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

FCC RADIO TEST REPORT

Applicant's company	**Sony Corporation**
Applicant Address	1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan
FCC ID	**AK8SVF13NA1EL**
Manufacturer's company	**Sony Corporation**
Manufacturer Address	1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan

Product Name	Personal Computer
Brand Name	SONY
Model No.	SVF13NA1EL
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Jul. 26, 2013
Final Test Date	Oct. 17, 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 v03r01** and **KDB 662911 D01 v02**.

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

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR372647AC	Rev. 01	Initial issue of report	Oct. 14, 2013
FR372647AC	Rev. 02	Added NFC function and re-test AC Power Line Conducted Emissions and Radiated Emissions (30MHz ~ 1GHz)	Oct. 17, 2013

Certificate No.: CB10210065

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Personal Computer
Brand Name	:	SONY
Model No.	:	SVF13NA1EL
Applicant	:	Sony Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jul. 26, 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.

Sam Chen

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	12.19 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	15.04 dB
4.3	15.247(e)	Power Spectral Density	Complies	17.37 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	3.15 dB
4.6	15.247(d)	Band Edge Emissions	Complies	6.71 dB
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (1TX/2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter and battery
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/ac
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): 17.84 MHz ; MCS0 (40MHz): 36.16 MHz MCS8 (20MHz): 17.76 MHz ; MCS8 (40MHz): 36.16 MHz For 5GHz Band: 802.11n MCS0 (20MHz): 17.92 MHz 802.11n MCS8 (20MHz): 17.84 MHz 802.11n MCS0 (40MHz): 36.16 MHz 802.11n MCS8 (40MHz): 36.16 MHz 802.11ac MCS0/Nss1 (80MHz): 75.20 MHz 802.11ac MCS0/Nss2 (80MHz): 75.52 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 13.86 dBm ; MCS0 (40MHz): 12.44 dBm MCS8 (20MHz): 14.78 dBm ; MCS8 (40MHz): 13.85 dBm For 5GHz Band: 802.11n MCS0 (20MHz): 14.77 dBm 802.11n MCS8 (20MHz): 14.96 dBm 802.11n MCS0 (40MHz): 14.94 dBm 802.11n MCS8 (40MHz): 14.95 dBm 802.11ac MCS0/Nss1 (80MHz): 12.45 dBm 802.11ac MCS0/Nss2 (80MHz): 14.78 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11a/b/g

Items	Description
Product Type	WLAN (1TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter and battery
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: 14.24 MHz ; 11g: 16.64 MHz ; 11a: 16.64 MHz
Maximum Conducted Output Power	11b: 12.47 dBm ; 11g: 13.93 dBm ; 11a: 14.83 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	1, 2	MCS0-15
802.11n (HT40)	1, 2	MCS0-15
802.11ac (VHT80)	1, 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 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	Rating
Adapter	SONY	VGP-AC19V73	Input: 100-240Vac, 50/60Hz, 1.0A Output1: 19.5Vdc, 2.0A Output2: 5.0Vdc, 1.0A
LITHIUM ION BATTERY	SONY	VGP-BPS41	11.25Vdc, 3140mAh

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	P/N	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	VAIO	IRX-7660(B)	PANT13A00002-9-xx	PIFA Antenna	I-PEX	1.82	1.07
2	VAIO	IRX-7660(B)	PANT13A00002-9-xx	PIFA Antenna	I-PEX	-1.42	0.18

Note:

For IEEE 802.11abg mode (1TX, 2RX):

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one of them is used as transmitting antenna.

Both Chain 1 and Chain 2 could receive simultaneously.

The EUT supports the antenna with TX diversity function.

Chain 2 generated the worst case than Chain 1, so it is tested and recorded in the report.

For IEEE 802.11n/ac mode (1TX/2TX, 2RX):

The EUT can support 1TX and 2TX functions.

For 1TX, 2RX

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one of them is used as transmitting antenna.

Both Chain 1 and Chain 2 could receive simultaneously.

The EUT supports the antenna with TX diversity function.

Chain 2 generated the worst case than Chain 1, so it is tested and recorded in the report.

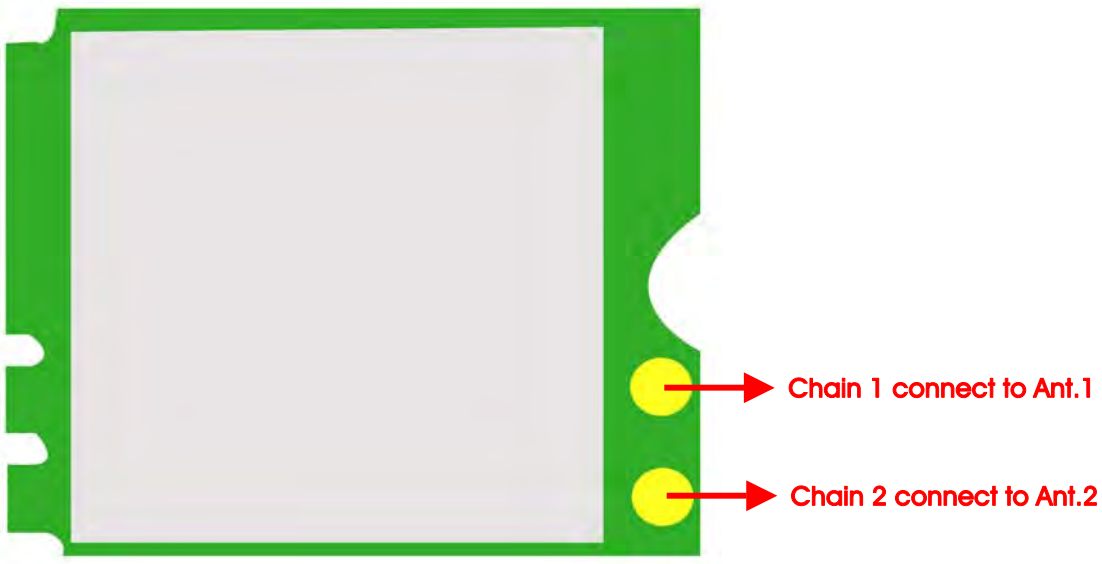
For 2TX, 2RX

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

Both Chain 1 and Chain 2 could transmit/receive simultaneously.

For Bluetooth mode (1TX, 1RX):

Only Chain 2 can be use as transmitting/receiving antenna.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

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

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

For 5GHz Band:

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	CTX	-	-	-
Maximum Conducted Output Power	11n 20MHz	MCS0	1/6/11	2
		MCS8	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	2
		MCS8	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	2
Power Spectral Density	11n 20MHz	MCS0	1/6/11	2
		MCS8	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	2
		MCS8	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	2
6dB Spectrum Bandwidth	11n 20MHz	MCS0	1/6/11	2
		MCS8	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	2
		MCS8	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	2
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11n 20MHz	MCS0	1/6/11	2
		MCS8	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	2
		MCS8	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	2
Band Edge Emissions	11n 20MHz	MCS0	1/6/11	2
		MCS8	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	2
		MCS8	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	2
	11g/BPSK	6 Mbps	1/6/11	2

For 5GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	CTX	-	-	-
Maximum Conducted Output Power	11n 20MHz	MCS0	149/157/165	2
		MCS8	149/157/165	1+2
	11n 40MHz	MCS0	151/159	2
		MCS8	151/159	1+2
	11ac 80MHz	MCS0/Nss1	155	2
		MCS0/Nss2	155	1+2
	11a/BPSK	6 Mbps	149/157/165	2
Power Spectral Density	11n 20MHz	MCS0	149/157/165	2
		MCS8	149/157/165	1+2
	11n 40MHz	MCS0	151/159	2
		MCS8	151/159	1+2
	11ac 80MHz	MCS0/Nss1	155	2
		MCS0/Nss2	155	1+2
	11a/BPSK	6 Mbps	149/157/165	2
6dB Spectrum Bandwidth	11n 20MHz	MCS0	149/157/165	2
		MCS8	149/157/165	1+2
	11n 40MHz	MCS0	151/159	2
		MCS8	151/159	1+2
	11ac 80MHz	MCS0/Nss1	155	2
		MCS0/Nss2	155	1+2
	11a/BPSK	6 Mbps	149/157/165	2
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11n 20MHz	MCS0	149/157/165	2
		MCS8	149/157/165	1+2
	11n 40MHz	MCS0	151/159	2
		MCS8	151/159	1+2
	11ac 80MHz	MCS0/Nss1	155	2
		MCS0/Nss2	155	1+2
	11a/BPSK	6 Mbps	149/157/165	2
Band Edge Emissions	11n 20MHz	MCS0	149/157/165	2
		MCS8	149/157/165	1+2
	11n 40MHz	MCS0	151/159	2
		MCS8	151/159	1+2
	11ac 80MHz	MCS0/Nss1	155	2
		MCS0/Nss2	155	1+2
	11a/BPSK	6 Mbps	149/157/165	2

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. EUT (CTX) with 2.4GHz WLAN, BT and NFC function

Mode 2. EUT (CTX) with 5GHz WLAN, BT and NFC function

Mode 1 is the worst case, so it was selected to record in this test report.

For Radiated Emission test:

The EUT for Radiated emission test was performed at stand, laptop and slate mode and the worst-case was found at slate mode. So the measurement will follow this same test configuration.

For below 1GHz:

Mode 1: EUT (CTX) with 2.4GHz WLAN, BT and NFC function – Slate Mode

Mode 2: EUT (CTX) with 5GHz WLAN, BT and NFC function – Slate Mode

Mode 1 is the worst case, so it was selected to record in this test report.

For Above 1GHz:

Mode 1: EUT (CTX) – Slate Mode

<For Co-location Test>:

The EUT could be applied with 2.4GHz/5GHz WLAN function and Bluetooth function and share common antenna; therefore Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz/5GHz WLAN function and Bluetooth function.

Mode 1: EUT (CTX) with 2.4GHz WLAN and BT function – Slate Mode

Mode 2: EUT (CTX) with 5GHz WLAN and BT function – Slate Mode

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 AC Power Conducted Emissions and Radiated Emissions Below 1GHz

Support Unit	Brand	Model	FCC ID
RFID Card	-	-	-

For Radiated Emissions Above 1GHz

N/A

3.8. Table for Parameters of Test Software Setting

During testing, Channel and 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

1TX

Power Parameters of IEEE 802.11n MCS0 20MHz

Test Software Version	DRTU , version 1.6.4-726		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	19.5	23.5	21

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	DRTU , version 1.6.4-726		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	17.5	22	20

Power Parameters of IEEE 802.11b/g

Test Software Version	DRTU , version 1.6.4-726		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	20.5	20.5	20.5
IEEE 802.11g	19.5	23.5	21.5

2TX

Power Parameters of IEEE 802.11n MCS8 20MHz

Test Software Version	DRTU , version 1.6.4-726		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS8 20MHz	17/20	20/23	17/20

Power Parameters of IEEE 802.11n MCS8 40MHz

Test Software Version	DRTU , version 1.6.4-726		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS8 40MHz	15/17.5	19.5/22	19/21.5

For 5GHz Band

1TX

Power Parameters of IEEE 802.11n MCS0 20MHz

Test Software Version	DRTU , version 1.6.4-726		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	31	31.5	32

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	DRTU , version 1.6.4-726	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	31.5	32

Power Parameters of IEEE 802.11ac MCS0/Nss1 80MHz

Test Software Version	DRTU , version 1.6.4-726
Frequency	5775 MHz
MCS0/Nss1 80MHz	29.5

Power Parameters of IEEE 802.11a

Test Software Version	DRTU , version 1.6.4-726		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	31	31.5	32

2TX

Power Parameters of IEEE 802.11n MCS8 20MHz

Test Software Version	DRTU , version 1.6.4-726		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS8 20MHz	30.5/31	31/31	31/31.5

Power Parameters of IEEE 802.11n MCS8 40MHz

Test Software Version	DRTU , version 1.6.4-726	
Frequency	5755 MHz	5795 MHz
MCS8 40MHz	30.5/31	31/31.5

Power Parameters of IEEE 802.11ac MCS8 80MHz

Test Software Version	DRTU , version 1.6.4-726
Frequency	5775 MHz
MCS0/Nss2 80MHz	31/31.5

3.9. EUT Operation during Test

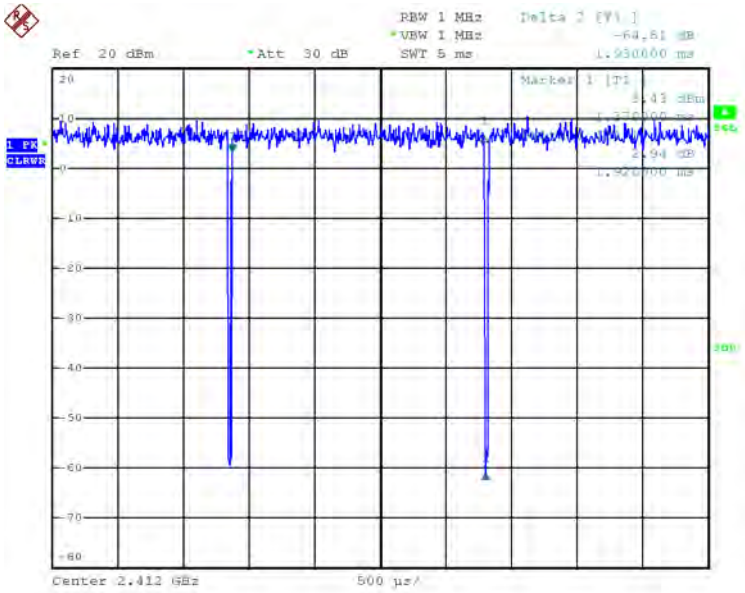
The EUT was programmed to be in continuously transmitting mode.

3.10. Duty Cycle

For 2.4GHz Band:

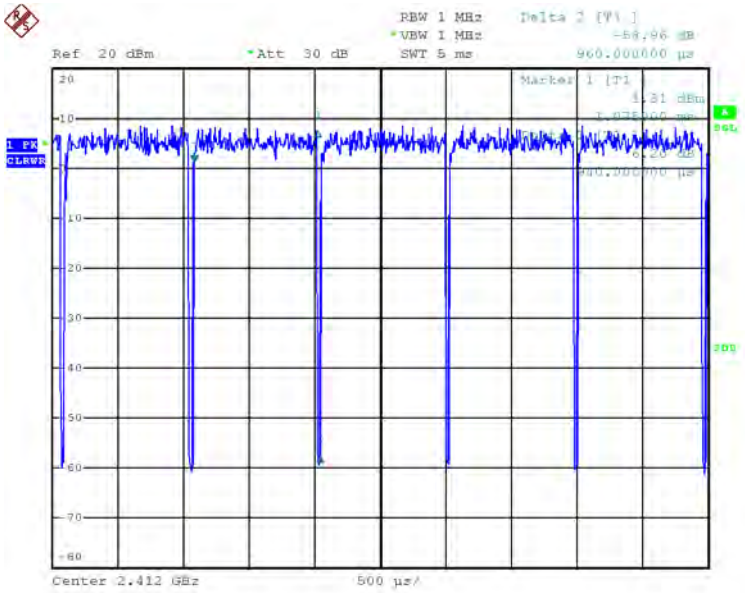
1TX

IEEE 802.11n MCS0 20MHz



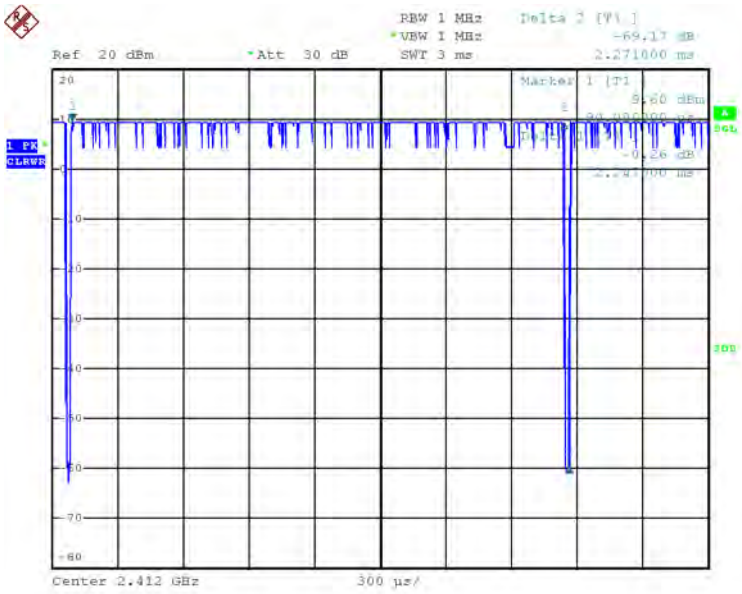
Date: 2.OCT.2013 23:42:52

IEEE 802.11n MCS0 40MHz



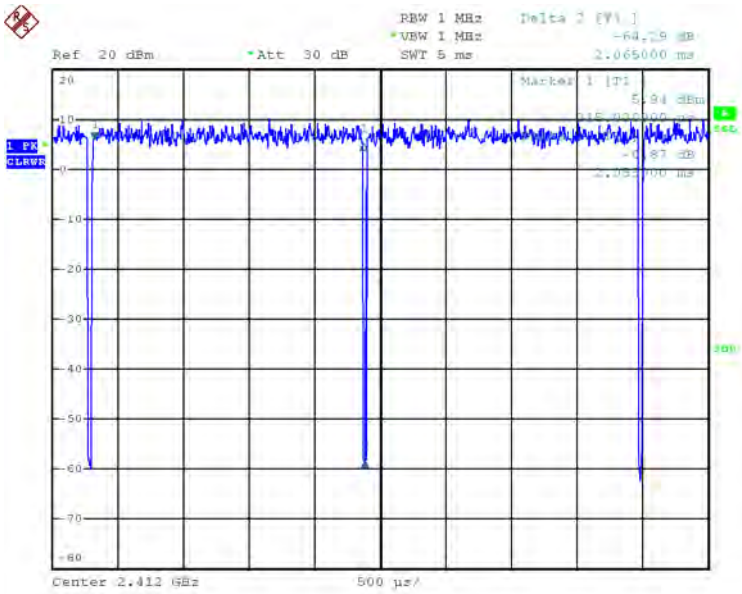
Date: 2.OCT.2013 23:45:07

IEEE 802.11b



Date: 2.OCT.2013 23:33:25

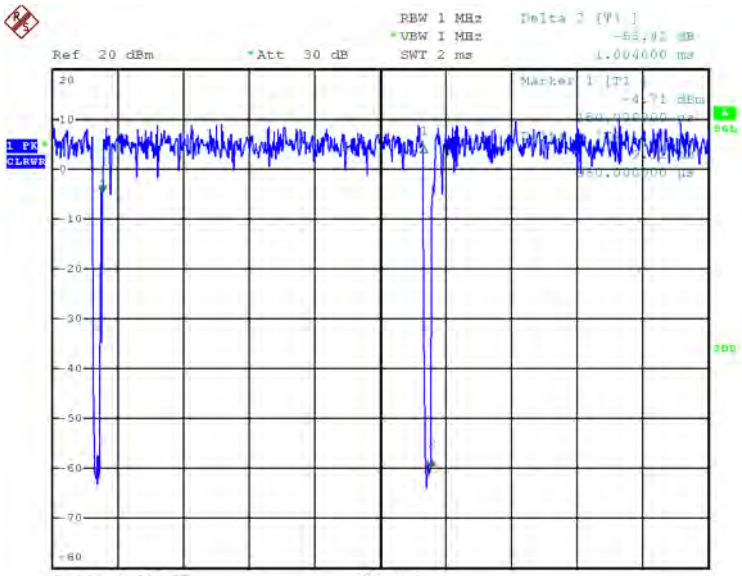
IEEE 802.11g



Date: 2.OCT.2013 23:39:49

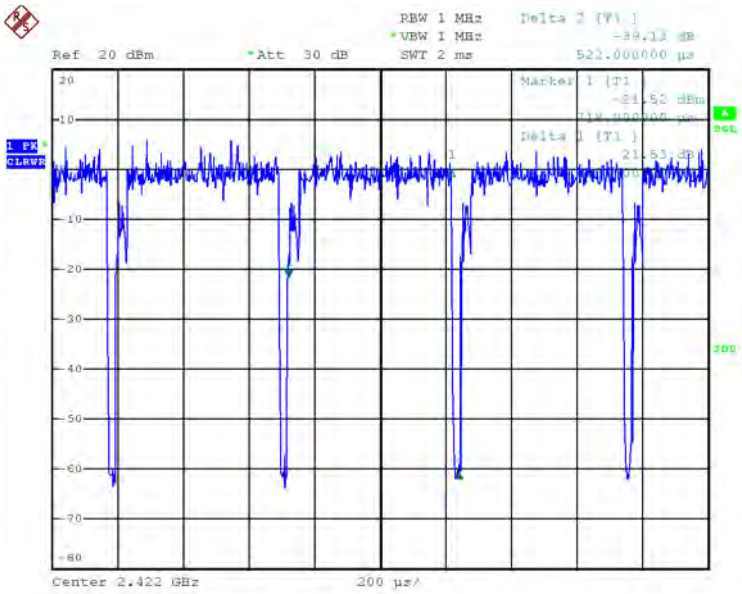
2TX

IEEE 802.11n MCS8 20MHz



Date: 3.OCT.2013 00:03:16

IEEE 802.11n MCS8 40MHz

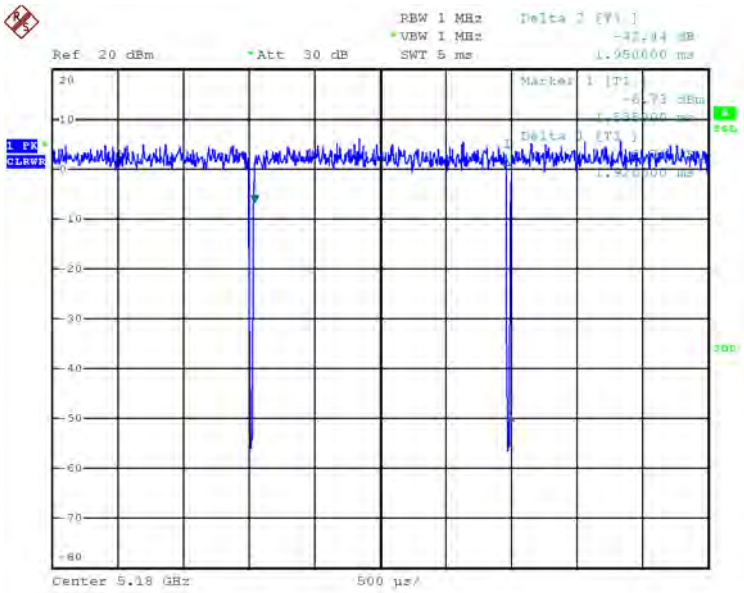


Date: 3.OCT.2013 00:04:34

For 5GHz Band:

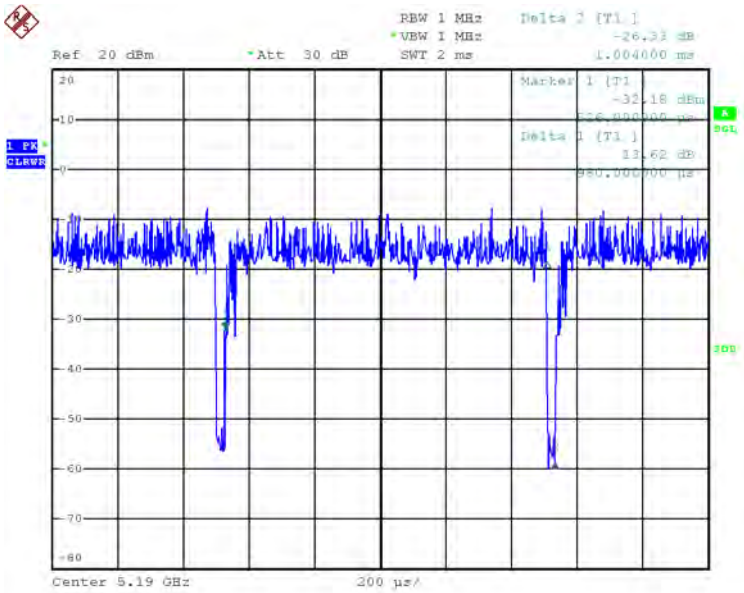
1TX

IEEE 802.11n MCS0 20MHz



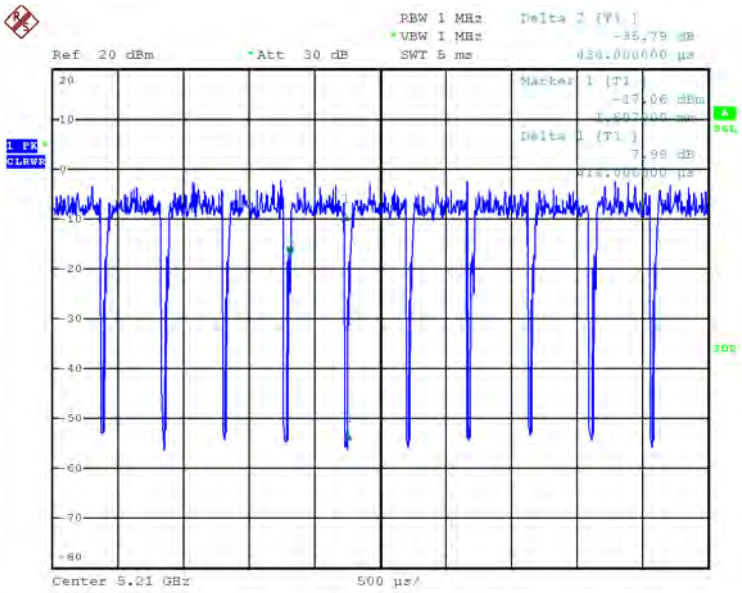
Date: 2.OCT.2013 23:49:35

IEEE 802.11n MCS0 40MHz



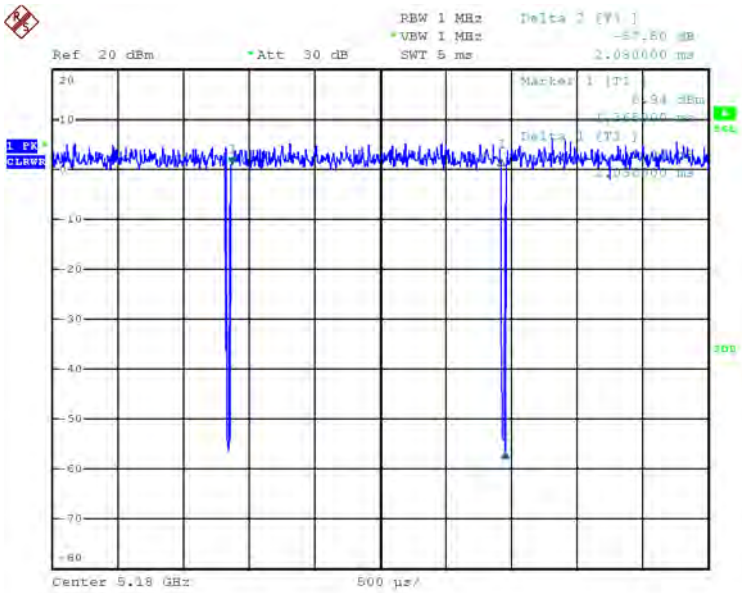
Date: 3.OCT.2013 00:01:11

IEEE 802.11ac MCS0/Nss1 80MHz



Date: 2.OCT.2013 23:54:02

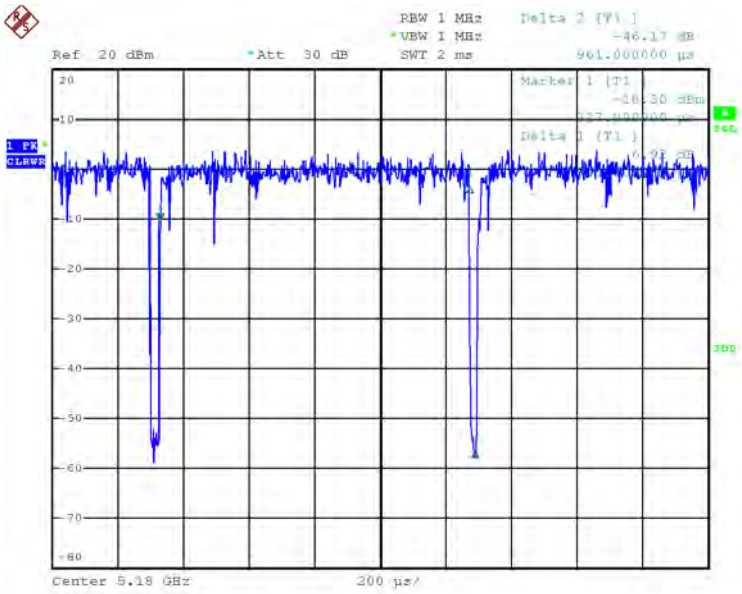
IEEE 802.11a



Date: 2.OCT.2013 23:47:35

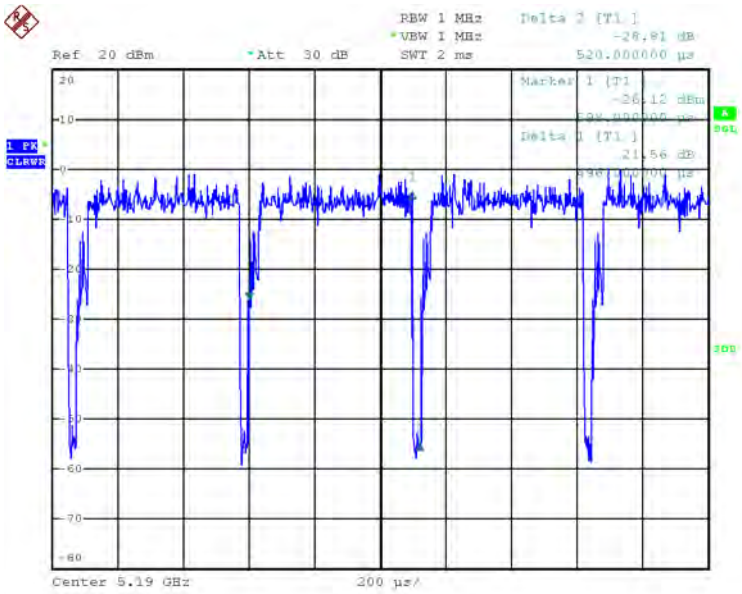
2TX

IEEE 802.11n MCS8 20MHz



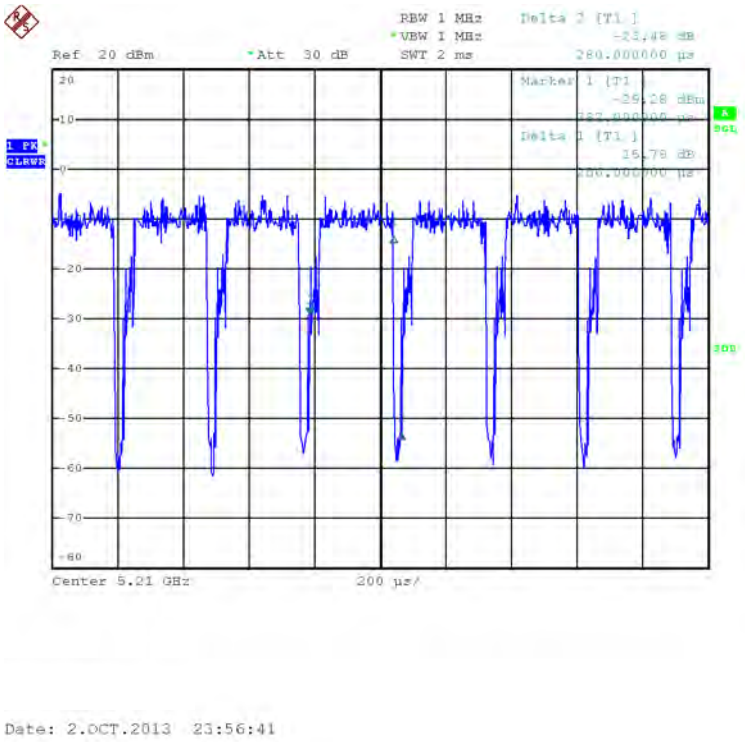
Date: 2.OCT.2013 23:51:47

IEEE 802.11n MCS8 40MHz



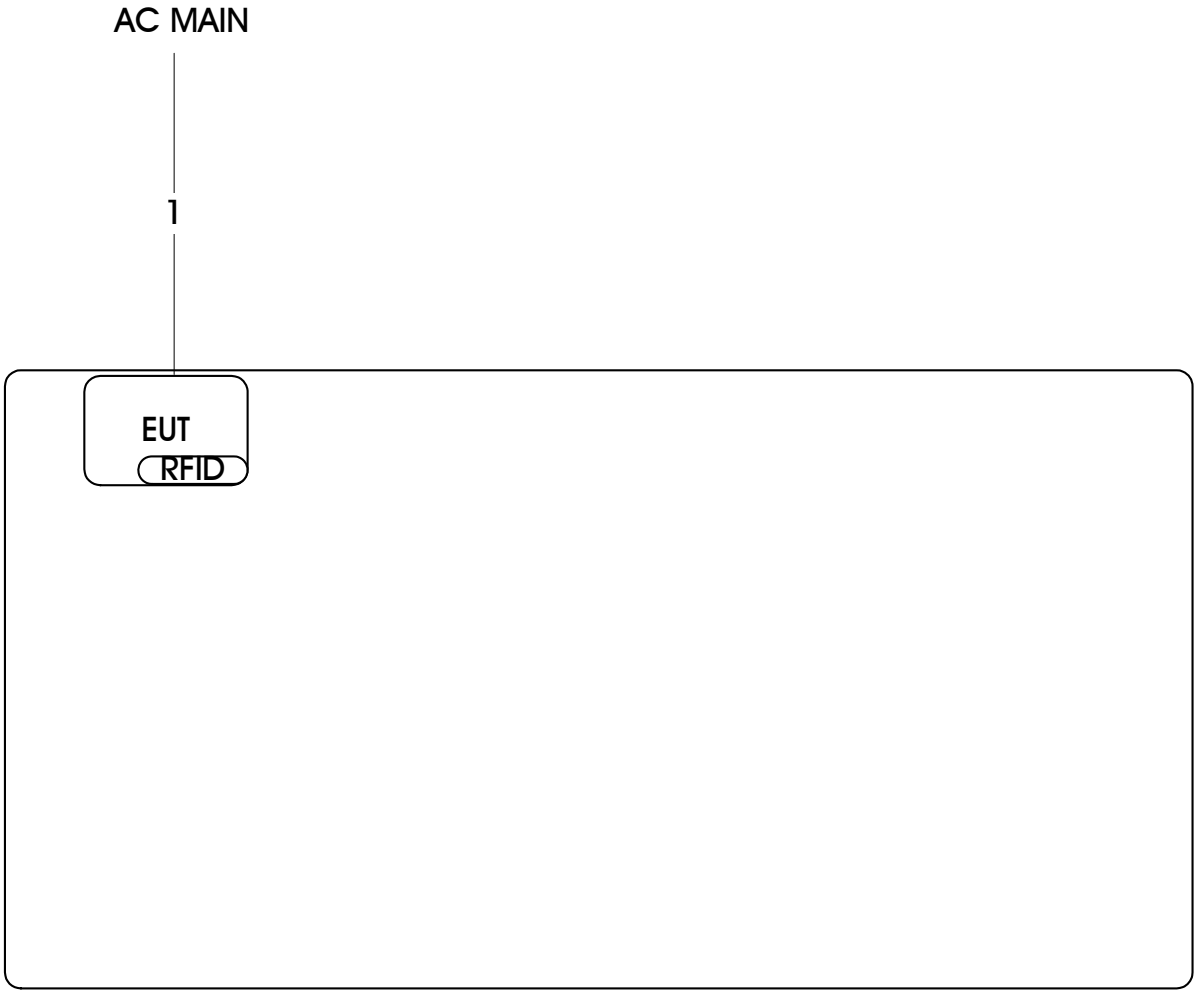
Date: 2.OCT.2013 23:59:31

IEEE 802.11ac MCS8 80MHz



3.11. Test Configurations

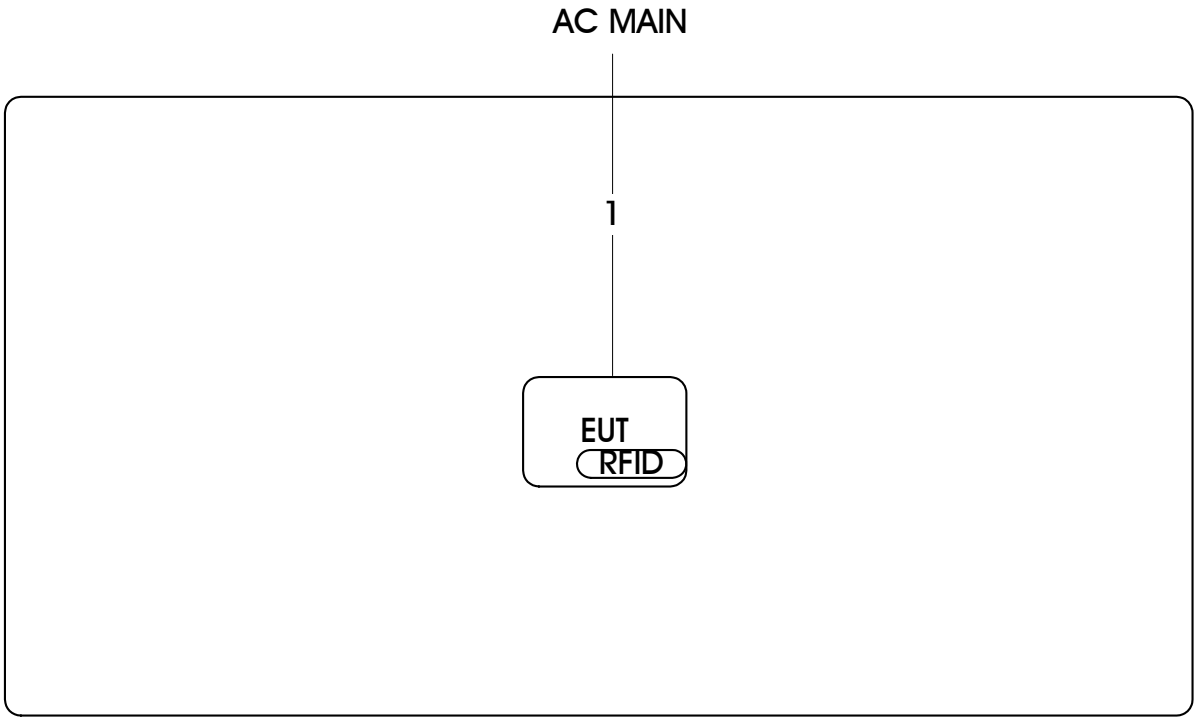
3.11.1. AC Power Line Conduction Emissions



Item	Connection	Shielded	Length(m)	Remark
1	Power Cable	No	2.6m	-

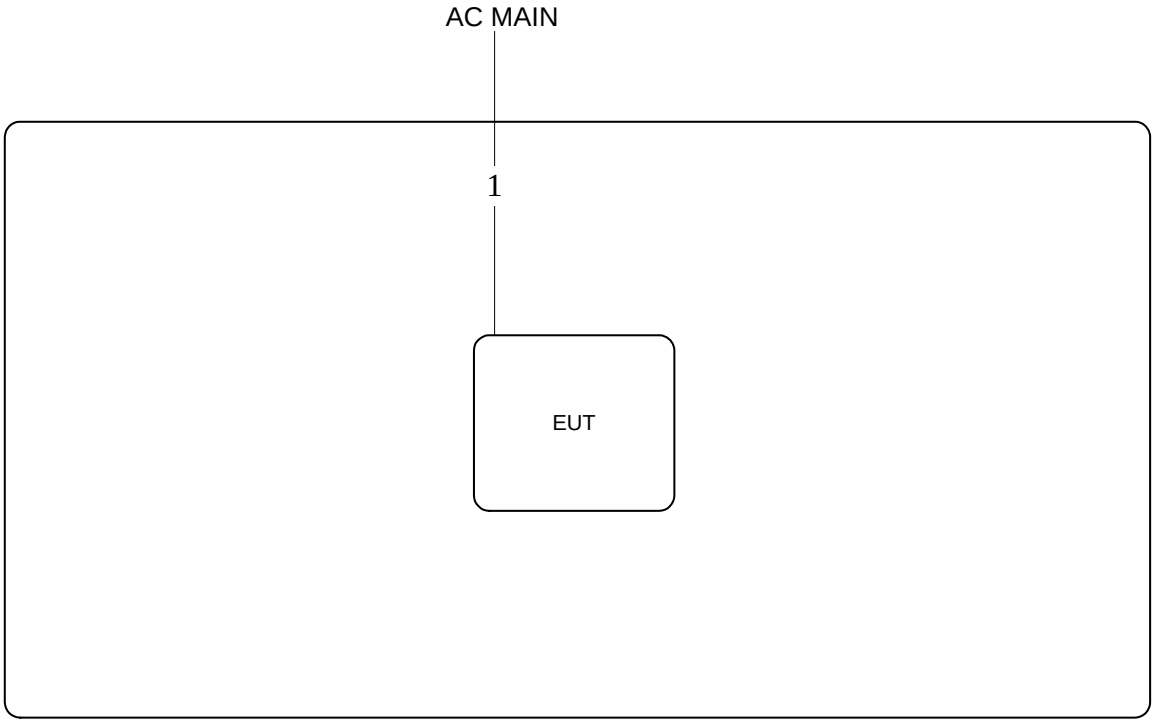
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length(m)	Remark
1	Power Cable	No	2.6m	-

Test Configuration: above 1GHz



Item	Connection	Shielded	Length(m)	Remark
1	Power Cable	No	2.6m	-

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

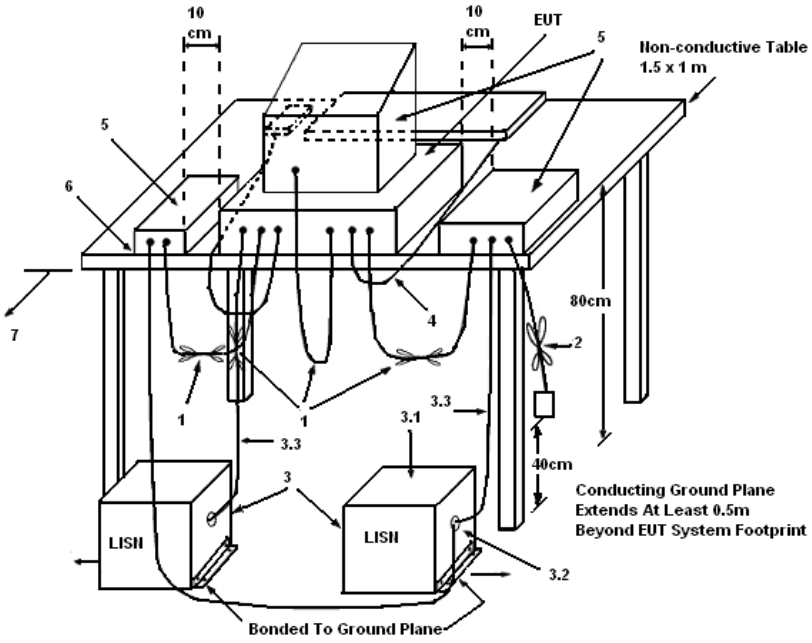
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

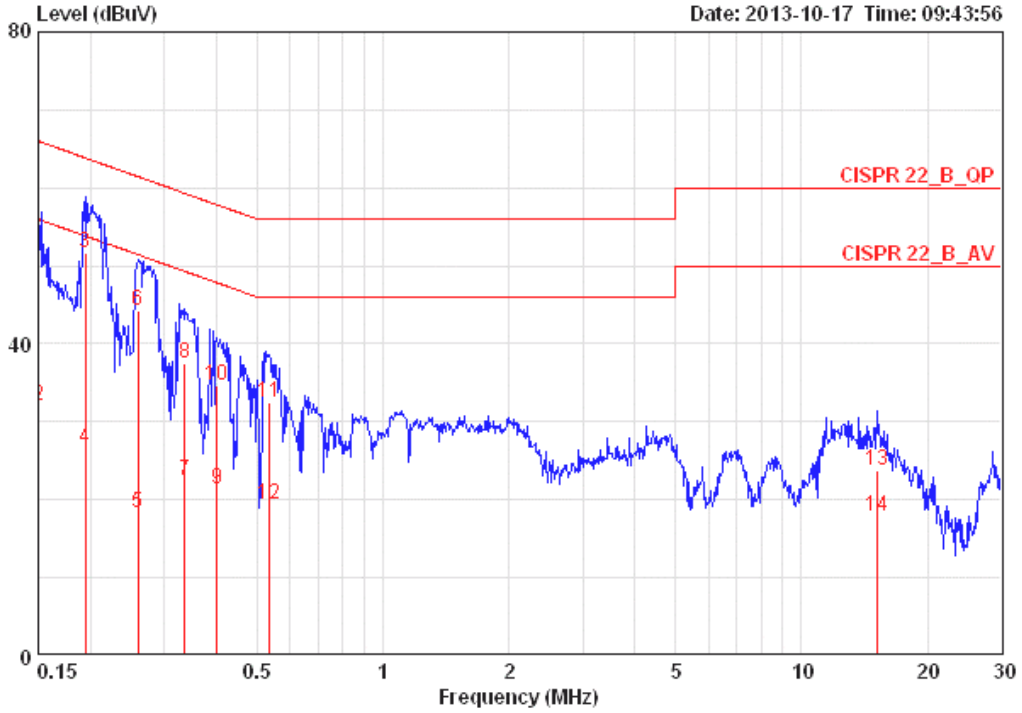
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

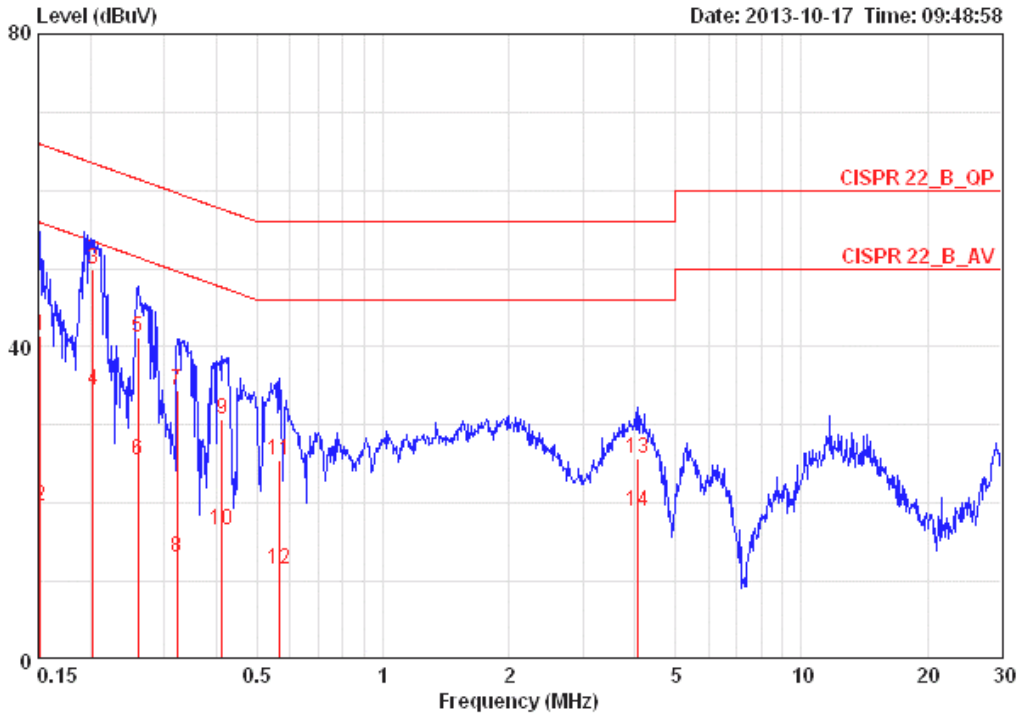
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	48%
Test Engineer	Sin Chang	Phase	Line
Configuration	Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15000	47.32	-18.68	66.00	46.99	0.15	0.18	LINE	QP
2	0.15000	32.09	-23.91	56.00	31.76	0.15	0.18	LINE	AVERAGE
3 @	0.19447	51.66	-12.19	63.84	51.31	0.15	0.20	LINE	QP
4	0.19447	26.66	-27.19	53.84	26.31	0.15	0.20	LINE	AVERAGE
5	0.26026	18.33	-33.09	51.42	17.98	0.15	0.20	LINE	AVERAGE
6	0.26026	44.24	-17.18	61.42	43.89	0.15	0.20	LINE	QP
7	0.33562	22.51	-26.80	49.31	22.16	0.15	0.20	LINE	AVERAGE
8	0.33562	37.50	-21.81	59.31	37.15	0.15	0.20	LINE	QP
9	0.40187	21.47	-26.34	47.81	21.12	0.15	0.20	LINE	AVERAGE
10	0.40187	34.73	-23.08	57.81	34.38	0.15	0.20	LINE	QP
11	0.53498	32.50	-23.50	56.00	32.15	0.15	0.20	LINE	QP
12	0.53498	19.38	-26.62	46.00	19.03	0.15	0.20	LINE	AVERAGE
13	15.146	23.73	-36.27	60.00	22.83	0.49	0.41	LINE	QP
14	15.146	17.82	-32.18	50.00	16.92	0.49	0.41	LINE	AVERAGE

Temperature	24°C	Humidity	48%
Test Engineer	Sin Chang	Phase	Neutral
Configuration	Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15160	41.32	-24.59	65.91	41.07	0.07	0.18	NEUTRAL	QP
2	0.15160	19.57	-36.34	55.91	19.32	0.07	0.18	NEUTRAL	AVERAGE
3 @	0.20289	49.90	-13.59	63.49	49.63	0.07	0.20	NEUTRAL	QP
4	0.20289	34.34	-19.15	53.49	34.07	0.07	0.20	NEUTRAL	AVERAGE
5	0.26026	41.23	-20.19	61.42	40.96	0.07	0.20	NEUTRAL	QP
6	0.26026	25.48	-25.94	51.42	25.21	0.07	0.20	NEUTRAL	AVERAGE
7	0.32169	34.55	-25.11	59.66	34.28	0.07	0.20	NEUTRAL	QP
8	0.32169	13.01	-36.65	49.66	12.74	0.07	0.20	NEUTRAL	AVERAGE
9	0.41266	30.82	-26.77	57.59	30.55	0.07	0.20	NEUTRAL	QP
10	0.41266	16.66	-30.93	47.59	16.39	0.07	0.20	NEUTRAL	AVERAGE
11	0.56409	25.43	-30.57	56.00	25.16	0.07	0.20	NEUTRAL	QP
12	0.56409	11.51	-34.49	46.00	11.24	0.07	0.20	NEUTRAL	AVERAGE
13	4.070	25.75	-30.25	56.00	25.32	0.13	0.30	NEUTRAL	QP
14	4.070	19.00	-27.00	46.00	18.57	0.13	0.30	NEUTRAL	AVERAGE

Note: Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for 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

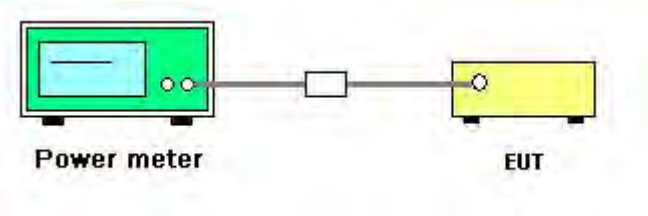
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r01 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	25°C	Humidity	60%
Test Engineer	Kenneth Huang Nick Peng	Configurations	IEEE 802.11n/ac
Test Date	Oct. 02, 2013		

For 2.4GHz Band

1TX

Configuration IEEE 802.11n MCS0 20MHz / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	10.47	30.00	Complies
6	2437 MHz	13.86	30.00	Complies
11	2462 MHz	11.85	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	8.43	30.00	Complies
6	2437 MHz	12.44	30.00	Complies
9	2452 MHz	10.87	30.00	Complies

2TX

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	9.31	9.43	12.38	30.00	Complies
6	2437 MHz	11.64	11.89	14.78	30.00	Complies
11	2462 MHz	8.73	8.98	11.87	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
3	2422 MHz	6.91	6.79	9.86	30.00	Complies
6	2437 MHz	10.72	10.95	13.85	30.00	Complies
9	2452 MHz	10.37	10.31	13.35	30.00	Complies

For 5GHz Band

1TX

Configuration IEEE 802.11n MCS0 20MHz / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	14.55	30.00	Complies
157	5785 MHz	14.75	30.00	Complies
165	5825 MHz	14.77	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	14.94	30.00	Complies
159	5795 MHz	14.90	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
155	5775 MHz	12.45	30.00	Complies

2TX

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	11.97	11.93	14.96	30.00	Complies
157	5785 MHz	11.73	11.79	14.77	30.00	Complies
165	5825 MHz	11.81	11.86	14.85	30.00	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	11.75	11.83	14.80	30.00	Complies
159	5795 MHz	11.92	11.96	14.95	30.00	Complies

Configuration IEEE 802.11ac MCS8 80MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	11.71	11.83	14.78	30.00	Complies

Temperature	25°C	Humidity	60%
Test Engineer	Kenneth Huang Nick Peng	Configurations	IEEE 802.11a/b/g
Test Date	Oct. 02, 2013		

1TX

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	12.47	30.00	Complies
6	2437 MHz	12.45	30.00	Complies
11	2462 MHz	12.37	30.00	Complies

Configuration IEEE 802.11g / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	10.47	30.00	Complies
6	2437 MHz	13.93	30.00	Complies
11	2462 MHz	11.96	30.00	Complies

Configuration IEEE 802.11a / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	14.51	30.00	Complies
157	5785 MHz	14.83	30.00	Complies
165	5825 MHz	14.72	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

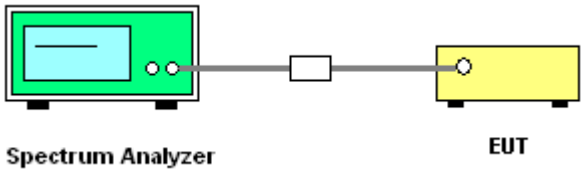
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.3.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r01 section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
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 ≥ 2 x span/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	25°C	Humidity	60%
Test Engineer	Kenneth Huang Nick Peng	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

1TX

Configuration IEEE 802.11n MCS0 20MHz / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	-14.84	8.00	Complies
6	2437 MHz	-10.81	8.00	Complies
11	2462 MHz	-12.49	8.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
3	2422 MHz	-19.07	8.00	Complies
6	2437 MHz	-15.94	8.00	Complies
9	2452 MHz	-16.78	8.00	Complies

2TX

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	-17.26	-17.49	-14.36	8.00	Complies
6	2437 MHz	-14.97	-15.05	-12.00	8.00	Complies
11	2462 MHz	-18.53	-16.18	-14.19	8.00	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
3	2422 MHz	-20.72	-21.99	-18.30	8.00	Complies
6	2437 MHz	-17.33	-17.58	-14.44	8.00	Complies
9	2452 MHz	-17.30	-18.89	-15.01	8.00	Complies

For 5GHz Band

1TX

Configuration IEEE 802.11n MCS0 20MHz / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
149	5745 MHz	-10.94	8.00	Complies
157	5785 MHz	-10.31	8.00	Complies
165	5825 MHz	-11.19	8.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
151	5755 MHz	-13.56	8.00	Complies
159	5795 MHz	-13.38	8.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
155	5775 MHz	-18.08	8.00	Complies

2TX

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	-13.38	-14.14	-10.73	8.00	Complies
157	5785 MHz	-15.41	-14.55	-11.95	8.00	Complies
165	5825 MHz	-15.36	-14.79	-12.06	8.00	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	-17.78	-19.20	-15.42	8.00	Complies
159	5795 MHz	-17.94	-18.44	-15.17	8.00	Complies

Configuration IEEE 802.11ac MCS8 80MHz / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	-18.62	-19.10	-15.84	8.00	Complies

Temperature	25°C	Humidity	60%
Test Engineer	Kenneth Huang Nick Peng	Configurations	IEEE 802.11a/b/g
Test Date	Oct. 02, 2013		

1TX

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	-11.91	8.00	Complies
6	2437 MHz	-11.45	8.00	Complies
11	2462 MHz	-11.47	8.00	Complies

Configuration IEEE 802.11g / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	-15.37	8.00	Complies
6	2437 MHz	-11.84	8.00	Complies
11	2462 MHz	-12.74	8.00	Complies

Configuration IEEE 802.11a / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
149	5745 MHz	-9.37	8.00	Complies
157	5785 MHz	-11.08	8.00	Complies
165	5825 MHz	-10.56	8.00	Complies

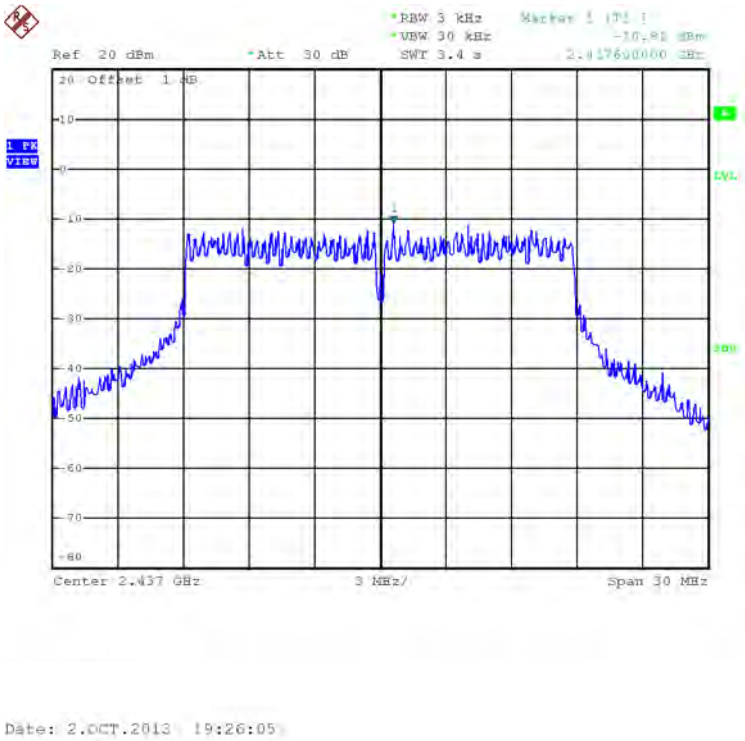
Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

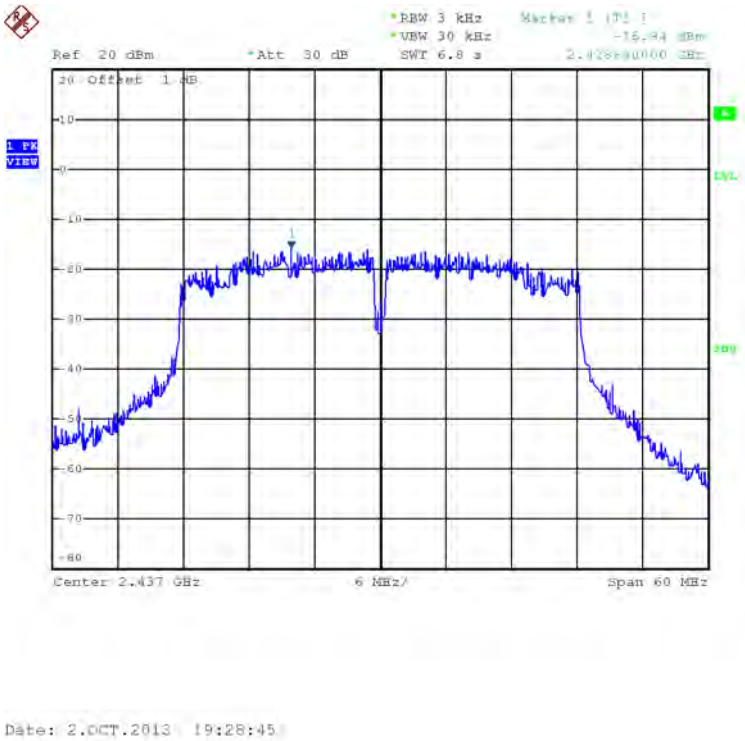
For 2.4GHz Band

1TX

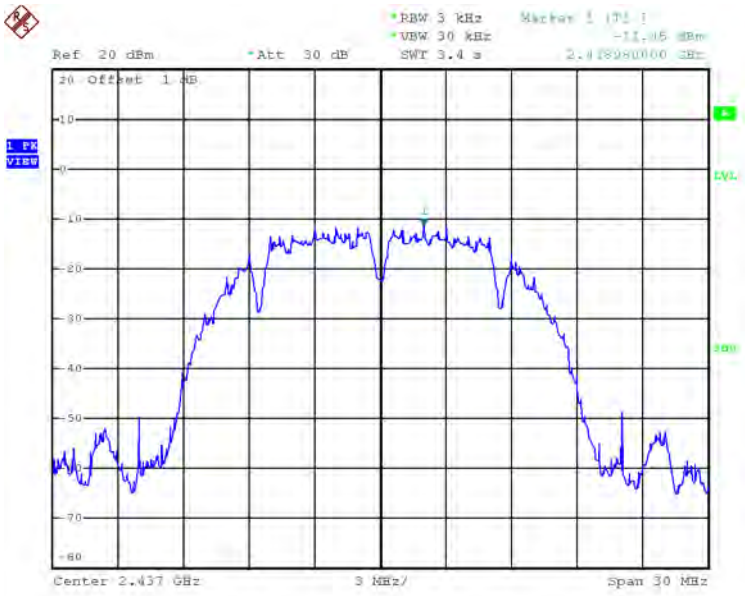
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 2437 MHz / Chain 2



Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 2437 MHz / Chain 2

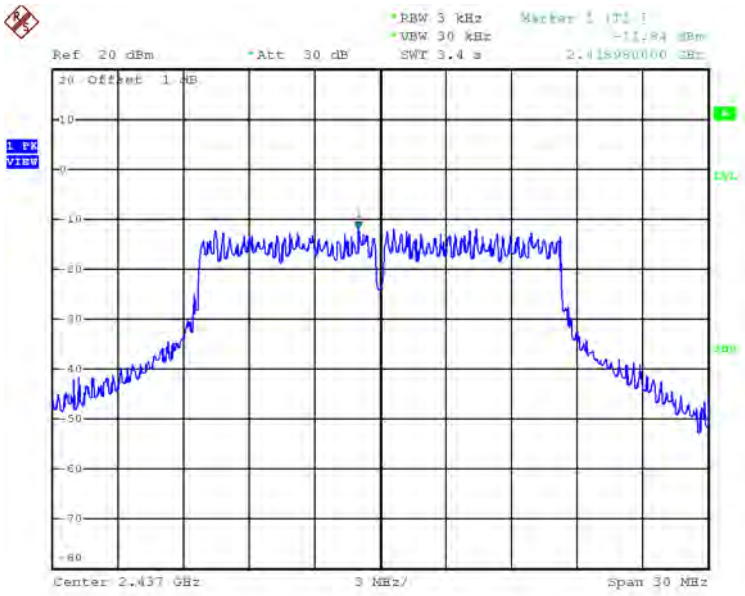


Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 2



Date: 2.OCT.2013 19:12:30

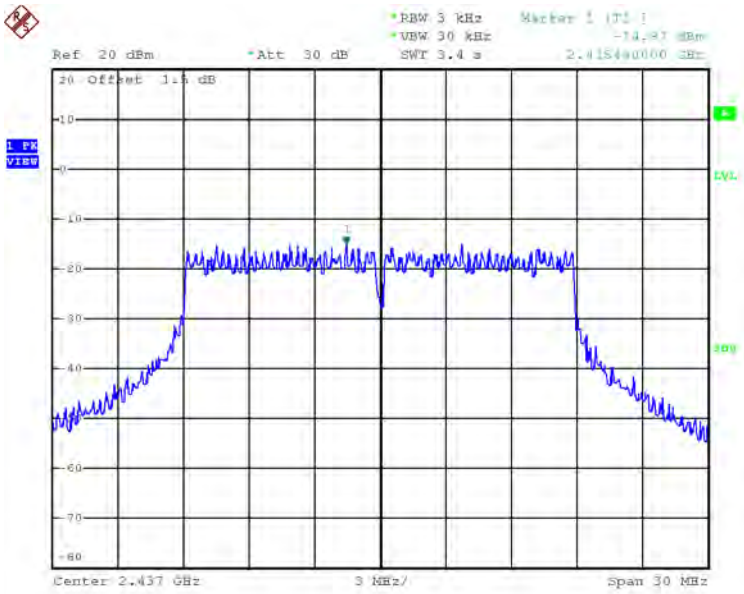
Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



