

FCC RADIO TEST REPORT

Applicant's company	Amtran Technology Co., Ltd.
Applicant Address	17F, No.268, Lien Chen Rd. Chung Ho City, Taipei County, 235 Taiwan
FCC ID	MDZVF552XVT-WL

Product Name	WLAN USB CARD WN8522B 1-LF-MT
Brand Name	VIZIO
Model Name	0980014000XX (XX = 0~9)
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Aug. 04, 2009
Final Test Date	Aug. 20, 2009
Submission Type	Original Equipment
Multiple Listing	Please refer to section 3.7



Statement

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

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

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

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

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

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History of This Test Report

Original Issue Date: Aug. 20, 2009

Report No.: FR980428AB

☒ No additional attachment.

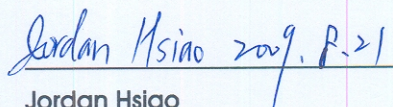
☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name : WLAN USB CARD WN8522B 1-LF-MT
Brand Name : VIZIO
Model Name : 0980014000XX (XX = 0~9)
Applicant : Amtran Technology Co., Ltd.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Aug. 04, 2009 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Jordan Hsiao

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	19.64 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	2.31 dB
4.3	15.247(e)	Power Spectral Density	Complies	1.76 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.53 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.08 dB
4.7	15.203	Antenna Requirements	Complies	-

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

3. GENERAL INFORMATION

3.1. Product Details

Draft n

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	see the below table for draft n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for Draft n
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS8 (20MHz): 17.72 MHz ; MCS8 (40MHz): 36.24 MHz For 5GHz Band: MCS8 (20MHz): 17.76 MHz ; MCS8 (40MHz): 36.40 MHz
Conducted Output Power	For 2.4GHz Band: MCS8 (20MHz): 27.69 dBm ; MCS8 (40MHz): 22.65 dBm For 5GHz Band: MCS8 (20MHz): 22.34 dBm ; MCS8 (40MHz): 23.10 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11a/b/g

Items	Description
Product Type	WLAN (1TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 13.24 MHz ; 11g: 16.56 MHz ; 11a: 17.44 MHz
Conducted Output Power	11b: 19.39 dBm ; 11g: 21.33 dBm ; 11a: 19.63 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

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

Draft n spec

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

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
1	Arcadyan	120800000200J	PIFA Antenna	I-PEX	2.0	TX/RX
2	Arcadyan	120800000200J	PIFA Antenna	I-PEX	2.0	TX/RX

Note: The EUT has two Antennas.

For 802.11a/b/g Mode:

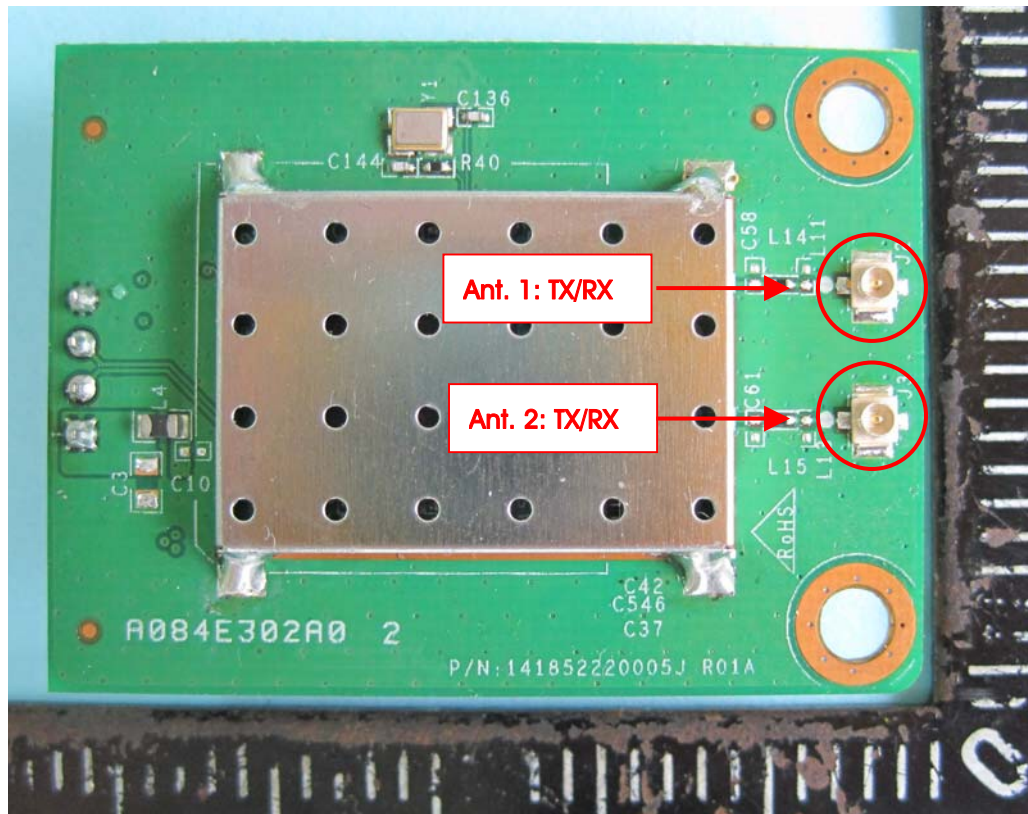
Only Ant. 1 can be used as transmitting antenna.

Ant. 1 and Ant. 2 will receive the same signal simultaneously.

For Draft n Mode:

Both Ant. 1 and Ant. 2 can be used as transmitting/receiving antenna.

Ant. 1 and Ant. 2 will transmit/receive the same signal simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band

Frequency Allocation for 802.11b/g

There are two bandwidth systems for draft n.

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

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

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

For 5GHz Band

Frequency Allocation for 802.11a

There are two bandwidth systems for draft n.

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

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

Frequency Band	Channel No.	Frequency
5725~5850 MHz (USA/Canada/Taiwan)	149	5745 MHz
	151	5755 MHz
	153	5765 MHz
	157	5785 MHz
	159	5795 MHz
	161	5805 MHz
	165	5825 MHz

3.5. Table for Test Modes

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

For 2.4GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Max. Peak Conducted Output Power	MCS8/20MHz	13 Mbps	1/6/11	1 / 2 / 1+2
	MCS8/40MHz	27 Mbps	3/6/9	1 / 2 / 1+2
	11b/CCK	1 Mbps	1/6/11	1 / 2 / 1+2
	11g/BPSK	6 Mbps	1/6/11	1 / 2 / 1+2
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	1/6/11	1+2
	MCS8/40MHz	27 Mbps	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS8/20MHz	13 Mbps	1/6/11	1+2
	MCS8/40MHz	27 Mbps	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Band Edge Emissions	MCS8/20MHz	13 Mbps	1/11	1+2
	MCS8/40MHz	27 Mbps	3/9	1+2
	11b/CCK	1 Mbps	1/11	1
	11g/BPSK	6 Mbps	1/11	1

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Max. Peak Conducted Output Power	MCS8/20MHz	13 Mbps	149/157/165	1 / 2 / 1+2
	MCS8/40MHz	27 Mbps	151/159	1 / 2 / 1+2
	11a/BPSK	6 Mbps	149/157/165	1 / 2 / 1+2
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	149/157/165	1+2
	MCS8/40MHz	27 Mbps	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS8/20MHz	13 Mbps	149/157/165	1+2
	MCS8/40MHz	27 Mbps	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1
Band Edge Emissions	MCS8/20MHz	13 Mbps	149/157/165	1+2
	MCS8/40MHz	27 Mbps	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	480872	IC 4088	-
CO04-HY	Conduction	Hwa Ya	-	-	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

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

Please refer section 6 for Test Site Address.

3.7. Table for Multiple List

The models are series model to 0980014000 (0980014000XX).

Model Name 0980014000XX, the X could be "number 0~9", only for marketing purpose.

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	E2K24GBRL
Mouse	iCooky	AMS0706W	DoC
Wireless AP	Planex	GW-AP54SGX	N/A

3.9. Table for Parameters of Test Software Setting

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

For 2.4GHz Band

Power Parameters of Draft n MCS8 20MHz

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
Ant. 1 / Ant. 2	18	23	16

Power Parameters of Draft n MCS8 40MHz

Test Software Version	DOS		
Frequency	2422 MHz	2437 MHz	2452 MHz
Ant. 1 / Ant. 2	14	18	16

Power Parameters of IEEE 802.11b/g

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
Ant. 1	20	18	18
Ant. 1	20	23	20

For 5GHz Band

Power Parameters of Draft n MCS8 20MHz

Test Software Version	DOS		
Frequency	5745 MHz	5785 MHz	5825 MHz
Ant. 1 / Ant. 2	18	18	19

Power Parameters of Draft n MCS8 40MHz

Test Software Version	DOS	
Frequency	5755 MHz	5795 MHz
Ant. 1 / Ant. 2	18	20

Power Parameters of IEEE 802.11a

Test Software Version	DOS		
Frequency	5745 MHz	5785 MHz	5825 MHz
Ant. 1	19	20	20

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 program was executed as follows:

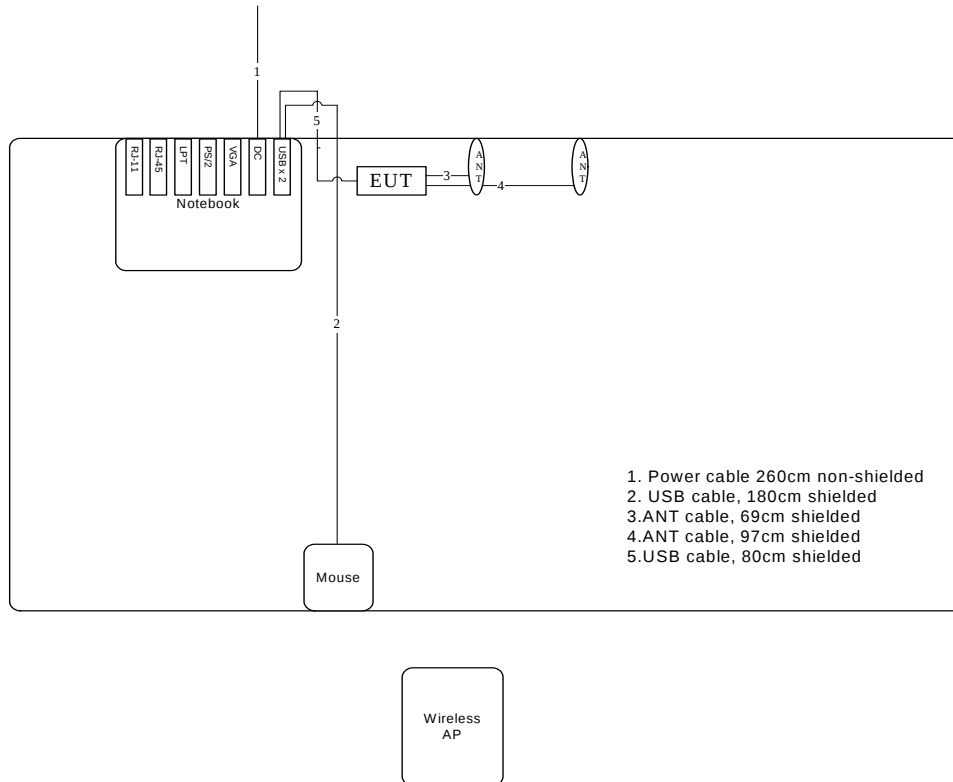
- Turn on the power of all equipment.
- The NB sends " H " messages to the panel, and the panel displays " H " patterns on the screen.
- Repeat the steps b.

At the same time, " DOS " was executed to control the EUT continuously transmit RF signal.

