



**SGS-CSTC Standards Technical
Services (Shanghai) Co., Ltd.**

588 West Jindu Road, Songjiang District, Shanghai, China

Telephone: +86 (0) 21 6191 5666

Fax: +86 (0) 21 6191 5655

ee.shang@sgs.com

Report No.: SHEM120900140302

Page 1 of 56

TEST REPORT

Application No. : SHEM1209001403RF

Applicant: MobiWire SAS

FCC ID: QPN-MOBIPRINT2

Equipment Under Test (EUT):

Product Name: MobiWire Mobiprinter

Brand Name: MobiWire

Model: MobiPrint²

Standards: FCC PART 15 SUBPART C, Section 15.247

Date of Receipt: Sep. 25, 2012

Date of Test: Sep. 26, 2012 to Oct. 20, 2012

Date of Issue: Oct. 31, 2012

Test Result: **PASS ***

* In the configuration tested, the EUT complied with the standards specified above

E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.

E&E EMC Engineer
SGS-CSTC(Shanghai) Co., Ltd.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

2 Test Summary

Test	Test Requirement	Test Procedure	Result
AC Power Line Conducted Emission	FCC PART 15 Section 15.207(a)	ANSI C63.4,2003	PASS
Peak Output Power	FCC PART 15 Section 15.247(b)(3),(4)(c)	KDB 558074	PASS
6dB Bandwidth	FCC PART 15 Section 15.247(a)(2)	KDB 558074	PASS
Radiated Emission Band Edge	FCC PART 15 Section 15.247(d)	ANSI C63.4,2003 KDB 558074	PASS
Conducted Spurious Emission	FCC PART 15 Section 15.247(d)	KDB 558074	PASS
Radiated Spurious Emission	FCC PART 15 Section 15.247(d)&15.209	ANSI C63.10,2003 KDB 558074	PASS
Peak Power Density	FCC PART 15 Section 15.247(e)	ANSI C63.10,2009	PASS
Antenna Requirement	FCC PART 15 Section 15.203	N/A	PASS



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	2
3 CONTENTS	3
4 GENERAL INFORMATION.....	4
4.1 CLIENT INFORMATION	4
4.2 GENERAL DESCRIPTION OF E.U.T.....	4
4.3 DETAILS OF E.U.T.....	4
4.4 STANDARDS APPLICABLE FOR TESTING	4
4.5 TEST LOCATION	4
4.6 TEST CONFIDENT LEVEL.....	5
5 EQUIPMENTS USED DURING TEST.....	6
6 TEST PROCEDURE & MEASUREMENT DATA.....	7
6.1 E.U.T. OPERATION.....	7
6.2 ANTENNA REQUIREMENT.....	8
6.3 CONDUCTED EMISSION TEST	9
6.4 PEAK OUTPUT POWER MEASUREMENT	12
6.5 6dB BANDWIDTH.....	17
6.6 RADIATED EMISSION BAND EDGE	21
6.7 CONDUCTED SPURIOUS EMISSION TEST	38
6.8 SPURIOUS RADIATED EMISSION TEST	44
6.9 PEAK POWER SPECTRAL DENSITY	52



4 General Information

4.1 Client Information

Applicant : MobiWire SAS
Applicant Address: 79 avenue Francois Arago, 92000 NANTERRE France
Manufacturer: MOBIWIRE MOBILES (NINGBO) Co., Ltd
Manufacturer Address: No.999, Dacheng East Road, Fenghua City, Zhejiang

4.2 General Description of E.U.T.

Product Name MobiWire Mobiprinter
Brand Name: MobiWire
Model No: MobiPrint²
Antenna Type Interior antenna
Supported Frequency Bands: GSM850: 824.2MHz ~ 848.8MHz
GSM1900: 1850.2MHz ~ 1909.8MHz
WiFi: 2412MHz ~ 2462MHz
Bluetooth: 2402MHz ~ 2480MHz
Test Frequency Bands: 2.402GHz to 2.480GHz

4.3 Details of E.U.T.

Hardware Version: V03
Software Version: V00-M121106-MP2-MP
Bluetooth support: V 2.1 (EDR)
WiFi support: 802.11 b/g
AC Adaptor : Mode: S024WM1200200
Input: 100~240V~50/60Hz 600mA
Output: 12V DC 2000mA
Battery: 1800mAh
13.2W/h
Sample No.: Not supplied by the client

4.4 Standards Applicable for Testing

The standard used were FCC PART 15 Subpart C: 2009, DA 00-705, ANSI C63.10: 2009.

4.5 Test Location

All the tests were performance at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666
Fax: +86 21 6191 5655



4.6 Test Confident level

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.



5 Equipments Used during Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-04	2013-06-03
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-06-04	2013-06-03
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-04-25	2013-04-24
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-06-04	2013-06-03
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-09	2013-10-08
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2003P	--	2012-10-15	2013-10-14
7	CLAMP METER	FLUKE	316	86080010	2012-04-25	2013-04-24
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-15	2013-10-14
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2012-06-17	2013-06-16
10	DC power	KIKUSUI	PMC35—3	NF100260	2012-04-25	2013-04-24
11	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-05-07	2013-05-06
12	Power meter	Rohde & Schwarz	NRP	101641	2012-05-05	2013-05-04
13	CBT	Rohde & Schwarz	10082	EMC0070	2012-04-25	2013-04-24
14	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-04	2013-06-03
15	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2012-04-25	2013-04-24
16	Broadband Horn ANTENNA	SCHWARZBECK	BBHA9170	9170-373	2012-06-04	2013-06-03



6 Test Procedure & Measurement Data

6.1 E.U.T. Operation

Input voltage: 120V 60Hz for AC adapter

Operating Environment:

Temperature: 20.0 -25.0 °C

Humidity: 38-52 % RH

Atmospheric Pressure: 992 -1010 mbar

EUT Operation:

The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

802.11 b mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 11Mbps data rate was report for radiated spurious emission.

802.11 g mode:Channel low (2412MHz) mid(2437MHz) high(2462MHz) with the worst case 54Mbps data rate was report for radiated spurious emission.



6.2 Antenna Requirement

Test Requirement:	FCC Part15 15.203
Measurement Distance:	3m (Semi-Anechoic Chamber)
Requirements:	An intentional radiator shall be designed to ensure that no antenna other than 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.
FCC Rules (Section 15.203)	Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique Antenna connector, for every antenna proposed for use with the EUT. The exception in those cases where EUT must be professionally Installed. In order to demonstrate that professional installation is Required, the following 3 points must be addressed: <ul style="list-style-type: none">• The application (or intended use) of the EUT• The installation requirements of the EUT• The method by which the EUT will be marketed
Conclusion	The directional gains of antenna used for transmitting is -3.0 dBi, The RF transmitter uses an integrate antenna without connector.



6.3 Conducted Emission Test

Test Requirement: FCC Part15 15.207

Test date: Sep. 28, 2012

Standard Applicable According to section 15.207,frequency 150KHz to 30MHz shall not exceed the limit table as blew.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

EUT Setup

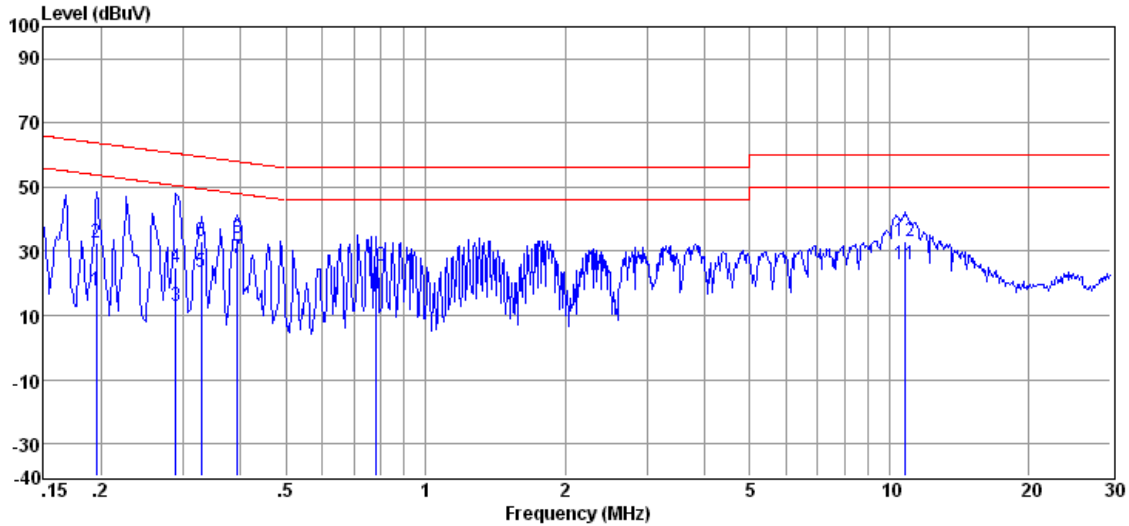
- 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2003.
- 2.EUT is charged with adapter plug-in LISN.
- 3.The LISN was connected with 120V AC/60Hz power source.

Measurement Result

Operation mode:Normal Link Mode



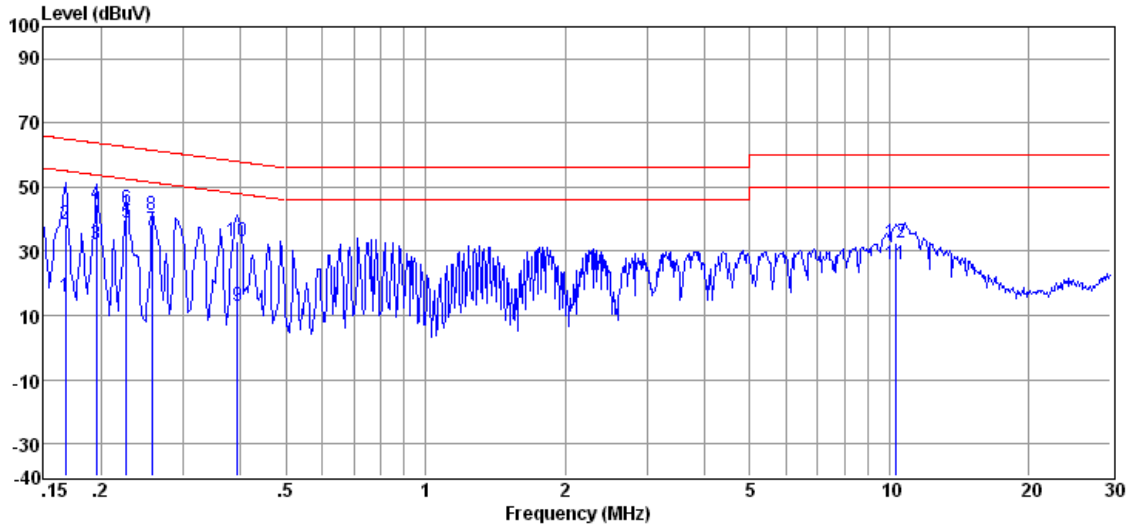
L line:



Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector
0.196	17.41	0.11	0.10	17.62	53.80	-36.18	Average
0.196	32.61	0.11	0.10	32.82	63.80	-30.98	QP
0.289	12.66	0.13	0.10	12.89	50.54	-37.65	Average
0.289	24.51	0.13	0.10	24.74	60.54	-35.80	QP
0.329	23.30	0.14	0.10	23.54	49.49	-25.95	Average
0.329	33.06	0.14	0.10	33.30	59.49	-26.19	QP
0.393	27.55	0.16	0.10	27.81	47.99	-20.18	Average
0.393	34.01	0.16	0.10	34.27	57.99	-23.72	QP
0.779	15.91	0.20	0.10	16.21	46.00	-29.79	Average
0.779	25.11	0.20	0.10	25.41	56.00	-30.59	QP
10.847	25.18	0.60	0.10	25.88	50.00	-24.12	Average
10.847	32.30	0.60	0.10	33.00	60.00	-27.00	QP



N Line:



Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector
0.168	15.46	0.16	0.10	15.72	55.08	-39.36	Average
0.168	38.14	0.16	0.10	38.40	65.08	-26.68	QP
0.196	32.05	0.11	0.10	32.26	53.80	-21.54	Average
0.196	44.57	0.11	0.10	44.78	63.80	-19.02	QP
0.227	38.62	0.11	0.10	38.83	52.57	-13.74	Average
0.227	42.88	0.11	0.10	43.09	62.57	-19.48	QP
0.258	36.51	0.12	0.10	36.73	51.51	-14.78	Average
0.258	41.01	0.12	0.10	41.23	61.51	-20.28	QP
0.393	12.54	0.16	0.10	12.80	47.99	-35.19	Average
0.393	32.63	0.16	0.10	32.89	57.99	-25.10	QP
10.342	25.44	0.60	0.10	26.14	50.00	-23.86	Average
10.342	31.91	0.60	0.10	32.61	60.00	-27.39	QP



6.4 Peak Output Power Measurement

Test Requirement:	FCC Part 15 15.247(a)(2),(b)
Test date	Oct. 15, 2012
Standard Applicable:	According to section 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.

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.
3. Set the occur band to the entire emission bandwidth of the signal.
4. Record the max.channel power reading
5. Repeat above procedures until all the frequency measured were complete.

Measurement Result:



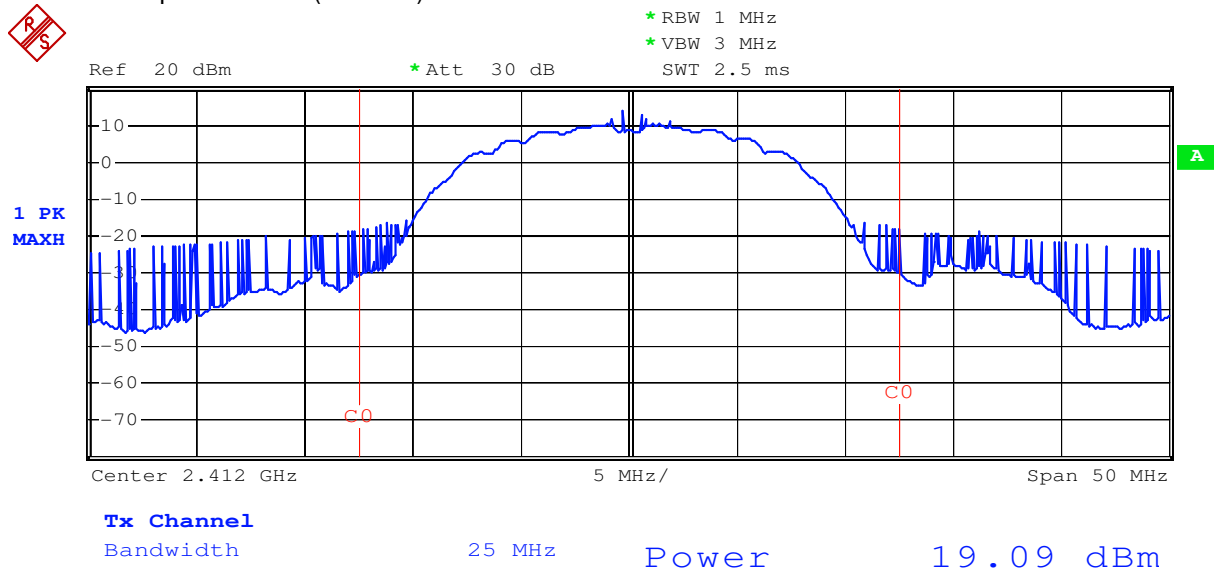
The test was performed with 802.11b, the data was shown the worst case 802.11b 11Mbps.

CH	Frequency (MHz)	Reading Peak Power(dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Limit (dBm)	Result
LOW	2412	19.09	0.5	19.59	30	PASS
MID	2437	19.42	0.5	19.97	30	PASS
HIGH	2462	18.99	0.5	19.49	30	PASS

The test was performed with 802.11g, the data was shown the worst case 802.11g 54Mbps.

