

TEST REPORT

Report No: SRTC2011-H024-E0096

Product Name: 2.4GHz Wireless Memory Card

Marketing Name: ez Share

Product Model: ES100

Applicant: LZeal Information Technology Co., Ltd.

Manufacturer: LZeal Information Technology Co., Ltd.

Specification: 47CFR Part 15 July 10, 2008, Subpart C

FCC ID: A7JEZS126

The State Radio_monitoring_center Testing Center (SRTC)

No.80 Beilishi Road Xicheng District Beijing, China

Tel: 86-10-68009202 Fax: 86-10-68009205

CONTENTS

1. General information	3
1.1 Notes of the test report	3
1.2 Information about the testing laboratory.....	3
1.3 Applicant's details	3
1.4 Manufacturer's details.....	3
1.5 Application details	4
1.6 Reference specification	4
1.7 Information of EUT	4
1.7.1 General information	4
1.7.2 EUT details.....	5
1.7.3 Auxiliary equipment details	5
2. Test information.....	6
2.1 Summary of the test results	6
2.2 Test result.....	7
2.2.1 Peak power output-§15.247(b) (3).....	7
2.2.2 Occupied Bandwidth-§15.247(a) (2)	14
2.2.3 Transmitter Power Spectral Density- §15.247 (e).....	21
2.2.4 Spurious RF conducted emissions-§15.247(d).....	28
2.2.5 Spurious radiated emissions-§15.247(d),§15.209(a).....	47
2.2.6 Band edge compliance-§15.247(d)	57
2.3. List of test equipment.....	72

1. General information

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).

The test results relate only to individual items of the samples which have been tested.

1.2 Information about the testing laboratory

Company: The State Radio_monitoring_center Testing Center (SRTC)
Address: No.80 Beilishi Road, Xicheng District, Beijing China
City: Beijing
Country or Region: China
Contacted person: Wang Junfeng
Tel: +86 10 68009181 +86 10 68009202
Fax: +86 10 68009195 +86 10 68009205
Email: wangjf@srrc.org.cn / wangjunfeng@srtc.org.cn

1.3 Applicant's details

Company: LZeal Information Technology Co., Ltd.
Address: F18, Unit 2, 530 Building, No. 100, Dicui Road, Liyuan Development Zone, 214072
City: Wuxi City, Jiangsu Province
Country or Region: P.R. China
Grantee Code: A7J
Contacted person: Guo Gang
Tel: +86-510-8117 0199
Fax: +86-510-8117 0187
Email: guog@lzeal.com

1.4 Manufacturer's details

Company: LZeal Information Technology Co., Ltd.
Address: F18, Unit 2, 530 Building, No. 100, Dicui Road, Liyuan Development Zone, 214072
City: Wuxi City, Jiangsu Province
Country or Region: P.R. China
Contacted person: Guo Gang
Tel: +86-510-8117 0199
Fax: +86-510-8117 0187
Email: guog@lzeal.com

1.5 Application details

Date of receipt of test sample: 01st Dec 2011

Date of test: 01st Dec 2011 to 8th Feb 2012

1.6 Reference specification

47CFR Part 15, July 10, 2008, Subpart C

1.7 Information of EUT

1.7.1 General information

Name of EUT	2.4GHz Wireless Memory Card
FCC ID	A7JEZS126
Frequency range	2.4000GHz~2.4835GHz
Number of channel	11
Modulation type	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM
Duplex mode	TDD
Channel spacing	5MHz
Emission Designator	5M00Q1D
Data rate	1Mbps/2Mbps/5.5Mbps/11Mbps/6Mbps/9Mbps/12Mbps/ 18Mbps/24Mbps/36Mbps/48Mbps/54Mbps/6.5Mbps/ 13 Mbps/19.5 Mbps/26 Mbps/39 Mbps/52 Mbps/ 58.5 Mbps/65 Mbps
Antenna type	Fixed Internal
Power Supply	USB docking card
Rated Power Supply Voltage	3.1V
HW Version	EZS-P2
SW Version	V2.1.0

1.7.2 EUT details

Product Name	Marketing Name	Product Model	Serial Number
2.4GHz Wireless Memory Card	ez Share	ES100	EZ1448000060AA1

1.7.3 Auxiliary equipment details

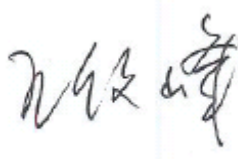
Equipment	USB docking card
Manufacturer	LZeal Information Technology Co., Ltd.
Model Number	---

Equipment	Notebook
Manufacturer	Lenovo
Model Number	E42G

2. Test information

2.1 Summary of the test results

No.	Test case	FCC reference	Verdict
1	Peak Power Output	15.247(b) (3)	Pass
2	Occupied Bandwidth	15.247(a) (2)	Pass
3	Transmitter Power Spectral Density	15.247 (e)	Pass
4	Spurious RF Conducted Emissions	15.247(d)	Pass
5	Spurious Radiated Emissions	15.247(d),15.209(a)	Pass
6	Band Edge Compliance	15.247(d)	Pass

This Test Report Is Issued by: Mr. Song Qizhu Director of the test lab 	Checked by: Mr. Wang Junfeng Deputy director of the test lab 
Tested by: Mr. Li Bin Test engineer 	Issued date: 2012.02.08

2.2 Test result

2.2.1 Peak power output-§15.247(b) (3)

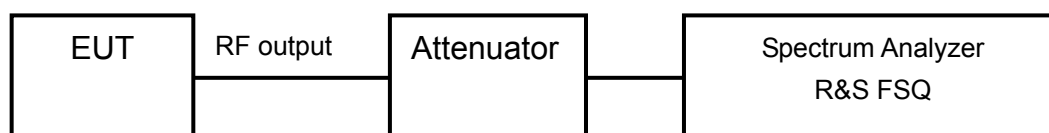
2.2.1.1 Ambient condition:

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.1.2 Test Description

The measurement is made according to ANSI C63.10-2009 and KDB558074.
WIFI is operating in 100% Duty Factor mode.

The resolution bandwidth for measuring the output power was 20 MHz.



2.2.1.3 Test limit

FCC Part 15, Subpart C, §15.247 (b) (3)

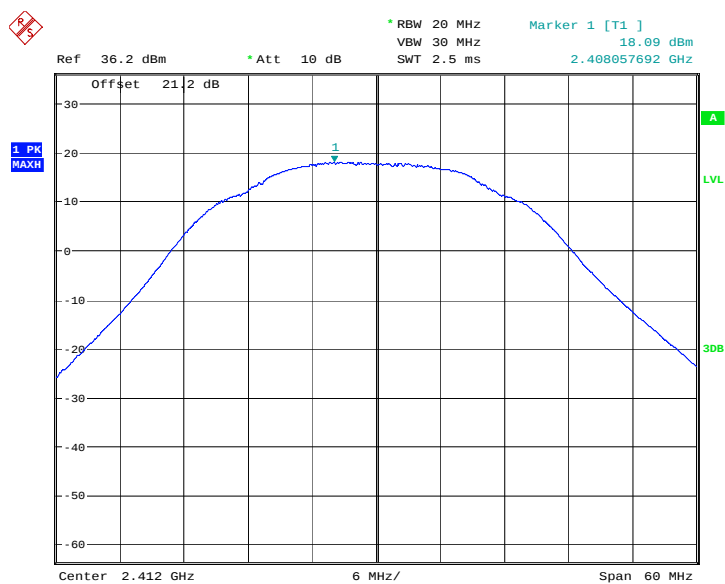
Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

==> Maximum Output Power: 30 dBm

2.2.1.4 Test result:

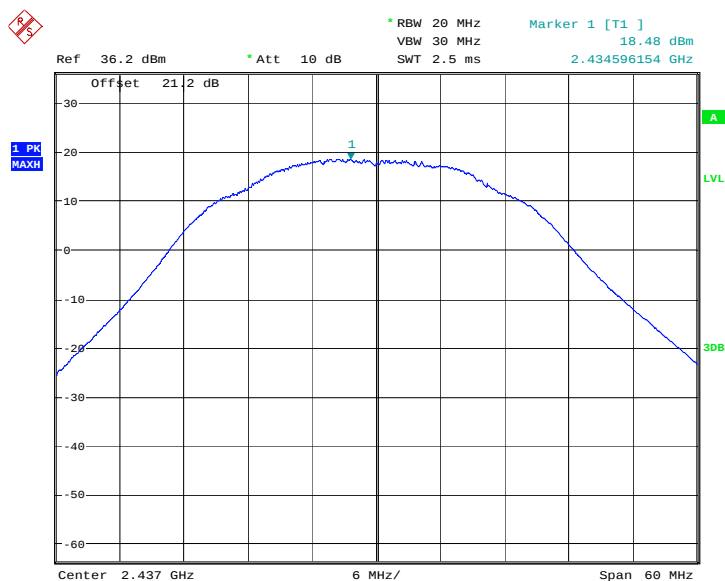
Test Mode	Data Rate (Mbps)	Test Result(dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	18.09	18.48	18.61*
	2	18.08	18.39	18.51
	5.5	18.09	18.42	18.51
	11	18.09	18.34	18.53
802.11g	6	21.92	21.54	22.02
	9	22.30	22.00	21.64
	12	21.93	21.64	21.55
	18	21.80	21.54	21.63
	24	22.46	22.24	22.50*
	36	22.48	22.40	22.32
	48	21.79	21.55	21.66
	54	22.02	21.99	22.00
802.11n	6.5	22.31*	21.66	21.74
	13	21.33	21.70	21.62
	19.5	21.60	21.50	21.46
	26	21.93	21.82	21.80
	39	20.52	20.73	20.75
	52	20.35	20.37	20.67
	58.5	18.89	19.17	19.72
	65	18.54	18.88	19.55

*The data rate 1, 24 and 6.5 are selected as worse condition, and the following cases are performed with this condition.