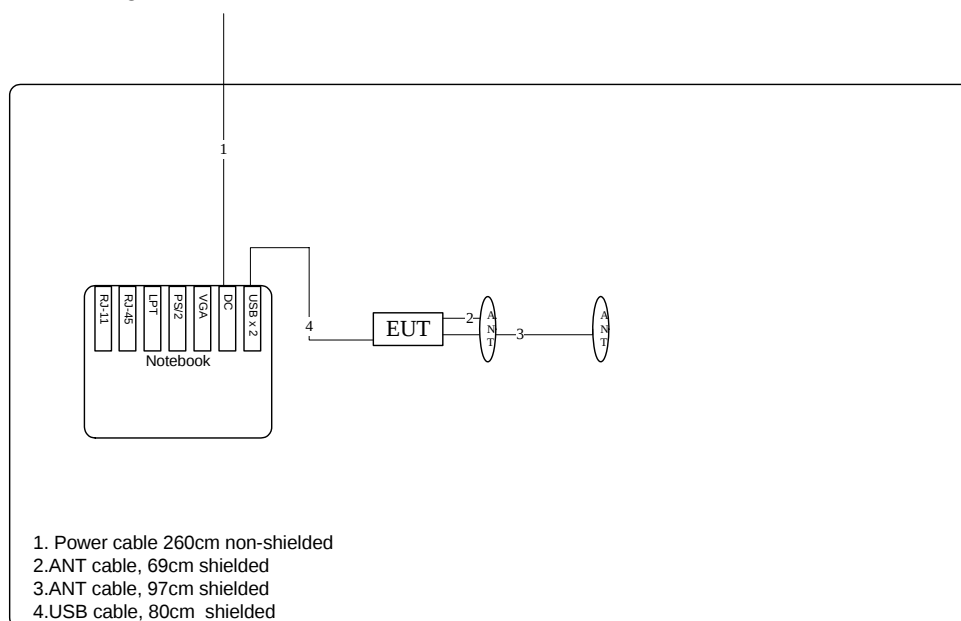
3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration

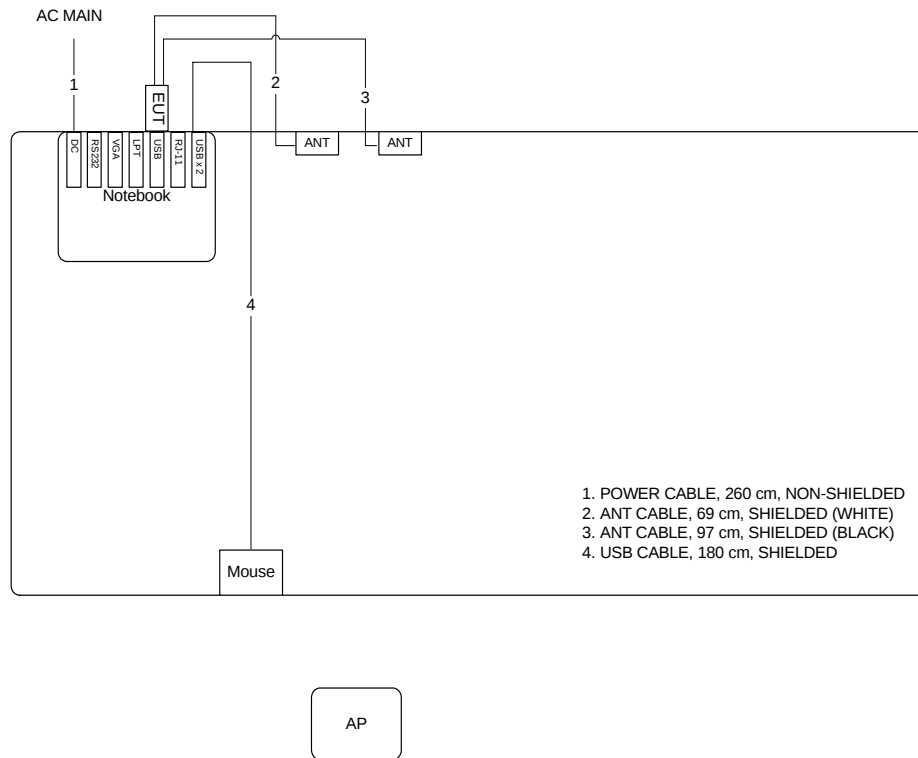
Test Configuration: 9kHz~1 GHz



Test Configuration: above 1 GHz



3.10.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

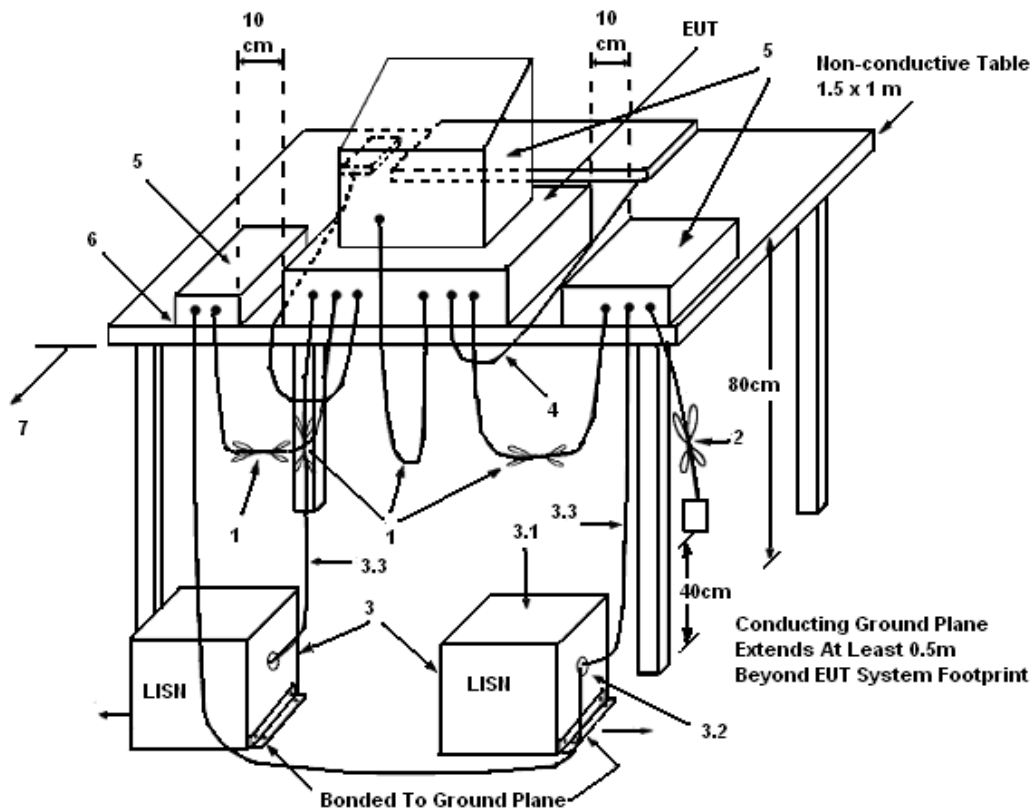
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

4.1.5. Test Deviation

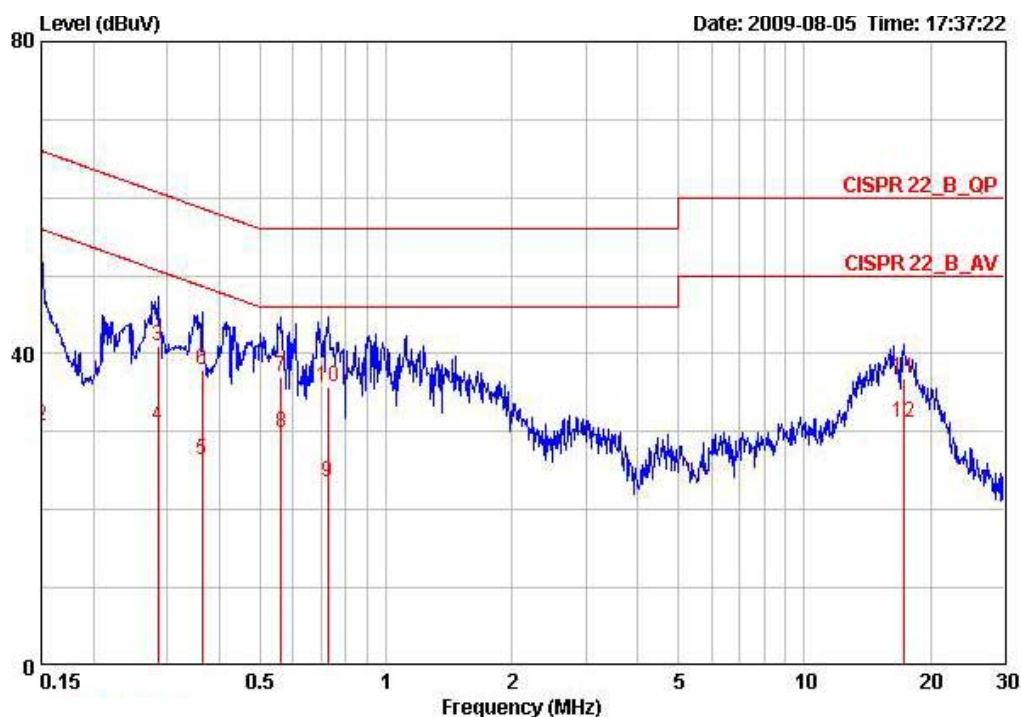
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

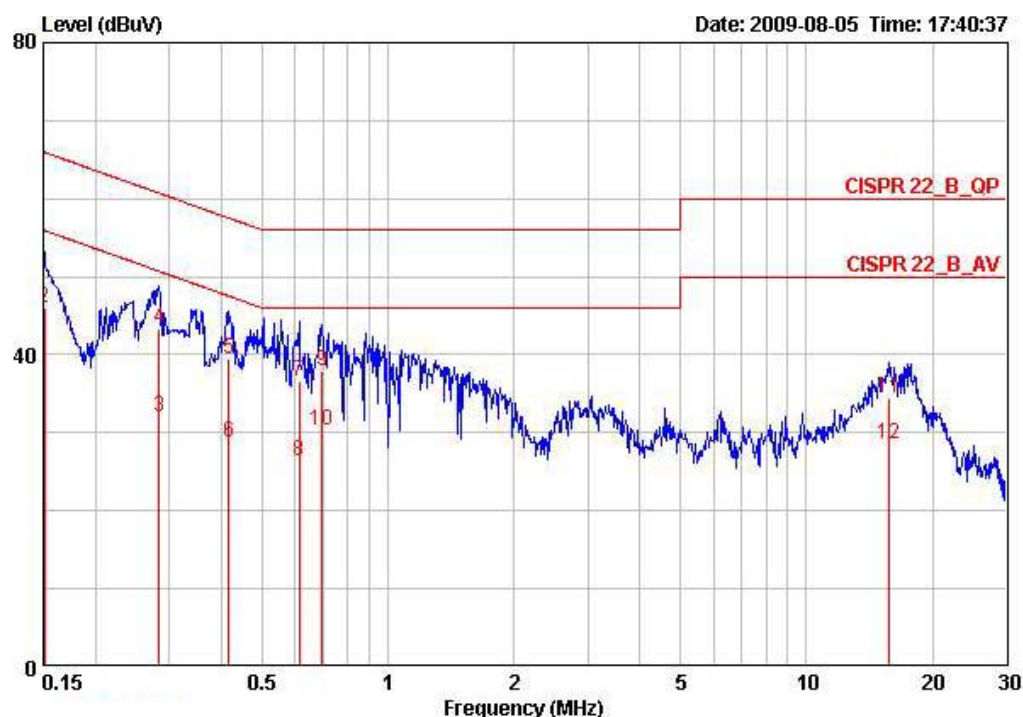
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23.5°C	Humidity	52.3%
Test Engineer	Aric Li	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15000	44.14	-21.86	66.00	43.86	0.08	0.20	QP
2	0.15000	30.64	-25.36	56.00	30.36	0.08	0.20	AVERAGE
3	0.28478	40.91	-19.77	60.68	40.67	0.04	0.20	QP
4	0.28478	30.70	-19.98	50.68	30.46	0.04	0.20	AVERAGE
5	0.36338	26.41	-22.24	48.65	26.18	0.03	0.20	AVERAGE
6	0.36338	37.98	-20.67	58.65	37.75	0.03	0.20	QP
7	0.56111	37.13	-18.87	56.00	36.90	0.03	0.20	QP
8	0.56111	29.83	-16.17	46.00	29.60	0.03	0.20	AVERAGE
9	0.72744	23.58	-22.42	46.00	23.35	0.03	0.20	AVERAGE
10	0.72744	35.74	-20.26	56.00	35.51	0.03	0.20	QP
11	17.291	36.95	-23.06	60.00	35.76	0.69	0.50	QP
12	17.291	31.25	-18.76	50.00	30.06	0.69	0.50	AVERAGE

Temperature	23.5°C	Humidity	52.3%
Test Engineer	Aric Li	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.15080	29.08	-26.87	55.96	28.78	0.10	0.20	AVERAGE
2	0.15080	45.96	-19.99	65.96	45.66	0.10	0.20	QP
3	0.28328	32.00	-18.71	50.72	31.73	0.07	0.20	AVERAGE
4	0.28328	43.33	-17.38	60.72	43.06	0.07	0.20	QP
5	0.41705	39.39	-18.12	57.51	39.12	0.07	0.20	QP
6	0.41705	28.78	-18.73	47.51	28.51	0.07	0.20	AVERAGE
7	0.61400	36.60	-19.40	56.00	36.33	0.07	0.20	QP
8	0.61400	26.31	-19.69	46.00	26.04	0.07	0.20	AVERAGE
9	0.69725	38.03	-17.97	56.00	37.76	0.07	0.20	QP
10	0.69725	30.36	-15.64	46.00	30.09	0.07	0.20	AVERAGE
11	15.801	34.48	-25.52	60.00	33.47	0.61	0.40	QP
12	15.801	28.52	-21.48	50.00	27.51	0.61	0.40	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

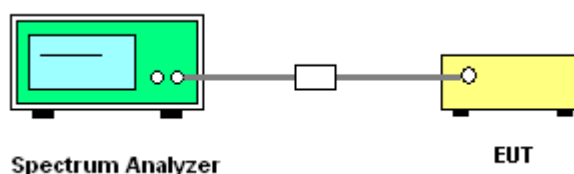
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1MHz
VB	3MHz
Detector	RMS
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	23°C	Humidity	58%
Test Engineer	Johnson Chang	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS8 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.41	30.00	Complies
6	2437 MHz	24.50	30.00	Complies
11	2462 MHz	17.51	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.51	30.00	Complies
6	2437 MHz	24.85	30.00	Complies
11	2462 MHz	17.69	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	22.47	30.00	Complies
6	2437 MHz	27.69	30.00	Complies
11	2462 MHz	20.61	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	15.20	30.00	Complies
6	2437 MHz	19.11	30.00	Complies
9	2452 MHz	17.11	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	15.95	30.00	Complies
6	2437 MHz	20.11	30.00	Complies
9	2452 MHz	17.70	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	18.60	30.00	Complies
6	2437 MHz	22.65	30.00	Complies
9	2452 MHz	20.43	30.00	Complies

