TEST REPORT

of

FCC Part 15 Subpart C

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product :	**Cloudia multimedia player**
Brand:	**MUZEE**
Model:	**Cloudia0701**
Model Difference:	**N/A**
FCC ID:	**ZZ9MUZEE0701**
FCC Rule Part:	**§15.247, Cat: DTS**
Applicant:	**MUZEE Corporation**
Address:	**16F., No. 30, Beiping E. Rd., Zhongzheng Dist., Taipei City 100, Taiwan**

Test Performed by:

International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;
*Address:
No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-11LR065FC**

Issue Date : **2011/09/13**

Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.
This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.

VERIFICATION OF COMPLIANCE

Applicant:	MUZEE Corporation
Product Description:	Cloudia multimedia player
Brand Name:	MUZEE
Model No.:	Cloudia0701
Model Difference:	N/A
FCC ID:	ZZ9MUZEE0701
Date of Receipt:	Aug. 30, 2011
Date of test:	Aug. 31, 2011 – Sep. 08, 2011
Date of EUT Received:	2011/09/06
FCC Rule Part:	§15.247, Cat: DTS

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Dion Chen	***Date:***	2011/09/13
	Dion Chang / Engineer		
Prepared By:	Eva Kao	***Date:***	2011/09/13
	Eva Kao / Asst. Supervisor		
Approved By:	Jim Chu	***Date:***	2011/09/13
	Jim Chu / Director		

Version

Version No.	Date	Description
00	2011/09/13	Initial creation of document

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1 GENERAL INFORMATION

General:

Product Name	Cloudia multimedia player	
Brand Name	MUZEE	
Model Name	Cloudia0701	
Model Difference	N/A	
Power Supply	7.4 Vdc re-chargeable battery or 12Vdc by AC/DC power adapter	
	Battery:	Model: AEC454865 2S1P
	Adapter:	Model No.: SYS1308-2412-W2, Supplier: Sunny

WLAN:

Wi-Fi	Frequency Range	Channels	Rated Power	Modulation Technology	Type of Emission
11b/g	2412-2462	11	b : 17.61dBm g : 16.94dBm	DSSS, OFDM	b : 12M6G1D g : 16M7G1D
11n	HT20 2412-2462	11	n : 16.01Bm	OFDM	17M8D1D
11n	HT40 2422-2452	7	n : 15.94Bm	OFDM	36M8D1D
Antenna Designation:			Dipole Antenna with 2.87dBi peak gain		
Modulation type:			CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM		
Transition Rate:			802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 130Mbps 802.11 n_40MHz: 13.5 – 135Mbps		

The EUT is compliance with IEEE 802.11 b/g/n Standard.

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.1 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: ZZ9MUZEE0701** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd., Lung-Tan Hsiang, Tao Yuan County 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number is: TW1036, Canada Registration Number: 4067B-3.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

2.4 Configuration of Tested System

Fig. 2-1 AC Power line and Radiated Emission Configuration

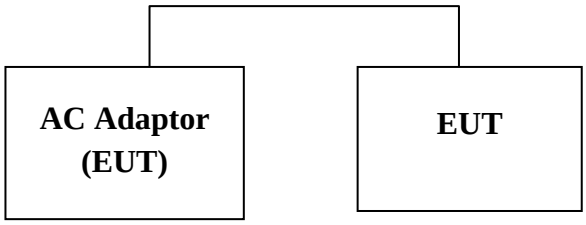


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	N/A					

3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3),(4)(c)	Peak Output Power	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
§15.247(d)	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(d)	Spurious Emission	Compliant
§15.247(e)	Peak Power Density	Compliant
§15.203	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.
Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode: Channel low (2412MHz)、mid (2437MHz) and high (2462MHz) with 1Mbps lowest data rate are chosen for full testing.
802.11 g mode: Channel low (2412MHz)、mid (2437MHz) and high (2462MHz) with 6Mbps lowest data rate are chosen for full testing.
802.11 n _20MHz: Channel low (2412MHz)、mid (2437MHz) and high (2462MHz) with 6.5Mbps lowest data rate are chosen for full testing.
802.11 n_40MHz: Lowest (2422MHz), Mid (2442MHz) and Highest (2452MHz) with 13.5Mbps lowest data rate are chosen for full testing.

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11b/g/n WLAN Transmitter for channel Low, Mid and High, the worst case H position was reported.

5 CONDUCTED EMISSION TEST

5.1 Standard Applicable:

According to §15.207, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

5.2 Measurement Equipment Used:

AC Power Line Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Conduction 03 -1 Cable	WOKEN	CFD 300-NL	Conduction 0-1	06/27/2011	06/27/2012
EMI Receiver 12	ROHDE & SCHWARZ	ESCI	100804	06/25/2011	06/25/2012
LISN 07	FCC Inc.	FCC-LISN-50-100-4-02	07040	06/02/2011	06/02/2012
LISN 08	FCC	FCC-LISN50-25-2-01	07039	06/25/2011	06/25/2012

5.3 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

5.4 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

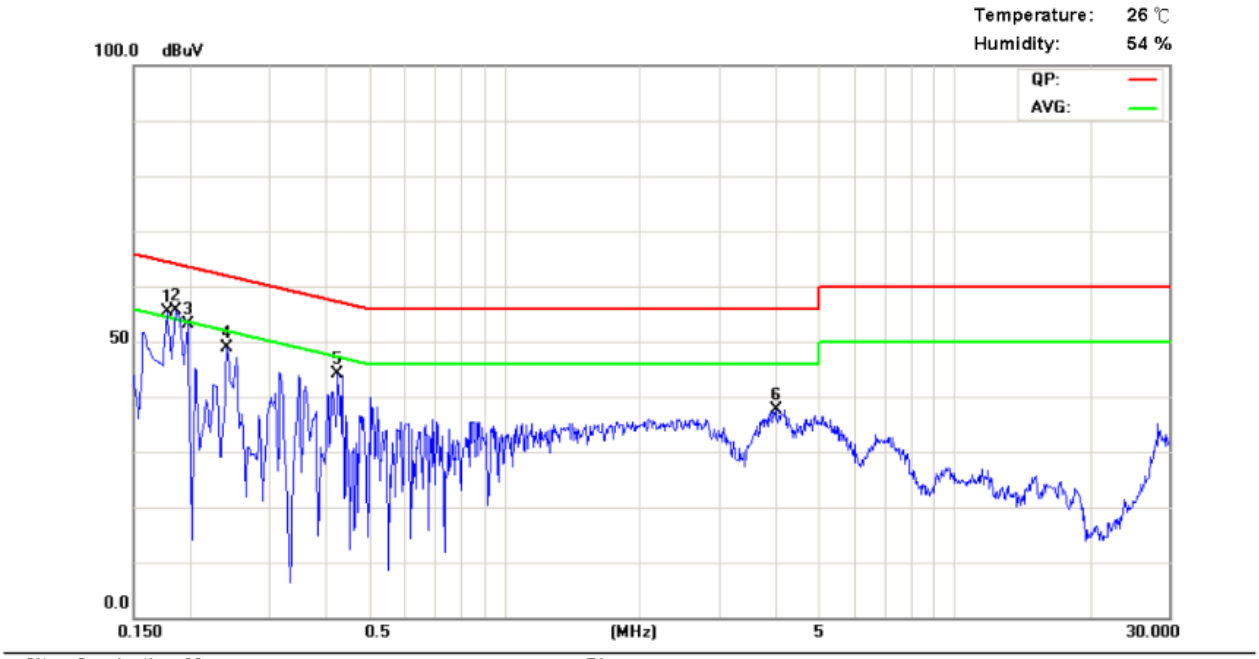
5.5 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

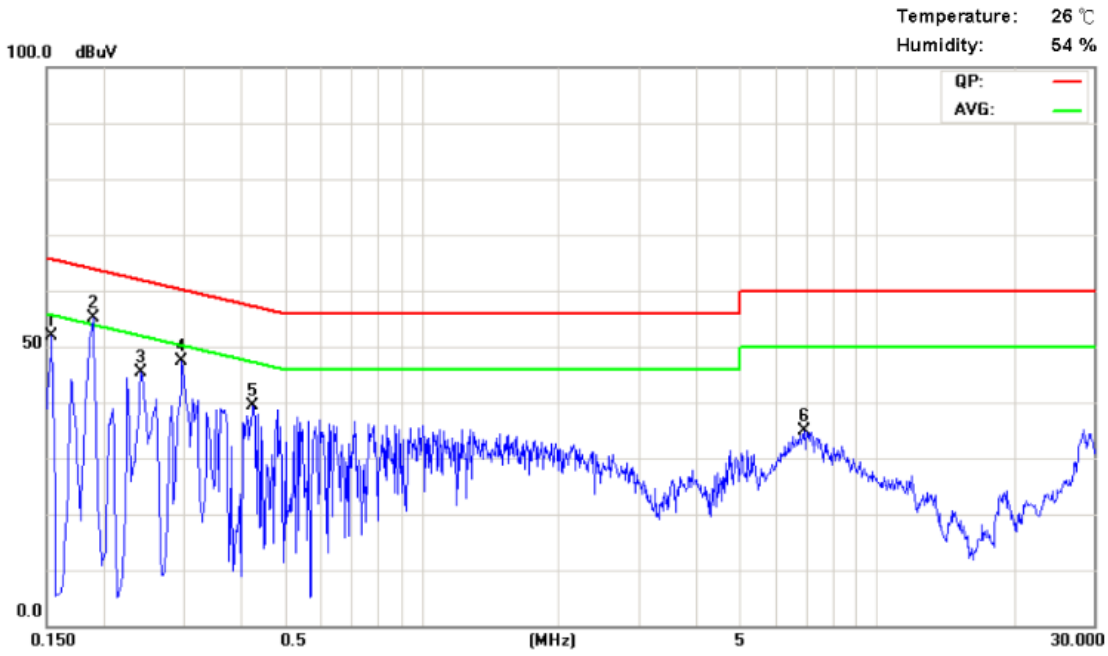
AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2011/09/07
Test By:	Dino		



Site: Conduction 02
Phase: L1
Limit: CISPR22 Class B Conduction
Power: AC 110V/60Hz
Company: Muzee
Witness:
EUT Model: CLOUDIA
Execute Program:
Note: 11LR065

No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	0.1780	0.09	0.02	56.61	64.5	-7.97	41.23	54.5	-13.3	
2	0.1860	0.09	0.02	55.04	64.2	-9.17	39.34	54.2	-14.8	
3	0.1986	0.08	0.02	48.71	63.6	-14.9	27.41	53.6	-26.2	
4	0.2420	0.08	0.03	45.76	62.0	-16.2	29.97	52.0	-22.0	
5	0.4260	0.06	0.03	39.85	57.3	-17.4	26.56	47.3	-20.7	
6	4.0220	0.07	0.1	33.27	56.0	-22.7	27.51	46.0	-18.4	



Site: Conduction 02
Phase: N
Limit: CISPR22 Class B Conduction
Power: AC 110V/60Hz
Company: Muzee
Witness:
EUT Model: CLOUDIA
Execute Program:
Note: 11LR065

No.	Frequency MHz	LISN Loss dB	Cable Loss dB	QP Correct. dBuV	QP Limit dBuV	QP Margin dB	AVG Correct. dBuV	AVG Limit dBuV	AVG Margin dB	Note
1	0.1540	0.1	0.02	46.47	65.7	-19.3	20.56	55.7	-35.2	
2	0.1900	0.08	0.02	54.78	64.0	-9.26	39.09	54.0	-14.9	
3	0.2420	0.08	0.03	46.25	62.0	-15.7	32.15	52.0	-19.8	
4	0.2980	0.07	0.03	44.77	60.3	-15.5	27.92	50.3	-22.3	
5	0.4260	0.06	0.03	38.53	57.3	-18.8	26.56	47.3	-20.7	
6	6.9260	0.07	0.14	31.02	60.0	-28.9	24.86	50.0	-25.1	

6 PEAK OUTPUT POWER MEASUREMENT

6.1 Standard Applicable:

According to §15.247(a)(2), (b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

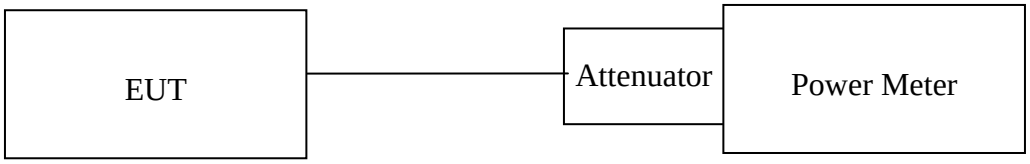
(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) 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 conducted output power.

6.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter 05	Anritsu	ML2495A	1116010	04/22/2011	04/21/2012
Power Sensor 05	Anritsu	MA2411B	34NKF50	04/22/2011	04/21/2012
Spectrum Analyzer 19	R&S	FSP40	100116	10/18/2010	10/18/2011
Spectrum Analyzer 20	Agilent	E4443A	MY48250315	05/12/2011	05/11/2012
Temperature Chamber	KSON	THS-B4H100	2287	03/03/2011	03/03/2012
DC Power supply	ABM	51850	N/A	06/17/2011	06/16/2012

6.3 Test Set-up:



6.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter or spectrum. (Channel power function, RBW, VBW = 1MHz,Bandwidth=26dB occupied Bandwidth)
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

6.5 Measurement Result:

802.11b

Cable loss = 0		Output Power	
CH	Frequency (MHz)	Detector	
		PK (dBm)	AV (dBm)
1	2412	17.61	14.72
6	2437	17.11	14.34
11	2462	17.02	14.21

802.11g

Cable loss = 0		Output Power	
CH	Frequency (MHz)	Detector	
		PK (dBm)	AV (dBm)
1	2412	16.94	8.02
6	2437	16.63	7.84
11	2462	16.31	7.12

802.11N 20MHz

Cable loss = 0		Output Power	
CH	Frequency (MHz)	Detector	
		PK (dBm)	AV (dBm)
1	2412	16.01	7.12
6	2437	15.41	6.79
11	2462	15.01	6.22

802.11N 40MHz

Cable loss = 0		Output Power	
CH	Frequency (MHz)	Detector	
		PK (dBm)	AV (dBm)
3	2422	15.94	7.04
6	2437	15.47	6.62
9	2452	15.12	6.34

7 6dB Bandwidth

7.1 Standard Applicable:

According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

7.2 Measurement Equipment Used:

Refer to section 6.2 for details.

7.3 Test Set-up:

Refer to section 6.3 for details.

7.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW = 3*RBW, Span= 30M/50MHz, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

7.5 Measurement Result:

802.11b

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	12.500	> 500	PASS
2437	12.600	> 500	PASS
2462	12.600	> 500	PASS

802.11g

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	16.700	> 500	PASS
2437	16.400	> 500	PASS
2462	16.500	> 500	PASS

802.11n_20M

Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.800	> 500	PASS
2437	17.800	> 500	PASS
2462	17.800	> 500	PASS

802.11n_40M

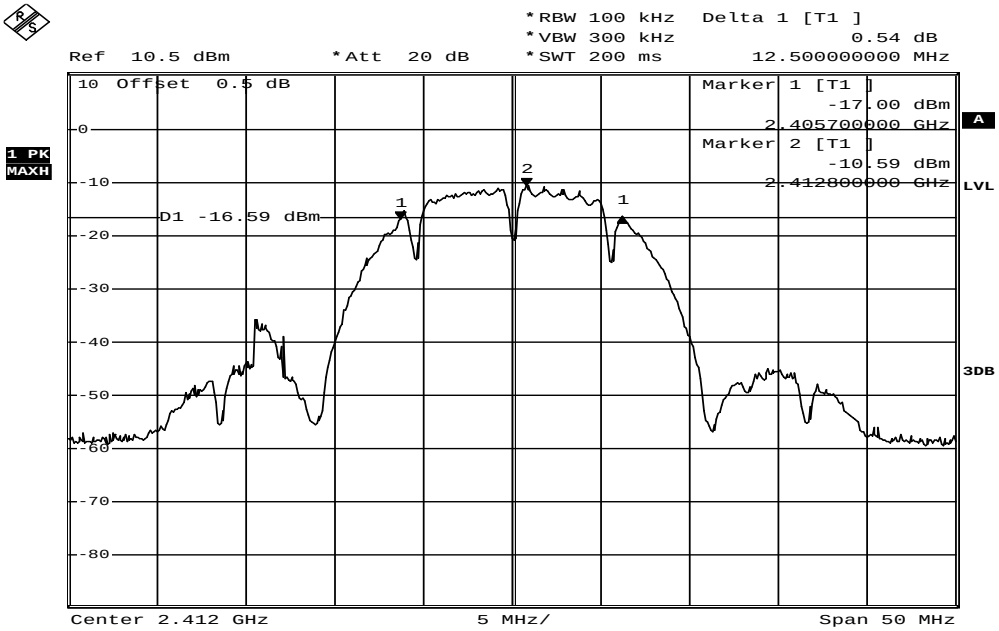
Frequency (MHz)	Bandwidth (MHz)	Bandwidth (KHz)	Result
2422	36.600	> 500	PASS
2437	36.780	> 500	PASS
2452	36.720	> 500	PASS

offset 0.5dB

Note: Refer to next page for plots.

802.11b

6dB Band Width Test Data CH-Low



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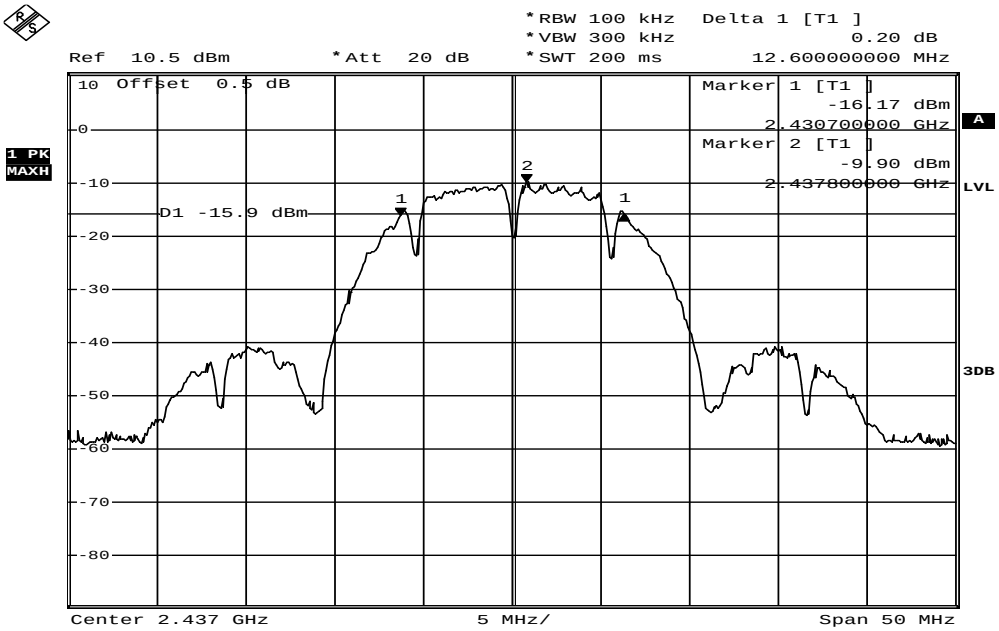
6dB Band Width Test Data CH-Mid



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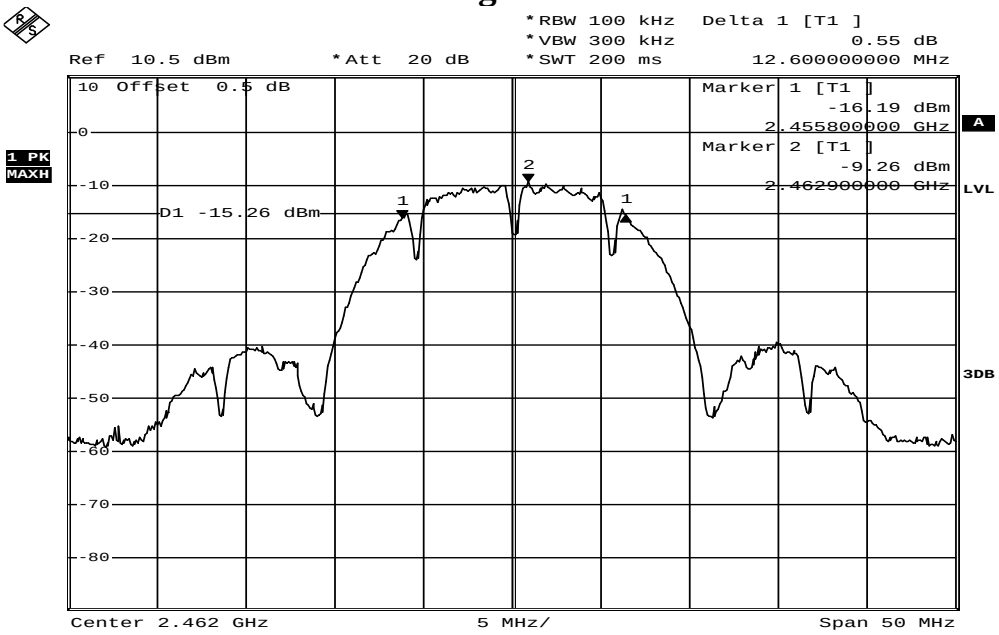

