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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-RT0M00**
Manufacturer's company (1)	**ASKEY TECHNOLOGH(JIANGSU)LTD.**
Manufacturer Address	N0.1388, JiaoTong Road, WuKiang Economic-Technological Development Area,Jangus Province,P.R.C
Manufacturer's company (2)	**Compal Networking (KunShan) Co., LTD.**
Manufacturer Address	No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China

Product Name	Wireless-AC3200 Tri-band Gigabit Router
Brand Name	ASUS
Model No.	RT-AC3200, RT-AC3200R, RT-AC3200W
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Jul. 17, 2014
Final Test Date	Dec. 16, 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 C63.10-2013**, **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
FR471703AA	Rev. 01	Initial issue of report	Dec. 18, 2014

Certificate No.: CB10312057

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless-AC3200 Tri-band Gigabit Router
Brand Name	:	ASUS
Model No.	:	RT-AC3200, RT-AC3200R, RT-AC3200W
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 Jul. 17, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	12.56 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	0.04 dB
4.3	15.247(e)	Power Spectral Density	Complies	0.28 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	2.88 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.05 dB
4.7	15.203	Antenna Requirements	Complies	-

Note: This device supports Bridge Mode in Band 1 and Band 4.

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	see the below table for IEEE 802.11n/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 Non-Beamforming Mode> For 2.4GHz Band: MCS0/Nss1 (VHT20): 18.18 MHz ; MCS0/Nss1 (VHT40): 36.72 MHz For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 21.84 MHz ; 802.11ac MCS0/Nss1 (VHT40): 40.80 MHz ; 802.11ac MCS0/Nss1 (VHT80): 75.60 MHz <For Beamforming Mode> For 2.4GHz Band: MCS0/Nss1 (VHT20): 18.16 dBm ; MCS0/Nss1 (VHT40): 36.96 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 18.24 MHz ; 802.11ac MCS0/Nss1 (VHT40): 37.32 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.08 MHz

Maximum Conducted Output Power	<For Non-Beamforming Mode> For 2.4GHz Band: MCS0/Nss1 (VHT20): 29.80 dBm ; MCS0/Nss1 (VHT40): 25.74 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 29.93 dBm ; 802.11ac MCS0/Nss1 (VHT40): 29.74 dBm ; 802.11ac MCS0/Nss1 (VHT80): 26.95 dBm <For Beamforming Mode> For 2.4GHz Band: MCS0/Nss1 (VHT20): 28.51 dBm ; MCS0/Nss1 (VHT40): 24.87 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 27.72 dBm ; 802.11ac MCS0/Nss1 (VHT40): 27.72 dBm ; 802.11ac MCS0/Nss1 (VHT80): 26.75 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	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 12.00 MHz ; 11g: 17.46 MHz ; 11a: 22.08 MHz
Maximum Conducted Output Power	11b: 29.85 dBm ; 11g: 29.38 dBm ; 11a: 29.93 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming for 802 11n/ac in 2.4GHz/5GHz.	☐ Without beamforming

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol		Number of Transmit Chains (NTX)	Data Rate / MCS
2.4GHz	802.11n (HT20)	3	MCS0-23
	802.11n (HT40)	3	MCS0-23
	802.11ac (VHT20)	3	MCS0-23
	802.11ac (VHT20)	3	MCS0-23
5GHz	802.11ac (VHT20)	3	MCS 0-9/Nss1-3
	802.11ac (VHT40)	3	MCS 0-9/Nss1-3
	802.11ac (VHT80)	3	MCS 0-9/Nss1-3

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 supports VHT20, VHT40 in 2.4GHz and supports VHT20, VHT40, VHT80 in 5GHz.

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 No.	Rating
Adapter 1 (Fixed plug)	PI	AD883J20	Input: 100-240V~50/60Hz 1.0A Output: 19V, 2.37A
Adapter 2 (Fixed plug)	Delta	ADP-45BW B	Input: 100-240V~50-60Hz 1.2A Output: 19V, 2.37A
Others			
RJ-45 Cable*1: Shielded, 1.5m			

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)			Remark
					2.4GHz	5GHz (Band 1)	5GHz (Band 4)	
1	M.gear	C660-510331-A	Dipole Ant.	Reversed-SMA	-	-	3.47	support single band
2	M.gear	C660-510331-A	Dipole Ant.	Reversed-SMA	-	-	3.47	support single band
3	PSA	RFDPA181300SBLB805	Dipole Ant.	Reversed-SMA	2.6	3.37	2.89	support dual band
4	M.gear	C660-510331-A	Dipole Ant.	Reversed-SMA	-	-	3.47	support single band
5	M.gear	C660-510324-A	Dipole Ant.	Reversed-SMA	1.87	3.23	3.33	support dual band

Note 1: Above antennas are the same type antenna, thus only the highest antenna gain Ant. 3 for 2.4GHz/5GHz band1 and Ant. 1, 2, 4 for 5GHz band 4 tested and recorded in the report.

Note 2:

<For 2.4GHz and 5GHz Band 1>

For IEEE 802.11b/g/a/n/ac mode (3TX/3RX)

Chain 3, Chain 5 and Chain 6 can be used as transmitting/receiving antenna.

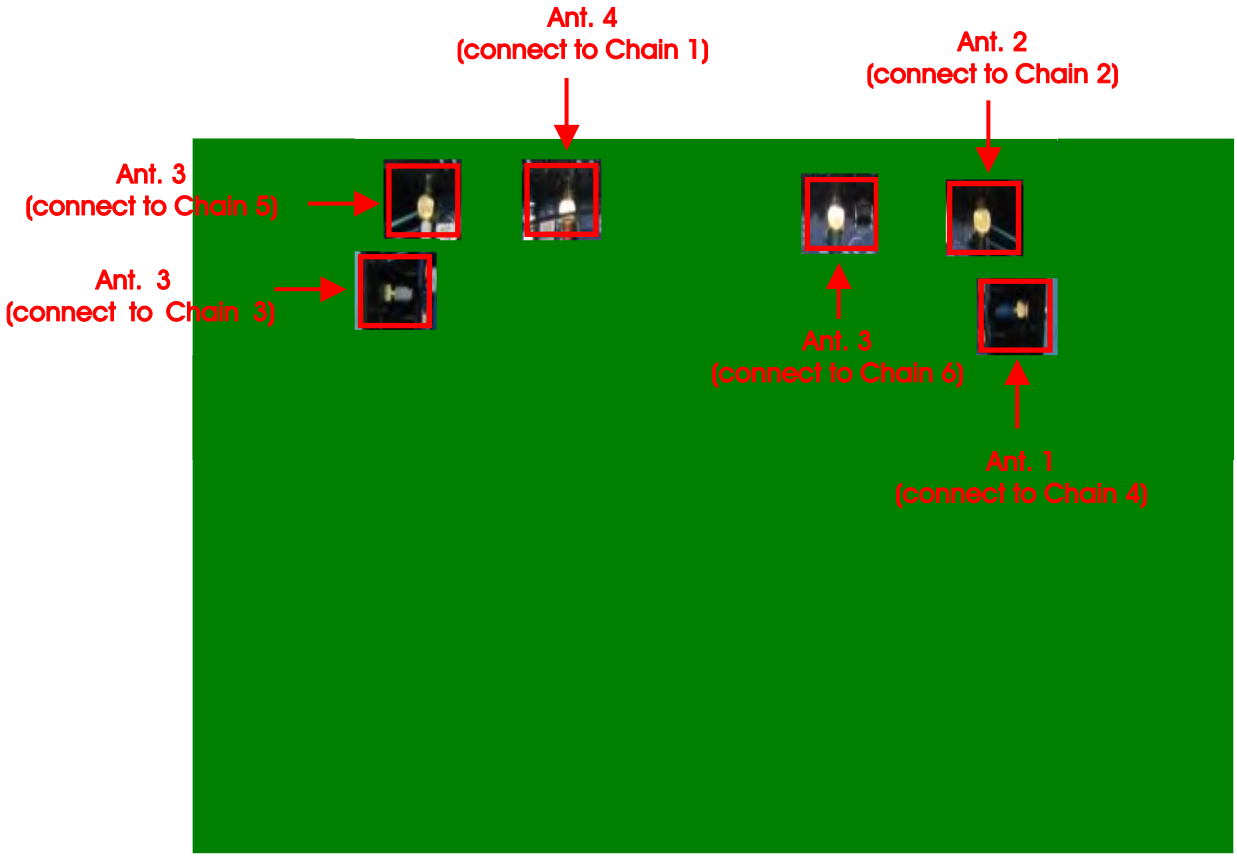
Chain 3, Chain 5 and Chain 6 could transmit/receive simultaneously.

<For 5GHz Band 4>

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

Chain 1, Chain 2 and Chain 4 can be used as transmitting/receiving antenna.

Chain 1, Chain 2 and Chain 4 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	CTX	-	-	-
Maximum Conducted Output Power	11ac VHT20	MCS0/Nss1	1/6/11	3+5+6
	11ac VHT40	MCS0/Nss1	3/6/9	3+5+6
	11b/CCK	1 Mbps	1/6/11	3+5+6
	11g/BPSK	6 Mbps	1/6/11	3+5+6
Power Spectral Density	11ac VHT20	MCS0/Nss1	1/6/11	3+5+6
	11ac VHT40	MCS0/Nss1	3/6/9	3+5+6
	11b/CCK	1 Mbps	1/6/11	3+5+6
	11g/BPSK	6 Mbps	1/6/11	3+5+6
6dB Spectrum Bandwidth	11ac VHT20	MCS0/Nss1	1/6/11	3+5+6
	11ac VHT40	MCS0/Nss1	3/6/9	3+5+6
	11b/CCK	1 Mbps	1/6/11	3+5+6
	11g/BPSK	6 Mbps	1/6/11	3+5+6
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11ac VHT20	MCS0/Nss1	1/6/11	3+5+6
	11ac VHT40	MCS0/Nss1	3/6/9	3+5+6
	11b/CCK	1 Mbps	1/6/11	3+5+6
	11g/BPSK	6 Mbps	1/6/11	3+5+6
Band Edge Emissions	11ac VHT20	MCS0/Nss1	1/6/11	3+5+6
	11ac VHT40	MCS0/Nss1	3/6/9	3+5+6
	11b/CCK	1 Mbps	1/6/11	3+5+6
	11g/BPSK	6 Mbps	1/6/11	3+5+6

For 5GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	CTX	-	-	-
Maximum Conducted Output Power	11ac VHT20	MCS0/Nss1	149/157/165	1+2+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+4
	11ac VHT80	MCS0/Nss1	155	1+2+4
	11a/BPSK	6 Mbps	149/157/165	1+2+4
Power Spectral Density	11ac VHT20	MCS0/Nss1	149/157/165	1+2+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+4
	11ac VHT80	MCS0/Nss1	155	1+2+4
	11a/BPSK	6 Mbps	149/157/165	1+2+4
6dB Spectrum Bandwidth	11ac VHT20	MCS0/Nss1	149/157/165	1+2+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+4
	11ac VHT80	MCS0/Nss1	155	1+2+4
	11a/BPSK	6 Mbps	149/157/165	1+2+4
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11ac VHT20	MCS0/Nss1	149/157/165	1+2+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+4
	11ac VHT80	MCS0/Nss1	155	1+2+4
	11a/BPSK	6 Mbps	149/157/165	1+2+4
Band Edge Emissions	11ac VHT20	MCS0/Nss1	149/157/165	1+2+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+4
	11ac VHT80	MCS0/Nss1	155	1+2+4
	11a/BPSK	6 Mbps	149/157/165	1+2+4

Note 1: VHT20/VHT40 covers HT20/HT40, due to same modulation.

Note 2: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802 11n/ac in 2.4GHz / 5GHz. Beamforming mode and non-beamforming mode has been test and record in this test report.

The following test modes were performed for all tests:

For Conducted Emission test:

The EUT has two SKU (SKU 1 and SKU 2). After evaluating, SKU2 was the worst case, Consequently, measurement for Conducted Emission will follow this same test mode

Mode 1. CTX: EUT (SKU 2) + Adapter 1

Mode 2. CTX: EUT (SKU 2) + Adapter 2

Mode 2 is the worst case, so it was selected to record in this test report.

For Radiated Emission <Below 1GHz>test:

The EUT has two SKU (SKU 1 and SKU 2). After evaluating, SKU1 was the worst case, Consequently, measurement for Radiated Emission <Below 1GHz> will follow this same test mode

Mode 1. CTX: EUT (SKU 1) + 2.4GHz + Adapter 1

Mode 2. CTX: EUT (SKU 1) + 5GHz Band 1 + Adapter 1

Mode 3. CTX: EUT (SKU 1) + 5GHz Band 4 + Adapter 1

Mode 3 has been evaluated to be the worst case among Mode 1~3, thus measurement for Mode 4 will follow this same test mode.

Mode 4: CTX: EUT (SKU 1) + 5GHz Band 4 + Adapter 2

Mode 3 is the worst case, so it was selected to record in this test report.

For Radiated Emission <Above 1GHz>test:

Mode 1. CTX: EUT

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

The EUT could be applied with WLAN 2.4GHz+5GHz band1+5GHz band4 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 among WLAN 2.4GHz+5GHz band1+5GHz band4 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 Multiple List

The EUT has three model names which are identical to each other in all aspects except for the following table:

Brand Name	Model Name	Description
ASUS	RT-AC3200	All the models are identical, the difference model for difference brand served as marketing strategy.
	RT-AC3200R	
	RT-AC3200W	

From the above models, model: RT-AC3200 was selected as representative model for the test and its data was recorded in this report.

3.8. Table for SKU List

The EUT has two SKU which are identical to each other in all aspects except for the following table:

SKU	Description
1	The difference between SKU 1 and SKU 2 is LAN transformer
2	

3.9. Table for Housing List

The EUT has two housing and which are identical to each other in all aspects except for the following table:

Housing	With Hole	Without Hole
1	V	X
2	X	V

From the above models, model: housing 2 was selected as representative model for the test and its data was recorded in this report.

3.10.Table for Supporting Units

For Test Site No: 03CH01-CB <Below 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	E2K4965AGNM

<For Non-Beamforming Mode>

For Test Site No: 03CH01-CB <Above 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	E2K4965AGNM

<For Beamforming Mode>

For Test Site No: 03CH01-CB <Above 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	E2K4965AGNM
NB	DELL	M1340	E2K4965AGNM
WLAN ac Dongle	Netgear	A6200	PY31220200

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6220	DoC

3.11. Table for Parameters of Test Software Setting

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

<For Non-Beamforming Mode>

For 2.4GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.8		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	83	100	76

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.8		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	78	85	75

Power Parameters of IEEE 802.11b/g

Test Software Version	Mtool 2.0.1.8		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	99	99	99
IEEE 802.11g	83	99	84

For 5GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.8		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	102	99	99

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.8	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	97	101

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool 2.0.1.8
Frequency	5775 MHz
MCS0/Nss1 VHT80	89

Power Parameters of IEEE 802.11a

Test Software Version	Mtool 2.0.1.8		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	102	99	99

<For Beamforming Mode>

For 2.4GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.8		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	71	94	70

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.8		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	77	80	71

For 5GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.8		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	91	89	89

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.8	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	92	90

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool 2.0.1.8
Frequency	5775 MHz
MCS0/Nss1 VHT80	88

3.12. 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%

3.13. Duty Cycle

<For Non-Beamforming Mode>

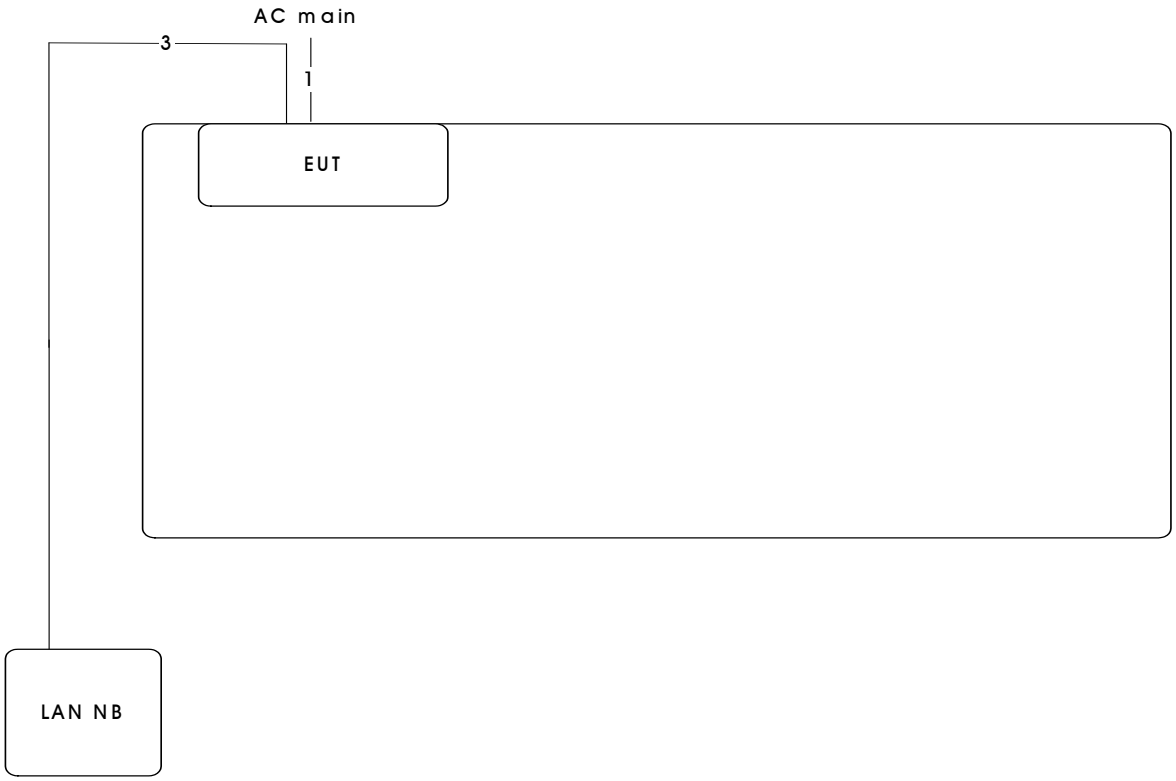
Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
2.4G	802.11ac MCS0/Nss1 VHT20	1.899	1.913	99.25%	0.03	0.01
	802.11ac MCS0/Nss1 VHT40	0.898	0.920	97.63%	0.11	1.11
	802.11b	1.000	1.000	100.00%	0.00	0.01
	802.11g	2.043	2.058	99.28%	0.03	0.01
5G	802.11ac MCS0/Nss1 VHT20	1.913	1.928	99.25%	0.03	0.01
	802.11ac MCS0/Nss1 VHT40	0.942	0.964	97.72%	0.10	1.06
	802.11ac MCS0/Nss1 VHT80	0.465	0.480	96.88%	0.14	2.15
	802.11a	2.058	2.073	99.30%	0.03	0.01

<For Beamforming Mode>

Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
2.4G	802.11ac MCS0/Nss1 VHT20	3.739	3.768	99.23%	0.03	0.01
	802.11ac MCS0/Nss1 VHT40	4.623	4.725	97.85%	0.09	0.22
5G	802.11ac MCS0/Nss1 VHT20	1.949	2.051	95.04%	0.22	0.51
	802.11ac MCS0/Nss1 VHT40	4.478	4.580	97.78%	0.10	0.22
	802.11ac MCS0/Nss1 VHT80	4.623	4.725	97.84%	0.09	0.22

3.14. Test Configurations

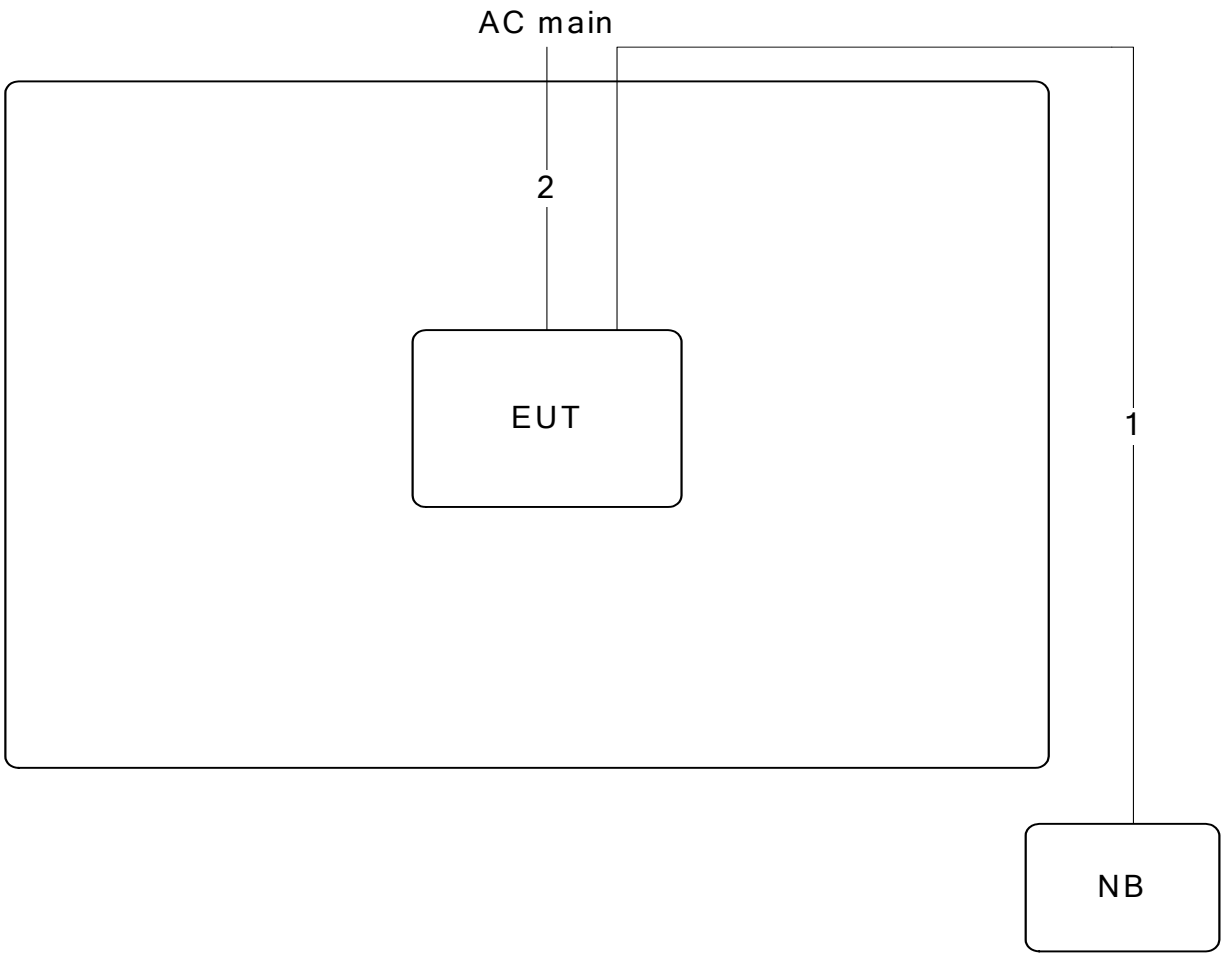
3.14.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length(m)
1	Power cable	No	2.2m
2	RJ-45 cable	No	10m

3.14.2. Radiation Emissions Test Configuration

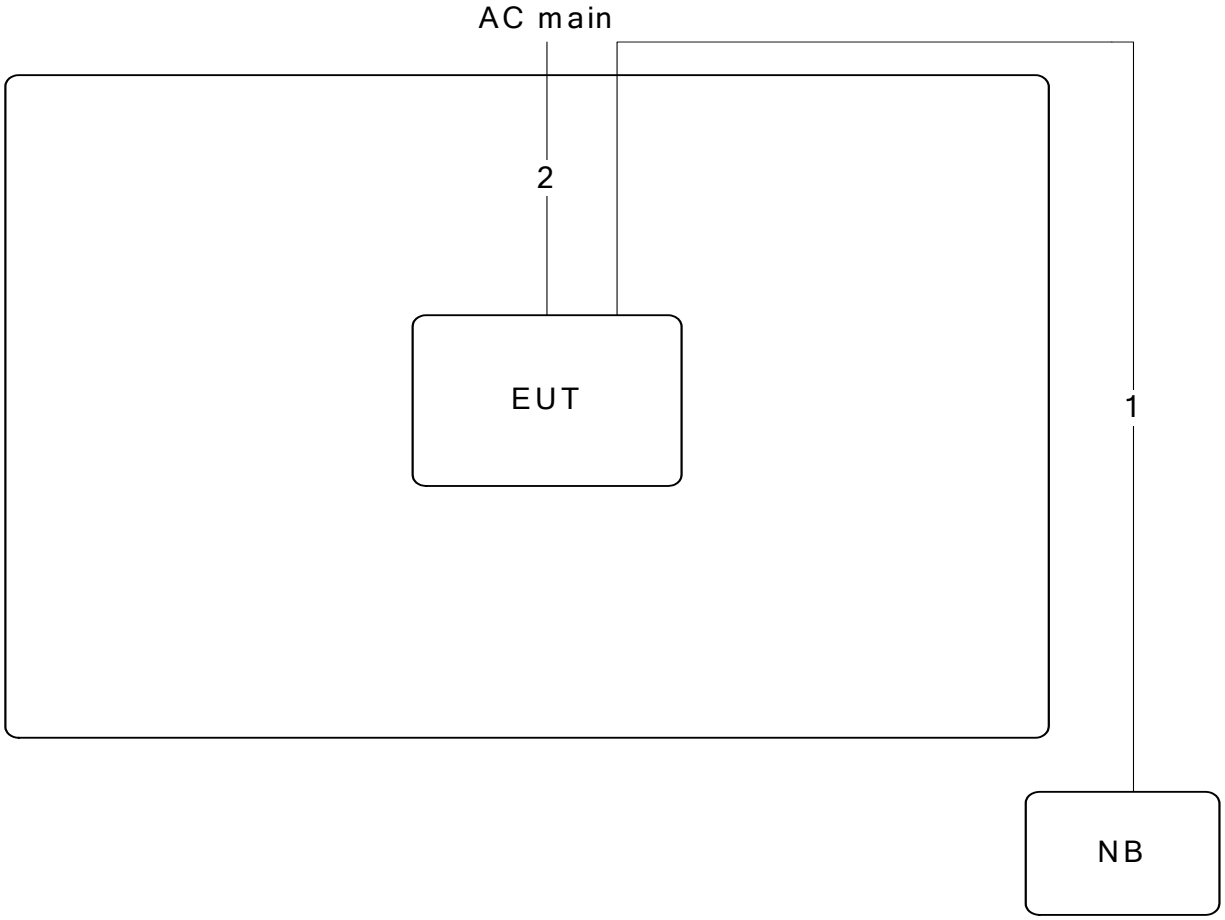
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length(m)
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m

<For Non-Beamforming Mode>

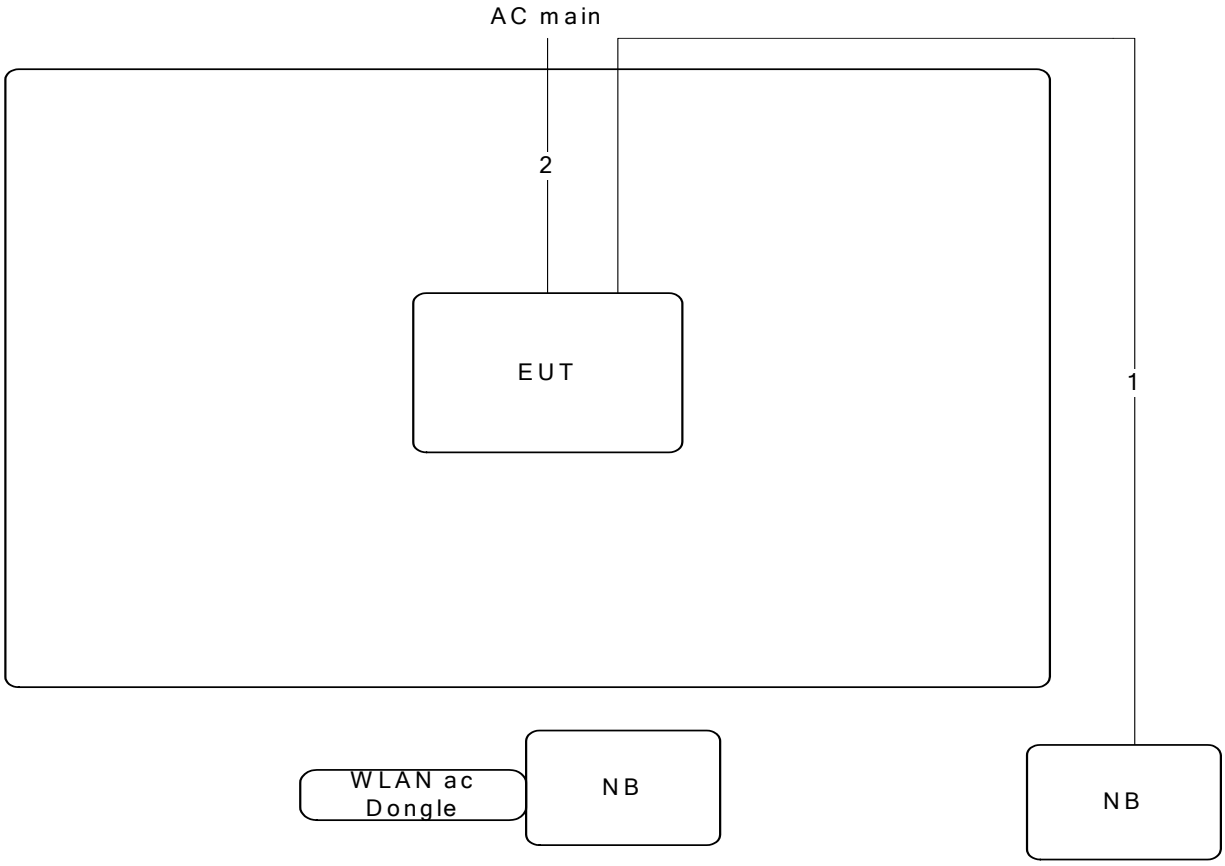
Test Configuration: above 1GHz



Item	Connection	Shielded	Length(m)
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m

<For Beamforming Mode>

Test Configuration: above 1GHz



Item	Connection	Shielded	Length(m)
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m

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

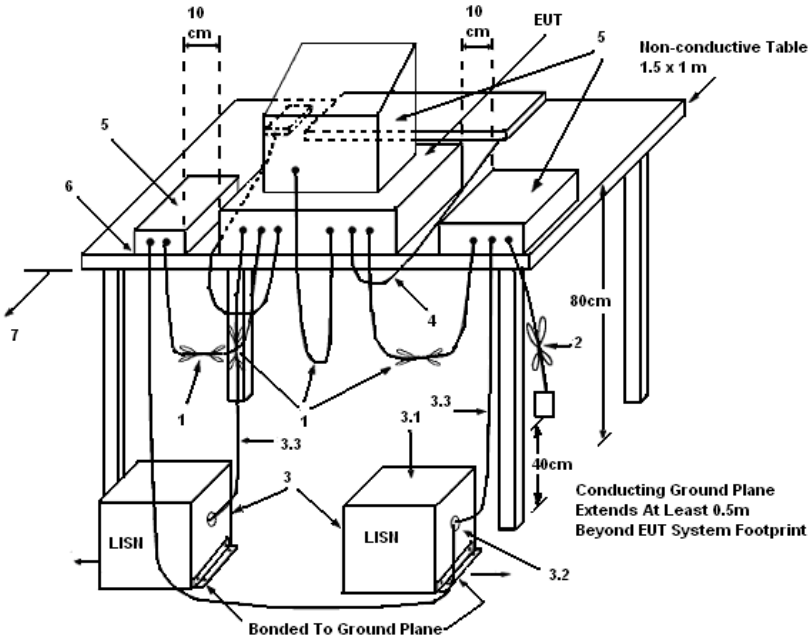
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

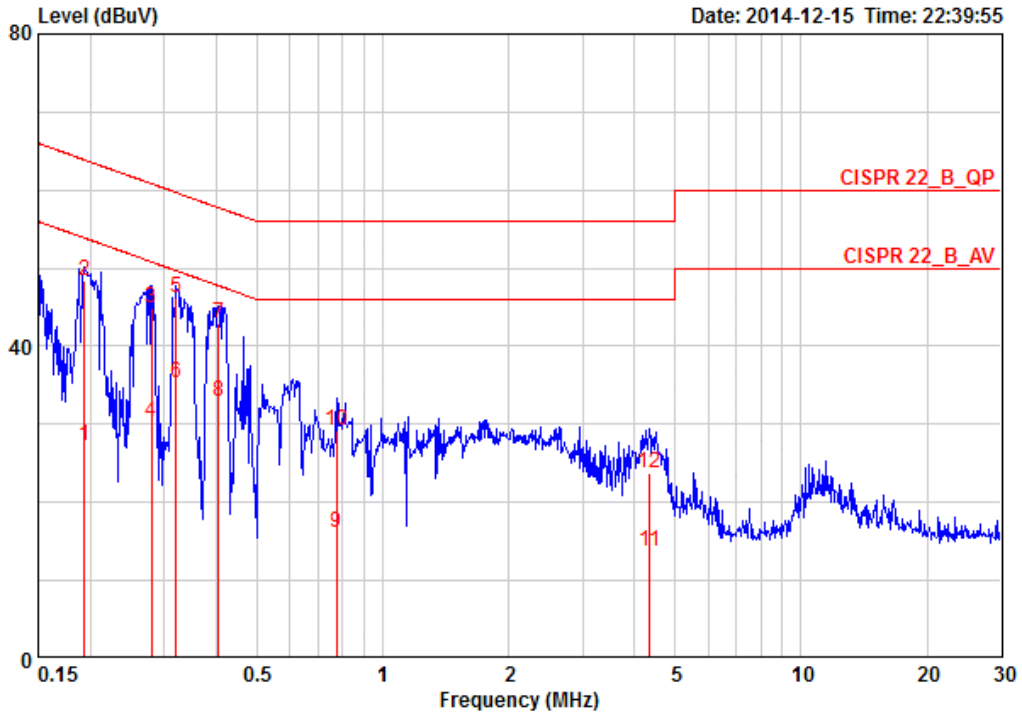
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

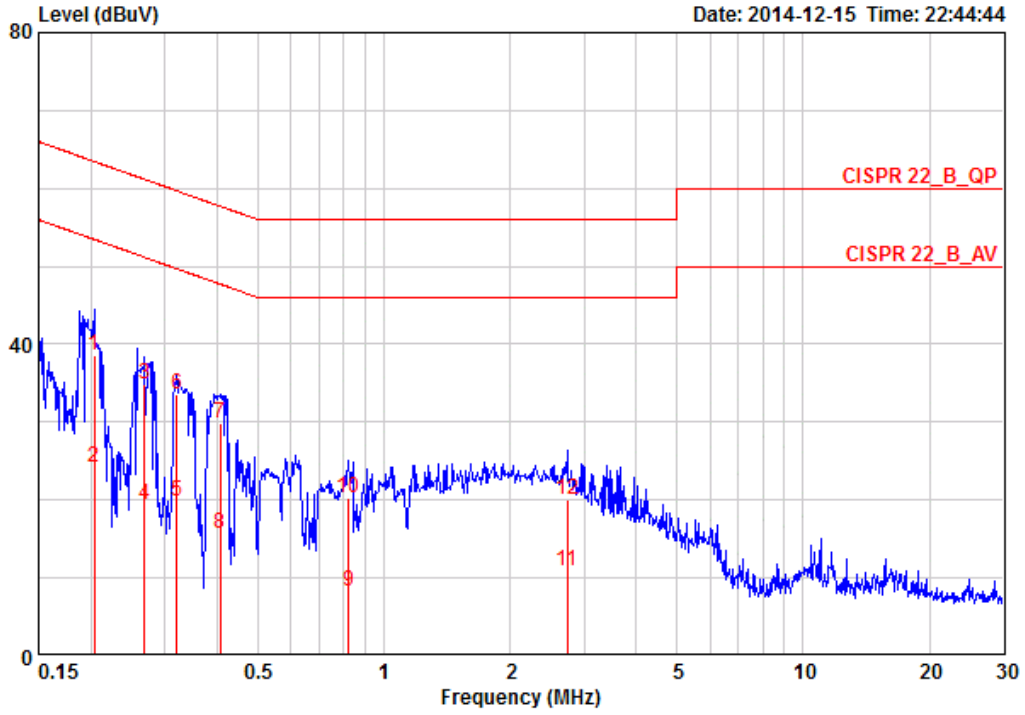
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	58%
Test Engineer	Edison Lin	Phase	Line
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.19344	27.30	-26.58	53.89	17.36	9.78	0.16	AVERAGE	LINE
2 @	0.19344	48.32	-15.56	63.89	38.38	9.78	0.16	QP	LINE
3 @	0.28029	44.95	-15.86	60.81	35.00	9.78	0.17	QP	LINE
4	0.28029	30.25	-20.56	50.81	20.30	9.78	0.17	AVERAGE	LINE
5 @	0.31999	46.15	-13.56	59.71	36.20	9.77	0.18	QP	LINE
6 @	0.31999	35.42	-14.29	49.71	25.47	9.77	0.18	AVERAGE	LINE
7 @	0.40400	42.93	-14.84	57.77	32.98	9.77	0.18	QP	LINE
8 @	0.40400	32.86	-14.91	47.77	22.91	9.77	0.18	AVERAGE	LINE
9	0.77519	16.15	-29.85	46.00	6.19	9.77	0.19	AVERAGE	LINE
10	0.77519	29.22	-26.78	56.00	19.26	9.77	0.19	QP	LINE
11	4.338	13.65	-32.35	46.00	3.64	9.70	0.31	AVERAGE	LINE
12	4.338	23.79	-32.21	56.00	13.78	9.70	0.31	QP	LINE

Temperature	24°C	Humidity	58%
Test Engineer	Edison Lin	Phase	Neutral
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.20396	38.61	-24.84	63.45	38.44	0.00	0.17	QP	NEUTRAL
2	0.20396	24.28	-29.17	53.45	24.11	0.00	0.17	AVERAGE	NEUTRAL
3	0.26866	34.89	-26.27	61.16	34.72	0.00	0.17	QP	NEUTRAL
4	0.26866	19.45	-31.71	51.16	19.28	0.00	0.17	AVERAGE	NEUTRAL
5	0.31999	19.86	-29.85	49.71	19.68	0.00	0.18	AVERAGE	NEUTRAL
6	0.31999	33.68	-26.03	59.71	33.50	0.00	0.18	QP	NEUTRAL
7	0.40615	29.86	-27.87	57.73	29.68	0.00	0.18	QP	NEUTRAL
8	0.40615	15.67	-32.06	47.73	15.49	0.00	0.18	AVERAGE	NEUTRAL
9	0.82172	8.25	-37.75	46.00	8.05	0.00	0.20	AVERAGE	NEUTRAL
10	0.82172	20.18	-35.82	56.00	19.98	0.00	0.20	QP	NEUTRAL
11	2.736	10.89	-35.11	46.00	10.62	0.00	0.27	AVERAGE	NEUTRAL
12	2.736	20.01	-35.99	56.00	19.74	0.00	0.27	QP	NEUTRAL