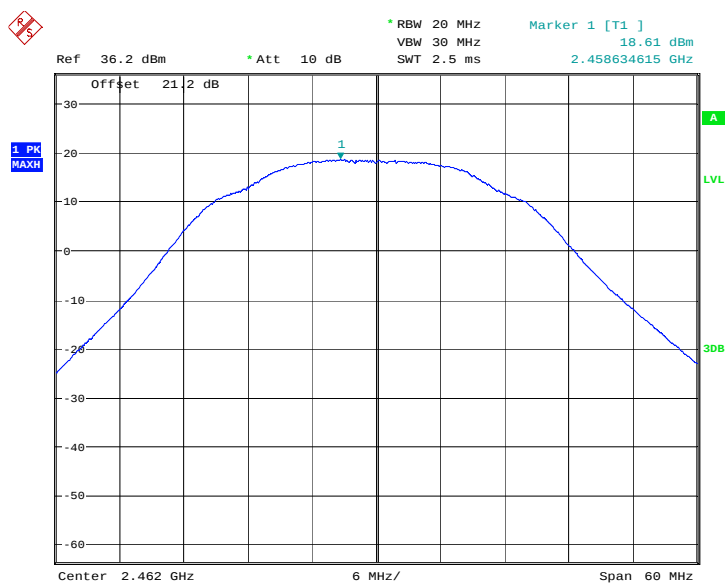
Date: 1.DEC.2011 09:00:56

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11b



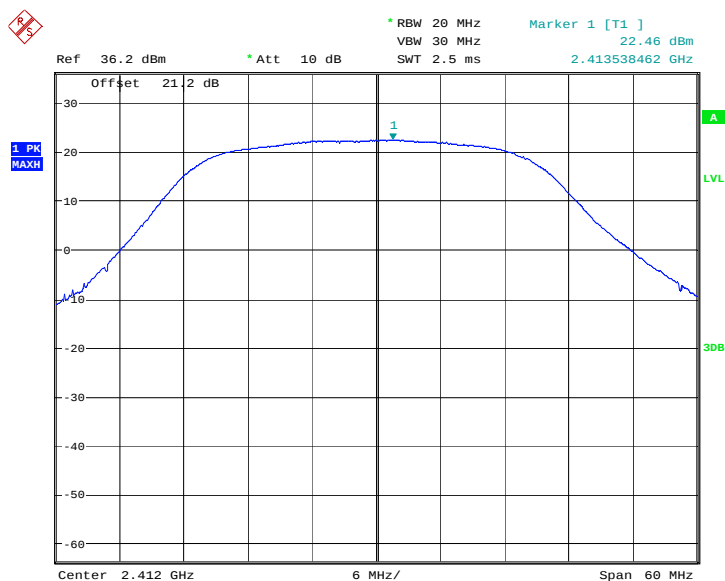
Date: 1.DEC.2011 09:30:15

Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11b



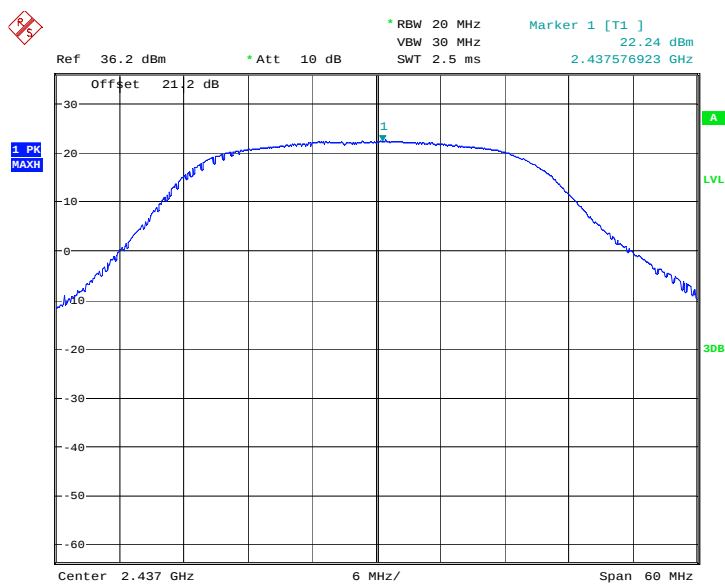
Date: 1.DEC.2011 13:30:56

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11b



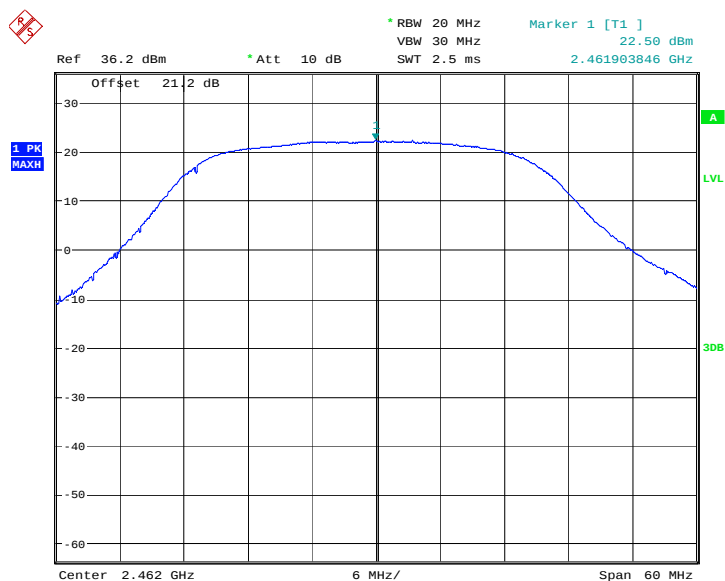
Date: 1.DEC.2011 09:14:00

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11g



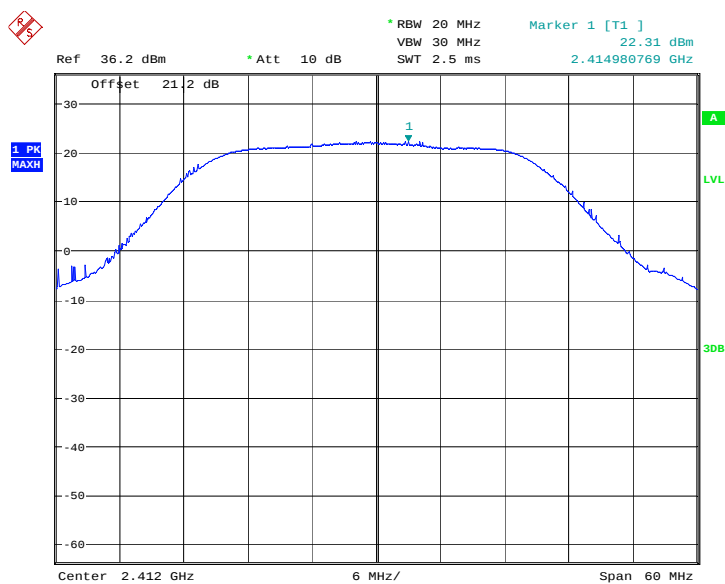
Date: 1.DEC.2011 09:50:03

Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11g



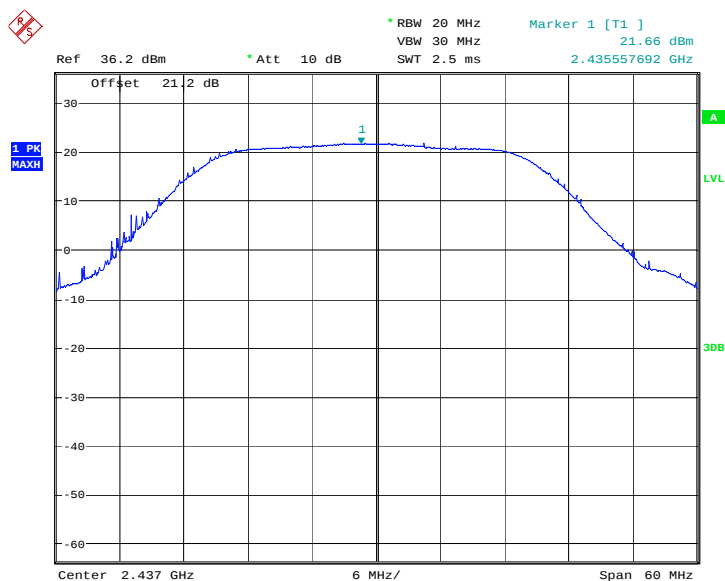
Date: 1.DEC.2011 13:36:40

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g



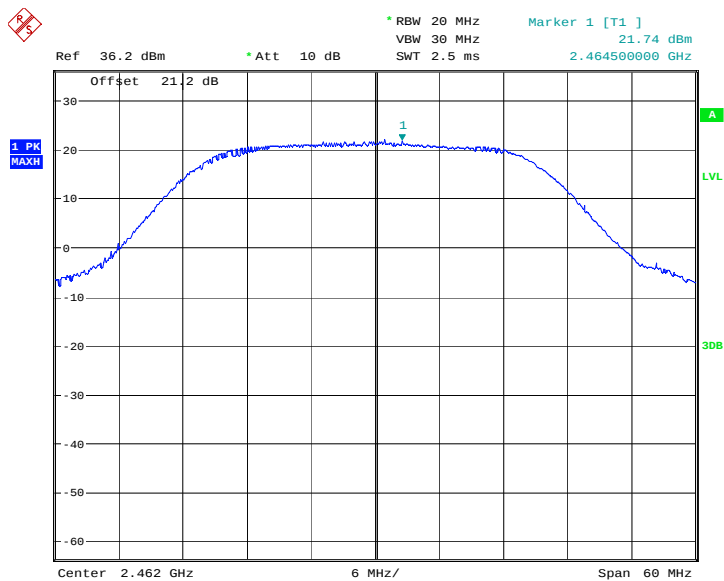
Date: 1.DEC.2011 09:24:09

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11n



Date: 1.DEC.2011 11:00:23

Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11n



Date: 1.DEC.2011 13:40:19

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n

2.2.2 Occupied Bandwidth-§15.247(a) (2)

2.2.2.1 Ambient condition

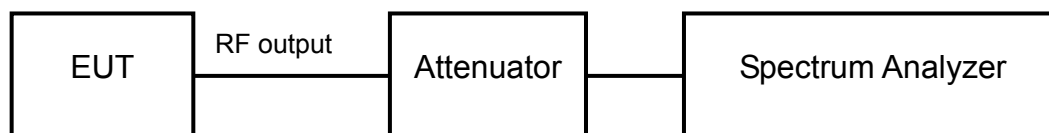
Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.2.2 Test Description

The measurement is made according to ANSI C63.4-2009 and KDB558074. The Equipment Under Test (EUT) was setup in a shielded room to perform the occupied bandwidth measurements.

The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

The results recorded were measured with the modulation which produces the worst-case (widest) occupied bandwidth.



