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FCC RADIO TEST REPORT

Applicant's company	Belkin International, Inc.
Applicant Address	12045 East Waterfront Drive, Playa Vista, CA 90094
FCC ID	K7SF9K1118V2

Product Name	AC1800 DB Wi-Fi Dual-Band AC+ Gigabit Router
Brand Name	Belkin
Model No.	F9K1118v2
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Apr. 03, 2013
Final Test Date	Apr. 26, 2013
Submission Type	Original Equipment

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g part and IEEE 802.11a/ac (5725 ~ 5850MHz) of the product.

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in ANSI C63.10-2009,

47 CFR FCC Part 15 Subpart C, KDB 558074 D01 v03 and KDB 662911 D01 v01r02.

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



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1. CERTIFICATE OF COMPLIANCE

Product Name : AC1800 DB Wi-Fi Dual-Band AC+ Gigabit Router
Brand Name : Belkin
Model No. : F9K1118v2
Applicant : Belkin International, Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Apr. 03, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

A handwritten signature in blue ink that reads 'Sam Chen' is written over a horizontal line.

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	6.25 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	1.12 dB
4.3	15.247(e)	Power Spectral Density	Complies	6.96 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	3.02 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.17 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1GHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n /ac

Items	Description
Product Type	For 802.11n: <2.4GHz Band>: WLAN (2TX, 2RX) <5GHz Band>: WLAN (3TX, 3RX) For 802.11ac: WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth ; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (20MHz): 17.04 MHz ; MCS0 (40MHz): 36.32 MHz For 5GHz Band: 802.11ac MCS0, Nss1 (20MHz): 17.60 MHz 802.11ac MCS0, Nss1 (40MHz): 36.48 MHz 802.11ac MCS0, Nss1 (80MHz): 74.88 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 21.13 dBm ; MCS0 (40MHz): 18.56 dBm For 5GHz Band: 802.11ac MCS0, Nss1 (20MHz): 26.32 dBm 802.11ac MCS0, Nss1 (40MHz): 28.88 dBm 802.11ac MCS0, Nss1 (80MHz): 27.28 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11a/b/g

Items	Description
Product Type	802.11b: WLAN (1TX, 1RX) 802.11g: WLAN (2TX, 2RX) 802.11a: WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 10.08 MHz ; 11g: 16.24 MHz ; 11a: 16.48 MHz
Maximum Conducted Output Power	11b: 19.62 dBm ; 11g: 19.95 dBm ; 11a: 25.76 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Single (TX)		Two (TX)		Three (TX)		
	20 MHz	40 MHz	20 MHz	40 MHz	20 MHz	40 MHz	80 MHz
IEEE 802.11a	X	X	X	X	V	X	X
IEEE 802.11b	V	X	X	X	X	X	X
IEEE 802.11g	X	X	V	X	X	X	X
IEEE 802.11n <2.4GHz Band>	X	X	V	V	X	X	X
IEEE 802.11n <5GHz Band>	X	X	X	X	V	V	X
IEEE 802.11ac	X	X	X	X	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Ant.s (NTX)	Data Rate / MCS
802.11n (HT20) <2.4GHz Band>	2	MCS 0-15
802.11n (HT40) <2.4GHz Band>	2	MCS 0-15
802.11n (HT20) <5GHz Band>	3	MCS 0-23
802.11n (HT40) <5GHz Band>	3	MCS 0-23
802.11ac (VHT20)	3	MCS 0-9, Nss1-3
802.11ac (VHT40)	3	MCS 0-9, Nss1-3
802.11ac (VHT80)	3	MCS 0-9, Nss1-3
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40 and VHT80 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: 11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

Power	Brand	Model	Rating
Adapter 1	LEI	ML30-V120250-A1	INPUT: 120Vac, 60Hz, 0.8A OUTPUT: 12Vdc, 2.5A
Adapter 2	DVE.	DSA-30PFB-12 FUS 120250	INPUT: 100-240Vac, 50/60Hz, 0.8A OUTPUT: 12Vdc, 2.5A

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	Arcadyan	-	Dipole Antenna	I-PEX	3.98	-
2	Arcadyan	-	Dipole Antenna	I-PEX	4.60	-
3	Arcadyan	-	Dipole Antenna	I-PEX	-	4.11
4	Arcadyan	-	Dipole Antenna	I-PEX	-	4.06
5	Arcadyan	-	Dipole Antenna	I-PEX	-	4.09

Note: The EUT has five antennas.

<For 2.4GHz Band>

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

Only Ant. 1 can be used as transmitting/receiving antenna.

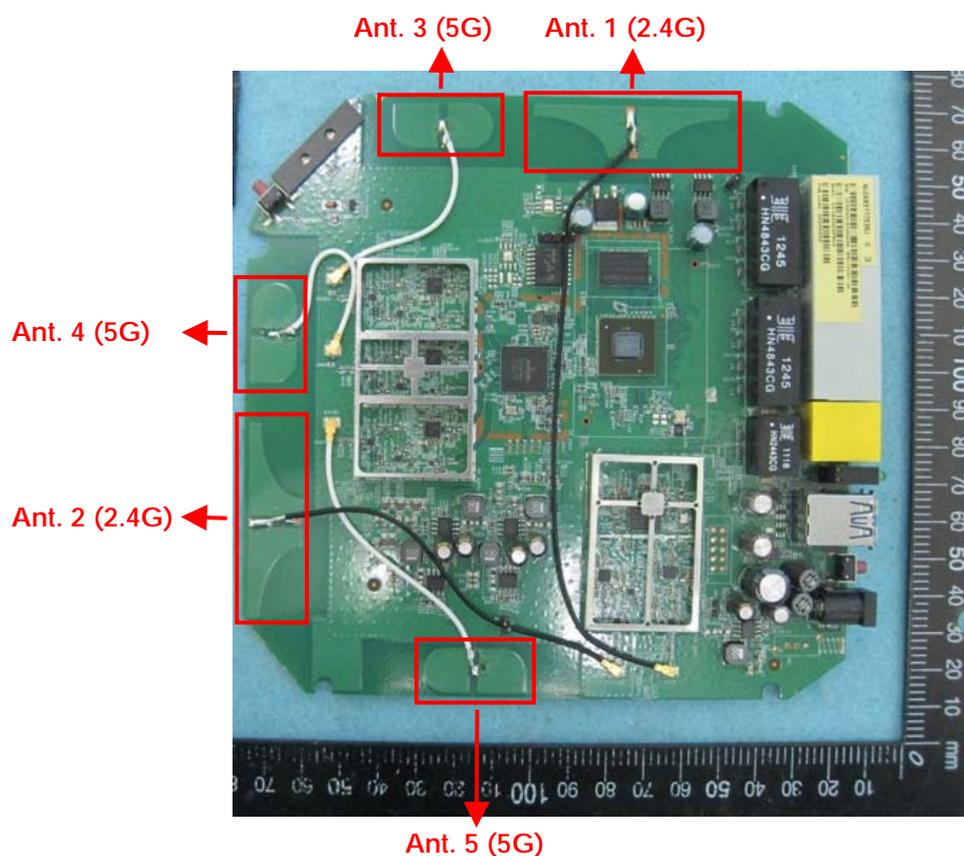
For IEEE 802.11n/g mode (2TX/2RX):

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

<For 5GHz Band>

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

Ant. 3, Ant. 4 and Ant. 5 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

For both 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 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1+2
Power Spectral Density	11n 20MHz	MCS0	1/6/11	1, 2
	11n 40MHz	MCS0	3/6/9	1, 2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1, 2
6dB Spectrum Bandwidth	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1+2
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1+2
Band Edge Emissions	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1+2

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	11ac 20MHz	MCS0, Nss1	149/157/165	3+4+5
	11ac 40MHz	MCS0, Nss1	151/159	3+4+5
	11ac 80MHz	MCS0, Nss1	155	3+4+5
	11a/BPSK	6 Mbps	149/157/165	3+4+5
Power Spectral Density	11ac 20MHz	MCS0, Nss1	149/157/165	3, 4, 5
	11ac 40MHz	MCS0, Nss1	151/159	3, 4, 5
	11ac 80MHz	MCS0, Nss1	155	3, 4, 5
	11a/BPSK	6 Mbps	149/157/165	3, 4, 5
6dB Spectrum Bandwidth	11ac 20MHz	MCS0, Nss1	149/157/165	3+4+5
	11ac 40MHz	MCS0, Nss1	151/159	3+4+5
	11ac 80MHz	MCS0, Nss1	155	3+4+5
	11a/BPSK	6 Mbps	149/157/165	3+4+5
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11ac 20MHz	MCS0, Nss1	149/157/165	3+4+5
	11ac 40MHz	MCS0, Nss1	151/159	3+4+5
	11ac 80MHz	MCS0, Nss1	155	3+4+5
	11a/BPSK	6 Mbps	149/157/165	3+4+5
Band Edge Emissions	11ac 20MHz	MCS0, Nss1	149/157/165	3+4+5
	11ac 40MHz	MCS0, Nss1	151/159	3+4+5
	11ac 80MHz	MCS0, Nss1	155	3+4+5
	11a/BPSK	6 Mbps	149/157/165	3+4+5

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. Upstanding EUT + Adapter 1

Mode 2. Upstanding EUT + Adapter 2

For Radiated Emissions below 1GHz test:

Mode 1. Upstanding EUT + Adapter 1

Mode 2. Upstanding EUT + Adapter 2

<For MPE and Co-location Test>:

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

3.6. Table for Testing Locations

Test Site 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).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

For AC Power Line Conducted Emissions and Radiated Emissions below 1GHz tests:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	E6430	QDS-BRCM1049LE
Flash disk3.0	Silicon	I-Series	DoC
Flash disk3.0	ADATA	C103	DoC

For Radiated Emissions above 1GHz, Maximum Conducted Output Power, Power Spectral Density, 6dB Spectrum Bandwidth and Band Edge Emissions tests:

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

3.8. Table for Parameters of Test Software Setting

During testing, Channel & 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 20MHz / Ant. 1+ Ant. 2

Test Software Version	Manual Tool Version : 2.0.0.3		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	60	65	67

Power Parameters of IEEE 802.11n MCS0 40MHz / Ant. 1+ Ant. 2

Test Software Version	Manual Tool Version : 2.0.0.3		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	56	58	58

Power Parameters of IEEE 802.11b / Ant. 1

Test Software Version	Manual Tool Version : 2.0.0.3		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	71	72	73

Power Parameters of IEEE 802.11g / Ant. 1+ Ant. 2

Test Software Version	Manual Tool Version : 2.0.0.3		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	60	62	62

For 5GHz Band
Power Parameters of IEEE 802.11ac MCS0, Nss1 20MHz / Ant. 3+ Ant. 4+ Ant. 5

Test Software Version	Manual Tool Version : 2.0.0.3		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0, Nss1 20MHz	83	81	81

Power Parameters of IEEE 802.11ac MCS0, Nss1 40MHz / Ant. 3+ Ant. 4+ Ant. 5

Test Software Version	Manual Tool Version : 2.0.0.3	
Frequency	5755 MHz	5795 MHz
MCS0, Nss1 40MHz	88	92

Power Parameters of IEEE 802.11ac MCS0, Nss1 80MHz / Ant. 3+ Ant. 4+ Ant. 5

Test Software Version	Manual Tool Version : 2.0.0.3
Frequency	5775 MHz
MCS0, Nss1 80MHz	88

Power Parameters of IEEE 802.11a / Ant. 3+ Ant. 4+ Ant. 5

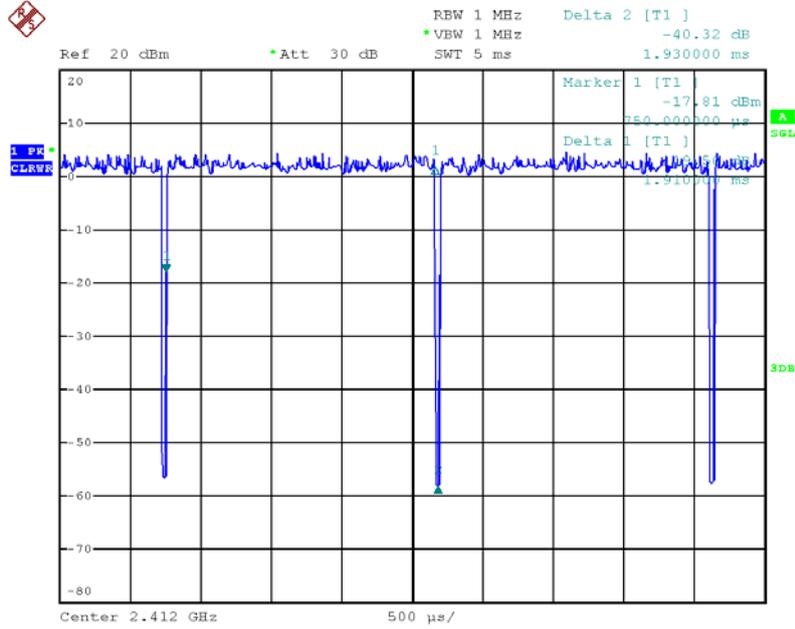
Test Software Version	Manual Tool Version : 2.0.0.3		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	79	78	79

3.9. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

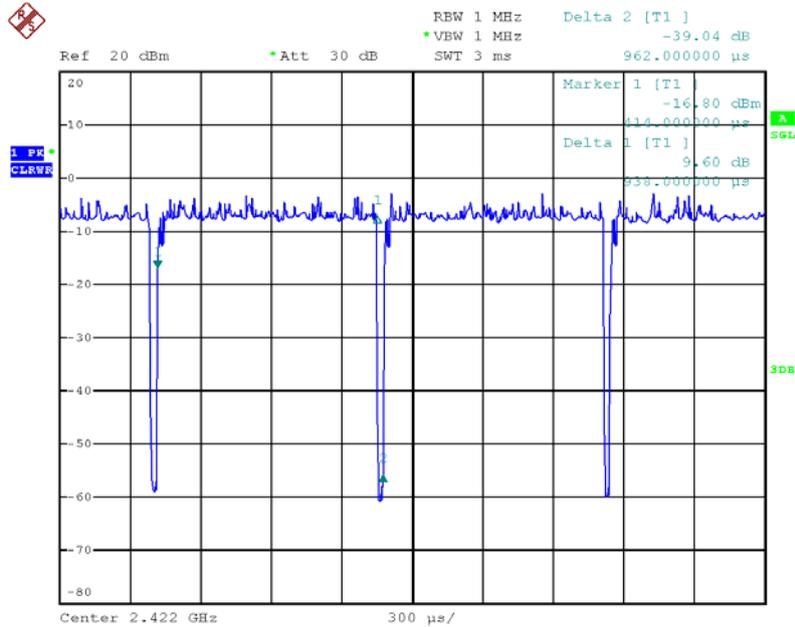
3.10. Duty Cycle

IEEE 802.11n MCS0 20MHz / For 2.4GHz Band



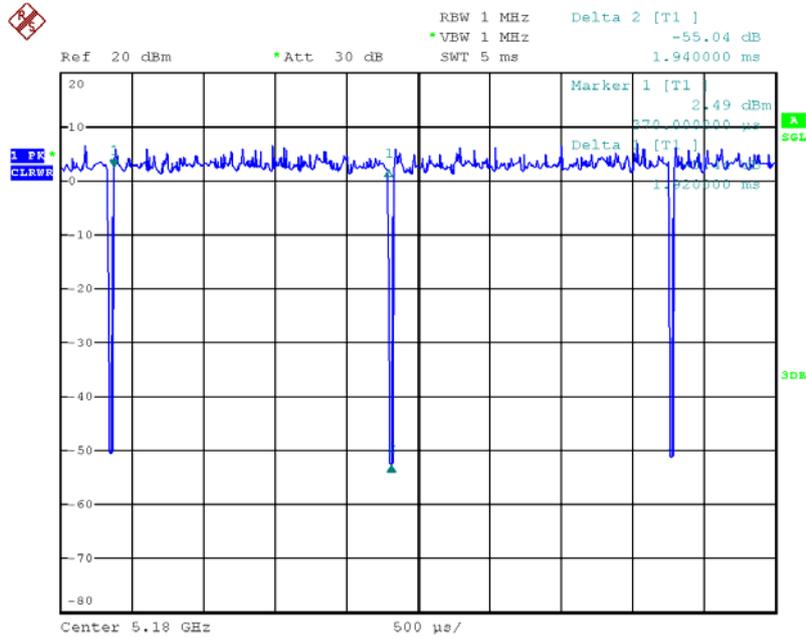
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IEEE 802.11n MCS0 40MHz / For 2.4GHz Band



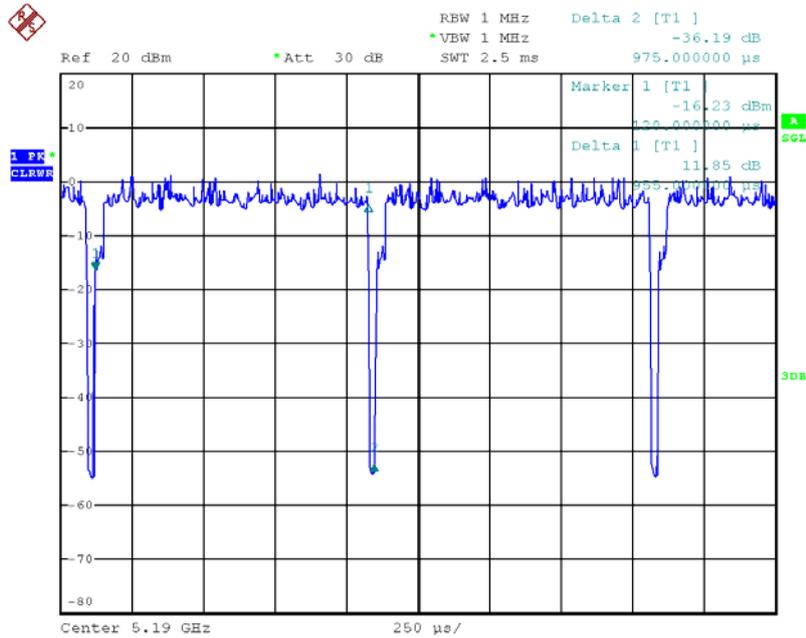
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IEEE 802.11ac MCS0, Nss1 20MHz / For 5GHz Band



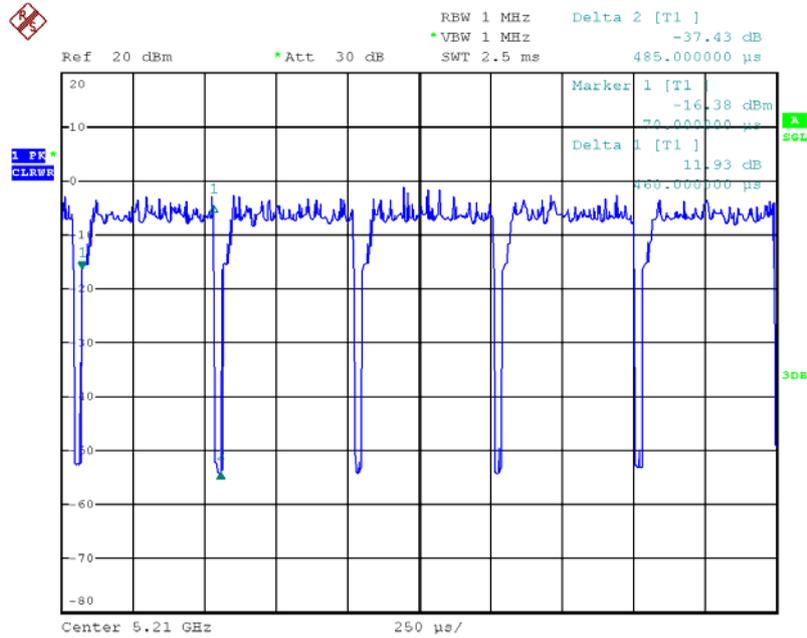
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IEEE 802.11ac MCS0, Nss1 40MHz / For 5GHz Band



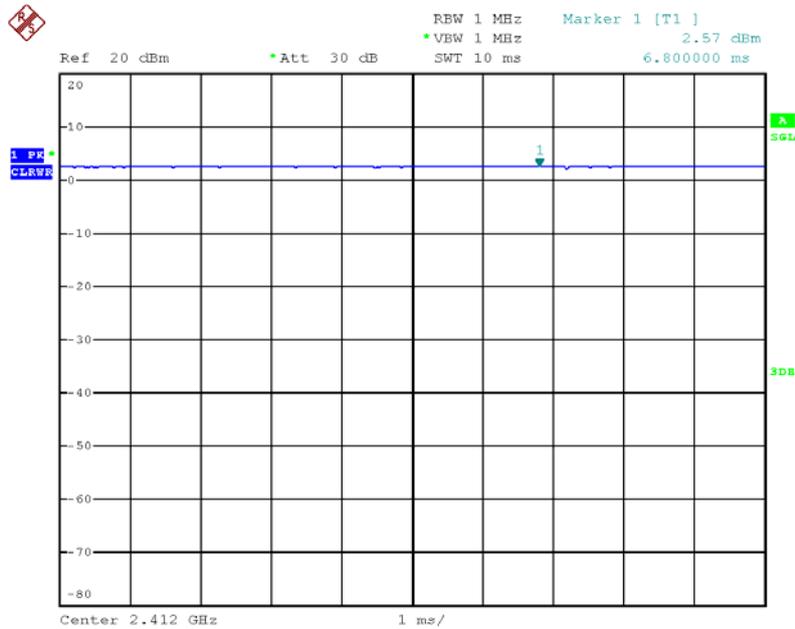
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IEEE 802.11ac MCS0, Nss1 80MHz / For 5GHz Band