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

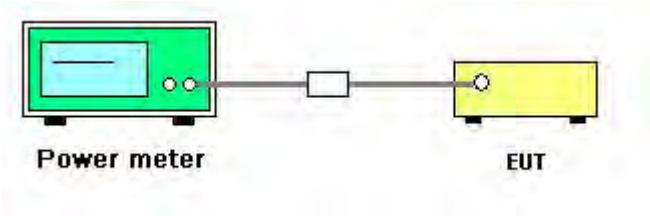
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Dec. 07, 2014		

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	21.34	20.89	21.81	26.13	30.00	Complies
6	2437 MHz	24.69	25.01	25.37	29.80	30.00	Complies
11	2462 MHz	19.69	19.42	19.83	24.42	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
3	2422 MHz	19.47	19.11	19.68	24.20	30.00	Complies
6	2437 MHz	20.71	21.03	21.15	25.74	30.00	Complies
9	2452 MHz	18.49	18.08	17.95	22.95	30.00	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
149	5745 MHz	24.68	25.13	25.15	29.76	30.00	Complies
157	5785 MHz	25.04	25.03	25.08	29.82	30.00	Complies
165	5825 MHz	25.22	25.21	25.04	29.93	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
151	5755 MHz	23.83	23.65	23.96	28.59	30.00	Complies
159	5795 MHz	25.09	24.84	24.96	29.74	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
155	5775 MHz	22.23	21.89	22.39	26.95	30.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	24.79	25.14	25.19	29.81	30.00	Complies
6	2437 MHz	24.86	25.03	25.34	29.85	30.00	Complies
11	2462 MHz	24.71	24.97	25.41	29.81	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	21.11	20.91	21.11	25.82	30.00	Complies
6	2437 MHz	24.37	24.61	24.83	29.38	30.00	Complies
11	2462 MHz	21.17	21.18	21.49	26.05	30.00	Complies

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
149	5745 MHz	24.87	25.11	25.21	29.84	30.00	Complies
157	5785 MHz	25.13	24.96	25.19	29.87	30.00	Complies
165	5825 MHz	25.23	25.23	25.01	29.93	30.00	Complies

<For Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Dec. 07, 2014		

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	18.81	18.22	18.98	23.45	28.63	Complies
6	2437 MHz	23.65	23.36	24.16	28.51	28.63	Complies
11	2462 MHz	18.18	18.02	18.27	22.93	28.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi, So Power Density Limit =30-(7.37-6)=28.63dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
3	2422 MHz	19.51	19.08	19.73	24.22	28.63	Complies
6	2437 MHz	20.12	19.78	20.38	24.87	28.63	Complies
9	2452 MHz	17.74	17.49	18.05	22.54	28.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi, So Power Density Limit =30-(7.37-6)=28.63dBm

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
149	5745 MHz	22.88	22.92	23.05	27.72	27.76	Complies
157	5785 MHz	22.81	22.91	23.09	27.71	27.76	Complies
165	5825 MHz	22.78	22.87	22.97	27.65	27.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ss}}\left\{\sum_{k=1}^{N_{ant}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =30-(8.24-6)=27.76dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
151	5755 MHz	22.83	23.02	22.98	27.72	27.76	Complies
159	5795 MHz	22.79	22.95	22.86	27.64	27.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ss}}\left\{\sum_{k=1}^{N_{ant}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =30-(8.24-6)=27.76dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 4	Total		
155	5775 MHz	22.03	21.79	22.12	26.75	27.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ss}}\left\{\sum_{k=1}^{N_{ant}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =30-(8.24-6)=27.76dBm

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

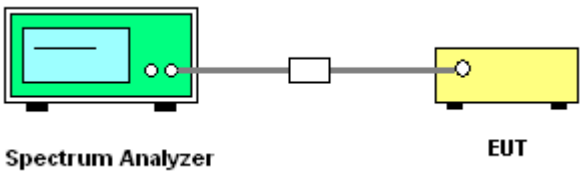
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	-4.07	-4.18	-3.7	0.79	6.63	Complies
6	2437 MHz	-1.69	-1.51	-1.49	3.21	6.63	Complies
11	2462 MHz	-6.79	-6.85	-6.1	-1.80	6.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi,So Power Density Limit =8-(7.37-6)=6.63dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 5	Chain 6	Total		
3	2422 MHz	-8.77	-8.87	-8.27	-3.86	6.63	Complies
6	2437 MHz	-7.92	-7.51	-7.37	-2.82	6.63	Complies
9	2452 MHz	-9.35	-9.57	-10.08	-4.88	6.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi,So Power Density Limit =8-(7.37-6)=6.63dBm/3kHz

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
149	5745 MHz	-1.38	-1.14	-0.93	3.63	5.76	Complies
157	5785 MHz	-1.3	-1.11	-1.02	3.63	5.76	Complies
165	5825 MHz	-1.35	-1.18	-1.13	3.55	5.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASG}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
151	5755 MHz	-4.84	-5.25	-4.45	-0.06	5.76	Complies
159	5795 MHz	-3.44	-4.71	-4.28	0.66	5.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASG}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
155	5775 MHz	-9.3	-9.45	-8.77	-4.39	5.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASG}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	1.35	1.45	1.56	6.23	6.63	Complies
6	2437 MHz	1.41	1.63	1.68	6.35	6.63	Complies
11	2462 MHz	1.33	1.40	1.44	6.16	6.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi,So Power Density Limit =8-(7.37-6)=6.63dBm/3kHz

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	-4.35	-4.42	-3.81	0.59	6.63	Complies
6	2437 MHz	-0.86	-0.36	-0.25	4.29	6.63	Complies
11	2462 MHz	-3.78	-3.6	-3.34	1.20	6.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi,So Power Density Limit =8-(7.37-6)=6.63dBm/3kHz

Configuration IEEE 802.11a

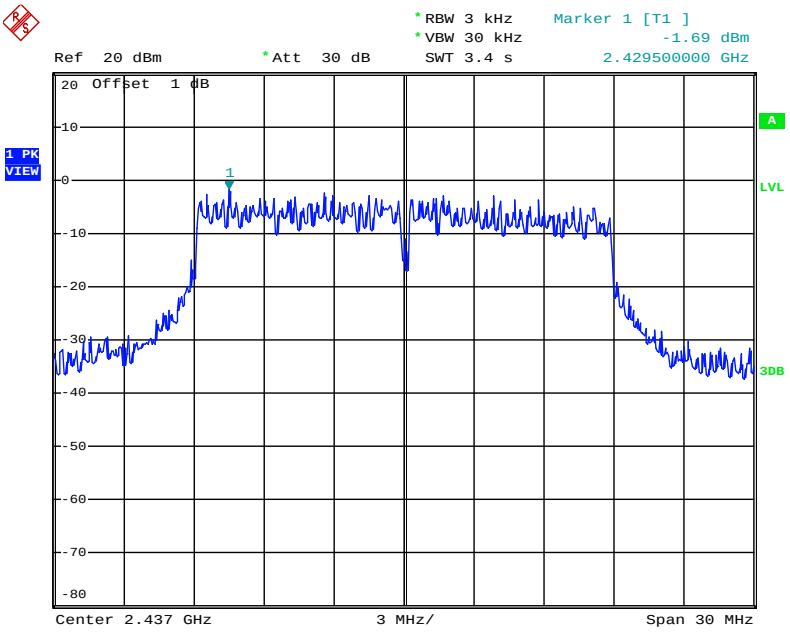
Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
149	5745 MHz	-0.85	-0.7	-0.43	4.11	5.76	Complies
157	5785 MHz	-0.67	-1.42	-0.28	4.01	5.76	Complies
165	5825 MHz	-0.97	-0.62	-0.49	4.08	5.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

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

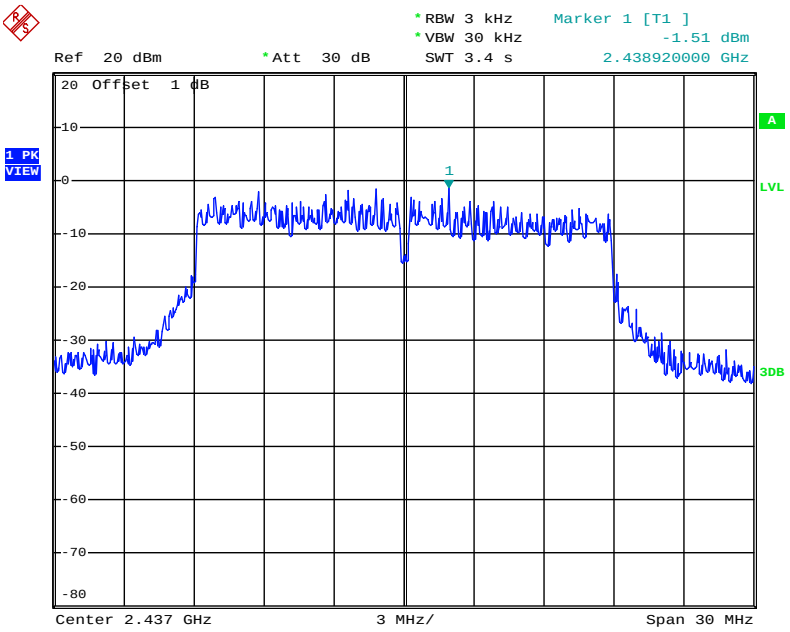
For plots, only the channel with worse result was shown.

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



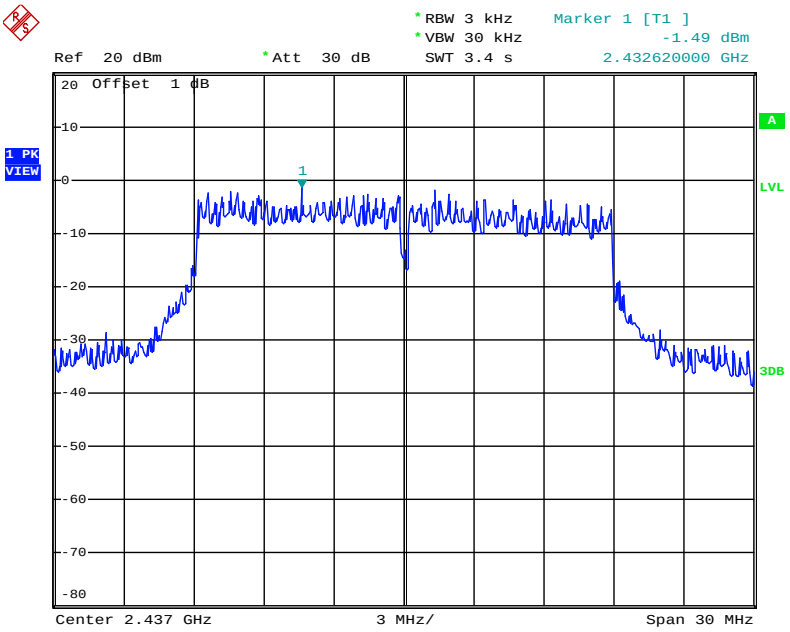
Date: 7.NOV.2014 22:16:01

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 5



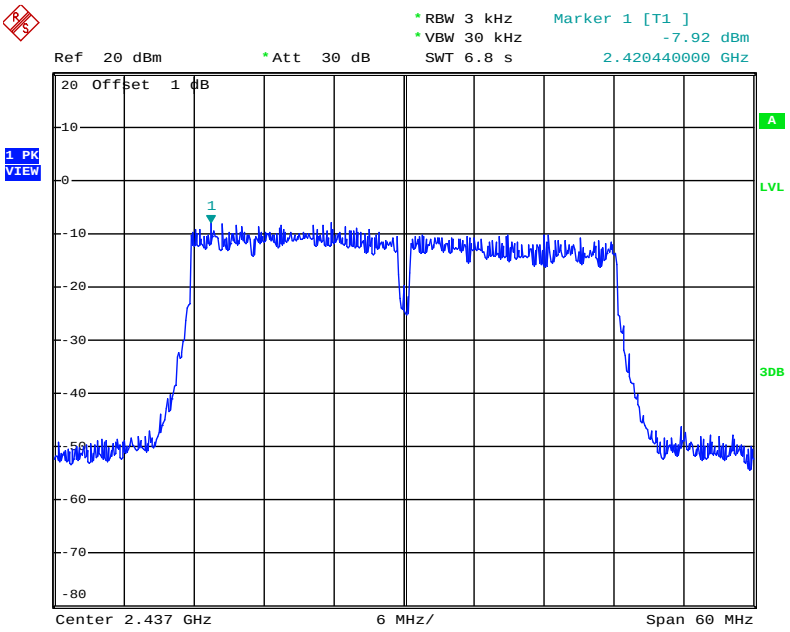
Date: 7.NOV.2014 22:15:35

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 6



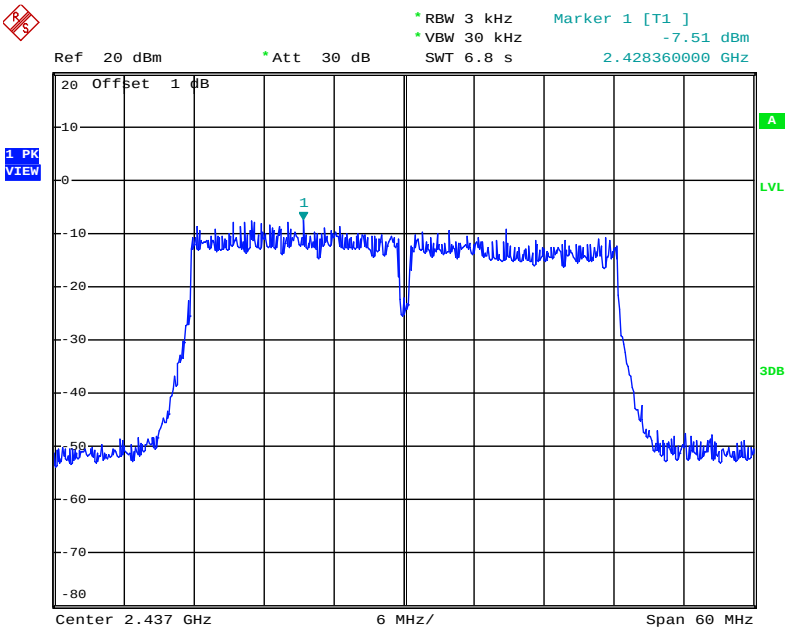
Date: 7.NOV.2014 22:15:48

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



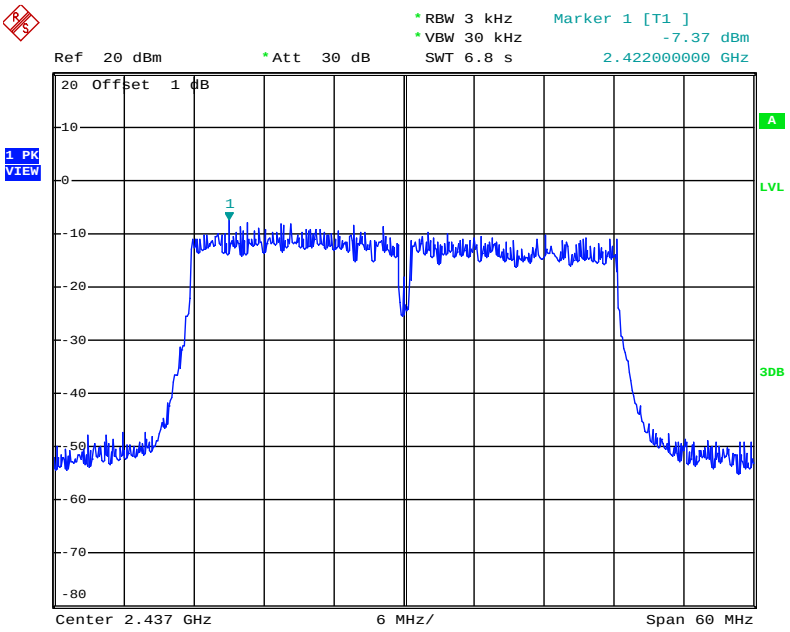
Date: 7.NOV.2014 22:30:06

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 5



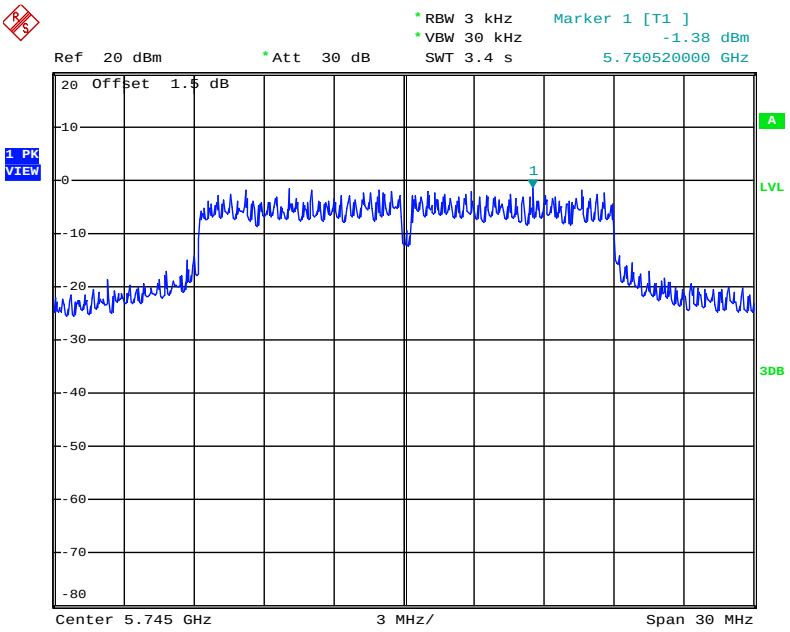
Date: 7.NOV.2014 22:30:31

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 6



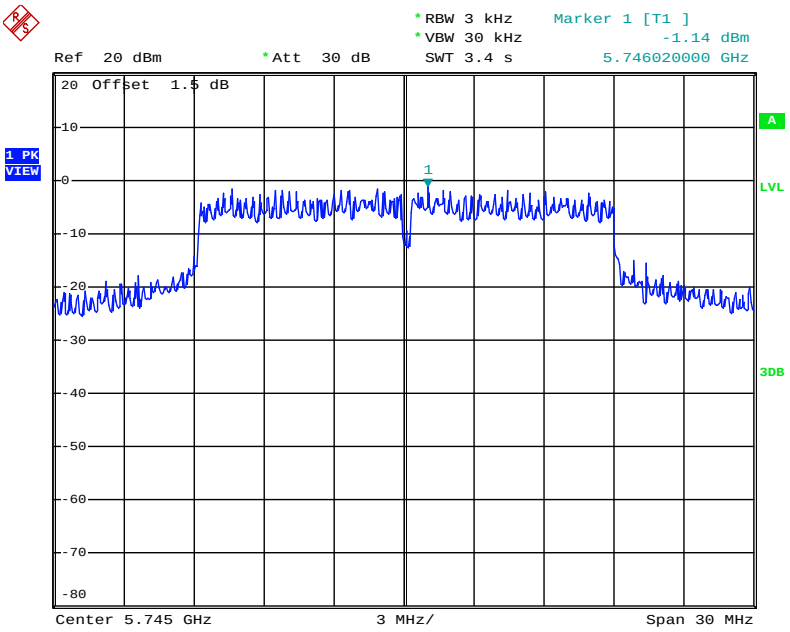
Date: 7.NOV.2014 22:29:42

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 1



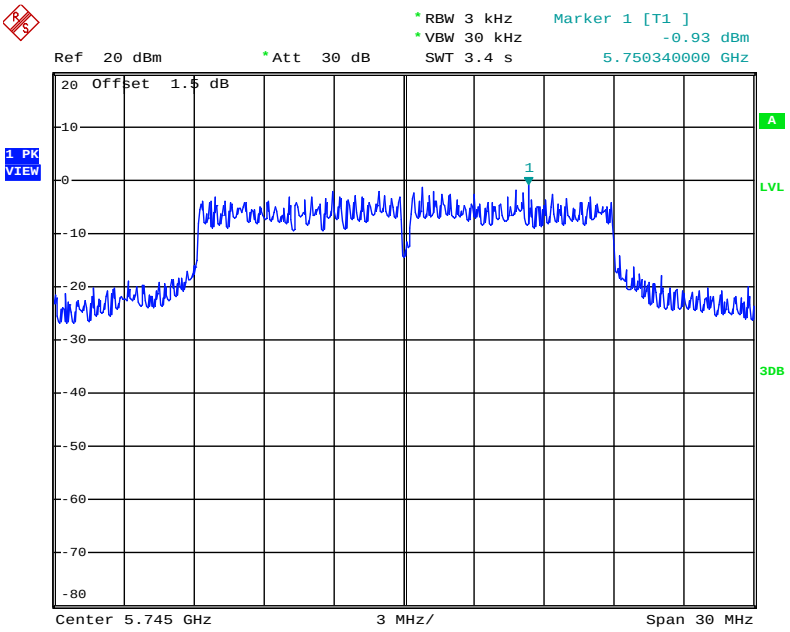
Date: 7.NOV.2014 23:28:16

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 2



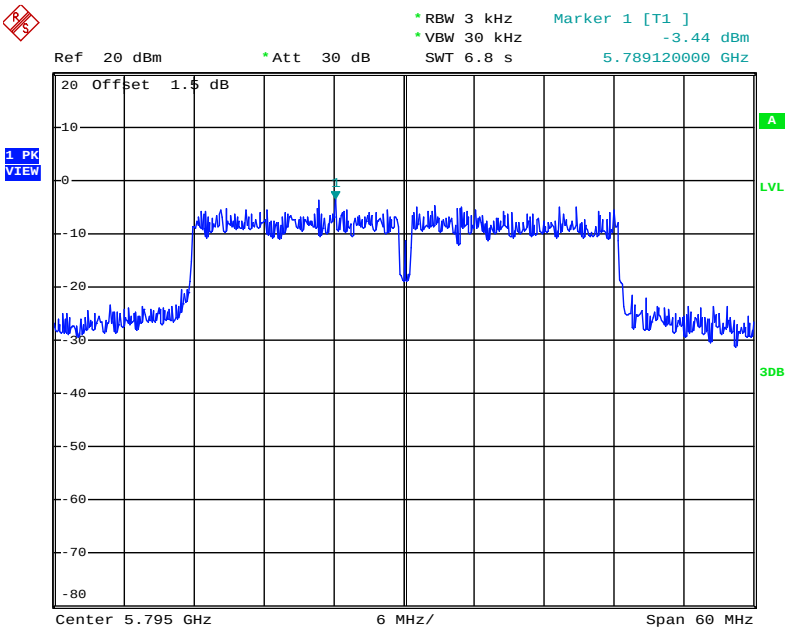
Date: 7.NOV.2014 23:27:51

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 4



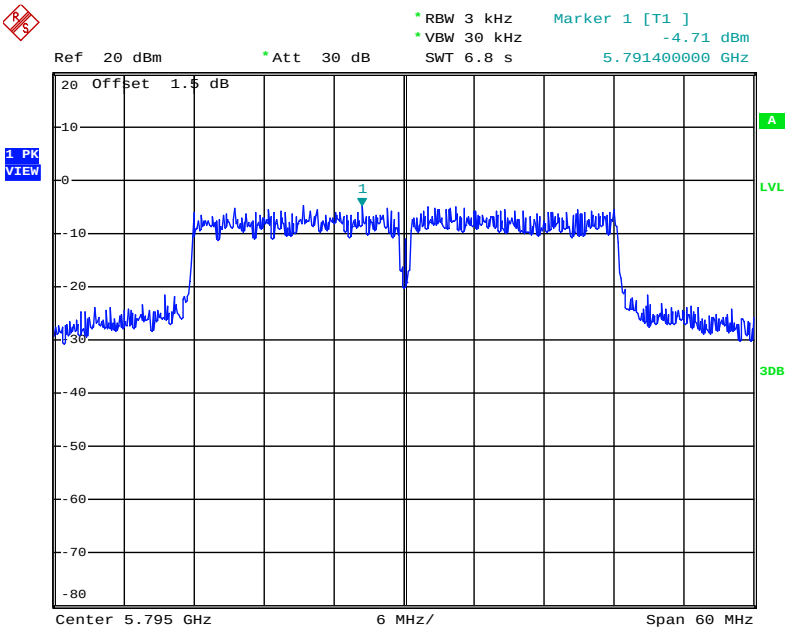
Date: 7.NOV.2014 23:27:16

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



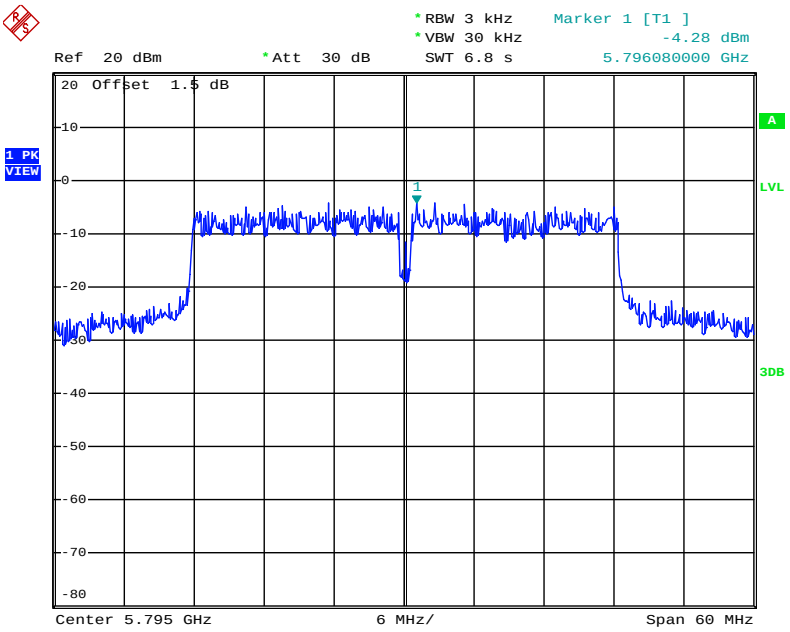
Date: 7.NOV.2014 23:43:39

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



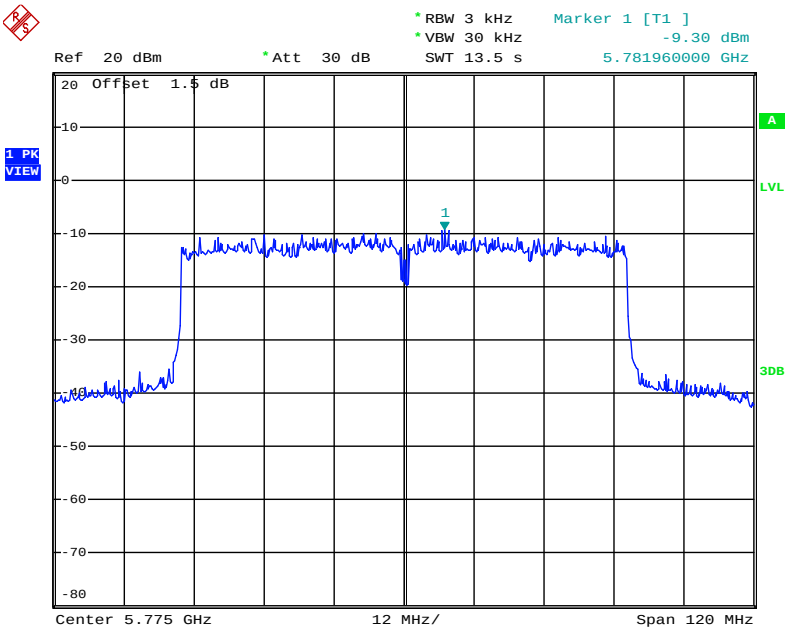
Date: 7.NOV.2014 23:43:57

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 4



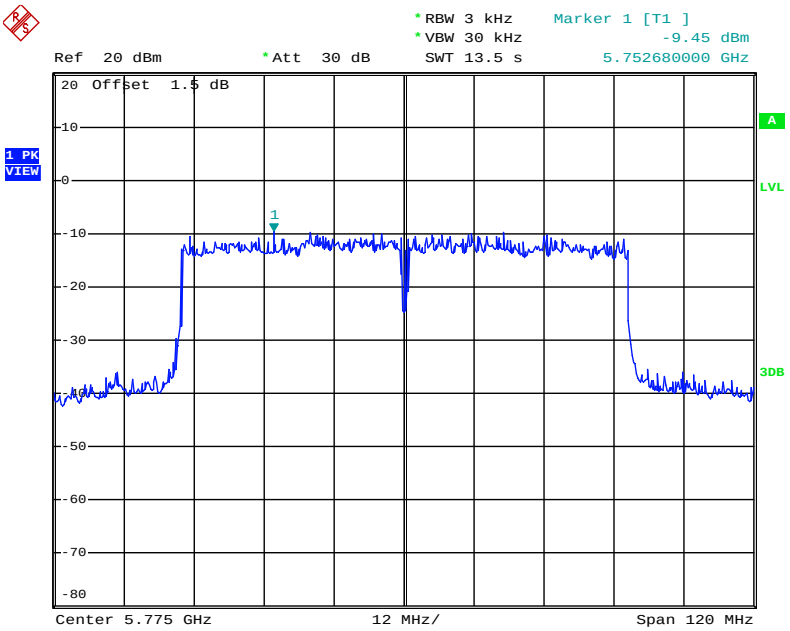
Date: 7.NOV.2014 23:43:22

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



Date: 7.NOV.2014 23:49:46

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



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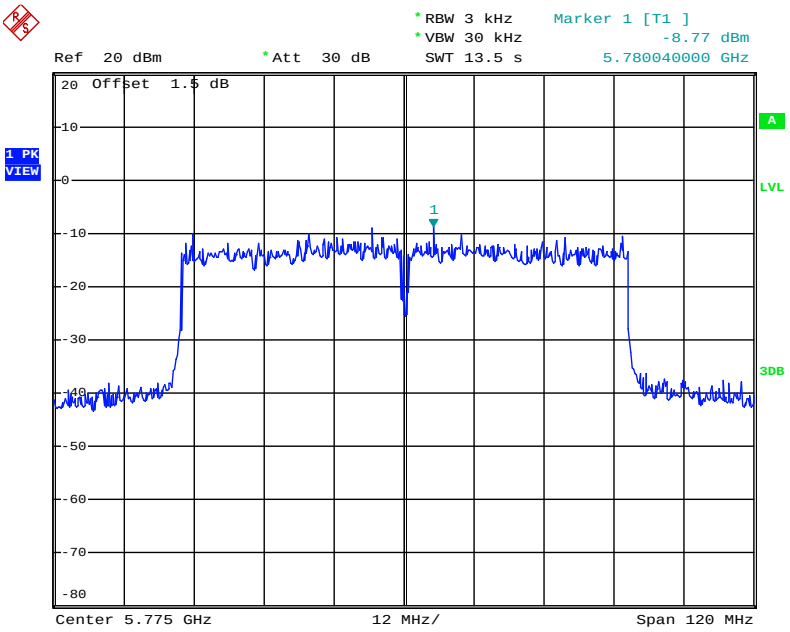
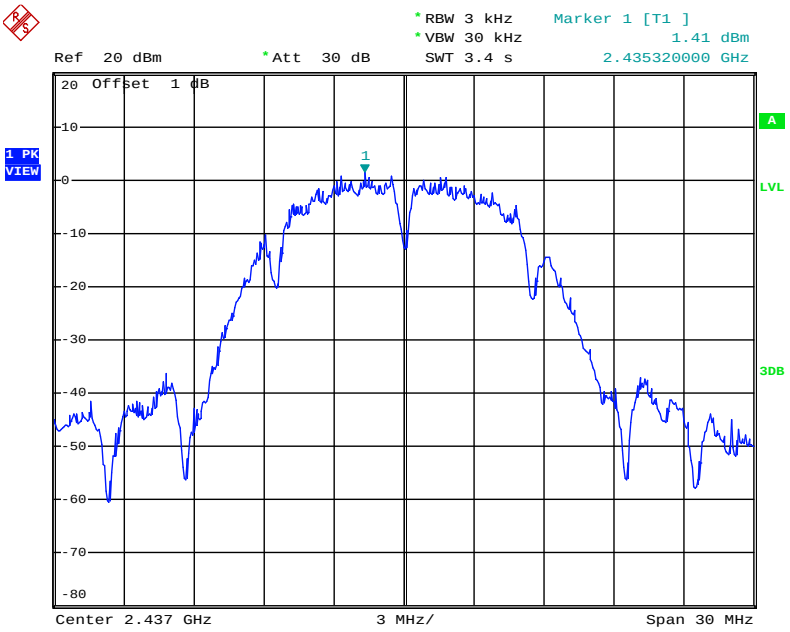
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 4



