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FCC RADIO TEST REPORT

Applicant's company	**D-Link Corporation**
Applicant Address	No.289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan, R.O.C.
FCC ID	**KA2AP3662A1**

Product Name	Wireless AC1200 Dual Band Outdoor PoE Access Point
Brand Name	D-Link
Model No.	DAP-3662
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Oct. 22, 2014
Final Test Date	Dec. 18, 2014
Submission Type	Original Equipment

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart C**, **KDB 558074 D01 v03r02**, **KDB 662911 D01 v02r01**, **KDB644545 D01 v01r02.**

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

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4N2206AA	Rev. 01	Initial issue of report	Jan. 26, 2015

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless AC1200 Dual Band Outdoor PoE Access Point
Brand Name	:	D-Link
Model No.	:	DAP-3662
Applicant	:	D-Link Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Oct. 22, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	6.77 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	1.06 dB
4.3	15.247(e)	Power Spectral Density	Complies	0.01 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	3.31 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.10 dB
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter and PoE
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth ; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (HT20): 18.78 MHz ; MCS0 (HT40): 38.28 MHz For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 21.42 MHz ; 802.11ac MCS0/Nss1 (VHT40): 38.88 MHz ; 802.11ac MCS0/Nss1 (VHT80): 77.04 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (HT20): 27.12 dBm ; MCS0 (HT40): 22.09 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (VHT20): 28.68 dBm ; 802.11ac MCS0/Nss1 (VHT40): 28.06 dBm ; 802.11ac MCS0/Nss1 (VHT80): 25.08 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 (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter and PoE
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: 10.80 MHz ; 11g: 17.58 MHz ; 11a: 19.08 MHz
Maximum Conducted Output Power	11b: 27.03 dBm ; 11g: 27.96 dBm ; 11a: 28.74 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☐ With beamforming	☒ Without beamforming

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS0-15
802.11n (HT40)	2	MCS0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

Power	Brand	Model	Rating
Adapter	LEI	MU24-B480050-A1	Input: 100-240VAC, 50/60Hz 1.0A Output: 48VDC, 0.5A
PoE	LanReady	PE03G	Input: 8-57VDC (Max. 48W) Output: 8-57VDC (Max. 48W)
Others			
Ground Cable*1, Non-shielded, 0.2m			

3.3. Table for Filed Antenna

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	Grand-Tek	OA-58-06-03	Embedded Antenna	I-PEX	-	6.2
2	Grand-Tek	OA-58-05-02	Embedded Antenna	I-PEX	-	6.2
3	Grand-Tek	OA-24-05-06	Embedded Antenna	I-PEX	6.1	-
4	Grand-Tek	OA-24-04-02	Embedded Antenna	I-PEX	4.8	-

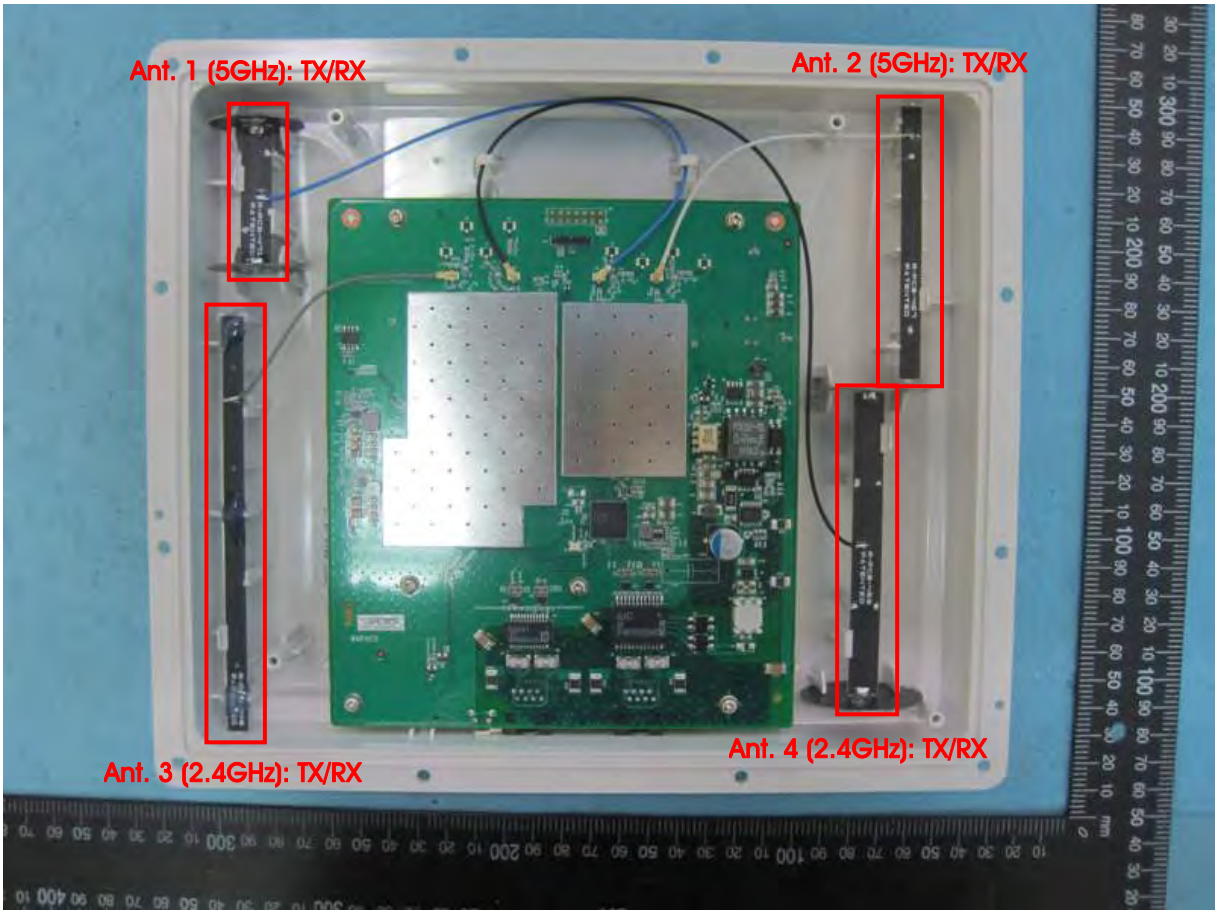
Note: The EUT has four antennas.

For IEEE 802.11a/n/ac mode:

Ant. 1 and Ant. 2 could transmit/receive simultaneously.

For IEEE 802.11b/g/n mode:

Ant. 3 and Ant. 4 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

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

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

For 5GHz Band:

There are three bandwidth systems.

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

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

For 80MHz bandwidth systems, use Channel 155.

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

3.5. Table for Test Modes

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

For 2.4GHz Band:

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	11n HT20	MCS0	1/6/11	3+4
	11n HT40	MCS0	3/6/9	3+4
	11b/CCK	1 Mbps	1/6/11	3+4
	11g/BPSK	6 Mbps	1/6/11	3+4
Power Spectral Density	11n HT20	MCS0	1/6/11	3+4
	11n HT40	MCS0	3/6/9	3+4
	11b/CCK	1 Mbps	1/6/11	3+4
	11g/BPSK	6 Mbps	1/6/11	3+4
6dB Spectrum Bandwidth	11n HT20	MCS0	1/6/11	3+4
	11n HT40	MCS0	3/6/9	3+4
	11b/CCK	1 Mbps	1/6/11	3+4
	11g/BPSK	6 Mbps	1/6/11	3+4
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11n HT20	MCS0	1/6/11	3+4
	11n HT40	MCS0	3/6/9	3+4
	11b/CCK	1 Mbps	1/6/11	3+4
	11g/BPSK	6 Mbps	1/6/11	3+4
Band Edge Emissions	11n HT20	MCS0	1/6/11	3+4
	11n HT40	MCS0	3/6/9	3+4
	11b/CCK	1 Mbps	1/6/11	3+4
	11g/BPSK	6 Mbps	1/6/11	3+4

For 5GHz Band:

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

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

The following test modes were performed for all tests:

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

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

3.6. Table for Testing Locations

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

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

3.7. Table for Supporting Units

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	DoC
Notebook	DELL	M1340	DoC
Notebook	DELL	E6430	DoC
Notebook	DELL	D420	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Notebook	DELL	E6430	DoC
Notebook	DELL	E6430	DoC
LCD Monitor	DELL	E1913C	DoC
Printer	EPSON	LQ-300+	DoC
Modem	ACEEX	DM1414	N/A
PC	DELL	T3400	IFAXDM1414
Mouse	HP	FM100	DoC
Keyboard	iCooky	SK068	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6220	DoC

3.8. Table for Parameters of Test Software Setting

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

For 2.4GHz Band

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 HT20	15.5	24	15

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	DOS		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 HT40	12.5	18.5	14.5

Power Parameters of IEEE 802.11b/g

Test Software Version	DOS		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	24	24	24
IEEE 802.11g	16.5	25	16

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	24	25	25

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	DOS	
Frequency	5755 MHz	5795 MHz
MCS0/Nss1 VHT40	24	25

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	DOS
Frequency	5775 MHz
MCS0/Nss1 VHT80	22.5

Power Parameters of IEEE 802.11a

Test Software Version	DOS		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	24	25	25

3.9. EUT Operation during Test

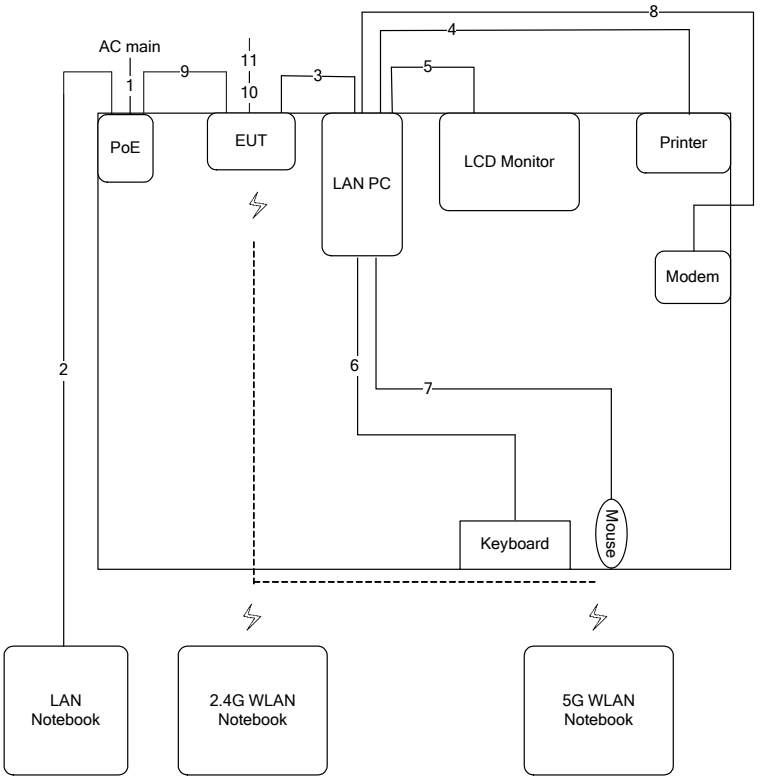
The EUT was programmed to be in continuously transmitting mode.

3.10. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11n MCS0 HT20	1.882	1.931	97.46	0.11	0.53
802.11n MCS0 HT40	1.874	1.931	97.05	0.13	0.53
802.11b	1.000	1.000	100.00	0.00	0.01
802.11g	2.014	2.057	97.91	0.09	0.50
802.11ac MCS0/Nss1 VHT20	1.891	1.952	96.88	0.14	0.53
802.11ac MCS0/Nss1 VHT40	0.899	0.951	94.53	0.24	1.11
802.11ac MCS0/Nss1 VHT80	0.446	0.503	88.67	0.52	2.24
802.11a	2.021	2.086	96.88	0.14	0.49

3.11. Test Configurations

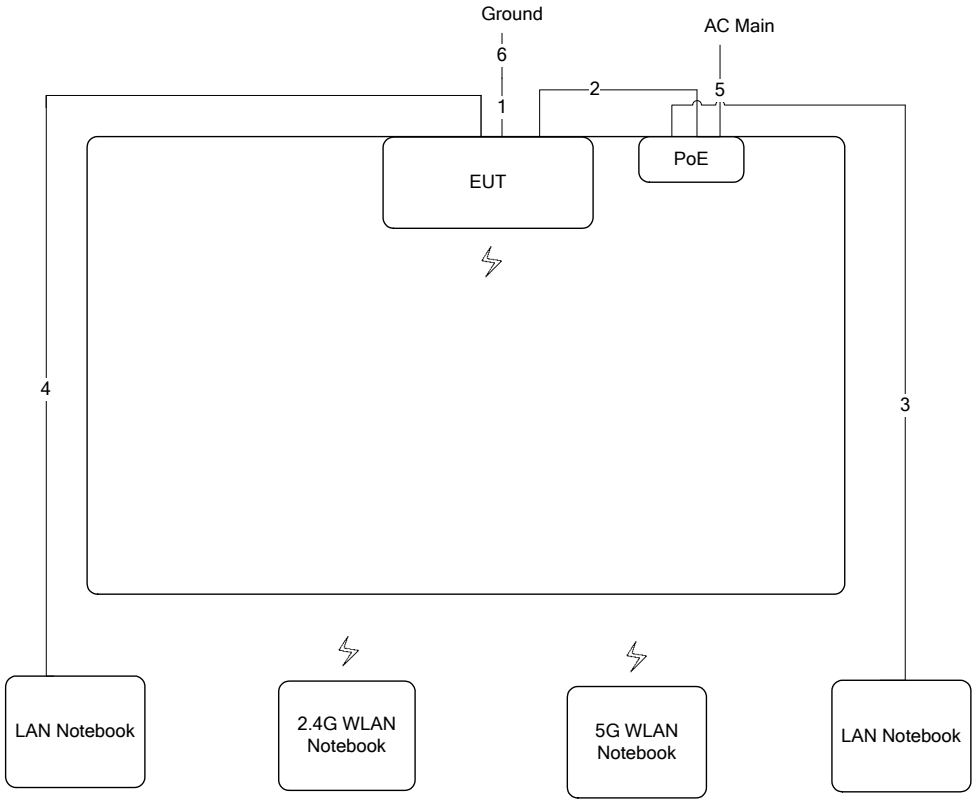
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length (m)
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	3m
4	USB cable	Yes	1.8m
5	VGA cable	Yes	1.8m
6	USB cable	Yes	1.8m
7	USB cable	Yes	1.8m
8	RS-232 cable	Yes	1.8m
9	RJ-45 cable	No	3m
10	Ground cable	No	0.2m
11	Ground cable	No	1.5m

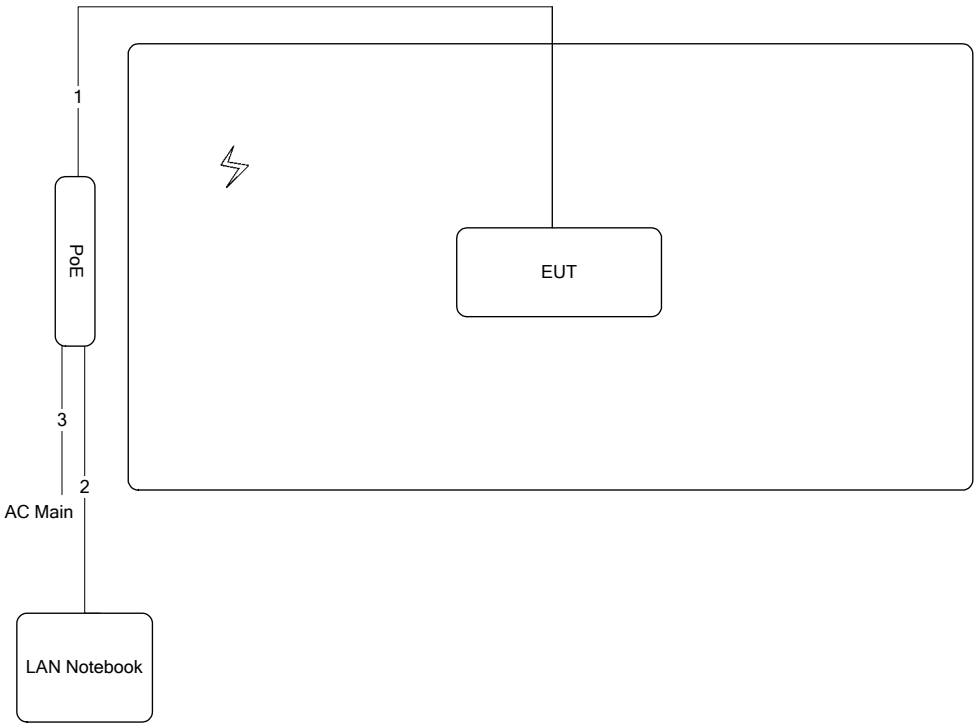
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length (m)
1	Ground cable	No	0.2m
2	RJ-45 cable	No	1m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	Power cable	No	1.5m
6	Ground cable	No	1.5m

Test Configuration: above 1GHz



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

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

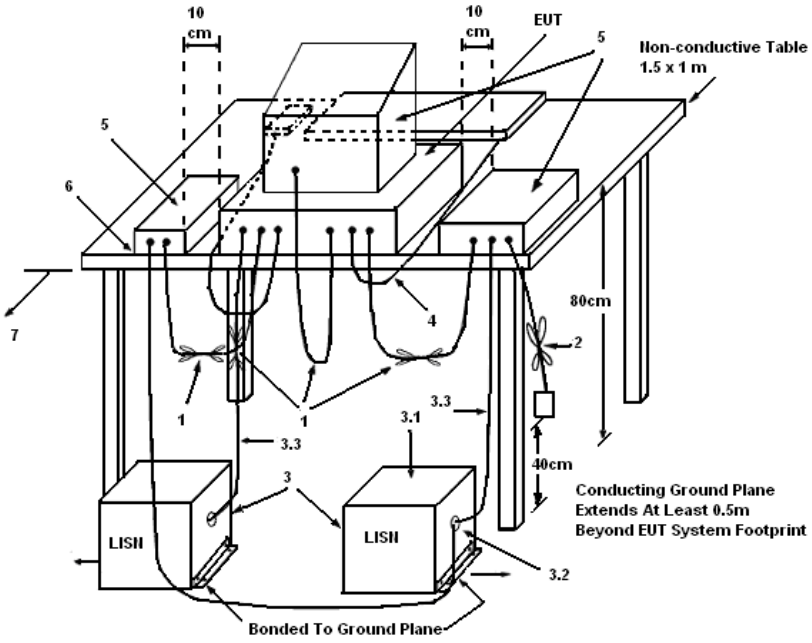
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

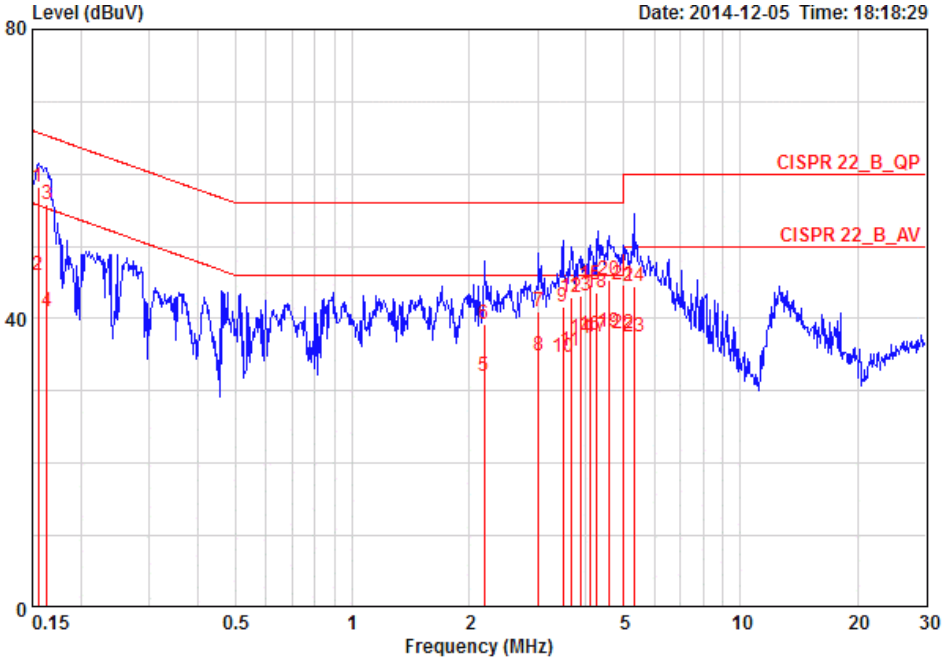
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

4.1.7. Results of AC Power Line Conducted Emissions Measurement

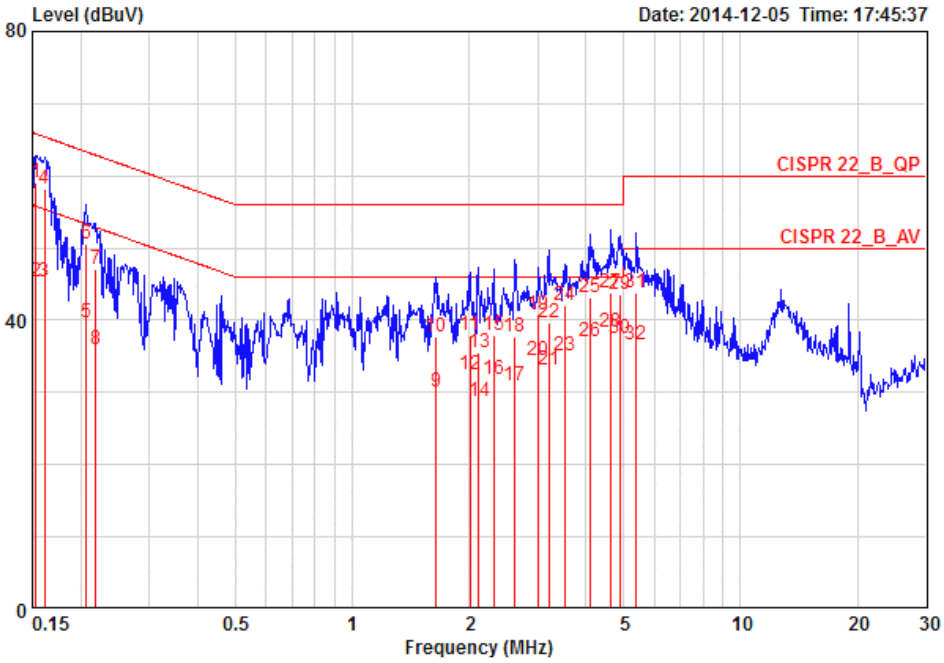
Temperature	24°C	Humidity	56%
Test Engineer	Sollo Luo	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1 @	0.15567	58.26	-7.43	65.69	48.14	9.96	0.16	QP	LINE
2	0.15567	46.00	-9.69	55.69	35.88	9.96	0.16	AVERAGE	LINE
3	0.16327	55.76	-9.54	65.30	45.64	9.96	0.16	QP	LINE
4	0.16327	41.06	-14.24	55.30	30.94	9.96	0.16	AVERAGE	LINE
5	2.190	31.97	-14.03	46.00	21.68	10.04	0.26	AVERAGE	LINE
6	2.190	39.30	-16.70	56.00	29.01	10.04	0.26	QP	LINE
7	3.025	41.07	-14.93	56.00	30.74	10.05	0.28	QP	LINE
8	3.025	34.84	-11.16	46.00	24.51	10.05	0.28	AVERAGE	LINE
9	3.491	41.71	-14.29	56.00	31.36	10.06	0.29	QP	LINE
10	3.491	34.67	-11.33	46.00	24.32	10.06	0.29	AVERAGE	LINE
11	3.661	35.62	-10.38	46.00	25.26	10.06	0.29	AVERAGE	LINE
12	3.661	42.93	-13.07	56.00	32.57	10.06	0.29	QP	LINE
13	3.881	43.23	-12.77	56.00	32.86	10.07	0.30	QP	LINE
14	3.881	37.27	-8.73	46.00	26.90	10.07	0.30	AVERAGE	LINE
15	4.092	44.78	-11.22	56.00	34.41	10.07	0.30	QP	LINE
16	4.092	37.62	-8.38	46.00	27.25	10.07	0.30	AVERAGE	LINE
17	4.269	37.56	-8.44	46.00	27.17	10.08	0.31	AVERAGE	LINE
18	4.269	43.60	-12.40	56.00	33.21	10.08	0.31	QP	LINE
19	4.574	38.14	-7.86	46.00	27.74	10.09	0.31	AVERAGE	LINE
20	4.574	45.36	-10.64	56.00	34.96	10.09	0.31	QP	LINE
21	5.005	44.62	-15.38	60.00	34.19	10.11	0.32	QP	LINE
22	5.005	37.91	-12.09	50.00	27.48	10.11	0.32	AVERAGE	LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
23	5.305	37.49	-12.51	50.00	27.05	10.12	0.33	AVERAGE	LINE
24	5.305	44.43	-15.57	60.00	33.99	10.12	0.33	QP	LINE

Temperature	24°C	Humidity	56%
Test Engineer	Sollo Luo	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1 @	0.15321	59.05	-6.77	65.82	48.94	9.95	0.16	QP	NEUTRAL
2	0.15321	45.27	-10.55	55.82	35.16	9.95	0.16	AVERAGE	NEUTRAL
3	0.16155	45.34	-10.04	55.38	35.23	9.95	0.16	AVERAGE	NEUTRAL
4 @	0.16155	58.14	-7.24	65.38	48.03	9.95	0.16	QP	NEUTRAL
5	0.20614	39.60	-13.76	53.36	29.48	9.95	0.17	AVERAGE	NEUTRAL
6	0.20614	50.48	-12.88	63.36	40.36	9.95	0.17	QP	NEUTRAL
7	0.21851	47.00	-15.88	62.88	36.88	9.95	0.17	QP	NEUTRAL
8	0.21851	36.04	-16.84	52.88	25.92	9.95	0.17	AVERAGE	NEUTRAL
9	1.645	30.19	-15.81	46.00	19.95	10.00	0.24	AVERAGE	NEUTRAL
10	1.645	37.62	-18.38	56.00	27.38	10.00	0.24	QP	NEUTRAL
11	2.012	38.02	-17.98	56.00	27.76	10.01	0.25	QP	NEUTRAL
12	2.012	32.48	-13.52	46.00	22.22	10.01	0.25	AVERAGE	NEUTRAL
13	2.121	35.57	-20.43	56.00	25.30	10.01	0.25	QP	NEUTRAL
14	2.121	28.74	-17.26	46.00	18.47	10.01	0.25	AVERAGE	NEUTRAL
15	2.309	37.90	-18.10	56.00	27.62	10.02	0.26	QP	NEUTRAL
16	2.309	31.82	-14.18	46.00	21.54	10.02	0.26	AVERAGE	NEUTRAL
17	2.622	31.05	-14.95	46.00	20.75	10.03	0.27	AVERAGE	NEUTRAL
18	2.622	37.69	-18.31	56.00	27.39	10.03	0.27	QP	NEUTRAL
19	3.025	40.71	-15.29	56.00	30.40	10.03	0.28	QP	NEUTRAL
20	3.025	34.46	-11.54	46.00	24.15	10.03	0.28	AVERAGE	NEUTRAL
21	3.207	33.22	-12.78	46.00	22.90	10.04	0.28	AVERAGE	NEUTRAL
22	3.207	39.63	-16.37	56.00	29.31	10.04	0.28	QP	NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
23	3.528	35.03	-10.97	46.00	24.70	10.04	0.29	AVERAGE	NEUTRAL
24	3.528	42.06	-13.94	56.00	31.73	10.04	0.29	QP	NEUTRAL
25	4.092	43.17	-12.83	56.00	32.82	10.05	0.30	QP	NEUTRAL
26	4.092	37.08	-8.92	46.00	26.73	10.05	0.30	AVERAGE	NEUTRAL
27	4.647	43.86	-12.14	56.00	33.47	10.07	0.31	QP	NEUTRAL
28	4.647	38.30	-7.70	46.00	27.91	10.07	0.31	AVERAGE	NEUTRAL
29	4.874	43.68	-12.32	56.00	33.28	10.08	0.32	QP	NEUTRAL
30	4.874	37.47	-8.53	46.00	27.07	10.08	0.32	AVERAGE	NEUTRAL
31	5.390	43.81	-16.19	60.00	33.39	10.10	0.33	QP	NEUTRAL
32	5.390	36.59	-13.41	50.00	26.17	10.10	0.33	AVERAGE	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

4.2.2. Measuring Instruments and Setting

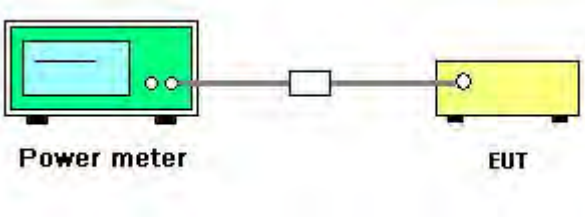
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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	22°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n/ac
Test Date	Nov. 20, 2014		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Total		
1	2412 MHz	16.45	16.28	19.38	29.90	Complies
6	2437 MHz	23.91	24.31	27.12	29.90	Complies
11	2462 MHz	15.82	15.37	18.61	29.90	Complies

Note: Max Ant. Gain = 6.1dBi > 6dBi, so limit = 30 - (6.1 - 6) = 29.9dBm.

