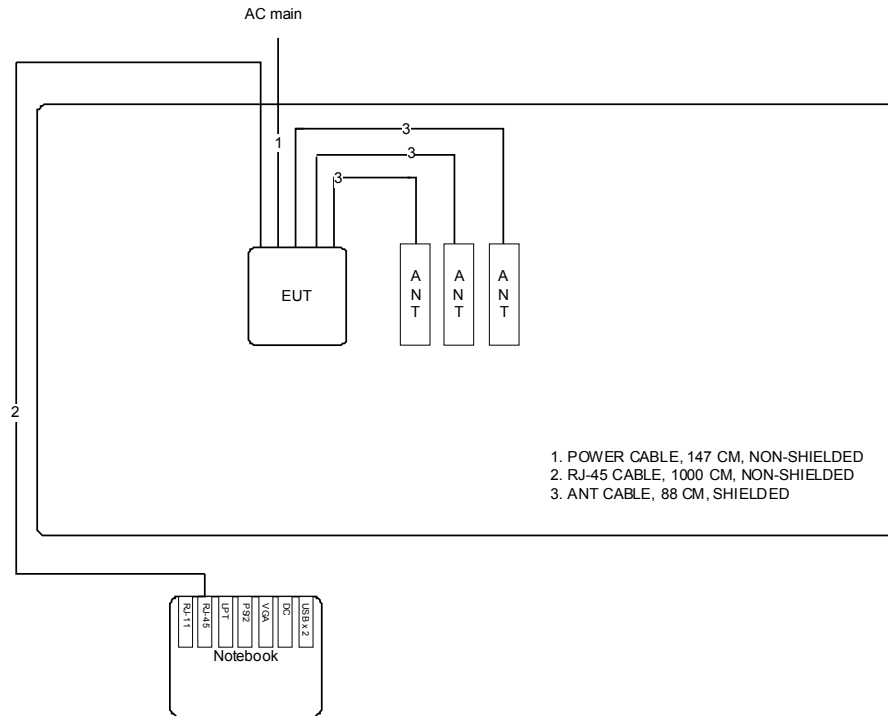
Test Configuration: above 1GHz
 <For External Antenna / Ant. 2> <2.4GHz>



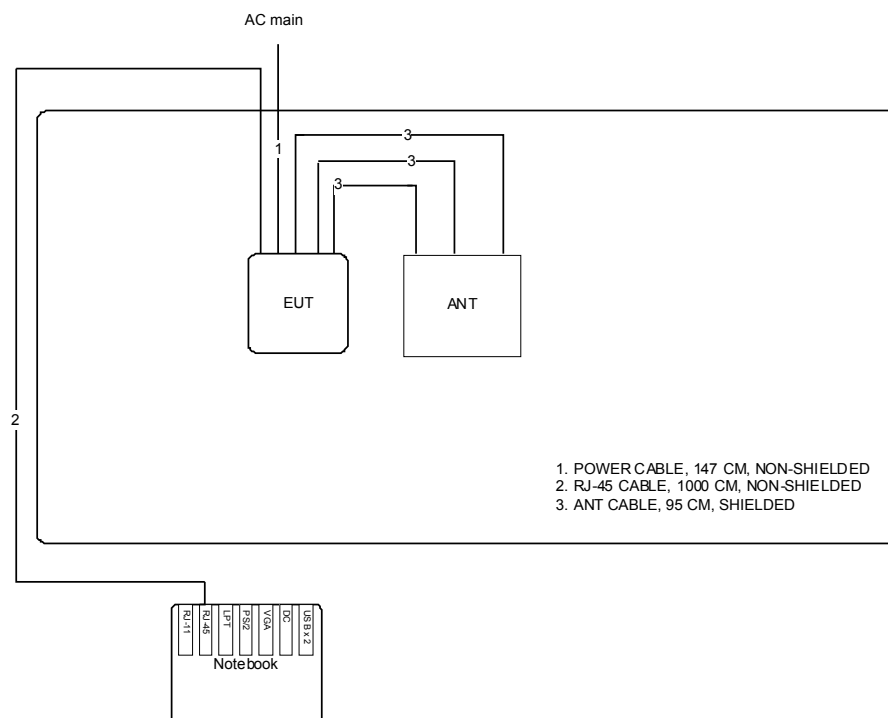
<For External Antenna / Ant. 5> <2.4GHz / 5GHz>



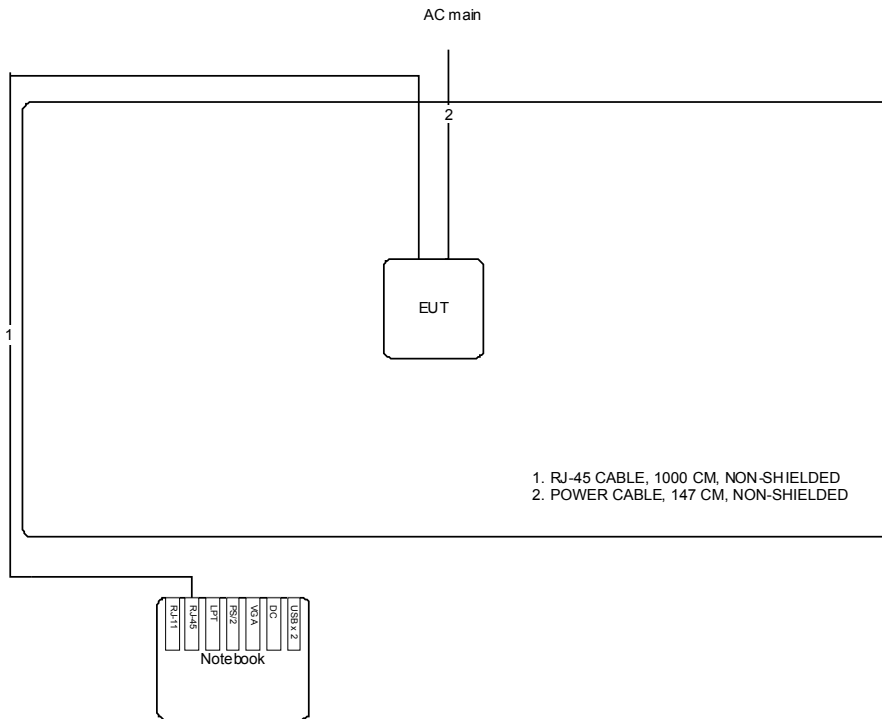
<For External Antenna / Ant. 6> <5GHz>



<For External Antenna / Ant. 7> <5GHz>

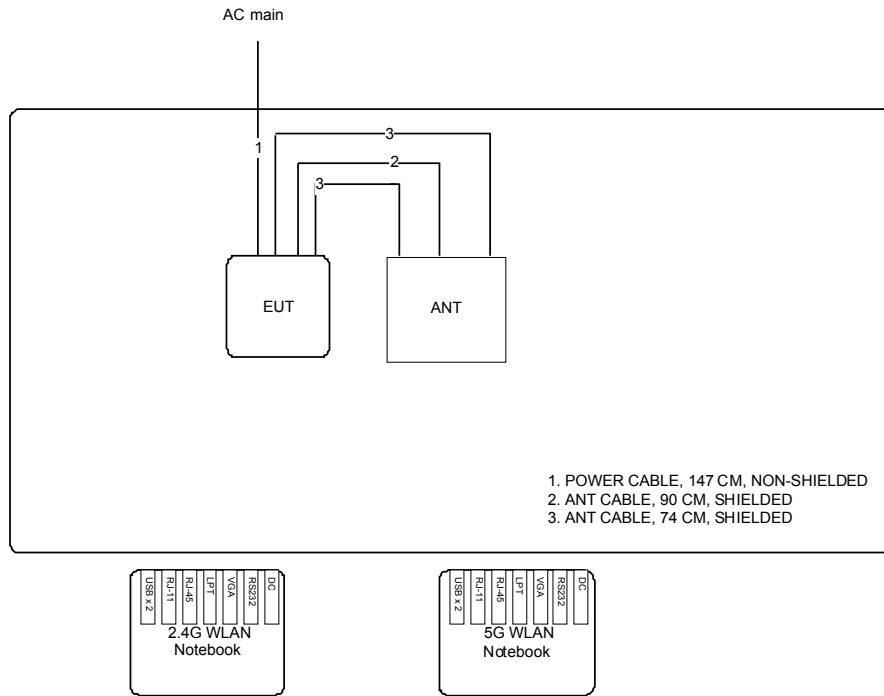


<For Internal Antenna / Ant. 8> <2.4GHz / 5GHz>

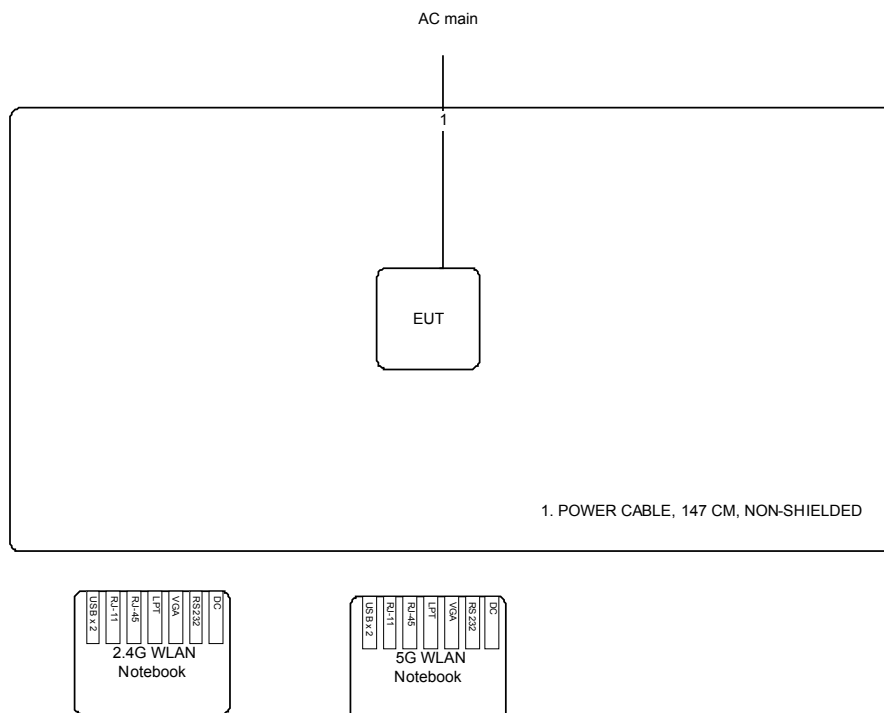


Test Configuration: Co-Location

<For External Antenna / Ant. 5>

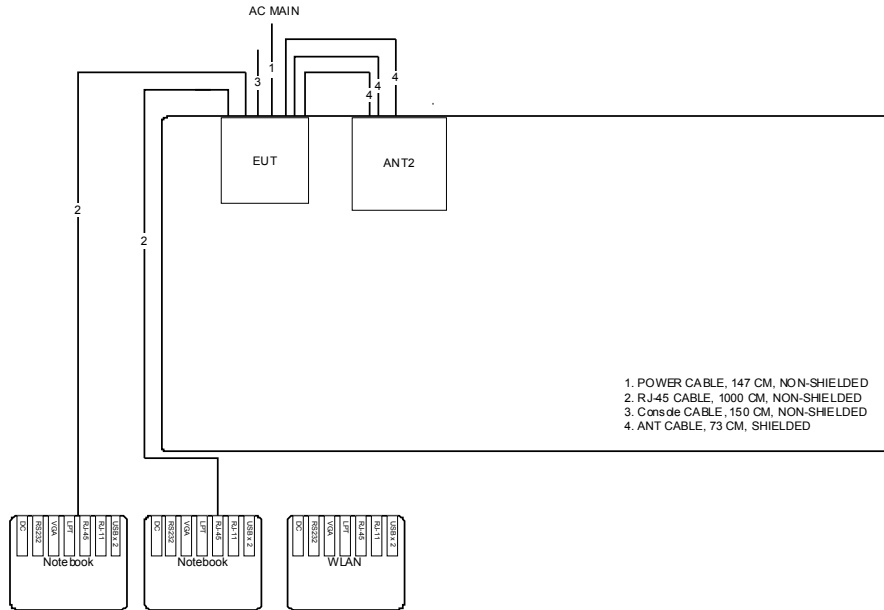


<For Internal Antenna / Ant. 8>

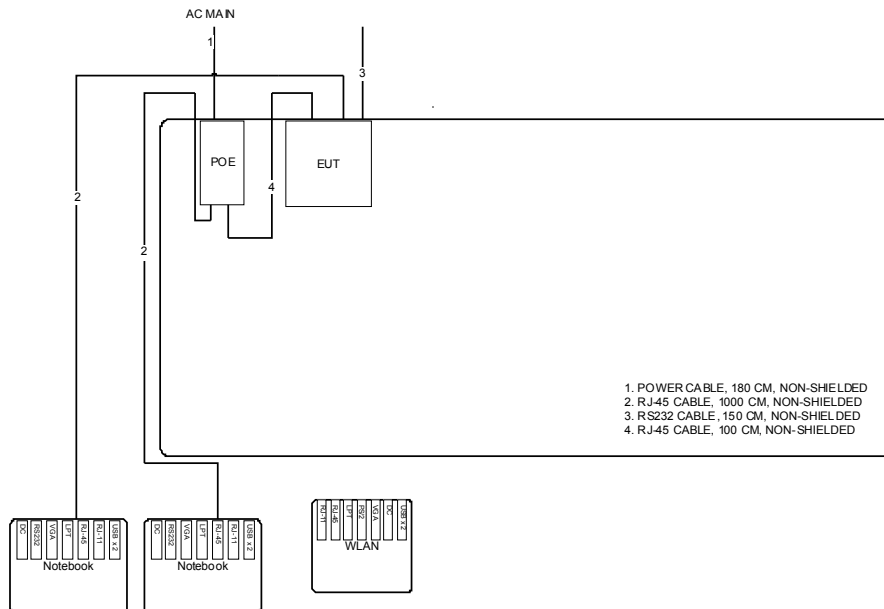


3.10.2. AC Power Line Conduction Emissions Test Configuration

Test Mode: Mode 1



Test Mode: Mode 4



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

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

4.1.2. Measuring Instruments and Setting

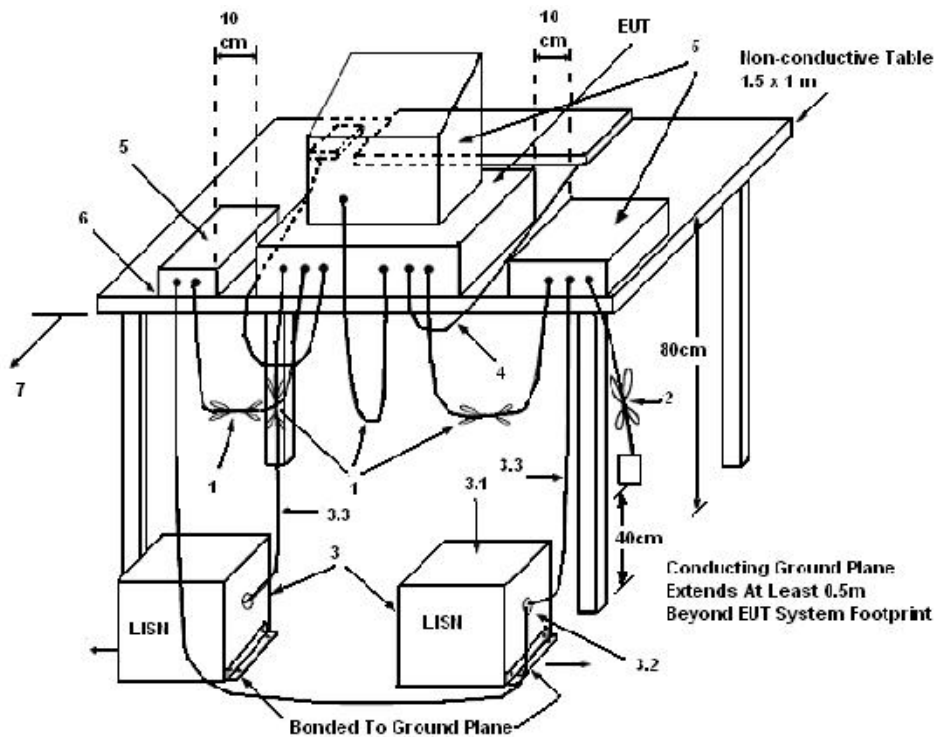
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
 - (3.1) All other equipment powered from additional LISN(s).
 - (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
 - (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