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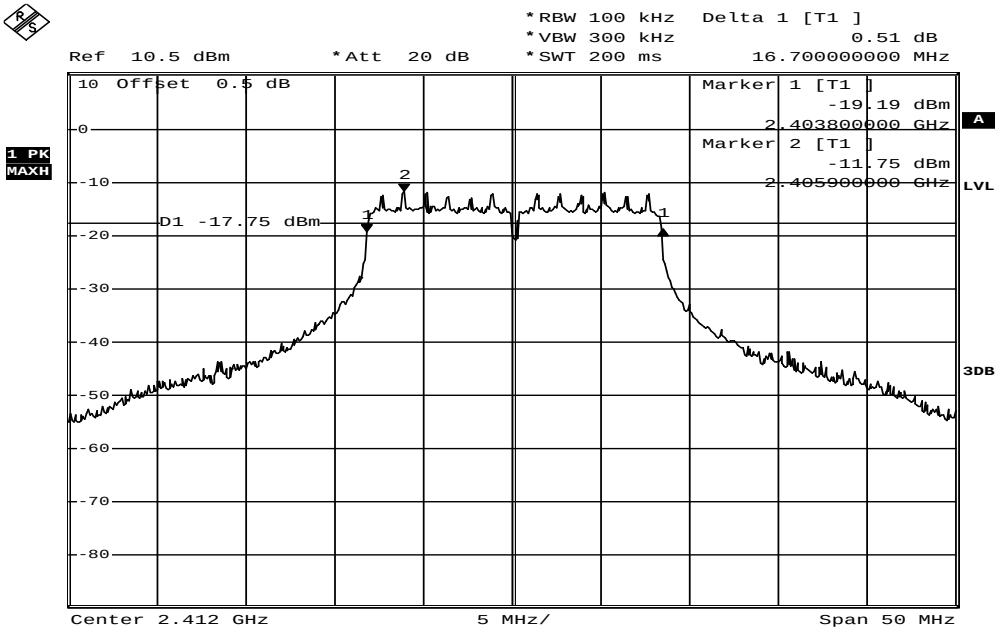
802.11g

6dB Band Width Test Data CH-Low



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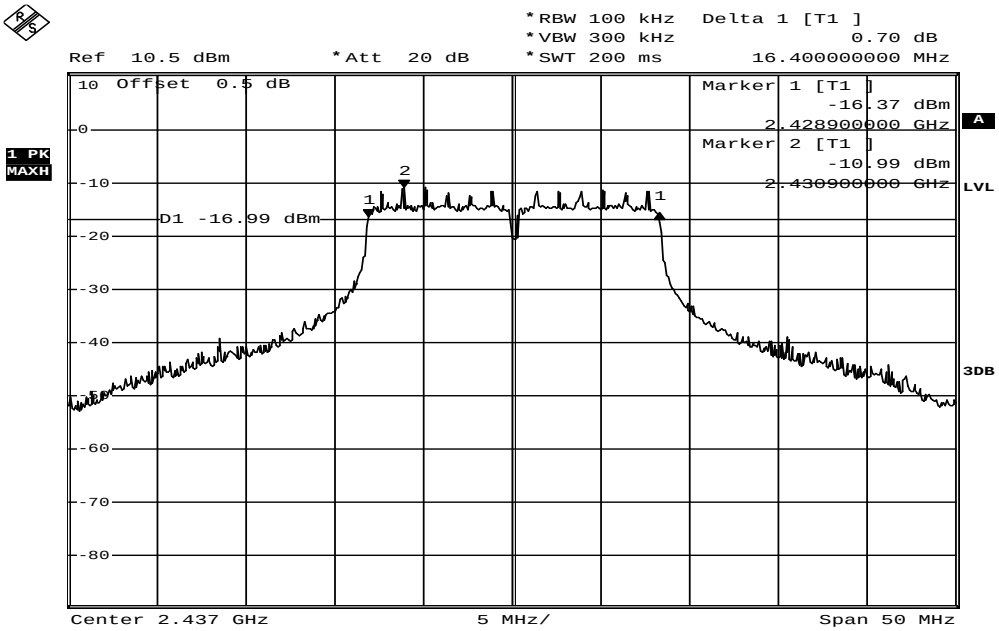

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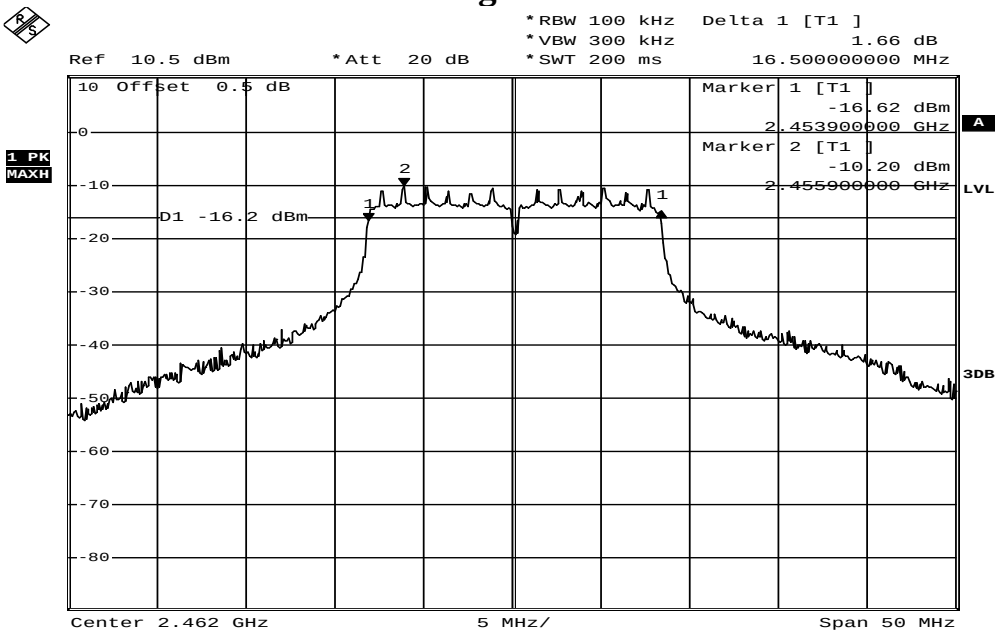
6dB Band Width Test Data CH-High



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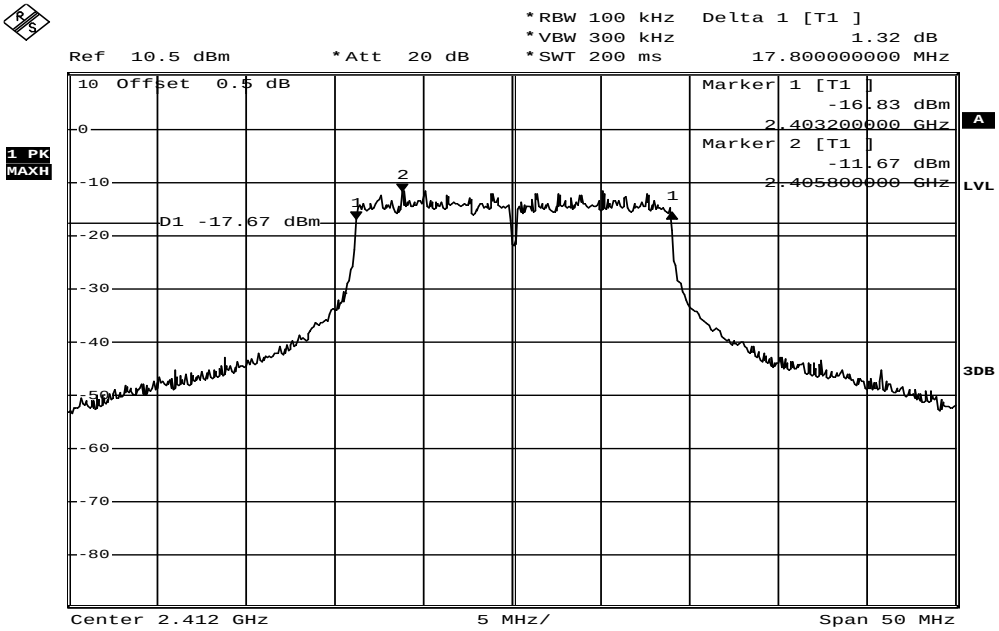
802.11n_20M

6dB Band Width Test Data CH-Low



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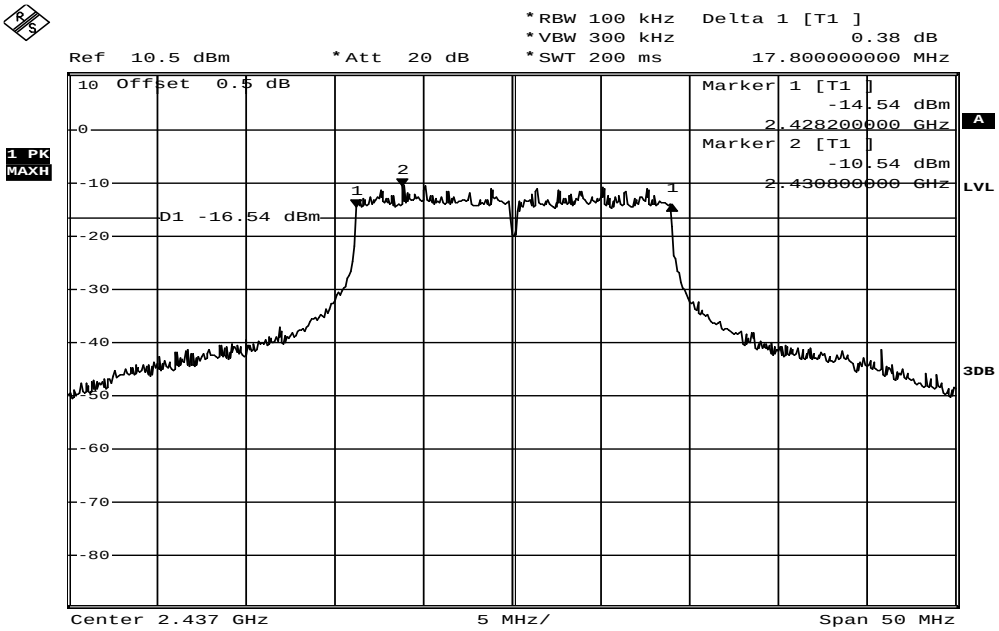

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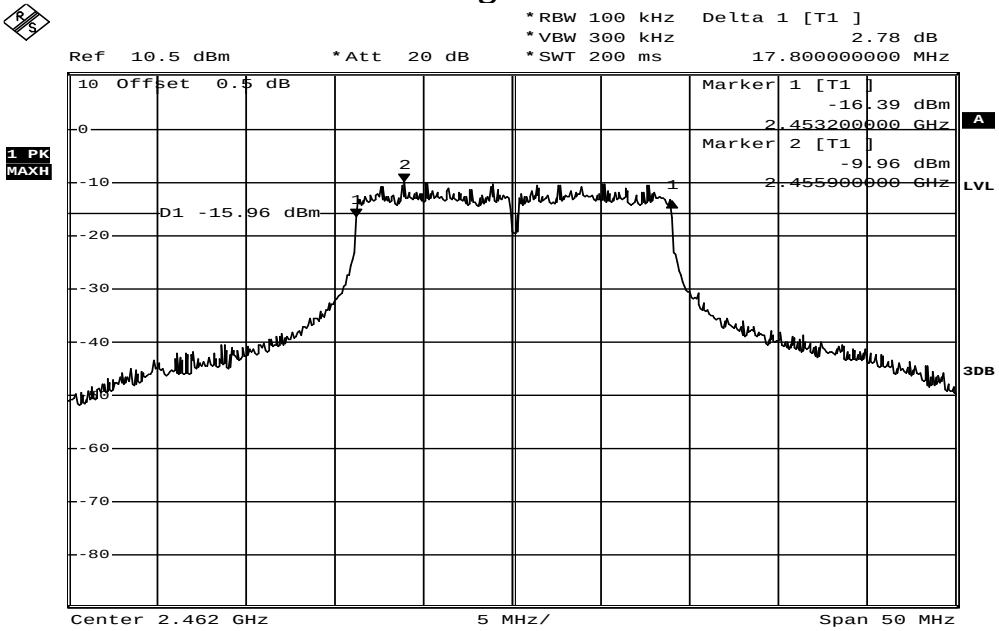

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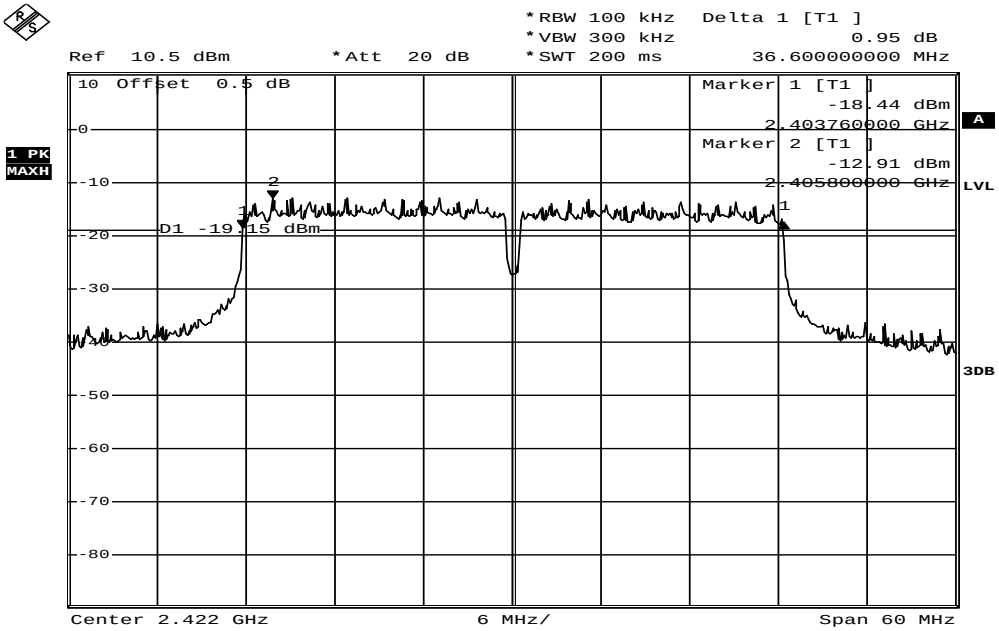
802.11n_40M

6dB Band Width Test Data CH-Low



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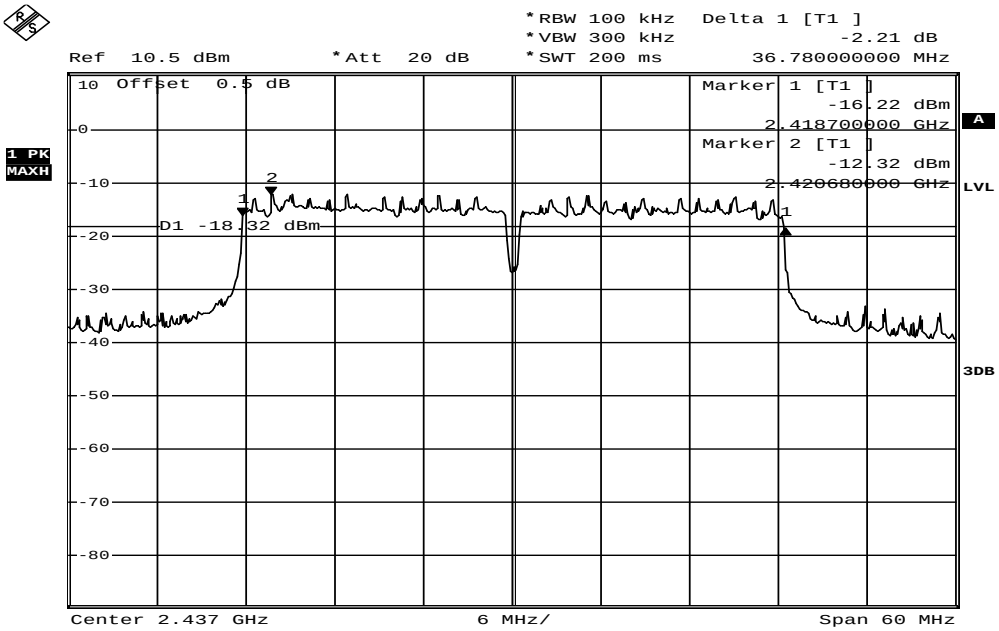

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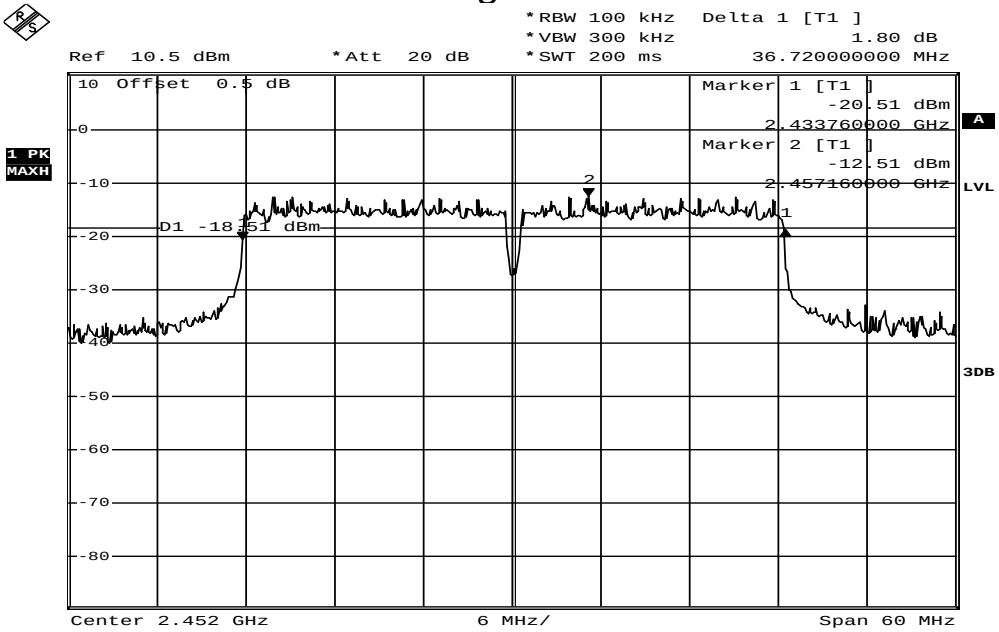

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8 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable:

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

8.2 Measurement Equipment Used:

8.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2 Radiated emission:

Chamber 14(966)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer 21	Agilent	N9010A	MY49060537	07/18/2011	07/17/2012
Spectrum Analyzer 19	R&S	FSP40	100116	10/18/2010	10/17/2011
Spectrum Analyzer 20	Agilent	E4443A	MY48250315	05/12/2011	05/11/2012
Short Dipole antenna	Schwarzbeck Mess-Elektronik	VHAA9110	NA	07/17/2011	07/16/2012
Dipole antenna	SCHWARZBECK	VHAP&HUAP	NA	07/17/2011	07/16/2012
Dipole antenna	SCHWARZBECK	UHA9105	NA	07/17/2011	07/16/2012
Loop Antenna	A.H.SYSTEM	SAS-564	294	02/28/2011	02/27/2012
Bilog Antenna	Schaffner	CBL 6111D	22612	03/30/2011	03/29/2012
Horn antenna(06)	EMCO	3117	0006665	09/28/2010	09/27/2011
Horn antenna(05)	Com-power	AH-640	100A	01/11/2011	01/10/2013
Horn antenna(04)	Com-power	AH-826	081001	05/04/2011	05/03/2013
Horn antenna(02)	EMCO	AH118	0006665	02/15/2011	02/14/2012
Preamplifier	HP	8447F	NA	05/04/2011	05/03/2012
Preamplifier 15	Agilent	8449B	3008A2471	02/16/2011	02/15/2012
Cable	Huber Suhner	Sucoflex 106	NA	02/09/2011	02/08/2012
Cable	Pacific	8D-FB	NA	10/18/2010	10/17/2011
Signal Generator	R&S	SMU200A	NA	10/12/2010	09/12/2011