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Total		
3	2422 MHz	13.26	13.53	16.41	29.90	Complies
6	2437 MHz	18.67	19.45	22.09	29.90	Complies
9	2452 MHz	15.02	15.17	18.11	29.90	Complies

Note: Max Ant. Gain = 6.1dBi > 6dBi, so limit = 30 - (6.1 - 6) = 29.9dBm.

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
149	5745 MHz	24.97	25.32	28.16	29.80	Complies
157	5785 MHz	25.33	25.98	28.68	29.80	Complies
165	5825 MHz	25.25	25.96	28.63	29.80	Complies

Note: Max Ant. Gain = 6.2dBi > 6dBi, so limit = 30 - (6.2 - 6) = 29.8dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
151	5755 MHz	24.23	24.67	27.47	29.80	Complies
159	5795 MHz	24.59	25.46	28.06	29.80	Complies

Note: Max Ant. Gain = 6.2dBi > 6dBi, so limit = 30 - (6.2 - 6) = 29.8dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
155	5775 MHz	21.67	22.44	25.08	29.80	Complies

Note: Max Ant. Gain = 6.2dBi > 6dBi, so limit = 30 - (6.2 - 6) = 29.8dBm.

Temperature	22°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a/b/g
Test Date	Nov. 20, 2014		

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Total		
1	2412 MHz	24.46	23.54	27.03	29.90	Complies
6	2437 MHz	23.78	23.94	26.87	29.90	Complies
11	2462 MHz	23.91	23.62	26.78	29.90	Complies

Note: Max Ant. Gain = 6.1dBi > 6dBi, so limit = 30 - (6.1 - 6) = 29.9dBm.

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Total		
1	2412 MHz	16.96	16.97	19.98	29.90	Complies
6	2437 MHz	24.83	25.06	27.96	29.90	Complies
11	2462 MHz	16.45	16.18	19.33	29.90	Complies

Note: Max Ant. Gain = 6.1dBi > 6dBi, so limit = 30 - (6.1 - 6) = 29.9dBm.

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
149	5745 MHz	24.91	25.43	28.19	29.80	Complies
157	5785 MHz	25.43	25.93	28.70	29.80	Complies
165	5825 MHz	25.47	25.97	28.74	29.80	Complies

Note: Max Ant. Gain = 6.2dBi > 6dBi, so limit = 30 - (6.2 - 6) = 29.8dBm.

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

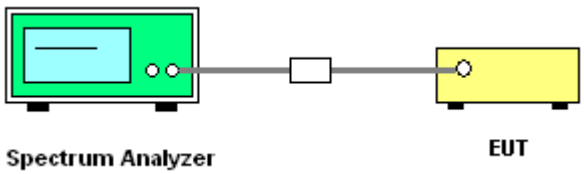
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	22°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Total		
1	2412 MHz	-8.73	-8.88	-5.79	5.49	Complies
6	2437 MHz	-1.27	-1.02	1.87	5.49	Complies
11	2462 MHz	-9.73	-9.95	-6.83	5.49	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{Spat}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 8.51dBi > 6dBi, so limit = 8 - (8.51 - 6) = 5.49dBm/3KHz.

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Total		
3	2422 MHz	-14.72	-14.38	-11.54	5.49	Complies
6	2437 MHz	-8.76	-9.15	-5.94	5.49	Complies
9	2452 MHz	-12.49	-13.01	-9.73	5.49	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{Spat}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 8.51dBi > 6dBi, so limit = 8 - (8.51 - 6) = 5.49dBm/3KHz.

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2	Total		
149	5745 MHz	-0.26	-0.07	2.85	4.79	Complies
157	5785 MHz	0.27	-0.28	3.01	4.79	Complies
165	5825 MHz	-0.32	0.66	3.21	4.79	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{jk}\right\}^2}{N_{ANT}}\right]$ = 9.21dBi > 6dBi, so limit = 8 - (9.21 - 6) = 4.79dBm/3KHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2	Total		
151	5755 MHz	-3.69	-3.80	-0.73	4.79	Complies
159	5795 MHz	-3.02	-3.71	-0.34	4.79	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{jk}\right\}^2}{N_{ANT}}\right]$ = 9.21dBi > 6dBi, so limit = 8 - (9.21 - 6) = 4.79dBm/3KHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2	Total		
155	5775 MHz	-9.50	-8.79	-6.12	4.79	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{jk}\right\}^2}{N_{ANT}}\right]$ = 9.21dBi > 6dBi, so limit = 8 - (9.21 - 6) = 4.79dBm/3KHz.

Temperature	22°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Total		
1	2412 MHz	2.49	2.20	5.36	5.49	Complies
6	2437 MHz	2.68	2.24	5.48	5.49	Complies
11	2462 MHz	2.49	2.10	5.31	5.49	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{jk}\right\}^2}{N_{ANT}}\right]$ = 8.51dBi > 6dBi, so limit = 8 - (8.51 - 6) = 5.49dBm/3KHz.

Configuration IEEE 802.11g

Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Total		
1	2412 MHz	-7.94	-7.38	-4.64	5.49	Complies
6	2437 MHz	-0.62	-0.88	2.26	5.49	Complies
11	2462 MHz	-8.48	-8.53	-5.49	5.49	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{jk}\right\}^2}{N_{ANT}}\right]$ = 8.51dBi > 6dBi, so limit = 8 - (8.51 - 6) = 5.49dBm/3KHz.

Configuration IEEE 802.11a

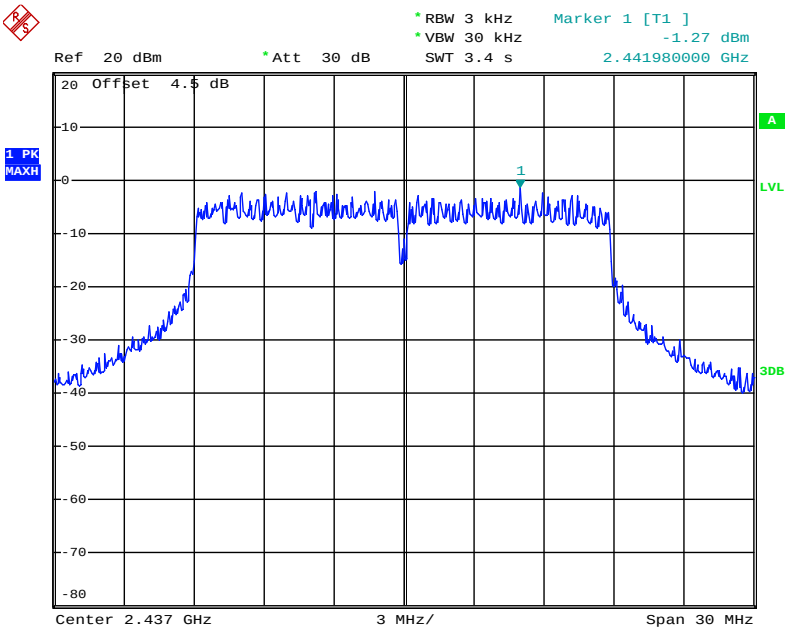
Channel	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2	Total		
149	5745 MHz	0.64	0.32	3.49	4.79	Complies
157	5785 MHz	0.50	0.83	3.68	4.79	Complies
165	5825 MHz	1.81	0.71	4.31	4.79	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{jk}\right\}^2}{N_{ANT}}\right]$ = 9.21dBi > 6dBi, so limit = 8 - (9.21 - 6) = 4.79dBm/3KHz.

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

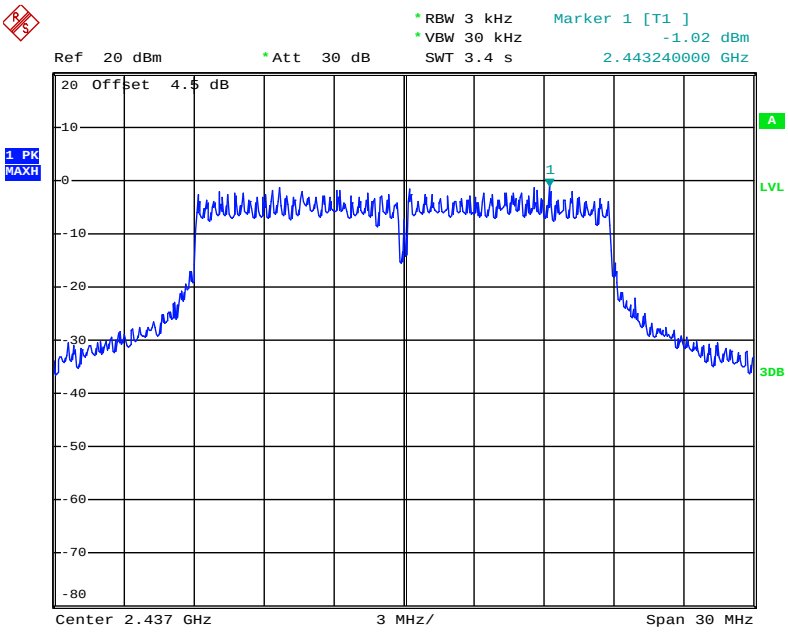
For plots, only the channel with worse result was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Ant. 3



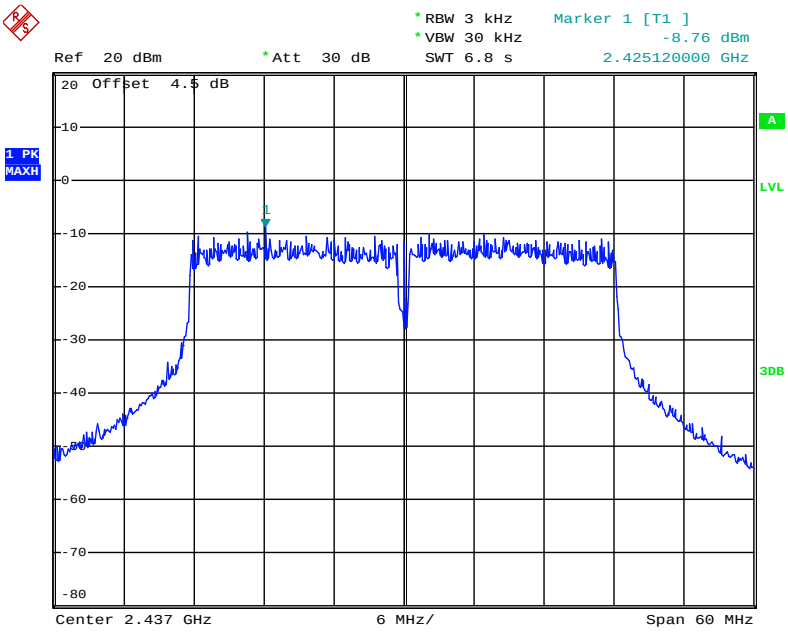
Date: 20.NOV.2014 19:05:17

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Ant. 4



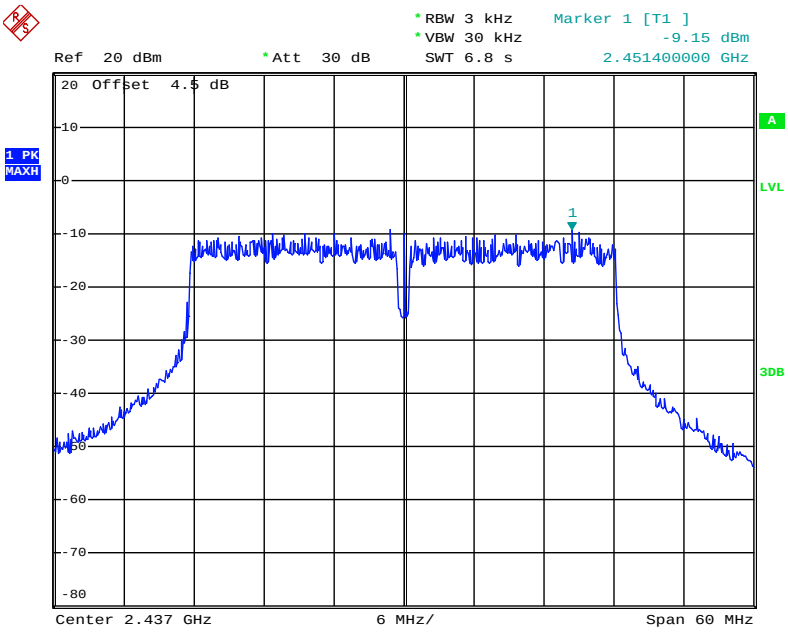
Date: 20.NOV.2014 19:04:27

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Ant. 3



Date: 20.NOV.2014 19:12:50

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Ant. 4



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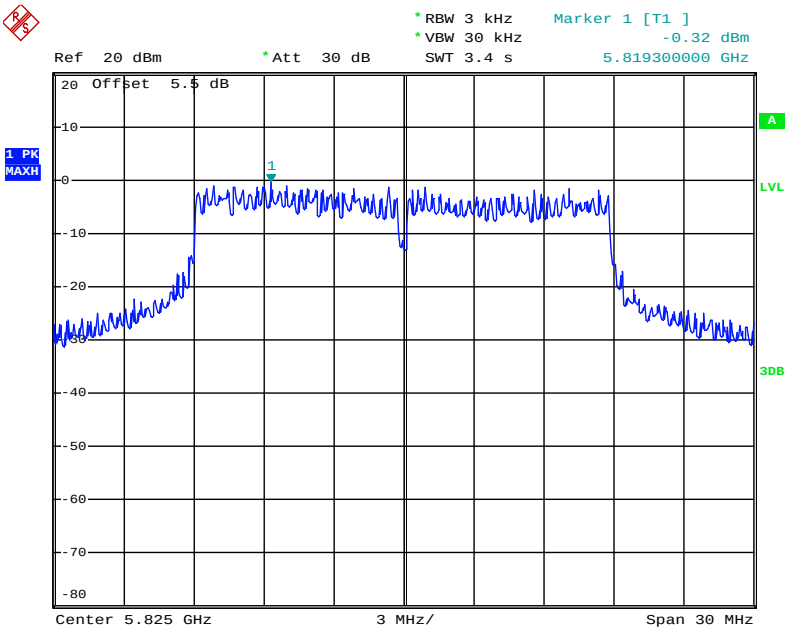
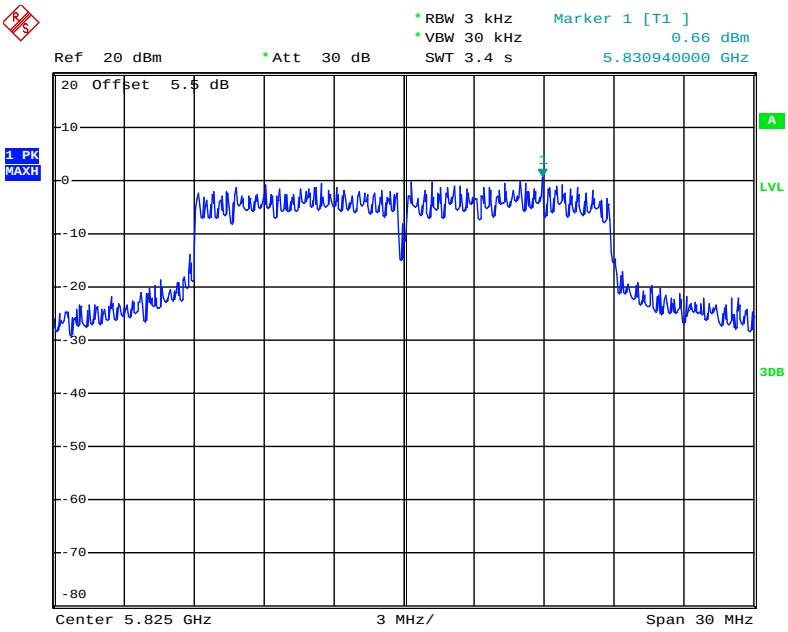
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Ant. 1



