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FCC RADIO TEST REPORT

Applicant's company	**Motorola Solutions, Inc.**
Applicant Address	One Motorola Plaza Holtsville, NY 11742 USA
FCC ID	**UZ7AP7522I**
Manufacturer's company	**Wistron NeWeb Corporation**
Manufacturer Address	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

Product Name	Oak Internal
Brand Name	MOTOROLA
Model No.	AP-7522I
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Apr. 15, 2014
Final Test Date	Jun. 19, 2014
Submission Type	Original Equipment

Statement

Test result included is for the IEEE 802.11n, IEEE 802.11b/g and IEEE 802.11ac 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 v03r02**, **KDB 662911 D01 v02r01** and **KDB644545 D01 v01r02**

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
FR441804-03AA	Rev. 01	Initial issue of report	Jul. 03, 2014

Certificate No.: CB10306093

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Oak Internal
Brand Name	:	MOTOROLA
Model No.	:	AP-7522I
Applicant	:	Motorola Solutions, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Apr. 15, 2014 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

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	6.90 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	4.33 dB
4.3	15.247(e)	Power Spectral Density	Complies	8.15 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	1.06 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.06 dB
4.7	15.203	Antenna Requirements	Complies	-

Note: The PoE is for measurement only, would not be marketed.

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (1TX,2TX , 1RX,2RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter or PoE
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
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Band Width (99%)	Non-beamforming mode: For 1TX 802.11ac MCS0/Nss1 (VHT20): 17.76 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz Beamforming mode: For 2TX 802.11ac MCS0/Nss1 (VHT20): 17.76 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz
Maximum Conducted Output Power	Non-beamforming mode: For 1TX 802.11ac MCS0/Nss1 (VHT20): 21.89 dBm ; 802.11ac MCS0/Nss1 (VHT40): 17.40 dBm For 2TX 802.11ac MCS0/Nss1 (VHT20): 24.53 dBm ; 802.11ac MCS0/Nss1 (VHT40): 19.63 dBm Beamforming mode: For 2TX 802.11ac MCS0/Nss1 (VHT20): 24.53 dBm ; 802.11ac MCS0/Nss1 (VHT40): 19.63 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11b/g

Items	Description
Product Type	WLAN (1TX,2TX, 1RX,2RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter or PoE
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11g
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
Channel Number	11
Channel Band Width (99%)	Non-beamforming mode: For 1TX 11b: 11.60 MHz For 2TX 11b: 11.68 MHz
Maximum Conducted Output Power	Non-beamforming mode: For 1TX 11b: 19.75 dBm ; 11g: 21.81 dBm For 2TX 11b: 22.63 dBm ; 11g: 24.49 dBm Beamforming mode: For 2TX 11g: 24.49 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming	☐ Without beamforming

Note : The beamforming function supports 802.11g/n/ac in 2400~2483.5MHz and 802.11a/n/ac in 5150~5250MHz/5725~5850MHz.

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	1,2	MCS 0-15
802.11n (HT40)	1,2	MCS 0-15
802.11ac (VHT20)	1,2	MCS 0-9/Nss1-2
802.11ac (VHT40)	1,2	MCS 0-9/Nss1-2

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

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). The EUT supports VHT20, VHT40 in 2.4GHz and VHT20, VHT40, VHT80 in 5GHz.

Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40: IEEE 802.11ac

3.2. Accessories

Power	Brand	Model	Rating
Adapter	Leader	NU60-H120500-13	INPUT: 100-240V ~ 50/60Hz, 1.4A OUTPUT: 12.0V, 5.0A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Antenna Gain (dBi)		Cable Loss (dBi)		True Gain (dBi)	
					2.4G	5G	2.4G	5G	2.4G	5G
1	MOTOROLA	BIRCH INT ANT	PIFA Antenna	U.FL	4.13	5.92	-	-	4.13	5.92
2	MOTOROLA	BIRCH INT ANT	PIFA Antenna	U.FL	4.13	5.92	-	-	4.13	5.92
3	MOTOROLA	BIRCH INT ANT	PIFA Antenna	U.FL	4.13	5.92	-	-	4.13	5.92
4	MOTOROLA	BIRCH INT ANT	PIFA Antenna	U.FL	4.13	5.92	-	-	4.13	5.92

Note: The EUT has four antennas of the same type

<For 2.4GHz Band>

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

The EUT can support 1TX, 2TX and 1RX, 2RX functions.

For 1TX

Both Chain 3 and Chain 4 support transmit and receive functions, but only one of them will be used at one time.

After evaluating, Chain 3 has been evaluated to be the worst case, so it's selected to record in this test report.

For 2TX

Chain 3 and Chain 4 could transmit/receive simultaneously.

<For 5GHz Band>

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

The EUT can support 1TX, 2TX and 1RX, 2RX functions.

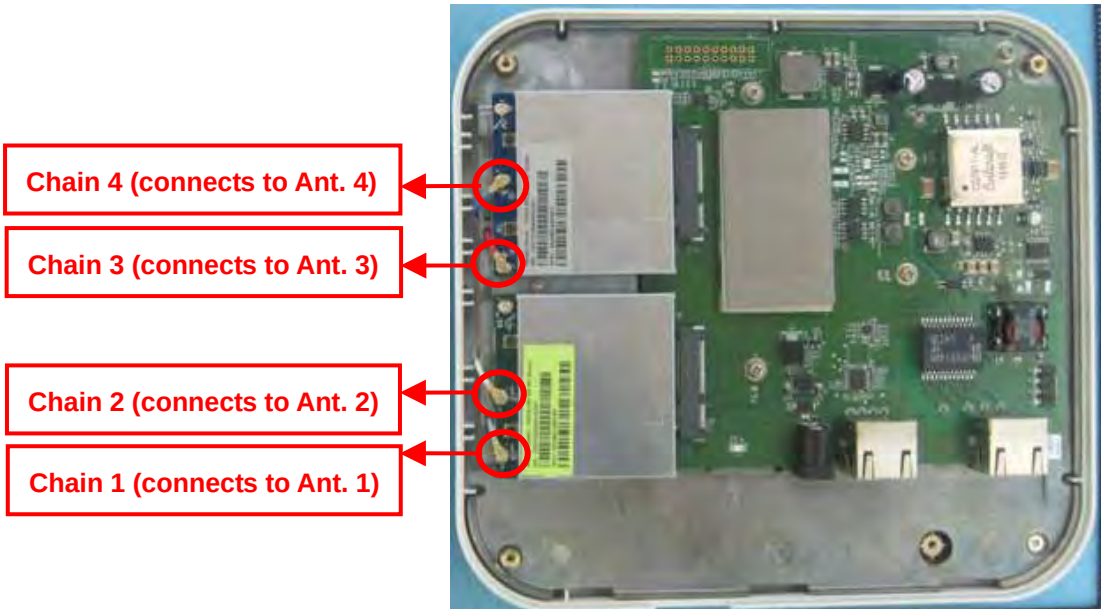
For 1TX

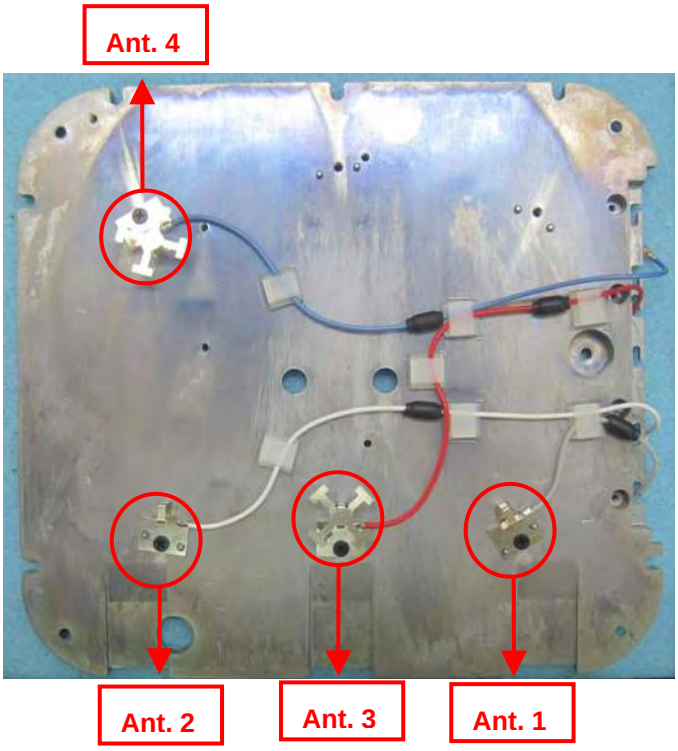
Both Chain 1 and Chain 2 support transmit and receive functions, but only one of them will be used at one time.

After evaluating, Chain 2 has been evaluated to be the worst case, so it's selected to record in this test report.

For 2TX

Chain 1 and Chain 2 could transmit/receive simultaneously.


Chain 4 (connects to Ant. 4)
Chain 3 (connects to Ant. 3)
Chain 2 (connects to Ant. 2)
Chain 1 (connects to Ant. 1)


Ant. 4
Ant. 2
Ant. 3
Ant. 1

3.4. Table for Carrier Frequencies

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	-	-

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.

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	Non-beamforming Mode			
	802.11ac VHT20	MCS0/Nss1	1/6/11	3 3+4
	802.11ac VHT40	MCS0/Nss1	3/6/9	3 3+4
	11b/BPSK	1 Mbps	1/6/11	3 3+4
	11g/BPSK	6 Mbps	1/6/11	3 3+4
	Beamforming Mode			
	802.11ac VHT20	MCS0/Nss1	1/6/11	3+4
	802.11ac VHT40	MCS0/Nss1	3/6/9	3+4
	11g/BPSK	1 Mbps	1/6/11	3+4
Power Spectral Density	Non-beamforming Mode			
	802.11n VHT20	MCS0/Nss1	1/6/11	3
	802.11n VHT40	MCS0/Nss1	3/6/9	3
	11b/BPSK	1 Mbps	1/6/11	3 3+4
	Beamforming Mode			
	802.11n VHT20	MCS0/Nss1	1/6/11	3+4
	802.11n VHT40	MCS0/Nss1	3/6/9	3+4

6dB Spectrum Bandwidth	Non-beamforming Mode			
	802.11n VHT20	MCS0/Nss1	1/6/11	3
	802.11n VHT40	MCS0/Nss1	3/6/9	3
	11b/BPSK	1 Mbps	1/6/11	3 3+4
	Beamforming Mode			
	802.11ac VHT20	MCS0/Nss1	1/6/11	3+4
	802.11ac VHT40	MCS0/Nss1	3/6/9	3+4
Radiated Emissions 9kHz~1GHz	Normal Link	-	-	-
Radiated Emissions 1GHz~10th Harmonic	802.11ac VHT20	MCS0/Nss1	1/6/11	3 3+4
	802.11ac VHT40	MCS0/Nss1	3/6/9	3 3+4
	11b/BPSK	1 Mbps	1/6/11	3 3+4
Band Edge Emissions	802.11ac VHT20	MCS0/Nss1	1/6/11	3 3+4
	802.11ac VHT40	MCS0/Nss1	3/6/9	3 3+4
	11b/BPSK	1 Mbps	1/6/11	3 3+4

Note: VHT20/VHT40 covers HT20/HT40, due to same modulation.

The following test modes were performed for all tests:

For Conducted Emission test:

Test Mode 1: Normal Link - EUT + Adapter

Test Mode 2: Normal Link - EUT + PoE

Mode 1 performed as worst case, it was recorded in this report.

For Radiated Emission below 1GHz test:

Test Mode 1: Normal Link - EUT standing + Adapter

Test Mode 2: Normal Link - EUT laying + Adapter

Mode 2 has been evaluated to be the worst case, thus measurement will follow this same test mode for Mode 3.

Test Mode 3: Normal Link - EUT laying + PoE

Mode 2 performed as worst case, it was recorded in this report.

For Radiated Emission above 1GHz test:

There are two test modes, one is EUT standing, and the other is EUT laying. After evaluating, EUT standing has been evaluated to be the worst case. Consequently, measurements for Radiated Emission above 1GHz test will follow this same test mode.

Test Mode 1: CTX - EUT standing

For Co-location MPE and Radiated Emission Co-location Test:

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

3.6. Table for Testing Locations

Test Site Location				
Address:	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			
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).

3.7. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook*3	DELL	E6430	DoC

For Test Site No: 03CH01-CB (For Below 1GHz)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2K4965AGNM
Notebook	DELL	M1340	E2K4965AGNM
Notebook	DELL	E6430	DoC

For Test Site No: 03CH01-CB (For Above 1GHz)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2K4965AGNM

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6220	DoC

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 Non-Beamforming Mode>

For 1TX

Power Parameters of IEEE 802.11ac

Test Software Version	Mtool_2.0.1.0		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	61	82	66
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	51	65	56

Power Parameters of IEEE 802.11b/g

Test Software Version	Mtool_2.0.1.0		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	68	74	67
IEEE 802.11g	61	82	66

For 2TX

Power Parameters of IEEE 802.11ac

Test Software Version	Mtool_2.0.1.0		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	56	81	60
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	48	61	56

Power Parameters of IEEE 802.11b/g

Test Software Version	Mtool_2.0.1.0		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	65	73	68
IEEE 802.11g	56	81	60

<For Beamforming Mode>

For 2TX

Power Parameters of IEEE 802.11ac

Test Software Version	Mtool_2.0.1.0		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	56	81	60
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	48	61	56

Power Parameters of IEEE 802.11g

Test Software Version	Mtool_2.0.1.0		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	56	81	60

3.9. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain 10*log(2)=3.01dBi as worse case in beamforming mode.

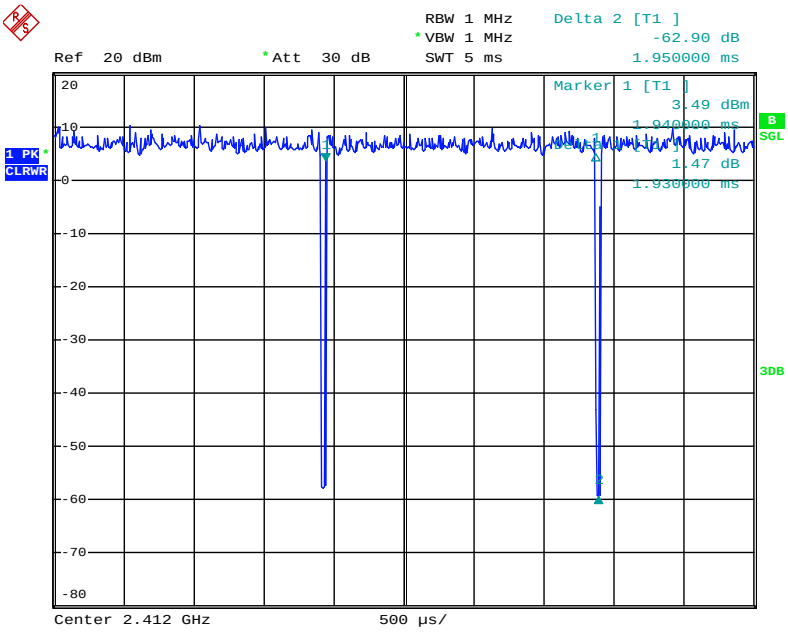
For Radiated Mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain 10*log(2)=3.01dBi as worse case in beamforming mode.

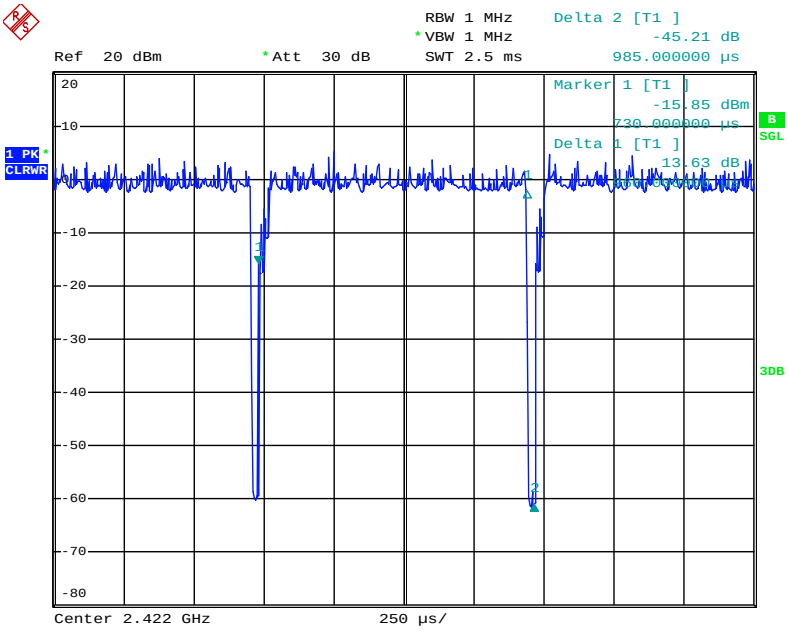
3.10. Duty Cycle

IEEE 802.11ac MCS0/Nss1 VHT20



Date: 29.MAY.2014 11:16:42

IEEE 802.11ac MCS0/Nss1 VHT40



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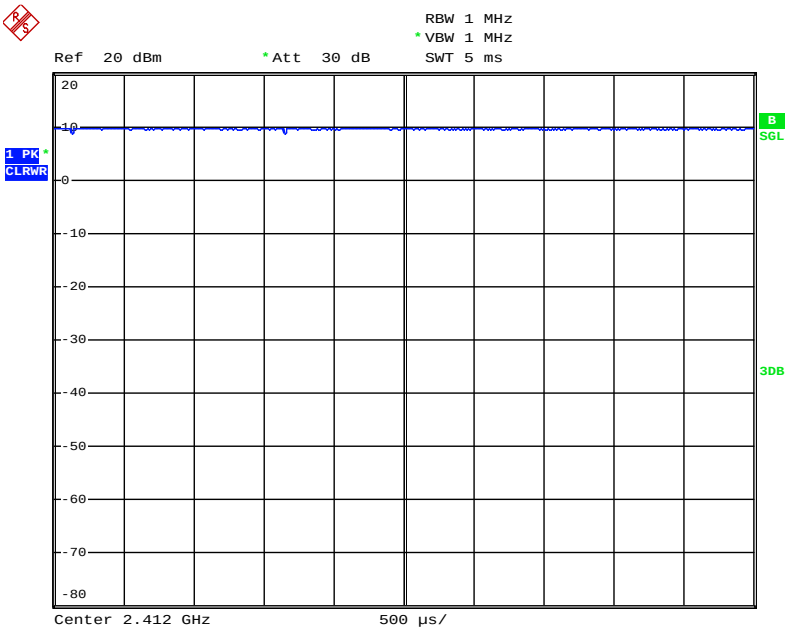
IEEE 802.11b



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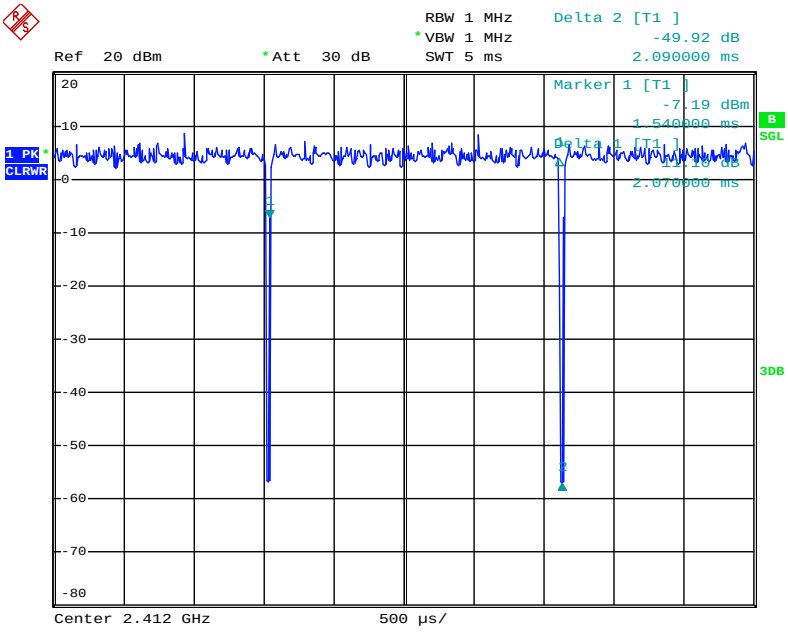
IEEE 802.11g



