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Report No.: SZEMO09020039701
Page: 1 of 39
FCC ID: W5DIRA001248

TEST REPORT

Application No.: SZEMO090200397RF
Applicant: Myine Electronics LLC
Manufacturer: BlueTinum Group Ltd
Address of Applicant: 3136 Hilton I Ferndale, MI I 48220 USA
Address of Manufacturer: No.32, Longping West Road, Longgang District Shenzhen (Donpinxin Creative Science Park)
FCC ID: W5DIRA001248
Fundamental Carrier Frequency : 2.412GHz to 2.462GHz
Equipment Under Test (EUT):
Name: Internet FM radio adapter
Model No.: BT-H20XX, BT-H21XX, BT-H16XX, BT-H18XX(XX=01-10), IR001, IR003♣
Trade Mark: Myine, IRA, IRIS
♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Standards: FCC PART 15 Subpart C: 2008
Date of Receipt: 12 February 2009
Date of Test: 12 to 27 February 2009
Date of Issue: 06 March 2009

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

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This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the SGS PRODUCT CERTIFICATION MARK.. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
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2 Test Summary

Test	Test Requirement	Standard Paragraph	Result
Conducted Emissions	FCC PART 15:2008	Section 15.107 / 15.207	PASS
Radiated Emission	FCC PART 15:2008	Section 15.205/15.209	PASS*
Maximum Peak Output Power	FCC PART 15 :2008	Section 15.247 (b)	PASS
Occupied Bandwidth	FCC PART 15 :2008	Section 15.247 (a2)	PASS
Edges Measurement	FCC PART 15 2008	Section 15.247(d)	PASS
Power Spectral Density Measurement	FCC PART 15 :2008	Section 15.247 (e)	PASS
Antenna requirement.	FCC PART 15:2008	Section 15.247 (b)	PASS

Remark:

1. The EUT passed the Radiated Emission test according to the client's request.
2. Item No.: BT-H20XX, BT-H21XX, BT-H16XX, BT-H18XX(XX=01-10), IR001, IR003

Only the Item BT-H2000 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above items.

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3 Contents

Page

.....	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION.....	4
4.1 GENERAL DESCRIPTION OF E.U.T.....	4
4.2 TEST LOCATION	4
4.3 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	4
5 TEST RESULTS	5
5.1 TEST INSTRUMENTS.....	5
5.2 E.U.T. OPERATION	6
5.3 TEST PROCEDURE & MEASUREMENT DATA	7
5.3.1 Conducted Emissions.....	7
5.3.2 Radiated Emissions.....	10
5.3.2.1 Radiated emission below 1GHz.....	12
5.3.2.2 Transmitter emission above 1GHz.....	13
5.3.3 Occupied Bandwidth.....	20
5.3.4 Maximum Peak Output Power	24
5.3.5 Band Edges Measurement.....	27
5.3.6 Power Spectral Density Measurement	34
5.3.7 Antenna Requirement	39

FCC ID: W5DIRA001248

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4 General Information

4.1 General Description of E.U.T.

Name:	Internet FM radio adapter
Item No.:	BT-H20XX, BT-H21XX, BT-H16XX, BT-H18XX(XX=01-10), IR001, IR003
Frequency Range	2412-2462MHz
Channel number:	11
Type of modulation(802.11b):	DBPSK(1MHz), DQPSK(2MHz), CCK(5.5/11MHz)
Type of modulation(802.11g):	OFDM
Data speed(802.11b):	1/2/5.5/11Mbps
Data speed(802.11g):	6/9/12/18/24/36/48/54Mbps
Antenna Type;	Integral
Antenna Gain:	+1.00dBi

Working Frequency of Each channel:

Channel	Frequency(MHz)	Channel	Frequency(MHz)	Channel	Frequency(MHz)
001	2412	002	2417	003	2422
004	2427	005	2432	006	2437
007	2442	008	2447	009	2452
010	2457	011	2462		

Note:

Regards to the frequency band over 10MHz, the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.

So the there channel as follow:

Lowest channel: 2412MHz

Middle channel: 2437MHz

Highest channel: 2462 MHz

4.2 Test Location

All tests were performed at:

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, District Shenzhen, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Other Information Requested by the Customer

None

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5 Test Results

5.1 Test Instruments

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	16-06-2007	15-06-2009
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	12-12-2008	11-12-2009
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	18-06-2008	17-06-2009
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0014	12-08-2008	11-08-2009
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	18-06-2008	17-06-2009
7	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0005	12-08-2008	11-08-2009
8	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	12-08-2008	11-08-2009
9	Pre-amplifier (1-18GHz)	Rohde & Schwarz	AFS42-00101 800-25-S-42	SEL0081	18-06-2008	17-06-2009
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33- 18002650-30- 8P-44	SEL0080	18-06-2008	17-06-2009
11	Band filter	Amindeon	82346	SEL0094	18-06-2008	17-06-2009
12	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	15-06-2008	14-06-2009

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	N/A	N/A
2	LISN	ETS-LINDGREN	3816/2	SEL0021	18-06-2008	17-06-2009
3	ISN	Rohde & Schwarz	ENY 22 1109	EMC0114	18-06-2008	17-06-2009
4	ISN	Rohde & Schwarz	ENY 41 1110	EMC0115	18-06-2008	17-06-2009
5	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	18-06-2008	17-06-2009
6	Coaxial Cable	SGS	N/A	SEL0024	18-06-2008	17-06-2009

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5.2 E.U.T. Operation

Power supply: Input: 100-240VAC, 50-60Hz
Output: 9.0V/100mA
Test Voltage 120V AC
Operating Environment
Temperature: 24 °C
Humidity: 54 % RH
Atmospheric Pressure: 1010 mbar

Test mode:

SGS has verified the construction and function in typical operation. All the test modes were carried out with out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-Test mode	
Transmit	1/2/5.5/11Mbps for 802.11b 6/9/12/18/24/36/48/54Mbps for 802.11g
Final Test mode	
Transmit	11Mbps for 802.11b 54Mbps for 802.11g

Note: according to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”.

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5.3 Test Procedure & Measurement Data

5.3.1 Conducted Emissions

Test Requirement: FCC Part15 C Section 15.207

Test Method: ANSI C63.4:2003

Frequency Range: 150KHz to 30MHz

Class / Severity: Class B

Detector: RBW=9KHz VBW=30KHz

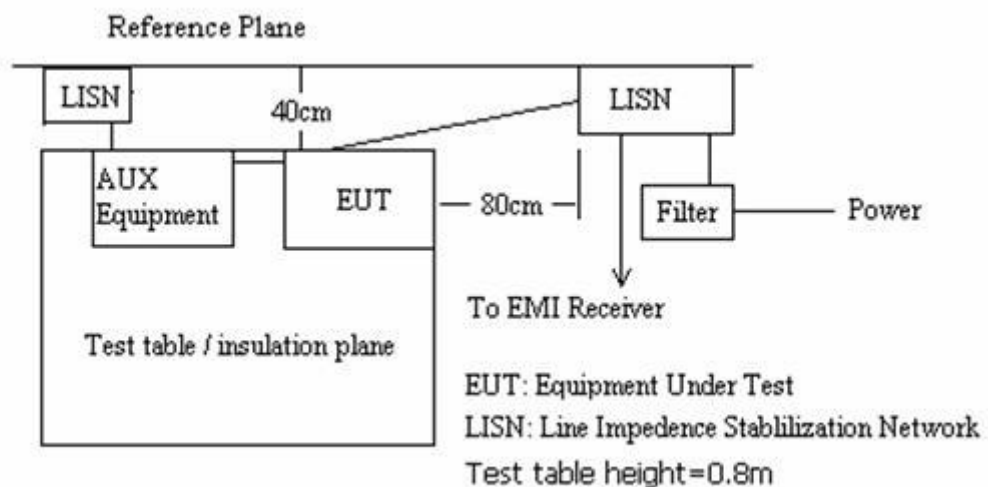
Operating Environment:

Temperature: 24 °C Humidity: 52 % RH Atmospheric Pressure: 1010 Mbar

EUT Operation: Test in normal mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Plan View of Test Setup



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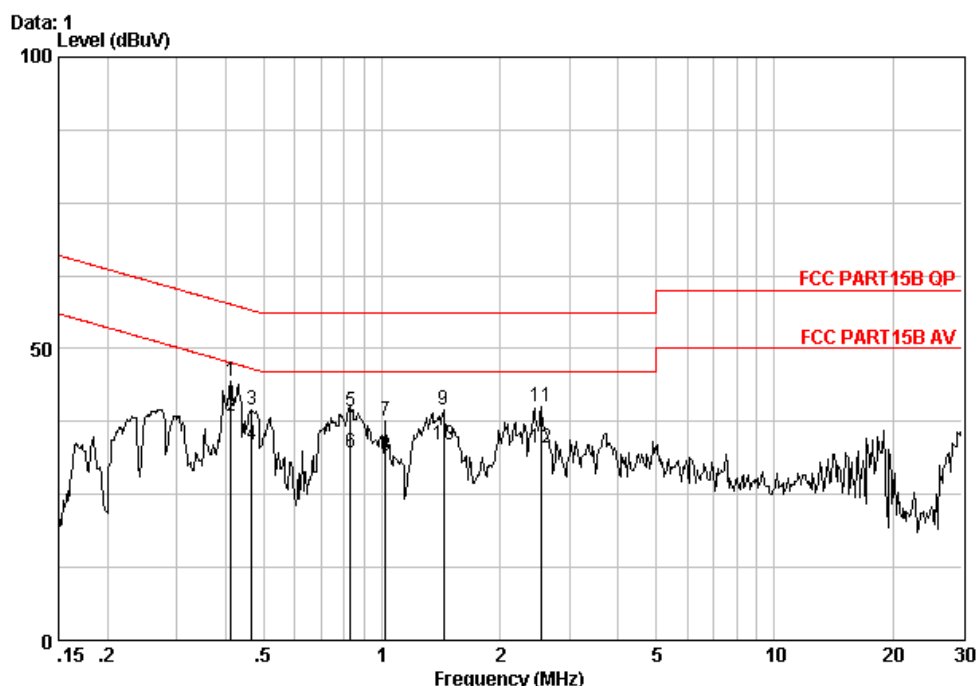
5.3.1.1 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT communicating with worst case mode.