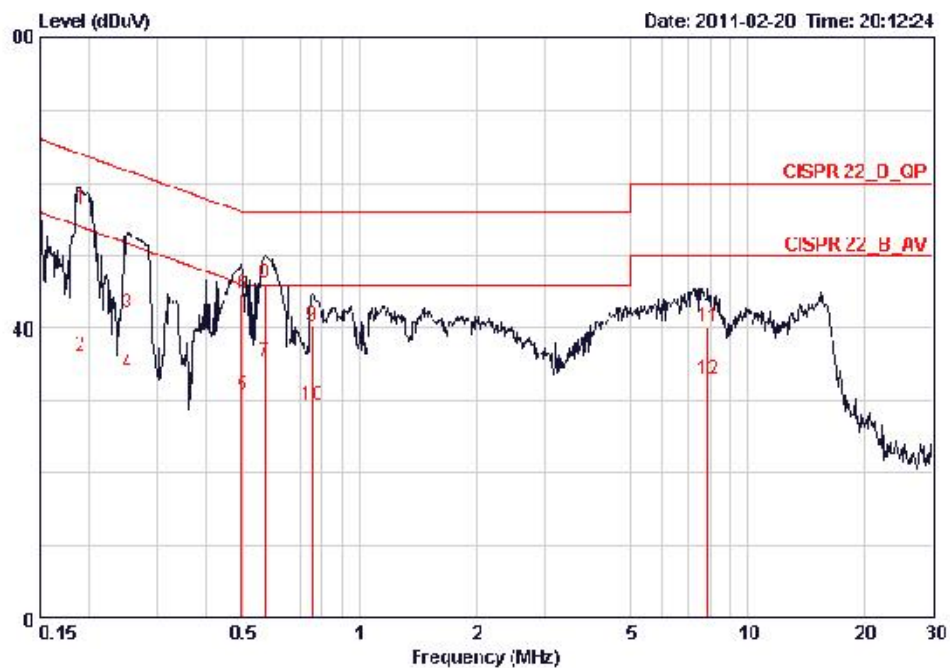
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

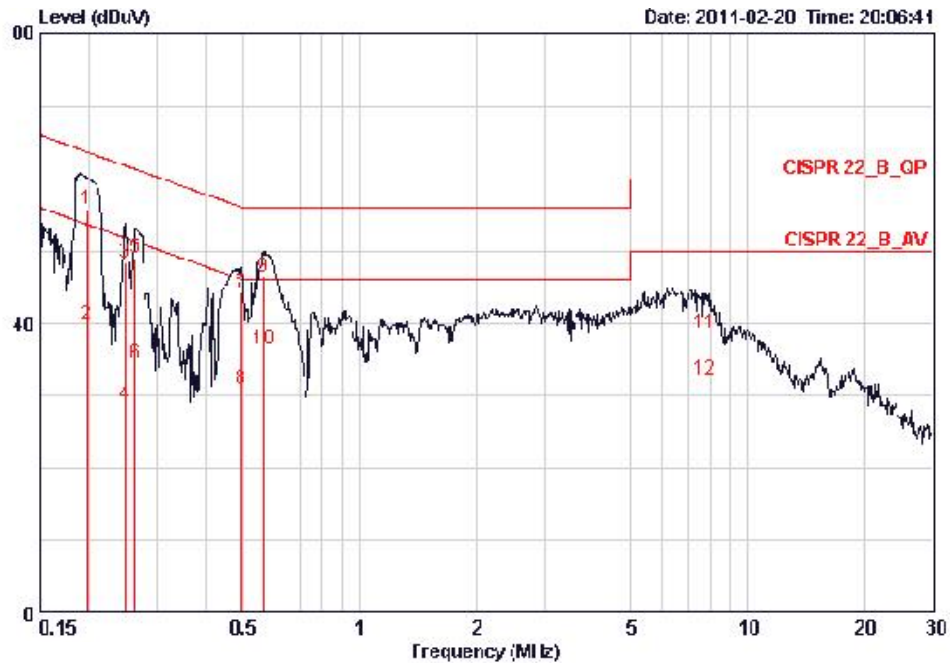
4.1.7. Results of AC Power Line Conducted Emissions Measurement

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



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19039	56.49	-7.53	64.02	56.24	0.05	0.20	QP
2	0.19039	36.18	-17.84	54.02	35.93	0.05	0.20	AVERAGE
3	0.25211	42.01	-19.67	61.69	41.77	0.04	0.20	QP
4	0.25211	33.81	-17.87	51.69	33.57	0.04	0.20	AVERAGE
5	0.49673	30.81	-15.25	46.05	30.60	0.03	0.18	AVERAGE
6	0.49673	44.67	-11.39	56.05	44.46	0.03	0.18	QP
7	0.57010	35.33	-10.67	46.00	35.10	0.03	0.20	AVERAGE
8	0.57010	46.74	-9.26	56.00	46.01	0.03	0.20	QP
9	0.75493	40.35	-15.65	56.00	40.12	0.03	0.20	QP
10	0.75493	29.40	-16.60	46.00	29.17	0.03	0.20	AVERAGE
11	7.893	40.85	-19.95	60.00	39.37	0.24	0.40	QP
12	7.093	32.93	17.07	50.00	32.25	0.20	0.40	AVERAGE

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

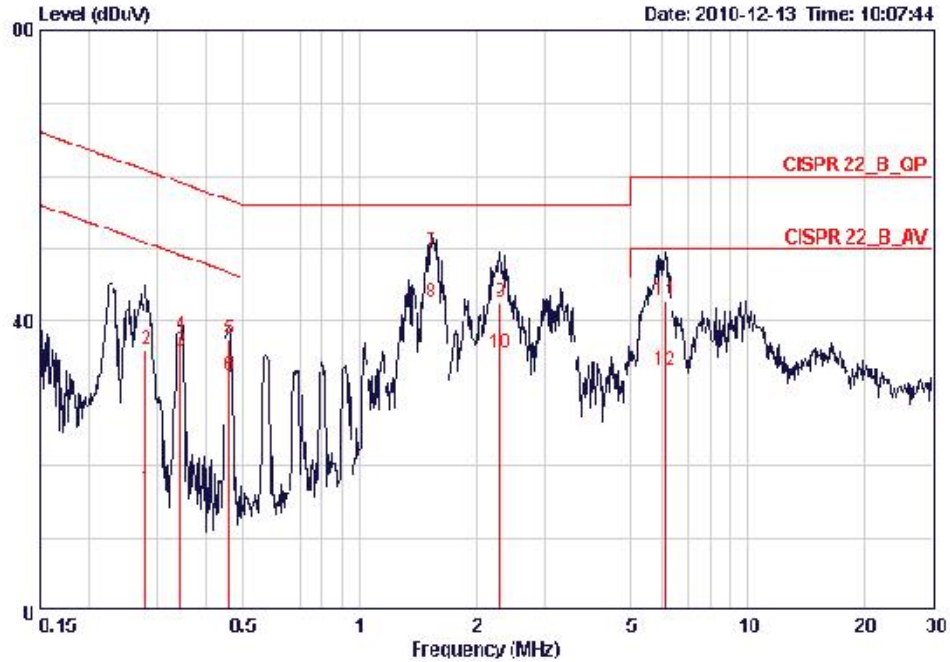


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19789	55.81	-7.89	63.70	55.53	0.04	0.20	QP
2	0.19789	39.98	-13.72	53.70	39.70	0.04	0.20	AVERAGE
3	0.24814	48.36	-13.46	61.82	48.08	0.04	0.20	QP
4	0.24814	28.40	-23.02	51.82	28.52	0.04	0.20	AVERAGE
5	0.26303	49.08	-12.26	61.34	48.80	0.04	0.20	QP
6	0.26303	34.40	-16.94	51.34	34.12	0.04	0.20	AVERAGE
7	0.42411	44.30	11.77	56.10	44.00	0.07	0.10	QP
8	0.42411	31.00	-15.10	46.10	30.75	0.07	0.18	AVERAGE
9	0.56409	46.52	-9.48	56.00	46.25	0.07	0.20	QP
10	0.56409	36.48	-9.52	46.00	36.21	0.07	0.20	AVERAGE
11	7.769	38.51	-21.49	60.00	37.79	0.32	0.40	QP
12	7.769	32.22	-17.78	50.00	31.50	0.32	0.40	AVERAGE

Note:

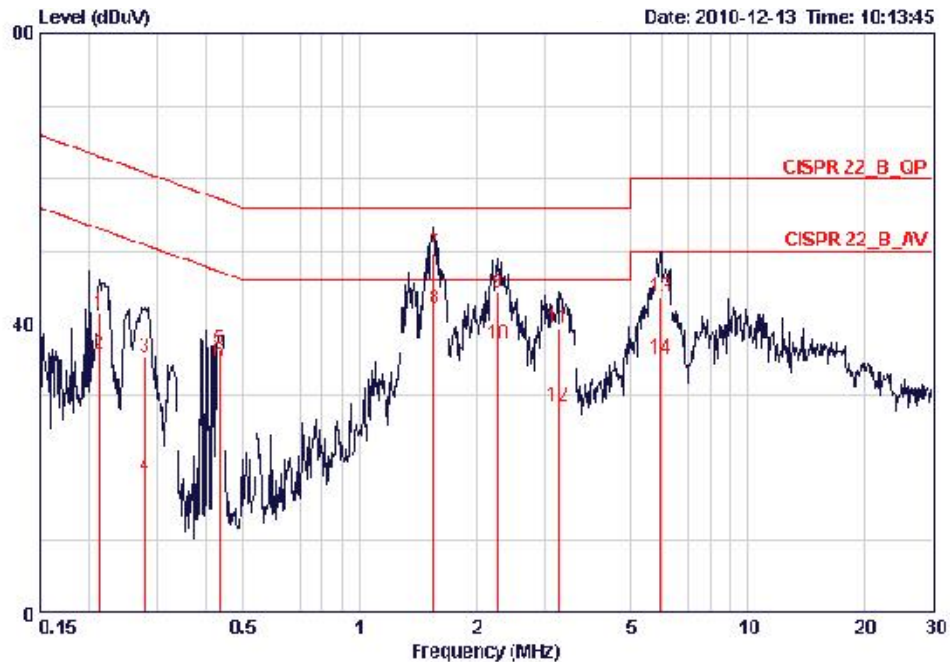
Level = Read Level + LISN Factor + Cable Loss.

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



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.28178	17.03	-33.73	50.76	16.79	0.04	0.20	AVERAGE
2	0.28178	35.99	-24.77	60.76	35.75	0.04	0.20	QP
3	0.34463	35.74	-13.35	49.09	35.51	0.03	0.20	AVERAGE
4	0.34463	37.87	-21.22	59.09	37.64	0.03	0.20	QP
5	0.46122	37.59	-19.08	56.67	37.36	0.03	0.20	QP
6	0.46122	32.48	-11.19	46.67	32.25	0.03	0.20	AVERAGE
7	1.535	42.55	-6.45	56.00	42.40	0.04	0.11	QP
8	1.535	42.51	-3.49	46.00	42.36	0.04	0.11	AVERAGE
9	2.297	42.47	-13.53	56.00	42.21	0.06	0.20	QP
10	2.297	35.50	-10.50	46.00	35.24	0.06	0.20	AVERAGE
11	6.153	42.76	-17.24	60.00	42.21	0.22	0.34	QP
12	6.153	33.23	-16.77	50.00	32.68	0.22	0.34	AVERAGE

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



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21392	41.92	-21.53	63.05	41.24	0.03	0.20	QP
2	0.21392	35.72	-17.33	53.05	35.44	0.02	0.20	AVERAGE
3	0.28029	35.35	-25.46	60.81	35.07	0.03	0.20	QP
4	0.28029	19.03	-31.78	50.81	18.75	0.03	0.20	AVERAGE
5	0.43511	36.47	-20.68	57.15	36.20	0.07	0.20	QP
6	0.43511	34.62	-12.53	47.15	34.35	0.07	0.20	AVERAGE
7	1.552	49.76	-6.24	56.00	49.57	0.03	0.11	QP
8	1.552	12.04	-3.96	16.00	11.85	0.03	0.11	AVERAGE
9	2.273	44.24	-11.76	56.00	43.94	0.10	0.20	QP
10	2.273	37.14	-8.86	46.00	36.84	0.10	0.20	AVERAGE
11	3.241	39.34	16.66	56.00	39.96	0.12	0.25	QP
12	3.241	28.54	-17.46	46.00	28.16	0.12	0.25	AVERAGE
13	5.961	43.65	-16.35	60.00	43.10	0.25	0.30	QP
14	5.961	35.01	-14.99	50.00	34.46	0.25	0.30	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Peak Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3dB that the directional gain of the antenna exceeds 6dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

4.2.2. Measuring Instruments and Setting

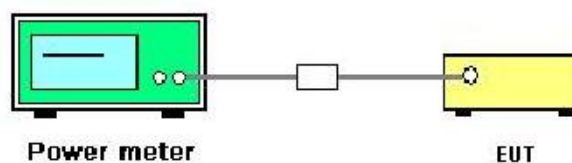
Please refer to section 5 of equipments list in this report. The following table is the setting of the peak power meter.

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

4.2.3. Test Procedures

Spectrum Parameter	Setting
RF Output Power Method	<input checked="" type="checkbox"/> ANSI C63.10 clause 6.10.2.1 (a) power meter method
RF Output Power Method	<input type="checkbox"/> ANSI C63.10 clause 6.10.2.1 (b) channel integration method
RF Output Power Method	<input type="checkbox"/> ANSI C63.10 clause 6.10.3.1 Method 1 - spectral trace averaging
RF Output Power Method	<input type="checkbox"/> ANSI C63.10 clause 6.10.3.2 Method 2 - zero-span mode with trace averaging

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 Peak Output Power

<For External Antenna / Ant. 2>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 2
Test Date	Mar. 08, 2011		

For 2.4GHz Band

Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	22.23	30.00	Complies
6	2437 MHz	24.61	30.00	Complies
11	2462 MHz	22.92	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	21.60	30.00	Complies
6	2437 MHz	24.62	30.00	Complies
11	2462 MHz	23.69	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	21.94	30.00	Complies
6	2437 MHz	24.91	30.00	Complies
11	2462 MHz	24.08	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	26.70	30.00	Complies
6	2437 MHz	29.49	30.00	Complies
11	2462 MHz	28.36	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	19.41	30.00	Complies
6	2437 MHz	22.45	30.00	Complies
9	2452 MHz	18.23	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	19.45	30.00	Complies
6	2437 MHz	22.62	30.00	Complies
9	2452 MHz	19.30	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	19.65	30.00	Complies
6	2437 MHz	23.41	30.00	Complies
9	2452 MHz	19.65	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	24.28	30.00	Complies
6	2437 MHz	27.62	30.00	Complies
9	2452 MHz	23.87	30.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11b/g / Ant. 2
Test Date	Mar. 08, 2011		

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

<For External Antenna / Ant. 5>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 5
Test Date	Mar. 29, 2011		

For 2.4GHz Band

Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.72	30.00	Complies
6	2437 MHz	25.24	30.00	Complies
11	2462 MHz	24.00	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.50	30.00	Complies
6	2437 MHz	25.20	30.00	Complies
11	2462 MHz	24.19	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.40	30.00	Complies
6	2437 MHz	25.18	30.00	Complies
11	2462 MHz	24.78	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	28.31	30.00	Complies
6	2437 MHz	29.98	30.00	Complies



11	2462 MHz	29.11	30.00	Complies
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Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	20.02	30.00	Complies
6	2437 MHz	23.86	30.00	Complies
9	2452 MHz	21.52	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	20.12	30.00	Complies
6	2437 MHz	23.65	30.00	Complies
9	2452 MHz	22.21	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	19.70	30.00	Complies
6	2437 MHz	23.70	30.00	Complies
9	2452 MHz	21.14	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	24.72	30.00	Complies
6	2437 MHz	28.51	30.00	Complies
9	2452 MHz	26.42	30.00	Complies

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

For 5GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.34	30.00	Complies
157	5785 MHz	23.33	30.00	Complies
165	5825 MHz	23.25	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.28	30.00	Complies
157	5785 MHz	22.74	30.00	Complies
165	5825 MHz	22.65	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.27	30.00	Complies
157	5785 MHz	23.10	30.00	Complies
165	5825 MHz	23.14	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	28.07	30.00	Complies
157	5785 MHz	27.83	30.00	Complies
165	5825 MHz	27.79	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.60	30.00	Complies
159	5795 MHz	22.55	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.75	30.00	Complies
159	5795 MHz	22.59	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.78	30.00	Complies
159	5795 MHz	22.65	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	27.48	30.00	Complies
159	5795 MHz	27.37	30.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11b/g / Ant. 5
Test Date	Mar. 29, 2011		

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

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

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

<For External Antenna / Ant. 6>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 6
Test Date	Mar. 09, 2011		

For 5GHz Band

Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.73	30.00	Complies
157	5785 MHz	22.74	30.00	Complies
165	5825 MHz	22.74	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.95	30.00	Complies
157	5785 MHz	22.93	30.00	Complies
165	5825 MHz	22.87	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.06	30.00	Complies
157	5785 MHz	23.11	30.00	Complies

165	5825 MHz	23.14	30.00	Complies
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Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	27.69	30.00	Complies
157	5785 MHz	27.70	30.00	Complies
165	5825 MHz	27.69	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.64	30.00	Complies
159	5795 MHz	22.66	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.86	30.00	Complies
159	5795 MHz	22.78	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.91	30.00	Complies
159	5795 MHz	23.00	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	27.58	30.00	Complies
159	5795 MHz	27.59	30.00	Complies



Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 6
Test Date	Mar. 09, 2011		

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

<For External Antenna / Ant. 7>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 7
Test Date	Mar. 09, 2011		