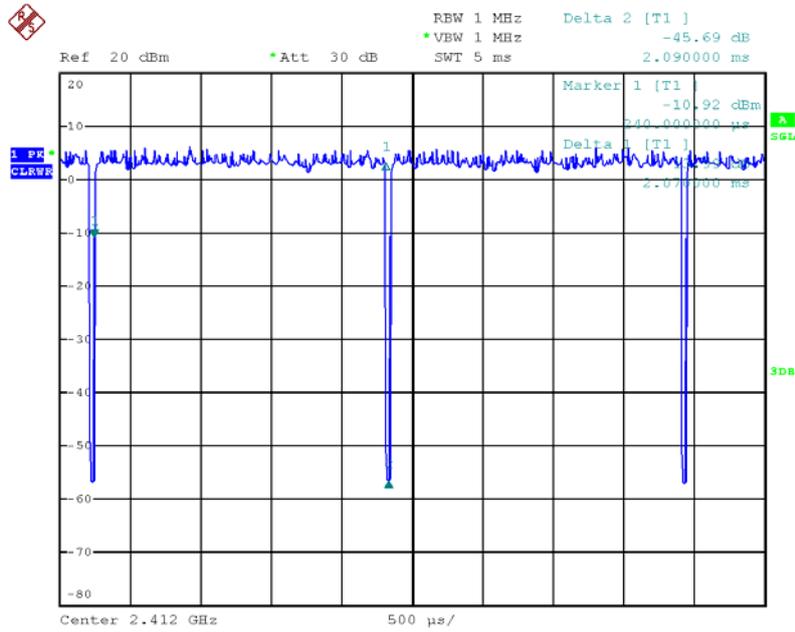
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IEEE 802.11b



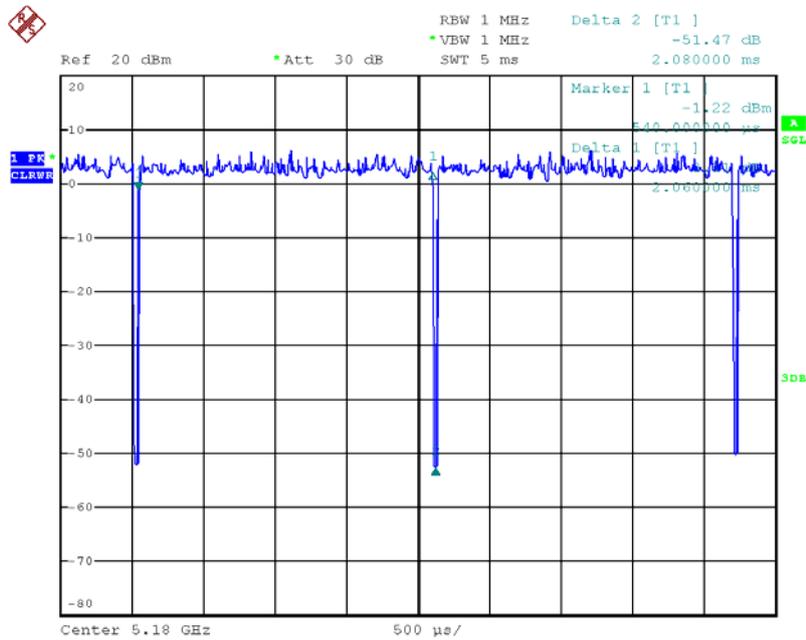
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IEEE 802.11g



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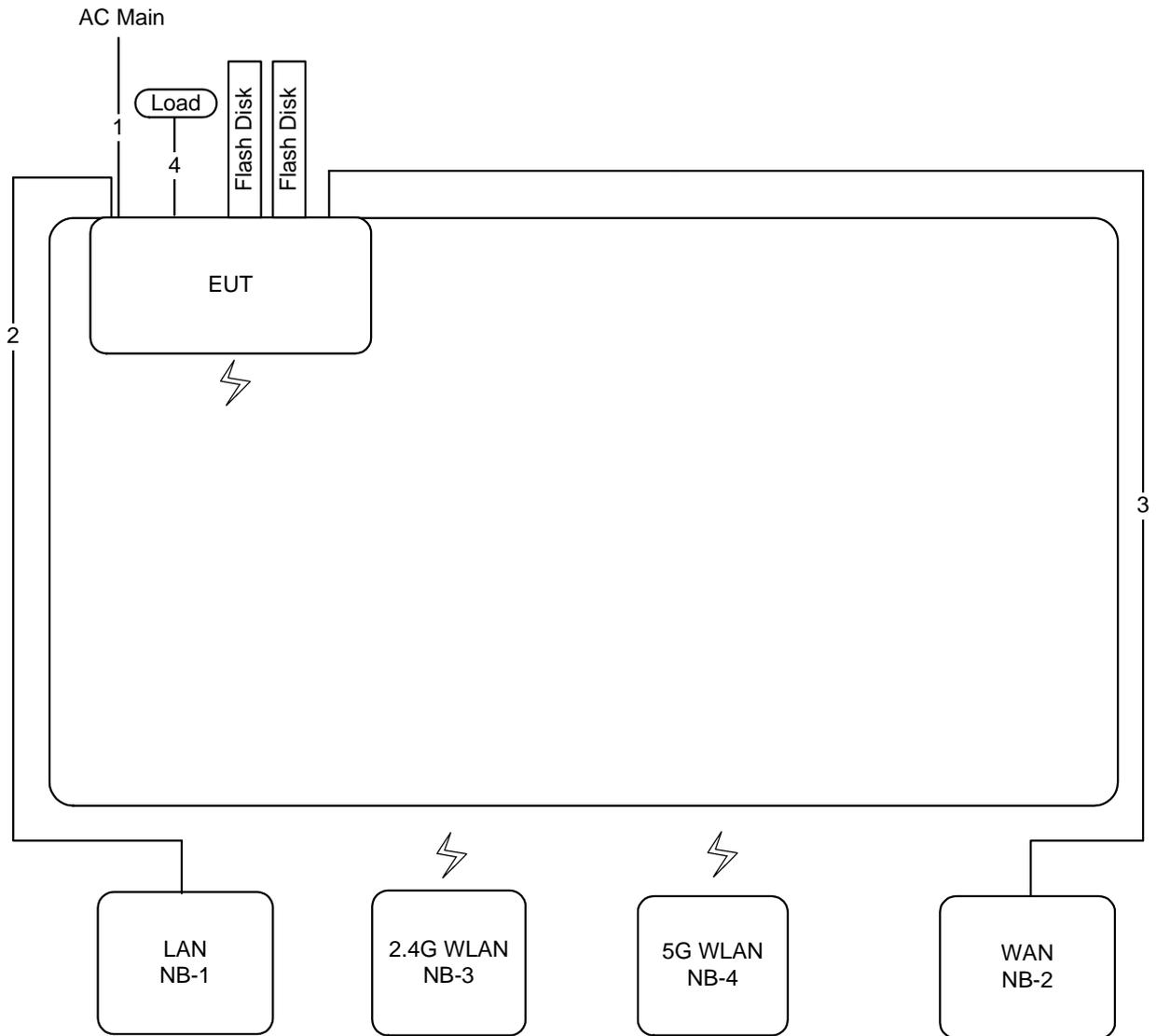
IEEE 802.11a



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3.11. Test Configurations

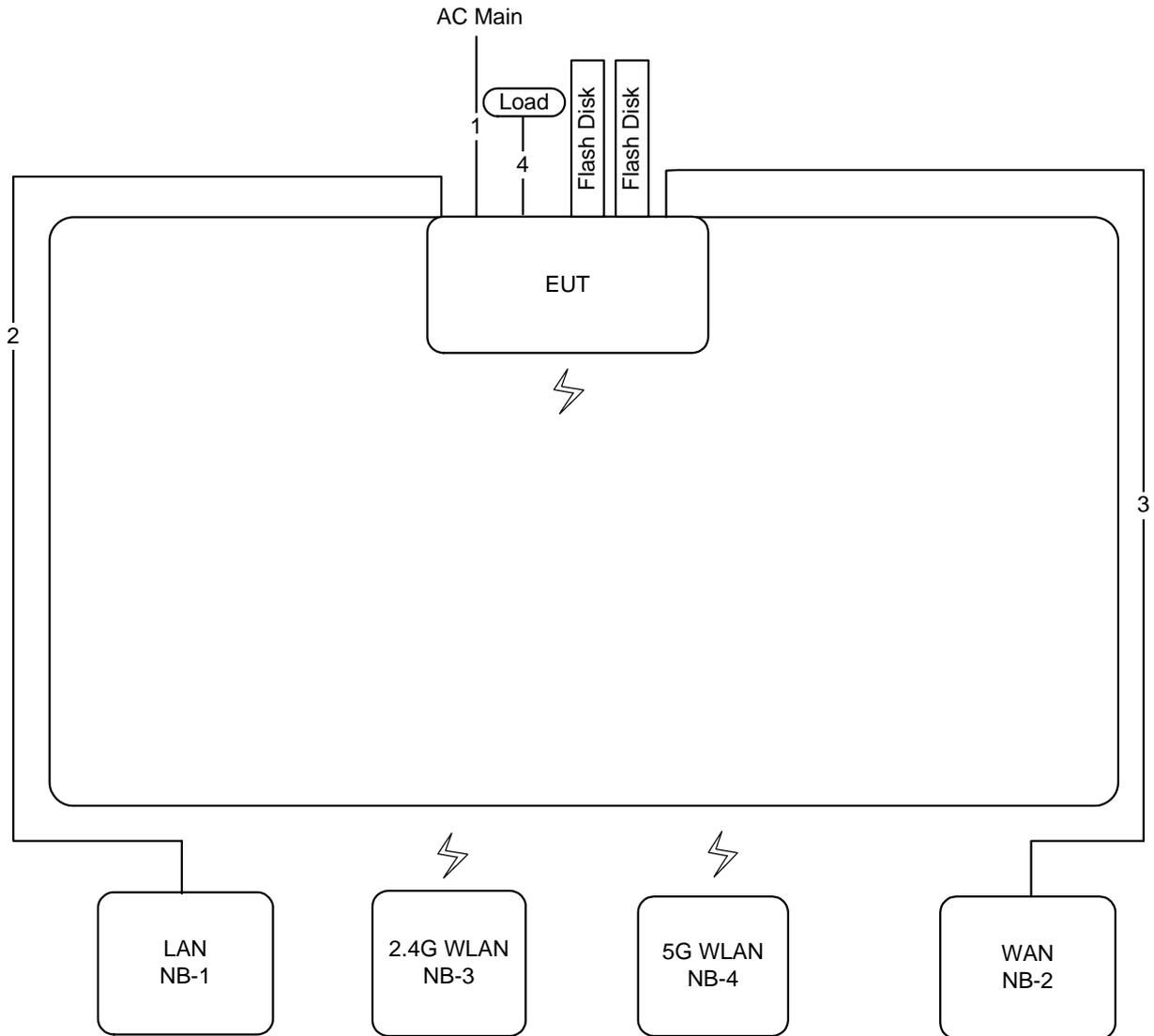
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1m

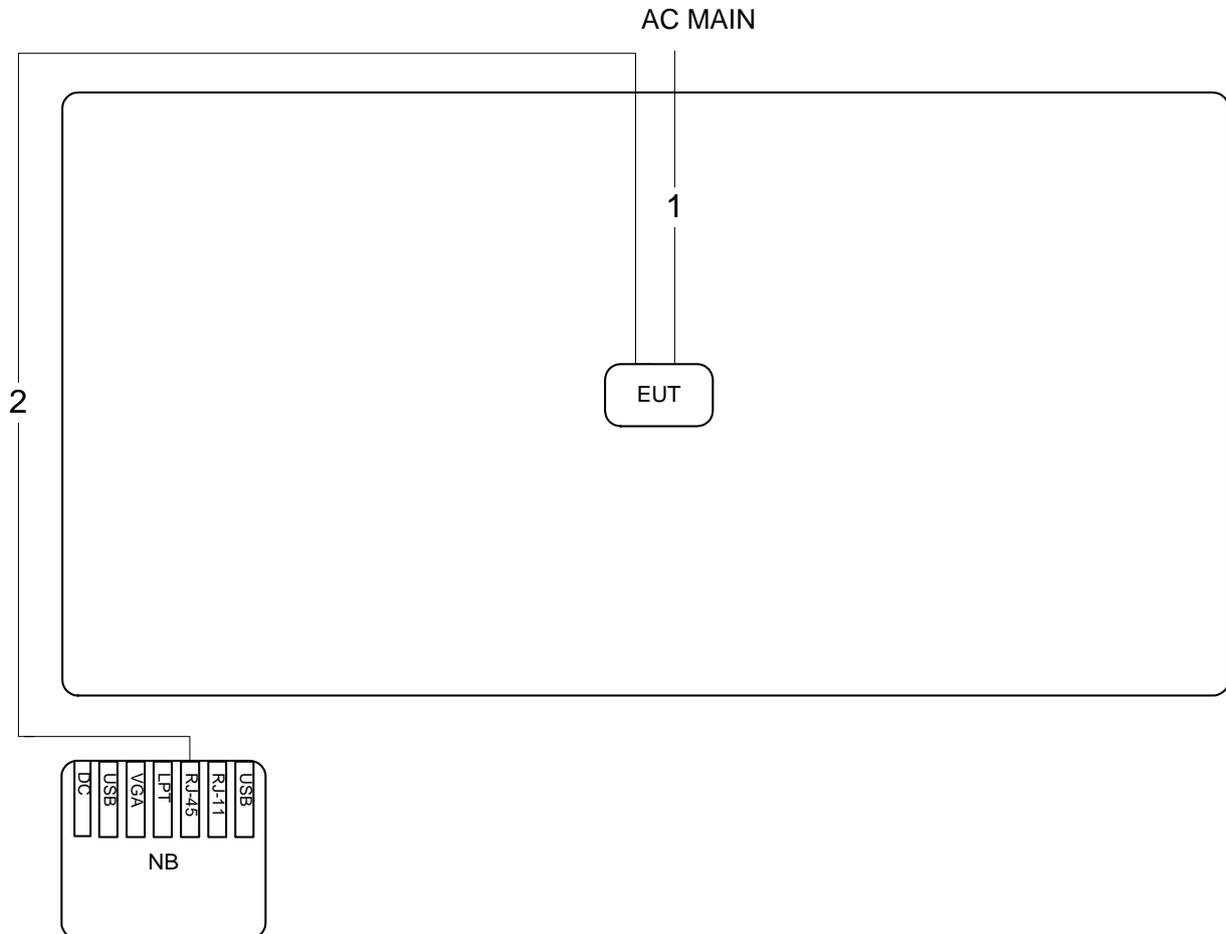
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shield	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1m

Test Configuration: above 1GHz



Item	Connection	Shield	Length
1	Power cable	No	1.5m
2	RJ-45 cable	No	10m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

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

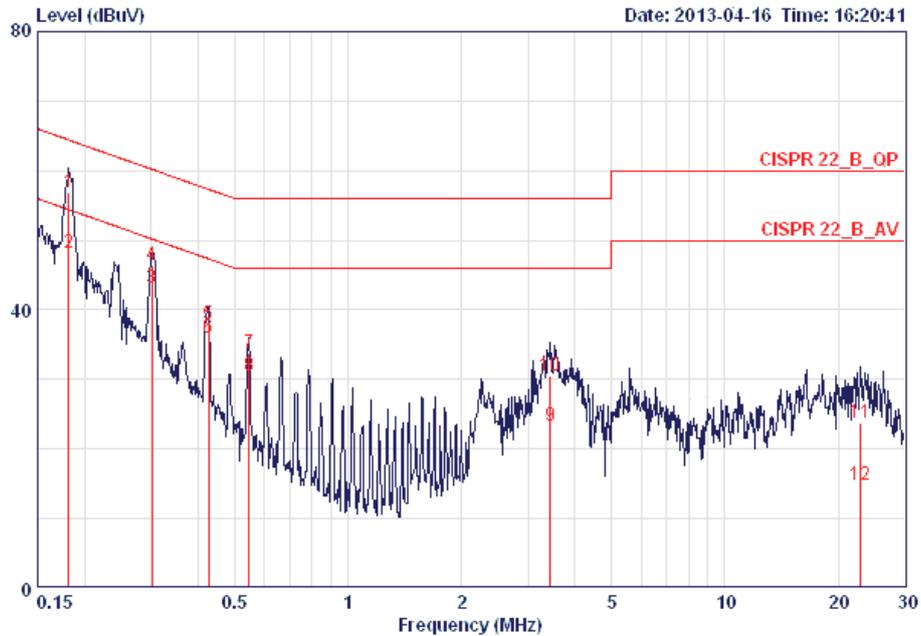
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

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

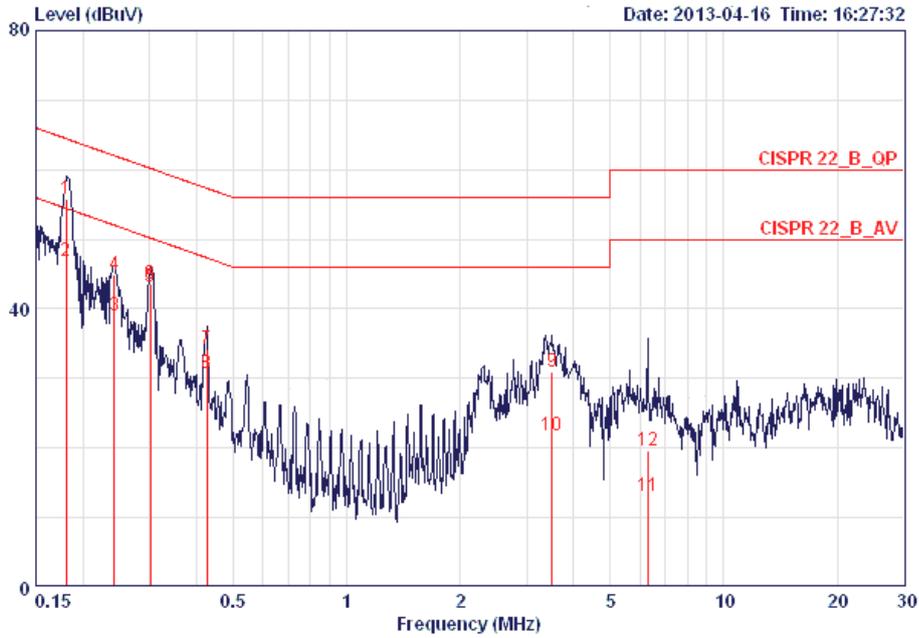
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	50%
Test Engineer	Simon Yang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 1.



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.18152	56.99	-7.42	64.42	56.65	0.15	0.19	QP
2	0.18152	48.16	-6.25	54.42	47.82	0.15	0.19	AVERAGE
3	0.30188	43.24	-6.95	50.19	42.89	0.15	0.20	AVERAGE
4	0.30188	46.40	-13.79	60.19	46.05	0.15	0.20	QP
5	0.42599	38.03	-19.30	57.33	37.68	0.15	0.20	QP
6	0.42599	35.86	-11.47	47.33	35.51	0.15	0.20	AVERAGE
7	0.54644	33.76	-22.25	56.00	33.40	0.16	0.20	QP
8	0.54644	30.56	-15.45	46.00	30.20	0.16	0.20	AVERAGE
9	3.436	23.34	-22.66	46.00	22.85	0.21	0.27	AVERAGE
10	3.436	30.60	-25.40	56.00	30.11	0.21	0.27	QP
11	22.775	23.68	-36.32	60.00	22.62	0.54	0.53	QP
12	22.775	14.91	-35.09	50.00	13.85	0.54	0.53	AVERAGE

Temperature	24°C	Humidity	50%
Test Engineer	Simon Yang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 1.

