FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart E § 15.407

Equipment	:	**Wireless LAN adapter**
Model No.	:	**WIS09ABGN2**
Filing Type	:	**New Application**
Applicant	:	**Samsung Electronics CO. LTD** 416, Maetan-3Dong, Yeongtong-Gu Suwon-City, Gyeonggi-Do,443-742, Korea
FCC ID	:	**A3L-WIS09ABGN2**
Manufacturer	:	**Askey Computer Corporation** 10F, No.119, Chienkang Way, Chung-Ho, Taipei, Taiwan, R.O.C. **Askey Technology (Jing Su) Ltd.** No.1388, Jiao Tong Road, Wujiang Economic-Technological Development Area, Jiangsu Province, P.R.China
Received Date	:	Jul. 06, 2009
Final Test Date	:	Jul. 30, 2009

Statement

Test result included is only for the 802.11a/n (5150~5350MHz; 5470~5725MHz) of the product.

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

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 E**.

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

Testing Laboratory
1190

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of This Test Report

Original Issue Date: Jul. 30, 2009

Report No.: FR970632AI

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart E § 15.407

Equipment : Wireless LAN adapter
Model No. : WIS09ABGN2
Applicant : Samsung Electronics CO. LTD
416, Maetan-3Dong, Yeongtong-Gu Suwon-City, Gyeonggi-Do,443-742, Korea

Sporton International as requested by the applicant to evaluate the EMC performance of the product Davidple received on Jul. 06, 2009 would like to declare that the tested Davidple 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.

7.31.2009
Sam Lee/ Supervisor

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1 SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	17.57 dB
3.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
3.3	15.407(a)	Maximum Conducted Output Power	Complies	0.47 dB
3.4	15.407(a)	Power Spectral Density	Complies	0.06 dB
3.5	15.407(a)	Peak Excursion	Complies	2.62 dB
3.6	15.407(b)	Radiated Emissions	Complies	3.25 dB
3.7	15.407(b)	Band Edge Emissions	Complies	1.58 dB
3.8	15.407(g)	Frequency Stability	Complies	-
3.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	$\pm 8.5\times10^{-8}$	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%

2 GENERAL INFORMATION

2.1 Product Details

Only the radio detail of IEEE 802.11a/n is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Modulation	See the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	See the below table for IEEE 802.11n
Frequency Range	5150~5350MHz; 5470~5725MHz
Channel Band Width (99%)	1TX-11a Band 1: 16.70 MHz ; Band 2: 18.30 MHz ; Band 3: 17.20 MHz 2TX-11n MCS 8 (20MHz) Band 1: 17.60 MHz ; Band 2: 17.60 MHz ; Band 3: 17.70 MHz (40MHz) Band 1: 36.00 MHz ; Band 2: 36.40 MHz ; Band 3: 36.40 MHz
Conducted Output Power	1TX-11a Band 1: 14.54 dBm ; Band 2: 21.58 dBm ; Band 3: 20.08 dBm 2TX-11n MCS 8 (20MHz) Band 1: 14.24 dBm ; Band 2: 20.94 dBm ; Band 3: 21.27 dBm (40MHz) Band 1: 16.51 dBm ; Band 2: 23.53 dBm ; Band 3: 21.06 dBm

2.2 Table for Filed Antenna

Antenna & Bandwidth

Antenna Mode	Single Chain		Two Chain	
Bandwidth Mode	20 MHz	40 MHz	20 MHz	40 MHz
802.11b	V	X	X	X
802.11g	V	X	X	X
802.11n(2.4GHz)	X	X	V	V
802.11a (5150~5250MHz)	V	X	X	X
802.11a (5250~5350MHz)	V	X	X	X
802.11a (5470~5725MHz)	V	X	X	X
802.11a (5725~5850/5825MHz)	V	X	X	X
802.11n (5150~5250MHz)	X	X	V	V
802.11n (5250~5350MHz)	X	X	V	V
802.11n (5470~5725MHz)	X	X	V	V
802.11n (5725~5850/5825MHz)	X	X	V	V

※ The check represented that enable the function in which chain.

The fork represented that disable the function in which chain.

Ant.	Antenna Type	Connector	Gain (dBi)	Remark
A	Printed Antenna	MMCX	0.53 (2.4G)	TX / RX
B	Printed Antenna	MMCX	2.88 (5G)	TX / RX

Antenna: 2T2R Spatial Multiplexing MIMO configuration. 2 antennas are for signal transceiving.
IEEE 802.11 a only used 1 antenna for signal transceiving.
IEEE 802.11 n only used 2 antennas for signal transceiving.

IEEE 802.11n Modulation Scheme

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps) 800nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0

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

2.3 Table for Carrier Frequencies

Frequency Allocation

For 802.11a, 802.11n (20MHz): Use channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136and 140.

For 802.11n (40MHz): Use channel 38, 46, 54, 62, 102, 110, 118, 126 and 134.

Frequency Band	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz
	38	5190 MHz
	40	5200 MHz
	44	5220 MHz
	46	5230 MHz
	48	5240 MHz

Frequency Band	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz
	54	5270 MHz
	56	5280 MHz
	60	5300 MHz
	62	5310 MHz
	64	5320 MHz

Frequency Band	Channel No.		Frequency	
5470~5725 MHz Band 3	100	5500 MHz	120	5600 MHz
	102	5510 MHz	124	5620 MHz
	104	5520 MHz	126	5630 MHz
	108	5540 MHz	128	5640 MHz
	110	5550 MHz	132	5660 MHz
	112	5560 MHz	134	5670 MHz
	116	5580 MHz	136	5680 MHz
	118	5590 MHz	140	5700 MHz

2.4 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 the entire possible Configuration for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Conducted Emission	Normal mode	Auto	-	-
Max. Conducted Output Power	11a Band 1~3/BPSK	6Mbps	36/40/48/52/56 /64/100/116/120/140	A
	11n Band 1~3/BPSK MCS 8 (20MHz)	13Mbps	36/40/48/52/5 6 /64/100/116/120/140	A+B
	11n Band 1~3/BPSK MCS 8 (40MHz)	27Mbps	38/46/54/62/102/118/134	
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion	11a Band 1~3/BPSK	6Mbps	36/40/48/52/56 /64/100/116/120/140	A
	11n Band 1~3/BPSK MCS 8 (20MHz)	13Mbps	36/40/48/52/56 /64/100/116/120/140	A+B
	11n Band 1~3/BPSK MCS 8 (40MHz)	27Mbps	38/46/54/62/102/118/134	
Radiated Emission Below 1GHz	Normal mode	Auto	-	-
Radiated Emission Above 1GHz Band Edge Emission	11a Band 1~3/BPSK	6Mbps	36/40/48/52/56/64/100/120/140	A
	11n Band 1~3/BPSK MCS 8 (20MHz)	13Mbps	36/40/48/52/56/64/100/120/140	A+B
	11n Band 1~3/BPSK MCS 8 (40MHz)	27Mbps	38/46/54/62/102/118/134	
Frequency Stability	Band 1~3/BPSK	6Mbps	64	-

2.5 Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
CO04- HY	Conduction	Hwa Ya	643075	IC 4086B-1	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-
03CH02-HY	SAC	Hwa Ya	643075	IC 4086B-1	-

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

2.6 Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D505	DoC
Notebook	DELL	PP01L	DoC
Modem	ACEEX	DM1414	IFAXDM1414
Mouse (USB)	Microsoft	1004	N/A
A.P. (Remote Workstation)	SIMENS	SE361	DoC

2.7 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 Single Chain:

Power Parameters of IEEE 802.11a

Test Software Version	RT3x7xQA		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 802.11a	6	6	6
Frequency	5260 MHz	5280 MHz	5320 MHz
IEEE 802.11a	0F	0F	0F
Frequency	5500 MHz	5600 MHz	5700 MHz
IEEE 802.11a	0F	0F	0F

For Two Chain:

Power Parameters of IEEE 802.11n (20MHz)

Test Software Version	RT3x7xQA		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 802.11n	04 05	04 04	04 05
Frequency	5260 MHz	5280 MHz	5320 MHz
IEEE 802.11n	0C 0C	0C 0C	0C 0C
Frequency	5500 MHz	5600 MHz	5700 MHz
IEEE 802.11n	OE OE	OE OE	OE OE

Power Parameters of IEEE 802.11n (40MHz)

Test Software Version	RT3x7xQA		
Frequency	5190 MHz	5230 MHz	5270 MHz
IEEE 802.11n	07 07	07 07	0F 0F
Frequency	5310 MHz	5510 MHz	5590 MHz
IEEE 802.11n	0F 0F	OE OE	0E 0F
Frequency	5670 MHz	-	-
IEEE 802.11n	0E 0F	-	-

2.8 EUT Operation during Test

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating “H“ pattern was used as the test software.

The NB sends “H“ messages to the panel, and the panel displays “H “patterns on the screen.

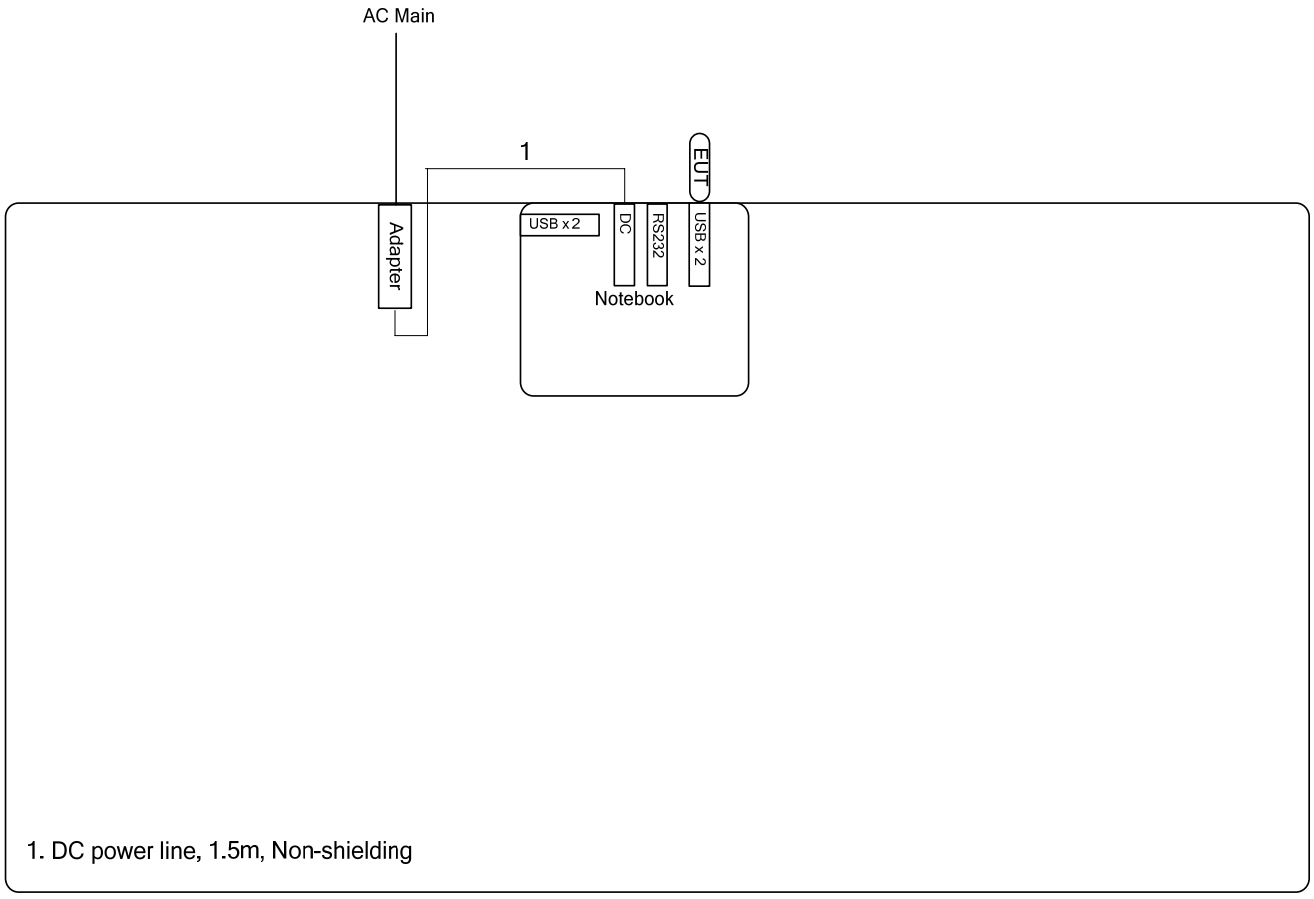
Executed “RT3x7xQA” to keep transmitting signals at fixed frequency.

Executed “ping.exe “to link with the remote workstation to receive and transmit data by LAN and WLAN.

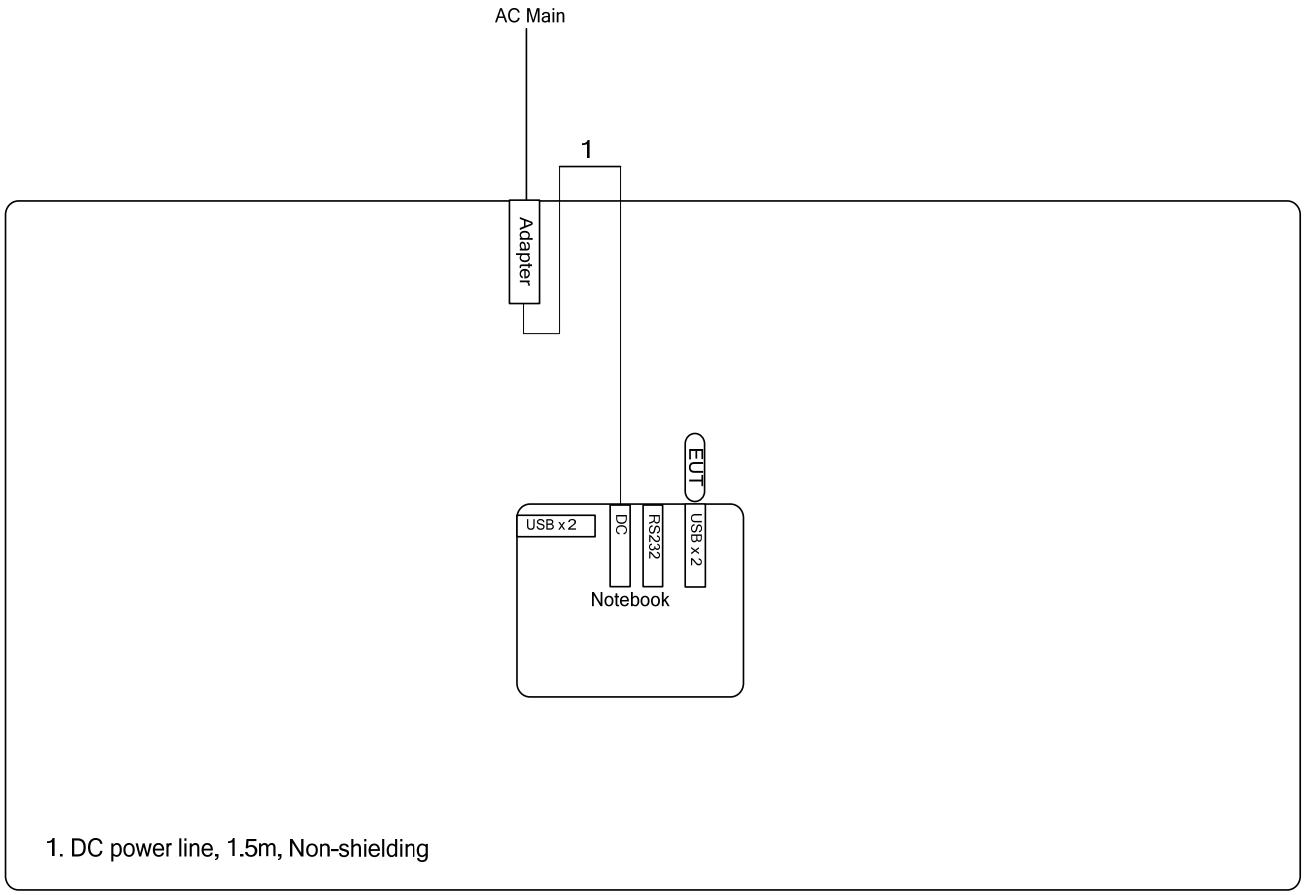
2.9 Test Configuration

2.9.1 Radiation Emissions Test Configuration

For radiated emissions 9kHz~1GHz



For radiated emissions above 1GHz



3 TEST RESULT

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 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.

Class B

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

3.1.2 Measuring Instruments and Setting

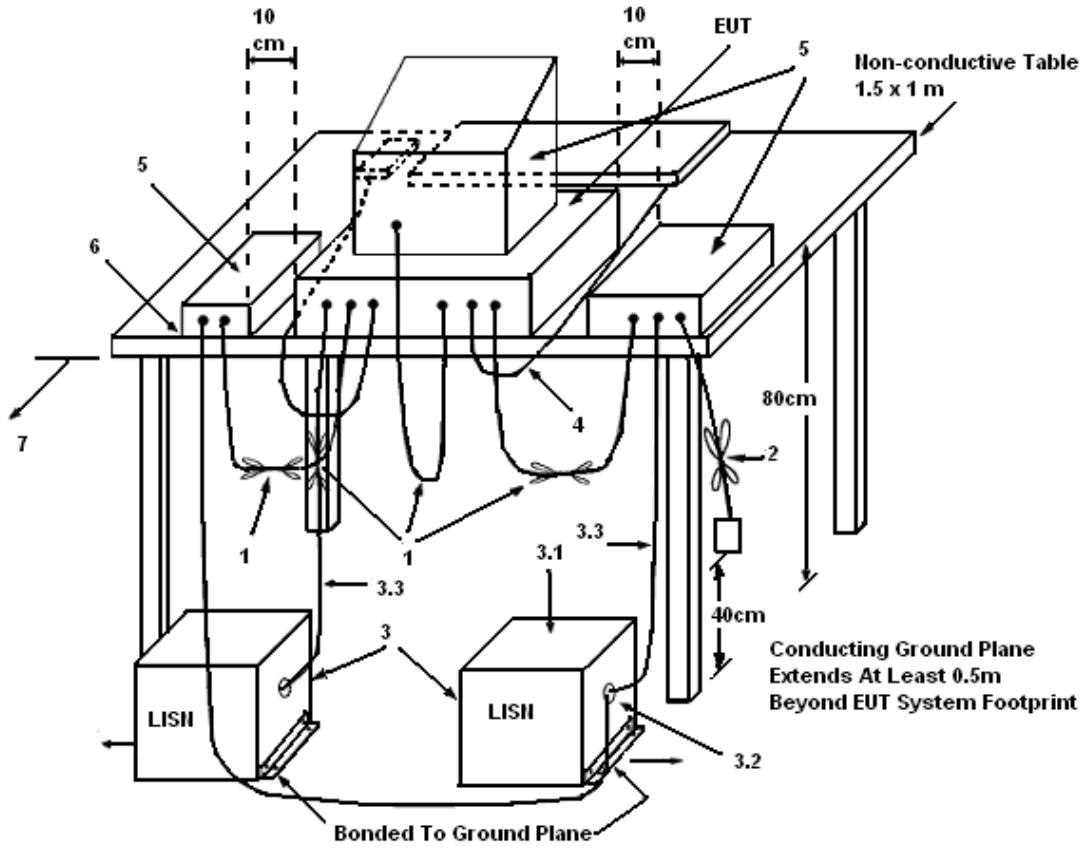
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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

3.1.3 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.

3.1.4 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.

3.1.5 Test Deviation

There is no deviation with the original standard.

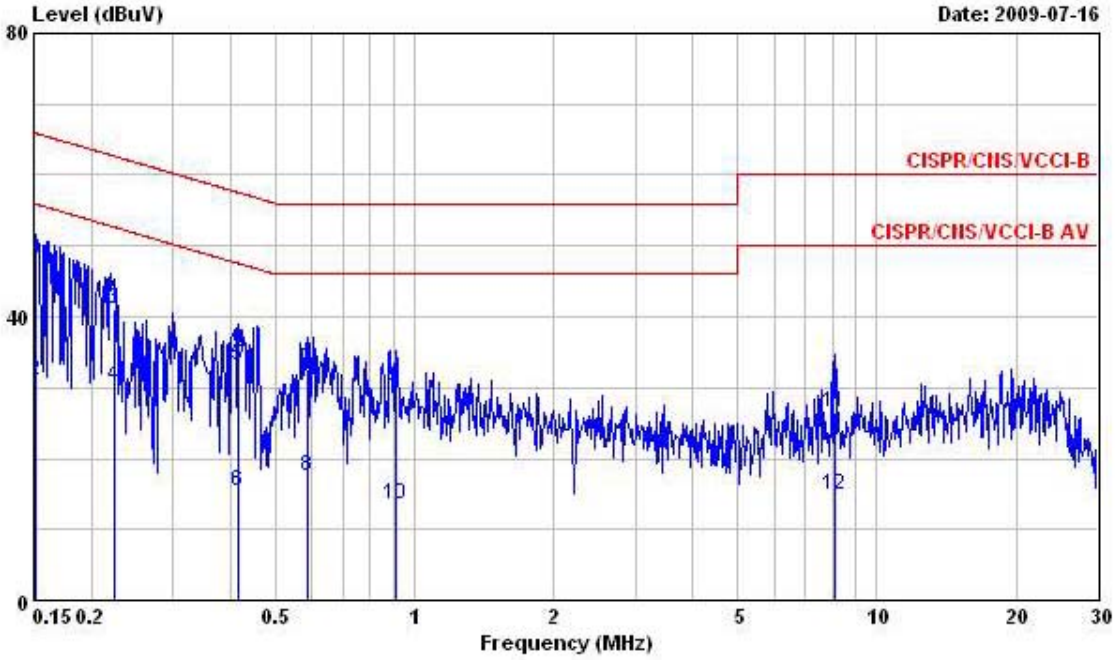
3.1.6 EUT Operation during Test

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

3.1.7 Results of AC Power Line Conducted Emissions Measurement

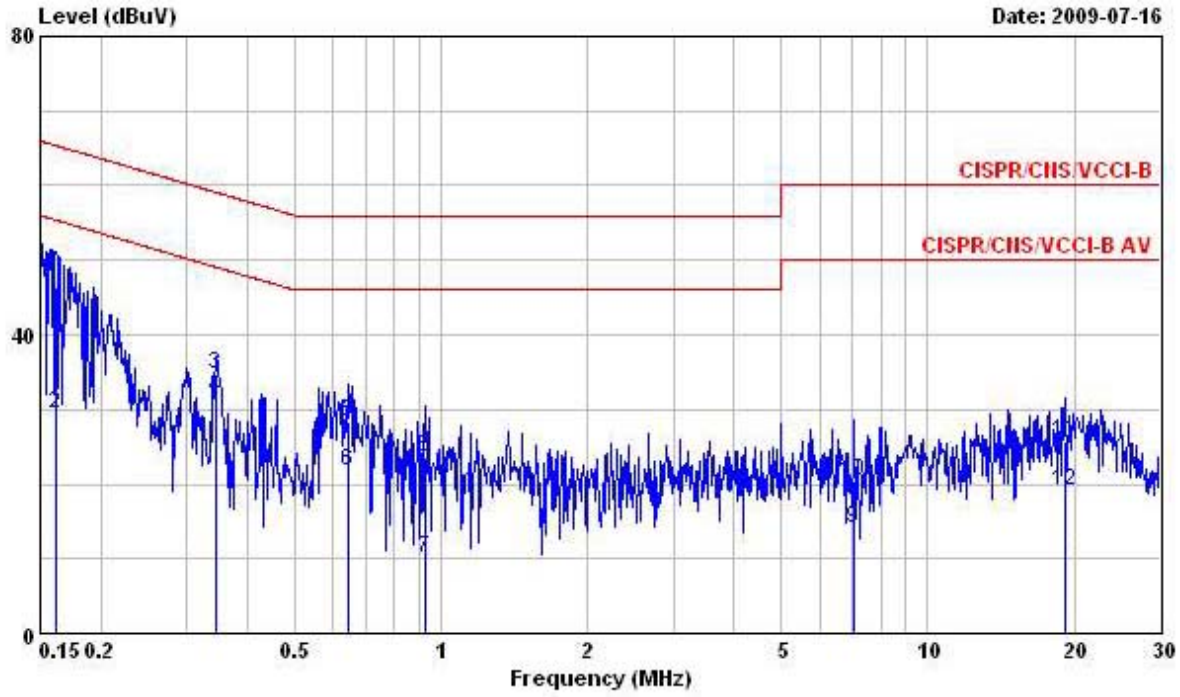
Final Test date	Jul. 16, 2009	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Chris	**Configuration**	Normal mode

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1507970	47.39	-18.57	65.96	47.18	0.09	0.12	QP
2	0.1507970	31.01	-24.95	55.96	30.80	0.09	0.12	Average
3	0.2231870	41.12	-21.58	62.70	40.98	0.08	0.06	QP
4	0.2231870	30.27	-22.43	52.70	30.13	0.08	0.06	Average
5	0.4170520	33.21	-24.30	57.51	33.04	0.09	0.08	QP
6	0.4170520	15.44	-32.07	47.51	15.27	0.09	0.08	Average
7	0.5885140	32.68	-23.32	56.00	32.47	0.10	0.11	QP
8	0.5885140	17.35	-28.65	46.00	17.14	0.10	0.11	Average
9	0.9135710	29.81	-26.19	56.00	29.57	0.11	0.13	QP
10	0.9135710	13.63	-32.37	46.00	13.39	0.11	0.13	Average
11	8.110	26.41	-33.59	60.00	25.81	0.25	0.35	QP
12	8.110	14.82	-35.18	50.00	14.22	0.25	0.35	Average

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1615500	46.31	-19.07	65.38	46.12	0.08	0.11	QP
2	0.1615500	29.46	-25.92	55.38	29.27	0.08	0.11	Average
3	0.3459100	34.75	-24.31	59.06	34.59	0.08	0.08	QP
4	@0.3459100	31.49	-17.57	49.06	31.33	0.08	0.08	Average
5	0.6439830	28.44	-27.56	56.00	28.24	0.09	0.11	QP
6	0.6439830	21.76	-24.24	46.00	21.56	0.09	0.11	Average
7	0.9282090	10.05	-35.95	46.00	9.81	0.10	0.14	Average
8	0.9282090	23.65	-32.35	56.00	23.41	0.10	0.14	QP
9	7.060	14.06	-35.94	50.00	13.51	0.22	0.33	Average
10	7.060	20.50	-39.50	60.00	19.95	0.22	0.33	QP
11	19.220	25.66	-34.34	60.00	24.75	0.39	0.52	QP
12	19.220	19.18	-30.82	50.00	18.27	0.39	0.52	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

3.2 99% Occupied Bandwidth Measurement

3.2.1 Limit

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

3.2.2 Measuring Instruments and Setting

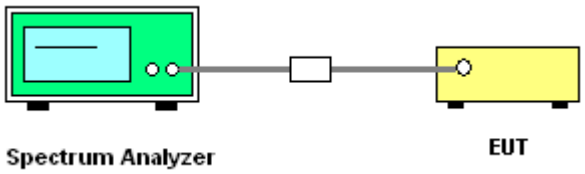
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	1000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.2.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 300 kHz and the video bandwidth of 1000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.
4. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner.

3.2.4 Test Setup Layout



3.2.5 Test Deviation

There is no deviation with the original standard.

3.2.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7 Test Result of 99% Occupied Bandwidth

Final Test date	Jul. 30, 2009	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Duncan	**Configuration**	802.11a/n

For Single Chain:

Configuration of IEEE 802.11a

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	19.80	16.70
40	5200 MHz	19.80	16.70
48	5240 MHz	19.70	16.70
52	5260 MHz	34.70	18.30
56	5280 MHz	33.20	17.40
64	5320 MHz	30.40	17.10
100	5500 MHz	27.20	17.10
116	5580 MHz	27.20	17.00
120	5600 MHz	33.10	17.20
140	5700 MHz	25.80	17.10

For Two Chain:

Configuration IEEE 802.11n (20MHz)

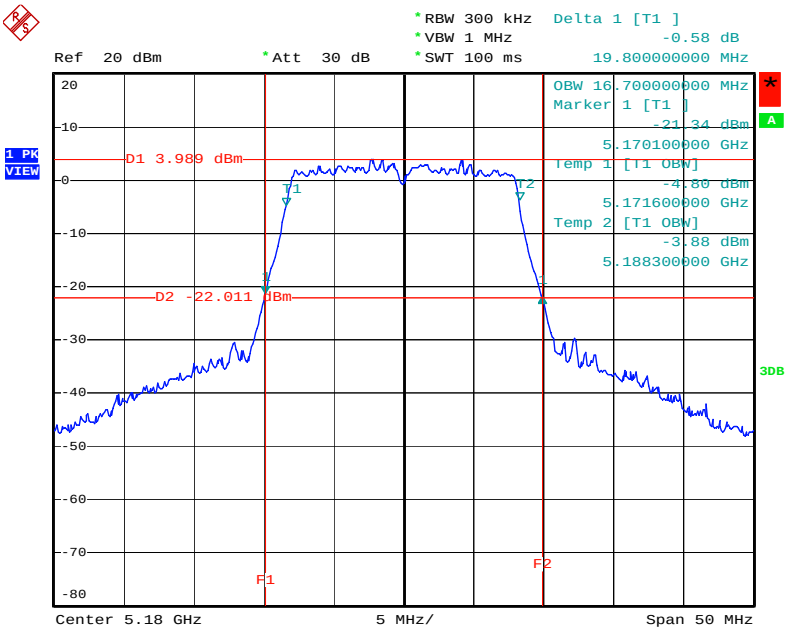
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	19.70	17.60
40	5200 MHz	19.70	17.60
48	5240 MHz	19.80	17.50
52	5260 MHz	20.00	17.60
56	5280 MHz	20.00	17.60
64	5320 MHz	19.80	17.60
100	5500 MHz	20.20	17.60
116	5580 MHz	24.10	17.70
120	5600 MHz	20.20	17.70
140	5700 MHz	20.00	17.70

Configuration IEEE 802.11n (40MHz)

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	39.40	36.00
46	5230 MHz	39.40	36.00
54	5270 MHz	55.20	36.40
62	5310 MHz	46.60	36.40
102	5510 MHz	41.20	36.40
118	5590 MHz	39.80	36.00
134	5670 MHz	40.00	36.00

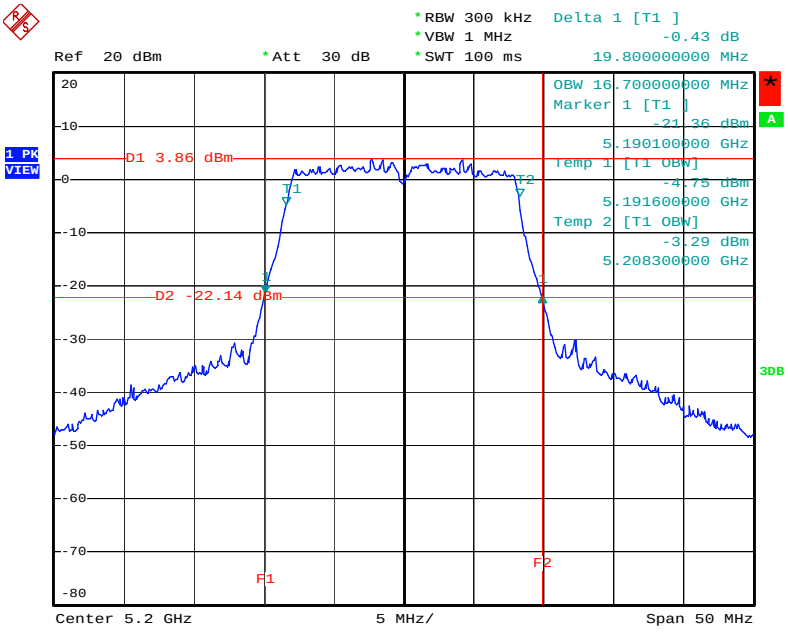
For Single Chain:

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5180 MHz



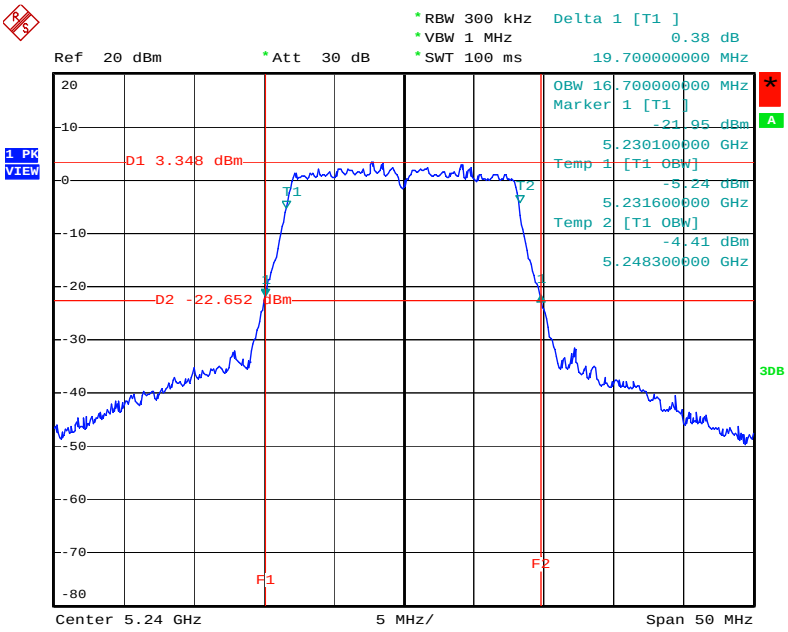
Date: 23.JUL.2009 20:23:55

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5200 MHz



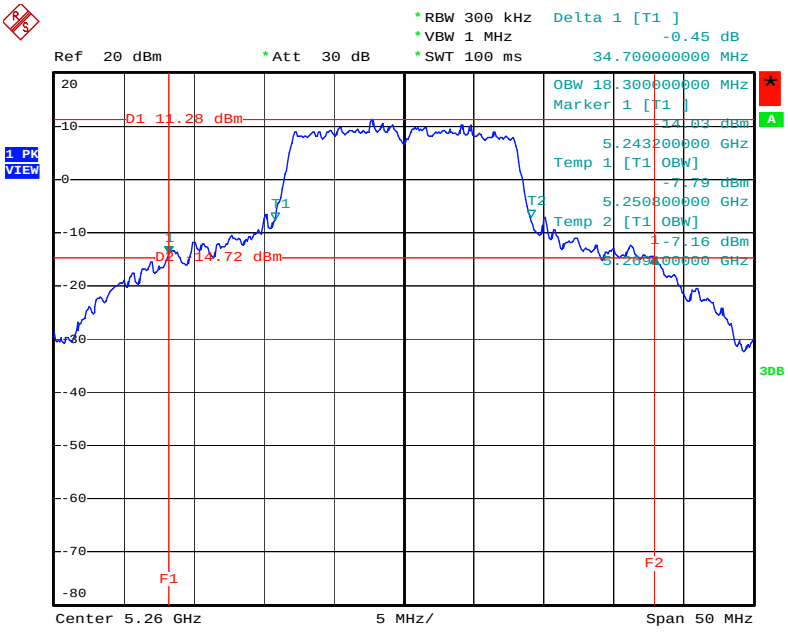
Date: 23.JUL.2009 20:25:03

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5240 MHz



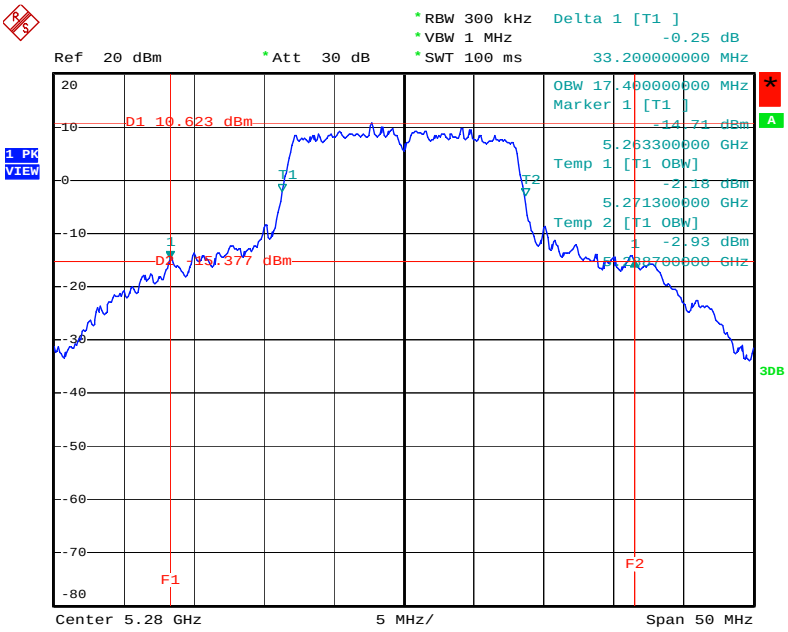
Date: 23.JUL.2009 20:26:39

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5260 MHz



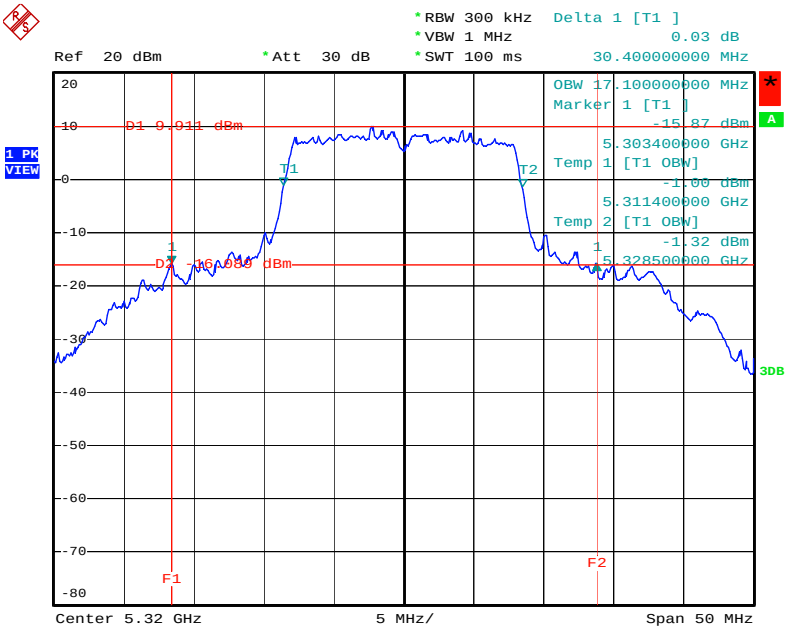
Date: 23.JUL.2009 20:10:49

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5280 MHz



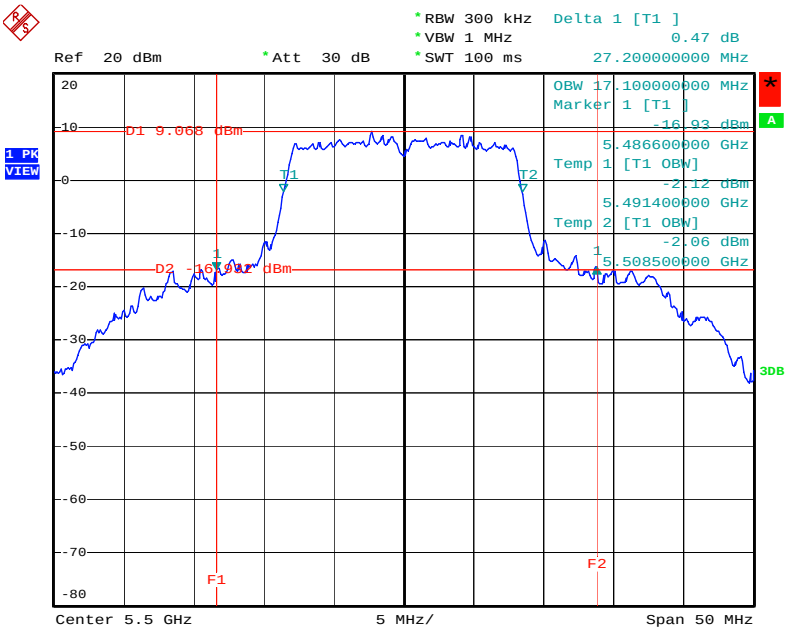
Date: 23.JUL.2009 20:14:00

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5320 MHz



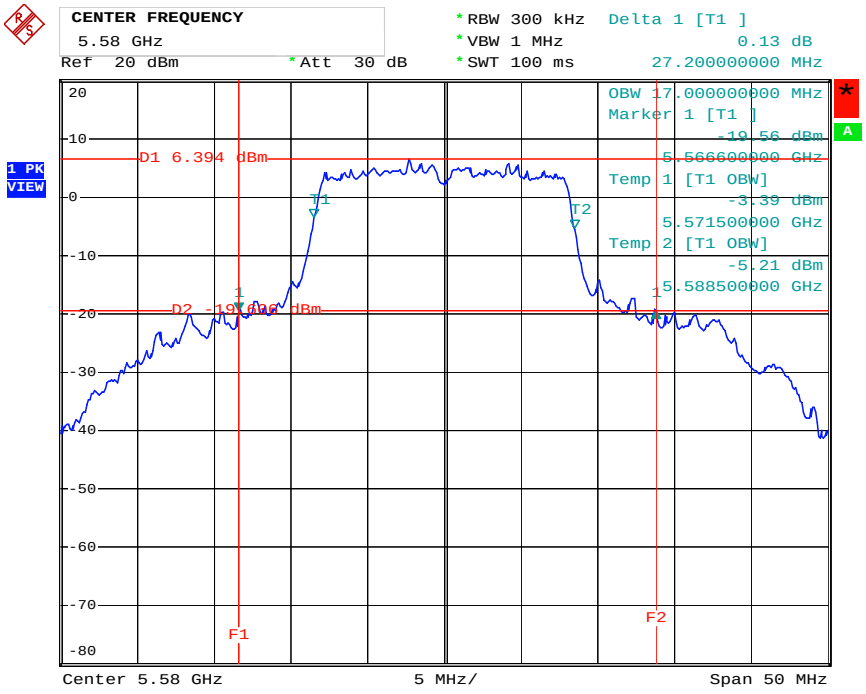
Date: 23.JUL.2009 20:17:52

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5500 MHz



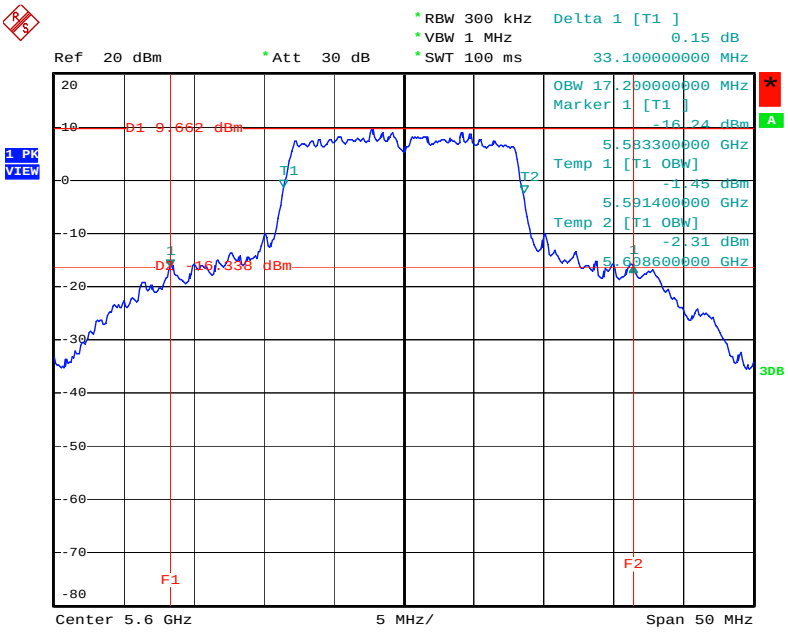
Date: 23.JUL.2009 20:42:21

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5580 MHz



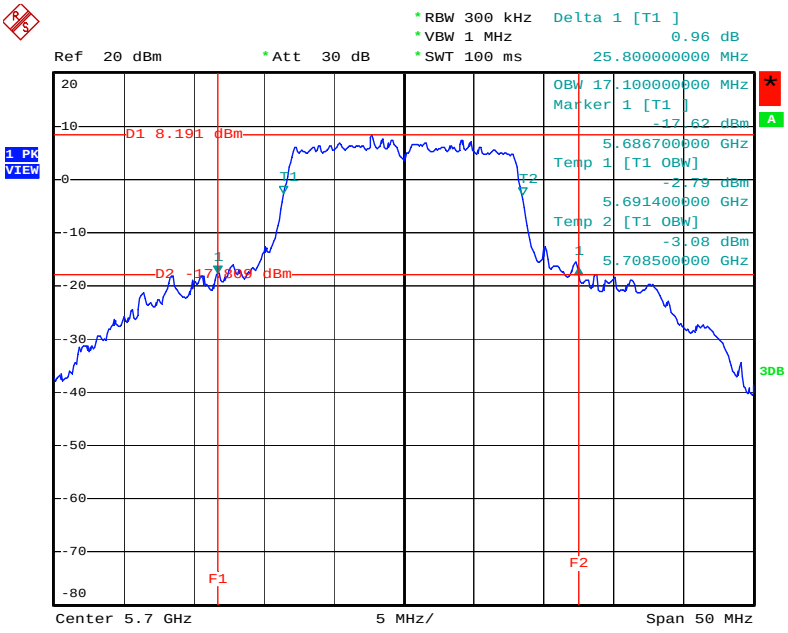
Date: 30.JUL.2009 20:45:38

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5600 MHz



Date: 23.JUL.2009 20:34:11

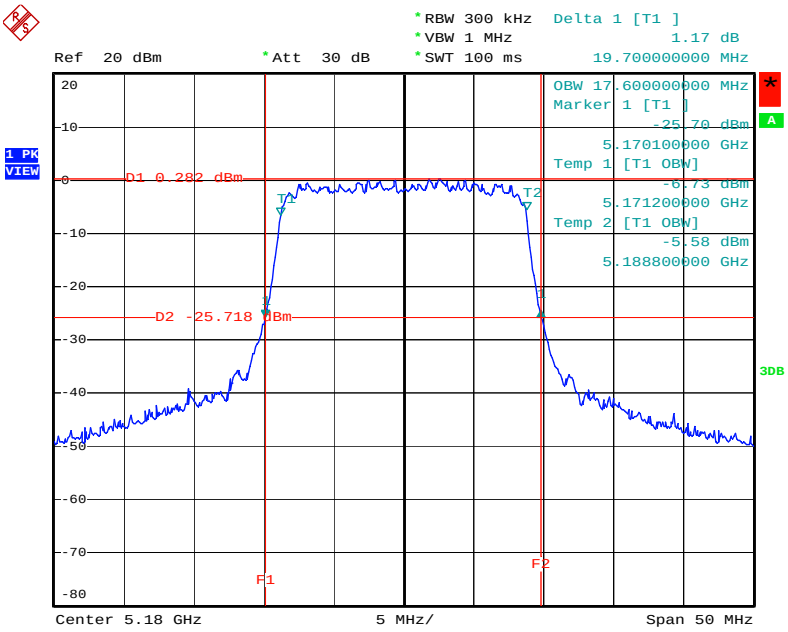
26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5700 MHz



Date: 23.JUL.2009 20:36:32

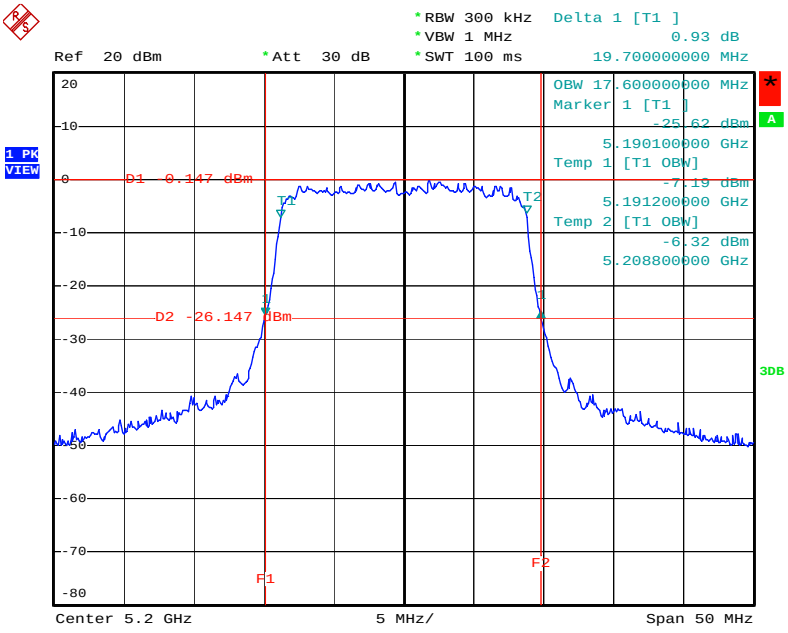
For Two Chain:

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5180 MHz



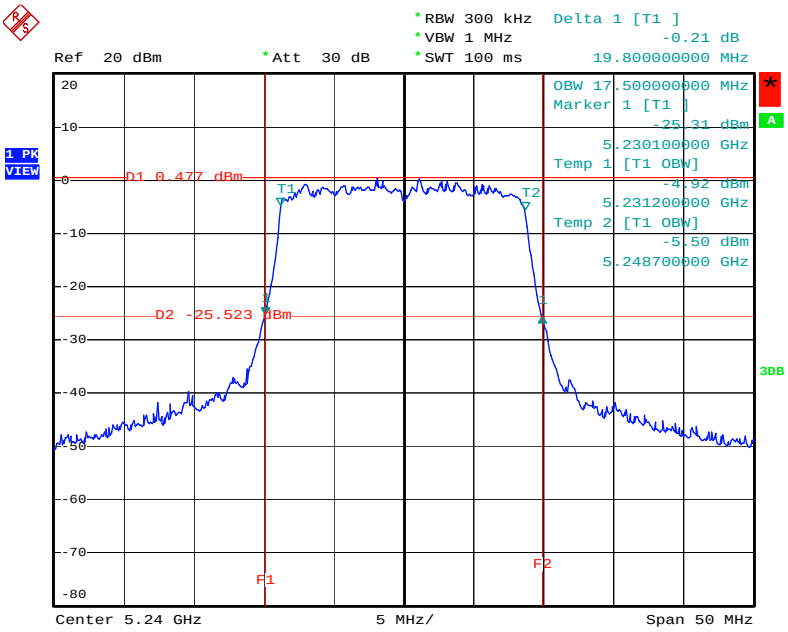
Date: 23.JUL.2009 21:29:59

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) / 5200 MHz



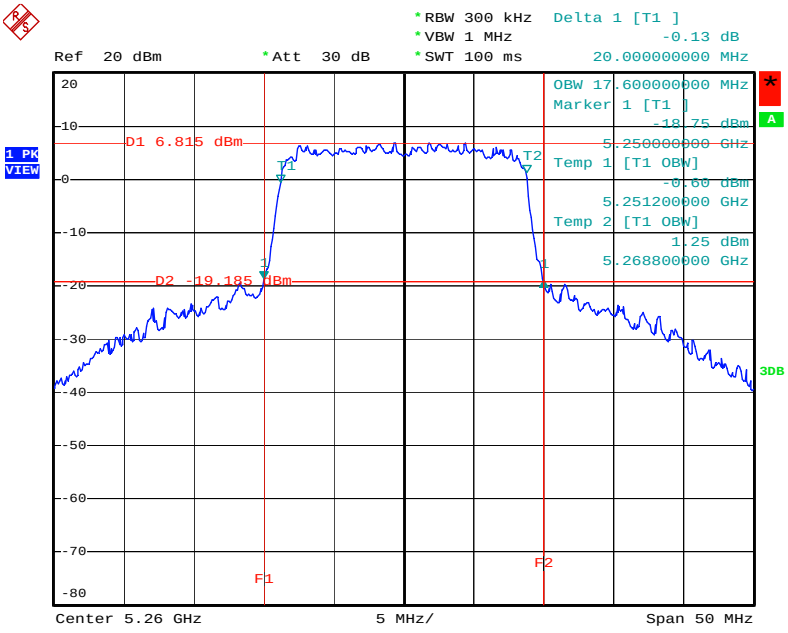
Date: 23.JUL.2009 21:31:59

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5240 MHz



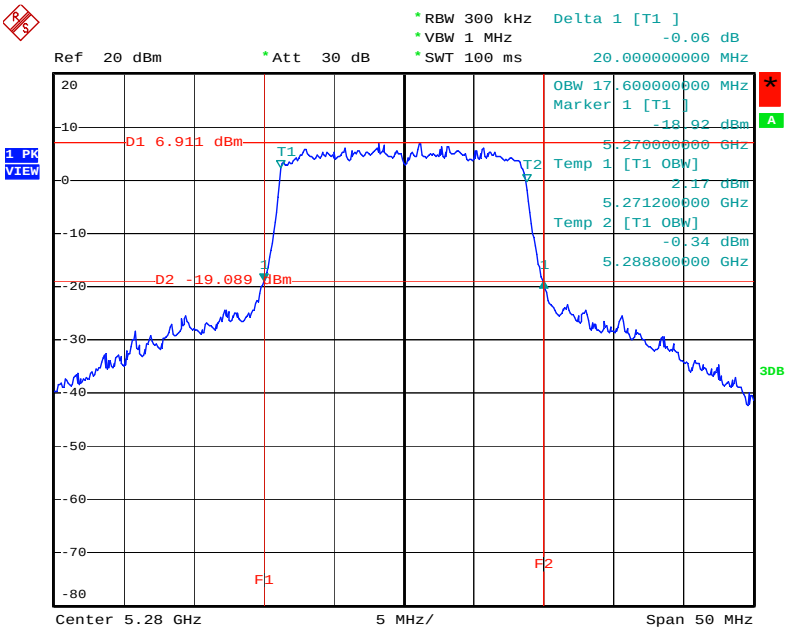
Date: 23.JUL.2009 21:34:17

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5260 MHz



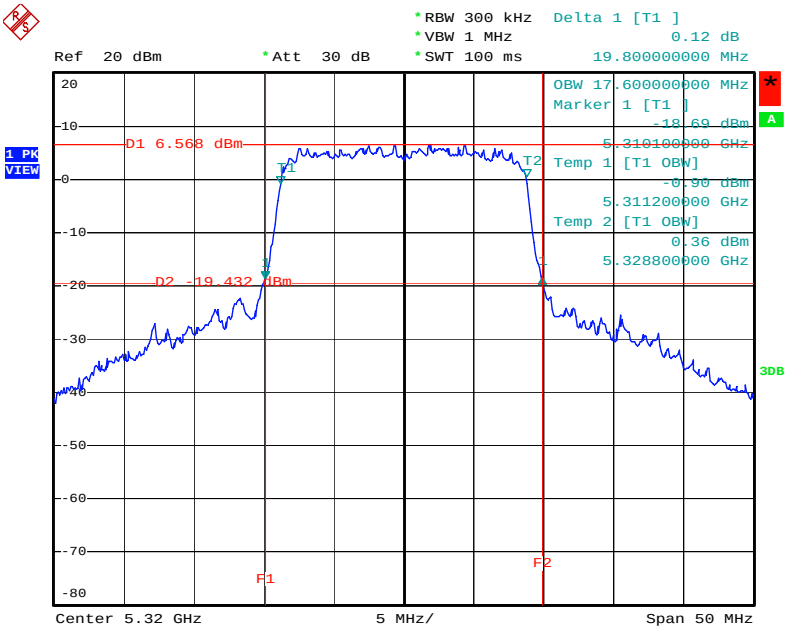
Date: 23.JUL.2009 21:39:21

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) / 5280 MHz



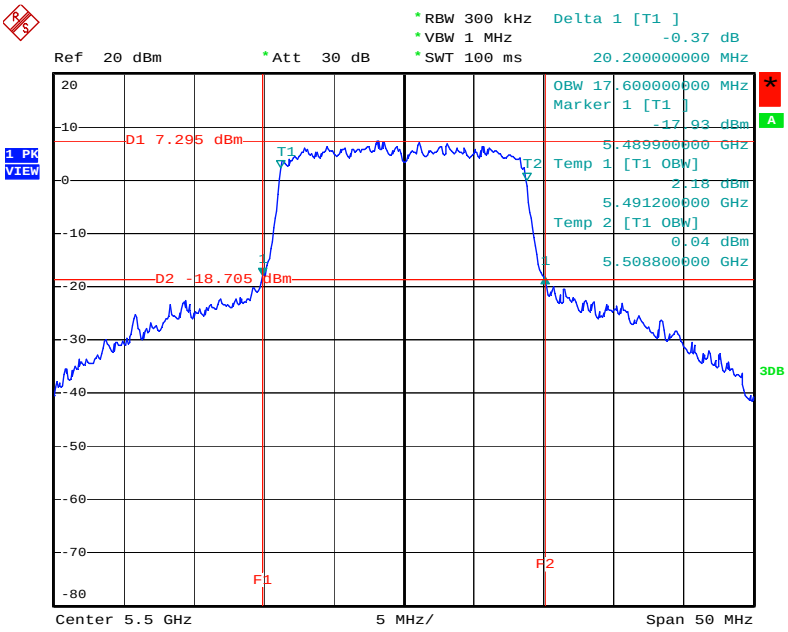
Date: 23.JUL.2009 21:41:19

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5320 MHz



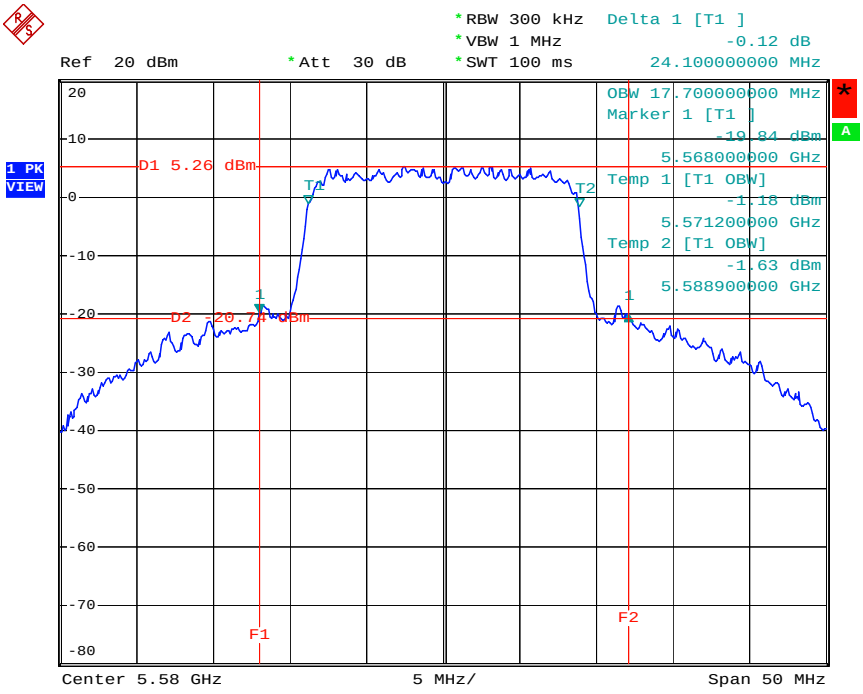
Date: 23.JUL.2009 21:42:54

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5500 MHz



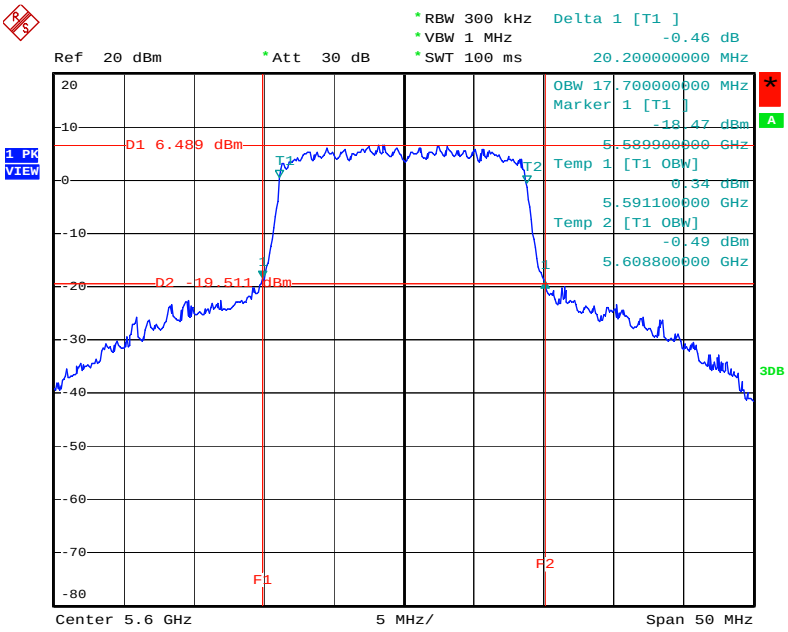
Date: 23.JUL.2009 21:54:11

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz) / 5580 MHz



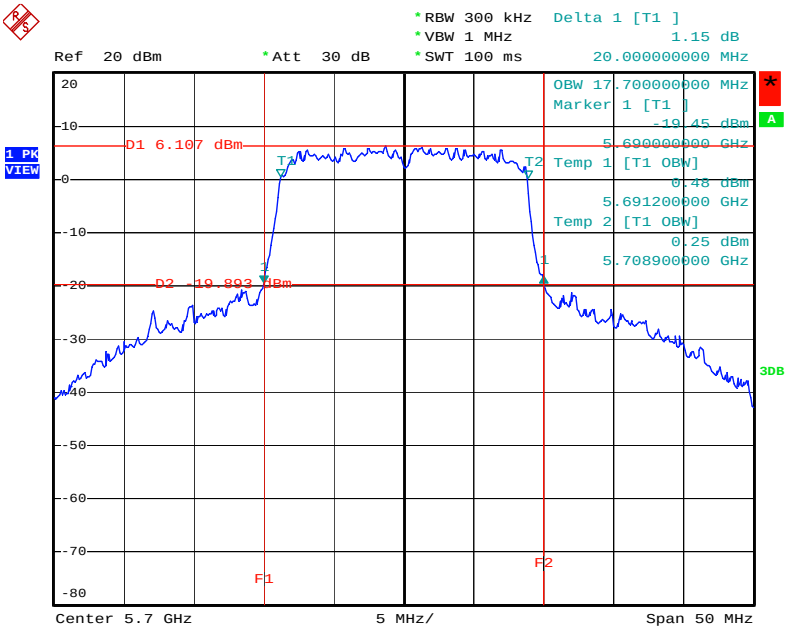
Date: 30.JUL.2009 19:28:49

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5600 MHz



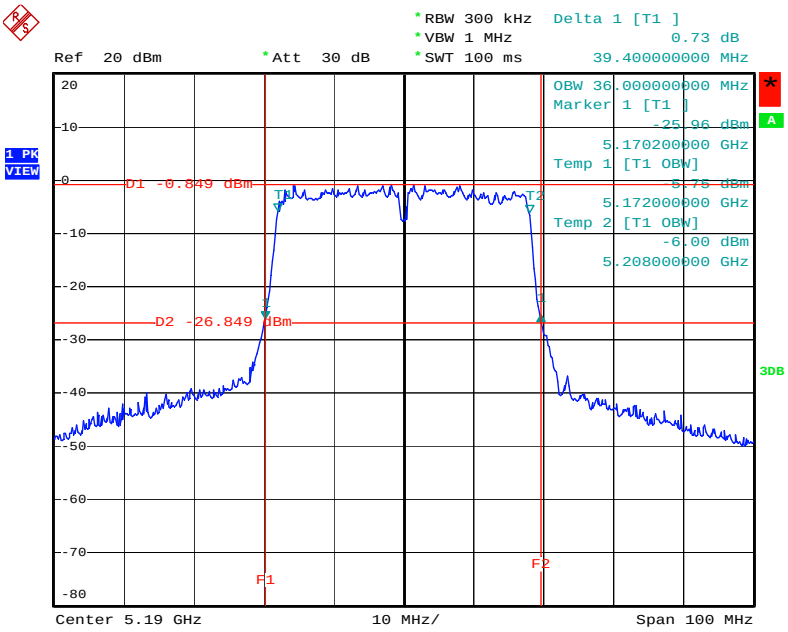
Date: 23.JUL.2009 21:51:09

26 dB Bandwidth Plot on Configuration IEEE 802.11n (20MHz)/ 5700 MHz



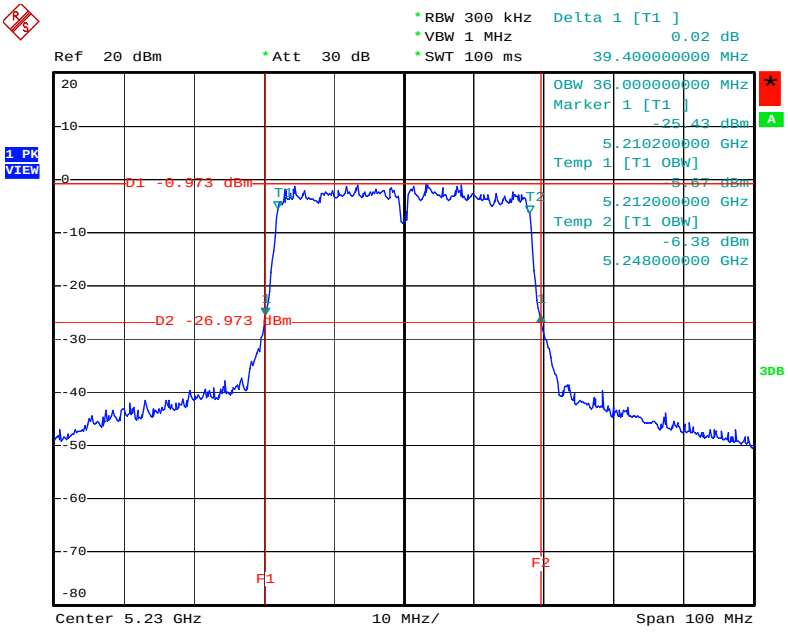
Date: 23.JUL.2009 21:52:54

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz)/ 5190 MHz



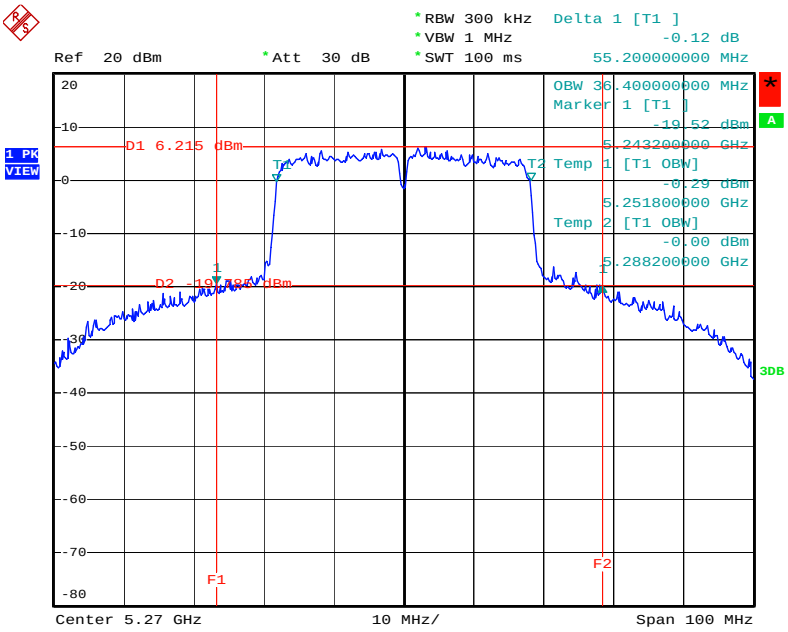
Date: 23.JUL.2009 22:16:44

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) / 5230 MHz



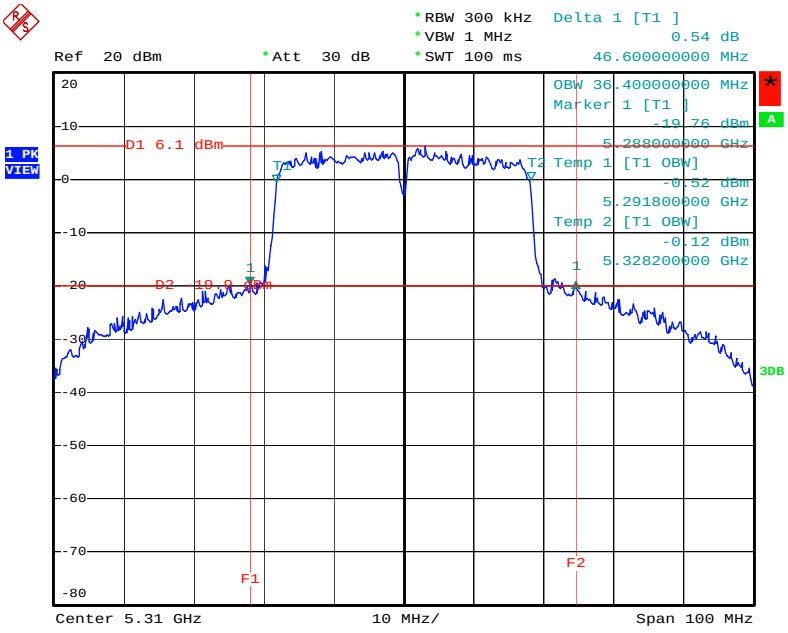
Date: 23.JUL.2009 22:21:20

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz)/ 5270 MHz



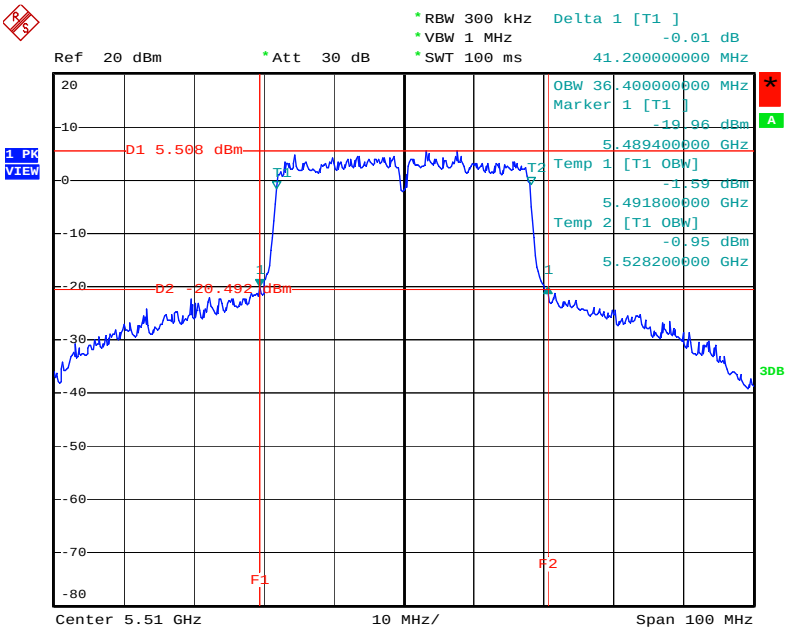
Date: 23.JUL.2009 22:25:39

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) / 5310 MHz



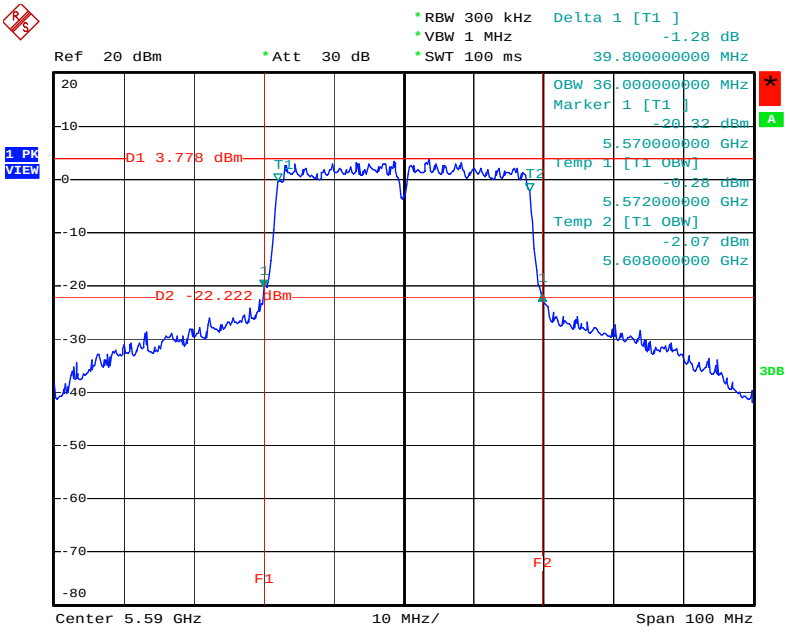
Date: 23.JUL.2009 22:28:31

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz)/ 5510 MHz



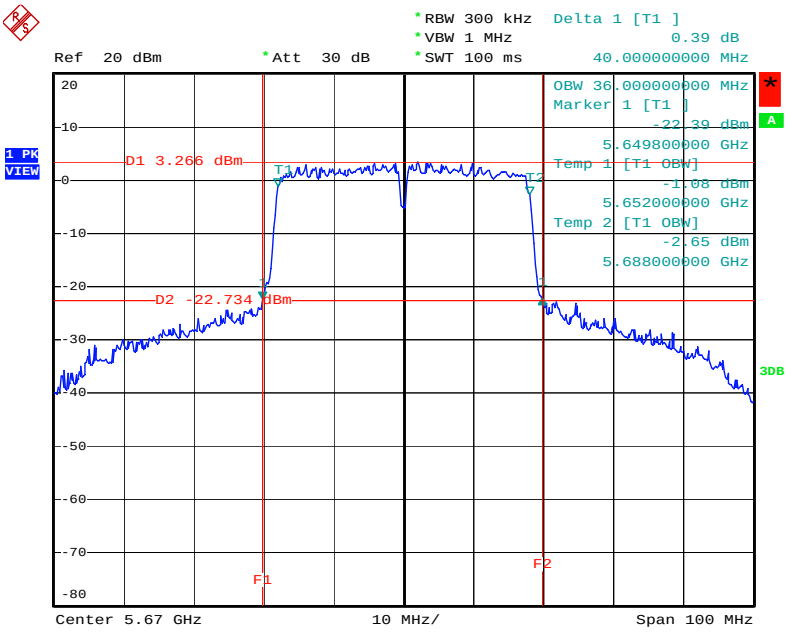
Date: 23.JUL.2009 22:34:41

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz)/ 5590 MHz



Date: 23.JUL.2009 22:39:21

26 dB Bandwidth Plot on Configuration IEEE 802.11n (40MHz) / 5670 MHz



3.3 Maximum Conducted Output Power Measurement

3.3.1 Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 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. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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 (30dBm) or 17 dBm + 10log B. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. 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 and 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.