For 5GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.73	30.00	Complies
157	5785 MHz	22.74	30.00	Complies
165	5825 MHz	22.74	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.95	30.00	Complies
157	5785 MHz	22.93	30.00	Complies
165	5825 MHz	22.87	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.06	30.00	Complies
157	5785 MHz	23.11	30.00	Complies
165	5825 MHz	23.14	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	27.69	30.00	Complies
157	5785 MHz	27.70	30.00	Complies
165	5825 MHz	27.69	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.64	30.00	Complies
159	5795 MHz	22.66	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.86	30.00	Complies
159	5795 MHz	22.78	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.91	30.00	Complies
159	5795 MHz	23.00	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	27.58	30.00	Complies
159	5795 MHz	27.59	30.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 7
Test Date	Mar. 09, 2011		

Configuration IEEE 802.11a Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.75	30.00	Complies
157	5785 MHz	22.74	30.00	Complies
165	5825 MHz	22.70	30.00	Complies

Configuration IEEE 802.11a Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.05	30.00	Complies
157	5785 MHz	22.90	30.00	Complies
165	5825 MHz	22.81	30.00	Complies

Configuration IEEE 802.11a Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.07	30.00	Complies
157	5785 MHz	23.08	30.00	Complies
165	5825 MHz	23.13	30.00	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	27.73	30.00	Complies
157	5785 MHz	27.68	30.00	Complies
165	5825 MHz	27.66	30.00	Complies

<For Internal Antenna / Ant. 8>

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

For 2.4GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.93	30.00	Complies
6	2437 MHz	24.81	30.00	Complies
11	2462 MHz	23.86	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	23.82	30.00	Complies
6	2437 MHz	24.89	30.00	Complies
11	2462 MHz	23.81	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	24.17	30.00	Complies
6	2437 MHz	25.35	30.00	Complies
11	2462 MHz	24.38	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	28.75	30.00	Complies
6	2437 MHz	29.79	30.00	Complies
11	2462 MHz	28.80	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	22.53	30.00	Complies
6	2437 MHz	24.74	30.00	Complies
9	2452 MHz	23.33	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	22.15	30.00	Complies
6	2437 MHz	24.87	30.00	Complies
9	2452 MHz	22.34	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	21.97	30.00	Complies
6	2437 MHz	25.17	30.00	Complies
9	2452 MHz	23.22	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	26.99	30.00	Complies
6	2437 MHz	29.70	30.00	Complies
9	2452 MHz	27.76	30.00	Complies

For 5GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.72	30.00	Complies
157	5785 MHz	23.42	30.00	Complies
165	5825 MHz	23.36	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.76	30.00	Complies
157	5785 MHz	23.47	30.00	Complies
165	5825 MHz	23.27	30.00	Complies

Configuration IEEE 802.11n MCS8 20MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	23.50	30.00	Complies
157	5785 MHz	23.46	30.00	Complies
165	5825 MHz	23.31	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	28.43	30.00	Complies
157	5785 MHz	28.22	30.00	Complies
165	5825 MHz	28.08	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	23.55	30.00	Complies
159	5795 MHz	23.70	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	23.30	30.00	Complies
159	5795 MHz	23.40	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz Connector J4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.95	30.00	Complies
159	5795 MHz	22.92	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	28.04	30.00	Complies
159	5795 MHz	28.12	30.00	Complies



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

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

4.3. Power Spectral Density Measurement

4.3.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2. Measuring Instruments and Setting

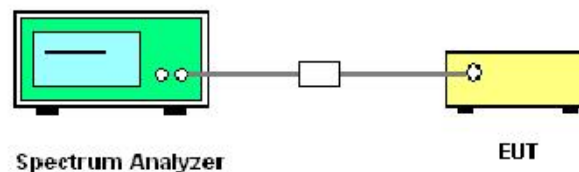
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	30 kHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	10s

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 30kHz and the sweep time to 10s and record the maximum peak value.
5. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

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

<For External Antenna / Ant. 2>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 2

For 2.4GHz Band

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

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-6.25	8.00	Complies
6	2437 MHz	-1.13	8.00	Complies
11	2462 MHz	-4.50	8.00	Complies

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

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
3	2422 MHz	-11.44	8.00	Complies
6	2437 MHz	-7.14	8.00	Complies
9	2452 MHz	-11.78	8.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11b/g / Ant. 2

Configuration IEEE 802.11b Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	2.11	8.00	Complies
6	2437 MHz	-8.86	8.00	Complies
11	2462 MHz	1.30	8.00	Complies

Configuration IEEE 802.11g Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-1.80	8.00	Complies
6	2437 MHz	0.22	8.00	Complies
11	2462 MHz	-3.48	8.00	Complies

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

For plots, only the worse case of DSSS and OFDM modulation were listed in the report.

<For External Antenna / Ant. 5>

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

For 2.4GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-6.14	8.00	Complies
6	2437 MHz	-0.17	8.00	Complies
11	2462 MHz	-4.69	8.00	Complies

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

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
3	2422 MHz	-12.09	8.00	Complies
6	2437 MHz	-8.38	8.00	Complies
9	2452 MHz	-10.87	8.00	Complies

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	-1.51	8.00	Complies
157	5785 MHz	-2.49	8.00	Complies
165	5825 MHz	-3.64	8.00	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
151	5755 MHz	-4.91	8.00	Complies
159	5795 MHz	-4.95	8.00	Complies

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

Configuration IEEE 802.11b Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-4.66	8.00	Complies
6	2437 MHz	-11.95	8.00	Complies
11	2462 MHz	-12.53	8.00	Complies

Configuration IEEE 802.11g Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-3.55	8.00	Complies
6	2437 MHz	-1.48	8.00	Complies
11	2462 MHz	-2.86	8.00	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	1.18	8.00	Complies
157	5785 MHz	-0.38	8.00	Complies
165	5825 MHz	1.49	8.00	Complies

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

For plots, only the worse case of DSSS and OFDM modulation were listed in the report.

<For External Antenna / Ant. 6>

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

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	-0.94	8.00	Complies
157	5785 MHz	-0.67	8.00	Complies
165	5825 MHz	-0.70	8.00	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
151	5755 MHz	-3.22	8.00	Complies
159	5795 MHz	-4.35	8.00	Complies

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

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	3.47	8.00	Complies
157	5785 MHz	0.45	8.00	Complies
165	5825 MHz	1.33	8.00	Complies

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

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

<For External Antenna / Ant. 7>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 7

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	-0.94	8.00	Complies
157	5785 MHz	-0.67	8.00	Complies
165	5825 MHz	-0.70	8.00	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
151	5755 MHz	-3.22	8.00	Complies
159	5795 MHz	-4.35	8.00	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 7

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	3.47	8.00	Complies
157	5785 MHz	0.45	8.00	Complies
165	5825 MHz	1.33	8.00	Complies

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

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

<For Internal Antenna / Ant. 8>

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

For 2.4GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-3.84	8.00	Complies
6	2437 MHz	3.53	8.00	Complies
11	2462 MHz	-2.65	8.00	Complies

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

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
3	2422 MHz	-8.07	8.00	Complies
6	2437 MHz	-4.61	8.00	Complies
9	2452 MHz	-8.99	8.00	Complies

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	0.20	8.00	Complies
157	5785 MHz	-0.75	8.00	Complies
165	5825 MHz	-0.67	8.00	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
151	5755 MHz	-3.08	8.00	Complies
159	5795 MHz	-4.17	8.00	Complies

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

Configuration IEEE 802.11b Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-1.76	8.00	Complies
6	2437 MHz	-1.59	8.00	Complies
11	2462 MHz	-3.71	8.00	Complies

Configuration IEEE 802.11g Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-1.67	8.00	Complies
6	2437 MHz	4.12	8.00	Complies
11	2462 MHz	-1.62	8.00	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	3.18	8.00	Complies
157	5785 MHz	1.93	8.00	Complies
165	5825 MHz	1.92	8.00	Complies

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

For plots, only the worse case of DSSS and OFDM modulation were listed in the report.

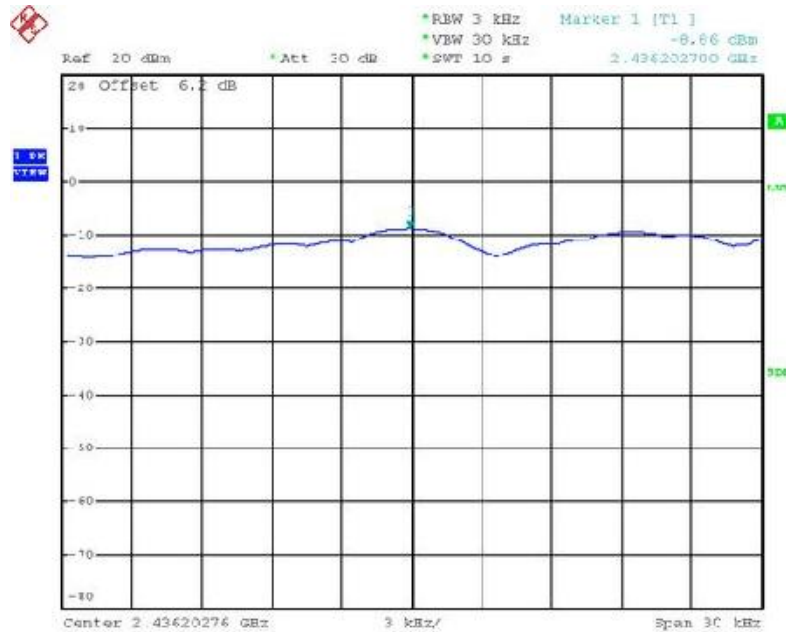
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Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2412 MHz



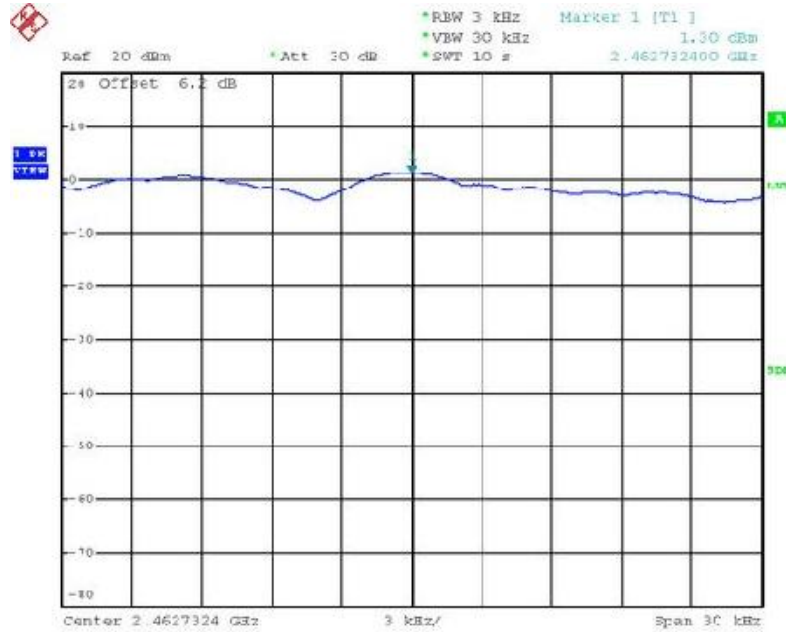
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Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2437 MHz



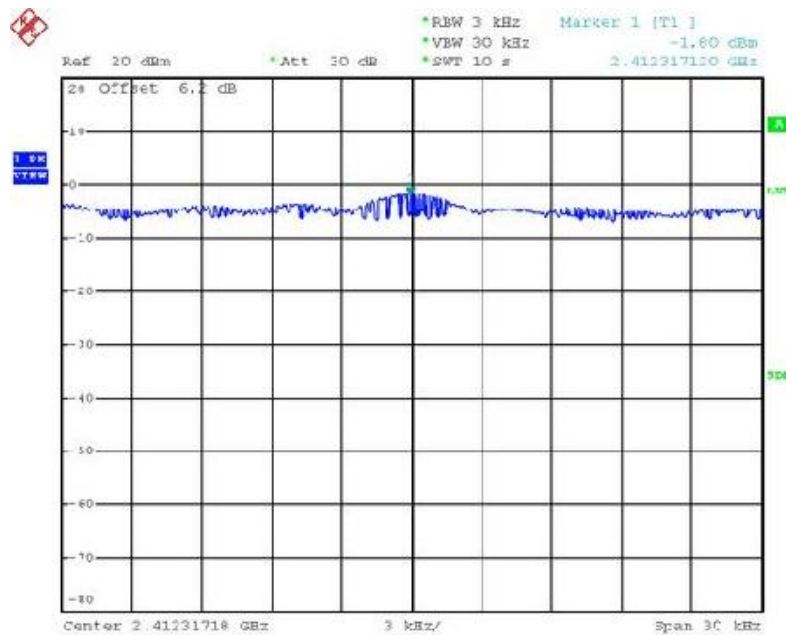
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Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2462 MHz



Date: 8.MAR.2011 16:34:42

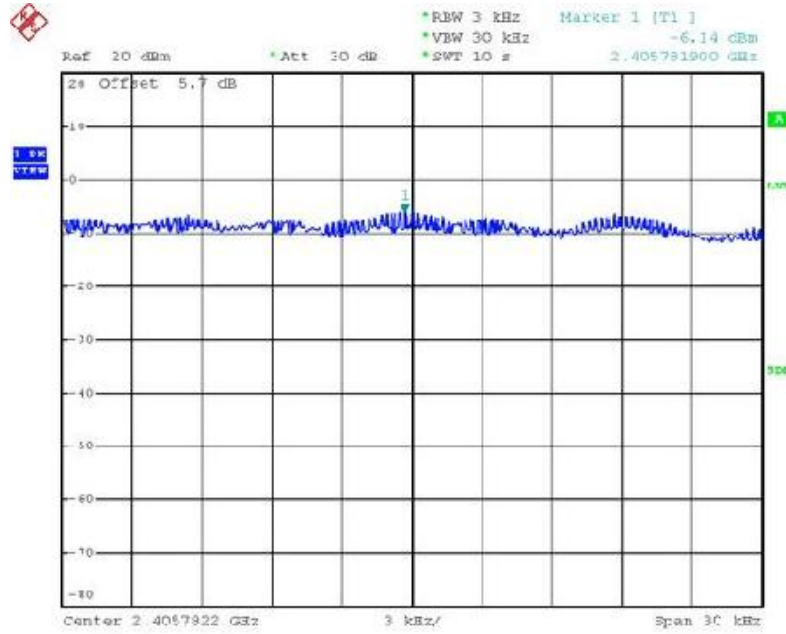
Power Density Plot on Configuration IEEE 802.11g Connector J2 + J3 + J4 / 2412 MHz



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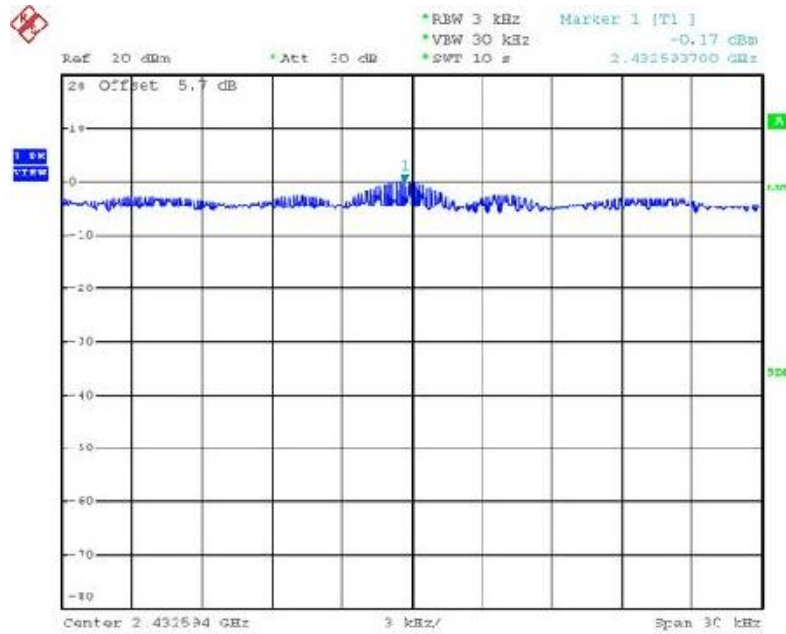
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Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2412 MHz



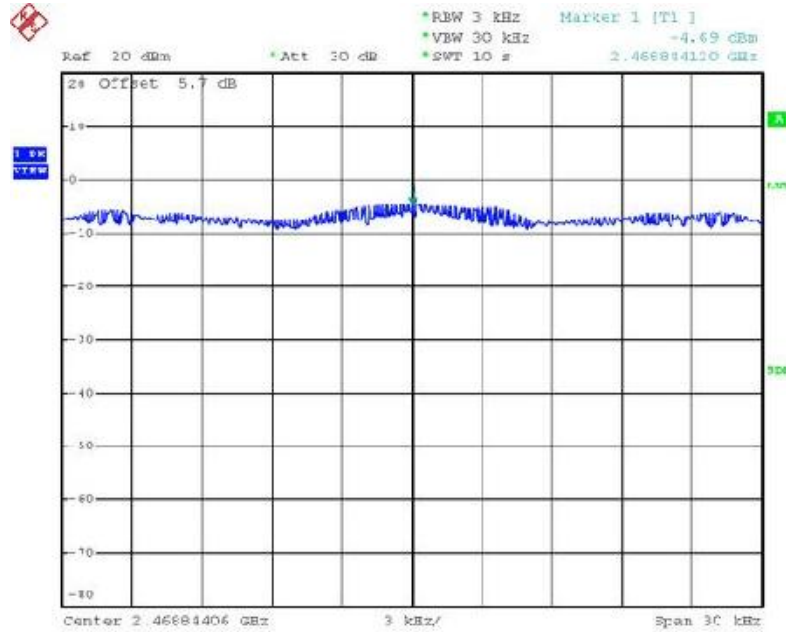
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Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2437 MHz



