SPORTON International Inc.
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FCC RADIO TEST REPORT

Applicant's company	**Motorola Solutions, Inc.**
Applicant Address	One Motorola Plaza Holtsville, NY 11742 USA
FCC ID	**UZ7TW5**
Manufacturer's company	**Wistron NeWeb Corporation**
Manufacturer Address	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308,Taiwan,R.O.C.

Product Name	2x2 802.11n PCIe module
Brand Name	MOTOROLA
Model No.	TW-5
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	May 02, 2013
Final Test Date	Jun. 10, 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 (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.

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR290357-02AA	Rev. 01	Initial issue of report	Jun. 24, 2013

Certificate No.: CB10205083

1. CERTIFICATE OF COMPLIANCE

Product Name	:	2x2 802.11n PCIe module
Brand Name	:	MOTOROLA
Model No.	:	TW-5
Applicant	:	Motorola Solutions, 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 May 02, 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

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	7.44 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	7.94 dB
4.3	15.247(e)	Power Spectral Density	Complies	12.43 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	3.01 dB
4.6	15.247(d)	Band Edge Emissions	Complies	1.06 dB
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
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 2.4GHz Band: MCS0 (20MHz): 17.92 MHz ; MCS0 (40MHz): 36.64 MHz For 5GHz Band: MCS0 (20MHz): 21.60 MHz ; MCS0 (40MHz): 49.28 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 18.90 dBm ; MCS0 (40MHz): 15.93 dBm For 5GHz Band: MCS0 (20MHz): 21.01 dBm ; MCS0 (40MHz): 20.92 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11a/b/g

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 12.48 MHz ; 11g: 16.96 MHz ; 11a: 20.56 MHz
Maximum Conducted Output Power	11b: 13.84 dBm ; 11g: 22.06 dBm ; 11a: 20.82 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Two (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)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
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

N/A

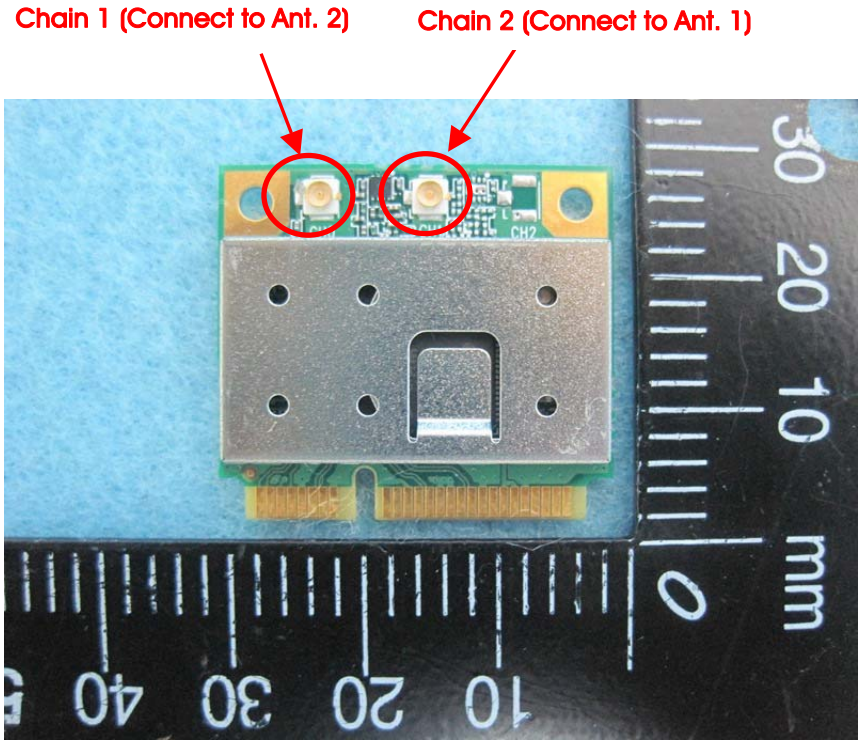
3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4G	5G
1	WNC	95EAAH15.G07	PIFA Antenna	I-PEX	-1.57	3.71
2	WNC	95EAAH15.G08	PIFA Antenna	I-PEX	-1.57	3.71

Note: The EUT has two antennas.

(1) Chain 1 and Chain 2 can be used as transmitting/receiving antennas.

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

For IEEE 802.11b/g, use Channel 1~Channel 11.

There are two bandwidth systems for IEEE 802.11n.

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:

For IEEE 802.11a, use Channel 149, 153, 157, 161, 165.

There are two bandwidth systems for IEEE 802.11n.

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

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

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

3.5. Table for Test Modes

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

For 2.4GHz Band

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	CTX	-	-	-
Maximum Conducted Output Power	11n 20MHz	MCS0	1/6/11	1+2
	11n 40MHz	MCS0	3/6/9	1+2
	11b/CCK	1 Mbps	1/6/11	1+2
	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&2
	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+2
	11g/BPSK	6 Mbps	1/6/11	1+2
Radiated Emissions Below 1GHz	CTX	-	-	-
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+2
	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+2
	11g/BPSK	6 Mbps	1/6/11	1+2

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	CTX	-	-	-
Maximum Conducted Output Power	11n 20MHz	MCS0	149/157/165	1+2
	11n 40MHz	MCS0	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Power Spectral Density	11n 20MHz	MCS0	149/157/165	1&2
	11n 40MHz	MCS0	151/159	1&2
	11a/BPSK	6 Mbps	149/157/165	1&2
6dB Spectrum Bandwidth	11n 20MHz	MCS0	149/157/165	1+2
	11n 40MHz	MCS0	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11n 20MHz	MCS0	149/157/165	1+2
	11n 40MHz	MCS0	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2
Band Edge Emissions	11n 20MHz	MCS0	149/157/165	1+2
	11n 40MHz	MCS0	151/159	1+2
	11a/BPSK	6 Mbps	149/157/165	1+2

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

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	QDS-BRCM1049LE
Test Fixture	Bplus	PE3B	N/A

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

Test Software Version	ART2-GUI Version 1.5		
Frequency	2412 MHz	2437 MHz	2462 MHz
MCS0 20MHz	8.5	14.5	11.5

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	ART2-GUI Version 1.5		
Frequency	2422 MHz	2437 MHz	2452 MHz
MCS0 40MHz	7	11	9.5

Power Parameters of IEEE 802.11b/g

Test Software Version	ART2-GUI Version 1.5		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11b	10	8.5	6.5
IEEE 802.11g	10	18	11.5

For 5GHz Band

Power Parameters of IEEE 802.11n MCS0 20MHz

Test Software Version	ART2-GUI Version 1.5		
Frequency	5745 MHz	5785 MHz	5825 MHz
MCS0 20MHz	20	19.5	18.5

Power Parameters of IEEE 802.11n MCS0 40MHz

Test Software Version	ART2-GUI Version 1.5	
Frequency	5755 MHz	5795 MHz
MCS0 40MHz	16	20.5

Power Parameters of IEEE 802.11a

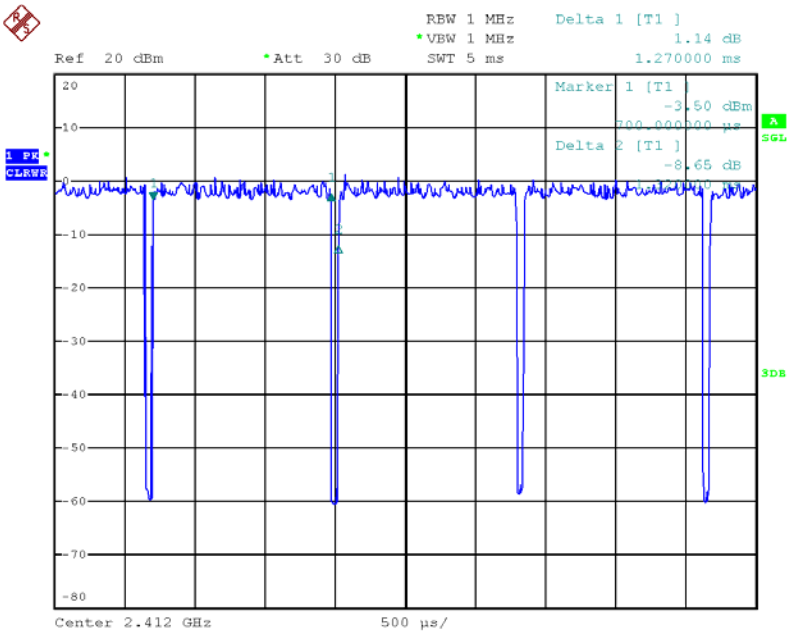
Test Software Version	ART2-GUI Version 1.5		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11a	19.5	19.5	18

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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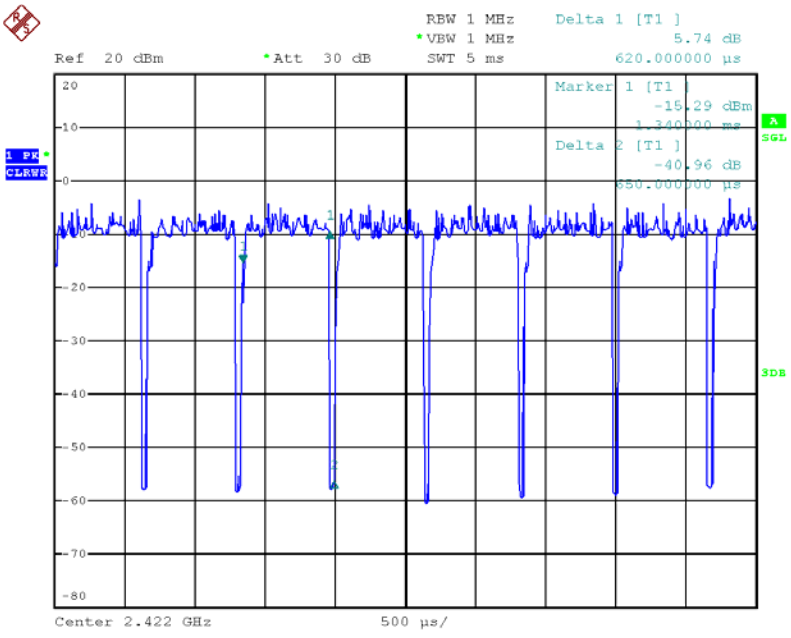
IEEE 802.11n MCS0 40MHz / For 2.4GHz Band



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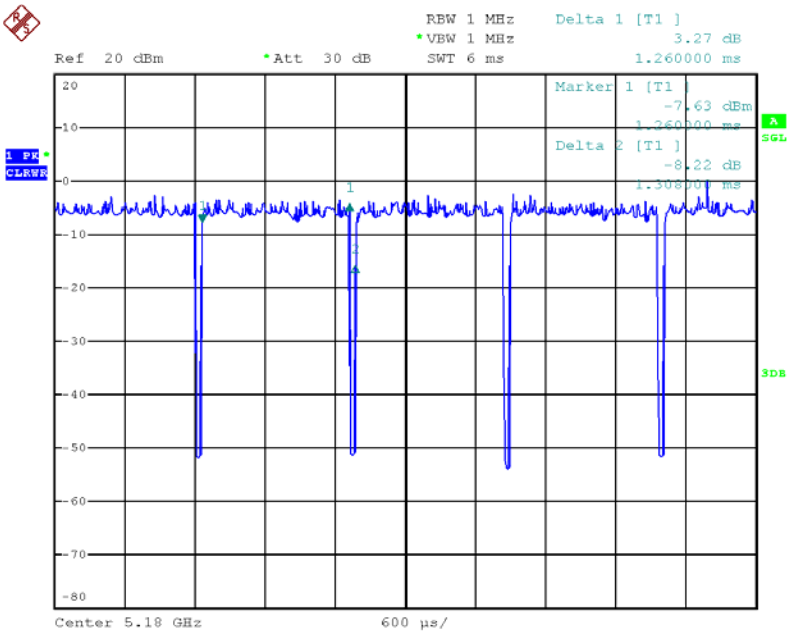

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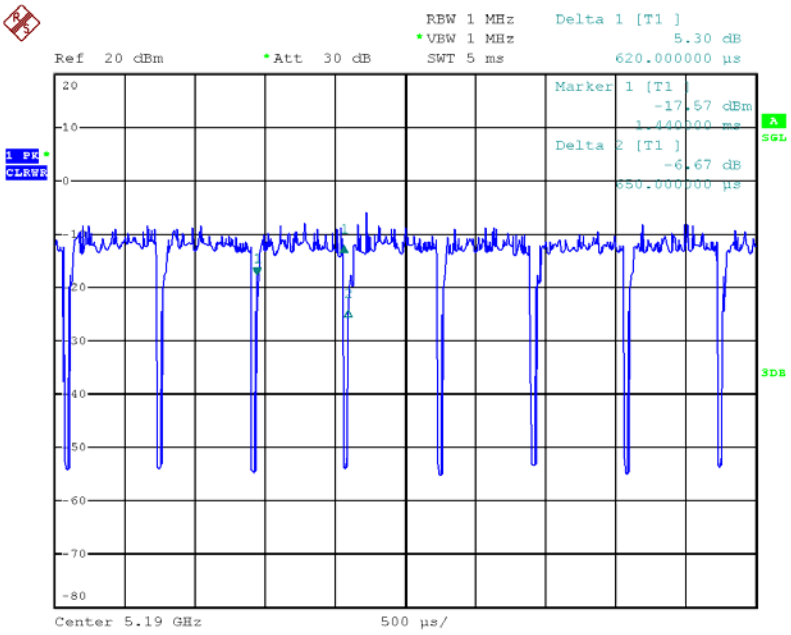
IEEE 802.11n MCS0 40MHz / For 5GHz Band



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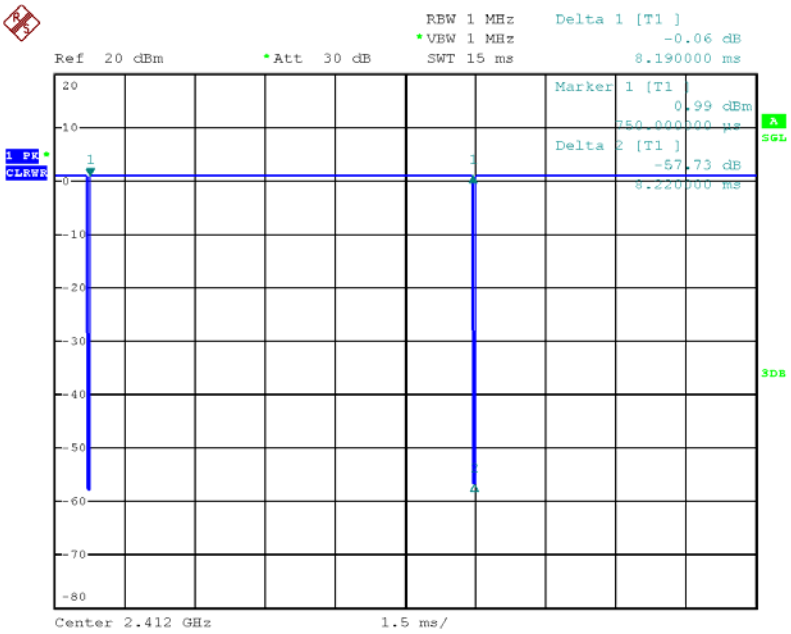
IEEE 802.11b



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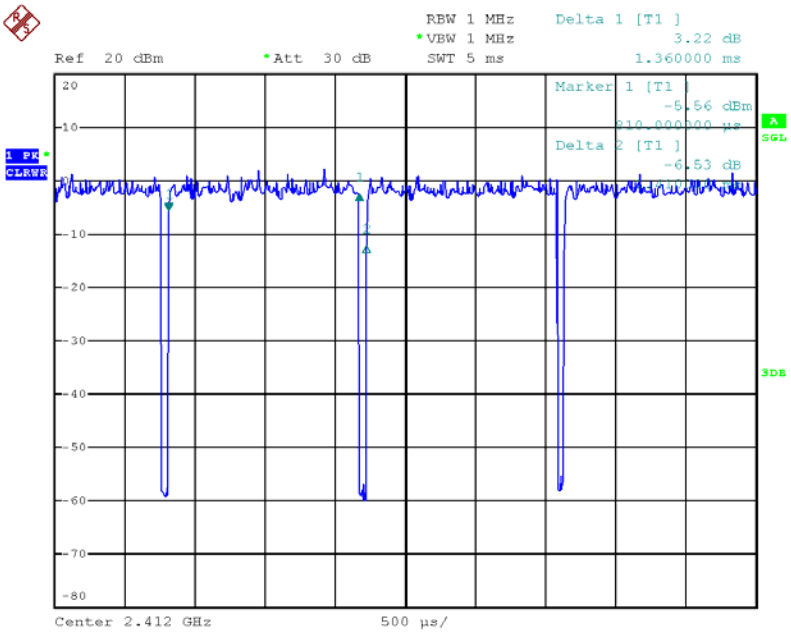
IEEE 802.11g



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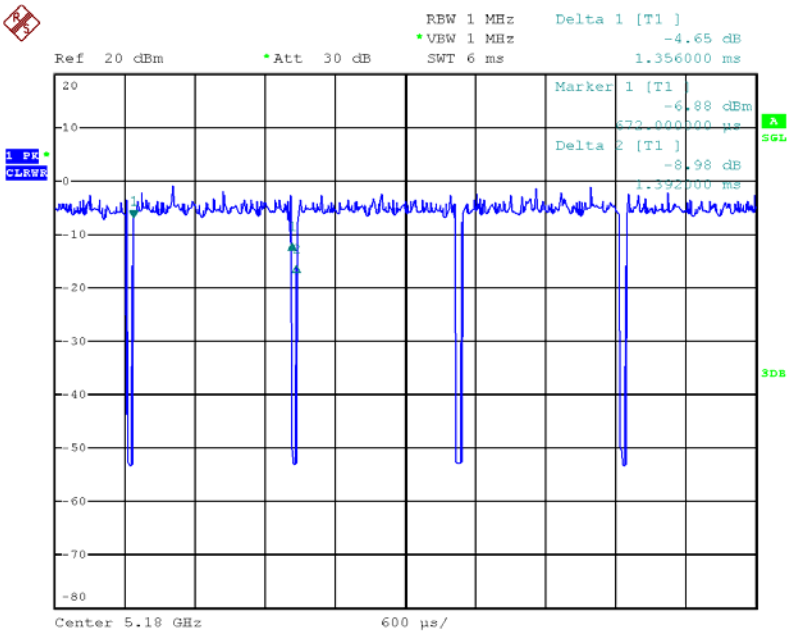
IEEE 802.11a