3.3.2 Measuring Instruments and Setting

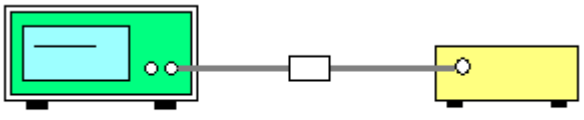
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	Max Hold
Sweep Time	Hold 60s

3.3.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with method #3 of FCC Public Notice DA-02-2138.
3. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula.

3.3.4 Test Setup Layout



3.3.5 Test Deviation

There is no deviation with the original standard.

3.3.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.3.7 Test Result of Maximum Conducted Output Power

Final Test date	Jul. 30, 2009	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Duncan	**Configuration**	802.11a/n

For Single Chain:

Configuration of IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	14.54	17.00	**Complies**
40	5200 MHz	14.42	17.00	**Complies**
48	5240 MHz	13.82	17.00	**Complies**
52	5260 MHz	21.58	24.00	**Complies**
56	5280 MHz	20.85	24.00	**Complies**
64	5320 MHz	20.10	24.00	**Complies**
100	5500 MHz	19.49	24.00	**Complies**
116	5580 MHz	18.47	24.00	**Complies**
120	5600 MHz	20.08	24.00	**Complies**
140	5700 MHz	18.45	24.00	**Complies**

For Two Chain:

Configuration IEEE 802.11n Ant. A (20MHz)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	11.54	17.00	**Complies**
40	5200 MHz	10.89	17.00	**Complies**
48	5240 MHz	11.21	17.00	**Complies**
52	5260 MHz	18.12	24.00	**Complies**
56	5280 MHz	17.90	24.00	**Complies**
64	5320 MHz	17.87	24.00	**Complies**
100	5500 MHz	18.42	24.00	**Complies**
116	5580 MHz	17.35	24.00	**Complies**
120	5600 MHz	18.00	24.00	**Complies**
140	5700 MHz	17.43	24.00	**Complies**

Configuration IEEE 802.11n Ant. B (20MHz)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	10.89	17.00	**Complies**
40	5200 MHz	10.35	17.00	**Complies**
48	5240 MHz	10.69	17.00	**Complies**
52	5260 MHz	17.74	24.00	**Complies**
56	5280 MHz	17.53	24.00	**Complies**
64	5320 MHz	17.50	24.00	**Complies**
100	5500 MHz	18.10	24.00	**Complies**
116	5580 MHz	16.94	24.00	**Complies**
120	5600 MHz	17.74	24.00	**Complies**
140	5700 MHz	17.15	24.00	**Complies**

Configuration IEEE 802.11n Ant. A & B (20MHz)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	14.24	17.00	**Complies**
40	5200 MHz	13.64	17.00	**Complies**
48	5240 MHz	13.97	17.00	**Complies**
52	5260 MHz	20.94	24.00	**Complies**
56	5280 MHz	20.73	24.00	**Complies**
64	5320 MHz	20.70	24.00	**Complies**
100	5500 MHz	21.27	24.00	**Complies**
116	5580 MHz	20.16	24.00	**Complies**
120	5600 MHz	20.88	24.00	**Complies**
140	5700 MHz	20.30	24.00	**Complies**

Configuration IEEE 802.11n Ant. A (40MHz)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	13.61	17.00	**Complies**
46	5230 MHz	13.31	17.00	**Complies**
54	5270 MHz	20.61	24.00	**Complies**
62	5310 MHz	20.30	24.00	**Complies**
102	5510 MHz	18.10	24.00	**Complies**
134	5670 MHz	18.00	24.00	**Complies**

Configuration IEEE 802.11n Ant. B (40MHz)

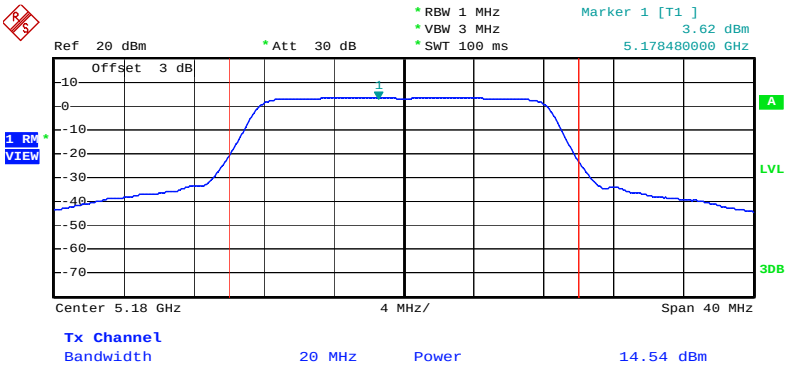
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	13.39	17.00	**Complies**
46	5230 MHz	13.05	17.00	**Complies**
54	5270 MHz	20.42	24.00	**Complies**
62	5310 MHz	19.92	24.00	**Complies**
102	5510 MHz	17.76	24.00	**Complies**
134	5670 MHz	17.18	24.00	**Complies**

Configuration IEEE 802.11n Ant. A & B (40MHz)

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	16.51	17.00	**Complies**
46	5230 MHz	16.19	17.00	**Complies**
54	5270 MHz	23.53	24.00	**Complies**
62	5310 MHz	23.12	24.00	**Complies**
102	5510 MHz	20.94	24.00	**Complies**
118	5590 MHz	20.62	24.00	**Complies**
134	5670 MHz	21.06	24.00	**Complies**

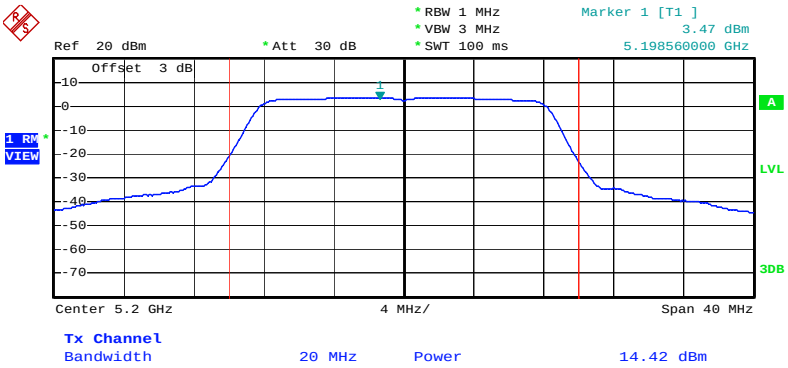
For Single Chain:

Channel Output Power Plot on Configuration IEEE 802.11a / 5180 MHz



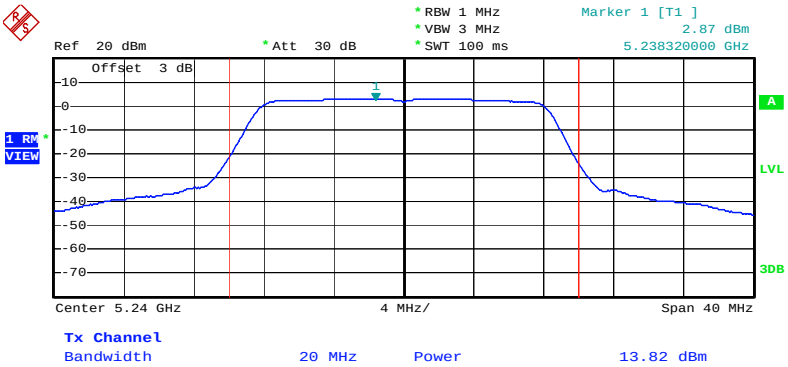
Date: 23.JUL.2009 20:23:39

Channel Output Power Plot on Configuration IEEE 802.11a / 5200 MHz



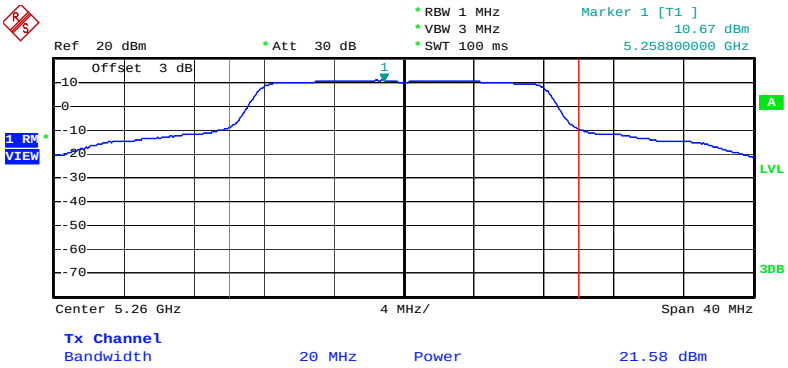
Date: 23.JUL.2009 20:24:47

Channel Output Power Plot on Configuration IEEE 802.11a / 5240 MHz



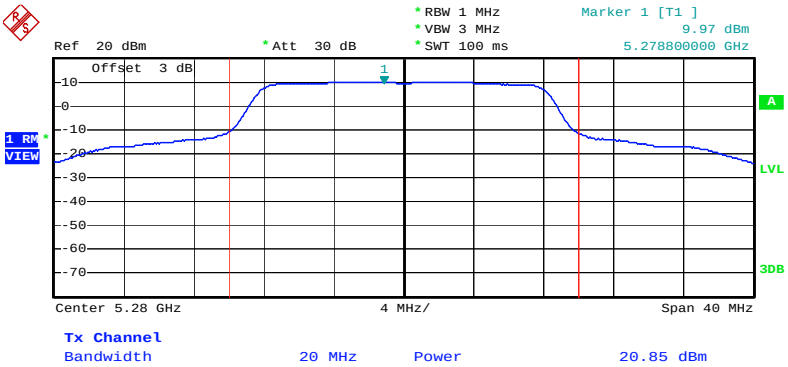
Date: 23.JUL.2009 20:26:23

Channel Output Power Plot on Configuration IEEE 802.11a / 5260 MHz



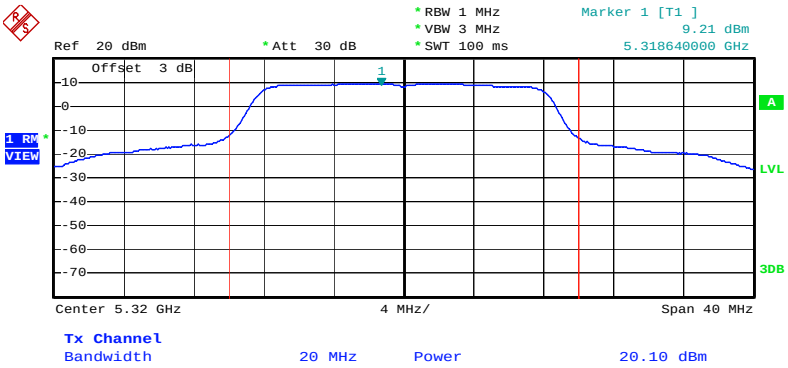
Date: 23.JUL.2009 20:10:32

Channel Output Power Plot on Configuration IEEE 802.11a / 5280 MHz



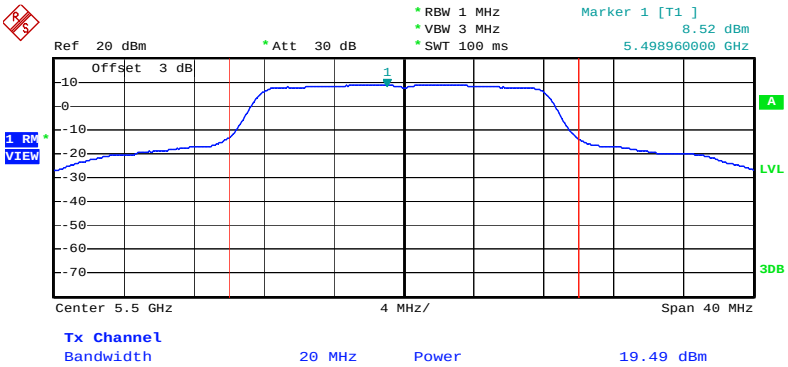
Date: 23.JUL.2009 20:13:44

Channel Output Power Plot on Configuration IEEE 802.11a / 5320 MHz



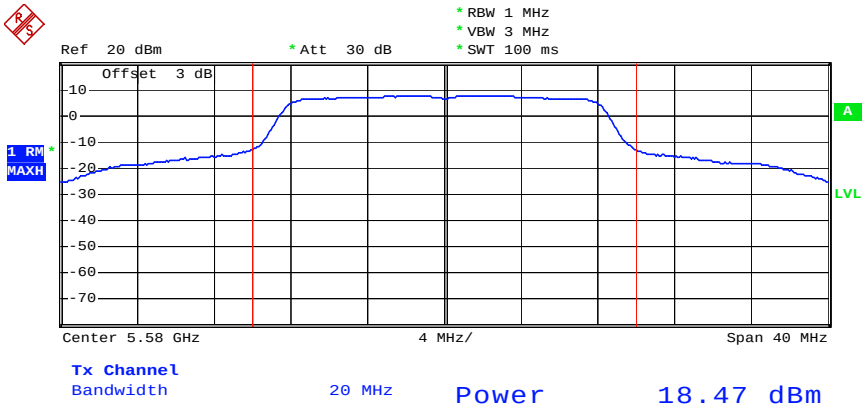
Date: 23.JUL.2009 20:17:35

Channel Output Power Plot on Configuration IEEE 802.11a / 5500 MHz



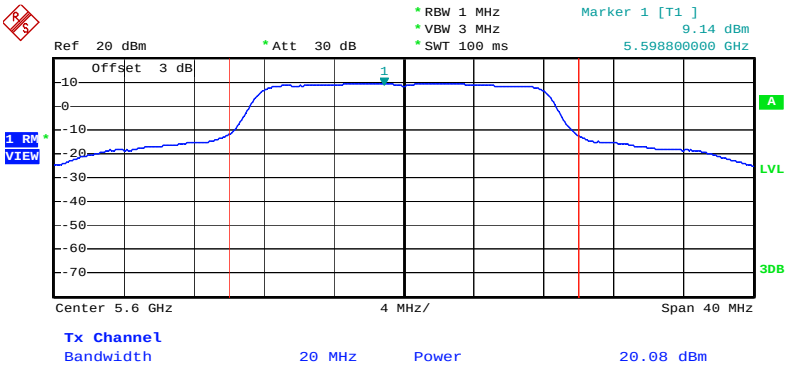
Date: 23.JUL.2009 20:42:05

Channel Output Power Plot on Configuration IEEE 802.11a / 5580 MHz



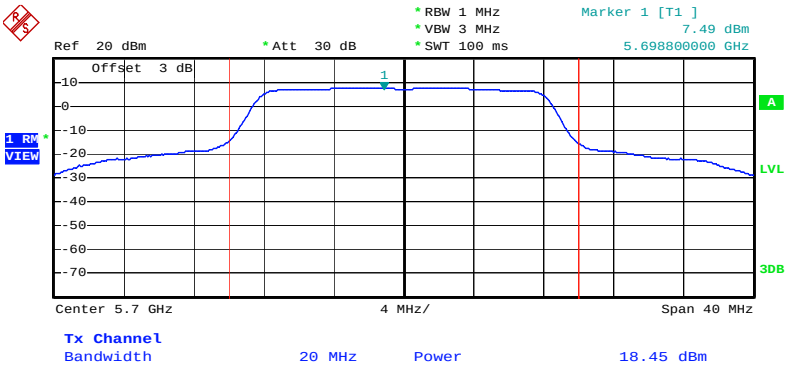
Date: 30.JUL.2009 20:36:51

Channel Output Power Plot on Configuration IEEE 802.11a / 5600 MHz



Date: 23.JUL.2009 20:33:54

Channel Output Power Plot on Configuration IEEE 802.11a / 5700 MHz

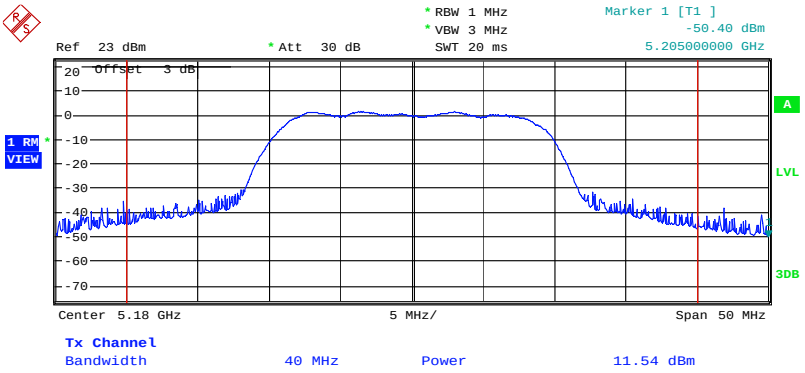


Date: 23.JUL.2009 20:36:16

For Two Chain:

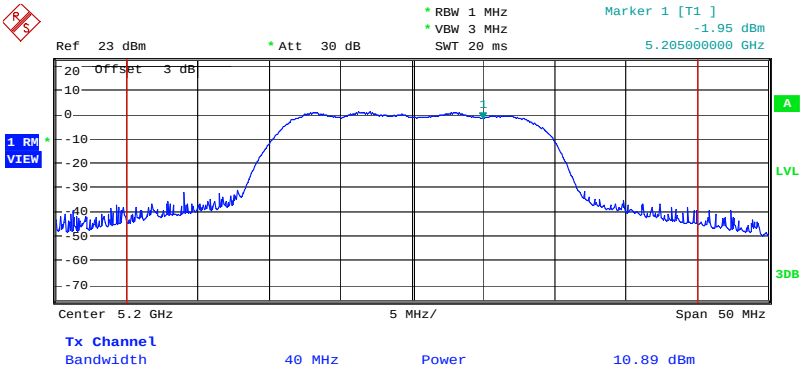
Ant. A

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5180 MHz



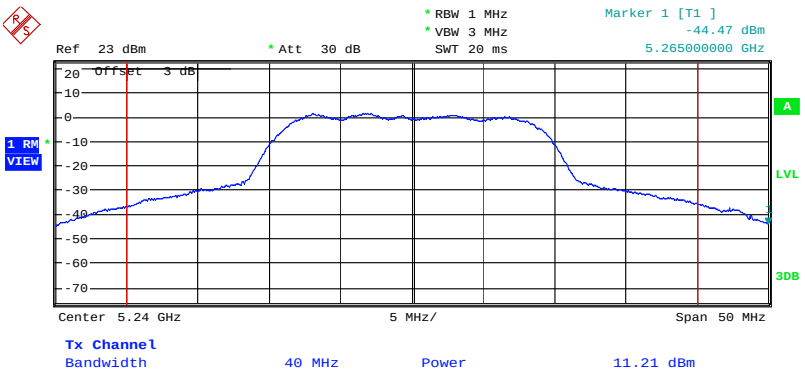
Date: 30.JUL.2009 13:07:22

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5200 MHz



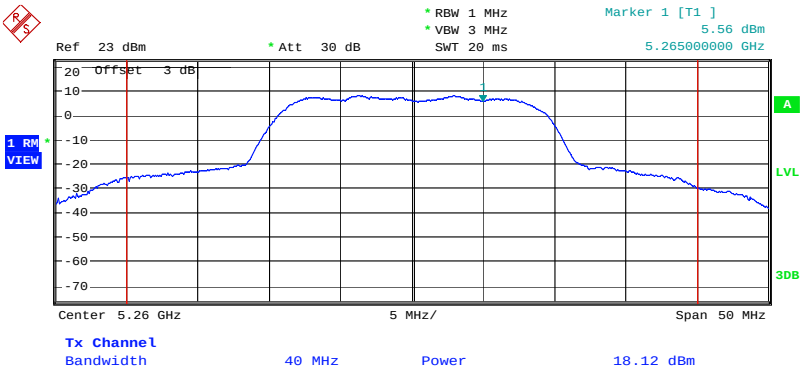
Date: 30.JUL.2009 13:09:16

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5240 MHz



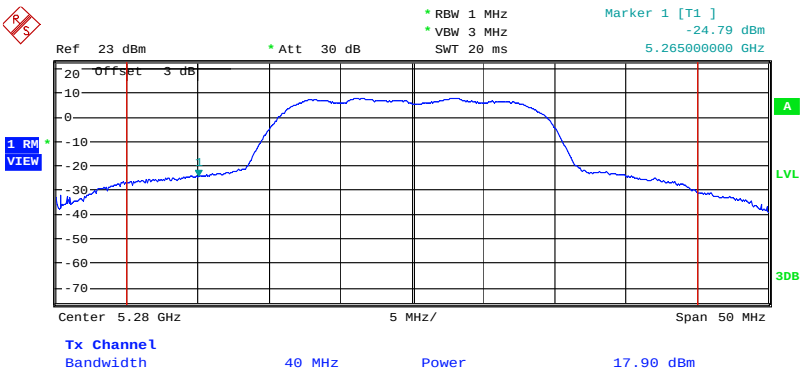
Date: 30.JUL.2009 13:15:27

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5260 MHz



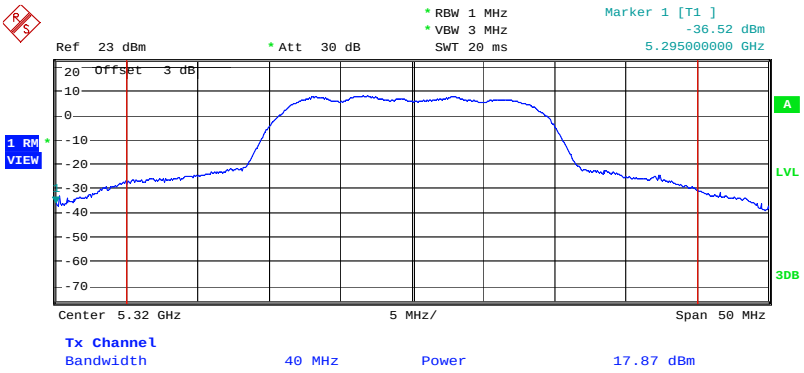
Date: 30.JUL.2009 13:17:10

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5280 MHz



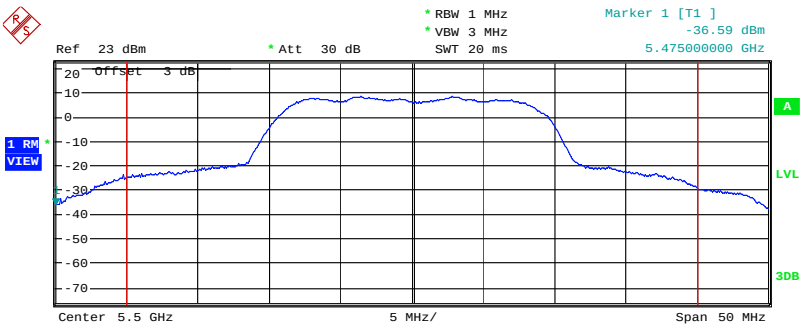
Date: 30.JUL.2009 13:19:04

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5320 MHz



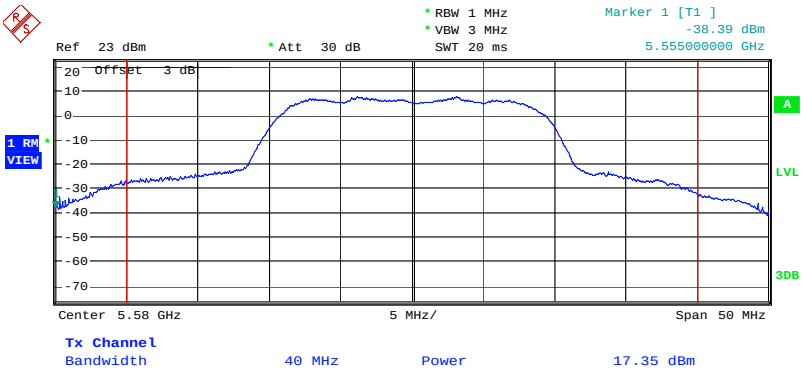
Date: 30.JUL.2009 13:20:29

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5500 MHz



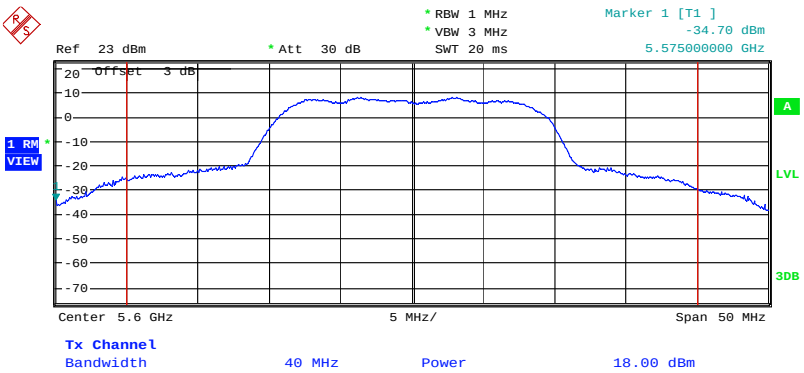
Date: 30.JUL.2009 13:22:42

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5580 MHz



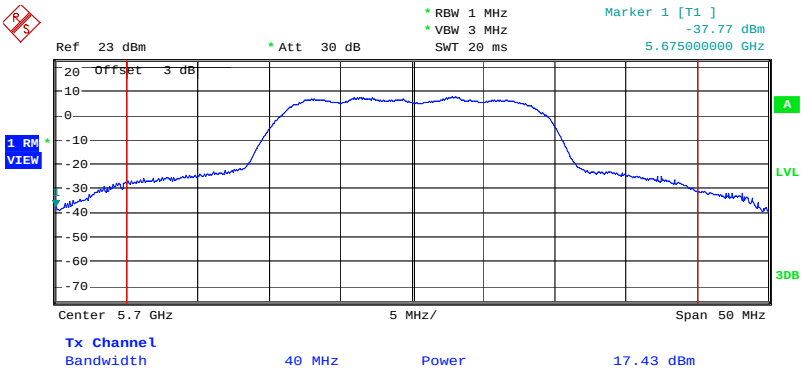
Date: 30.JUL.2009 13:24:00

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5600 MHz



Date: 30.JUL.2009 13:25:10

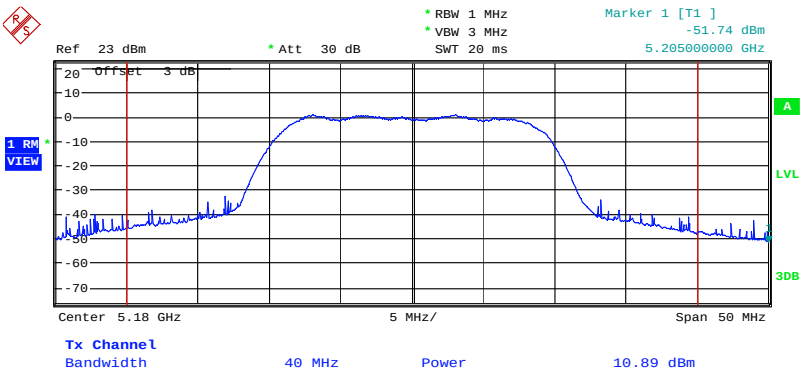
Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5700 MHz



Date: 30.JUL.2009 13:26:42

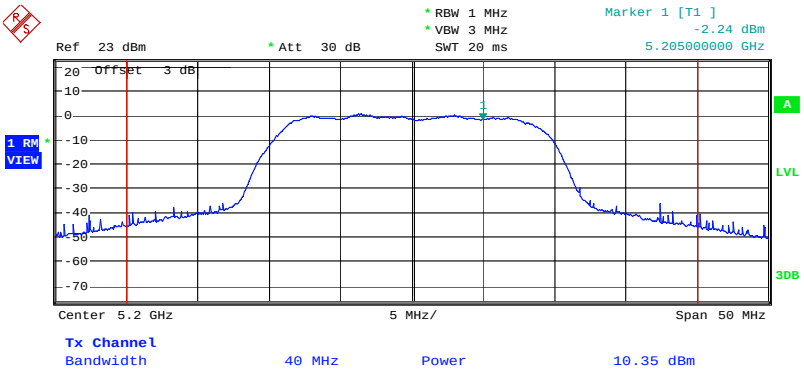
Ant. B

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5180 MHz



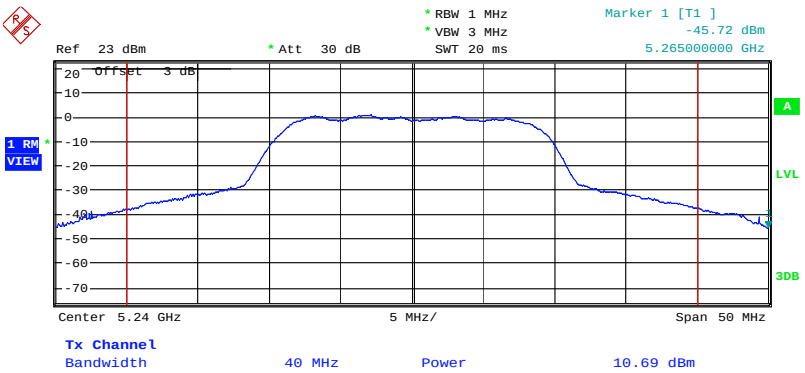
Date: 30.JUL.2009 13:08:10

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5200 MHz



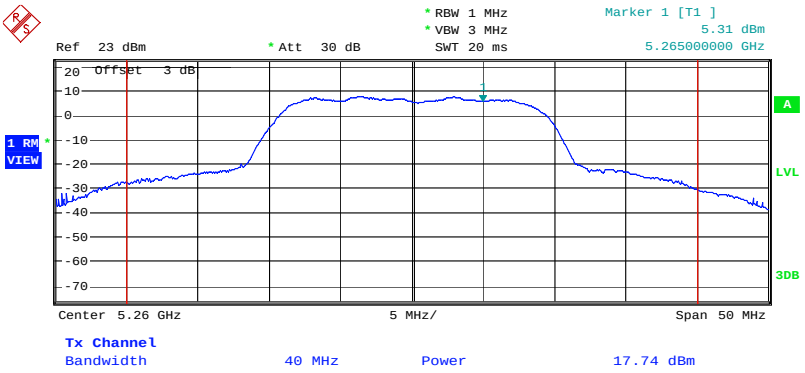
Date: 30.JUL.2009 13:10:01

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5240 MHz



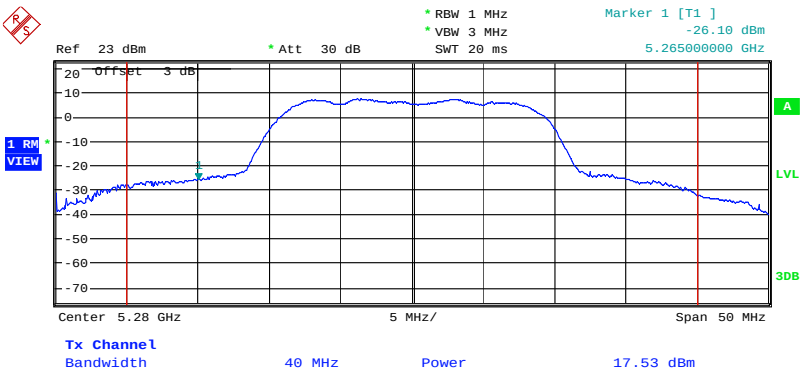
Date: 30.JUL.2009 13:16:27

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5260 MHz



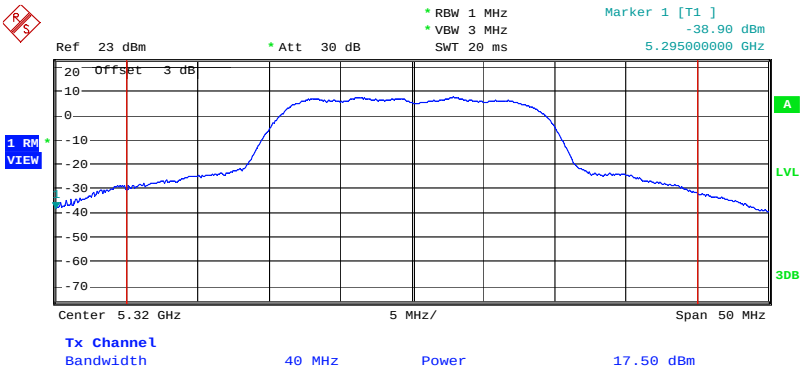
Date: 30.JUL.2009 13:18:04

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5280 MHz



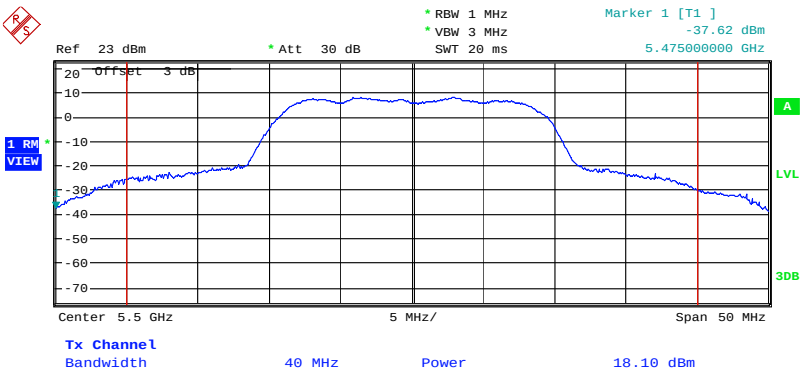
Date: 30.JUL.2009 13:19:28

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5320 MHz



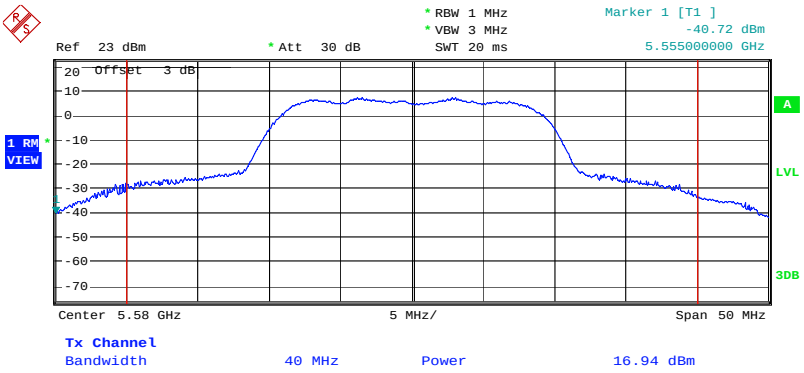
Date: 30.JUL.2009 13:20:53

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5500 MHz



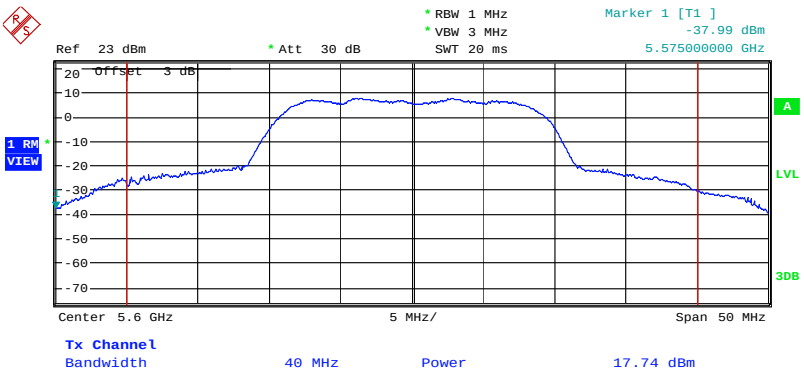
Date: 30.JUL.2009 13:22:58

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5580 MHz



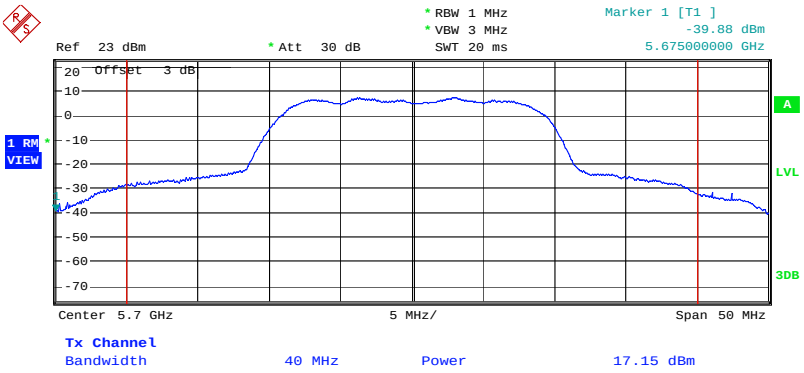
Date: 30.JUL.2009 13:24:27

Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5600 MHz



Date: 30.JUL.2009 13:25:31

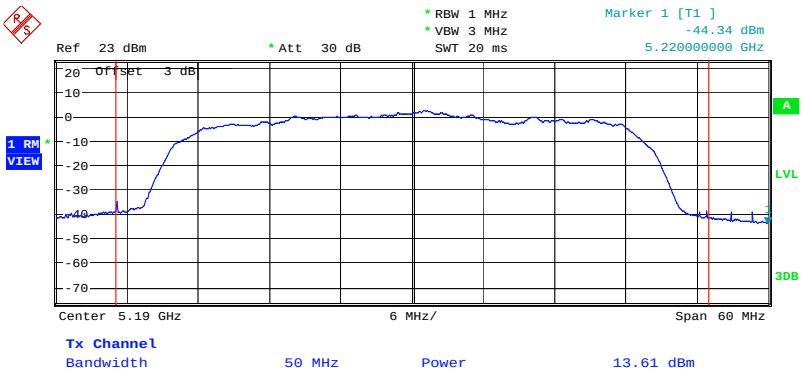
Channel Output Power Plot on Configuration IEEE 802.11n (20MHz) / 5700 MHz



