SPORTON International Inc.
No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
Ph: 886-3-327-3456 / FAX: 886-3-327-0973 / www.sporton.com.tw

FCC RADIO TEST REPORT

Applicant's company	**D-Link Corporation**
Applicant Address	No.289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan, R.O.C.
FCC ID	**KA2IR865LA1**
Manufacturer's company	**Alpha Networks Inc.**
Manufacturer Address	No.8 Li-shing 7th Rd., Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.

Product Name	Wireless AC 1750 Dual Band Cloud Router
Brand Name	D-Link
Model Name	DIR-865L
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	May 18, 2012
Final Test Date	May 29, 2012
Submission Type	Original Equipment

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2009** and **47 CFR FCC Part 15 Subpart C**.

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

TAF
Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR251806AB	Rev. 01	Initial issue of report	Jun. 06, 2012

Certificate No.: CB10105152

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless AC 1750 Dual Band Cloud Router
Brand Name	:	D-Link
Model Name	:	DIR-865L
Applicant	:	D-Link 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 May 18, 2012 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Jordan Hsiao

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	19.20 dB
4.2	15.247(b)(3)	Conducted Output Power	Complies	0.16 dB
4.3	15.247(e)	Power Spectral Density	Complies	12.78 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.13 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.15 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	$\pm 8.5\times 10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1GHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter
Modulation	see the below table for IEEE 802.11n see the below table for IEEE 802.11ac
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11n OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) For 802.11ac
Data Rate (Mbps)	see the below table for IEEE 802.11n see the below table for IEEE 802.11ac
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; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (HT 20MHz): 17.64 MHz ; MCS0 (HT 40MHz): 35.92 MHz For 5GHz Band: 11n MCS0 (HT 20MHz): 17.68 MHz ; 11n MCS0 (HT40 MHz): 36.16 MHz; 11ac MCS0 (VHT 80MHz): 75.20 MHz
Conducted Output Power	For 2.4GHz Band: MCS0 (HT 20MHz): 29.79 dBm ; MCS0 (HT 40MHz): 23.00 dBm For 5GHz Band: 11n MCS0 (HT 20MHz): 28.86 dBm ; 11n MCS0 (HT 40 MHz): 27.90 dBm; 11ac MCS0 (VHT 20MHz): 28.95 dBm; 11ac MCS0 (VHT 40MHz): 27.91 dBm; 11ac MCS0 (VHT 80MHz): 24.78 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 (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 10.12 MHz ; 11g: 16.44 MHz ; 11a: 16.48 MHz
Conducted Output Power	11b: 25.64 dBm ; 11g: 28.07 dBm ; 11a: 26.31 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Three (TX)		
Band width Mode	20 MHz	40 MHz	80MHz
IEEE 802.11a	V	X	X
IEEE 802.11b	V	X	X
IEEE 802.11g	V	X	X
IEEE 802.11n	V	V	X
IEEE 802.11ac	V	V	V

IEEE 802.11n spec

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

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

IEEE 802. 11a, 11n and 11ac Spec.

Worst Modulation Used for Conformance Testing				
Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS	Worst Data Rate / MCS	Worst Modulation Mode
802.11a	3	6-54 Mbps	6Mbps	11A5.2G-20M
802.11n 20MHz	3	MCS 0-15	MCS 0	11N5.2G-20M
802.11n 40MHz	3	MCS 0-15	MCS 0	11N5.2G-40M
802.11ac 20MHz	3	MCS 0-9	MCS 0-Nss1	11AC5.8G-20M
802.11ac 40MHz	3	MCS 0-9	MCS 0-Nss1	11AC5.8G-40M
802.11ac 80MHz	3	MCS 0-9	MCS 0-Nss1	11AC5.8G-80M
Note 1: IEEE Std. 802.11-2007 modulation consists of IEEE Std. 802.11a-1999.				
Note 2: IEEE Std. 802.11n-2009 modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Worst modulation mode of Guard Interval (GI) is 400ns.				
Note 3: draft IEEE Std. 802.11ac-2012 modulation consists of VHT20, VHT40, VHT80 and VHT160. Then EUT support VHT20, VHT40, VHT80. (VHT: Very High Throughput).				
Note 4: Modulation modes consist of 11A5.2G-20M, 11A5.3G-20M, 11A5.6G-20M, 11A5.8G-20M 11N5.2G-20M, 11N5.3G-20M, 11N5.6G-20M, 11N5.8G-20M, 11N5.2G-40M, 11N5.3G-40M, 11N5.6G-40M, 11N5.8G-40M,11AC5.2G-20M, 11AC5.3G-20M, 11AC5.6G-20M, 11AC5.8G-20M,11AC5.2G-40M, 11AC5.3G-40M, 11AC5.6G-40M, 11AC5.8G-40M, 11AC5.2G-80M, 11AC5.3G-80M, 11AC5.6G-80M, 11AC5.8G-80M,				
11A: IEEE 802.11a, 11N: IEEE 802.11n, 11AC: IEEE 802.11ac. 5.2G: 5.15-5.25 GHz band, 5.3G: 5.25-5.35 GHz band, 5.6G: 5.47-5.725 GHz band , 5.8G: 5.725-5.850GHz band				
20M/40M/80M: Channel Bandwidth 20MHz/40MHz/80MHz				

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	Asian Power Devices Inc.	WA-36C12R	INPUT: 100-240V ~ 50-60Hz, 1.0A OUTPUT: 12.0V – 3.0A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
1	Wha Yu Group	-	PCB Antenna	I-PEX	2.4G	3.0
2	Wha Yu Group	-	PCB Antenna	I-PEX	2.4G	3.0
3	Wha Yu Group	-	PCB Antenna	I-PEX	2.4G	3.0
4	Wha Yu Group	-	PCB Antenna	I-PEX	5G	4.5
5	Wha Yu Group	-	PCB Antenna	I-PEX	5G	4.5
6	Wha Yu Group	-	PCB Antenna	I-PEX	5G	4.5

Note: The EUT has three antennas

For 2.4GHz Band:

For IEEE 802.11bgn mode (3TX/3RX):

Ant. 1, Ant. 2 and Ant. 3 could transmit/receive simultaneously.

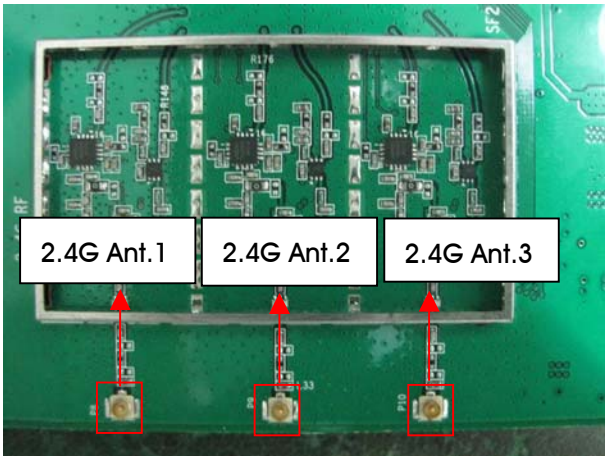
For 5GHz Band:

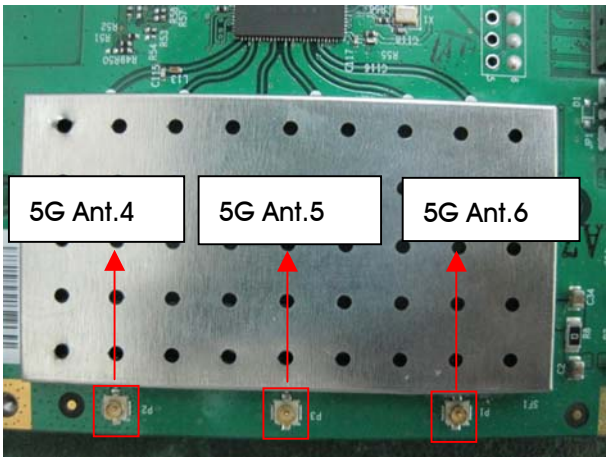
For IEEE 802.11n mode (3TX/3RX):

Ant. 4, Ant. 5 and Ant. 6 could transmit/receive simultaneously.

For IEEE 802.11a/ac mode (3TX/3RX):

Ant. 4, Ant. 5 and Ant. 6 could transmit/receive simultaneously.




5G Ant.4
5G Ant.5
5G Ant.6

3.4. Table for Carrier Frequencies

For 2.4GHz Band:

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

There are two bandwidth systems for IEEE 802.11n.

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

For 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:

The EUT has three bandwidth system.

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

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

For 80MHz bandwidth systems, use Channel 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725～5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 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	CTX	Auto	-	-
Conducted Output Power Power Spectral Density	MCS0/20MHz	6.5 Mbps	1/6/11	1/2/3/1+2+3
	MCS0/40MHz	13.5 Mbps	3/6/9	1/2/3/1+2+3
	11b/CCK	1 Mbps	1/6/11	1/2/3/1+2+3
	11g/BPSK	6 Mbps	1/6/11	1/2/3/1+2+3
6dB Spectrum Bandwidth	MCS0/20MHz	6.5 Mbps	1/6/11	1+2+3
	MCS0/40MHz	13.5 Mbps	3/6/9	1+2+3
	11b/CCK	1 Mbps	1/6/11	1+2+3
	11g/BPSK	6 Mbps	1/6/11	1+2+3
Radiated Emissions Below 1GHz	CTX	Auto	-	-
Radiated Emissions Above 1GHz	MCS0/20MHz	6.5 Mbps	1/6/11	1+2+3
	MCS0/40MHz	13.5 Mbps	3/6/9	1+2+3
	11b/CCK	1 Mbps	1/6/11	1+2+3
	11g/BPSK	6 Mbps	1/6/11	1+2+3
Band Edge Emissions	MCS0/20MHz	6.5 Mbps	1/11	1+2+3
	MCS0/40MHz	13.5 Mbps	3/9	1+2+3
	11b/CCK	1 Mbps	1/11	1+2+3
	11g/BPSK	6 Mbps	1/11	1+2+3

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	CTX	Auto	-	-
Conducted Output Power Power Spectral Density	11n 20MHz	6.5 Mbps	149/157/165	4/5/6/4+5+6
	11n 40MHz	13.5 Mbps	151/159	4/5/6/4+5+6
	11ac 20MHz	MCS0	149/157/165	4/5/6/4+5+6
	11ac 40MHz	MCS0	151/159	4/5/6/4+5+6
	11ac 80MHz	MCS0	155	4/5/6/4+5+6
	11a	6 Mbps	149/157/165	4/5/6/4+5+6
6dB Spectrum Bandwidth	11n 20MHz	6.5 Mbps	149/157/165	4+5+6
	11n 40MHz	13.5 Mbps	151/159	4+5+6
	11ac 80MHz	MCS0	155	4+5+6
	11a	6 Mbps	149/157/165	4+5+6
Radiated Emissions Below 1GHz	CTX	Auto	-	-
Radiated Emissions Above 1GHz	11n 20MHz	6.5 Mbps	149/157/165	4+5+6
	11n 40MHz	13.5 Mbps	151/159	4+5+6
	11ac 20MHz	MCS0	149/157/165	4+5+6
	11ac 40MHz	MCS0	151/159	4+5+6
	11ac 80MHz	MCS0	155	4+5+6
	11a	6 Mbps	149/157/165	4+5+6
Band Edge Emissions	11n 20MHz	6.5 Mbps	149/157/165	4+5+6
	11n 40MHz	13.5 Mbps	151/159	4+5+6
	11ac 20MHz	MCS0	149/157/165	4+5+6
	11ac 40MHz	MCS0	151/159	4+5+6
	11ac 80MHz	MCS0	155	4+5+6
	11a	6 Mbps	149/157/165	4+5+6

The following test modes were performed for all tests:

For Conducted Emission test:

Test Mode : Upstanding EUT + Adapter 1

For Radiated Emission test:

Test Mode : Upstanding EUT + Adapter 1

<For MPE and Co-location Test>:

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

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

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

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2K4965AGNM

3.8. 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 IEEE 802.11n MCS0 HT 20MHz

Test Software Version	Mtool 0.0.0.9		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	54	100	52

Power Parameters of IEEE 802.11n MCS0 HT 40MHz

Test Software Version	Mtool 0.0.0.9		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	41	64	50

Power Parameters of IEEE 802.11b/g

Test Software Version	Mtool 0.0.0.9		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	72	82	78
IEEE 802.11g	66	92	67

For 5GHz Band

Power Parameters of IEEE 802.11n MCS0 HT 20MHz

Test Software Version	Mtool 0.0.0.9		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	92	90	92

Power Parameters of IEEE 802.11n MCS0 HT 40MHz

Test Software Version	Mtool 0.0.0.9	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	82	88

Power Parameters of IEEE 802.11ac MCS0 VHT 20MHz

Test Software Version	Mtool 0.0.0.9		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	92	90	92

Power Parameters of IEEE 802.11ac MCS0 VHT 40MHz

Test Software Version	Mtool 0.0.0.9	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	82	88

Power Parameters of IEEE 802.11ac MSC0 VHT 80MHz

Test Software Version	Mtool 0.0.0.9
Frequency	5775 MHz
MCS0 80MHz	75

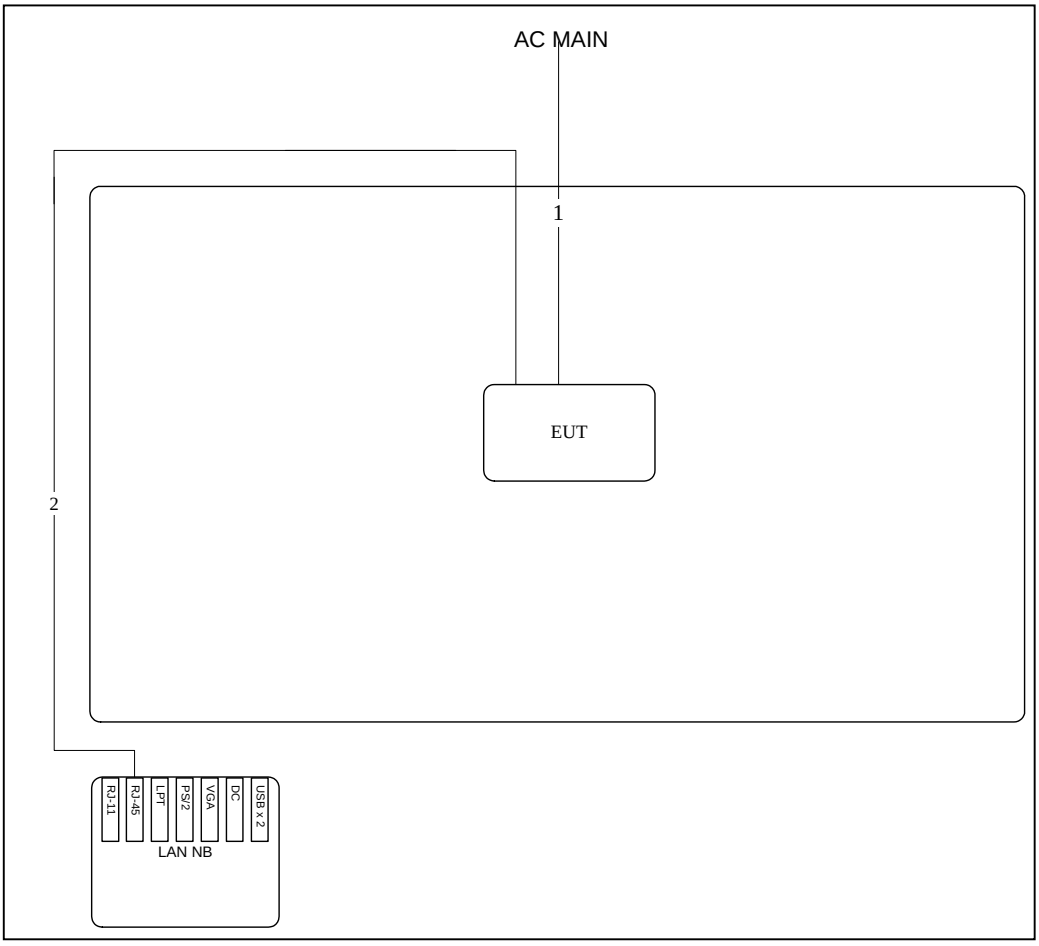
Power Parameters of IEEE 802.11a

Test Software Version	Mtool 0.0.0.9		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	80	81	81

During the test, “Mtool 0.0.0.9” under WIN XP was executed the test program to control the EUT continuously transmit RF signal.

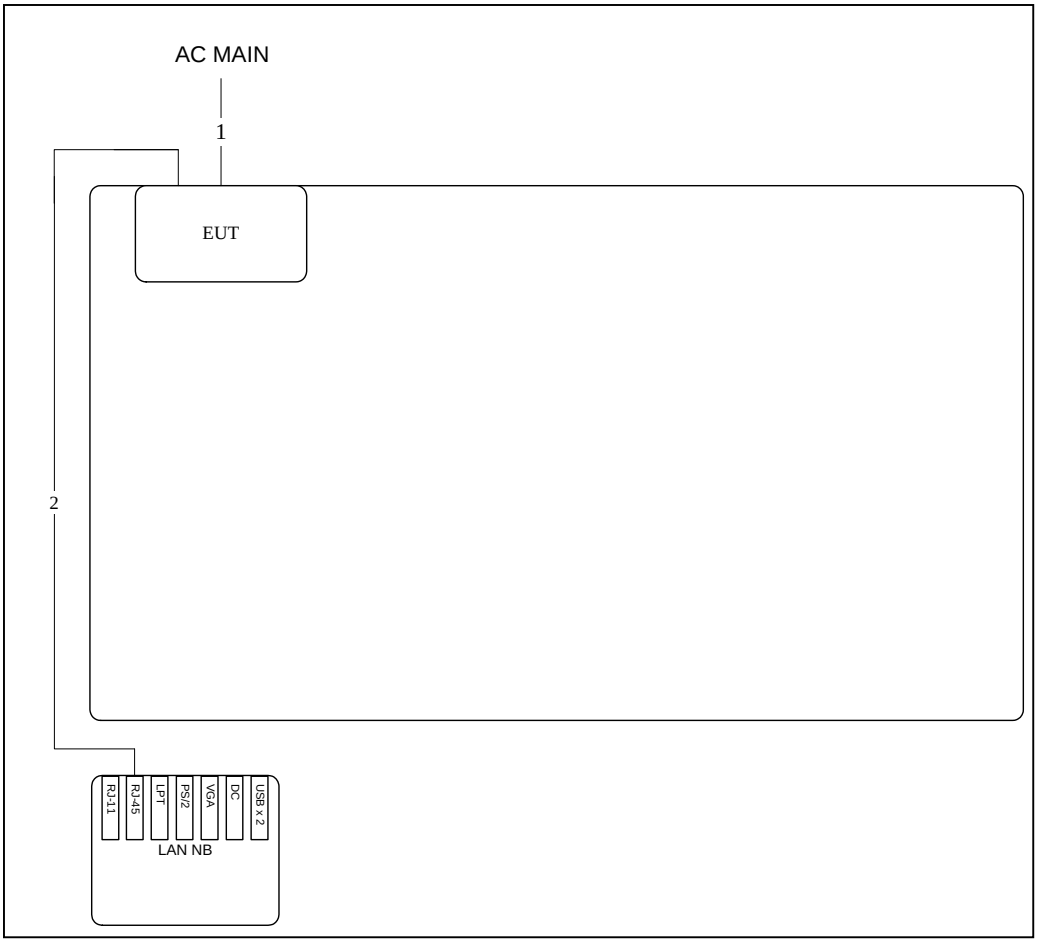
3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration



Item	Connection	Shield	Length
1	Power cable	No	1.75M
2	RJ-45 cable	No	10M

3.9.2. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	Power cable	No	1.75M
2	RJ-45 cable	No	10M

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

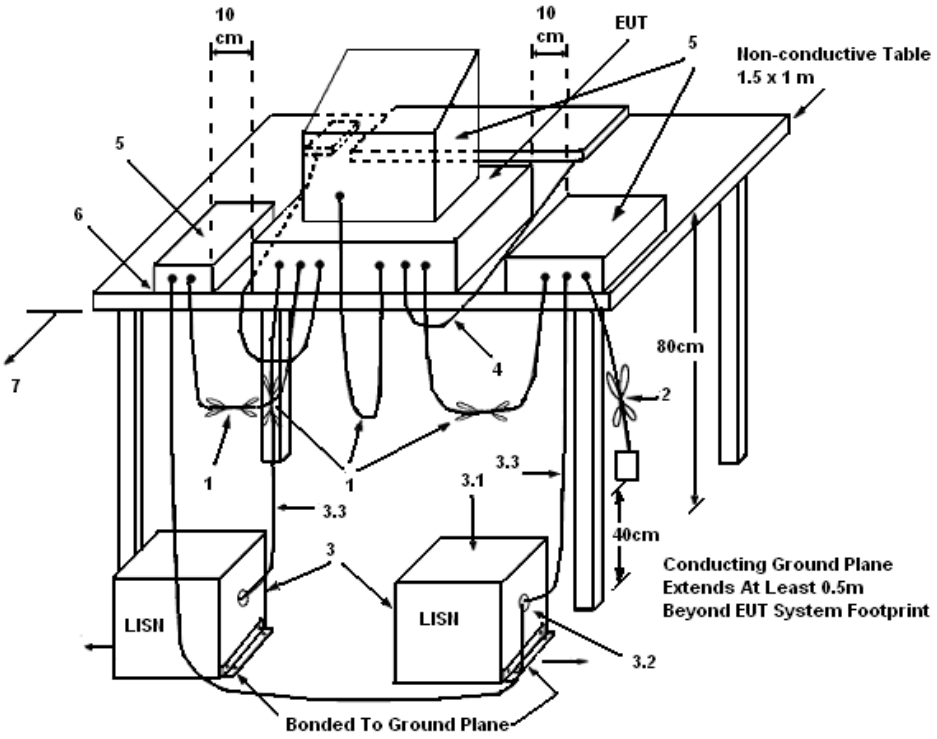
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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 C63.10. 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

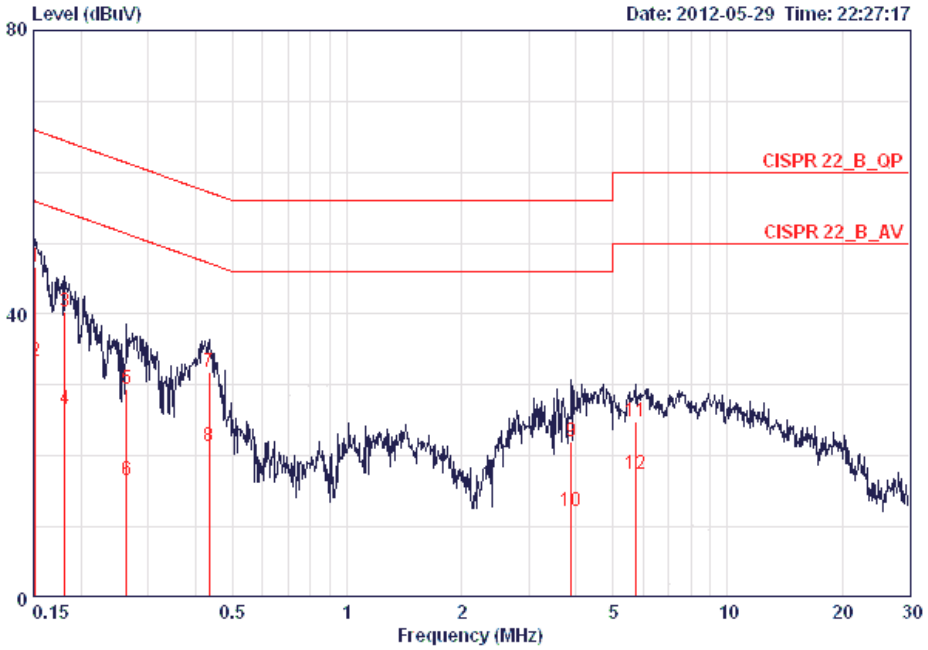
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

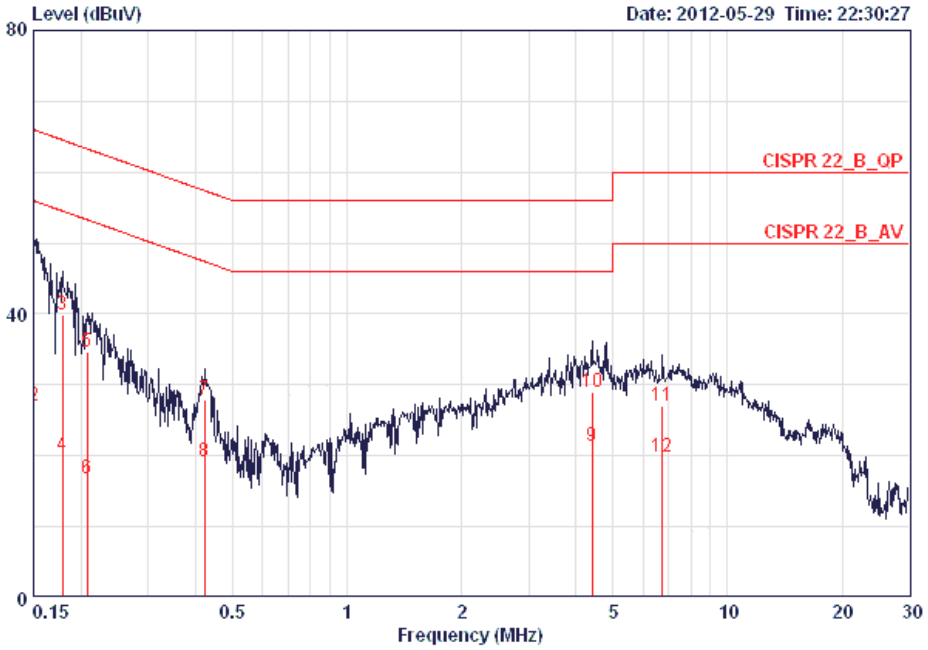
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	65%
Test Engineer	Simon Yang	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @	0.15160	46.71	-19.20	65.91	46.45	0.06	0.20	QP
2	0.15160	33.38	-22.53	55.91	33.12	0.06	0.20	AVERAGE
3	0.18152	40.34	-24.07	64.42	40.09	0.05	0.20	QP
4	0.18152	26.52	-27.89	54.42	26.27	0.05	0.20	AVERAGE
5	0.26303	29.50	-31.83	61.34	29.27	0.03	0.20	QP
6	0.26303	16.59	-34.74	51.34	16.36	0.03	0.20	AVERAGE
7	0.43511	31.79	-25.37	57.15	31.57	0.02	0.20	QP
8	0.43511	21.36	-25.80	47.15	21.14	0.02	0.20	AVERAGE
9	3.881	22.00	-34.00	56.00	21.60	0.10	0.30	QP
10	3.881	12.21	-33.79	46.00	11.81	0.10	0.30	AVERAGE
11	5.713	24.84	-35.16	60.00	24.41	0.13	0.30	QP
12	5.713	17.39	-32.61	50.00	16.96	0.13	0.30	AVERAGE

Temperature	23°C	Humidity	65%
Test Engineer	Simon Yang	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 @	0.15000	46.12	-19.88	66.00	45.86	0.06	0.20	QP
2	0.15000	27.02	-28.98	56.00	26.76	0.06	0.20	AVERAGE
3	0.17866	39.84	-24.70	64.55	39.59	0.05	0.20	QP
4	0.17866	19.97	-34.57	54.55	19.72	0.05	0.20	AVERAGE
5	0.20723	34.56	-28.76	63.32	34.31	0.05	0.20	QP
6	0.20723	16.86	-36.46	53.32	16.61	0.05	0.20	AVERAGE
7	0.42150	27.91	-29.51	57.42	27.66	0.05	0.20	QP
8	0.42150	19.17	-28.25	47.42	18.92	0.05	0.20	AVERAGE
9	4.407	21.32	-24.68	46.00	20.88	0.14	0.30	AVERAGE
10	4.407	28.95	-27.05	56.00	28.51	0.14	0.30	QP
11	6.733	27.01	-32.99	60.00	26.48	0.19	0.34	QP
12	6.733	19.94	-30.06	50.00	19.41	0.19	0.34	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. 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.