Date: 2.OCT.2013 19:14:35

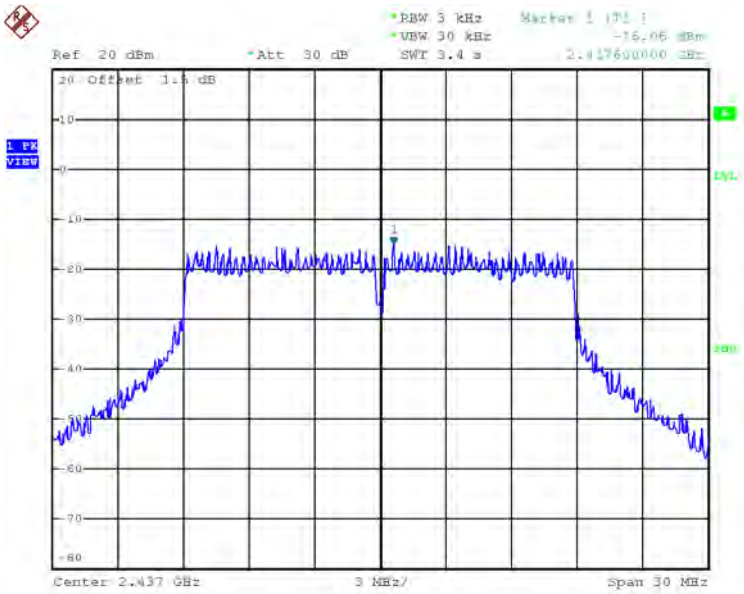
2TX

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 2437 MHz / Chain 1



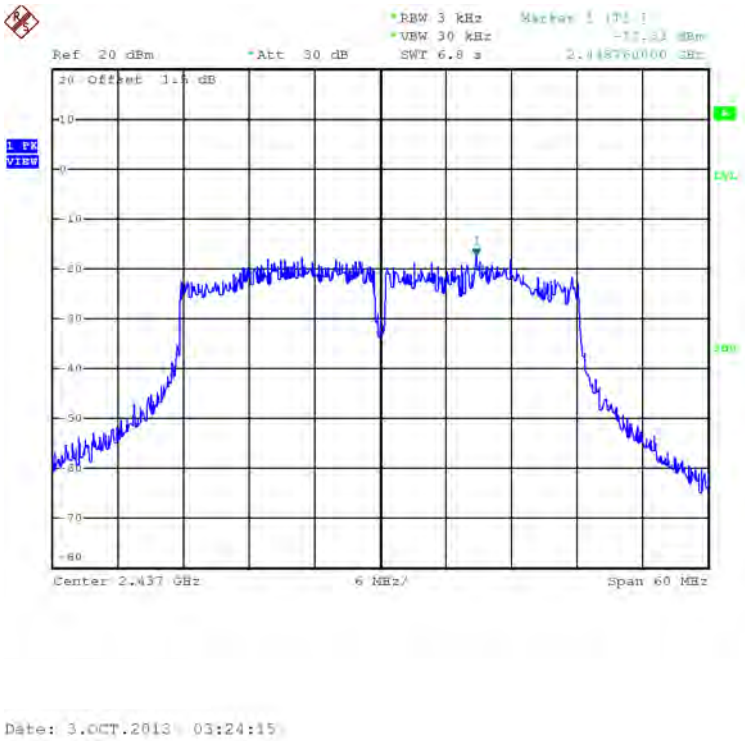
Date: 3.OCT.2013 03:13:37

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 2437 MHz / Chain 2

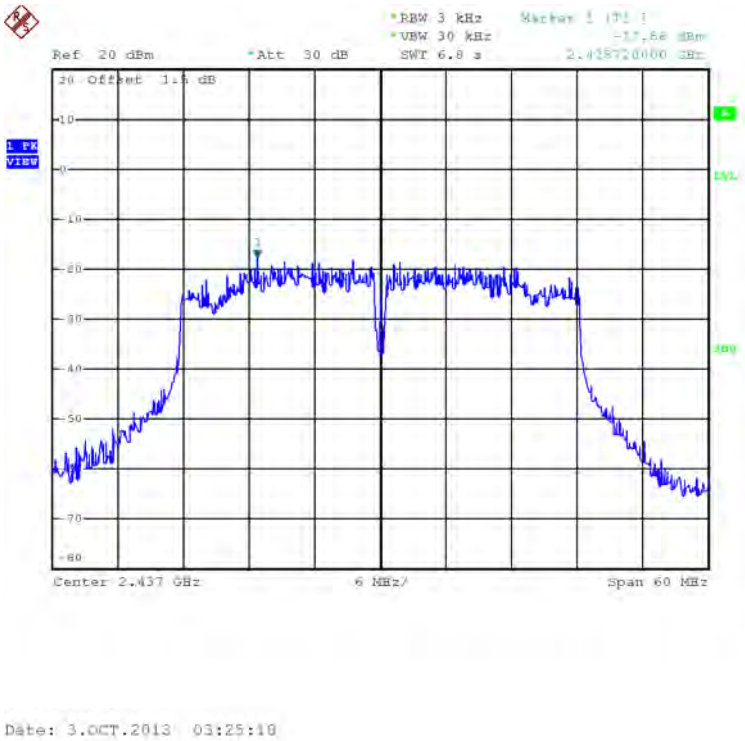


Date: 3.OCT.2013 03:15:04

Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 2437 MHz / Chain 1



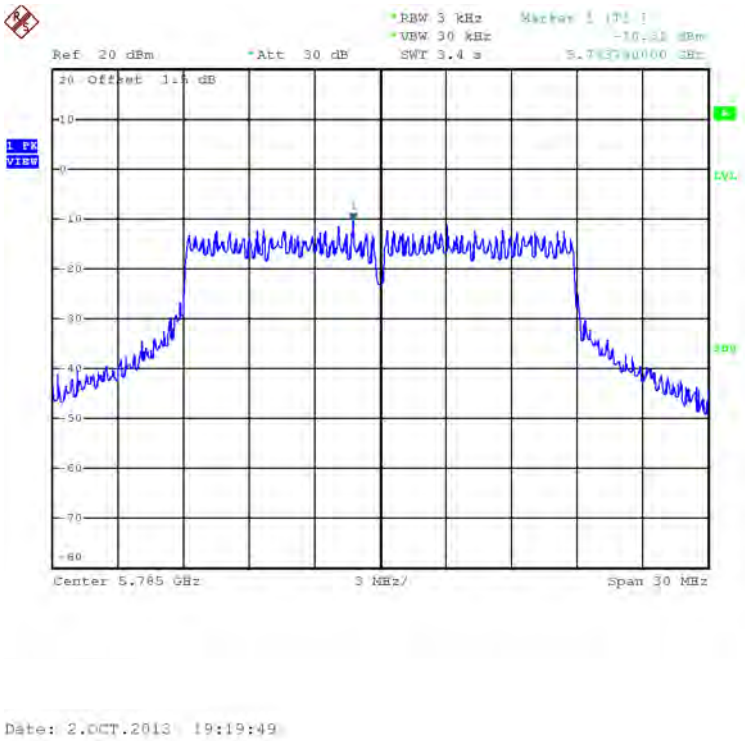
Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 2437 MHz / Chain 2



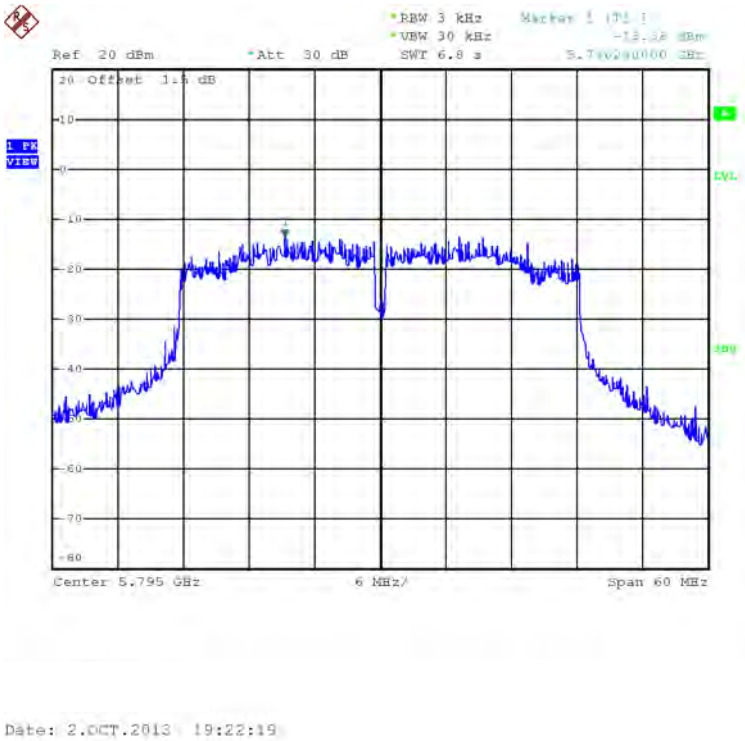
For 5GHz Band

1TX

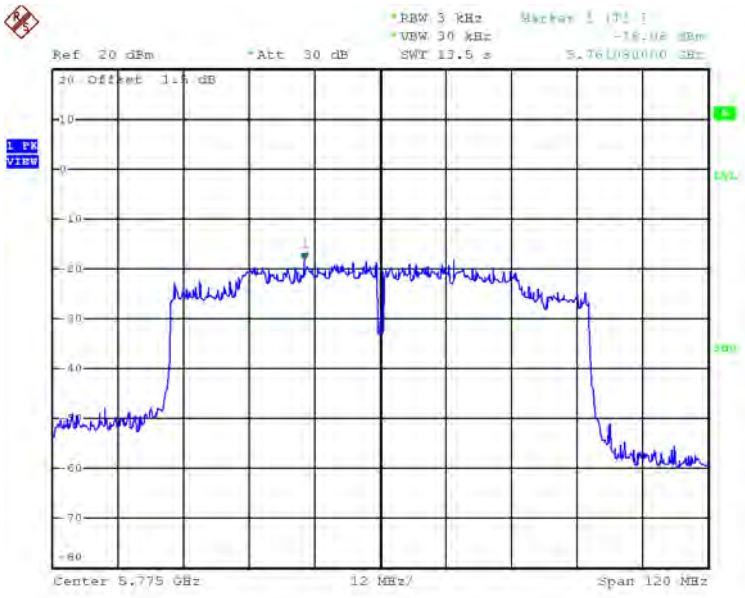
Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / 5785 MHz / Chain 2



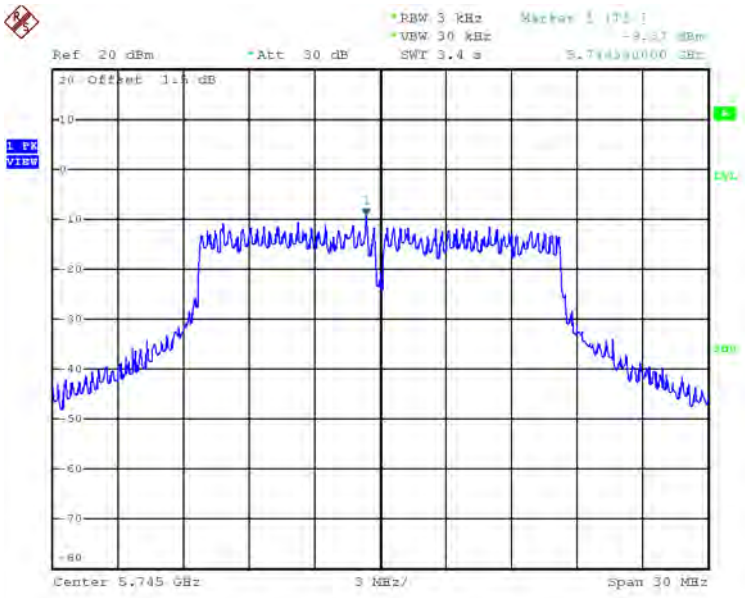
Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / 5795 MHz / Chain 2



Power Density Plot on Configuration IEEE 802.11ac MCS0 80MHz / 5775 MHz / Chain 2

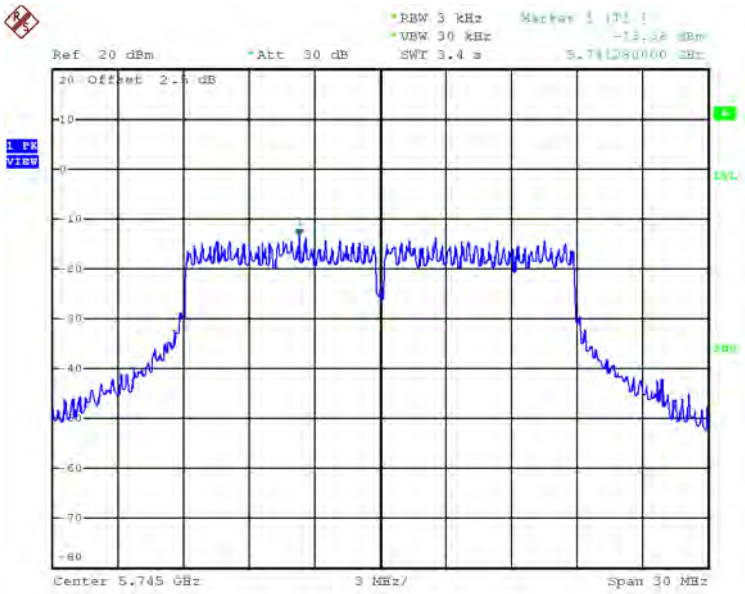


Power Density Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 2



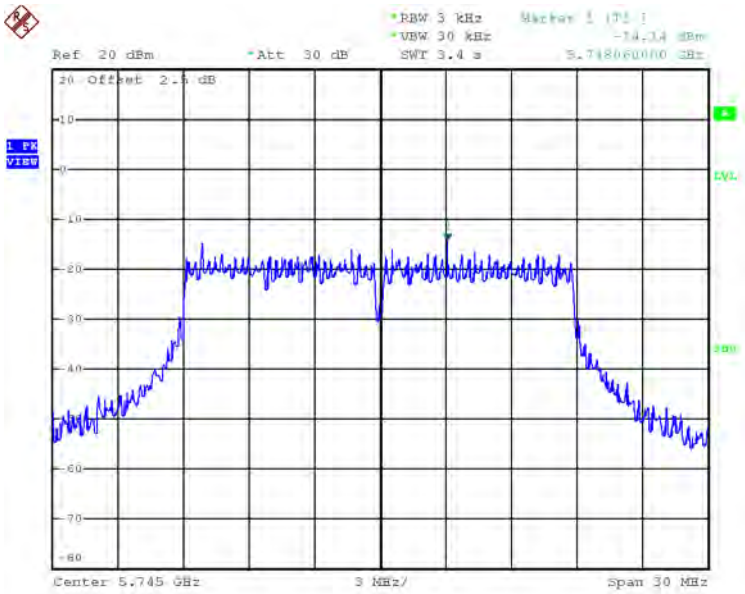
2TX

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 5745 MHz / Chain 1



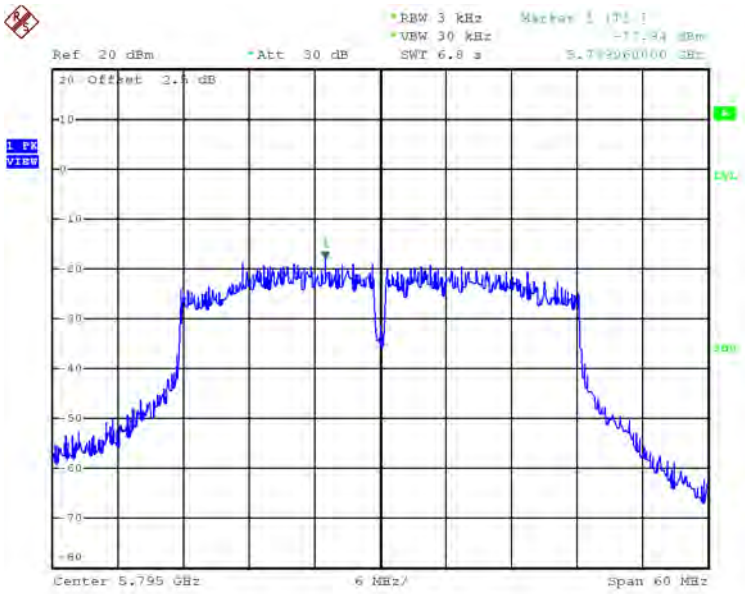
Date: 3.OCT.2013 03:32:42

Power Density Plot on Configuration IEEE 802.11n MCS8 20MHz / 5745 MHz / Chain 2

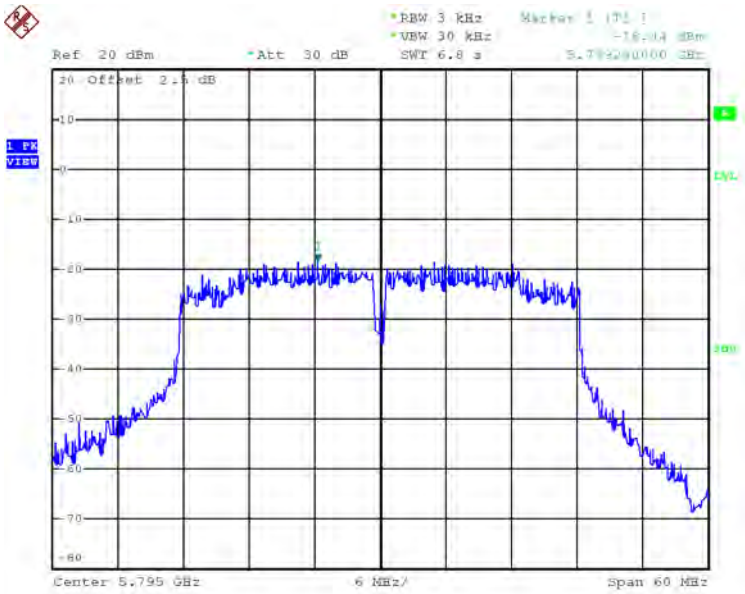


Date: 3.OCT.2013 03:33:44

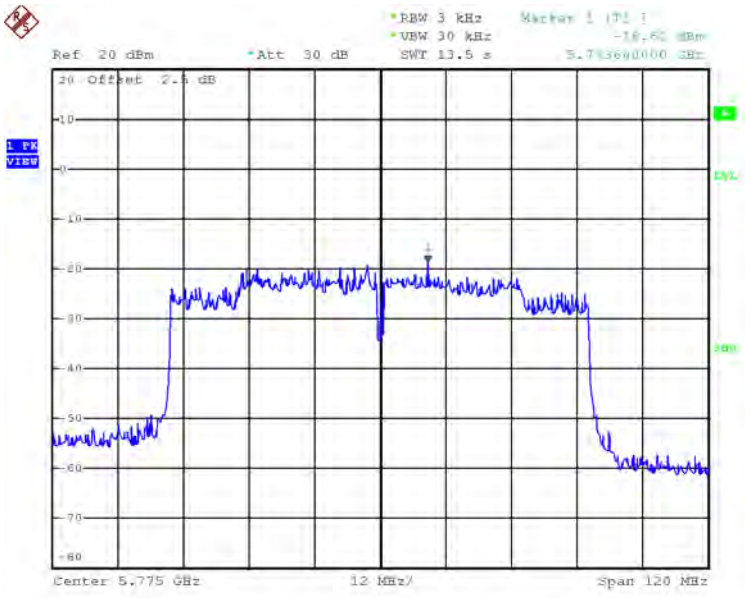
Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 5795 MHz / Chain 1



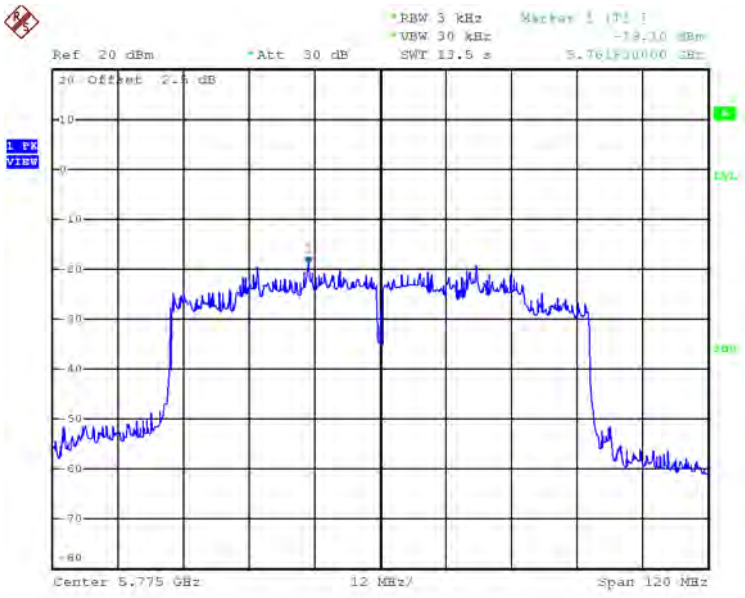
Power Density Plot on Configuration IEEE 802.11n MCS8 40MHz / 5795 MHz / Chain 2



Power Density Plot on Configuration IEEE 802.11ac MCS8 80MHz / 5775 MHz / Chain 1



Power Density Plot on Configuration IEEE 802.11ac MCS8 80MHz / 5775 MHz / Chain 2



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

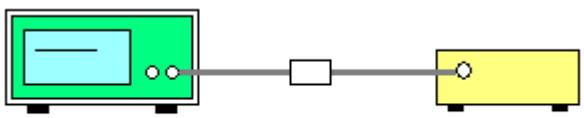
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03r01 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.0 DTS 6-dB signal bandwidth option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	25°C	Humidity	60%
Test Engineer	Kenneth Huang Nick Peng	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

1TX

Configuration IEEE 802.11n MCS0 20MHz / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.60	17.76	500	Complies
6	2437 MHz	17.60	17.76	500	Complies
11	2462 MHz	17.60	17.84	500	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	30.24	36.16	500	Complies
6	2437 MHz	35.04	36.00	500	Complies
9	2452 MHz	35.04	35.84	500	Complies

2TX

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.60	17.76	500	Complies
6	2437 MHz	17.60	17.76	500	Complies
11	2462 MHz	17.60	17.76	500	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	33.28	36.16	500	Complies
6	2437 MHz	35.04	35.84	500	Complies
9	2452 MHz	35.20	36.00	500	Complies

For 5GHz Band

1TX

Configuration IEEE 802.11n MCS0 20MHz / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.60	17.92	500	Complies
157	5785 MHz	17.60	17.84	500	Complies
165	5825 MHz	17.60	17.84	500	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	31.36	36.16	500	Complies
159	5795 MHz	31.36	36.16	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	68.80	75.20	500	Complies

2TX

Configuration IEEE 802.11n MCS8 20MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.60	17.84	500	Complies
157	5785 MHz	16.32	17.76	500	Complies
165	5825 MHz	16.32	17.68	500	Complies

Configuration IEEE 802.11n MCS8 40MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	30.08	36.16	500	Complies
159	5795 MHz	30.24	36.00	500	Complies

Configuration IEEE 802.11ac MCS8 80MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	50.56	75.52	500	Complies

Temperature	25°C	Humidity	60%
Test Engineer	Kenneth Huang Nick Peng	Configurations	IEEE 802.11a/b/g

1TX

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	11.04	14.24	500	Complies
6	2437 MHz	11.12	14.24	500	Complies
11	2462 MHz	11.04	14.24	500	Complies

Configuration IEEE 802.11g / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	16.56	500	Complies
6	2437 MHz	16.32	16.64	500	Complies
11	2462 MHz	16.32	16.64	500	Complies

Configuration IEEE 802.11a / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.32	16.64	500	Complies
157	5785 MHz	16.32	16.64	500	Complies
165	5825 MHz	16.32	16.64	500	Complies

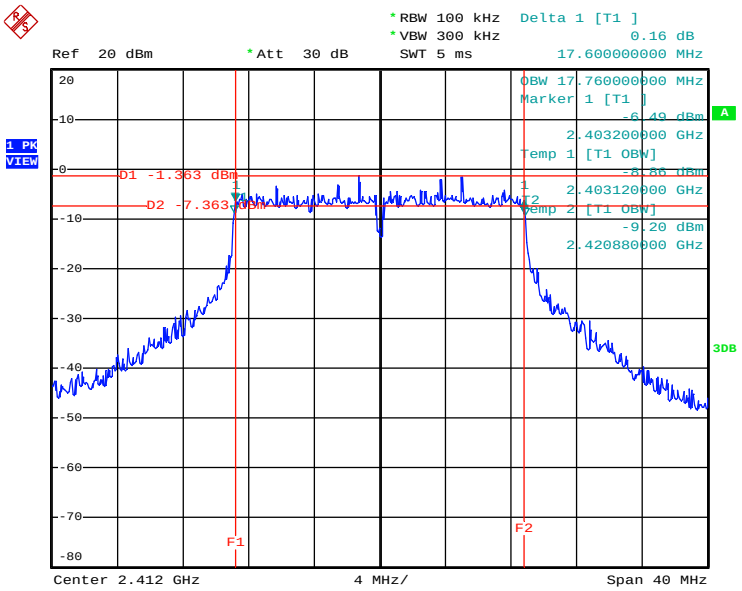
Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

For 2.4GHz Band

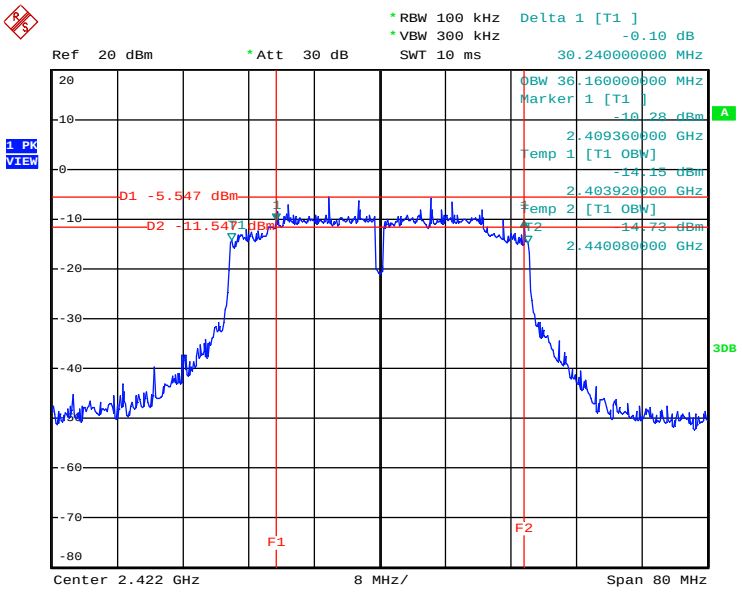
1TX

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 2412 MHz / Chain 2



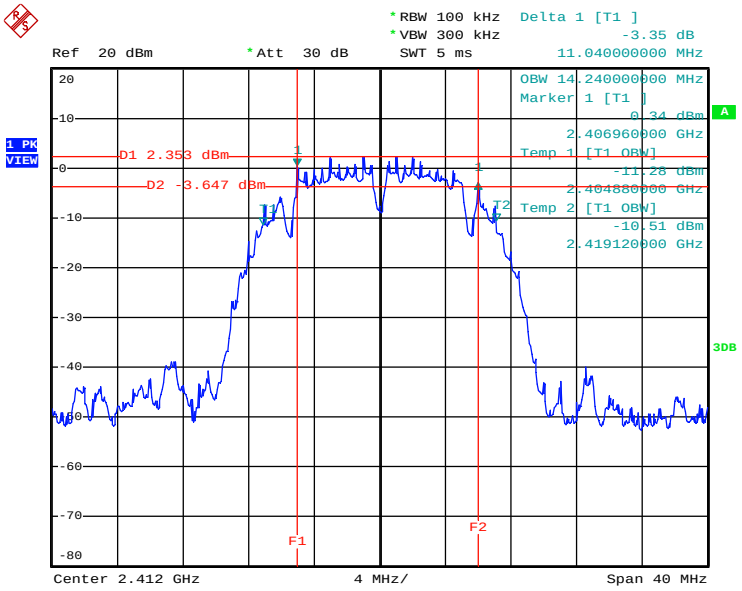
Date: 2.OCT.2013 18:12:40

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



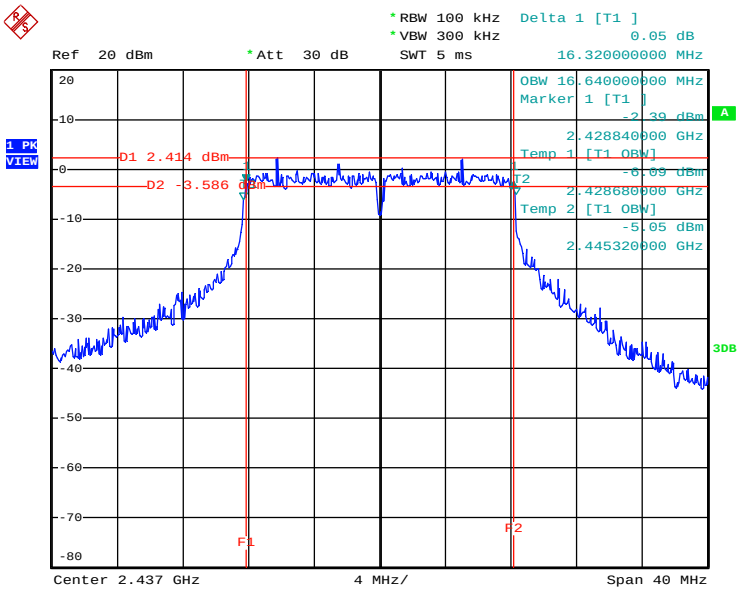
Date: 2.OCT.2013 18:14:40

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 2



Date: 2.OCT.2013 17:36:23

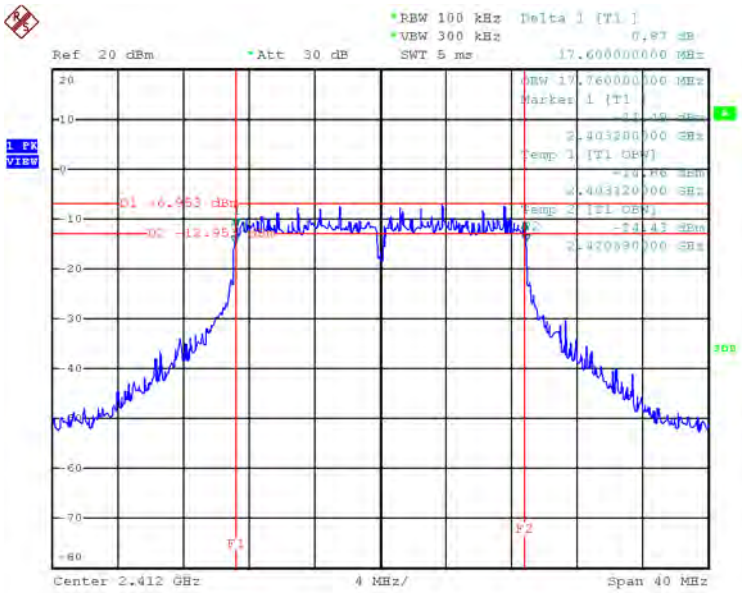
6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