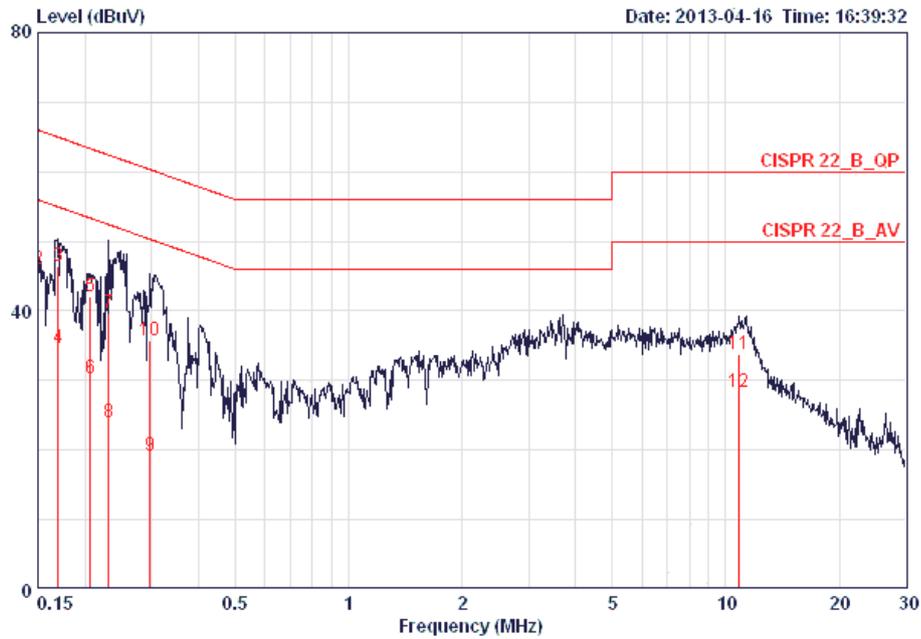


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18056	55.82	-8.64	64.46	55.55	0.08	0.19	QP
2	0.18056	46.91	-7.55	54.46	46.64	0.08	0.19	AVERAGE
3	0.24165	38.92	-13.12	52.04	38.64	0.08	0.20	AVERAGE
4	0.24165	44.85	-17.19	62.04	44.57	0.08	0.20	QP
5	0.30188	43.26	-6.93	50.19	42.98	0.08	0.20	AVERAGE
6	0.30188	43.58	-16.61	60.19	43.30	0.08	0.20	QP
7	0.42599	34.14	-23.19	57.33	33.86	0.08	0.20	QP
8	0.42599	30.65	-16.68	47.33	30.37	0.08	0.20	AVERAGE
9	3.509	31.02	-24.98	56.00	30.62	0.13	0.28	QP
10	3.509	21.89	-24.11	46.00	21.49	0.13	0.28	AVERAGE
11	6.285	13.14	-36.86	50.00	12.65	0.17	0.32	AVERAGE
12	6.285	19.67	-40.33	60.00	19.18	0.17	0.32	QP

Note:

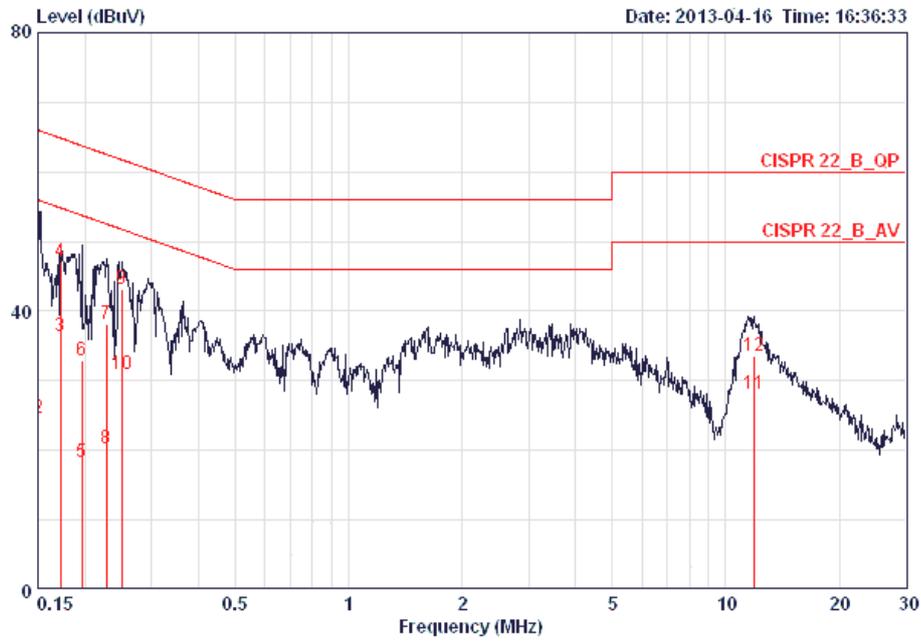
Level = Read Level + LISN Factor + Cable Loss

Temperature	24°C	Humidity	50%
Test Engineer	Simon Yang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 2.



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.15000	26.29	-29.71	56.00	25.95	0.16	0.18	AVERAGE
2	0.15000	46.09	-19.91	66.00	45.75	0.16	0.18	QP
3	0.16944	46.43	-18.56	64.99	46.08	0.16	0.19	QP
4	0.16944	34.60	-20.39	54.99	34.25	0.16	0.19	AVERAGE
5	0.20614	42.01	-21.35	63.36	41.66	0.15	0.20	QP
6	0.20614	30.34	-23.02	53.36	29.99	0.15	0.20	AVERAGE
7	0.23162	39.70	-22.69	62.39	39.35	0.15	0.20	QP
8	0.23162	23.90	-28.49	52.39	23.55	0.15	0.20	AVERAGE
9	0.29712	19.18	-31.14	50.32	18.83	0.15	0.20	AVERAGE
10	0.29712	35.83	-24.49	60.32	35.48	0.15	0.20	QP
11	10.847	33.79	-26.21	60.00	33.06	0.35	0.38	QP
12	10.847	28.32	-21.68	50.00	27.59	0.35	0.38	AVERAGE

Temperature	24°C	Humidity	50%
Test Engineer	Simon Yang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 2.



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15000	45.46	-20.54	66.00	45.20	0.08	0.18	QP
2	0.15000	24.56	-31.44	56.00	24.30	0.08	0.18	AVERAGE
3	0.17215	36.35	-18.51	54.86	36.08	0.08	0.19	AVERAGE
4	0.17215	46.98	-17.88	64.86	46.71	0.08	0.19	QP
5	0.19654	18.41	-35.35	53.76	18.13	0.08	0.20	AVERAGE
6	0.19654	32.81	-30.95	63.76	32.53	0.08	0.20	QP
7	0.22797	38.19	-24.33	62.52	37.91	0.08	0.20	QP
8	0.22797	20.26	-32.26	52.52	19.98	0.08	0.20	AVERAGE
9	0.25078	43.11	-18.62	61.73	42.83	0.08	0.20	QP
10	0.25078	31.02	-20.71	51.73	30.74	0.08	0.20	AVERAGE
11	11.870	28.10	-21.90	50.00	27.43	0.27	0.40	AVERAGE
12	11.870	33.51	-26.49	60.00	32.84	0.27	0.40	QP

Note:

$$\text{Level} = \text{Read Level} + \text{LISN Factor} + \text{Cable Loss}$$

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

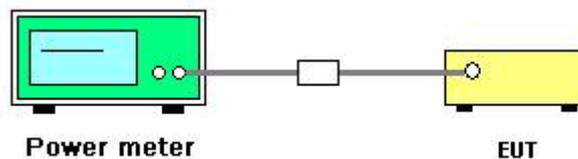
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03 section 9.2.2.
2. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	23°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n
Test Date	Apr. 24, 2013		

Configuration IEEE 802.11n MCS0 20MHz / Ant. 1+Ant. 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2			
1	2412 MHz	16.83	16.77	19.81	30.00	Complies
6	2437 MHz	17.82	17.81	20.83	30.00	Complies
11	2462 MHz	17.88	18.34	21.13	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1+Ant. 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2			
3	2422 MHz	15.24	15.04	18.15	30.00	Complies
6	2437 MHz	15.75	15.35	18.56	30.00	Complies
9	2452 MHz	15.43	15.42	18.44	30.00	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11ac
Test Date	Apr. 26, 2013		

Configuration IEEE 802.11ac MCS0, Nss1 20MHz / Ant. 3+Ant. 4+Ant. 5

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Ant. 5			
149	5745 MHz	21.65	22.12	20.77	26.32	30.00	Complies
157	5785 MHz	21.11	21.51	21.28	26.07	30.00	Complies
165	5825 MHz	21.14	21.56	21.26	26.09	30.00	Complies

Configuration IEEE 802.11ac MCS0, Nss1 40MHz / Ant. 3+Ant. 4+Ant. 5

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Ant. 5			
151	5755 MHz	22.72	23.23	23.16	27.81	30.00	Complies
159	5795 MHz	23.77	24.39	24.15	28.88	30.00	Complies

Configuration IEEE 802.11ac MCS0, Nss1 80MHz / Ant. 3+Ant. 4+Ant. 5

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Ant. 5			
155	5775 MHz	22.43	22.93	22.12	27.28	30.00	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b/g
Test Date	Apr. 24, 2013		

Configuration IEEE 802.11b / Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	19.46	30.00	Complies
6	2437 MHz	19.58	30.00	Complies
11	2462 MHz	19.62	30.00	Complies

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

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2			
1	2412 MHz	16.27	16.55	19.42	30.00	Complies
6	2437 MHz	16.92	16.52	19.73	30.00	Complies
11	2462 MHz	17.22	16.63	19.95	30.00	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a
Test Date	Apr. 26, 2013		

Configuration IEEE 802.11a / Ant. 3+Ant. 4+Ant. 5

Channel	Frequency	Conducted Power (dBm)			Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 3	Ant. 4	Ant. 5			
149	5745 MHz	20.93	21.15	20.88	25.76	30.00	Complies
157	5785 MHz	20.51	20.72	20.61	25.39	30.00	Complies
165	5825 MHz	20.61	21.03	20.82	25.59	30.00	Complies

4.3. Power Spectral Density Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

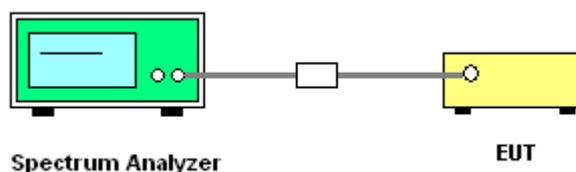
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RB	$3 \text{ kHz} \leq \text{RBW} \leq 100\text{kHz}$
VB	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.3.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03 section 10.2 & KDB 662911 D01 v01r02 section In-Band Power Spectral Density (PSD) Measurements option (2) Measure and add 10 log(NANT) dB.
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 $\geq 2 \times \text{span}/\text{RBW}$ (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 $\leq 8 \text{ dBm}$.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	23°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Ant. 1, Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2		
1	2412 MHz	-9.23	-9.13	4.99	Complies
6	2437 MHz	-8.47	-7.84	4.99	Complies
11	2462 MHz	-7.19	-7.46	4.99	Complies

Note: PSD Limit = $(8\text{dBm}/3\text{kHz} - (10\log(2))) = 4.99\text{dBm}/3\text{kHz}$

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1, Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2		
3	2422 MHz	-13.07	-13.17	4.99	Complies
6	2437 MHz	-12.98	-13.30	4.99	Complies
9	2452 MHz	-12.56	-12.94	4.99	Complies

Note: PSD Limit = $(8\text{dBm}/3\text{kHz} - (10\log(2))) = 4.99\text{dBm}/3\text{kHz}$

Temperature	25°C	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0, Nss1 20MHz / Ant. 3, Ant. 4, Ant. 5

Channel	Frequency	Power Density (dBm/3kHz)			Single Port Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Ant. 5		
149	5745 MHz	-3.73	-3.76	-3.74	3.23	Complies
157	5785 MHz	-4.28	-4.02	-4.39	3.23	Complies
165	5825 MHz	-4.26	-4.49	-4.36	3.23	Complies

Note: PSD Limit = (8dBm/3kHz - (10log(3)))=3.23dBm/3kHz

Configuration IEEE 802.11ac MCS0, Nss1 40MHz / Ant. 3, Ant. 4, Ant. 5

Channel	Frequency	Power Density (dBm/3kHz)			Single Port Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Ant. 5		
151	5755 MHz	-4.84	-4.21	-5.14	3.23	Complies
159	5795 MHz	-4.97	-4.11	-4.72	3.23	Complies

Note: PSD Limit = (8dBm/3kHz - (10log(3)))=3.23dBm/3kHz

Configuration IEEE 802.11ac MCS0, Nss1 80MHz / Ant. 3, Ant. 4, Ant. 5

Channel	Frequency	Power Density (dBm/3kHz)			Single Port Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Ant. 5		
155	5775 MHz	-9.29	-8.67	-8.42	3.23	Complies

Note: PSD Limit = (8dBm/3kHz - (10log(3)))=3.23dBm/3kHz

Temperature	23°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Ant. 1

Channel	Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
1	2412 MHz	-3.86	8.00	Complies
6	2437 MHz	-2.96	8.00	Complies
11	2462 MHz	-1.72	8.00	Complies

Configuration IEEE 802.11g / Ant. 1, Ant. 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Ant. 1	Ant. 2		
1	2412 MHz	-8.74	-8.84	4.99	Complies
6	2437 MHz	-8.38	-8.86	4.99	Complies
11	2462 MHz	-8.46	-9.21	4.99	Complies

Note: PSD Limit = (8dBm/3kHz - (10log(2))) = 4.99dBm/3kHz

Temperature	25°C	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Ant. 3, Ant. 4, Ant. 5

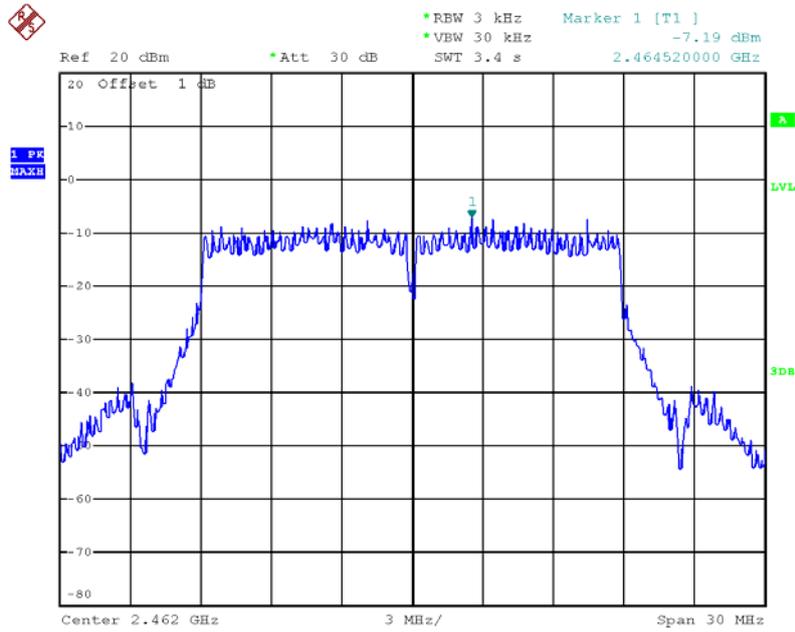
Channel	Frequency	Power Density (dBm/3kHz)			Single Port Limit (dBm/3kHz)	Result
		Ant. 3	Ant. 4	Ant. 5		
149	5745 MHz	-4.03	-3.81	-4.64	3.23	Complies
157	5785 MHz	-4.85	-4.59	-4.83	3.23	Complies
165	5825 MHz	-4.76	-4.94	-4.92	3.23	Complies

Note: PSD Limit = $(8\text{dBm}/3\text{kHz} - (10\log(3))) = 3.23\text{dBm}/3\text{kHz}$

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

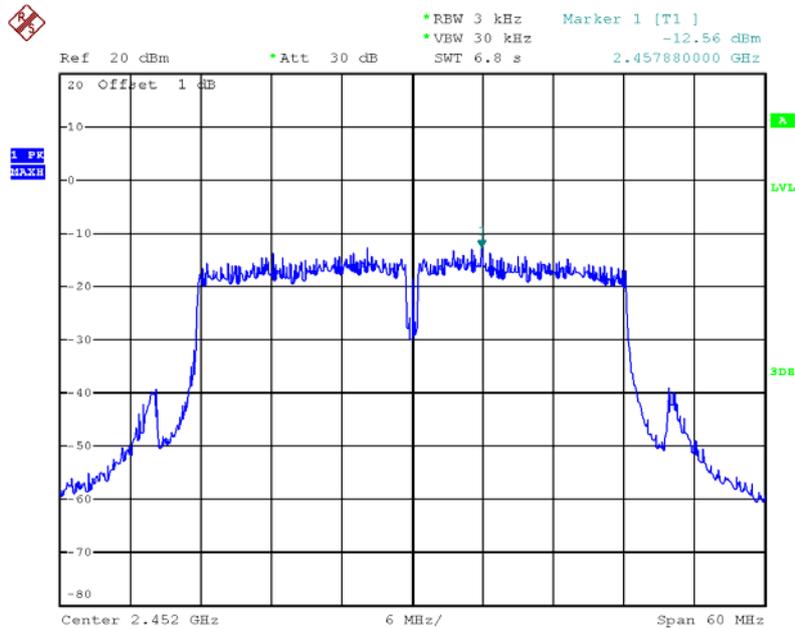
For plots, only the channel with maximum results was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1 / 2462 MHz



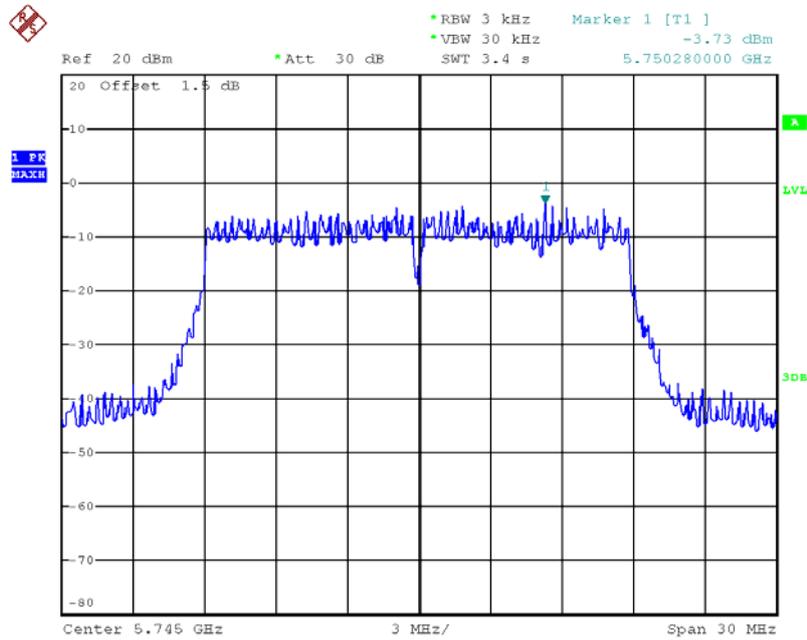
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Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1 / 2452 MHz



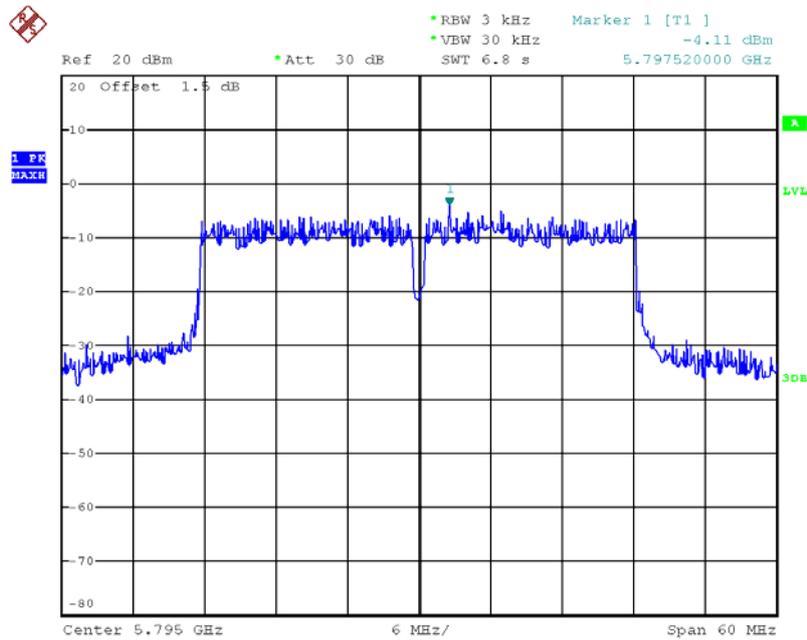
Date: 24.APR.2013 19:24:00

Power Density Plot on Configuration IEEE 802.11ac MCS0, Nss1 20MHz / Ant. 3 / 5745 MHz



