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FCC RADIO TEST REPORT

Applicant's company	**ASUSTeK COMPUTER INC.**
Applicant Address	4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan
FCC ID	**MSQ-RTAC53U**
Manufacturer's company	**Compal Networking (KunShan) Co., LTD.**
Manufacturer Address	No. 520, Nabbang Rd.,Economic & Technical Development Zone Kunshan, Jiangsu Province China

Product Name	Dual-band Wireless-AC Router
Brand Name	ASUS
Model No.	RT-AC53U
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Dec. 04, 2013
Final Test Date	Jan. 29, 2014
Submission Type	Original Equipment

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g and IEEE 802.11a/ac 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**, **KDB644545 D01 v01r02.**

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

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D0427AA	Rev. 01	Initial issue of report	Oct. 14, 2014

Certificate No.: CB10307159

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Dual-band Wireless-AC Router
Brand Name	:	ASUS
Model No.	:	RT-AC53U
Applicant	:	ASUSTeK COMPUTER 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 Dec. 04, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

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	13.56 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	2.94 dB
4.3	15.247(e)	Power Spectral Density	Complies	6.90 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	2.11 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.22 dB
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth ; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (HT20): 17.60 MHz ; MCS0 (HT40): 36.32 MHz For 5GHz Band: For non-beamforming mode: 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz For 5GHz Band: For beamforming mode: 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (HT20): 26.98 dBm ; MCS0 (HT40): 22.92 dBm For 5GHz Band: For non-beamforming mode: 802.11ac MCS0/Nss1 (VHT20): 23.31 dBm ; 802.11ac MCS0/Nss1 (VHT40): 24.38 dBm ; 802.11ac MCS0/Nss1 (VHT80): 23.21 dBm For beamforming mode: 802.11ac MCS0/Nss1 (VHT20): 23.31 dBm ; 802.11ac MCS0/Nss1 (VHT40): 24.38 dBm ; 802.11ac MCS0/Nss1 (VHT80): 23.21 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a/b/g

Items	Description
Product Type	802.11a/g: WLAN (2TX, 2RX) 802.11b: WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b for Chain 1: 10.32 MHz ; 11b for Chain 2: 10.16 MHz 11g: 16.48 MHz ; 11a: 16.80 MHz
Maximum Conducted Output Power	11b for Chain 1: 25.16 dBm ; 11b for Chain 2: 24.78 dBm 11g: 27.06 dBm ; 11a: 23.44 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 product has beamforming function for 802.11n HT20/40 and 802.11ac VHT20/40/80 in 5150-5250MHz and 5725-5850MHz.

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS0-15
802.11n (HT40)	2	MCS0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2

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

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

Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

Power	Brand	Model	Rating
Adapter	LEI	MU18-R120150-A1	INPUT: 100-240Vac, 50/60Hz, 0.6A OUTPUT: 12Vdc, 1.5A
Other			
RJ-45 cable*1: Non-shielded, 1.5m			

3.3. Table for Filed Antenna

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	M.gear	C660-510303-A (SRF2014062)	Dipole Antenna	Reversed-SMA	3.79	4.52
2	M.gear	C660-510302-A (SRF2014026)	Dipole Antenna	Reversed-SMA	3.51	4.25
3	PSA	RFDPA141000SBLB805	Dipole Antenna	Reversed-SMA	3.31	4.51
4	MAG.LAYERS	RT-AC53U	Dipole Antenna	Reversed-SMA	3.11	4.48

Note: The EUT has four sets of antenna, and each set contains two antennas.

Ant. 1～ 4 are the same type antennas. Only the higher gain antennas "Ant. 1" were tested and recorded in the report.

For 2.4GHz function:

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

The EUT supports the antenna with TX and RX diversity functions.

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

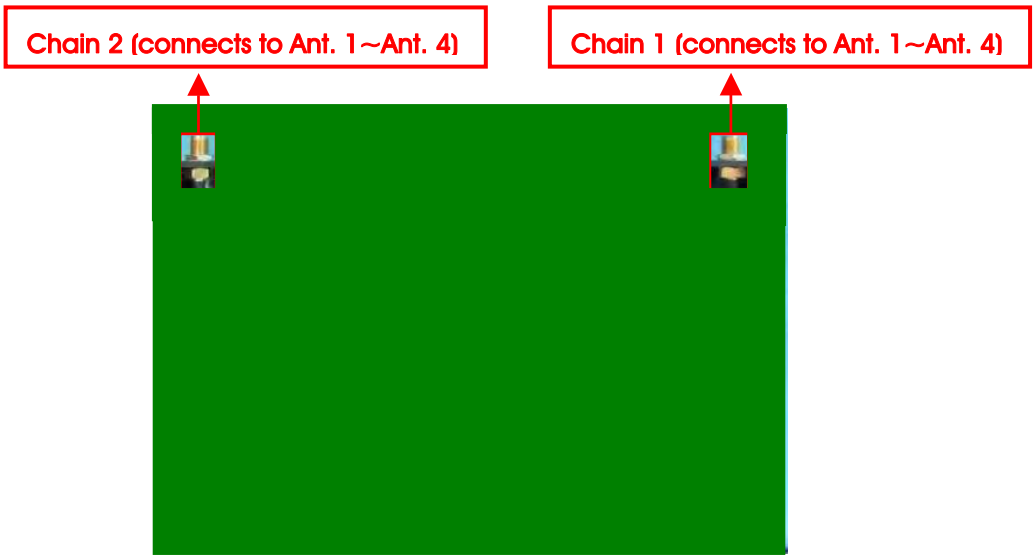
For IEEE 802.11g/n mode (2TX/2RX)

Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz function:

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

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

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

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

For 5GHz Band:

There are three bandwidth systems.

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

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

For 80MHz bandwidth systems, use Channel 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Test Modes

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

For 2.4GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1, 2
	11g/BPSK	6 Mbps	1/6/11	1+2
Power Spectral Density	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1, 2
	11g/BPSK	6 Mbps	1/6/11	1+2
6dB Spectrum Bandwidth	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1, 2
	11g/BPSK	6 Mbps	1/6/11	1+2
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1, 2
	11g/BPSK	6 Mbps	1/6/11	1+2
Band Edge Emissions	11n HT20	MCS0	1/6/11	1+2
	11n HT40	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1, 2
	11g/BPSK	6 Mbps	1/6/11	1+2

For 5GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Power Spectral Density	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
6dB Spectrum Bandwidth	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Band Edge Emissions	11ac VHT20	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	MCS0/Nss1	151/159	1+2
	11ac VHT80	MCS0/Nss1	155	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2

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

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. Normal Link - EUT with AC Adapter

For Radiated Emission below 1GHz test:

Mode 1. Normal Link - EUT laying with AC Adapter

Mode 2. Normal Link - EUT standing with AC Adapter

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

For Radiated Emission above 1GHz test:

There are two modes of EUT, one is standing, the other one is Laying position.

Standing has been evaluated to be the worst case after evaluating.

Consequently, measurement for Radiated Emission above 1GHz test will follow this same test mode.

Mode 1. 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 C) and Radiated Emission Co-location (please refer to Appendix D) 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*4	DELL	E6430	DoC
Flash Disk	Transcend	604108 8255	DoC

For Test Site No: 03CH01-CB

For Radiated Emission 30MHz~1GHz test

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Notebook	Apple	Mac Book	DoC
Notebook	DELL	E6220	DoC
Notebook	DELL	D420	DoC
Flash Disk	Silicon	D33B01	DoC

For Radiated Emission above 1GHz test

For Non-Beamforming Mode

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC

For Beamforming Mode

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6220	DoC
Notebook	DELL	D420	DoC
WLAN ac Dongle	Netgear	A6200	PY31220200

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE

3.8. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For 2.4GHz Band

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	MTOOL 2.0.0.9		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 HT20	74	96	78

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	MTOOL 2.0.0.9		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 HT40	66	82	80

Power Parameters of IEEE 802.11b/g

Test Software Version	MTOOL 2.0.0.9		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b for Chain 1	64	98	100
IEEE 802.11b for Chain 2	98	93	93
IEEE 802.11g	76	96	80

For 5GHz Band

For non-beamforming mode:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	MTOOL 2.0.0.9		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	80	80	80

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	MTOOL 2.0.0.9	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	80	80

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	MTOOL 2.0.0.9
Frequency	5775 MHz
MCS0/Nss1 VHT80	80

Power Parameters of IEEE 802.11a

Test Software Version	MTOOL 2.0.0.9		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	80	80	80

For 5GHz Band

For beamforming mode:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	MTOOL 2.0.0.9		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	80	80	80

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	MTOOL 2.0.0.9	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	80	80

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	MTOOL 2.0.0.9
Frequency	5775 MHz
MCS0/Nss1 VHT80	80

3.9. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

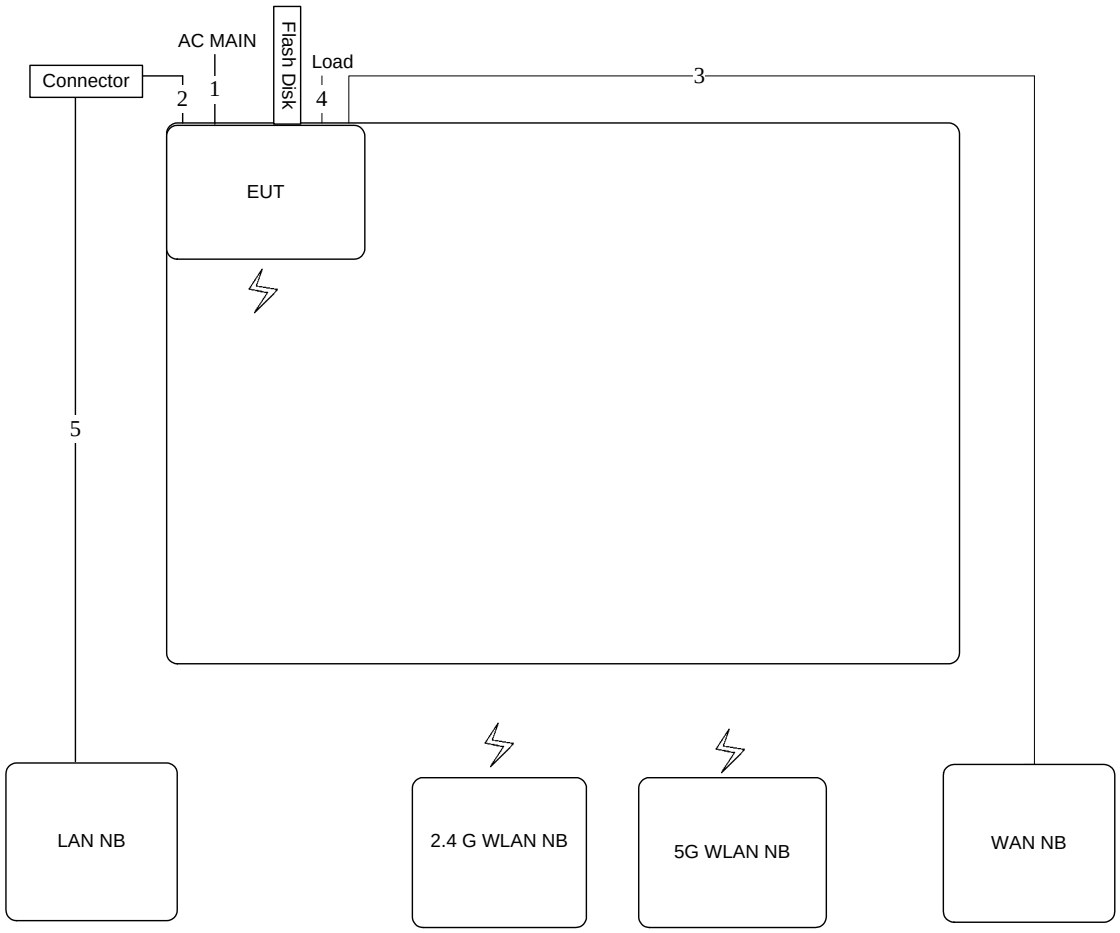
1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under DOS.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by WLAN ac Dongle and transmit duty cycle no less 98%

3.10. Duty Cycle

Band	Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle(%)	1/T Minimum VBW (kHz)
2.4G	802.11n MCS0 HT20	1.920	1.944	98.77	0.01
	802.11n MCS0 HT40	0.928	0.960	96.67	1.08
	802.11b	1.000	1.000	100	0.01
	802.11g	2.064	2.088	98.85	0.01
5G	802.11ac MCS0/Nss1 VHT20	1.932	1.956	98.77	0.01
	802.11ac MCS0/Nss1 VHT40	0.930	0.960	96.88	1.08
	802.11ac MCS0/Nss1 VHT80	0.450	0.480	93.75	2.22
	802.11a	2.064	2.088	98.85	0.01

3.11. Test Configurations

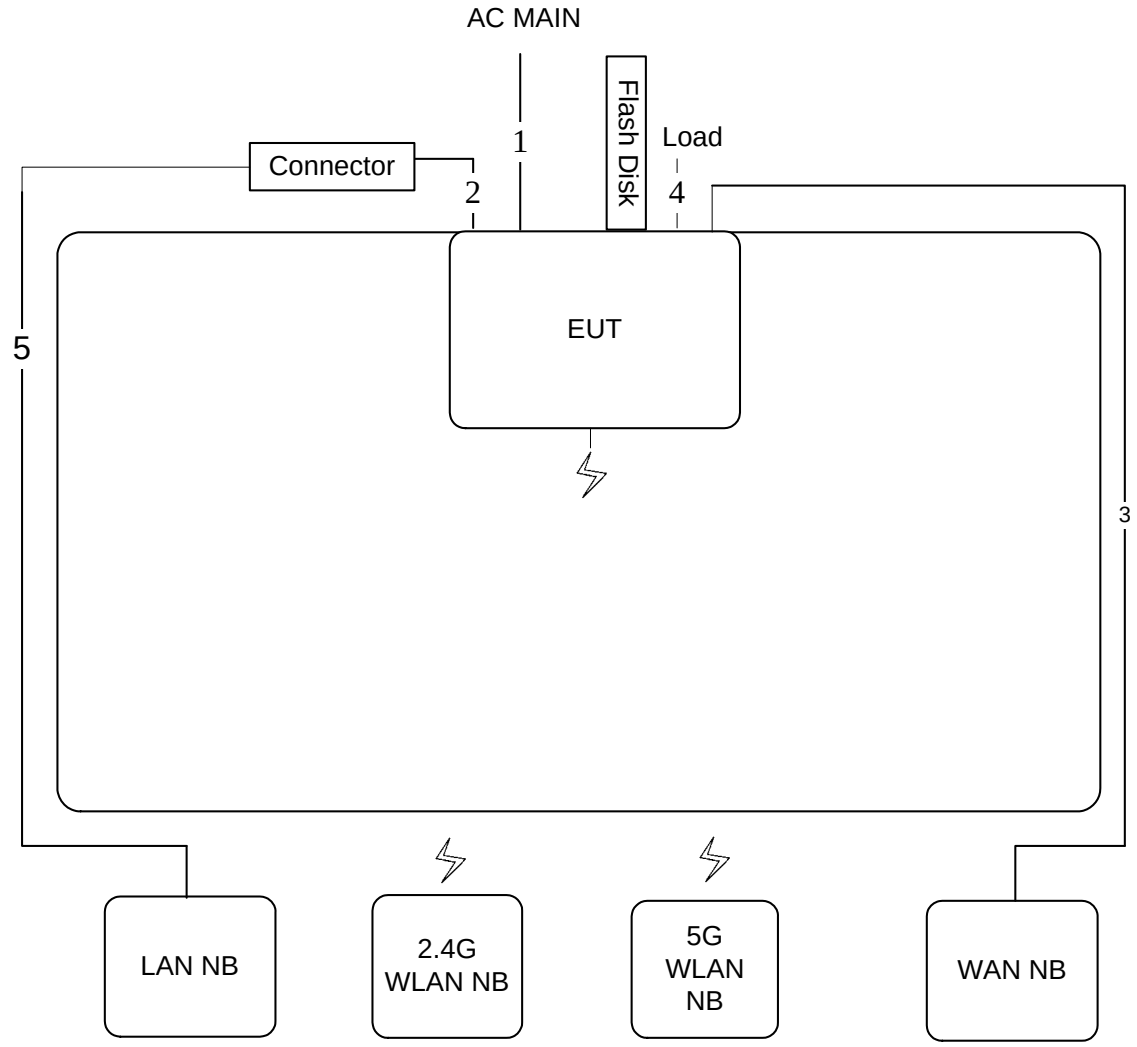
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length(m)	Remark
1	Power cable	No	1.5m	-
2	RJ-45 cable	No	1.5m	-
3	RJ-45 cable	No	10m	-
4	RJ-45 cable*3	No	3m	Load
5	RJ-45 cable	No	10m	-

3.11.2. Radiation Emissions Test Configuration

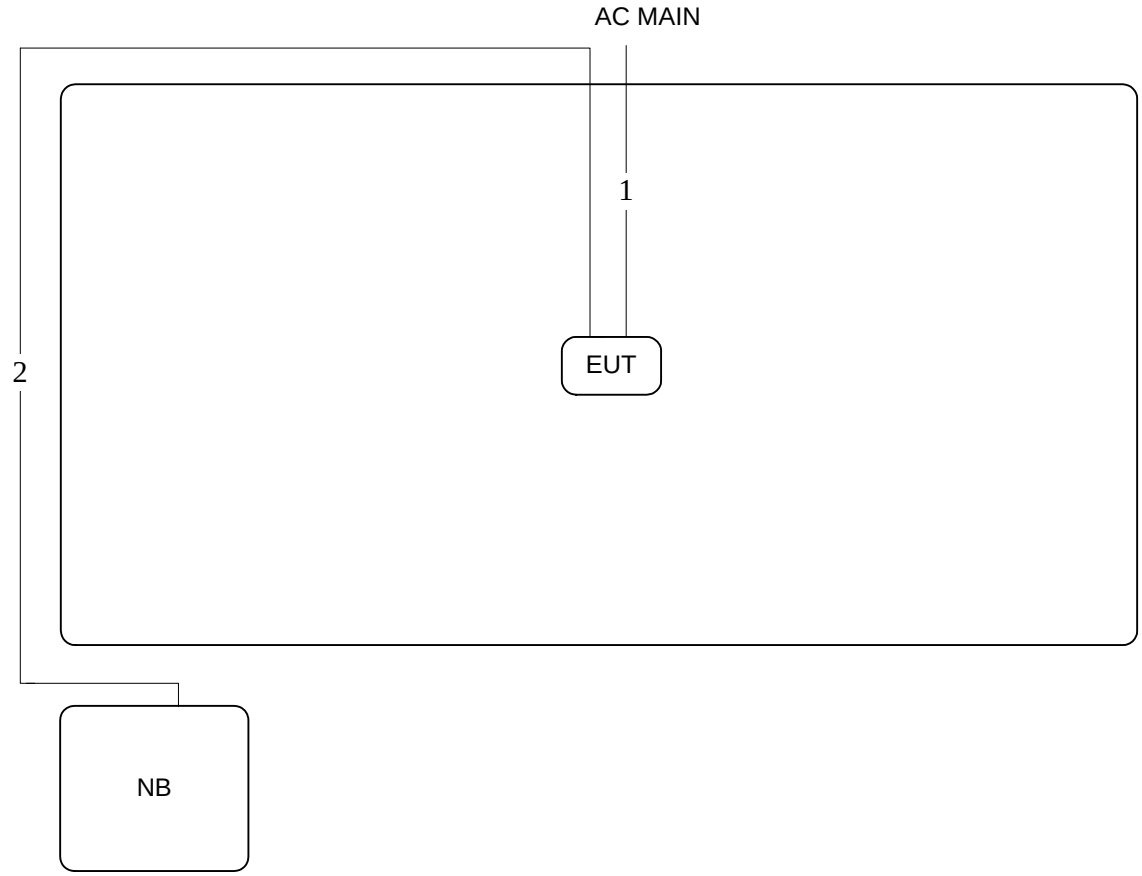
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length(m)	Remark
1	Power cable	No	1.5m	-
2	RJ-45 cable	No	1.5m	-
3	RJ-45 cable	No	10m	-
4	RJ-45 cable*3	No	3m	Load
5	RJ-45 cable	No	10m	-

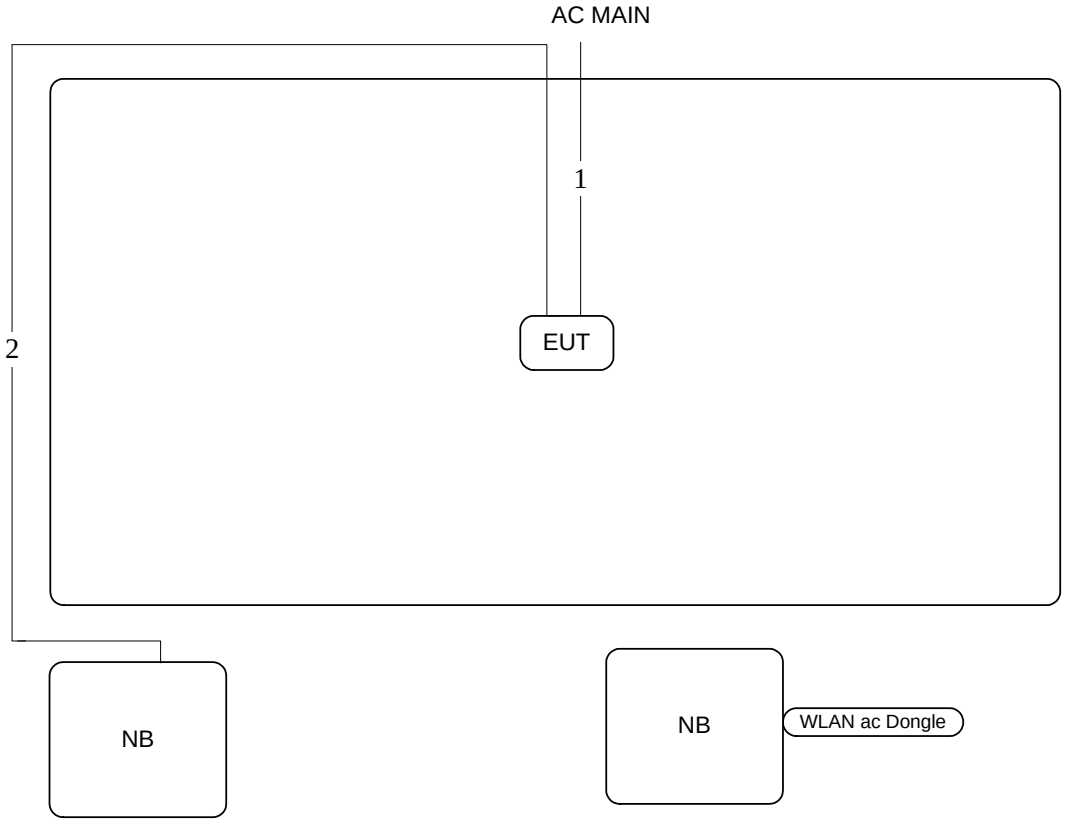
Test Configuration: above 1GHz

For non-beamforming mode:



Item	Connection	Shielded	Length(m)	Remark
1	Power cable	No	1.5m	-
2	RJ-45 cable	No	10m	-

For beamforming mode:



Item	Connection	Shielded	Length(m)	Remark
1	Power cable	No	1.5m	-
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

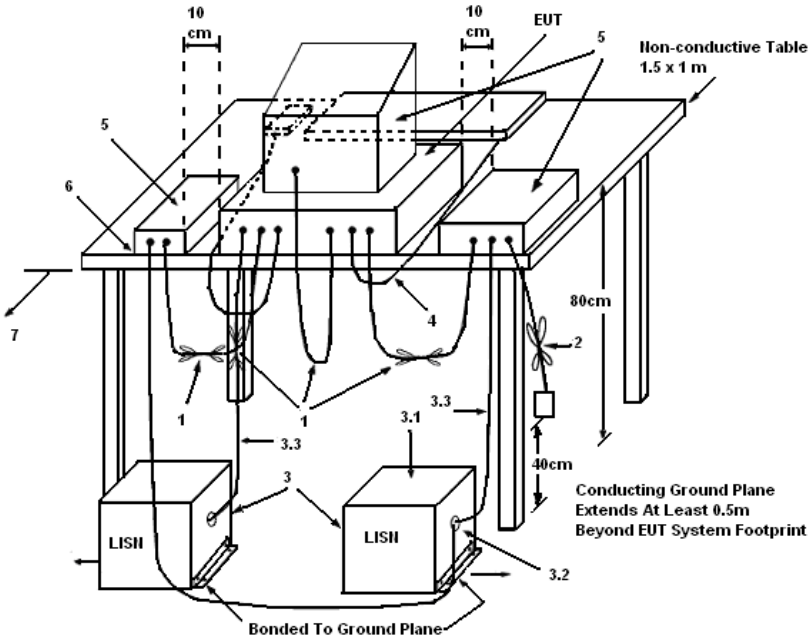
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

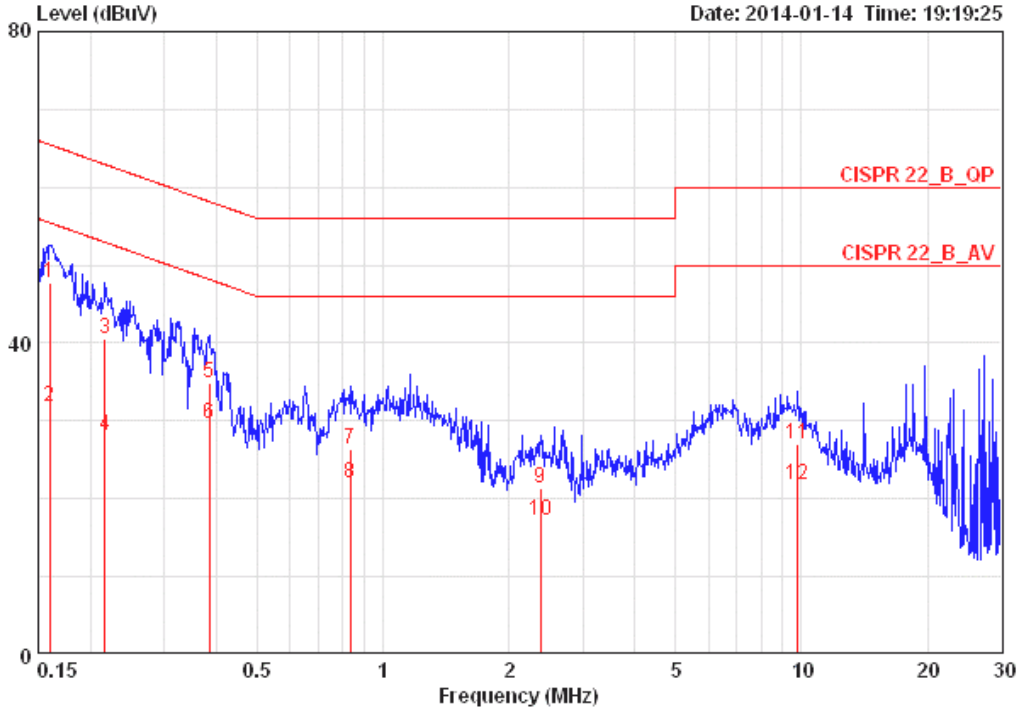
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