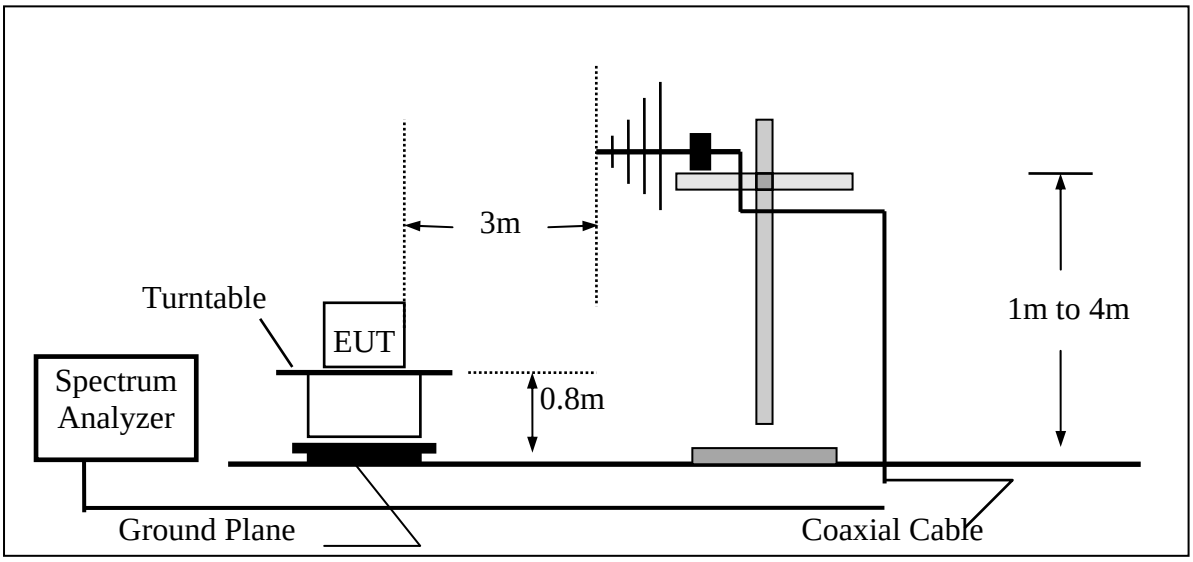
8.3 Test SET-UP:

8.3.1 Conducted Emission at antenna port:

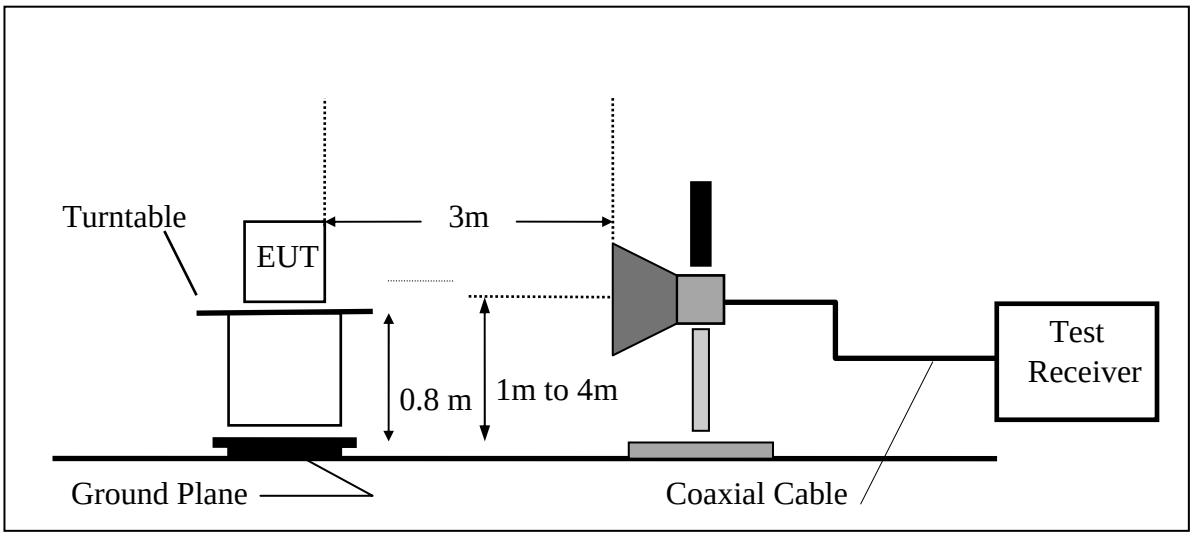
Refer to section 6.3 for details.

8.3.2 Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



8.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.

8.5 Field Strength Calculation:

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

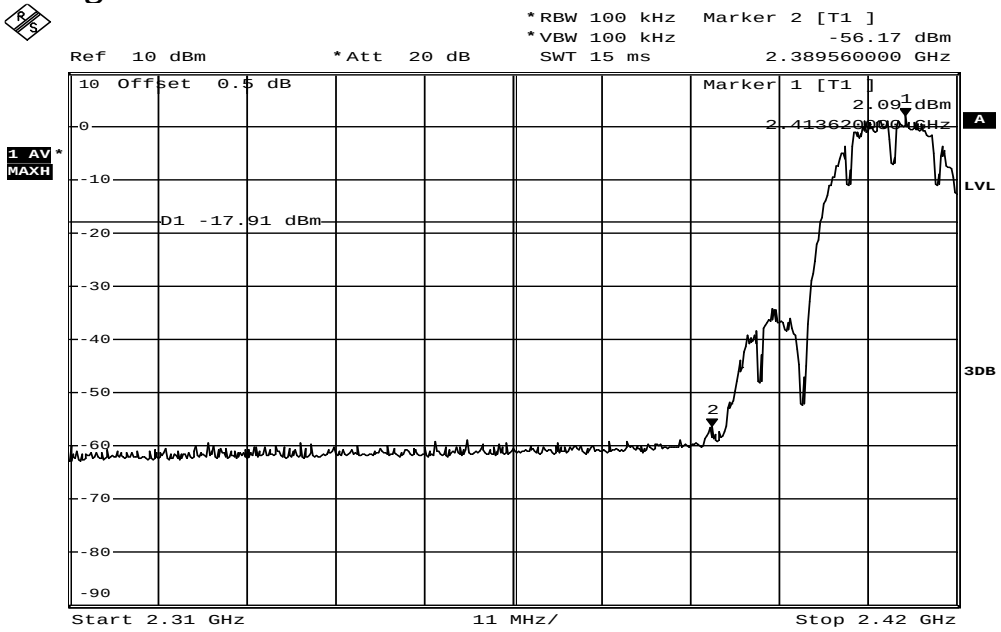
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

8.6 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

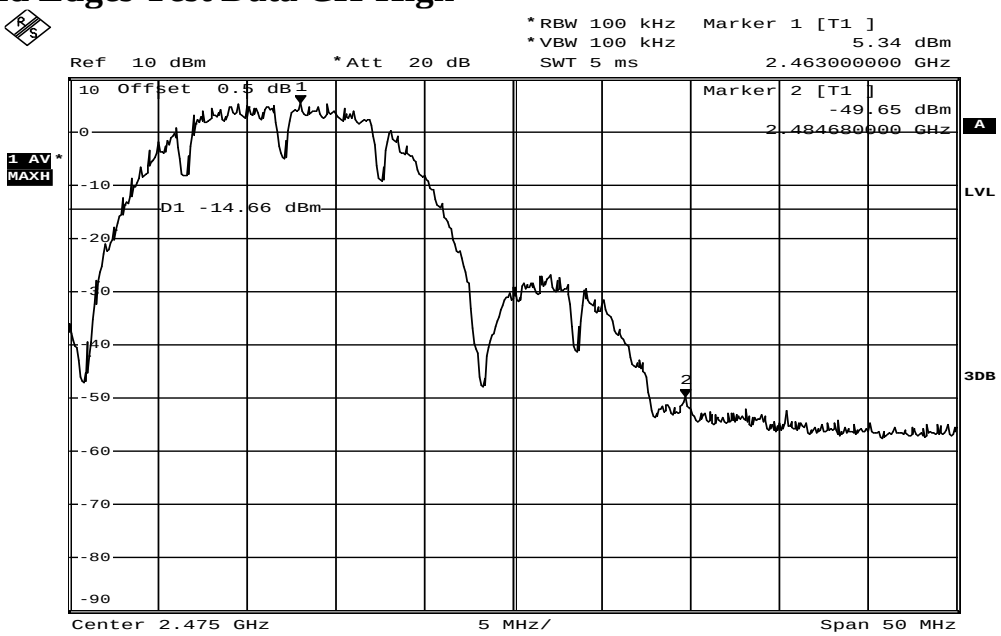
802.11b

Band Edges Test Data CH-Low



Date: 7.SEP.2011 17:07:29

Band Edges Test Data CH-High



Date: 7.SEP.2011 17:31:31

Radiated Emission: 802.11 b mode

Operation Mode	TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver.
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2386.40	43.38	-1.06	42.32	54.00	-11.68	Average	VERTICAL
2	2386.40	53.24	-1.06	52.18	74.00	-21.82	Peak	VERTICAL
3	2390.00	49.70	-1.06	48.64	74.00	-25.36	Peak	VERTICAL
1	2385.10	43.21	-1.06	42.15	54.00	-11.85	Average	HORIZONTAL
2	2385.10	53.78	-1.06	52.72	74.00	-21.28	Peak	HORIZONTAL
3	2390.00	50.92	-1.06	49.86	74.00	-24.14	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	49.24	-0.96	48.28	74.00	-25.72	Peak	VERTICAL
2	2489.40	51.07	-0.96	50.11	74.00	-23.89	Peak	VERTICAL
1	2483.50	42.57	-0.96	41.61	54.00	-12.39	Average	HORIZONTAL
2	2483.50	53.32	-0.96	52.36	74.00	-21.64	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

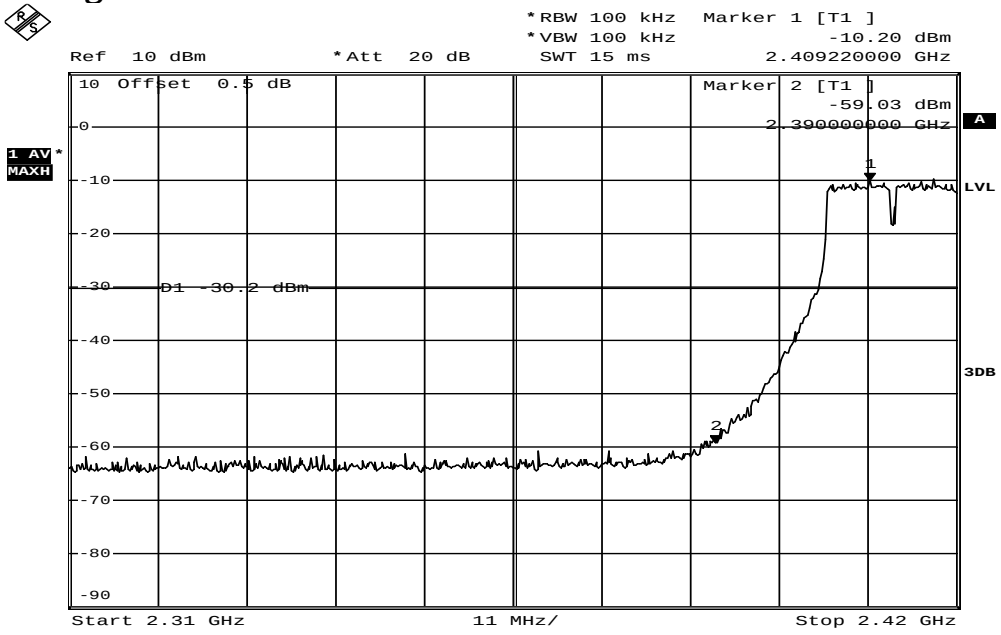
4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

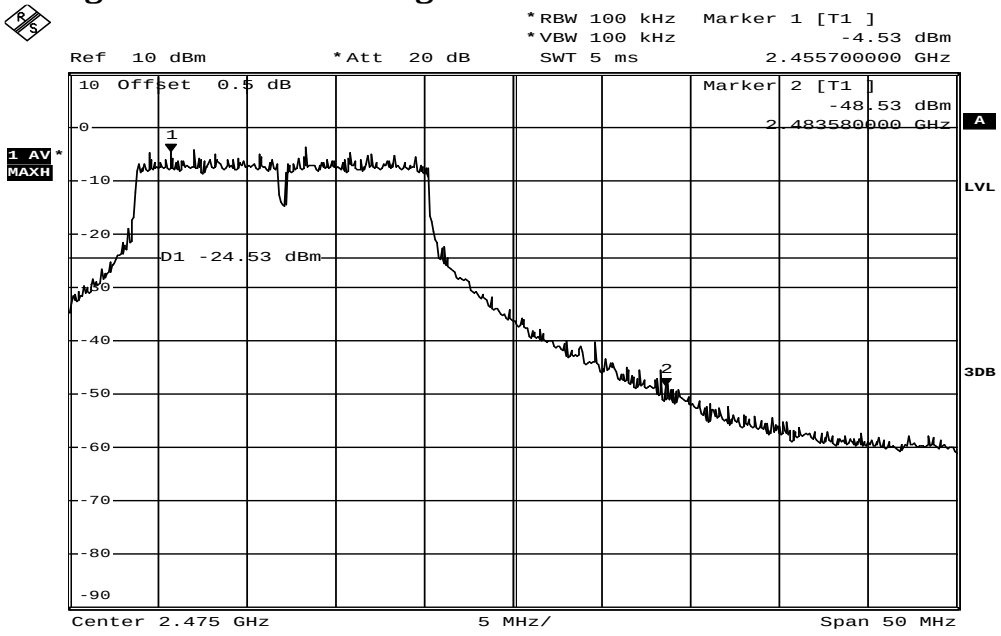
802.11g

Band Edges Test Data CH-Low



Date: 7.SEP.2011 17:12:17

Band Edges Test Data CH-High



Date: 7.SEP.2011 17:29:27

Radiated Emission: 802.11 g mode

Operation Mode	TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2390.00	49.12	-1.06	48.06	54.00	-5.94	Average	VERTICAL
2	2390.00	60.33	-1.06	59.27	74.00	-14.73	Peak	VERTICAL
1	2390.00	49.58	-1.06	48.52	54.00	-5.48	Average	HORIZONTAL
2	2390.00	61.86	-1.06	60.80	74.00	-13.20	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver.
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	44.75	-0.96	43.79	54.00	-10.21	Average	VERTICAL
2	2483.50	56.64	-0.96	55.68	74.00	-18.32	Peak	VERTICAL
1	2483.50	42.57	-0.96	41.61	54.00	-12.39	Average	HORIZONTAL
2	2483.50	53.32	-0.96	52.36	74.00	-21.64	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

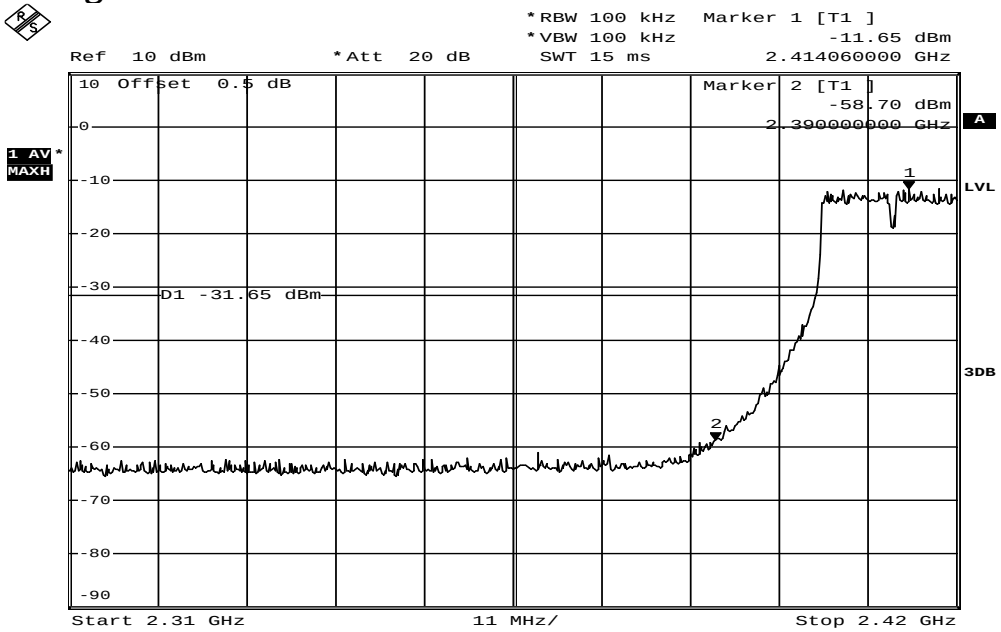
4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

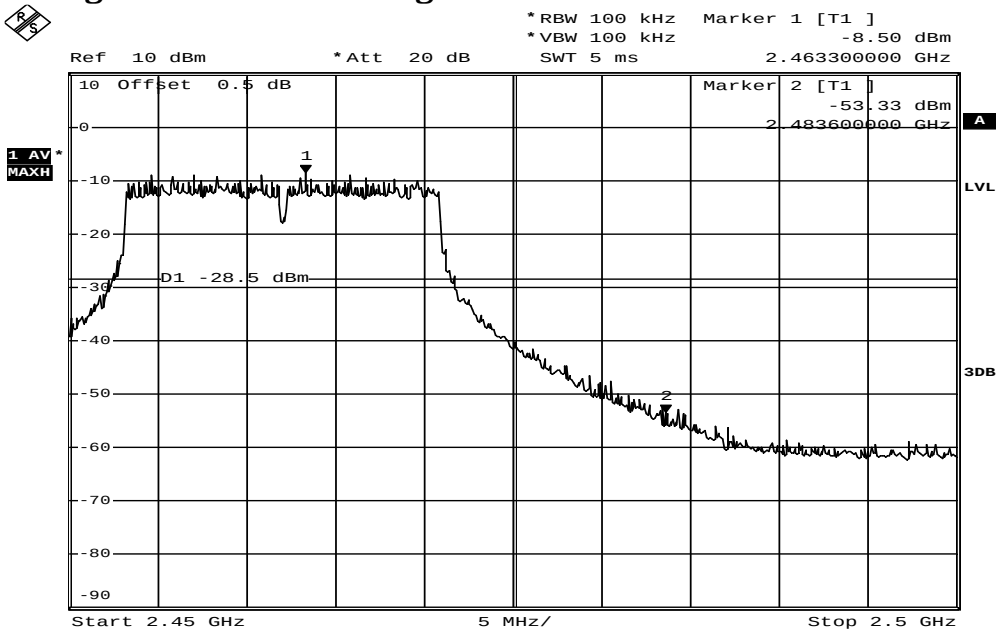
802.11n_20M

Band Edges Test Data CH-Low



Date: 7.SEP.2011 17:13:45

Band Edges Test Data CH-High



Date: 7.SEP.2011 17:23:35

Radiated Emission: 802.11 n_20M mode

Operation Mode	TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2390.00	44.68	-1.06	43.62	54.00	-10.38	Average	VERTICAL
2	2390.00	56.79	-1.06	55.73	74.00	-18.27	Peak	VERTICAL
1	2390.00	47.05	-1.06	45.99	54.00	-8.01	Average	HORIZONTAL
2	2390.00	59.12	-1.06	58.06	74.00	-15.94	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver.
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	52.63	-0.96	51.67	74.00	-22.33	Peak	VERTICAL
1	2483.50	49.60	-0.96	48.64	74.00	-25.36	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

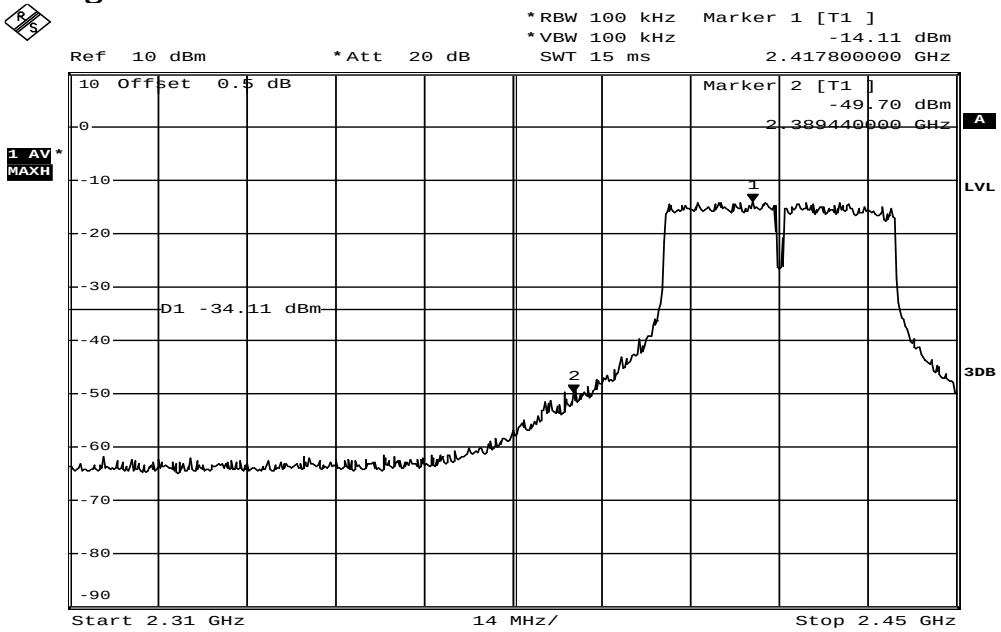
4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

