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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-RTAC68UV2**
Manufacturer's company	**Compal Networking (KunShan) Co., LTD.**
Manufacturer Address	No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China
Manufacturer's company	**Askey Technology (Jiangsu) Ltd.**
Manufacturer Address	1388, Jiao Tong Road, Wujiang Economic Technological Development Area, Jiang Su Province, P.R.C

Product Name	Wireless-AC1900 Dual Band Gigabit Router
Brand Name	ASUS
Model No.	RT-AC68U, RT-AC68R, RT-AC68W, RT-AC68P, TM-AC1900, RT-AC1900
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Dec. 04, 2014
Final Test Date	Jul. 24, 2014
Submission Type	Original Equipment

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g and IEEE 802.11a/ac of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2009**, **47 CFR FCC Part 15 Subpart C**, **KDB 558074 D01 v03r02**, **KDB 662911 D01 v02r01**, **KDB644545 D01 v01r02.**

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

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D0426AA	Rev. 01	Initial issue of report	Aug. 11, 2014

Certificate No.: CB10307245

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless-AC1900 Dual Band Gigabit Router
Brand Name	:	ASUS
Model No.	:	RT-AC68U, RT-AC68R, RT-AC68W, RT-AC68P, TM-AC1900, RT-AC1900
Applicant	:	ASUSTeK COMPUTER INC.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 04, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	10.25 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	1.03 dB
4.3	15.247(e)	Power Spectral Density	Complies	1.37 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	2.44 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.02 dB
4.7	15.203	Antenna Requirements	Complies	-

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 802.11ac/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 function: For 2.4GHz Band: 802.11ac MCS0/Nss1 (VHT20): 17.52 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz For beamforming function: For 2.4GHz Band: 802.11ac MCS0/Nss1 (VHT20): 17.68 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 17.68 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz ; 802.11ac MCS0/Nss1 (VHT80): 75.52 MHz

Maximum Conducted Output Power	For non-beamforming function: For 2.4GHz Band: 802.11ac MCS0/Nss1 (VHT20): 27.17 dBm ; 802.11ac MCS0/Nss1 (VHT40): 22.34 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 28.64 dBm ; 802.11ac MCS0/Nss1 (VHT40): 28.53 dBm ; 802.11ac MCS0/Nss1 (VHT80): 26.27 dBm For beamforming function: For 2.4GHz Band: 802.11ac MCS0/Nss1 (VHT20): 25.92 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.57 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 26.26 dBm ; 802.11ac MCS0/Nss1 (VHT40): 26.20 dBm ; 802.11ac MCS0/Nss1 (VHT80): 26.25 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: 13.20 MHz ; 11g: 16.48 MHz ; 11a: 16.72 MHz
Maximum Conducted Output Power	11b: 26.57 dBm ; 11g: 27.94 dBm ; 11a: 28.62 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Band width Mode	Description	
IEEE 802.11a	☐ With beamforming	☒ Without beamforming
IEEE 802.11b	☐ With beamforming	☒ Without beamforming
IEEE 802.11g	☐ With beamforming	☒ Without beamforming
IEEE 802.11n	☒ With beamforming	☐ Without beamforming
IEEE 802.11ac	☒ With beamforming	☐ 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 (For 2.4GHz Band)	V	V	X
IEEE 802.11ac (For 5GHz Band)	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	3	MCS0-23
802.11n (HT40)	3	MCS0-23
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	Rating
Adapter 1	PIE	AD890326	Input: 100-240Vac, 50/60Hz, 0.8A Output: 19Vdc, 1.75A
Adapter 2	ENERTRONIX	EXA1206UH	Input: 100-240Vac, 50-60Hz, 1.0A Output: 19Vdc, 1.75A
Other			
RJ-45 cable*1: Shielded, 1.5m			

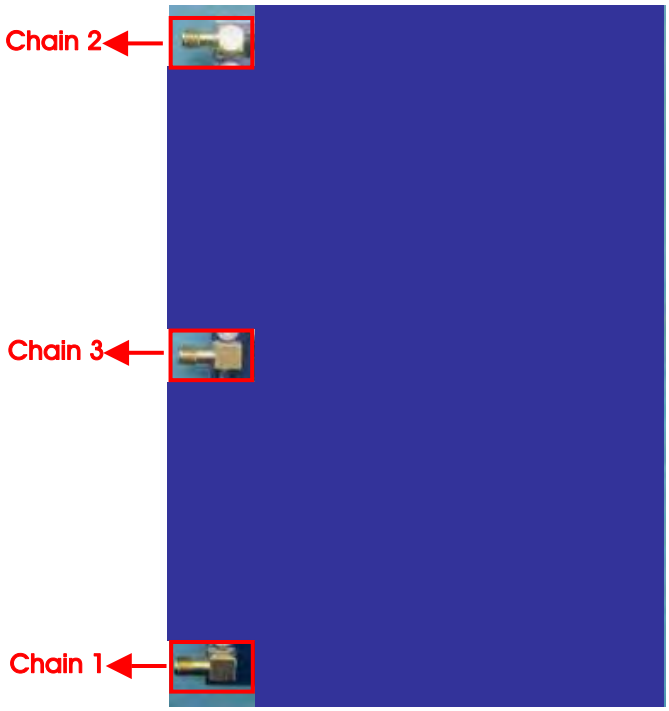
3.3. Table for Filed Antenna

Set	Brand	P/N	Antenna Type	Connector	Gain (dBi)		
					2.4GHz	5GHz	
						Band 1	Band 4
1	PSA	RFDPA141000SBLB802	Dipole Antenna	Reverse SMA	1.91	4.04	3.94

Note: The EUT has one set of antenna (three external antennas).

There is one set of antenna provided to this EUT and them can be used as transmitting and receiving antenna.

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

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

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+3
	11ac VHT40	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	MCS0/Nss1	155	1+2+3
	11a/BPSK	6 Mbps	149/157/165	1+2+3
Power Spectral Density	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	MCS0/Nss1	155	1+2+3
	11a/BPSK	6 Mbps	149/157/165	1+2+3
6dB Spectrum Bandwidth	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	MCS0/Nss1	155	1+2+3
	11a/BPSK	6 Mbps	149/157/165	1+2+3
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	MCS0/Nss1	155	1+2+3
	11a/BPSK	6 Mbps	149/157/165	1+2+3
Band Edge Emissions	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	MCS0/Nss1	155	1+2+3
	11a/BPSK	6 Mbps	149/157/165	1+2+3

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

The EUT has non-beamforming function and beamforming function for 802.11n/ac. They were verified for all tests, and all test results were recorded in the report.

The following test modes were performed for all tests:

For AC Power Line Conducted Emissions test:

Mode 1. EUT + Adapter 1

Mode 2. EUT + Adapter 2

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

For Radiated Emissions Below 1GHz test:

Mode 1. EUT + Adapter 1

Mode 2. EUT + Adapter 2

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

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

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

3.6. Table for Testing Locations

Test Site Location				
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.			
TEL:	886-3-656-9065			
FAX:	886-3-656-9085			
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.7. Table for Multiple List

1. The EUT has six model numbers and all the models are identical, the different model numbers served as marketing strategy.
2. The EUT has two SKU which are identical to each other in all aspects except for the following table:

SKU / Description	SKU1	SKU2
Vendor	NET SWAPN(FCE)	MINGTEK
LAN port transformer (Model No.)	FCE_NS771802	HN18101CG
WAN port transformer (Model No.)	FCE_NS773602	HN36201CG
Spec	DIP 10/100/1000 BASE-T	1GB DUAL DIP

From the EUT's above, SKU2 was selected as representative model for the test and its data was recorded in this report.

3.8. Table for Supporting Units

For Test Site No: CO01-CB and TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

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

For non-beamforming function:

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

For Beamforming function:

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
NB	DELL	M1330	DoC
WiFi USB Adapter	NETGEAR	A6200	PY312200200

3.9. 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 function:

For 2.4GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.0.8		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	74	97	71

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.0.8		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	68	84	74

Power Parameters of IEEE 802.11b/g

Test Software Version	Mtool 2.0.0.8		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	76	94	88
IEEE 802.11g	78	100	76

For 5GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.0.8		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	95	95	95

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.0.8	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	93	96

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool 2.0.0.8
Frequency	5775 MHz
MCS0/Nss1 VHT80	90

Power Parameters of IEEE 802.11a

Test Software Version	Mtool 2.0.0.8		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	95	95	95

For beamforming function:

For 2.4GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0/Nss1 VHT20	70	90	72

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	DOS		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0/Nss1 VHT40	66	78	70

For 5GHz Band

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	DOS		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0/Nss1 VHT20	85	85	85

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	DOS	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	85	85

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	DOS
Frequency	5775 MHz
MCS0/Nss1 VHT80	85

3.10. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

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 WiFi USB Adapter and transmit duty cycle no less 98%

3.11. Duty Cycle

For non-beamforming function:

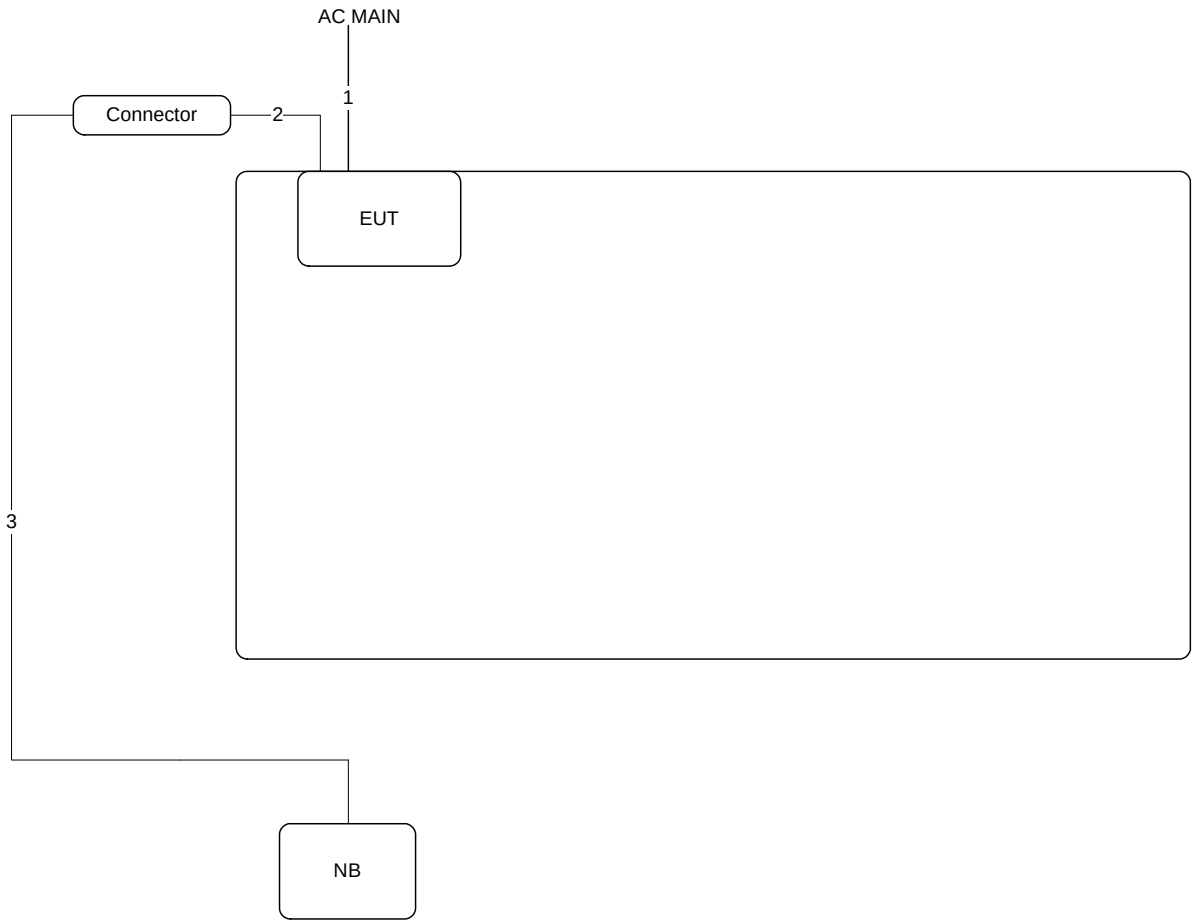
Band	Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle(%)	1/T Minimum VBW (kHz)
2.4G	802.11ac MCS0/Nss1 VHT20	1.930	1.940	99.48	0.02
	802.11ac MCS0/Nss1 VHT40	0.956	0.976	97.95	0.09
	802.11b	1.000	1.000	100.00	0.00
	802.11g	2.080	2.09	99.52	0.02
5G	802.11ac MCS0/Nss1 VHT20	1.930	1.95	98.97	0.04
	802.11ac MCS0/Nss1 VHT40	0.960	0.98	97.96	0.09
	802.11ac MCS0/Nss1 VHT80	0.468	0.484	96.69	0.15
	802.11a	2.080	2.090	99.52	0.02

For beamforming function:

Band	Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle(%)	1/T Minimum VBW (kHz)
2.4G	802.11ac MCS0/Nss1 VHT20	3.820	4.180	91.39	0.39
	802.11ac MCS0/Nss1 VHT40	3.660	3.960	92.42	0.34
5G	802.11ac MCS0/Nss1 VHT20	3.800	4.080	93.14	0.31
	802.11ac MCS0/Nss1 VHT40	4.540	4.860	93.42	0.30
	802.11ac MCS0/Nss1 VHT80	2.120	2.420	87.60	0.57

3.12. Test Configurations

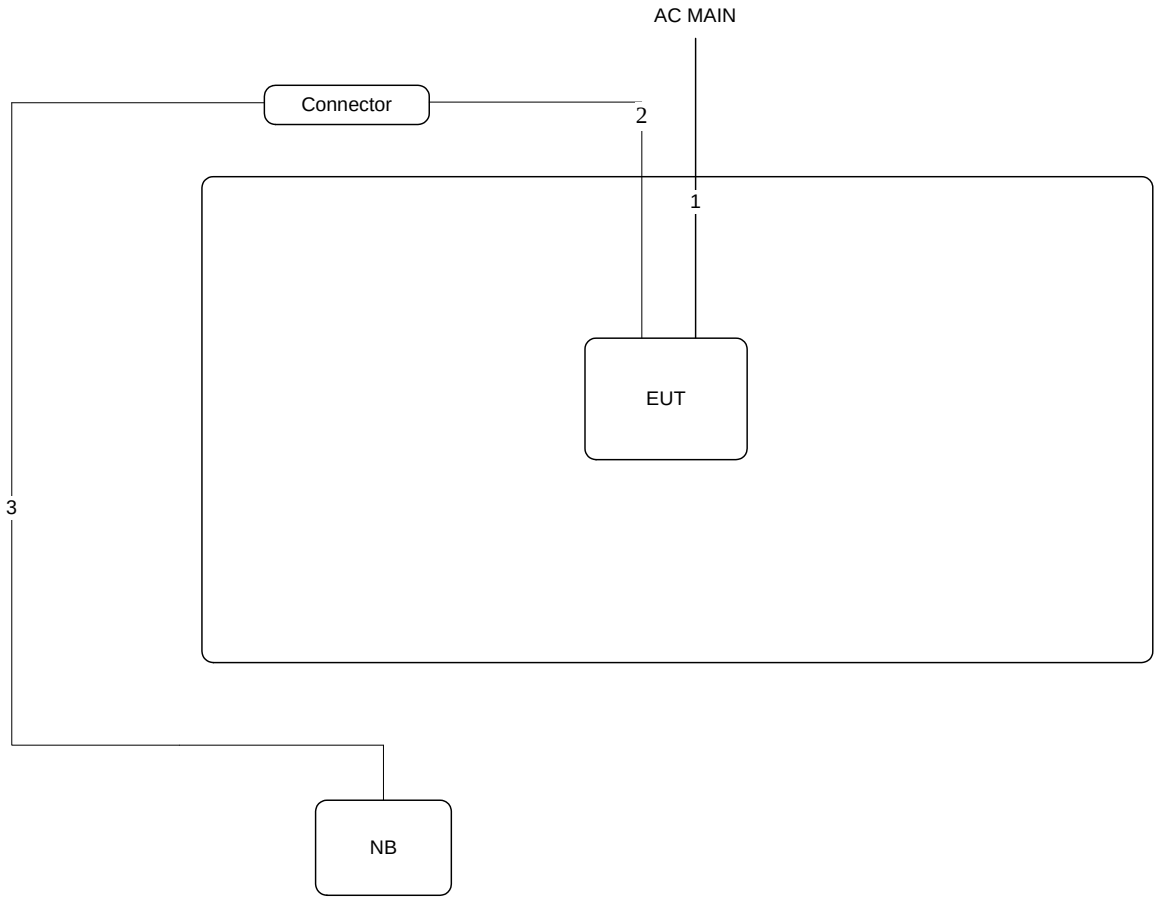
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	Yes	1.5m
3	RJ-45 cable	Yes	10m

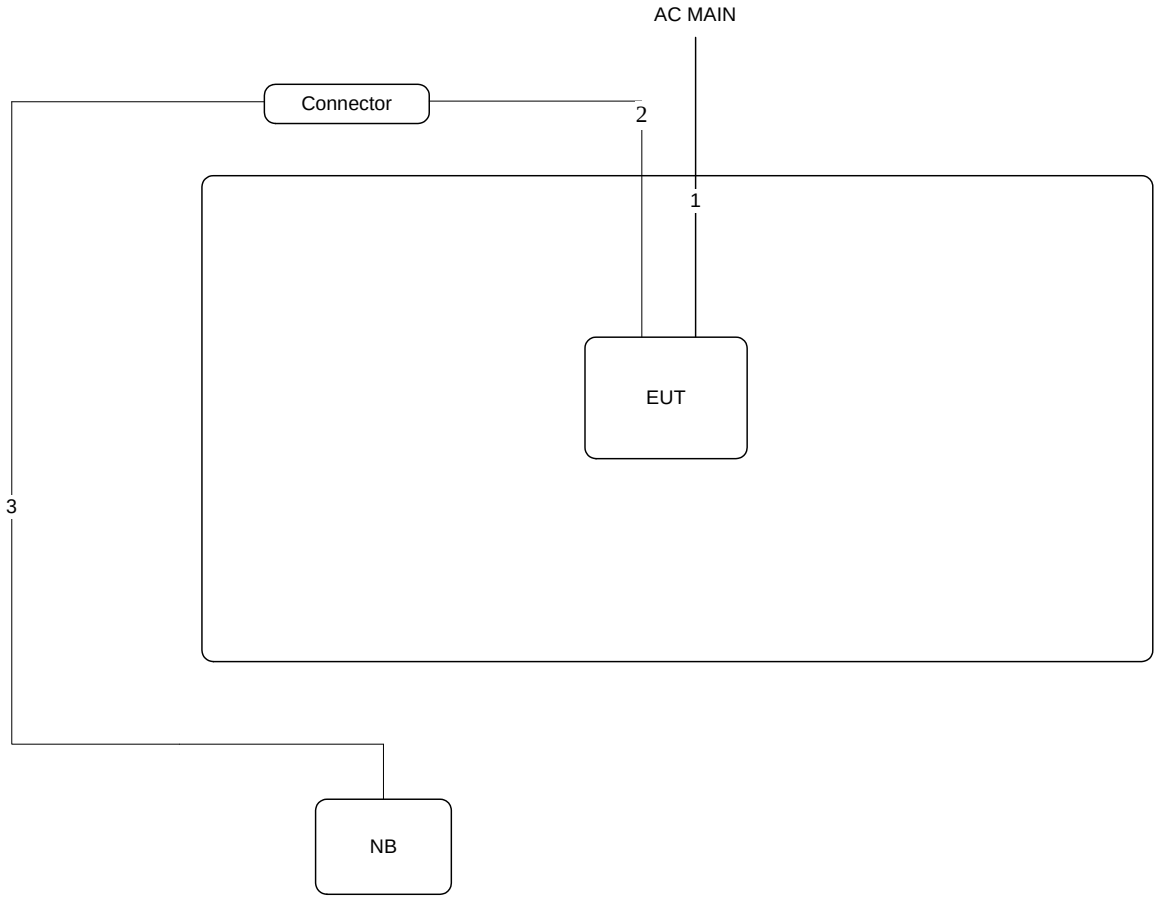
3.12.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



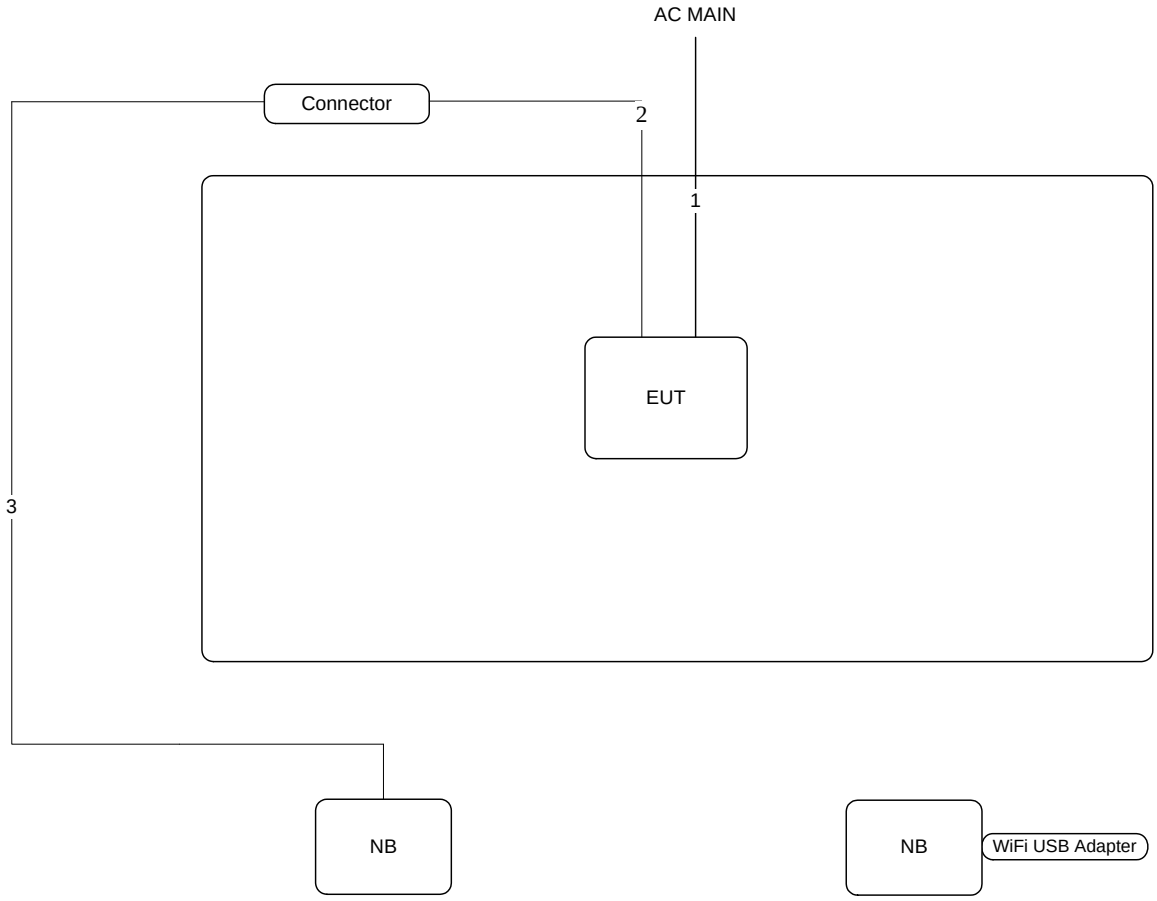
Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	Yes	1.5m
3	RJ-45 cable	Yes	10m

Test Configuration: above 1GHz / For non-beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	Yes	1.5m
3	RJ-45 cable	Yes	10m

Test Configuration: above 1GHz / For beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	2.4m
2	RJ-45 cable	Yes	1.5m
3	RJ-45 cable	Yes	10m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

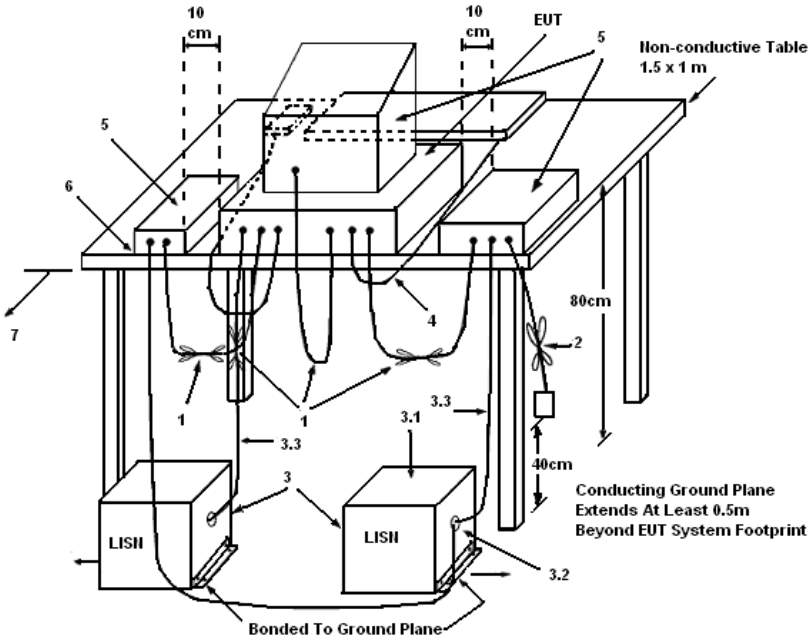
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

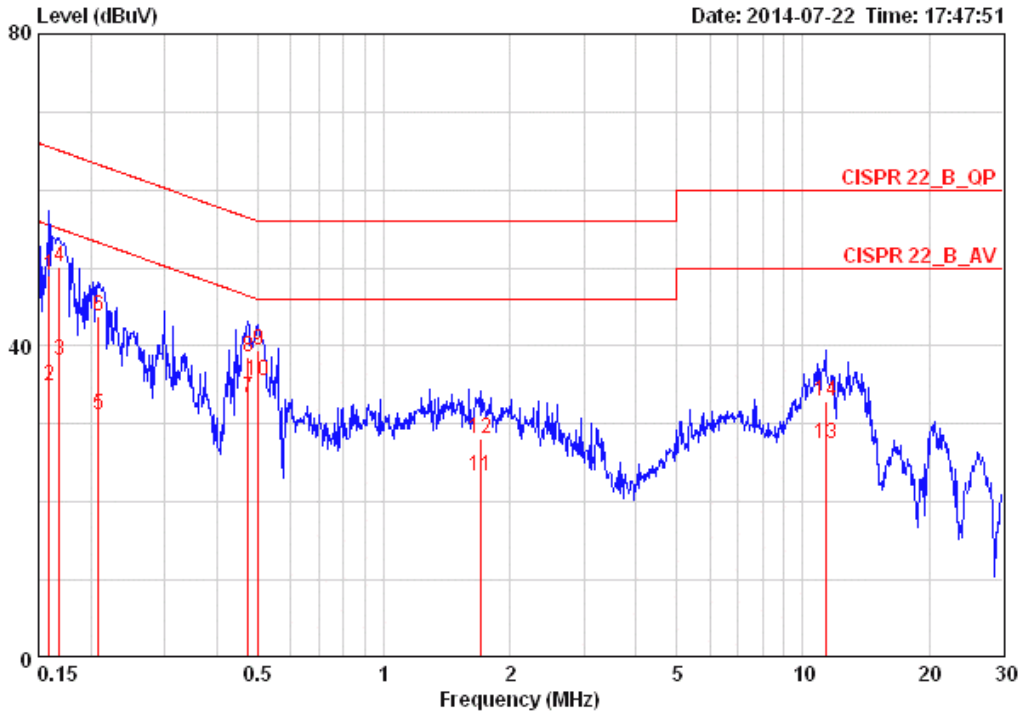
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

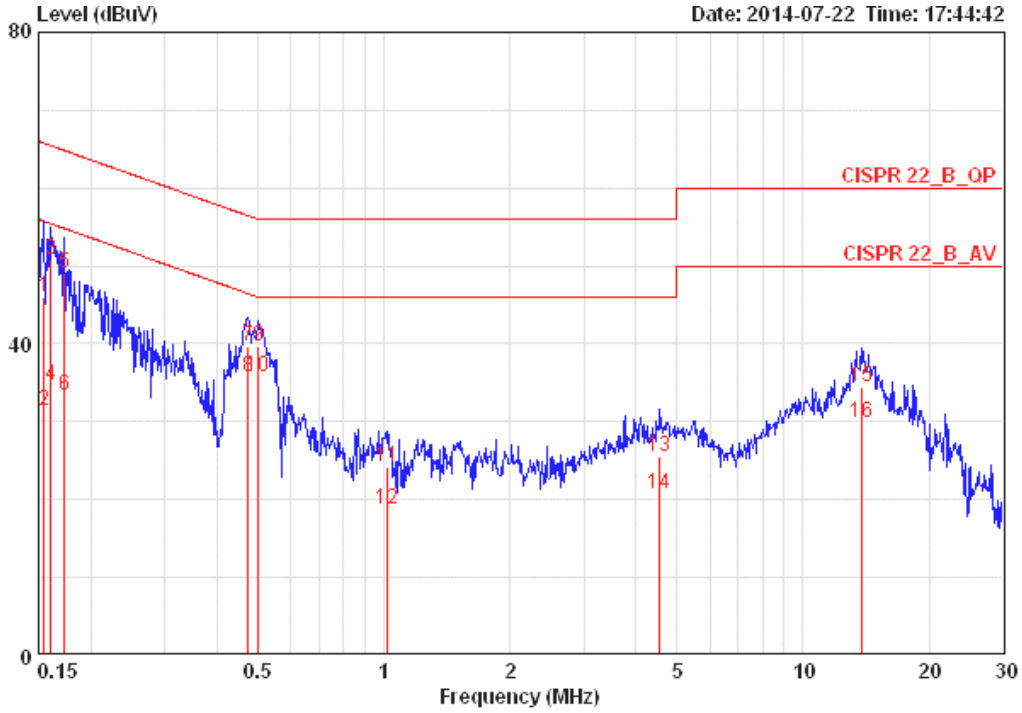
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24℃	Humidity	51%
Test Engineer	Parody Lin	Phase	Line
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.15900	48.96	-16.56	65.52	0.10	48.70	0.16	LINE	QP
2	0.15900	34.98	-20.54	55.52	0.10	34.72	0.16	LINE	AVERAGE
3	0.16854	38.20	-16.83	55.03	0.10	37.94	0.16	LINE	AVERAGE
4	0.16854	50.24	-14.79	65.03	0.10	49.98	0.16	LINE	QP
5	0.20833	31.24	-22.04	53.27	0.10	30.97	0.17	LINE	AVERAGE
6	0.20833	43.82	-19.46	63.27	0.10	43.55	0.17	LINE	QP
7	0.47360	33.39	-13.06	46.45	0.11	33.10	0.18	LINE	AVERAGE
8	0.47360	38.55	-17.90	56.45	0.11	38.26	0.18	LINE	QP
9	0.50203	39.40	-16.60	56.00	0.11	39.11	0.19	LINE	QP
10 @	0.50203	35.60	-10.40	46.00	0.11	35.31	0.19	LINE	AVERAGE
11	1.698	23.34	-22.66	46.00	0.15	22.95	0.24	LINE	AVERAGE
12	1.698	28.11	-27.89	56.00	0.15	27.72	0.24	LINE	QP
13	11.317	27.51	-22.49	50.00	0.36	26.75	0.39	LINE	AVERAGE
14	11.317	32.89	-27.11	60.00	0.36	32.13	0.39	LINE	QP

Temperature	24°C	Humidity	51%
Test Engineer	Parody Lin	Phase	Neutral
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.15485	45.89	-19.85	65.74	0.09	45.64	0.16	NEUTRAL	QP
2	0.15485	31.49	-24.25	55.74	0.09	31.24	0.16	NEUTRAL	AVERAGE
3	0.16070	50.86	-14.57	65.43	0.09	50.61	0.16	NEUTRAL	QP
4	0.16070	34.71	-20.72	55.43	0.09	34.46	0.16	NEUTRAL	AVERAGE
5	0.17307	48.94	-15.87	64.81	0.09	48.69	0.16	NEUTRAL	QP
6	0.17307	33.43	-21.38	54.81	0.09	33.18	0.16	NEUTRAL	AVERAGE
7	0.47360	39.61	-16.84	56.45	0.10	39.33	0.18	NEUTRAL	QP
8	0.47360	35.80	-10.65	46.45	0.10	35.52	0.18	NEUTRAL	AVERAGE
9	0.50203	39.77	-16.23	56.00	0.10	39.49	0.19	NEUTRAL	QP
10 @	0.50203	35.75	-10.25	46.00	0.10	35.47	0.19	NEUTRAL	AVERAGE
11	1.021	24.09	-31.91	56.00	0.12	23.77	0.20	NEUTRAL	QP
12	1.021	18.82	-27.18	46.00	0.12	18.50	0.20	NEUTRAL	AVERAGE
13	4.549	25.51	-30.49	56.00	0.21	24.99	0.31	NEUTRAL	QP
14	4.549	20.73	-25.27	46.00	0.21	20.21	0.31	NEUTRAL	AVERAGE
15	13.841	34.39	-25.61	60.00	0.38	33.58	0.43	NEUTRAL	QP
16	13.841	29.89	-20.11	50.00	0.38	29.08	0.43	NEUTRAL	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

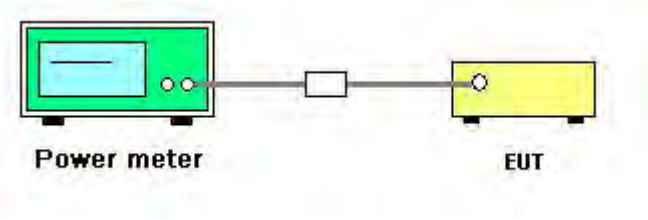
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r02 section 9.2.3.2 Measurement using a power meter (PM).
2. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Jul. 24, 2014	Test Function	Non-beamforming function

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	17.09	18.26	17.36	22.37	30.00	Complies
6	2437 MHz	22.12	22.81	22.23	27.17	30.00	Complies
11	2462 MHz	16.01	16.98	16.33	21.23	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
3	2422 MHz	13.77	14.72	13.85	18.91	30.00	Complies
6	2437 MHz	17.28	18.09	17.27	22.34	30.00	Complies
9	2452 MHz	15.08	15.67	15.12	20.07	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 3	Total		
149	5745 MHz	23.92	23.75	23.92	28.64	30.00	Complies
157	5785 MHz	23.91	23.71	23.8	28.58	30.00	Complies
165	5825 MHz	23.94	23.77	23.81	28.61	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
151	5755 MHz	23.18	22.92	22.95	27.79	30.00	Complies
159	5795 MHz	23.82	23.62	23.83	28.53	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
155	5775 MHz	21.33	21.42	21.73	26.27	30.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g
Test Date	Jul. 24, 2014	Test Function	Non-beamforming function

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	17.41	18.64	17.29	22.60	30.00	Complies
6	2437 MHz	21.28	22.32	21.72	26.57	30.00	Complies
11	2462 MHz	19.94	20.54	20.02	24.95	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	18.01	19.12	18.03	23.19	30.00	Complies
6	2437 MHz	22.91	23.55	23.02	27.94	30.00	Complies
11	2462 MHz	17.47	18.21	17.33	22.46	30.00	Complies

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
149	5745 MHz	23.91	23.74	23.84	28.60	30.00	Complies
157	5785 MHz	23.93	23.72	23.88	28.62	30.00	Complies
165	5825 MHz	23.89	23.68	23.91	28.60	30.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Jul. 24, 2014	Test Function	Beamforming function

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	16.33	17.88	16.43	21.71	29.32	Complies
6	2437 MHz	20.71	21.82	20.83	25.92	29.32	Complies
11	2462 MHz	16.52	17.58	16.63	21.71	29.32	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{jk}\right\}^2}{N_{ANT}}\right]$ =6.68dBi>6dBi, so limit=30 – (6.68 – 6)=29.32dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
3	2422 MHz	13.73	15.01	14.47	19.21	29.32	Complies
6	2437 MHz	16.21	17.2	16.92	21.57	29.32	Complies
9	2452 MHz	14.46	15.68	15.33	19.96	29.32	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{jk}\right\}^2}{N_{ANT}}\right]$ =6.68dBi>6dBi, so limit=30 – (6.68 – 6)=29.32dBm.

