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FCC RADIO TEST REPORT

Applicant's company	NETGEAR, Inc.
Applicant Address	350 East Plumeria Drive, San Jose, California 95134, USA
FCC ID	PY312400218
Manufacturer's company	Ambit Microsystems (Shanghai) Ltd.
Manufacturer Address	No. 1925, Nanle Road, Songjiang Export Processing Zone, Shanghai, China

Product Name	R6200 Smart WiFi Router
Brand Name	NETGEAR
Model Name	R6200v2
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Jan. 18, 2013
Final Test Date	May 23, 2013
Submission Type	Original Equipment

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g part and IEEE 802.11a/ac (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,

47 CFR FCC Part 15 Subpart C, KDB 558074 D01 v03 and KDB 662911 D01 v01r02.

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





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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR351533AB	Rev. 01	Initial issue of report	May 28, 2013



1. CERTIFICATE OF COMPLIANCE

Product Name : R6200 Smart WiFi Router
Brand Name : NETGEAR
Model Name : R6200v2
Applicant : NETGEAR, Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jan. 18, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

A handwritten signature in blue ink that reads 'Sam Chen' is written over a horizontal line.

Sam Chen

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	5.60 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	3.22 dB
4.3	15.247(e)	Power Spectral Density	Complies	4.27 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.69 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.02 dB
4.7	15.203	Antenna Requirements	Complies	-

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

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth ; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (20MHz): 17.44 MHz ; MCS0 (40MHz): 36.16 MHz For 5GHz Band: MCS0 (20MHz): 20.16 MHz ; MCS0 (40MHz): 51.68 MHz ; MCS0 (80MHz): 75.84 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 25.09 dBm ; MCS0 (40MHz): 20.48 dBm For 5GHz Band: IEEE 802.11ac: MCS0 (20MHz): 24.59 dBm ; MCS0 (40MHz): 26.78 dBm ; MCS0 (80MHz): 23.32 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Note: The product has beamforming function for 802.11ac mode only.

IEEE 802.11a/b/g

Items	Description
Product Type	IEEE 802.11b: WLAN (1TX, 2RX) IEEE 802.11a/g/n: WLAN (2TX, 2RX)
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: 11.36 MHz ; 11g: 16.08 MHz ; 11a: 20.56 MHz
Maximum Conducted Output Power	11b: 25.39 dBm ; 11g: 26.24 dBm ; 11a: 25.62 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Single (TX)			Two (TX)		
	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
IEEE 802.11a	X	X	X	V	X	X
IEEE 802.11b	V	X	X	X	X	X
IEEE 802.11g	X	X	X	V	X	X
IEEE 802.11n	X	X	X	V	V	X
IEEE 802.11ac	X	X	X	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	M0-15
802.11n (HT40)	2	M0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput).

Then EUT support HT20 and HT40.

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80.

Note 3: Modulation modes consist of below configuration:

11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

Power	Brand	Model	P/N	Rating
Adapter 1	NETGEAR	MU30-5120250-A1	332-10234-01	Input: 100-240VAC, 50/60Hz, 0.8A Output: 12VDC, 2.5A
Adapter 2	NETGEAR	P030WF120B 11200-6LF	332-10200-02	Input: 100-240VAC, 50/60Hz, 1.0A Output: 12VDC, 2.5A
Others				
RJ-45 Cable*1, Shielded, 1.55m				

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	NETGEAR	-	PCB Antenna	I-PEX	1.5	-
2	NETGEAR	-	PCB Antenna	I-PEX	1.3	-
3	NETGEAR	-	PCB Antenna	I-PEX	-	2.5
4	NETGEAR	-	PCB Antenna	I-PEX	-	2.1

Note: The EUT has four antennas

For 2.4GHz Band:

For IEEE 802.11b mode (1TX/2RX)

Only Chain 2 can be used as transmitting, but Chain 1 and Chain 2 could receive simultaneously.

For IEEE 802.11g/n mode (2TX/2RX)

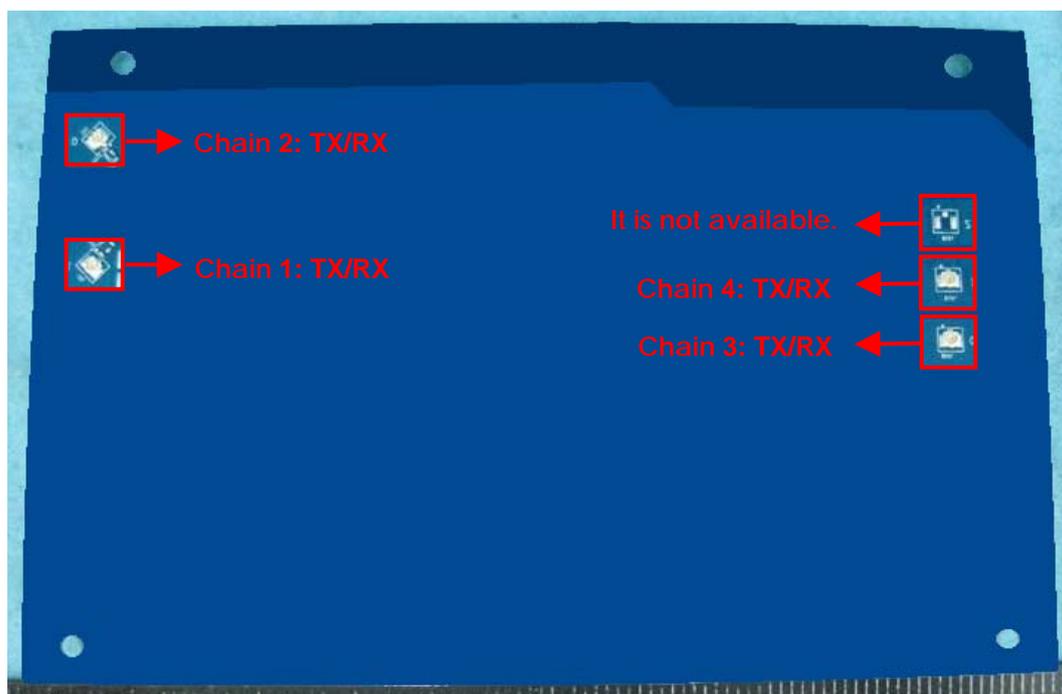
Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz Band:

For IEEE 802.11a/n/ac mode (2TX/2RX):

Chain 3 and Chain 4 could transmit/receive simultaneously.

According to the above antennas, there are two antennas will transit simultaneously (one is Horizontal and the others are Vertical)



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

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

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

For 5GHz Band:

There are three bandwidth systems.

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	Chain
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Maximum Conducted Output Power	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	1+2
Power Spectral Density	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	1+2
6dB Spectrum Bandwidth	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	1+2
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	1+2
Band Edge Emissions	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	1+2

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Maximum Conducted Output Power	11ac 20MHz	MCS0	149/157/165	3+4
	11ac 40MHz	MCS0	151/159	3+4
	11ac 80MHz	MCS0-Nss1	155	3+4
	11a/BPSK	6 Mbps	149/157/165	3+4
Power Spectral Density	11ac 20MHz	MCS0	149/157/165	3+4
	11ac 40MHz	MCS0	151/159	3+4
	11ac 80MHz	MCS0-Nss1	155	3+4
	11a/BPSK	6 Mbps	149/157/165	3+4
6dB Spectrum Bandwidth	11ac 20MHz	MCS0	149/157/165	3+4
	11ac 40MHz	MCS0	151/159	3+4
	11ac 80MHz	MCS0-Nss1	155	3+4
	11a/BPSK	6 Mbps	149/157/165	3+4
Radiated Emissions Below 1GHz	Normal Link	Auto	-	-
Radiated Emissions Above 1GHz	11ac 20MHz	MCS0	149/157/165	3+4
	11ac 40MHz	MCS0	151/159	3+4
	11ac 80MHz	MCS0-Nss1	155	3+4
	11a/BPSK	6 Mbps	149/157/165	3+4
Band Edge Emissions	11ac 20MHz	MCS0	149/157/165	3+4
	11ac 40MHz	MCS0	151/159	3+4
	11ac 80MHz	MCS0-Nss1	155	3+4
	11a/BPSK	6 Mbps	149/157/165	3+4

Beamforming mode is worse case than non-beamforming mode, so that it is representative and recorded in the test report.

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. EUT + Power Adapter 1

Mode 2. EUT + Power Adapter 2

Mode 1 generated the worst test result, so it was recorded in this report.

For Radiated Emission test:

Mode 1. EUT + Power Adapter 1

Mode 2. EUT + Power Adapter 2

Mode 1 generated the worst test result, it was recorded in this report.

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).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

For Conducted emission test:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Flash Disk 3.0	ADATA	C103	DoC

For Radiated emission below 1GHz test:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6220	E2KWM3945ABG
Notebook	DELL	E6220	E2KWM3945ABG
Notebook	DELL	E6430	E2K4965AGNM
Flash Disk 3.0	ADATA	D3331A	DoC

For other test items:

For 2.4GHz band:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6220	QDS-BRCM1049LE
Mouse	Logitech M90	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	N/A
Flash Disk	ADATA	C103	DoC
Notebook	DELL	E6220	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE

For 5GHz band:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	M1330	E2KWM3945ABG
WLAN Dongle	Netgear	A6200	PY31220200

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 20MHz / Chain 1 + Chain 2

Test Software Version	Manual Tool Version : 1.0.0.10		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	64	90	66

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2

Test Software Version	Manual Tool Version : 1.0.0.10		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	52	71	55

Power Parameters of IEEE 802.11b / Chain 2

Test Software Version	Manual Tool Version : 1.0.0.10		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	78	99	83

Power Parameters of IEEE 802.11g / Chain 1 + Chain 2

Test Software Version	Manual Tool Version : 1.0.0.10		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	70	97	67

For 5GHz Band

Power Parameters of IEEE 802.11ac MCS0 20MHz / Chain 3 + Chain 4

Test Software Version	Telnet for Beam-forming		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	88	88	88

Power Parameters of IEEE 802.11ac MCS0 40MHz / Chain 3 + Chain 4

Test Software Version	Telnet for Beam-forming	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	84	100

Power Parameters of IEEE 802.11ac MCS0 80MHz / Chain 3 + Chain 4

Test Software Version	Telnet for Beam-forming
Frequency	5775 MHz
MCS0 80MHz	78

Power Parameters of IEEE 802.11a / Chain 3 + Chain 4

Test Software Version	Manual Tool Version : 1.0.0.10		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	88	88	88

3.9. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

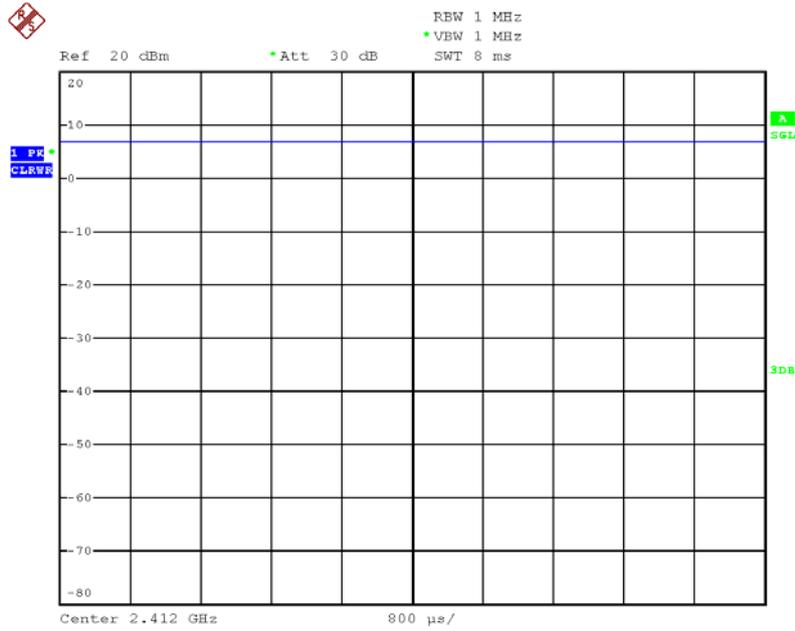
For Radiated Mode:

During the test, the following programs under WIN XP were executed.

The program was executed as follows:

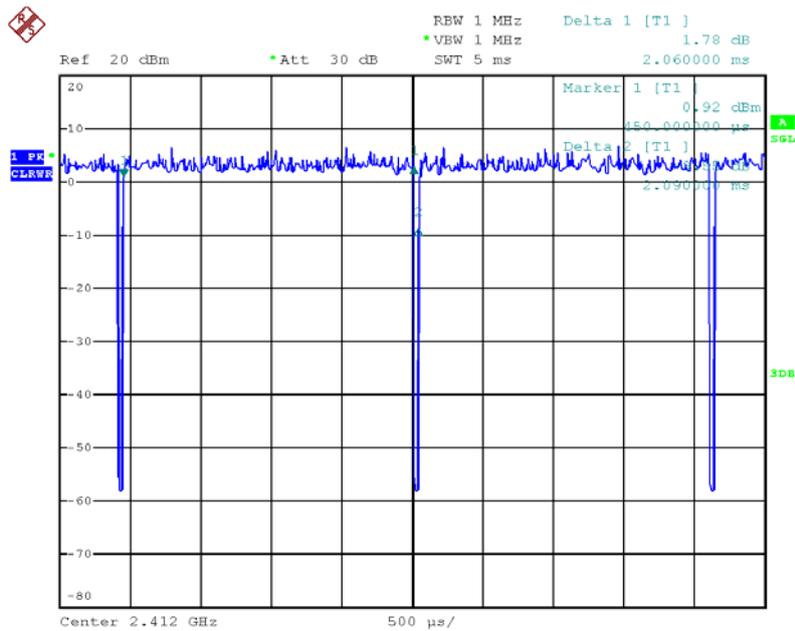
1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under DOS.
3. Executed "Latest.exe " to link with the remote workstation to receive and transmit packet by Wireless AP and transmit duty cycle no less 98%