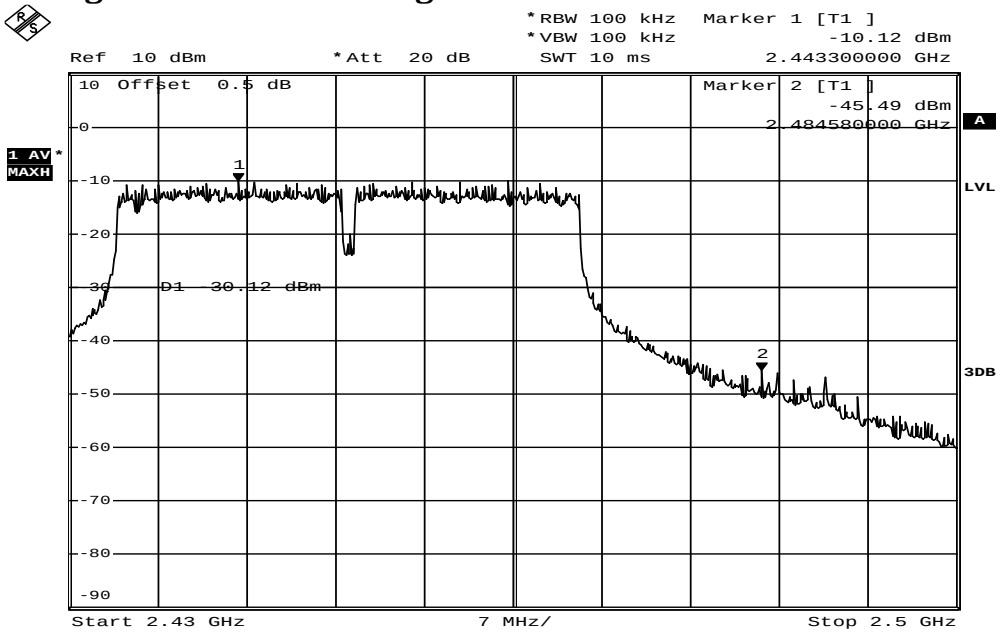
802.11n_40M

Band Edges Test Data CH-Low



Date: 7.SEP.2011 17:34:53

Band Edges Test Data CH-High



Date: 7.SEP.2011 17:26:56

Radiated Emission: 802.11 n_40M mode

Operation Mode	TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2422 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2390.00	50.17	-1.06	49.11	54.00	-4.89	Average	VERTICAL
2	2390.00	60.97	-1.06	59.91	74.00	-14.09	Peak	VERTICAL
1	2390.00	50.34	-1.06	49.28	54.00	-4.72	Average	HORIZONTAL
2	2390.00	62.17	-1.06	61.11	74.00	-12.89	Peak	HORIZONTAL

Operation Mode	TX CH High	Test Date	2011/09/06
Fundamental Frequency	2452 MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver.
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	52.85	-0.96	51.89	54.00	-2.11	Average	VERTICAL
2	2483.50	64.44	-0.96	63.48	74.00	-10.52	Peak	VERTICAL
1	2483.50	49.65	-0.96	48.69	54.00	-5.31	Average	HORIZONTAL
2	2483.50	61.02	-0.96	60.06	74.00	-13.94	Peak	HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

9 SPURIOUS RADIATED EMISSION TEST

9.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

9.2 Measurement Equipment Used:

9.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

9.2.2 Radiated emission:

Refer to section 7.2 for details.

9.3 Test SET-UP:

9.3.1 Conducted Emission at antenna port:

Refer to section 6.3 for details.

9.3.2 Radiated emission:

Refer to section 7.3 for details.

9.4 Measurement Procedure:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measured were complete.

9.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

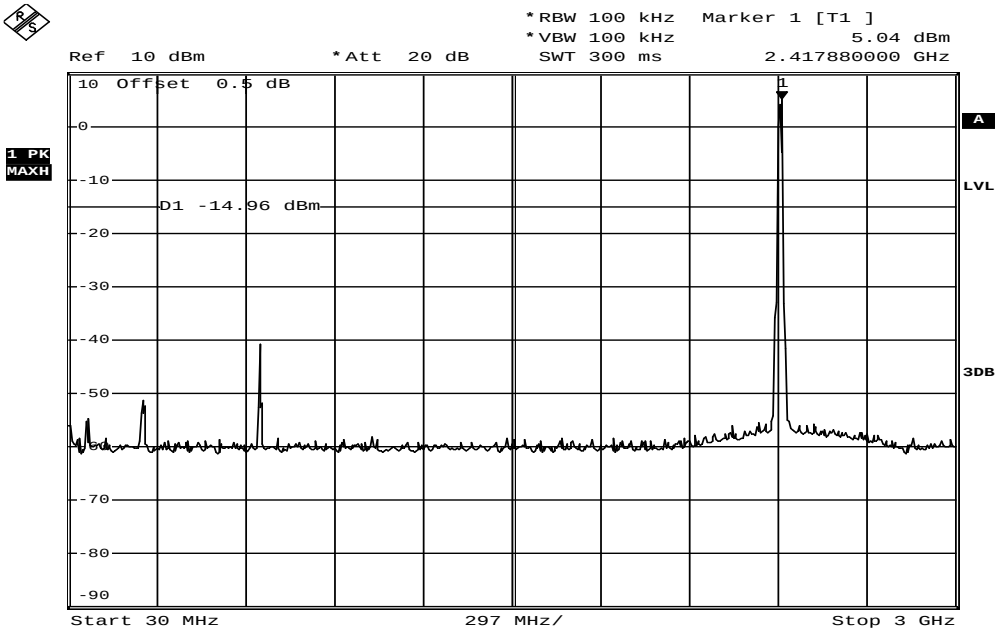
Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

9.6 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

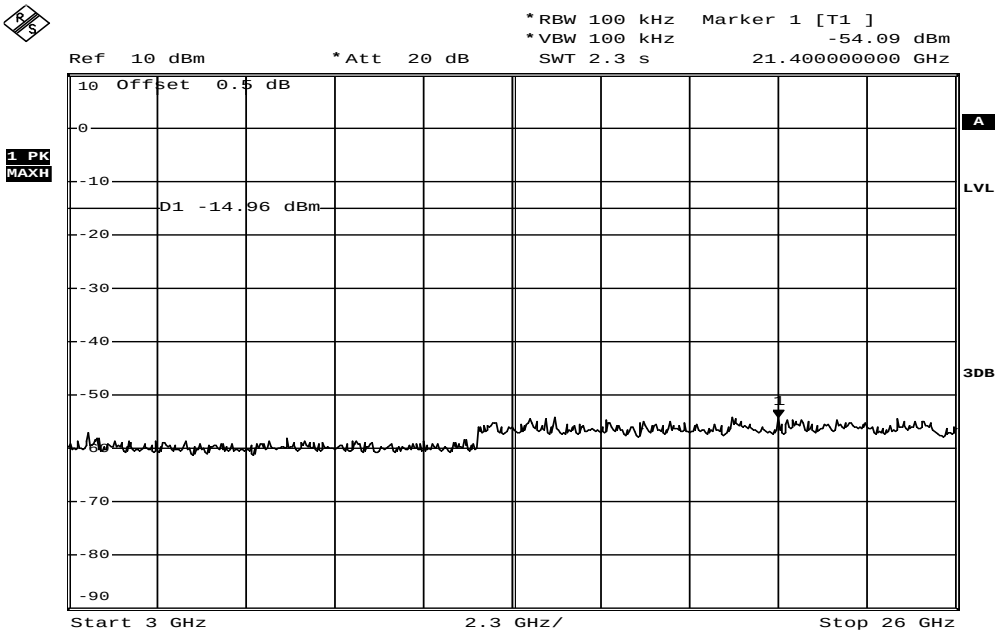
Conducted Spurious Emission Measurement Result (802.11b)

Ch Low 30MHz – 3GHz



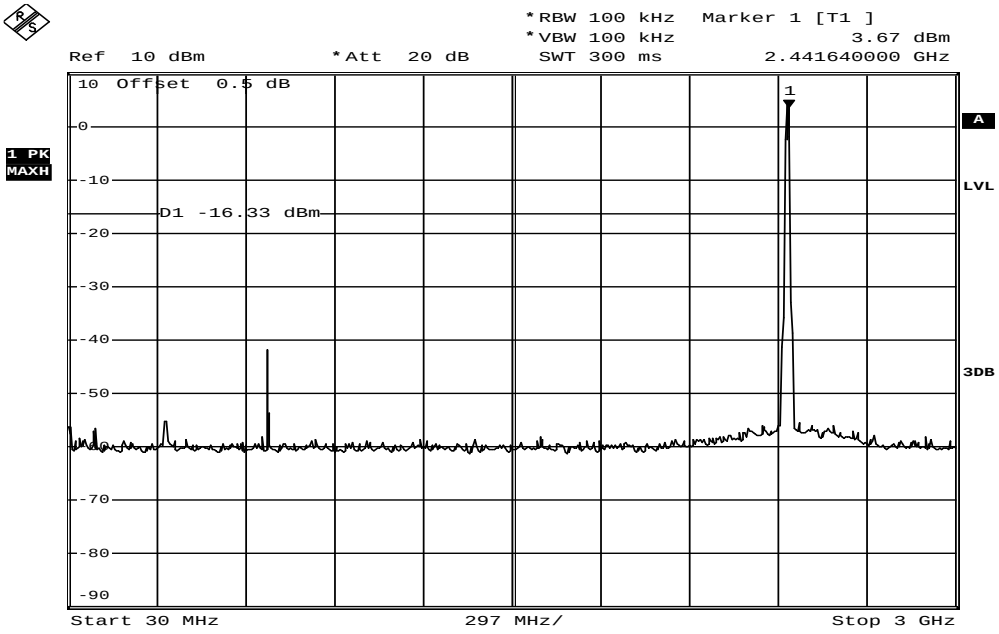
Date: 7.SEP.2011 20:15:46

Ch Low 3GHz – 26.5GHz



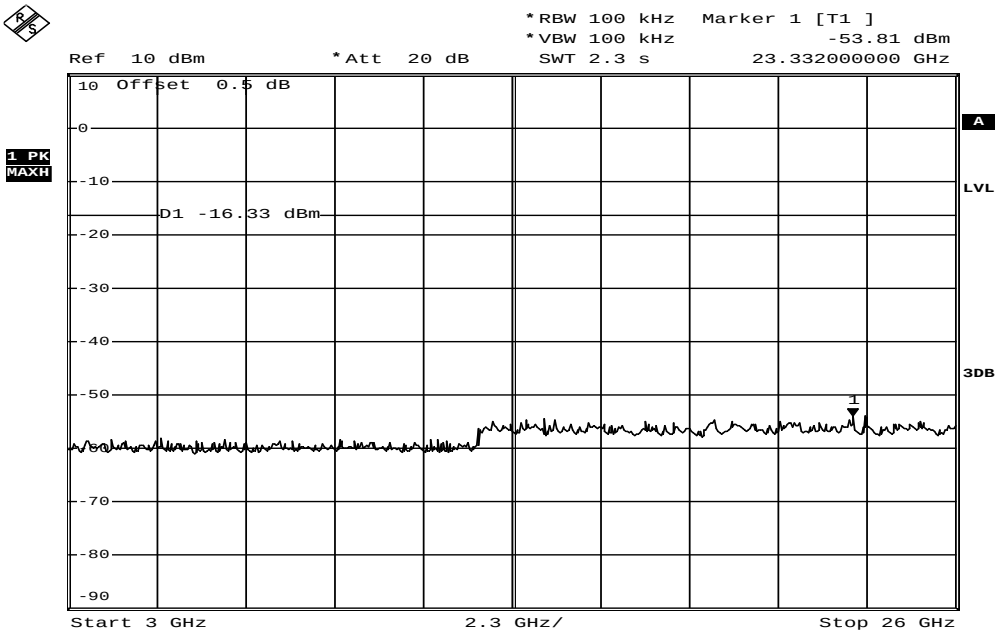
Date: 7.SEP.2011 20:16:05

Ch Mid 30MHz – 3GHz



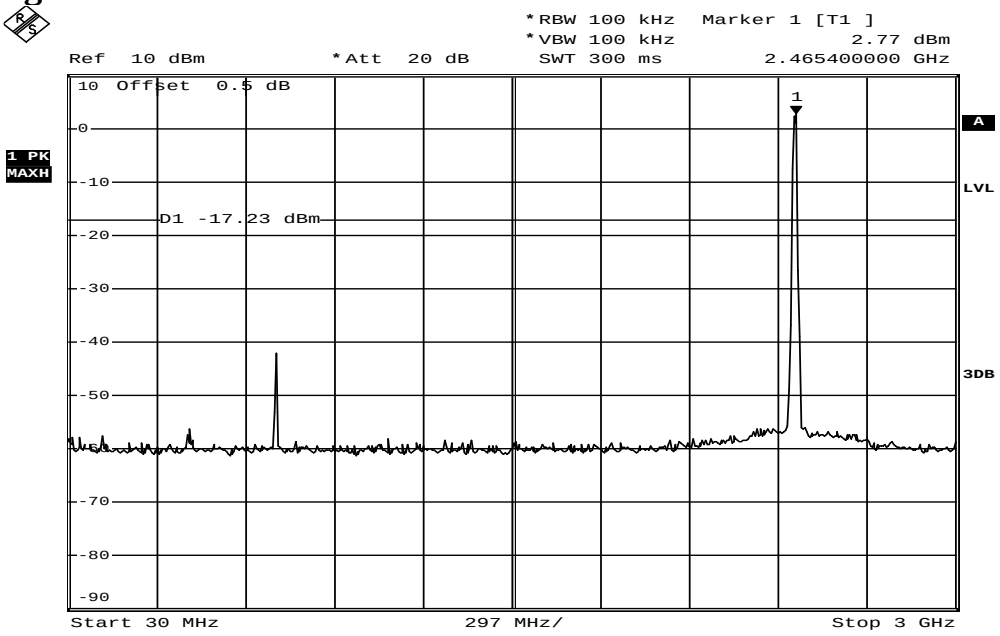
Date: 7.SEP.2011 20:17:17

Ch Mid 3GHz – 26.5GHz



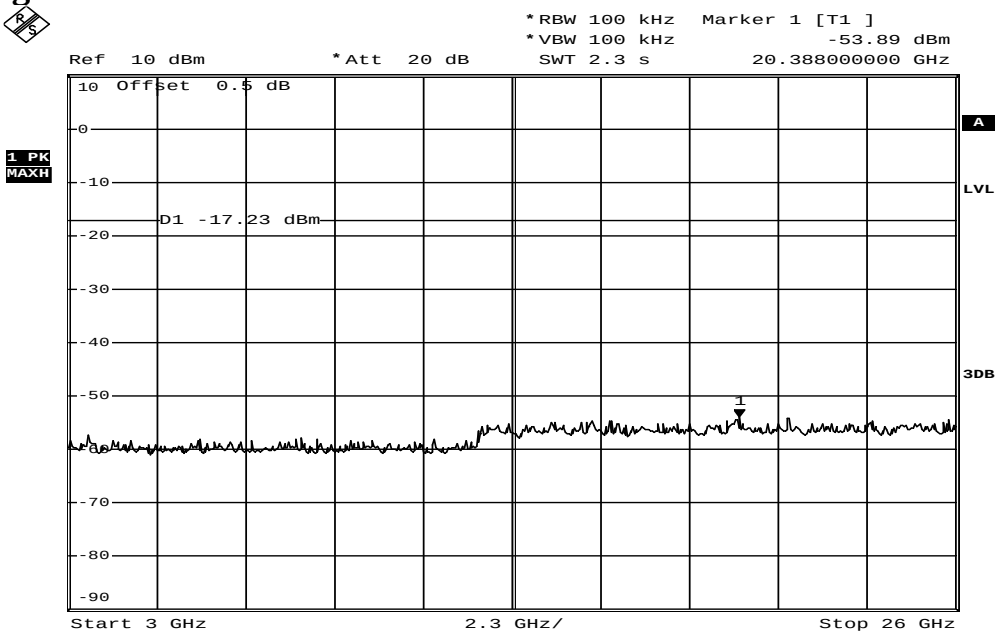
Date: 7.SEP.2011 20:17:31

Ch High 30MHz – 3GHz



Date: 7.SEP.2011 20:18:43

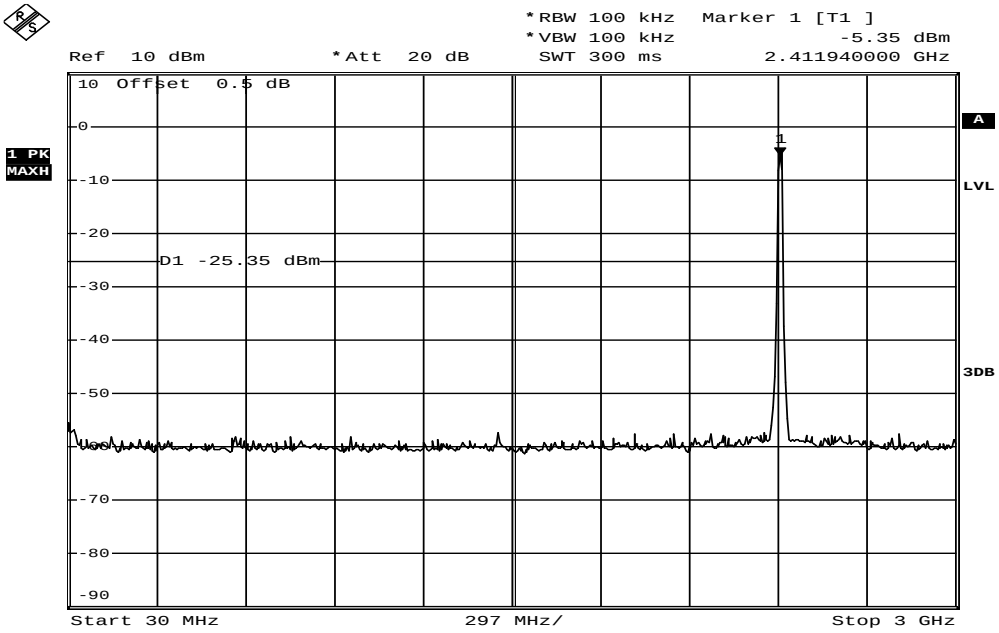
Ch High 3GHz – 26.5GHz



Date: 7.SEP.2011 20:19:02

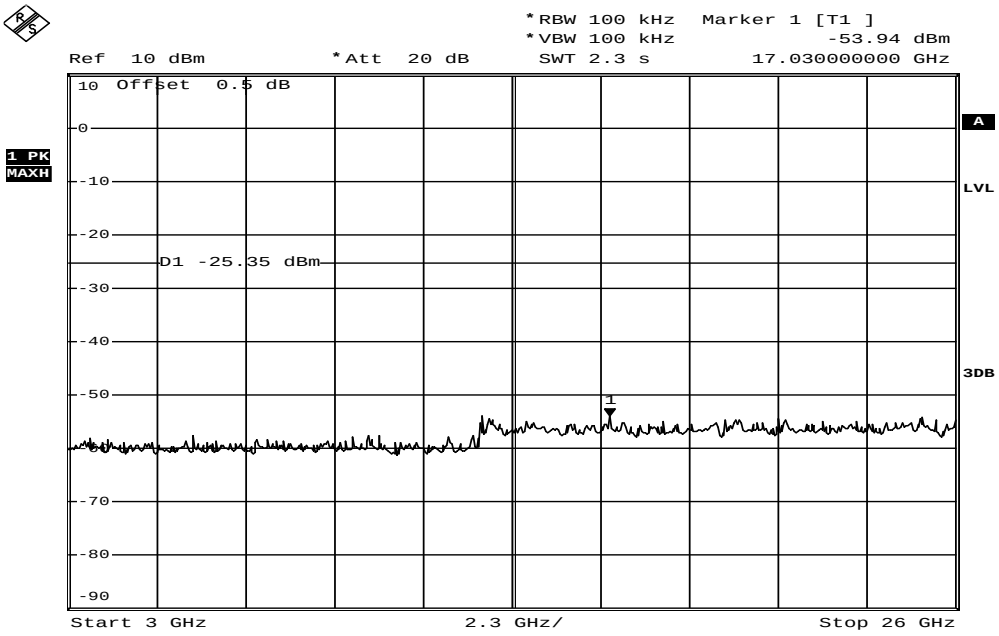
Conducted Spurious Emission Measurement Result (802.11g)