4.2.2. Measuring Instruments and Setting

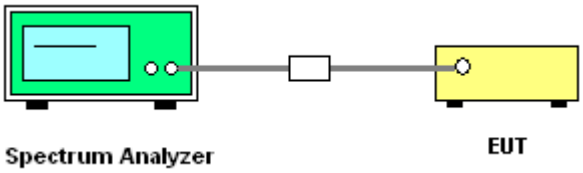
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1MHz
VB	3MHz
Detector	RMS
Trace	Average 100
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 Conducted Output Power

Temperature	25°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3			
1	2412 MHz	14.83	15.7	14.95	19.95	30.00	Complies
6	2437 MHz	24.87	25.11	25.08	29.79	30.00	Complies
11	2462 MHz	14.48	15.07	14.56	19.48	30.00	Complies

Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3			
3	2422 MHz	11.15	10.58	11.09	15.72	30.00	Complies
6	2437 MHz	18	17.99	18.67	23.00	30.00	Complies
9	2452 MHz	14.27	14.05	14.51	19.05	30.00	Complies

For 5GHz Band

Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6			
149	5745 MHz	24.00	23.98	24.29	28.86	30.00	Complies
157	5785 MHz	23.51	23.53	23.58	28.31	30.00	Complies
165	5825 MHz	23.79	24.13	23.68	28.64	30.00	Complies

Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6			
151	5755 MHz	21.70	21.80	21.91	26.58	30.00	Complies
159	5795 MHz	23.05	23.29	23.04	27.90	30.00	Complies

Configuration IEEE 802.11ac MCS0 VHT20MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6			
149	5745 MHz	24.20	24.02	24.32	28.95	30.00	Complies
157	5785 MHz	23.55	23.57	23.65	28.36	30.00	Complies
165	5825 MHz	23.86	24.22	23.84	28.75	30.00	Complies

Configuration IEEE 802.11ac MCS0 VHT40MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6			
151	5755 MHz	21.89	21.72	21.91	26.61	30.00	Complies
159	5795 MHz	23.11	23.21	23.09	27.91	30.00	Complies

Configuration IEEE 802.11ac MCS0 VHT80MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6			
155	5775 MHz	19.82	20.11	20.10	24.78	30.00	Complies

Temperature	25°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3			
1	2412 MHz	18.51	19.36	18.86	23.70	28.23	Complies
6	2437 MHz	20.8	20.88	20.94	25.64	28.23	Complies
11	2462 MHz	19.88	19.85	20.17	24.74	28.23	Complies

Note: $\text{Directional gain} = G_{ANT} + 10\log(N)\ \text{dBi}$ =7.77dBi > 6dBi, so the conducted power limit =30-(7.77dBi-6)=28.23dBm

Configuration IEEE 802.11g / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3			
1	2412 MHz	17.92	18.5	18.02	22.93	28.23	Complies
6	2437 MHz	23.08	23.36	23.45	28.07	28.23	Complies
11	2462 MHz	18.01	18.55	18.5	23.13	28.23	Complies

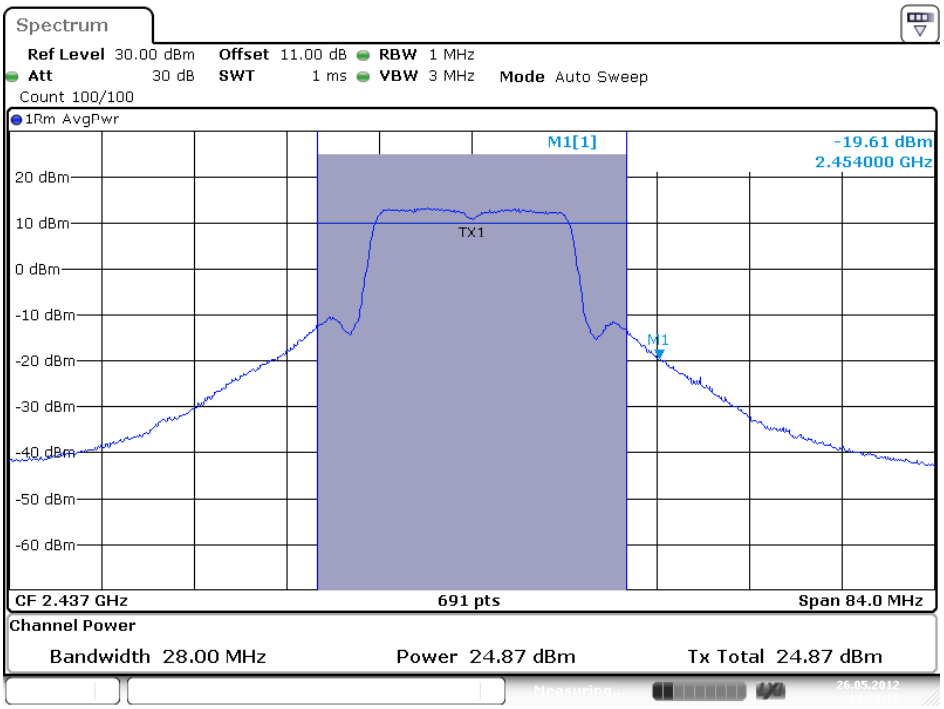
Note: $\text{Directional gain} = G_{ANT} + 10\log(N)\ \text{dBi}$ =7.77dBi > 6dBi, so the conducted power limit =30-(7.77dBi-6)=28.23dBm

Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 4	Ant. 5	Ant. 6			
149	5745 MHz	21.45	21.37	21.46	26.20	26.73	Complies
157	5785 MHz	21.42	21.56	21.62	26.31	26.73	Complies
165	5825 MHz	21.43	21.45	21.44	26.21	26.73	Complies

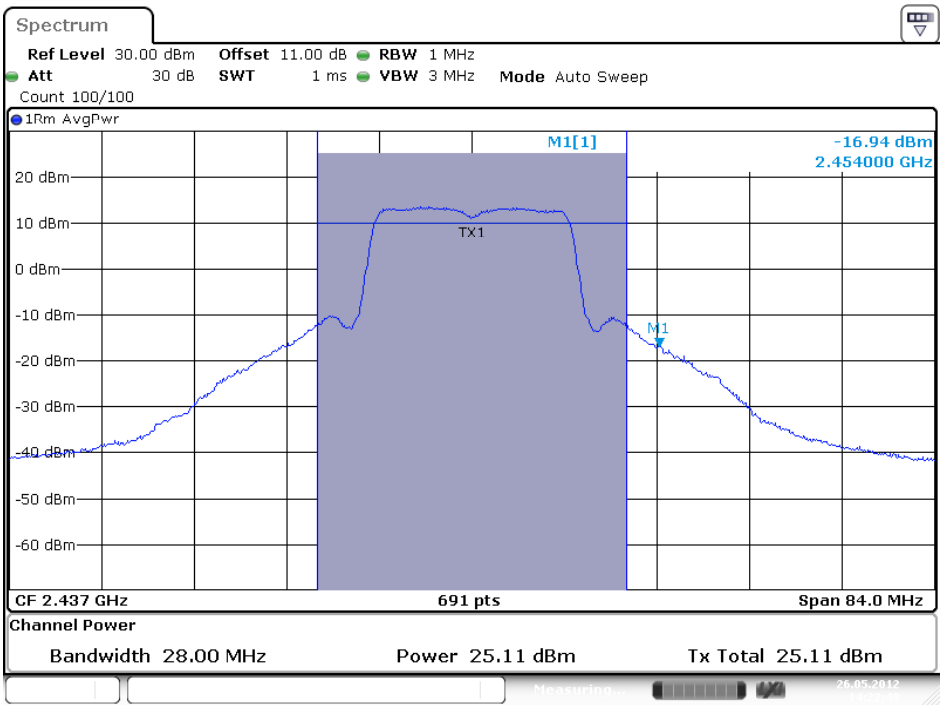
Note: $\text{Directional gain} = G_{ANT} + 10\log(N)\ \text{dBi}$ =9.27dBi > 6dBi, so the conducted power limit =30-(9.27dBi-6)=26.73dBm

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT20MHz / 2437 MHz / ANT. 1



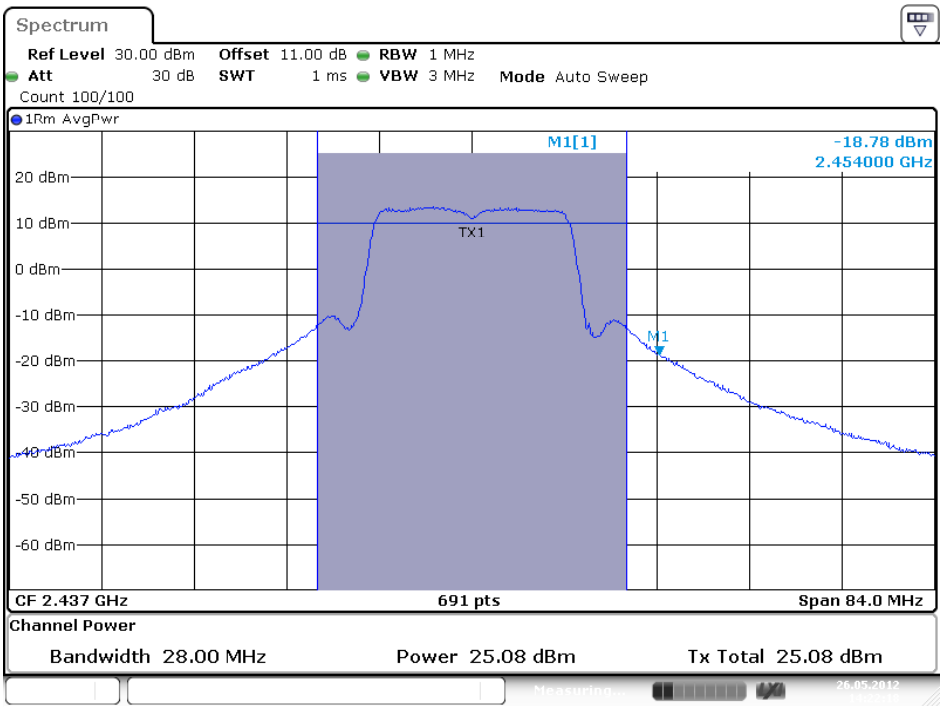
Date: 26.MAY.2012 14:23:11

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT20MHz / 2437 MHz/ ANT.2



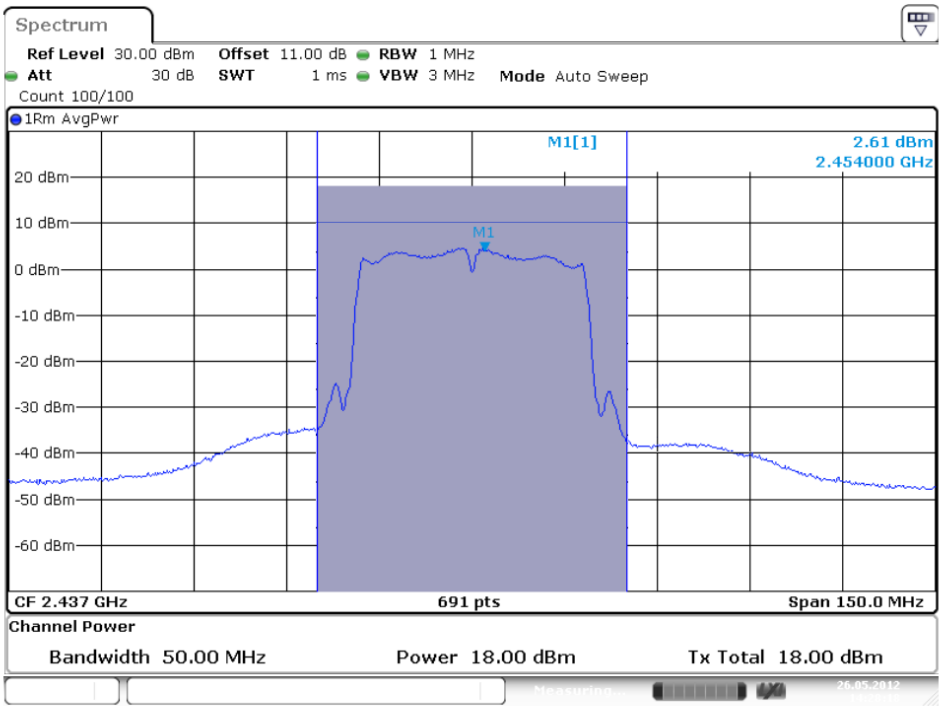
Date: 26.MAY.2012 14:22:49

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT20MHz / 2437 MHz/ ANT.3



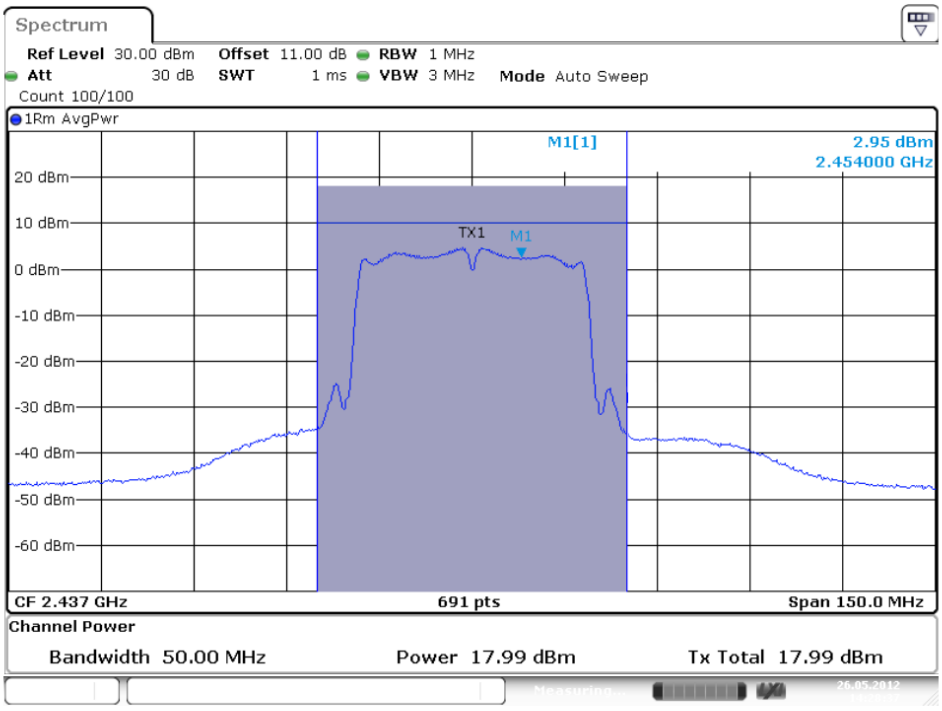
Date: 26.MAY.2012 14:22:19

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT40MHz / 2437 MHz/ ANT. 1



Date: 26.MAY.2012 14:28:18

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT40MHz / 2437 MHz/ ANT.2



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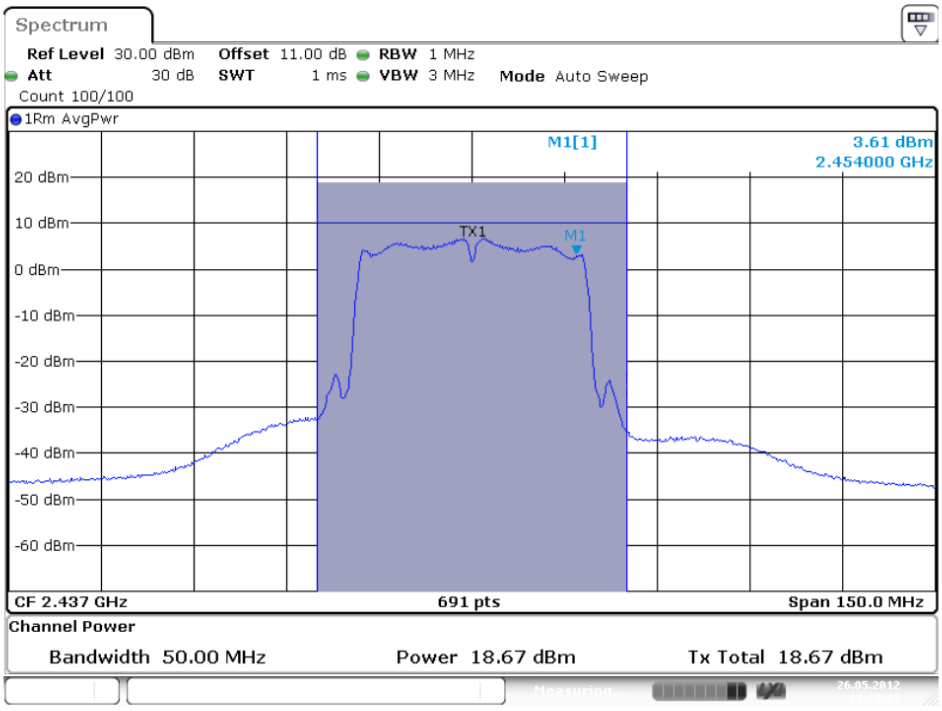
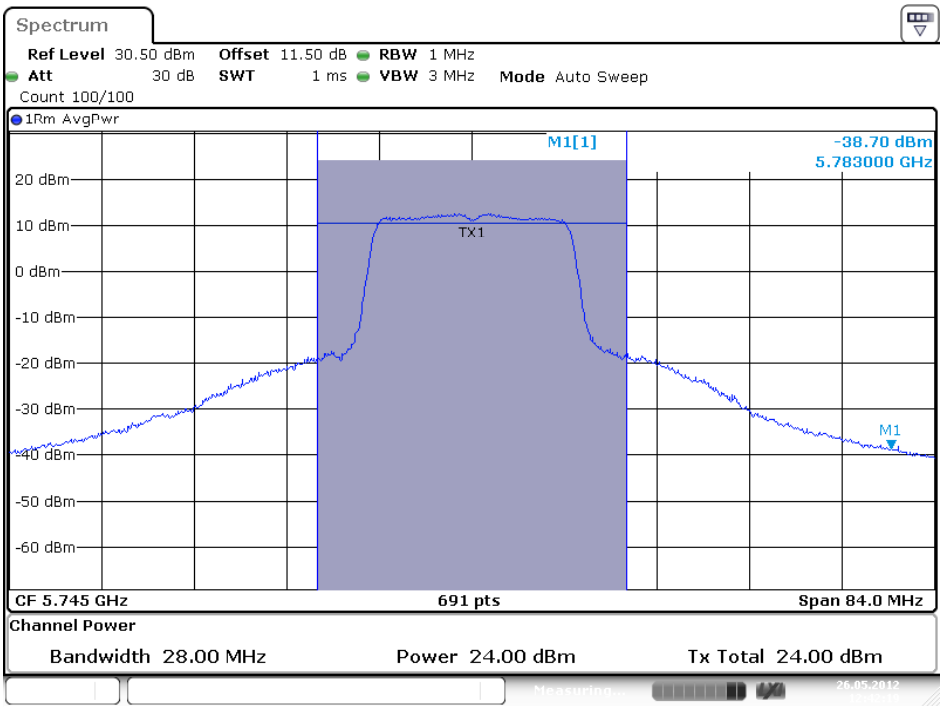
Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT40MHz / 2437 MHz/ ANT.3



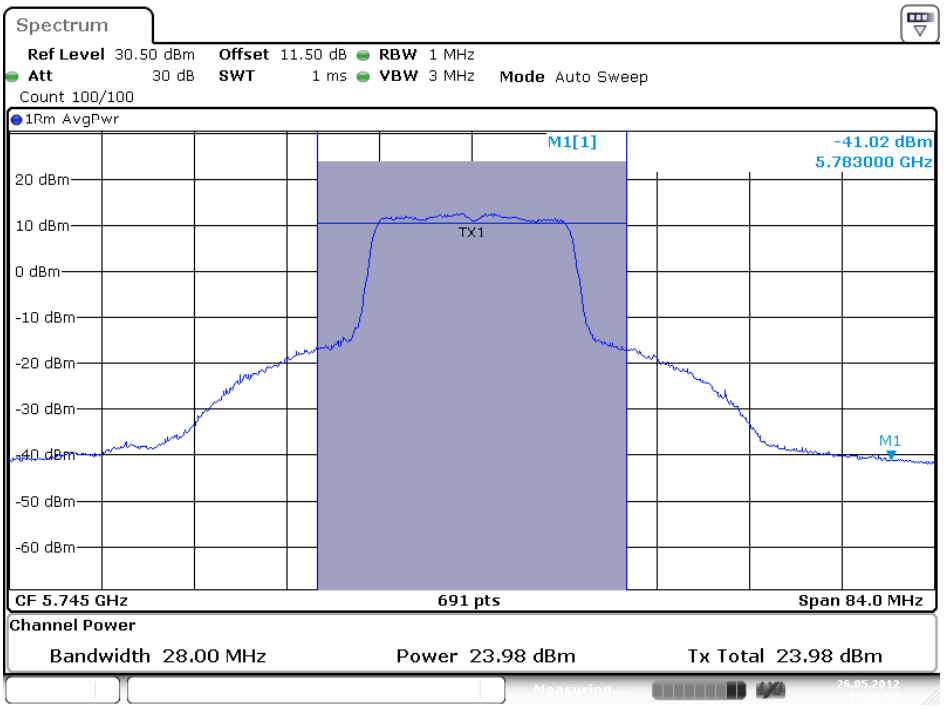
Date: 26.MAY.2012 14:29:17

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT20MHz / 5745 MHz / ANT. 4



Date: 26.MAY.2012 12:42:20

Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT20MHz / 5745 MHz/ ANT. 5



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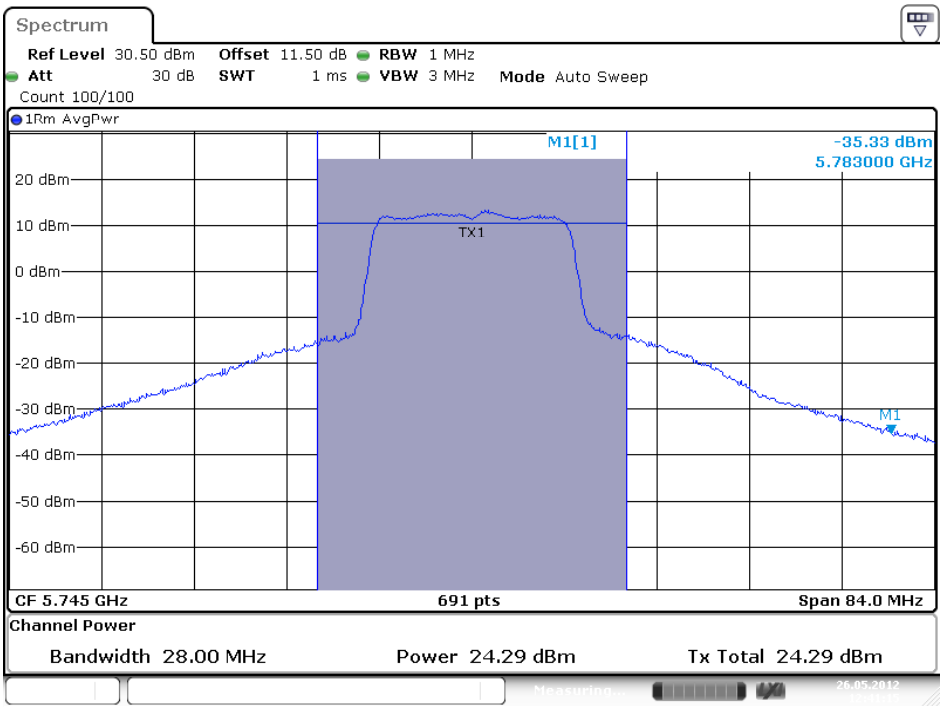
Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT20MHz / 5745 MHz/ ANT. 6



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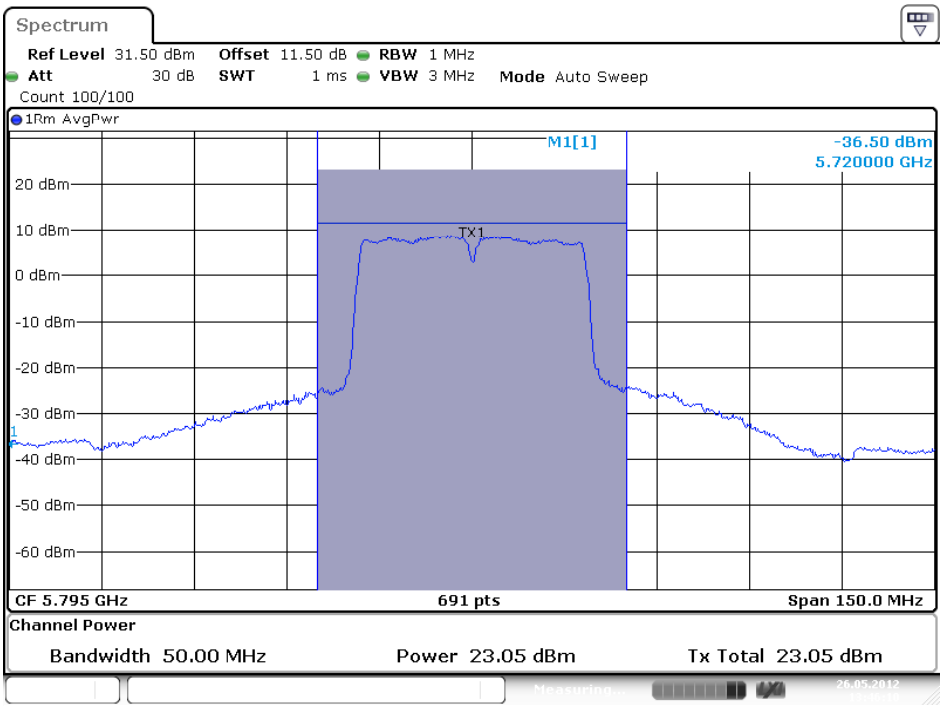
Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT40MHz / 5795 MHz/ ANT. 4



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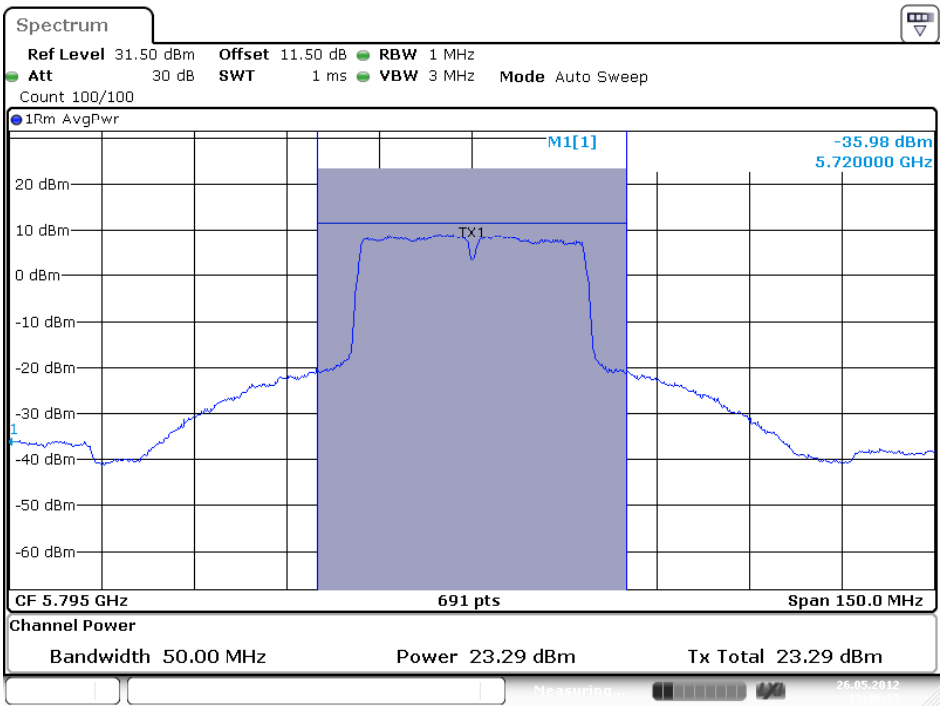
Conducted Output Power Plot on Configuration IEEE 802.11n MCS0 HT40MHz / 5795 MHz/ ANT. 5