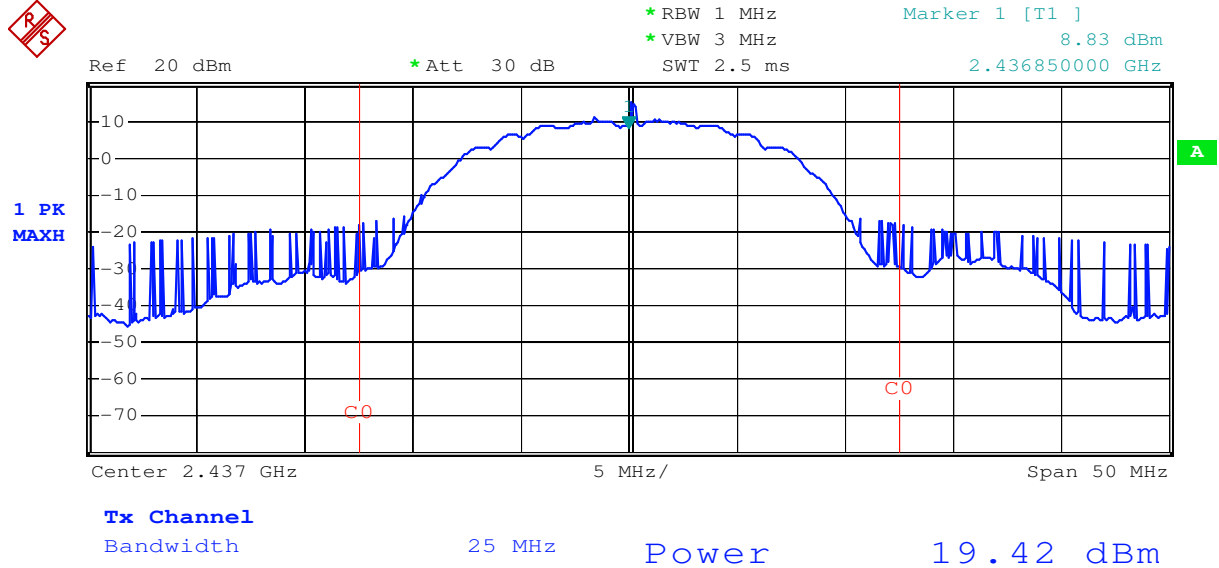
CH	Frequency (MHz)	Reading Peak Power(dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Limit (dBm)	Result
LOW	2412	23.20	0.5	23.70	30	PASS
MID	2437	23.96	0.5	24.46	30	PASS
HIGH	2462	23.78	0.5	24.28	30	PASS

Peak Power Output Data Plot(CH Low)802.11b

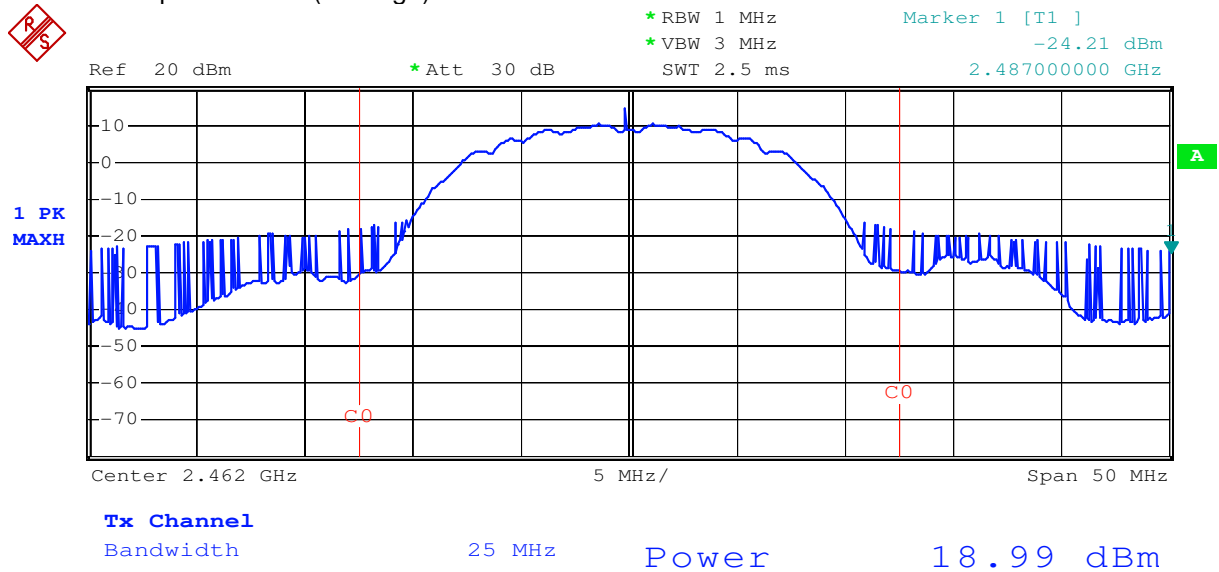




Peak Power Output Data Plot(CH Mid)802.11b

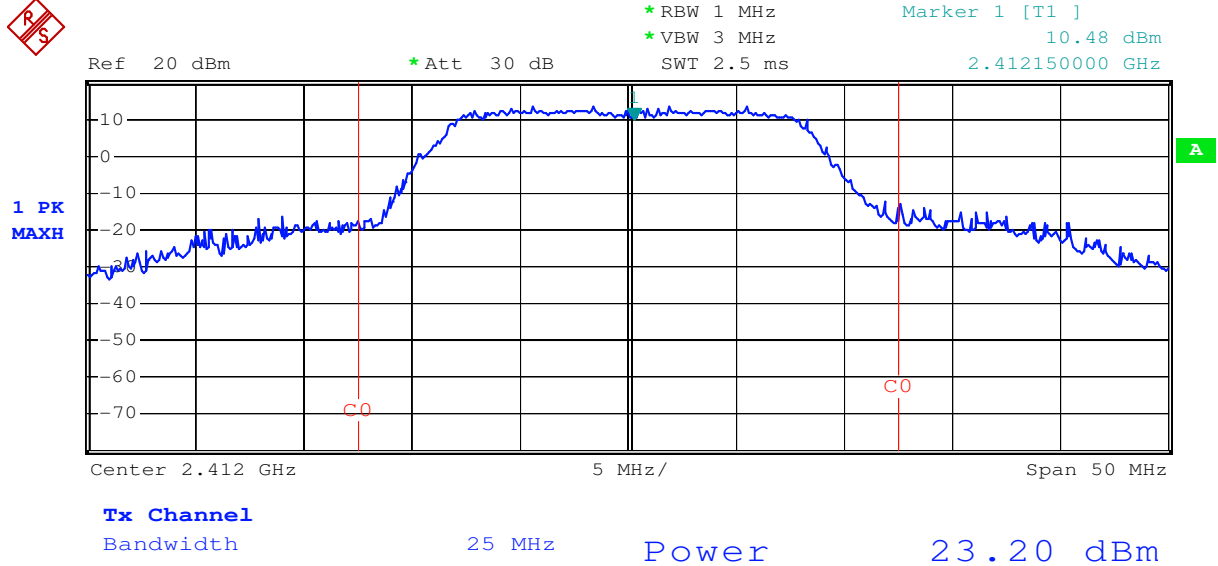


Peak Power Output Data Plot(CH High)802.11b

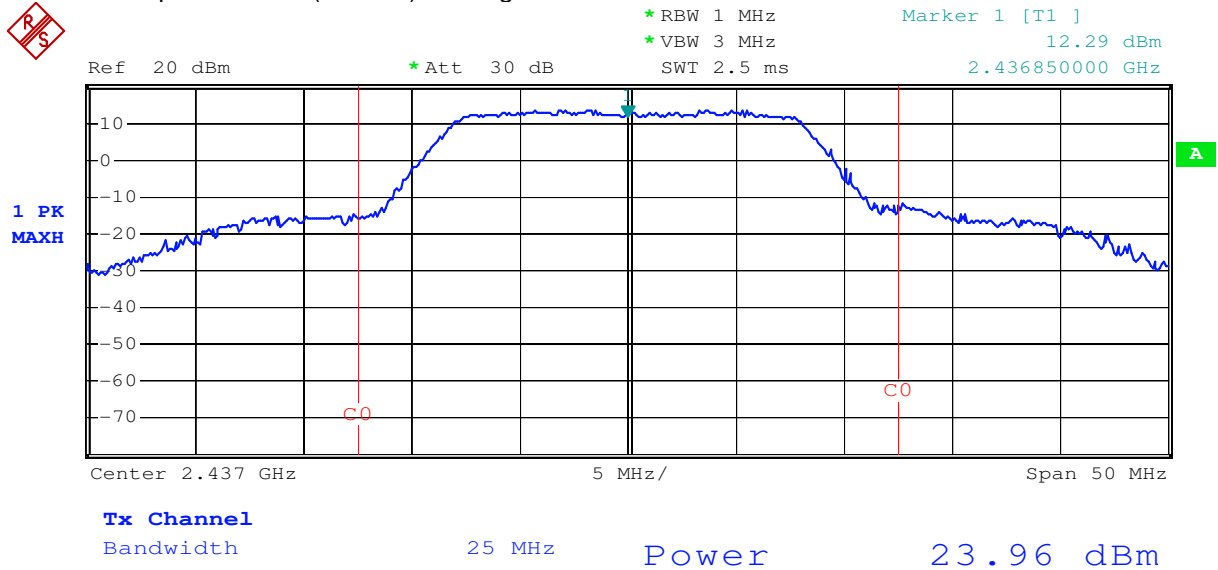




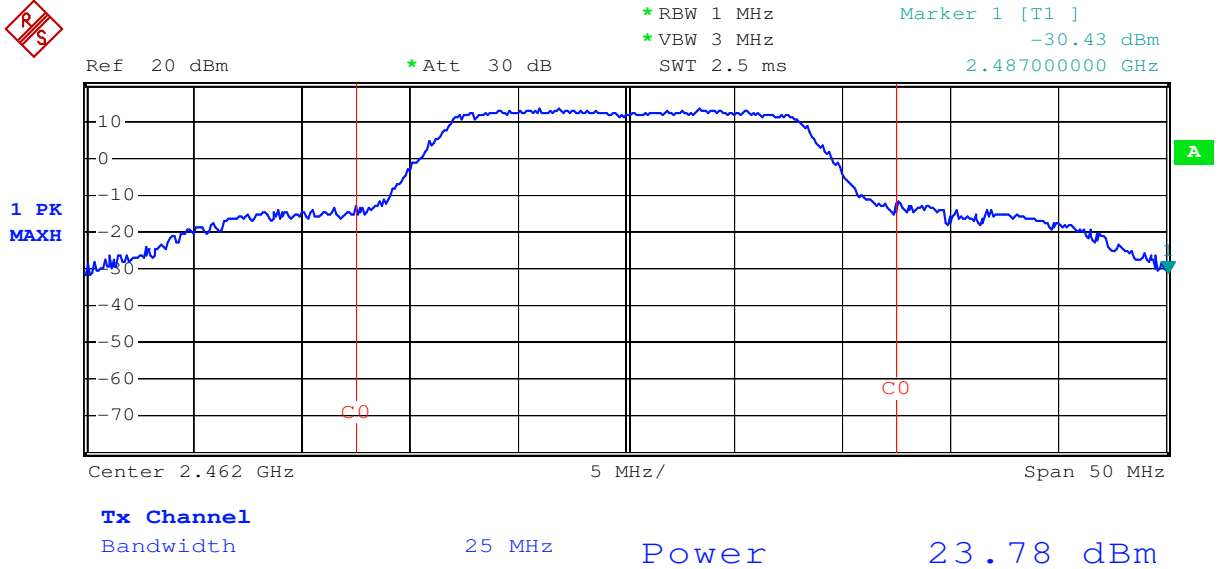
Peak Power Output Data Plot(CH Low)802.11g



Peak Power Output Data Plot(CH Mid)802.11g



Peak Power Output Data Plot(CH High)802.11g





6.5 6dB Bandwidth

Test Requirement: FCC Part15 247(a)(2)

Test date: Oct. 15, 2012

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

- 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 =300, Span=30/ 50MHz, Sweep=auto
 4. Mark the peak frequency and -6dB (upper and lower) frequency.
 5. Repeat above procedures until all frequency measured were complete.

Measurement Result:

The test was performed with 802.11b, the data was shown the worst case 802.11b 11Mbps.

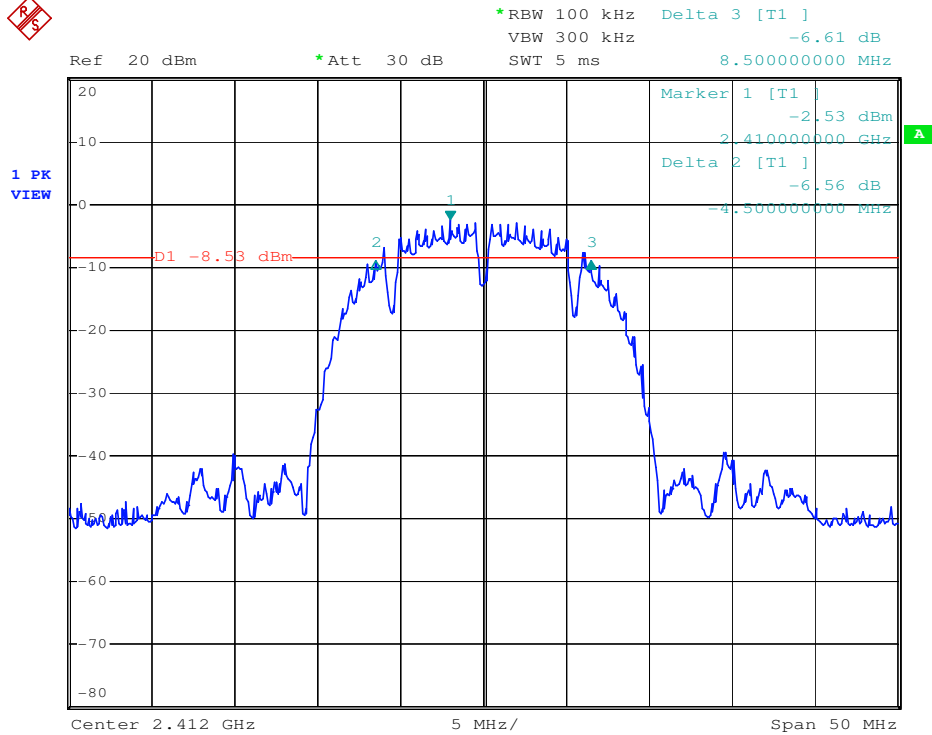
CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	13.00	500	PASS
MID	2437	13.00	500	PASS
HIGH	2462	13.00	500	PASS

The test was performed with 802.11g, the data was shown the worst case 802.11g 54Mbps.

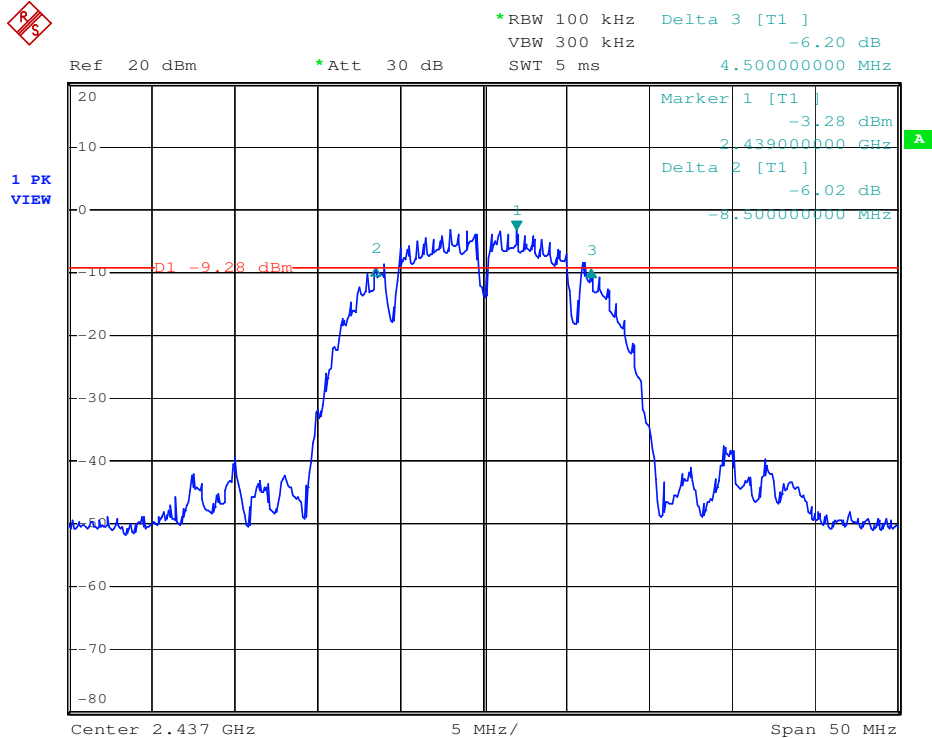
CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	16.60	500	PASS
MID	2437	16.50	500	PASS
HIGH	2462	16.50	500	PASS