Ch Low 30MHz – 3GHz



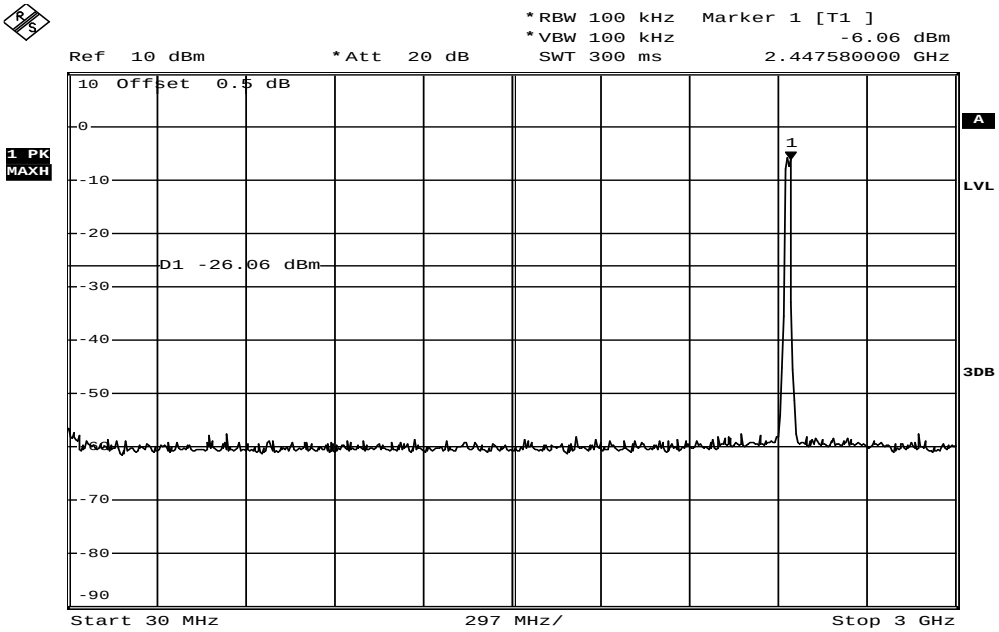
Date: 7.SEP.2011 20:14:01

Ch Low 3GHz – 26.5GHz



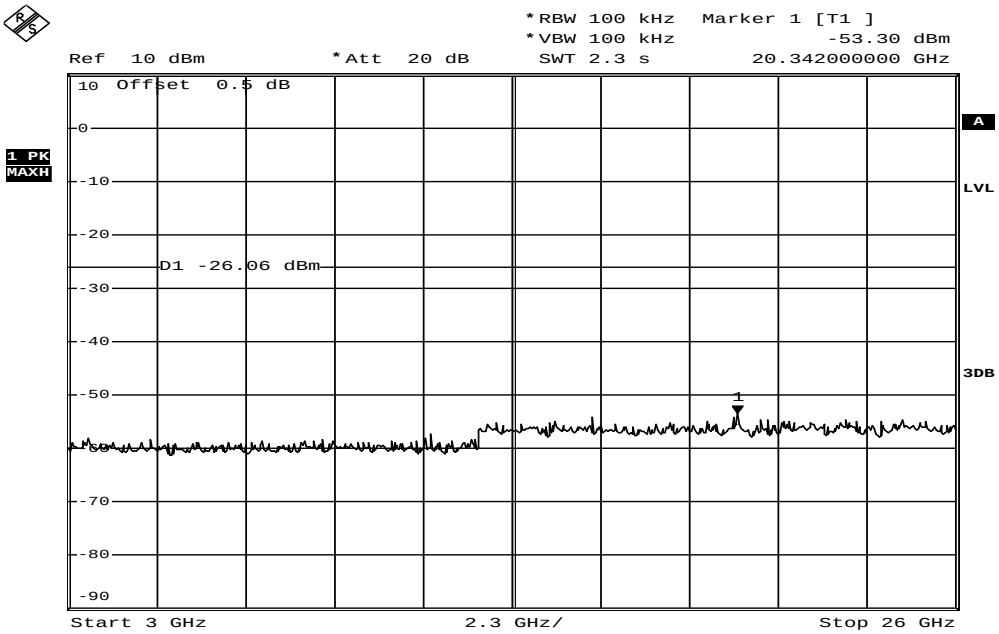
Date: 7.SEP.2011 20:14:16

Ch Mid 30MHz – 3GHz



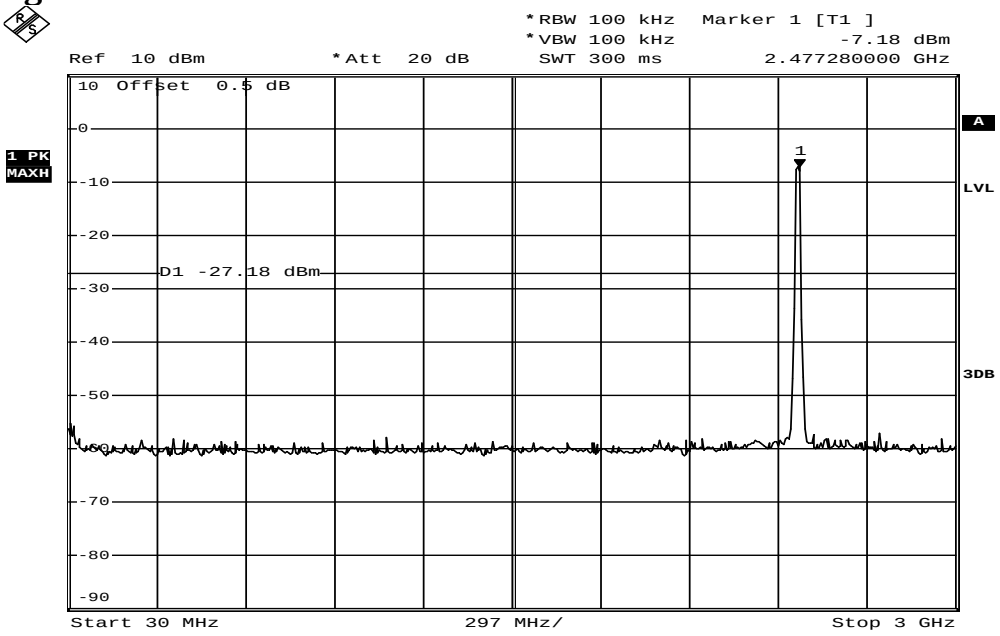
Date: 7.SEP.2011 20:12:28

Ch Mid 3GHz – 26.5GHz



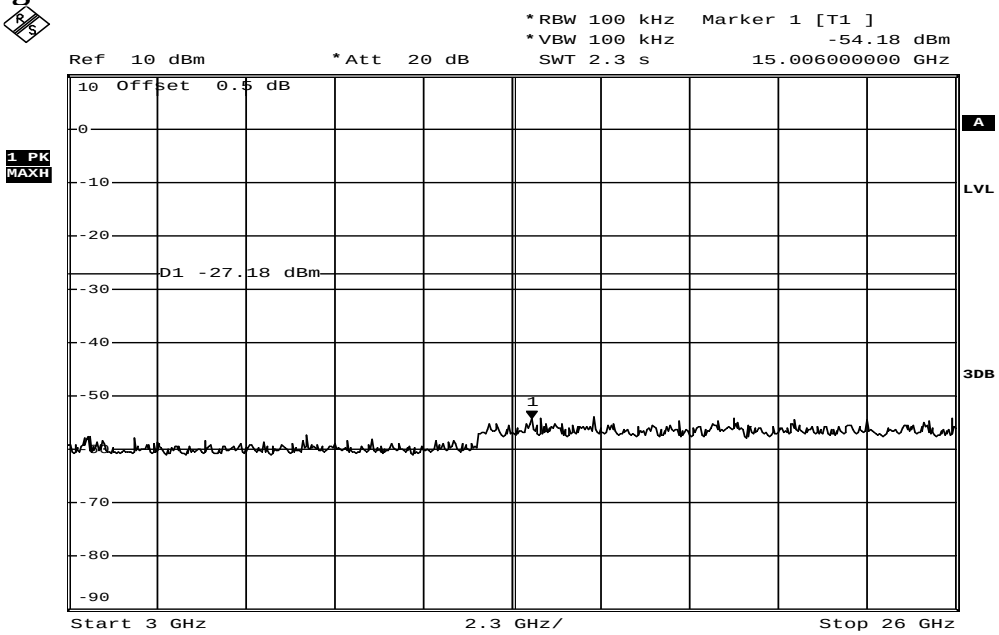
Date: 7.SEP.2011 20:12:43

Ch High 30MHz – 3GHz



Date: 7.SEP.2011 20:10:55

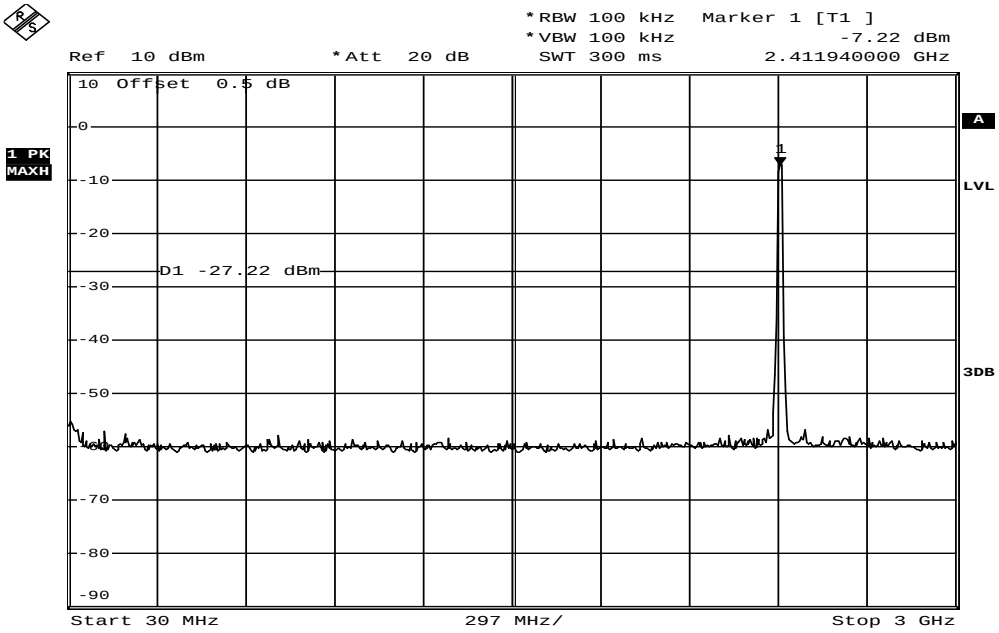
Ch High 3GHz – 26.5GHz



Date: 7.SEP.2011 20:11:12

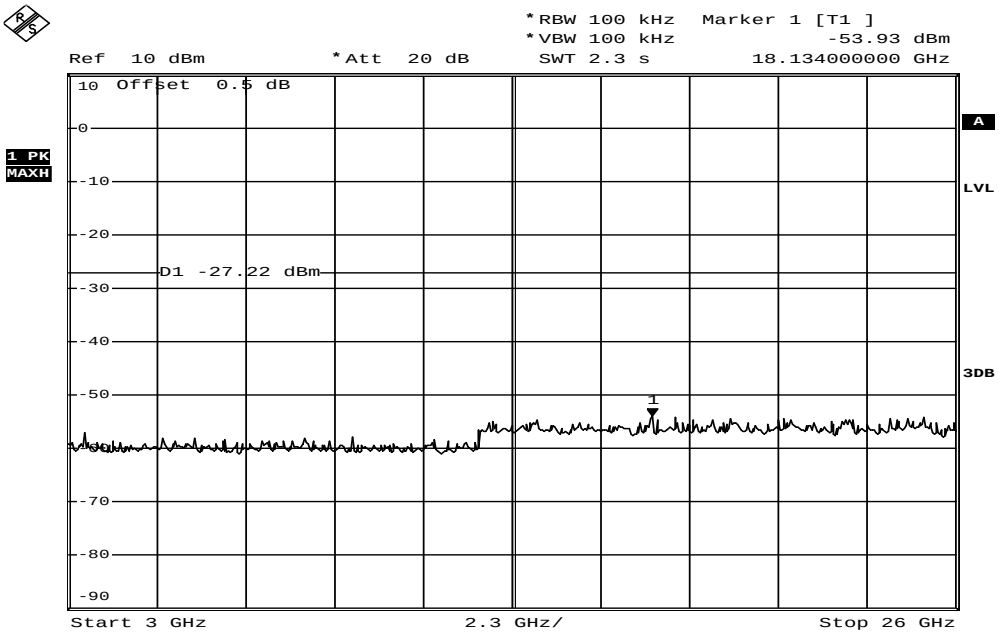
Conducted Spurious Emission Measurement Result (802.11n_20M)