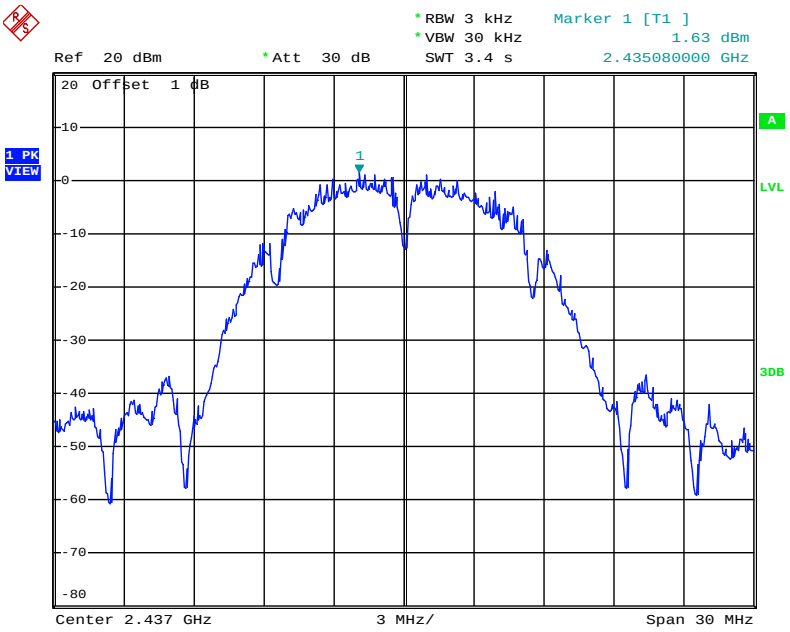
Date: 7.NOV.2014 23:48:40

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



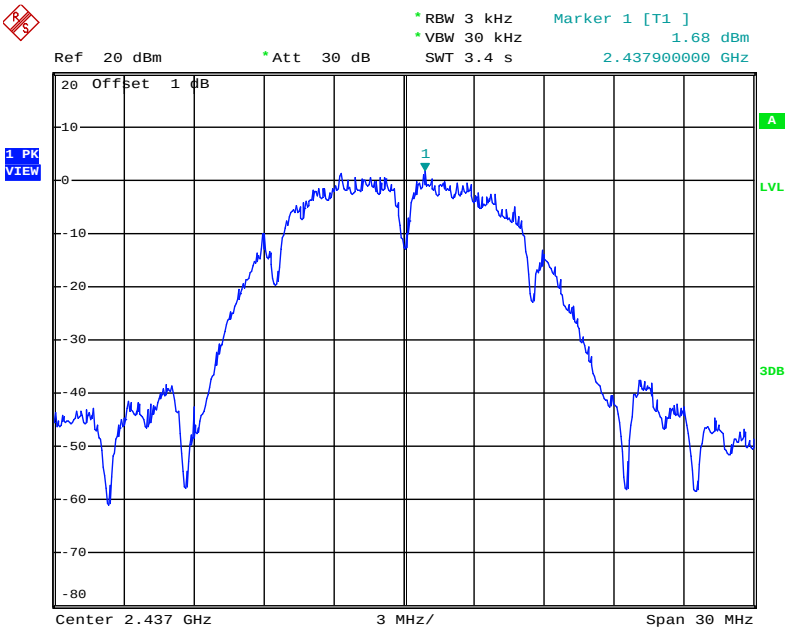
Date: 7.NOV.2014 21:37:22

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 5



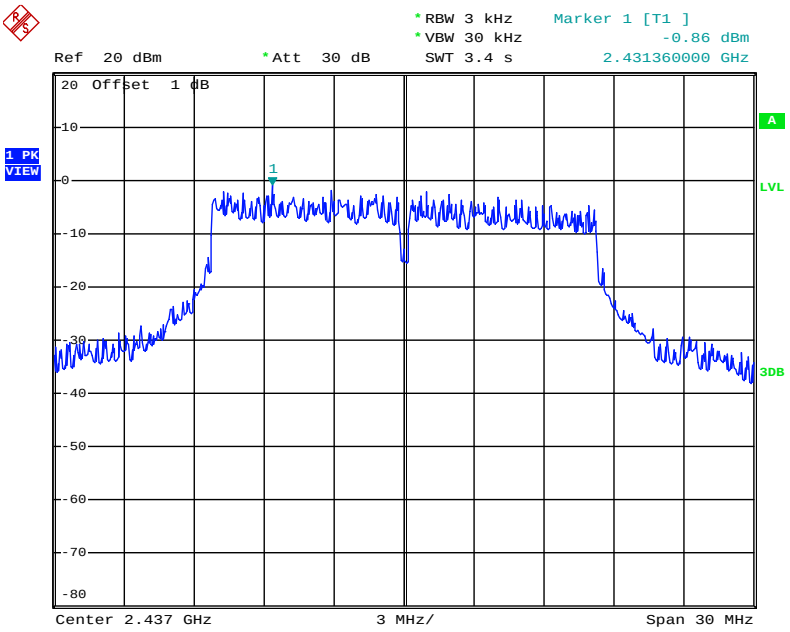
Date: 7.NOV.2014 21:37:05

Power Density Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 6



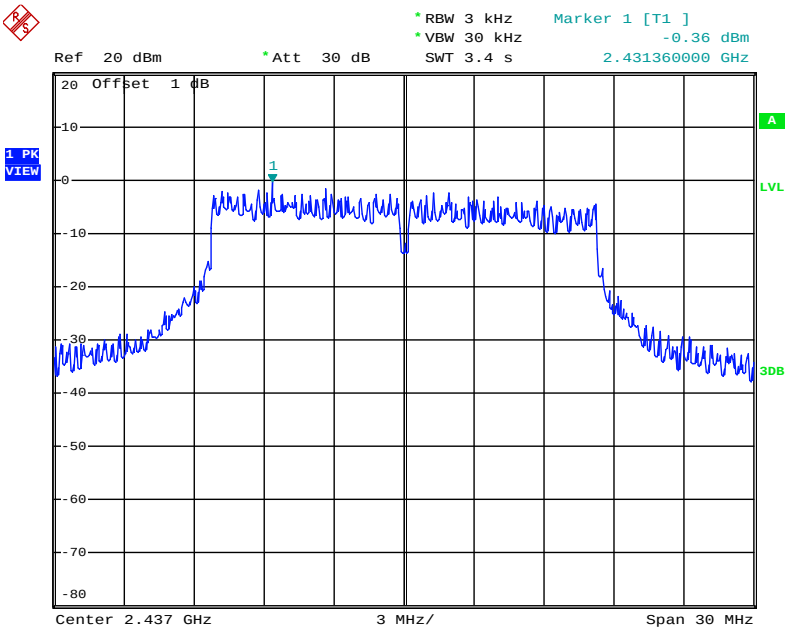
Date: 7.NOV.2014 21:36:53

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



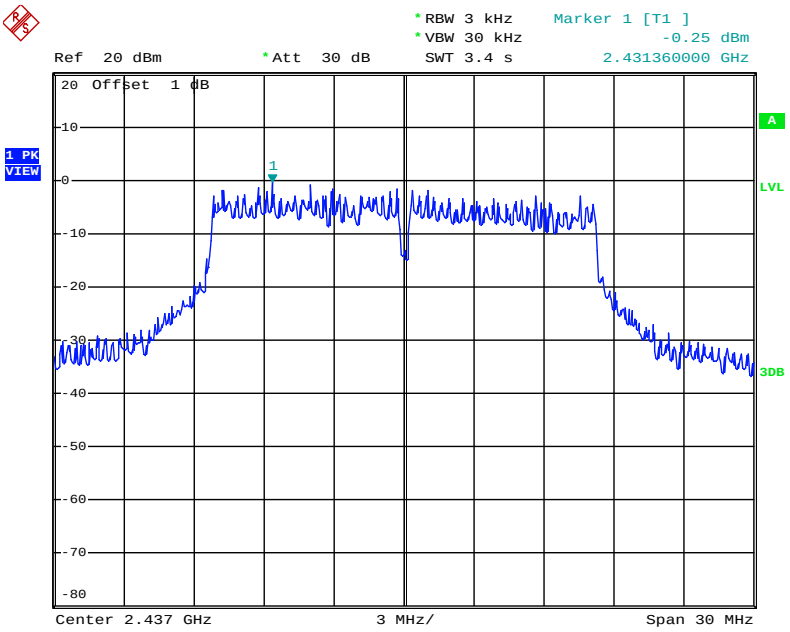
Date: 7.NOV.2014 21:57:26

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 5



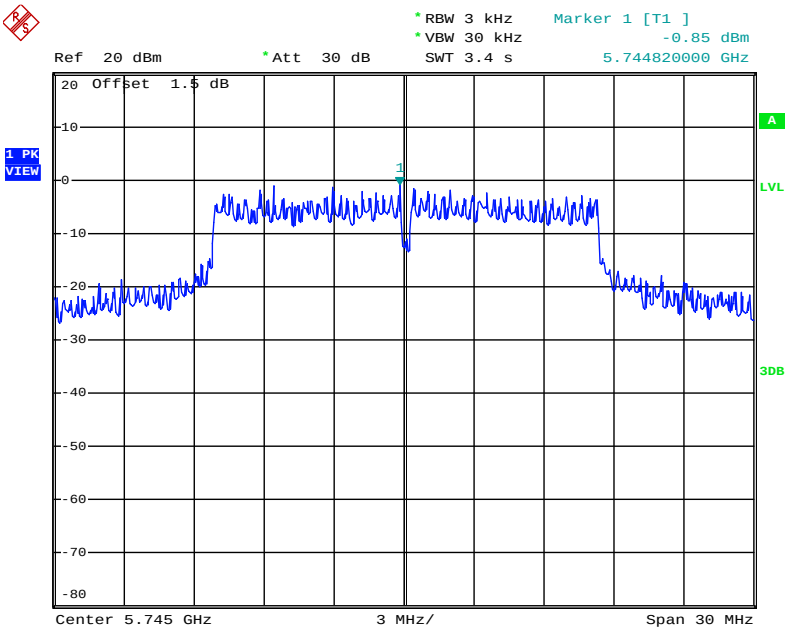
Date: 7.NOV.2014 21:58:10

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 6



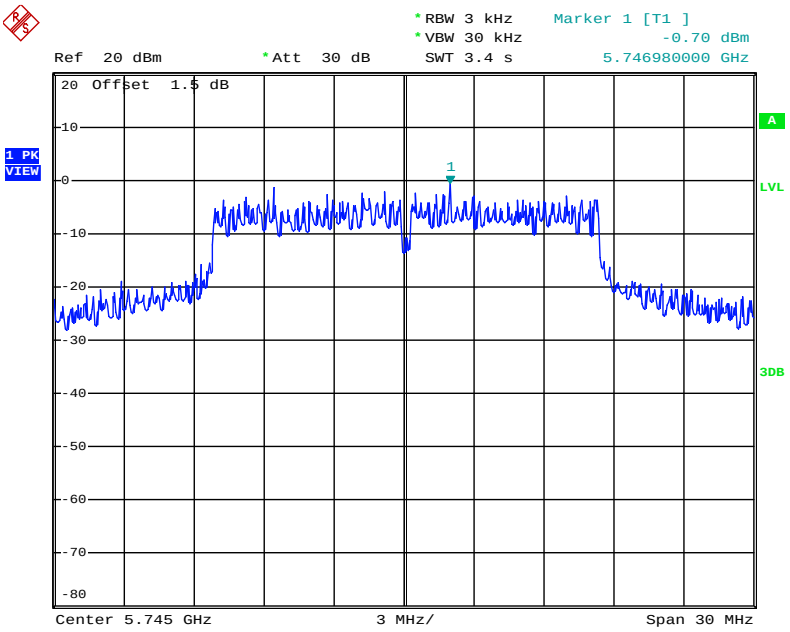
Date: 7.NOV.2014 21:57:55

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 1



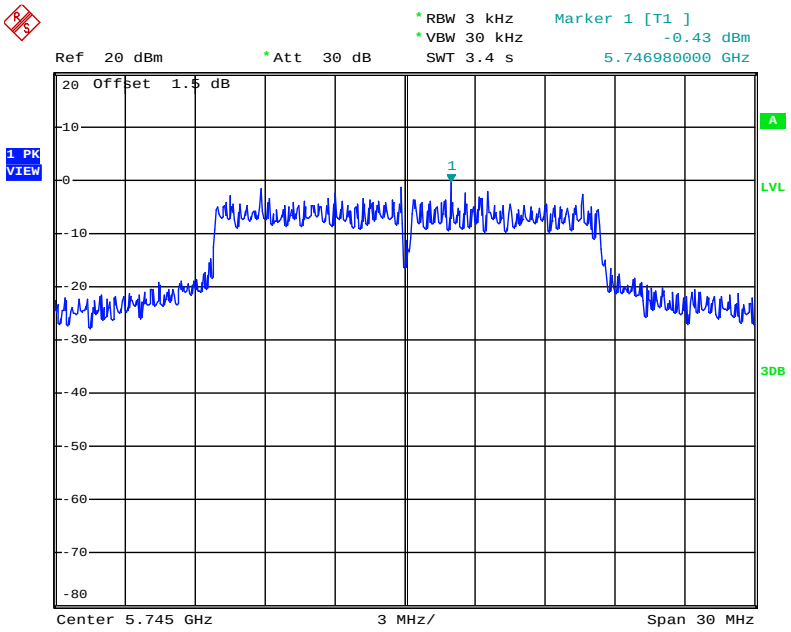
Date: 7.NOV.2014 23:21:12

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



Date: 7.NOV.2014 23:21:23

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 4



Date: 7.NOV.2014 23:21:35

<For Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 5	Chain 6	Total		
1	2412 MHz	-7.08	-7.84	-6.92	-2.49	6.63	Complies
6	2437 MHz	-3.2	-3.1	-2.65	1.79	6.63	Complies
11	2462 MHz	-7.21	-7.88	-6.69	-2.46	6.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASQ}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi,So Power Density Limit =8-(7.37-6)=6.63dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 3	Chain 5	Chain 6	Total		
3	2422 MHz	-8.95	-9.11	-8.41	-4.04	6.63	Complies
6	2437 MHz	-8.33	-8.58	-8.28	-3.62	6.63	Complies
9	2452 MHz	-9.76	-9.97	-9.63	-5.01	6.63	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASQ}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.37dBi > 6dBi,So Power Density Limit =8-(7.37-6)=6.63dBm/3kHz

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
149	5745 MHz	-3.78	-3.68	-3.14	1.25	5.76	Complies
157	5785 MHz	-3.81	-3.42	-3.01	1.37	5.76	Complies
165	5825 MHz	-3.29	-3.13	-2.59	1.78	5.76	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASG}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
151	5755 MHz	-6.8	-6.2	-6.65	-1.77	5.76	Complies
159	5795 MHz	-6.82	-6.35	-6.58	-1.81	5.76	Complies

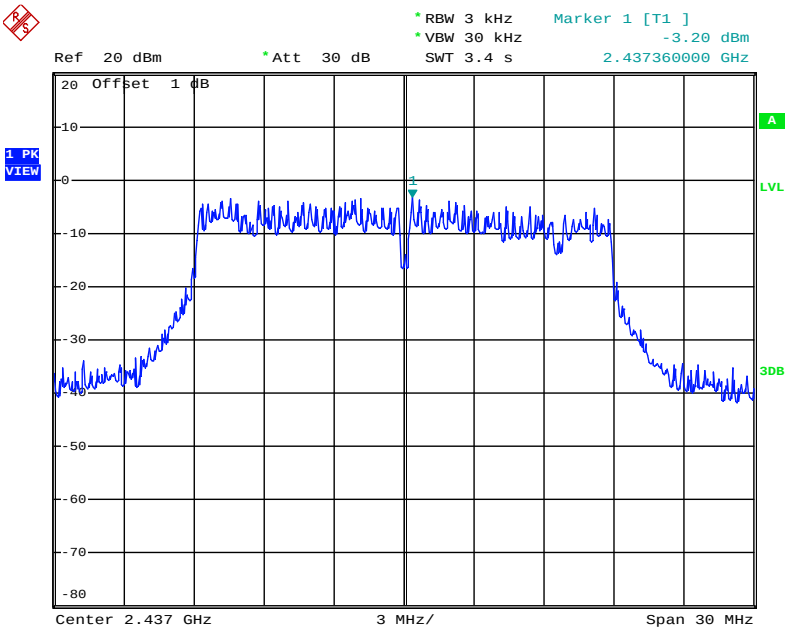
Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASG}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 4	Total		
155	5775 MHz	-10.16	-10.65	-9.8	-5.42	5.76	Complies

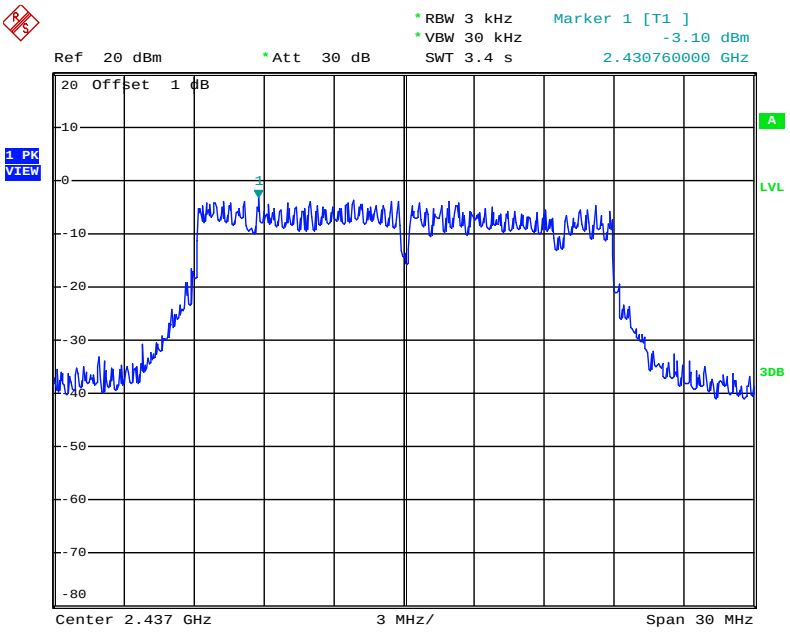
Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ASG}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.24dBi > 6dBi,So Power Density Limit =8-(8.24-6)=5.76dBm/3kHz

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



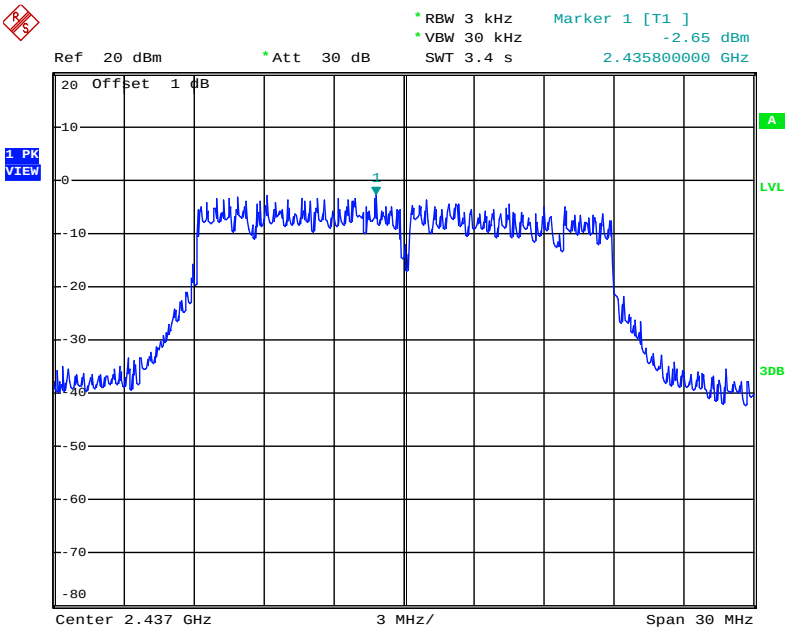
Date: 7.NOV.2014 22:40:43

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 5



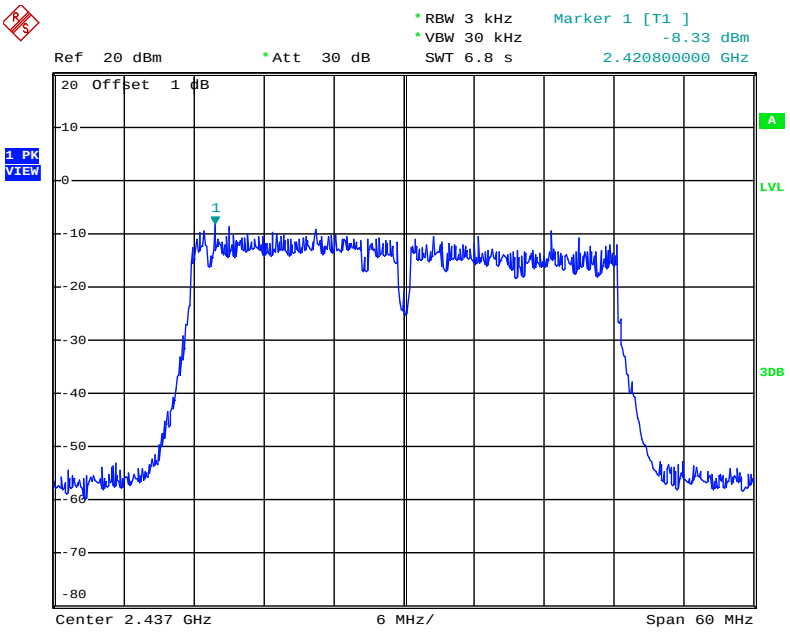
Date: 7.NOV.2014 22:41:39

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 6



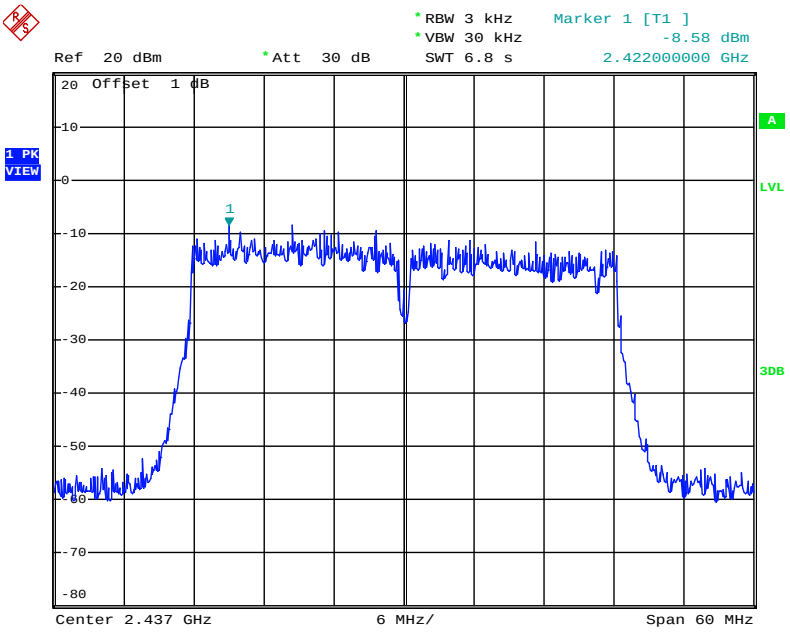
Date: 7.NOV.2014 22:42:07

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



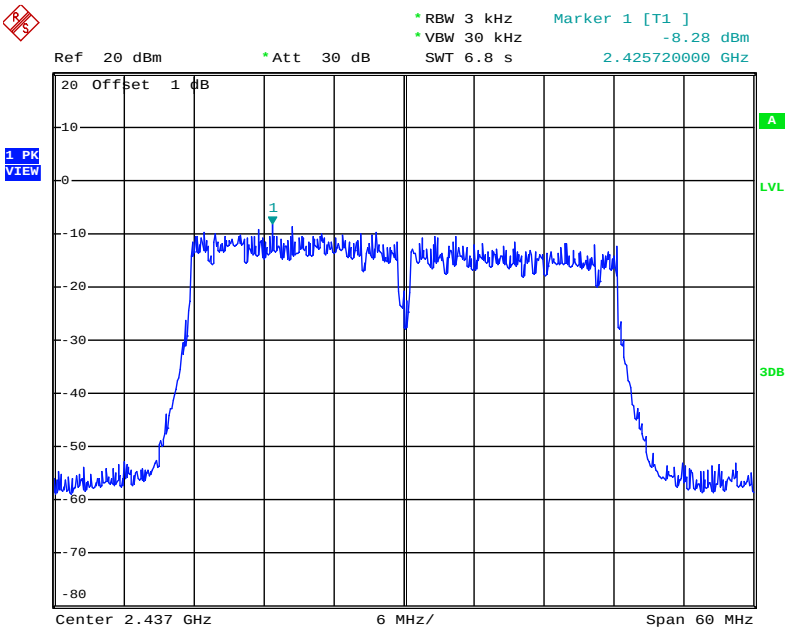
Date: 7.NOV.2014 22:53:02

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 5



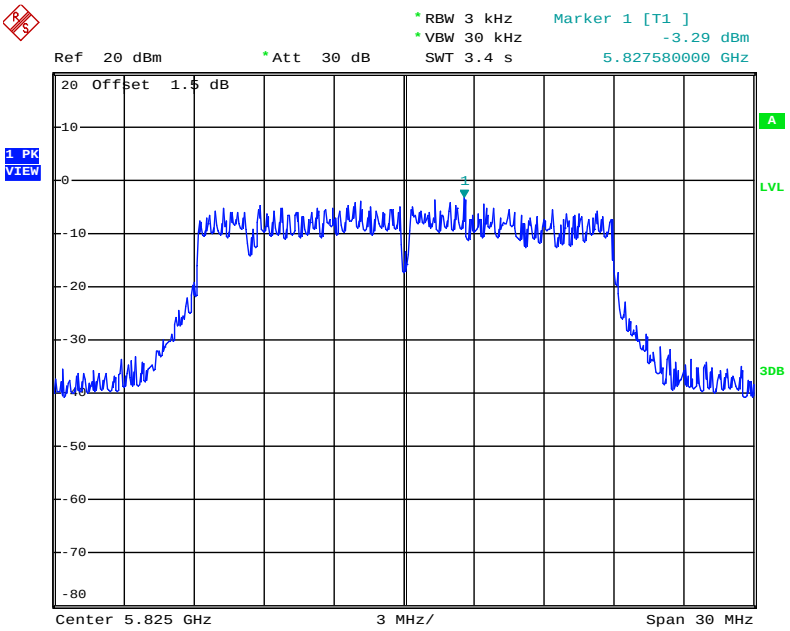
Date: 7.NOV.2014 22:53:16

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 6



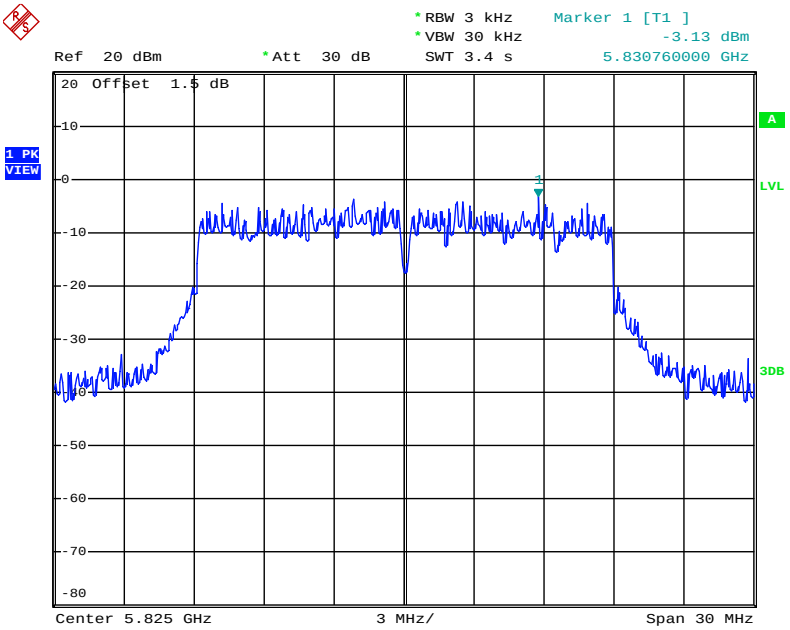
Date: 7.NOV.2014 22:53:38

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



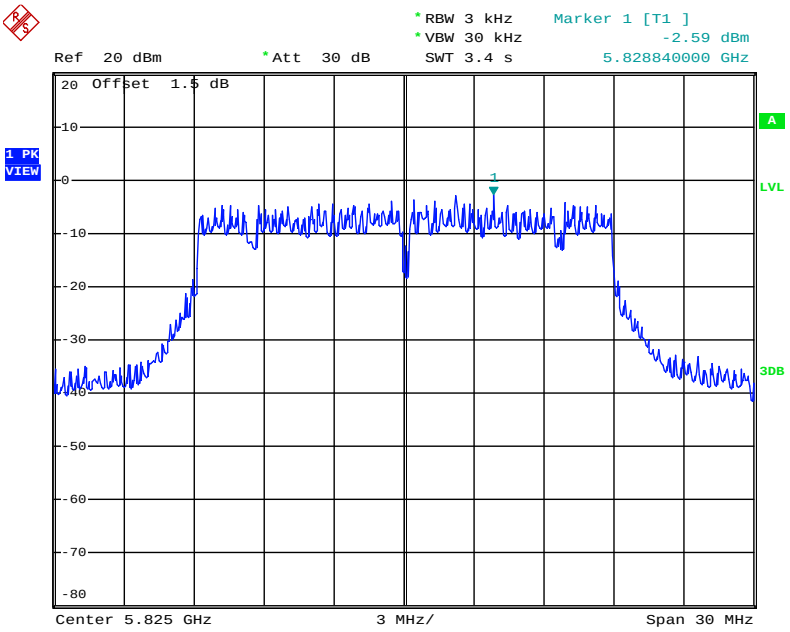
Date: 8.NOV.2014 00:35:53

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



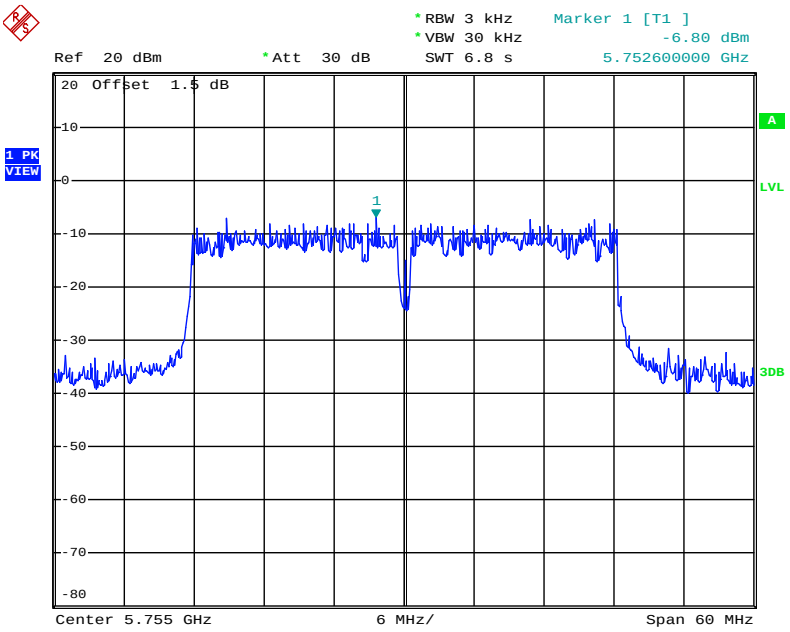
Date: 8.NOV.2014 00:36:03

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 4



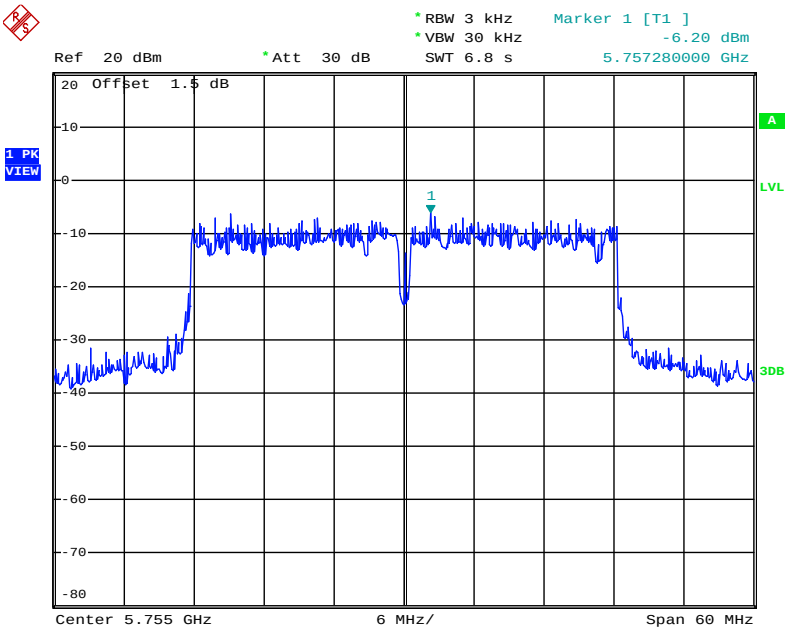
Date: 8.NOV.2014 00:35:43

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 1



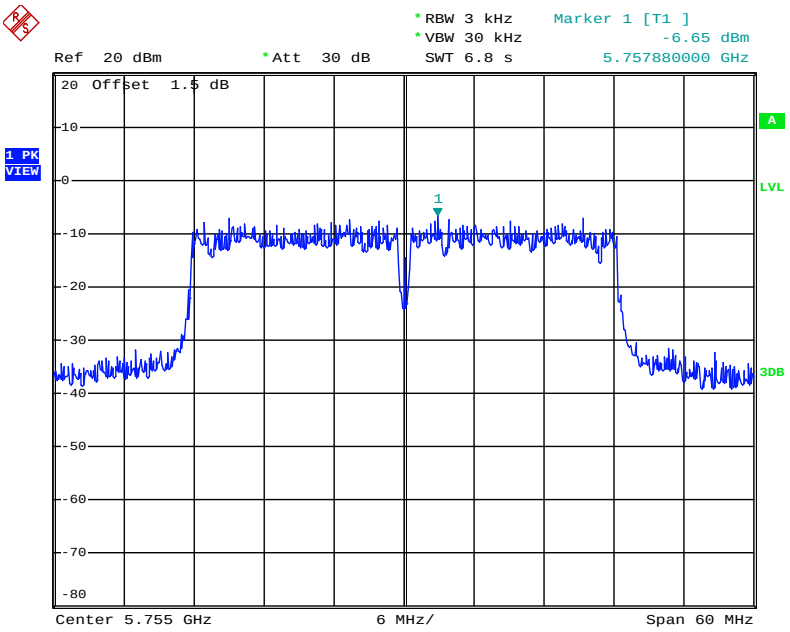
Date: 8.NOV.2014 00:39:10

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 2



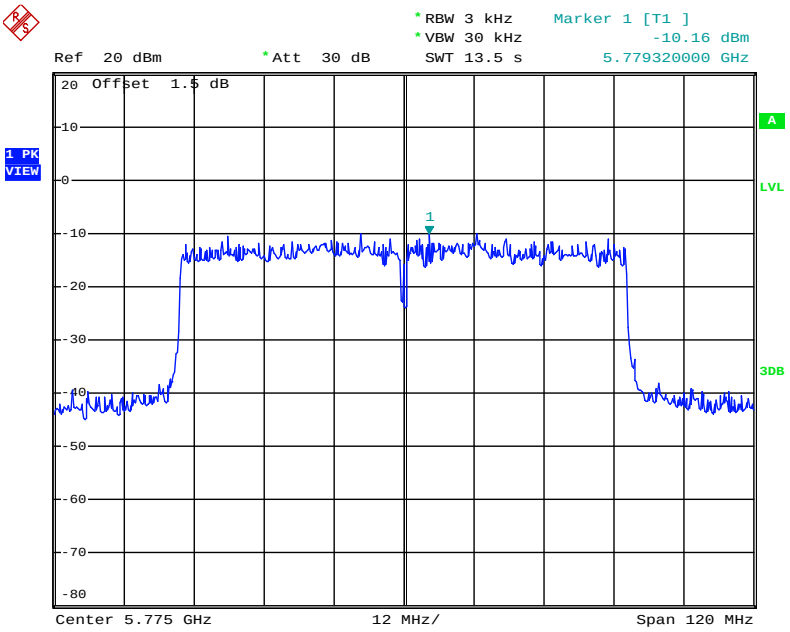
Date: 8.NOV.2014 00:38:34

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 4



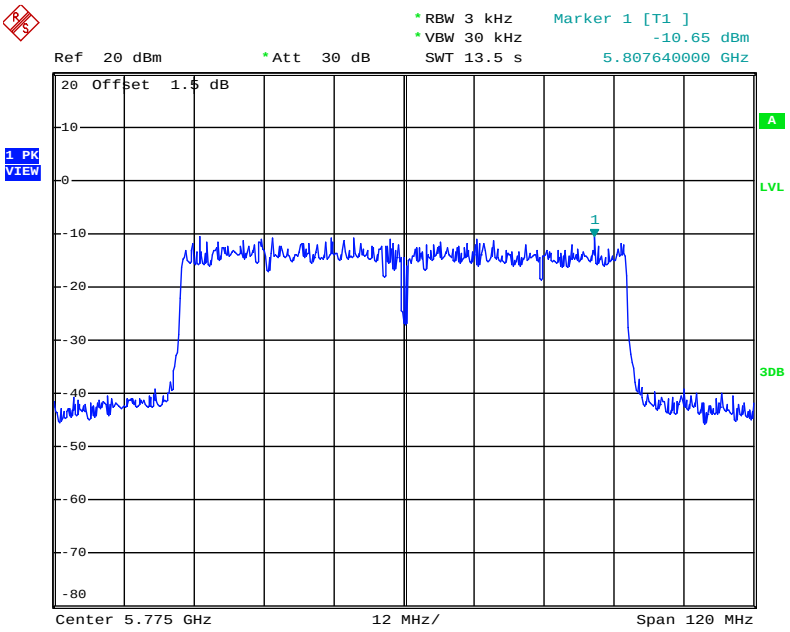
Date: 8.NOV.2014 00:38:58

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



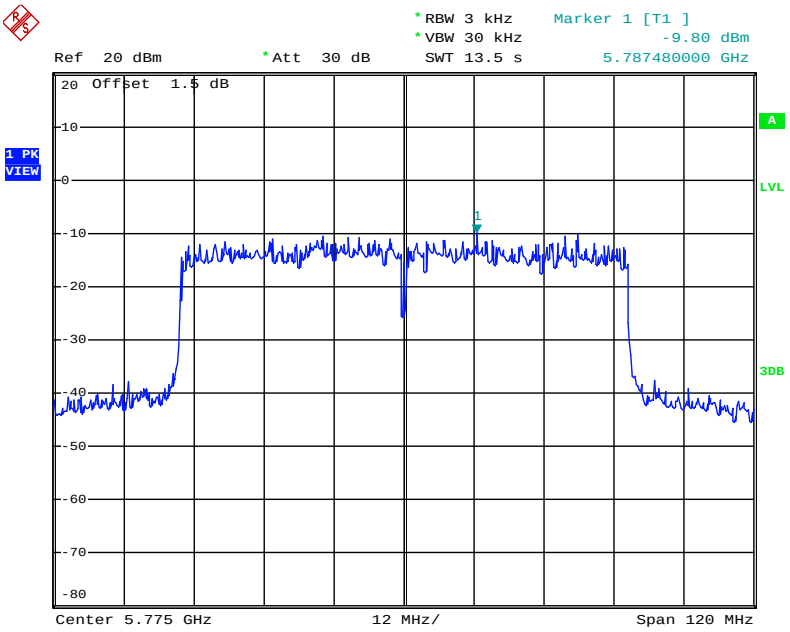
Date: 8.NOV.2014 00:24:46

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



Date: 8.NOV.2014 00:25:45

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 4



Date: 8.NOV.2014 00:26:12

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.