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
149	5745 MHz	21.72	21.48	21.25	26.26	27.29	Complies
157	5785 MHz	21.66	21.45	21.09	26.18	27.29	Complies
165	5825 MHz	21.53	21.47	21.19	26.17	27.29	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.71dBi>6dBi, so limit=30 – (8.71 – 6)=27.29dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
151	5755 MHz	21.61	21.51	21.14	26.20	27.29	Complies
159	5795 MHz	21.52	21.46	21.17	26.16	27.29	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.71dBi>6dBi, so limit=30 – (8.71 – 6)=27.29dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
155	5775 MHz	21.62	21.54	21.28	26.25	27.29	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.71dBi>6dBi, so limit=30 – (8.71 – 6)=27.29dBm.

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

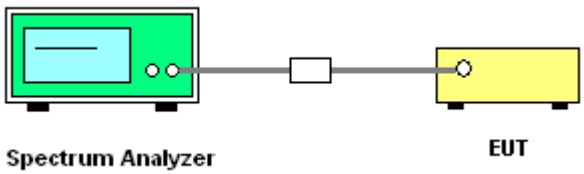
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Function	Non-beamforming function		

For 2.4GHz 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 3	Total		
1	2412 MHz	-8.04	-6.35	-7.96	-2.61	7.32	Complies
6	2437 MHz	-3.42	-0.86	-0.93	3.19	7.32	Complies
11	2462 MHz	-9.13	-7.34	-8.39	-3.45	7.32	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.68dBi>6dBi, so limit=8 – (6.68 – 6)=7.32dBm/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 3	Total		
3	2422 MHz	-12.74	-11.81	-12.69	-7.62	7.32	Complies
6	2437 MHz	-9.91	-8.42	-9.77	-4.54	7.32	Complies
9	2452 MHz	-10.96	-11.01	-11.06	-6.24	7.32	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.68dBi>6dBi, so limit=8 – (6.68 – 6)=7.32dBm/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 3	Total		
149	5745 MHz	-1.36	-2.06	-2.11	2.94	5.29	Complies
157	5785 MHz	-1.68	-1.31	-1.29	3.35	5.29	Complies
165	5825 MHz	-1.79	-1.14	-0.45	3.68	5.29	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/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 3	Total		
151	5755 MHz	-4.45	-4.48	-4.73	0.22	5.29	Complies
159	5795 MHz	-4.35	-4.44	-4.49	0.34	5.29	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/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 3	Total		
155	5775 MHz	-8.18	-9.12	-7.32	-3.37	5.29	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/3kHz.

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g
Test Function	Non-beamforming function		

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	-5.89	-3.80	-5.19	-0.10	7.32	Complies
6	2437 MHz	-1.44	-0.53	-1.76	3.56	7.32	Complies
11	2462 MHz	-2.06	-2.50	-2.25	2.50	7.32	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left\{ \sum_{k=1}^{N_{ANT}} g_{jk} \right\}^2}{N_{ANT}} \right]$ =6.68dBi>6dBi, so limit=8 – (6.68 – 6)=7.32dBm/3kHz.

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	-6.27	-5.29	-6.90	-1.33	7.32	Complies
6	2437 MHz	-2.72	-1.52	-2.30	2.62	7.32	Complies
11	2462 MHz	-6.92	-5.96	-7.53	-1.98	7.32	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left\{ \sum_{k=1}^{N_{ANT}} g_{jk} \right\}^2}{N_{ANT}} \right]$ =6.68dBi>6dBi, so limit=8 – (6.68 – 6)=7.32dBm/3kHz.

Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Total		
149	5745 MHz	-0.73	-1.65	-0.60	3.80	5.29	Complies
157	5785 MHz	-1.23	-1.08	-0.46	3.86	5.29	Complies
165	5825 MHz	-0.21	-0.91	-1.53	3.92	5.29	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left\{ \sum_{k=1}^{N_{ANT}} g_{jk} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/3kHz.

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

For 2.4GHz 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 3	Total		
1	2412 MHz	-9.85	-7.82	-8.35	-3.82	7.32	Complies
6	2437 MHz	-4.83	-4.45	-4.35	0.23	7.32	Complies
11	2462 MHz	-8.95	-7.93	-8.22	-3.57	7.32	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.68dBi>6dBi, so limit=8 – (6.68 – 6)=7.32dBm/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 3	Total		
3	2422 MHz	-14.69	-12.15	-13.84	-8.66	7.32	Complies
6	2437 MHz	-12.48	-10.22	-9.24	-5.68	7.32	Complies
9	2452 MHz	-12.62	-12.14	-12.63	-7.69	7.32	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.68dBi>6dBi, so limit=8 – (6.68 – 6)=7.32dBm/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 3	Total		
149	5745 MHz	-4.30	-4.29	-4.26	0.49	5.29	Complies
157	5785 MHz	-3.76	-4.73	-4.08	0.60	5.29	Complies
165	5825 MHz	-3.12	-3.06	-4.42	1.28	5.29	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/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 3	Total		
151	5755 MHz	-5.57	-7.26	-7.39	-1.89	5.29	Complies
159	5795 MHz	-6.98	-6.63	-6.58	-1.96	5.29	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/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 3	Total		
155	5775 MHz	-9.51	-10.04	-9.97	-5.06	5.29	Complies

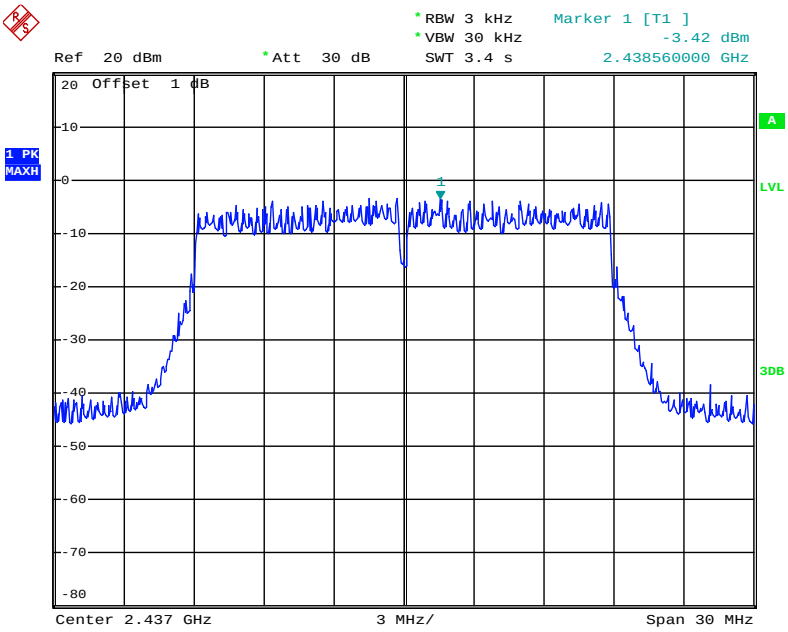
Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.71dBi>6dBi, so limit=8 – (8.71 – 6)=5.29dBm/3kHz.

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

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

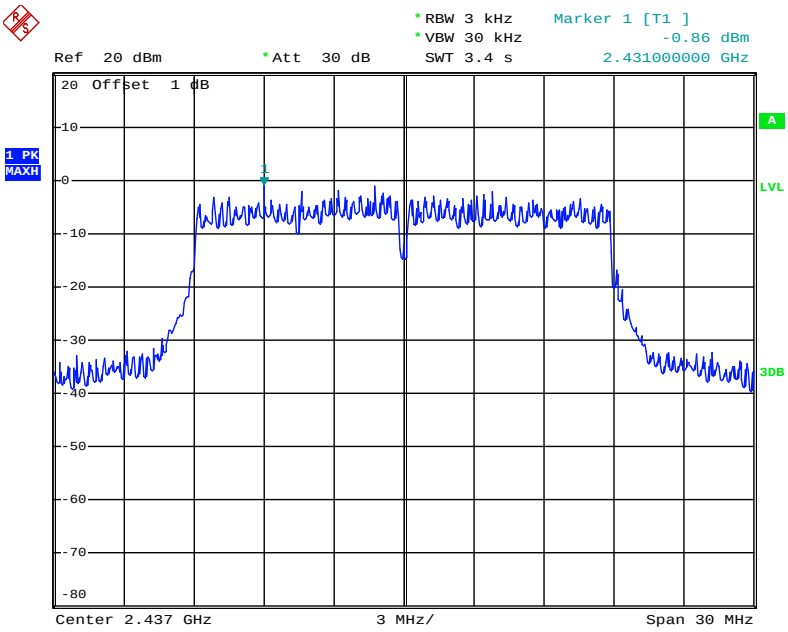
For non-beamforming function:

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1



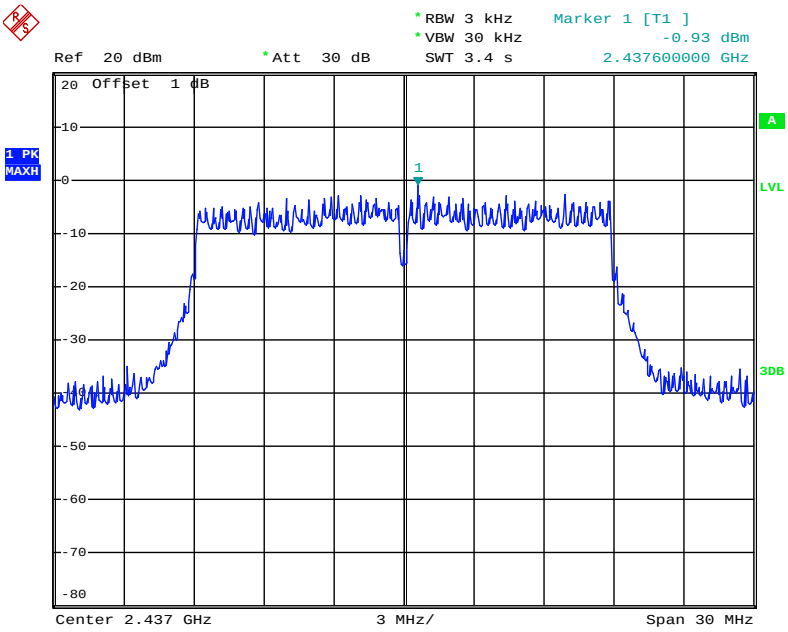
Date: 24.JUL.2014 17:35:58

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 2



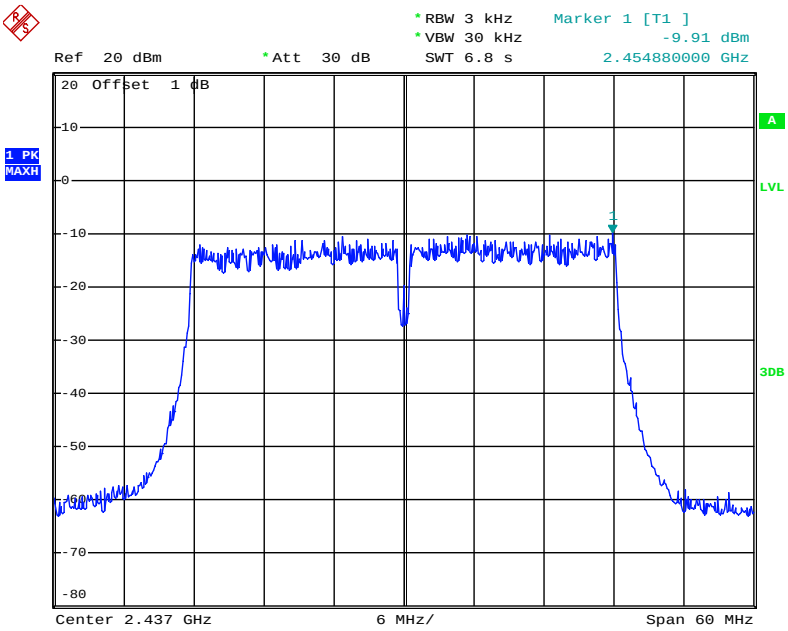
Date: 24.JUL.2014 17:35:07

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



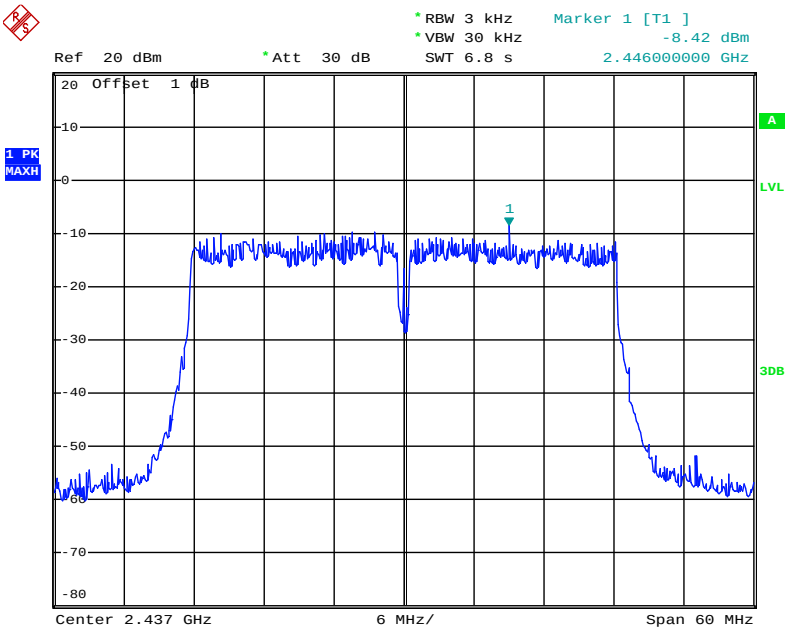
Date: 24.JUL.2014 17:34:14

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1



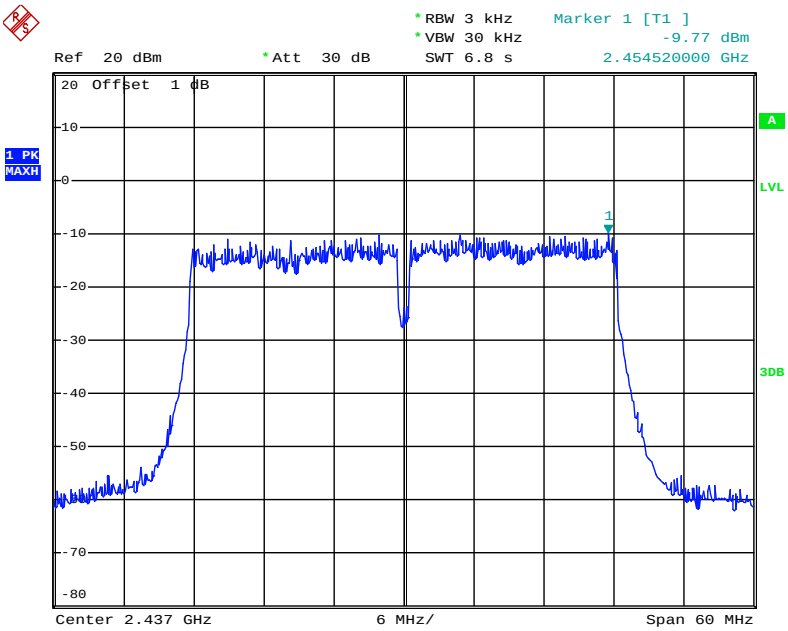
Date: 24.JUL.2014 17:42:01

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 2



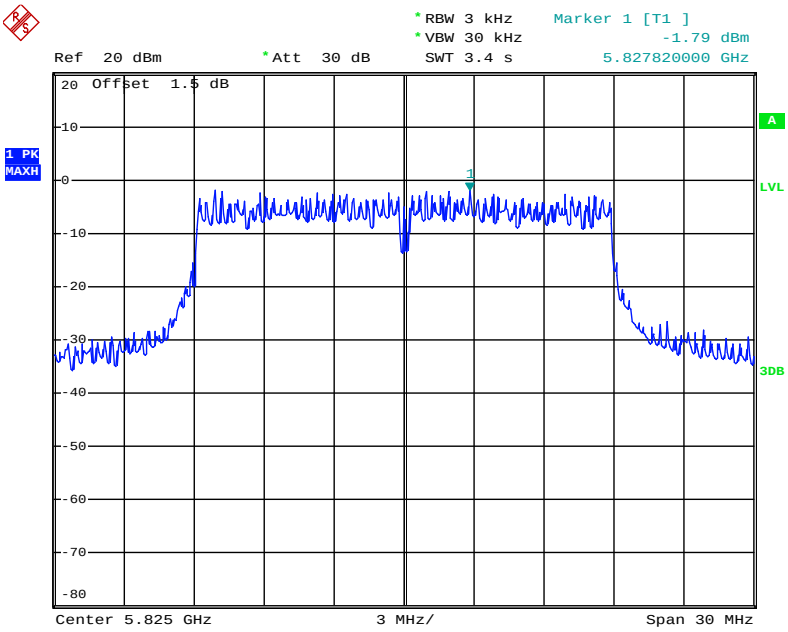
Date: 24.JUL.2014 17:42:48

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



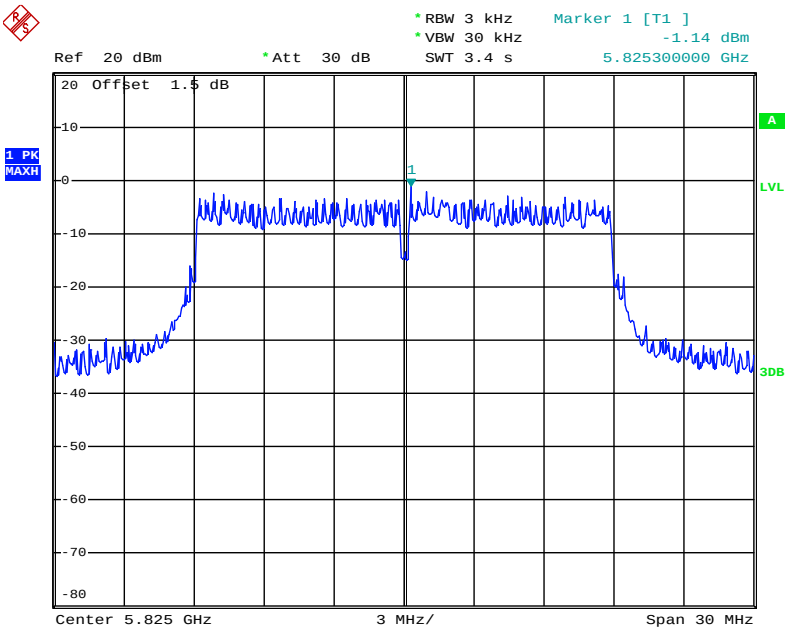
Date: 24.JUL.2014 17:43:47

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



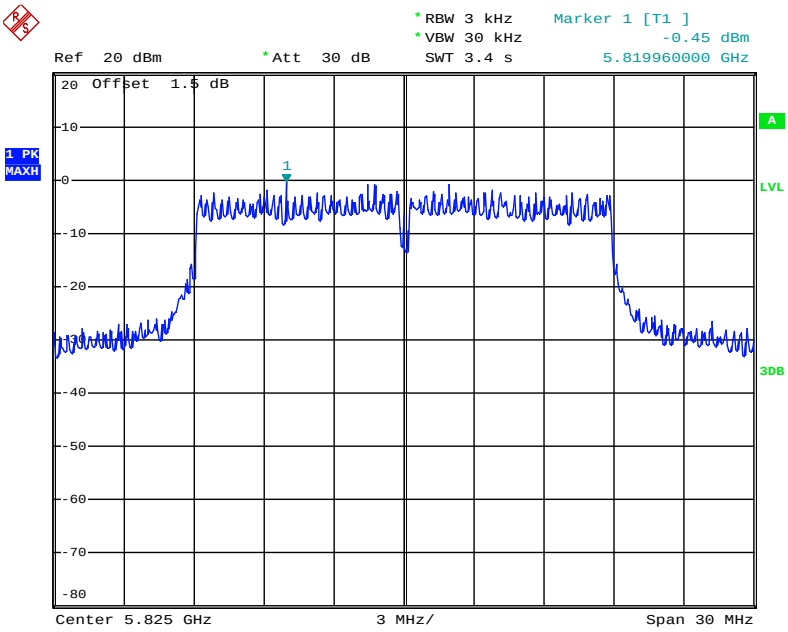
Date: 24.JUL.2014 19:34:21

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



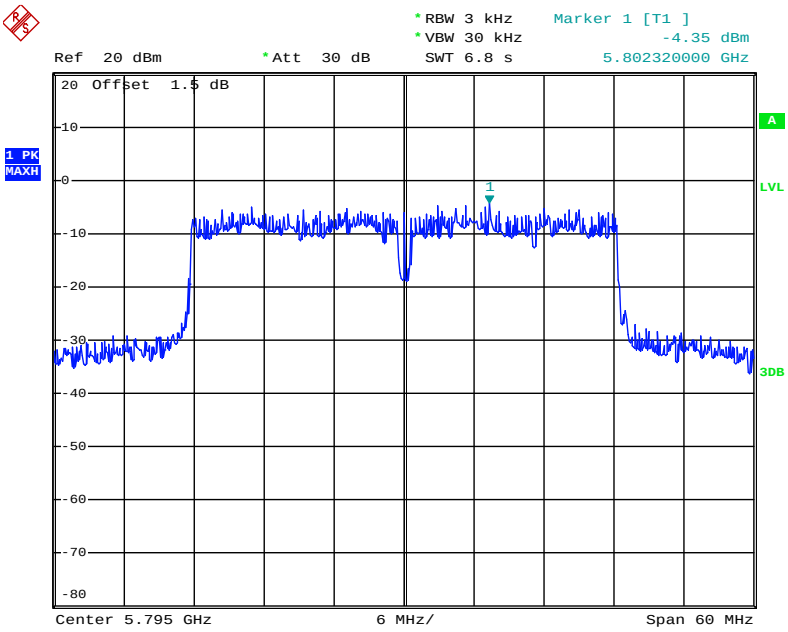
Date: 24.JUL.2014 19:33:36

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 3



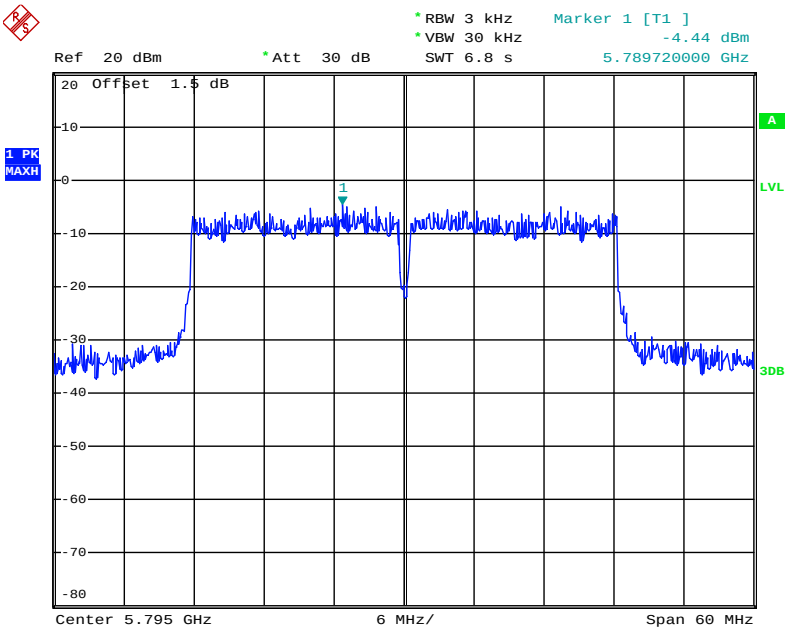
Date: 24.JUL.2014 19:32:52

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



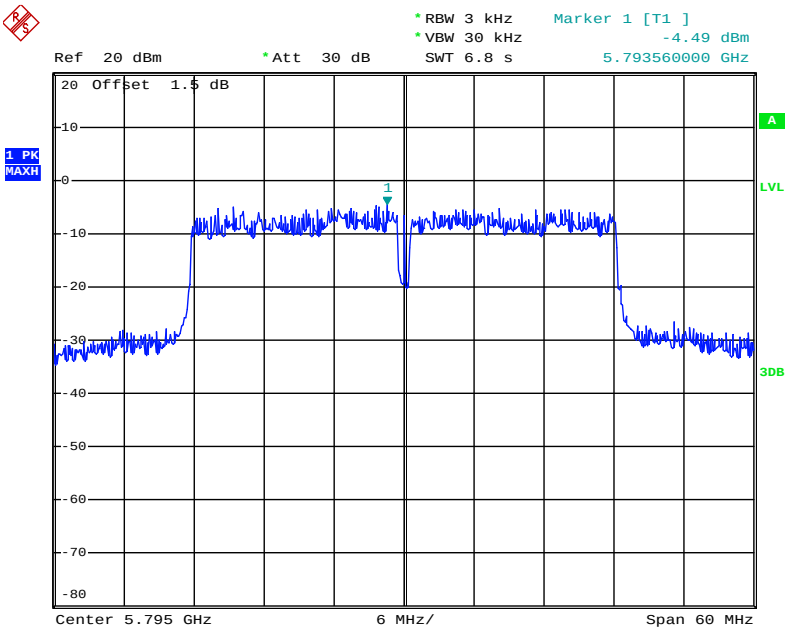
Date: 24.JUL.2014 19:45:01

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



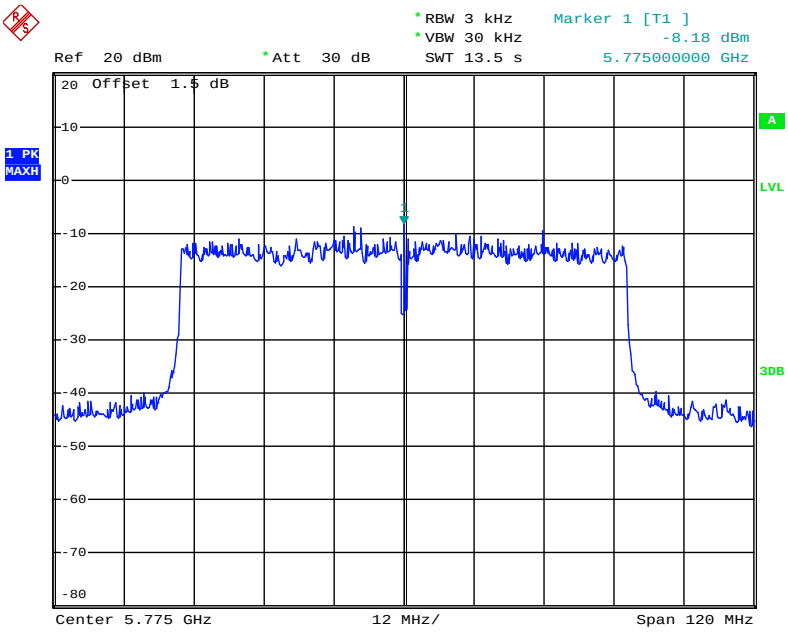
Date: 24.JUL.2014 19:44:17

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 3



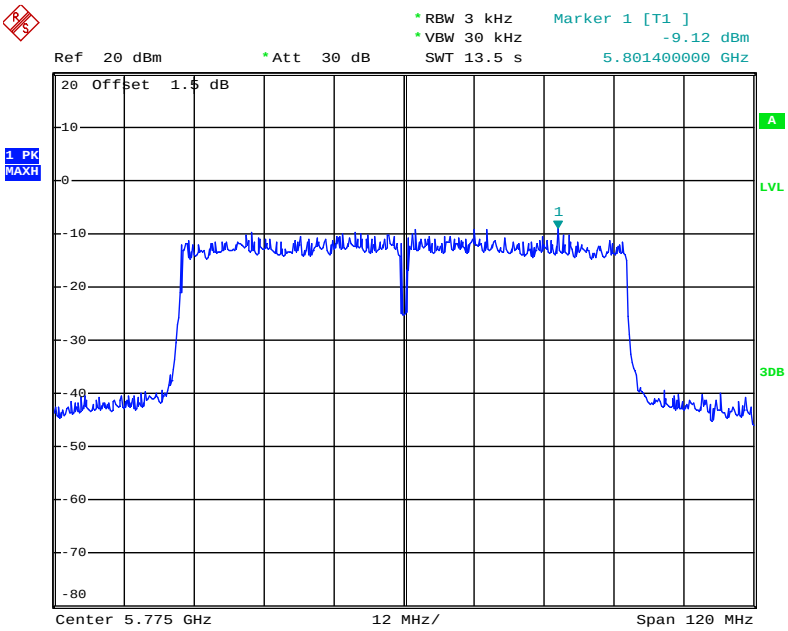
Date: 24.JUL.2014 19:43:28

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



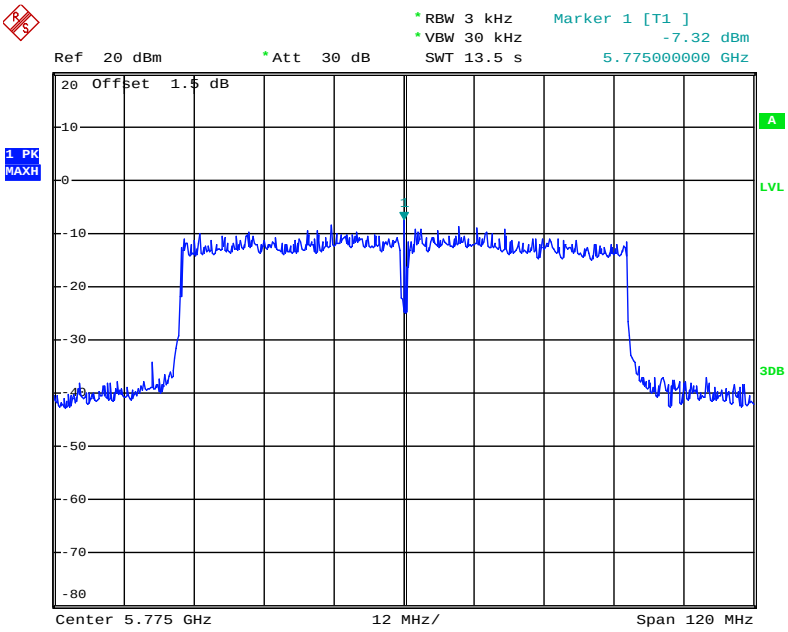
Date: 24.JUL.2014 19:46:07

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



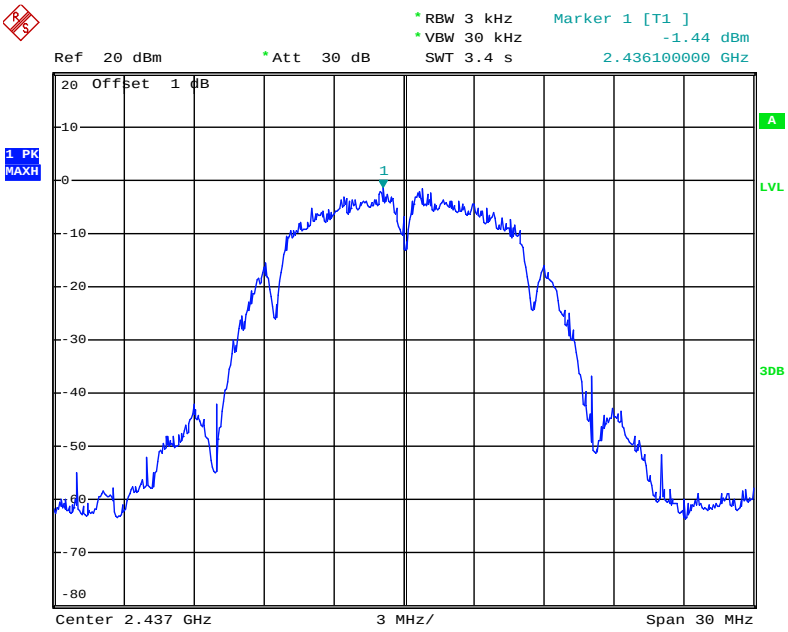
Date: 24.JUL.2014 19:47:20

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 3



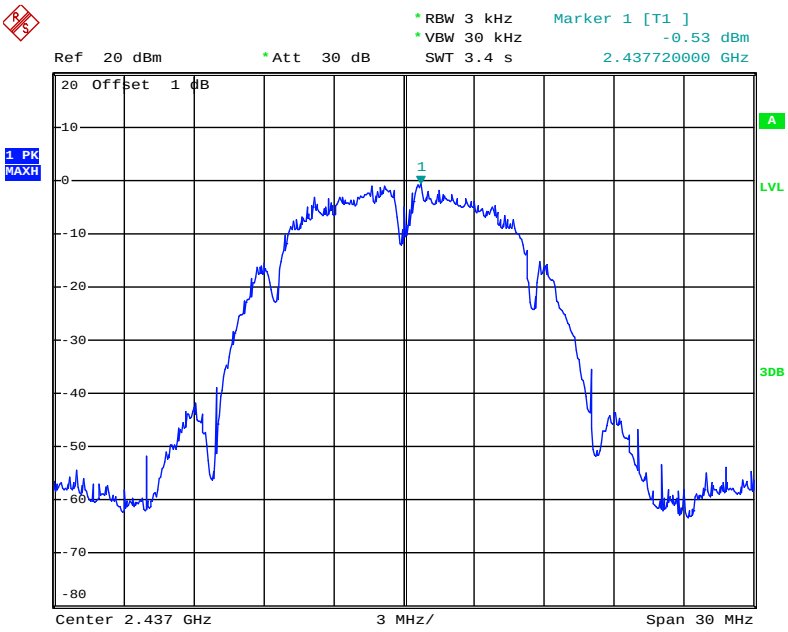
Date: 24.JUL.2014 19:48:17

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



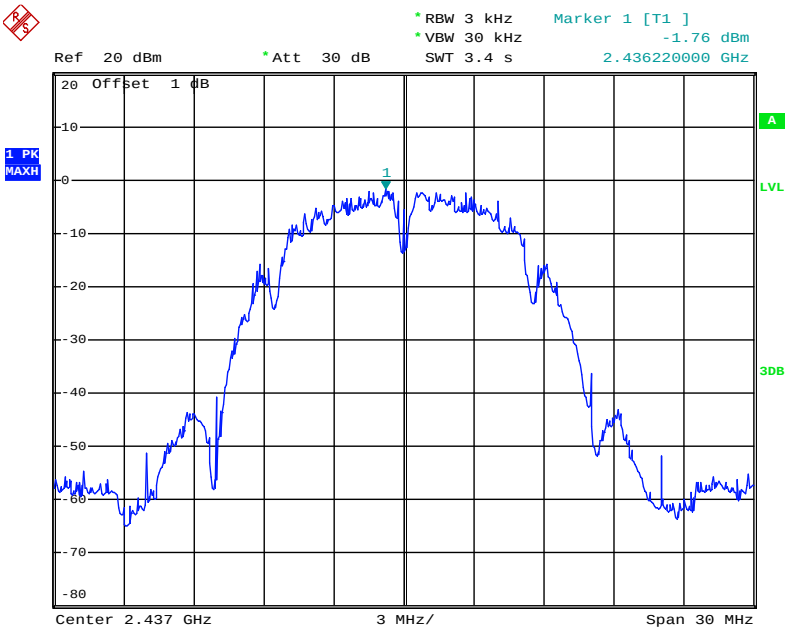
Date: 24.JUL.2014 11:56:34

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



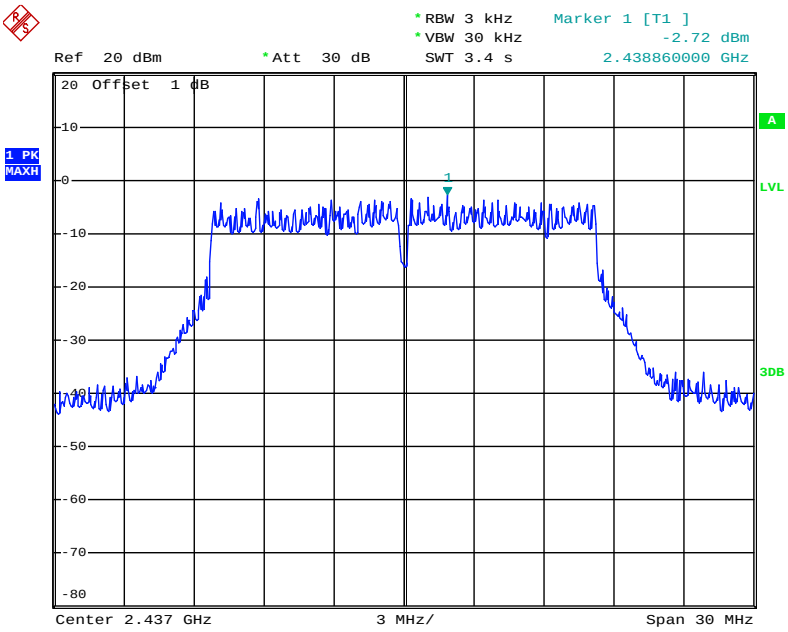
Date: 24.JUL.2014 11:57:42

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



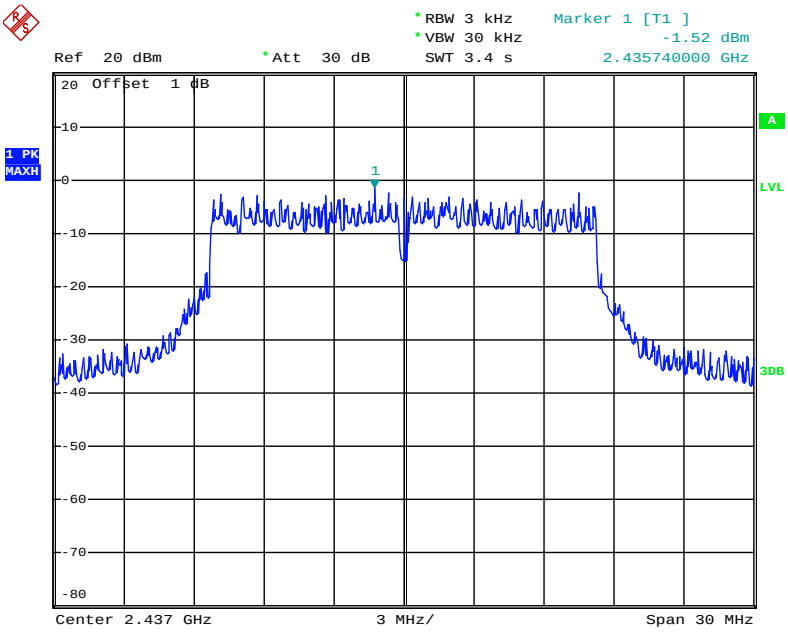
Date: 24.JUL.2014 11:58:30

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



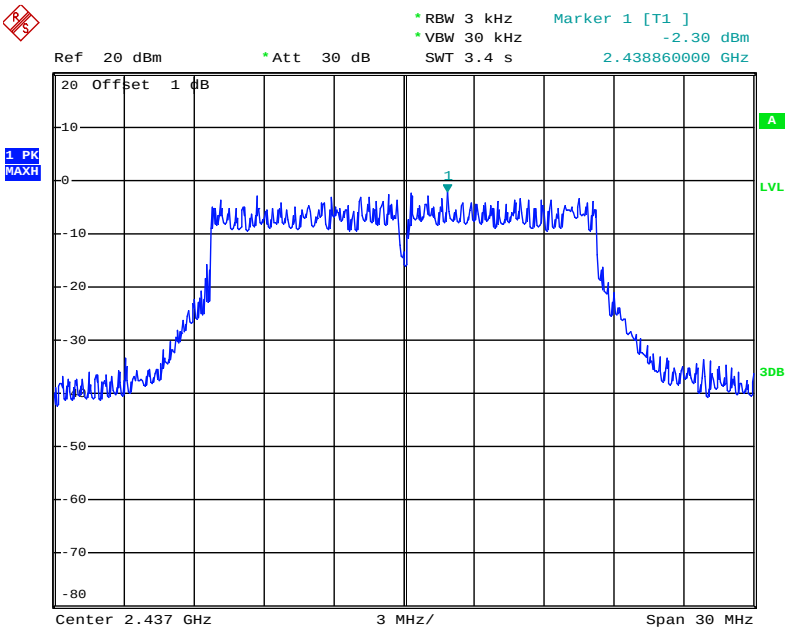
Date: 24.JUL.2014 12:05:24

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



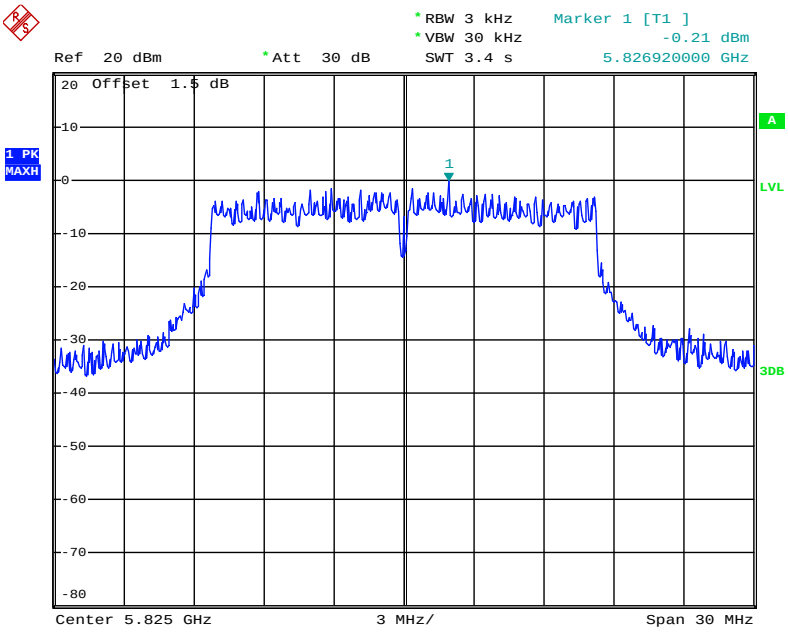
Date: 24.JUL.2014 12:04:48

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



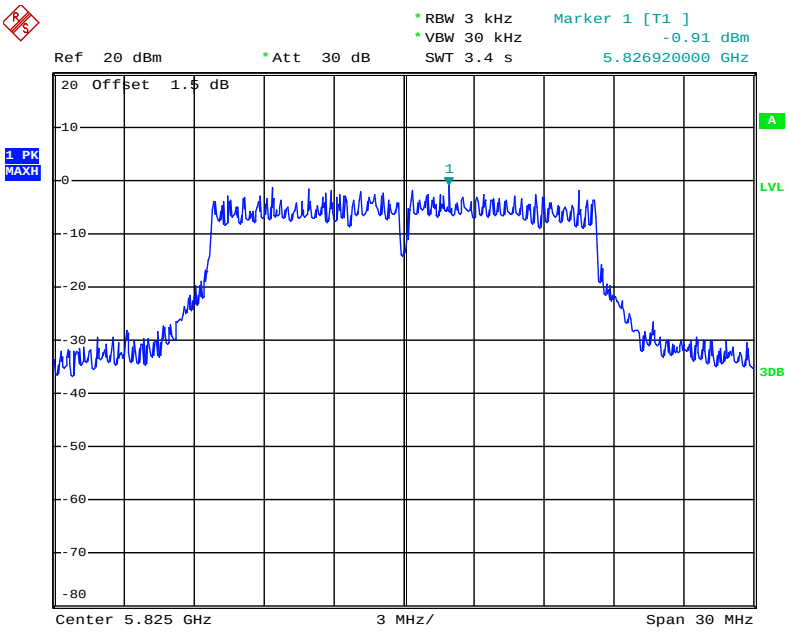
Date: 24.JUL.2014 12:04:15

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 1



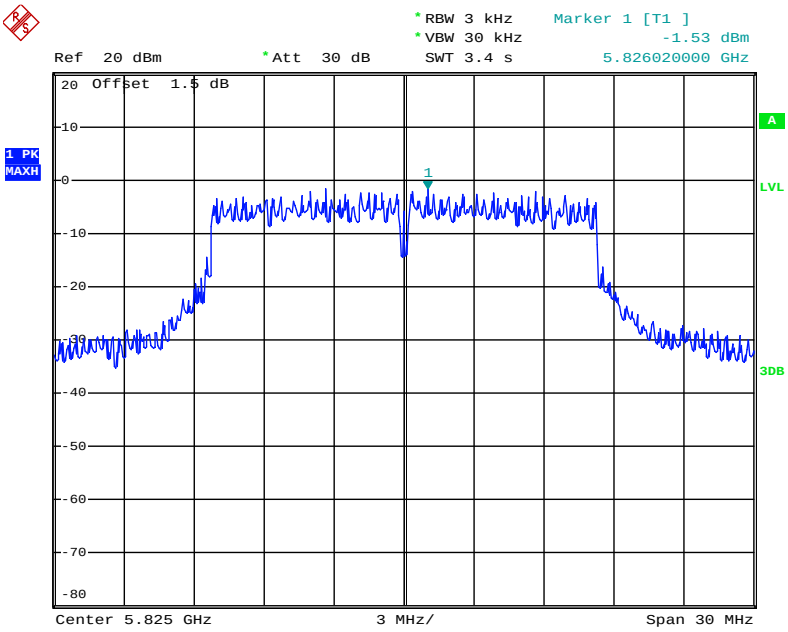
Date: 24.JUL.2014 19:30:33

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 2



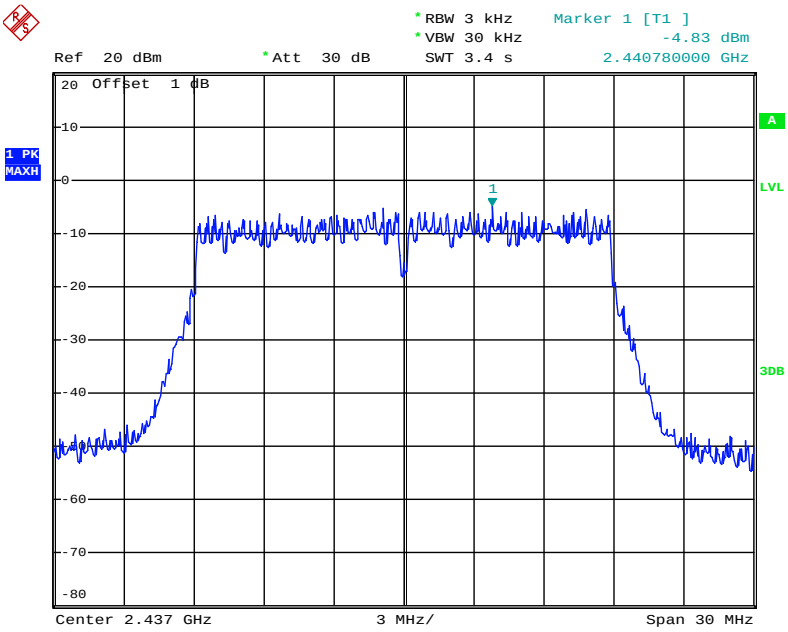
Date: 24.JUL.2014 19:31:20

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 3



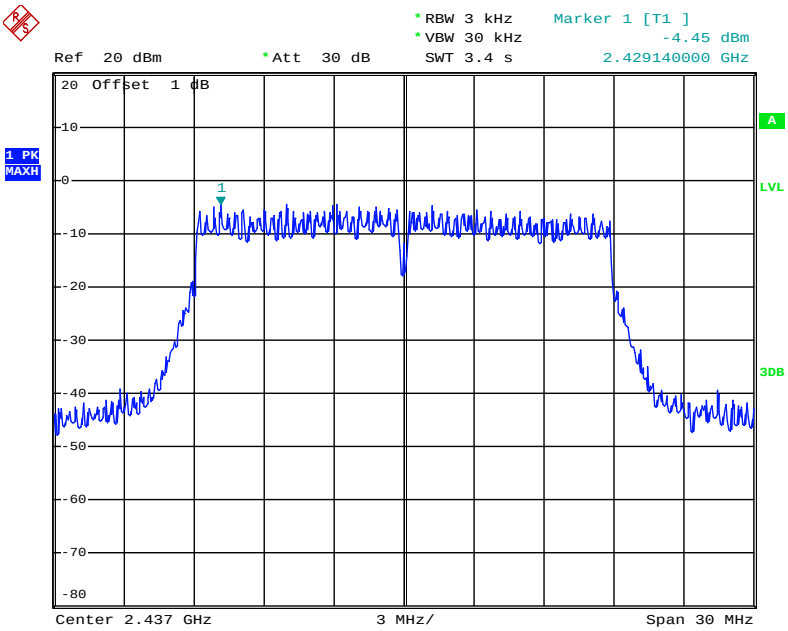
For beamforming function:

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1



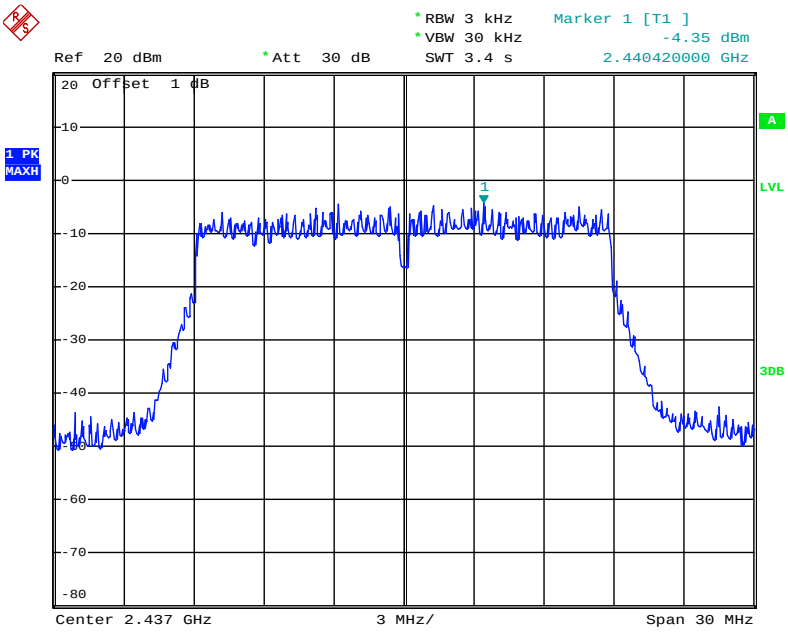
Date: 24.JUL.2014 17:57:51

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 2



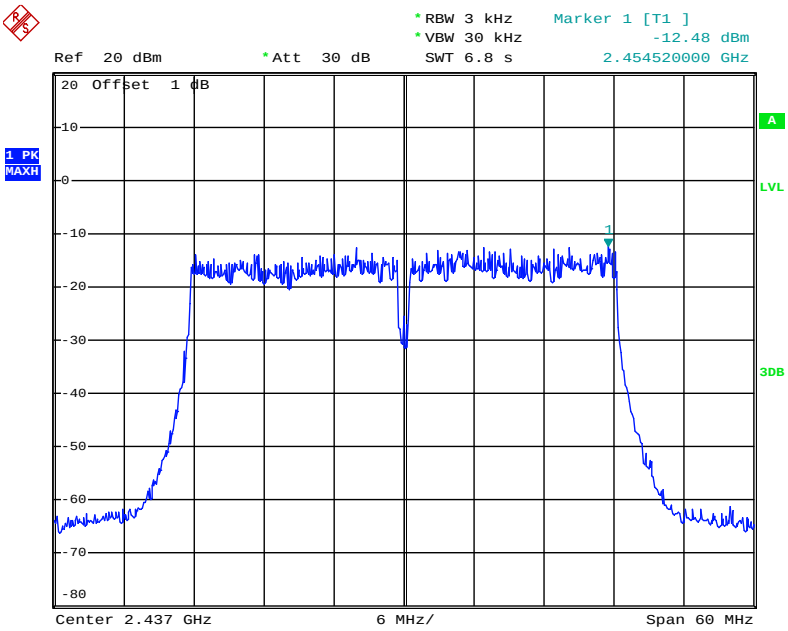
Date: 24.JUL.2014 17:58:36

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



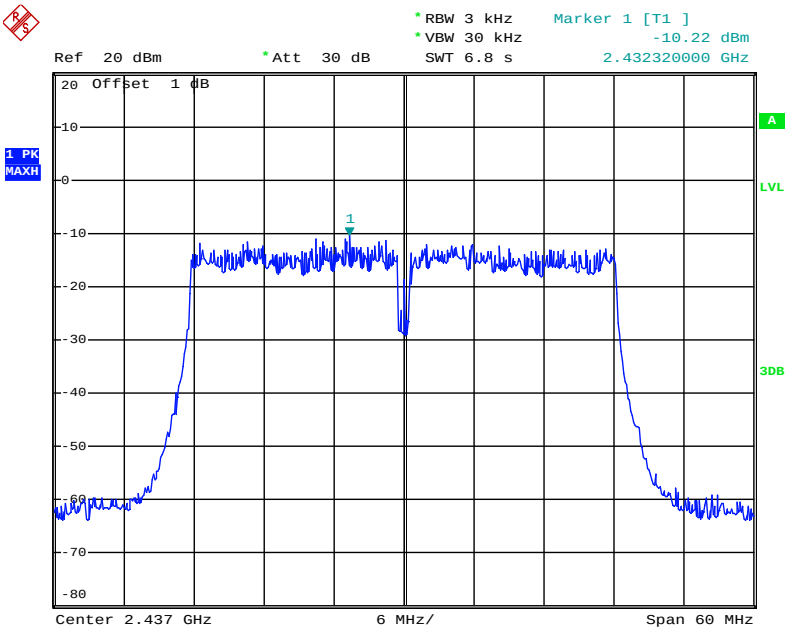
Date: 24.JUL.2014 17:59:25

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1



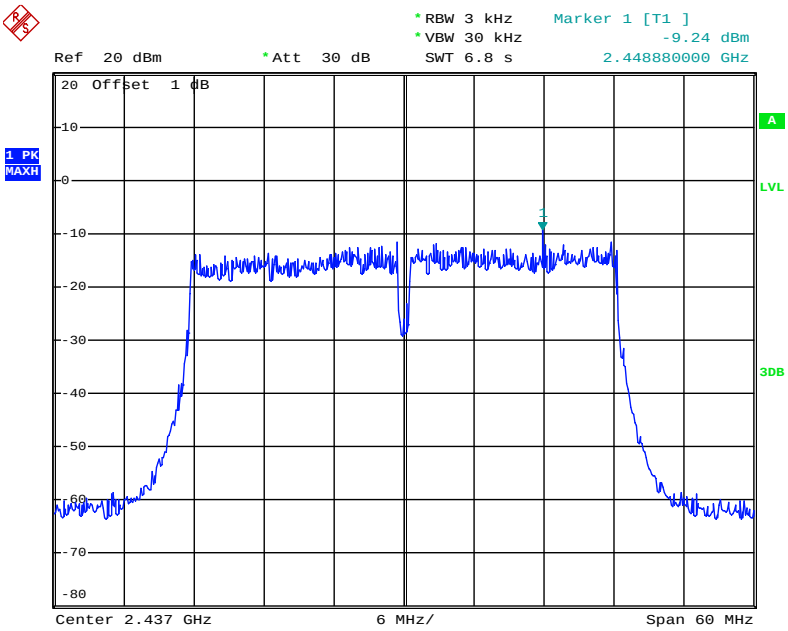
Date: 24.JUL.2014 17:52:45

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 2



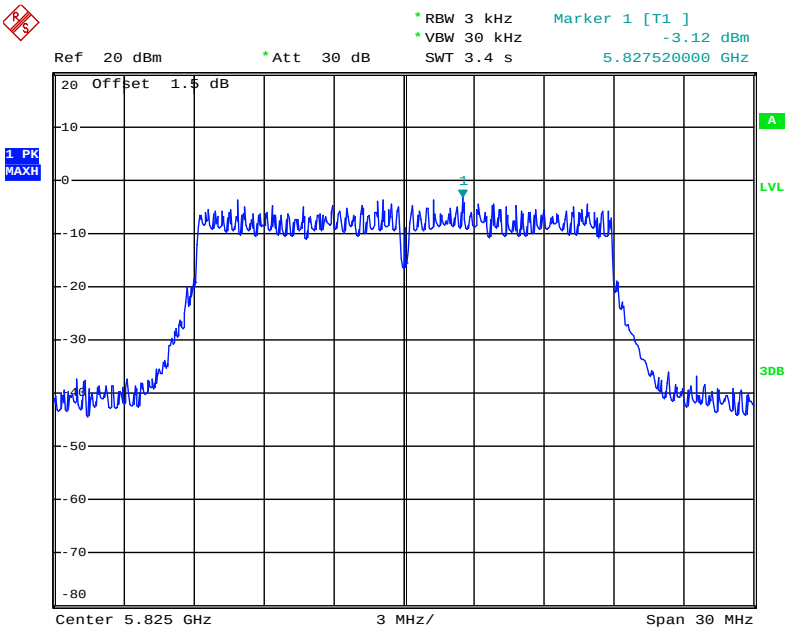
Date: 24.JUL.2014 17:52:01

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



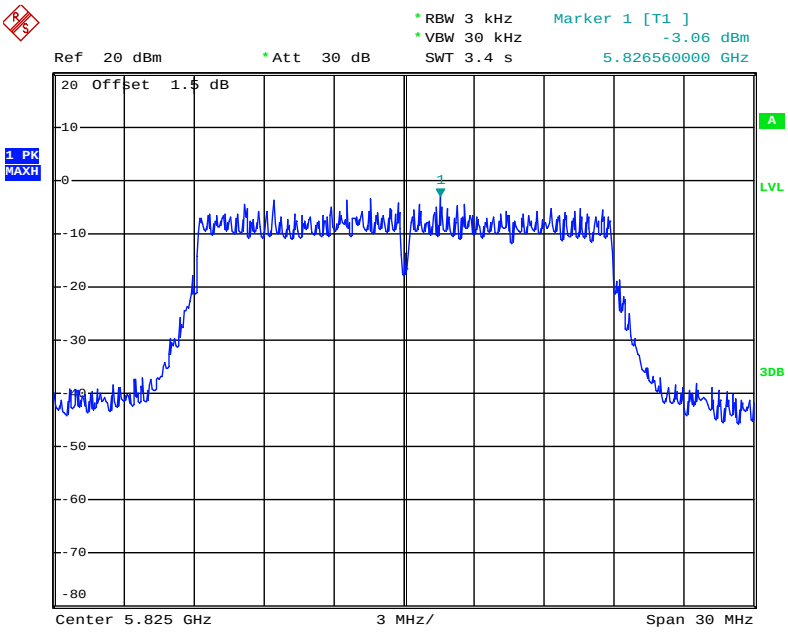
Date: 24.JUL.2014 17:51:20

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



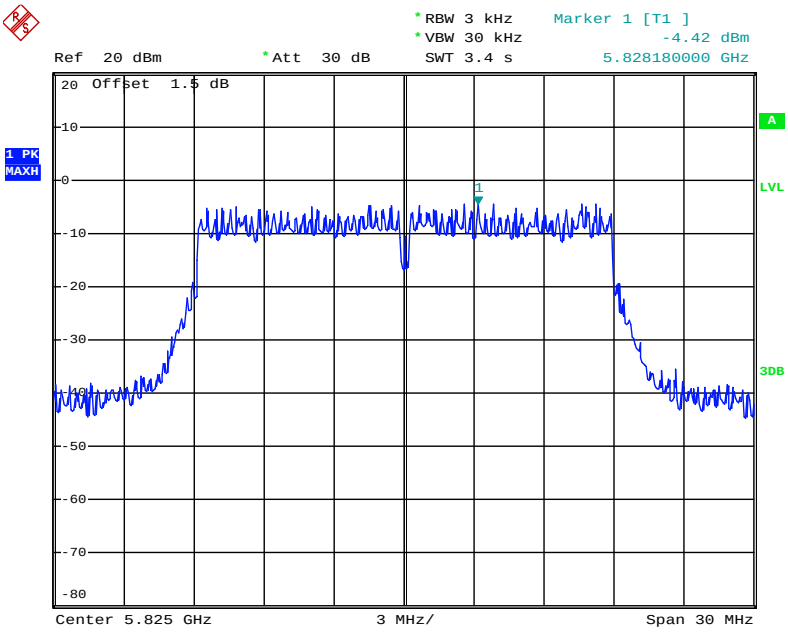
Date: 24.JUL.2014 20:00:45

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



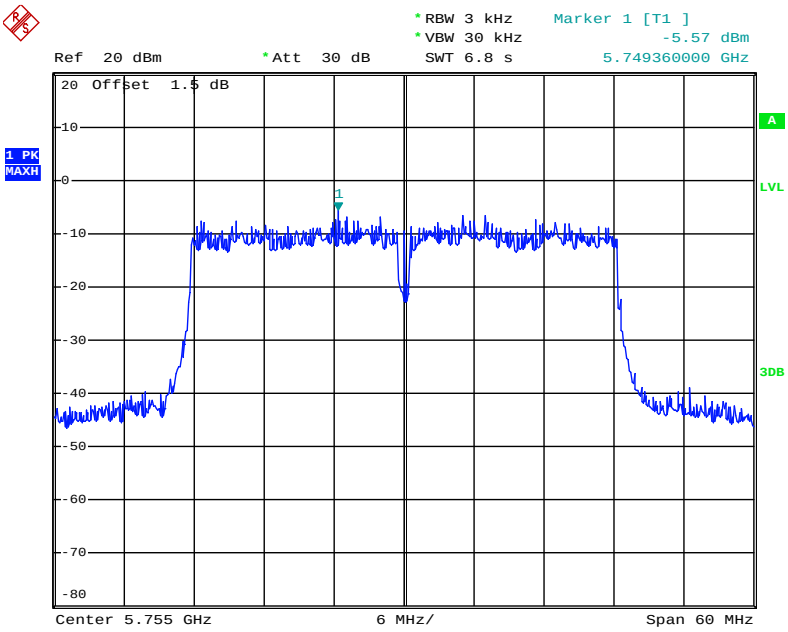
Date: 24.JUL.2014 20:01:22

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 3



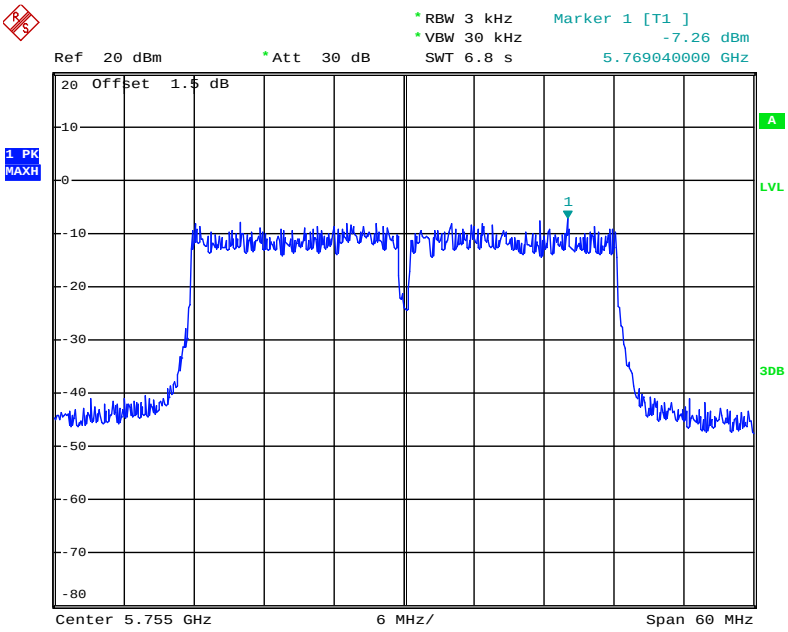
Date: 24.JUL.2014 20:02:08

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



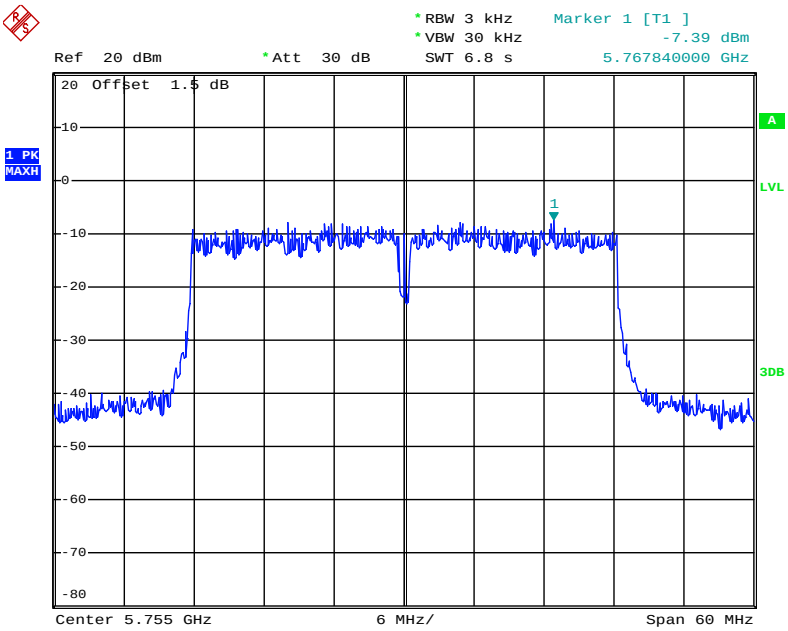
Date: 24.JUL.2014 19:52:25

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



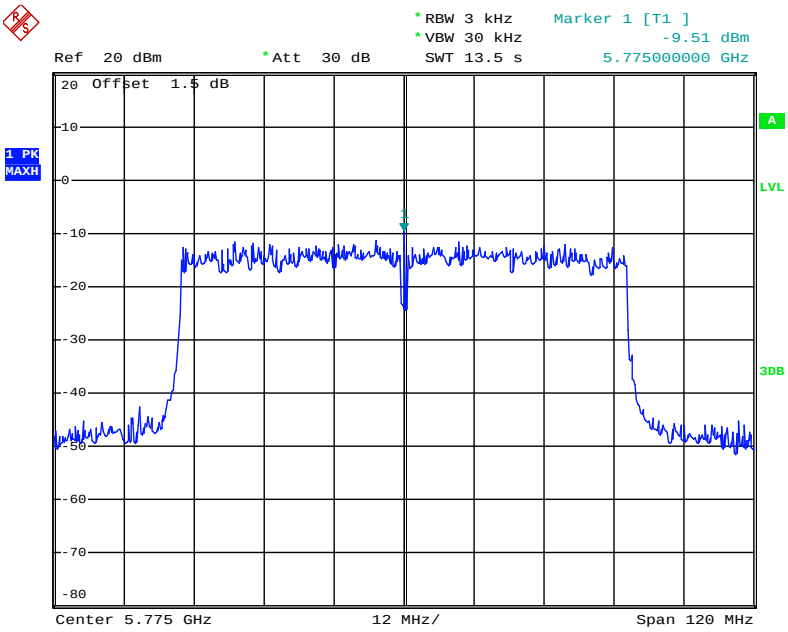
Date: 24.JUL.2014 19:53:00

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 3



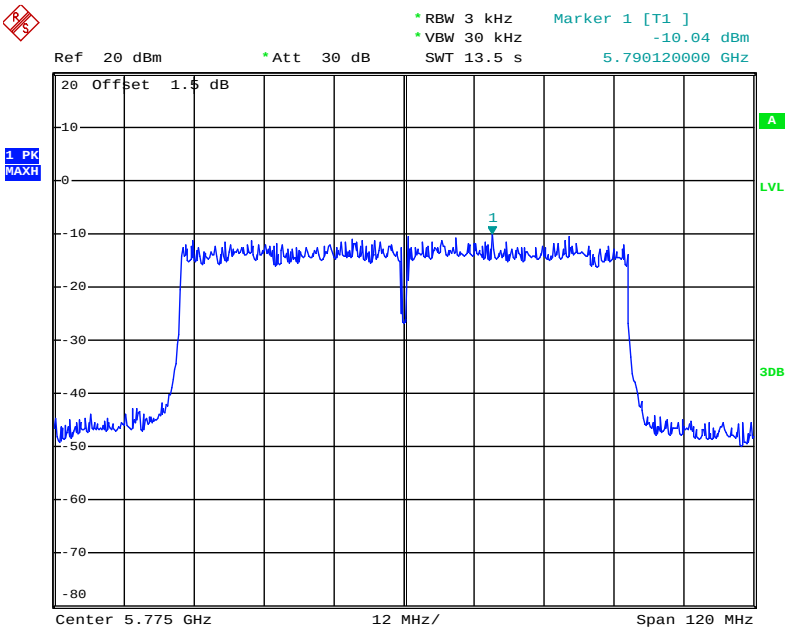
Date: 24.JUL.2014 19:53:38

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



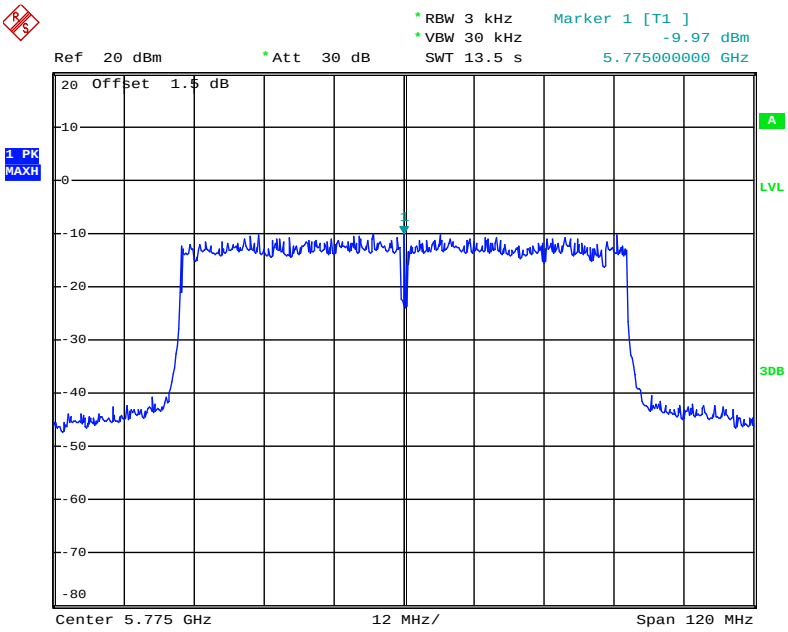
Date: 24.JUL.2014 19:51:36

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



Date: 24.JUL.2014 19:50:56

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 3



Date: 24.JUL.2014 19:49:50

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

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

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

4.4.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.4.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Function	Non-beamforming function		