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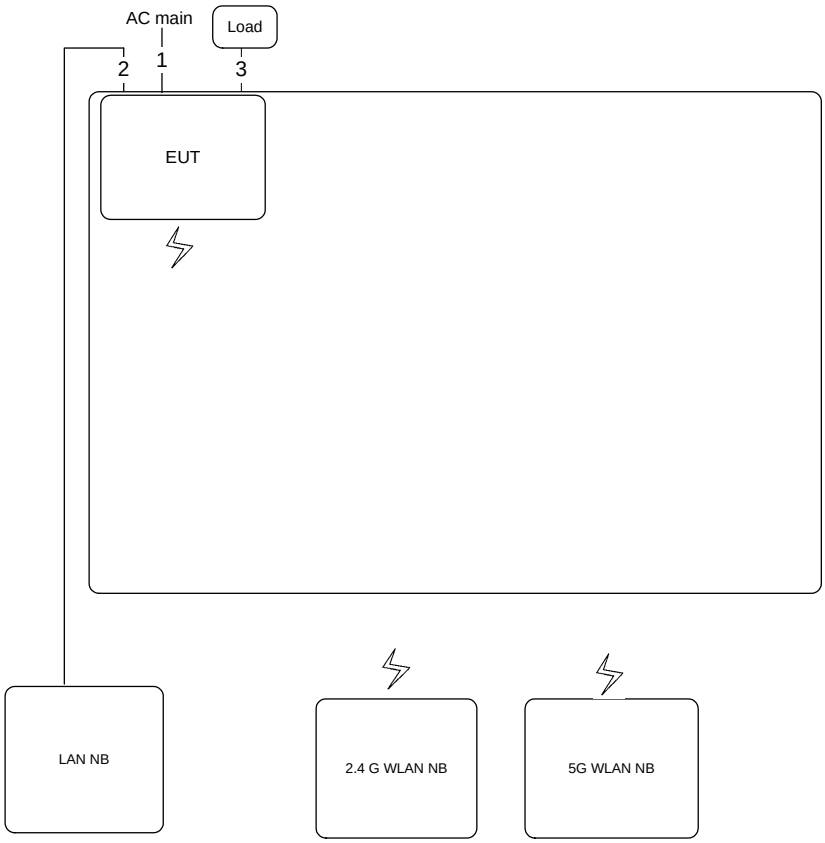
3.11. Test Configurations

3.11.1. AC Power Line Conduction Emissions Test Configuration

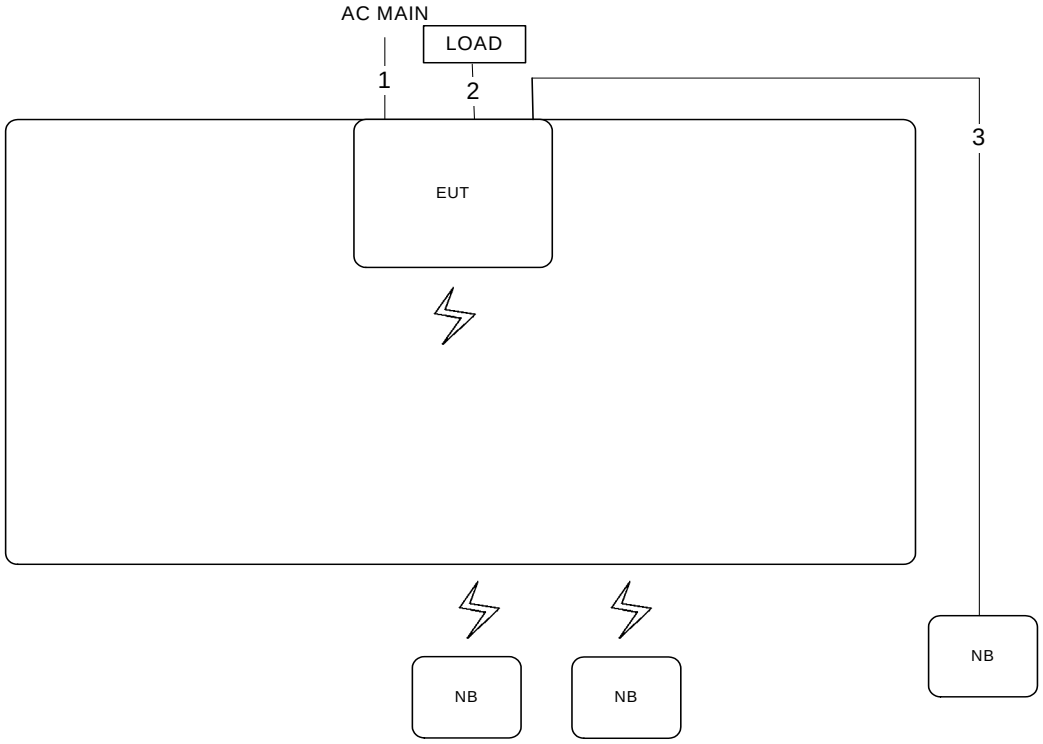
Test Mode: Mode 1



Item	Connection	Shield	Length(m)	Remark
1	AC power cable	No	3.3m	-
2	RJ-45 cable	No	10m	-
3	Console cable	No	1.5m	Load

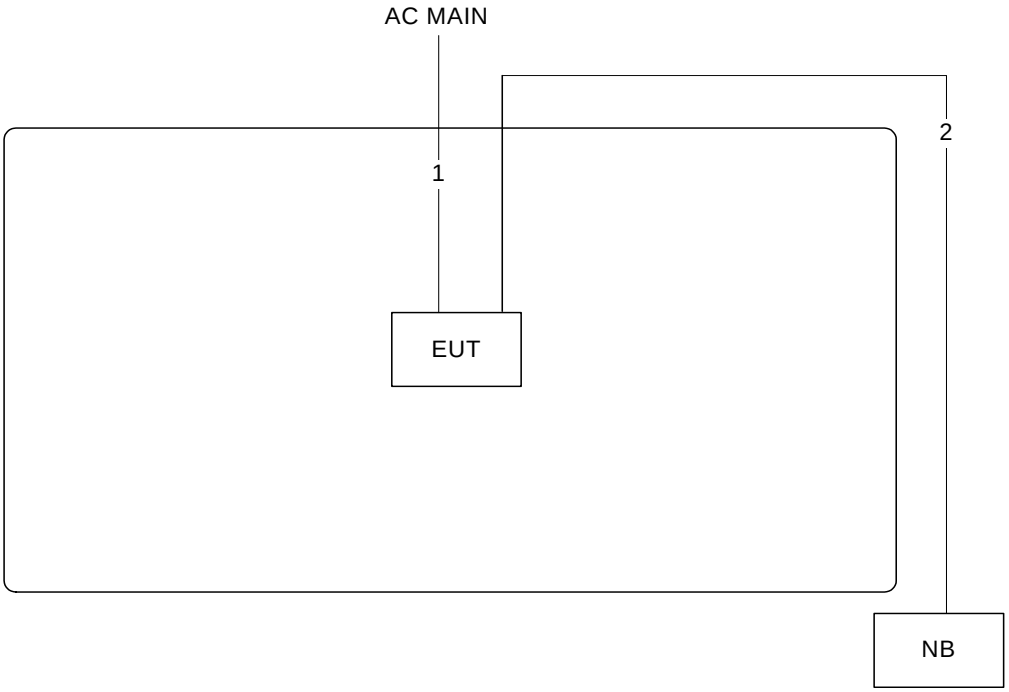
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz / Test Mode: Mode 2



Item	Connection	Shield	Length(m)	Remark
1	AC power cable	No	3.3m	-
2	Console cable	No	1.5m	Load
3	RJ-45 cable	No	10m	-

Test Configuration: above 1GHz / Test Mode: Mode 1



Item	Connection	Shield	Length(m)
1	AC power cable	No	3.3m
2	RJ-45 cable	No	10m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

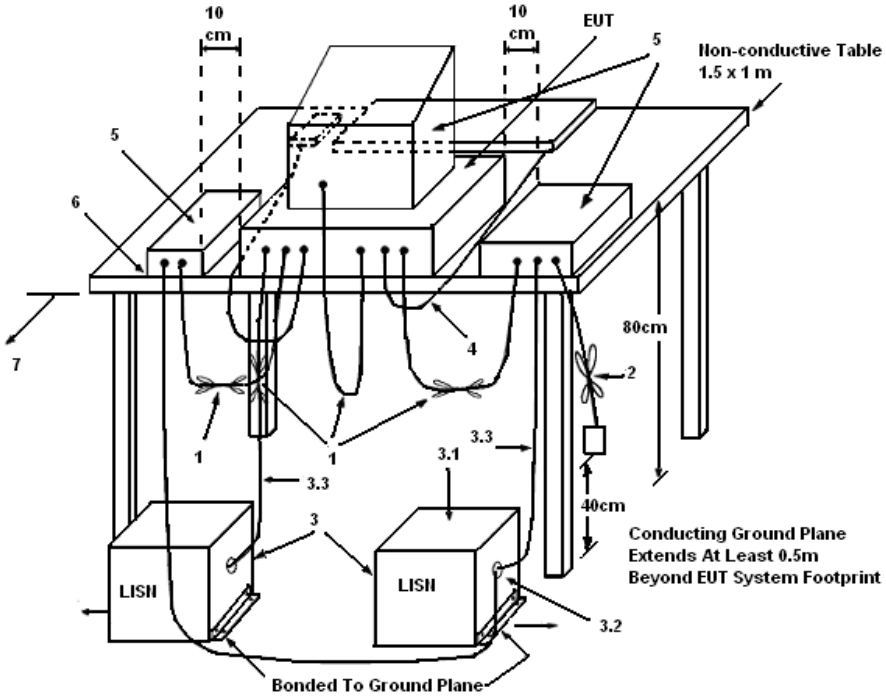
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

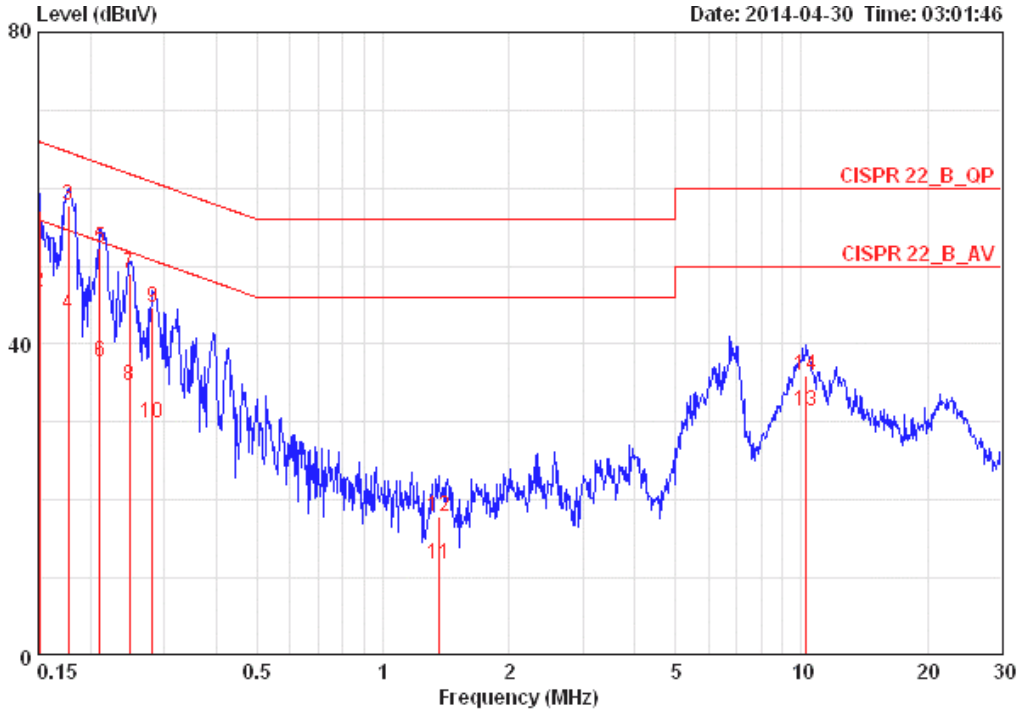
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

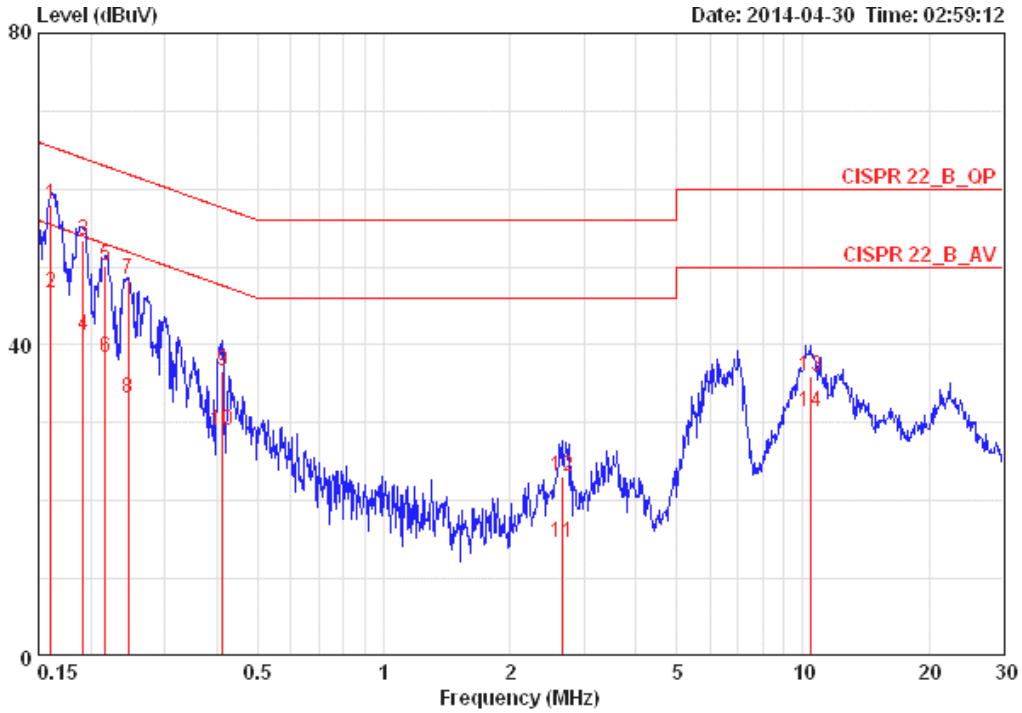
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	55%
Test Engineer	Parody Lin	Phase	Line
Configuration	Normal Link	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.15080	57.11	-8.85	65.96	0.15	56.80	0.16	LINE	QP
2	0.15080	46.55	-9.41	55.96	0.15	46.24	0.16	LINE	AVERAGE
3	0.17678	57.73	-6.90	64.64	0.15	57.42	0.16	LINE	QP
4	0.17678	43.90	-10.73	54.64	0.15	43.59	0.16	LINE	AVERAGE
5	0.21055	52.39	-10.80	63.18	0.15	52.07	0.17	LINE	QP
6	0.21055	37.61	-15.58	53.18	0.15	37.29	0.17	LINE	AVERAGE
7	0.24814	49.00	-12.82	61.82	0.15	48.68	0.17	LINE	QP
8	0.24814	34.69	-17.13	51.82	0.15	34.37	0.17	LINE	AVERAGE
9	0.28178	44.63	-16.13	60.76	0.15	44.31	0.17	LINE	QP
10	0.28178	29.88	-20.88	50.76	0.15	29.56	0.17	LINE	AVERAGE
11	1.359	11.66	-34.34	46.00	0.17	11.27	0.22	LINE	AVERAGE
12	1.359	17.82	-38.18	56.00	0.17	17.43	0.22	LINE	QP
13	10.288	31.36	-18.64	50.00	0.38	30.60	0.39	LINE	AVERAGE
14	10.288	35.95	-24.05	60.00	0.38	35.19	0.39	LINE	QP

Temperature	24°C	Humidity	55%
Test Engineer	Parody Lin	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.16070	57.92	-7.51	65.43	0.07	57.69	0.16	NEUTRAL	QP
2	0.16070	46.56	-8.87	55.43	0.07	46.33	0.16	NEUTRAL	AVERAGE
3	0.19140	53.34	-10.63	63.98	0.07	53.11	0.16	NEUTRAL	QP
4	0.19140	41.09	-12.88	53.98	0.07	40.86	0.16	NEUTRAL	AVERAGE
5	0.21620	50.08	-12.89	62.96	0.07	49.84	0.17	NEUTRAL	QP
6	0.21620	38.34	-14.63	52.96	0.07	38.10	0.17	NEUTRAL	AVERAGE
7	0.24552	48.38	-13.53	61.91	0.07	48.14	0.17	NEUTRAL	QP
8	0.24552	33.19	-18.72	51.91	0.07	32.95	0.17	NEUTRAL	AVERAGE
9	0.41266	36.64	-20.95	57.59	0.07	36.39	0.18	NEUTRAL	QP
10	0.41266	28.97	-18.62	47.59	0.07	28.72	0.18	NEUTRAL	AVERAGE
11	2.664	14.66	-31.34	46.00	0.12	14.27	0.27	NEUTRAL	AVERAGE
12	2.664	23.08	-32.92	56.00	0.12	22.69	0.27	NEUTRAL	QP
13	10.397	35.91	-24.09	60.00	0.28	35.25	0.39	NEUTRAL	QP
14	10.397	31.40	-18.60	50.00	0.28	30.74	0.39	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.

