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FCC RADIO TEST REPORT

Applicant's company	**ZTE Corporation**
Applicant Address	ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen, Guangdong, 518057 China
FCC ID	**Q78-ZXWLW822E**
Manufacturer's company	**ZTE Corporation**
Manufacturer Address	ZTE Plaza, Hi-tech Park, Nanshan District, Shenzhen, Guangdong, 518057 China

Product Name	Indoor Wireless AP
Brand Name	ZTE
Model No.	ZXWL W822Ei
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Aug. 07, 2013
Final Test Date	Feb. 24, 2014
Submission Type	Class II Change

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g part and IEEE 802.11a (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 v03r01** and **KDB 662911 D01 v02r01**.

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

TAF
Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR380712-01AA	Rev. 01	Initial issue of report	Feb. 27, 2014

Certificate No.: CB10302132

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Indoor Wireless AP
Brand Name	:	ZTE
Model No.	:	ZXWL W822Ei
Applicant	:	ZTE Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Aug. 07, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.247(b)(3)	Maximum Conducted Output Power	Complies	3.73 dB
4.2	15.247(e)	Power Spectral Density	Complies	5.64 dB
4.3	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.4	15.247(d)	Radiated Emissions	Complies	0.16 dB
4.5	15.247(d)	Band Edge Emissions	Complies	1.90 dB
4.6	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter or PoE
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
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
Channel Band Width (99%)	For 5GHz Band: MCS0 (HT20): 17.84 MHz ; MCS0 (HT40): 36.48 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 22.97 dBm ; MCS0 (40MHz): 19.99 dBm For 5GHz Band: MCS0 (HT20): 25.70 dBm ; MCS0 (HT40): 26.27 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a/b/g

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter or PoE
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11a: 16.32 MHz
Maximum Conducted Output Power	11b: 25.94 dBm ; 11g: 23.12 dBm ; 11a: 25.64 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☐ With beamforming	☒ Without beamforming

Antenna and Band width

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

IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	3	MCS 0-23
802.11n (HT40)	3	MCS 0-23
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n		

3.2. Accessories

Power	Brand	Model No.	Rating
Adapter	MOSO	MSP-C2000IC12.0-24W-US	Input: 100-240Vac, 50/60Hz, 0.8A max. Output: 12.0Vdc, 2A
Other			
Wall-mounted pedestal*1			

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	Airgain	M2450DL6	PIFA Antenna	I-PEX	4.9	5.0

Note: The EUT has six internal antennas.

<For 2.4GHz Band:>

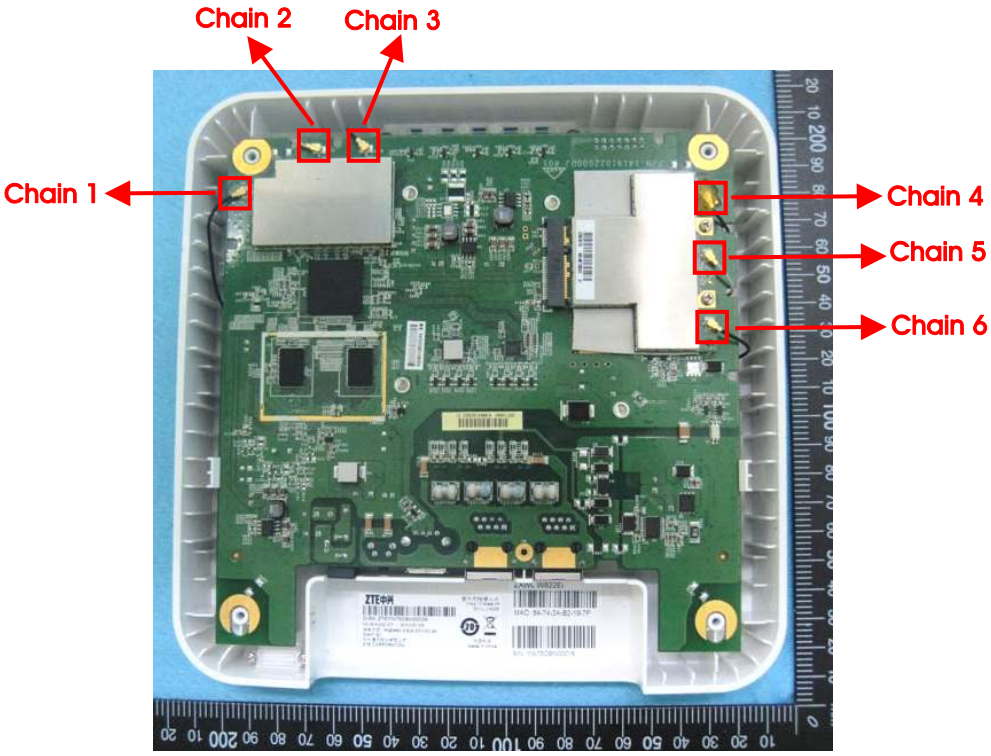
For IEEE 802.11b/g/n mode (3TX/3RX):

Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.

<For 5GHz Band:>

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

Chain 4, Chain 5 and Chain 6 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

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

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

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

For 5GHz Band:

There are two bandwidth systems.

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

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

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

3.5. Table for Test Modes

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

For 2.4GHz Band

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

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Chain
Maximum Conducted Output Power	11n HT20	MCS0	149/157/165	4+5+6
	11n HT40	MCS0	151/159	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4+5+6
Power Spectral Density	11n HT20	MCS0	149/157/165	4+5+6
	11n HT40	MCS0	151/159	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4+5+6
6dB Spectrum Bandwidth	11n HT20	MCS0	149/157/165	4+5+6
	11n HT40	MCS0	151/159	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4+5+6
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	11n HT20	MCS0	149/157/165	4+5+6
	11n HT40	MCS0	151/159	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4+5+6
Band Edge Emissions	11n HT20	MCS0	149/157/165	4+5+6
	11n HT40	MCS0	151/159	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4+5+6

The following test modes were performed for all tests:

For Radiated Emission below 1GHz test:

Mode 1. Stand of EUT + Adapter

Mode 2. Laying of EUT + Adapter

Mode 1 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.

Mode 3. Stand of EUT + PoE

Mode 1 and Mode 3 are worst test result among Mode 1~Mode 3, and the test result of those two modes are selected to record in the test report.

For Radiated Emission above 1GHz test:

The EUT for Radiated Emission above 1GHz test was performed at X axis, Y axis and Z axis and the worst-case was found at Y axis. So the measurement will follow this same test configuration.

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

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

3.6. Table for Testing Locations

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

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR380712AA.

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. It adds six internal antennas for this device. 2. Change the model number to "ZXWL W822Ei" from "ZXWL W822E".	1. Maximum Conducted Output Power. 2. Power Spectral Density, and it is verified for 5GHz Band 4 only. 3. 6dB Spectrum Bandwidth, and it is verified for 5GHz Band 4 only. 4. Radiated Emissions. 5. Band Edges Emissions. 6. Out of Band Emissions. 7. Co-location Maximum Permissible Exposure. 8. Radiated Emission Co-location.

3.8. Table for Supporting Units

For Radiated Emissions below 1GHz test:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	E2K4965AGNM
Notebook	DELL	M1340	E2K4965AGNM
Notebook	DELL	E6430	DoC
Notebook	DELL	D420	E2KWM3945ABG
PoE	PowerDsine	PD-6561G300	NA

For Others test:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC

3.9. Table for Parameters of Test Software Setting

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

For 2.4GHz Band

Power Parameters of IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 + Chain 3

Test Software Version	ART2-GUI		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	13	16	12

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 + Chain 3

Test Software Version	ART2-GUI		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	10.5	13.5	10.5

Power Parameters of IEEE 802.11b/g / Chain 1 + Chain 2 + Chain 3

Test Software Version	ART2-GUI		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	15.5	19.5	18
IEEE 802.11g	12.5	16	13

For 5GHz Band

Power Parameters of IEEE 802.11n MCS0 20MHz / Chain 4 + Chain 5 + Chain 6

Test Software Version	ART2-GUI		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	22.5	21	18

Power Parameters of IEEE 802.11n MCS0 40MHz / Chain 4 + Chain 5 + Chain 6

Test Software Version	ART2-GUI	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	23	20

Power Parameters of IEEE 802.11a / Chain 4 + Chain 5 + Chain 6

Test Software Version	ART2-GUI		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	22.5	21.5	19

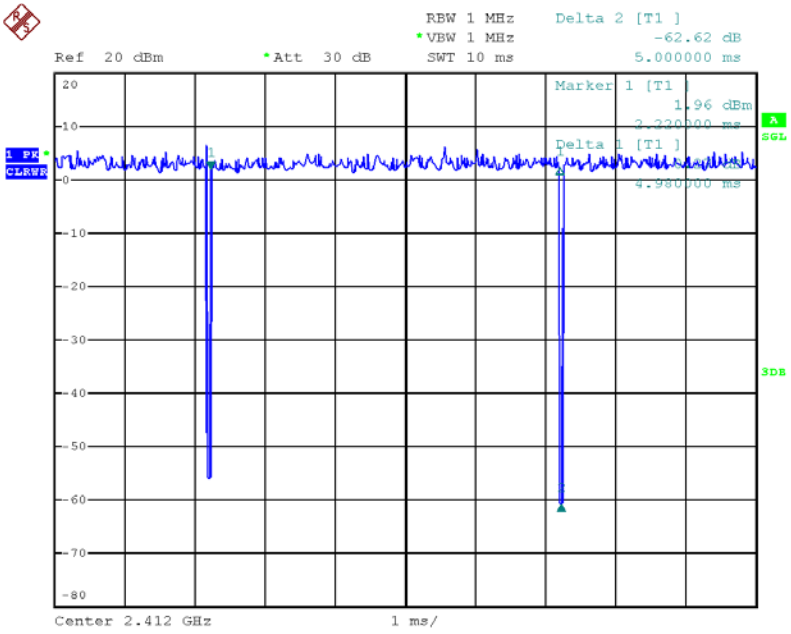
3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

For 2.4GHz Band:

IEEE 802.11n MCS0 20MHz



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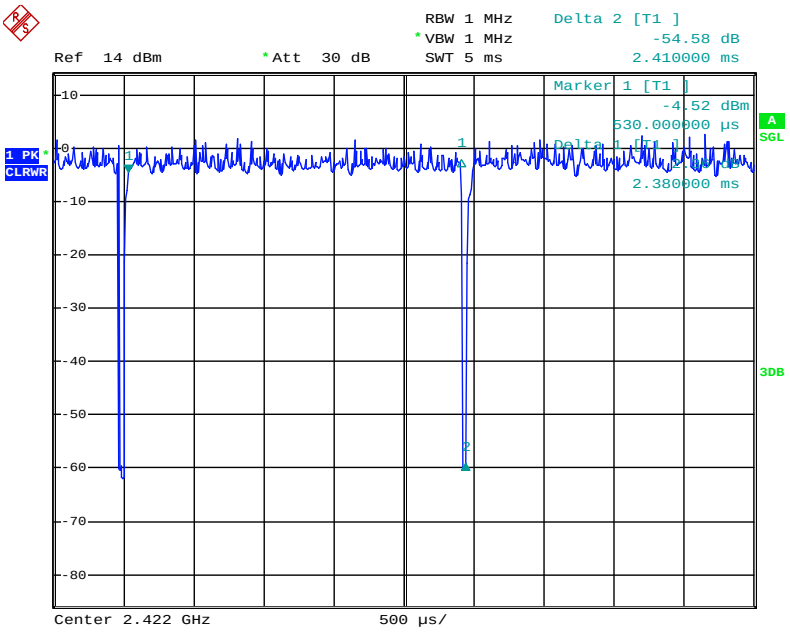
IEEE 802.11n MCS0 40MHz



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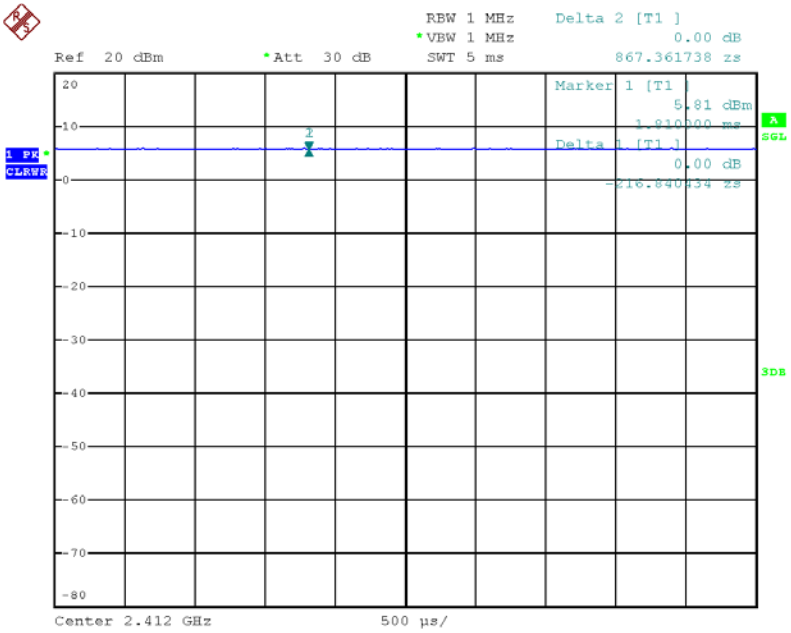
IEEE 802.11b



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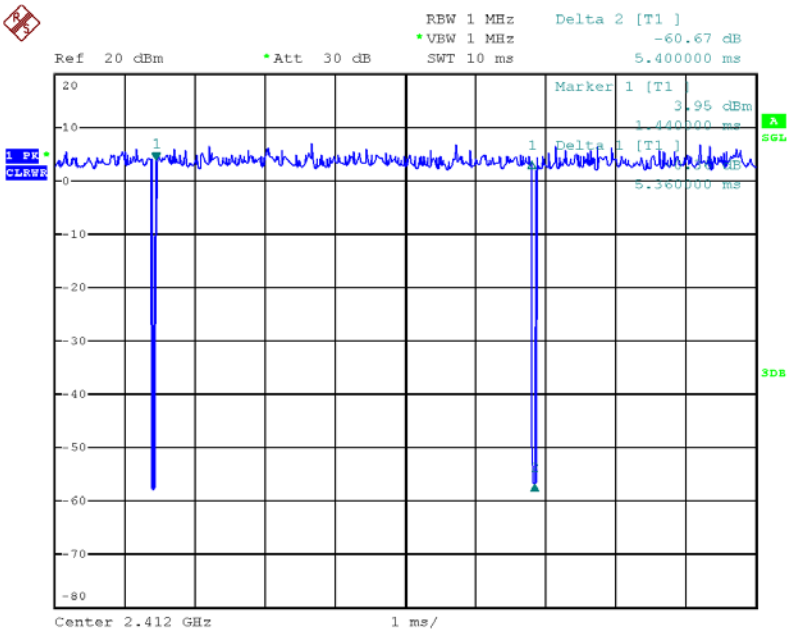
IEEE 802.11g



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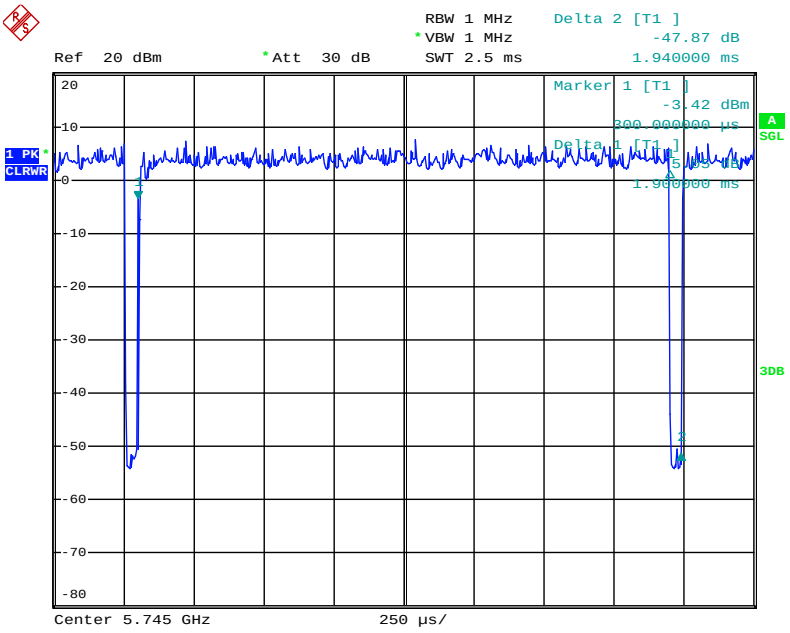
For 5GHz Band:

IEEE 802.11n MCS0 20MHz



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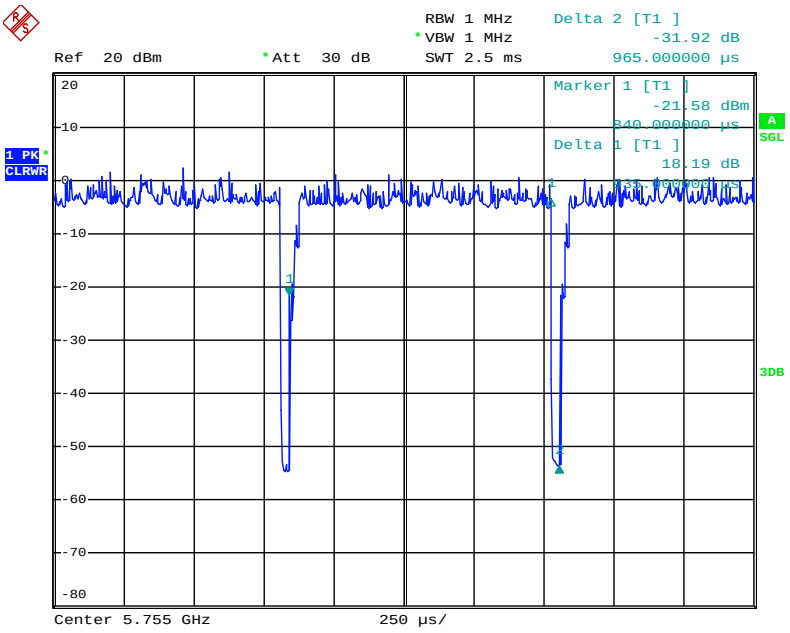
IEEE 802.11n MCS0 40MHz



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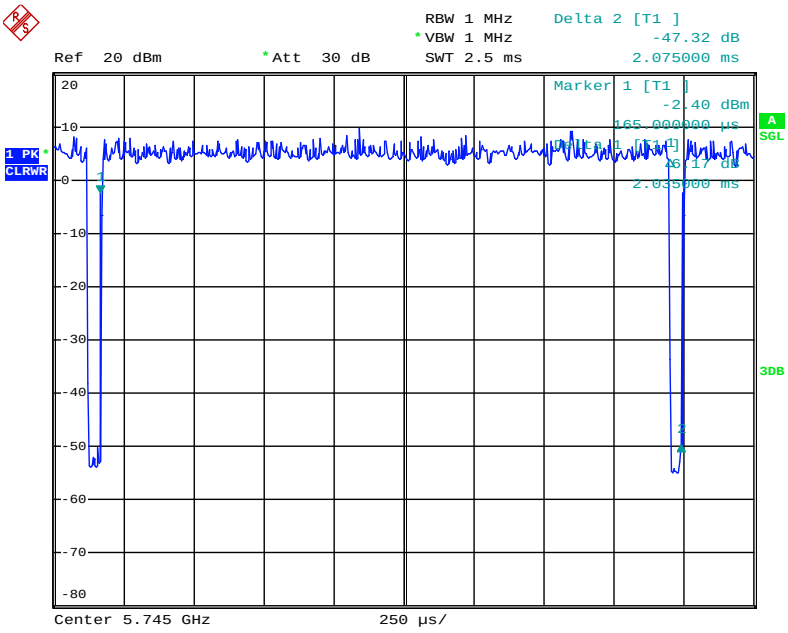
IEEE 802.11a