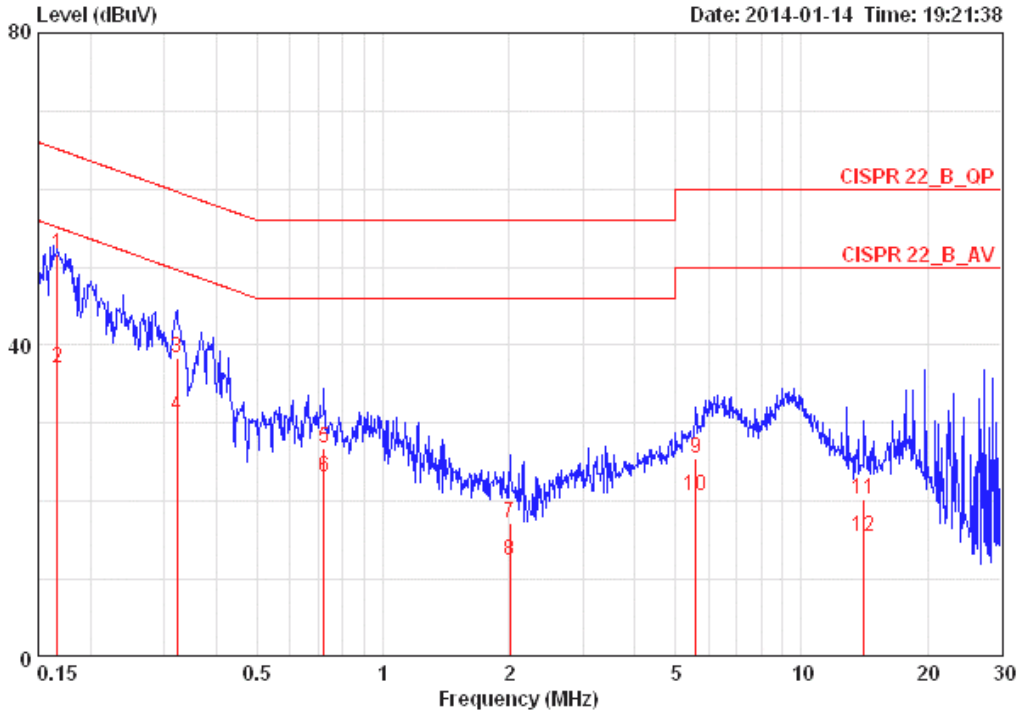
4.1.7. Results of AC Power Line Conducted Emissions Measurement

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



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.15985	47.81	-17.66	65.47	0.15	47.48	0.18	LINE	QP
2	0.15985	31.91	-23.56	55.47	0.15	31.58	0.18	LINE	AVERAGE
3	0.21620	40.45	-22.51	62.96	0.15	40.10	0.20	LINE	QP
4	0.21620	28.06	-24.90	52.96	0.15	27.71	0.20	LINE	AVERAGE
5	0.38519	34.88	-23.29	58.17	0.15	34.53	0.20	LINE	QP
6	0.38519	29.59	-18.58	48.17	0.15	29.24	0.20	LINE	AVERAGE
7	0.83488	26.43	-29.57	56.00	0.16	26.07	0.20	LINE	QP
8	0.83488	21.98	-24.02	46.00	0.16	21.62	0.20	LINE	AVERAGE
9	2.384	21.35	-34.65	56.00	0.21	20.90	0.24	LINE	QP
10	2.384	17.24	-28.76	46.00	0.21	16.79	0.24	LINE	AVERAGE
11	9.809	27.04	-32.96	60.00	0.37	26.33	0.34	LINE	QP
12	9.809	21.77	-28.23	50.00	0.37	21.06	0.34	LINE	AVERAGE

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



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.16677	51.56	-13.56	65.12	0.07	51.30	0.19	NEUTRAL	QP
2	0.16677	37.01	-18.11	55.12	0.07	36.75	0.19	NEUTRAL	AVERAGE
3	0.32169	38.35	-21.31	59.66	0.07	38.08	0.20	NEUTRAL	QP
4	0.32169	30.97	-18.69	49.66	0.07	30.70	0.20	NEUTRAL	AVERAGE
5	0.72360	26.76	-29.24	56.00	0.08	26.48	0.20	NEUTRAL	QP
6	0.72360	23.13	-22.87	46.00	0.08	22.85	0.20	NEUTRAL	AVERAGE
7	2.012	17.15	-38.85	56.00	0.11	16.81	0.23	NEUTRAL	QP
8	2.012	12.42	-33.58	46.00	0.11	12.08	0.23	NEUTRAL	AVERAGE
9	5.594	25.46	-34.54	60.00	0.17	24.97	0.33	NEUTRAL	QP
10	5.594	20.73	-29.27	50.00	0.17	20.24	0.33	NEUTRAL	AVERAGE
11	14.138	20.28	-39.72	60.00	0.34	19.53	0.40	NEUTRAL	QP
12	14.138	15.51	-34.49	50.00	0.34	14.76	0.40	NEUTRAL	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

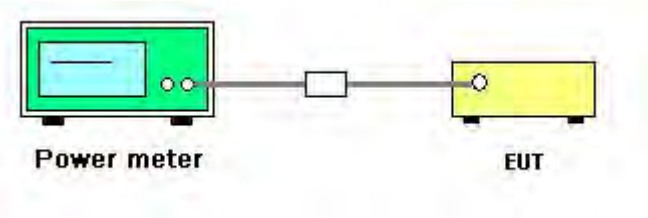
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r02 section 9.2.3.2 Measurement using a power meter (PM).
2. Multiple antenna system 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

Temperature	23°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac
Test Date	Jan. 27, 2014		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	18.98	18.57	21.79	30.00	Complies
6	2437 MHz	24.16	23.78	26.98	30.00	Complies
11	2462 MHz	19.33	19.34	22.35	30.00	Complies

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
3	2422 MHz	17.88	16.27	20.16	30.00	Complies
6	2437 MHz	19.68	20.13	22.92	30.00	Complies
9	2452 MHz	19.16	19.57	22.38	30.00	Complies

For 5GHz Band

For non-beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	20.41	20.18	23.31	30.00	Complies
157	5785 MHz	20.26	20.14	23.21	30.00	Complies
165	5825 MHz	20.23	20.19	23.22	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	21.12	21.13	24.14	30.00	Complies
159	5795 MHz	21.53	21.21	24.38	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	20.28	20.12	23.21	30.00	Complies

For 5GHz Band

For beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	20.41	20.18	23.31	28.47	Complies
157	5785 MHz	20.26	20.14	23.21	28.47	Complies
165	5825 MHz	20.23	20.19	23.22	28.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power limit=30-(7.53-6)=28.47dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	21.12	21.13	24.14	28.47	Complies
159	5795 MHz	21.53	21.21	24.38	28.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power limit=30-(7.53-6)=28.47dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	20.28	20.12	23.21	28.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power limit=30-(7.53-6)=28.47dBm

Temperature	23°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g
Test Date	Jan. 27, 2014		

Configuration IEEE 802.11b / Chain 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.55	30.00	Complies
6	2437 MHz	25.10	30.00	Complies
11	2462 MHz	25.16	30.00	Complies

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	24.78	30.00	Complies
6	2437 MHz	23.16	30.00	Complies
11	2462 MHz	23.25	30.00	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	19.37	18.94	22.17	30.00	Complies
6	2437 MHz	24.12	23.98	27.06	30.00	Complies
11	2462 MHz	19.92	19.93	22.94	30.00	Complies

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	20.51	20.23	23.38	30.00	Complies
157	5785 MHz	20.52	20.34	23.44	30.00	Complies
165	5825 MHz	20.44	20.36	23.41	30.00	Complies

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

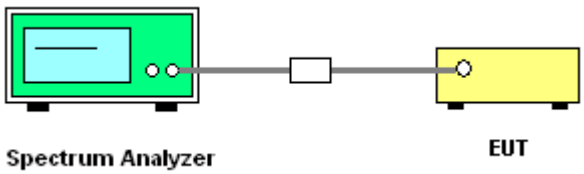
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

1. Test 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

Temperature	23°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	-8.08	-4.76	-3.10	7.20	Complies
6	2437 MHz	-2.93	-3.02	0.04	7.20	Complies
11	2462 MHz	-6.71	-6.26	-3.47	7.20	Complies

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

Note: =6.80dBi>6dBi, so power density limit=8-(6.80-6)=7.20dBm/3kHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
3	2422 MHz	-12.78	-12.88	-9.82	7.20	Complies
6	2437 MHz	-9.97	-8.76	-6.31	7.20	Complies
9	2452 MHz	-10.30	-8.69	-6.41	7.20	Complies

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

Note: =6.80dBi>6dBi, so power density limit=8-(6.80-6)=7.20dBm/3kHz

For 5GHz Band

For non-beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	-3.72	-5.50	-1.51	6.47	Complies
157	5785 MHz	-5.40	-4.70	-2.03	6.47	Complies
165	5825 MHz	-2.51	-5.14	-0.62	6.47	Complies

$$DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$$

Note: =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	-6.25	-7.00	-3.60	6.47	Complies
159	5795 MHz	-6.54	-6.42	-3.47	6.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	-9.67	-8.67	-6.13	6.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

For 5GHz Band

For beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	-3.72	-5.50	-1.51	6.47	Complies
157	5785 MHz	-5.40	-4.70	-2.03	6.47	Complies
165	5825 MHz	-2.51	-5.14	-0.62	6.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
151	5755 MHz	-6.25	-7.00	-3.60	6.47	Complies
159	5795 MHz	-6.54	-6.42	-3.47	6.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
155	5775 MHz	-9.67	-8.67	-6.13	6.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

Temperature	23°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 1

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	-7.91	8.00	Complies
6	2437 MHz	1.02	8.00	Complies
11	2462 MHz	0.69	8.00	Complies

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)	Result
1	2412 MHz	0.55	8.00	Complies
6	2437 MHz	-0.01	8.00	Complies
11	2462 MHz	-1.27	8.00	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
1	2412 MHz	-6.79	-7.99	-4.34	7.20	Complies
6	2437 MHz	-2.63	-2.79	0.30	7.20	Complies
11	2462 MHz	-6.87	-5.22	-2.96	7.20	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.80dBi>6dBi, so power density limit=8-(6.80-6)=7.20dBm/3kHz

Configuration IEEE 802.11a / Chain 1 + Chain 2

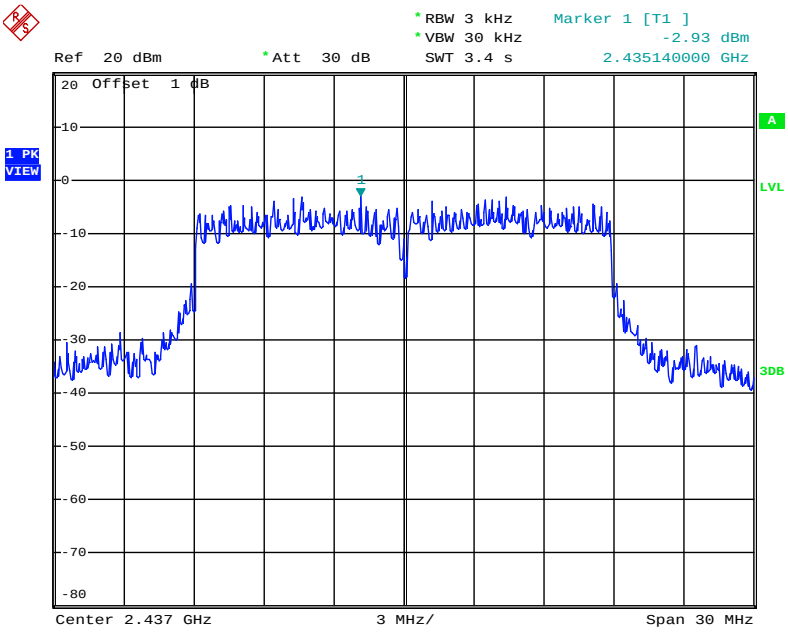
Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
149	5745 MHz	-3.54	-4.74	-1.09	6.47	Complies
157	5785 MHz	-3.67	-4.14	-0.89	6.47	Complies
165	5825 MHz	-4.40	-4.62	-1.50	6.47	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.53dBi>6dBi, so power density limit=8-(7.53-6)=6.47dBm/3kHz

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

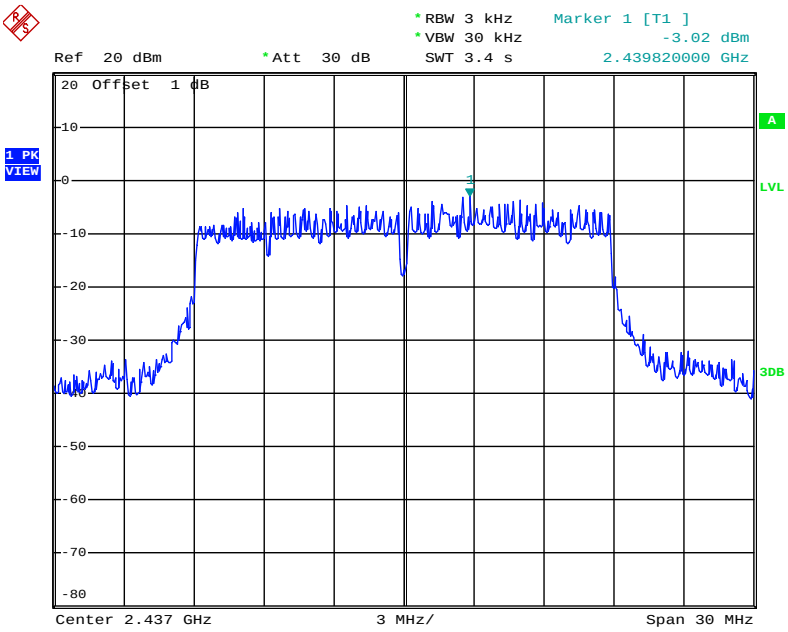
For plots, only the channel with worse result was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Chain 1



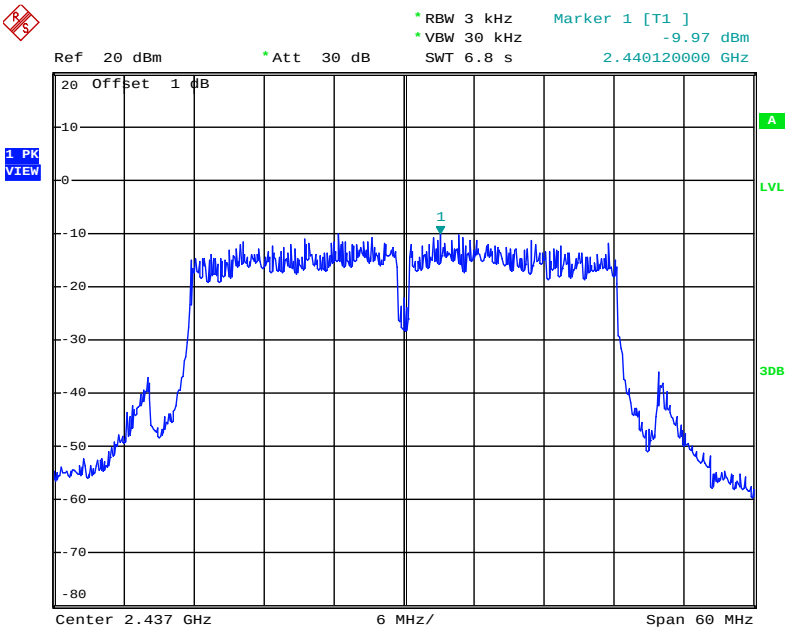
Date: 27.JAN.2014 16:52:54

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Chain 2



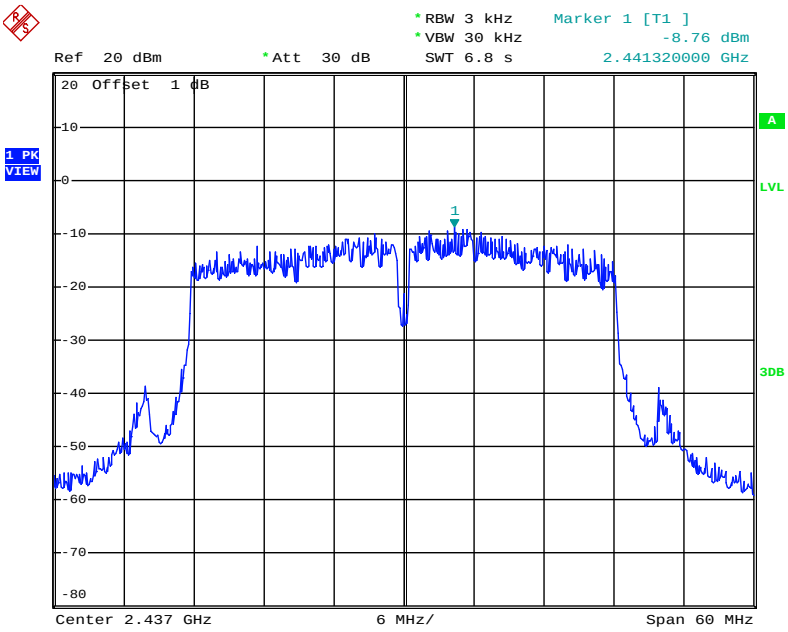
Date: 27.JAN.2014 17:06:26

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Chain 1



Date: 27.JAN.2014 16:55:21

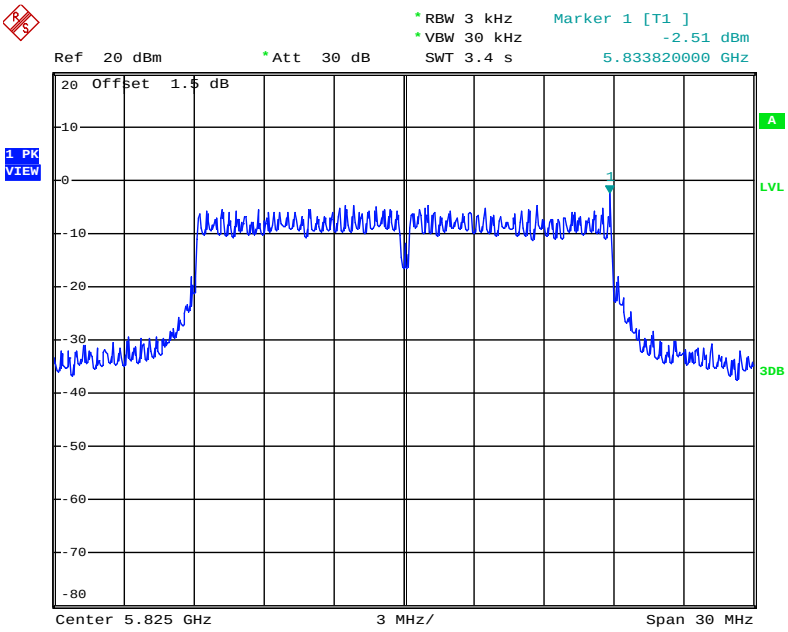
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Chain 2



Date: 27.JAN.2014 17:08:43

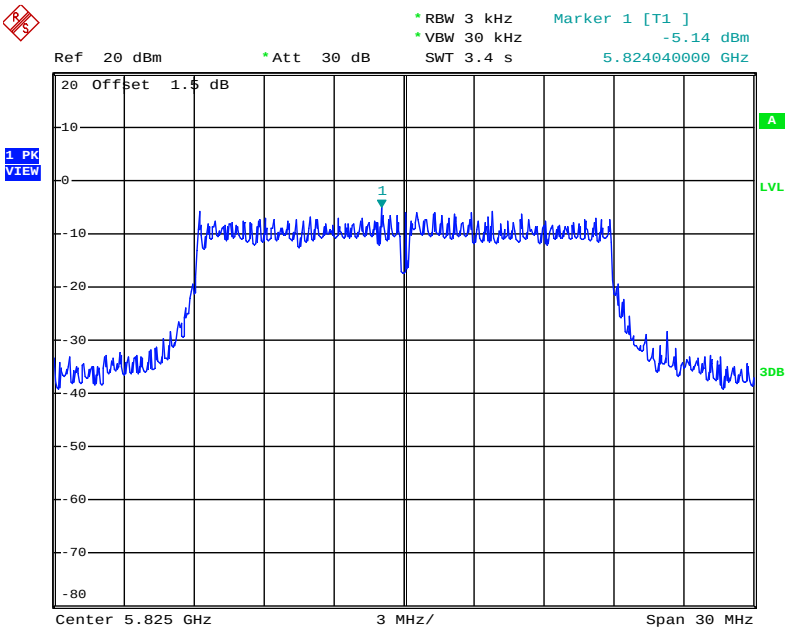
For non-beamforming mode:

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 1



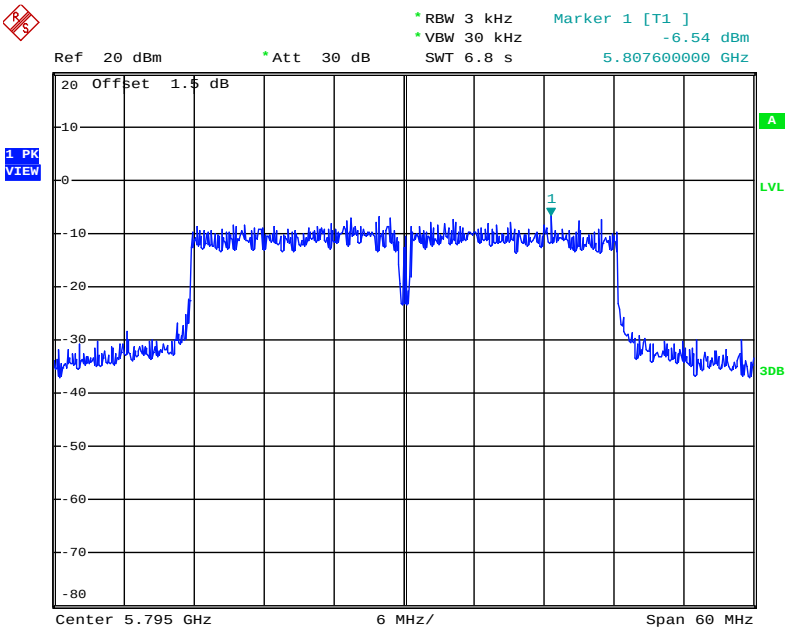
Date: 27.JAN.2014 19:37:30

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 2



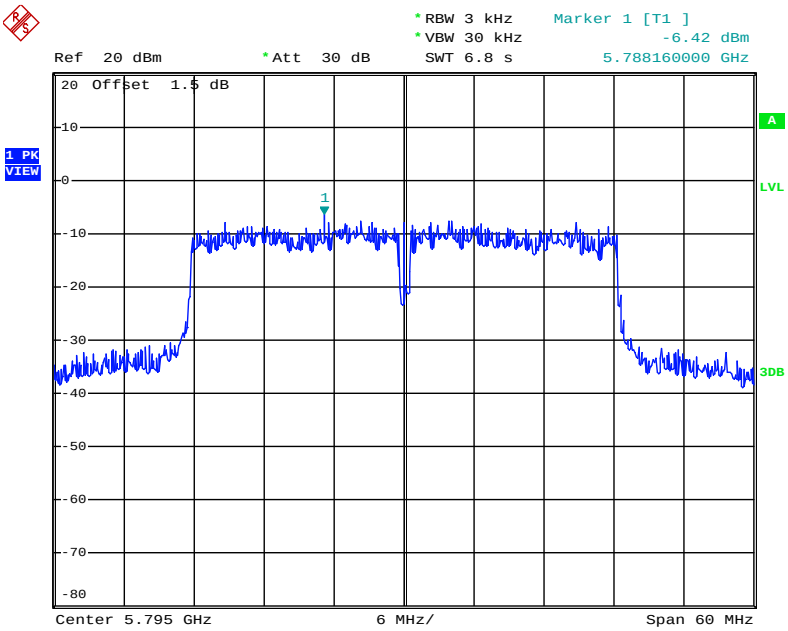
Date: 27.JAN.2014 19:36:23

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 1



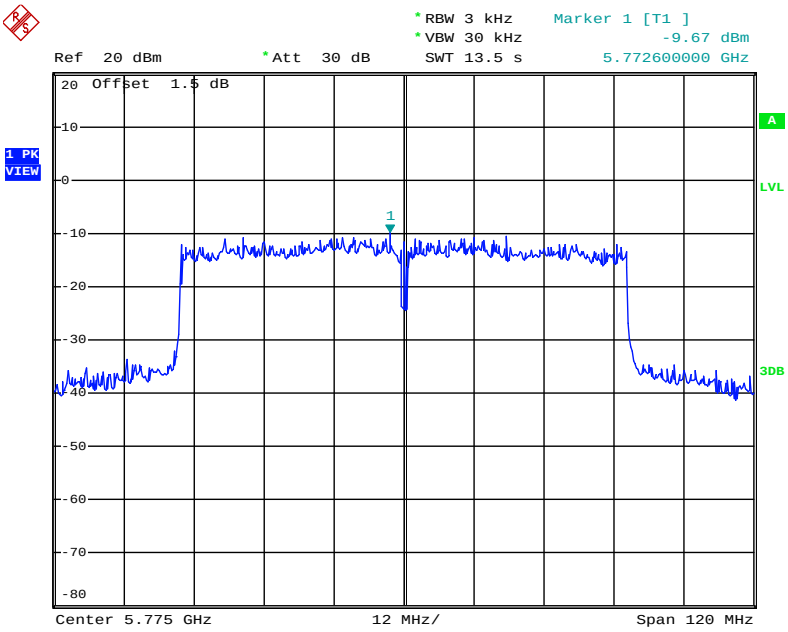
Date: 27.JAN.2014 19:47:11

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 2



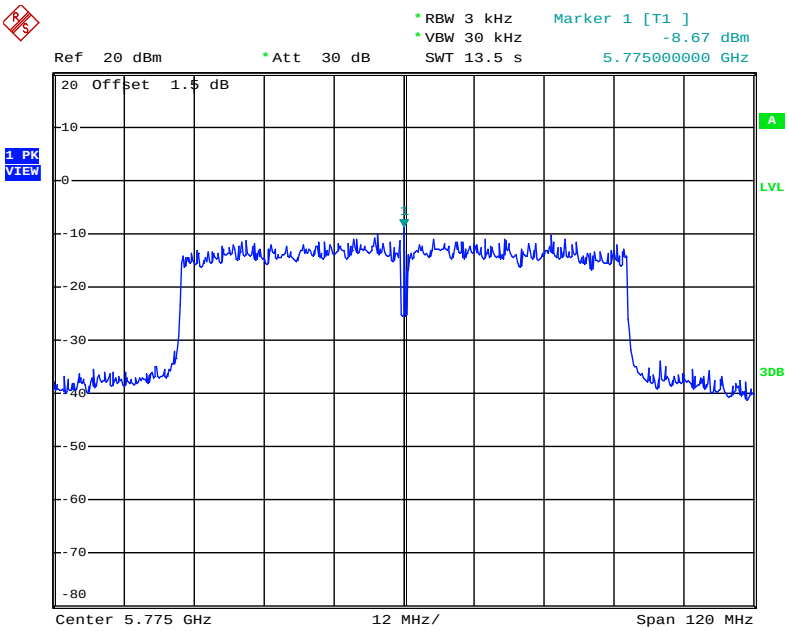
Date: 27.JAN.2014 19:46:17

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1



Date: 27.JAN.2014 19:49:00

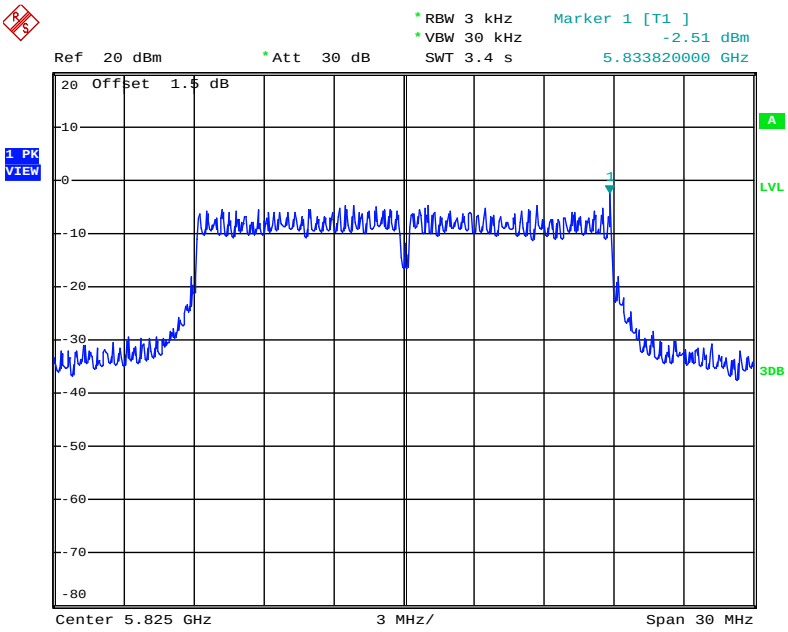
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 2