The following Quasi-Peak and Average measurements were performed on the EUT:

Live Line



Site : Shielding Room
Condition : FCC PART15B QP CE LINE
EUT : internet FM radio adapter
JOB NO : 0397RF
MODE : on

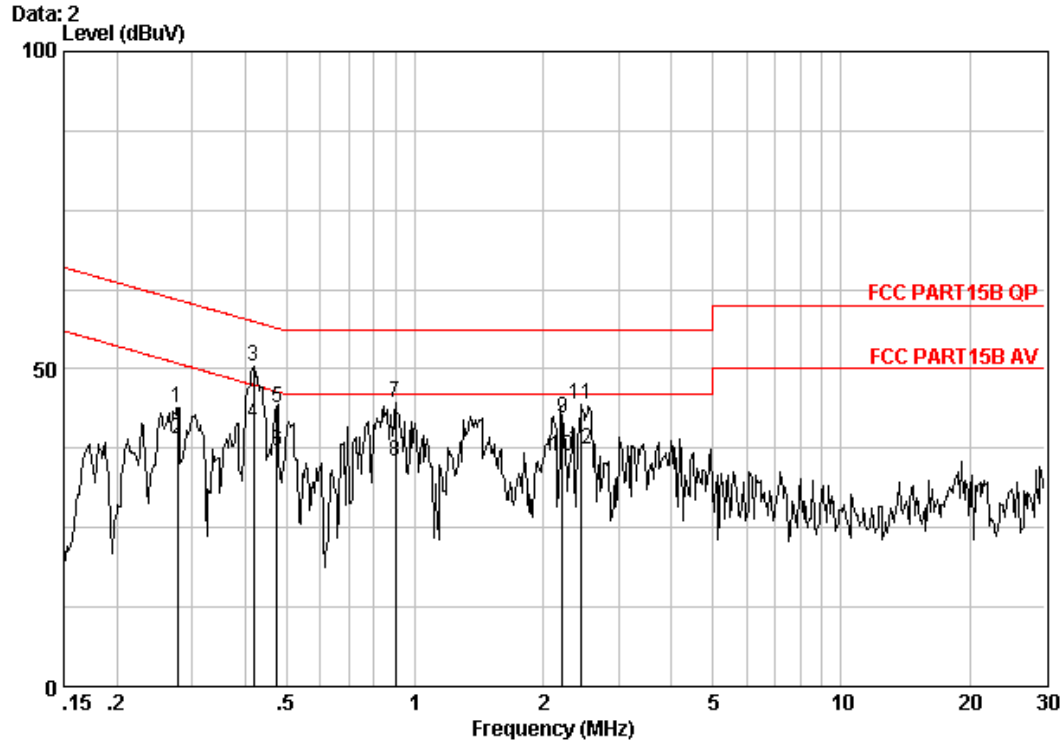
	Freq	Cable	LISN	Read	Limit	Over	
	MHz	Loss	Factor	Level	Line	Limit	Remark
		dB		dBuV	dBuV	dB	
1	0.41266	0.06	-0.04	44.40	44.41	57.59	QP
2	0.41266	0.06	-0.04	38.40	38.41	47.59	Average
3	0.46614	0.06	-0.04	39.61	39.62	56.58	QP
4	0.46614	0.06	-0.04	33.61	33.62	46.58	Average
5	0.83047	0.07	-0.05	39.17	39.19	56.00	QP
6	0.83047	0.07	-0.05	32.17	32.19	46.00	Average
7	1.021	0.08	-0.05	37.53	37.56	56.00	QP
8	1.021	0.08	-0.05	31.53	31.56	46.00	Average
9	1.433	0.10	-0.06	39.46	39.50	56.00	QP
10	1.433	0.10	-0.06	33.46	33.50	46.00	Average
11	2.540	0.13	-0.07	39.93	39.99	56.00	QP
12	2.540	0.13	-0.07	32.93	32.99	46.00	Average

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Neutral Line



Site : Shielding Room
Condition : FCC PART15B QP CE NEUTRAL
EUT : internet FM radio adapter
JOB NO : 0397RF
MODE : on

	Freq	Cable	LISN	Read	Limit	Over	
	MHz	Loss	Factor	Level	Line	Limit	Remark
		dB	dB	dBuV	dBuV	dBuV	dB
1	0.27734	0.05	-0.04	43.87	43.88	60.90	-17.02 QP
2	0.27734	0.05	-0.04	38.87	38.88	50.90	-12.02 Average
3	0.41927	0.06	-0.04	50.31	50.33	57.46	-7.13 QP
4 @	0.41927	0.06	-0.04	41.31	41.33	47.46	-6.13 Average
5	0.47360	0.06	-0.04	43.92	43.94	56.45	-12.51 QP
6	0.47360	0.06	-0.04	36.92	36.94	46.45	-9.51 Average
7	0.89917	0.07	-0.04	44.53	44.56	56.00	-11.44 QP
8	0.89917	0.07	-0.04	35.53	35.56	46.00	-10.44 Average
9	2.213	0.12	-0.06	42.28	42.34	56.00	-13.66 QP
10	2.213	0.12	-0.06	36.28	36.34	46.00	-9.66 Average
11	2.448	0.13	-0.07	44.24	44.30	56.00	-11.70 QP
12	2.448	0.13	-0.07	37.24	37.30	46.00	-8.70 Average

TEST RESULTS: The unit does meet the FCC requirement

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5.3.2 Radiated Emissions

Test Requirement:	FCC Part15 C Section 15.247, 15.209 and 15.205
Test Method:	ANSI C63.4
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Test Range	30MHz to 25GHz
	30MHz-1000MHz: RBW=100KHz, VBW=300KHz
	Above 1GHz: PK RBW=1MHz, VBW=3MHz
	Average RBW=1MHz, VBW=10Hz
15.209 Limit:	40.0 dB μ V/m between 30MHz & 88MHz
	43.5 dB μ V/m between 88MHz & 216MHz
	46.0 dB μ V/m between 216MHz & 960MHz
	above 960MHz: Average value Limit 54.0 dB μ V/m
	Peak value Limit 74.0 dB μ V/m.

Test Configuration

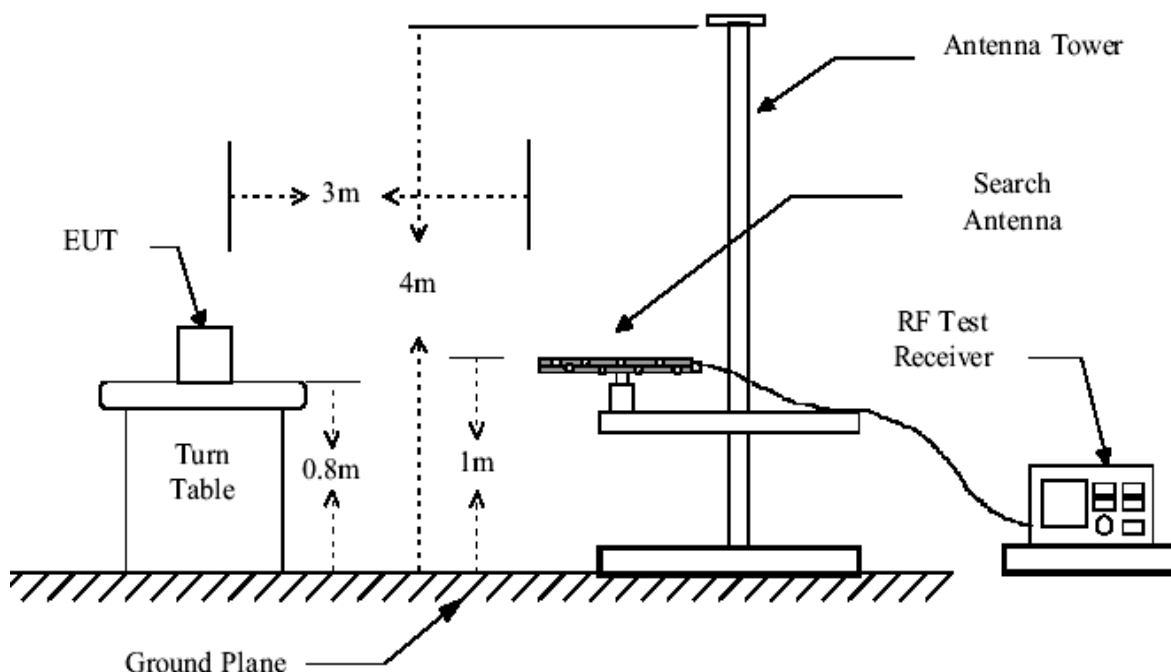


Figure1: 30MHz to 1GHz radiated emissions test configuration

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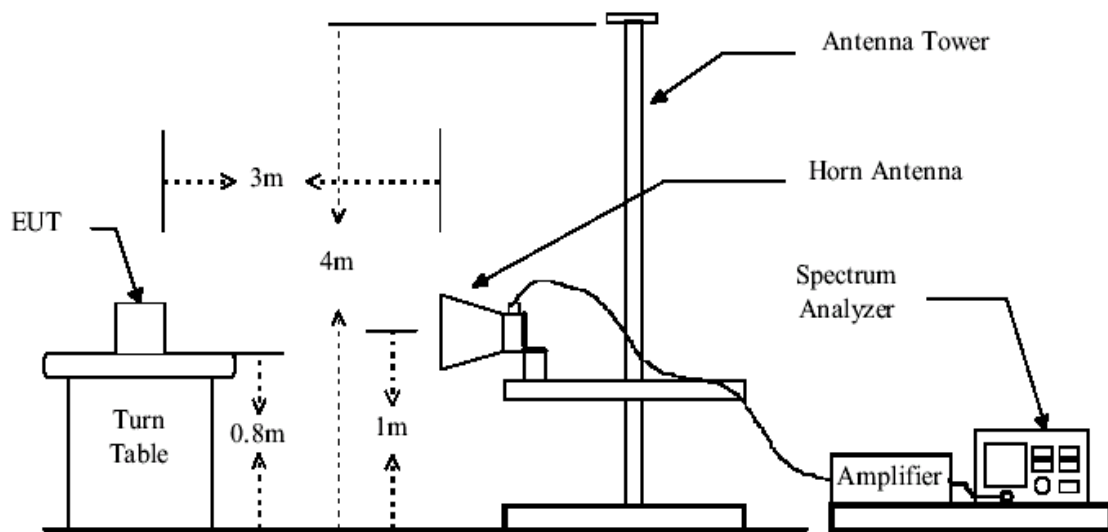


Figure 2: Above 1GHz radiated emissions test configuration

Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. The EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
- 7 The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

**5.3.2.1 Radiated emission below 1GHz**

Test in Wi-Fi mode

Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
43.580	0.68	9.93	28.10	56.32	38.83	40.00	-1.17
109.540	1.23	8.62	27.78	55.92	37.99	43.50	-5.51
195.870	1.39	10.16	27.17	51.17	35.55	43.50	-7.95
397.630	2.20	16.27	27.39	49.88	40.96	46.00	-5.04
478.140	2.52	17.80	27.65	50.88	43.55	46.00	-2.45
838.980	3.37	22.40	26.74	44.52	43.55	46.00	-2.45

Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
397.630	2.20	16.27	27.39	54.79	45.87	46.00	-0.13
478.140	2.52	17.80	27.65	52.93	45.60	46.00	-0.40
598.420	2.70	19.74	27.62	44.26	39.08	46.00	-6.92
797.270	3.20	22.09	26.95	44.38	42.72	46.00	-3.28
839.968	3.37	22.40	26.74	46.84	45.87	46.00	-0.13
929.190	3.63	23.30	26.43	43.46	43.96	46.00	-2.04

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5.3.2.2 Transmitter emission above 1GHz

Transmitting mode (802.11b lowest channel=2412MHz)

Peak Measurement

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	polarization
2390.00	4.97	32.24	44.75	58.14	50.60	74.00	-23.40	Vertical
2400.00	4.97	32.25	44.75	64.26	56.73	74.00	-17.27	Vertical
7392.00	7.55	35.99	44.32	53.10	52.32	74.00	-21.68	Vertical
12424.00	10.24	39.06	43.85	52.29	57.74	74.00	-16.26	Vertical
2390.00	4.97	32.24	44.75	54.62	47.08	74.00	-26.92	Horizontal
2400.00	4.97	32.25	44.75	60.73	53.20	74.00	-20.80	Horizontal
4740.00	6.58	34.05	45.37	52.12	47.38	74.00	-26.62	Horizontal
9653.00	8.55	37.01	42.17	50.54	53.93	74.00	-20.07	Horizontal

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over limit	polarization
2390.00	4.97	32.24	44.75	41.56	34.02	54.00	-19.98	Vertical
2400.00	4.97	32.25	44.75	45.41	37.88	54.00	-16.12	Vertical
4825.00	6.62	34.03	45.40	35.26	30.51	54.00	-23.49	Vertical
9738.00	8.62	37.08	42.09	32.43	36.04	54.00	-17.96	Vertical
2390.00	4.97	32.24	44.75	44.72	37.18	54.00	-16.82	Horizontal
2400.00	4.97	32.25	44.75	49.17	41.64	54.00	-12.36	Horizontal
4808.00	6.61	34.04	45.40	40.48	35.73	54.00	-18.27	Horizontal
12373.00	10.22	39.01	43.78	35.90	41.35	54.00	-12.65	Horizontal

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Transmitting mode (802.11b middle channel=2437MHz)

Peak Measurement

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2400.00	4.97	32.25	44.75	55.66	48.13	74.00	-25.87	Vertical
2485.00	5.08	32.29	44.77	54.15	46.75	74.00	-27.25	Vertical
4859.00	6.63	34.03	45.41	57.34	52.59	74.00	-21.41	Vertical
7511.00	7.51	35.81	44.19	53.97	53.10	74.00	-20.90	Vertical
2400.00	4.97	32.25	44.75	56.59	49.06	74.00	-24.94	Horizontal
2500.00	5.10	32.30	44.78	54.92	47.54	74.00	-26.46	Horizontal
4825.00	6.62	34.03	45.40	50.04	45.29	74.00	-28.71	Horizontal
7307.00	7.59	36.14	44.41	53.05	52.37	74.00	-21.63	Horizontal

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over limit	polarization
2400.00	4.97	32.25	44.75	40.38	32.85	54.00	-21.15	Vertical
2490.00	5.10	32.30	44.78	38.59	31.21	54.00	-22.79	Vertical
4842.00	6.62	34.03	45.41	38.47	33.71	54.00	-20.29	Vertical
7222.00	7.63	36.29	44.49	36.65	36.08	54.00	-17.92	Vertical
2400.00	4.97	32.25	44.75	40.15	32.62	54.00	-21.38	Horizontal
2500.00	5.10	32.30	44.78	38.75	31.37	54.00	-22.63	Horizontal
4842.00	6.62	34.03	45.41	37.37	32.61	54.00	-21.39	Horizontal
9806.00	8.68	37.14	42.03	35.09	38.88	54.00	-15.12	Horizontal

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Transmitting mode (802.11b highest channel=2462MHz)

Peak Measurement

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2480.00	5.08	32.29	44.77	61.81	54.41	74.00	-19.59	Vertical
2500.00	5.10	32.30	44.78	57.96	50.58	74.00	-23.42	Vertical
4876.00	6.64	34.02	45.42	51.14	46.38	74.00	-27.62	Vertical
9857.00	8.72	37.19	41.98	49.69	53.62	74.00	-20.38	Vertical
2480.00	5.08	32.29	44.77	60.46	53.06	74.00	-20.94	Horizontal
2500.00	5.10	32.30	44.78	58.38	51.00	74.00	-23.00	Horizontal
7239.00	7.62	36.25	44.48	54.15	53.54	74.00	-20.46	Horizontal
9806.00	8.68	37.14	42.03	52.65	56.44	74.00	-17.56	Horizontal

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over limit	polarization
2483.50	5.08	32.29	44.77	43.11	35.71	54.00	-18.29	Vertical
2500.00	5.10	32.30	44.78	37.75	30.37	54.00	-23.63	Vertical
4842.00	6.62	34.03	45.41	38.37	33.61	54.00	-20.39	Vertical
9891.00	8.75	37.21	41.95	33.34	37.35	54.00	-16.65	Vertical
2483.50	5.08	32.29	44.77	40.40	33.00	54.00	-21.00	Horizontal
2500.00	5.10	32.30	44.78	36.74	29.36	54.00	-24.64	Horizontal
7630.00	7.62	35.85	44.07	35.37	34.77	54.00	-19.23	Horizontal
9891.00	8.75	37.21	41.95	31.60	35.61	54.00	-18.39	Horizontal

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Transmitting mode (802.11g lowest channel=2412MHz)

Peak Measurement

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2390.00	4.97	32.24	44.75	55.92	48.38	74.00	-25.62	Vertical
2400.00	4.97	32.25	44.75	60.09	52.56	74.00	-21.44	Vertical
4808.00	6.61	34.04	45.40	52.24	47.49	74.00	-26.51	Vertical
9653.00	8.55	37.01	42.17	52.54	55.93	74.00	-18.07	Vertical
2390.00	4.97	32.24	44.75	54.56	47.02	74.00	-26.98	Horizontal
2400.00	4.97	32.25	44.75	57.78	50.25	74.00	-23.75	Horizontal
4876.00	6.64	34.02	45.42	55.29	50.53	74.00	-23.47	Horizontal
7307.00	7.59	36.14	44.41	54.05	53.37	74.00	-20.63	Horizontal

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	polarization
2390.00	4.97	32.24	44.75	41.21	33.67	54.00	-20.33	Vertical
2400.00	4.97	32.25	44.75	36.67	29.14	54.00	-24.86	Vertical
4757.00	6.59	34.05	45.38	37.46	32.72	54.00	-21.28	Vertical
9619.00	8.53	36.99	42.20	34.61	37.93	54.00	-16.07	Vertical
2390.00	4.97	32.24	44.75	37.25	29.71	54.00	-24.29	Horizontal
2400.00	4.97	32.25	44.75	41.62	34.09	54.00	-19.91	Horizontal
4876.00	6.64	34.02	45.42	36.30	31.54	54.00	-22.46	Horizontal
9687.00	8.58	37.06	42.14	31.17	34.67	54.00	-19.33	Horizontal

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Transmitting mode (802.11g middle channel=2437MHz)

Peak Measurement

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2400.00	4.97	32.25	44.75	53.73	46.20	74.00	-27.80	Vertical
2483.50	5.08	32.29	44.77	54.79	47.39	74.00	-26.61	Vertical
4910.00	6.65	34.02	45.43	53.74	48.98	74.00	-25.02	Vertical
7324.00	7.58	36.10	44.39	54.11	53.40	74.00	-20.60	Vertical
2400.00	4.97	32.25	44.75	55.71	48.18	74.00	-25.82	Horizontal
2483.50	5.08	32.29	44.77	57.11	49.71	74.00	-24.29	Horizontal
4876.00	6.64	34.02	45.42	51.29	46.53	74.00	-27.47	Horizontal
7239.00	7.62	36.25	44.48	52.15	51.54	74.00	-22.46	Horizontal

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	polarization
2400.00	4.97	32.25	44.75	38.51	30.98	54.00	-23.02	Vertical
2483.50	5.08	32.29	44.77	37.28	29.88	54.00	-24.12	Vertical
4859.00	6.63	34.03	45.41	36.24	31.49	54.00	-22.51	Vertical
9806.00	8.68	37.14	42.03	32.09	35.88	54.00	-18.12	Vertical
2400.00	4.97	32.25	44.75	40.02	32.49	54.00	-21.51	Horizontal
2483.50	5.08	32.29	44.77	41.29	33.89	54.00	-20.11	Horizontal
4808.00	6.61	34.04	45.40	39.48	34.73	54.00	-19.27	Horizontal
7273.00	7.61	36.21	44.44	35.65	35.03	54.00	-18.97	Horizontal

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Transmitting mode (802.11g highest channel=2462MHz)

Peak Measurement

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2483.50	5.08	32.29	44.77	60.15	52.75	74.00	-21.25	Vertical
2500.00	5.10	32.30	44.78	55.84	48.46	74.00	-25.54	Vertical
4842.00	6.62	34.03	45.41	57.68	52.92	74.00	-21.08	Vertical
7358.00	7.57	36.06	44.35	55.13	54.41	74.00	-19.59	Vertical
2483.50	5.08	32.29	44.77	63.20	55.80	74.00	-18.20	Horizontal
2500.00	5.10	32.30	44.78	54.58	47.20	74.00	-26.80	Horizontal
7307.00	7.59	36.14	44.41	54.05	53.37	74.00	-20.63	Horizontal
9772.00	8.65	37.12	42.06	52.46	56.17	74.00	-17.83	Horizontal

Average Measurement

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamplifier factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Over limit (dB)	polarization
2483.50	5.08	32.29	44.77	37.49	30.09	54.00	-23.91	Vertical
2500.00	5.10	32.30	44.78	34.95	27.57	54.00	-26.43	Vertical
4876.00	6.64	34.02	45.42	36.51	31.75	54.00	-22.25	Vertical
9653.00	8.55	37.01	42.17	33.61	37.00	54.00	-17.00	Vertical
2483.50	5.08	32.29	44.77	42.11	34.71	54.00	-19.29	Horizontal
2500.00	5.10	32.30	44.78	37.84	30.46	54.00	-23.54	Horizontal
7154.00	7.67	36.40	44.57	35.21	34.71	54.00	-19.29	Horizontal
9857.00	8.72	37.19	41.98	34.18	38.11	54.00	-15.89	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

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Hence there no other emissions have been reported.