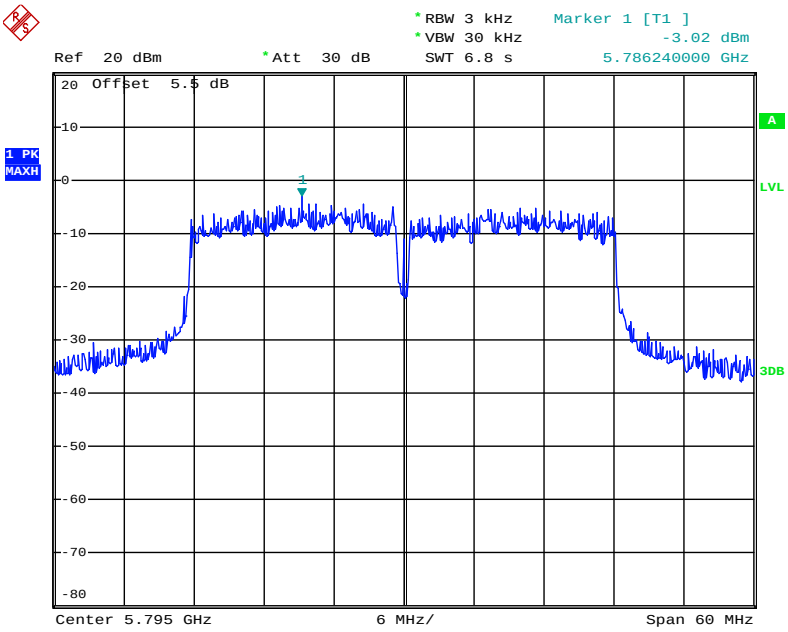
Date: 20.NOV.2014 19:51:57

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



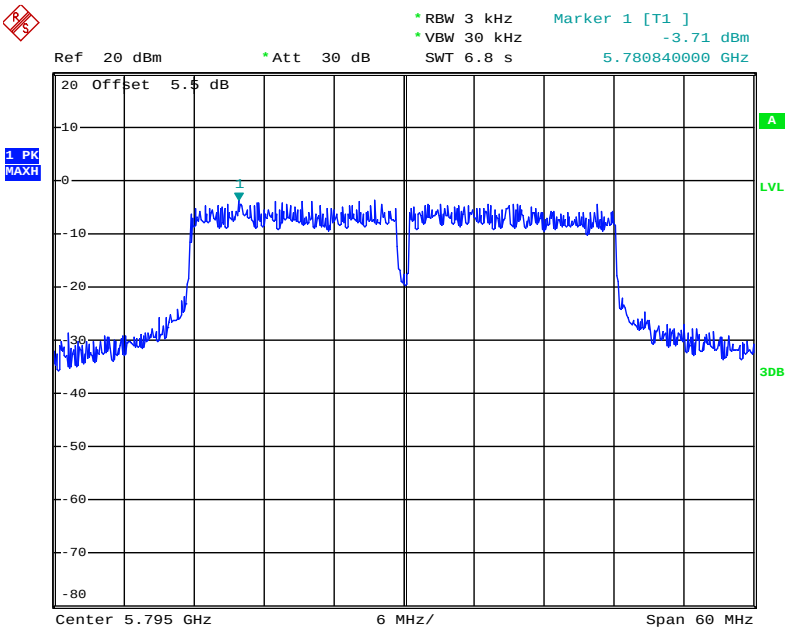
Date: 20.NOV.2014 19:52:42

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



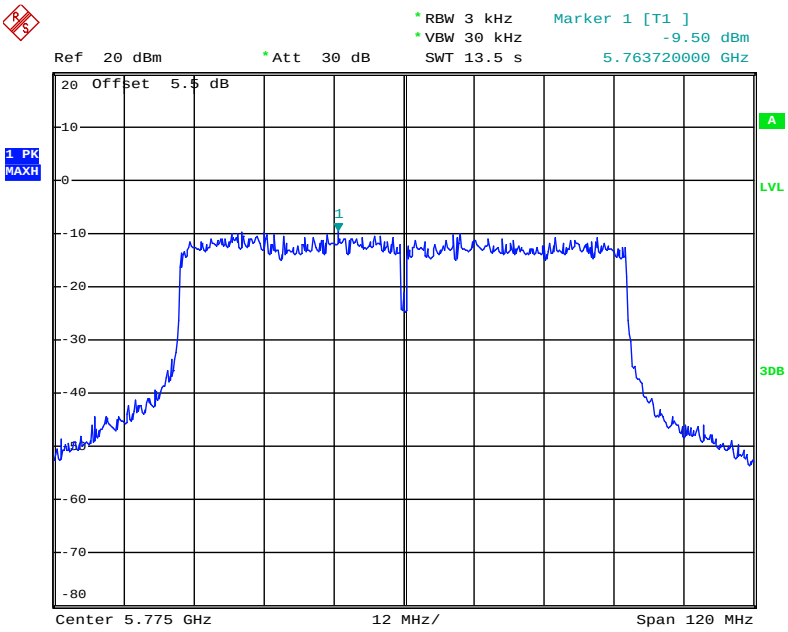
Date: 20.NOV.2014 20:00:03

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



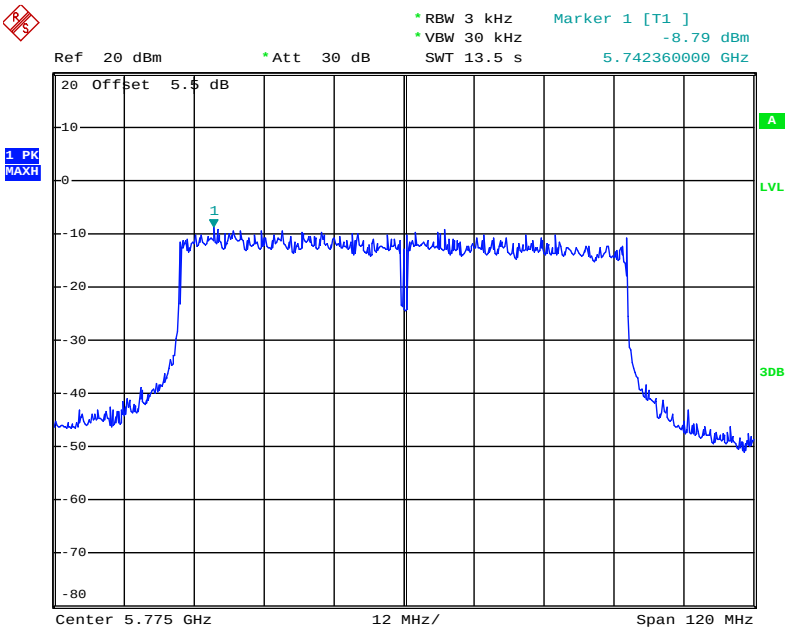
Date: 20.NOV.2014 20:00:51

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



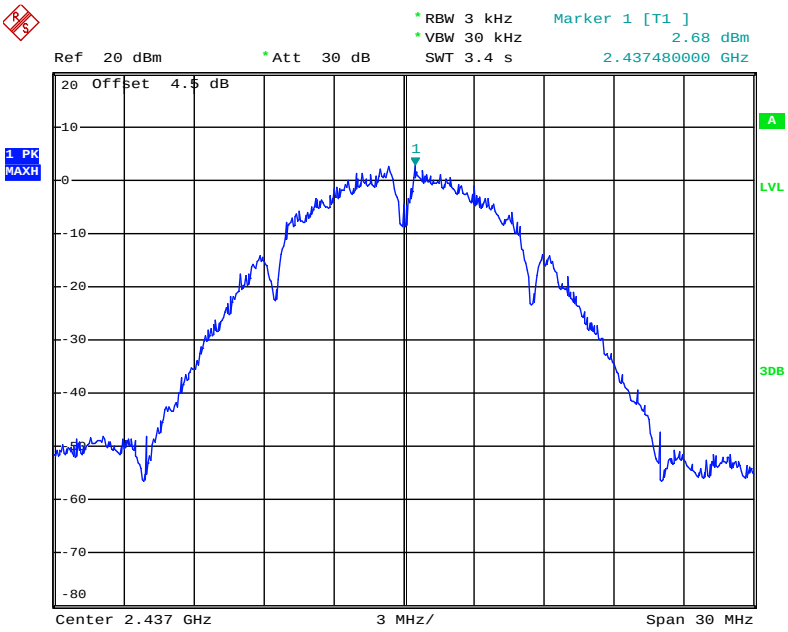
Date: 20.NOV.2014 20:03:53

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



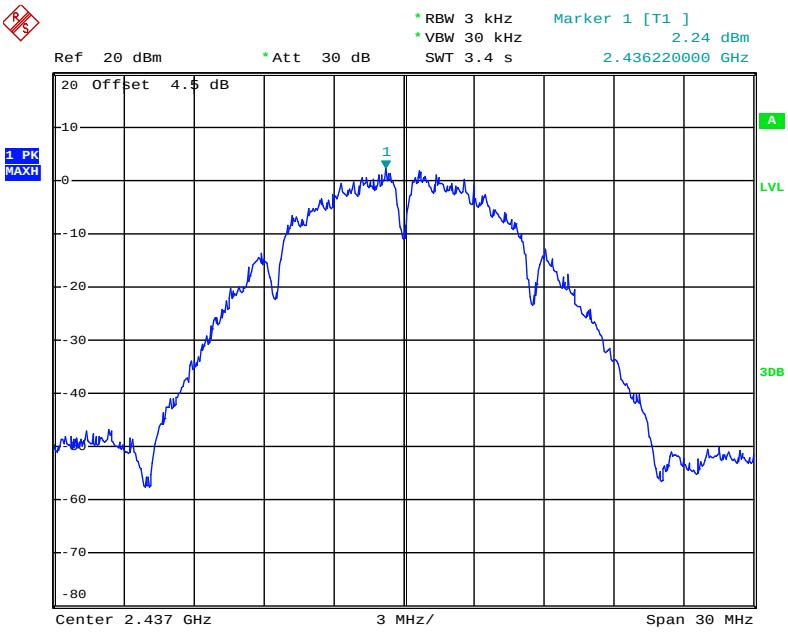
Date: 20.NOV.2014 20:02:50

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



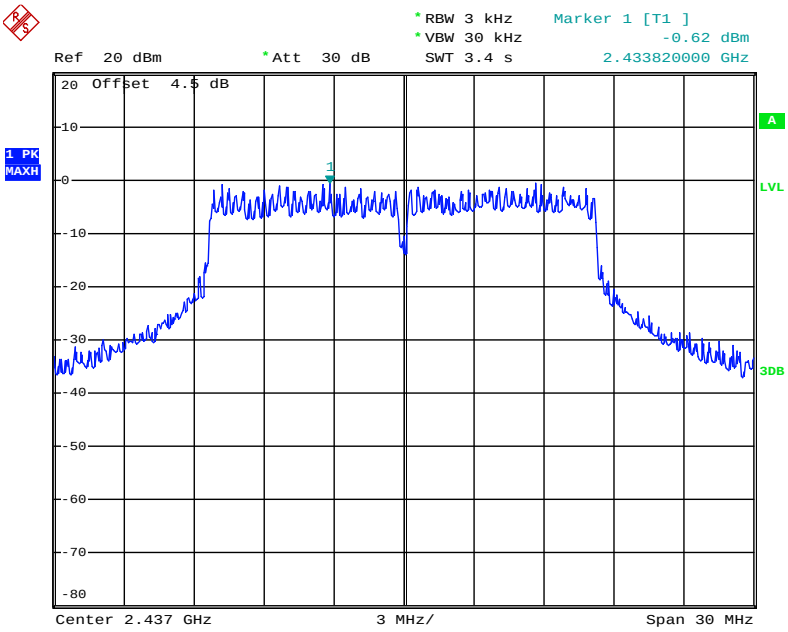
Date: 16.DEC.2014 12:01:36

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



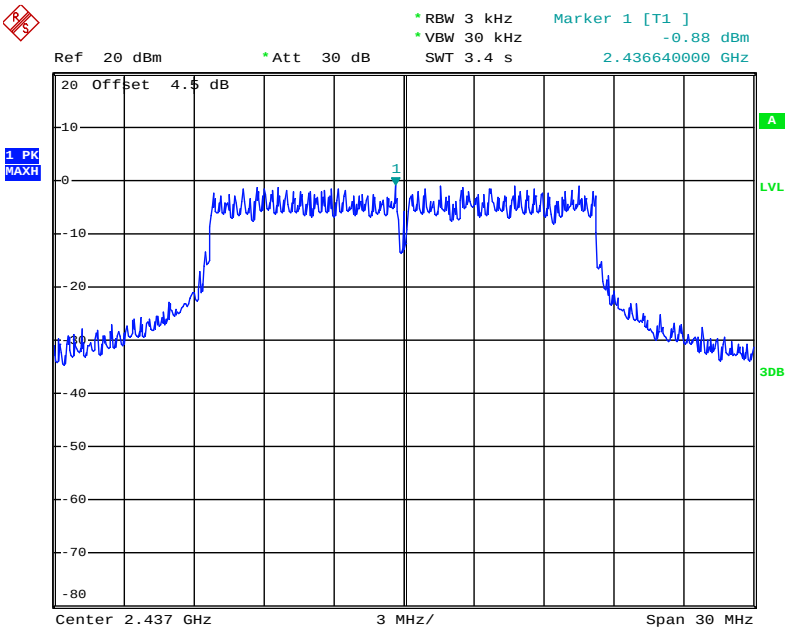
Date: 16.DEC.2014 12:03:52

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



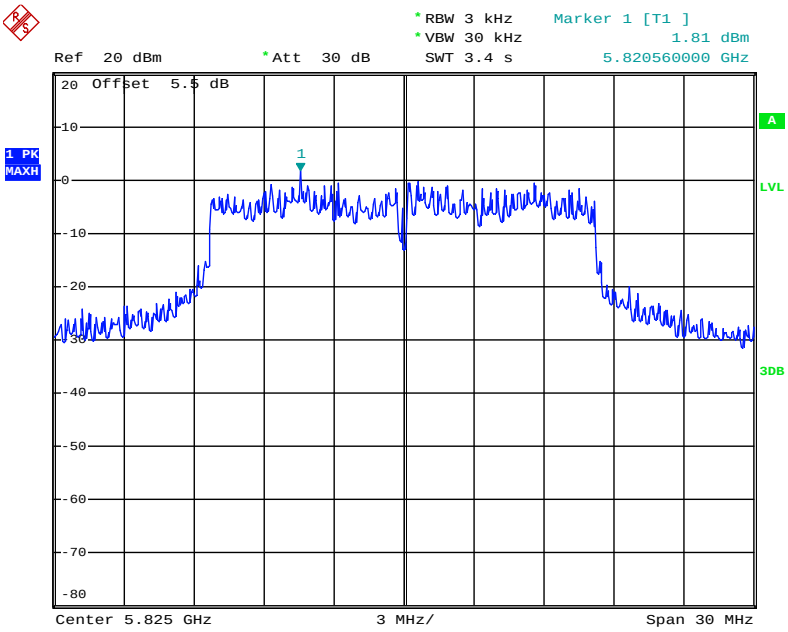
Date: 20.NOV.2014 18:51:46

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Ant. 4



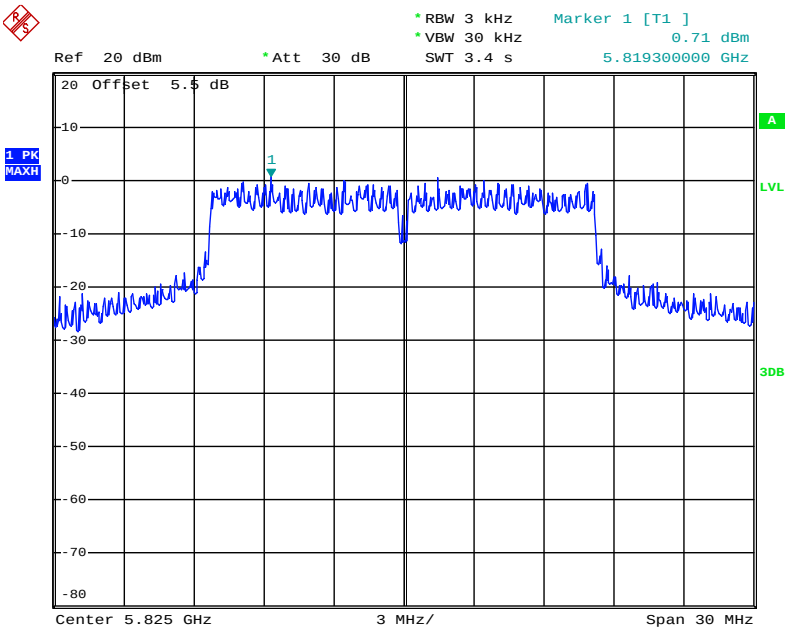
Date: 20.NOV.2014 18:52:27

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



Date: 20.NOV.2014 19:49:50

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



Date: 20.NOV.2014 19:49:02

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

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

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

4.4.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.4.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	22°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n/ac

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 HT20 / Ant. 3 + Ant. 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.60	18.72	500	Complies
6	2437 MHz	17.60	18.78	500	Complies
11	2462 MHz	17.60	18.78	500	Complies

Configuration IEEE 802.11n MCS0 HT40 / Ant. 3 + Ant. 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.84	38.16	500	Complies
6	2437 MHz	36.48	38.28	500	Complies
9	2452 MHz	36.16	38.28	500	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.52	18.84	500	Complies
157	5785 MHz	17.68	20.64	500	Complies
165	5825 MHz	17.60	21.42	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.00	38.16	500	Complies
159	5795 MHz	36.48	38.88	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	75.52	77.04	500	Complies

Temperature	22°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Ant. 3 + Ant. 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	6.56	10.80	500	Complies
6	2437 MHz	6.56	10.80	500	Complies
11	2462 MHz	5.60	10.68	500	Complies

Configuration IEEE 802.11g / Ant. 3 + Ant. 4

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.40	17.46	500	Complies
6	2437 MHz	16.08	17.58	500	Complies
11	2462 MHz	16.40	17.46	500	Complies

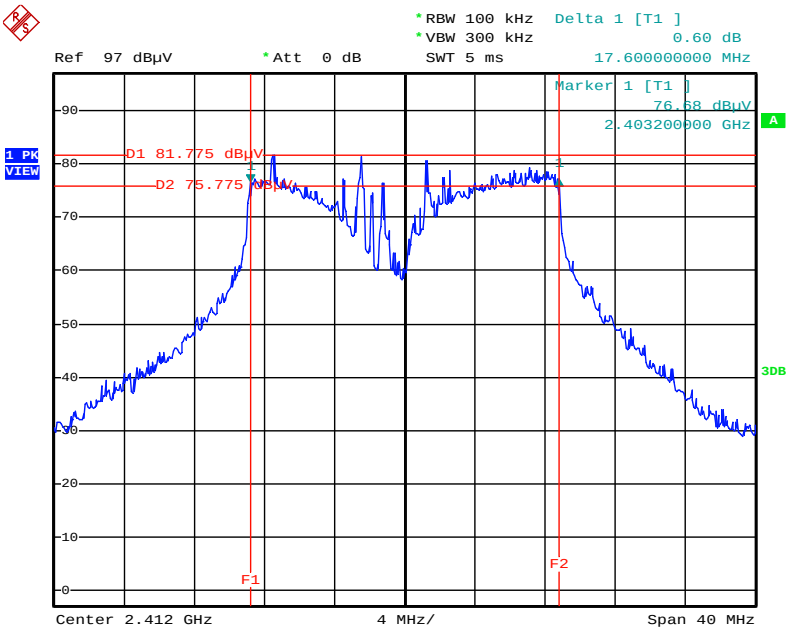
Configuration IEEE 802.11a / Ant. 1 + Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.40	17.46	500	Complies
157	5785 MHz	16.32	18.12	500	Complies
165	5825 MHz	16.40	19.08	500	Complies

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

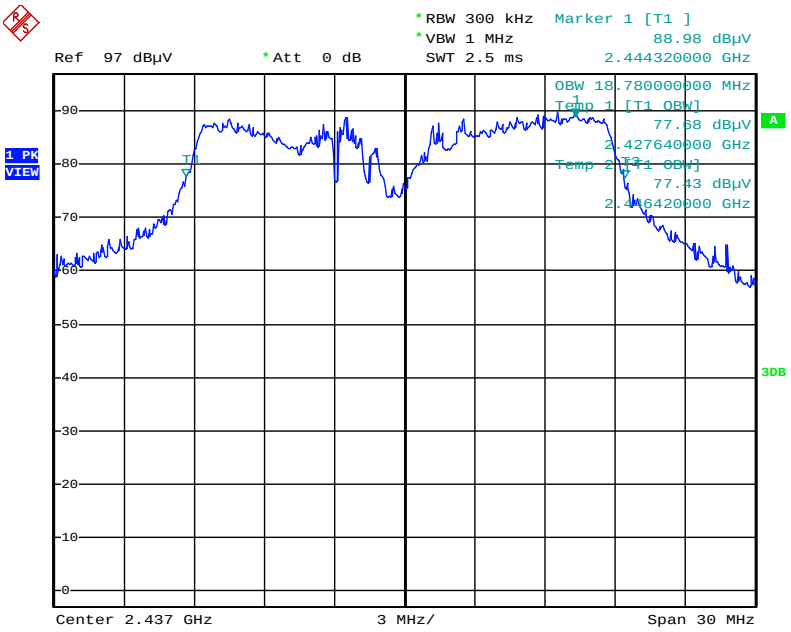
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 2412 MHz / Ant. 3 + Ant. 4



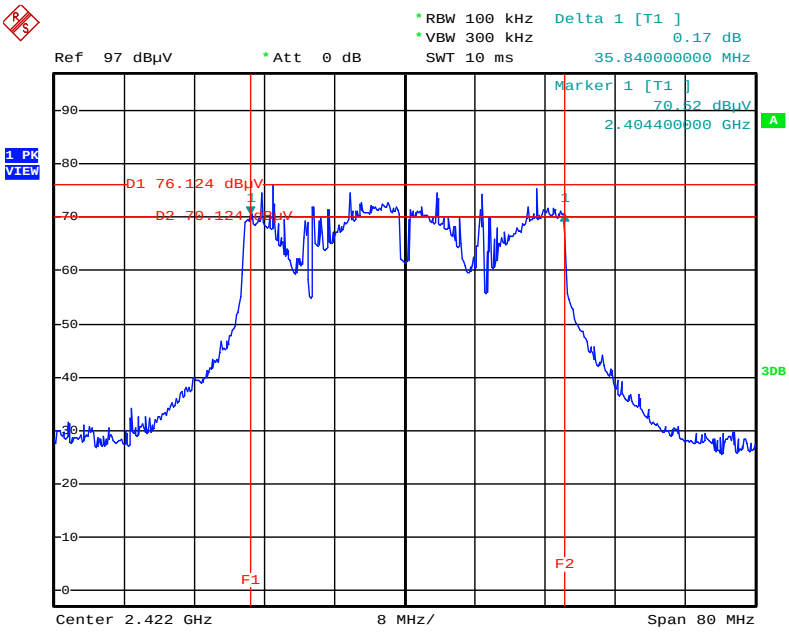
Date: 21.NOV.2014 00:44:43

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 2437 MHz / Ant. 3 + Ant. 4



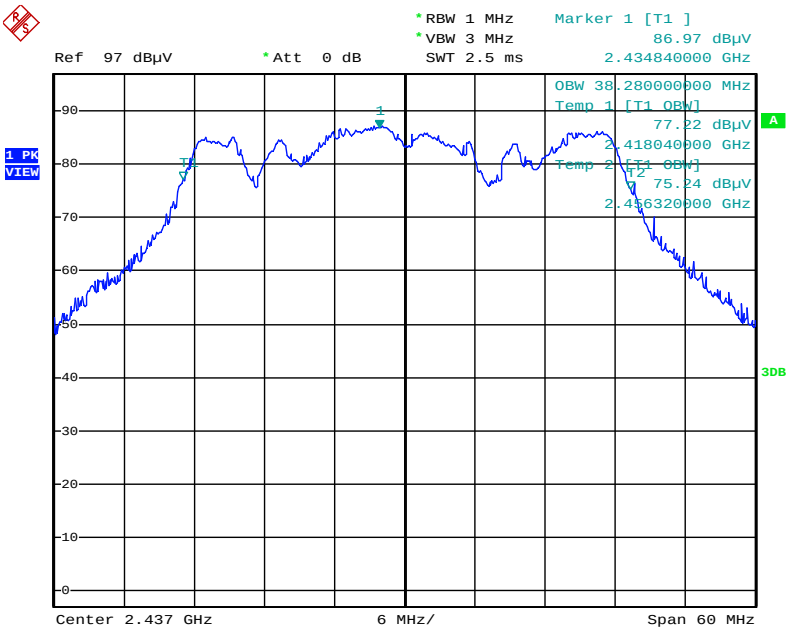
Date: 21.NOV.2014 01:16:03

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 2422 MHz / Ant. 3 + Ant. 4



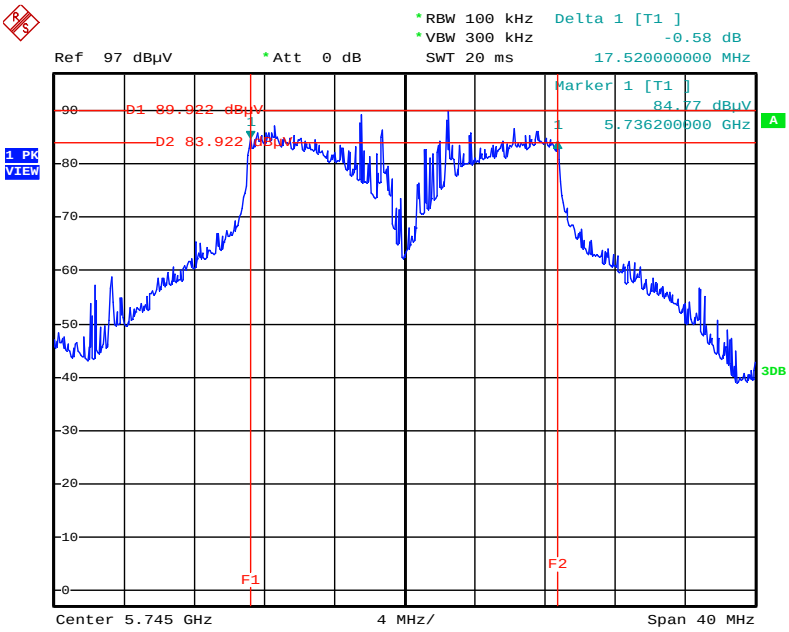
Date: 21.NOV.2014 00:42:33

99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 2437 MHz / Ant. 3 + Ant. 4