4.2.2. Measuring Instruments and Setting

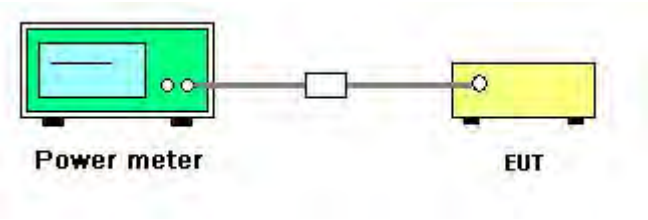
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.2.3. Test Procedures

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 9.2.3.2 Method AVGPM-G (Measurement using a gated RF average power meter).
2. Multiple antenna systems was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. 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

<For Non-Beamforming Mode>

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac
Test Date	May 29, 2014		

For 1TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.23	30.00	Complies
6	2437 MHz	21.89	30.00	Complies
11	2462 MHz	17.26	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	14.30	30.00	Complies
6	2437 MHz	17.40	30.00	Complies
9	2452 MHz	15.38	30.00	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b/g
Test Date	May 29, 2014		

For 1TX

Configuration IEEE 802.11b / Chain 3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	17.96	30.00	Complies
6	2437 MHz	19.75	30.00	Complies
11	2462 MHz	17.64	30.00	Complies

Configuration IEEE 802.11g / Chain 3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.20	30.00	Complies
6	2437 MHz	21.81	30.00	Complies
11	2462 MHz	17.35	30.00	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac
Test Date	May 29, 2014		

For 2TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	15.00	15.16	18.09	30.00	Complies
6	2437 MHz	21.71	21.33	24.53	30.00	Complies
11	2462 MHz	15.80	15.85	18.84	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
3	2422 MHz	13.53	13.31	16.43	30.00	Complies
6	2437 MHz	16.53	16.70	19.63	30.00	Complies
9	2452 MHz	15.25	15.37	18.32	30.00	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b/g
Test Date	May 29, 2014		

For 2TX

Configuration IEEE 802.11b / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	17.33	17.64	20.50	30.00	Complies
6	2437 MHz	19.60	19.63	22.63	30.00	Complies
11	2462 MHz	17.82	17.98	20.91	30.00	Complies

Configuration IEEE 802.11g / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	15.16	15.29	18.24	30.00	Complies
6	2437 MHz	21.67	21.28	24.49	30.00	Complies
11	2462 MHz	15.86	16.00	18.94	30.00	Complies

<For Beamforming Mode>

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac
Test Date	May 29, 2014		

For 2TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	15.00	15.16	18.09	28.86	Complies
6	2437 MHz	21.71	21.33	24.53	28.86	Complies
11	2462 MHz	15.80	15.85	18.84	28.86	Complies

Note: $Directional\ gain = G_{ANT} + 10\log(N_{ANT}/N_{SS})$ =7.14dBi >6dBi,So Limit =30-(7.14-6)=28.86dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
3	2422 MHz	13.53	13.31	16.43	28.86	Complies
6	2437 MHz	16.53	16.70	19.63	28.86	Complies
9	2452 MHz	15.25	15.37	18.32	28.86	Complies

Note: $Directional\ gain = G_{ANT} + 10\log(N_{ANT}/N_{SS})$ =7.14dBi >6dBi,So Limit =30-(7.14-6)=28.86dBm

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g
Test Date	May 29, 2014		

For 2TX

Configuration IEEE 802.11g / Chain 3 + Chain 4

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	15.16	15.29	18.24	28.86	Complies
6	2437 MHz	21.67	21.28	24.49	28.86	Complies
11	2462 MHz	15.86	16.00	18.94	28.86	Complies

Note: $Directional\ gain = G_{ANT} + 10\log(N_{ANT}/N_{SS})$=7.14dBi >6dBi,So Limit =30-(7.14-6)=28.86dBm

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 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2. Measuring Instruments and Setting

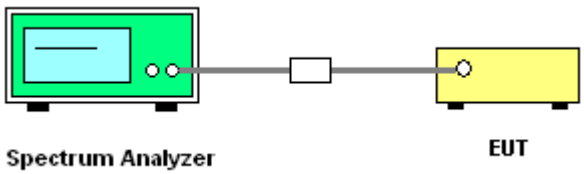
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 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

<For Non-Beamforming Mode>

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac

For 1TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	-9.92	8.00	Complies
6	2437 MHz	-4.70	8.00	Complies
11	2462 MHz	-8.68	8.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
3	2422 MHz	-14.29	8.00	Complies
6	2437 MHz	-12.18	8.00	Complies
9	2452 MHz	-13.62	8.00	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b

For 1TX

Configuration IEEE 802.11b / Chain 3

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	-5.46	8.00	Complies
6	2437 MHz	-3.59	8.00	Complies
11	2462 MHz	-6.42	8.00	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b

For 2TX

Configuration IEEE 802.11b / Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	-6.15	-6.29	-3.21	6.86	Complies
6	2437 MHz	-4.42	-4.18	-1.29	6.86	Complies
11	2462 MHz	-5.89	-5.81	-2.84	6.86	Complies

Note: $Directional\ gain = G_{ANT} + 10\log(N_{ANT}/N_{SS})$=7.14dBi >6dBi,So Limit =8-(7.14-6)=6.86dBm/3kHz

<For Beamforming Mode>

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac

For 2TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 4	Total		
1	2412 MHz	-11.20	-10.93	-8.05	6.86	Complies
6	2437 MHz	-5.01	-5.31	-2.15	6.86	Complies
11	2462 MHz	-9.68	-9.40	-6.53	6.86	Complies

Note: $Directional\ gain = G_{ANT} + 10\log(N_{ANT}/N_{SS})$ =7.14dBi >6dBi,So Limit =8-(7.14-6)=6.86dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 4	Total		
3	2422 MHz	-15.23	-15.46	-12.33	6.86	Complies
6	2437 MHz	-11.87	-11.29	-8.56	6.86	Complies
9	2452 MHz	-12.83	-12.79	-9.80	6.86	Complies

Note: $Directional\ gain = G_{ANT} + 10\log(N_{ANT}/N_{SS})$ =7.14dBi >6dBi,So Limit =8-(7.14-6)=6.86dBm/3kHz

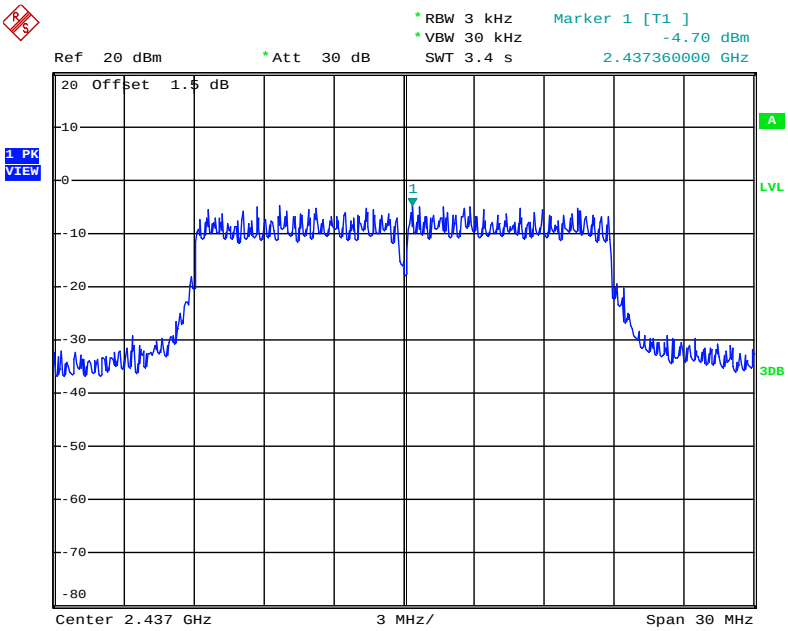
Note: All the test values were listed in the report.

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

<For Non-Beamforming Mode>

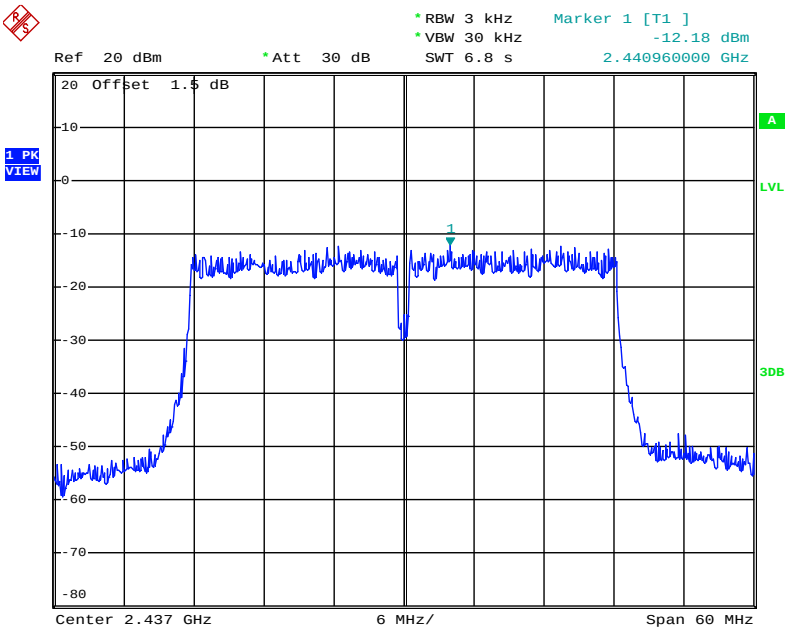
For 1TX

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3



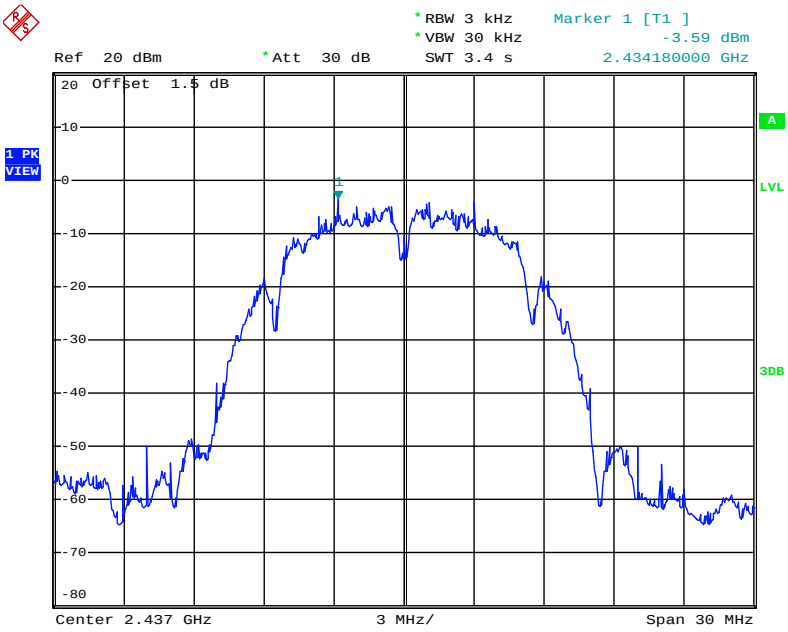
Date: 29.MAY.2014 11:24:27

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 3



Date: 29.MAY.2014 11:28:03

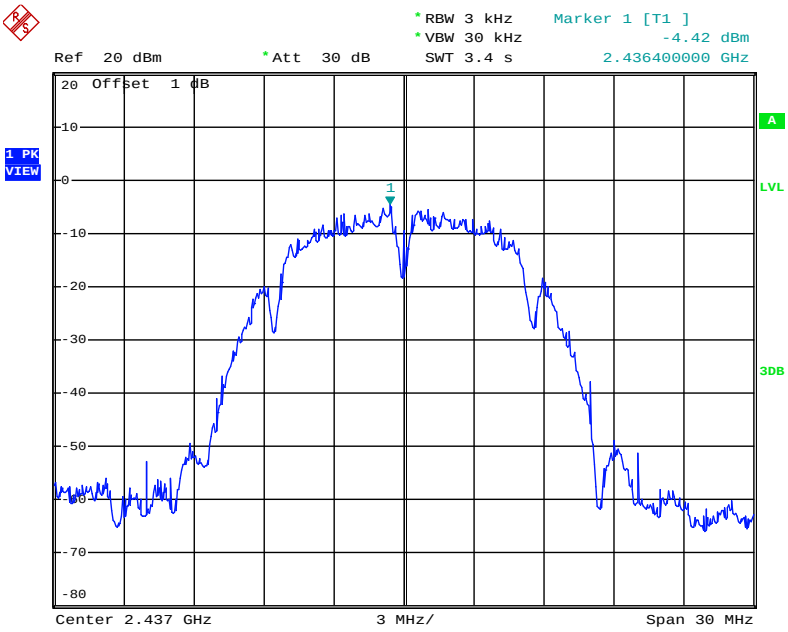
Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 3



Date: 29.MAY.2014 11:11:12

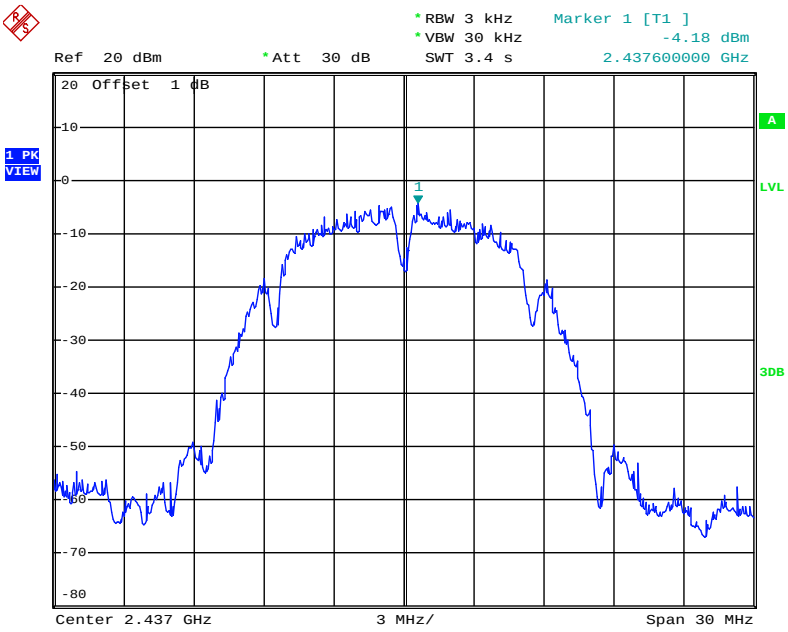
For 2TX

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



Date: 19.JUN.2014 00:29:49

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 4

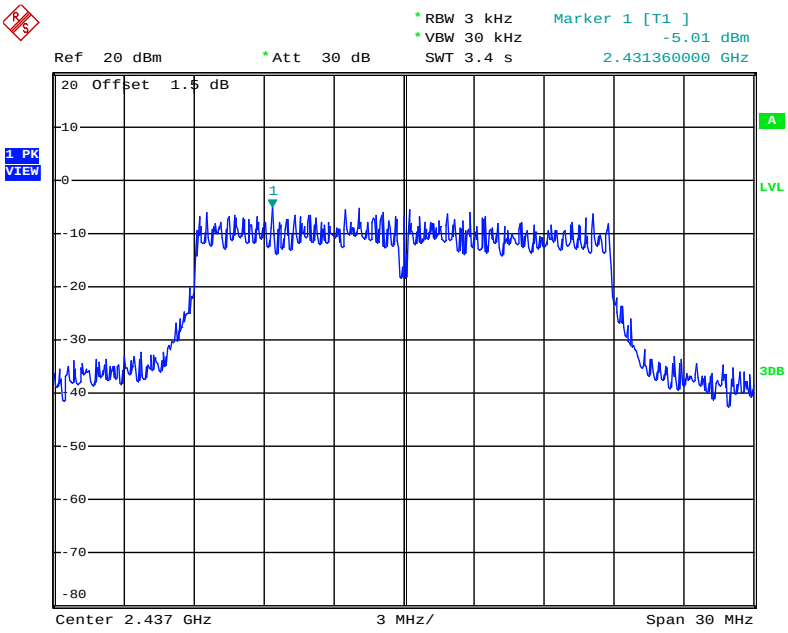


Date: 19.JUN.2014 00:29:12

<For Beamforming Mode>

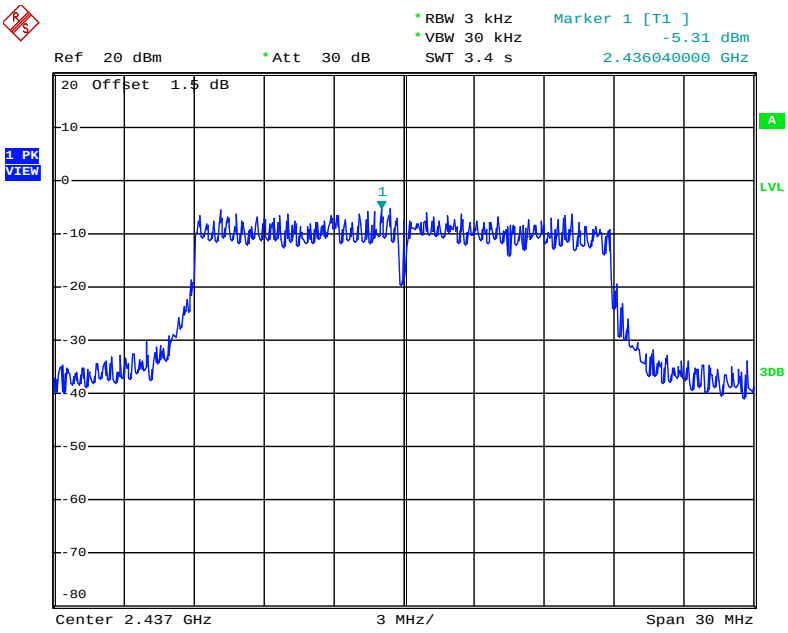
For 2TX

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3



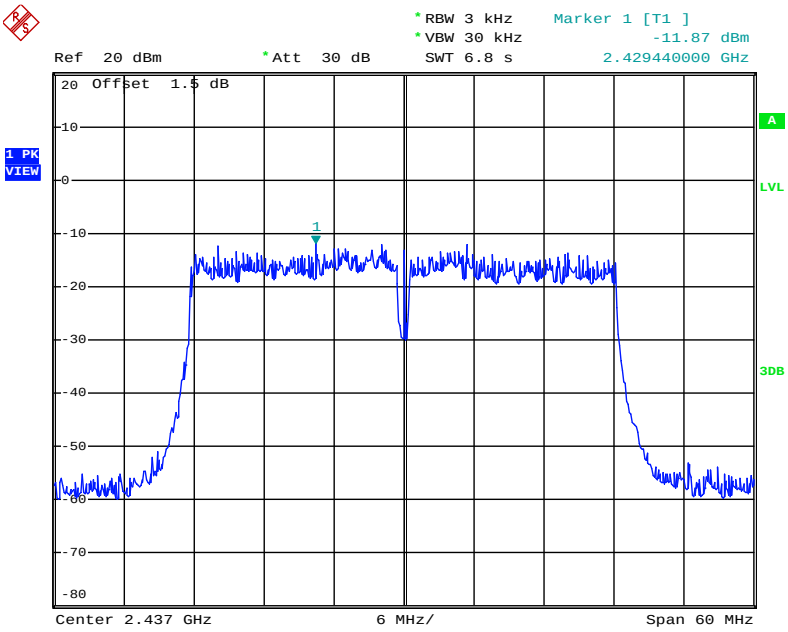
Date: 29.MAY.2014 19:52:05

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 4



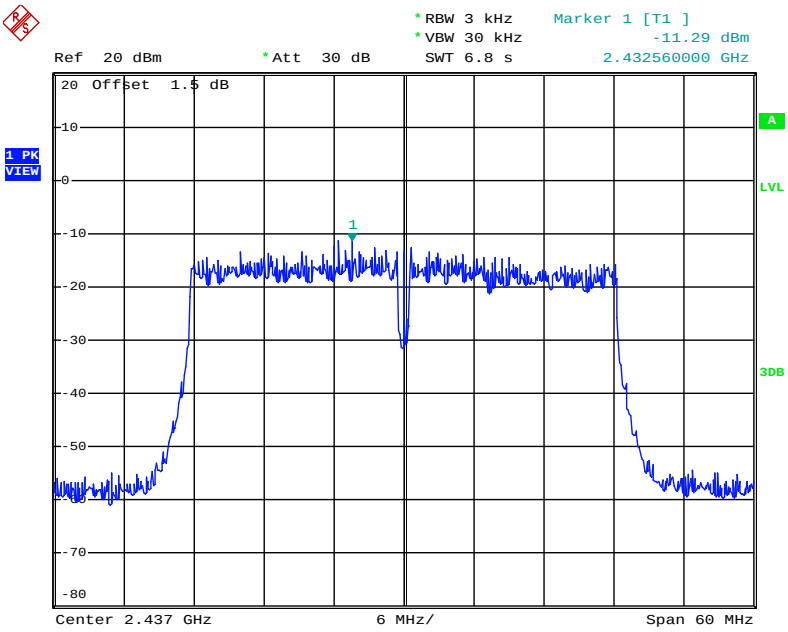
Date: 29.MAY.2014 19:51:51

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 3



Date: 29.MAY.2014 20:00:11

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



Date: 29.MAY.2014 19:59:46

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

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

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

4.4.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 8.0 DTS bandwidth=> 8.1 Option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 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

For Radiated 6dB Bandwidth Measurement:

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

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

<For Non-Beamforming Mode>

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac

For 1TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3

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 802.11ac MCS0/Nss1 VHT40 / Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.32	36.32	500	Complies
6	2437 MHz	36.48	36.32	500	Complies
9	2452 MHz	36.32	36.32	500	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b

