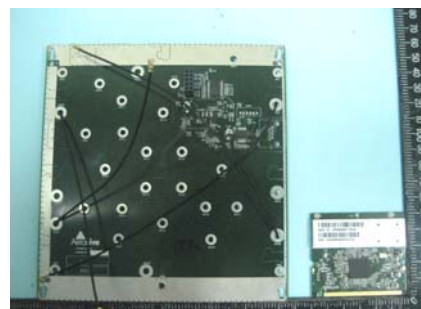


FCC RADIO TEST REPORT

Applicant's company	Wistron Neweb Corporation
Applicant Address	No.10-1,Li-hsin Road I,Hsinchu Science Park,Hsinchu 300,Taiwan, R.O.C.
FCC ID	NKR-DNMA-92
Manufacturer's company	Wistron Neweb Corporation
Manufacturer Address	No.10-1,Li-hsin Road I,Hsinchu Science Park,Hsinchu 300,Taiwan, R.O.C.

Product Name	WLAN a/b/g/n mini-PCI Module
Brand Name	WNC
Model Name	DNMA-92
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Mar. 18, 2009
Final Test Date	May 24, 2009
Submission Type	Class II Change
Class II Change	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: May 27, 2009

Report No.: FR931819-01AB

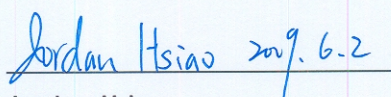
- No additional attachment.
- ☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name : WLAN a/b/g/n mini-PCI Module
Brand Name : WNC
Model Name : DNMA-92
Applicant : Wistron Neweb Corporation
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 Mar. 18, 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
-	15.207	AC Power Line Conducted Emissions	Complies	1.88 dB
4.1	15.247(b)(3)	Maximum Conducted Output Power	Complies	3.54 dB
4.2	15.247(e)	Power Spectral Density	Complies	6.83 dB
4.3	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.4	15.247(d)	Radiated Emissions	Complies	2.42 dB
4.5	15.247(d)	Band Edge Emissions	Complies	0.15 dB
4.6	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: MCS0 (20MHz): 17.60 MHz ; MCS0 (40MHz): 36.56 MHz For 5GHz Band: MCS0 (20MHz): 16.68 MHz ; MCS0 (40MHz): 35.76 MHz
Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 25.80 dBm ; MCS0 (40MHz): 19.96 dBm For 5GHz Band: MCS0 (20MHz): 22.53 dBm ; MCS0 (40MHz): 21.47 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 (2TX, 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: 13.08 MHz ; 11g: 16.48 MHz ; 11a: 16.36 MHz
Conducted Output Power	11b: 22.09 dBm ; 11g: 26.46 dBm ; 11a: 22.72 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	X	X	V	X
802.11b	X	X	V	X
802.11g	X	X	V	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

For 2.4GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
A1	Tyco	1513164-1	Embedded Antenna	I-PEX	2	TX/RX
A2	Tyco	1513164-1	Embedded Antenna	I-PEX	2	TX/RX
B1	Tyco	1513504-1	Embedded Antenna	I-PEX	4	TX/RX
B2	Tyco	1513504-1	Embedded Antenna	I-PEX	4	TX/RX

For 5GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
A1	Tyco	1513164-1	Embedded Antenna	I-PEX	2	TX/RX
A2	Tyco	1513164-1	Embedded Antenna	I-PEX	2	TX/RX

Note: The EUT has two Antennas.

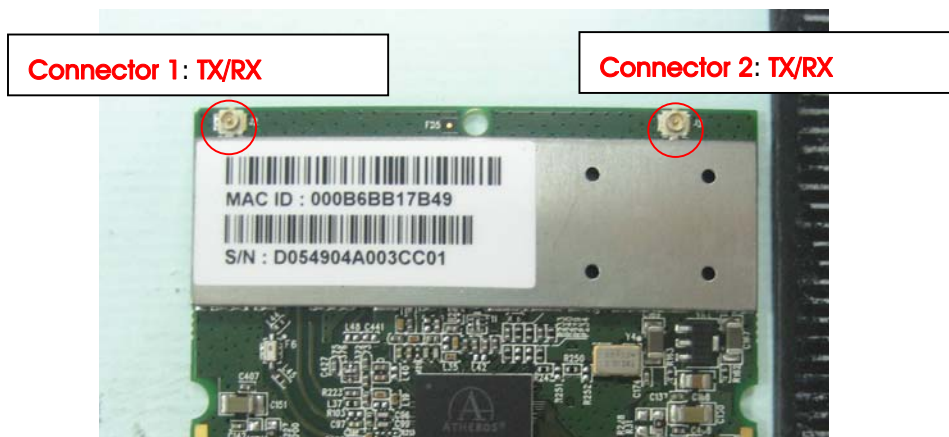
Both antenna A and B can be used as transmitting/receiving antenna.

For 2.4GHz Band:

Since antenna B gain higher than antenna A, so only antenna B was tested and recorded in this report.

For 5GHz Band:

All the test use antenna A to test and record in this report.



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

3.5. Table for Test Modes

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

For 2.4GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power	Normal Link	Auto	-	-
Conducted Emission				
Max. Peak Conducted Output Power	MCS0/20MHz	6.5 Mbps	1/6/11	B1/ B2/ B1+B2
	MCS0/40MHz	13.5 Mbps	3/6/9	B1/ B2/ B1+B2
	11b/CCK	1 Mbps	1/6/11	B1/ B2/ B1+B2
	11g/BPSK	6 Mbps	1/6/11	B1/ B2/ B1+B2
Power Spectral Density 6dB Spectrum Bandwidth	MCS0/20MHz	6.5 Mbps	1/6/11	B1+B2
	MCS0/40MHz	13.5 Mbps	3/6/9	B1+B2
	11b/CCK	1 Mbps	1/6/11	B1+B2
	11g/BPSK	6 Mbps	1/6/11	B1+B2
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	MCS0/20MHz	6.5 Mbps	1/6/11	B1+B2
	MCS0/40MHz	13.5 Mbps	3/6/9	B1+B2
	11b/CCK	1 Mbps	1/6/11	B1+B2
	11g/BPSK	6 Mbps	1/6/11	B1+B2
Band Edge Emissions	MCS0/20MHz	6.5 Mbps	1/11	B1+B2
	MCS0/40MHz	13.5 Mbps	3/9	B1+B2
	11b/CCK	1 Mbps	1/11	B1+B2
	11g/BPSK	6 Mbps	1/11	B1+B2

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Conducted Emission	Normal Link	Auto	-	-
Max. Peak Conducted Output Power	MCS0/20MHz	6.5 Mbps	149/157/165	A1/ A2/ A1+A2
	MCS0/40MHz	13.5 Mbps	151/159	A1/ A2/ A1+A2
	11a/BPSK	6 Mbps	149/157/165	A1/ A2/ A1+A2
Power Spectral Density 6dB Spectrum Bandwidth	MCS0/20MHz	6.5 Mbps	149/157/165	A1+A2
	MCS0/40MHz	13.5 Mbps	151/159	A1+A2
	11a/BPSK	6 Mbps	149/157/165	A1+A2
Radiated Emissions Below 1GHz	Normal Link	Auto	-	A1+A2
Radiated Emissions Above 1GHz	MCS0/20MHz	6.5 Mbps	149/157/165	A1+A2
	MCS0/40MHz	13.5 Mbps	151/159	A1+A2
	11a/BPSK	6 Mbps	149/157/165	A1+A2
Band Edge Emissions	MCS0/20MHz	6.5 Mbps	149/157/165	A1+A2
	MCS0/40MHz	13.5 Mbps	151/159	A1+A2
	11a/BPSK	6 Mbps	149/157/165	A1+A2