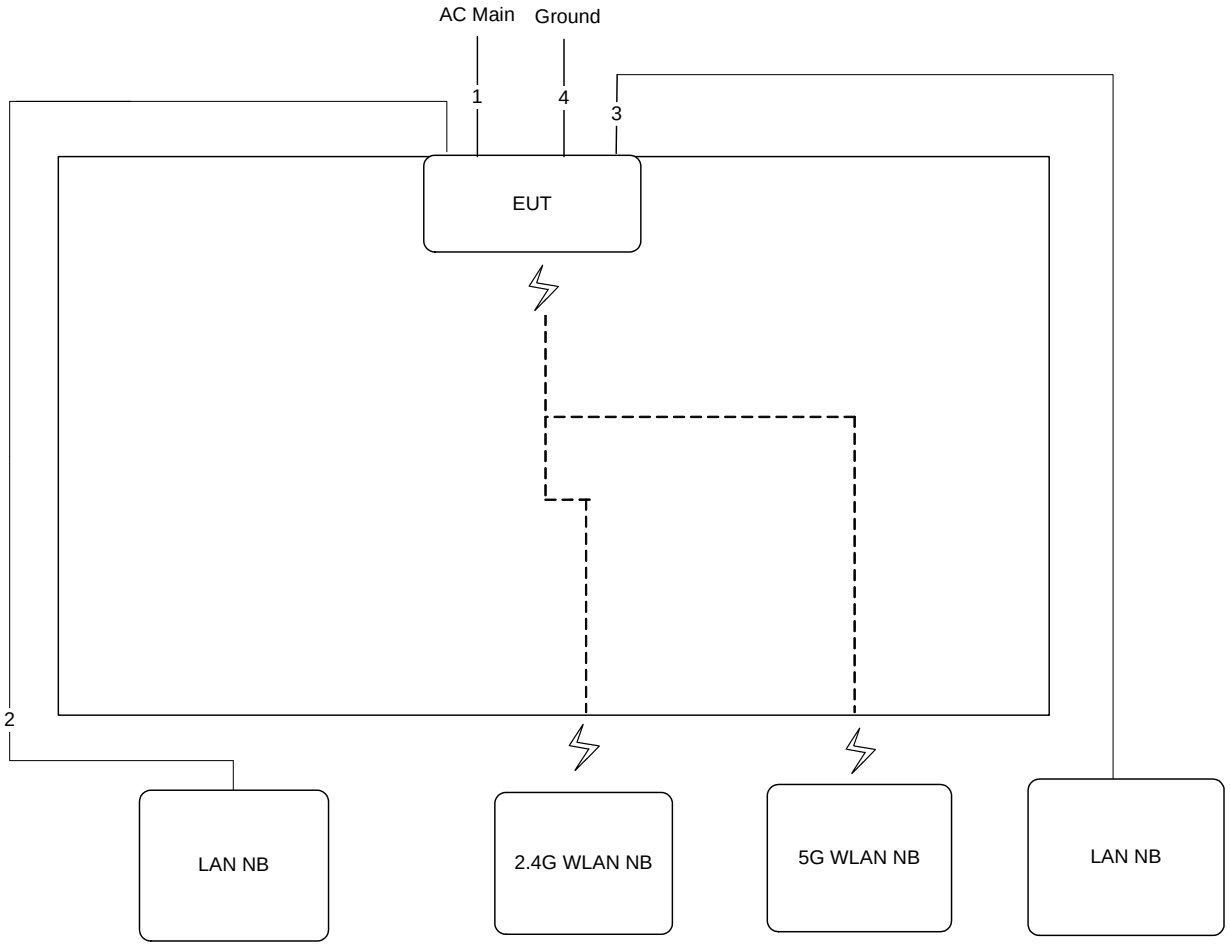


Date: 14.FEB.2014 21:44:33

3.12. Test Configurations

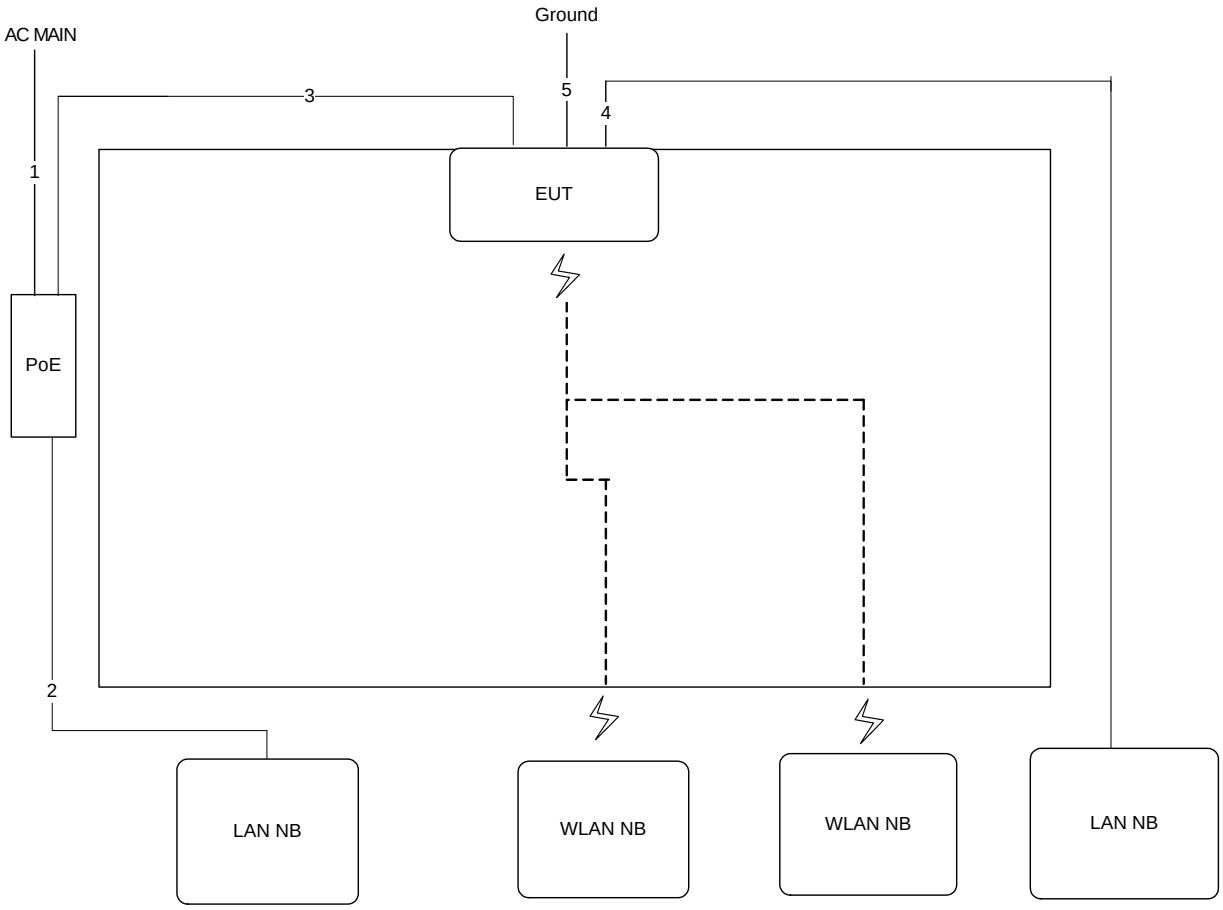
3.12.1. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz / Test Mode: Mode 1



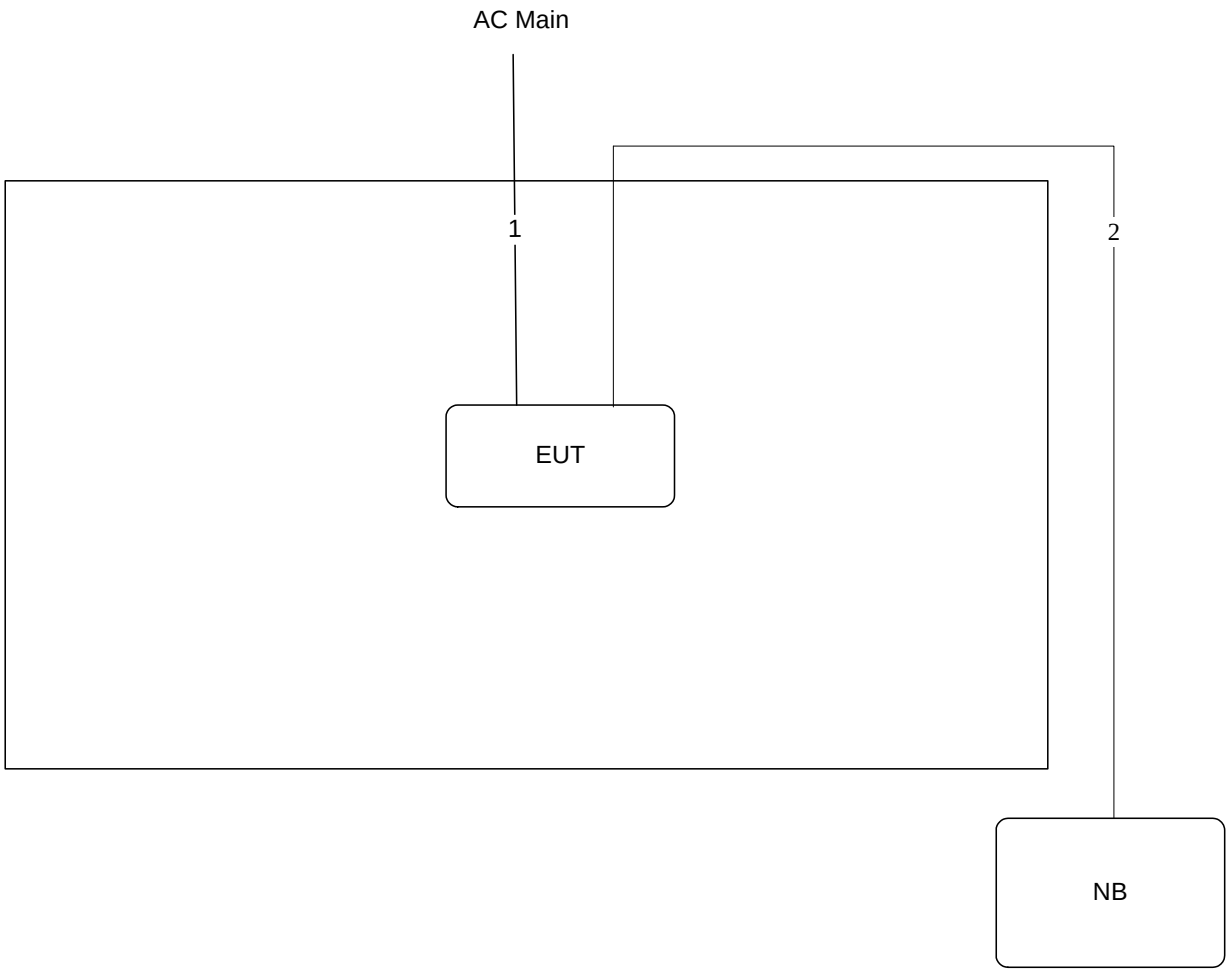
Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	Ground cable	No	1.5m

Test Mode: Mode 3



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m
4	RJ-45 cable	No	10m
5	Ground cable	No	1.5m

Test Configuration: above 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. 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.

4.1.2. Measuring Instruments and Setting

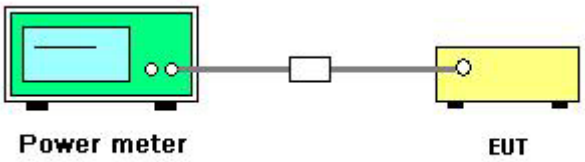
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Average

4.1.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r01 section 9.2.2 Measurement using a power meter (PM).
2. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of Maximum Conducted Output Power

Temperature	22°C	Humidity	58%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n
Test Date	Feb. 15, 2014		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	14.86	15.05	14.93	19.72	30.00	Complies
6	2437 MHz	18.15	18.23	18.21	22.97	30.00	Complies
11	2462 MHz	13.92	14.16	14.15	18.85	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
3	2422 MHz	12.72	12.81	12.76	17.53	30.00	Complies
6	2437 MHz	15.12	15.31	15.21	19.99	30.00	Complies
9	2452 MHz	12.11	12.53	12.46	17.14	30.00	Complies

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
149	5745 MHz	20.31	20.87	21.51	25.70	30.00	Complies
157	5785 MHz	19.81	20.13	20.55	24.95	30.00	Complies
165	5825 MHz	17.21	17.34	17.62	22.16	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
151	5755 MHz	21.15	21.14	22.13	26.27	30.00	Complies
159	5795 MHz	18.51	18.58	19.54	23.67	30.00	Complies

Temperature	22°C	Humidity	58%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a/b/g
Test Date	Feb. 15, 2014		

Configuration IEEE 802.11b

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	17.03	17.26	17.18	21.93	30.00	Complies
6	2437 MHz	21.09	21.25	21.15	25.94	30.00	Complies
11	2462 MHz	19.23	19.48	19.45	24.16	30.00	Complies

Configuration IEEE 802.11g

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	14.61	14.82	14.62	19.46	30.00	Complies
6	2437 MHz	18.21	18.59	18.23	23.12	30.00	Complies
11	2462 MHz	15.06	15.21	15.27	19.95	30.00	Complies

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
149	5745 MHz	20.34	20.57	21.58	25.64	30.00	Complies
157	5785 MHz	20.03	20.39	20.34	25.03	30.00	Complies
165	5825 MHz	18.39	18.56	18.62	23.30	30.00	Complies

4.2. Power Spectral Density Measurement

4.2.1. 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.

4.2.2. Measuring Instruments and Setting

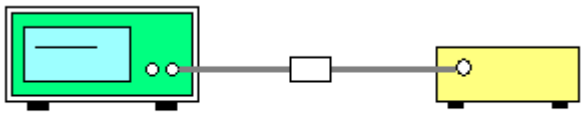
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r01 section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.2.4. 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 Power Spectral Density

Temperature	22°C	Humidity	58%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 4	Chain 5	Chain 6	Total		
149	5745 MHz	-4.87	-4.59	-2.14	1.09	8.00	Complies
157	5785 MHz	-4.82	-4.13	-2.21	1.20	8.00	Complies
165	5825 MHz	-6.79	-6.09	-5.96	-1.49	8.00	Complies

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 4	Chain 5	Chain 6	Total		
151	5755 MHz	-7.31	-5.02	-3.93	-0.43	8.00	Complies
159	5795 MHz	-8.07	-8.89	-7.00	-3.15	8.00	Complies

Temperature	22°C	Humidity	58%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

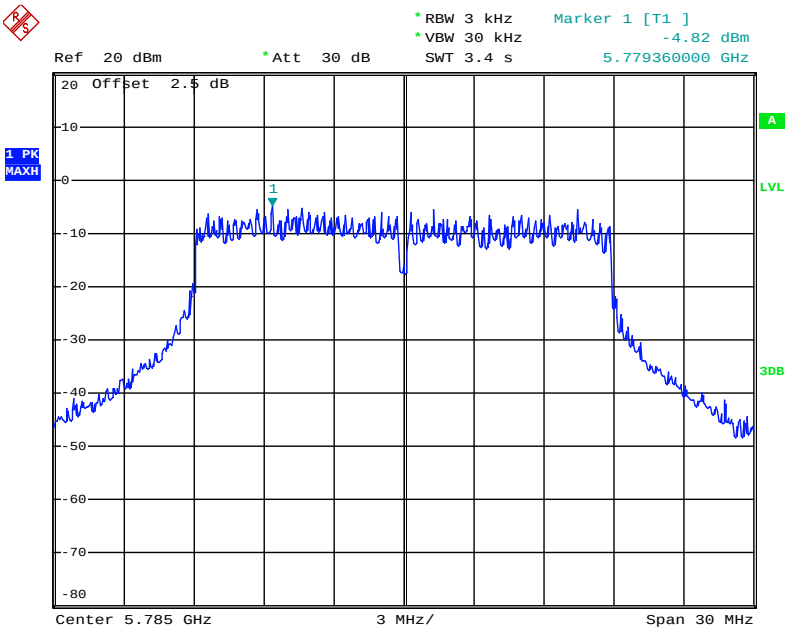
Configuration IEEE 802.11a

Channel	Frequency	Power Density (dBm/3kHz)				Power Density Limit (dBm/3kHz)	Result
		Chain 4	Chain 5	Chain 6	Total		
149	5745 MHz	-1.71	-3.13	-2.52	2.36	8.00	Complies
157	5785 MHz	-3.73	-3.71	-1.45	1.95	8.00	Complies
165	5825 MHz	-4.92	-6.14	-4.97	-0.54	8.00	Complies

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

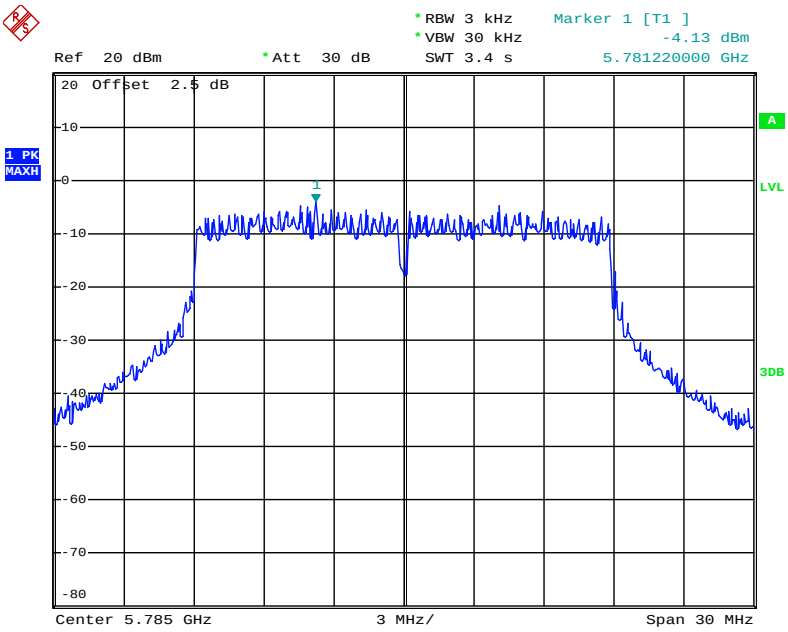
For plots, only the channel with worse result was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 5785 MHz / Chain 4