6dB Band Width Test Data CH-Low,802.11b,111M mode

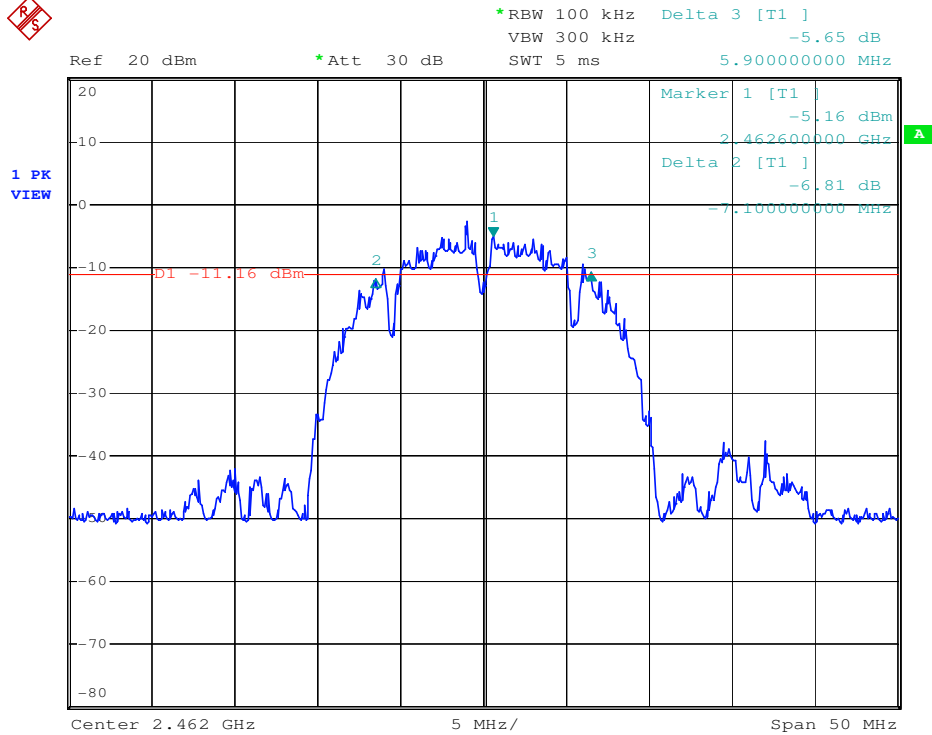


6dB Band Width Test Data CH-Mid,802.11b,111M mode

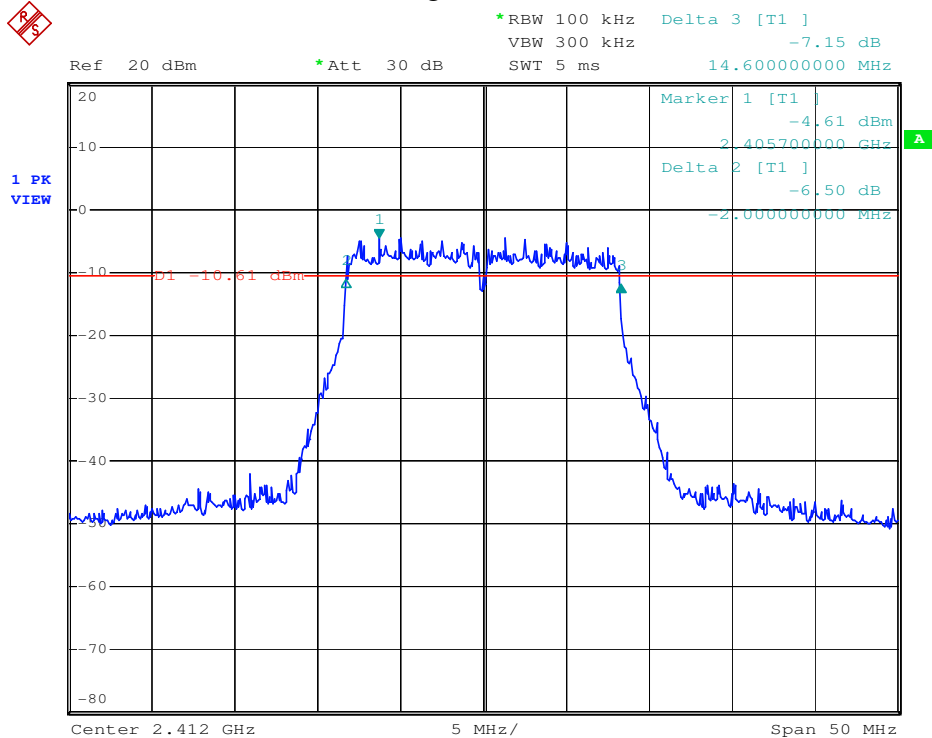




6dB Band Width Test Data CH-High,802.11b,111M mode

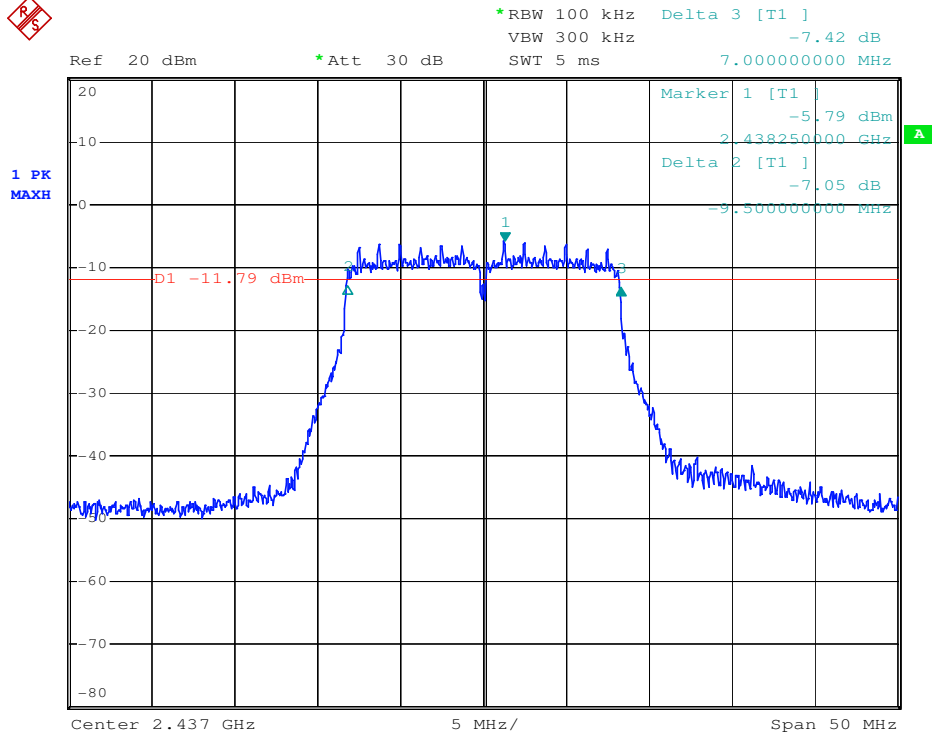


6dB Band Width Test Data CH-Low,802.11g,54M mode

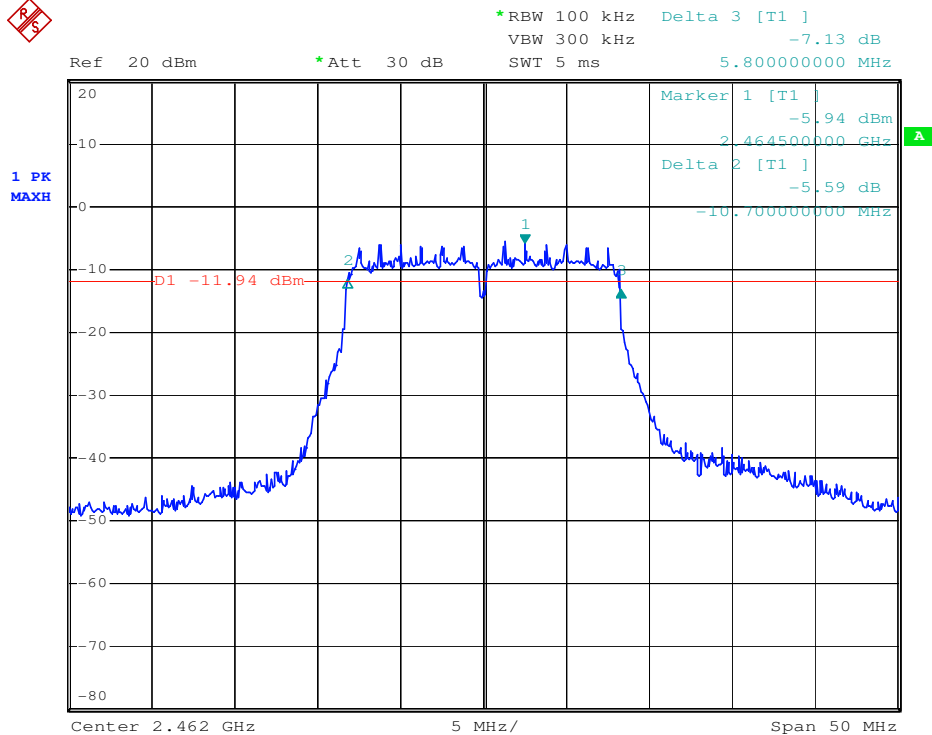




6dB Band Width Test Data CH-Mid,802.11g,54M mode



6dB Band Width Test Data CH-High,802.11g,54M mode



6.6 Radiated Emission Band Edge

Test Requirement: FCC Part15 247(c)

Test date: Oct. 12, 2012

Standard Applicable: According to section 15.247(c), in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is 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 section 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

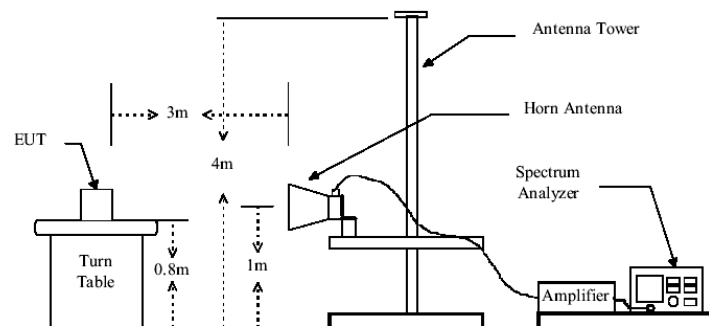
Measurement Procedure: The EUT was setup according to ANSI 63.4, 2003 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47 CFR 15.247 requirements. The EUT is placed on a turn table which is 0.8 m above ground. The turn table is rotated 360 degrees to determine to the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSIC 63.4:2003 on radiated measurement.

Spectrum analyzer parameters setting as shown below:

(a) PEAK: RBW=VBW=111MHz / Sweep= AUTO

(b) AVERAGE: RBW=111MHz / VBW=10Hz / Sweep= AUTO

Radiated Emission Test Set-up Frequency Over 1GHz

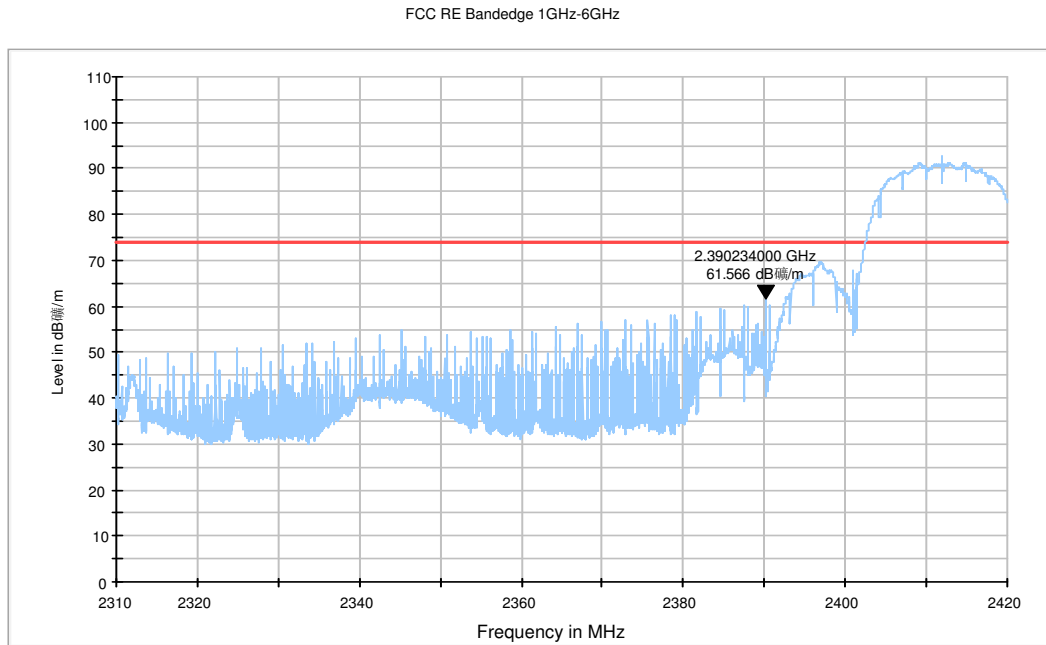


The field strength is calculated by adding the Antenna Factor, Preamplifier Factor & Cable Factor. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor



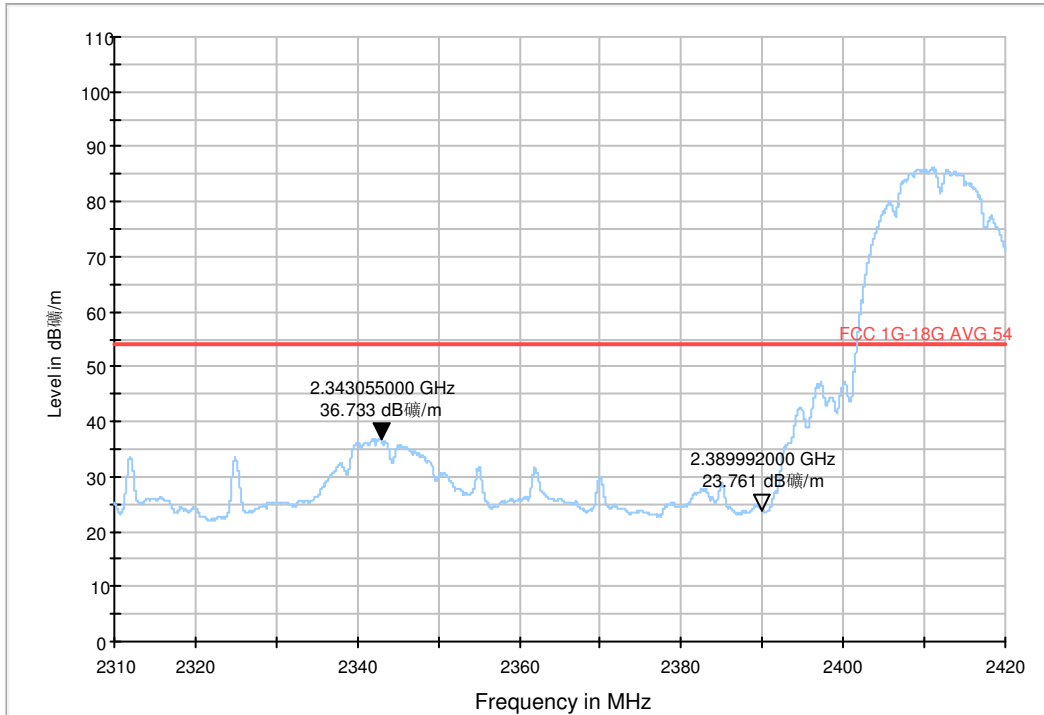
Remark: Factor= Antenna Factor+Cable Factor- Preamplifier Factor
Measurement Result:



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2390	71.61	-10.04	61.57	74.00	12.43



Horizontal, AVG Detector:

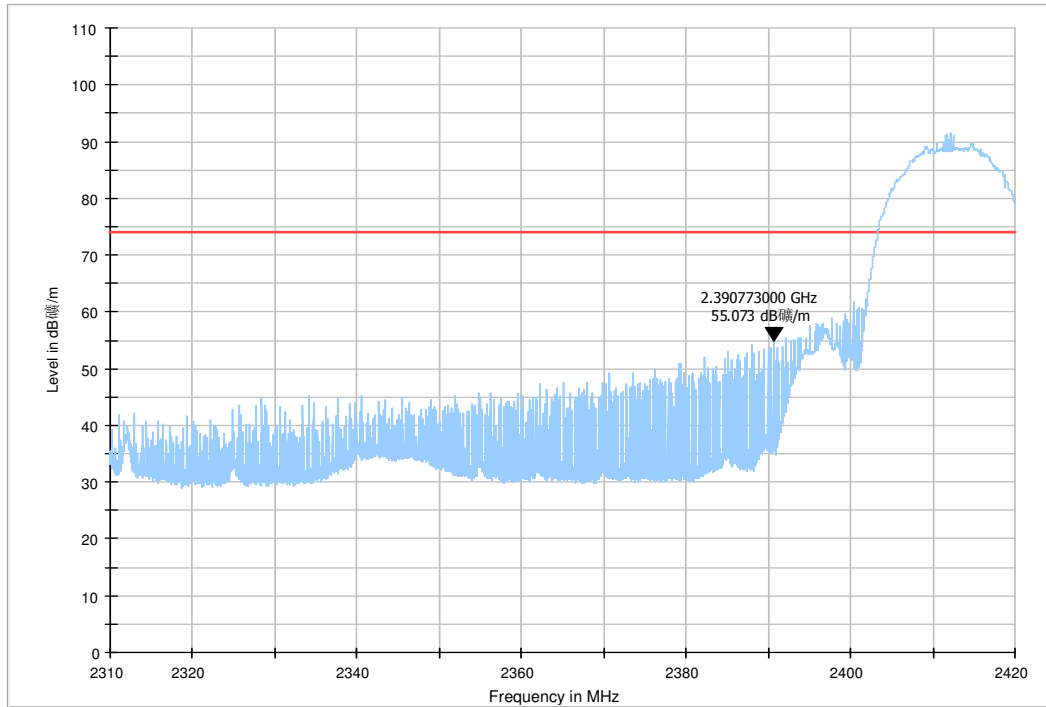


Horizontal, AV Detector:

Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2343	46.77	-10.04	36.73	54.00	17.27



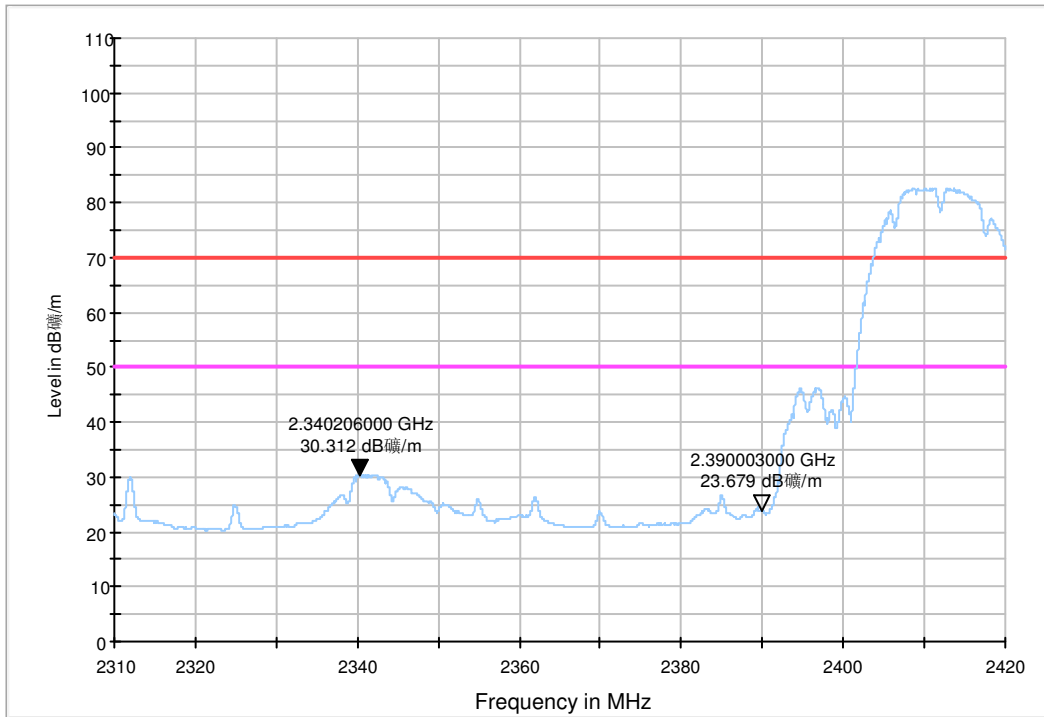
CH Low 802.11b Mode 11M
Vertical, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2390	65.11	-10.04	55.07	74.00	18.93



Vertical, AVG Detector:

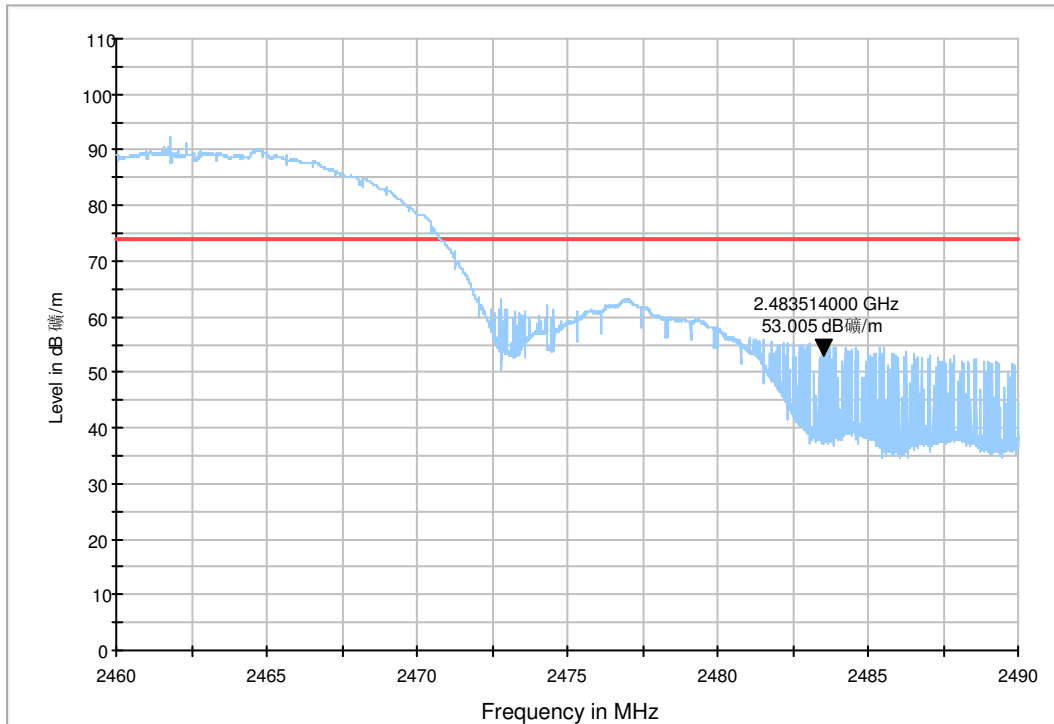


Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2343	40.35	-10.04	30.31	54.00	23.69



CH High 802.11b Mode 11M
Horizontal, Peak Detector:

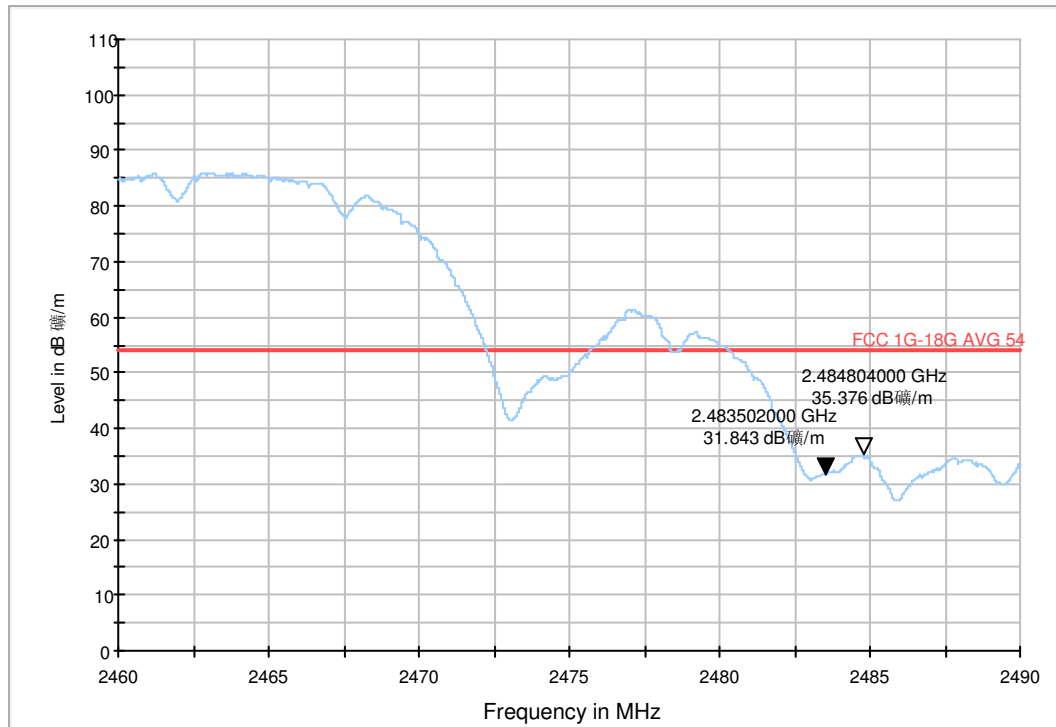
FCC RE Bandedge 1GHz-6GHz



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	63.05	-10.04	53.01	74.00	20.99



Horizontal, AV Detector:



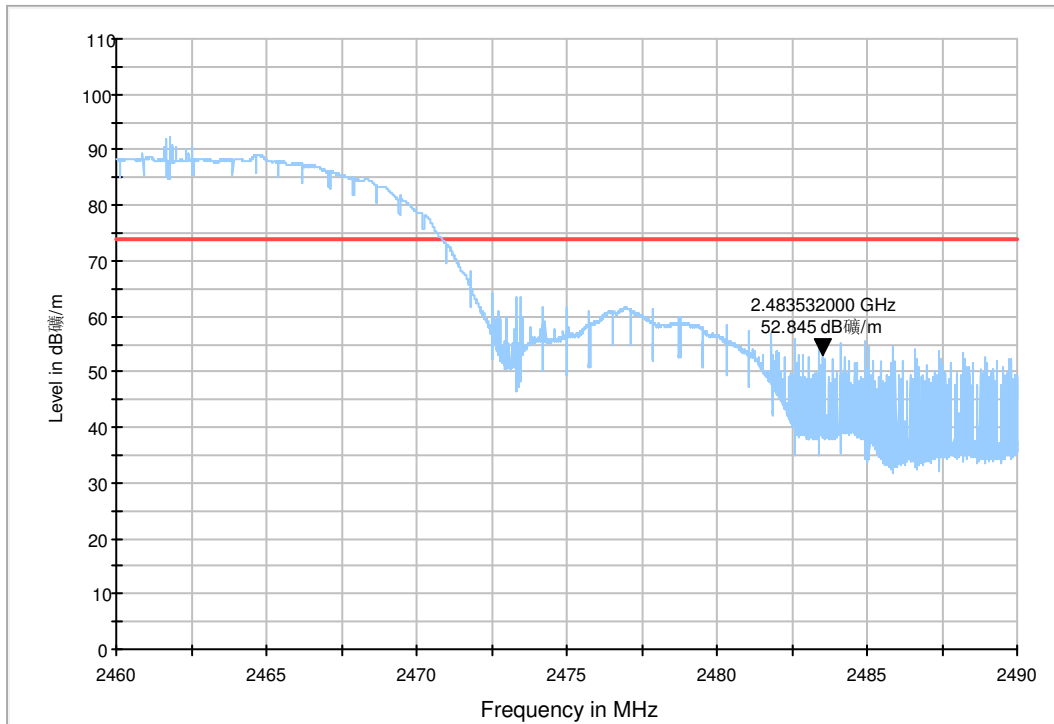
Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2484.8	45.42	-10.04	35.38	54.00	18.72



CH High 802.11b Mode 11M

Vertical, Peak Detector:

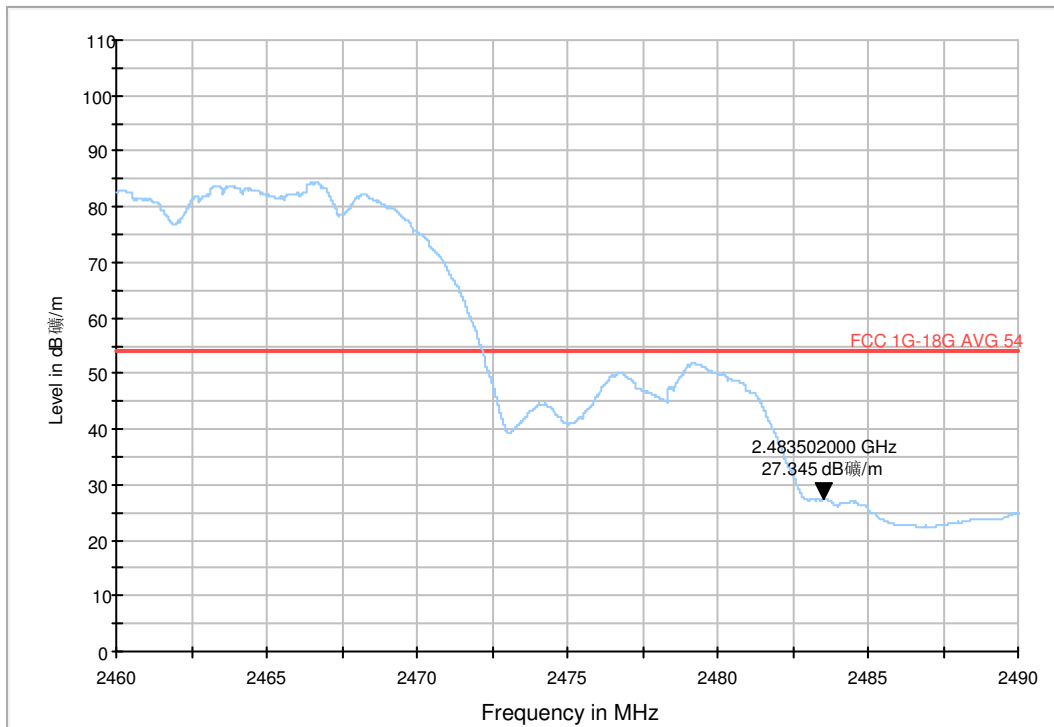
FCC RE Bandedge 1GHz-6GHz



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.5	62.89	-10.04	52.85	74.00	21.15



Vertical, AVG Detector:

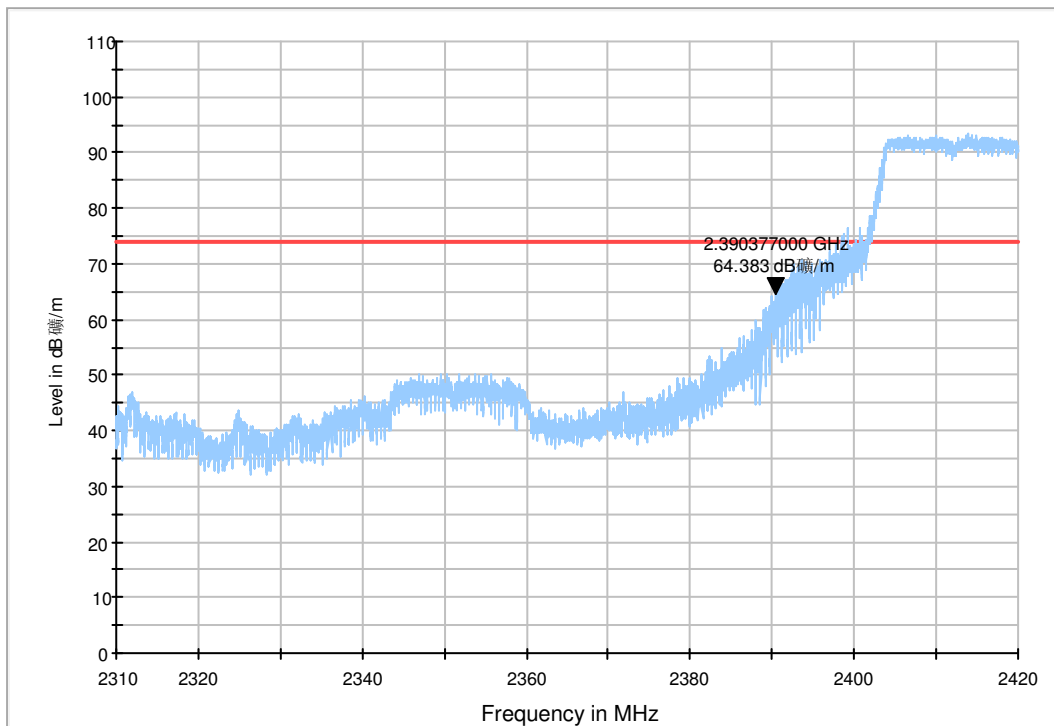


Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2483.5	37.39	-10.04	27.35	54.00	26.65