Date: 2.OCT.2013 17:38:51

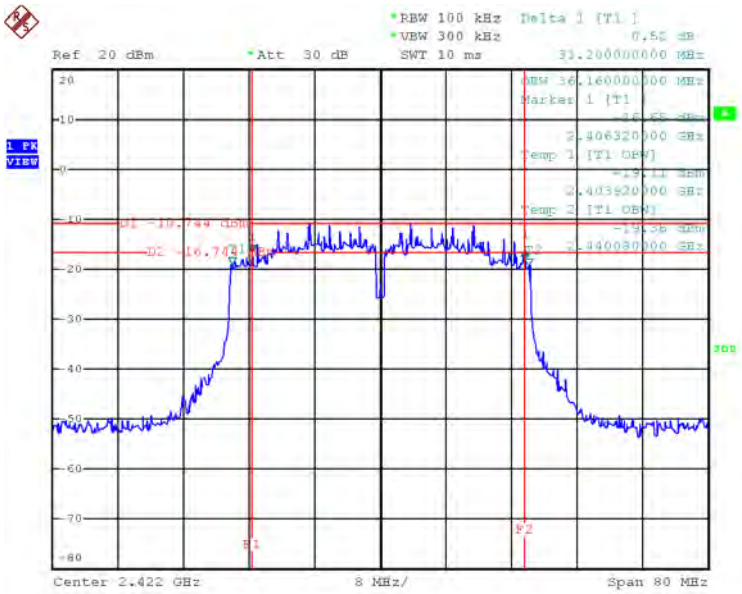
2TX

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 2412 MHz / Chain 1 + Chain 2



Date: 3.OCT.2013 04:07:04

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 2422MHz / Chain 1 + Chain 2

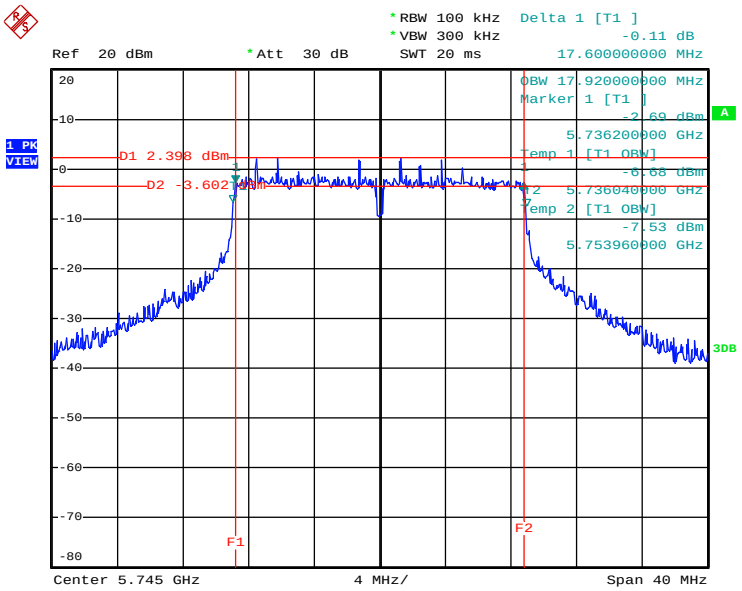


Date: 3.OCT.2013 04:17:58

For 5GHz Band

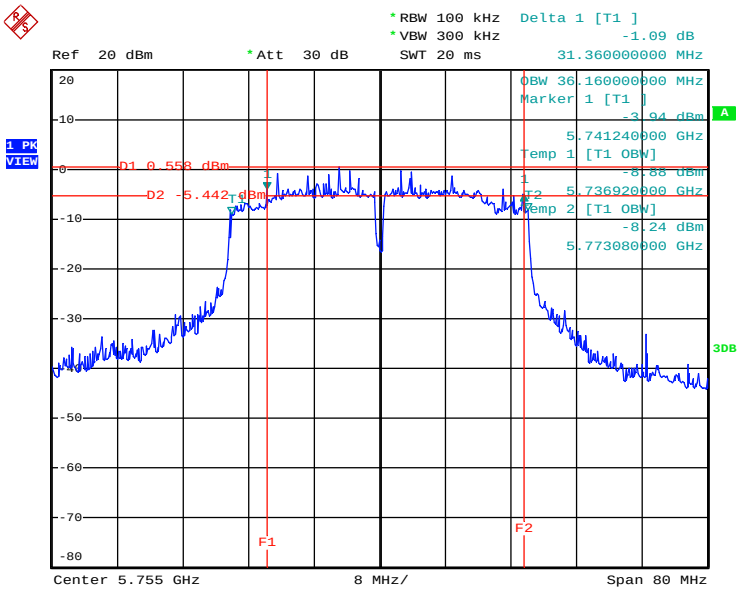
1TX

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / 5745 MHz / Chain 2



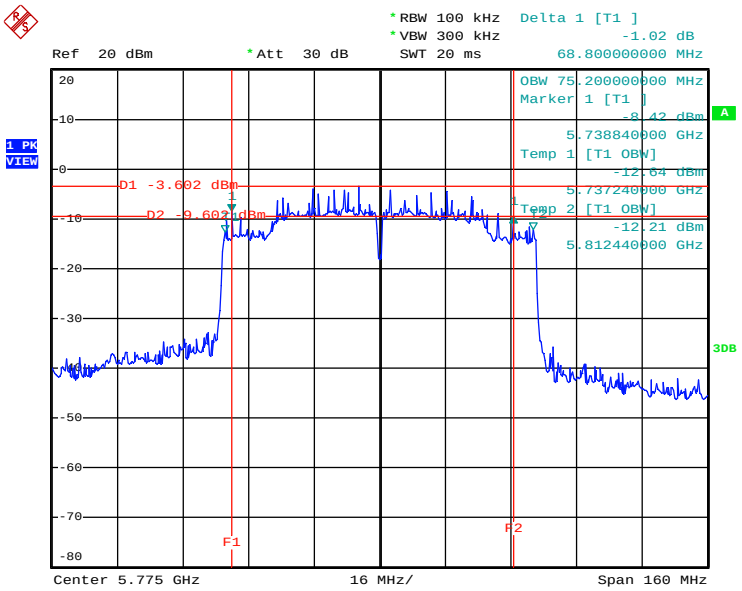
Date: 2.OCT.2013 18:10:15

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / 5755MHz / Chain 2



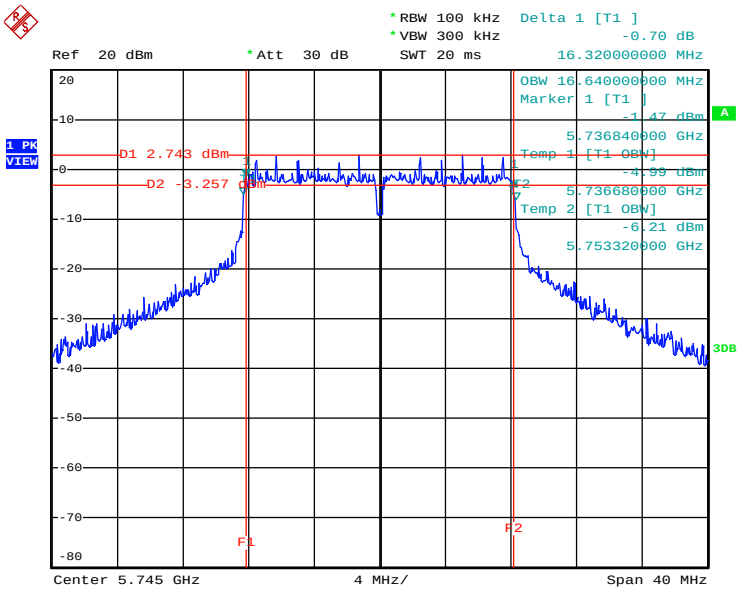
Date: 2.OCT.2013 18:08:33

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 2



Date: 2.OCT.2013 18:06:07

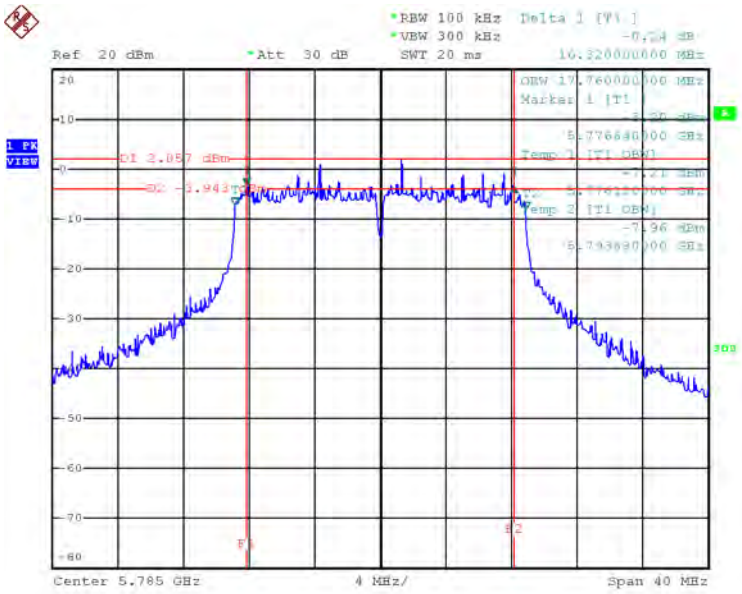
6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 2



Date: 2.OCT.2013 17:42:37

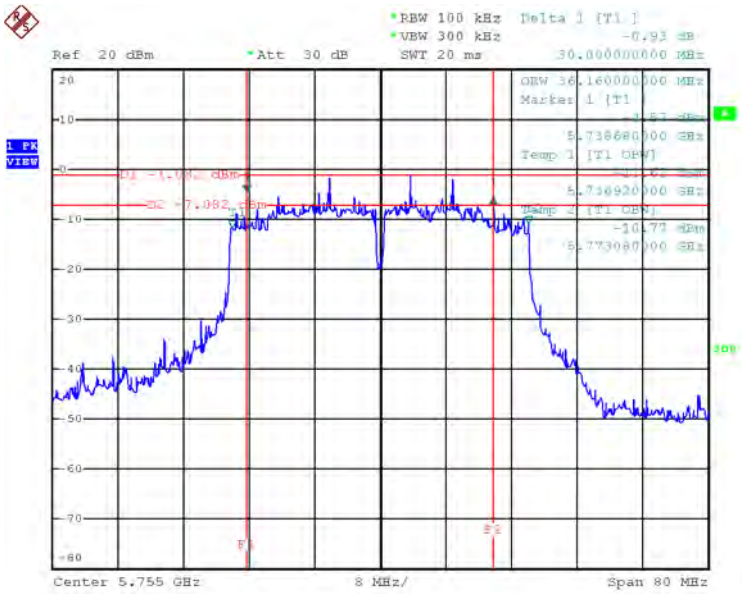
2TX

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 20MHz / 5785 MHz / Chain 1 + Chain 2



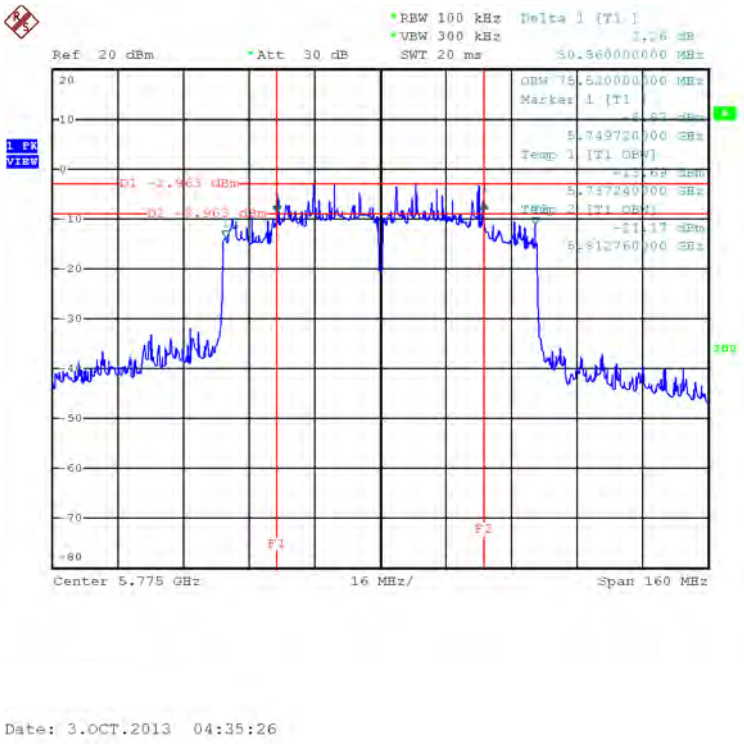
Date: 3.OCT.2013 04:26:08

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS8 40MHz / 5755 MHz / Chain 1 + Chain 2



Date: 3.OCT.2013 04:29:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS8 80MHz / 5775 MHz / Chain 1 + Chain 2



Date: 3.OCT.2013 04:35:26

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

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1GHz
Stop Frequency	10th carrier harmonic
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

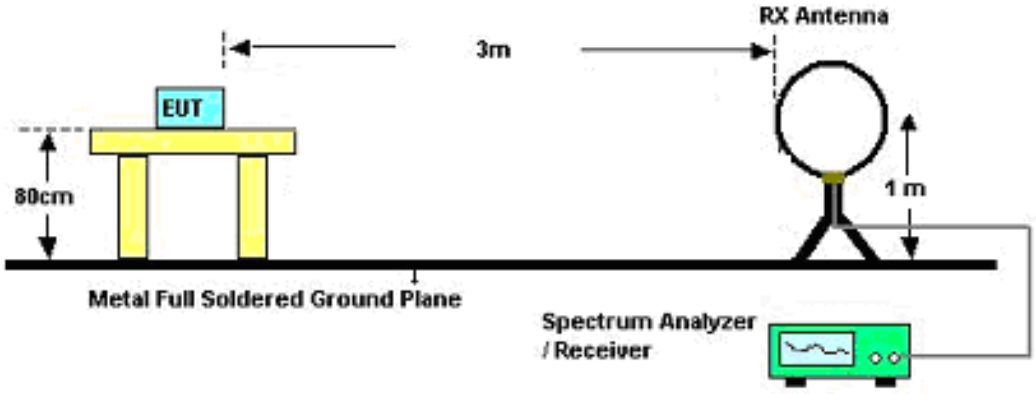
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

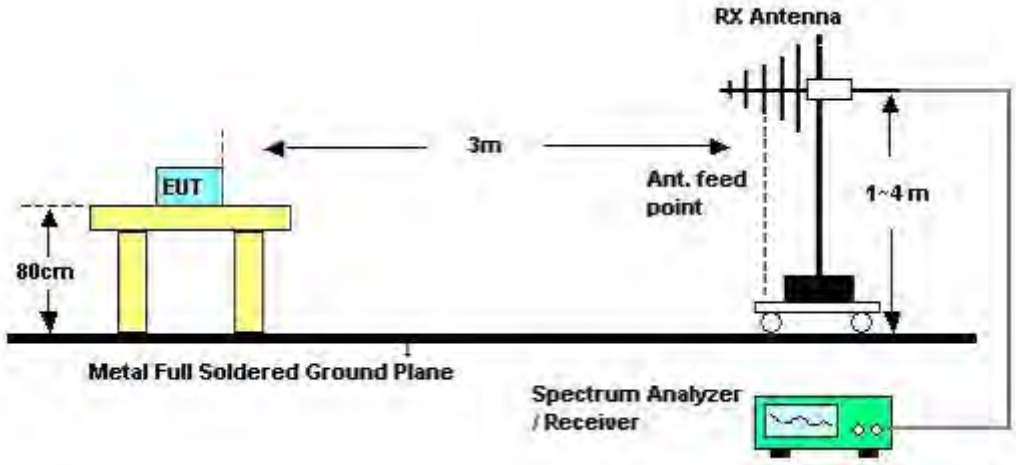
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

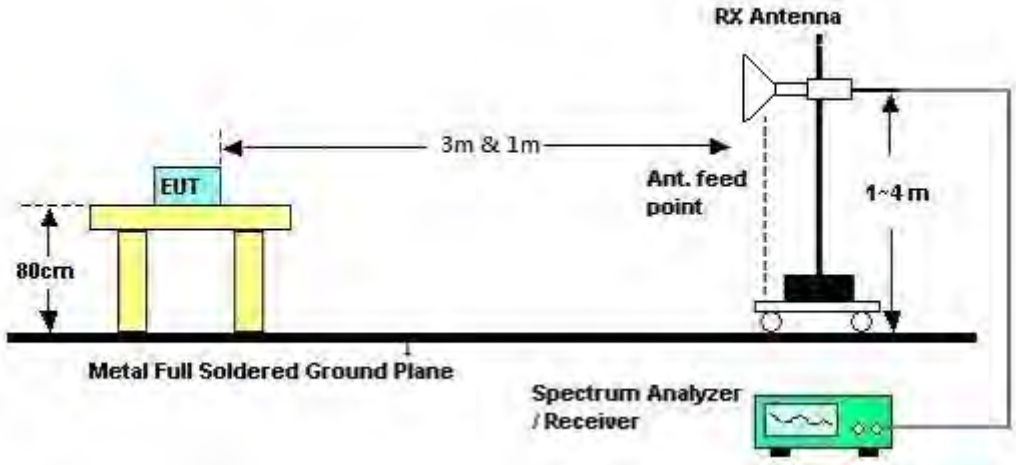
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	40%
Test Engineer	YC Chen	Test Date	Oct. 16, 2013
Configurations	Mode 1 / CTX		

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

Note:

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

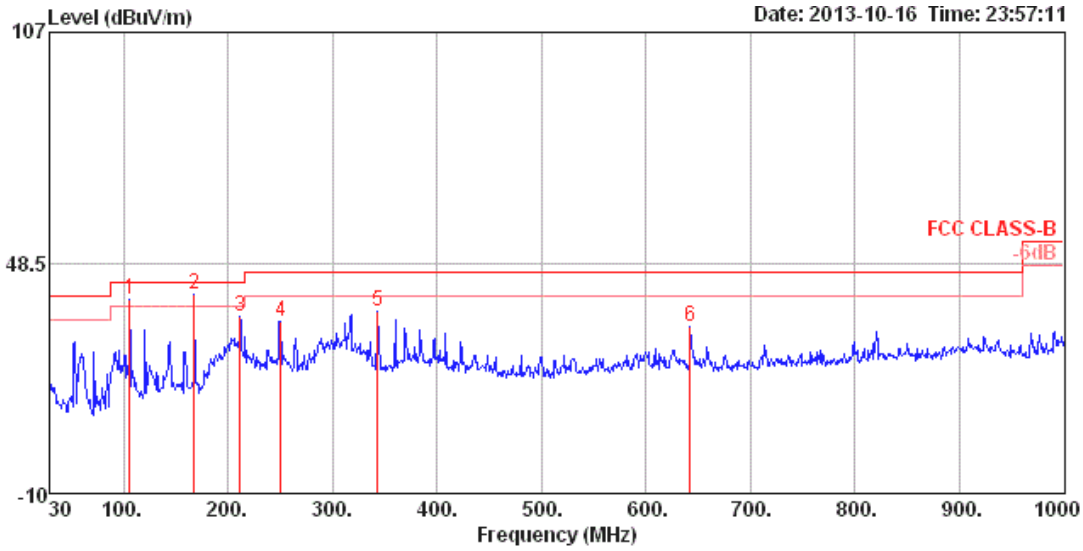
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

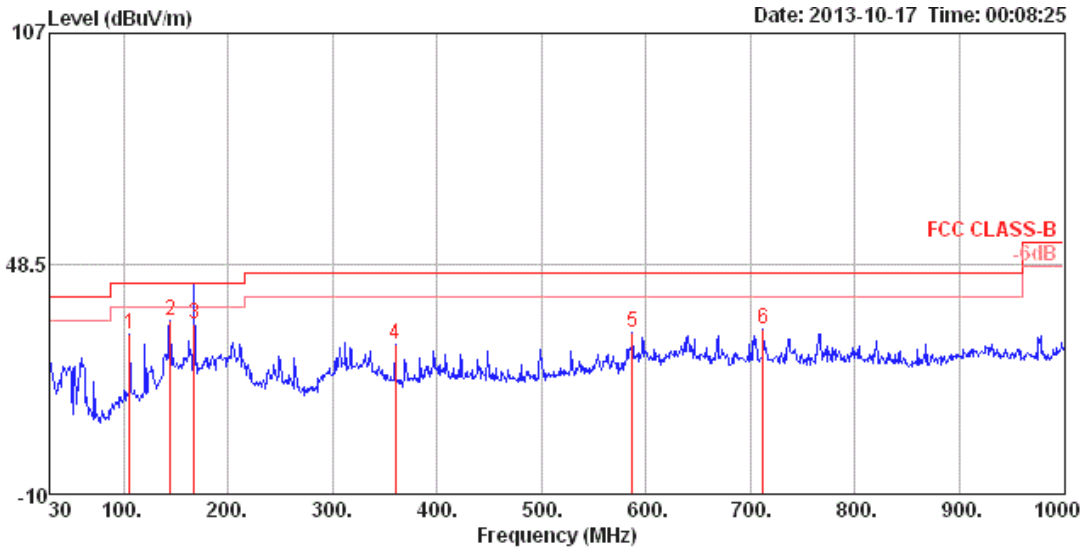
Temperature	25°C	Humidity	40%
Test Engineer	YC Chen	Configurations	Mode 1 / CTX

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	105.66	39.42	43.50	-4.08	58.74	1.22	11.03	31.57	300	276	HORIZONTAL	Peak
2	167.74	40.35	43.50	-3.15	61.06	1.57	9.25	31.53	200	309	HORIZONTAL	Peak
3	211.39	34.91	43.50	-8.59	56.11	1.78	8.44	31.42	200	131	HORIZONTAL	Peak
4	250.19	33.63	46.00	-12.37	51.31	1.90	11.91	31.49	200	155	HORIZONTAL	Peak
5	343.31	36.21	46.00	-9.79	51.20	2.30	14.06	31.35	100	53	HORIZONTAL	Peak
6	642.07	32.12	46.00	-13.88	41.68	3.21	18.68	31.45	100	152	HORIZONTAL	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	105.66	30.57	43.50	-12.93	49.89	1.22	11.03	31.57	100	230	VERTICAL	Peak
2	144.46	34.07	43.50	-9.43	53.67	1.43	10.51	31.54	100	131	VERTICAL	Peak
3	167.74	33.16	43.50	-10.34	53.87	1.57	9.25	31.53	100	167	VERTICAL	QP
4	359.80	28.11	46.00	-17.89	42.43	2.35	14.66	31.33	100	198	VERTICAL	Peak
5	586.78	30.96	46.00	-15.04	40.75	3.07	18.34	31.20	100	135	VERTICAL	Peak
6	711.91	31.89	46.00	-14.11	40.59	3.43	19.14	31.27	100	185	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)

For 2.4GHz Band

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 20MHz CH 1 / 1TX / Chain 2
Test Date	Sep. 29, 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	4823.62	41.08	74.00	-32.92	39.74	3.31	33.06	35.03	Peak	100	141	HORIZONTAL
2	4823.81	28.30	54.00	-25.70	26.96	3.31	33.06	35.03	Average	100	141	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	4823.74	41.85	74.00	-32.15	40.51	3.31	33.06	35.03	Peak	100	274	VERTICAL
2	4824.45	29.03	54.00	-24.97	27.69	3.31	33.06	35.03	Average	100	274	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 20MHz CH 6 / 1TX / Chain 2
Test Date	Sep. 29, 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	4874.13	42.18	74.00	-31.82	40.72	3.33	33.16	35.03	Peak	100	192	HORIZONTAL
2	4874.37	28.81	54.00	-25.19	27.35	3.33	33.16	35.03	Average	100	192	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	4874.00	42.35	74.00	-31.65	40.89	3.33	33.16	35.03	Peak	100	310	VERTICAL
2	4874.01	30.28	54.00	-23.72	28.82	3.33	33.16	35.03	Average	100	310	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 20MHz CH 11 / 1TX / Chain 2
Test Date	Sep. 29, 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	4923.76	28.85	54.00	-25.15	27.25	3.35	33.26	35.01	Average	100	176	HORIZONTAL
2	4923.93	41.73	74.00	-32.27	40.13	3.35	33.26	35.01	Peak	100	176	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4923.74	42.75	74.00	-31.25	41.15	3.35	33.26	35.01	Peak	100	263	VERTICAL
2	4924.00	29.98	54.00	-24.02	28.38	3.35	33.26	35.01	Average	100	263	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 40MHz CH 3 / 1TX / Chain 2
Test Date	Sep. 29, 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	4843.79	28.69	54.00	-25.31	27.31	3.32	33.09	35.03	Average	100	208	HORIZONTAL
2	4844.34	41.77	74.00	-32.23	40.39	3.32	33.09	35.03	Peak	100	208	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4844.44	41.66	74.00	-32.34	40.28	3.32	33.09	35.03	Peak	100	132	VERTICAL
2	4844.47	28.88	54.00	-25.12	27.50	3.32	33.09	35.03	Average	100	132	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 40MHz CH 6 / 1TX / Chain 2
Test Date	Sep. 29, 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	4874.14	41.19	74.00	-32.81	39.73	3.33	33.16	35.03	Peak	100	186	HORIZONTAL
2	4874.46	28.48	54.00	-25.52	27.02	3.33	33.16	35.03	Average	100	186	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	4873.75	41.33	74.00	-32.67	39.87	3.33	33.16	35.03	Peak	100	260	VERTICAL
2	4874.01	29.32	54.00	-24.68	27.86	3.33	33.16	35.03	Average	100	260	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 40MHz CH 9 / 1TX / Chain 2
Test Date	Sep. 29, 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	4903.52	28.71	54.00	-25.29	27.20	3.34	33.19	35.02	Average	100	138	HORIZONTAL
2	4903.67	41.52	74.00	-32.48	40.01	3.34	33.19	35.02	Peak	100	138	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	4904.10	29.08	54.00	-24.92	27.57	3.34	33.19	35.02	Average	100	253	VERTICAL
2	4904.16	41.84	74.00	-32.16	40.33	3.34	33.19	35.02	Peak	100	253	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11b CH 1 / 1TX / Chain 2
Test Date	Sep. 29, 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	4823.94	36.89	54.00	-17.11	35.55	3.31	33.06	35.03	Average	100	208	HORIZONTAL
2	4824.02	45.91	74.00	-28.09	44.57	3.31	33.06	35.03	Peak	100	208	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.81	48.33	74.00	-25.67	46.99	3.31	33.06	35.03	Peak	118	343	VERTICAL
2	4823.94	40.95	54.00	-13.05	39.61	3.31	33.06	35.03	Average	118	343	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11b CH 6 / 1TX / Chain 2
Test Date	Sep. 29, 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	4873.91	43.94	74.00	-30.06	42.48	3.33	33.16	35.03	Peak	100	209	HORIZONTAL
2	4873.99	34.31	54.00	-19.69	32.85	3.33	33.16	35.03	Average	100	209	HORIZONTAL
3	7310.57	31.19	54.00	-22.81	26.57	4.06	35.96	35.40	Average	100	238	HORIZONTAL
4	7311.27	43.92	74.00	-30.08	39.30	4.06	35.96	35.40	Peak	100	238	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	4873.96	42.69	54.00	-11.31	41.23	3.33	33.16	35.03	Average	102	342	VERTICAL
2	4874.08	47.95	74.00	-26.05	46.49	3.33	33.16	35.03	Peak	102	342	VERTICAL
3	7311.11	31.57	54.00	-22.43	26.95	4.06	35.96	35.40	Average	100	141	VERTICAL
4	7311.40	43.73	74.00	-30.27	39.11	4.06	35.96	35.40	Peak	100	141	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11b CH 11 / 1TX / Chain 2
Test Date	Sep. 29, 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	4923.94	36.68	54.00	-17.32	35.08	3.35	33.26	35.01	Average	165	258	HORIZONTAL
2	4924.40	42.61	74.00	-31.39	41.01	3.35	33.26	35.01	Peak	165	258	HORIZONTAL
3	7386.05	31.94	54.00	-22.06	27.19	4.06	36.09	35.40	Average	100	172	HORIZONTAL
4	7386.32	44.47	74.00	-29.53	39.72	4.06	36.09	35.40	Peak	100	172	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4923.98	42.93	54.00	-11.07	41.33	3.35	33.26	35.01	Average	101	342	VERTICAL
2	4923.99	48.34	74.00	-25.66	46.74	3.35	33.26	35.01	Peak	101	342	VERTICAL
3	7385.75	44.59	74.00	-29.41	39.84	4.06	36.09	35.40	Peak	100	184	VERTICAL
4	7385.94	31.84	54.00	-22.16	27.09	4.06	36.09	35.40	Average	100	184	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11g CH 1 / 1TX / Chain 2
Test Date	Sep. 29, 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	4824.46	28.18	54.00	-25.82	26.84	3.31	33.06	35.03	Average	100	264	HORIZONTAL
2	4824.48	40.89	74.00	-33.11	39.55	3.31	33.06	35.03	Peak	100	264	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	4823.76	29.35	54.00	-24.65	28.01	3.31	33.06	35.03	Average	100	189	VERTICAL
2	4824.01	42.83	74.00	-31.17	41.49	3.31	33.06	35.03	Peak	100	189	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11g CH 6 / 1TX / Chain 2
Test Date	Sep. 29, 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	4874.26	41.41	74.00	-32.59	39.95	3.33	33.16	35.03	Peak	100	204	HORIZONTAL
2	4874.28	29.05	54.00	-24.95	27.59	3.33	33.16	35.03	Average	100	204	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	4873.96	43.22	74.00	-30.78	41.76	3.33	33.16	35.03	Peak	100	160	VERTICAL
2	4874.03	30.63	54.00	-23.37	29.17	3.33	33.16	35.03	Average	100	160	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11g CH 11 / 1TX / Chain 2
Test Date	Sep. 29, 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	4923.53	29.27	54.00	-24.73	27.67	3.35	33.26	35.01	Average	100	227	HORIZONTAL
2	4924.06	41.66	74.00	-32.34	40.06	3.35	33.26	35.01	Peak	100	227	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	4924.16	30.84	54.00	-23.16	29.24	3.35	33.26	35.01	Average	100	93	VERTICAL
2	4924.22	41.81	74.00	-32.19	40.21	3.35	33.26	35.01	Peak	100	93	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 20MHz CH 1 / 2TX / Chain 1 + Chain 2
Test Date	Sep. 29, 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	4824.12	28.13	54.00	-25.87	26.79	3.31	33.06	35.03	Average	100	194	HORIZONTAL
2	4824.23	41.31	74.00	-32.69	39.97	3.31	33.06	35.03	Peak	100	194	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	4823.72	42.40	74.00	-31.60	41.06	3.31	33.06	35.03	Peak	100	254	VERTICAL
2	4823.81	28.72	54.00	-25.28	27.38	3.31	33.06	35.03	Average	100	254	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 20MHz CH 6 / 2TX / Chain 1 + Chain 2
Test Date	Sep. 29, 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	4873.68	41.53	74.00	-32.47	40.07	3.33	33.16	35.03	Peak	100	205	HORIZONTAL
2	4874.23	28.63	54.00	-25.37	27.17	3.33	33.16	35.03	Average	100	205	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	4873.77	43.29	74.00	-30.71	41.83	3.33	33.16	35.03	Peak	100	119	VERTICAL
2	4874.07	29.61	54.00	-24.39	28.15	3.33	33.16	35.03	Average	100	119	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 20MHz CH 11 / 2TX / Chain 1 + Chain 2
Test Date	Sep. 29, 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	4923.57	41.84	74.00	-32.16	40.24	3.35	33.26	35.01	Peak	100	275	HORIZONTAL
2	4923.88	28.90	54.00	-25.10	27.30	3.35	33.26	35.01	Average	100	275	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4923.55	29.42	54.00	-24.58	27.82	3.35	33.26	35.01	Average	100	117	VERTICAL
2	4924.42	42.46	74.00	-31.54	40.86	3.35	33.26	35.01	Peak	100	117	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 40MHz CH 3 / 2TX / Chain 1 + Chain 2
Test Date	Sep. 29, 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	4843.51	42.23	74.00	-31.77	40.85	3.32	33.09	35.03	Peak	100	145	HORIZONTAL
2	4844.50	28.46	54.00	-25.54	27.08	3.32	33.09	35.03	Average	100	145	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	4844.23	29.36	54.00	-24.64	27.98	3.32	33.09	35.03	Average	100	249	VERTICAL
2	4844.32	42.16	74.00	-31.84	40.78	3.32	33.09	35.03	Peak	100	249	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 40MHz CH 6 / 2TX / Chain 1 + Chain 2
Test Date	Sep. 29, 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	4873.56	40.96	74.00	-33.04	39.50	3.33	33.16	35.03	Peak	100	198	HORIZONTAL
2	4873.64	28.39	54.00	-25.61	26.93	3.33	33.16	35.03	Average	100	198	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	4873.54	42.20	74.00	-31.80	40.74	3.33	33.16	35.03	Peak	100	260	VERTICAL
2	4873.84	29.43	54.00	-24.57	27.97	3.33	33.16	35.03	Average	100	260	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 40MHz CH 9 / 2TX / Chain 1 + Chain 2
Test Date	Sep. 29, 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	4903.62	41.75	74.00	-32.25	40.24	3.34	33.19	35.02	Peak	100	182	HORIZONTAL
2	4903.76	28.68	54.00	-25.32	27.17	3.34	33.19	35.02	Average	100	182	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	4903.72	41.88	74.00	-32.12	40.37	3.34	33.19	35.02	Peak	100	250	VERTICAL
2	4904.38	28.86	54.00	-25.14	27.35	3.34	33.19	35.02	Average	100	250	VERTICAL