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	**Setting**
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold

4.4.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 8.0 DTS bandwidth=> 8.1 Option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

<For Non-Beamforming Mode>

Temperature	26℃	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	17.46	500	Complies
6	2437 MHz	16.32	18.18	500	Complies
11	2462 MHz	16.48	17.52	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	33.92	36.12	500	Complies
6	2437 MHz	32.64	36.48	500	Complies
9	2452 MHz	32.16	36.72	500	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.04	21.84	500	Complies
157	5785 MHz	11.68	19.98	500	Complies
165	5825 MHz	11.92	19.68	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	31.84	38.04	500	Complies
159	5795 MHz	32.32	40.80	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	70.72	75.60	500	Complies

Temperature	26℃	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 3 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	9.04	11.94	500	Complies
6	2437 MHz	9.28	12.00	500	Complies
11	2462 MHz	9.04	11.94	500	Complies

Configuration IEEE 802.11g / Chain 3 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	15.84	16.80	500	Complies
6	2437 MHz	15.36	17.46	500	Complies
11	2462 MHz	15.84	16.68	500	Complies

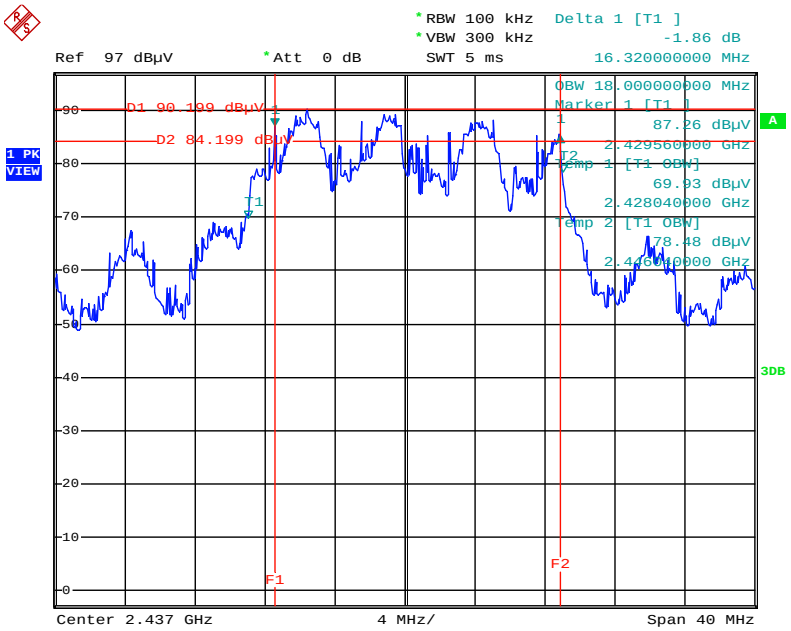
Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.32	22.08	500	Complies
157	5785 MHz	16.32	20.34	500	Complies
165	5825 MHz	16.40	20.22	500	Complies

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

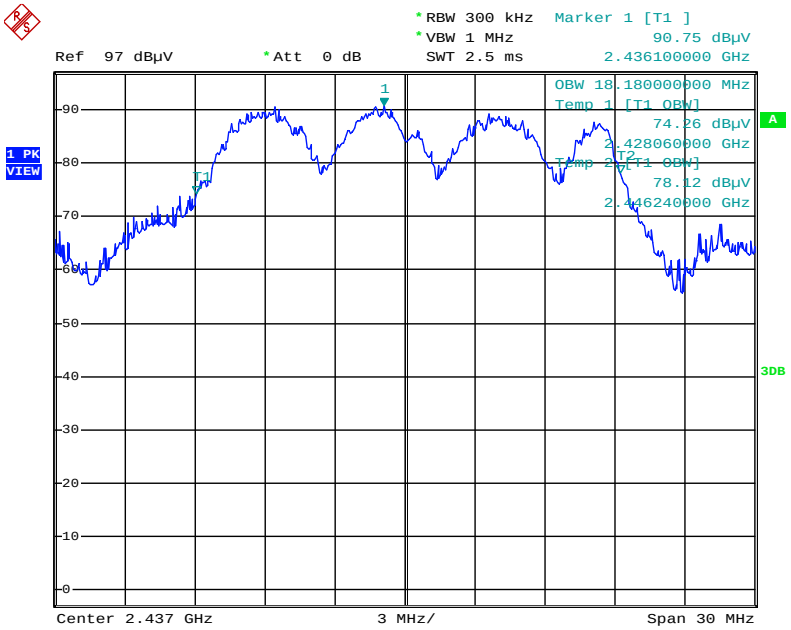
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3 + Chain 5 + Chain 6



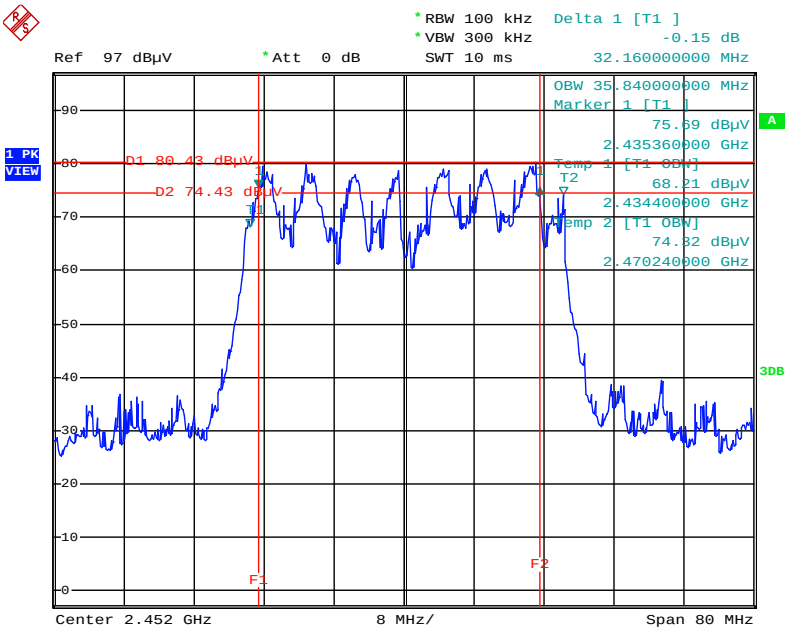
Date: 7.NOV.2014 20:51:22

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3 + Chain 5 + Chain 6



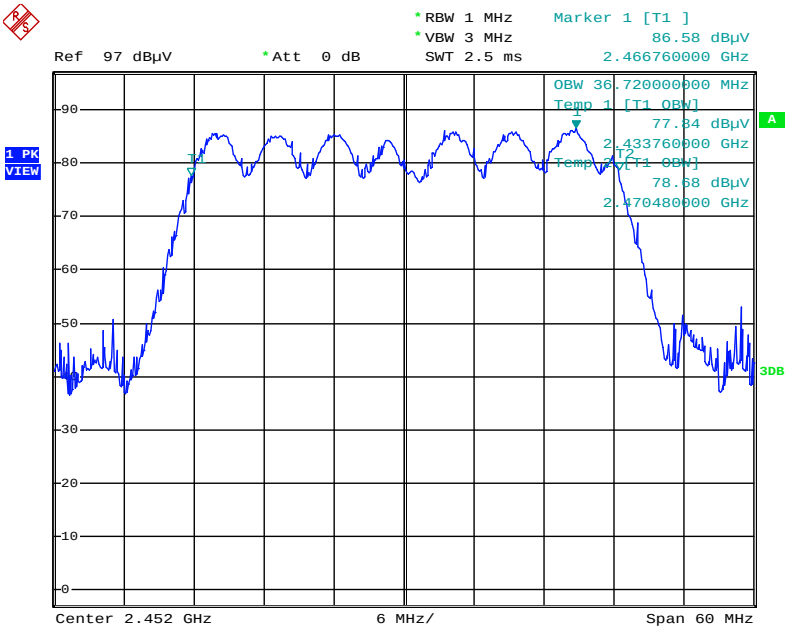
Date: 25.NOV.2014 00:48:27

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2452 MHz / Chain 3 + Chain 5 + Chain 6



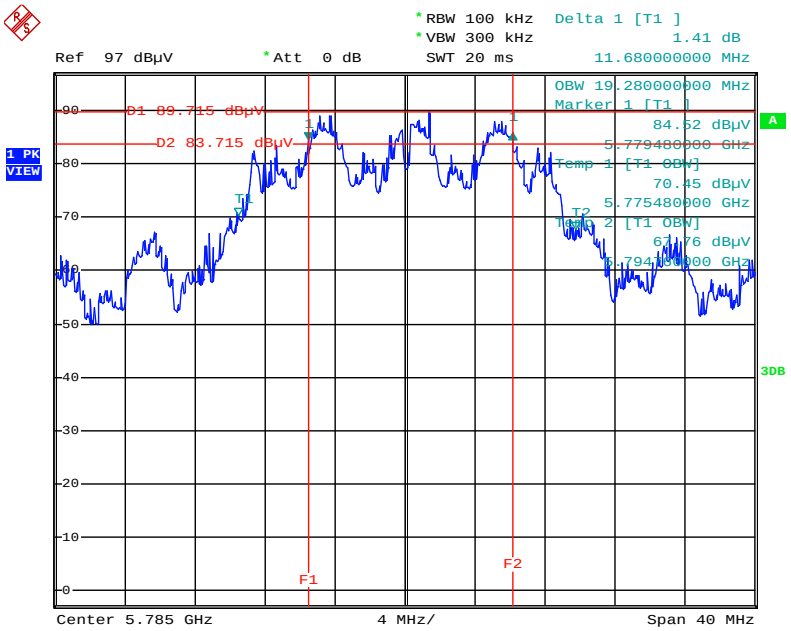
Date: 7.NOV.2014 21:02:35

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2452 MHz / Chain 3 + Chain 5 + Chain 6



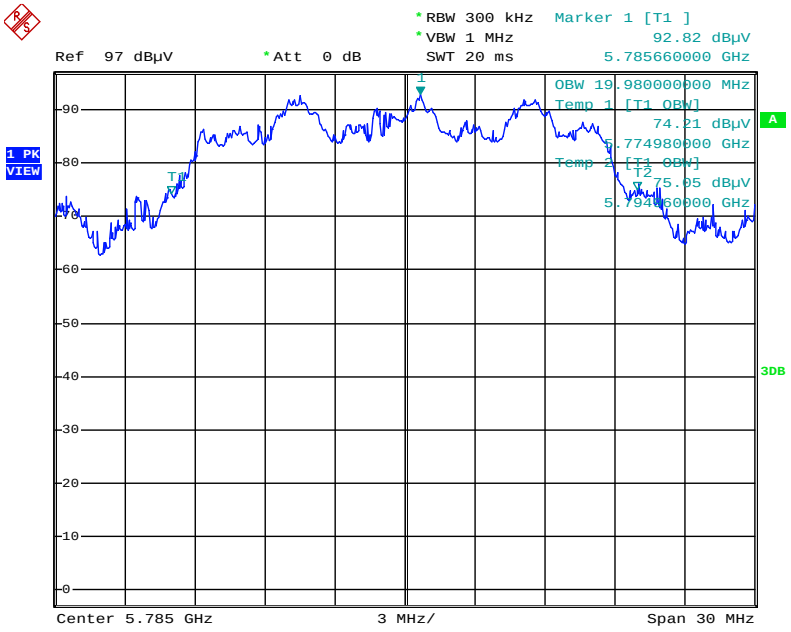
Date: 25.NOV.2014 00:44:53

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 1 + Chain 2 + Chain 4



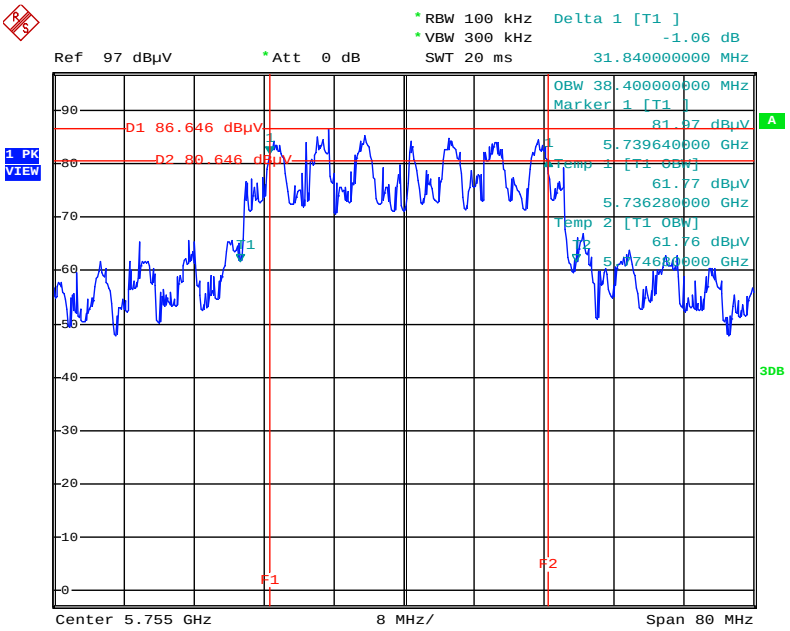
Date: 8.NOV.2014 01:08:32

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 1 + Chain 2 + Chain 4



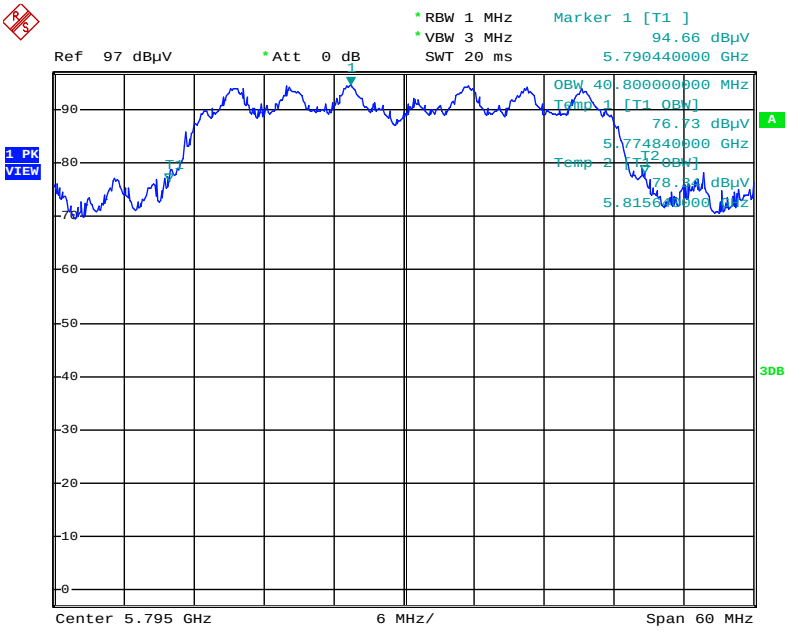
Date: 25.NOV.2014 01:28:35

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755MHz / Chain 1 + Chain 2 + Chain 4



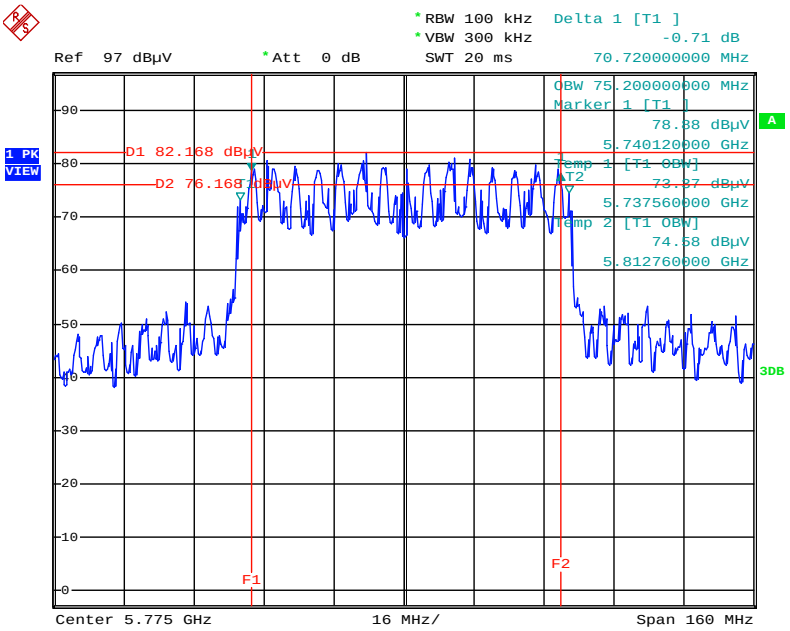
Date: 8.NOV.2014 01:10:44

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 1 + Chain 2 + Chain 4



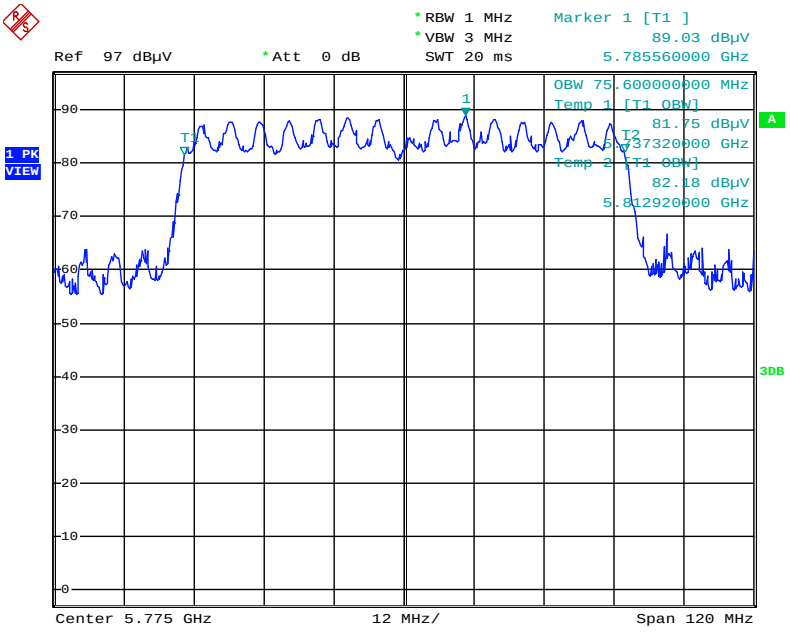
Date: 25.NOV.2014 01:31:53

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2 + Chain 4



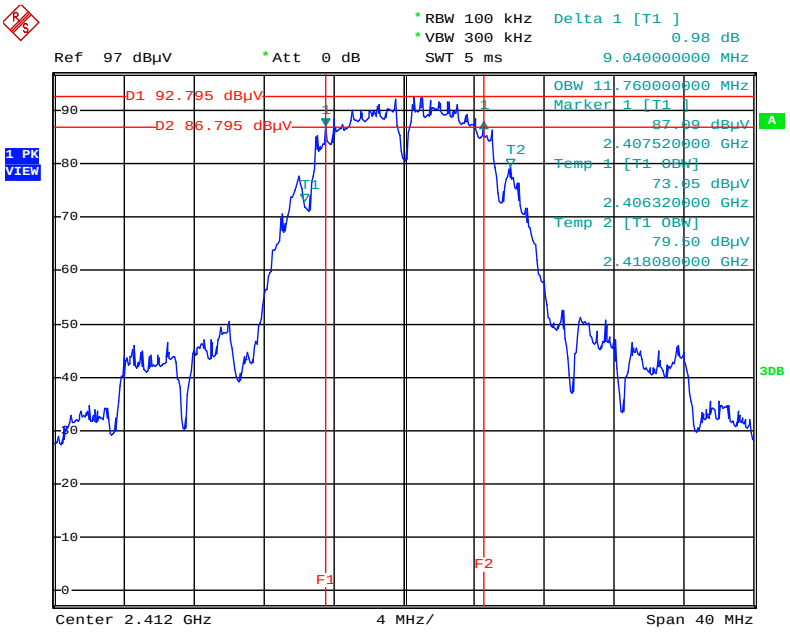
Date: 8.NOV.2014 01:15:24

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2 + Chain 4



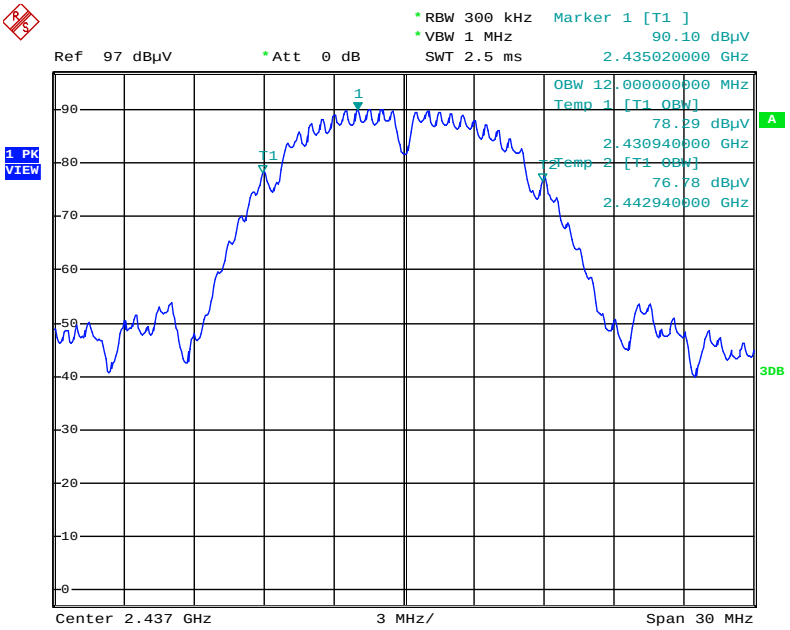
Date: 25.NOV.2014 01:46:10

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 3 + Chain 5 + Chain 6



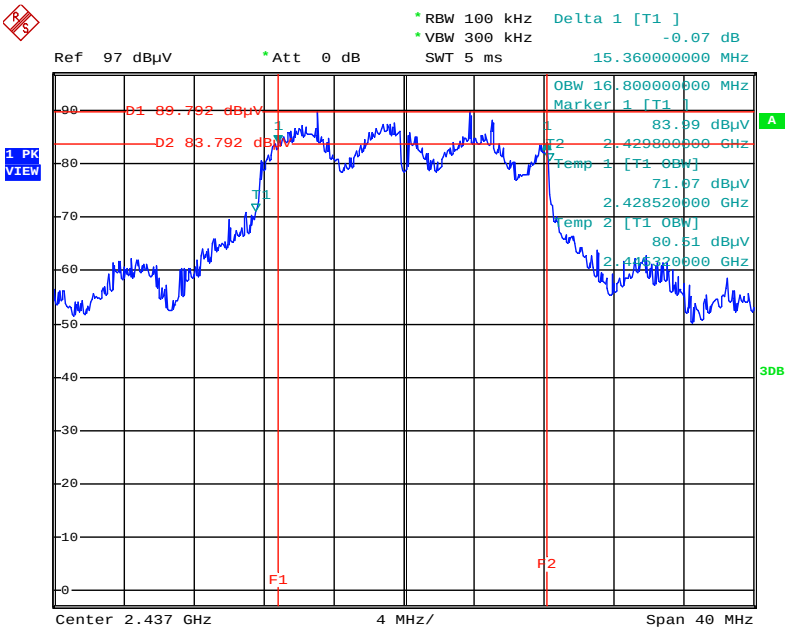
Date: 7.NOV.2014 20:35:17

99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 3 + Chain 5 + Chain 6



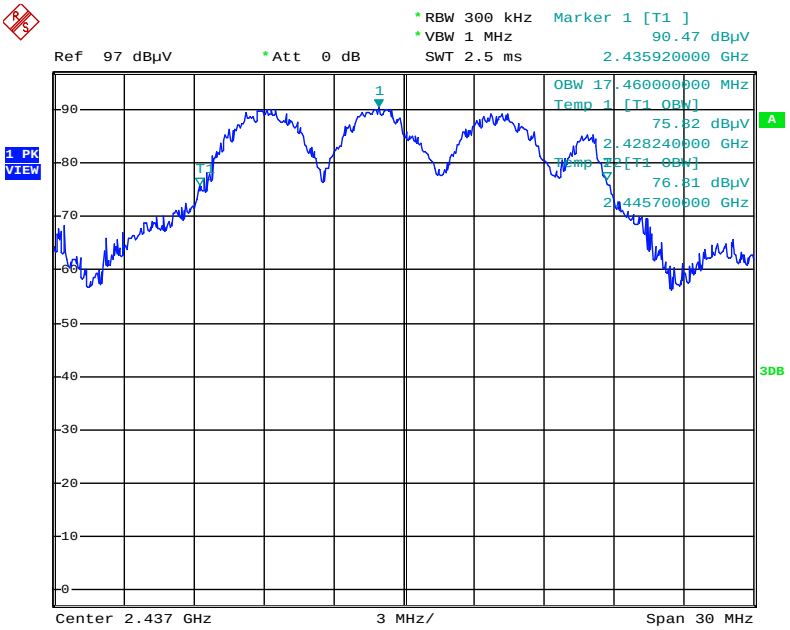
Date: 25.NOV.2014 00:52:19

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 3 + Chain 5 + Chain 6



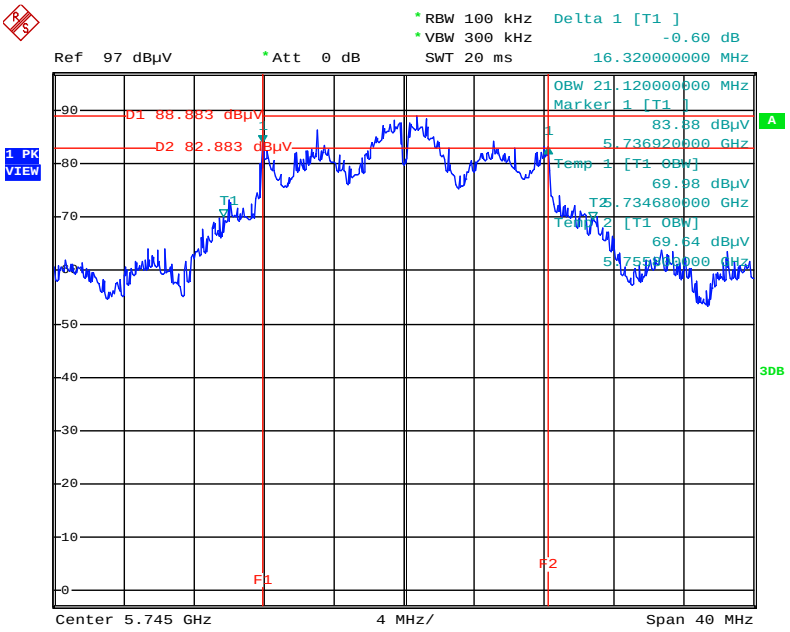
Date: 7.NOV.2014 20:43:48

99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 3 + Chain 5 + Chain 6



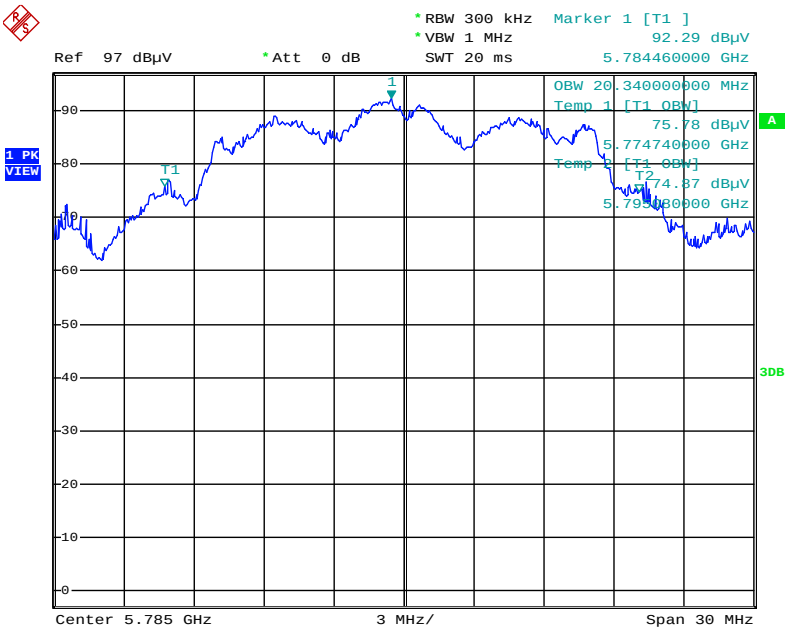
Date: 25.NOV.2014 00:54:23

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 1 + Chain 2 + Chain 4



Date: 8.NOV.2014 00:52:37

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 1 + Chain 2 + Chain 4



Date: 25.NOV.2014 01:18:04

<For Beamforming Mode>

Temperature	26℃	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.24	18.16	500	Complies
6	2437 MHz	16.32	18.12	500	Complies
11	2462 MHz	17.28	18.06	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.04	36.36	500	Complies
6	2437 MHz	35.36	36.72	500	Complies
9	2452 MHz	36.00	36.96	500	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.60	18.24	500	Complies
157	5785 MHz	17.60	18.12	500	Complies
165	5825 MHz	17.60	18.06	500	Complies

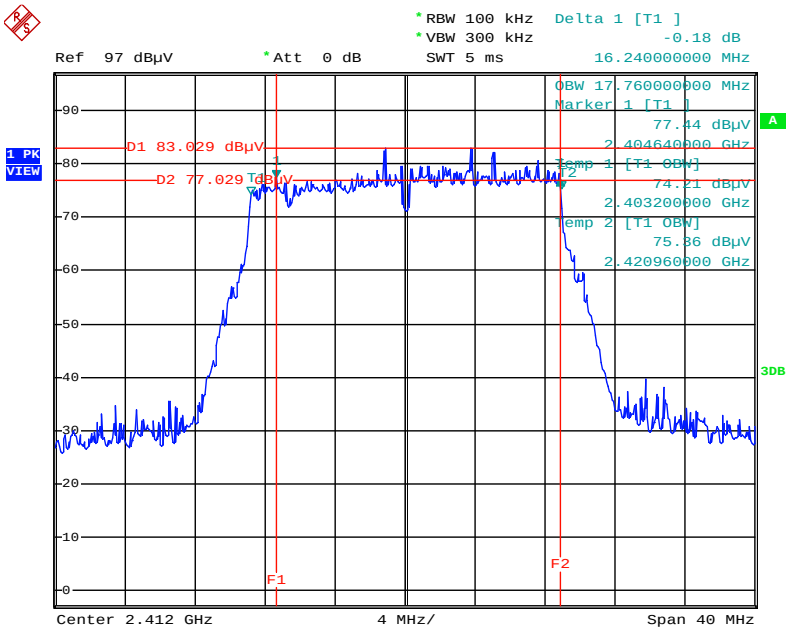
Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.32	37.32	500	Complies
159	5795 MHz	36.48	37.20	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 4

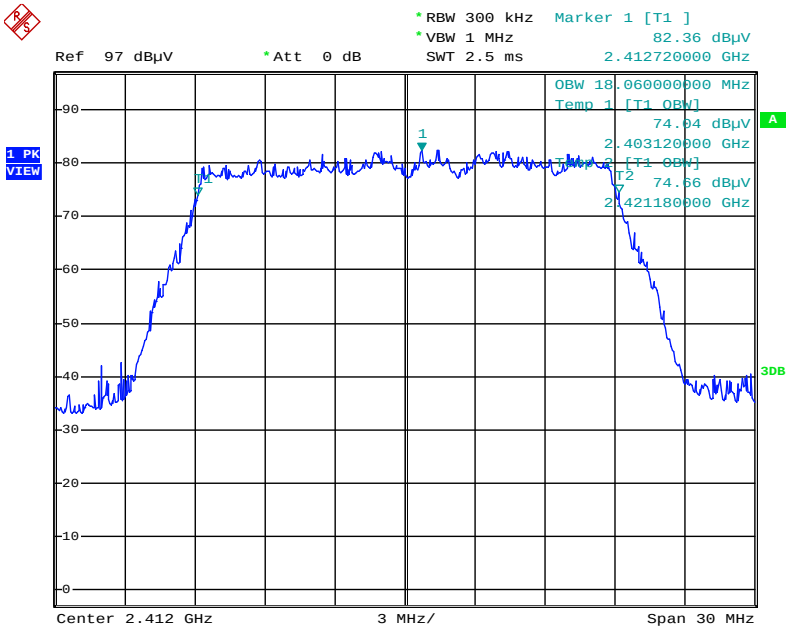
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	75.84	76.08	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 3 + Chain 5 + Chain 6



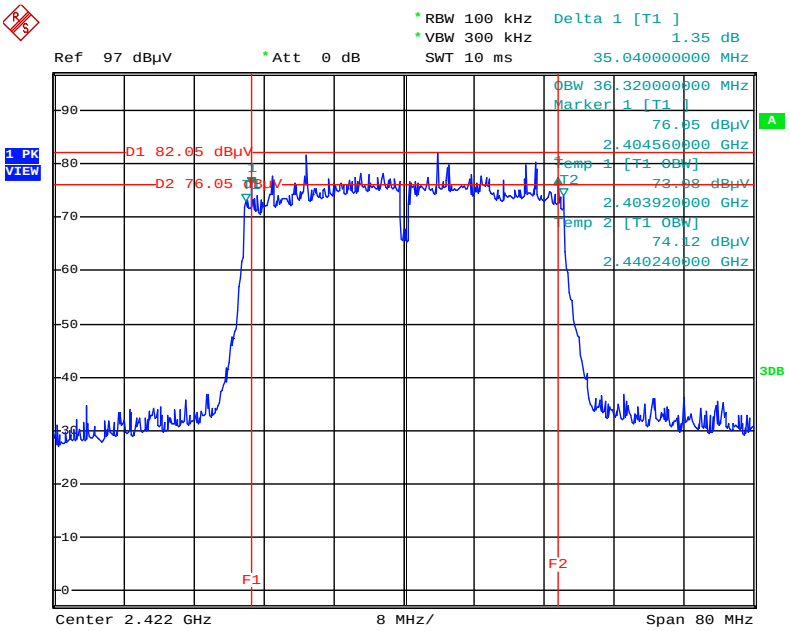
Date: 7.NOV.2014 21:09:31

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 3 + Chain 5 + Chain 6



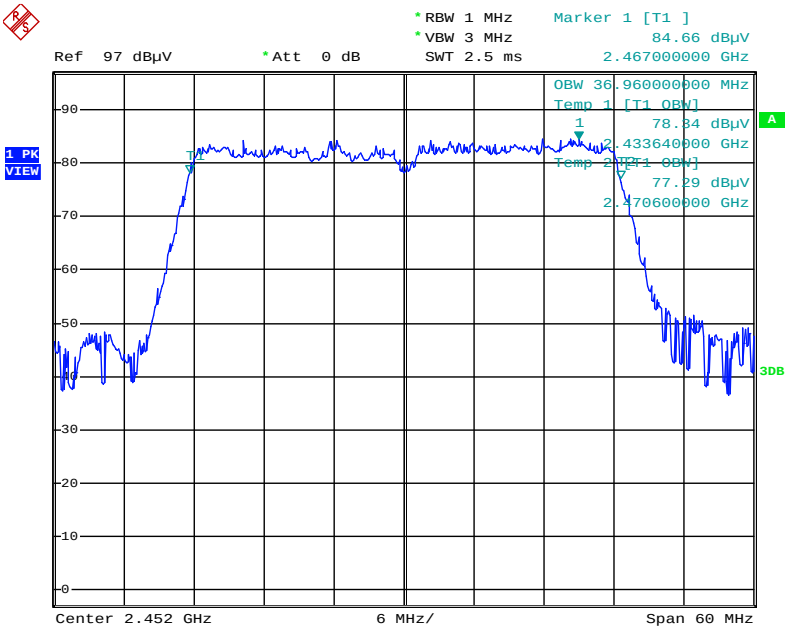
Date: 25.NOV.2014 00:36:39

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2422 MHz / Chain 3 + Chain 5 + Chain 6



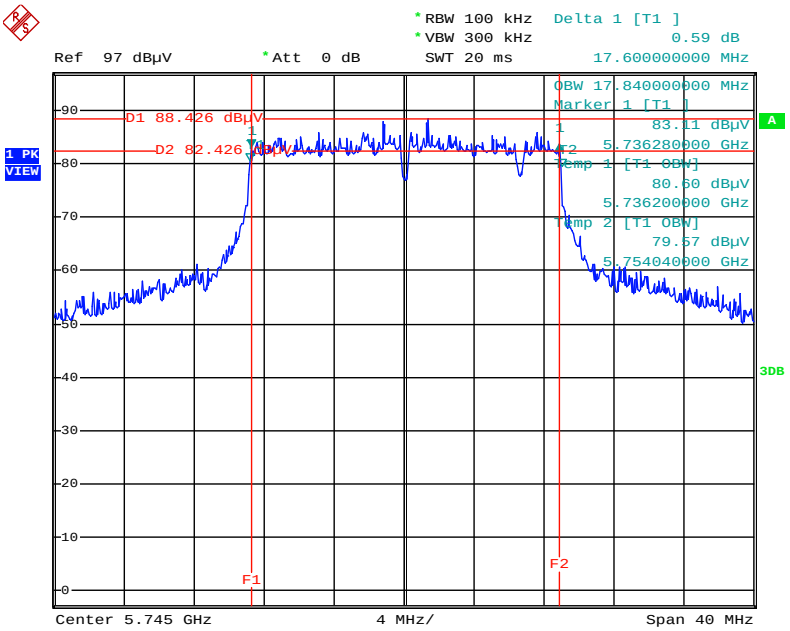
Date: 7.NOV.2014 21:20:17

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2452 MHz / Chain 3 + Chain 5 + Chain 6



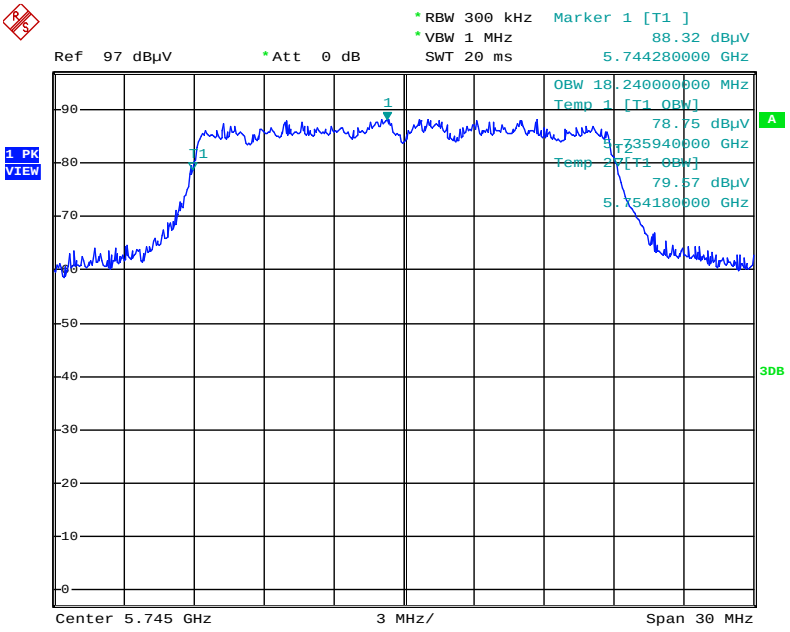
Date: 25.NOV.2014 00:41:17

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 1 + Chain 2 + Chain 4



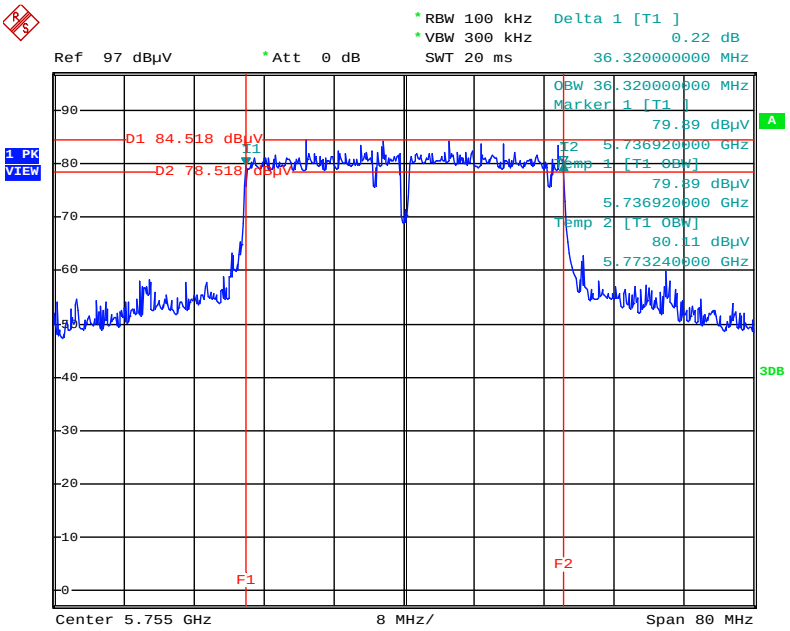
Date: 8.NOV.2014 01:19:11

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 1 + Chain 2 + Chain 4



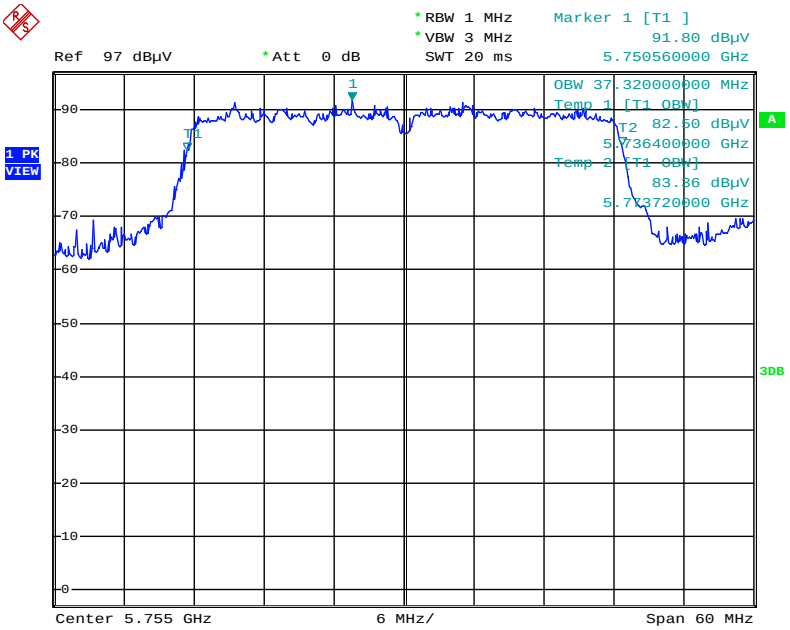
Date: 25.NOV.2014 01:37:21

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755MHz / Chain 1 + Chain 2 + Chain 4