2.2.2.3 Test limit

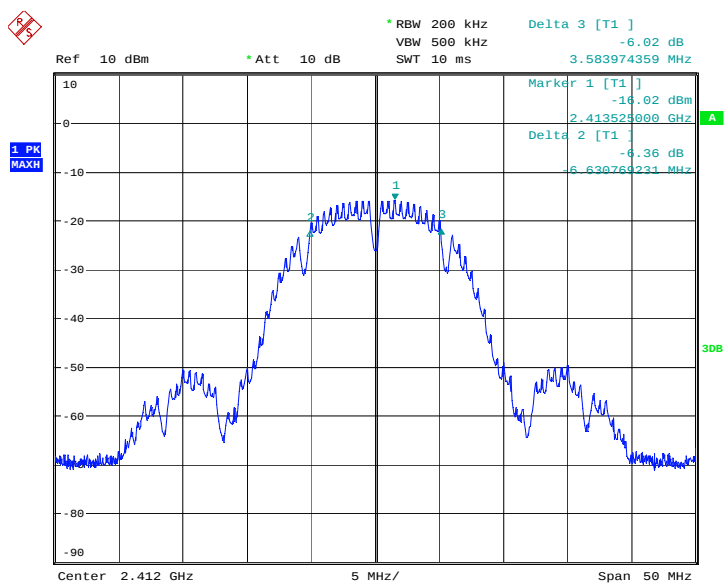
FCC Part 15, Subpart C, §15.247 (a) (2)

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.

2.2.2.4 Test result

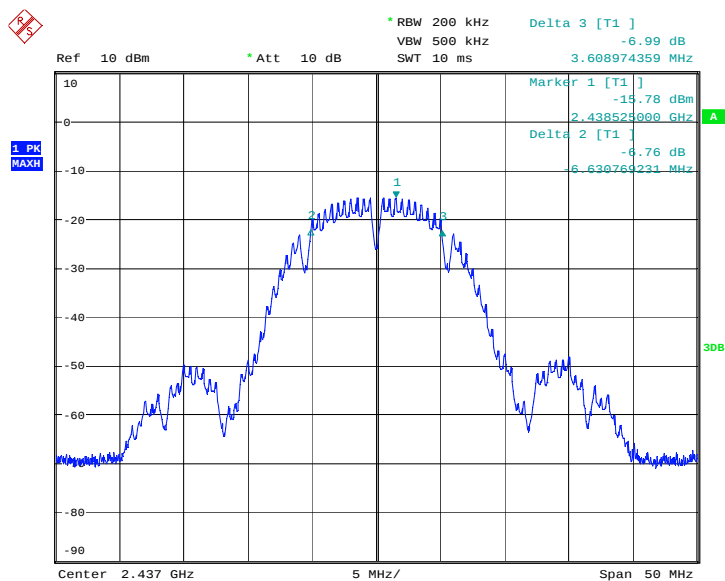
Test Mode: 802.11b

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2412	1	10.22
2437	6	10.24
2462	11	10.26



Date: 1.DEC.2011 14:09:34

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11b

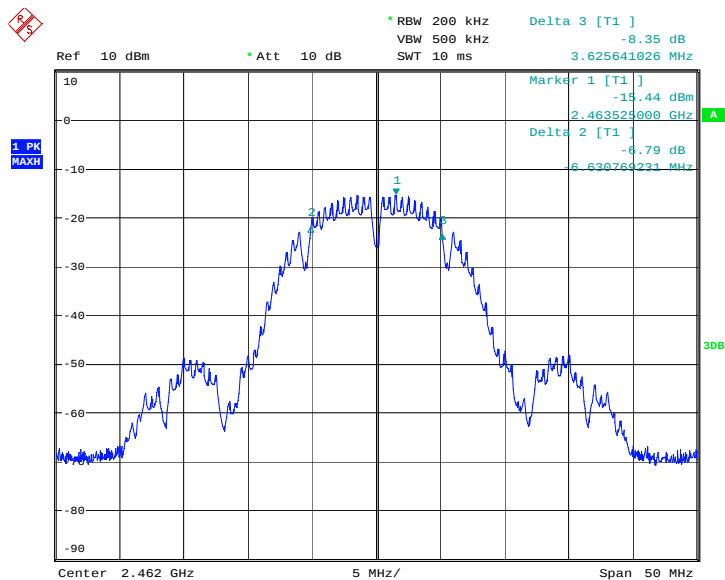


Date: 1.DEC.2011 14:10:50

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11b



Date: 1.DEC.2011 14:13:00

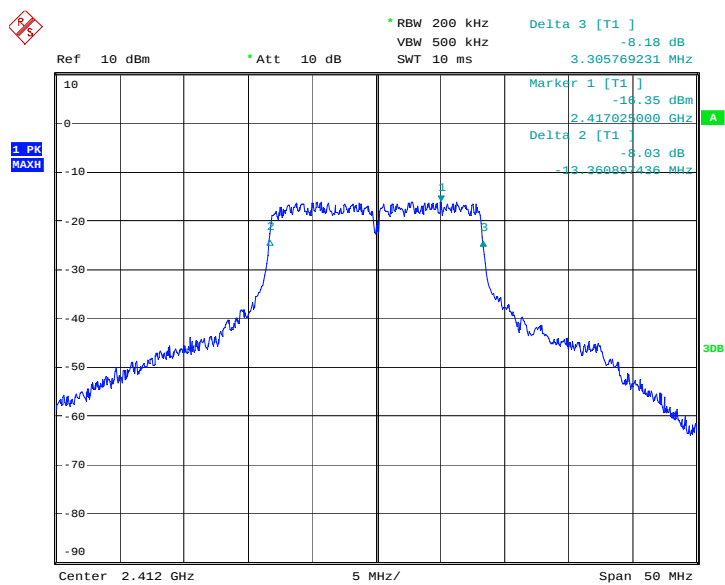
Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

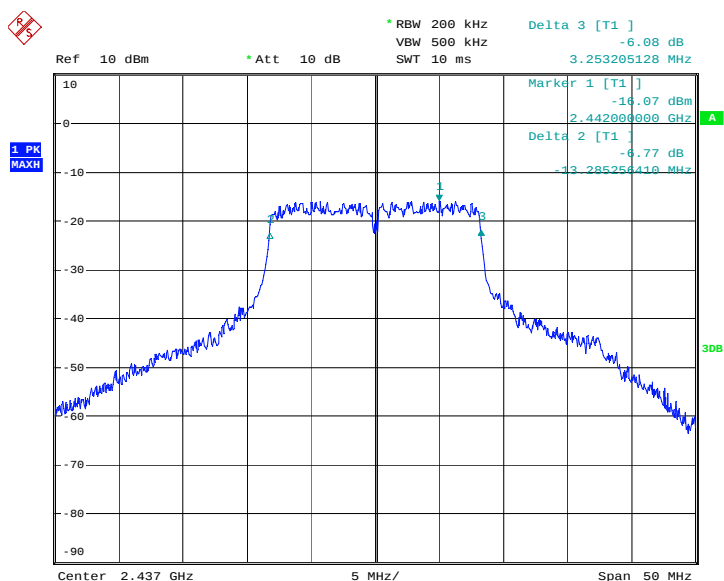
Test Mode: 802.11g

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2412	1	16.67
2437	6	16.54
2462	11	16.61



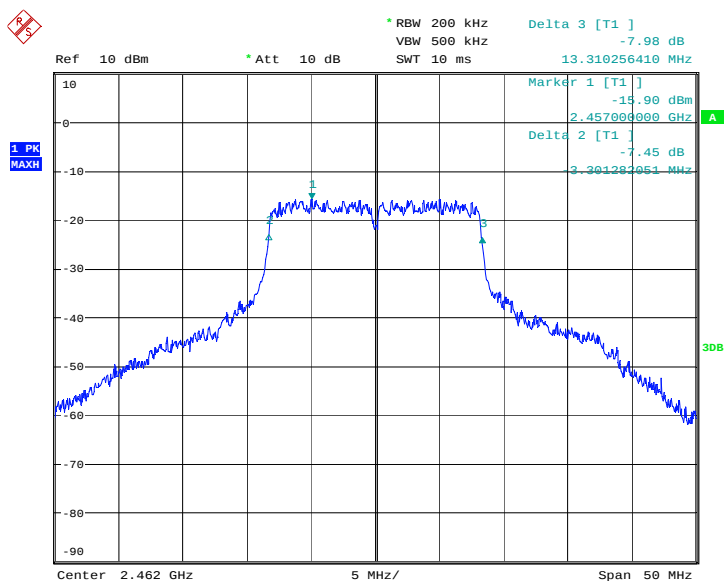
Date: 1.DEC.2011 14:14:59

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11g



Date: 1.DEC.2011 14:16:05

Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11g

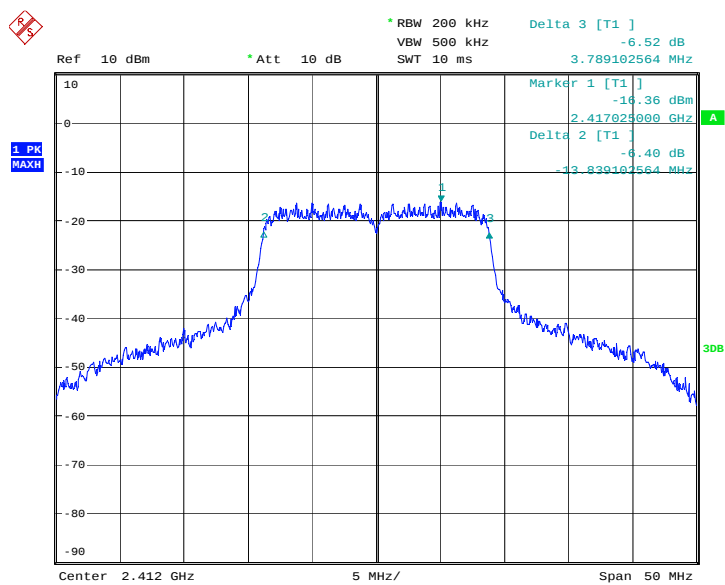


Date: 1.DEC.2011 14:16:54

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g

Test Mode: 802.11g

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(MHz)
2412	1	17.63
2437	6	17.61
2462	11	17.71