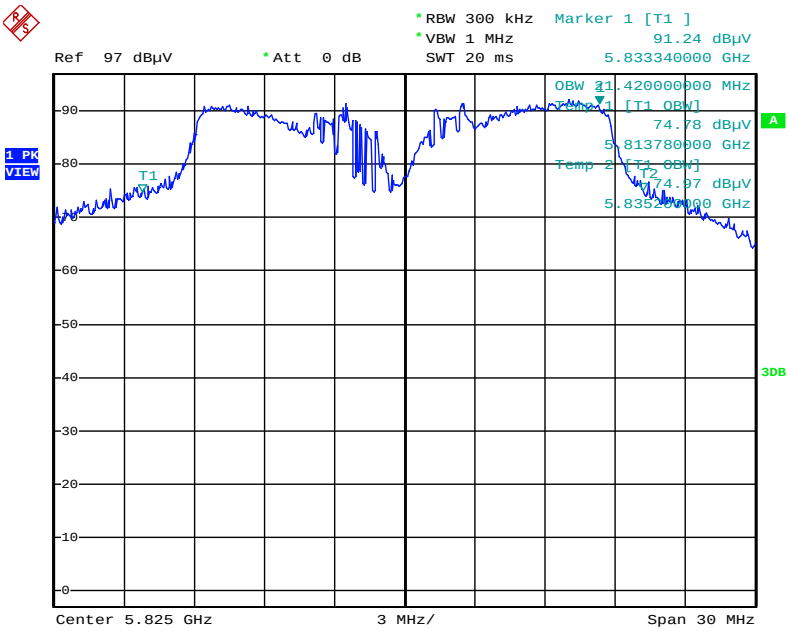
Date: 21.NOV.2014 01:18:35

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



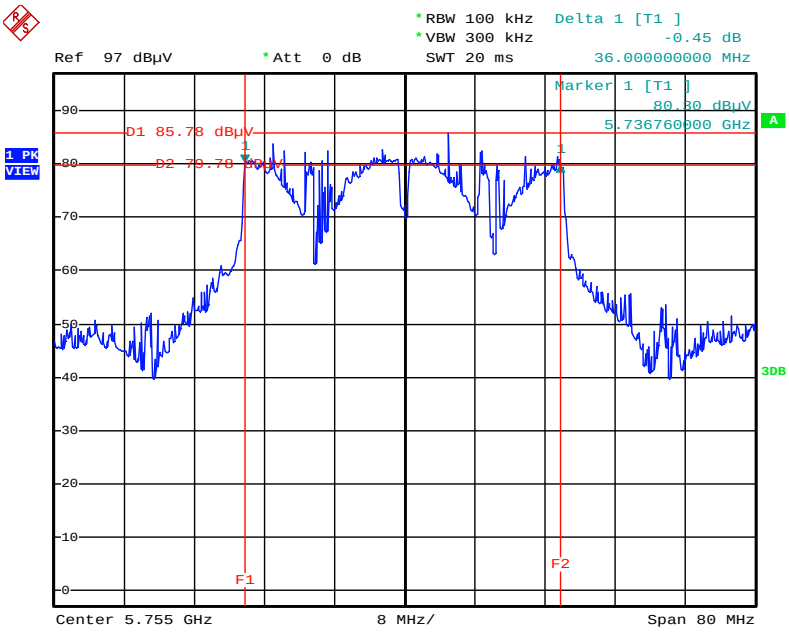
Date: 20.NOV.2014 23:59:01

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Ant. 1 + Ant. 2



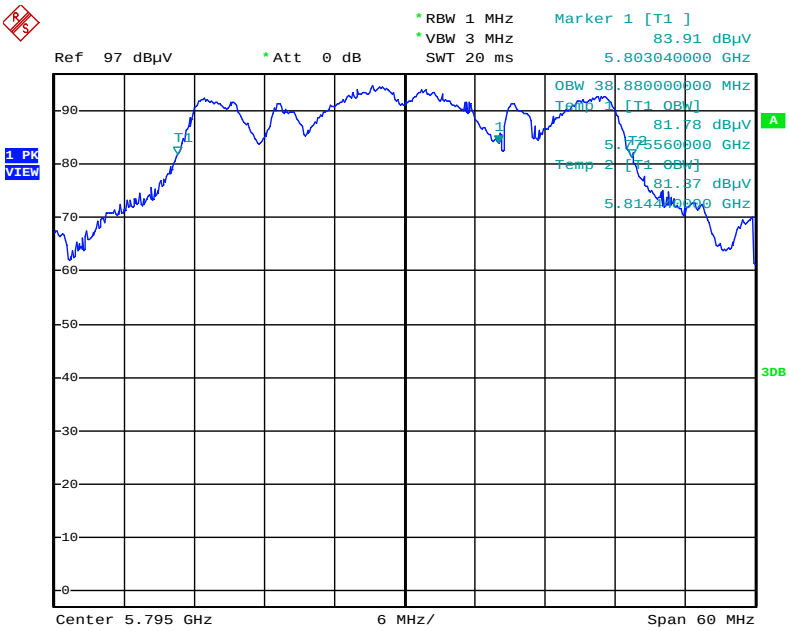
Date: 20.NOV.2014 23:26:26

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



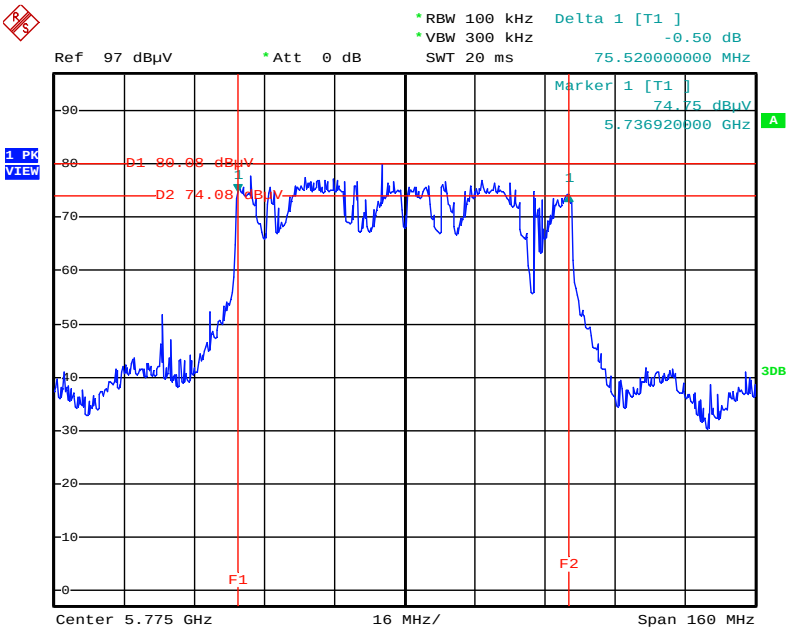
Date: 21.NOV.2014 00:14:14

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



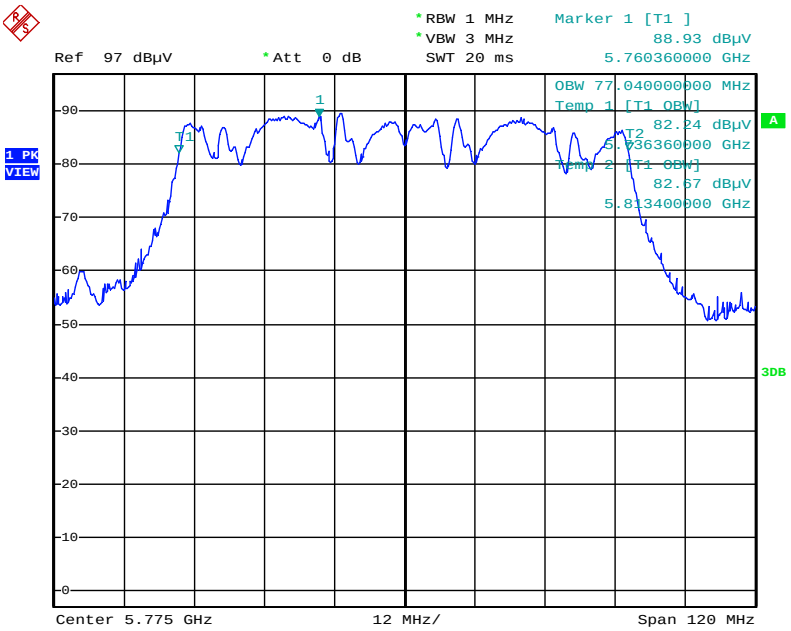
Date: 20.NOV.2014 23:23:09

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



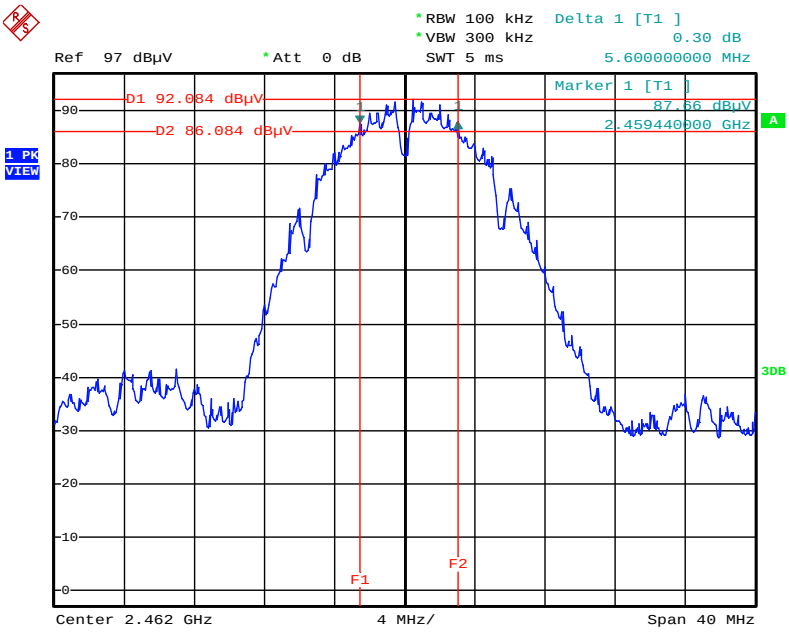
Date: 21.NOV.2014 00:17:26

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



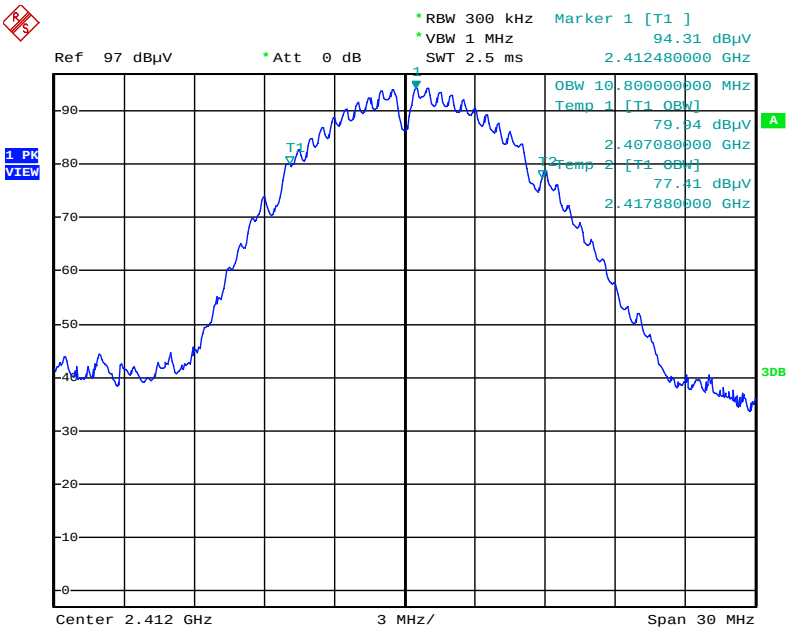
Date: 20.NOV.2014 22:06:31

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2462 MHz / Ant. 3 + Ant. 4



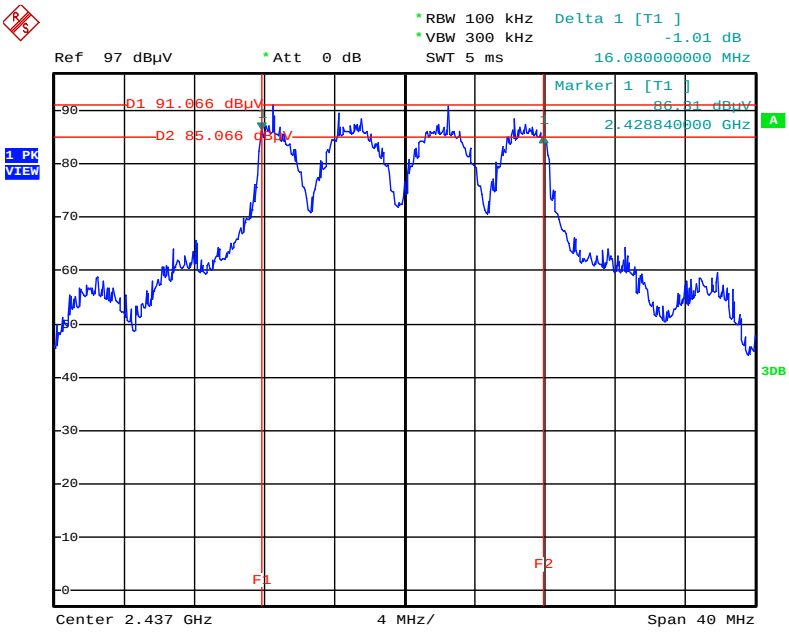
Date: 21.NOV.2014 01:07:00

99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Ant. 3 + Ant. 4



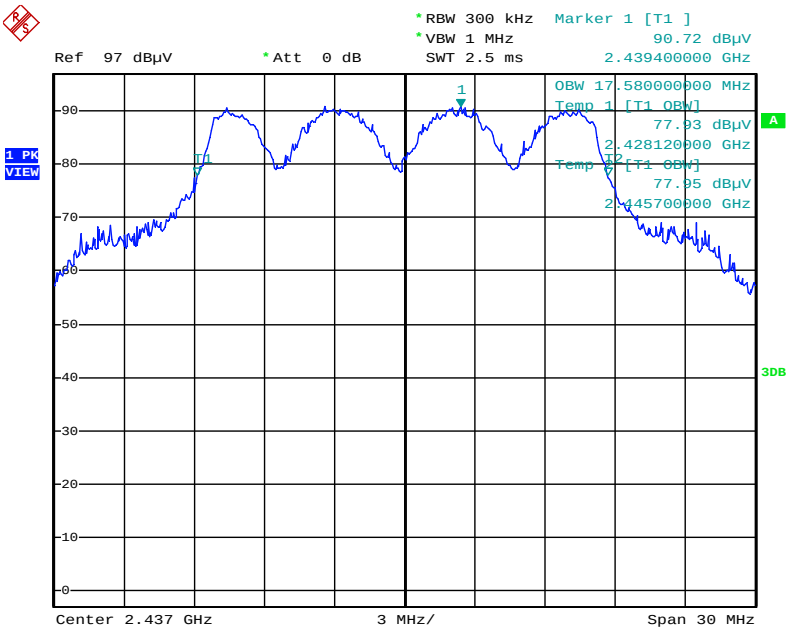
Date: 21.NOV.2014 01:12:31

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Ant. 3 + Ant. 4



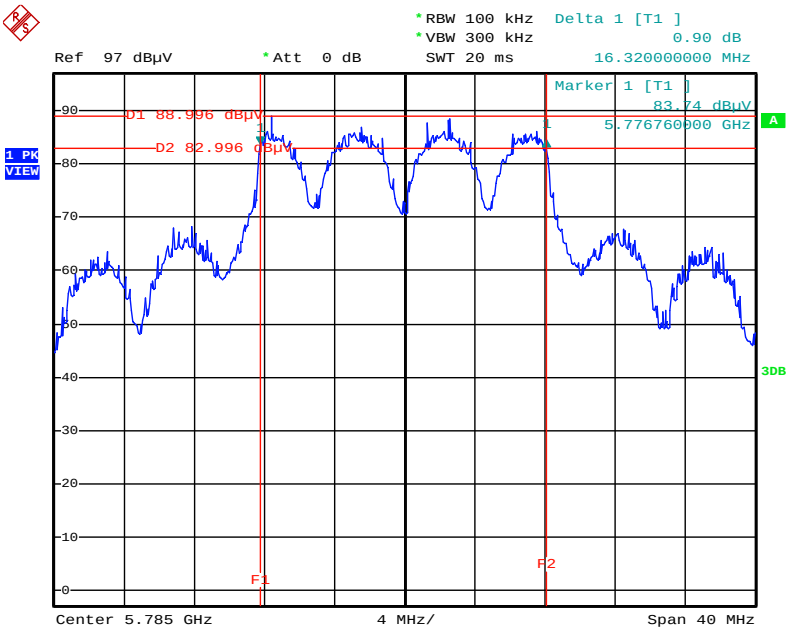
Date: 21.NOV.2014 00:50:25

99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Ant. 3 + Ant. 4



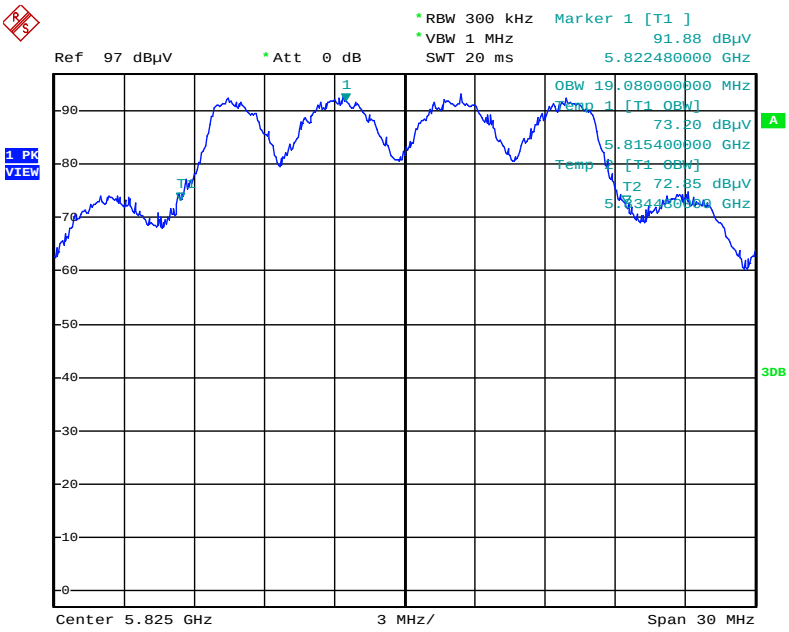
Date: 21.NOV.2014 01:14:08

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz / Ant. 1 + Ant. 2



Date: 20.NOV.2014 23:49:06

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / 5825 MHz / Ant. 1 + Ant. 2



Date: 20.NOV.2014 23:42:42

4.5. Radiated Emissions Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

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

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

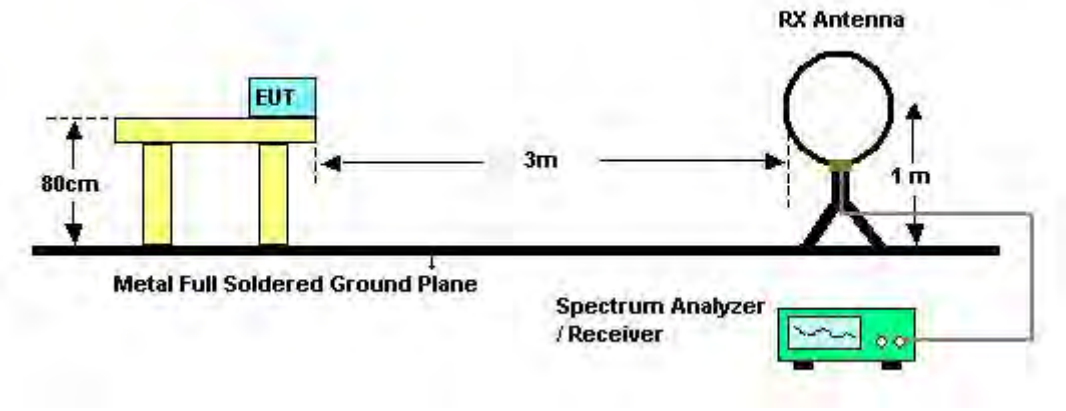
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

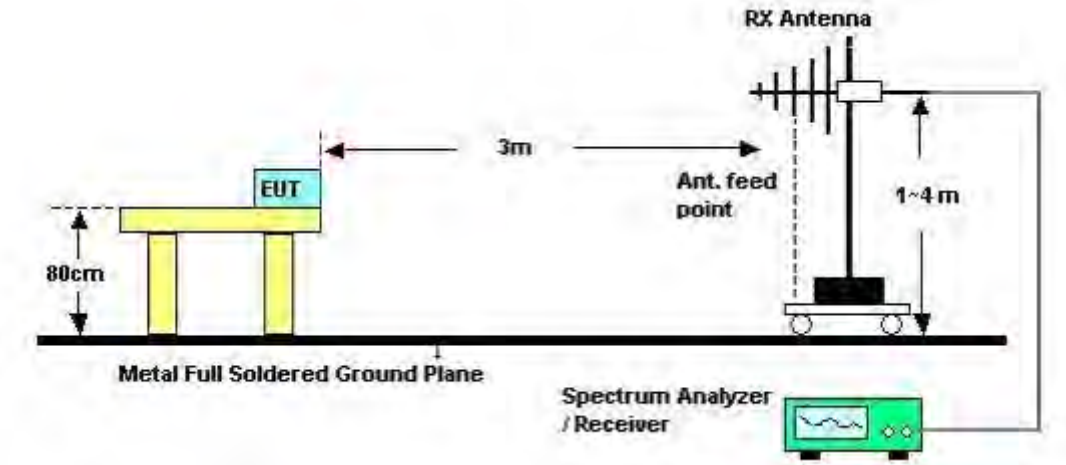
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.5.4. Test Setup Layout

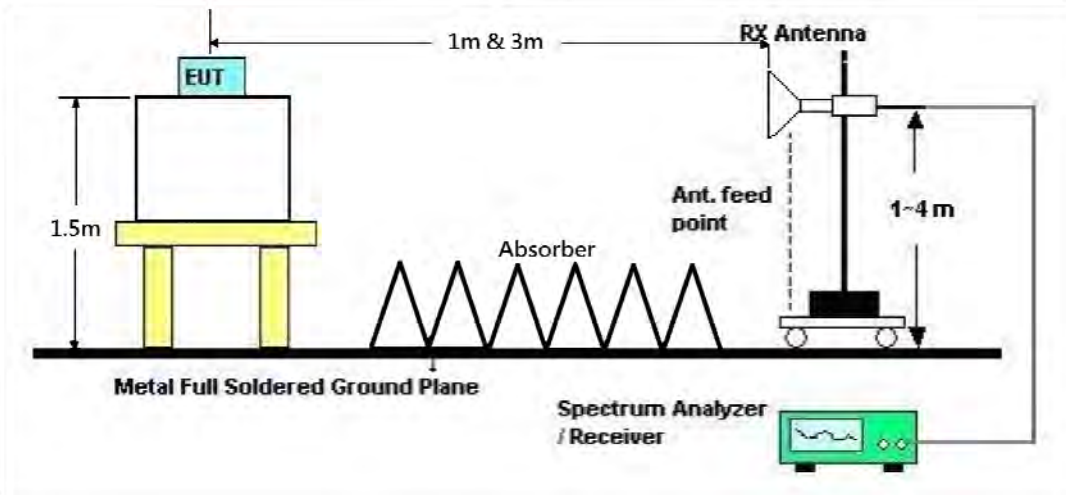
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	Normal Link
Test Date	Dec. 08, 2014		

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

Note:

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

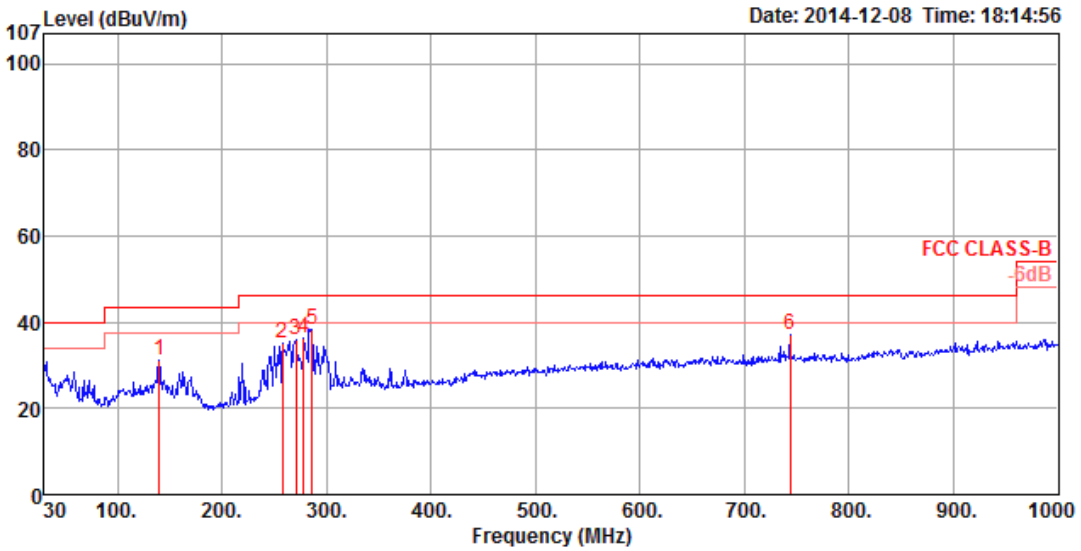
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

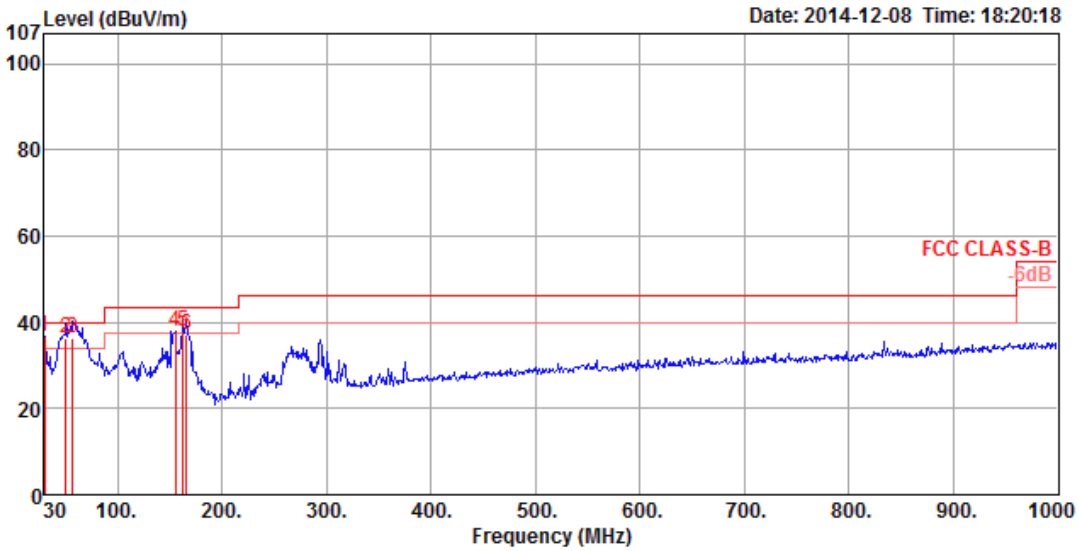
Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	Normal Link

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	139.61	31.35	43.50	-12.15	50.86	0.85	32.38	12.02	HORIZONTAL	174	200	Peak
2	257.95	35.14	46.00	-10.86	52.68	1.15	32.41	13.72	HORIZONTAL	164	150	Peak
3	270.56	35.84	46.00	-10.16	53.41	1.18	32.44	13.69	HORIZONTAL	327	150	Peak
4	278.32	36.47	46.00	-9.53	54.15	1.19	32.40	13.53	HORIZONTAL	118	150	Peak
5	286.08	38.31	46.00	-7.69	55.80	1.21	32.32	13.62	HORIZONTAL	156	100	Peak
6	743.92	37.04	46.00	-8.96	47.34	1.97	32.41	20.14	HORIZONTAL	236	400	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	30.00	36.69	40.00	-3.31	48.71	0.41	32.43	20.00	VERTICAL	216	100	Peak
2	50.37	36.24	40.00	-3.76	59.27	0.50	32.53	9.00	VERTICAL	292	125	QP
3	57.16	36.47	40.00	-3.53	60.97	0.54	32.50	7.46	VERTICAL	179	125	QP
4	155.13	37.95	43.50	-5.55	58.48	0.89	32.37	10.95	VERTICAL	132	100	Peak
5	162.89	37.83	43.50	-5.67	58.77	0.91	32.40	10.55	VERTICAL	127	125	QP
6	165.80	37.28	43.50	-6.22	58.36	0.92	32.40	10.40	VERTICAL	169	100	QP