IEEE 802.11b



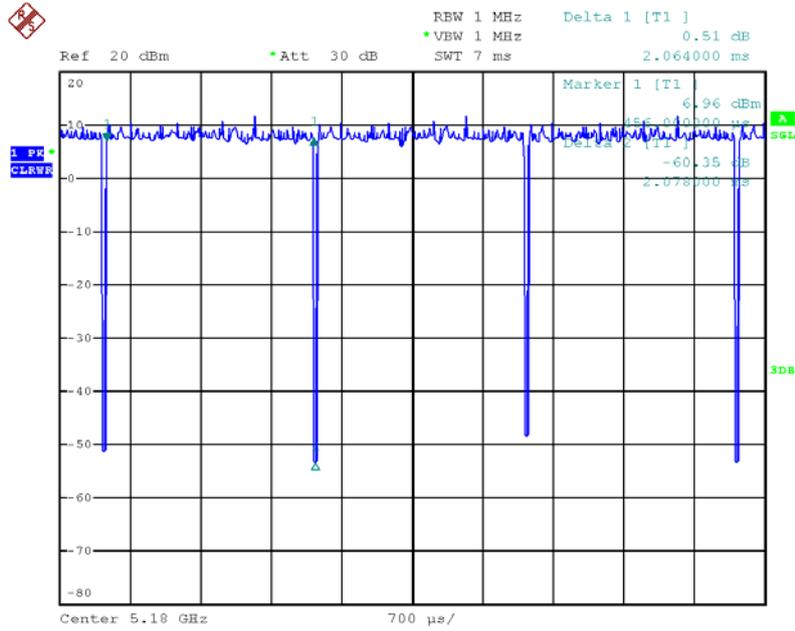
Date: 23.MAY.2013 11:37:27

IEEE 802.11g



Date: 23.MAY.2013 11:39:35

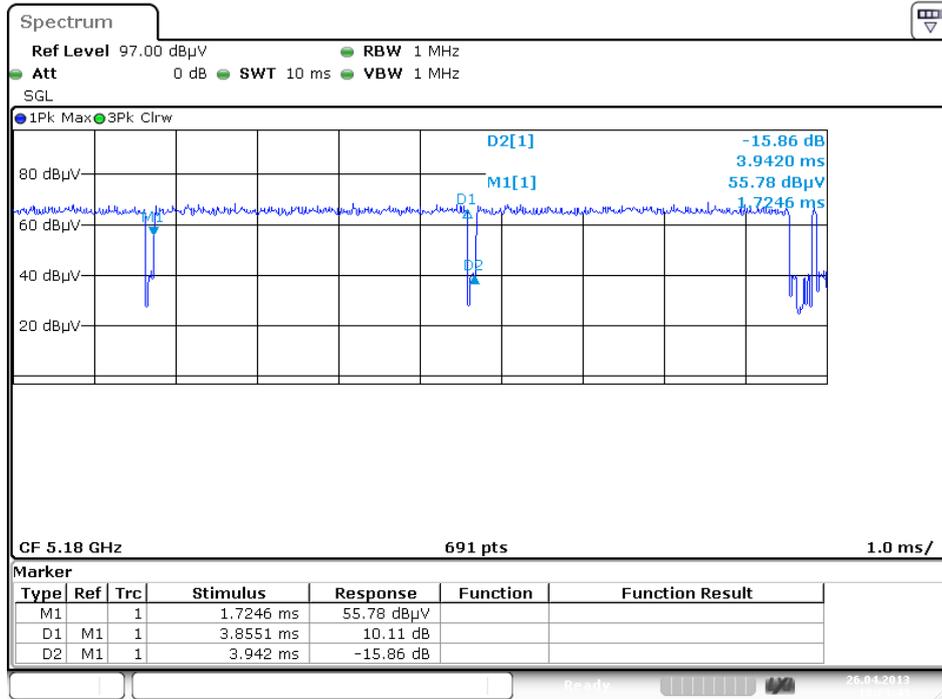
IEEE 802.11a



Date: 23.MAY.2013 11:26:19

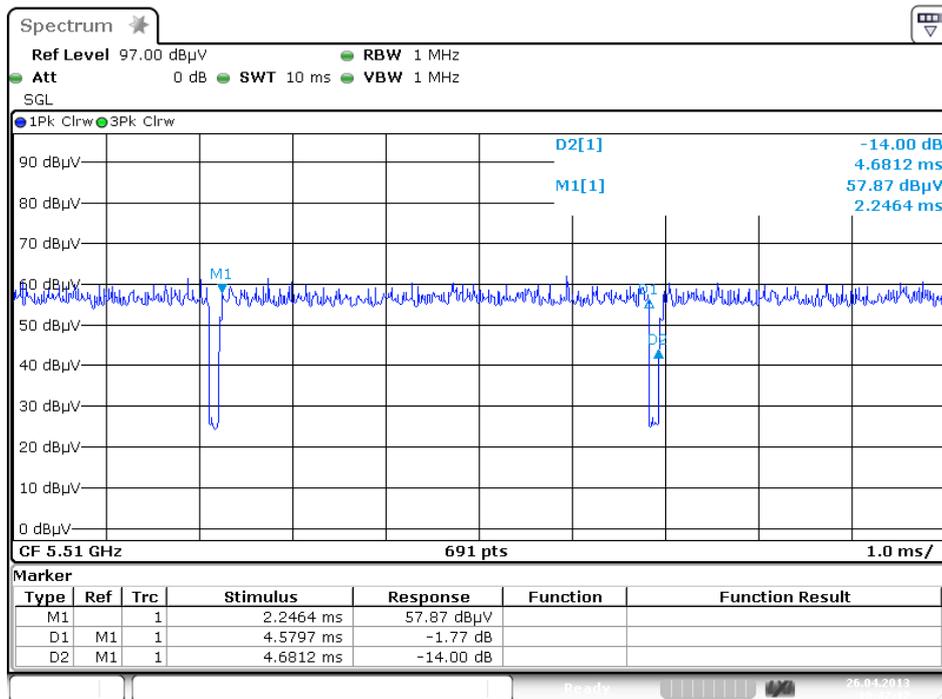
For beamforming mode

IEEE 802.11ac MCS0/Nss1 20MHz



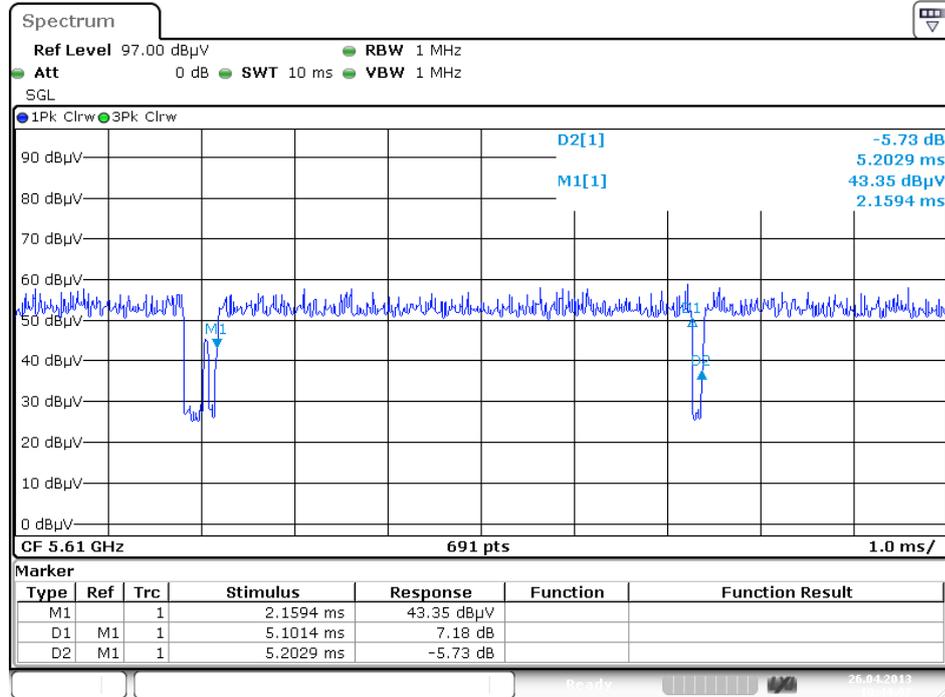
Date: 26.APR.2013 10:23:43

IEEE 802.11ac MCS0/Nss1 40MHz



Date: 26.APR.2013 10:47:17

IEEE 802.11ac MCS0/Nss1 80MHz

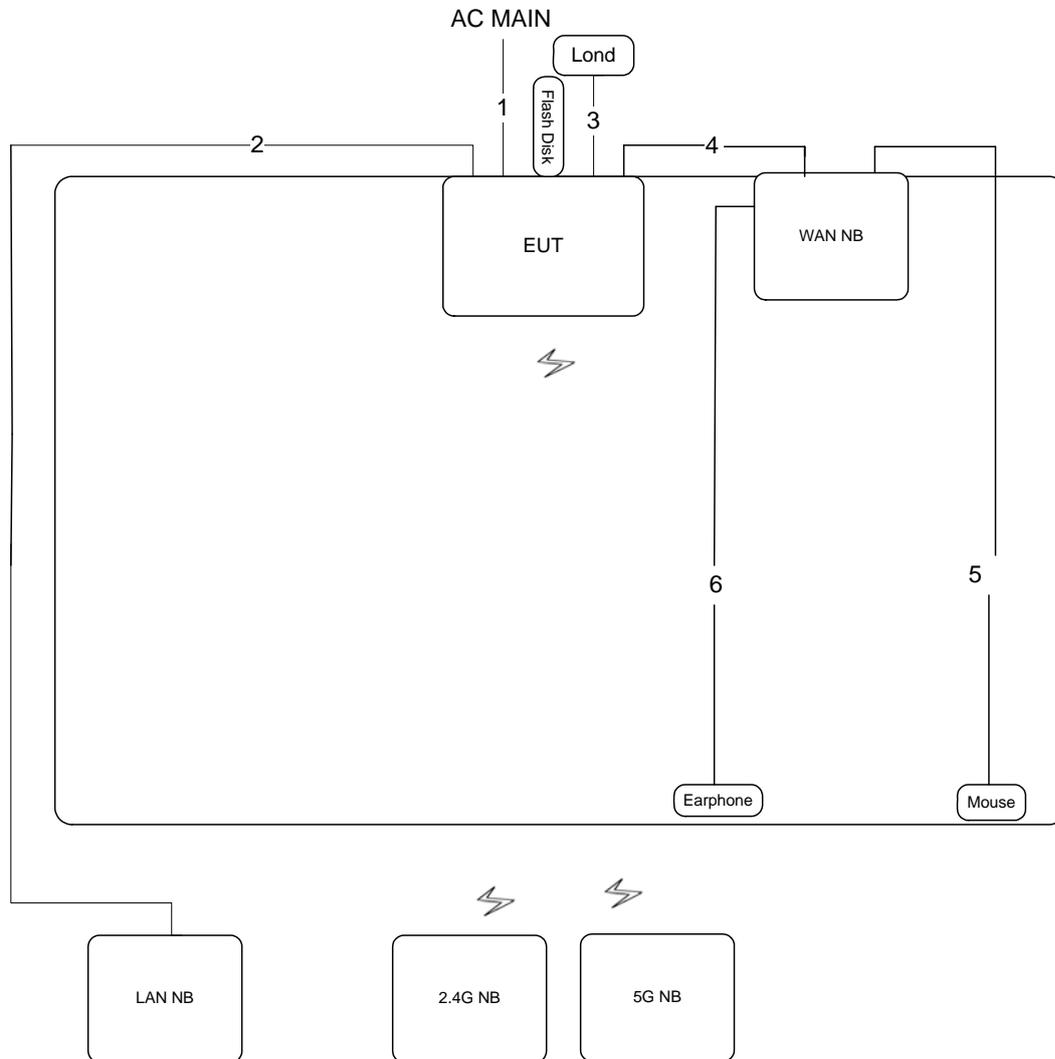


Date: 26.APR.2013 10:44:07

3.11. Test Configurations

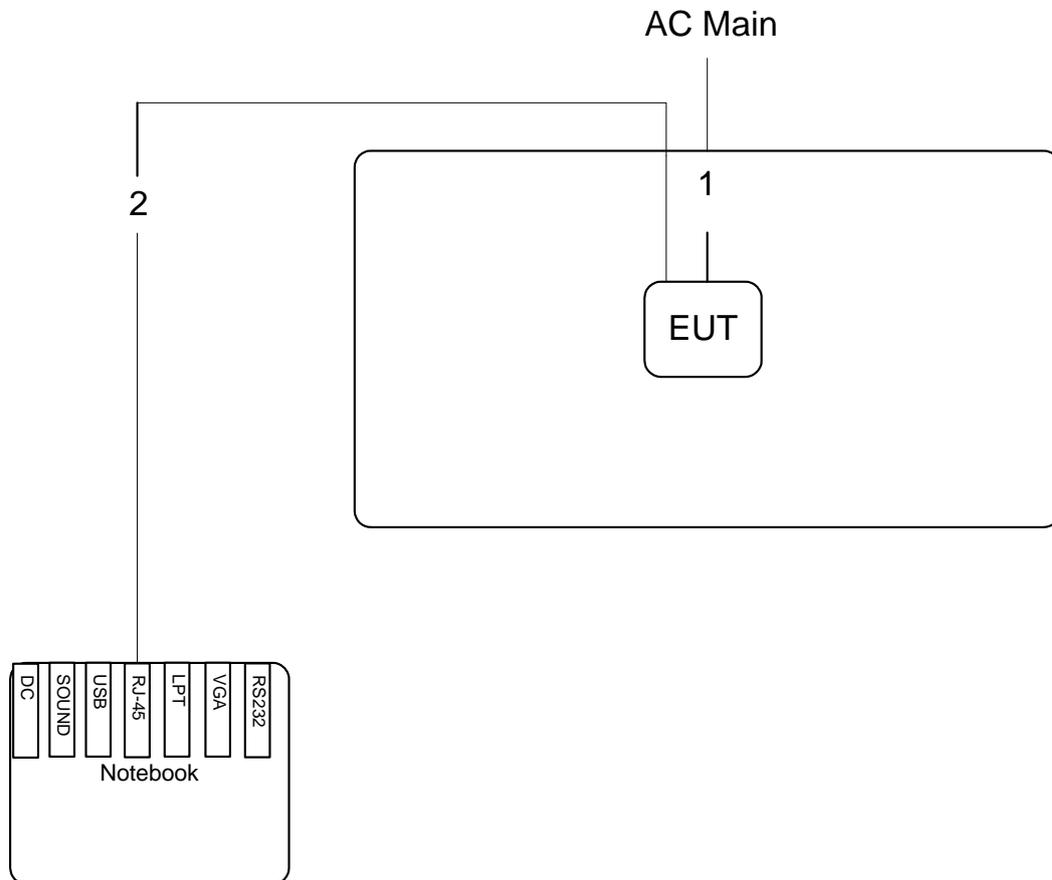
3.11.1. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz / Test Mode: Mode 1



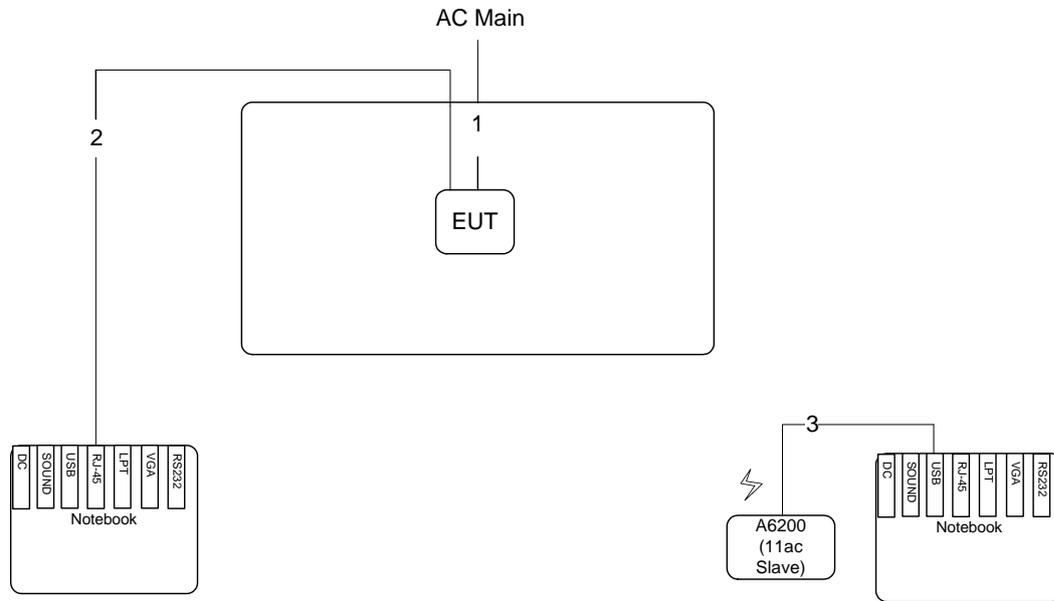
Item	Connection	Shield	Length
1	Power cable	No	1.85m
2	RJ-45 cable	No	10m
3	RJ-45 cable*3	No	1m
4	RJ-45 cable	Yes	1.55m
5	USB cable	No	1.8m
6	Audio cable	No	1.1m

For non-beamforming mode:



Item	Connection	Shield	Length
1	Power cable	No	1.85m
2	RJ-45 cable	No	10m

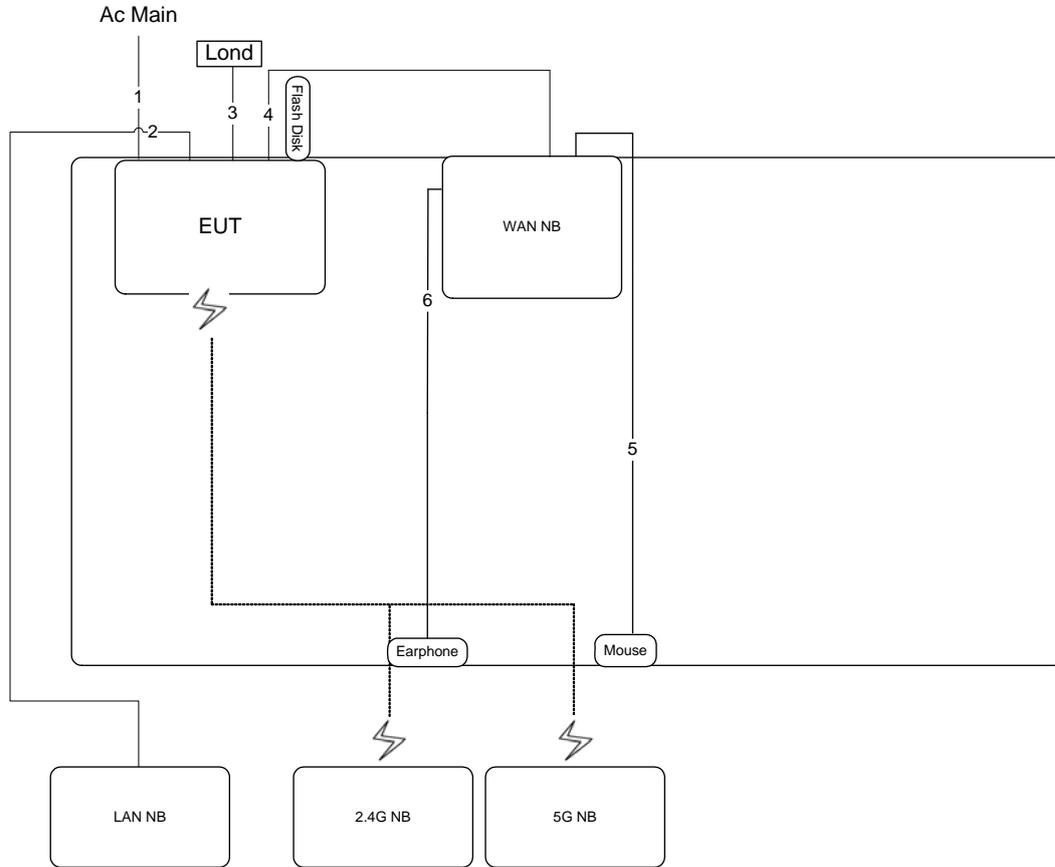
For beamforming mode:



Item	Connection	Shield	Length
1	Power cable	No	1.85m
2	RJ-45 cable	No	10m
3	USB cable	Yes	1.8m

3.11.2. AC Power Line Conduction Emissions Test Configuration

Test Mode: Mode 1.



Item	Connection	Shield	Length
1	Power cable	No	1.85m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m
4	RJ-45 cable	YES	1.55m
5	USB cable	No	1.8m
6	Audio cable	No	1.1m

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

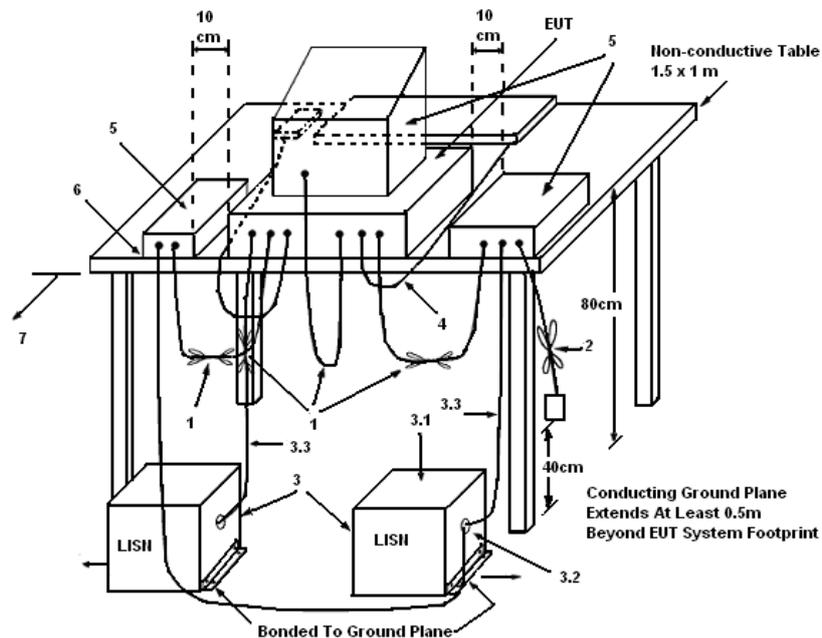
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

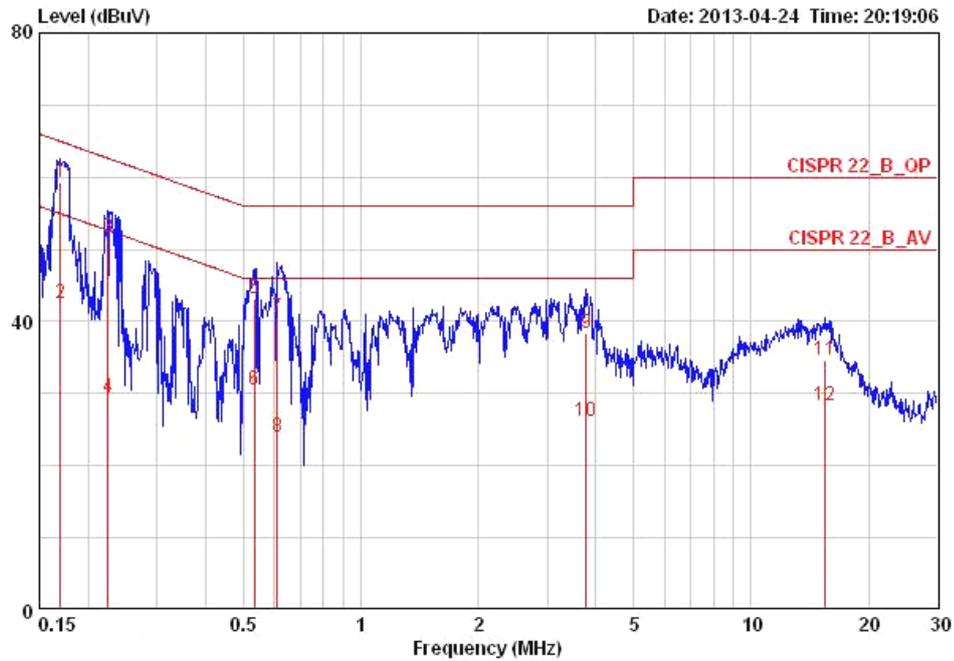
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

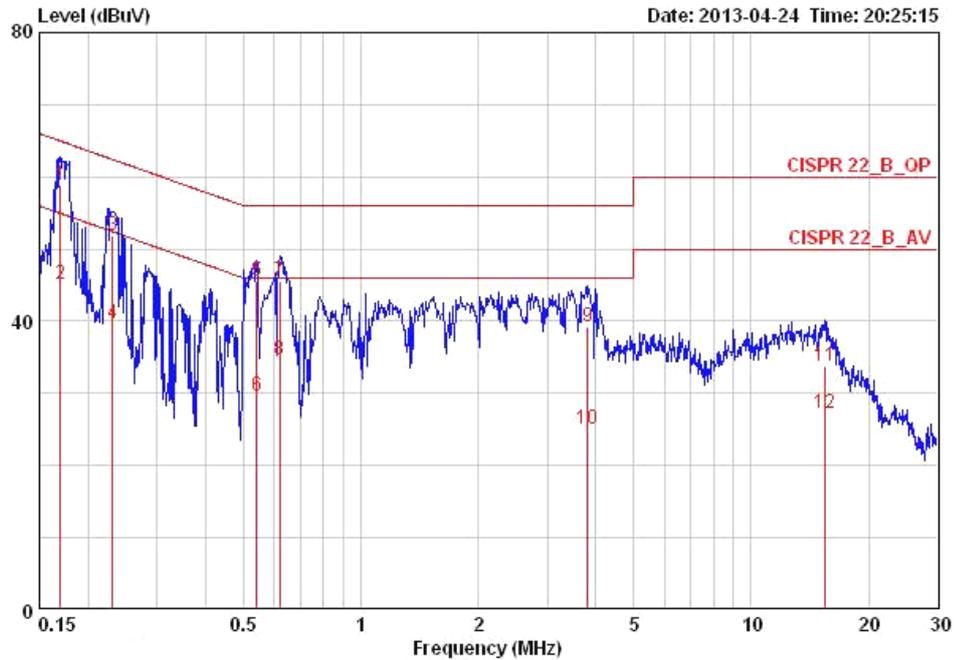
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	48%
Test Engineer	Hank Yang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 1. EUT + Power Adapter 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.16944	59.39	-5.60	64.99	59.04	0.16	0.19	LINE	QP
2	0.16944	42.45	-12.54	54.99	42.10	0.16	0.19	LINE	AVERAGE
3	0.22437	51.77	-10.89	62.66	51.42	0.15	0.20	LINE	QP
4	0.22437	29.49	-23.17	52.66	29.14	0.15	0.20	LINE	AVERAGE
5	0.53215	43.15	-12.85	56.00	42.80	0.15	0.20	LINE	QP
6	0.53215	30.46	-15.54	46.00	30.11	0.15	0.20	LINE	AVERAGE
7	0.61075	40.48	-15.52	56.00	40.12	0.16	0.20	LINE	QP
8	0.61075	23.94	-22.06	46.00	23.58	0.16	0.20	LINE	AVERAGE
9	3.779	38.45	-17.55	56.00	37.94	0.22	0.29	LINE	QP
10	3.779	26.08	-19.92	46.00	25.57	0.22	0.29	LINE	AVERAGE
11	15.388	34.74	-25.26	60.00	33.92	0.42	0.41	LINE	QP
12	15.388	28.39	-21.61	50.00	27.57	0.42	0.41	LINE	AVERAGE

Temperature	24°C	Humidity	48%
Test Engineer	Hank Yang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 1. EUT + Power Adapter 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.16944	58.85	-6.14	64.99	58.58	0.08	0.19	NEUTRAL	QP
2	0.16944	45.21	-9.78	54.99	44.94	0.08	0.19	NEUTRAL	AVERAGE
3	0.23162	51.78	-10.61	62.39	51.50	0.08	0.20	NEUTRAL	QP
4	0.23162	39.77	-12.62	52.39	39.49	0.08	0.20	NEUTRAL	AVERAGE
5	0.54068	45.50	-10.50	56.00	45.22	0.08	0.20	NEUTRAL	QP
6	0.54068	29.65	-16.35	46.00	29.37	0.08	0.20	NEUTRAL	AVERAGE
7	0.62054	45.64	-10.36	56.00	45.36	0.08	0.20	NEUTRAL	QP
8	0.62054	34.62	-11.38	46.00	34.34	0.08	0.20	NEUTRAL	AVERAGE
9	3.820	39.23	-16.77	56.00	38.81	0.13	0.29	NEUTRAL	QP
10	3.820	25.02	-20.98	46.00	24.60	0.13	0.29	NEUTRAL	AVERAGE
11	15.470	33.69	-26.31	60.00	32.96	0.32	0.41	NEUTRAL	QP
12	15.470	27.15	-22.85	50.00	26.42	0.32	0.41	NEUTRAL	AVERAGE

Note:

$$\text{Level} = \text{Read Level} + \text{LISN Factor} + \text{Cable Loss}$$

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

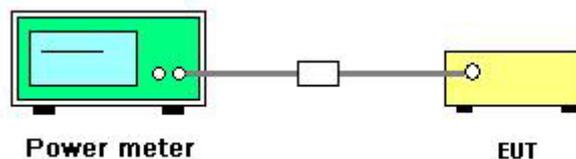
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03 section 9.2.2 Measurement using a power meter (PM).
2. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n (2.4GHz)
Test Date	Jan. 31, 2013		

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
1	2412 MHz	15.98	15.35	18.69	30.00	Complies
6	2437 MHz	22.14	22.01	25.09	30.00	Complies
11	2462 MHz	16.43	16.59	19.52	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
3	2422 MHz	12.31	12.45	15.39	30.00	Complies
6	2437 MHz	17.18	17.75	20.48	30.00	Complies
9	2452 MHz	13.26	13.57	16.43	30.00	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Sean Ku	Configurations	IEEE 802.11ac (5GHz)
Test Date	May 20, 2013		

Configuration IEEE 802.11ac MCS0 20MHz / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 3	Chain 4			
149	5745 MHz	21.62	21.44	24.54	30.00	Complies
157	5785 MHz	21.53	21.62	24.59	30.00	Complies
165	5825 MHz	21.66	21.46	24.57	30.00	Complies

Note: Directional gain = $G_{ANT} + 10\log(N_{ANT} / N_{SS}) = 5.32\text{dBi} < 6\text{dBi}$, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0 40MHz / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 3	Chain 4			
151	5755 MHz	22.26	22.05	25.17	30.00	Complies
159	5795 MHz	23.33	24.16	26.78	30.00	Complies

Note: Directional gain = $G_{ANT} + 10\log(N_{ANT} / N_{SS}) = 5.32\text{dBi} < 6\text{dBi}$, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0 80MHz / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 3	Chain 4			
155	5775 MHz	20.36	20.26	23.32	30.00	Complies

Note: Directional gain = $G_{ANT} + 10\log(N_{ANT} / N_{SS}) = 5.32\text{dBi} < 6\text{dBi}$, so the limit doesn't reduce.