Date: 27.JAN.2014 19:50:52

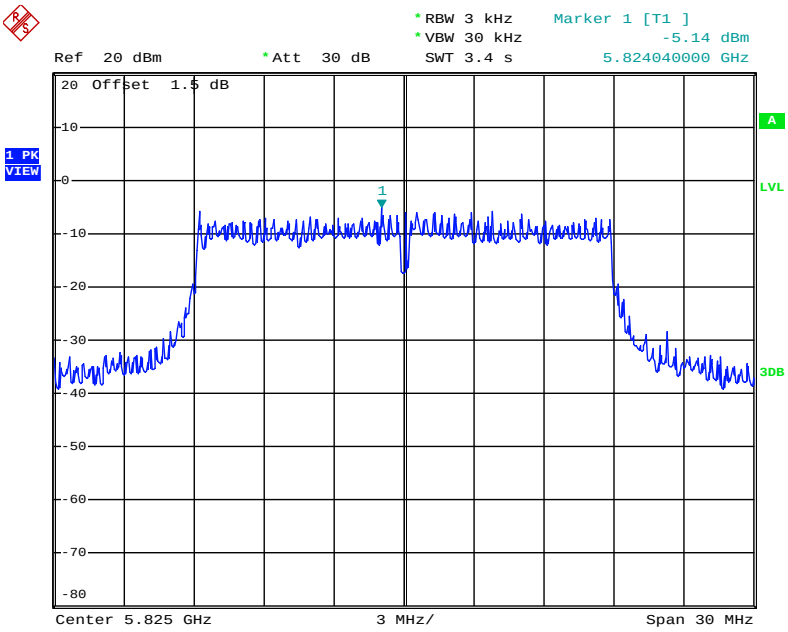
For beamforming mode:

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 1



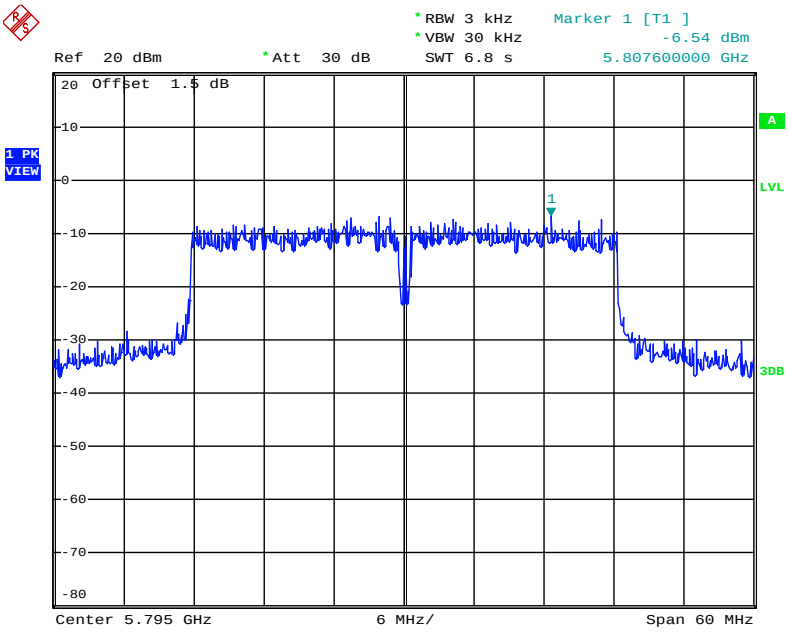
Date: 27.JAN.2014 19:37:30

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 2



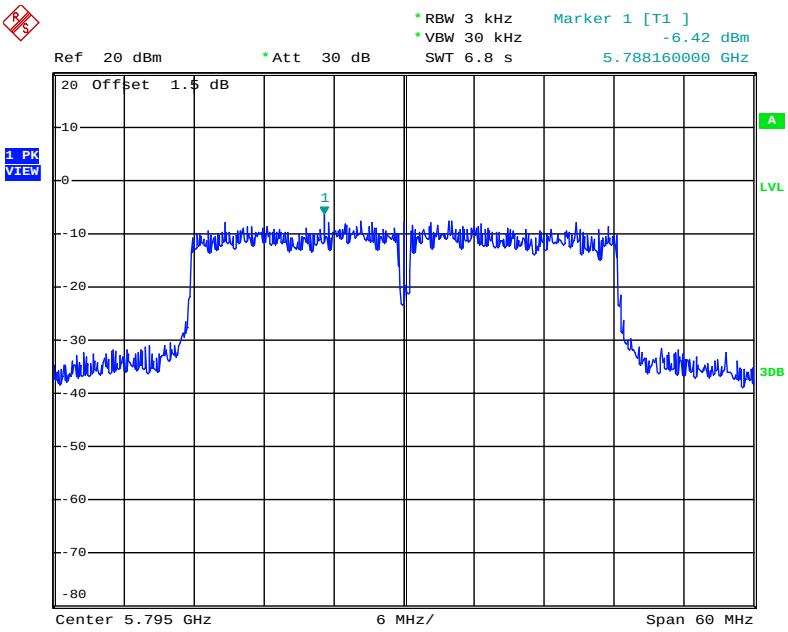
Date: 27.JAN.2014 19:36:23

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 1



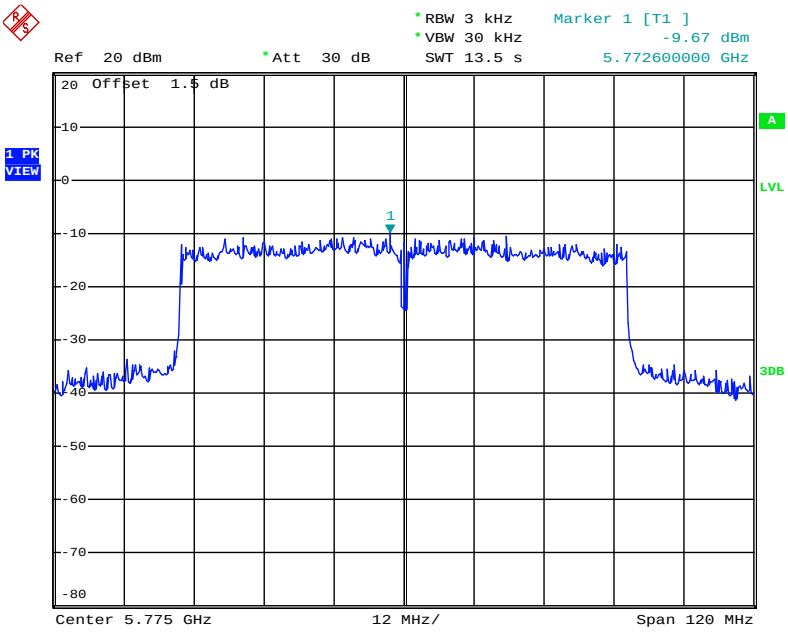
Date: 27.JAN.2014 19:47:11

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 2



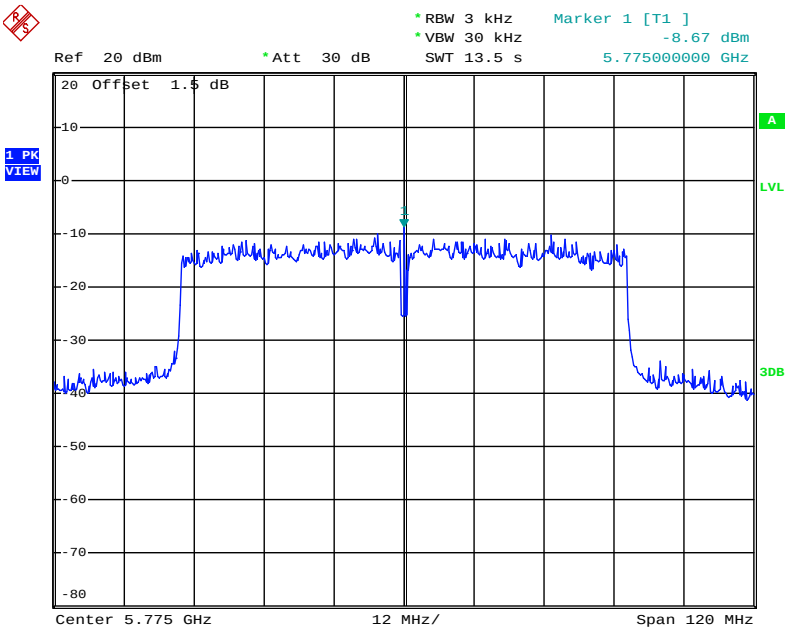
Date: 27.JAN.2014 19:46:17

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1



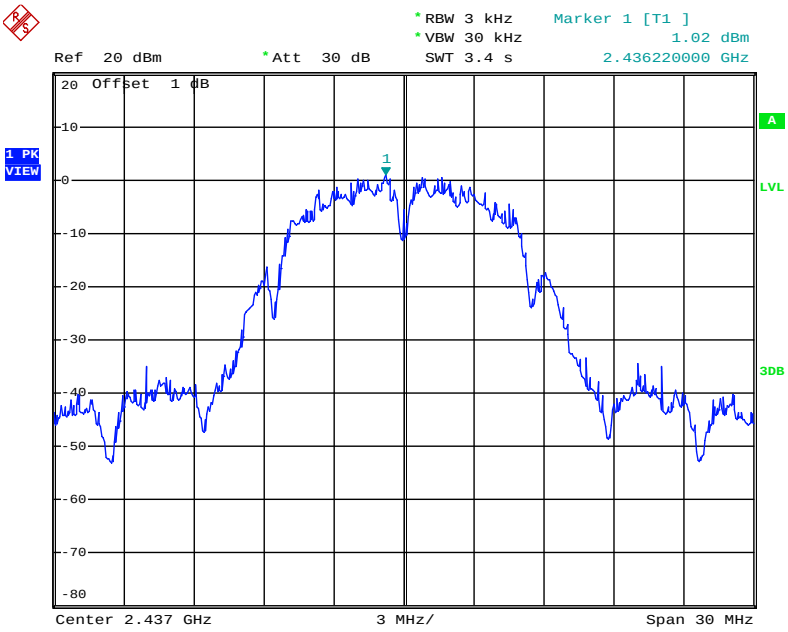
Date: 27.JAN.2014 19:49:00

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 2



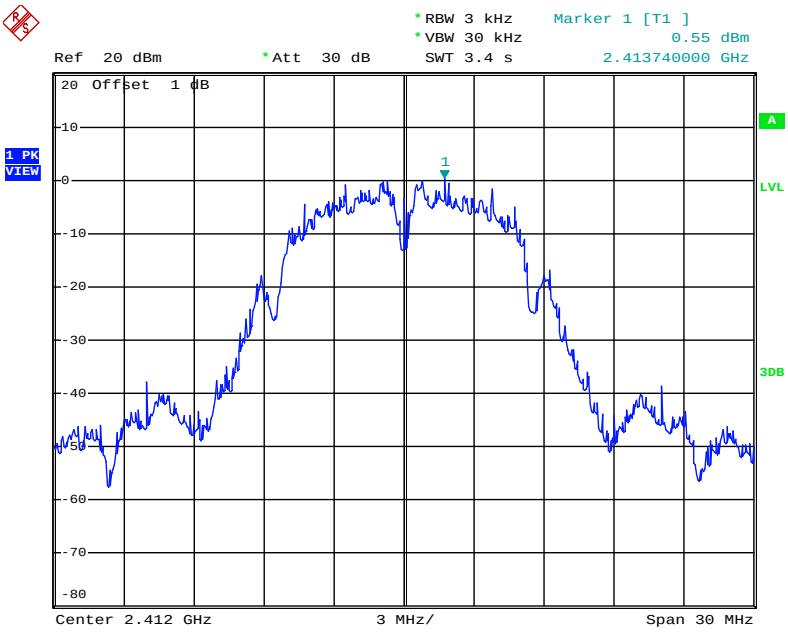
Date: 27.JAN.2014 19:50:52

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



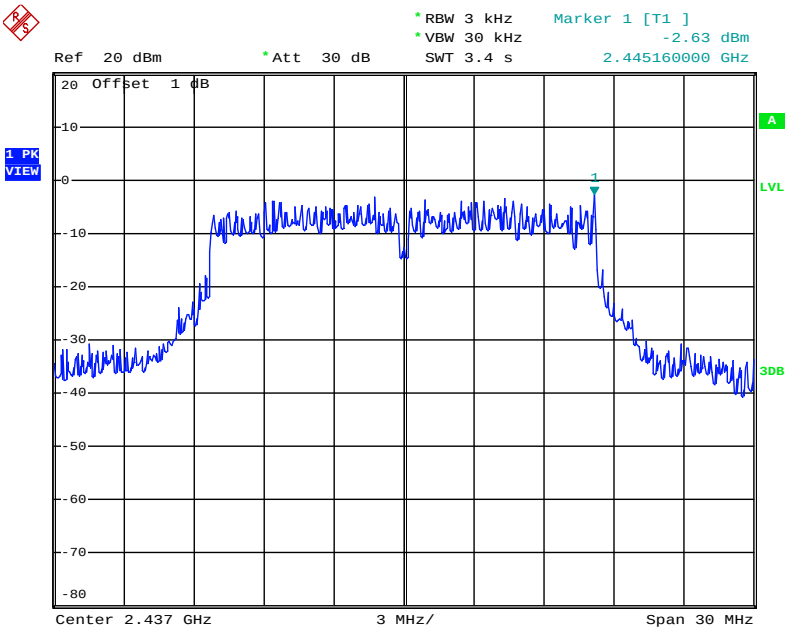
Date: 27.JAN.2014 16:44:49

Power Density Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 2



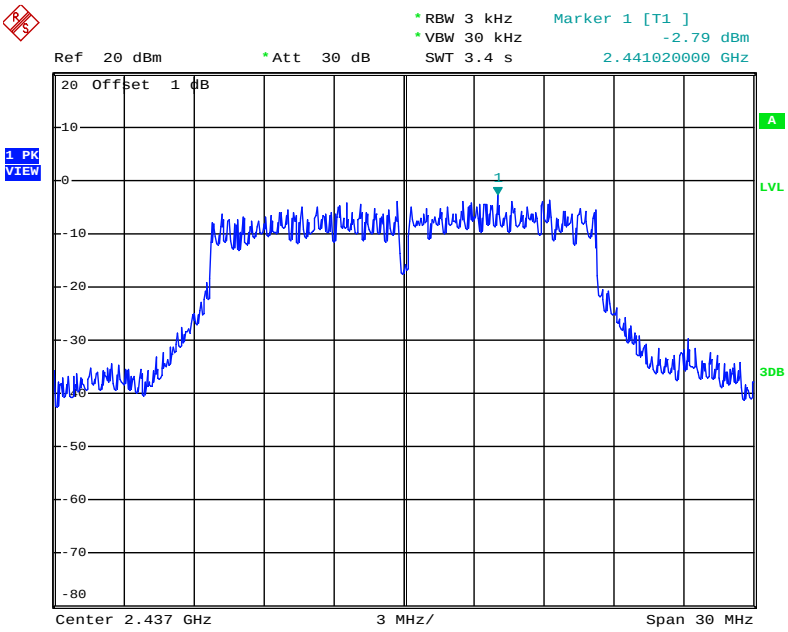
Date: 27.JAN.2014 16:46:41

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



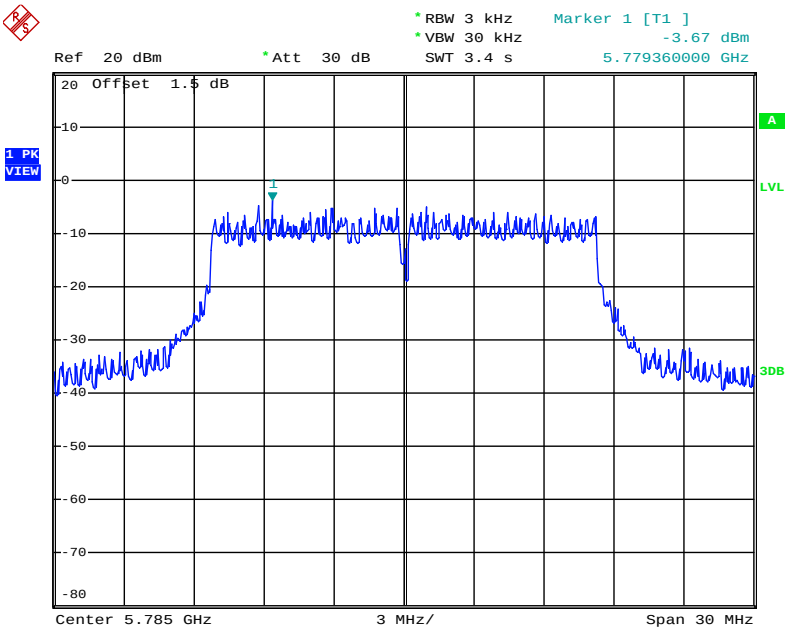
Date: 27.JAN.2014 16:49:40

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



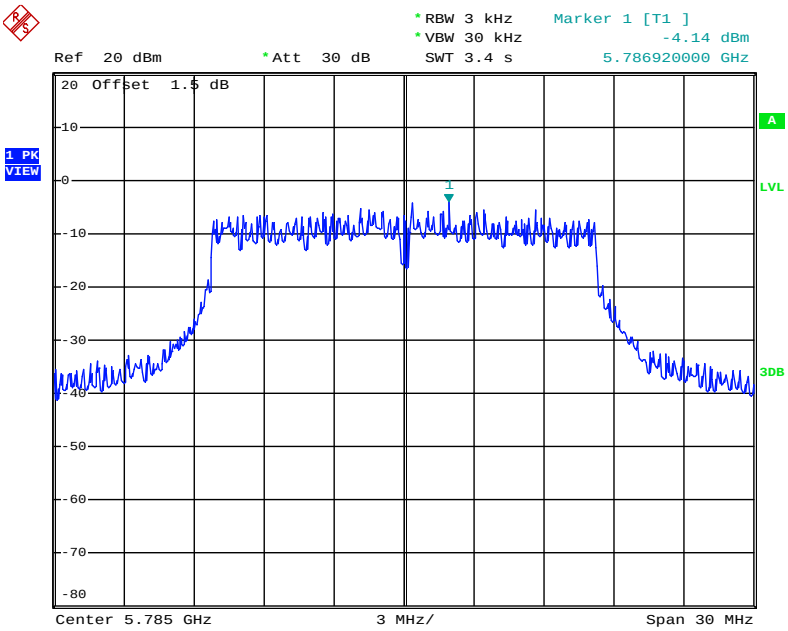
Date: 27.JAN.2014 17:04:08

Power Density Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 1



Date: 27.JAN.2014 19:33:31

Power Density Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 2



Date: 27.JAN.2014 19:32:42

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

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

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

4.4.3. Test Procedures

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

Temperature	23°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.16	17.60	500	Complies
6	2437 MHz	15.84	17.28	500	Complies
11	2462 MHz	16.08	17.52	500	Complies

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	34.24	36.32	500	Complies
6	2437 MHz	29.92	36.32	500	Complies
9	2452 MHz	30.08	36.16	500	Complies

For 5GHz Band

For non-beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.52	17.84	500	Complies
157	5785 MHz	17.60	17.84	500	Complies
165	5825 MHz	17.60	17.92	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	35.04	36.48	500	Complies
159	5795 MHz	35.36	36.48	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	73.92	76.16	500	Complies

For 5GHz Band

For beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.52	17.84	500	Complies
157	5785 MHz	17.60	17.84	500	Complies
165	5825 MHz	17.60	17.92	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	35.04	36.48	500	Complies
159	5795 MHz	35.36	36.48	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	73.92	76.16	500	Complies

Temperature	23°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 1

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	7.68	10.08	500	Complies
6	2437 MHz	8.48	10.24	500	Complies
11	2462 MHz	7.52	10.32	500	Complies

Configuration IEEE 802.11b / Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	8.00	10.16	500	Complies
6	2437 MHz	8.00	10.08	500	Complies
11	2462 MHz	7.68	10.16	500	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	12.72	16.48	500	Complies
6	2437 MHz	12.24	15.76	500	Complies
11	2462 MHz	15.12	16.24	500	Complies

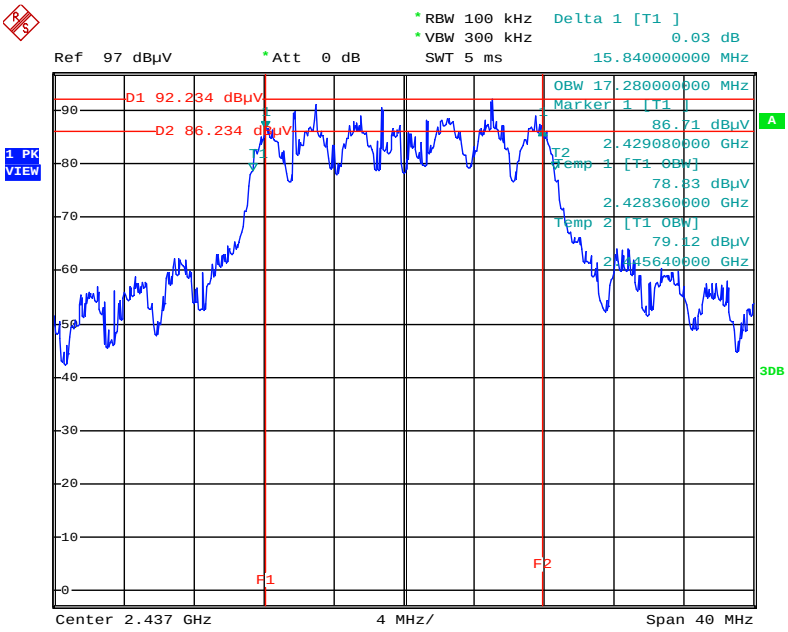
Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.24	16.64	500	Complies
157	5785 MHz	16.48	16.72	500	Complies
165	5825 MHz	16.32	16.80	500	Complies

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

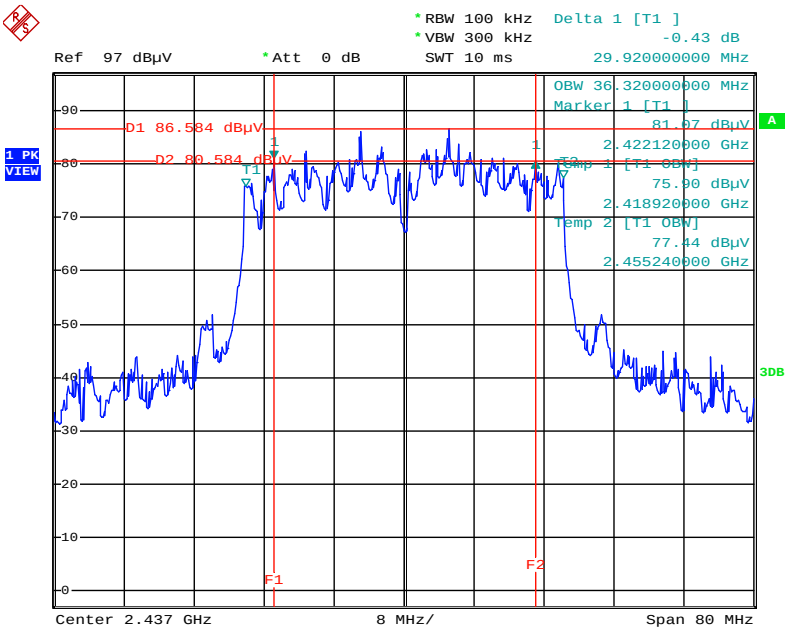
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Chain 1 + Chain 2



Date: 27.JAN.2014 17:25:21

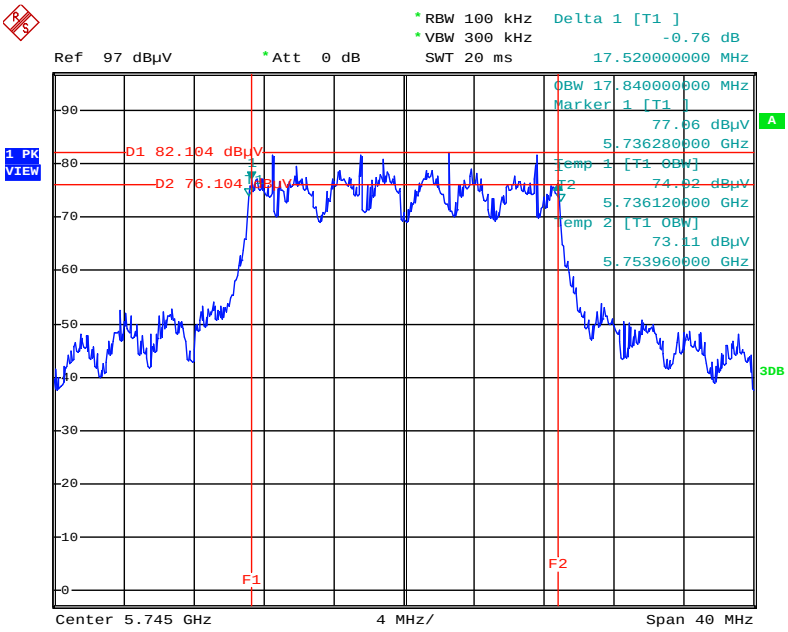
6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Chain 1 + Chain 2



Date: 27.JAN.2014 17:28:22

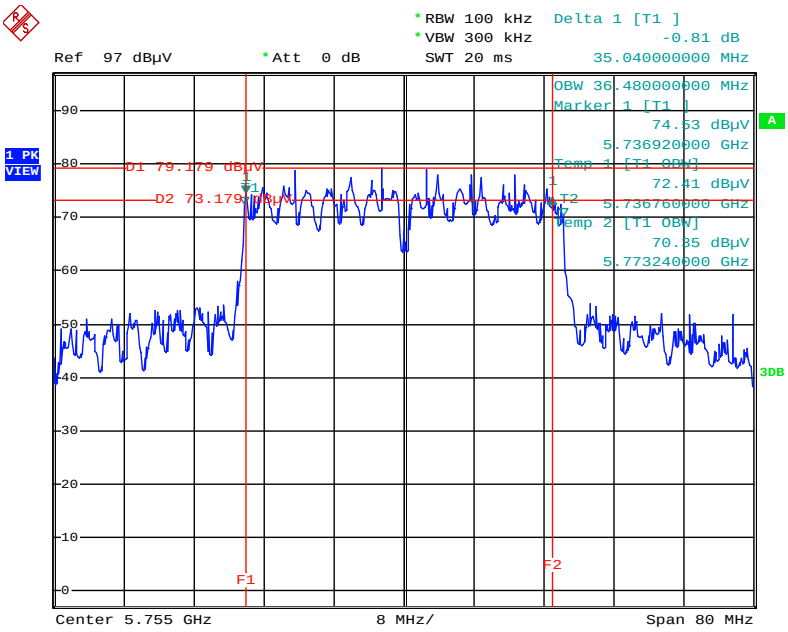
For non-beamforming mode:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 1 + Chain 2