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.16	17.52	500	Complies
6	2437 MHz	15.44	17.52	500	Complies
11	2462 MHz	16.00	17.52	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.68	36.32	500	Complies
6	2437 MHz	35.20	36.32	500	Complies
9	2452 MHz	35.36	36.32	500	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.16	17.84	500	Complies
157	5785 MHz	16.32	17.84	500	Complies
165	5825 MHz	16.32	17.92	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.16	36.48	500	Complies
159	5795 MHz	35.84	36.48	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3

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

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g
Test Function	Non-beamforming function		

Configuration IEEE 802.11b / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.08	13.12	500	Complies
6	2437 MHz	11.04	13.20	500	Complies
11	2462 MHz	10.16	13.12	500	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	10.72	16.16	500	Complies
6	2437 MHz	10.72	16.40	500	Complies
11	2462 MHz	10.72	16.48	500	Complies

Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	12.56	16.64	500	Complies
157	5785 MHz	15.44	16.72	500	Complies
165	5825 MHz	13.12	16.64	500	Complies

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

For 2.4GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.08	17.68	500	Complies
6	2437 MHz	15.04	17.68	500	Complies
11	2462 MHz	16.64	17.68	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	34.88	36.32	500	Complies
6	2437 MHz	35.20	36.32	500	Complies
9	2452 MHz	35.20	36.32	500	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.60	17.68	500	Complies
157	5785 MHz	17.68	17.68	500	Complies
165	5825 MHz	17.52	17.68	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.32	36.32	500	Complies
159	5795 MHz	36.16	36.32	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3

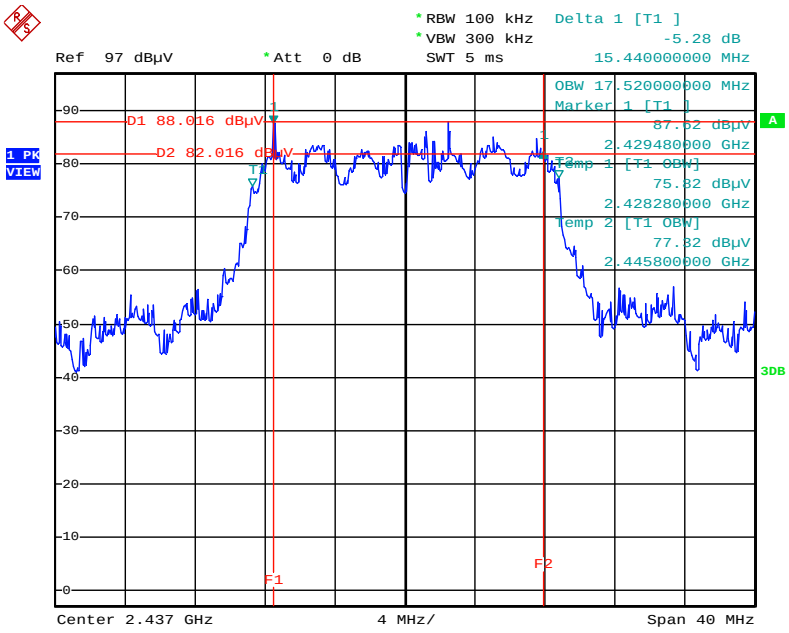
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	75.20	75.52	500	Complies

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

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

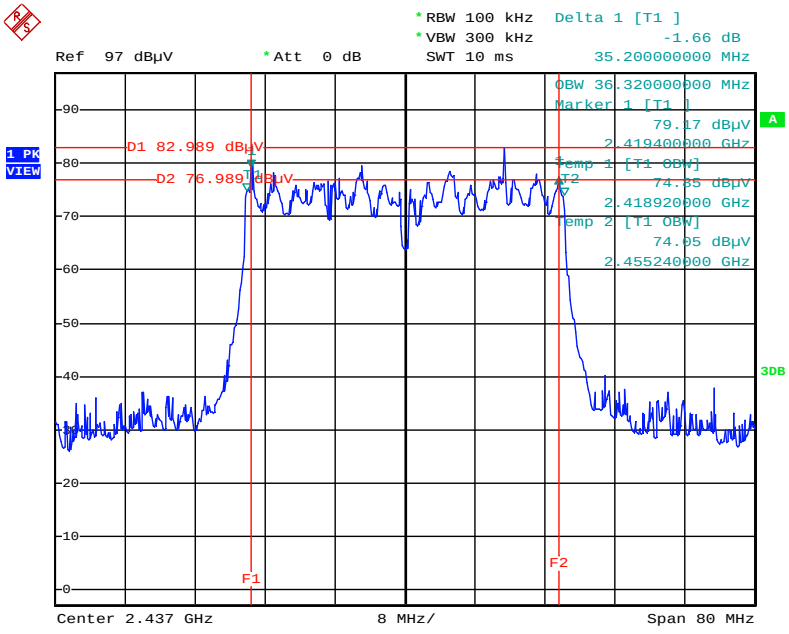
For non-beamforming function:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3



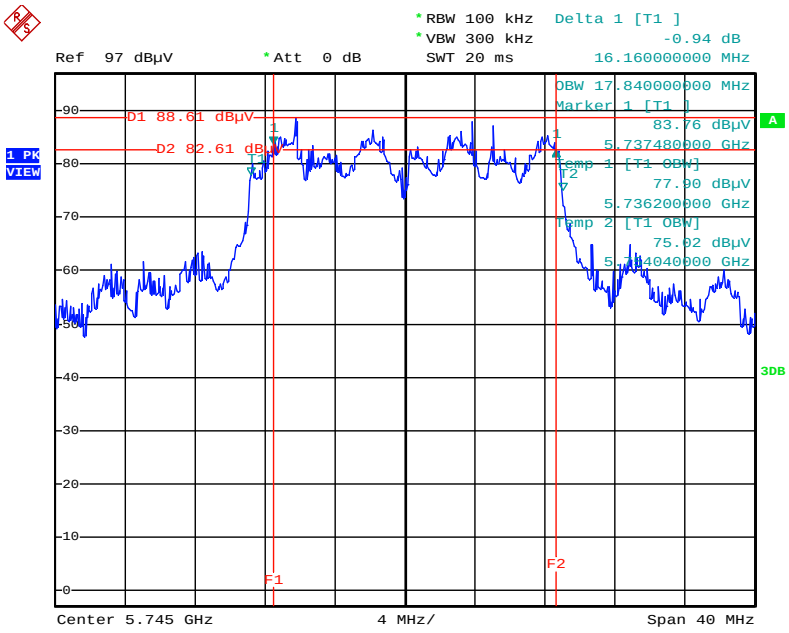
Date: 24.JUL.2014 18:24:44

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1 + Chain 2 + Chain 3



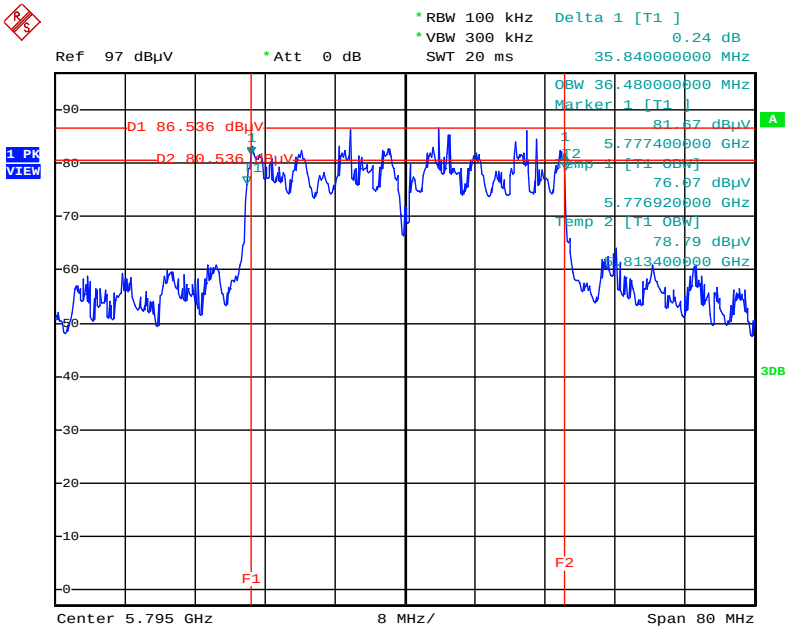
Date: 24.JUL.2014 18:26:15

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 1 + Chain 2 + Chain 3



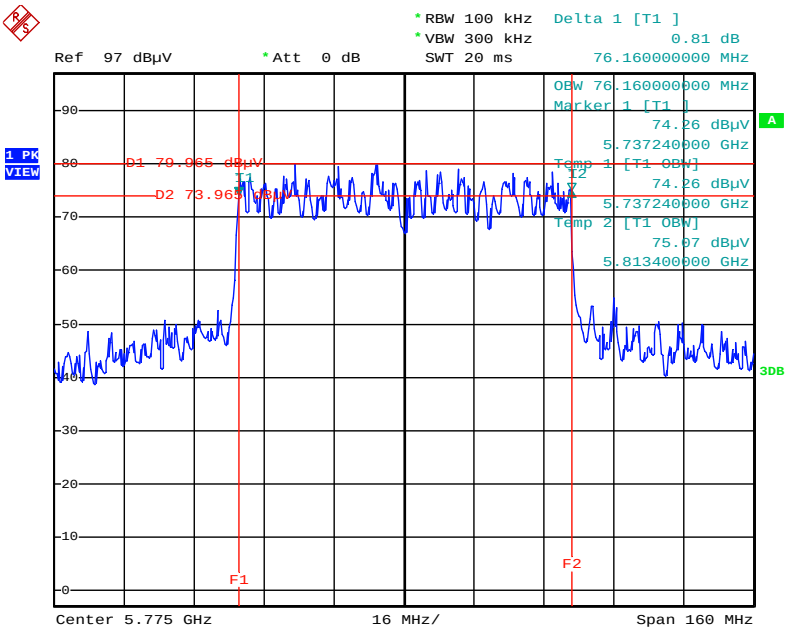
Date: 24.JUL.2014 20:10:36

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 1 + Chain 2 + Chain 3



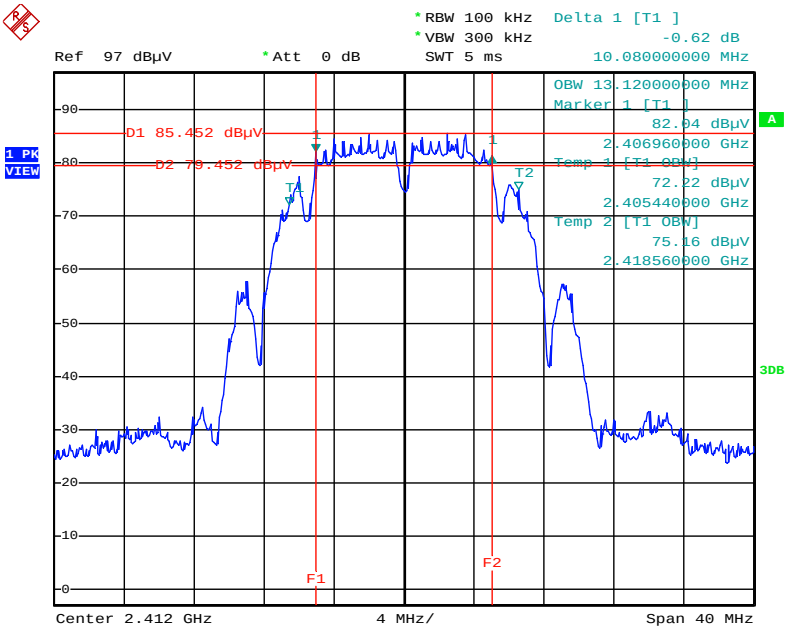
Date: 24.JUL.2014 20:10:01

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2 + Chain 3



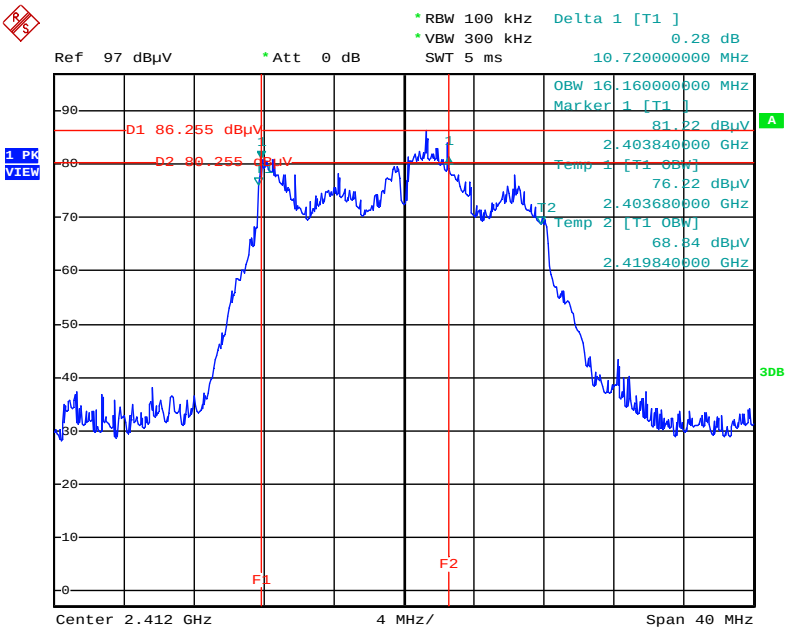
Date: 24.JUL.2014 20:08:57

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 1 + Chain 2 + Chain 3



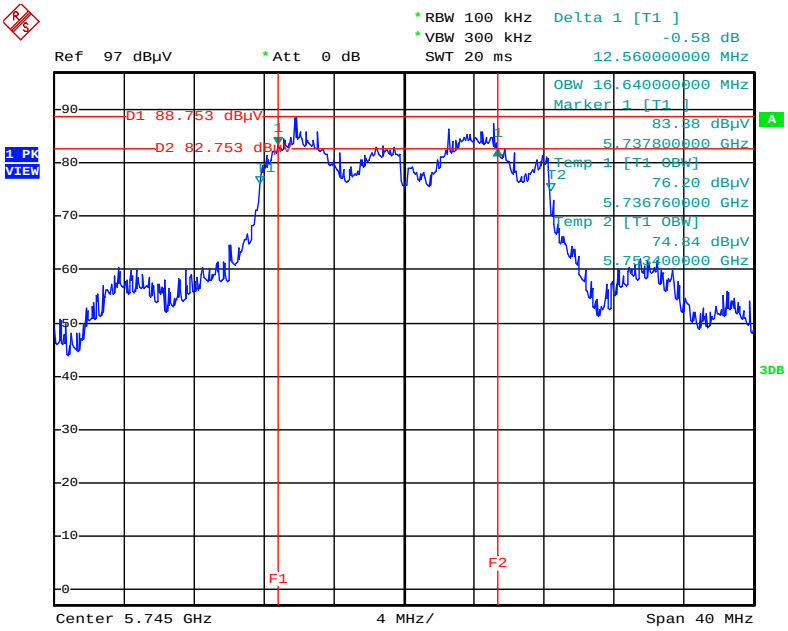
Date: 24.JUL.2014 18:20:39

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1 + Chain 2 + Chain 3



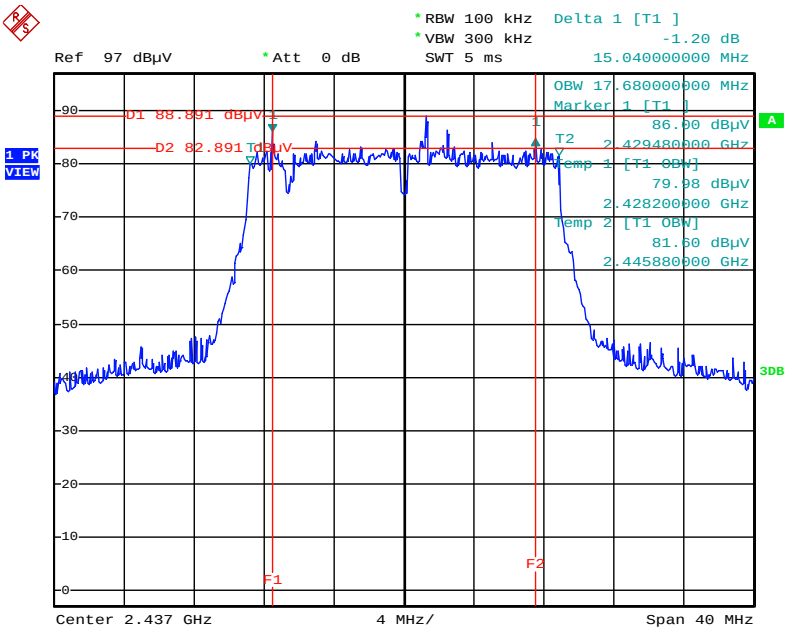
Date: 24.JUL.2014 18:23:42

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 1 + Chain 2 + Chain 3



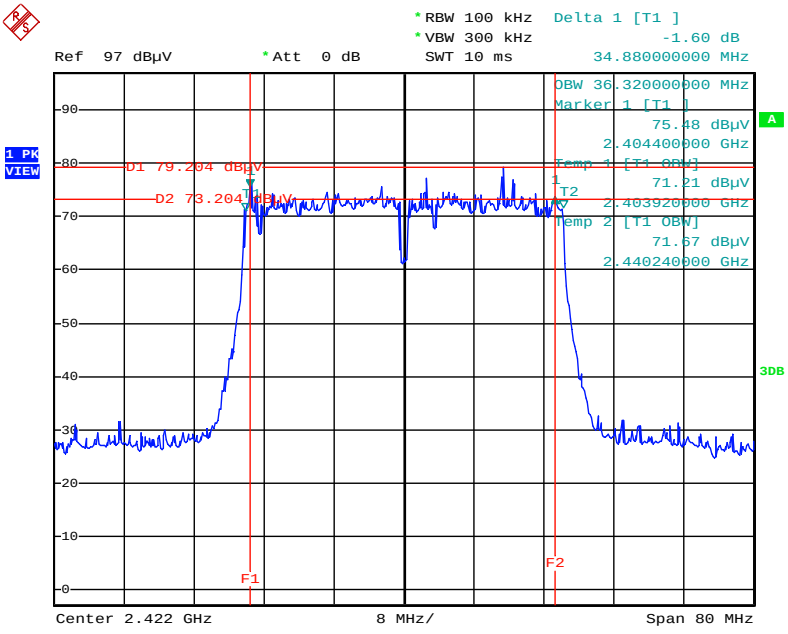
For beamforming function:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3



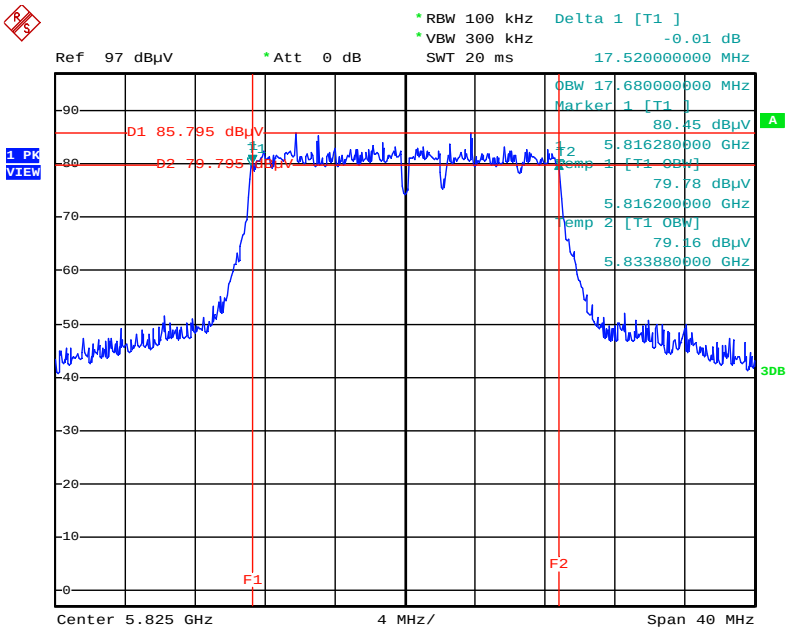
Date: 24.JUL.2014 18:29:35

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2 + Chain 3



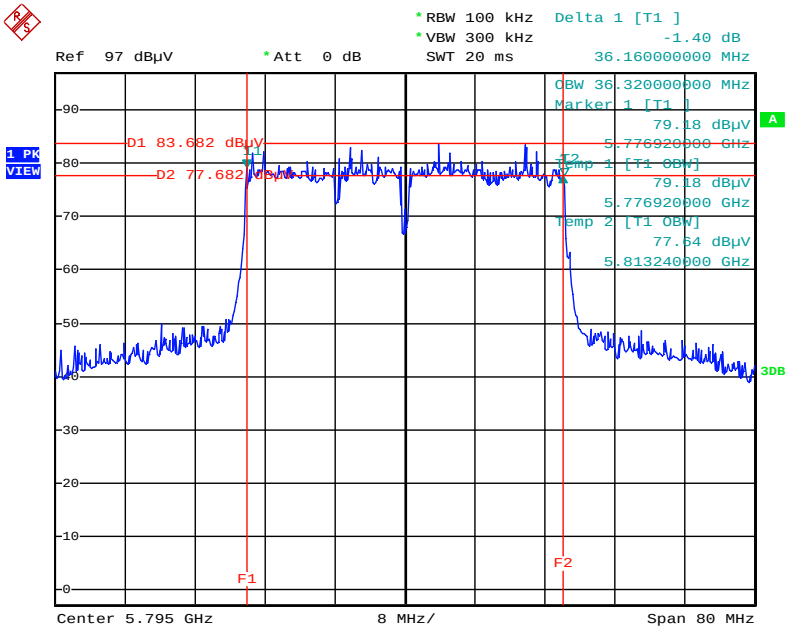
Date: 24.JUL.2014 18:28:28

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 1 + Chain 2 + Chain 3



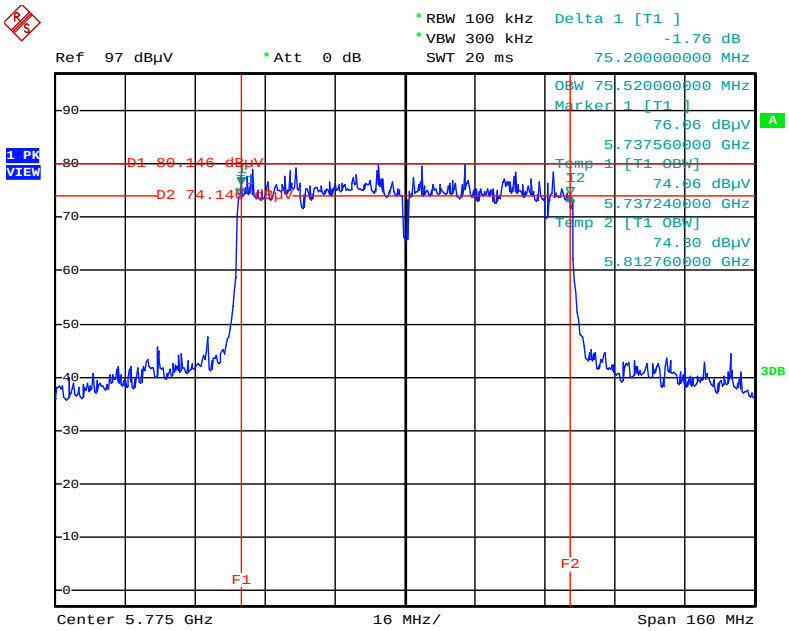
Date: 24.JUL.2014 20:05:37

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 1 + Chain 2 + Chain 3



Date: 24.JUL.2014 20:07:27

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 1 + Chain 2 + Chain 3



Date: 24.JUL.2014 20:08:13

4.5. Radiated Emissions Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, Please refer to section 3.11 for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

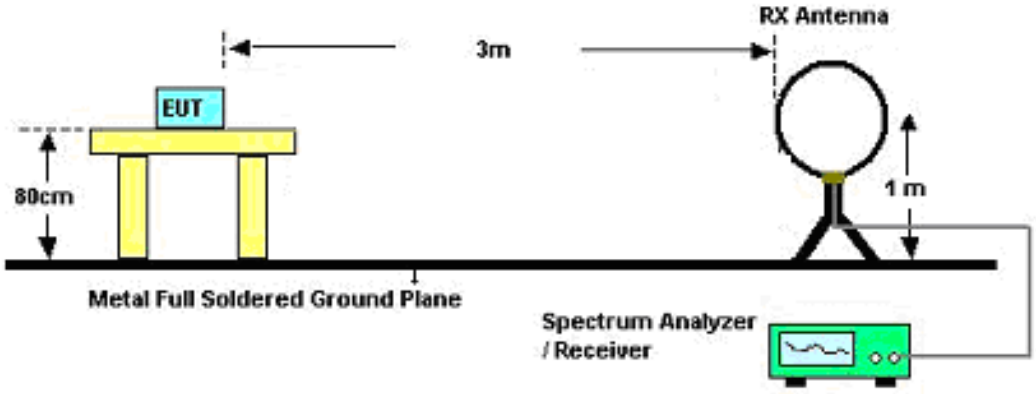
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

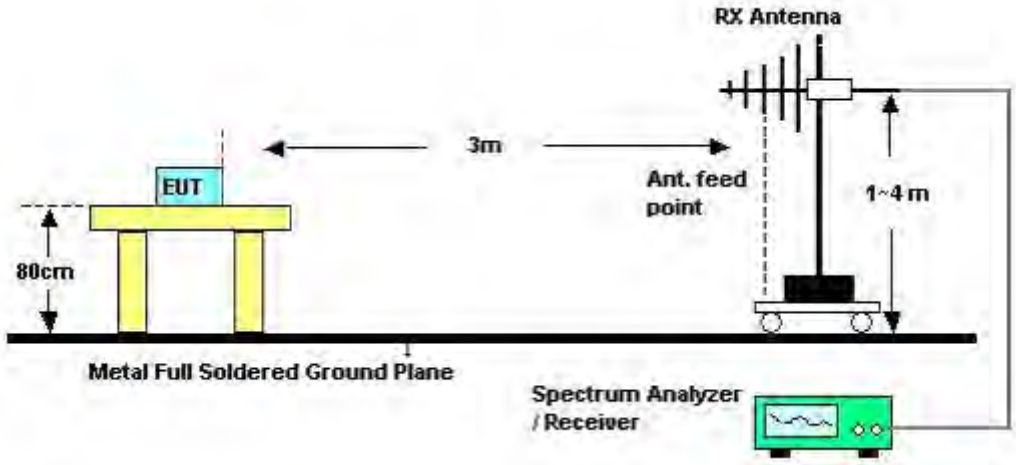
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.5.4. Test Setup Layout

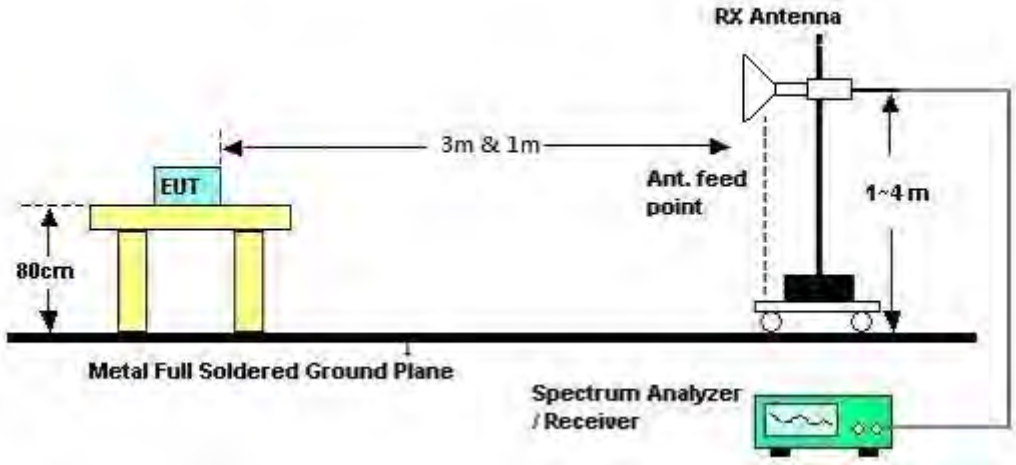
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	CTX
Test Date	Jul. 25, 2014	Test Mode	Mode 2

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

Note:

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

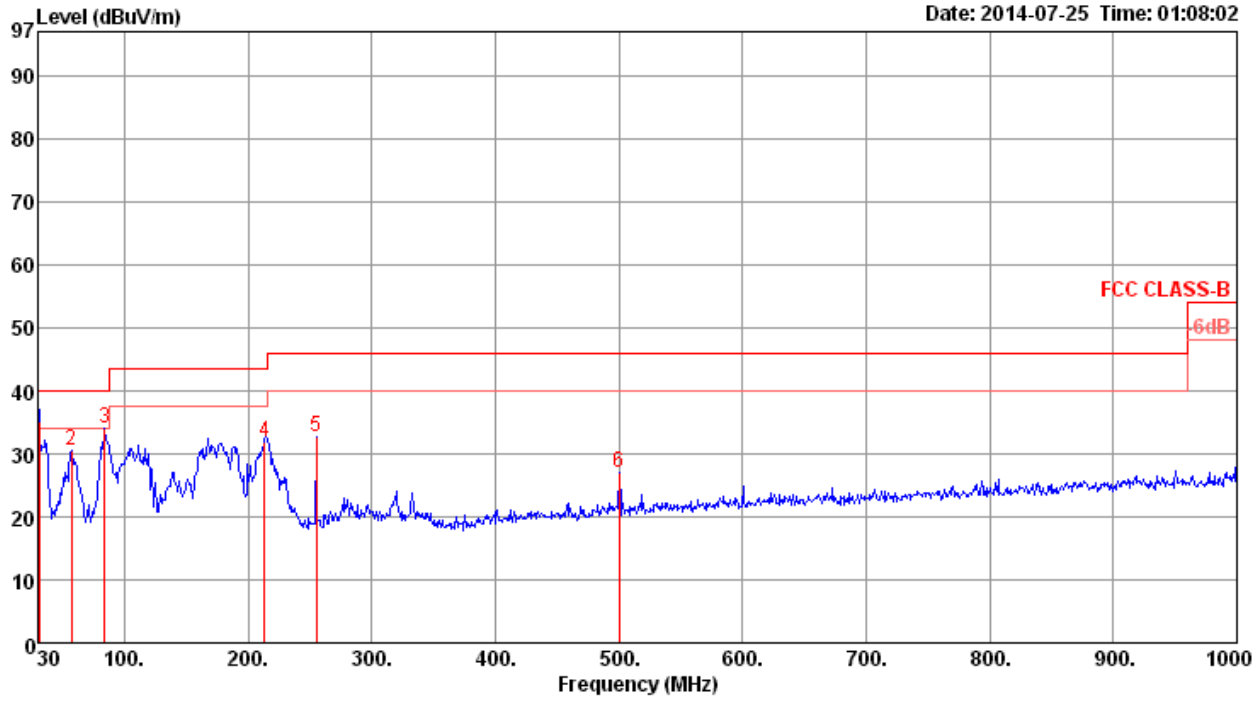
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

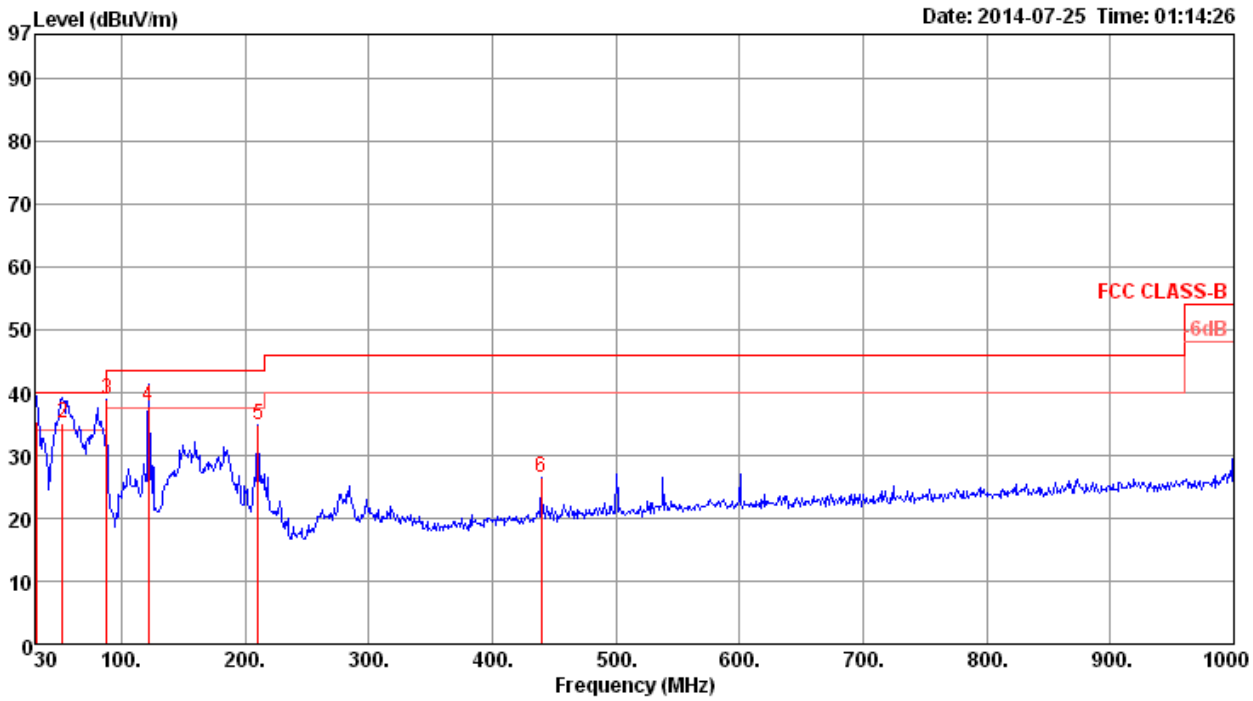
Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	CTX
Test Mode	Mode 2		

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	30.97	35.07	40.00	-4.93	44.02	0.63	18.22	27.80	QP	100	56	HORIZONTAL
2	57.16	30.54	40.00	-9.46	50.14	0.87	7.30	27.77	Peak	100	0	HORIZONTAL
3	84.32	34.11	40.00	-5.89	52.78	1.10	7.89	27.66	Peak	100	0	HORIZONTAL
4	213.33	32.00	43.50	-11.50	47.33	1.69	10.05	27.07	Peak	100	0	HORIZONTAL
5	255.04	32.58	46.00	-13.42	44.94	1.80	12.83	26.99	Peak	100	0	HORIZONTAL
6	500.45	26.96	46.00	-19.04	34.76	2.67	17.63	28.10	Peak	100	0	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	30.97	35.31	40.00	-4.69	44.26	0.63	18.22	27.80	QP	100	156	VERTICAL
2	52.31	35.20	40.00	-4.80	53.95	0.86	8.18	27.79	QP	100	189	VERTICAL
3	88.20	38.82	43.50	-4.68	56.77	1.08	8.62	27.65	Peak	400	0	VERTICAL
4	122.15	37.91	43.50	-5.59	51.69	1.31	12.40	27.49	QP	100	188	VERTICAL
5	210.42	34.96	43.50	-8.54	50.51	1.69	9.84	27.08	Peak	400	0	VERTICAL
6	439.34	26.56	46.00	-19.44	35.25	2.43	16.68	27.80	Peak	400	0	VERTICAL

Note:

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

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

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

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4821.56	44.48	74.00	-29.52	41.34	5.68	32.76	35.30	100	360	HORIZONTAL	Peak
2	4824.86	32.83	54.00	-21.17	29.68	5.69	32.76	35.30	100	360	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4821.76	36.80	54.00	-17.20	33.66	5.68	32.76	35.30	100	33	VERTICAL	Average
2	4822.02	48.97	74.00	-25.03	45.83	5.68	32.76	35.30	100	33	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4869.88	46.08	74.00	-27.92	42.85	5.74	32.80	35.31	100	84	HORIZONTAL	Peak
2	4875.10	34.24	54.00	-19.76	31.01	5.75	32.80	35.32	100	84	HORIZONTAL	Average
3	7312.16	38.46	54.00	-15.54	29.64	7.06	37.12	35.36	100	356	HORIZONTAL	Average
4	7312.40	49.91	74.00	-24.09	41.09	7.06	37.12	35.36	100	356	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4875.12	39.97	54.00	-14.03	36.74	5.75	32.80	35.32	100	185	VERTICAL	Average
2	4875.14	52.49	74.00	-21.51	49.26	5.75	32.80	35.32	100	185	VERTICAL	Peak
3	7303.44	50.93	74.00	-23.07	42.12	7.05	37.12	35.36	103	160	VERTICAL	Peak
4	7313.90	38.77	54.00	-15.23	29.95	7.06	37.12	35.36	103	160	VERTICAL	Average

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4923.42	44.58	74.00	-29.42	41.27	5.81	32.83	35.33	101	0	HORIZONTAL	Peak
2	4925.40	34.45	54.00	-19.55	31.13	5.81	32.84	35.33	101	0	HORIZONTAL	Average
3	7382.32	38.67	54.00	-15.33	29.75	7.08	37.16	35.32	100	216	HORIZONTAL	Average
4	7383.84	49.82	74.00	-24.18	40.90	7.08	37.16	35.32	100	216	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4924.64	46.78	74.00	-27.22	43.46	5.81	32.84	35.33	100	188	VERTICAL	Peak
2	4925.00	34.47	54.00	-19.53	31.15	5.81	32.84	35.33	100	188	VERTICAL	Average
3	7377.42	38.64	54.00	-15.36	29.73	7.08	37.15	35.32	100	178	VERTICAL	Average
4	7392.52	49.38	74.00	-24.62	40.44	7.09	37.16	35.31	100	178	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4836.02	32.33	54.00	-21.67	29.16	5.70	32.77	35.30	156	85	HORIZONTAL	Average
2	4836.08	44.28	74.00	-29.72	41.11	5.70	32.77	35.30	156	85	HORIZONTAL	Peak
3	7259.74	50.24	74.00	-23.76	41.48	7.04	37.11	35.39	100	360	HORIZONTAL	Peak
4	7270.70	38.85	54.00	-15.15	30.08	7.04	37.11	35.38	100	360	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4836.86	34.20	54.00	-19.80	31.03	5.70	32.77	35.30	136	356	VERTICAL	Average
2	4841.10	44.64	74.00	-29.36	41.45	5.71	32.78	35.30	136	356	VERTICAL	Peak
3	7260.64	39.06	54.00	-14.94	30.30	7.04	37.11	35.39	100	154	VERTICAL	Average
4	7271.94	49.88	74.00	-24.12	41.11	7.04	37.11	35.38	100	154	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4872.76	34.14	54.00	-19.86	30.90	5.75	32.80	35.31	100	360	HORIZONTAL	Average
2	4877.75	45.01	74.00	-28.99	41.78	5.75	32.80	35.32	100	360	HORIZONTAL	Peak
3	7307.27	49.01	74.00	-24.99	40.20	7.05	37.12	35.36	100	0	HORIZONTAL	Peak
4	7311.80	37.63	54.00	-16.37	28.81	7.06	37.12	35.36	100	0	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4874.46	46.34	74.00	-27.66	43.10	5.75	32.80	35.31	100	187	VERTICAL	Peak
2	4875.03	34.75	54.00	-19.25	31.52	5.75	32.80	35.32	100	187	VERTICAL	Average
3	7314.35	37.57	54.00	-16.43	28.75	7.06	37.12	35.36	169	332	VERTICAL	Average
4	7314.70	49.44	74.00	-24.56	40.62	7.06	37.12	35.36	169	332	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4904.81	45.04	74.00	-28.96	41.76	5.79	32.82	35.33	100	187	HORIZONTAL	Peak
2	4905.03	33.26	54.00	-20.74	29.98	5.79	32.82	35.33	100	187	HORIZONTAL	Average
3	7359.28	49.82	74.00	-24.18	40.92	7.08	37.15	35.33	100	334	HORIZONTAL	Peak
4	7360.51	37.31	54.00	-16.69	28.41	7.08	37.15	35.33	100	334	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4899.93	34.26	54.00	-19.74	30.98	5.78	32.82	35.32	100	276	VERTICAL	Average
2	4908.51	44.60	74.00	-29.40	41.32	5.79	32.82	35.33	100	276	VERTICAL	Peak
3	7355.05	38.41	54.00	-15.59	29.53	7.07	37.14	35.33	100	116	VERTICAL	Average
4	7355.05	38.41	74.00	-35.59	29.53	7.07	37.14	35.33	100	116	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 04, 2014	Test Function	Non-beamforming function

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	11490.06	48.21	54.00	-5.79	38.76	5.11	39.39	35.05	Average	100	116	HORIZONTAL
2	11494.65	61.38	74.00	-12.62	51.92	5.12	39.39	35.05	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	11487.92	50.62	54.00	-3.38	41.17	5.11	39.39	35.05	Average	100	200	VERTICAL
2	11488.14	65.00	74.00	-9.00	55.55	5.11	39.39	35.05	Peak	100	200	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 04, 2014	Test Function	Non-beamforming function

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	11570.61	47.93	54.00	-6.07	38.41	5.14	39.44	35.06	Average	100	171	HORIZONTAL
2	11574.81	54.99	74.00	-19.01	45.47	5.14	39.44	35.06	Peak	100	171	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	11570.22	64.29	74.00	-9.71	54.77	5.14	39.44	35.06	Peak	100	358	VERTICAL
2	11570.48	50.09	54.00	-3.91	40.57	5.14	39.44	35.06	Average	100	358	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 04, 2014	Test Function	Non-beamforming function

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	11650.22	49.51	54.00	-4.49	39.95	5.16	39.48	35.08	Average	100	323	HORIZONTAL
2	11650.54	62.16	74.00	-11.84	52.59	5.16	39.49	35.08	Peak	100	323	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11648.17	50.43	54.00	-3.57	40.87	5.16	39.48	35.08	Average	100	162	VERTICAL
2	11648.21	62.55	74.00	-11.45	52.99	5.16	39.48	35.08	Peak	100	162	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11510.72	45.34	54.00	-8.66	35.87	5.12	39.40	35.05	Average	100	65	HORIZONTAL
2	11517.53	52.75	74.00	-21.25	43.27	5.12	39.41	35.05	Peak	100	65	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	11509.92	48.85	54.00	-5.15	39.38	5.12	39.40	35.05	Average	100	347	VERTICAL
2	11515.29	60.30	74.00	-13.70	50.82	5.12	39.41	35.05	Peak	100	347	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 04, 2014	Test Function	Non-beamforming function

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	11588.94	53.05	74.00	-20.95	43.52	5.14	39.45	35.06	Peak	100	131	HORIZONTAL
2	11595.29	44.51	54.00	-9.49	34.98	5.15	39.45	35.07	Average	100	131	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11587.24	49.58	54.00	-4.42	40.05	5.14	39.45	35.06	Average	100	347	VERTICAL
2	11587.37	62.44	74.00	-11.56	52.91	5.14	39.45	35.06	Peak	100	347	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Non-beamforming function

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	11545.27	42.91	54.00	-11.09	33.42	5.13	39.42	35.06	Average	144	135	HORIZONTAL
2	11569.71	55.46	74.00	-18.54	45.95	5.13	39.44	35.06	Peak	144	135	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11537.26	44.22	54.00	-9.78	34.72	5.13	39.42	35.05	Average	110	358	VERTICAL
2	11552.32	56.08	74.00	-17.92	46.58	5.13	39.43	35.06	Peak	110	358	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4824.03	38.07	54.00	-15.93	34.92	5.69	32.76	35.30	100	323	HORIZONTAL	Average
2	4824.09	46.82	74.00	-27.18	43.67	5.69	32.76	35.30	100	323	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4824.03	48.63	54.00	-5.37	45.48	5.69	32.76	35.30	100	26	VERTICAL	Average
2	4824.05	52.45	74.00	-21.55	49.30	5.69	32.76	35.30	100	26	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4874.01	49.10	74.00	-24.90	45.86	5.75	32.80	35.31	100	324	HORIZONTAL	Peak
2	4874.01	41.92	54.00	-12.08	38.68	5.75	32.80	35.31	100	324	HORIZONTAL	Average
3	7305.58	49.78	74.00	-24.22	40.97	7.05	37.12	35.36	100	57	HORIZONTAL	Peak
4	7320.24	37.92	54.00	-16.08	29.08	7.06	37.13	35.35	100	57	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4874.01	51.56	54.00	-2.44	48.32	5.75	32.80	35.31	100	25	VERTICAL	Average
2	4874.06	54.89	74.00	-19.11	51.65	5.75	32.80	35.31	100	25	VERTICAL	Peak
3	7312.44	50.08	74.00	-23.92	41.26	7.06	37.12	35.36	100	304	VERTICAL	Peak
4	7318.36	37.95	54.00	-16.05	29.12	7.06	37.13	35.36	100	304	VERTICAL	Average

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4923.89	49.58	74.00	-24.42	46.26	5.81	32.84	35.33	114	301	HORIZONTAL	Peak
2	4924.03	43.06	54.00	-10.94	39.74	5.81	32.84	35.33	114	301	HORIZONTAL	Average
3	7386.35	50.69	74.00	-23.31	41.76	7.09	37.16	35.32	100	90	HORIZONTAL	Peak
4	7386.92	37.63	54.00	-16.37	28.70	7.09	37.16	35.32	100	90	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4924.02	47.01	54.00	-6.99	43.69	5.81	32.84	35.33	100	12	VERTICAL	Average
2	4924.18	51.25	74.00	-22.75	47.93	5.81	32.84	35.33	100	12	VERTICAL	Peak
3	7386.31	52.02	74.00	-21.98	43.09	7.09	37.16	35.32	100	347	VERTICAL	Peak
4	7386.98	37.67	54.00	-16.33	28.74	7.09	37.16	35.32	100	347	VERTICAL	Average

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4824.14	32.99	54.00	-21.01	29.84	5.69	32.76	35.30	100	312	HORIZONTAL	Average
2	4832.24	45.82	74.00	-28.18	42.65	5.70	32.77	35.30	100	312	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4825.52	38.71	54.00	-15.29	35.55	5.69	32.77	35.30	100	31	VERTICAL	Average
2	4826.24	51.53	74.00	-22.47	48.37	5.69	32.77	35.30	100	31	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.56	47.00	74.00	-27.00	43.76	5.75	32.80	35.31	100	324	HORIZONTAL	Peak
2	4873.62	35.45	54.00	-18.55	32.21	5.75	32.80	35.31	100	324	HORIZONTAL	Average
3	7307.10	38.71	54.00	-15.29	29.90	7.05	37.12	35.36	102	0	HORIZONTAL	Average
4	7318.52	49.92	74.00	-24.08	41.09	7.06	37.13	35.36	102	0	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4875.34	42.62	54.00	-11.38	39.39	5.75	32.80	35.32	100	32	VERTICAL	Average
2	4875.96	54.79	74.00	-19.21	51.56	5.75	32.80	35.32	100	32	VERTICAL	Peak
3	7309.12	52.22	74.00	-21.78	43.40	7.06	37.12	35.36	100	157	VERTICAL	Peak
4	7310.10	39.87	54.00	-14.13	31.05	7.06	37.12	35.36	100	157	VERTICAL	Average

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4924.16	33.24	54.00	-20.76	29.92	5.81	32.84	35.33	100	5	HORIZONTAL	Average
2	4926.20	46.07	74.00	-27.93	42.75	5.81	32.84	35.33	100	5	HORIZONTAL	Peak
3	7376.94	37.70	54.00	-16.30	28.79	7.08	37.15	35.32	100	360	HORIZONTAL	Average
4	7393.24	49.83	74.00	-24.17	40.89	7.09	37.16	35.31	100	360	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4922.24	35.29	54.00	-18.71	31.98	5.81	32.83	35.33	100	221	VERTICAL	Average
2	4922.36	47.06	74.00	-26.94	43.75	5.81	32.83	35.33	100	221	VERTICAL	Peak
3	7376.58	37.66	54.00	-16.34	28.75	7.08	37.15	35.32	151	0	VERTICAL	Average
4	7383.64	49.82	74.00	-24.18	40.90	7.08	37.16	35.32	151	0	VERTICAL	Peak

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Non-beamforming function

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	11488.48	46.90	54.00	-7.10	37.45	5.11	39.39	35.05	Average	152	82	HORIZONTAL
2	11488.96	58.39	74.00	-15.61	48.94	5.11	39.39	35.05	Peak	152	82	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11488.88	63.05	74.00	-10.95	53.60	5.11	39.39	35.05	Peak	100	11	VERTICAL
2	11489.12	51.06	54.00	-2.94	41.61	5.11	39.39	35.05	Average	100	11	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Non-beamforming function

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	11572.32	56.99	74.00	-17.01	47.47	5.14	39.44	35.06	Peak	100	240	HORIZONTAL
2	11572.48	44.49	54.00	-9.51	34.97	5.14	39.44	35.06	Average	100	240	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11568.96	62.86	74.00	-11.14	53.35	5.13	39.44	35.06	Peak	100	353	VERTICAL
2	11569.12	50.26	54.00	-3.74	40.75	5.13	39.44	35.06	Average	100	353	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11649.44	60.51	74.00	-13.49	50.95	5.16	39.48	35.08	Peak	146	137	HORIZONTAL
2	11650.00	48.94	54.00	-5.06	39.38	5.16	39.48	35.08	Average	146	137	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	11652.40	61.33	74.00	-12.67	51.76	5.16	39.49	35.08	Peak	100	38	VERTICAL
2	11652.56	49.38	54.00	-4.62	39.81	5.16	39.49	35.08	Average	100	38	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	4819.90	42.77	74.00	-31.23	40.93	3.31	33.56	35.03	Peak	100	224	HORIZONTAL
2	4825.60	30.55	54.00	-23.45	28.71	3.31	33.56	35.03	Average	100	224	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	4819.00	45.77	74.00	-28.23	43.93	3.31	33.56	35.03	Peak	100	55	VERTICAL
2	4828.80	40.09	54.00	-13.91	38.25	3.31	33.56	35.03	Average	100	55	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	4867.30	52.08	74.00	-21.92	50.16	3.33	33.62	35.03	Peak	100	227	HORIZONTAL
2	4880.70	39.47	54.00	-14.53	37.51	3.33	33.66	35.03	Average	100	227	HORIZONTAL
3	7324.20	50.03	74.00	-23.97	44.68	4.06	36.69	35.40	Peak	100	65	HORIZONTAL
4	7327.10	38.48	54.00	-15.52	33.13	4.06	36.69	35.40	Average	100	65	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	4882.00	60.42	74.00	-13.58	58.46	3.33	33.66	35.03	Peak	100	229	VERTICAL
2	4882.80	49.03	54.00	-4.97	47.07	3.33	33.66	35.03	Average	100	229	VERTICAL
3	7327.80	44.03	54.00	-9.97	38.68	4.06	36.69	35.40	Average	161	233	VERTICAL
4	7332.70	59.73	74.00	-14.27	54.34	4.06	36.73	35.40	Peak	161	233	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	4922.40	42.52	74.00	-31.48	40.42	3.35	33.76	35.01	Peak	100	244	HORIZONTAL
2	4928.70	31.38	54.00	-22.62	29.28	3.35	33.76	35.01	Average	100	244	HORIZONTAL
3	7385.00	45.95	74.00	-28.05	40.44	4.06	36.85	35.40	Peak	100	104	HORIZONTAL
4	7392.60	33.61	54.00	-20.39	28.10	4.06	36.85	35.40	Average	100	104	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	4914.60	39.24	54.00	-14.76	37.18	3.35	33.73	35.02	Average	100	162	VERTICAL
2	4924.00	48.25	74.00	-25.75	46.15	3.35	33.76	35.01	Peak	100	162	VERTICAL
3	7392.80	46.69	74.00	-27.31	41.18	4.06	36.85	35.40	Peak	100	247	VERTICAL
4	7396.10	34.15	54.00	-19.85	28.64	4.06	36.85	35.40	Average	100	247	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	4816.36	29.25	54.00	-24.75	27.46	3.31	33.52	35.04	Average	100	166	HORIZONTAL
2	4819.32	42.22	74.00	-31.78	40.38	3.31	33.56	35.03	Peak	100	166	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	4819.60	41.93	74.00	-32.07	40.09	3.31	33.56	35.03	Peak	100	299	VERTICAL
2	4822.60	32.31	54.00	-21.69	30.47	3.31	33.56	35.03	Average	100	299	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	4880.80	44.30	74.00	-29.70	42.34	3.33	33.66	35.03	Peak	100	231	HORIZONTAL
2	4881.60	32.54	54.00	-21.46	30.58	3.33	33.66	35.03	Average	100	231	HORIZONTAL
3	7261.60	33.51	54.00	-20.49	28.33	4.06	36.52	35.40	Average	100	306	HORIZONTAL
4	7285.00	45.54	74.00	-28.46	40.28	4.06	36.60	35.40	Peak	100	306	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4874.00	49.32	74.00	-24.68	47.36	3.33	33.66	35.03	Peak	100	93	VERTICAL
2	4896.20	38.83	54.00	-15.17	36.82	3.34	33.69	35.02	Average	100	93	VERTICAL
3	7261.60	33.95	54.00	-20.05	28.77	4.06	36.52	35.40	Average	100	193	VERTICAL
4	7290.80	46.39	74.00	-27.61	41.13	4.06	36.60	35.40	Peak	100	193	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	4889.40	30.15	54.00	-23.85	28.15	3.34	33.69	35.03	Average	100	211	HORIZONTAL
2	4939.20	42.36	74.00	-31.64	40.22	3.35	33.80	35.01	Peak	100	211	HORIZONTAL
3	7319.80	45.88	74.00	-28.12	40.53	4.06	36.69	35.40	Peak	100	116	HORIZONTAL
4	7331.60	33.54	54.00	-20.46	28.19	4.06	36.69	35.40	Average	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	4903.80	49.48	74.00	-24.52	47.43	3.34	33.73	35.02	Peak	100	219	VERTICAL
2	4904.60	36.24	54.00	-17.76	34.19	3.34	33.73	35.02	Average	100	219	VERTICAL
3	7307.20	33.30	54.00	-20.70	28.00	4.06	36.64	35.40	Average	100	170	VERTICAL
4	7311.60	45.66	74.00	-28.34	40.36	4.06	36.64	35.40	Peak	100	170	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.20	59.20	74.00	-14.80	49.75	5.11	39.39	35.05	Peak	159	27	HORIZONTAL
2	11490.32	46.97	54.00	-7.03	37.52	5.11	39.39	35.05	Average	159	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	11488.24	61.87	74.00	-12.13	52.42	5.11	39.39	35.05	Peak	100	356	VERTICAL
2	11488.56	47.71	54.00	-6.29	38.26	5.11	39.39	35.05	Average	100	356	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 02, 2014	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11568.70	44.92	54.00	-9.08	35.41	5.13	39.44	35.06	Average	100	335	HORIZONTAL
2	11571.40	55.19	74.00	-18.81	45.67	5.14	39.44	35.06	Peak	100	335	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	11578.00	60.17	74.00	-13.83	50.65	5.14	39.44	35.06	Peak	100	81	VERTICAL
2	11579.00	48.33	54.00	-5.67	38.81	5.14	39.44	35.06	Average	100	81	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 02, 2014	Test Function	Beamforming function

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	11640.40	56.86	74.00	-17.14	47.29	5.16	39.48	35.07	Peak	100	72	HORIZONTAL
2	11641.80	45.11	54.00	-8.89	35.54	5.16	39.48	35.07	Average	100	72	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11649.50	59.82	74.00	-14.18	50.26	5.16	39.48	35.08	Peak	100	278	VERTICAL
2	11650.00	47.57	54.00	-6.43	38.01	5.16	39.48	35.08	Average	100	278	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	11492.40	52.96	74.00	-21.04	43.51	5.11	39.39	35.05	Peak	100	107	HORIZONTAL
2	11509.90	44.82	54.00	-9.18	35.35	5.12	39.40	35.05	Average	100	107	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.80	50.24	54.00	-3.76	40.79	5.11	39.39	35.05	Average	103	184	VERTICAL
2	11510.20	65.26	74.00	-8.74	55.79	5.12	39.40	35.05	Peak	103	184	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	11589.80	60.02	74.00	-13.98	50.49	5.14	39.45	35.06	Peak	100	257	HORIZONTAL
2	11599.10	45.04	54.00	-8.96	35.51	5.15	39.45	35.07	Average	100	257	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11589.50	61.71	74.00	-12.29	52.18	5.14	39.45	35.06	Peak	108	162	VERTICAL
2	11589.70	50.82	54.00	-3.18	41.29	5.14	39.45	35.06	Average	108	162	VERTICAL

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 03, 2014	Test Function	Beamforming function

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	11526.70	44.09	54.00	-9.91	34.60	5.13	39.41	35.05	Average	100	117	HORIZONTAL
2	11551.00	53.91	74.00	-20.09	44.41	5.13	39.43	35.06	Peak	100	117	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	11533.60	61.27	74.00	-12.73	51.77	5.13	39.42	35.05	Peak	102	71	VERTICAL
2	11550.41	47.04	54.00	-6.96	37.54	5.13	39.43	35.06	Average	102	71	VERTICAL

Note:

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

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

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

4.6. Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, Please refer to section 3.11 for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure
2. The radiated emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
   Only worst data of each operating mode is presented.

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	CH 1, 11: Jul. 15, 2014 / CH6: Jul. 09, 2014	Test Function	Non-beamforming function

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.60	51.26	54.00	-2.74	19.68	3.68	27.90	0.00	100	358	VERTICAL	Average
2	2390.00	72.97	74.00	-1.03	41.39	3.68	27.90	0.00	100	358	VERTICAL	Peak
3	2409.40	108.57			76.98	3.69	27.90	0.00	100	358	VERTICAL	Average
4	2414.60	119.65			88.06	3.69	27.90	0.00	100	358	VERTICAL	Peak

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	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	50.04	54.00	-3.96	18.46	3.68	27.90	0.00	100	3	VERTICAL	Average
2	2390.00	60.05	74.00	-13.95	28.47	3.68	27.90	0.00	100	3	VERTICAL	Peak
3	2429.60	123.16			91.56	3.70	27.90	0.00	100	3	VERTICAL	Peak
4	2444.60	112.72			81.11	3.71	27.90	0.00	100	3	VERTICAL	Average
5	2484.50	68.27	74.00	-5.73	36.64	3.73	27.90	0.00	100	3	VERTICAL	Peak
6	2485.50	52.93	54.00	-1.07	21.30	3.73	27.90	0.00	100	3	VERTICAL	Average

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	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2464.20	109.05			77.43	3.72	27.90	0.00	100	357	VERTICAL	Average
2	2464.60	120.50			88.88	3.72	27.90	0.00	100	357	VERTICAL	Peak
3	2484.30	51.85	54.00	-2.15	20.22	3.73	27.90	0.00	100	357	VERTICAL	Average
4	2484.50	72.76	74.00	-1.24	41.13	3.73	27.90	0.00	100	357	VERTICAL	Peak

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.00	66.66	74.00	-7.34	35.08	3.68	27.90	0.00	100	356	VERTICAL	Peak
2	2389.20	52.68	54.00	-1.32	21.10	3.68	27.90	0.00	100	356	VERTICAL	Average
3	2418.80	114.14			82.54	3.70	27.90	0.00	100	356	VERTICAL	Peak
4	2419.40	102.46			70.86	3.70	27.90	0.00	100	356	VERTICAL	Average

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	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2389.40	52.24	54.00	-1.76	20.66	3.68	27.90	0.00	100	360	VERTICAL	Average
2	2389.40	64.26	74.00	-9.74	32.68	3.68	27.90	0.00	100	360	VERTICAL	Peak
3	2454.40	105.70			74.08	3.72	27.90	0.00	100	360	VERTICAL	Average
4	2454.60	118.15			86.53	3.72	27.90	0.00	100	360	VERTICAL	Peak
5	2484.50	52.92	54.00	-1.08	21.29	3.73	27.90	0.00	100	360	VERTICAL	Average
6	2485.90	71.51	74.00	-2.49	39.88	3.73	27.90	0.00	100	360	VERTICAL	Peak

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	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2459.40	103.99			72.37	3.72	27.90	0.00	100	358	VERTICAL	Average
2	2463.40	116.68			85.06	3.72	27.90	0.00	100	358	VERTICAL	Peak
3	2484.30	72.92	74.00	-1.08	41.29	3.73	27.90	0.00	100	358	VERTICAL	Peak
4	2484.31	52.85	54.00	-1.15	21.22	3.73	27.90	0.00	100	358	VERTICAL	Average

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2413.60	117.33			85.74	3.69	27.90	0.00	100	356	VERTICAL	Peak
2	2414.80	113.97			82.38	3.69	27.90	0.00	100	356	VERTICAL	Average
3	2488.90	52.88	54.00	-1.12	21.25	3.73	27.90	0.00	100	356	VERTICAL	Average
4	2489.90	63.07	74.00	-10.93	31.44	3.73	27.90	0.00	100	356	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2388.40	62.16	74.00	-11.84	30.58	3.68	27.90	0.00	100	181	VERTICAL	Peak
2	2390.00	47.30	54.00	-6.70	15.72	3.68	27.90	0.00	100	181	VERTICAL	Average
3	2434.20	117.96			86.36	3.70	27.90	0.00	100	181	VERTICAL	Average
4	2434.80	121.30			89.70	3.70	27.90	0.00	100	181	VERTICAL	Peak
5	2483.50	49.36	54.00	-4.64	17.73	3.73	27.90	0.00	100	181	VERTICAL	Average
6	2486.70	62.80	74.00	-11.20	31.17	3.73	27.90	0.00	100	181	VERTICAL	Peak

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	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2383.80	61.59	74.00	-12.41	30.01	3.68	27.90	0.00	100	360	VERTICAL	Peak
2	2384.80	51.45	54.00	-2.55	19.87	3.68	27.90	0.00	100	360	VERTICAL	Average
3	2464.80	119.23			87.61	3.72	27.90	0.00	100	360	VERTICAL	Peak
4	2465.20	116.04			84.42	3.72	27.90	0.00	100	360	VERTICAL	Average
5	2483.50	52.42	54.00	-1.58	20.79	3.73	27.90	0.00	100	360	VERTICAL	Average
6	2483.50	62.21	74.00	-11.79	30.58	3.73	27.90	0.00	100	360	VERTICAL	Peak

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 09, 2014	Test Function	Non-beamforming function

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2413.40	111.35			79.76	3.69	27.90	0.00	100	0	VERTICAL	Average
2	2414.20	121.35			89.76	3.69	27.90	0.00	100	0	VERTICAL	Peak
3	2493.10	64.59	74.00	-9.41	32.95	3.74	27.90	0.00	100	0	VERTICAL	Peak
4	2493.50	52.89	54.00	-1.11	21.25	3.74	27.90	0.00	100	0	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 2412 MHz.

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2390.00	49.42	54.00	-4.58	17.84	3.68	27.90	0.00	100	178	VERTICAL	Average
2	2390.00	65.12	74.00	-8.88	33.54	3.68	27.90	0.00	100	178	VERTICAL	Peak
3	2438.40	114.86			83.25	3.71	27.90	0.00	100	178	VERTICAL	Average
4	2438.80	124.64			93.03	3.71	27.90	0.00	100	178	VERTICAL	Peak
5	2483.50	51.08	54.00	-2.92	19.45	3.73	27.90	0.00	100	178	VERTICAL	Average
6	2488.50	70.79	74.00	-3.21	39.16	3.73	27.90	0.00	100	178	VERTICAL	Peak

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	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2383.00	60.64	74.00	-13.36	29.06	3.68	27.90	0.00	100	1	VERTICAL	Peak
2	2383.60	48.96	54.00	-5.04	17.38	3.68	27.90	0.00	100	1	VERTICAL	Average
3	2463.40	111.70			80.08	3.72	27.90	0.00	100	1	VERTICAL	Average
4	2463.80	121.96			90.34	3.72	27.90	0.00	100	1	VERTICAL	Peak
5	2483.50	51.22	54.00	-2.78	19.59	3.73	27.90	0.00	100	1	VERTICAL	Average
6	2483.50	72.86	74.00	-1.14	41.23	3.73	27.90	0.00	100	1	VERTICAL	Peak

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Beamforming function

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.00	71.02	74.00	-2.98	40.32	2.21	28.49	0.00	Peak	100	177	VERTICAL
2	2390.00	52.66	54.00	-1.34	21.95	2.22	28.49	0.00	Average	100	177	VERTICAL
3	2409.60	110.96			80.21	2.22	28.53	0.00	Average	100	177	VERTICAL
4	2413.60	121.86			91.11	2.22	28.53	0.00	Peak	100	177	VERTICAL
5	2483.90	52.35	54.00	-1.65	21.42	2.26	28.67	0.00	Average	100	177	VERTICAL
6	2484.30	62.29	74.00	-11.71	31.36	2.26	28.67	0.00	Peak	100	177	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	47.53	54.00	-6.47	16.82	2.22	28.49	0.00	Average	100	356	VERTICAL
2	2390.00	57.15	74.00	-16.85	26.44	2.22	28.49	0.00	Peak	100	356	VERTICAL
3	2439.80	115.45			84.62	2.23	28.60	0.00	Average	100	356	VERTICAL
4	2440.20	125.85			95.02	2.23	28.60	0.00	Peak	100	356	VERTICAL
5	2484.30	52.71	54.00	-1.29	21.78	2.26	28.67	0.00	Average	100	356	VERTICAL
6	2487.10	68.02	74.00	-5.98	37.09	2.26	28.67	0.00	Peak	100	356	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	2390.00	49.91	54.00	-4.09	19.20	2.22	28.49	0.00	Average	100	346	VERTICAL
2	2390.00	60.87	74.00	-13.13	30.16	2.22	28.49	0.00	Peak	100	346	VERTICAL
3	2464.80	111.45			80.58	2.24	28.63	0.00	Average	100	346	VERTICAL
4	2465.20	122.51			91.64	2.24	28.63	0.00	Peak	100	346	VERTICAL
5	2483.50	51.24	54.00	-2.76	20.31	2.26	28.67	0.00	Average	100	346	VERTICAL
6	2483.50	72.98	74.00	-1.02	42.05	2.26	28.67	0.00	Peak	100	346	VERTICAL

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

Temperature	25°C	Humidity	62%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Jul. 17, 2014	Test Function	Beamforming function

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	2387.60	67.68	74.00	-6.32	36.98	2.21	28.49	0.00	Peak	100	166	VERTICAL
2	2390.00	52.64	54.00	-1.36	21.93	2.22	28.49	0.00	Average	100	166	VERTICAL
3	2425.20	117.04			86.25	2.23	28.56	0.00	Peak	100	166	VERTICAL
4	2426.80	105.96			75.17	2.23	28.56	0.00	Average	100	166	VERTICAL
5	2484.70	50.18	54.00	-3.82	19.25	2.26	28.67	0.00	Average	100	166	VERTICAL
6	2484.70	60.63	74.00	-13.37	29.70	2.26	28.67	0.00	Peak	100	166	VERTICAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.80	65.14	74.00	-8.86	34.44	2.21	28.49	0.00	Peak	100	349	VERTICAL
2	2390.00	49.51	54.00	-4.49	18.80	2.22	28.49	0.00	Average	100	349	VERTICAL
3	2448.60	120.73			89.89	2.24	28.60	0.00	Peak	100	349	VERTICAL
4	2450.20	110.02			79.18	2.24	28.60	0.00	Average	100	349	VERTICAL
5	2483.90	67.90	74.00	-6.10	36.97	2.26	28.67	0.00	Peak	100	349	VERTICAL
6	2499.20	52.93	54.00	-1.07	21.96	2.27	28.70	0.00	Average	100	349	VERTICAL

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

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2447.20	119.57			88.73	2.24	28.60	0.00	Peak	100	347	VERTICAL
2	2447.60	109.45			78.61	2.24	28.60	0.00	Average	100	347	VERTICAL
3	2483.50	52.96	54.00	-1.04	22.03	2.26	28.67	0.00	Average	100	347	VERTICAL
4	2483.50	64.61	74.00	-9.39	33.68	2.26	28.67	0.00	Peak	100	347	VERTICAL

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

Note:

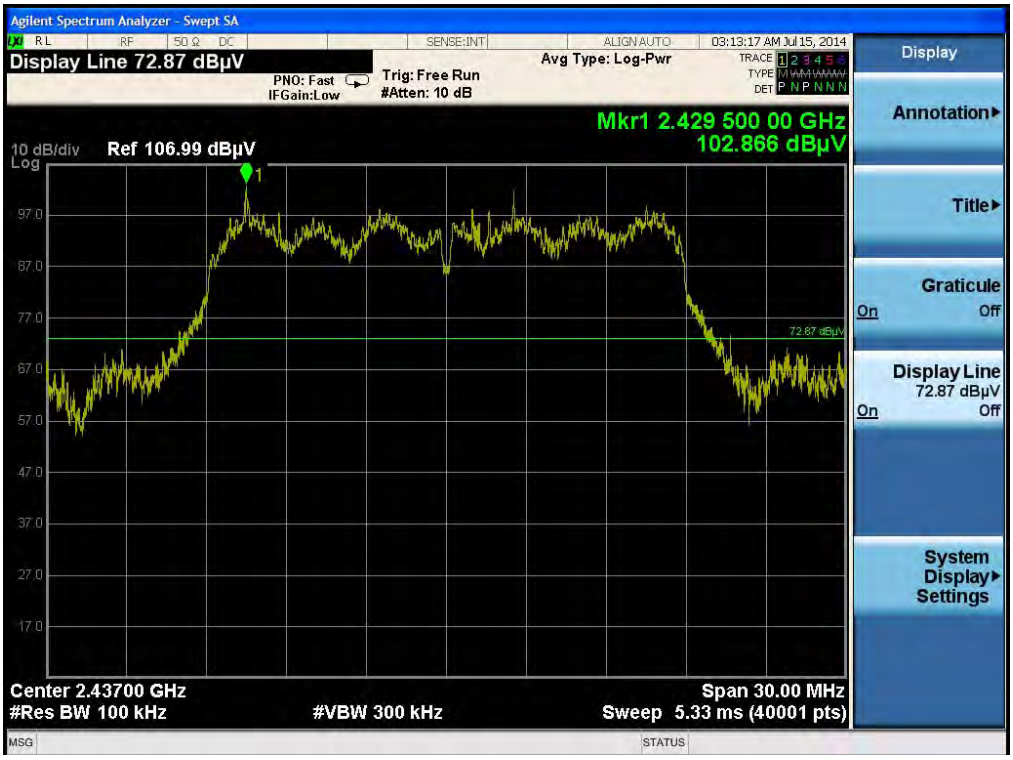
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