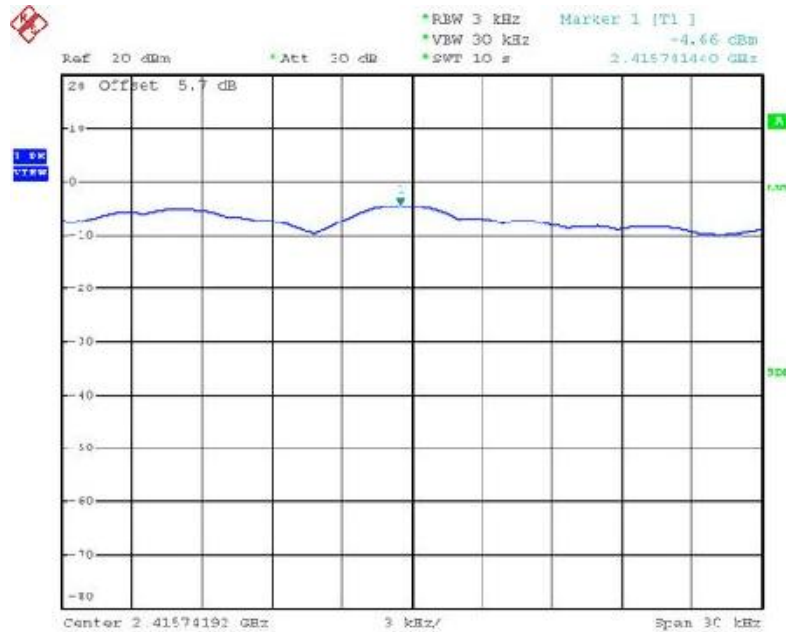
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Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2462 MHz



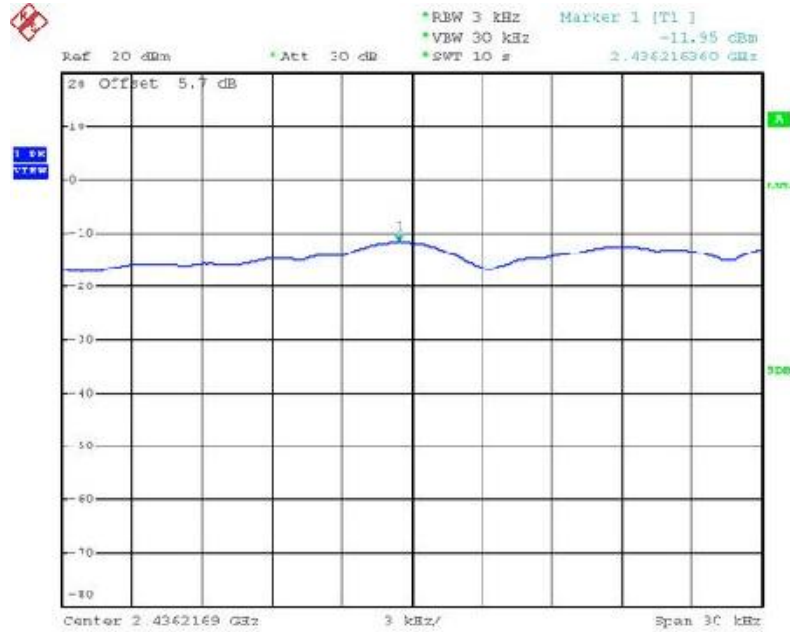
Date: 29.MAR.2011 06:25:06

Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2412 MHz



Date: 29.MAR.2011 06:11:46

Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2437 MHz



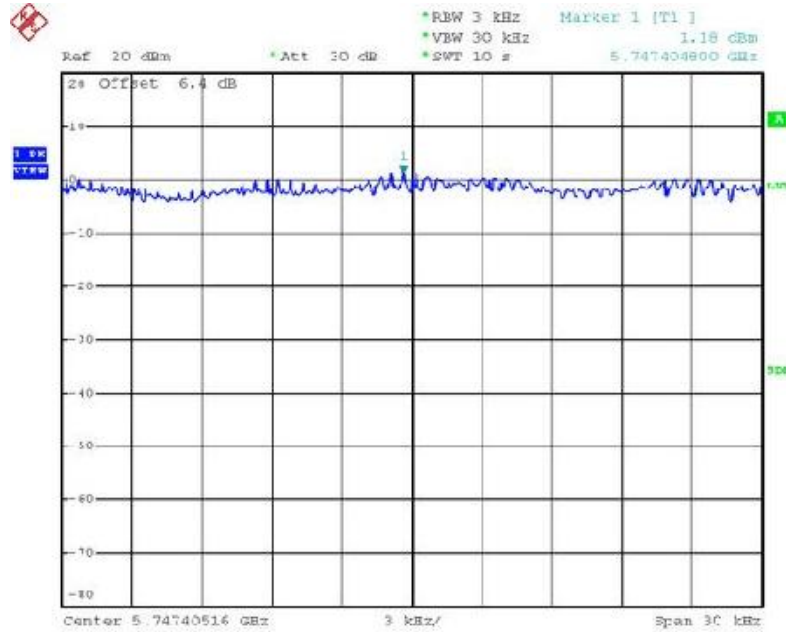
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Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2462 MHz



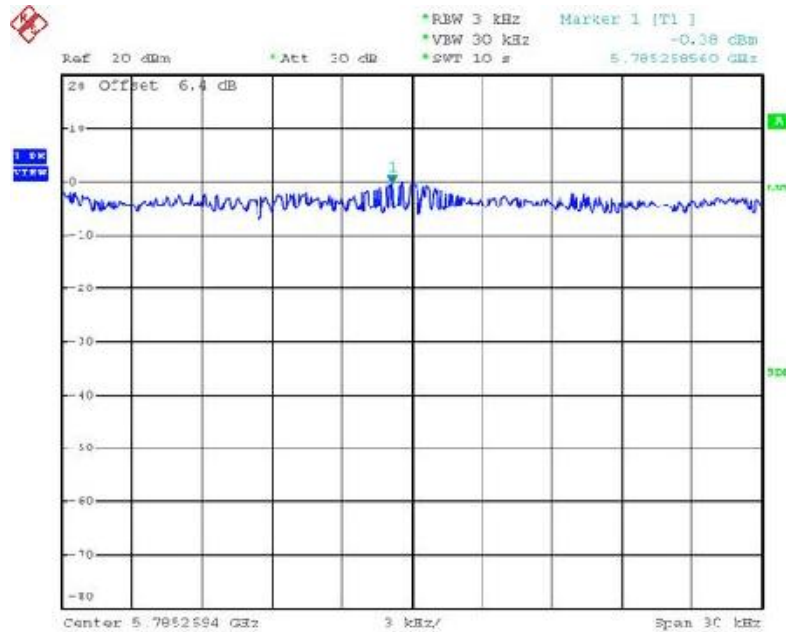
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Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



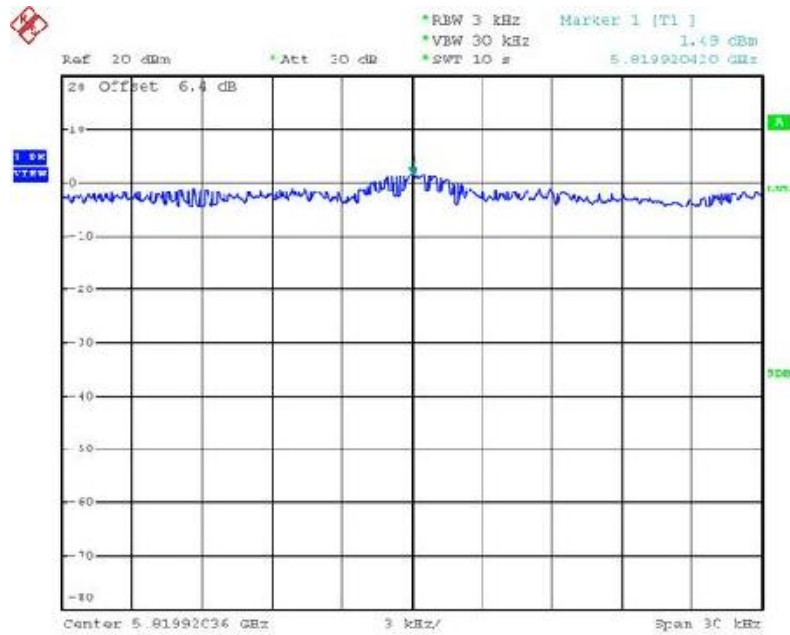
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Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 11:34:26

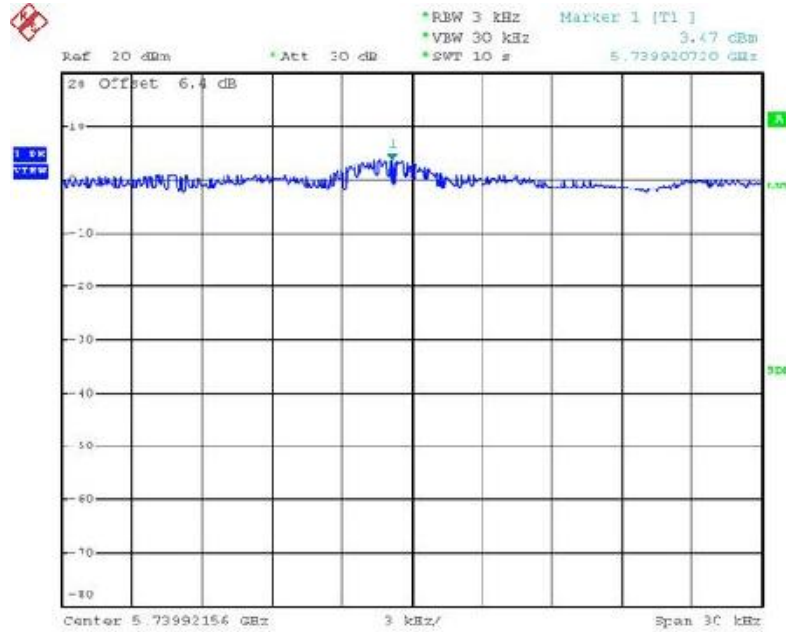
Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 11:37:47

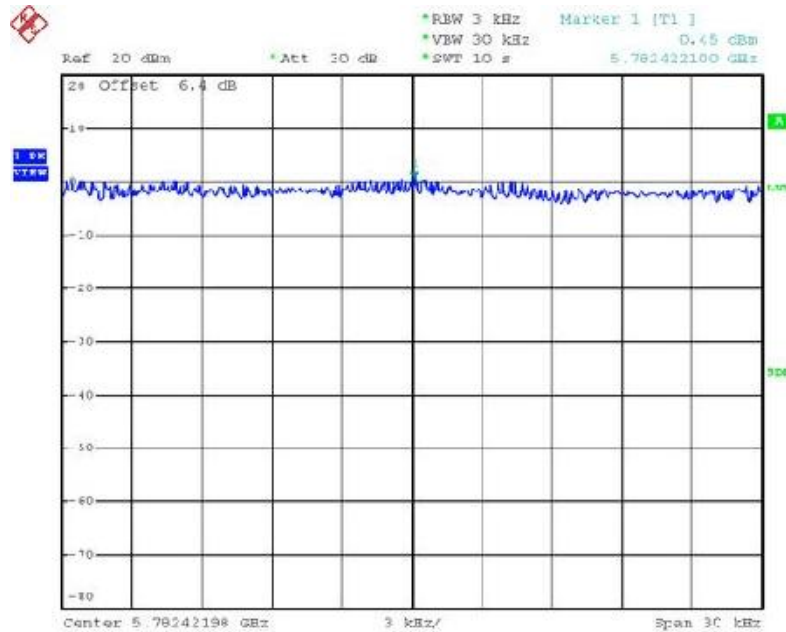
<For External Antenna / Ant. 6>

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



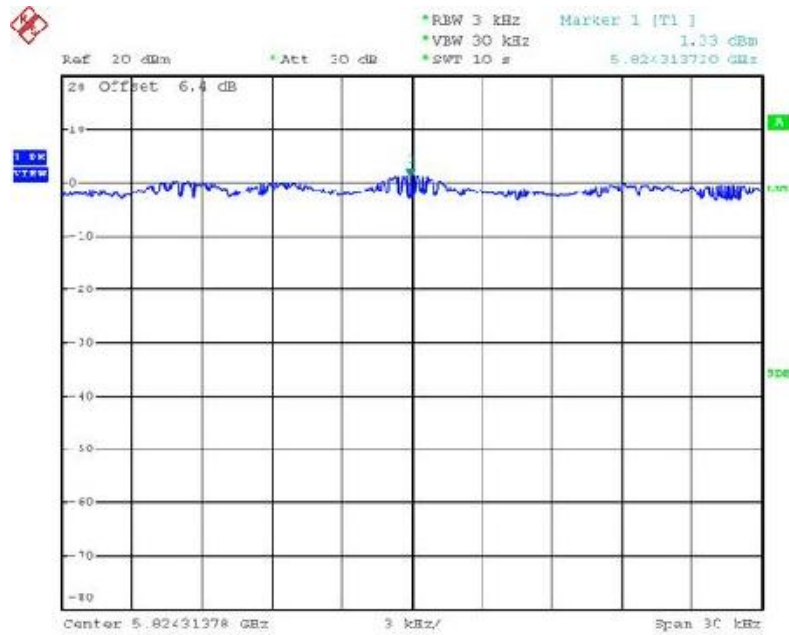
Date: 9.MAR.2011 12:34:35

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 12:37:30

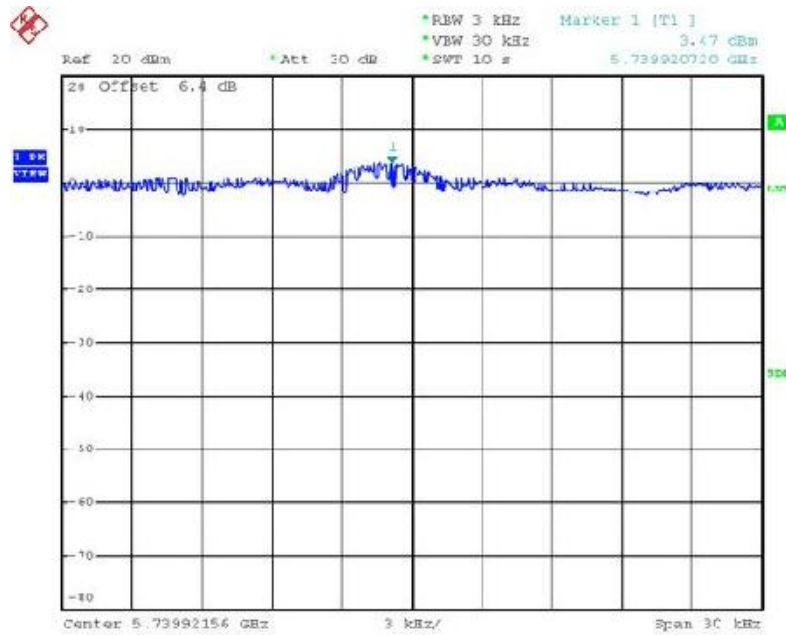
Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 12:39:30