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11b/g
Test Date	Jan. 31, 2013		

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.33	30.00	Complies
6	2437 MHz	25.39	30.00	Complies
11	2462 MHz	20.19	30.00	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
1	2412 MHz	17.32	17.19	20.27	30.00	Complies
6	2437 MHz	23.39	23.07	26.24	30.00	Complies
11	2462 MHz	16.54	16.34	19.45	30.00	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a
Test Date	May 20, 2013		

Configuration IEEE 802.11a / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 3	Chain 4			
149	5745 MHz	22.62	22.55	25.60	30.00	Complies
157	5785 MHz	22.68	22.54	25.62	30.00	Complies
165	5825 MHz	22.71	22.49	25.61	30.00	Complies

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

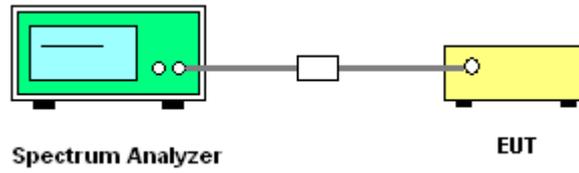
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100\text{kHz}$
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.3.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03 section 10.2 Method PKPSD (peak PSD) & KDB 662911 D01 v01r02 section In-Band Power Spectral Density (PSD) Measurements option (2) Measure and add $10 \log(\text{NANT})$ dB.
2. 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.
3. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$ (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	23°C	Humidity	63%
Test Engineer	Sean Ku	Configurations	IEEE 802.11n/ac

For 2.4GHz band

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
1	2412 MHz	-9.81	-10.19	4.99	Complies
6	2437 MHz	-3.78	-4.32	4.99	Complies
11	2462 MHz	-9.67	-9.70	4.99	Complies

Note: PSD Limit = $(8\text{dBm}/3\text{kHz} - (10\log(2))) = 4.99\text{dBm}/3\text{kHz}$

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
3	2422 MHz	-15.42	-15.61	4.99	Complies
6	2437 MHz	-10.18	-10.79	4.99	Complies
9	2452 MHz	-14.63	-15.32	4.99	Complies

Note: PSD Limit = $(8\text{dBm}/3\text{kHz} - (10\log(2))) = 4.99\text{dBm}/3\text{kHz}$

For 5GHz band

Configuration IEEE 802.11ac MCS0/Nss1 20MHz

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 3	Chain 4		
149	5745 MHz	-3.26	-3.74	4.99	Complies
157	5785 MHz	-3.52	-3.67	4.99	Complies
165	5825 MHz	-2.72	-2.89	4.99	Complies

Note 1: PSD Limit = (8dBm/3kHz – (10log(2))) = 4.99dBm/3kHz

Note 2: Directional gain = $G_{ANT} + 10\log(N_{ANT} / N_{ss}) = 5.32\text{dBi} < 6\text{dBi}$, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0/Nss1 40MHz

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 3	Chain 4		
151	5755 MHz	-6.00	-6.85	4.99	Complies
159	5795 MHz	-5.77	-6.54	4.99	Complies

Note 1: PSD Limit = (8dBm/3kHz – (10log(2))) = 4.99dBm/3kHz

Note 2: Directional gain = $G_{ANT} + 10\log(N_{ANT} / N_{ss}) = 5.32\text{dBi} < 6\text{dBi}$, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0/Nss1 80MHz

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 3	Chain 4		
155	5775 MHz	-11.65	-12.01	4.99	Complies

Note 1: PSD Limit = (8dBm/3kHz – (10log(2))) = 4.99dBm/3kHz

Note 2: Directional gain = $G_{ANT} + 10\log(N_{ANT} / N_{ss}) = 5.32\text{dBi} < 6\text{dBi}$, so the limit doesn't reduce.

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
1	2412 MHz	-3.89	8.00	Complies
6	2437 MHz	3.73	8.00	Complies
11	2462 MHz	-1.64	8.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
1	2412 MHz	-8.22	-8.55	4.99	Complies
6	2437 MHz	-1.11	-1.45	4.99	Complies
11	2462 MHz	-9.02	-9.55	4.99	Complies

Note: PSD Limit = (8dBm/3kHz – (10log(2))) = 4.99dBm/3kHz

Configuration IEEE 802.11a

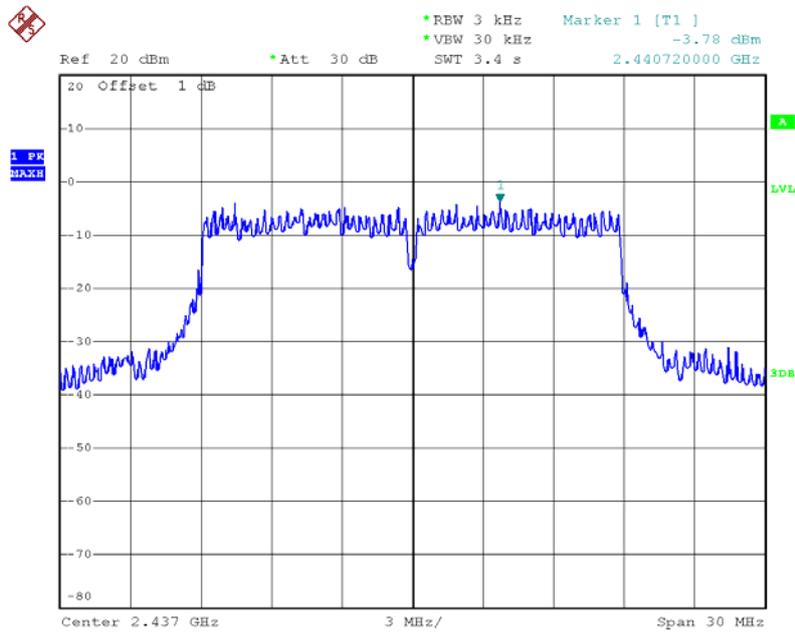
Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 3	Chain 4		
149	5745 MHz	-2.13	-2.80	4.99	Complies
157	5785 MHz	-2.38	-3.06	4.99	Complies
165	5825 MHz	-2.24	-3.13	4.99	Complies

Note: PSD Limit = (8dBm/3kHz – (10log(2))) = 4.99dBm/3kHz

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

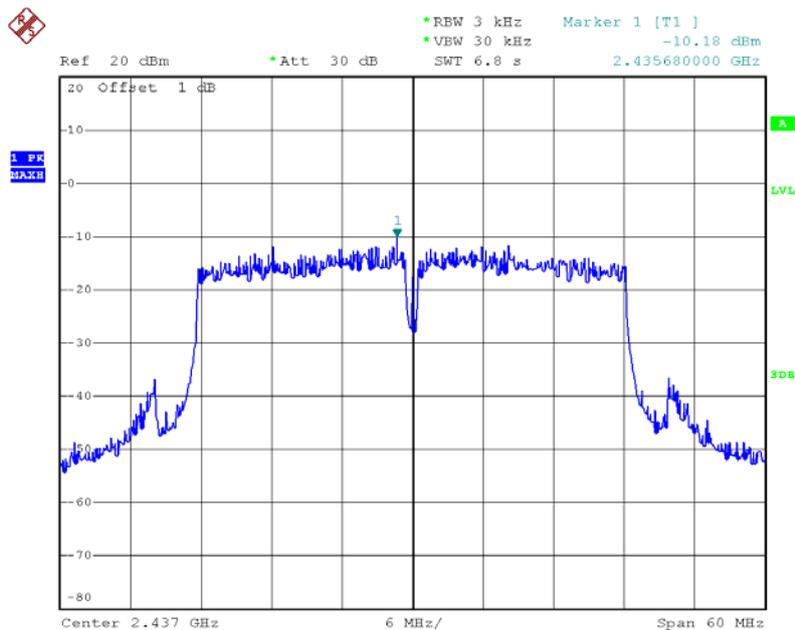
For plots, only the channel with maximum results was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Chain 1 / 2437 MHz



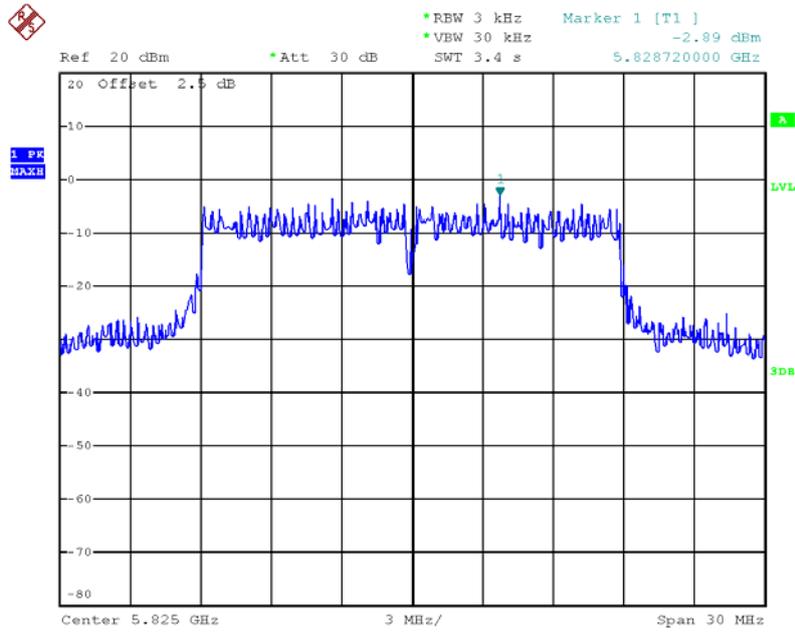
Date: 23.MAY.2013 18:15:35

Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Chain 1 / 2437 MHz



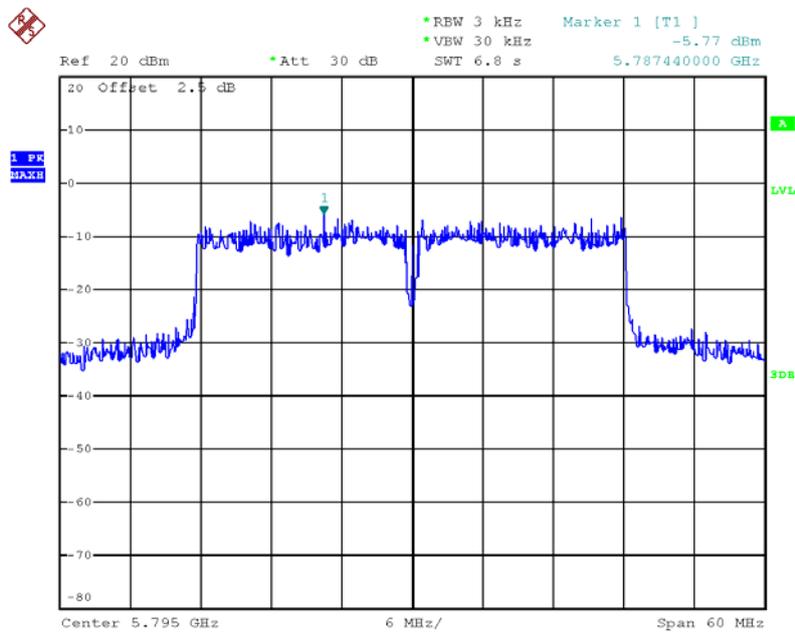
Date: 23.MAY.2013 18:28:41

Power Density Plot on Configuration IEEE 802.11ac MCS0 20MHz / Chain 3 / 5825 MHz



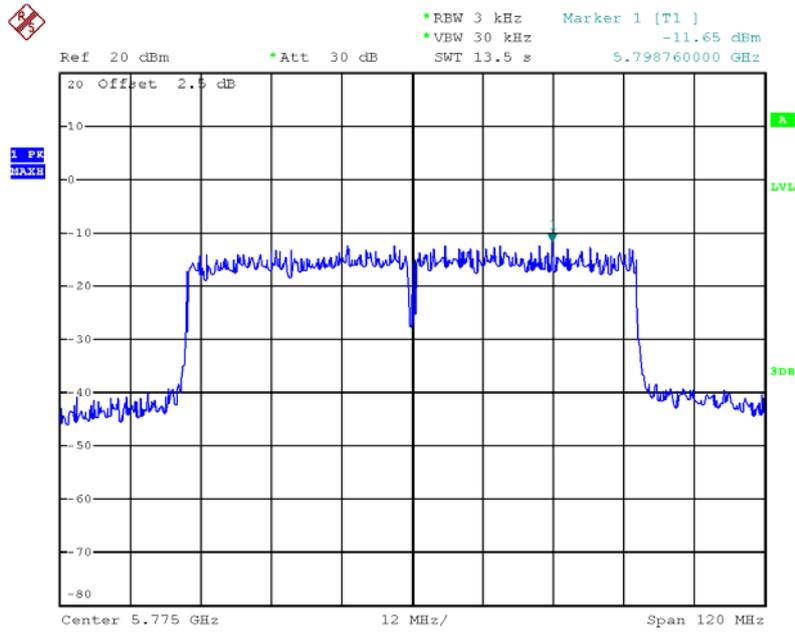
Date: 21.MAY.2013 01:23:39

Power Density Plot on Configuration IEEE 802.11ac MCS0 40MHz / Chain 3 / 5795 MHz



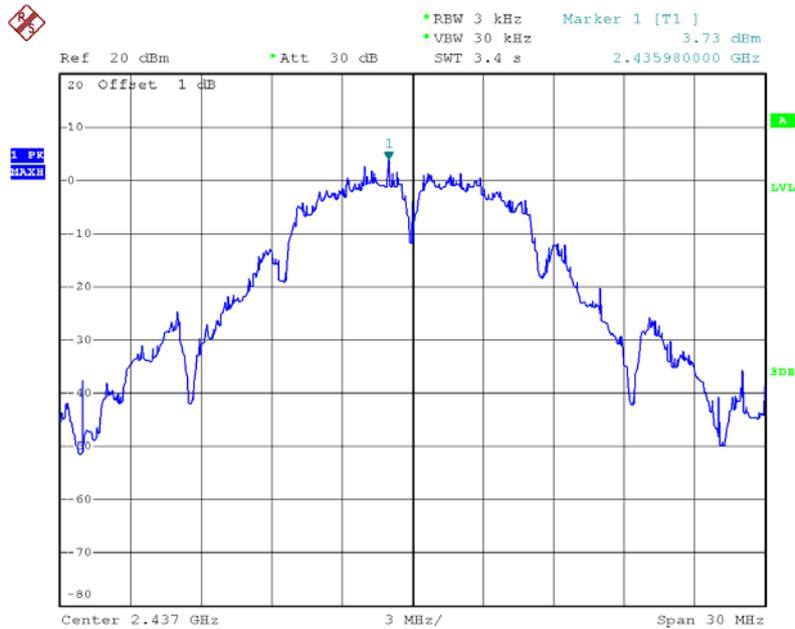
Date: 21.MAY.2013 01:27:17

Power Density Plot on Configuration IEEE 802.11ac MCS0 80MHz / Chain 3 / 5745 MHz



Date: 21.MAY.2013 01:29:47

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



Date: 23.MAY.2013 17:56:00

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

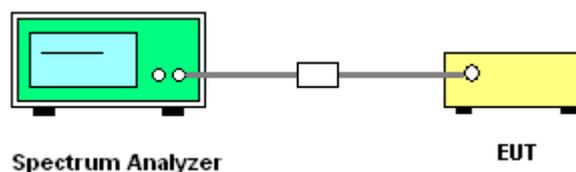
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

7. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
8. Test was performed in accordance with KDB 558074 D01 v03 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.0 DTS 6-dB signal bandwidth option 1.
9. Multiple antenna system was performed in accordance with KDB 662911 D01 v01r02 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
10. 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	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11n (2.4GHz)

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.08	17.44	500	Complies
6	2437 MHz	16.40	17.44	500	Complies
11	2462 MHz	16.00	17.36	500	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.20	36.00	500	Complies
6	2437 MHz	35.52	36.16	500	Complies
9	2452 MHz	35.68	36.00	500	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Sean Ku	Configurations	IEEE 802.11ac (5GHz)

Configuration IEEE 802.11ac MCS0 20MHz / Chain 3 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.76	20.16	500	Complies
157	5785 MHz	16.16	19.76	500	Complies
165	5825 MHz	15.68	19.68	500	Complies

Configuration IEEE 802.11ac MCS0 40MHz / Chain 3 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	35.68	35.68	500	Complies
159	5795 MHz	35.84	51.68	500	Complies

Configuration IEEE 802.11ac MCS0 80MHz / Chain 3 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	74.88	75.84	500	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Benson Peng	Configurations	IEEE 802.11b/g

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	8.08	10.16	500	Complies
6	2437 MHz	8.08	11.36	500	Complies
11	2462 MHz	8.08	10.08	500	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.64	16.00	500	Complies
6	2437 MHz	12.32	16.08	500	Complies
11	2462 MHz	12.32	15.84	500	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Sean Ku	Configurations	IEEE 802.11a

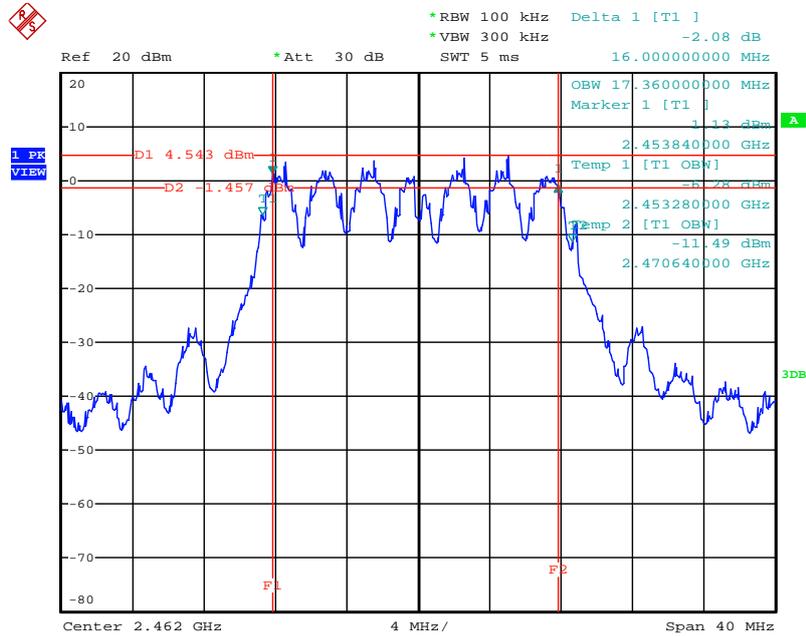
Configuration IEEE 802.11a / Chain 3 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	12.32	19.52	500	Complies
157	5785 MHz	12.56	20.08	500	Complies
165	5825 MHz	12.96	20.56	500	Complies