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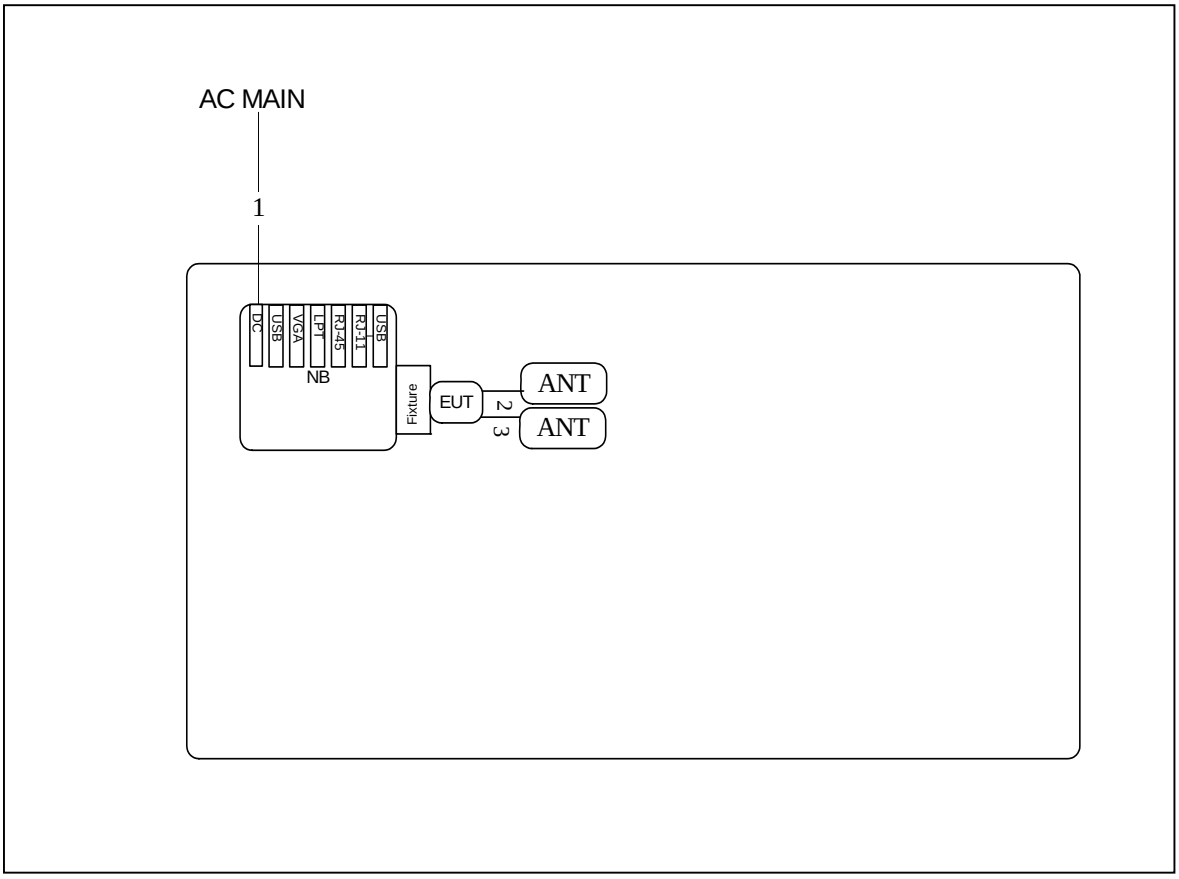
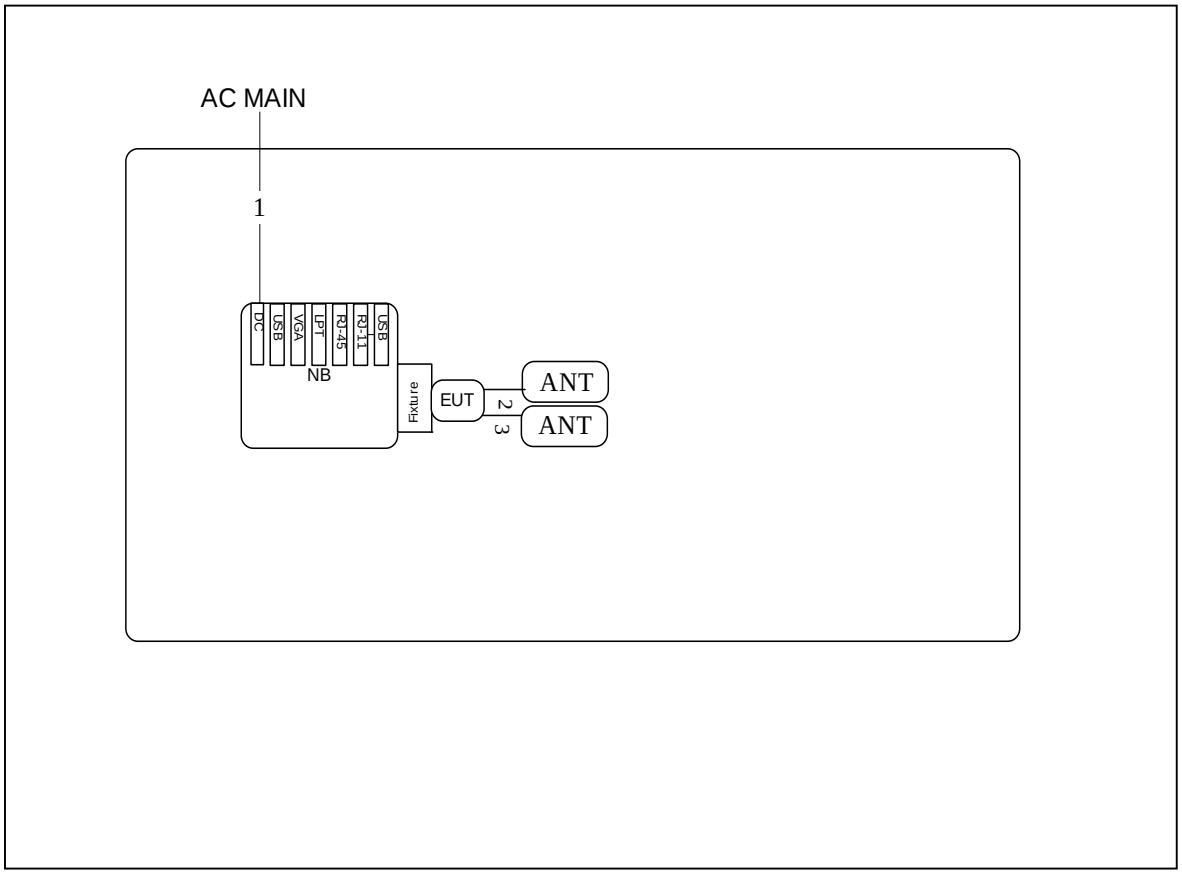
3.11. Test Configurations

3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	AC power cable	No	2.6m
2	Antenna cable	No	0.08m
3	Antenna cable	No	0.06m

3.11.2. Radiation Emissions Test Configuration



Item	Connection	Shield	Length
1	AC power cable	No	2.6m
2	Antenna cable	No	0.08m
3	Antenna cable	No	0.06m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

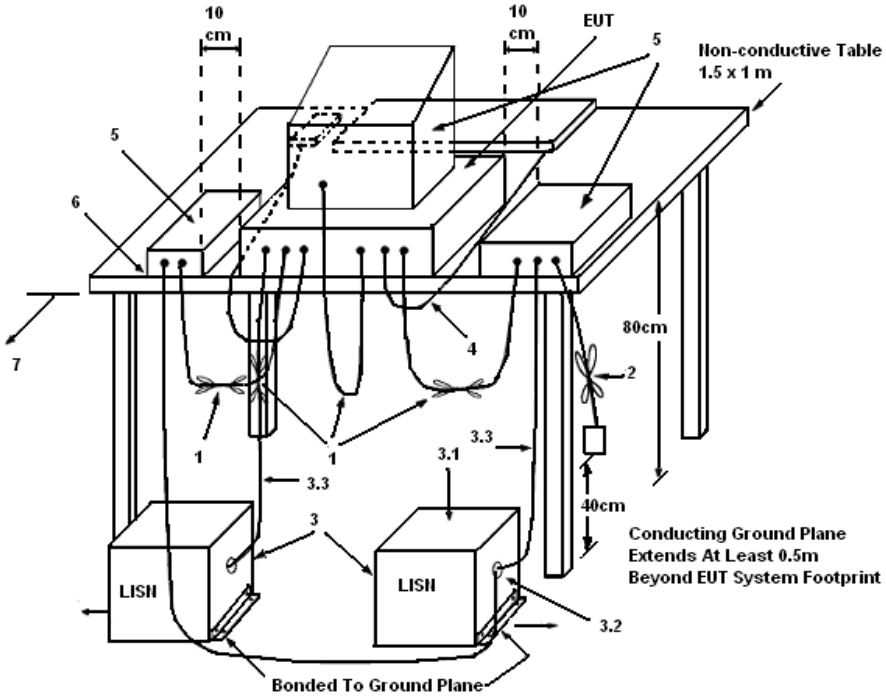
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

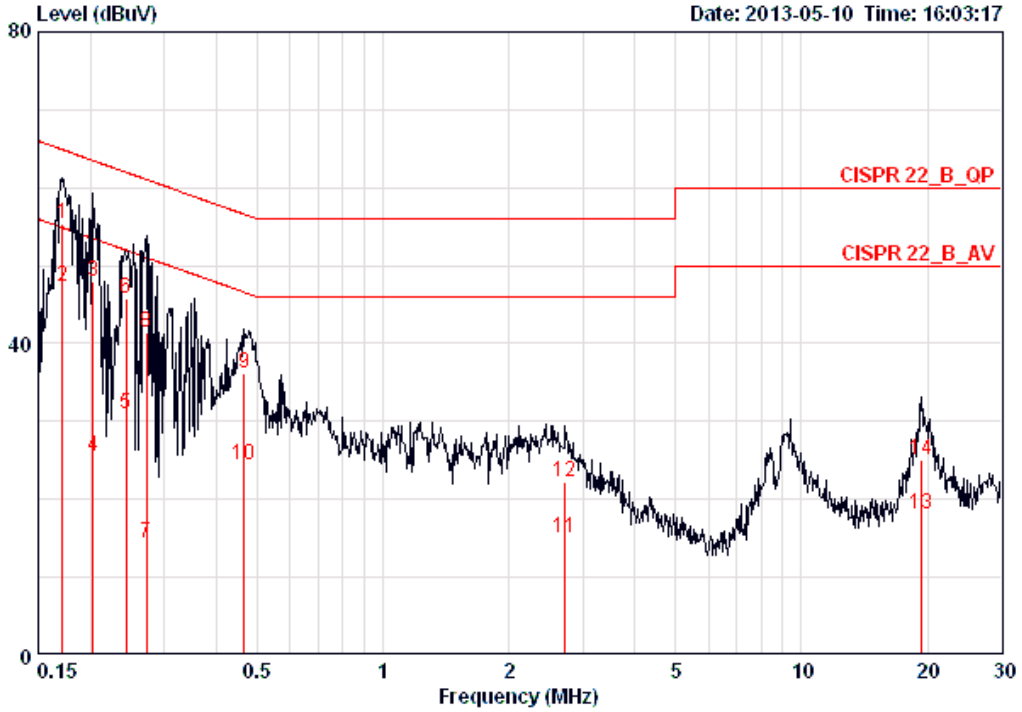
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

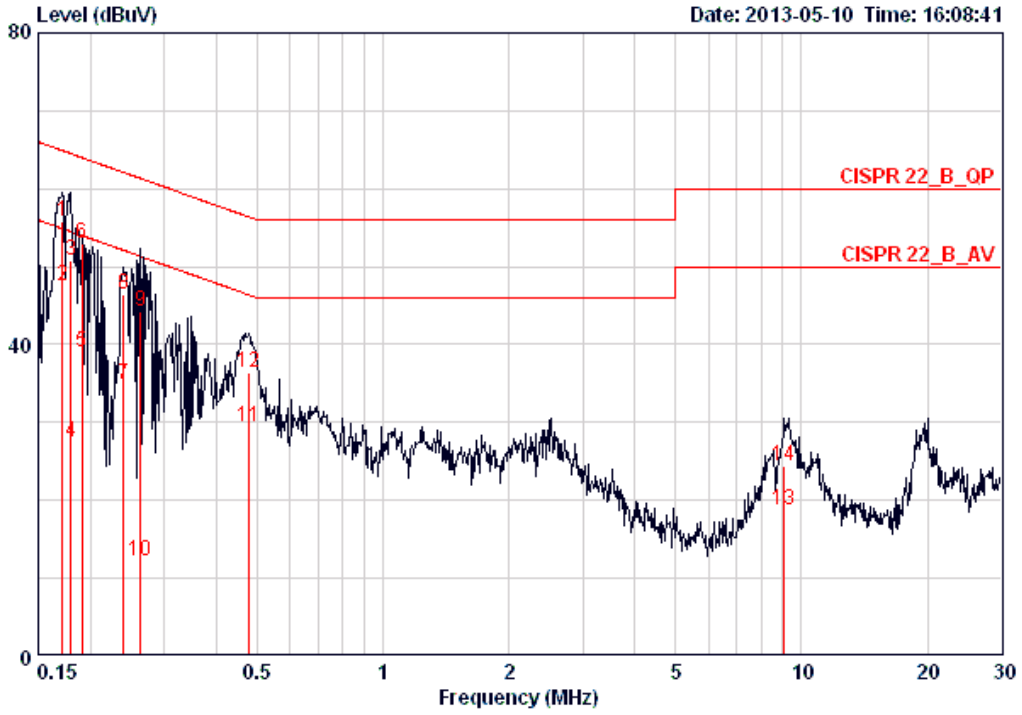
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	48%
Test Engineer	Hank Yang	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.17125	55.37	-9.53	64.90	55.02	0.16	0.19	LINE	QP
2	0.17125	47.31	-7.59	54.90	46.96	0.16	0.19	LINE	AVERAGE
3	0.20289	48.06	-15.43	63.49	47.71	0.15	0.20	LINE	QP
4	0.20289	25.59	-27.90	53.49	25.24	0.15	0.20	LINE	AVERAGE
5	0.24362	30.95	-21.02	51.97	30.60	0.15	0.20	LINE	AVERAGE
6	0.24362	45.72	-16.25	61.97	45.37	0.15	0.20	LINE	QP
7	0.27152	14.32	-36.75	51.07	13.97	0.15	0.20	LINE	AVERAGE
8	0.27152	41.40	-19.67	61.07	41.05	0.15	0.20	LINE	QP
9	0.46614	36.27	-20.31	56.58	35.92	0.15	0.20	LINE	QP
10	0.46614	24.43	-22.15	46.58	24.08	0.15	0.20	LINE	AVERAGE
11	2.721	15.04	-30.96	46.00	14.59	0.20	0.25	LINE	AVERAGE
12	2.721	22.16	-33.84	56.00	21.71	0.20	0.25	LINE	QP
13	19.326	18.06	-31.94	50.00	17.09	0.47	0.50	LINE	AVERAGE
14	19.326	25.17	-34.83	60.00	24.20	0.47	0.50	LINE	QP

Temperature	24°C	Humidity	48%
Test Engineer	Hank Yang	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.17125	55.87	-9.03	64.90	55.60	0.08	0.19	NEUTRAL	QP
2 @	0.17125	47.46	-7.44	54.90	47.19	0.08	0.19	NEUTRAL	AVERAGE
3	0.17961	50.82	-13.68	64.50	50.55	0.08	0.19	NEUTRAL	QP
4	0.17961	27.52	-26.98	54.50	27.25	0.08	0.19	NEUTRAL	AVERAGE
5	0.19039	38.99	-15.03	54.02	38.71	0.08	0.20	NEUTRAL	AVERAGE
6	0.19039	52.99	-11.03	64.02	52.71	0.08	0.20	NEUTRAL	QP
7	0.24037	34.89	-17.19	52.08	34.61	0.08	0.20	NEUTRAL	AVERAGE
8	0.24037	46.47	-15.61	62.08	46.19	0.08	0.20	NEUTRAL	QP
9	0.26303	44.28	-17.06	61.34	44.00	0.08	0.20	NEUTRAL	QP
10	0.26303	12.11	-39.23	51.34	11.83	0.08	0.20	NEUTRAL	AVERAGE
11	0.47865	29.44	-16.92	46.36	29.16	0.08	0.20	NEUTRAL	AVERAGE
12	0.47865	36.51	-19.85	56.36	36.23	0.08	0.20	NEUTRAL	QP
13	9.107	18.65	-31.35	50.00	18.12	0.22	0.31	NEUTRAL	AVERAGE
14	9.107	24.49	-35.51	60.00	23.96	0.22	0.31	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

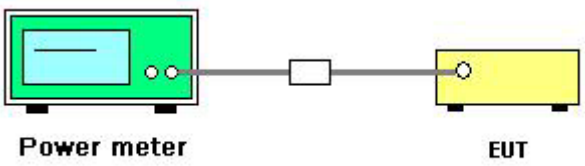
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03 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.

4.2.4. 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	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n
Test Date	Jun. 08, 2013		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
1	2412 MHz	10.05	9.92	13.00	30.00	Complies
6	2437 MHz	15.96	15.81	18.90	30.00	Complies
11	2462 MHz	13.52	13.78	16.66	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
3	2422 MHz	8.63	8.55	11.60	30.00	Complies
6	2437 MHz	12.67	13.15	15.93	30.00	Complies
9	2452 MHz	11.26	11.69	14.49	30.00	Complies

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
149	5745 MHz	17.52	18.44	21.01	30.00	Complies
157	5785 MHz	17.06	17.81	20.46	30.00	Complies
165	5825 MHz	16.36	17.11	19.76	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
151	5755 MHz	15.04	16.01	18.56	30.00	Complies
159	5795 MHz	17.51	18.28	20.92	30.00	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g
Test Date	Jun. 08, 2013		

Configuration IEEE 802.11b / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
1	2412 MHz	10.84	10.81	13.84	30.00	Complies
6	2437 MHz	9.84	9.72	12.79	30.00	Complies
11	2462 MHz	7.61	8.36	11.01	30.00	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
1	2412 MHz	11.46	11.21	14.35	30.00	Complies
6	2437 MHz	19.07	19.02	22.06	30.00	Complies
11	2462 MHz	13.46	13.78	16.63	30.00	Complies

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1	Chain 2			
149	5745 MHz	17.36	18.21	20.82	30.00	Complies
157	5785 MHz	17.16	17.99	20.61	30.00	Complies
165	5825 MHz	16.01	16.89	19.48	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

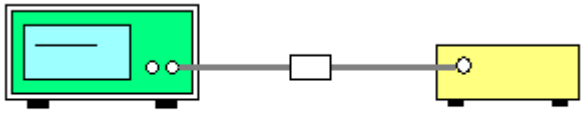
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03 section 10.2 Method PKPSD (peak PSD) & 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 ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 & Chain 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
1	2412 MHz	-16.26	-16.45	4.99	Complies
6	2437 MHz	-10.35	-11.27	4.99	Complies
11	2462 MHz	-12.88	-14.41	4.99	Complies

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

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 & Chain 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
3	2422 MHz	-21.25	-21.11	4.99	Complies
6	2437 MHz	-16.20	-16.42	4.99	Complies
9	2452 MHz	-18.91	-18.57	4.99	Complies

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

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 & Chain 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
149	5745 MHz	-11.43	-9.92	4.99	Complies
157	5785 MHz	-12.17	-10.97	4.99	Complies
165	5825 MHz	-12.82	-9.48	4.99	Complies

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

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
151	5755 MHz	-17.45	-15.17	4.99	Complies
159	5795 MHz	-11.89	-12.45	4.99	Complies

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

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 1 & Chain 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
1	2412 MHz	-12.82	-13.83	4.99	Complies
6	2437 MHz	-15.59	-15.11	4.99	Complies
11	2462 MHz	-13.39	-17.24	4.99	Complies

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

Configuration IEEE 802.11g / Chain 1 & Chain 2

Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
1	2412 MHz	-14.97	-15.34	4.99	Complies
6	2437 MHz	-7.62	-7.44	4.99	Complies
11	2462 MHz	-12.57	-13.11	4.99	Complies

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

Configuration IEEE 802.11a / Chain 1 & Chain 2

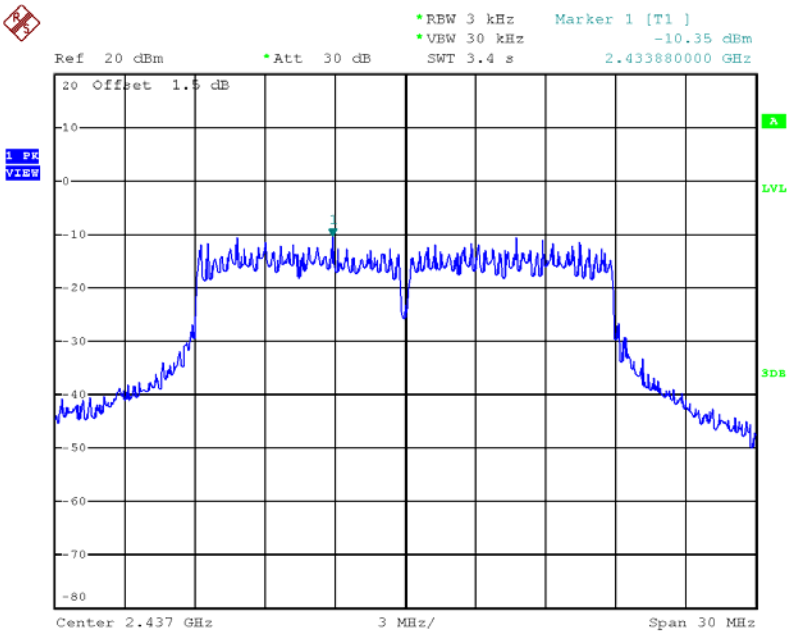
Channel	Frequency	Power Density (dBm/3kHz)		Single Port Limit (dBm/3kHz)	Result
		Chain 1	Chain 2		
149	5745 MHz	-10.94	-9.68	4.99	Complies
157	5785 MHz	-11.74	-10.72	4.99	Complies
165	5825 MHz	-12.78	-10.86	4.99	Complies

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

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

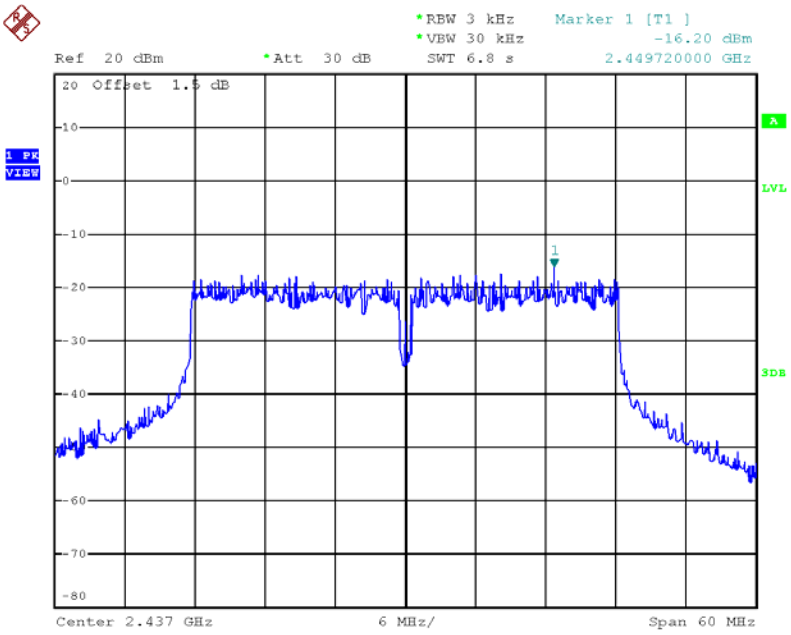
For plots, only the channel with maximum results was shown.