Remark:

- 1). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 2). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.
- 3) Protest the Bluetooth normal mode
- 4) For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the 4th harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 4th harmonic.

Remark:

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

TEST RESULTS: The unit does meet the FCC requirements.

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5.3.3 Occupied Bandwidth

Test Requirement:	FCC 15.247(a2)
Test Method:	ANSI C63.4:2003 and KDB558074
Select test data rate:	11Mbps(802.11 b) & 54Mbps(802.11g)
Requirements:	15.247 (a2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates (802.11b 1/2/5.5/11Mbps and 802.11g 6/9/12/18/24/36/48/54Mbps) and antenna ports (if EUT with antenna diversity architecture). Following channel was (were) selected for the final test as listed below.
802.11b 11Mbps and 802.11g 54Mbps

Equipment Mode	Spectrum Analyzer
Detector Function	Peak
RBW	100KHz
VBW	300KHz

Method of measurement:

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB. Analyzer and the attached plot were taken. The EUT was setup to ANSI C63.4, 2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance with FCC 47CFR 15.247 requirements.

Test results:

1. The EUT communicating with 802.11b Mode

CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
2.412	8.76	0.5	Pass
2.437	8.16	0.5	Pass
2.462	8.52	0.5	Pass

2. The EUT communicating with 802.11g Mode

CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
2.412	16.50	0.5	Pass
2.437	16.56	0.5	Pass
2.462	16.50	0.5	Pass

Conclusion: The unit does meet the FCC requirements.

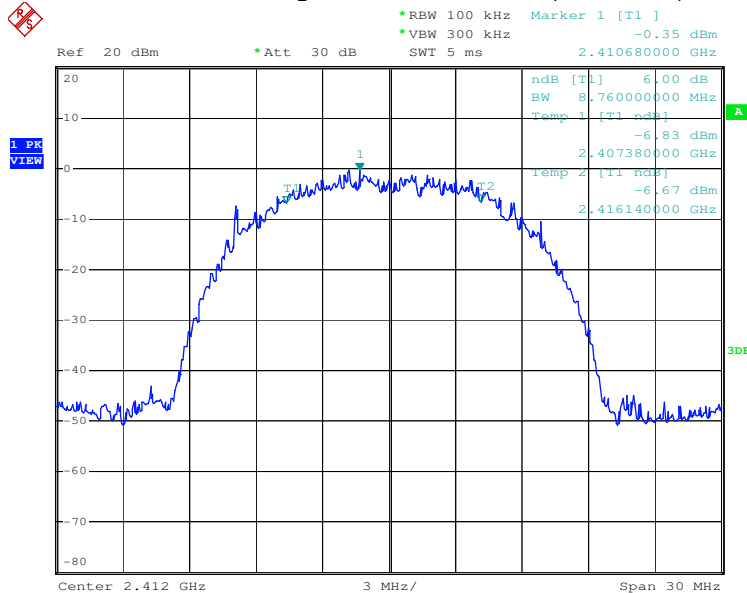
Please refer to the graph as below:

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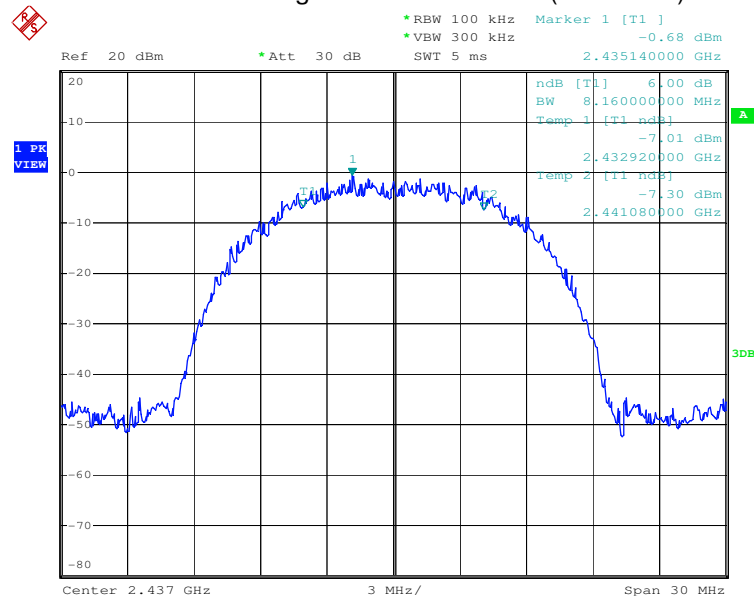


1. For EUT communicating with 802.11b mode (2.412GHz)



Date: 23.FEB.2009 16:18:49

2. For EUT communicating with 802.11b mode (2.437GHz)

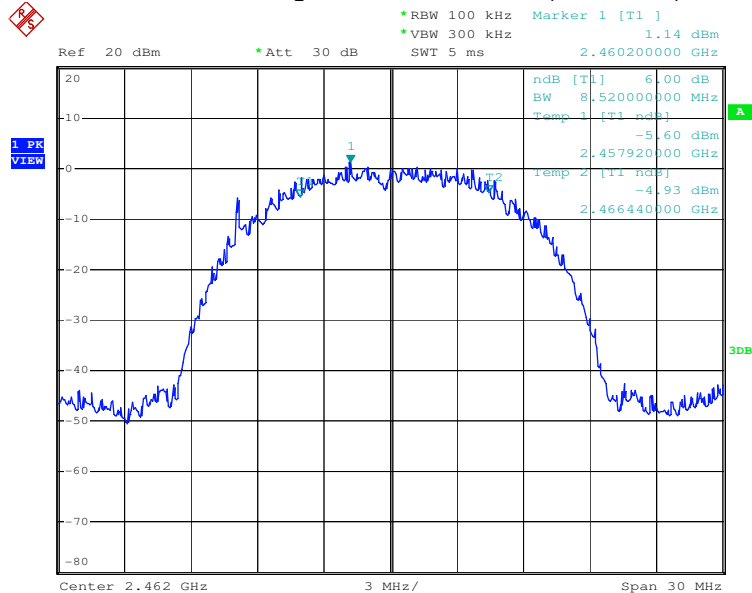


Date: 24.FEB.2009 12:34:57

FCC ID: W5DIRA001248

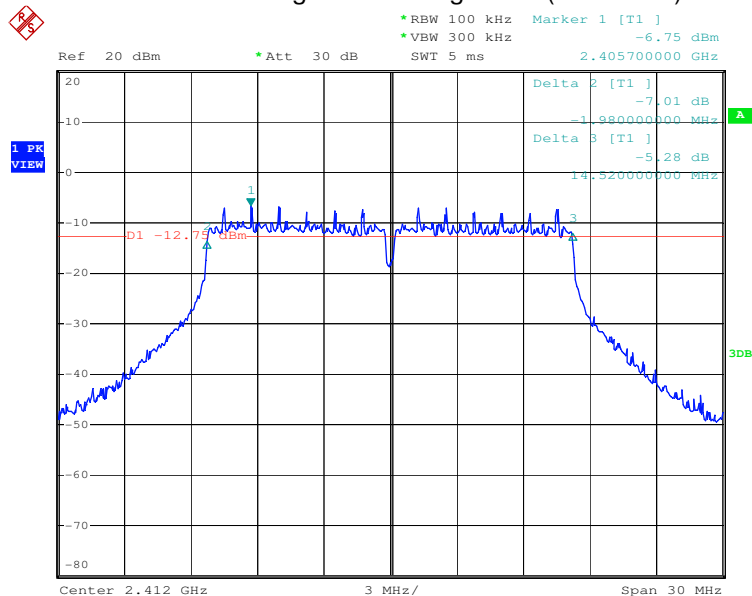
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3. For EUT communicating with 802.11b mode (2.462GHz)



Date: 24.FEB.2009 12:42:13

4. For EUT communicating with 802.11g mode (2.412GHz)



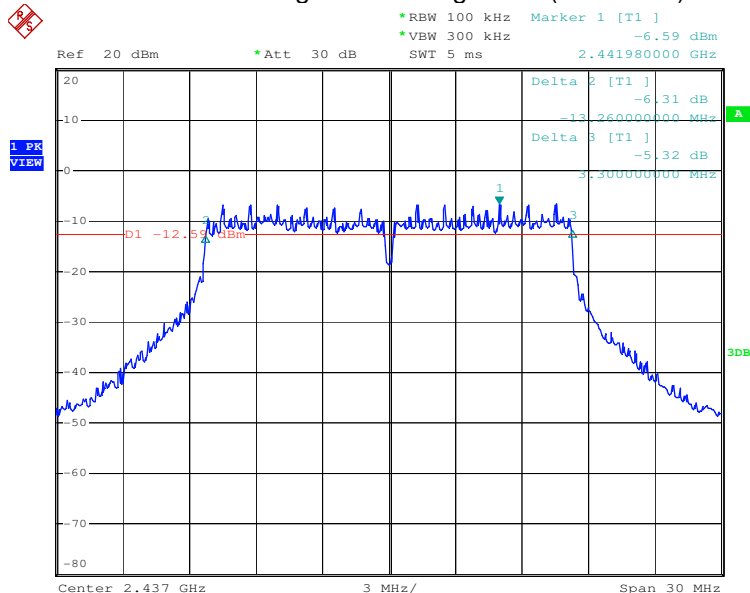
Date: 24.FEB.2009 14:30:48

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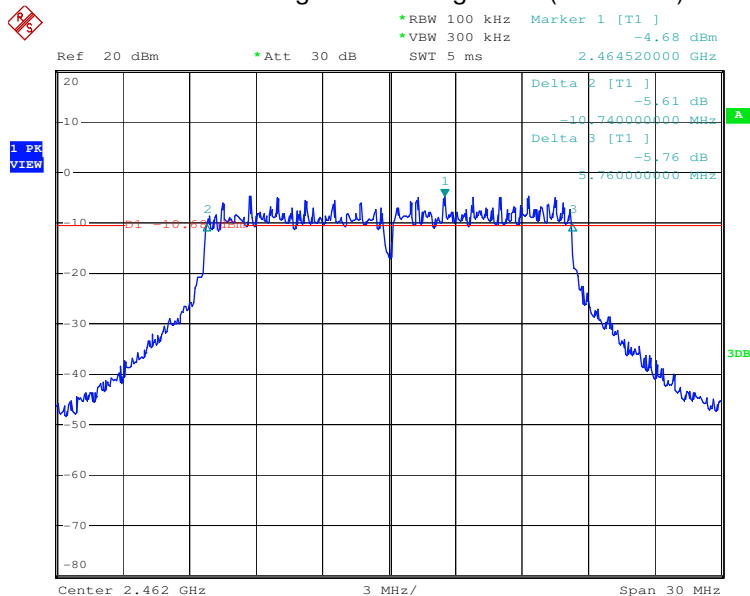


5. For EUT communicating with 802.11g mode (2.437GHz)



Date: 24.FEB.2009 15:03:32

6. For EUT communicating with 802.11g Mode (2.462GHz)



Date: 24.FEB.2009 15:28:12

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5.3.4 Maximum Peak Output Power

Test Requirement: FCC 15.247(b)
Test Method: ANSI C63.4:2003 and KDB558074.
Method of measurement: The EUT was setup to ANSI C63.4, 2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.
Select test data rate: 11Mbps(802.11b) & 54Mbps(802.11g)

Equipment Mode	Spectrum Analyzer
Detector Function	Peak
RBW	1MHz
VBW	3MHz

Test Procedure:

Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates (802.11b 1/2/5.5/11Mbps and 802.11g 6/9/12/18/24/36/48/54Mbps) and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
802.11b 11Mbps and 802.11g 54Mbps.