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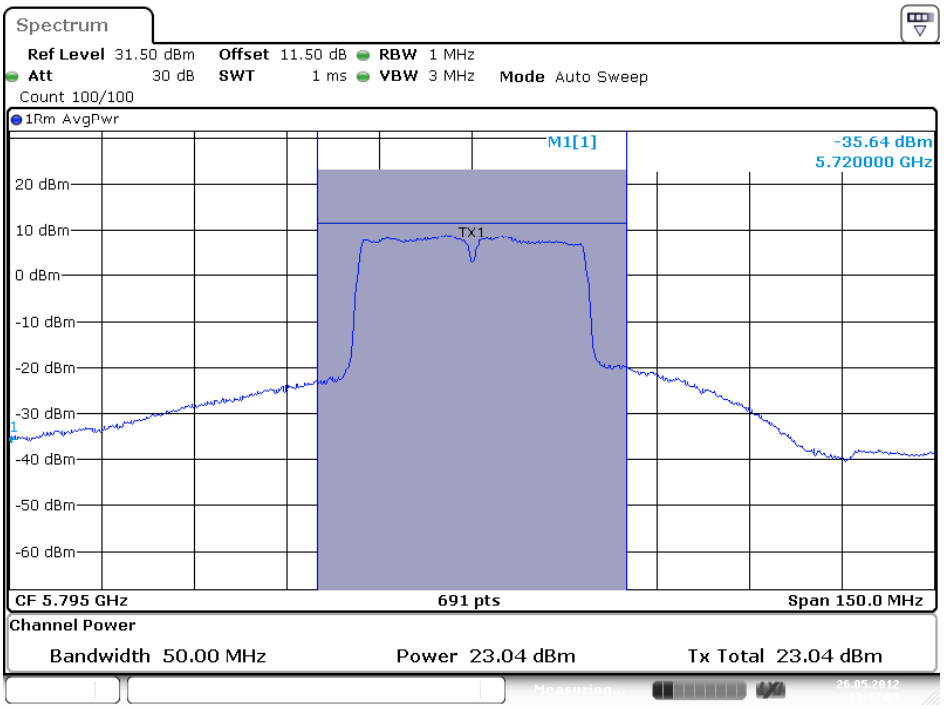

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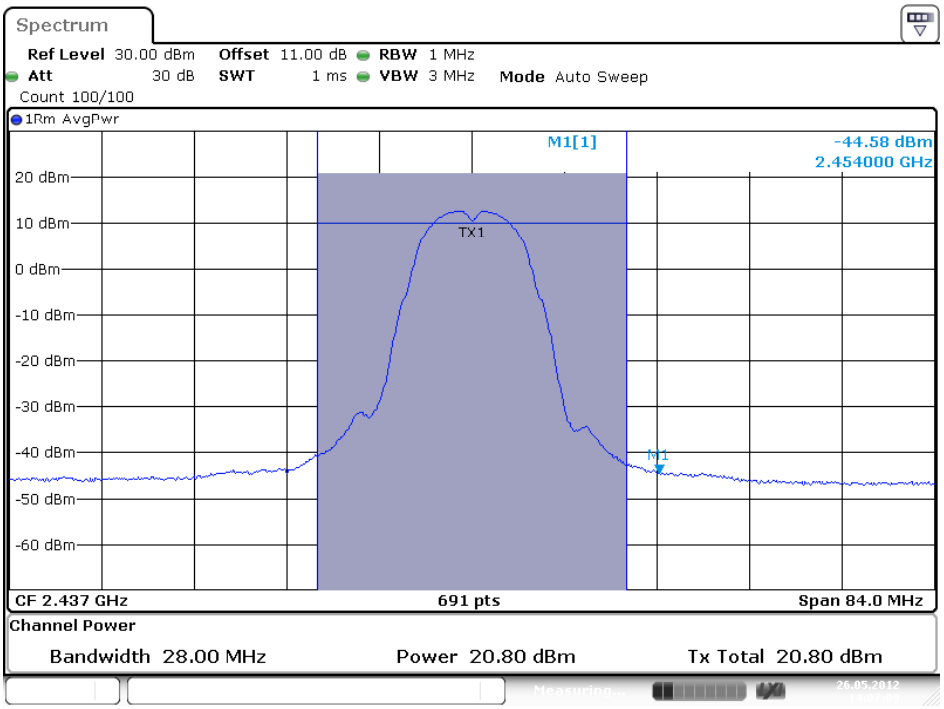
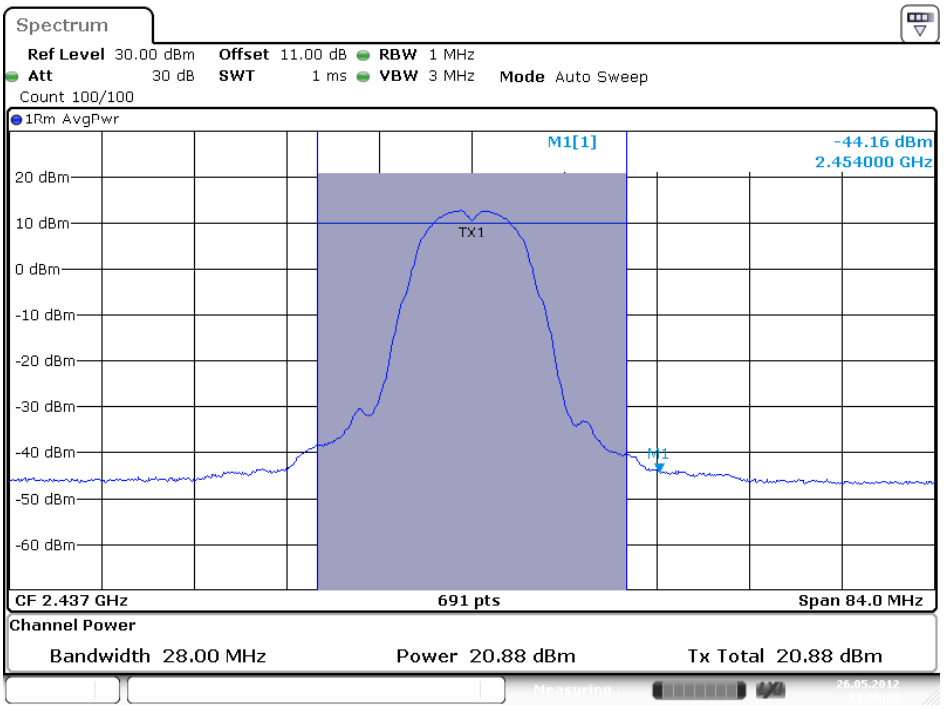
Conducted Output Power Plot on Configuration IEEE 802.11b / 2437 MHz/ ANT. 1



Date: 26.MAY.2012 14:07:10

Conducted Output Power Plot on Configuration IEEE 802.11b / 2437 MHz/ ANT. 2



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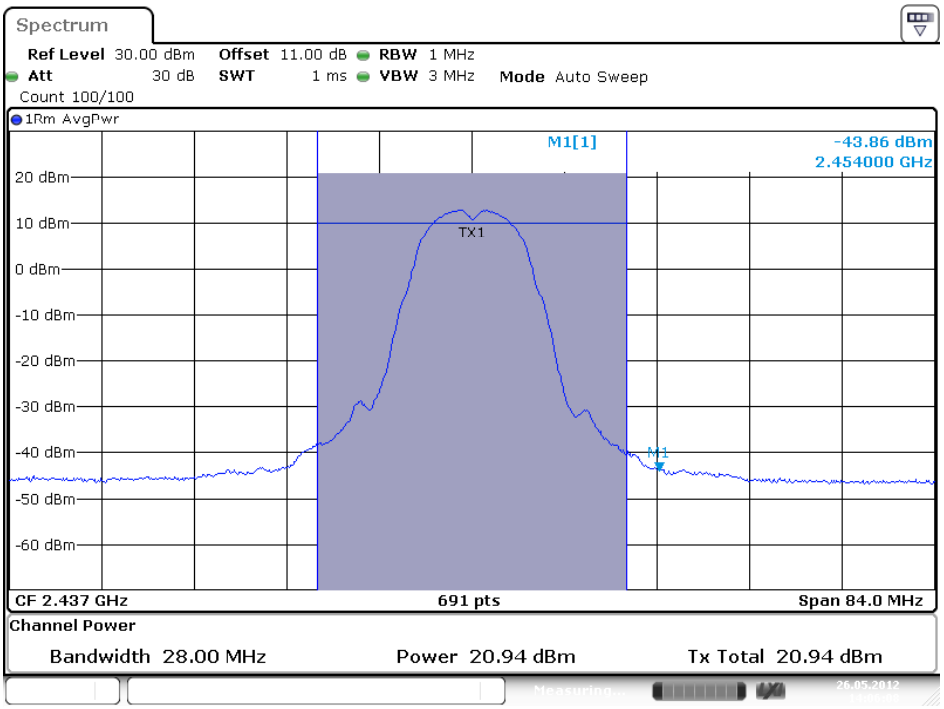
Conducted Output Power Plot on Configuration IEEE 802.11b / 2437 MHz/ ANT. 3



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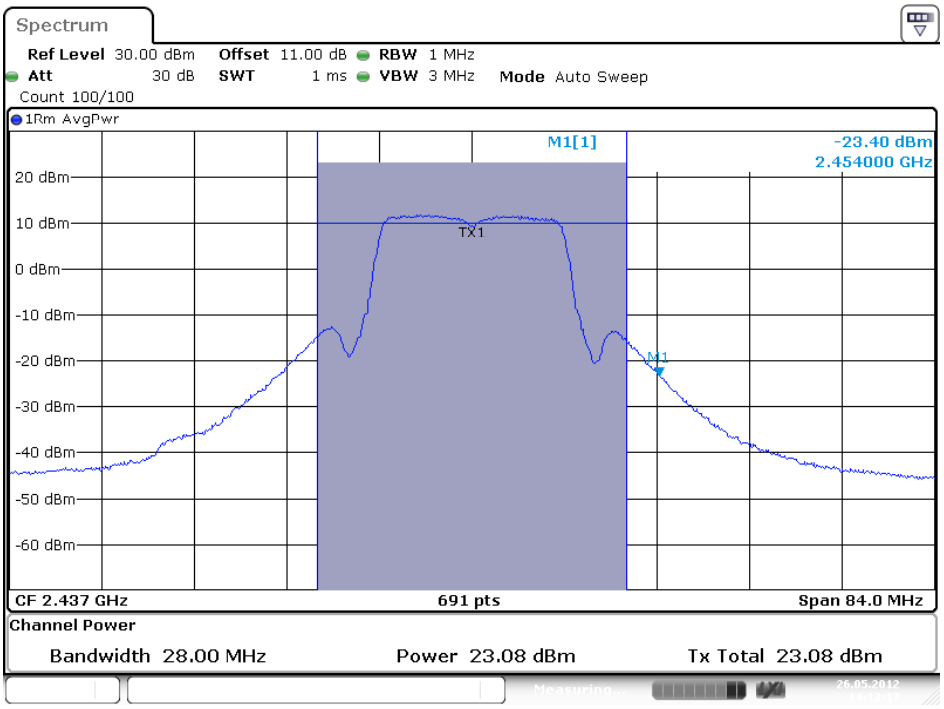
Conducted Output Power Plot on Configuration IEEE 802.11g / 2437 MHz/ ANT.1



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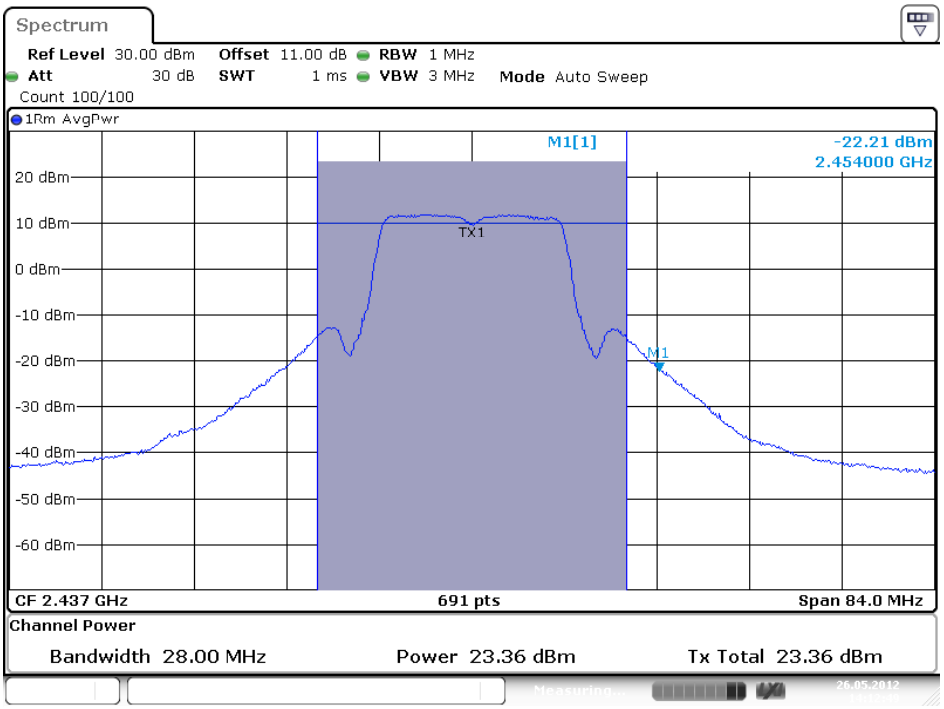
Conducted Output Power Plot on Configuration IEEE 802.11g / 2437 MHz/ ANT.2



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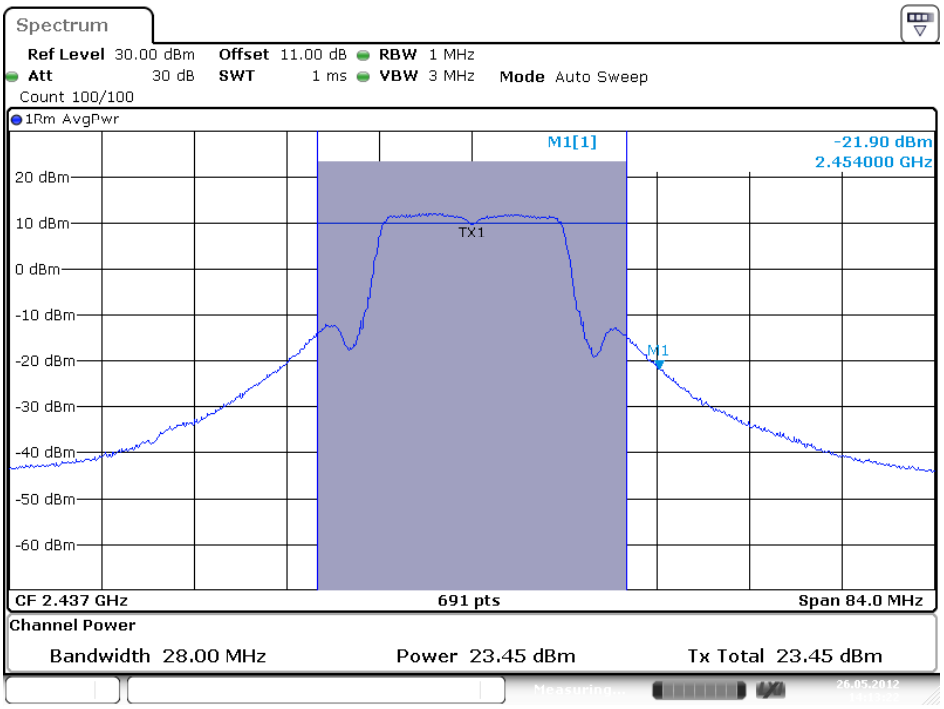
Conducted Output Power Plot on Configuration IEEE 802.11g / 2437 MHz/ ANT.3



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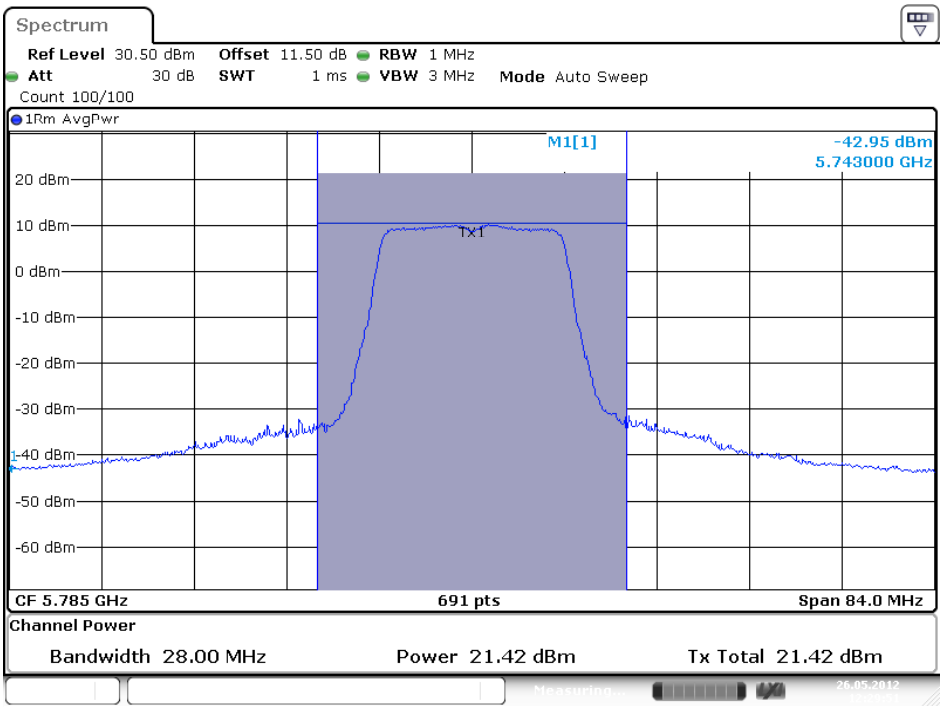
Conducted Output Power Plot on Configuration IEEE 802.11a / 5785 MHz/ ANT.4



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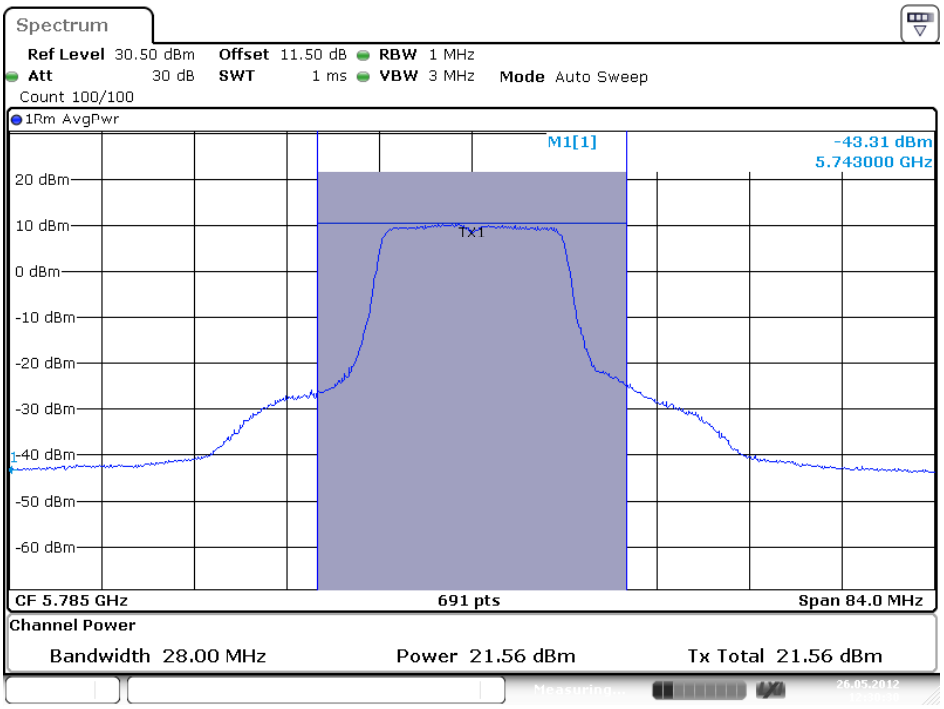
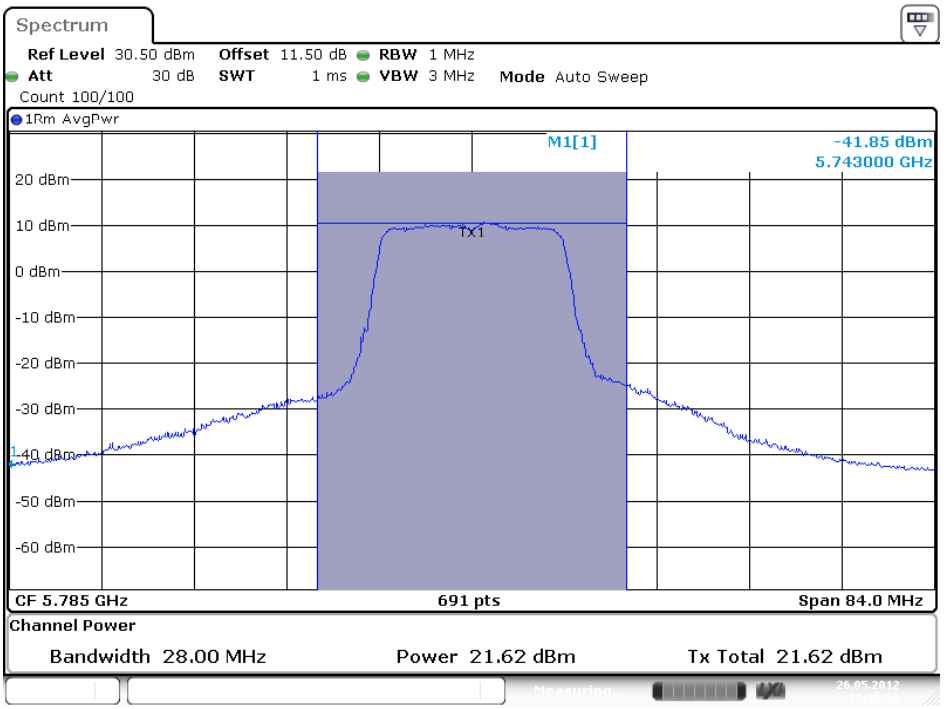
Conducted Output Power Plot on Configuration IEEE 802.11a / 5785 MHz/ ANT. 5