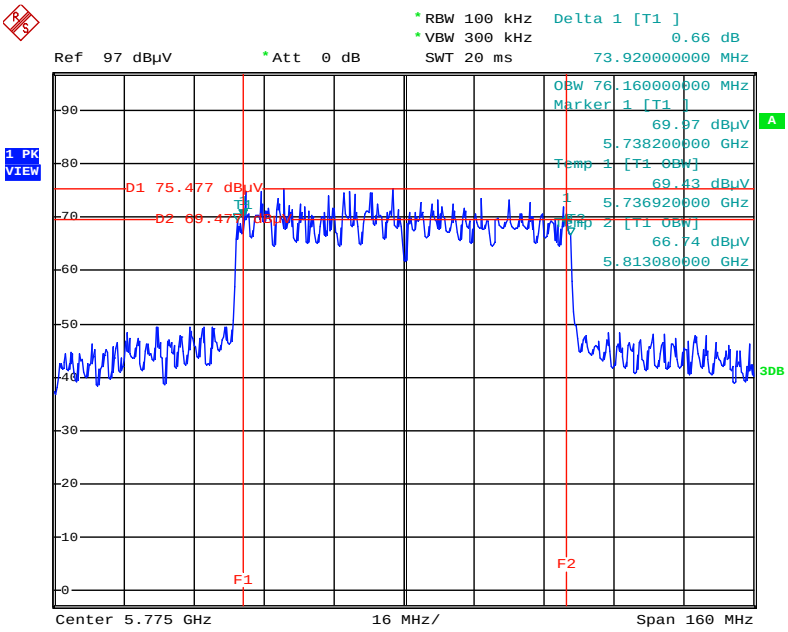
Date: 27.JAN.2014 21:15:52

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755MHz / Chain 1 + Chain 2



Date: 27.JAN.2014 21:16:47

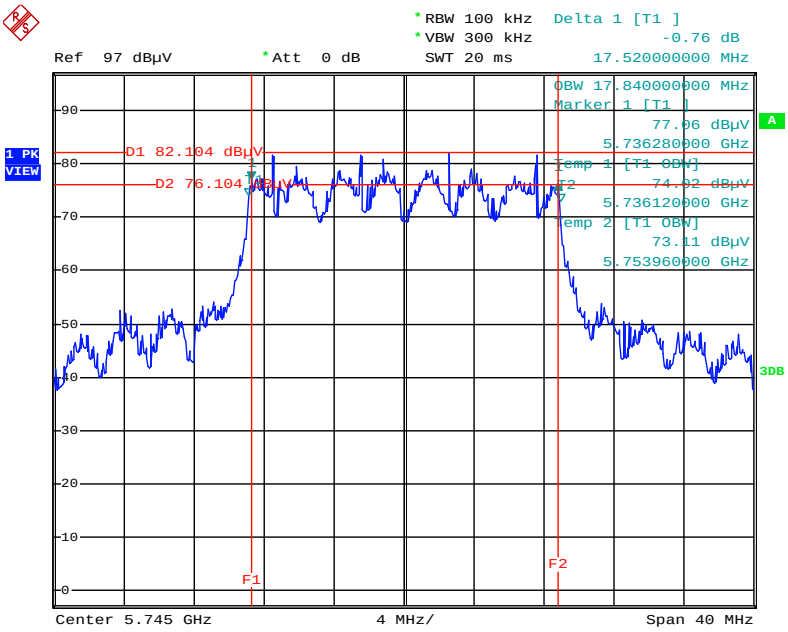
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2



Date: 27.JAN.2014 21:18:08

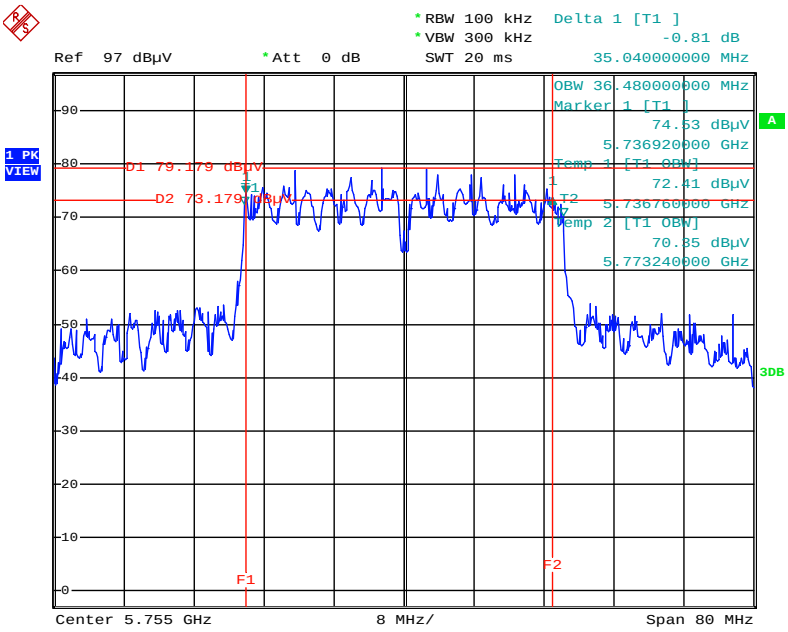
For beamforming mode:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 1 + Chain 2



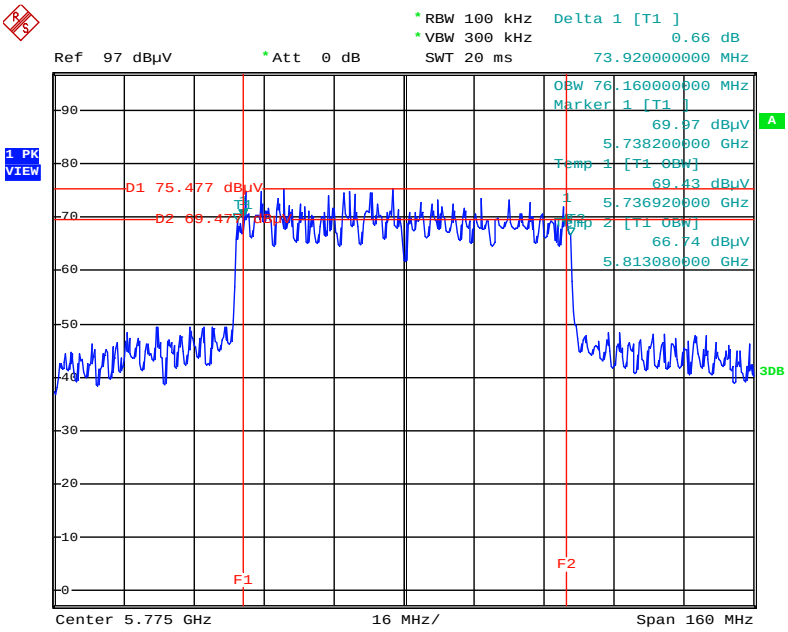
Date: 27.JAN.2014 21:15:52

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755MHz / Chain 1 + Chain 2



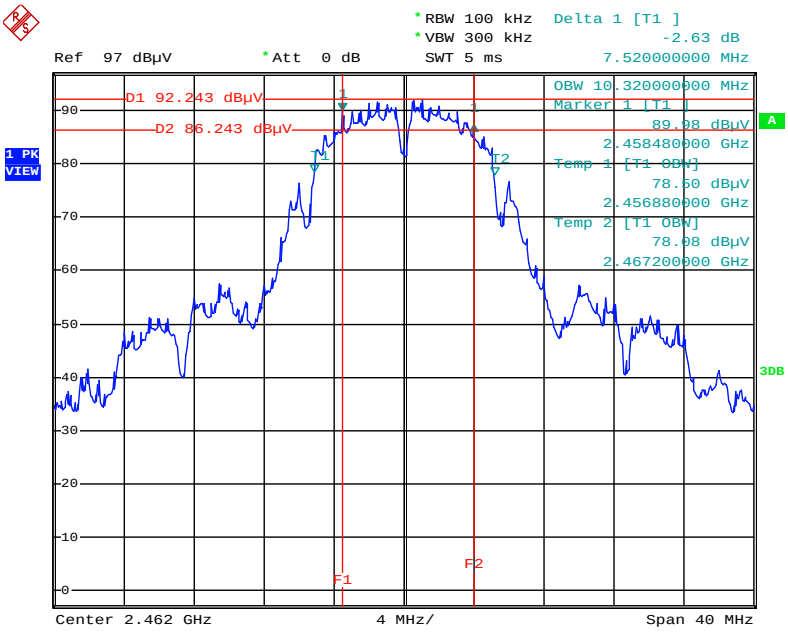
Date: 27.JAN.2014 21:16:47

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2



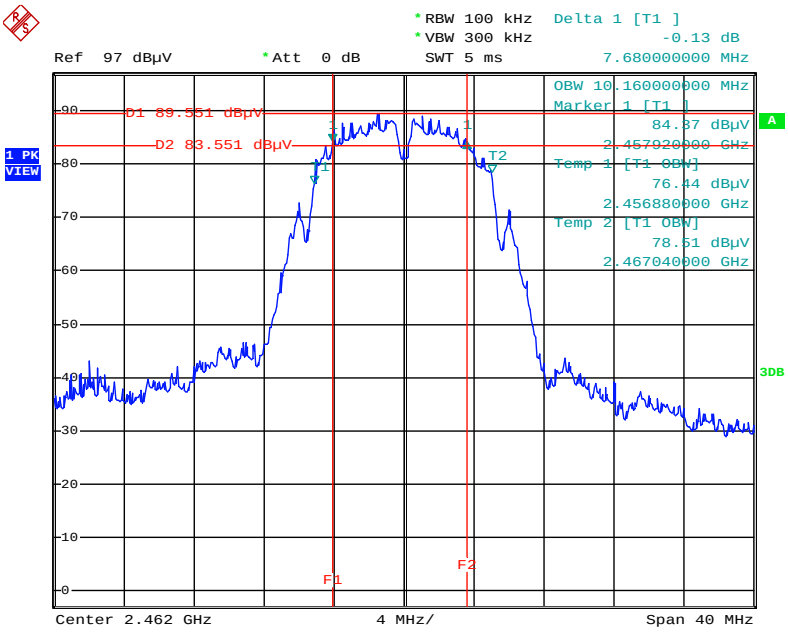
Date: 27.JAN.2014 21:18:08

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1



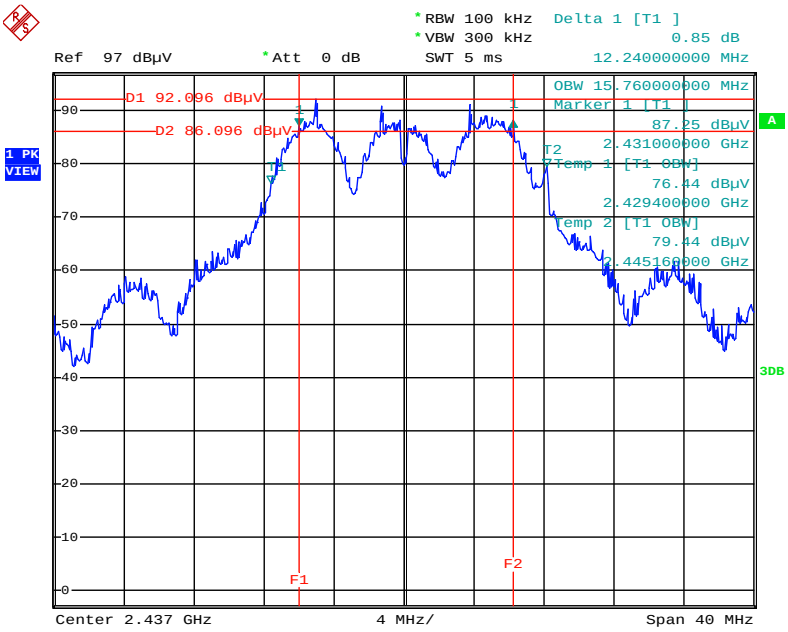
Date: 27.JAN.2014 17:16:18

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 2



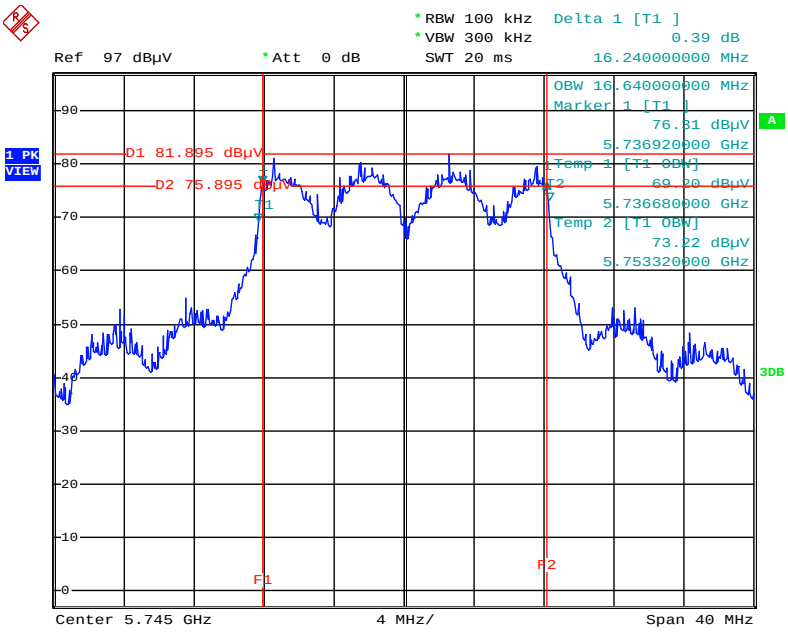
Date: 27.JAN.2014 17:19:21

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



Date: 27.JAN.2014 17:21:07

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 1 + Chain 2



Date: 27.JAN.2014 21:10:25

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, Please refer to section 3.10 for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

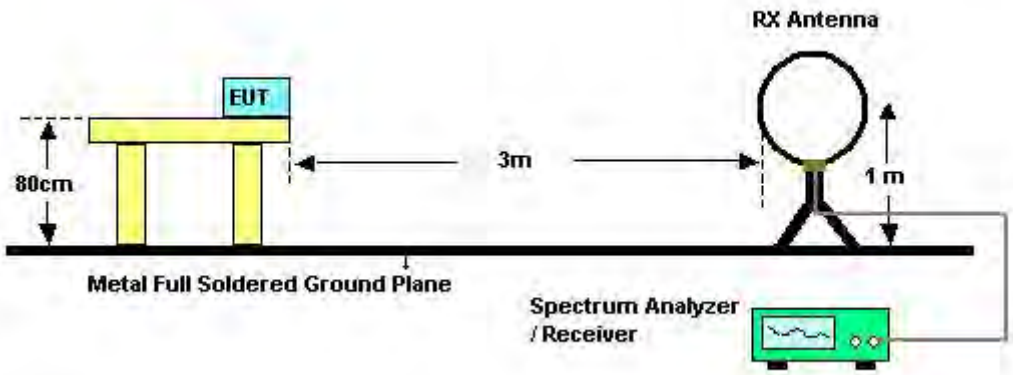
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

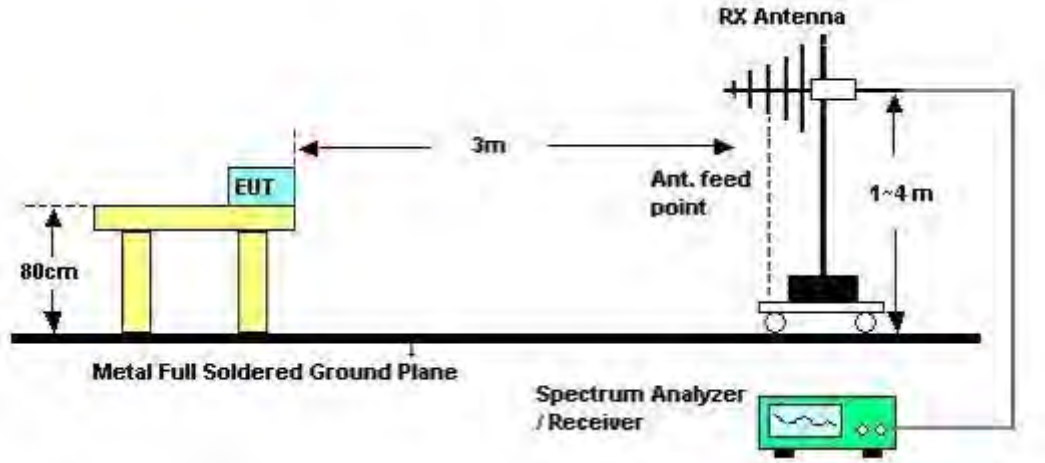
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. 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

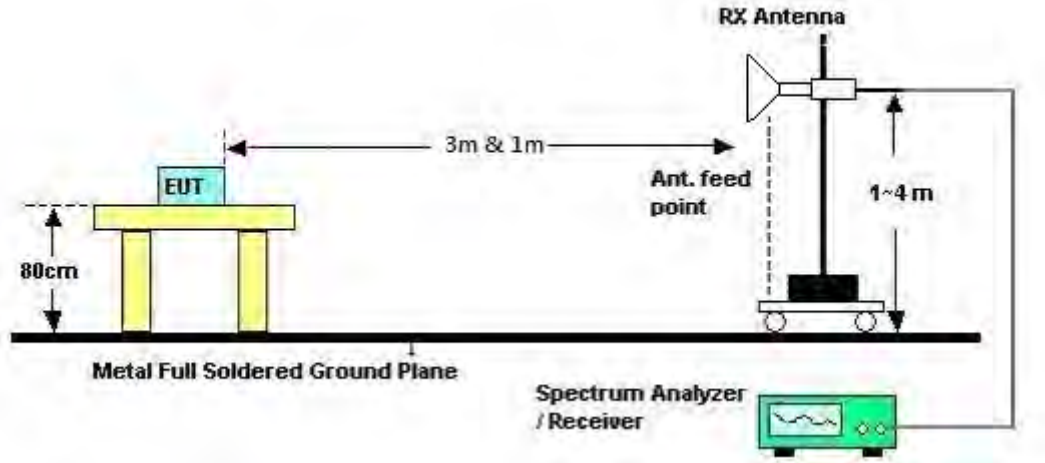
For Radiated Emissions: 9kHz ~30MHz



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

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	Normal Link
Test Date	Jan. 29, 2014	Test Mode	Mode 1

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

Note:

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

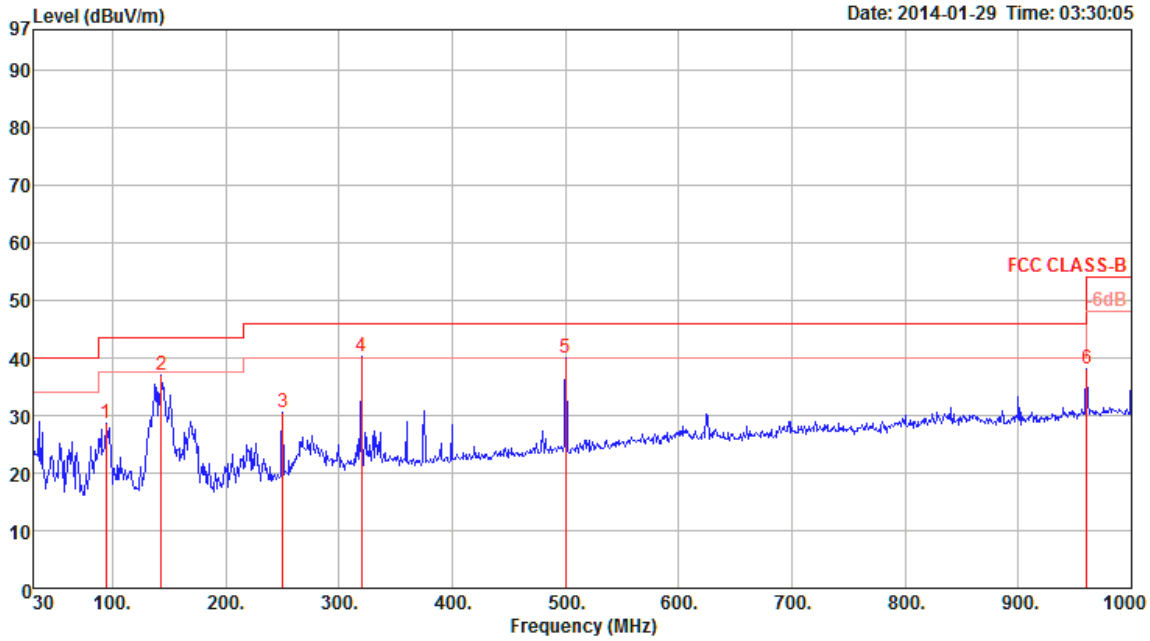
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

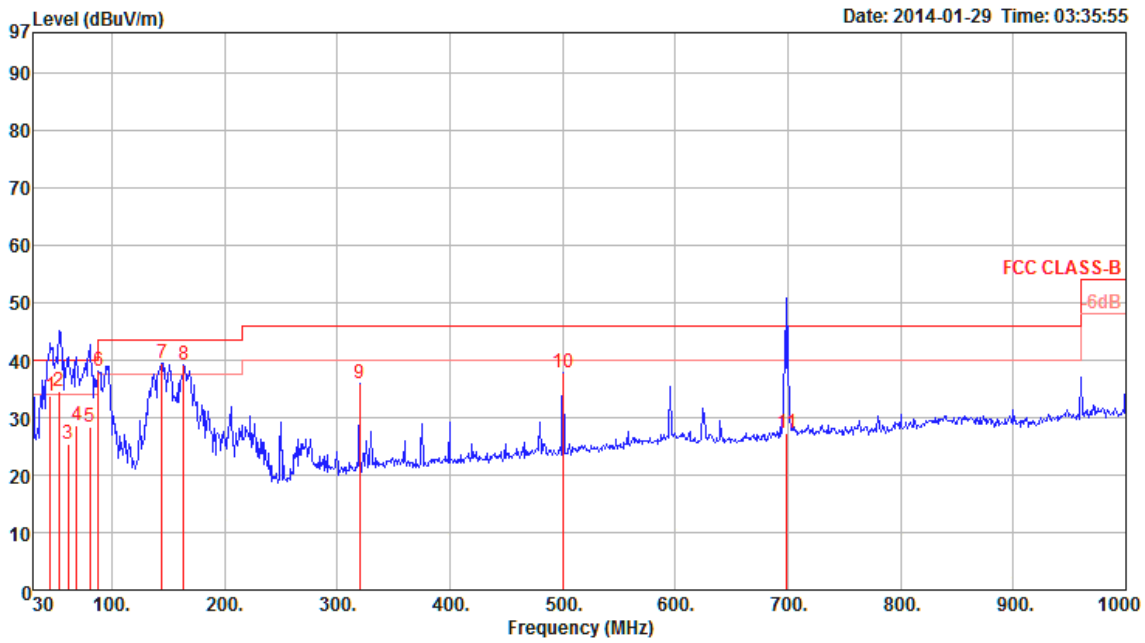
Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	94.02	28.51	43.50	-14.99	44.79	1.43	27.85	-16.28	Peak	0	400	HORIZONTAL
2	143.49	37.11	43.50	-6.39	51.14	1.74	27.54	-14.03	Peak	0	400	HORIZONTAL
3	250.19	30.47	46.00	-15.53	42.14	2.38	26.95	-11.67	Peak	0	400	HORIZONTAL
4	320.03	40.15	46.00	-5.85	50.02	2.63	26.91	-9.87	Peak	0	400	HORIZONTAL
5	500.45	39.88	46.00	-6.12	46.63	3.38	27.93	-6.75	Peak	0	400	HORIZONTAL
6	960.23	38.14	54.00	-15.86	37.77	4.86	26.45	0.37	Peak	0	400	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	45.52	33.71	40.00	-6.29	50.20	1.00	27.94	-16.49	QP	177	100	VERTICAL
2	53.28	34.55	40.00	-5.45	53.20	1.10	27.91	-18.65	QP	272	100	VERTICAL
3	61.04	25.39	40.00	-14.61	45.30	1.18	27.98	-19.91	QP	114	217	VERTICAL
4	68.80	28.73	40.00	-11.27	48.60	1.26	27.94	-19.87	QP	64	149	VERTICAL
5	80.44	28.25	40.00	-11.75	47.30	1.35	27.90	-19.05	QP	84	159	VERTICAL
6	88.20	37.97	43.50	-5.53	55.51	1.40	27.88	-17.54	Peak	0	100	VERTICAL
7	144.46	39.38	43.50	-4.12	53.47	1.75	27.53	-14.09	Peak	0	100	VERTICAL
8	163.86	39.19	43.50	-4.31	54.22	1.90	27.41	-15.03	Peak	0	100	VERTICAL
9	320.03	35.81	46.00	-10.19	45.68	2.63	26.91	-9.87	Peak	0	100	VERTICAL
10	500.45	37.74	46.00	-8.26	44.49	3.38	27.93	-6.75	Peak	0	100	VERTICAL
11	699.30	27.36	46.00	-18.64	30.30	4.16	27.09	-2.94	QP	353	100	VERTICAL

Note:

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

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

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

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

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT20 CH 1 / Chain 1 + Chain 2
Test Date	Jan. 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	4820.60	42.48	74.00	-31.52	41.14	3.31	33.06	35.03	Peak	100	131	HORIZONTAL
2	4822.92	30.22	54.00	-23.78	28.88	3.31	33.06	35.03	Average	100	88	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	4820.00	42.84	74.00	-31.16	41.50	3.31	33.06	35.03	Peak	100	211	VERTICAL
2	4825.32	29.95	54.00	-24.05	28.61	3.31	33.06	35.03	Average	100	211	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT20 CH 6 / Chain 1 + Chain 2
Test Date	Jan. 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	4873.64	46.03	74.00	-27.97	44.57	3.33	33.16	35.03	Peak	100	308	HORIZONTAL
2	4873.68	35.42	54.00	-18.58	33.96	3.33	33.16	35.03	Average	100	308	HORIZONTAL
3	7307.80	34.14	54.00	-19.86	29.52	4.06	35.96	35.40	Average	100	106	HORIZONTAL
4	7313.04	46.15	74.00	-27.85	41.53	4.06	35.96	35.40	Peak	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	4873.36	34.97	54.00	-19.03	33.51	3.33	33.16	35.03	Average	100	58	VERTICAL
2	4879.12	45.72	74.00	-28.28	44.26	3.33	33.16	35.03	Peak	100	58	VERTICAL
3	7306.56	34.48	54.00	-19.52	29.90	4.06	35.92	35.40	Average	100	321	VERTICAL
4	7311.00	46.95	74.00	-27.05	42.33	4.06	35.96	35.40	Peak	100	321	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT20 CH 11 / Chain 1 + Chain 2
Test Date	Jan. 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	30.84	54.00	-23.16	29.24	3.35	33.26	35.01	Average	100	57	HORIZONTAL
2	4926.52	42.12	74.00	-31.88	40.52	3.35	33.26	35.01	Peak	100	57	HORIZONTAL
3	7380.48	32.92	54.00	-21.08	28.17	4.06	36.09	35.40	Average	100	271	HORIZONTAL
4	7385.24	45.87	74.00	-28.13	41.12	4.06	36.09	35.40	Peak	100	271	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4924.28	32.43	54.00	-21.57	30.83	3.35	33.26	35.01	Average	100	216	VERTICAL
2	4927.56	44.19	74.00	-29.81	42.59	3.35	33.26	35.01	Peak	100	216	VERTICAL
3	7386.00	32.98	54.00	-21.02	28.23	4.06	36.09	35.40	Average	100	99	VERTICAL
4	7393.44	45.63	74.00	-28.37	40.84	4.06	36.13	35.40	Peak	100	99	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT40 CH 3 / Chain 1 + Chain 2
Test Date	Jan. 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	4843.88	29.18	54.00	-24.82	27.80	3.32	33.09	35.03	Average	100	258	HORIZONTAL
2	4847.80	41.48	74.00	-32.52	40.10	3.32	33.09	35.03	Peak	100	258	HORIZONTAL
3	7260.72	45.18	74.00	-28.82	40.67	4.06	35.85	35.40	Peak	100	141	HORIZONTAL
4	7273.80	32.23	54.00	-21.77	27.68	4.06	35.89	35.40	Average	100	141	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4845.40	41.93	74.00	-32.07	40.55	3.32	33.09	35.03	Peak	100	233	VERTICAL
2	4852.68	28.70	54.00	-25.30	27.32	3.32	33.09	35.03	Average	100	233	VERTICAL
3	7258.80	45.02	74.00	-28.98	40.51	4.06	35.85	35.40	Peak	100	301	VERTICAL
4	7275.44	32.23	54.00	-21.77	27.68	4.06	35.89	35.40	Average	100	301	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Chain 1 + Chain 2
Test Date	Jan. 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	4873.96	30.29	54.00	-23.71	28.83	3.33	33.16	35.03	Average	100	128	HORIZONTAL
2	4881.24	43.07	74.00	-30.93	41.61	3.33	33.16	35.03	Peak	100	128	HORIZONTAL
3	7314.44	32.63	54.00	-21.37	28.01	4.06	35.96	35.40	Average	100	274	HORIZONTAL
4	7316.80	45.74	74.00	-28.26	41.12	4.06	35.96	35.40	Peak	100	274	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	4883.48	30.78	54.00	-23.22	29.32	3.33	33.16	35.03	Average	100	222	VERTICAL
2	4883.72	43.33	74.00	-30.67	41.87	3.33	33.16	35.03	Peak	100	222	VERTICAL
3	7311.64	32.73	54.00	-21.27	28.11	4.06	35.96	35.40	Average	100	152	VERTICAL
4	7316.00	45.49	74.00	-28.51	40.87	4.06	35.96	35.40	Peak	100	152	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT40 CH 9 / Chain 1 + Chain 2
Test Date	Jan. 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	4901.48	43.32	74.00	-30.68	41.81	3.34	33.19	35.02	Peak	100	193	HORIZONTAL
2	4907.12	30.31	54.00	-23.69	28.76	3.34	33.23	35.02	Average	100	193	HORIZONTAL
3	7359.16	46.26	74.00	-27.74	41.54	4.06	36.06	35.40	Peak	100	80	HORIZONTAL
4	7365.36	32.82	54.00	-21.18	28.10	4.06	36.06	35.40	Average	100	80	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4903.96	30.32	54.00	-23.68	28.81	3.34	33.19	35.02	Average	100	9	VERTICAL
2	4911.44	42.83	74.00	-31.17	41.28	3.34	33.23	35.02	Peak	100	9	VERTICAL
3	7357.48	45.45	74.00	-28.55	40.77	4.06	36.02	35.40	Peak	100	157	VERTICAL
4	7365.88	33.09	54.00	-20.91	28.37	4.06	36.06	35.40	Average	100	157	VERTICAL