For 5GHz Band

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS0 20MHz CH 149 / 1TX / Chain 2
Test Date	Sep. 30, 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	11489.60	40.38	54.00	-13.62	26.72	9.24	39.50	35.08	Average	100	33	HORIZONTAL
2	11497.56	54.60	74.00	-19.40	40.95	9.25	39.50	35.10	Peak	100	33	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	11484.36	54.46	74.00	-19.54	40.80	9.24	39.50	35.08	Peak	100	196	VERTICAL
2	11495.04	40.48	54.00	-13.52	26.82	9.24	39.50	35.08	Average	100	196	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS0 20MHz CH 157 / 1TX / Chain 2
Test Date	Sep. 30, 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	11569.60	54.36	74.00	-19.64	40.72	9.26	39.47	35.09	Peak	100	249	HORIZONTAL
2	11577.72	40.63	54.00	-13.37	26.98	9.26	39.47	35.08	Average	100	249	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	11569.16	54.94	74.00	-19.06	41.30	9.26	39.47	35.09	Peak	100	107	VERTICAL
2	11577.20	40.64	54.00	-13.36	26.99	9.26	39.47	35.08	Average	100	107	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS0 20MHz CH 165 / 1TX / Chain 2
Test Date	Sep. 30, 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	11649.56	40.67	54.00	-13.33	27.02	9.28	39.44	35.07	Average	100	258	HORIZONTAL
2	11659.04	54.19	74.00	-19.81	40.54	9.28	39.44	35.07	Peak	100	258	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	11648.48	54.65	74.00	-19.35	41.00	9.28	39.44	35.07	Peak	100	124	VERTICAL
2	11652.36	40.47	54.00	-13.53	26.82	9.28	39.44	35.07	Average	100	124	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS0 40MHz CH 151 / 1TX / Chain 2
Test Date	Oct. 01, 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	11510.22	41.69	54.00	-12.31	28.04	9.25	39.50	35.10	Average	100	262	HORIZONTAL
2	11512.01	55.84	74.00	-18.16	42.19	9.25	39.50	35.10	Peak	100	262	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	11510.45	55.70	74.00	-18.30	42.05	9.25	39.50	35.10	Peak	153	102	VERTICAL
2	11510.53	41.40	54.00	-12.60	27.75	9.25	39.50	35.10	Average	153	102	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS0 40MHz CH 159 / 1TX / Chain 2
Test Date	Sep. 30, 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	11582.36	54.63	74.00	-19.37	40.98	9.26	39.47	35.08	Peak	100	71	HORIZONTAL
2	11594.08	40.71	54.00	-13.29	27.05	9.27	39.47	35.08	Average	100	71	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11589.32	54.77	74.00	-19.23	41.11	9.27	39.47	35.08	Peak	100	208	VERTICAL
2	11594.40	40.69	54.00	-13.31	27.03	9.27	39.47	35.08	Average	100	208	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 155 / 1TX / Chain 2
Test Date	Oct. 01, 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	11551.67	41.62	54.00	-12.38	27.97	9.26	39.48	35.09	Average	105	220	HORIZONTAL
2	11552.58	55.64	74.00	-18.36	41.99	9.26	39.48	35.09	Peak	105	220	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	11549.85	54.76	74.00	-19.24	41.10	9.26	39.49	35.09	Peak	105	86	VERTICAL
2	11550.00	42.12	54.00	-11.88	28.46	9.26	39.49	35.09	Average	105	86	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 149 / 1TX / Chain 2
Test Date	Sep. 30, 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	11492.16	54.12	74.00	-19.88	40.46	9.24	39.50	35.08	Peak	100	209	HORIZONTAL
2	11497.92	40.31	54.00	-13.69	26.66	9.25	39.50	35.10	Average	100	209	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	11485.24	54.02	74.00	-19.98	40.36	9.24	39.50	35.08	Peak	100	62	VERTICAL
2	11499.68	40.63	54.00	-13.37	26.98	9.25	39.50	35.10	Average	8280	62	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 157 / 1TX / Chain 2
Test Date	Sep. 30, 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	11576.12	55.09	74.00	-18.91	41.44	9.26	39.47	35.08	Peak	100	259	HORIZONTAL
2	11577.68	40.73	54.00	-13.27	27.08	9.26	39.47	35.08	Average	100	259	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	11574.32	54.87	74.00	-19.13	41.22	9.26	39.47	35.08	Peak	100	128	VERTICAL
2	11577.52	40.66	54.00	-13.34	27.01	9.26	39.47	35.08	Average	100	128	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 165 / 1TX / Chain 2
Test Date	Sep. 30, 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	11645.16	54.47	74.00	-19.53	40.82	9.28	39.44	35.07	Peak	100	213	HORIZONTAL
2	11646.76	40.66	54.00	-13.34	27.01	9.28	39.44	35.07	Average	100	213	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11641.40	56.72	74.00	-17.28	43.07	9.28	39.44	35.07	Peak	100	159	VERTICAL
2	11646.64	40.72	54.00	-13.28	27.07	9.28	39.44	35.07	Average	100	159	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS8 20MHz CH 149 / 2TX / Chain 1 + Chain 2
Test Date	Oct. 01, 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	11489.28	53.34	74.00	-20.66	39.68	9.24	39.50	35.08	Peak	100	48	HORIZONTAL
2	11489.70	40.01	54.00	-13.99	26.35	9.24	39.50	35.08	Average	100	48	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11490.22	53.93	74.00	-20.07	40.27	9.24	39.50	35.08	Peak	100	259	VERTICAL
2	11490.42	39.71	54.00	-14.29	26.05	9.24	39.50	35.08	Average	100	259	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS8 20MHz CH 157 / 2TX / Chain 1 + Chain 2
Test Date	Oct. 01, 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	11569.38	40.60	54.00	-13.40	26.96	9.26	39.47	35.09	Average	100	127	HORIZONTAL
2	11569.48	53.50	74.00	-20.50	39.86	9.26	39.47	35.09	Peak	100	127	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	11569.34	54.33	74.00	-19.67	40.69	9.26	39.47	35.09	Peak	100	294	VERTICAL
2	11569.46	40.63	54.00	-13.37	26.99	9.26	39.47	35.09	Average	100	294	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS8 20MHz CH 165 / 2TX / Chain 1 + Chain 2
Test Date	Oct. 01, 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	11648.12	55.52	74.00	-18.48	41.87	9.28	39.44	35.07	Peak	100	100	HORIZONTAL
2	11649.56	40.61	54.00	-13.39	26.96	9.28	39.44	35.07	Average	100	100	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	11649.04	40.45	54.00	-13.55	26.80	9.28	39.44	35.07	Average	100	299	VERTICAL
2	11649.46	54.38	74.00	-19.62	40.73	9.28	39.44	35.07	Peak	100	299	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS8 40MHz CH 151 / 2TX / Chain 1 + Chain 2
Test Date	Oct. 02, 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	11508.13	41.94	54.00	-12.06	28.29	9.25	39.50	35.10	Average	105	162	HORIZONTAL
2	11511.69	54.17	74.00	-19.83	40.52	9.25	39.50	35.10	Peak	105	162	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	11510.00	42.09	54.00	-11.91	28.44	9.25	39.50	35.10	Average	105	356	VERTICAL
2	11510.07	56.31	74.00	-17.69	42.66	9.25	39.50	35.10	Peak	105	356	VERTICAL

Temperature	25°C	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11n MCS8 40MHz CH 159 / 2TX / Chain 1 + Chain 2
Test Date	Oct. 01, 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	11590.54	40.43	54.00	-13.57	26.77	9.27	39.47	35.08	Average	100	114	HORIZONTAL
2	11590.70	54.76	74.00	-19.24	41.10	9.27	39.47	35.08	Peak	100	114	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11589.36	54.42	74.00	-19.58	40.76	9.27	39.47	35.08	Peak	100	267	VERTICAL
2	11591.58	40.46	54.00	-13.54	26.80	9.27	39.47	35.08	Average	100	267	VERTICAL

Temperature	25℃	Humidity	57%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS8 80MHz CH 155 / 2TX / Chain 1 + Chain 2
Test Date	Oct. 02, 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	11549.11	55.72	74.00	-18.28	42.06	9.26	39.49	35.09	Peak	106	139	HORIZONTAL
2	11549.76	41.90	54.00	-12.10	28.24	9.26	39.49	35.09	Average	106	139	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11550.34	55.88	74.00	-18.12	42.22	9.26	39.49	35.09	Peak	106	348	VERTICAL
2	11551.49	42.16	54.00	-11.84	28.51	9.26	39.48	35.09	Average	8955	348	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)	1MHz / 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 Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03r01 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 radiated 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 Radiated Out of Band Emission Measurement:

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 20MHz CH 1, 6, 11 / 1TX / Chain 2
Test date	Sep. 29, 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	2389.40	62.49	74.00	-11.51	32.11	2.21	28.17	0.00	Peak	118	271	VERTICAL
2	2390.00	47.29	54.00	-6.71	16.90	2.22	28.17	0.00	Average	118	271	VERTICAL
3	2404.80	88.74			58.31	2.22	28.21	0.00	Average	118	271	VERTICAL
4	2405.20	99.38			68.95	2.22	28.21	0.00	Peak	118	271	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2387.20	54.47	74.00	-19.53	24.09	2.21	28.17	0.00	Peak	120	272	VERTICAL
2	2389.20	43.18	54.00	-10.82	12.80	2.21	28.17	0.00	Average	120	272	VERTICAL
3	2429.80	91.03			60.55	2.23	28.25	0.00	Average	120	272	VERTICAL
4	2430.60	102.17			71.69	2.23	28.25	0.00	Peak	120	272	VERTICAL
5	2483.50	42.62	54.00	-11.38	11.99	2.26	28.37	0.00	Average	120	272	VERTICAL
6	2485.50	54.92	74.00	-19.08	24.25	2.26	28.41	0.00	Peak	120	272	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2466.60	100.61			70.02	2.26	28.33	0.00	Peak	110	194	VERTICAL
2	2469.00	89.83			59.20	2.26	28.37	0.00	Average	110	194	VERTICAL
3	2483.50	44.81	54.00	-9.19	14.18	2.26	28.37	0.00	Average	110	194	VERTICAL
4	2483.90	58.93	74.00	-15.07	28.30	2.26	28.37	0.00	Peak	110	194	VERTICAL

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

Temperature	25℃	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS0 40MHz CH 3, 6, 9 / 1TX / Chain 2
Test date	Sep. 29, 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	45.79	54.00	-8.21	15.40	2.22	28.17	0.00	Average	117	269	VERTICAL
2	2390.00	58.55	74.00	-15.45	28.16	2.22	28.17	0.00	Peak	117	269	VERTICAL
3	2424.80	95.20			64.72	2.23	28.25	0.00	Peak	117	269	VERTICAL
4	2425.20	84.39			53.91	2.23	28.25	0.00	Average	117	269	VERTICAL

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	2388.80	60.41	74.00	-13.59	30.03	2.21	28.17	0.00	Peak	122	270	VERTICAL
2	2390.00	45.40	54.00	-8.60	15.01	2.22	28.17	0.00	Average	122	270	VERTICAL
3	2425.00	97.63			67.15	2.23	28.25	0.00	Peak	122	270	VERTICAL
4	2428.20	86.69			56.21	2.23	28.25	0.00	Average	122	270	VERTICAL
5	2483.50	42.45	54.00	-11.55	11.82	2.26	28.37	0.00	Average	122	270	VERTICAL
6	2484.70	53.00	74.00	-21.00	22.37	2.26	28.37	0.00	Peak	122	270	VERTICAL

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

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	2448.80	84.66			54.13	2.24	28.29	0.00	Average	107	196	VERTICAL
2	2456.00	97.10			66.53	2.24	28.33	0.00	Peak	107	196	VERTICAL
3	2483.50	44.26	54.00	-9.74	13.63	2.26	28.37	0.00	Average	107	196	VERTICAL
4	2484.30	56.32	74.00	-17.68	25.69	2.26	28.37	0.00	Peak	107	196	VERTICAL

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℃	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11b CH 1, 6, 11 / 1TX / Chain 2
Test Date	Sep. 29, 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	2385.80	44.68	54.00	-9.32	14.30	2.21	28.17	0.00	Average	120	272	VERTICAL
2	2386.80	54.77	74.00	-19.23	24.39	2.21	28.17	0.00	Peak	120	272	VERTICAL
3	2409.40	99.06			68.63	2.22	28.21	0.00	Peak	120	272	VERTICAL
4	2410.20	94.49			64.06	2.22	28.21	0.00	Average	120	272	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.80	54.42	74.00	-19.58	24.04	2.21	28.17	0.00	Peak	120	271	VERTICAL
2	2389.20	43.31	54.00	-10.69	12.93	2.21	28.17	0.00	Average	120	271	VERTICAL
3	2434.60	99.33			68.81	2.23	28.29	0.00	Peak	120	271	VERTICAL
4	2435.00	94.01			63.49	2.23	28.29	0.00	Average	120	271	VERTICAL
5	2484.30	54.24	74.00	-19.76	23.61	2.26	28.37	0.00	Peak	120	271	VERTICAL
6	2484.70	42.83	54.00	-11.17	12.20	2.26	28.37	0.00	Average	120	271	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2460.20	95.00			64.43	2.24	28.33	0.00	Average	100	196	HORIZONTAL
2	2461.20	99.68			69.11	2.24	28.33	0.00	Peak	100	196	HORIZONTAL
3	2486.70	55.05	74.00	-18.95	24.37	2.26	28.42	0.00	Peak	100	196	HORIZONTAL
4	2487.90	44.57	54.00	-9.43	13.89	2.26	28.42	0.00	Average	100	196	HORIZONTAL

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

Temperature	25℃	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11g CH 1, 6, 11 / 1TX / Chain 2
Test Date	Sep. 29, 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	2389.80	59.64	74.00	-14.36	29.25	2.22	28.17	0.00	Peak	118	271	VERTICAL
2	2390.00	46.35	54.00	-7.65	15.96	2.22	28.17	0.00	Average	118	271	VERTICAL
3	2405.00	89.43			59.00	2.22	28.21	0.00	Average	118	271	VERTICAL
4	2415.80	100.44			70.00	2.23	28.21	0.00	Peak	118	271	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.20	54.83	74.00	-19.17	24.45	2.21	28.17	0.00	Peak	119	271	VERTICAL
2	2390.00	43.41	54.00	-10.59	13.02	2.22	28.17	0.00	Average	119	271	VERTICAL
3	2429.80	92.04			61.56	2.23	28.25	0.00	Average	119	271	VERTICAL
4	2429.80	102.10			71.62	2.23	28.25	0.00	Peak	119	271	VERTICAL
5	2483.50	42.99	54.00	-11.01	12.36	2.26	28.37	0.00	Average	119	271	VERTICAL
6	2483.50	54.34	74.00	-19.66	23.71	2.26	28.37	0.00	Peak	119	271	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2464.00	100.94			70.37	2.24	28.33	0.00	Peak	100	174	HORIZONTAL
2	2469.20	90.50			59.86	2.26	28.38	0.00	Average	100	174	HORIZONTAL
3	2483.50	45.13	54.00	-8.87	14.49	2.26	28.38	0.00	Average	100	174	HORIZONTAL
4	2483.50	57.78	74.00	-16.22	27.14	2.26	28.38	0.00	Peak	100	174	HORIZONTAL

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

Temperature	25°C	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 20MHz CH 1, 6, 11 / 2TX / Chain 1 + Chain 2
Test date	Sep. 29, 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	2388.60	57.08	74.00	-16.92	26.70	2.21	28.17	0.00	Peak	121	271	VERTICAL
2	2390.00	44.88	54.00	-9.12	14.49	2.22	28.17	0.00	Average	121	271	VERTICAL
3	2404.20	87.42			56.99	2.22	28.21	0.00	Average	121	271	VERTICAL
4	2405.60	100.69			70.26	2.22	28.21	0.00	Peak	121	271	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.40	53.11	74.00	-20.89	22.73	2.21	28.17	0.00	Peak	100	165	HORIZONTAL
2	2390.00	42.52	54.00	-11.48	12.13	2.22	28.17	0.00	Average	100	165	HORIZONTAL
3	2432.60	102.01			71.53	2.23	28.25	0.00	Peak	100	165	HORIZONTAL
4	2433.40	90.94			60.46	2.23	28.25	0.00	Average	100	165	HORIZONTAL
5	2483.50	42.52	54.00	-11.48	11.88	2.26	28.38	0.00	Average	100	165	HORIZONTAL
6	2485.10	54.06	74.00	-19.94	23.38	2.26	28.42	0.00	Peak	100	165	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	2467.80	100.47			69.88	2.26	28.33	0.00	Peak	109	195	VERTICAL
2	2469.40	87.39			56.76	2.26	28.37	0.00	Average	109	195	VERTICAL
3	2483.50	43.38	54.00	-10.62	12.75	2.26	28.37	0.00	Average	109	195	VERTICAL
4	2483.50	58.00	74.00	-16.00	27.37	2.26	28.37	0.00	Peak	109	195	VERTICAL

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

Temperature	25℃	Humidity	57%
Test Engineer	Serway Li	Configurations	IEEE 802.11n MCS8 40MHz CH 3, 6, 9 / 2TX / Chain 1 + Chain 2
Test date	Sep. 29, 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	44.01	54.00	-9.99	13.62	2.22	28.17	0.00	Average	110	206	VERTICAL
2	2390.00	56.33	74.00	-17.67	25.94	2.22	28.17	0.00	Peak	110	206	VERTICAL
3	2412.80	96.97			66.54	2.22	28.21	0.00	Peak	110	206	VERTICAL
4	2413.20	83.19			52.76	2.22	28.21	0.00	Average	110	206	VERTICAL

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	2389.20	55.85	74.00	-18.15	25.47	2.21	28.17	0.00	Peak	108	206	VERTICAL
2	2390.00	44.11	54.00	-9.89	13.72	2.22	28.17	0.00	Average	108	206	VERTICAL
3	2425.00	87.15			56.67	2.23	28.25	0.00	Average	108	206	VERTICAL
4	2428.20	99.58			69.10	2.23	28.25	0.00	Peak	108	206	VERTICAL
5	2483.50	43.24	54.00	-10.76	12.61	2.26	28.37	0.00	Average	108	206	VERTICAL
6	2483.50	54.67	74.00	-19.33	24.04	2.26	28.37	0.00	Peak	108	206	VERTICAL

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

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2449.20	84.21			53.68	2.24	28.29	0.00	Average	105	194	VERTICAL
2	2458.80	97.52			66.95	2.24	28.33	0.00	Peak	105	194	VERTICAL
3	2483.50	44.40	54.00	-9.60	13.77	2.26	28.37	0.00	Average	105	194	VERTICAL
4	2484.30	56.07	74.00	-17.93	25.44	2.26	28.37	0.00	Peak	105	194	VERTICAL

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

Note:

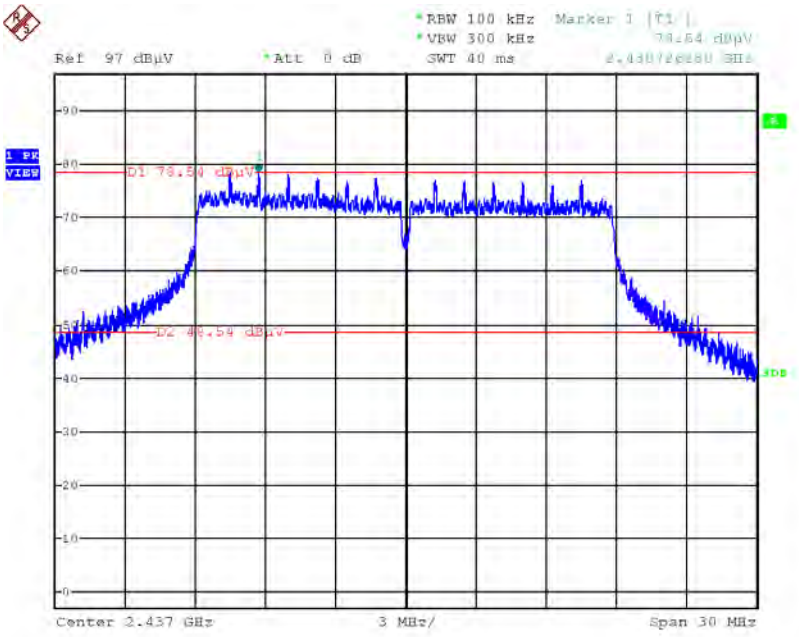
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

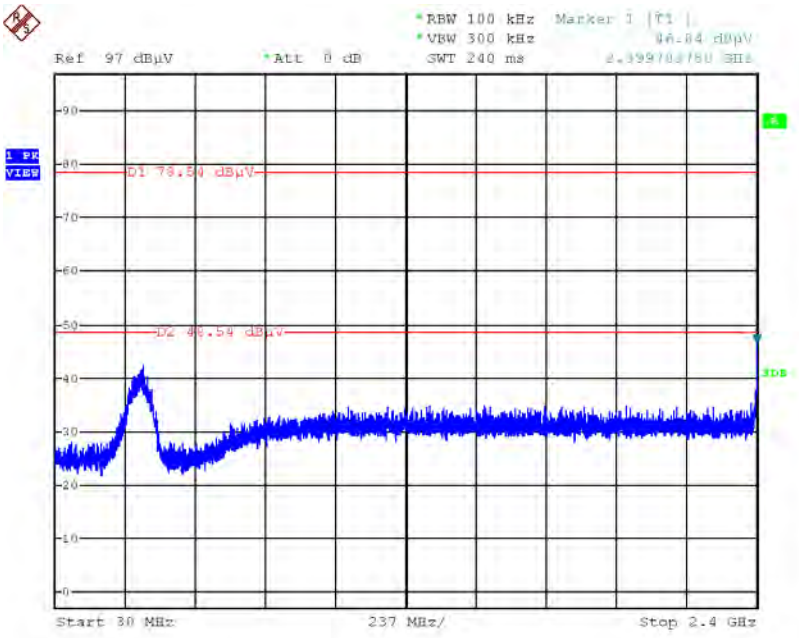
For 2.4GHz Band / 1TX

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



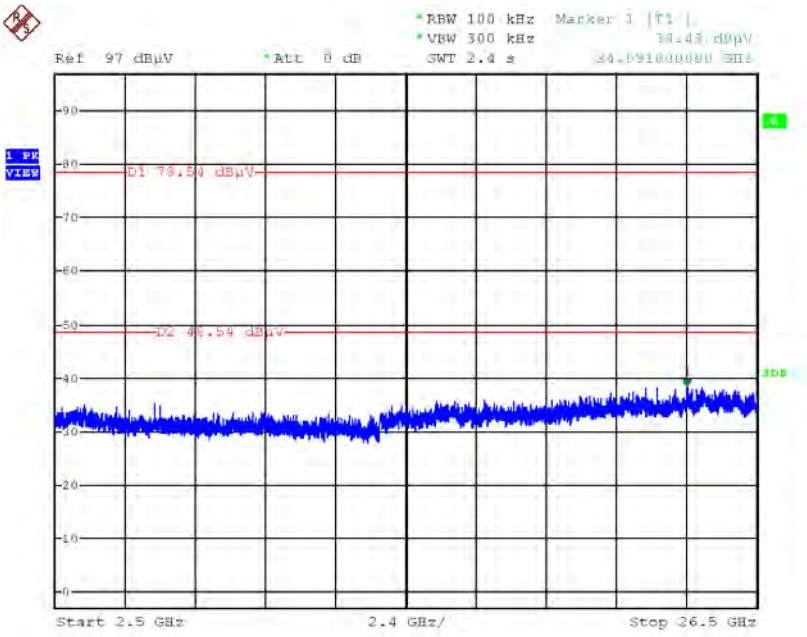
Date: 2.OCT.2013 03:40:37

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



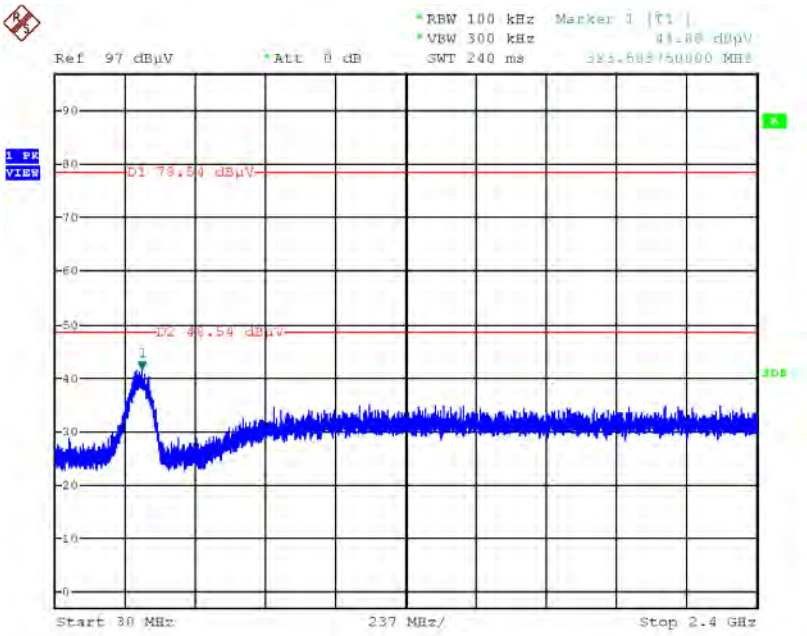
Date: 2.OCT.2013 03:42:06

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



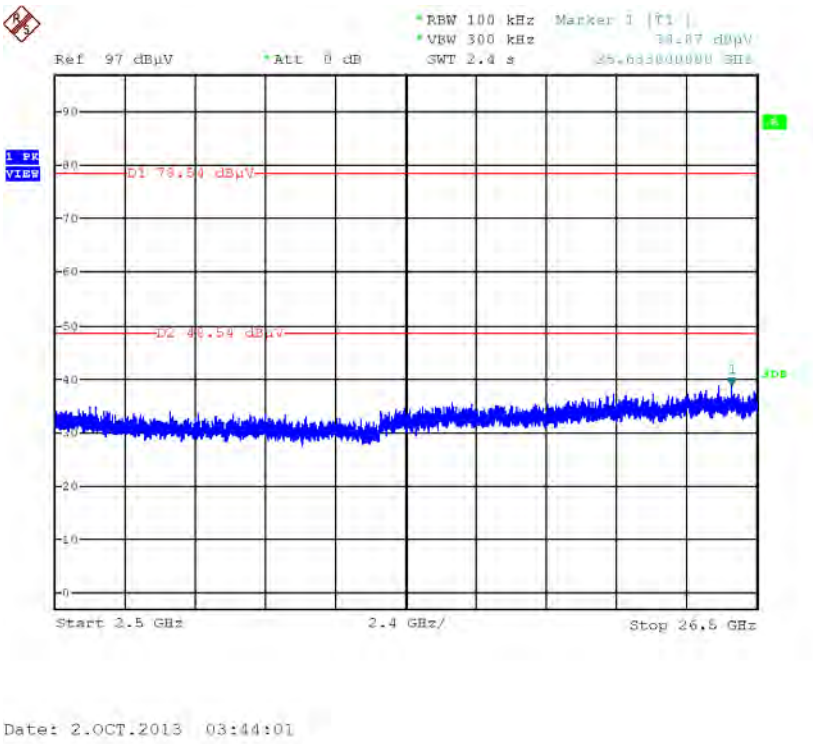
Date: 2.OCT.2013 03:42:48

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 11 / 30MHz~2400MHz (down 30dBc)



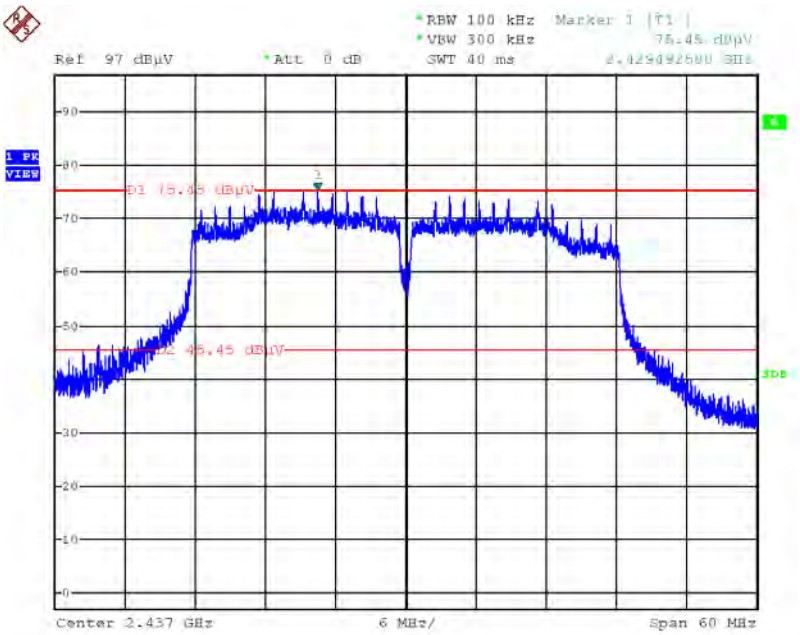
Date: 2.OCT.2013 03:44:25

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 11 / 2500MHz~26500MHz (down 30dBc)