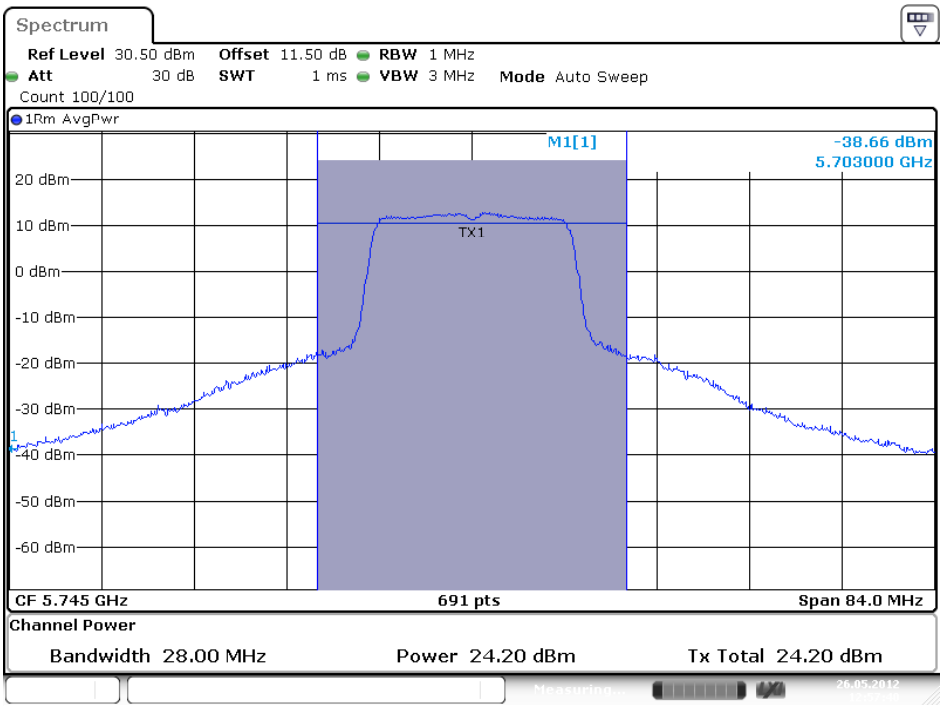
Date: 26.MAY.2012 12:30:31

Conducted Output Power Plot on Configuration IEEE 802.11a / 5785 MHz/ ANT. 6



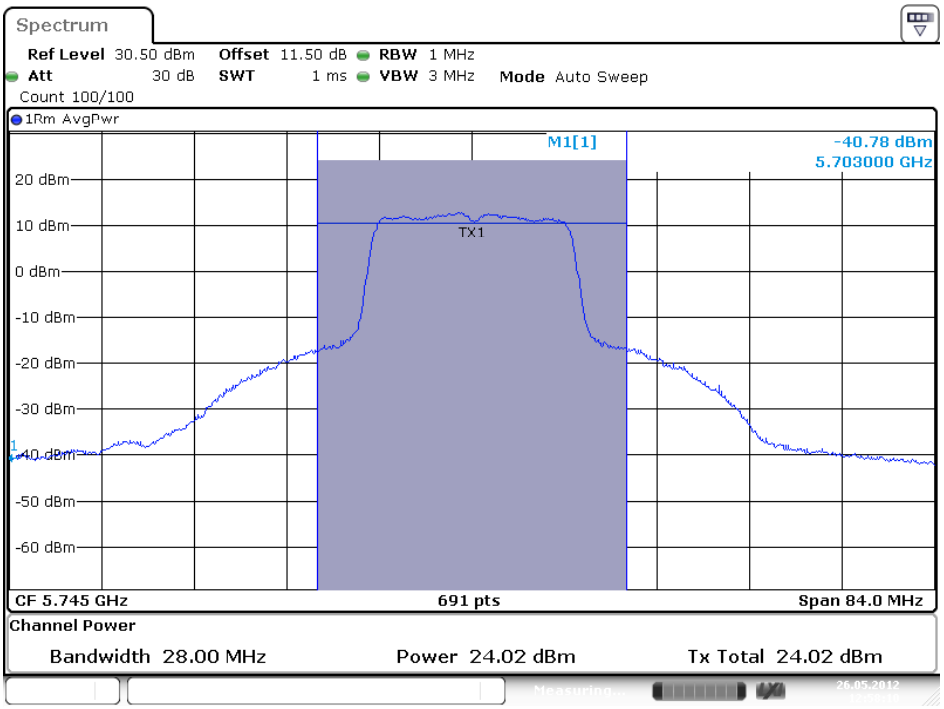
Date: 26.MAY.2012 12:30:58

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 20MHz / 5745 MHz / ANT.4



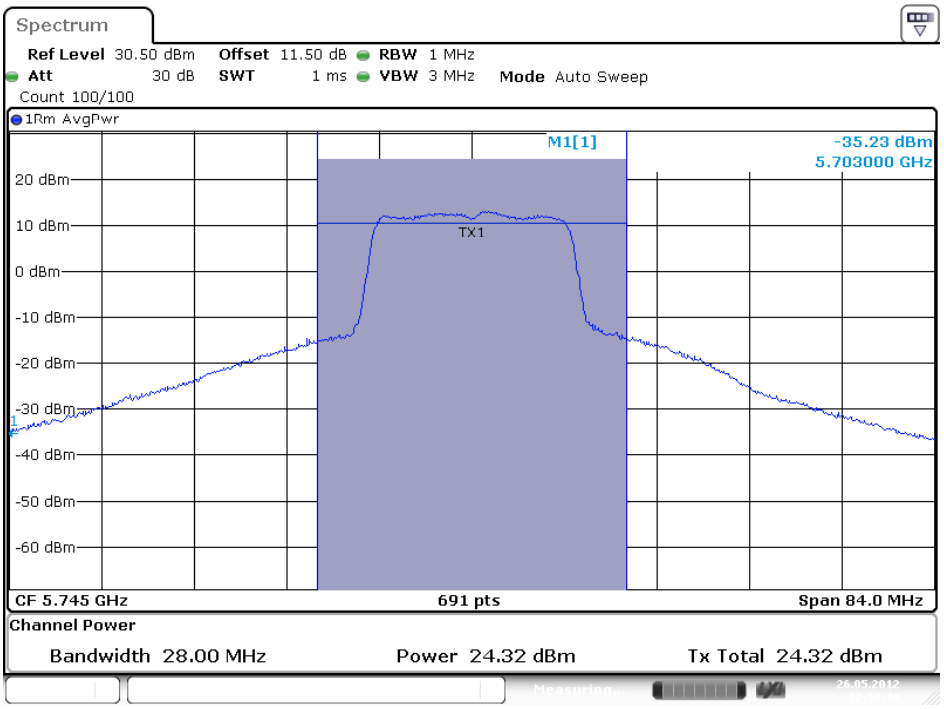
Date: 26.MAY.2012 12:57:41

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 20MHz / 5745MHz / ANT. 5



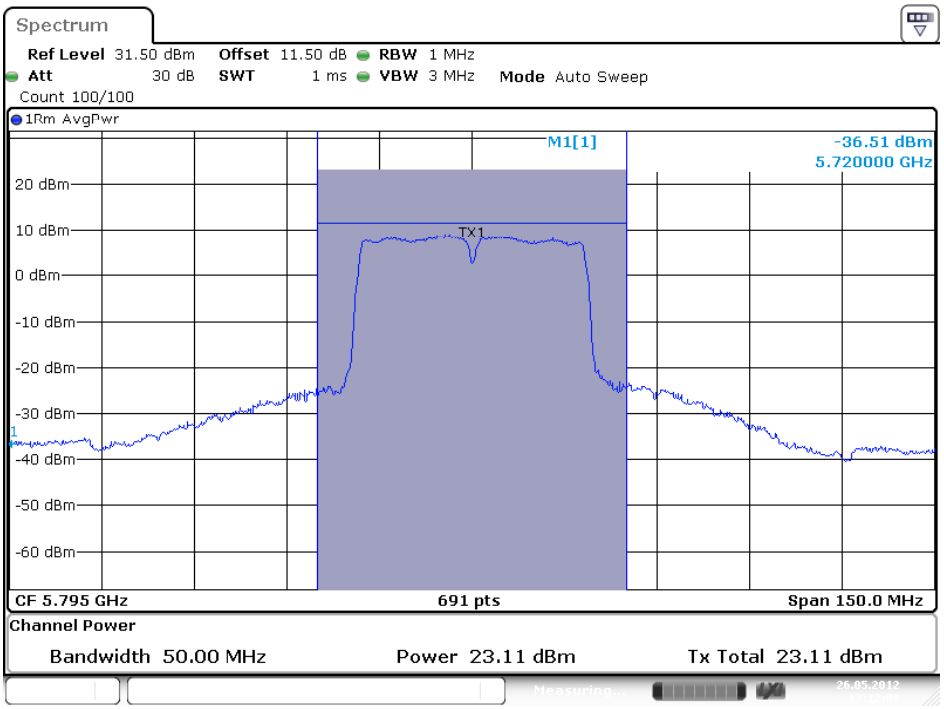
Date: 26.MAY.2012 12:58:10

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 20MHz / 5745 MHz / ANT. 6



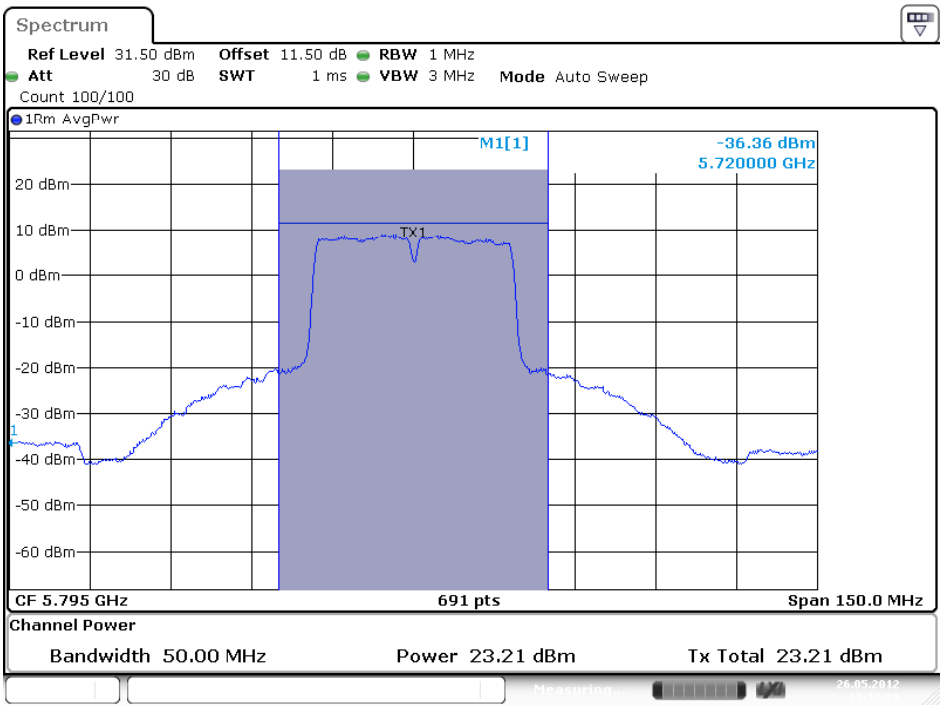
Date: 26.MAY.2012 12:58:44

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 40MHz / 5795 MHz / ANT. 4



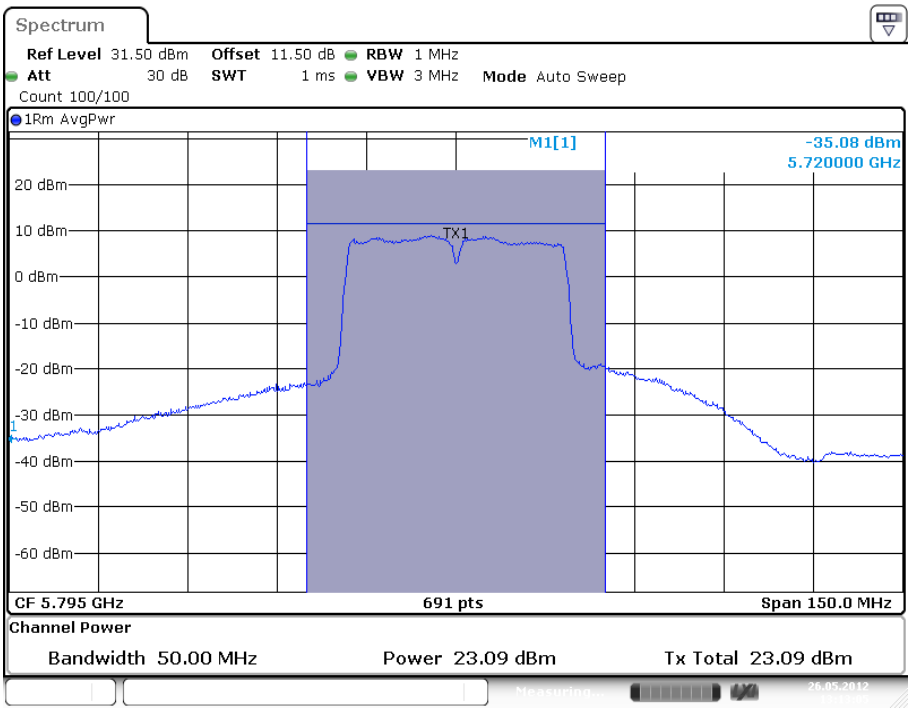
Date: 26.MAY.2012 13:12:09

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 40MHz / 5795MHz / ANT. 5



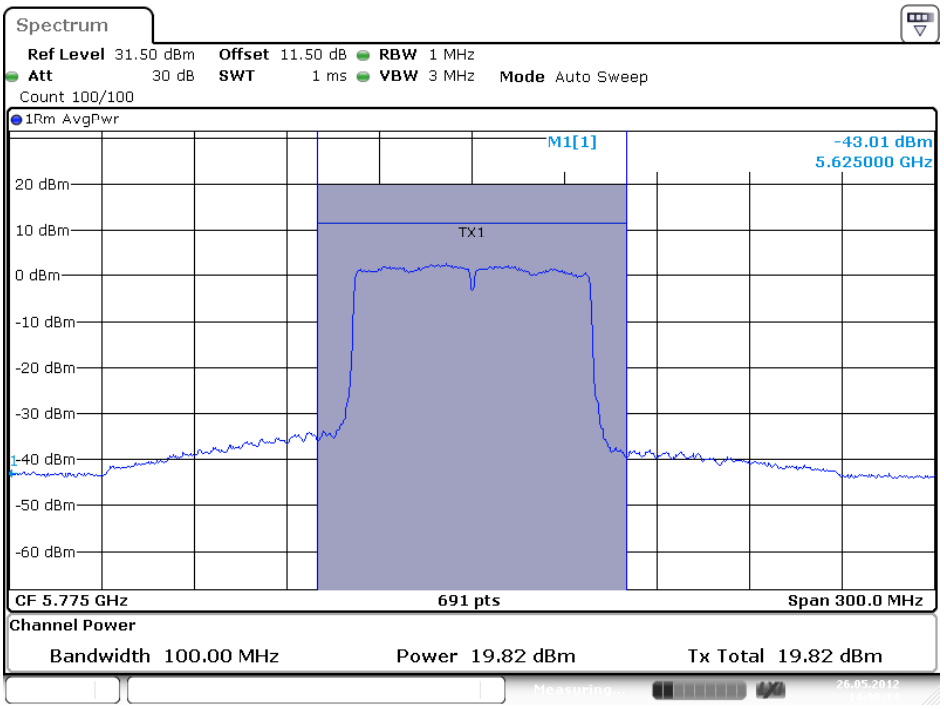
Date: 26.MAY.2012 13:12:29

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 40MHz / 5795 MHz / ANT. 6



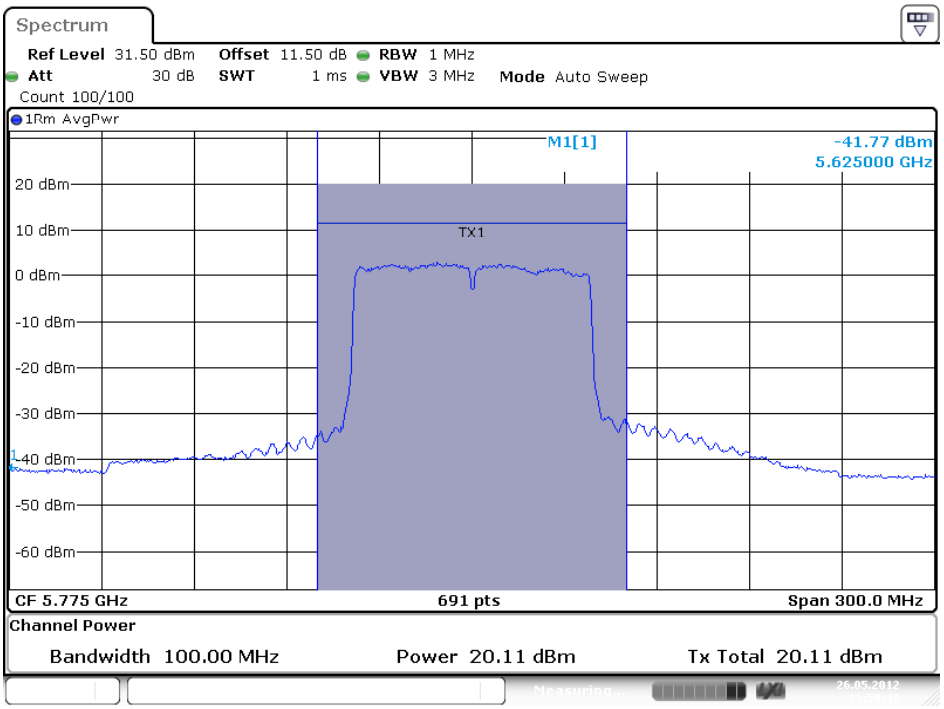
Date: 26.MAY.2012 13:13:05

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5775 MHz / ANT. 4



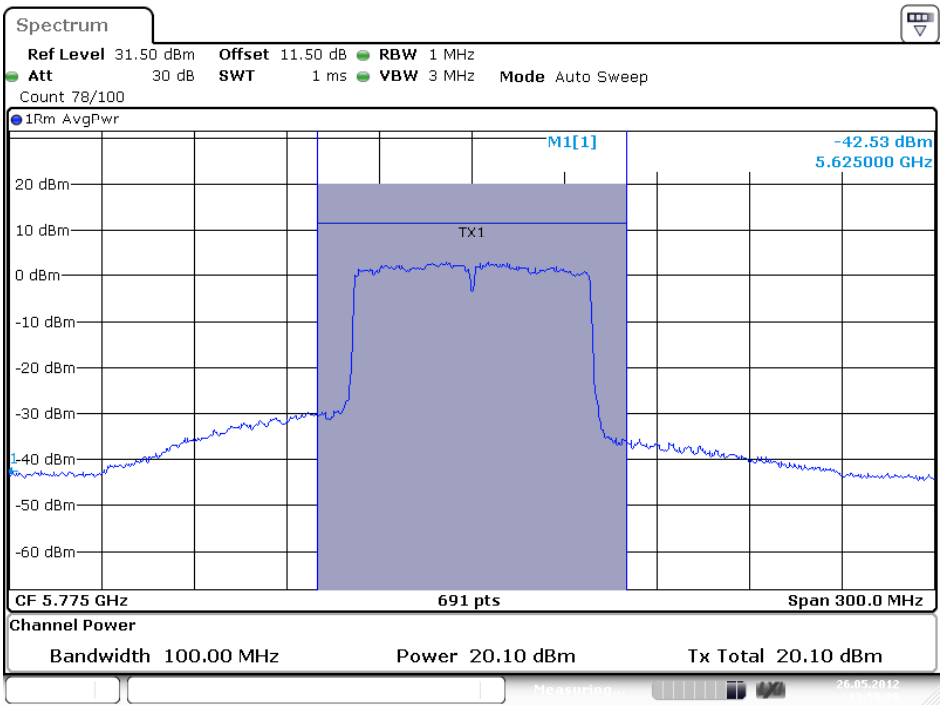
Date: 26.MAY.2012 14:00:14

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5775MHz / ANT. 5



Date: 26.MAY.2012 13:59:48

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / 5775 MHz / ANT. 6



Date: 26.MAY.2012 13:59:21

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

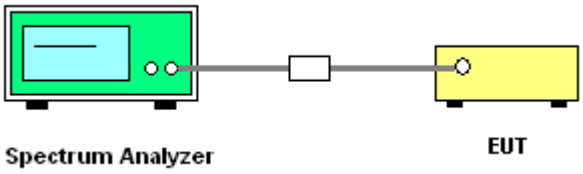
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the analyzer span to 5-30% greater than the EBW.
RB	100 kHz
VB	300 kHz
Detector	RMS
Trace	Single Sweep
Sweep Time	≥ 10 x (number of measurement points in sweep) x (transmission symbol period).

4.3.3. Test Procedures

1. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
2. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
3. Use the peak marker function to determine the maximum level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent level in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where: BWCF = 10log (3 kHz/100 kHz = -15.2 dB).
5. The resulting PSD level must be ≤ 8 dBm.
6. When measuring power spectral density with multiple antenna systems, add every result of the values by mathematic formula.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n / ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.1	Ant.2	ANT.3					
1	2412 MHz	-6.08	-6.01	-6.42	-1.40	-15.23	-16.62	8.00	Complies
6	2437 MHz	3.53	4.05	3.40	8.44	-15.23	-6.79	8.00	Complies
11	2462 MHz	-6.76	-6.22	-6.67	-1.77	-15.23	-17.00	8.00	Complies

Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.1	Ant.2	ANT.3					
3	2422 MHz	-11.79	-12.62	-11.71	-7.25	-15.23	-22.48	8.00	Complies
6	2437 MHz	-5.05	-5.07	-4.28	-0.01	-15.23	-15.24	8.00	Complies
9	2452 MHz	-8.32	-8.73	-8.60	-3.78	-15.23	-19.00	8.00	Complies

For 5GHz Band

Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.4	Ant.5	ANT.6					
149	5745 MHz	3.81	3.10	3.88	8.38	-15.23	-6.85	8.00	Complies
157	5785 MHz	3.25	3.40	3.47	8.15	-15.23	-7.08	8.00	Complies
165	5825 MHz	3.68	4.06	3.56	8.54	-15.23	-6.68	8.00	Complies

Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.4	Ant.5	ANT.6					
151	5755 MHz	-1.14	-1.27	-1.21	3.56	-15.23	-11.66	8.00	Complies
159	5795 MHz	0.12	0.33	0.17	4.98	-15.23	-10.25	8.00	Complies

Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.4	Ant.5	ANT.6					
155	5775 MHz	-6.13	-5.37	-5.76	-0.97	-15.23	-16.20	8.00	Complies

Temperature	25°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.1	Ant.2	ANT.3					
1	2412 MHz	1.27	2.15	1.41	6.40	-15.23	-8.83	6.23	Complies
6	2437 MHz	3.89	3.96	3.86	8.67	-15.23	-6.55	6.23	Complies
11	2462 MHz	2.65	2.72	2.51	7.40	-15.23	-7.83	6.23	Complies

Note: $\text{Directional gain} = G_{ANT} + 10\log(N)\ \text{dBi}$ =7.77dBi > 6dBi, so the conducted power limit =8-(7.77dBi-6)=6.23dBm

Configuration IEEE 802.11g / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.1	Ant.2	ANT.3					
1	2412 MHz	-2.99	-3.51	-3.06	1.59	-15.23	-13.64	6.23	Complies
6	2437 MHz	1.96	2.48	2.63	7.14	-15.23	-8.09	6.23	Complies
11	2462 MHz	-3.00	-2.91	-2.72	1.90	-15.23	-13.33	6.23	Complies

Note: $\text{Directional gain} = G_{ANT} + 10\log(N)\ \text{dBi}$ =7.77dBi > 6dBi, so the conducted power limit =8-(7.77dBi-6)=6.23dBm

Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6

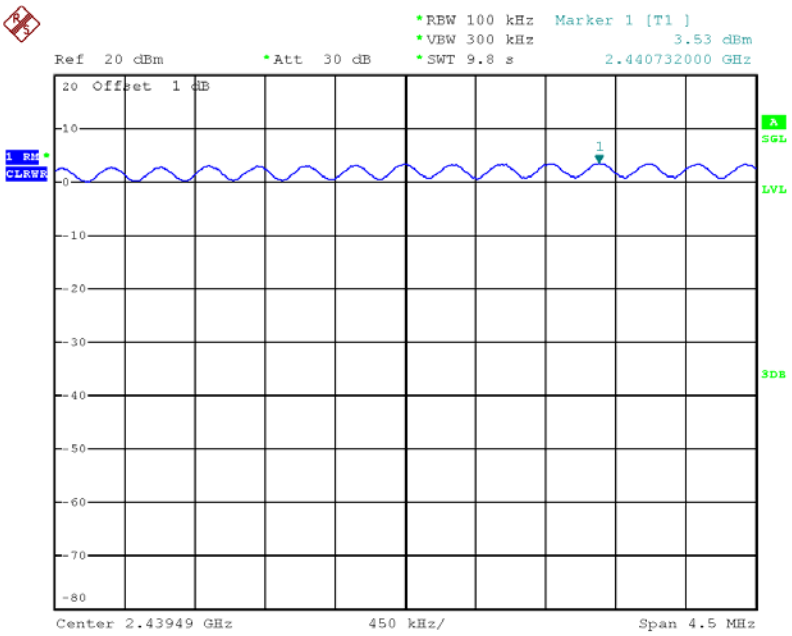
Channel	Frequency	Power Density (dBm/100kHz)			Total Power Density (dBm/100 kHz)	BWCF factor (100KHz to 3KHz	Total Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
		Ant.4	Ant.5	ANT.6					
149	5745 MHz	1.32	1.06	1.51	6.07	-15.23	-9.16	4.73	Complies
157	5785 MHz	1.29	1.55	1.76	6.31	-15.23	-8.92	4.73	Complies
165	5825 MHz	1.25	1.57	1.76	6.30	-15.23	-8.93	4.73	Complies

Note: $\text{Directional gain} = G_{ANT} + 10\log(N)\ \text{dBi}$ =9.27dBi > 6dBi, so the conducted power limit =8-(9.27dBi-6)=4.73dBm

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

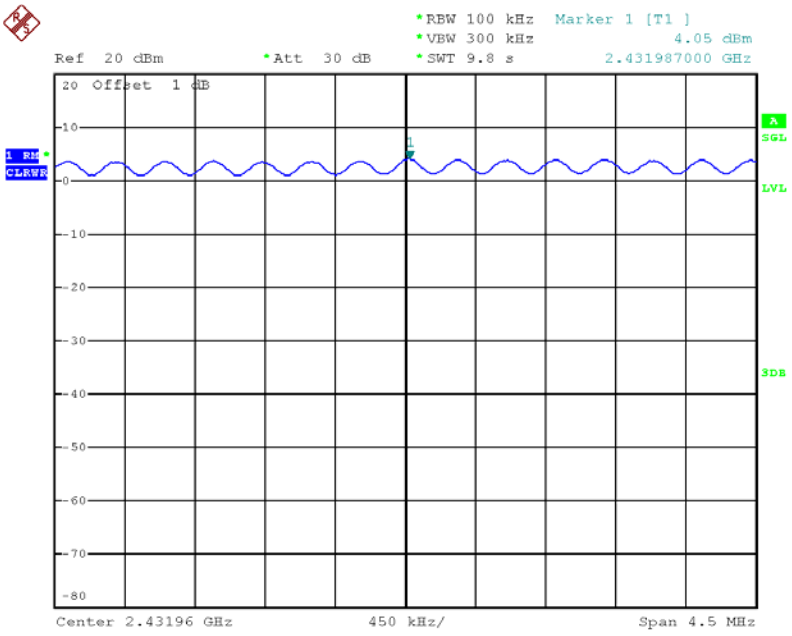
For plots, only the channel with maximum results was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1 / 2437 MHz



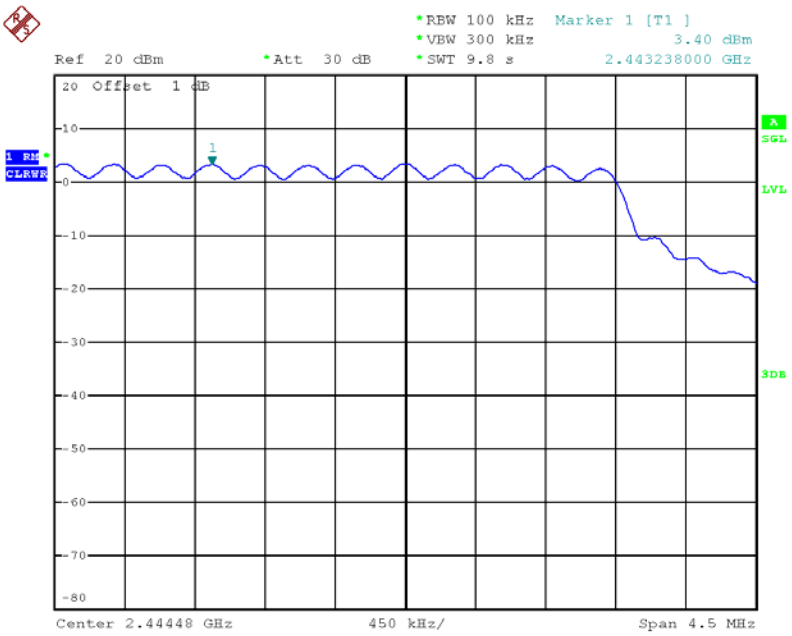
Date: 26.MAY.2012 15:36:13

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 2 / 2437 MHz



Date: 26.MAY.2012 15:34:47

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 3 / 2437 MHz



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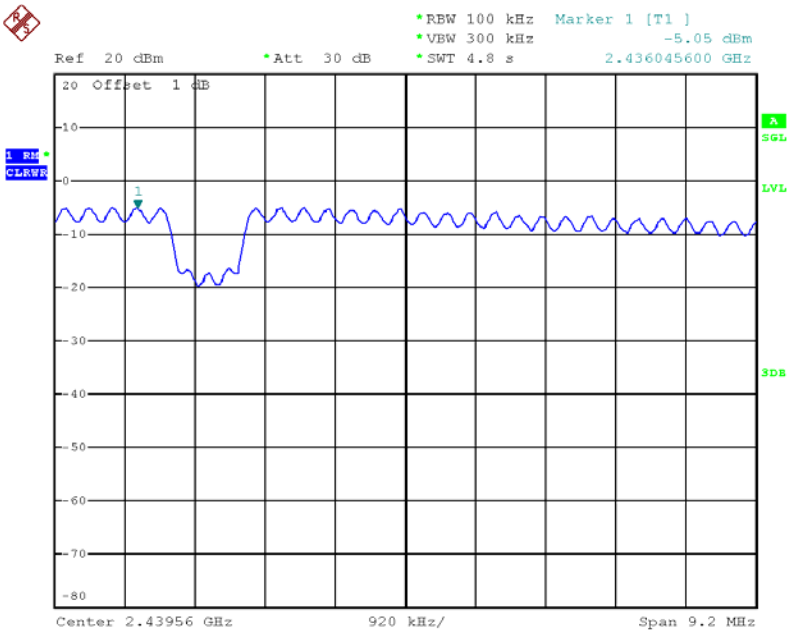
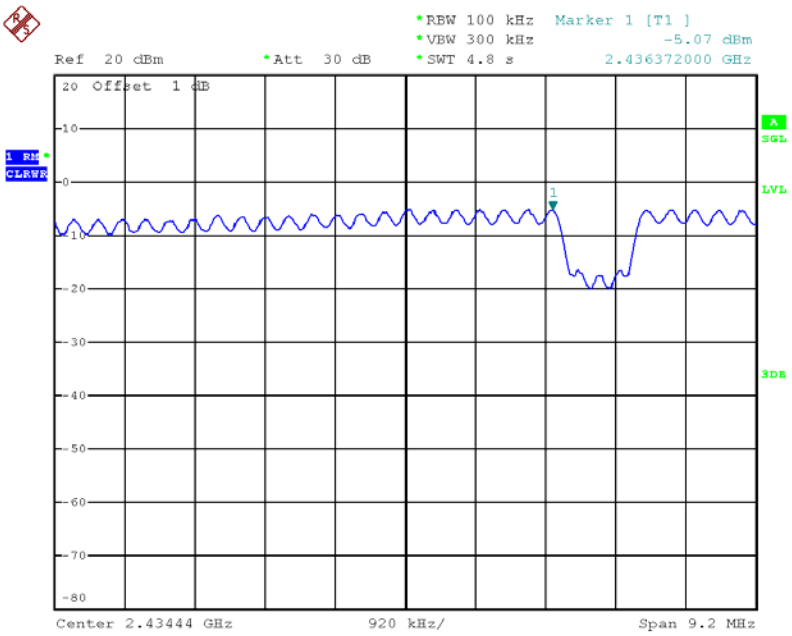
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1 / 2437 MHz