For 5GHz Band

Configuration Draft n MCS8 20MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	16.60	30.00	Complies
157	5785 MHz	17.18	30.00	Complies
165	5825 MHz	19.01	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	16.91	30.00	Complies
157	5785 MHz	17.80	30.00	Complies
165	5825 MHz	19.63	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	19.77	30.00	Complies
157	5785 MHz	20.51	30.00	Complies
165	5825 MHz	22.34	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	18.50	30.00	Complies
159	5795 MHz	19.36	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	19.89	30.00	Complies
159	5795 MHz	20.71	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	22.26	30.00	Complies
159	5795 MHz	23.10	30.00	Complies

Temperature	23°C	Humidity	58%
Test Engineer	Johnson Chang	Configurations	802.11a/b/g

Configuration IEEE 802.11b Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.39	30.00	Complies
6	2437 MHz	17.42	30.00	Complies
11	2462 MHz	17.60	30.00	Complies

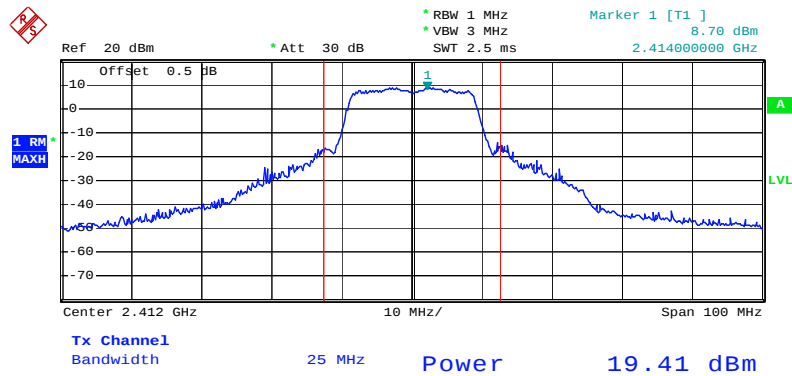
Configuration IEEE 802.11g Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	21.11	30.00	Complies
6	2437 MHz	21.33	30.00	Complies
11	2462 MHz	21.29	30.00	Complies

Configuration IEEE 802.11a Ant. 1

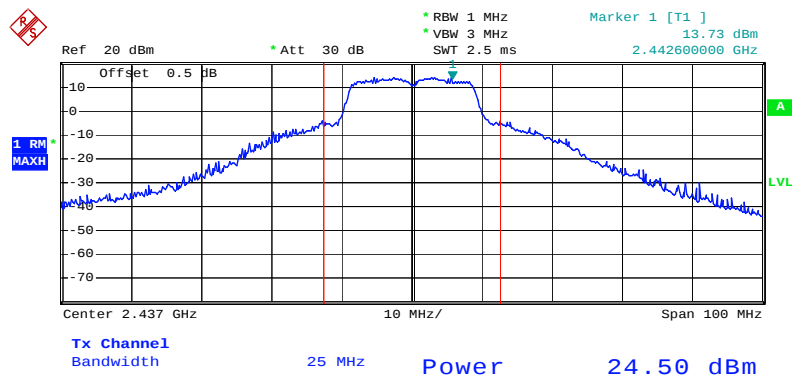
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	17.12	30.00	Complies
157	5785 MHz	18.79	30.00	Complies
165	5825 MHz	19.63	30.00	Complies