**CH Low 802.11g Mode 54M
Horizontal, Peak Detector:**

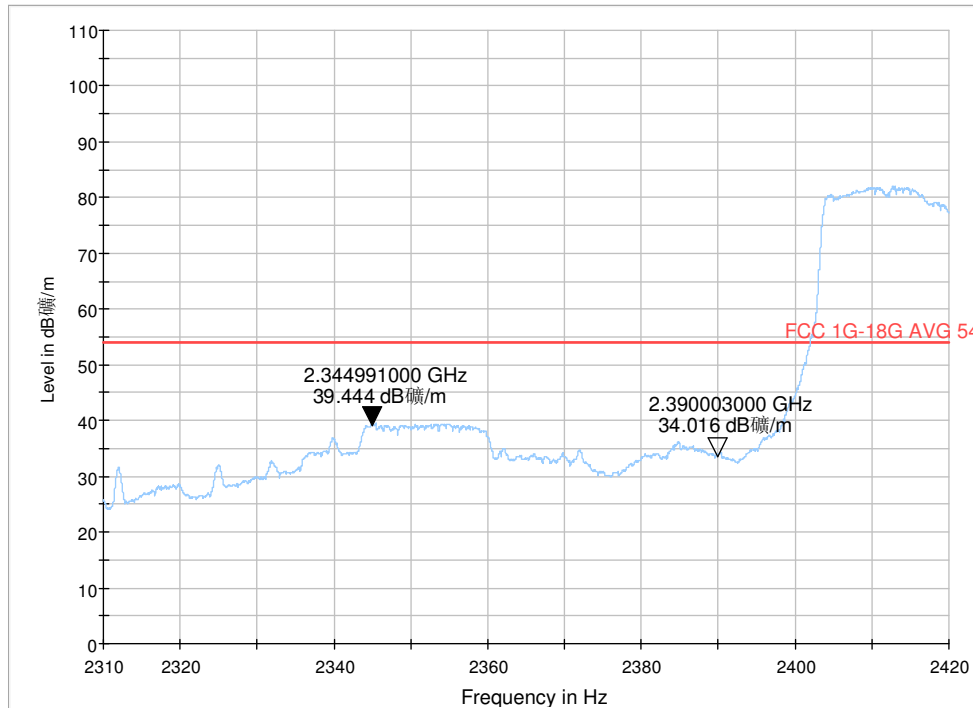
FCC RE Bandedge 1GHz-6GHz



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2390	84.42	-10.04	64.38	74.00	9.62



Horizontal, AV Detector:

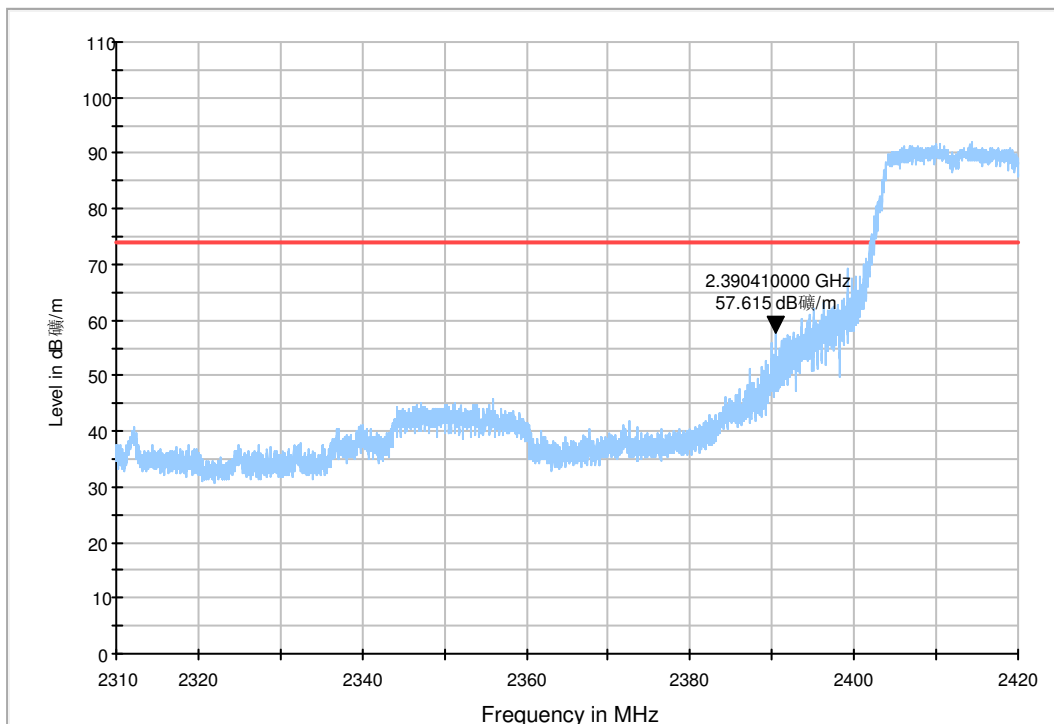


Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2344.99	49.48	-10.04	39.44	54.00	14.56



**CH Low 802.11g Mode 54M
Vertical, Peak Detector:**

FCC RE Bandedge 1GHz-6GHz

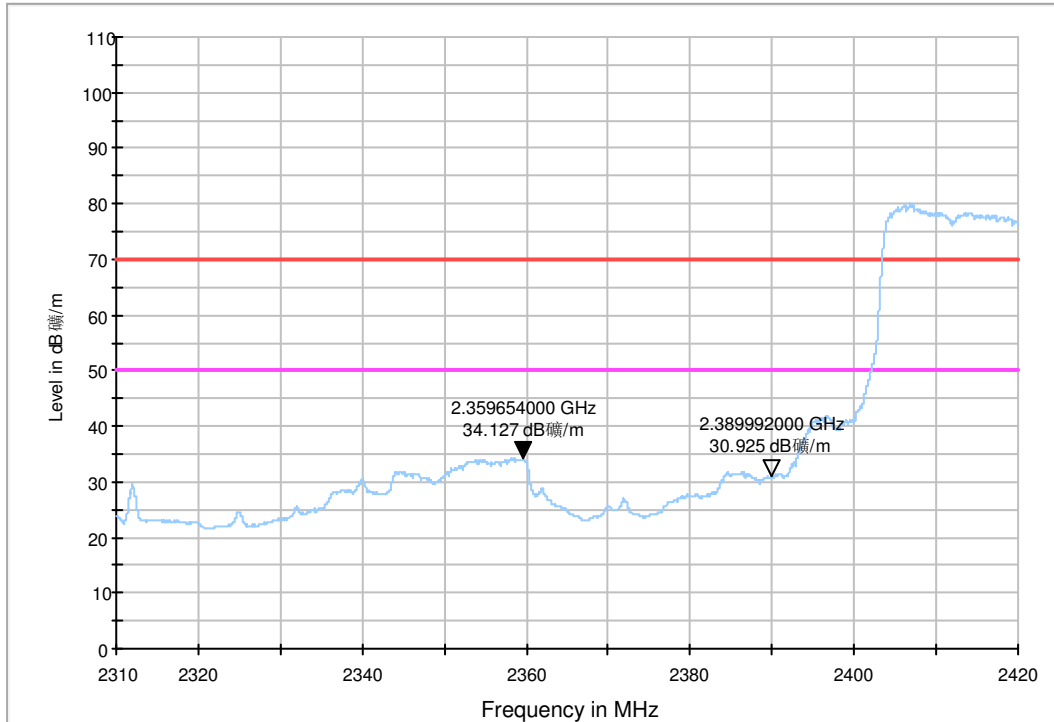


Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2390	67.66	-10.04	57.62	74.00	16.38



Vertical, AVG Detector:

CISPR22 RE 1GHz-6GHz AV



Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2359.65	44.17	-10.04	34.13	54.00	19.87

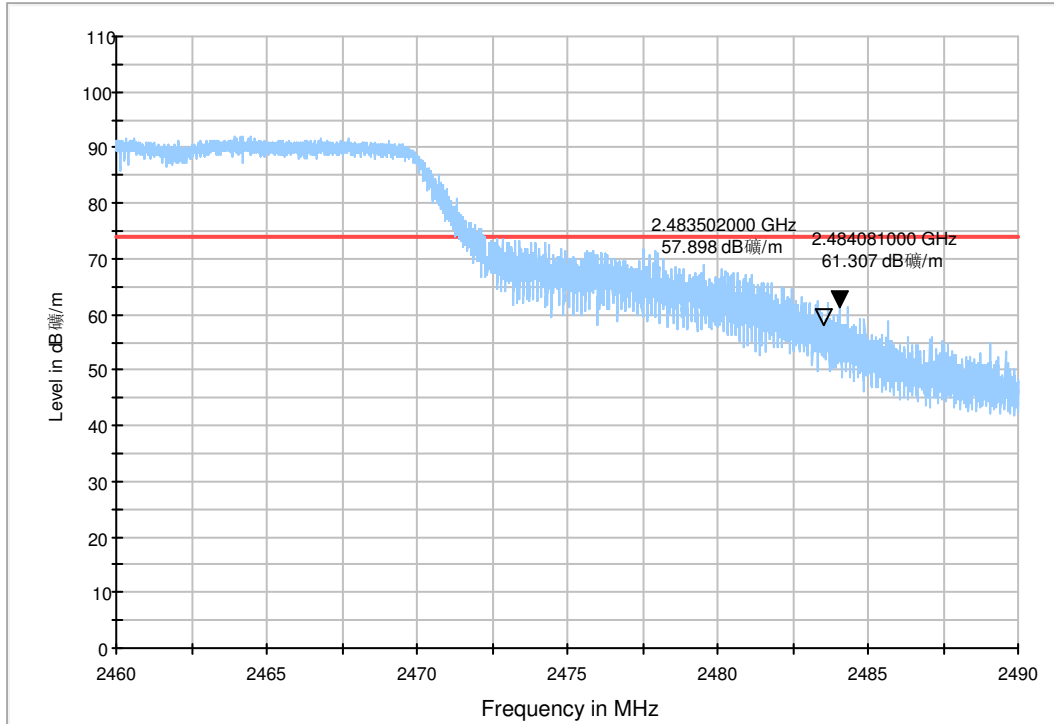
CH High 802.11g Mode 54M

Horizontal, Peak Detector:

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

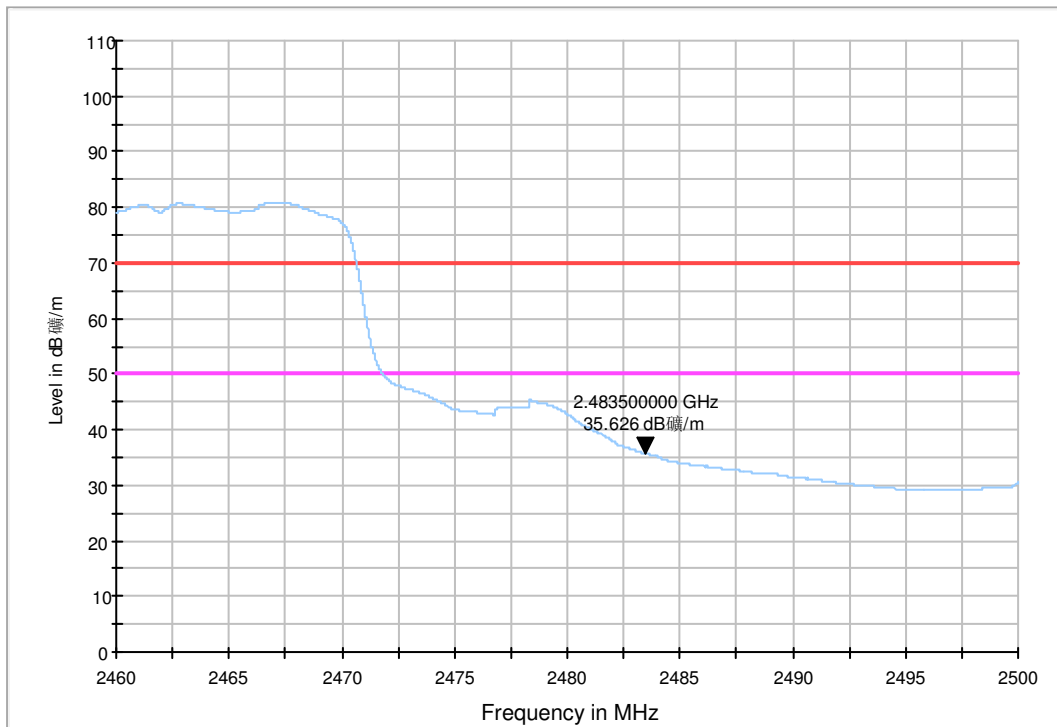


FCC RE Bandedge 1GHz-6GHz



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2484.08	71.35	-10.04	61.31	74.00	12.69

Horizontal, AV Detector:

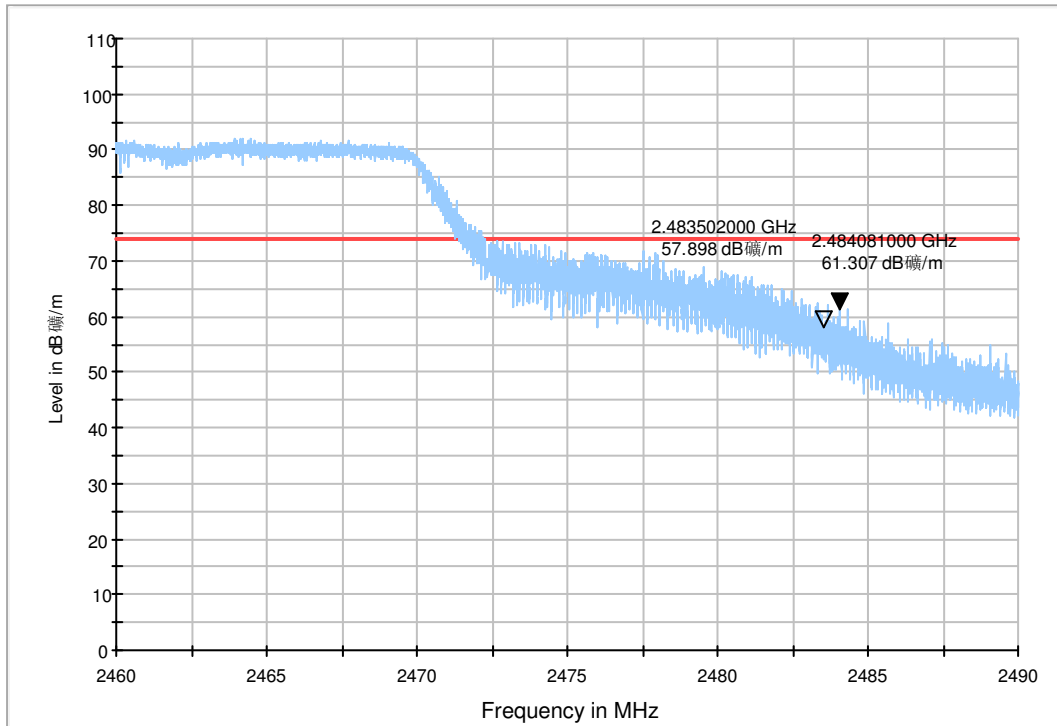


Frequency (MHz)	AV Reading (dBuV)	Factor (dB/m)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
2484.8	45.67	-10.04	35.63	54.00	18.37



CH High 802.11g Mode 54 M
Vertical, Peak Detector:

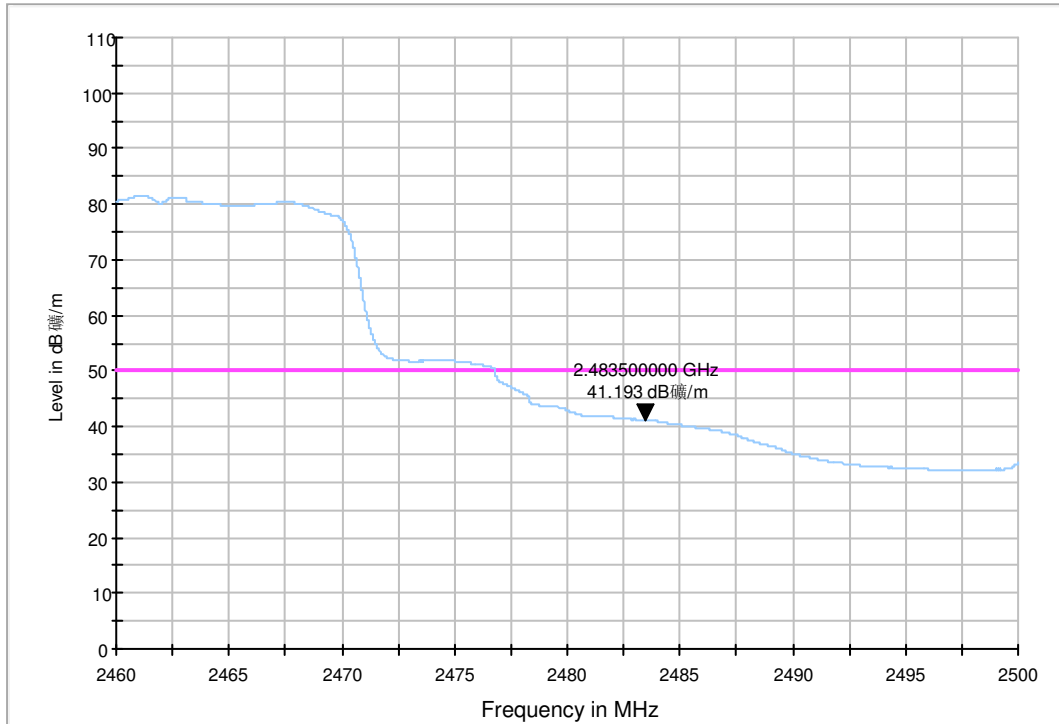
FCC RE Bandedge 1GHz-6GHz



Frequency (MHz)	Peak Reading (dBuV)	Factor (dB/m)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2484.08	71.35	-10.04	61.31	74.00	12.69