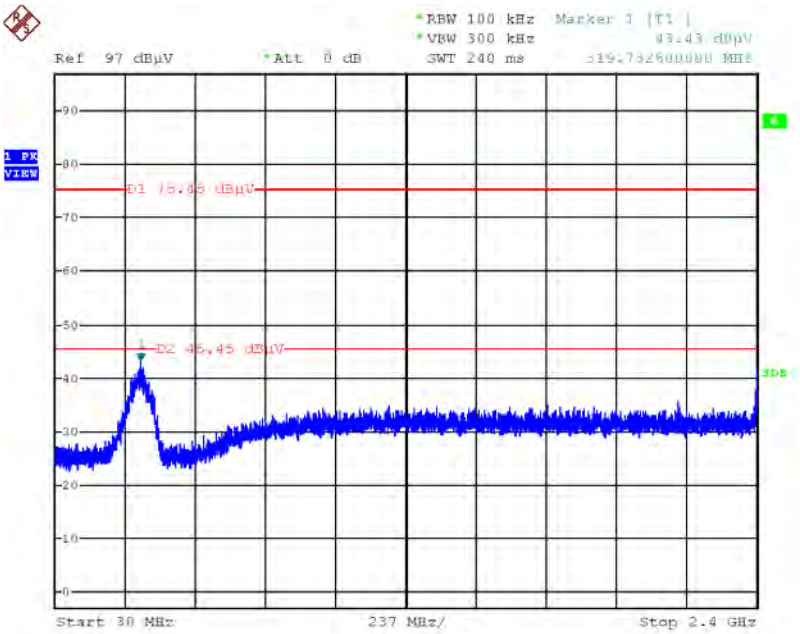
Date: 2.OCT.2013 03:44:01

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



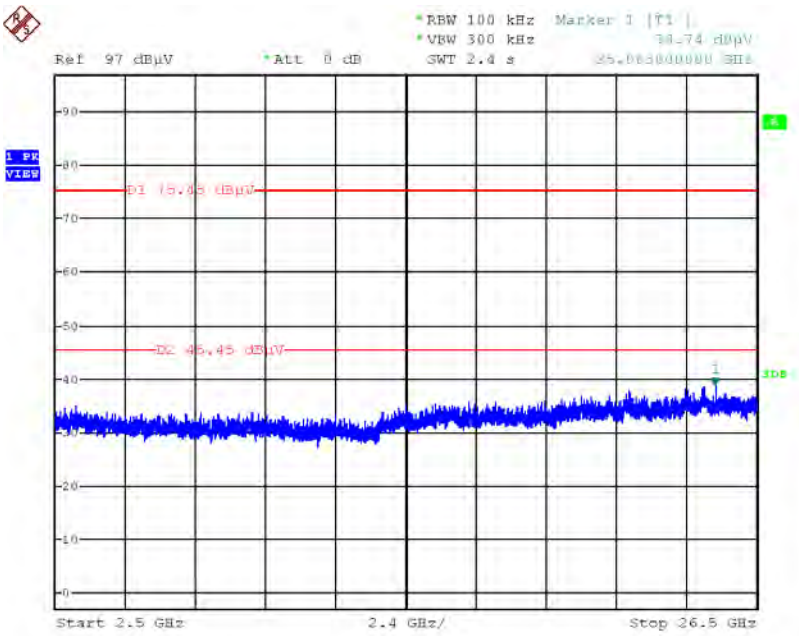
Date: 2.OCT.2013 03:46:20

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



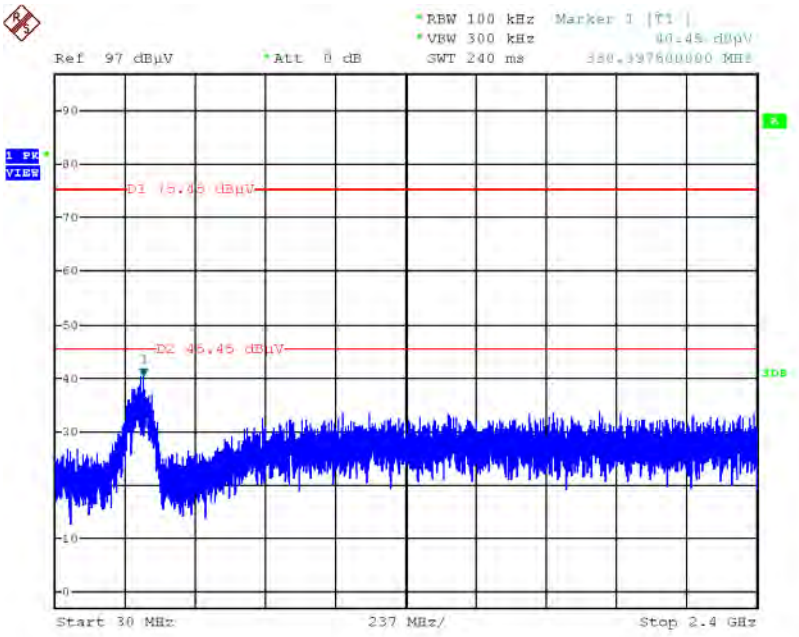
Date: 2.OCT.2013 03:47:30

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 3 / 2500MHz~26500MHz (down 30dBc)



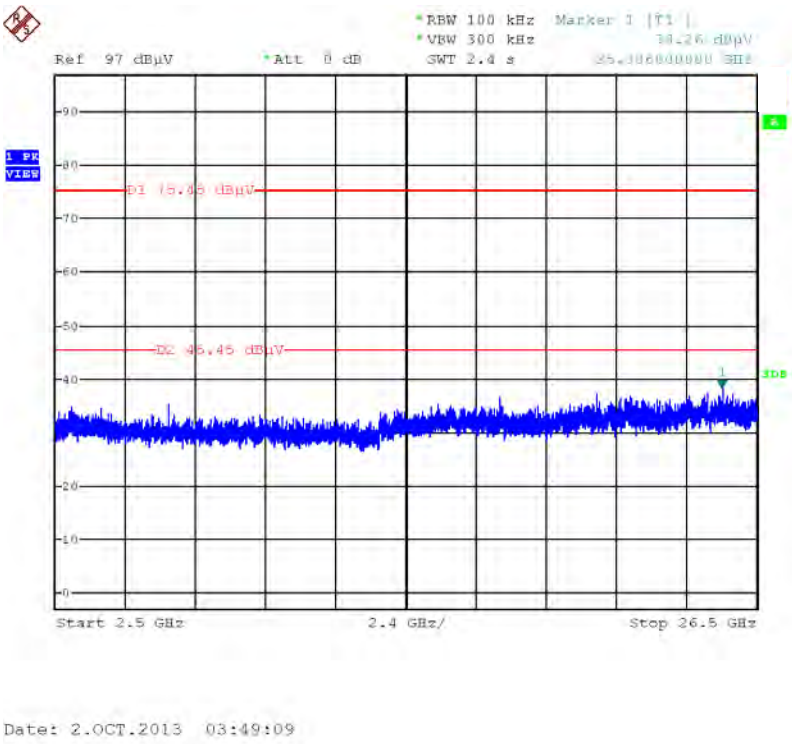
Date: 2.OCT.2013 03:48:02

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 9 / 30MHz~2400MHz (down 30dBc)



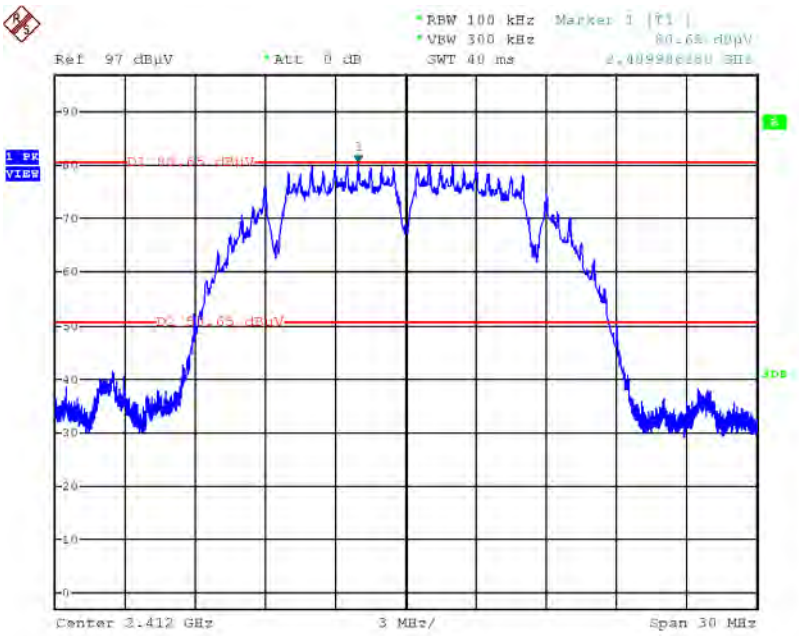
Date: 2.OCT.2013 03:49:47

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



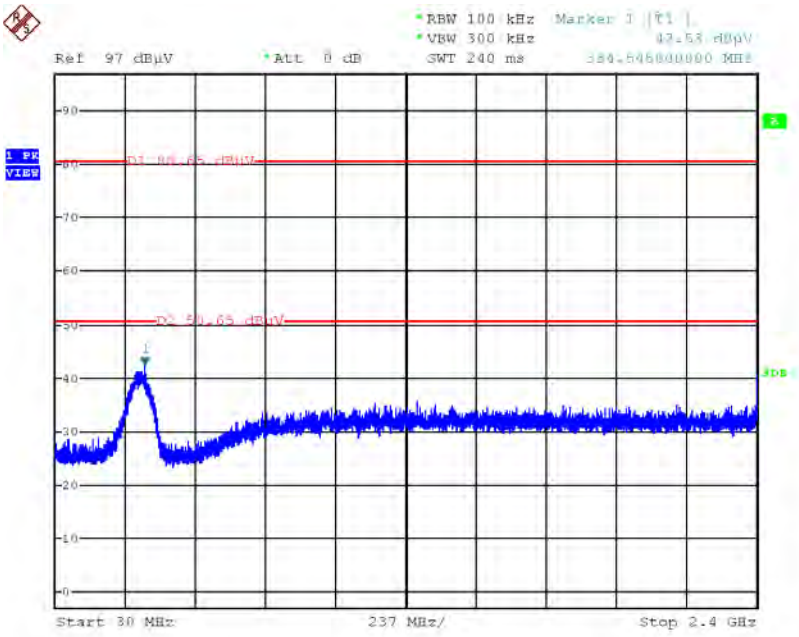
Date: 2.OCT.2013 03:49:09

Plot on Configuration IEEE 802.11b / Reference Level



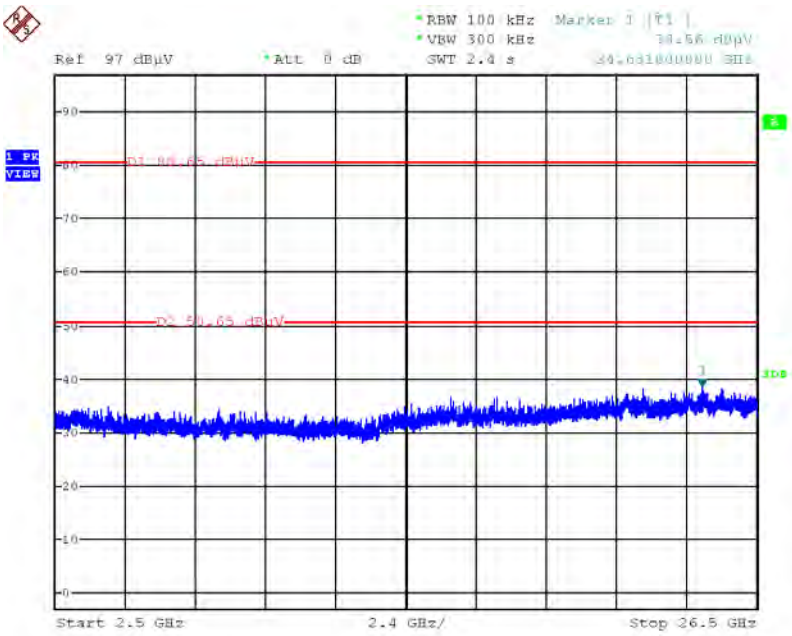
Date: 2.OCT.2013 03:28:21

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



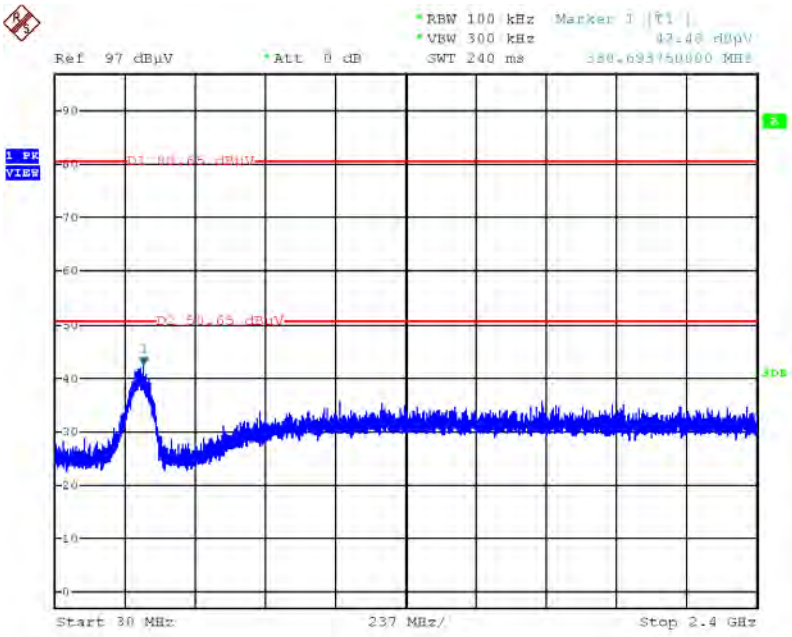
Date: 2.OCT.2013 03:30:26

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



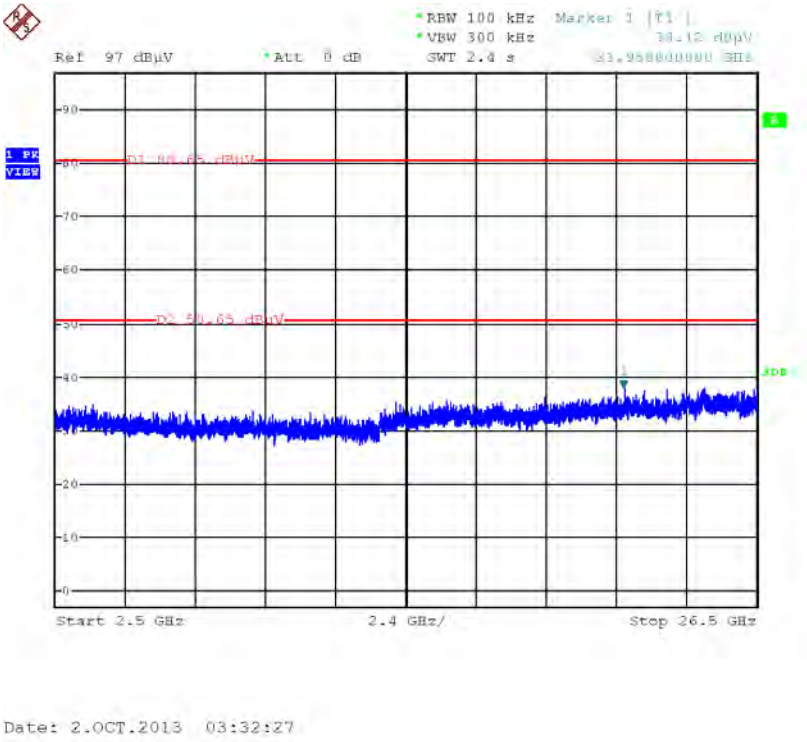
Date: 2.OCT.2013 03:31:09

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

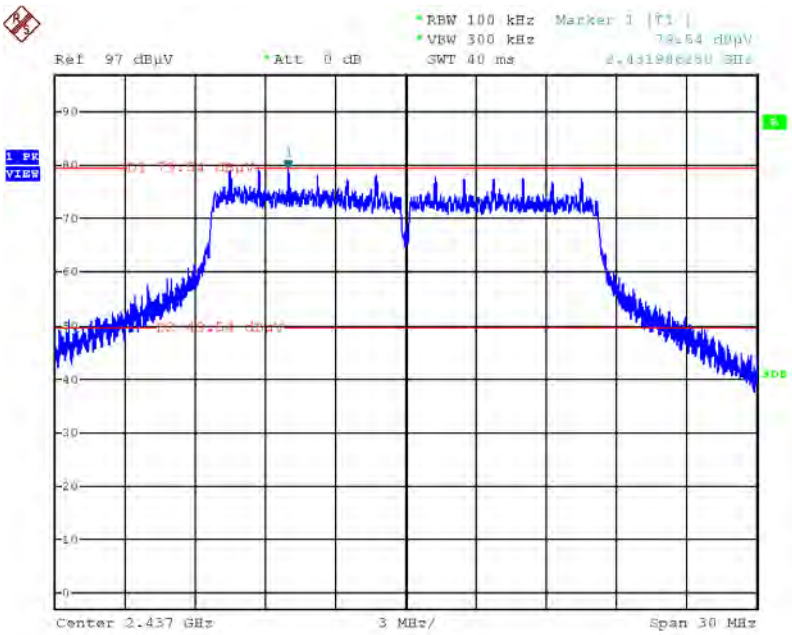


Date: 2.OCT.2013 03:32:51

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

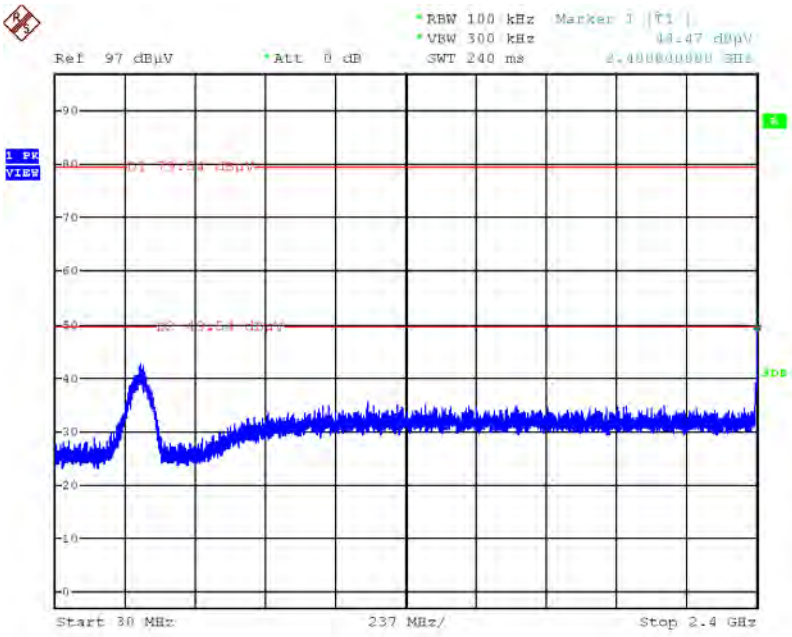


Plot on Configuration IEEE 802.11g / Reference Level



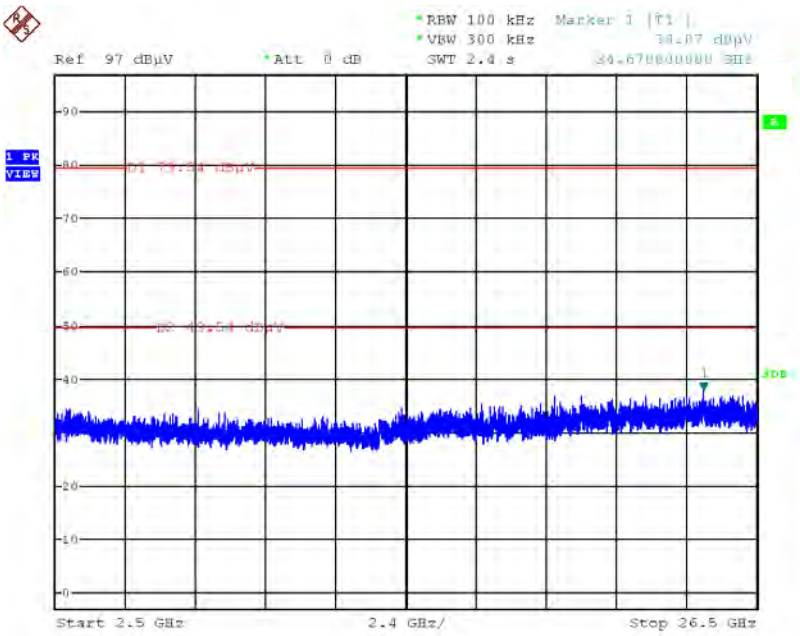
Date: 2.OCT.2013 03:34:22

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



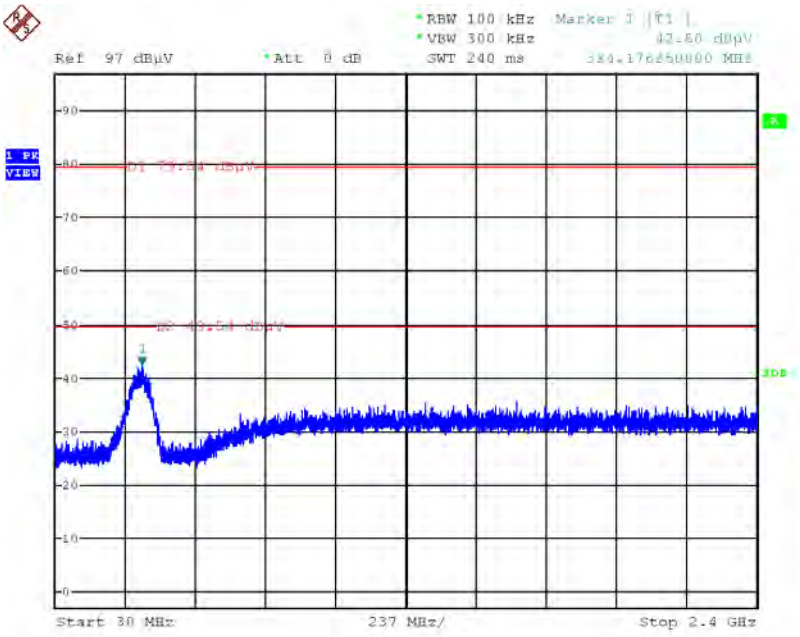
Date: 2.OCT.2013 03:35:34

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



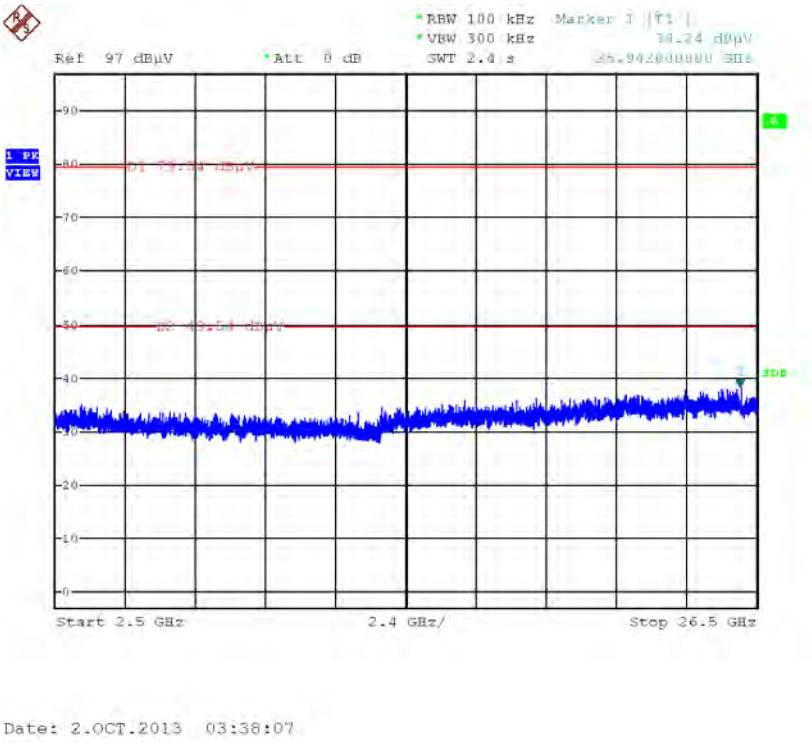
Date: 2.OCT.2013 03:36:45

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



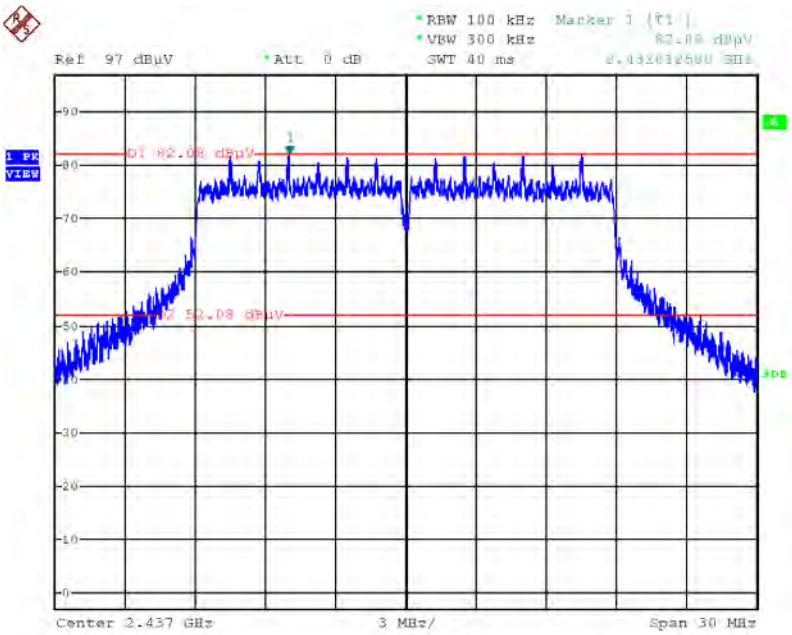
Date: 2.OCT.2013 03:38:38

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



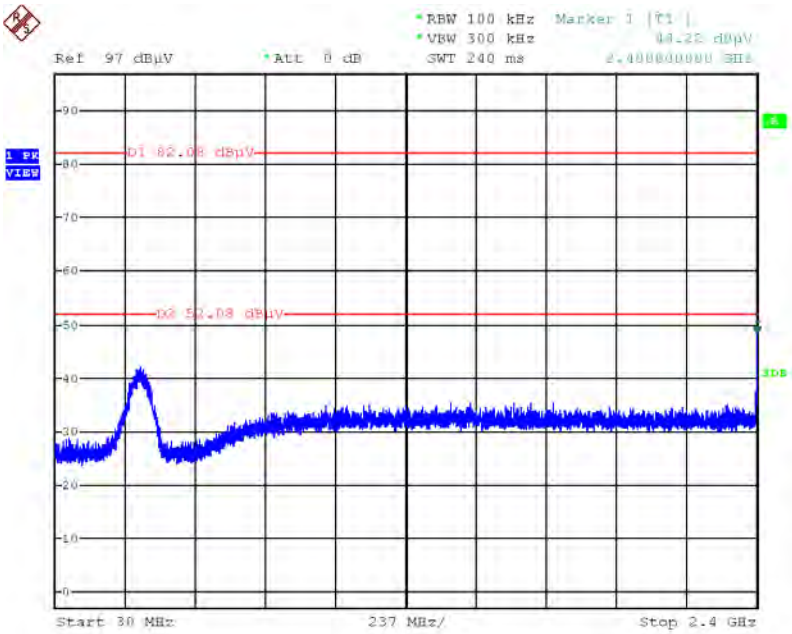
2TX

Plot on Configuration IEEE 802.11n MCS8 20MHz / Reference Level



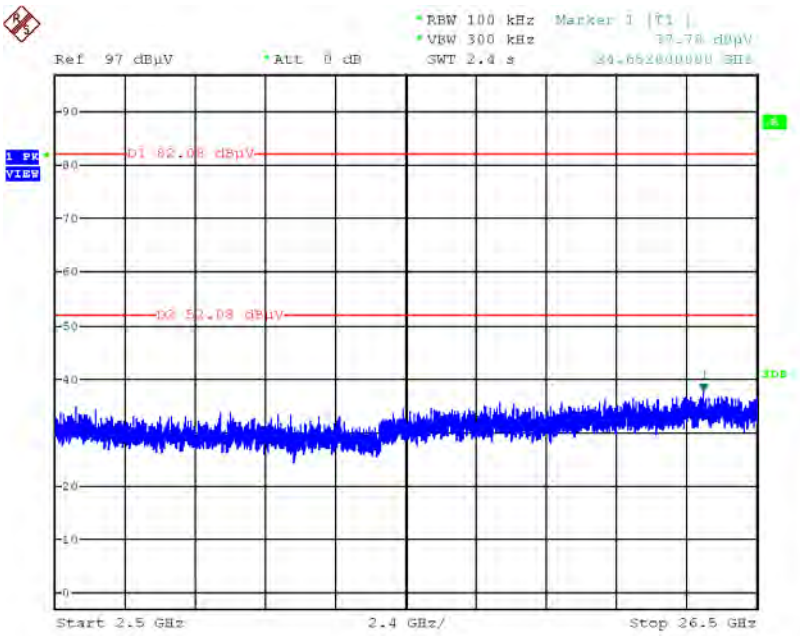
Date: 2.OCT.2013 03:11:03

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 1 / 30MHz~2400MHz (down 30dBc)



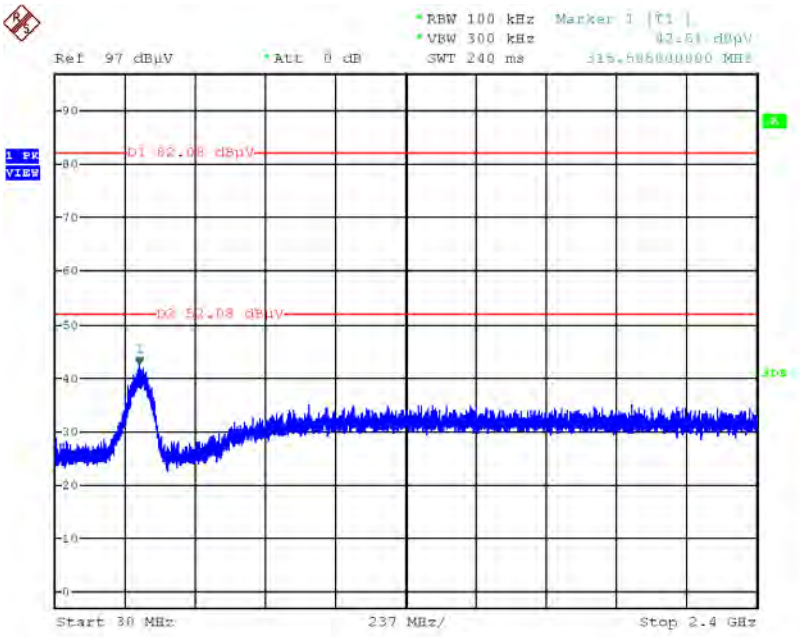
Date: 2.OCT.2013 03:13:01

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 1 / 2500MHz~26500MHz (down 30dBc)



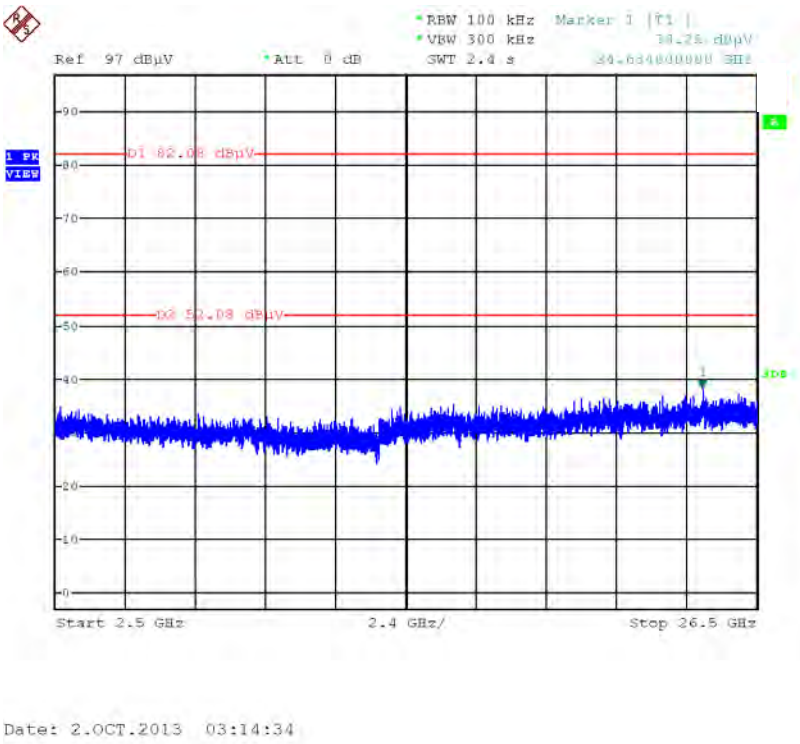
Date: 2.OCT.2013 03:13:30

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 11 / 30MHz~2400MHz (down 30dBc)



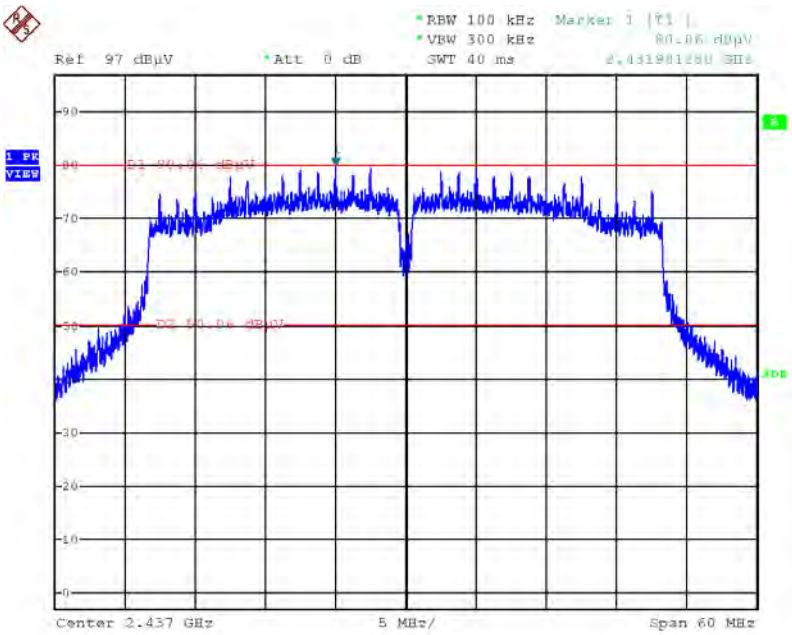
Date: 2.OCT.2013 03:15:04

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 11 / 2500MHz~26500MHz (down 30dBc)