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 1 / 2412 MHz



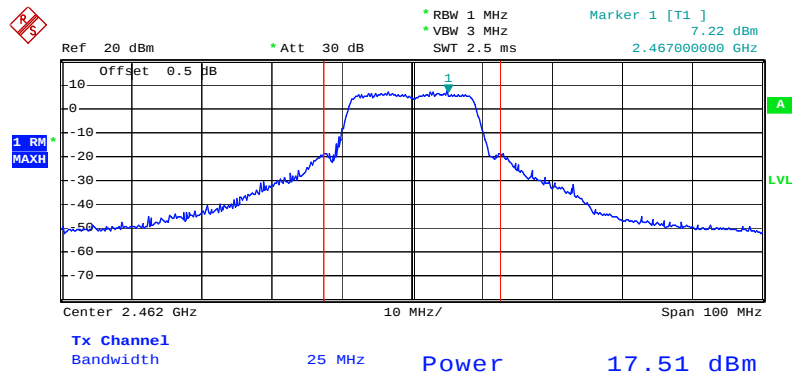
Date: 10.AUG.2009 11:25:44

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 1 / 2437 MHz



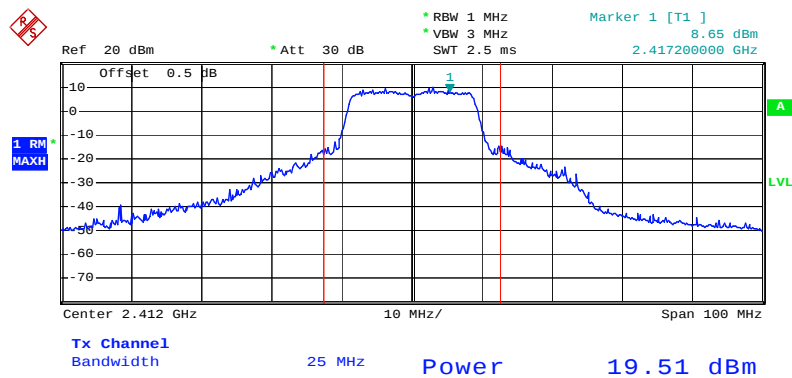
Date: 10.AUG.2009 11:28:52

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 1 / 2462 MHz



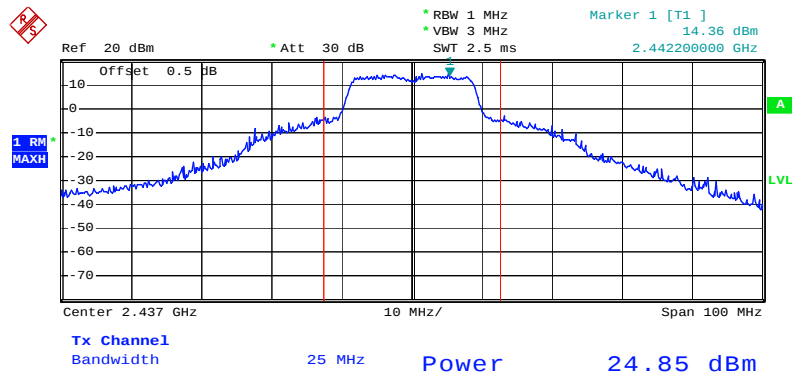
Date: 10.AUG.2009 11:31:09

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 2 / 2412 MHz



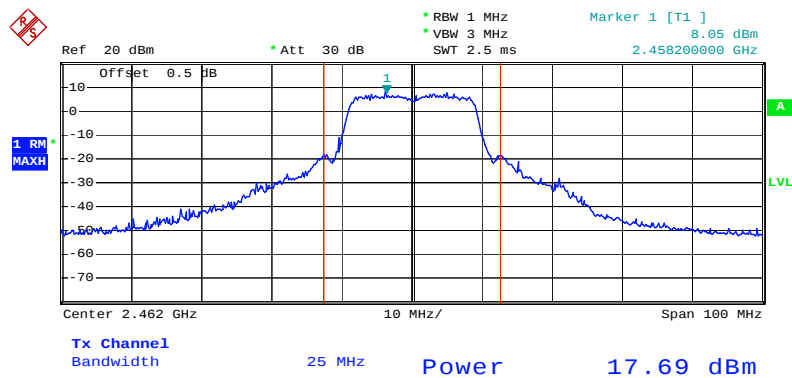
Date: 10.AUG.2009 11:26:45

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 2 / 2437 MHz



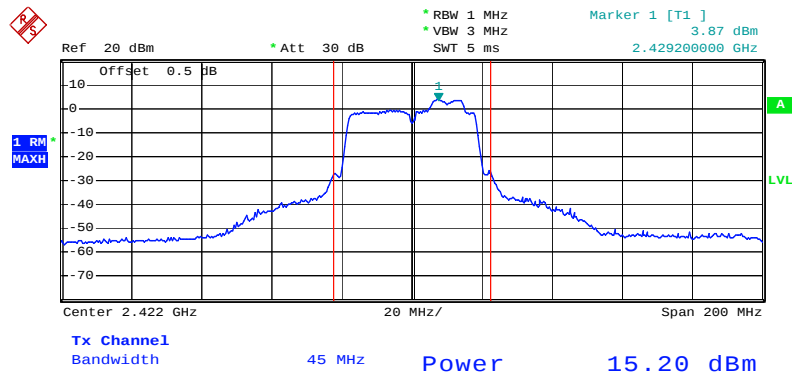
Date: 10.AUG.2009 11:27:50

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. 2 / 2462 MHz



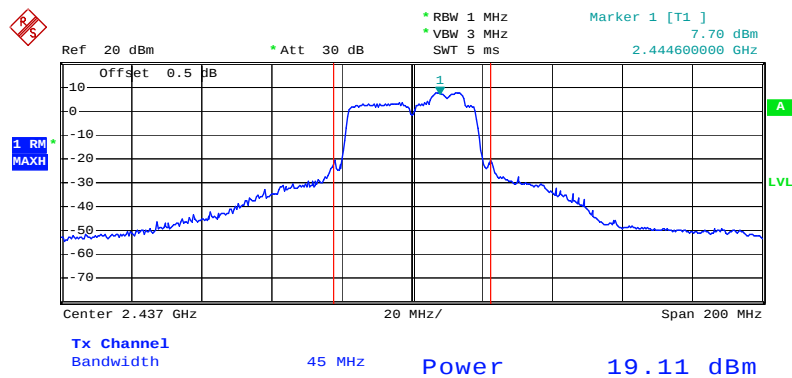
Date: 10.AUG.2009 11:32:04

Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 1 / 2422 MHz



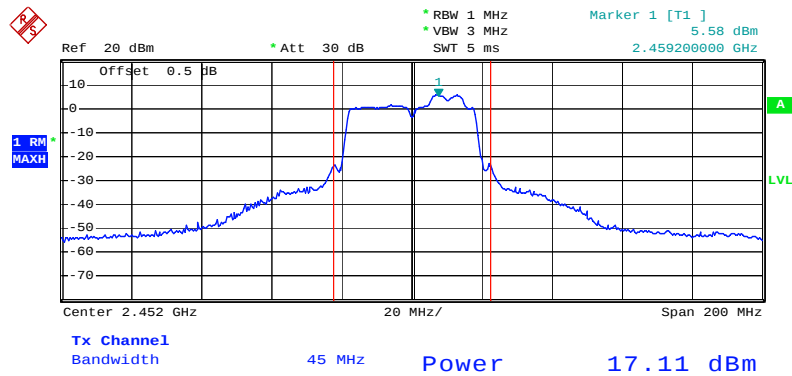
Date: 10.AUG.2009 11:36:42

Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 1 / 2437 MHz



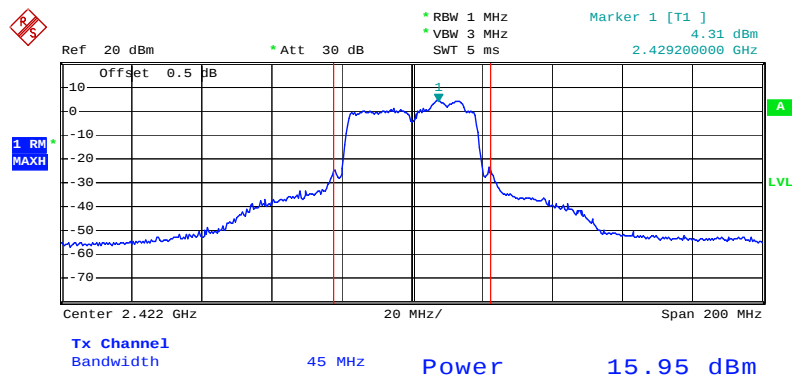
Date: 10.AUG.2009 11:37:58

Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 1 / 2452 MHz



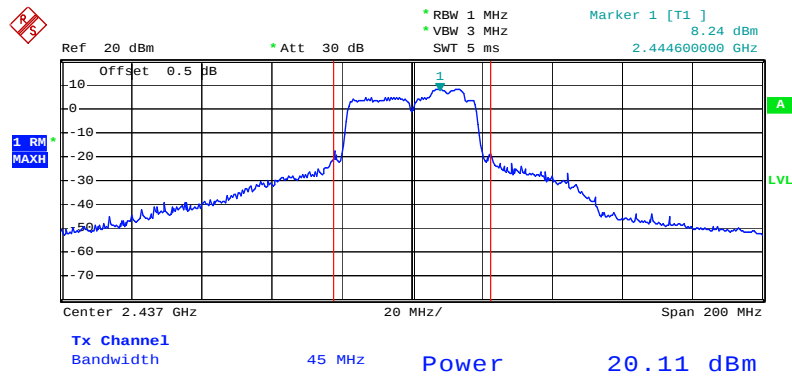
Date: 10.AUG.2009 11:41:24

Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 2 / 2422 MHz



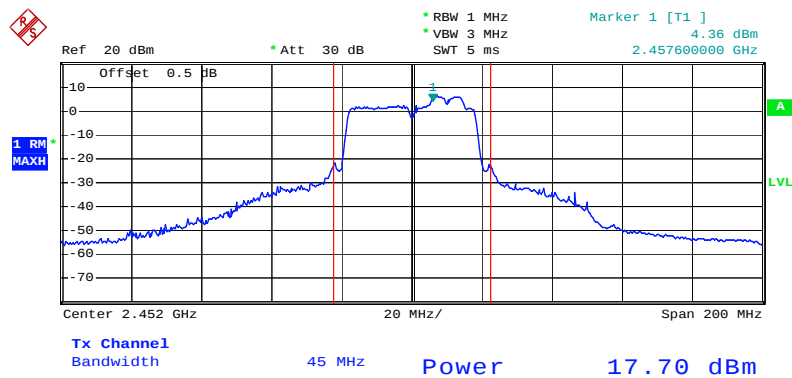
Date: 10.AUG.2009 11:35:50

Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 2 / 2437 MHz



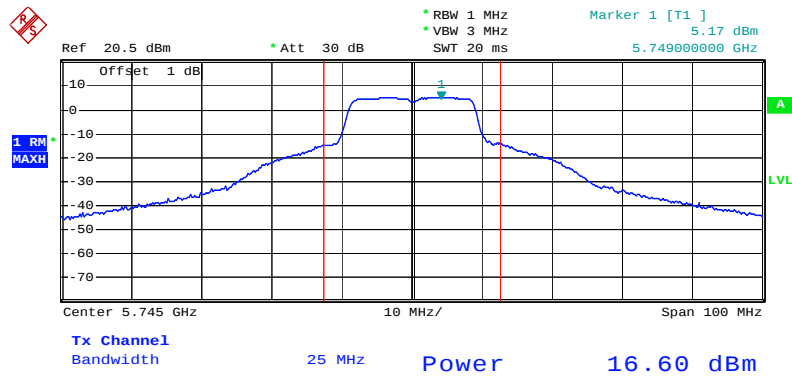
Date: 10.AUG.2009 11:39:00

Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. 2 / 2452 MHz



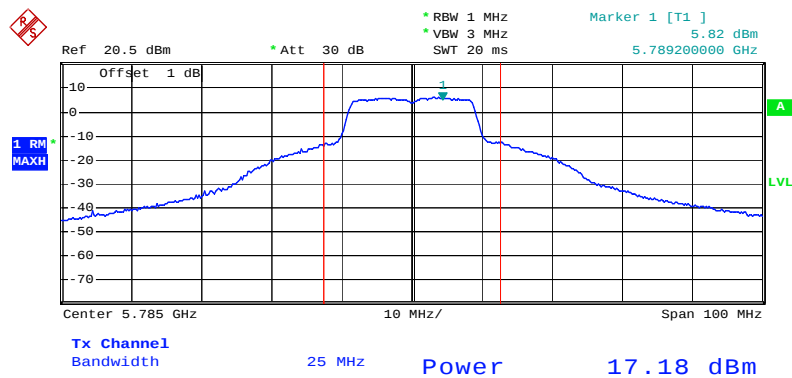
Date: 10.AUG.2009 11:40:40

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. 1 / 5745 MHz



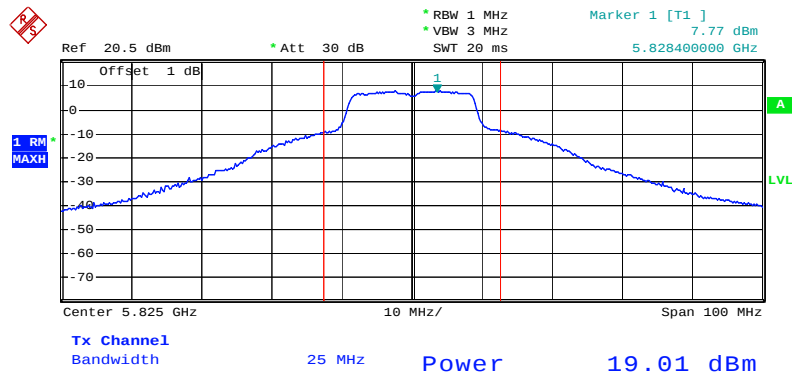
Date: 10.AUG.2009 14:54:50

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. 1 / 5785MHz



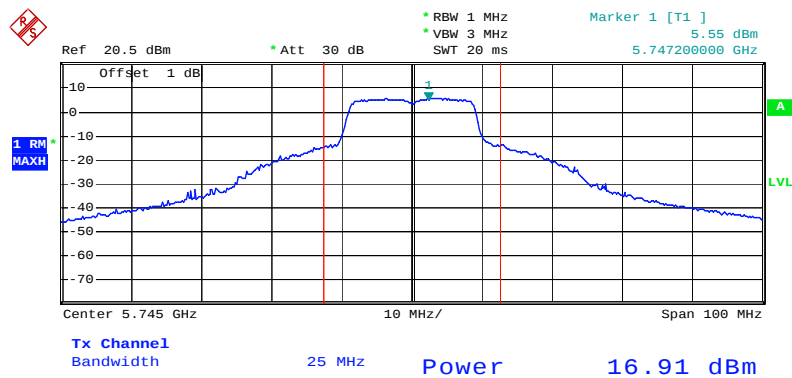
Date: 10.AUG.2009 14:58:37

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. 1 / 5825 MHz



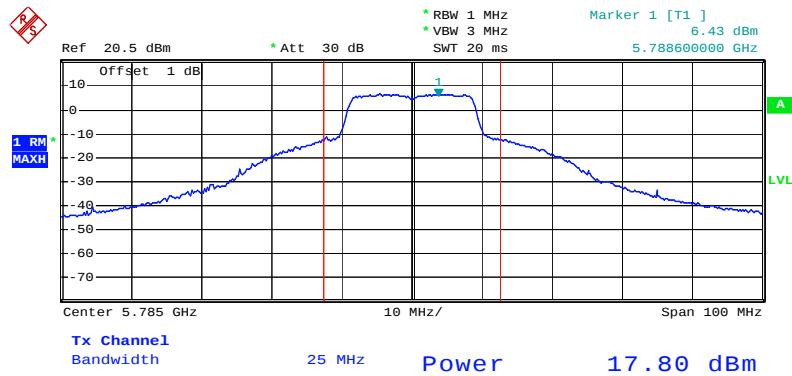
Date: 10.AUG.2009 14:59:42

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. 2 / 5745 MHz



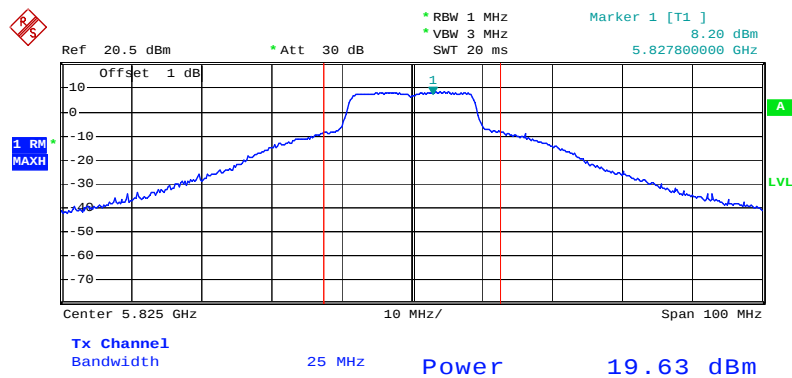
Date: 10.AUG.2009 14:55:16

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. 2 / 5785MHz



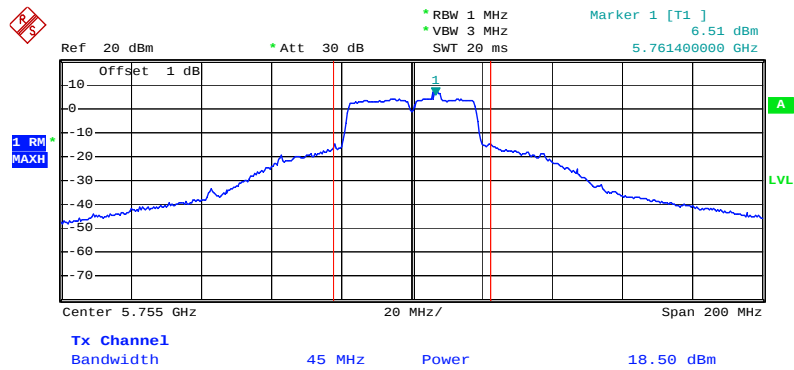
Date: 10.AUG.2009 14:58:06

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. 2 / 5825 MHz



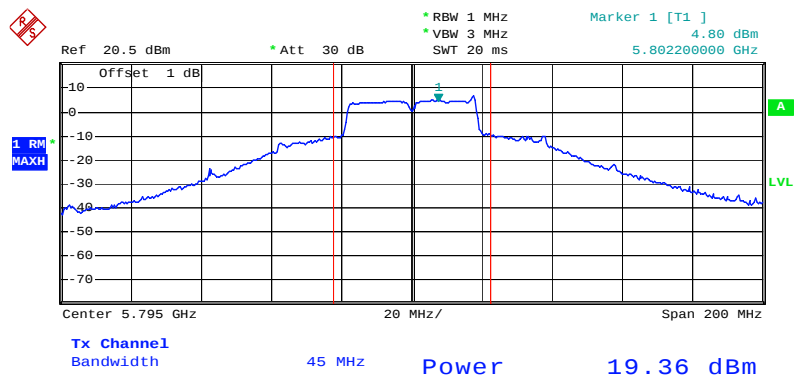
Date: 10.AUG.2009 15:00:39

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. 1 / 5755 MHz



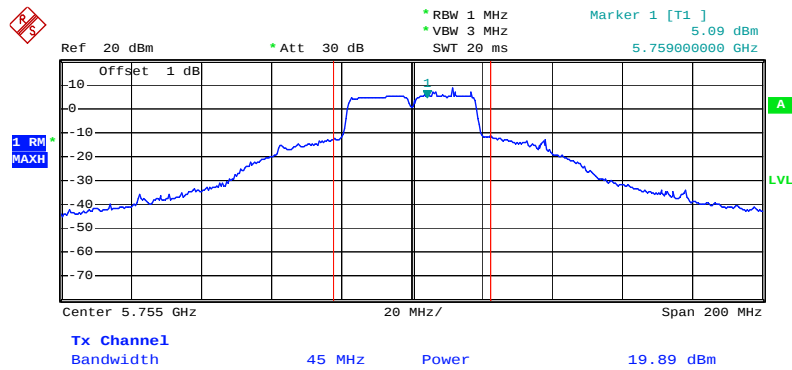
Date: 20.AUG.2009 14:12:08

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. 1 / 5795 MHz



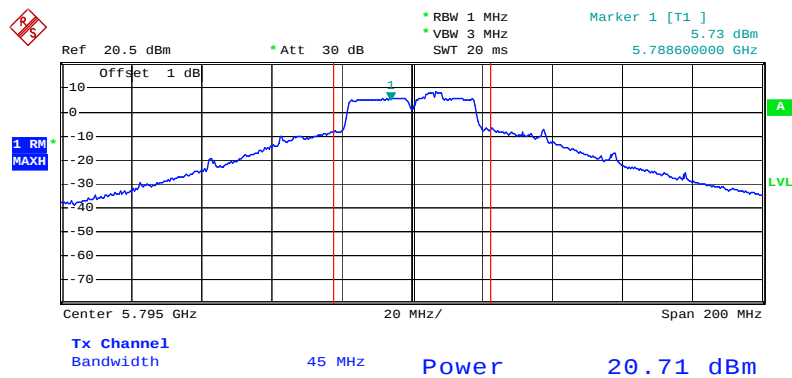
Date: 10.AUG.2009 15:07:13

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. 2 / 5755 MHz



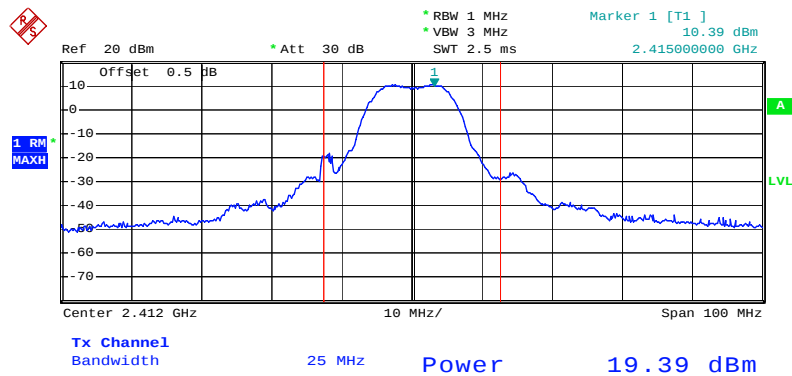
Date: 20.AUG.2009 14:11:02