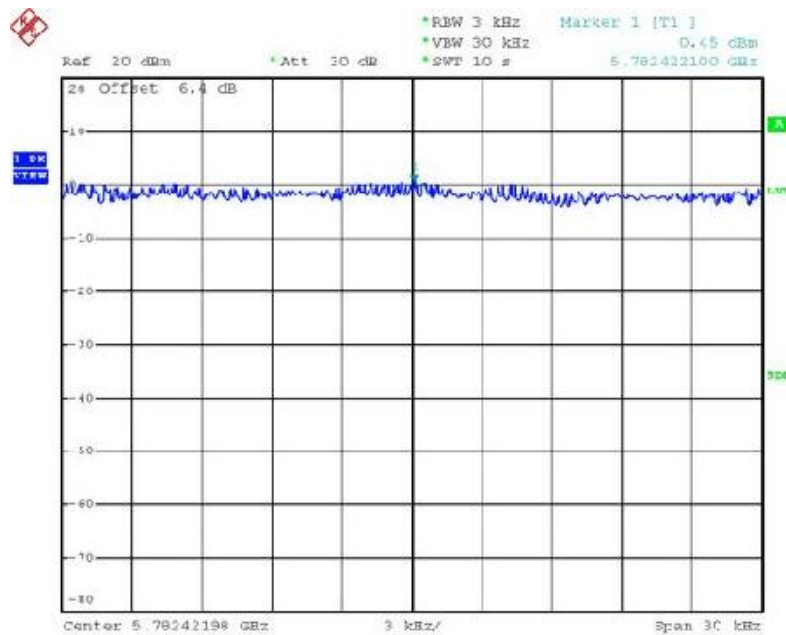
<For External Antenna / Ant. 7>

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



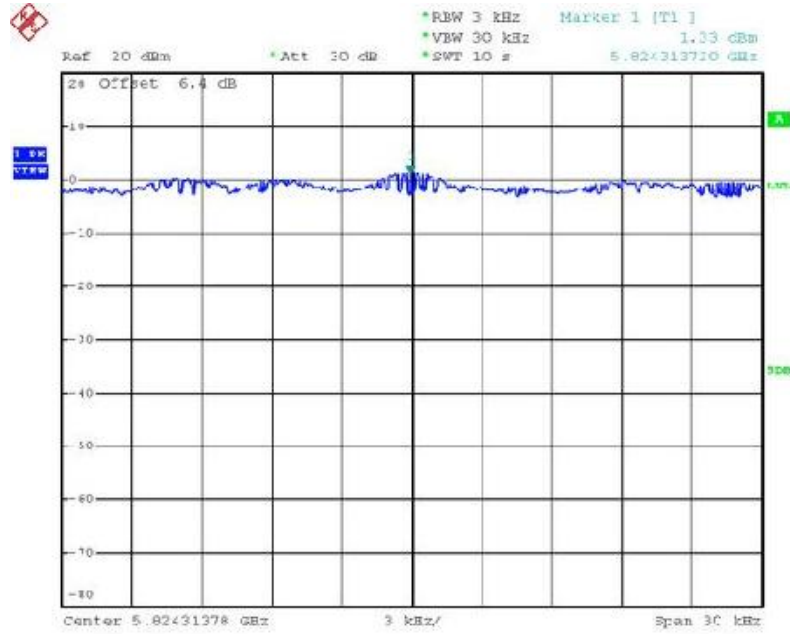
Date: 9.MAR.2011 12:34:35

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 12:37:30

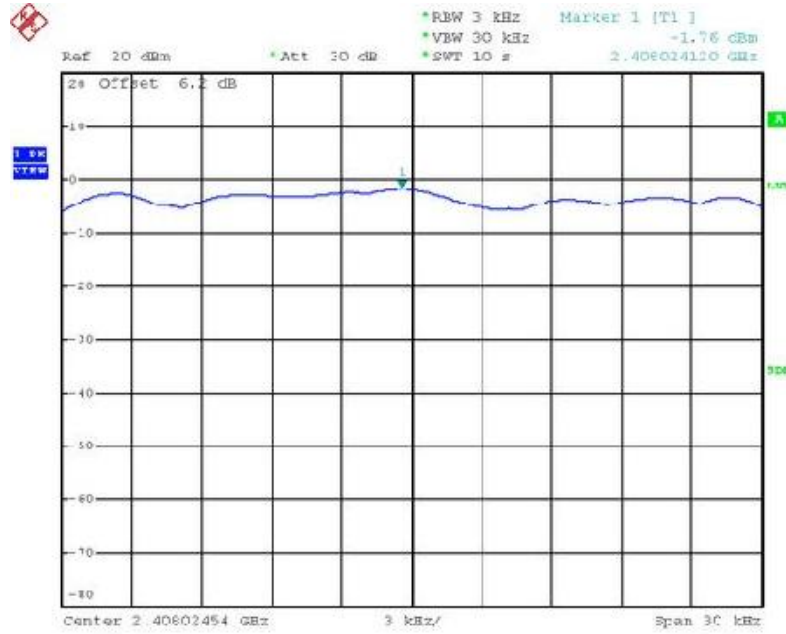
Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 12:39:30

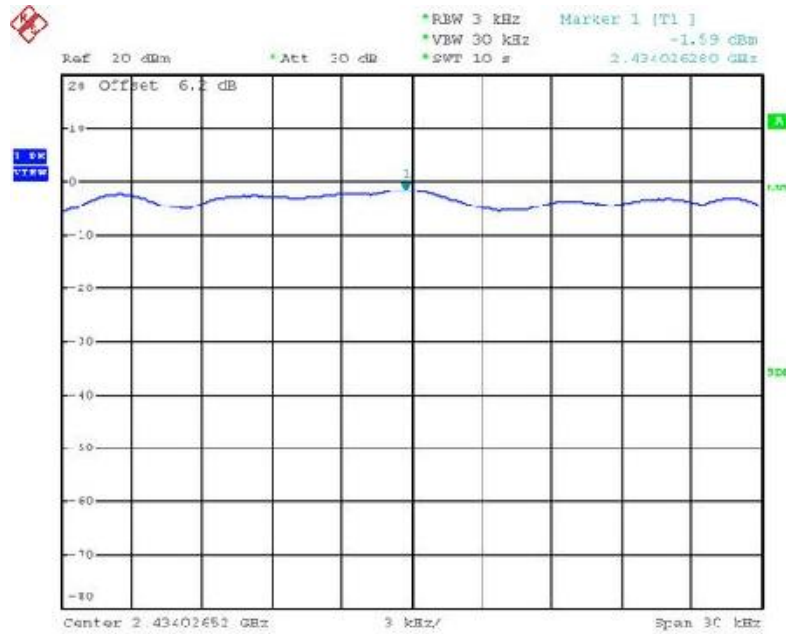
<For Internal Antenna / Ant. 8>

Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2412 MHz



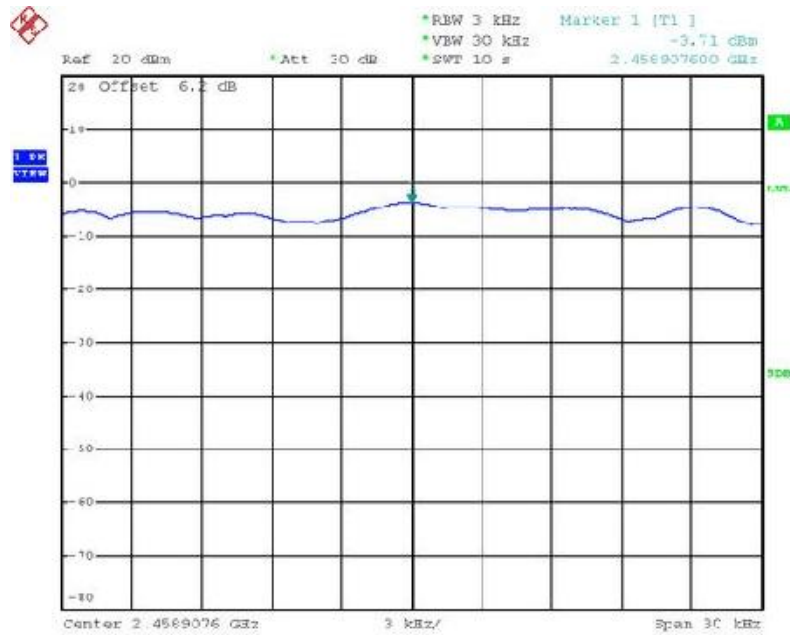
Date: 8.MAR.2011 15:27:51

Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2437 MHz



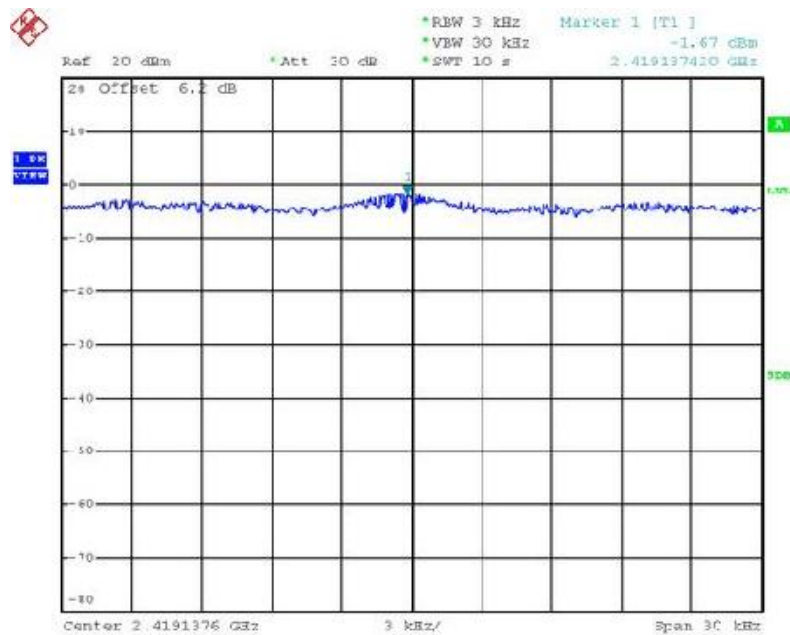
Date: 8.MAR.2011 15:22:29

Power Density Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2462 MHz



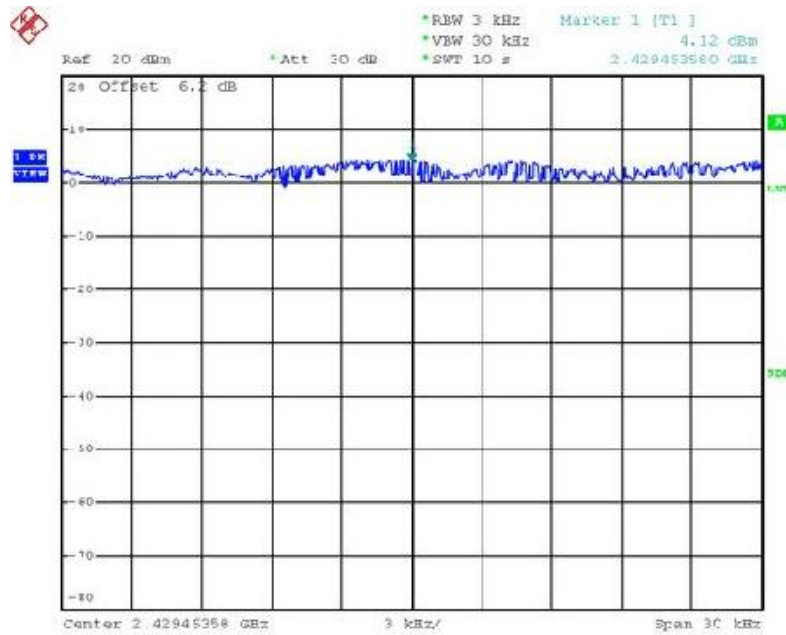
Date: 8.MAR.2011 15:25:37

Power Density Plot on Configuration IEEE 802.11g Connector J2 + J3 + J4 / 2412 MHz



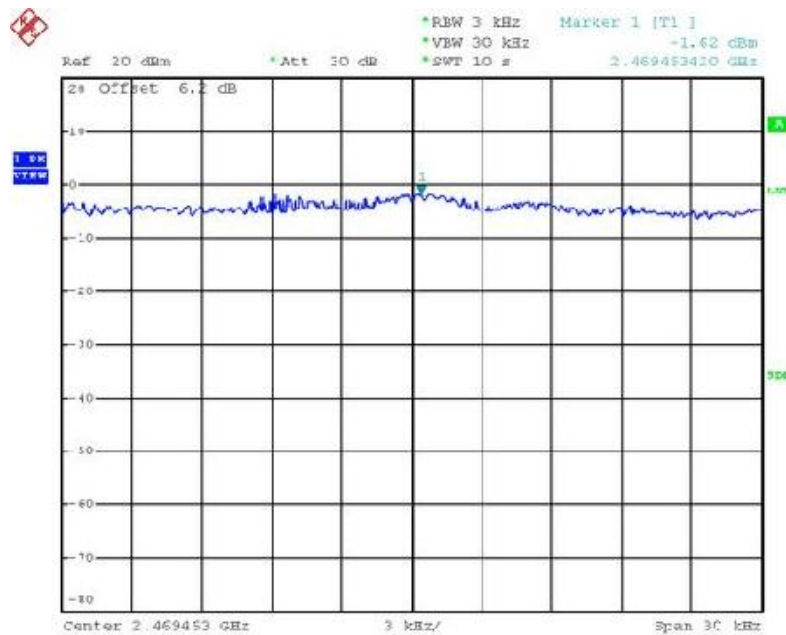
Date: 8.MAR.2011 15:29:55

Power Density Plot on Configuration IEEE 802.11g Connector J2 + J3 + J4 / 2437 MHz



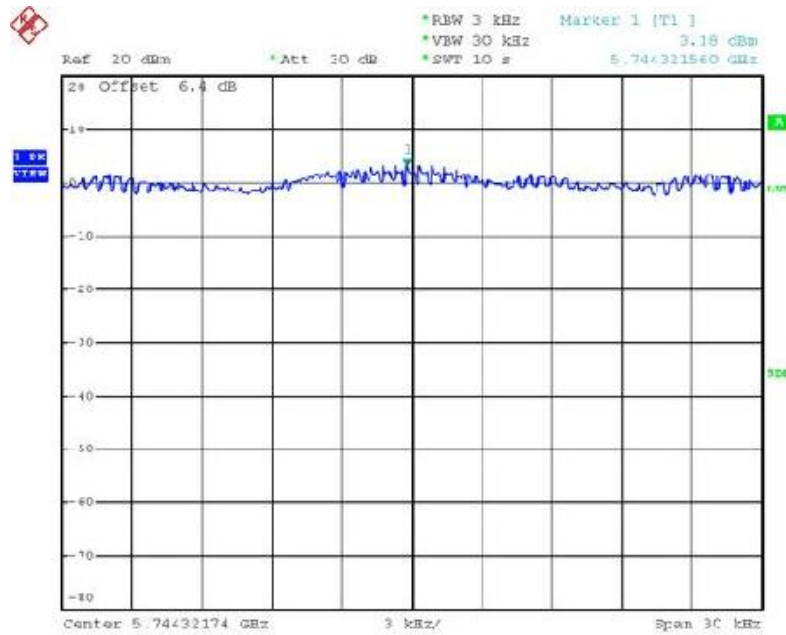
Date: 8.MAR.2011 15:31:54

Power Density Plot on Configuration IEEE 802.11g Connector J2 + J3 + J4 / 2462 MHz



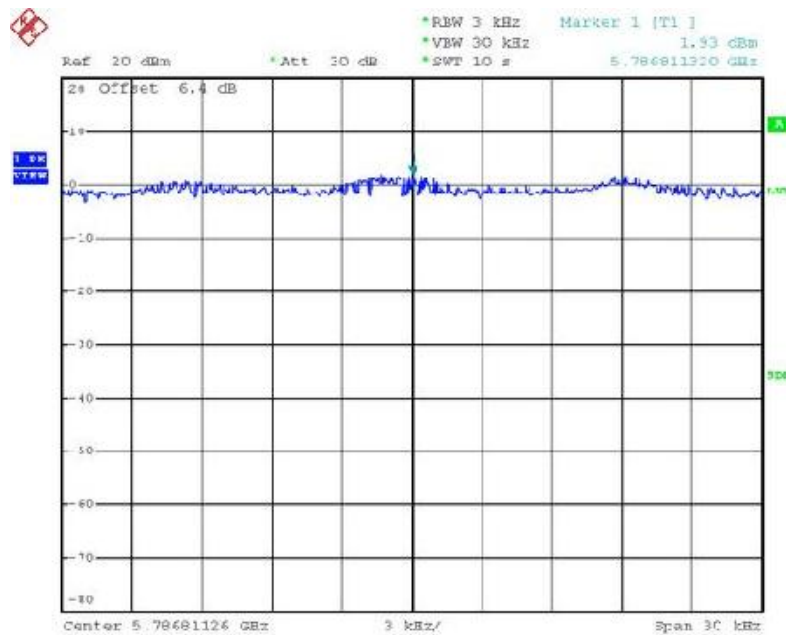
Date: 8.MAR.2011 15:34:21

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



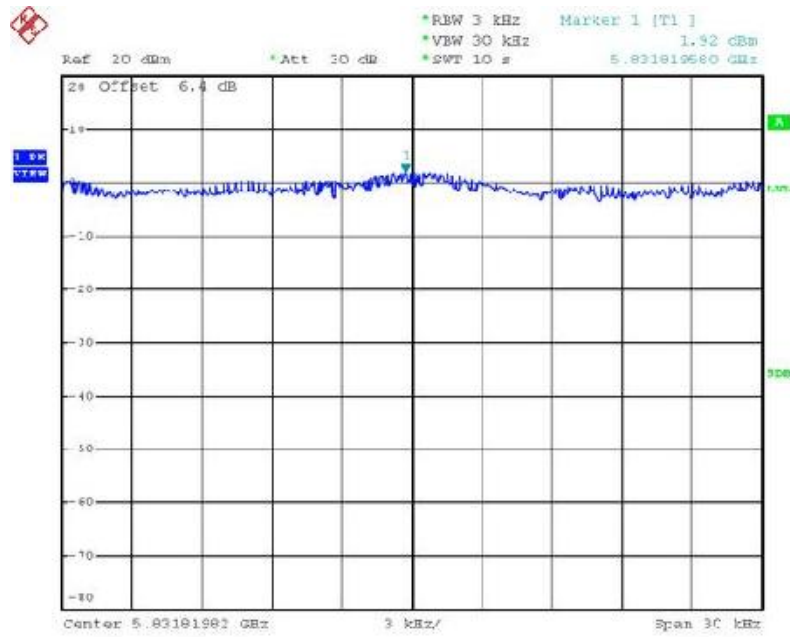
Date: 9.MAR.2011 03:16:32

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 03:11:42

Power Density Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 08:13:47

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

4.4.2. Measuring Instruments and Setting

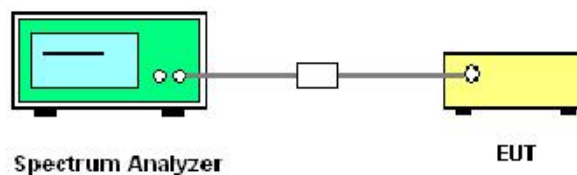
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.
4. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

<For External Antenna / Ant. 2>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 2

For 2.4GHz Band

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	15.64	17.68	500	Complies
6	2437 MHz	12.92	17.56	500	Complies
11	2462 MHz	17.04	17.60	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.40	36.48	500	Complies
6	2437 MHz	33.92	35.60	500	Complies
9	2452 MHz	36.48	36.48	500	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11b/g / Ant. 2

Configuration IEEE 802.11b Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	7.08	9.84	500	Complies
6	2437 MHz	8.08	15.92	500	Complies
11	2462 MHz	7.04	9.84	500	Complies

Configuration IEEE 802.11g Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	13.20	16.52	500	Complies
6	2437 MHz	16.40	16.56	500	Complies
11	2462 MHz	16.36	16.60	500	Complies

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

For plots, only the worse case of DSSS and OFDM modulation were listed in the report.