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	-
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 Class II Change

This product is an extension of original one reported under Sporton project number: FR931819AB

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

Modifications	Description	Performance Checking
Add 2 antennas	Original report has two PIFA antennas. Both two antennas can be used in 2.4GHz/5GHz Band. For 2.4GHz Band: The highest antenna gain is 3.90dBi. For 5GHz Band: The highest antenna gain is 5.12dBi. New report adds two Embedded antennas. 1513164-1(Model No.) can be used in 2.4GHz/5GHz Band. 2.4GHz Gain: 2dBi, 5GHz Gain: 2dBi 1513504-1(Model No.) only can be used in 2.4GHz Band. 2.4GHz Gain: 4dBi	● Conducted Emissions ● Max. Conducted Output Power, ● 6dB Spectrum Bandwidth, ● 99% Occupied Bandwidth, ● Power Spectral Density, ● Radiated Emissions, ● Band Edge Emission,

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	E2K24GBRL
Mouse	HP	M-UAE96	DoC
Modem	ACEEX	DM1414	IFAXDM1414
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

Test Software Version	ART		
Frequency	2412 MHz	2437 MHz	2462 MHz
Draft n MCS0 20MHz	13.5	20.5	12
Frequency	2422 MHz	2437 MHz	2452 MHz
Draft n MCS0 40MHz	10	15	8.5

Power Parameters of IEEE 802.11b/g

Test Software Version	ART		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	16	18.5	16.5
IEEE 802.11g	14	21	13

For 5GHz Band

Test Software Version	ART		
Frequency	5745 MHz	5785 MHz	5825 MHz
Draft n MCS0 20MHz	18	18	18
Frequency	5755 MHz	5795 MHz	
Draft n MCS0 40MHz	18	18	

Power Parameters of IEEE 802.11a

Test Software Version	ART		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	18	18	18

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.
- The NB sends " H " messages to the modem.
- Repeat the steps from b to C.

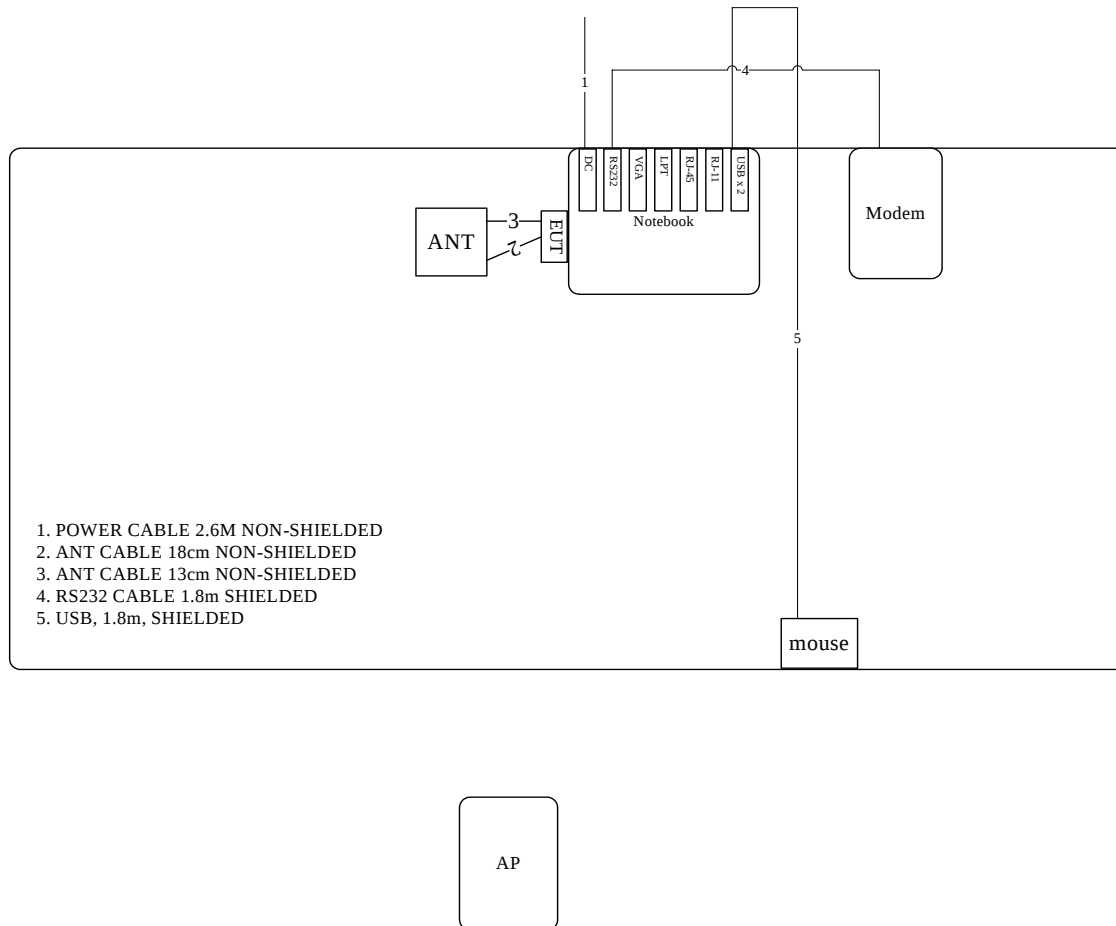
At the same time, the following programs were executed:

Executed "ping.exe" to link with the remote workstation to receive and transmit signal by WLAN.

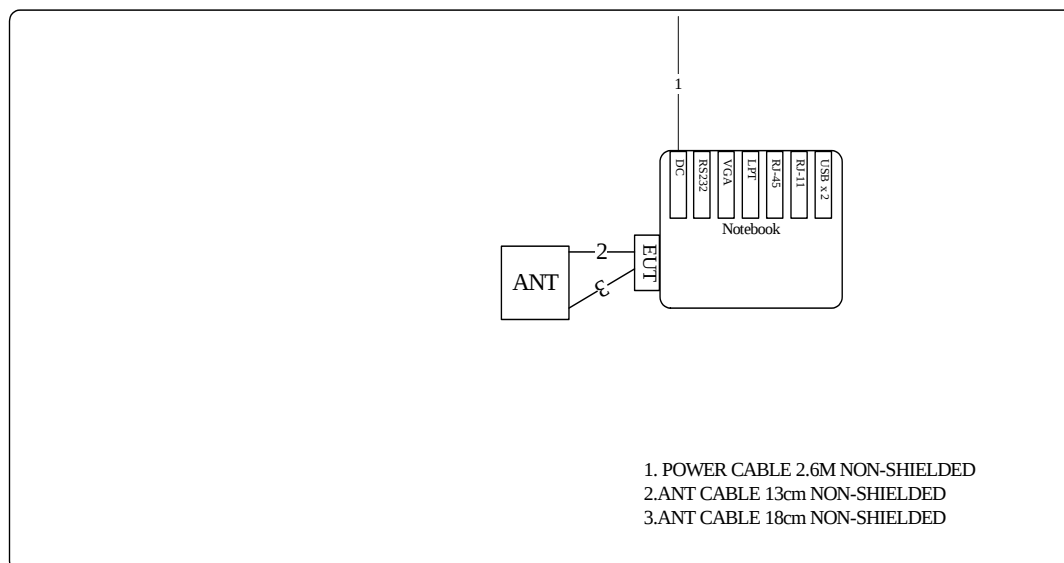
3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration