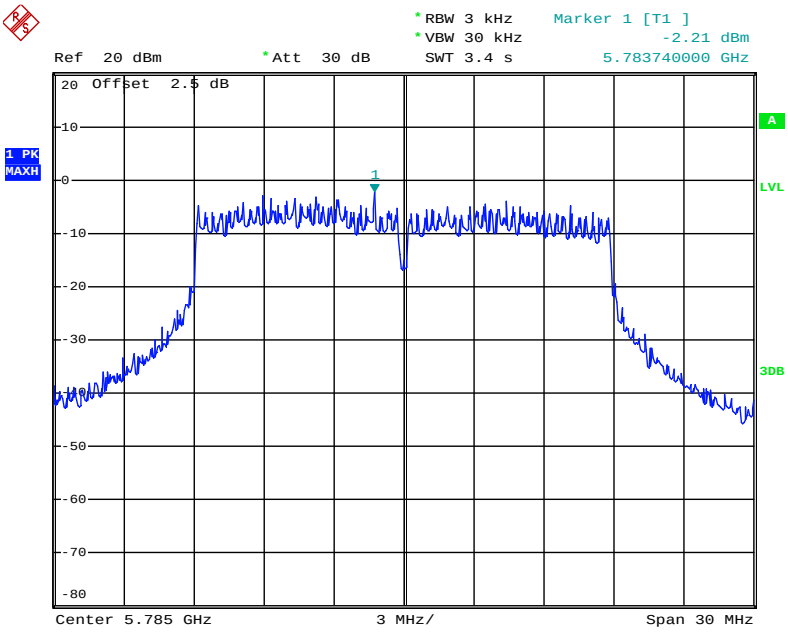
Date: 14.FEB.2014 22:06:36

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 5785 MHz / Chain 5



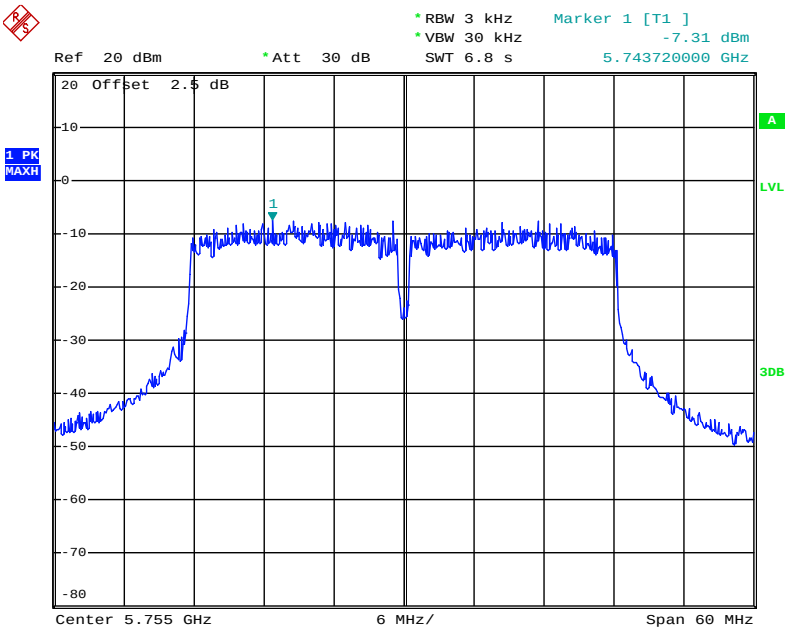
Date: 14.FEB.2014 22:07:36

Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / 5785 MHz / Chain 6



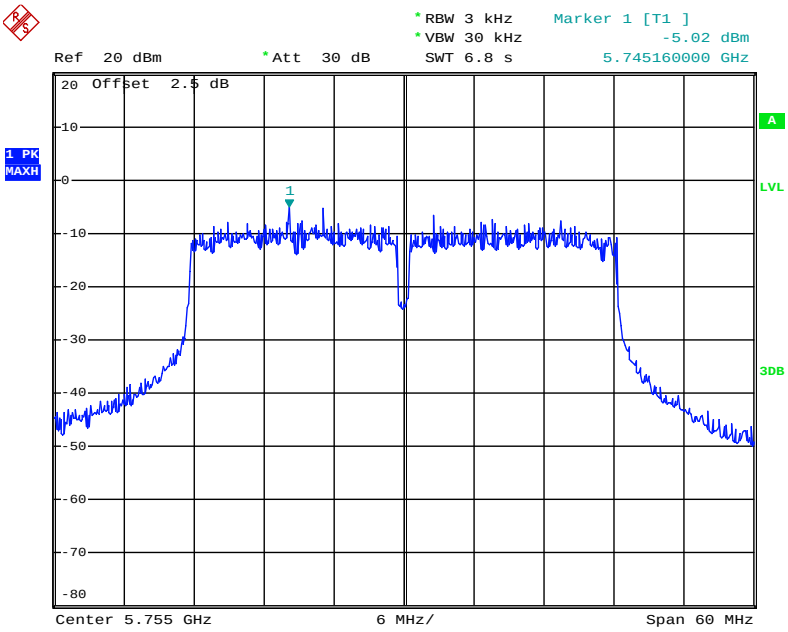
Date: 14.FEB.2014 22:08:18

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 5755 MHz / Chain 4



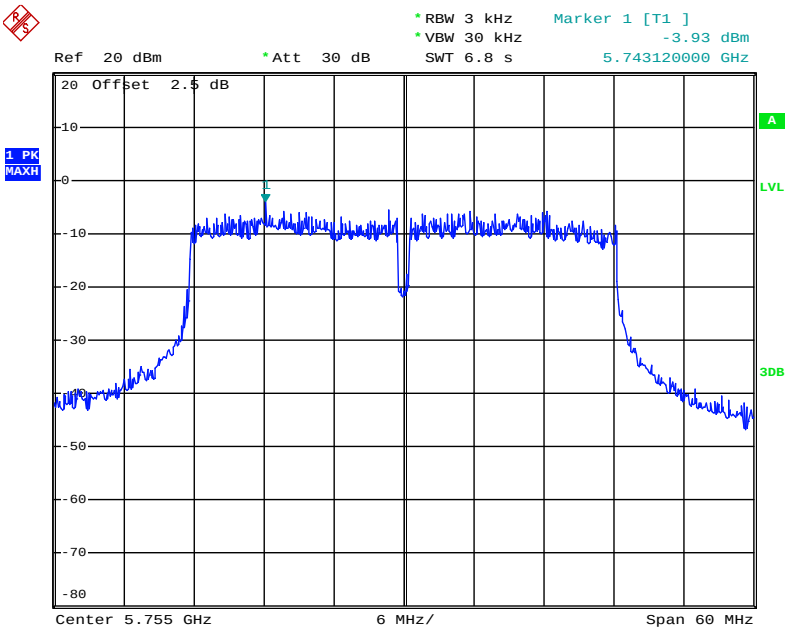
Date: 14.FEB.2014 22:11:44

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 5755 MHz / Chain 5



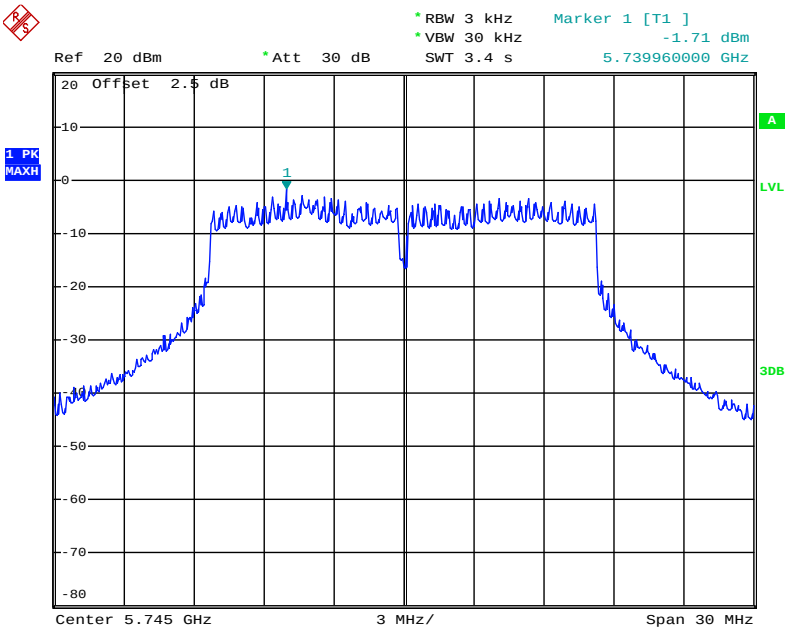
Date: 14.FEB.2014 22:12:41

Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / 5755 MHz / Chain 6



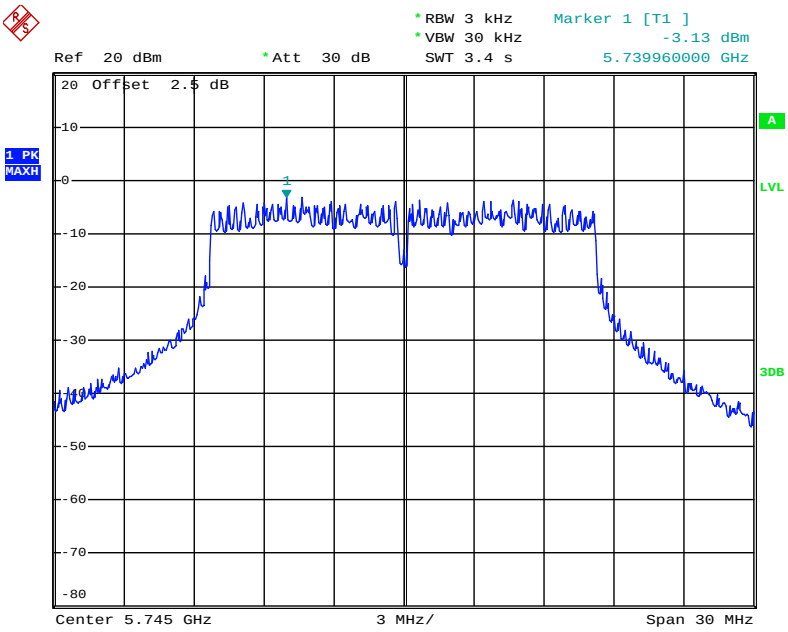
Date: 14.FEB.2014 22:15:02

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



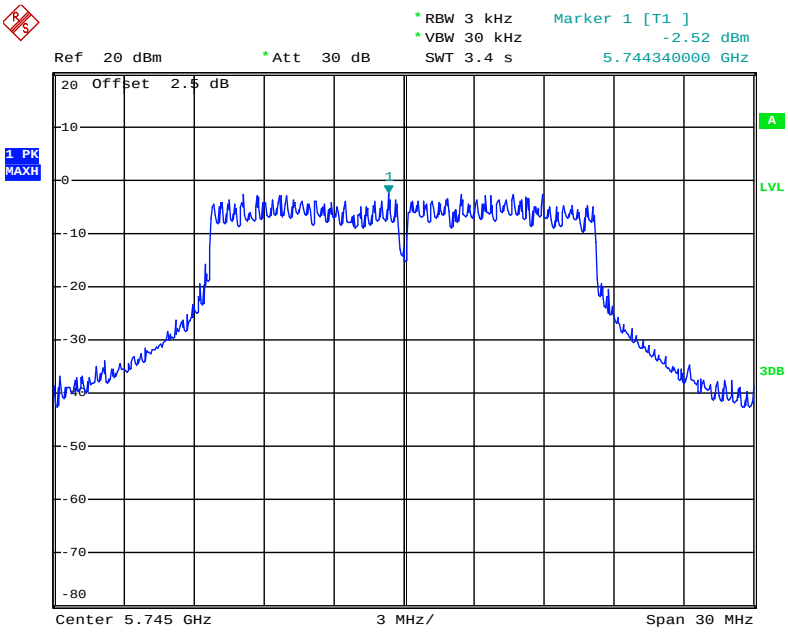
Date: 14.FEB.2014 21:53:42

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 5



Date: 14.FEB.2014 21:55:28

Power Density Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 6



Date: 14.FEB.2014 21:56:47

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB 558074 D01 v03r01 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 8.0 DTS 6-dB signal bandwidth option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

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 6dB Spectrum Bandwidth

Temperature	22°C	Humidity	58%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n

Configuration IEEE 802.11n MCS0 HT20 / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	14.48	17.28	500	Complies
157	5785 MHz	16.24	17.84	500	Complies
165	5825 MHz	16.00	17.60	500	Complies

Configuration IEEE 802.11n MCS0 HT40 / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	34.56	36.48	500	Complies
159	5795 MHz	33.28	36.48	500	Complies

Temperature	22°C	Humidity	58%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

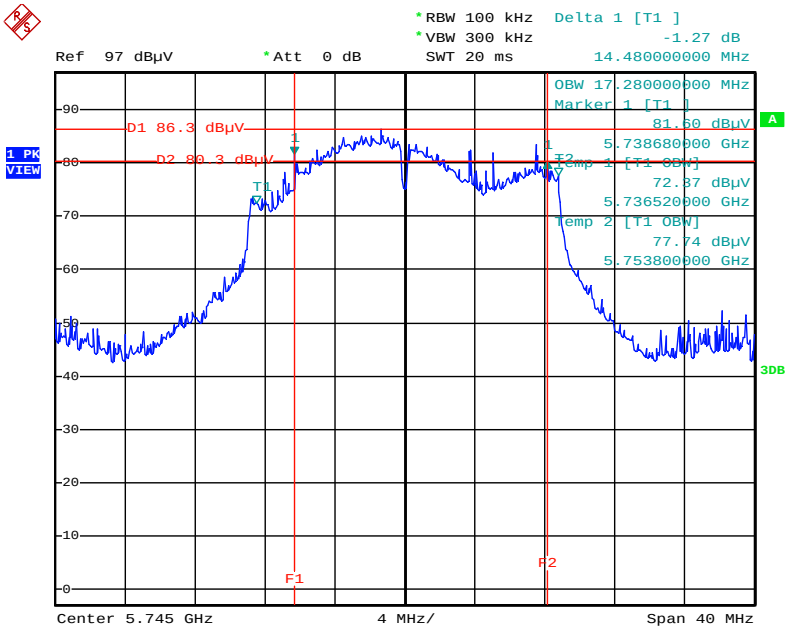
Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	13.20	16.24	500	Complies
157	5785 MHz	13.52	16.24	500	Complies
165	5825 MHz	13.28	16.32	500	Complies

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

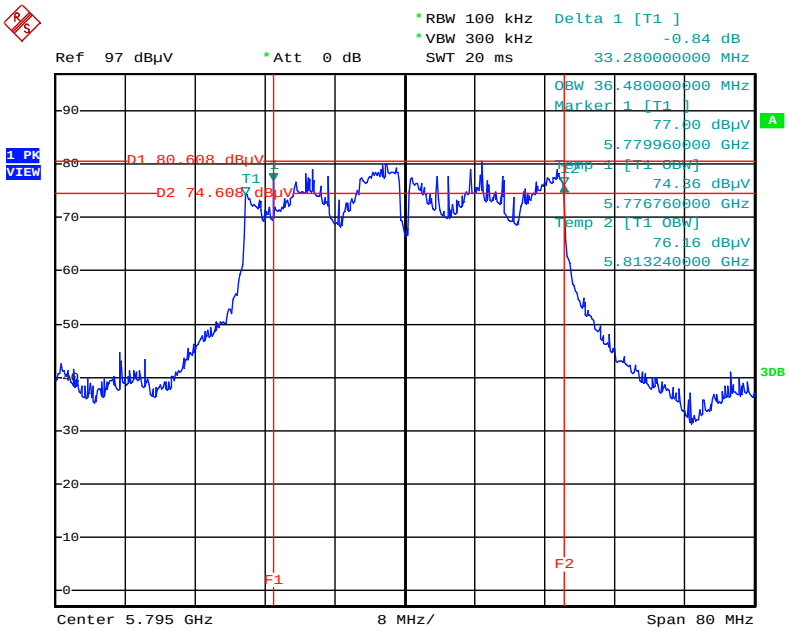
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / 5745 MHz / Chain 4 + Chain 5 + Chain 6



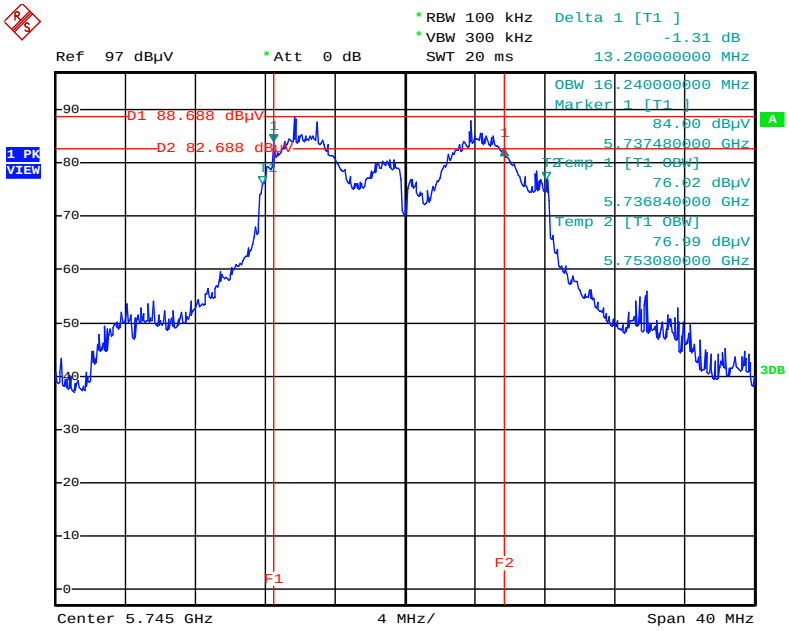
Date: 14.FEB.2014 22:23:42

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / 5795MHz / Chain 4 + Chain 5 + Chain 6



Date: 14.FEB.2014 22:21:47

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5745 MHz / Chain 4 + Chain 5 + Chain 6



Date: 14.FEB.2014 22:28:55

4.4. Radiated Emissions Measurement

4.4.1. 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

4.4.2. Measuring Instruments and Setting

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

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

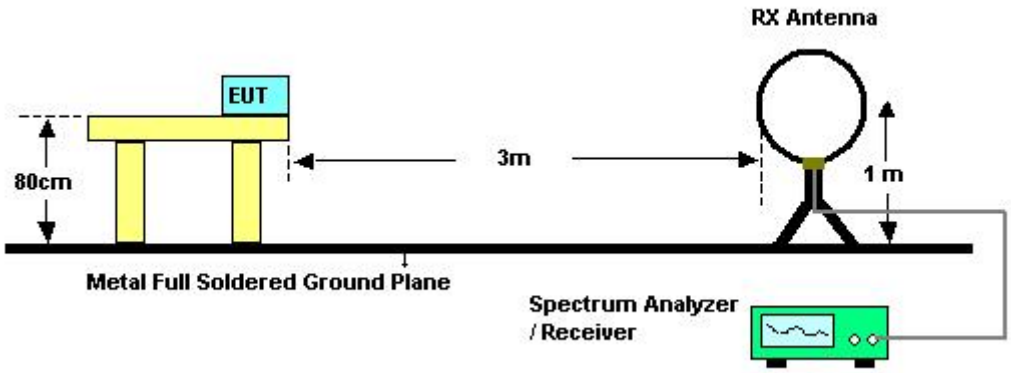
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

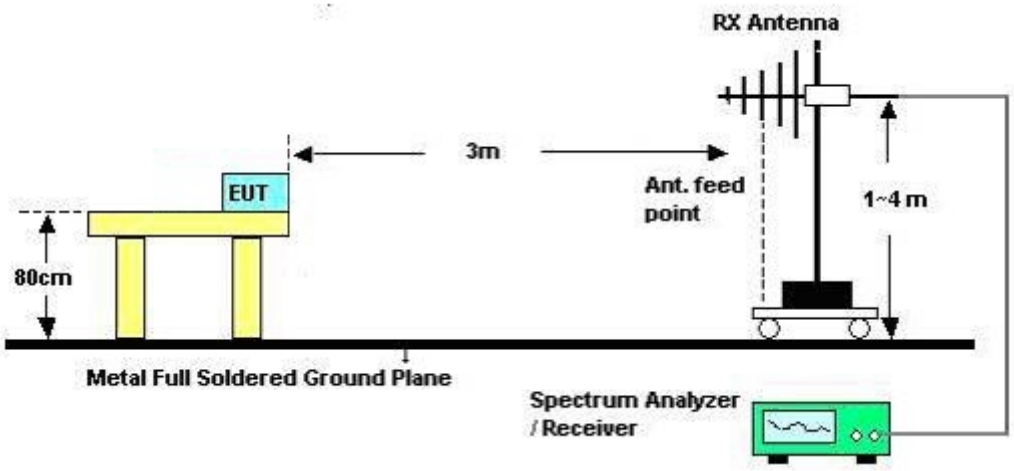
5. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
6. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
7. 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.
8. 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.
9. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.