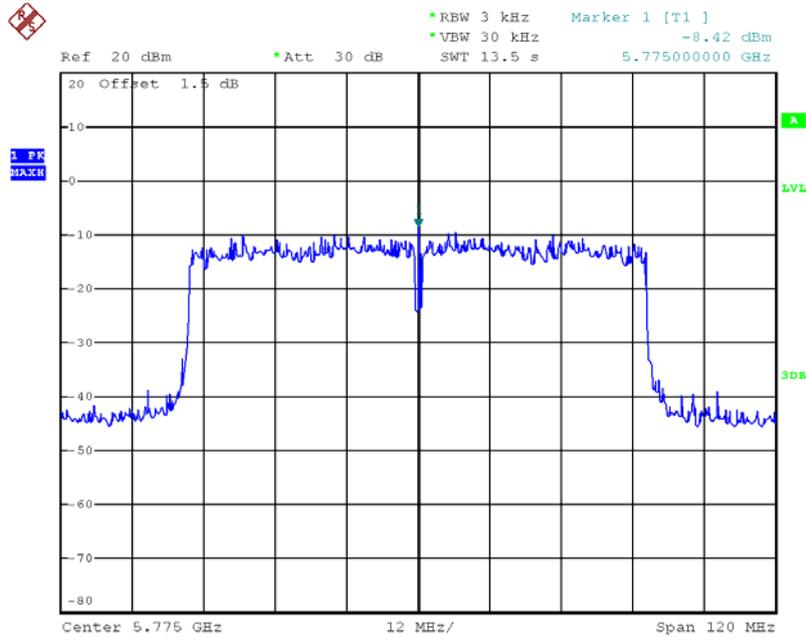
Date: 26.APR.2013 08:19:21

Power Density Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / Ant. 4 / 5795 MHz



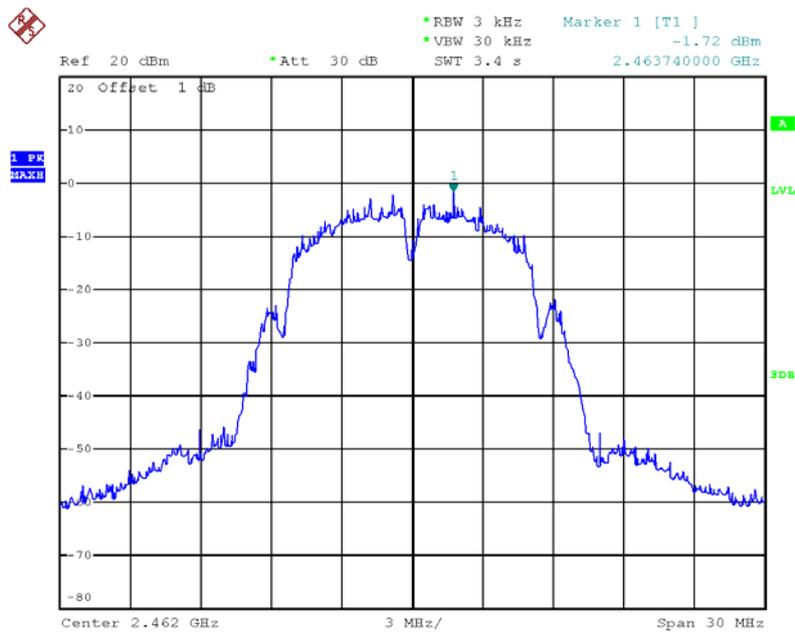
Date: 26.APR.2013 08:37:19

Power Density Plot on Configuration IEEE 802.11ac MCS0, Nss1 80MHz / Ant. 5 / 5775 MHz



Date: 26.APR.2013 08:41:01

Power Density Plot on Configuration IEEE 802.11b / Ant. 1 / 2462 MHz



Date: 24.APR.2013 19:09:44

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

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

4.4.2. Measuring Instruments and Setting

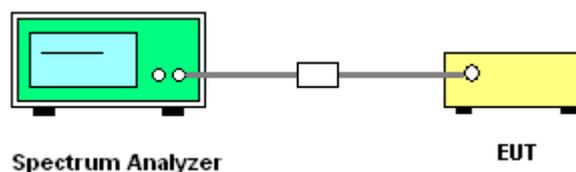
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100kHz
VB	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 5.1.1 EBW Measurement Procedure
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v01r02 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



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	23°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 20MHz / Ant. 1+Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.08	16.96	500	Complies
6	2437 MHz	16.32	17.04	500	Complies
11	2462 MHz	16.08	16.96	500	Complies

Configuration IEEE 802.11n MCS0 40MHz / Ant. 1+Ant. 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	35.84	36.16	500	Complies
6	2437 MHz	35.52	36.16	500	Complies
9	2452 MHz	35.36	36.32	500	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0, Nss1 20MHz / Ant. 3+Ant. 4+ Ant. 5

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.52	17.60	500	Complies
157	5785 MHz	15.52	17.52	500	Complies
165	5825 MHz	15.52	17.52	500	Complies

Configuration IEEE 802.11ac MCS0, Nss1 40MHz / Ant. 3+Ant. 4+ Ant. 5

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	34.72	36.16	500	Complies
159	5795 MHz	34.40	36.48	500	Complies

Configuration IEEE 802.11ac MCS0, Nss1 80MHz / Ant. 3+Ant. 4+ Ant. 5

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	74.24	74.88	500	Complies

Temperature	23°C	Humidity	63%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Ant. 1

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	8.00	10.08	500	Complies
6	2437 MHz	8.00	10.08	500	Complies
11	2462 MHz	8.08	10.08	500	Complies

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

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	13.28	16.24	500	Complies
6	2437 MHz	13.04	16.24	500	Complies
11	2462 MHz	12.56	16.24	500	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Benson Peng	Configurations	IEEE 802.11a

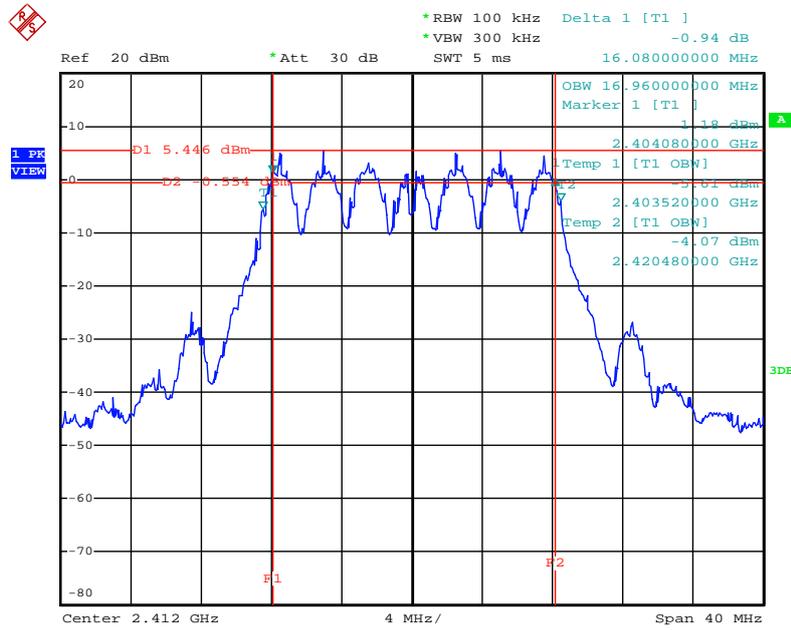
Configuration IEEE 802.11a / Ant. 3+Ant. 4+ Ant. 5

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	15.68	16.48	500	Complies
157	5785 MHz	15.12	16.48	500	Complies
165	5825 MHz	15.68	16.40	500	Complies

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

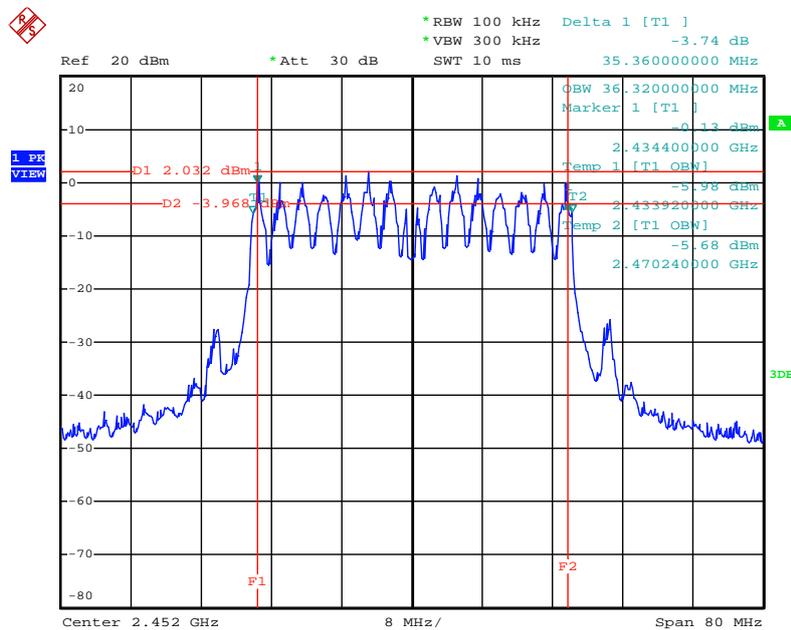
For plots, only the channel with maximum results was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Ant. 1+Ant. 2 / 2412 MHz



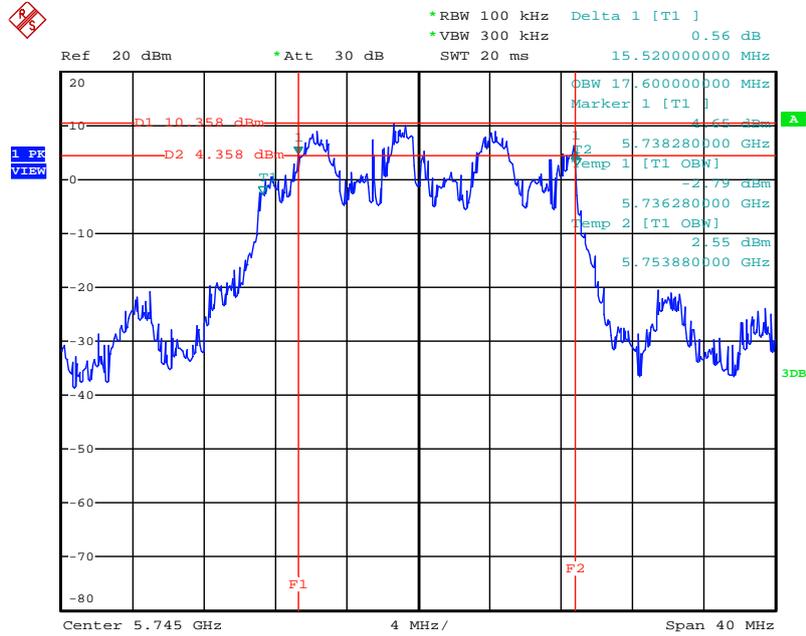
Date: 24.APR.2013 21:39:50

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Ant. 1+Ant. 2 / 2452 MHz



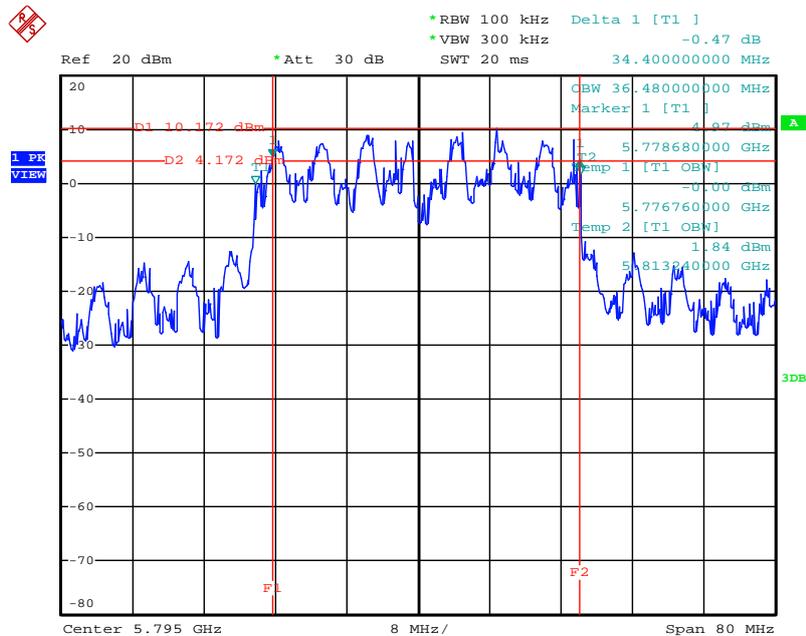
Date: 24.APR.2013 21:43:41

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0, Nss1 20MHz / Ant. 3+Ant. 4+Ant. 5 / 5745 MHz



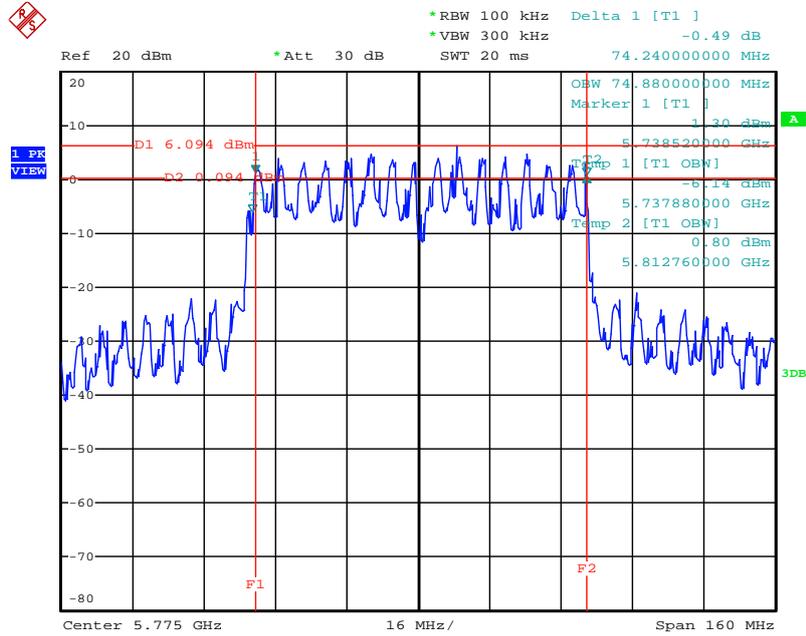
Date: 26.APR.2013 07:52:42

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / Ant. 3+Ant. 4+Ant. 5 / 5795 MHz



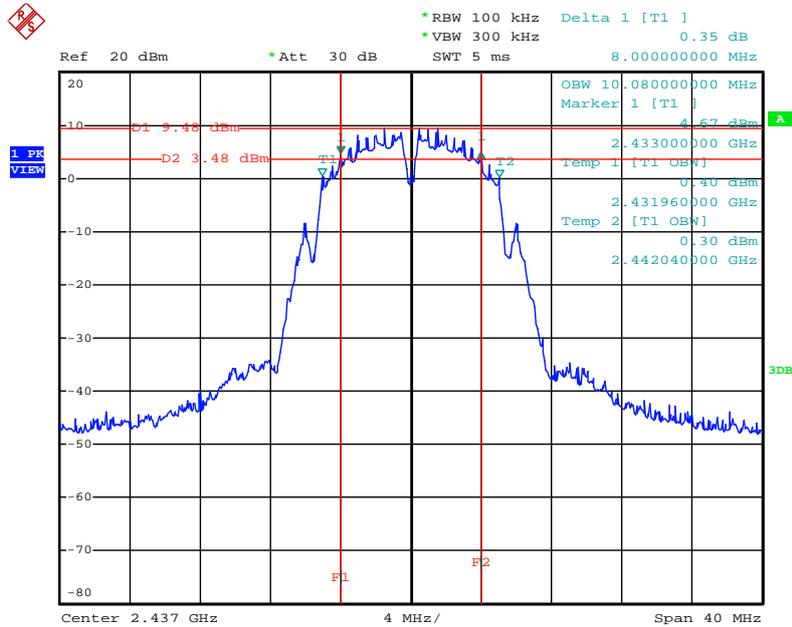
Date: 26.APR.2013 07:51:54

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0, Nss1 80MHz / Ant. 3+Ant. 4+Ant. 5 / 5775 MHz



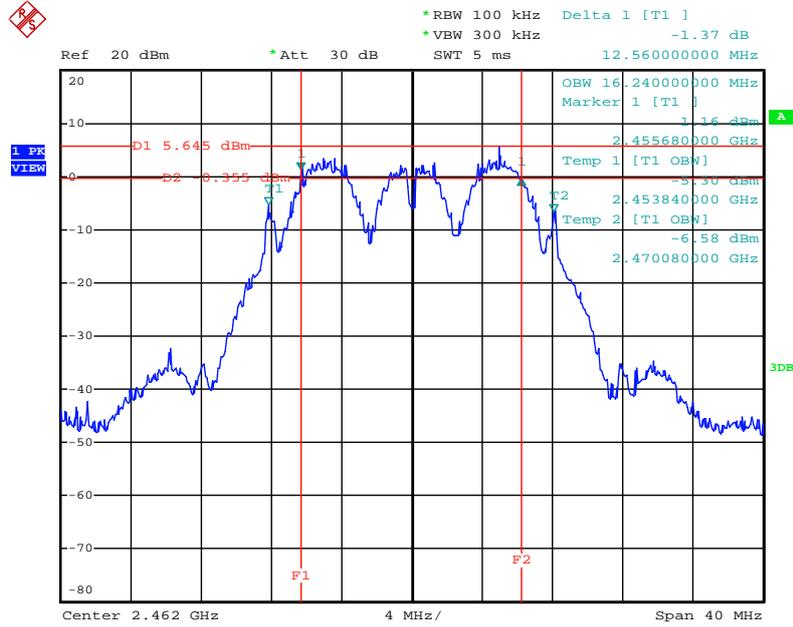
Date: 26.APR.2013 07:50:29

6 dB Bandwidth Plot on Configuration IEEE 802.11b / Ant. 1 / 2437 MHz



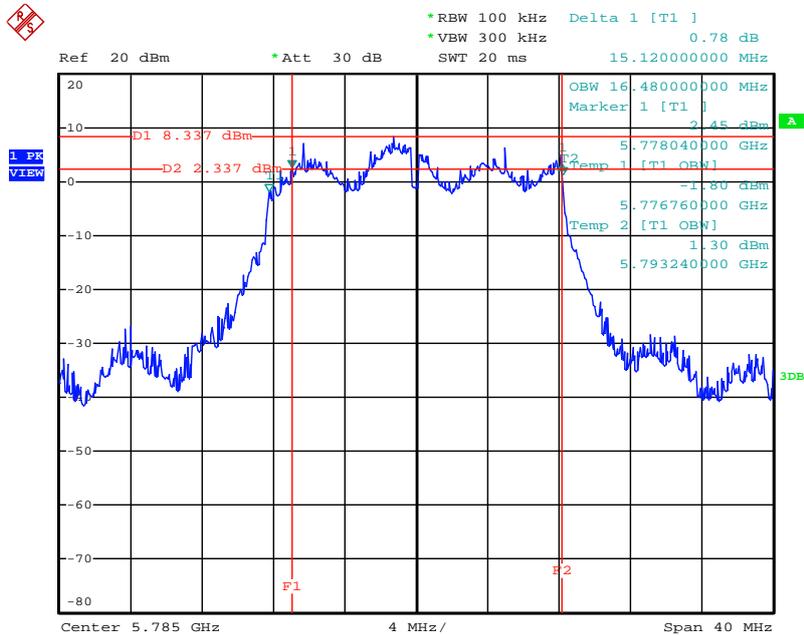
Date: 24.APR.2013 21:28:30

6 dB Bandwidth Plot on Configuration IEEE 802.11g / Ant. 1+Ant. 2 / 2462 MHz



Date: 24.APR.2013 21:34:45

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 3+Ant. 4+Ant. 5 / 5785 MHz



Date: 26.APR.2013 07:54:33

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	1GHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100kHz / 300kHz for peak

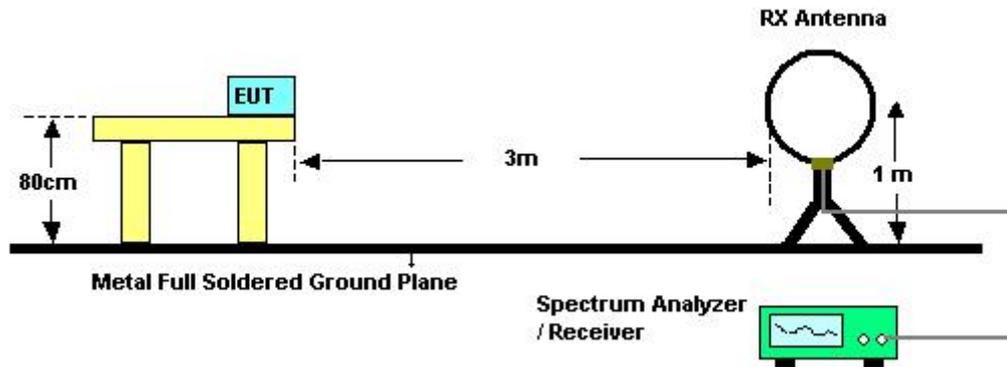
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RB 120kHz for QP

4.5.3. Test Procedures

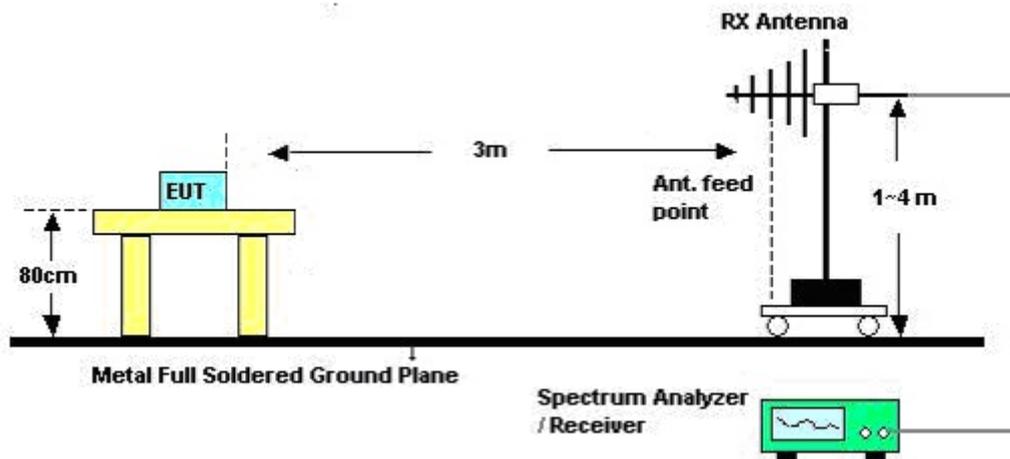
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. 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.
9. 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.
10. 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 below 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	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	Normal Link
Test Date	Apr. 23, 2013		

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.