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Chain 1 / 2437 MHz



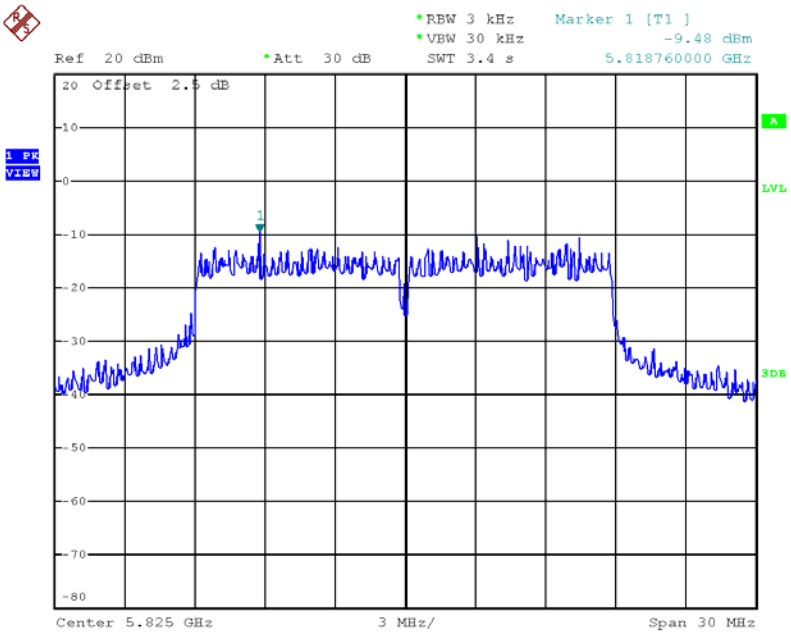
Date: 8.JUN.2013 15:33:16

Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Chain 1 / 2437 MHz



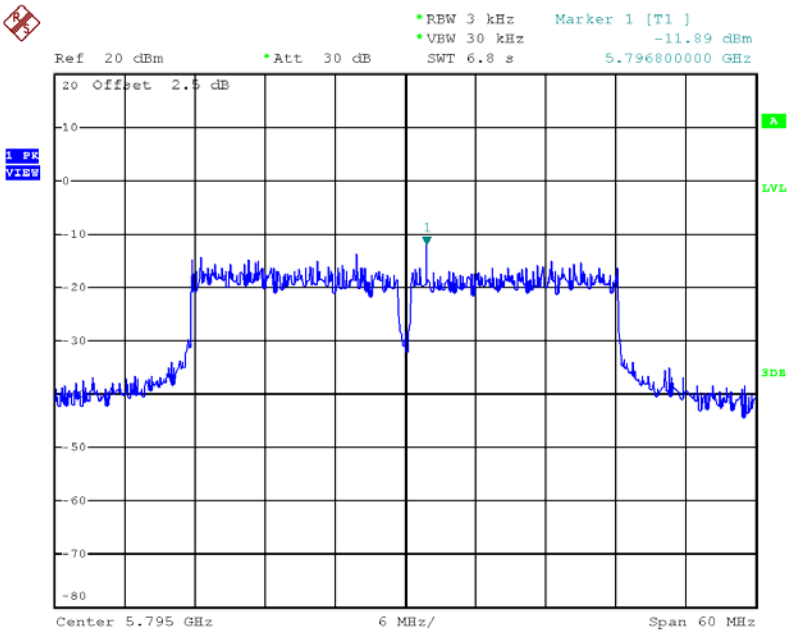
Date: 8.JUN.2013 15:42:47

Power Density Plot on Configuration IEEE 802.11n MCS0 20MHz / Chain 2 / 5825 MHz



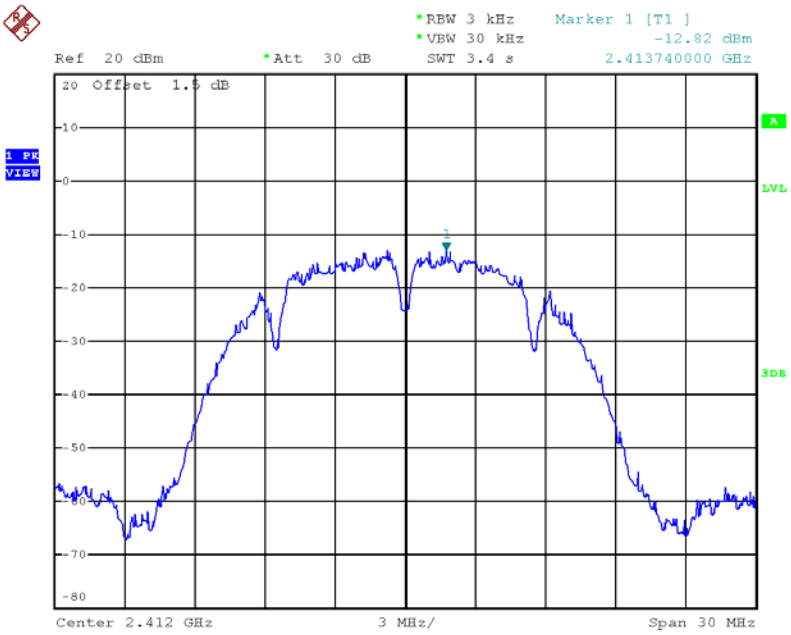
Date: 8.JUN.2013 16:43:04

Power Density Plot on Configuration IEEE 802.11n MCS0 40MHz / Chain 1 / 5795 MHz



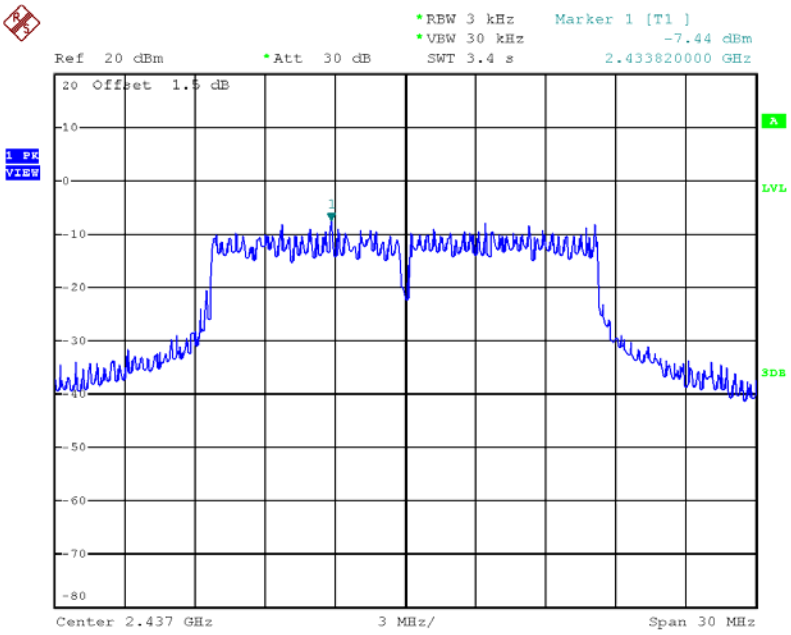
Date: 8.JUN.2013 16:48:36

Power Density Plot on Configuration IEEE 802.11b / Chain 1 / 2412 MHz



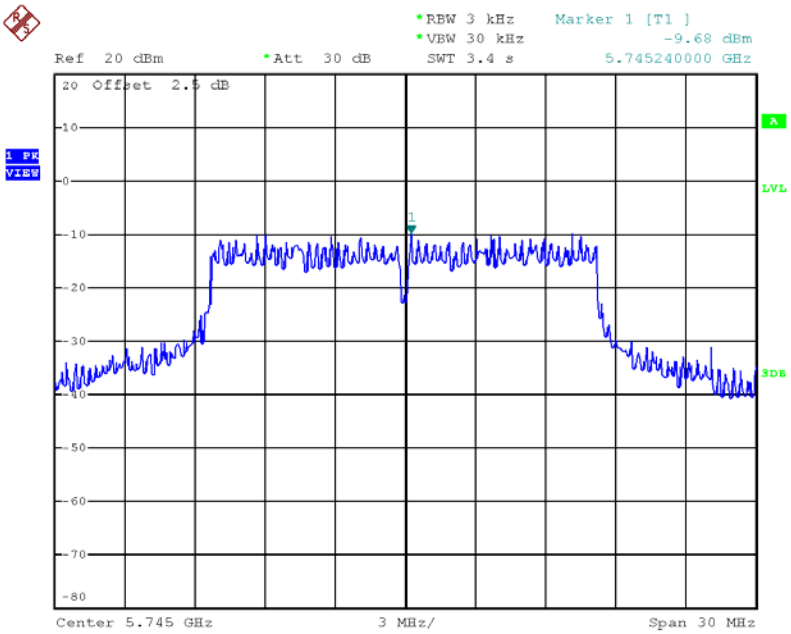
Date: 8.JUN.2013 15:00:38

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



Date: 8.JUN.2013 15:21:56

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



Date: 8.JUN.2013 16:26:14

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

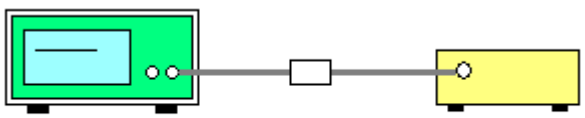
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. 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 8.0 DTS 6-dB signal bandwidth option 1.
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	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	13.20	16.80	500	Complies
6	2437 MHz	17.60	17.92	500	Complies
11	2462 MHz	11.04	16.56	500	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.48	36.64	500	Complies
6	2437 MHz	36.32	36.32	500	Complies
9	2452 MHz	36.32	36.64	500	Complies

For 5GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.60	21.60	500	Complies
157	5785 MHz	11.36	18.00	500	Complies
165	5825 MHz	17.52	20.08	500	Complies

Configuration IEEE 802.11n MCS0 40MHz

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.48	36.80	500	Complies
159	5795 MHz	32.64	49.28	500	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g

Configuration IEEE 802.11b / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	8.56	12.24	500	Complies
6	2437 MHz	9.04	12.48	500	Complies
11	2462 MHz	9.04	12.08	500	Complies

Configuration IEEE 802.11g / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.08	16.64	500	Complies
6	2437 MHz	16.40	16.96	500	Complies
11	2462 MHz	16.32	16.64	500	Complies

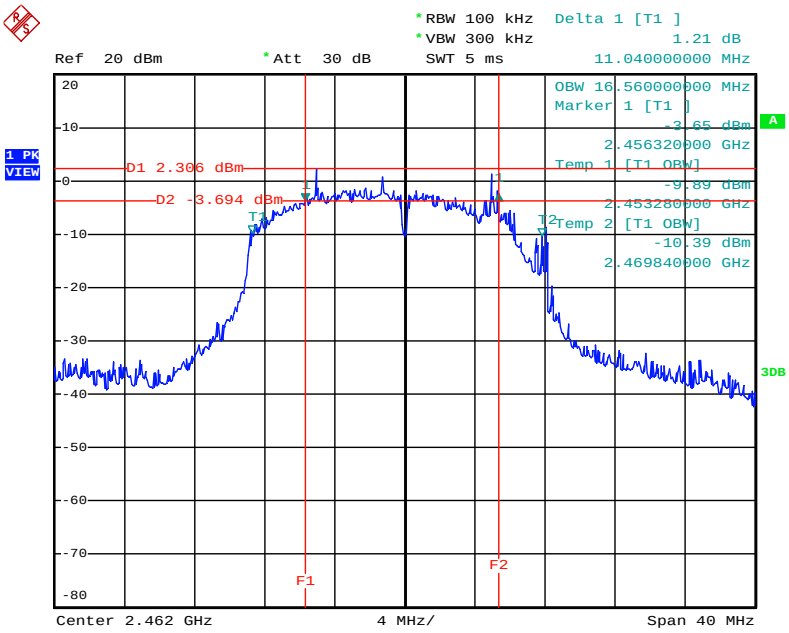
Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.32	18.00	500	Complies
157	5785 MHz	16.32	20.56	500	Complies
165	5825 MHz	16.40	17.68	500	Complies

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

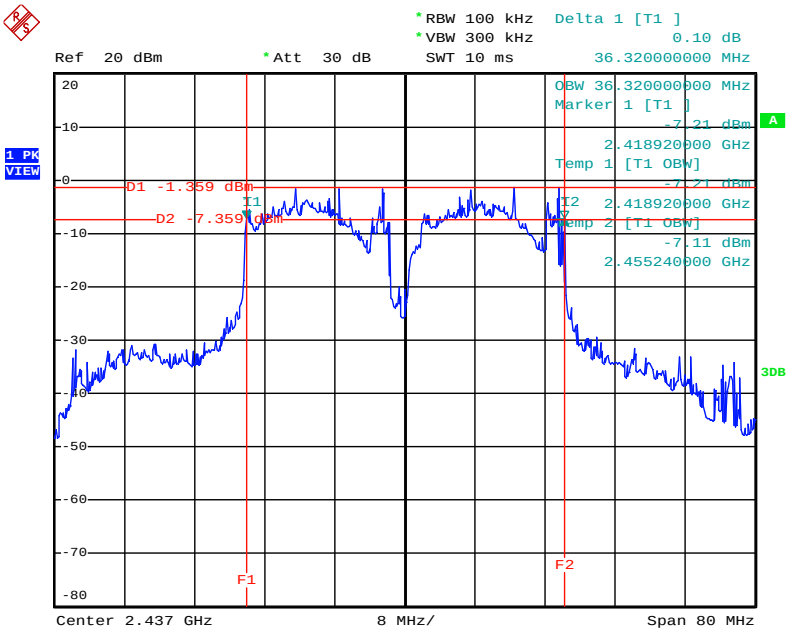
For plots, only the channel with maximum results was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2/ 2462 MHz



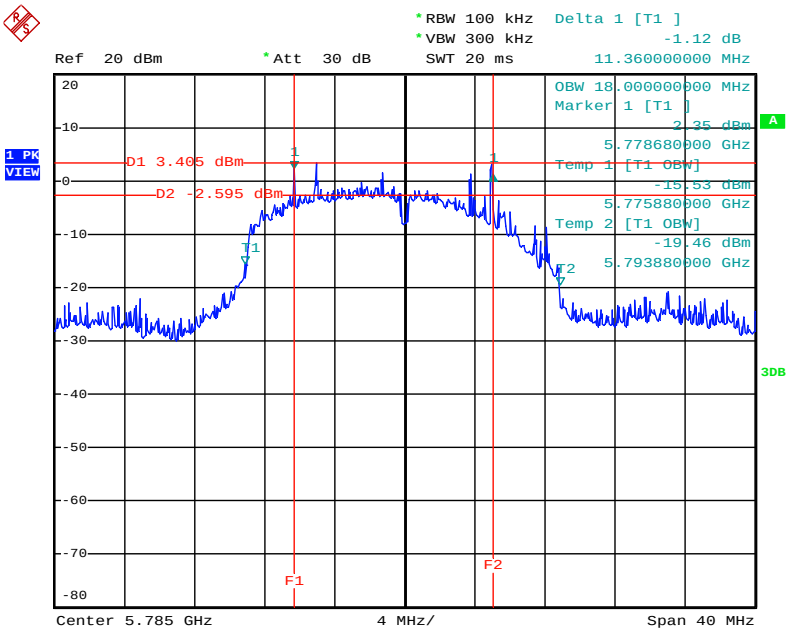
Date: 8.JUN.2013 17:47:02

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2/ 2437 MHz



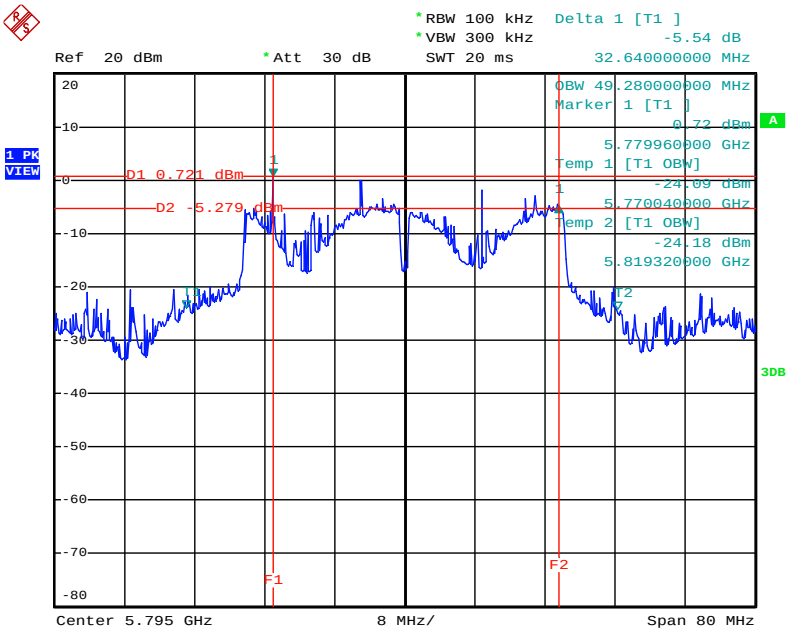
Date: 8.JUN.2013 17:49:21

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 / 5785MHz



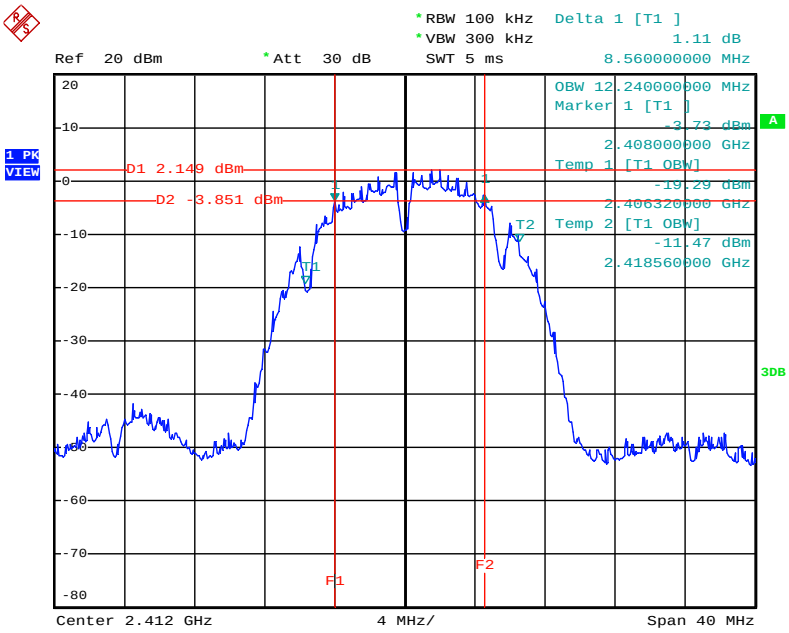
Date: 8.JUN.2013 17:54:57

6 dB Bandwidth Plot on Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 / 5795 MHz