Ch Low 30MHz – 3GHz



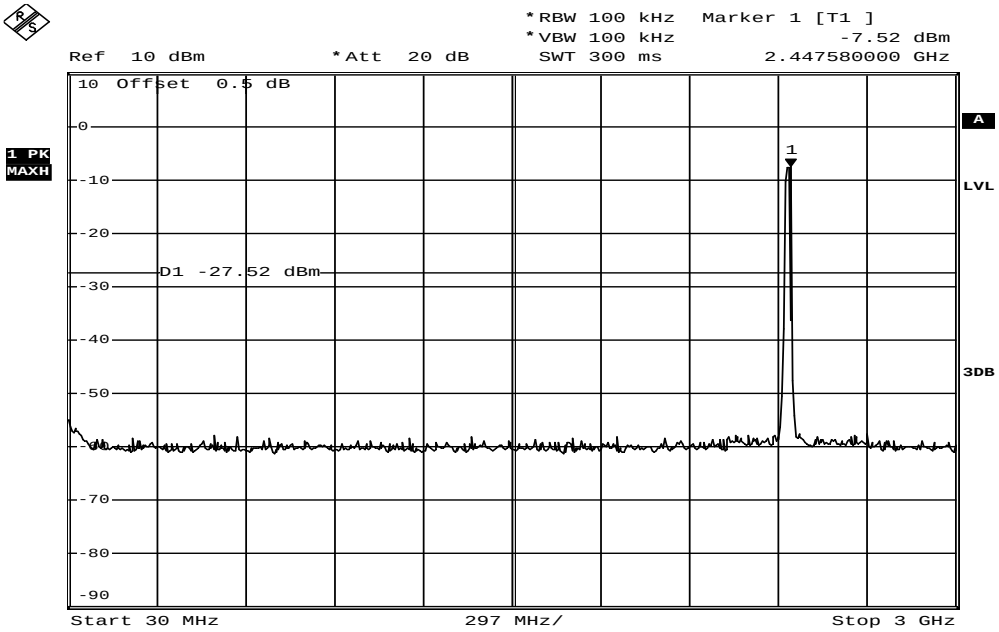
Date: 7.SEP.2011 20:05:49

Ch Low 3GHz – 26.5GHz



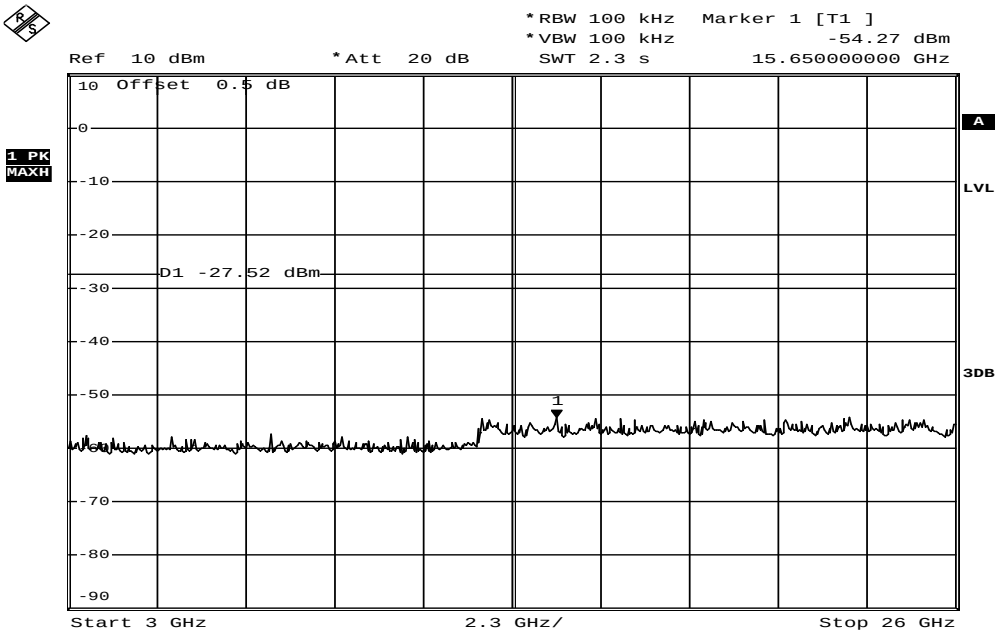
Date: 7.SEP.2011 20:06:08

Ch Mid 30MHz – 3GHz



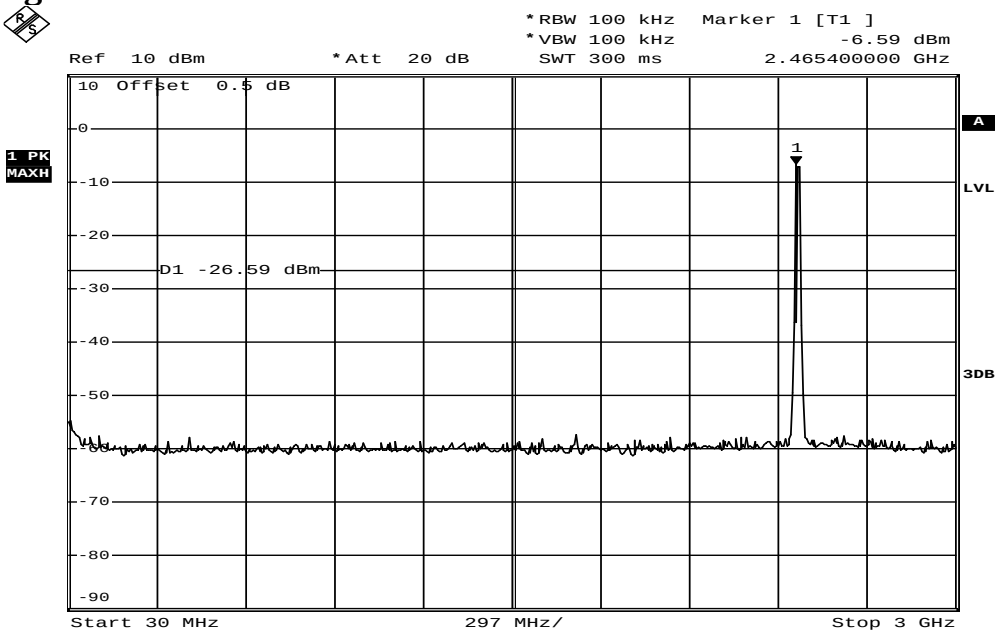
Date: 7.SEP.2011 20:07:24

Ch Mid 3GHz – 26.5GHz



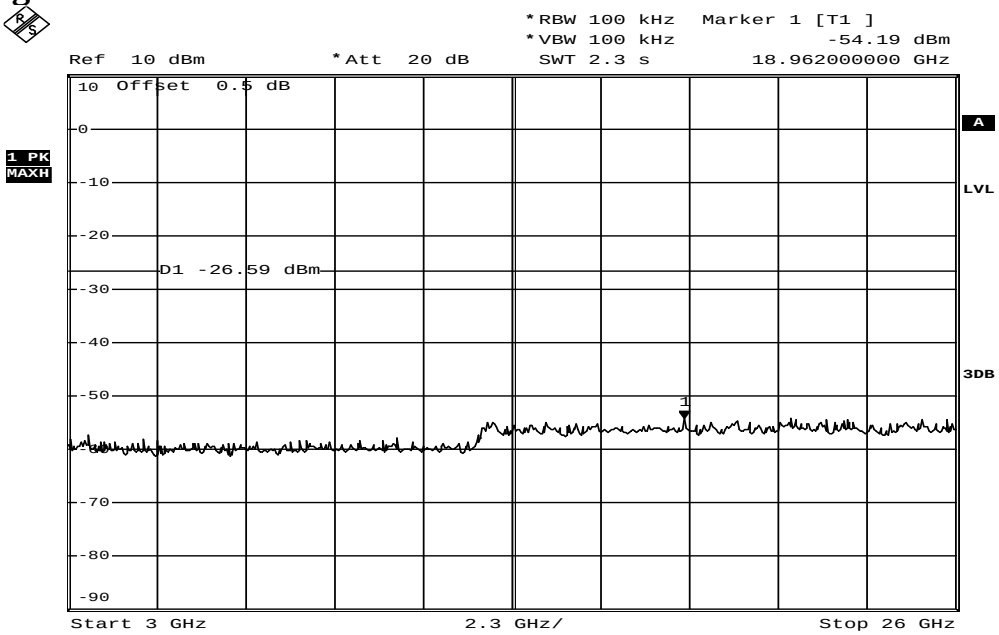
Date: 7.SEP.2011 20:07:40

Ch High 30MHz – 3GHz



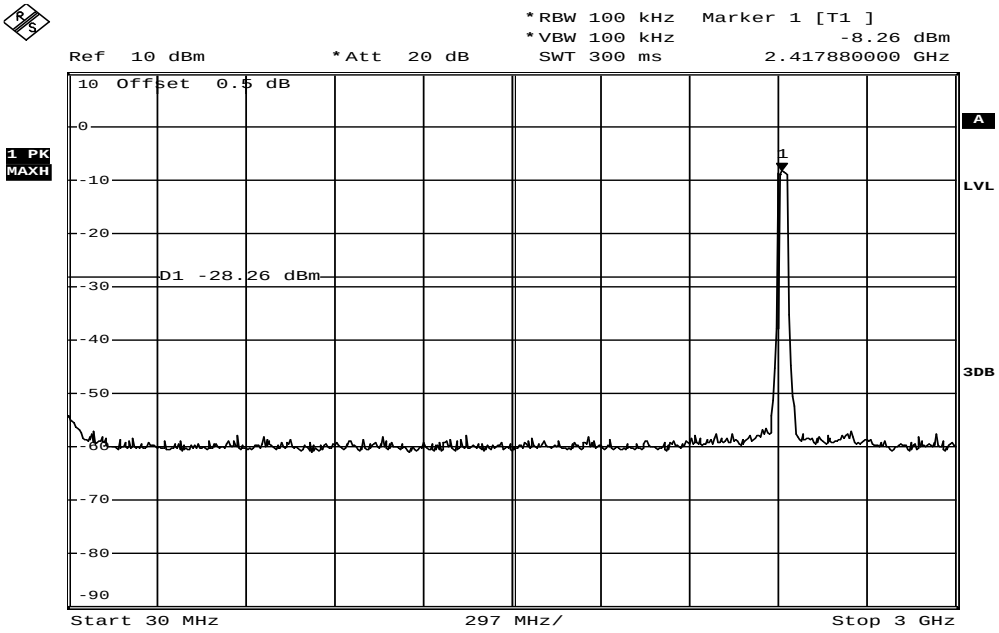
Date: 7.SEP.2011 20:09:06

Ch High 3GHz – 26.5GHz



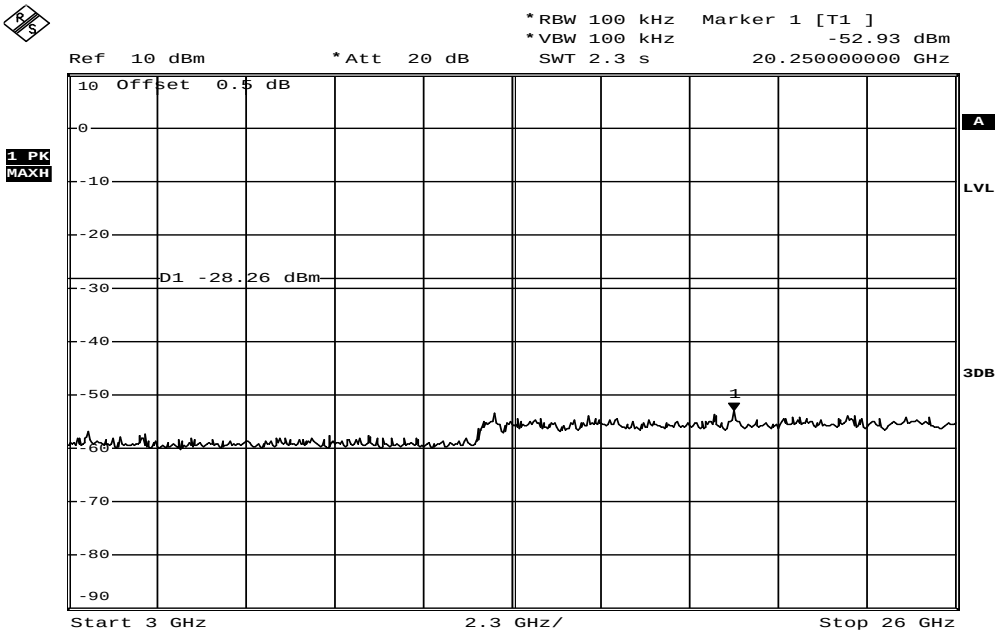
Date: 7.SEP.2011 20:09:23

Conducted Spurious Emission Measurement Result (802.11n_40M)
Ch Low 30MHz – 3GHz



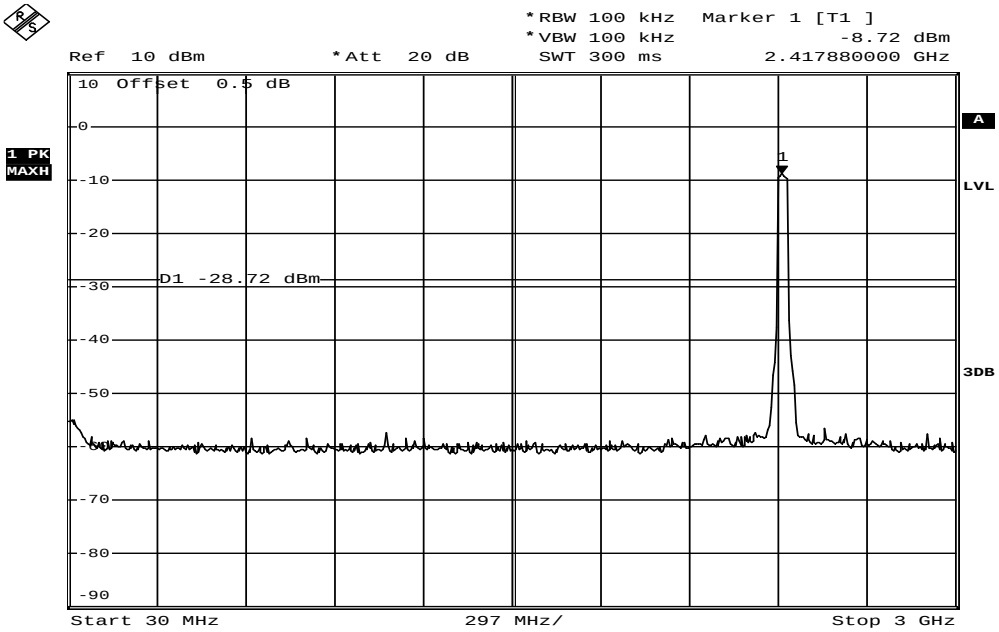
Date: 7.SEP.2011 19:59:49

Ch Low 3GHz – 26.5GHz



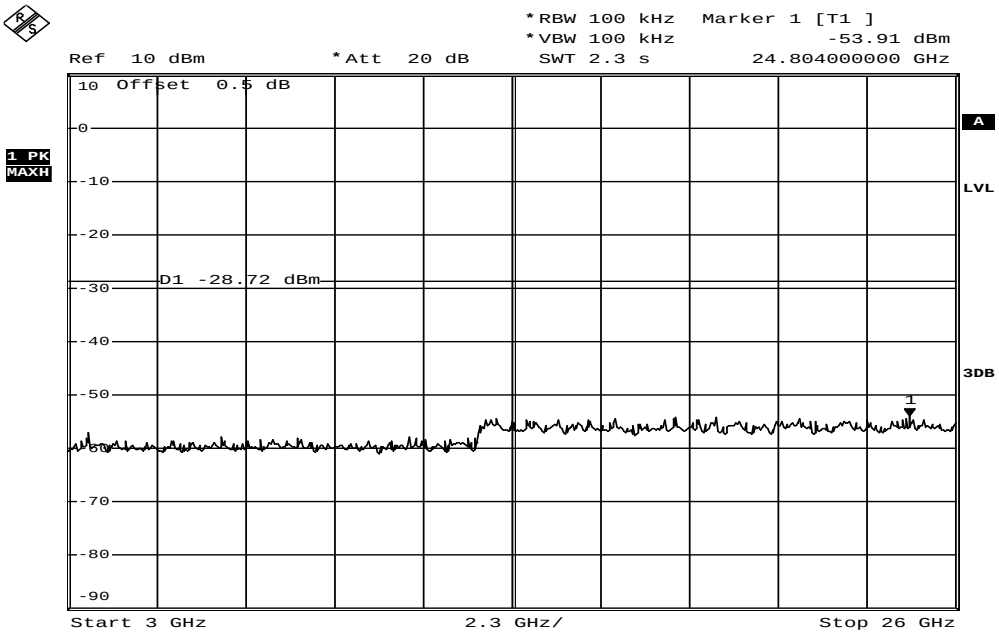
Date: 7.SEP.2011 20:00:56

Ch Mid 30MHz – 3GHz



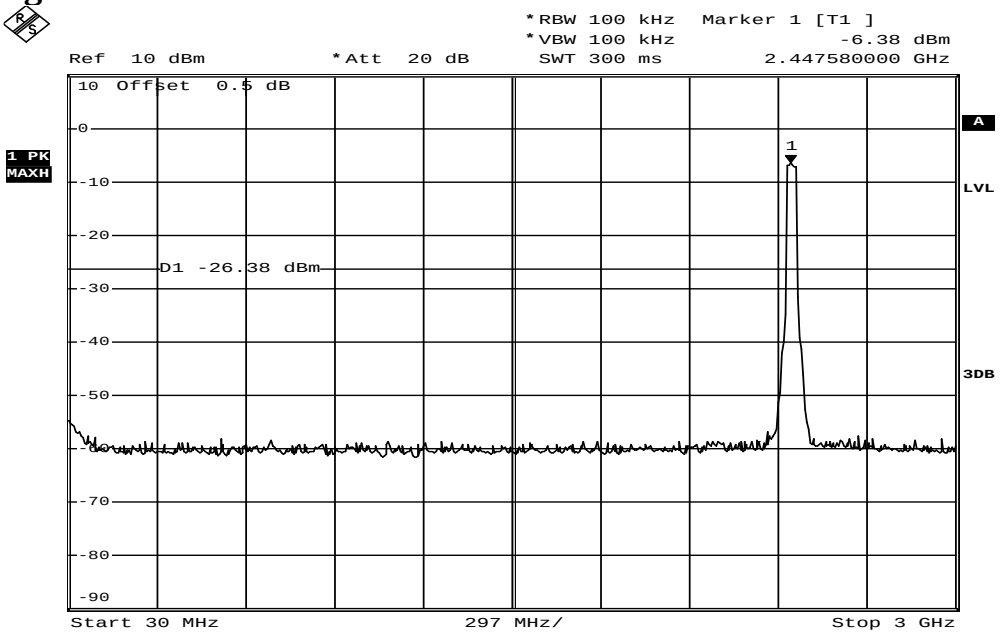
Date: 7.SEP.2011 20:02:28

Ch Mid 3GHz – 26.5GHz



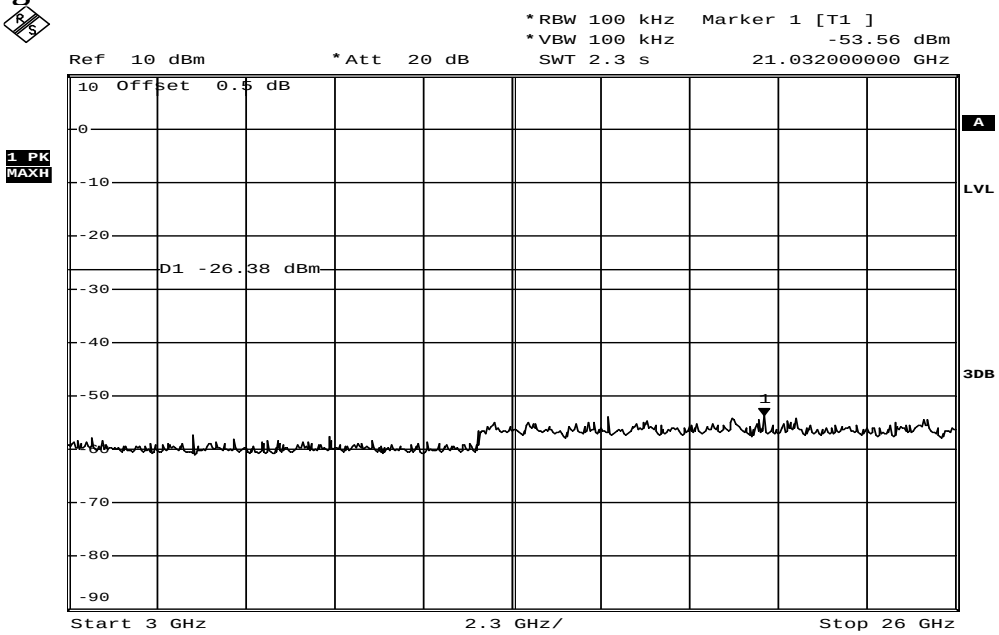
Date: 7.SEP.2011 20:02:49

Ch High 30MHz – 3GHz



Date: 7.SEP.2011 20:04:07

Ch High 3GHz – 26.5GHz



Date: 7.SEP.2011 20:04:23

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode	802.11b TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	49.32	-14.80	34.52	43.50	-8.98	Peak	VERTICAL
2	232.73	48.51	-15.44	33.07	46.00	-12.93	Peak	VERTICAL
3	282.20	46.83	-13.25	33.58	46.00	-12.42	Peak	VERTICAL
4	365.62	48.15	-11.56	36.59	46.00	-9.41	Peak	VERTICAL
5	668.26	44.69	-8.95	35.74	46.00	-10.26	Peak	VERTICAL
6	959.26	36.73	-6.14	30.59	46.00	-15.41	Peak	VERTICAL
1	129.91	54.95	-14.80	40.15	43.50	-3.35	Peak	HORIZONTAL
2	249.22	51.65	-14.01	37.64	46.00	-8.36	Peak	HORIZONTAL
3	365.62	49.41	-11.56	37.85	46.00	-8.15	Peak	HORIZONTAL
4	480.08	45.04	-10.82	34.22	46.00	-11.78	Peak	HORIZONTAL
5	668.26	48.54	-8.95	39.59	46.00	-6.41	Peak	HORIZONTAL
6	816.67	39.59	-7.92	31.67	46.00	-14.33	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode	802.11b TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	48.48	-14.80	33.68	43.50	-9.82	Peak	VERTICAL
2	222.06	45.55	-16.27	29.28	46.00	-16.72	Peak	VERTICAL
3	298.69	41.13	-13.02	28.11	46.00	-17.89	Peak	VERTICAL
4	365.62	46.90	-11.56	35.34	46.00	-10.66	Peak	VERTICAL
5	816.67	32.66	-7.92	24.74	46.00	-21.26	Peak	VERTICAL
6	959.26	34.55	-6.14	28.41	46.00	-17.59	Peak	VERTICAL
1	132.82	45.04	-14.98	30.06	43.50	-13.44	Peak	HORIZONTAL
2	222.06	49.12	-16.27	32.85	46.00	-13.15	Peak	HORIZONTAL
3	365.62	45.69	-11.56	34.13	46.00	-11.87	Peak	HORIZONTAL
4	431.58	44.75	-11.05	33.70	46.00	-12.30	Peak	HORIZONTAL
5	668.26	46.87	-8.95	37.92	46.00	-8.08	Peak	HORIZONTAL
6	816.67	38.48	-7.92	30.56	46.00	-15.44	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11b)

Operation Mode	802.11b TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	47.66	-14.80	32.86	43.50	-10.64	Peak	VERTICAL
2	222.06	46.38	-16.27	30.11	46.00	-15.89	Peak	VERTICAL
3	315.18	43.79	-12.61	31.18	46.00	-14.82	Peak	VERTICAL
4	365.62	46.61	-11.56	35.05	46.00	-10.95	Peak	VERTICAL
5	816.67	32.29	-7.92	24.37	46.00	-21.63	Peak	VERTICAL
6	959.26	34.31	-6.14	28.17	46.00	-17.83	Peak	VERTICAL
1	132.82	45.52	-14.98	30.54	43.50	-12.96	Peak	HORIZONTAL
2	232.73	50.13	-15.44	34.69	46.00	-11.31	Peak	HORIZONTAL
3	365.62	46.72	-11.56	35.16	46.00	-10.84	Peak	HORIZONTAL
4	431.58	44.39	-11.05	33.34	46.00	-12.66	Peak	HORIZONTAL
5	668.26	47.65	-8.95	38.70	46.00	-7.30	Peak	HORIZONTAL
6	816.67	39.26	-7.92	31.34	46.00	-14.66	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g)

Operation Mode	802.11g TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	132.82	48.34	-14.98	33.36	43.50	-10.14	Peak	VERTICAL
2	222.06	45.95	-16.27	29.68	46.00	-16.32	Peak	VERTICAL
3	315.18	41.76	-12.61	29.15	46.00	-16.85	Peak	VERTICAL
4	365.62	47.11	-11.56	35.55	46.00	-10.45	Peak	VERTICAL
5	816.67	32.93	-7.92	25.01	46.00	-20.99	Peak	VERTICAL
6	960.23	34.75	-6.14	28.61	54.00	-25.39	Peak	VERTICAL
1	129.91	44.94	-14.80	30.14	43.50	-13.36	Peak	HORIZONTAL
2	222.06	49.02	-16.27	32.75	46.00	-13.25	Peak	HORIZONTAL
3	365.62	46.49	-11.56	34.93	46.00	-11.07	Peak	HORIZONTAL
4	431.58	44.23	-11.05	33.18	46.00	-12.82	Peak	HORIZONTAL
5	668.26	47.62	-8.95	38.67	46.00	-7.33	Peak	HORIZONTAL
6	816.67	38.29	-7.92	30.37	46.00	-15.63	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g)

Operation Mode	802.11g TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	48.59	-14.80	33.79	43.50	-9.71	Peak	VERTICAL
2	222.06	45.20	-16.27	28.93	46.00	-17.07	Peak	VERTICAL
3	282.20	44.07	-13.25	30.82	46.00	-15.18	Peak	VERTICAL
4	315.18	44.80	-12.61	32.19	46.00	-13.81	Peak	VERTICAL
5	365.62	46.76	-11.56	35.20	46.00	-10.80	Peak	VERTICAL
6	960.23	34.16	-6.14	28.02	54.00	-25.98	Peak	VERTICAL
1	132.82	45.49	-14.98	30.51	43.50	-12.99	Peak	HORIZONTAL
2	232.73	50.47	-15.44	35.03	46.00	-10.97	Peak	HORIZONTAL
3	315.18	48.86	-12.61	36.25	46.00	-9.75	Peak	HORIZONTAL
4	668.26	47.47	-8.95	38.52	46.00	-7.48	Peak	HORIZONTAL
5	816.67	39.29	-7.92	31.37	46.00	-14.63	Peak	HORIZONTAL
6	965.08	35.19	-6.14	29.05	54.00	-24.95	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11g)

Operation Mode	802.11g TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	47.79	-14.80	32.99	43.50	-10.51	Peak	VERTICAL
2	222.06	45.37	-16.27	29.10	46.00	-16.90	Peak	VERTICAL
3	282.20	44.68	-13.25	31.43	46.00	-14.57	Peak	VERTICAL
4	315.18	43.27	-12.61	30.66	46.00	-15.34	Peak	VERTICAL
5	365.62	46.70	-11.56	35.14	46.00	-10.86	Peak	VERTICAL
6	960.23	34.85	-6.14	28.71	54.00	-25.29	Peak	VERTICAL
1	132.82	47.41	-14.98	32.43	43.50	-11.07	Peak	HORIZONTAL
2	222.06	48.84	-16.27	32.57	46.00	-13.43	Peak	HORIZONTAL
3	365.62	46.21	-11.56	34.65	46.00	-11.35	Peak	HORIZONTAL
4	431.58	44.63	-11.05	33.58	46.00	-12.42	Peak	HORIZONTAL
5	668.26	47.93	-8.95	38.98	46.00	-7.02	Peak	HORIZONTAL
6	816.67	38.42	-7.92	30.50	46.00	-15.50	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n_20M)

Operation Mode	802.11 n_20M TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	49.44	-14.80	34.64	43.50	-8.86	Peak	VERTICAL
2	222.06	45.57	-16.27	29.30	46.00	-16.70	Peak	VERTICAL
3	282.20	41.90	-13.25	28.65	46.00	-17.35	Peak	VERTICAL
4	365.62	46.56	-11.56	35.00	46.00	-11.00	Peak	VERTICAL
5	431.58	37.21	-11.05	26.16	46.00	-19.84	Peak	VERTICAL
6	960.23	34.35	-6.14	28.21	54.00	-25.79	Peak	VERTICAL
1	129.91	45.43	-14.80	30.63	43.50	-12.87	Peak	HORIZONTAL
2	222.06	48.81	-16.27	32.54	46.00	-13.46	Peak	HORIZONTAL
3	365.62	46.29	-11.56	34.73	46.00	-11.27	Peak	HORIZONTAL
4	668.26	47.47	-8.95	38.52	46.00	-7.48	Peak	HORIZONTAL
5	816.67	39.15	-7.92	31.23	46.00	-14.77	Peak	HORIZONTAL
6	965.08	35.00	-6.14	28.86	54.00	-25.14	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n_20M)