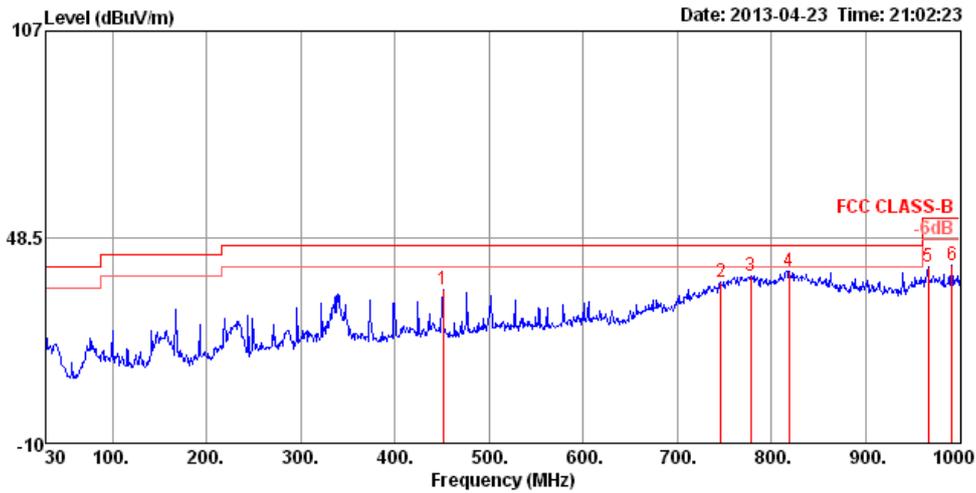
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

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

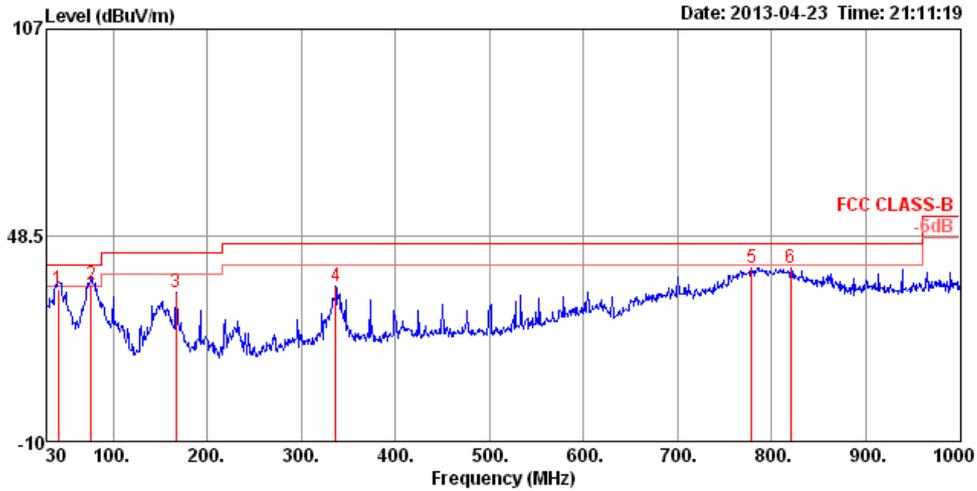
Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	Normal Link
Test Mode	Mode 1.		

Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	450.98	33.77	46.00	-12.23	46.10	2.65	16.21	31.19	100	273	HORIZONTAL Peak
2	745.86	35.66	46.00	-10.34	43.84	3.51	19.68	31.37	150	94	HORIZONTAL Peak
3	777.87	37.51	46.00	-8.49	45.47	3.63	19.75	31.34	150	107	HORIZONTAL Peak
4 pp	818.61	38.80	46.00	-7.20	46.01	3.72	20.27	31.20	100	264	HORIZONTAL Peak
5	966.05	40.01	54.00	-13.99	45.90	4.11	21.09	31.09	100	244	HORIZONTAL Peak
6	991.27	40.60	54.00	-13.40	46.22	4.19	21.33	31.14	100	244	HORIZONTAL Peak

Vertical



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	41.64	33.28	40.00	-6.72	53.11	0.76	11.27	31.86	125	94 VERTICAL	QP
2	pp 76.56	34.65	40.00	-5.35	58.99	1.03	6.32	31.69	200	197 VERTICAL	QP
3	166.77	32.42	43.50	-11.08	53.07	1.57	9.32	31.54	100	168 VERTICAL	Peak
4	336.52	33.98	46.00	-12.02	49.20	2.28	13.87	31.37	150	2 VERTICAL	Peak
5	pk 778.84	39.39	46.00	-6.61	47.34	3.63	19.76	31.34	100	172 VERTICAL	Peak
6	820.55	39.20	46.00	-6.80	46.38	3.72	20.29	31.19	100	150 VERTICAL	Peak

Note:

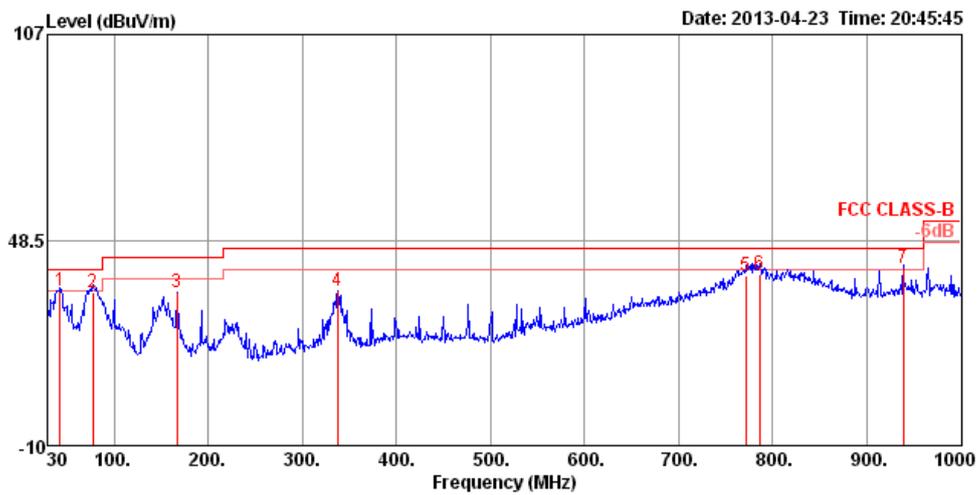
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

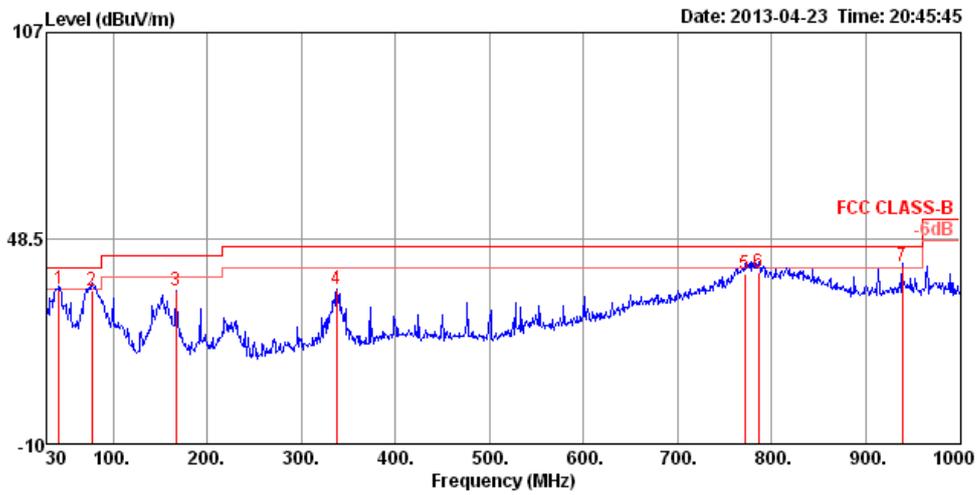
Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	Normal Link
Test Mode	Mode 2.		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	42.61	33.92	40.00	-6.08	54.24	0.77	10.76	31.85	100	15	VERTICAL	QP
2	77.53	33.57	40.00	-6.43	57.71	1.03	6.53	31.70	100	343	VERTICAL	QP
3 pk	166.77	33.62	43.50	-9.88	54.27	1.57	9.32	31.54	100	235	VERTICAL	Peak
4	337.49	33.96	46.00	-12.04	49.16	2.28	13.89	31.37	150	7	VERTICAL	Peak
5	771.08	38.44	46.00	-7.56	46.53	3.61	19.66	31.36	100	157	VERTICAL	QP
6	785.63	38.86	46.00	-7.14	46.79	3.64	19.75	31.32	100	126	VERTICAL	QP
7 pp	938.89	40.72	46.00	-5.28	47.03	4.04	20.78	31.13	150	112	VERTICAL	QP

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	42.61	33.92	40.00	-6.08	54.24	0.77	10.76	31.85	100	15 VERTICAL	QP
2	77.53	33.57	40.00	-6.43	57.71	1.03	6.53	31.70	100	343 VERTICAL	QP
3 pk	166.77	33.62	43.50	-9.88	54.27	1.57	9.32	31.54	100	235 VERTICAL	Peak
4	337.49	33.96	46.00	-12.04	49.16	2.28	13.89	31.37	150	7 VERTICAL	Peak
5	771.08	38.44	46.00	-7.56	46.53	3.61	19.66	31.36	100	157 VERTICAL	QP
6	785.63	38.86	46.00	-7.14	46.79	3.64	19.75	31.32	100	126 VERTICAL	QP
7 pp	938.89	40.72	46.00	-5.28	47.03	4.04	20.78	31.13	150	112 VERTICAL	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	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 1 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4824.28	33.80	54.00	-20.20	29.84	5.77	33.39	35.20	Average	138	115	HORIZONTAL
2	4826.36	50.93	74.00	-23.07	46.97	5.77	33.39	35.20	Peak	138	115	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4824.08	34.27	54.00	-19.73	30.31	5.77	33.39	35.20	Average	120	96	VERTICAL
2	4826.30	48.78	74.00	-25.22	44.82	5.77	33.39	35.20	Peak	120	96	VERTICAL

Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 6 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4874.34	34.35	54.00	-19.65	30.28	5.79	33.48	35.20	Average	135	116 HORIZONTAL
2	4874.44	49.15	74.00	-24.85	45.08	5.79	33.48	35.20	Peak	135	116 HORIZONTAL
3	7309.41	70.63	74.00	-3.37	60.92	8.63	36.51	35.43	Peak	131	131 HORIZONTAL
4	7311.75	44.24	54.00	-9.76	34.53	8.63	36.51	35.43	Average	131	131 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4872.40	45.82	74.00	-28.18	41.75	5.79	33.48	35.20	Peak	139	130 VERTICAL
2	4874.34	32.12	54.00	-21.88	28.05	5.79	33.48	35.20	Average	139	130 VERTICAL
3	7309.67	37.59	54.00	-16.41	27.88	8.63	36.51	35.43	Average	100	202 VERTICAL
4	7311.85	56.75	74.00	-17.25	47.04	8.63	36.51	35.43	Peak	100	202 VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 11 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4921.83	35.15	54.00	-18.85	30.95	5.82	33.58	35.20	Average	174	126	HORIZONTAL
2	4923.91	49.66	74.00	-24.34	45.46	5.82	33.58	35.20	Peak	174	126	HORIZONTAL
3	7383.95	70.31	74.00	-3.69	60.41	8.75	36.61	35.46	Peak	140	126	HORIZONTAL
4	7386.59	44.16	54.00	-9.84	34.26	8.75	36.61	35.46	Average	140	126	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4924.20	34.20	54.00	-19.80	30.00	5.82	33.58	35.20	Average	131	86	VERTICAL
2	4924.21	48.51	74.00	-25.49	44.31	5.82	33.58	35.20	Peak	131	86	VERTICAL
3	7383.90	64.44	74.00	-9.56	54.54	8.75	36.61	35.46	Peak	141	89	VERTICAL
4	7386.53	40.37	54.00	-13.63	30.47	8.75	36.61	35.46	Average	141	89	VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 3 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4842.04	45.52	74.00	-28.48	41.52	5.78	33.42	35.20 Peak	100	65	HORIZONTAL
2	4845.75	32.48	54.00	-21.52	28.48	5.78	33.42	35.20 Average	100	65	HORIZONTAL
3	7264.32	51.64	74.00	-22.36	42.06	8.56	36.43	35.41 Peak	100	141	HORIZONTAL
4	7266.54	37.52	54.00	-16.48	27.92	8.58	36.43	35.41 Average	100	141	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4842.22	45.84	74.00	-28.16	41.84	5.78	33.42	35.20 Peak	100	164	VERTICAL
2	4845.02	32.49	54.00	-21.51	28.49	5.78	33.42	35.20 Average	100	164	VERTICAL
3	7263.67	50.84	74.00	-23.16	41.26	8.56	36.43	35.41 Peak	100	115	VERTICAL
4	7266.22	37.84	54.00	-16.16	28.24	8.58	36.43	35.41 Average	100	115	VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 6 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4872.56	45.12	74.00	-28.88	41.05	5.79	33.48	35.20	Peak	100	294 HORIZONTAL
2	4874.41	32.29	54.00	-21.71	28.22	5.79	33.48	35.20	Average	100	294 HORIZONTAL
3	7309.73	51.55	74.00	-22.45	41.84	8.63	36.51	35.43	Peak	100	141 HORIZONTAL
4	7312.21	37.40	54.00	-16.60	27.69	8.63	36.51	35.43	Average	100	141 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4874.37	32.44	54.00	-21.56	28.37	5.79	33.48	35.20	Average	100	167 VERTICAL
2	4876.40	45.73	74.00	-28.27	41.66	5.79	33.48	35.20	Peak	100	167 VERTICAL
3	7309.29	37.67	54.00	-16.33	27.96	8.63	36.51	35.43	Average	100	0 VERTICAL
4	7312.26	50.64	74.00	-23.36	40.93	8.63	36.51	35.43	Peak	100	0 VERTICAL

Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 9 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4905.92	45.62	74.00	-28.38	41.47	5.81	33.54	35.20	Peak	100	252	HORIZONTAL
2	4906.04	32.87	54.00	-21.13	28.72	5.81	33.54	35.20	Average	100	252	HORIZONTAL
3	7355.69	57.17	74.00	-16.83	47.35	8.70	36.56	35.44	Peak	139	63	HORIZONTAL
4	7358.01	38.98	54.00	-15.02	29.17	8.70	36.56	35.45	Average	139	63	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4904.32	45.04	74.00	-28.96	40.92	5.81	33.51	35.20	Peak	100	153	VERTICAL
2	4906.38	32.71	54.00	-21.29	28.56	5.81	33.54	35.20	Average	100	153	VERTICAL
3	7353.94	51.34	74.00	-22.66	41.52	8.70	36.56	35.44	Peak	100	115	VERTICAL
4	7356.51	38.11	54.00	-15.89	28.29	8.70	36.56	35.44	Average	100	115	VERTICAL



Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac MCS0, Nss1 20MHz CH 149 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11490.24	50.78	54.00	-3.22	35.34	11.02	39.50	35.08	Average	137	62 HORIZONTAL
2	11495.52	63.66	74.00	-10.34	48.24	11.02	39.50	35.10	Peak	137	62 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11491.12	46.10	54.00	-7.90	30.66	11.02	39.50	35.08	Average	134	177 VERTICAL
2	11495.68	59.70	74.00	-14.30	44.28	11.02	39.50	35.10	Peak	134	177 VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac MCS0, Nss1 20MHz CH 157 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.16	50.81	54.00	-3.19	35.05	11.38	39.47	35.09	Average	143	135	HORIZONTAL
2	11570.24	65.48	74.00	-8.52	49.72	11.38	39.47	35.09	Peak	143	135	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11561.36	58.45	74.00	-15.55	42.77	11.29	39.48	35.09	Peak	100	62	VERTICAL
2	11568.96	45.80	54.00	-8.20	30.04	11.38	39.47	35.09	Average	100	62	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac MCS0, Nss1 20MHz CH 165 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11650.32	50.83	54.00	-3.17	34.74	11.72	39.44	35.07	Average	101	58 HORIZONTAL
2	11650.80	64.64	74.00	-9.36	48.47	11.80	39.44	35.07	Peak	101	58 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11649.20	46.93	54.00	-7.07	30.84	11.72	39.44	35.07	Average	100	60 VERTICAL
2	11653.84	60.39	74.00	-13.61	44.22	11.80	39.44	35.07	Peak	100	60 VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac MCS0, Nss1 40MHz CH 151 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11507.60	64.72	74.00	-9.28	49.28	11.04	39.50	35.10	Peak	107	60 HORIZONTAL
2	11508.08	50.72	54.00	-3.28	35.28	11.04	39.50	35.10	Average	107	60 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11508.48	60.37	74.00	-13.63	44.93	11.04	39.50	35.10	Peak	111	63 VERTICAL
2	11509.20	47.11	54.00	-6.89	31.67	11.04	39.50	35.10	Average	111	63 VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac MCS0, Nss1 40MHz CH 159 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11590.24	65.29	74.00	-8.71	49.44	11.46	39.47	35.08	Peak	100	60 HORIZONTAL
2	11590.40	50.72	54.00	-3.28	34.87	11.46	39.47	35.08	Average	100	60 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11589.12	47.14	54.00	-6.86	31.29	11.46	39.47	35.08	Average	100	62 VERTICAL
2	11594.00	60.21	74.00	-13.79	44.36	11.46	39.47	35.08	Peak	100	62 VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac MCS0, Nss1 80MHz CH 155 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5133.31	50.35	74.00	-23.65	45.62	5.95	33.98	35.20	Peak	100	95	HORIZONTAL
2	5133.35	38.92	54.00	-15.08	34.19	5.95	33.98	35.20	Average	100	95	HORIZONTAL
3	5458.88	61.82	74.00	-12.18	56.21	6.18	34.63	35.20	Peak	100	281	HORIZONTAL
4	5459.65	43.79	54.00	-10.21	38.18	6.18	34.63	35.20	Average	100	281	HORIZONTAL
5	11547.60	64.35	74.00	-9.65	48.74	11.21	39.49	35.09	Peak	140	54	HORIZONTAL
6	11552.72	49.03	54.00	-4.97	33.35	11.29	39.48	35.09	Average	140	54	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5133.32	41.56	54.00	-12.44	36.83	5.95	33.98	35.20	Average	103	9	VERTICAL
2	5133.37	55.20	74.00	-18.80	50.47	5.95	33.98	35.20	Peak	103	9	VERTICAL
3	5447.96	67.58	74.00	-6.42	62.00	6.18	34.60	35.20	Peak	100	270	VERTICAL
4	5449.71	47.07	54.00	-6.93	41.49	6.18	34.60	35.20	Average	100	270	VERTICAL
5	11559.04	46.28	54.00	-7.72	30.60	11.29	39.48	35.09	Average	106	61	VERTICAL
6	11564.24	59.91	74.00	-14.09	44.23	11.29	39.48	35.09	Peak	106	61	VERTICAL

Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b CH 1 / Ant. 1
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.96	43.42	54.00	-10.58	39.46	5.77	33.39	35.20	Average	135	139	HORIZONTAL
2	4824.01	49.79	74.00	-24.21	45.83	5.77	33.39	35.20	Peak	135	139	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4823.96	41.68	54.00	-12.32	37.72	5.77	33.39	35.20	Average	110	136	VERTICAL
2	4824.01	48.49	74.00	-25.51	44.53	5.77	33.39	35.20	Peak	110	136	VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b CH 6 / Ant. 1
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	4873.82	51.11	74.00	-22.89	47.04	5.79	33.48	35.20	173	121	HORIZONTAL
2	4873.94	45.27	54.00	-8.73	41.20	5.79	33.48	35.20	173	121	HORIZONTAL
3	7311.23	57.40	74.00	-16.60	47.69	8.63	36.51	35.43	137	63	HORIZONTAL
4	7311.69	50.69	54.00	-3.31	40.98	8.63	36.51	35.43	137	63	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	4873.91	48.56	74.00	-25.44	44.49	5.79	33.48	35.20	110	136	VERTICAL
2	4873.97	40.51	54.00	-13.49	36.44	5.79	33.48	35.20	110	136	VERTICAL
3	7309.36	50.74	74.00	-23.26	41.03	8.63	36.51	35.43	100	204	VERTICAL
4	7310.25	39.10	54.00	-14.90	29.39	8.63	36.51	35.43	100	204	VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b CH 11 / Ant. 1
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	Pol/Phase
1	4923.96	43.76	54.00	-10.24	39.56	5.82	33.58	35.20	133	137	HORIZONTAL
2	4924.02	49.99	74.00	-24.01	45.79	5.82	33.58	35.20	133	137	HORIZONTAL
3	7385.19	50.98	54.00	-3.02	41.08	8.75	36.61	35.46	135	63	HORIZONTAL
4	7386.88	57.86	74.00	-16.14	47.96	8.75	36.61	35.46	135	63	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	Pol/Phase
1	4923.96	43.42	54.00	-10.58	39.22	5.82	33.58	35.20	118	76	VERTICAL
2	4923.99	49.94	74.00	-24.06	45.74	5.82	33.58	35.20	118	76	VERTICAL
3	7385.44	38.92	54.00	-15.08	29.02	8.75	36.61	35.46	100	200	VERTICAL
4	7386.30	51.60	74.00	-22.40	41.70	8.75	36.61	35.46	100	200	VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g CH 1 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4824.44	49.12	74.00	-24.88	45.16	5.77	33.39	35.20	Peak	175	124	HORIZONTAL
2	4824.61	34.47	54.00	-19.53	30.51	5.77	33.39	35.20	Average	175	124	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4824.09	31.70	54.00	-22.30	27.74	5.77	33.39	35.20	Average	100	143	VERTICAL
2	4824.62	45.53	74.00	-28.47	41.57	5.77	33.39	35.20	Peak	100	143	VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g CH 6 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4874.79	33.46	54.00	-20.54	29.39	5.79	33.48	35.20	Average	137	139 HORIZONTAL
2	4874.95	48.10	74.00	-25.90	44.03	5.79	33.48	35.20	Peak	137	139 HORIZONTAL
3	7310.58	42.55	54.00	-11.45	32.84	8.63	36.51	35.43	Average	138	69 HORIZONTAL
4	7310.87	70.57	74.00	-3.43	60.86	8.63	36.51	35.43	Peak	138	69 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	4874.21	33.57	54.00	-20.43	29.50	5.79	33.48	35.20	Average	120	94 VERTICAL
2	4874.32	47.82	74.00	-26.18	43.75	5.79	33.48	35.20	Peak	120	94 VERTICAL
3	7309.63	36.81	54.00	-17.19	27.10	8.63	36.51	35.43	Average	100	316 VERTICAL
4	7312.57	50.97	74.00	-23.03	41.26	8.63	36.51	35.43	Peak	100	316 VERTICAL



Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g CH 11 / Ant. 1+Ant. 2
Test Date	Apr. 24, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos		
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	4924.65	49.15	74.00	-24.85	44.95	5.82	33.58	35.20	Peak	170	123	HORIZONTAL
2	4924.78	34.18	54.00	-19.82	29.98	5.82	33.58	35.20	Average	170	123	HORIZONTAL
3	7385.42	70.61	74.00	-3.39	60.71	8.75	36.61	35.46	Peak	138	69	HORIZONTAL
4	7385.56	43.01	54.00	-10.99	33.11	8.75	36.61	35.46	Average	138	69	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos		
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	Pol/Phase
1	4924.06	33.40	54.00	-20.60	29.20	5.82	33.58	35.20	Average	116	86	VERTICAL
2	4924.26	46.90	74.00	-27.10	42.70	5.82	33.58	35.20	Peak	116	86	VERTICAL
3	7388.21	54.28	74.00	-19.72	44.38	8.75	36.61	35.46	Peak	100	200	VERTICAL
4	7388.42	37.25	54.00	-16.75	27.35	8.75	36.61	35.46	Average	100	200	VERTICAL

Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a CH 149 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	
1	11490.24	65.07	74.00	-8.93	49.63	11.02	39.50	35.08	Peak	138	59	HORIZONTAL
2	11491.52	50.79	54.00	-3.21	35.35	11.02	39.50	35.08	Average	138	59	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	cm	deg	
1	11487.76	46.03	54.00	-7.97	30.59	11.02	39.50	35.08	Average	134	178	VERTICAL
2	11488.32	59.37	74.00	-14.63	43.93	11.02	39.50	35.08	Peak	134	178	VERTICAL



Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a CH 157 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.48	64.75	74.00	-9.25	48.99	11.38	39.47	35.09	Peak	139	135	HORIZONTAL
2	11570.88	50.85	54.00	-3.15	35.09	11.38	39.47	35.09	Average	139	135	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11567.44	58.17	74.00	-15.83	42.41	11.38	39.47	35.09	Peak	124	66	VERTICAL
2	11567.84	45.65	54.00	-8.35	29.89	11.38	39.47	35.09	Average	124	66	VERTICAL



Temperature	24.5°C	Humidity	57%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a CH 165 / Ant. 3+Ant. 4+Ant. 5
Test Date	Apr. 21, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11651.68	50.76	54.00	-3.24	34.59	11.80	39.44	35.07	Average	101	145	HORIZONTAL
2	11652.32	63.70	74.00	-10.30	47.53	11.80	39.44	35.07	Peak	101	145	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11647.92	46.05	54.00	-7.95	29.96	11.72	39.44	35.07	Average	114	64	VERTICAL
2	11648.40	58.99	74.00	-15.01	42.90	11.72	39.44	35.07	Peak	114	64	VERTICAL

Note:

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

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

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

4.6. Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

For Radiated band edges Measurement:

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

For Conducted Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure

2. The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.

Only worst data of each operating mode is presented.

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Conducted Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.4.4.

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	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 20MHz Ch 1, 6, 11 / Ant. 1+Ant. 2
Test date	Apr. 24, 2013		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2390.00	51.34	54.00	-2.66	19.32	3.97	28.05	0.00	Average	144	88	HORIZONTAL
2	2390.00	63.91	74.00	-10.09	31.89	3.97	28.05	0.00	Peak	144	88	HORIZONTAL
3	2415.80	102.14			70.06	3.99	28.09	0.00	Average	144	88	HORIZONTAL
4	2416.20	112.91			80.83	3.99	28.09	0.00	Peak	144	88	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2387.20	52.34	54.00	-1.66	20.32	3.97	28.05	0.00	Average	100	36	VERTICAL
2	2387.20	64.39	74.00	-9.61	32.37	3.97	28.05	0.00	Peak	100	36	VERTICAL
3	2431.00	114.11			81.98	4.00	28.13	0.00	Peak	100	36	VERTICAL
4	2434.00	101.59			69.41	4.00	28.18	0.00	Average	100	36	VERTICAL
5	2483.50	50.46	54.00	-3.54	18.15	4.05	28.26	0.00	Average	100	36	VERTICAL
6	2484.10	61.61	74.00	-12.39	29.30	4.05	28.26	0.00	Peak	100	36	VERTICAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2466.60	101.56			69.31	4.03	28.22	0.00	Average	100	35	VERTICAL
2	2466.60	113.24			80.99	4.03	28.22	0.00	Peak	100	35	VERTICAL
3	2483.50	52.22	54.00	-1.78	19.91	4.05	28.26	0.00	Average	100	35	VERTICAL
4	2485.90	69.45	74.00	-4.55	37.10	4.05	28.30	0.00	Peak	100	35	VERTICAL

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

Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11n MCS0 40MHz Ch 3, 6, 9 / Ant. 1+Ant. 2
Test date	Apr. 24, 2013		

Channel 3

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2388.80	64.99	74.00	-9.01	32.97	3.97	28.05	0.00 Peak	148	270	HORIZONTAL
2	2390.00	52.83	54.00	-1.17	20.81	3.97	28.05	0.00 Average	148	270	HORIZONTAL
3	2418.00	97.11			64.99	3.99	28.13	0.00 Average	148	270	HORIZONTAL
4	2418.80	108.33			76.21	3.99	28.13	0.00 Peak	148	270	HORIZONTAL

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

Channel 6

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2389.60	61.54	74.00	-12.46	29.52	3.97	28.05	0.00 Peak	149	73	HORIZONTAL
2	2390.00	49.38	54.00	-4.62	17.36	3.97	28.05	0.00 Average	149	73	HORIZONTAL
3	2433.40	97.37			65.24	4.00	28.13	0.00 Average	149	73	HORIZONTAL
4	2434.20	109.47			77.29	4.00	28.18	0.00 Peak	149	73	HORIZONTAL
5	2485.10	49.25	54.00	-4.75	16.90	4.05	28.30	0.00 Average	149	73	HORIZONTAL
6	2487.10	61.87	74.00	-12.13	29.52	4.05	28.30	0.00 Peak	149	73	HORIZONTAL

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

Channel 9

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2446.80	107.96			75.76	4.02	28.18	0.00 Peak	143	82	HORIZONTAL
2	2447.20	97.14			64.94	4.02	28.18	0.00 Average	143	82	HORIZONTAL
3	2483.50	52.56	54.00	-1.44	20.25	4.05	28.26	0.00 Average	143	82	HORIZONTAL
4	2483.90	64.17	74.00	-9.83	31.86	4.05	28.26	0.00 Peak	143	82	HORIZONTAL

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

Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11b CH 1, 6, 11 / Ant. 1
Test date	Apr. 24, 2013		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2389.00	62.48	74.00	-11.52	30.46	3.97	28.05	0.00	Peak	153	282	HORIZONTAL
2	2390.00	50.66	54.00	-3.34	18.64	3.97	28.05	0.00	Average	153	282	HORIZONTAL
3	2410.20	108.60			76.52	3.99	28.09	0.00	Average	153	282	HORIZONTAL
4	2411.00	112.64			80.56	3.99	28.09	0.00	Peak	153	282	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2388.60	62.66	74.00	-11.34	30.64	3.97	28.05	0.00	Peak	147	79	HORIZONTAL
2	2388.80	50.00	54.00	-4.00	17.98	3.97	28.05	0.00	Average	147	79	HORIZONTAL
3	2436.20	109.73			77.55	4.00	28.18	0.00	Average	147	79	HORIZONTAL
4	2436.20	113.60			81.42	4.00	28.18	0.00	Peak	147	79	HORIZONTAL
5	2484.30	61.76	74.00	-12.24	29.45	4.05	28.26	0.00	Peak	147	79	HORIZONTAL
6	2485.50	49.74	54.00	-4.26	17.39	4.05	28.30	0.00	Average	147	79	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2462.80	109.47			77.22	4.03	28.22	0.00	Average	143	285	HORIZONTAL
2	2463.00	113.42			81.17	4.03	28.22	0.00	Peak	143	285	HORIZONTAL
3	2492.30	61.91	74.00	-12.09	29.55	4.06	28.30	0.00	Peak	143	285	HORIZONTAL
4	2493.30	50.12	54.00	-3.88	17.76	4.06	28.30	0.00	Average	143	285	HORIZONTAL

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

Temperature	22°C	Humidity	60%
Test Engineer	Robert Chang	Configurations	IEEE 802.11g CH 1, 6, 11 / Ant. 1+Ant. 2
Test date	Apr. 24, 2013		

Channel 1

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2390.00	49.82	54.00	-4.18	17.80	3.97	28.05	0.00 Average	100	36	VERTICAL
2	2390.00	62.93	74.00	-11.07	30.91	3.97	28.05	0.00 Peak	100	36	VERTICAL
3	2415.60	100.52			68.44	3.99	28.09	0.00 Average	100	36	VERTICAL
4	2415.60	111.50			79.42	3.99	28.09	0.00 Peak	100	36	VERTICAL

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

Channel 6

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2387.00	52.02	54.00	-1.98	20.00	3.97	28.05	0.00 Average	100	36	VERTICAL
2	2387.40	64.35	74.00	-9.65	32.33	3.97	28.05	0.00 Peak	100	36	VERTICAL
3	2431.40	101.01			68.88	4.00	28.13	0.00 Average	100	36	VERTICAL
4	2431.80	113.13			81.00	4.00	28.13	0.00 Peak	100	36	VERTICAL
5	2485.70	50.41	54.00	-3.59	18.06	4.05	28.30	0.00 Average	100	36	VERTICAL
6	2486.10	63.15	74.00	-10.85	30.80	4.05	28.30	0.00 Peak	100	36	VERTICAL

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

Channel 11

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2465.80	113.68			81.43	4.03	28.22	0.00 Peak	100	36	VERTICAL
2	2466.00	101.79			69.54	4.03	28.22	0.00 Average	100	36	VERTICAL
3	2483.50	51.72	54.00	-2.28	19.41	4.05	28.26	0.00 Average	100	36	VERTICAL
4	2484.70	67.39	74.00	-6.61	35.08	4.05	28.26	0.00 Peak	100	36	VERTICAL

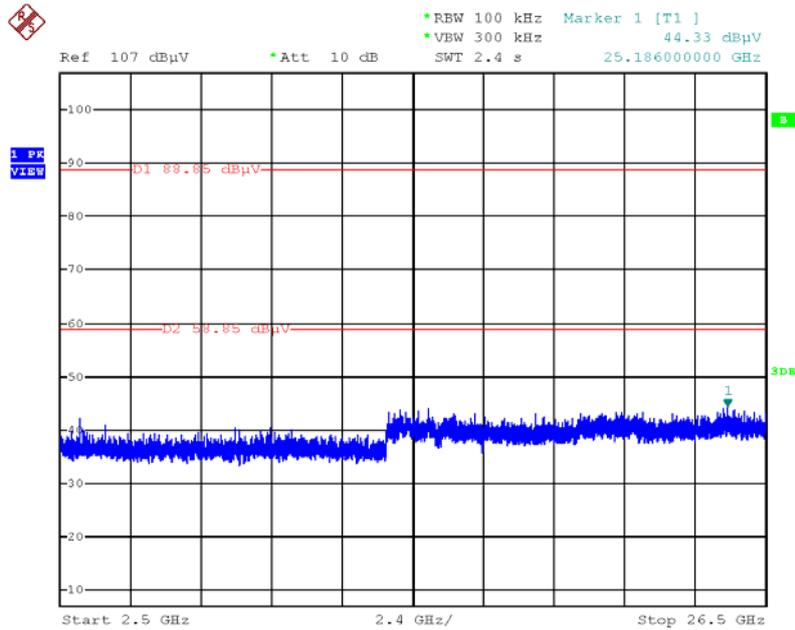
Item 1, 2 are the fundamental frequency at 2462 MHz.

Note:

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

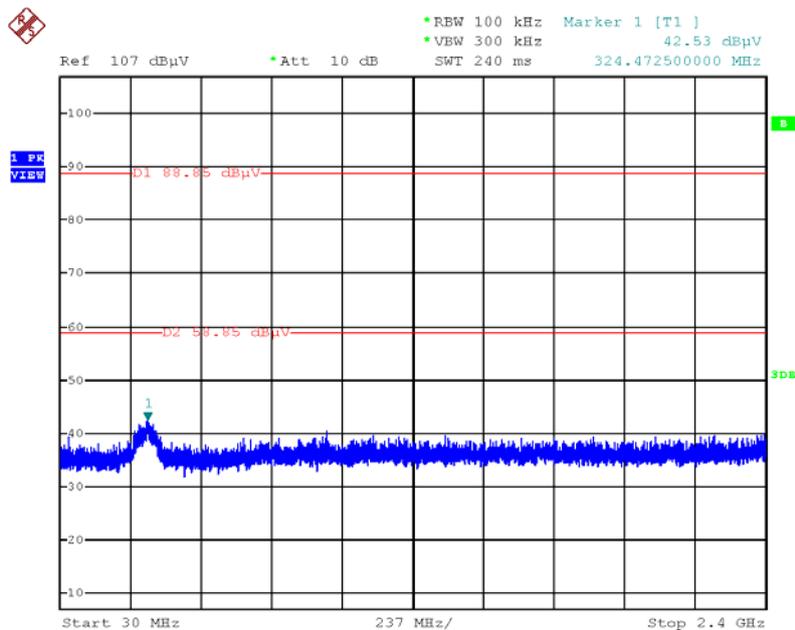
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 1 / 2500MHz~26500MHz (down 30dBc)



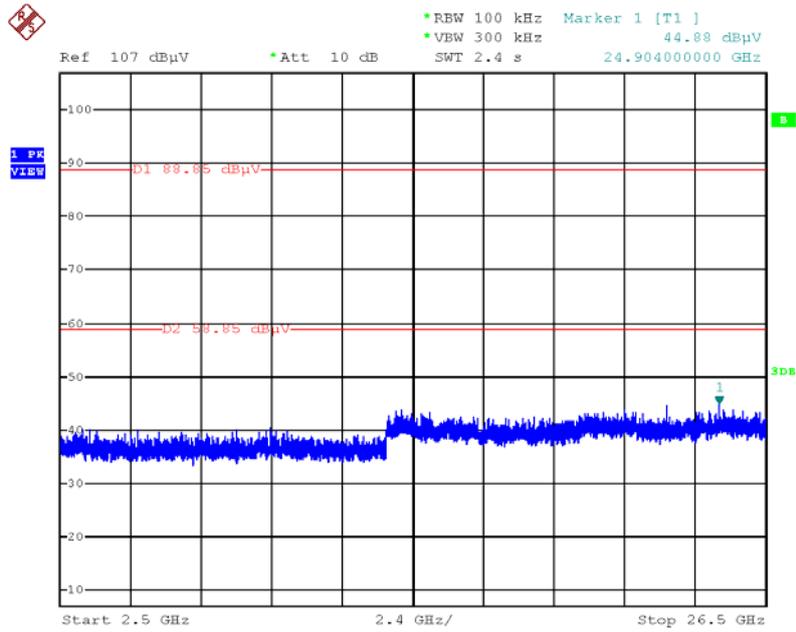
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Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 11 / 30MHz~2400MHz (down 30dBc)



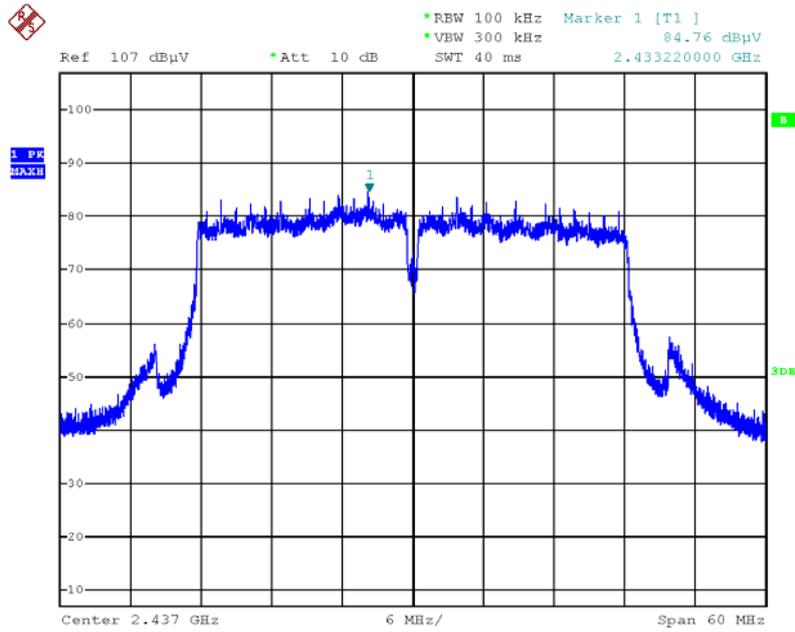
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Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 11 / 2500MHz~26500MHz (down 30dBc)



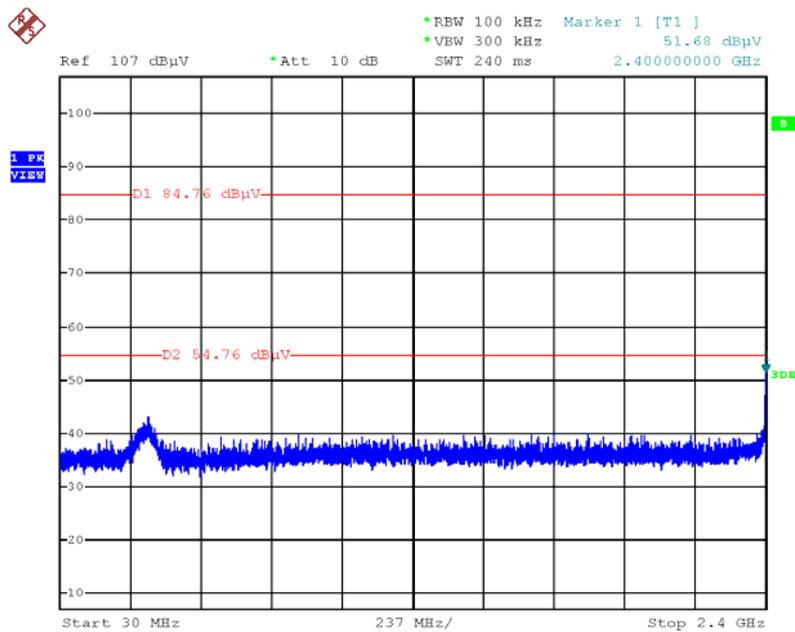
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Plot on Configuration IEEE 802.11n MCS0 40MHz / Reference Level