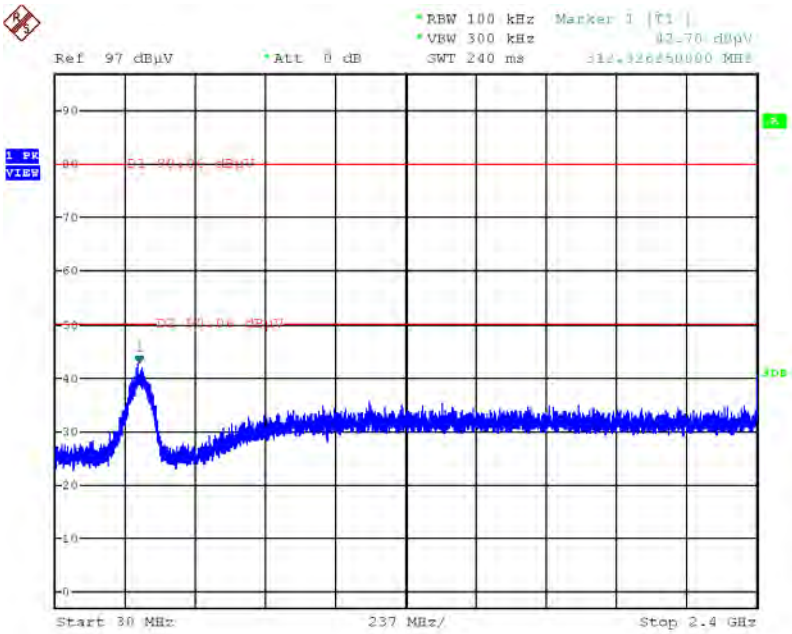
Date: 2.OCT.2013 03:14:34

Plot on Configuration IEEE 802.11n MCS8 40MHz / Reference Level



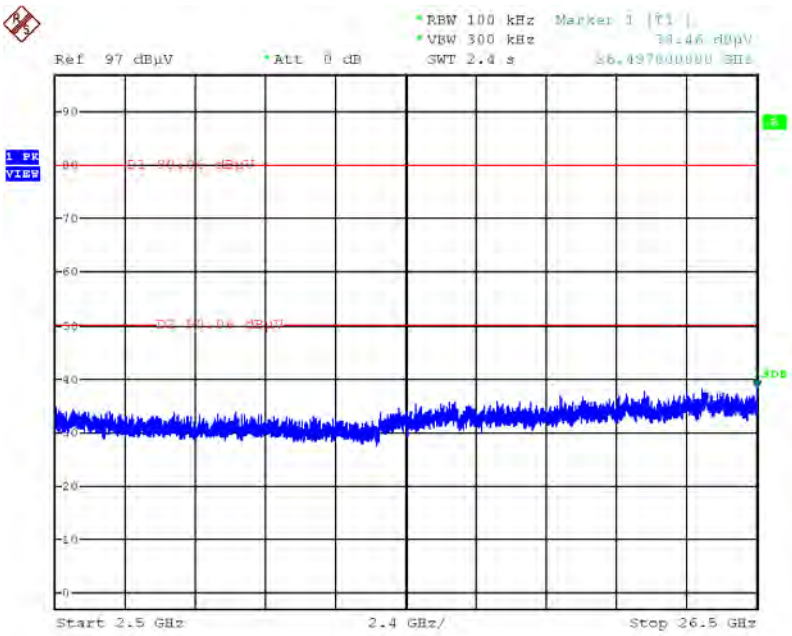
Date: 2.OCT.2013 03:19:19

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 3 / 30MHz~2400MHz (down 30dBc)



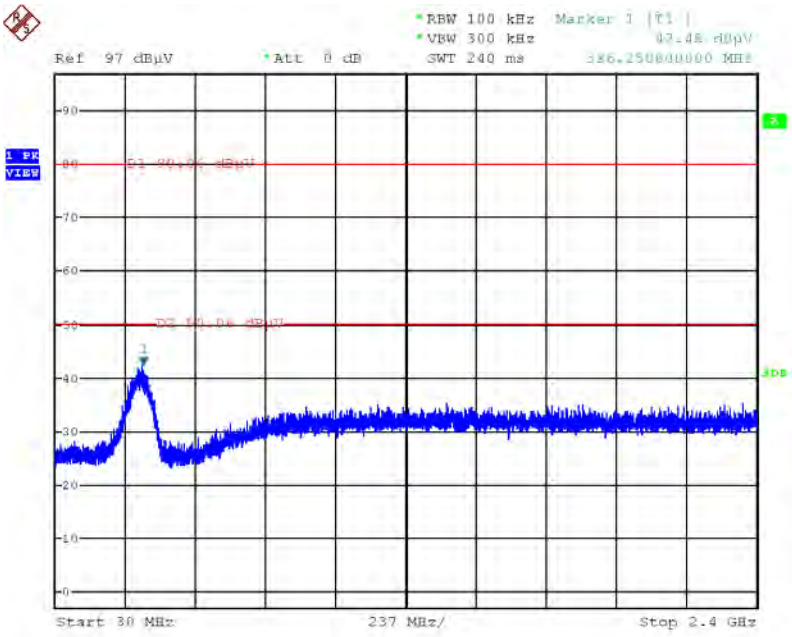
Date: 2.OCT.2013 03:20:42

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 3 / 2500MHz~26500MHz (down 30dBc)



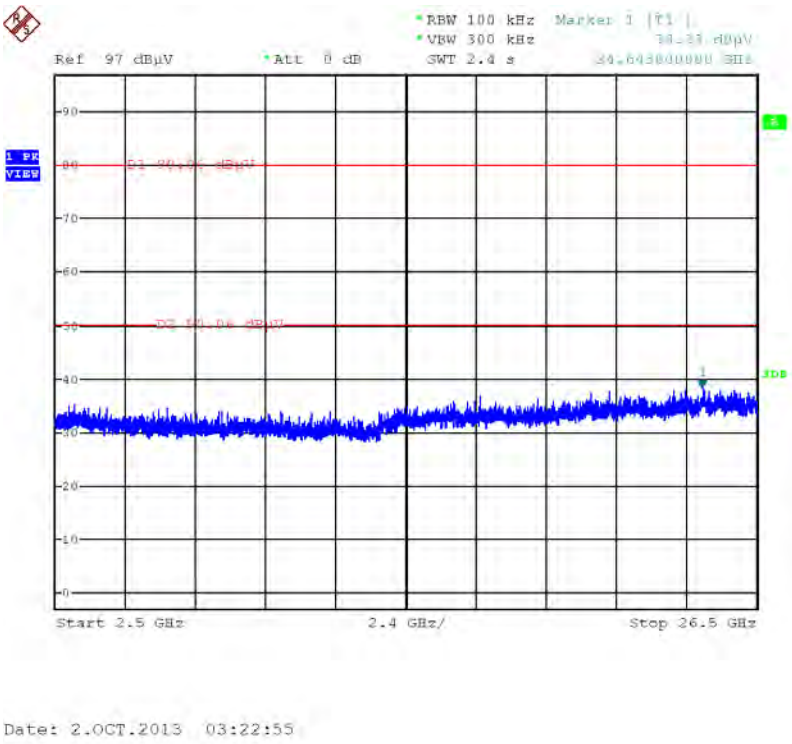
Date: 2.OCT.2013 03:21:23

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 2.OCT.2013 03:23:26

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 9 / 2500MHz~26500MHz (down 30dBc)

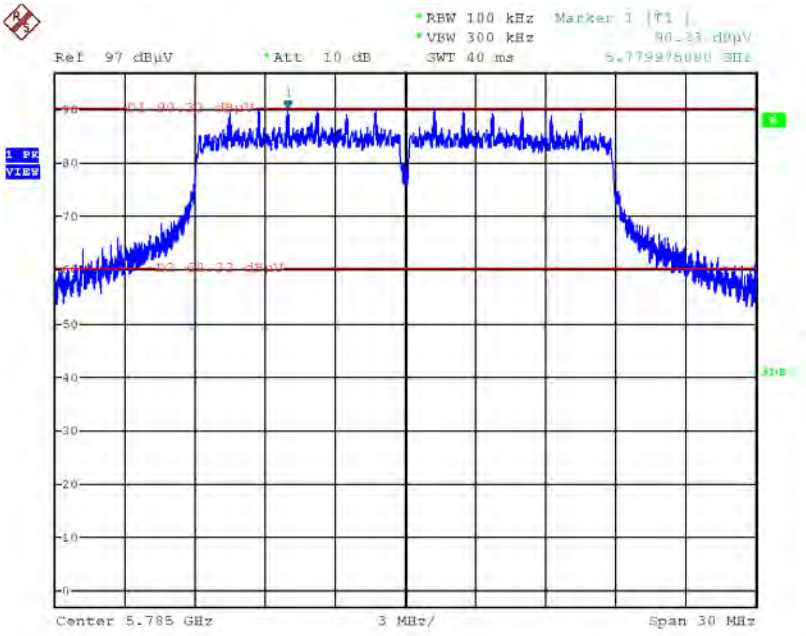


Date: 2.OCT.2013 03:22:55

For 5GHz Band

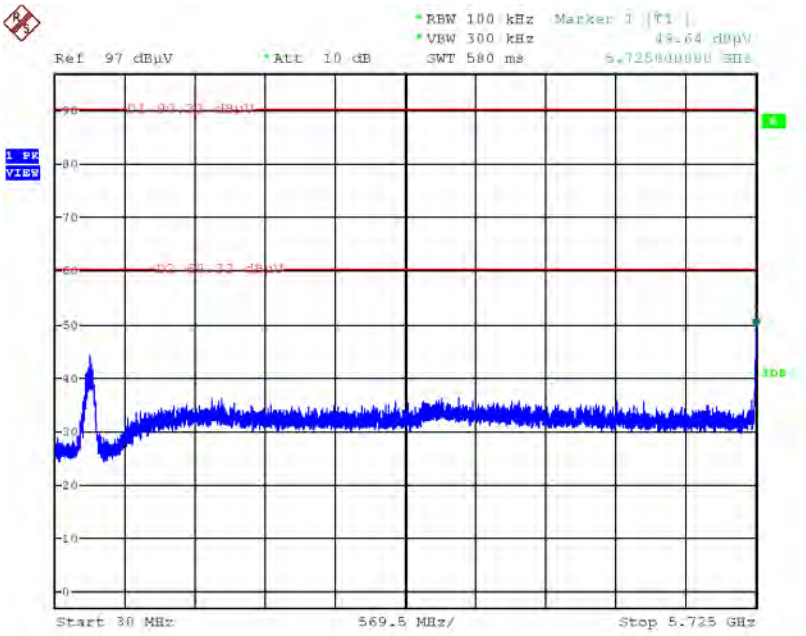
1TX

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



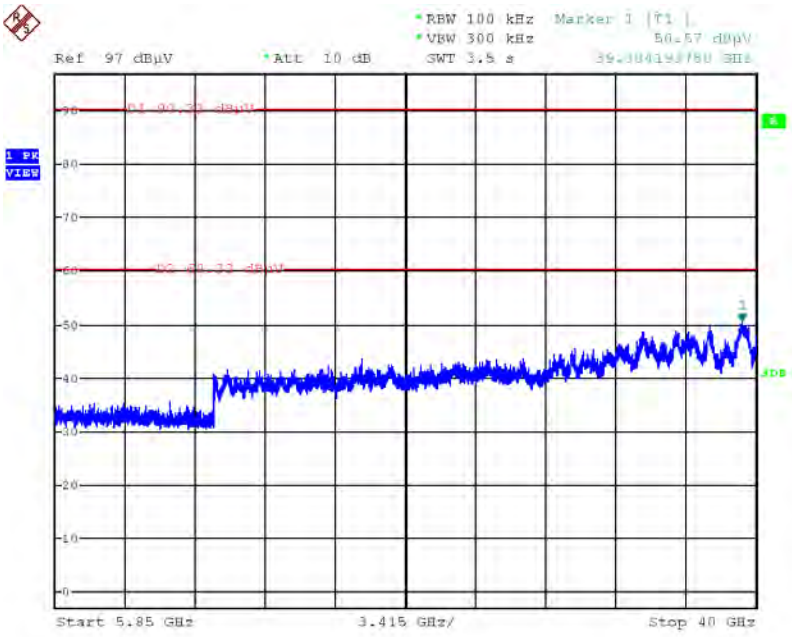
Date: 2.OCT.2013 01:29:34

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



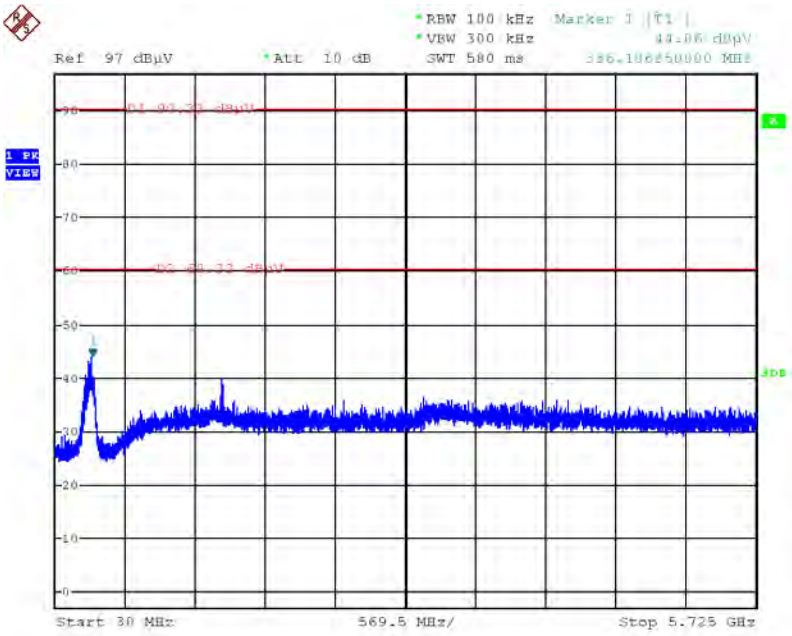
Date: 2.OCT.2013 01:41:01

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



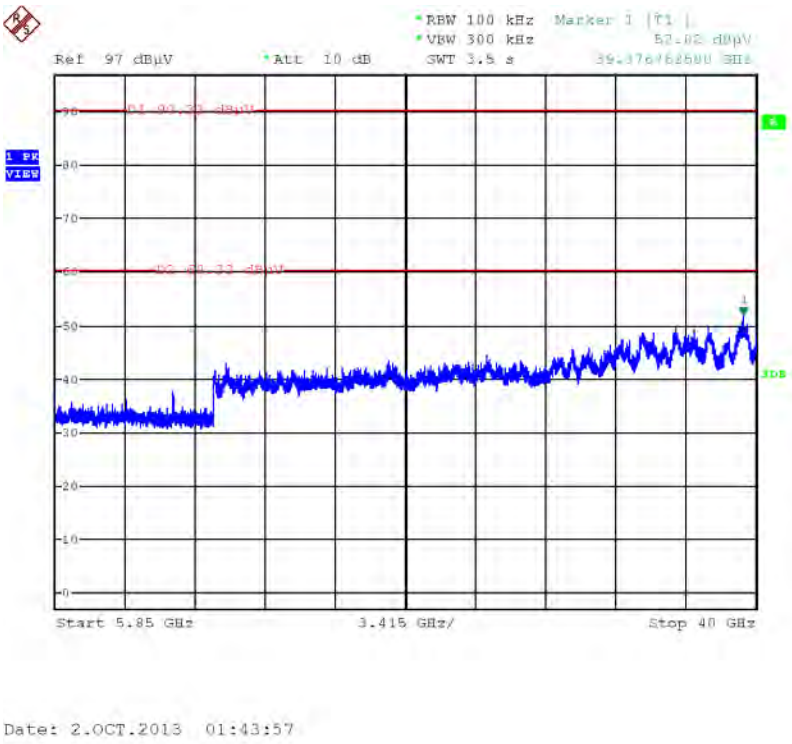
Date: 2.OCT.2013 01:40:19

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

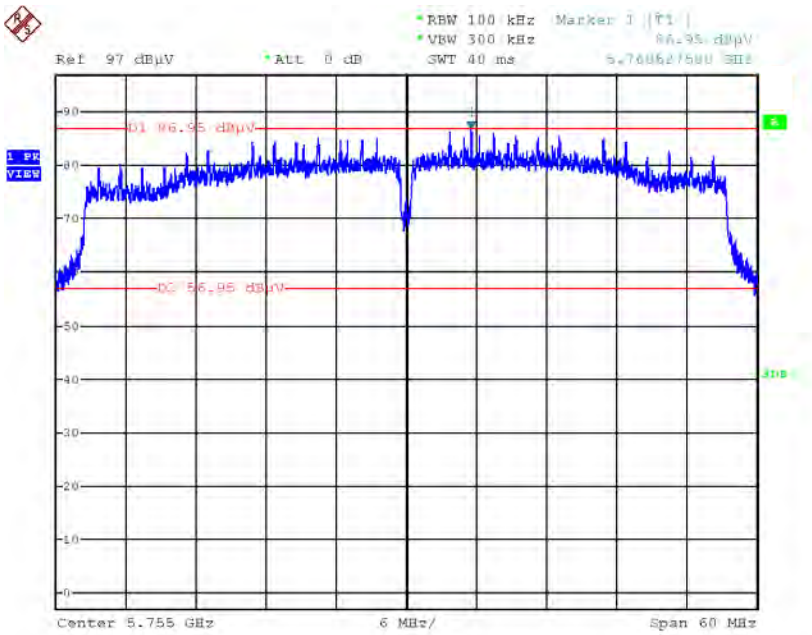


Date: 2.OCT.2013 01:42:44

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 165 / 5850MHz~40000MHz (down 30dBc)

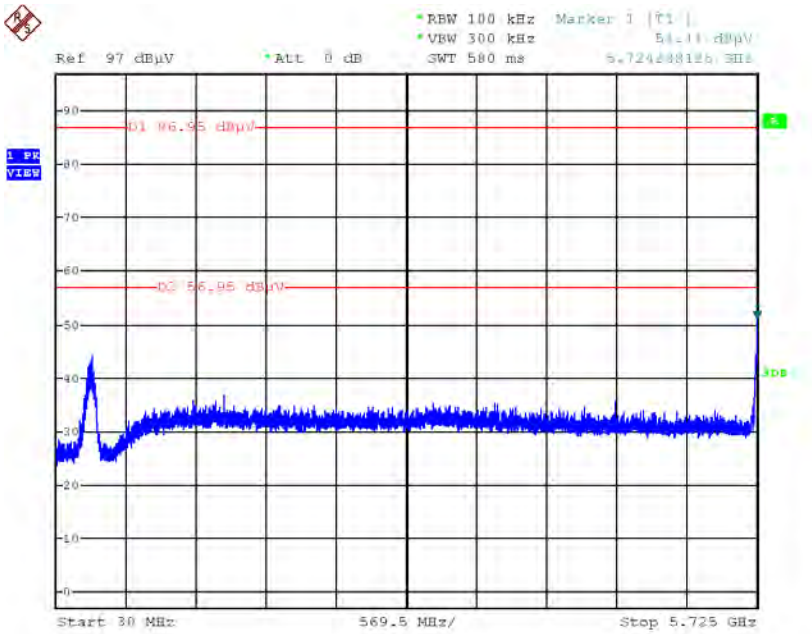


Plot on Configuration IEEE 802.11n MCS0 40MHz / Reference Level



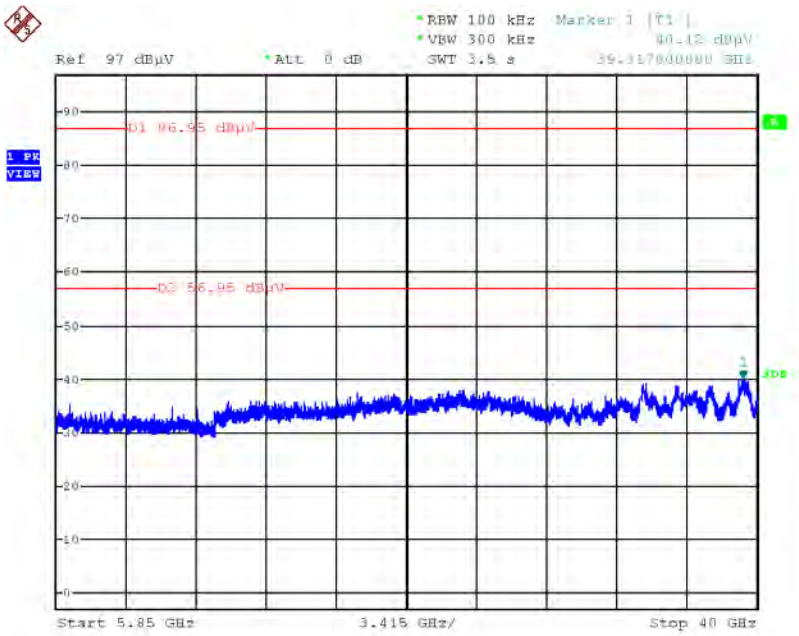
Date: 2.OCT.2013 01:12:19

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 151 / 30MHz~5725MHz (down 30dBc)



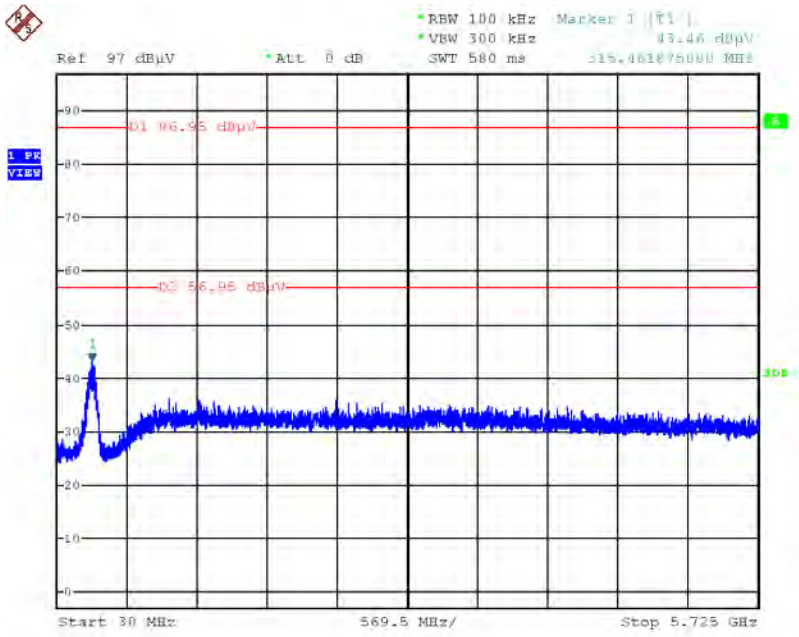
Date: 2.OCT.2013 01:13:43

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



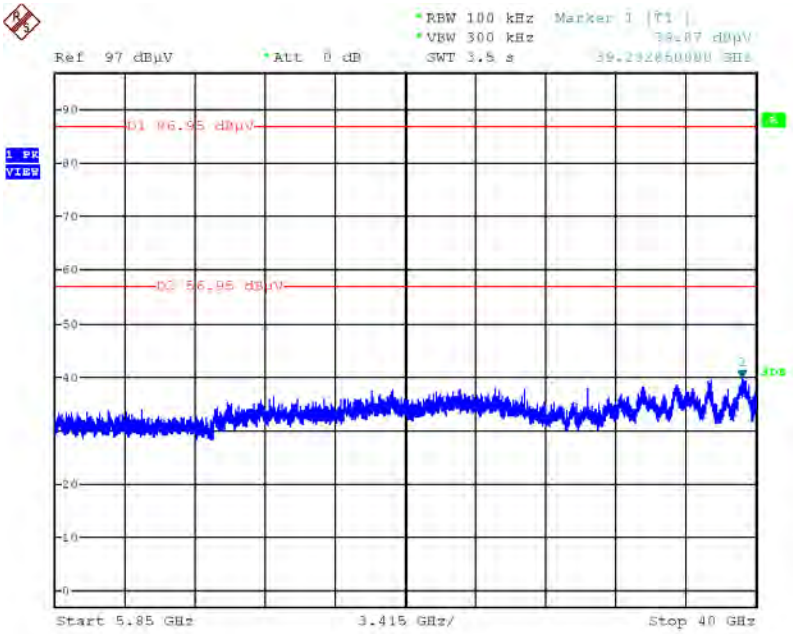
Date: 2.OCT.2013 01:15:23

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



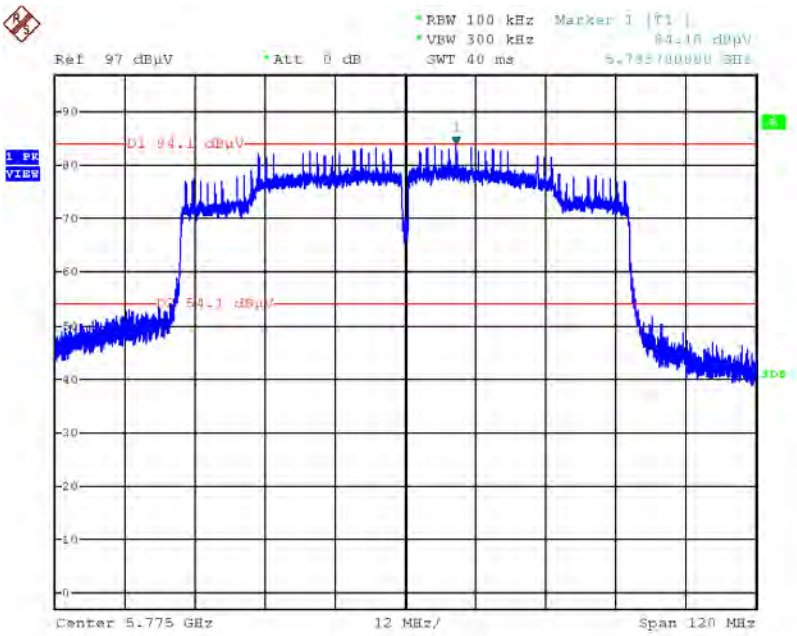
Date: 2.OCT.2013 01:20:36

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 159 / 5850MHz~40000MHz (down 30dBc)



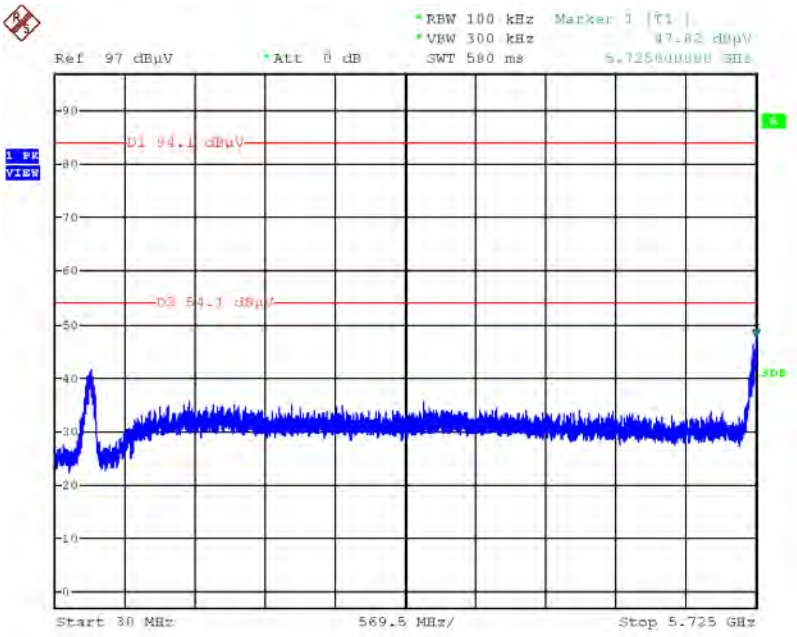
Date: 2.OCT.2013 01:21:18

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



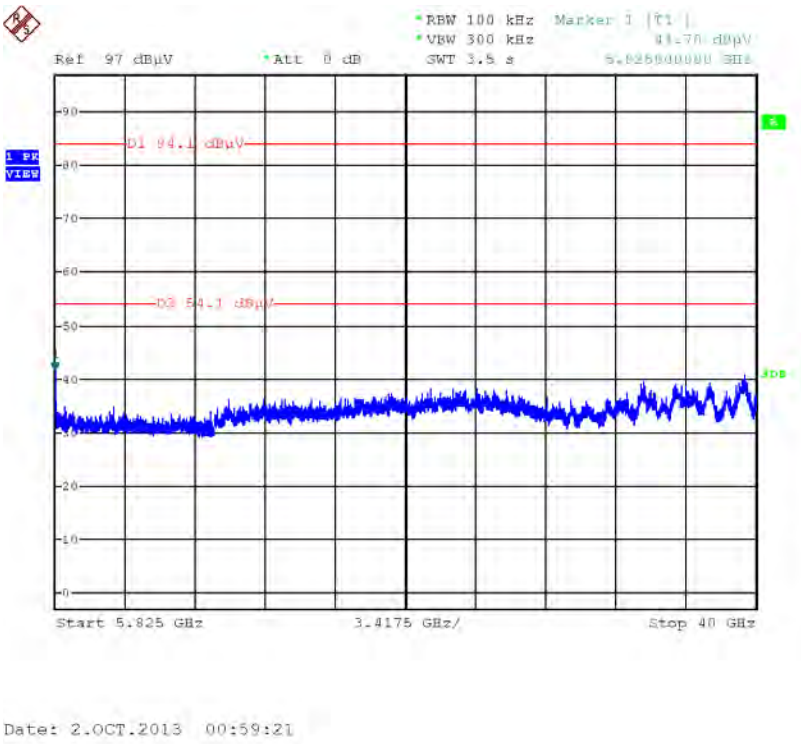
Date: 2.OCT.2013 00:57:22

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



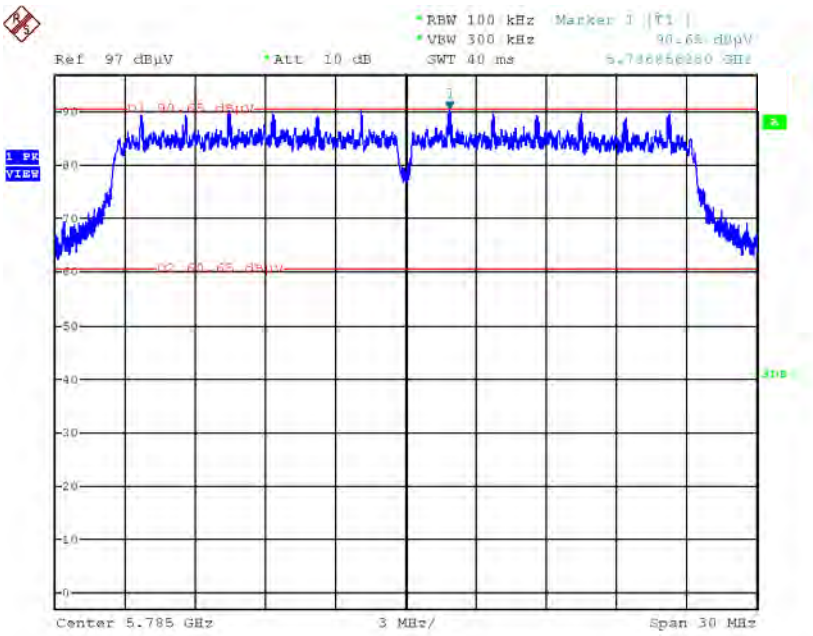
Date: 2.OCT.2013 00:58:06

Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / CH 155 / 5850MHz~40000MHz (down 30dBc)