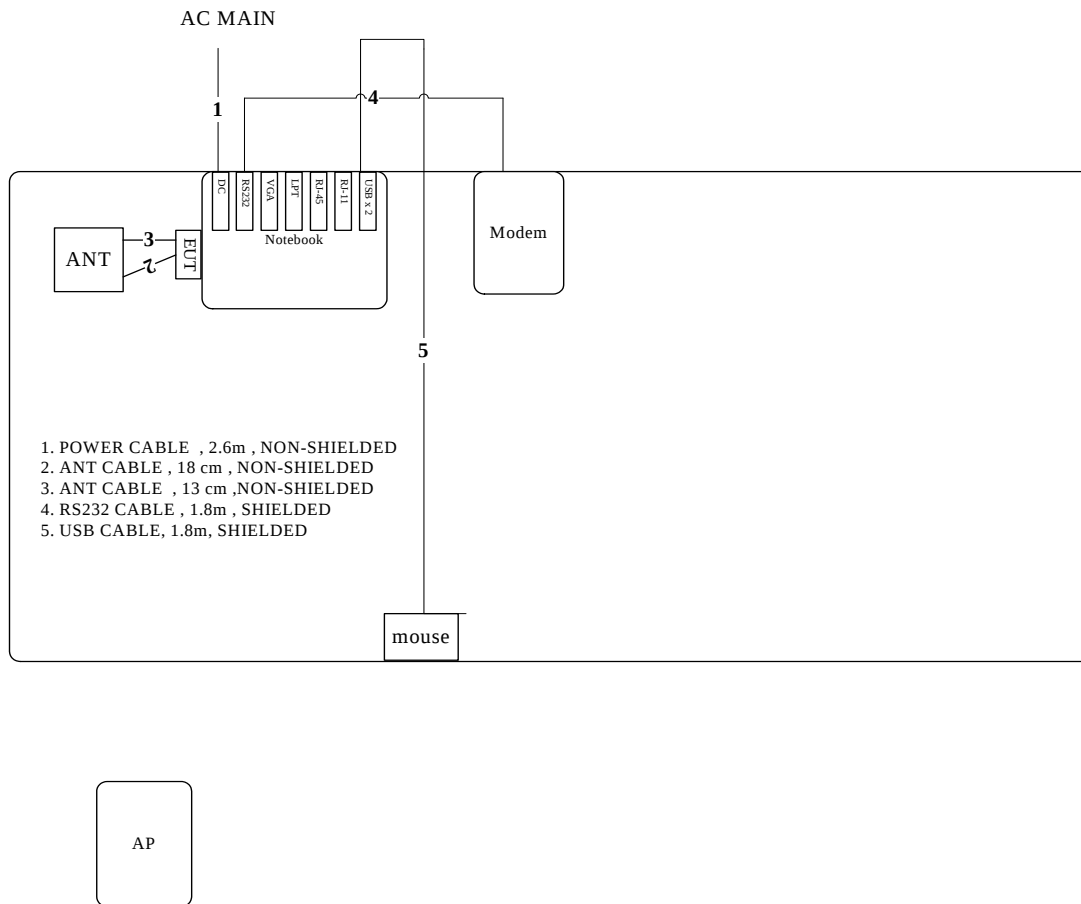
Test Configuration: 9kHz~1GHz



Test Configuration: above 1GHz



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

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

4.1.2. Measuring Instruments and Setting

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

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

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. 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.

[illegible]

- (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.

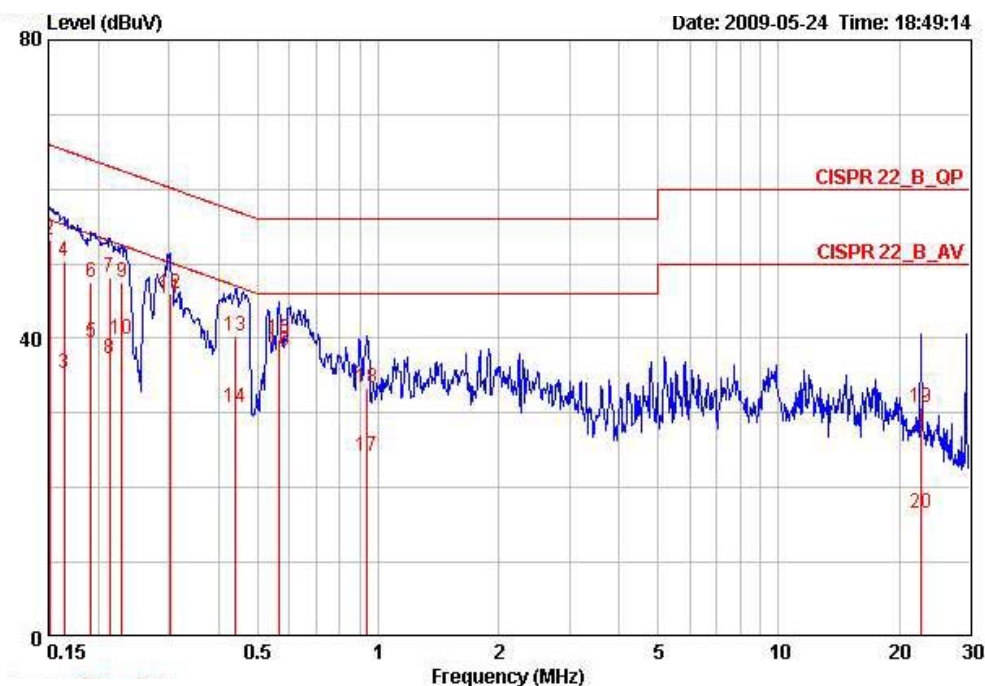
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

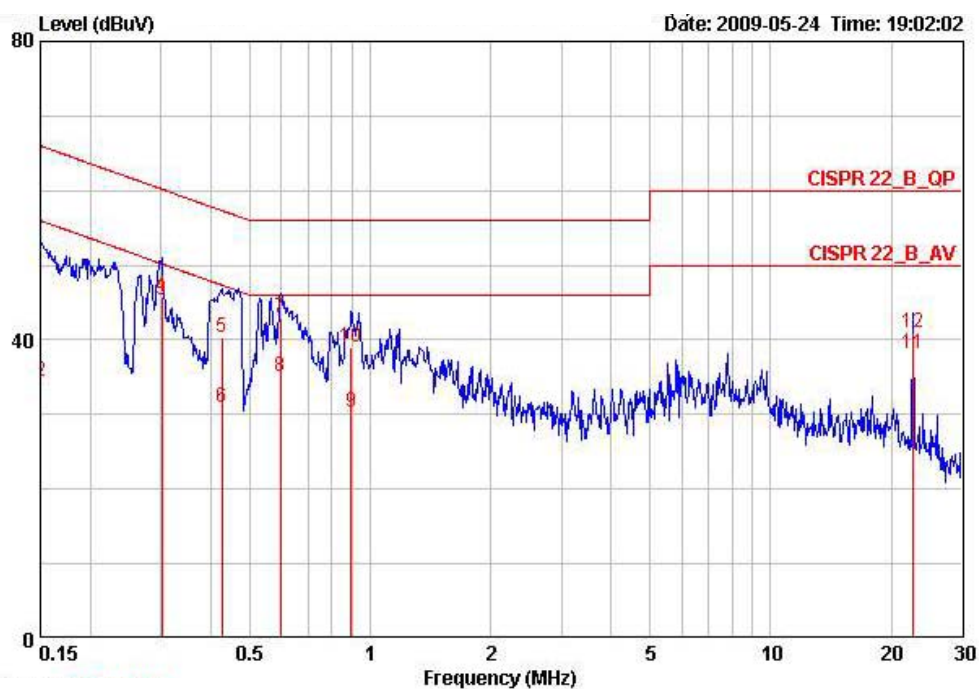
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25.8°C	Humidity	57.8%
Test Engineer	Aric Li	Phase	Line
Configuration	Normal Link with 5GHz Antenna		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15080	35.11	-20.84	55.96	34.84	0.07	0.20	AVERAGE
2	0.15080	53.25	-12.70	65.96	52.98	0.07	0.20	QP
3	0.16414	35.37	-19.88	55.25	35.10	0.07	0.20	AVERAGE
4	0.16414	50.40	-14.85	65.25	50.13	0.07	0.20	QP
5	0.19140	39.41	-14.56	53.98	39.16	0.05	0.20	AVERAGE
6	0.19140	47.41	-16.56	63.98	47.16	0.05	0.20	QP
7	0.21392	48.07	-14.98	63.05	47.82	0.05	0.20	QP
8	0.21392	37.31	-15.74	53.05	37.06	0.05	0.20	AVERAGE
9	0.22918	47.53	-14.95	62.48	47.28	0.05	0.20	QP
10	0.22918	40.00	-12.48	52.48	39.75	0.05	0.20	AVERAGE
11	0.30188	45.29	-4.90	50.19	45.05	0.04	0.20	AVERAGE
12	0.30188	46.08	-14.11	60.19	45.84	0.04	0.20	QP
13	0.43974	40.28	-16.79	57.07	40.05	0.03	0.20	QP
14	0.43974	30.66	-16.41	47.07	30.43	0.03	0.20	AVERAGE
15	0.56709	39.97	-16.03	56.00	39.74	0.03	0.20	QP
16	0.56709	38.47	-7.53	46.00	38.24	0.03	0.20	AVERAGE
17	0.93810	24.11	-21.89	46.00	23.88	0.03	0.20	AVERAGE
18	0.93810	33.27	-22.73	56.00	33.04	0.03	0.20	QP
19	22.655	30.79	-29.21	60.00	29.29	1.00	0.50	QP
20	22.655	16.61	-33.39	50.00	15.11	1.00	0.50	AVERAGE