Date: 30.JUL.2009 13:27:11

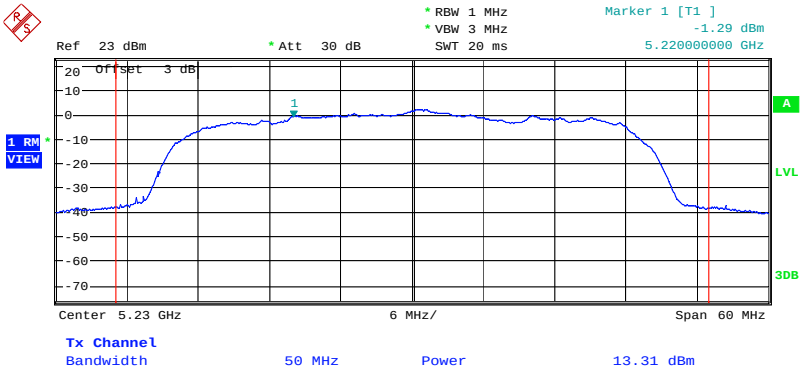
Ant. A

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5190 MHz



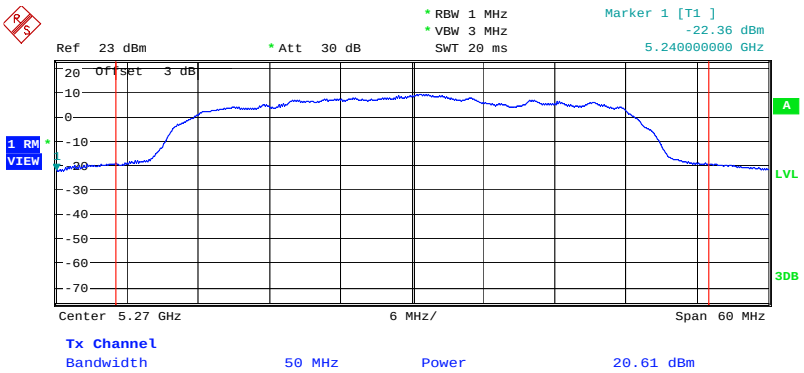
Date: 30.JUL.2009 13:29:38

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5230 MHz



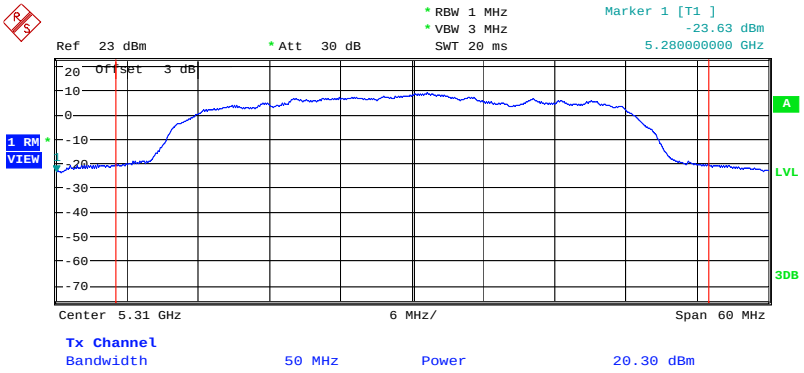
Date: 30.JUL.2009 13:31:18

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5270 MHz



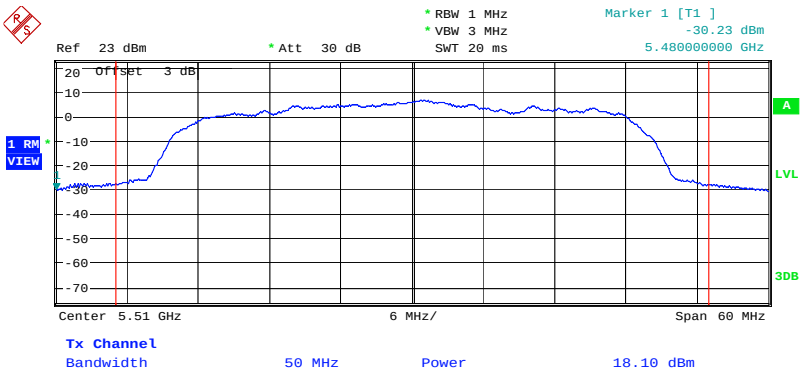
Date: 30.JUL.2009 13:34:33

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5310 MHz



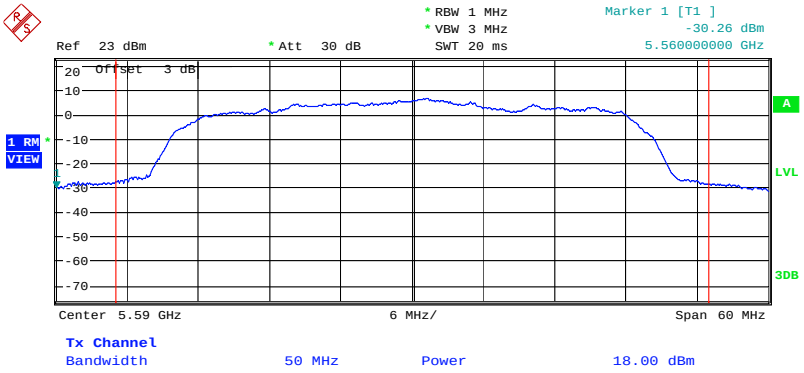
Date: 30.JUL.2009 13:36:14

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5510 MHz



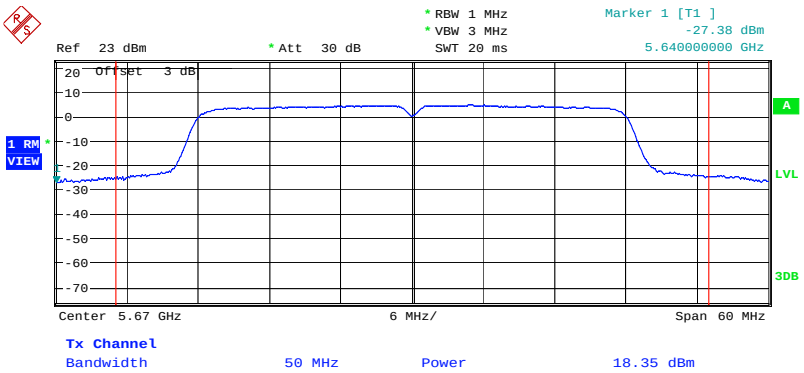
Date: 30.JUL.2009 13:37:32

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5590 MHz



Date: 30.JUL.2009 13:40:16

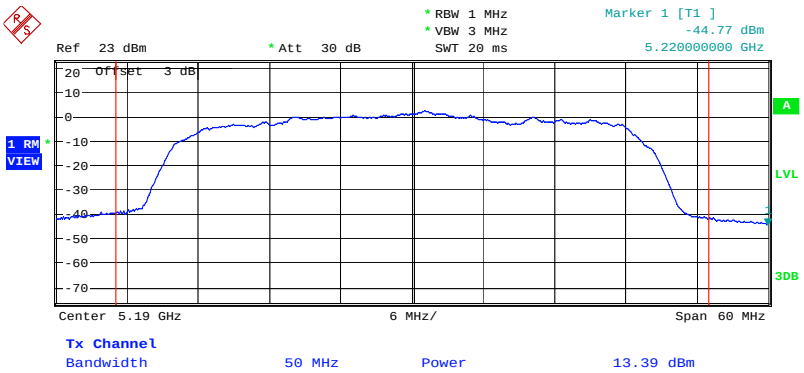
Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5670 MHz



Date: 30.JUL.2009 13:46:23

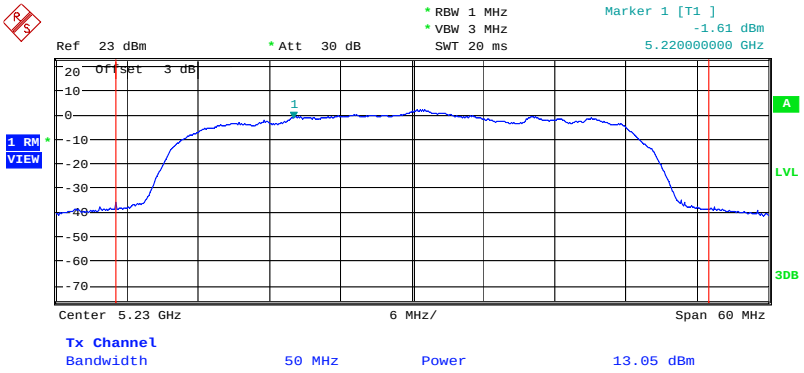
Ant. B

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5190 MHz



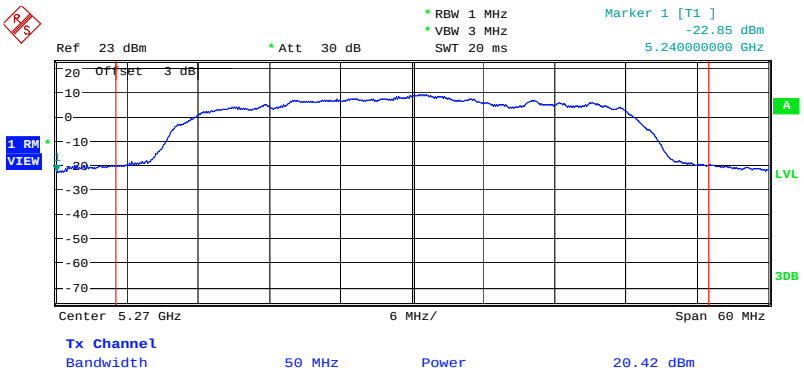
Date: 30.JUL.2009 13:30:15

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5230 MHz



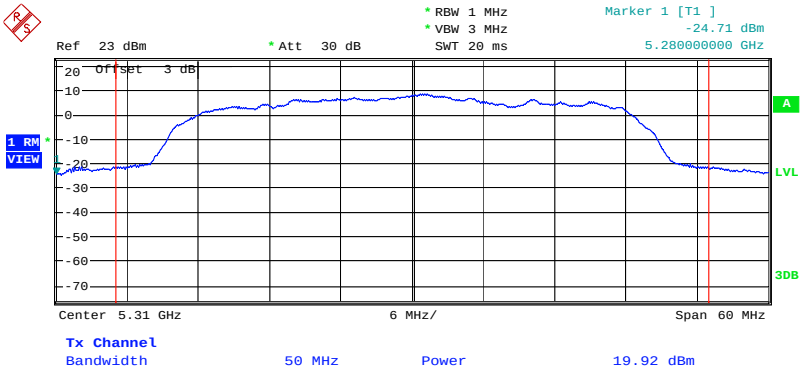
Date: 30.JUL.2009 13:31:35

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5270 MHz



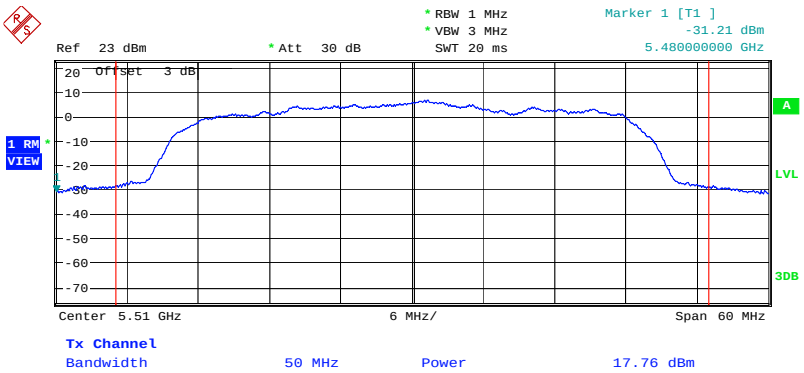
Date: 30.JUL.2009 13:35:21

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5310 MHz



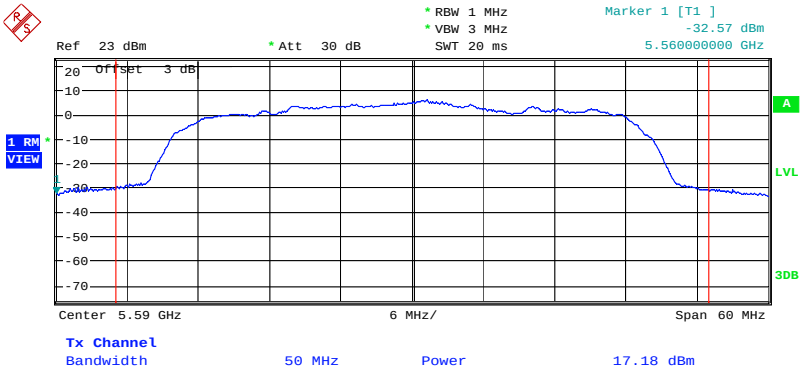
Date: 30.JUL.2009 13:36:44

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5510 MHz



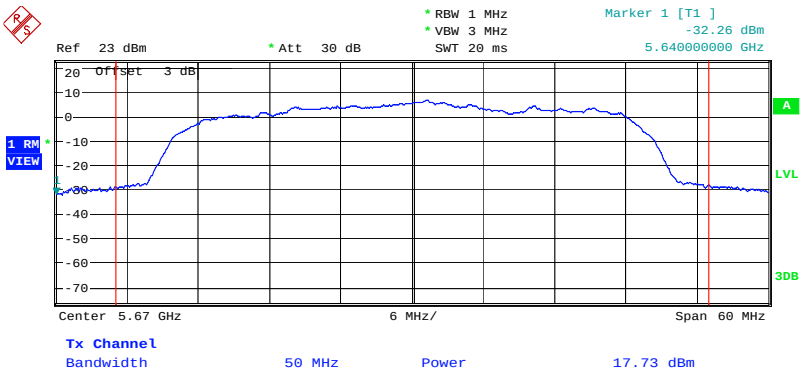
Date: 30.JUL.2009 13:38:08

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5590 MHz



Date: 30.JUL.2009 13:40:36

Channel Output Power Plot on Configuration IEEE 802.11n (40MHz) / 5670 MHz



Date: 30.JUL.2009 13:43:04

3.4 Power Spectral Density Measurement

3.4.1 Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 3.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5.725-5.825	17

3.4.2 Measuring Instruments and Setting

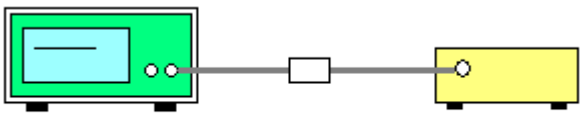
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	Max Hold
Sweep Time	Auto

3.4.3 Test Procedures

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

3.4.4 Test Setup Layout



3.4.5 Test Deviation

There is no deviation with the original standard.

3.4.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.4.7 Test Result of Power Spectral Density

Final Test date	Jul. 30, 2009	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Duncan	**Configuration**	802.11a/n

For Single Chain:

Configuration of IEEE 802.11a

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	3.83	4.00	**Complies**
5200 MHz	3.69	4.00	**Complies**
5240 MHz	3.20	4.00	**Complies**
5260 MHz	10.94	11.00	**Complies**
5280 MHz	10.36	11.00	**Complies**
5320 MHz	9.63	11.00	**Complies**
5500 MHz	8.78	11.00	**Complies**
5580 MHz	8.32	11.00	**Complies**
5600 MHz	9.51	11.00	**Complies**
5700 MHz	7.81	11.00	**Complies**

For Two Chain:

Configuration IEEE 802.11n (20MHz)

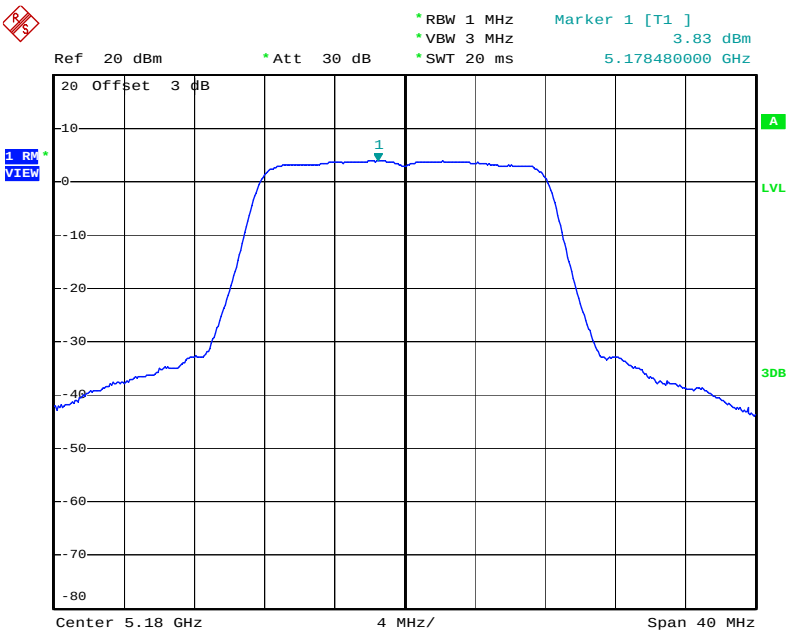
Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	3.78	4.00	**Complies**
5200 MHz	3.33	4.00	**Complies**
5240 MHz	3.72	4.00	**Complies**
5260 MHz	10.52	11.00	**Complies**
5280 MHz	10.31	11.00	**Complies**
5320 MHz	10.10	11.00	**Complies**
5500 MHz	10.76	11.00	**Complies**
5580 MHz	10.18	11.00	**Complies**
5600 MHz	10.24	11.00	**Complies**
5700 MHz	9.85	11.00	**Complies**

Configuration IEEE 802.11n (40MHz)

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5190 MHz	3.14	4.00	**Complies**
5230 MHz	2.91	4.00	**Complies**
5270 MHz	9.90	11.00	**Complies**
5310 MHz	9.57	11.00	**Complies**
5510 MHz	8.81	11.00	**Complies**
5590 MHz	7.22	11.00	**Complies**
5670 MHz	7.30	11.00	**Complies**

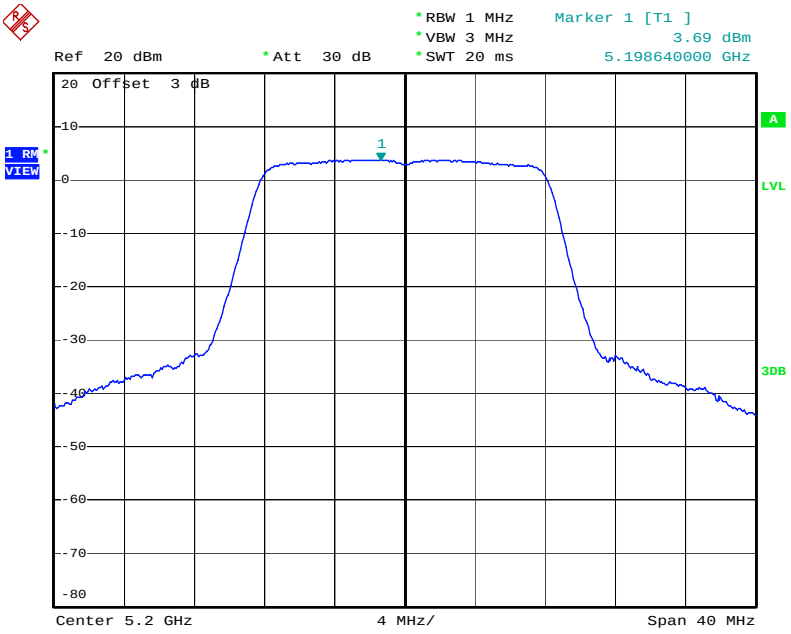
For Single Chain:

Power Density Plot on Configuration IEEE 802.11a / 5180 MHz



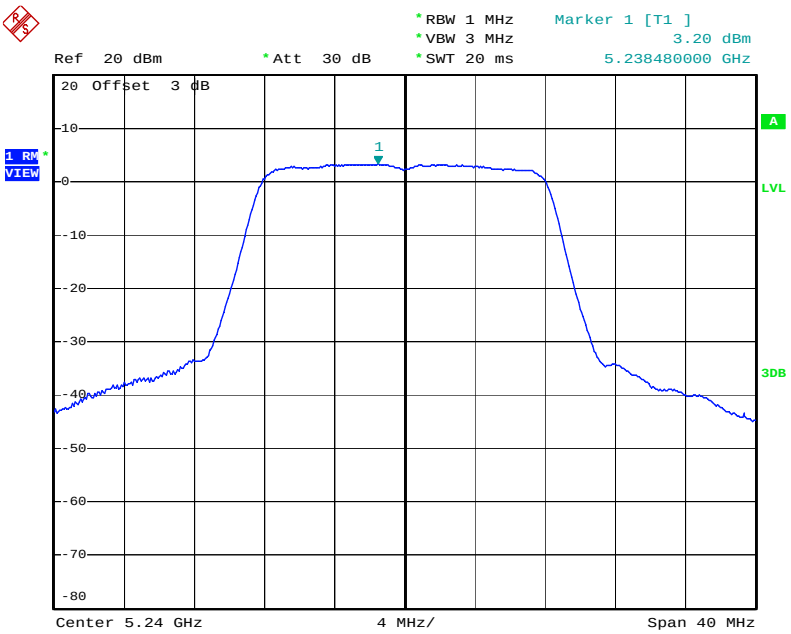
Date: 23.JUL.2009 20:23:47

Power Density Plot on Configuration IEEE 802.11a / 5200 MHz



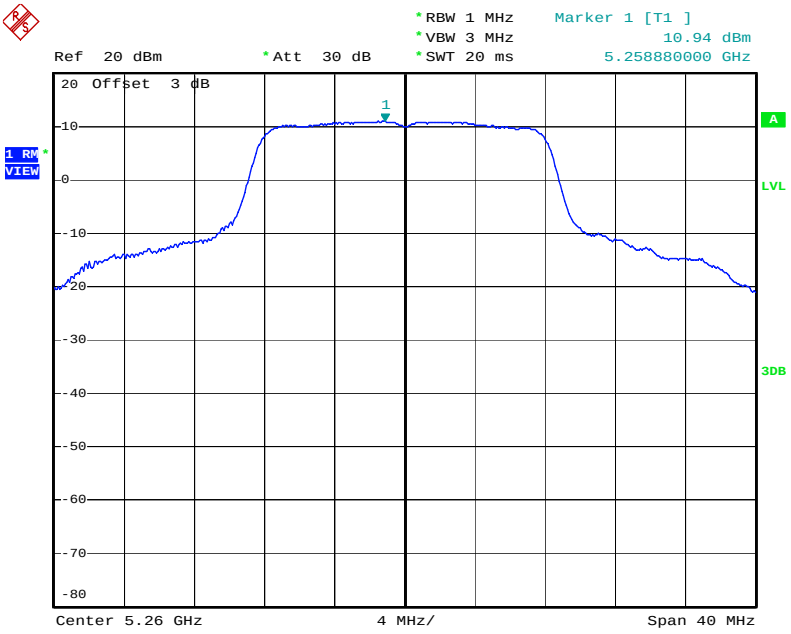
Date: 23.JUL.2009 20:24:55

Power Density Plot on Configuration IEEE 802.11a / 5240 MHz



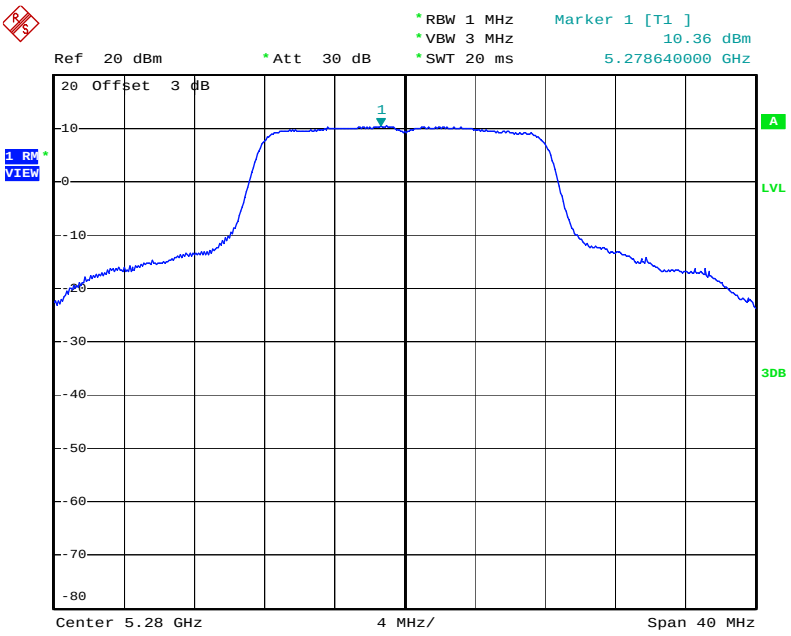
Date: 23.JUL.2009 20:26:31

Power Density Plot on Configuration IEEE 802.11a / 5260 MHz



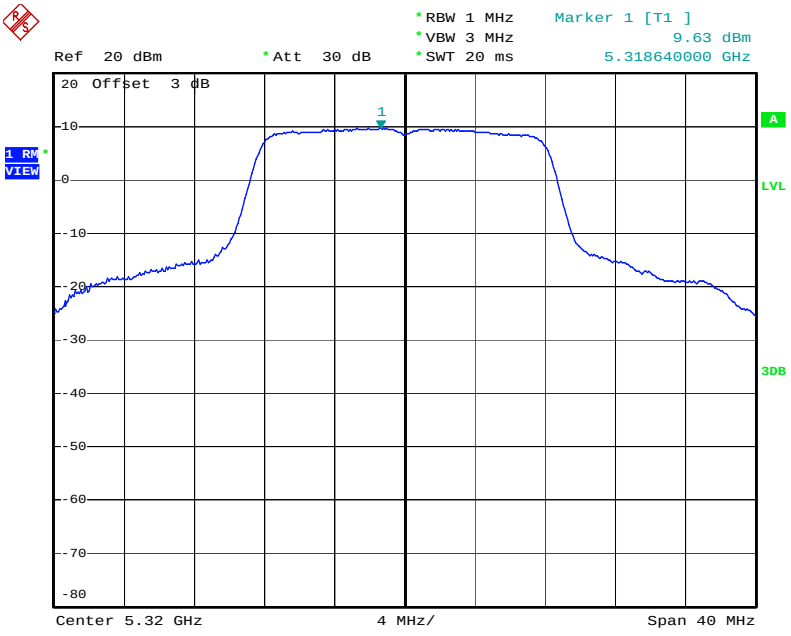
Date: 23.JUL.2009 20:10:40

Power Density Plot on Configuration IEEE 802.11a / 5280 MHz



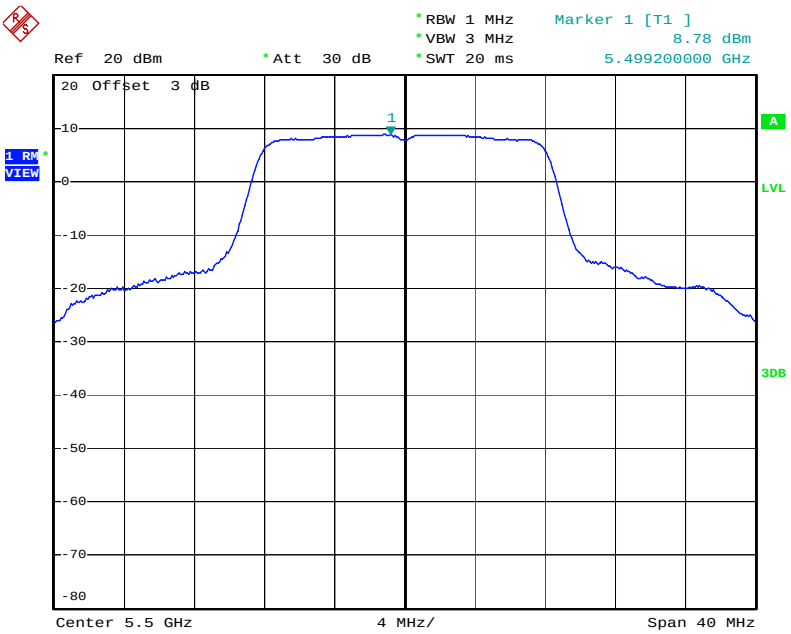
Date: 23.JUL.2009 20:13:52

Power Density Plot on Configuration IEEE 802.11a / 5320 MHz



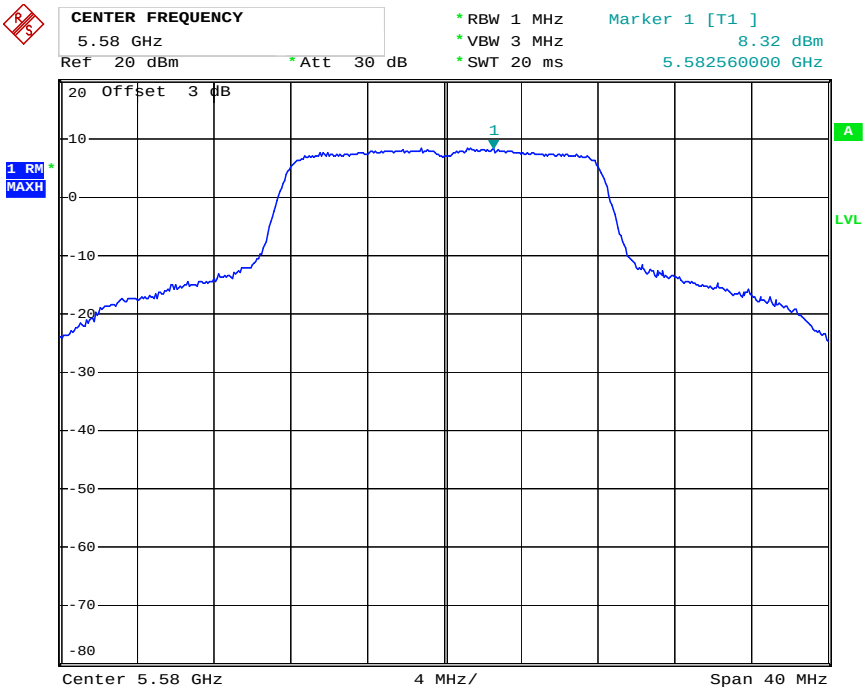
Date: 23.JUL.2009 20:17:43

Power Density Plot on Configuration IEEE 802.11a / 5500 MHz



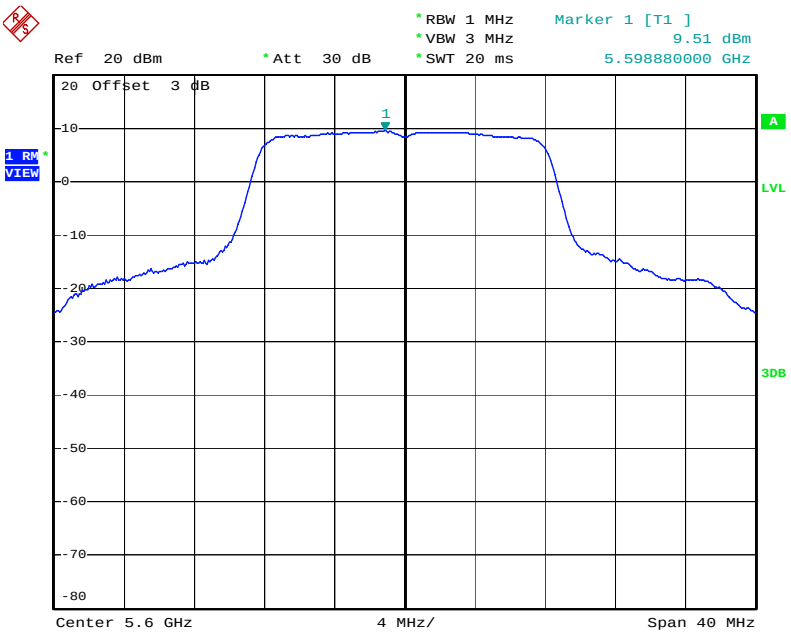
Date: 23.JUL.2009 20:42:13

Power Density Plot on Configuration IEEE 802.11a / 5580 MHz



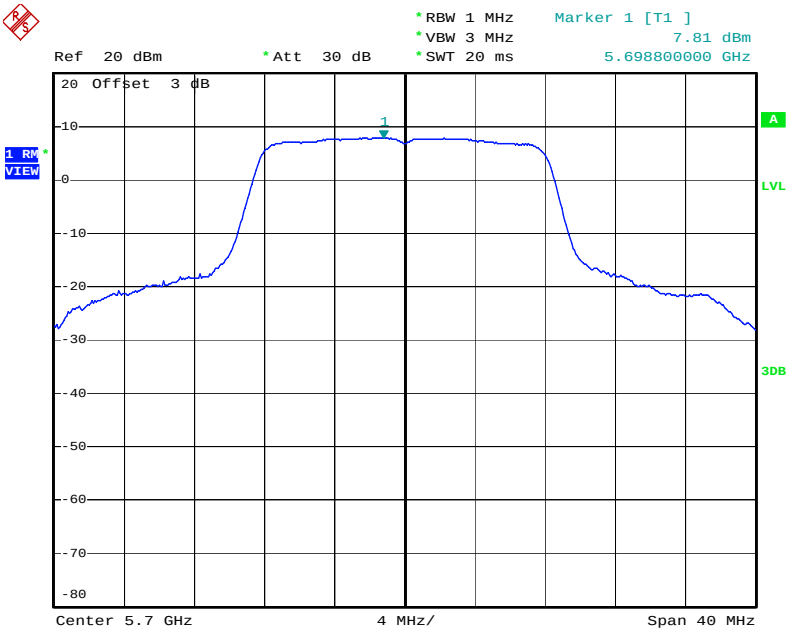
Date: 30.JUL.2009 20:41:49

Power Density Plot on Configuration IEEE 802.11a / 5600 MHz



Date: 23.JUL.2009 20:34:02

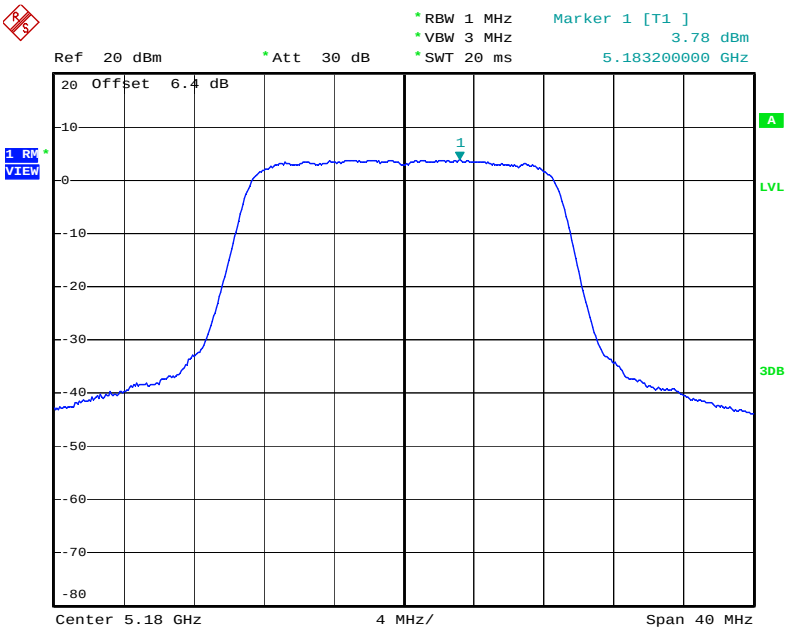
Power Density Plot on Configuration IEEE 802.11a / 5700 MHz