Date: 26.MAY.2012 15:45:04

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 2 / 2437 MHz



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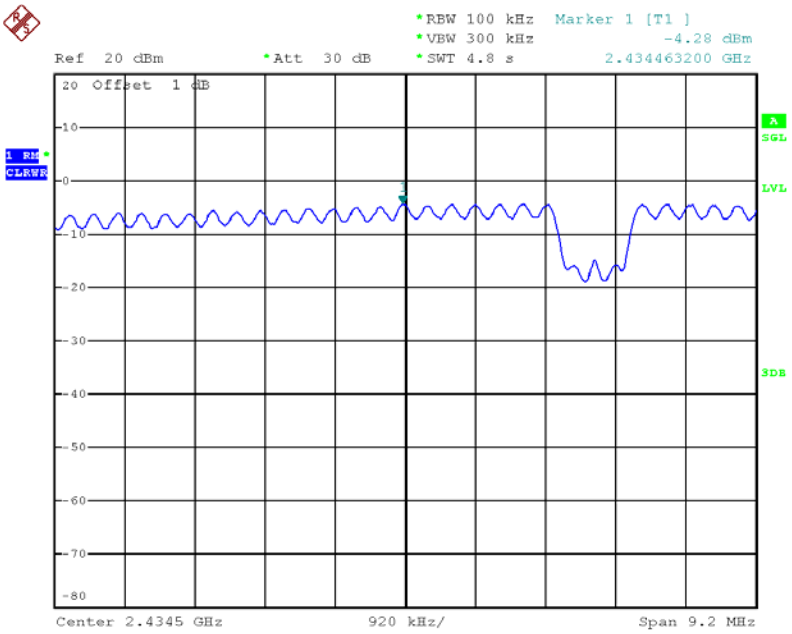
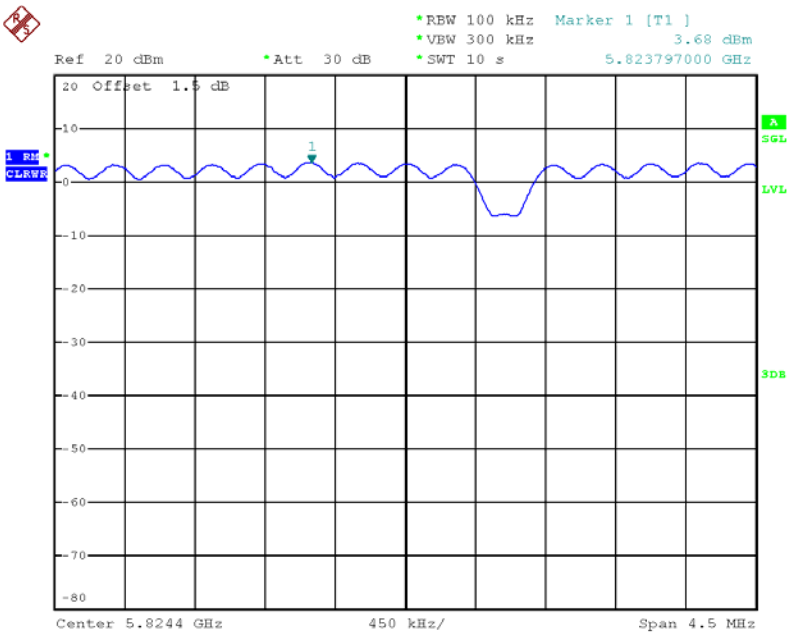
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 3 / 2437 MHz



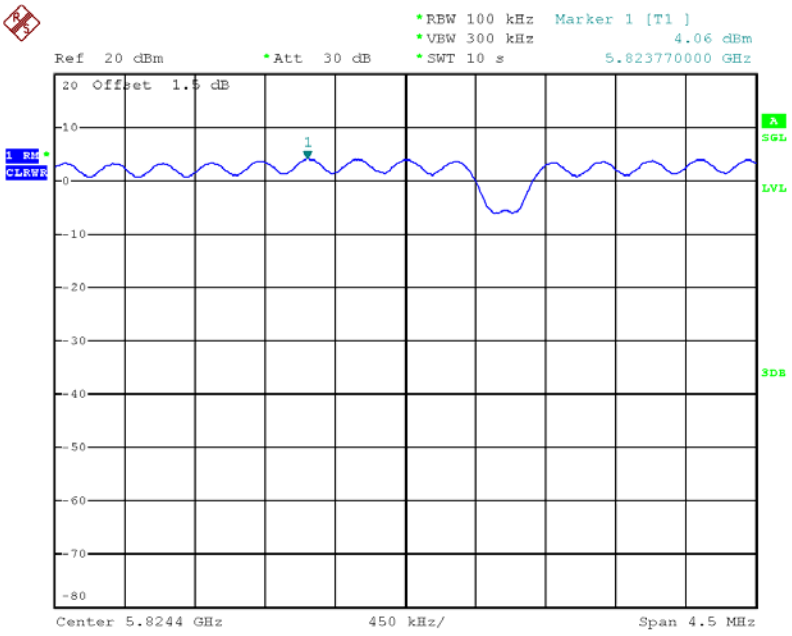
Date: 26.MAY.2012 15:46:53

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 4 / 5825 MHz



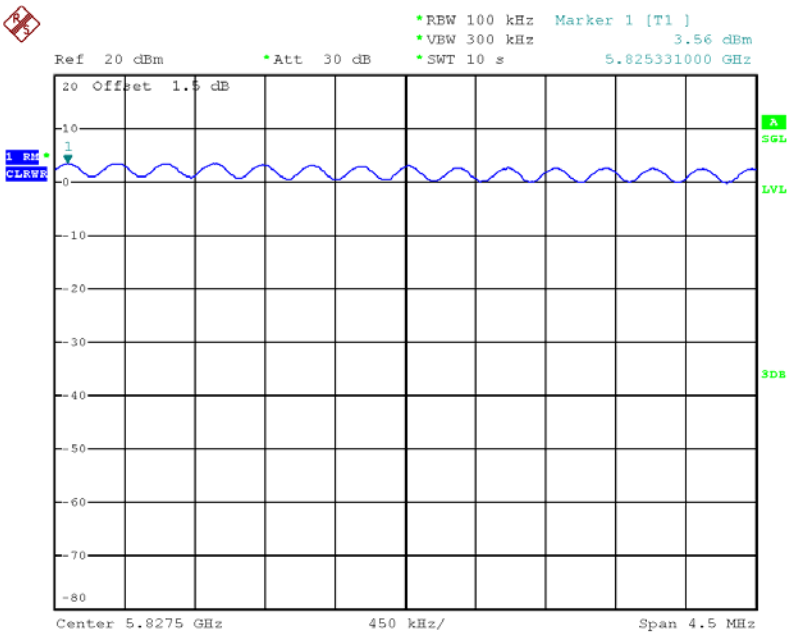
Date: 26.MAY.2012 14:23:16

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 5 / 5825 MHz



Date: 26.MAY.2012 14:22:13

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 6 / 5825 MHz



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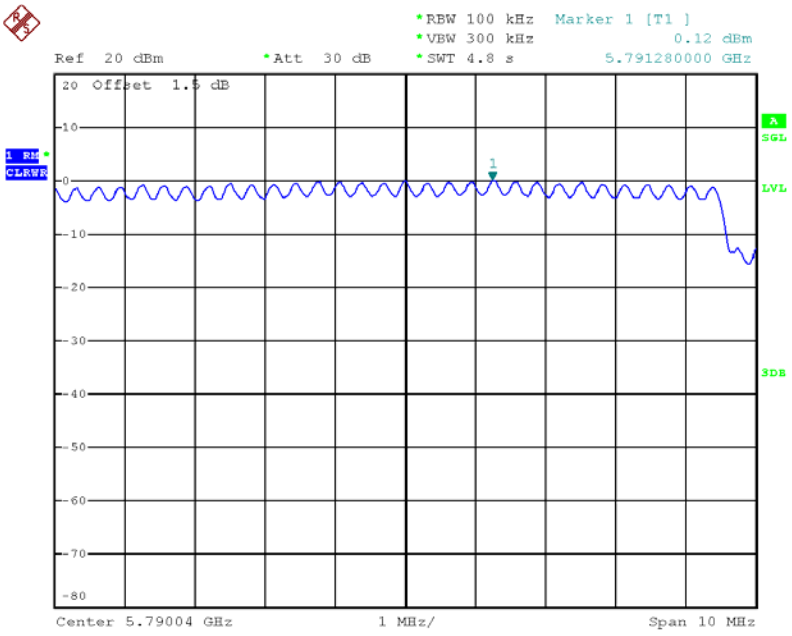
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 4 / 5795 MHz



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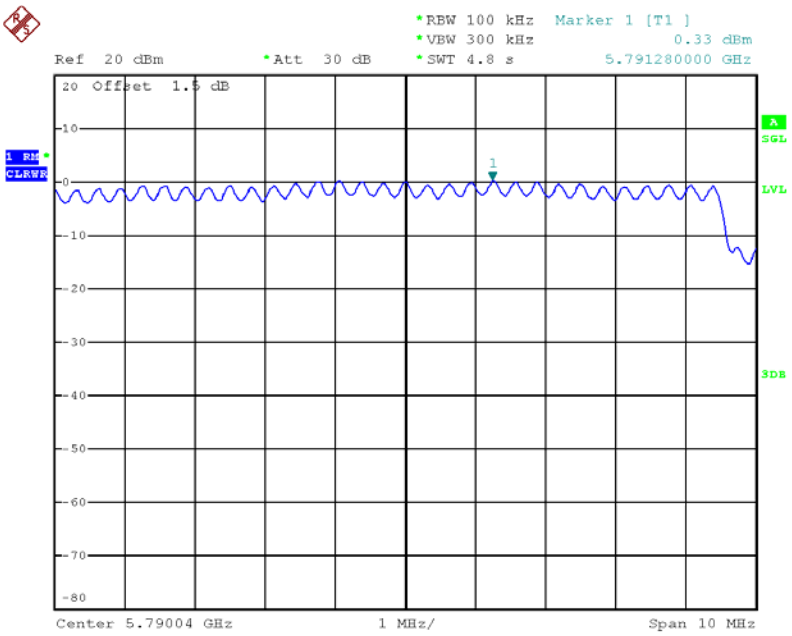
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 5 / 5795 MHz



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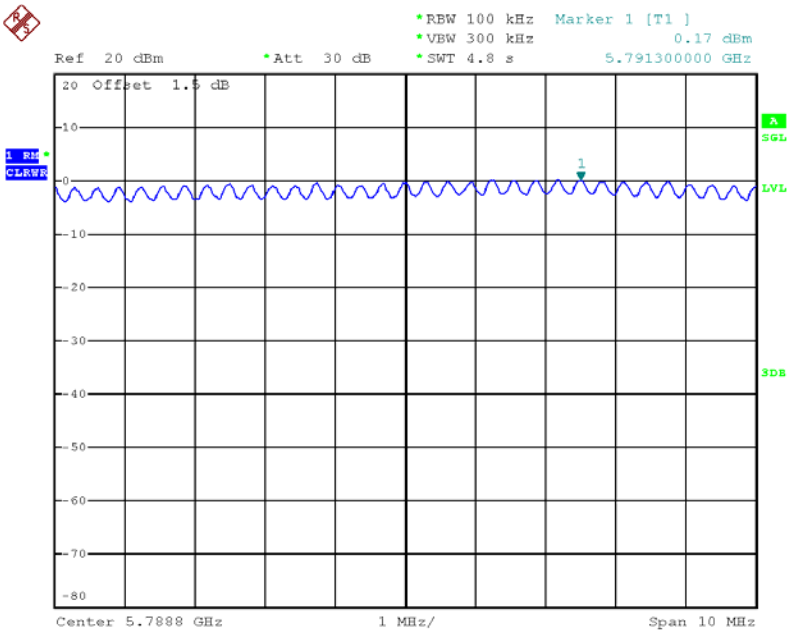
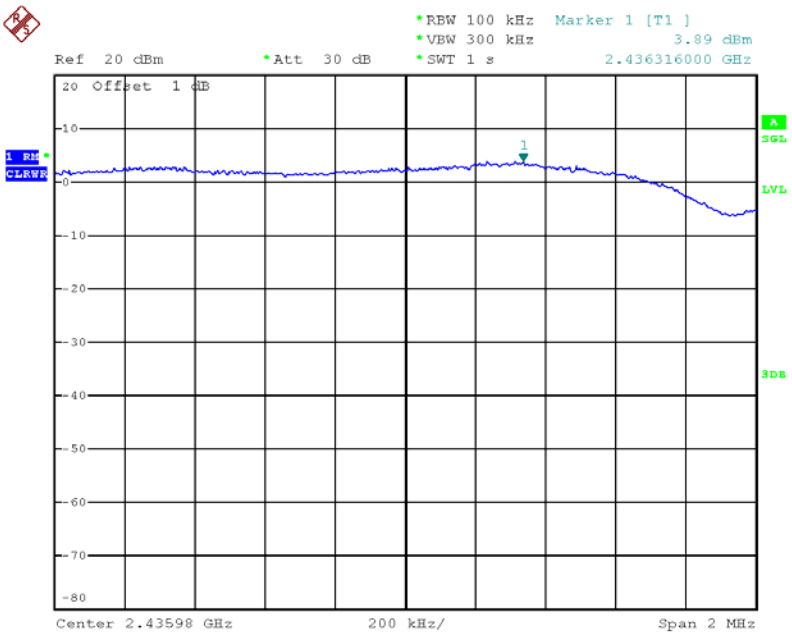
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 6 / 5795 MHz



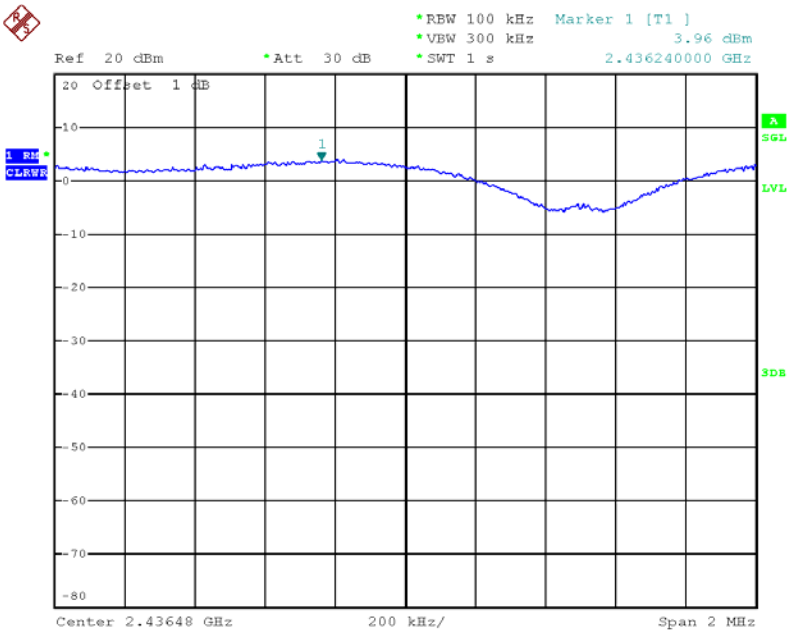
Date: 26.MAY.2012 14:38:23

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



Date: 26.MAY.2012 15:11:29

Power Density Plot on Configuration IEEE 802.11b / Ant. 2 / 2437 MHz



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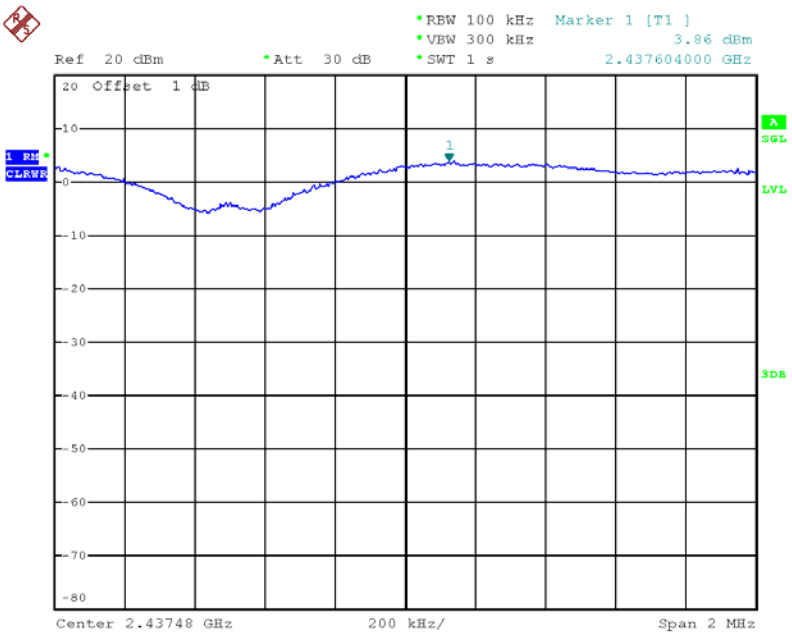
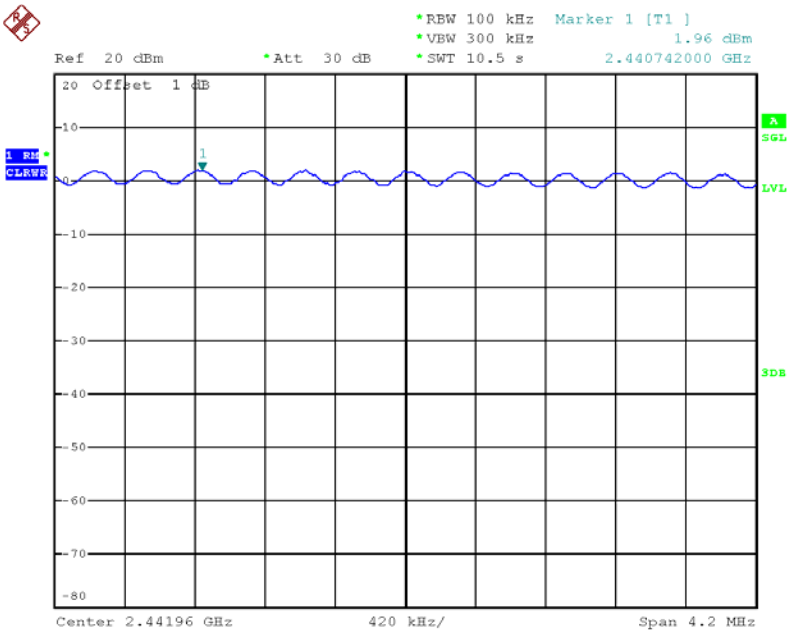
Power Density Plot on Configuration IEEE 802.11b / Ant. 3 / 2437 MHz



Date: 26.MAY.2012 15:10:06

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



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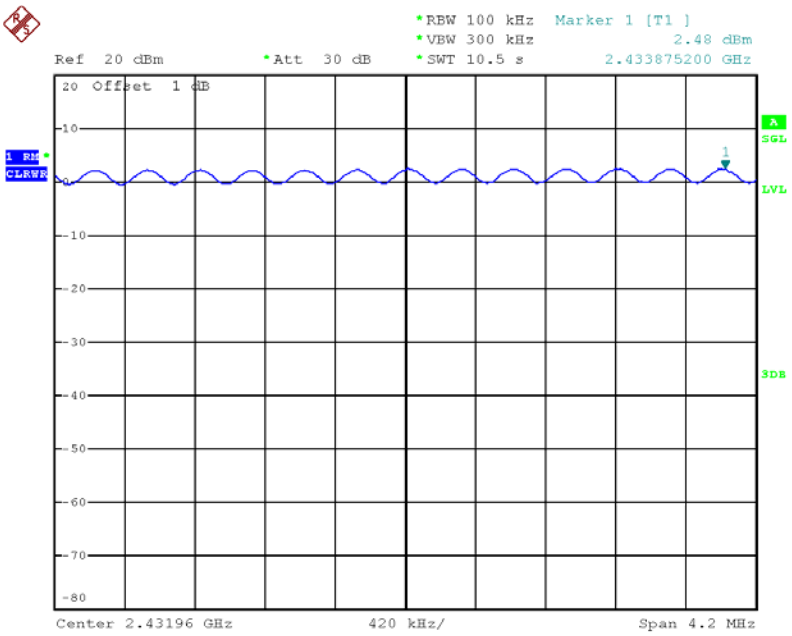
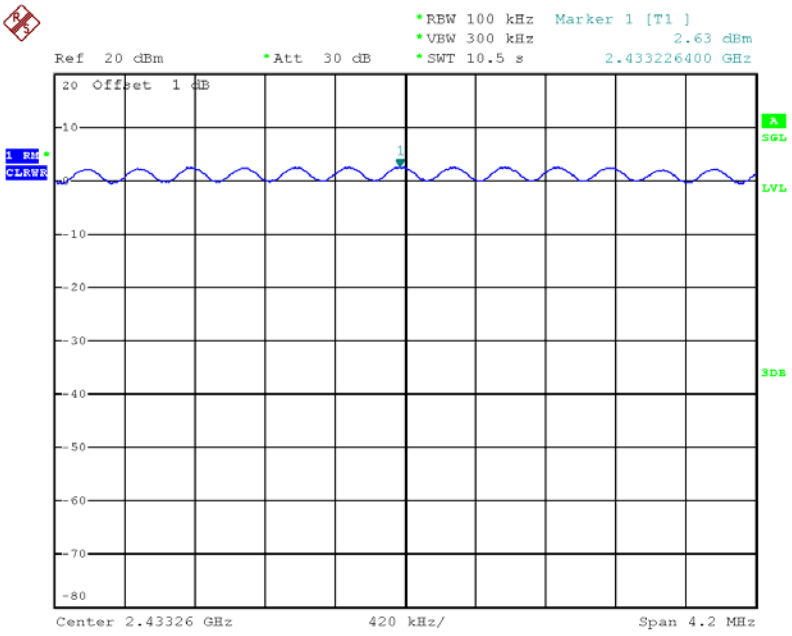
Power Density Plot on Configuration IEEE 802.11g / Ant. 2 / 2437 MHz



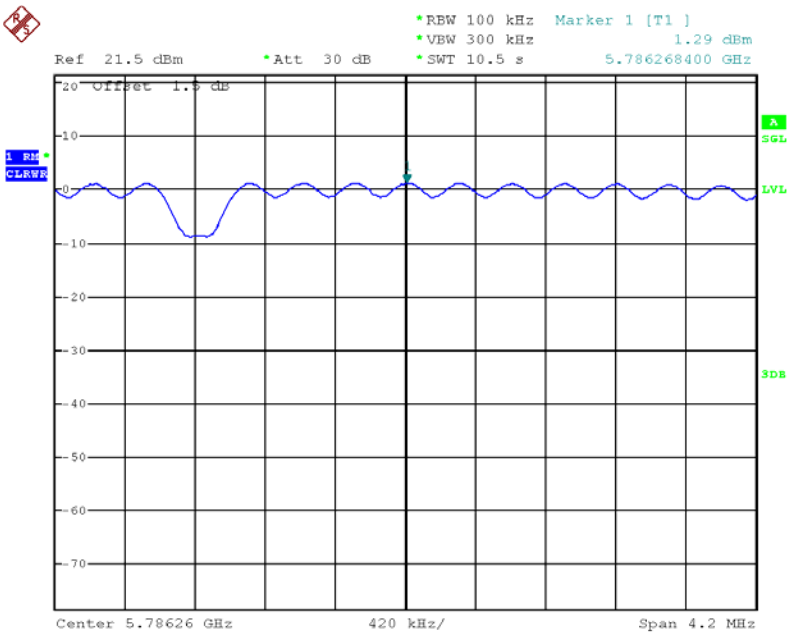
Date: 26.MAY.2012 15:20:41

Power Density Plot on Configuration IEEE 802.11g / Ant. 3 / 2437 MHz



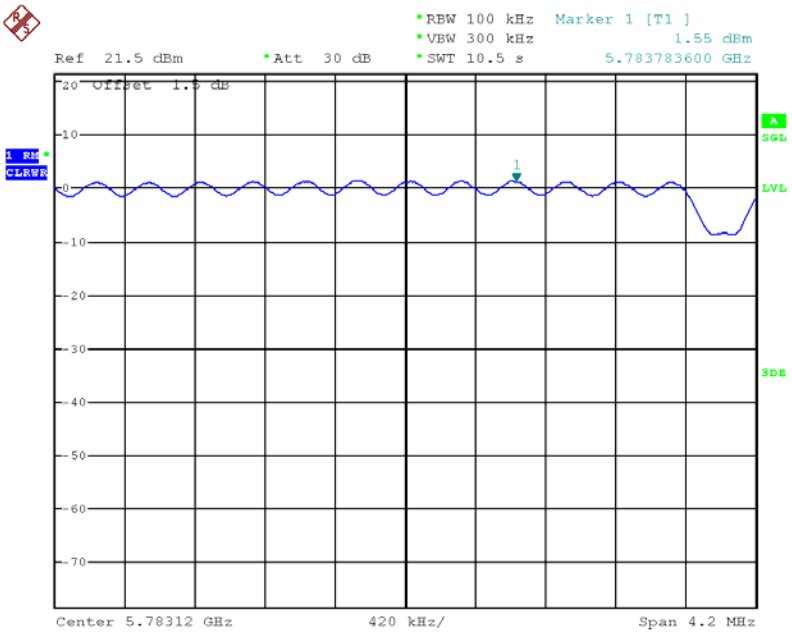
Date: 26.MAY.2012 15:22:23

Power Density Plot on Configuration IEEE 802.11a / Ant. 4 / 5785 MHz



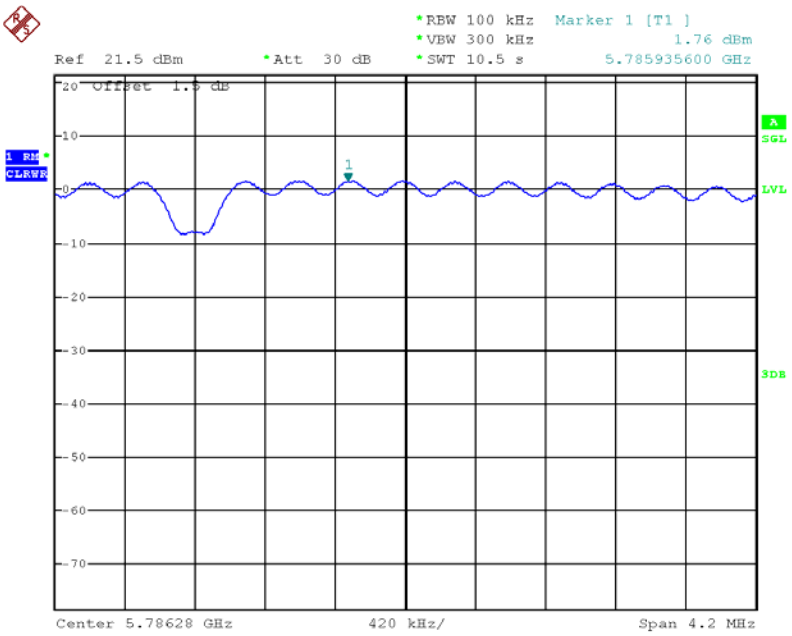
Date: 26.MAY.2012 13:48:19

Power Density Plot on Configuration IEEE 802.11a / Ant. 5 / 5785 MHz



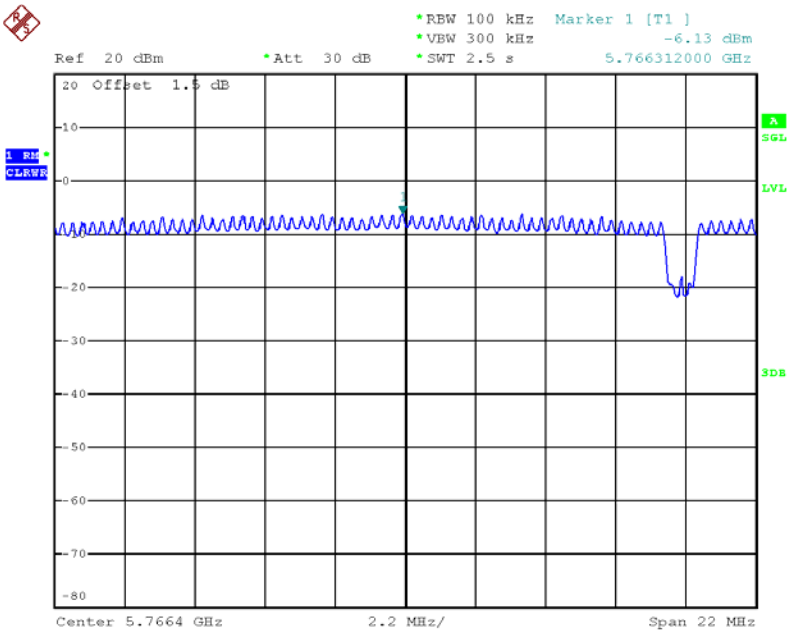
Date: 26.MAY.2012 13:47:02

Power Density Plot on Configuration IEEE 802.11a / Ant. 6 / 5785 MHz



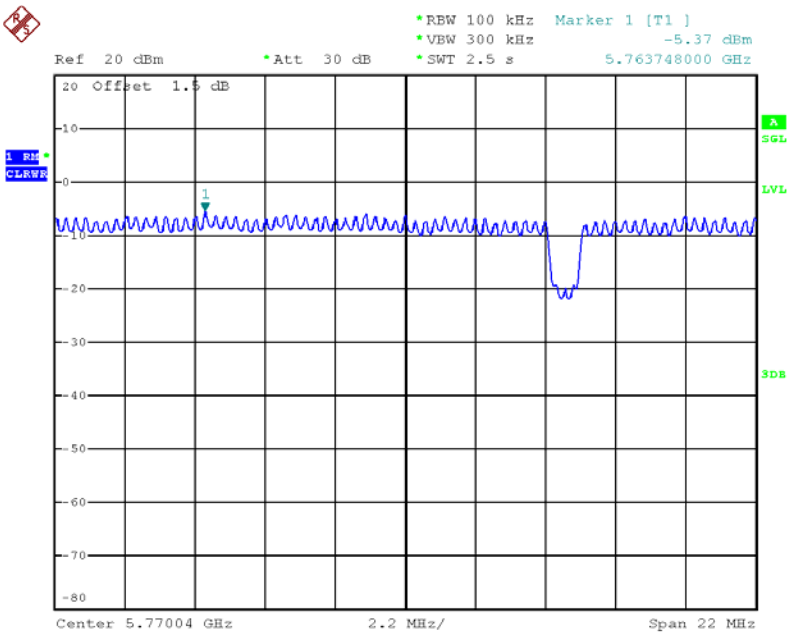
Date: 26.MAY.2012 13:44:49

Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 4 / 5775 MHz



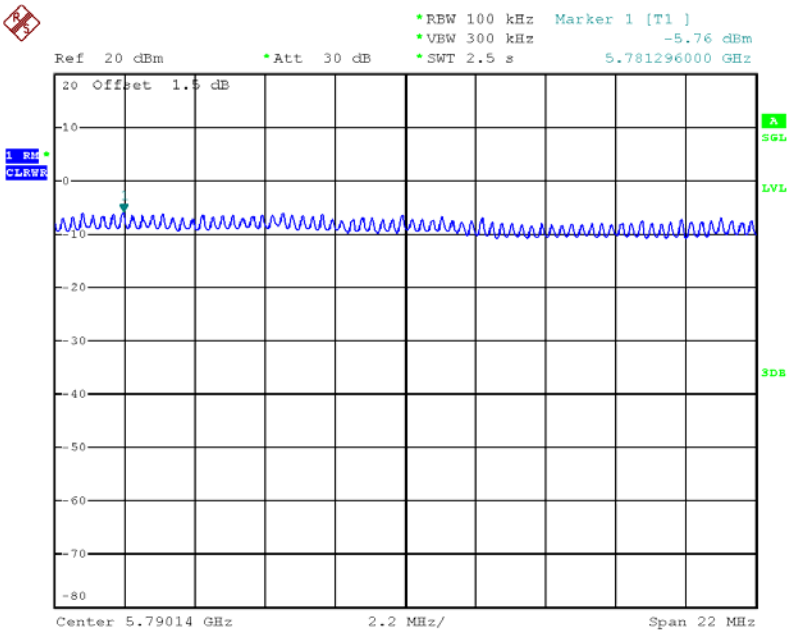
Date: 26.MAY.2012 15:02:44

Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 5 / 5775 MHz



Date: 26.MAY.2012 15:02:04

Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 6 / 5775 MHz



Date: 26.MAY.2012 15:01:27

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

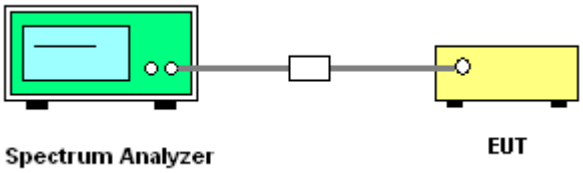
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

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.