For non-beamforming mode:

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2
Test Date	Jan. 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	3830.02	43.47	74.00	-30.53	44.16	2.84	31.64	35.17	Peak	101	211	HORIZONTAL
2	3830.03	37.22	54.00	-16.78	37.91	2.84	31.64	35.17	Average	101	211	HORIZONTAL
3	4787.84	41.52	74.00	-32.48	40.28	3.29	32.99	35.04	Peak	101	115	HORIZONTAL
4	4789.40	32.96	54.00	-21.04	31.72	3.29	32.99	35.04	Average	101	115	HORIZONTAL
5	11490.72	38.21	54.00	-15.79	29.60	5.11	38.78	35.28	Average	100	138	HORIZONTAL
6	11495.34	49.49	74.00	-24.51	40.87	5.12	38.78	35.28	Peak	100	138	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	3829.99	49.14	74.00	-24.86	49.83	2.84	31.64	35.17	Peak	100	350	VERTICAL
2	3830.04	45.99	54.00	-8.01	46.68	2.84	31.64	35.17	Average	100	350	VERTICAL
3	4787.42	48.64	74.00	-25.36	47.40	3.29	32.99	35.04	Peak	100	309	VERTICAL
4	4787.50	41.79	54.00	-12.21	40.55	3.29	32.99	35.04	Average	100	309	VERTICAL
5	11487.78	45.30	54.00	-8.70	36.69	5.11	38.78	35.28	Average	106	8	VERTICAL
6	11490.54	57.93	74.00	-16.07	49.32	5.11	38.78	35.28	Peak	106	8	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2
Test Date	Jan. 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	3856.71	43.37	74.00	-30.63	43.88	2.84	31.81	35.16	Peak	100	210	HORIZONTAL
2	3856.72	37.50	54.00	-16.50	38.01	2.84	31.81	35.16	Average	100	210	HORIZONTAL
3	4820.79	44.79	74.00	-29.21	43.45	3.31	33.06	35.03	Peak	100	221	HORIZONTAL
4	4820.87	32.43	54.00	-21.57	31.09	3.31	33.06	35.03	Average	100	221	HORIZONTAL
5	11559.26	51.21	74.00	-22.79	42.56	5.13	38.82	35.30	Peak	100	20	HORIZONTAL
6	11568.92	39.48	54.00	-14.52	30.82	5.13	38.83	35.30	Average	100	20	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	3856.66	48.96	74.00	-25.04	49.47	2.84	31.81	35.16	Peak	100	350	VERTICAL
2	3856.69	45.87	54.00	-8.13	46.38	2.84	31.81	35.16	Average	100	350	VERTICAL
3	4820.81	49.29	74.00	-24.71	47.95	3.31	33.06	35.03	Peak	100	305	VERTICAL
4	4820.86	41.84	54.00	-12.16	40.50	3.31	33.06	35.03	Average	100	305	VERTICAL
5	11567.00	56.40	74.00	-17.60	47.75	5.13	38.82	35.30	Peak	100	346	VERTICAL
6	11569.40	45.31	54.00	-8.69	36.65	5.13	38.83	35.30	Average	100	346	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2
Test Date	Jan. 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	3883.35	44.99	74.00	-29.01	45.32	2.84	31.98	35.15	Peak	100	243	HORIZONTAL
2	3883.39	38.94	54.00	-15.06	39.27	2.84	31.98	35.15	Average	100	243	HORIZONTAL
3	4854.19	34.30	54.00	-19.70	32.89	3.32	33.12	35.03	Average	100	188	HORIZONTAL
4	4854.98	43.64	54.00	-10.36	42.23	3.32	33.12	35.03	Average	100	188	HORIZONTAL
5	11643.32	49.80	74.00	-24.20	41.08	5.16	38.86	35.30	Peak	100	295	HORIZONTAL
6	11651.00	38.86	54.00	-15.14	30.14	5.16	38.86	35.30	Average	100	295	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	3883.35	46.03	54.00	-7.97	46.36	2.84	31.98	35.15	Average	100	353	VERTICAL
2	3883.38	49.29	74.00	-24.71	49.62	2.84	31.98	35.15	Peak	100	353	VERTICAL
3	4853.84	49.05	74.00	-24.95	47.64	3.32	33.12	35.03	Peak	100	307	VERTICAL
4	4854.21	41.37	54.00	-12.63	39.96	3.32	33.12	35.03	Average	100	307	VERTICAL
5	11642.86	54.87	74.00	-19.13	46.15	5.16	38.86	35.30	Peak	104	349	VERTICAL
6	11650.36	43.38	54.00	-10.62	34.66	5.16	38.86	35.30	Average	104	349	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2
Test Date	Jan. 06, 2014 ~ Jan. 07, 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	3836.69	38.46	54.00	-15.54	39.07	2.84	31.72	35.17	Average	102	243	HORIZONTAL
2	3836.78	44.76	74.00	-29.24	45.37	2.84	31.72	35.17	Peak	102	243	HORIZONTAL
3	11508.30	37.94	54.00	-16.06	29.31	5.12	38.79	35.28	Average	100	209	HORIZONTAL
4	11508.70	49.36	74.00	-24.64	40.73	5.12	38.79	35.28	Peak	100	209	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	3835.00	45.87	54.00	-8.13	46.48	2.84	31.72	35.17	Average	100	297	VERTICAL
2	3836.61	49.62	74.00	-24.38	50.23	2.84	31.72	35.17	Peak	100	351	VERTICAL
3	11504.80	41.87	54.00	-12.13	33.24	5.12	38.79	35.28	Average	100	348	VERTICAL
4	11508.80	54.76	74.00	-19.24	46.13	5.12	38.79	35.28	Peak	100	348	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3863.33	37.42	54.00	-16.58	37.93	2.84	31.81	35.16	Average	100	243	HORIZONTAL
2	3863.39	44.07	74.00	-29.93	44.58	2.84	31.81	35.16	Peak	100	243	HORIZONTAL
3	11586.40	39.55	54.00	-14.45	30.88	5.14	38.83	35.30	Average	100	197	HORIZONTAL
4	11596.50	49.46	74.00	-24.54	40.78	5.15	38.83	35.30	Peak	100	197	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	3863.30	49.50	74.00	-24.50	50.01	2.84	31.81	35.16	Peak	100	354	VERTICAL
2	3863.36	44.90	54.00	-9.10	45.41	2.84	31.81	35.16	Average	100	354	VERTICAL
3	11586.70	53.09	74.00	-20.91	44.42	5.14	38.83	35.30	Peak	100	281	VERTICAL
4	11591.30	42.32	54.00	-11.68	33.65	5.14	38.83	35.30	Average	100	281	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3850.02	42.59	74.00	-31.41	43.11	2.84	31.81	35.17	Peak	100	243	HORIZONTAL
2	3850.03	35.89	54.00	-18.11	36.41	2.84	31.81	35.17	Average	100	243	HORIZONTAL
3	5133.58	32.89	54.00	-21.11	30.85	3.43	33.64	35.03	Average	100	335	HORIZONTAL
4	5134.13	44.39	54.00	-9.61	42.35	3.43	33.64	35.03	Average	100	335	HORIZONTAL
5	11563.28	48.65	74.00	-25.35	40.00	5.13	38.82	35.30	Peak	100	236	HORIZONTAL
6	11571.28	36.38	54.00	-17.62	27.71	5.14	38.83	35.30	Average	100	236	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	3850.06	44.92	54.00	-9.08	45.44	2.84	31.81	35.17	Average	100	353	VERTICAL
2	3850.07	50.10	74.00	-23.90	50.62	2.84	31.81	35.17	Peak	100	353	VERTICAL
3	5133.37	42.78	54.00	-11.22	40.74	3.43	33.64	35.03	Average	100	265	VERTICAL
4	5133.56	49.15	74.00	-24.85	47.11	3.43	33.64	35.03	Peak	100	265	VERTICAL
5	11537.68	41.78	54.00	-12.22	33.13	5.13	38.81	35.29	Average	100	341	VERTICAL
6	11557.68	51.60	74.00	-22.40	42.95	5.13	38.82	35.30	Peak	100	341	VERTICAL

For beamforming mode:

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3830.04	37.55	54.00	-16.45	38.24	2.84	31.64	35.17	Average	100	212	HORIZONTAL
2	3830.10	44.02	74.00	-29.98	44.71	2.84	31.64	35.17	Peak	100	212	HORIZONTAL
3	11489.19	38.62	54.00	-15.38	30.01	5.11	38.78	35.28	Average	100	13	HORIZONTAL
4	11489.94	48.64	74.00	-25.36	40.03	5.11	38.78	35.28	Peak	100	13	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	3829.99	50.42	74.00	-23.58	51.11	2.84	31.64	35.17	Peak	100	357	VERTICAL
2	3830.06	47.79	54.00	-6.21	48.48	2.84	31.64	35.17	Average	100	357	VERTICAL
3	11489.07	44.59	54.00	-9.41	35.98	5.11	38.78	35.28	Average	100	147	VERTICAL
4	11490.63	56.62	74.00	-17.38	48.01	5.11	38.78	35.28	Peak	100	147	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3856.62	43.78	74.00	-30.22	44.29	2.84	31.81	35.16	Peak	100	213	HORIZONTAL
2	3856.71	37.44	54.00	-16.56	37.95	2.84	31.81	35.16	Average	100	213	HORIZONTAL
3	11569.70	49.89	74.00	-24.11	41.23	5.13	38.83	35.30	Peak	100	110	HORIZONTAL
4	11569.82	38.65	54.00	-15.35	29.98	5.14	38.83	35.30	Average	100	110	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	3856.74	47.38	54.00	-6.62	47.89	2.84	31.81	35.16	Average	100	1	VERTICAL
2	3856.79	49.42	74.00	-24.58	49.93	2.84	31.81	35.16	Peak	100	1	VERTICAL
3	11568.69	44.65	54.00	-9.35	35.99	5.13	38.83	35.30	Average	100	3	VERTICAL
4	11571.35	57.60	74.00	-16.40	48.93	5.14	38.83	35.30	Peak	100	3	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3883.39	40.11	54.00	-13.89	40.44	2.84	31.98	35.15	Average	100	228	HORIZONTAL
2	3883.45	44.68	74.00	-29.32	45.01	2.84	31.98	35.15	Peak	100	228	HORIZONTAL
3	11648.14	37.56	54.00	-16.44	28.84	5.16	38.86	35.30	Average	100	125	HORIZONTAL
4	11648.49	51.54	74.00	-22.46	42.82	5.16	38.86	35.30	Peak	100	125	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	3883.34	51.03	74.00	-22.97	51.36	2.84	31.98	35.15	Peak	100	354	VERTICAL
2	3883.40	48.54	54.00	-5.46	48.87	2.84	31.98	35.15	Average	100	354	VERTICAL
3	11650.54	45.02	54.00	-8.98	36.30	5.16	38.86	35.30	Average	100	6	VERTICAL
4	11650.70	58.39	74.00	-15.61	49.67	5.16	38.86	35.30	Peak	100	6	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3836.61	43.64	74.00	-30.36	44.25	2.84	31.72	35.17	Peak	100	212	HORIZONTAL
2	3836.72	37.58	54.00	-16.42	38.19	2.84	31.72	35.17	Average	100	212	HORIZONTAL
3	11510.18	37.87	54.00	-16.13	29.24	5.12	38.79	35.28	Average	100	304	HORIZONTAL
4	11510.26	50.52	74.00	-23.48	41.89	5.12	38.79	35.28	Peak	100	304	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	3836.66	50.66	74.00	-23.34	51.27	2.84	31.72	35.17	Peak	100	357	VERTICAL
2	3836.72	46.71	54.00	-7.29	47.32	2.84	31.72	35.17	Average	100	357	VERTICAL
3	11509.50	41.31	54.00	-12.69	32.68	5.12	38.79	35.28	Average	100	43	VERTICAL
4	11510.11	59.61	74.00	-14.39	50.98	5.12	38.79	35.28	Peak	100	43	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3863.27	44.06	74.00	-29.94	44.57	2.84	31.81	35.16	Peak	100	213	HORIZONTAL
2	3863.41	37.39	54.00	-16.61	37.90	2.84	31.81	35.16	Average	100	213	HORIZONTAL
3	11590.03	51.26	74.00	-22.74	42.59	5.14	38.83	35.30	Peak	100	133	HORIZONTAL
4	11590.66	38.09	54.00	-15.91	29.42	5.14	38.83	35.30	Average	100	133	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	3863.35	50.11	74.00	-23.89	50.62	2.84	31.81	35.16	Peak	100	358	VERTICAL
2	3863.41	46.23	54.00	-7.77	46.74	2.84	31.81	35.16	Average	100	358	VERTICAL
3	11587.59	42.69	54.00	-11.31	34.02	5.14	38.83	35.30	Average	100	345	VERTICAL
4	11590.10	61.24	74.00	-12.76	52.57	5.14	38.83	35.30	Peak	100	345	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	Jan. 07, 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	3850.02	37.49	54.00	-16.51	38.01	2.84	31.81	35.17	Average	100	243	HORIZONTAL
2	3850.12	42.98	74.00	-31.02	43.49	2.84	31.81	35.16	Peak	100	243	HORIZONTAL
3	11548.11	36.44	54.00	-17.56	27.80	5.13	38.81	35.30	Average	100	59	HORIZONTAL
4	11551.26	48.96	74.00	-25.04	40.31	5.13	38.82	35.30	Peak	100	59	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	3850.02	47.44	54.00	-6.56	47.96	2.84	31.81	35.17	Average	100	328	VERTICAL
2	3850.02	50.45	74.00	-23.55	50.97	2.84	31.81	35.17	Peak	100	328	VERTICAL
3	11547.89	51.34	74.00	-22.66	42.70	5.13	38.81	35.30	Peak	100	318	VERTICAL
4	11550.18	39.84	54.00	-14.16	31.20	5.13	38.81	35.30	Average	100	318	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 1 / Chain 1
Test Date	Jan. 16, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4823.81	44.03	74.00	-29.97	41.95	4.21	34.69	2.08	Peak	45	100	HORIZONTAL
2	4824.01	30.36	54.00	-23.64	28.28	4.21	34.69	2.08	Average	44	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4841.00	29.48	54.00	-24.52	27.36	4.21	34.68	2.12	Average	232	100	VERTICAL
2	4846.00	42.54	74.00	-31.46	40.42	4.21	34.68	2.12	Peak	232	100	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 6 / Chain 1
Test Date	Jan. 16, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4873.94	45.54	54.00	-8.46	43.33	4.22	34.67	2.21	Average	257	100	HORIZONTAL
2	4873.98	50.36	74.00	-23.64	48.15	4.22	34.67	2.21	Peak	257	100	HORIZONTAL
3	7301.44	49.10	74.00	-24.90	41.72	5.34	34.93	7.38	Peak	184	100	HORIZONTAL
4	7311.80	37.87	54.00	-16.13	30.50	5.34	34.94	7.37	Average	184	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4873.89	53.52	74.00	-20.48	51.31	4.22	34.67	2.21	Peak	131	119	VERTICAL
2	4873.92	49.47	54.00	-4.53	47.26	4.22	34.67	2.21	Average	131	119	VERTICAL
3	7309.24	49.26	74.00	-24.74	41.88	5.34	34.93	7.38	Peak	360	100	VERTICAL
4	7310.08	38.40	54.00	-15.60	31.02	5.34	34.93	7.38	Average	360	100	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 11 / Chain 1
Test Date	Jan. 16, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.92	49.66	74.00	-24.34	47.32	4.23	34.65	2.34	Peak	256	100	HORIZONTAL
2	4923.99	44.74	54.00	-9.26	42.40	4.23	34.65	2.34	Average	256	100	HORIZONTAL
3	7385.41	49.78	74.00	-24.22	42.30	5.36	34.96	7.48	Peak	32	100	HORIZONTAL
4	7385.75	35.89	54.00	-18.11	28.41	5.36	34.96	7.48	Average	32	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.98	47.03	54.00	-6.97	44.69	4.23	34.65	2.34	Average	202	132	VERTICAL
2	4924.03	51.21	74.00	-22.79	48.87	4.23	34.65	2.34	Peak	145	132	VERTICAL
3	7386.04	37.67	54.00	-16.33	30.19	5.36	34.96	7.48	Average	211	121	VERTICAL
4	7386.26	50.55	74.00	-23.45	43.07	5.36	34.96	7.48	Peak	211	121	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 1 / Chain 2
Test Date	Jan. 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	4824.00	49.33	54.00	-4.67	47.99	3.31	33.06	35.03	Average	101	200	HORIZONTAL
2	4824.00	52.07	74.00	-21.93	50.73	3.31	33.06	35.03	Peak	101	200	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	4823.92	49.92	74.00	-24.08	48.58	3.31	33.06	35.03	Peak	100	131	VERTICAL
2	4824.00	46.15	54.00	-7.85	44.81	3.31	33.06	35.03	Average	100	131	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 6 / Chain 2
Test Date	Jan. 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	4873.94	50.11	74.00	-23.89	48.65	3.33	33.16	35.03	Peak	102	196	HORIZONTAL
2	4873.95	46.04	54.00	-7.96	44.58	3.33	33.16	35.03	Average	102	196	HORIZONTAL
3	7309.22	45.59	74.00	-28.41	40.97	4.06	35.96	35.40	Peak	100	255	HORIZONTAL
4	7312.04	32.66	54.00	-21.34	28.04	4.06	35.96	35.40	Average	100	255	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	4873.89	53.76	74.00	-20.24	52.30	3.33	33.16	35.03	Peak	104	204	VERTICAL
2	4873.98	51.46	54.00	-2.54	50.00	3.33	33.16	35.03	Average	104	204	VERTICAL
3	7311.54	46.35	74.00	-27.65	41.73	4.06	35.96	35.40	Peak	100	243	VERTICAL
4	7311.80	34.06	54.00	-19.94	29.44	4.06	35.96	35.40	Average	100	243	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 11 / Chain 2
Test Date	Jan. 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	4923.98	46.55	54.00	-7.45	44.95	3.35	33.26	35.01	Average	170	137	HORIZONTAL
2	4924.02	50.16	74.00	-23.84	48.56	3.35	33.26	35.01	Peak	170	137	HORIZONTAL
3	7385.24	33.15	54.00	-20.85	28.40	4.06	36.09	35.40	Average	146	183	HORIZONTAL
4	7385.84	46.45	74.00	-27.55	41.70	4.06	36.09	35.40	Peak	146	183	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	51.89	54.00	-2.11	50.29	3.35	33.26	35.01	Average	104	198	VERTICAL
2	4924.00	53.93	74.00	-20.07	52.33	3.35	33.26	35.01	Peak	104	198	VERTICAL
3	7385.82	46.73	74.00	-27.27	41.98	4.06	36.09	35.40	Peak	100	225	VERTICAL
4	7386.92	34.33	54.00	-19.67	29.58	4.06	36.09	35.40	Average	100	225	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2
Test Date	Jan. 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	4816.12	41.65	74.00	-32.35	40.36	3.31	33.02	35.04	Peak	100	28	HORIZONTAL
2	4827.08	30.69	54.00	-23.31	29.35	3.31	33.06	35.03	Average	100	28	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4826.20	30.32	54.00	-23.68	28.98	3.31	33.06	35.03	Average	100	341	VERTICAL
2	4832.76	42.02	74.00	-31.98	40.68	3.31	33.06	35.03	Peak	100	341	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2
Test Date	Jan. 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	4873.32	49.03	74.00	-24.97	47.57	3.33	33.16	35.03	Peak	100	197	HORIZONTAL
2	4873.56	36.49	54.00	-17.51	35.03	3.33	33.16	35.03	Average	100	197	HORIZONTAL
3	7305.00	33.94	54.00	-20.06	29.36	4.06	35.92	35.40	Average	100	135	HORIZONTAL
4	7314.08	45.70	74.00	-28.30	41.08	4.06	35.96	35.40	Peak	100	135	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	4872.76	35.78	54.00	-18.22	34.32	3.33	33.16	35.03	Average	100	152	VERTICAL
2	4872.80	48.40	74.00	-25.60	46.94	3.33	33.16	35.03	Peak	100	152	VERTICAL
3	7305.80	46.53	74.00	-27.47	41.95	4.06	35.92	35.40	Peak	100	317	VERTICAL
4	7311.68	34.89	54.00	-19.11	30.27	4.06	35.96	35.40	Average	100	317	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2
Test Date	Jan. 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	4923.04	42.48	74.00	-31.52	40.88	3.35	33.26	35.01	Peak	100	85	HORIZONTAL
2	4924.04	31.41	54.00	-22.59	29.81	3.35	33.26	35.01	Average	100	85	HORIZONTAL
3	7377.16	45.67	74.00	-28.33	40.92	4.06	36.09	35.40	Peak	100	202	HORIZONTAL
4	7378.00	33.01	54.00	-20.99	28.26	4.06	36.09	35.40	Average	100	202	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4923.96	46.89	74.00	-27.11	45.29	3.35	33.26	35.01	Peak	100	30	VERTICAL
2	4924.24	34.07	54.00	-19.93	32.47	3.35	33.26	35.01	Average	100	30	VERTICAL
3	7377.16	32.95	54.00	-21.05	28.20	4.06	36.09	35.40	Average	100	301	VERTICAL
4	7389.84	45.84	74.00	-28.16	41.09	4.06	36.09	35.40	Peak	100	301	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2
Test Date	Jan. 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	3829.97	43.08	74.00	-30.92	43.77	2.84	31.64	35.17	Peak	100	243	HORIZONTAL
2	3830.03	36.96	54.00	-17.04	37.65	2.84	31.64	35.17	Average	100	243	HORIZONTAL
3	11488.14	40.80	54.00	-13.20	32.19	5.11	38.78	35.28	Average	112	279	HORIZONTAL
4	11497.26	51.70	74.00	-22.30	43.08	5.12	38.78	35.28	Peak	112	279	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	3829.97	49.05	74.00	-24.95	49.74	2.84	31.64	35.17	Peak	100	352	VERTICAL
2	3830.00	45.57	54.00	-8.43	46.26	2.84	31.64	35.17	Average	100	352	VERTICAL
3	11490.24	46.15	54.00	-7.85	37.54	5.11	38.78	35.28	Average	101	8	VERTICAL
4	11490.48	60.94	74.00	-13.06	52.33	5.11	38.78	35.28	Peak	101	8	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2
Test Date	Jan. 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	3856.67	37.74	54.00	-16.26	38.25	2.84	31.81	35.16	Average	100	245	HORIZONTAL
2	3856.74	44.09	74.00	-29.91	44.60	2.84	31.81	35.16	Peak	100	245	HORIZONTAL
3	4820.57	31.58	54.00	-22.42	30.24	3.31	33.06	35.03	Average	100	89	HORIZONTAL
4	4821.23	43.29	74.00	-30.71	41.95	3.31	33.06	35.03	Peak	100	89	HORIZONTAL
5	11569.52	41.00	54.00	-13.00	32.34	5.13	38.83	35.30	Average	100	156	HORIZONTAL
6	11574.20	52.18	74.00	-21.82	43.51	5.14	38.83	35.30	Peak	100	156	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	3856.69	45.47	54.00	-8.53	45.98	2.84	31.81	35.16	Average	100	350	VERTICAL
2	3856.74	48.74	74.00	-25.26	49.25	2.84	31.81	35.16	Peak	100	350	VERTICAL
3	4820.87	43.99	54.00	-10.01	42.65	3.31	33.06	35.03	Average	103	172	VERTICAL
4	4820.92	52.57	74.00	-21.43	51.23	3.31	33.06	35.03	Peak	103	172	VERTICAL
5	11569.16	46.09	54.00	-7.91	37.43	5.13	38.83	35.30	Average	105	346	VERTICAL
6	11569.34	57.20	74.00	-16.80	48.54	5.13	38.83	35.30	Peak	105	346	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2
Test Date	Jan. 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	3883.34	39.42	54.00	-14.58	39.75	2.84	31.98	35.15	Average	100	243	HORIZONTAL
2	3883.39	44.77	74.00	-29.23	45.10	2.84	31.98	35.15	Peak	100	243	HORIZONTAL
3	4854.12	31.02	54.00	-22.98	29.61	3.32	33.12	35.03	Average	100	279	HORIZONTAL
4	4854.32	42.90	74.00	-31.10	41.49	3.32	33.12	35.03	Peak	100	279	HORIZONTAL
5	11652.52	40.93	54.00	-13.07	32.21	5.16	38.86	35.30	Average	100	173	HORIZONTAL
6	11654.44	51.73	74.00	-22.27	43.01	5.16	38.86	35.30	Peak	100	173	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	3883.38	46.81	54.00	-7.19	47.14	2.84	31.98	35.15	Average	100	353	VERTICAL
2	3883.44	50.22	74.00	-23.78	50.55	2.84	31.98	35.15	Peak	100	353	VERTICAL
3	4854.12	48.95	74.00	-25.05	47.54	3.32	33.12	35.03	Peak	100	305	VERTICAL
4	4854.20	42.16	54.00	-11.84	40.75	3.32	33.12	35.03	Average	100	305	VERTICAL
5	11650.12	46.70	54.00	-7.30	37.98	5.16	38.86	35.30	Average	100	365	VERTICAL
6	11650.36	59.70	74.00	-14.30	50.98	5.16	38.86	35.30	Peak	100	365	VERTICAL

Note:

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

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

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

4.6. Emissions Measurement

4.6.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, Please refer to section 3.10 for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 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

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT20 CH 1, 6, 11 / Chain 1 + Chain 2
Test date	Jan. 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	2388.80	72.56	74.00	-1.44	42.18	2.21	28.17	0.00	Peak	100	80	VERTICAL
2	2390.00	51.96	54.00	-2.04	21.57	2.22	28.17	0.00	Average	100	80	VERTICAL
3	2408.60	105.07			74.64	2.22	28.21	0.00	Average	100	80	VERTICAL
4	2409.00	115.66			85.23	2.22	28.21	0.00	Peak	100	80	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.60	68.91	74.00	-5.09	38.53	2.21	28.17	0.00	Peak	100	15	VERTICAL
2	2390.00	52.20	54.00	-1.80	21.81	2.22	28.17	0.00	Average	100	15	VERTICAL
3	2439.00	120.56			90.04	2.23	28.29	0.00	Peak	100	15	VERTICAL
4	2441.80	109.76			79.23	2.24	28.29	0.00	Average	100	15	VERTICAL
5	2485.10	50.02	54.00	-3.98	19.35	2.26	28.41	0.00	Average	100	15	VERTICAL
6	2485.50	66.39	74.00	-7.61	35.72	2.26	28.41	0.00	Peak	100	15	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2454.40	105.11			74.54	2.24	28.33	0.00	Average	100	20	VERTICAL
2	2454.60	116.35			85.78	2.24	28.33	0.00	Peak	100	20	VERTICAL
3	2484.90	50.23	54.00	-3.77	19.60	2.26	28.37	0.00	Average	100	20	VERTICAL
4	2484.90	72.39	74.00	-1.61	41.76	2.26	28.37	0.00	Peak	100	20	VERTICAL