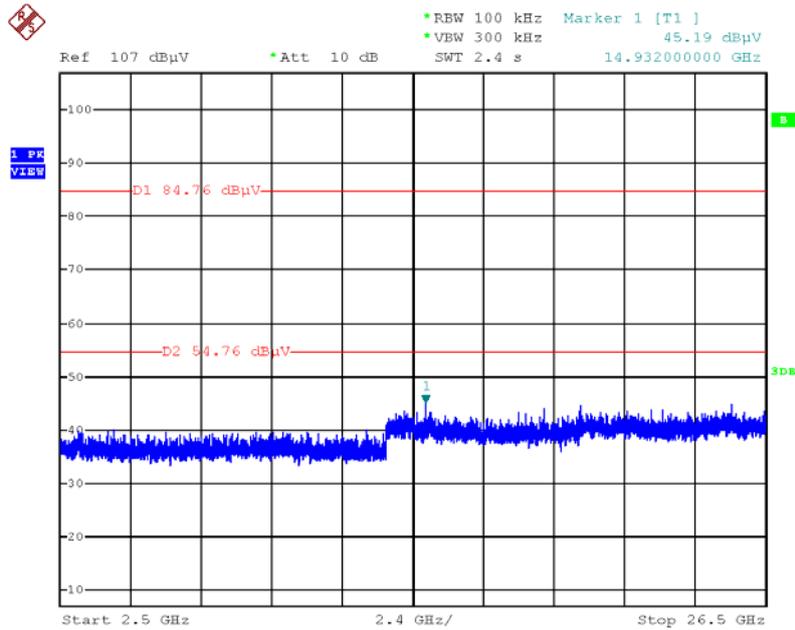
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Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 3 / 30MHz~2400MHz (down 30dBc)



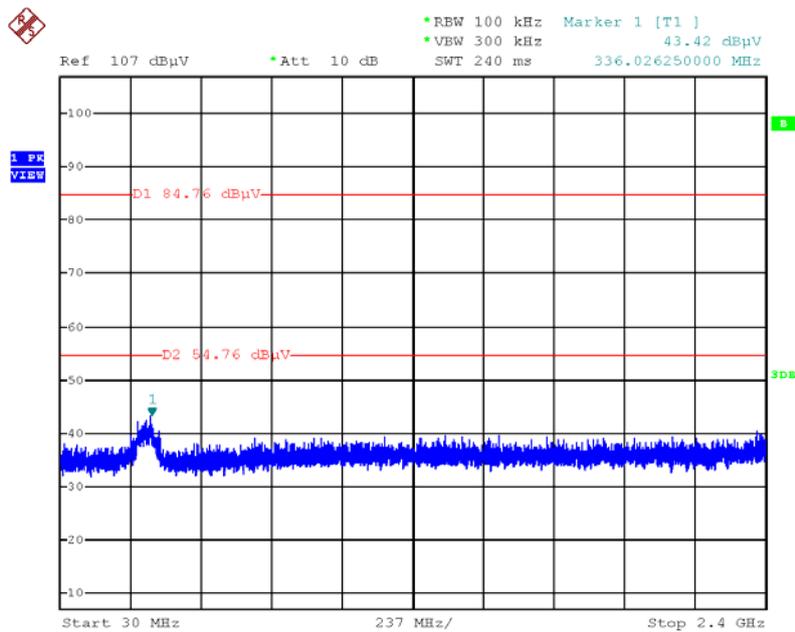
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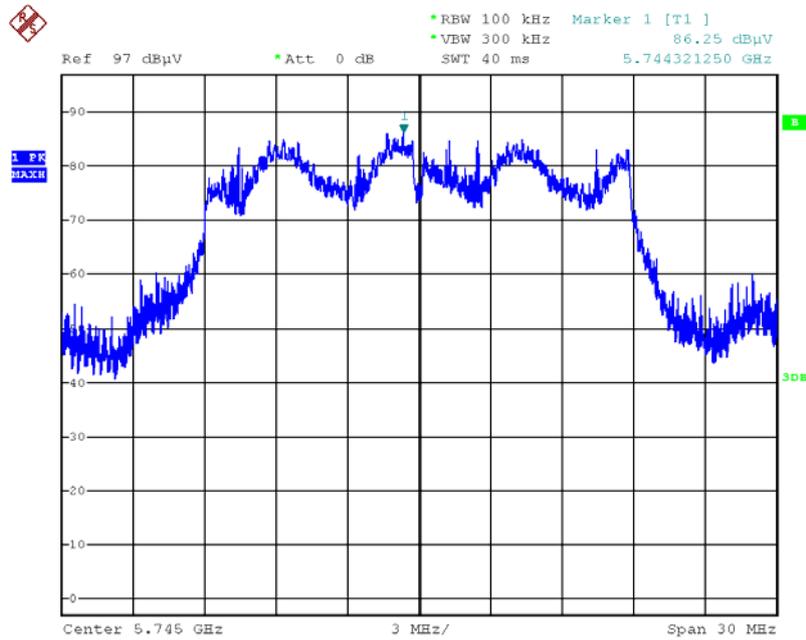
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Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 9 / 30MHz~2400MHz (down 30dBc)



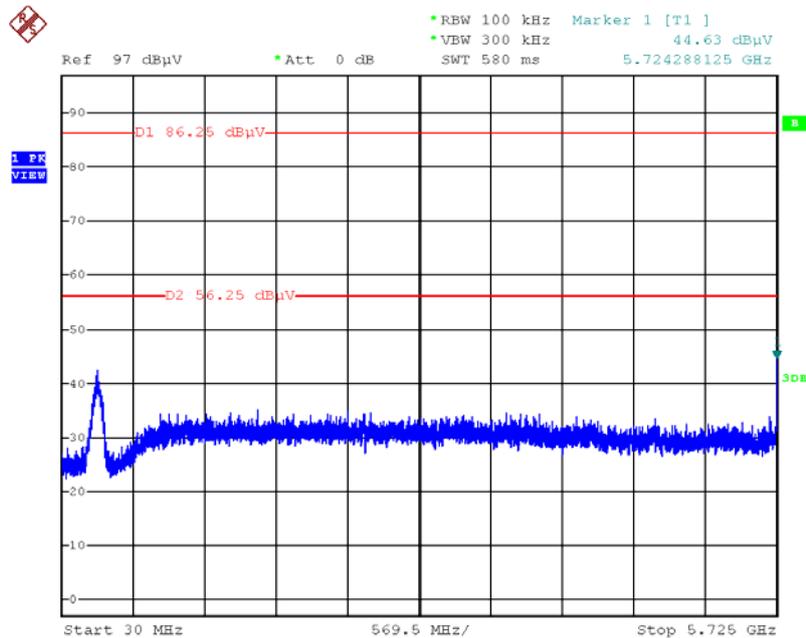
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Plot on Configuration IEEE 802.11ac MCS0, Nss1 20MHz / Reference Level



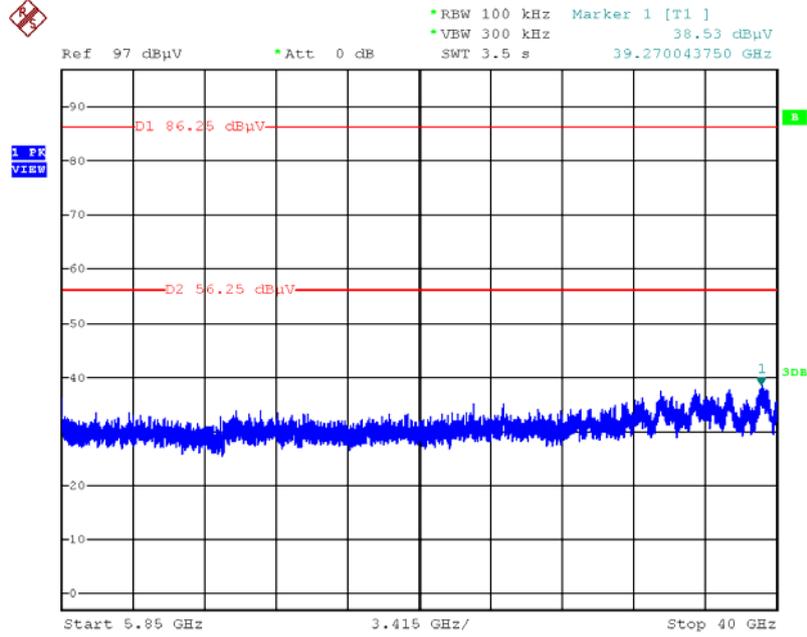
Date: 22.APR.2013 11:37:38

Plot on Configuration IEEE 802.11ac MCS0, Nss1 20MHz / CH 149 / 30MHz~5725MHz (down 30dBc)



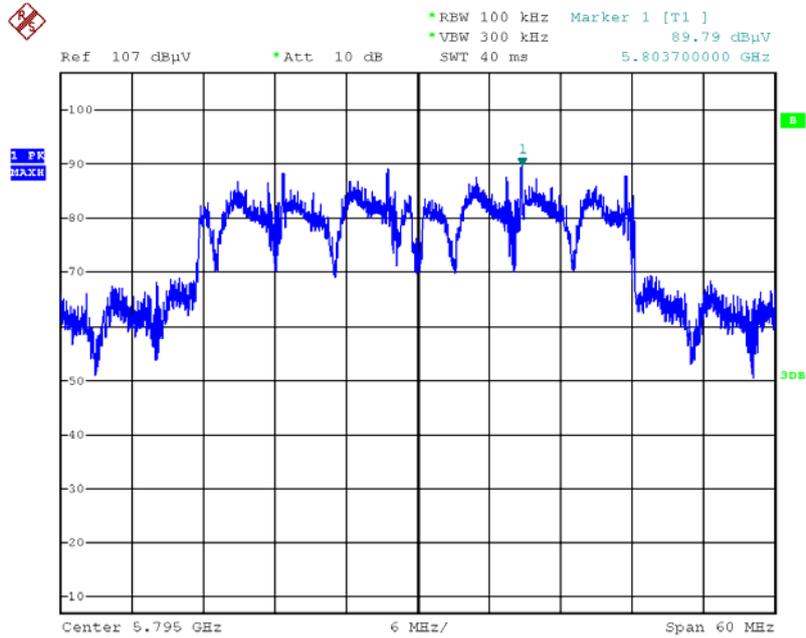
Date: 22.APR.2013 11:38:24

Plot on Configuration IEEE 802.11ac MCS0, Nss1 20MHz / CH 165 / 5850MHz~4000MHz
(down 30dBc)



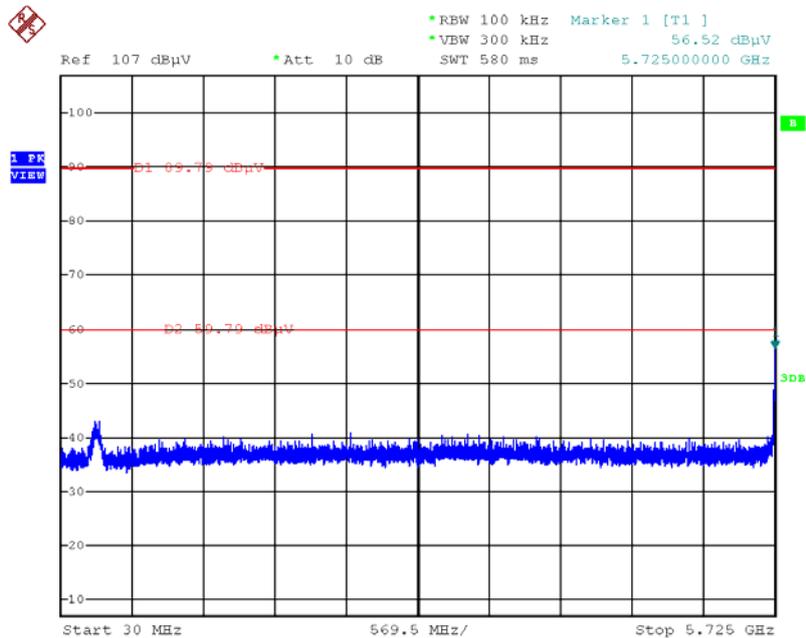
Date: 22.APR.2013 11:43:02

Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / Reference Level



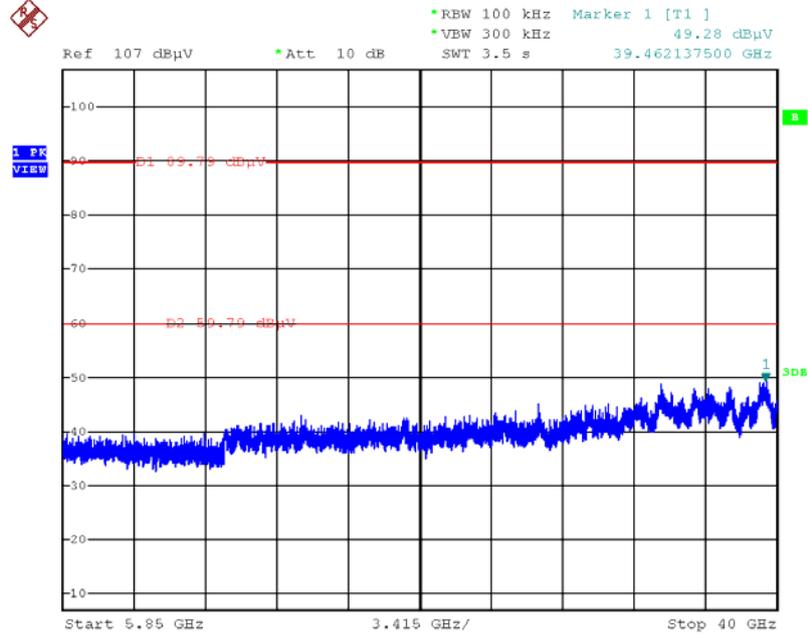
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Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / CH 151 / 30MHz~5725MHz (down 30dBc)



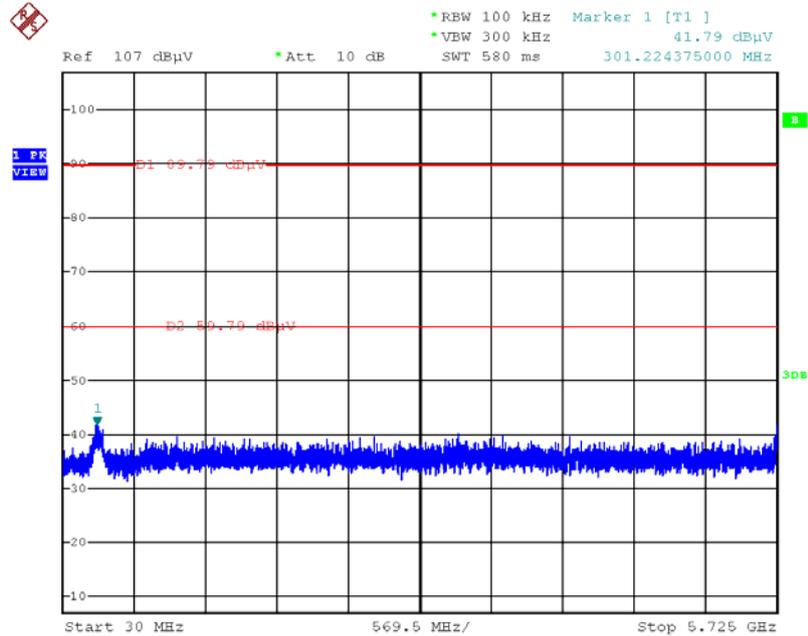
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Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / CH 151 / 5850MHz~40000MHz
(down 30dBc)



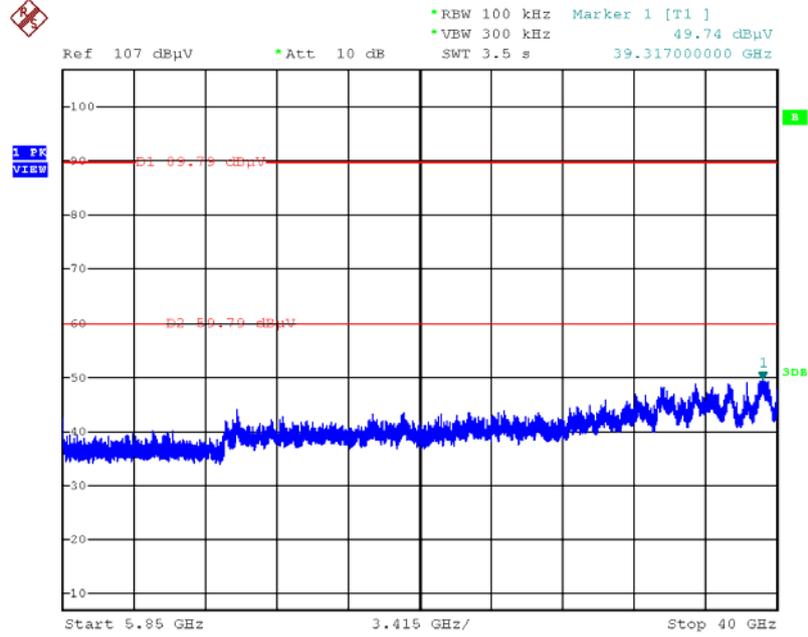
Date: 22.APR.2013 11:55:18

Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / CH 159 / 30MHz~5725MHz (down 30dBc)



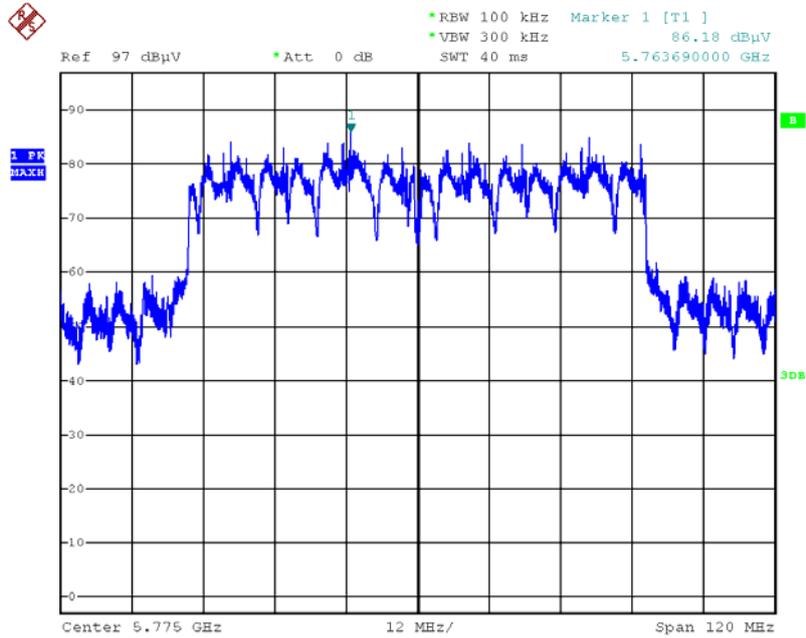
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Plot on Configuration IEEE 802.11ac MCS0, Nss1 40MHz / CH 159 / 5850MHz~4000MHz
(down 30dBc)



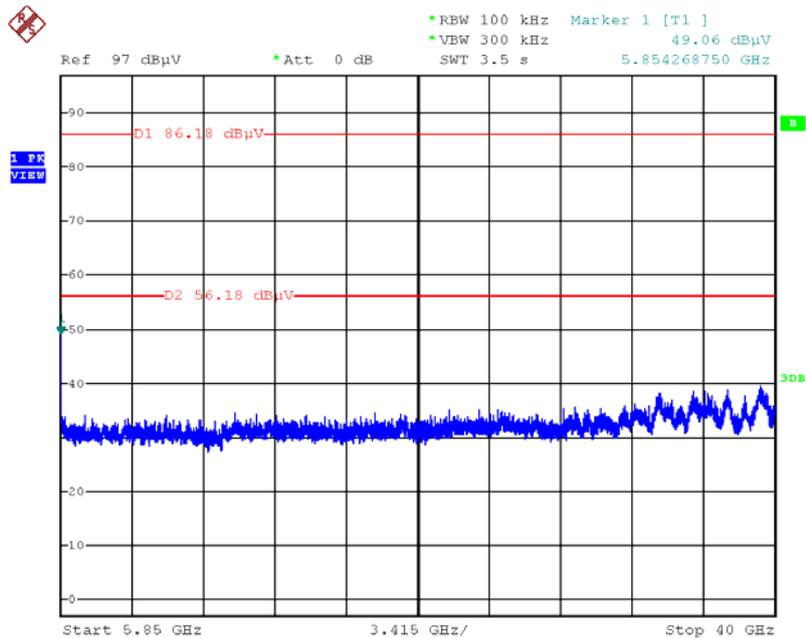
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Plot on Configuration IEEE 802.11ac MCS0, Nss1 80MHz / Reference Level