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

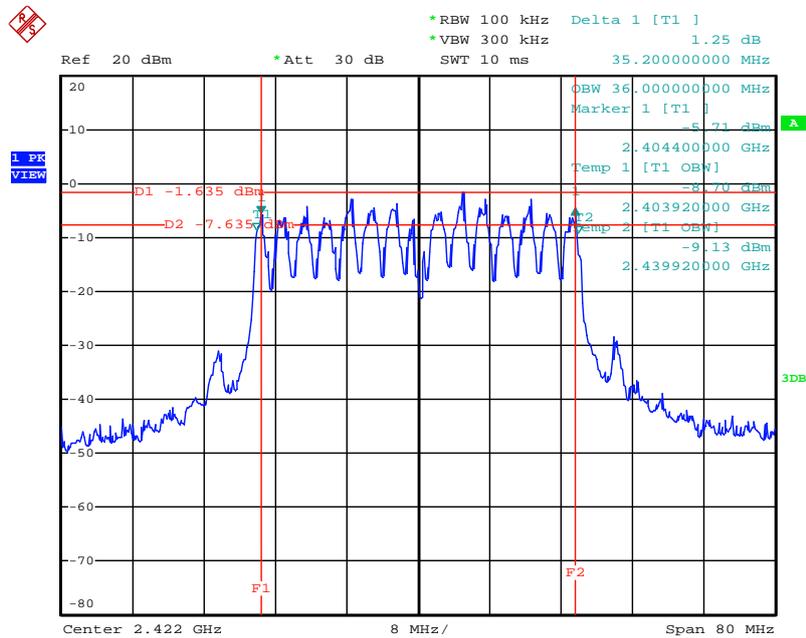
For plots, only the channel with maximum results was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 / 2462 MHz



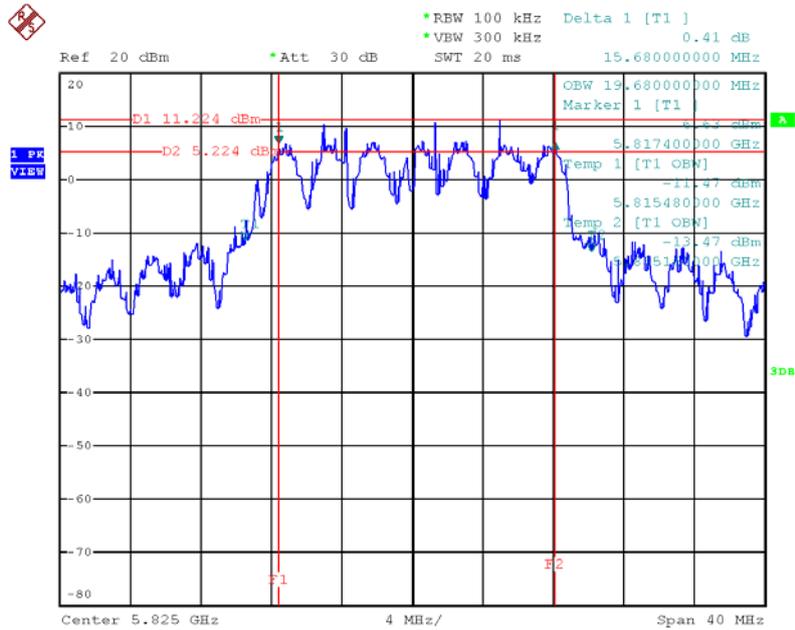
Date: 31.JAN.2013 11:36:43

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 / 2422 MHz



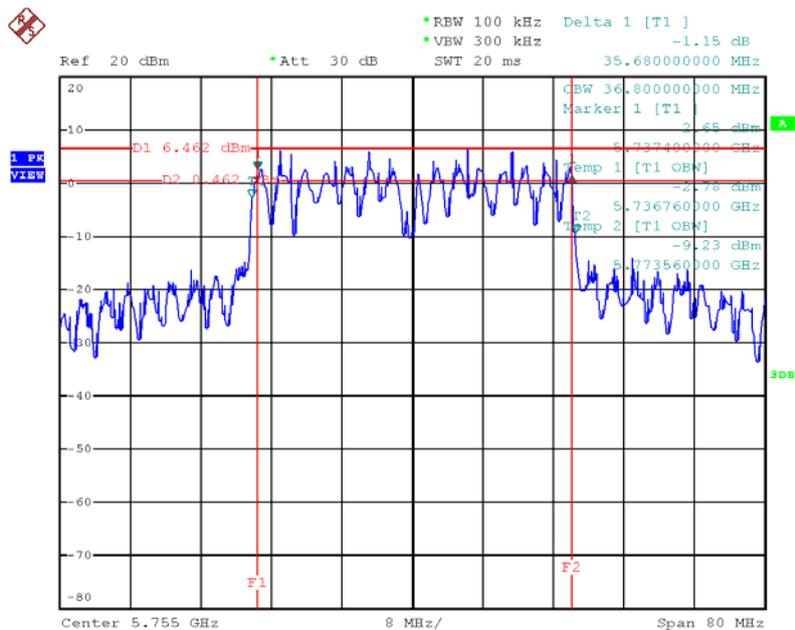
Date: 31.JAN.2013 11:37:22

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0 20MHz / Chain 3 + Chain 4 / 5825 MHz



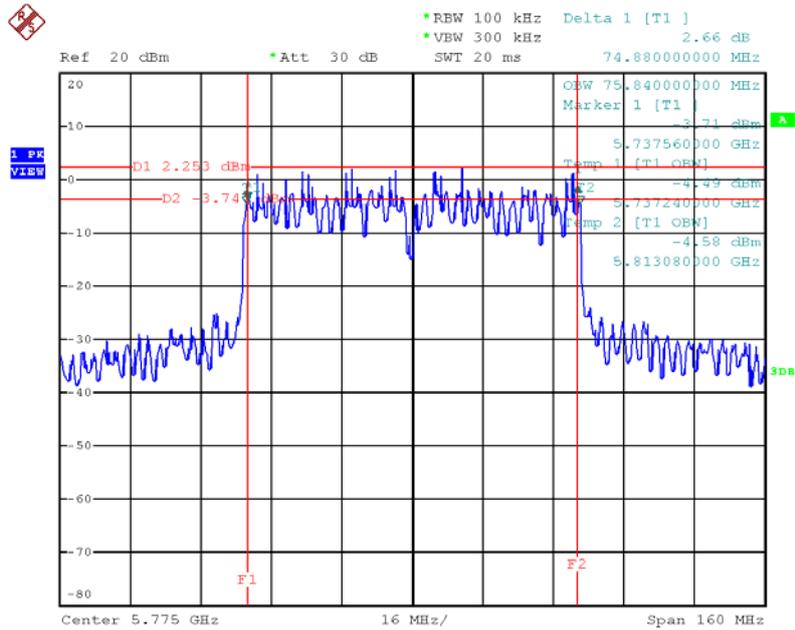
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6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0 40MHz / Chain 3 + Chain 4 / 5755MHz



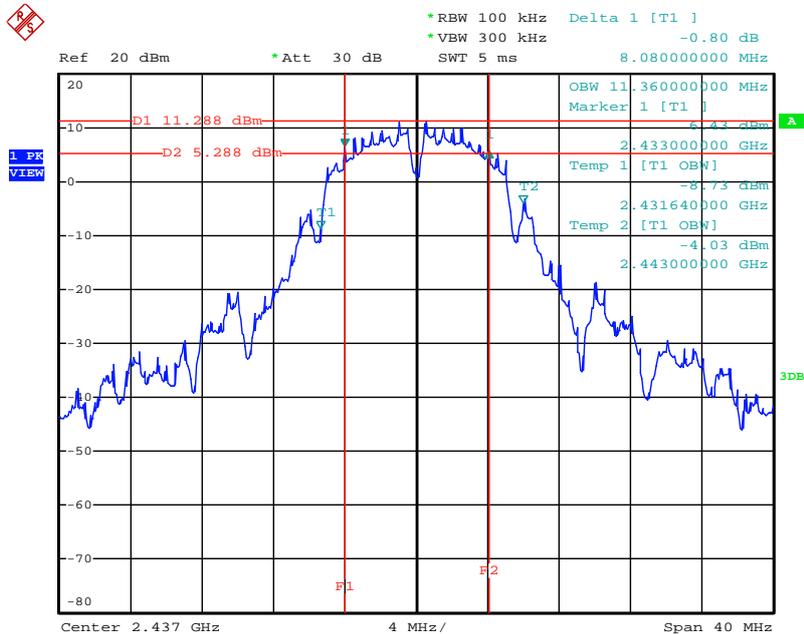
Date: 21.MAY.2013 02:15:28

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0 80MHz / Chain 3 + Chain 4 / 5775 MHz



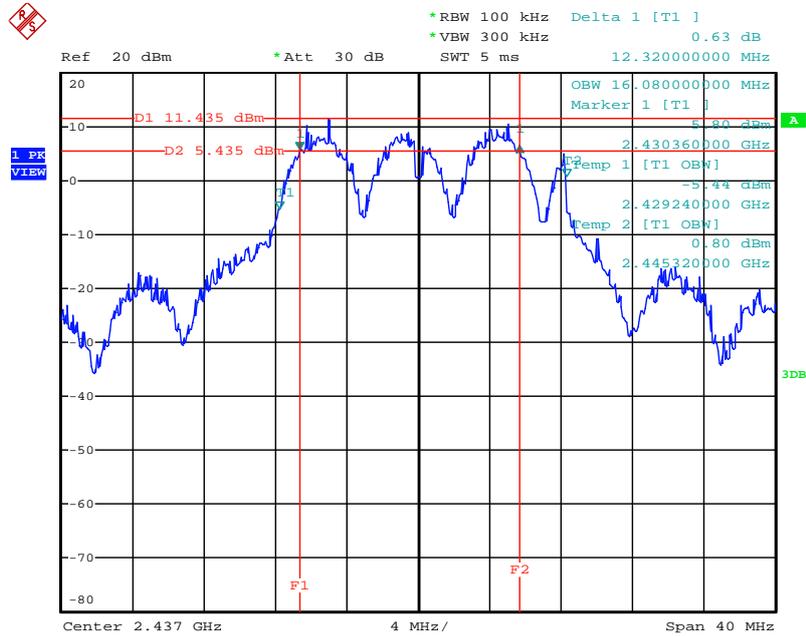
Date: 21.MAY.2013 02:19:23

6 dB Bandwidth Plot on Configuration IEEE 802.11b / Chain 2 / 2437 MHz



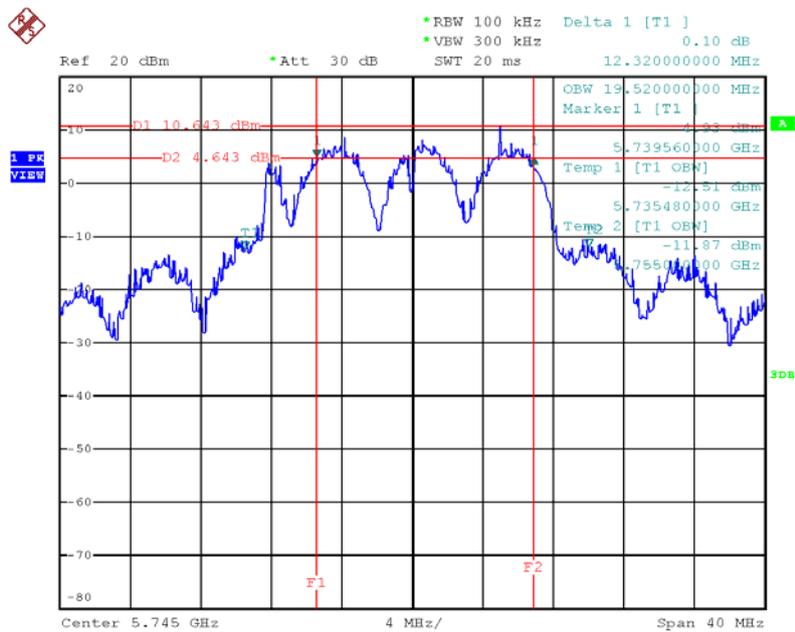
Date: 31.JAN.2013 11:32:43

6 dB Bandwidth Plot on Configuration IEEE 802.11g / Chain 1 + Chain 2 / 2437 MHz



Date: 31.JAN.2013 11:34:57

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 + Chain 4 / 5745 MHz



Date: 21.MAY.2013 02:09:36

4.5. Radiated Emissions Measurement

4.5.1. Limit

30dBc 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 (microrvolts/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
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

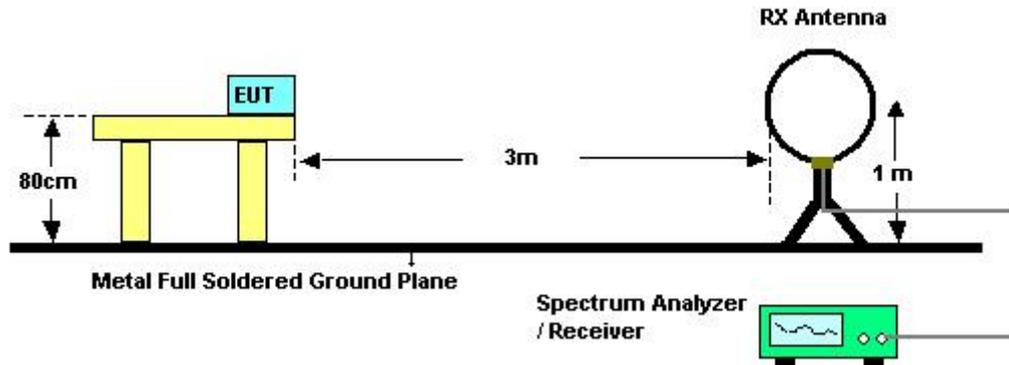
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RB 120kHz for QP

4.5.3. Test Procedures

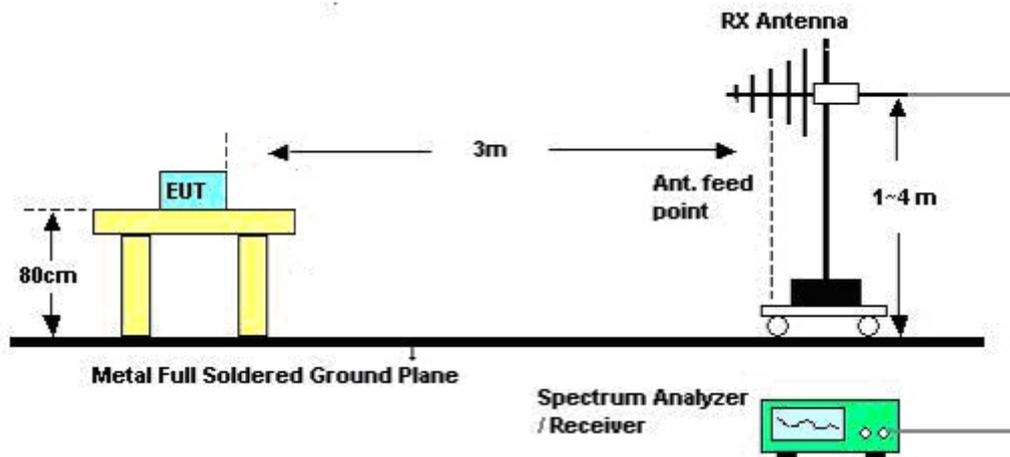
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	Normal Link
Test Date	May 22, 2013		

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.

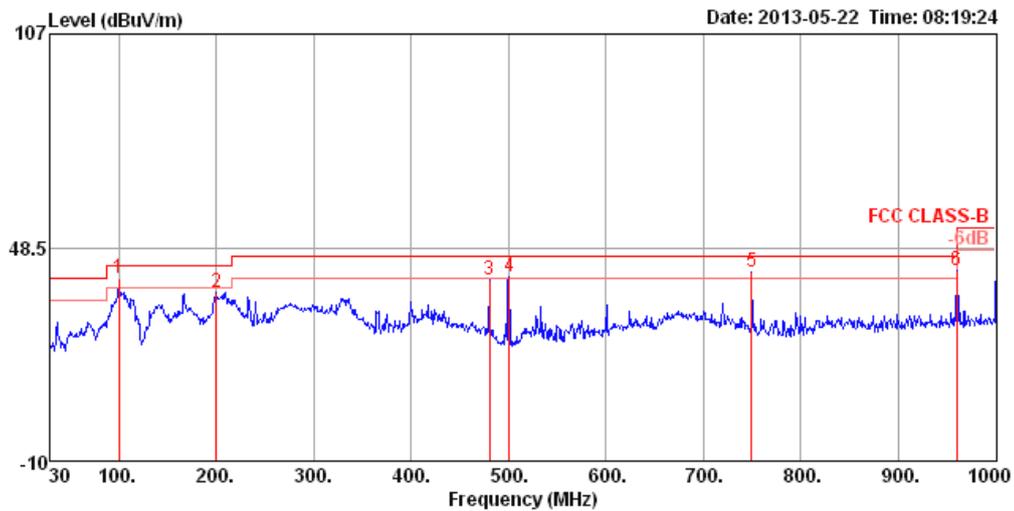
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

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

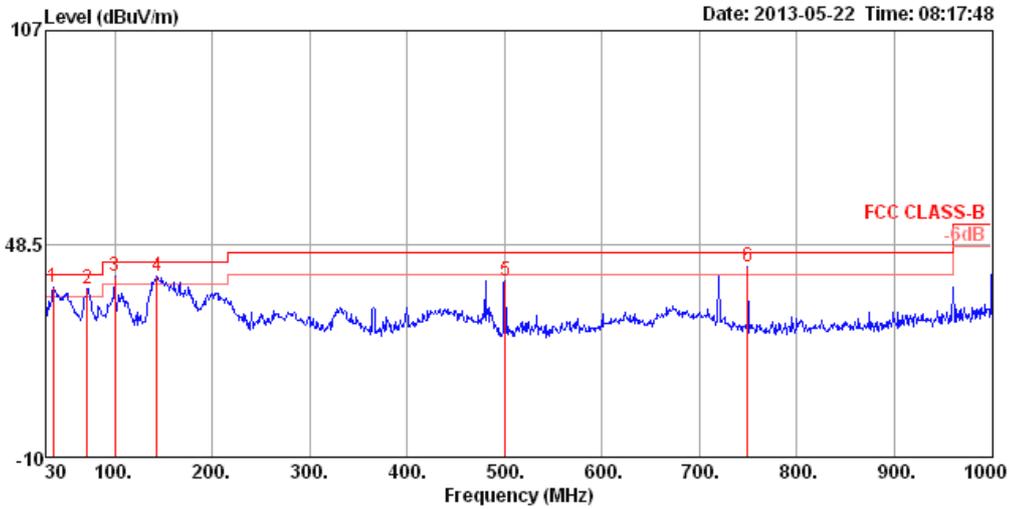
Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	Normal Link
Test Mode	Mode 1. EUT + Power Adapter 1		

Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	pp	99.84	40.19	43.50	-3.31	60.31	1.18	10.31	31.61	300	174 HORIZONTAL Peak
2		199.75	36.22	43.50	-7.28	57.28	1.70	8.75	31.51	150	70 HORIZONTAL Peak
3		480.08	39.49	46.00	-6.51	51.16	2.72	16.81	31.20	125	305 HORIZONTAL Peak
4	!	500.45	40.59	46.00	-5.41	52.26	2.82	16.92	31.41	100	139 HORIZONTAL Peak
5	!	749.74	42.01	46.00	-3.99	50.16	3.53	19.69	31.37	125	87 HORIZONTAL Peak
6		960.23	42.32	54.00	-11.68	48.26	4.10	21.05	31.09	100	135 HORIZONTAL Peak

Vertical



	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	pp	36.79	36.50	40.00	-3.50	53.47	0.71	14.20	31.88	100	99 VERTICAL	Peak
2	!	71.71	36.16	40.00	-3.84	61.41	1.01	5.49	31.75	150	100 VERTICAL	Peak
3	!	99.84	39.48	43.50	-4.02	59.60	1.18	10.31	31.61	100	184 VERTICAL	Peak
4	!	143.49	39.85	43.50	-3.65	59.37	1.42	10.59	31.53	100	147 VERTICAL	Peak
5	!	500.45	38.56	46.00	-7.44	50.23	2.82	16.92	31.41	125	205 VERTICAL	Peak
6	!	749.74	42.40	46.00	-3.60	50.55	3.53	19.69	31.37	100	224 VERTICAL	Peak

Note:

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

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

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

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

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 1 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4823.30	44.36	74.00	-29.64	43.02	3.31	33.06	35.03	Peak	101	18	HORIZONTAL
2	4823.95	31.30	54.00	-22.70	29.96	3.31	33.06	35.03	Average	101	18	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	4823.29	42.45	74.00	-31.55	41.11	3.31	33.06	35.03	Peak	100	281	VERTICAL
2	4823.49	30.22	54.00	-23.78	28.88	3.31	33.06	35.03	Average	100	281	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 6 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4873.82	34.54	54.00	-19.46	33.08	3.33	33.16	35.03	Average	100	105	HORIZONTAL
2	4875.88	46.67	74.00	-27.33	45.21	3.33	33.16	35.03	Peak	100	105	HORIZONTAL
3	7310.18	53.51	74.00	-20.49	48.89	4.06	35.96	35.40	Peak	128	277	HORIZONTAL
4	7310.67	38.66	54.00	-15.34	34.04	4.06	35.96	35.40	Average	128	277	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	4873.10	37.60	54.00	-16.40	36.14	3.33	33.16	35.03	Average	100	102	VERTICAL
2	4873.11	55.05	74.00	-18.95	53.59	3.33	33.16	35.03	Peak	100	102	VERTICAL
3	7312.55	56.31	74.00	-17.69	51.69	4.06	35.96	35.40	Peak	100	344	VERTICAL
4	7312.92	40.58	54.00	-13.42	35.96	4.06	35.96	35.40	Average	100	344	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 11 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	4923.99	32.63	54.00	-21.37	31.03	3.35	33.26	35.01	Average	100	238	HORIZONTAL
2	4923.99	45.00	74.00	-29.00	43.40	3.35	33.26	35.01	Peak	100	238	HORIZONTAL
3	7387.39	46.55	74.00	-27.45	41.80	4.06	36.09	35.40	Peak	100	159	HORIZONTAL
4	7387.88	35.16	54.00	-18.84	30.41	4.06	36.09	35.40	Average	100	159	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	4924.70	31.97	54.00	-22.03	30.37	3.35	33.26	35.01	Average	100	11	VERTICAL
2	4926.49	43.97	74.00	-30.03	42.37	3.35	33.26	35.01	Peak	100	11	VERTICAL
3	7385.83	35.31	54.00	-18.69	30.56	4.06	36.09	35.40	Average	100	213	VERTICAL
4	7387.25	46.28	74.00	-27.72	41.53	4.06	36.09	35.40	Peak	100	213	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 3 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4842.31	42.78	74.00	-31.22	41.40	3.32	33.09	35.03	Peak	100	295	HORIZONTAL
2	4844.10	30.02	54.00	-23.98	28.64	3.32	33.09	35.03	Average	100	295	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	4844.10	43.01	74.00	-30.99	41.63	3.32	33.09	35.03	Peak	100	155	VERTICAL
2	4844.31	29.80	54.00	-24.20	28.42	3.32	33.09	35.03	Average	100	155	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 6 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4874.02	30.77	54.00	-23.23	29.31	3.33	33.16	35.03	Average	100	225	HORIZONTAL
2	4874.41	43.98	74.00	-30.02	42.52	3.33	33.16	35.03	Peak	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	4874.82	43.57	74.00	-30.43	42.11	3.33	33.16	35.03	Peak	100	292	VERTICAL
2	4874.84	30.51	54.00	-23.49	29.05	3.33	33.16	35.03	Average	100	292	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 9 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4903.06	42.70	74.00	-31.30	41.19	3.34	33.19	35.02	Peak	100	128	HORIZONTAL
2	4903.95	30.29	54.00	-23.71	28.78	3.34	33.19	35.02	Average	100	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	4901.57	43.01	74.00	-30.99	41.50	3.34	33.19	35.02	Peak	100	232	VERTICAL
2	4903.74	30.46	54.00	-23.54	28.95	3.34	33.19	35.02	Average	100	232	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11ac MCS0 20MHz Ch 149 / Chain 3 + Chain 4
Test Date	Apr. 25, 2013		

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	11480.38	66.42	74.00	-7.58	57.82	5.11	38.77	35.28	Peak	100	148	HORIZONTAL
2	11488.65	50.21	54.00	-3.79	41.60	5.11	38.78	35.28	Average	100	148	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	11489.78	44.95	54.00	-9.05	36.34	5.11	38.78	35.28	Average	100	201	VERTICAL
2	11489.87	57.69	74.00	-16.31	49.08	5.11	38.78	35.28	Peak	100	201	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11ac MCS0 20MHz Ch 157 / Chain 3 + Chain 4
Test Date	Apr. 25, 2013		

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	11566.44	65.04	74.00	-8.96	56.39	5.13	38.82	35.30	Peak	151	154	HORIZONTAL
2	11569.13	48.73	54.00	-5.27	40.07	5.13	38.83	35.30	Average	151	154	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	11569.90	57.49	74.00	-16.51	48.82	5.14	38.83	35.30	Peak	100	212	VERTICAL
2	11569.97	44.73	54.00	-9.27	36.06	5.14	38.83	35.30	Average	100	212	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11ac MCS0 20MHz Ch 165 / Chain 3 + Chain 4
Test Date	Apr. 25, 2013		

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	11648.72	67.78	74.00	-6.22	59.06	5.16	38.86	35.30	Peak	149	153	HORIZONTAL
2	11648.97	52.54	54.00	-1.46	43.82	5.16	38.86	35.30	Average	149	153	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	11649.33	59.26	74.00	-14.74	50.54	5.16	38.86	35.30	Peak	100	214	VERTICAL
2	11649.87	46.46	54.00	-7.54	37.74	5.16	38.86	35.30	Average	100	214	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11ac MCS0 40MHz Ch 151 / Chain 3 + Chain 4
Test Date	Apr. 25, 2013		

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	11486.44	67.29	74.00	-6.71	58.68	5.11	38.78	35.28	Peak	100	157	HORIZONTAL
2	11509.52	53.31	54.00	-0.69	44.68	5.12	38.79	35.28	Average	100	157	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	11493.01	59.79	74.00	-14.21	51.18	5.11	38.78	35.28	Peak	111	111	VERTICAL
2	11508.72	45.94	54.00	-8.06	37.31	5.12	38.79	35.28	Average	111	111	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11ac MCS0 40MHz Ch 159 / Chain 3 + Chain 4
Test Date	Apr. 25, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11573.01	53.22	54.00	-0.78	44.55	5.14	38.83	35.30 Average	148	143	HORIZONTAL
2	11579.50	64.66	74.00	-9.34	55.99	5.14	38.83	35.30 Peak	148	143	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11589.84	58.64	74.00	-15.36	49.97	5.14	38.83	35.30 Peak	100	203	VERTICAL
2	11589.92	45.54	54.00	-8.46	36.87	5.14	38.83	35.30 Average	100	203	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11ac MCS0 80MHz Ch 155 / Chain 3 + Chain 4
Test Date	Apr. 25, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11537.66	61.34	74.00	-12.66	52.69	5.13	38.81	35.29	Peak	144	156	HORIZONTAL
2	11564.42	50.76	54.00	-3.24	42.11	5.13	38.82	35.30	Average	144	156	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11537.82	54.09	74.00	-19.91	45.44	5.13	38.81	35.29	Peak	100	168	VERTICAL
2	11567.87	44.27	54.00	-9.73	35.61	5.13	38.83	35.30	Average	100	168	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b Ch 1 / Chain 2
Test Date	Jan. 22, 2013		

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	4824.02	44.62	54.00	-9.38	43.28	3.31	33.06	35.03	Average	101	320	HORIZONTAL
2	4824.10	46.70	74.00	-27.30	45.36	3.31	33.06	35.03	Peak	101	320	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	4824.02	44.80	54.00	-9.20	43.46	3.31	33.06	35.03	Average	138	128	VERTICAL
2	4824.04	47.54	74.00	-26.46	46.20	3.31	33.06	35.03	Peak	138	128	VERTICAL



Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b Ch 6 / Chain 2
Test Date	Jan. 22, 2013		

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	1624.68	47.15	74.00	-26.85	54.95	1.79	25.83	35.42	Peak	100	161	HORIZONTAL
2	1624.68	44.44	54.00	-9.56	52.24	1.79	25.83	35.42	Average	100	161	HORIZONTAL
3	4873.93	50.84	74.00	-23.16	49.38	3.33	33.16	35.03	Peak	100	274	HORIZONTAL
4	4874.02	46.58	54.00	-7.42	45.12	3.33	33.16	35.03	Average	100	274	HORIZONTAL
5	7310.31	39.40	54.00	-14.60	34.78	4.06	35.96	35.40	Average	101	309	HORIZONTAL
6	7311.90	49.74	74.00	-24.26	45.12	4.06	35.96	35.40	Peak	101	309	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	1624.64	49.72	74.00	-24.28	57.52	1.79	25.83	35.42	Peak	100	251	VERTICAL
2	1624.66	47.81	54.00	-6.19	55.61	1.79	25.83	35.42	Average	100	251	VERTICAL
3	4873.94	54.32	74.00	-19.68	52.86	3.33	33.16	35.03	Peak	100	341	VERTICAL
4	4874.02	51.36	54.00	-2.64	49.90	3.33	33.16	35.03	Average	100	341	VERTICAL
5	7310.01	54.39	74.00	-19.61	49.77	4.06	35.96	35.40	Peak	114	319	VERTICAL
6	7310.30	47.60	54.00	-6.40	42.98	4.06	35.96	35.40	Average	114	319	VERTICAL



Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b Ch 11 / Chain 2 (1TX)
Test Date	Jan. 22, 2013		

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	4924.03	44.58	54.00	-9.42	42.98	3.35	33.26	35.01	Average	100	158	HORIZONTAL
2	4924.06	49.98	74.00	-24.02	48.38	3.35	33.26	35.01	Peak	100	158	HORIZONTAL
3	7385.87	47.51	74.00	-26.49	42.76	4.06	36.09	35.40	Peak	103	207	HORIZONTAL
4	7386.87	35.26	54.00	-18.74	30.51	4.06	36.09	35.40	Average	103	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	4924.03	50.85	74.00	-23.15	49.25	3.35	33.26	35.01	Peak	114	212	VERTICAL
2	4924.04	46.42	54.00	-7.58	44.82	3.35	33.26	35.01	Average	114	212	VERTICAL
3	7385.34	42.46	54.00	-11.54	37.71	4.06	36.09	35.40	Average	103	141	VERTICAL
4	7386.85	51.02	74.00	-22.98	46.27	4.06	36.09	35.40	Peak	103	141	VERTICAL

Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g Ch 1 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4800.02	49.99	74.00	-24.01	48.75	3.29	32.99	35.04	Peak	163	99	HORIZONTAL
2	4800.06	46.59	54.00	-7.41	45.35	3.29	32.99	35.04	Average	163	99	HORIZONTAL
3	4823.70	45.73	74.00	-28.27	44.39	3.31	33.06	35.03	Peak	152	131	HORIZONTAL
4	4823.87	32.55	54.00	-21.45	31.21	3.31	33.06	35.03	Average	152	131	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	4799.93	53.24	74.00	-20.76	52.00	3.29	32.99	35.04	Peak	118	89	VERTICAL
2	4800.04	50.43	54.00	-3.57	49.19	3.29	32.99	35.04	Average	118	89	VERTICAL
3	4821.84	31.08	54.00	-22.92	29.74	3.31	33.06	35.03	Average	100	292	VERTICAL
4	4826.08	46.58	74.00	-27.42	45.24	3.31	33.06	35.03	Peak	100	292	VERTICAL



Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g Ch 6 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4873.34	36.14	54.00	-17.86	34.68	3.33	33.16	35.03	Average	100	92	HORIZONTAL
2	4873.36	49.69	74.00	-24.31	48.23	3.33	33.16	35.03	Peak	100	92	HORIZONTAL
3	7309.73	56.13	74.00	-17.87	51.51	4.06	35.96	35.40	Peak	104	52	HORIZONTAL
4	7309.85	41.70	54.00	-12.30	37.08	4.06	35.96	35.40	Average	104	52	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	4872.69	40.47	54.00	-13.53	39.01	3.33	33.16	35.03	Average	100	204	VERTICAL
2	4872.91	58.35	74.00	-15.65	56.89	3.33	33.16	35.03	Peak	100	204	VERTICAL
3	7314.61	43.00	54.00	-11.00	38.38	4.06	35.96	35.40	Average	100	71	VERTICAL
4	7315.28	58.75	74.00	-15.25	54.13	4.06	35.96	35.40	Peak	100	71	VERTICAL



Temperature	25.6	Humidity	56%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g Ch 11 / Chain 1 + Chain 2
Test Date	Jan. 22, 2013		

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	4924.01	33.02	54.00	-20.98	31.42	3.35	33.26	35.01	Average	128	1	HORIZONTAL
2	4924.71	46.19	74.00	-27.81	44.59	3.35	33.26	35.01	Peak	128	1	HORIZONTAL
3	7385.18	35.38	54.00	-18.62	30.63	4.06	36.09	35.40	Average	100	360	HORIZONTAL
4	7386.18	48.26	74.00	-25.74	43.51	4.06	36.09	35.40	Peak	100	360	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	4924.65	32.86	54.00	-21.14	31.26	3.35	33.26	35.01	Average	113	342	VERTICAL
2	4924.81	44.71	74.00	-29.29	43.11	3.35	33.26	35.01	Peak	113	342	VERTICAL
3	7385.60	50.21	74.00	-23.79	45.46	4.06	36.09	35.40	Peak	106	9	VERTICAL
4	7385.76	36.91	54.00	-17.09	32.16	4.06	36.09	35.40	Average	106	9	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11a Ch 149 / Chain 3 + Chain 4
Test Date	Apr. 24, 2013		

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	11487.95	51.98	54.00	-2.02	43.37	5.11	38.78	35.28	Average	150	146	HORIZONTAL
2	11488.14	68.55	74.00	-5.45	59.94	5.11	38.78	35.28	Peak	150	146	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	11488.65	64.13	74.00	-9.87	55.52	5.11	38.78	35.28	Peak	100	113	VERTICAL
2	11491.03	49.77	54.00	-4.23	41.16	5.11	38.78	35.28	Average	100	113	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11a Ch 157 / Chain 3 + Chain 4
Test Date	Apr. 24, 2013		

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	11568.17	51.06	54.00	-2.94	42.40	5.13	38.83	35.30	Average	155	152	HORIZONTAL
2	11568.21	67.64	74.00	-6.36	58.98	5.13	38.83	35.30	Peak	155	152	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	11568.69	63.99	74.00	-10.01	55.33	5.13	38.83	35.30	Peak	100	210	VERTICAL
2	11568.94	48.87	54.00	-5.13	40.21	5.13	38.83	35.30	Average	100	210	VERTICAL

Temperature	26°C	Humidity	60%
Test Engineer	Serway Li	Configurations	IEEE 802.11a Ch 165 / Chain 3 + Chain 4
Test Date	Apr. 24, 2013		

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	11648.78	65.84	74.00	-8.16	57.12	5.16	38.86	35.30	Peak	100	163	HORIZONTAL
2	11649.39	51.43	54.00	-2.57	42.71	5.16	38.86	35.30	Average	100	163	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	11648.72	59.69	74.00	-14.31	50.97	5.16	38.86	35.30	Peak	100	179	VERTICAL
2	11649.87	46.36	54.00	-7.64	37.64	5.16	38.86	35.30	Average	100	179	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. Emissions Measurement

4.6.1. Limit

30dBc 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
RBW / VBW (Emission in restricted band)	1 MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around band edges.

For Conducted Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure
2. The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Conducted Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.4.4.

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25.6°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 20MHz Ch 1, 6, 11 / Chain 1 + Chain 2
Test date	Jan. 20, 2013		

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	53.81	54.00	-0.19	23.42	2.22	28.17	0.00	Average	160	97	HORIZONTAL
2	2390.00	68.49	74.00	-5.51	38.10	2.22	28.17	0.00	Peak	160	97	HORIZONTAL
3	2409.44	101.76			71.33	2.22	28.21	0.00	Average	160	97	HORIZONTAL
4	2409.60	111.69			81.26	2.22	28.21	0.00	Peak	160	97	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	2388.40	65.53	74.00	-8.47	35.15	2.21	28.17	0.00	Peak	122	81	HORIZONTAL
2	2390.00	51.38	54.00	-2.62	20.99	2.22	28.17	0.00	Average	122	81	HORIZONTAL
3	2434.60	108.49			77.97	2.23	28.29	0.00	Average	122	81	HORIZONTAL
4	2434.76	119.41			88.89	2.23	28.29	0.00	Peak	122	81	HORIZONTAL
5	2484.14	67.98	74.00	-6.02	37.34	2.26	28.38	0.00	Peak	122	81	HORIZONTAL
6	2484.46	53.52	54.00	-0.48	22.88	2.26	28.38	0.00	Average	122	81	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	2459.44	102.85			72.28	2.24	28.33	0.00	Average	156	346	HORIZONTAL
2	2464.56	113.35			82.78	2.24	28.33	0.00	Peak	156	346	HORIZONTAL
3	2483.98	70.92	74.00	-3.08	40.28	2.26	28.38	0.00	Peak	156	346	HORIZONTAL
4	2484.46	53.98	54.00	-0.02	23.34	2.26	28.38	0.00	Average	156	346	HORIZONTAL

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

Temperature	25.6°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n MCS0 40MHz Ch 3, 6, 9 / Chain 1 + Chain 2
Test date	Jan. 20, 2013		

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	2390.00	53.73	54.00	-0.27	23.34	2.22	28.17	0.00	Average	123	31	HORIZONTAL
2	2390.00	67.31	74.00	-6.69	36.92	2.22	28.17	0.00	Peak	123	31	HORIZONTAL
3	2424.56	106.23			75.75	2.23	28.25	0.00	Peak	123	31	HORIZONTAL
4	2426.81	96.24			65.76	2.23	28.25	0.00	Average	123	31	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	2389.68	51.52	54.00	-2.48	21.14	2.21	28.17	0.00	Average	152	272	HORIZONTAL
2	2390.00	66.10	74.00	-7.90	35.71	2.22	28.17	0.00	Peak	152	272	HORIZONTAL
3	2431.87	100.53			70.05	2.23	28.25	0.00	Average	152	272	HORIZONTAL
4	2434.12	111.64			81.12	2.23	28.29	0.00	Peak	152	272	HORIZONTAL
5	2484.46	53.73	54.00	-0.27	23.09	2.26	28.38	0.00	Average	152	272	HORIZONTAL
6	2484.46	68.38	74.00	-5.62	37.74	2.26	28.38	0.00	Peak	152	272	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	2446.87	96.13			65.60	2.24	28.29	0.00	Average	154	138	HORIZONTAL
2	2446.87	106.47			75.94	2.24	28.29	0.00	Peak	154	138	HORIZONTAL
3	2483.82	66.43	74.00	-7.57	35.79	2.26	28.38	0.00	Peak	154	138	HORIZONTAL
4	2484.78	53.15	54.00	-0.85	22.51	2.26	28.38	0.00	Average	154	138	HORIZONTAL

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

Note:

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

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

Temperature	25.6°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11b Ch 1, 6, 11 / Chain 2
Test date	Jan. 20, 2013		

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	53.54	54.00	-0.46	23.15	2.22	28.17	0.00	Average	123	155	HORIZONTAL
2	2390.00	64.82	74.00	-9.18	34.43	2.22	28.17	0.00	Peak	123	155	HORIZONTAL
3	2411.04	115.04			84.61	2.22	28.21	0.00	Peak	123	155	HORIZONTAL
4	2411.36	111.26			80.83	2.22	28.21	0.00	Average	123	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	2390.00	53.76	54.00	-0.24	23.37	2.22	28.17	0.00	Average	156	144	HORIZONTAL
2	2390.00	66.17	74.00	-7.83	35.78	2.22	28.17	0.00	Peak	156	144	HORIZONTAL
3	2436.36	115.15			84.63	2.23	28.29	0.00	Average	156	144	HORIZONTAL
4	2436.36	118.93			88.41	2.23	28.29	0.00	Peak	156	144	HORIZONTAL
5	2483.50	53.65	54.00	-0.35	23.01	2.26	28.38	0.00	Average	156	144	HORIZONTAL
6	2483.50	65.48	74.00	-8.52	34.84	2.26	28.38	0.00	Peak	156	144	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	2461.20	112.54			81.97	2.24	28.33	0.00	Average	141	86	HORIZONTAL
2	2461.20	117.08			86.51	2.24	28.33	0.00	Peak	141	86	HORIZONTAL
3	2483.50	53.82	54.00	-0.18	23.18	2.26	28.38	0.00	Average	141	86	HORIZONTAL
4	2484.30	67.00	74.00	-7.00	36.36	2.26	28.38	0.00	Peak	141	86	HORIZONTAL

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

Temperature	25.6°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11g Ch 1, 6, 11 / Chain 1 + Chain 2
Test date	Jan. 20, 2013		

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	2388.24	68.78	74.00	-5.22	38.40	2.21	28.17	0.00	Peak	154	0	HORIZONTAL
2	2390.00	53.76	54.00	-0.24	23.37	2.22	28.17	0.00	Average	154	0	HORIZONTAL
3	2407.03	104.45			74.02	2.22	28.21	0.00	Average	154	0	HORIZONTAL
4	2416.33	114.59			84.15	2.23	28.21	0.00	Peak	154	0	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	2389.84	67.23	74.00	-6.77	36.84	2.22	28.17	0.00	Peak	154	8	HORIZONTAL
2	2390.00	53.73	54.00	-0.27	23.34	2.22	28.17	0.00	Average	154	8	HORIZONTAL
3	2431.55	119.36			88.88	2.23	28.25	0.00	Peak	154	8	HORIZONTAL
4	2431.87	108.98			78.50	2.23	28.25	0.00	Average	154	8	HORIZONTAL
5	2486.20	53.39	54.00	-0.61	22.71	2.26	28.42	0.00	Average	154	8	HORIZONTAL
6	2486.68	67.92	74.00	-6.08	37.24	2.26	28.42	0.00	Peak	154	8	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	2456.71	113.51			82.94	2.24	28.33	0.00	Peak	153	320	HORIZONTAL
2	2456.87	103.47			72.90	2.24	28.33	0.00	Average	153	320	HORIZONTAL
3	2483.50	53.68	54.00	-0.32	23.04	2.26	28.38	0.00	Average	153	320	HORIZONTAL
4	2483.50	68.33	74.00	-5.67	37.69	2.26	28.38	0.00	Peak	153	320	HORIZONTAL