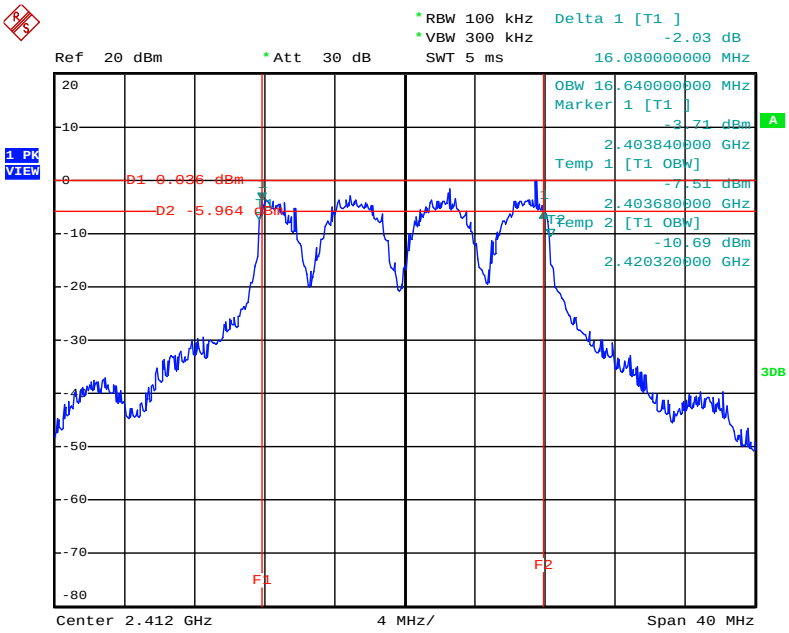
Date: 8.JUN.2013 17:57:48

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



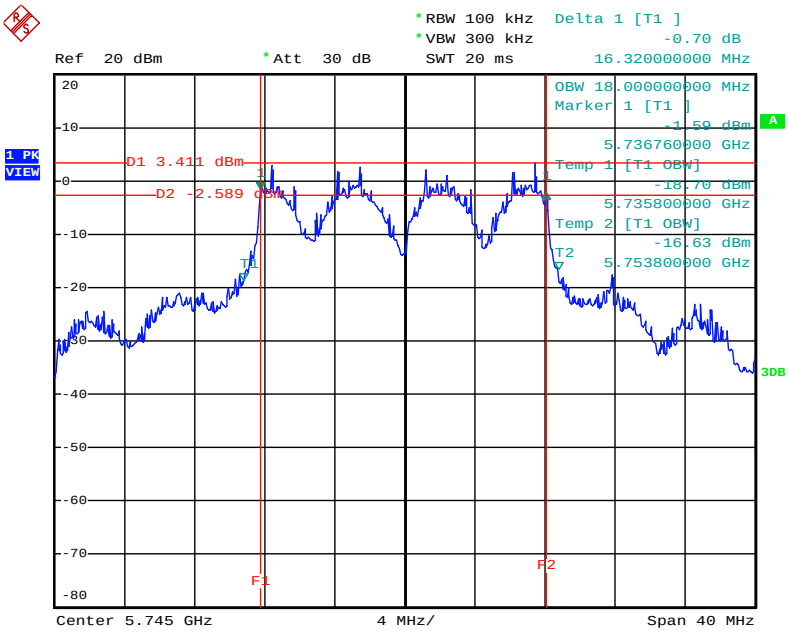
Date: 8.JUN.2013 17:37:29

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



Date: 8.JUN.2013 17:41:42

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



Date: 8.JUN.2013 17:51:48

4.5. Radiated Emissions Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

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

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

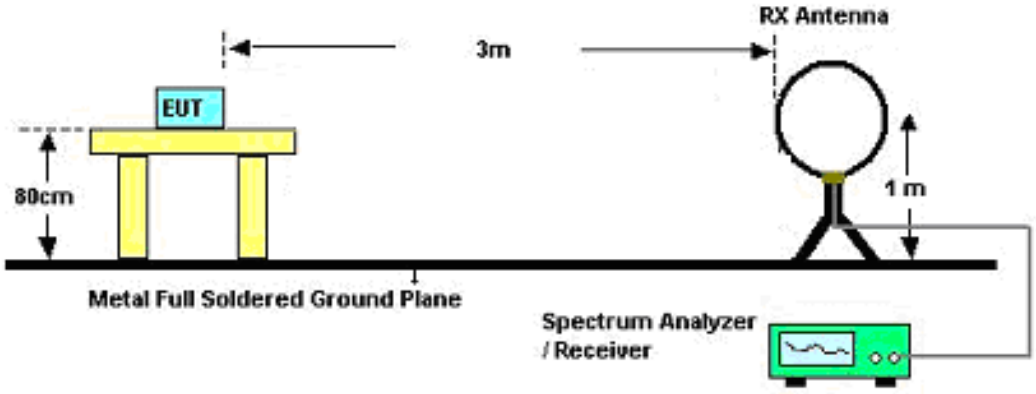
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

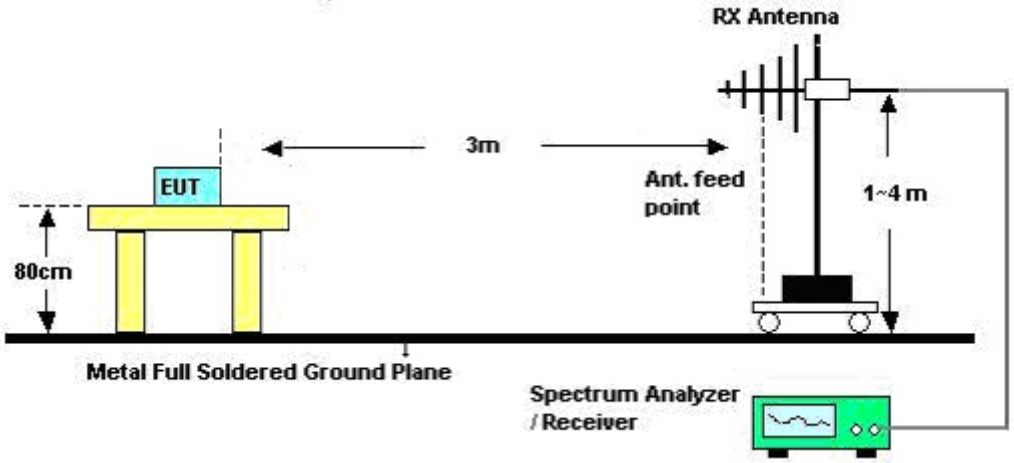
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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	26°C	Humidity	48%
Test Engineer	Wen Chao	Configurations	CTX
Test Date	Jun. 10, 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.

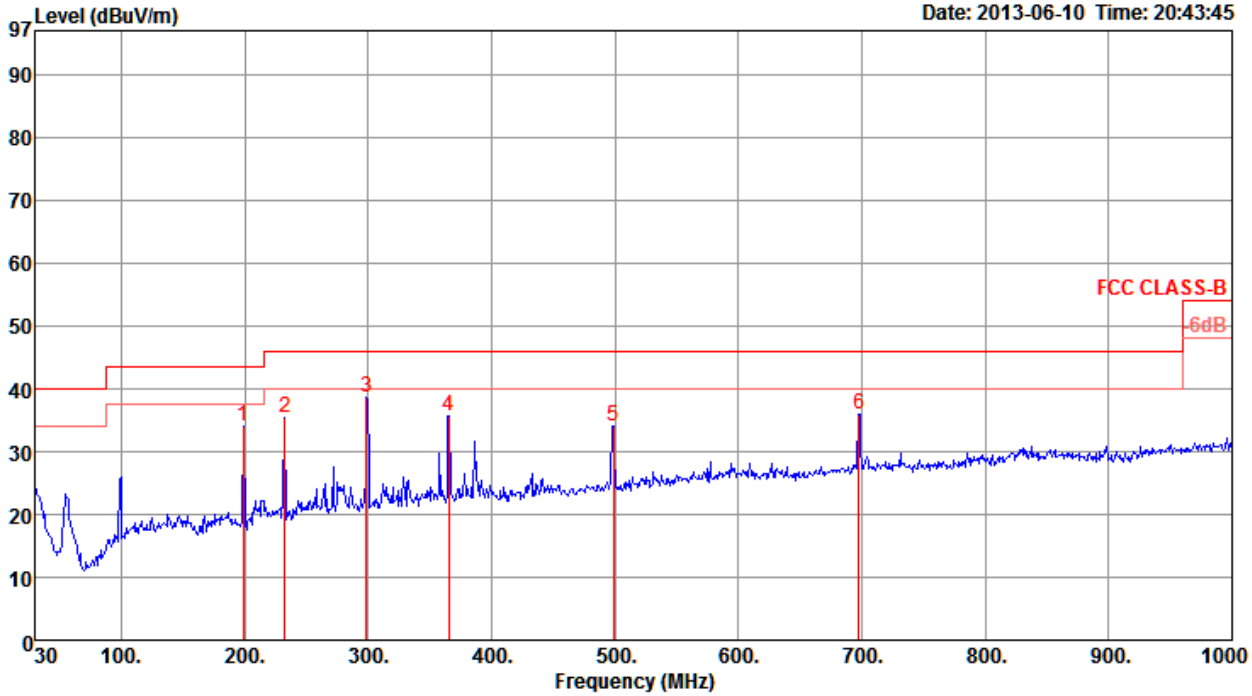
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

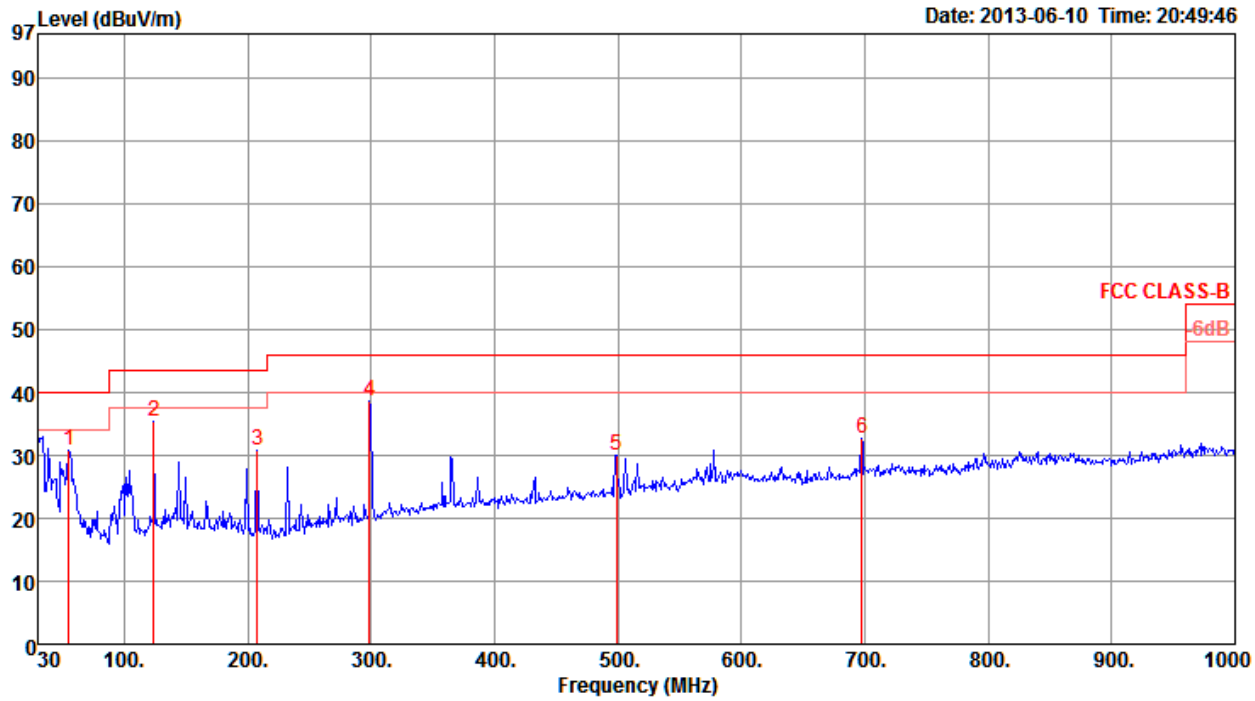
Temperature	26°C	Humidity	48%
Test Engineer	Wen Chao	Configurations	CTX

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	198.78	34.09	43.50	-9.41	48.92	2.09	27.26	10.34	Peak	0	400	HORIZONTAL
2	232.73	35.50	46.00	-10.50	48.68	2.29	27.01	11.54	Peak	0	400	HORIZONTAL
3 p	298.69	38.74	46.00	-7.26	49.26	2.51	26.83	13.80	Peak	0	400	HORIZONTAL
4	365.62	35.79	46.00	-10.21	44.44	2.86	27.19	15.68	Peak	0	400	HORIZONTAL
5	498.51	34.15	46.00	-11.85	40.93	3.38	27.93	17.77	Peak	0	400	HORIZONTAL
6	697.36	35.98	46.00	-10.02	38.96	4.15	27.11	19.98	Peak	0	400	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	55.22	30.87	40.00	-9.13	49.84	1.13	27.90	7.80	Peak	0	100	VERTICAL
2	124.09	35.29	43.50	-8.21	48.39	1.65	27.67	12.92	Peak	0	100	VERTICAL
3	207.51	30.75	43.50	-12.75	45.24	2.15	27.19	10.55	Peak	0	100	VERTICAL
4 p	298.69	38.51	46.00	-7.49	49.03	2.51	26.83	13.80	Peak	0	100	VERTICAL
5	498.51	30.12	46.00	-15.88	36.90	3.38	27.93	17.77	Peak	0	100	VERTICAL
6	697.36	32.64	46.00	-13.36	35.62	4.15	27.11	19.98	Peak	0	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.

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

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz Ch 1 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4825.82	42.74	54.00	-11.26	39.58	5.69	32.77	35.30	101	190	HORIZONTAL	Average
2 pk	4826.02	47.61	74.00	-26.39	44.45	5.69	32.77	35.30	101	190	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 pk	4824.80	47.82	74.00	-26.18	44.67	5.69	32.76	35.30	174	119	VERTICAL	Peak
2 pp	4825.30	38.97	54.00	-15.03	35.81	5.69	32.77	35.30	174	119	VERTICAL	Average

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz Ch 6 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pk	4873.88	61.93	74.00	-12.07	58.69	5.75	32.80	35.31	100	24	HORIZONTAL	Peak
2 pp	4875.02	50.64	54.00	-3.36	47.41	5.75	32.80	35.32	100	24	HORIZONTAL	Average
3	7304.20	48.35	74.00	-25.65	39.54	7.05	37.12	35.36	167	96	HORIZONTAL	Peak
4	7306.50	44.62	54.00	-9.38	35.81	7.05	37.12	35.36	173	96	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 pp	4875.00	46.91	54.00	-7.09	43.67	5.75	32.80	35.31	192	125	VERTICAL	Average
2 pk	4877.18	58.30	74.00	-15.70	55.07	5.75	32.80	35.32	192	125	VERTICAL	Peak
3	7305.36	39.19	54.00	-14.81	30.38	7.05	37.12	35.36	159	272	VERTICAL	Average
4	7316.82	49.66	74.00	-24.34	40.83	7.06	37.13	35.36	159	272	VERTICAL	Peak

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz Ch11 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4924.08	44.87	54.00	-9.13	41.55	5.81	32.84	35.33	114	21	HORIZONTAL	Average
2 pk	4924.30	55.92	74.00	-18.08	52.60	5.81	32.84	35.33	114	21	HORIZONTAL	Peak
3	7378.34	48.99	74.00	-25.01	40.08	7.08	37.15	35.32	100	296	HORIZONTAL	Peak
4	7382.40	40.16	54.00	-13.84	31.24	7.08	37.16	35.32	100	296	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 pp	4924.30	47.05	54.00	-6.95	43.73	5.81	32.84	35.33	167	181	VERTICAL	Average
2 pk	4925.94	58.70	74.00	-15.30	55.38	5.81	32.84	35.33	167	181	VERTICAL	Peak
3	7379.94	39.49	54.00	-14.51	30.57	7.08	37.16	35.32	100	63	VERTICAL	Average
4	7391.32	48.68	74.00	-25.32	39.74	7.09	37.16	35.31	100	63	VERTICAL	Peak

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz Ch 3 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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	4843.60	39.36	54.00	-14.64	36.17	5.71	32.78	35.30	100	162	HORIZONTAL	Average
2	4856.15	47.79	74.00	-26.21	44.58	5.73	32.79	35.31	100	162	HORIZONTAL	Peak
3 pp	7277.40	41.55	54.00	-12.45	32.77	7.04	37.12	35.38	100	79	HORIZONTAL	Average
4 pk	7281.20	51.15	74.00	-22.85	42.37	7.04	37.12	35.38	100	79	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	4858.25	35.90	54.00	-18.10	32.69	5.73	32.79	35.31	100	259	VERTICAL	Average
2	4865.85	45.90	74.00	-28.10	42.68	5.74	32.79	35.31	100	259	VERTICAL	Peak
3 pk	7271.65	49.61	74.00	-24.39	40.84	7.04	37.11	35.38	100	153	VERTICAL	Peak
4 pp	7277.30	40.48	54.00	-13.52	31.70	7.04	37.12	35.38	100	153	VERTICAL	Average

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz Ch 6 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4874.00	43.57	54.00	-10.43	40.33	5.75	32.80	35.31	100	236	HORIZONTAL	Average
2	4876.55	50.10	74.00	-23.90	46.87	5.75	32.80	35.32	100	236	HORIZONTAL	Peak
3	7292.40	42.97	54.00	-11.03	34.17	7.05	37.12	35.37	100	157	HORIZONTAL	Average
4 pk	7303.65	51.17	74.00	-22.83	42.36	7.05	37.12	35.36	100	157	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	4874.00	41.32	54.00	-12.68	38.08	5.75	32.80	35.31	100	329	VERTICAL	Average
2	4895.10	48.68	74.00	-25.32	45.42	5.77	32.81	35.32	100	329	VERTICAL	Peak
3 pp	7314.40	44.24	54.00	-9.76	35.42	7.06	37.12	35.36	100	70	VERTICAL	Average
4 pk	7319.40	52.57	74.00	-21.43	43.73	7.06	37.13	35.35	100	70	VERTICAL	Peak

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz Ch 9 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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	4898.80	47.51	74.00	-26.49	44.23	5.78	32.82	35.32	100	254	HORIZONTAL	Peak
2 pp	4902.75	42.02	54.00	-11.98	38.74	5.78	32.82	35.32	100	254	HORIZONTAL	Average
3 pk	7339.45	49.43	74.00	-24.57	40.56	7.07	37.14	35.34	100	118	HORIZONTAL	Peak
4	7359.40	40.84	54.00	-13.16	31.94	7.08	37.15	35.33	100	118	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4912.65	47.45	74.00	-26.55	44.16	5.79	32.83	35.33	100	223	VERTICAL	Peak
2	4923.10	40.80	54.00	-13.20	37.49	5.81	32.83	35.33	100	223	VERTICAL	Average
3 pp	7346.25	41.12	54.00	-12.88	32.25	7.07	37.14	35.34	100	196	VERTICAL	Average
4 pk	7368.90	50.44	74.00	-23.56	41.54	7.08	37.15	35.33	100	196	VERTICAL	Peak

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz CH 149 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11491.36	48.65	54.00	-5.35	34.99	9.24	39.50	35.08	Average	135	342	HORIZONTAL
2	11493.68	63.81	74.00	-10.19	50.15	9.24	39.50	35.08	Peak	135	342	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11489.68	50.91	54.00	-3.09	37.25	9.24	39.50	35.08	Average	144	336	VERTICAL
2	11493.28	67.40	74.00	-6.60	53.74	9.24	39.50	35.08	Peak	144	336	VERTICAL

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz CH 157 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11571.20	49.07	54.00	-4.93	35.43	9.26	39.47	35.09	Average	133	340	HORIZONTAL
2	11571.92	63.96	74.00	-10.04	50.31	9.26	39.47	35.08	Peak	133	340	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11571.76	50.99	54.00	-3.01	37.35	9.26	39.47	35.09	Average	140	21	VERTICAL
2	11573.44	66.77	74.00	-7.23	53.12	9.26	39.47	35.08	Peak	140	21	VERTICAL

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz CH 165 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11651.36	48.95	54.00	-5.05	35.30	9.28	39.44	35.07	Average	133	348	HORIZONTAL
2	11651.52	64.05	74.00	-9.95	50.40	9.28	39.44	35.07	Peak	133	348	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	11651.28	50.49	54.00	-3.51	36.84	9.28	39.44	35.07	Average	139	19	VERTICAL
2	11652.96	65.60	74.00	-8.40	51.95	9.28	39.44	35.07	Peak	139	19	VERTICAL

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz CH 151 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11511.60	50.06	54.00	-3.94	36.41	9.25	39.50	35.10	Average	140	347	HORIZONTAL
2	11514.56	65.49	74.00	-8.51	51.84	9.25	39.50	35.10	Peak	140	347	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	11511.52	50.60	54.00	-3.40	36.95	9.25	39.50	35.10	Average	144	28	VERTICAL
2	11515.76	65.53	74.00	-8.47	51.88	9.25	39.50	35.10	Peak	144	28	VERTICAL

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz CH 159 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11591.44	49.28	54.00	-4.72	35.62	9.27	39.47	35.08	Average	140	343	HORIZONTAL
2	11595.36	64.16	74.00	-9.84	50.50	9.27	39.47	35.08	Peak	140	343	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	11590.64	66.99	74.00	-7.01	53.33	9.27	39.47	35.08	Peak	141	28	VERTICAL
2	11591.52	50.94	54.00	-3.06	37.28	9.27	39.47	35.08	Average	141	28	VERTICAL

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4823.98	50.42	54.00	-3.58	47.27	5.69	32.76	35.30	112	90	HORIZONTAL	Average
2 pk	4823.99	53.44	74.00	-20.56	50.29	5.69	32.76	35.30	112	90	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 pk	4823.93	53.47	74.00	-20.53	50.32	5.69	32.76	35.30	187	190	VERTICAL	Peak
2 pp	4823.96	50.61	54.00	-3.39	47.46	5.69	32.76	35.30	187	190	VERTICAL	Average