Temperature	25.8°C	Humidity	57.8%
Test Engineer	Aric Li	Phase	Neutral
Configuration	Normal Link with 5GHz Antenna		

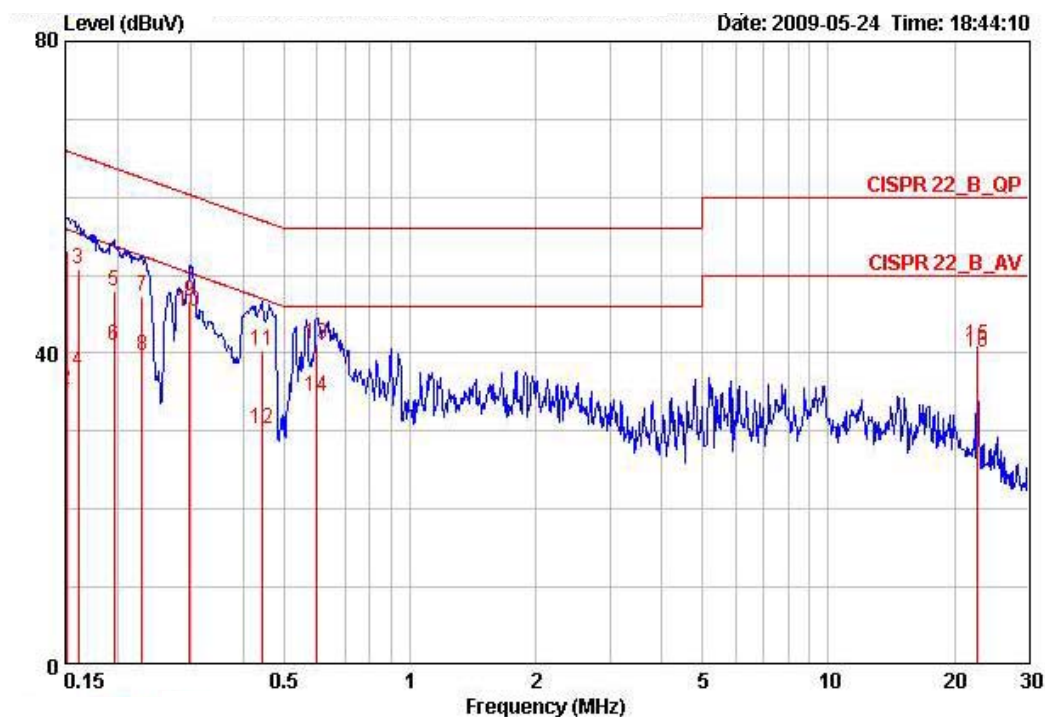


	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.15000	49.04	-16.96	66.00	48.73	0.11	0.20	QP
2	0.15000	34.47	-21.53	56.00	34.16	0.11	0.20	AVERAGE
3	0.30188	45.24	-4.95	50.19	44.97	0.07	0.20	AVERAGE
4	0.30188	45.77	-14.42	60.19	45.50	0.07	0.20	QP
5	0.42599	40.31	-17.02	57.33	40.04	0.07	0.20	QP
6	0.42599	30.93	-16.40	47.33	30.66	0.07	0.20	AVERAGE
7	0.59794	42.92	-13.08	56.00	42.65	0.07	0.20	QP
8	0.59794	35.11	-10.89	46.00	34.84	0.07	0.20	AVERAGE
9	0.89441	30.24	-15.76	46.00	29.97	0.07	0.20	AVERAGE
10	0.89441	38.95	-17.05	56.00	38.68	0.07	0.20	QP
11	22.641	38.12	-11.88	50.00	36.61	1.01	0.50	AVERAGE
12	22.641	41.03	-18.97	60.00	39.52	1.01	0.50	QP

Note:

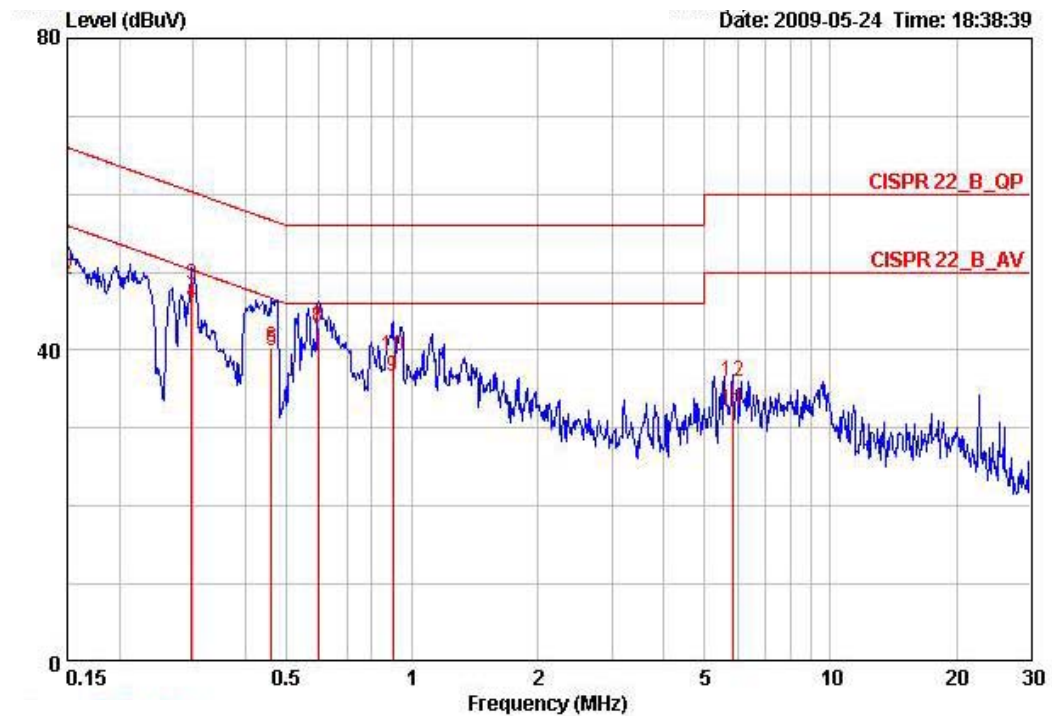
Level = Read Level + LISN Factor + Cable Loss