<For External Antenna / Ant. 5>

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

For 2.4GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.00	17.56	500	Complies
6	2437 MHz	15.72	17.68	500	Complies
11	2462 MHz	12.32	17.40	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	33.84	35.68	500	Complies
6	2437 MHz	36.40	36.40	500	Complies
9	2452 MHz	35.84	36.32	500	Complies

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.32	17.72	500	Complies
157	5785 MHz	17.36	17.72	500	Complies
165	5825 MHz	17.32	17.72	500	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.32	36.40	500	Complies
159	5795 MHz	32.72	35.76	500	Complies

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

Configuration IEEE 802.11b Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.04	14.08	500	Complies
6	2437 MHz	14.04	16.08	500	Complies
11	2462 MHz	13.56	16.08	500	Complies

Configuration IEEE 802.11g Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.36	16.56	500	Complies
6	2437 MHz	16.36	16.60	500	Complies
11	2462 MHz	16.36	16.56	500	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.72	16.60	500	Complies
157	5785 MHz	13.20	16.56	500	Complies
165	5825 MHz	13.24	15.80	500	Complies

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

For plots, only the worse case of DSSS and OFDM modulation were listed in the report.

<For External Antenna / Ant. 6>

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

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	13.84	17.60	500	Complies
157	5785 MHz	17.32	17.76	500	Complies
165	5825 MHz	13.60	17.56	500	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.40	36.40	500	Complies
159	5795 MHz	36.32	36.40	500	Complies



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

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	12.96	15.68	500	Complies
157	5785 MHz	15.72	16.60	500	Complies
165	5825 MHz	13.20	16.72	500	Complies

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

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

<For External Antenna / Ant. 7>

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11n / Ant. 7

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	13.84	17.60	500	Complies
157	5785 MHz	17.32	17.76	500	Complies
165	5825 MHz	13.60	17.56	500	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.40	36.40	500	Complies
159	5795 MHz	36.32	36.40	500	Complies

Temperature	22°C	Humidity	65%
Test Engineer	Allen Liu	Configurations	IEEE 802.11a / Ant. 7

Configuration IEEE 802.11a Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	12.96	15.68	500	Complies
157	5785 MHz	15.72	16.60	500	Complies
165	5825 MHz	13.20	16.72	500	Complies

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

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

<For Internal Antenna / Ant. 8>

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

For 2.4GHz Band
Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.04	17.60	500	Complies
6	2437 MHz	14.40	17.68	500	Complies
11	2462 MHz	16.96	17.60	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.84	36.32	500	Complies
6	2437 MHz	36.48	36.40	500	Complies
9	2452 MHz	36.48	36.40	500	Complies

For 5GHz Band
Configuration 11a IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.04	17.76	500	Complies
157	5785 MHz	17.32	17.76	500	Complies
165	5825 MHz	16.08	17.76	500	Complies

Configuration 11a IEEE 802.11n MCS8 40MHz Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	35.76	36.00	500	Complies
159	5795 MHz	36.08	36.48	500	Complies

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

Configuration IEEE 802.11b Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	11.12	14.08	500	Complies
6	2437 MHz	11.16	14.20	500	Complies
11	2462 MHz	10.08	14.04	500	Complies

Configuration IEEE 802.11g Connector J2 + J3 + J4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.36	16.60	500	Complies
6	2437 MHz	16.08	16.64	500	Complies
11	2462 MHz	16.40	16.56	500	Complies

Configuration IEEE 802.11a Connector J2 + J3 + J4

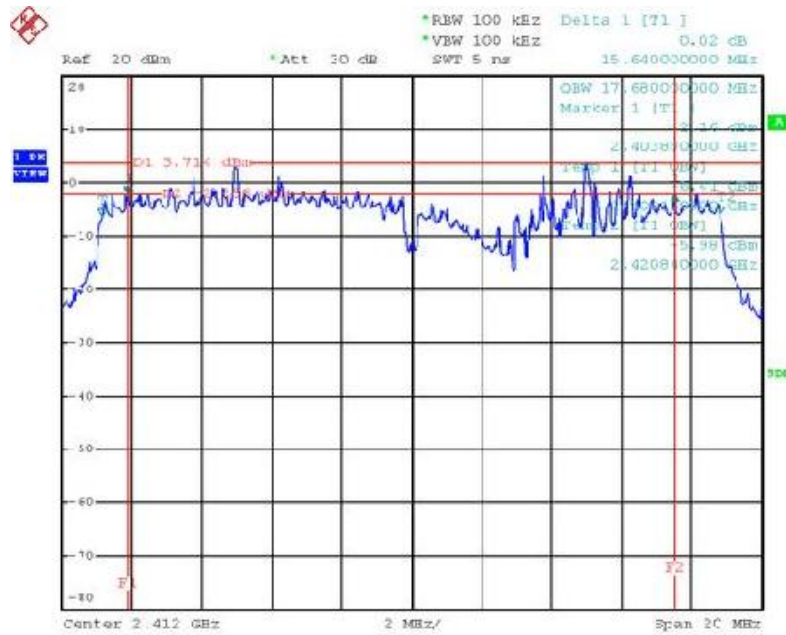
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	13.16	17.32	500	Complies
157	5785 MHz	15.76	16.76	500	Complies
165	5825 MHz	15.72	16.60	500	Complies

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

For plots, only the worse case of DSSS and OFDM modulation were listed in the report.

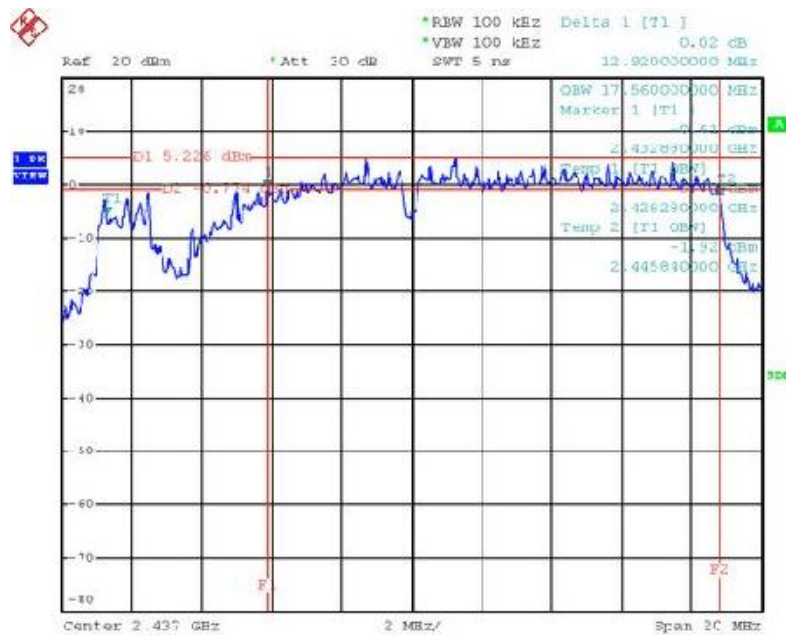
<For External Antenna / Ant. 2>

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2412 MHz



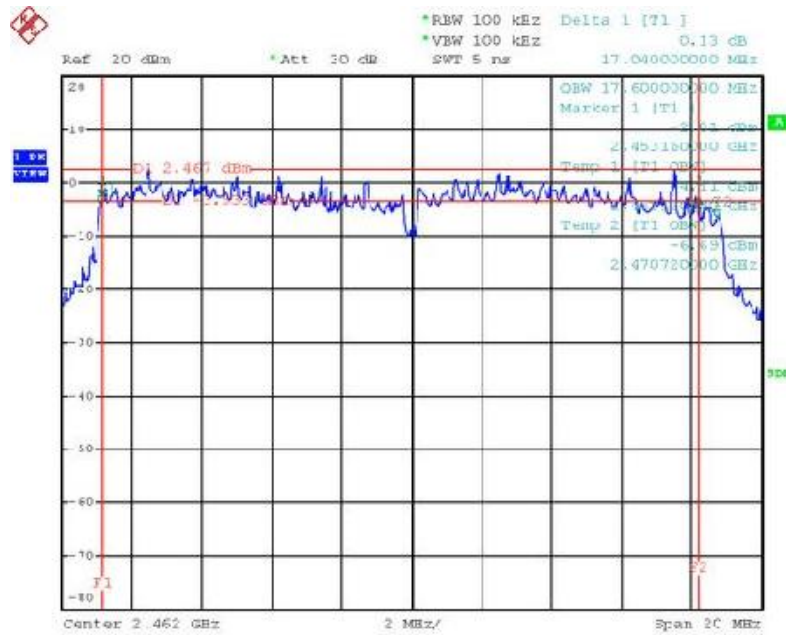
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6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2437 MHz



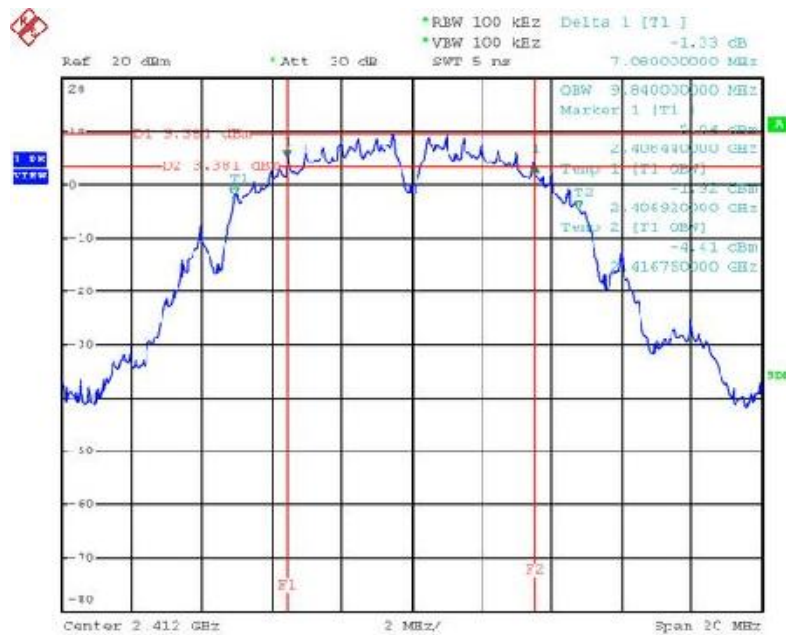
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6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2462 MHz



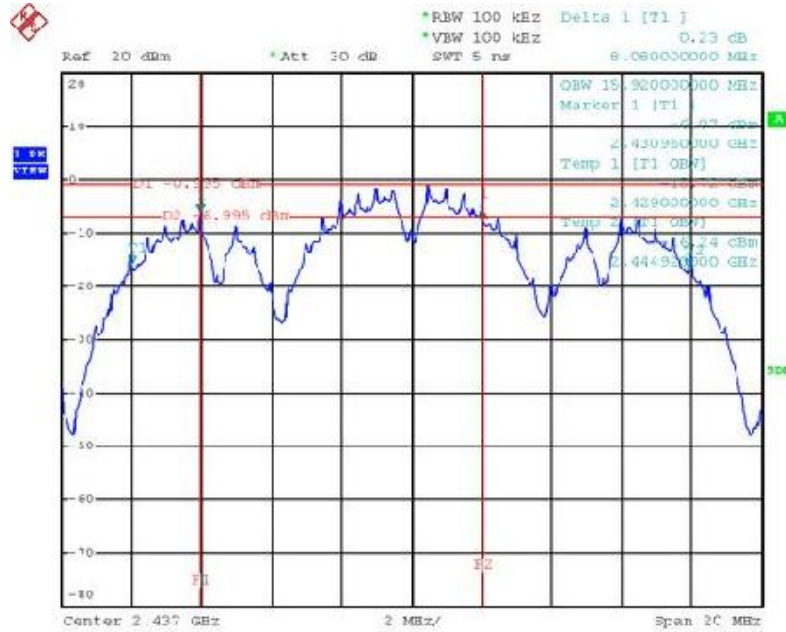
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2412 MHz



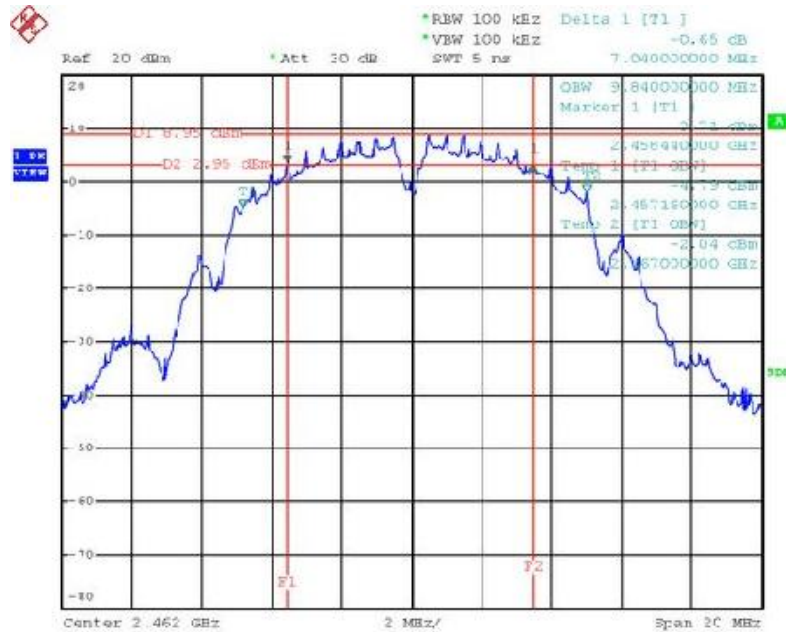
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2437 MHz



Date: 8.MAR.2011 16:31:18

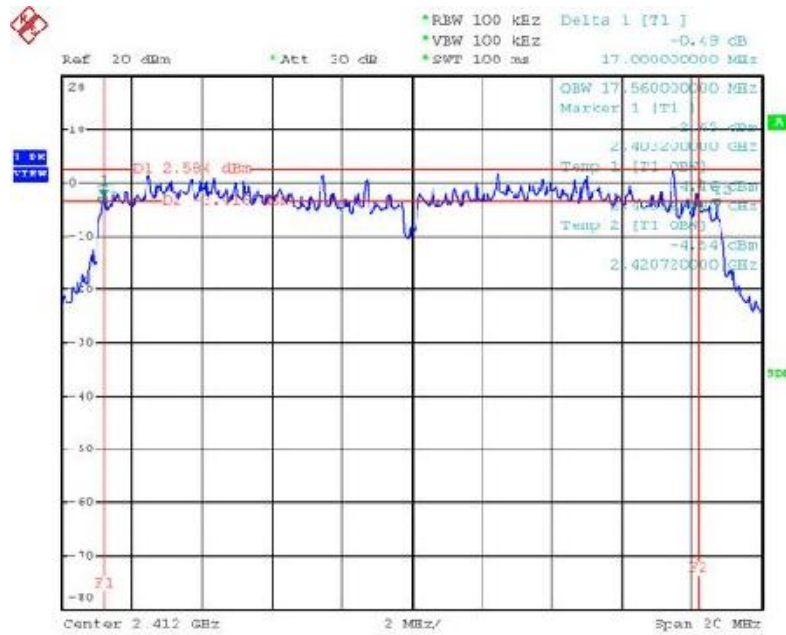
6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2462 MHz