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. 2 / 5795 MHz



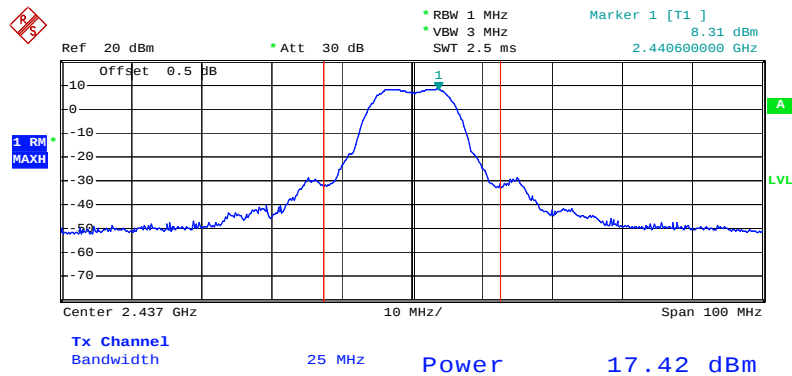
Date: 10.AUG.2009 15:07:34

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 1 / 2412 MHz



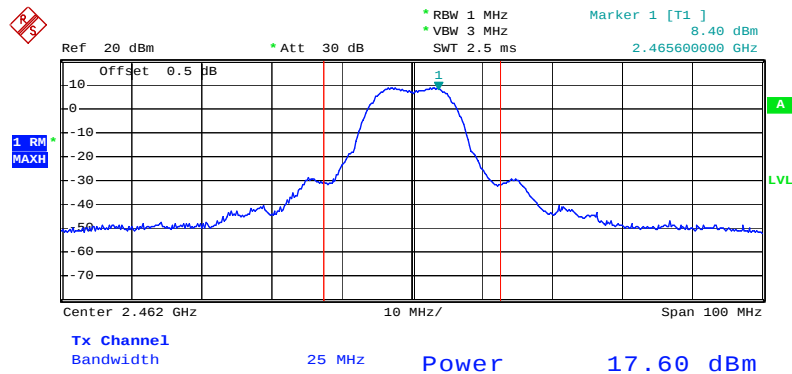
Date: 10.AUG.2009 11:03:57

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 1 / 2437 MHz



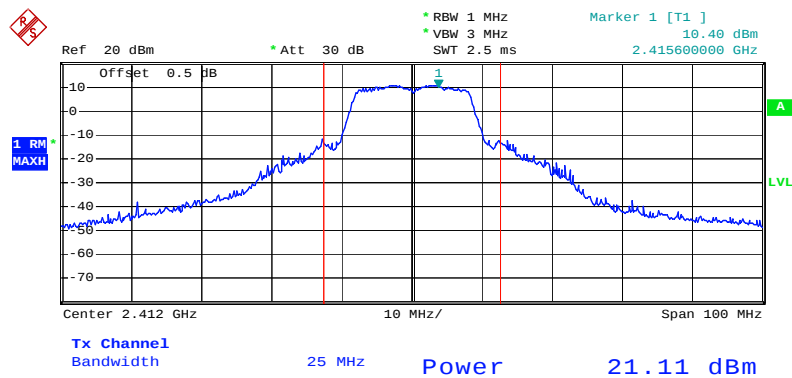
Date: 10.AUG.2009 11:05:16

Conducted Output Power Plot on Configuration IEEE 802.11b Ant. 1 / 2462 MHz



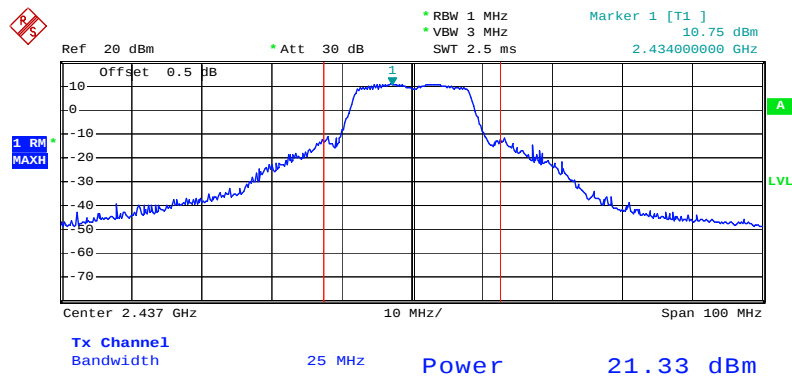
Date: 10.AUG.2009 11:10:28

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 1 / 2412 MHz



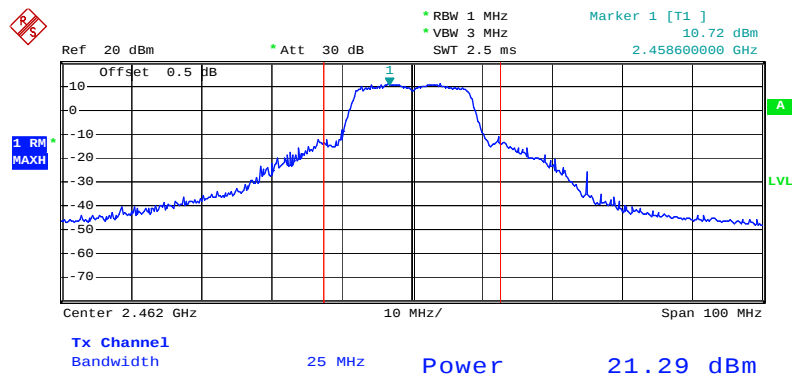
Date: 10.AUG.2009 11:23:57

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 1 / 2437 MHz



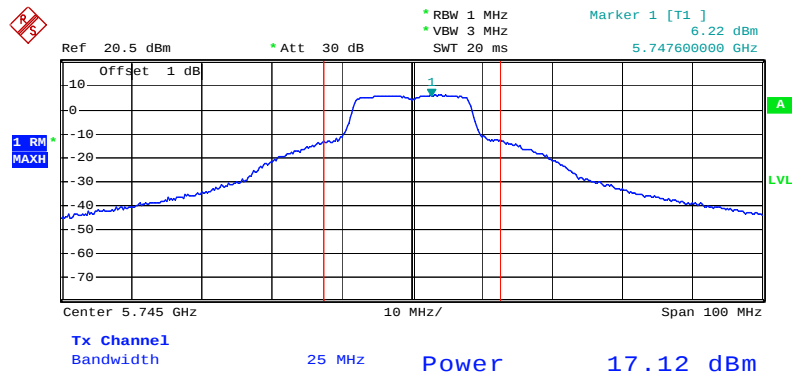
Date: 10.AUG.2009 11:23:07

Conducted Output Power Plot on Configuration IEEE 802.11g Ant. 1 / 2462 MHz



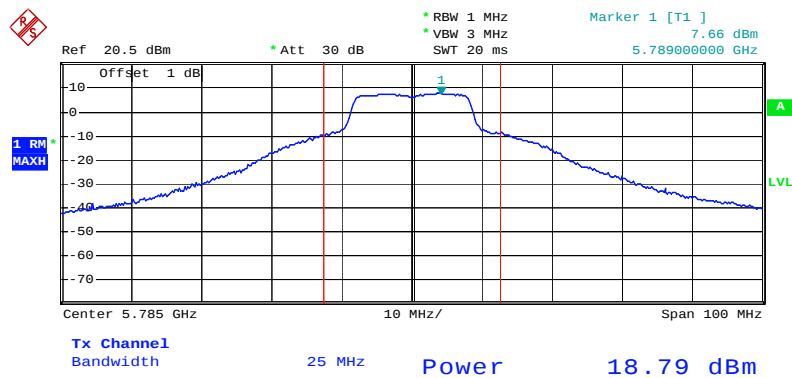
Date: 10.AUG.2009 11:19:41

Conducted Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5745 MHz



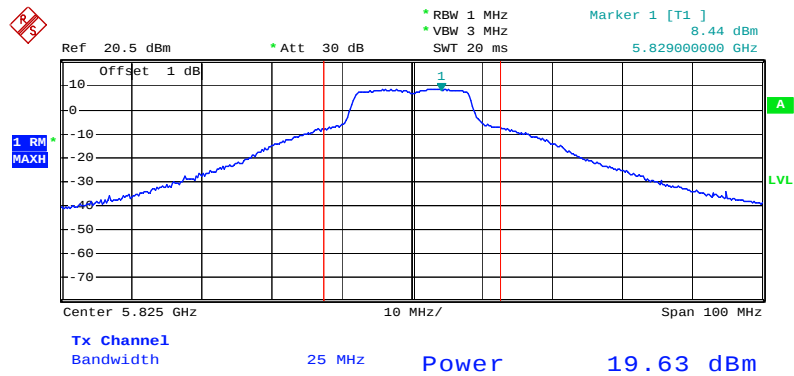
Date: 10.AUG.2009 14:51:28

Conducted Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5785 MHz



Date: 10.AUG.2009 14:52:25

Conducted Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5825 MHz



Date: 10.AUG.2009 14:53:11

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

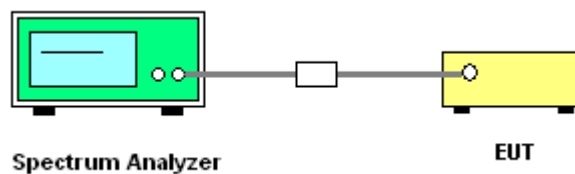
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

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

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	23°C	Humidity	58%
Test Engineer	Johnson Chang	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-3.11	8.00	Complies
6	2437 MHz	6.24	8.00	Complies
11	2462 MHz	-6.54	8.00	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
3	2422 MHz	-8.20	8.00	Complies
6	2437 MHz	-4.80	8.00	Complies
9	2452 MHz	-6.78	8.00	Complies

For 5GHz Band

Configuration 11a Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	-2.14	8.00	Complies
157	5785 MHz	-2.24	8.00	Complies
165	5825 MHz	-1.93	8.00	Complies

Configuration 11a Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
151	5755 MHz	-5.31	8.00	Complies
159	5795 MHz	-3.16	8.00	Complies

Temperature	23°C	Humidity	58%
Test Engineer	Johnson Chang	Configurations	802.11a/b/g

Configuration IEEE 802.11b Ant. 1

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-2.11	8.00	Complies
6	2437 MHz	-5.86	8.00	Complies
11	2462 MHz	-4.74	8.00	Complies

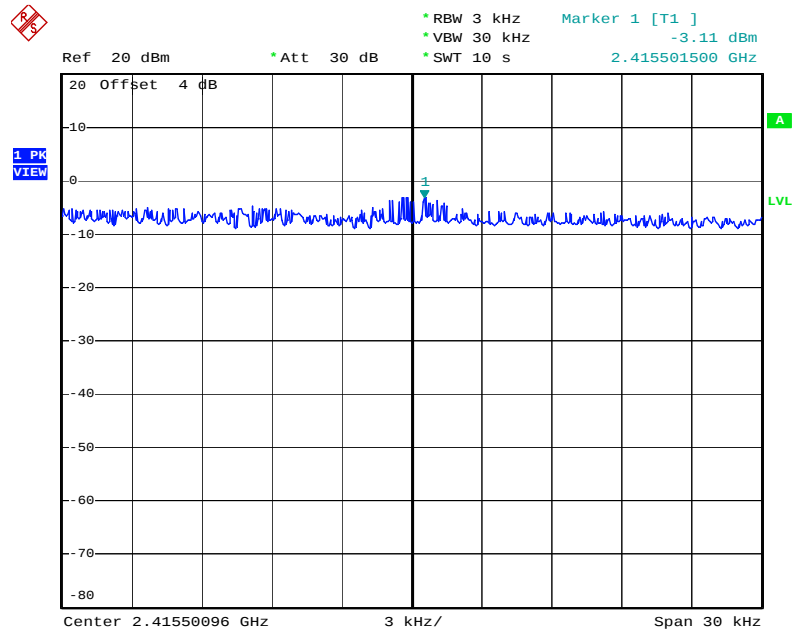
Configuration IEEE 802.11g Ant. 1

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-5.27	8.00	Complies
6	2437 MHz	-2.45	8.00	Complies
11	2462 MHz	-4.38	8.00	Complies

Configuration IEEE 802.11a Ant. 1

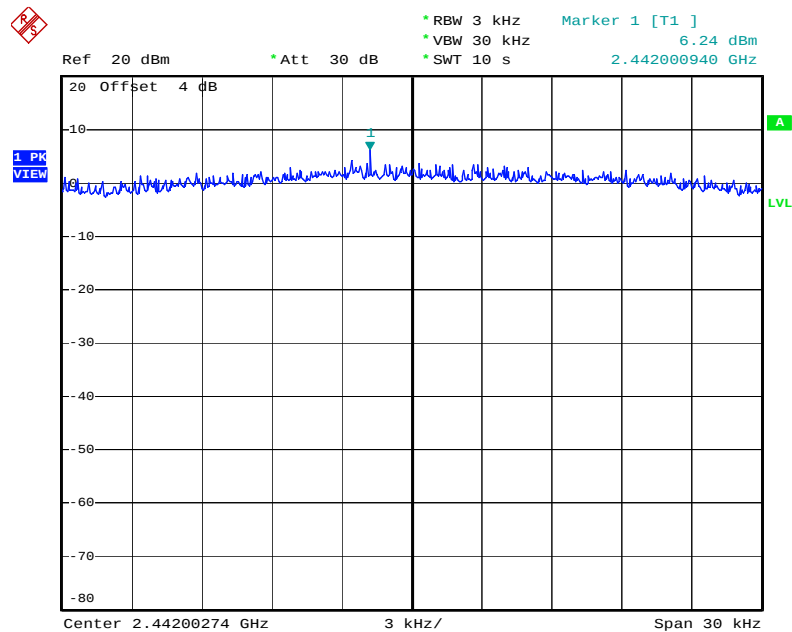
Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
149	5745 MHz	-7.21	8.00	Complies
157	5785 MHz	-5.41	8.00	Complies
165	5825 MHz	-4.52	8.00	Complies