Temperature	25.8°C	Humidity	57.8%
Test Engineer	Aric Li	Phase	Line
Configuration	Normal Link / EUT with 2.4GHz Antenna		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.15080	53.21	-12.74	65.96	52.94	0.07	0.20	QP
2	0.15080	35.32	-20.63	55.96	35.05	0.07	0.20	AVERAGE
3	0.16155	50.74	-14.65	65.38	50.47	0.07	0.20	QP
4	0.16155	37.69	-17.70	55.38	37.42	0.07	0.20	AVERAGE
5	0.19654	47.85	-15.90	63.76	47.60	0.05	0.20	QP
6	0.19654	40.97	-12.78	53.76	40.72	0.05	0.20	AVERAGE
7	0.22918	47.39	-15.09	62.48	47.14	0.05	0.20	QP
8	0.22918	39.61	-12.87	52.48	39.36	0.05	0.20	AVERAGE
9	0.29712	46.58	-13.74	60.32	46.34	0.04	0.20	QP
10	0.29712	45.29	-5.03	50.32	45.05	0.04	0.20	AVERAGE
11	0.44208	40.40	-16.62	57.02	40.17	0.03	0.20	QP
12	0.44208	30.26	-16.76	47.02	30.03	0.03	0.20	AVERAGE
13	0.59794	41.15	-14.85	56.00	40.92	0.03	0.20	QP
14	0.59794	34.53	-11.47	46.00	34.30	0.03	0.20	AVERAGE
15	22.638	40.89	-19.11	60.00	39.39	1.00	0.50	QP
16	22.638	40.10	-9.90	50.00	38.60	1.00	0.50	AVERAGE

Temperature	25.8°C	Humidity	57.8%
Test Engineer	Aric Li	Phase	Neutral
Configuration	Normal Link / EUT with 2.4GHz Antenna		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15000	34.68	-21.32	56.00	34.37	0.11	0.20	AVERAGE
2	0.15000	49.04	-16.96	66.00	48.73	0.11	0.20	QP
3	0.29712	48.44	-1.88	50.32	48.17	0.07	0.20	AVERAGE
4	0.29712	45.95	-14.37	60.32	45.68	0.07	0.20	QP
5	0.46122	39.81	-16.86	56.67	39.54	0.07	0.20	QP
6	0.46122	40.32	-6.35	46.67	40.05	0.07	0.20	AVERAGE
7	0.59794	42.76	-13.24	56.00	42.49	0.07	0.20	QP
8	0.59794	42.93	-3.07	46.00	42.66	0.07	0.20	AVERAGE
9	0.89917	36.66	-9.34	46.00	36.39	0.07	0.20	AVERAGE
10	0.89917	39.21	-16.79	56.00	38.94	0.07	0.20	QP
11	5.836	32.26	-27.74	60.00	31.72	0.24	0.30	QP
12	5.836	35.98	-14.02	50.00	35.44	0.24	0.30	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

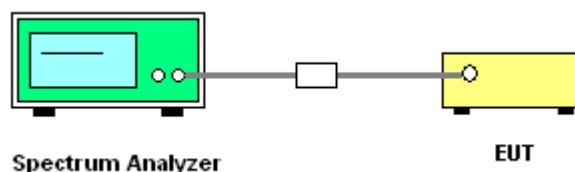
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	24°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS0 20MHz Ant. B1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.50	30.00	Complies
6	2437 MHz	22.54	30.00	Complies
11	2462 MHz	14.32	30.00	Complies

Configuration Draft n MCS0 20MHz Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.04	30.00	Complies
6	2437 MHz	23.02	30.00	Complies
11	2462 MHz	14.51	30.00	Complies

Configuration Draft n MCS0 20MHz Ant. B1 + Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.29	30.00	Complies
6	2437 MHz	25.80	30.00	Complies
11	2462 MHz	17.43	30.00	Complies

Configuration Draft n MCS0 40MHz Ant. B1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	12.15	30.00	Complies
6	2437 MHz	16.73	30.00	Complies
9	2452 MHz	11.50	30.00	Complies

Configuration Draft n MCS0 40MHz Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	12.05	30.00	Complies
6	2437 MHz	17.15	30.00	Complies
9	2452 MHz	11.01	30.00	Complies

Configuration Draft n MCS0 40MHz Ant. B1 + Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	15.11	30.00	Complies
6	2437 MHz	19.96	30.00	Complies
9	2452 MHz	14.27	30.00	Complies

For 5GHz Band

Configuration Draft n MCS0 20MHz Ant. A1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	20.79	30.00	Complies
157	5785 MHz	20.00	30.00	Complies
165	5825 MHz	19.51	30.00	Complies

Configuration Draft n MCS0 20MHz Ant. A2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	17.73	30.00	Complies
157	5785 MHz	17.01	30.00	Complies
165	5825 MHz	16.66	30.00	Complies

Configuration Draft n MCS0 20MHz Ant. A 1+ Ant. A2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.53	30.00	Complies
157	5785 MHz	21.77	30.00	Complies
165	5825 MHz	21.33	30.00	Complies

Configuration Draft n MCS0 40MHz Ant. A1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	19.64	30.00	Complies
159	5795 MHz	19.09	30.00	Complies

Configuration Draft n MCS0 40MHz Ant. A2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	16.83	30.00	Complies
159	5795 MHz	16.50	30.00	Complies

Configuration Draft n MCS0 40MHz Ant. A1 + Ant. A2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	21.47	30.00	Complies
159	5795 MHz	21.00	30.00	Complies

Temperature	24°C	Humidity	56%
Test Engineer	Allen Liu	Configurations	802.11a/b/g

Configuration IEEE 802.11b Ant. B1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.37	30.00	Complies
6	2437 MHz	18.75	30.00	Complies
11	2462 MHz	16.39	30.00	Complies

Configuration IEEE 802.11b Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	15.84	30.00	Complies
6	2437 MHz	19.39	30.00	Complies
11	2462 MHz	17.99	30.00	Complies

Configuration IEEE 802.11b Ant. B1 + Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.12	30.00	Complies
6	2437 MHz	22.09	30.00	Complies
11	2462 MHz	20.27	30.00	Complies

Configuration IEEE 802.11g Ant. B1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	17.04	30.00	Complies
6	2437 MHz	22.97	30.00	Complies
11	2462 MHz	15.07	30.00	Complies

Configuration IEEE 802.11g Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.87	30.00	Complies
6	2437 MHz	23.88	30.00	Complies
11	2462 MHz	16.02	30.00	Complies

Configuration IEEE 802.11g Ant. B1 + Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.97	30.00	Complies
6	2437 MHz	26.46	30.00	Complies
11	2462 MHz	18.58	30.00	Complies

Configuration IEEE 802.11a Ant. B1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	20.76	30.00	Complies
157	5785 MHz	20.02	30.00	Complies
165	5825 MHz	20.03	30.00	Complies