For 1TX

Configuration IEEE 802.11b / Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	7.68	11.52	500	Complies
6	2437 MHz	8.08	11.60	500	Complies
11	2462 MHz	8.64	11.52	500	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b

For 2TX

Configuration IEEE 802.11b / Chain 3 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	8.64	11.68	500	Complies
6	2437 MHz	8.48	11.68	500	Complies
11	2462 MHz	8.56	11.52	500	Complies

<For Beamforming Mode>

Temperature	20°C	Humidity	53%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac

For 2TX

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 4

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	17.68	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 4

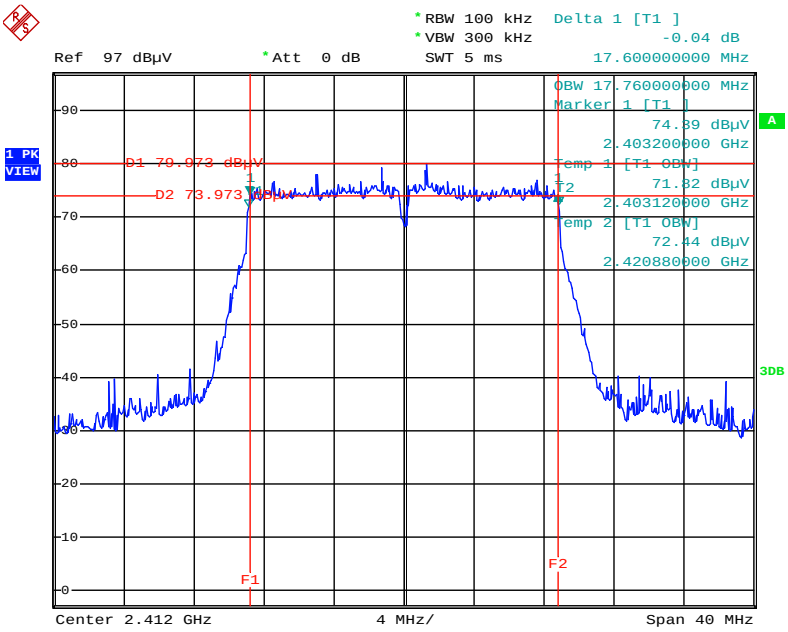
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.36	36.32	500	Complies
6	2437 MHz	35.52	36.16	500	Complies
9	2452 MHz	36.16	36.32	500	Complies

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

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

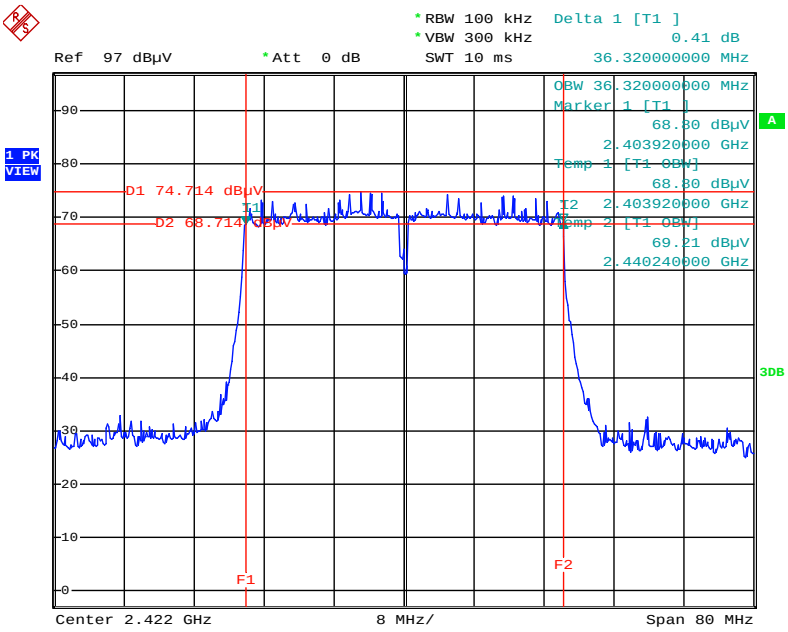
<For Non-Beamforming Mode>

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 3



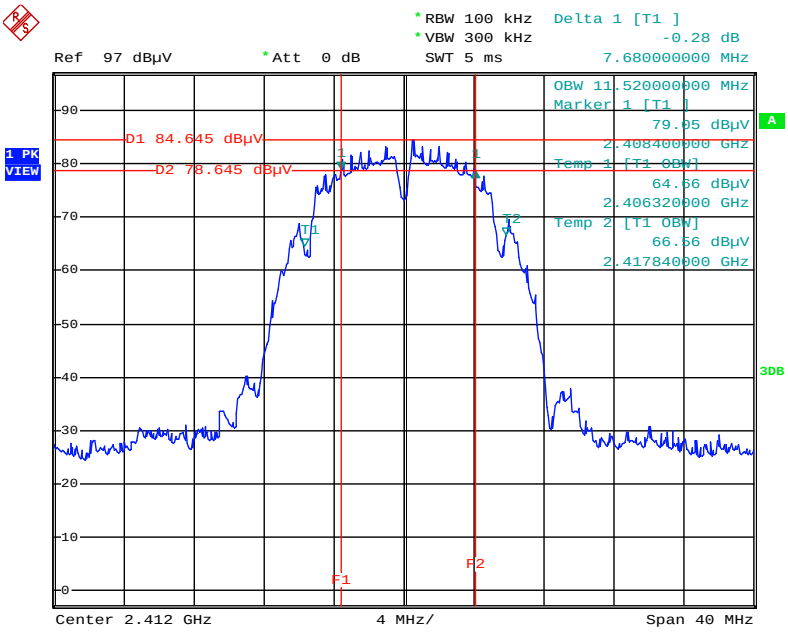
Date: 29.MAY.2014 11:41:28

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2422 MHz / Chain 3



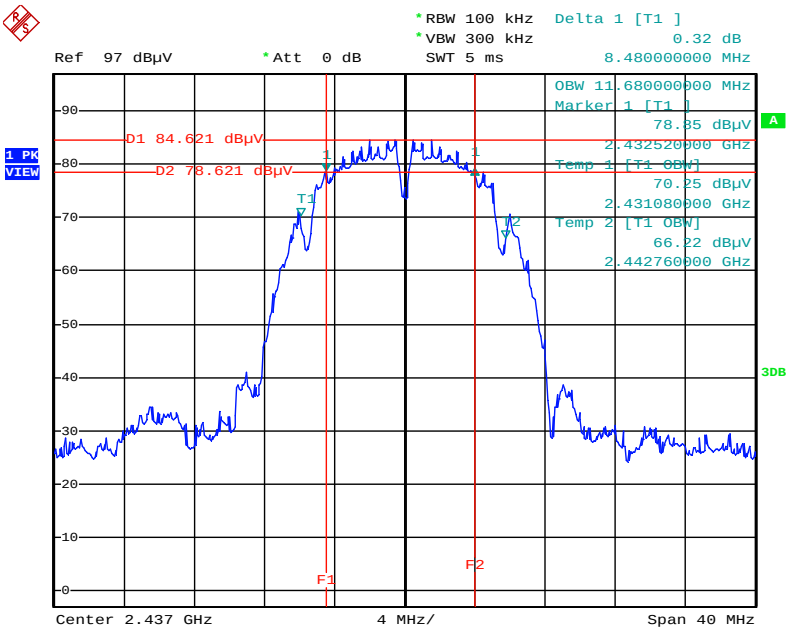
Date: 29.MAY.2014 11:43:58

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 3



Date: 29.MAY.2014 11:38:23

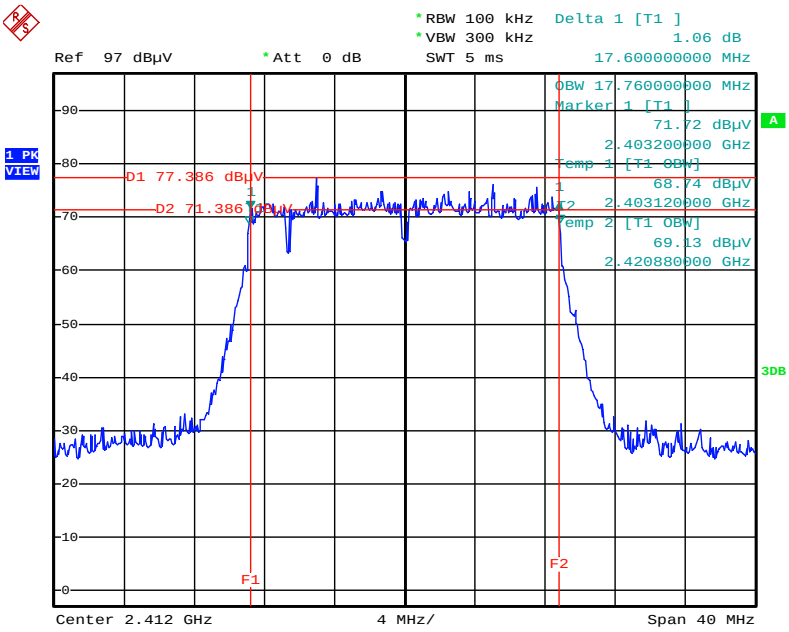
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 3 + Chain 4



Date: 19.JUN.2014 00:41:43

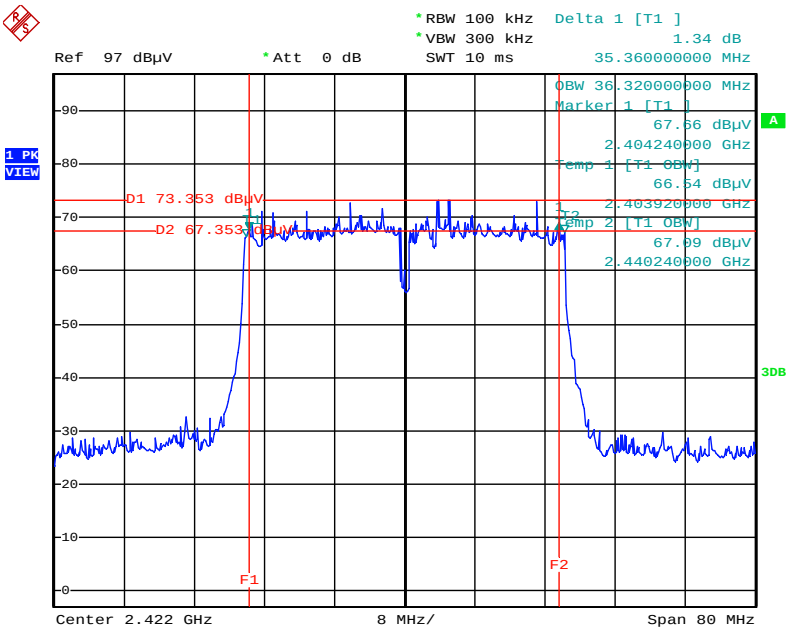
<For Beamforming Mode>

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 3 + Chain 4



Date: 19.JUN.2014 00:45:38

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2422 MHz / Chain 3 + Chain 4



Date: 19.JUN.2014 01:00:11

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	1000 MHz
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

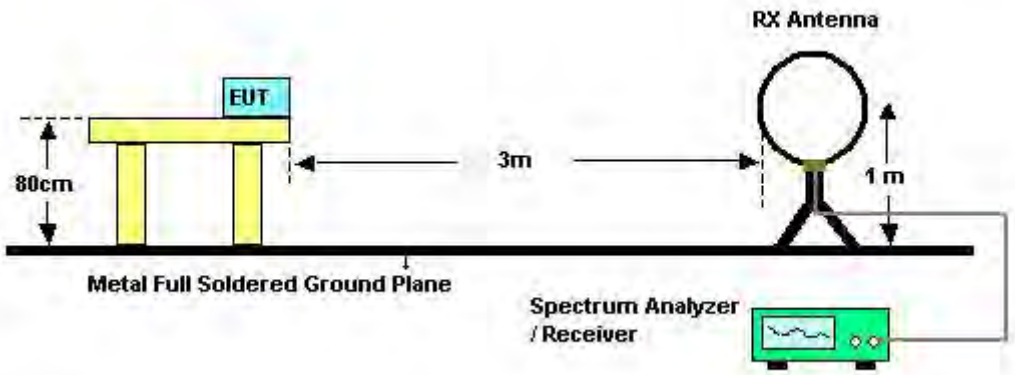
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

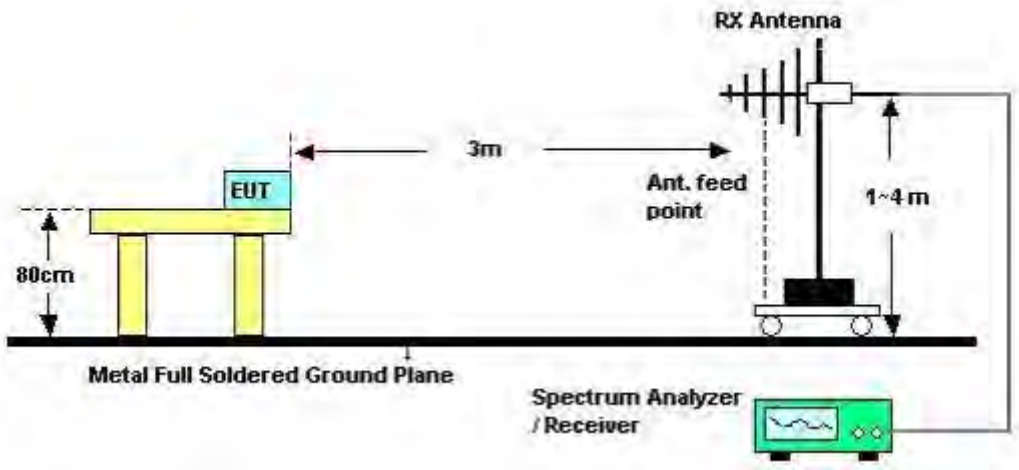
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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. 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.
8. 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.
9. 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

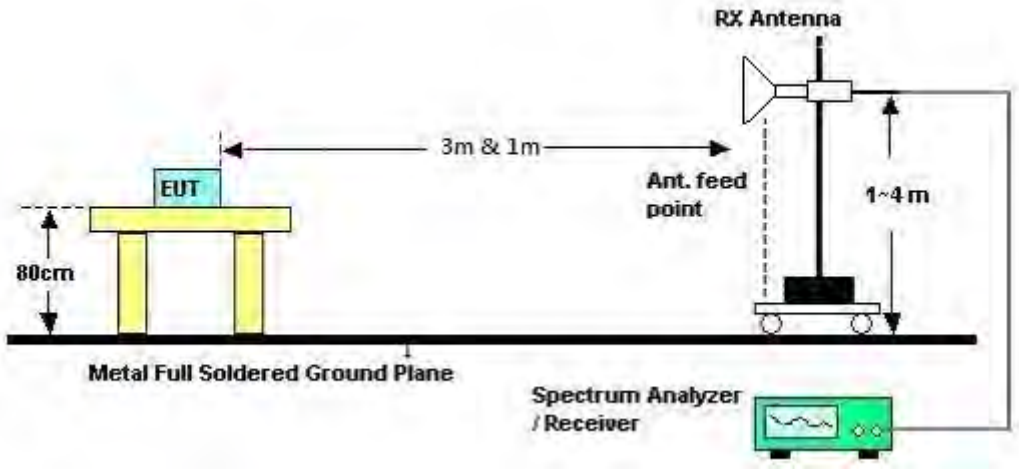
For Radiated Emissions: 9kHz ~30MHz



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	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Date	Apr. 26, 2014	Test Mode	Mode 2

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

Note:

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

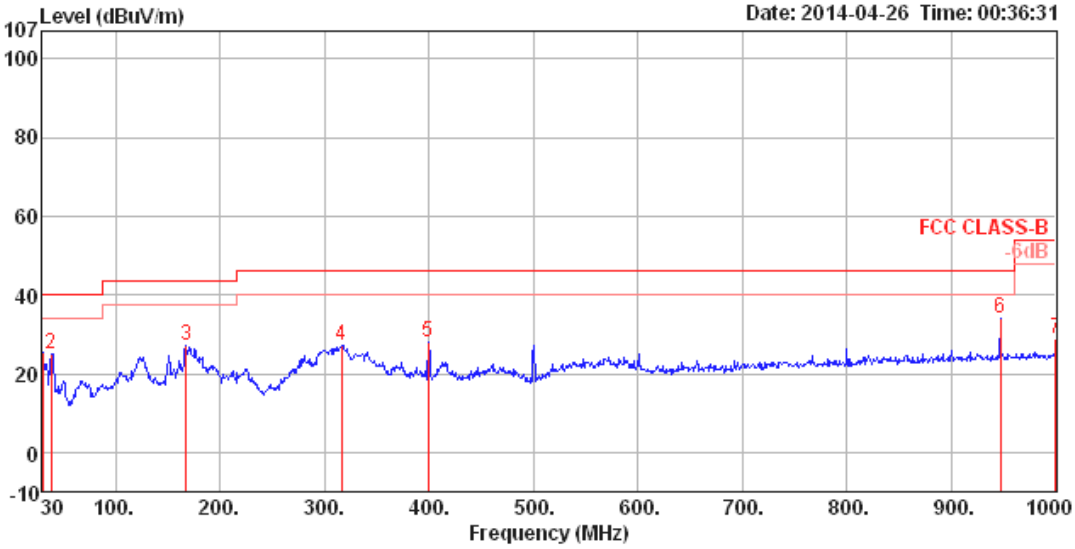
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

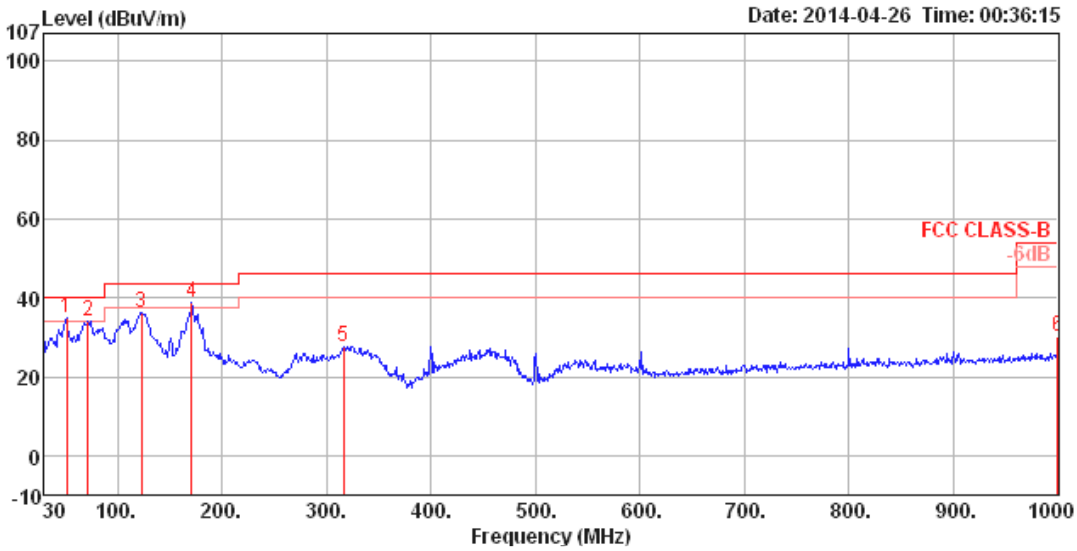
Temperature	24℃	Humidity	56%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Mode	Mode 2		