Requirements:

Regulation 15.247 (b) The Limit of Maximum Peak Output Power Measurement is 30dBm.

Test Result:

For EUT communicating with 802.11b Mode

Channel (GHz)	Peak Output Power (dBm)	Cable loss (dB)	Power level(dBm)	Limit (dBm)	Margin (dB)
2.412	17.08	0.50	17.58	30.00	11.42
2.437	16.63	0.50	17.13	30.00	11.87
2.462	17.83	0.50	18.33	30.00	10.67

For EUT communicating with 802.11g Mode

Channel (GHz)	Peak Output Power (dBm)	Cable loss (dB)	Power level(dBm)	Limit (dBm)	Margin (dB)
2.412	12.24	0.50	13.74	30.00	16.26
2.437	12.44	0.50	13.94	30.00	16.06
2.462	14.26	0.50	15.76	30.00	14.24

Test result: The unit does meet the FCC requirements.

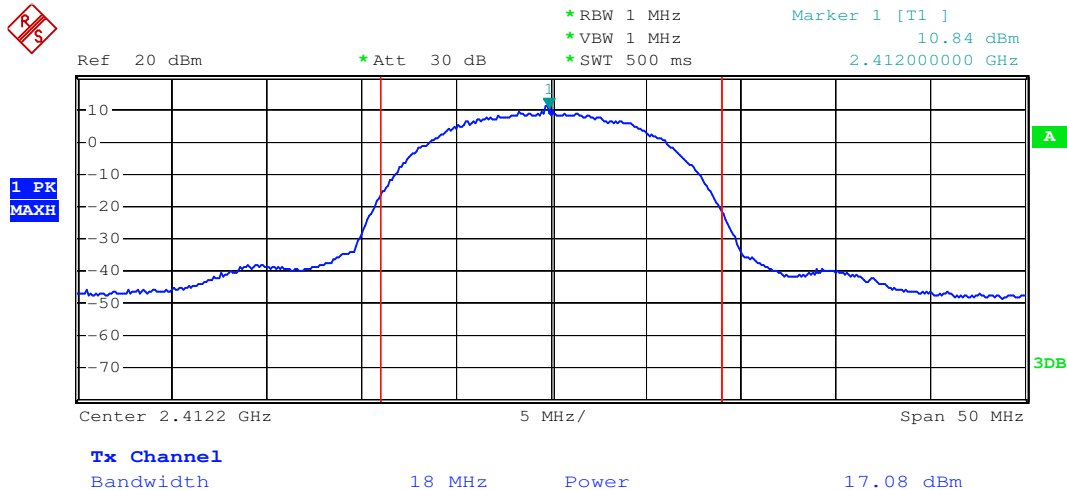
Test result plot as follows:

FCC ID: W5DIRA001248

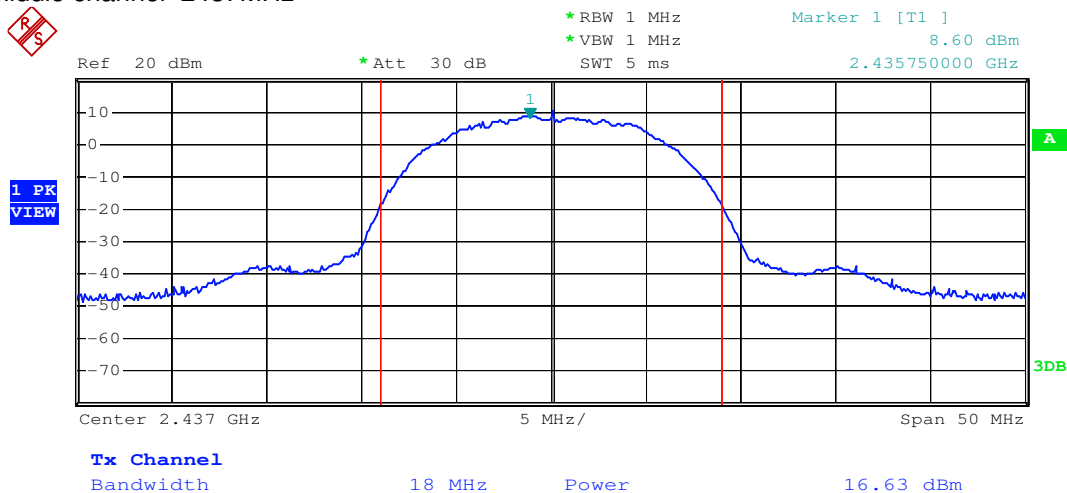
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**The EUT communicating with 802.11b Mode**

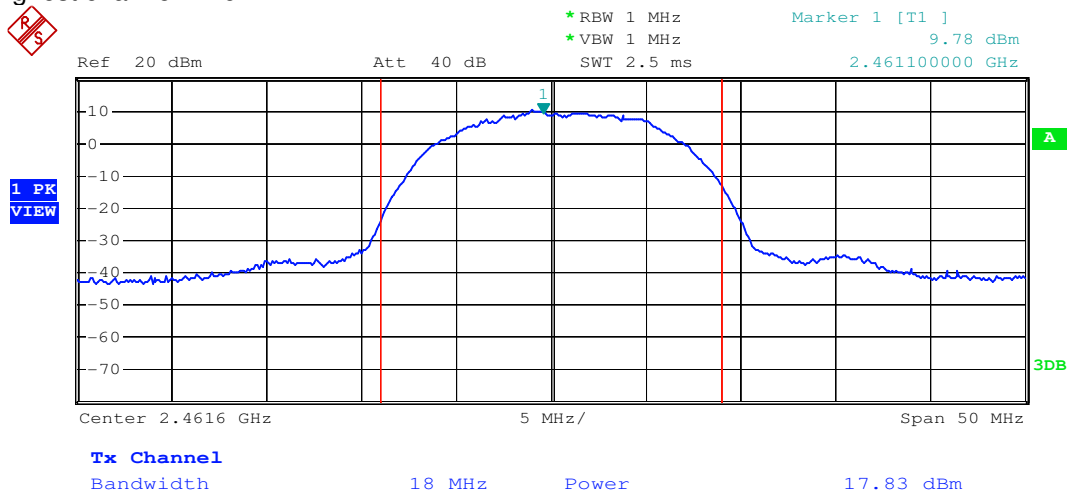
Lowest channel=2412MHz



Middle channel=2437MHz



Highest channel=2462MHz

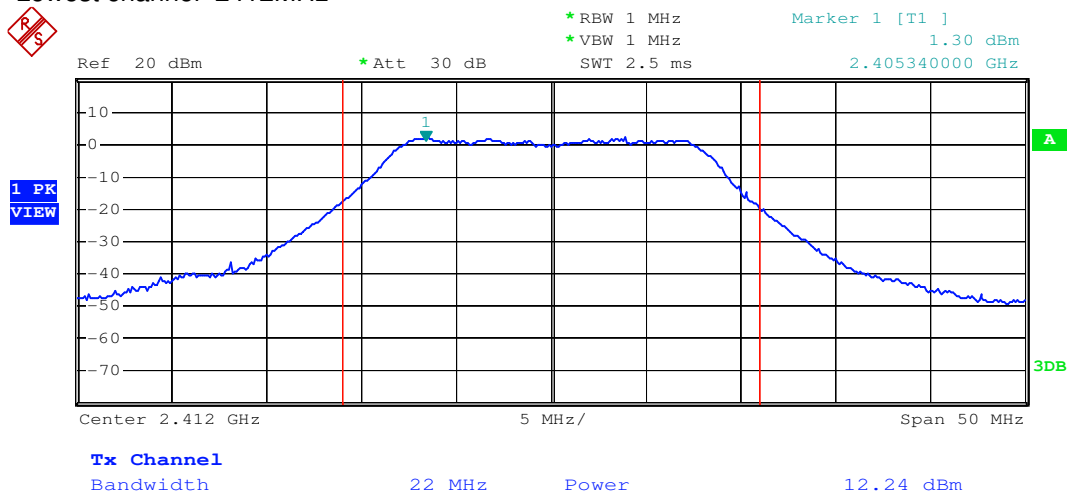


FCC ID: W5DIRA001248

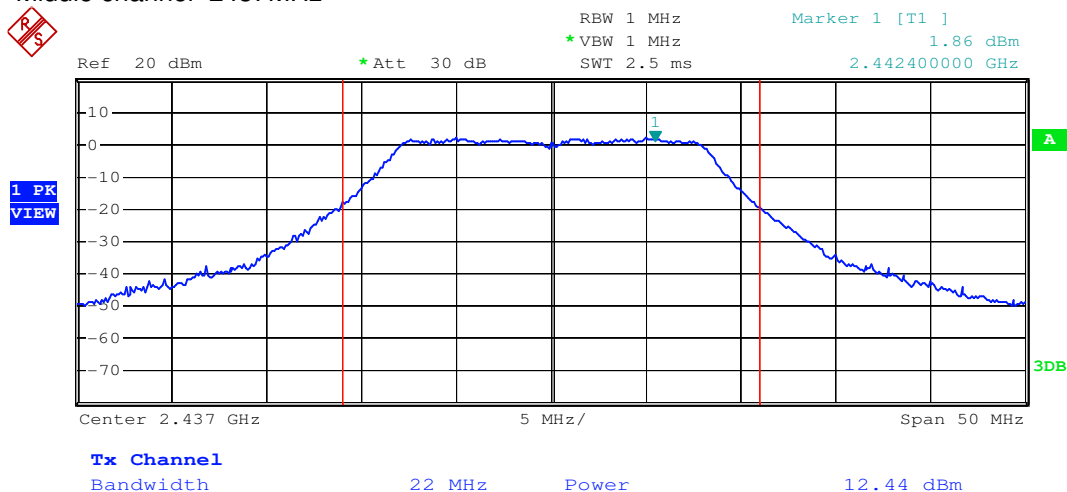
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**The EUT communicating with 802.11g Mode**