Date: 8.MAR.2011 16:33:15

<For External Antenna / Ant. 5>

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2412 MHz



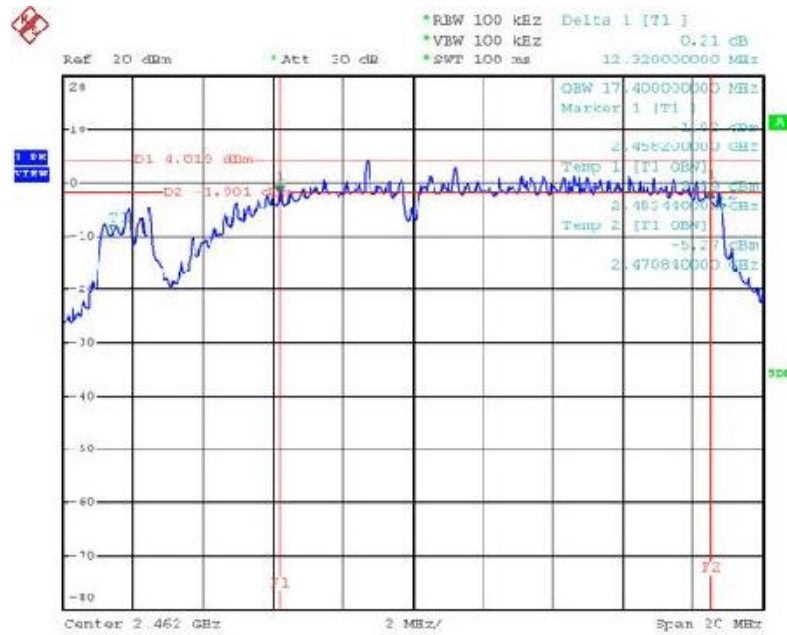
Date: 29.MAR.2011 06:19:18

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2437 MHz



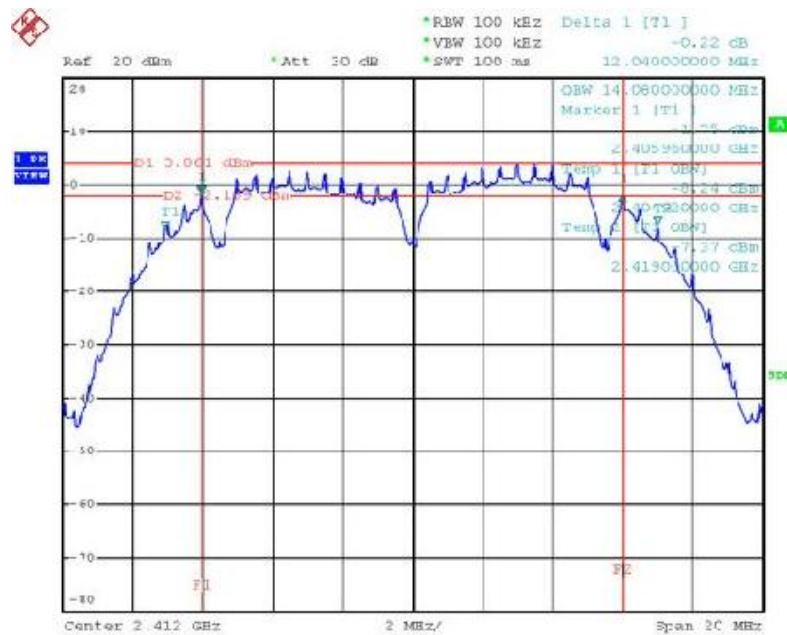
Date: 29.MAR.2011 06:21:32

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2462 MHz



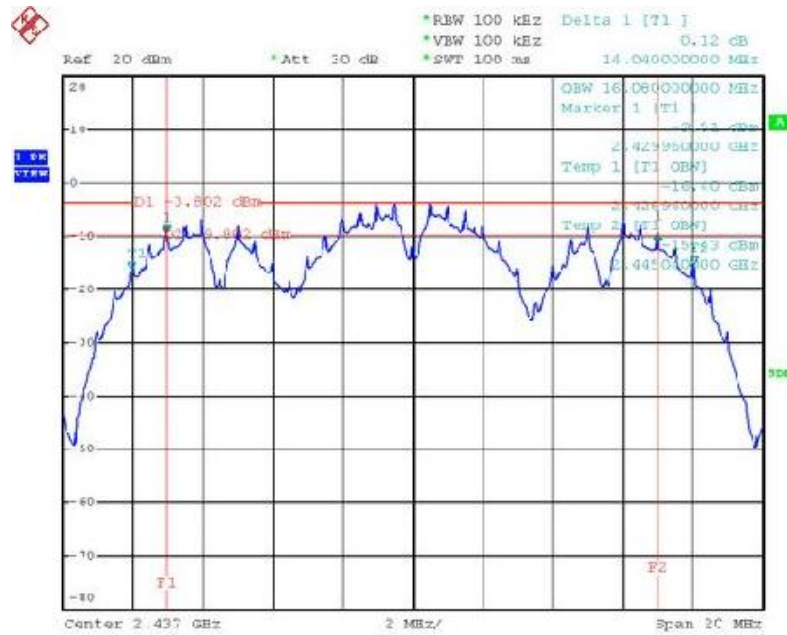
Date: 29.MAR.2011 06:23:36

6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2412 MHz



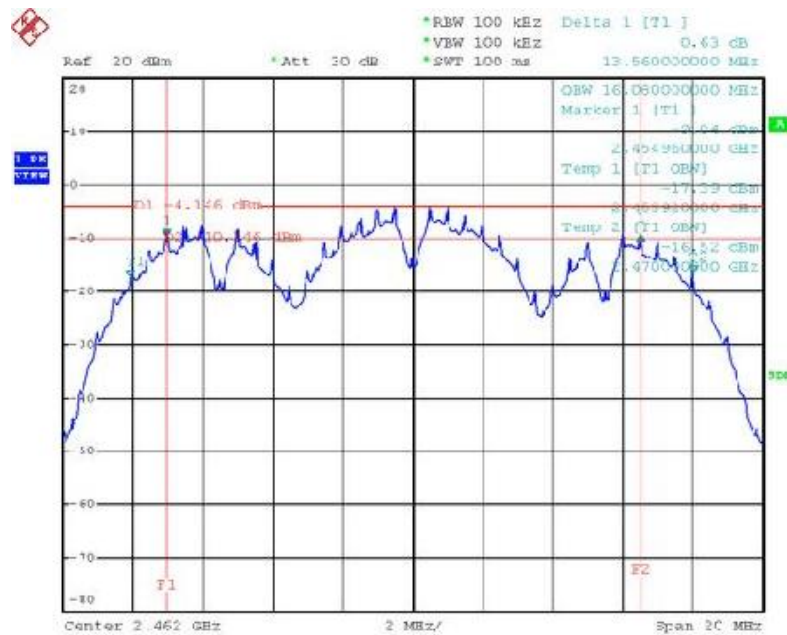
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2437 MHz



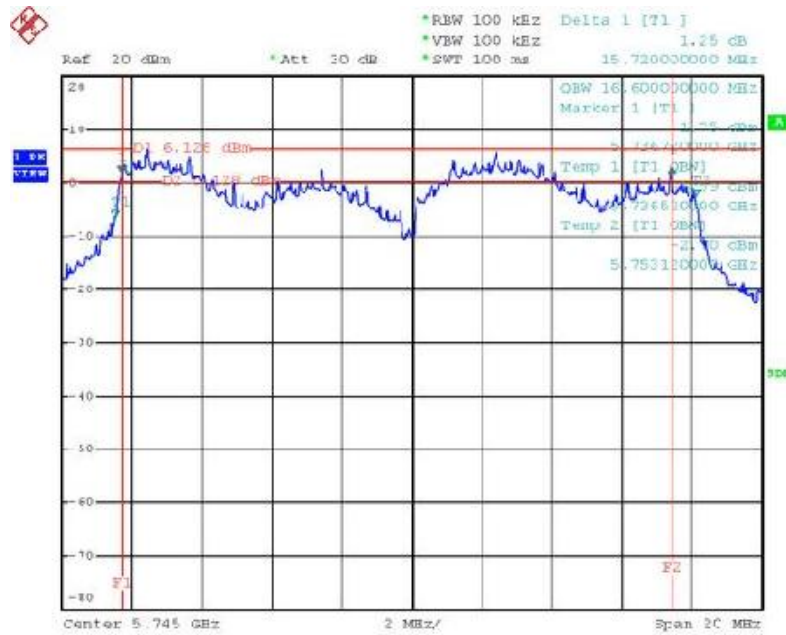
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2462 MHz



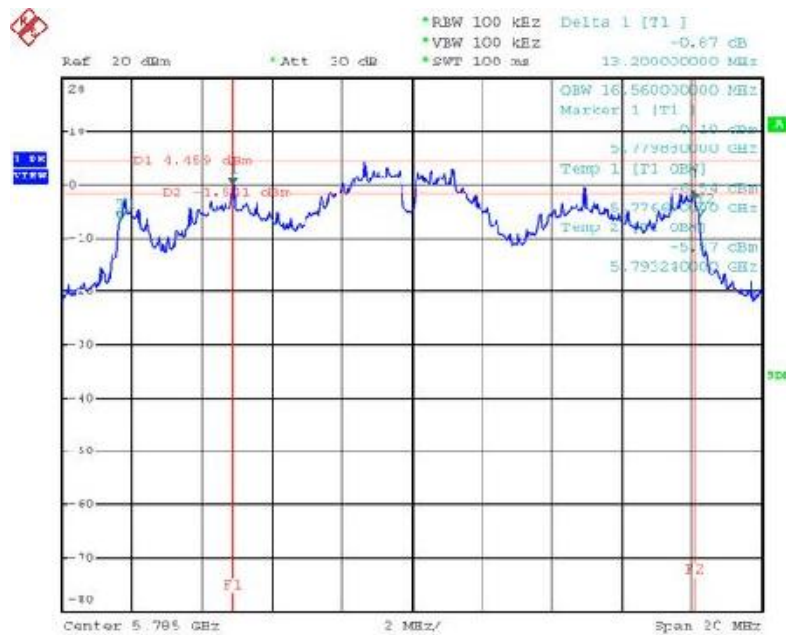
Date: 29.MAR.2011 06:08:07

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



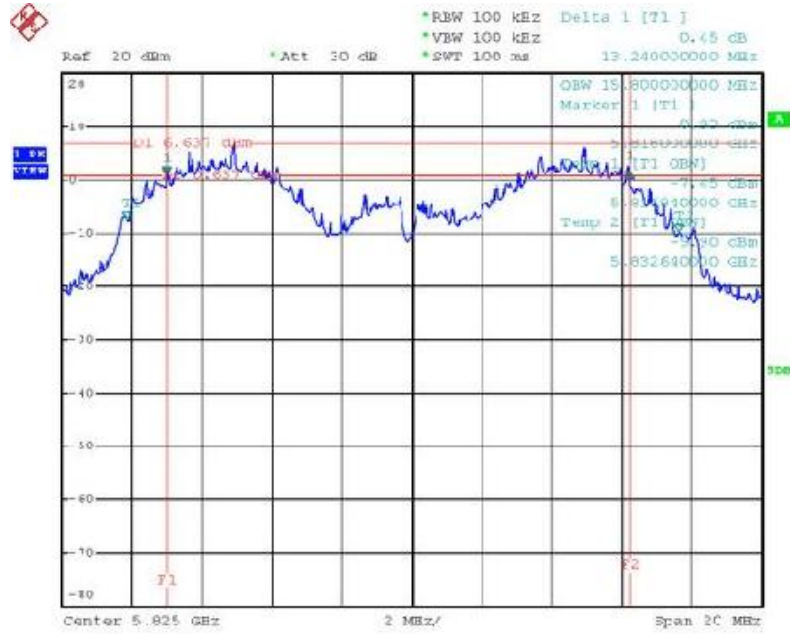
Date: 9.MAR.2011 11:30:38

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 11:32:56

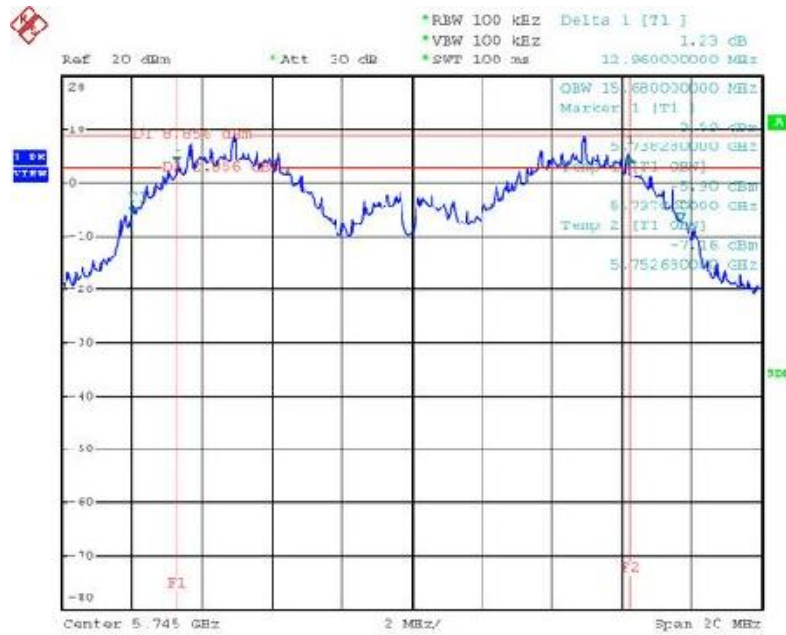
6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 11:36:17

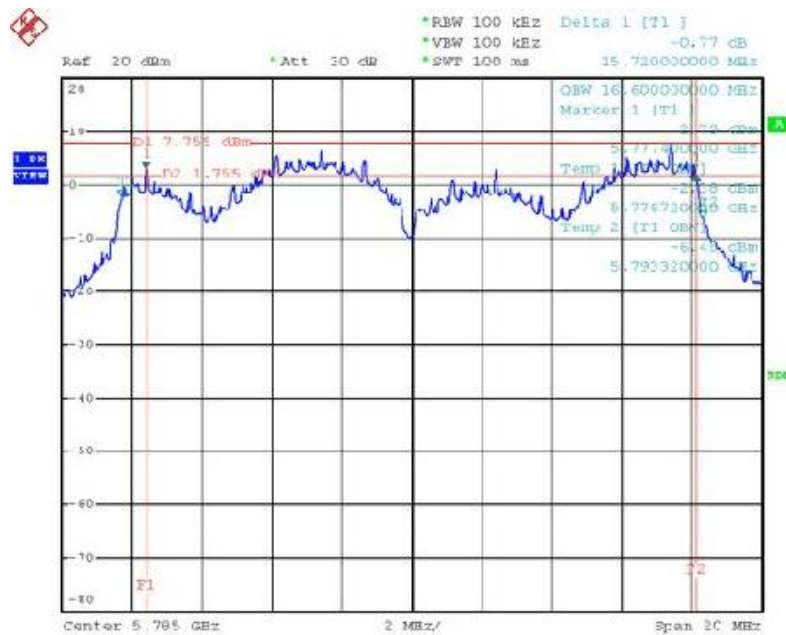
<For External Antenna / Ant. 6>

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



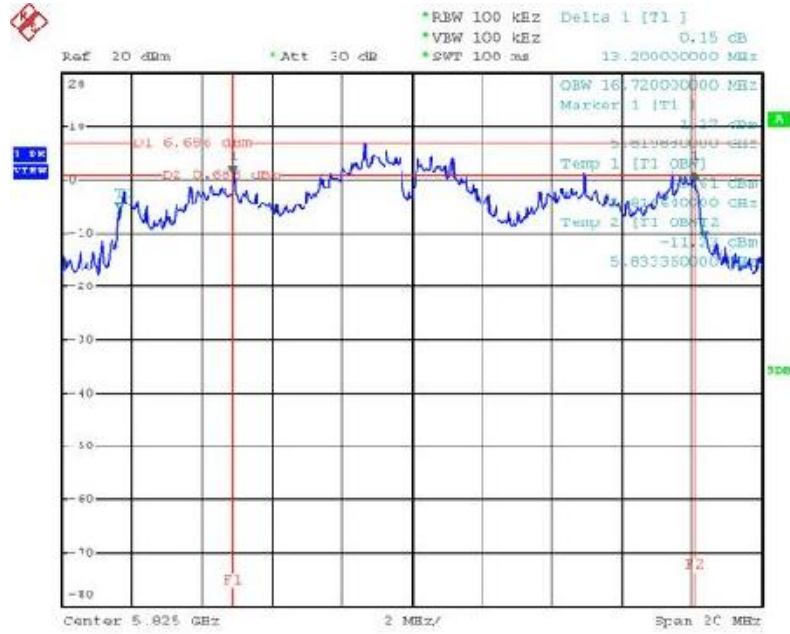
Date: 9.MAR.2011 12:33:05

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 12:36:00

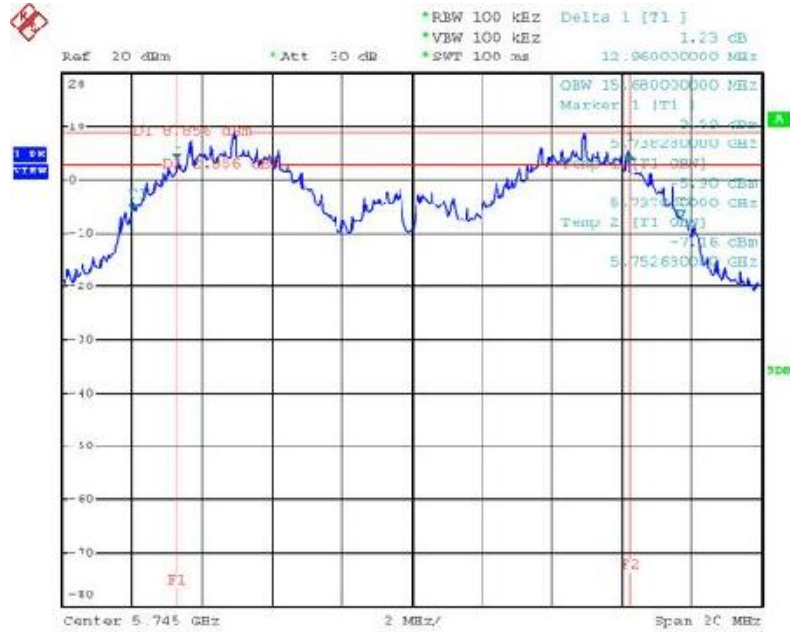
6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 12:38:00