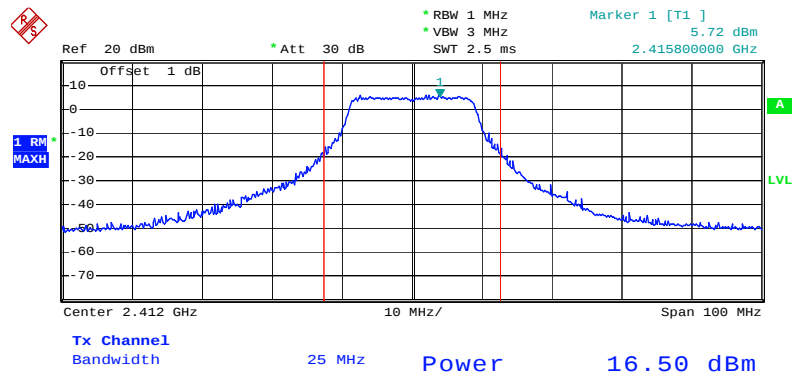
Configuration IEEE 802.11a Ant. B2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	18.33	30.00	Complies
157	5785 MHz	17.13	30.00	Complies
165	5825 MHz	17.00	30.00	Complies

Configuration IEEE 802.11a Ant. B1 +Ant. B2

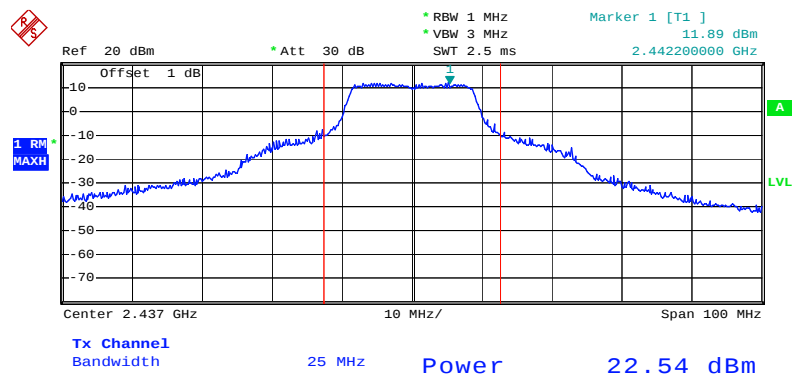
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.72	30.00	Complies
157	5785 MHz	21.82	30.00	Complies
165	5825 MHz	21.78	30.00	Complies

Channel Output Power Plot on Configuration Draft n MCS0 20MHz Ant. B1 / 2412 MHz



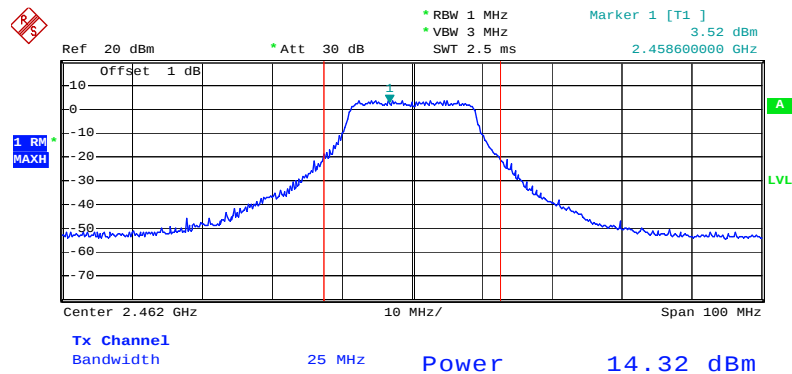
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Channel Output Power Plot on Configuration Draft n MCS0 20MHz Ant. B1 / 2437 MHz



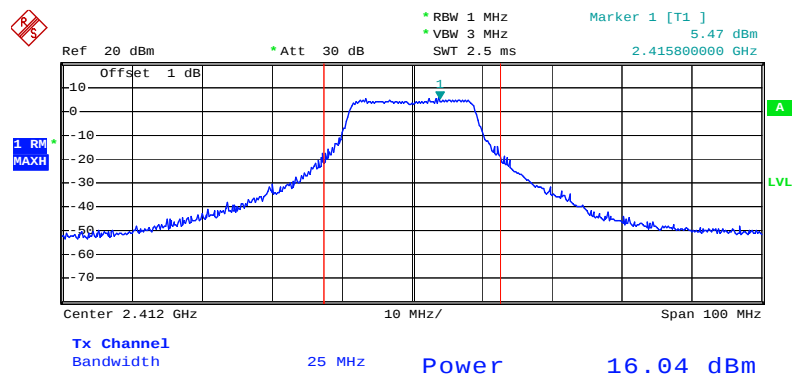
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Channel Output Power Plot on Configuration Draft n MCS0 20MHz Ant. B1 / 2462 MHz



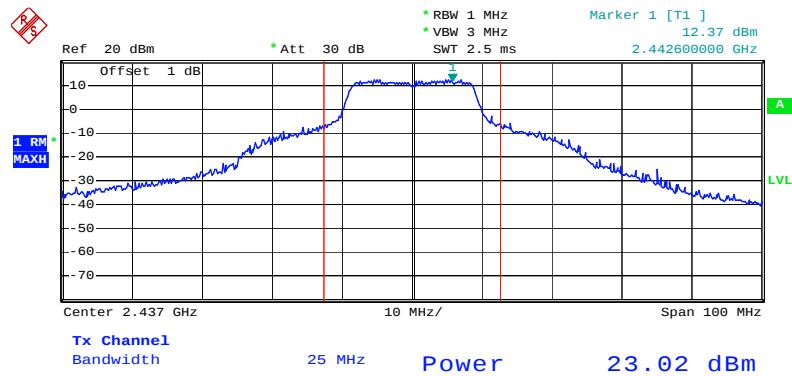
Date: 25.MAR.2009 15:48:59

Channel Output Power Plot on Configuration Draft n MCS0 20MHz Ant. B2 / 2412 MHz



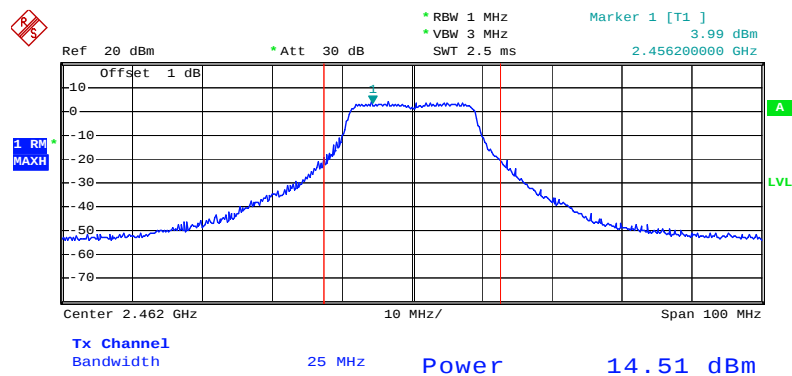
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Channel Output Power Plot on Configuration Draft n MCS0 20MHz Ant. B2 / 2437 MHz



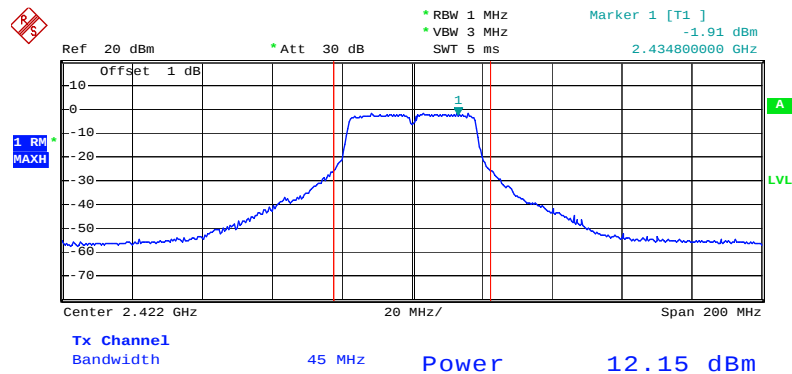
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Channel Output Power Plot on Configuration Draft n MCS0 20MHz Ant. B2 / 2462 MHz