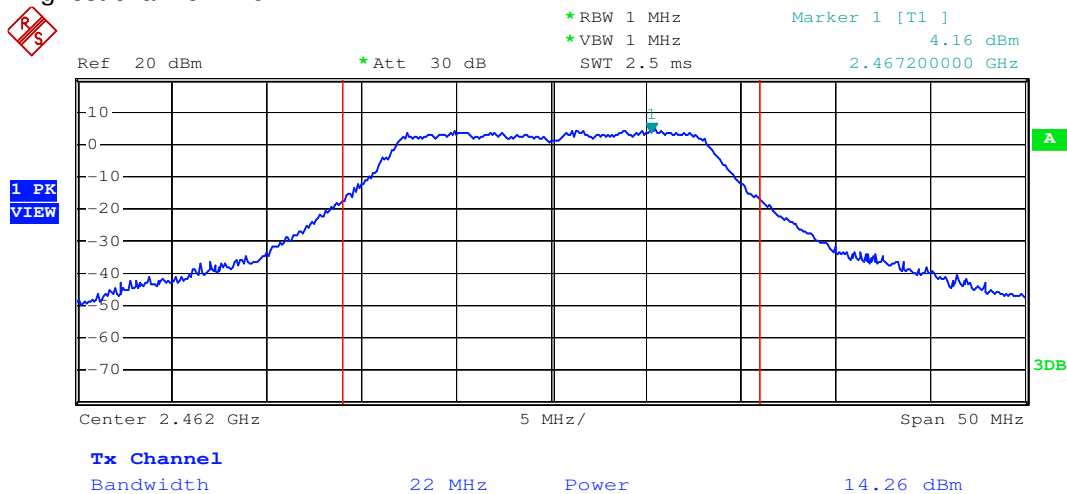
Lowest channel=2412MHz



Middle channel=2437MHz



Highest channel=2462MHz

**Conclusion: The EUT meets the requirements of this section.**

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5.3.5 Band Edges Measurement

Test Requirement: FCC Part15 C Section 15.247(d)
Test Method: ANSI C63.4; FCC Part15 C Section 15.247:
KDB Publication No. 558074 for DSS
Select test mode: 802.11 b 11Mbps & 802.11g 54Mbps
Requirements:

Regulation 15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Procedures:

Procedure: The EUT was setup to ANSI C63.4, 2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Equipment Mode	Spectrum Analyzer
Detector Function	Peak Mode
RBW	100KHz
VBW	300KHz

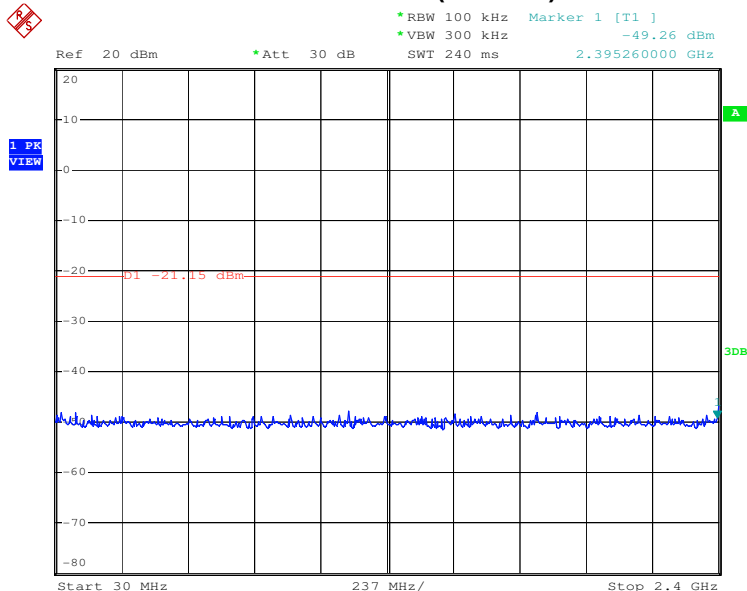
Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates (802.11b 1/2/5.5/11Mbps and 802.11g 6/9/12/18/24/36/48/54Mbps) and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
802.11b 11Mbps and 802.11g 54Mbps

Test Result:

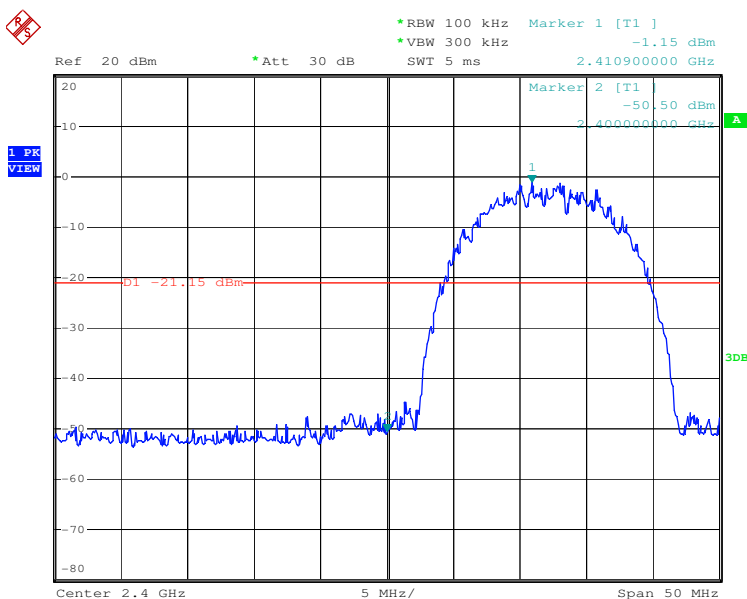
Please refer to the measurement graph and data.



Transmitting mode in lowest channel=2412MHz (802.11b)



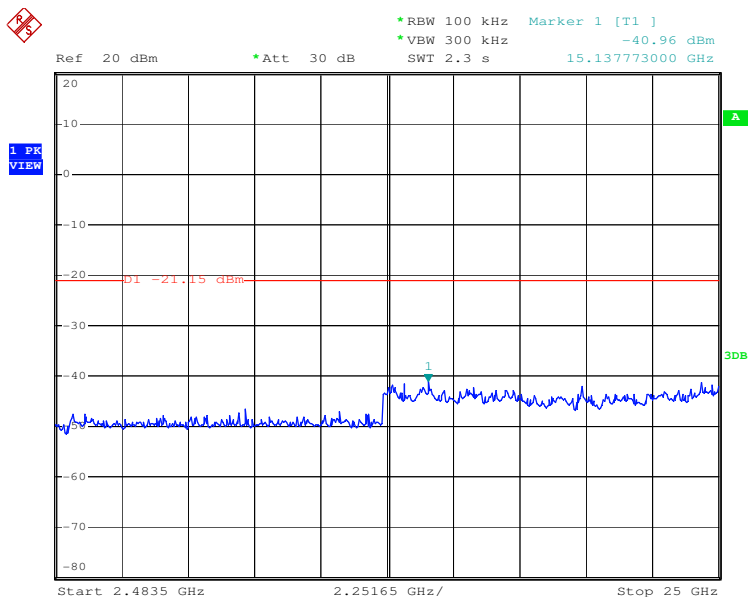
Date: 24.FEB.2009 12:38:44



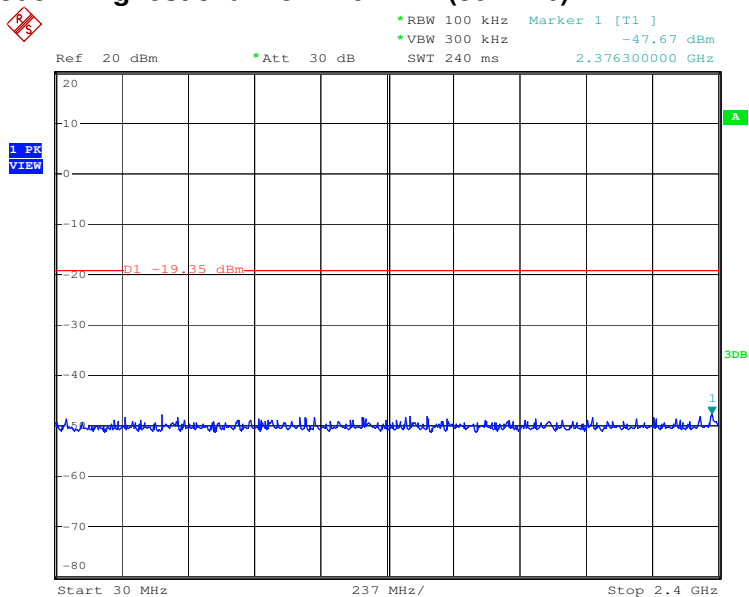
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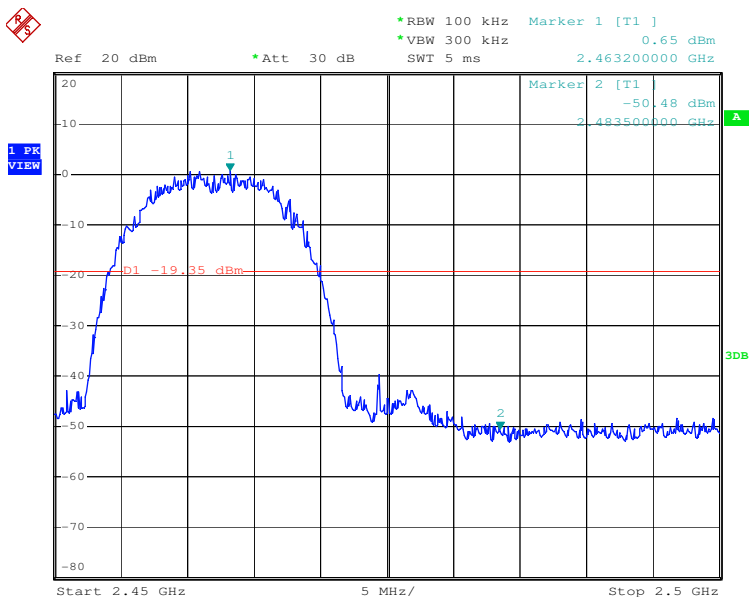
Date: 24.FEB.2009 12:39:18

Transmitting mode in highest channel=2462MHz (802.11b)