4.4.4. Test Setup Layout

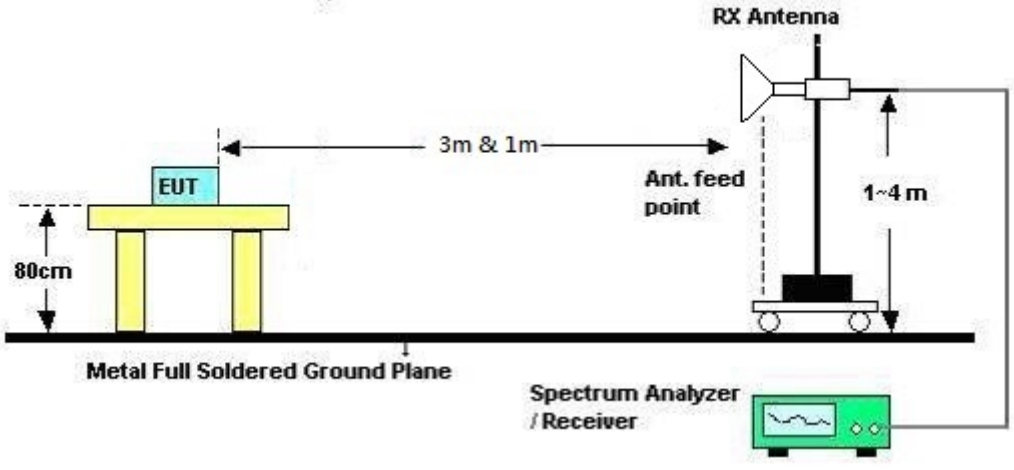
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Date	Feb. 14, 2014	Test Mode	Mode 1

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

Note:

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

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

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

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Date	Feb. 24, 2014	Test Mode	Mode 3

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

Note:

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

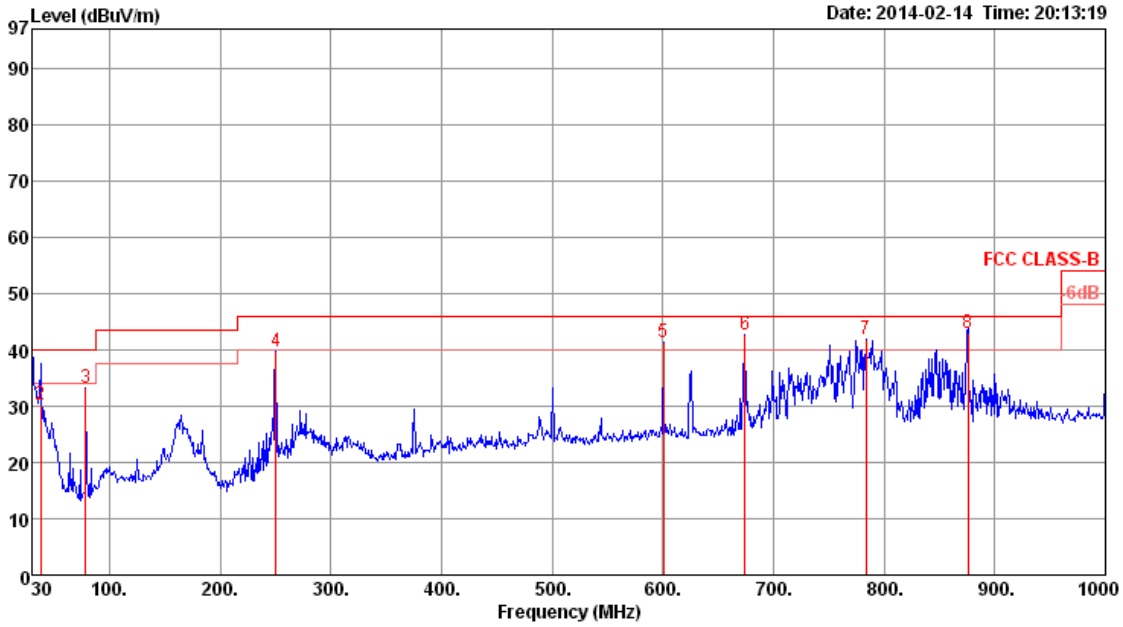
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

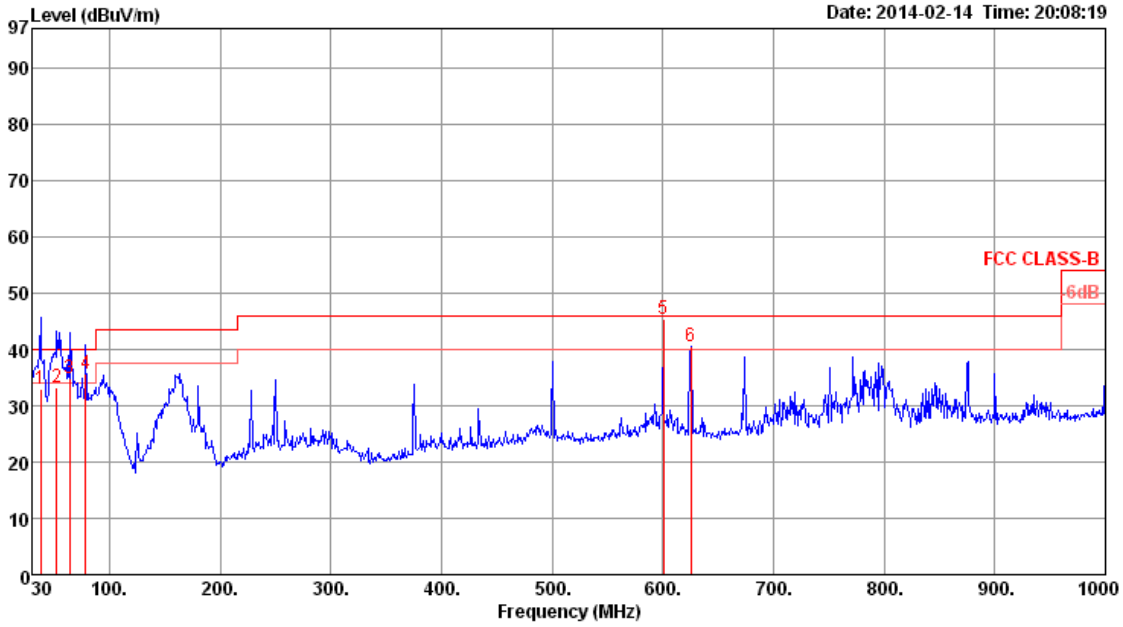
Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	30.00	32.80	40.00	-7.20	41.23	0.61	18.76	27.80	QP	100	312	HORIZONTAL
2	37.76	30.29	40.00	-9.71	43.11	0.68	14.30	27.80	QP	133	0	HORIZONTAL
3	78.50	33.13	40.00	-6.87	52.79	0.96	7.07	27.69	Peak	100	0	HORIZONTAL
4	250.19	39.60	46.00	-6.40	52.05	1.78	12.77	27.00	Peak	100	0	HORIZONTAL
5	600.36	41.26	46.00	-4.74	47.78	2.81	18.77	28.10	Peak	100	0	HORIZONTAL
6	674.08	42.58	46.00	-3.42	48.56	3.04	19.01	28.03	Peak	100	0	HORIZONTAL
7	783.69	41.81	46.00	-4.19	46.61	3.21	19.66	27.67	Peak	100	0	HORIZONTAL
8	875.84	42.97	46.00	-3.03	46.61	3.46	20.35	27.45	QP	100	154	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	37.76	32.87	40.00	-7.13	45.69	0.68	14.30	27.80	QP	100	173	VERTICAL
2	52.31	33.33	40.00	-6.67	52.08	0.86	8.18	27.79	QP	100	136	VERTICAL
3	63.95	34.89	40.00	-5.11	54.98	0.93	6.72	27.74	QP	100	196	VERTICAL
4	78.50	35.74	40.00	-4.26	55.40	0.96	7.07	27.69	QP	100	179	VERTICAL
5	600.36	45.40	46.00	-0.60	51.92	2.81	18.77	28.10	QP	100	170	VERTICAL
6	625.58	40.44	46.00	-5.56	46.76	2.90	18.85	28.07	Peak	400	0	VERTICAL

Note:

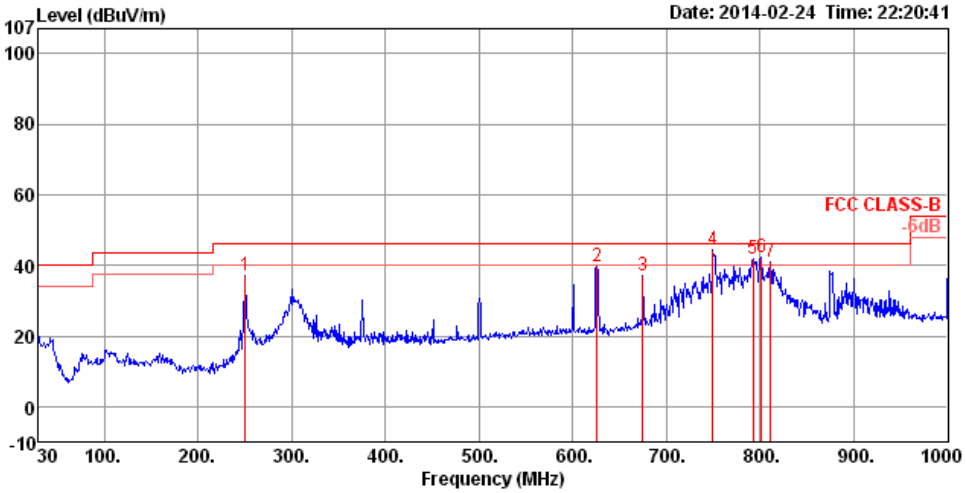
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

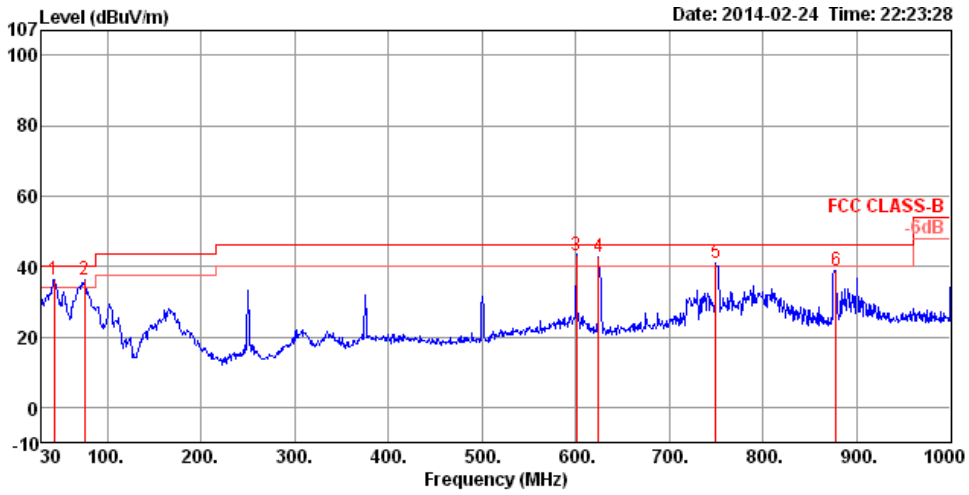
Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Mode	Mode 3		

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	250.19	36.91	46.00	-9.09	54.59	1.90	11.91	31.49	125	248	HORIZONTAL	Peak
2	625.58	39.57	46.00	-6.43	49.17	3.19	18.62	31.41	150	266	HORIZONTAL	Peak
3	675.05	36.92	46.00	-9.08	46.17	3.33	18.78	31.36	125	209	HORIZONTAL	Peak
4	749.74	44.54	46.00	-1.46	52.69	3.53	19.69	31.37	132	359	HORIZONTAL	QP
5	792.42	41.64	46.00	-4.36	49.55	3.65	19.74	31.30	125	360	HORIZONTAL	Peak
6	801.15	42.06	46.00	-3.94	49.86	3.67	19.80	31.27	150	357	HORIZONTAL	Peak
7	810.85	41.07	46.00	-4.93	48.44	3.69	20.17	31.23	125	6	HORIZONTAL	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	43.58	36.28	40.00	-3.72	57.09	0.78	10.25	31.84	100	239	VERTICAL	Peak
2	75.59	36.34	40.00	-3.66	60.89	1.02	6.11	31.68	125	246	VERTICAL	Peak
3	600.36	42.93	46.00	-3.07	52.60	3.12	18.45	31.24	100	352	VERTICAL	QP
4	624.61	42.51	46.00	-3.49	52.12	3.18	18.61	31.40	100	84	VERTICAL	Peak
5	749.74	40.98	46.00	-5.02	49.13	3.53	19.69	31.37	100	288	VERTICAL	Peak
6	877.78	38.84	46.00	-7.16	45.81	3.91	20.26	31.14	150	32	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.