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	30.00	25.32	40.00	-14.68	38.51	0.64	17.98	31.81	100	138	HORIZONTAL	Peak
2	38.73	24.96	40.00	-15.04	43.01	0.73	13.10	31.88	100	56	HORIZONTAL	Peak
3	167.74	27.08	43.50	-16.42	47.79	1.57	9.25	31.53	150	195	HORIZONTAL	Peak
4	316.15	27.04	46.00	-18.96	42.76	2.17	13.51	31.40	125	191	HORIZONTAL	Peak
5	399.57	27.78	46.00	-18.22	40.89	2.49	15.86	31.46	125	184	HORIZONTAL	Peak
6	946.65	34.02	46.00	-11.98	40.18	4.07	20.89	31.12	100	214	HORIZONTAL	Peak
7	1000.00	28.76	54.00	-25.24	34.29	4.21	21.44	31.18	125	218	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	51.34	34.79	40.00	-5.21	58.58	0.85	7.15	31.79	125	188	VERTICAL	Peak
2	71.71	34.09	40.00	-5.91	59.34	1.01	5.49	31.75	125	200	VERTICAL	Peak
3	123.12	36.21	43.50	-7.29	54.79	1.31	11.67	31.56	100	262	VERTICAL	Peak
4	170.65	38.72	43.50	-4.78	59.61	1.59	9.04	31.52	125	158	VERTICAL	Peak
5	316.15	27.53	46.00	-18.47	43.25	2.17	13.51	31.40	200	182	VERTICAL	Peak
6	1000.00	30.01	54.00	-23.99	35.54	4.21	21.44	31.18	150	3	VERTICAL	Peak

Note:

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

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

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

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

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 3 / 1TX
Test Date	May 02, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4822.39	36.15	54.00	-17.85	34.20	3.31	33.56	34.92	Average	100	12	HORIZONTAL
2	4823.82	46.78	74.00	-27.22	44.83	3.31	33.56	34.92	Peak	100	12	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	4821.58	48.32	74.00	-25.68	46.37	3.31	33.56	34.92	Peak	100	79	VERTICAL
2	4822.35	35.80	54.00	-18.20	33.85	3.31	33.56	34.92	Average	100	79	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 3 / 1TX
Test Date	May 02, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.87	58.50	74.00	-15.50	56.43	3.33	33.66	34.92	Peak	132	307	HORIZONTAL
2	4873.28	44.32	54.00	-9.68	42.25	3.33	33.66	34.92	Average	132	307	HORIZONTAL
3	7308.90	55.84	74.00	-18.16	50.33	4.06	36.64	35.19	Peak	136	50	HORIZONTAL
4	7310.33	42.53	54.00	-11.47	37.02	4.06	36.64	35.19	Average	136	50	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.65	61.73	74.00	-12.27	59.66	3.33	33.66	34.92	Peak	129	44	VERTICAL
2	4875.41	47.65	54.00	-6.35	45.58	3.33	33.66	34.92	Average	129	44	VERTICAL
3	7312.09	44.57	54.00	-9.43	39.06	4.06	36.64	35.19	Average	100	116	VERTICAL
4	7313.22	56.44	74.00	-17.56	50.93	4.06	36.64	35.19	Peak	100	116	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 3 / 1TX
Test Date	May 02, 2014		

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	4923.70	46.86	74.00	-27.14	44.66	3.35	33.76	34.91	Peak	100	115	HORIZONTAL
2	4925.86	38.01	54.00	-15.99	35.81	3.35	33.76	34.91	Average	100	115	HORIZONTAL
3	7386.00	50.35	74.00	-23.65	44.65	4.06	36.85	35.21	Peak	145	56	HORIZONTAL
4	7386.06	39.63	54.00	-14.37	33.93	4.06	36.85	35.21	Average	145	56	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4922.76	49.85	74.00	-24.15	47.65	3.35	33.76	34.91	Peak	100	34	VERTICAL
2	4923.44	36.29	54.00	-17.71	34.09	3.35	33.76	34.91	Average	100	34	VERTICAL
3	7385.91	51.63	74.00	-22.37	45.93	4.06	36.85	35.21	Peak	155	320	VERTICAL
4	7385.97	37.75	54.00	-16.25	32.05	4.06	36.85	35.21	Average	155	320	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 3 / 1TX
Test Date	May 02, 2014		

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	4844.50	33.38	54.00	-20.62	31.39	3.32	33.59	34.92	Average	100	29	HORIZONTAL
2	4844.73	44.88	74.00	-29.12	42.89	3.32	33.59	34.92	Peak	100	29	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	4844.15	43.72	74.00	-30.28	41.73	3.32	33.59	34.92	Peak	100	100	VERTICAL
2	4844.87	30.48	54.00	-23.52	28.49	3.32	33.59	34.92	Average	100	100	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 3 / 1TX
Test Date	May 02, 2014		

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	4873.87	33.35	54.00	-20.65	31.28	3.33	33.66	34.92	Average	100	80	HORIZONTAL
2	4874.46	43.22	74.00	-30.78	41.15	3.33	33.66	34.92	Peak	100	80	HORIZONTAL
3	7310.77	50.52	74.00	-23.48	45.01	4.06	36.64	35.19	Peak	124	44	HORIZONTAL
4	7310.99	39.71	54.00	-14.29	34.20	4.06	36.64	35.19	Average	124	44	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	4873.70	43.00	74.00	-31.00	40.93	3.33	33.66	34.92	Peak	100	121	VERTICAL
2	4874.46	29.80	54.00	-24.20	27.73	3.33	33.66	34.92	Average	100	121	VERTICAL
3	7310.90	47.61	74.00	-26.39	42.10	4.06	36.64	35.19	Peak	100	159	VERTICAL
4	7311.00	35.88	54.00	-18.12	30.37	4.06	36.64	35.19	Average	100	159	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 3 / 1TX
Test Date	May 02, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4902.84	44.24	74.00	-29.76	42.08	3.34	33.73	34.91	Peak	100	8	HORIZONTAL
2	4906.19	32.12	54.00	-21.88	29.96	3.34	33.73	34.91	Average	100	8	HORIZONTAL
3	7355.94	49.65	74.00	-24.35	44.02	4.06	36.77	35.20	Peak	136	34	HORIZONTAL
4	7356.04	39.15	54.00	-14.85	33.52	4.06	36.77	35.20	Average	136	34	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	4904.90	43.76	74.00	-30.24	41.60	3.34	33.73	34.91	Peak	100	346	VERTICAL
2	4913.01	33.06	54.00	-20.94	30.90	3.34	33.73	34.91	Average	100	346	VERTICAL
3	7355.07	47.24	74.00	-26.76	41.61	4.06	36.77	35.20	Peak	100	230	VERTICAL
4	7355.97	34.68	54.00	-19.32	29.05	4.06	36.77	35.20	Average	100	230	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1 / Chain 3 / 1TX
Test Date	May 01, 2014		

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	4823.90	55.31	74.00	-18.69	53.36	3.31	33.56	34.92	Peak	121	252	HORIZONTAL
2	4823.96	52.91	54.00	-1.09	50.96	3.31	33.56	34.92	Average	121	252	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.93	55.26	74.00	-18.74	53.31	3.31	33.56	34.92	Peak	111	323	VERTICAL
2	4823.97	52.94	54.00	-1.06	50.99	3.31	33.56	34.92	Average	111	323	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 6 / Chain 3 / 1TX
Test Date	May 01, 2014		

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	4873.97	52.76	54.00	-1.24	50.69	3.33	33.66	34.92	Average	121	254	HORIZONTAL
2	4874.00	55.43	74.00	-18.57	53.36	3.33	33.66	34.92	Peak	121	254	HORIZONTAL
3	7310.22	47.63	54.00	-6.37	42.12	4.06	36.64	35.19	Average	125	327	HORIZONTAL
4	7311.05	54.40	74.00	-19.60	48.89	4.06	36.64	35.19	Peak	125	327	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	52.75	54.00	-1.25	50.68	3.33	33.66	34.92	Average	110	322	VERTICAL
2	4873.98	55.17	74.00	-18.83	53.10	3.33	33.66	34.92	Peak	110	322	VERTICAL
3	7310.22	43.32	54.00	-10.68	37.81	4.06	36.64	35.19	Average	100	71	VERTICAL
4	7311.53	51.17	74.00	-22.83	45.66	4.06	36.64	35.19	Peak	100	71	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 11 / Chain 3 / 1TX
Test Date	May 01, 2014		

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	55.00	74.00	-19.00	52.80	3.35	33.76	34.91	Peak	130	285	HORIZONTAL
2	4923.97	52.17	54.00	-1.83	49.97	3.35	33.76	34.91	Average	130	285	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	4923.97	52.75	54.00	-1.25	50.55	3.35	33.76	34.91	Average	109	323	VERTICAL
2	4924.03	55.29	74.00	-18.71	53.09	3.35	33.76	34.91	Peak	109	323	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	2487.31	58.49	74.00	-15.51	62.58	2.26	28.67	35.02	Peak	147	327	HORIZONTAL
2	2487.35	51.83	54.00	-2.17	55.92	2.26	28.67	35.02	Average	147	327	HORIZONTAL
3	4824.13	38.64	54.00	-15.36	36.69	3.31	33.56	34.92	Average	127	296	HORIZONTAL
4	4825.54	51.94	74.00	-22.06	49.99	3.31	33.56	34.92	Peak	127	296	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	2487.29	56.08	74.00	-17.92	60.17	2.26	28.67	35.02	Peak	100	4	VERTICAL
2	2487.35	50.93	54.00	-3.07	55.02	2.26	28.67	35.02	Average	100	4	VERTICAL
3	4823.26	38.11	54.00	-15.89	36.16	3.31	33.56	34.92	Average	100	80	VERTICAL
4	4830.44	50.82	74.00	-23.18	48.87	3.31	33.56	34.92	Peak	100	80	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	4873.90	45.97	54.00	-8.03	43.90	3.33	33.66	34.92	Average	129	300	HORIZONTAL
2	4878.87	59.87	74.00	-14.13	57.80	3.33	33.66	34.92	Peak	129	300	HORIZONTAL
3	7312.92	48.77	54.00	-5.23	43.26	4.06	36.64	35.19	Average	159	44	HORIZONTAL
4	7317.76	63.56	74.00	-10.44	58.00	4.06	36.69	35.19	Peak	159	44	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	4875.44	48.95	54.00	-5.05	46.88	3.33	33.66	34.92	Average	100	353	VERTICAL
2	4877.88	64.09	74.00	-9.91	62.02	3.33	33.66	34.92	Peak	100	353	VERTICAL
3	7310.97	45.50	54.00	-8.50	39.99	4.06	36.64	35.19	Average	100	323	VERTICAL
4	7311.03	57.87	74.00	-16.13	52.36	4.06	36.64	35.19	Peak	100	323	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	4923.90	39.99	54.00	-14.01	37.79	3.35	33.76	34.91	Average	113	311	HORIZONTAL
2	4926.60	52.63	74.00	-21.37	50.43	3.35	33.76	34.91	Peak	113	311	HORIZONTAL
3	7385.94	43.49	54.00	-10.51	37.79	4.06	36.85	35.21	Average	157	40	HORIZONTAL
4	7386.35	56.97	74.00	-17.03	51.27	4.06	36.85	35.21	Peak	157	40	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	4923.52	41.13	54.00	-12.87	38.93	3.35	33.76	34.91	Average	100	352	VERTICAL
2	4927.69	55.31	74.00	-18.69	53.11	3.35	33.76	34.91	Peak	100	352	VERTICAL
3	7386.03	39.21	54.00	-14.79	33.51	4.06	36.85	35.21	Average	100	236	VERTICAL
4	7388.44	50.24	74.00	-23.76	44.54	4.06	36.85	35.21	Peak	100	236	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4842.91	33.61	54.00	-20.39	31.62	3.32	33.59	34.92	Average	100	174	HORIZONTAL
2	4847.94	46.60	74.00	-27.40	44.61	3.32	33.59	34.92	Peak	100	174	HORIZONTAL
3	7265.78	50.88	74.00	-23.12	45.45	4.06	36.56	35.19	Peak	100	43	HORIZONTAL
4	7265.94	41.51	54.00	-12.49	36.08	4.06	36.56	35.19	Average	100	43	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	4850.19	46.35	74.00	-27.65	44.36	3.32	33.59	34.92	Peak	100	244	VERTICAL
2	4853.84	33.62	54.00	-20.38	31.60	3.32	33.62	34.92	Average	100	244	VERTICAL
3	7265.81	36.72	54.00	-17.28	31.29	4.06	36.56	35.19	Average	100	125	VERTICAL
4	7269.59	50.51	74.00	-23.49	45.08	4.06	36.56	35.19	Peak	100	125	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.43	46.57	74.00	-27.43	44.50	3.33	33.66	34.92	Peak	107	312	HORIZONTAL
2	4883.94	34.03	54.00	-19.97	31.96	3.33	33.66	34.92	Average	107	312	HORIZONTAL
3	7301.96	53.11	74.00	-20.89	47.60	4.06	36.64	35.19	Peak	100	106	HORIZONTAL
4	7318.63	42.47	54.00	-11.53	36.91	4.06	36.69	35.19	Average	100	106	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4872.21	46.38	74.00	-27.62	44.31	3.33	33.66	34.92	Peak	100	227	VERTICAL
2	4882.21	33.89	54.00	-20.11	31.82	3.33	33.66	34.92	Average	100	227	VERTICAL
3	7311.74	50.91	74.00	-23.09	45.40	4.06	36.64	35.19	Peak	100	9	VERTICAL
4	7311.77	39.01	54.00	-14.99	33.50	4.06	36.64	35.19	Average	100	9	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	4905.09	48.47	74.00	-25.53	46.31	3.34	33.73	34.91	Peak	132	309	HORIZONTAL
2	4906.63	36.32	54.00	-17.68	34.16	3.34	33.73	34.91	Average	132	309	HORIZONTAL
3	7355.78	51.81	74.00	-22.19	46.18	4.06	36.77	35.20	Peak	100	48	HORIZONTAL
4	7355.94	41.75	54.00	-12.25	36.12	4.06	36.77	35.20	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	4915.78	36.82	54.00	-17.18	34.65	3.35	33.73	34.91	Average	100	359	VERTICAL
2	4917.94	49.14	74.00	-24.86	46.97	3.35	33.73	34.91	Peak	100	359	VERTICAL
3	7355.97	37.63	54.00	-16.37	32.00	4.06	36.77	35.20	Average	100	140	VERTICAL
4	7357.09	49.79	74.00	-24.21	44.16	4.06	36.77	35.20	Peak	100	140	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	4823.92	54.08	74.00	-19.92	52.13	3.31	33.56	34.92	Peak	115	233	HORIZONTAL
2	4823.95	51.35	54.00	-2.65	49.40	3.31	33.56	34.92	Average	115	233	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	4823.96	52.64	54.00	-1.36	50.69	3.31	33.56	34.92	Average	107	72	VERTICAL
2	4824.02	55.03	74.00	-18.97	53.08	3.31	33.56	34.92	Peak	107	72	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 6 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	4873.87	52.22	74.00	-21.78	50.15	3.33	33.66	34.92	Peak	100	356	HORIZONTAL
2	4873.98	49.44	54.00	-4.56	47.37	3.33	33.66	34.92	Average	100	356	HORIZONTAL
3	7310.19	46.82	54.00	-7.18	41.31	4.06	36.64	35.19	Average	100	68	HORIZONTAL
4	7311.76	52.13	74.00	-21.87	46.62	4.06	36.64	35.19	Peak	100	68	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	4873.91	54.17	74.00	-19.83	52.10	3.33	33.66	34.92	Peak	100	318	VERTICAL
2	4873.94	52.56	54.00	-1.44	50.49	3.33	33.66	34.92	Average	100	318	VERTICAL
3	7311.69	46.28	54.00	-7.72	40.77	4.06	36.64	35.19	Average	100	68	VERTICAL
4	7311.73	53.67	74.00	-20.33	48.16	4.06	36.64	35.19	Peak	100	68	VERTICAL

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 11 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	4923.92	51.52	54.00	-2.48	49.32	3.35	33.76	34.91	Average	112	300	HORIZONTAL
2	4923.96	54.81	74.00	-19.19	52.61	3.35	33.76	34.91	Peak	112	300	HORIZONTAL
3	7386.29	53.06	74.00	-20.94	47.36	4.06	36.85	35.21	Peak	162	45	HORIZONTAL
4	7386.64	47.01	54.00	-6.99	41.31	4.06	36.85	35.21	Average	162	45	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	4923.91	55.32	74.00	-18.68	53.12	3.35	33.76	34.91	Peak	100	30	VERTICAL
2	4923.94	52.70	54.00	-1.30	50.50	3.35	33.76	34.91	Average	100	30	VERTICAL
3	7385.88	49.97	74.00	-24.03	44.27	4.06	36.85	35.21	Peak	100	326	VERTICAL
4	7386.69	40.36	54.00	-13.64	34.66	4.06	36.85	35.21	Average	100	326	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB 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, 1MHz / 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 freqeuncy 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 v03r02 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	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 3 / 1TX
Test Date	May 02, 2014		

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	2388.88	72.89	74.00	-1.11	42.19	2.21	28.49	0.00	Peak	148	63	HORIZONTAL
2	2390.00	52.92	54.00	-1.08	22.21	2.22	28.49	0.00	Average	148	63	HORIZONTAL
3	2409.44	112.17			81.42	2.22	28.53	0.00	Peak	148	63	HORIZONTAL
4	2409.92	101.38			70.63	2.22	28.53	0.00	Average	148	63	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	52.63	54.00	-1.37	21.92	2.22	28.49	0.00	Average	183	37	HORIZONTAL
2	2390.00	69.46	74.00	-4.54	38.75	2.22	28.49	0.00	Peak	183	37	HORIZONTAL
3	2430.59	117.07			86.28	2.23	28.56	0.00	Peak	183	37	HORIZONTAL
4	2435.72	106.74			75.95	2.23	28.56	0.00	Average	183	37	HORIZONTAL
5	2483.50	51.89	54.00	-2.11	20.96	2.26	28.67	0.00	Average	183	37	HORIZONTAL
6	2484.14	67.06	74.00	-6.94	36.13	2.26	28.67	0.00	Peak	183	37	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	2463.76	110.11			79.24	2.24	28.63	0.00	Peak	210	89	HORIZONTAL
2	2469.21	98.88			67.99	2.26	28.63	0.00	Average	210	89	HORIZONTAL
3	2483.50	52.40	54.00	-1.60	21.47	2.26	28.67	0.00	Average	210	89	HORIZONTAL
4	2483.82	71.58	74.00	-2.42	40.65	2.26	28.67	0.00	Peak	210	89	HORIZONTAL

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

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 3 / 1TX
Test Date	May 02, 2014		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2384.23	67.53	74.00	-6.47	36.86	2.21	28.46	0.00	Peak	179	50	HORIZONTAL
2	2390.00	52.57	54.00	-1.43	21.86	2.22	28.49	0.00	Average	179	50	HORIZONTAL
3	2417.83	96.84			66.08	2.23	28.53	0.00	Average	179	50	HORIZONTAL
4	2417.83	108.43			77.67	2.23	28.53	0.00	Peak	179	50	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	50.85	54.00	-3.15	20.14	2.22	28.49	0.00	Average	179	88	HORIZONTAL
2	2390.00	66.08	74.00	-7.92	35.37	2.22	28.49	0.00	Peak	179	88	HORIZONTAL
3	2431.87	97.71			66.92	2.23	28.56	0.00	Average	179	88	HORIZONTAL
4	2432.83	109.26			78.47	2.23	28.56	0.00	Peak	179	88	HORIZONTAL
5	2483.50	51.91	54.00	-2.09	20.98	2.26	28.67	0.00	Average	179	88	HORIZONTAL
6	2484.46	72.63	74.00	-1.37	41.70	2.26	28.67	0.00	Peak	179	88	HORIZONTAL

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	2446.87	97.64			66.80	2.24	28.60	0.00	Average	177	55	HORIZONTAL
2	2455.21	109.47			78.60	2.24	28.63	0.00	Peak	177	55	HORIZONTAL
3	2483.50	52.04	54.00	-1.96	21.11	2.26	28.67	0.00	Average	177	55	HORIZONTAL
4	2484.46	72.28	74.00	-1.72	41.35	2.26	28.67	0.00	Peak	177	55	HORIZONTAL