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

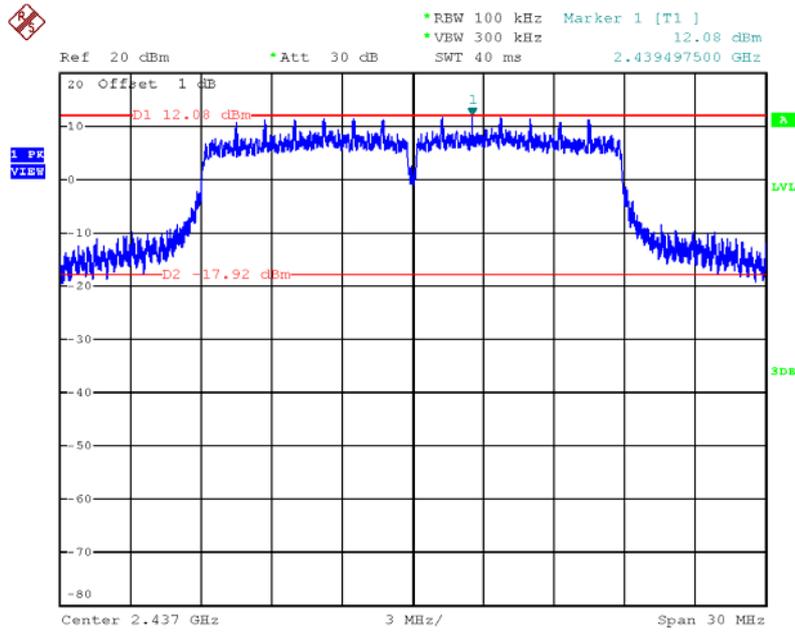
Note:

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

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

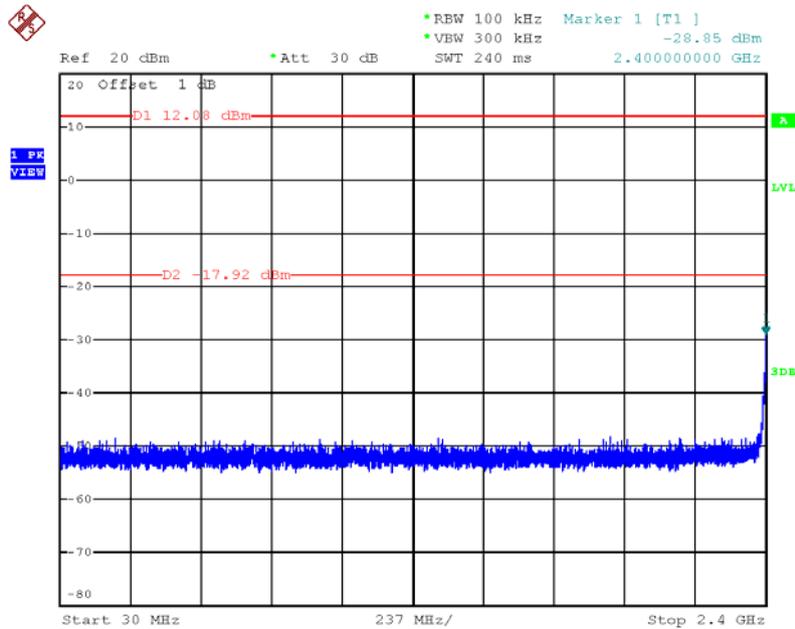
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 20MHz / Reference Level



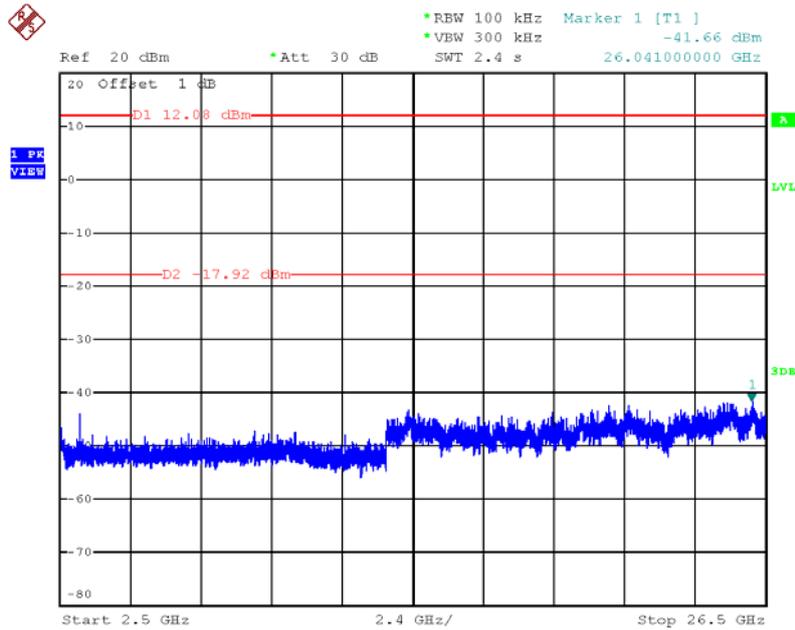
Date: 23.MAY.2013 20:05:43

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 1 / 30MHz~2400MHz (down 30dBc)



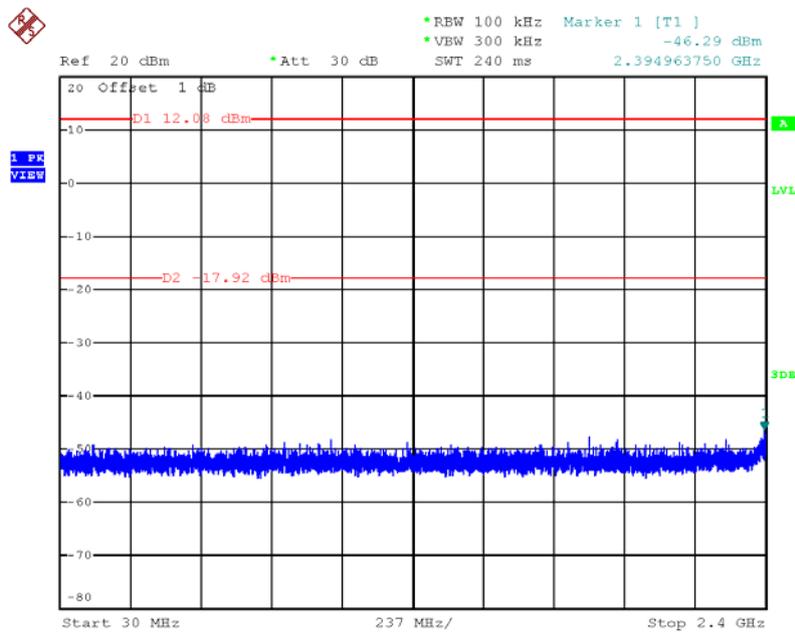
Date: 23.MAY.2013 20:07:09

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 1 / 2500MHz~26500MHz (down 30dBc)



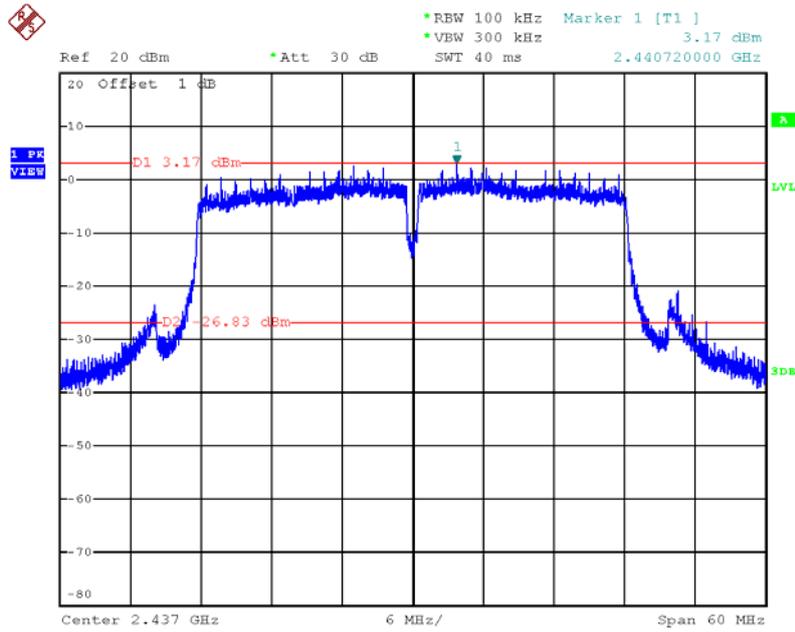
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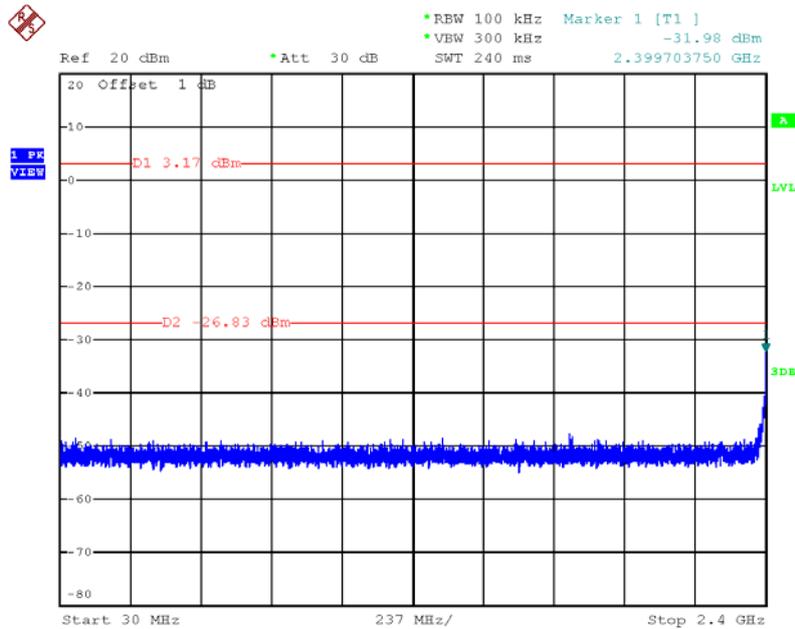
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Plot on Configuration IEEE 802.11n MCS0 40MHz / Reference Level



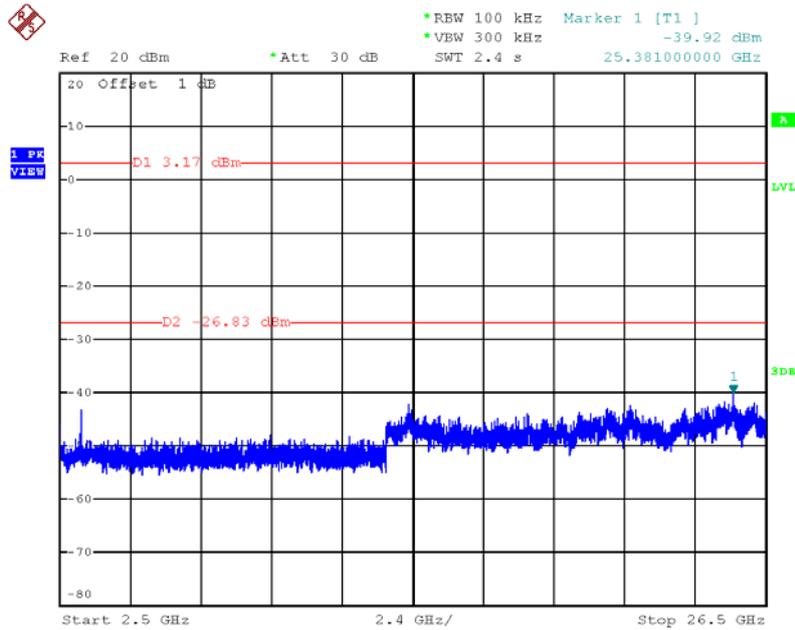
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Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 3 / 30MHz~2400MHz (down 30dBc)



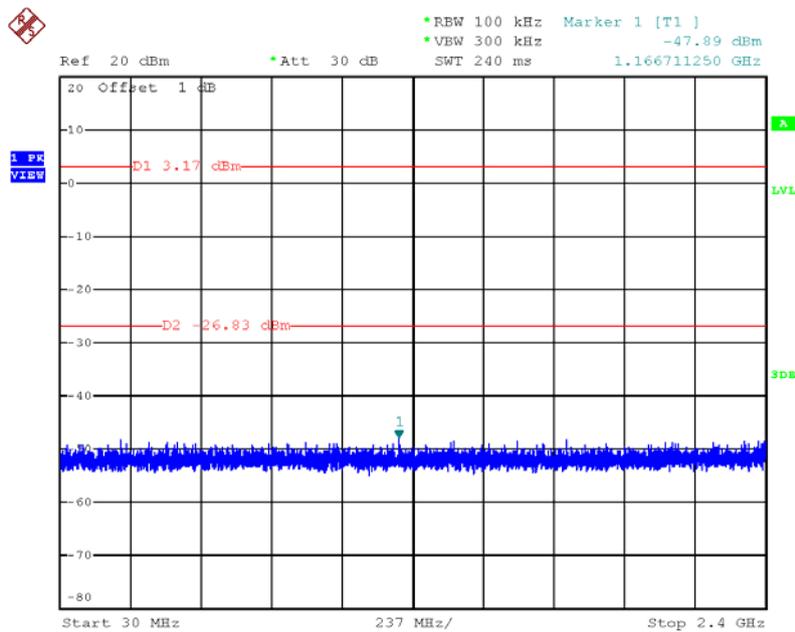
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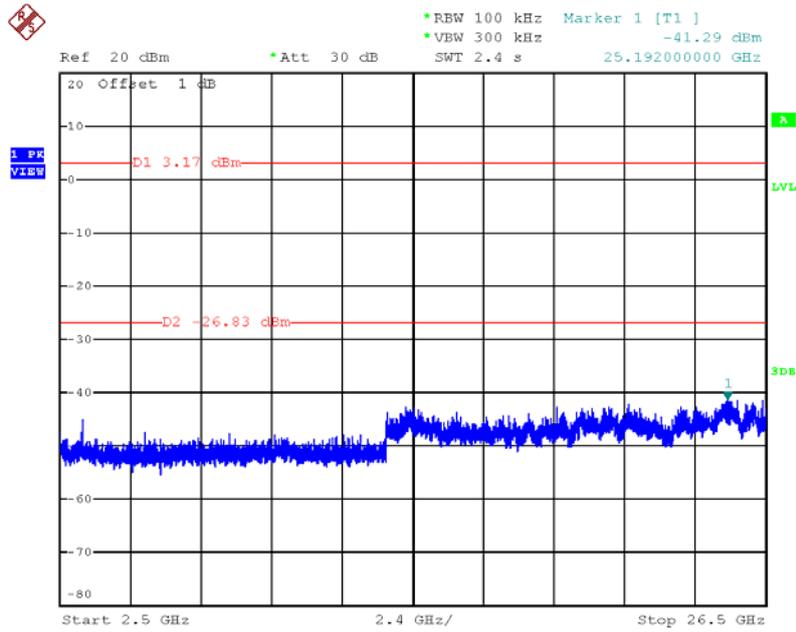
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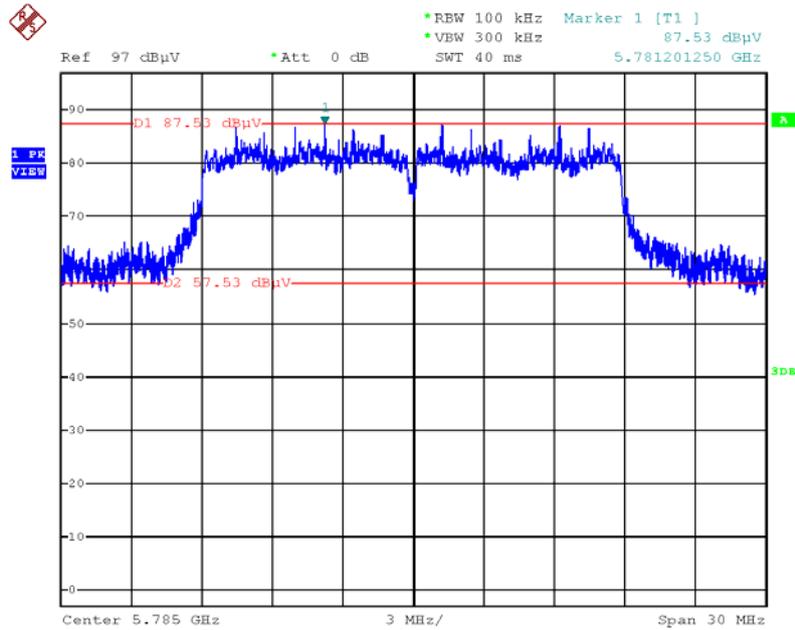
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Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 9 / 2500MHz~26500MHz (down 30dBc)



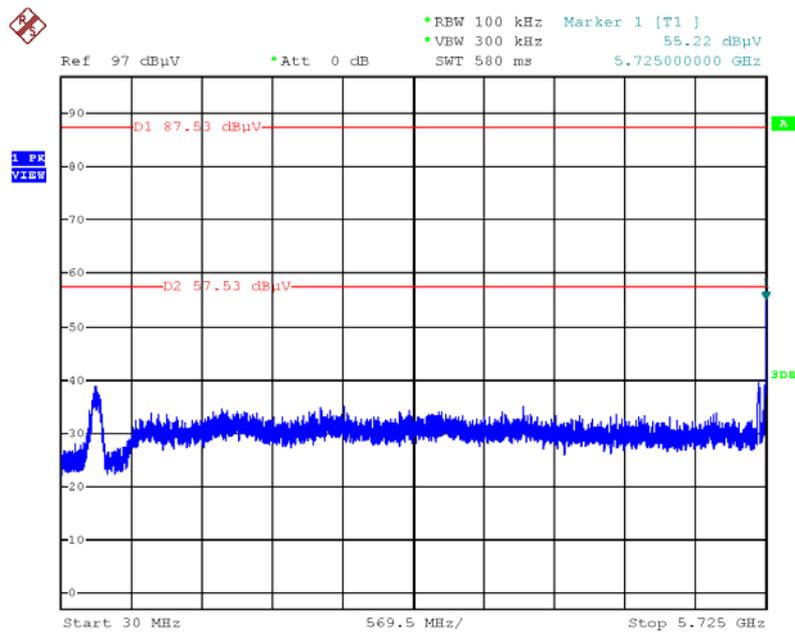
Date: 23.MAY.2013 20:17:28

Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Reference Level



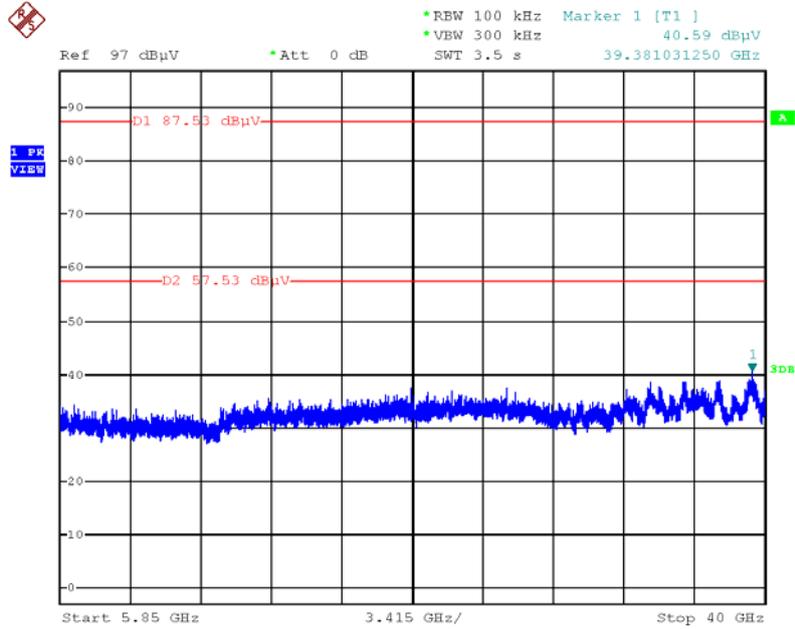
Date: 26.APR.2013 02:50:17

Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / CH 149 / 30MHz~5725MHz (down 30dBc)