Date: 23.JUL.2009 20:36:24

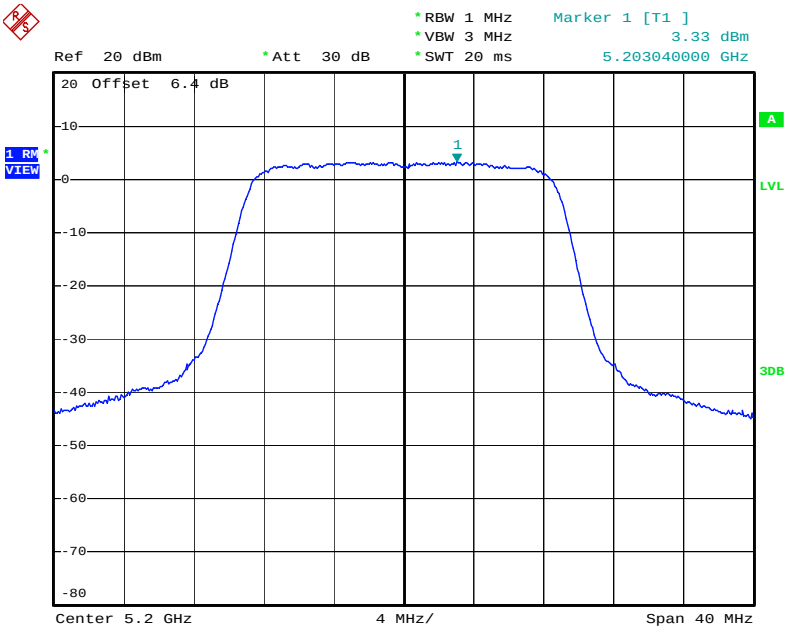
For Two Chain:

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5180 MHz



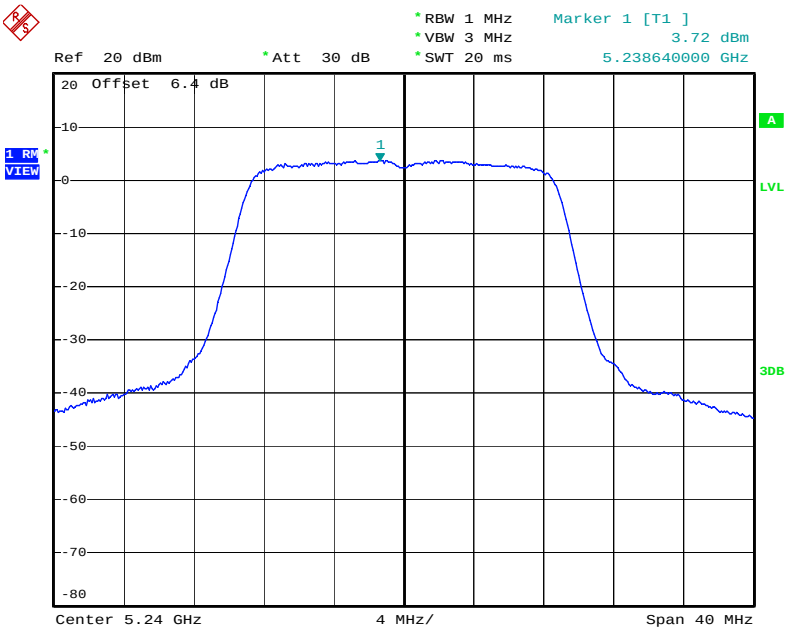
Date: 23.JUL.2009 21:29:50

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5200 MHz



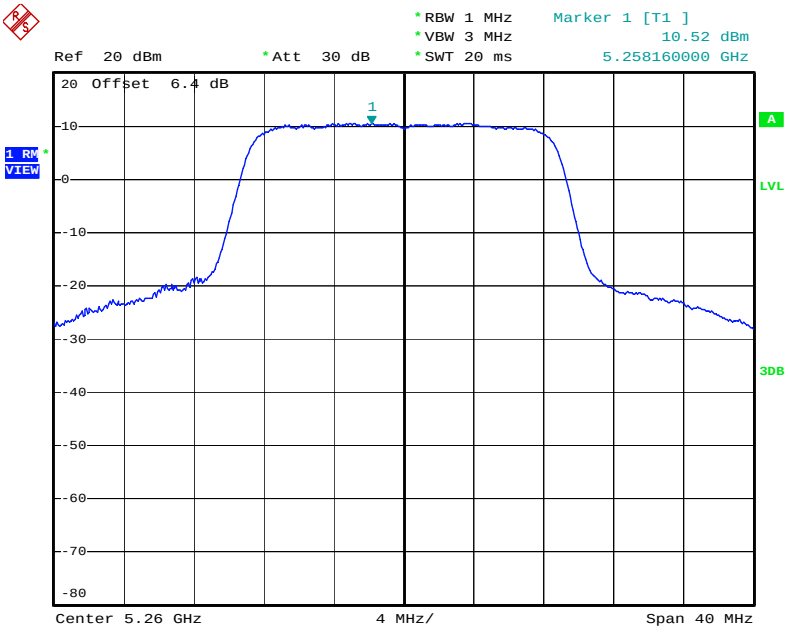
Date: 23.JUL.2009 21:31:51

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5240 MHz



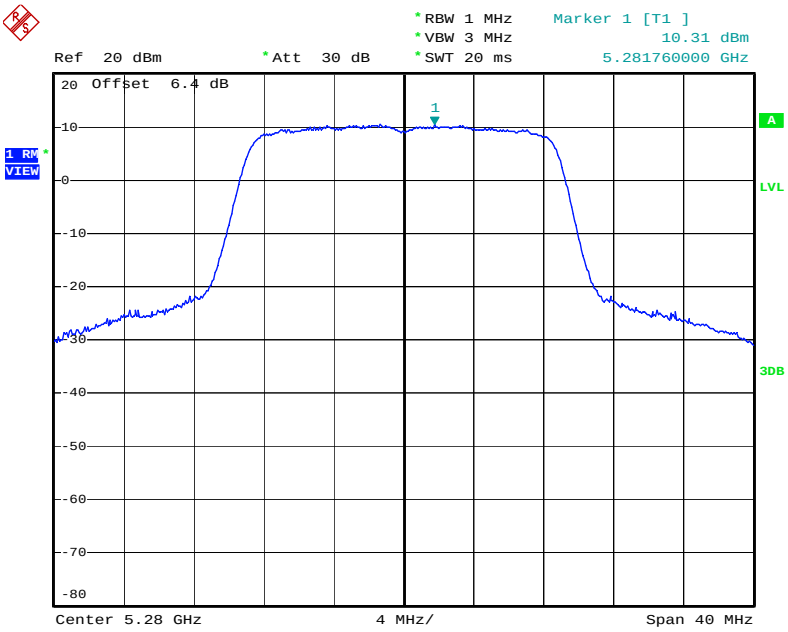
Date: 23.JUL.2009 21:34:08

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5260 MHz



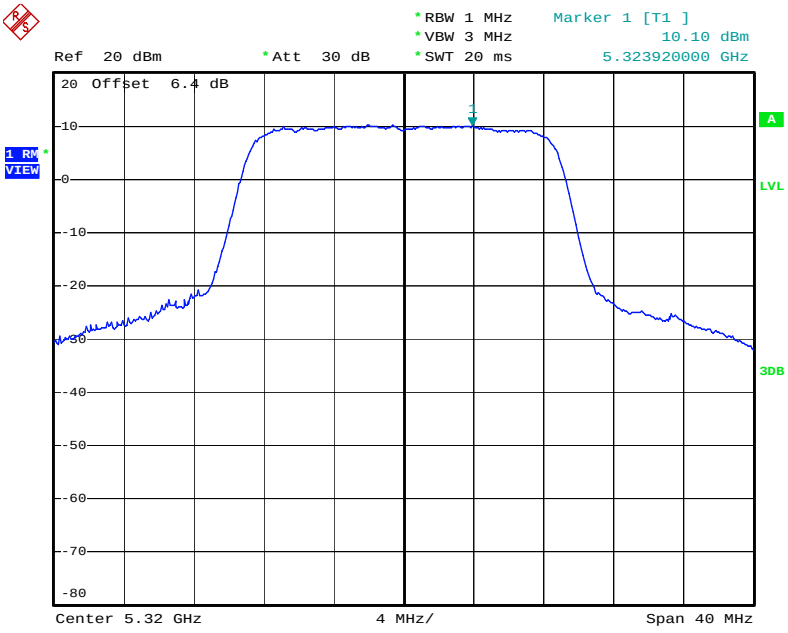
Date: 23.JUL.2009 21:39:12

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5280 MHz



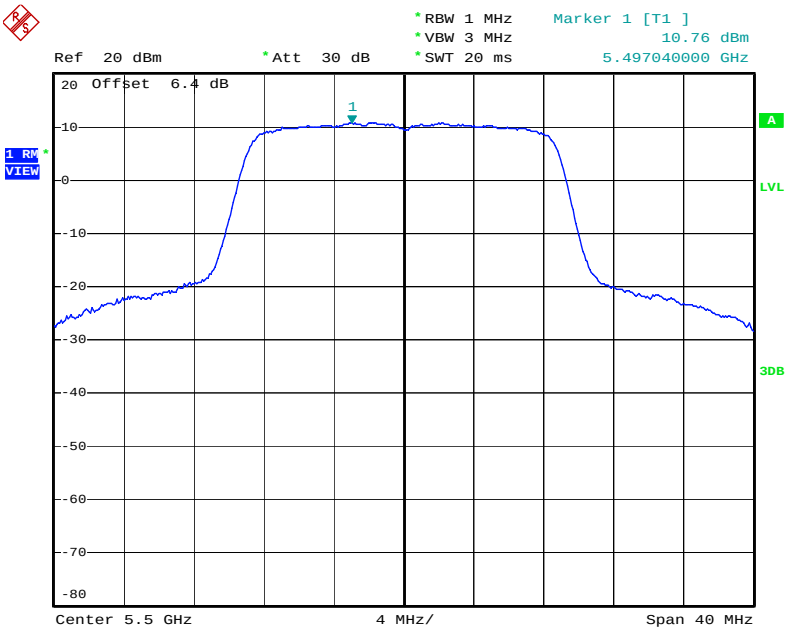
Date: 23.JUL.2009 21:41:10

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5320 MHz

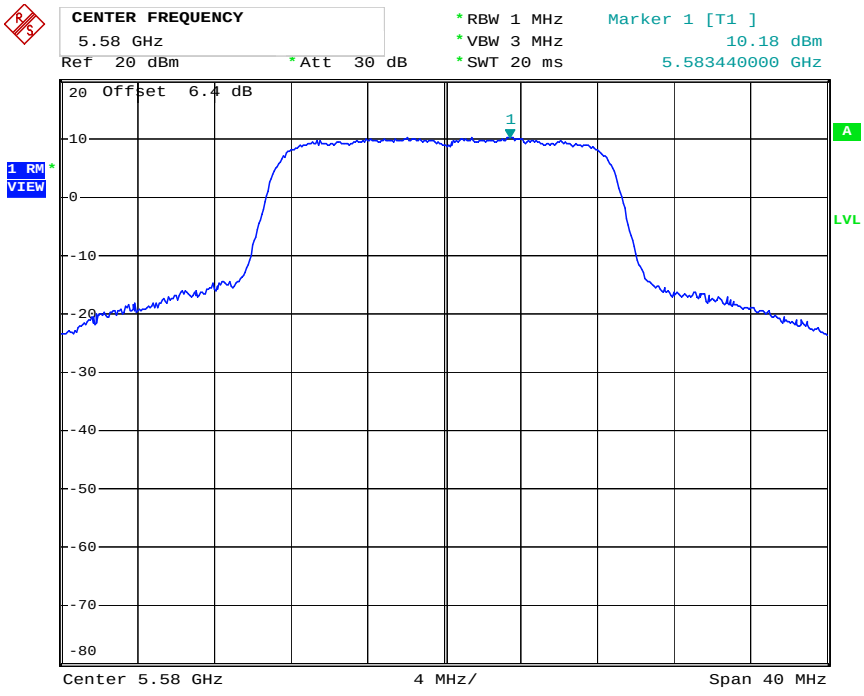


Date: 23.JUL.2009 21:42:46

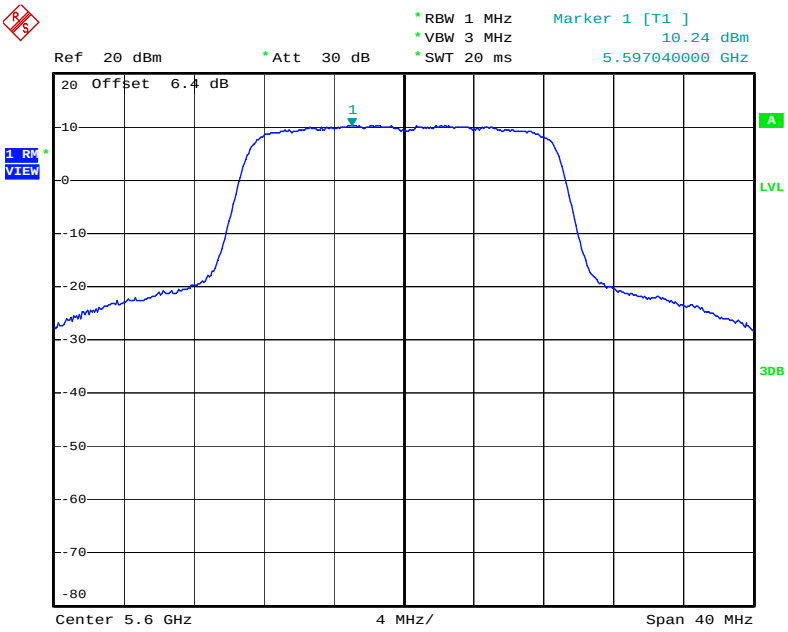
Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5500 MHz



Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5580 MHz

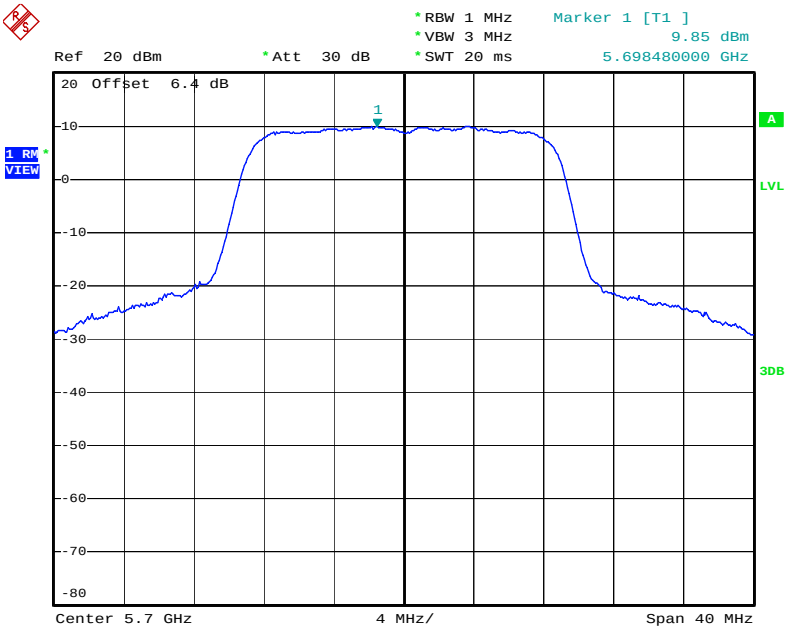


Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5600 MHz



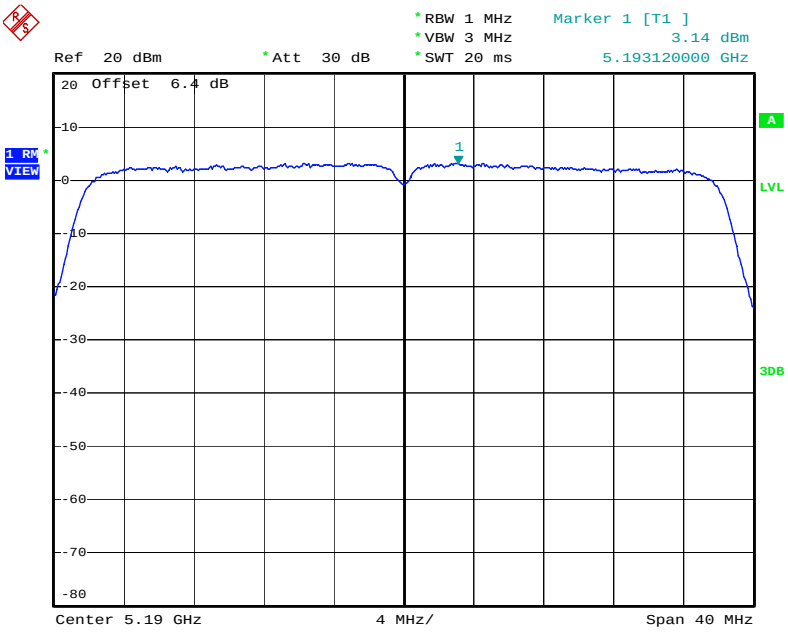
Date: 23.JUL.2009 21:51:01

Power Density Plot on Configuration IEEE 802.11n (20MHz) / 5700 MHz



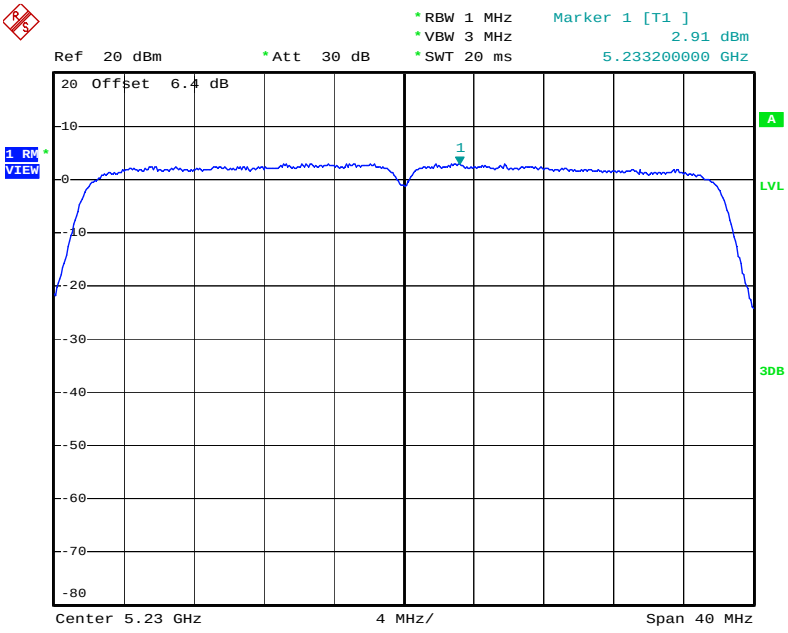
Date: 23.JUL.2009 21:52:45

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5190 MHz



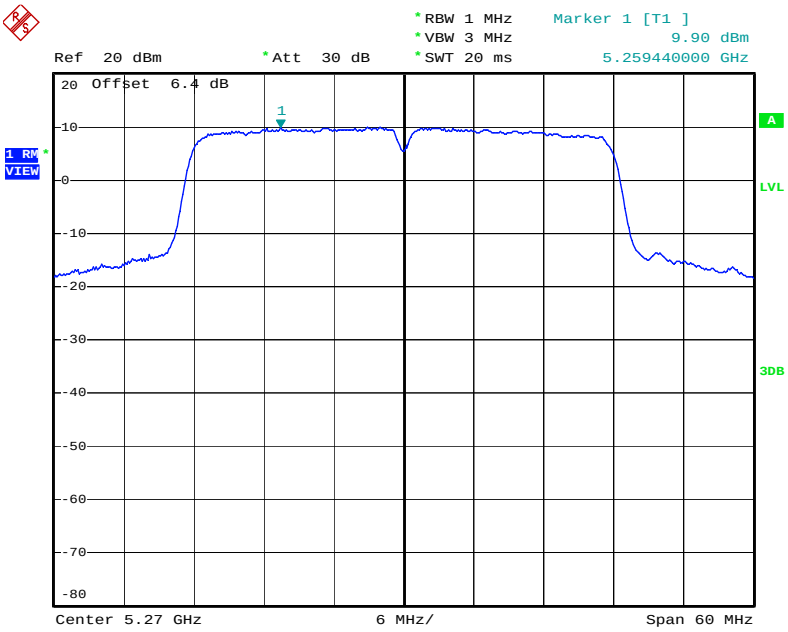
Date: 23.JUL.2009 22:16:36

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5230 MHz



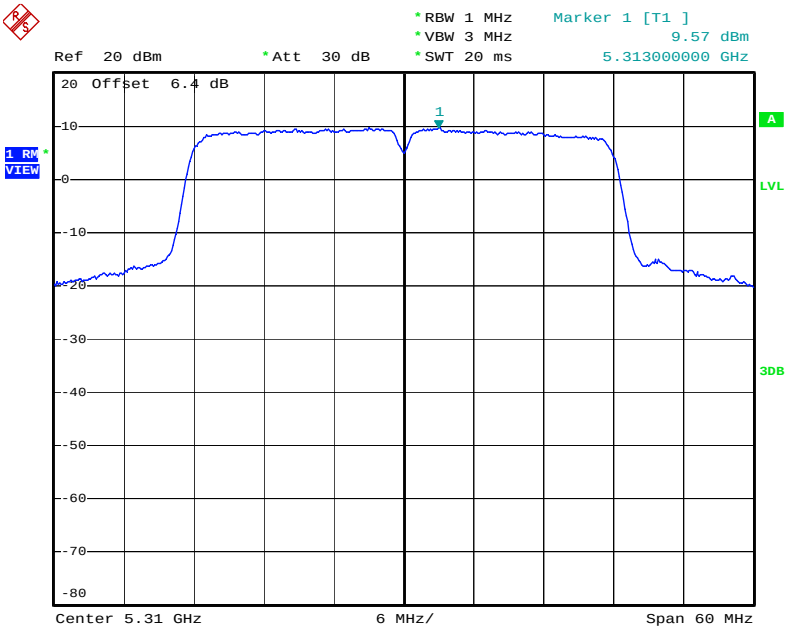
Date: 23.JUL.2009 22:21:12

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5270 MHz



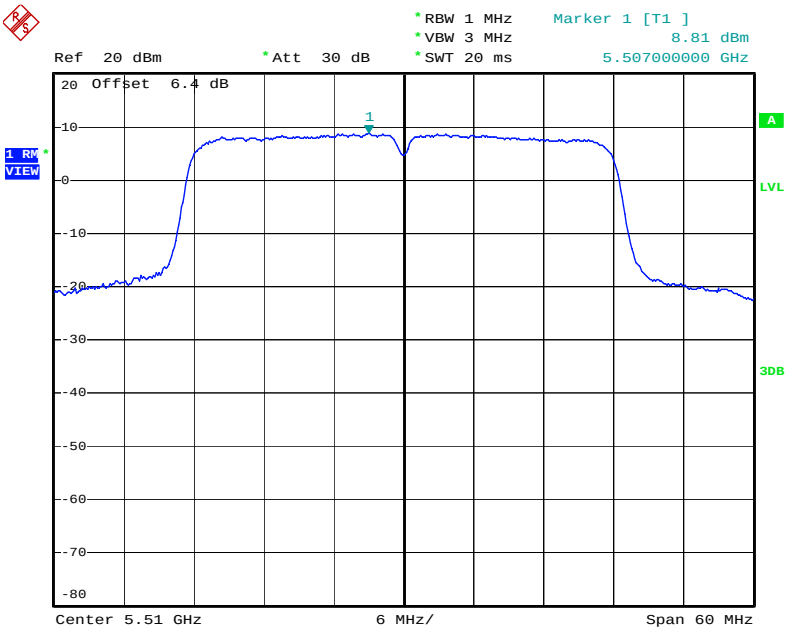
Date: 23.JUL.2009 22:25:31

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5310 MHz



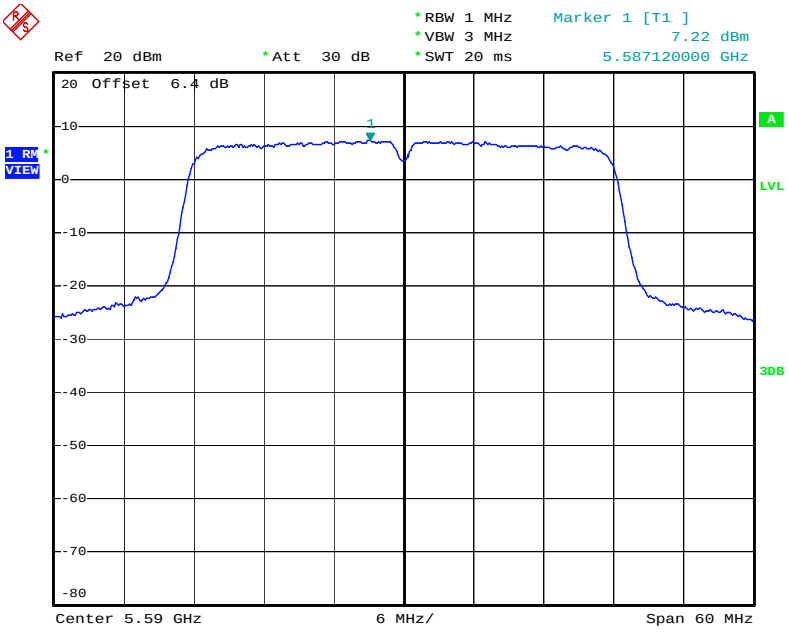
Date: 23.JUL.2009 22:28:23

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5510 MHz



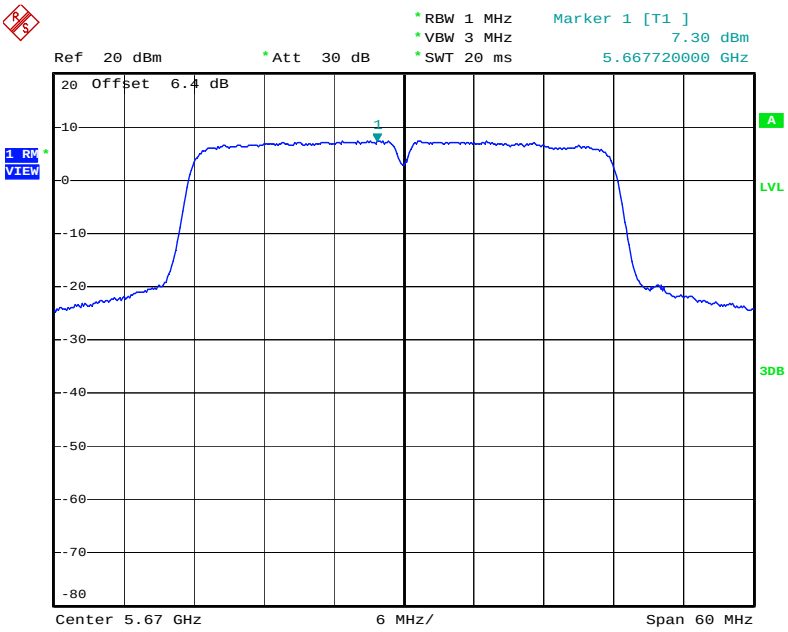
Date: 23.JUL.2009 22:34:33

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5590 MHz



Date: 23.JUL.2009 22:39:13

Power Density Plot on Configuration IEEE 802.11n (40MHz) / 5670 MHz



Date: 23.JUL.2009 22:41:38

3.5 Peak Excursion Measurement

3.5.1 Limit

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

3.5.2 Measuring Instruments and Setting

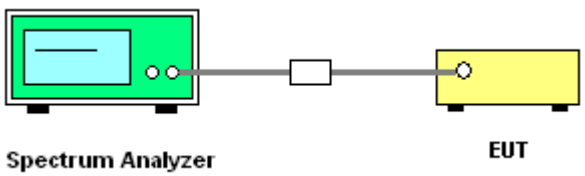
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

3.5.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emissions bandwidth. The largest difference between the following two traces (Peak Trace and Average Trace) must be ≤ 13 dB for all frequencies across the emissions bandwidth. Submit a plot.
3. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and max-hold settings.
4. Average Trace: Method #3—video averaging with max hold--and sum power across the band. Set span to encompass the entire emissions bandwidth (EBW) of the signal. Set sweep trigger to “free run”. Set RBW = 1 MHz. Set VBW ≥ 1/T (IEEE 802.11a VBW = 300kHz ≥ 1/4μs). Use Davidple detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode. Set max hold. Allow max hold to run for 60 seconds.
5. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula.

3.5.4 Test Setup Layout



3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.5.7 Test Result of Peak Excursion

Final Test date	Jul. 30, 2008	**Test Site No.**	TH01-HY
Temperature	26℃	**Humidity**	56%
Test Engineer	Duncan	**Configuration**	802.11a/n

For Single Chain:

Configuration of IEEE 802.11a

Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5180 MHz	9.02	13	**Complies**
5200 MHz	8.99	13	**Complies**
5240 MHz	9.02	13	**Complies**
5260 MHz	8.83	13	**Complies**
5280 MHz	8.80	13	**Complies**
5320 MHz	8.87	13	**Complies**
5500 MHz	8.88	13	**Complies**
5580 MHz	8.91	13	**Complies**
5600 MHz	8.84	13	**Complies**
5700 MHz	8.90	13	**Complies**

For Two Chain:

Configuration IEEE 802.11n (20MHz)

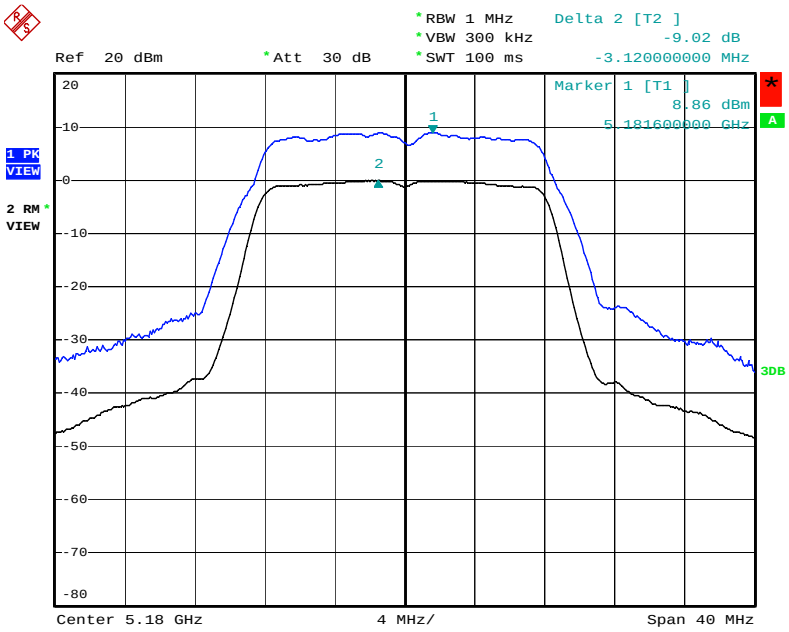
Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5180 MHz	10.25	13	**Complies**
5200 MHz	10.10	13	**Complies**
5240 MHz	9.77	13	**Complies**
5260 MHz	9.93	13	**Complies**
5280 MHz	9.63	13	**Complies**
5320 MHz	9.91	13	**Complies**
5500 MHz	9.56	13	**Complies**
5580 MHz	10.38	13	**Complies**
5600 MHz	9.66	13	**Complies**
5700 MHz	10.23	13	**Complies**

Configuration IEEE 802.11n (40MHz)

Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
5190 MHz	9.59	13	**Complies**
5230 MHz	9.58	13	**Complies**
5270 MHz	9.79	13	**Complies**
5310 MHz	9.75	13	**Complies**
5510 MHz	9.77	13	**Complies**
5590 MHz	10.02	13	**Complies**
5670 MHz	9.91	13	**Complies**

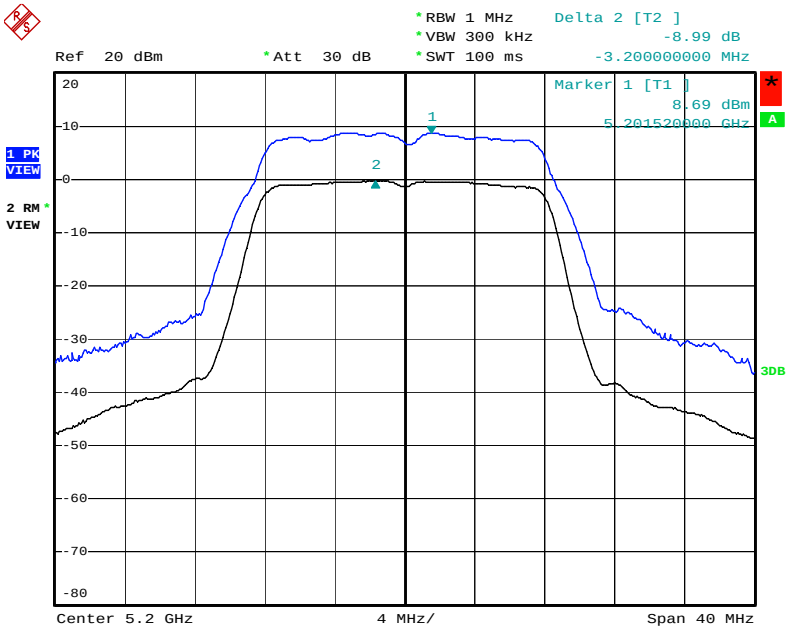
For Single Chain:

Peak Excursion Plot on Configuration IEEE 802.11a / 5180 MHz



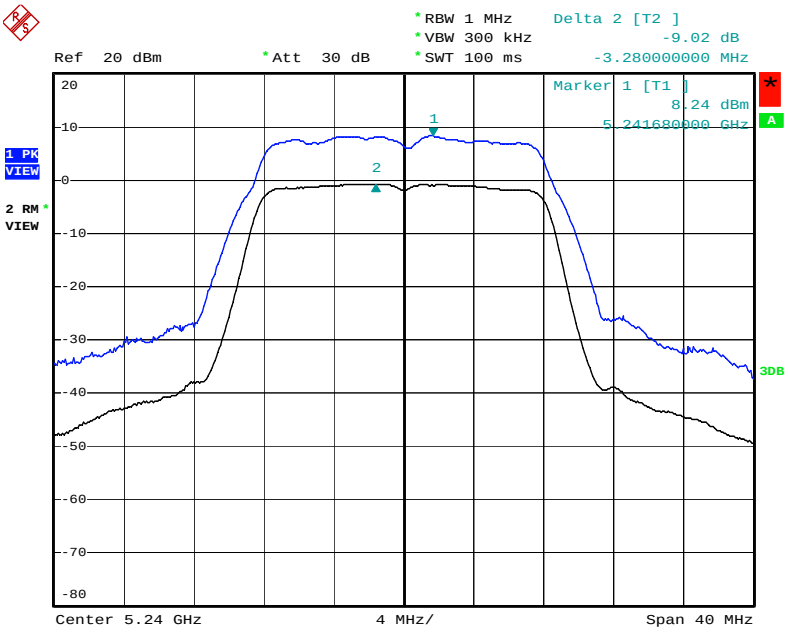
Date: 23.JUL.2009 20:24:08

Peak Excursion Plot on Configuration IEEE 802.11a / 5200 MHz



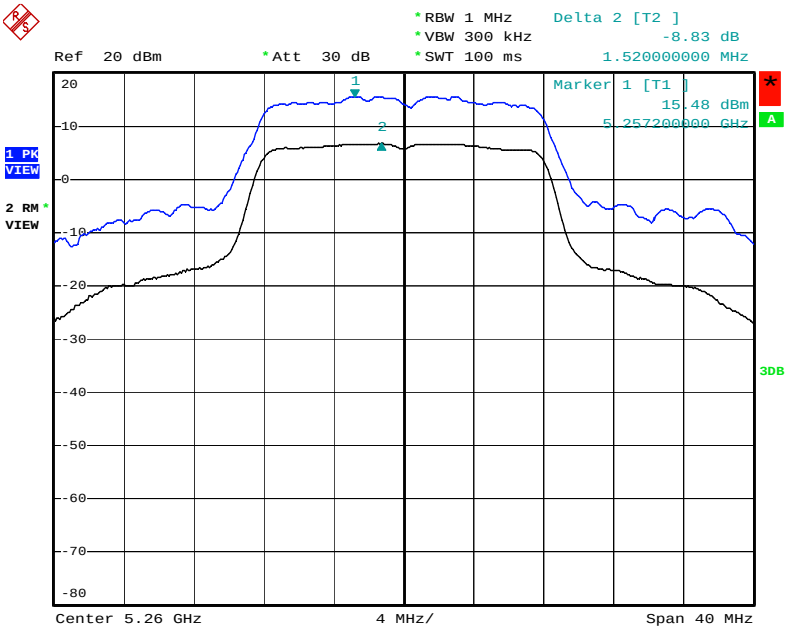
Date: 23.JUL.2009 20:25:16

Peak Excursion Plot on Configuration IEEE 802.11a / 5240 MHz



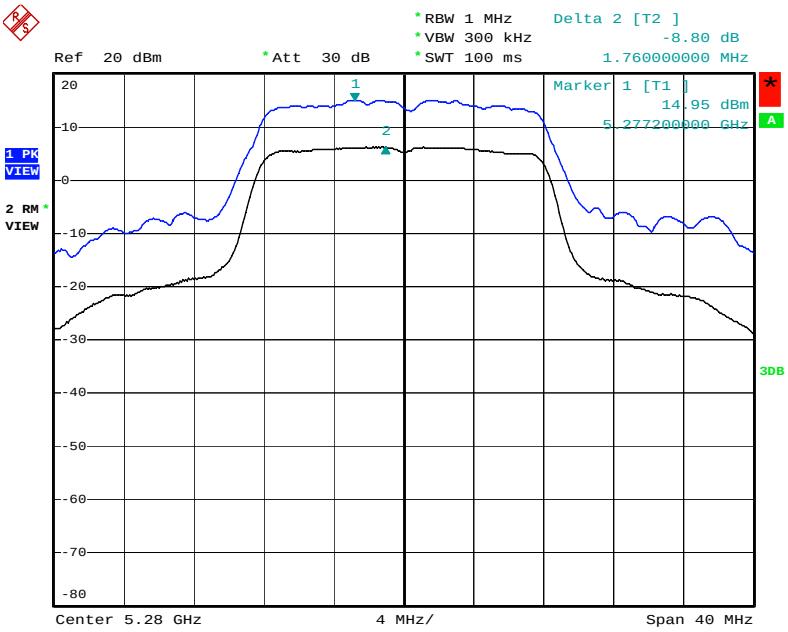
Date: 23.JUL.2009 20:26:53

Peak Excursion Plot on Configuration IEEE 802.11a / 5260 MHz



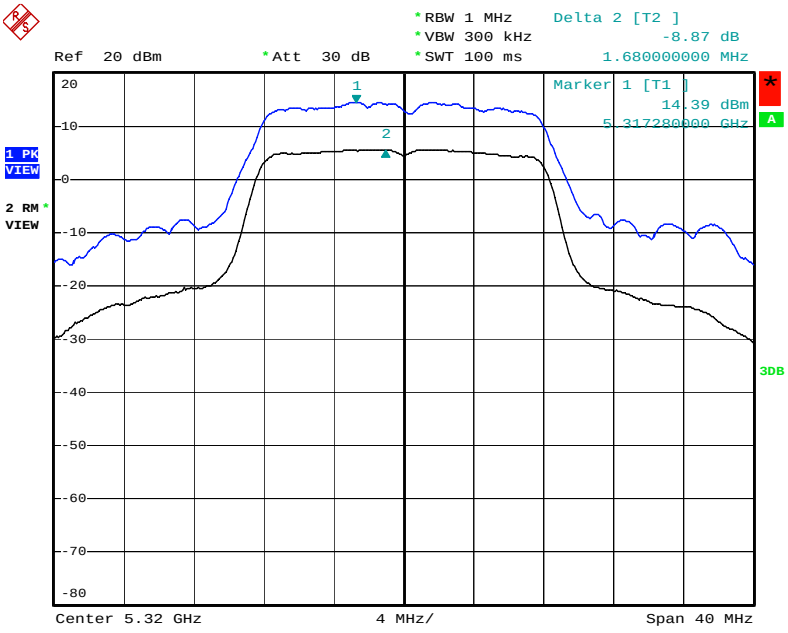
Date: 23.JUL.2009 20:11:02

Peak Excursion Plot on Configuration IEEE 802.11a / 5280 MHz



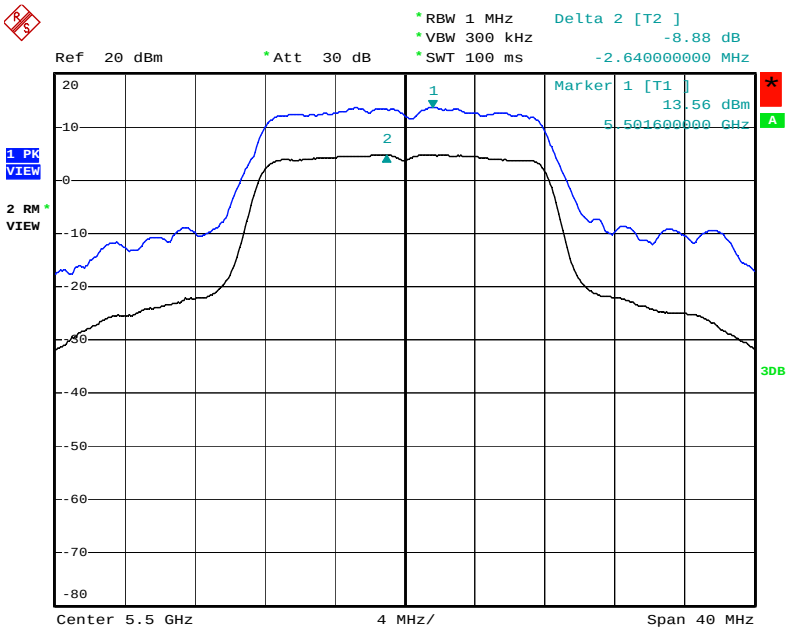
Date: 23.JUL.2009 20:14:13

Peak Excursion Plot on Configuration IEEE 802.11a / 5320 MHz



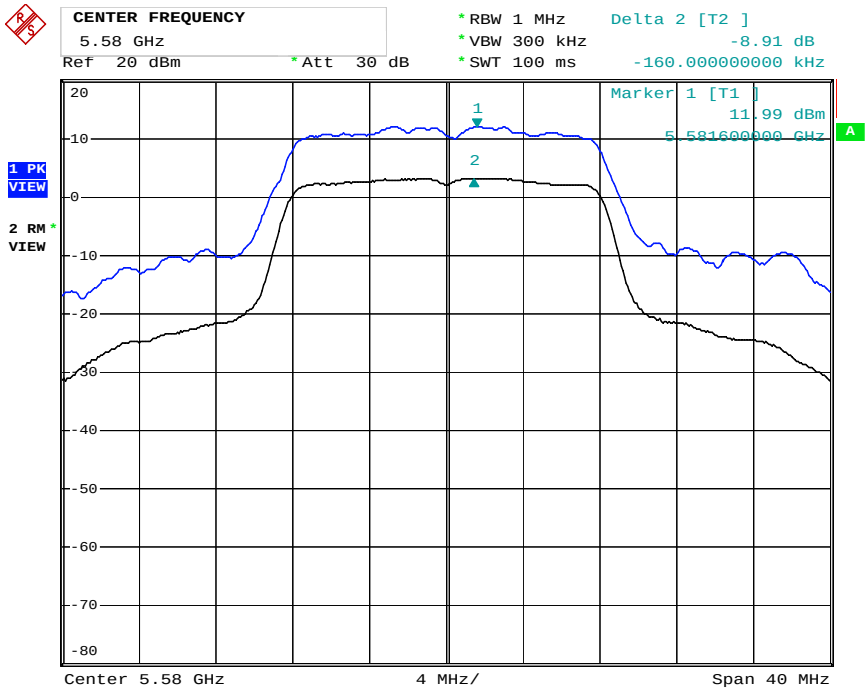
Date: 23.JUL.2009 20:18:05

Peak Excursion Plot on Configuration IEEE 802.11a / 5500 MHz



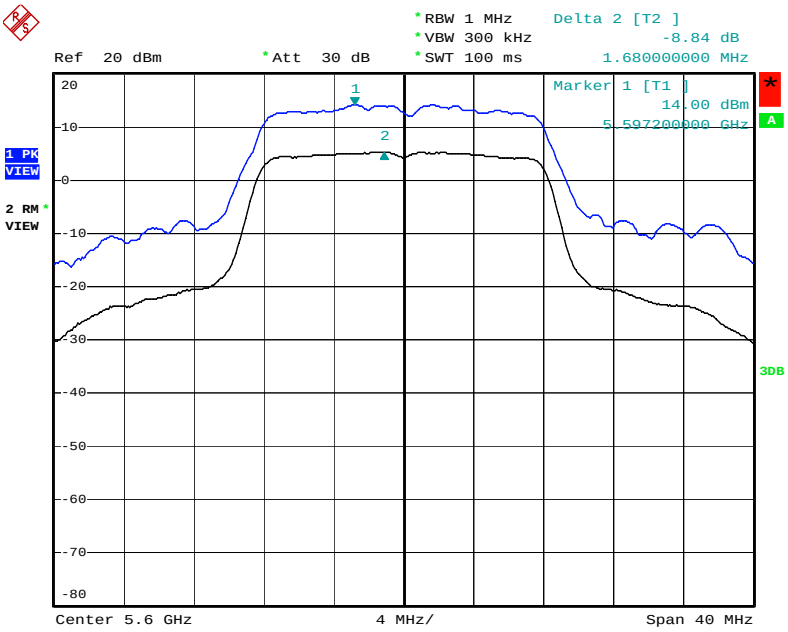
Date: 23.JUL.2009 20:42:35

Peak Excursion Plot on Configuration IEEE 802.11a / 5580 MHz



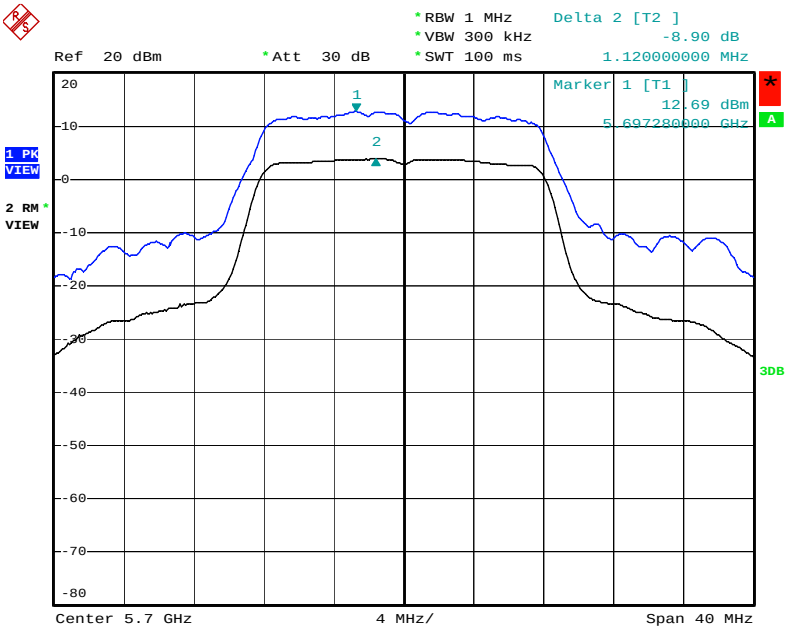
Date: 30.JUL.2009 20:43:05

Peak Excursion Plot on Configuration IEEE 802.11a / 5600 MHz



Date: 23.JUL.2009 20:34:24

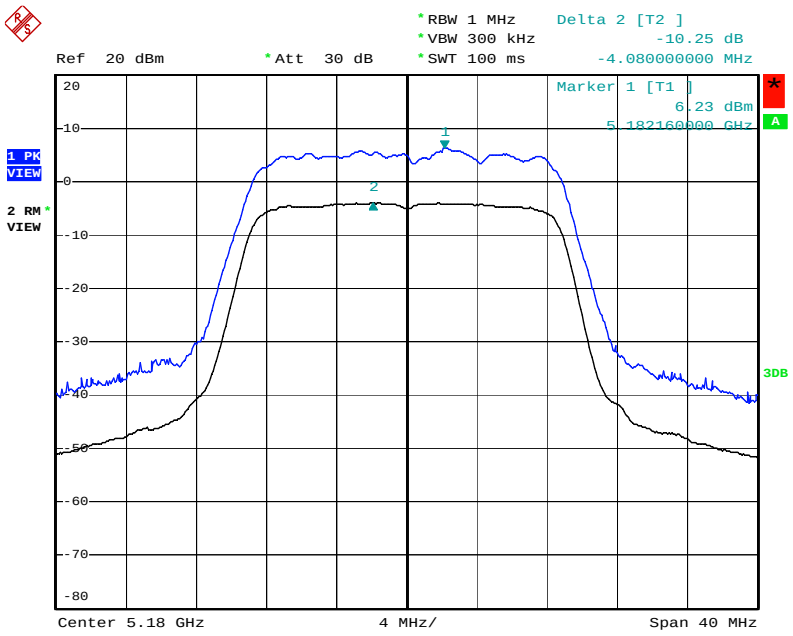
Peak Excursion Plot on Configuration IEEE 802.11a / 5700 MHz



Date: 23.JUL.2009 20:36:46

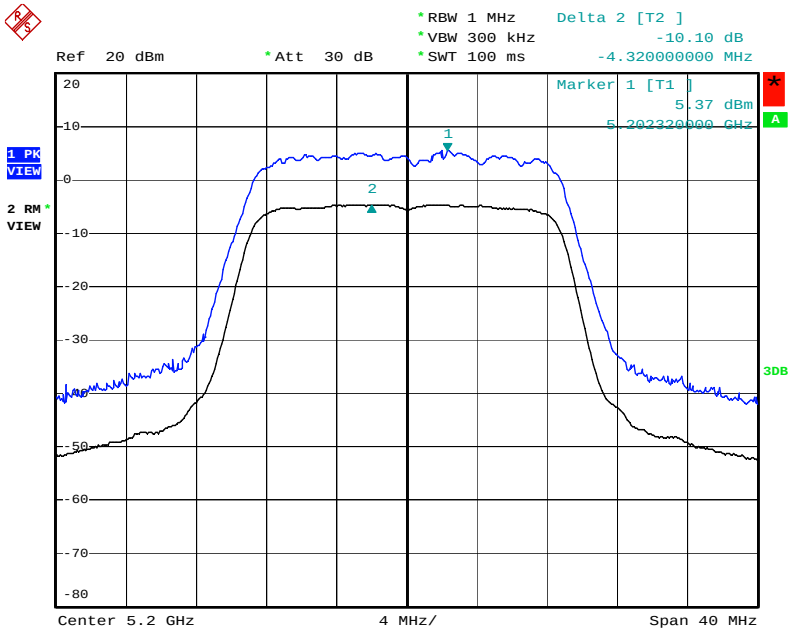
For Two Chain:

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5180 MHz



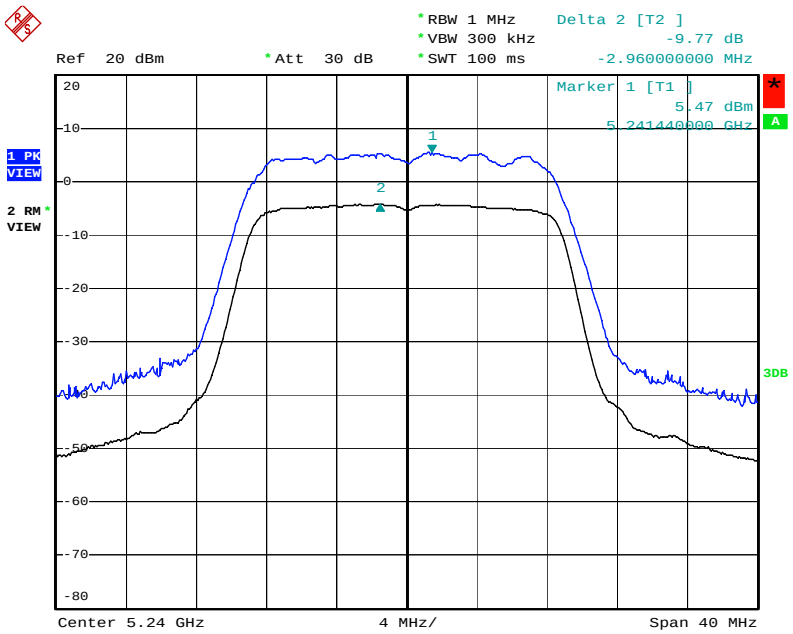
Date: 23.JUL.2009 21:30:12

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5200 MHz



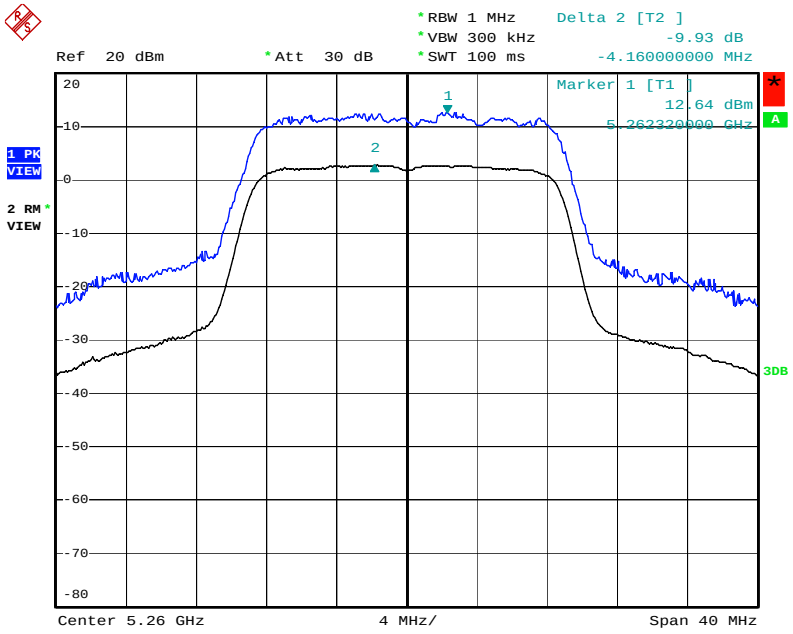
Date: 23.JUL.2009 21:32:12

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5240 MHz



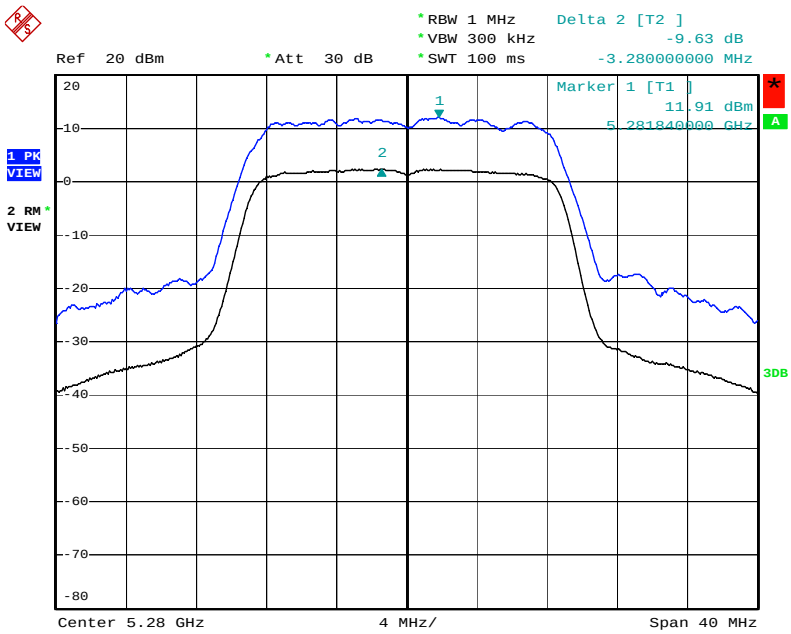
Date: 23.JUL.2009 21:34:30

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5260 MHz



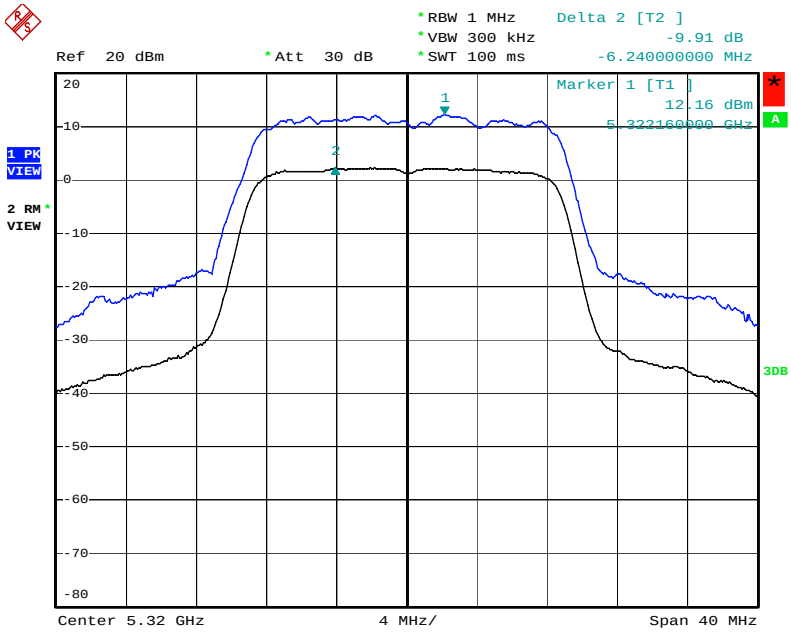
Date: 23.JUL.2009 21:39:34

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5280 MHz



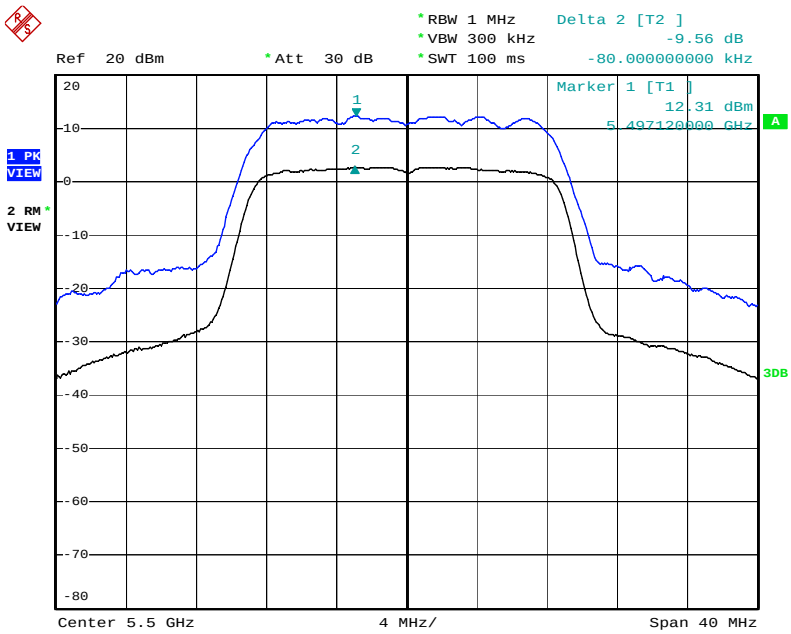
Date: 23.JUL.2009 21:41:32

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5320 MHz



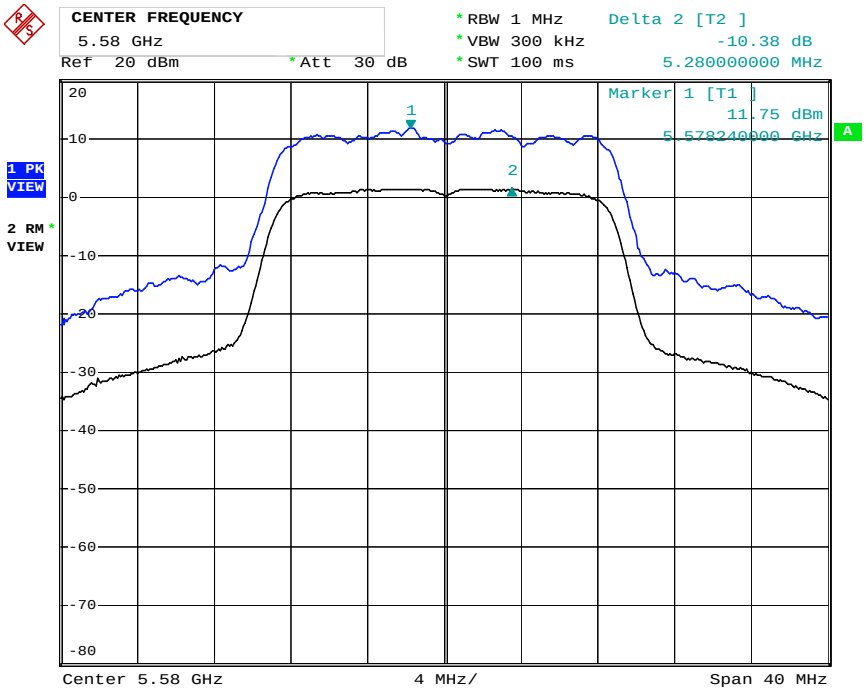
Date: 23.JUL.2009 21:43:08

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5500 MHz



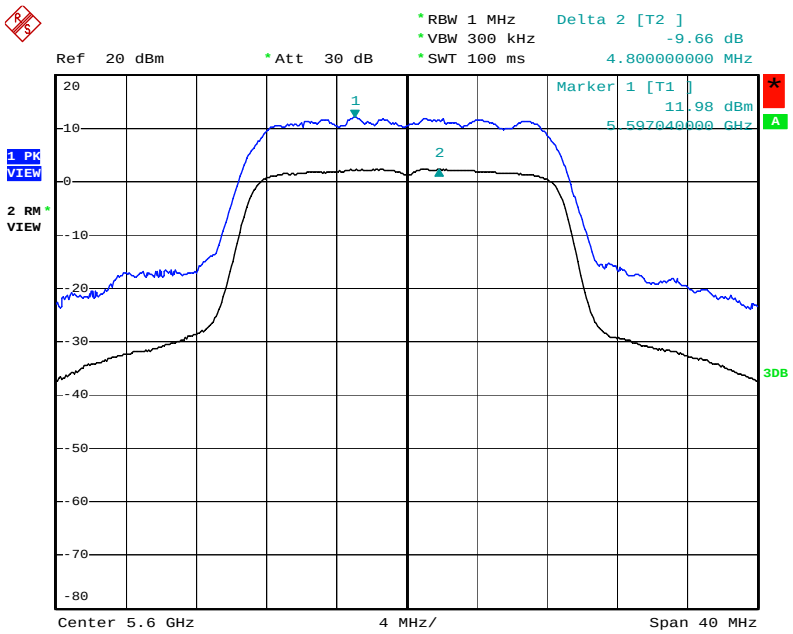
Date: 23.JUL.2009 21:54:24

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5580 MHz



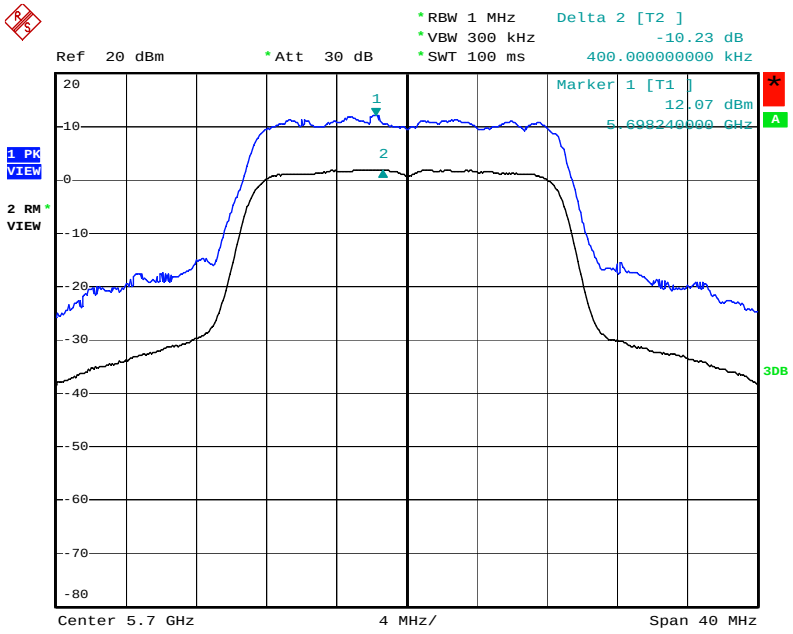
Date: 30.JUL.2009 19:22:34

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5600 MHz



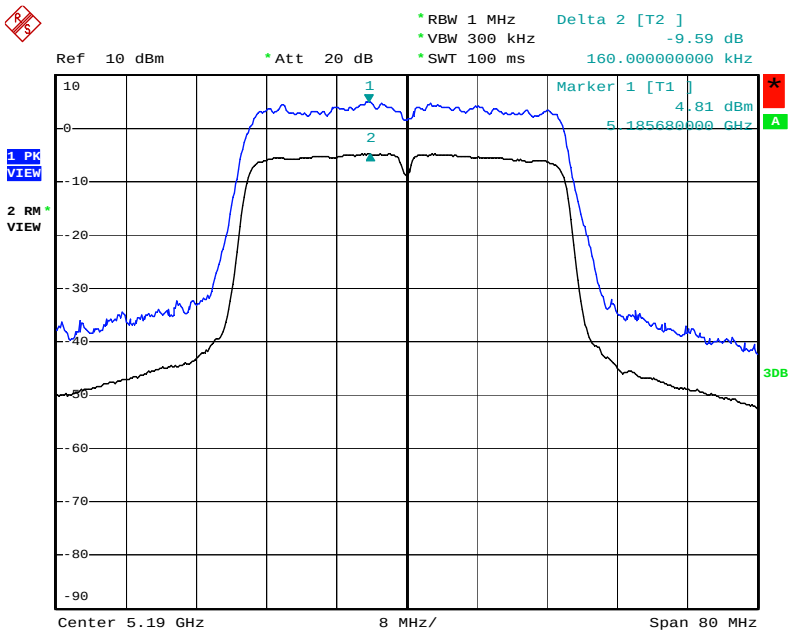
Date: 23.JUL.2009 21:51:23

Peak Excursion Plot on Configuration IEEE 802.11n (20MHz) / 5700 MHz



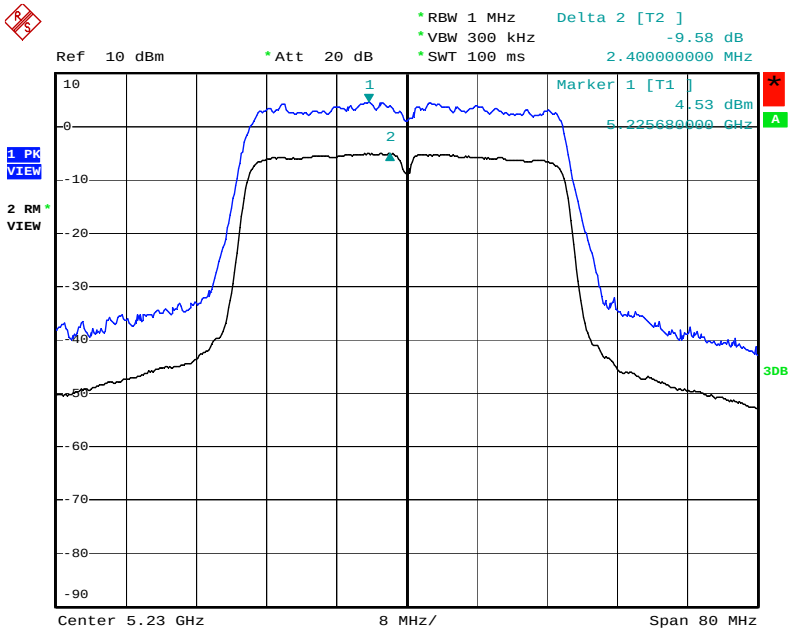
Date: 23.JUL.2009 21:53:07

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5190 MHz



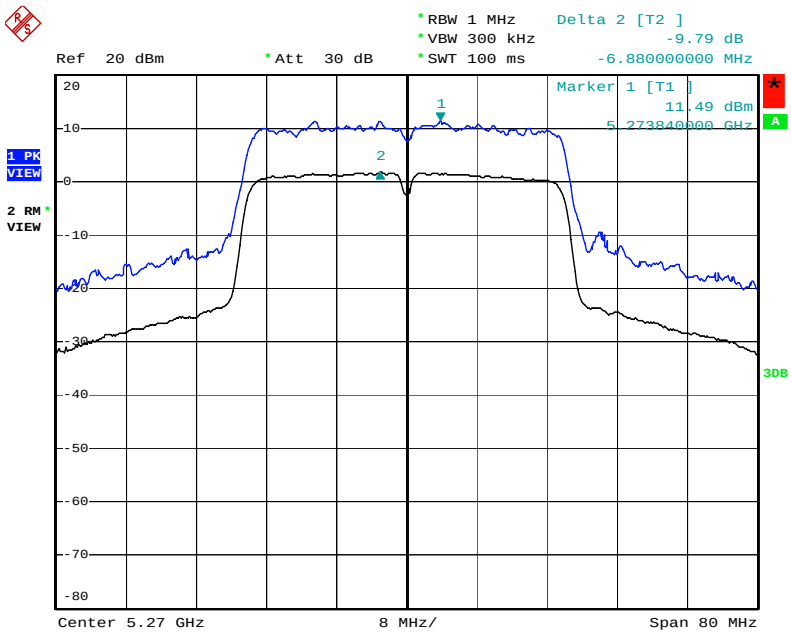
Date: 23.JUL.2009 22:16:58

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5230 MHz



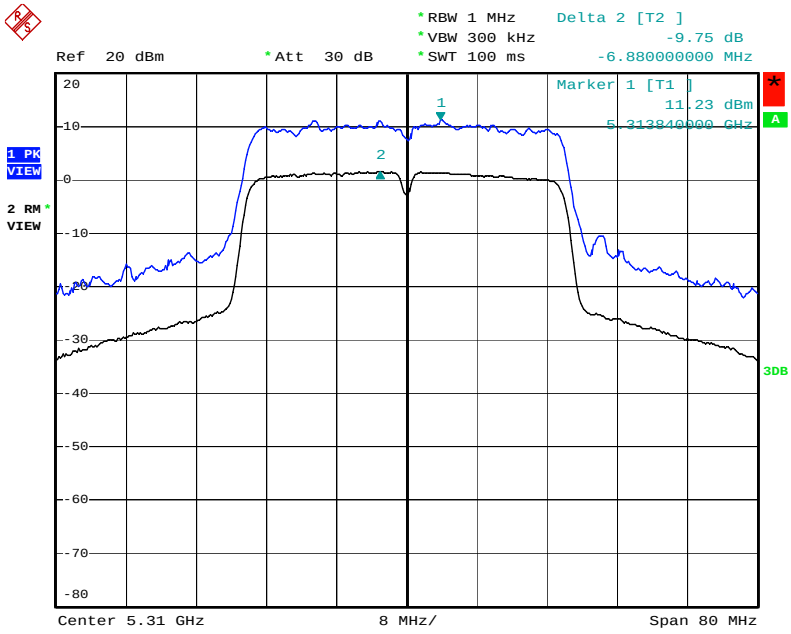
Date: 23.JUL.2009 22:21:34

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5270 MHz



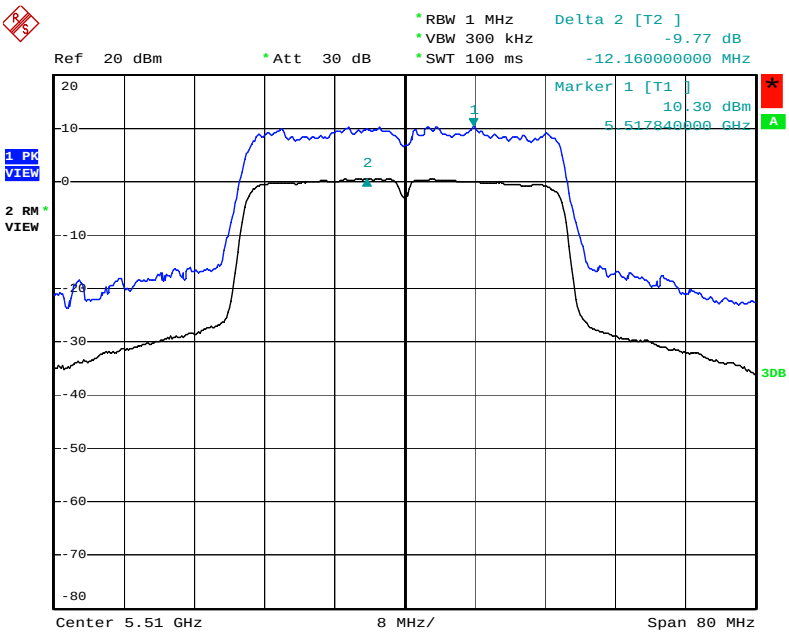
Date: 23.JUL.2009 22:25:52

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5310 MHz



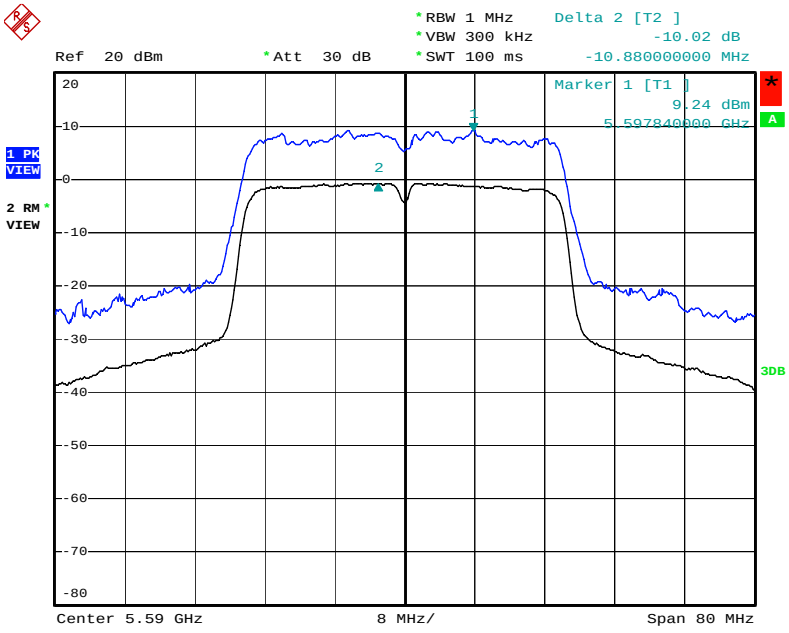
Date: 23.JUL.2009 22:28:45

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5510 MHz



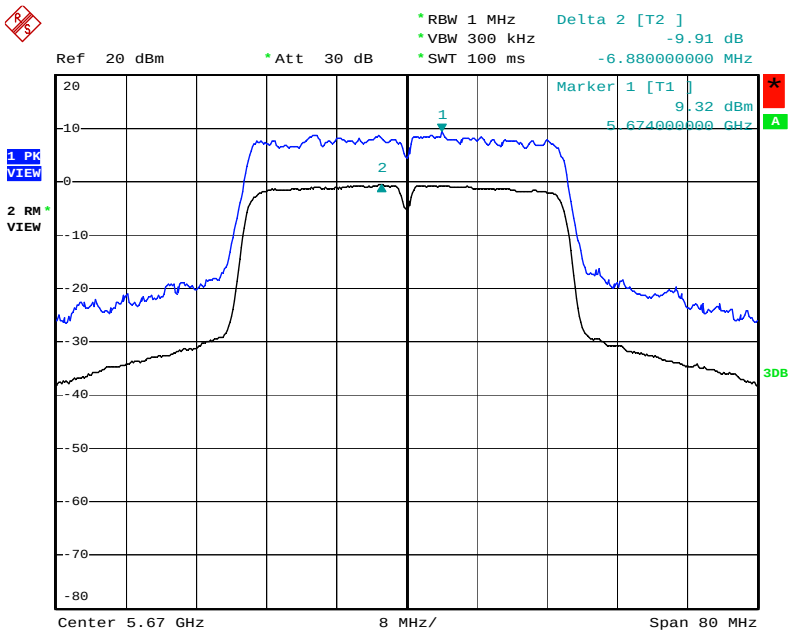
Date: 23.JUL.2009 22:34:55

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5590 MHz



Date: 23.JUL.2009 22:39:35

Peak Excursion Plot on Configuration IEEE 802.11n (40MHz) / 5670 MHz



Date: 23.JUL.2009 22:41:59

3.6 Radiated Emissions Measurement

3.6.1 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 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 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