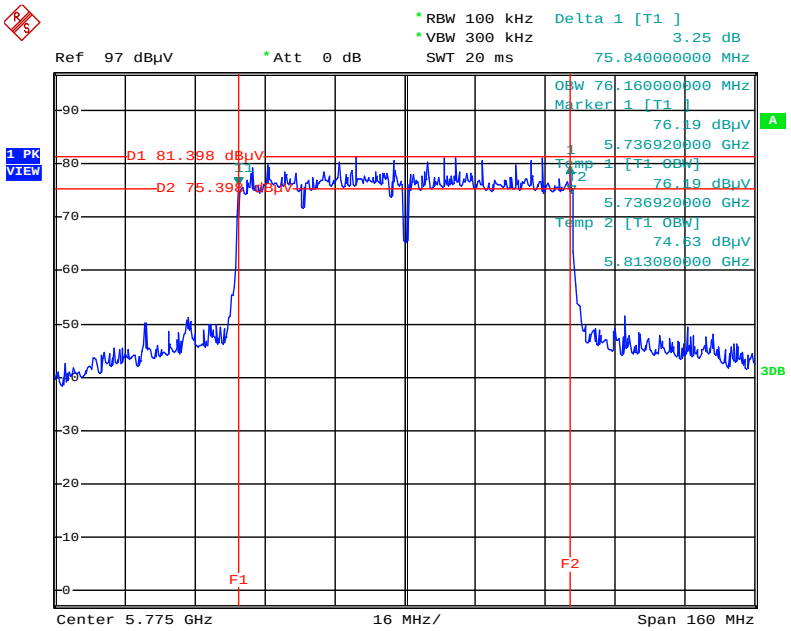
Date: 8.NOV.2014 01:22:51

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755MHz / Chain 1 + Chain 2 + Chain 4



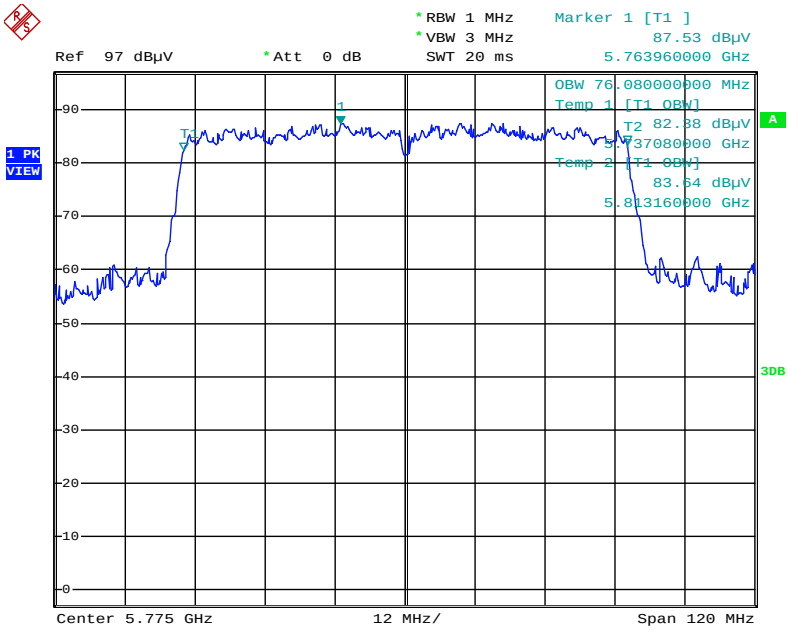
Date: 25.NOV.2014 01:35:18

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2 + Chain 4



Date: 8.NOV.2014 01:17:39

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2 + Chain 4



Date: 25.NOV.2014 01:44:28

4.5. Radiated Emissions Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

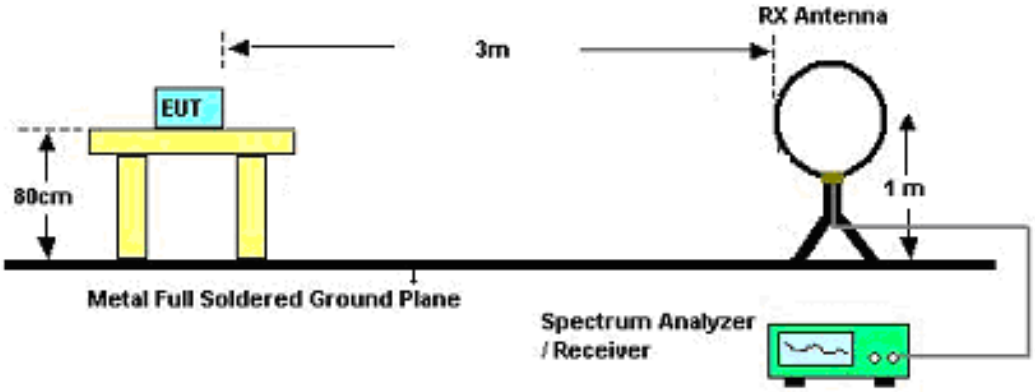
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

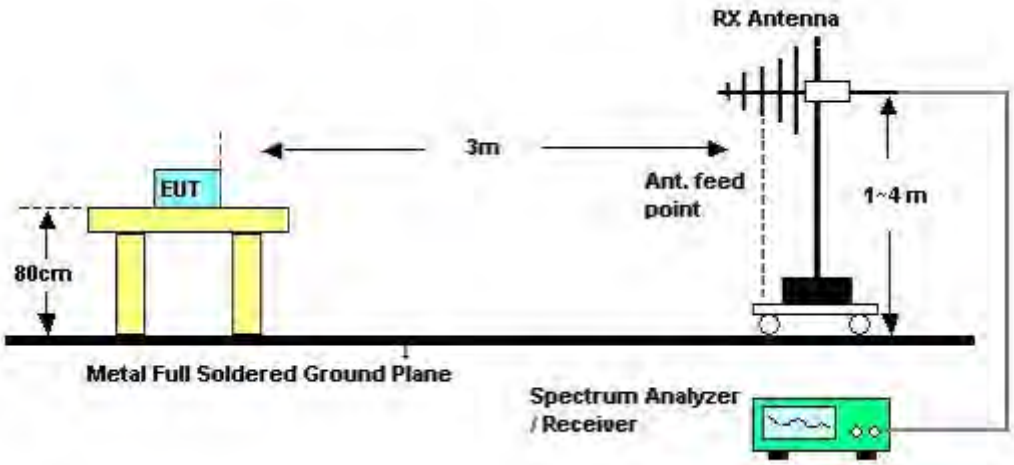
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 1/T 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

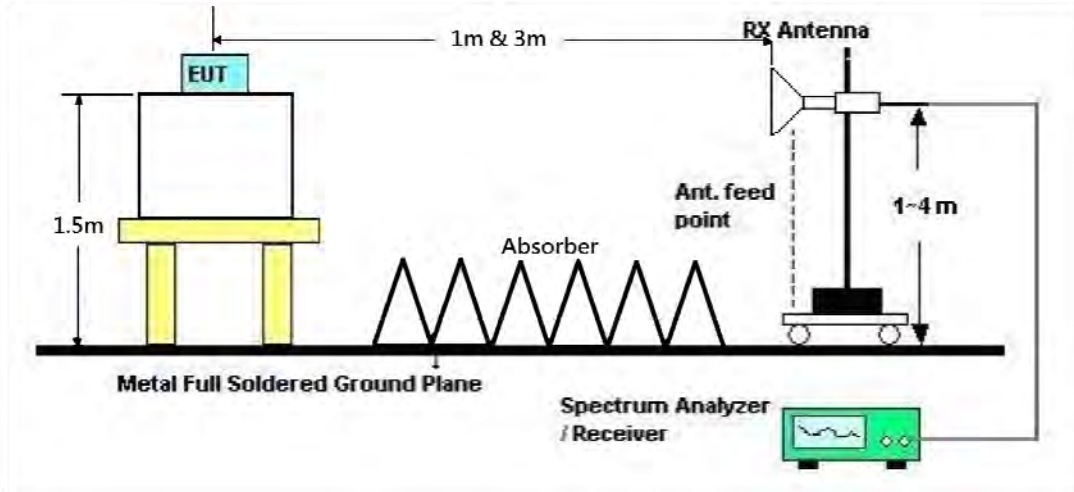
For Radiated Emissions: 9kHz ~30MHz



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	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	CTX
Test Date	Dec. 16, 2014	Test Mode	Mode 3

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.

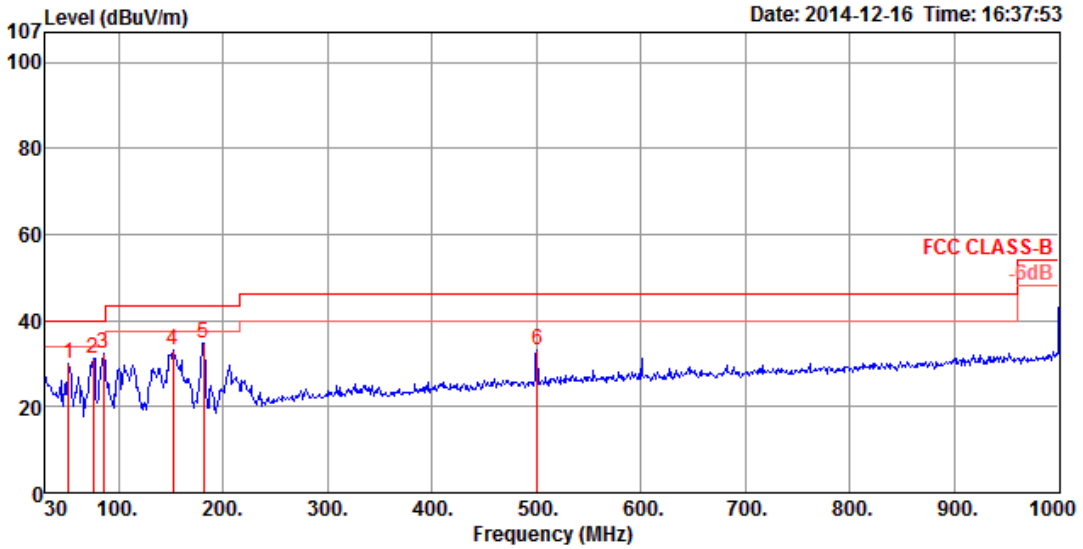
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

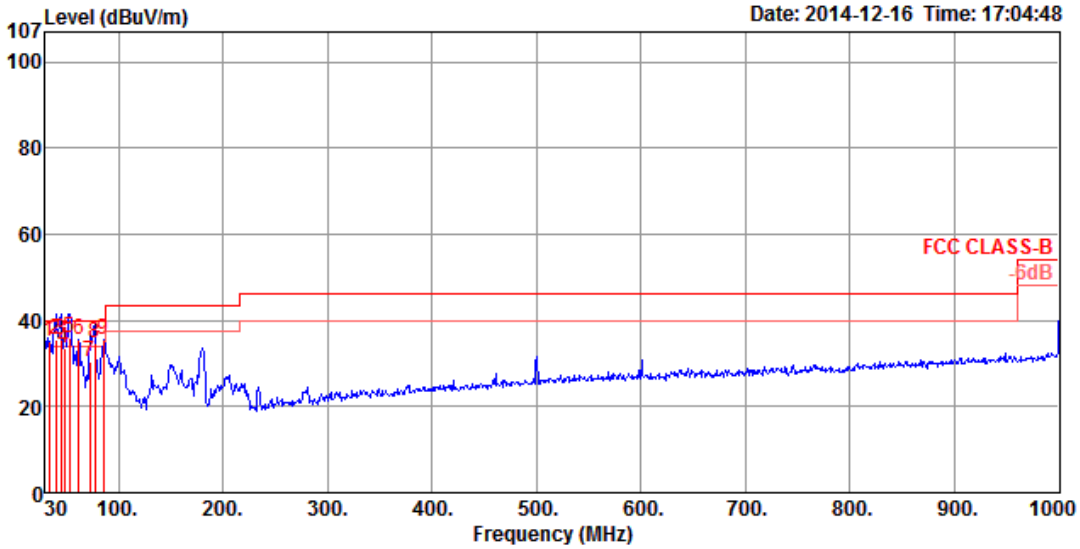
Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	CTX
Test Mode	Mode 3		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	52.31	29.83	40.00	-10.17	53.38	0.51	32.52	8.46	HORIZONTAL	273	400	Peak
2	75.59	31.39	40.00	-8.61	55.87	0.63	32.37	7.26	HORIZONTAL	289	400	Peak
3	85.29	32.35	40.00	-7.65	55.66	0.66	32.44	8.47	HORIZONTAL	277	400	Peak
4	152.22	33.00	43.50	-10.50	53.38	0.88	32.35	11.09	HORIZONTAL	288	200	Peak
5	181.32	34.83	43.50	-8.67	56.57	0.97	32.30	9.59	HORIZONTAL	288	200	Peak
6	500.45	33.17	46.00	-12.83	46.17	1.60	32.41	17.81	HORIZONTAL	156	100	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	33.88	35.07	40.00	-4.93	49.46	0.42	32.41	17.60	VERTICAL	154	100	Peak
2	39.70	35.51	40.00	-4.49	53.46	0.44	32.49	14.10	VERTICAL	1	100	QP
3	44.55	35.37	40.00	-4.63	56.12	0.48	32.43	11.20	VERTICAL	318	100	QP
4	48.43	33.56	40.00	-6.44	55.84	0.49	32.50	9.73	VERTICAL	313	100	QP
5	53.28	35.90	40.00	-4.10	59.55	0.52	32.51	8.34	VERTICAL	318	100	QP
6	62.01	35.37	40.00	-4.63	60.51	0.57	32.51	6.80	VERTICAL	360	125	Peak
7	72.68	30.44	40.00	-9.56	55.24	0.62	32.44	7.02	VERTICAL	182	200	QP
8	77.53	34.62	40.00	-5.38	58.96	0.64	32.36	7.38	VERTICAL	222	100	QP
9	85.29	35.72	40.00	-4.28	59.10	0.66	32.44	8.40	VERTICAL	175	125	Peak

Note:

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

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

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

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

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.32	46.48	74.00	-27.52	42.42	5.87	33.39	35.20	Peak	165	181	HORIZONTAL
2	4825.95	34.46	54.00	-19.54	30.40	5.87	33.39	35.20	Average	165	181	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4821.87	46.81	74.00	-27.19	42.75	5.87	33.39	35.20	Peak	196	265	VERTICAL
2	4823.83	33.19	54.00	-20.81	29.13	5.87	33.39	35.20	Average	196	265	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4891.87	30.42	54.00	-23.58	28.16	4.13	32.69	34.56	Average	60	154	HORIZONTAL
2	4894.55	44.42	74.00	-29.58	42.16	4.13	32.69	34.56	Peak	61	154	HORIZONTAL
3	7306.59	55.71	74.00	-18.29	48.37	5.09	37.07	34.82	Peak	322	107	HORIZONTAL
4	7307.38	40.89	54.00	-13.11	33.55	5.09	37.07	34.82	Average	322	107	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4872.90	31.02	54.00	-22.98	28.80	4.13	32.66	34.57	Average	334	100	VERTICAL
2	4874.06	45.57	74.00	-28.43	43.35	4.13	32.66	34.57	Peak	334	100	VERTICAL
3	7308.03	40.76	54.00	-13.24	33.42	5.09	37.07	34.82	Average	311	110	VERTICAL
4	7308.54	55.10	74.00	-18.90	47.76	5.09	37.07	34.82	Peak	311	110	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	4916.88	46.97	74.00	-27.03	42.68	5.95	33.54	35.20	Peak	212	330	HORIZONTAL
2	4917.92	32.70	54.00	-21.30	28.41	5.95	33.54	35.20	Average	212	330	HORIZONTAL
3	7381.02	38.03	54.00	-15.97	29.71	7.16	36.61	35.45	Average	100	93	HORIZONTAL
4	7381.57	50.82	74.00	-23.18	42.50	7.16	36.61	35.45	Peak	100	93	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4915.95	33.17	54.00	-20.83	28.88	5.95	33.54	35.20	Average	175	88	VERTICAL
2	4925.62	46.60	74.00	-27.40	42.25	5.97	33.58	35.20	Peak	175	88	VERTICAL
3	7376.68	39.94	54.00	-14.06	31.62	7.16	36.61	35.45	Average	167	325	VERTICAL
4	7379.69	51.44	74.00	-22.56	43.12	7.16	36.61	35.45	Peak	167	325	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	4845.30	33.69	74.00	-40.31	29.59	5.88	33.42	35.20	Peak	181	43	HORIZONTAL
2	4845.82	33.22	54.00	-20.78	29.12	5.88	33.42	35.20	Average	181	43	HORIZONTAL
3	7261.54	37.70	54.00	-16.30	29.58	7.10	36.43	35.41	Average	158	325	HORIZONTAL
4	7269.36	50.81	74.00	-23.19	42.68	7.11	36.43	35.41	Peak	158	325	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	4843.36	47.15	74.00	-26.85	43.05	5.88	33.42	35.20	Peak	170	107	VERTICAL
2	4844.64	33.16	54.00	-20.84	29.06	5.88	33.42	35.20	Average	170	107	VERTICAL
3	7265.71	50.68	74.00	-23.32	42.55	7.11	36.43	35.41	Peak	167	229	VERTICAL
4	7268.34	37.86	54.00	-16.14	29.73	7.11	36.43	35.41	Average	167	229	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4883.55	44.91	74.00	-29.09	42.69	4.13	32.66	34.57	Peak	90	169	HORIZONTAL
2	4883.58	30.12	54.00	-23.88	27.90	4.13	32.66	34.57	Average	90	169	HORIZONTAL
3	7302.75	35.66	54.00	-18.34	28.32	5.09	37.07	34.82	Average	288	152	HORIZONTAL
4	7303.79	50.31	74.00	-23.69	42.97	5.09	37.07	34.82	Peak	288	152	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4881.90	44.37	74.00	-29.63	42.15	4.13	32.66	34.57	Peak	109	173	VERTICAL
2	4883.44	30.24	54.00	-23.76	28.02	4.13	32.66	34.57	Average	109	173	VERTICAL
3	7301.56	49.72	74.00	-24.28	42.38	5.09	37.07	34.82	Peak	334	184	VERTICAL
4	7301.68	35.69	54.00	-18.31	28.35	5.09	37.07	34.82	Average	334	184	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4905.80	46.74	74.00	-27.26	42.45	5.95	33.54	35.20	Peak	166	197	HORIZONTAL
2	4905.94	32.43	54.00	-21.57	28.14	5.95	33.54	35.20	Average	166	197	HORIZONTAL
3	7355.57	37.24	54.00	-16.76	28.96	7.16	36.56	35.44	Average	158	346	HORIZONTAL
4	7363.21	45.53	74.00	-28.47	37.23	7.16	36.59	35.45	Peak	158	346	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	4907.76	33.18	54.00	-20.82	28.89	5.95	33.54	35.20	Average	171	54	VERTICAL
2	4913.47	46.87	74.00	-27.13	42.58	5.95	33.54	35.20	Peak	171	54	VERTICAL
3	7356.75	37.76	54.00	-16.24	29.48	7.16	36.56	35.44	Average	162	209	VERTICAL
4	7363.15	51.80	74.00	-22.20	43.50	7.16	36.59	35.45	Peak	162	209	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 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	11448.02	56.67	74.00	-17.33	43.02	9.22	39.50	35.07	Peak	163	190	HORIZONTAL
2	11450.64	43.69	54.00	-10.31	30.04	9.22	39.50	35.07	Average	163	190	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	11446.83	44.65	54.00	-9.35	31.00	9.22	39.50	35.07	Average	165	236	VERTICAL
2	11449.81	56.77	74.00	-17.23	43.12	9.22	39.50	35.07	Peak	165	236	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11570.94	44.75	54.00	-9.25	34.56	6.55	38.33	34.69	Average	148	103	HORIZONTAL
2	11571.01	57.73	74.00	-16.27	47.54	6.55	38.33	34.69	Peak	148	103	HORIZONTAL
3	17369.62	59.41	74.00	-14.59	43.24	8.09	42.01	33.93	Peak	124	138	HORIZONTAL
4	17379.38	45.88	54.00	-8.12	29.71	8.09	42.01	33.93	Average	121	138	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11570.43	48.86	54.00	-5.14	38.67	6.55	38.33	34.69	Average	180	149	VERTICAL
2	11571.08	62.73	74.00	-11.27	52.54	6.55	38.33	34.69	Peak	180	149	VERTICAL
3	17373.74	59.67	74.00	-14.33	43.50	8.09	42.01	33.93	Peak	151	150	VERTICAL
4	17379.60	45.92	54.00	-8.08	29.72	8.09	42.04	33.93	Average	151	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 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	11450.68	56.22	74.00	-17.78	42.57	9.22	39.50	35.07	Peak	164	138	HORIZONTAL
2	11451.78	43.28	54.00	-10.72	29.63	9.22	39.50	35.07	Average	164	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	11451.03	56.83	74.00	-17.17	43.18	9.22	39.50	35.07	Peak	173	155	VERTICAL
2	11451.35	43.57	54.00	-10.43	29.92	9.22	39.50	35.07	Average	173	155	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 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	11505.15	55.79	74.00	-18.21	42.14	9.25	39.50	35.10	Peak	173	115	HORIZONTAL
2	11508.77	42.53	54.00	-11.47	28.88	9.25	39.50	35.10	Average	173	115	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	11505.27	43.54	54.00	-10.46	29.89	9.25	39.50	35.10	Average	161	157	VERTICAL
2	11507.08	56.46	74.00	-17.54	42.81	9.25	39.50	35.10	Peak	161	157	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11579.72	55.24	74.00	-18.76	45.05	6.55	38.33	34.69	Peak	214	100	HORIZONTAL
2	11584.86	41.65	54.00	-12.35	31.46	6.55	38.33	34.69	Average	214	100	HORIZONTAL
3	17400.85	59.74	74.00	-14.26	43.49	8.10	42.08	33.93	Peak	214	125	HORIZONTAL
4	17407.07	45.91	54.00	-8.09	29.66	8.10	42.08	33.93	Average	214	125	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11590.51	59.76	74.00	-14.24	49.57	6.55	38.33	34.69	Peak	229	100	VERTICAL
2	11590.58	45.41	54.00	-8.59	35.22	6.55	38.33	34.69	Average	229	100	VERTICAL
3	17387.75	59.65	74.00	-14.35	43.45	8.09	42.04	33.93	Peak	139	150	VERTICAL
4	17398.60	45.99	54.00	-8.01	29.74	8.10	42.08	33.93	Average	139	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11513.42	39.90	54.00	-14.10	29.72	6.54	38.30	34.66	Average	10	100	HORIZONTAL
2	11549.53	54.56	74.00	-19.44	44.37	6.55	38.32	34.68	Peak	10	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11510.67	57.26	74.00	-16.74	47.08	6.54	38.30	34.66	Peak	227	100	VERTICAL
2	11510.82	42.99	54.00	-11.01	32.81	6.54	38.30	34.66	Average	227	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11b CH 1 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.60	48.85	74.00	-25.15	44.79	5.87	33.39	35.20	Peak	233	276	HORIZONTAL
2	4824.03	39.28	54.00	-14.72	35.22	5.87	33.39	35.20	Average	233	276	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4824.06	43.30	54.00	-10.70	39.24	5.87	33.39	35.20	Average	100	64	VERTICAL
2	4824.38	50.27	74.00	-23.73	46.21	5.87	33.39	35.20	Peak	100	64	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11b CH 6 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4872.80	45.50	74.00	-28.50	43.28	4.13	32.66	34.57	Peak	265	100	HORIZONTAL
2	4874.12	34.11	54.00	-19.89	31.89	4.13	32.66	34.57	Average	265	100	HORIZONTAL
3	7310.13	53.59	74.00	-20.41	46.25	5.09	37.07	34.82	Peak	323	100	HORIZONTAL
4	7310.35	46.04	54.00	-7.96	38.70	5.09	37.07	34.82	Average	323	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4874.04	42.45	54.00	-11.55	40.23	4.13	32.66	34.57	Average	51	101	VERTICAL
2	4874.29	48.35	74.00	-25.65	46.13	4.13	32.66	34.57	Peak	51	101	VERTICAL
3	7310.31	50.02	54.00	-3.98	42.68	5.09	37.07	34.82	Average	360	114	VERTICAL
4	7312.33	56.36	74.00	-17.64	49.03	5.09	37.07	34.83	Peak	360	114	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11b CH 11 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	4924.13	39.52	54.00	-14.48	35.17	5.97	33.58	35.20	Average	156	70	HORIZONTAL
2	4924.23	49.62	74.00	-24.38	45.27	5.97	33.58	35.20	Peak	156	70	HORIZONTAL
3	7385.48	48.68	54.00	-5.32	40.36	7.17	36.61	35.46	Average	100	294	HORIZONTAL
4	7387.77	56.53	74.00	-17.47	48.21	7.17	36.61	35.46	Peak	100	294	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	4924.12	49.45	74.00	-24.55	45.10	5.97	33.58	35.20	Peak	100	114	VERTICAL
2	4924.17	41.13	54.00	-12.87	36.78	5.97	33.58	35.20	Average	100	114	VERTICAL
3	7386.96	46.19	54.00	-7.81	37.87	7.17	36.61	35.46	Average	248	320	VERTICAL
4	7387.27	59.88	74.00	-14.12	51.56	7.17	36.61	35.46	Peak	248	320	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11g CH 1 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	4826.24	31.86	54.00	-22.14	27.80	5.87	33.39	35.20	Average	181	210	HORIZONTAL
2	4826.32	46.81	74.00	-27.19	42.75	5.87	33.39	35.20	Peak	181	210	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4821.68	33.40	54.00	-20.60	29.34	5.87	33.39	35.20	Average	176	80	VERTICAL
2	4824.49	46.02	54.00	-7.98	41.96	5.87	33.39	35.20	Average	176	80	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11g CH 6 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4869.28	45.22	74.00	-28.78	43.00	4.13	32.66	34.57	Peak	91	136	HORIZONTAL
2	4879.64	30.51	54.00	-23.49	28.29	4.13	32.66	34.57	Average	88	136	HORIZONTAL
3	7305.79	56.19	74.00	-17.81	48.85	5.09	37.07	34.82	Peak	325	114	HORIZONTAL
4	7307.60	41.09	54.00	-12.91	33.75	5.09	37.07	34.82	Average	325	114	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4870.32	31.64	54.00	-22.36	29.42	4.13	32.66	34.57	Average	320	144	VERTICAL
2	4870.76	45.36	74.00	-28.64	43.14	4.13	32.66	34.57	Peak	320	144	VERTICAL
3	7308.11	41.62	54.00	-12.38	34.28	5.09	37.07	34.82	Average	312	116	VERTICAL
4	7308.97	56.08	74.00	-17.92	48.74	5.09	37.07	34.82	Peak	312	116	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11g CH 11 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	4923.33	46.43	74.00	-27.57	42.08	5.97	33.58	35.20	Peak	167	57	HORIZONTAL
2	4924.97	33.06	54.00	-20.94	28.71	5.97	33.58	35.20	Average	167	57	HORIZONTAL
3	7387.32	50.66	74.00	-23.34	42.34	7.17	36.61	35.46	Peak	158	123	HORIZONTAL
4	7388.03	40.86	54.00	-13.14	32.54	7.17	36.61	35.46	Average	158	123	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4921.63	46.62	74.00	-27.38	42.31	5.97	33.54	35.20	Peak	175	27	VERTICAL
2	4921.94	33.51	54.00	-20.49	29.16	5.97	33.58	35.20	Average	175	27	VERTICAL
3	7388.39	52.96	74.00	-21.04	44.64	7.17	36.61	35.46	Peak	154	333	VERTICAL
4	7388.42	41.95	54.00	-12.05	33.63	7.17	36.61	35.46	Average	154	333	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 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	11481.32	43.76	54.00	-10.24	30.10	9.24	39.50	35.08	Average	156	194	HORIZONTAL
2	11483.23	56.40	74.00	-17.60	42.74	9.24	39.50	35.08	Peak	156	194	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11480.25	43.78	54.00	-10.22	30.13	9.23	39.50	35.08	Average	167	230	VERTICAL
2	11482.65	56.96	74.00	-17.04	43.30	9.24	39.50	35.08	Peak	167	230	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11568.99	43.83	54.00	-10.17	33.63	6.55	38.33	34.68	Average	152	116	HORIZONTAL
2	11569.28	58.37	74.00	-15.63	48.17	6.55	38.33	34.68	Peak	152	116	HORIZONTAL
3	17371.64	60.00	74.00	-14.00	43.83	8.09	42.01	33.93	Peak	301	133	HORIZONTAL
4	17379.89	45.94	54.00	-8.06	29.74	8.09	42.04	33.93	Average	302	133	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11572.10	49.00	54.00	-5.00	38.81	6.55	38.33	34.69	Average	228	171	VERTICAL
2	11572.39	62.60	74.00	-11.40	52.41	6.55	38.33	34.69	Peak	228	171	VERTICAL
3	17379.46	45.85	54.00	-8.15	29.68	8.09	42.01	33.93	Average	53	140	VERTICAL
4	17379.53	60.10	74.00	-13.90	43.90	8.09	42.04	33.93	Peak	58	140	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 4
Test Date	Oct. 26, 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	11650.26	43.63	54.00	-10.37	29.98	9.28	39.44	35.07	Average	176	115	HORIZONTAL
2	11652.08	56.82	74.00	-17.18	43.17	9.28	39.44	35.07	Peak	176	115	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	11066.34	44.01	54.00	-9.99	30.38	8.97	39.50	34.84	Average	156	157	VERTICAL
2	11072.09	57.56	74.00	-16.44	43.93	8.97	39.50	34.84	Peak	156	157	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.

<For Beamforming Mode>

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 3 + Chain 5 + Chain 6
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4816.53	32.07	54.00	-21.93	28.04	5.87	33.36	35.20	Average	168	26	HORIZONTAL
2	4822.29	45.23	74.00	-28.77	41.17	5.87	33.39	35.20	Peak	168	26	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4827.18	32.14	54.00	-21.86	28.08	5.87	33.39	35.20	Average	163	265	VERTICAL
2	4828.63	45.48	74.00	-28.52	41.42	5.87	33.39	35.20	Peak	163	265	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 3 + Chain 5 + Chain 6
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4865.26	32.66	54.00	-21.34	28.51	5.90	33.45	35.20	Average	134	50	HORIZONTAL
2	4880.98	45.80	74.00	-28.20	41.60	5.92	33.48	35.20	Peak	134	50	HORIZONTAL
3	7308.25	49.52	54.00	-4.48	41.31	7.13	36.51	35.43	Average	103	293	HORIZONTAL
4	7308.83	64.08	74.00	-9.92	55.87	7.13	36.51	35.43	Peak	103	293	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	4868.27	33.01	54.00	-20.99	28.84	5.92	33.45	35.20	Average	192	330	VERTICAL
2	4876.29	46.18	74.00	-27.82	41.98	5.92	33.48	35.20	Peak	192	330	VERTICAL
3	7289.87	64.89	74.00	-9.11	56.74	7.12	36.45	35.42	Peak	213	314	VERTICAL
4	7294.94	47.63	54.00	-6.37	39.45	7.12	36.48	35.42	Average	213	314	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 3 + Chain 5 + Chain 6
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4915.46	32.89	54.00	-21.11	28.60	5.95	33.54	35.20	Average	166	78	HORIZONTAL
2	4916.76	45.79	74.00	-28.21	41.50	5.95	33.54	35.20	Peak	166	78	HORIZONTAL
3	7376.13	36.72	54.00	-17.28	28.40	7.16	36.61	35.45	Average	176	299	HORIZONTAL
4	7376.94	49.41	74.00	-24.59	41.09	7.16	36.61	35.45	Peak	176	299	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	4914.80	33.10	54.00	-20.90	28.81	5.95	33.54	35.20	Average	176	313	VERTICAL
2	4927.18	45.43	74.00	-28.57	41.08	5.97	33.58	35.20	Peak	176	313	VERTICAL
3	7388.37	50.20	74.00	-23.80	41.88	7.17	36.61	35.46	Peak	164	152	VERTICAL
4	7393.47	36.93	54.00	-17.07	28.58	7.17	36.64	35.46	Average	164	152	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 3 + Chain 5 + Chain 6
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4838.30	45.98	74.00	-28.02	41.88	5.88	33.42	35.20	Peak	166	14	HORIZONTAL
2	4844.29	32.73	54.00	-21.27	28.63	5.88	33.42	35.20	Average	166	14	HORIZONTAL
3	7260.18	49.46	74.00	-24.54	41.34	7.10	36.43	35.41	Peak	152	120	HORIZONTAL
4	7271.53	36.60	54.00	-17.40	28.47	7.11	36.43	35.41	Average	152	120	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4845.07	32.98	54.00	-21.02	28.88	5.88	33.42	35.20	Average	170	325	VERTICAL
2	4848.72	45.46	74.00	-28.54	41.36	5.88	33.42	35.20	Peak	170	325	VERTICAL
3	7258.97	49.63	74.00	-24.37	41.51	7.10	36.43	35.41	Peak	161	176	VERTICAL
4	7274.42	36.70	54.00	-17.30	28.55	7.11	36.45	35.41	Average	161	176	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 3 + Chain 5 + Chain 6
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4866.16	32.56	54.00	-21.44	28.41	5.90	33.45	35.20	Average	170	156	HORIZONTAL
2	4867.92	45.12	74.00	-28.88	40.95	5.92	33.45	35.20	Peak	170	156	HORIZONTAL
3	7305.33	49.69	74.00	-24.31	41.50	7.13	36.48	35.42	Peak	168	42	HORIZONTAL
4	7308.14	36.89	54.00	-17.11	28.68	7.13	36.51	35.43	Average	168	42	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	4864.33	32.48	54.00	-21.52	28.33	5.90	33.45	35.20	Average	165	29	VERTICAL
2	4865.26	45.29	74.00	-28.71	41.14	5.90	33.45	35.20	Peak	165	29	VERTICAL
3	7304.31	50.25	74.00	-23.75	42.06	7.13	36.48	35.42	Peak	179	329	VERTICAL
4	7306.37	37.01	54.00	-16.99	28.82	7.13	36.48	35.42	Average	179	329	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 3 + Chain 5 + Chain 6
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4894.19	46.45	74.00	-27.55	42.21	5.93	33.51	35.20	Peak	158	322	HORIZONTAL
2	4905.94	32.98	54.00	-21.02	28.69	5.95	33.54	35.20	Average	158	322	HORIZONTAL
3	7363.67	37.12	54.00	-16.88	28.82	7.16	36.59	35.45	Average	156	27	HORIZONTAL
4	7365.84	50.55	74.00	-23.45	42.25	7.16	36.59	35.45	Peak	156	27	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4896.30	46.38	74.00	-27.62	42.14	5.93	33.51	35.20	Peak	172	24	VERTICAL
2	4905.74	33.21	54.00	-20.79	28.92	5.95	33.54	35.20	Average	172	24	VERTICAL
3	7354.12	50.79	74.00	-23.21	42.51	7.16	36.56	35.44	Peak	159	342	VERTICAL
4	7358.17	37.26	54.00	-16.74	28.99	7.16	36.56	35.45	Average	159	342	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 4
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11491.52	46.40	54.00	-7.60	32.74	9.24	39.50	35.08	Average	206	144	HORIZONTAL
2	11491.52	58.52	74.00	-15.48	44.86	9.24	39.50	35.08	Peak	206	144	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	11491.95	51.12	54.00	-2.88	37.46	9.24	39.50	35.08	Average	172	146	VERTICAL
2	11498.90	63.41	74.00	-10.59	49.76	9.25	39.50	35.10	Peak	172	146	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 4
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11557.99	58.54	74.00	-15.46	44.89	9.26	39.48	35.09	Peak	226	138	HORIZONTAL
2	11570.72	46.01	54.00	-7.99	32.37	9.26	39.47	35.09	Average	226	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	11564.28	62.41	74.00	-11.59	48.76	9.26	39.48	35.09	Peak	236	162	VERTICAL
2	11569.78	50.02	54.00	-3.98	36.38	9.26	39.47	35.09	Average	236	162	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 4
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11640.74	44.10	54.00	-9.90	30.45	9.28	39.44	35.07	Average	123	200	HORIZONTAL
2	11641.82	56.94	74.00	-17.06	43.29	9.28	39.44	35.07	Peak	123	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	11646.96	58.71	74.00	-15.29	45.06	9.28	39.44	35.07	Peak	213	108	VERTICAL
2	11651.01	47.30	54.00	-6.70	33.65	9.28	39.44	35.07	Average	213	108	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 4
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11492.78	44.80	54.00	-9.20	31.14	9.24	39.50	35.08	Average	100	116	HORIZONTAL
2	11510.51	56.98	74.00	-17.02	43.33	9.25	39.50	35.10	Peak	100	116	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	11487.79	60.33	74.00	-13.67	46.67	9.24	39.50	35.08	Peak	149	210	VERTICAL
2	11488.87	48.10	54.00	-5.90	34.44	9.24	39.50	35.08	Average	149	210	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 4
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11575.53	43.06	54.00	-10.94	29.41	9.26	39.47	35.08	Average	136	212	HORIZONTAL
2	11602.30	56.24	74.00	-17.76	42.59	9.27	39.46	35.08	Peak	136	212	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	11571.19	48.85	54.00	-5.15	35.21	9.26	39.47	35.09	Average	120	155	VERTICAL
2	11590.43	62.61	74.00	-11.39	48.95	9.27	39.47	35.08	Peak	120	155	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 4
Test Date	Nov. 01, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11527.93	44.61	54.00	-9.39	30.96	9.25	39.49	35.09	Average	151	337	HORIZONTAL
2	11566.71	56.50	74.00	-17.50	42.85	9.26	39.48	35.09	Peak	151	337	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	11527.86	49.70	54.00	-4.30	36.05	9.25	39.49	35.09	Average	8960	157	VERTICAL
2	11537.26	58.15	74.00	-15.85	44.49	9.26	39.49	35.09	Peak	100	157	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, 1MHz / 1/T for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

<u>For Radiated band edges Measurement</u>:

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

<u>For Radiated Out of Band Emission Measurement</u>:

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

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

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 3 + Chain 5 + Chain 6
Test date	Oct. 26, 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	2387.68	71.82	74.00	-2.18	39.68	4.09	28.05	0.00	Peak	188	174	VERTICAL
2	2387.97	52.15	54.00	-1.85	20.01	4.09	28.05	0.00	Average	188	174	VERTICAL
3	2413.16	105.77			73.57	4.11	28.09	0.00	Average	188	174	VERTICAL
4	2413.45	116.50			84.30	4.11	28.09	0.00	Peak	188	174	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	2386.09	70.40	74.00	-3.60	38.26	4.09	28.05	0.00	Peak	195	186	VERTICAL
2	2390.00	52.90	54.00	-1.10	20.76	4.09	28.05	0.00	Average	195	186	VERTICAL
3	2435.26	111.43			79.13	4.12	28.18	0.00	Average	195	186	VERTICAL
4	2435.26	123.25			90.95	4.12	28.18	0.00	Peak	195	186	VERTICAL
5	2485.24	52.55	54.00	-1.45	20.09	4.16	28.30	0.00	Average	195	186	VERTICAL
6	2486.10	69.47	74.00	-4.53	37.01	4.16	28.30	0.00	Peak	195	186	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	2468.95	103.77			71.37	4.14	28.26	0.00	Average	105	339	VERTICAL
2	2468.95	114.53			82.13	4.14	28.26	0.00	Peak	105	339	VERTICAL
3	2483.50	50.58	54.00	-3.42	18.16	4.16	28.26	0.00	Average	105	339	VERTICAL
4	2483.50	72.95	74.00	-1.05	40.53	4.16	28.26	0.00	Peak	105	339	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 3 + Chain 5 + Chain 6
Test date	Oct. 26, 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	2381.61	50.24	54.00	-3.76	18.15	4.08	28.01	0.00	Average	100	319	VERTICAL
2	2390.00	72.70	74.00	-1.30	40.56	4.09	28.05	0.00	Peak	100	319	VERTICAL
3	2426.34	102.75			70.50	4.12	28.13	0.00	Average	100	319	VERTICAL
4	2426.34	111.96			79.71	4.12	28.13	0.00	Peak	100	319	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	2386.53	70.82	74.00	-3.18	38.68	4.09	28.05	0.00	Peak	100	41	VERTICAL
2	2387.40	52.78	54.00	-1.22	20.64	4.09	28.05	0.00	Average	100	41	VERTICAL
3	2422.24	103.89			71.64	4.12	28.13	0.00	Average	100	41	VERTICAL
4	2424.26	114.27			82.02	4.12	28.13	0.00	Peak	100	41	VERTICAL
5	2484.37	52.93	54.00	-1.07	20.51	4.16	28.26	0.00	Average	100	41	VERTICAL
6	2487.26	71.85	74.00	-2.15	39.39	4.16	28.30	0.00	Peak	100	41	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	2468.79	102.16			69.76	4.14	28.26	0.00	Average	103	340	VERTICAL
2	2468.79	112.41			80.01	4.14	28.26	0.00	Peak	103	340	VERTICAL
3	2483.50	51.99	54.00	-2.01	19.57	4.16	28.26	0.00	Average	103	340	VERTICAL
4	2484.60	72.93	74.00	-1.07	40.51	4.16	28.26	0.00	Peak	103	340	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	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	2387.40	52.86	54.00	-1.14	20.72	4.09	28.05	0.00	Average	108	42	VERTICAL
2	2388.26	66.61	74.00	-7.39	34.47	4.09	28.05	0.00	Peak	108	42	VERTICAL
3	2412.87	116.12			83.92	4.11	28.09	0.00	Average	108	42	VERTICAL
4	2413.45	120.66			88.46	4.11	28.09	0.00	Peak	108	42	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	2388.26	65.08	74.00	-8.92	32.94	4.09	28.05	0.00	Peak	106	41	VERTICAL
2	2390.00	45.60	54.00	-8.40	13.46	4.09	28.05	0.00	Average	106	41	VERTICAL
3	2434.68	114.40			82.10	4.12	28.18	0.00	Average	106	41	VERTICAL
4	2435.55	121.07			88.77	4.12	28.18	0.00	Peak	106	41	VERTICAL
5	2483.50	48.04	54.00	-5.96	15.62	4.16	28.26	0.00	Average	106	41	VERTICAL
6	2489.58	64.39	74.00	-9.61	31.92	4.17	28.30	0.00	Peak	106	41	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2460.26	114.93			82.57	4.14	28.22	0.00	Average	111	45	VERTICAL
2	2460.55	118.20			85.84	4.14	28.22	0.00	Peak	111	45	VERTICAL
3	2483.50	52.33	54.00	-1.67	19.91	4.16	28.26	0.00	Average	111	45	VERTICAL
4	2485.82	67.24	74.00	-6.76	34.78	4.16	28.30	0.00	Peak	111	45	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 3 + Chain 5 + Chain 6
Test Date	Oct. 26, 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	2387.68	52.94	54.00	-1.06	20.80	4.09	28.05	0.00	Average	190	191	VERTICAL
2	2390.00	67.81	74.00	-6.19	35.67	4.09	28.05	0.00	Peak	190	191	VERTICAL
3	2416.63	108.39			76.19	4.11	28.09	0.00	Average	190	191	VERTICAL
4	2416.63	119.88			87.68	4.11	28.09	0.00	Peak	190	191	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	2385.66	67.26	74.00	-6.74	35.12	4.09	28.05	0.00	Peak	193	186	VERTICAL
2	2390.00	51.64	54.00	-2.36	19.50	4.09	28.05	0.00	Average	193	186	VERTICAL
3	2430.34	124.15			91.90	4.12	28.13	0.00	Peak	193	186	VERTICAL
4	2430.63	112.67			80.42	4.12	28.13	0.00	Average	193	186	VERTICAL
5	2483.50	52.91	54.00	-1.09	20.49	4.16	28.26	0.00	Average	193	186	VERTICAL
6	2486.68	67.57	74.00	-6.43	35.11	4.16	28.30	0.00	Peak	193	186	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	2467.21	120.80			88.44	4.14	28.22	0.00	Peak	178	194	VERTICAL
2	2467.50	109.49			77.13	4.14	28.22	0.00	Average	178	194	VERTICAL
3	2486.97	52.91	54.00	-1.09	20.45	4.16	28.30	0.00	Average	178	194	VERTICAL
4	2487.55	72.55	74.00	-1.45	40.08	4.17	28.30	0.00	Peak	178	194	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 Non-Beamforming Mode>

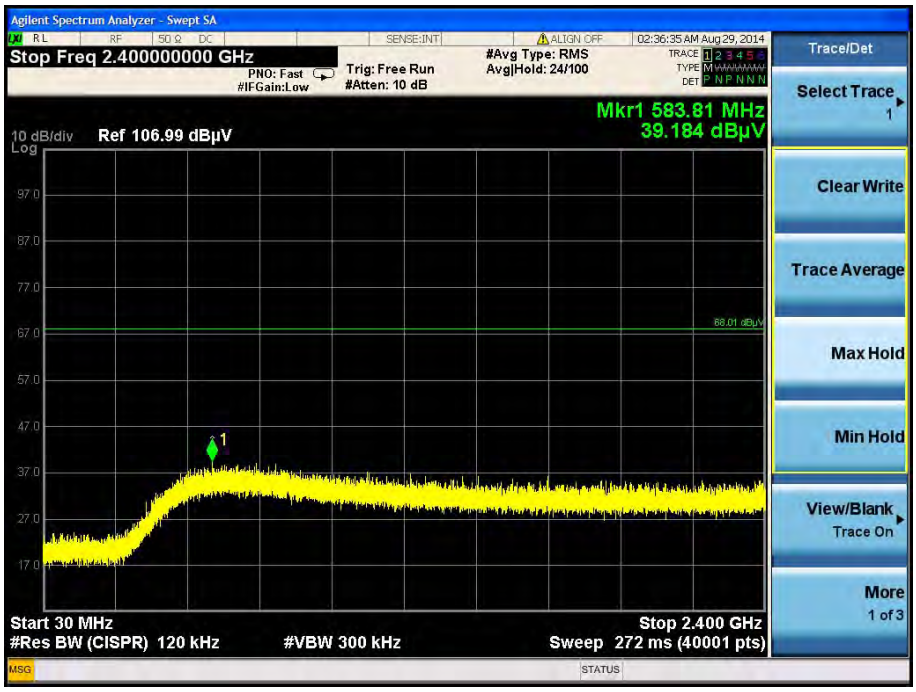
For Emission not in Restricted Band

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

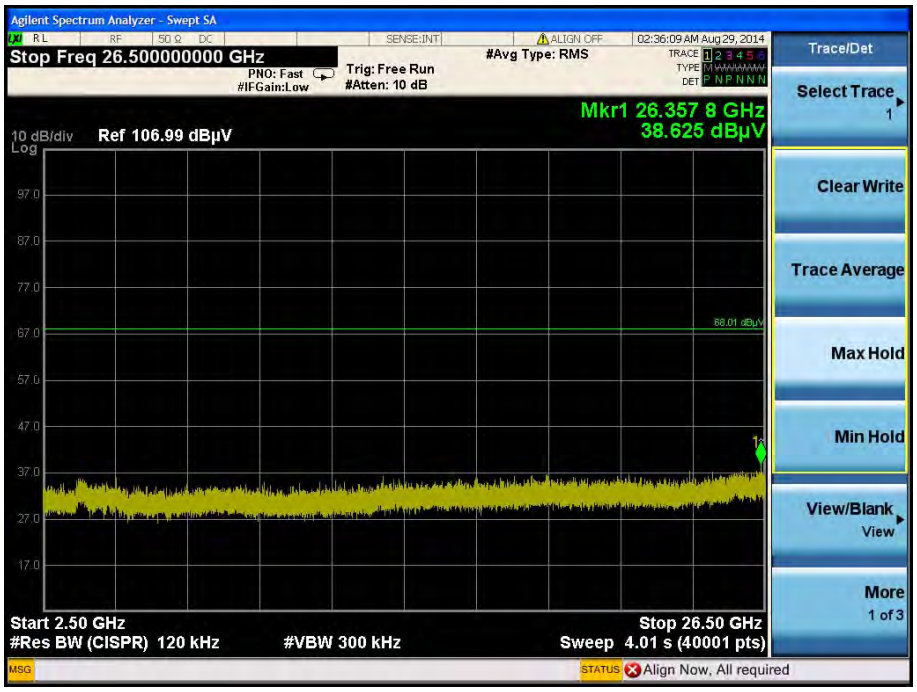
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)

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

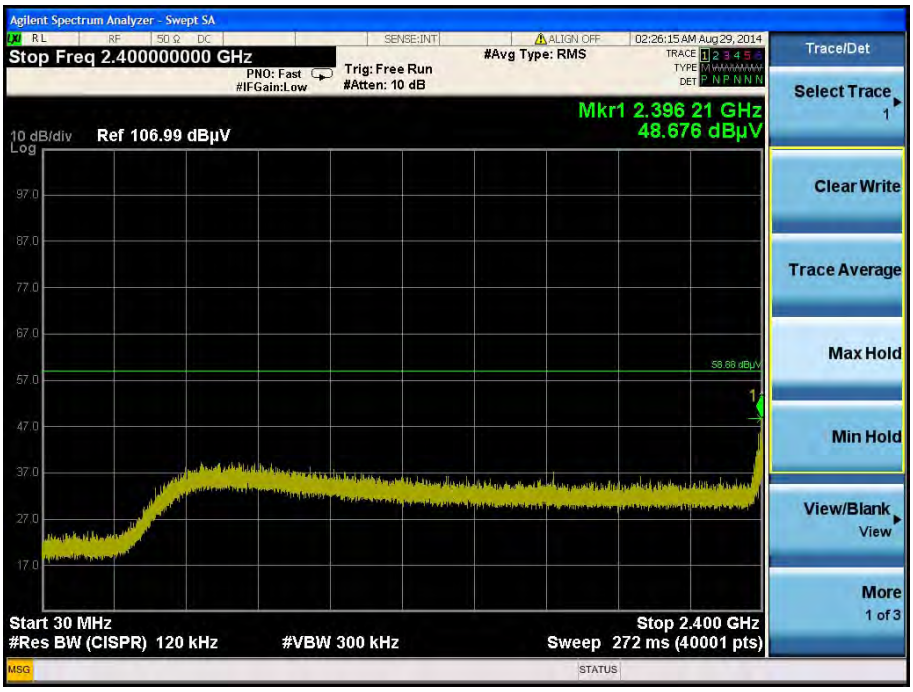


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)

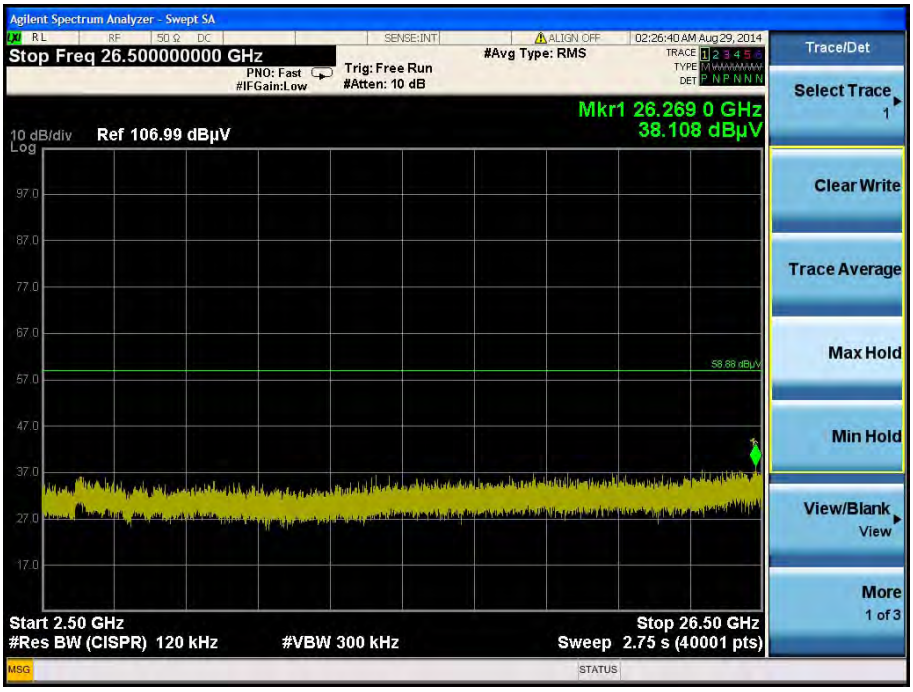


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level

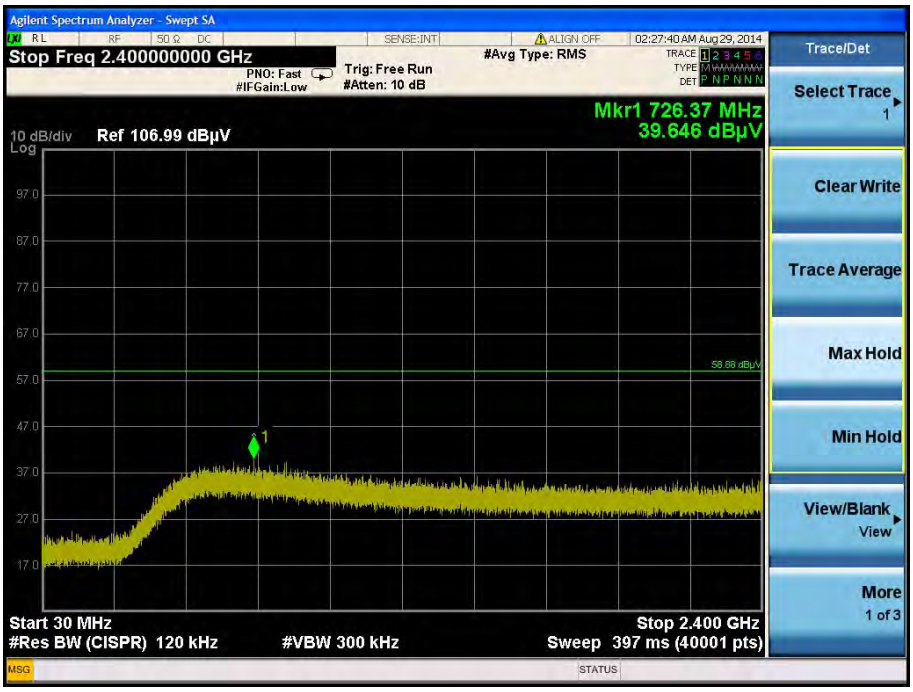
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



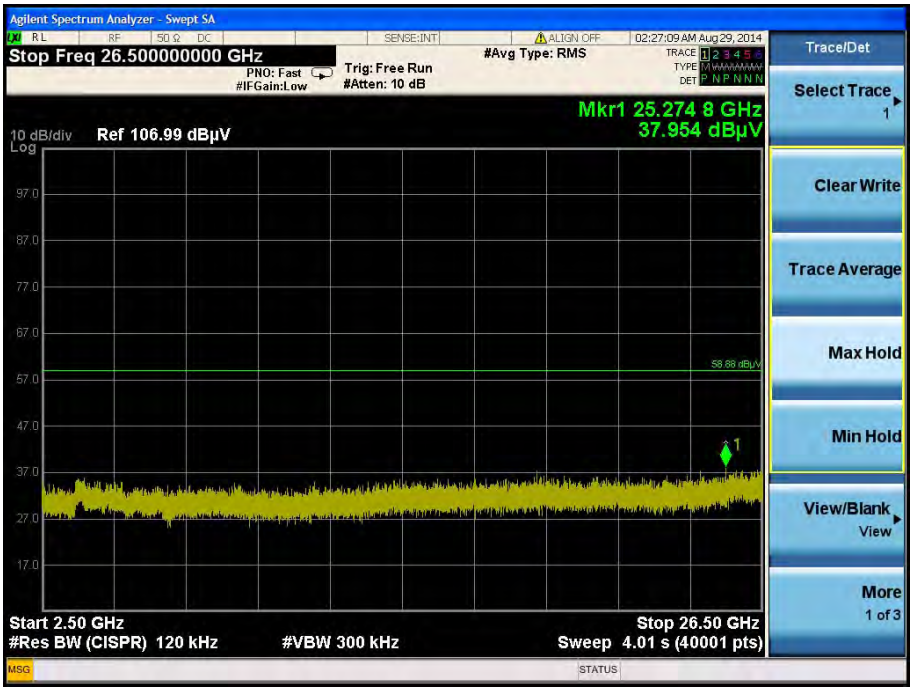
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



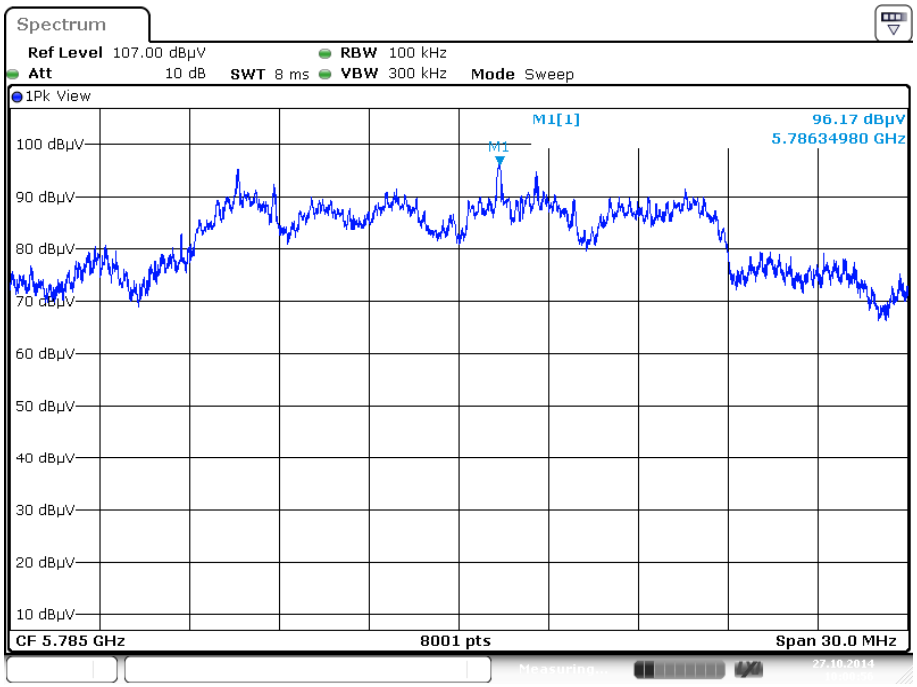
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