Operation Mode	802.11 n_20M TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	48.51	-14.80	33.71	43.50	-9.79	Peak	VERTICAL
2	165.80	43.78	-16.75	27.03	43.50	-16.47	Peak	VERTICAL
3	222.06	45.77	-16.27	29.50	46.00	-16.50	Peak	VERTICAL
4	298.69	41.07	-13.02	28.05	46.00	-17.95	Peak	VERTICAL
5	365.62	47.13	-11.56	35.57	46.00	-10.43	Peak	VERTICAL
6	960.23	34.53	-6.14	28.39	54.00	-25.61	Peak	VERTICAL
1	222.06	48.86	-16.27	32.59	46.00	-13.41	Peak	HORIZONTAL
2	315.18	50.89	-12.61	38.28	46.00	-7.72	Peak	HORIZONTAL
3	365.62	45.87	-11.56	34.31	46.00	-11.69	Peak	HORIZONTAL
4	431.58	44.48	-11.05	33.43	46.00	-12.57	Peak	HORIZONTAL
5	668.26	47.90	-8.95	38.95	46.00	-7.05	Peak	HORIZONTAL
6	816.67	38.67	-7.92	30.75	46.00	-15.25	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n_20M)

Operation Mode	802.11 n_20M TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	132.82	47.92	-14.98	32.94	43.50	-10.56	Peak	VERTICAL
2	222.06	46.16	-16.27	29.89	46.00	-16.11	Peak	VERTICAL
3	315.18	47.65	-12.61	35.04	46.00	-10.96	Peak	VERTICAL
4	365.62	47.09	-11.56	35.53	46.00	-10.47	Peak	VERTICAL
5	431.58	37.24	-11.05	26.19	46.00	-19.81	Peak	VERTICAL
6	960.23	34.78	-6.14	28.64	54.00	-25.36	Peak	VERTICAL
1	132.82	48.48	-14.98	33.50	43.50	-10.00	Peak	HORIZONTAL
2	232.73	50.51	-15.44	35.07	46.00	-10.93	Peak	HORIZONTAL
3	315.18	50.41	-12.61	37.80	46.00	-8.20	Peak	HORIZONTAL
4	431.58	44.71	-11.05	33.66	46.00	-12.34	Peak	HORIZONTAL
5	668.26	47.61	-8.95	38.66	46.00	-7.34	Peak	HORIZONTAL
6	816.67	38.83	-7.92	30.91	46.00	-15.09	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n_40M)

Operation Mode	802.11 n_40M TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2422MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	48.70	-14.80	33.90	43.50	-9.60	Peak	VERTICAL
2	222.06	45.49	-16.27	29.22	46.00	-16.78	Peak	VERTICAL
3	282.20	44.25	-13.25	31.00	46.00	-15.00	Peak	VERTICAL
4	315.18	44.44	-12.61	31.83	46.00	-14.17	Peak	VERTICAL
5	365.62	47.28	-11.56	35.72	46.00	-10.28	Peak	VERTICAL
6	959.26	34.47	-6.14	28.33	46.00	-17.67	Peak	VERTICAL
1	232.73	49.90	-15.44	34.46	46.00	-11.54	Peak	HORIZONTAL
2	315.18	47.48	-12.61	34.87	46.00	-11.13	Peak	HORIZONTAL
3	365.62	46.56	-11.56	35.00	46.00	-11.00	Peak	HORIZONTAL
4	431.58	44.87	-11.05	33.82	46.00	-12.18	Peak	HORIZONTAL
5	668.26	48.40	-8.95	39.45	46.00	-6.55	Peak	HORIZONTAL
6	816.67	38.51	-7.92	30.59	46.00	-15.41	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n_40M)

Operation Mode	802.11 n_40M TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	47.76	-14.80	32.96	43.50	-10.54	Peak	VERTICAL
2	222.06	45.70	-16.27	29.43	46.00	-16.57	Peak	VERTICAL
3	315.18	42.59	-12.61	29.98	46.00	-16.02	Peak	VERTICAL
4	365.62	47.40	-11.56	35.84	46.00	-10.16	Peak	VERTICAL
5	431.58	36.87	-11.05	25.82	46.00	-20.18	Peak	VERTICAL
6	960.23	33.50	-6.14	27.36	54.00	-26.64	Peak	VERTICAL
1	132.82	51.79	-14.98	36.81	43.50	-6.69	Peak	HORIZONTAL
2	249.22	49.96	-14.01	35.95	46.00	-10.05	Peak	HORIZONTAL
3	365.62	48.73	-11.56	37.17	46.00	-8.83	Peak	HORIZONTAL
4	431.58	45.23	-11.05	34.18	46.00	-11.82	Peak	HORIZONTAL
5	668.26	48.04	-8.95	39.09	46.00	-6.91	Peak	HORIZONTAL
6	816.67	39.88	-7.92	31.96	46.00	-14.04	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz) (802.11n_40M)

Operation Mode	802.11 n_40M TX CH High	Test Date	2011/09/06
Fundamental Frequency	2452MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	129.91	48.32	-14.80	33.52	43.50	-9.98	Peak	VERTICAL
2	222.06	45.39	-16.27	29.12	46.00	-16.88	Peak	VERTICAL
3	315.18	47.40	-12.61	34.79	46.00	-11.21	Peak	VERTICAL
4	365.62	46.91	-11.56	35.35	46.00	-10.65	Peak	VERTICAL
5	431.58	37.72	-11.05	26.67	46.00	-19.33	Peak	VERTICAL
6	960.23	34.65	-6.14	28.51	54.00	-25.49	Peak	VERTICAL
1	132.82	48.15	-14.98	33.17	43.50	-10.33	Peak	HORIZONTAL
2	232.73	49.37	-15.44	33.93	46.00	-12.07	Peak	HORIZONTAL
3	365.62	46.30	-11.56	34.74	46.00	-11.26	Peak	HORIZONTAL
4	431.58	44.32	-11.05	33.27	46.00	-12.73	Peak	HORIZONTAL
5	668.26	47.54	-8.95	38.59	46.00	-7.41	Peak	HORIZONTAL
6	816.67	38.91	-7.92	30.99	46.00	-15.01	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak / QP detector mode.

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode	802.11b TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver.
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	39.52	-7.54	31.98	74.00	-42.02	Peak	VERTICAL
2	1595.00	38.35	-4.98	33.37	74.00	-40.63	Peak	VERTICAL
3	4824.00	36.36	10.10	46.46	74.00	-27.54	Peak	VERTICAL
4	7236.00	---						VERTICAL
5	9648.00	---						VERTICAL
6	12060.00	---						VERTICAL
1	1196.00	46.94	-7.54	39.40	74.00	-34.60	Peak	HORIZONTAL
2	1602.00	44.91	-4.93	39.98	74.00	-34.02	Peak	HORIZONTAL
3	4824.00	39.78	10.10	49.88	74.00	-24.12	Peak	HORIZONTAL
4	7236.00	---						HORIZONTAL
5	9648.00	---						HORIZONTAL
6	12060.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode	802.11b TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	40.46	-7.54	32.92	74.00	-41.08	Peak	VERTICAL
2	4874.00	35.27	10.30	45.57	54.00	-8.43	Average	VERTICAL
3	4874.00	45.25	10.30	55.55	74.00	-18.45	Peak	VERTICAL
4	7311.00	---						VERTICAL
5	9748.00	---						VERTICAL
6	12185.00	---						VERTICAL
1	1196.00	45.48	-7.54	37.94	74.00	-36.06	Peak	HORIZONTAL
2	1623.00	43.57	-4.74	38.83	74.00	-35.17	Peak	HORIZONTAL
3	4874.00	37.69	10.30	47.99	54.00	-6.01	Average	HORIZONTAL
4	4874.00	47.71	10.30	58.01	74.00	-15.99	Peak	HORIZONTAL
5	7311.00	---						HORIZONTAL
6	9748.00	---						HORIZONTAL
7	12185.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11b)

Operation Mode	802.11b TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	39.31	-7.54	31.77	74.00	-42.23	Peak	VERTICAL
2	1595.00	36.93	-4.98	31.95	74.00	-42.05	Peak	VERTICAL
3	4924.00	35.16	10.51	45.67	54.00	-8.33	Average	VERTICAL
4	4924.00	45.28	10.51	55.79	74.00	-18.21	Peak	VERTICAL
5	7386.00	---						VERTICAL
6	9848.00	---						VERTICAL
7	12310.00	---						VERTICAL
1	1196.00	44.73	-7.54	37.19	74.00	-36.81	Peak	HORIZONTAL
2	1637.00	38.77	-4.61	34.16	74.00	-39.84	Peak	HORIZONTAL
3	4924.00	34.28	10.51	44.79	54.00	-9.21	Average	HORIZONTAL
4	4924.00	46.34	10.51	56.85	74.00	-17.15	Peak	HORIZONTAL
5	7386.00	---						HORIZONTAL
6	9848.00	---						HORIZONTAL
7	12310.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode	802.11g TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	39.24	-7.54	31.70	74.00	-42.30	Peak	VERTICAL
2	4824.00	32.45	10.10	42.55	74.00	-31.45	Peak	VERTICAL
3	7236.00	---						VERTICAL
4	9648.00	---						VERTICAL
5	12060.00	---						VERTICAL
1	1196.00	45.70	-7.54	38.16	74.00	-35.84	Peak	HORIZONTAL
2	4824.00	32.47	10.10	42.57	74.00	-31.43	Peak	HORIZONTAL
3	7236.00	---						HORIZONTAL
4	9648.00	---						HORIZONTAL
5	12060.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode	802.11g TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	38.71	-7.54	31.17	74.00	-42.83	Peak	VERTICAL
2	1595.00	37.75	-4.98	32.77	74.00	-41.23	Peak	VERTICAL
3	4874.00	32.60	10.30	42.90	74.00	-31.10	Peak	VERTICAL
4	7311.00	---						VERTICAL
5	9748.00	---						VERTICAL
6	12185.00	---						VERTICAL
1	1196.00	43.90	-7.54	36.36	74.00	-37.64	Peak	HORIZONTAL
2	4874.00	33.42	10.30	43.72	74.00	-30.28	Peak	HORIZONTAL
3	7311.00	---						HORIZONTAL
4	9748.00	---						HORIZONTAL
5	12185.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11g)

Operation Mode	802.11g TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	39.52	-7.54	31.98	74.00	-42.02	Peak	VERTICAL
2	4924.00	32.82	10.51	43.33	74.00	-30.67	Peak	VERTICAL
3	7386.00	---						VERTICAL
4	9848.00	---						VERTICAL
5	12310.00	---						VERTICAL
1	1196.00	45.74	-7.54	38.20	74.00	-35.80	Peak	HORIZONTAL
2	4924.00	33.37	10.51	43.88	74.00	-30.12	Peak	HORIZONTAL
3	7386.00	---						HORIZONTAL
4	9848.00	---						HORIZONTAL
5	12310.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n_20M)

Operation Mode	802.11n_20M TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	40.10	-7.54	32.56	74.00	-41.44	Peak	VERTICAL
2	4824.00	33.81	10.10	43.91	74.00	-30.09	Peak	VERTICAL
3	7236.00	---						VERTICAL
4	9648.00	---						VERTICAL
5	12060.00	---						VERTICAL
1	1196.00	44.47	-7.54	36.93	74.00	-37.07	Peak	HORIZONTAL
2	4824.00	33.03	10.10	43.13	74.00	-30.87	Peak	HORIZONTAL
3	7236.00	---						HORIZONTAL
4	9648.00	---						HORIZONTAL
5	12060.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n_20M)

Operation Mode	802.11n_20M TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	38.14	-7.54	30.60	74.00	-43.40	Peak	VERTICAL
2	1595.00	36.67	-4.98	31.69	74.00	-42.31	Peak	VERTICAL
3	4874.00	32.79	10.30	43.09	74.00	-30.91	Peak	VERTICAL
4	7311.00	---						VERTICAL
5	9748.00	---						VERTICAL
6	12185.00	---						VERTICAL
1	1196.00	45.32	-7.54	37.78	74.00	-36.22	Peak	HORIZONTAL
2	1399.00	38.88	-6.39	32.49	74.00	-41.51	Peak	HORIZONTAL
3	4874.00	32.56	10.30	42.86	74.00	-31.14	Peak	HORIZONTAL
4	7311.00	---						HORIZONTAL
5	9748.00	---						HORIZONTAL
6	12185.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n_20M)

Operation Mode	802.11n_20M TX CH High	Test Date	2011/09/06
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	38.32	-7.54	30.78	74.00	-43.22	Peak	VERTICAL
2	1595.00	37.15	-4.98	32.17	74.00	-41.83	Peak	VERTICAL
3	4924.00	31.85	10.51	42.36	74.00	-31.64	Peak	VERTICAL
4	7386.00	---						VERTICAL
5	9848.00	---						VERTICAL
6	12310.00	---						VERTICAL
1	1196.00	45.61	-7.54	38.07	74.00	-35.93	Peak	HORIZONTAL
2	4924.00	30.25	10.51	40.76	74.00	-33.24	Peak	HORIZONTAL
3	7386.00	---						HORIZONTAL
4	9848.00	---						HORIZONTAL
5	12310.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n_40M)

Operation Mode	802.11n_40M TX CH Low	Test Date	2011/09/06
Fundamental Frequency	2422MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	38.50	-7.54	30.96	74.00	-43.04	Peak	VERTICAL
2	1595.00	37.14	-4.98	32.16	74.00	-41.84	Peak	VERTICAL
3	4844.00	32.23	10.18	42.41	74.00	-31.59	Peak	VERTICAL
4	7266.00	---						VERTICAL
5	9688.00	---						VERTICAL
6	12110.00	---						VERTICAL
1	1196.00	45.00	-7.54	37.46	74.00	-36.54	Peak	HORIZONTAL
2	4844.00	32.35	10.18	42.53	74.00	-31.47	Peak	HORIZONTAL
3	7266.00	---						HORIZONTAL
4	9688.00	---						HORIZONTAL
5	12110.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n_40M)

Operation Mode	802.11n_40M TX CH Mid	Test Date	2011/09/06
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1196.00	37.97	-7.54	30.43	74.00	-43.57	Peak	VERTICAL
2	4874.00	32.13	10.30	42.43	74.00	-31.57	Peak	VERTICAL
3	7311.00	---						VERTICAL
4	9748.00	---						VERTICAL
5	12185.00	---						VERTICAL
1	1196.00	44.78	-7.54	37.24	74.00	-36.76	Peak	HORIZONTAL
2	4874.00	32.79	10.30	43.09	74.00	-30.91	Peak	HORIZONTAL
3	7311.00	---						HORIZONTAL
4	9748.00	---						HORIZONTAL
5	12185.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz) (802.11n_40M)

Operation Mode	802.11n_40M TX CH High	Test Date	2011/09/06
Fundamental Frequency	2452MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	1091.00	41.43	-8.16	33.27	74.00	-40.73	Peak	VERTICAL
2	1686.00	41.93	-4.19	37.74	74.00	-36.26	Peak	VERTICAL
3	4904.00	32.60	10.43	43.03	74.00	-30.97	Peak	VERTICAL
4	7356.00	---						VERTICAL
5	9808.00	---						VERTICAL
6	12260.00	---						VERTICAL
1	1196.00	45.73	-7.54	38.19	74.00	-35.81	Peak	HORIZONTAL
2	4904.00	32.52	10.43	42.95	74.00	-31.05	Peak	HORIZONTAL
3	7356.00	---						HORIZONTAL
4	9808.00	---						HORIZONTAL
5	12260.00	---						HORIZONTAL

Remark:

1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency

2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.

3 “F” denotes fundamental frequency; “H” denotes harmonics frequency. “S” denotes spurious frequency.

4 Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.

6 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

10 Peak Power Spectral Density

10.1 Standard Applicable:

According to §15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

10.2 Measurement Equipment Used:

Refer to section 6.2 for details.

10.3 Test Set-up:

Refer to section 6.3 for details.

10.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3KHz, VBW = 10KHz, Span = 300kHz, Sweep=100s
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

10.5 Measurement Result:

802.11b Mode

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-11.18	0.00	-11.18	8
2437	-13.62	0.00	-13.62	8
2462	-15.45	0.00	-15.45	8

802.11g Mode

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-19.31	0.00	-19.31	8
2437	-19.30	0.00	-19.30	8
2462	-18.88	0.00	-18.88	8

802.11n_20M Mode

Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2412	-21.54	0.00	-21.54	8
2437	-23.08	0.00	-23.08	8
2462	-23.09	0.00	-23.09	8

802.11n_40M Mode

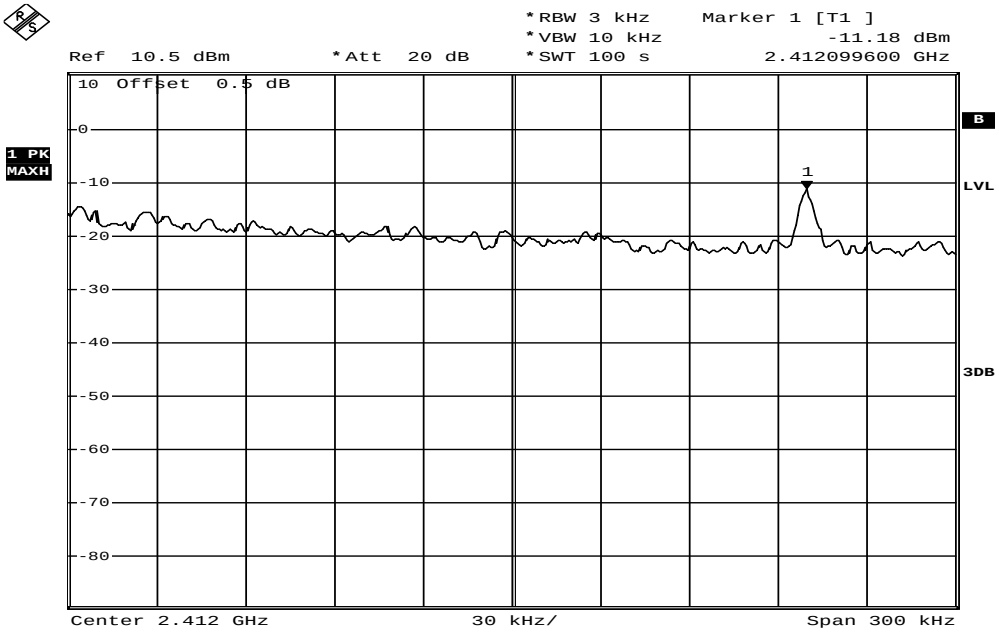
Frequency MHz	RF Power Density Reading (dBm)	Cable loss (dB)	RF Power Density Level (dBm)	Maximum Limit (dBm)
2422	-25.14	0.00	-25.14	8
2437	-30.91	0.00	-30.91	8
2452	-21.97	0.00	-21.97	8

offset 0.5dB

Note: Refer to next page for plots.