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	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT20 CH 1 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4815.64	44.56	74.00	-29.44	42.42	4.20	32.52	34.58	Peak	87	100	HORIZONTAL
2	4825.07	31.22	54.00	-22.78	29.03	4.21	32.56	34.58	Average	87	100	HORIZONTAL
3	7228.85	36.47	54.00	-17.53	28.99	5.32	36.97	34.81	Average	102	100	HORIZONTAL
4	7231.02	48.72	74.00	-25.28	41.21	5.33	36.99	34.81	Peak	102	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4819.05	31.23	54.00	-22.77	29.04	4.21	32.56	34.58	Average	12	100	VERTICAL
2	4822.81	44.32	74.00	-29.68	42.13	4.21	32.56	34.58	Peak	12	100	VERTICAL
3	7232.85	49.17	74.00	-24.83	41.66	5.33	36.99	34.81	Peak	85	100	VERTICAL
4	7234.06	36.18	54.00	-17.82	28.67	5.33	36.99	34.81	Average	85	100	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT20 CH 6 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4871.92	32.49	54.00	-21.51	30.18	4.22	32.66	34.57	Average	302	100	HORIZONTAL
2	4882.05	44.43	74.00	-29.57	42.12	4.22	32.66	34.57	Peak	302	100	HORIZONTAL
3	7315.81	52.30	74.00	-21.70	44.69	5.35	37.09	34.83	Peak	271	100	HORIZONTAL
4	7316.64	37.12	54.00	-16.88	29.51	5.35	37.09	34.83	Average	271	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4875.01	31.96	54.00	-22.04	29.65	4.22	32.66	34.57	Average	229	100	VERTICAL
2	4879.90	44.22	74.00	-29.78	41.91	4.22	32.66	34.57	Peak	229	100	VERTICAL
3	7308.16	49.36	74.00	-24.64	41.77	5.34	37.07	34.82	Peak	238	100	VERTICAL
4	7312.51	37.08	54.00	-16.92	29.50	5.34	37.07	34.83	Average	238	100	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT20 CH 11 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4923.71	31.59	54.00	-22.41	29.15	4.23	32.76	34.55	Average	30	100	HORIZONTAL
2	4930.72	44.58	74.00	-29.42	42.14	4.23	32.76	34.55	Peak	30	100	HORIZONTAL
3	7382.47	51.19	74.00	-22.81	43.51	5.36	37.16	34.84	Peak	24	100	HORIZONTAL
4	7389.39	37.26	54.00	-16.74	29.56	5.36	37.18	34.84	Average	24	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4919.63	44.65	74.00	-29.35	42.21	4.23	32.76	34.55	Peak	120	100	VERTICAL
2	4923.10	31.66	54.00	-22.34	29.22	4.23	32.76	34.55	Average	120	100	VERTICAL
3	7385.45	50.33	74.00	-23.67	42.63	5.36	37.18	34.84	Peak	153	100	VERTICAL
4	7395.75	37.00	54.00	-17.00	29.30	5.36	37.18	34.84	Average	153	100	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT40 CH 3 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4842.70	43.75	74.00	-30.25	41.53	4.21	32.59	34.58	Peak	138	100	HORIZONTAL
2	4853.84	31.15	54.00	-22.85	28.90	4.21	32.62	34.58	Average	138	100	HORIZONTAL
3	7272.66	49.58	74.00	-24.42	42.03	5.34	37.03	34.82	Peak	107	100	HORIZONTAL
4	7275.20	36.06	54.00	-17.94	28.51	5.34	37.03	34.82	Average	107	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4837.46	43.32	74.00	-30.68	41.10	4.21	32.59	34.58	Peak	293	100	VERTICAL
2	4842.47	30.89	54.00	-23.11	28.67	4.21	32.59	34.58	Average	293	100	VERTICAL
3	7257.35	48.85	74.00	-25.15	41.33	5.33	37.01	34.82	Peak	240	100	VERTICAL
4	7272.72	36.05	54.00	-17.95	28.50	5.34	37.03	34.82	Average	240	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4874.00	43.63	74.00	-30.37	41.32	4.22	32.66	34.57	Peak	285	100	HORIZONTAL
2	4874.00	31.36	54.00	-22.64	29.05	4.22	32.66	34.57	Average	285	100	HORIZONTAL
3	7311.00	49.45	74.00	-24.55	41.86	5.34	37.07	34.82	Peak	263	100	HORIZONTAL
4	7311.00	36.57	54.00	-17.43	28.98	5.34	37.07	34.82	Average	263	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4874.00	43.96	74.00	-30.04	41.65	4.22	32.66	34.57	Peak	339	100	VERTICAL
2	4874.00	31.29	54.00	-22.71	28.98	4.22	32.66	34.57	Average	339	100	VERTICAL
3	7311.00	49.68	74.00	-24.32	42.09	5.34	37.07	34.82	Peak	299	100	VERTICAL
4	7311.00	36.44	54.00	-17.56	28.85	5.34	37.07	34.82	Average	299	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT40 CH 9 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4904.00	44.04	74.00	-29.96	41.65	4.22	32.73	34.56	Peak	302	100	HORIZONTAL
2	4904.00	30.98	54.00	-23.02	28.59	4.22	32.73	34.56	Average	302	100	HORIZONTAL
3	7356.00	49.13	74.00	-24.87	41.48	5.35	37.13	34.83	Peak	302	100	HORIZONTAL
4	7356.00	36.65	54.00	-17.35	29.00	5.35	37.13	34.83	Average	302	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4904.00	31.35	54.00	-22.65	28.96	4.22	32.73	34.56	Average	283	100	VERTICAL
2	4904.00	44.49	74.00	-29.51	42.10	4.22	32.73	34.56	Peak	283	100	VERTICAL
3	7356.00	50.04	74.00	-23.96	42.39	5.35	37.13	34.83	Peak	331	100	VERTICAL
4	7356.00	36.66	54.00	-17.34	29.01	5.35	37.13	34.83	Average	331	100	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11490.00	61.27	74.00	-12.73	47.93	9.09	39.10	34.85	158	55	HORIZONTAL	Peak
2	11490.00	47.29	54.00	-6.71	33.95	9.09	39.10	34.85	158	55	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	11490.00	59.63	74.00	-14.37	46.29	9.09	39.10	34.85	120	320	VERTICAL	Peak
2	11490.00	47.04	54.00	-6.96	33.70	9.09	39.10	34.85	120	320	VERTICAL	Average

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11571.39	46.02	54.00	-7.98	32.75	9.11	39.01	34.85	160	65	HORIZONTAL	Average
2	11573.85	59.18	74.00	-14.82	45.91	9.11	39.01	34.85	160	65	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	11573.04	58.96	74.00	-15.04	45.69	9.11	39.01	34.85	130	315	VERTICAL	Peak
2	11574.49	46.22	54.00	-7.78	32.95	9.11	39.01	34.85	130	315	VERTICAL	Average

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11649.91	45.95	54.00	-8.05	32.76	9.11	38.93	34.85	134	55	HORIZONTAL	Average
2	11650.09	59.77	74.00	-14.23	46.58	9.11	38.93	34.85	134	55	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	11643.95	55.33	74.00	-18.67	42.14	9.11	38.93	34.85	158	252	VERTICAL	Peak
2	11652.00	44.56	54.00	-9.44	31.41	9.11	38.89	34.85	158	252	VERTICAL	Average

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11513.44	44.32	54.00	-9.68	30.97	9.10	39.10	34.85	100	349	HORIZONTAL	Average
2	11515.99	57.65	74.00	-16.35	44.30	9.10	39.10	34.85	100	349	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	11510.98	58.16	74.00	-15.84	44.81	9.10	39.10	34.85	100	318	VERTICAL	Peak
2	11515.01	44.80	54.00	-9.20	31.45	9.10	39.10	34.85	100	318	VERTICAL	Average

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11591.82	56.44	74.00	-17.56	43.21	9.11	38.97	34.85	100	360	HORIZONTAL	Peak
2	11599.41	42.54	54.00	-11.46	29.31	9.11	38.97	34.85	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	11580.77	55.86	74.00	-18.14	42.59	9.11	39.01	34.85	170	322	VERTICAL	Peak
2	11595.96	44.11	54.00	-9.89	30.88	9.11	38.97	34.85	170	322	VERTICAL	Average

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11552.84	44.27	54.00	-9.73	31.01	9.10	39.01	34.85	134	56	HORIZONTAL	Average
2	11554.98	57.93	74.00	-16.07	44.67	9.10	39.01	34.85	134	56	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	11551.59	43.19	54.00	-10.81	29.93	9.10	39.01	34.85	120	323	VERTICAL	Average
2	11554.60	56.31	74.00	-17.69	43.05	9.10	39.01	34.85	100	323	VERTICAL	Peak

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11b CH 1 / Ant. 3 + Ant. 4
Test Date	Oct. 23, 2014		

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	4823.82	48.07	74.00	-25.93	44.92	5.69	32.76	35.30	122	280	HORIZONTAL	Peak
2	4823.95	40.98	54.00	-13.02	37.83	5.69	32.76	35.30	122	280	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	4823.88	36.05	54.00	-17.95	32.90	5.69	32.76	35.30	100	148	VERTICAL	Average
2	4823.92	46.48	74.00	-27.52	43.33	5.69	32.76	35.30	100	148	VERTICAL	Peak

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11b CH 6 / Ant. 3 + Ant. 4
Test Date	Oct. 23, 2014		

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	4873.92	45.71	54.00	-8.29	42.47	5.75	32.80	35.31	118	279	HORIZONTAL	Average
2	4873.93	50.77	74.00	-23.23	47.53	5.75	32.80	35.31	118	279	HORIZONTAL	Peak
3	7311.46	54.05	74.00	-19.95	45.23	7.06	37.12	35.36	100	36	HORIZONTAL	Peak
4	7311.67	43.92	54.00	-10.08	35.10	7.06	37.12	35.36	100	36	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	4873.90	47.80	74.00	-26.20	44.56	5.75	32.80	35.31	100	149	VERTICAL	Peak
2	4873.95	37.02	54.00	-16.98	33.78	5.75	32.80	35.31	100	149	VERTICAL	Average
3	7309.67	42.62	54.00	-11.38	33.80	7.06	37.12	35.36	100	27	VERTICAL	Average
4	7310.54	52.52	74.00	-21.48	43.70	7.06	37.12	35.36	100	27	VERTICAL	Peak

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11b CH 11 / Ant. 3 + Ant. 4
Test Date	Oct. 23, 2014		

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	4923.78	48.51	74.00	-25.49	45.19	5.81	32.84	35.33	134	278	HORIZONTAL	Peak
2	4923.97	40.99	54.00	-13.01	37.67	5.81	32.84	35.33	134	278	HORIZONTAL	Average
3	7385.07	53.16	74.00	-20.84	44.23	7.09	37.16	35.32	115	33	HORIZONTAL	Peak
4	7386.68	43.40	54.00	-10.60	34.47	7.09	37.16	35.32	115	33	HORIZONTAL	Average
5	12311.19	59.03	74.00	-14.97	45.74	9.22	38.56	34.49	158	322	HORIZONTAL	Peak
6	12311.45	49.76	54.00	-4.24	36.47	9.22	38.56	34.49	158	322	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	4923.77	47.18	74.00	-26.82	43.86	5.81	32.84	35.33	100	144	VERTICAL	Peak
2	4924.02	34.56	54.00	-19.44	31.24	5.81	32.84	35.33	100	144	VERTICAL	Average
3	7384.67	42.68	54.00	-11.32	33.75	7.09	37.16	35.32	207	171	VERTICAL	Average
4	7386.45	53.14	74.00	-20.86	44.21	7.09	37.16	35.32	207	171	VERTICAL	Peak
5	12308.34	55.55	74.00	-18.45	42.30	9.21	38.53	34.49	226	28	VERTICAL	Peak
6	12308.83	41.50	54.00	-12.50	28.22	9.21	38.56	34.49	226	28	VERTICAL	Average

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11g CH 1 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4816.04	43.97	74.00	-30.03	41.83	4.20	32.52	34.58	Peak	165	100	HORIZONTAL
2	4825.74	31.39	54.00	-22.61	29.20	4.21	32.56	34.58	Average	165	100	HORIZONTAL
3	7226.88	49.28	74.00	-24.72	41.80	5.32	36.97	34.81	Peak	196	100	HORIZONTAL
4	7229.63	36.68	54.00	-17.32	29.20	5.32	36.97	34.81	Average	196	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4814.80	43.98	74.00	-30.02	41.84	4.20	32.52	34.58	Peak	356	100	VERTICAL
2	4826.11	31.36	54.00	-22.64	29.17	4.21	32.56	34.58	Average	356	100	VERTICAL
3	7227.69	36.51	54.00	-17.49	29.03	5.32	36.97	34.81	Average	253	100	VERTICAL
4	7234.35	48.75	74.00	-25.25	41.24	5.33	36.99	34.81	Peak	253	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11g CH 6 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4873.39	34.06	54.00	-19.94	31.75	4.22	32.66	34.57	Average	84	165	HORIZONTAL
2	4874.72	45.10	74.00	-28.90	42.79	4.22	32.66	34.57	Peak	84	100	HORIZONTAL
3	7308.25	38.93	54.00	-15.07	31.34	5.34	37.07	34.82	Average	352	100	HORIZONTAL
4	7312.91	51.55	74.00	-22.45	43.97	5.34	37.07	34.83	Peak	352	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4873.10	32.25	54.00	-21.75	29.94	4.22	32.66	34.57	Average	357	8995	VERTICAL
2	4873.80	44.87	74.00	-29.13	42.56	4.22	32.66	34.57	Peak	357	100	VERTICAL
3	7304.58	38.53	54.00	-15.47	30.94	5.34	37.07	34.82	Average	10	166	VERTICAL
4	7307.70	49.25	74.00	-24.75	41.66	5.34	37.07	34.82	Peak	10	166	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11g CH 11 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4927.82	31.70	54.00	-22.30	29.26	4.23	32.76	34.55	Average	127	100	HORIZONTAL
2	4927.88	43.97	74.00	-30.03	41.53	4.23	32.76	34.55	Peak	127	100	HORIZONTAL
3	7394.54	37.11	54.00	-16.89	29.41	5.36	37.18	34.84	Average	115	100	HORIZONTAL
4	7394.57	49.64	74.00	-24.36	41.94	5.36	37.18	34.84	Peak	115	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	4922.15	31.88	54.00	-22.12	29.44	4.23	32.76	34.55	Average	214	100	VERTICAL
2	4926.84	44.85	74.00	-29.15	42.41	4.23	32.76	34.55	Peak	214	100	VERTICAL
3	7386.52	50.59	74.00	-23.41	42.89	5.36	37.18	34.84	Peak	205	100	VERTICAL
4	7391.47	37.07	54.00	-16.93	29.37	5.36	37.18	34.84	Average	205	100	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11a CH 149 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11486.64	43.73	54.00	-10.27	30.39	9.09	39.10	34.85	256	360	HORIZONTAL	Average
2	11486.87	56.75	74.00	-17.25	43.41	9.09	39.10	34.85	256	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	11488.21	56.79	74.00	-17.21	43.45	9.09	39.10	34.85	176	140	VERTICAL	Peak
2	11492.05	43.29	54.00	-10.71	29.95	9.09	39.10	34.85	176	140	VERTICAL	Average

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11a CH 157 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11522.76	56.86	74.00	-17.14	43.55	9.10	39.06	34.85	100	0	HORIZONTAL	Peak
2	11536.97	42.82	54.00	-11.18	29.51	9.10	39.06	34.85	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	11570.00	42.92	54.00	-11.08	29.65	9.11	39.01	34.85	100	130	VERTICAL	Average
2	11570.00	56.76	74.00	-17.24	43.49	9.11	39.01	34.85	100	130	VERTICAL	Peak

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11a CH 165 / Ant. 1 + Ant. 2
Test Date	Oct. 28, 2014		

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	11610.00	43.30	54.00	-10.70	30.07	9.11	38.97	34.85	240	290	HORIZONTAL	Average
2	11610.00	56.21	74.00	-17.79	42.98	9.11	38.97	34.85	240	290	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	11610.00	56.72	74.00	-17.28	43.49	9.11	38.97	34.85	184	213	VERTICAL	Peak
2	11610.01	43.25	54.00	-10.75	30.02	9.11	38.97	34.85	184	213	VERTICAL	Average

Note:

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

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

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

4.6. Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

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

4.6.3. Test Procedures

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

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT20 CH 1, 6, 11 / Ant. 3 + Ant. 4
Test date	Oct. 30, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2390.00	68.39	74.00	-5.61	37.56	2.91	27.92	0.00	Peak	332	179	VERTICAL
2	2390.00	53.38	54.00	-0.62	22.55	2.91	27.92	0.00	Average	332	179	VERTICAL
3	2405.05	102.34			71.52	2.92	27.90	0.00	Average	332	179	VERTICAL
4	2405.49	112.57			81.75	2.92	27.90	0.00	Peak	332	179	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2389.71	68.05	74.00	-5.95	37.22	2.91	27.92	0.00	Peak	221	183	VERTICAL
2	2390.00	52.58	54.00	-1.42	21.75	2.91	27.92	0.00	Average	221	183	VERTICAL
3	2434.97	110.07			79.26	2.93	27.88	0.00	Average	221	183	VERTICAL
4	2440.76	119.73			88.93	2.94	27.86	0.00	Peak	221	183	VERTICAL
5	2483.50	69.36	74.00	-4.64	38.58	2.96	27.82	0.00	Peak	221	183	VERTICAL
6	2483.50	53.30	54.00	-0.70	22.52	2.96	27.82	0.00	Average	221	183	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2457.66	102.43			71.64	2.95	27.84	0.00	Average	327	187	VERTICAL
2	2458.53	112.38			81.59	2.95	27.84	0.00	Peak	327	187	VERTICAL
3	2483.50	72.81	74.00	-1.19	42.03	2.96	27.82	0.00	Peak	327	187	VERTICAL
4	2483.50	53.66	54.00	-0.34	22.88	2.96	27.82	0.00	Average	327	187	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11n MCS0 HT40 CH 3, 6, 9 / Ant. 3 + Ant. 4
Test date	Oct. 30, 2014		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	2390.00	69.22	74.00	-4.78	38.39	2.91	27.92	0.00	Peak	334	192	VERTICAL
2	2390.00	53.32	54.00	-0.68	22.49	2.91	27.92	0.00	Average	334	192	VERTICAL
3	2434.45	106.74			75.93	2.93	27.88	0.00	Peak	334	192	VERTICAL
4	2435.02	95.92			65.11	2.93	27.88	0.00	Average	334	192	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	2388.84	67.91	74.00	-6.09	37.08	2.91	27.92	0.00	Peak	172	185	HORIZONTAL
2	2390.00	53.90	54.00	-0.10	23.07	2.91	27.92	0.00	Average	172	185	HORIZONTAL
3	2430.05	111.59			80.78	2.93	27.88	0.00	Peak	172	185	HORIZONTAL
4	2431.79	99.83			69.02	2.93	27.88	0.00	Average	172	185	HORIZONTAL
5	2483.50	50.46	54.00	-3.54	19.68	2.96	27.82	0.00	Average	172	185	HORIZONTAL
6	2484.95	65.10	74.00	-8.90	34.32	2.96	27.82	0.00	Peak	172	185	HORIZONTAL

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

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	2445.92	107.85			77.05	2.94	27.86	0.00	Peak	329	194	VERTICAL
2	2447.66	98.05			67.25	2.94	27.86	0.00	Average	329	194	VERTICAL
3	2483.00	70.33	74.00	-3.67	39.55	2.96	27.82	0.00	Peak	329	194	VERTICAL
4	2483.50	53.34	54.00	-0.66	22.56	2.96	27.82	0.00	Average	329	194	VERTICAL

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

Note:

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

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

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11b CH 1, 6, 11 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

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	2389.13	52.84	54.00	-1.16	21.26	3.68	27.90	0.00	218	218	VERTICAL	Average
2	2390.00	62.30	74.00	-11.70	30.72	3.68	27.90	0.00	218	218	VERTICAL	Peak
3	2411.13	117.60			86.01	3.69	27.90	0.00	218	218	VERTICAL	Peak
4	2412.87	114.60			83.01	3.69	27.90	0.00	218	218	VERTICAL	Average

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	2357.87	64.28	74.00	-9.72	32.72	3.66	27.90	0.00	218	301	VERTICAL	Peak
2	2360.01	49.26	54.00	-4.74	17.70	3.66	27.90	0.00	218	301	VERTICAL	Average
3	2436.13	114.25			82.64	3.71	27.90	0.00	218	301	VERTICAL	Average
4	2436.13	117.12			85.51	3.71	27.90	0.00	218	301	VERTICAL	Peak
5	2518.23	63.65	74.00	-10.35	31.90	3.76	27.99	0.00	218	301	VERTICAL	Peak
6	2519.97	50.03	54.00	-3.97	18.28	3.76	27.99	0.00	218	301	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	2380.16	63.21	74.00	-10.79	31.64	3.67	27.90	0.00	202	351	HORIZONTAL	Peak
2	2390.00	45.12	54.00	-8.88	13.54	3.68	27.90	0.00	202	351	HORIZONTAL	Average
3	2461.13	112.42			80.80	3.72	27.90	0.00	202	351	HORIZONTAL	Average
4	2461.42	115.27			83.65	3.72	27.90	0.00	202	351	HORIZONTAL	Peak
5	2483.50	51.10	54.00	-2.90	19.47	3.73	27.90	0.00	202	351	HORIZONTAL	Average
6	2484.08	62.04	74.00	-11.96	30.41	3.73	27.90	0.00	202	351	HORIZONTAL	Peak

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

Temperature	26℃	Humidity	68%
Test Engineer	Peter Wu	Configurations	IEEE 802.11g CH 1, 6, 11 / Ant. 3 + Ant. 4
Test Date	Oct. 30, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2390.00	68.11	74.00	-5.89	37.28	2.91	27.92	0.00	Peak	324	202	VERTICAL
2	2390.00	53.73	54.00	-0.27	22.90	2.91	27.92	0.00	Average	324	202	VERTICAL
3	2405.05	102.48			71.66	2.92	27.90	0.00	Average	324	202	VERTICAL
4	2416.34	112.77			81.95	2.92	27.90	0.00	Peak	324	202	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2389.13	52.62	54.00	-1.38	21.79	2.91	27.92	0.00	Average	171	181	HORIZONTAL
2	2390.00	68.30	74.00	-5.70	37.47	2.91	27.92	0.00	Peak	171	181	HORIZONTAL
3	2430.49	110.59			79.78	2.93	27.88	0.00	Average	171	181	HORIZONTAL
4	2431.36	122.18			91.37	2.93	27.88	0.00	Peak	171	181	HORIZONTAL
5	2483.50	68.51	74.00	-5.49	37.73	2.96	27.82	0.00	Peak	171	181	HORIZONTAL
6	2483.50	52.51	54.00	-1.49	21.73	2.96	27.82	0.00	Average	171	181	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	2464.60	103.32			72.53	2.95	27.84	0.00	Average	293	191	VERTICAL
2	2465.04	113.76			82.97	2.95	27.84	0.00	Peak	293	191	VERTICAL
3	2483.50	68.77	74.00	-5.23	37.99	2.96	27.82	0.00	Peak	293	191	VERTICAL
4	2483.50	53.16	54.00	-0.84	22.38	2.96	27.82	0.00	Average	293	191	VERTICAL

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

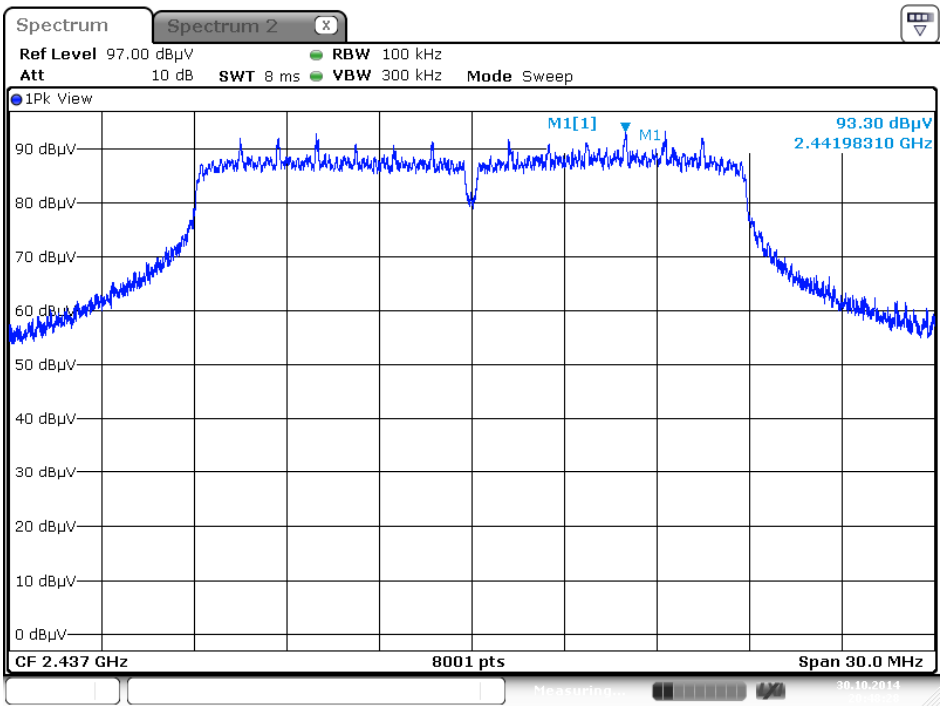
Note:

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

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

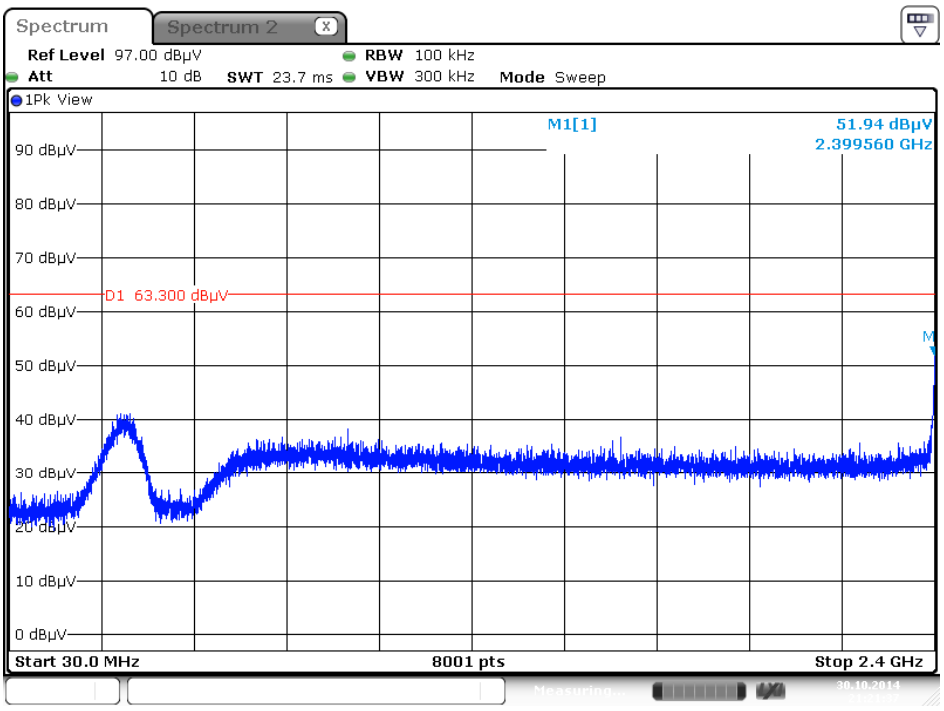
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level