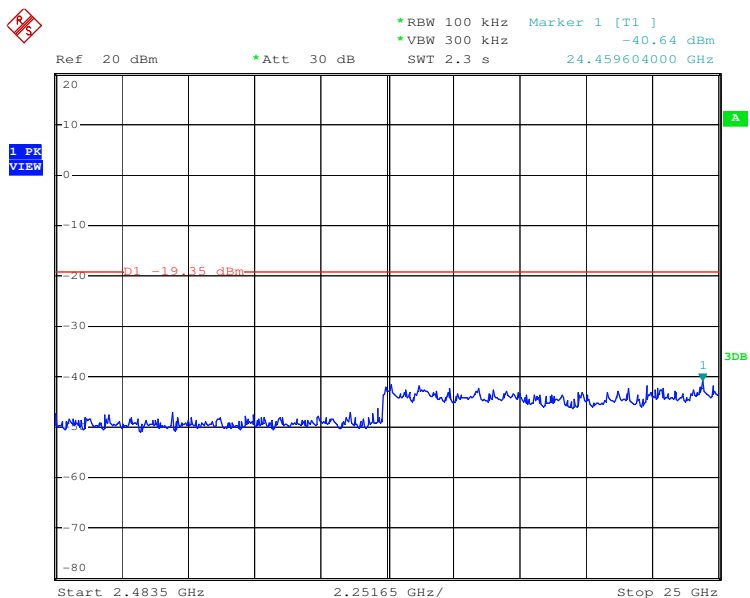
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Date: 24.FEB.2009 12:24:24



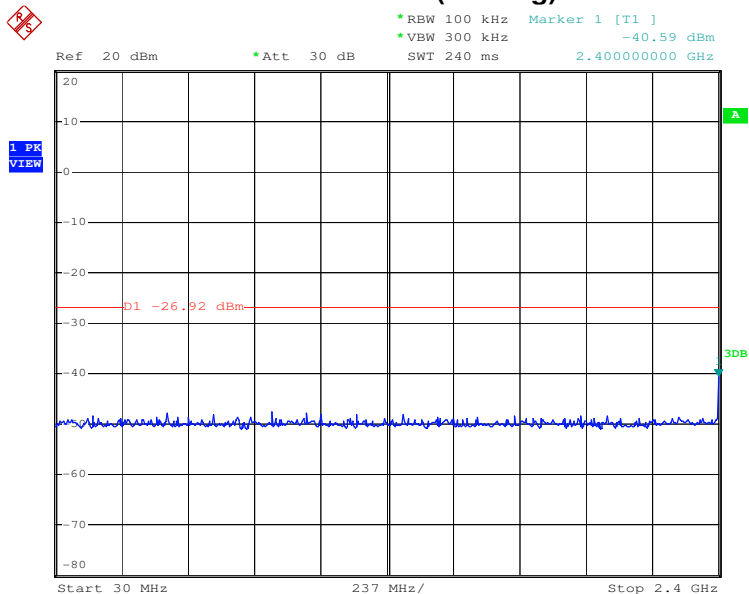
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FCC ID: W5DIRA001248

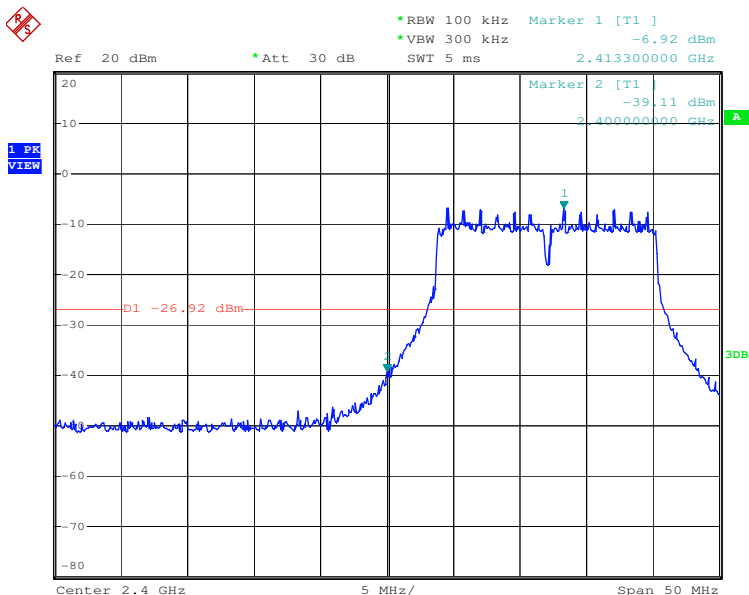
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Transmitting mode in lowest channel=2412MHz (802.11g)



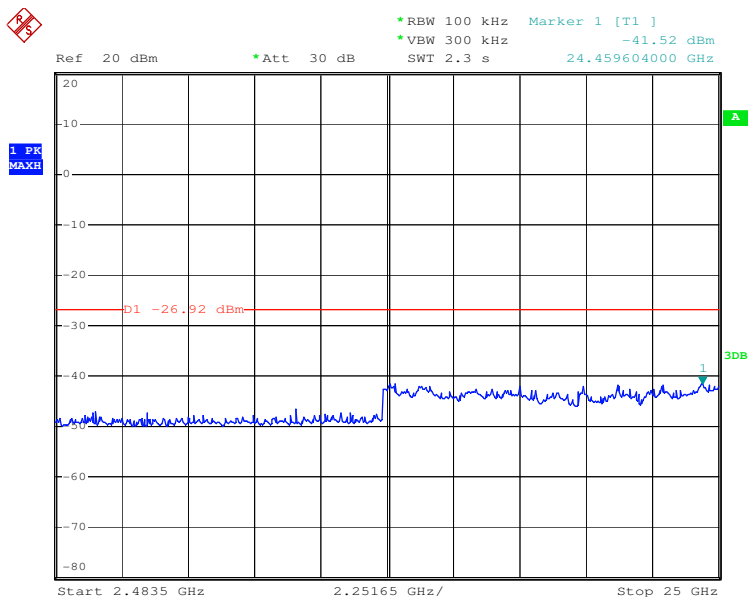
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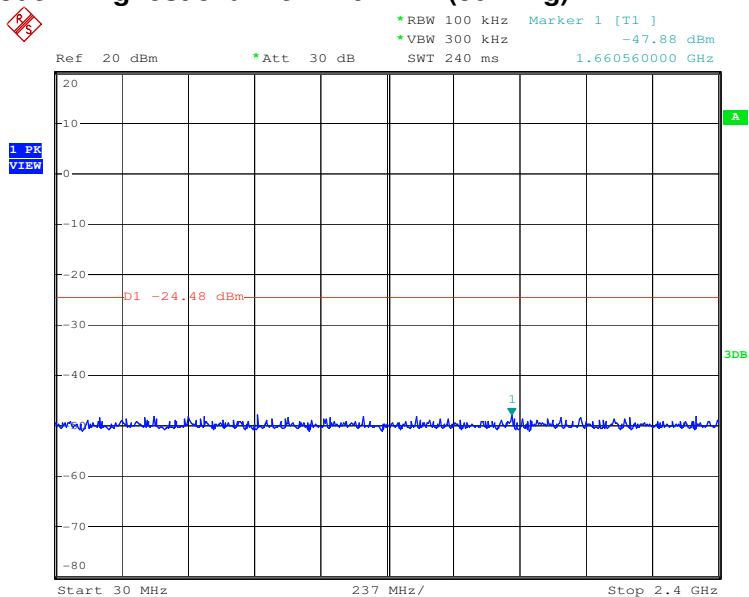
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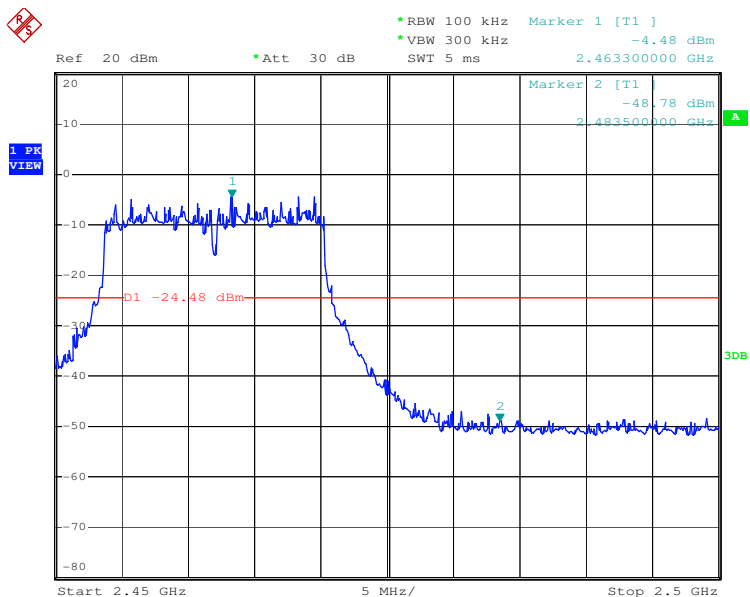
Date: 24.FEB.2009 14:29:28

Transmitting mode in highest channel=2462MHz (802.11g)

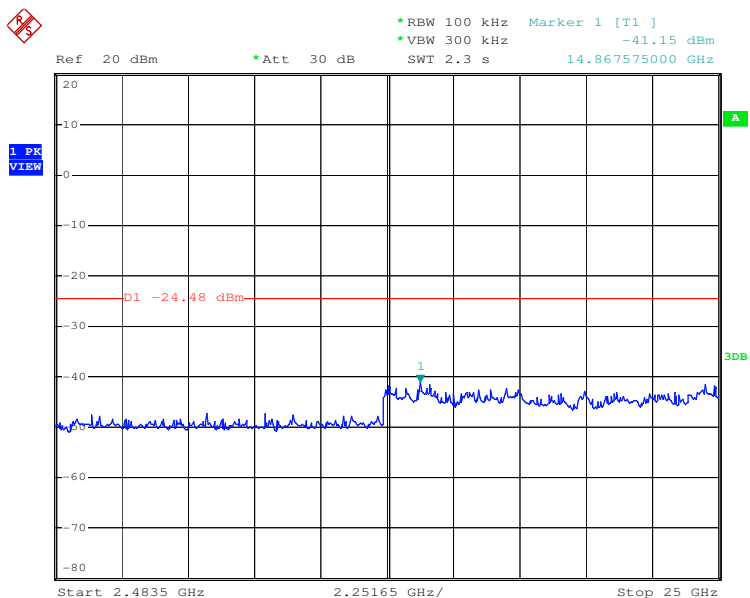
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Date: 24.FEB.2009 15:31:33

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5.3.6 Power Spectral Density Measurement

Test Requirement: FCC 15.247(d)

Test Method: ANSI C63.4 and KDB Publication No. 558074 for DSS.

Regulation 15.247 (d) for direct sequence systems, the peak 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

Test Procedures:

Equipment Mode	Spectrum Analyzer
Detector Function	Peak
RBW	3KHz
VBW	10KHz
Span	1500KHz
Sweep Time	500S

Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates (802.11b 1/2/5.5/11Mbps and 802.11g 6/9/12/18/24/36/48/54Mbps) and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
802.11b 11Mbps and 802.11g 54Mbps

The EUT was set transmitting continuously and force selection of output power level and channel number. We'd observed that the peak levels aren't greater than +8dBm limit.