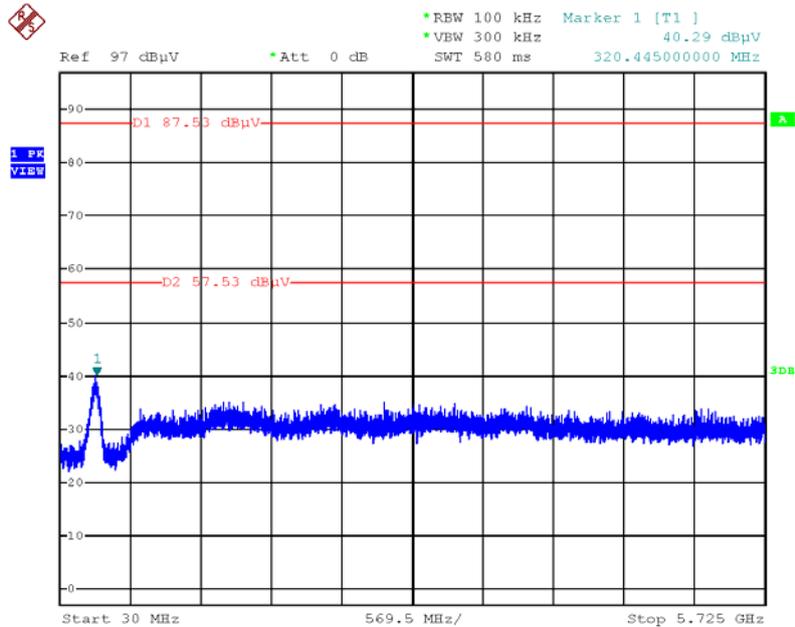
Date: 26.APR.2013 02:52:04

Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / CH 149 / 5850MHz~40000MHz (down 30dBc)



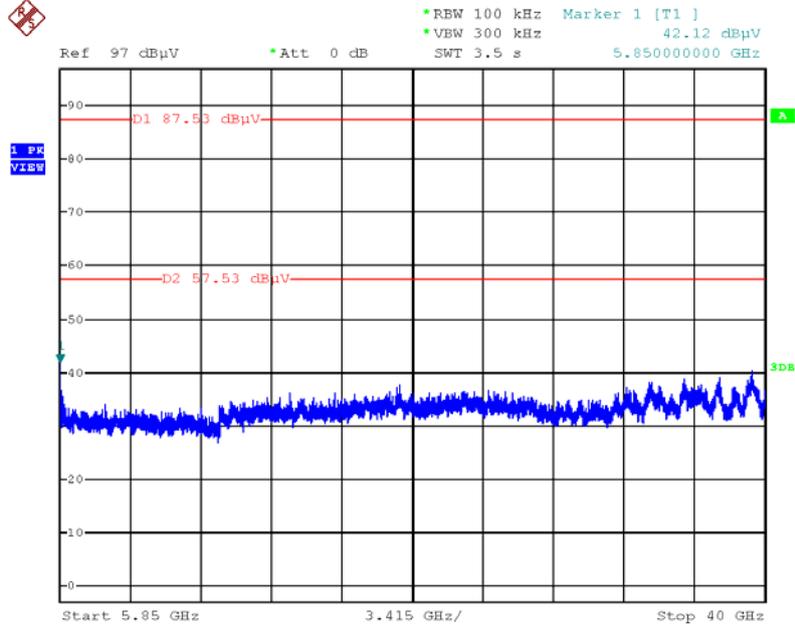
Date: 26.APR.2013 02:52:42

Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / CH 165 / 30MHz~5725MHz (down 30dBc)



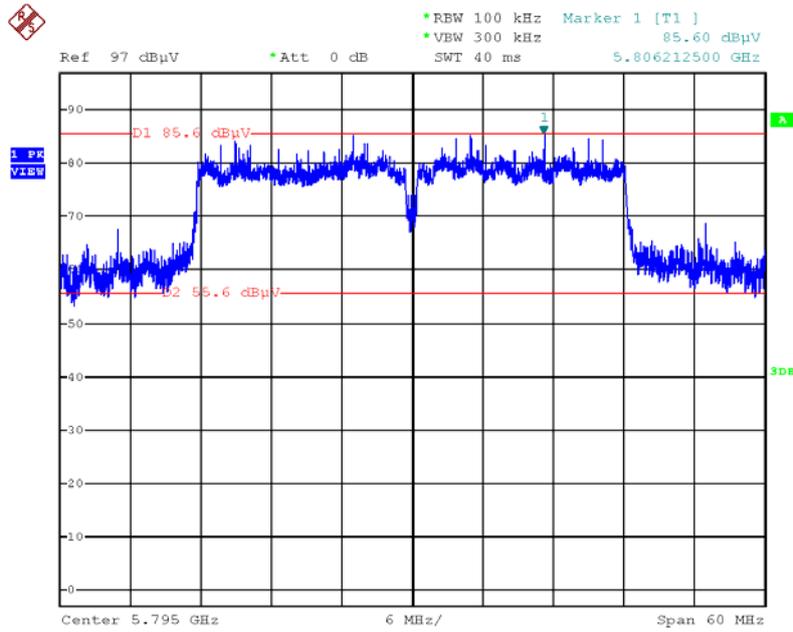
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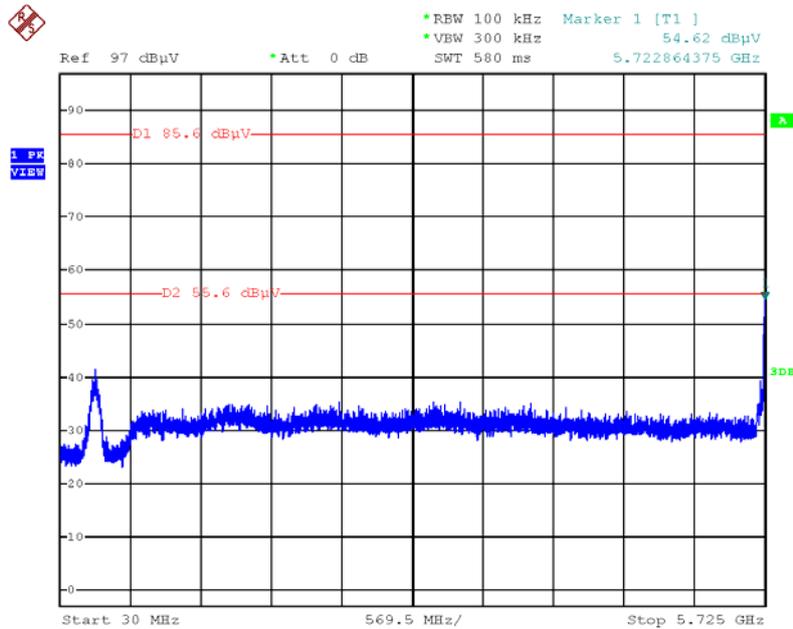
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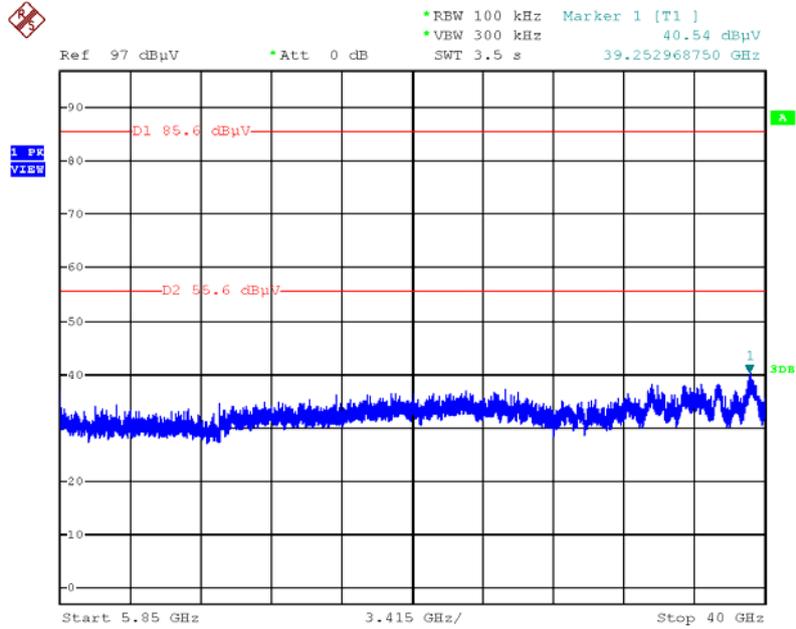
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Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / CH 151 / 30MHz-5725MHz (down 30dBc)



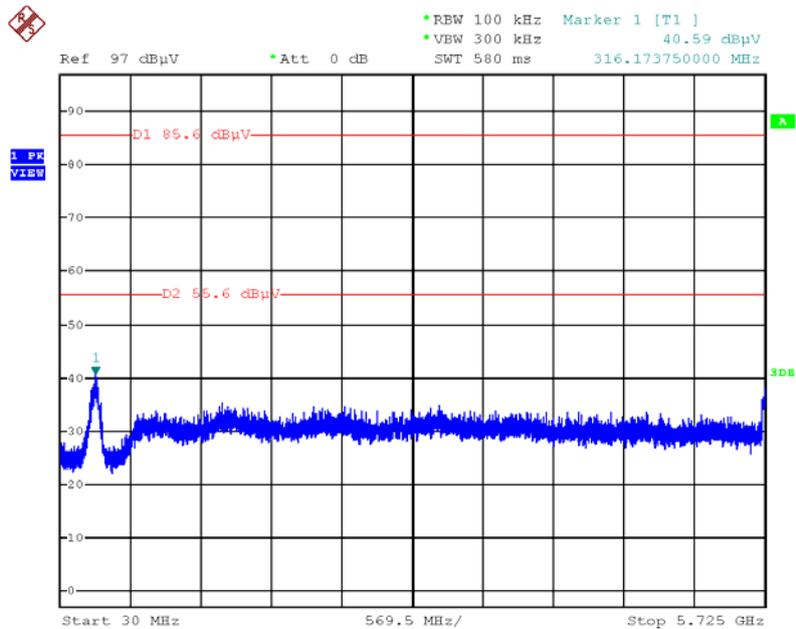
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Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / CH 151 / 5850MHz~40000MHz (down 30dBc)



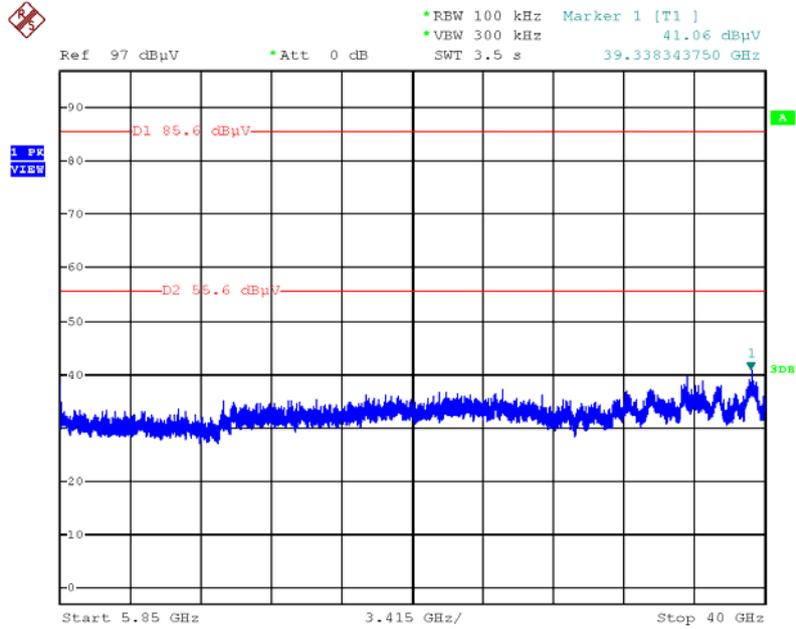
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Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / CH 159 / 30MHz~5725MHz (down 30dBc)



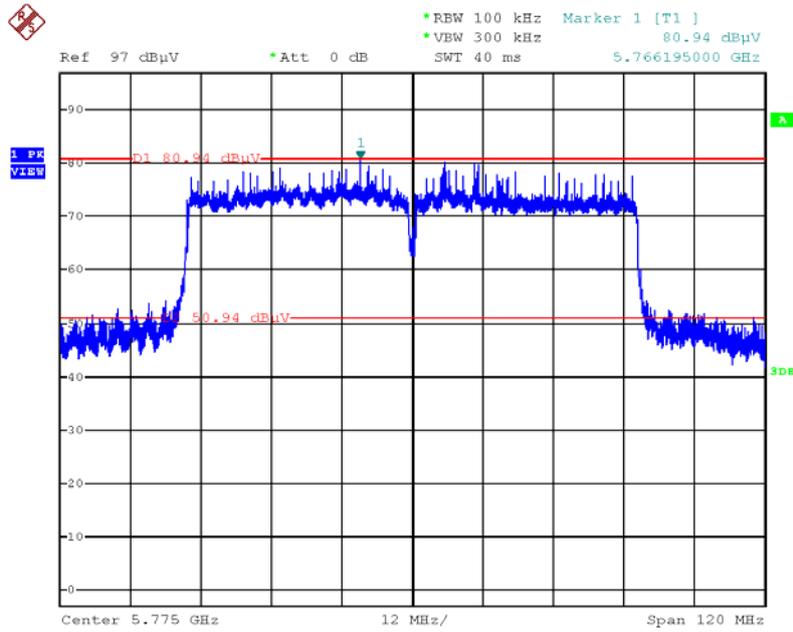
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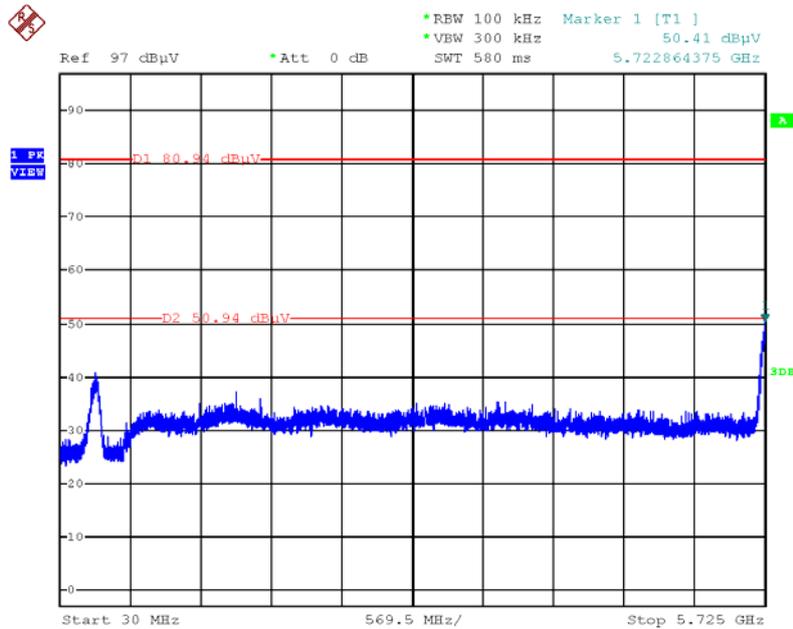
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Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Reference Level



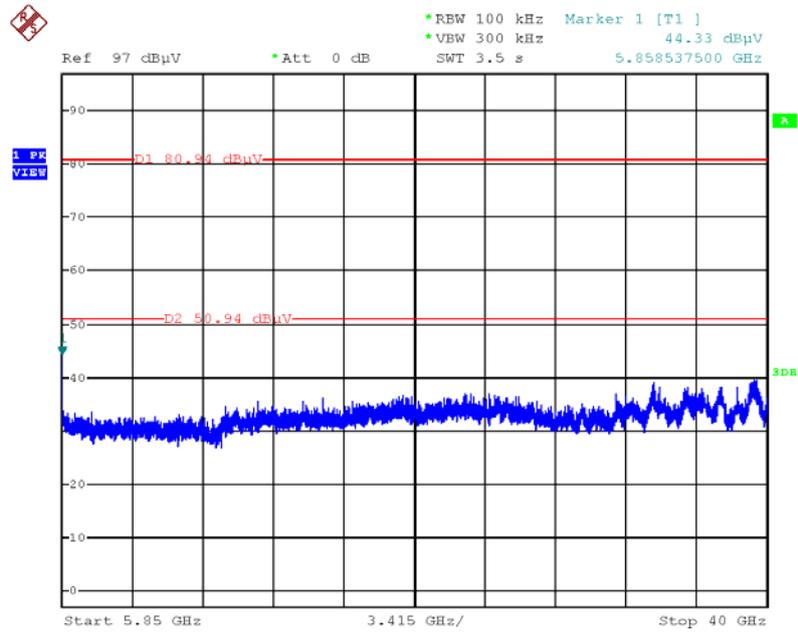
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Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / CH 155 / 30MHz~5725MHz (down 30dBc)



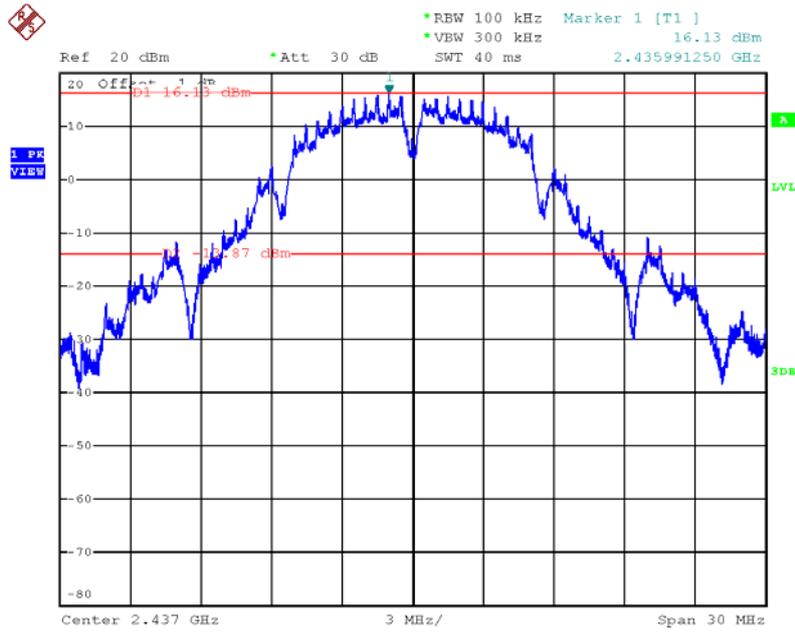
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Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / CH 155 / 5850MHz~4000MHz (down 30dBc)



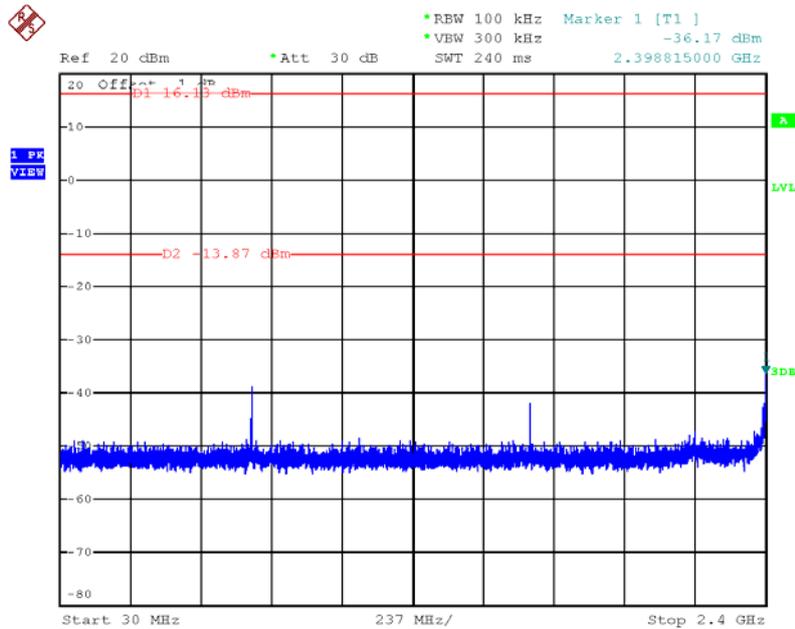
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Plot on Configuration IEEE 802.11b / Reference Level



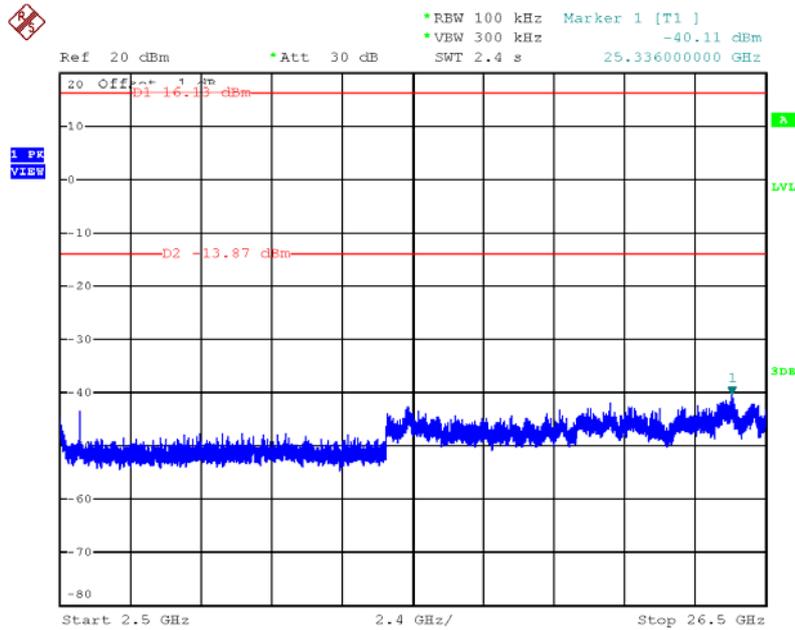
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Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc)