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

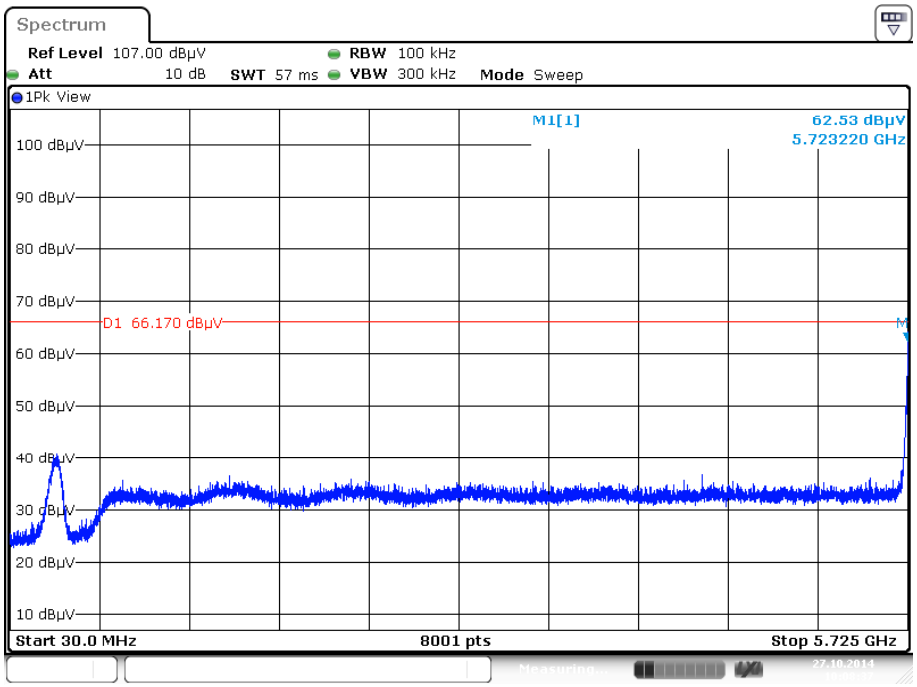


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



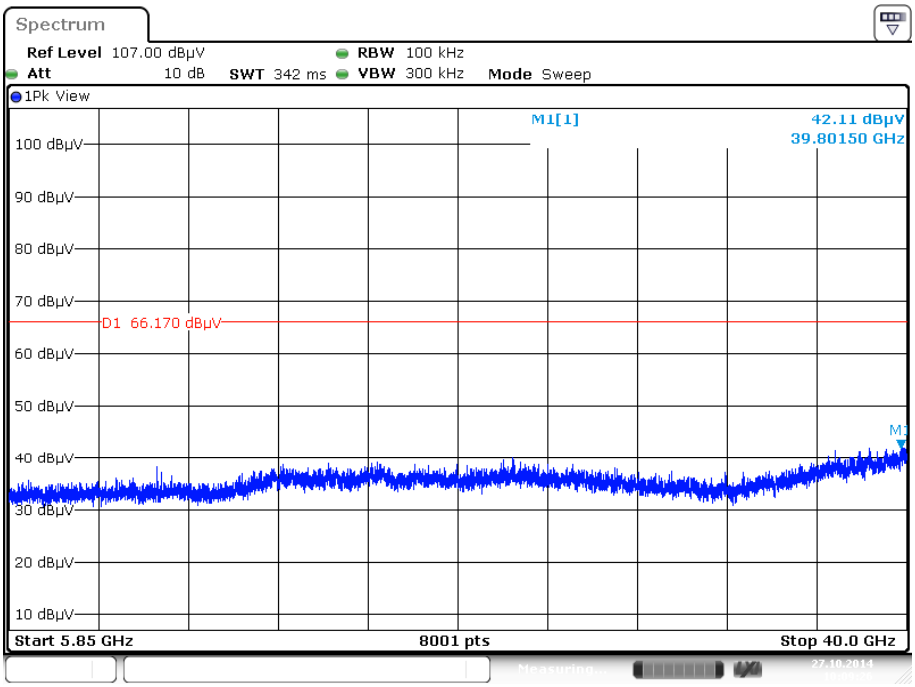
Date: 27.OCT.2014 10:00:56

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



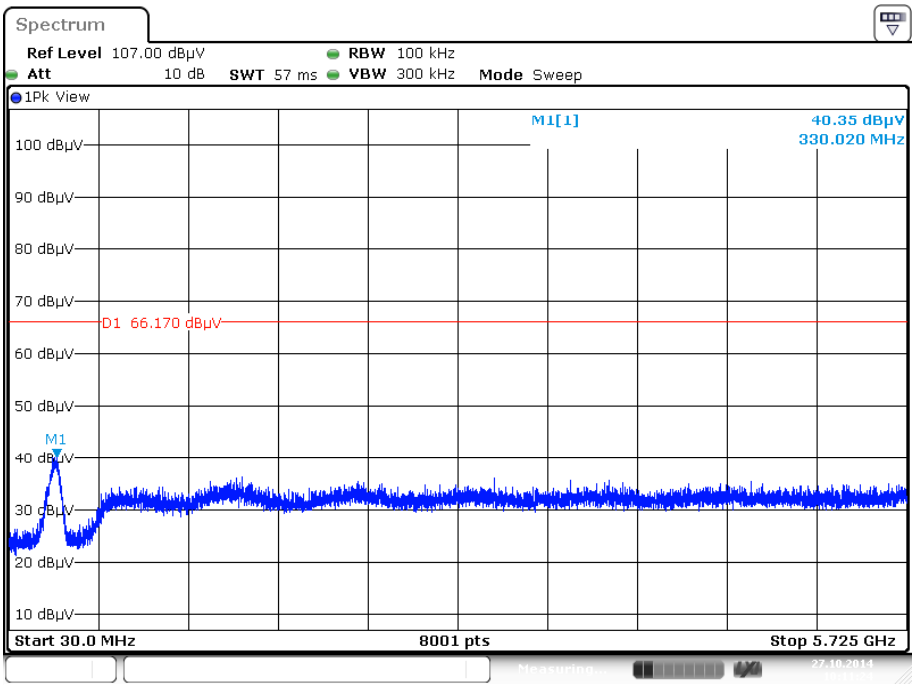
Date: 27.OCT.2014 10:08:37

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



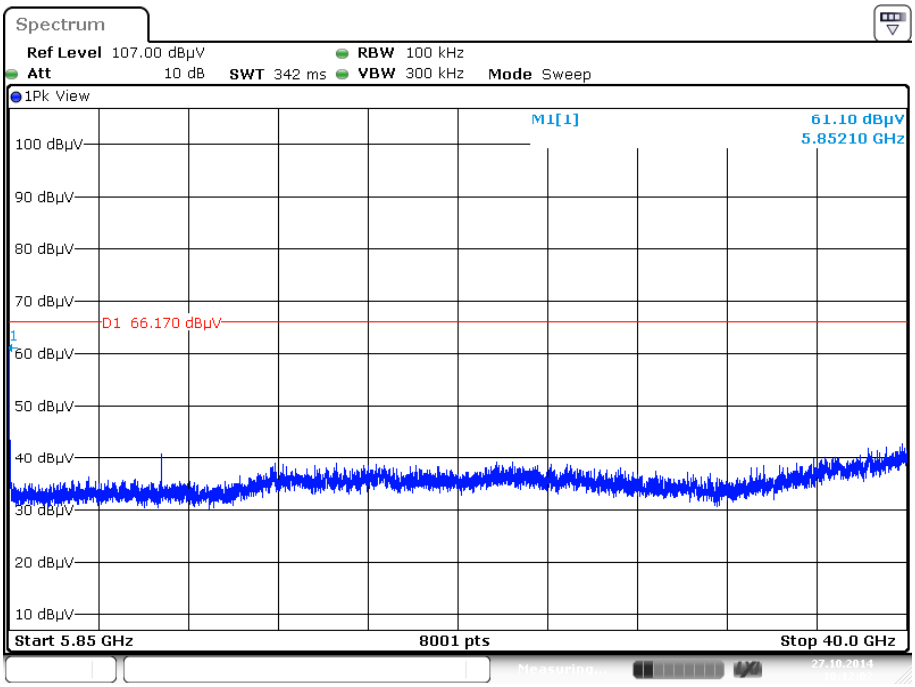
Date:27.OCT.2014 10:09:26

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

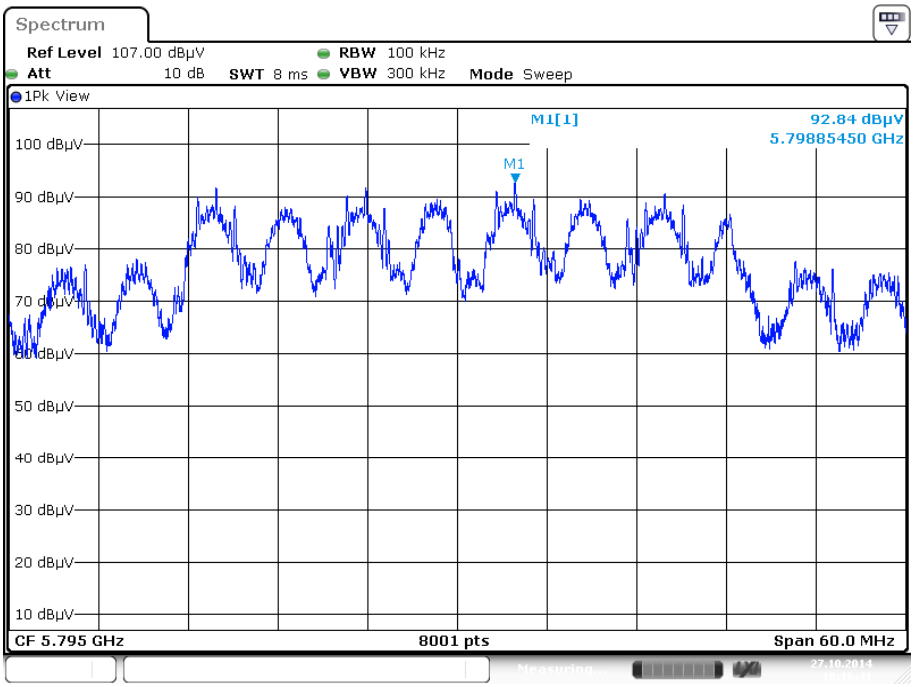


Date:27.OCT.2014 10:11:25

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

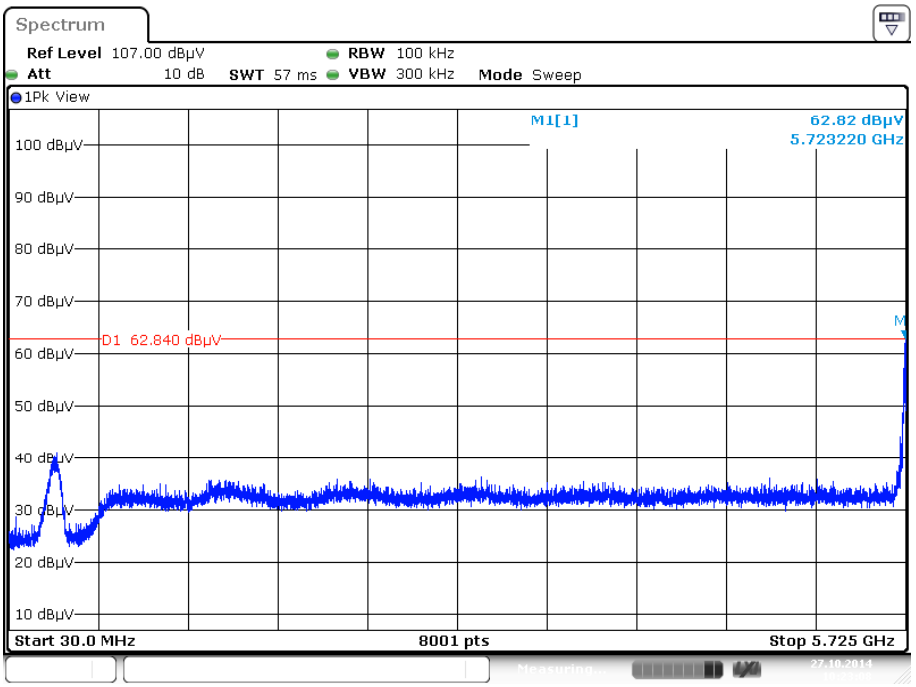


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



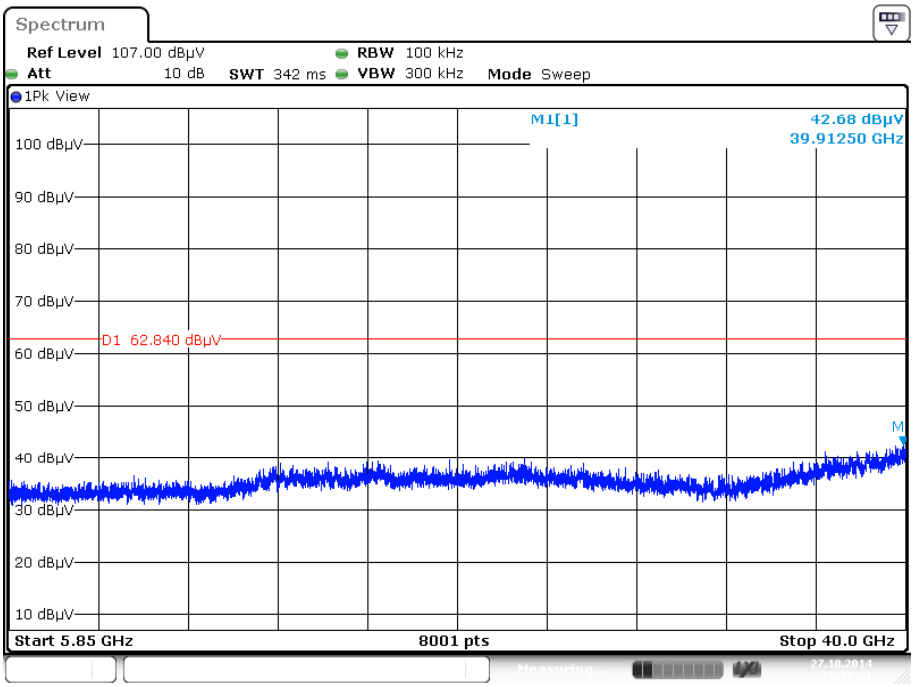
Date: 27.OCT.2014 10:16:41

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



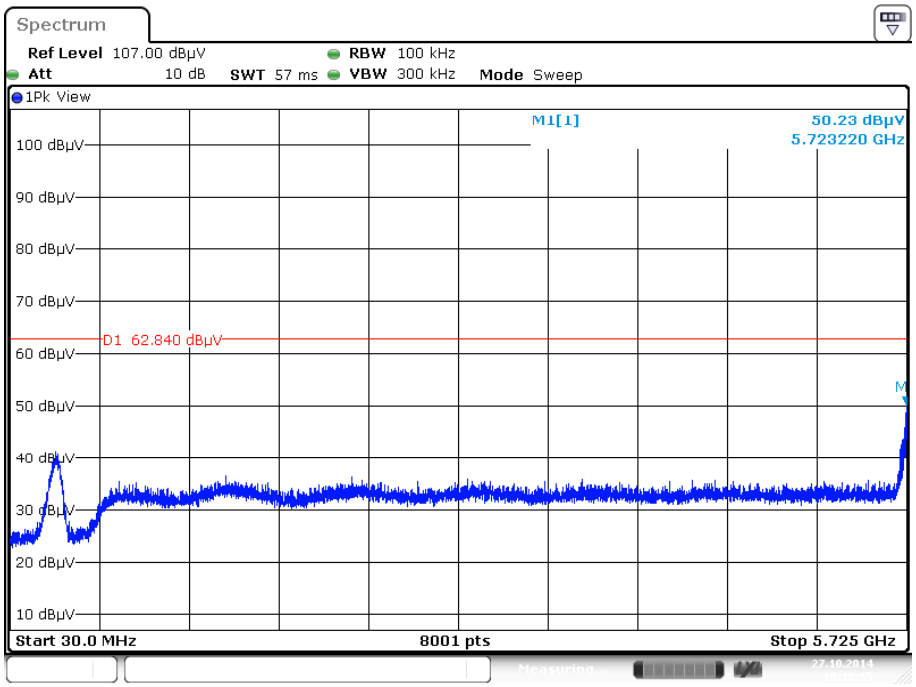
Date: 27.OCT.2014 10:23:08

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



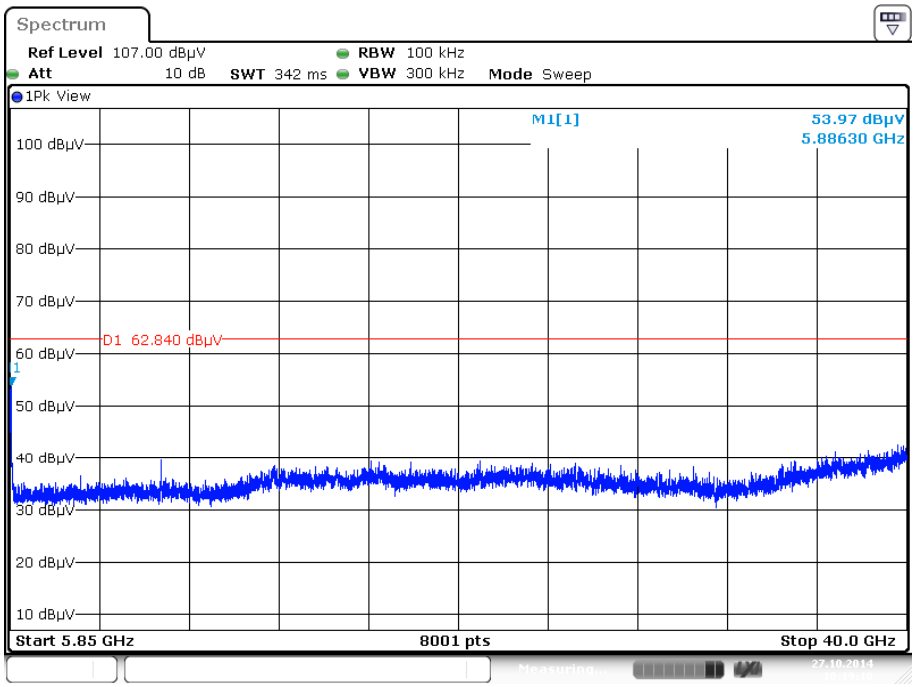
Date: 27.OCT.2014 10:25:01

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

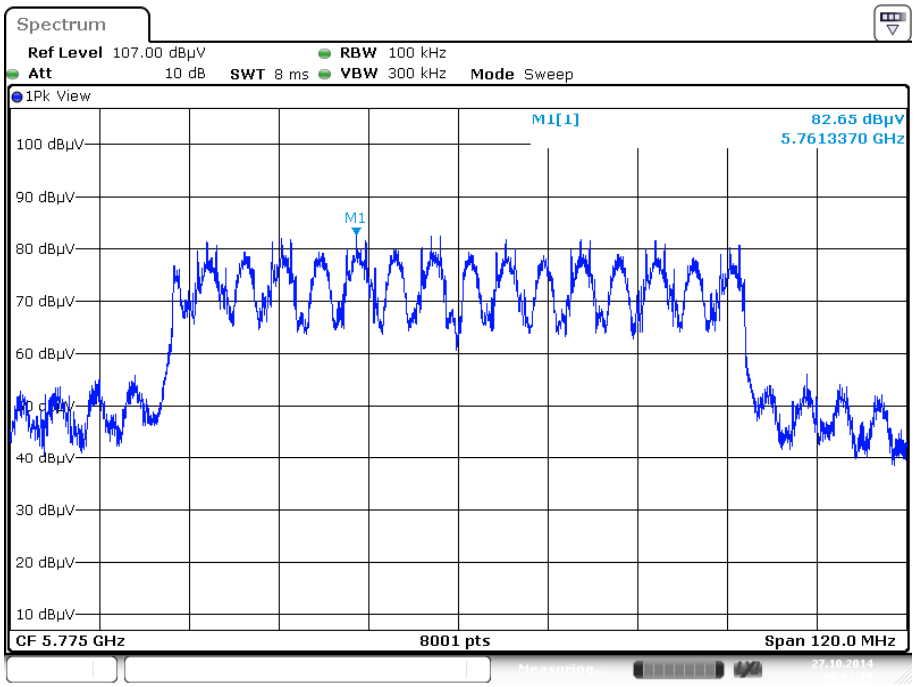


Date: 27.OCT.2014 10:18:35

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

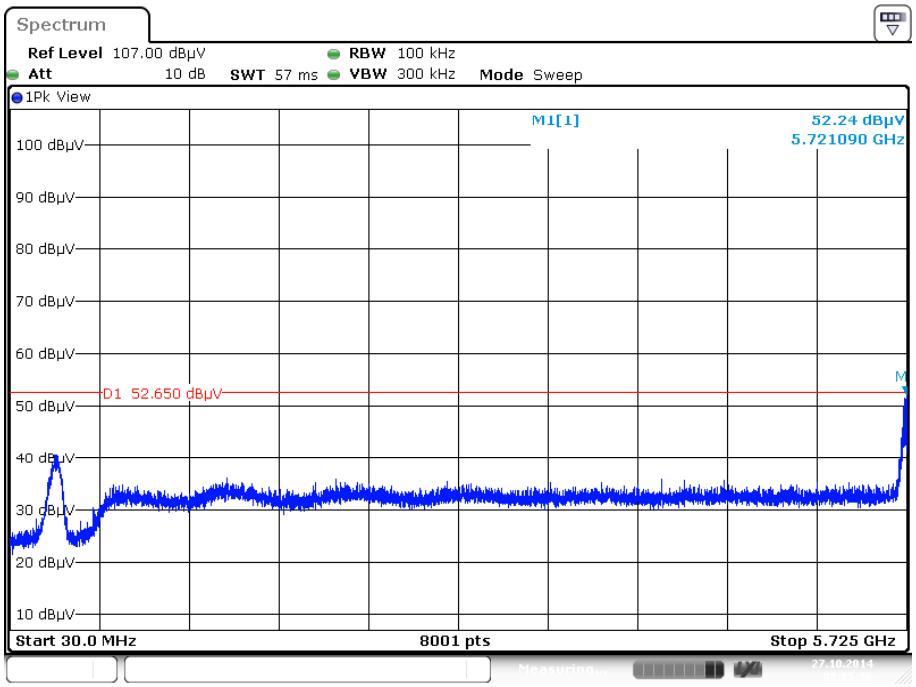


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



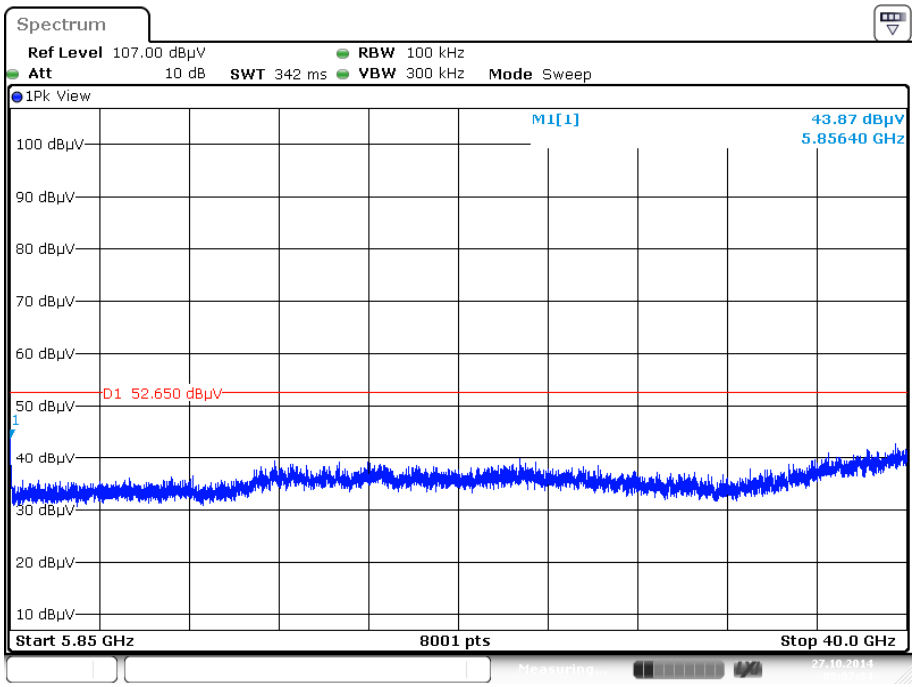
Date: 27.OCT.2014 08:02:20

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



Date: 27.OCT.2014 08:05:36

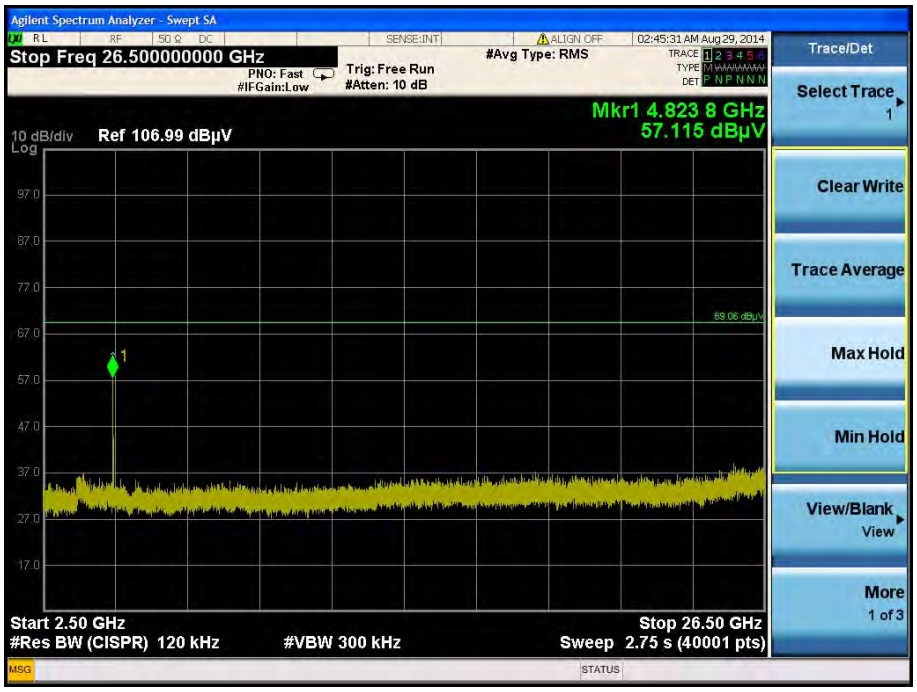
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)



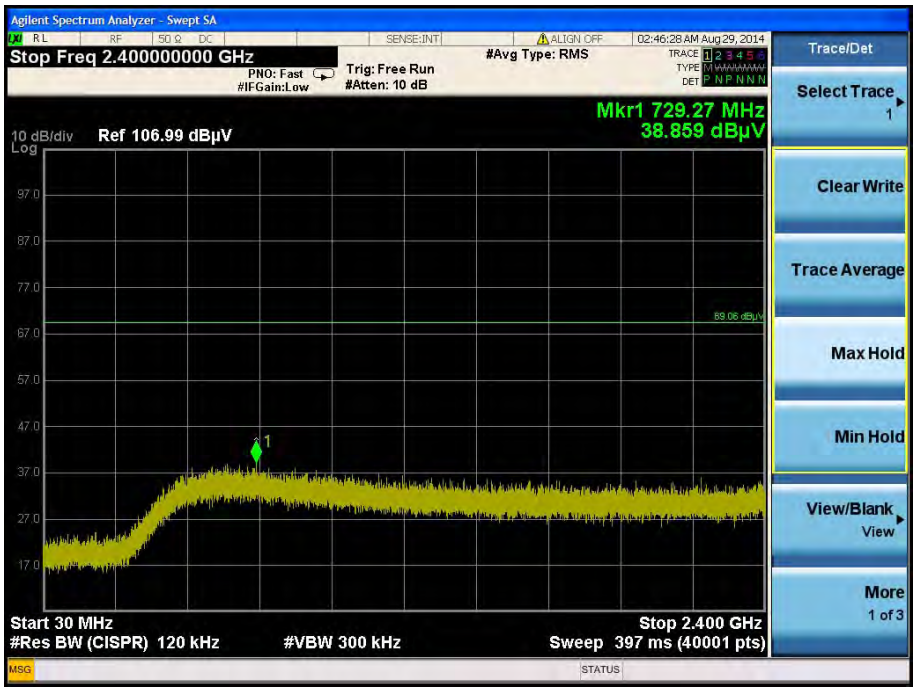
Plot on Configuration IEEE 802.11b / Reference Level

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

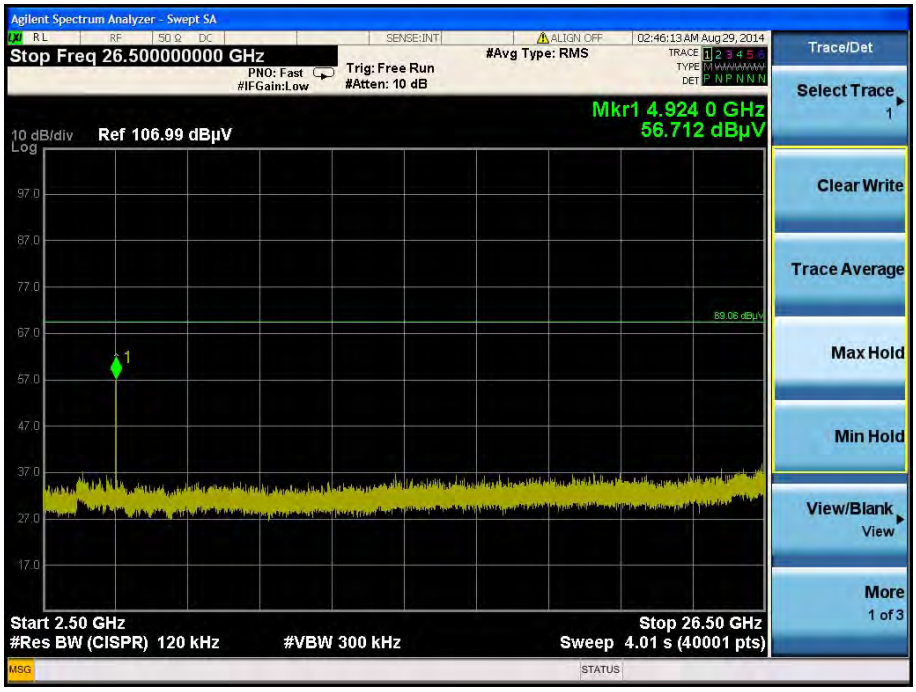
Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



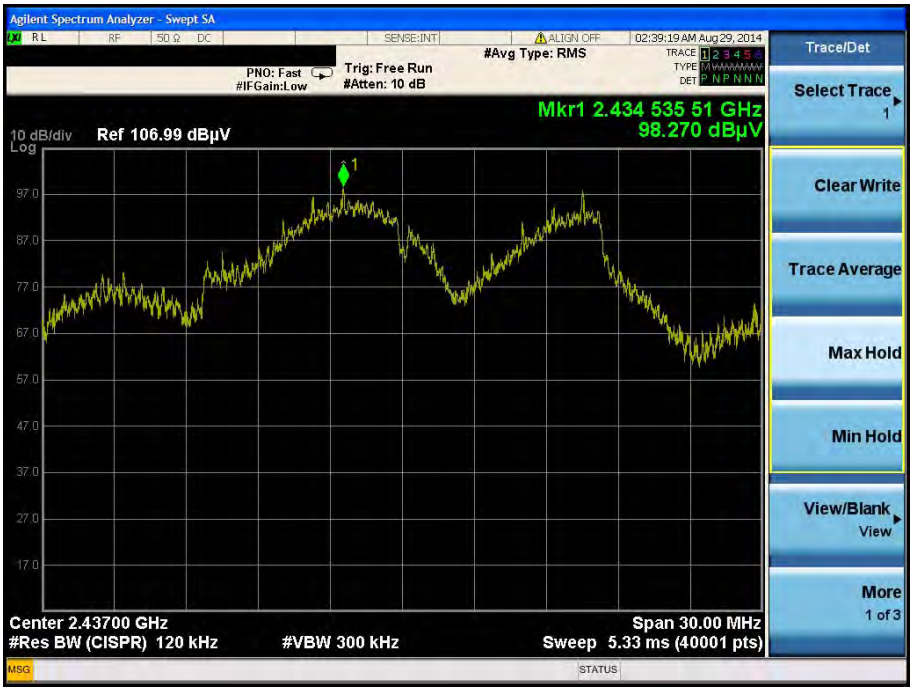
Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



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

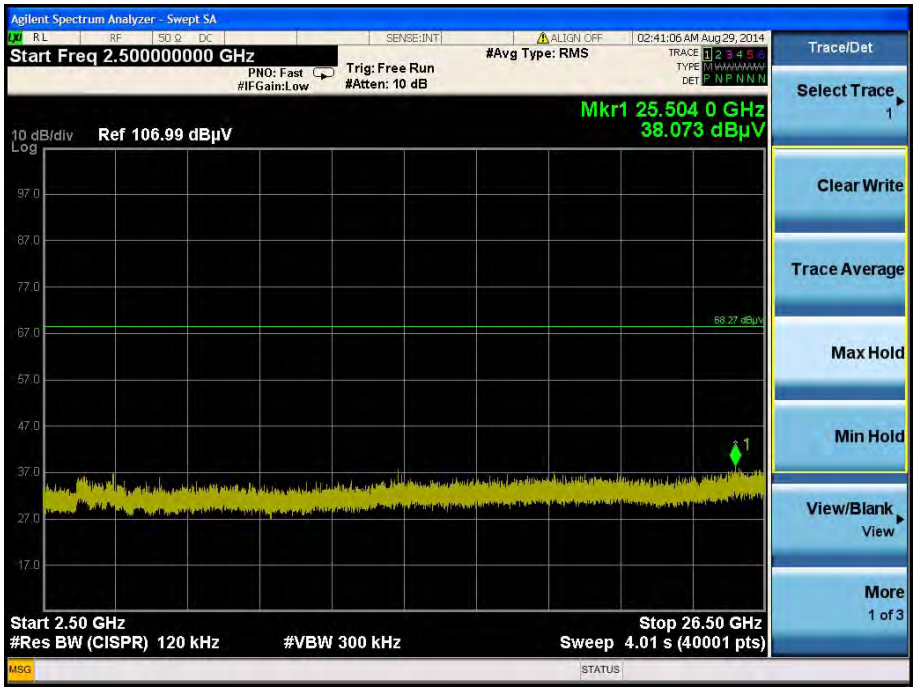


Plot on Configuration IEEE 802.11g / Reference Level

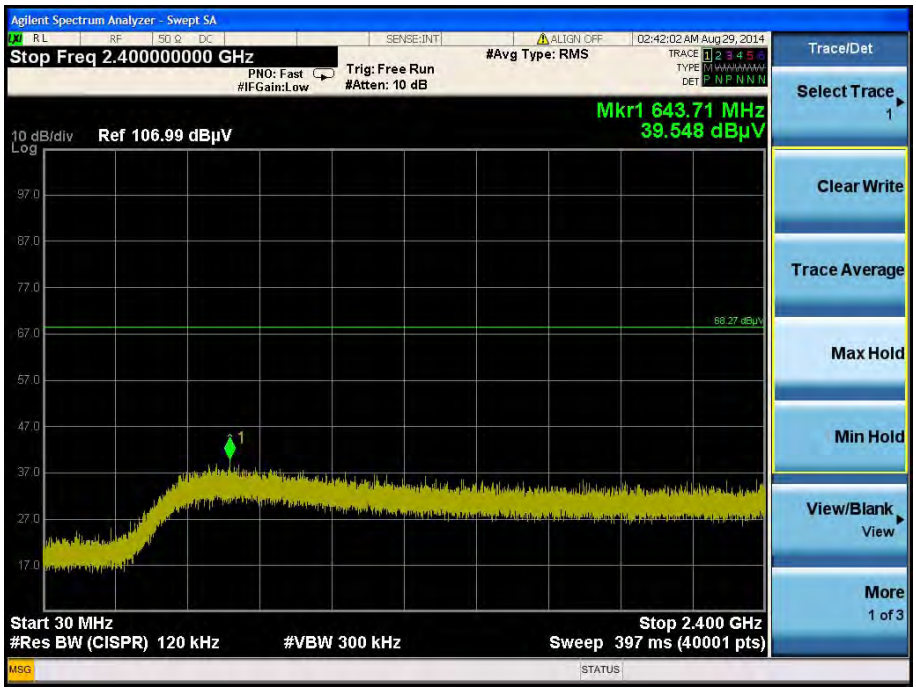


Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)

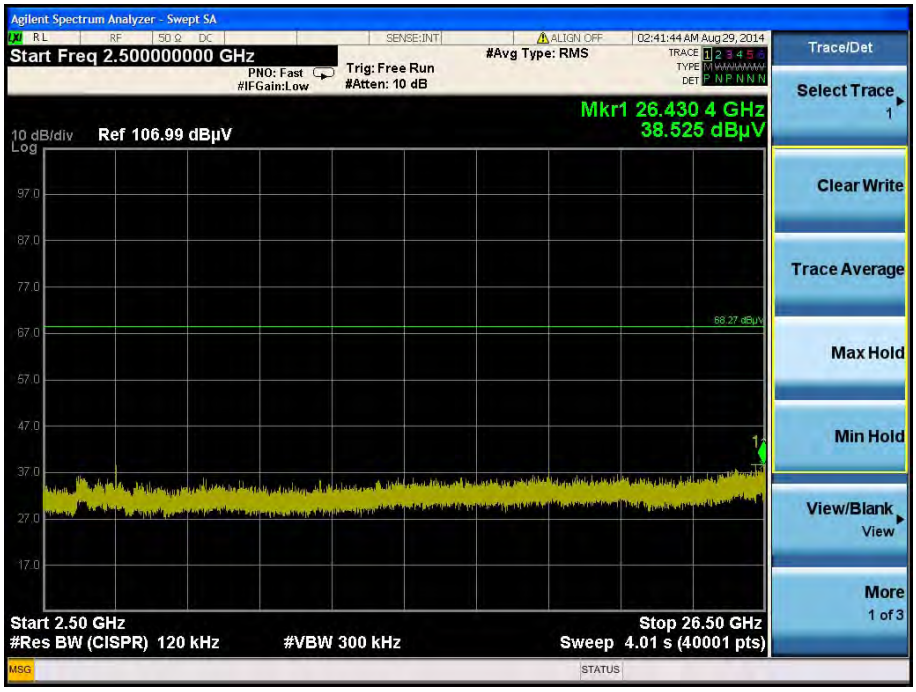
Plot on Configuration IEEE 802.11g / CH 1 / 2500MHz~26500MHz (down 30dBc)



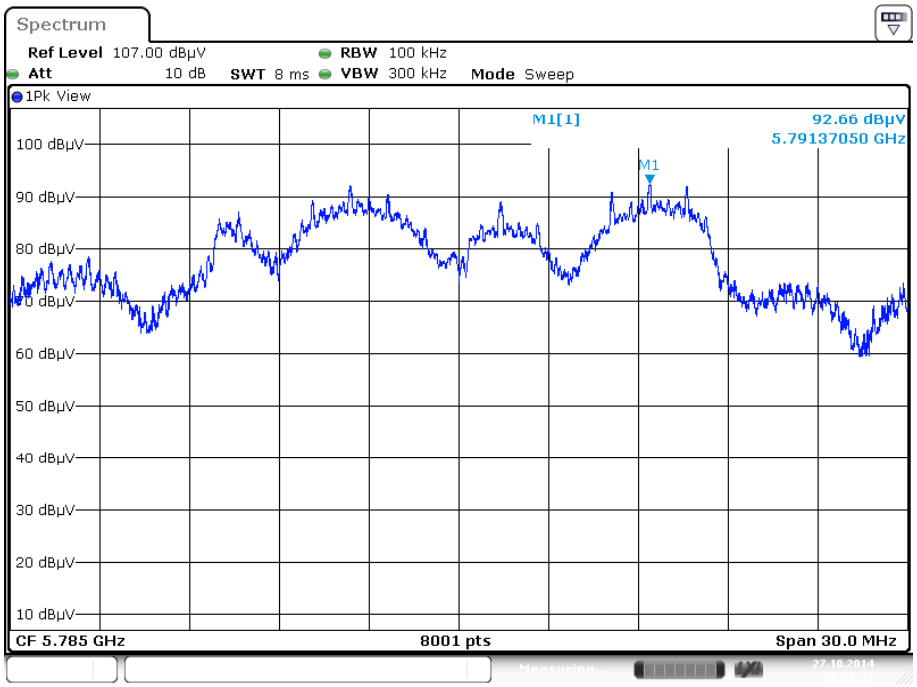
Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)