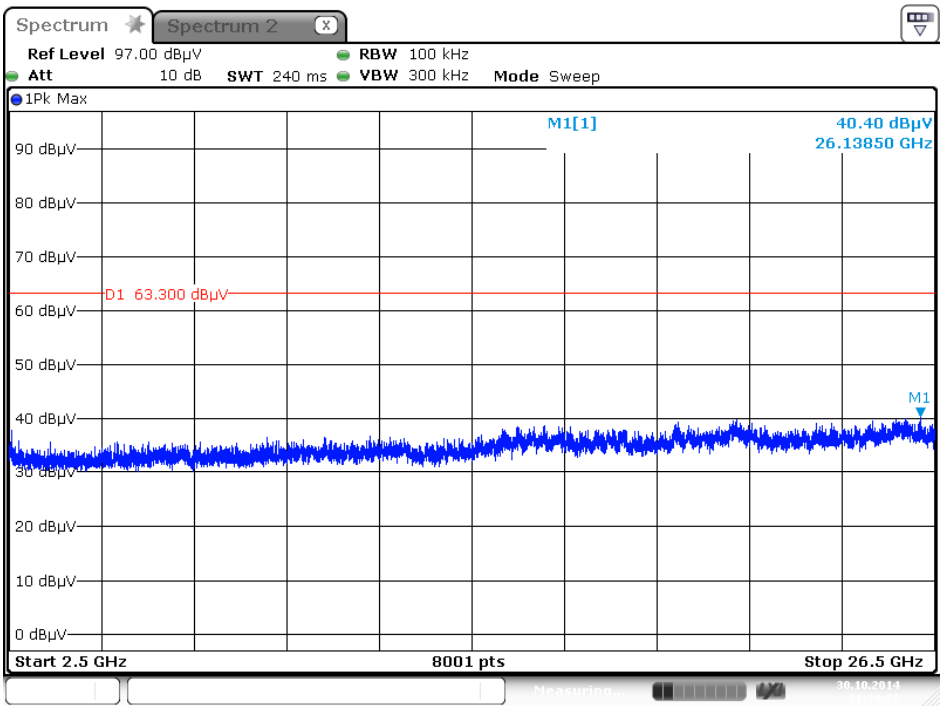
Date: 30.OCT.2014 20:48:29

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



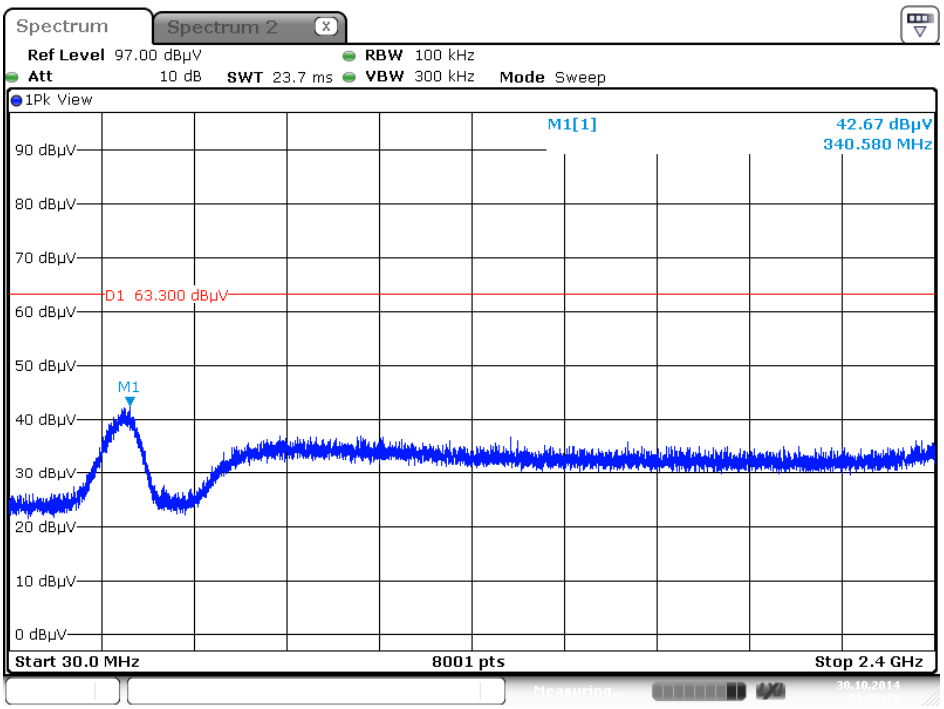
Date: 30.OCT.2014 21:21:37

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



Date: 30.OCT.2014 21:20:28

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



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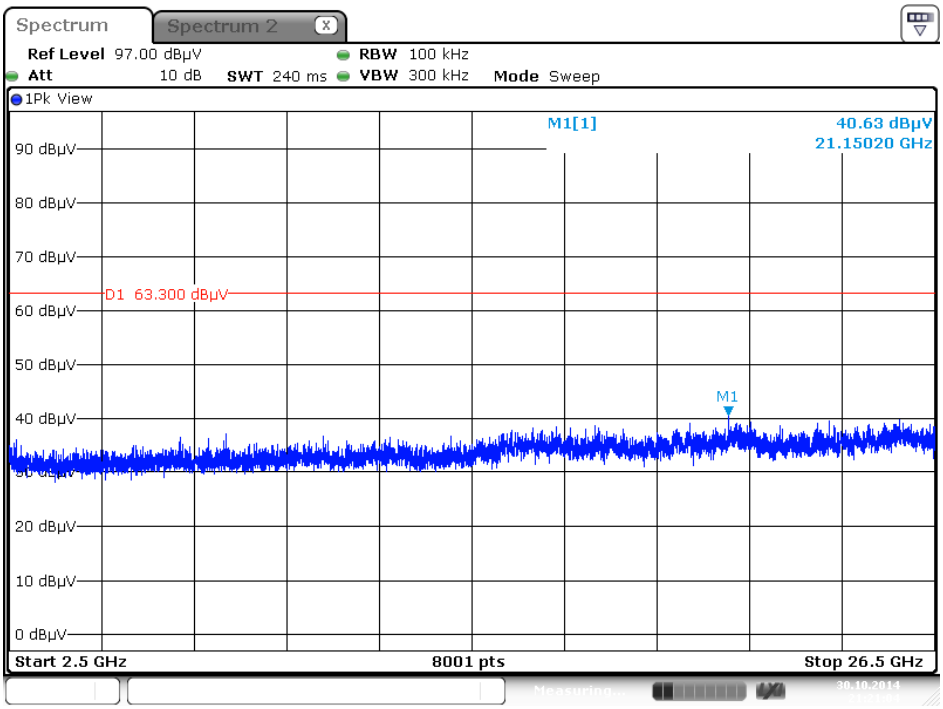
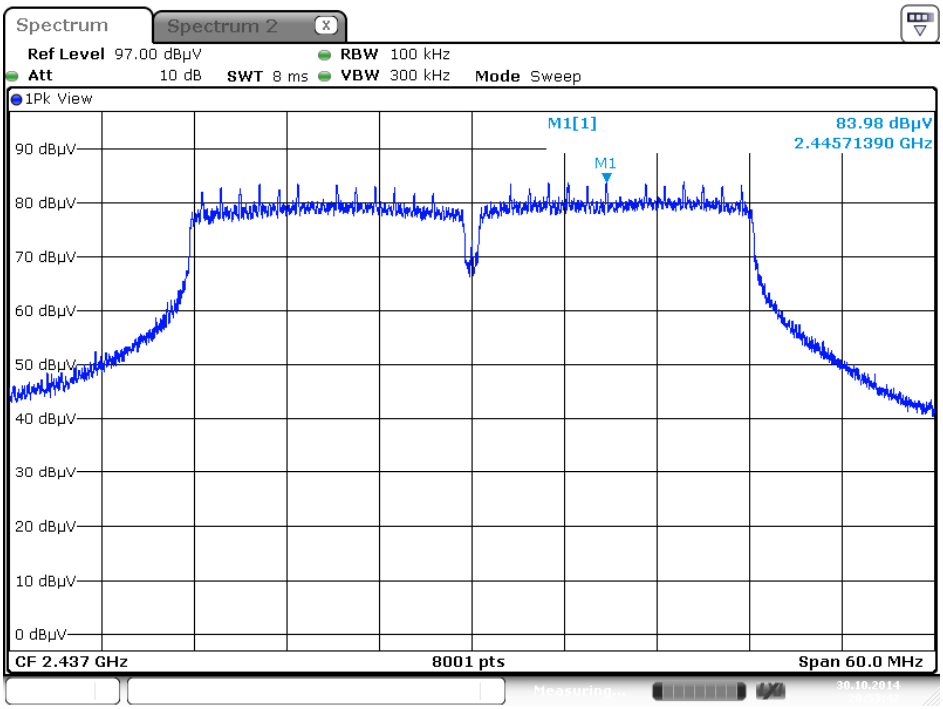
Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)