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4873.97	50.54	54.00	-3.46	47.30	5.75	32.80	35.31	103	152	HORIZONTAL	Average
2 pk	4873.97	53.37	74.00	-20.63	50.13	5.75	32.80	35.31	103	152	HORIZONTAL	Peak
3	7304.64	49.09	74.00	-24.91	40.28	7.05	37.12	35.36	100	263	HORIZONTAL	Peak
4	7310.10	40.14	54.00	-13.86	31.32	7.06	37.12	35.36	100	263	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 pp	4873.99	50.94	54.00	-3.06	47.70	5.75	32.80	35.31	163	196	VERTICAL	Average
2 pk	4874.00	53.17	74.00	-20.83	49.93	5.75	32.80	35.31	163	196	VERTICAL	Peak
3	7318.28	50.22	74.00	-23.78	41.39	7.06	37.13	35.36	100	354	VERTICAL	Peak
4	7320.66	40.32	54.00	-13.68	31.48	7.06	37.13	35.35	100	354	VERTICAL	Average

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pk	4923.89	53.18	74.00	-20.82	49.86	5.81	32.84	35.33	105	169	HORIZONTAL	Peak
2 pp	4923.95	50.44	54.00	-3.56	47.12	5.81	32.84	35.33	105	169	HORIZONTAL	Average
3	7386.75	50.84	74.00	-23.16	41.91	7.09	37.16	35.32	100	125	HORIZONTAL	Peak
4	7386.77	39.57	54.00	-14.43	30.64	7.09	37.16	35.32	100	125	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 pp	4923.94	48.27	54.00	-5.73	44.95	5.81	32.84	35.33	160	197	VERTICAL	Average
2 pk	4923.99	51.66	74.00	-22.34	48.34	5.81	32.84	35.33	160	197	VERTICAL	Peak
3	7385.50	50.65	74.00	-23.35	41.72	7.09	37.16	35.32	100	122	VERTICAL	Peak
4	7386.22	38.94	54.00	-15.06	30.01	7.09	37.16	35.32	100	122	VERTICAL	Average

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4824.38	43.65	54.00	-10.35	40.50	5.69	32.76	35.30	121	161	HORIZONTAL	Average
2 pk	4830.26	50.89	74.00	-23.11	47.73	5.69	32.77	35.30	121	161	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 pp	4823.92	41.65	54.00	-12.35	38.50	5.69	32.76	35.30	152	181	VERTICAL	Average
2 pk	4825.62	48.01	74.00	-25.99	44.85	5.69	32.77	35.30	152	181	VERTICAL	Peak

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	4873.44	60.68	74.00	-13.32	57.44	5.75	32.80	35.31	100	24	HORIZONTAL	Peak
2 pp	4874.54	50.26	54.00	-3.74	47.02	5.75	32.80	35.31	100	24	HORIZONTAL	Average
3 pk	7306.00	63.64	74.00	-10.36	54.83	7.05	37.12	35.36	172	163	HORIZONTAL	Peak
4 !	7306.90	50.17	54.00	-3.83	41.36	7.05	37.12	35.36	172	163	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 pp	4873.90	49.62	54.00	-4.38	46.38	5.75	32.80	35.31	165	120	VERTICAL	Average
2 pk	4876.10	59.41	74.00	-14.59	56.18	5.75	32.80	35.32	165	120	VERTICAL	Peak
3	7299.90	51.99	74.00	-22.01	43.19	7.05	37.12	35.37	100	52	VERTICAL	Peak
4	7314.10	45.16	54.00	-8.84	36.34	7.06	37.12	35.36	100	52	VERTICAL	Average

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

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 pp	4924.50	44.51	54.00	-9.49	41.19	5.81	32.84	35.33	114	159	HORIZONTAL	Average
2 pk	4924.52	54.54	74.00	-19.46	51.22	5.81	32.84	35.33	114	159	HORIZONTAL	Peak
3	7383.34	49.13	74.00	-24.87	40.21	7.08	37.16	35.32	100	213	HORIZONTAL	Peak
4	7386.78	40.47	54.00	-13.53	31.54	7.09	37.16	35.32	100	213	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 pp	4924.42	46.93	54.00	-7.07	43.61	5.81	32.84	35.33	162	155	VERTICAL	Average
2 pk	4924.88	57.94	74.00	-16.06	54.62	5.81	32.84	35.33	162	155	VERTICAL	Peak
3	7383.54	51.36	74.00	-22.64	42.44	7.08	37.16	35.32	100	306	VERTICAL	Peak
4	7388.56	39.64	54.00	-14.36	30.70	7.09	37.16	35.31	100	306	VERTICAL	Average

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11490.48	64.02	74.00	-9.98	50.36	9.24	39.50	35.08	Peak	141	347	HORIZONTAL
2	11490.64	47.99	54.00	-6.01	34.33	9.24	39.50	35.08	Average	141	347	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	11490.80	67.47	74.00	-6.53	53.81	9.24	39.50	35.08	Peak	149	346	VERTICAL
2	11491.12	50.56	54.00	-3.44	36.90	9.24	39.50	35.08	Average	149	346	VERTICAL

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11570.64	50.42	54.00	-3.58	36.78	9.26	39.47	35.09	Average	139	344	HORIZONTAL
2	11570.96	66.63	74.00	-7.37	52.99	9.26	39.47	35.09	Peak	139	344	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.80	50.97	54.00	-3.03	37.33	9.26	39.47	35.09	Average	140	21	VERTICAL
2	11571.12	66.25	74.00	-7.75	52.61	9.26	39.47	35.09	Peak	140	21	VERTICAL

Temperature	26℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2
Test Date	Jun. 06, 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	11650.80	49.94	54.00	-4.06	36.29	9.28	39.44	35.07	Average	133	344	HORIZONTAL
2	11650.88	66.14	74.00	-7.86	52.49	9.28	39.44	35.07	Peak	133	344	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11646.64	66.03	74.00	-7.97	52.38	9.28	39.44	35.07	Peak	140	24	VERTICAL
2	11650.72	50.48	54.00	-3.52	36.83	9.28	39.44	35.07	Average	140	24	VERTICAL

Note:

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

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

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

4.6. Emissions Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RBW / VBW (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 Radiated 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 Radiated emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz Ch 1 / Chain 1 + Chain 2
Test date	Jun. 06, 2013		

Channel 1 / 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 !	2389.80	69.62	74.00	-4.38	38.04	3.68	27.90	0.00	100	92	HORIZONTAL	Peak
2 !	2390.00	52.47	54.00	-1.53	20.89	3.68	27.90	0.00	100	92	HORIZONTAL	Average
3 pk	2406.90	102.14			70.55	3.69	27.90	0.00	100	92	HORIZONTAL	Peak
4 pp	2407.60	94.17			62.58	3.69	27.90	0.00	100	92	HORIZONTAL	Average

Channel 1 / 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	2389.60	67.67	74.00	-6.33	36.09	3.68	27.90	0.00	162	148	VERTICAL	Peak
2 !	2390.00	51.66	54.00	-2.34	20.08	3.68	27.90	0.00	162	148	VERTICAL	Average
3 pk	2417.80	103.40			71.80	3.70	27.90	0.00	162	148	VERTICAL	Peak
4 pp	2418.50	94.82			63.22	3.70	27.90	0.00	162	148	VERTICAL	Average

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

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz Ch 6 / Chain 1 + Chain 2
Test date	Jun. 06, 2013		

Channel 6 / 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	2389.80	45.75	54.00	-8.25	14.17	3.68	27.90	0.00	104	99	HORIZONTAL	Average
2	2390.00	63.72	74.00	-10.28	32.14	3.68	27.90	0.00	104	99	HORIZONTAL	Peak
3 pp	2434.40	101.05			69.45	3.70	27.90	0.00	104	99	HORIZONTAL	Average
4 pk	2435.20	111.73			80.13	3.70	27.90	0.00	104	99	HORIZONTAL	Peak
5	2487.10	44.88	54.00	-9.12	13.25	3.73	27.90	0.00	104	99	HORIZONTAL	Average
6	2493.70	61.00	74.00	-13.00	29.36	3.74	27.90	0.00	104	99	HORIZONTAL	Peak

Channel 6 / 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	2385.20	47.32	54.00	-6.68	15.74	3.68	27.90	0.00	194	165	VERTICAL	Average
2 !	2386.20	68.90	74.00	-5.10	37.32	3.68	27.90	0.00	194	165	VERTICAL	Peak
3 pp	2441.80	103.93			72.32	3.71	27.90	0.00	194	165	VERTICAL	Average
4 pk	2441.80	114.01			82.40	3.71	27.90	0.00	194	165	VERTICAL	Peak
5	2484.30	45.76	54.00	-8.24	14.13	3.73	27.90	0.00	194	165	VERTICAL	Average
6	2484.30	64.24	74.00	-9.76	32.61	3.73	27.90	0.00	194	165	VERTICAL	Peak

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

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 20MHz Ch 11 / Chain 1 + Chain 2
Test date	Jun. 06, 2013		

Channel 11 / 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 pk	2456.00	106.92			75.30	3.72	27.90	0.00	191	164	HORIZONTAL	Peak
2 pp	2456.70	97.88			66.26	3.72	27.90	0.00	191	164	HORIZONTAL	Average
3 !	2483.50	52.22	54.00	-1.78	20.59	3.73	27.90	0.00	191	164	HORIZONTAL	Average
4	2483.50	65.30	74.00	-8.70	33.67	3.73	27.90	0.00	191	164	HORIZONTAL	Peak

Channel 11 / 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 pp	2468.50	96.93			65.31	3.72	27.90	0.00	155	149	VERTICAL	Average
2 pk	2469.20	104.66			73.04	3.72	27.90	0.00	155	149	VERTICAL	Peak
3 !	2483.70	52.39	54.00	-1.61	20.76	3.73	27.90	0.00	155	149	VERTICAL	Average
4 !	2485.30	68.67	74.00	-5.33	37.04	3.73	27.90	0.00	155	149	VERTICAL	Peak

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

Temperature	26°C	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz Ch 3 / Chain 1 + Chain 2
Test date	Jun. 06, 2013		

Channel 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 !	2390.00	52.82	54.00	-1.18	21.24	3.68	27.90	0.00	100	91	HORIZONTAL	Average
2 !	2390.00	68.16	74.00	-5.84	36.58	3.68	27.90	0.00	100	91	HORIZONTAL	Peak
3 pp	2404.80	93.35			61.76	3.69	27.90	0.00	100	91	HORIZONTAL	Average
4 pk	2407.80	95.21			63.62	3.69	27.90	0.00	100	91	HORIZONTAL	Peak

Channel 3 / 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	2389.60	66.53	74.00	-7.47	34.95	3.68	27.90	0.00	196	195	VERTICAL	Peak
2 !	2390.00	52.94	54.00	-1.06	21.36	3.68	27.90	0.00	196	195	VERTICAL	Average
3 pp	2406.80	88.57			56.98	3.69	27.90	0.00	196	195	VERTICAL	Average
4 pk	2407.60	97.16			65.57	3.69	27.90	0.00	196	195	VERTICAL	Peak

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

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz Ch 6 / Chain 1 + Chain 2
Test date	Jun. 06, 2013		

Channel 6 / 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	2388.80	62.39	74.00	-11.61	30.81	3.68	27.90	0.00	100	100	HORIZONTAL	Peak
2 !	2390.00	50.33	54.00	-3.67	18.75	3.68	27.90	0.00	100	100	HORIZONTAL	Average
3 pp	2420.60	89.48			57.88	3.70	27.90	0.00	100	100	HORIZONTAL	Average
4 pk	2421.20	98.15			66.55	3.70	27.90	0.00	100	100	HORIZONTAL	Peak
5	2483.50	46.30	54.00	-7.70	14.67	3.73	27.90	0.00	100	100	HORIZONTAL	Average
6	2483.90	60.43	74.00	-13.57	28.80	3.73	27.90	0.00	100	100	HORIZONTAL	Peak

Channel 6 / 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	2389.40	67.85	74.00	-6.15	36.27	3.68	27.90	0.00	161	148	VERTICAL	Peak
2 !	2390.00	52.56	54.00	-1.44	20.98	3.68	27.90	0.00	161	148	VERTICAL	Average
3 pp	2419.60	91.53			59.93	3.70	27.90	0.00	161	148	VERTICAL	Average
4 pk	2420.80	100.37			68.77	3.70	27.90	0.00	161	148	VERTICAL	Peak
5	2483.50	45.93	54.00	-8.07	14.30	3.73	27.90	0.00	161	148	VERTICAL	Average
6	2483.90	59.73	74.00	-14.27	28.10	3.73	27.90	0.00	161	148	VERTICAL	Peak

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

Temperature	26℃	Humidity	56%
Test Engineer	Wen Chao	Configurations	IEEE 802.11n MCS0 40MHz Ch 9 / Chain 1 + Chain 2
Test date	Jun. 06, 2013		

Channel 9 / 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	pp 2440.80	87.87			56.26	3.71	27.90	0.00	100	98	HORIZONTAL	Average
2	pk 2444.00	96.06			64.45	3.71	27.90	0.00	100	98	HORIZONTAL	Peak
3	! 2483.50	50.87	54.00	-3.13	19.24	3.73	27.90	0.00	100	98	HORIZONTAL	Average
4	2483.90	63.05	74.00	-10.95	31.42	3.73	27.90	0.00	100	98	HORIZONTAL	Peak

Channel 9 / 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	pk 2435.60	98.63			67.03	3.70	27.90	0.00	193	186	VERTICAL	Peak
2	pp 2439.60	90.12			58.51	3.71	27.90	0.00	193	186	VERTICAL	Average
3	! 2483.50	52.73	54.00	-1.27	21.10	3.73	27.90	0.00	193	186	VERTICAL	Average
4	2484.50	64.33	74.00	-9.67	32.70	3.73	27.90	0.00	193	186	VERTICAL	Peak

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	25℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Channel 1 / 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	2388.80	57.98	74.00	-16.02	26.40	3.68	27.90	0.00	100	100	HORIZONTAL	Peak
2	2390.00	42.15	54.00	-11.85	10.57	3.68	27.90	0.00	100	100	HORIZONTAL	Average
3 pk	2412.90	100.74			69.15	3.69	27.90	0.00	100	100	HORIZONTAL	Peak
4 pp	2413.70	98.66			67.07	3.69	27.90	0.00	100	100	HORIZONTAL	Average

Channel 1 / 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	2390.00	42.59	54.00	-11.41	11.01	3.68	27.90	0.00	201	179	VERTICAL	Average
2	2390.00	56.74	74.00	-17.26	25.16	3.68	27.90	0.00	201	179	VERTICAL	Peak
3 pk	2409.30	101.87			70.28	3.69	27.90	0.00	201	179	VERTICAL	Peak
4 pp	2410.20	99.94			68.35	3.69	27.90	0.00	201	179	VERTICAL	Average

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

Temperature	25℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Channel 6 / 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	2389.20	57.20	74.00	-16.80	25.62	3.68	27.90	0.00	100	99	HORIZONTAL	Peak
2	2390.00	42.13	54.00	-11.87	10.55	3.68	27.90	0.00	100	99	HORIZONTAL	Average
3 pp	2438.80	97.31			65.70	3.71	27.90	0.00	100	99	HORIZONTAL	Average
4 pk	2439.80	99.66			68.05	3.71	27.90	0.00	100	99	HORIZONTAL	Peak
5	2483.50	42.37	54.00	-11.63	10.74	3.73	27.90	0.00	100	99	HORIZONTAL	Average
6	2499.50	57.44	74.00	-16.56	25.80	3.74	27.90	0.00	100	99	HORIZONTAL	Peak

Channel 6 / 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	2350.20	42.61	54.00	-11.39	11.05	3.66	27.90	0.00	163	37	VERTICAL	Average
2	2390.00	57.73	74.00	-16.27	26.15	3.68	27.90	0.00	163	37	VERTICAL	Peak
3 pk	2438.00	99.74			68.13	3.71	27.90	0.00	163	37	VERTICAL	Peak
4 pp	2438.80	97.77			66.16	3.71	27.90	0.00	163	37	VERTICAL	Average
5	2483.50	42.30	54.00	-11.70	10.67	3.73	27.90	0.00	163	37	VERTICAL	Average
6	2485.70	58.68	74.00	-15.32	27.05	3.73	27.90	0.00	163	37	VERTICAL	Peak

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

Temperature	25°C	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Channel 11 / 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 pk	2459.30	95.74			64.12	3.72	27.90	0.00	100	37	HORIZONTAL	Peak
2 pp	2460.20	93.25			61.63	3.72	27.90	0.00	100	37	HORIZONTAL	Average
3	2483.50	42.31	54.00	-11.69	10.68	3.73	27.90	0.00	100	37	HORIZONTAL	Average
4	2483.50	57.86	74.00	-16.14	26.23	3.73	27.90	0.00	100	37	HORIZONTAL	Peak

Channel 11 / 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 pk	2462.90	98.31			66.69	3.72	27.90	0.00	194	197	VERTICAL	Peak
2 pp	2463.70	96.29			64.67	3.72	27.90	0.00	194	197	VERTICAL	Average
3	2483.50	42.76	54.00	-11.24	11.13	3.73	27.90	0.00	194	197	VERTICAL	Average
4	2485.00	58.15	74.00	-15.85	26.52	3.73	27.90	0.00	194	197	VERTICAL	Peak

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

Temperature	25℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Channel 1 / 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 !	2390.00	51.99	54.00	-2.01	20.41	3.68	27.90	0.00	100	92	HORIZONTAL	Average
2 !	2390.00	69.77	74.00	-4.23	38.19	3.68	27.90	0.00	100	92	HORIZONTAL	Peak
3 pp	2408.50	95.52			63.93	3.69	27.90	0.00	100	92	HORIZONTAL	Average
4 pk	2408.90	104.07			72.48	3.69	27.90	0.00	100	92	HORIZONTAL	Peak

Channel 1 / 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 !	2390.00	52.56	54.00	-1.44	20.98	3.68	27.90	0.00	134	140	VERTICAL	Average
2 !	2390.00	68.50	74.00	-5.50	36.92	3.68	27.90	0.00	134	140	VERTICAL	Peak
3 pp	2406.50	96.22			64.63	3.69	27.90	0.00	134	140	VERTICAL	Average
4 pk	2406.90	103.66			72.07	3.69	27.90	0.00	134	140	VERTICAL	Peak

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

Temperature	25°C	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Channel 6 / 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	!	2389.80	49.46	54.00	-4.54	17.88	3.68	27.90	0.00	100	98	HORIZONTAL	Average
2		2390.00	64.49	74.00	-9.51	32.91	3.68	27.90	0.00	100	98	HORIZONTAL	Peak
3	pp	2443.60	104.18			72.57	3.71	27.90	0.00	100	98	HORIZONTAL	Average
4	pk	2443.60	112.11			80.50	3.71	27.90	0.00	100	98	HORIZONTAL	Peak
5		2483.50	47.21	54.00	-6.79	15.58	3.73	27.90	0.00	100	98	HORIZONTAL	Average
6		2483.50	60.62	74.00	-13.38	28.99	3.73	27.90	0.00	100	98	HORIZONTAL	Peak

Channel 6 / 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	!	2389.80	68.06	74.00	-5.94	36.48	3.68	27.90	0.00	193	168	VERTICAL	Peak
2	!	2390.00	51.82	54.00	-2.18	20.24	3.68	27.90	0.00	193	168	VERTICAL	Average
3	pk	2440.00	113.59			81.98	3.71	27.90	0.00	193	168	VERTICAL	Peak
4	pp	2440.60	105.62			74.01	3.71	27.90	0.00	193	168	VERTICAL	Average
5		2484.70	60.15	74.00	-13.85	28.52	3.73	27.90	0.00	193	168	VERTICAL	Peak
6		2484.90	46.05	54.00	-7.95	14.42	3.73	27.90	0.00	193	168	VERTICAL	Average

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

Temperature	25℃	Humidity	48%
Test Engineer	Wen Chao	Configurations	IEEE 802.11g CH 11/ Chain 1 + Chain 2
Test Date	Jun. 06, 2013		

Channel 11 / 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 pk	2456.20	105.54			73.92	3.72	27.90	0.00	103	100	HORIZONTAL	Peak
2 pp	2466.10	97.08			65.46	3.72	27.90	0.00	103	100	HORIZONTAL	Average
3	2484.40	65.22	74.00	-8.78	33.59	3.73	27.90	0.00	103	100	HORIZONTAL	Peak
4 !	2485.20	50.35	54.00	-3.65	18.72	3.73	27.90	0.00	103	100	HORIZONTAL	Average