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

Note:

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

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

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 3 / 1TX
Test Date	May 01, 2014		

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	2389.60	57.80	74.00	-16.20	27.10	2.21	28.49	0.00	Peak	184	58	HORIZONTAL
2	2389.80	45.72	54.00	-8.28	15.01	2.22	28.49	0.00	Average	184	58	HORIZONTAL
3	2411.00	113.56			82.81	2.22	28.53	0.00	Peak	184	58	HORIZONTAL
4	2411.20	109.71			78.96	2.22	28.53	0.00	Average	184	58	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2387.80	56.78	74.00	-17.22	26.08	2.21	28.49	0.00	Peak	181	54	HORIZONTAL
2	2390.00	44.43	54.00	-9.57	13.72	2.22	28.49	0.00	Average	181	54	HORIZONTAL
3	2436.20	110.41			79.62	2.23	28.56	0.00	Average	181	54	HORIZONTAL
4	2436.20	114.34			83.55	2.23	28.56	0.00	Peak	181	54	HORIZONTAL
5	2483.50	45.20	54.00	-8.80	14.27	2.26	28.67	0.00	Average	181	54	HORIZONTAL
6	2484.70	56.05	74.00	-17.95	25.12	2.26	28.67	0.00	Peak	181	54	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	2462.80	106.33			75.46	2.24	28.63	0.00	Average	121	52	HORIZONTAL
2	2463.00	110.41			79.54	2.24	28.63	0.00	Peak	121	52	HORIZONTAL
3	2492.90	57.57	74.00	-16.43	26.60	2.27	28.70	0.00	Peak	121	52	HORIZONTAL
4	2493.20	47.79	54.00	-6.21	16.82	2.27	28.70	0.00	Average	121	52	HORIZONTAL

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

Note:

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

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

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	2389.36	72.74	74.00	-1.26	42.04	2.21	28.49	0.00	Peak	150	303	HORIZONTAL
2	2390.00	52.70	54.00	-1.30	21.99	2.22	28.49	0.00	Average	150	303	HORIZONTAL
3	2410.25	115.30			84.55	2.22	28.53	0.00	Peak	150	303	HORIZONTAL
4	2410.38	104.75			74.00	2.22	28.53	0.00	Average	150	303	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.04	52.73	54.00	-1.27	22.03	2.21	28.49	0.00	Average	154	55	HORIZONTAL
2	2389.04	71.78	74.00	-2.22	41.08	2.21	28.49	0.00	Peak	154	55	HORIZONTAL
3	2429.25	109.78			78.99	2.23	28.56	0.00	Average	154	55	HORIZONTAL
4	2434.00	120.36			89.57	2.23	28.56	0.00	Peak	154	55	HORIZONTAL
5	2483.50	51.46	54.00	-2.54	20.53	2.26	28.67	0.00	Average	154	55	HORIZONTAL
6	2484.14	64.61	74.00	-9.39	33.68	2.26	28.67	0.00	Peak	154	55	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2456.63	115.45			84.58	2.24	28.63	0.00	Peak	151	42	HORIZONTAL
2	2469.13	104.91			74.02	2.26	28.63	0.00	Average	151	42	HORIZONTAL
3	2483.66	52.63	54.00	-1.37	21.70	2.26	28.67	0.00	Average	151	42	HORIZONTAL
4	2483.98	72.94	74.00	-1.06	42.01	2.26	28.67	0.00	Peak	151	42	HORIZONTAL

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

Note:

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

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

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

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	2389.36	52.89	54.00	-1.11	22.19	2.21	28.49	0.00	Average	153	49	HORIZONTAL
2	2390.00	70.36	74.00	-3.64	39.65	2.22	28.49	0.00	Peak	153	49	HORIZONTAL
3	2426.81	100.97			70.18	2.23	28.56	0.00	Average	153	49	HORIZONTAL
4	2426.81	111.70			80.91	2.23	28.56	0.00	Peak	153	49	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.72	68.64	74.00	-5.36	37.94	2.21	28.49	0.00	Peak	157	47	HORIZONTAL
2	2389.36	52.66	54.00	-1.34	21.96	2.21	28.49	0.00	Average	157	47	HORIZONTAL
3	2431.50	99.26			68.47	2.23	28.56	0.00	Average	157	47	HORIZONTAL
4	2454.50	109.97			79.10	2.24	28.63	0.00	Peak	157	47	HORIZONTAL
5	2484.14	49.82	54.00	-4.18	18.89	2.26	28.67	0.00	Average	157	47	HORIZONTAL
6	2484.14	66.27	74.00	-7.73	35.34	2.26	28.67	0.00	Peak	157	47	HORIZONTAL

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	2456.75	98.61			67.74	2.24	28.63	0.00	Average	151	53	HORIZONTAL
2	2456.75	109.79			78.92	2.24	28.63	0.00	Peak	151	53	HORIZONTAL
3	2483.82	52.66	54.00	-1.34	21.73	2.26	28.67	0.00	Average	151	53	HORIZONTAL
4	2488.63	72.94	74.00	-1.06	41.98	2.26	28.70	0.00	Peak	151	53	HORIZONTAL

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

Note:

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

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

Temperature	24°C	Humidity	56%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 3 + Chain 4 / 2TX
Test Date	May 06, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	41.17	54.00	-12.83	10.46	2.22	28.49	0.00	Average	119	263	HORIZONTAL
2	2390.00	53.03	74.00	-20.97	22.32	2.22	28.49	0.00	Peak	119	263	HORIZONTAL
3	2411.13	111.79			81.04	2.22	28.53	0.00	Peak	119	263	HORIZONTAL
4	2411.25	107.99			77.24	2.22	28.53	0.00	Average	119	263	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.40	51.49	74.00	-22.51	20.79	2.21	28.49	0.00	Peak	122	325	HORIZONTAL
2	2388.72	40.03	54.00	-13.97	9.33	2.21	28.49	0.00	Average	122	325	HORIZONTAL
3	2436.00	113.89			83.10	2.23	28.56	0.00	Peak	122	325	HORIZONTAL
4	2436.25	110.06			79.27	2.23	28.56	0.00	Average	122	325	HORIZONTAL
5	2483.50	41.82	54.00	-12.18	10.89	2.26	28.67	0.00	Average	122	325	HORIZONTAL
6	2483.82	53.99	74.00	-20.01	23.06	2.26	28.67	0.00	Peak	122	325	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2461.25	107.85			76.98	2.24	28.63	0.00	Average	122	322	HORIZONTAL
2	2463.00	111.69			80.82	2.24	28.63	0.00	Peak	122	322	HORIZONTAL
3	2492.96	53.08	74.00	-20.92	22.11	2.27	28.70	0.00	Peak	122	322	HORIZONTAL
4	2493.12	44.71	54.00	-9.29	13.74	2.27	28.70	0.00	Average	122	322	HORIZONTAL

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

Note:

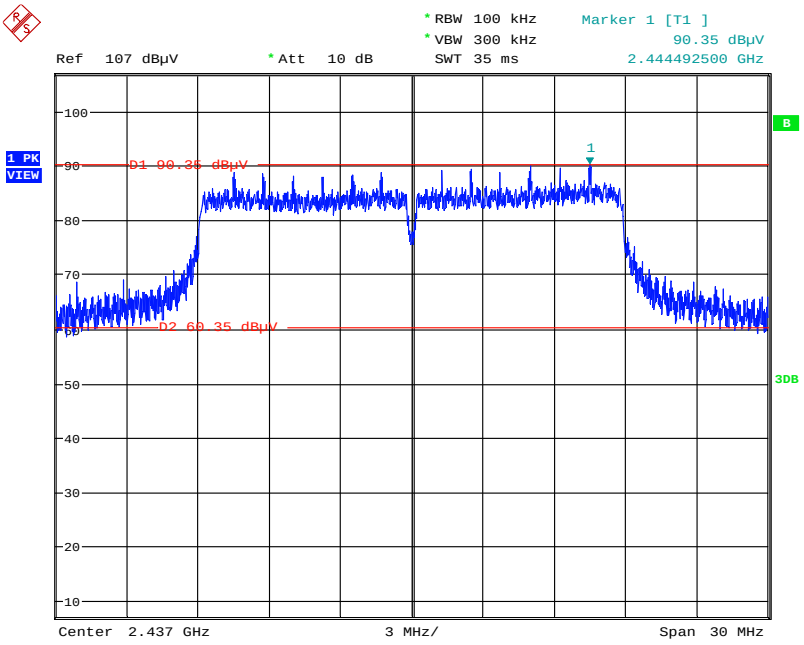
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

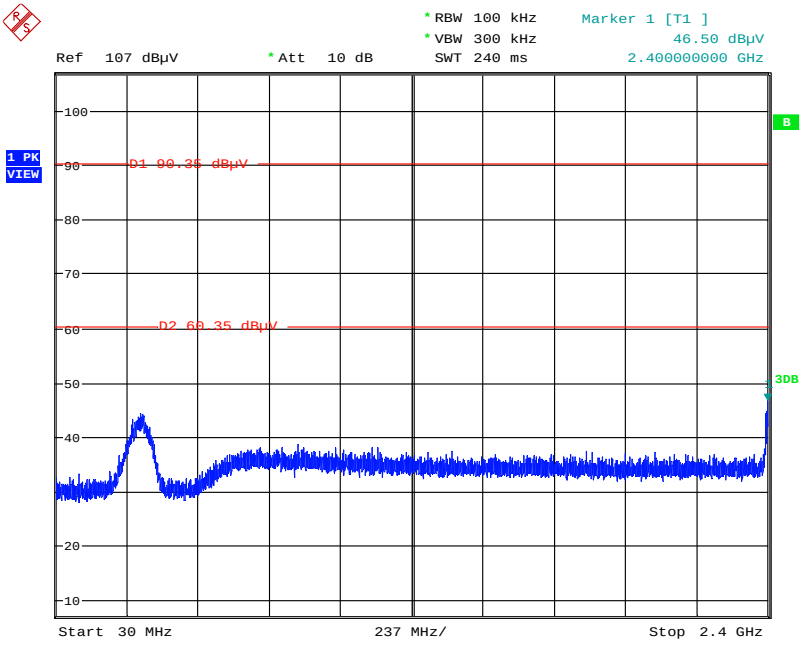
For 1TX

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



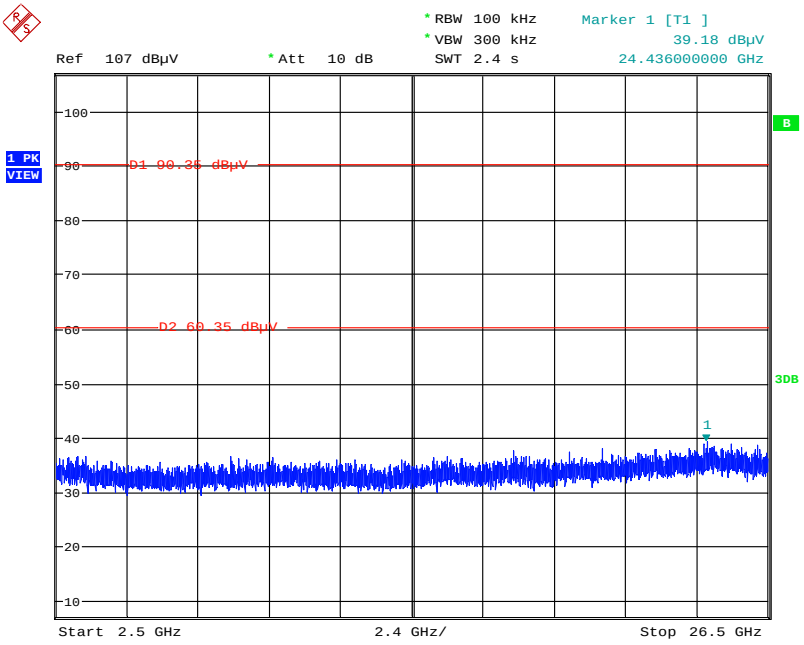
Date: 3.MAY.2014 01:29:19

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



Date: 3.MAY.2014 01:30:18

Plot on Configuration IEEE 802.11acMCS0/Nss1 VHT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



Date: 3.MAY.2014 01:31:03

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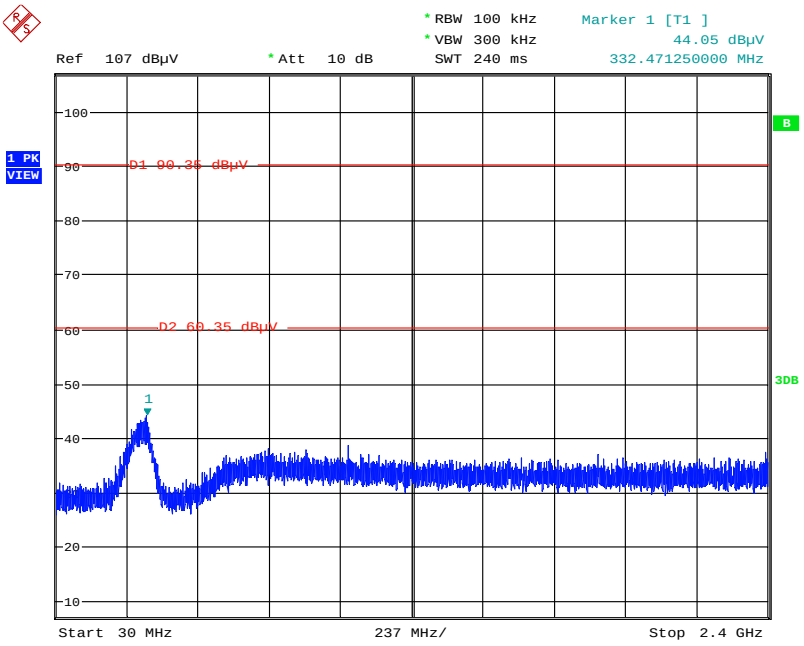
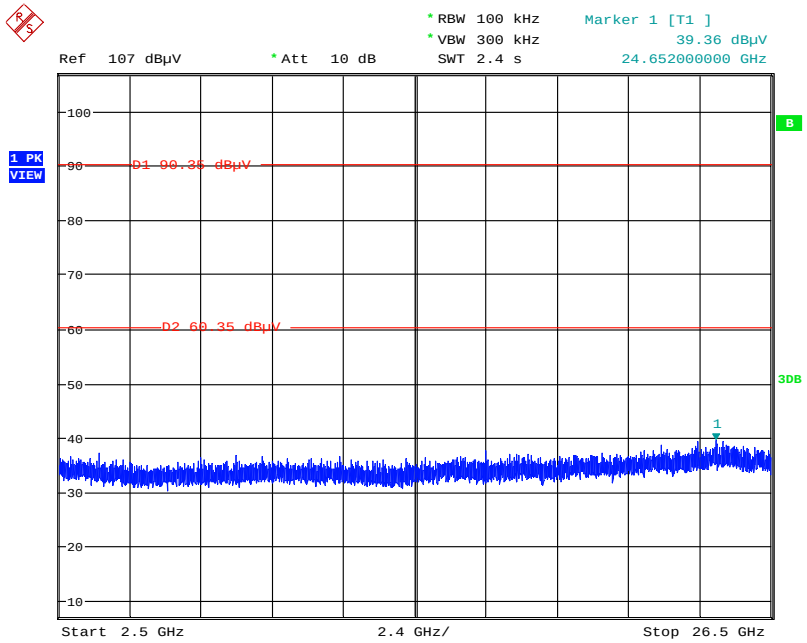


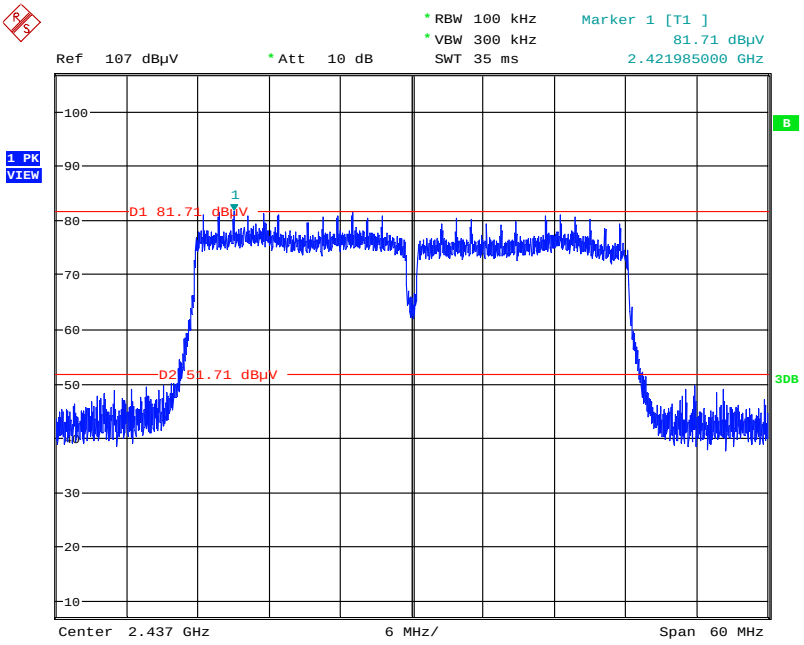
Date: 3.MAY.2014 01:32:03

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)