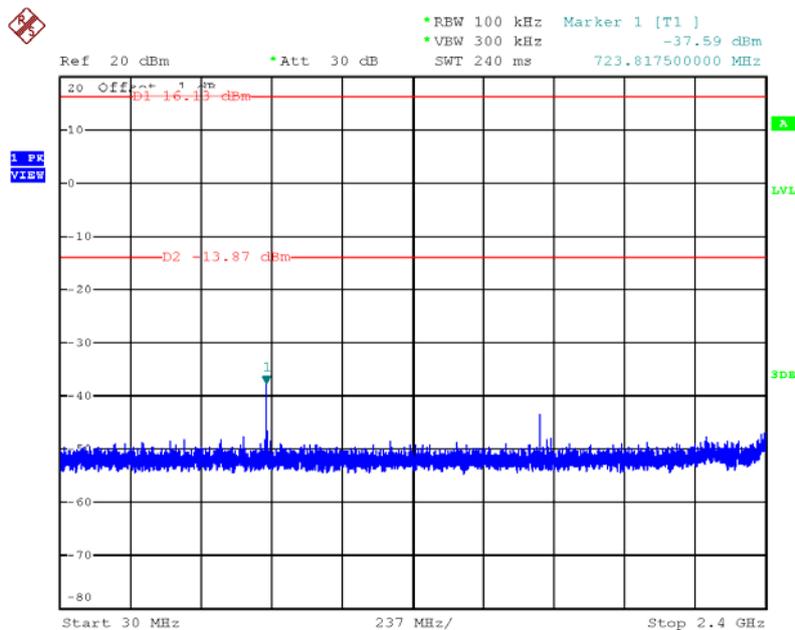
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Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



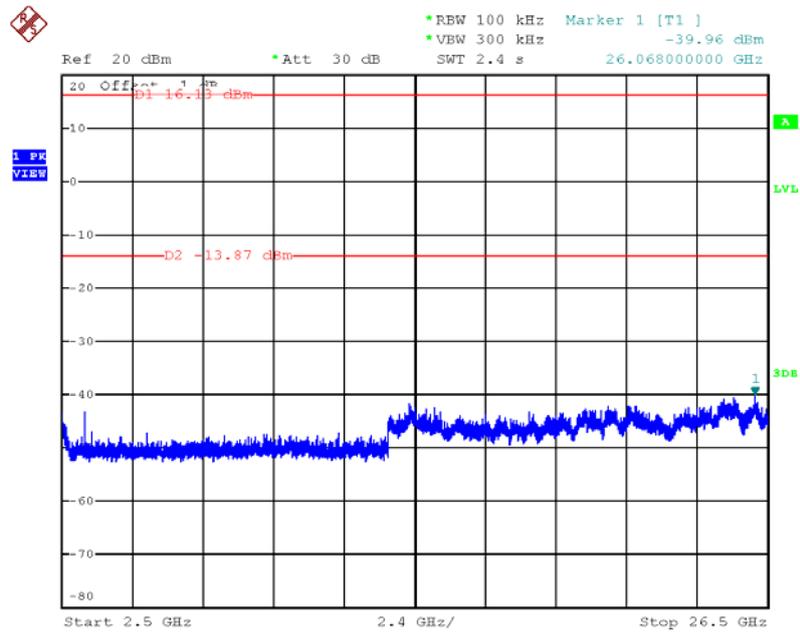
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Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



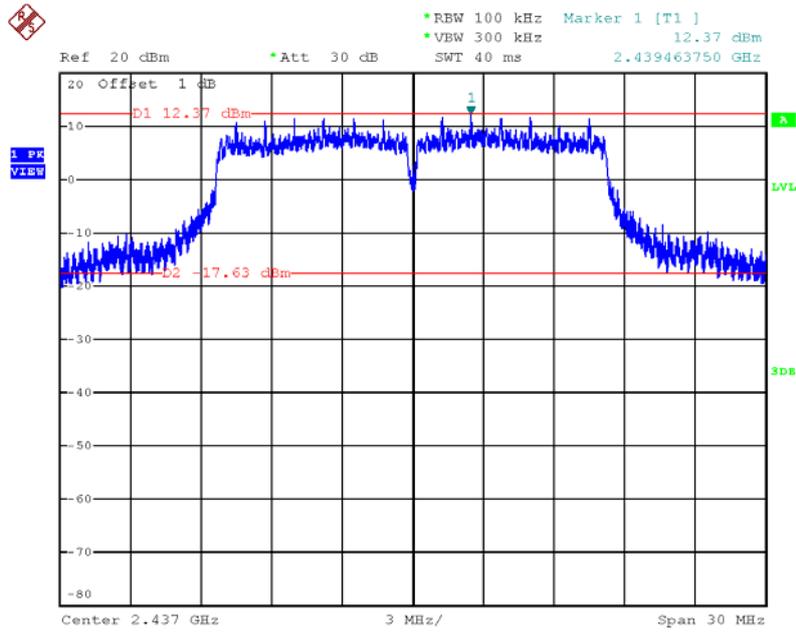
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Plot on Configuration IEEE 802.11b / CH 11 / 2500MHz~26500MHz (down 30dBc)



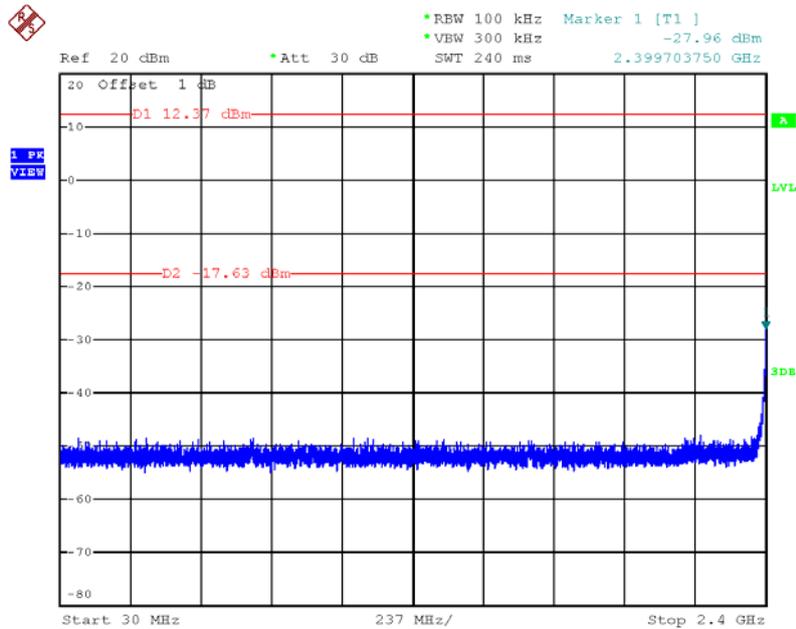
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Plot on Configuration IEEE 802.11g / Reference Level



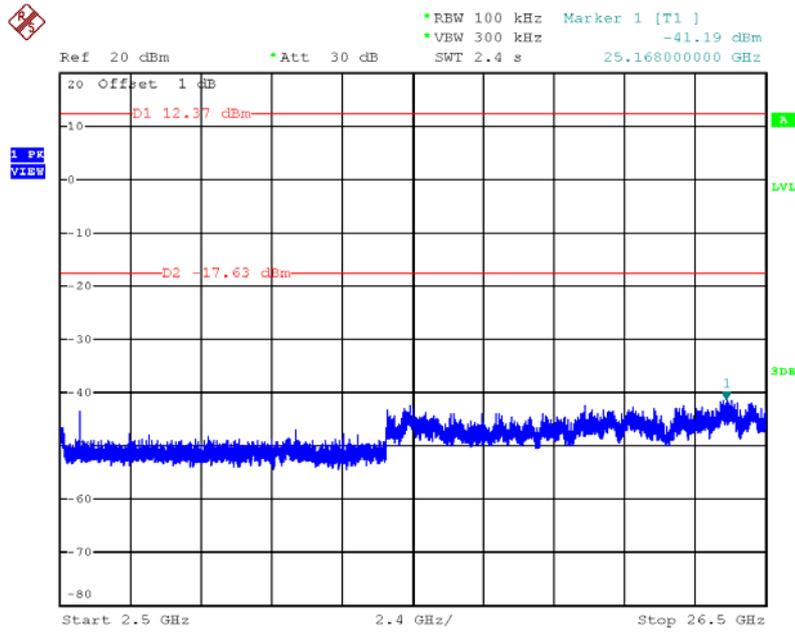
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Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)



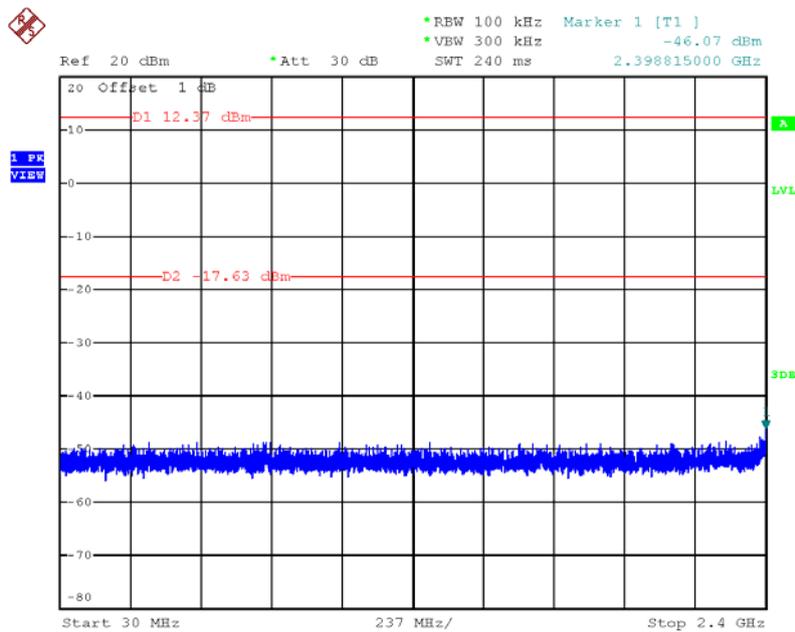
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Plot on Configuration IEEE 802.11g / CH 1 / 2500MHz~26500MHz (down 30dBc)



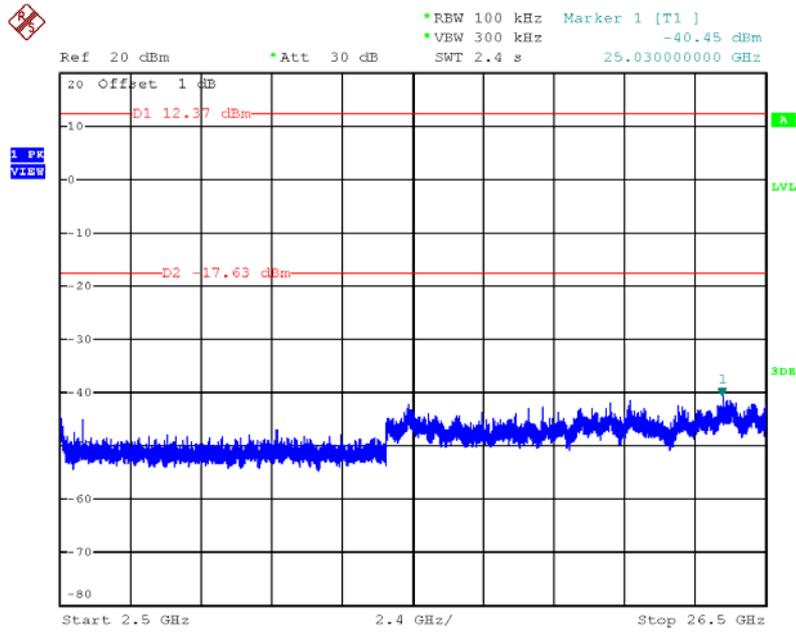
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Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)



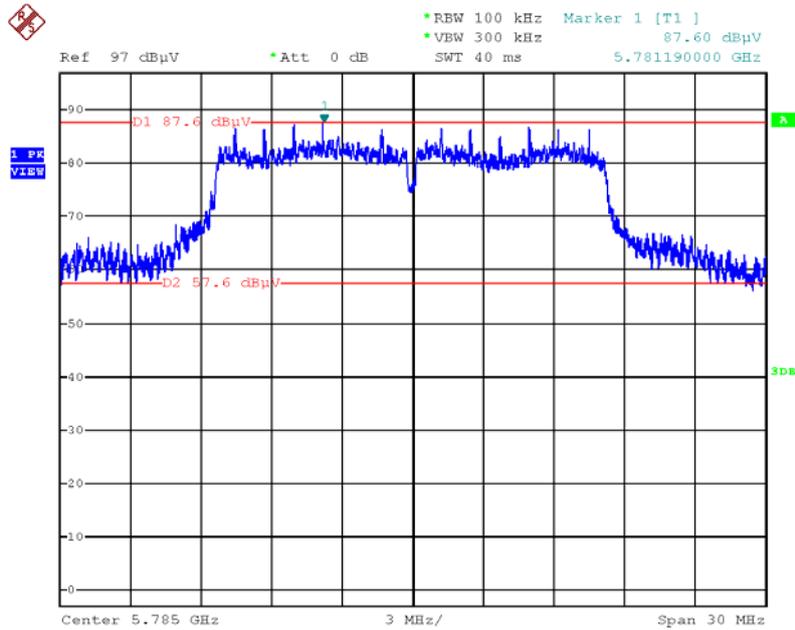
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Plot on Configuration IEEE 802.11g / CH 11 / 2500MHz~26500MHz (down 30dBc)



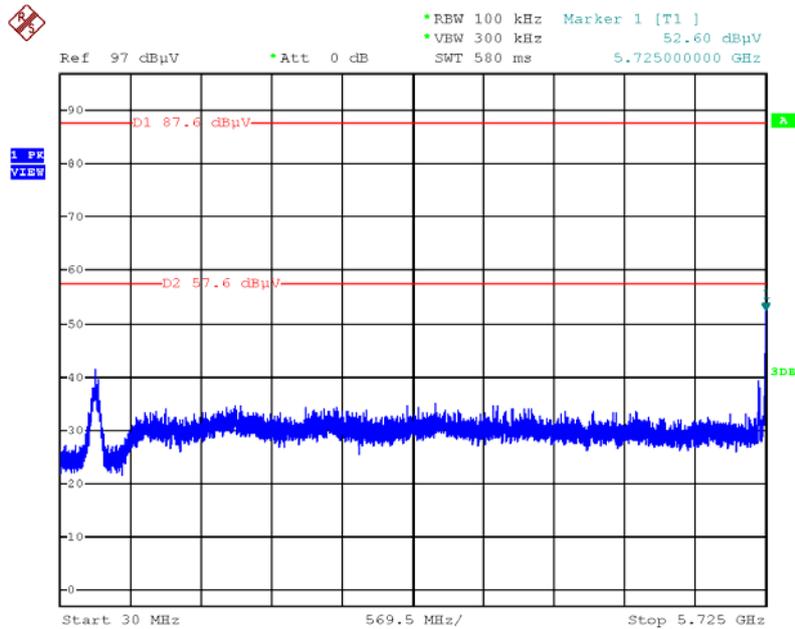
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Plot on Configuration IEEE 802.11a / Reference Level



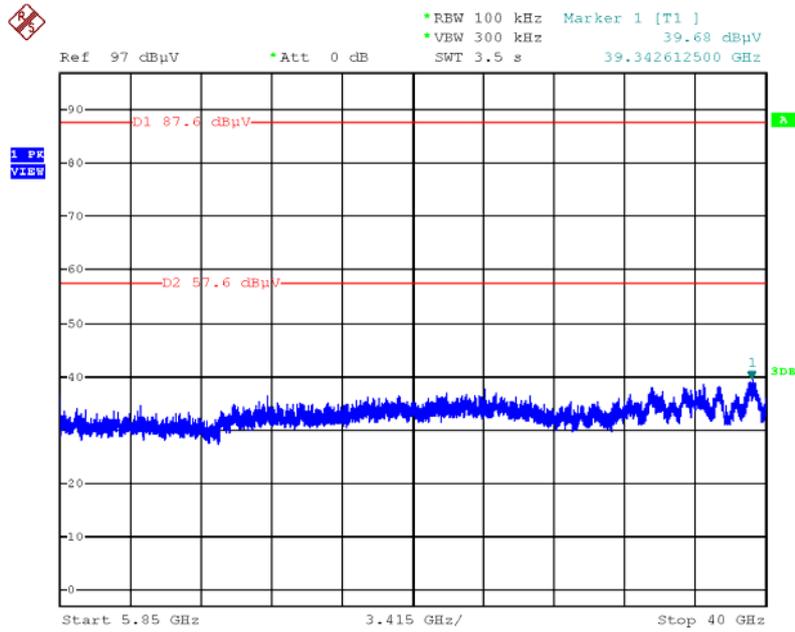
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Plot on Configuration IEEE 802.11a / CH 149 / 30MHz~5725MHz (down 30dBc)



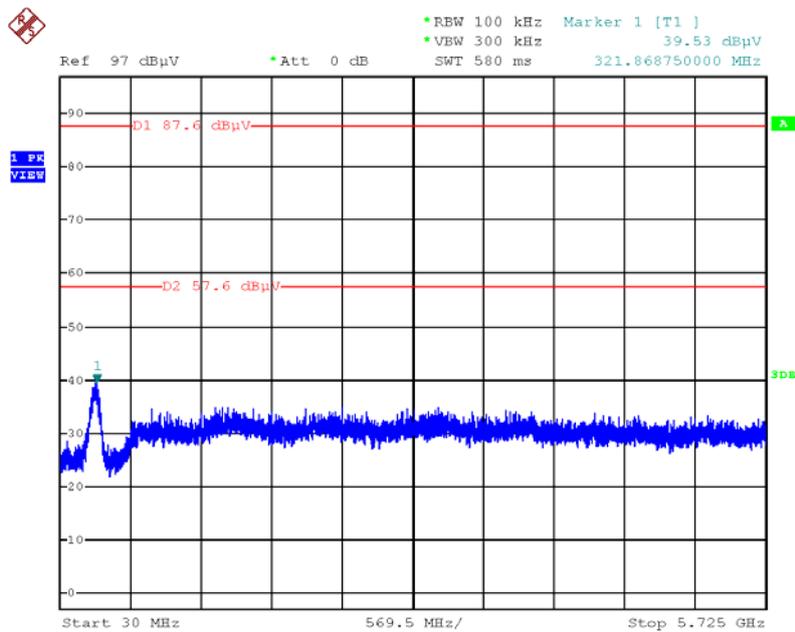
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Plot on Configuration IEEE 802.11a / CH 149 / 5850MHz~40000MHz (down 30dBc)



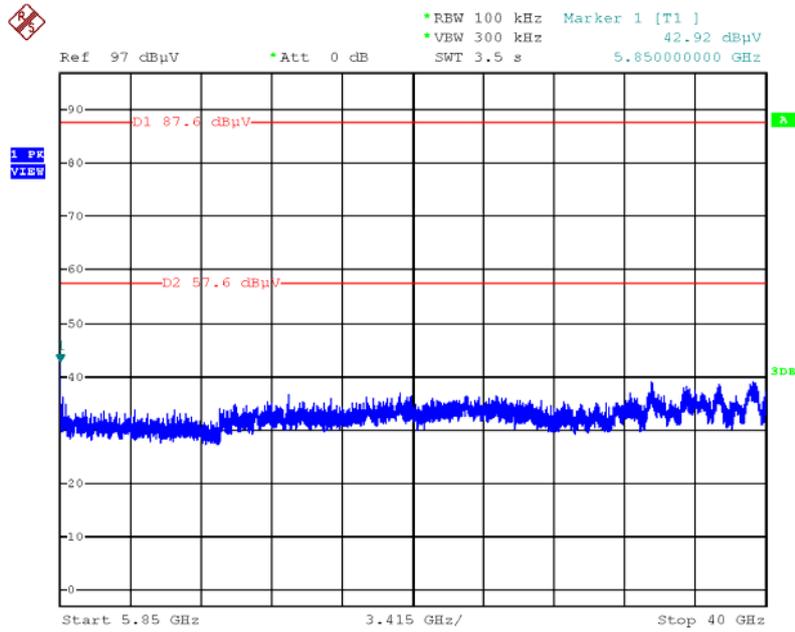
Date: 26.APR.2013 02:06:10

Plot on Configuration IEEE 802.11a / CH 165 / 30MHz~5725MHz (down 30dBc)



Date: 26.APR.2013 02:07:50

Plot on Configuration IEEE 802.11a / CH 165 / 5850MHz~40000MHz (down 30dBc)



Date: 26.APR.2013 02:06:54

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	Oct. 23, 2012	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9kHz ~ 30MHz	Jun. 22, 2012	Conduction (CO01-CB)
Impulsbegrenzer Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz~30MHz	Feb. 21, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 04, 2012	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	-	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
forHorn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002 D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Divider	Woken	4 Way	0120A04056002 D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)

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

“*” Calibration Interval of instruments listed above is two years.

N.C.R. means Non-Calibration required.

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 2 nd 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