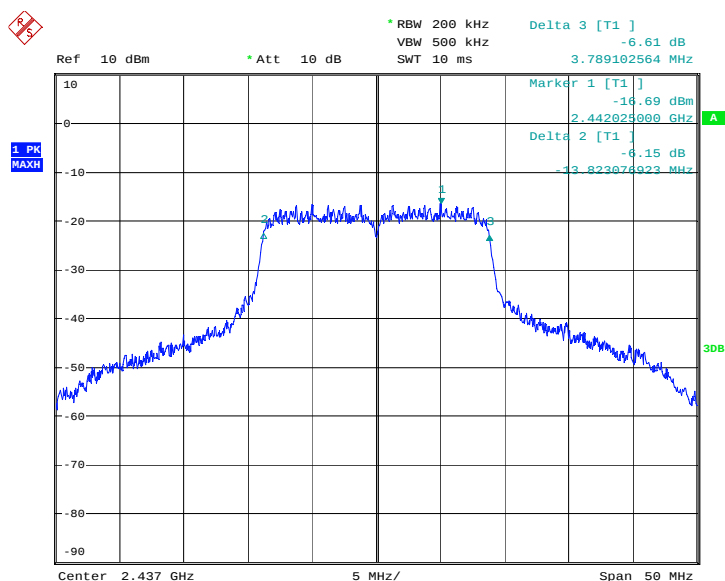


Date: 1.DEC.2011 14:20:02

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n

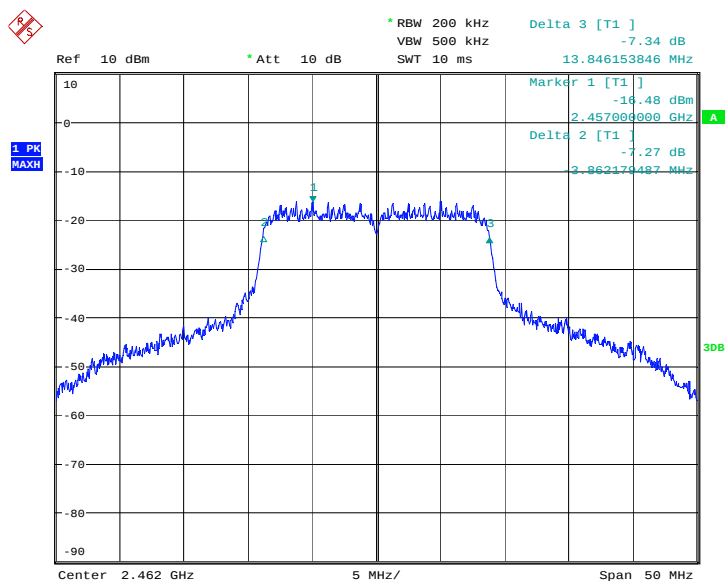


Date: 1.DEC.2011 14:20:55

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11n



Date: 1.DEC.2011 14:21:42

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n

2.2.3 Transmitter Power Spectral Density- §15.247 (e)

2.2.3.1 Ambient condition:

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.3.2 Test Description

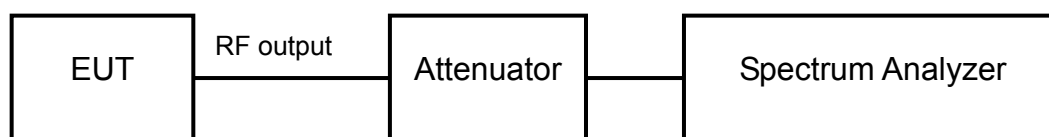
The measurement is made according to ANSI C63.4-2009 and KDB558074. The Equipment Under Test (EUT) was set up in a shielded room to perform the Power Spectral Density measurements.

The resolution bandwidth for measuring the output power was 3kHz.

The trace set to max hold.

The span set to 1.5MHz.

The sweep time set to 500s.



2.2.3.3 Test limit

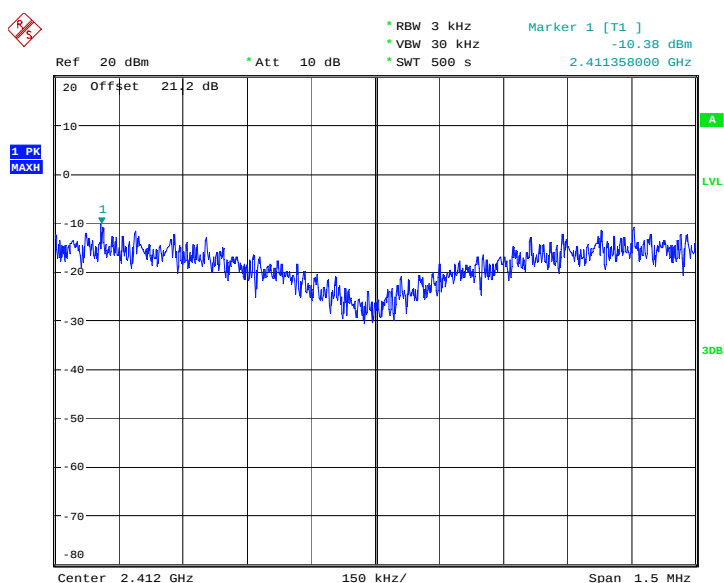
FCC Part 15, Subpart C, §15.247 (e)

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.

2.2.3.4 Test result:

Test Mode: 802.11b

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-10.38
2437	6	-10.74
2462	11	-10.72

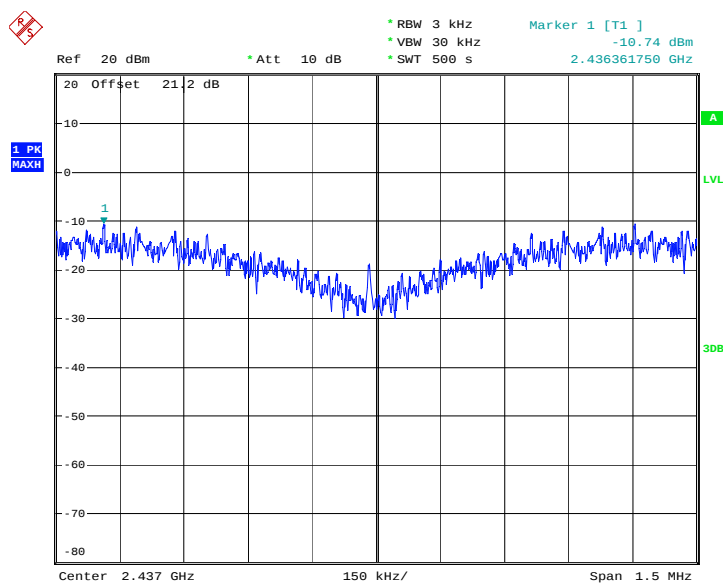


Date: 1.DEC.2011 14:38:01

Carrier frequency (MHz): 2412

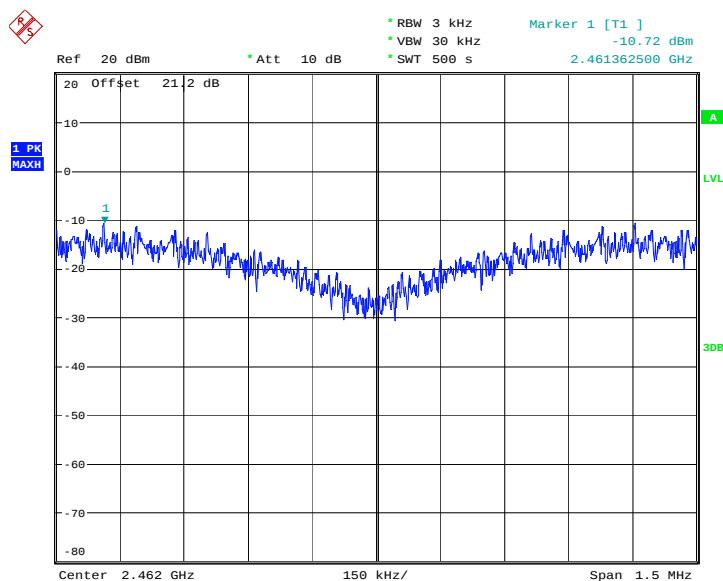
Channel No.1

Test Mode: 802.11b



Date: 1.DEC.2011 14:53:46

Carrier frequency (MHz): 2437
Channel No.6
Test Mode: 802.11b

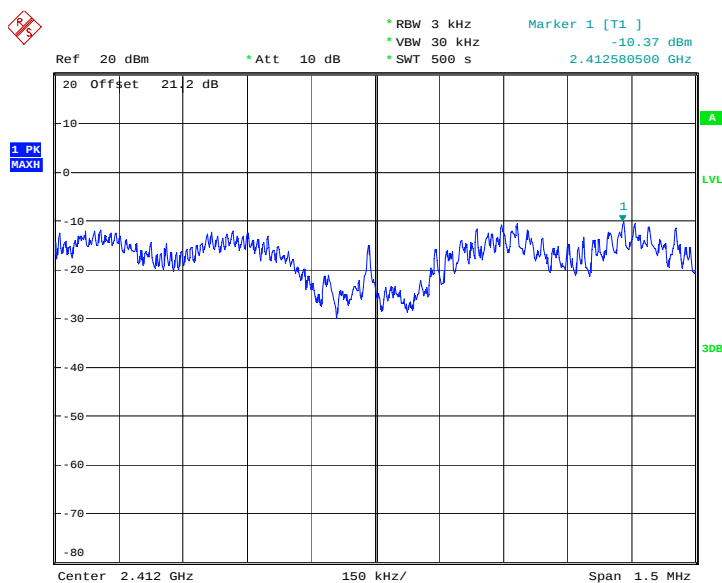


Date: 1.DEC.2011 15:02:45

Carrier frequency (MHz): 2462
Channel No.11
Test Mode: 802.11b

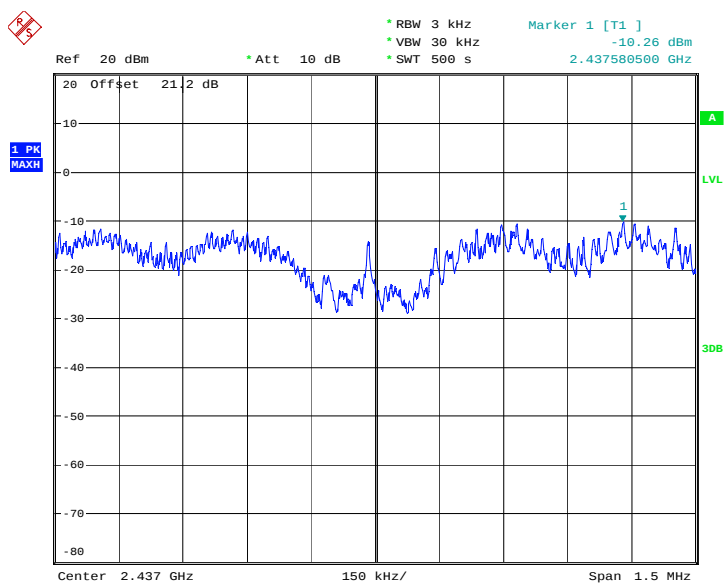
Test Mode: 802.11g

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-10.37
2437	6	-10.26
2462	11	-10.04