4.4.4. 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	25°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n / ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	15.24	17.36	500	Complies
6	2437 MHz	15.48	17.52	500	Complies
11	2462 MHz	15.44	17.64	500	Complies

Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	30.96	35.84	500	Complies
6	2437 MHz	31.44	35.92	500	Complies
9	2452 MHz	31.44	35.84	500	Complies

For 5GHz Band

Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.44	17.68	500	Complies
157	5785 MHz	15.04	17.64	500	Complies
165	5825 MHz	15.44	17.60	500	Complies

Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	33.92	36.16	500	Complies
159	5795 MHz	34.80	36.16	500	Complies

Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 4 + Ant. 5 + Ant. 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	73.92	75.20	500	Complies

Temperature	25℃	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	7.08	10.12	500	Complies
6	2437 MHz	8.04	10.12	500	Complies
11	2462 MHz	8.08	10.12	500	Complies

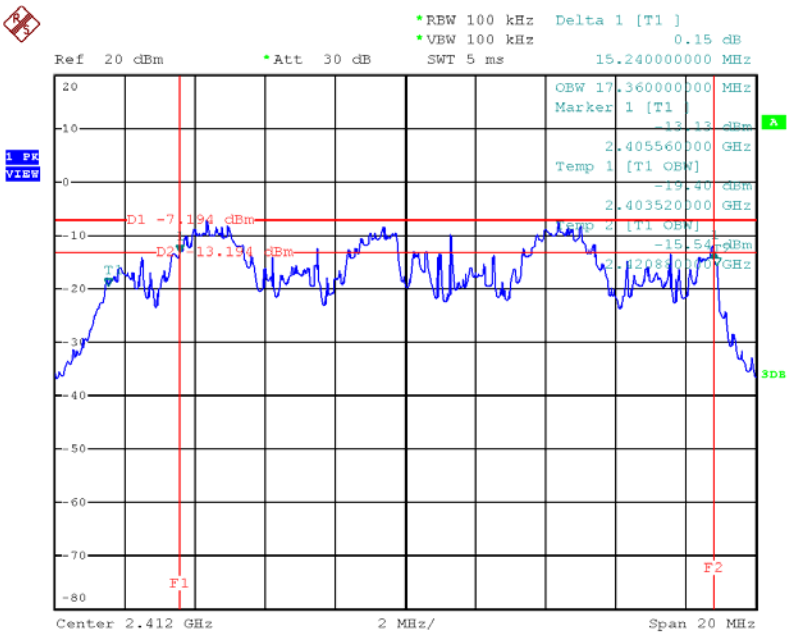
Configuration IEEE 802.11g / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	14.48	16.44	500	Complies
6	2437 MHz	14.16	16.44	500	Complies
11	2462 MHz	14.52	16.44	500	Complies

Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6

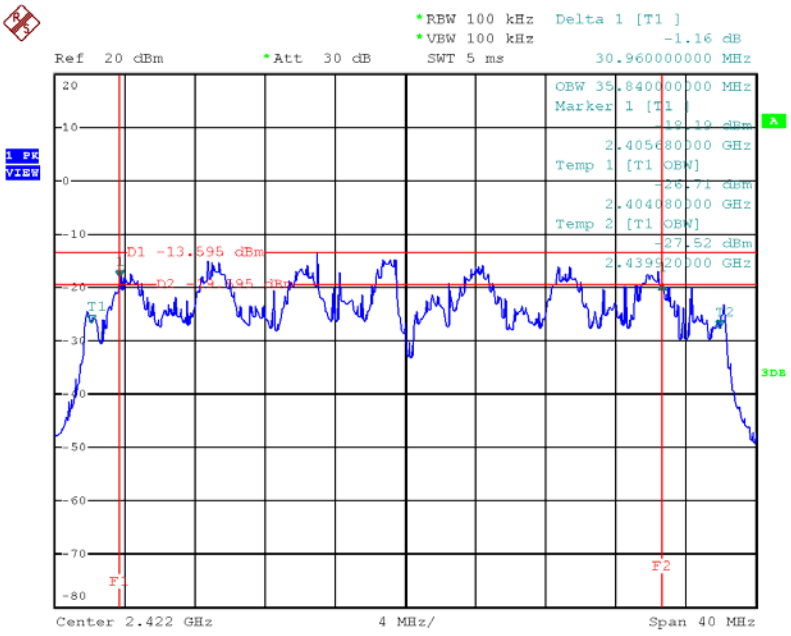
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.80	16.48	500	Complies
157	5785 MHz	14.20	16.40	500	Complies
165	5825 MHz	14.40	16.44	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1 + Ant. 2 + Ant. 3 / 2412 MHz



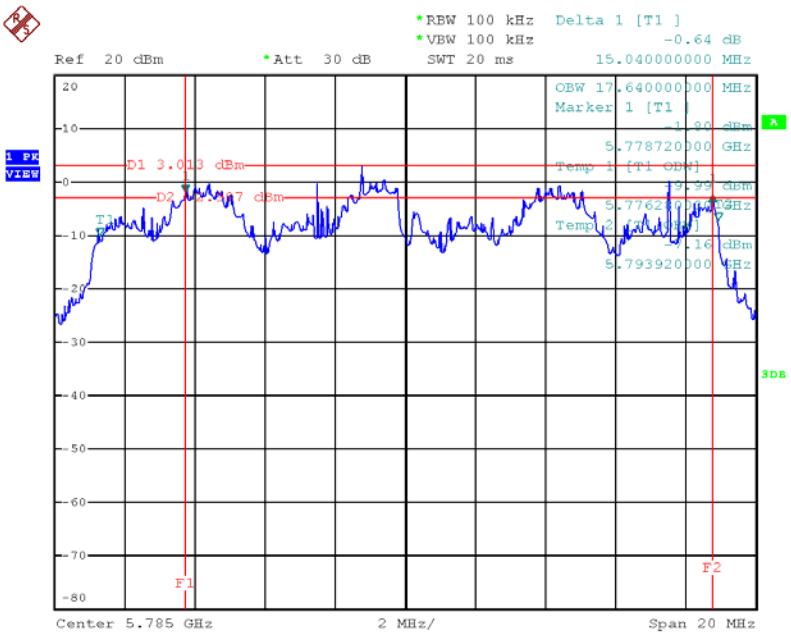
Date: 26.MAY.2012 12:23:56

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1 + Ant. 2 + Ant. 3 / 2422 MHz



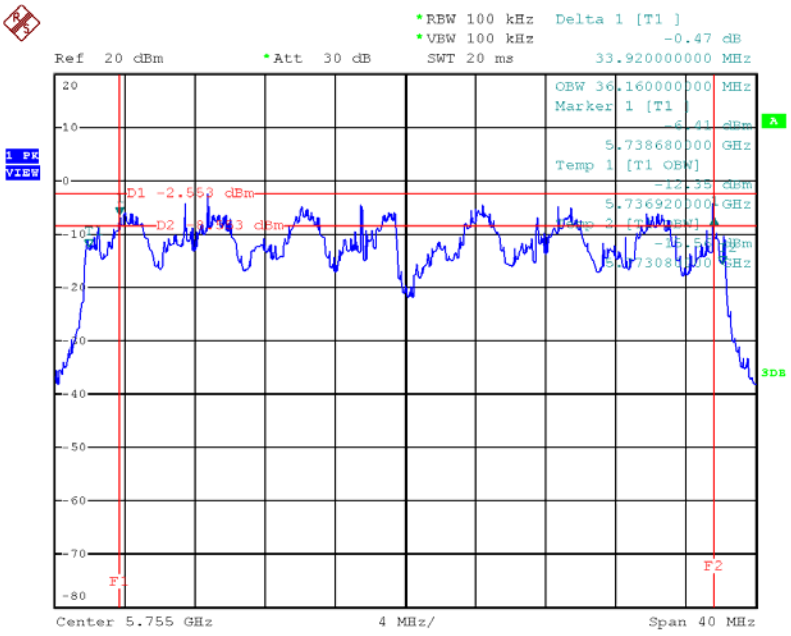
Date: 26.MAY.2012 12:29:55

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 4 + Ant. 5 + Ant. 6 / 5785 MHz



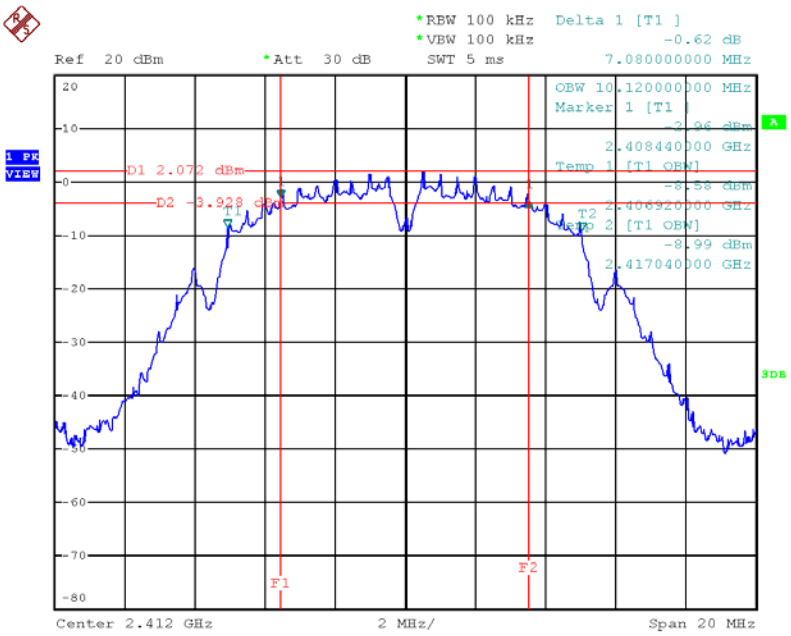
Date: 26.MAY.2012 12:50:24

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 4 + Ant. 5 + Ant. 6 / 5755 MHz



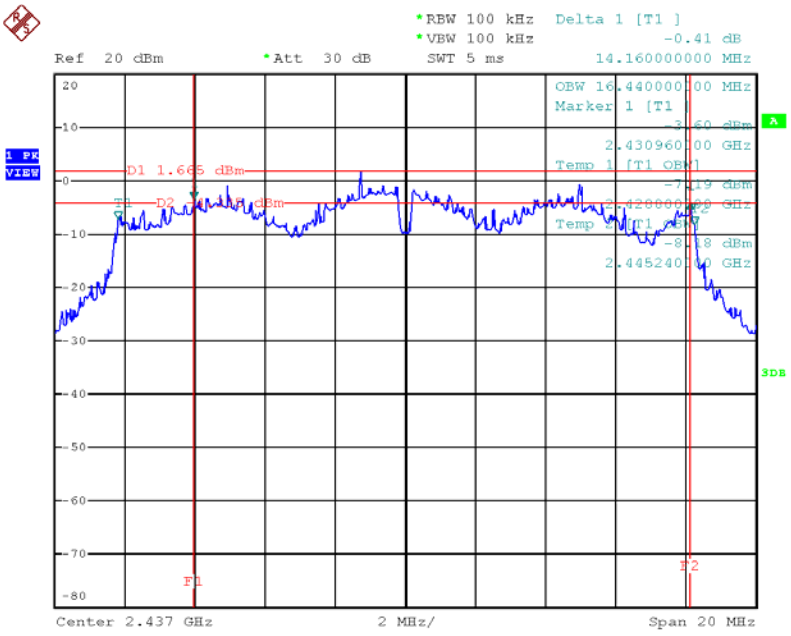
Date: 26.MAY.2012 12:52:56

6 dB Bandwidth Plot on Configuration IEEE 802.11b / Ant. 1 + Ant. 2 + Ant. 3 / 2412 MHz



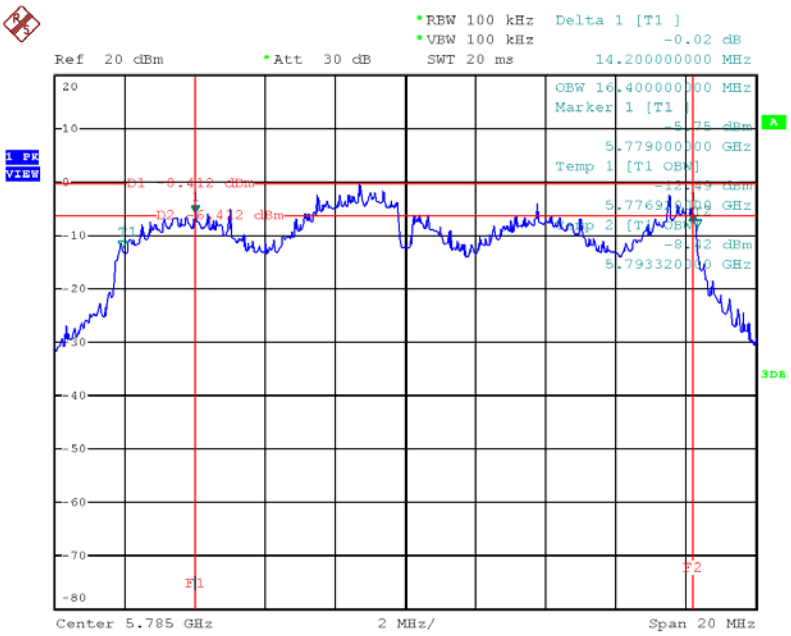
Date: 26.MAY.2012 12:17:20

6 dB Bandwidth Plot on Configuration IEEE 802.11g / Ant. 1 + Ant. 2 + Ant. 3 / 2437 MHz



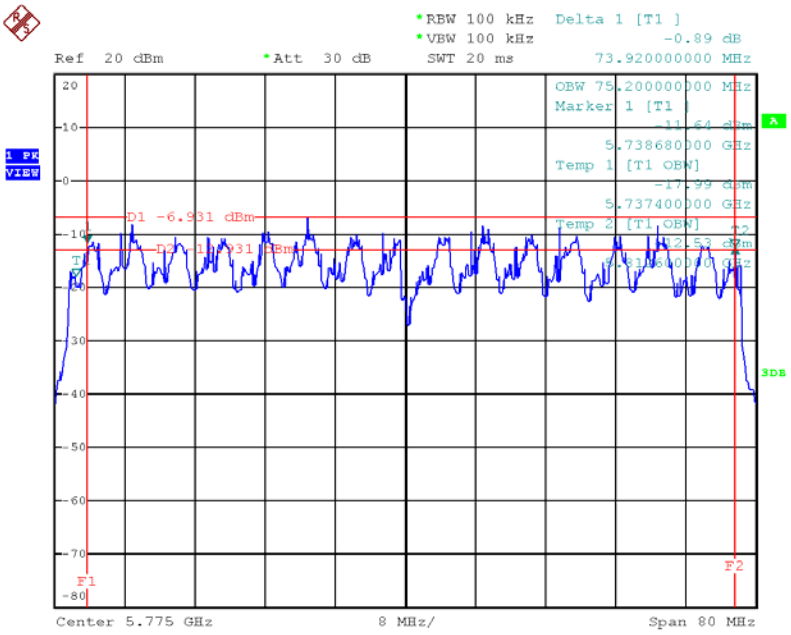
Date: 26.MAY.2012 12:21:46

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 4 + Ant. 5 + Ant. 6 / 5785 MHz



Date: 26.MAY.2012 12:47:02

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 4 + Ant. 5 + Ant. 6 / 5775 MHz



Date: 26.MAY.2012 13:00:56

4.5. Radiated Emissions Measurement

4.5.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.5.2. Measuring Instruments and Setting

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

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

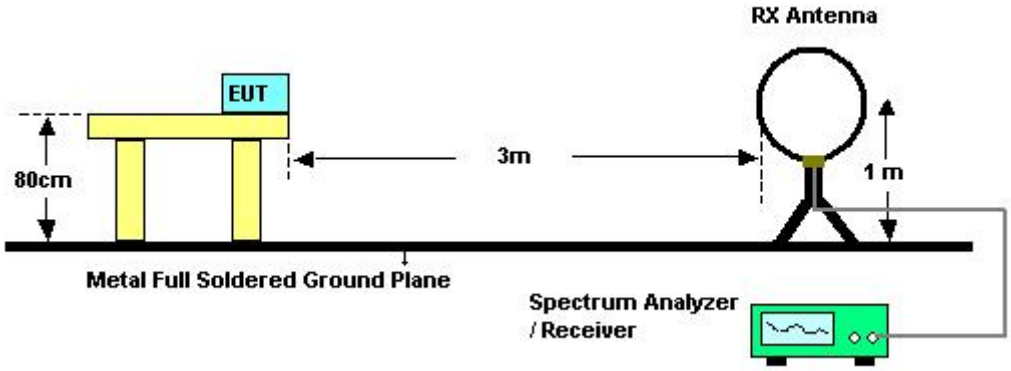
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RB 120kHz for QP

4.5.3. Test Procedures

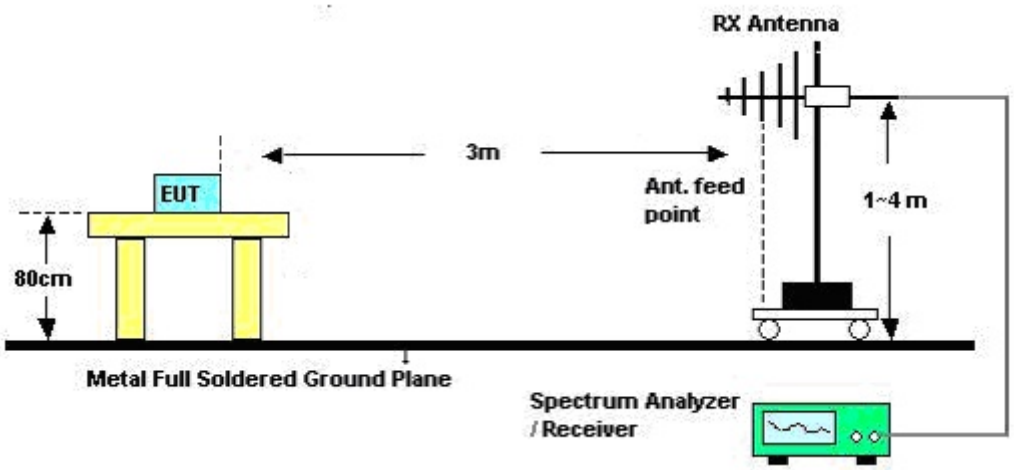
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 3MHz 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.

4.5.4. Test Setup Layout

For radiated emissions below 1GHz



For radiated emissions above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	CTX
Test Date	May 28, 2012		

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

Note:

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

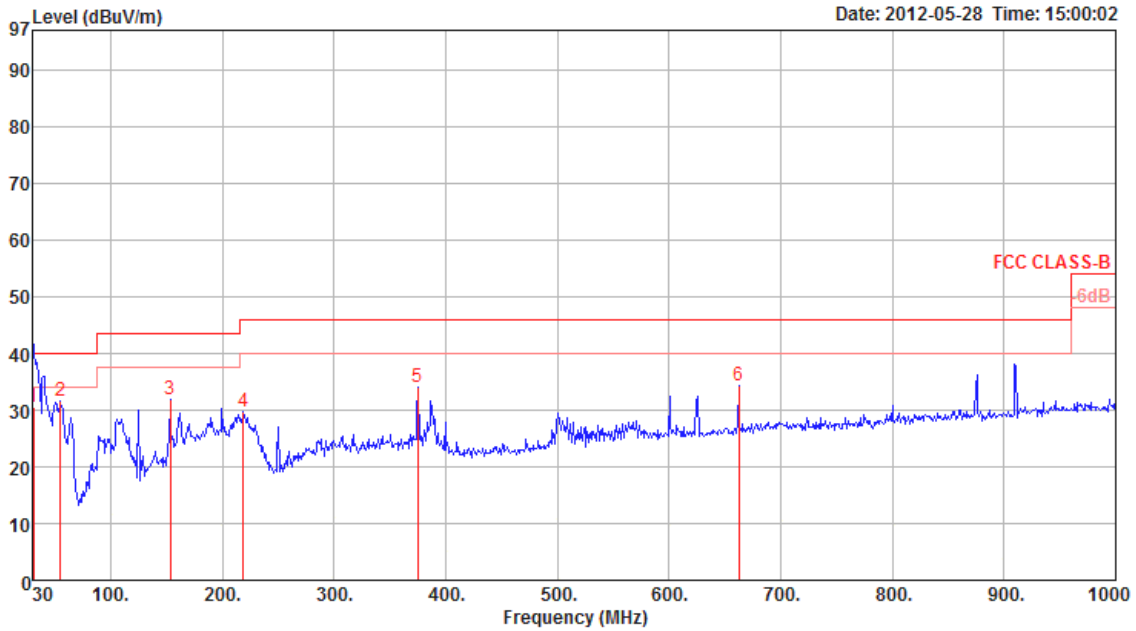
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

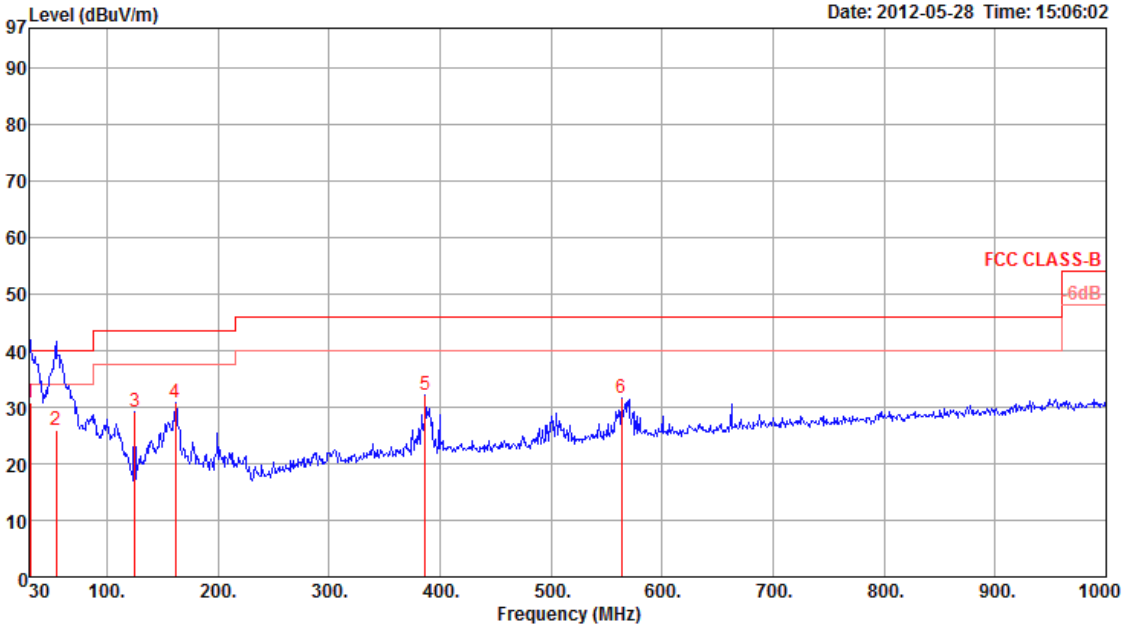
Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	CTX

Horizontal



		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	Pol/Phase	A/Pos	T/Pos
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m			cm	deg
1	q	30.98	30.57	40.00	-9.43	38.40	0.85	27.98	19.30	QP	HORIZONTAL	100	265
2	p	55.22	31.59	40.00	-8.41	50.56	1.13	27.90	7.80	Peak	HORIZONTAL	400	0
3		153.19	31.94	43.50	-11.56	46.57	1.82	27.47	11.02	Peak	HORIZONTAL	400	0
4		219.15	29.70	46.00	-16.30	43.97	2.25	27.12	10.60	Peak	HORIZONTAL	400	0
5		375.32	34.06	46.00	-11.94	42.52	2.89	27.26	15.91	Peak	HORIZONTAL	400	0
6		662.44	34.21	46.00	-11.79	37.98	3.97	27.44	19.70	Peak	HORIZONTAL	400	0

Vertical



		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	Pol/Phase	A/Pos	T/Pos
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m			cm	deg
1	q	30.97	30.67	40.00	-9.33	38.50	0.85	27.98	19.30	QP	VERTICAL	100	104
2		54.26	25.89	40.00	-14.11	44.69	1.12	27.90	7.98	QP	VERTICAL	162	57
3		125.06	29.23	43.50	-14.27	42.34	1.65	27.66	12.90	Peak	VERTICAL	100	0
4	p	161.92	30.80	43.50	-12.70	45.78	1.89	27.41	10.54	Peak	VERTICAL	100	0
5		386.96	32.22	46.00	-13.78	40.44	2.94	27.35	16.19	Peak	VERTICAL	100	0
6		563.50	31.75	46.00	-14.25	37.03	3.59	27.80	18.93	Peak	VERTICAL	100	0

Note:

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

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

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

4.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 1 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4822.30	45.87	74.00	-28.13	44.53	3.31	33.06	35.03	Peak	124	224	HORIZONTAL
2	4822.38	31.12	54.00	-22.88	29.78	3.31	33.06	35.03	Average	124	224	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4822.69	60.23	74.00	-13.77	58.89	3.31	33.06	35.03	Peak	100	254	VERTICAL
2	4822.80	43.06	54.00	-10.94	41.72	3.31	33.06	35.03	Average	100	254	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 6 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.70	41.77	54.00	-12.23	40.31	3.33	33.16	35.03	Average	100	298	HORIZONTAL
2	4872.86	56.32	74.00	-17.68	54.86	3.33	33.16	35.03	Peak	100	298	HORIZONTAL
3	7311.02	43.67	54.00	-10.33	39.05	4.06	35.96	35.40	Average	100	218	HORIZONTAL
4	7311.03	58.78	74.00	-15.22	54.16	4.06	35.96	35.40	Peak	100	218	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.33	52.58	54.00	-1.42	51.12	3.33	33.16	35.03	Average	100	247	VERTICAL
2	4878.01	67.78	74.00	-6.22	66.32	3.33	33.16	35.03	Peak	100	247	VERTICAL
3	7314.00	67.83	74.00	-6.17	63.21	4.06	35.96	35.40	Peak	169	261	VERTICAL
4	7314.41	52.48	54.00	-1.52	47.86	4.06	35.96	35.40	Average	169	261	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 11 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4922.51	29.54	54.00	-24.46	27.94	3.35	33.26	35.01	Average	100	207	HORIZONTAL
2	4922.93	44.14	74.00	-29.86	42.54	3.35	33.26	35.01	Peak	100	207	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4922.49	42.35	54.00	-11.65	40.75	3.35	33.26	35.01	Average	100	250	VERTICAL
2	4922.57	57.26	74.00	-16.74	55.66	3.35	33.26	35.01	Peak	100	250	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT40MHz Ch 3 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4841.07	27.60	54.00	-26.40	26.22	3.32	33.09	35.03	Average	100	180	HORIZONTAL
2	4842.09	41.50	74.00	-32.50	40.12	3.32	33.09	35.03	Peak	100	180	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4842.62	33.48	54.00	-20.52	32.10	3.32	33.09	35.03	Average	100	254	VERTICAL
2	4842.85	49.33	74.00	-24.67	47.95	3.32	33.09	35.03	Peak	100	254	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT40MHz Ch 6 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4877.53	46.69	74.00	-27.31	45.23	3.33	33.16	35.03	Peak	100	276	HORIZONTAL
2	4877.62	31.48	54.00	-22.52	30.02	3.33	33.16	35.03	Average	100	276	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.51	60.94	74.00	-13.06	59.48	3.33	33.16	35.03	Peak	100	248	VERTICAL
2	4877.51	45.40	54.00	-8.60	43.94	3.33	33.16	35.03	Average	100	248	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT40MHz Ch 9 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4902.27	43.69	74.00	-30.31	42.18	3.34	33.19	35.02	Peak	100	225	HORIZONTAL
2	4902.62	29.30	54.00	-24.70	27.79	3.34	33.19	35.02	Average	100	225	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4902.54	39.84	54.00	-14.16	38.33	3.34	33.19	35.02	Average	100	249	VERTICAL
2	4902.56	54.44	74.00	-19.56	52.93	3.34	33.19	35.02	Peak	100	249	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 149 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11490.80	61.60	74.00	-12.40	52.99	5.11	38.78	35.28	Peak	174	123	HORIZONTAL
2	11490.97	46.42	54.00	-7.58	37.81	5.11	38.78	35.28	Average	174	123	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11490.15	67.97	74.00	-6.03	59.36	5.11	38.78	35.28	Peak	100	64	VERTICAL
2	11490.23	53.30	54.00	-0.70	44.69	5.11	38.78	35.28	Average	100	64	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 157 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11571.01	62.06	74.00	-11.94	53.39	5.14	38.83	35.30	Peak	163	120	HORIZONTAL
2	11571.04	46.06	54.00	-7.94	37.39	5.14	38.83	35.30	Average	163	120	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.30	53.24	54.00	-0.76	44.57	5.14	38.83	35.30	Average	101	322	VERTICAL
2	11570.55	68.29	74.00	-5.71	59.62	5.14	38.83	35.30	Peak	101	322	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11650.59	46.79	54.00	-7.21	38.07	5.16	38.86	35.30	Average	101	28	HORIZONTAL
2	11650.78	60.25	74.00	-13.75	51.53	5.16	38.86	35.30	Peak	101	28	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11650.18	69.20	74.00	-4.80	60.48	5.16	38.86	35.30	Peak	100	287	VERTICAL
2	11650.42	53.36	54.00	-0.64	44.64	5.16	38.86	35.30	Average	100	287	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT40MHz Ch 151 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11510.19	41.01	54.00	-12.99	32.38	5.12	38.79	35.28	Average	101	87	HORIZONTAL
2	11510.23	55.10	74.00	-18.90	46.47	5.12	38.79	35.28	Peak	101	87	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11509.66	45.90	54.00	-8.10	37.27	5.12	38.79	35.28	Average	100	256	VERTICAL
2	11510.09	61.30	74.00	-12.70	52.67	5.12	38.79	35.28	Peak	100	256	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT40MHz Ch 159 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11588.96	58.91	74.00	-15.09	50.24	5.14	38.83	35.30	Peak	161	126	HORIZONTAL
2	11589.12	43.45	54.00	-10.55	34.78	5.14	38.83	35.30	Average	161	126	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11589.99	64.60	74.00	-9.40	55.93	5.14	38.83	35.30	Peak	101	336	VERTICAL
2	11590.01	50.84	54.00	-3.16	42.17	5.14	38.83	35.30	Average	101	336	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 1 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.82	47.60	74.00	-26.40	46.26	3.31	33.06	35.03	Peak	128	206	HORIZONTAL
2	4823.96	43.38	54.00	-10.62	42.04	3.31	33.06	35.03	Average	128	206	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.93	53.63	54.00	-0.37	52.29	3.31	33.06	35.03	Average	103	282	VERTICAL
2	4823.98	55.56	74.00	-18.44	54.22	3.31	33.06	35.03	Peak	103	282	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 6 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4873.96	42.79	54.00	-11.21	41.33	3.33	33.16	35.03	Average	100	31	HORIZONTAL
2	4873.96	47.15	74.00	-26.85	45.69	3.33	33.16	35.03	Peak	100	31	HORIZONTAL
3	7310.10	49.21	74.00	-24.79	44.59	4.06	35.96	35.40	Peak	100	221	HORIZONTAL
4	7310.18	42.66	54.00	-11.34	38.04	4.06	35.96	35.40	Average	100	221	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4873.94	55.92	74.00	-18.08	54.46	3.33	33.16	35.03	Peak	102	214	VERTICAL
2	4873.96	53.64	54.00	-0.36	52.18	3.33	33.16	35.03	Average	102	214	VERTICAL
3	7310.20	50.73	54.00	-3.27	46.11	4.06	35.96	35.40	Average	125	211	VERTICAL
4	7311.88	55.34	74.00	-18.66	50.72	4.06	35.96	35.40	Peak	125	211	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 11 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4923.94	43.22	54.00	-10.78	41.62	3.35	33.26	35.01	Average	102	204	HORIZONTAL
2	4924.01	47.37	74.00	-26.63	45.77	3.35	33.26	35.01	Peak	102	204	HORIZONTAL
3	7384.96	50.79	74.00	-23.21	46.04	4.06	36.09	35.40	Peak	120	211	HORIZONTAL
4	7385.20	44.58	54.00	-9.42	39.83	4.06	36.09	35.40	Average	120	211	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4923.96	53.58	54.00	-0.42	51.98	3.35	33.26	35.01	Average	100	235	VERTICAL
2	4923.96	55.51	74.00	-18.49	53.91	3.35	33.26	35.01	Peak	100	235	VERTICAL
3	7386.68	49.98	54.00	-4.02	45.23	4.06	36.09	35.40	Average	116	215	VERTICAL
4	7386.88	54.75	74.00	-19.25	50.00	4.06	36.09	35.40	Peak	116	215	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 1 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4820.19	32.98	54.00	-21.02	31.64	3.31	33.06	35.03	Average	100	332	HORIZONTAL
2	4830.06	46.89	74.00	-27.11	45.55	3.31	33.06	35.03	Peak	100	332	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4827.37	61.27	74.00	-12.73	59.93	3.31	33.06	35.03	Peak	101	254	VERTICAL
2	4827.78	46.83	54.00	-7.17	45.49	3.31	33.06	35.03	Average	101	254	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 6 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4869.13	41.14	54.00	-12.86	39.72	3.33	33.12	35.03	Average	100	352	HORIZONTAL
2	4869.45	54.75	74.00	-19.25	53.33	3.33	33.12	35.03	Peak	100	352	HORIZONTAL
3	7311.10	62.78	74.00	-11.22	58.16	4.06	35.96	35.40	Peak	130	213	HORIZONTAL
4	7311.26	47.61	54.00	-6.39	42.99	4.06	35.96	35.40	Average	130	213	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4873.04	66.63	74.00	-7.37	65.17	3.33	33.16	35.03	Peak	100	267	VERTICAL
2	4878.49	52.12	54.00	-1.88	50.66	3.33	33.16	35.03	Average	100	267	VERTICAL
3	7312.22	70.23	74.00	-3.77	65.61	4.06	35.96	35.40	Peak	132	237	VERTICAL
4	7312.64	53.77	54.00	-0.23	49.15	4.06	35.96	35.40	Average	132	237	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 11 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4925.57	47.15	74.00	-26.85	45.55	3.35	33.26	35.01	Peak	100	201	HORIZONTAL
2	4925.96	32.72	54.00	-21.28	31.12	3.35	33.26	35.01	Average	100	201	HORIZONTAL
3	7385.14	52.12	74.00	-21.88	47.37	4.06	36.09	35.40	Peak	128	208	HORIZONTAL
4	7385.90	37.01	54.00	-16.99	32.26	4.06	36.09	35.40	Average	128	208	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4926.40	61.48	74.00	-12.52	59.88	3.35	33.26	35.01	Peak	100	248	VERTICAL
2	4927.08	46.86	54.00	-7.14	45.26	3.35	33.26	35.01	Average	100	248	VERTICAL
3	7388.82	41.38	54.00	-12.62	36.63	4.06	36.09	35.40	Average	165	261	VERTICAL
4	7388.92	56.89	74.00	-17.11	52.14	4.06	36.09	35.40	Peak	165	261	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11a CH 149 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11490.46	61.45	74.00	-12.55	52.84	5.11	38.78	35.28	Peak	100	87	HORIZONTAL
2	11490.80	47.73	54.00	-6.27	39.12	5.11	38.78	35.28	Average	100	87	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.51	70.06	74.00	-3.94	61.45	5.11	38.78	35.28	Peak	100	62	VERTICAL
2	11489.67	53.87	54.00	-0.13	45.26	5.11	38.78	35.28	Average	100	62	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11a CH 157 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11573.19	46.23	54.00	-7.77	37.56	5.14	38.83	35.30	Average	151	80	HORIZONTAL
2	11573.27	61.65	74.00	-12.35	52.98	5.14	38.83	35.30	Peak	151	80	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11569.42	68.55	74.00	-5.45	59.89	5.13	38.83	35.30	Peak	100	298	VERTICAL
2	11569.80	53.71	54.00	-0.29	45.04	5.14	38.83	35.30	Average	100	298	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11a CH 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11651.31	62.83	74.00	-11.17	54.11	5.16	38.86	35.30	Peak	160	128	HORIZONTAL
2	11651.78	47.78	54.00	-6.22	39.06	5.16	38.86	35.30	Average	160	128	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11650.27	53.55	54.00	-0.45	44.83	5.16	38.86	35.30	Average	100	287	VERTICAL
2	11650.47	69.21	74.00	-4.79	60.49	5.16	38.86	35.30	Peak	100	287	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11ac MCS0 VHT 20MHz CH 149 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11490.75	60.96	74.00	-13.04	52.35	5.11	38.78	35.28	Peak	172	122	HORIZONTAL
2	11491.02	46.15	54.00	-7.85	37.54	5.11	38.78	35.28	Average	172	122	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11490.20	53.66	54.00	-0.34	45.05	5.11	38.78	35.28	Average	100	264	VERTICAL
2	11490.41	67.07	74.00	-6.93	58.46	5.11	38.78	35.28	Peak	100	264	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11ac MCS0 VHT 20MHz CH 157 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11569.08	62.38	74.00	-11.62	53.72	5.13	38.83	35.30	Peak	160	126	HORIZONTAL
2	11569.23	47.37	54.00	-6.63	38.71	5.13	38.83	35.30	Average	160	126	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.00	53.10	54.00	-0.90	44.43	5.14	38.83	35.30	Average	100	325	VERTICAL
2	11570.28	67.84	74.00	-6.16	59.17	5.14	38.83	35.30	Peak	100	325	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11ac MCS0 VHT 20MHz CH 165 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11650.61	44.95	54.00	-9.05	36.23	5.16	38.86	35.30	Average	100	27	HORIZONTAL
2	11650.81	59.59	74.00	-14.41	50.87	5.16	38.86	35.30	Peak	100	27	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11650.12	68.79	74.00	-5.21	60.07	5.16	38.86	35.30	Peak	100	334	VERTICAL
2	11650.39	53.06	54.00	-0.94	44.34	5.16	38.86	35.30	Average	100	334	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11ac MCS0 VHT 40MHz CH 151 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11505.86	56.45	74.00	-17.55	47.82	5.12	38.79	35.28	Peak	164	122	HORIZONTAL
2	11506.03	40.87	54.00	-13.13	32.24	5.12	38.79	35.28	Average	164	122	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11509.26	61.44	74.00	-12.56	52.81	5.12	38.79	35.28	Peak	100	254	VERTICAL
2	11509.59	45.62	54.00	-8.38	36.99	5.12	38.79	35.28	Average	100	254	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11ac MCS0 VHT 40MHz CH 159 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11589.15	57.80	74.00	-16.20	49.13	5.14	38.83	35.30	Peak	160	124	HORIZONTAL
2	11589.18	44.59	54.00	-9.41	35.92	5.14	38.83	35.30	Average	160	124	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11589.85	50.93	54.00	-3.07	42.26	5.14	38.83	35.30	Average	101	333	VERTICAL
2	11590.12	64.78	74.00	-9.22	56.11	5.14	38.83	35.30	Peak	101	333	VERTICAL

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802. 11ac MCS0 VHT 80MHz CH 155 / Ant. 4 + Ant. 5 + Ant. 6
Test Date	May 25, 2012		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11550.50	53.45	74.00	-20.55	44.80	5.13	38.82	35.30	Peak	166	121	HORIZONTAL
2	11550.74	39.09	54.00	-14.91	30.44	5.13	38.82	35.30	Average	166	121	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11550.11	58.22	74.00	-15.78	49.58	5.13	38.81	35.30	Peak	100	64	VERTICAL
2	11550.35	42.03	54.00	-11.97	33.39	5.13	38.81	35.30	Average	100	64	VERTICAL

Note:

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

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

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

4.6. Band Edge Emissions Measurement

4.6.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 KHz / 300 KHz for Peak

4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT20MHz Ch 1, 6, 11 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.68	69.06	74.00	-4.94	38.68	2.21	28.17	0.00	Peak	108	148	HORIZONTAL
2	2390.00	53.64	54.00	-0.36	23.25	2.22	28.17	0.00	Average	108	148	HORIZONTAL
3	2410.24				82.14	2.22	28.21	0.00	Peak	108	148	HORIZONTAL
4	2414.72				71.55	2.22	28.21	0.00	Average	108	148	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.20	50.84	54.00	-3.16	20.46	2.21	28.17	0.00	Average	100	154	HORIZONTAL
2	2389.36	66.25	74.00	-7.75	35.87	2.21	28.17	0.00	Peak	100	154	HORIZONTAL
3	2429.31				78.69	2.23	28.25	0.00	Average	100	154	HORIZONTAL
4	2429.47				88.93	2.23	28.25	0.00	Peak	100	154	HORIZONTAL
5	2483.98	49.17	54.00	-4.83	18.53	2.26	28.38	0.00	Average	100	154	HORIZONTAL
6	2484.30	67.64	74.00	-6.36	37.00	2.26	28.38	0.00	Peak	100	154	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2464.56				72.41	2.24	28.33	0.00	Average	100	148	HORIZONTAL
2	2464.56				83.09	2.24	28.33	0.00	Peak	100	148	HORIZONTAL
3	2483.98	53.61	54.00	-0.39	22.97	2.26	28.38	0.00	Average	100	148	HORIZONTAL
4	2484.14	70.17	74.00	-3.83	39.53	2.26	28.38	0.00	Peak	100	148	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 HT40MHz Ch 3, 6, 9 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2384.55	65.71	74.00	-8.29	35.33	2.21	28.17	0.00	Peak	134	134	HORIZONTAL
2	2389.68	52.93	54.00	-1.07	22.55	2.21	28.17	0.00	Average	134	134	HORIZONTAL
3	2419.44				76.18	2.23	28.25	0.00	Peak	134	134	HORIZONTAL
4	2419.76				66.05	2.23	28.25	0.00	Average	134	134	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	53.85	54.00	-0.15	23.46	2.22	28.17	0.00	Average	127	135	HORIZONTAL
2	2390.00	69.27	74.00	-4.73	38.88	2.22	28.17	0.00	Peak	127	135	HORIZONTAL
3	2434.44				83.57	2.23	28.29	0.00	Peak	127	135	HORIZONTAL
4	2434.76				71.67	2.23	28.29	0.00	Average	127	135	HORIZONTAL
5	2483.82	50.27	54.00	-3.73	19.63	2.26	28.38	0.00	Average	127	135	HORIZONTAL
6	2483.82	63.50	74.00	-10.50	32.86	2.26	28.38	0.00	Peak	127	135	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437MHz.

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2449.76				68.16	2.24	28.29	0.00	Average	104	147	HORIZONTAL
2	2449.76				78.70	2.24	28.29	0.00	Peak	104	147	HORIZONTAL
3	2484.14	65.72	74.00	-8.28	35.08	2.26	28.38	0.00	Peak	104	147	HORIZONTAL
4	2484.46	53.36	54.00	-0.64	22.72	2.26	28.38	0.00	Average	104	147	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Temperature	22°C	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 1, 6, 11 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	49.32	54.00	-4.68	18.93	2.22	28.17	0.00	Average	120	150	VERTICAL
2	2390.00	57.88	74.00	-16.12	27.49	2.22	28.17	0.00	Peak	120	150	VERTICAL
3	2411.04				82.87	2.22	28.21	0.00	Peak	120	150	VERTICAL
4	2411.20				79.07	2.22	28.21	0.00	Average	120	150	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.68	57.86	74.00	-16.14	27.48	2.21	28.17	0.00	Peak	120	151	VERTICAL
2	2390.00	44.50	54.00	-9.50	14.11	2.22	28.17	0.00	Average	120	151	VERTICAL
3	2436.04				85.85	2.23	28.29	0.00	Peak	120	151	VERTICAL
4	2436.20				82.11	2.23	28.29	0.00	Average	120	151	VERTICAL
5	2483.50	54.26	74.00	-19.74	23.63	2.26	28.37	0.00	Peak	120	151	VERTICAL
6	2484.78	42.22	54.00	-11.78	11.59	2.26	28.37	0.00	Average	120	151	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2461.20				81.73	2.24	28.33	0.00	Average	134	112	HORIZONTAL
2	2462.96				85.60	2.24	28.33	0.00	Peak	134	112	HORIZONTAL
3	2483.50	50.75	54.00	-3.25	20.11	2.26	28.38	0.00	Average	134	112	HORIZONTAL
4	2484.14	60.97	74.00	-13.03	30.33	2.26	28.38	0.00	Peak	134	112	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	22℃	Humidity	61%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 1, 6, 11 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	May 25, 2012		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.84	53.78	54.00	-0.22	23.39	2.22	28.17	0.00	Average	100	155	HORIZONTAL
2	2389.84	70.89	74.00	-3.11	40.50	2.22	28.17	0.00	Peak	100	155	HORIZONTAL
3	2414.56				72.89	2.22	28.21	0.00	Average	100	155	HORIZONTAL
4	2414.56				83.39	2.22	28.21	0.00	Peak	100	155	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.68	66.11	74.00	-7.89	35.73	2.21	28.17	0.00	Peak	130	153	HORIZONTAL
2	2390.00	51.48	54.00	-2.52	21.09	2.22	28.17	0.00	Average	130	153	HORIZONTAL
3	2429.47				91.31	2.23	28.25	0.00	Peak	130	153	HORIZONTAL
4	2439.72				80.46	2.23	28.29	0.00	Average	130	153	HORIZONTAL
5	2483.66	67.88	74.00	-6.12	37.24	2.26	28.38	0.00	Peak	130	153	HORIZONTAL
6	2483.98	50.26	54.00	-3.74	19.62	2.26	28.38	0.00	Average	130	153	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2464.40				73.38	2.24	28.33	0.00	Average	100	150	HORIZONTAL
2	2464.56				84.14	2.24	28.33	0.00	Peak	100	150	HORIZONTAL
3	2483.50	53.72	54.00	-0.28	23.08	2.26	28.38	0.00	Average	100	150	HORIZONTAL
4	2484.14	68.13	74.00	-5.87	37.49	2.26	28.38	0.00	Peak	100	150	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

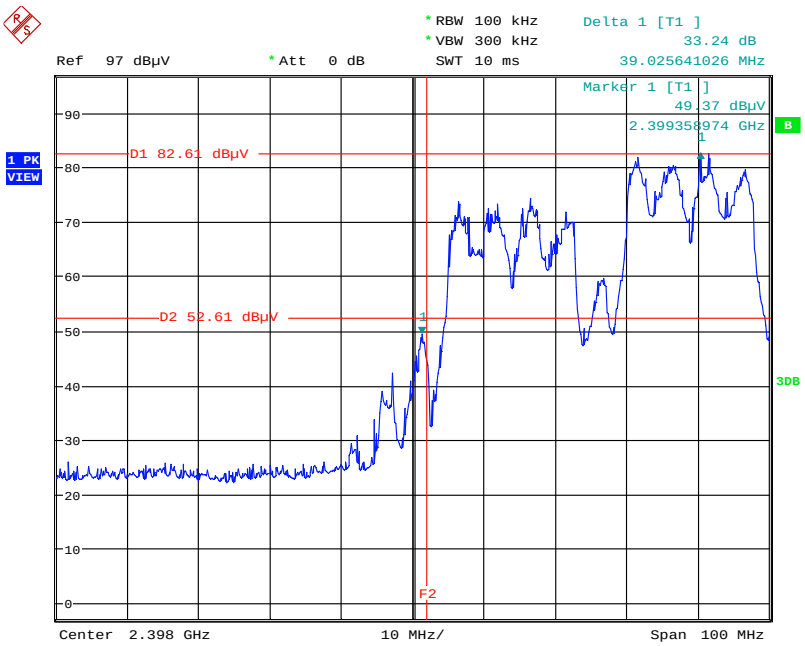
Note:

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

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

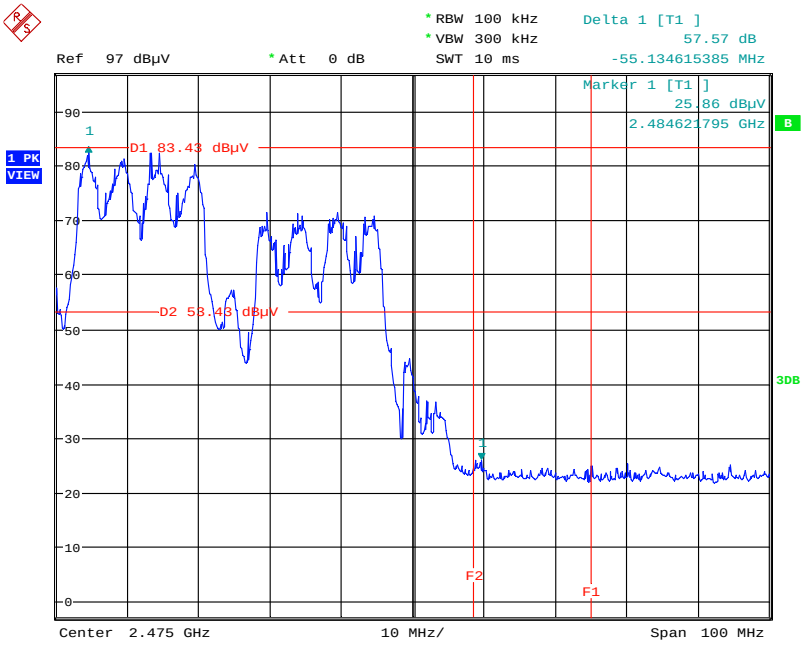
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1+ Ant. 2 + Ant. 3 / 2412 MHz



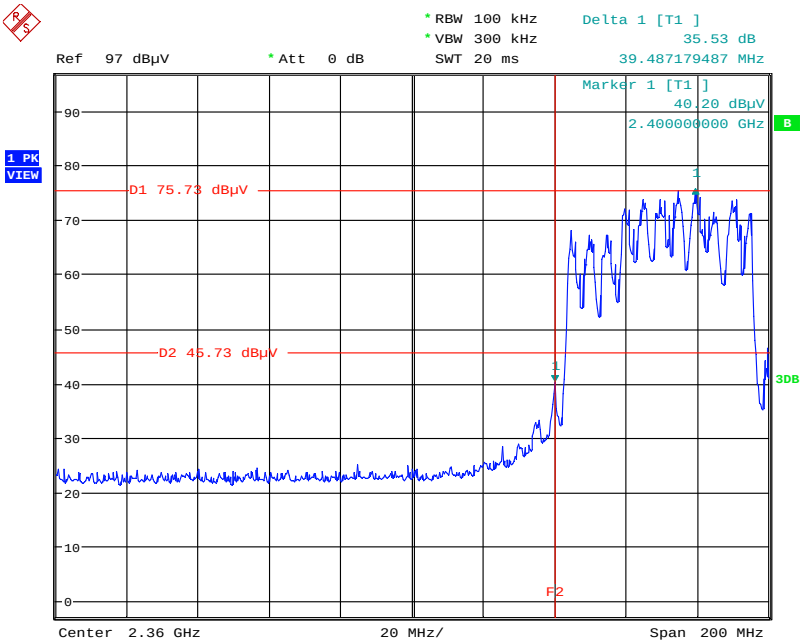
Date: 26.MAY.2012 02:45:56

Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 1+ Ant. 2 + Ant. 3 / 2462 MHz



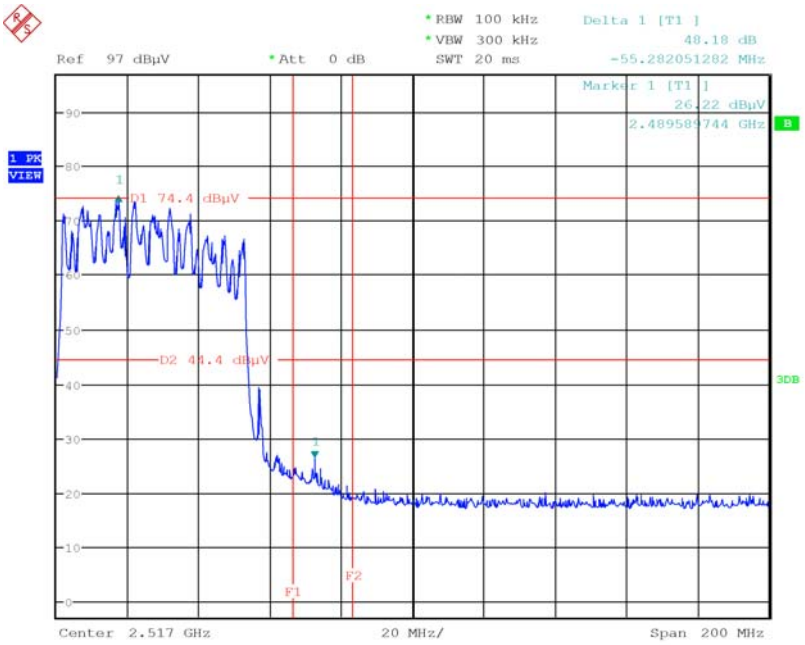
Date: 26.MAY.2012 02:43:13

Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1+ Ant. 2 + Ant. 3 / 2422 MHz