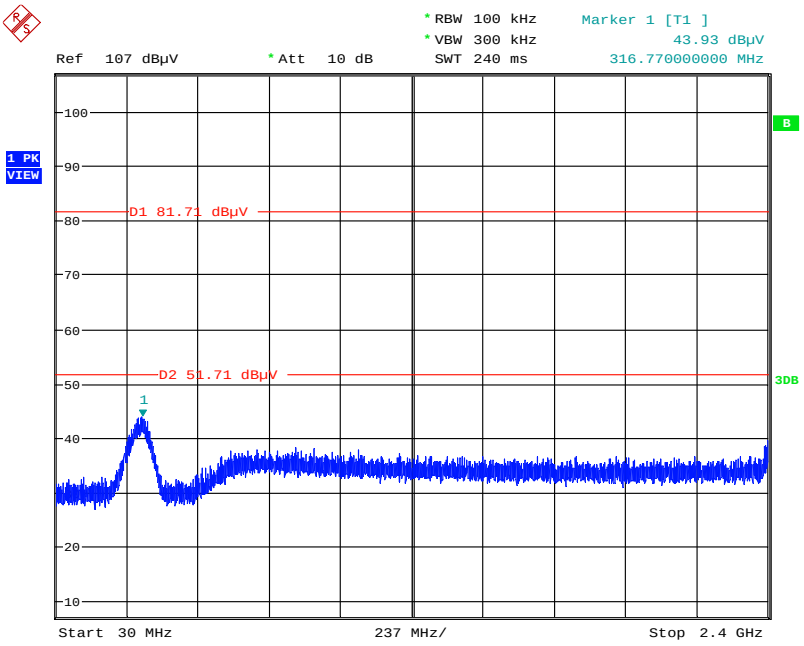
Date: 3.MAY.2014 01:31:45

Plot on Configuration IEEE 802.11nac MCS0/Nss1 VHT40 / Reference Level



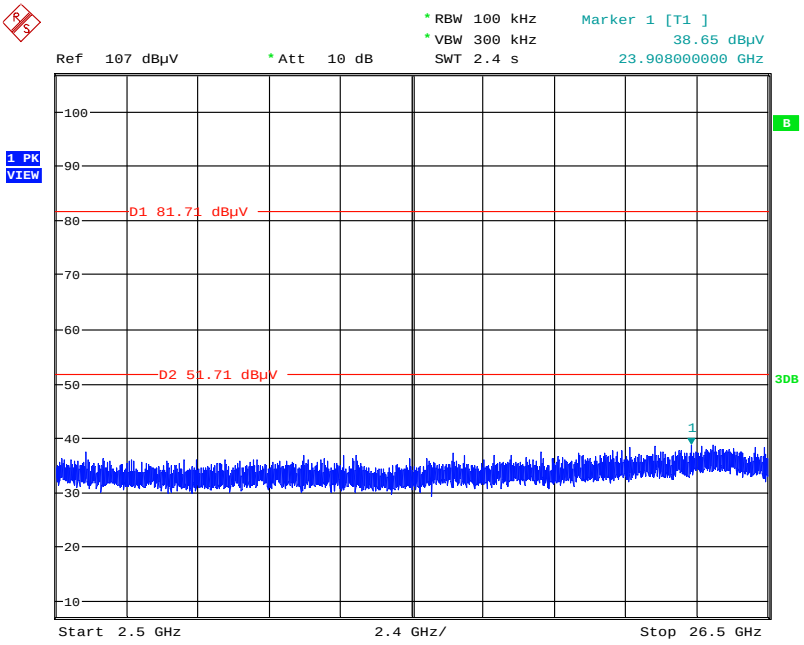
Date: 3.MAY.2014 01:34:57

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



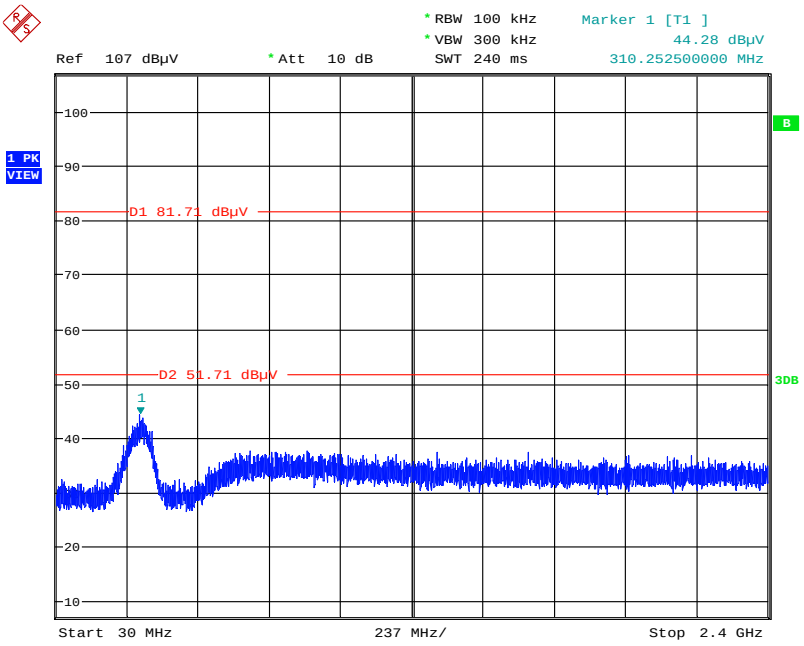
Date: 3.MAY.2014 01:35:49

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



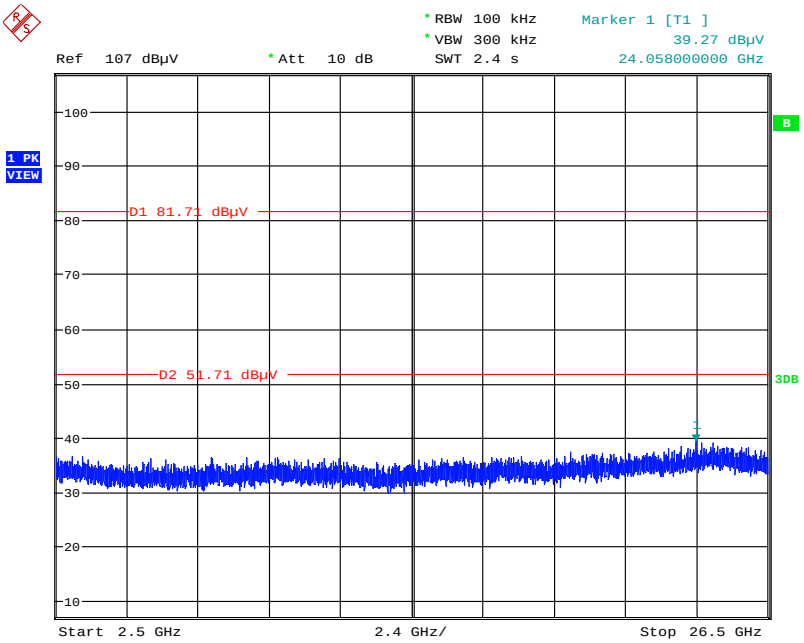
Date: 3.MAY.2014 01:36:12

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



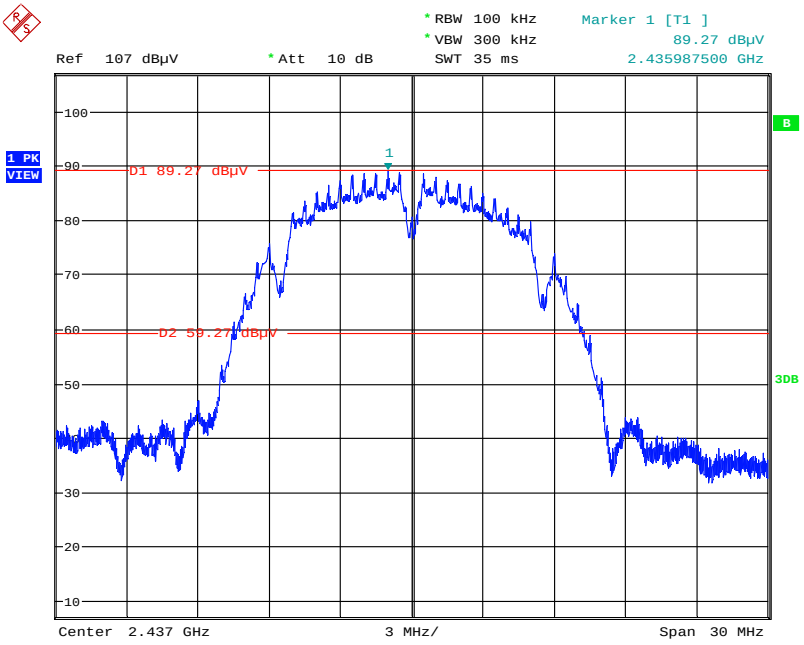
Date: 3.MAY.2014 01:37:18

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



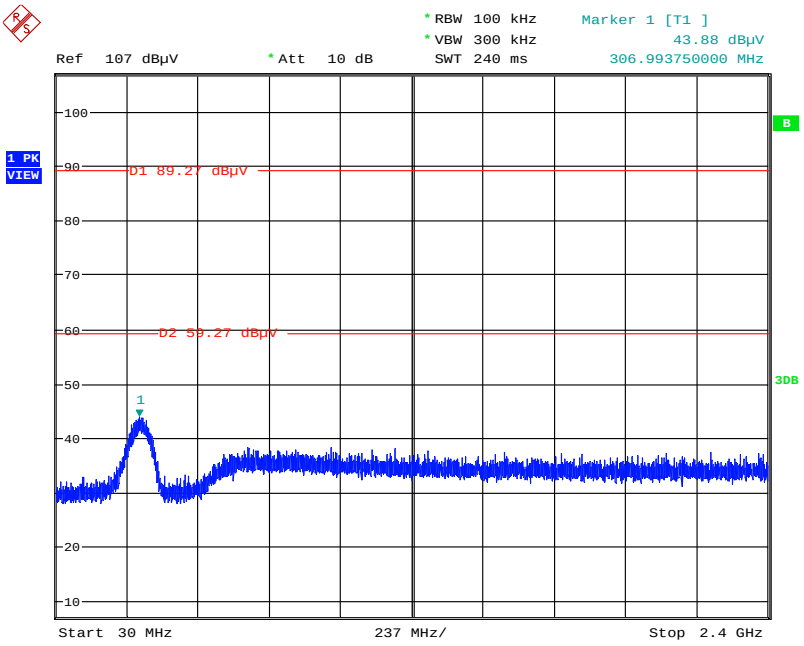
Date: 3.MAY.2014 01:36:43

Plot on Configuration IEEE 802.11b / Reference Level



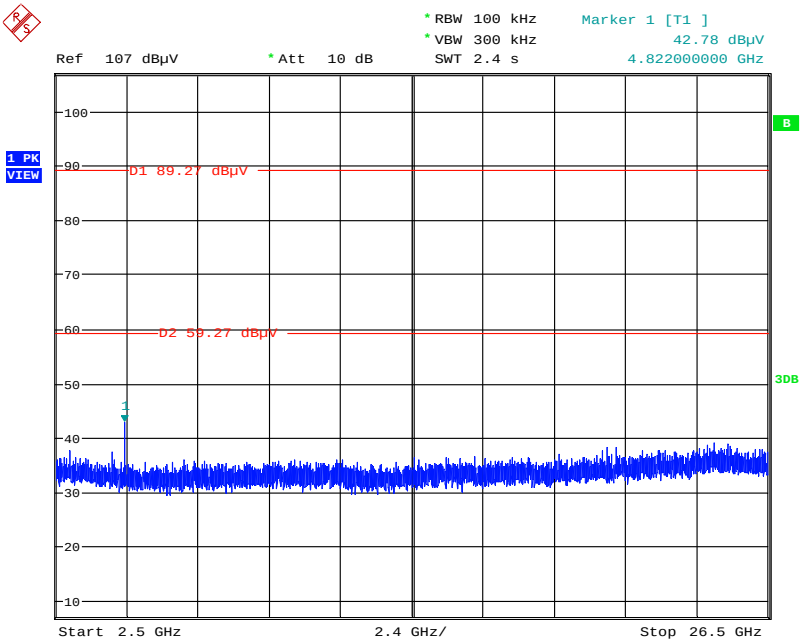
Date: 3.MAY.2014 00:54:35

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



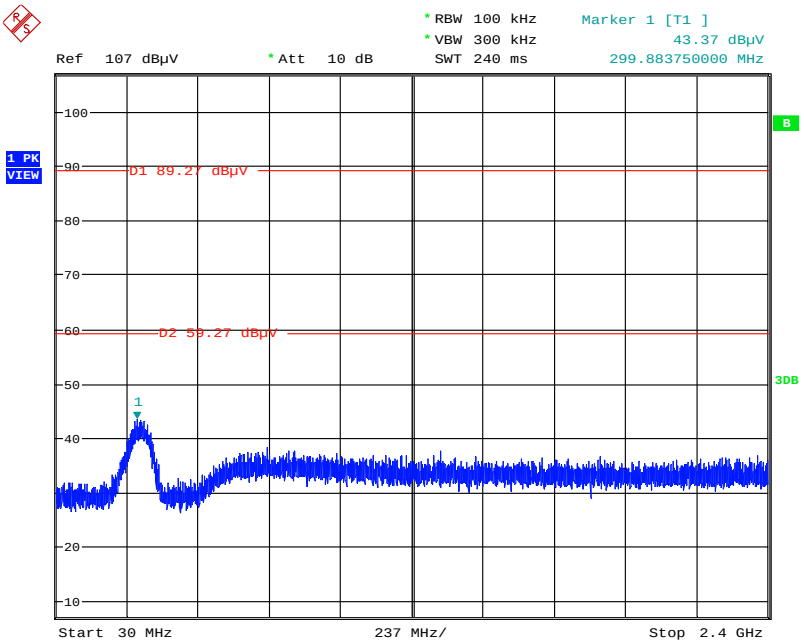
Date: 3.MAY.2014 00:56:01

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



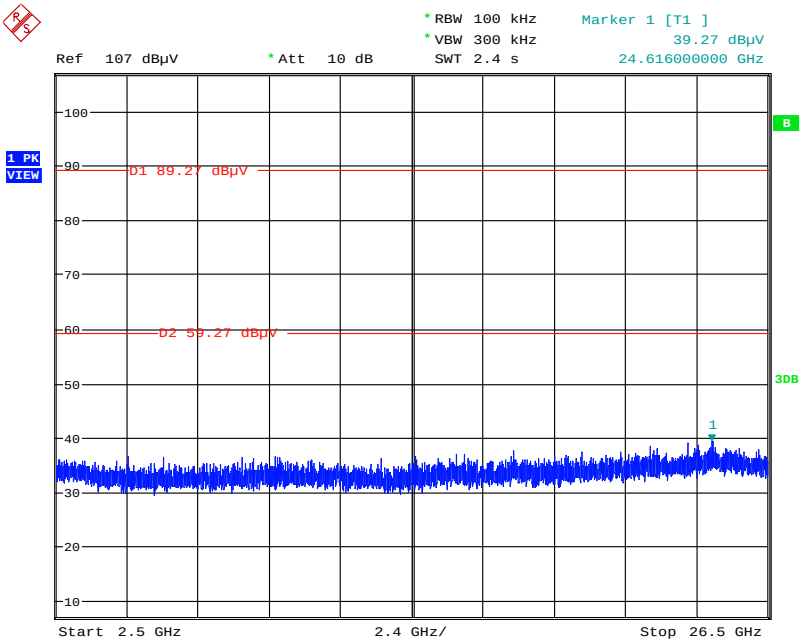
Date: 3.MAY.2014 00:58:16

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



Date: 3.MAY.2014 00:59:01

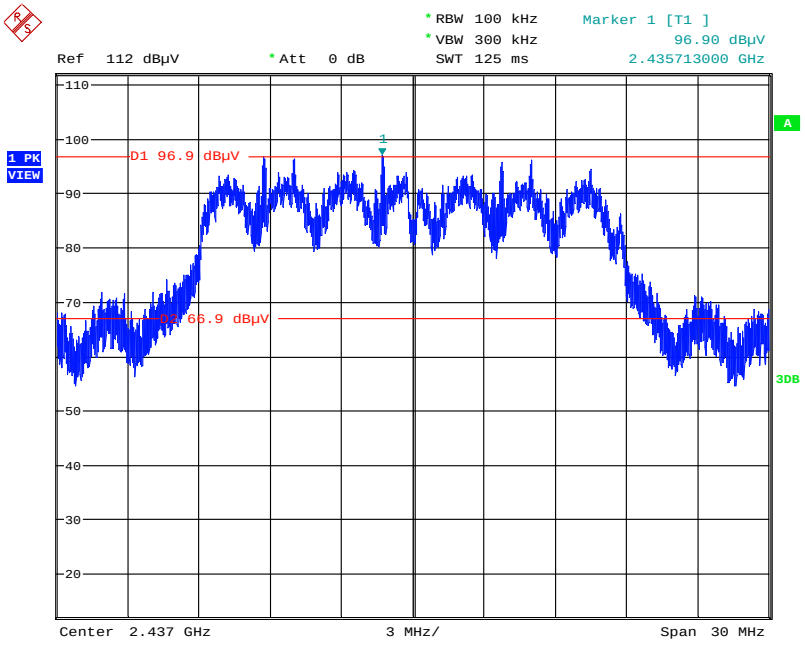
Plot on Configuration IEEE 802.11b / CH 11 / 2500MHz~26500MHz (down 30dBc)



Date: 3.MAY.2014 00:58:42

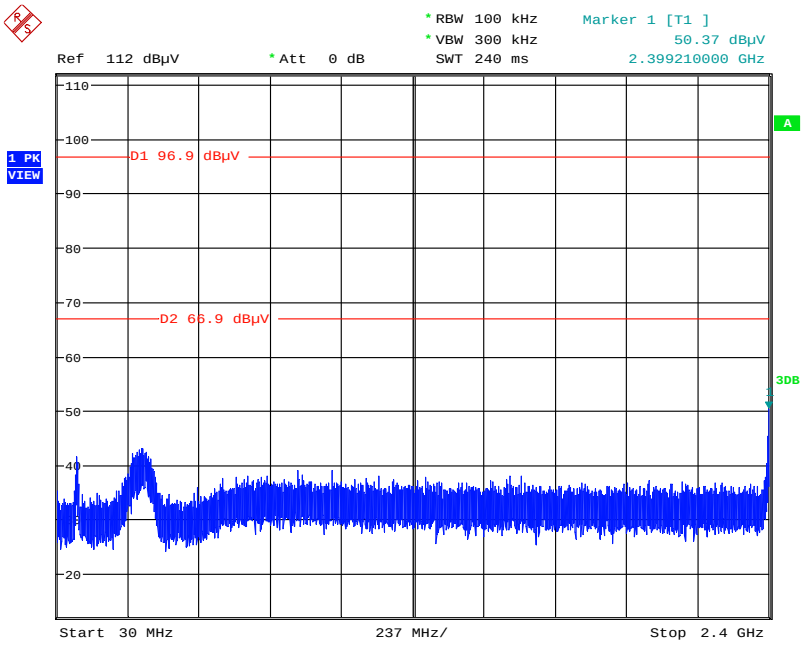
For 2TX

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



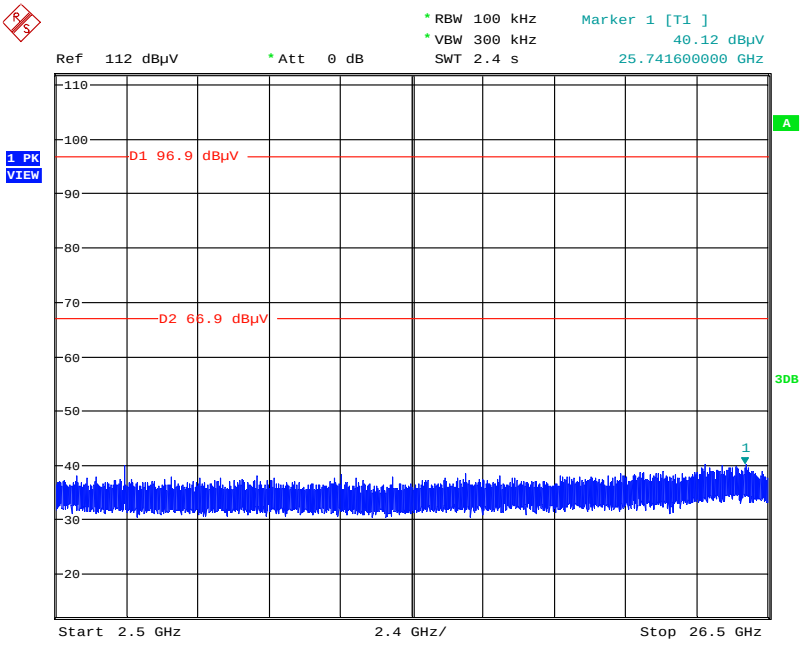
Date: 3.MAY.2014 11:58:51

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



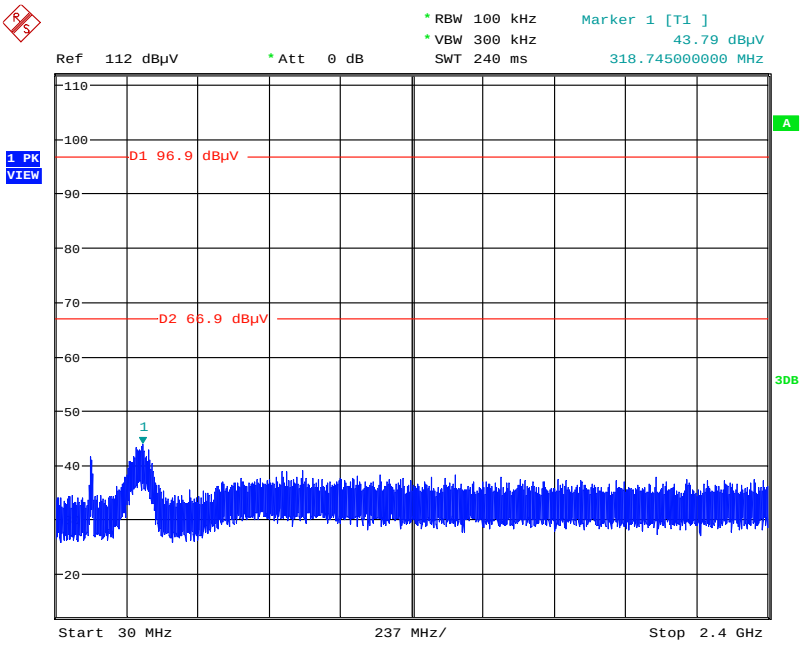
Date: 3.MAY.2014 12:03:34

Plot on Configuration IEEE 802.11acMCS0/Nss1 VHT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