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

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n MCS0 HT40 CH 3, 6, 9 / Chain 1 + Chain 2
Test date	Jan. 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	2384.00	65.56	74.00	-8.44	35.18	2.21	28.17	0.00	Peak	122	275	VERTICAL
2	2389.60	52.52	54.00	-1.48	22.14	2.21	28.17	0.00	Average	122	275	VERTICAL
3	2425.20	110.14			79.66	2.23	28.25	0.00	Peak	122	275	VERTICAL
4	2427.20	99.09			68.61	2.23	28.25	0.00	Average	122	275	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.00	69.38	74.00	-4.62	39.00	2.21	28.17	0.00	Peak	100	14	VERTICAL
2	2390.00	52.65	54.00	-1.35	22.26	2.22	28.17	0.00	Average	100	14	VERTICAL
3	2441.40	114.45			83.92	2.24	28.29	0.00	Peak	100	14	VERTICAL
4	2441.80	103.14			72.61	2.24	28.29	0.00	Average	100	14	VERTICAL
5	2484.70	50.29	54.00	-3.71	19.66	2.26	28.37	0.00	Average	100	14	VERTICAL
6	2485.10	67.02	74.00	-6.98	36.35	2.26	28.41	0.00	Peak	100	14	VERTICAL

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

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2447.20	104.13			73.60	2.24	28.29	0.00	Average	100	343	VERTICAL
2	2447.60	113.35			82.82	2.24	28.29	0.00	Peak	100	343	VERTICAL
3	2483.50	52.11	54.00	-1.89	21.48	2.26	28.37	0.00	Average	100	343	VERTICAL
4	2485.10	71.70	74.00	-2.30	41.03	2.26	28.41	0.00	Peak	100	343	VERTICAL

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

Note:

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

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

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1
Test date	Jan. 16, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2387.60	64.40	74.00	-9.60	33.62	2.91	0.00	30.78	Peak	204	127	VERTICAL
2	2390.00	52.55	54.00	-1.45	21.77	2.91	0.00	30.78	Average	204	127	VERTICAL
3	2411.00	112.48			81.72	2.92	0.00	30.76	Peak	204	127	VERTICAL
4	2411.20	108.84			78.08	2.92	0.00	30.76	Average	204	127	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2389.20	64.62	74.00	-9.38	33.84	2.91	0.00	30.78	Peak	205	100	VERTICAL
2	2390.00	52.36	54.00	-1.64	21.58	2.91	0.00	30.78	Average	205	100	VERTICAL
3	2437.80	116.93			86.21	2.94	0.00	30.72	Average	205	100	VERTICAL
4	2438.20	121.04			90.32	2.94	0.00	30.72	Peak	205	100	VERTICAL
5	2487.50	61.68	74.00	-12.32	31.01	2.97	0.00	30.67	Peak	205	100	VERTICAL
6	2489.90	49.49	54.00	-4.51	18.82	2.97	0.00	30.67	Average	205	100	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2387.60	65.16	74.00	-8.84	34.38	2.91	0.00	30.78	Peak	202	100	VERTICAL
2	2390.00	52.78	54.00	-1.22	22.00	2.91	0.00	30.78	Average	202	100	VERTICAL
3	2461.20	119.22			88.51	2.95	0.00	30.71	Peak	202	100	VERTICAL
4	2461.20	115.39			84.68	2.95	0.00	30.71	Average	202	100	VERTICAL
5	2483.50	51.35	54.00	-2.65	20.66	2.96	0.00	30.69	Average	202	100	VERTICAL
6	2487.10	63.56	74.00	-10.44	32.87	2.96	0.00	30.69	Peak	202	100	VERTICAL

Item 3, 4 are the fundamental frequency at 2462 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 2
Test date	Jan. 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	2387.00	52.33	54.00	-1.67	21.95	2.21	28.17	0.00	Average	100	337	VERTICAL
2	2388.60	63.74	74.00	-10.26	33.36	2.21	28.17	0.00	Peak	100	337	VERTICAL
3	2411.00	115.51			85.08	2.22	28.21	0.00	Peak	100	337	VERTICAL
4	2411.20	111.57			81.14	2.22	28.21	0.00	Average	100	337	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.00	47.88	54.00	-6.12	17.50	2.21	28.17	0.00	Average	100	92	VERTICAL
2	2388.00	60.55	74.00	-13.45	30.17	2.21	28.17	0.00	Peak	100	92	VERTICAL
3	2436.20	111.16			80.64	2.23	28.29	0.00	Average	100	92	VERTICAL
4	2438.20	115.27			84.75	2.23	28.29	0.00	Peak	100	92	VERTICAL
5	2487.50	61.23	74.00	-12.77	30.56	2.26	28.41	0.00	Peak	100	92	VERTICAL
6	2488.70	48.30	54.00	-5.70	17.63	2.26	28.41	0.00	Average	100	92	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2461.20	114.96			84.39	2.24	28.33	0.00	Peak	100	141	VERTICAL
2	2461.40	111.33			80.76	2.24	28.33	0.00	Average	100	141	VERTICAL
3	2483.50	48.74	54.00	-5.26	18.11	2.26	28.37	0.00	Average	100	141	VERTICAL
4	2483.90	59.68	74.00	-14.32	29.05	2.26	28.37	0.00	Peak	100	141	VERTICAL

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

Temperature	25°C	Humidity	54%
Test Engineer	Jim Huang	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2
Test date	Jan. 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	2389.40	72.00	74.00	-2.00	41.62	2.21	28.17	0.00	Peak	100	81	VERTICAL
2	2390.00	52.22	54.00	-1.78	21.83	2.22	28.17	0.00	Average	100	81	VERTICAL
3	2410.20	115.81			85.38	2.22	28.21	0.00	Peak	100	81	VERTICAL
4	2410.40	105.61			75.18	2.22	28.21	0.00	Average	100	81	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	52.46	54.00	-1.54	22.07	2.22	28.17	0.00	Average	100	16	VERTICAL
2	2390.00	71.21	74.00	-2.79	40.82	2.22	28.17	0.00	Peak	100	16	VERTICAL
3	2441.00	112.45			81.92	2.24	28.29	0.00	Average	100	16	VERTICAL
4	2441.40	121.33			90.80	2.24	28.29	0.00	Peak	100	16	VERTICAL
5	2483.50	67.68	74.00	-6.32	37.05	2.26	28.37	0.00	Peak	100	16	VERTICAL
6	2488.30	51.46	54.00	-2.54	20.79	2.26	28.41	0.00	Average	100	16	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2457.20	106.92			76.35	2.24	28.33	0.00	Average	100	20	VERTICAL
2	2457.40	117.17			86.60	2.24	28.33	0.00	Peak	100	20	VERTICAL
3	2483.50	52.44	54.00	-1.56	21.81	2.26	28.37	0.00	Average	100	20	VERTICAL
4	2487.50	72.44	74.00	-1.56	41.77	2.26	28.41	0.00	Peak	100	20	VERTICAL

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

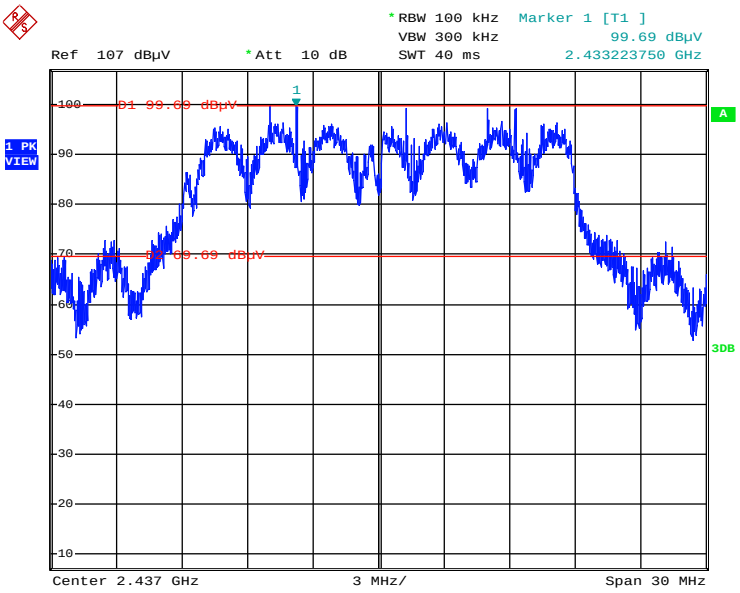
Note:

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

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

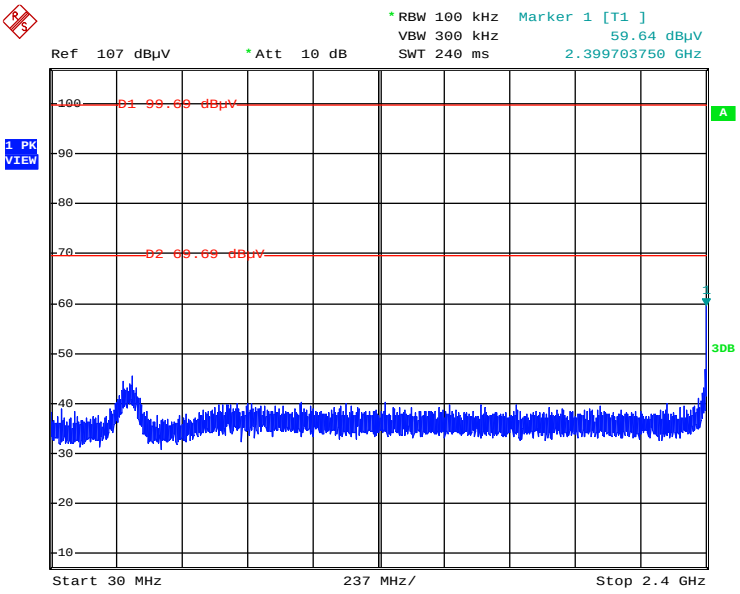
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level



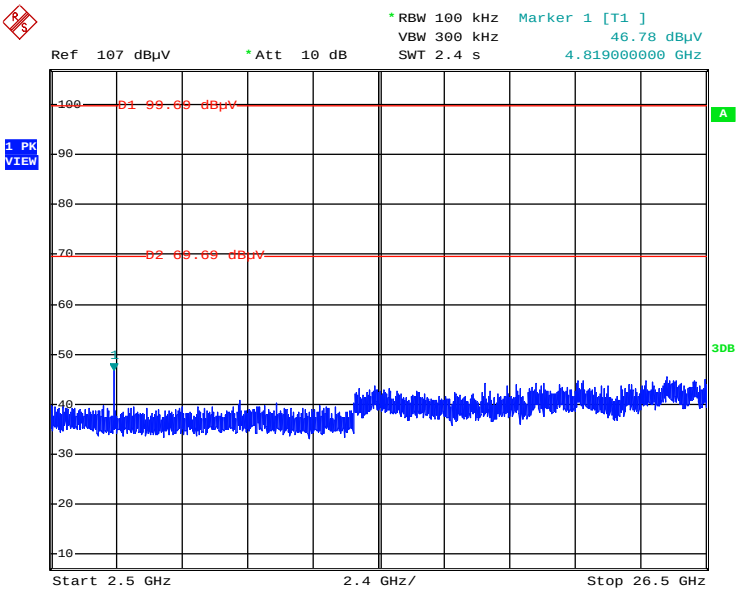
Date: 7.JAN.2014 03:58:20

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



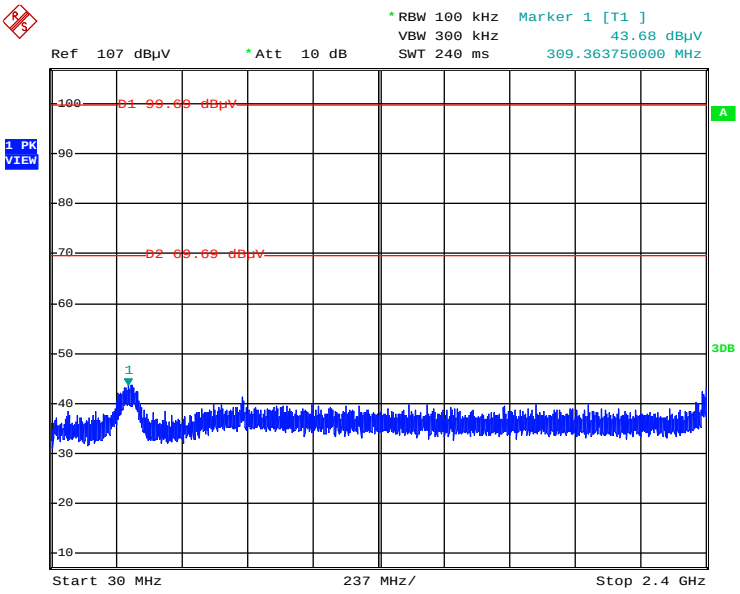
Date: 7.JAN.2014 03:59:06

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



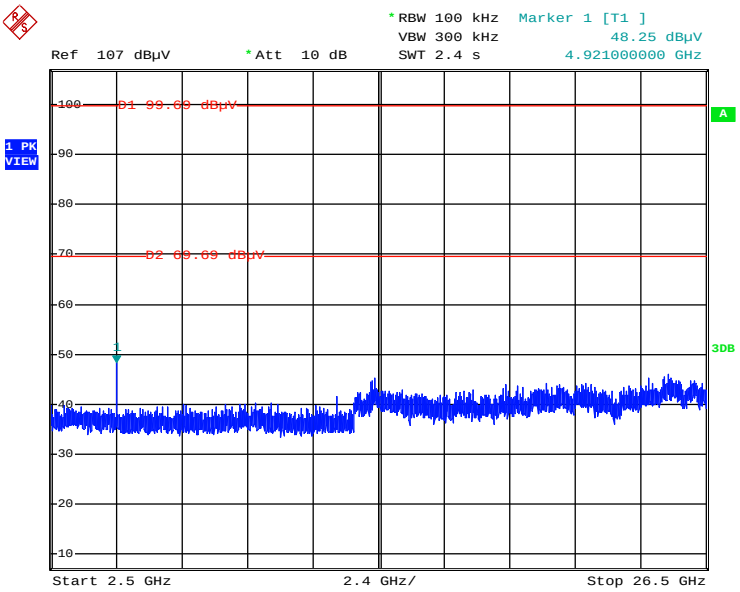
Date: 7.JAN.2014 03:59:37

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



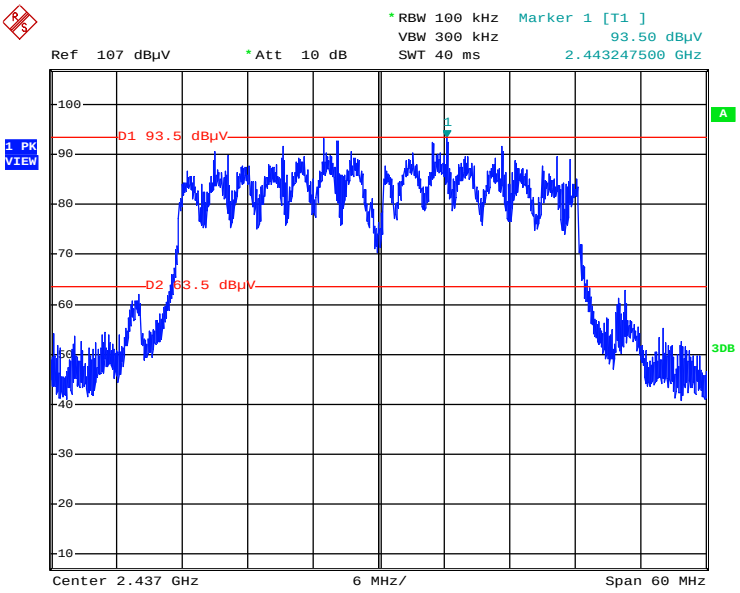
Date: 7.JAN.2014 04:00:47

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)



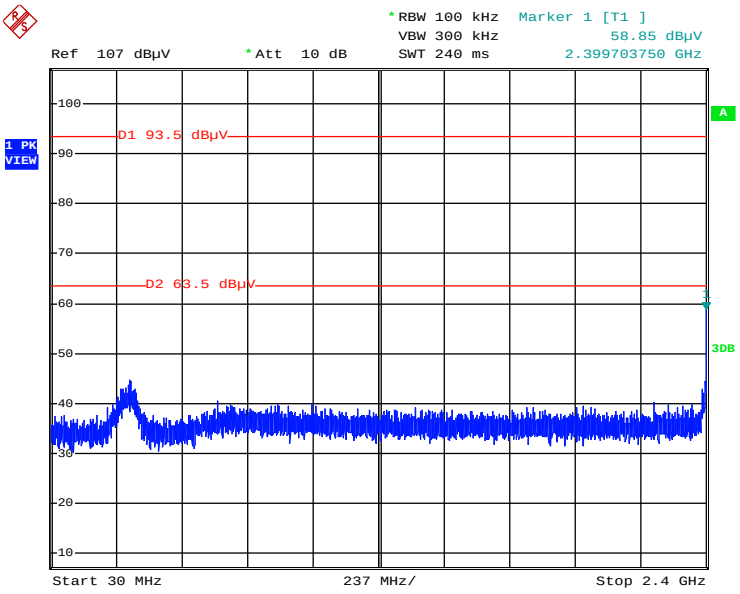
Date: 7.JAN.2014 04:00:14

Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level



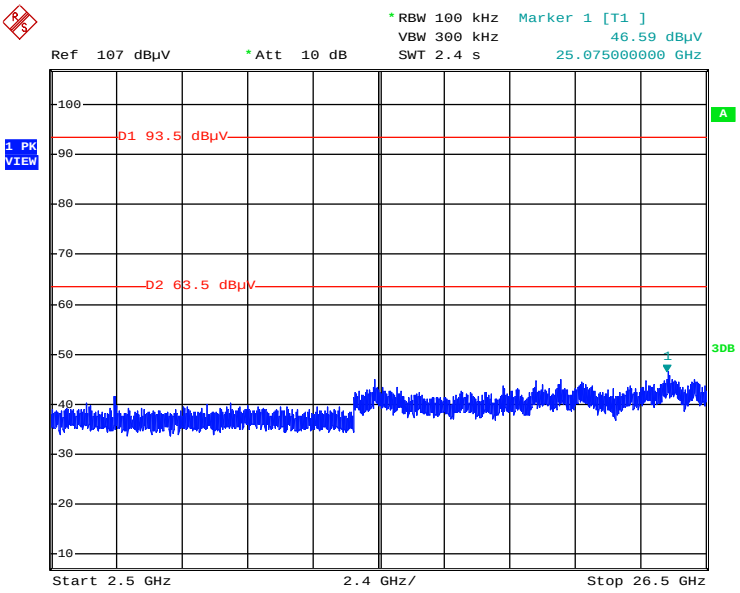
Date: 7.JAN.2014 04:02:20

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



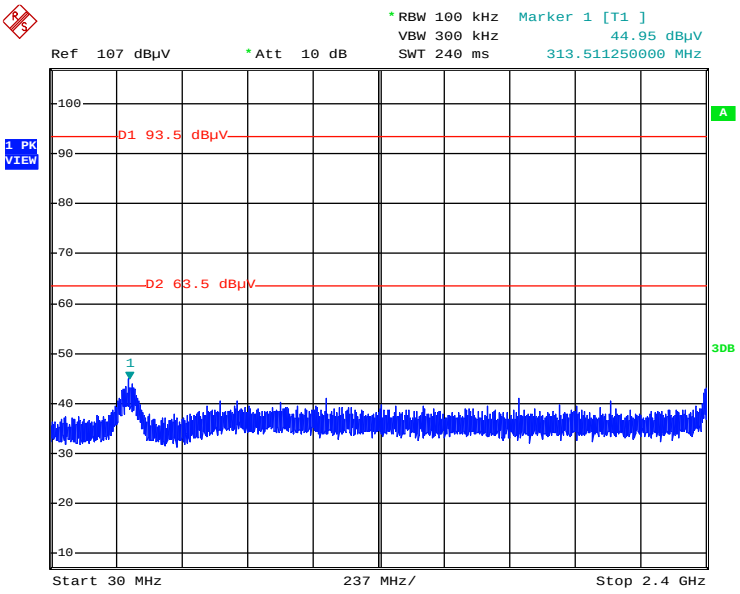
Date: 7.JAN.2014 04:02:56

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



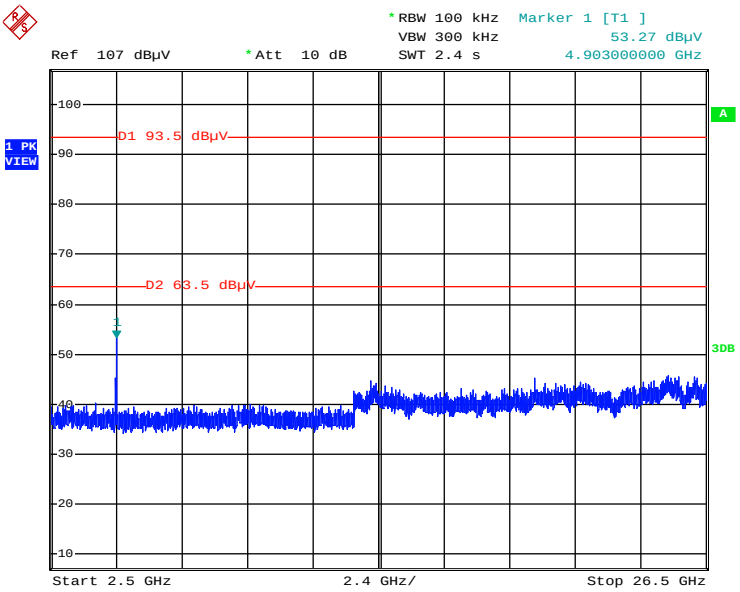
Date: 7.JAN.2014 04:03:31

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 7.JAN.2014 04:04:36

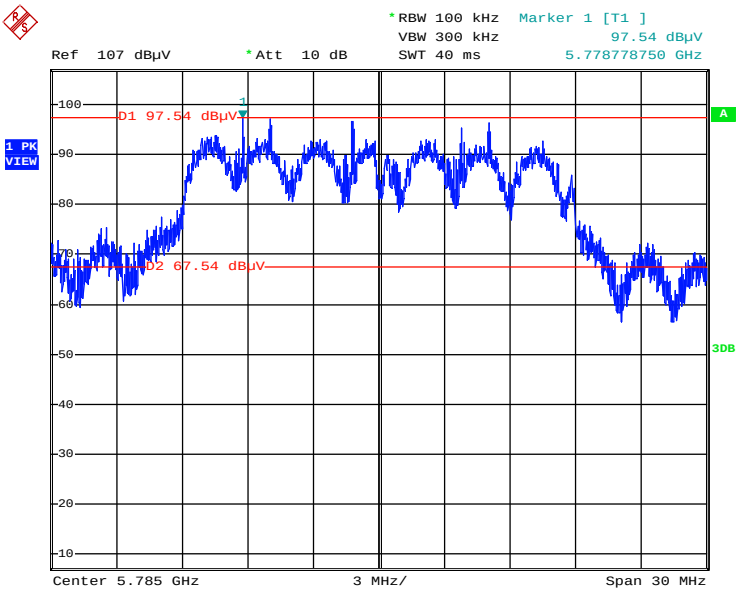
Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



Date: 7.JAN.2014 04:04:13

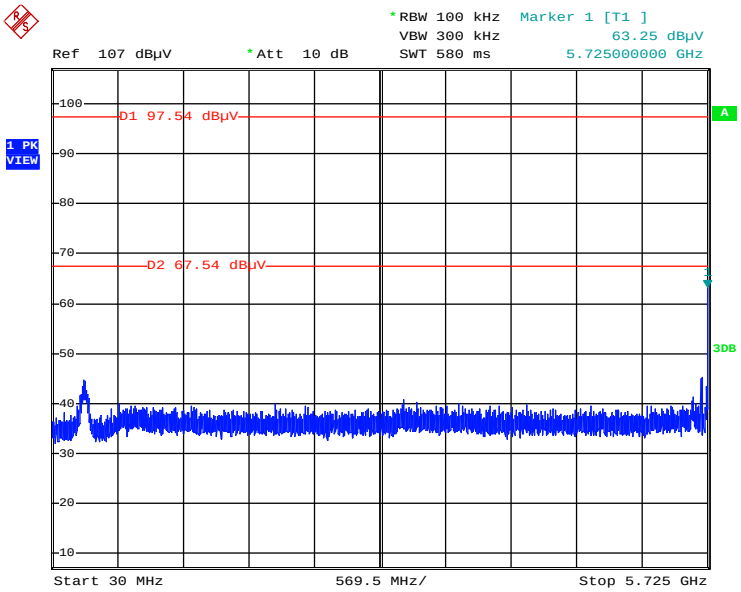
For non-beamforming mode:

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



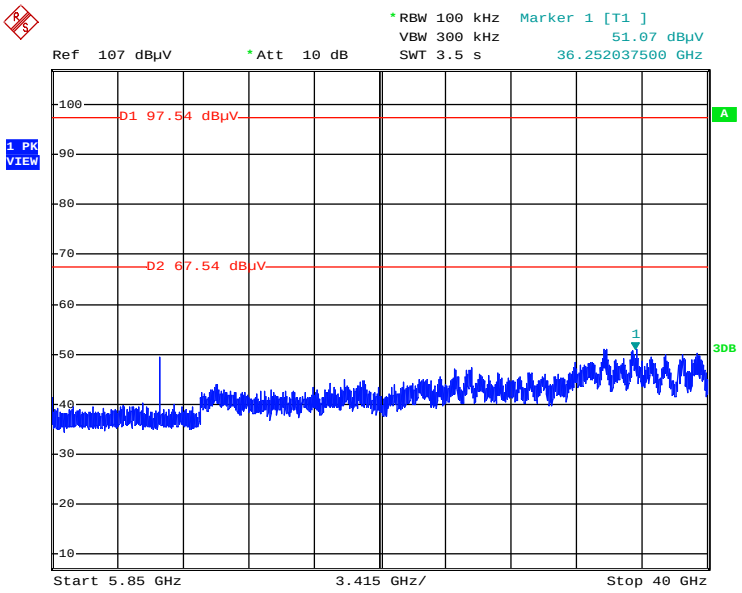
Date: 7.JAN.2014 04:16:00

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 30MHz~5725MHz (down 30dBc)



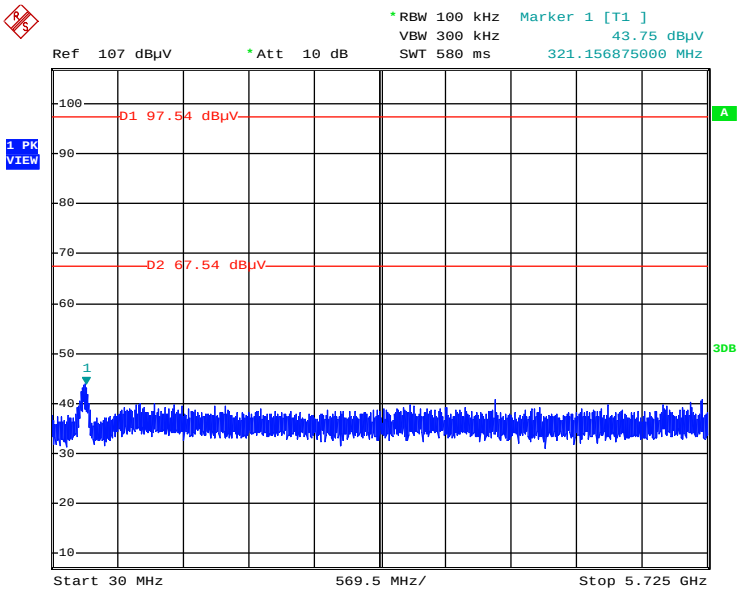
Date: 7.JAN.2014 04:16:36

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 5850MHz~40000MHz (down 30dBc)