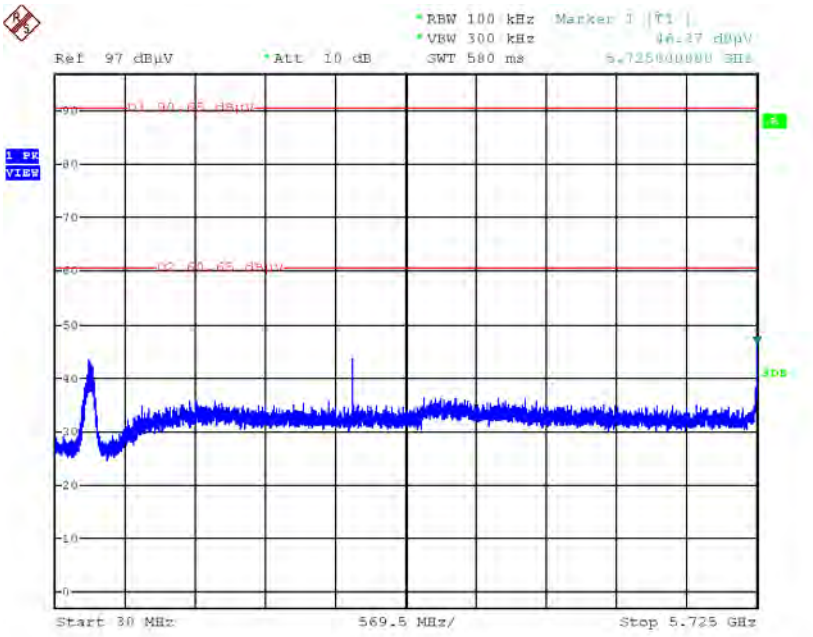
Date: 2.OCT.2013 00:59:21

Plot on Configuration IEEE 802.11a / Reference Level



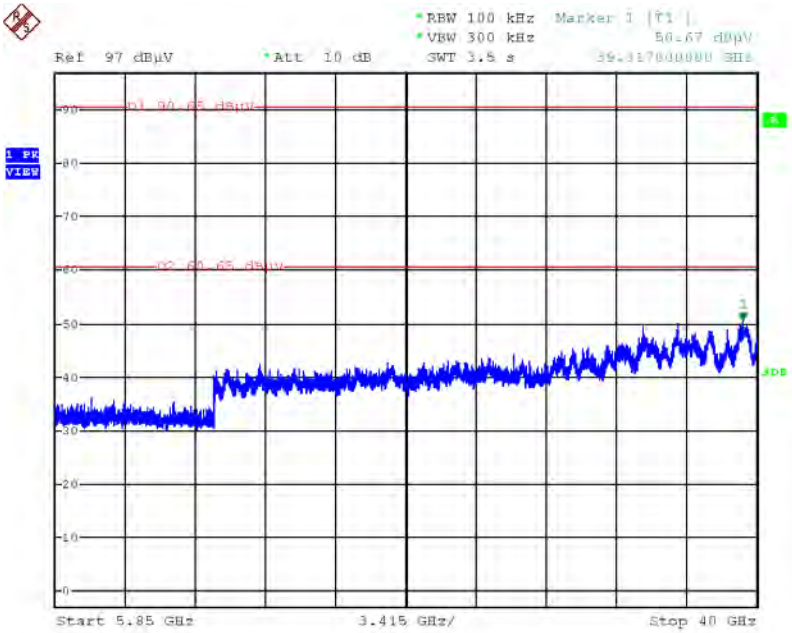
Date: 2.OCT.2013 01:58:00

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



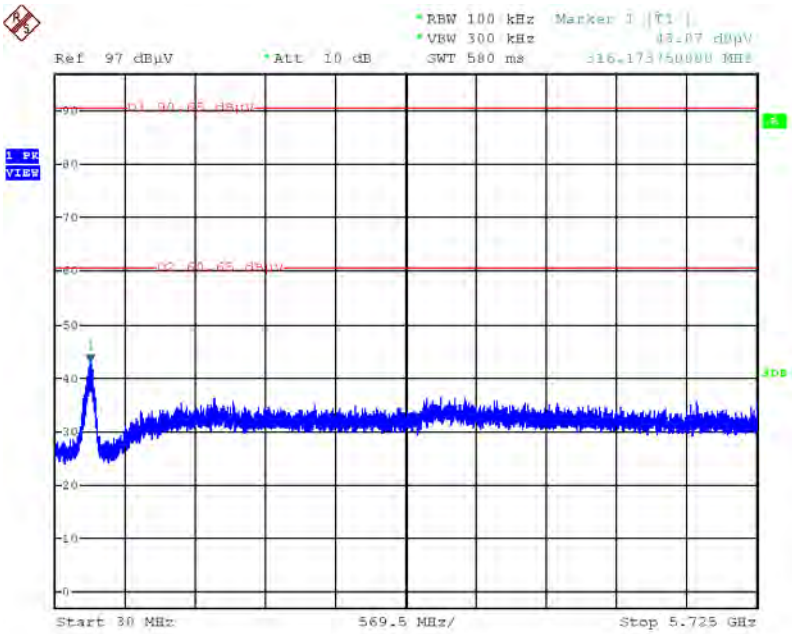
Date: 2.OCT.2013 01:59:39

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



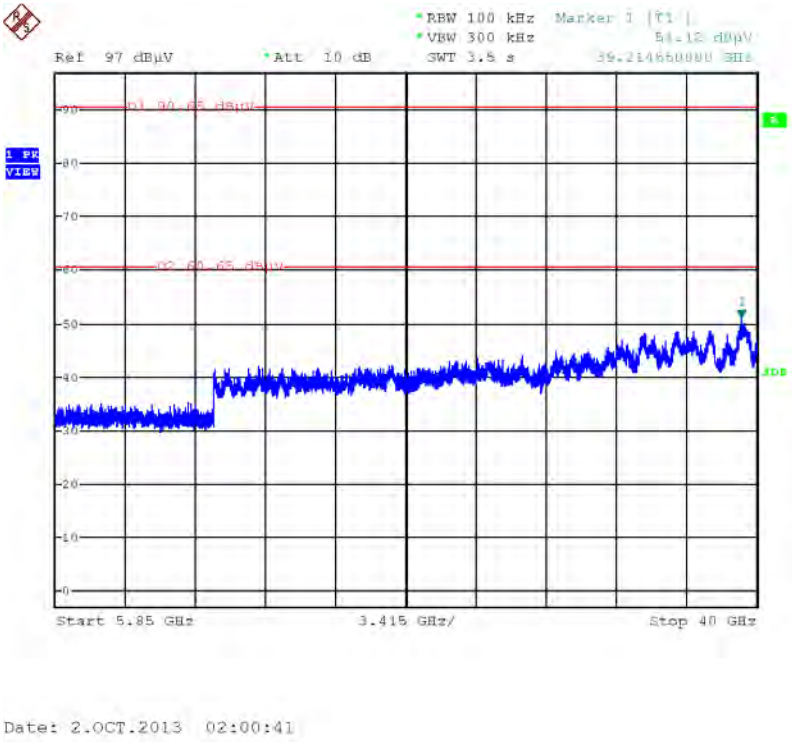
Date: 2.OCT.2013 02:02:44

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



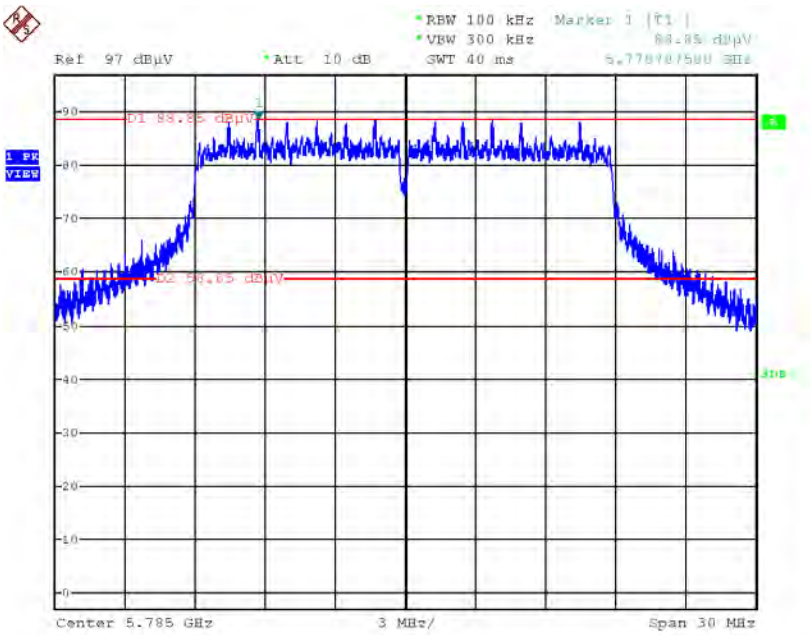
Date: 2.OCT.2013 02:01:53

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



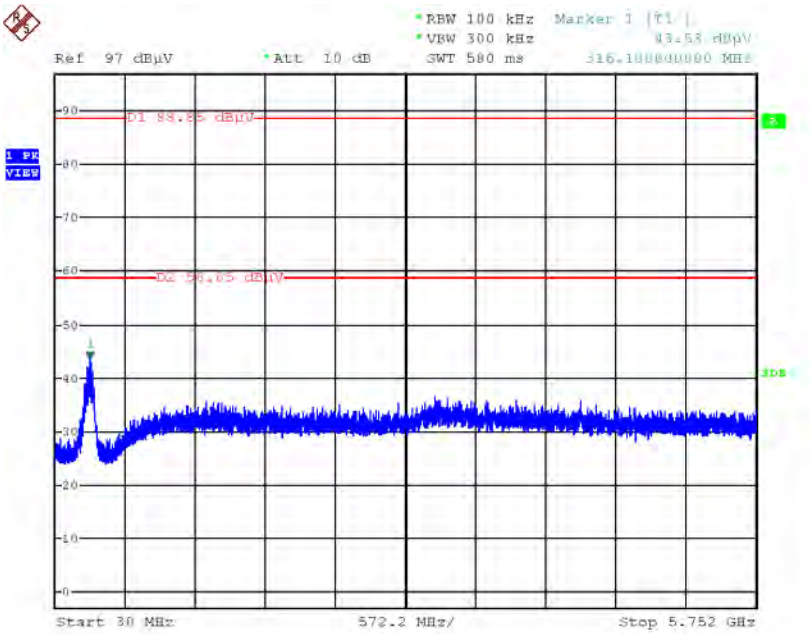
2TX

Plot on Configuration IEEE 802.11n MCS8 20MHz / Reference Level



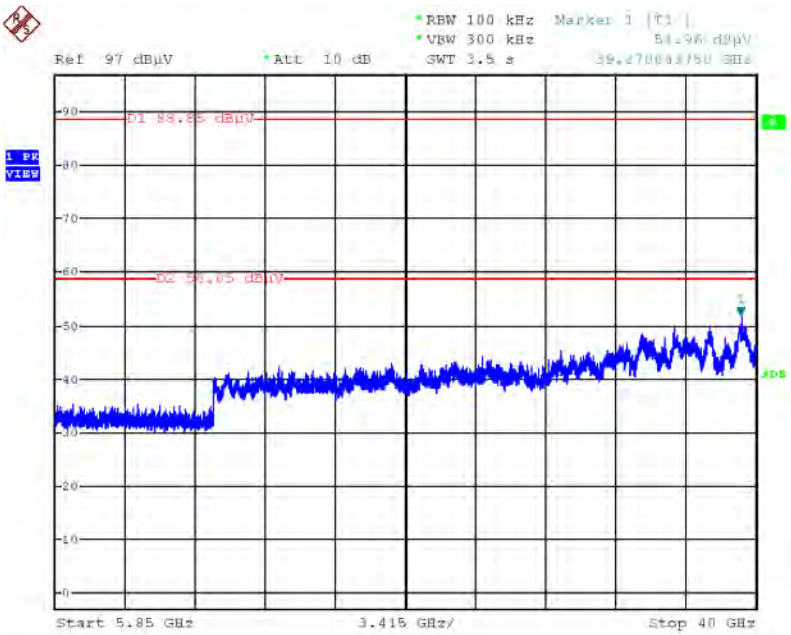
Date: 2.OCT.2013 02:52:46

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 149 / 30MHz~5725MHz (down 30dBc)



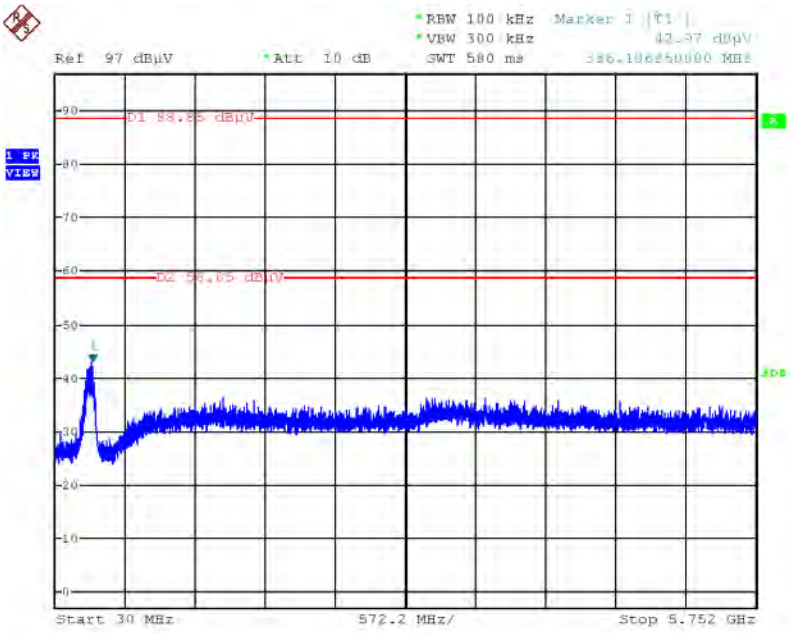
Date: 2.OCT.2013 02:54:21

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 149 / 5850MHz~40000MHz (down 30dBc)



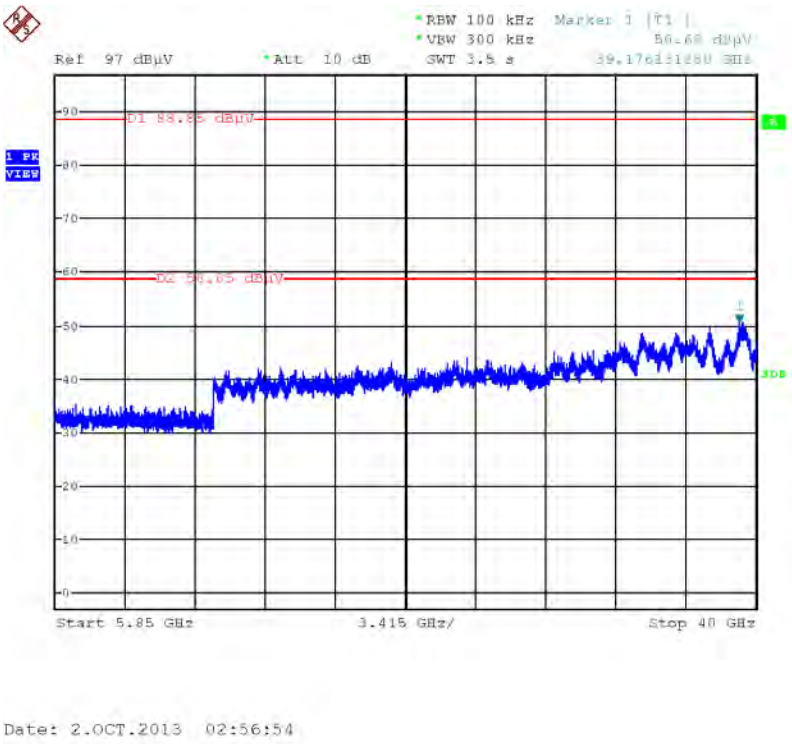
Date: 2.OCT.2013 02:55:02

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 165 / 30MHz~5725MHz (down 30dBc)

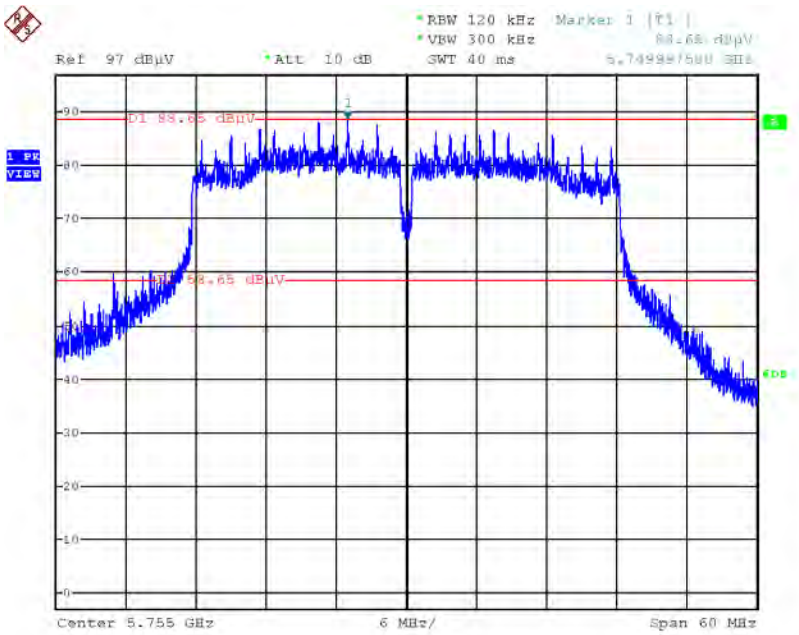


Date: 2.OCT.2013 02:57:30

Plot on Configuration IEEE 802.11n MCS8 20MHz / CH 165 / 5850MHz~40000MHz (down 30dBc)

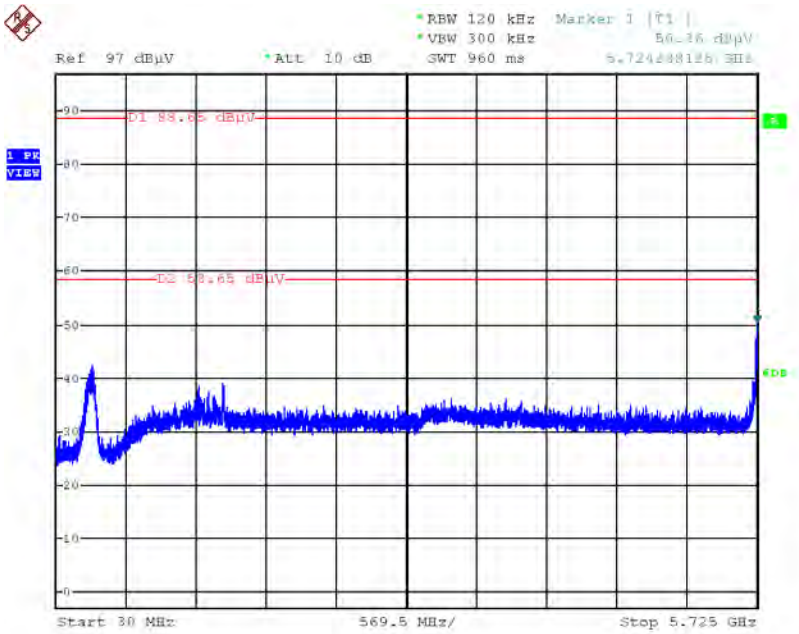


Plot on Configuration IEEE 802.11n MCS8 40MHz / Reference Level



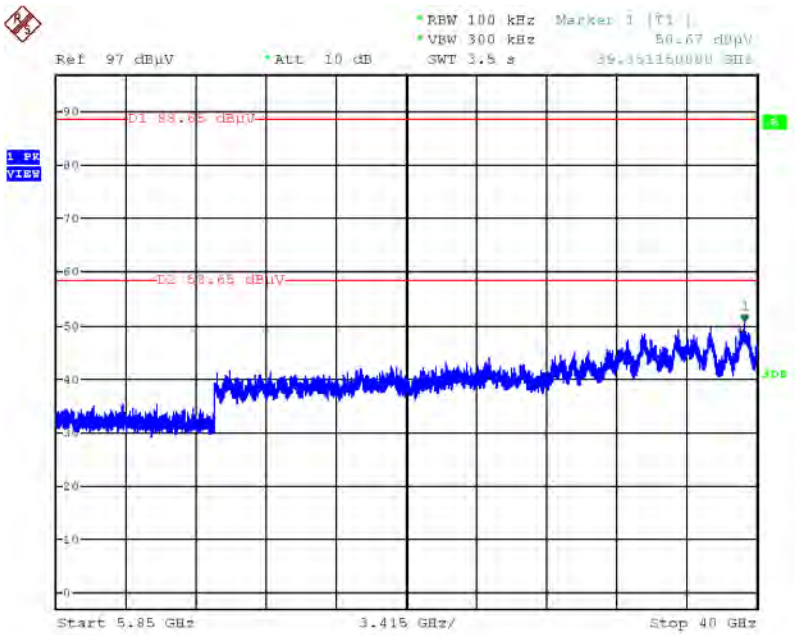
Date: 2.OCT.2013 02:40:23

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 151 / 30MHz~5725MHz (down 30dBc)



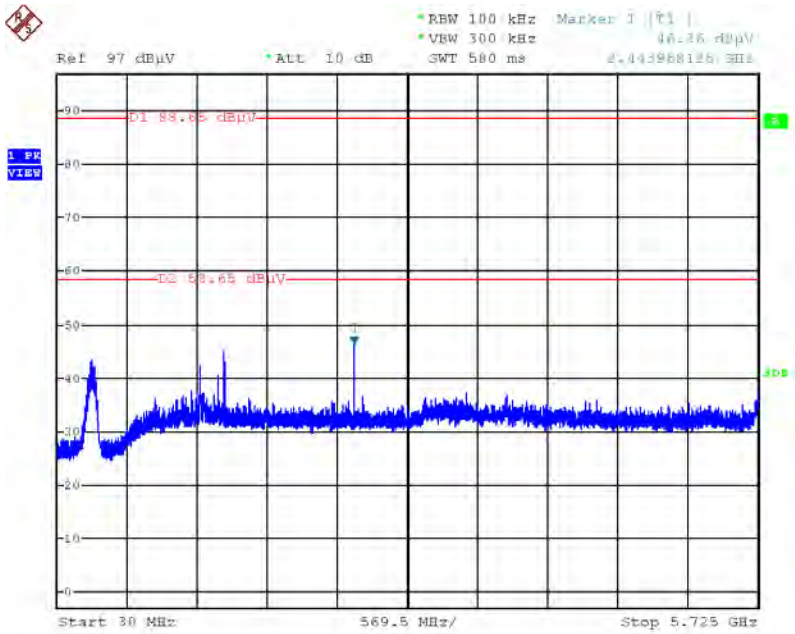
Date: 2.OCT.2013 02:41:11

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 151 / 5850MHz~40000MHz (down 30dBc)



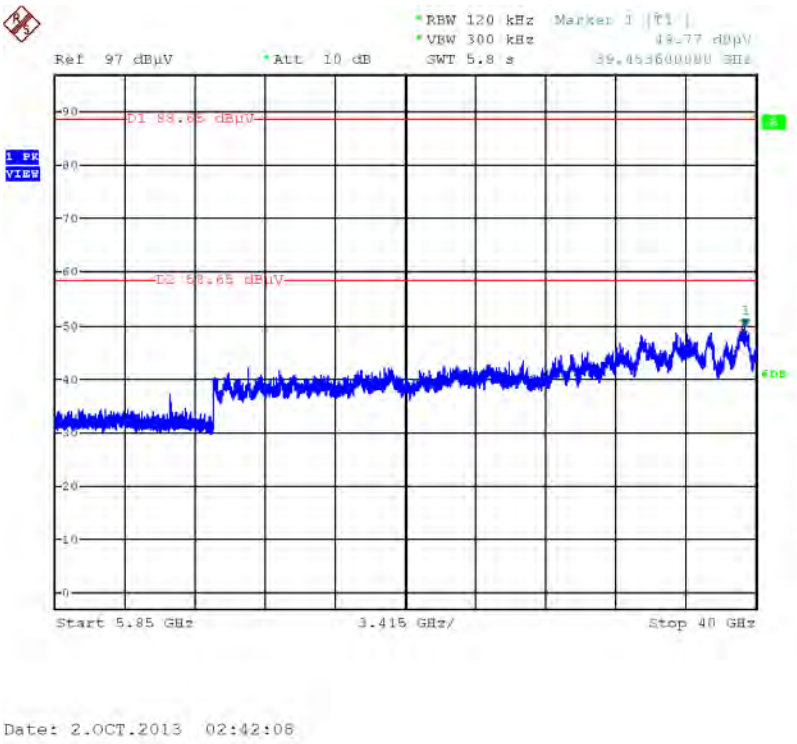
Date: 2.OCT.2013 02:47:30

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 159 / 30MHz~5725MHz (down 30dBc)

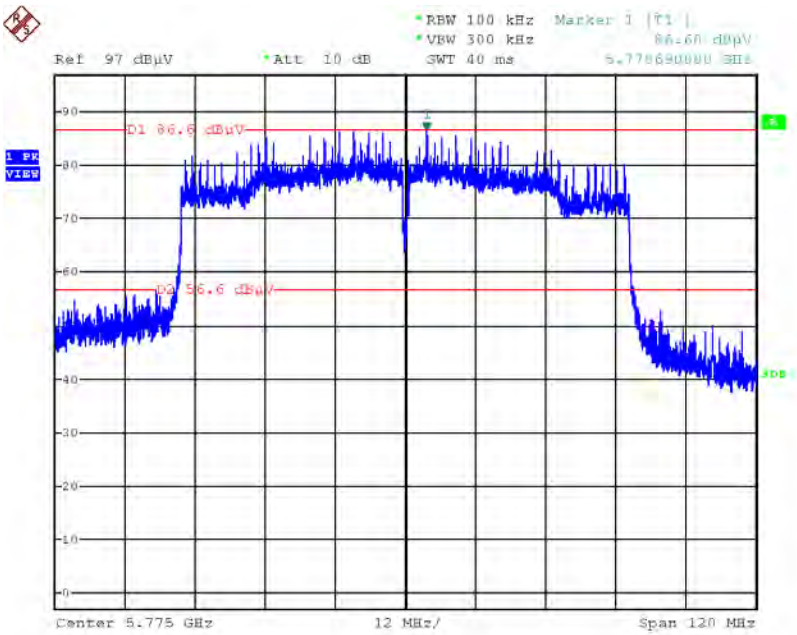


Date: 2.OCT.2013 02:48:12

Plot on Configuration IEEE 802.11n MCS8 40MHz / CH 159 / 5850MHz~40000MHz (down 30dBc)

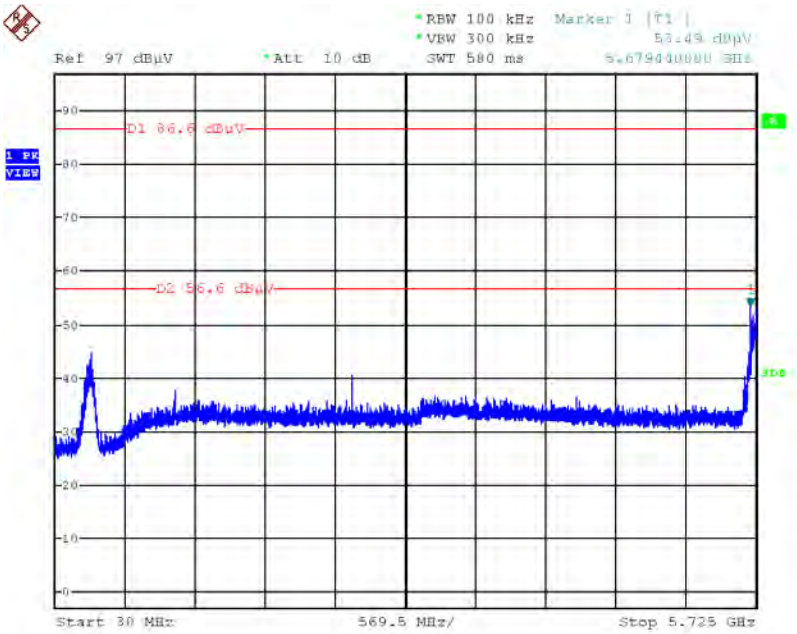


Plot on Configuration IEEE 802.11ac MCS8 80MHz / Reference Level



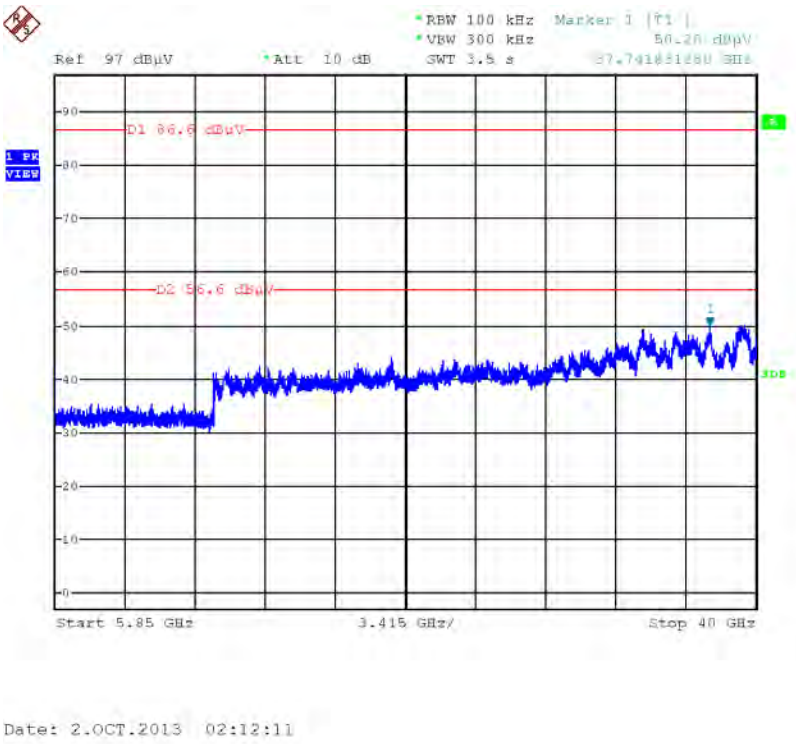
Date: 2.OCT.2013 02:09:23

Plot on Configuration IEEE 802.11ac MCS8 80MHz / CH 155 / 30MHz~5725MHz (down 30dBc)



Date: 2.OCT.2013 02:10:40

Plot on Configuration IEEE 802.11ac MCS8 80MHz / CH 155 / 5850MHz~40000MHz (down 30dBc)



Date: 2.OCT.2013 02:12:11

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	8127478	9kHz ~ 30MHz	Jul. 17, 2013	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	Apr. 16, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn 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. 30, 2013	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	Apr. 12, 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)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	4 Way	0120A04056002D	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)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
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	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)

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

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

NCR 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 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

7. MEASUREMENT UNCERTAINTY

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.026	dB	normal(k=2)	0.013
Cable loss	0.002	dB	normal(k=2)	0.001
AMN/LISN specification	1.200	dB	normal(k=2)	0.600
Mismatch Receiver VSWR 1= AMN/LISN VSWR 2=	-0.080	dB	U-shaped	0.060
Combined standard uncertainty Uc(y)				1.2
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				2.4

Uncertainty of Radiated Emission Measurement (30MHz ~ 1,000MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.173	dB	K=1	0.086
Cable loss	±0.174	dB	K=2	0.087
Antenna gain	±0.169	dB	K=2	0.084
Site imperfection	±0.433	dB	Triangular	0.214
Pre-amplifier gain	±0.366	dB	K=2	0.183
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.778
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.555

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.191	dB	K=1	0.095
Cable loss	±0.169	dB	K=2	0.084
Antenna gain	±0.191	dB	K=2	0.096
Site imperfection	±0.582	dB	Triangular	0.291
Pre-amplifier gain	±0.304	dB	K=2	0.152
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.839
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.678

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.186	dB	K=1	0.093
Cable loss	±0.167	dB	K=2	0.083
Antenna gain	±0.190	dB	K=2	0.095
Site imperfection	±0.488	dB	Triangular	0.244
Pre-amplifier gain	±0.269	dB	K=2	0.134
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.771
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.541

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Cable loss	±0.038	dB	K=2	0.019
Attenuator	±0.047	dB	K=2	0.024
Power Meter specification	±0.300	dB	Triangular	0.150
Power Sensor specification	±0.300	dB	Rectangular	0.150
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				0.863
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				1.726