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

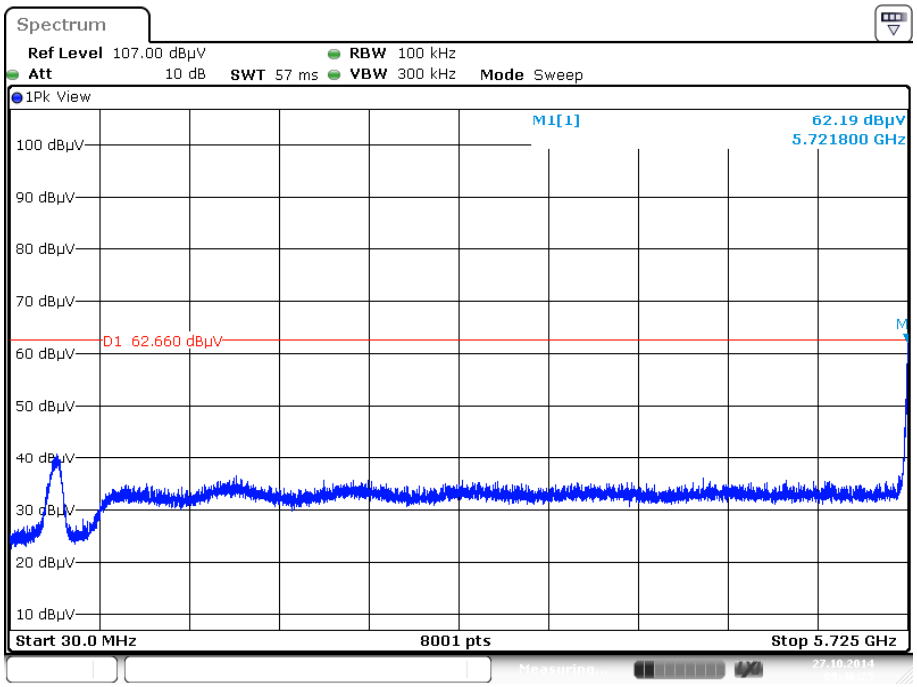


Plot on Configuration IEEE 802.11a / Reference Level



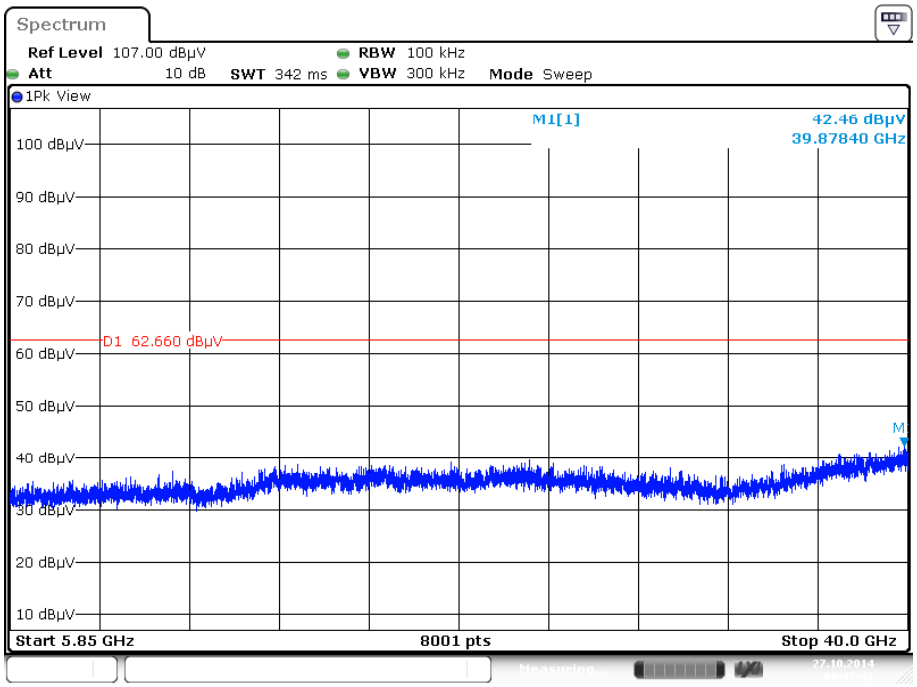
Date: 27.OCT.2014 08:51:37

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



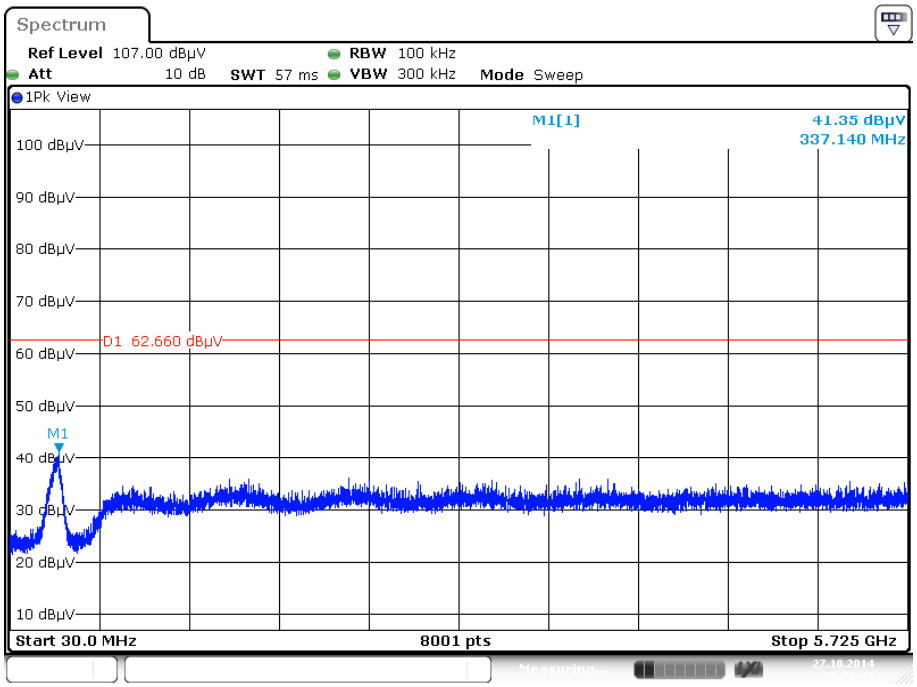
Date: 27.OCT.2014 09:46:25

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



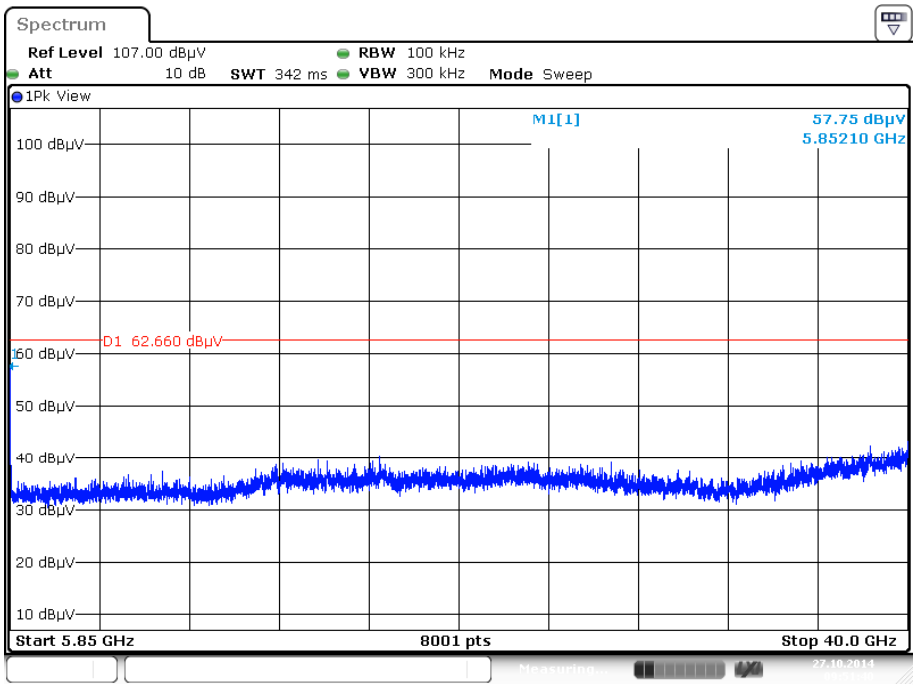
Date:27.OCT.2014 09:47:42

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



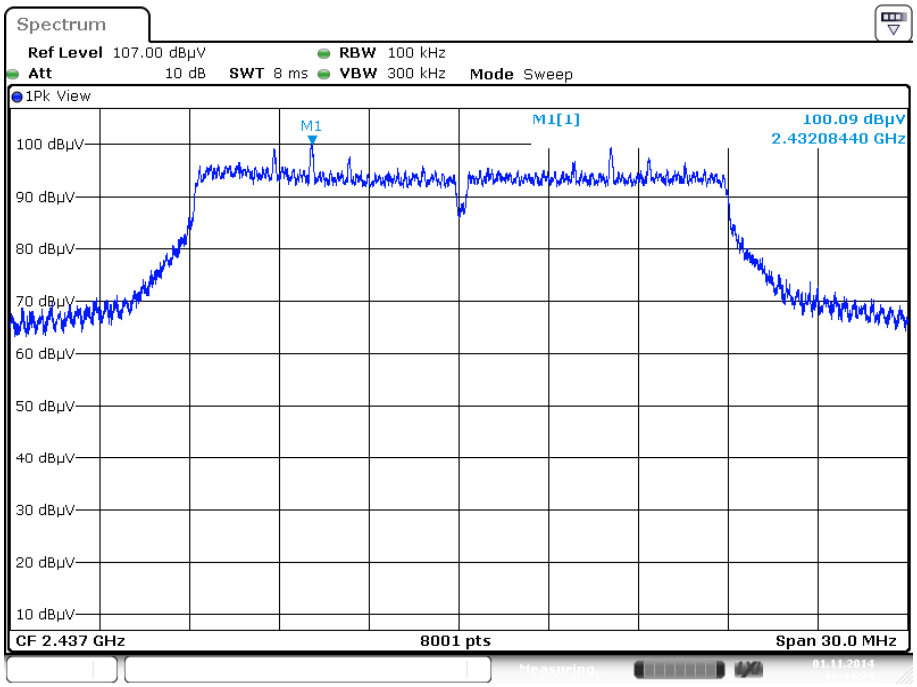
Date:27.OCT.2014 09:50:43

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



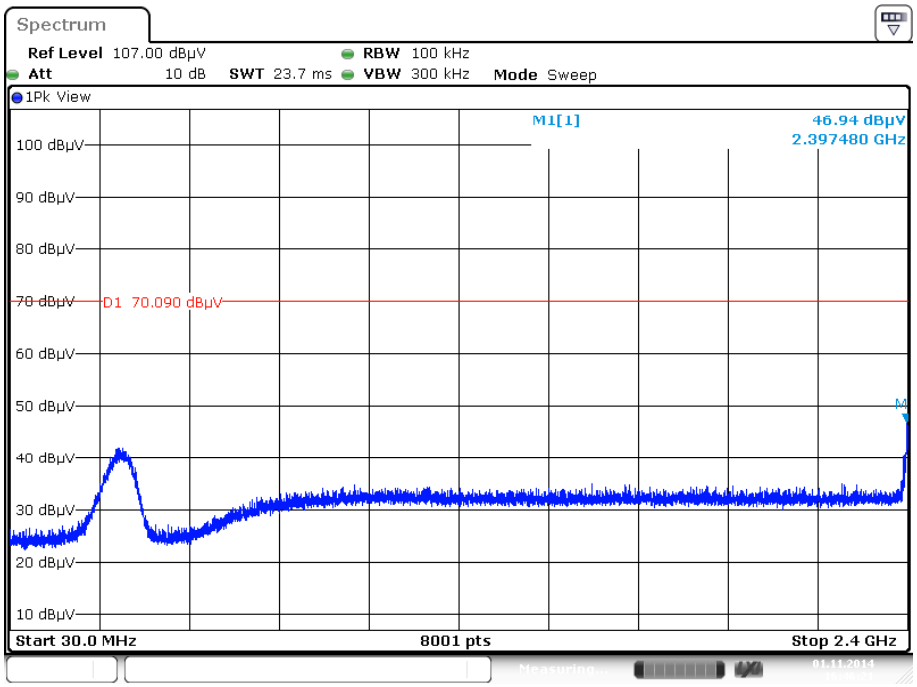
<For Beamforming Mode>

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



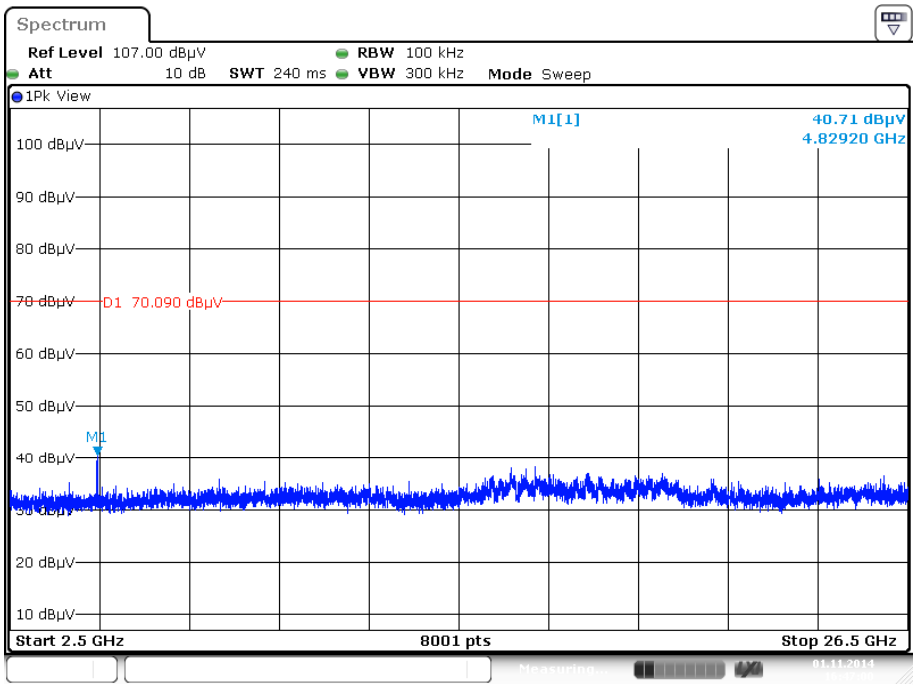
Date: 1.NOV.2014 16:44:24

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



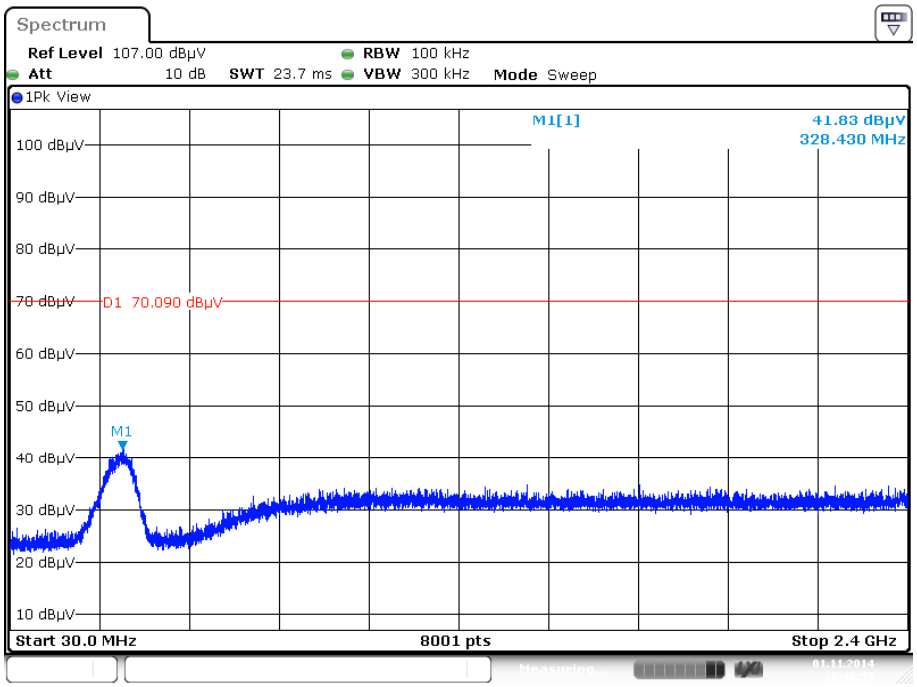
Date: 1.NOV.2014 16:46:21

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



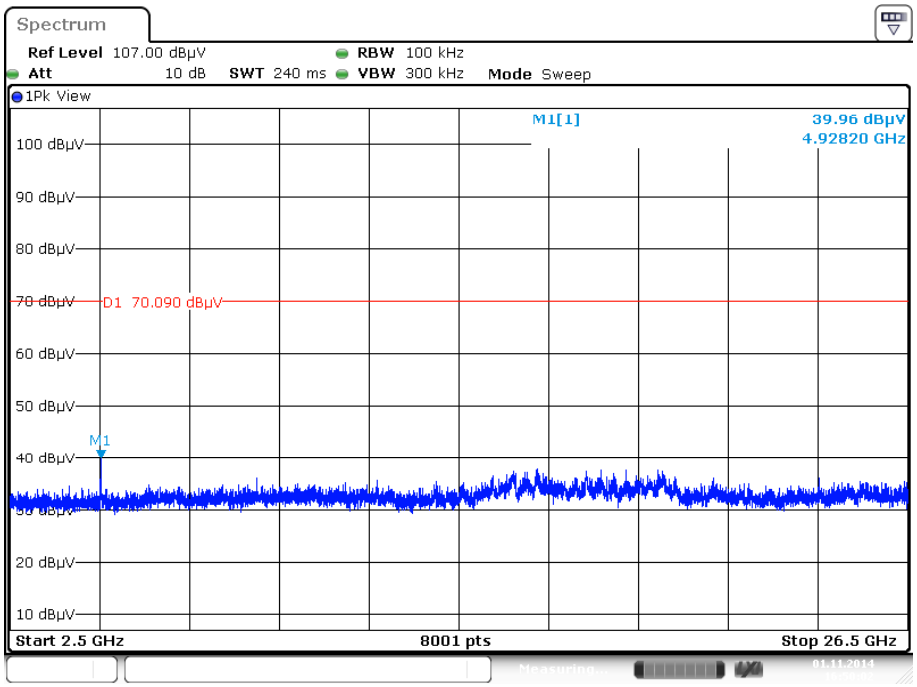
Date: 1.NOV.2014 16:46:59

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

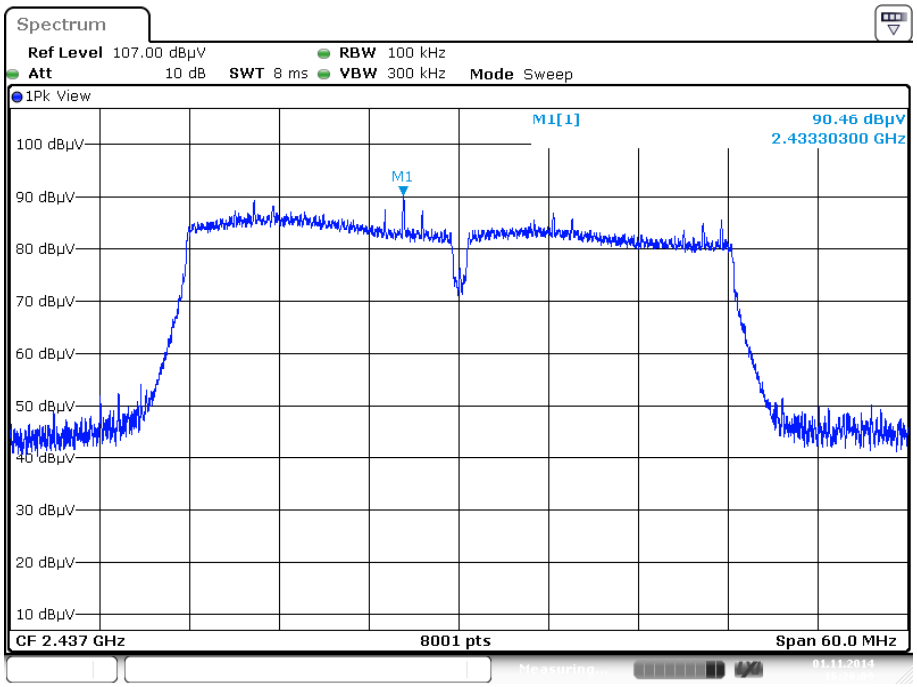


Date: 1.NOV.2014 16:48:56

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

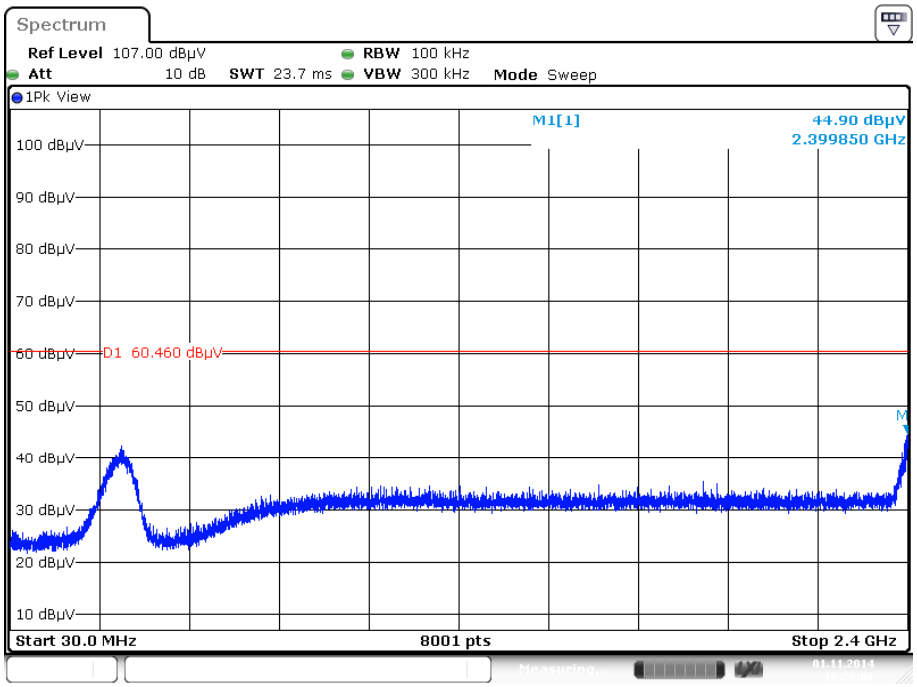


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



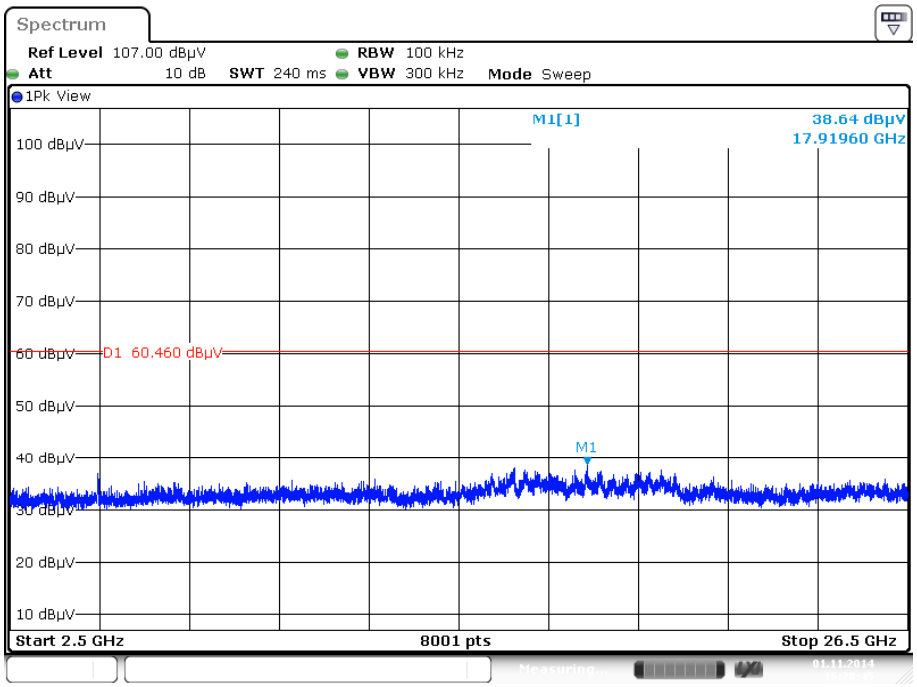
Date: 1.NOV.2014 16:26:09

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



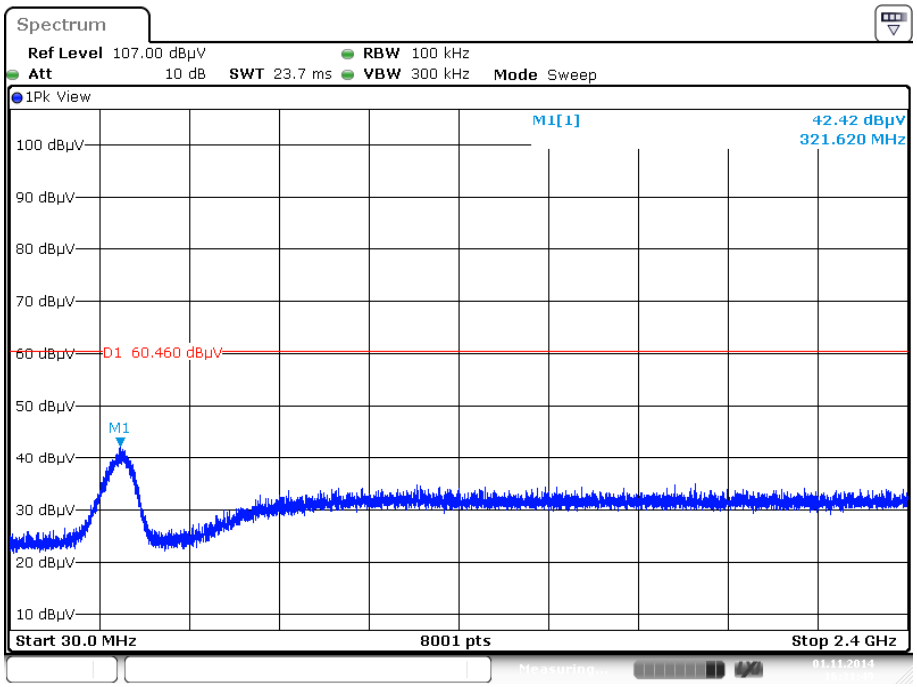
Date: 1.NOV.2014 16:28:06

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



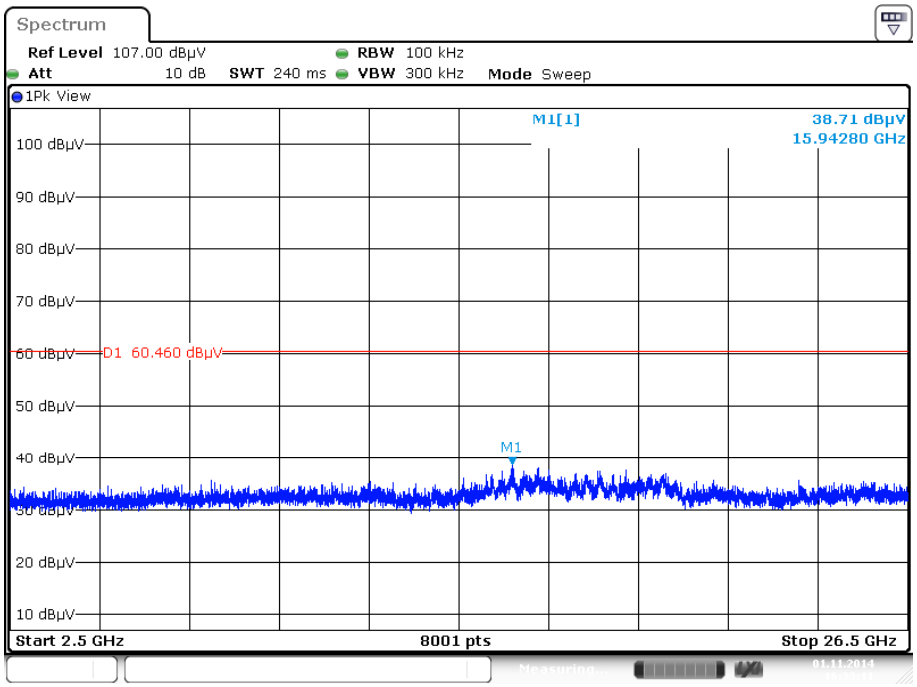
Date:1.NOV.2014 16:28:45

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

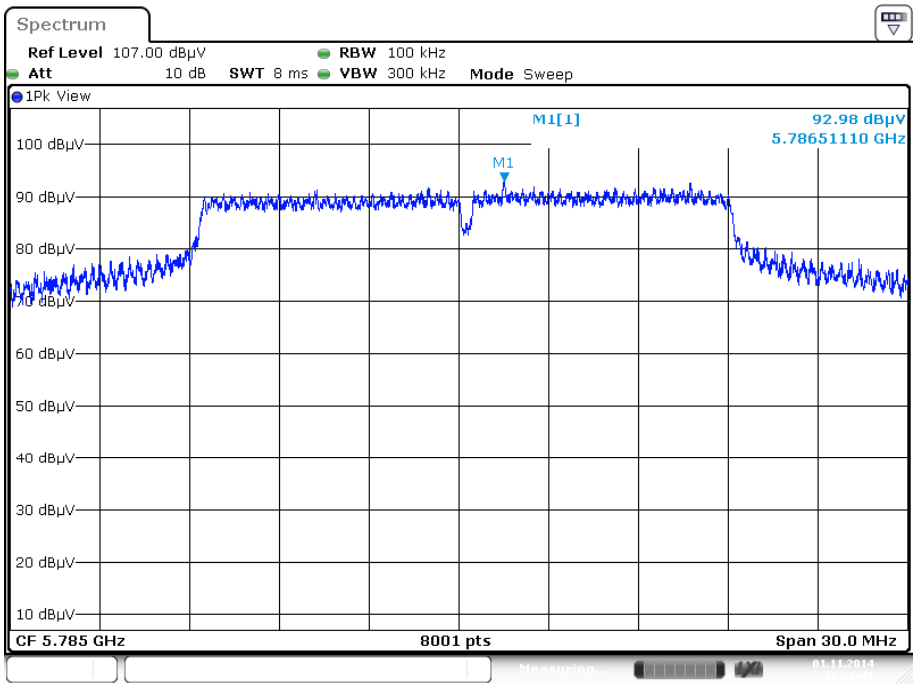


Date:1.NOV.2014 16:31:50

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

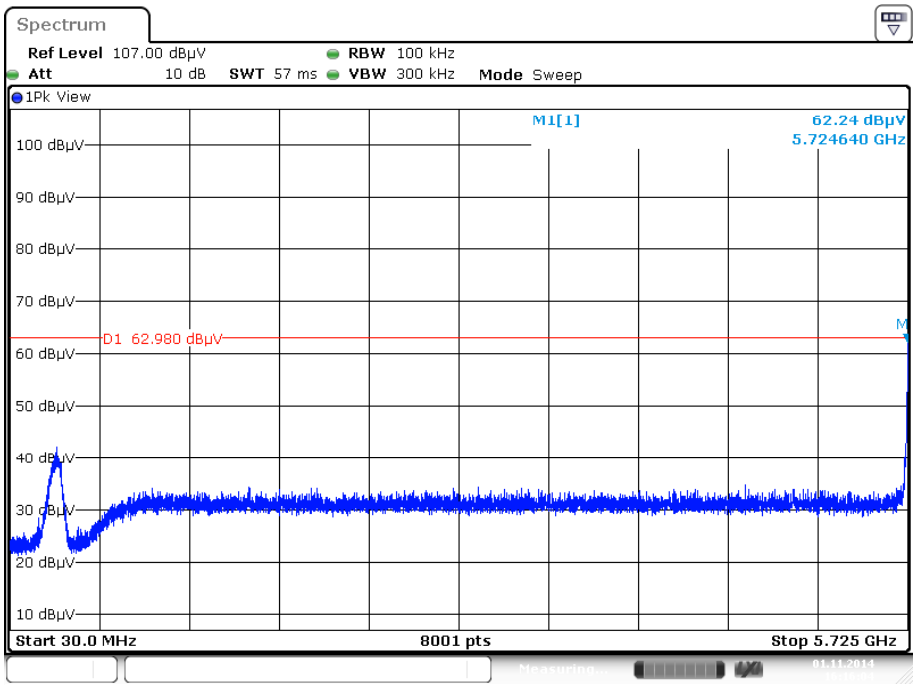


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



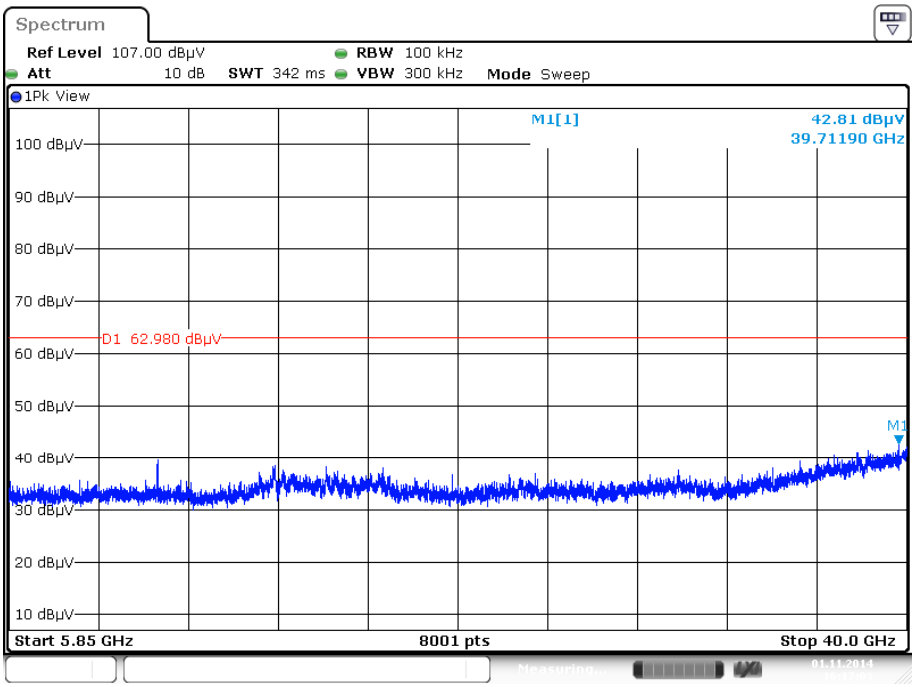
Date: 1.NOV.2014 16:08:49

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



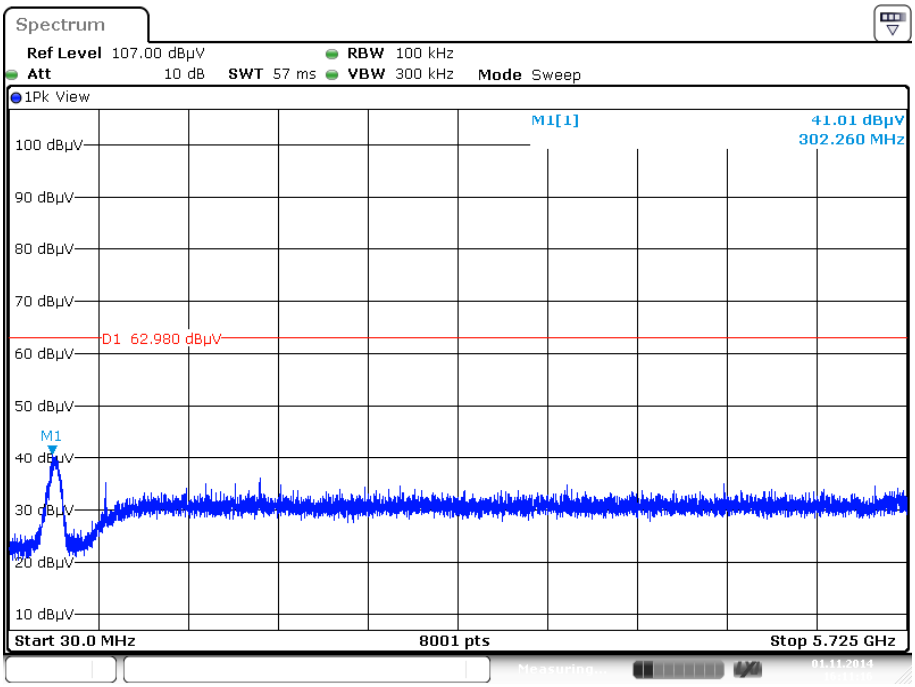
Date: 1.NOV.2014 16:16:04

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



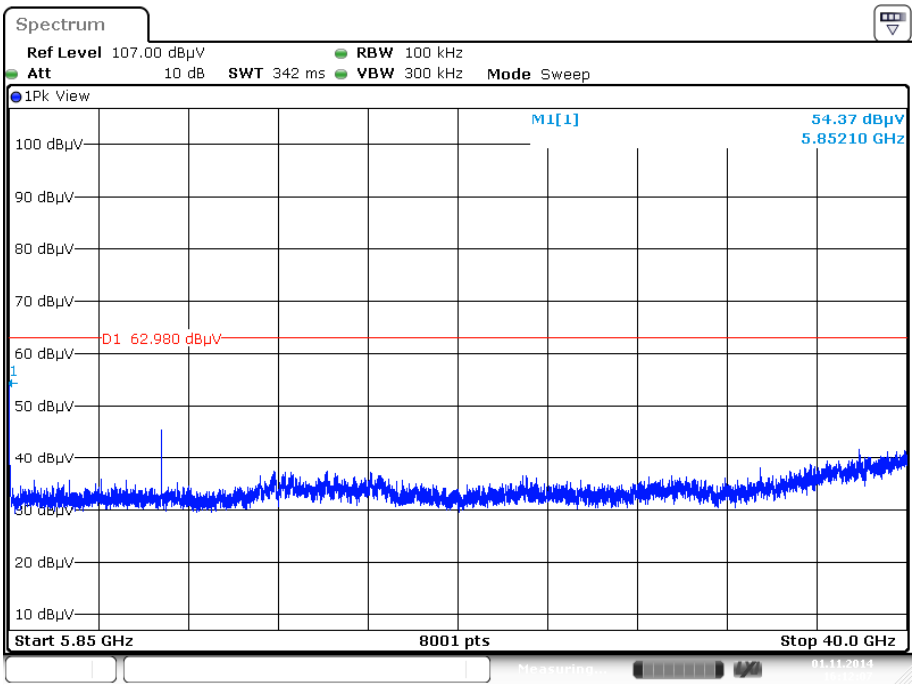
Date:1.NOV.2014 16:17:03

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

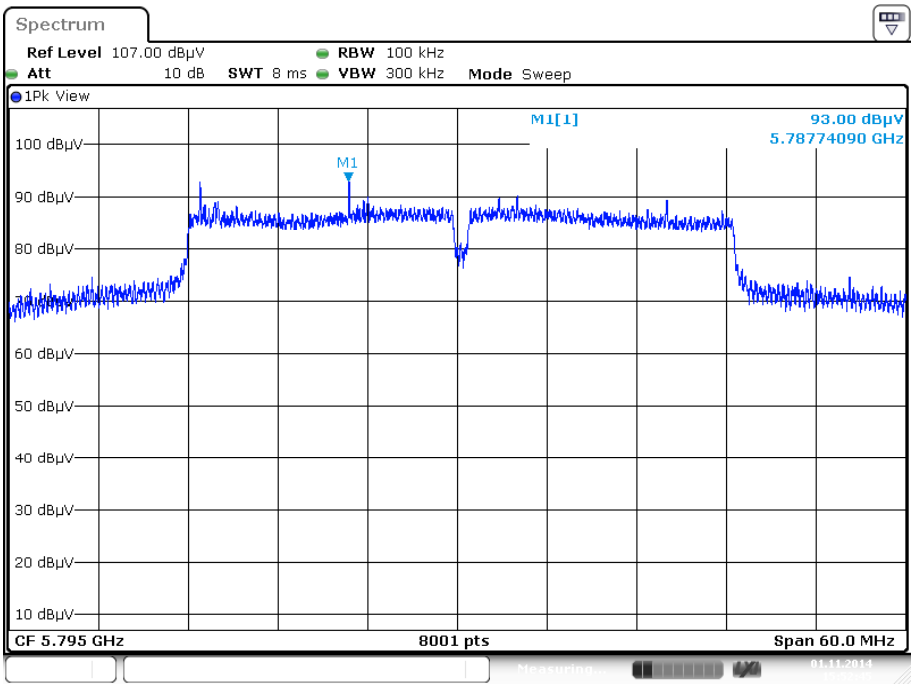


Date:1.NOV.2014 16:11:17

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

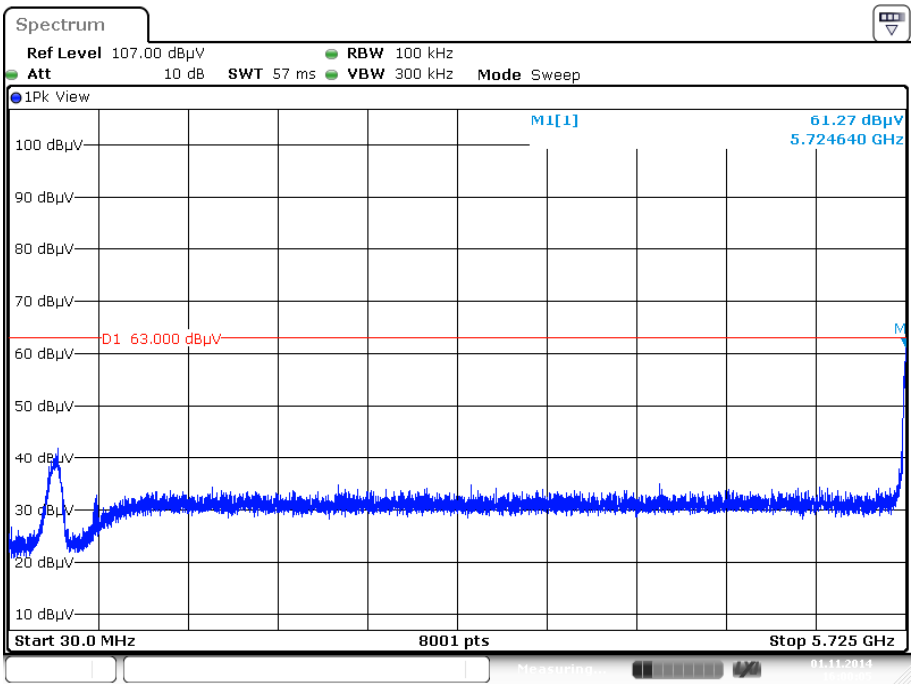


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



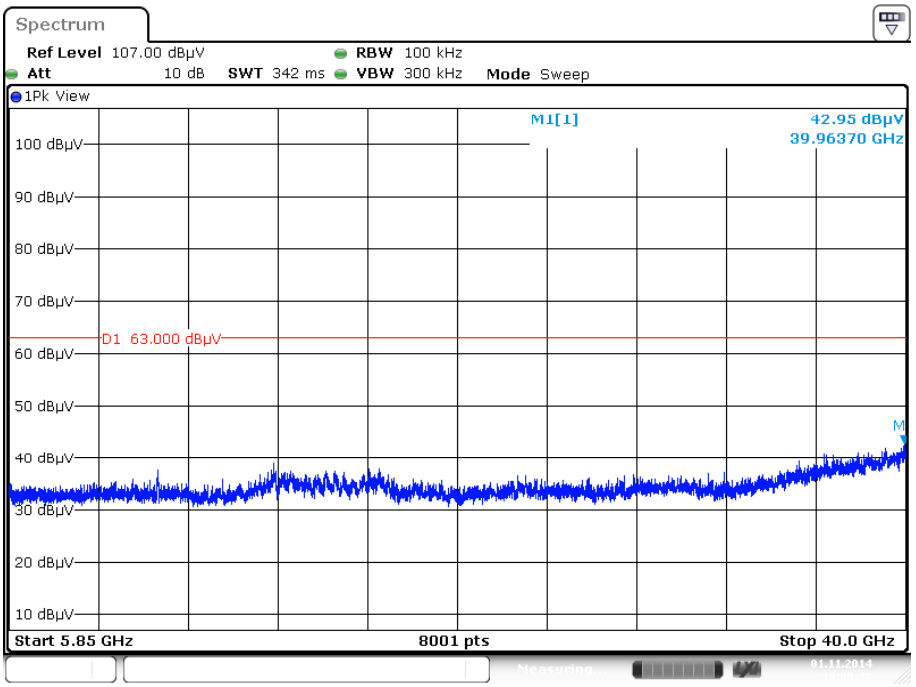
Date: 1.NOV.2014 15:52:45

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



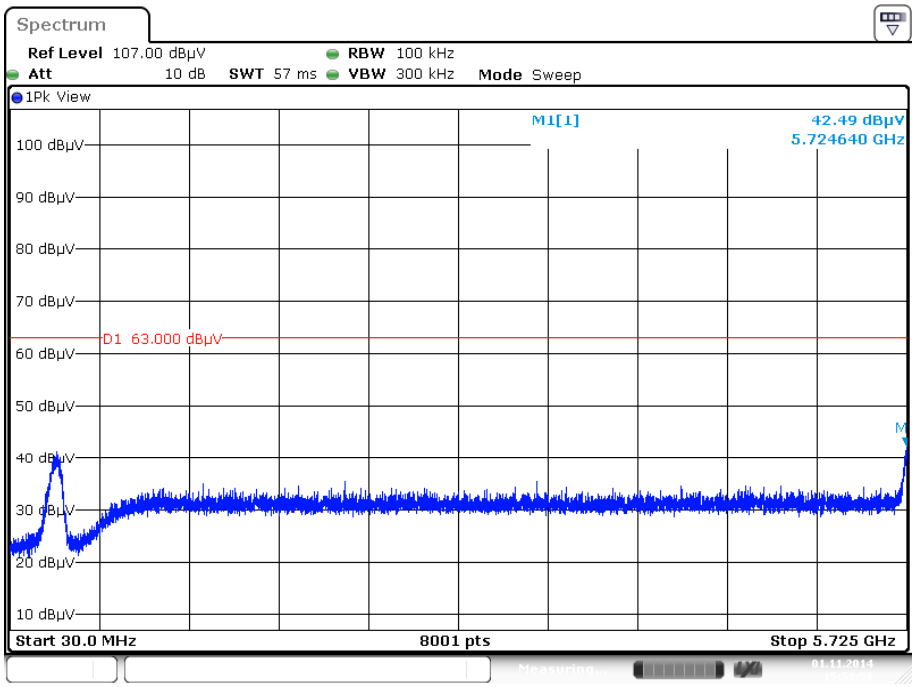
Date: 1.NOV.2014 16:00:05

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



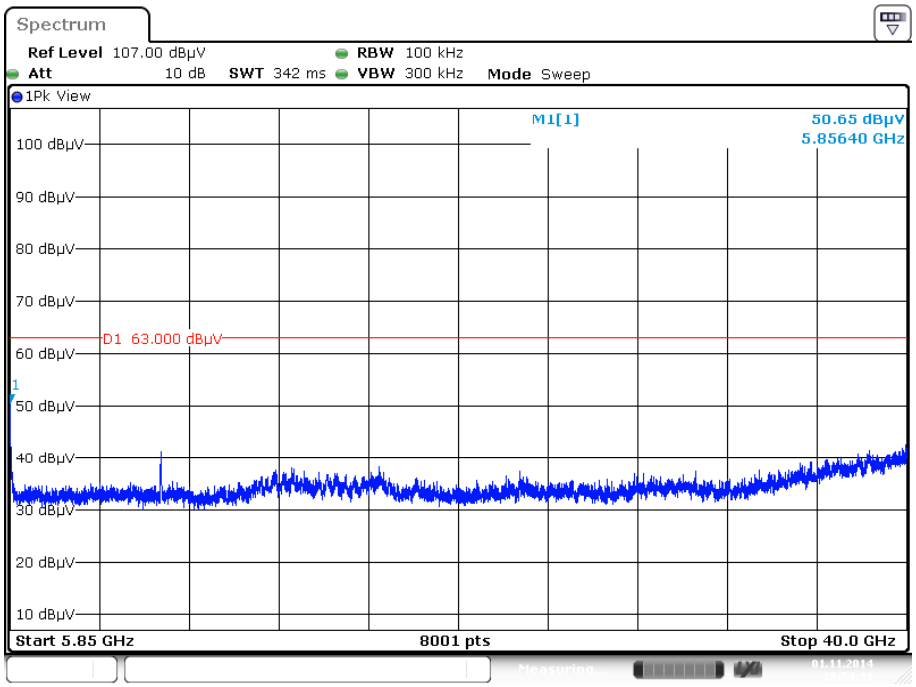
Date: 1.NOV.2014 16:00:49

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

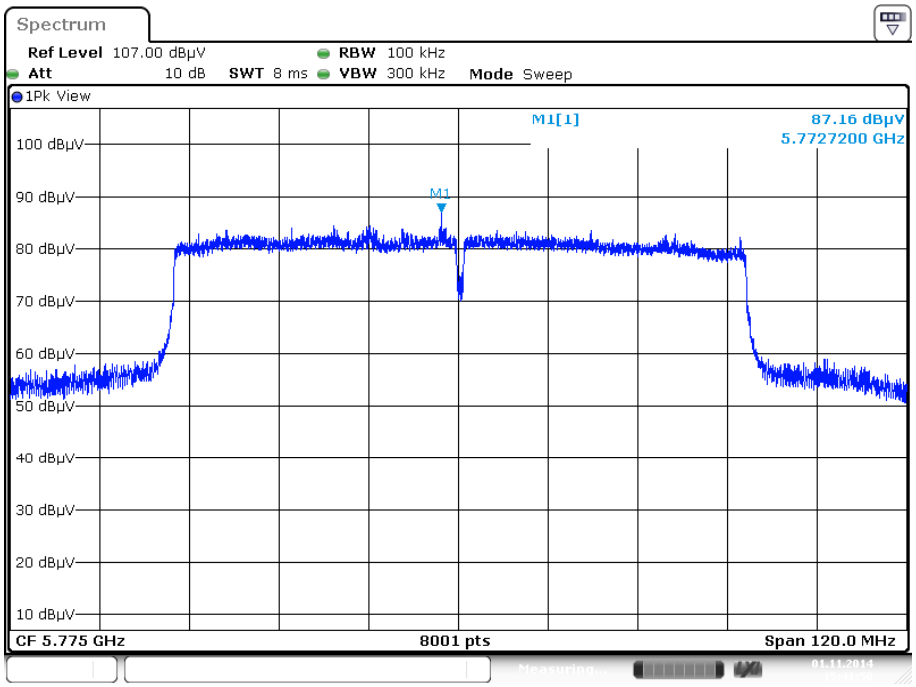


Date: 1.NOV.2014 15:53:58

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

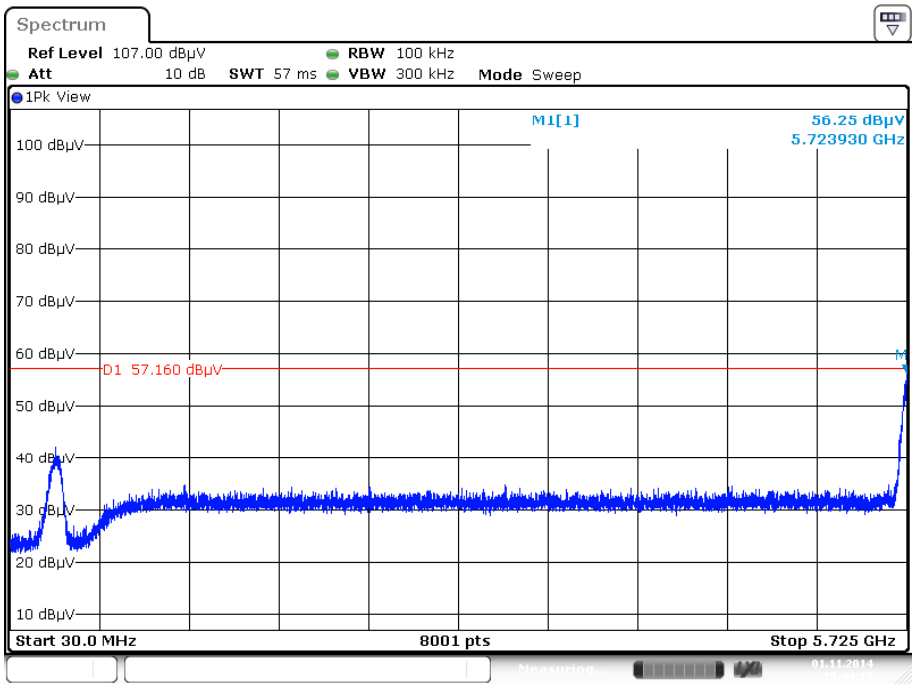


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



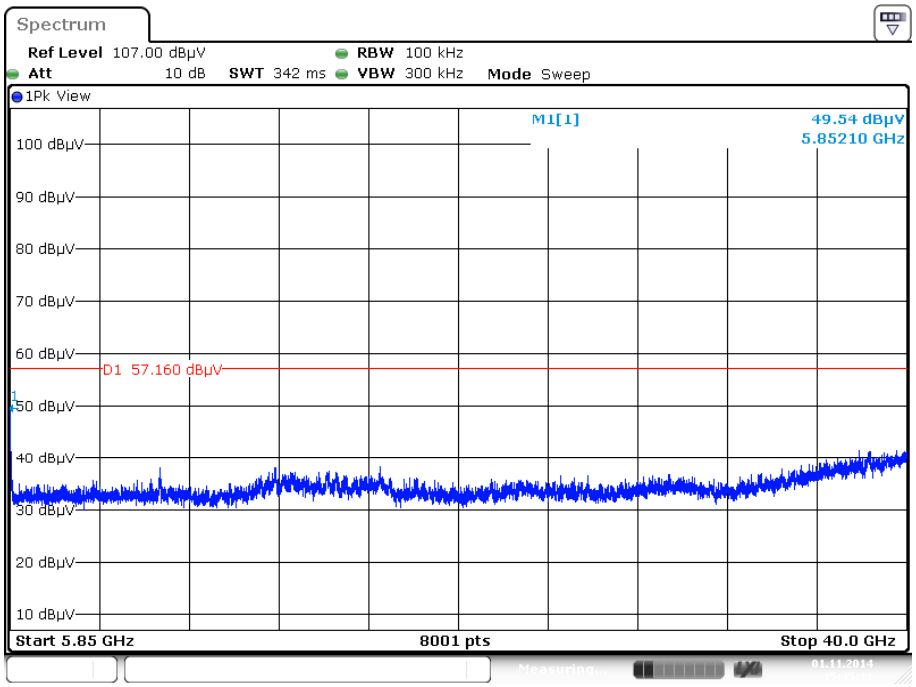
Date: 1.NOV.2014 15:41:49

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



Date: 1.NOV.2014 15:44:15

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



4.7. Antenna Requirements

4.7.1. Limit

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

4.7.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 23, 2014	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 02, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 02, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 26, 2014	Radiation (03CH01-CB)
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz - 30 MHz	Dec. 02, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Apr. 22, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 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	CO 2000	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. 15, 2014	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)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 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-7	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 15, 2014	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-9	-	1 GHz – 26.5 GHz	Nov. 15, 2014	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-10	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz～40GHz	Oct. 06, 2014	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz～40GHz	Oct. 06, 2014	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%