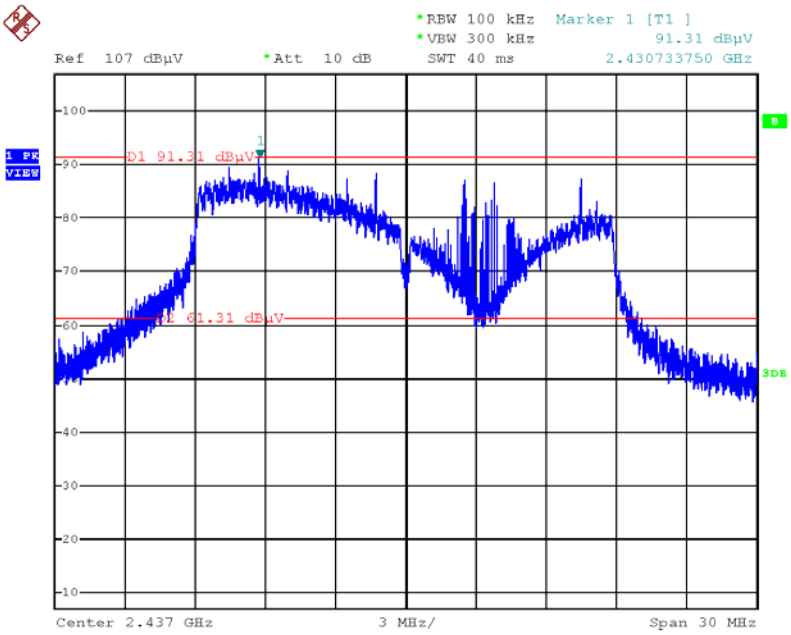
Channel 11 / Vertical

	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 pk	2458.80	105.54			73.92	3.72	27.90	0.00	130	38	VERTICAL	Peak
2 pp	2459.10	97.60			65.98	3.72	27.90	0.00	130	38	VERTICAL	Average
3 !	2483.70	52.84	54.00	-1.16	21.21	3.73	27.90	0.00	130	38	VERTICAL	Average
4	2483.80	67.88	74.00	-6.12	36.25	3.73	27.90	0.00	130	38	VERTICAL	Peak

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

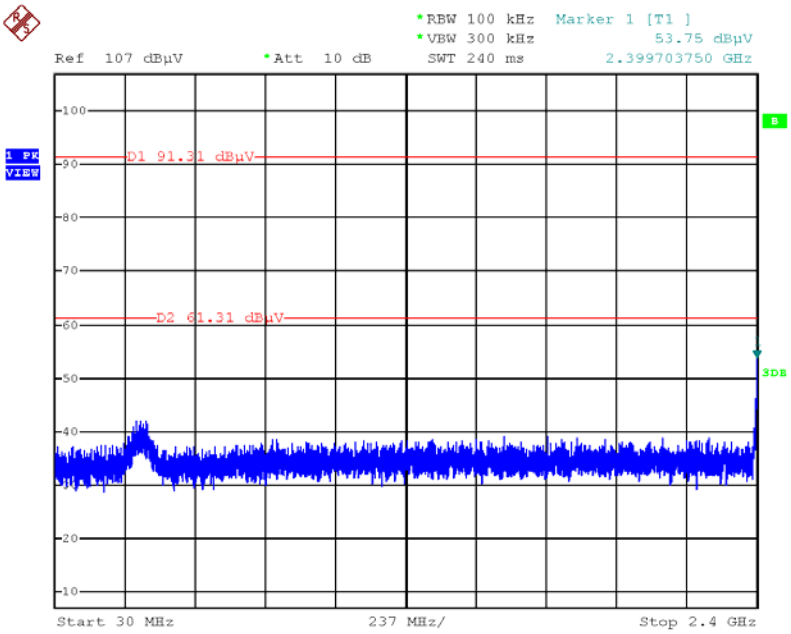
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11n MCS0 20MHz / Reference Level



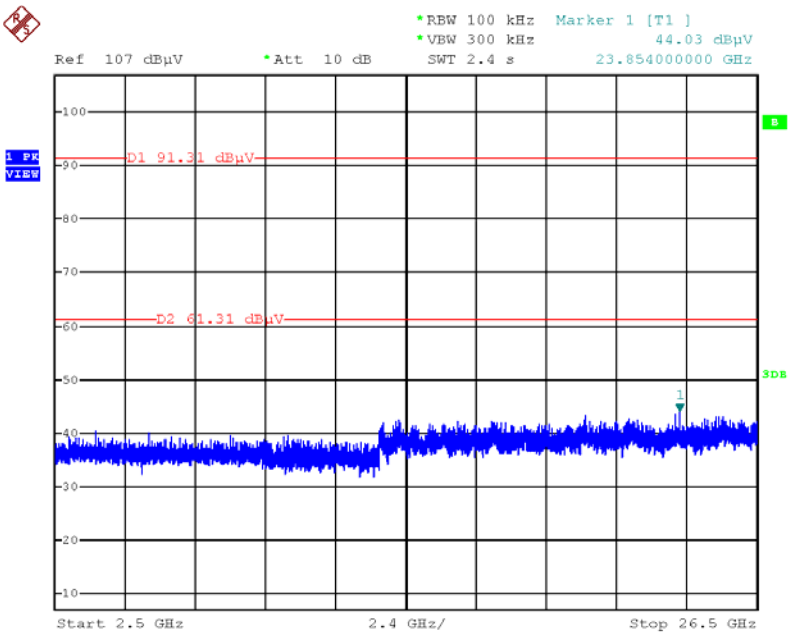
Date: 7.JUN.2013 04:59:07

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 1 / 30MHz~2400MHz (down 30dBc)



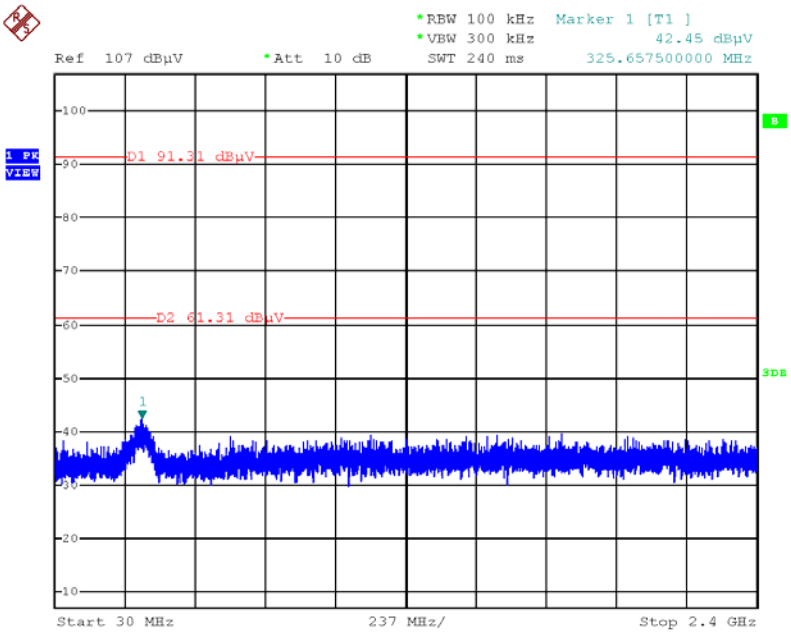
Date: 7.JUN.2013 04:59:26

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



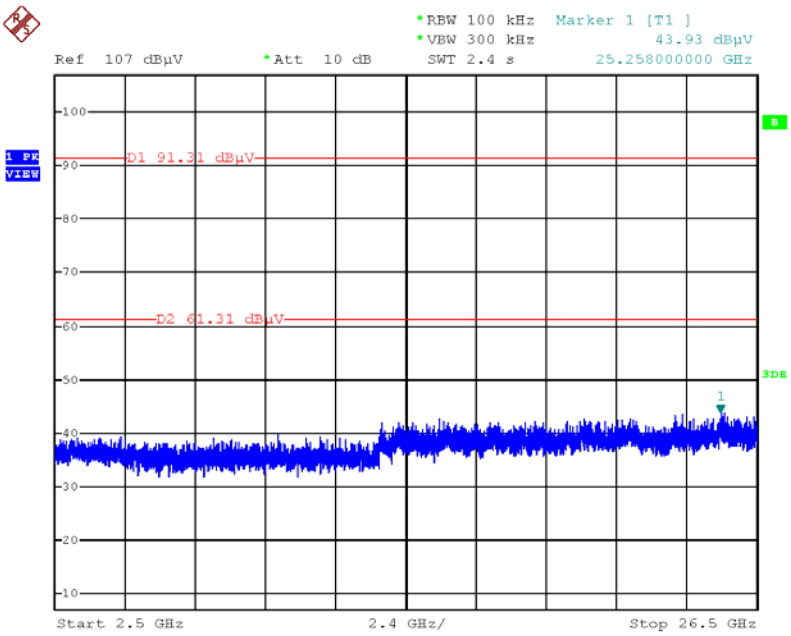
Date: 7.JUN.2013 04:59:41

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



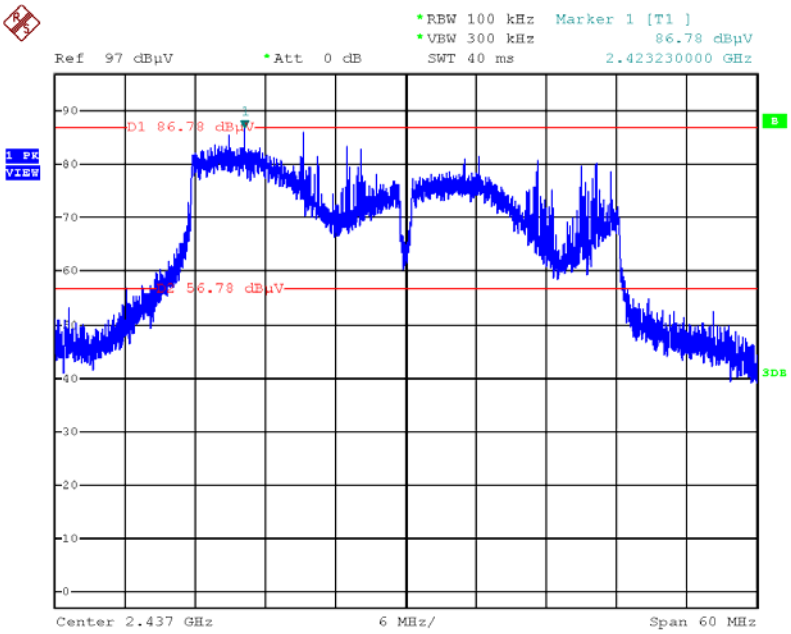
Date: 7.JUN.2013 05:00:08

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



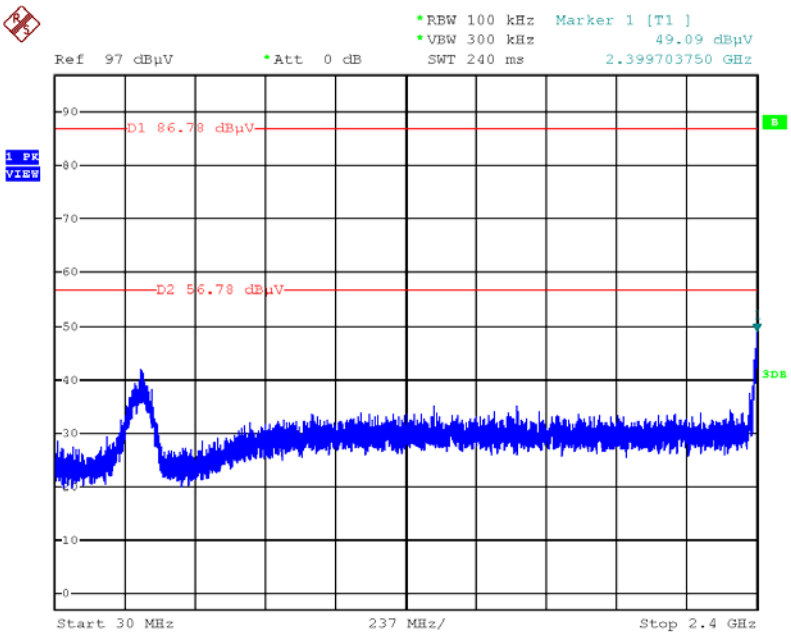
Date: 7.JUN.2013 04:59:57

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



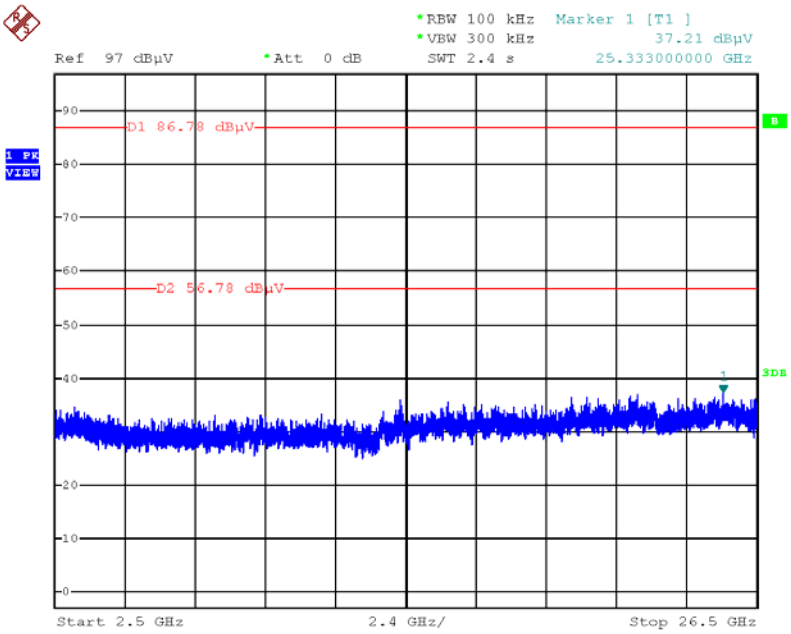
Date: 7.JUN.2013 04:56:57

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



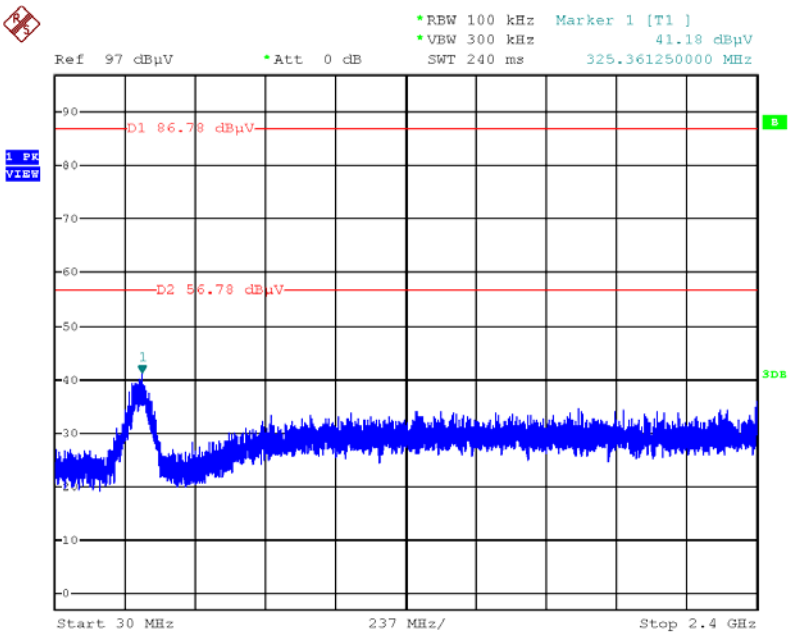
Date: 7.JUN.2013 04:57:31

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 3 / 2500MHz~26500MHz (down 30dBc)



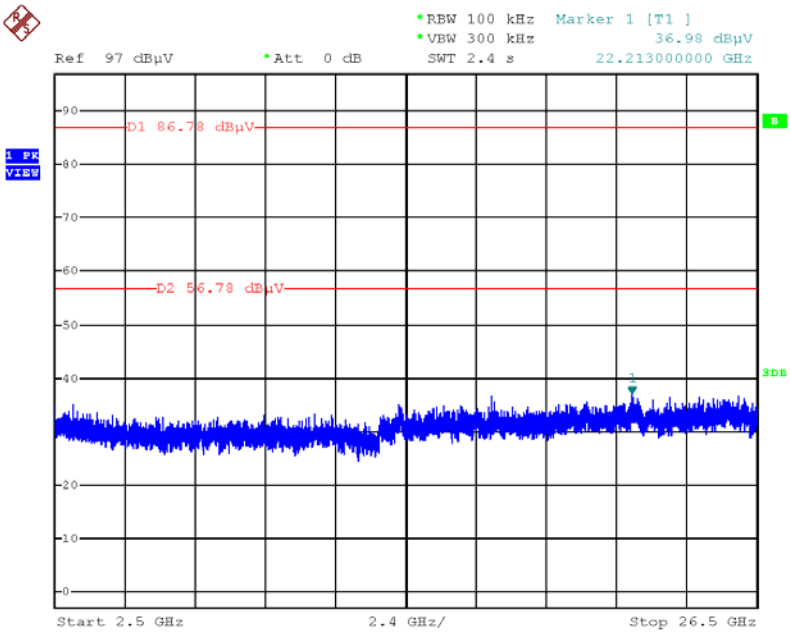
Date: 7.JUN.2013 04:57:45

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



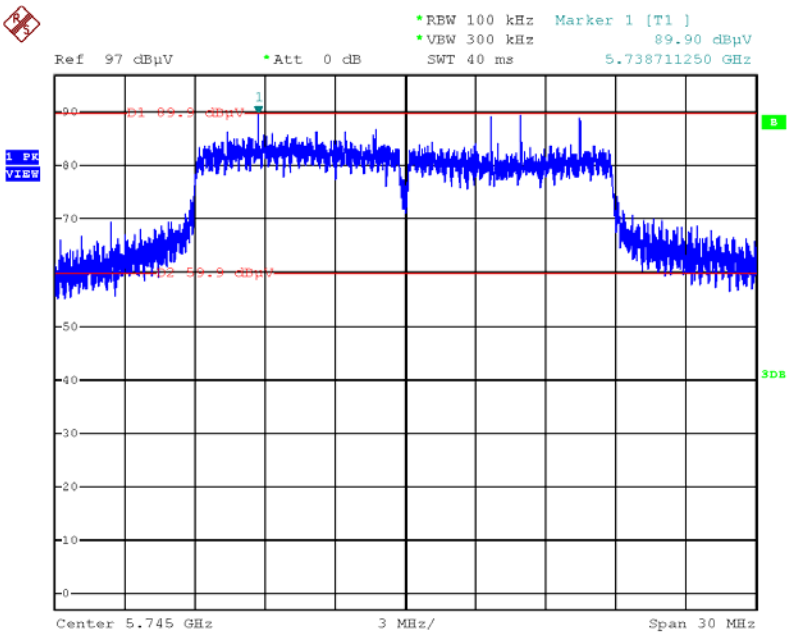
Date: 7.JUN.2013 04:58:14

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 9 / 2500MHz~26500MHz (down 30dBc)