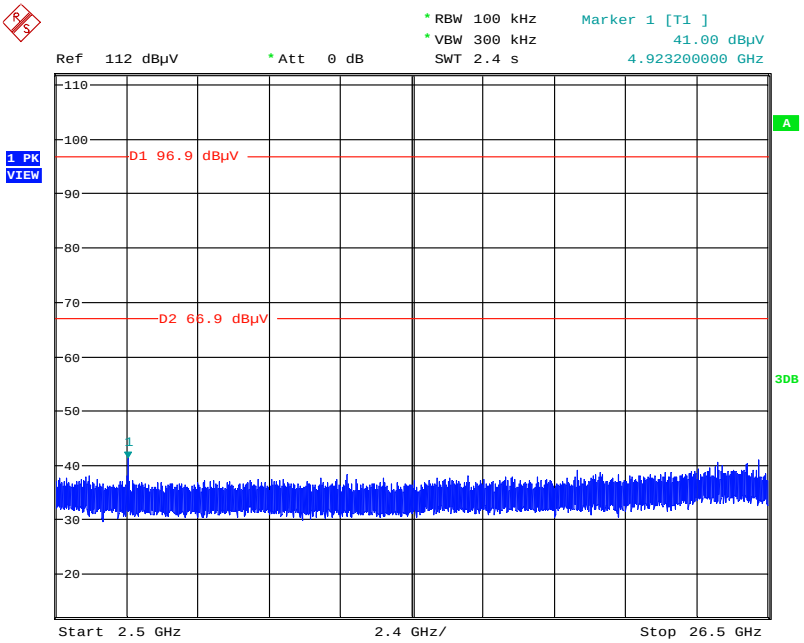
Date: 3.MAY.2014 12:04:11

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



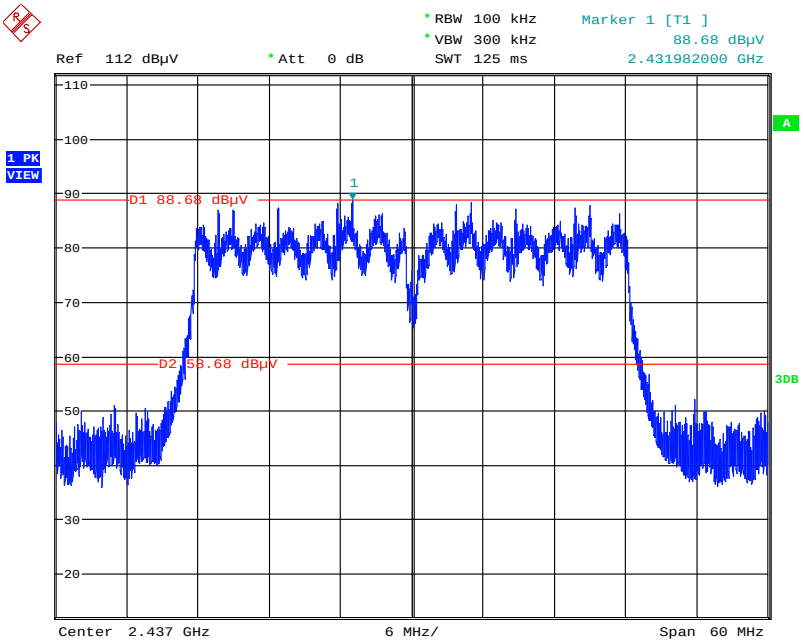
Date: 3.MAY.2014 12:05:23

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)



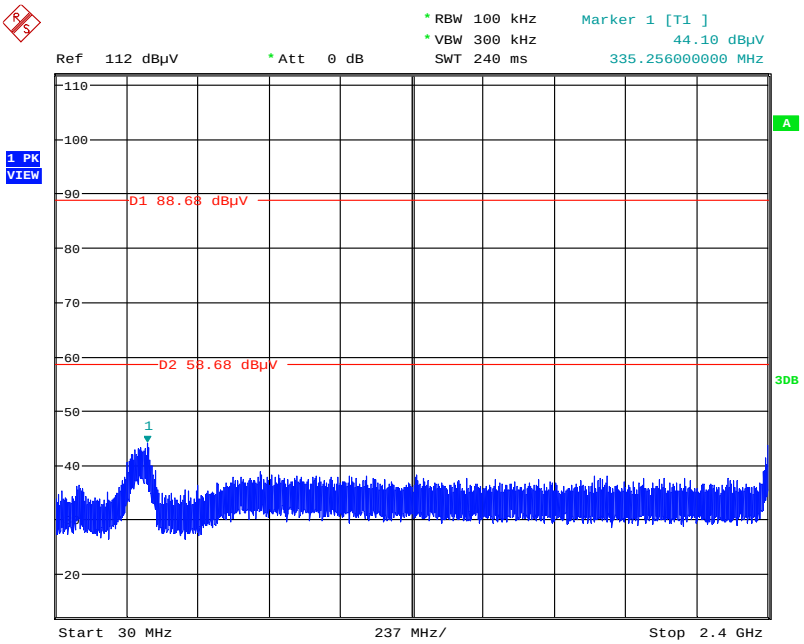
Date: 3.MAY.2014 12:04:51

Plot on Configuration IEEE 802.11nac MCS0/Nss1 VHT40 / Reference Level



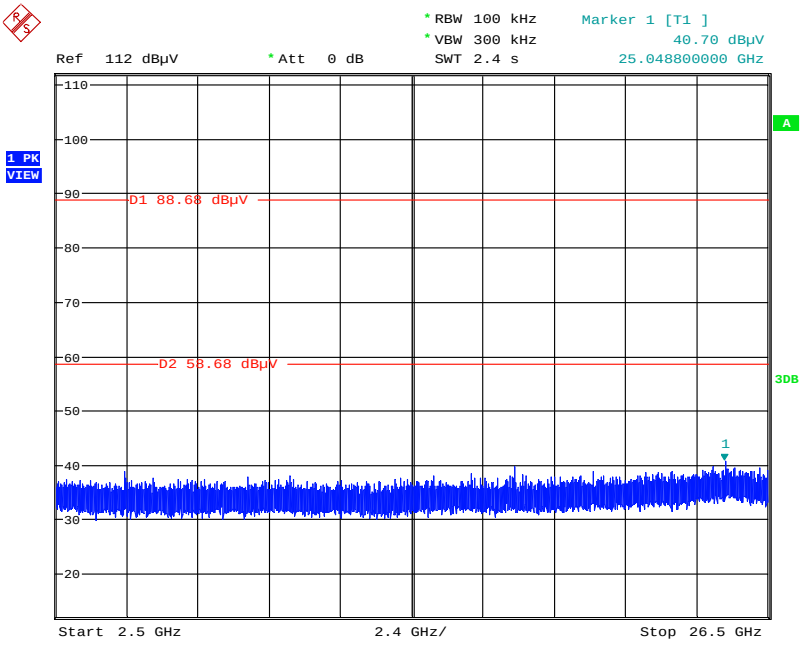
Date: 3.MAY.2014 12:06:54

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



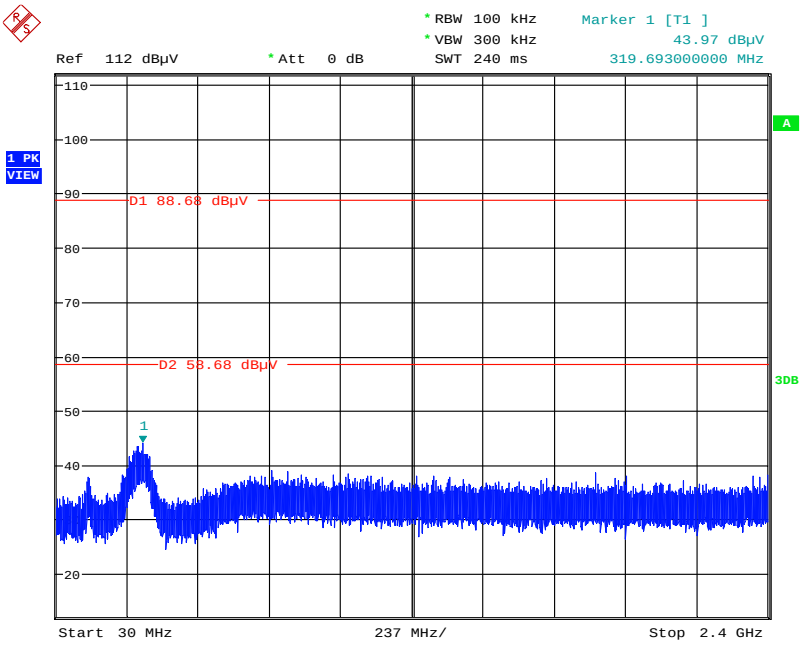
Date: 3.MAY.2014 12:08:21

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



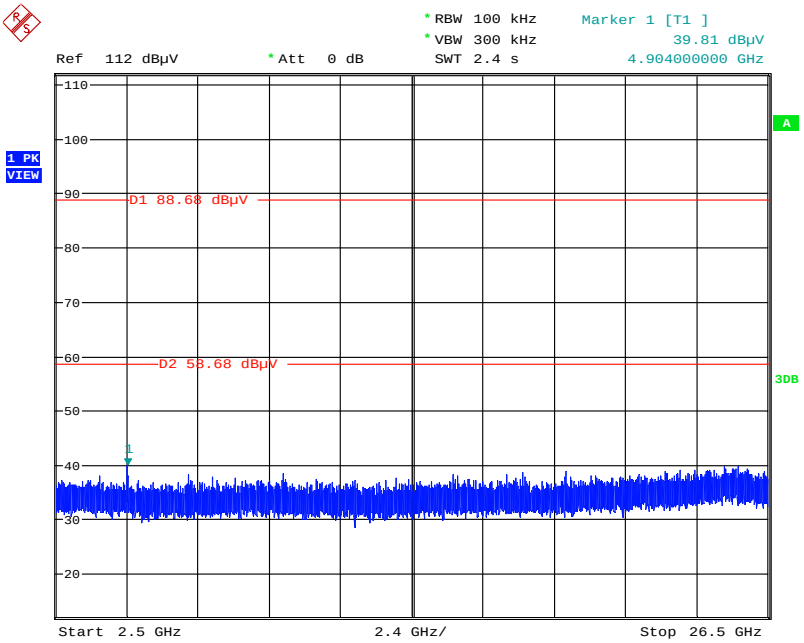
Date: 3.MAY.2014 12:09:36

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



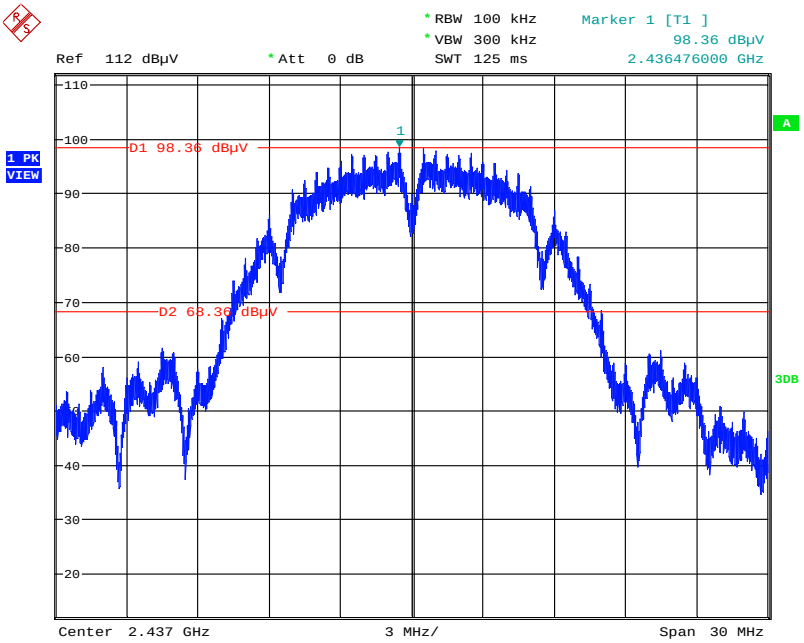
Date: 3.MAY.2014 12:10:35

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



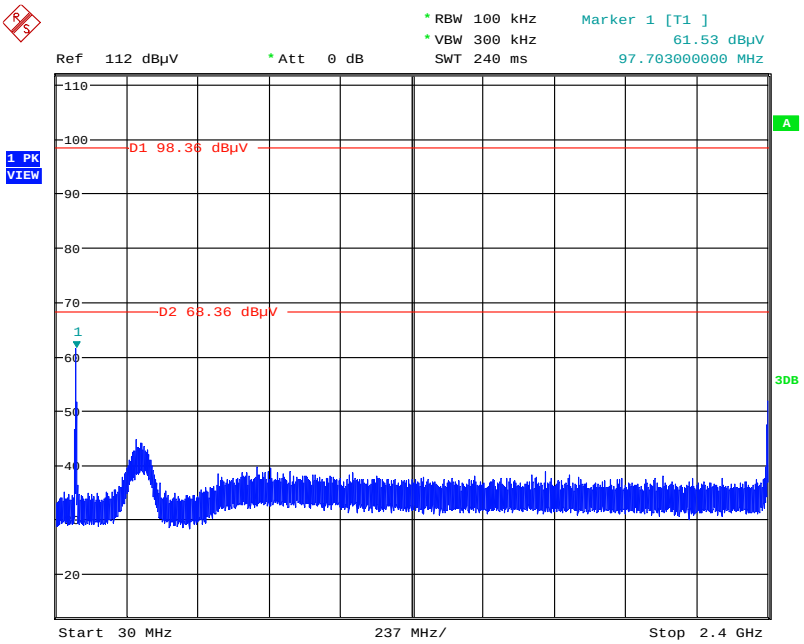
Date: 3.MAY.2014 12:10:11

Plot on Configuration IEEE 802.11b / Reference Level



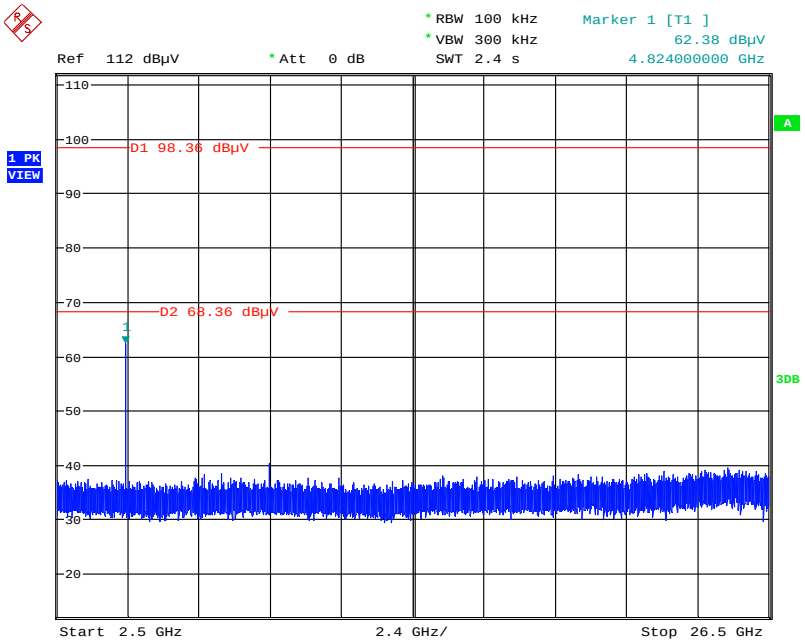
Date: 3.MAY.2014 11:53:55

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



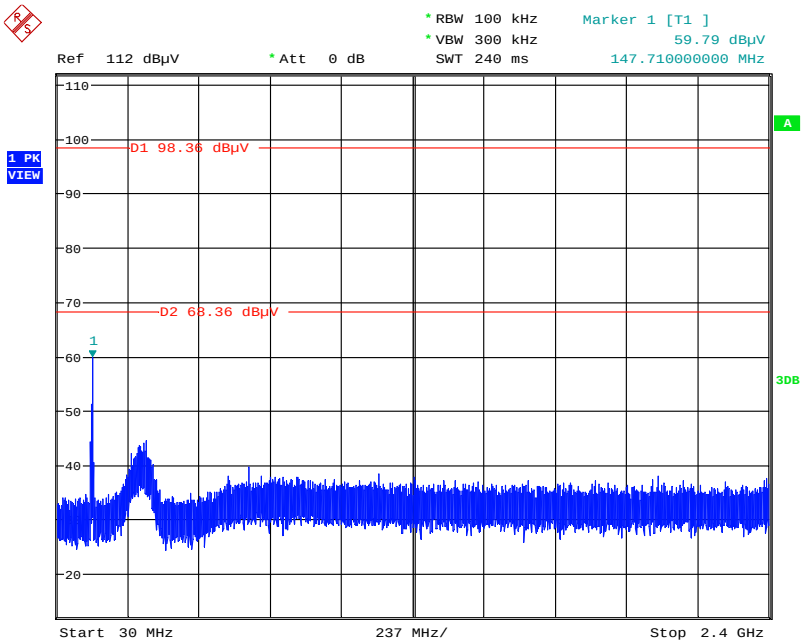
Date: 3.MAY.2014 11:55:50

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



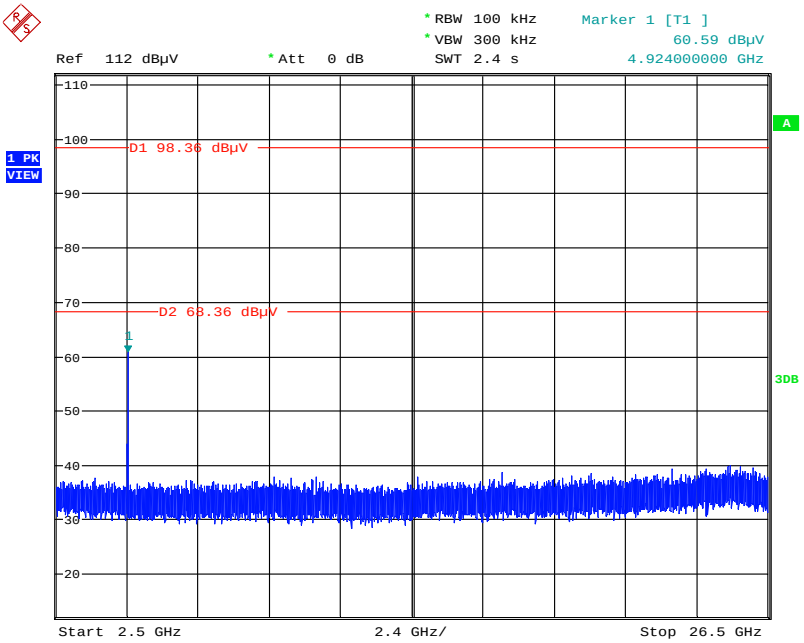
Date: 3.MAY.2014 11:56:16

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



Date: 3.MAY.2014 11:57:16

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



Date: 3.MAY.2014 11:56:49

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	100355	9kHz ~ 2.75GHz	Apr. 23, 2014	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 23, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 11, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112B	2928	30MHz ~ 2GHz	Dec. 27, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 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	30MHz - 1GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1GHz – 40GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1GHz – 40GHz	Nov. 17, 2013	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 2013	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 04, 2013	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1GHz – 26.5GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1GHz – 26.5GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1GHz – 26.5GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1GHz – 26.5GHz	Nov. 17, 2013	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	High Cable-11	-	1GHz – 26.5GHz	Nov. 17, 2013	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.

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emissions	1.7 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	2.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	2.6 dB	Confidence levels of 95%