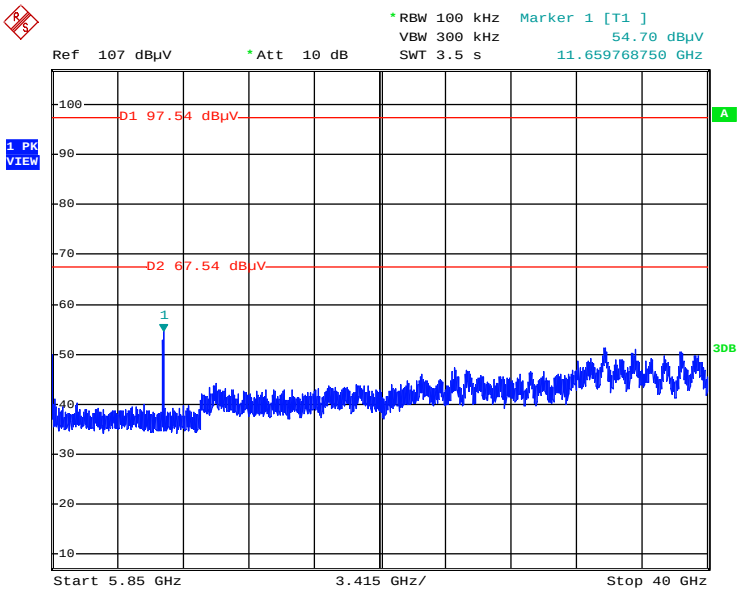
Date: 7.JAN.2014 04:17:09

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 30MHz~5725MHz (down 30dBc)



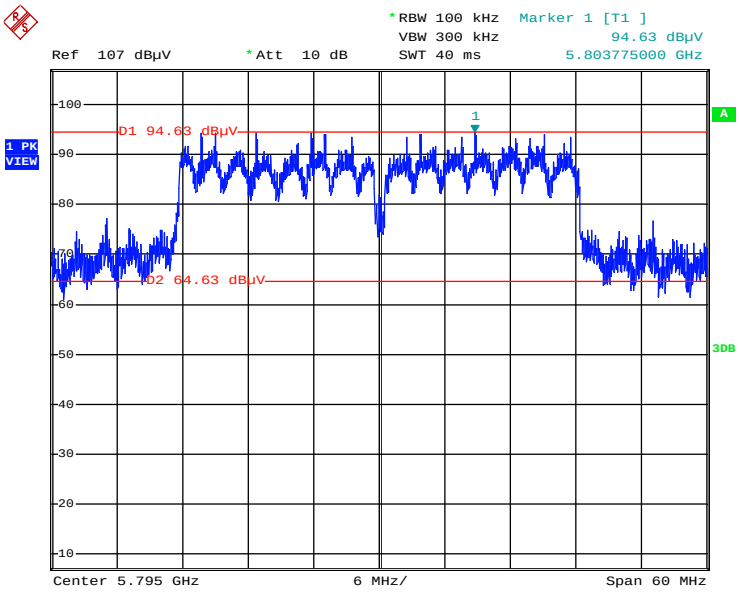
Date: 7.JAN.2014 04:18:19

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)



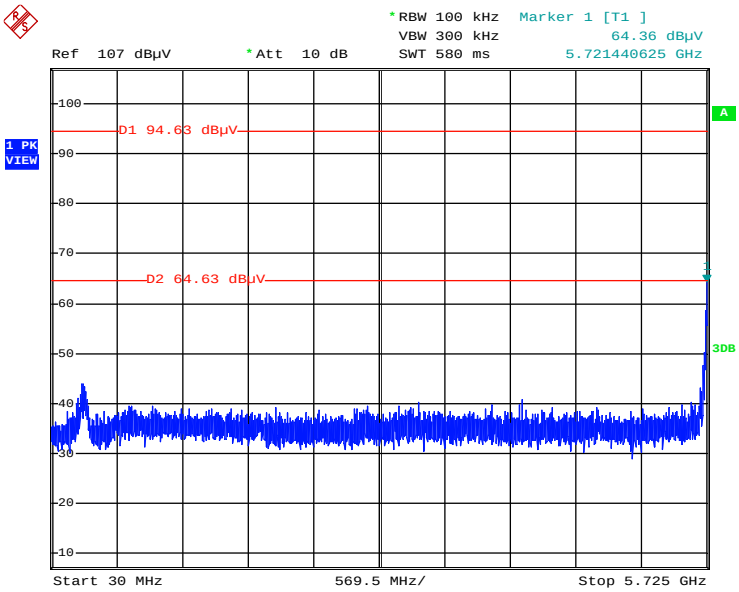
Date: 7.JAN.2014 04:17:41

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



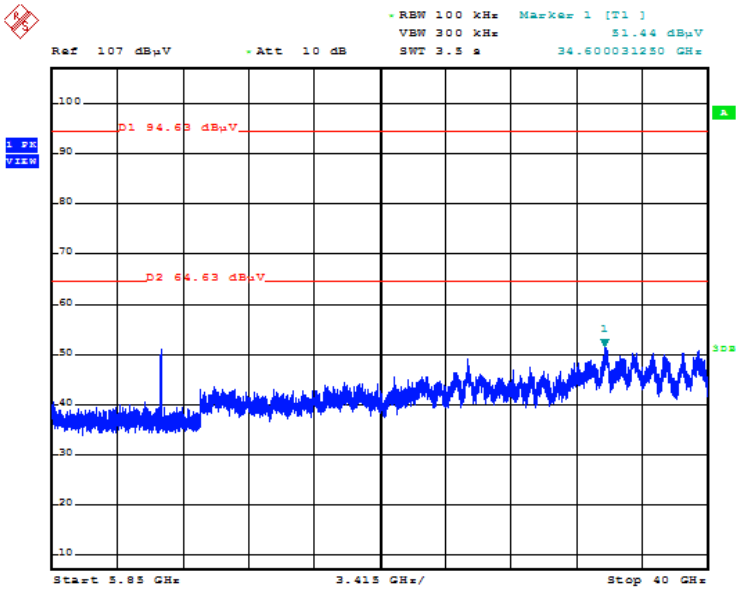
Date: 7.JAN.2014 04:19:30

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 30MHz~5725MHz (down 30dBc)



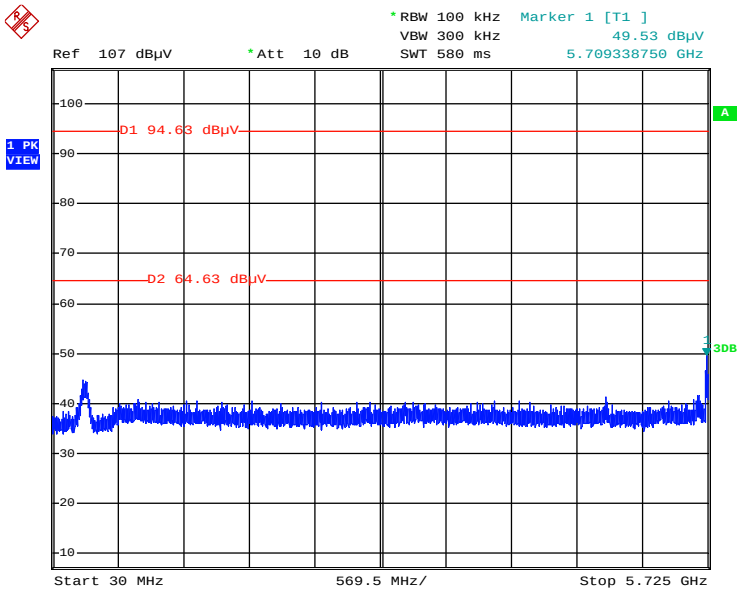
Date: 7.JAN.2014 04:22:08

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 5850MHz~40000MHz (down 30dBc)



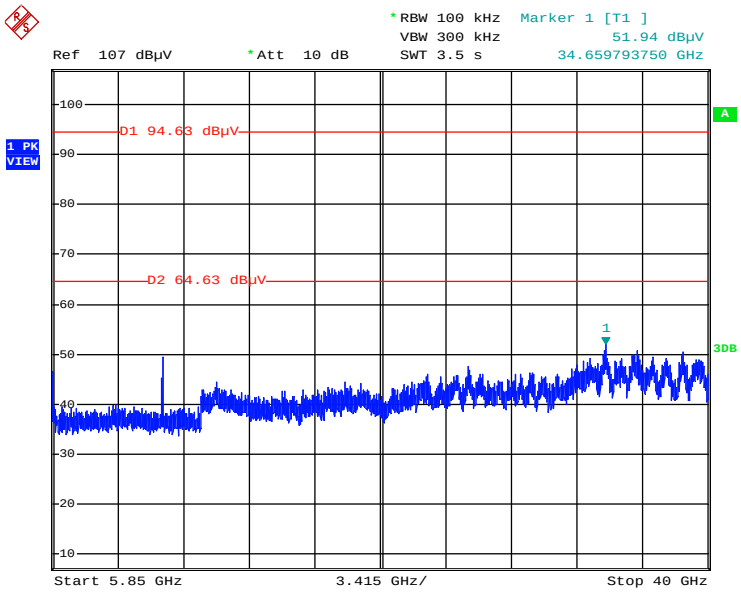
Date: 7.JAN.2014 04:21:26

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 30MHz~5725MHz (down 30dBc)



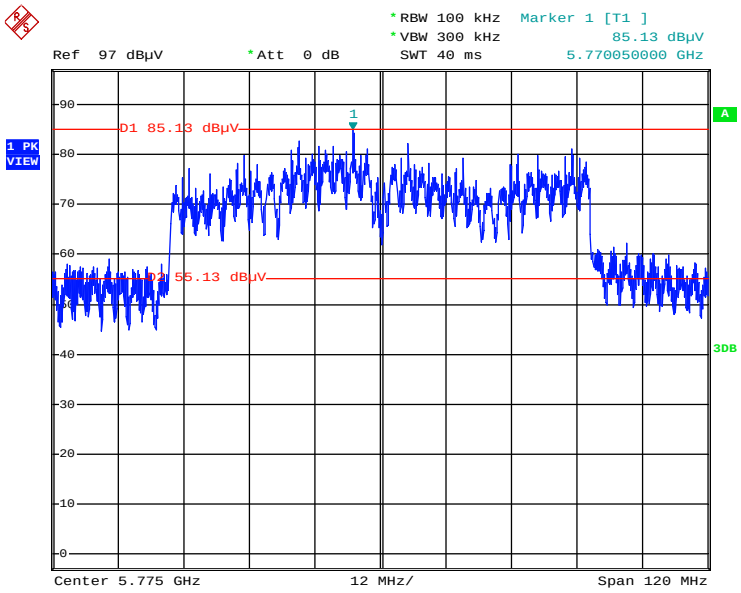
Date: 7.JAN.2014 04:20:24

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 5850MHz~40000MHz (down 30dBc)



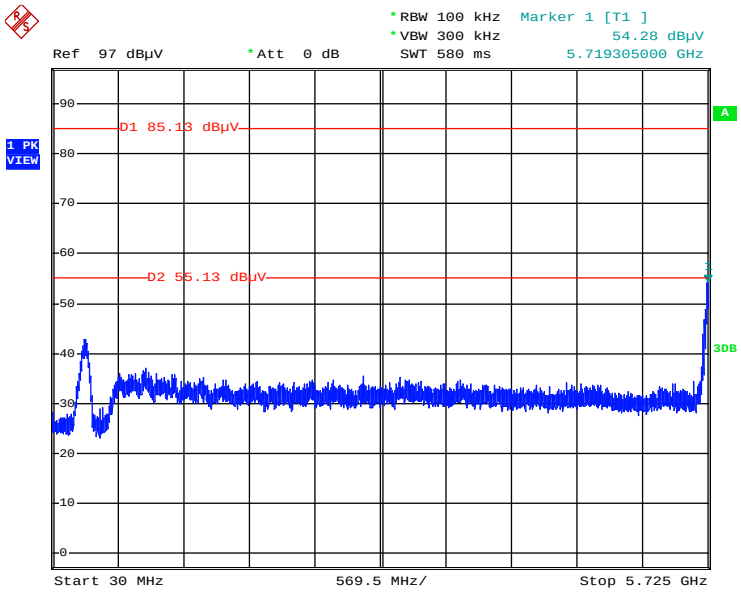
Date: 7.JAN.2014 04:20:55

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



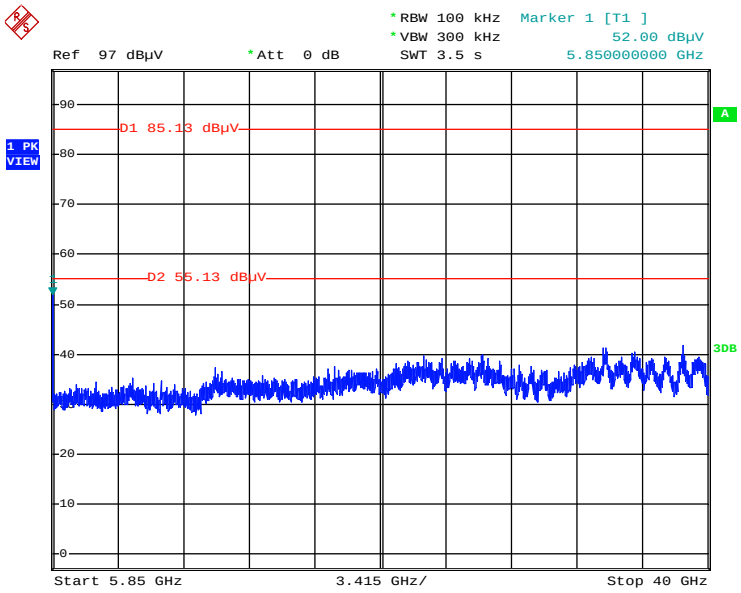
Date: 7.JAN.2014 12:08:45

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 30MHz~5725MHz (down 30dBc)



Date: 7.JAN.2014 12:09:47

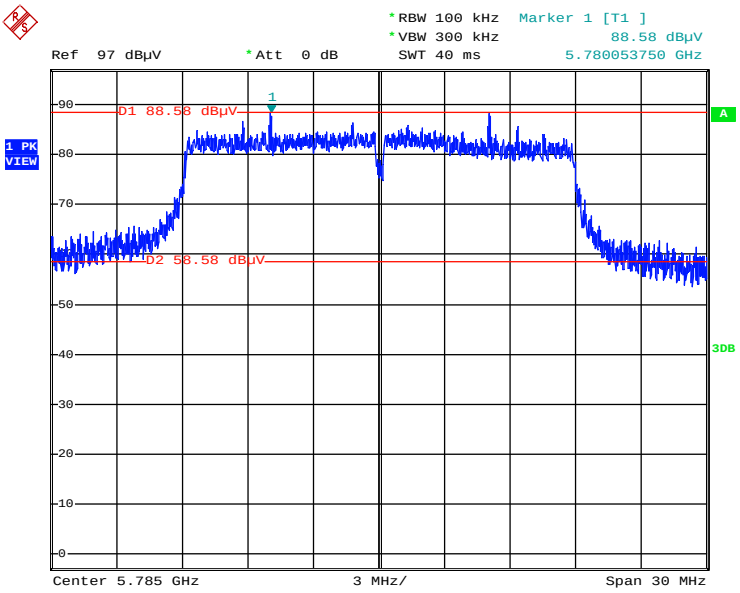
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)



Date: 7.JAN.2014 12:11:05

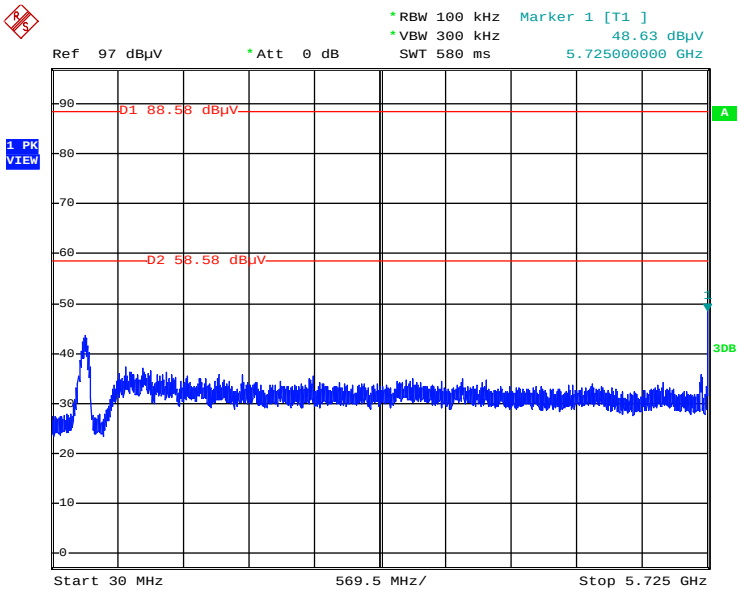
For beamforming mode:

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



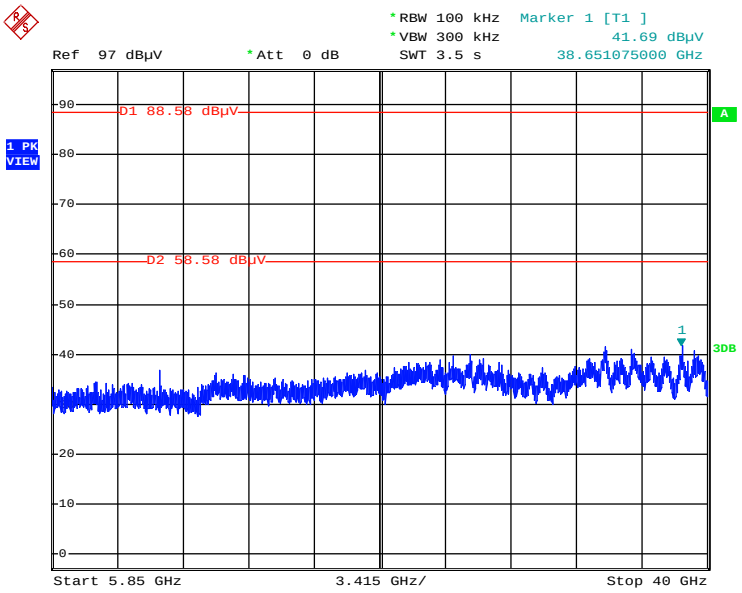
Date: 7.JAN.2014 11:55:24

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 30MHz~5725MHz (down 30dBc)



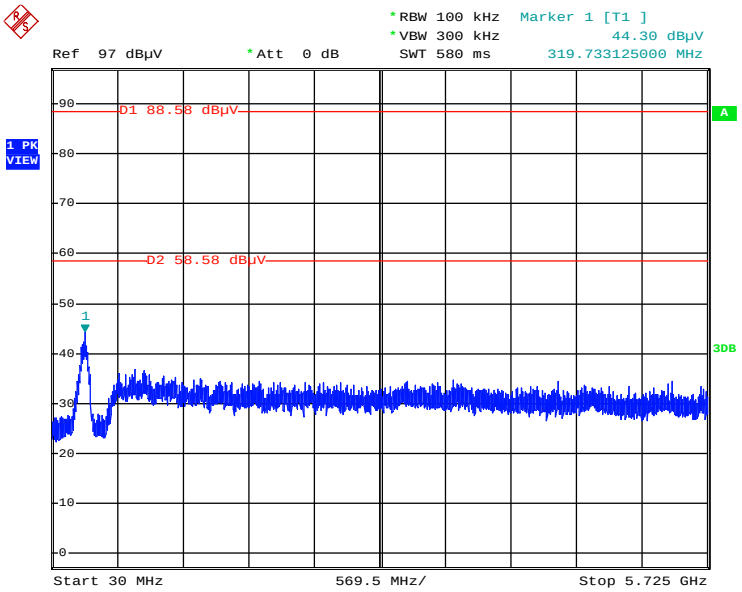
Date: 7.JAN.2014 11:56:20

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 5850MHz~40000MHz (down 30dBc)



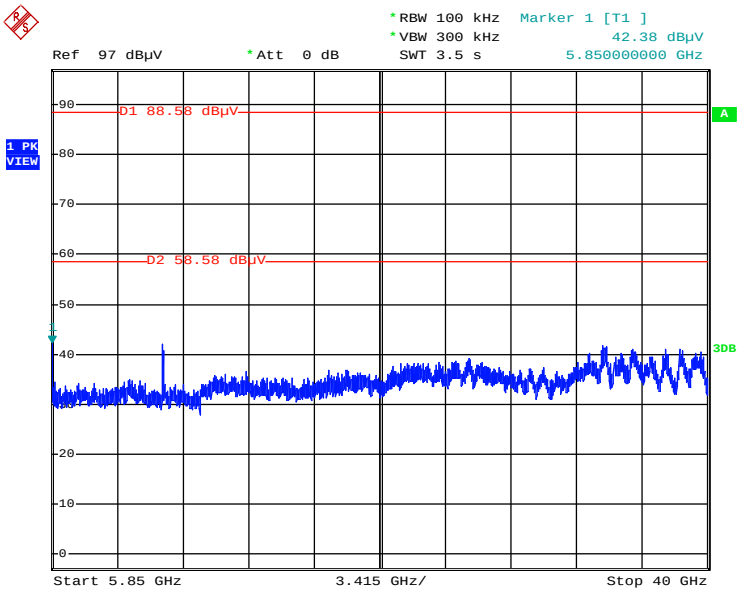
Date: 7.JAN.2014 11:56:52

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 30MHz~5725MHz (down 30dBc)



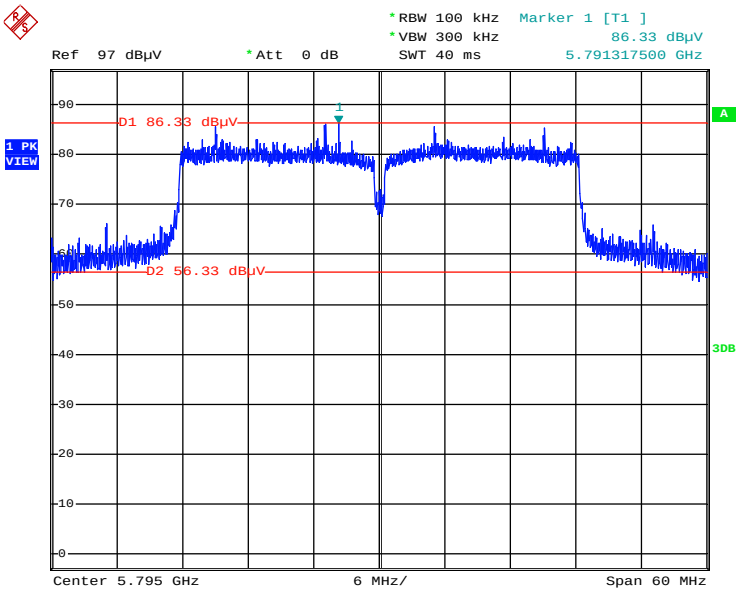
Date: 7.JAN.2014 11:58:15

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)



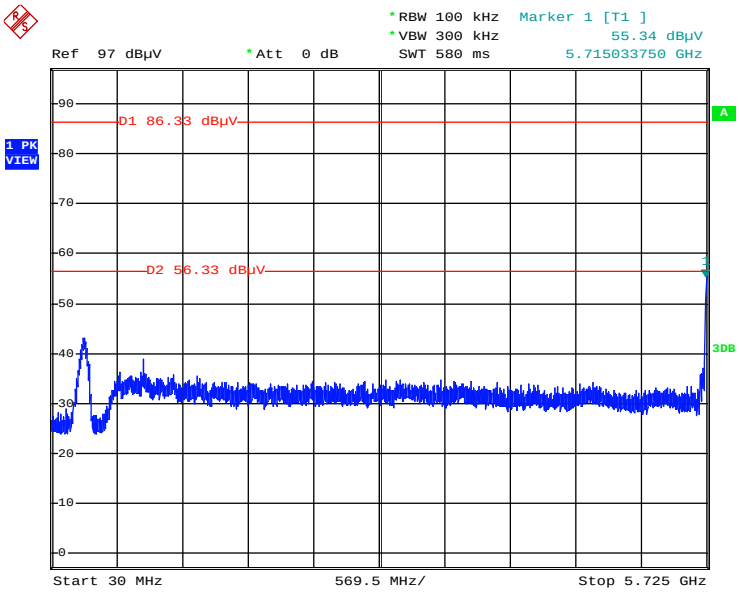
Date: 7.JAN.2014 11:57:52

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



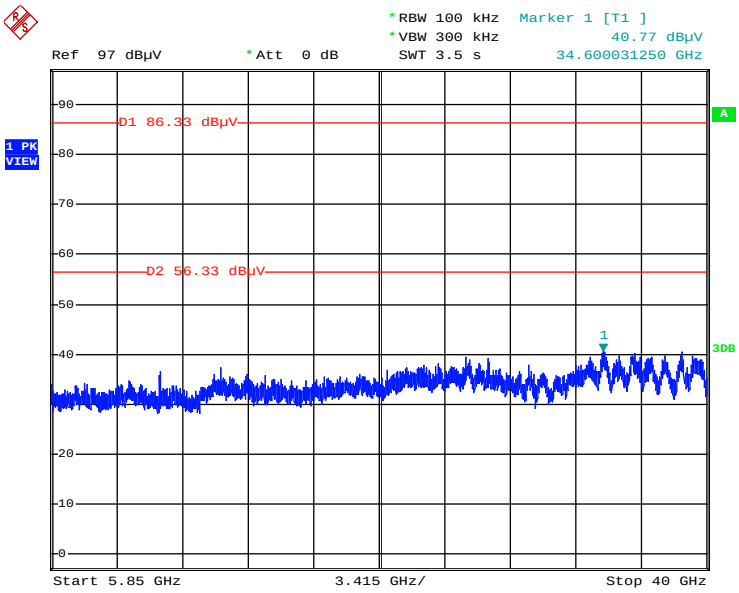
Date: 7.JAN.2014 11:48:17

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 30MHz~5725MHz (down 30dBc)



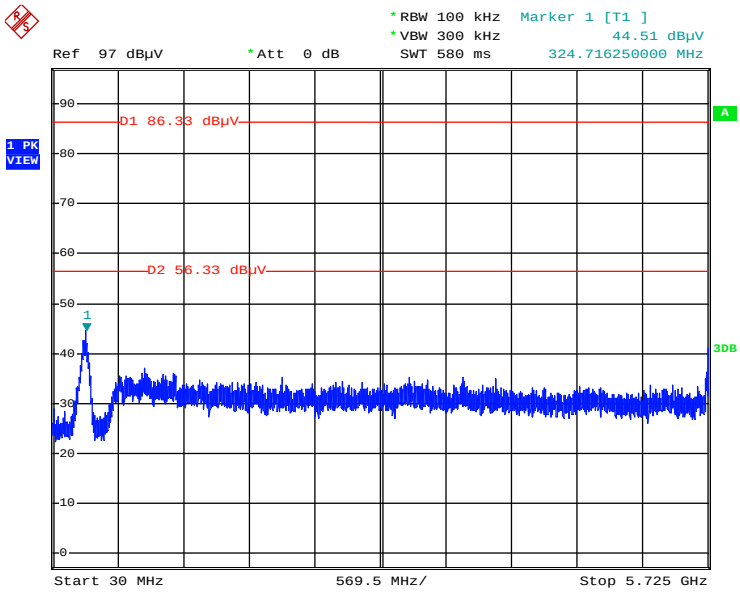
Date: 7.JAN.2014 11:53:21

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 5850MHz~40000MHz (down 30dBc)



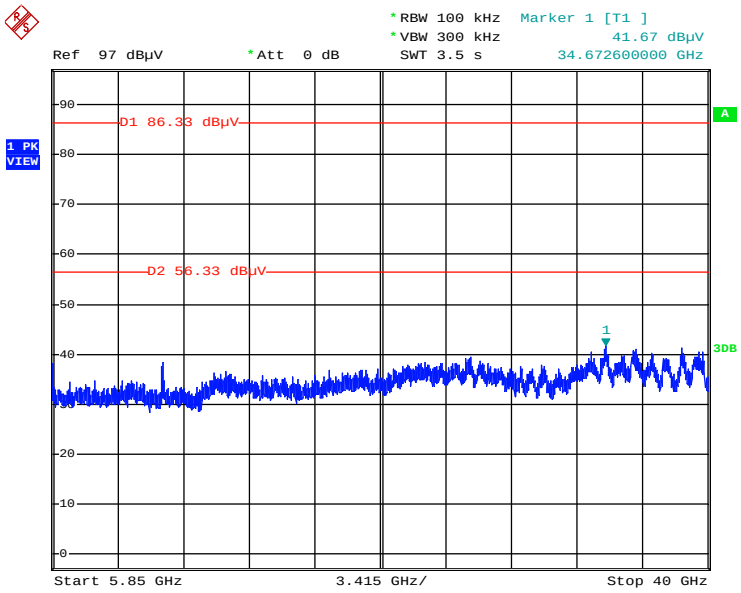
Date: 7.JAN.2014 11:52:46

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 30MHz~5725MHz (down 30dBc)