Vertical, AVG Detector:





6.7 Conducted Spurious Emission Test

Test Requirement: FCC Part15 247(c)

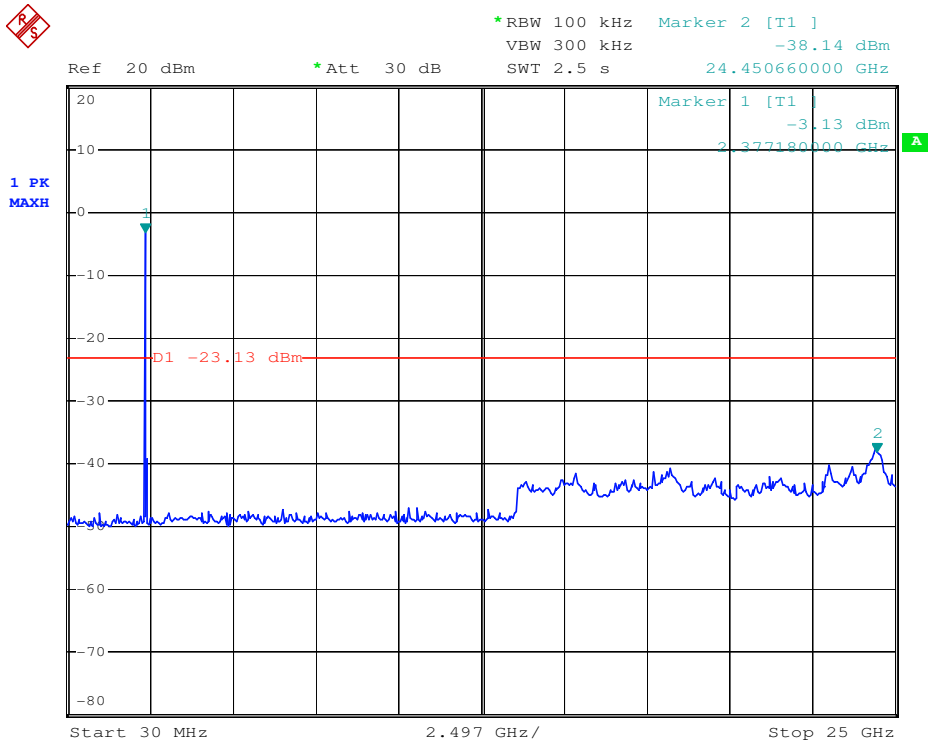
Test date: Oct. 18, 2012

Standard Applicable: According to section 15.247(c),in any 100KHz 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 section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

- 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=100KHz VBW=300KHz, Sweep = auto
 6. Repeat above procedures until all frequency measured were complete.

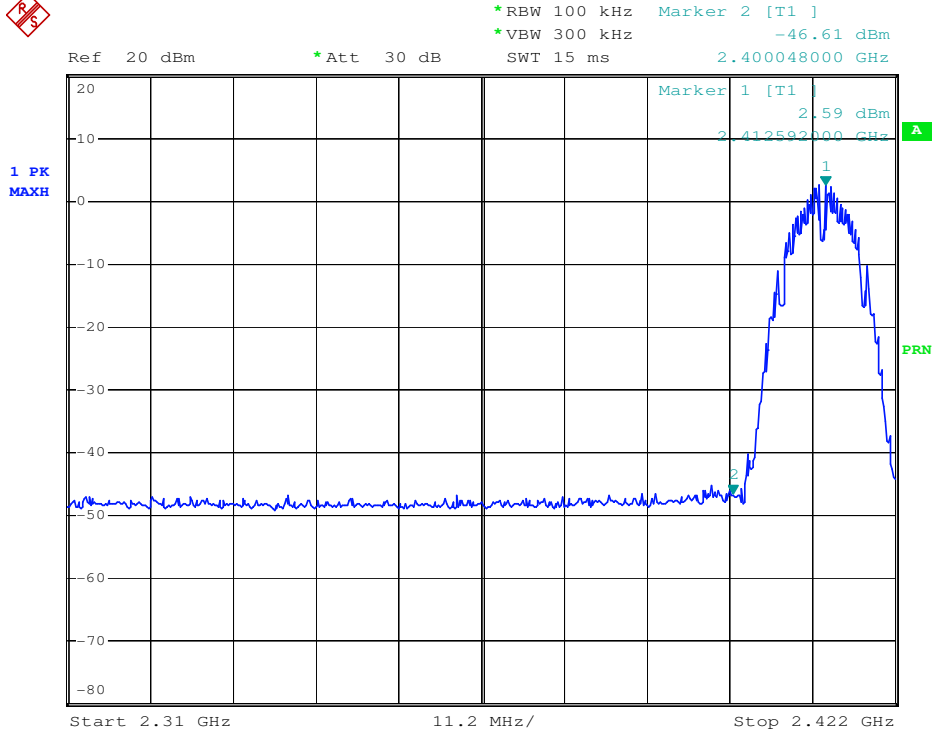
Measurement Result:

Conducted spurious Emission Measurement Result
802.11b 111Mbps CH Low 30MHz-25GHz

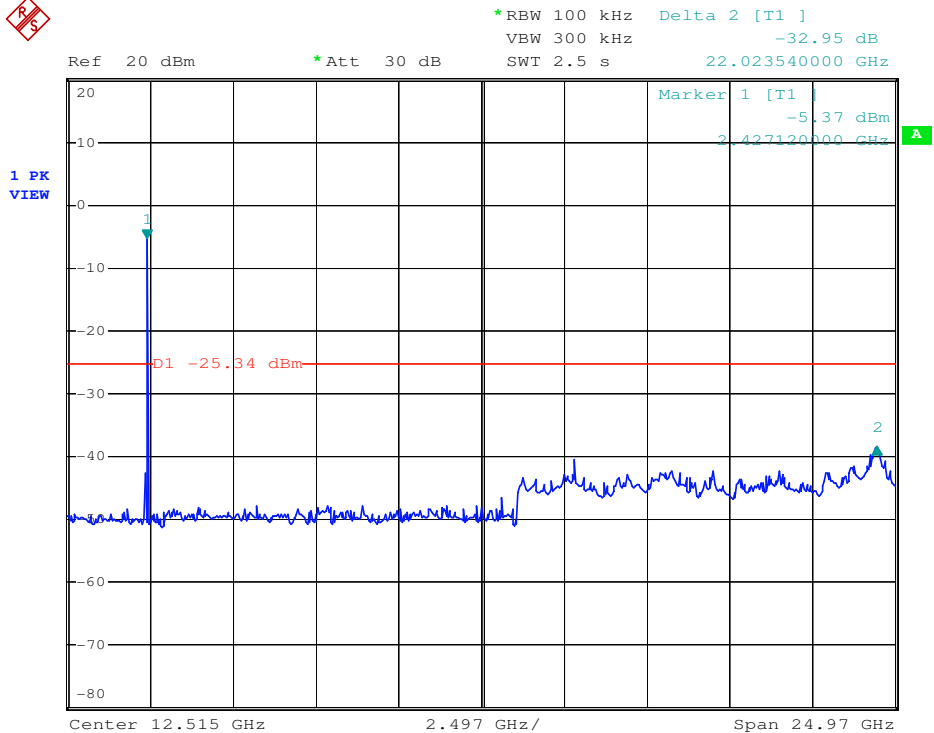




Band Edge (Conducted Mode)