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



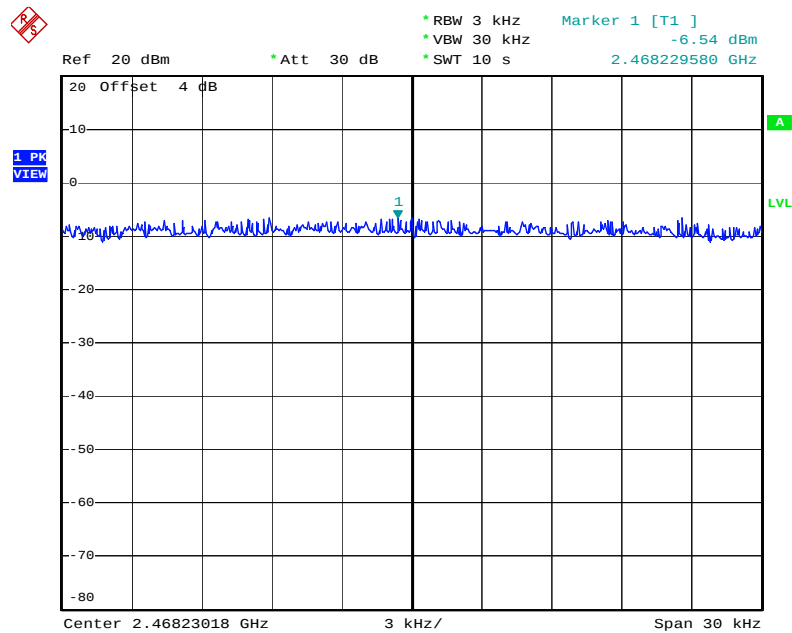
Date: 10.AUG.2009 23:29:47

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2437 MHz



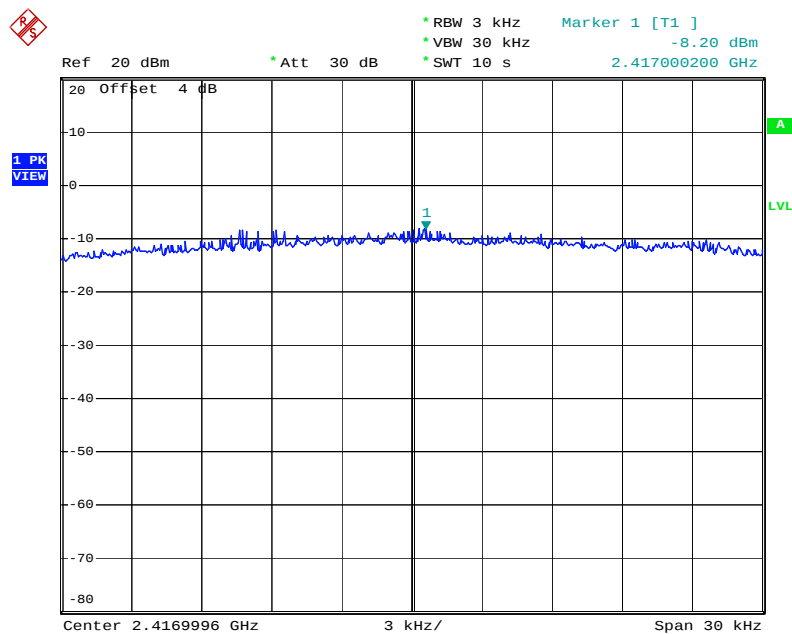
Date: 10.AUG.2009 23:00:15

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



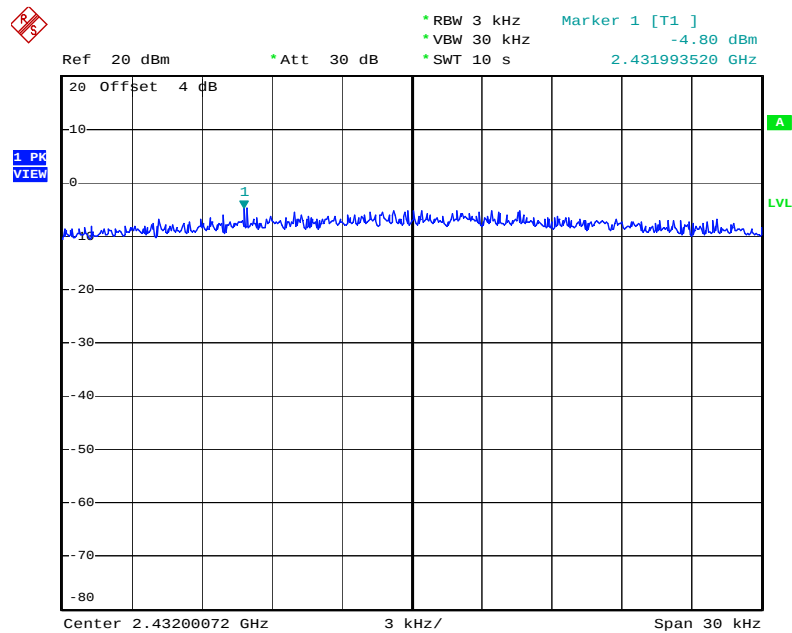
Date: 10.AUG.2009 23:02:33

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2422 MHz



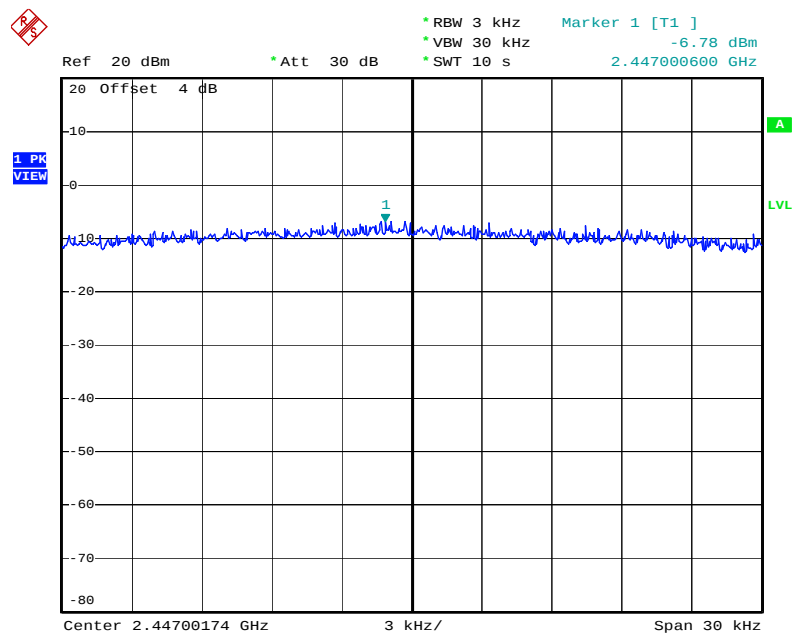
Date: 12.AUG.2009 14:54:55

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2437 MHz



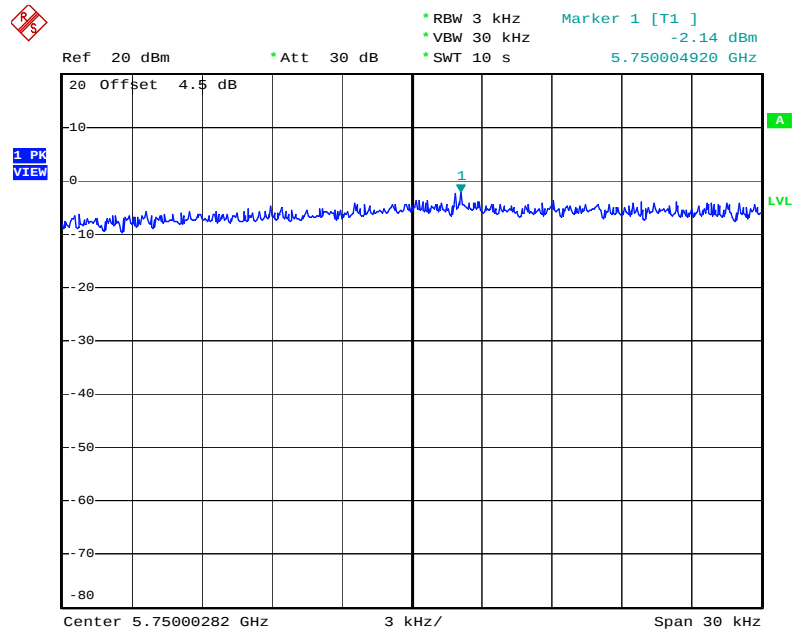
Date: 12.AUG.2009 11:18:46

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. 1 + Ant. 2 / 2452 MHz



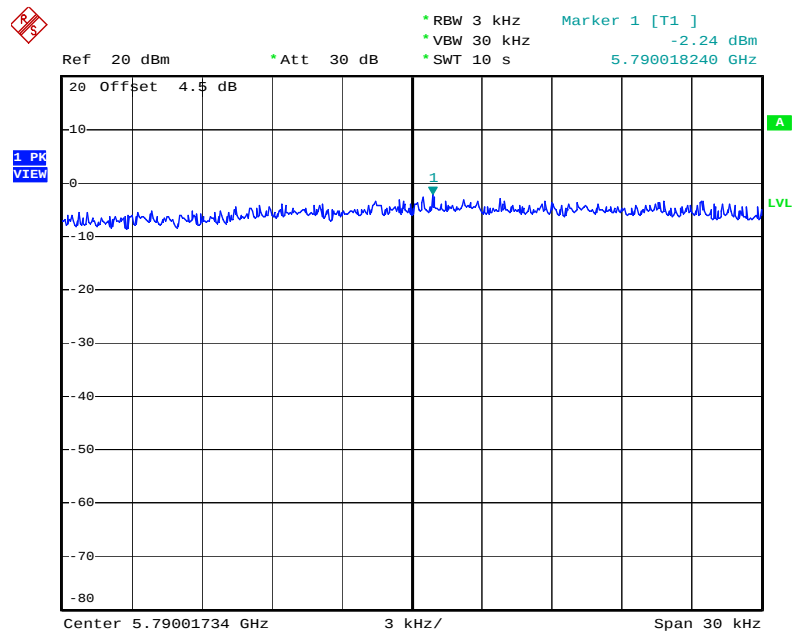
Date: 12.AUG.2009 11:30:15

Power Density Plot on Configuration 11a Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 5745 MHz



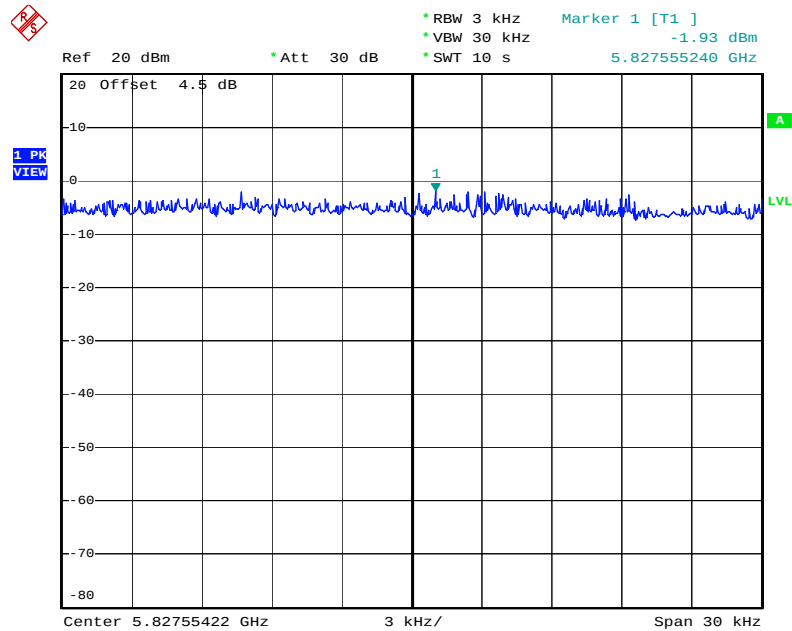
Date: 10.AUG.2009 16:15:39

Power Density Plot on Configuration 11a Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 5785 MHz



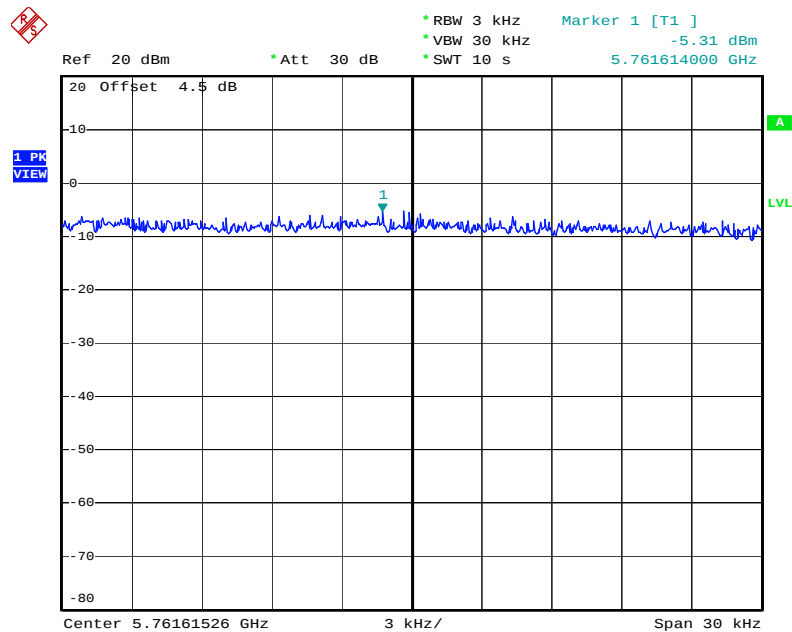
Date: 10.AUG.2009 16:24:17

Power Density Plot on Configuration 11a Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 5825 MHz