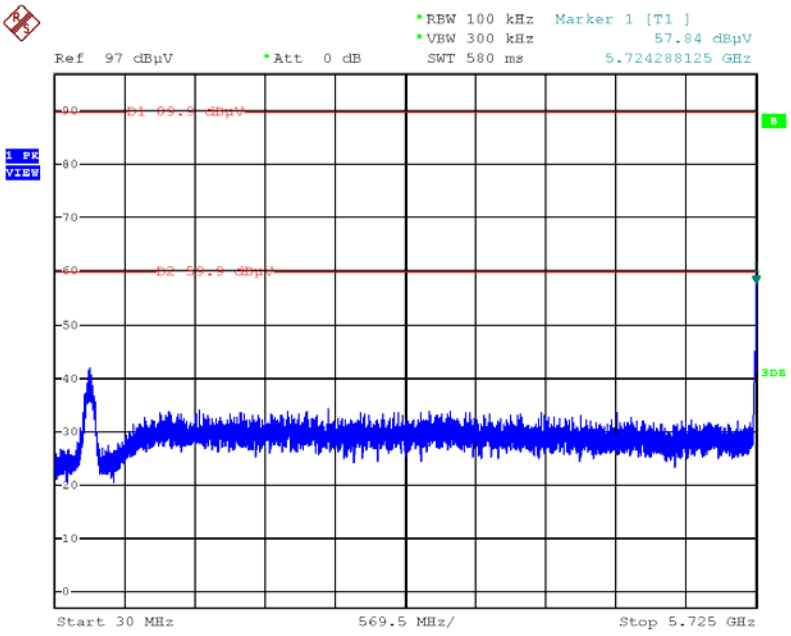
Date: 7.JUN.2013 04:58:03

Plot on Configuration IEEE 802.11n MCS0 20MHz / Reference Level



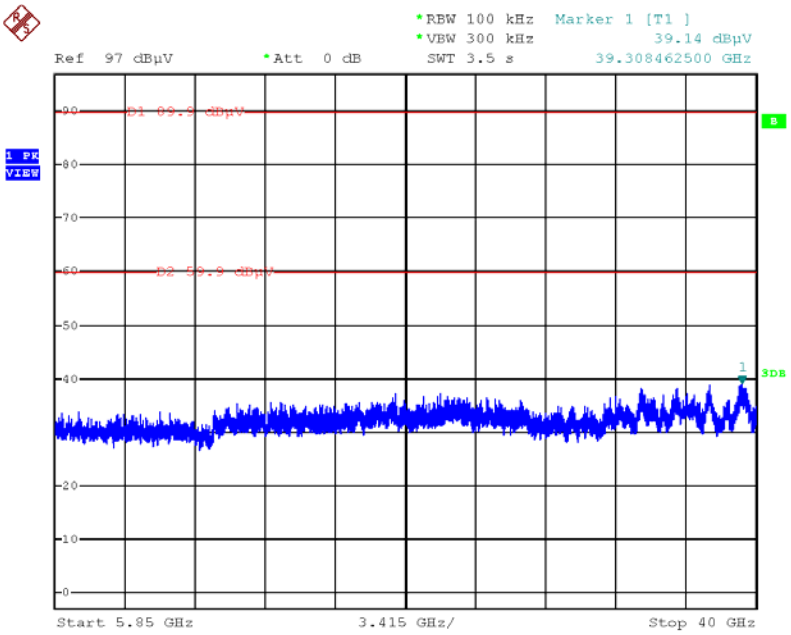
Date: 7.JUN.2013 04:49:16

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



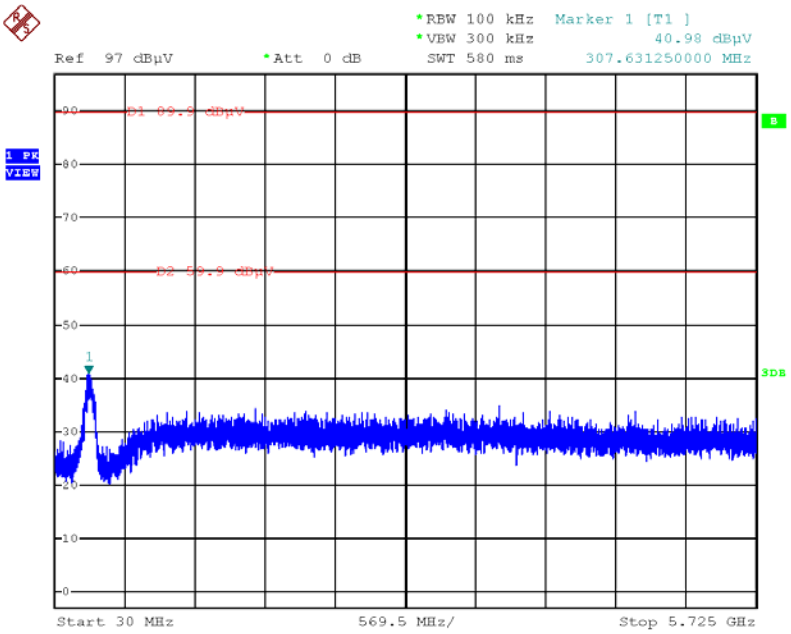
Date: 7.JUN.2013 04:49:53

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 149 / 5850MHz~40000MHz (down 30dBc)



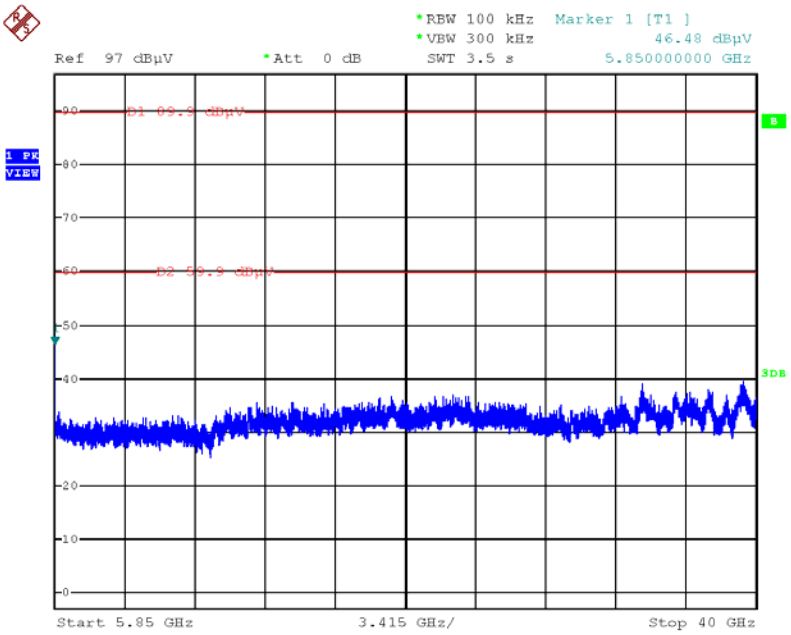
Date: 7.JUN.2013 04:50:18

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 165 / 30MHz~5725MHz (down 30dBc)



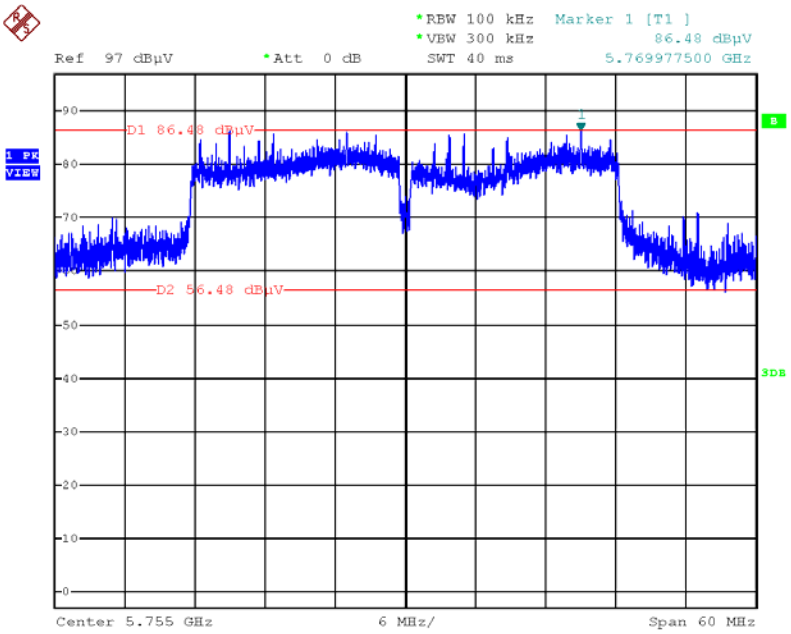
Date: 7.JUN.2013 04:51:08

Plot on Configuration IEEE 802.11n MCS0 20MHz / CH 165 / 5850MHz~40000MHz (down 30dBc)



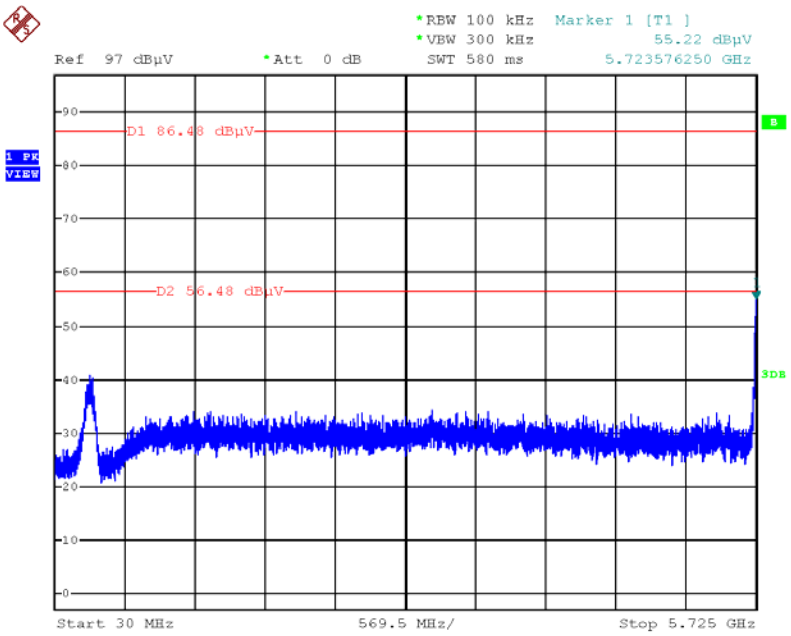
Date: 7.JUN.2013 04:50:50

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



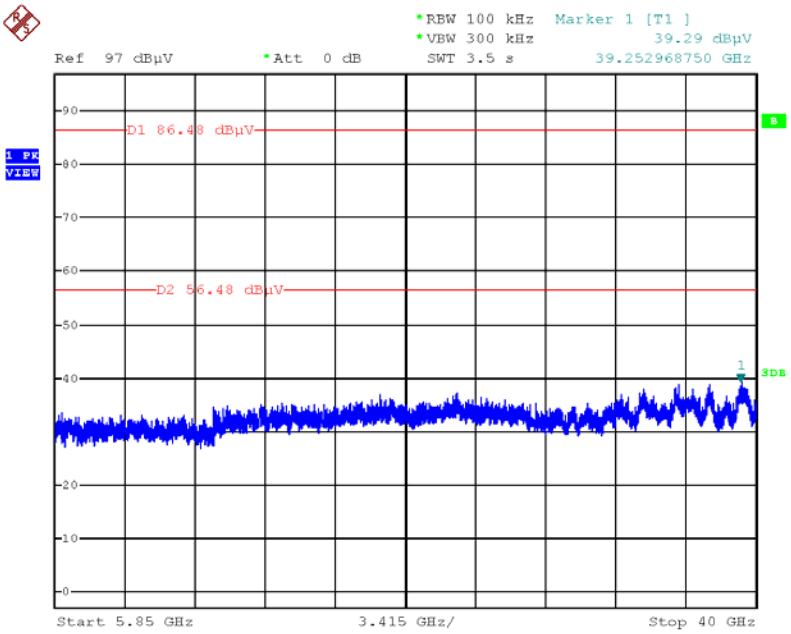
Date: 7.JUN.2013 04:36:59

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



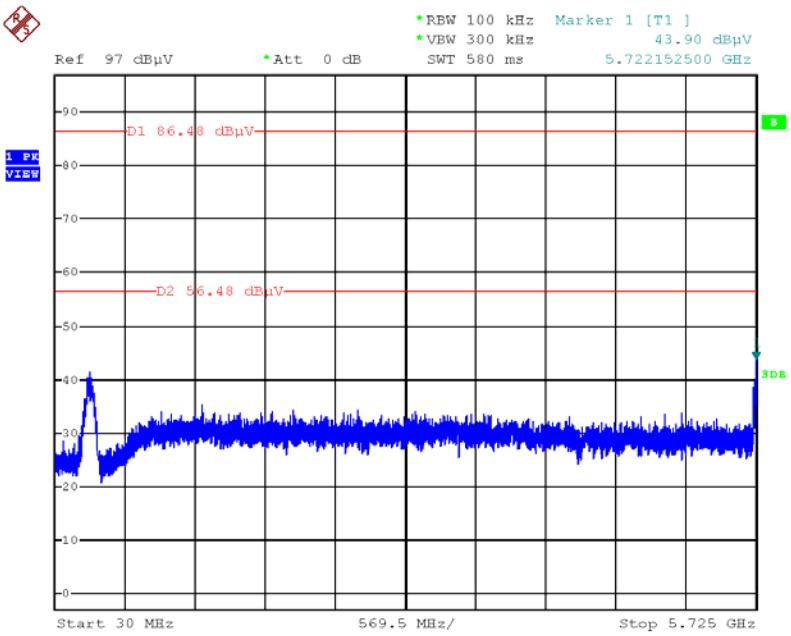
Date: 7.JUN.2013 04:43:59

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



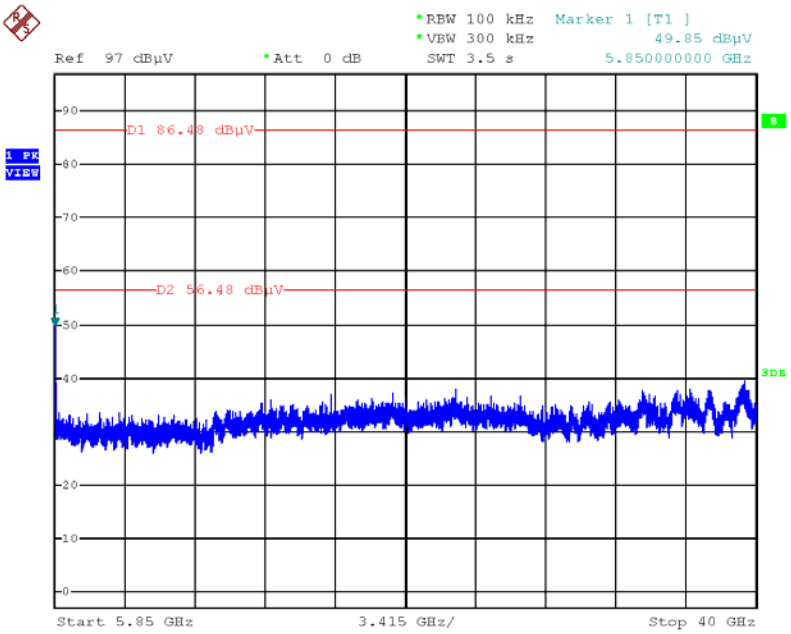
Date: 7.JUN.2013 04:46:44

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



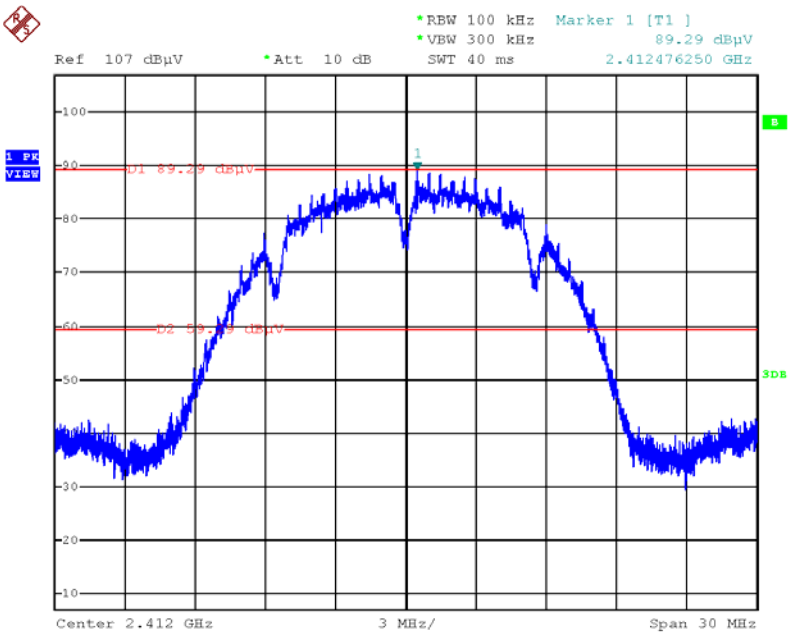
Date: 7.JUN.2013 04:47:41

Plot on Configuration IEEE 802.11n MCS0 40MHz / CH 159 / 5850MHz~40000MHz (down 30dBc)