3.6.2 Measuring Instruments and Setting

Please refer to section 4 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 / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

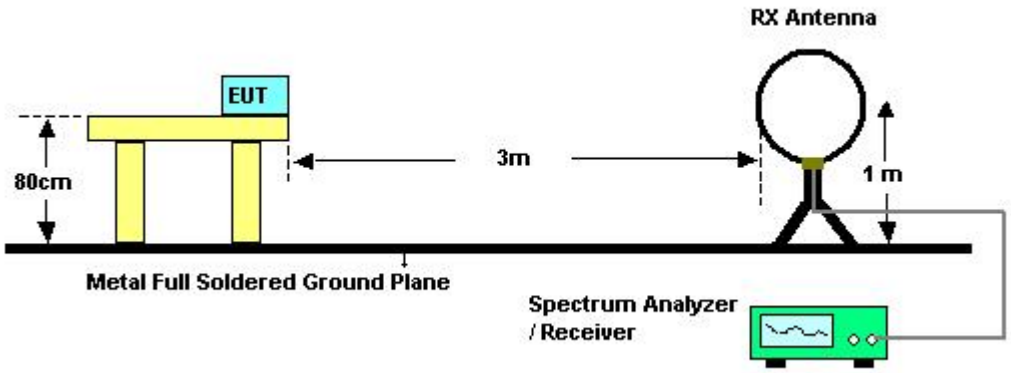
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.6.3 Test Procedures

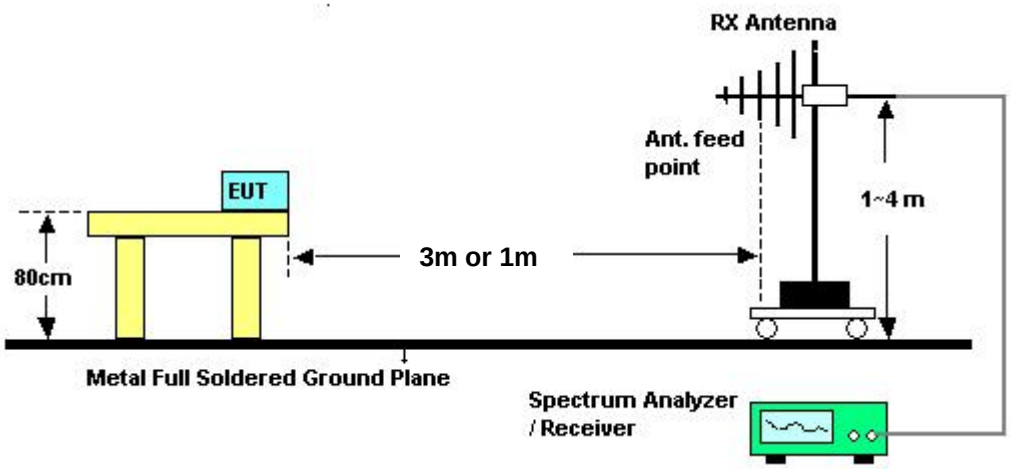
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.6.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 1GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.6.5 Test Deviation

There is no deviation with the original standard.

3.6.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7 Results of Radiated Emissions (9kHz~30MHz)

Final Test date	Jul. 15, 2009	**Test Site No.**	03CH02-HY
Temperature	24.9℃	**Humidity**	52.2%
Test Engineer	David		

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.

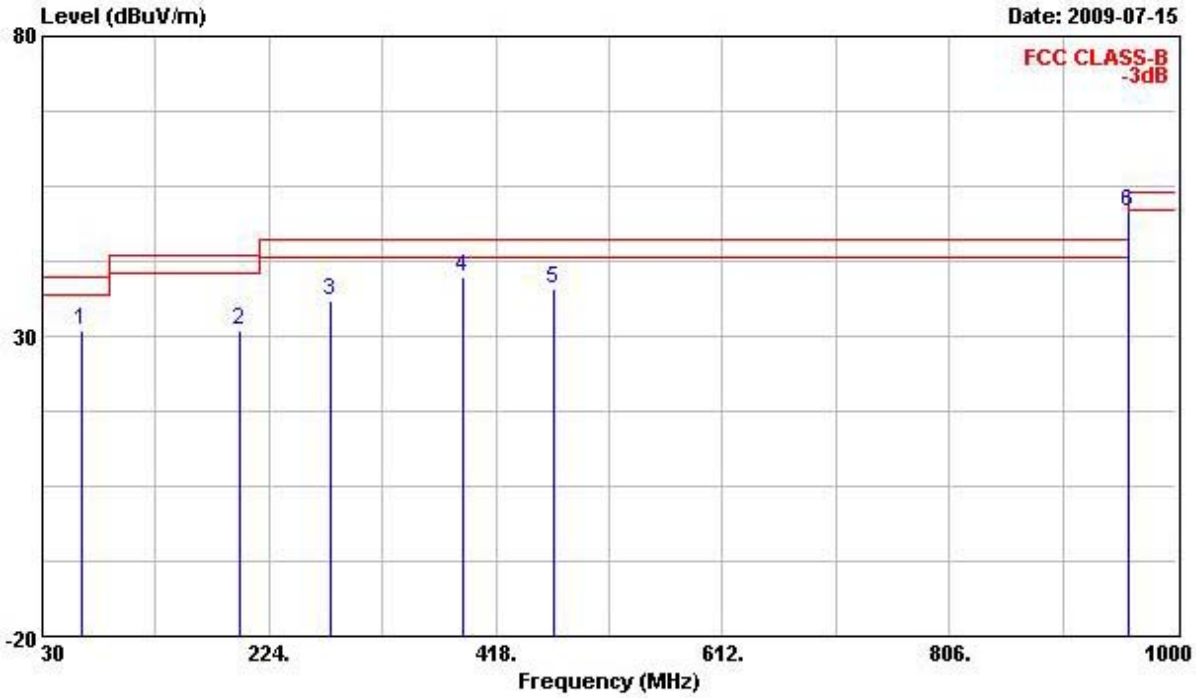
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

3.6.8 Results of Radiated Emissions (30MHz~1GHz)

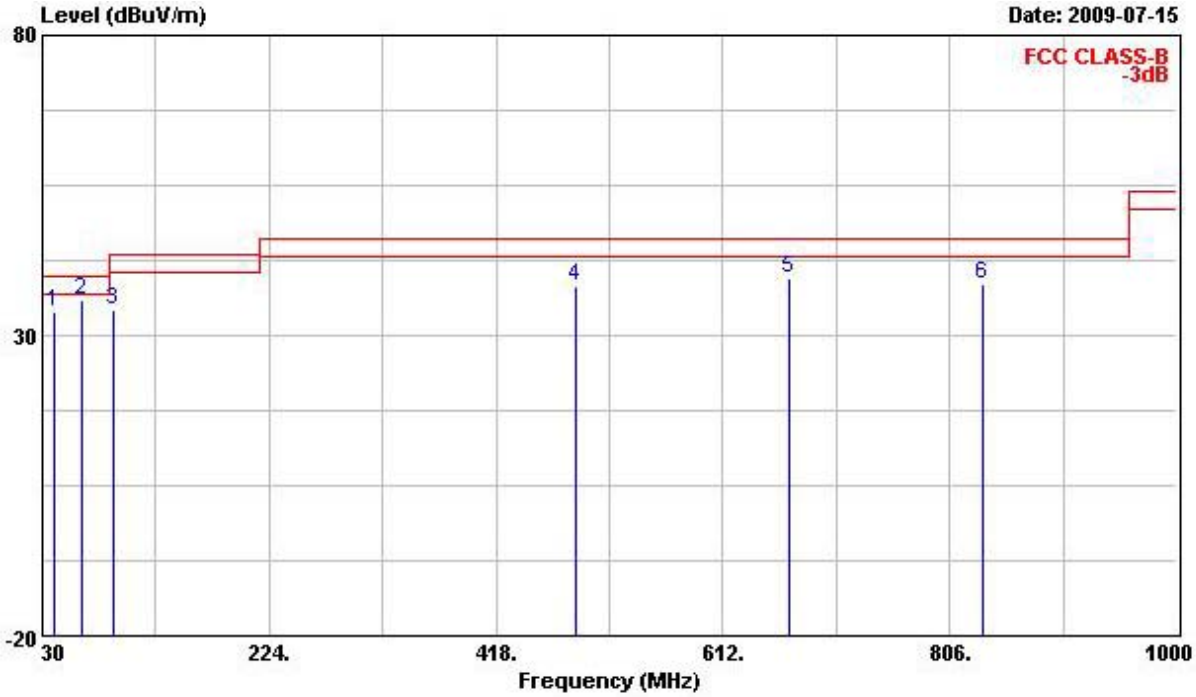
Final Test date	Jul. 15, 2009	**Test Site No.**	03CH02-HY
Temperature	24.9℃	**Humidity**	52.2%
Test Engineer	David	**Configurations**	Normal mode

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	63.950	30.99	-9.01	40.00	53.06	6.98	1.75	30.80	---	---	Peak
2	199.750	30.93	-12.57	43.50	47.34	11.35	2.84	30.60	---	---	Peak
3	277.350	35.96	-10.04	46.00	49.71	13.38	3.31	30.44	---	---	Peak
4	389.870	39.82	-6.18	46.00	51.09	15.10	3.85	30.22	---	---	Peak
5	467.470	38.05	-7.95	46.00	47.25	16.63	4.17	30.00	---	---	Peak
6 @	960.230	50.75	-3.25	54.00	51.60	21.52	6.09	28.46	---	---	QP

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	40.670	34.00	-6.00	40.00	50.46	13.01	1.37	30.84	---	---	Peak
2 @	63.950	35.82	-4.18	40.00	57.89	6.98	1.75	30.80	---	---	QP
3	90.140	34.20	-9.30	43.50	53.57	9.50	1.93	30.80	---	---	Peak
4	486.870	38.38	-7.62	46.00	47.05	17.02	4.25	29.94	---	---	Peak
5	668.260	39.44	-6.56	46.00	44.36	19.27	5.14	29.33	---	---	Peak
6	835.100	38.68	-7.32	46.00	41.87	20.19	5.52	28.89	---	---	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).

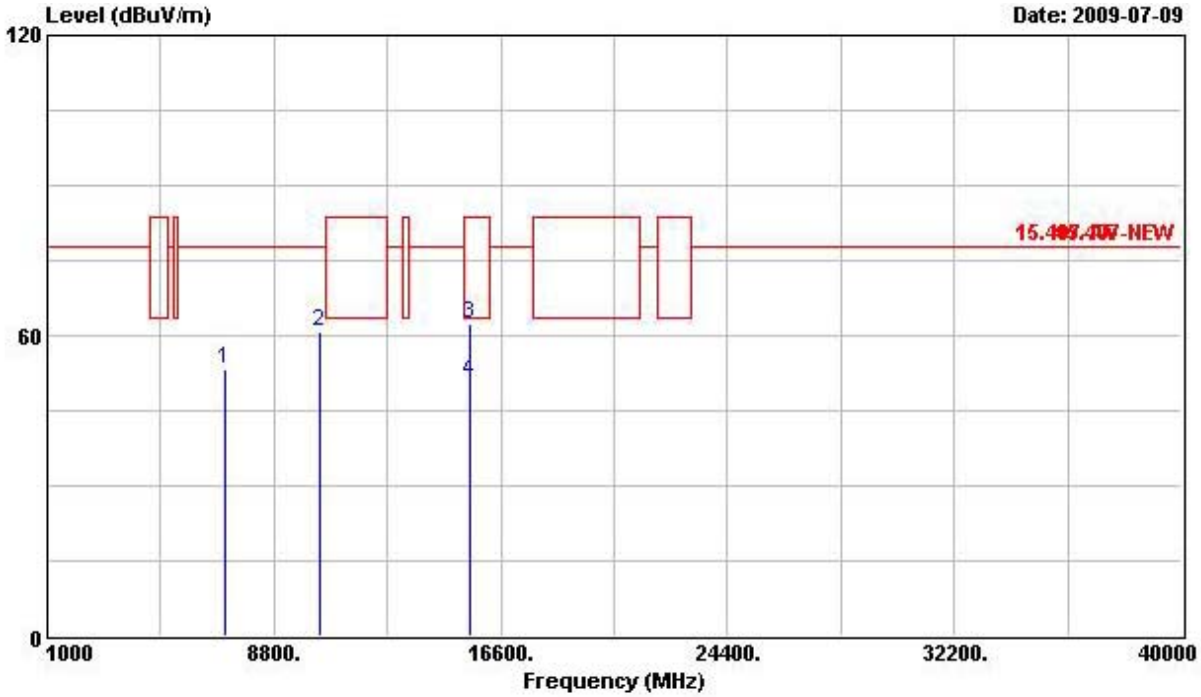
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6.9 Results for Radiated Emissions (1GHz~40GHz)

For Single Chain:

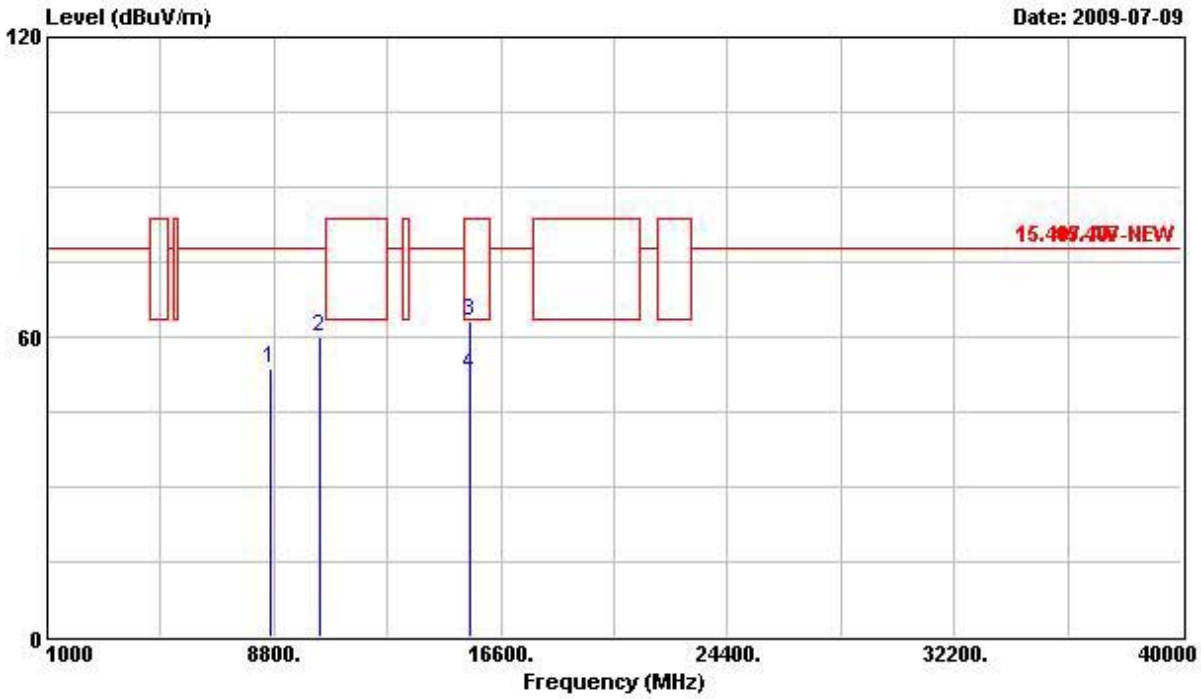
Final Test date	Jul. 09, 2009	**Test Site No.**	03CH02-HY
Temperature	24.9℃	**Humidity**	52.2%
Test Engineer	David	**Configuration**	802.11a CH 36

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7136.000	53.21	-24.63	77.84	45.00	37.83	5.61	35.23	---	---	PEAK
2	10360.000	60.78	-17.06	77.84	49.47	40.02	6.71	35.42	---	---	PEAK
3	15540.000	62.49	-21.05	83.54	46.37	42.81	8.45	35.13	---	---	PEAK
4	15540.000	50.99	-12.55	63.54	34.86	42.81	8.45	35.13	---	---	Average

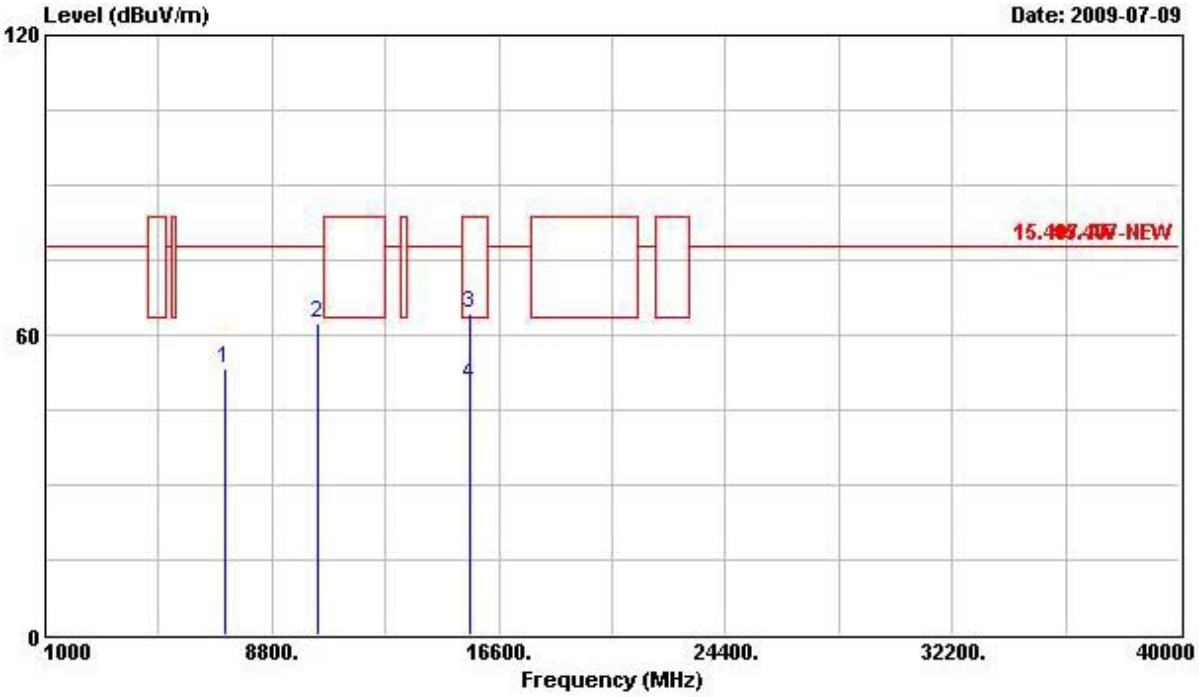
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8700.000	53.78	-24.06	77.84	44.85	38.34	6.02	35.44	---	---	PEAK
2	10360.000	59.82	-18.02	77.84	48.51	40.02	6.71	35.42	---	---	PEAK
3	15540.000	63.26	-20.28	83.54	47.13	42.81	8.45	35.13	---	---	PEAK
4	15540.000	52.33	-11.21	63.54	36.20	42.81	8.45	35.13	---	---	Average

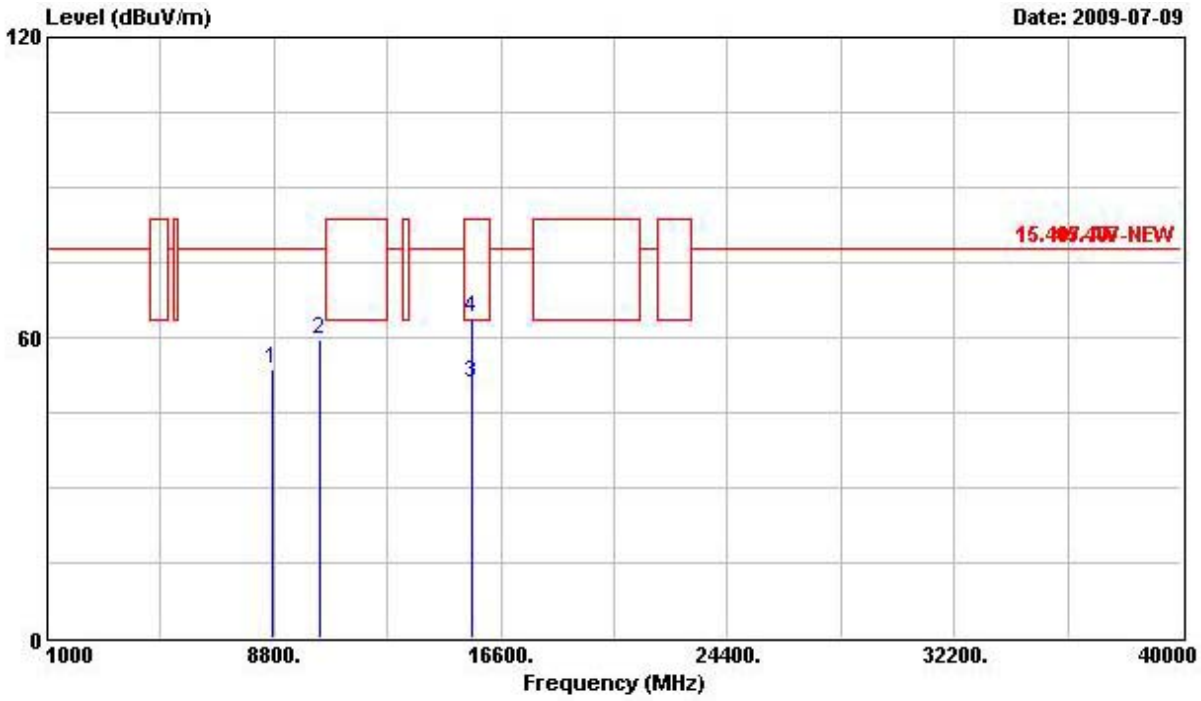
Final Test date	Jul. 09, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 40

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7156.000	53.20	-24.64	77.84	44.98	37.83	5.62	35.23	---	---	PEAK
2	10400.000	62.35	-15.49	77.84	50.95	40.04	6.75	35.38	---	---	PEAK
3	15602.100	64.50	-19.04	83.54	48.45	42.82	8.45	35.23	---	---	Peak
4	15602.100	50.17	-13.37	63.54	34.12	42.82	8.45	35.23	---	---	Average

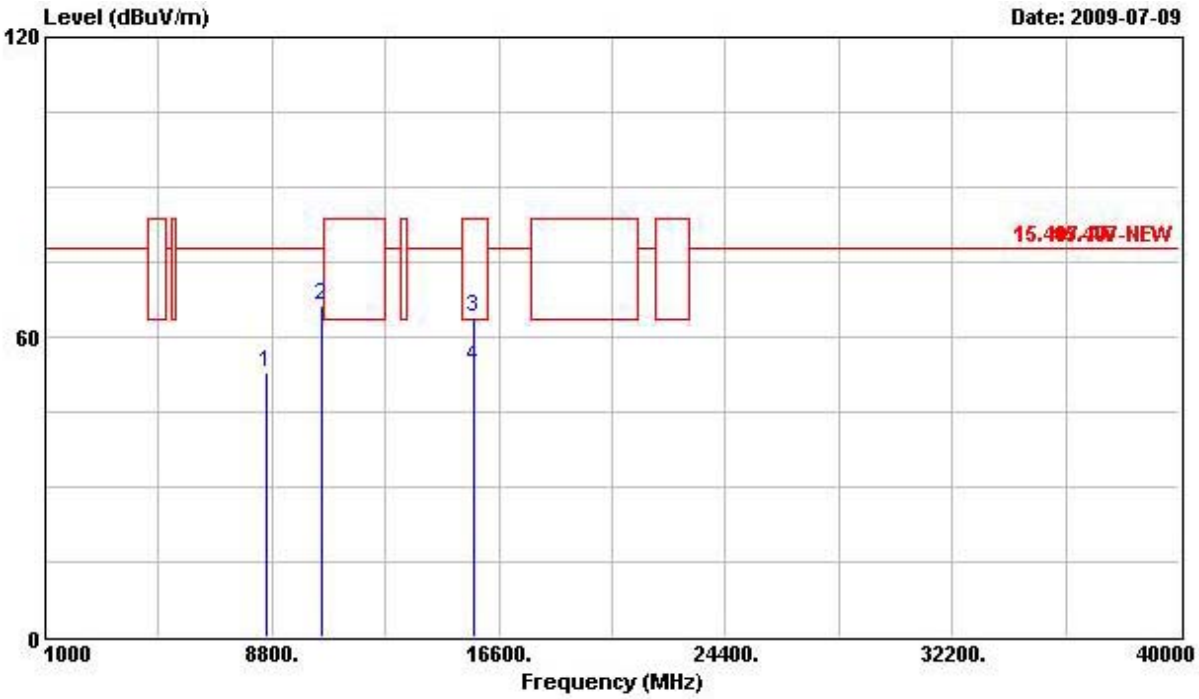
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8732.000	53.61	-24.23	77.84	44.70	38.31	6.04	35.45	---	---	PEAK
2	10400.000	59.76	-18.08	77.84	48.35	40.04	6.75	35.38	---	---	PEAK
3	15600.000	50.79	-12.75	63.54	34.74	42.82	8.45	35.23	---	---	Average
4	15600.000	64.07	-19.47	83.54	48.02	42.82	8.45	35.23	---	---	PEAK

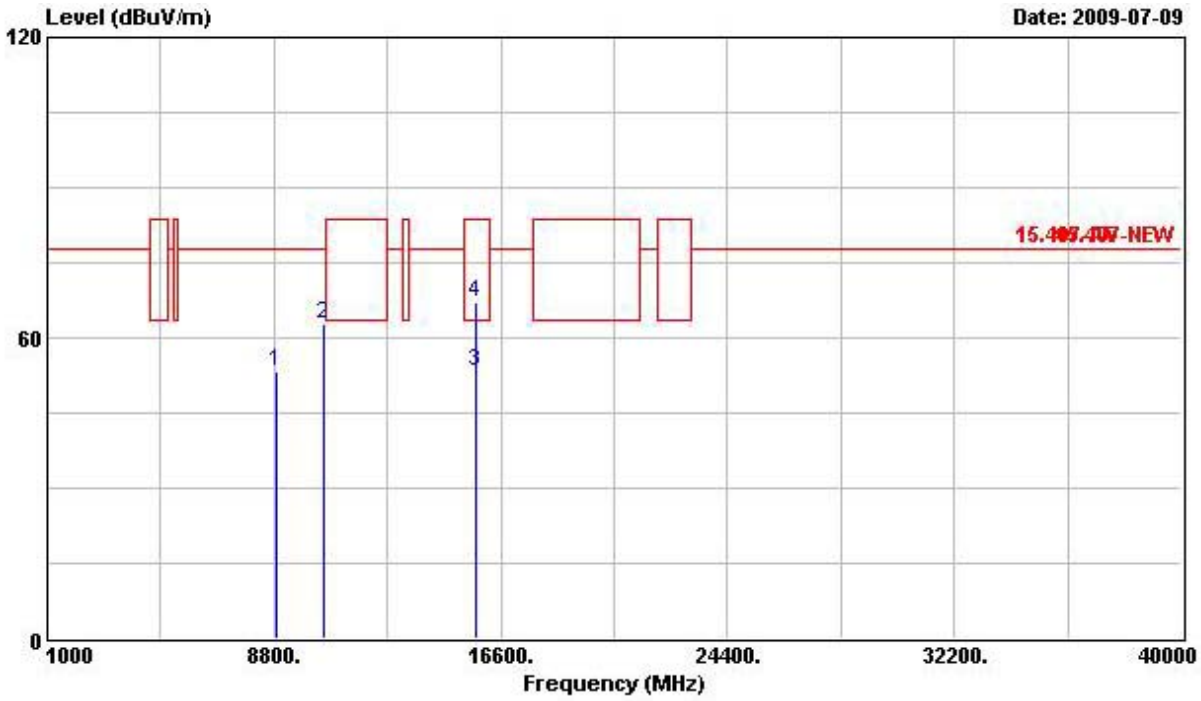
Final Test date	Jul. 09, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 48

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8608.000	52.72	-25.12	77.84	43.74	38.41	5.99	35.42	---	---	PEAK
2	10480.000	66.15	-11.69	77.84	54.56	40.09	6.82	35.32	---	---	PEAK
3	15720.000	64.11	-19.43	83.54	48.17	42.84	8.46	35.35	---	---	PEAK
4	15720.000	53.98	-9.56	63.54	38.03	42.84	8.46	35.35	---	---	Average

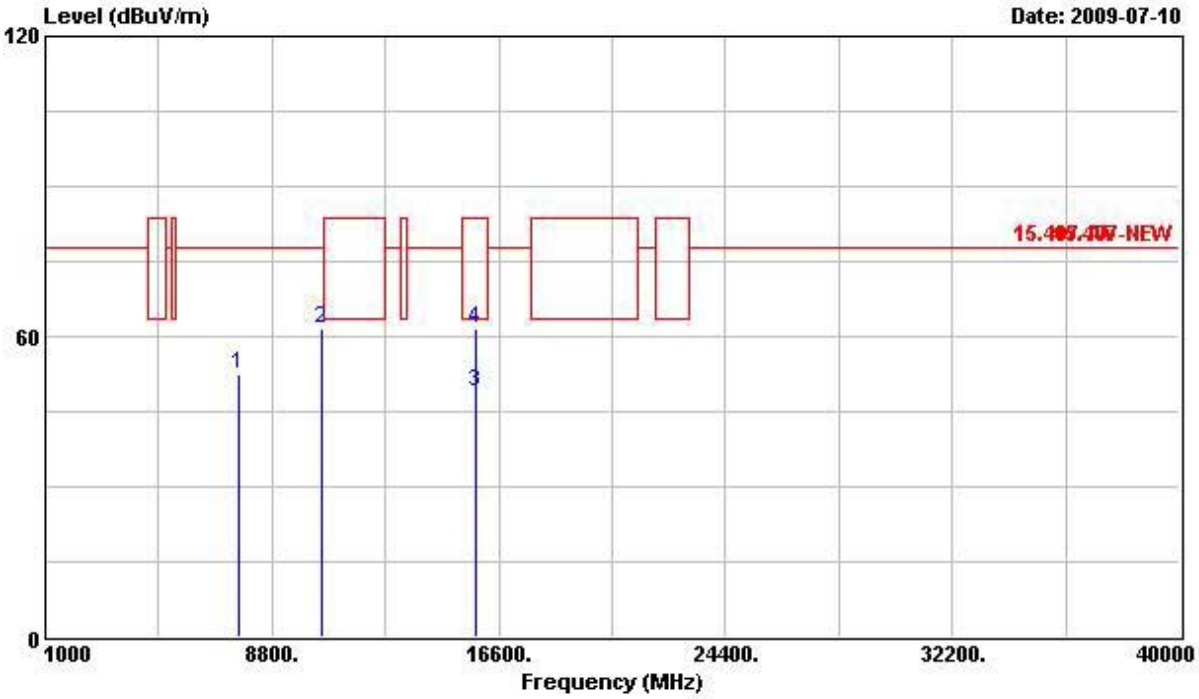
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8884.000	53.39	-24.45	77.84	44.56	38.19	6.11	35.48	---	---	PEAK
2	10480.000	62.85	-14.99	77.84	51.27	40.09	6.82	35.32	---	---	PEAK
3	15719.400	53.47	-10.07	63.54	37.52	42.84	8.46	35.35	---	---	Average
4	15719.400	67.04	-16.50	83.54	51.09	42.84	8.46	35.35	---	---	Peak

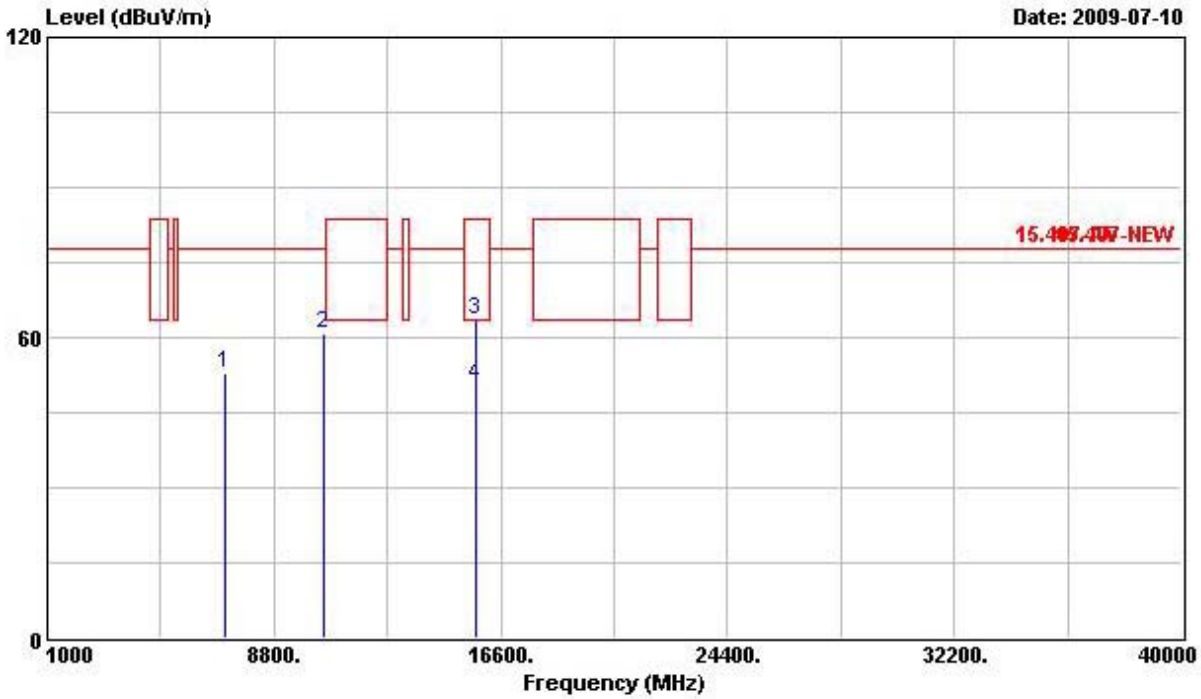
Final Test date	Jul. 10, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 52

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7684.000	52.56	-25.28	77.84	44.22	38.01	5.71	35.37	---	---	PEAK
2	10504.000	61.60	-16.24	77.84	49.95	40.10	6.85	35.30	---	---	PEAK
3	15784.000	48.96	-14.58	63.54	33.09	42.86	8.46	35.45	---	---	Average
4	15784.000	61.44	-22.10	83.54	45.56	42.86	8.46	35.45	---	---	PEAK