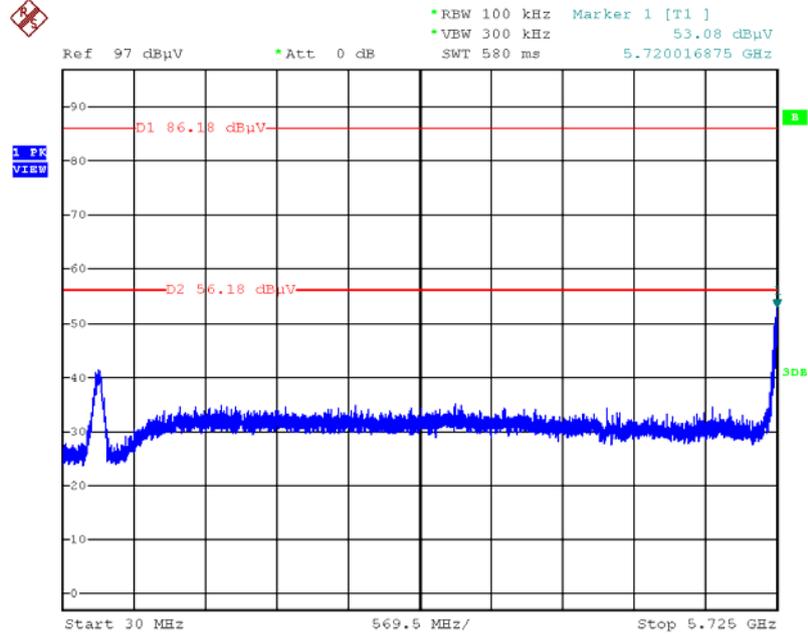
Date: 22.APR.2013 11:59:30

Plot on Configuration IEEE 802.11ac MCS0, Nss1 80MHz / CH 155 / 30MHz~5725MHz (down 30dBc)



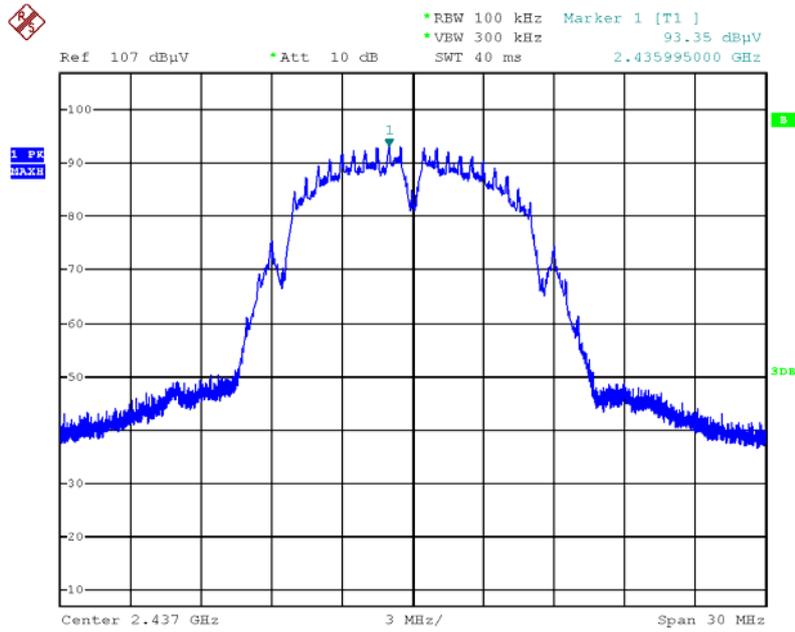
Date: 22.APR.2013 12:00:55

Plot on Configuration IEEE 802.11ac MCS0, Nss1 80MHz / CH 155 / 5850MHz~40000MHz
(down 30dBc)



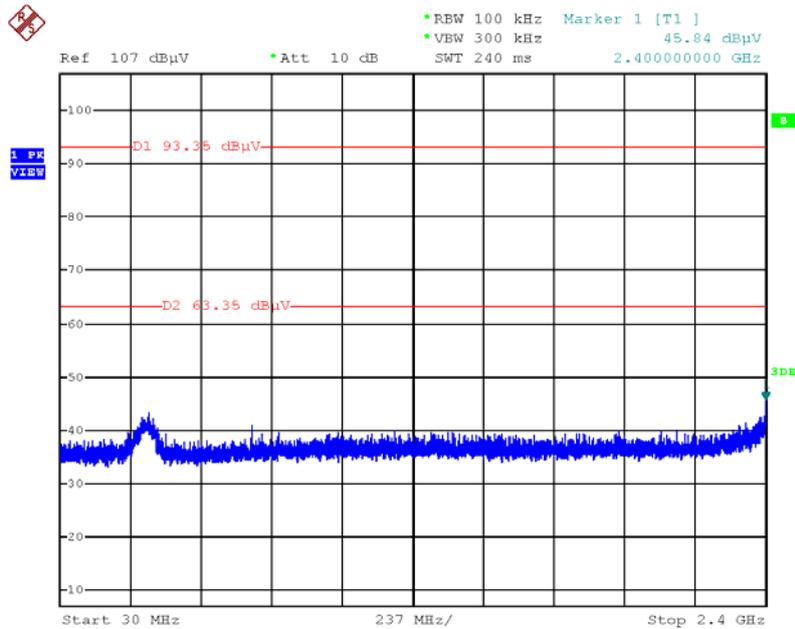
Date: 22.APR.2013 12:04:32

Plot on Configuration IEEE 802.11b / Reference Level



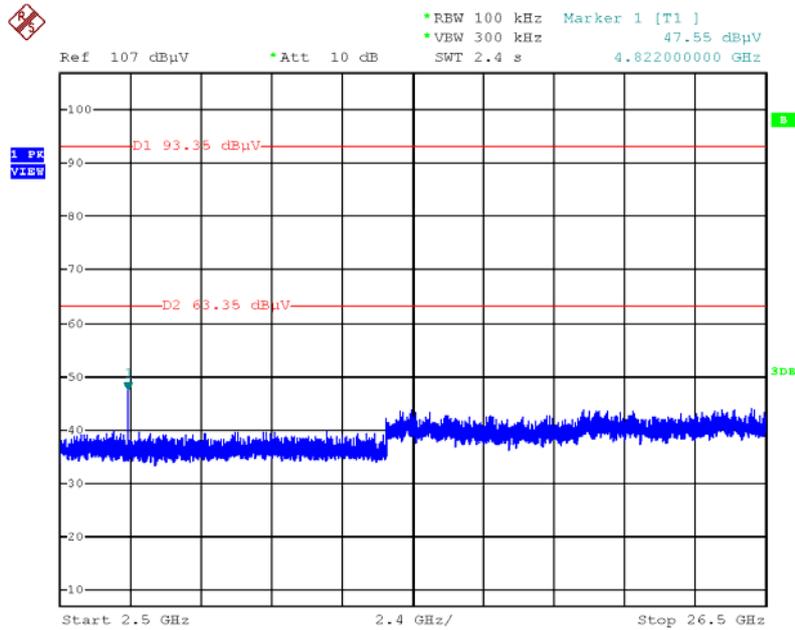
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Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc)



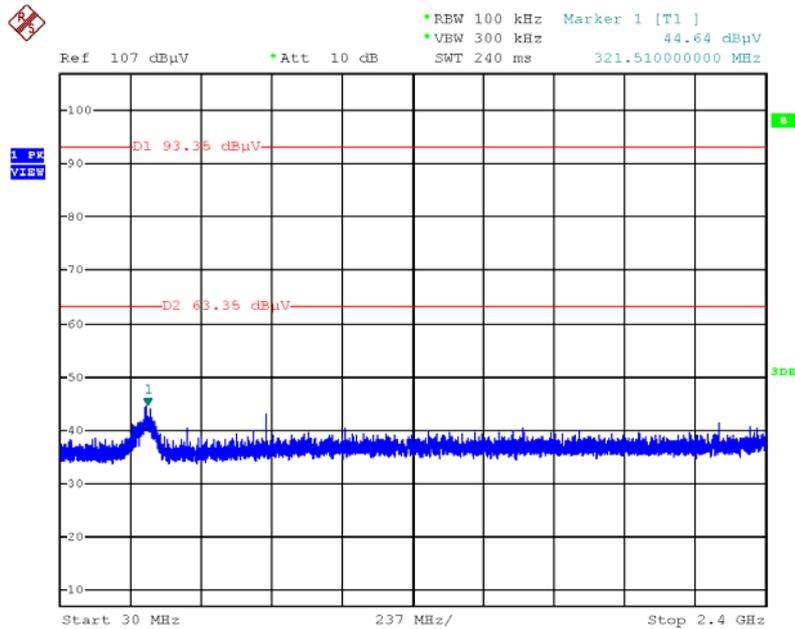
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Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



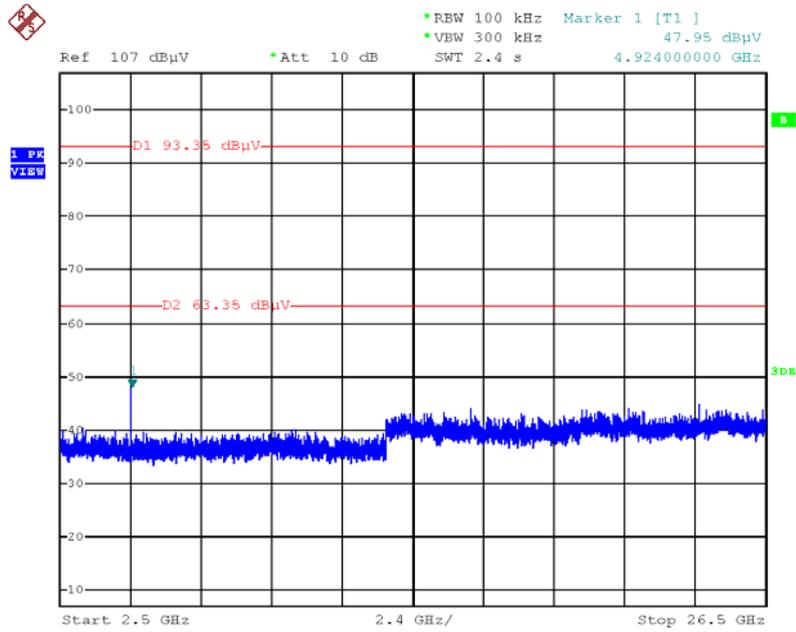
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Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



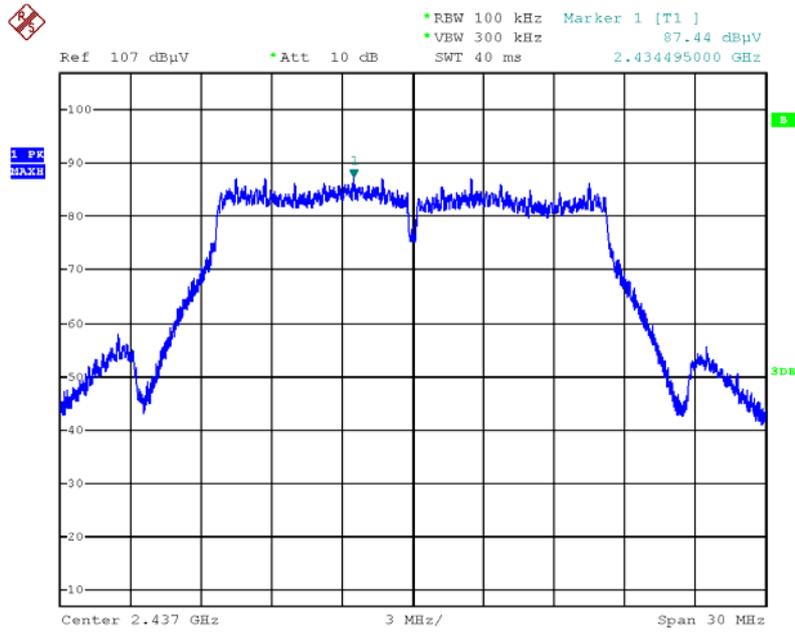
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Plot on Configuration IEEE 802.11b / CH 11 / 2500MHz~26500MHz (down 30dBc)



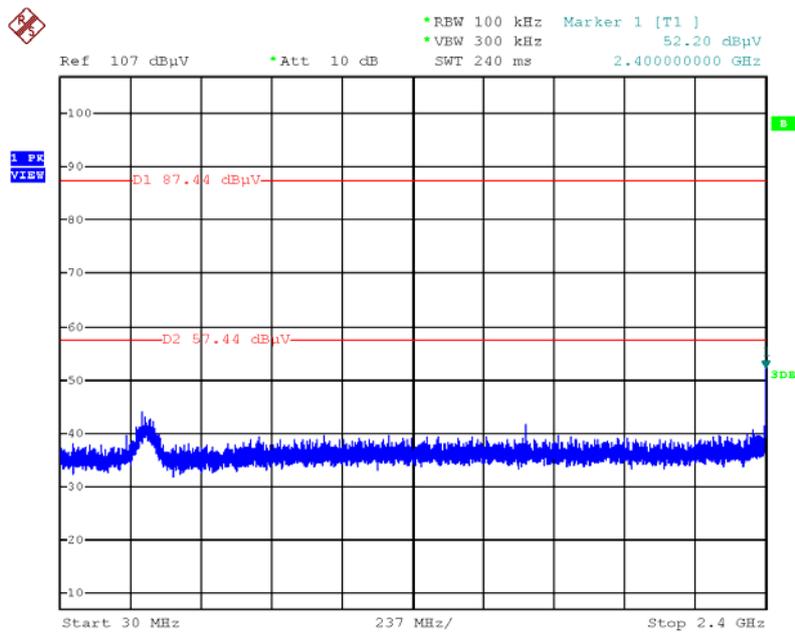
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Plot on Configuration IEEE 802.11g / Reference Level



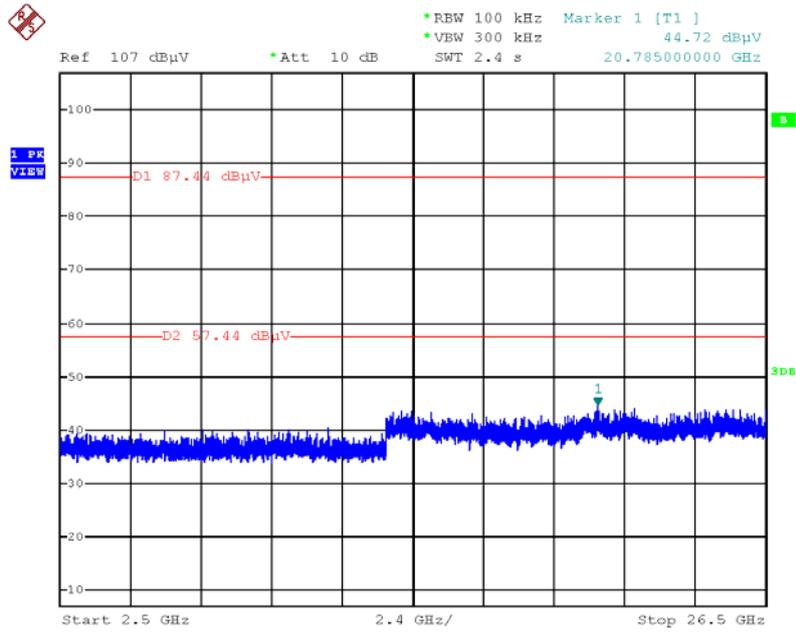
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Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)



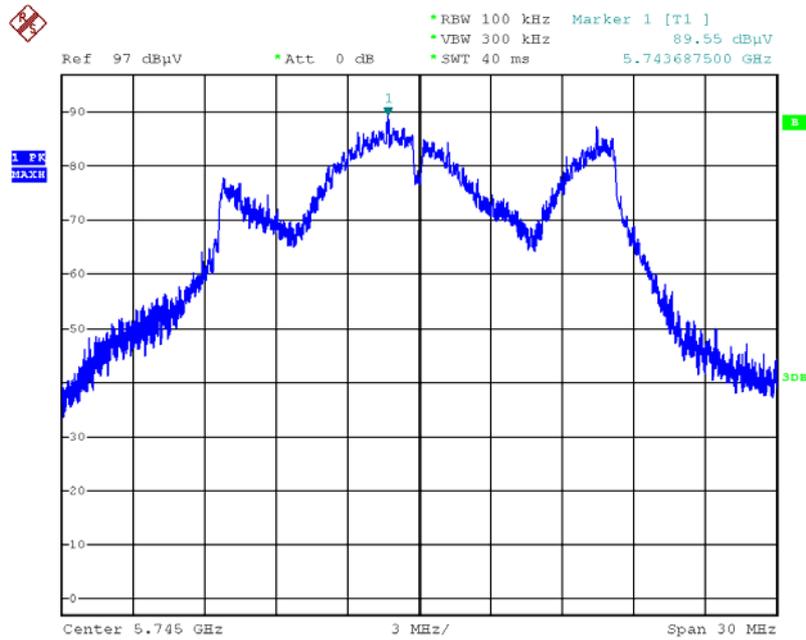
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Plot on Configuration IEEE 802.11g / CH 11 / 2500MHz~26500MHz (down 30dBc)



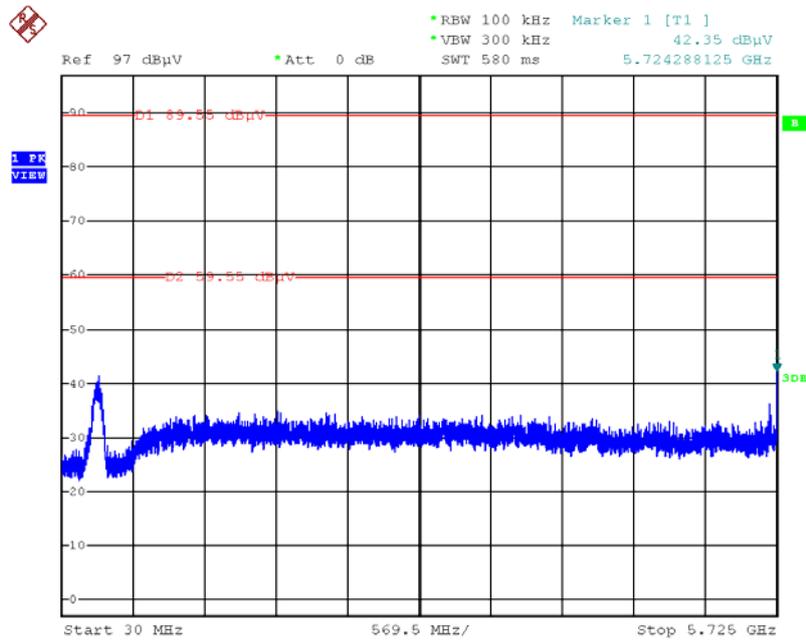
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Plot on Configuration IEEE 802.11a / Reference Level



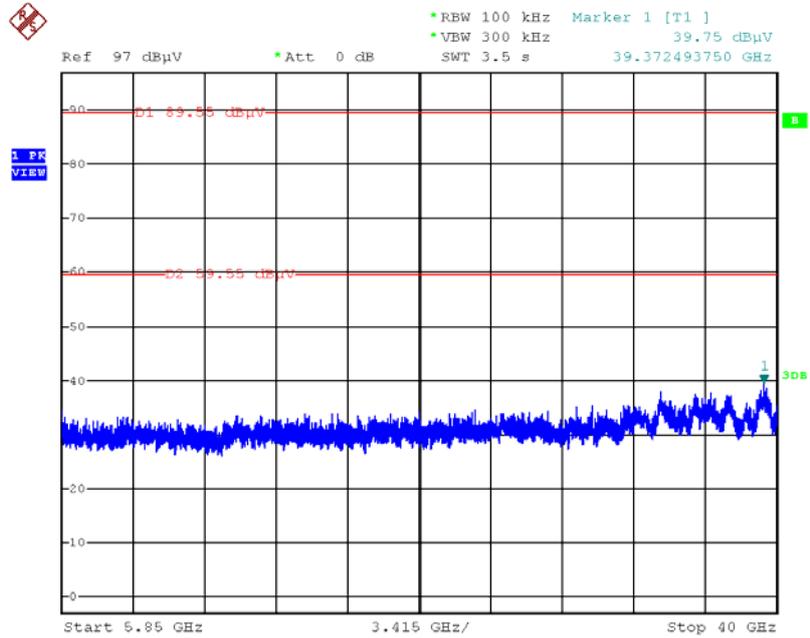
Date: 22.APR.2013 11:27:02

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



Date: 22.APR.2013 11:28:59

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



Date: 22.APR.2013 11:33:43

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	100377	9kHz ~ 2.75GHz	Oct. 23, 2012	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9kHz ~ 30MHz	Jun. 22, 2012	Conduction (CO01-CB)
Impulsbegrenzer Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz~30MHz	Feb. 21, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 04, 2012	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	-	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Apr. 16, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Apr. 15, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz - 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz - 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Power Divider	Woken	4 Way	0120A04056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)

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

“*” Calibration Interval of instruments listed above is two years.

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

6. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : 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