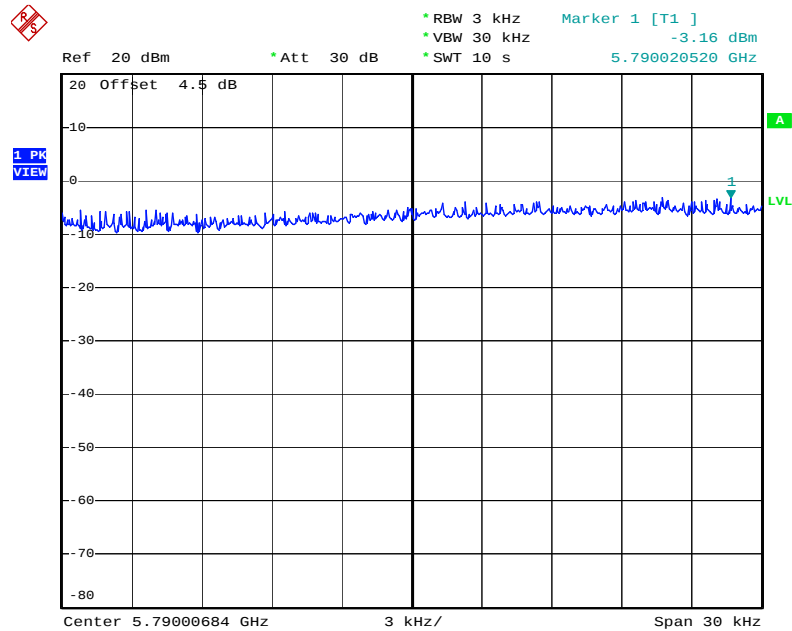
Date: 10.AUG.2009 16:28:08

Power Density Plot on Configuration 11a Draft n MCS8 40MHz Ant. 1 + Ant. 2 / 5755 MHz



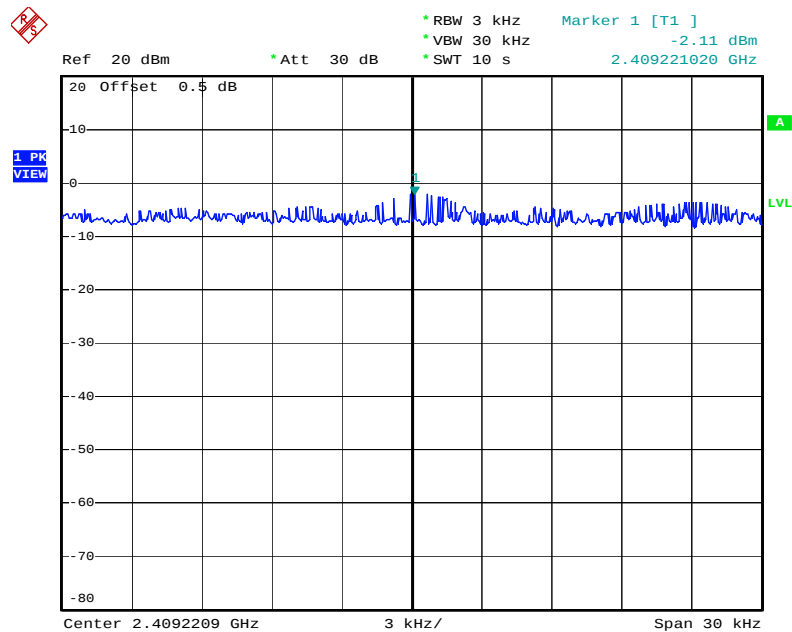
Date: 20.AUG.2009 14:06:16

Power Density Plot on Configuration 11a Draft n MCS8 40MHz Ant. 1 + Ant. 2 / 5795 MHz



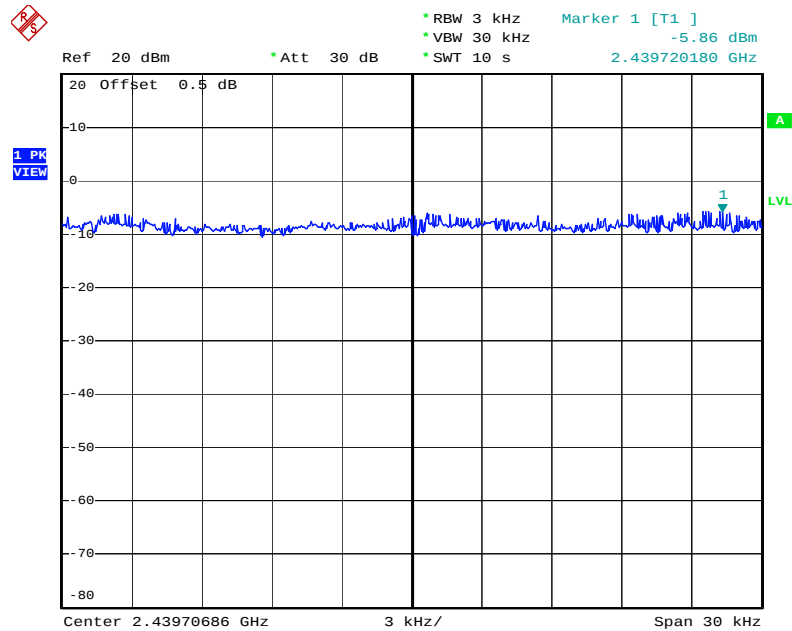
Date: 10.AUG.2009 16:08:43

Power Density Plot on Configuration IEEE 802.11b Ant. 1 / 2412 MHz



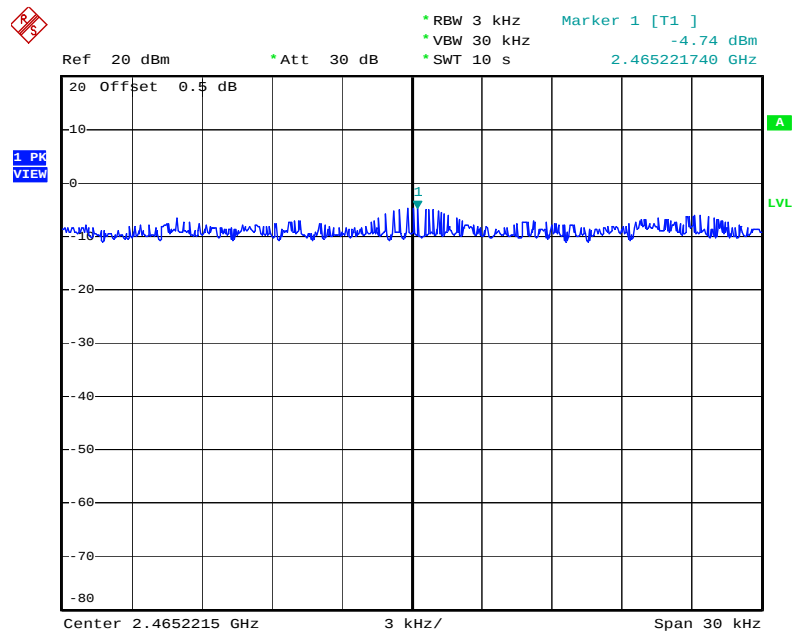
Date: 10.AUG.2009 22:37:24

Power Density Plot on Configuration IEEE 802.11b Ant. 1 / 2437 MHz



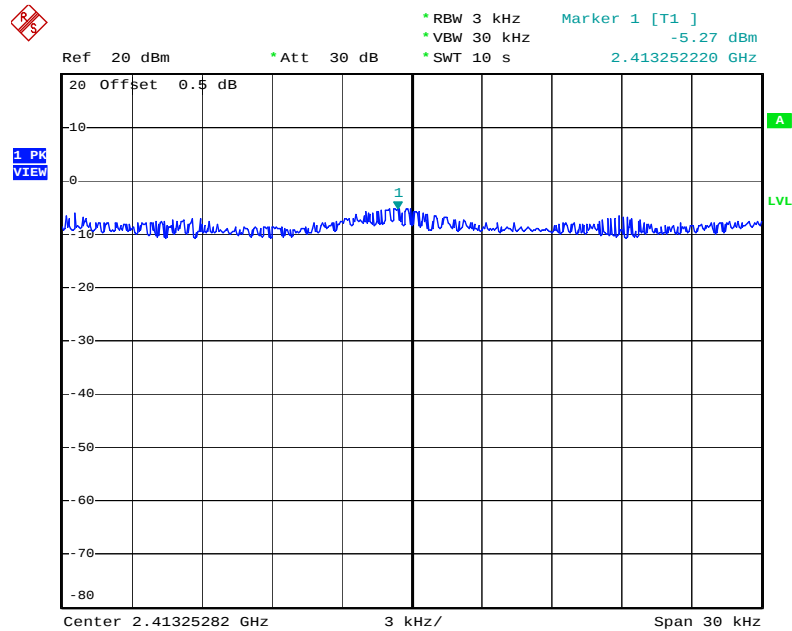
Date: 10.AUG.2009 22:39:48

Power Density Plot on Configuration IEEE 802.11b Ant. 1 / 2462 MHz



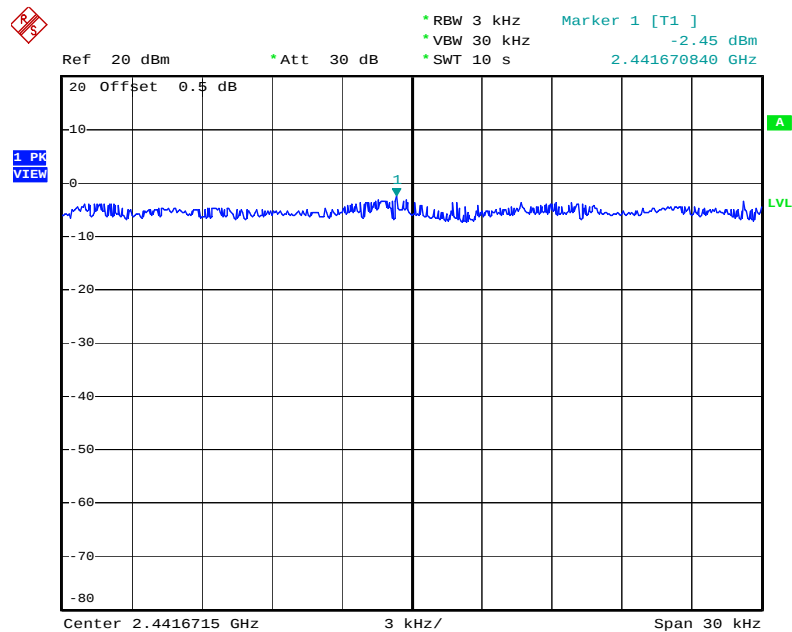
Date: 10.AUG.2009 23:33:31

Power Density Plot on Configuration IEEE 802.11g Ant. 1 / 2412 MHz



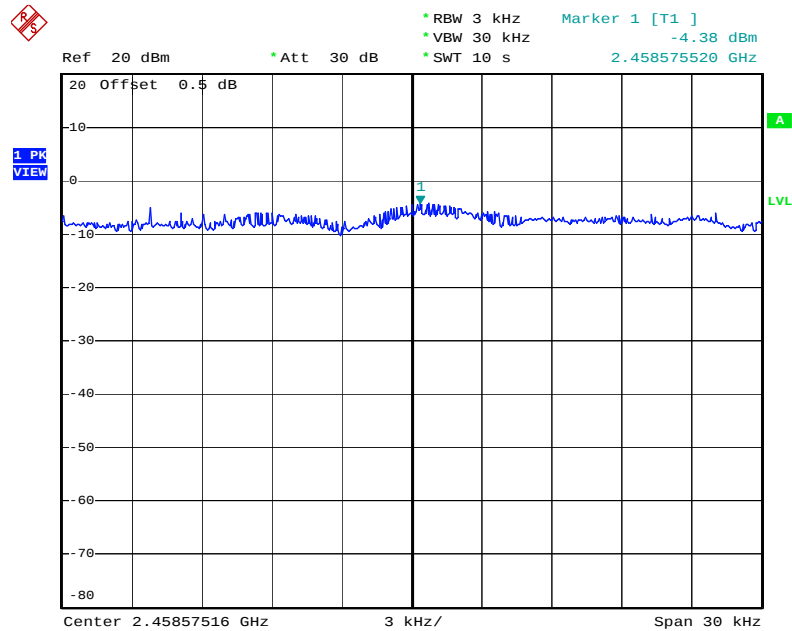
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Power Density Plot on Configuration IEEE 802.11g Ant. 1 / 2437 MHz