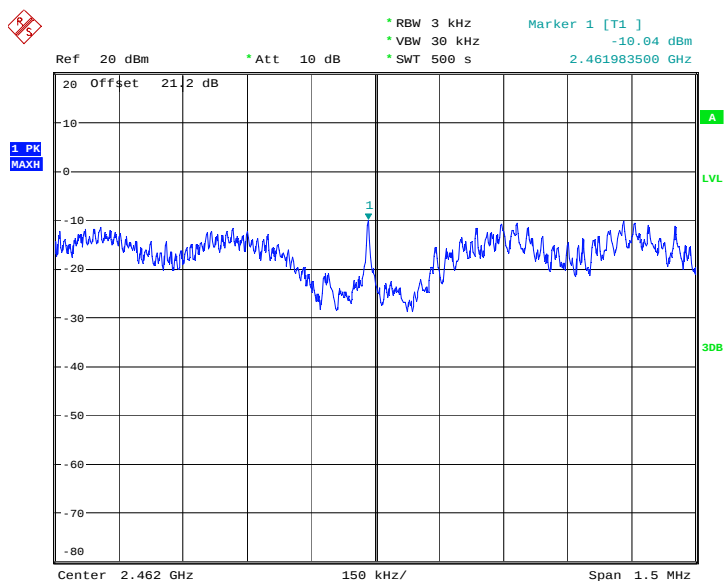
Date: 1.DEC.2011 15:22:01

Carrier frequency (MHz): 2412
Channel No.1
Test Mode: 802.11g



Date: 1.DEC.2011 15:30:40

Carrier frequency (MHz): 2437
Channel No.6
Test Mode: 802.11g

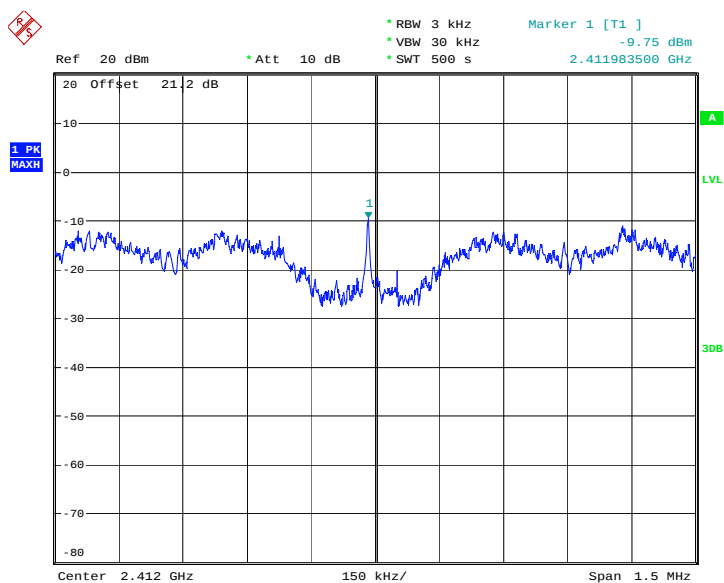


Date: 1.DEC.2011 15:40:24

Carrier frequency (MHz): 2462
Channel No.11
Test Mode: 802.11g

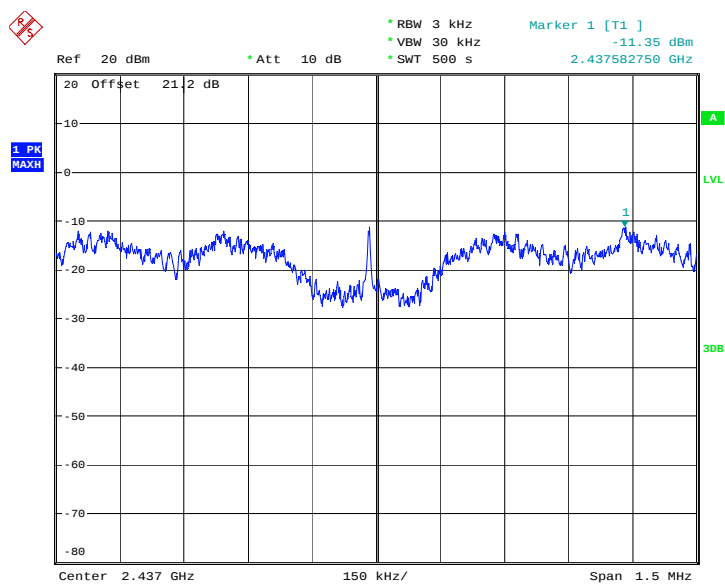
Test Mode: 802.11g

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-9.75
2437	6	-11.35
2462	11	-10.19



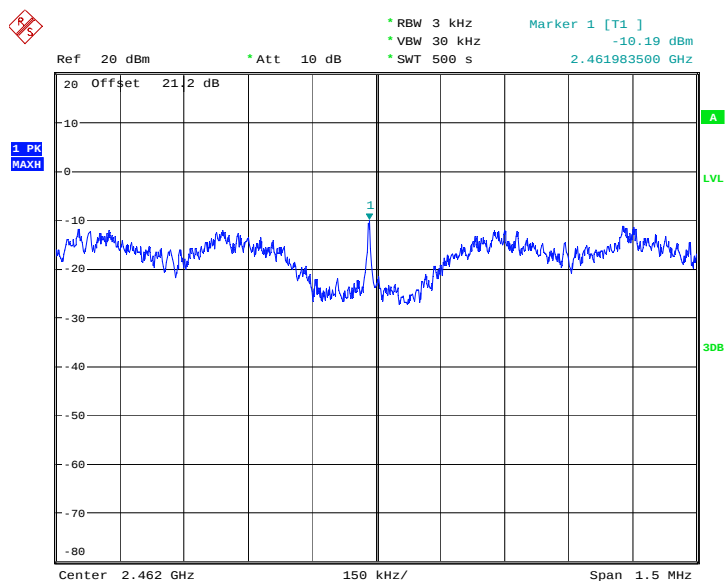
Date: 1.DEC.2011 15:51:37

Carrier frequency (MHz): 2412
Channel No.1
Test Mode: 802.11n



Date: 1.DEC.2011 16:01:46

Carrier frequency (MHz): 2437
Channel No.6
Test Mode: 802.11n



Date: 1.DEC.2011 16:11:13

Carrier frequency (MHz): 2462
Channel No.11
Test Mode: 802.11n

2.2.4 Spurious RF conducted emissions-§15.247(d)

2.2.4.1 Ambient condition:

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.4.2 Test Description

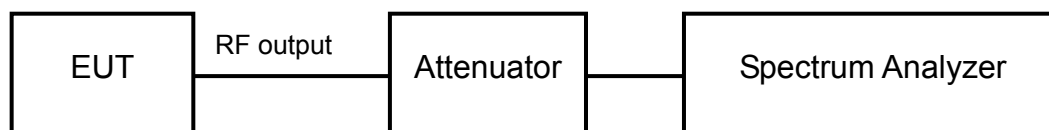
The measurement is made according to ANSI C63.4-2009 and KDB558074. The Equipment Under Test (EUT) was set up in a shielded room to perform the spurious emissions measurements.

The EUT was connected to the spectrum analyzer and WiFi set via a power splitter with a known loss.

Analyzer settings:

- Detector: Peak-Maxhold
- Frequency range: 30 ~25000 MHz
- Resolution Bandwidth (RBW): 100 kHz
- Video Bandwidth (VBW): 300 kHz

The reference value for the measurement of the spurious RF conducted emissions is determined during the test “band edge compliance” (cf. chapter 4.5). This value is used to calculate the 20 dBc limit.



2.2.4.3 Test limit

FCC Part 15, Subpart C, §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.

2.2.4.4 Test result

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11b

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

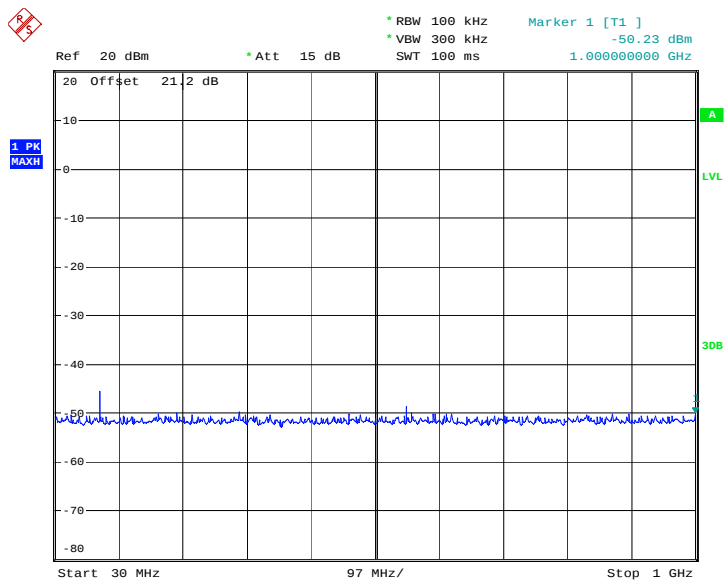
Carrier frequency (MHz): 2462

Channel No.:11

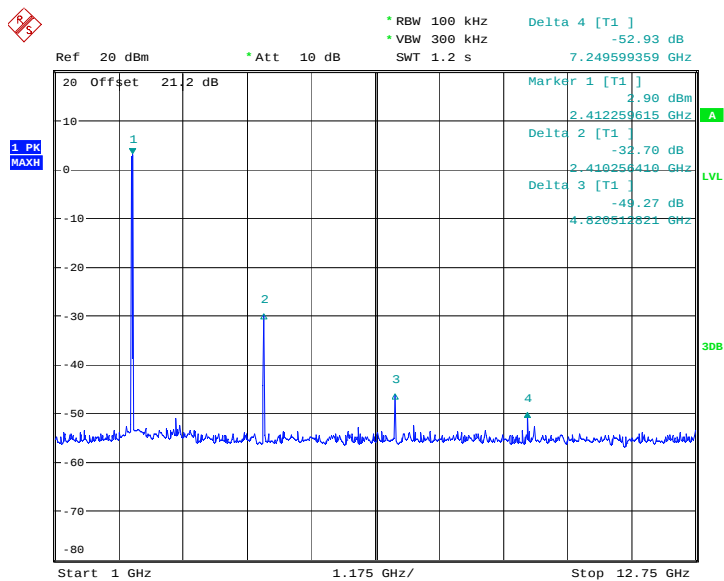
Test Mode: 802.11b

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

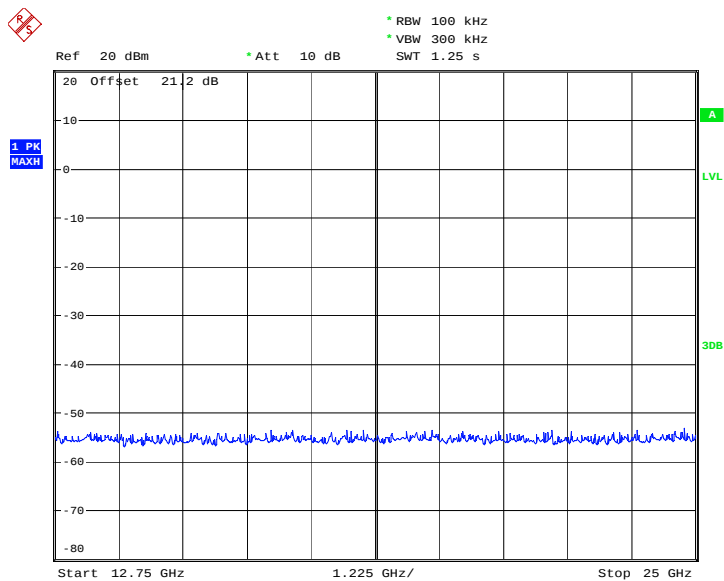
Note: The Reference value see 2.2.6 Band edge compliance