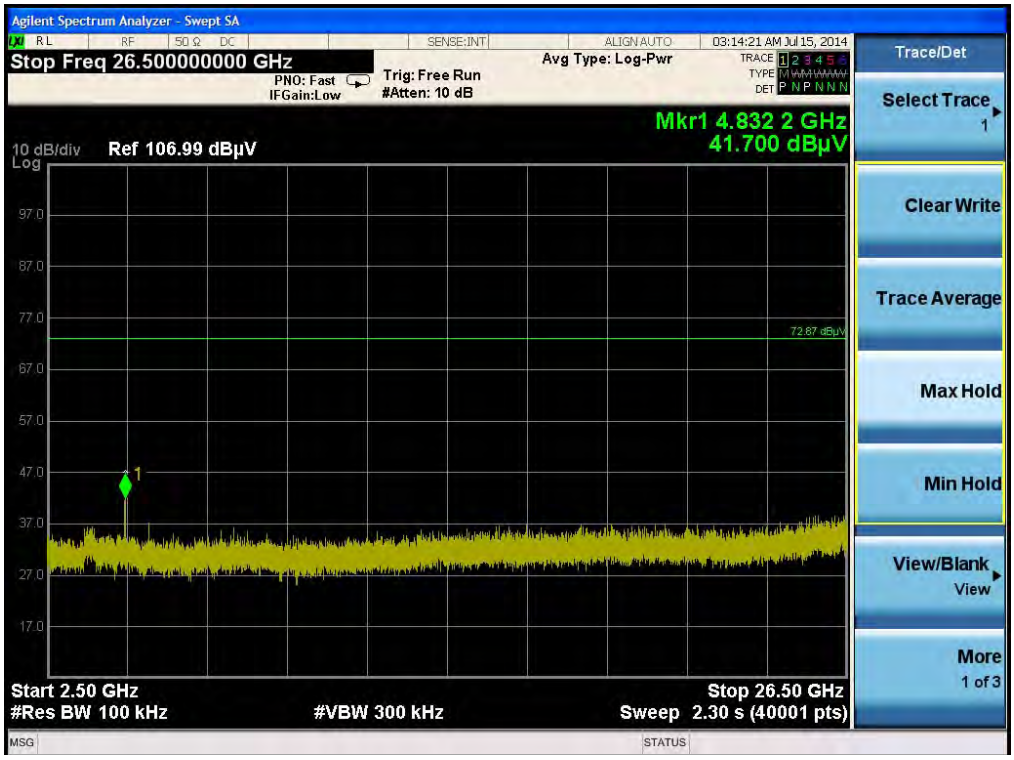
For non-beamforming function:

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

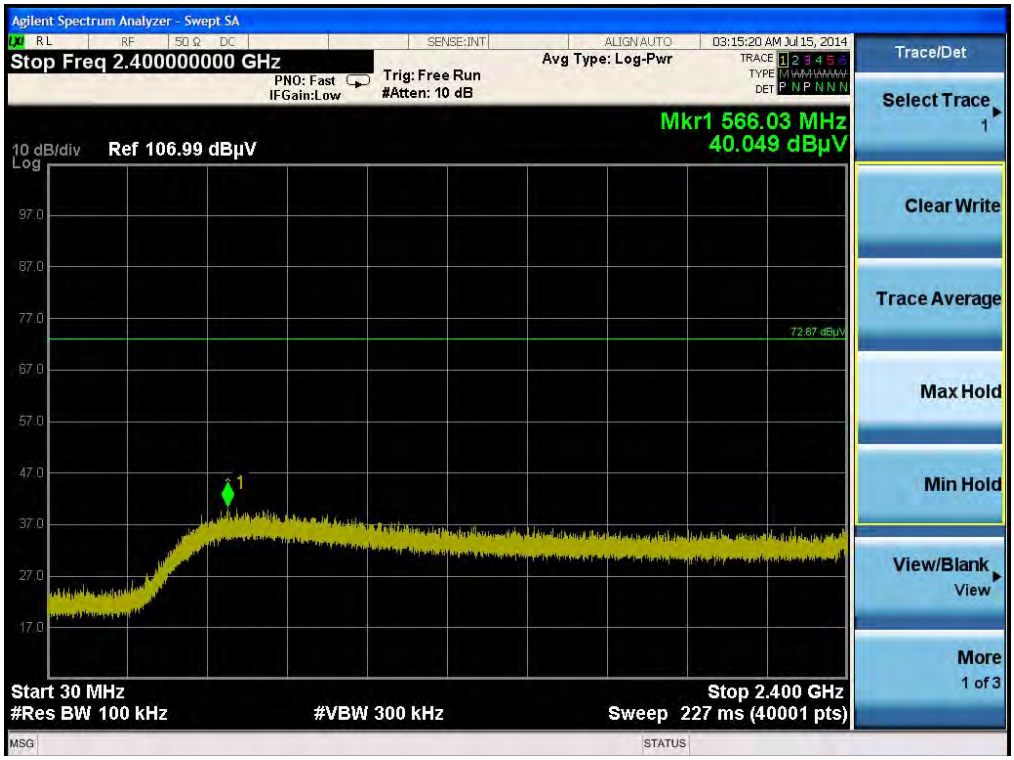


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)

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)



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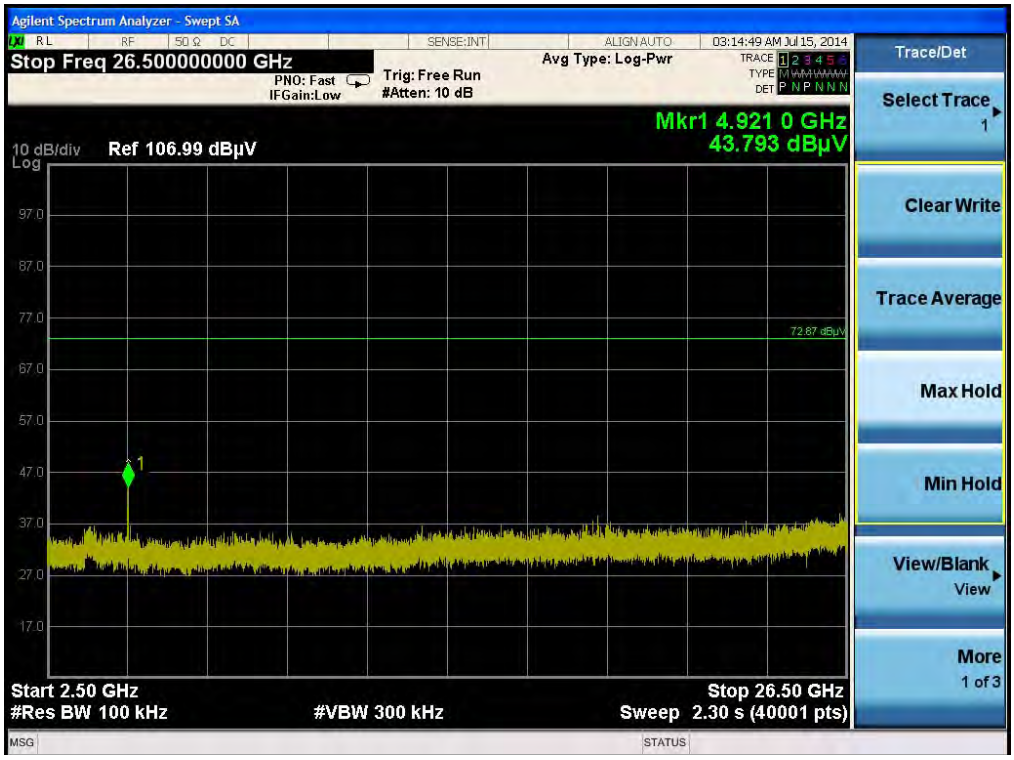
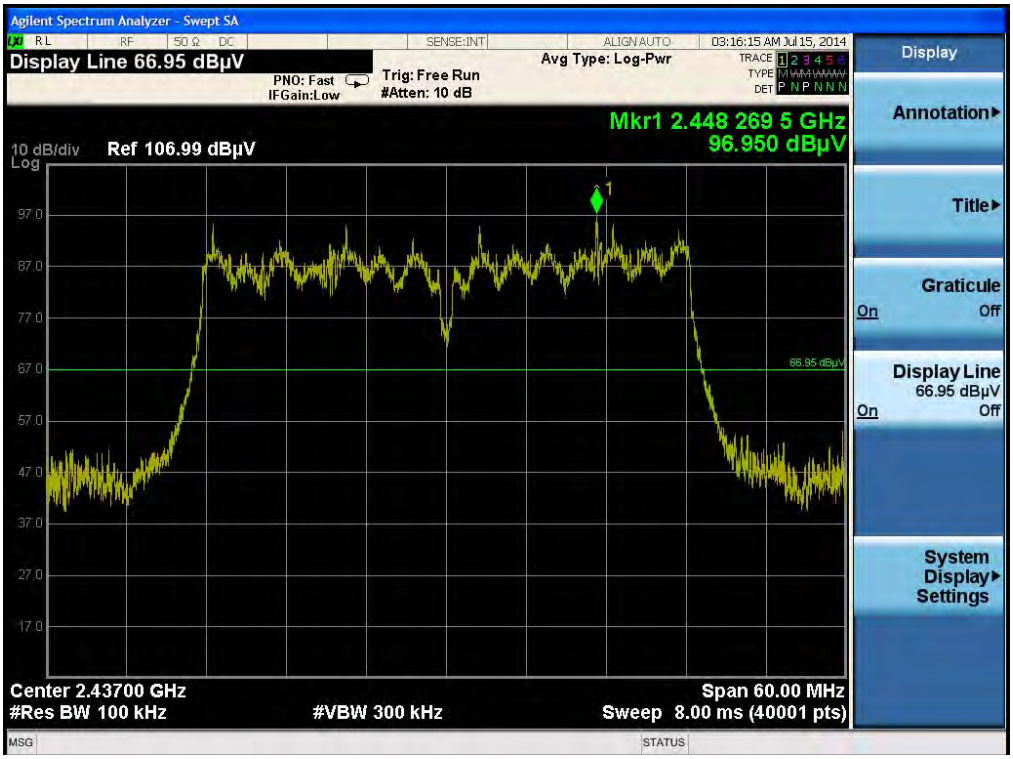
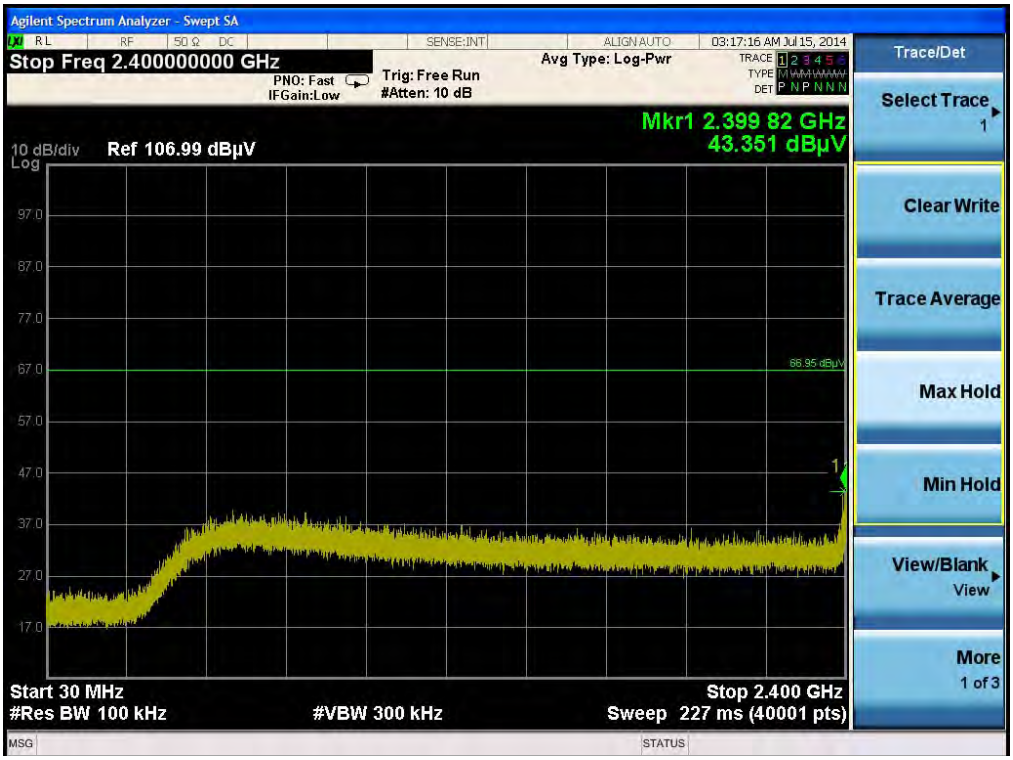


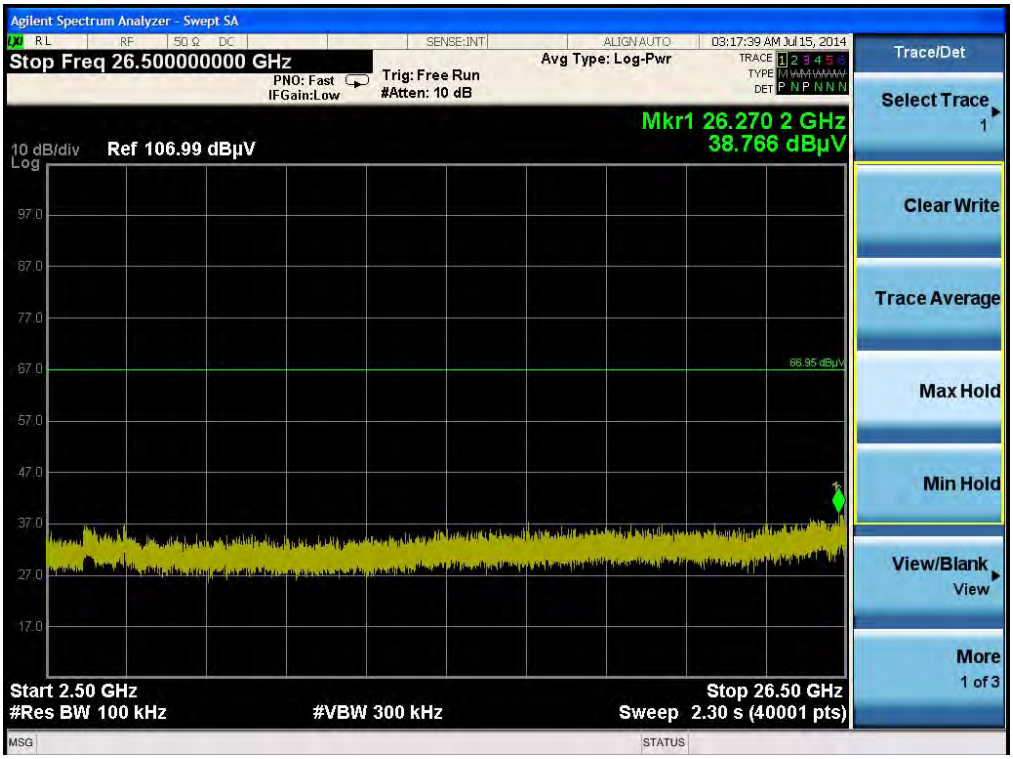
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



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

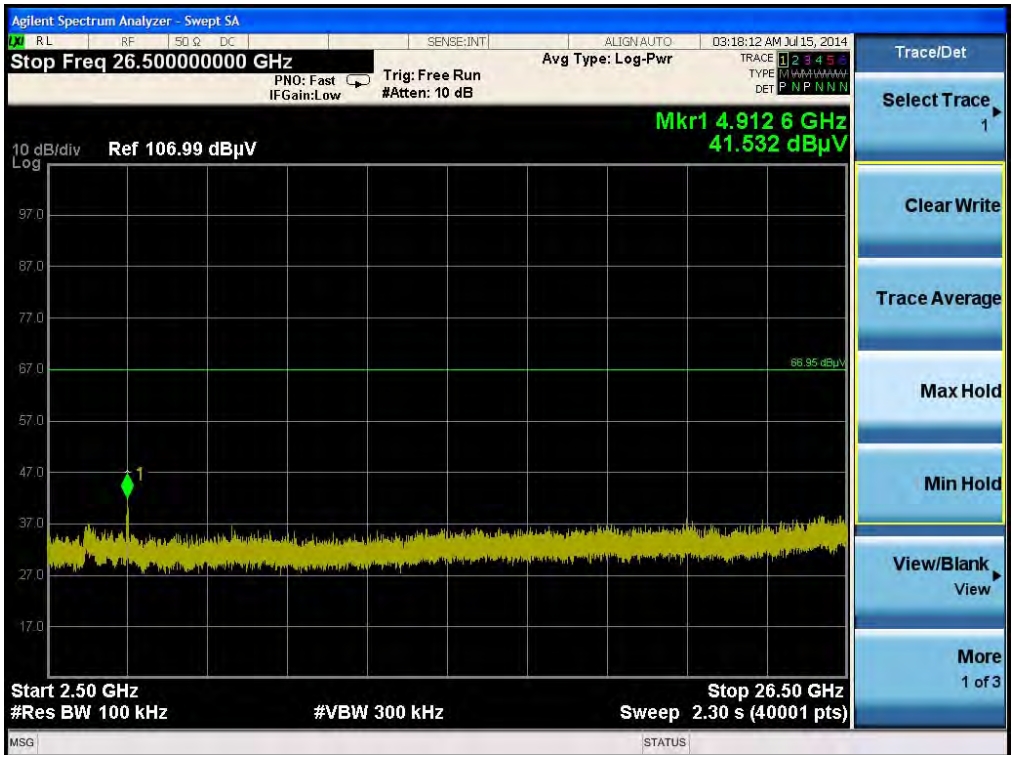


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)

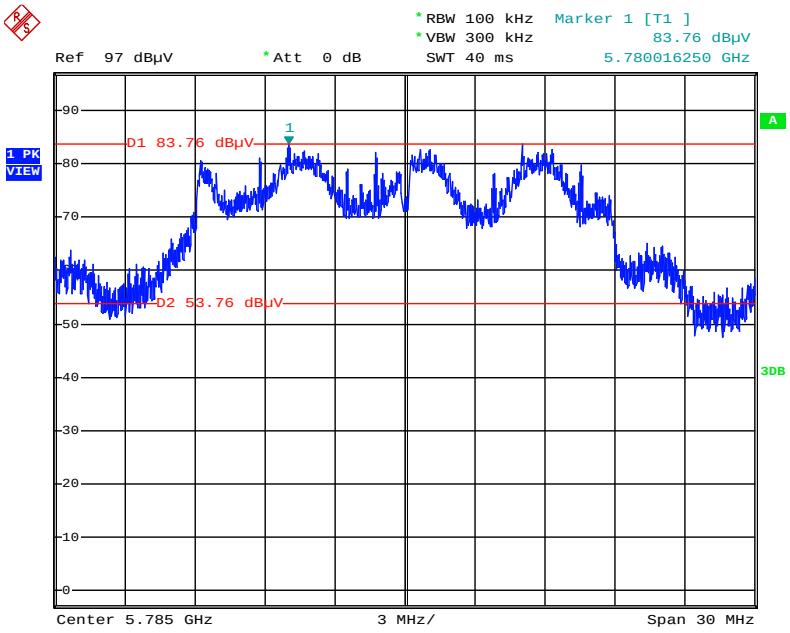


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)

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

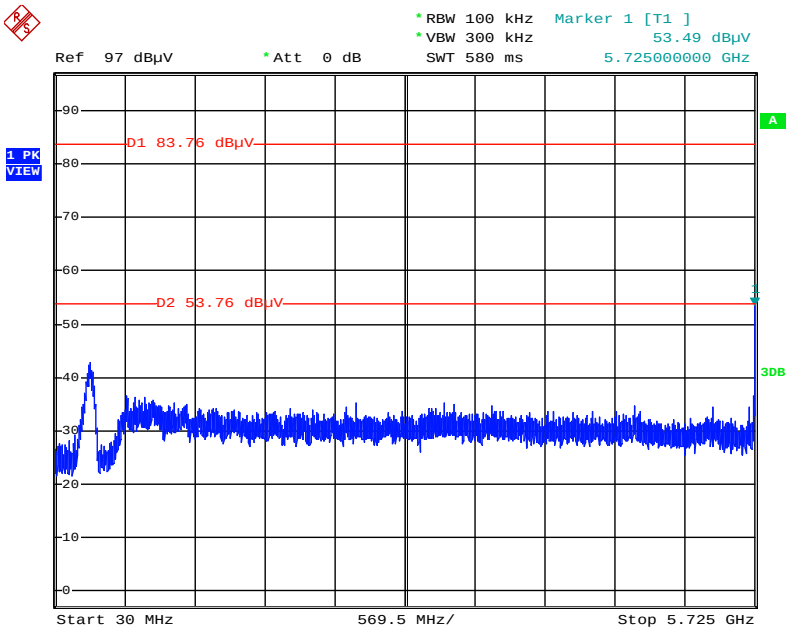


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



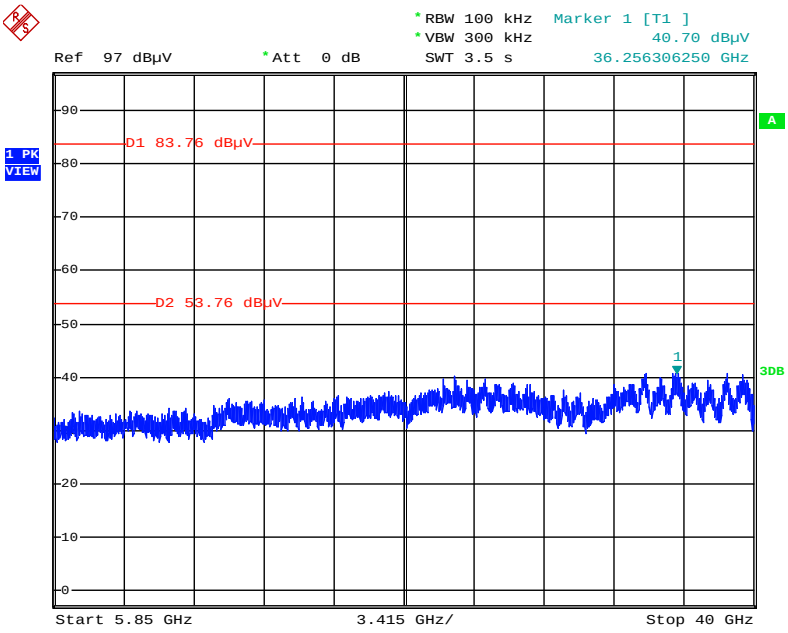
Date: 5.JUL.2014 00:21:47

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



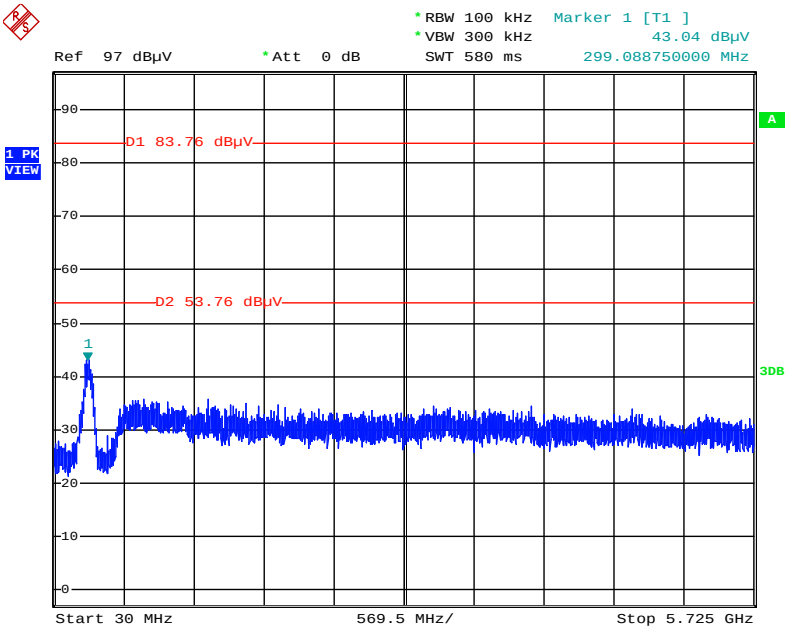
Date: 5.JUL.2014 00:22:21

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



Date: 5.JUL.2014 00:22:55

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



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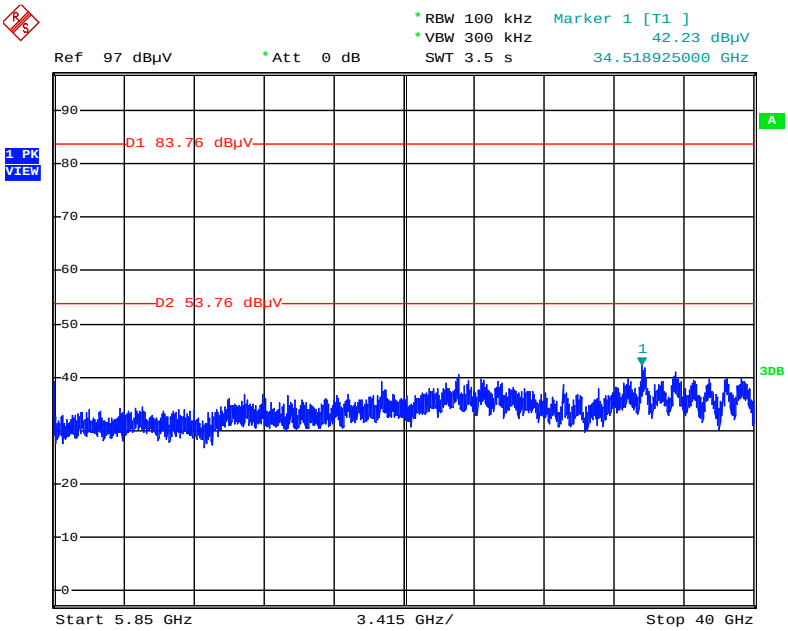
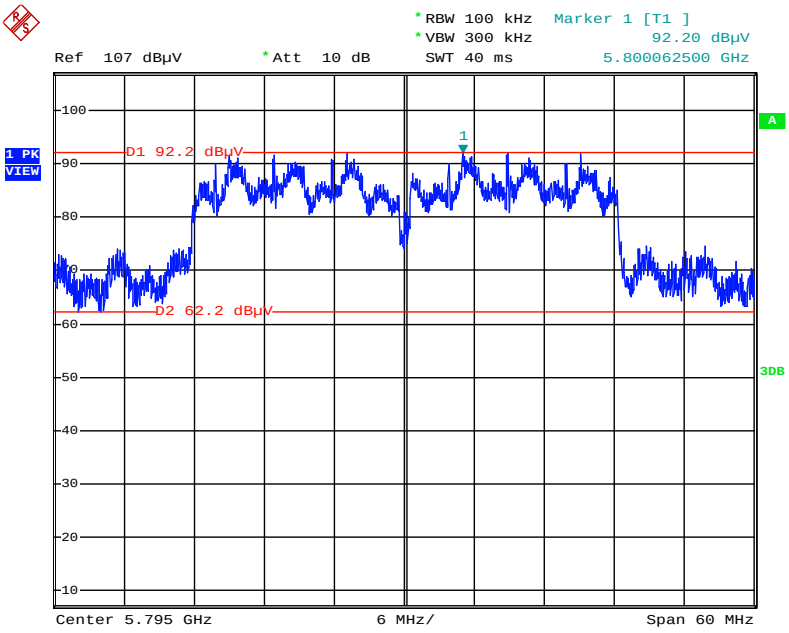
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)