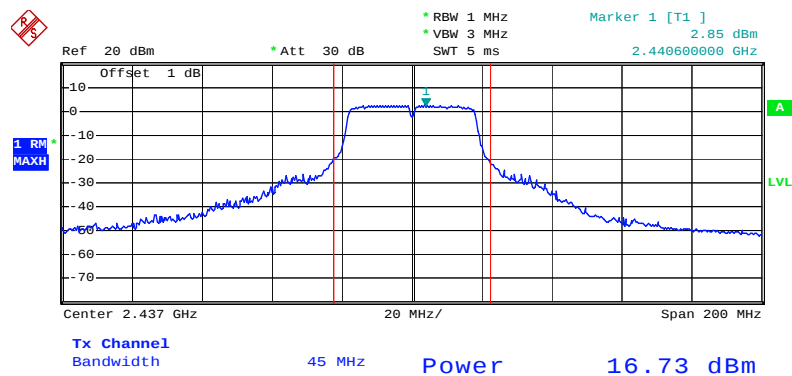
Date: 25.MAR.2009 15:48:04

Channel Output Power Plot on Configuration Draft n MCS0 40MHz Ant. B1 / 2422 MHz



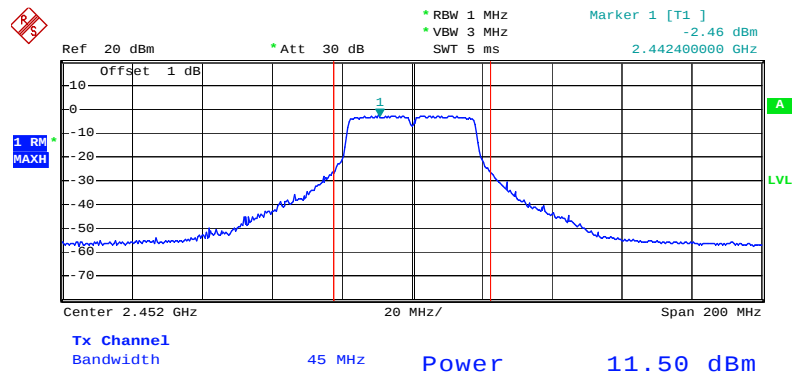
Date: 25.MAR.2009 15:57:43

Channel Output Power Plot on Configuration Draft n MCS0 40MHz Ant. B1 / 2437 MHz



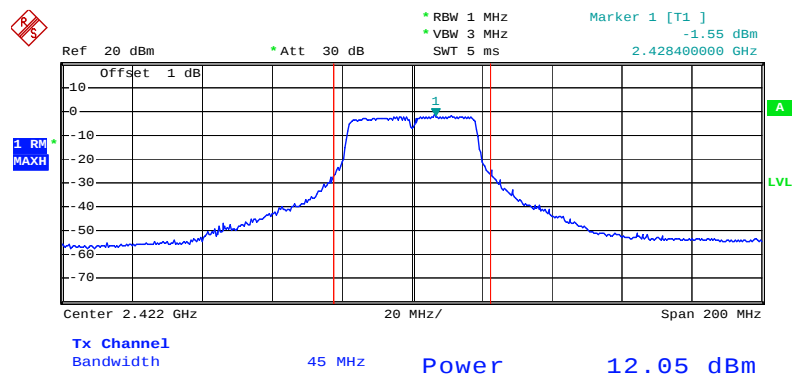
Date: 25.MAR.2009 16:01:19

Channel Output Power Plot on Configuration Draft n MCS0 40MHz Ant. B1 / 2452 MHz



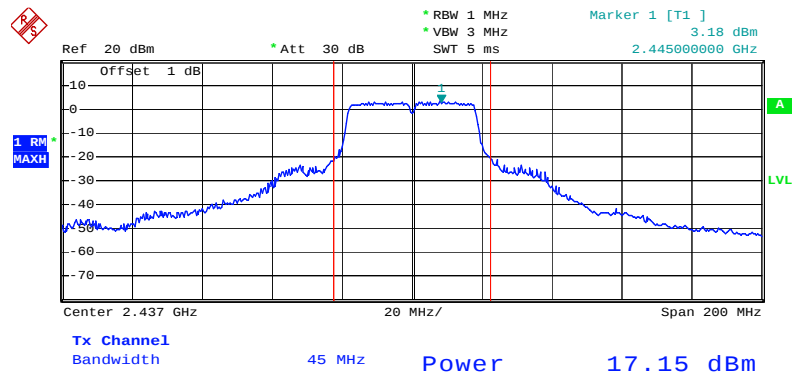
Date: 25.MAR.2009 16:02:34

Channel Output Power Plot on Configuration Draft n MCS0 40MHz Ant. B2 / 2422 MHz



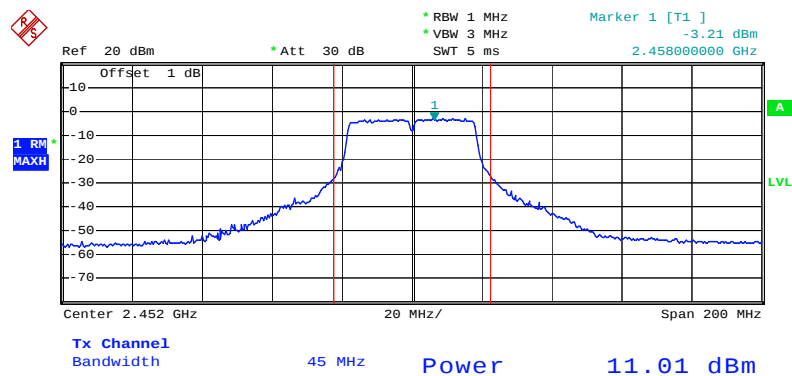
Date: 25.MAR.2009 15:58:56

Channel Output Power Plot on Configuration Draft n MCS0 40MHz Ant. B2 / 2437 MHz



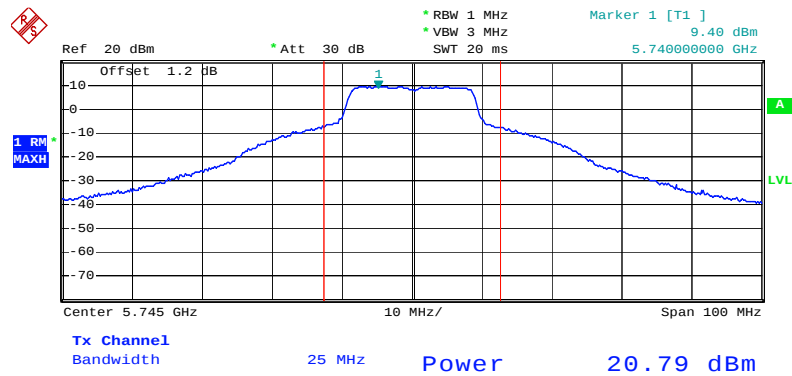
Date: 25.MAR.2009 16:00:18

Channel Output Power Plot on Configuration Draft n MCS0 40MHz Ant. B2 / 2452 MHz



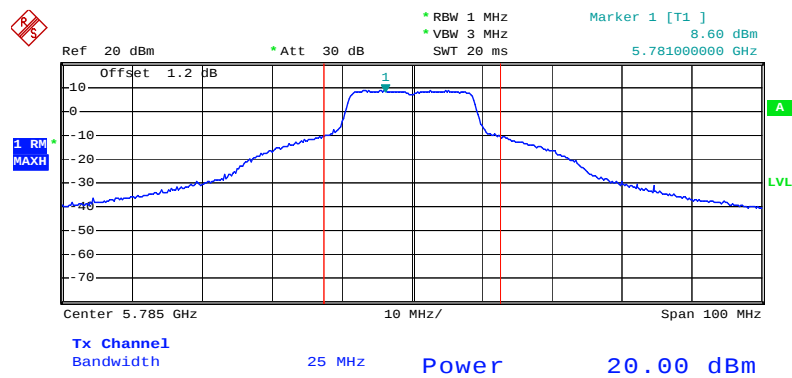
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Channel Output Power Plot on Configuration 11a Draft n MCS0 20MHz Ant. A1 / 5745 MHz