Date: 1.DEC.2011 16:13:22

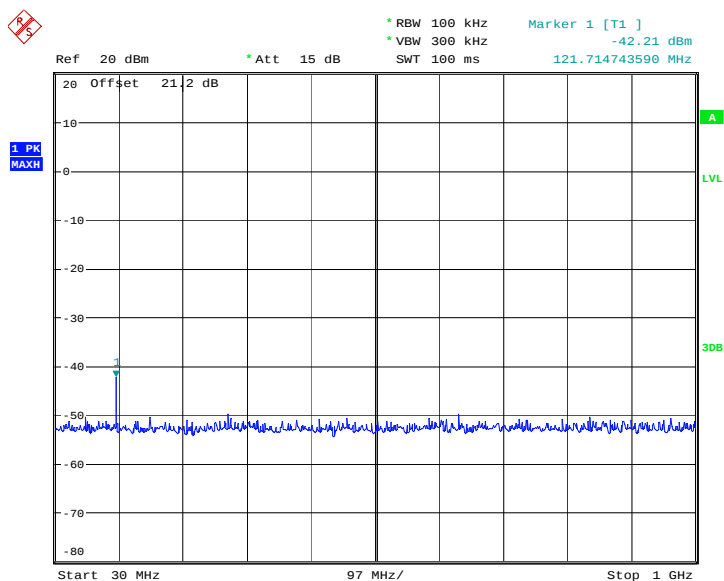


Date: 1.DEC.2011 16:15:06

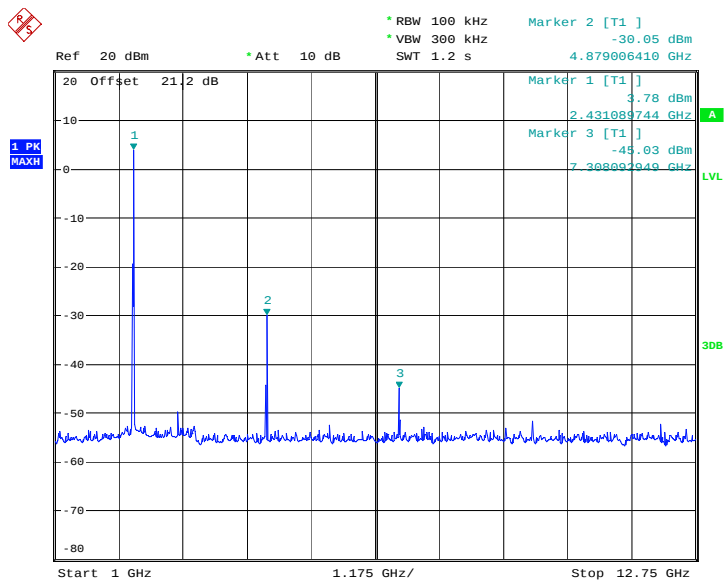


Date: 1.DEC.2011 16:23:23

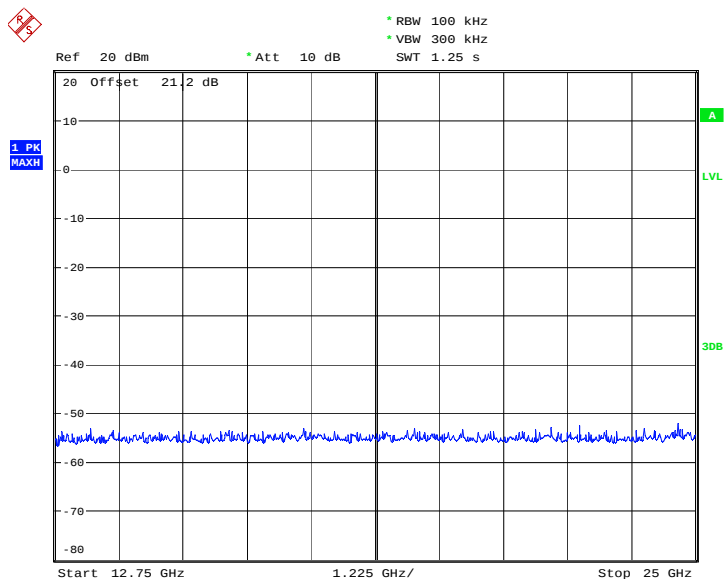
Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11b



Date: 2.DEC.2011 08:58:30

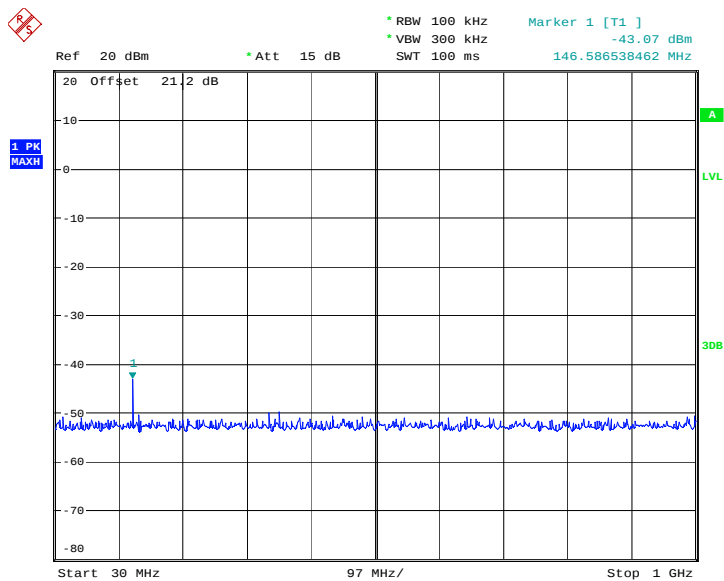


Date: 2.DEC.2011 08:58:52

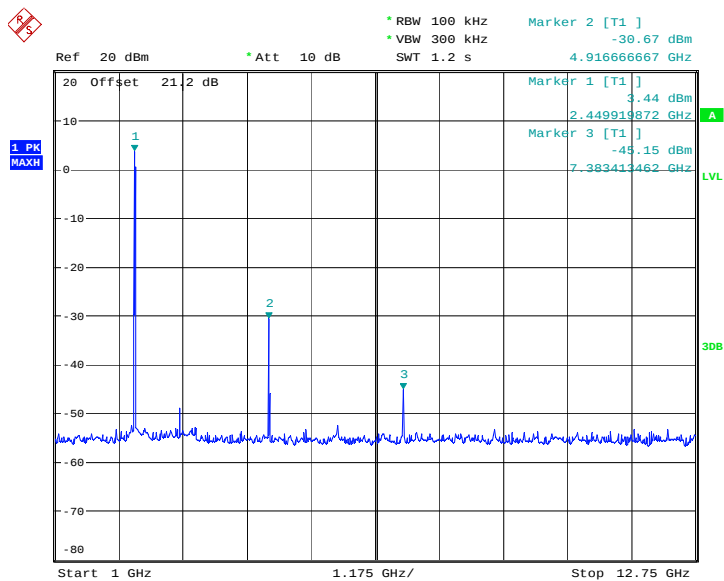


Date: 2.DEC.2011 08:59:13

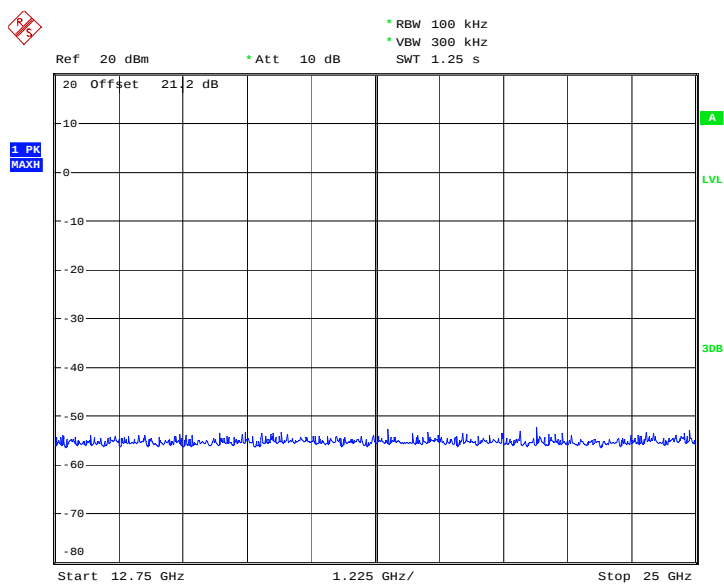
Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11b