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

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4823.33	35.47	54.00	-18.53	33.39	4.21	34.69	2.08	Average	163	124	HORIZONTAL
2	4833.04	49.21	74.00	-24.79	47.13	4.21	34.69	2.08	Peak	163	124	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4814.96	36.20	54.00	-17.80	34.17	4.20	34.69	2.03	Average	216	126	VERTICAL
2	4815.22	51.10	74.00	-22.90	49.07	4.20	34.69	2.03	Peak	216	126	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4873.36	35.39	54.00	-18.61	33.18	4.22	34.67	2.21	Average	199	114	HORIZONTAL
2	4873.55	48.57	74.00	-25.43	46.36	4.22	34.67	2.21	Peak	199	114	HORIZONTAL
3	7312.09	36.05	54.00	-17.95	28.68	5.34	34.94	7.37	Average	240	114	HORIZONTAL
4	7312.92	48.91	74.00	-25.09	41.54	5.34	34.94	7.37	Peak	240	114	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4867.85	37.60	54.00	-16.40	35.39	4.22	34.67	2.21	Average	211	100	VERTICAL
2	4873.87	48.84	74.00	-25.16	46.63	4.22	34.67	2.21	Peak	211	100	VERTICAL
3	7313.63	36.80	54.00	-17.20	29.43	5.34	34.94	7.37	Average	158	114	VERTICAL
4	7326.83	49.45	74.00	-24.55	42.05	5.35	34.94	7.40	Peak	158	114	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.55	30.62	54.00	-23.38	28.28	4.23	34.65	2.34	Average	237	120	HORIZONTAL
2	4929.55	43.81	74.00	-30.19	41.47	4.23	34.65	2.34	Peak	237	120	HORIZONTAL
3	7389.27	35.86	54.00	-18.14	28.38	5.36	34.96	7.48	Average	181	100	HORIZONTAL
4	7391.58	48.70	74.00	-25.30	41.22	5.36	34.96	7.48	Peak	181	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4922.40	30.80	54.00	-23.20	28.46	4.23	34.65	2.34	Average	223	100	VERTICAL
2	4928.78	43.79	74.00	-30.21	41.45	4.23	34.65	2.34	Peak	223	100	VERTICAL
3	7377.76	35.88	54.00	-18.12	28.42	5.36	34.96	7.46	Average	165	100	VERTICAL
4	7384.46	48.52	74.00	-25.48	41.04	5.36	34.96	7.48	Peak	165	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT40 CH 3 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4836.95	29.79	54.00	-24.21	27.68	4.21	34.69	2.11	Average	213	100	HORIZONTAL
2	4848.14	42.43	74.00	-31.57	40.31	4.21	34.68	2.12	Peak	213	100	HORIZONTAL
3	7258.56	48.27	74.00	-25.73	40.95	5.33	34.92	7.32	Peak	128	100	HORIZONTAL
4	7262.19	35.26	54.00	-18.74	27.95	5.33	34.93	7.31	Average	128	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4835.70	29.74	54.00	-24.26	27.63	4.21	34.69	2.11	Average	195	100	VERTICAL
2	4843.52	42.77	74.00	-31.23	40.65	4.21	34.68	2.12	Peak	195	100	VERTICAL
3	7260.04	48.37	74.00	-25.63	41.05	5.33	34.92	7.32	Peak	89	100	VERTICAL
4	7270.84	35.40	54.00	-18.60	28.06	5.34	34.93	7.34	Average	89	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT40 CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4872.21	42.22	74.00	-31.78	40.01	4.22	34.67	2.21	Peak	245	100	HORIZONTAL
2	4872.33	30.40	54.00	-23.60	28.19	4.22	34.67	2.21	Average	245	100	HORIZONTAL
3	7304.78	35.30	54.00	-18.70	27.92	5.34	34.93	7.38	Average	133	100	HORIZONTAL
4	7306.10	48.26	74.00	-25.74	40.88	5.34	34.93	7.38	Peak	133	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4867.05	30.70	54.00	-23.30	28.54	4.21	34.67	2.16	Average	228	100	VERTICAL
2	4869.42	42.53	74.00	-31.47	40.32	4.22	34.67	2.21	Peak	228	100	VERTICAL
3	7301.99	48.29	74.00	-25.71	40.91	5.34	34.93	7.38	Peak	169	100	VERTICAL
4	7306.51	35.48	54.00	-18.52	28.10	5.34	34.93	7.38	Average	169	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT40 CH 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4908.39	42.85	74.00	-31.15	40.56	4.22	34.66	2.29	Peak	214	100	HORIZONTAL
2	4913.26	30.06	54.00	-23.94	27.77	4.22	34.66	2.29	Average	214	100	HORIZONTAL
3	7346.48	49.16	74.00	-24.84	41.75	5.35	34.95	7.41	Peak	150	100	HORIZONTAL
4	7361.39	35.85	54.00	-18.15	28.42	5.35	34.95	7.43	Average	150	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4910.22	43.09	74.00	-30.91	40.80	4.22	34.66	2.29	Peak	211	100	VERTICAL
2	4911.21	30.34	54.00	-23.66	28.05	4.22	34.66	2.29	Average	211	100	VERTICAL
3	7360.26	48.74	74.00	-25.26	41.31	5.35	34.95	7.43	Peak	120	100	VERTICAL
4	7364.59	35.86	54.00	-18.14	28.44	5.35	34.96	7.42	Average	120	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 149 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 10, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5440.02	53.76	54.00	-0.24	50.26	4.53	34.62	3.50	Average	207	159	HORIZONTAL
2	5440.04	64.11	74.00	-9.89	60.61	4.53	34.62	3.50	Peak	207	159	HORIZONTAL
3	11488.60	50.92	54.00	-3.08	40.50	6.74	34.82	10.42	Average	234	100	HORIZONTAL
4	11489.64	65.12	74.00	-8.88	54.70	6.74	34.82	10.42	Peak	234	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.98	50.80	54.00	-3.20	47.30	4.53	34.62	3.50	Average	212	100	VERTICAL
2	5440.26	62.35	74.00	-11.65	58.85	4.53	34.62	3.50	Peak	212	100	VERTICAL
3	11492.12	49.39	54.00	-4.61	38.97	6.74	34.82	10.42	Average	187	100	VERTICAL
4	11492.20	62.99	74.00	-11.01	52.57	6.74	34.82	10.42	Peak	187	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 157 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 10, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.91	64.27	74.00	-9.73	60.77	4.53	34.62	3.50	Peak	216	114	HORIZONTAL
2	5439.97	53.70	54.00	-0.30	50.20	4.53	34.62	3.50	Average	216	114	HORIZONTAL
3	11567.48	63.06	74.00	-10.94	52.63	6.77	34.84	10.43	Peak	235	121	HORIZONTAL
4	11568.00	50.25	54.00	-3.75	39.82	6.77	34.84	10.43	Average	235	121	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5440.01	50.64	54.00	-3.36	47.14	4.53	34.62	3.50	Average	212	100	VERTICAL
2	5440.08	62.36	74.00	-11.64	58.86	4.53	34.62	3.50	Peak	212	100	VERTICAL
3	11571.08	61.24	74.00	-12.76	50.82	6.77	34.85	10.42	Peak	176	100	VERTICAL
4	11571.56	48.53	54.00	-5.47	38.11	6.77	34.85	10.42	Average	176	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 165 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 10, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5440.00	53.84	54.00	-0.16	50.34	4.53	34.62	3.50	Average	214	104	HORIZONTAL
2	5440.02	65.57	74.00	-8.43	62.07	4.53	34.62	3.50	Peak	214	104	HORIZONTAL
3	11649.16	60.13	74.00	-13.87	49.70	6.80	34.87	10.43	Peak	242	125	HORIZONTAL
4	11649.72	47.32	54.00	-6.68	36.89	6.80	34.87	10.43	Average	242	125	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5440.05	49.08	54.00	-4.92	45.58	4.53	34.62	3.50	Average	213	100	VERTICAL
2	5440.21	59.39	74.00	-14.61	55.89	4.53	34.62	3.50	Peak	213	100	VERTICAL
3	11650.60	59.25	74.00	-14.75	48.82	6.80	34.87	10.43	Peak	171	117	VERTICAL
4	11651.60	45.82	54.00	-8.18	35.39	6.80	34.87	10.43	Average	171	117	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT40 CH 151 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 11, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.98	64.50	74.00	-9.50	61.00	4.53	34.62	3.50	Peak	210	165	HORIZONTAL
2	5440.03	53.75	54.00	-0.25	50.25	4.53	34.62	3.50	Average	210	165	HORIZONTAL
3	11507.68	62.13	74.00	-11.87	51.70	6.75	34.82	10.43	Peak	238	100	HORIZONTAL
4	11507.68	48.59	54.00	-5.41	38.16	6.75	34.82	10.43	Average	238	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.96	50.93	54.00	-3.07	47.43	4.53	34.62	3.50	Average	214	100	VERTICAL
2	5439.98	63.20	74.00	-10.80	59.70	4.53	34.62	3.50	Peak	214	100	VERTICAL
3	11513.04	47.88	54.00	-6.12	37.45	6.75	34.82	10.43	Average	181	100	VERTICAL
4	11514.08	60.45	74.00	-13.55	50.02	6.75	34.82	10.43	Peak	181	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT40 CH 159 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 11, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.98	65.01	74.00	-8.99	61.51	4.53	34.62	3.50	Peak	210	161	HORIZONTAL
2	5439.99	53.58	54.00	-0.42	50.08	4.53	34.62	3.50	Average	210	161	HORIZONTAL
3	11590.40	61.19	74.00	-12.81	50.76	6.78	34.85	10.43	Peak	242	150	HORIZONTAL
4	11592.16	47.25	54.00	-6.75	36.82	6.78	34.85	10.43	Average	242	150	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5440.02	50.59	54.00	-3.41	47.09	4.53	34.62	3.50	Average	212	100	VERTICAL
2	5440.10	62.07	74.00	-11.93	58.57	4.53	34.62	3.50	Peak	212	100	VERTICAL
3	11583.68	46.26	54.00	-7.74	35.83	6.78	34.85	10.43	Average	153	100	VERTICAL
4	11586.16	58.73	74.00	-15.27	48.30	6.78	34.85	10.43	Peak	153	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4823.95	54.60	74.00	-19.40	52.52	4.21	34.69	2.08	Peak	154	137	HORIZONTAL
2	4823.97	52.03	54.00	-1.97	49.95	4.21	34.69	2.08	Average	154	137	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4823.97	52.31	54.00	-1.69	50.23	4.21	34.69	2.08	Average	188	117	VERTICAL
2	4823.98	55.21	74.00	-18.79	53.13	4.21	34.69	2.08	Peak	188	117	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4873.97	50.35	54.00	-3.65	48.14	4.22	34.67	2.21	Average	200	113	HORIZONTAL
2	4874.00	53.69	74.00	-20.31	51.48	4.22	34.67	2.21	Peak	200	113	HORIZONTAL
3	7310.34	51.14	74.00	-22.86	43.76	5.34	34.93	7.38	Peak	137	105	HORIZONTAL
4	7312.19	40.22	54.00	-13.78	32.85	5.34	34.94	7.37	Average	137	105	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4873.95	52.93	54.00	-1.07	50.72	4.22	34.67	2.21	Average	211	115	VERTICAL
2	4873.99	55.95	74.00	-18.05	53.74	4.22	34.67	2.21	Peak	211	115	VERTICAL
3	7311.81	52.29	74.00	-21.71	44.92	5.34	34.94	7.37	Peak	201	142	VERTICAL
4	7312.15	44.03	54.00	-9.97	36.66	5.34	34.94	7.37	Average	201	142	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.92	45.27	54.00	-8.73	42.93	4.23	34.65	2.34	Average	159	141	HORIZONTAL
2	4923.96	49.71	74.00	-24.29	47.37	4.23	34.65	2.34	Peak	159	141	HORIZONTAL
3	7384.50	37.74	54.00	-16.26	30.26	5.36	34.96	7.48	Average	235	100	HORIZONTAL
4	7384.83	49.27	74.00	-24.73	41.79	5.36	34.96	7.48	Peak	235	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4923.97	52.43	74.00	-21.57	50.09	4.23	34.65	2.34	Peak	195	114	VERTICAL
2	4923.99	48.10	54.00	-5.90	45.76	4.23	34.65	2.34	Average	195	114	VERTICAL
3	7384.65	39.74	54.00	-14.26	32.26	5.36	34.96	7.48	Average	162	100	VERTICAL
4	7386.35	50.79	74.00	-23.21	43.31	5.36	34.96	7.48	Peak	162	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4818.94	37.60	54.00	-16.40	35.52	4.21	34.69	2.08	Average	156	142	HORIZONTAL
2	4819.22	51.40	74.00	-22.60	49.32	4.21	34.69	2.08	Peak	156	142	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4820.47	35.37	54.00	-18.63	33.29	4.21	34.69	2.08	Average	215	124	VERTICAL
2	4821.60	49.36	74.00	-24.64	47.28	4.21	34.69	2.08	Peak	215	124	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4873.04	50.44	74.00	-23.56	48.23	4.22	34.67	2.21	Peak	198	117	HORIZONTAL
2	4873.42	37.74	54.00	-16.26	35.53	4.22	34.67	2.21	Average	198	117	HORIZONTAL
3	7319.37	35.80	54.00	-18.20	28.40	5.35	34.94	7.40	Average	254	100	HORIZONTAL
4	7320.58	47.90	74.00	-26.10	40.50	5.35	34.94	7.40	Peak	254	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4870.06	38.50	54.00	-15.50	36.29	4.22	34.67	2.21	Average	212	100	VERTICAL
2	4871.40	52.78	74.00	-21.22	50.57	4.22	34.67	2.21	Peak	212	100	VERTICAL
3	7319.81	48.86	74.00	-25.14	41.46	5.35	34.94	7.40	Peak	112	100	VERTICAL
4	7320.20	35.59	54.00	-18.41	28.19	5.35	34.94	7.40	Average	112	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4926.31	43.38	74.00	-30.62	41.04	4.23	34.65	2.34	Peak	229	114	HORIZONTAL
2	4929.99	31.00	54.00	-23.00	28.66	4.23	34.65	2.34	Average	229	114	HORIZONTAL
3	7377.67	35.59	54.00	-18.41	28.13	5.36	34.96	7.46	Average	178	100	HORIZONTAL
4	7389.78	48.43	74.00	-25.57	40.95	5.36	34.96	7.48	Peak	178	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4921.50	43.60	74.00	-30.40	41.26	4.23	34.65	2.34	Peak	141	100	VERTICAL
2	4922.49	31.31	54.00	-22.69	28.97	4.23	34.65	2.34	Average	141	100	VERTICAL
3	7381.00	48.66	74.00	-25.34	41.20	5.36	34.96	7.46	Peak	210	100	VERTICAL
4	7381.61	35.66	54.00	-18.34	28.20	5.36	34.96	7.46	Average	210	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 149 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 10, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4960.00	57.10	74.00	-16.90	54.68	4.23	34.64	2.42	Peak	231	103	HORIZONTAL
2	4960.00	49.42	54.00	-4.58	47.00	4.23	34.64	2.42	Average	231	103	HORIZONTAL
3	5439.80	65.27	74.00	-8.73	61.77	4.53	34.62	3.50	Peak	226	114	HORIZONTAL
4	5440.00	53.06	54.00	-0.94	49.56	4.53	34.62	3.50	Average	226	114	HORIZONTAL
5	11489.08	50.32	54.00	-3.68	39.90	6.74	34.82	10.42	Average	234	100	HORIZONTAL
6	11489.40	63.19	74.00	-10.81	52.77	6.74	34.82	10.42	Peak	234	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	4960.06	45.75	54.00	-8.25	43.33	4.23	34.64	2.42	Average	217	100	VERTICAL
2	4960.18	56.10	74.00	-17.90	53.68	4.23	34.64	2.42	Peak	217	100	VERTICAL
3	5439.93	51.64	54.00	-2.36	48.14	4.53	34.62	3.50	Average	213	100	VERTICAL
4	5440.07	62.84	74.00	-11.16	59.34	4.53	34.62	3.50	Peak	213	100	VERTICAL
5	11491.08	65.50	74.00	-8.50	55.08	6.74	34.82	10.42	Peak	185	100	VERTICAL
6	11491.52	51.39	54.00	-2.61	40.97	6.74	34.82	10.42	Average	185	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 157 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 10, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.97	53.48	54.00	-0.52	49.98	4.53	34.62	3.50	Average	213	105	HORIZONTAL
2	5440.09	65.61	74.00	-8.39	62.11	4.53	34.62	3.50	Peak	213	105	HORIZONTAL
3	11568.64	65.85	74.00	-8.15	55.42	6.77	34.84	10.43	Peak	244	118	HORIZONTAL
4	11569.28	51.67	54.00	-2.33	41.24	6.77	34.84	10.43	Average	244	118	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.96	61.90	74.00	-12.10	58.40	4.53	34.62	3.50	Peak	217	100	VERTICAL
2	5439.97	50.81	54.00	-3.19	47.31	4.53	34.62	3.50	Average	217	100	VERTICAL
3	11566.84	65.67	74.00	-8.33	55.24	6.77	34.84	10.43	Peak	198	100	VERTICAL
4	11566.96	51.57	54.00	-2.43	41.14	6.77	34.84	10.43	Average	198	100	VERTICAL

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11a CH 165 / Chain 4 + Chain 5 + Chain 6
Test Date	Feb. 10, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.90	63.95	74.00	-10.05	60.45	4.53	34.62	3.50	Peak	208	100	HORIZONTAL
2	5440.00	53.33	54.00	-0.67	49.83	4.53	34.62	3.50	Average	208	100	HORIZONTAL
3	11648.88	50.76	54.00	-3.24	40.33	6.80	34.87	10.43	Average	218	100	HORIZONTAL
4	11649.16	64.18	74.00	-9.82	53.75	6.80	34.87	10.43	Peak	218	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5439.88	62.06	74.00	-11.94	58.56	4.53	34.62	3.50	Peak	213	100	VERTICAL
2	5439.95	51.09	54.00	-2.91	47.59	4.53	34.62	3.50	Average	213	100	VERTICAL
3	11650.92	46.16	54.00	-7.84	35.73	6.80	34.87	10.43	Average	158	100	VERTICAL
4	11651.08	58.49	74.00	-15.51	48.06	6.80	34.87	10.43	Peak	158	100	VERTICAL

Note:

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

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

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

4.5. 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 the spectrum analyzer.

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

4.5.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.4.3, only the frequency range investigated is limited to 100MHz around band edges.

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03r01 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure
2. The radiated emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
   Only worst data of each operating mode is presented.

4.5.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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

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. Test Result of Band Edge and Fundamental Emissions

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2389.84	64.42	74.00	-9.58	33.64	2.91	0.00	30.78	Peak	237	143	HORIZONTAL
2	2390.00	50.66	54.00	-3.34	19.88	2.91	0.00	30.78	Average	237	143	HORIZONTAL
3	2404.47	105.16			74.40	2.92	0.00	30.76	Average	237	143	HORIZONTAL
4	2404.63	116.60			85.84	2.92	0.00	30.76	Peak	237	143	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2389.68	62.27	74.00	-11.73	31.49	2.91	0.00	30.78	Peak	211	148	HORIZONTAL
2	2390.00	50.73	54.00	-3.27	19.95	2.91	0.00	30.78	Average	211	148	HORIZONTAL
3	2435.72	119.39			88.65	2.93	0.00	30.74	Peak	211	148	HORIZONTAL
4	2435.72	108.44			77.70	2.93	0.00	30.74	Average	211	148	HORIZONTAL
5	2483.50	48.91	54.00	-5.09	18.22	2.96	0.00	30.69	Average	211	148	HORIZONTAL
6	2484.46	60.19	74.00	-13.81	29.50	2.96	0.00	30.69	Peak	211	148	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2459.44	104.13			73.42	2.95	0.00	30.71	Average	228	143	HORIZONTAL
2	2460.24	115.45			84.74	2.95	0.00	30.71	Peak	228	143	HORIZONTAL
3	2483.50	60.95	74.00	-13.05	30.26	2.96	0.00	30.69	Peak	228	143	HORIZONTAL
4	2483.50	49.22	54.00	-4.78	18.53	2.96	0.00	30.69	Average	228	143	HORIZONTAL

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

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11n MCS0 HT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2388.72	68.31	74.00	-5.69	37.53	2.91	0.00	30.78	Peak	207	121	HORIZONTAL
2	2390.00	52.10	54.00	-1.90	21.32	2.91	0.00	30.78	Average	207	121	HORIZONTAL
3	2419.76	110.23			79.49	2.93	0.00	30.74	Peak	207	121	HORIZONTAL
4	2419.76	98.78			68.04	2.93	0.00	30.74	Average	207	121	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2389.68	60.45	74.00	-13.55	29.67	2.91	0.00	30.78	Peak	231	143	HORIZONTAL
2	2390.00	50.16	54.00	-3.84	19.38	2.91	0.00	30.78	Average	231	143	HORIZONTAL
3	2439.24	101.59			70.87	2.94	0.00	30.72	Average	231	143	HORIZONTAL
4	2440.21	112.91			82.19	2.94	0.00	30.72	Peak	231	143	HORIZONTAL
5	2483.50	47.57	54.00	-6.43	16.88	2.96	0.00	30.69	Average	231	143	HORIZONTAL
6	2485.42	59.85	74.00	-14.15	29.16	2.96	0.00	30.69	Peak	231	143	HORIZONTAL

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

Channel 9

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2440.14	111.96			81.24	2.94	0.00	30.72	Peak	209	120	HORIZONTAL
2	2440.78	99.75			69.03	2.94	0.00	30.72	Average	209	120	HORIZONTAL
3	2483.50	64.78	74.00	-9.22	34.09	2.96	0.00	30.69	Peak	209	120	HORIZONTAL
4	2483.50	49.16	54.00	-4.84	18.47	2.96	0.00	30.69	Average	209	120	HORIZONTAL

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

Note:

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

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

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	Cm	
1	2390.00	65.53	74.00	-8.47	34.75	2.91	0.00	30.78	Peak	237	119	HORIZONTAL
2	2390.00	47.73	54.00	-6.27	16.95	2.91	0.00	30.78	Average	237	119	HORIZONTAL
3	2411.20	119.47			88.71	2.92	0.00	30.76	Peak	237	119	HORIZONTAL
4	2411.20	115.61			84.85	2.92	0.00	30.76	Average	237	119	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	Cm	
1	2388.72	64.46	74.00	-9.54	33.68	2.91	0.00	30.78	Peak	239	142	HORIZONTAL
2	2390.00	51.72	54.00	-2.28	20.94	2.91	0.00	30.78	Average	239	142	HORIZONTAL
3	2436.04	122.95			92.21	2.93	0.00	30.74	Peak	239	142	HORIZONTAL
4	2436.04	119.13			88.39	2.93	0.00	30.74	Average	239	142	HORIZONTAL
5	2483.50	49.16	54.00	-4.84	18.47	2.96	0.00	30.69	Average	239	142	HORIZONTAL
6	2483.82	59.78	74.00	-14.22	29.09	2.96	0.00	30.69	Peak	239	142	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	Cm	
1	2462.80	116.54			85.83	2.95	0.00	30.71	Average	217	140	HORIZONTAL
2	2462.96	120.53			89.82	2.95	0.00	30.71	Peak	217	140	HORIZONTAL
3	2483.50	49.71	54.00	-4.29	19.02	2.96	0.00	30.69	Average	217	140	HORIZONTAL
4	2488.31	62.90	74.00	-11.10	32.23	2.97	0.00	30.67	Peak	217	140	HORIZONTAL

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

Temperature	24°C	Humidity	53%
Test Engineer	Nick Peng	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3
Test Date	Feb. 08, 2014		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2389.84	63.03	74.00	-10.97	32.25	2.91	0.00	30.78	Peak	232	120	HORIZONTAL
2	2390.00	49.37	54.00	-4.63	18.59	2.91	0.00	30.78	Average	232	120	HORIZONTAL
3	2413.28	116.43			85.67	2.92	0.00	30.76	Peak	232	120	HORIZONTAL
4	2413.28	105.18			74.42	2.92	0.00	30.76	Average	232	120	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2389.04	63.49	74.00	-10.51	32.71	2.91	0.00	30.78	Peak	234	146	HORIZONTAL
2	2390.00	51.22	54.00	-2.78	20.44	2.91	0.00	30.78	Average	234	146	HORIZONTAL
3	2442.77	120.39			89.67	2.94	0.00	30.72	Peak	234	146	HORIZONTAL
4	2443.09	109.29			78.57	2.94	0.00	30.72	Average	234	146	HORIZONTAL
5	2483.50	61.60	74.00	-12.40	30.91	2.96	0.00	30.69	Peak	234	146	HORIZONTAL
6	2483.50	49.24	54.00	-4.76	18.55	2.96	0.00	30.69	Average	234	146	HORIZONTAL

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

Channel 11

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	2460.72	116.18			85.47	2.95	0.00	30.71	Peak	226	143	HORIZONTAL
2	2461.04	104.92			74.21	2.95	0.00	30.71	Average	226	143	HORIZONTAL
3	2483.50	62.93	74.00	-11.07	32.24	2.96	0.00	30.69	Peak	226	143	HORIZONTAL
4	2483.50	49.67	54.00	-4.33	18.98	2.96	0.00	30.69	Average	226	143	HORIZONTAL

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

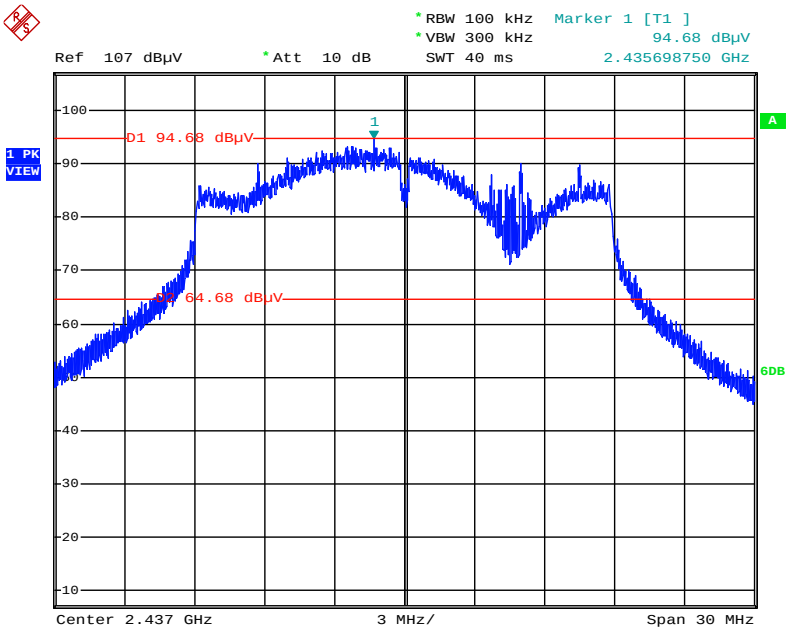
Note:

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

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

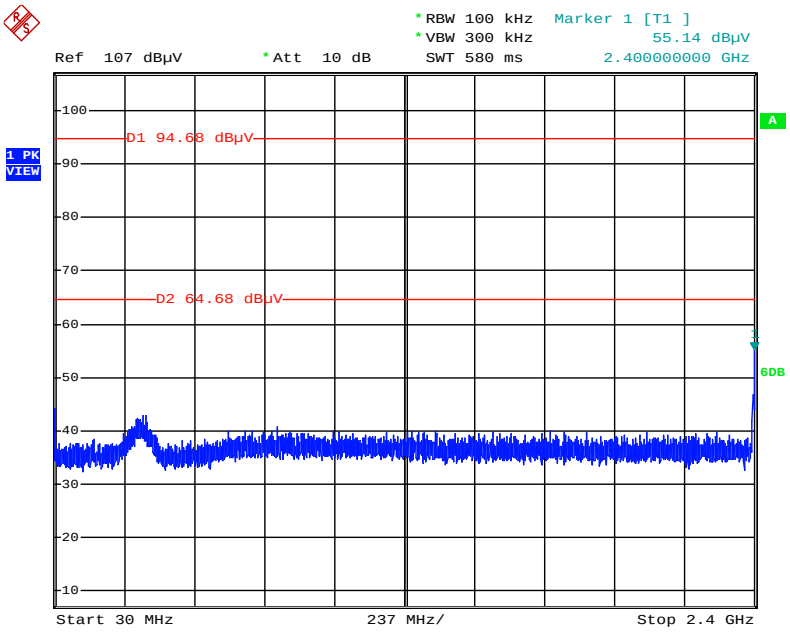
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level



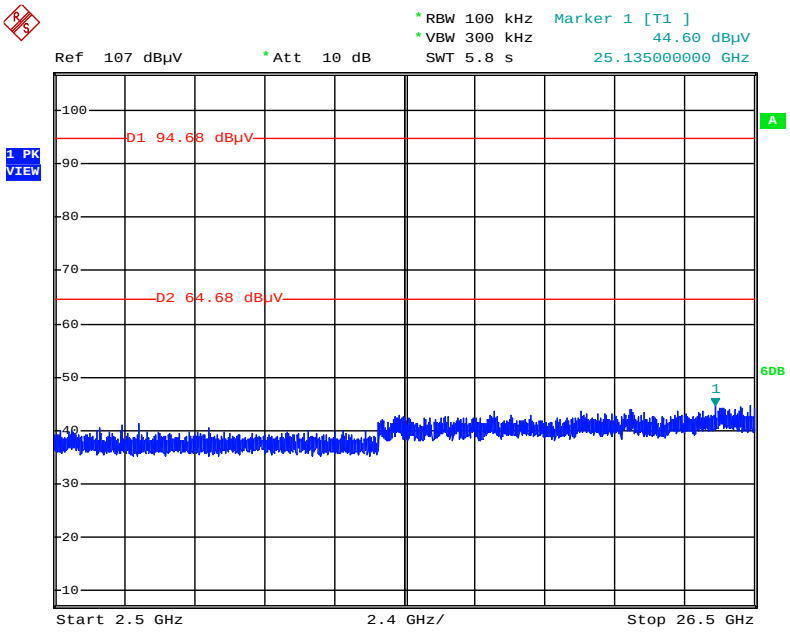
Date: 11.FEB.2014 02:02:29

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



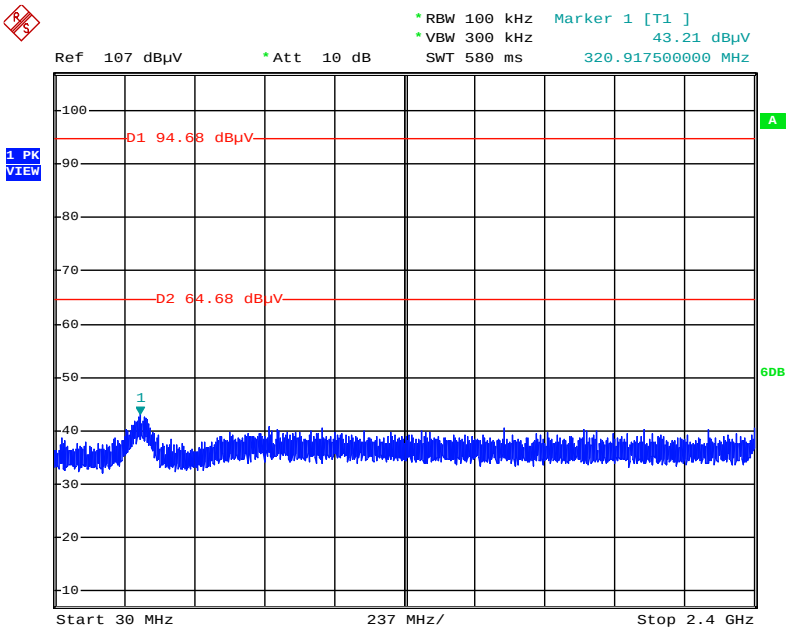
Date: 11.FEB.2014 02:03:01

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



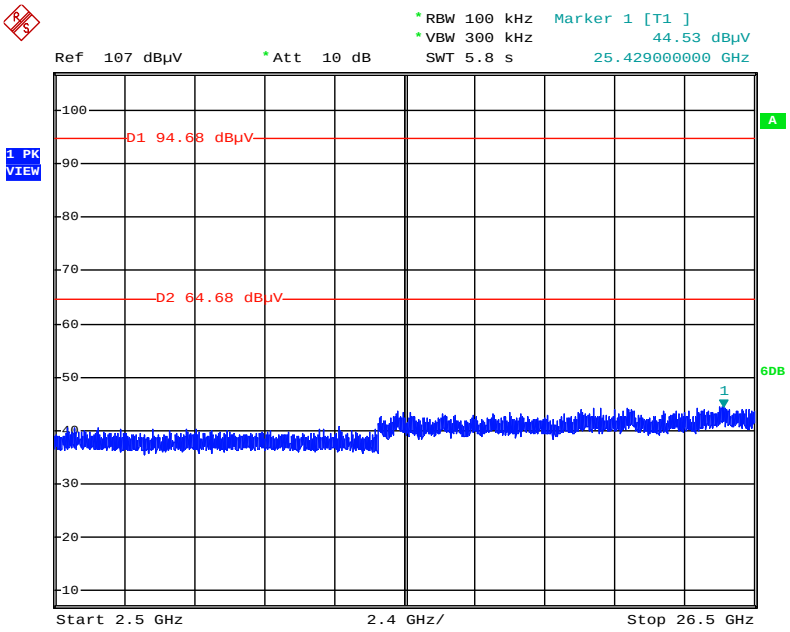
Date: 11.FEB.2014 02:03:39

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



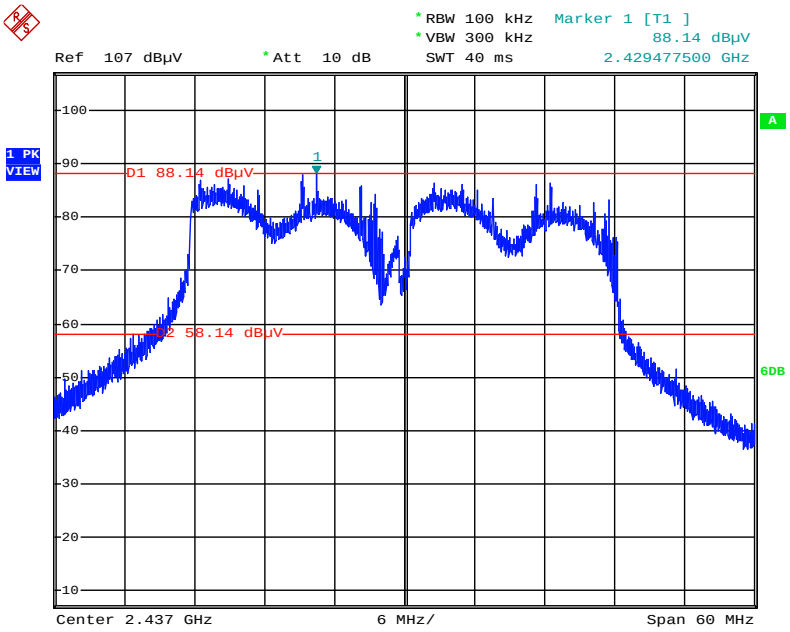
Date: 11.FEB.2014 02:04:51

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



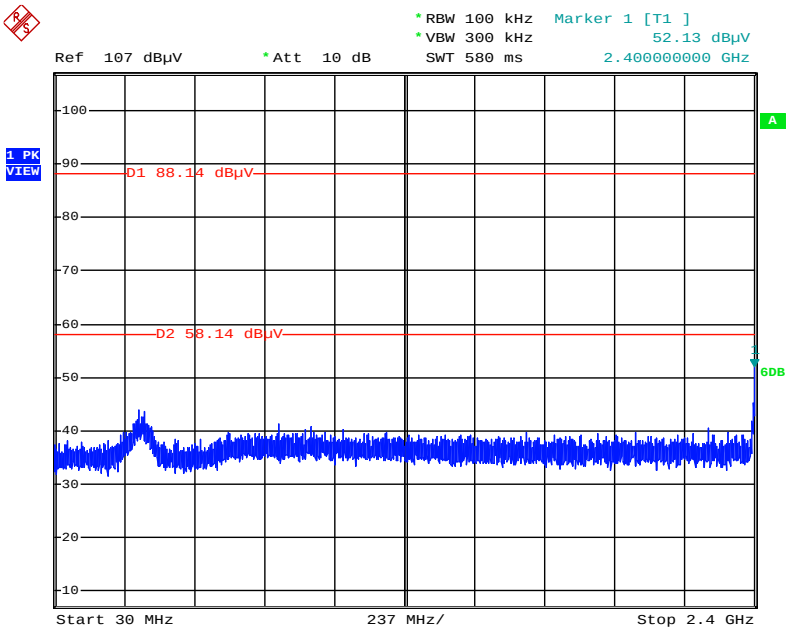
Date: 11.FEB.2014 02:06:29

Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level



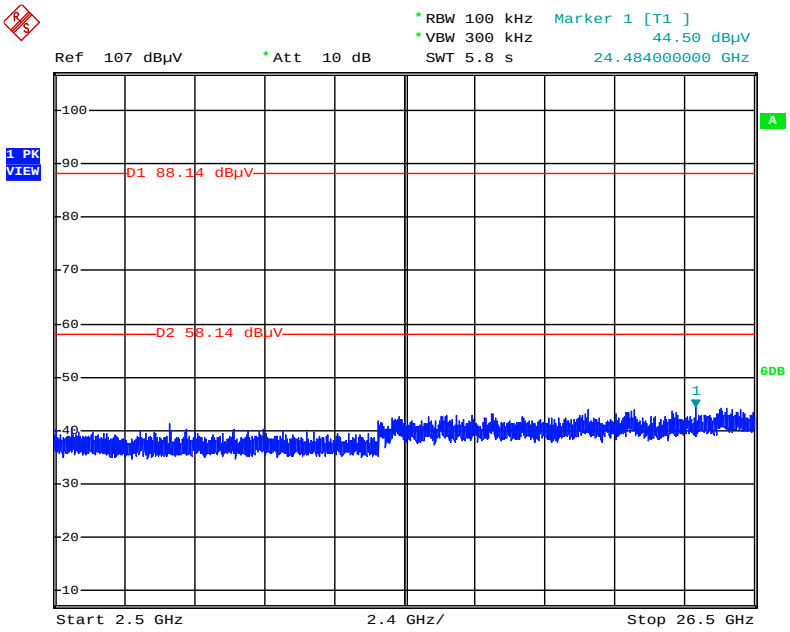
Date: 11.FEB.2014 02:07:25

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



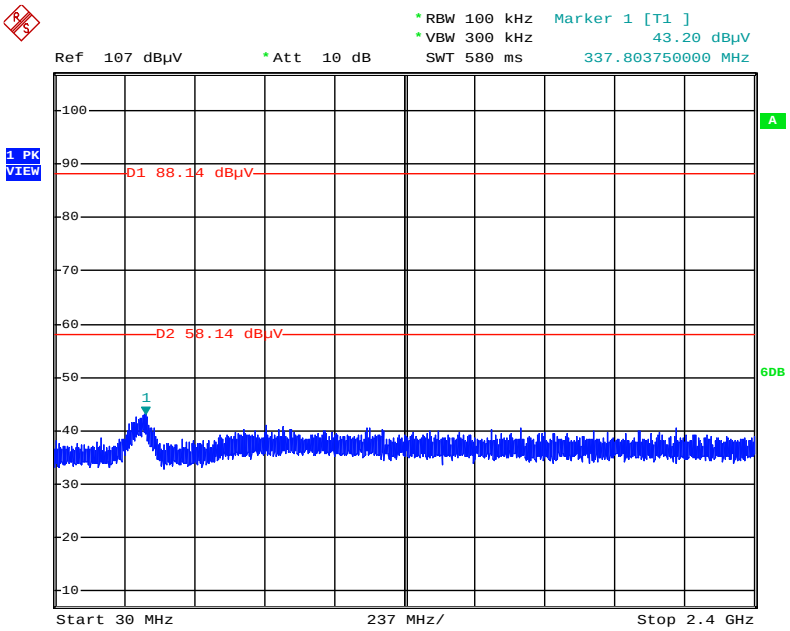
Date: 11.FEB.2014 02:08:18

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



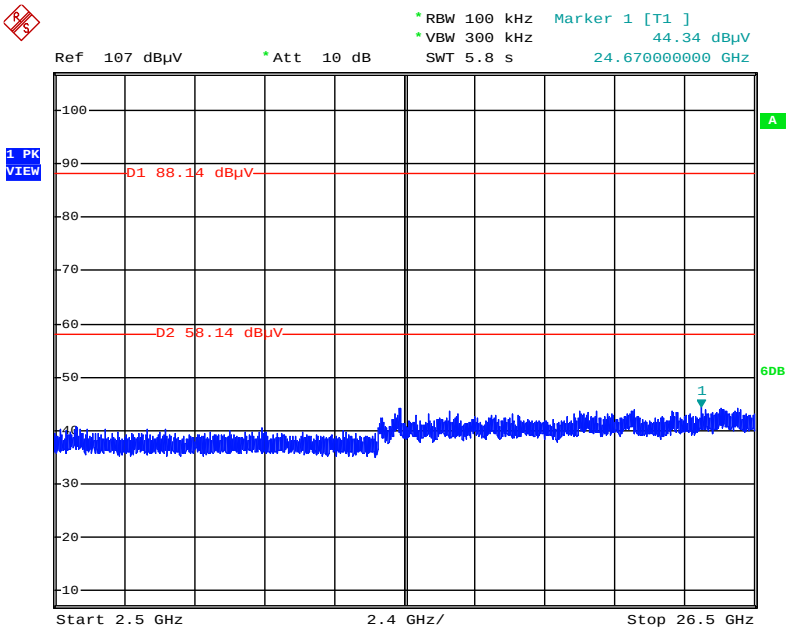
Date: 11.FEB.2014 02:08:47

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



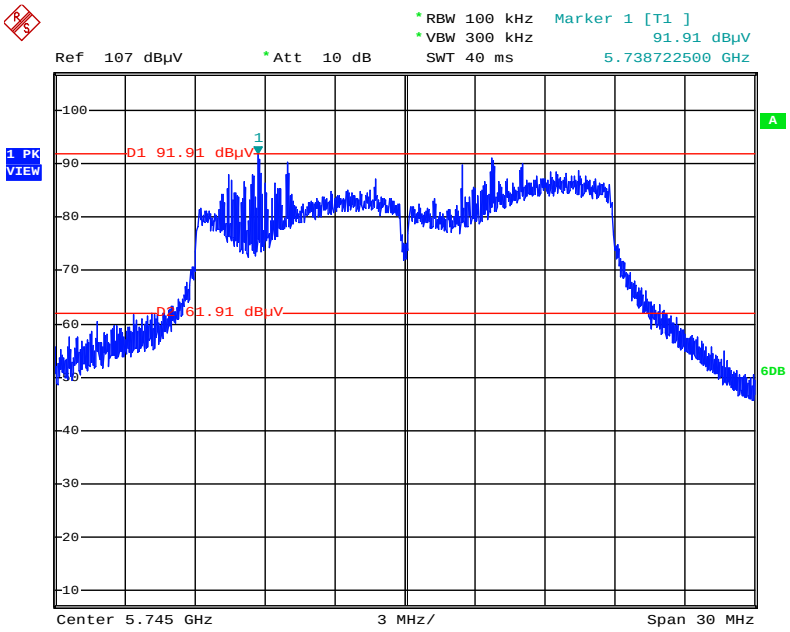
Date: 11.FEB.2014 02:10:04

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



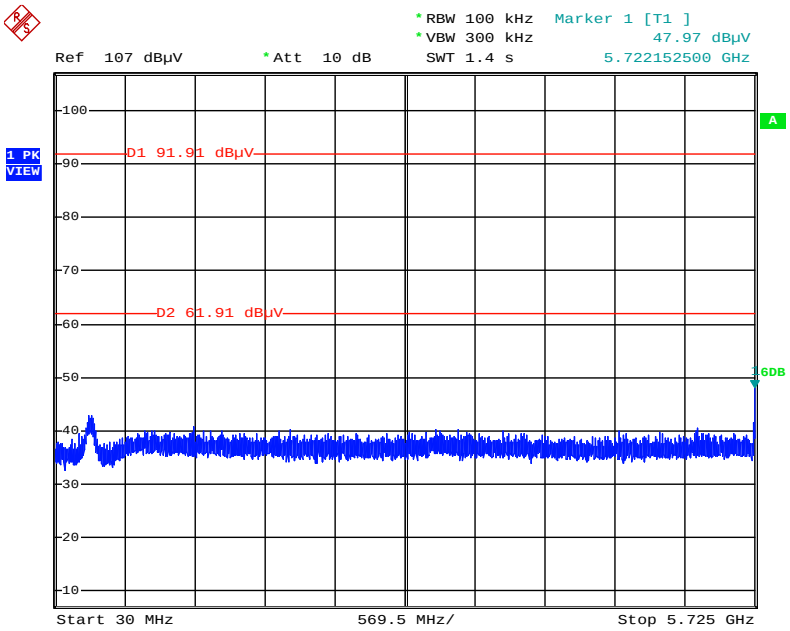
Date: 11.FEB.2014 02:09:31

Plot on Configuration IEEE 802.11n MCS0 HT20 / Reference Level



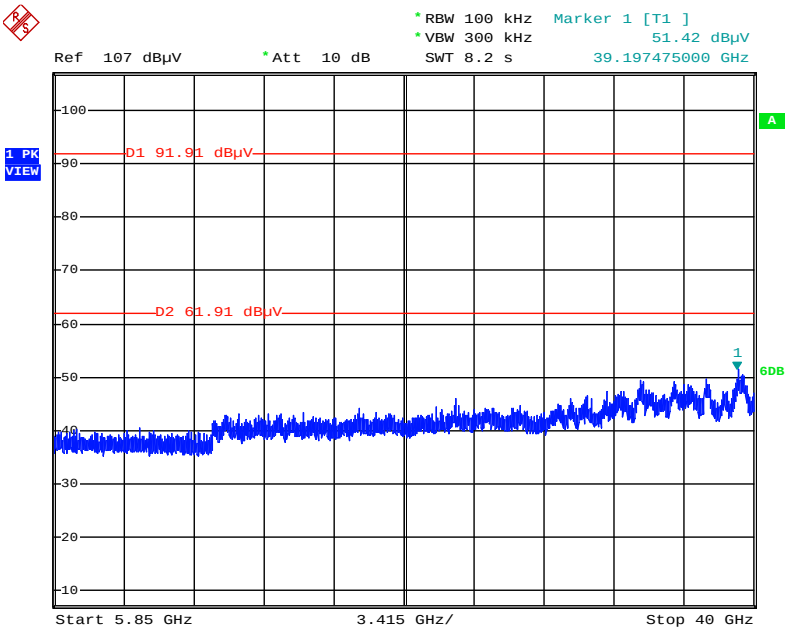
Date: 11.FEB.2014 01:47:43

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 149 / 30MHz~5725MHz (down 30dBc)