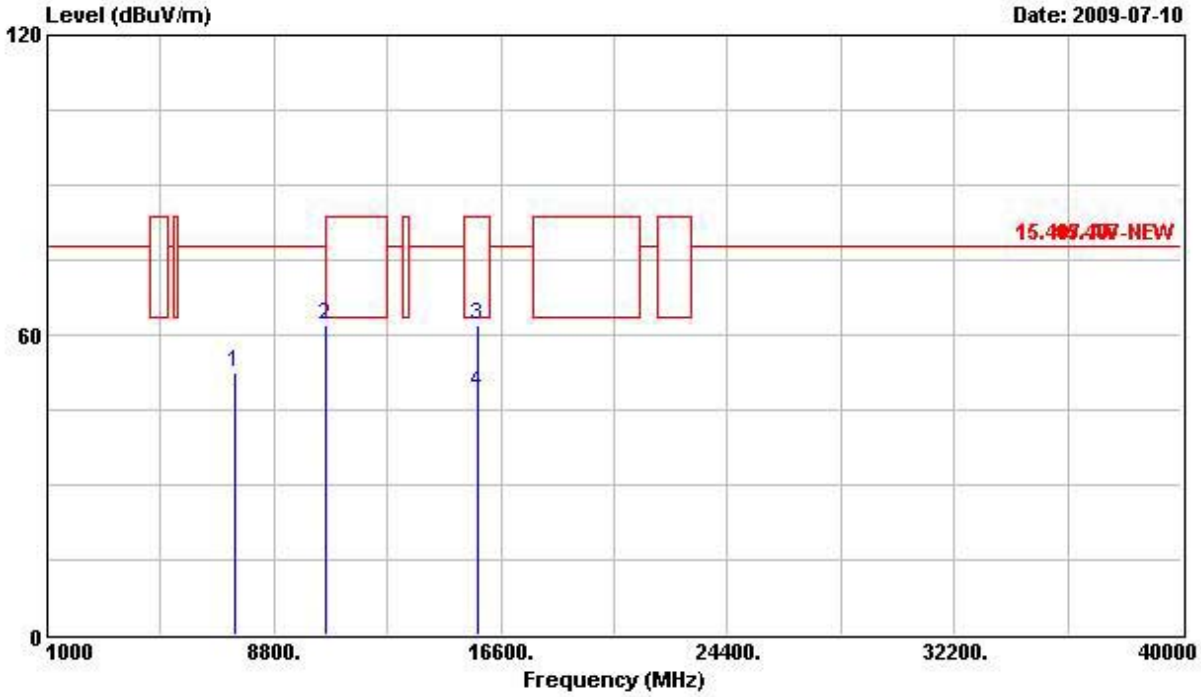
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7096.000	52.85	-24.99	77.84	44.64	37.82	5.61	35.22	---	---	PEAK
2	10511.000	60.77	-17.07	77.84	49.12	40.10	6.85	35.30	0	0	Peak
3	15776.000	63.36	-20.18	83.54	47.46	42.86	8.46	35.42	---	---	PEAK
4	15776.000	50.43	-13.11	63.54	34.53	42.86	8.46	35.42	---	---	Average

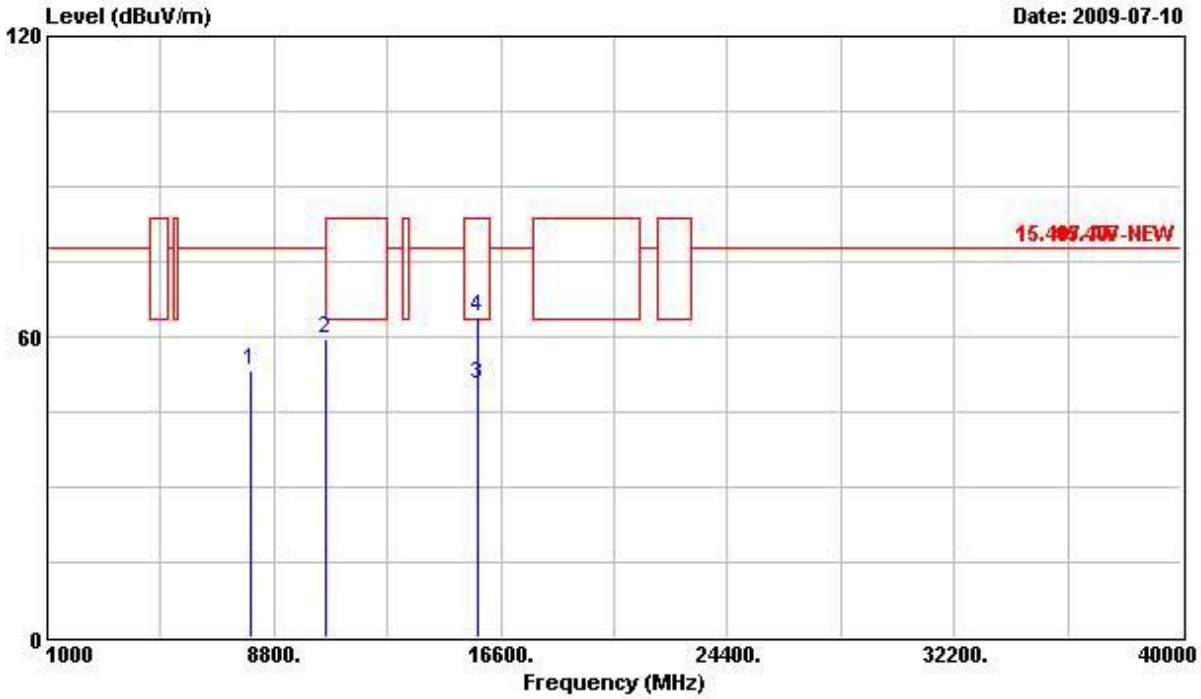
Final Test date	Jul. 10, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 56

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7472.000	52.55	-25.29	77.84	44.29	37.90	5.66	35.30	---	---	Peak
2	10564.000	62.00	-15.84	77.84	50.24	40.14	6.88	35.26	---	---	PEAK
3	15840.000	61.91	-21.63	83.54	46.08	42.87	8.46	35.51	---	---	PEAK
4	15840.000	48.70	-14.84	63.54	32.88	42.87	8.46	35.51	---	---	Average

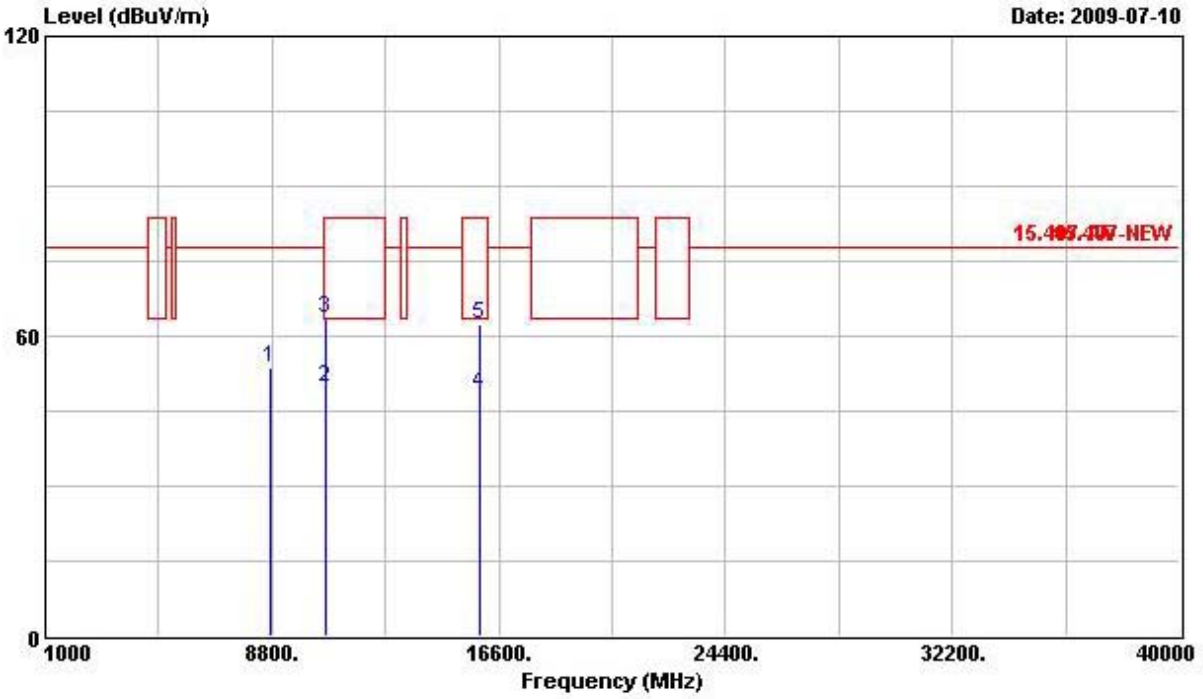
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8032.000	53.13	-24.71	77.84	44.59	38.22	5.81	35.49	---	---	Peak
2	10560.000	59.43	-18.41	77.84	47.68	40.13	6.88	35.26	---	---	PEAK
3	15836.000	50.35	-13.19	63.54	34.53	42.87	8.46	35.51	---	---	Average
4	15836.000	63.83	-19.71	83.54	48.00	42.87	8.46	35.51	---	---	PEAK

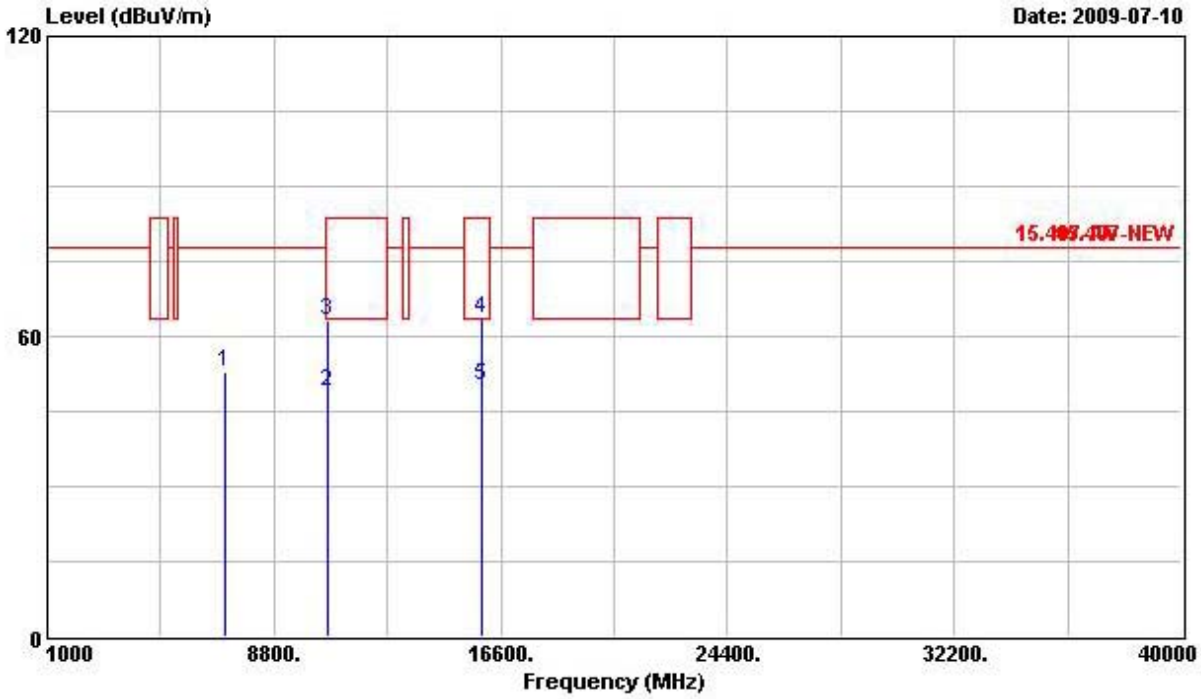
Final Test date	Jul. 10, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 64

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8756.000	53.78	-24.06	77.84	44.87	38.30	6.06	35.45	---	---	PEAK
2	10644.000	49.71	-13.83	63.54	37.79	40.18	6.93	35.19	---	---	Average
3	10644.000	63.37	-20.17	83.54	51.45	40.18	6.93	35.19	---	---	PEAK
4	15964.000	48.74	-14.80	63.54	33.05	42.89	8.47	35.67	---	---	Average
5	15964.000	62.22	-21.32	83.54	46.52	42.89	8.47	35.67	---	---	PEAK

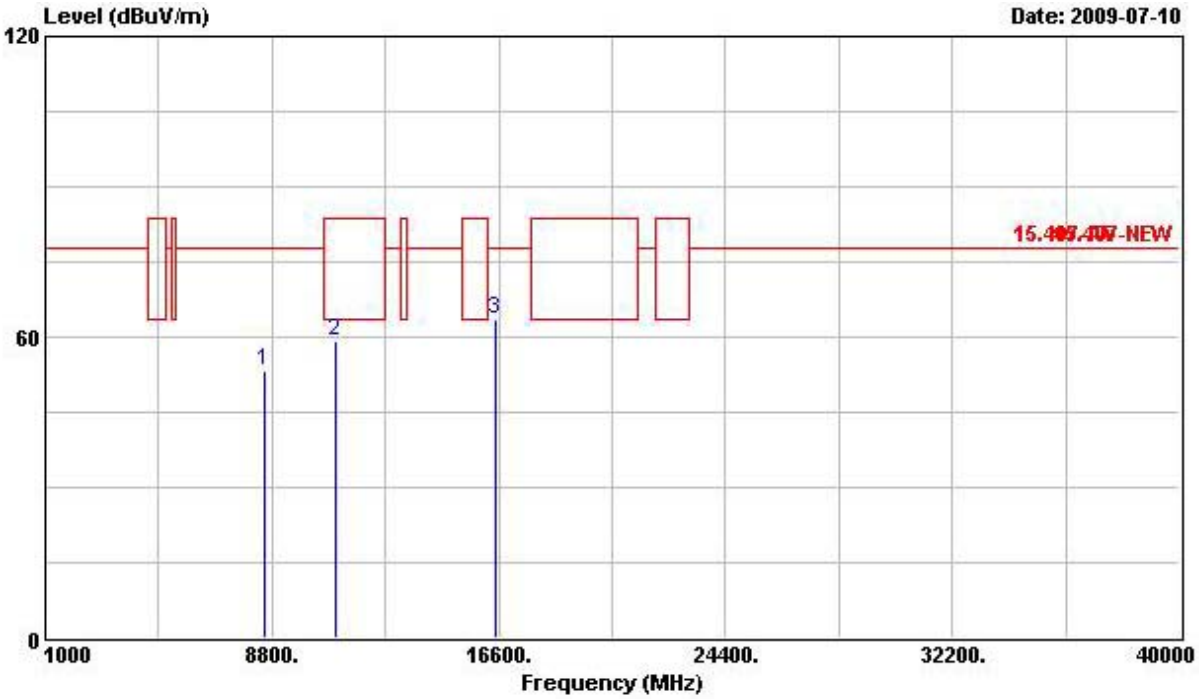
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7148.000	53.00	-24.84	77.84	44.78	37.83	5.62	35.23	---	---	PEAK
2	10640.300	48.80	-14.74	63.54	36.88	40.18	6.93	35.19	---	---	AVERAGE
3	10640.300	63.14	-20.40	83.54	51.22	40.18	6.93	35.19	---	---	Peak
4	15964.000	63.53	-20.01	83.54	47.83	42.89	8.47	35.67	---	---	PEAK
5	15964.000	50.27	-13.27	63.54	34.58	42.89	8.47	35.67	---	---	Average

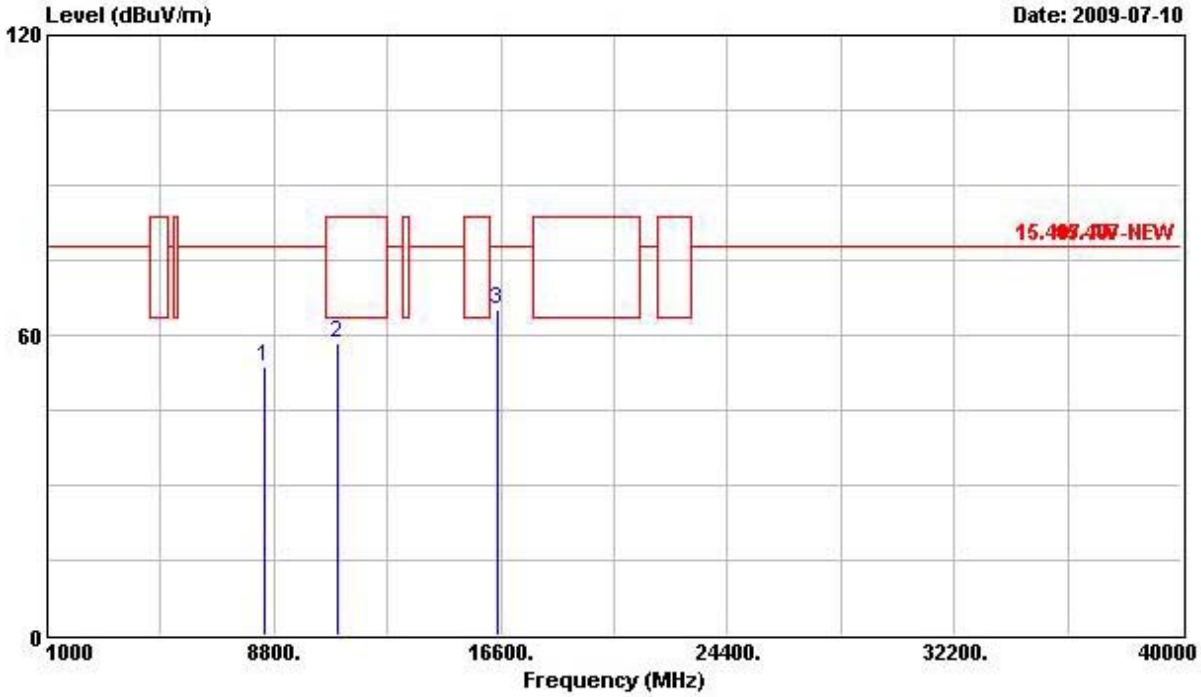
Final Test date	Jul. 10, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 100

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8520.000	53.48	-24.36	77.84	44.44	38.49	5.96	35.41	---	---	PEAK
2 @	11004.000	59.27	-4.27	63.54	46.64	40.40	7.13	34.90	---	---	PK
3	16500.000	63.40	-14.44	77.84	46.86	43.50	8.24	35.20	---	---	PEAK

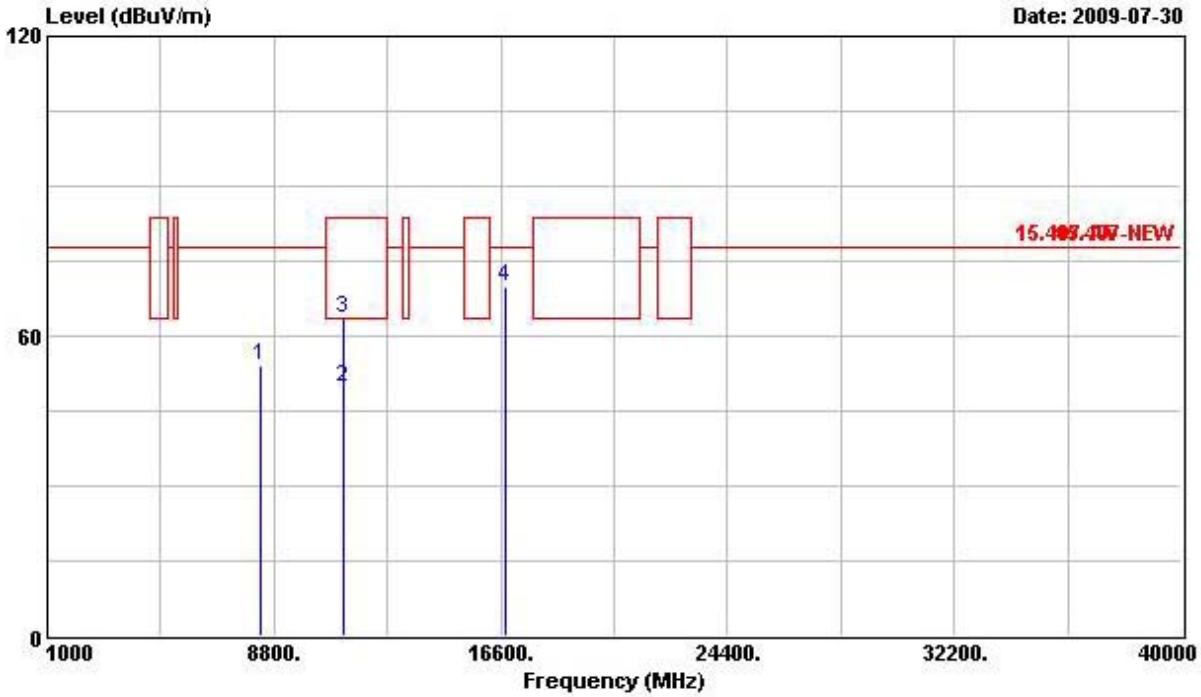
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8484.000	53.62	-24.22	77.84	44.59	38.49	5.94	35.41	---	---	Peak
2 @	11000.000	58.52	-5.02	63.54	45.85	40.40	7.17	34.90	---	---	PK
3	16500.000	65.07	-12.77	77.84	48.53	43.50	8.24	35.20	---	---	PEAK

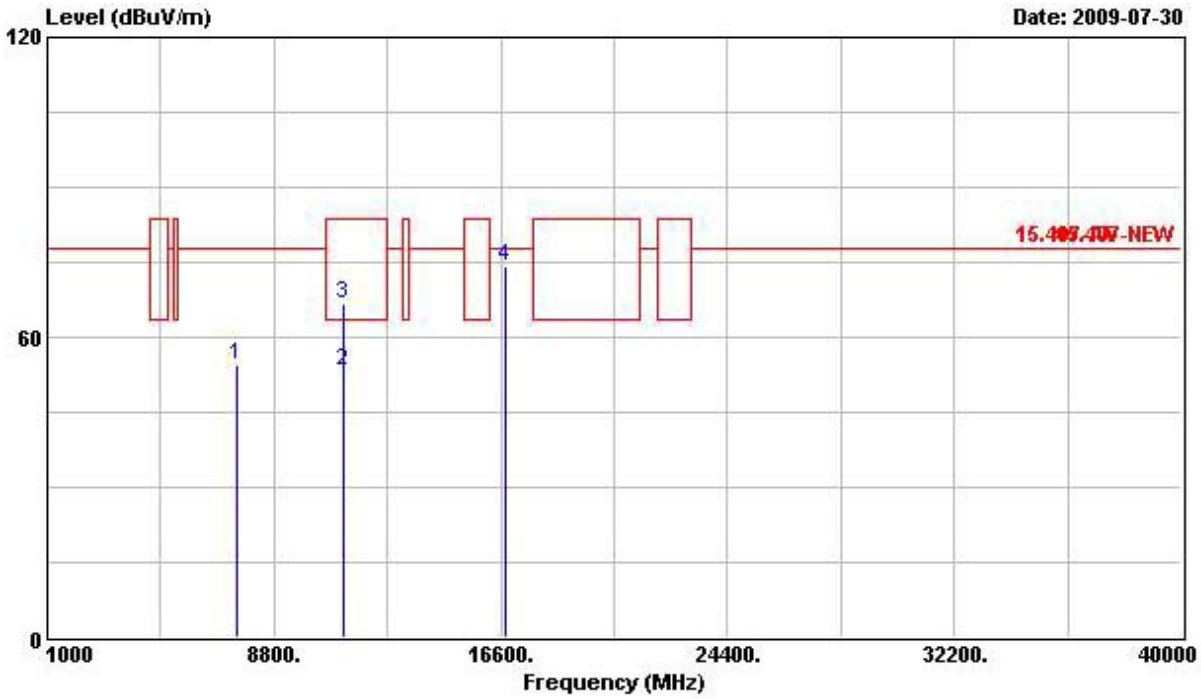
Final Test date	Jul. 30, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 116

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8340.000	54.17	-23.67	77.84	44.12	38.41	5.90	34.26	---	---	Peak
2	11160.900	49.68	-13.86	63.54	35.72	40.47	6.96	33.47	---	---	Average
3	11160.900	63.48	-20.06	83.54	49.52	40.47	6.96	33.47	---	---	Peak
4	16744.340	70.00	-7.84	77.84	50.49	43.60	8.47	32.56	---	---	PEAK

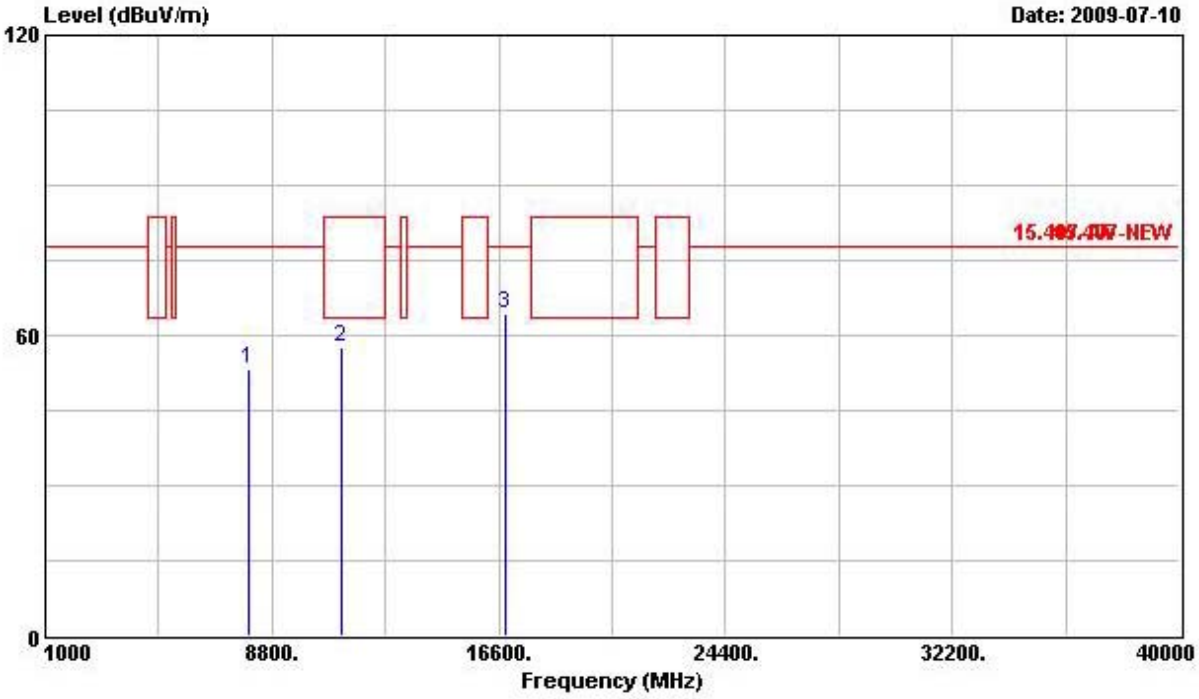
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7552.000	54.49	-23.35	77.84	45.19	37.93	5.67	34.30	---	---	Peak
2	11160.700	53.18	-10.36	63.54	39.22	40.47	6.96	33.47	---	---	Average
3	11160.700	66.52	-17.02	83.54	52.56	40.47	6.96	33.47	---	---	Peak
4	16737.600	74.38	-3.46	77.84	54.88	43.60	8.47	32.56	---	---	PEAK

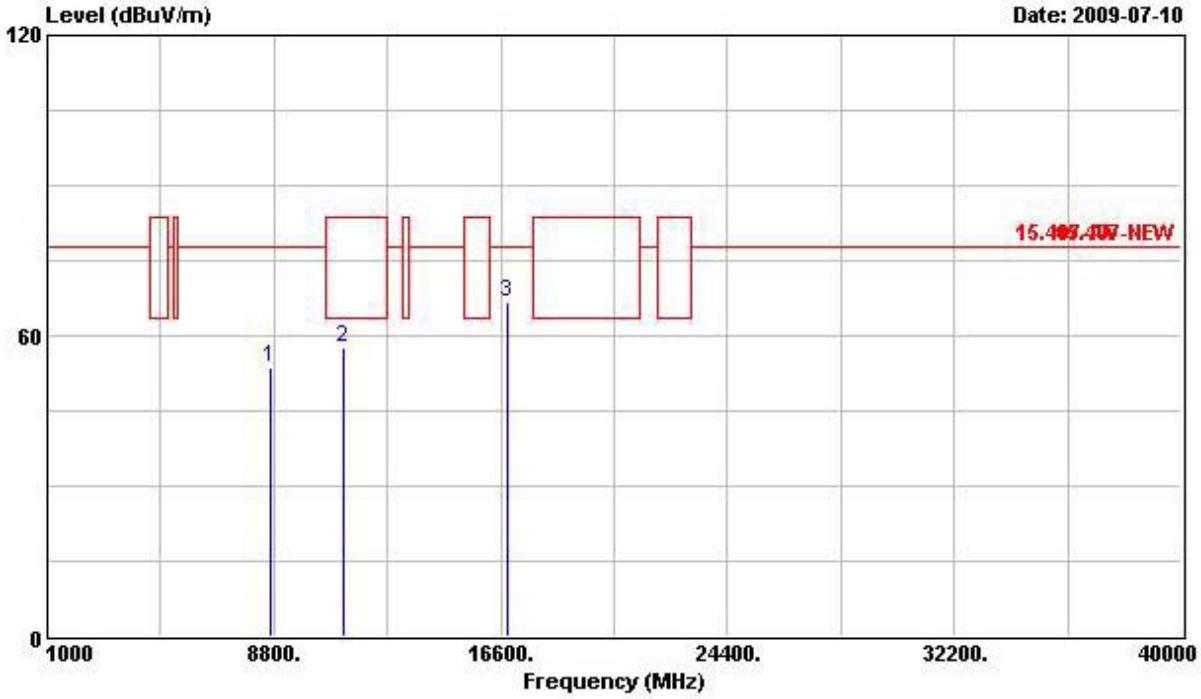
Final Test date	Jul. 10, 2009	Test Site No.	03CH02-HY
Temperature	24.9℃	Humidity	52.2%
Test Engineer	David	Configuration	802.11a CH 120

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7968.000	53.23	-24.61	77.84	44.73	38.18	5.80	35.48	---	---	PEAK
2 @	11200.000	57.55	-5.99	63.54	45.09	40.48	6.92	34.94	---	---	PK
3	16804.000	64.41	-13.43	77.84	46.85	43.62	8.50	34.57	---	---	PEAK

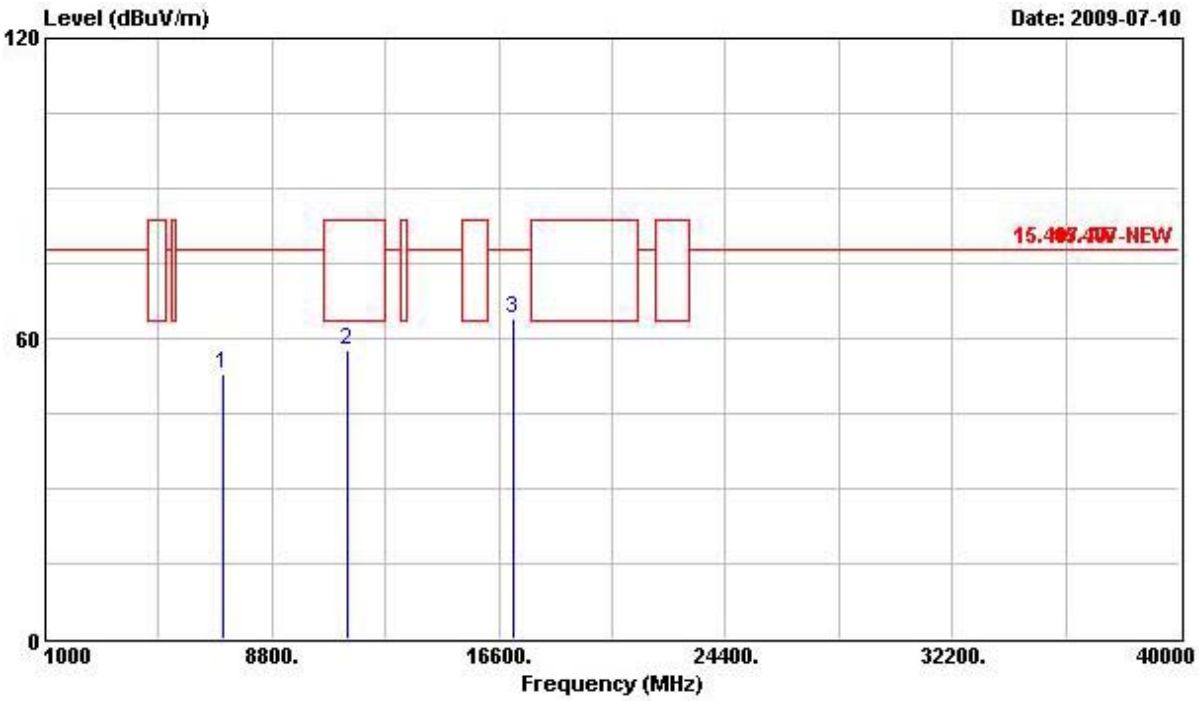
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	8684.000	53.88	-23.96	77.84	44.94	38.35	6.02	35.44	---	---	PEAK
2 @	11200.000	57.80	-5.74	63.54	45.34	40.48	6.92	34.94	---	---	PK
3	16804.000	66.84	-11.00	77.84	49.28	43.62	8.50	34.57	---	---	PEAK

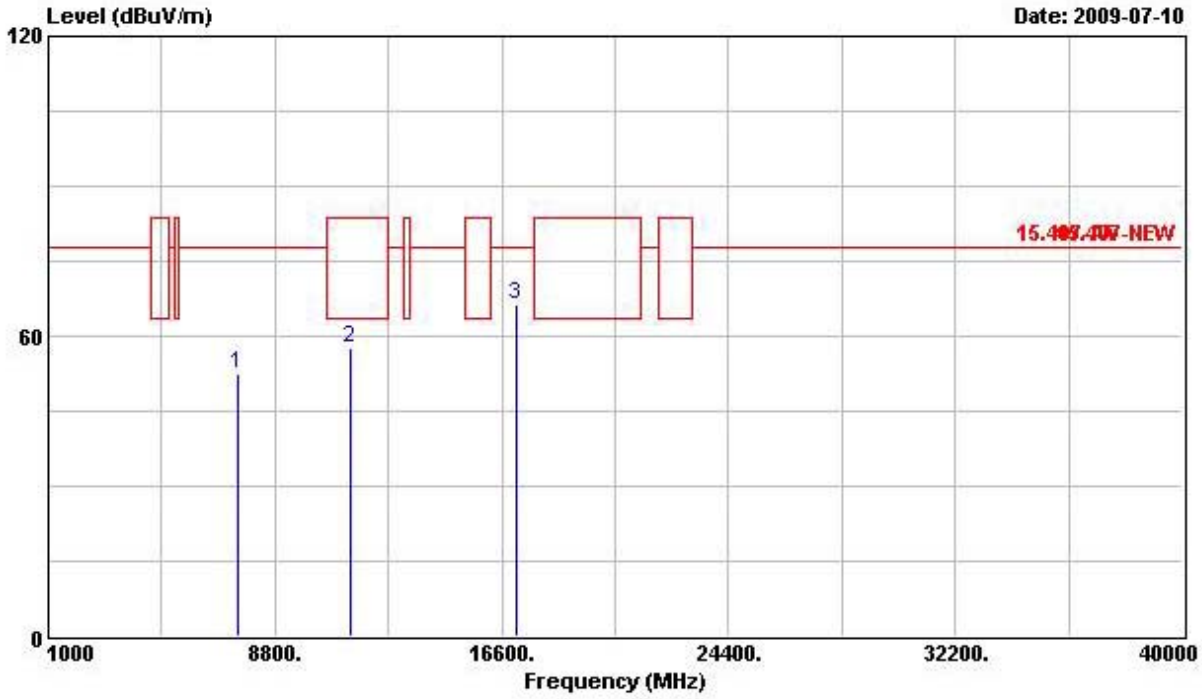
Final Test date	Jul. 10, 2009	**Test Site No.**	03CH02-HY
Temperature	24.9℃	**Humidity**	52.2%
Test Engineer	David	**Configuration**	802.11a CH 140

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7124.000	52.98	-24.86	77.84	44.77	37.82	5.61	35.23	---	---	PEAK
2 @	11400.000	57.77	-5.77	63.54	45.48	40.56	6.71	34.98	---	---	PK
3	17100.000	63.81	-14.03	77.84	45.71	43.64	8.61	34.16	---	---	PEAK

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	7504.000	52.41	-25.43	77.84	44.14	37.91	5.66	35.30	---	---	Peak
2 @	11396.000	57.59	-5.95	63.54	45.30	40.56	6.71	34.98	---	---	PK
3	17100.000	66.47	-11.37	77.84	48.38	43.64	8.61	34.16	---	---	PEAK