Date: 2.DEC.2011 09:00:20



Date: 2.DEC.2011 09:00:43



Date: 2.DEC.2011 09:01:08

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11b

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11g

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

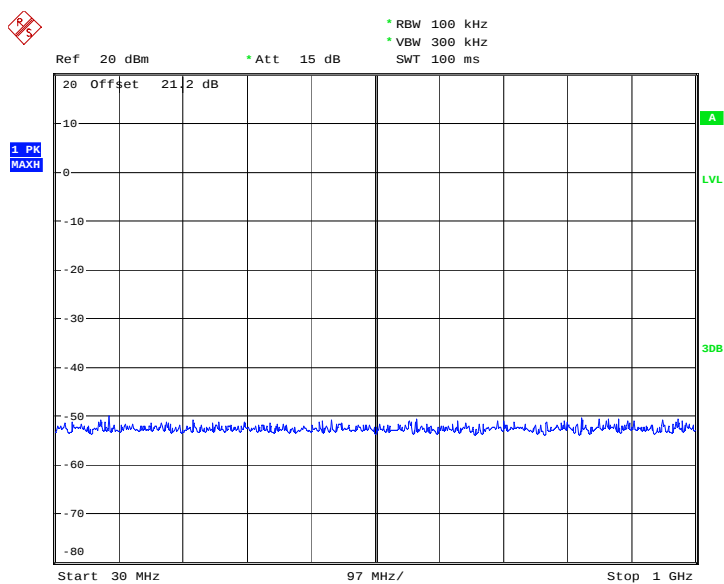
Carrier frequency (MHz): 2462

Channel No.:11

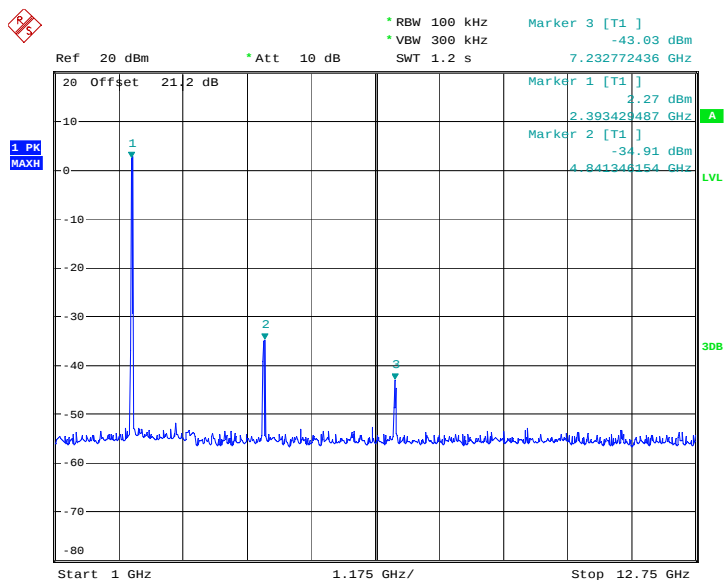
Test Mode: 802.11g

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

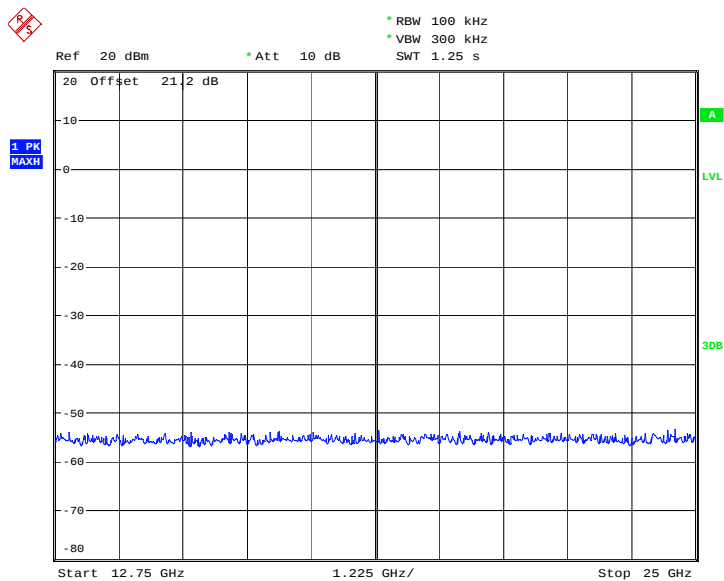
Note: The Reference value see 2.2.6 Band edge compliance



Date: 2.DEC.2011 09:04:15

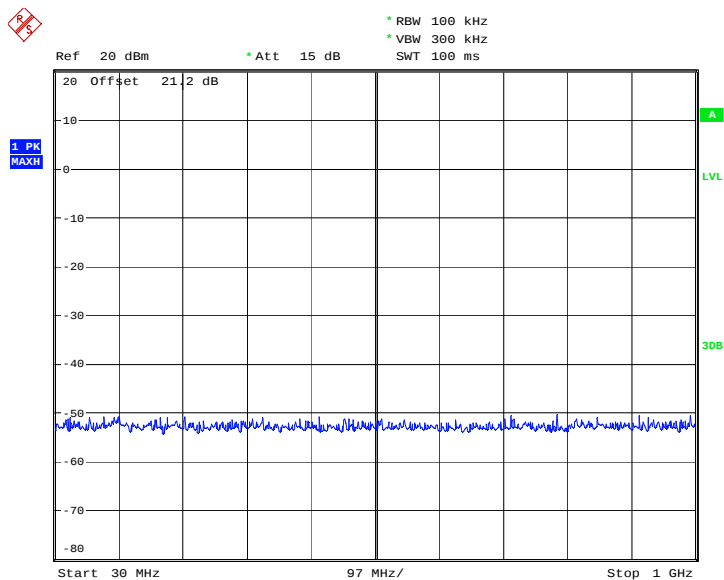


Date: 2.DEC.2011 09:04:34

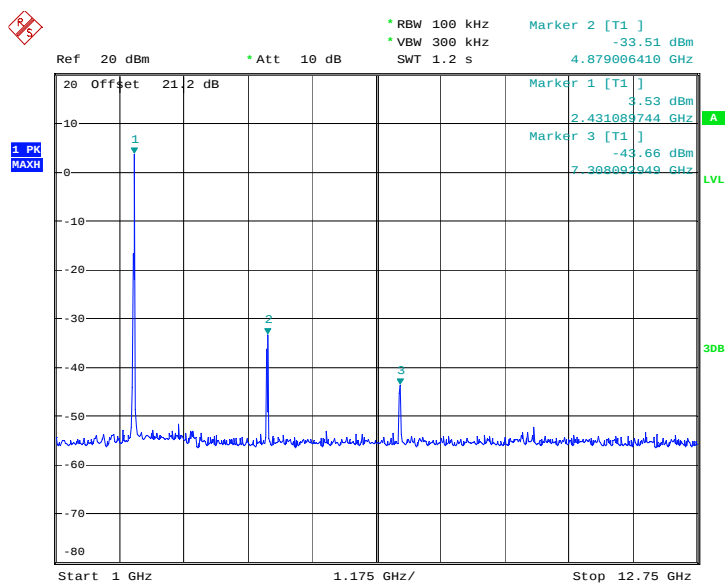


Date: 2.DEC.2011 09:04:51

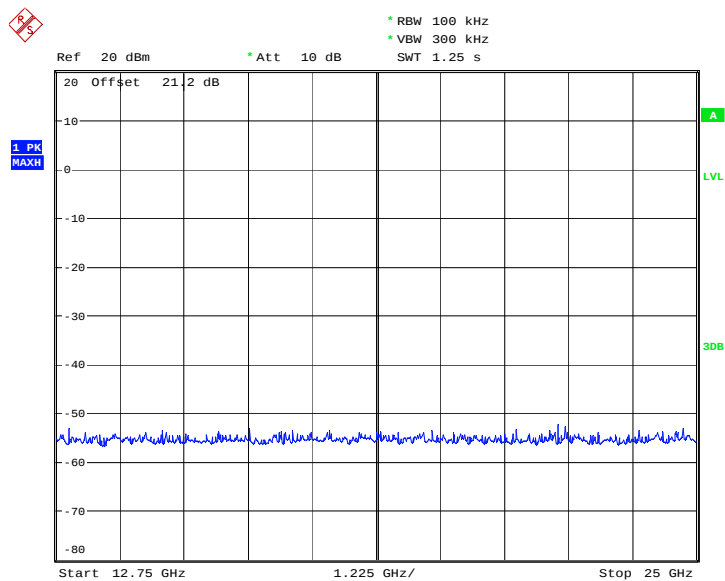
Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11g