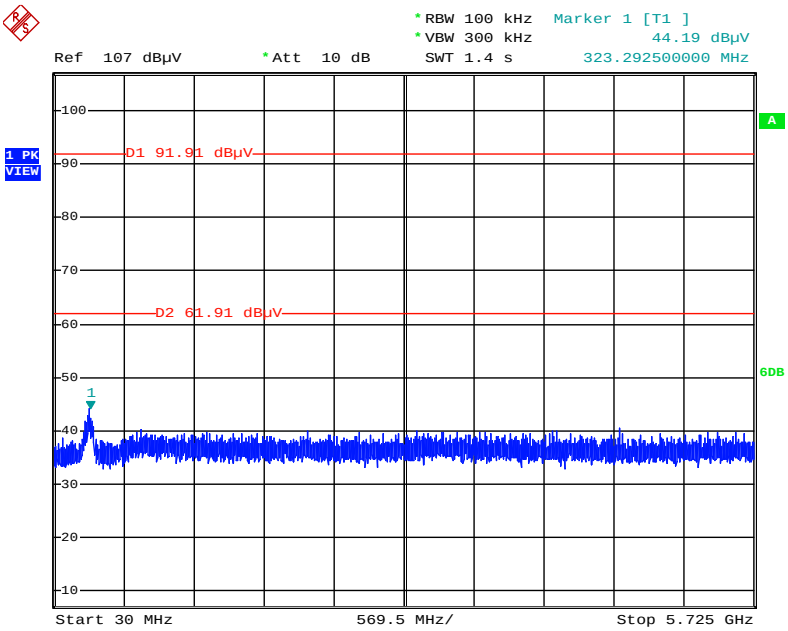
Date: 11.FEB.2014 01:48:35

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 149 / 5850MHz~40000MHz (down 30dBc)



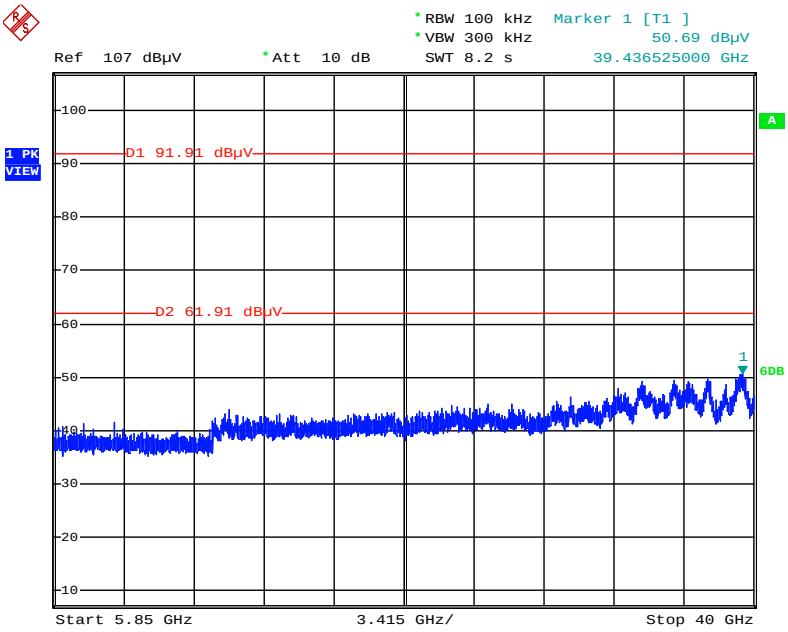
Date: 11.FEB.2014 01:49:16

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 165 / 30MHz~5725MHz (down 30dBc)



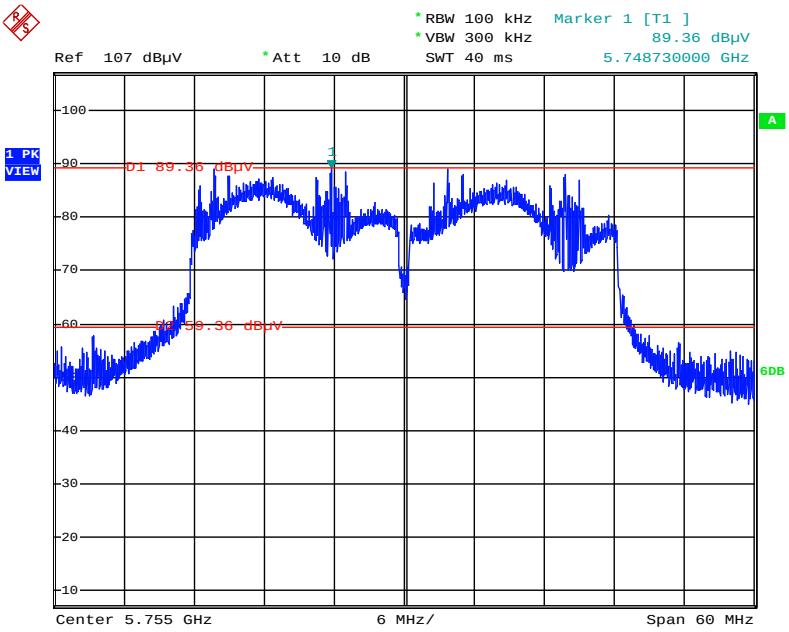
Date: 11.FEB.2014 01:50:31

Plot on Configuration IEEE 802.11n MCS0 HT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)



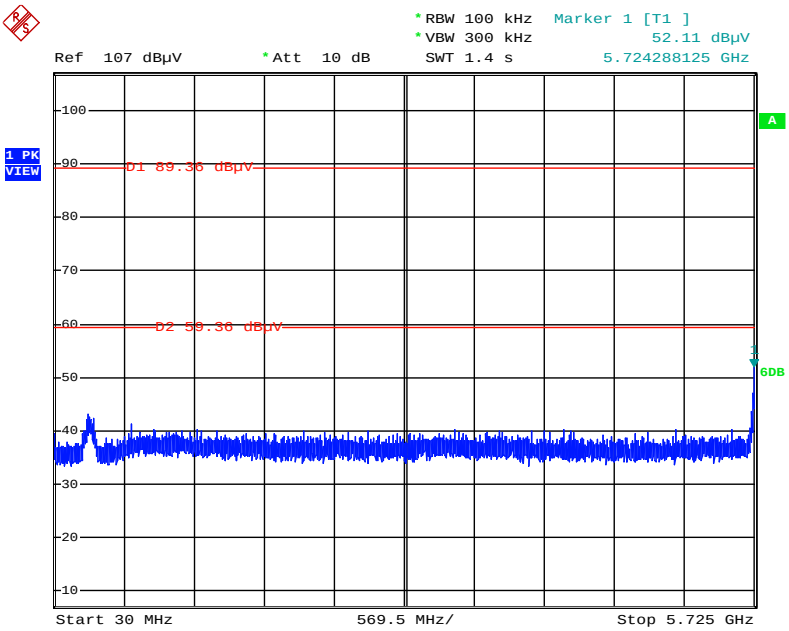
Date: 11.FEB.2014 01:50:07

Plot on Configuration IEEE 802.11n MCS0 HT40 / Reference Level



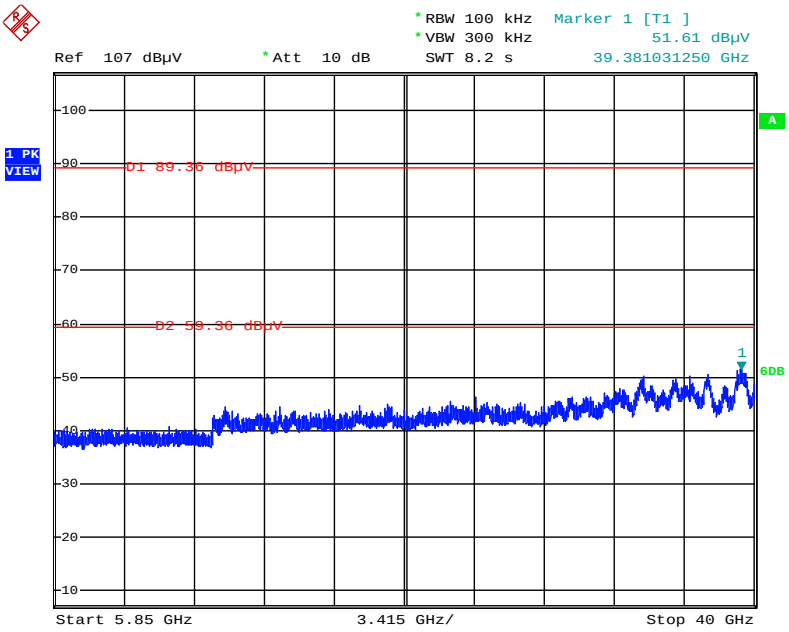
Date: 11.FEB.2014 01:36:58

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 151 / 30MHz~5725MHz (down 30dBc)



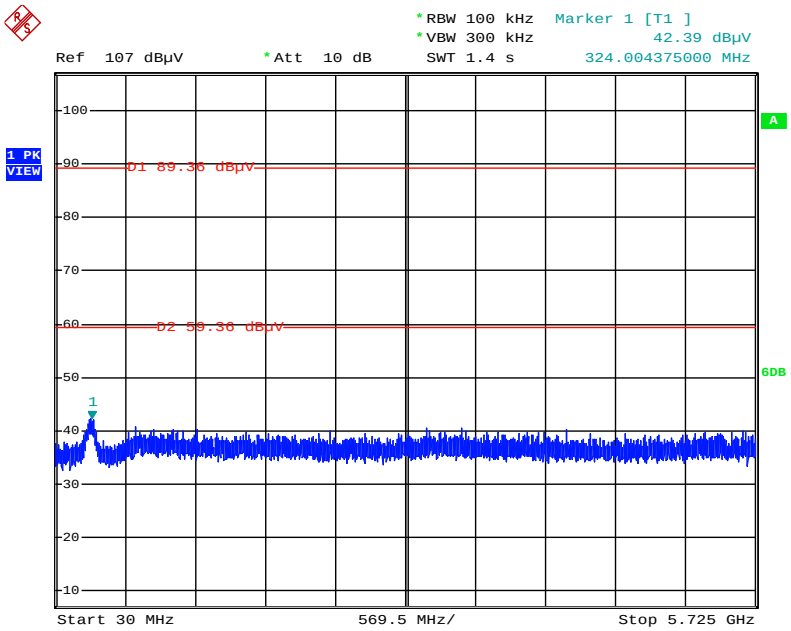
Date: 11.FEB.2014 01:38:57

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 151 / 5850MHz~40000MHz (down 30dBc)



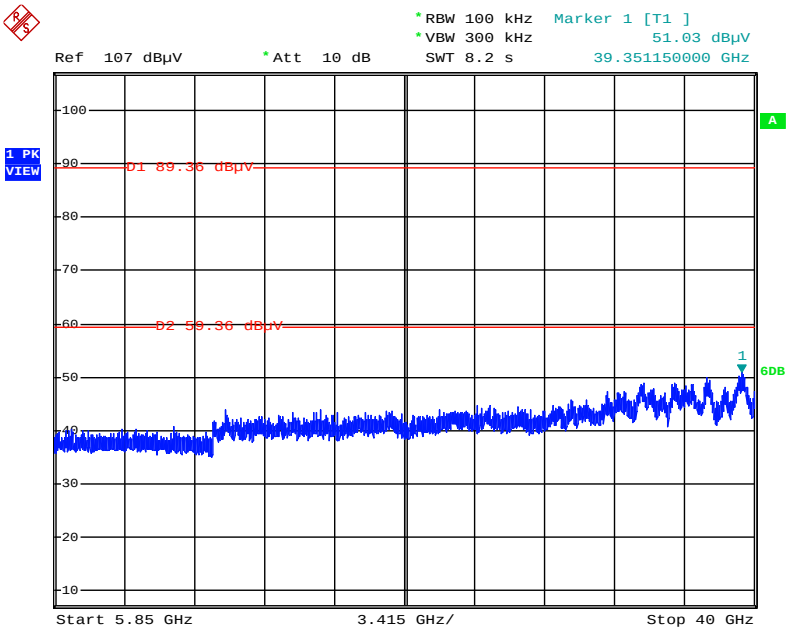
Date: 11.FEB.2014 01:41:10

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 159 / 30MHz~5725MHz (down 30dBc)



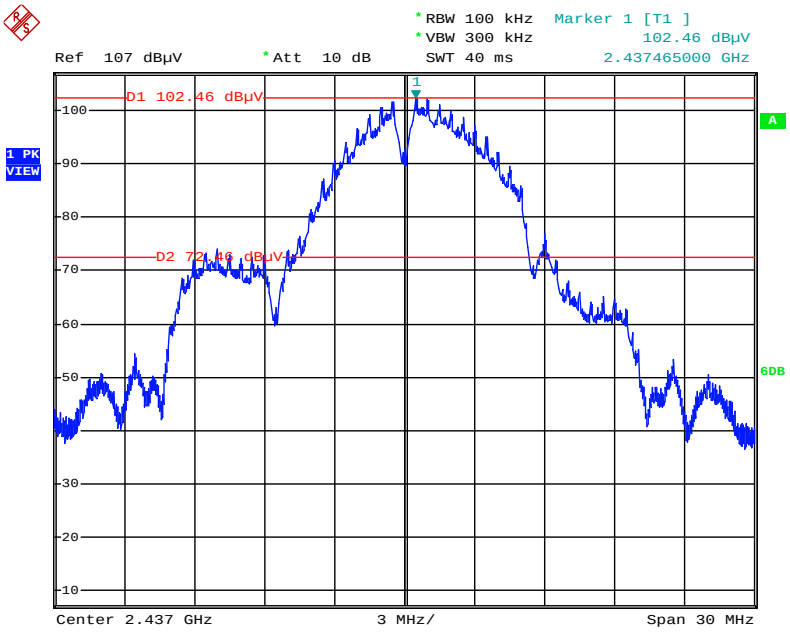
Date: 11.FEB.2014 01:42:32

Plot on Configuration IEEE 802.11n MCS0 HT40 / CH 159 / 5850MHz~40000MHz (down 30dBc)