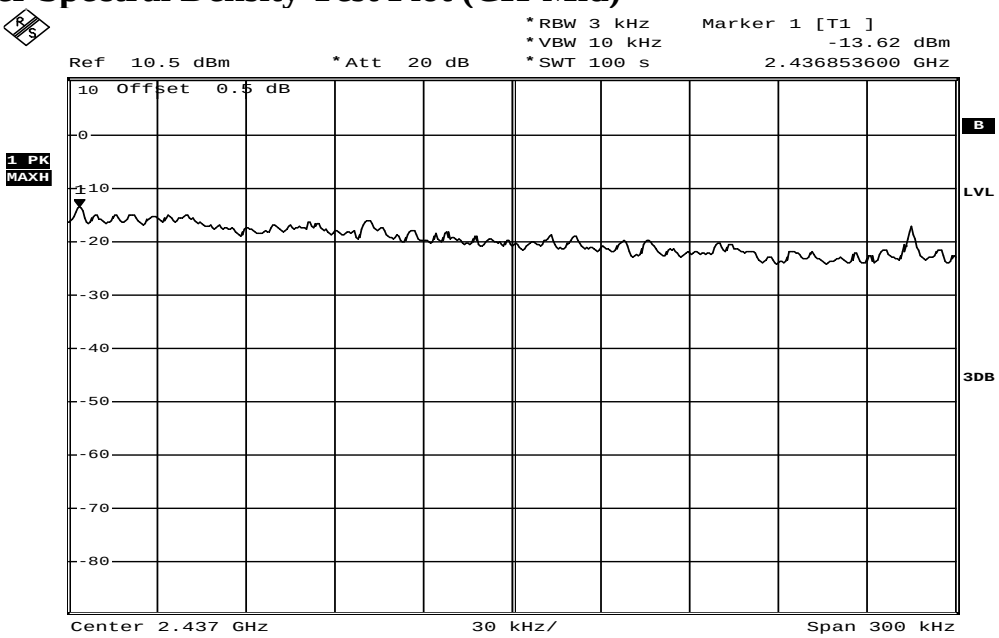
802.11b

Power Spectral Density Test Plot (CH-Low)



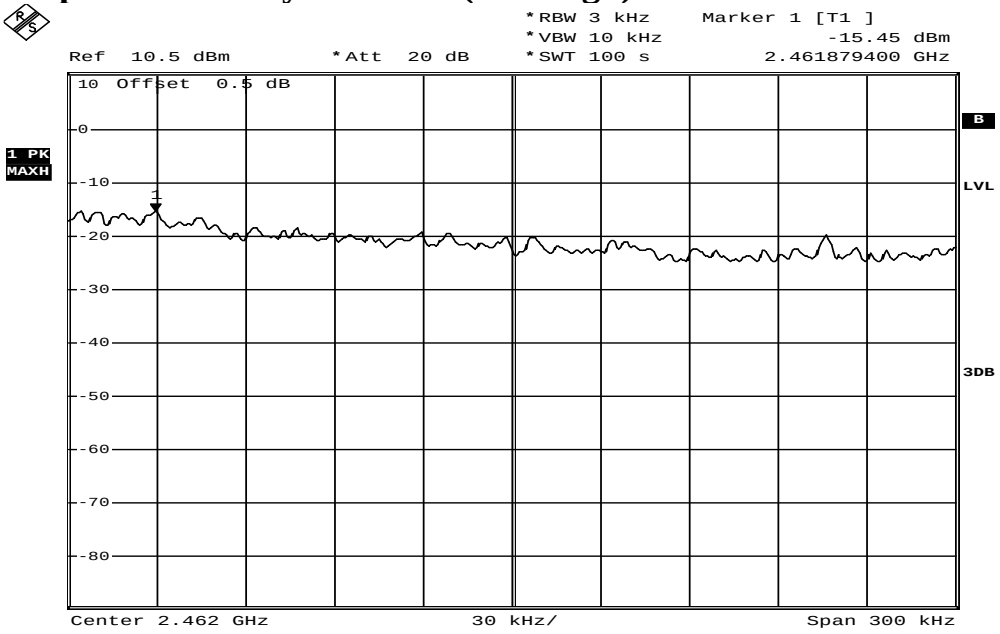
Date: 7.SEP.2011 20:35:55

Power Spectral Density Test Plot (CH-Mid)



Date: 7.SEP.2011 20:30:35

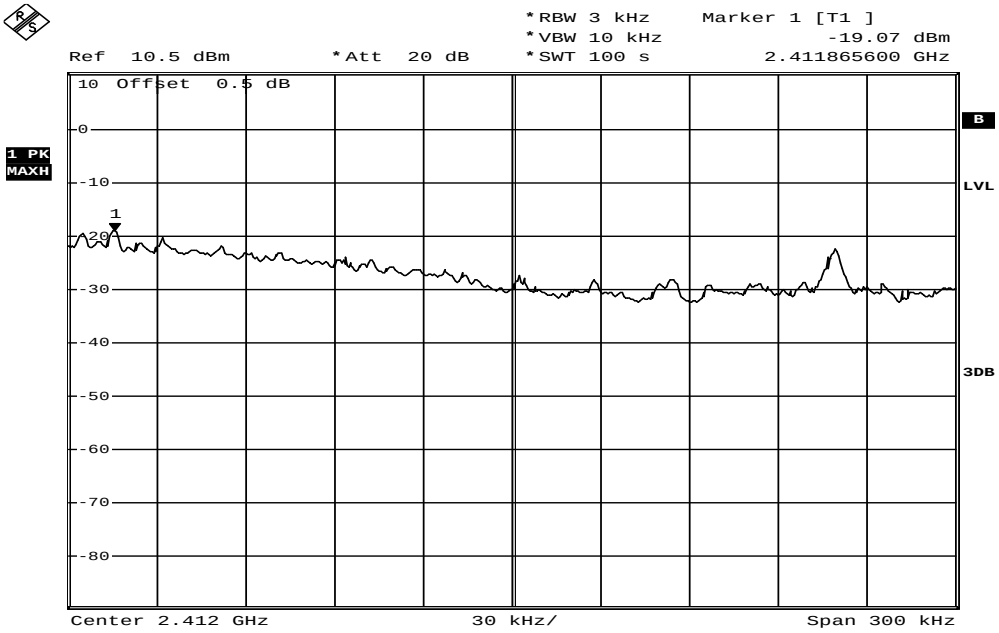
Power Spectral Density Test Plot (CH-High)



Date: 7.SEP.2011 20:33:20

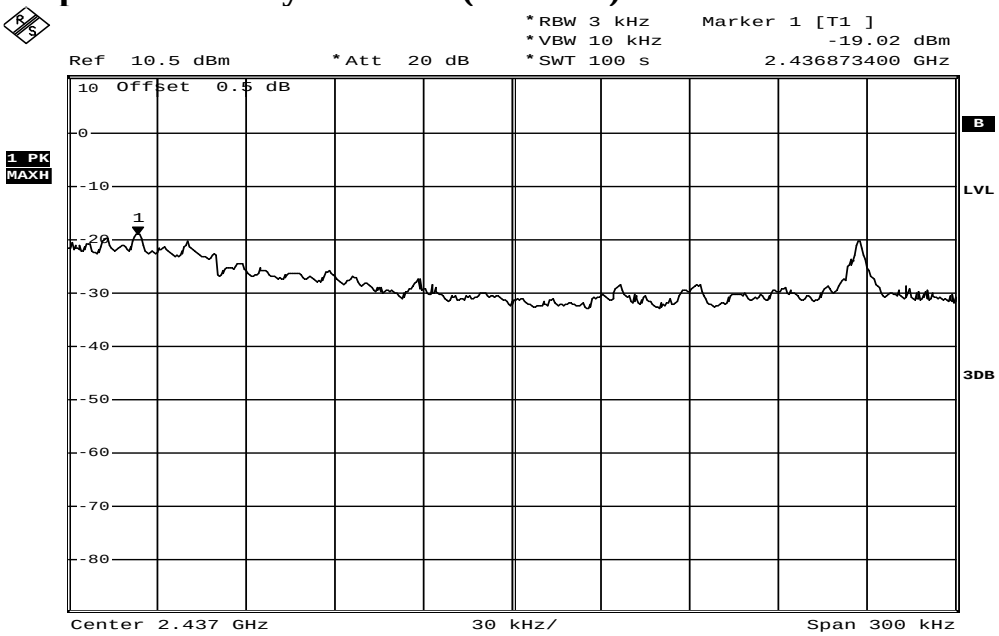
802.11g

Power Spectral Density Test Plot (CH-Low)



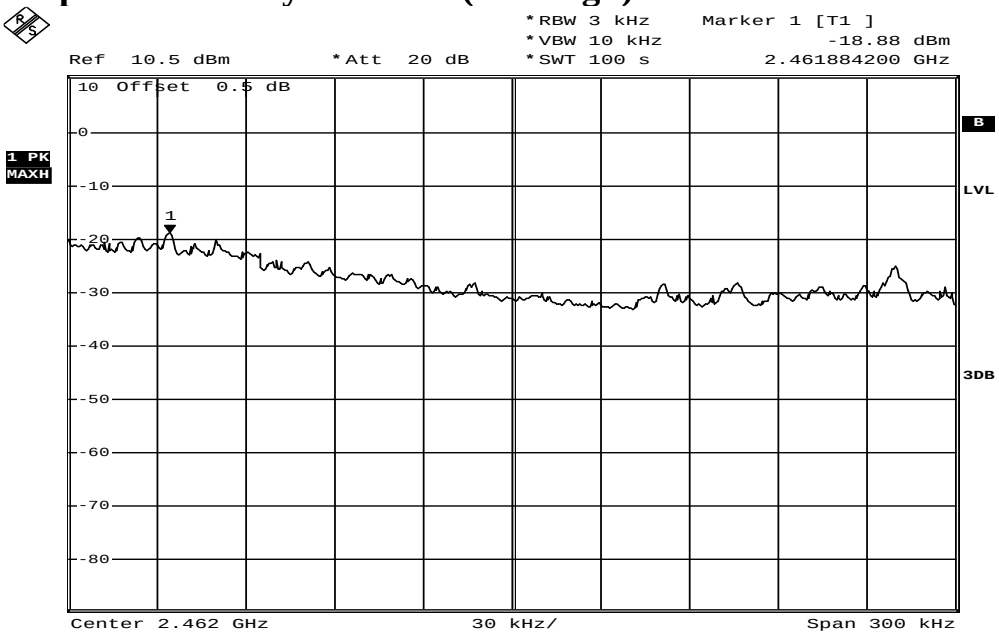
Date: 7.SEP.2011 20:40:32

Power Spectral Density Test Plot (CH-Mid)



Date: 7.SEP.2011 20:43:22

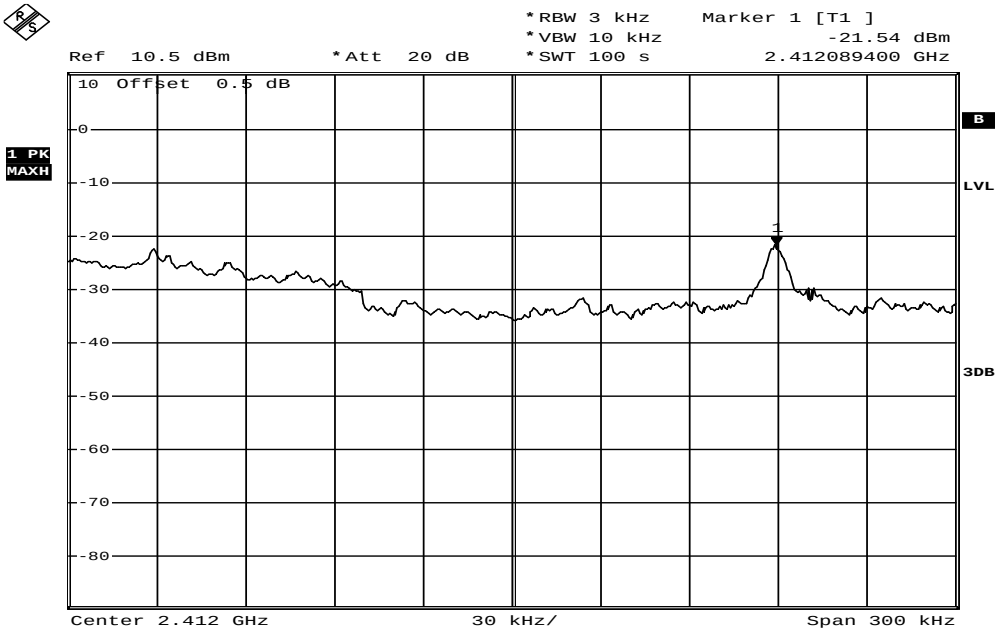
Power Spectral Density Test Plot (CH-High)



Date: 7.SEP.2011 20:47:06

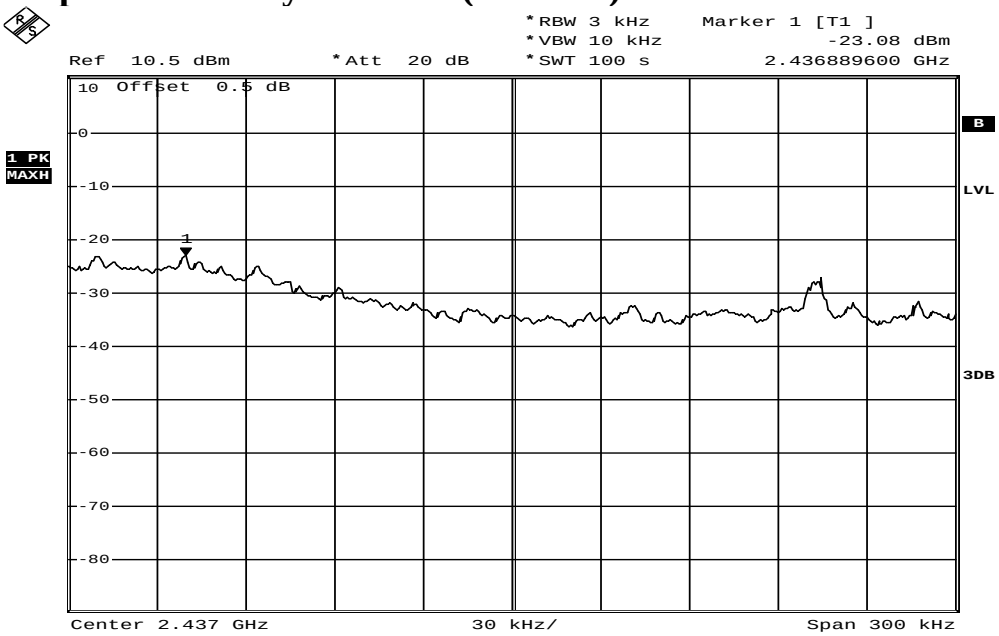
802.11n_20M

Power Spectral Density Test Plot (CH-Low)



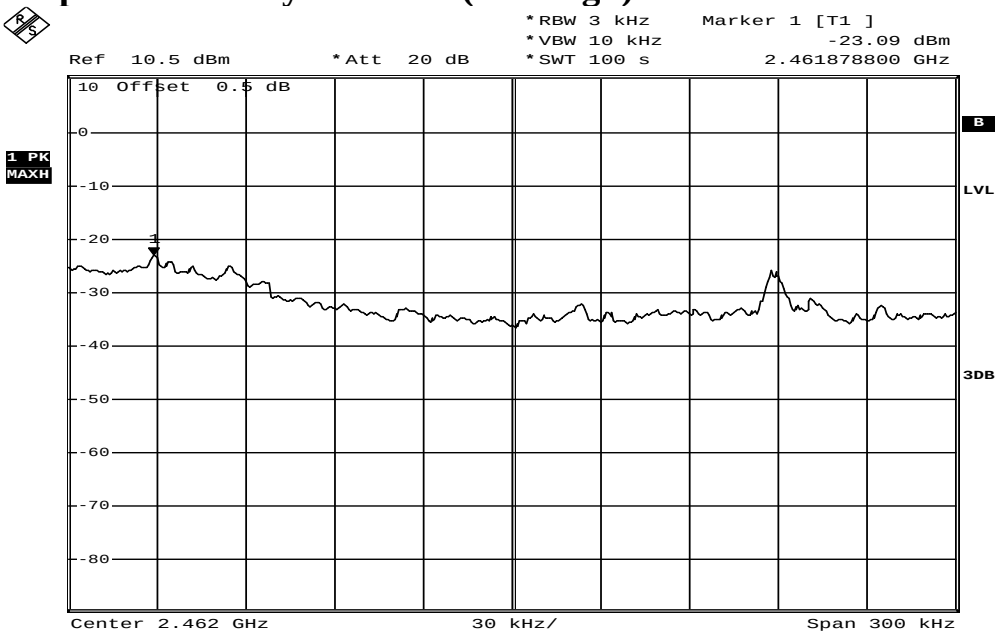
Date: 7.SEP.2011 20:57:31

Power Spectral Density Test Plot (CH-Mid)



Date: 7.SEP.2011 20:54:29

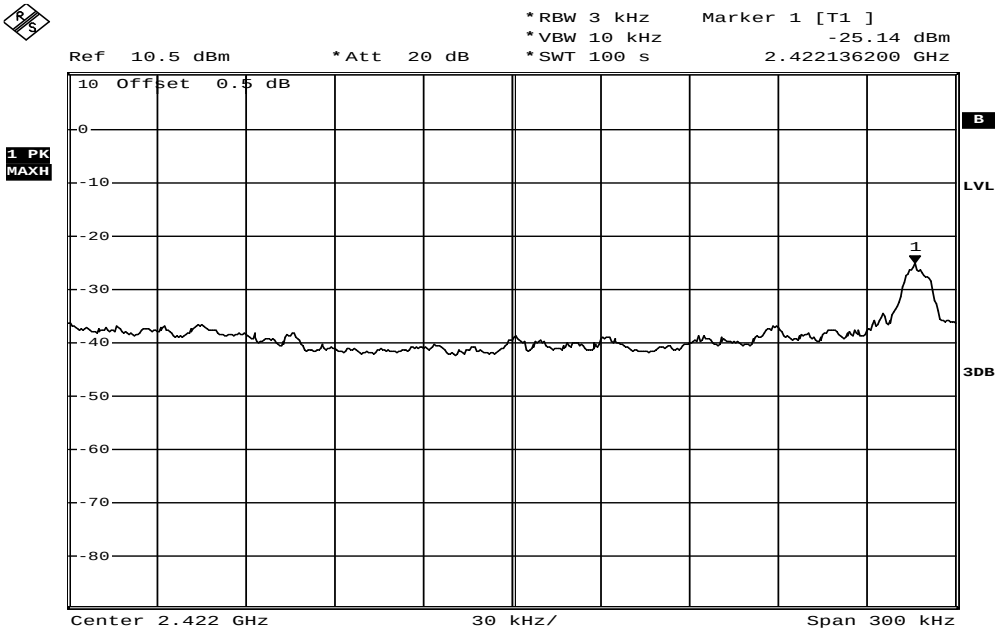
Power Spectral Density Test Plot (CH-High)



Date: 7.SEP.2011 20:50:45

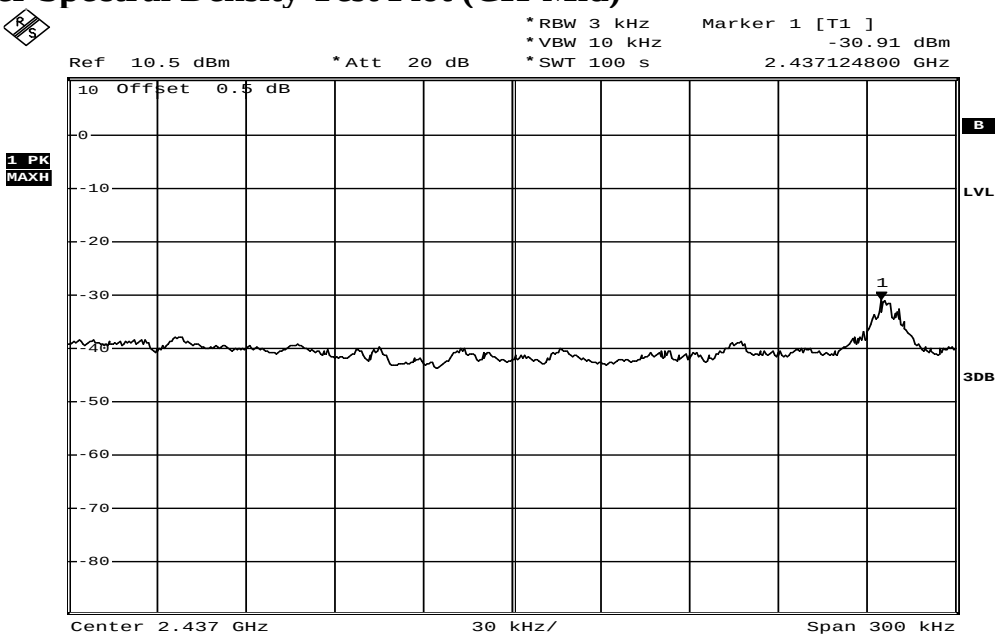
802.11n_40M

Power Spectral Density Test Plot (CH-Low)



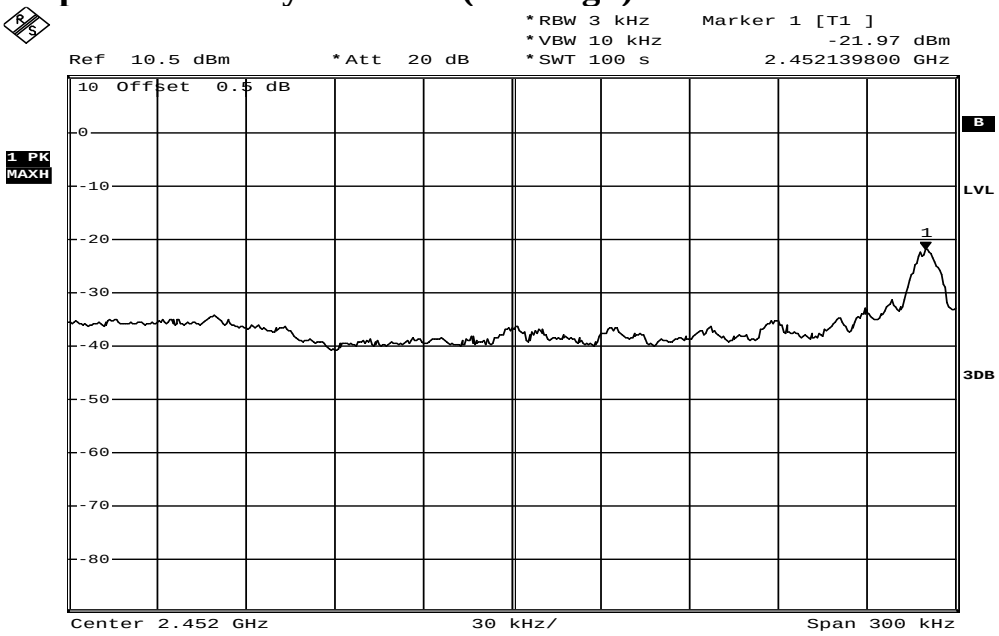
Date: 7.SEP.2011 21:01:36

Power Spectral Density Test Plot (CH-Mid)



Date: 7.SEP.2011 21:04:53

Power Spectral Density Test Plot (CH-High)



Date: 7.SEP.2011 21:08:24

11 ANTENNA REQUIREMENT

11.1 Standard Applicable:

According to §15.203, Antenna requirement.

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 a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

11.2 Antenna Connected Construction:

The directional gins of antenna used for transmitting is 2.87 dBi, and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.