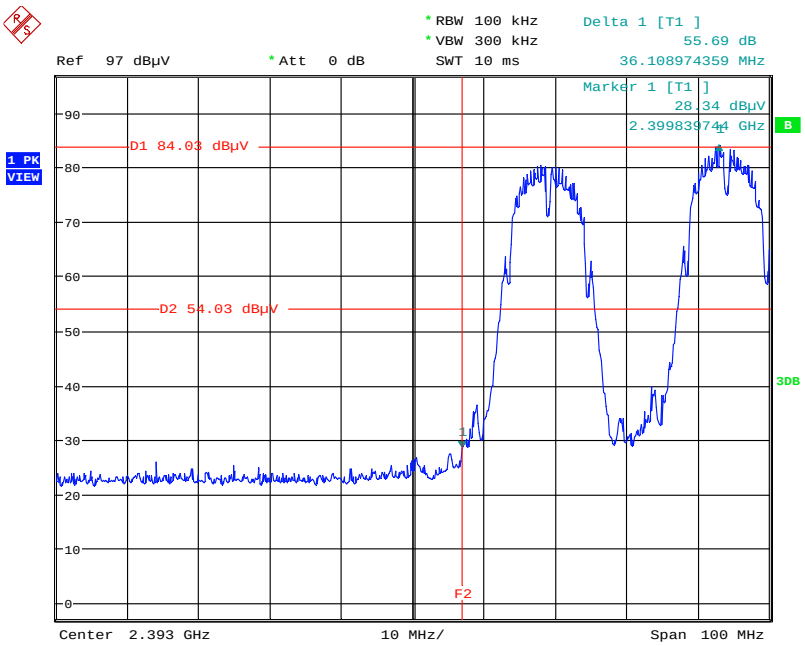
Date: 26.MAY.2012 03:14:55

Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 1+ Ant. 2 + Ant. 3 / 2452 MHz



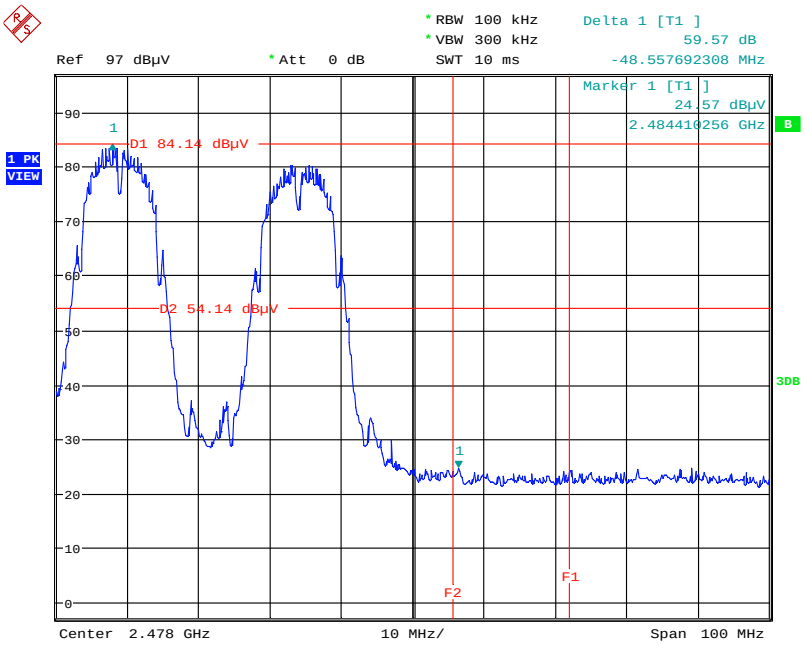
Date: 29.MAR.2012 21:34:36

Plot on Configuration IEEE 802.11b / Ant. 1+ Ant. 2 + Ant. 3 / 2412 MHz



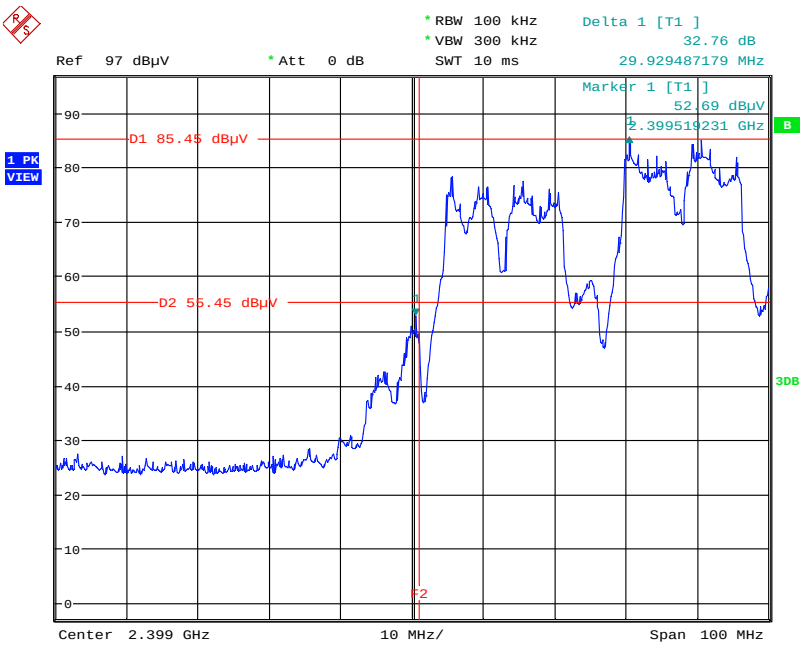
Date: 26.MAY.2012 00:51:06

Plot on Configuration IEEE 802.11b / Ant. 1+ Ant. 2 + Ant. 3 / 2462 MHz



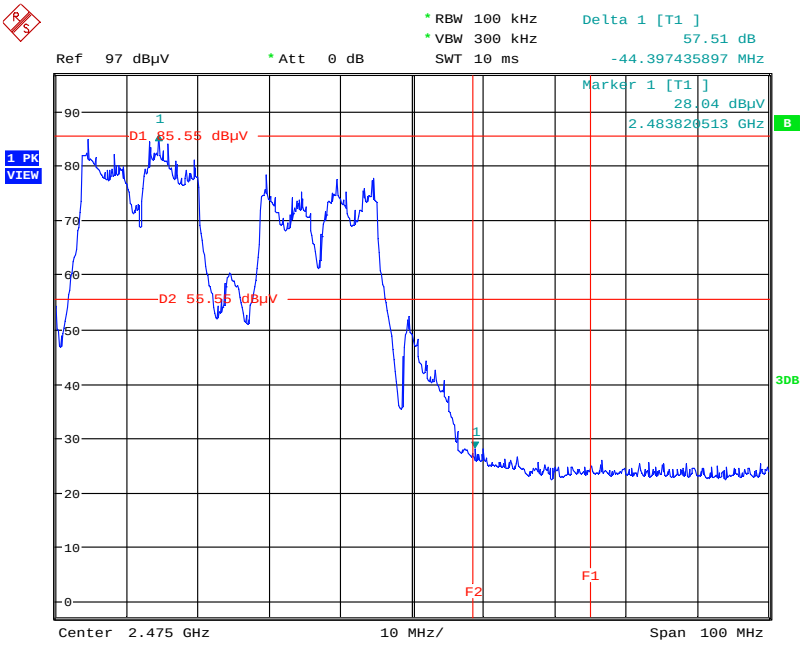
Date: 26.MAY.2012 00:49:09

Plot on Configuration IEEE 802.11g / Ant. 1+ Ant. 2 + Ant. 3 / 2412 MHz



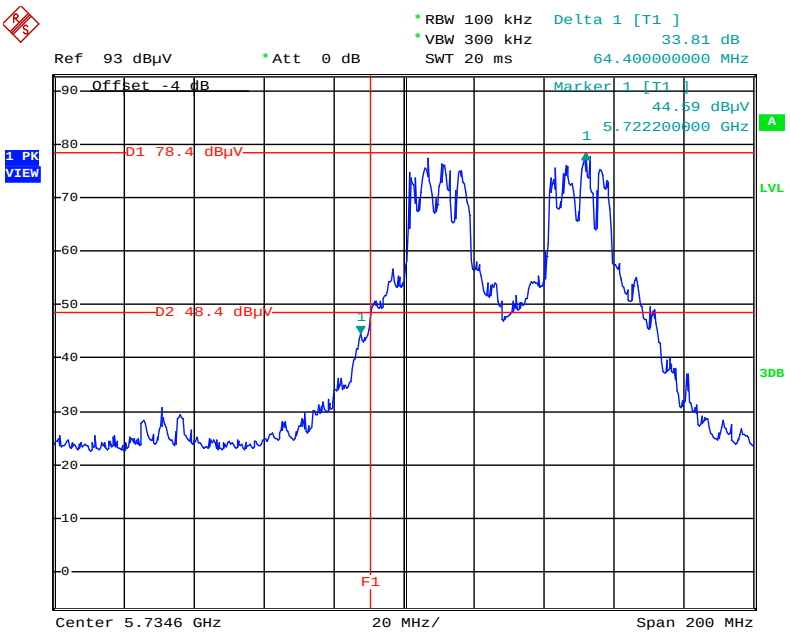
Date: 26.MAY.2012 01:15:52

Plot on Configuration IEEE 802.11g / Ant. 1+ Ant. 2 + Ant. 3 / 2462 MHz



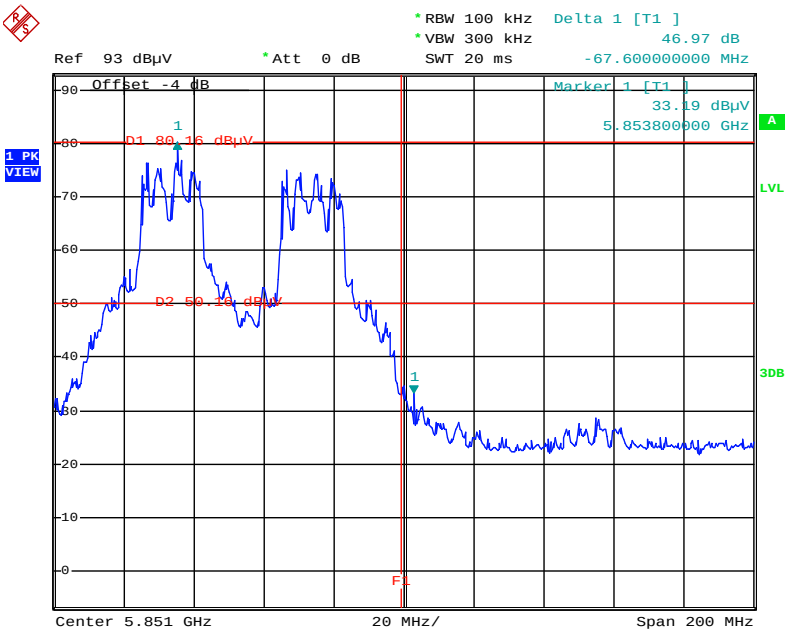
Date: 26.MAY.2012 01:18:38

Plot on Configuration IEEE 802.11n MCS0 HT20MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5745 MHz



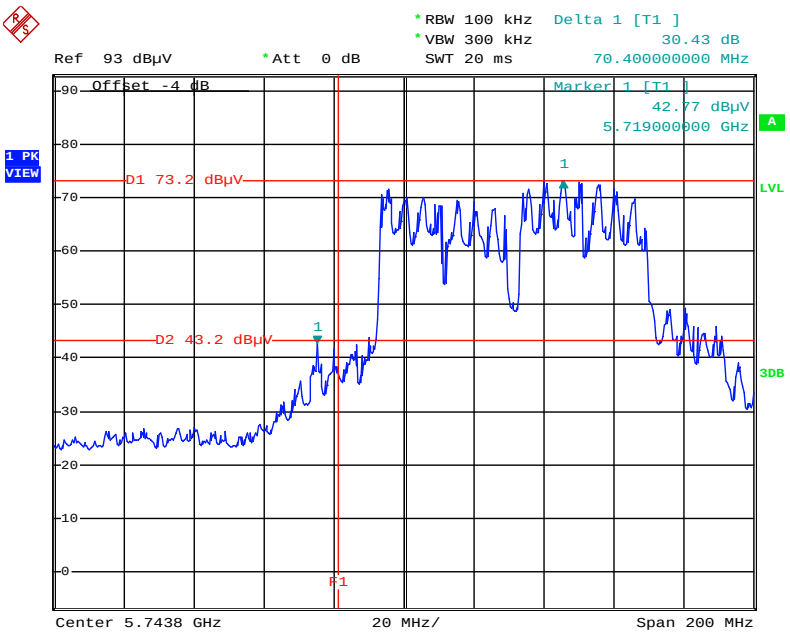
Date: 25.MAY.2012 12:29:36

Plot on Configuration IEEE 80211n MCS0 HT20MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5825 MHz



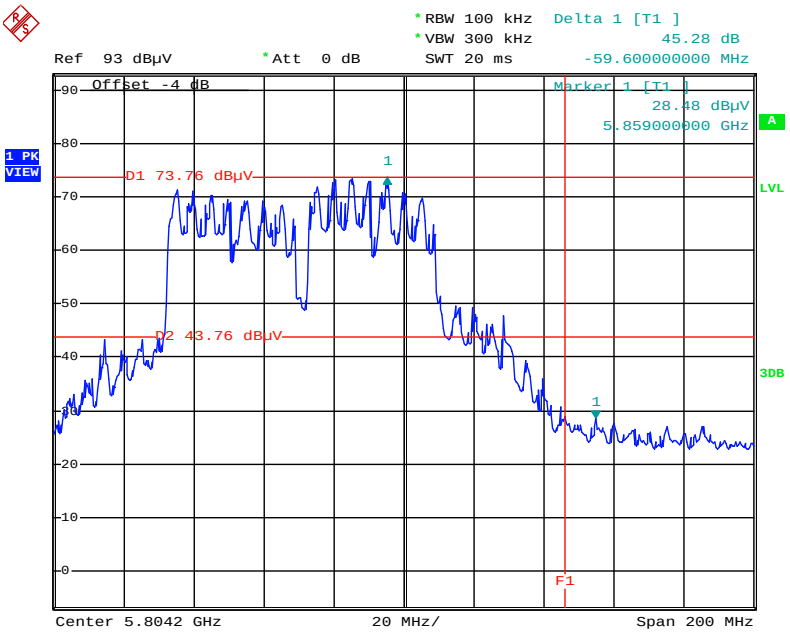
Date: 25.MAY.2012 12:25:11

Plot on Configuration IEEE 802.11n MCS0 HT40MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5755 MHz



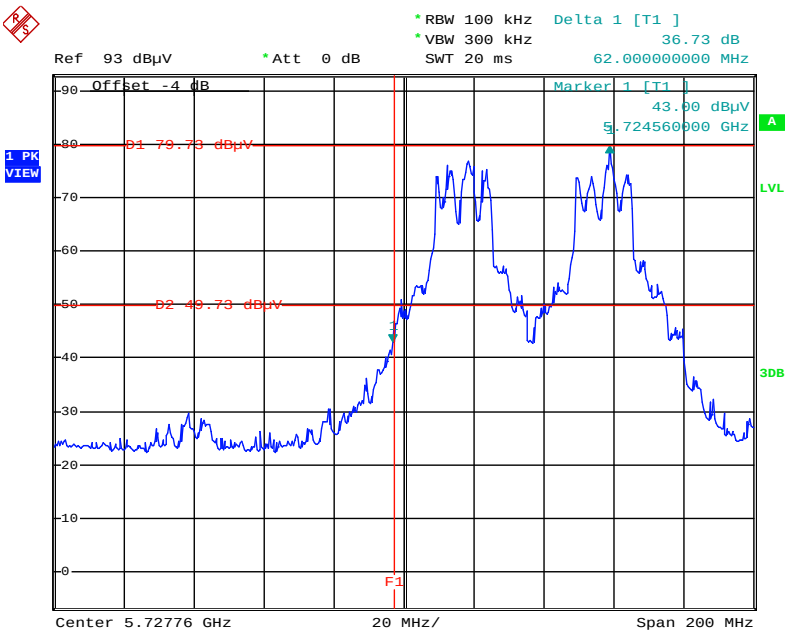
Date: 25.MAY.2012 12:55:55

Plot on Configuration IEEE 80211n MCS0 HT40MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5795 MHz



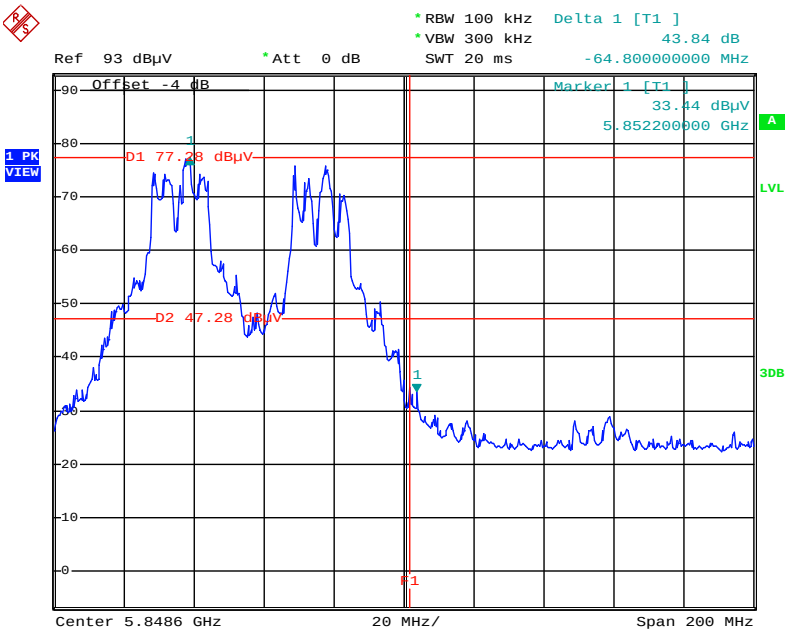
Date: 25.MAY.2012 13:00:19

Plot on Configuration IEEE 802.11a / Ant. 4+ Ant. 5 + Ant. 6 / 5745 MHz



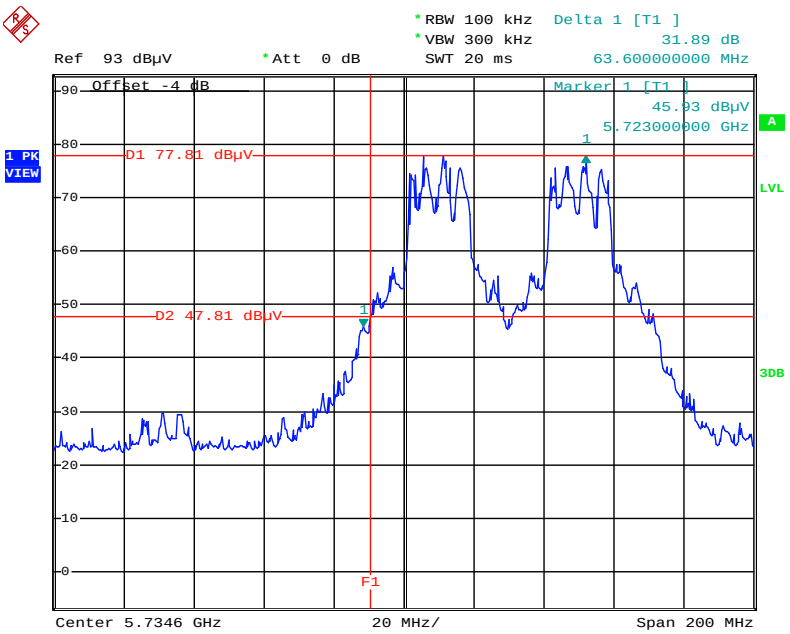
Date: 25.MAY.2012 12:19:40

Plot on Configuration IEEE 80211a / Ant. 4+ Ant. 5 + Ant. 6 / 5825 MHz



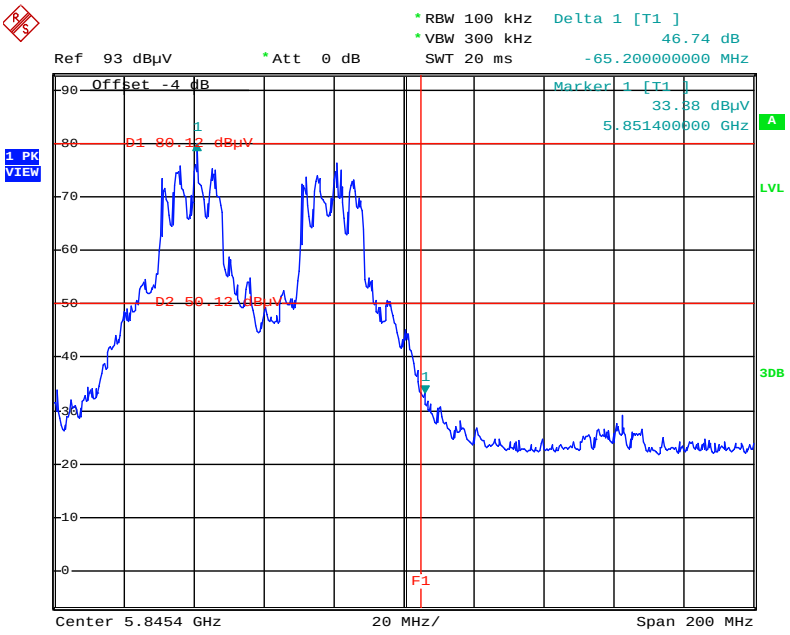
Date: 25.MAY.2012 12:22:50

Plot on Configuration IEEE 802.11ac MCS0 VHT 20MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5745 MHz



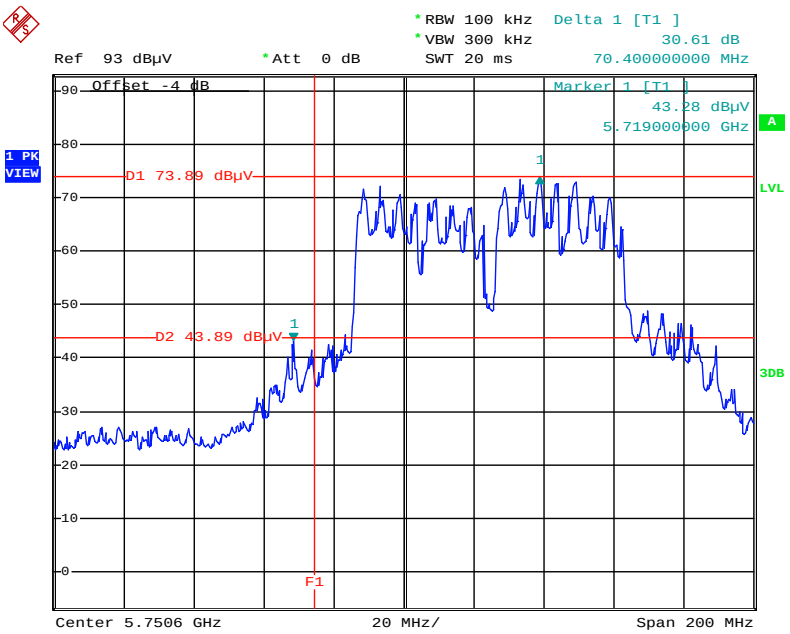
Date: 25.MAY.2012 12:33:01

Plot on Configuration IEEE 802.11ac MCS0 VHT 20MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5825 MHz



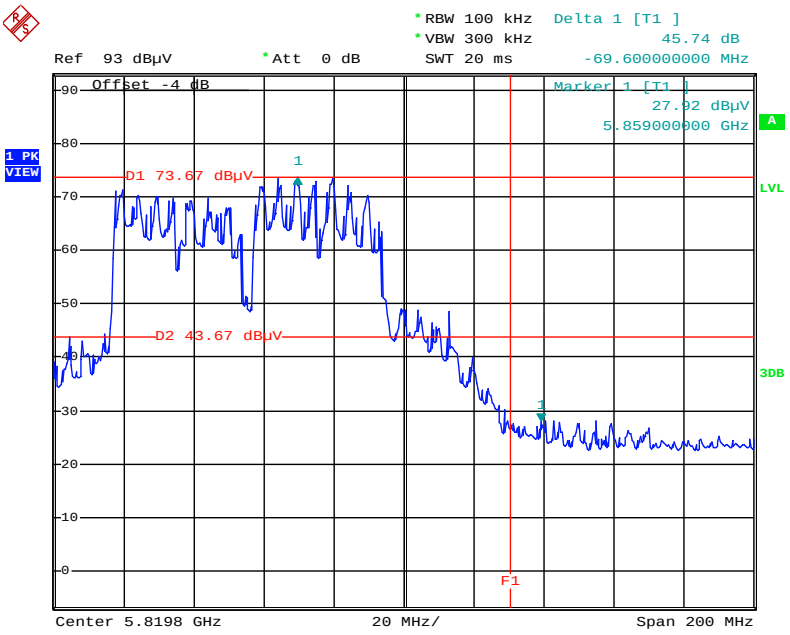
Date: 25.MAY.2012 12:35:36

Plot on Configuration IEEE 802.11ac MCS0 VHT 40MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5755 MHz



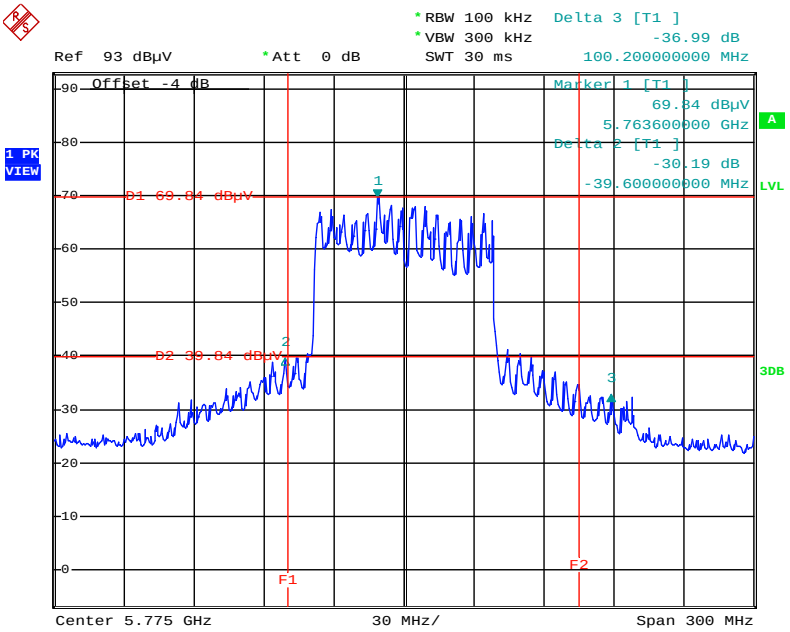
Date: 25.MAY.2012 13:03:59

Plot on Configuration IEEE 802.11ac MCS0 VHT 40MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5795 MHz



Date: 25.MAY.2012 13:06:13

Plot on Configuration IEEE 802.11ac MCS0 VHT 80MHz / Ant. 4+ Ant. 5 + Ant. 6 / 5775 MHz



Date: 25.MAY.2012 13:16:43

4.7. Antenna Requirements

4.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Sep. 14, 2011	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 14, 2011	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Nov. 30, 2011	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Feb. 03, 2012	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 4, 2011	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2012	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 25, 2011	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 22, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 29, 2011	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 03, 2011	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Sep. 09, 2010*	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2011	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Sep. 26, 2011	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	May 20, 2012	Conducted (TH01-CB)
Thermo-Hygro Meter	N/A	HC 520	#1	15~70 degree	Nov. 02, 2011	Conducted (TH01-CB)
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Nov. 22, 2011	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	Conducted (TH01-CB)
Signal generator	R&S	SMU200A	102782	10MHz-40GHz	Jun. 07, 2011	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	May 09, 2012	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071042	1GHz – 18GHz	Nov. 01, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 01, 2011	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 01, 2011	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

Note: "*" Calibration Interval of instruments listed above is two years.

6. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

7. TAF CERTIFICATE OF ACCREDITATION

TAF

Certificate No.：L1190-110702

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Road, Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

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

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