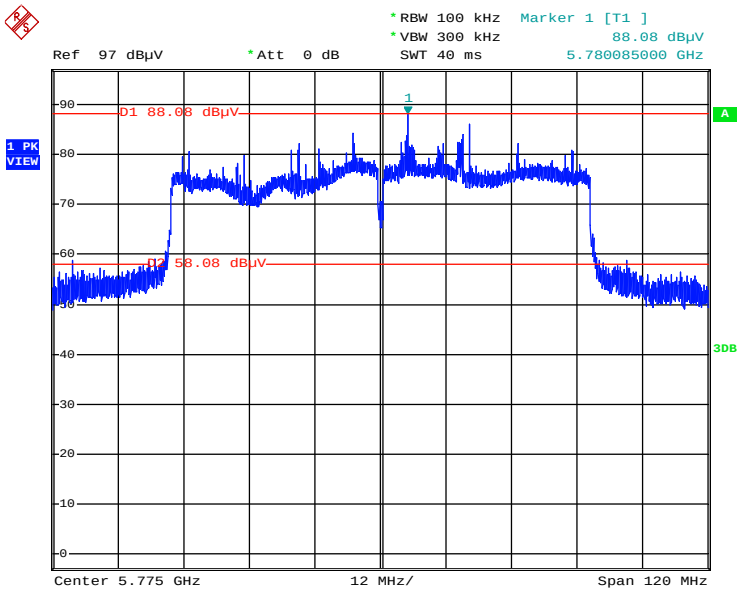
Date: 7.JAN.2014 11:51:09

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 5850MHz~40000MHz (down 30dBc)



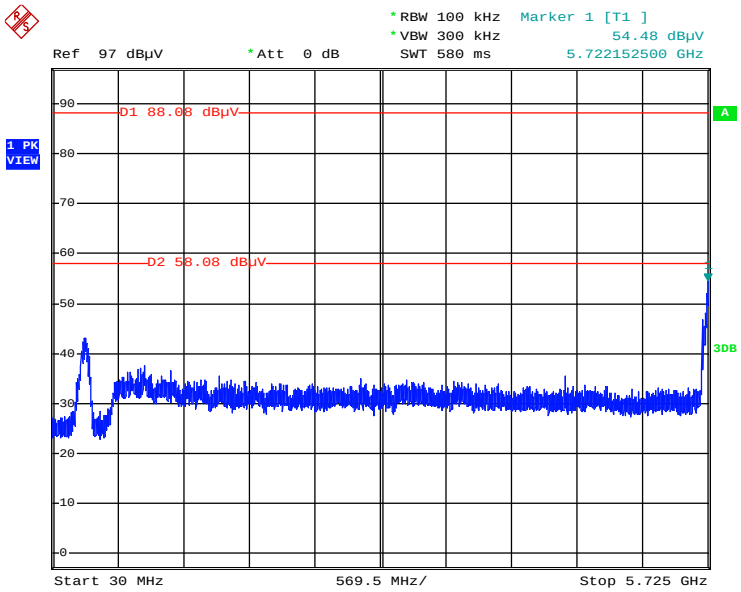
Date: 7.JAN.2014 11:51:56

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



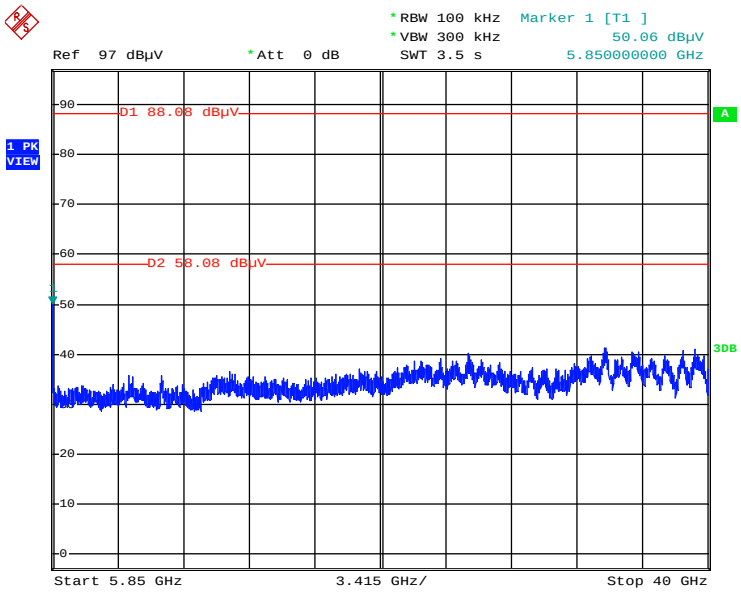
Date: 7.JAN.2014 11:44:51

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 30MHz~5725MHz (down 30dBc)



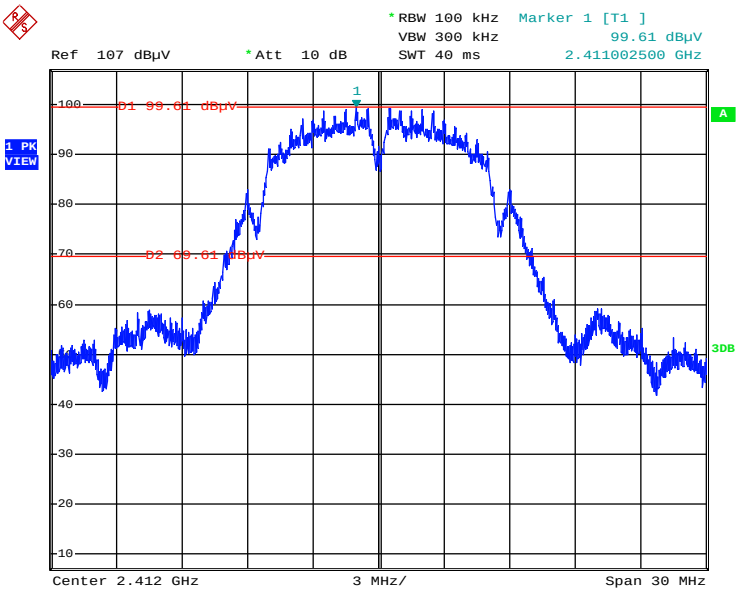
Date: 7.JAN.2014 11:45:20

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)



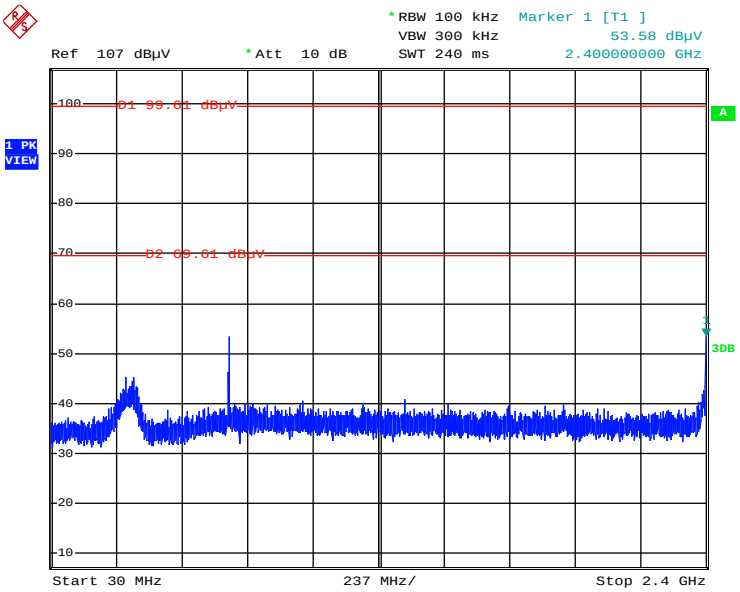
Date: 7.JAN.2014 11:45:59

Plot on Configuration IEEE 802.11b / Reference Level



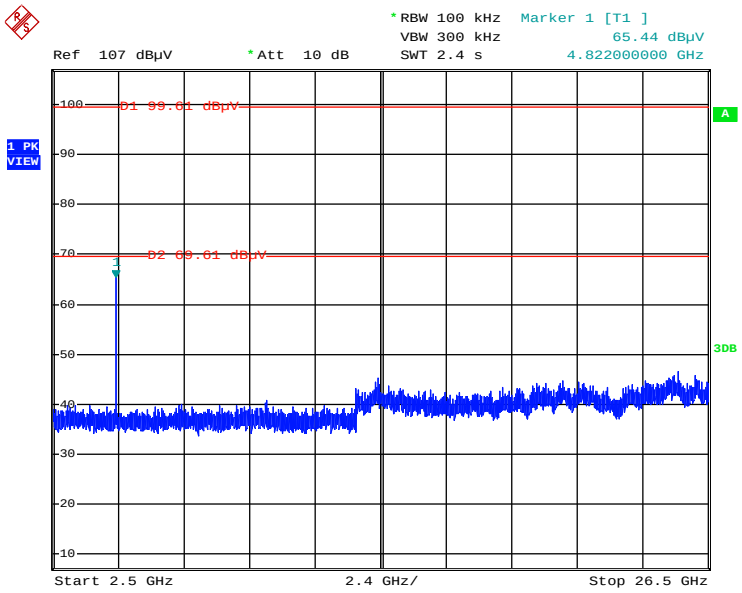
Date: 7.JAN.2014 03:50:20

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



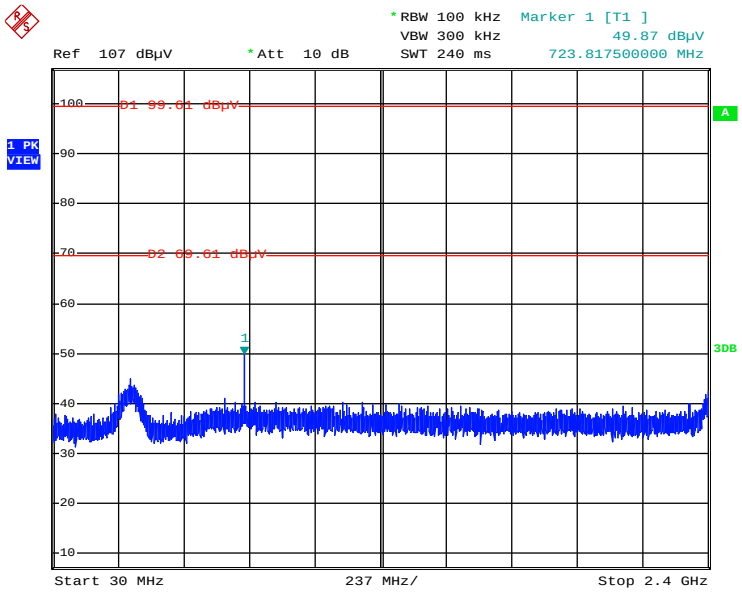
Date: 7.JAN.2014 03:50:41

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



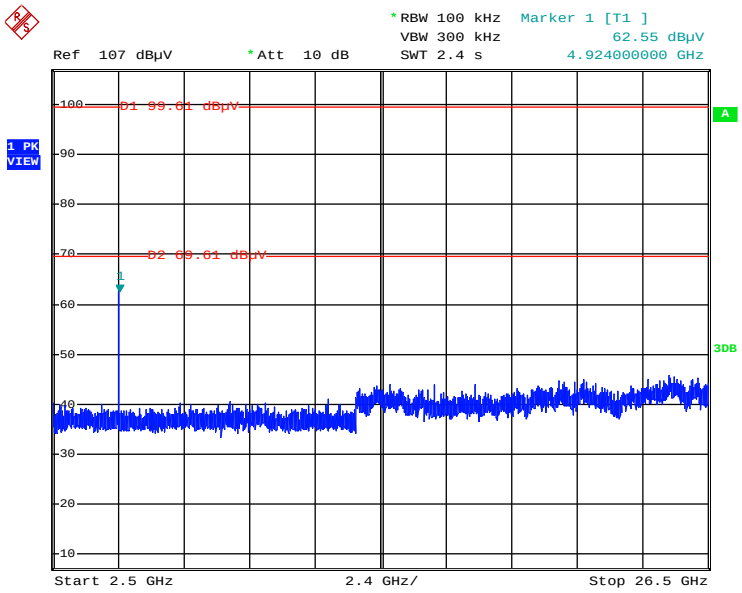
Date: 7.JAN.2014 03:52:05

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



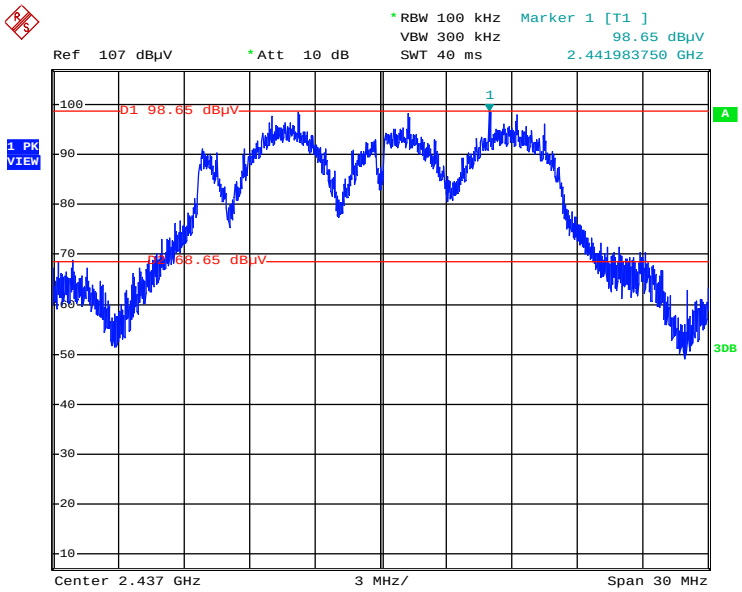
Date: 7.JAN.2014 03:53:19

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



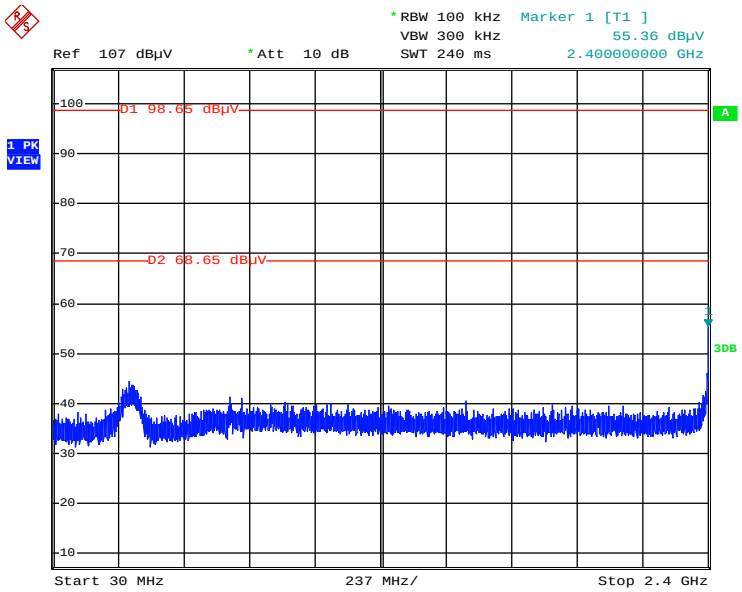
Date: 7.JAN.2014 03:52:49

Plot on Configuration IEEE 802.11g / Reference Level



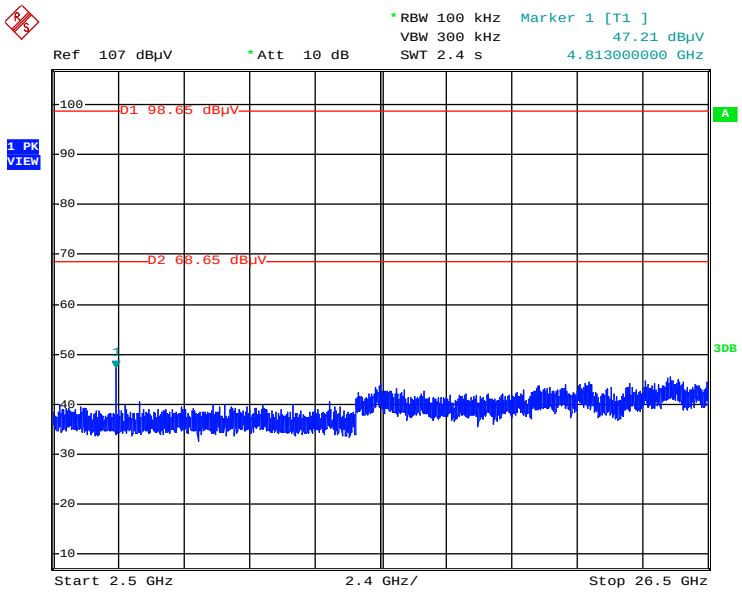
Date: 7.JAN.2014 03:54:57

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



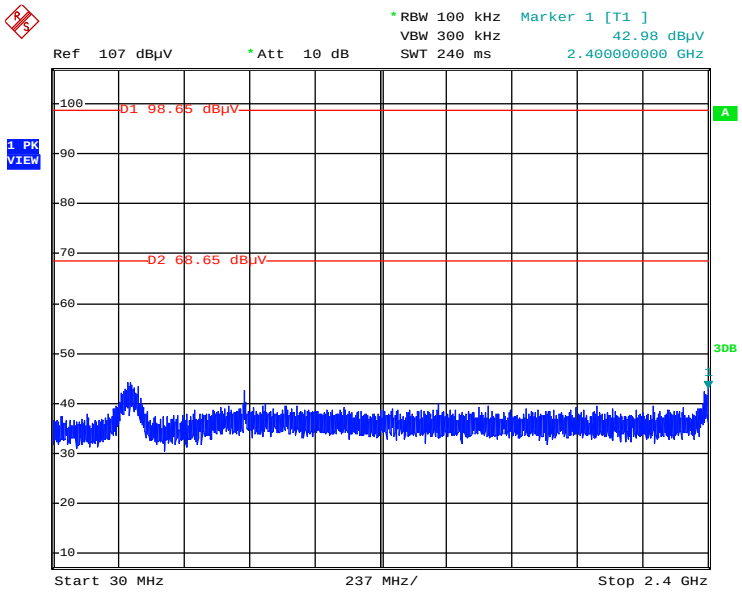
Date: 7.JAN.2014 03:55:45

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



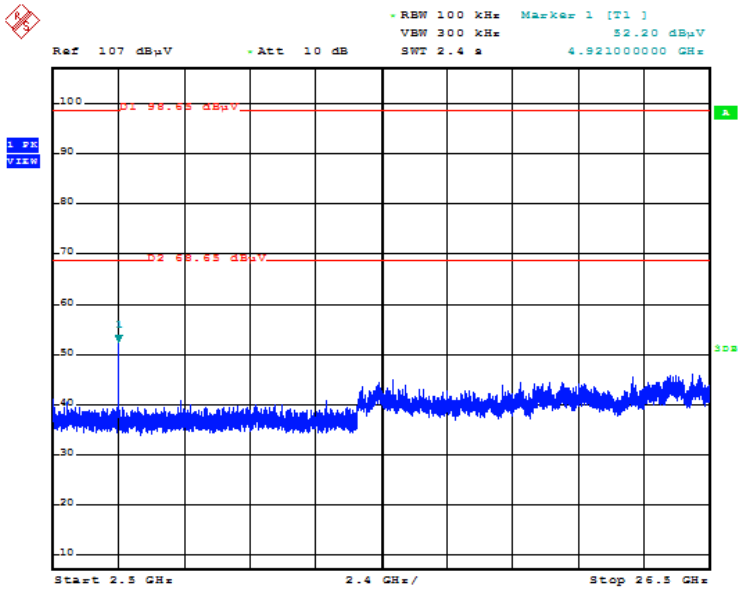
Date: 7.JAN.2014 03:56:17

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



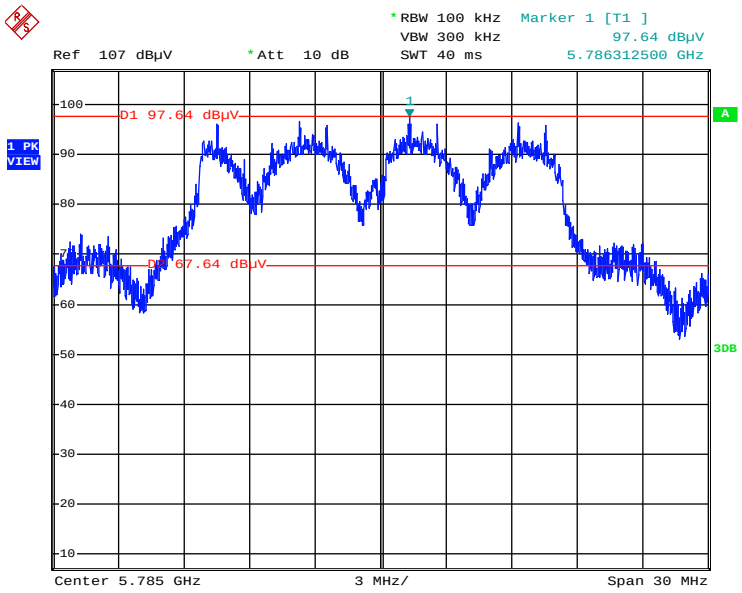
Date: 7.JAN.2014 03:57:18

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



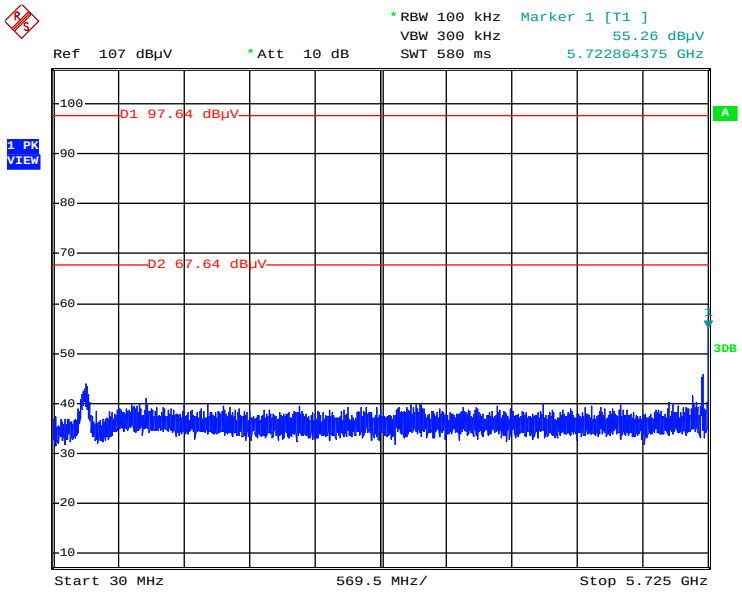
Date: 7.JAN.2014 03:56:53

Plot on Configuration IEEE 802.11a / Reference Level



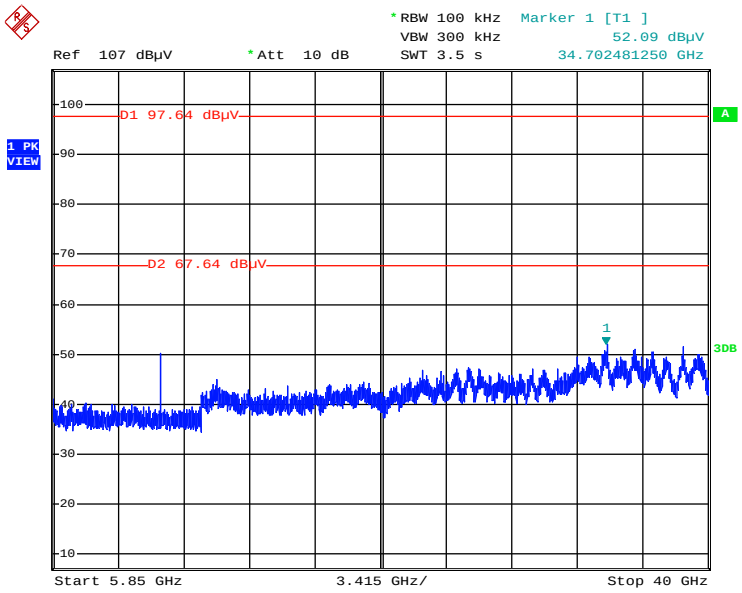
Date: 7.JAN.2014 04:10:55

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



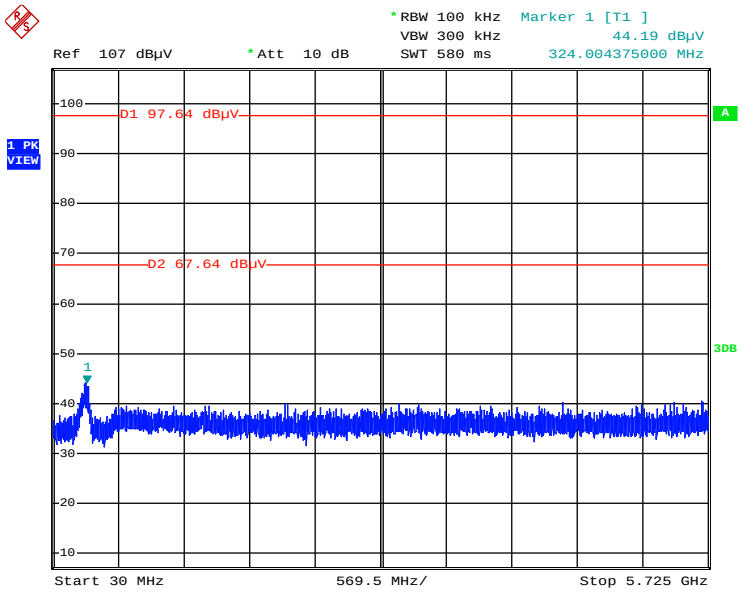
Date: 7.JAN.2014 04:11:56

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



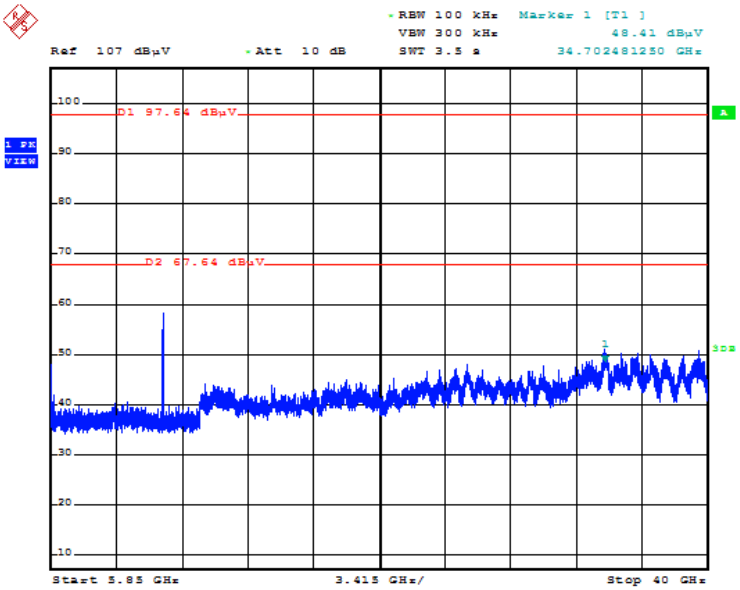
Date: 7.JAN.2014 04:12:47

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



Date: 7.JAN.2014 04:13:51

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



Date: 7.JAN.2014 04:13:26

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,

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	9 kHz ~ 2.75 GHz	Apr. 12, 2013	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150 kHz ~ 100 MHz	Nov. 23, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Nov. 23, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150 kHz ~ 30 MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Apr. 16, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	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	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	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)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
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 Emission (150kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%