The EUT was setup to ANSI C63.4, 2003, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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**Test Result:**

1. For EUT communicating with 802.11b Mode

Channel Frequency (MHz)	Power Spectral Density (dBm)	Cable loss (dB)	Power Spectral Density level (dBm)	Maximum Limit (dBm)	Margin (dB)
2412	-0.46	0.50	1.04	8.00	6.96
2437	-4.75	0.50	-3.25	8.00	11.25
2462	1.37	0.50	2.87	8.00	5.13

2. For EUT communicating with 802.11g Mode

Channel Frequency (MHz)	Power Spectral Density (dBm)	Cable loss (dB)	Power Spectral Density level (dBm)	Maximum Limit (dBm)	Margin (dB)
2412	-21.23	0.50	-19.73	8.00	27.73
2437	-19.73	0.50	-18.23	8.00	26.23
2462	-18.23	0.50	-16.73	8.00	24.73

Conclusion:**The EUT meets the requirements of this section.**

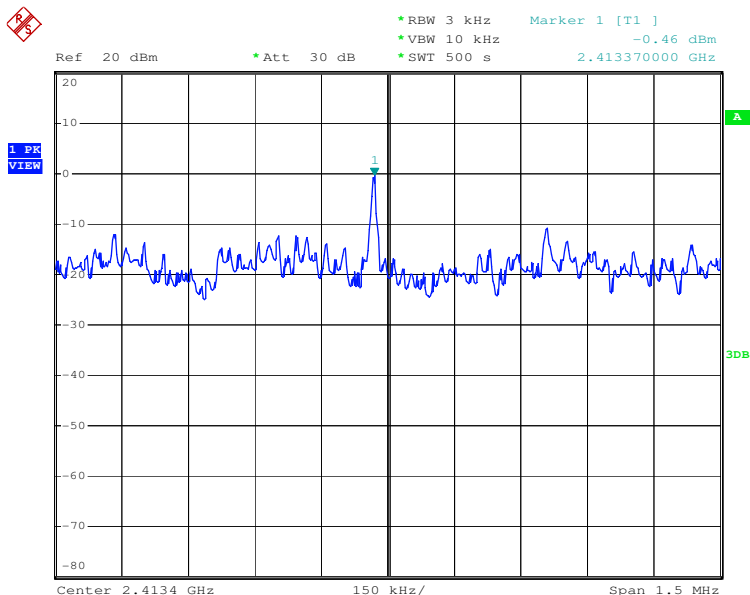
Please refer to the graph and data as below:

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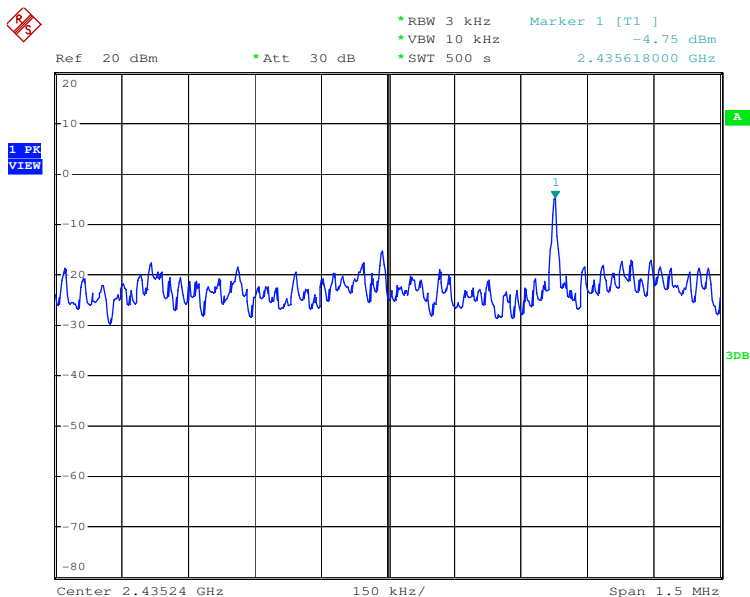


802.11b mode:
2412MHz



Date: 23.FEB.2009 16:13:25

2437MHz



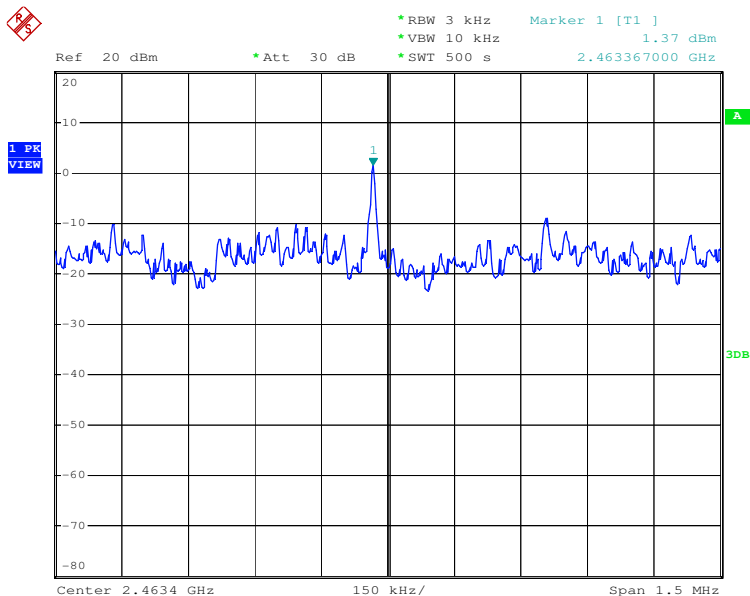
Date: 24.FEB.2009 13:12:55

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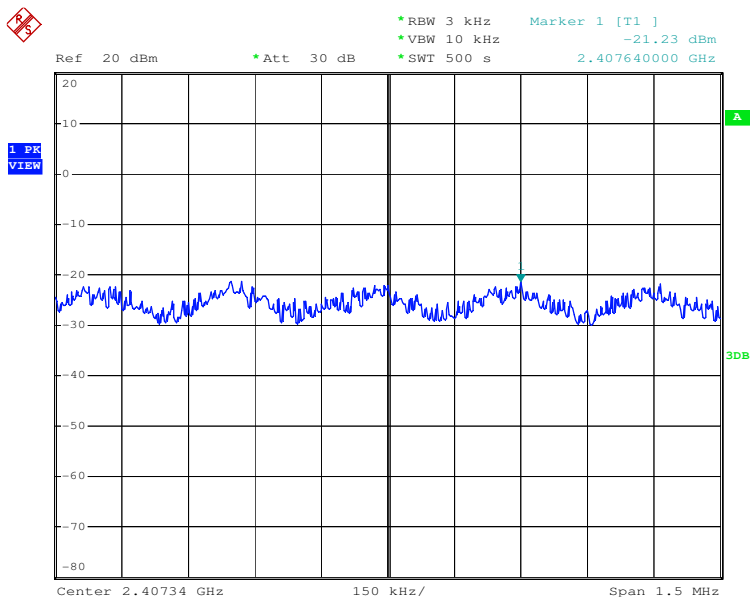
2462MHz



Date: 24.FEB.2009 12:22:44

802.11g mode:

2412MHz



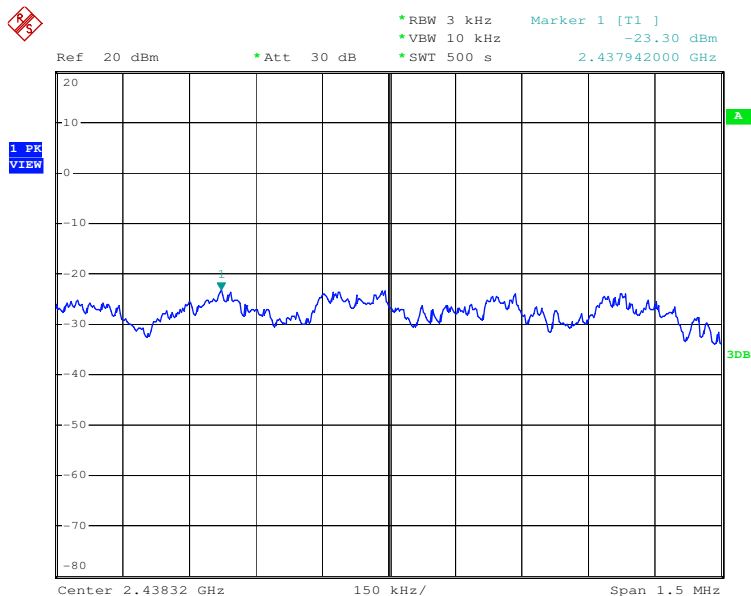
Date: 24.FEB.2009 14:26:25

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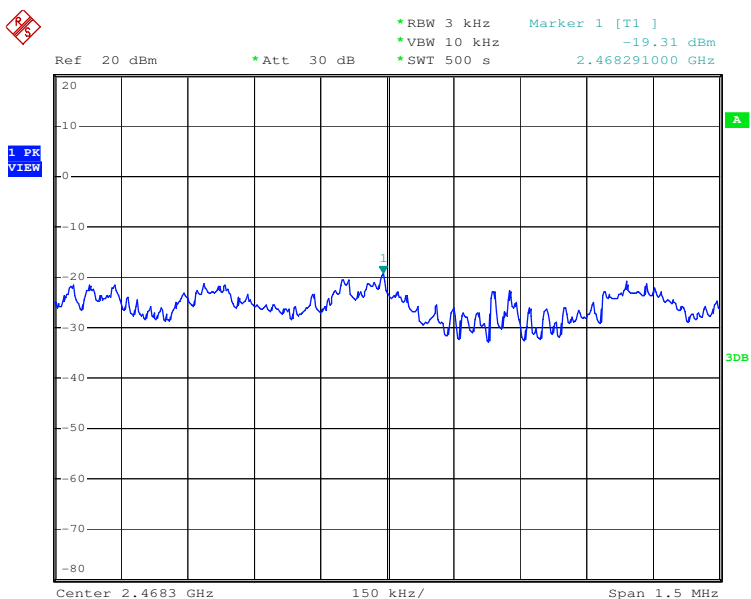


2437MHz



Date: 24.FEB.2009 15:24:23

2462MHz



Date: 24.FEB.2009 15:50:07

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5.3.7 Antenna Requirement

Standard requirement

15.203 requirement:

For intentional device. According to 15.203. 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.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz bands 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.

EUT Antenna

The best case gain of the antenna is 1.00dBi.