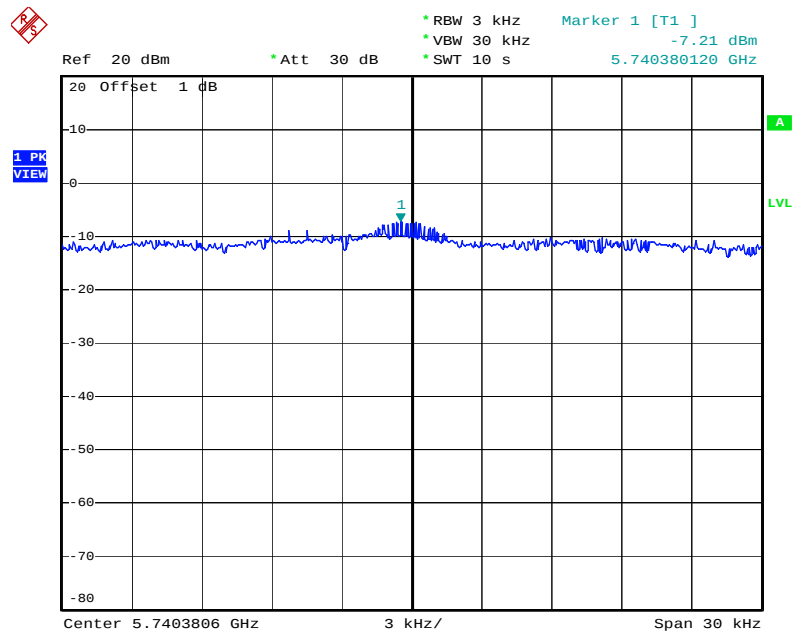
Date: 10.AUG.2009 22:49:18

Power Density Plot on Configuration IEEE 802.11g Ant. 1 / 2462 MHz



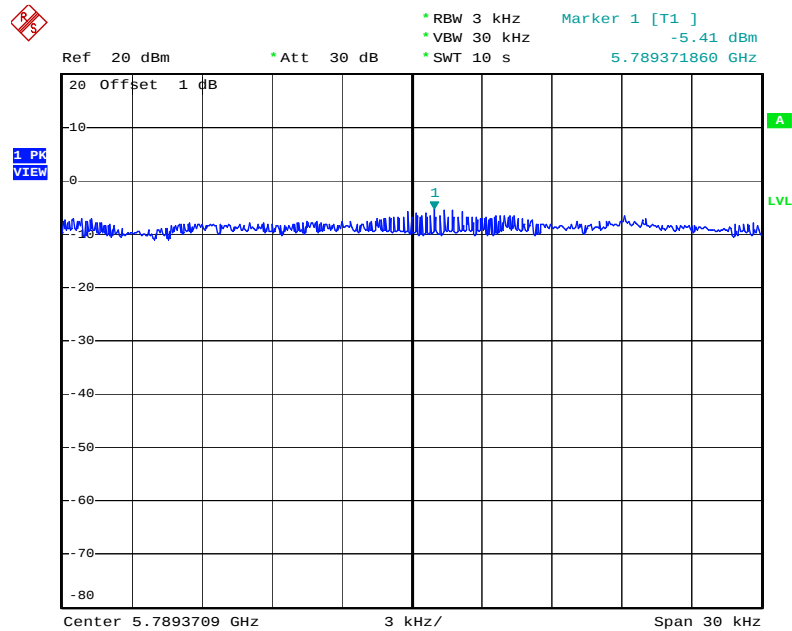
Date: 10.AUG.2009 22:46:28

Power Density Plot on Configuration IEEE 802.11a Ant. 1 / 5745 MHz



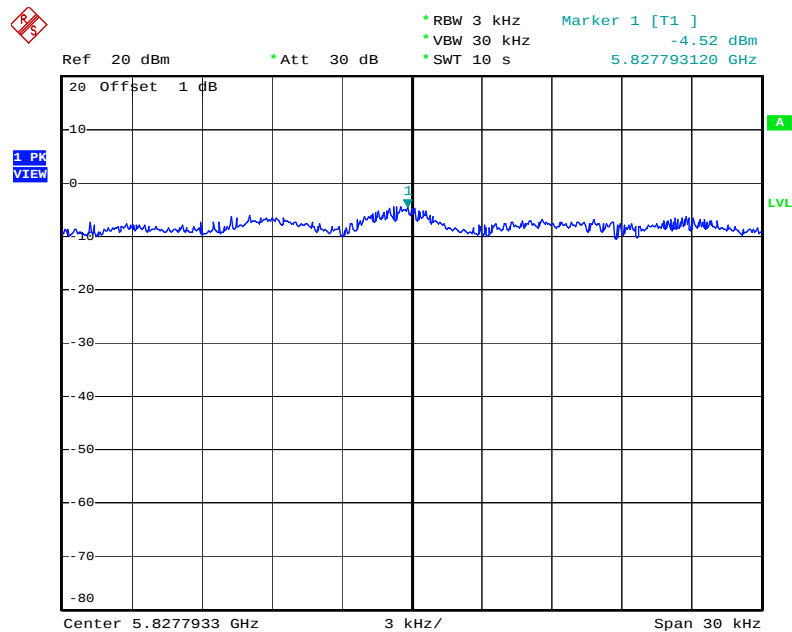
Date: 10.AUG.2009 15:38:56

Power Density Plot on Configuration IEEE 802.11a Ant. 1 / 5785 MHz



Date: 10.AUG.2009 15:41:22

Power Density Plot on Configuration IEEE 802.11a Ant. 1 / 5825 MHz



Date: 10.AUG.2009 15:45:24

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

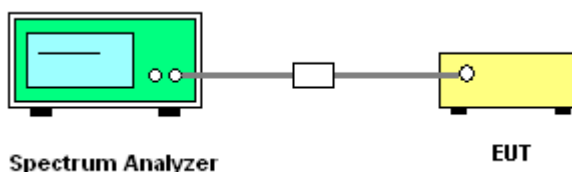
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	23°C	Humidity	58%
Test Engineer	Johnson Chang	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.56	17.68	500	Complies
6	2437 MHz	17.56	17.72	500	Complies
11	2462 MHz	17.60	17.64	500	Complies

Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.52	36.16	500	Complies
6	2437 MHz	35.44	36.16	500	Complies
9	2452 MHz	36.40	36.24	500	Complies

For 5GHz Band

Configuration 11a Draft n MCS8 20MHz Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.56	17.68	500	Complies
157	5785 MHz	17.28	17.68	500	Complies
165	5825 MHz	17.64	17.76	500	Complies

Configuration 11a Draft n MCS8 40MHz Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	35.76	36.32	500	Complies
159	5795 MHz	32.56	36.40	500	Complies

Temperature	23°C	Humidity	58%
Test Engineer	Johnson Chang	Configurations	802.11a/b/g

Configuration IEEE 802.11b Ant. 1

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.12	13.16	500	Complies
6	2437 MHz	10.12	13.24	500	Complies
11	2462 MHz	10.12	13.16	500	Complies

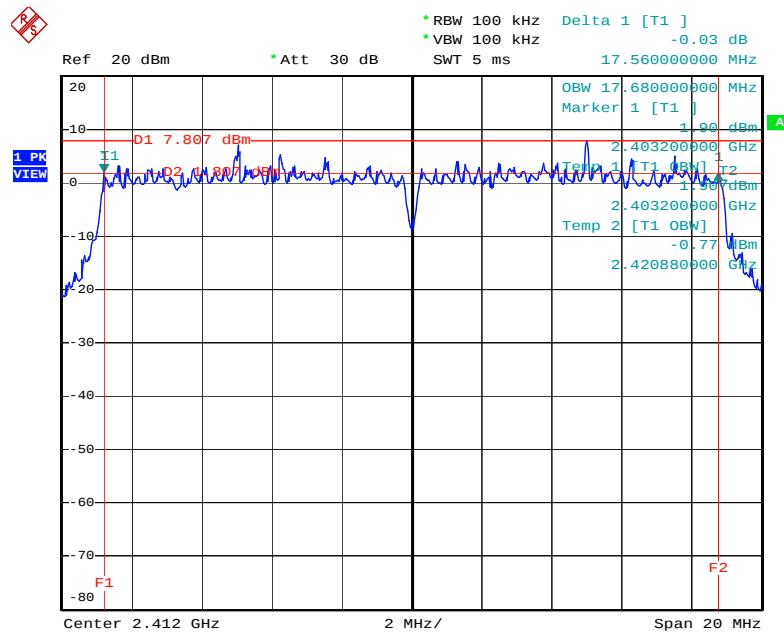
Configuration IEEE 802.11g Ant. 1

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

Configuration IEEE 802.11a Ant. 1

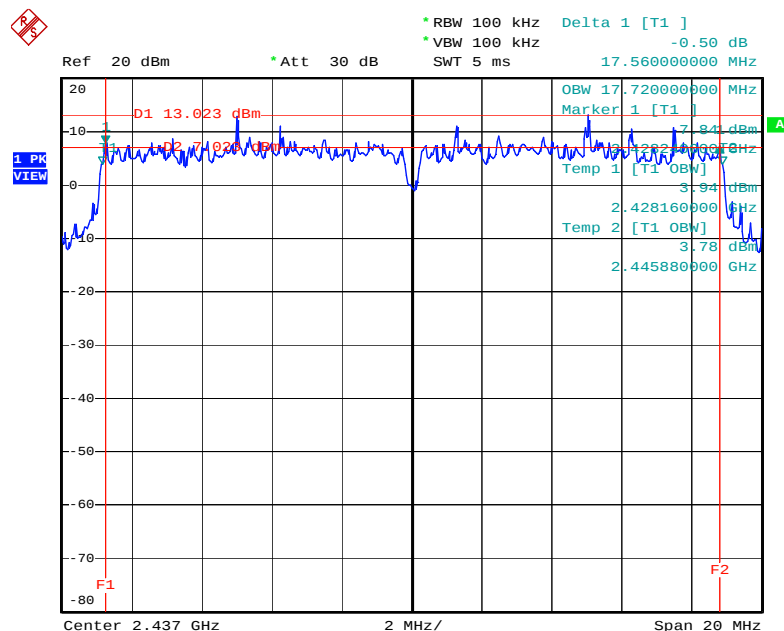
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.36	16.72	500	Complies
157	5785 MHz	16.40	17.24	500	Complies
165	5825 MHz	16.36	17.44	500	Complies

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 2412 MHz



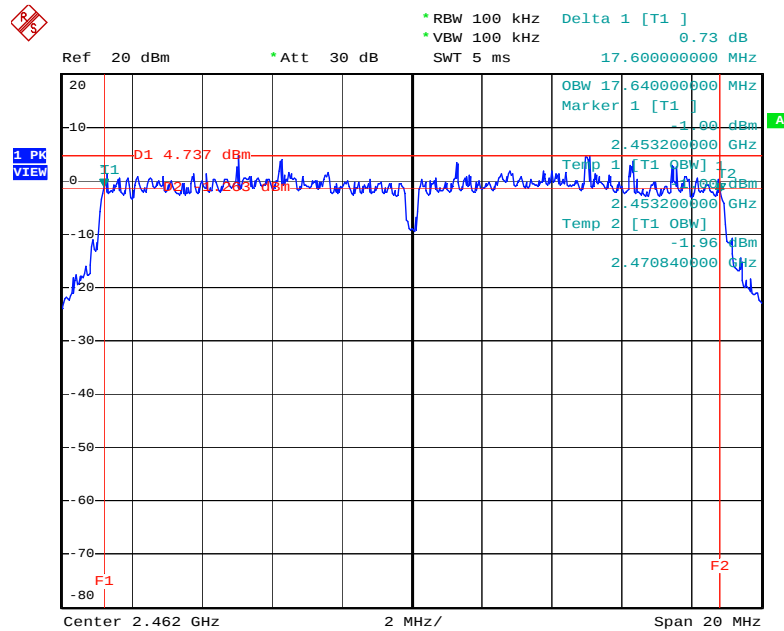
Date: 10.AUG.2009 23:28:19

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 2437 MHz



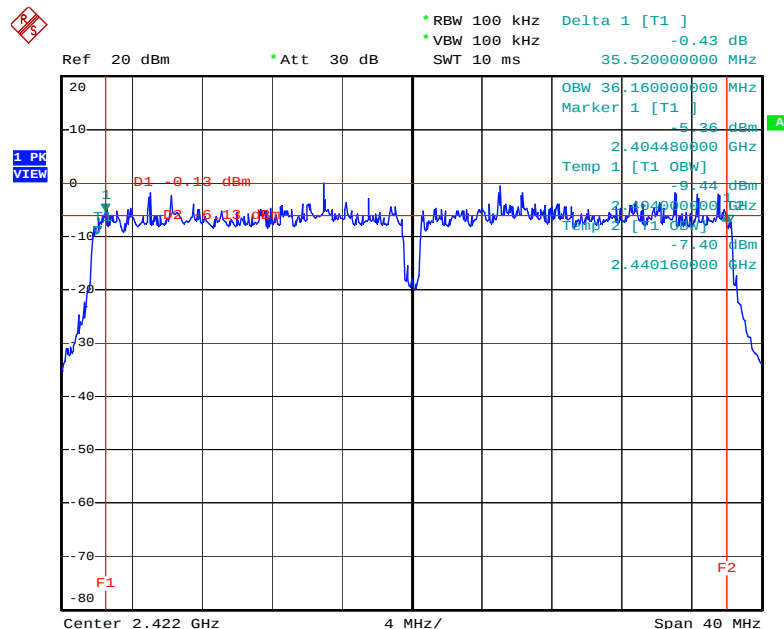
Date: 10.AUG.2009 22:58:47

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. 1 + Ant. 2 / 2462 MHz



Date: 10.AUG.2009 23:01:05

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. 1 + Ant. 2 / 2422 MHz



Date: 12.AUG.2009 11:25:14