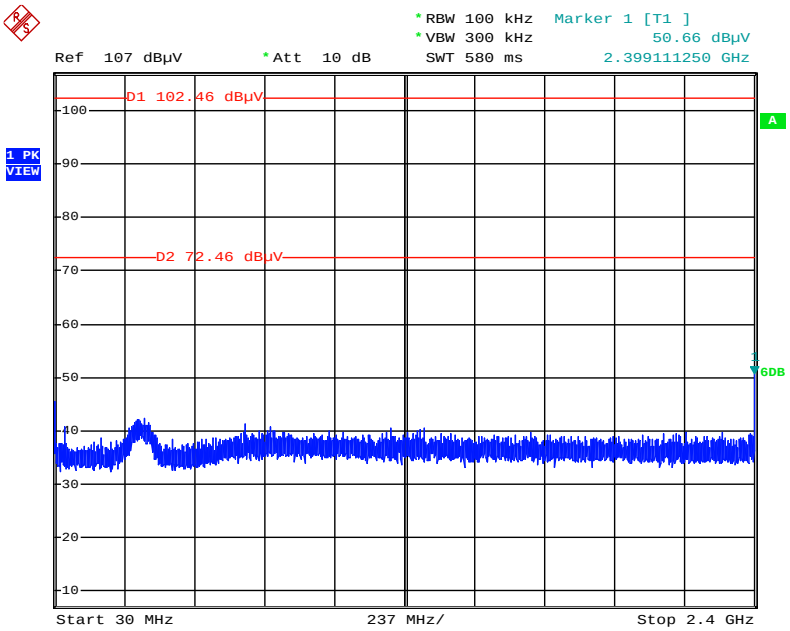
Date: 11.FEB.2014 01:42:04

Plot on Configuration IEEE 802.11b / Reference Level



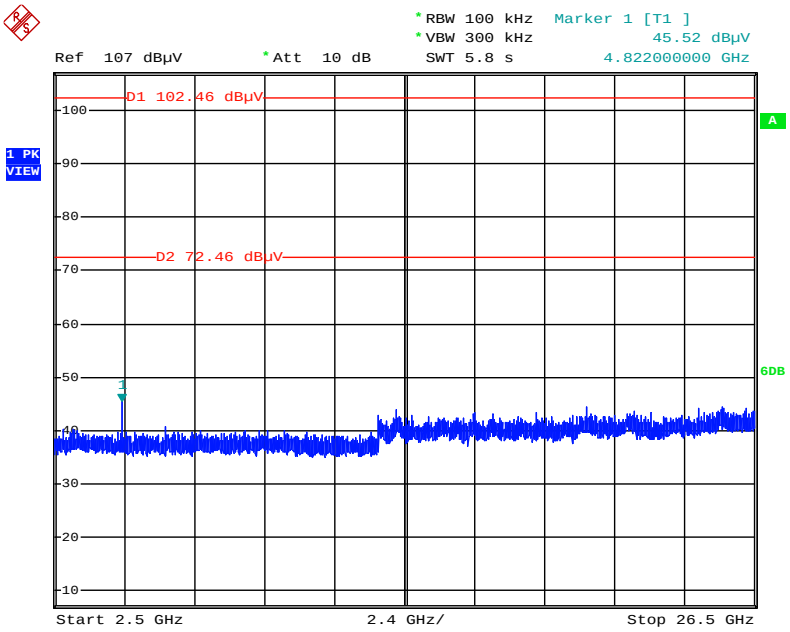
Date: 11.FEB.2014 01:54:38

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



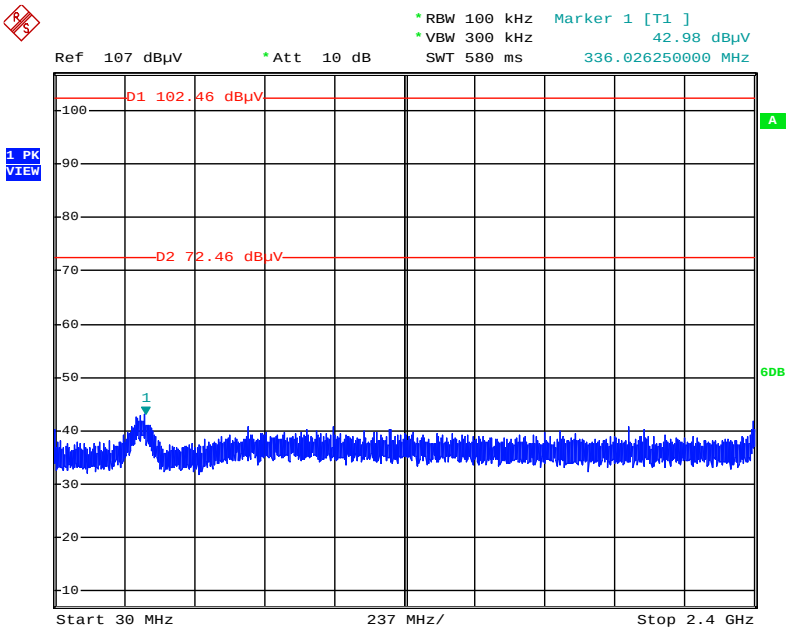
Date: 11.FEB.2014 01:55:50

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



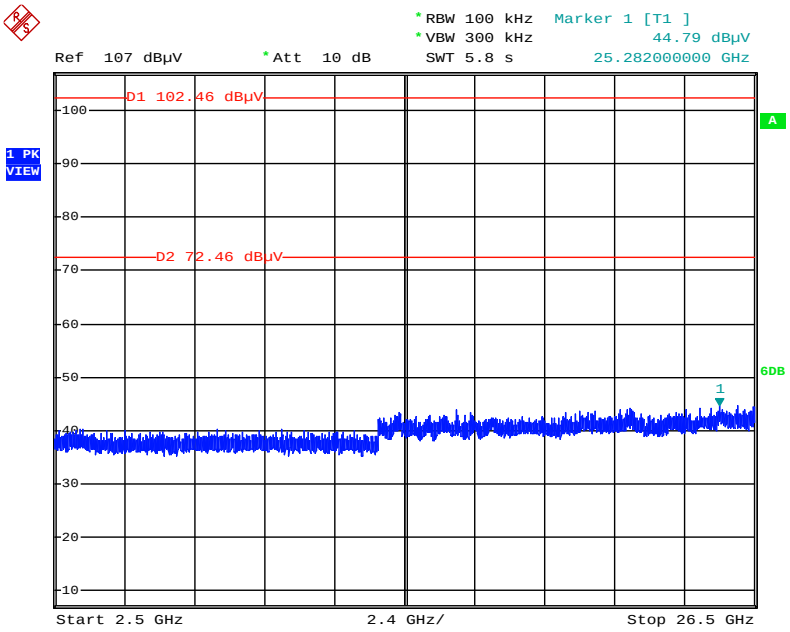
Date: 11.FEB.2014 01:56:26

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



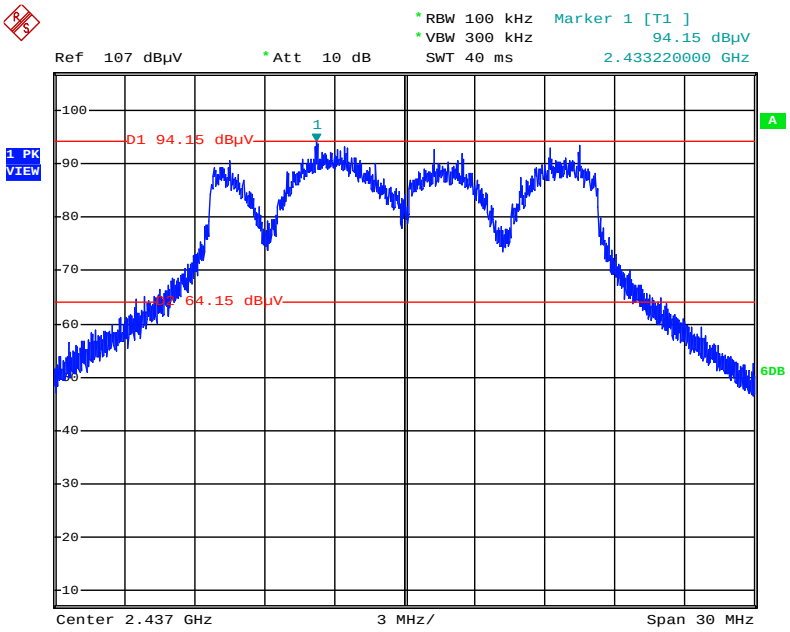
Date: 11.FEB.2014 01:57:46

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



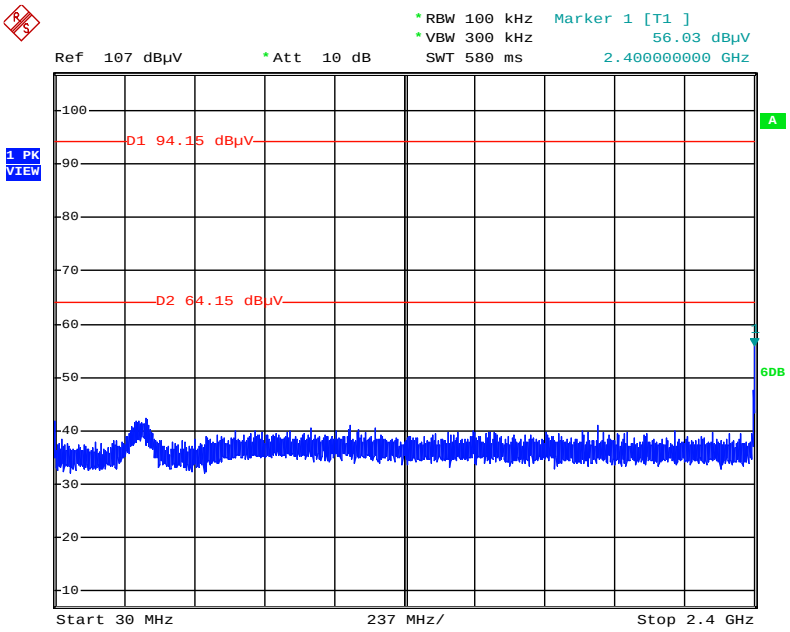
Date: 11.FEB.2014 01:57:25

Plot on Configuration IEEE 802.11g / Reference Level



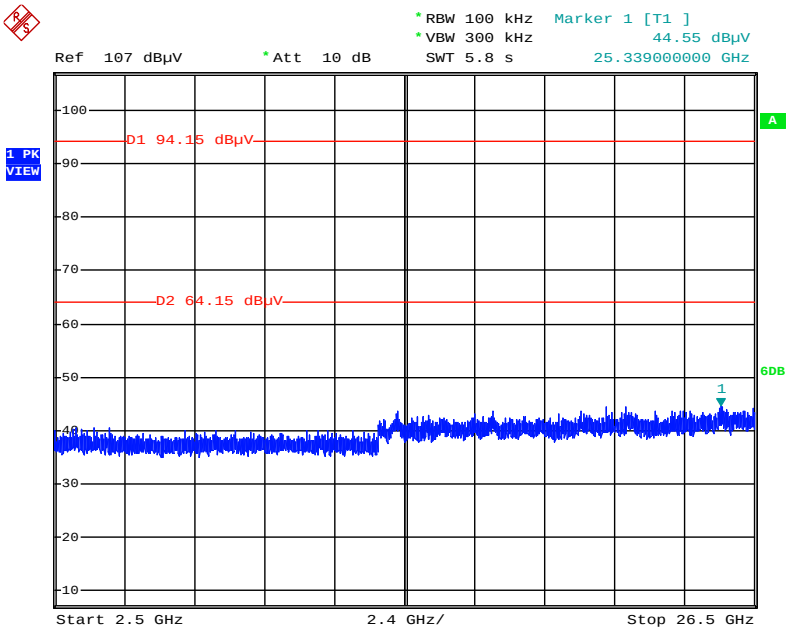
Date: 11.FEB.2014 01:58:54

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



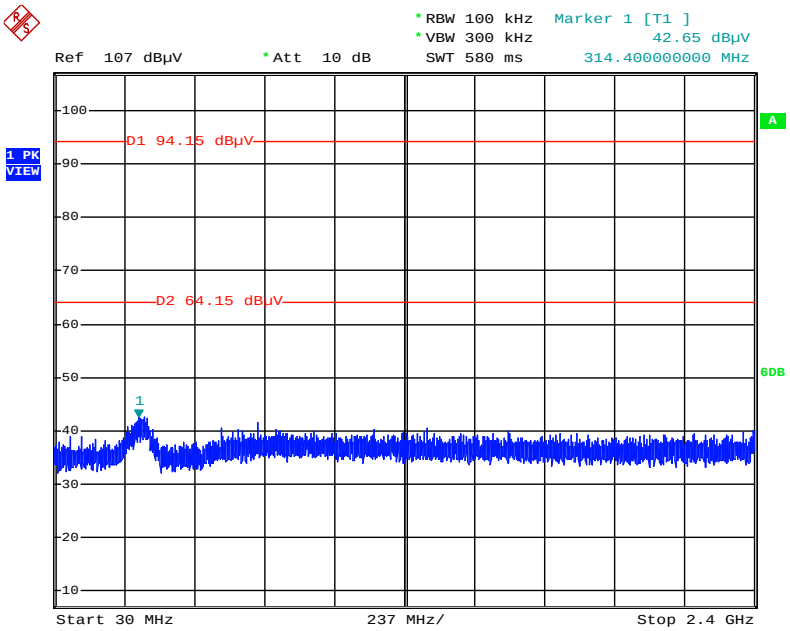
Date: 11.FEB.2014 01:59:28

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



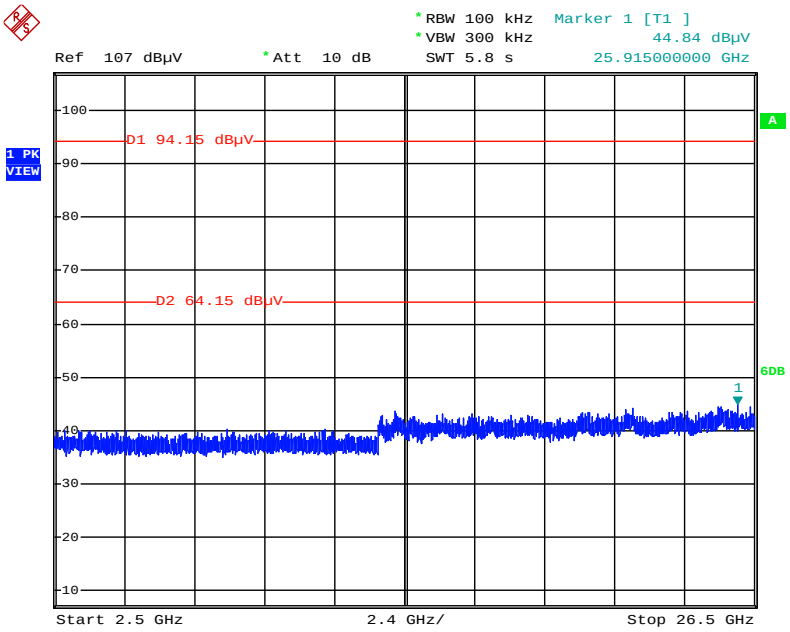
Date: 11.FEB.2014 02:00:07

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



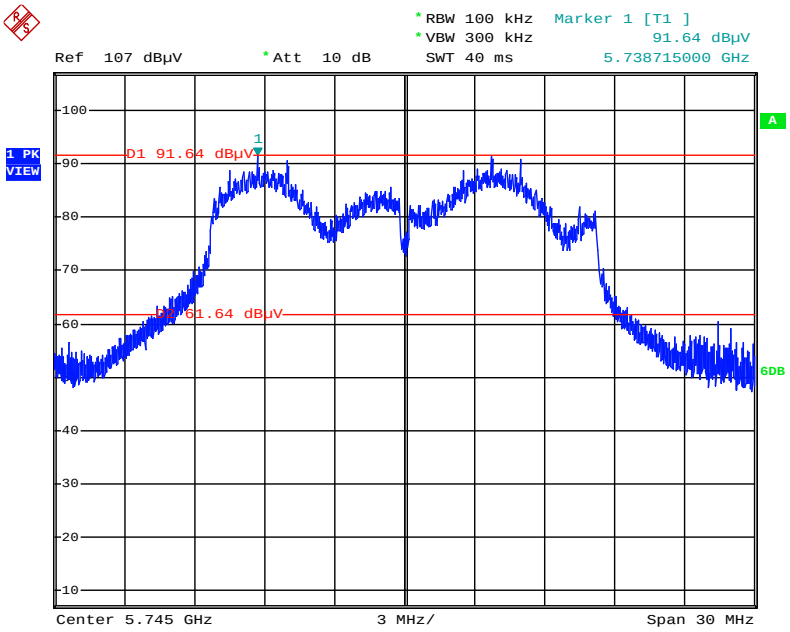
Date: 11.FEB.2014 02:01:09

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



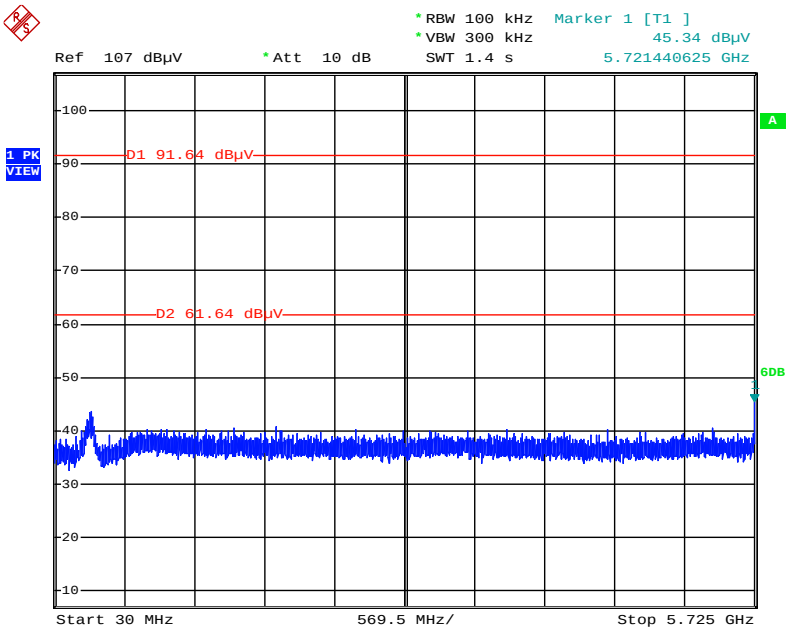
Date: 11.FEB.2014 02:00:48

Plot on Configuration IEEE 802.11a / Reference Level



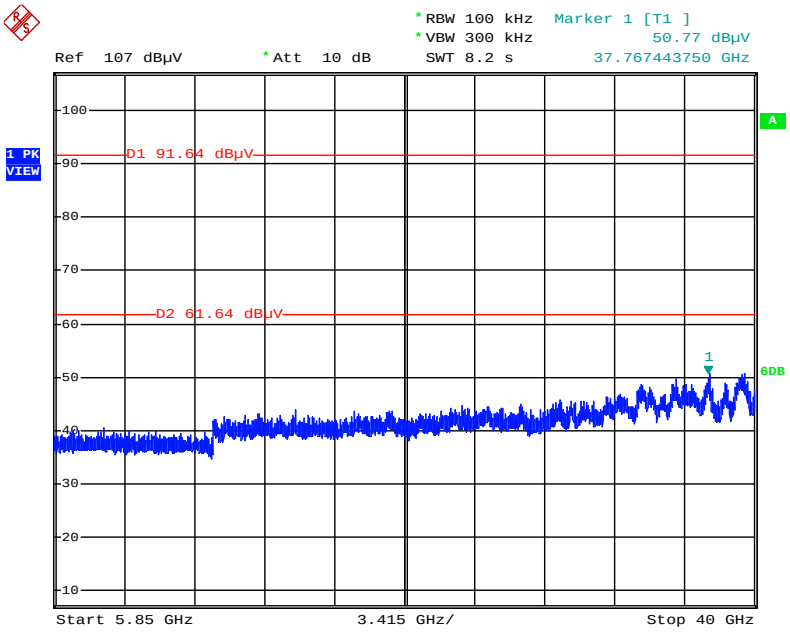
Date: 11.FEB.2014 01:43:36

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



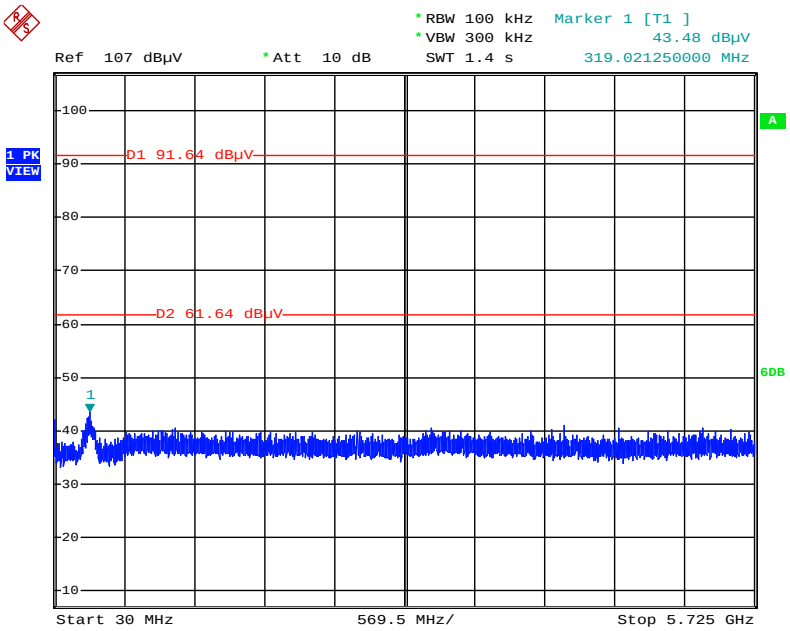
Date: 11.FEB.2014 01:44:09

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



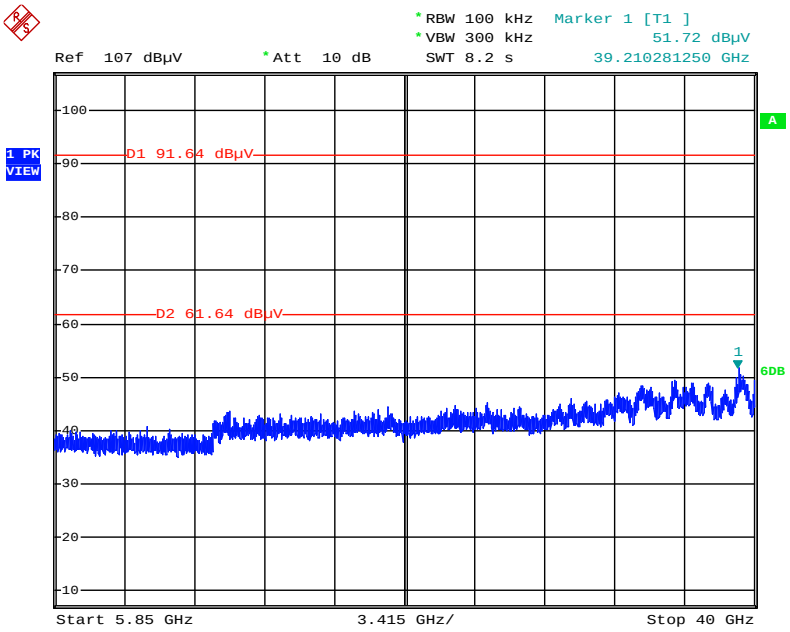
Date: 11.FEB.2014 01:45:10

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



Date: 11.FEB.2014 01:46:29

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



Date: 11.FEB.2014 01:45:56

4.6. Antenna Requirements

4.6.1. 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.

4.6.2. 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
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. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)

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

"*" Calibration Interval of instruments listed above is two years.

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

6. MEASUREMENT UNCERTAINTY

Uncertainty of Radiated Emission Measurement (30MHz ~ 1,000MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.173	dB	K=1	0.086
Cable loss	±0.174	dB	K=2	0.087
Antenna gain	±0.169	dB	K=2	0.084
Site imperfection	±0.433	dB	Triangular	0.214
Pre-amplifier gain	±0.366	dB	K=2	0.183
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.778
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.555

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.191	dB	K=1	0.095
Cable loss	±0.169	dB	K=2	0.084
Antenna gain	±0.191	dB	K=2	0.096
Site imperfection	±0.582	dB	Triangular	0.291
Pre-amplifier gain	±0.304	dB	K=2	0.152
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.839
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.678

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.186	dB	K=1	0.093
Cable loss	±0.167	dB	K=2	0.083
Antenna gain	±0.190	dB	K=2	0.095
Site imperfection	±0.488	dB	Triangular	0.244
Pre-amplifier gain	±0.269	dB	K=2	0.134
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.771
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.541

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Cable loss	±0.038	dB	K=2	0.019
Attenuator	±0.047	dB	K=2	0.024
Power Meter specification	±0.300	dB	Triangular	0.150
Power Sensor specification	±0.300	dB	Rectangular	0.150
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				0.863
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				1.726