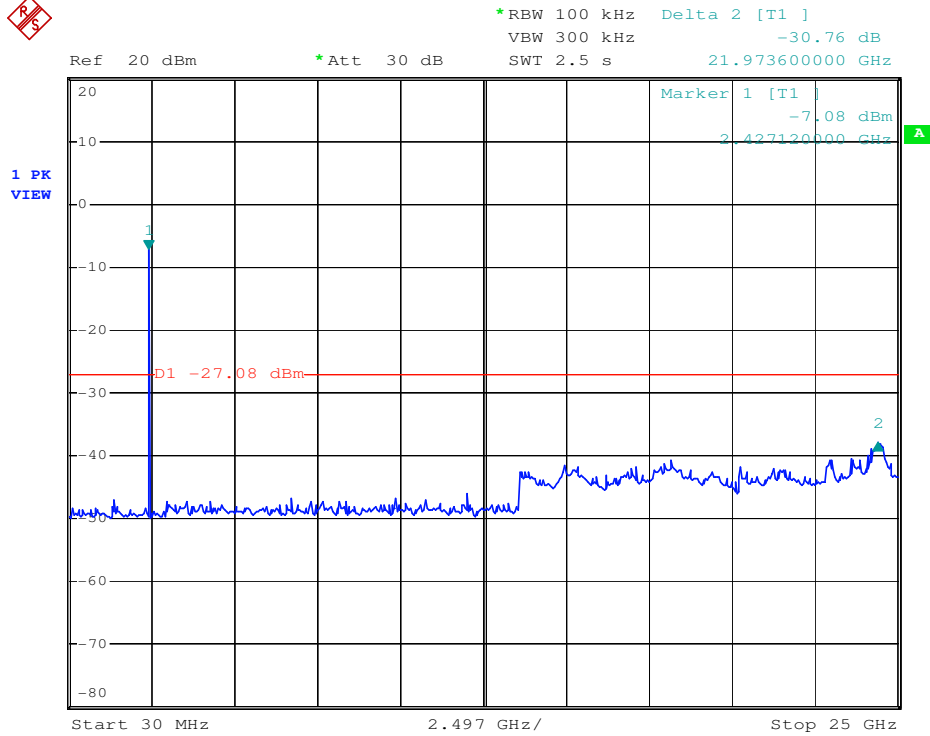


802.11b 111Mbps Ch Mid 30MHz-26.5GHz

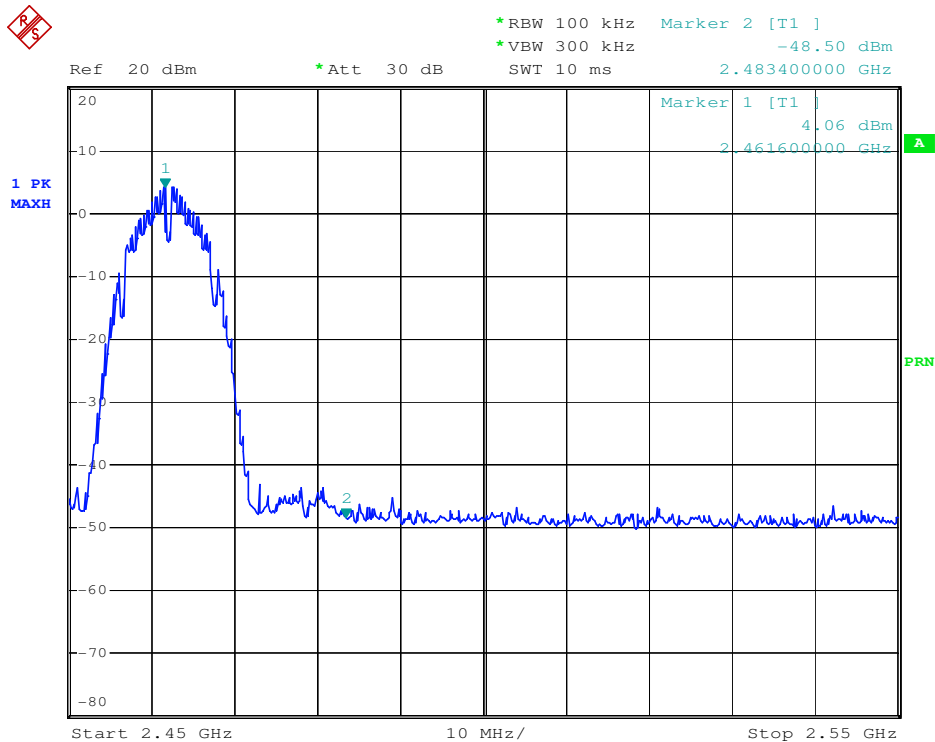




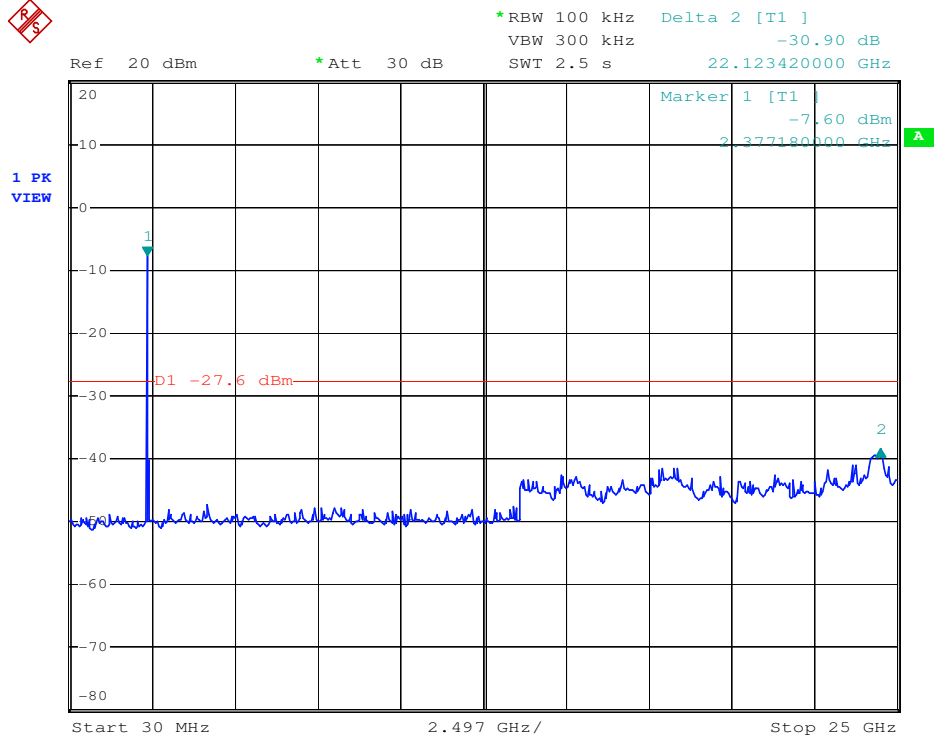
802.11b 111Mbps Ch High 30MHz-26.5GHz



Band Edge

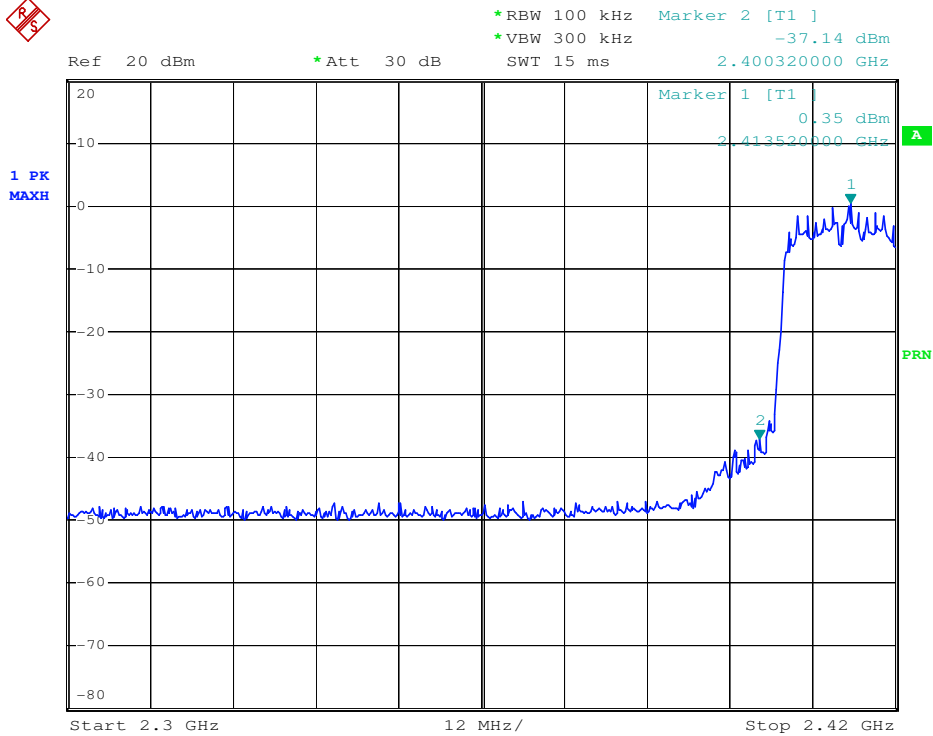


802.11g 54Mbps CH Low 30MHz-25GHz

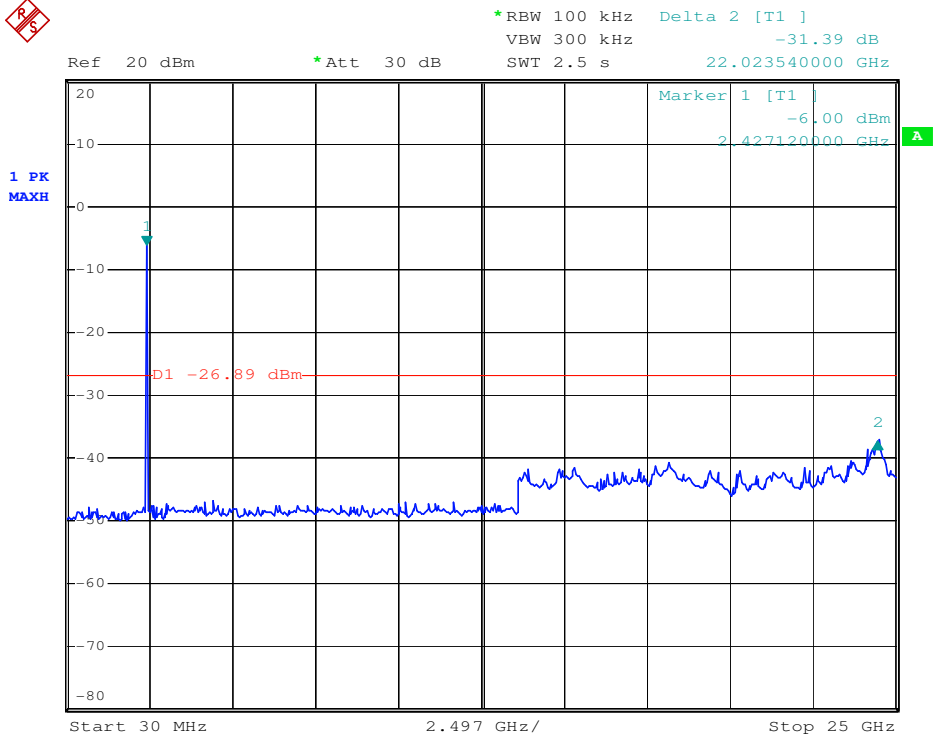




Band Edge (Conducted Mode)

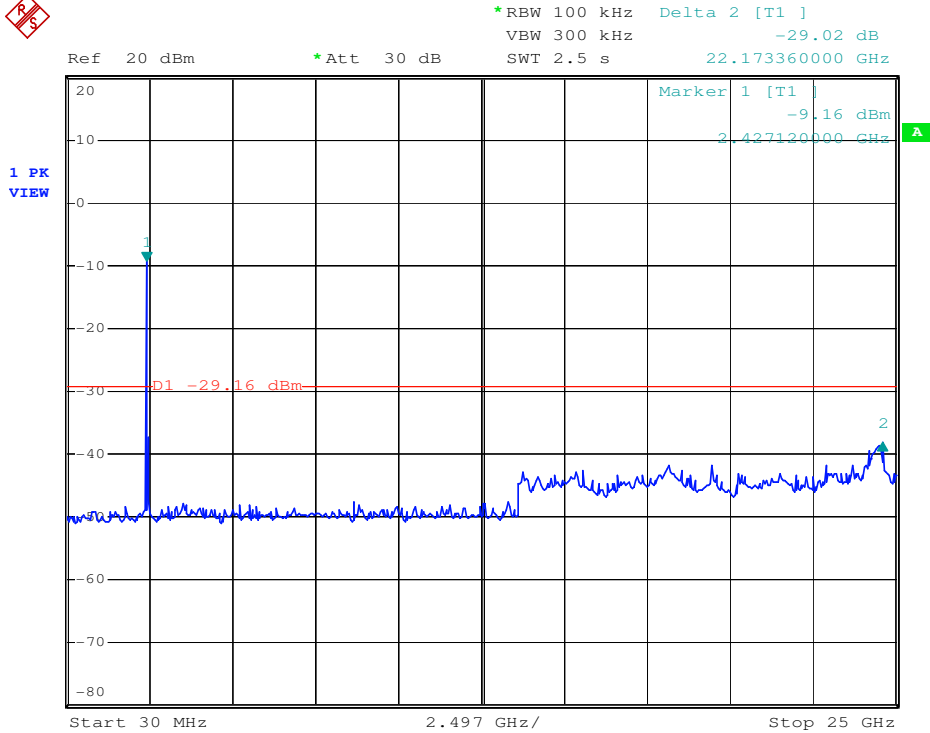


802.11g 54Mbps CH Middle 30MHz-25GHz

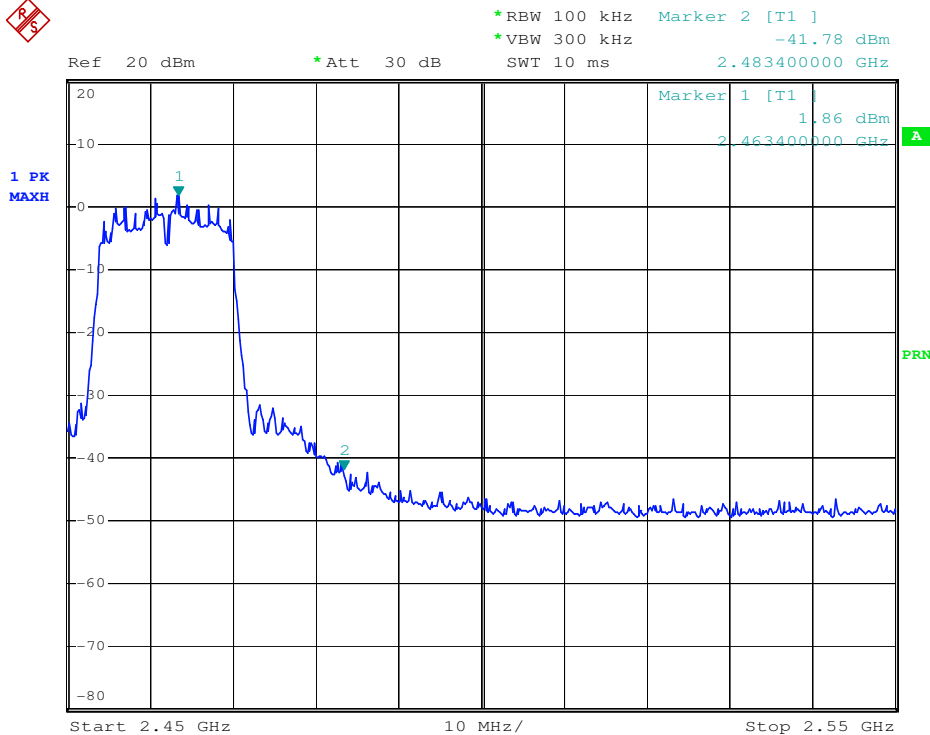




802.11g 54Mbps CH High 30MHz-25GHz



Band Edge



6.8 Spurious Radiated Emission Test

Test Requirement: FCC Part15 247(c)

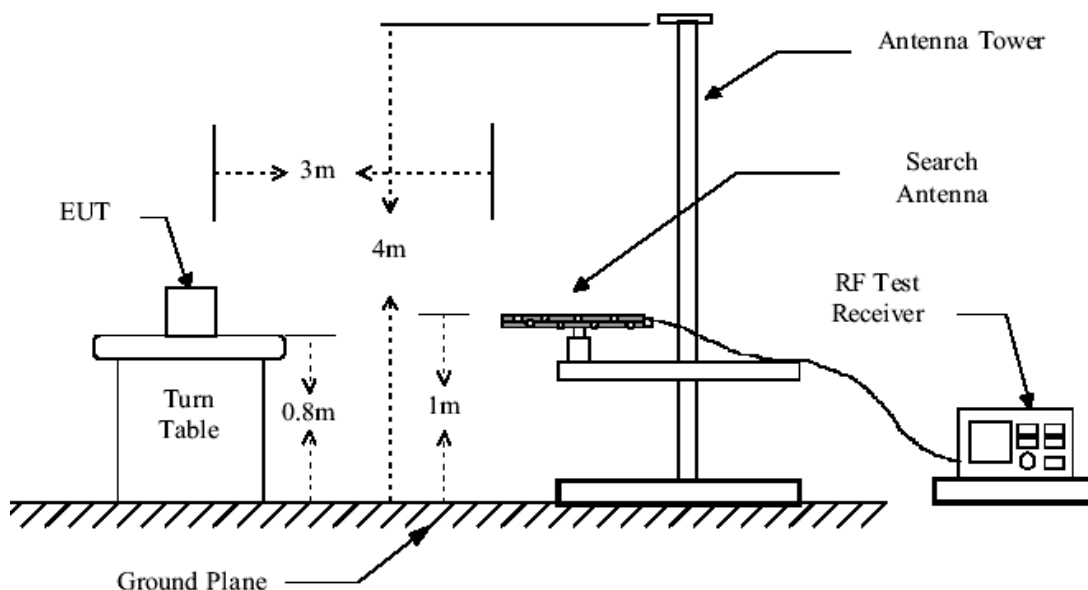
Test date: Oct. 12, 2012

Standard Applicable: According to section 15.247(c),all other emissions outside these bands shall not exceed the general radiated emission limits specified in section15.209(a).And according to section 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,which is lower.

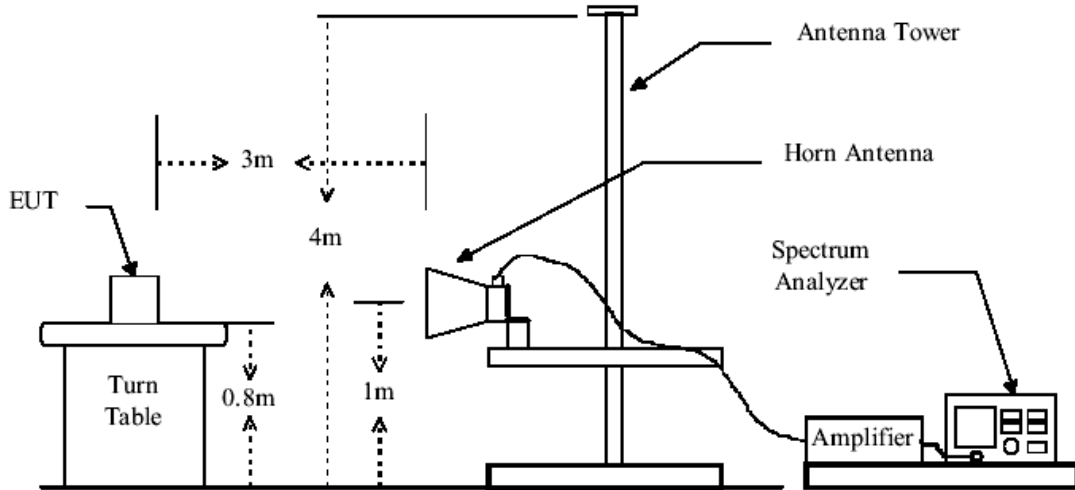
- Measurement Procedure:**
1. The EUT was placed on a turn table which is 0.8m above ground plane.
 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
 3. EUT is set 3m away from the receiving antenna which varied from 111M to 4m to find out the highest emissions.
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 111MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz)
Above 1GHz
(a) PEAK: RBW=VBW=111MHz / Sweep=AUTO
(b) AVERAGE: RBW=111MHz / VBW=10Hz / Sweep=AUTO.
 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 all frequency measured were complete.

Radiated Test Set-up:

Radiated Emission Test Set-up,Frequency Below 1000MHz



Radiated Emission Test Set-up Frequency Over 1GHz.



Above 1GHz, we used a notch filter for 2.4GHz frequency band.

802.11b 11Mbps Mode

Operation Mode: TX Low Mid CH 2412MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
59.48	13.7	0.8	24.6	41.7	31.6	40	Vertical
138.36	14.5	1.3	24.6	38.2	29.4	43.5	Vertical
214.55	11.1	1.6	24.5	53.0	41.2	43.5	Horizontal
479.99	17.1	2.4	24.4	45.2	40.3	46	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	1.2	0.5	43.4	56.21	45.51	74	Vertical
7236.0	35.5	1.7	0.6	43.1	45.23	39.93	74	V
4824.0	31.0	1.2	0.5	43.4	58.47	47.77	74	Horizontal



7236.0	35.5	1.7	0.6	43.1	45.27	39.97	74	H
--------	------	-----	-----	------	-------	-------	----	---

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	1.2	0.5	43.4	52.19	41.49	54	Vertical
7236.0	35.5	1.7	0.6	43.1	43.20	37.9	54	V
4824.0	31.0	1.2	0.5	43.4	52.81	42.11	54	Horizontal
7236.0	35.5	1.7	0.6	43.1	42.62	37.32	54	H

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Preamplifier Factor}$$



Operation Mode: TX Mid CH 2437MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
59.48	13.7	0.8	24.6	41.7	31.6	40	Vertical
138.36	14.5	1.3	24.6	38.2	29.4	43.5	Vertical
214.55	11.1	1.6	24.5	53.0	41.2	43.5	Horizontal
479.99	17.1	2.4	24.4	45.2	40.3	46	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4876.0	31.1	1.3	0.5	43.5	54.87	44.27	74	Vertical
7314.0	35.7	1.7	0.6	43.1	43.29	38.19	74	V
4876.0	31.1	1.3	0.5	43.5	52.45	41.85	74	Horizontal
7314.0	35.7	1.7	0.6	43.1	43.76	38.66	74	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4876.0	31.1	1.3	0.5	43.5	50.13	39.53	54	Vertical
7314.0	35.7	1.7	0.6	43.1	40.03	34.93	54	V
4876.0	31.1	1.3	0.5	43.5	48.17	37.57	54	Horizontal
7314.0	35.7	1.7	0.6	43.1	40.35	35.25	54	H

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Pre-amplifier Factor}$$



Operation Mode:TX High CH 2462MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
59.48	13.7	0.8	24.6	41.7	31.6	40	Vertical
138.36	14.5	1.3	24.6	38.2	29.4	43.5	Vertical
214.55	11.1	1.6	24.5	53.0	41.2	43.5	Horizontal
479.99	17.1	2.4	24.4	45.2	40.3	46	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4928.0	31.4	1.4	0.5	43.9	54.27	43.67	74	Vertical
7392.0	35.8	1.7	0.6	43.1	45.31	40.31	74	V
4928.0	31.4	1.4	0.5	43.9	53.76	43.16	74	Horizontal
7392.0	35.8	1.7	0.6	43.1	42.18	37.18	74	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4928.0	31.4	1.4	0.5	43.9	51.26	40.66	54	Vertical
7392.0	35.8	1.7	0.6	43.1	41.28	36.28	54	V
4928.0	31.4	1.4	0.5	43.9	49.65	39.05	54	Horizontal
7392.0	35.8	1.7	0.6	43.1	40.38	35.38	54	H

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

6. Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +Filter–Pre-amplifier Factor



802.11g 54Mbps Mode

Operation Mode: TX Low Mid CH 2412MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
59.48	13.7	0.8	24.6	41.7	31.6	40	Vertical
138.36	14.5	1.3	24.6	38.2	29.4	43.5	Vertical
214.55	11.1	1.6	24.5	53.0	41.2	43.5	Horizontal
479.99	17.1	2.4	24.4	45.2	40.3	46	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	1.2	0.5	43.4	60.39	49.69	74	Vertical
7236.0	35.5	1.7	0.6	43.1	48.57	43.27	74	V
4824.0	31.0	1.2	0.5	43.4	61.72	51.02	74	Horizontal
7236.0	35.5	1.7	0.6	43.1	49.58	44.28	74	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4824.0	31.0	1.2	0.5	43.4	54.13	43.43	54	Vertical
7236.0	35.5	1.7	0.6	43.1	44.29	38.99	54	V
4824.0	31.0	1.2	0.5	43.4	54.49	43.79	54	Horizontal
7236.0	35.5	1.7	0.6	43.1	45.27	39.97	54	H

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Pre-amplifier Factor}$$



Operation Mode: TX Mid CH 2437MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
59.48	13.7	0.8	24.6	41.7	31.6	40	Vertical
138.36	14.5	1.3	24.6	38.2	29.4	43.5	Vertical
214.55	11.1	1.6	24.5	53.0	41.2	43.5	Horizontal
479.99	17.1	2.4	24.4	45.2	40.3	46	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4876.0	31.1	1.3	0.5	43.5	59.29	48.69	74	Vertical
7314.0	35.7	1.7	0.6	43.1	47.37	42.27	74	V
4876.0	31.1	1.3	0.5	43.5	59.69	49.09	74	Horizontal
7314.0	35.7	1.7	0.6	43.1	47.91	42.81	74	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4876.0	31.1	1.3	0.5	43.5	53.57	42.97	54	Vertical
7314.0	35.7	1.7	0.6	43.1	42.62	37.52	54	V
4876.0	31.1	1.3	0.5	43.5	54.73	44.13	54	Horizontal
7314.0	35.7	1.7	0.6	43.1	43.49	38.39	54	H

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} + \text{Filter} - \text{Pre-amplifier Factor}$$



Operation Mode:TX High CH 2462MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
59.48	13.7	0.8	24.6	41.7	31.6	40	Vertical
138.36	14.5	1.3	24.6	38.2	29.4	43.5	Vertical
214.55	11.1	1.6	24.5	53.0	41.2	43.5	Horizontal
479.99	17.1	2.4	24.4	45.2	40.3	46	Horizontal

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4928.0	31.4	1.4	0.5	43.9	58.92	48.32	74	Vertical
7392.0	35.8	1.7	0.6	43.1	48.51	43.51	74	V
4928.0	31.4	1.4	0.5	43.9	58.77	48.17	74	Horizontal
7392.0	35.8	1.7	0.6	43.1	45.43	40.43	74	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4928.0	31.4	1.4	0.5	43.9	53.85	43.25	54	Vertical
7392.0	35.8	1.7	0.6	43.1	44.47	39.47	54	V
4928.0	31.4	1.4	0.5	43.9	53.89	43.29	54	Horizontal
7392.0	35.8	1.7	0.6	43.1	42.51	37.51	54	H

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

7. Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +Filter–Pre-amplifier Factor



6.9 Peak Power Spectral Density

Test Requirement: FCC Part15 247(e)

Test date: Oct. 18, 2012

Standard Applicable: According to section 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval 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 powr spectral density.