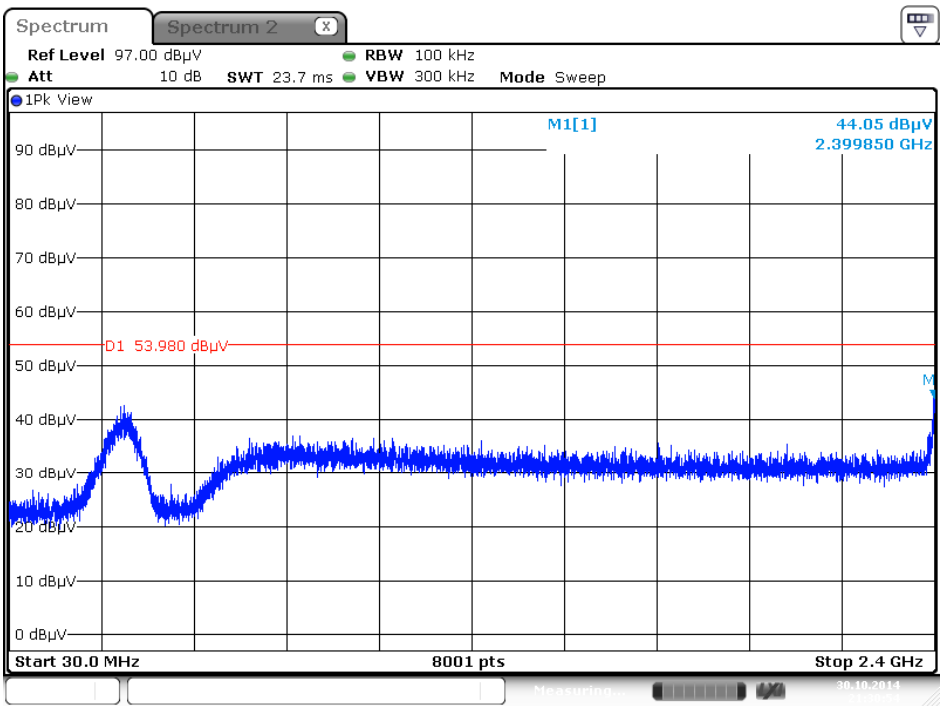


Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level



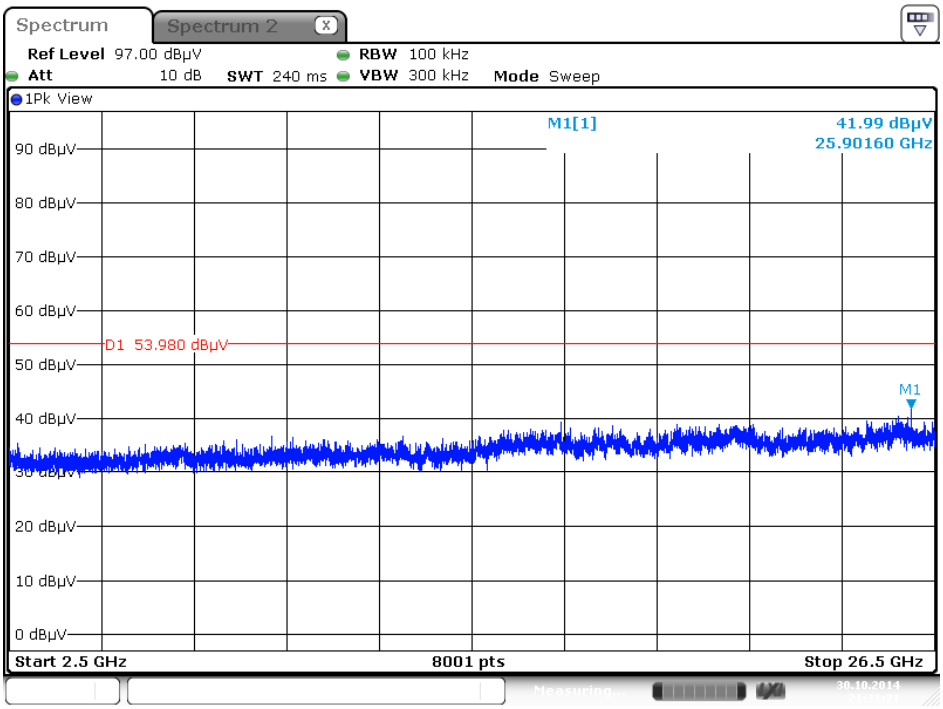
Date: 30.OCT.2014 20:53:42

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



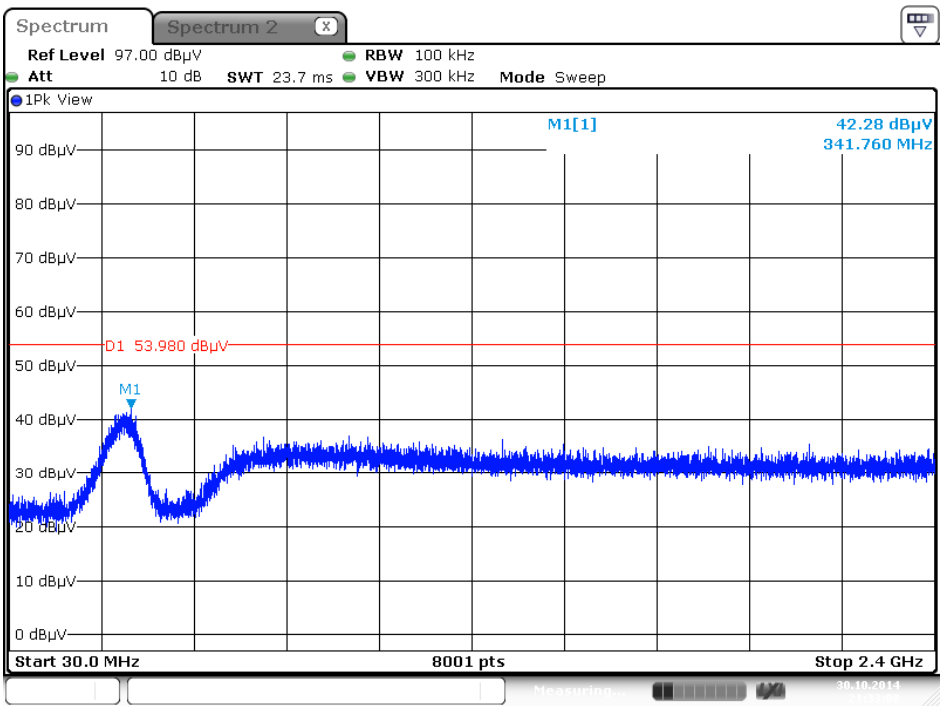
Date: 30.OCT.2014 21:30:54

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



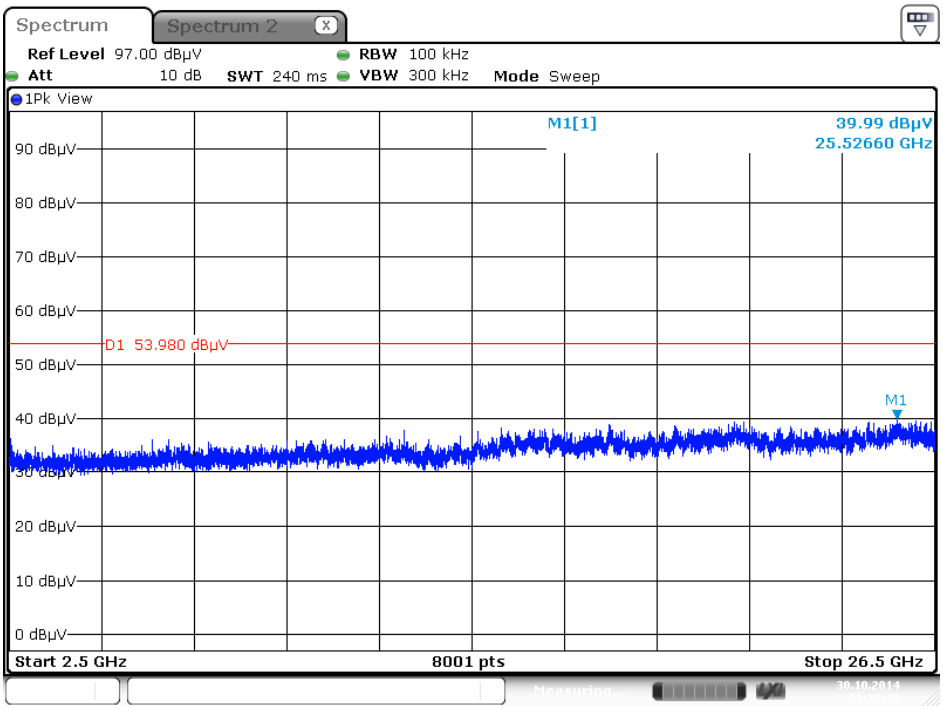
Date: 30.OCT.2014 21:31:21

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



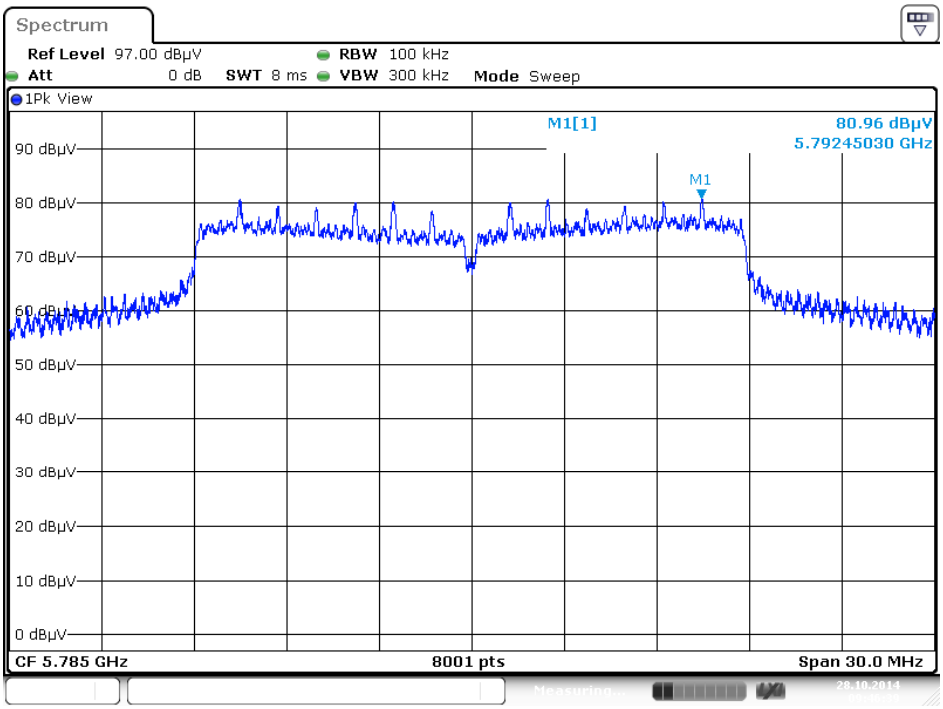
Date: 30.OCT.2014 21:33:09

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



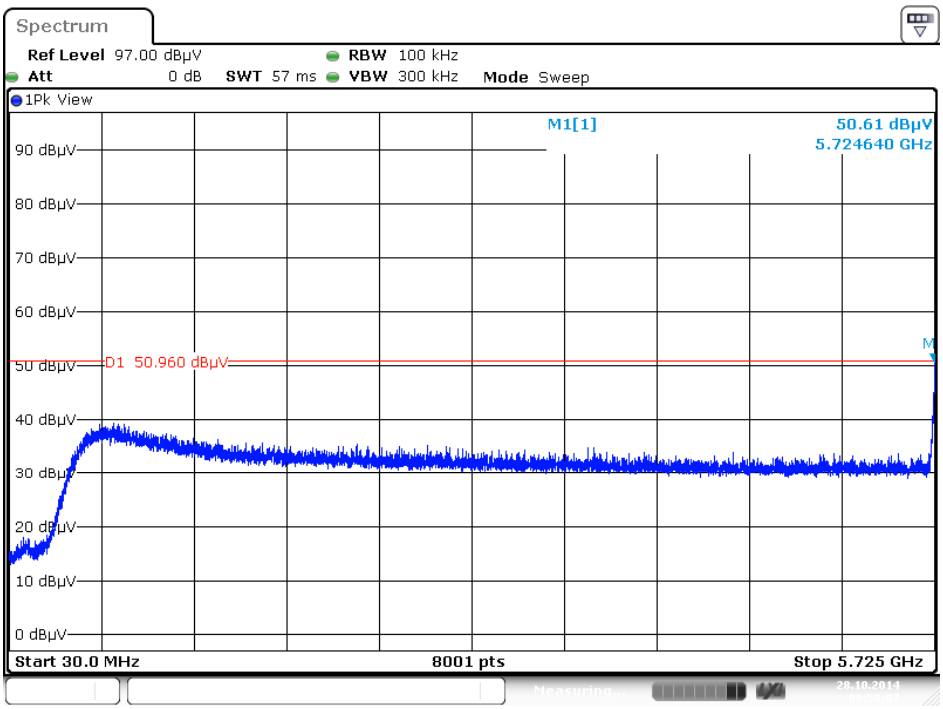
Date: 30.OCT.2014 21:32:43

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



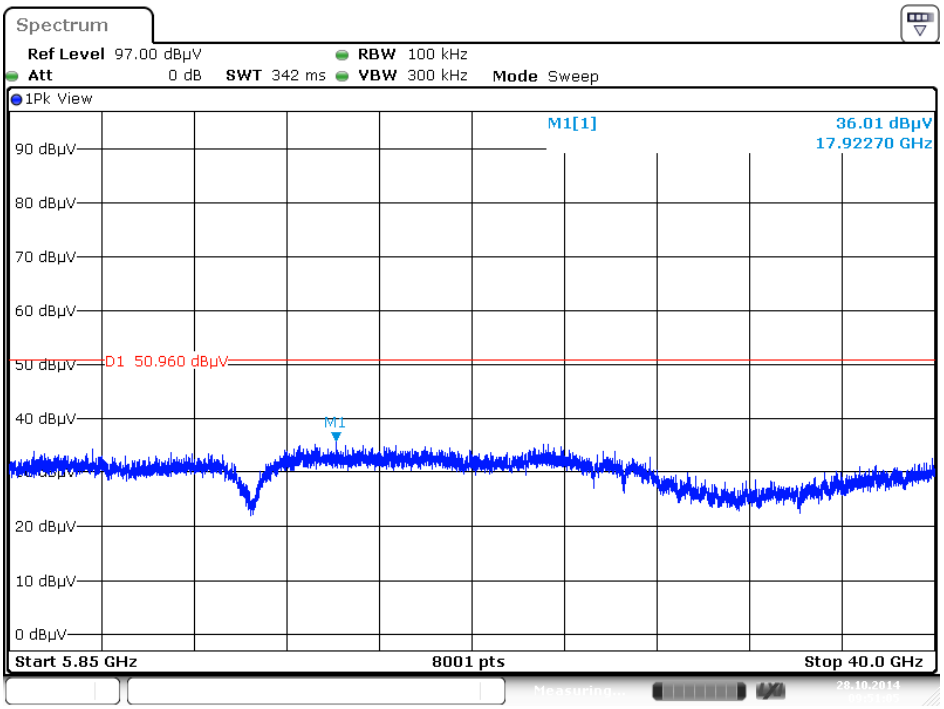
Date: 28.OCT.2014 09:46:39

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



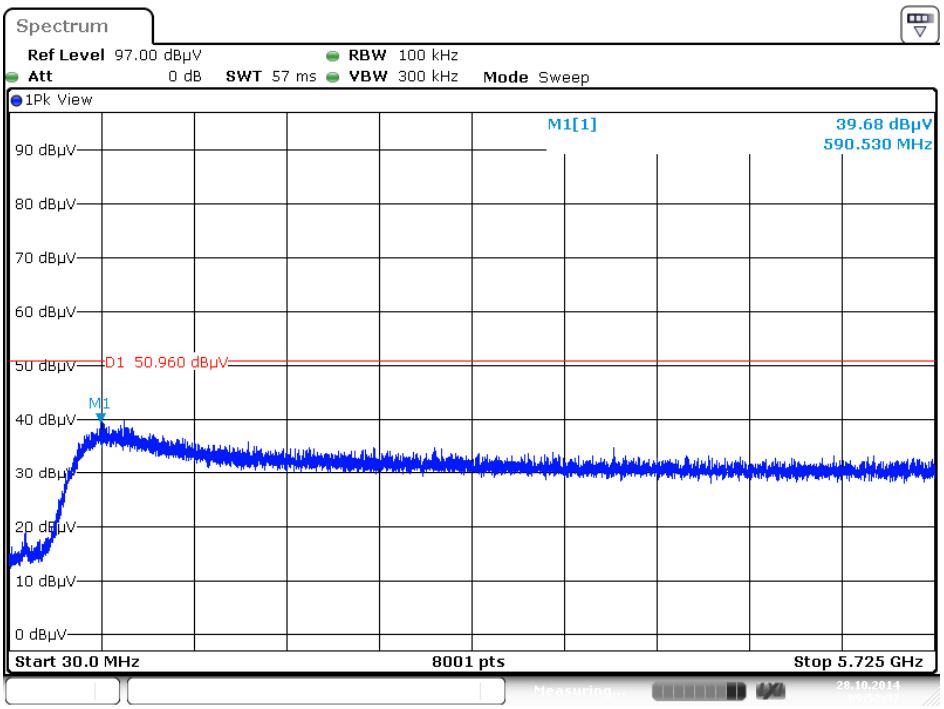
Date: 28.OCT.2014 09:50:08

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



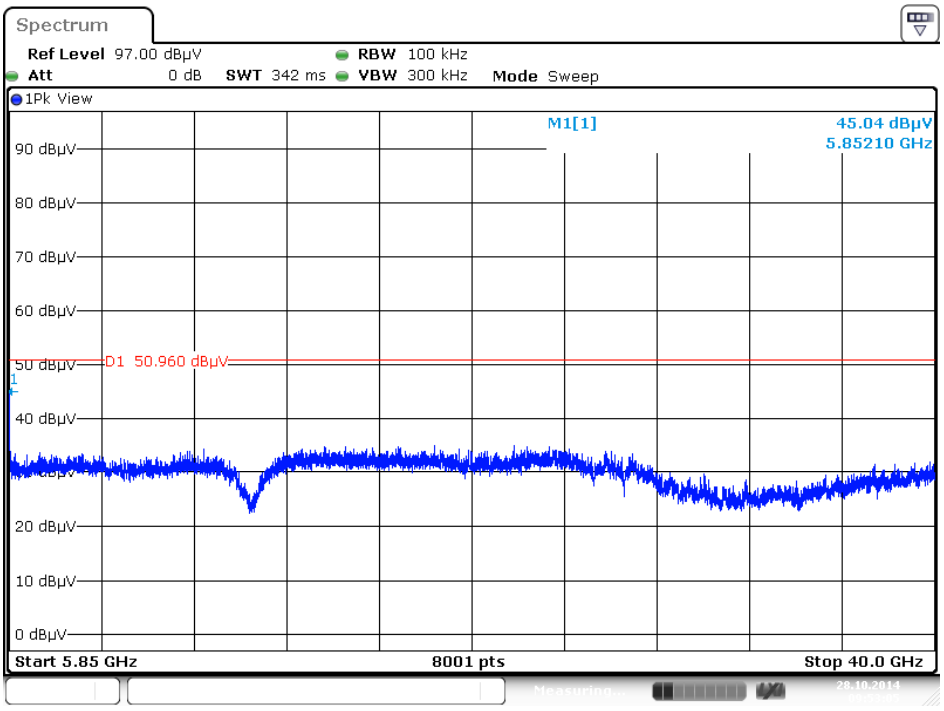
Date: 28.OCT.2014 09:51:05

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



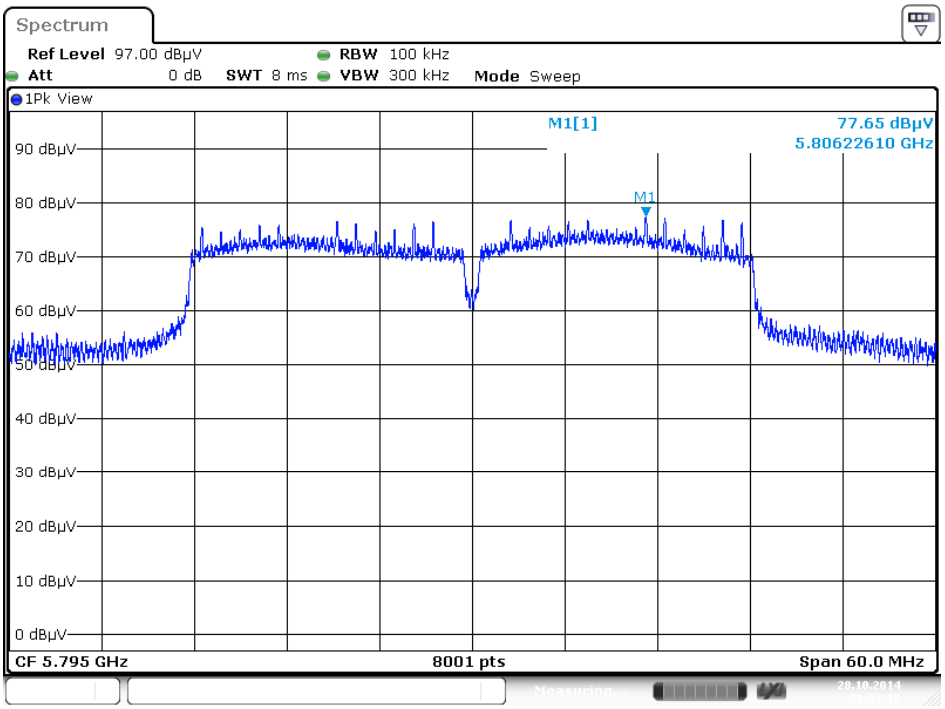
Date: 28.OCT.2014 09:52:33

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



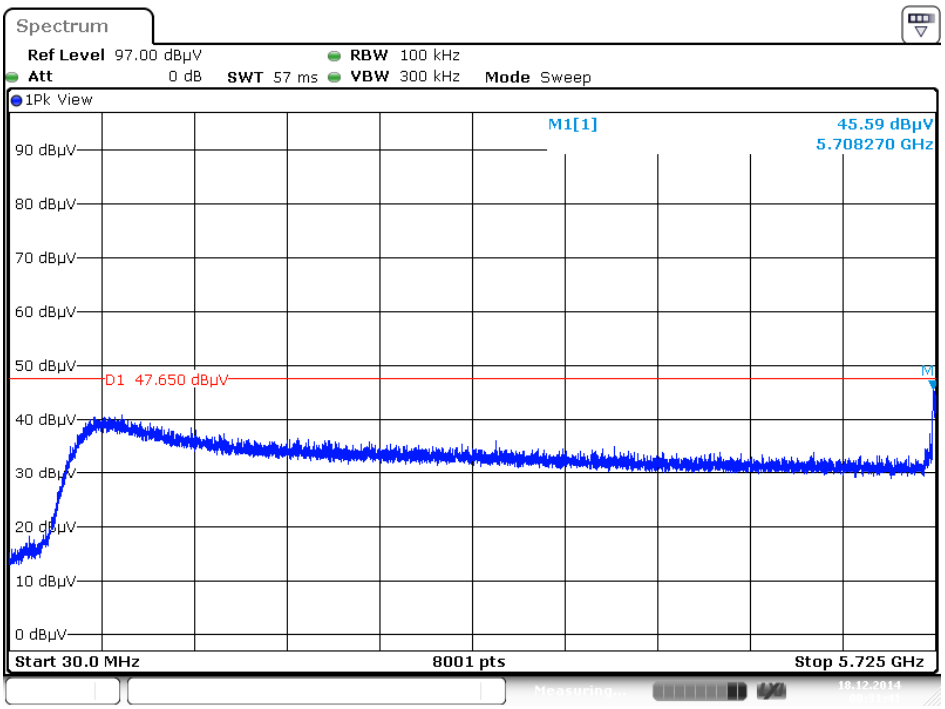
Date: 28.OCT.2014 09:53:05

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



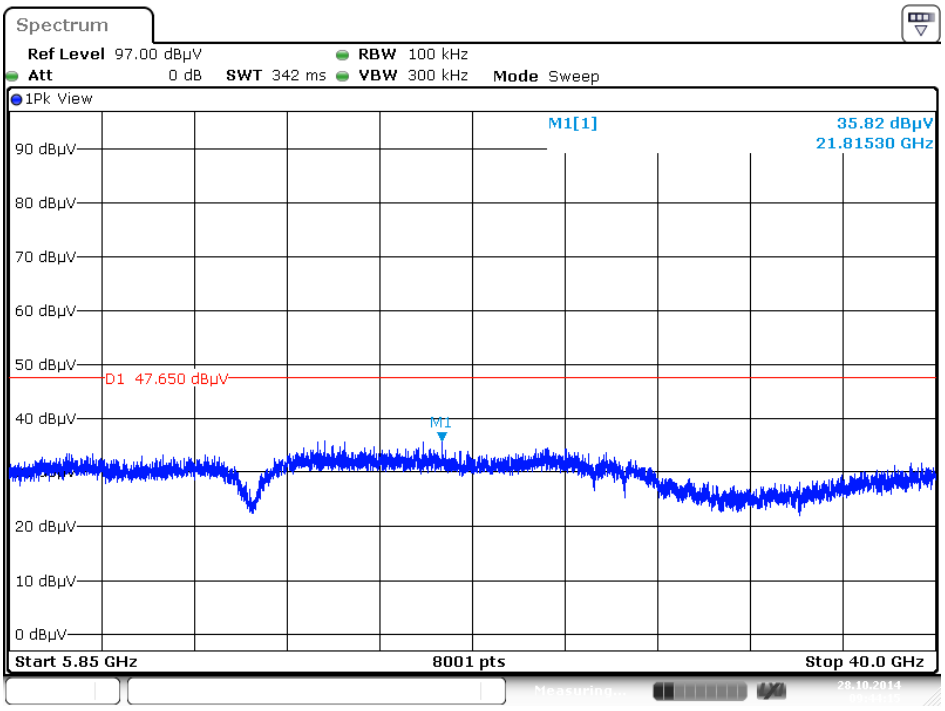
Date: 28.OCT.2014 09:32:17

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



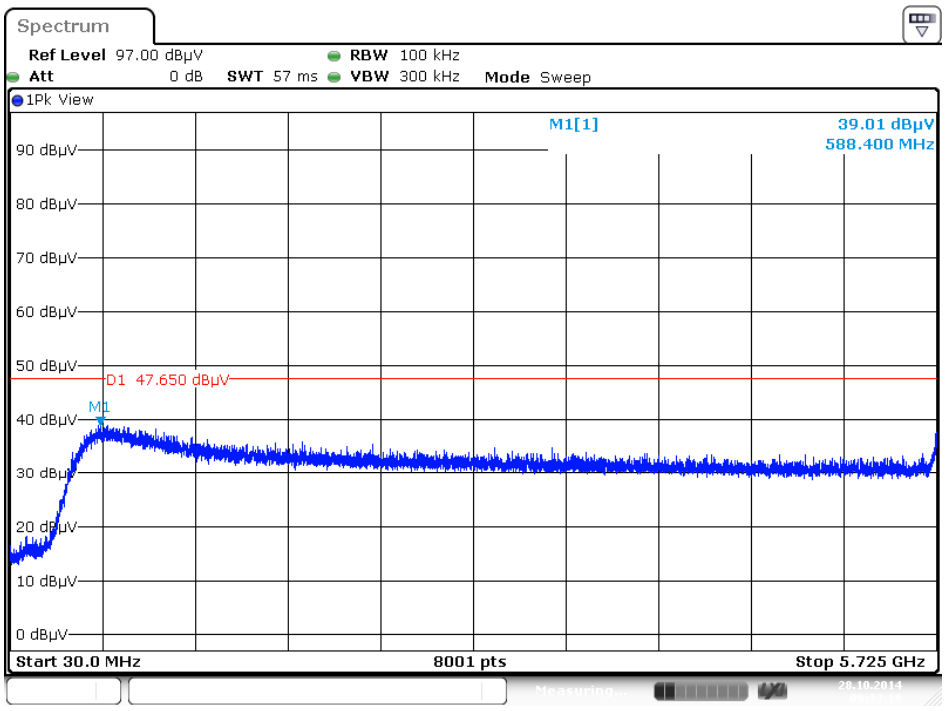
Date: 18.DEC.2014 00:31:41

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



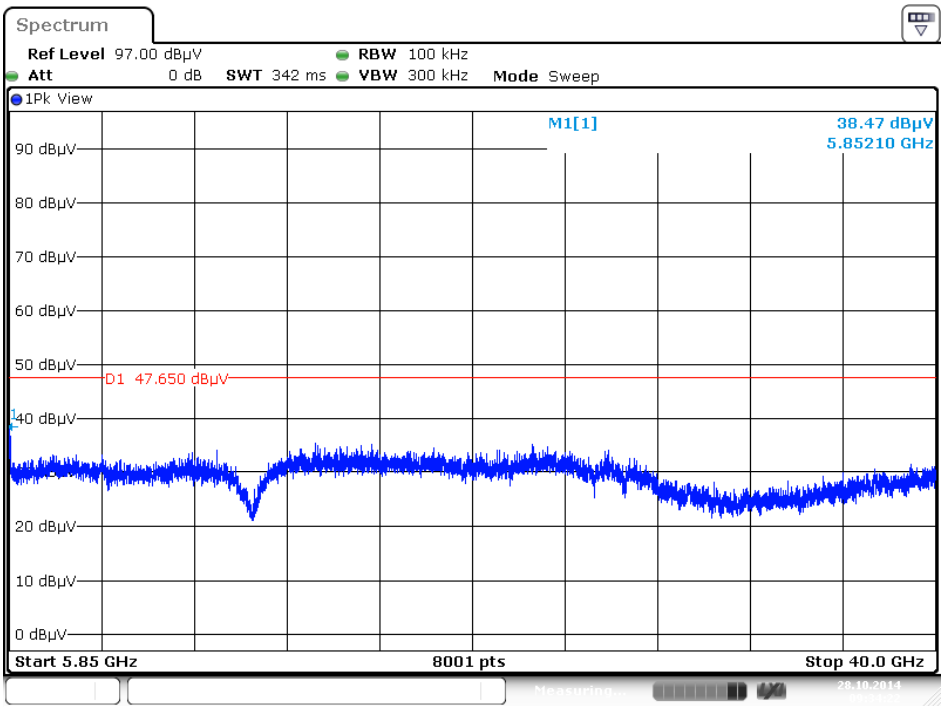
Date: 28.OCT.2014 09:44:15

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



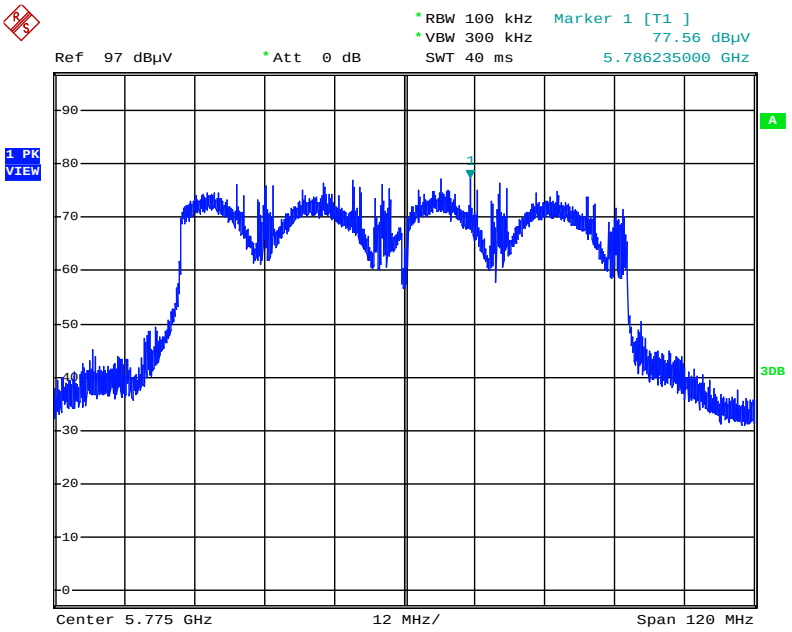
Date: 28.OCT.2014 09:33:19

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



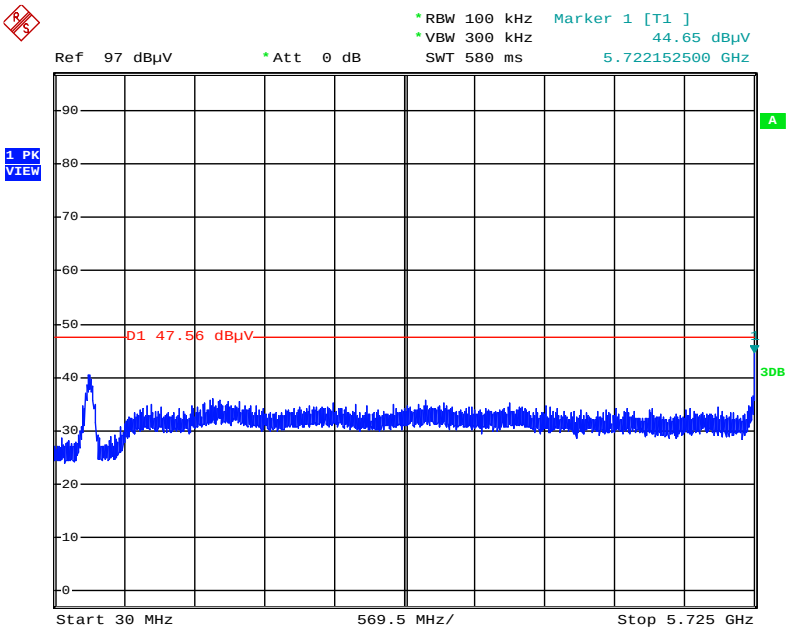
Date: 28.OCT.2014 09:34:23

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



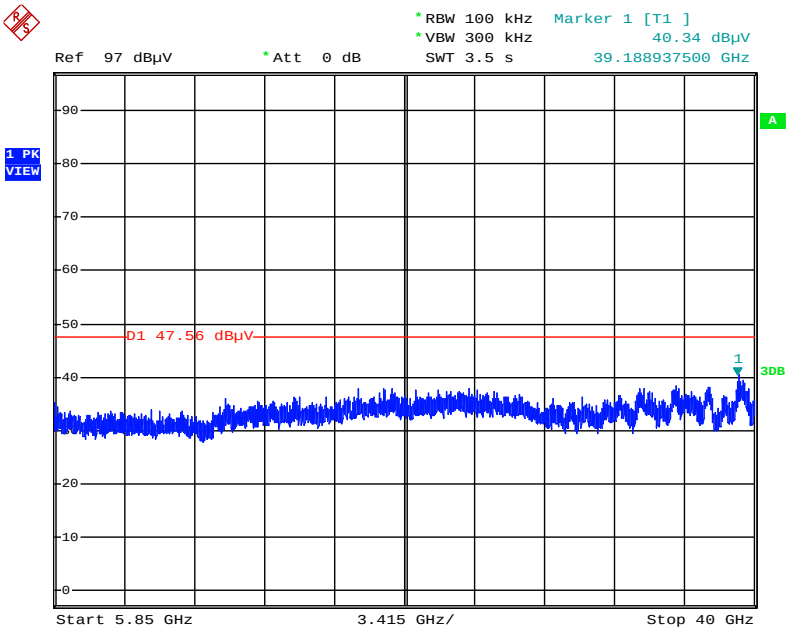
Date: 29.OCT.2014 16:56:14

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



Date: 29.OCT.2014 16:57:10

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

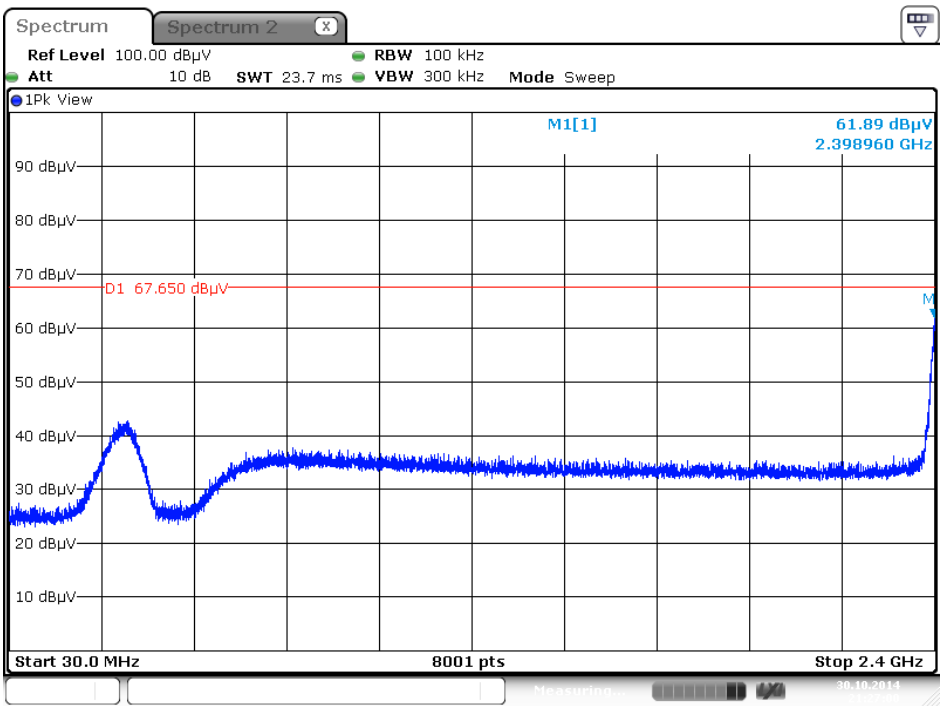


Date: 29.OCT.2014 16:57:47

Plot on Configuration IEEE 802.11b / Reference Level

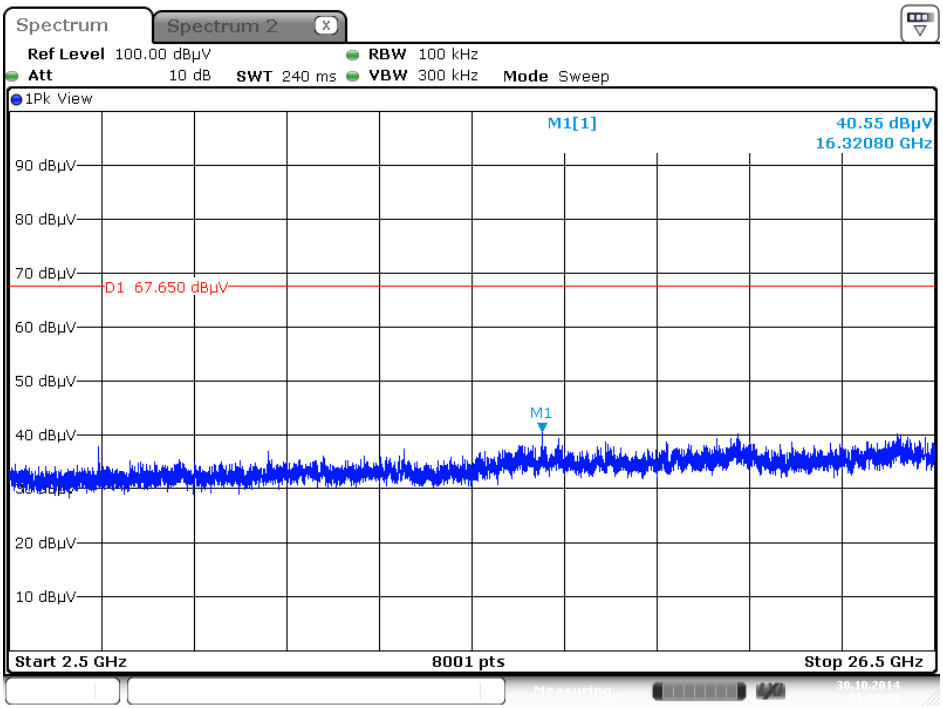
Date: 30.OCT.2014 20:34:37

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



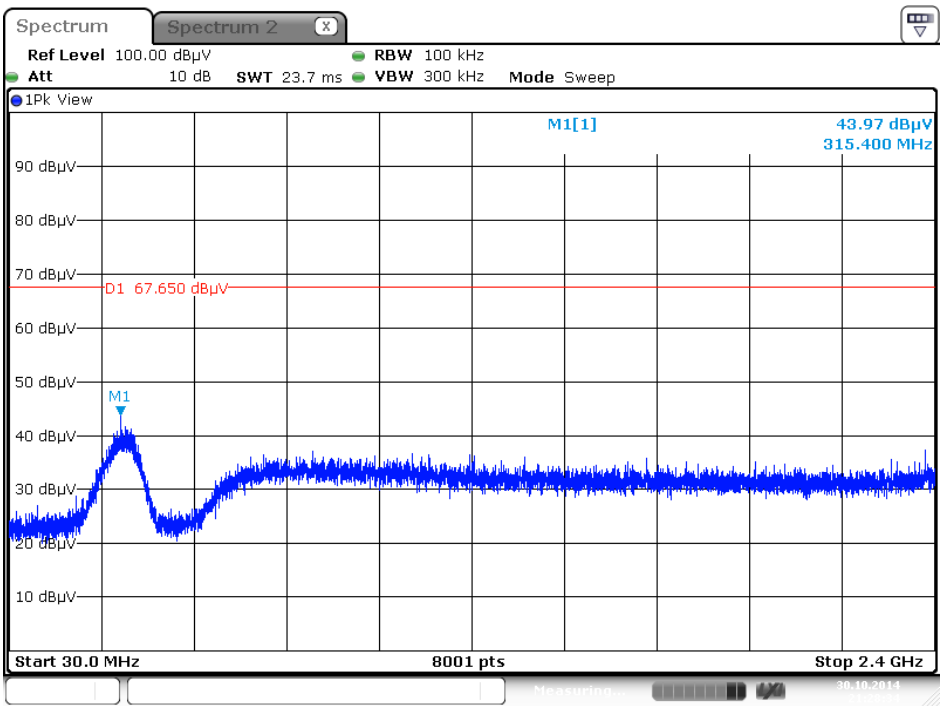
Date: 30.OCT.2014 21:27:00

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



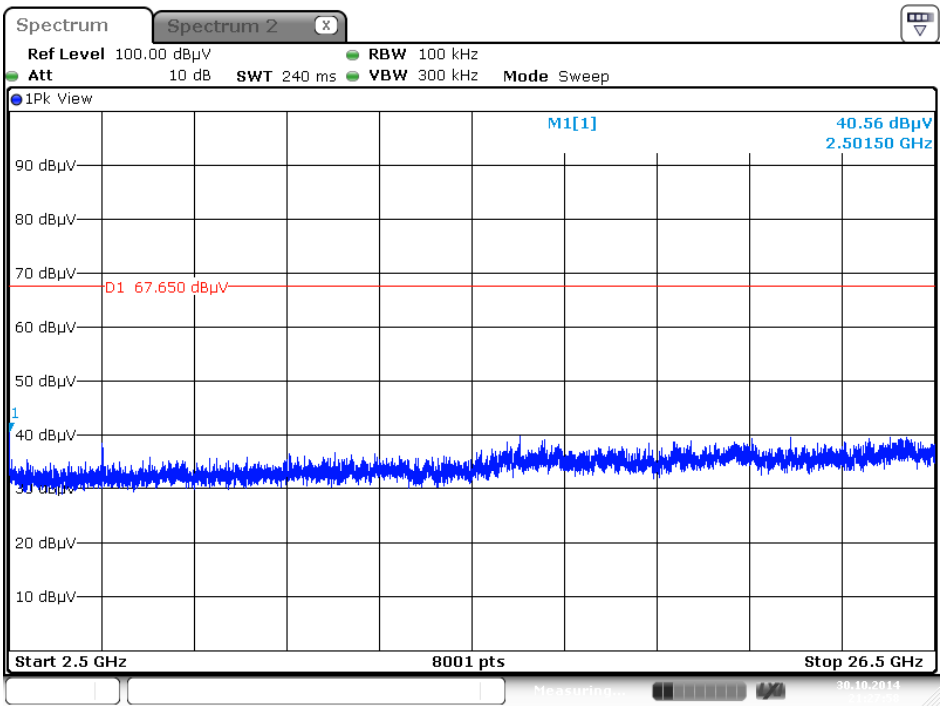
Date: 30.OCT.2014 21:27:28

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



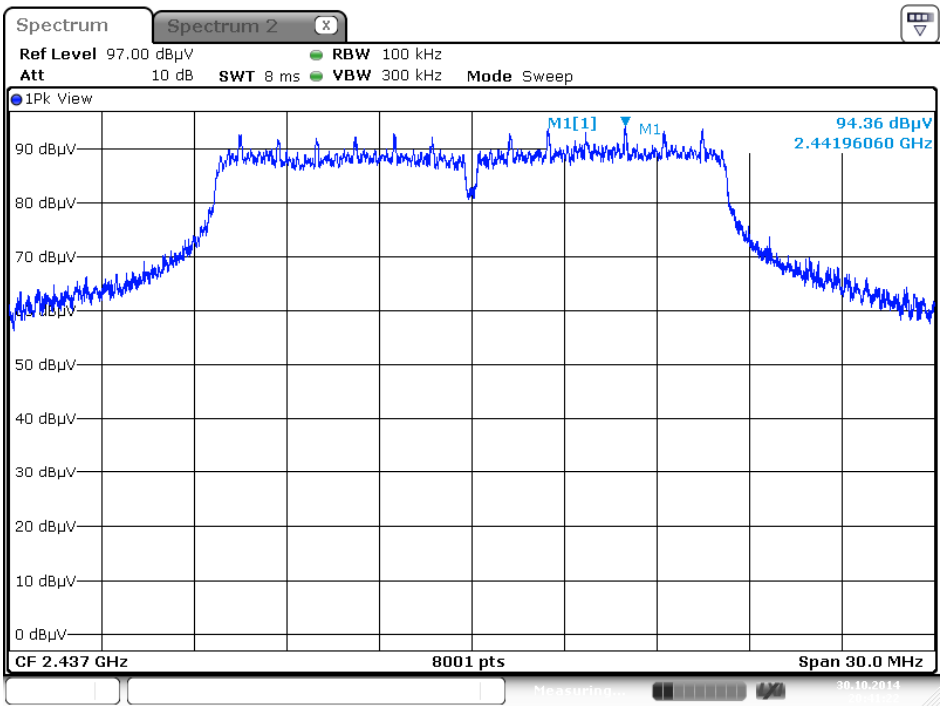
Date: 30.OCT.2014 21:28:34

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