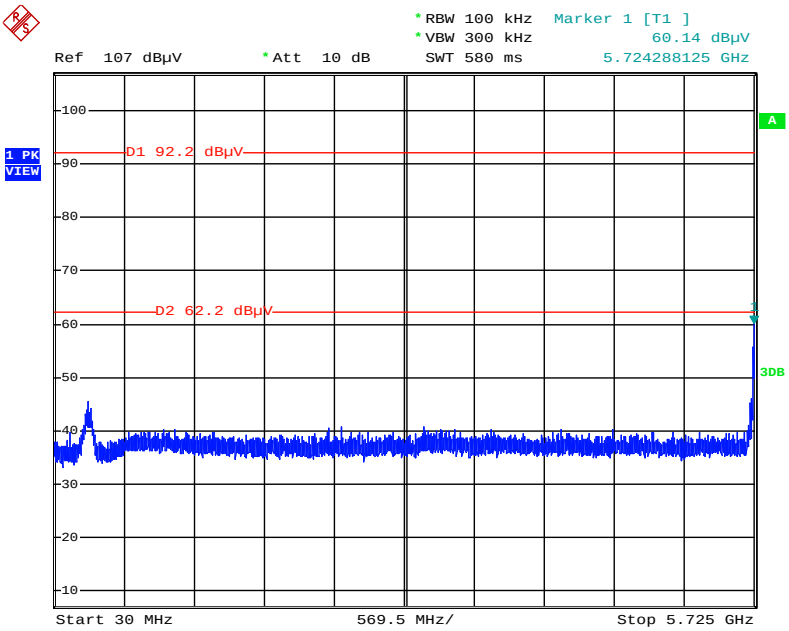
Date: 5.JUL.2014 00:23:39

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



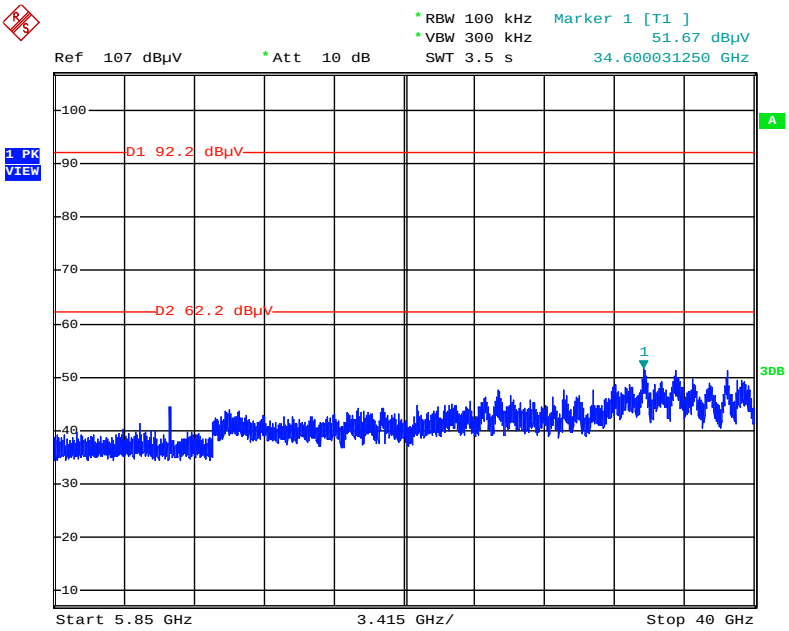
Date: 17.JUL.2014 03:24:14

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



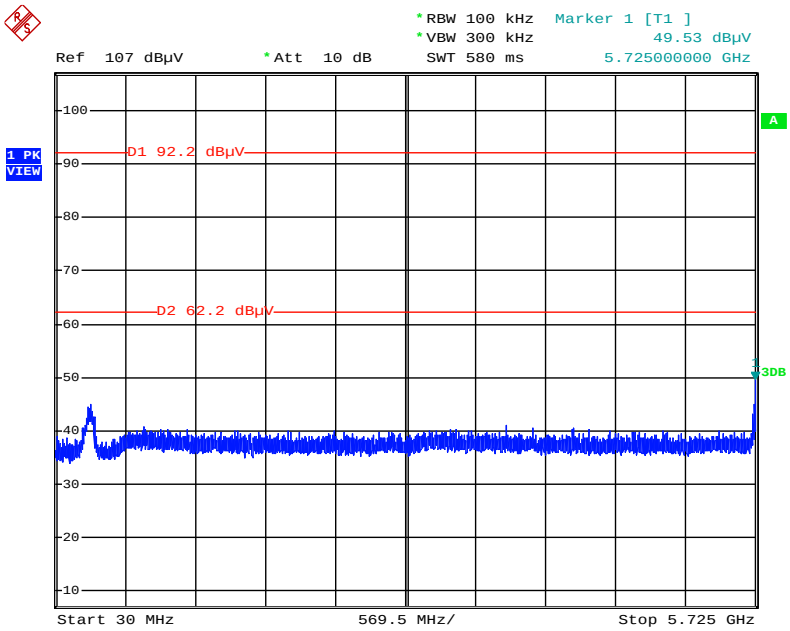
Date: 17.JUL.2014 03:28:57

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



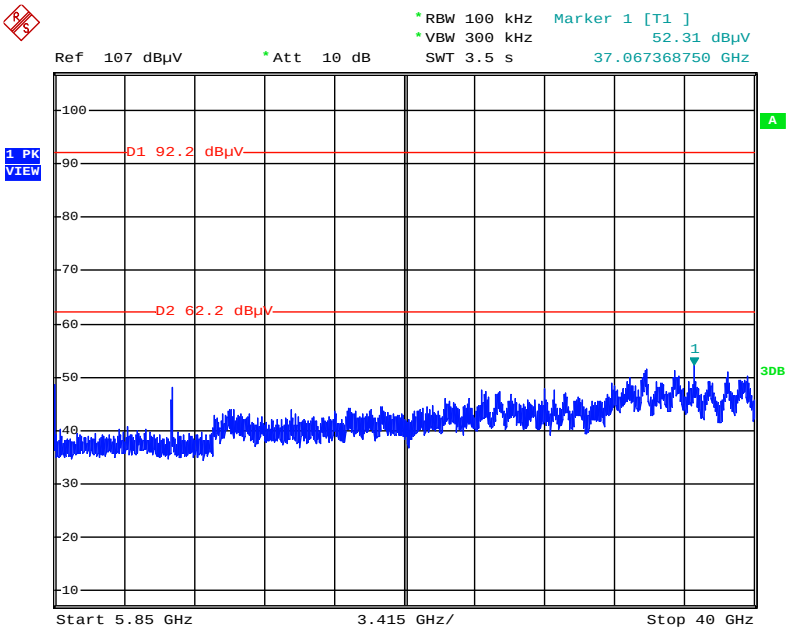
Date: 17.JUL.2014 03:29:26

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



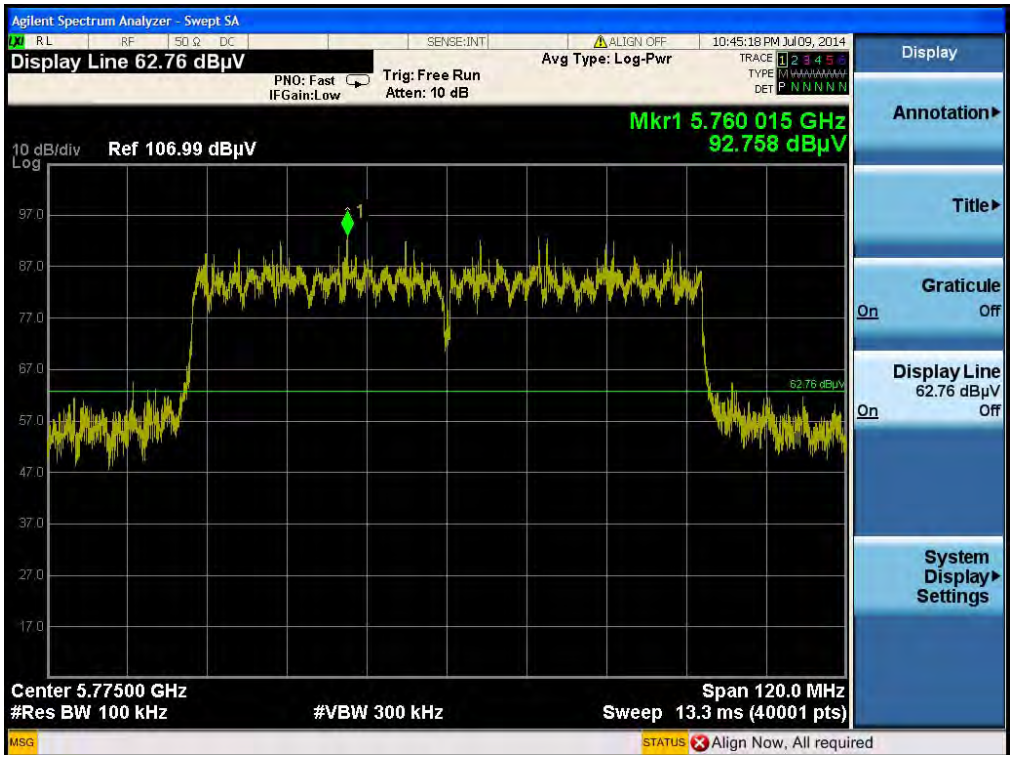
Date: 17.JUL.2014 03:25:59

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

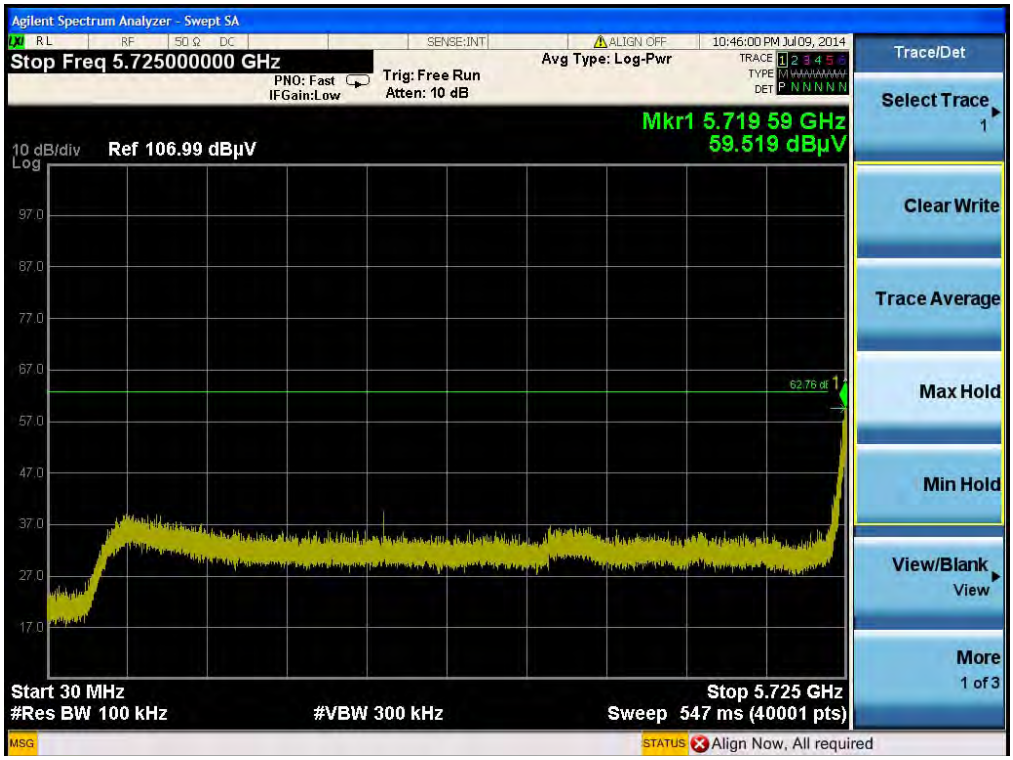


Date: 17.JUL.2014 03:26:39

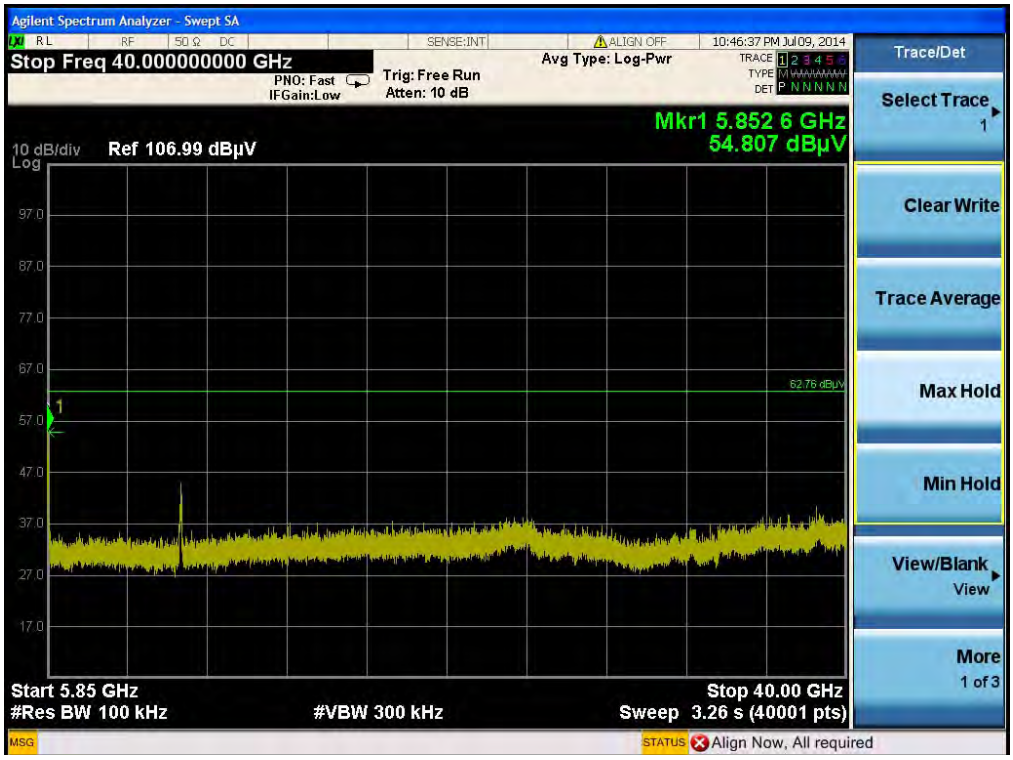
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



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

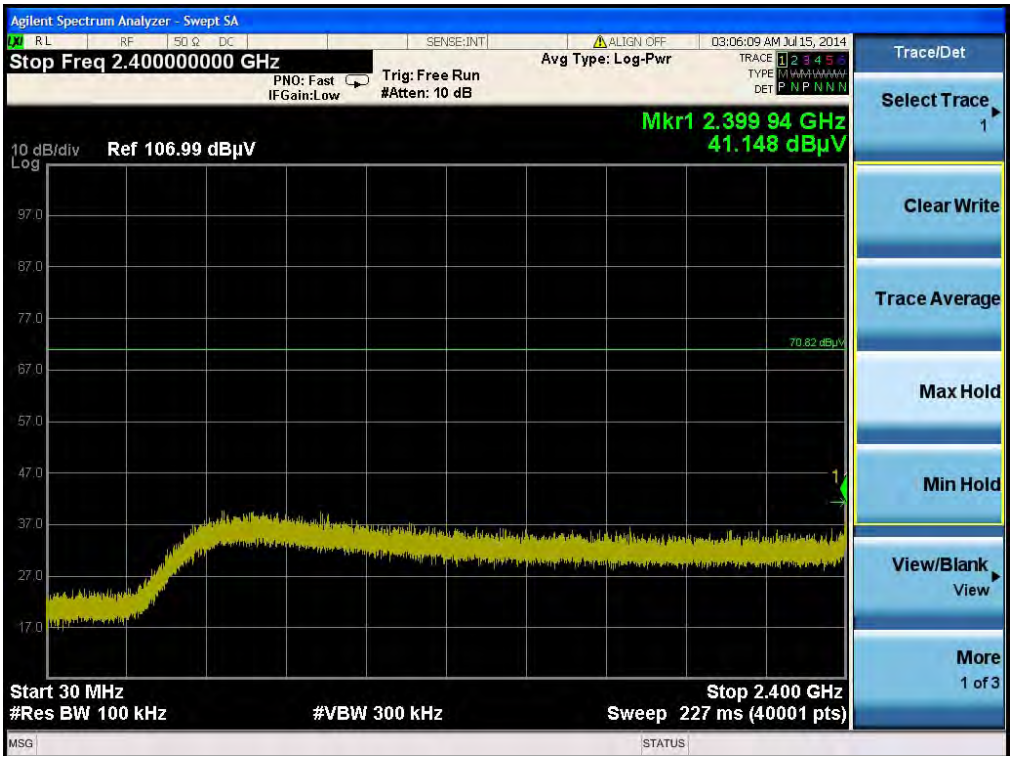


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)

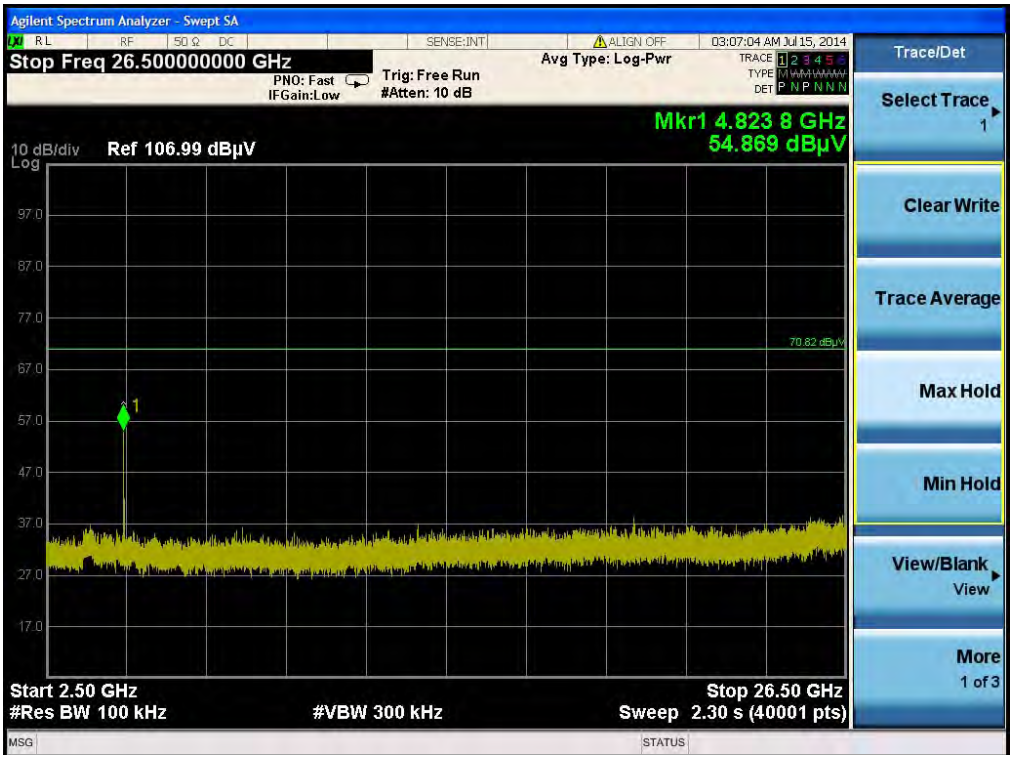


Plot on Configuration IEEE 802.11b / Reference Level

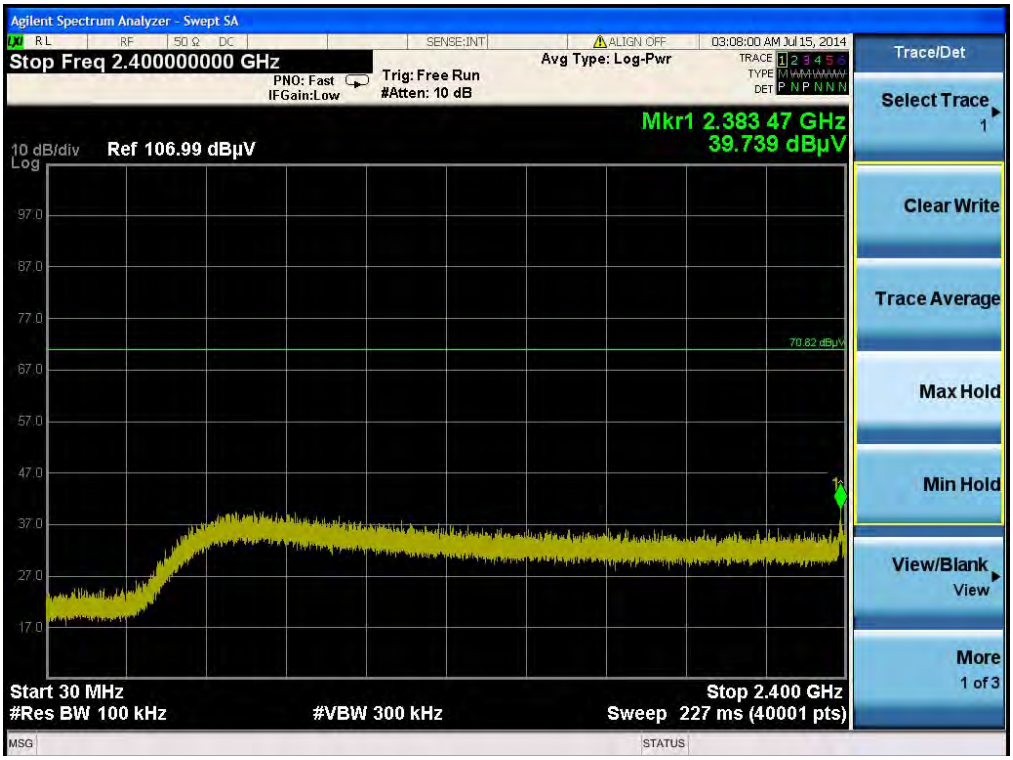
Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc)



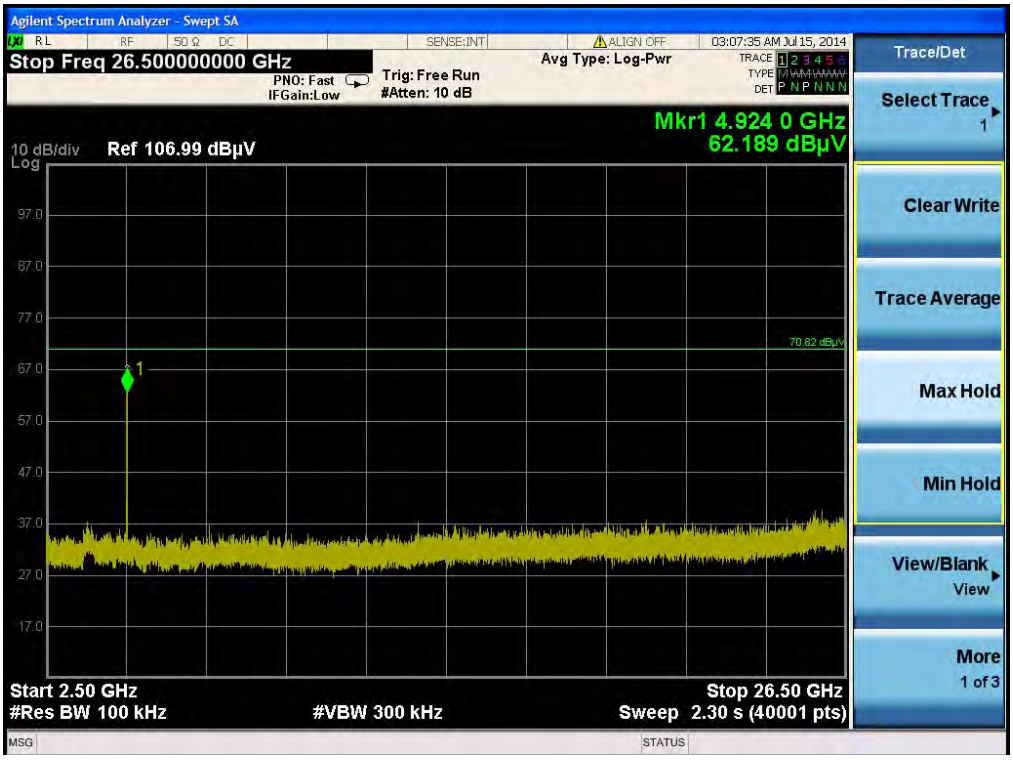
Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



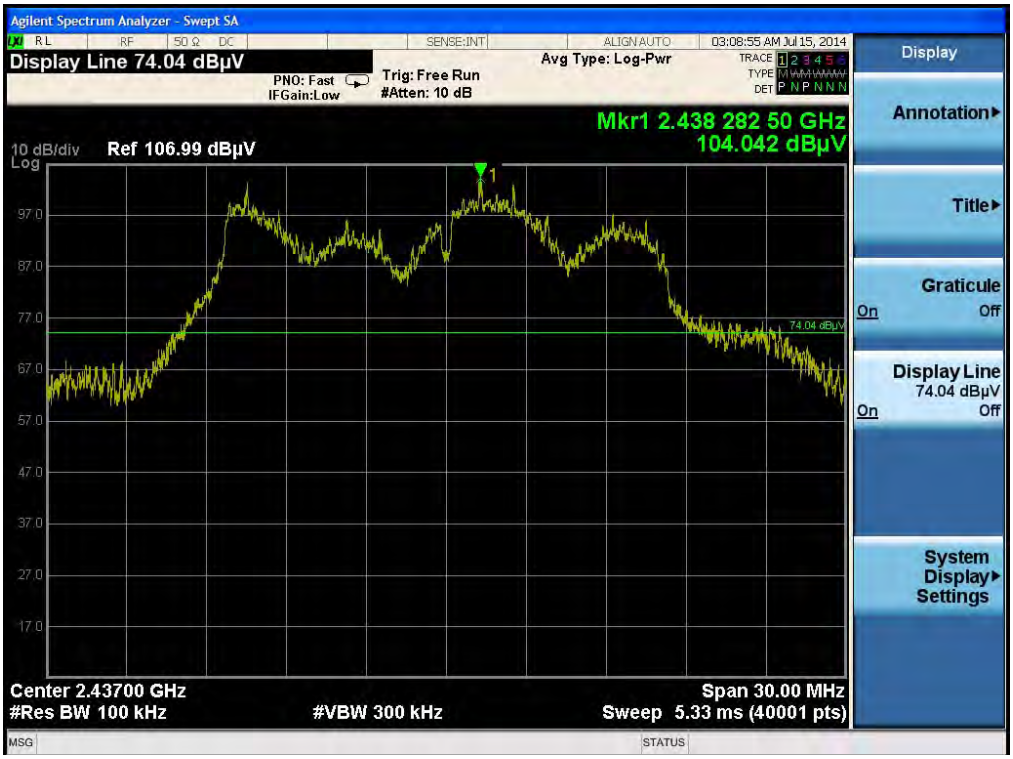
Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



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

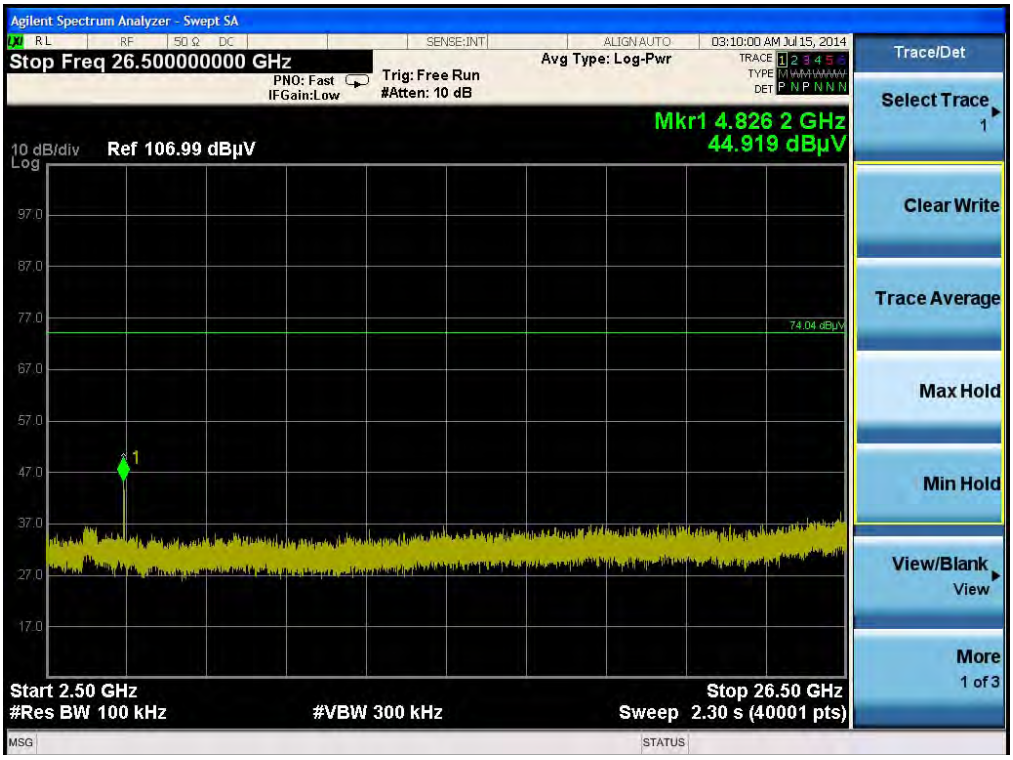


Plot on Configuration IEEE 802.11g / Reference Level



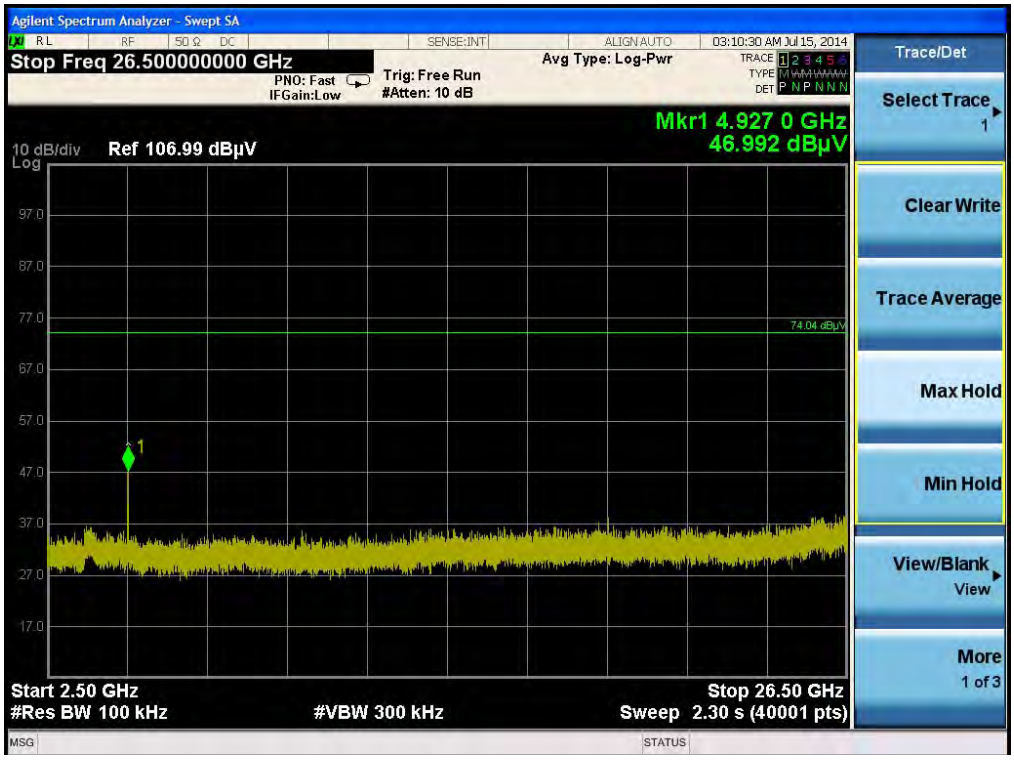
Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)

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

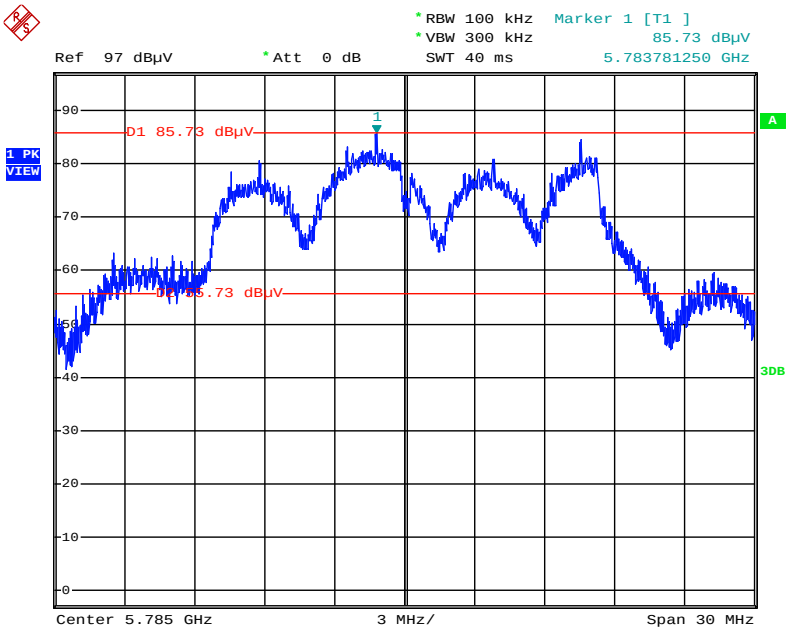


Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)

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

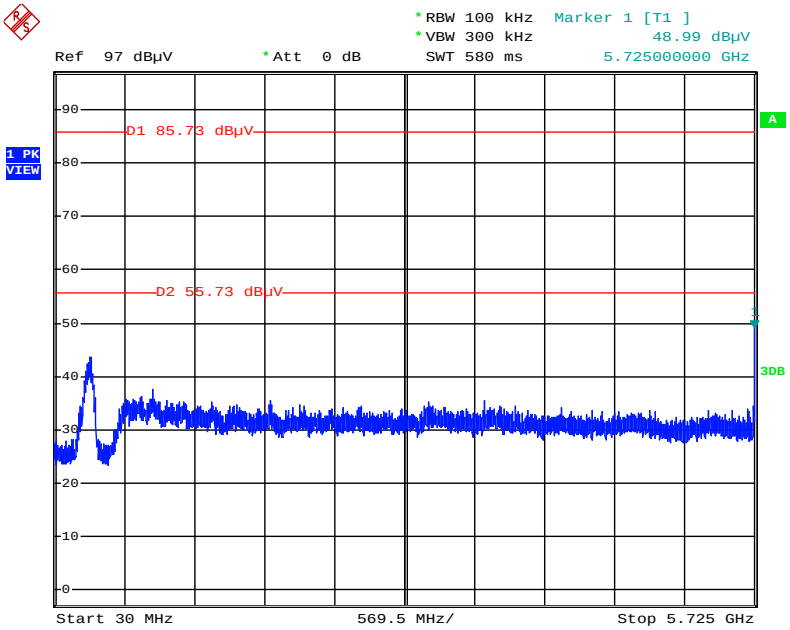


Plot on Configuration IEEE 802.11a / Reference Level



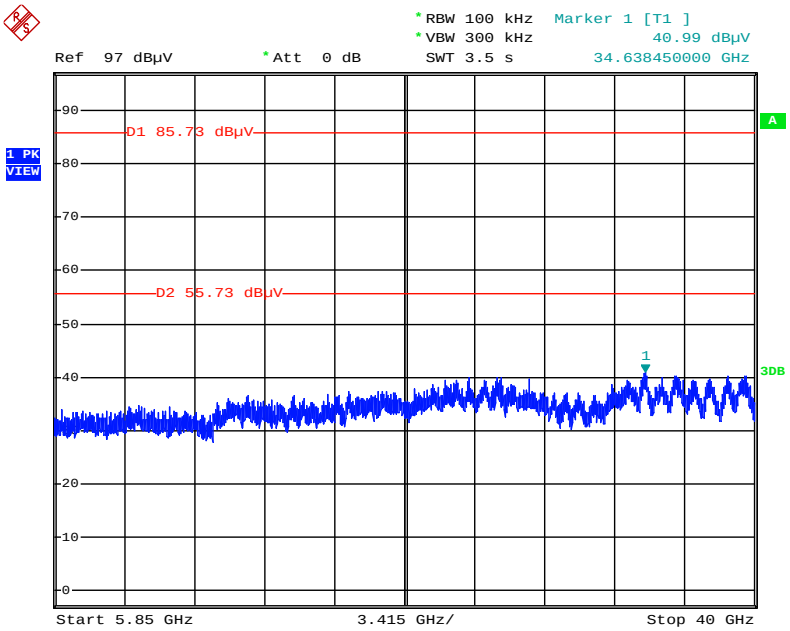
Date: 5.JUL.2014 00:27:37

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



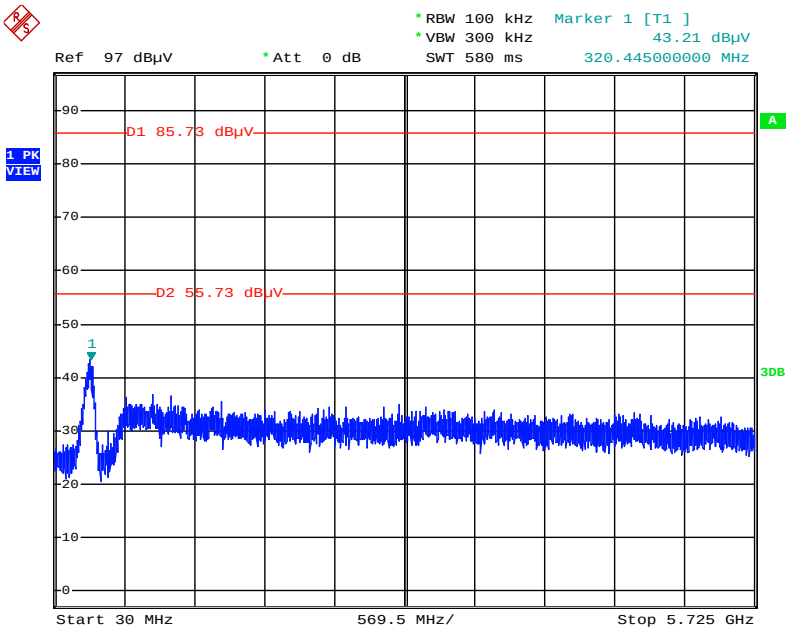
Date: 5.JUL.2014 00:28:28

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



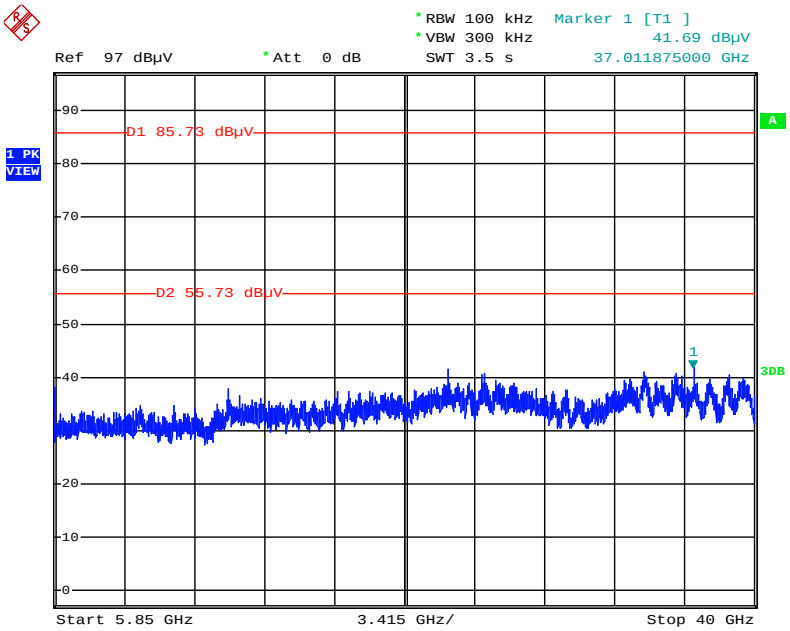
Date: 5.JUL.2014 00:28:58

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



Date: 5.JUL.2014 00:30:16

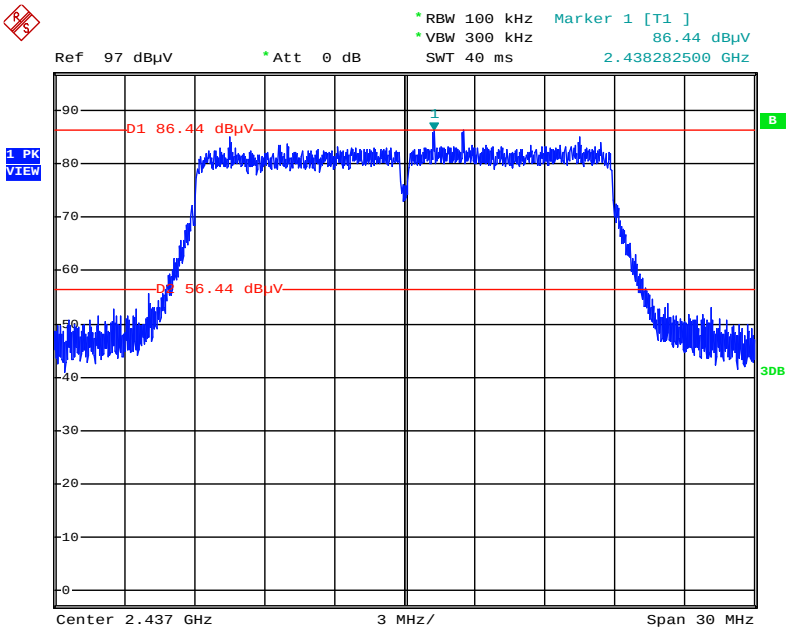
Plot on Configuration IEEE 802.11a / CH 165 / 5850MHz~40000MHz (down 30dBc)



Date: 5.JUL.2014 00:29:54

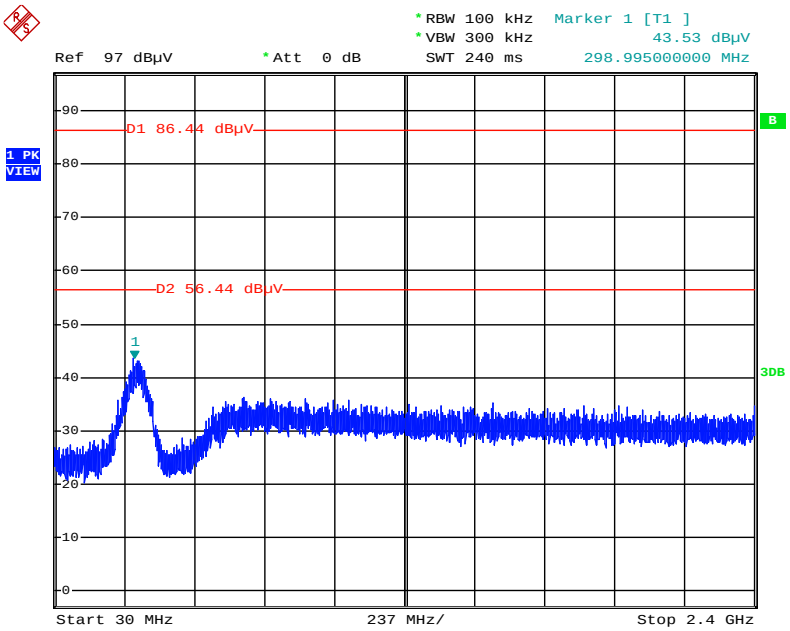
For beamforming function:

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



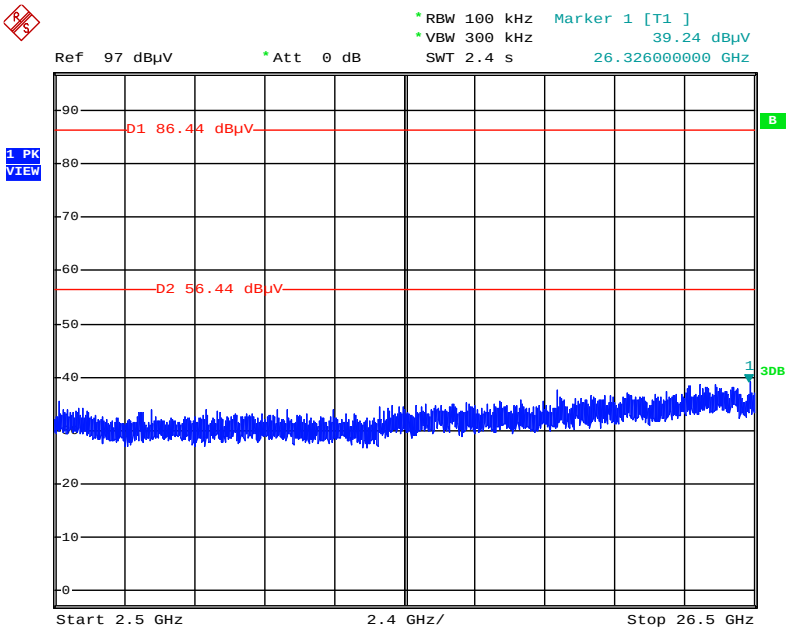
Date: 3.JUL.2014 02:16:47

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



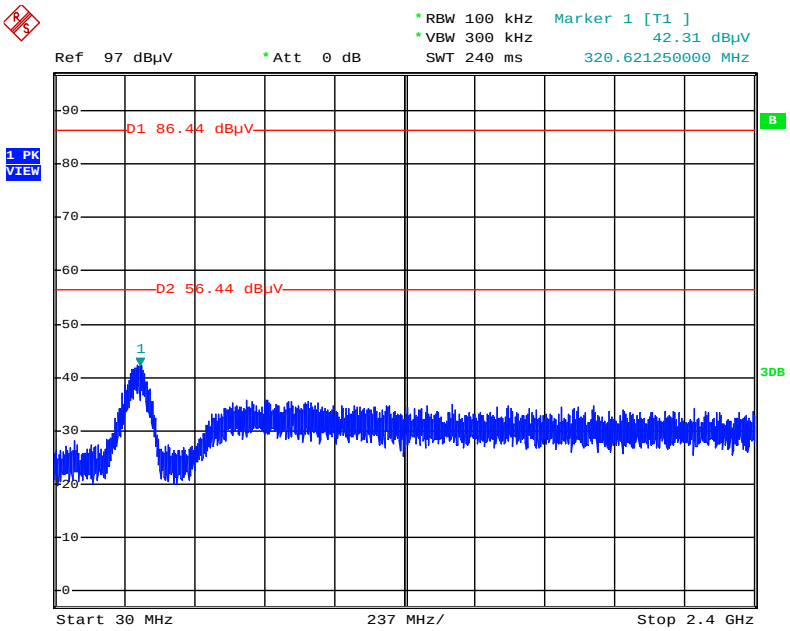
Date: 3.JUL.2014 02:17:17

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



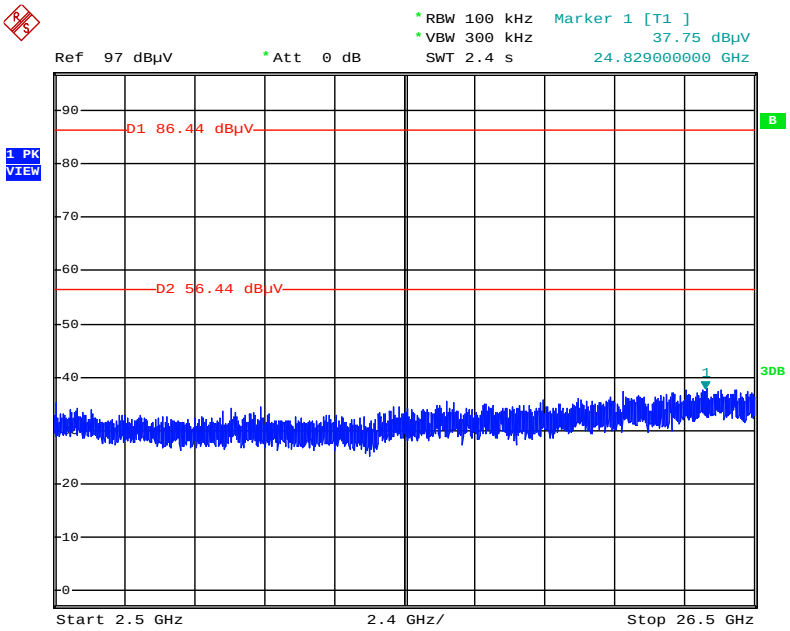
Date: 3.JUL.2014 02:17:41

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



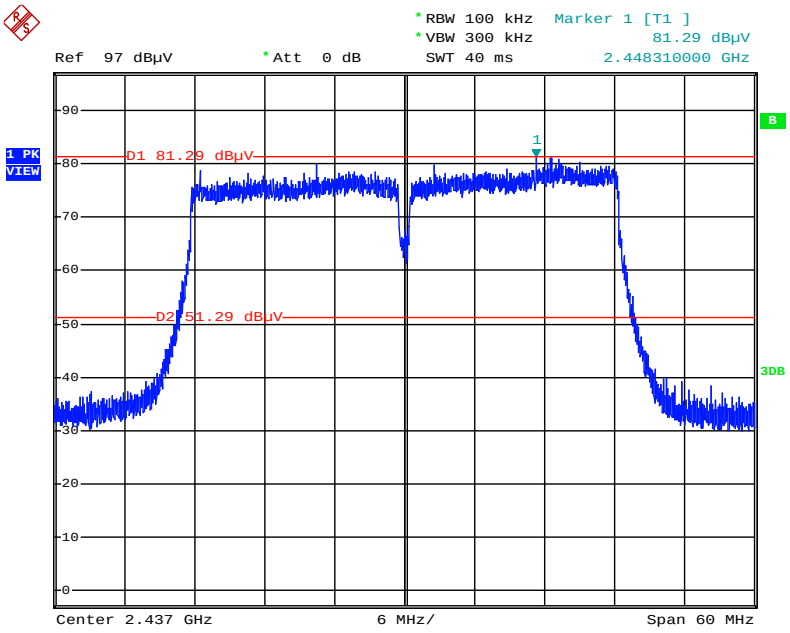
Date: 3.JUL.2014 02:18:24

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



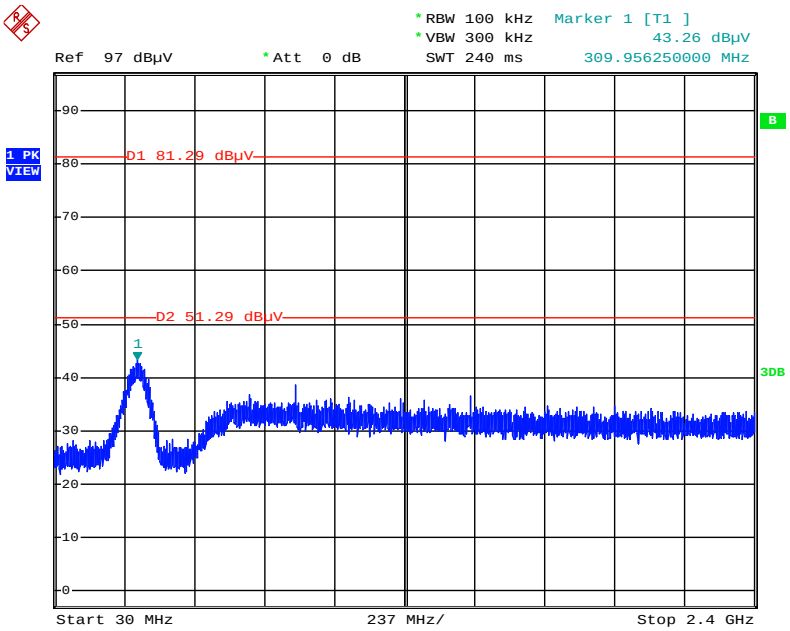
Date: 3.JUL.2014 02:18:39

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



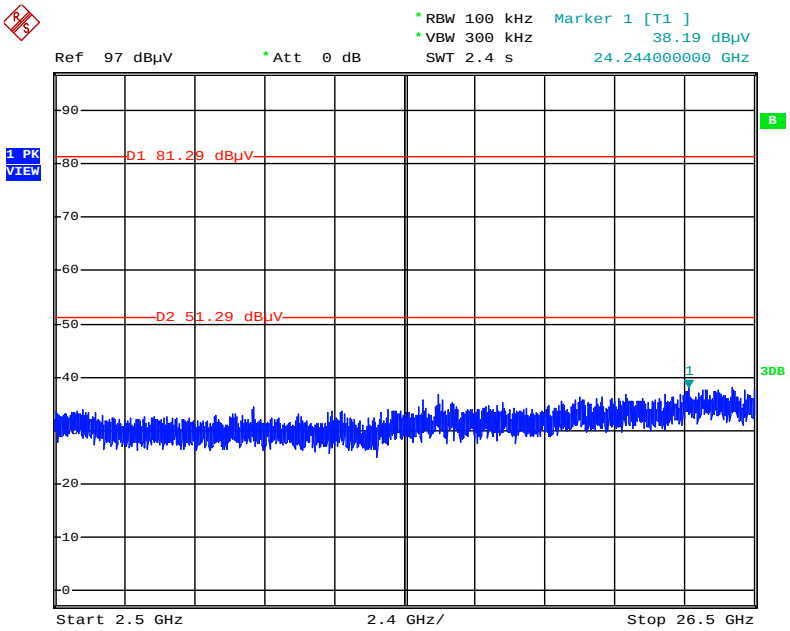
Date: 3.JUL.2014 02:11:55

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



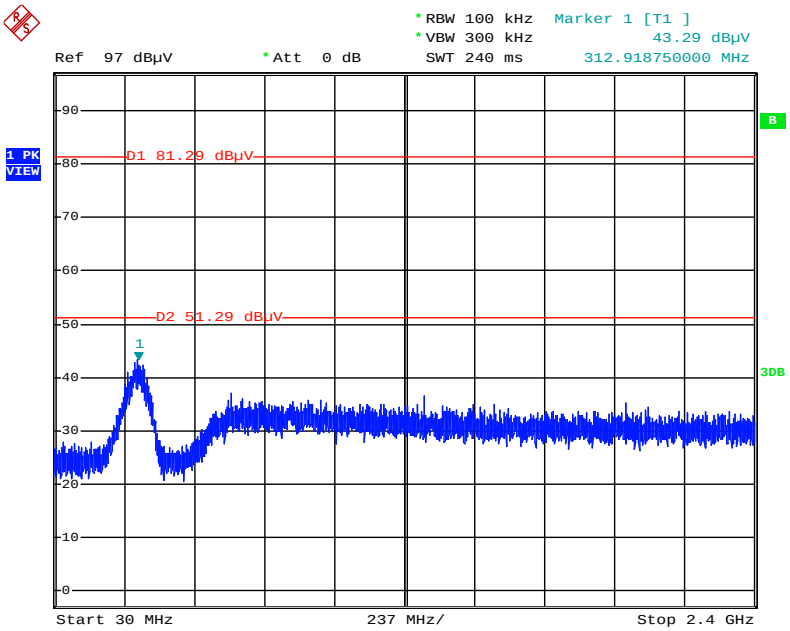
Date: 3.JUL.2014 02:12:48

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



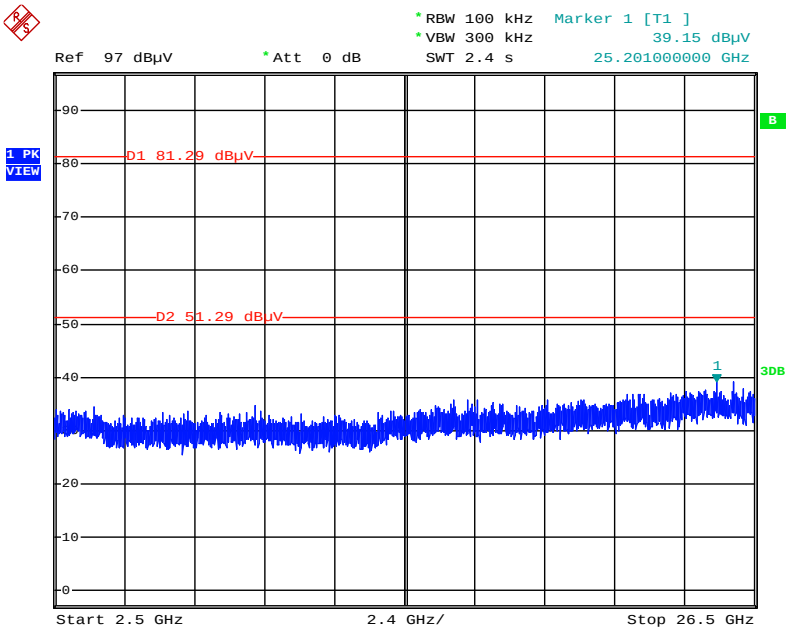
Date: 3.JUL.2014 02:13:08

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



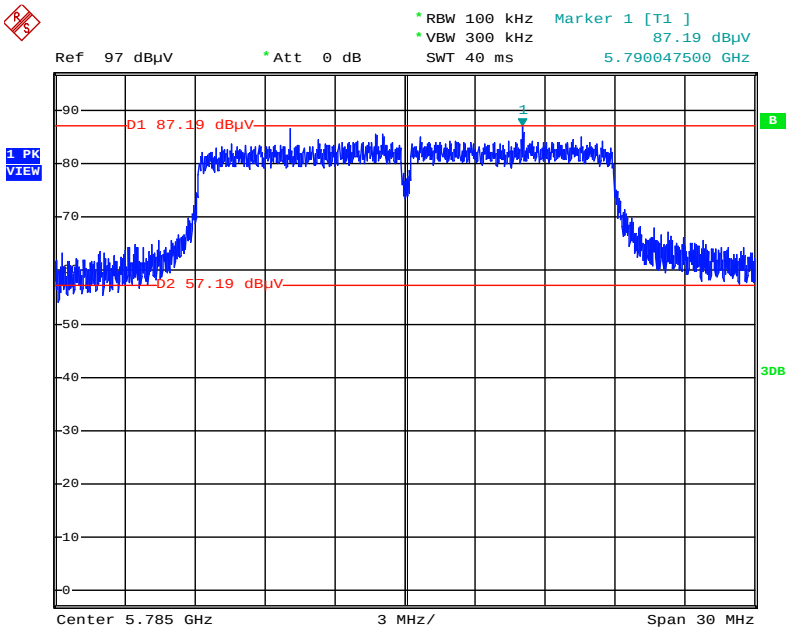
Date: 3.JUL.2014 02:13:51

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



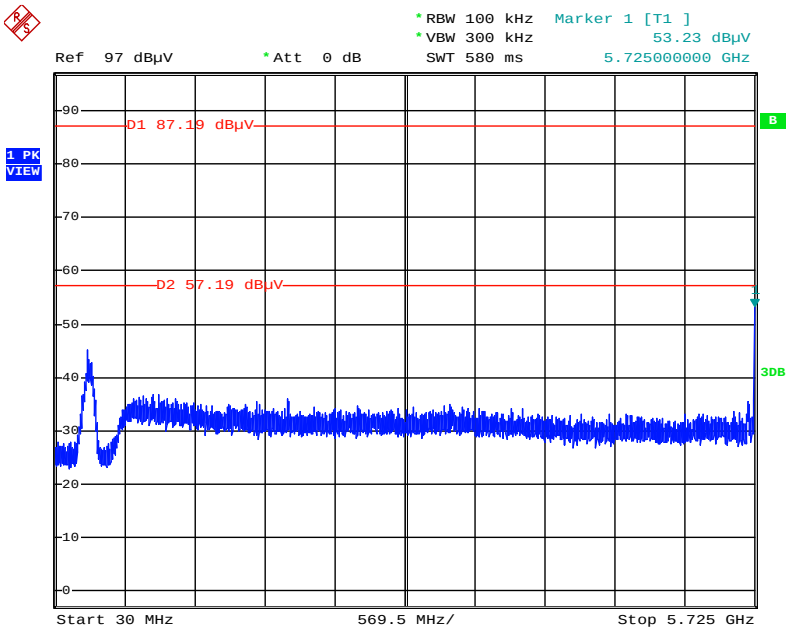
Date: 3.JUL.2014 02:14:03

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



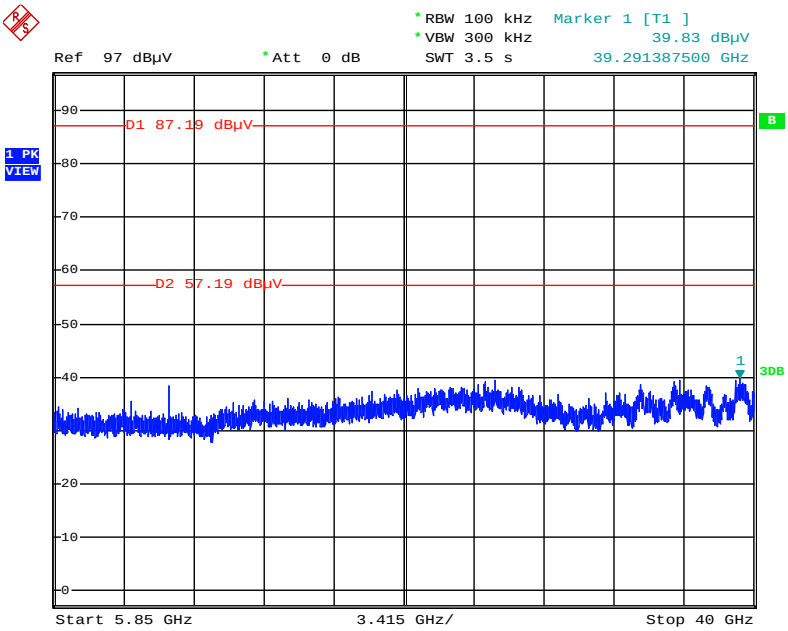
Date: 3.JUL.2014 00:03:06

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



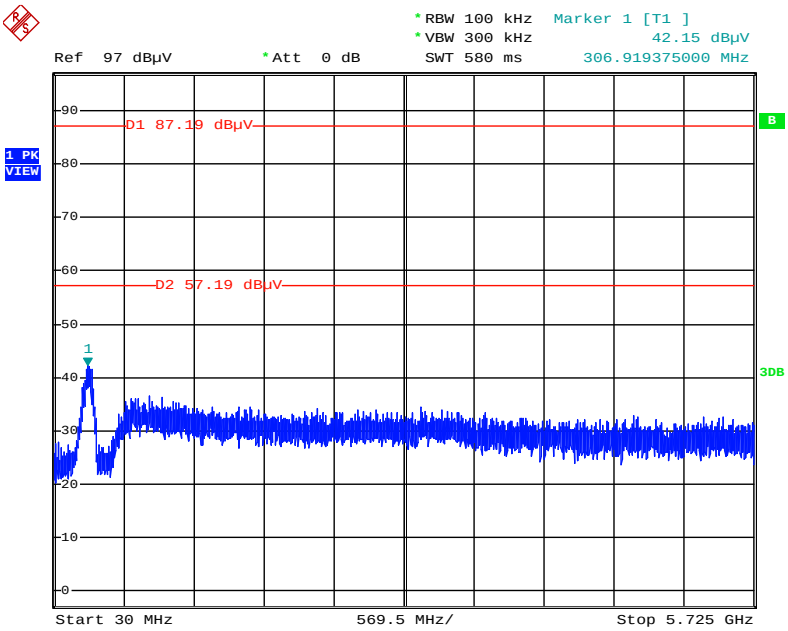
Date: 3.JUL.2014 00:03:52

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



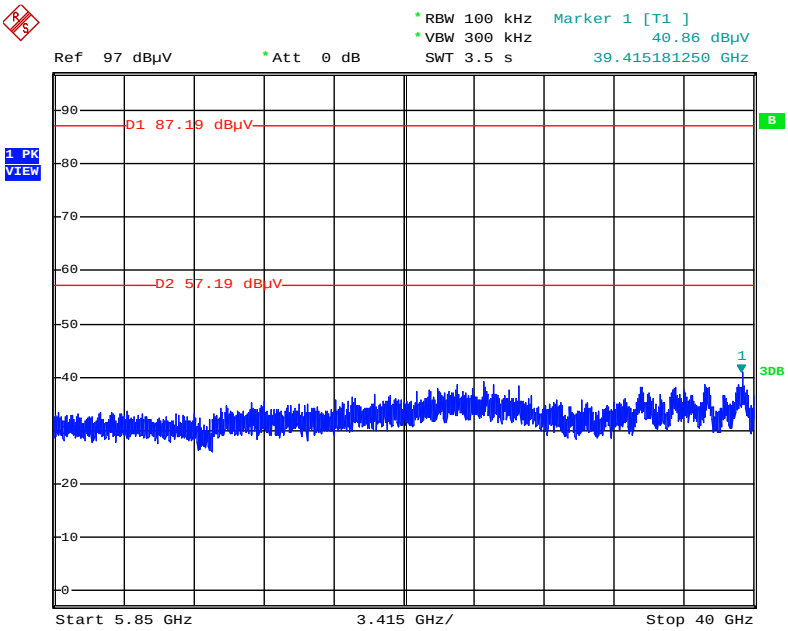
Date: 3.JUL.2014 00:05:09

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



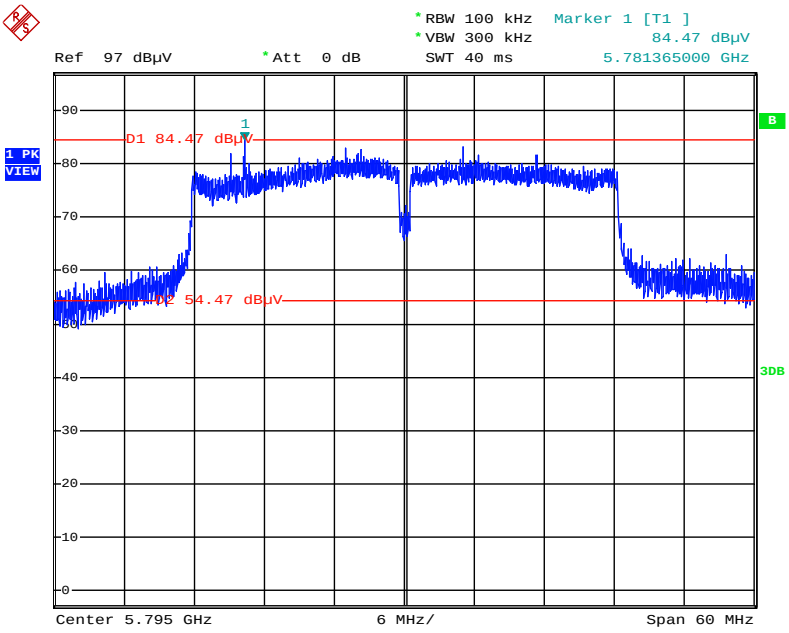
Date: 3.JUL.2014 00:35:37

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



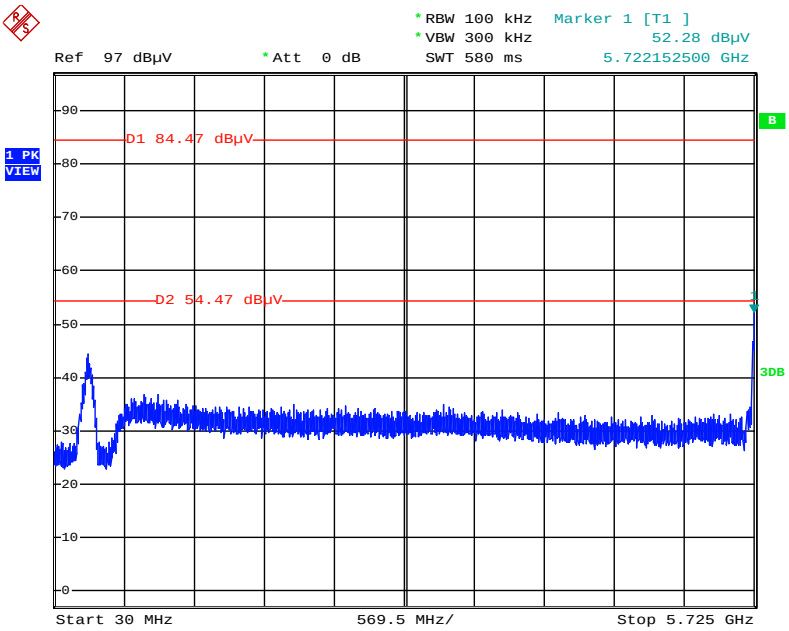
Date: 3.JUL.2014 00:35:56

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



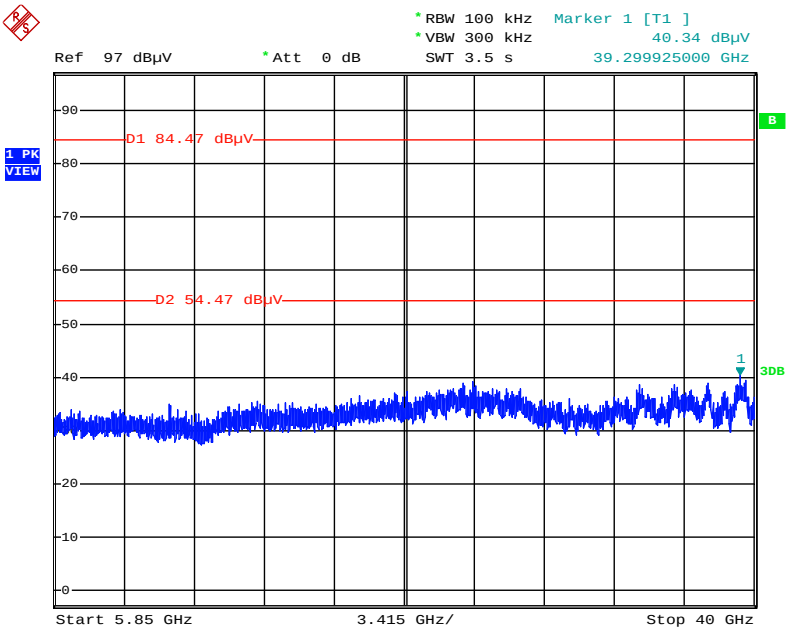
Date: 3.JUL.2014 00:11:01

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



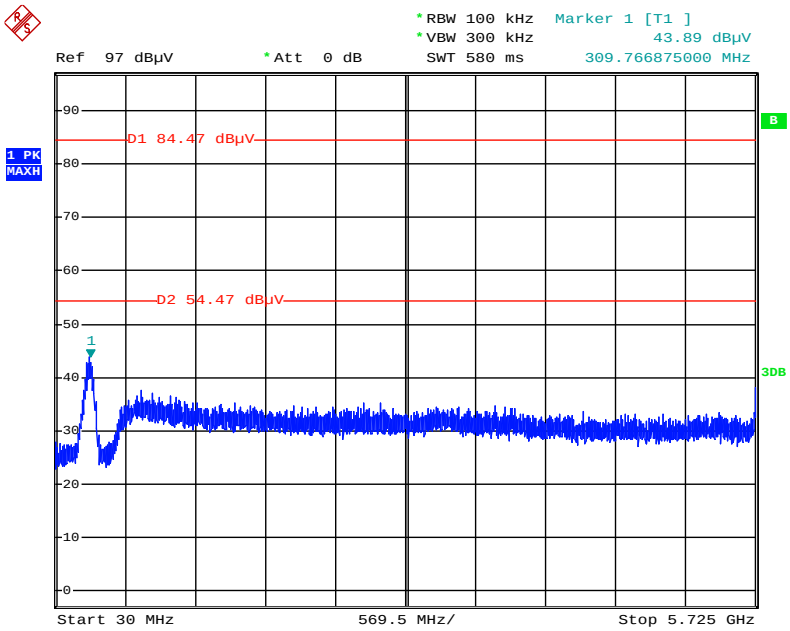
Date: 3.JUL.2014 00:16:33

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



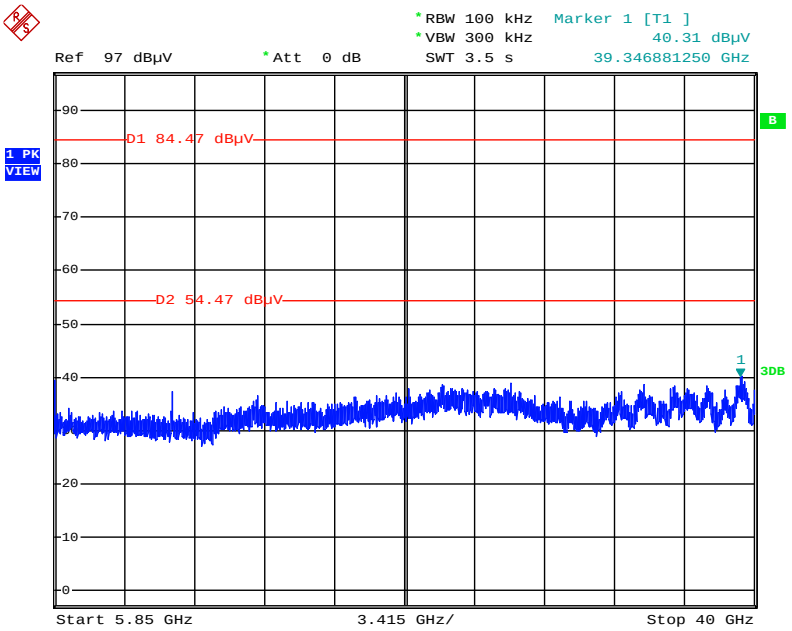
Date: 3.JUL.2014 00:16:51

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



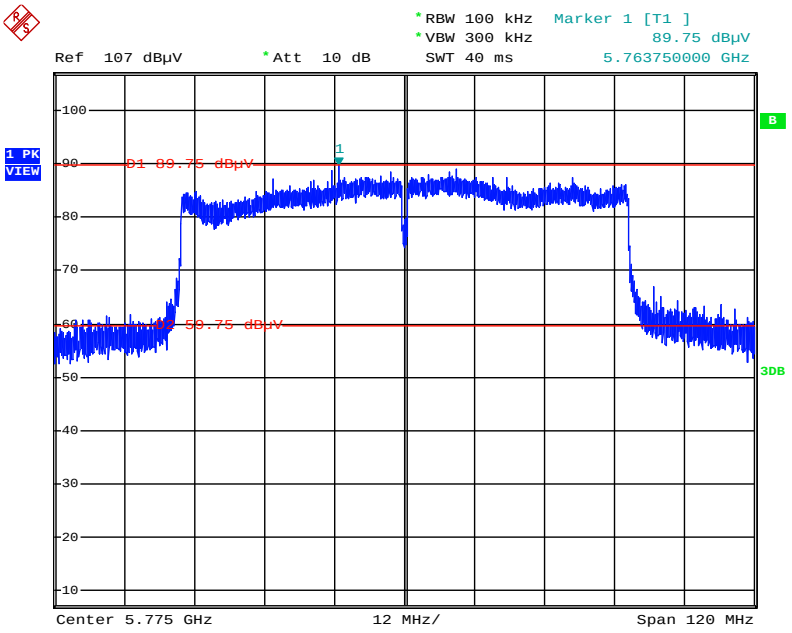
Date: 3.JUL.2014 00:11:36

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



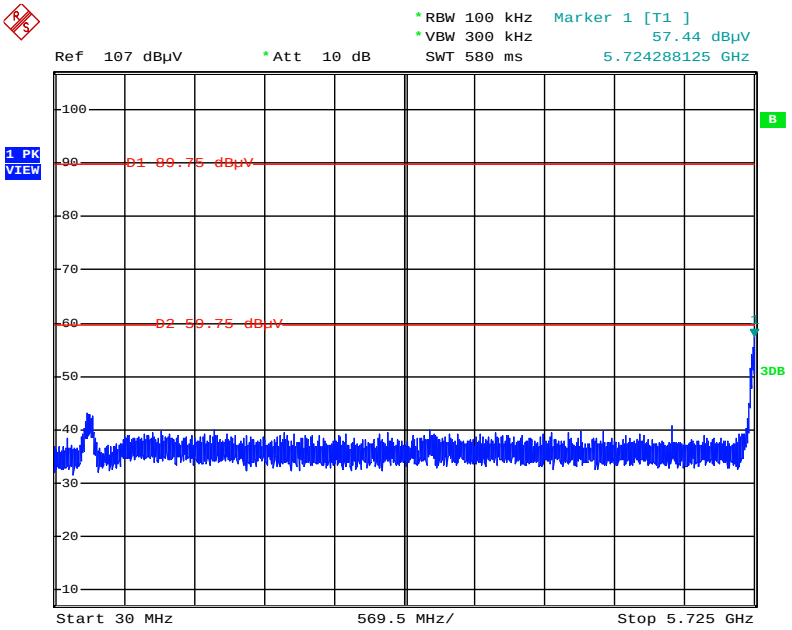
Date: 3.JUL.2014 00:11:59

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



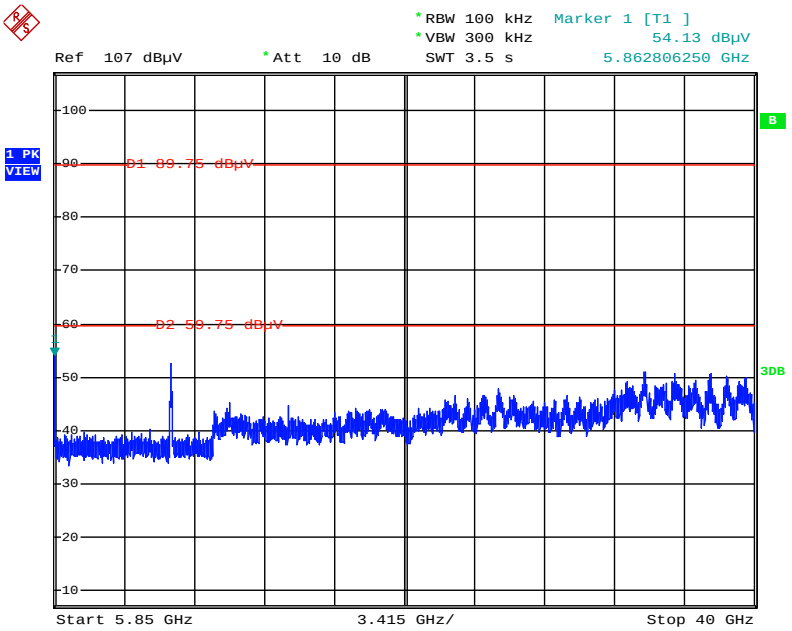
Date: 17.JUL.2014 21:56:19

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



Date: 17.JUL.2014 21:56:40

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



Date: 17.JUL.2014 21:57:05

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
MXE EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8 GHz	Dec. 25, 2013	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150 kHz ~ 100 MHz	Nov. 23, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 11, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150 kHz ~ 30 MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 2013	Conducted (TH01-CB)
Signal analyzer	Agilent	N9010A	MY52220519	10Hz~44GHz	Dec. 11, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)
BILOG ANTENNA	Teseq GmbH	CBL 6112D	35236	30MHz ~ 2GHz	Nov. 29, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
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)

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%