Measurement Procedure: The EUT was tested according to ANSI C63.10-2009 section 6.11.2.3.

Measurement Result:

Measurement Result:

802.11b 11Mbps

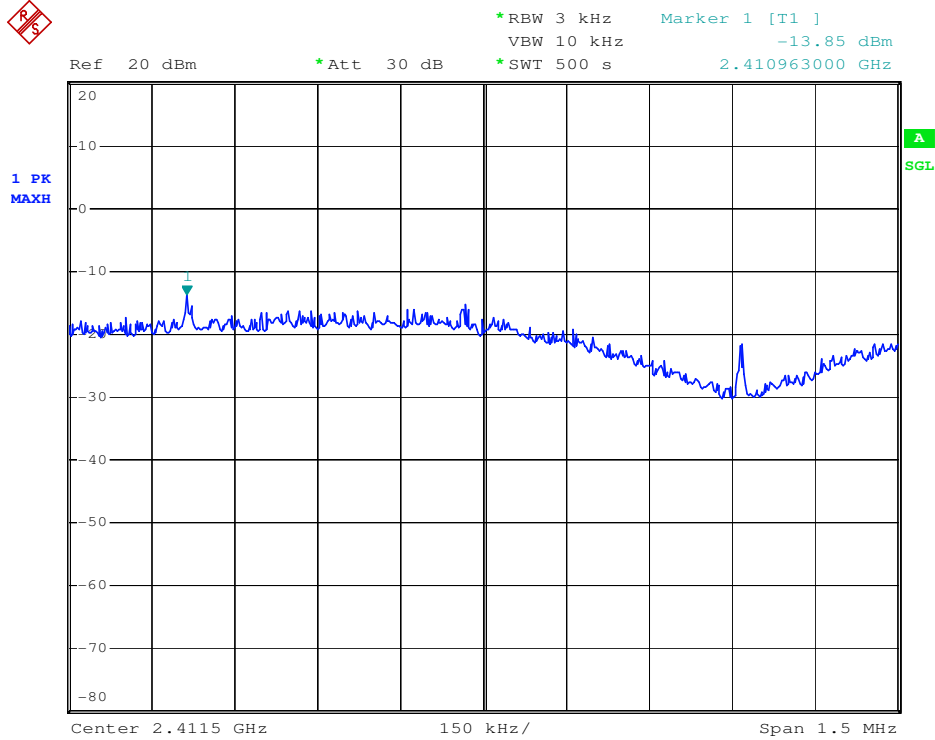
CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-13.85	2.30	-11.55	8	PASS
MID	2437	-17.64	2.30	-15.34	8	PASS
HIGH	2462	-16.88	2.30	-14.58	8	PASS

802.11g 54Mbps

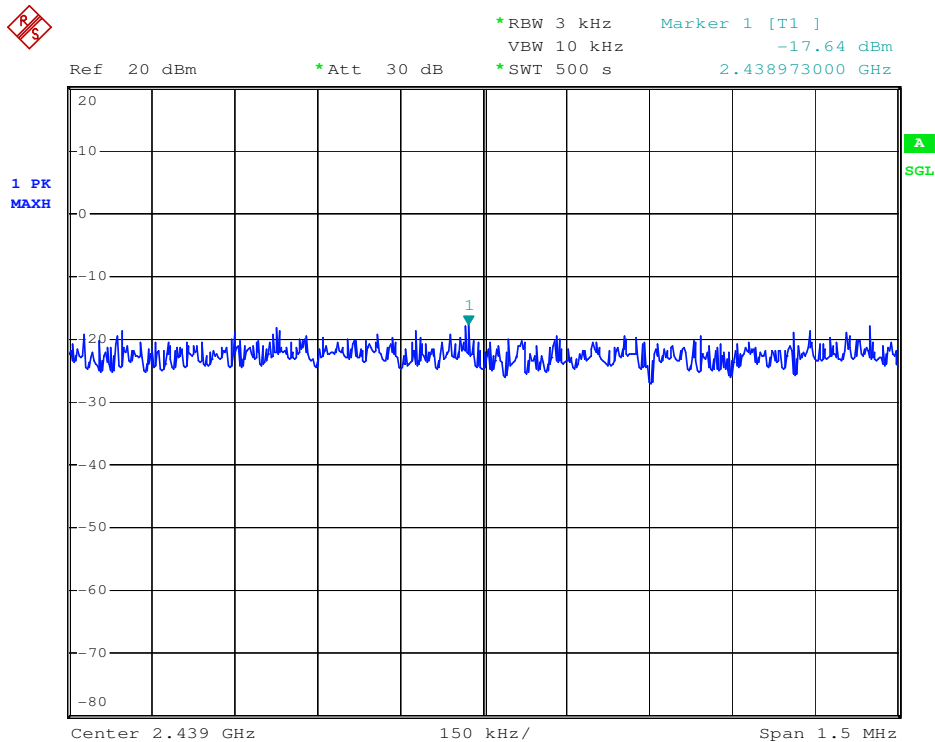
CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-19.00	2.30	-16.70	8	PASS
MID	2437	-19.12	2.30	-16.82	8	PASS
HIGH	2462	-18.73	2.30	-16.43	8	PASS



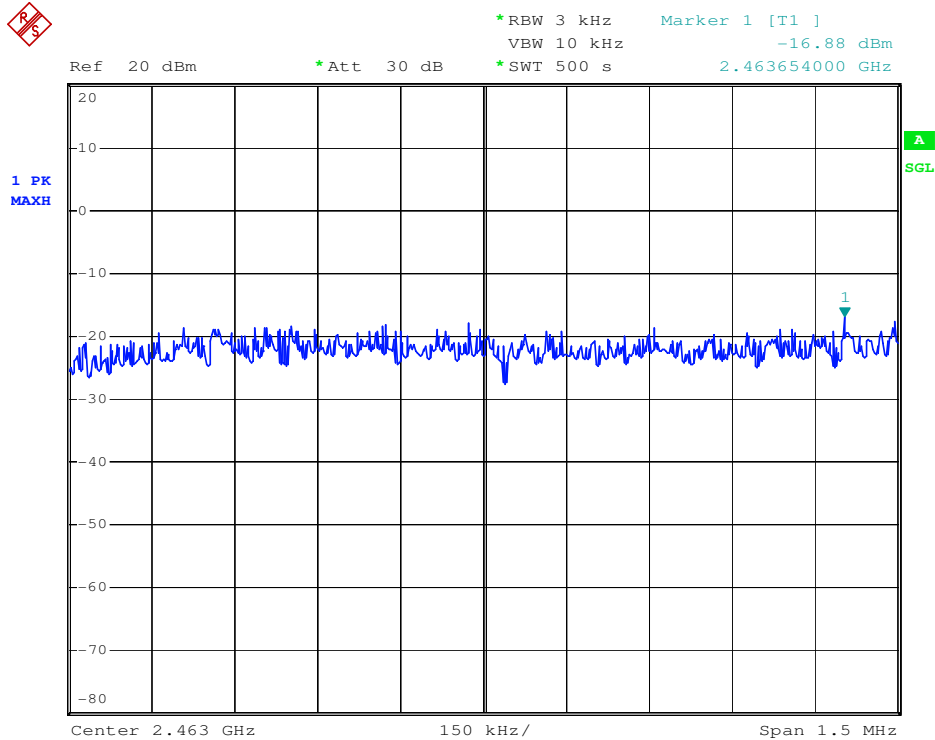
Channel Low 2412MHz (802.11b 11Mbps)



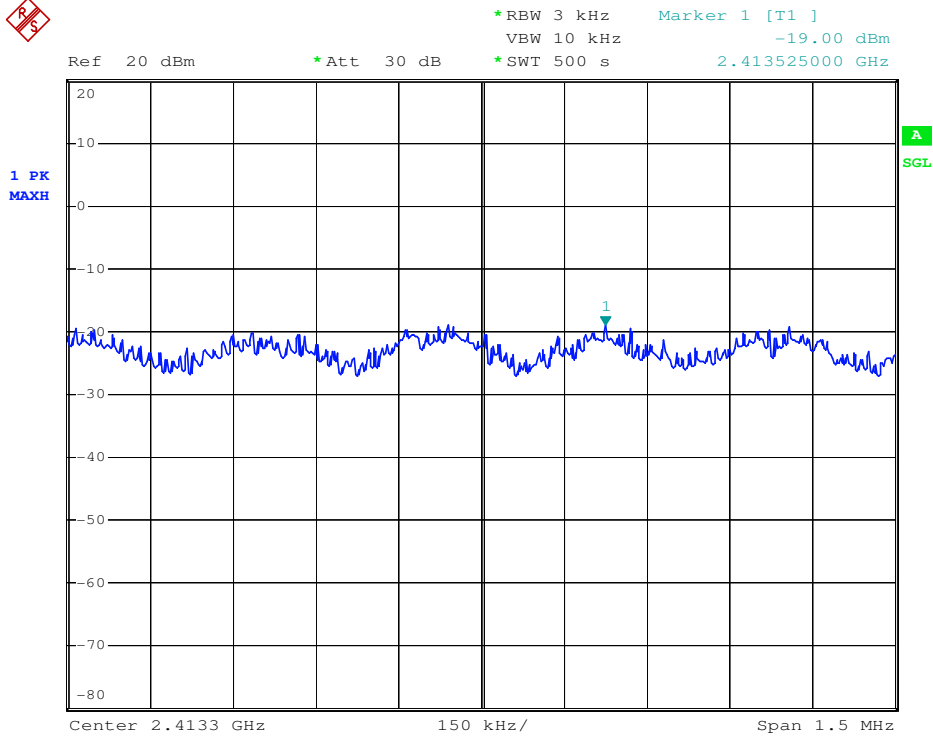
Channel Low 2437MHz (802.11b 11Mbps)



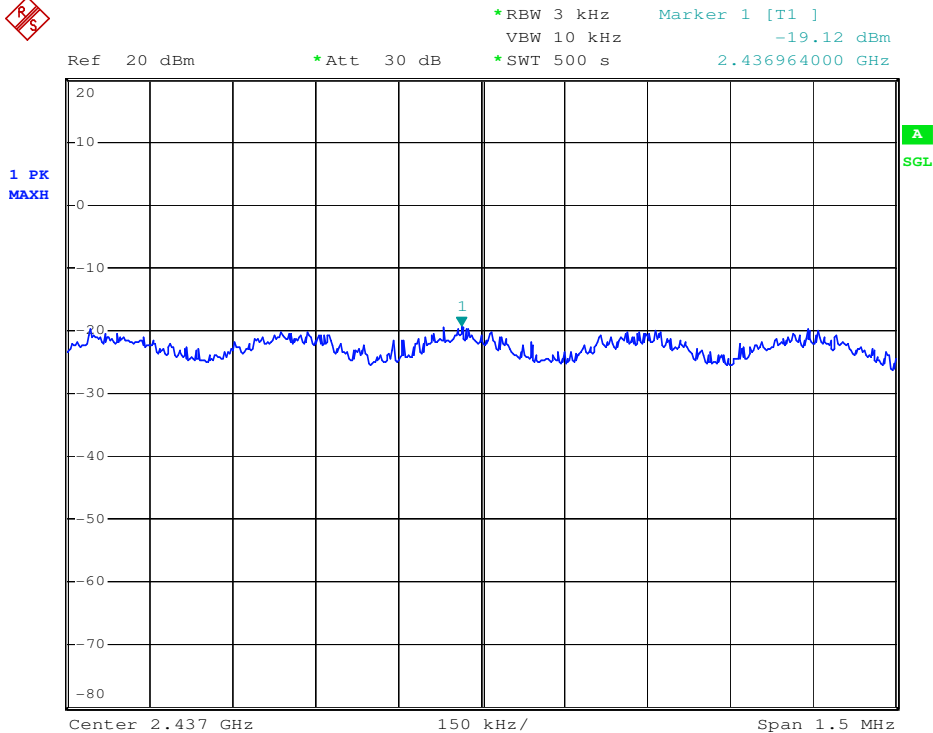
Channel High 2462MHz (802.11b 11Mbps)



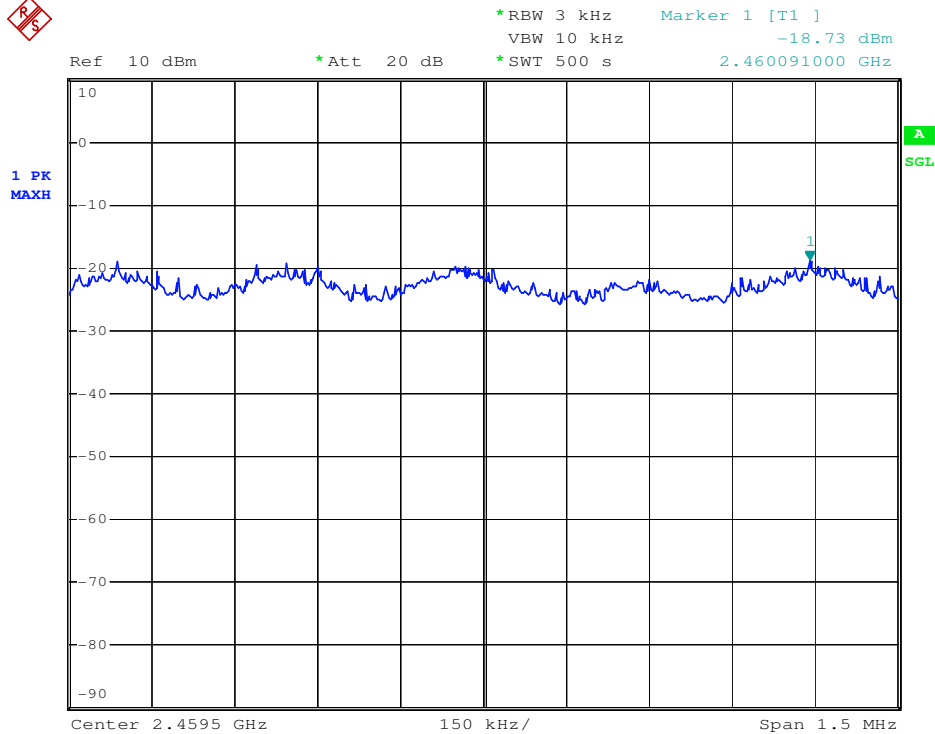
Channel Low 2412MHz (802.11g 54Mbps)



Channel Low 2437MHz (802.11g 54Mbps)



Channel High 2462MHz (802.11g 54Mbps)



The end of report