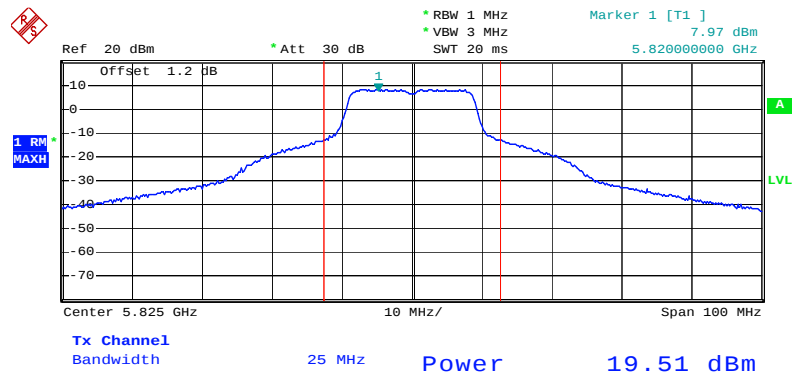
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Channel Output Power Plot on Configuration 11a Draft n MCS0 20MHz Ant. A1 / 5785MHz



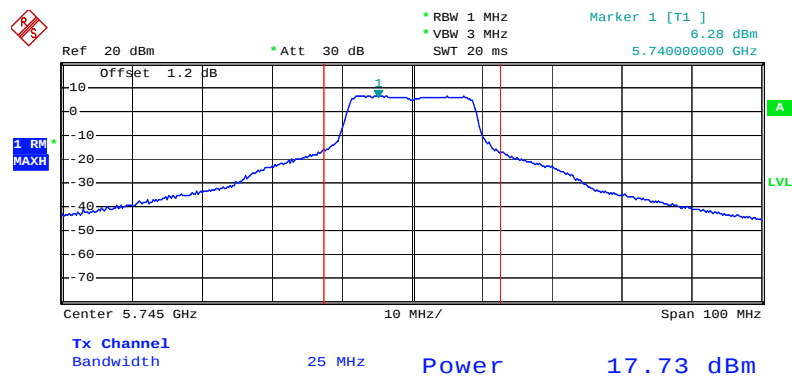
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Channel Output Power Plot on Configuration 11a Draft n MCS0 20MHz Ant. A1 / 5825 MHz



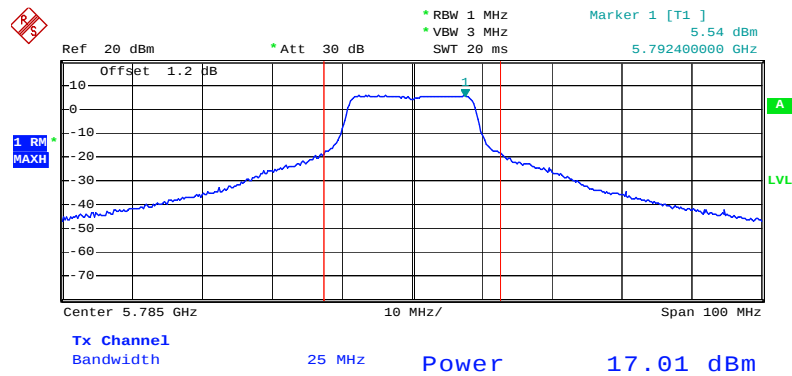
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Channel Output Power Plot on Configuration 11a Draft n MCS0 20MHz Ant. A2 / 5745 MHz



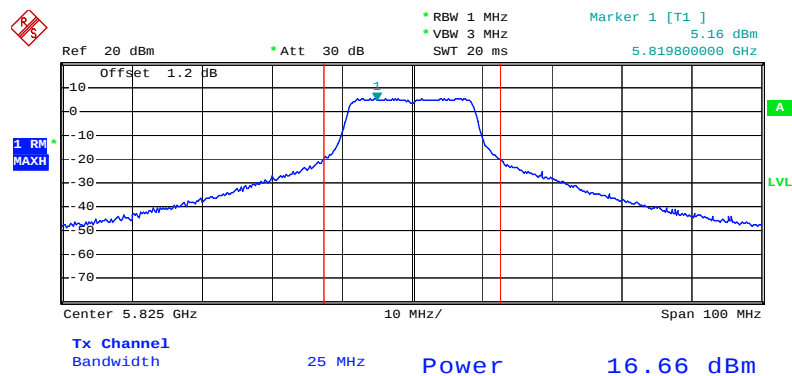
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Channel Output Power Plot on Configuration 11a Draft n MCS0 20MHz Ant. A2 / 5785MHz



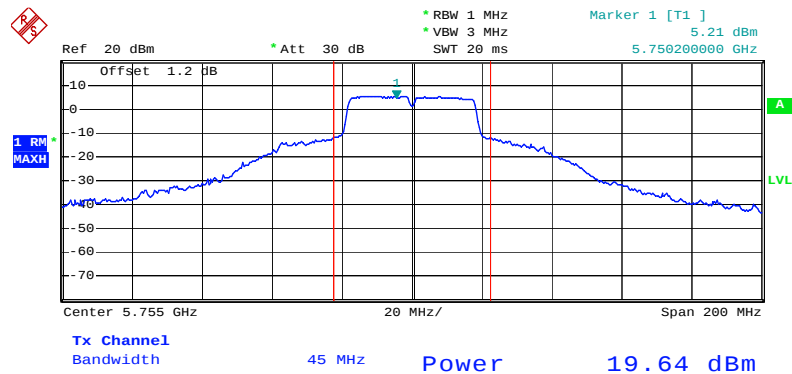
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Channel Output Power Plot on Configuration 11a Draft n MCS0 20MHz Ant. A2 / 5825 MHz



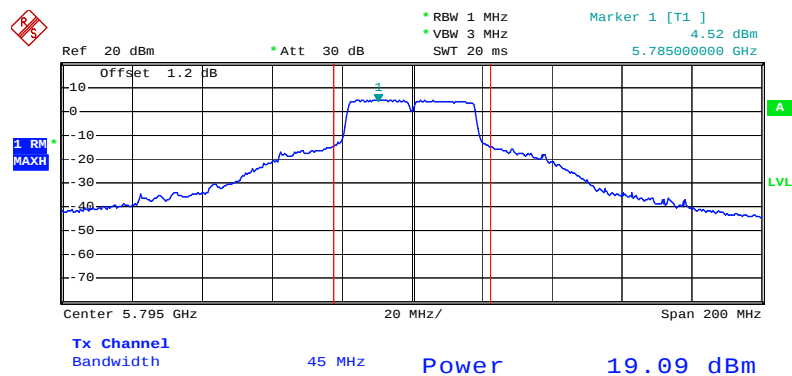
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Channel Output Power Plot on Configuration 11a Draft n MCS0 40MHz Ant. A1 / 5755 MHz



Date: 25.MAR.2009 16:55:36

Channel Output Power Plot on Configuration 11a Draft n MCS0 40MHz Ant. A1 / 5795 MHz



Date: 25.MAR.2009 16:54:45