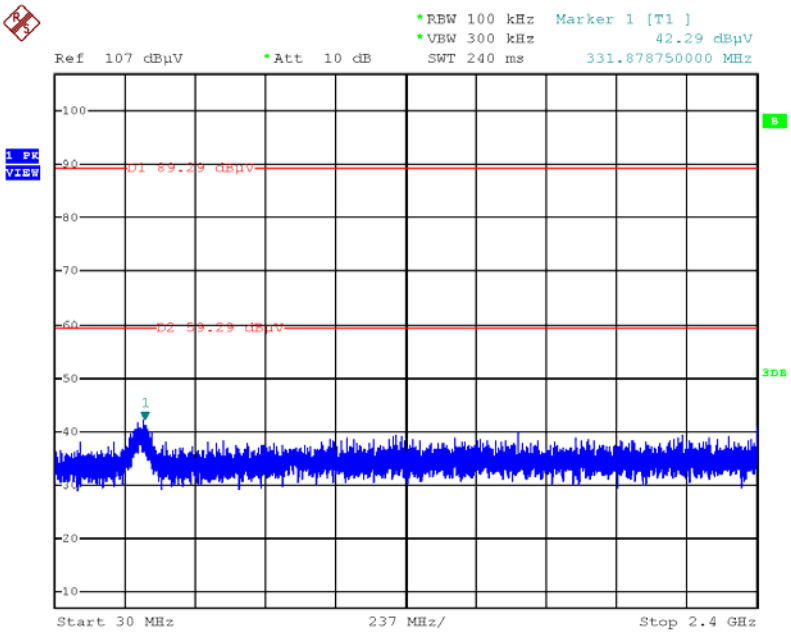
Date: 7.JUN.2013 04:47:21

Plot on Configuration IEEE 802.11b / Reference Level



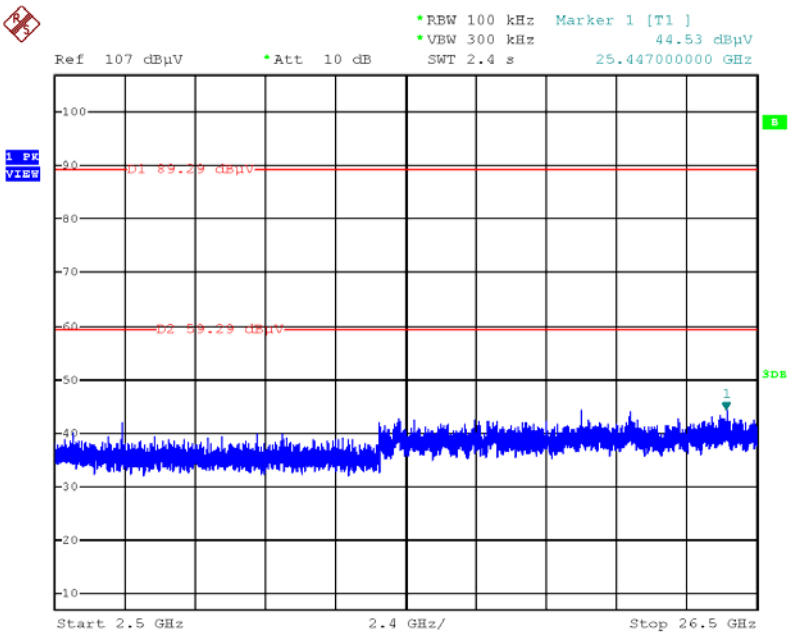
Date: 7.JUN.2013 05:04:28

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



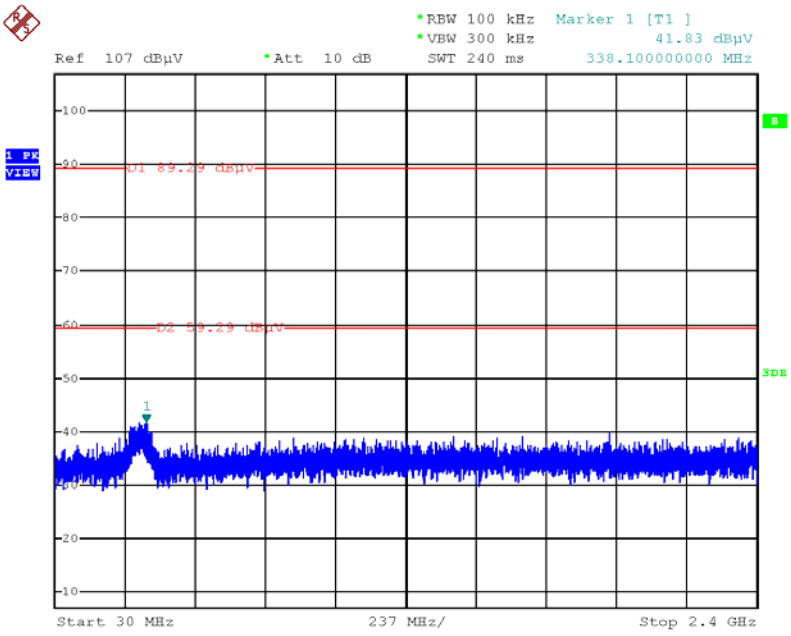
Date: 7.JUN.2013 05:04:42

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



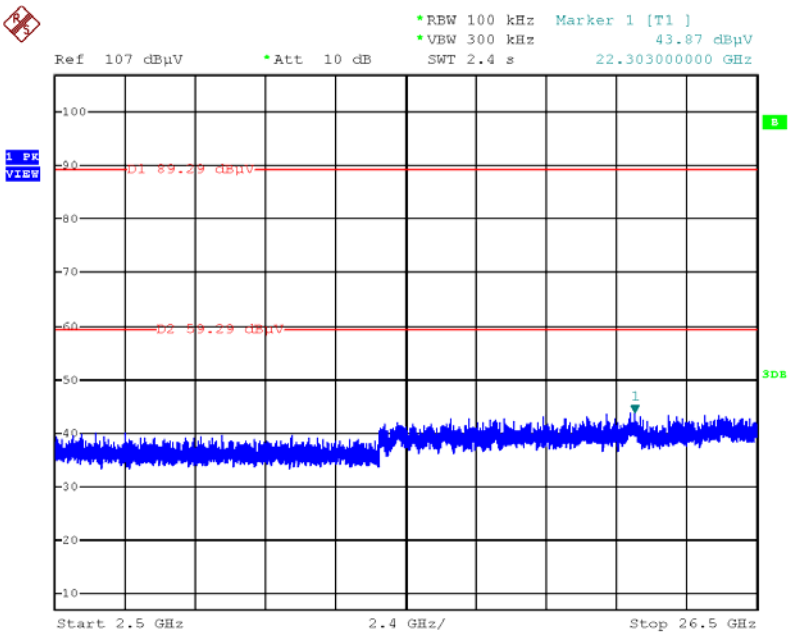
Date: 7.JUN.2013 05:05:00

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



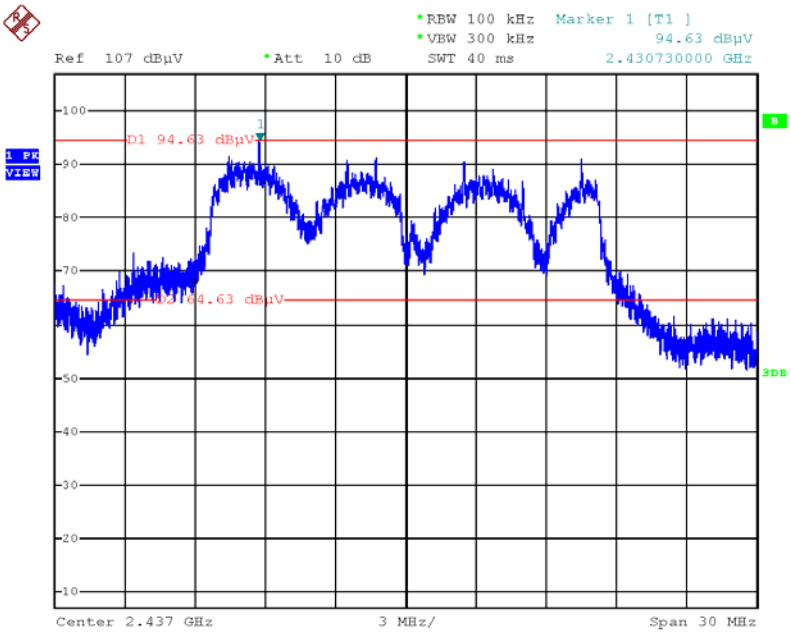
Date: 7.JUN.2013 05:05:54

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



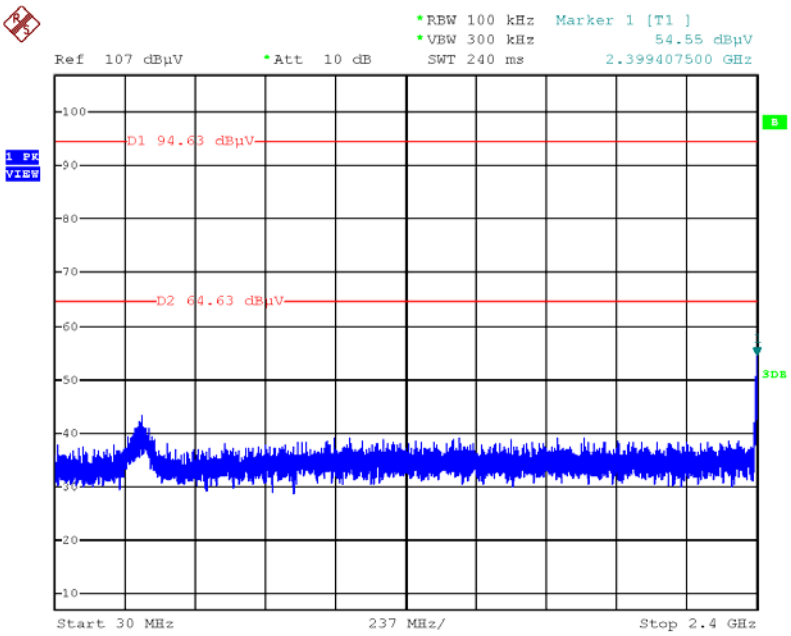
Date: 7.JUN.2013 05:05:42

Plot on Configuration IEEE 802.11g / Reference Level



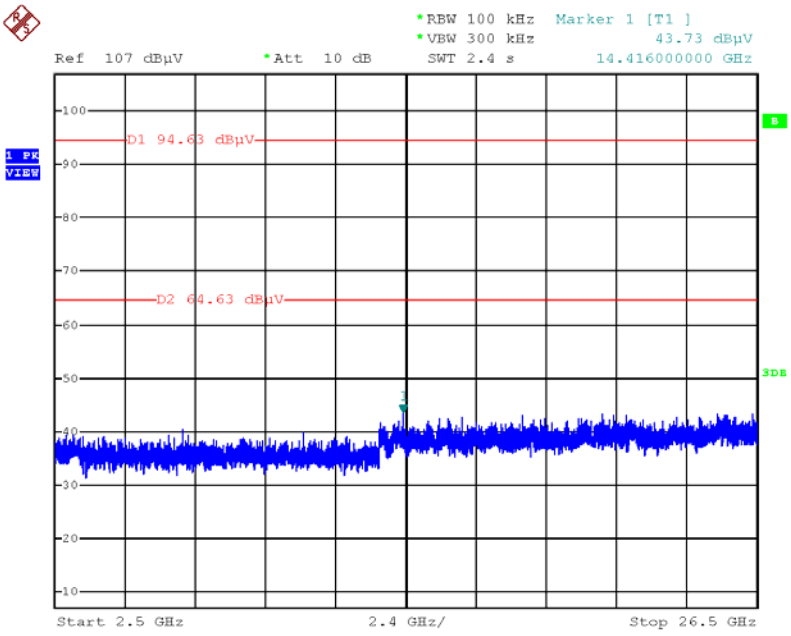
Date: 7.JUN.2013 05:01:05

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



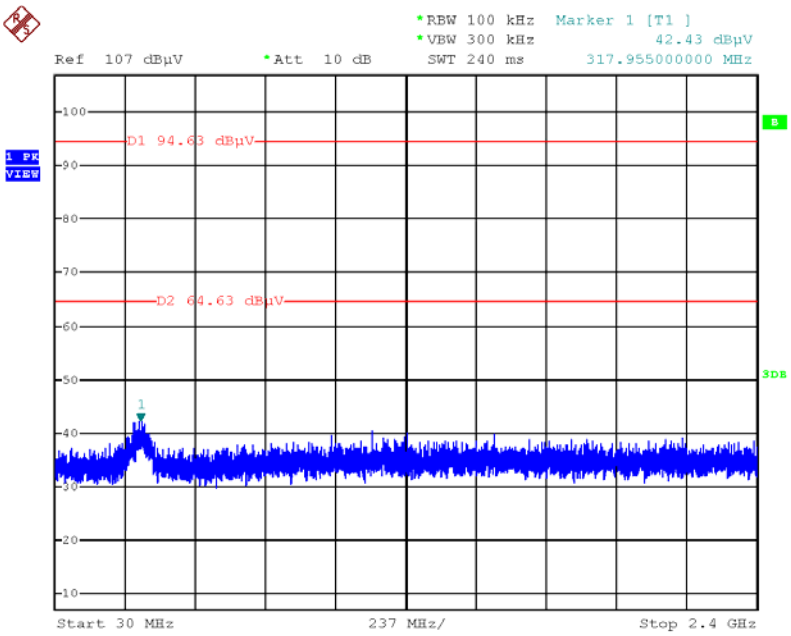
Date: 7.JUN.2013 05:01:40

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



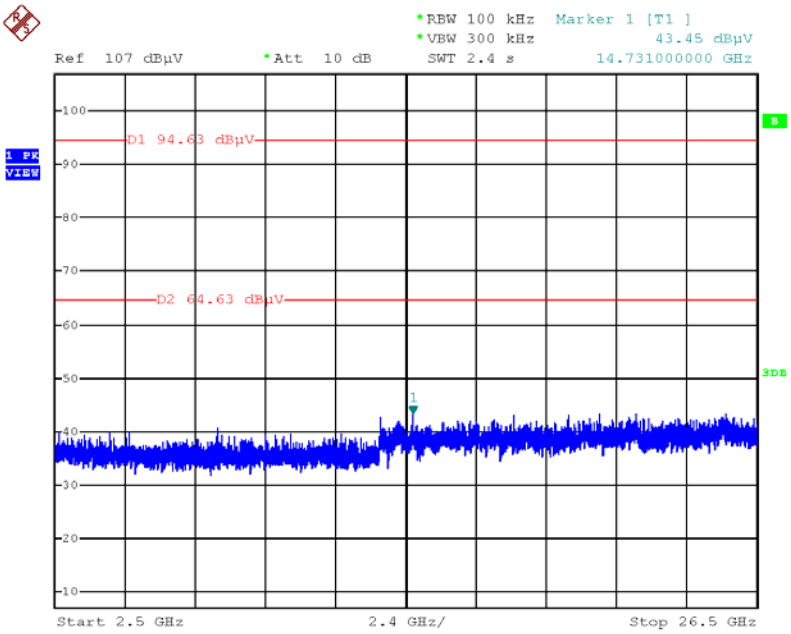
Date: 7.JUN.2013 05:01:53

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



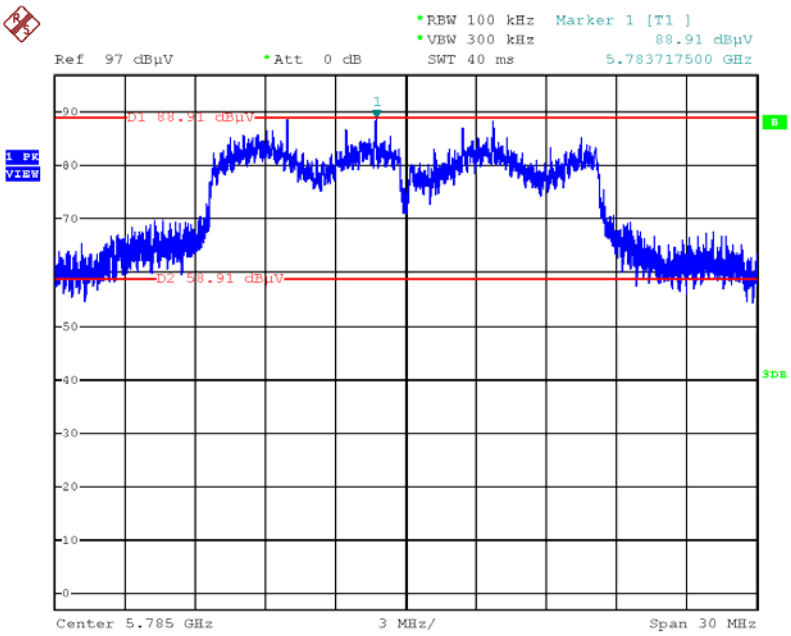
Date: 7.JUN.2013 05:02:22

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



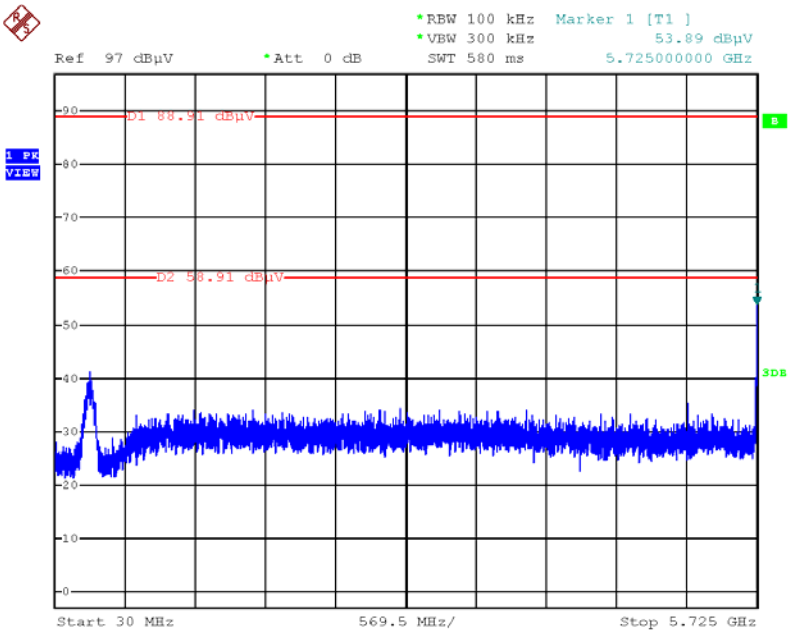
Date: 7.JUN.2013 05:02:10

Plot on Configuration IEEE 802.11a / Reference Level



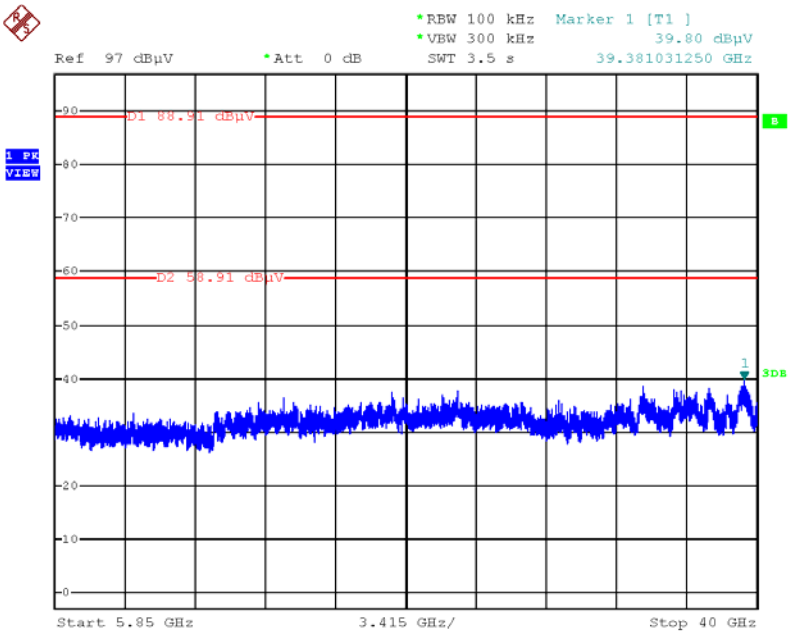
Date: 7.JUN.2013 04:51:43

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



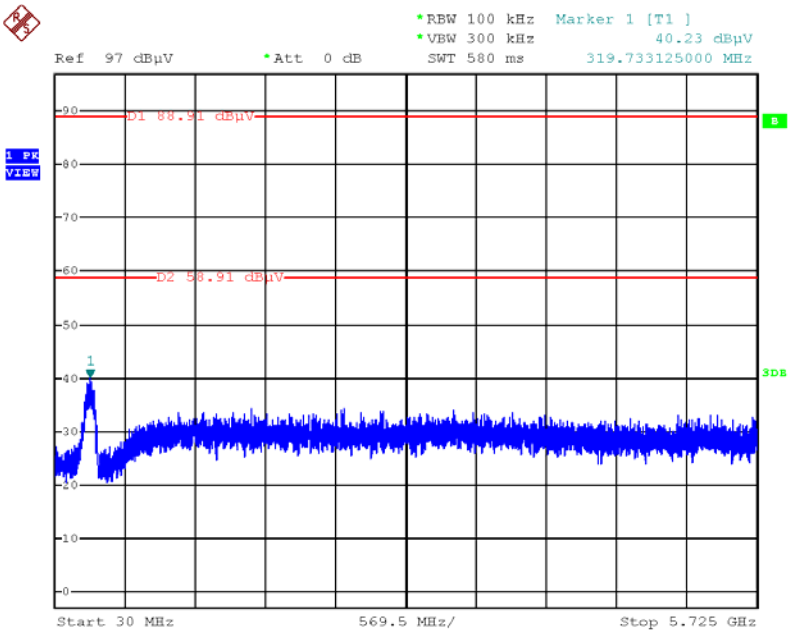
Date: 7.JUN.2013 04:52:08

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



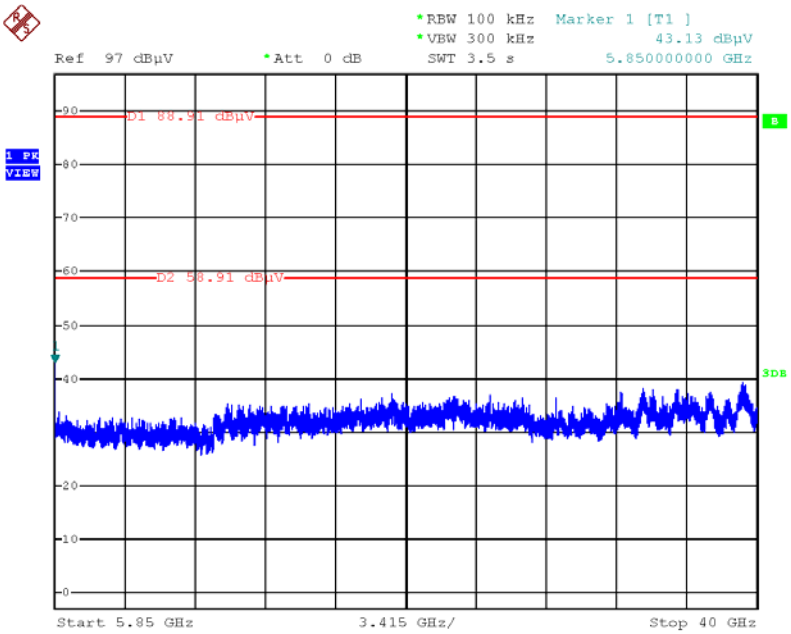
Date: 7.JUN.2013 04:52:22

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



Date: 7.JUN.2013 04:52:56

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



Date: 7.JUN.2013 04:52:42

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 2nd 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

7. MEASUREMENT UNCERTAINTY

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.026	dB	normal(k=2)	0.013
Cable loss	0.002	dB	normal(k=2)	0.001
AMN/LISN specification	1.200	dB	normal(k=2)	0.600
Mismatch Receiver VSWR 1= AMN/LISN VSWR 2=	-0.080	dB	U-shaped	0.060
combined standard uncertainty Ue(y)	1.2			
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	2.4			

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Cable loss	0.038	dB	normal(k=2)	0.019
Attenuator	0.047	dB	normal(k=2)	0.024
Power Meter specification	0.300	dB	normal(k=2)	0.150
Power Sensor specification	0.300	dB	normal(k=2)	0.150
Mismatch Receiver VSWR 1= Antenna VSWR 2= Pre Amplifier VSWR 3=	-0.080	dB	U-shaped	0.060
combined standard uncertainty Ue(y)	0.403			
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	0.806			

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

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.1727	dB	normal(k=1)	0.1727
Cable loss	0.1736	dB	normal(k=2)	0.0868
Antenna gain	0.1687	dB	normal(k=2)	0.0843
Site imperfection	0.4898	dB	Triangular	0.2
Pre-amplifier gain	0.3661	dB	normal(k=2)	0.183
Transmitter antenna	1.7	dB	rectangular	0.9815
Signal generator	0.5	dB	rectangular	0.2887
Mismatch	0.08	dB	u-shape	0.244
Spectrum analyzer	0.5	dB	rectangular	0.2887
combined standard uncertainty Ue(y)	1.1434			
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	2.2869			

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

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.1908	dB	normal(k=1)	0.1908
Cable loss	0.1685	dB	normal(k=2)	0.0843
Antenna gain	0.1912	dB	normal(k=2)	0.0956
Site imperfection	1.3091	dB	Triangular	0.5344
Pre-amplifier gain	0.3043	dB	normal(k=2)	0.1521
Transmitter antenna	1.7	dB	rectangular	0.9815
Signal generator	0.5	dB	rectangular	0.2887
Mismatch	0.08	dB	u-shape	0.244
Spectrum analyzer	0.8	dB	rectangular	0.4619
combined standard uncertainty Ue(y)	1.2965			
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	2.593			

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

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.1864	dB	normal(k=1)	0.1864
Cable loss	0.1666	dB	normal(k=2)	0.0833
Antenna gain	0.1904	dB	normal(k=2)	0.0952
Site imperfection	0.4882	dB	Triangular	0.1993
Pre-amplifier gain	0.2688	dB	normal(k=2)	0.1344
Transmitter antenna	1.7	dB	rectangular	0.9815
Signal generator	0.5	dB	rectangular	0.2887
Mismatch	0.08	dB	u-shape	0.244
Spectrum analyzer	0.8	dB	rectangular	0.4619
combined standard uncertainty Ue(y)	1.1874			
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	2.3749			