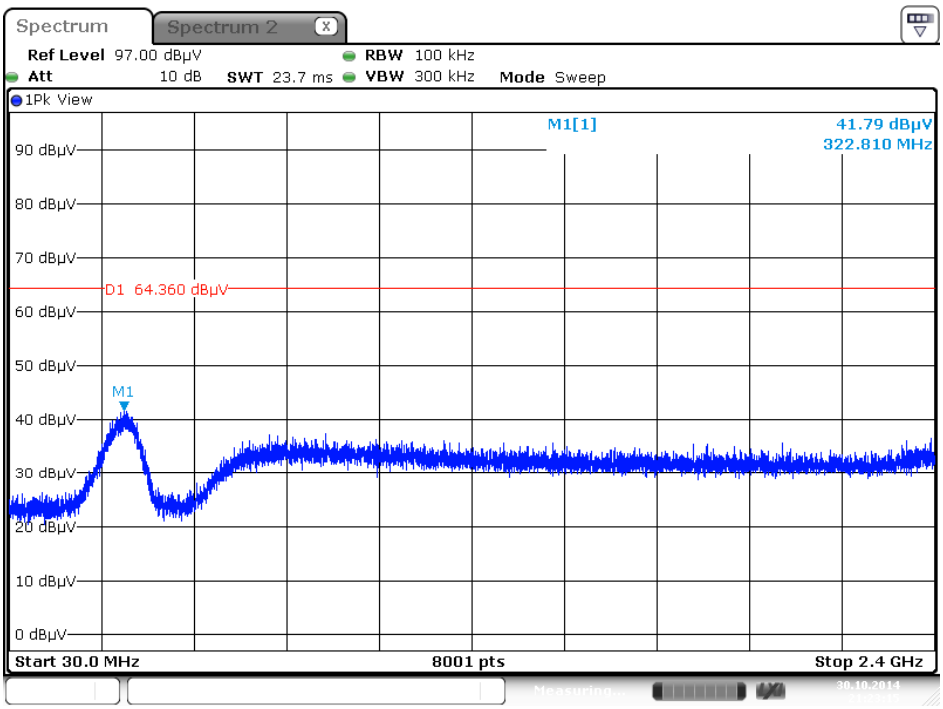
Date: 30.OCT.2014 21:27:59

Plot on Configuration IEEE 802.11g / Reference Level



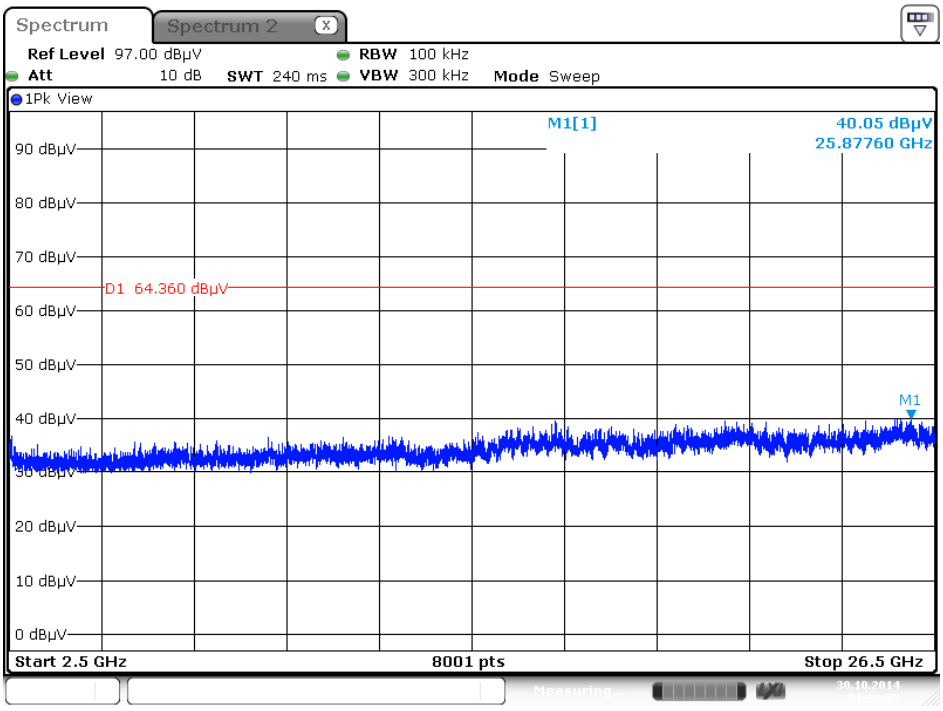
Date: 30.OCT.2014 20:41:22

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



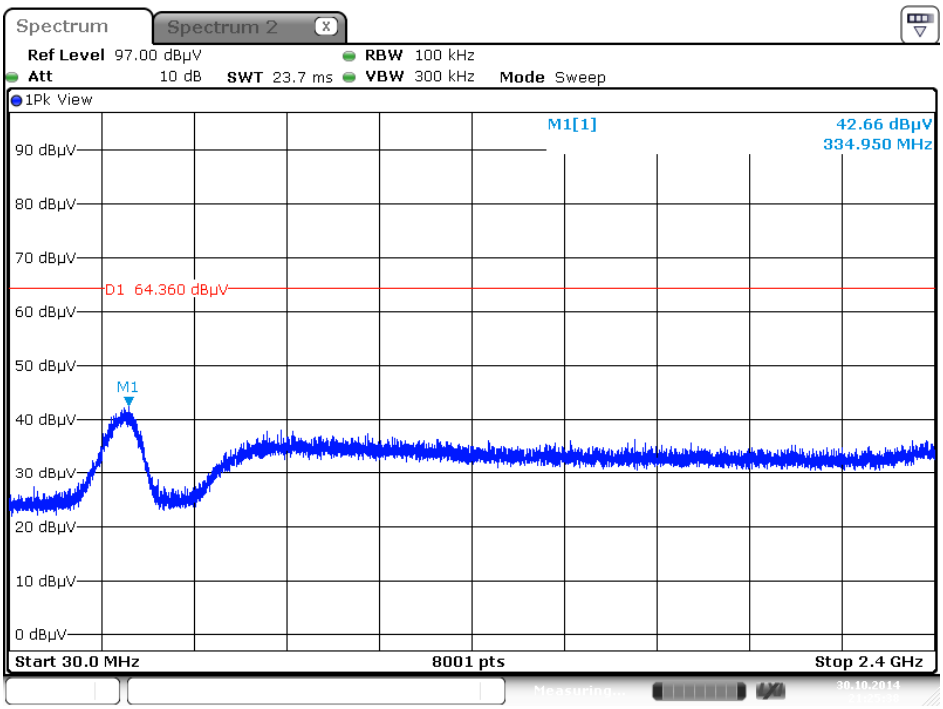
Date: 30.OCT.2014 21:23:15

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



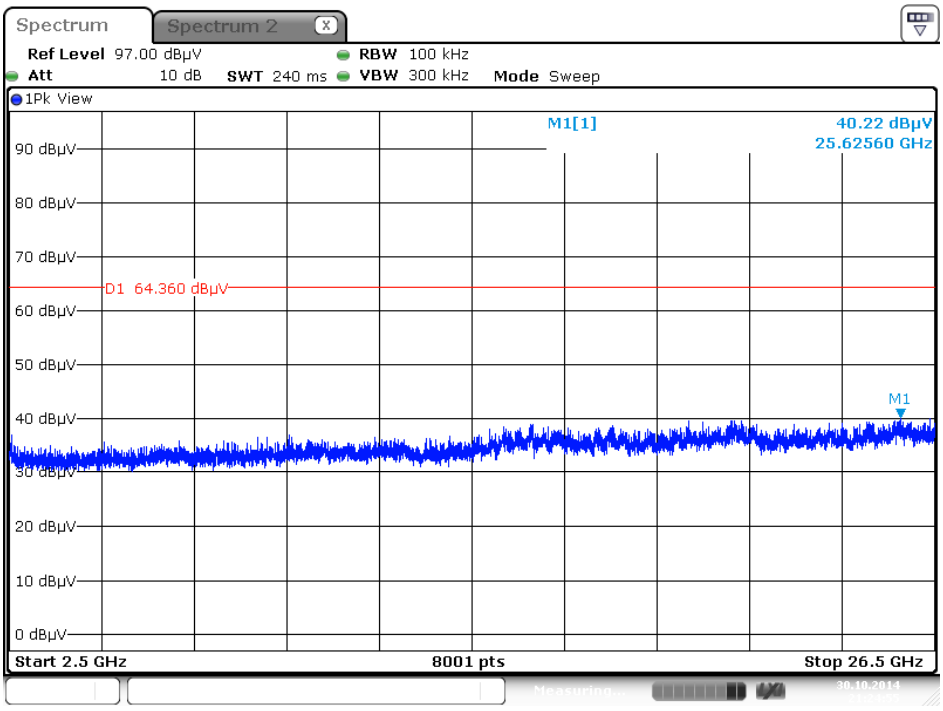
Date: 30.OCT.2014 21:23:55

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



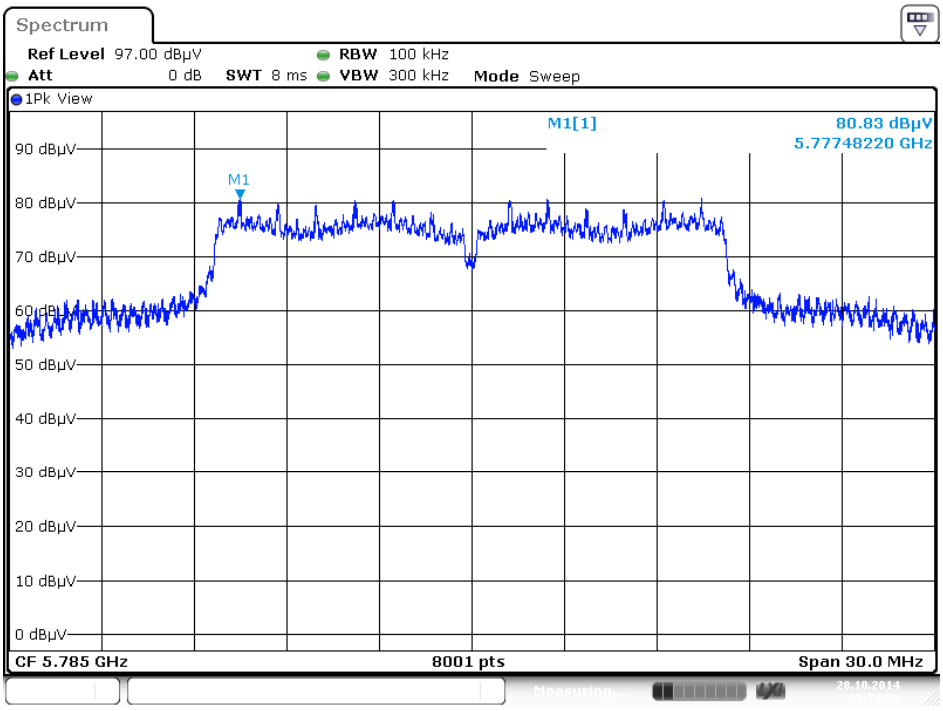
Date: 30.OCT.2014 21:25:39

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



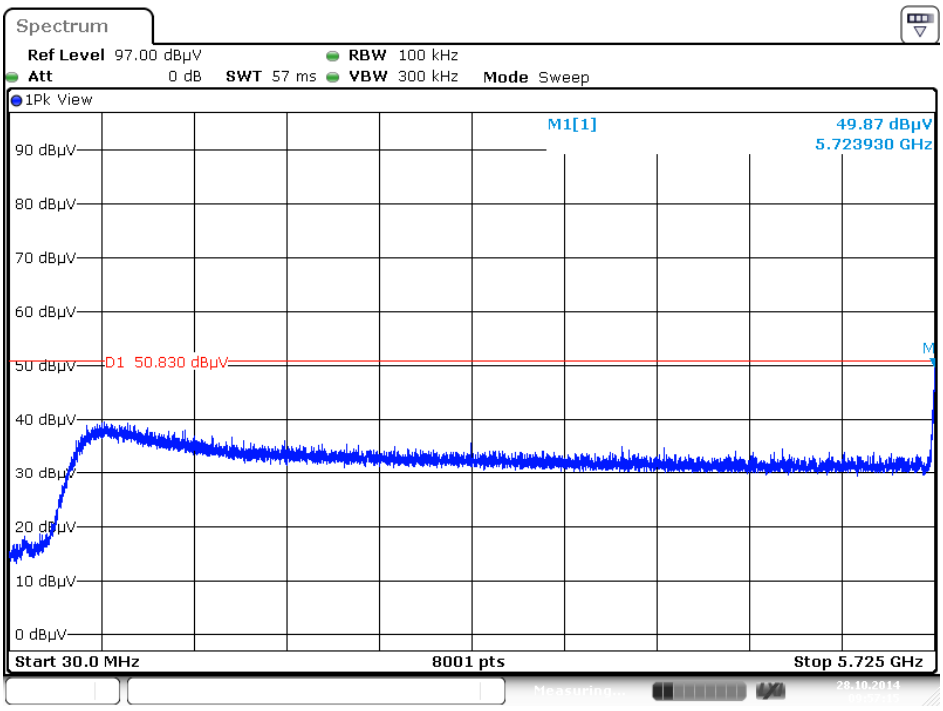
Date: 30.OCT.2014 21:24:55

Plot on Configuration IEEE 802.11a / Reference Level



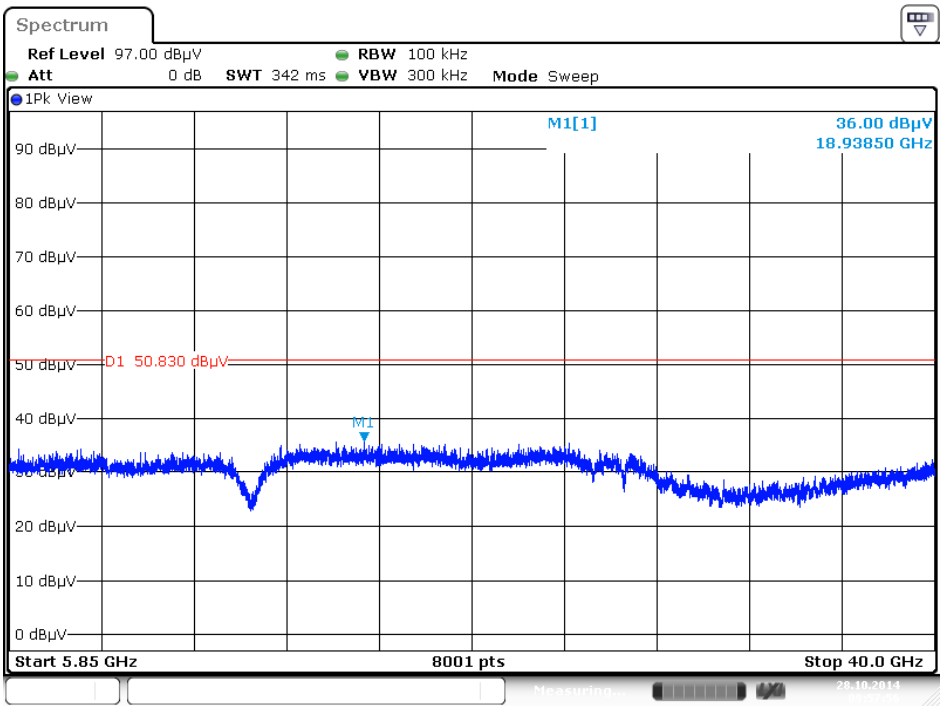
Date: 28.OCT.2014 09:54:51

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



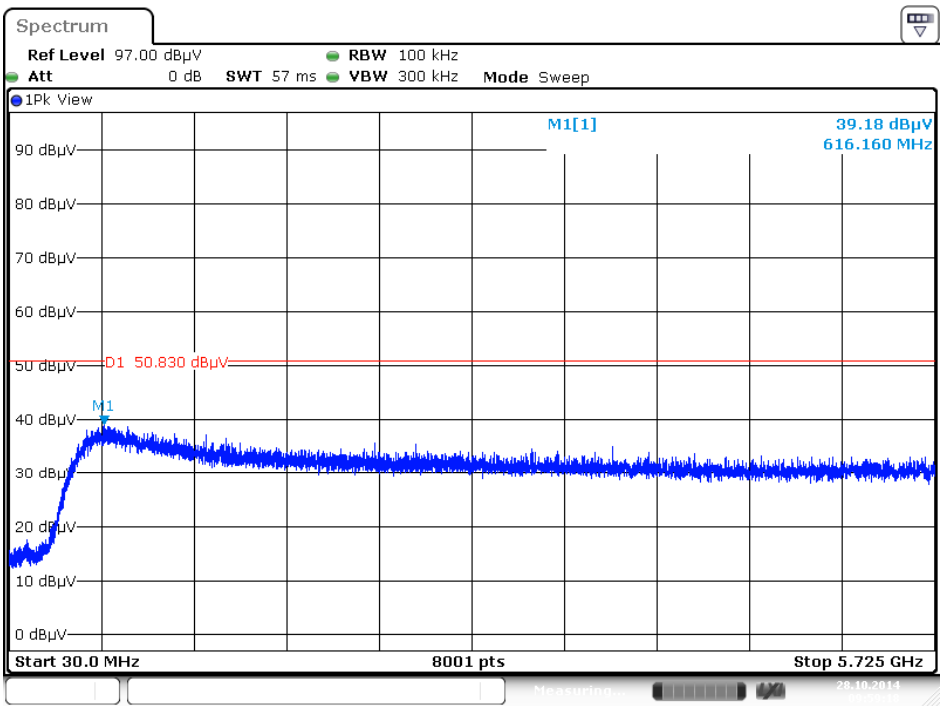
Date: 28.OCT.2014 09:57:15

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



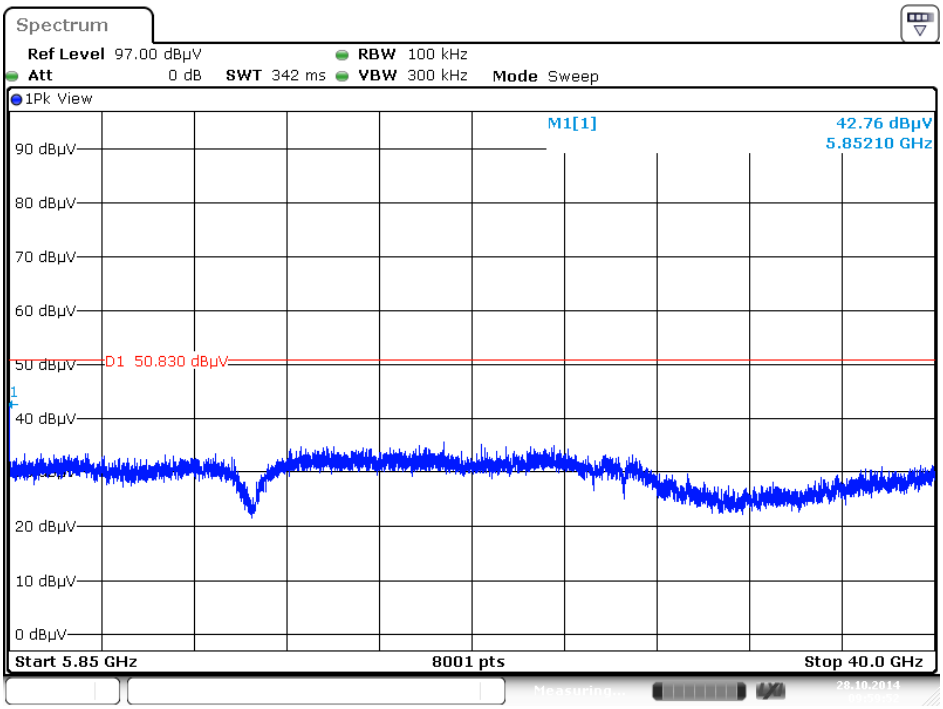
Date: 28.OCT.2014 09:57:56

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



Date: 28.OCT.2014 09:59:18

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



Date: 28.OCT.2014 09:59:51

4.7. Antenna Requirements

4.7.1. Limit

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

4.7.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 23, 2014	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 17, 2014	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 17, 2014	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 04, 2014	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 26, 2014	Radiation (03CH01-CB)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jul. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02121	1GHz ~ 26.5GHz	Aug. 25, 2014	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Apr. 22, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz~40GHz	Nov. 03,2014	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESR26	101289	9kHz~26GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO 2000	N/A	1 m - 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 15, 2014	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-2	N/A	1 GHz – 26.5 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	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. 15, 2014	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	101026	9kHz~40GHz	Aug. 28, 2014	Conducted (TH01-CB)
Signal analyzer	Agilent	N9010A	MY52220519	10Hz~44GHz	Dec. 11, 2013	Conducted (TH01-CB)
Signal analyzer	Agilent	N9010A	MY52220519	10Hz~44GHz	Dec. 10, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)

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

NCR 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%