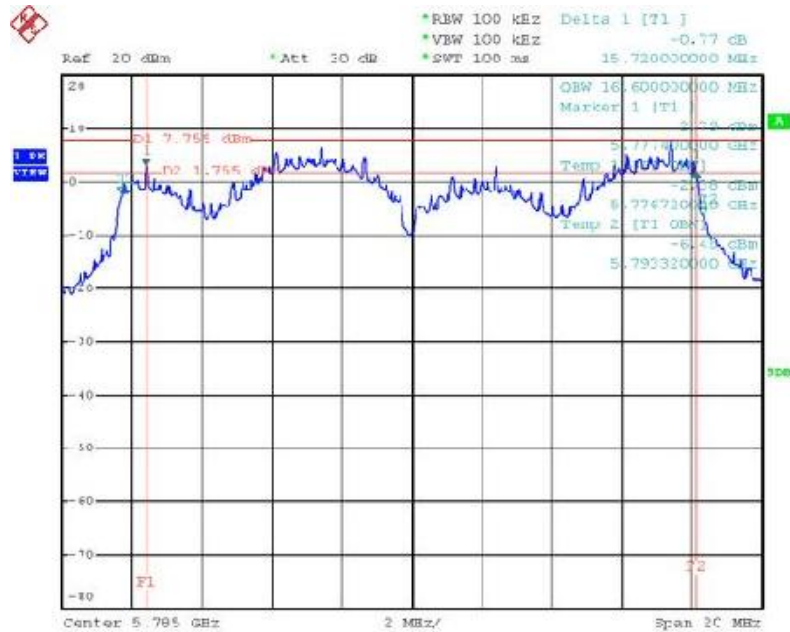
<For External Antenna / Ant. 7>

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



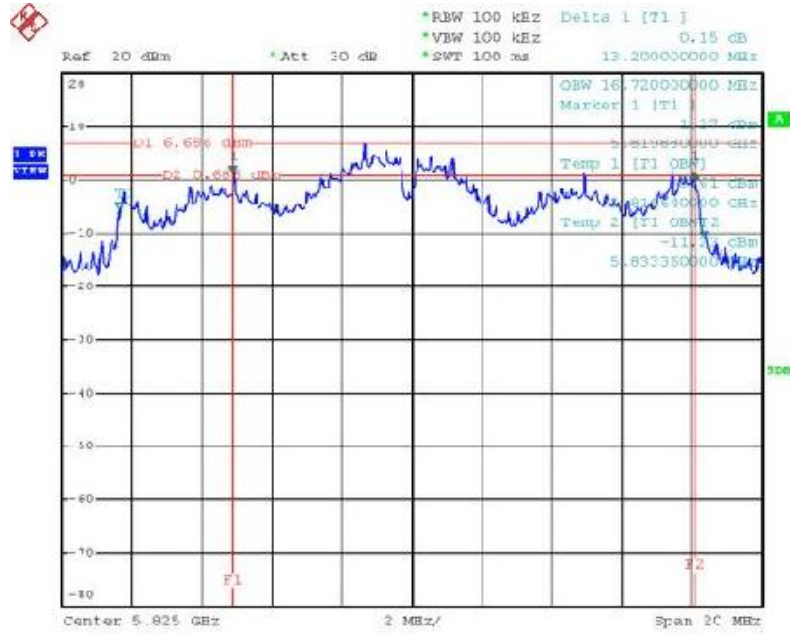
Date: 9.MAR.2011 12:33:05

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 12:36:00

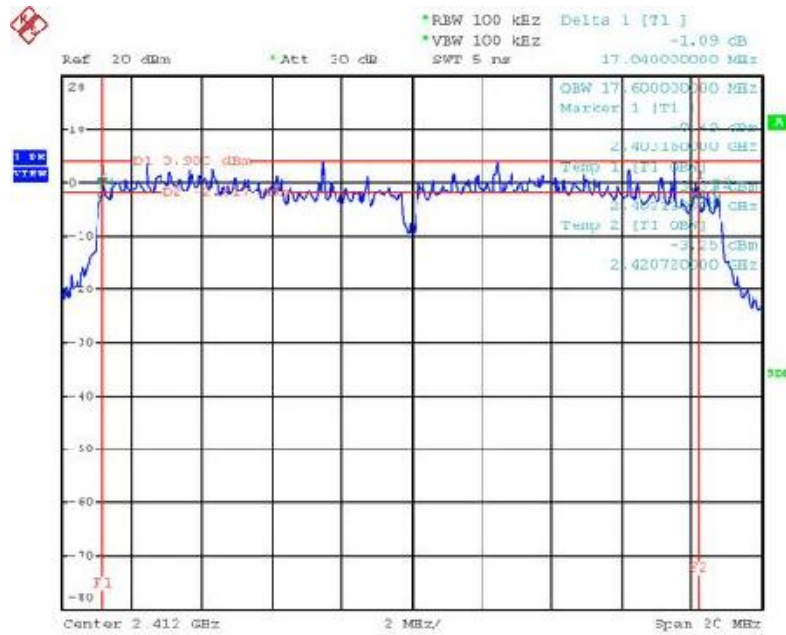
6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 12:38:00

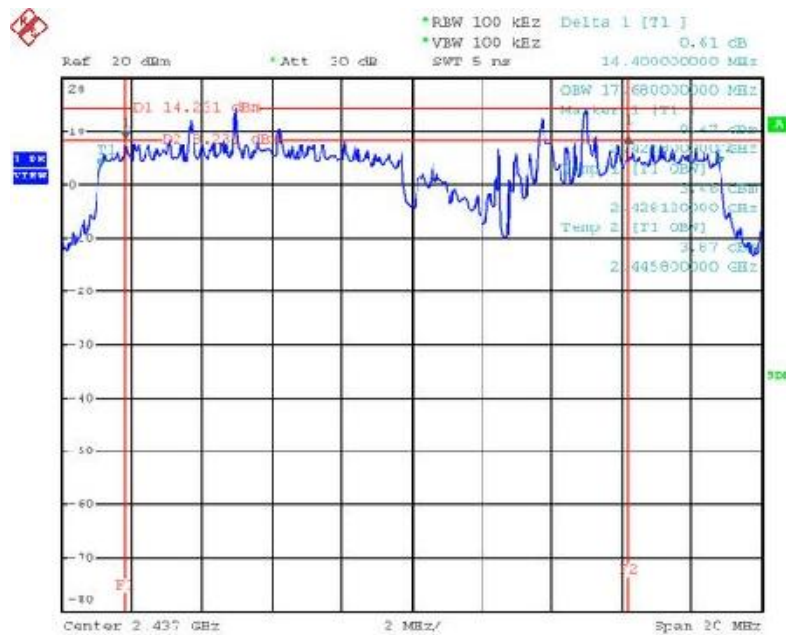
<For Internal Antenna / Ant. 8>

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2412 MHz



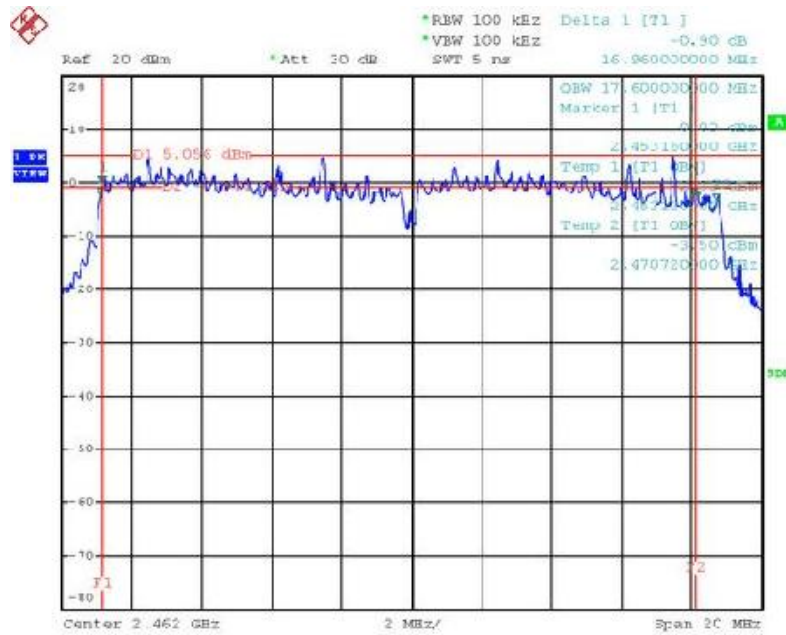
Date: 8.MAR.2011 15:44:25

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2437 MHz



Date: 8.MAR.2011 15:42:34

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz Connector J2 + J3 + J4 / 2462 MHz



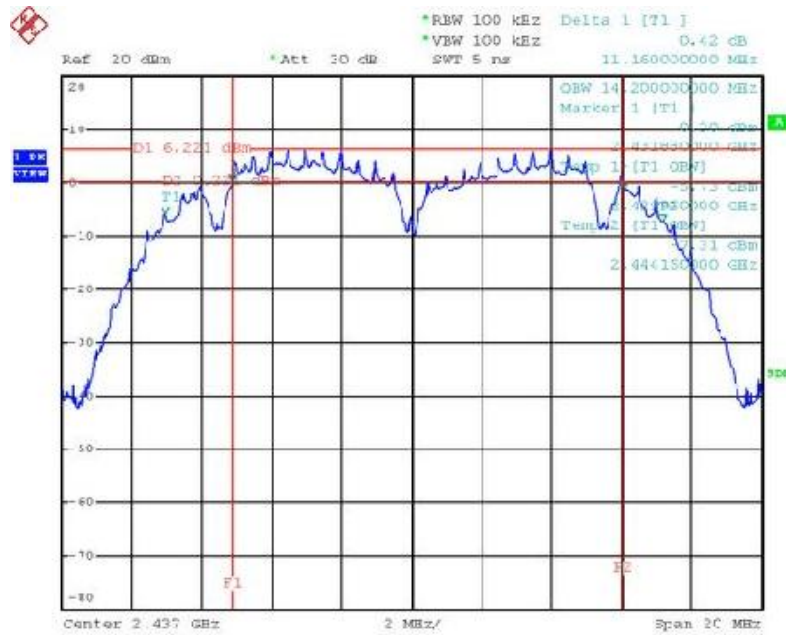
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2412 MHz



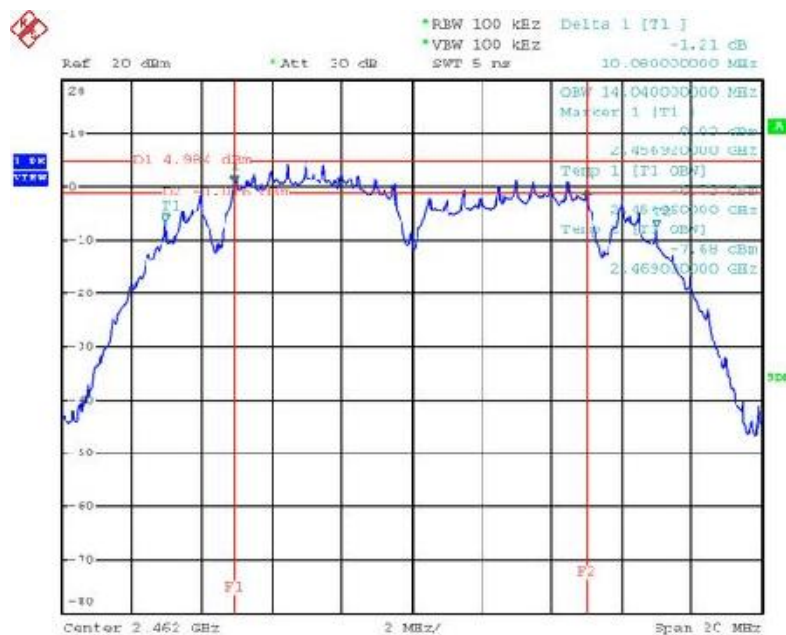
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2437 MHz



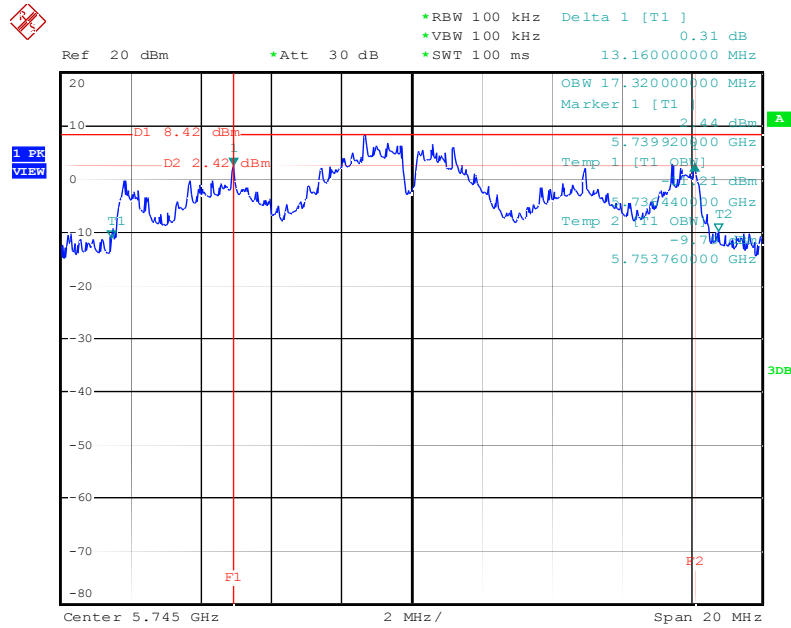
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6 dB Bandwidth Plot on Configuration IEEE 802.11b Connector J2 + J3 + J4 / 2462 MHz



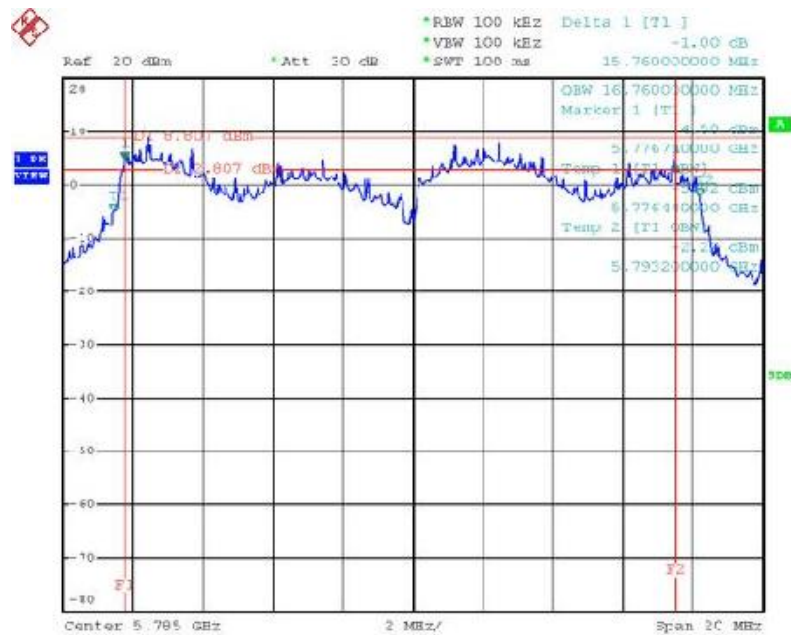
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6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5745 MHz



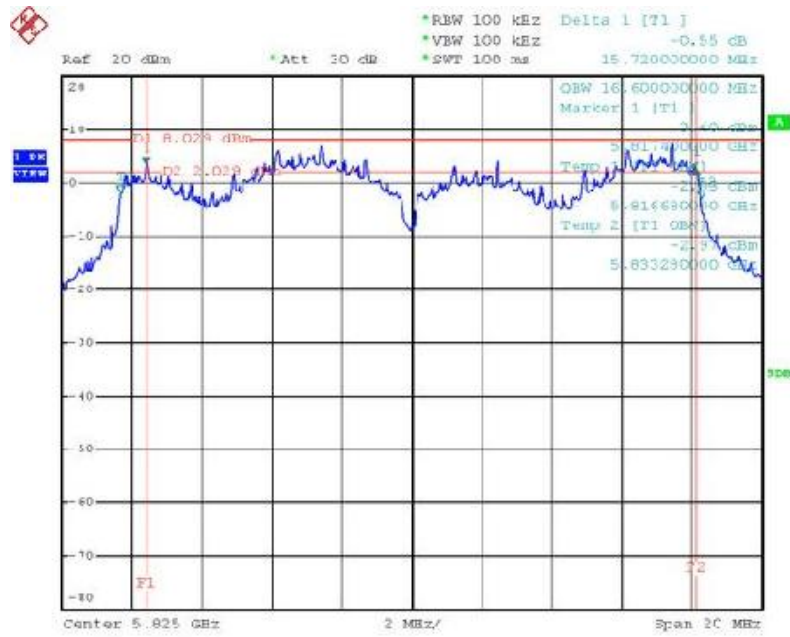
Date: 9.MAR.2011 08:15:02

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5785 MHz



Date: 9.MAR.2011 08:10:12

6 dB Bandwidth Plot on Configuration IEEE 802.11a Connector J2 + J3 + J4 / 5825 MHz



Date: 9.MAR.2011 08:12:18