Date: 2.DEC.2011 09:05:21

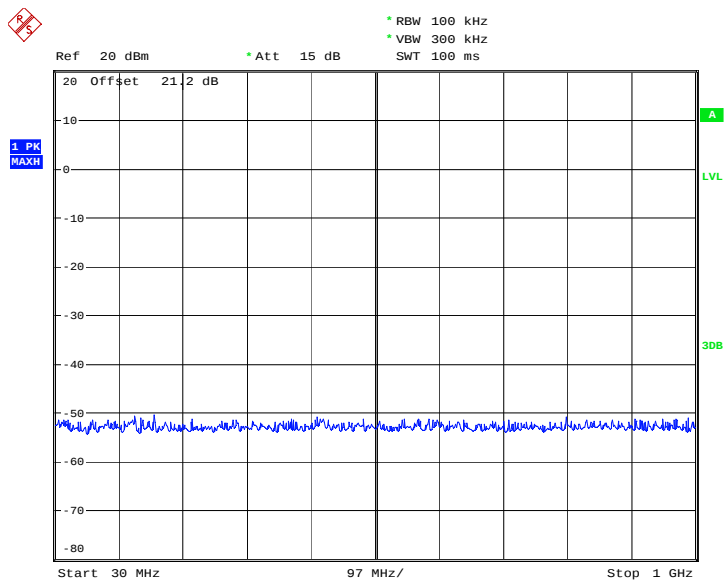


Date: 2.DEC.2011 09:05:42

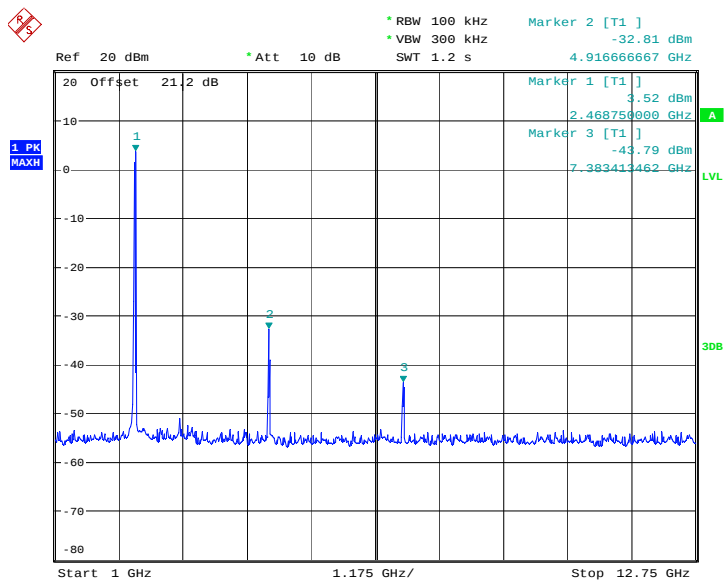


Date: 2.DEC.2011 09:06:47

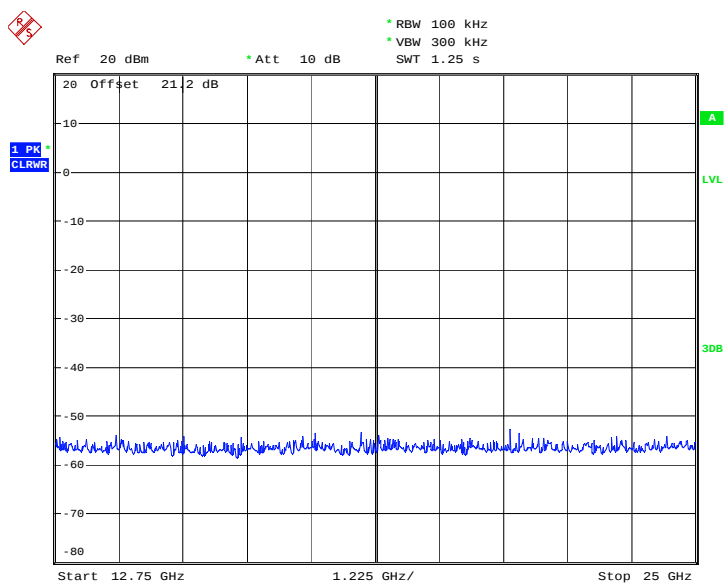
Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11g



Date: 2.DEC.2011 09:07:14



Date: 2.DEC.2011 09:07:32



Date: 2.DEC.2011 09:07:49

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11n

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

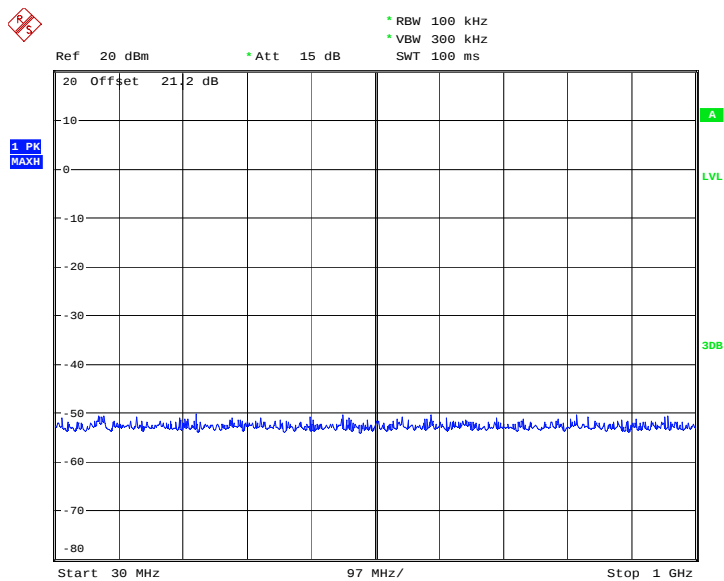
Carrier frequency (MHz): 2462

Channel No.:11

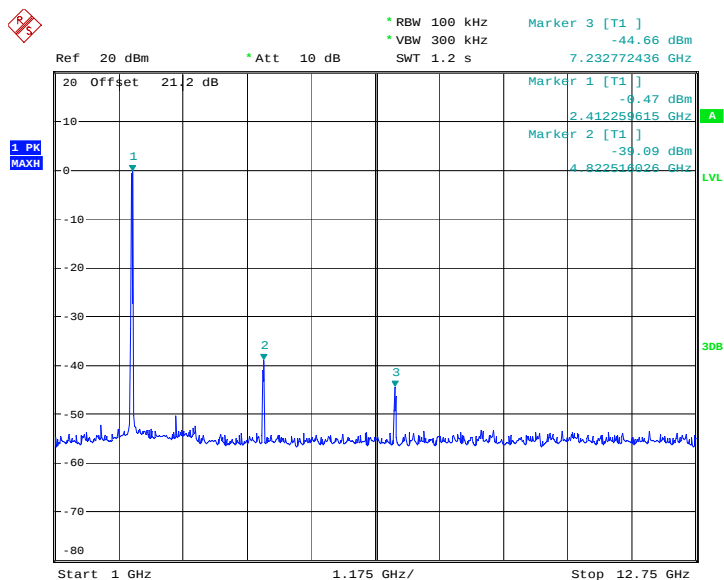
Test Mode: 802.11n

Frequency MHz	Corrected measurement value dBm	Reference value dBm	Limit dBm	Delta dB
---	---	---	---	---
---	---	---	---	---

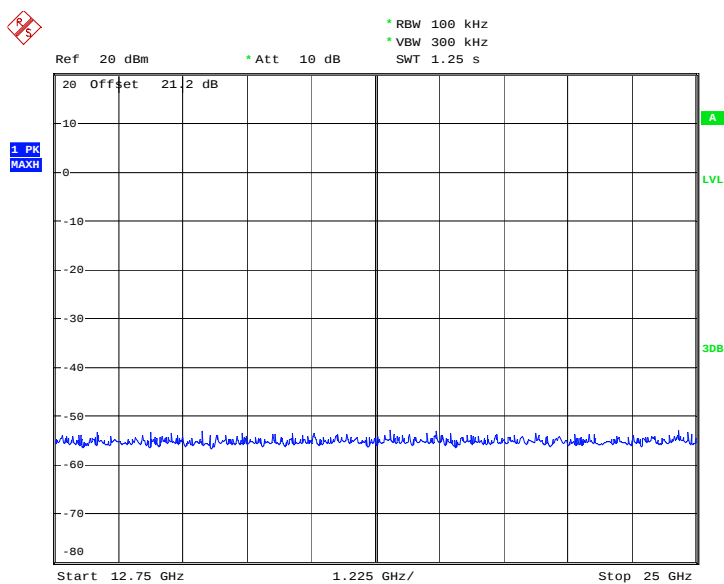
Note: The Reference value see 2.2.6 Band edge compliance



Date: 2.DEC.2011 09:08:43

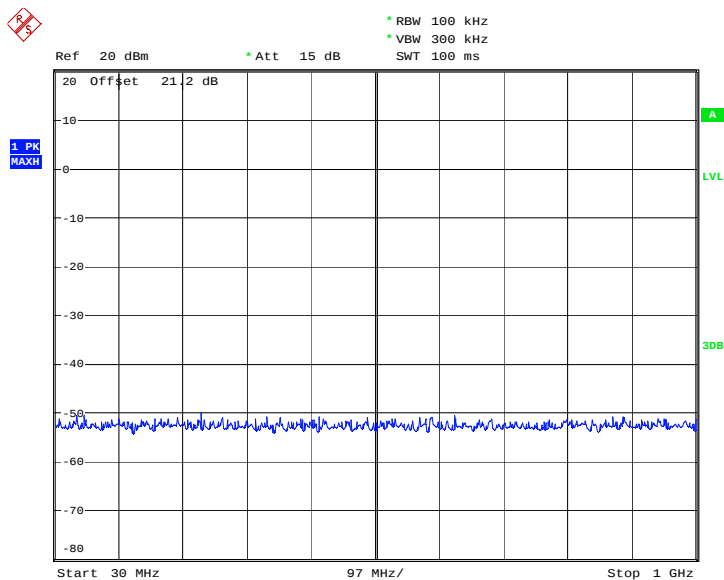


Date: 2.DEC.2011 09:09:03

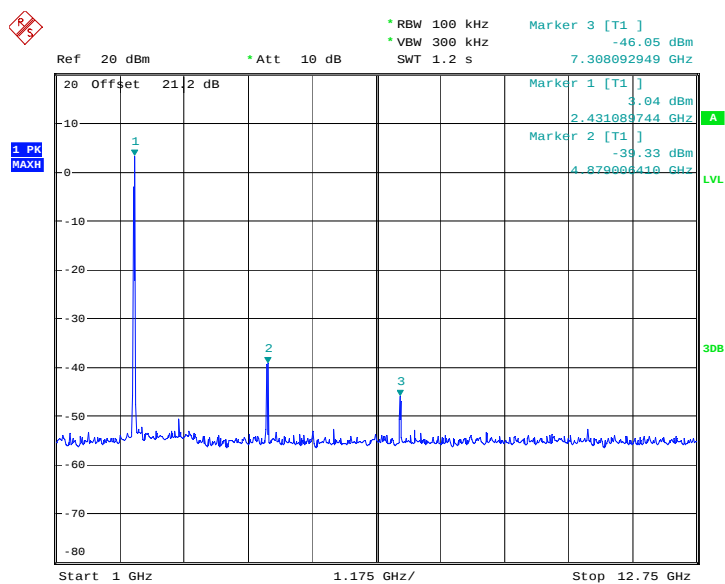


Date: 2.DEC.2011 09:09:22

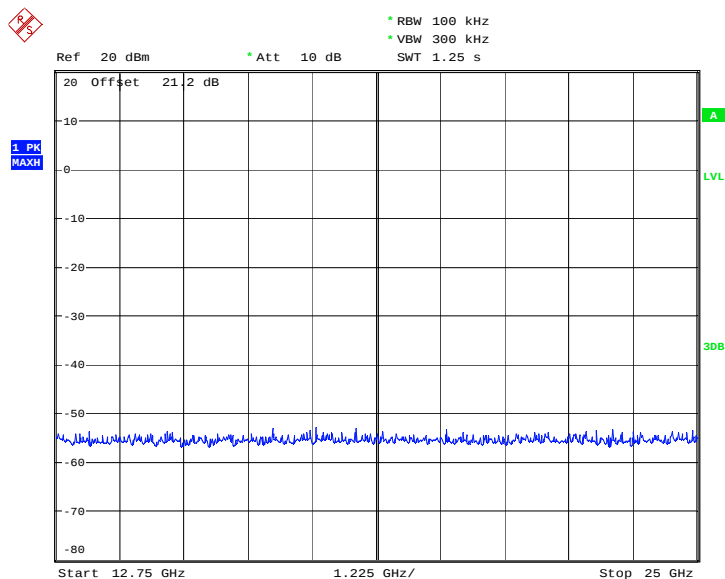
Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11n



Date: 2.DEC.2011 09:09:51

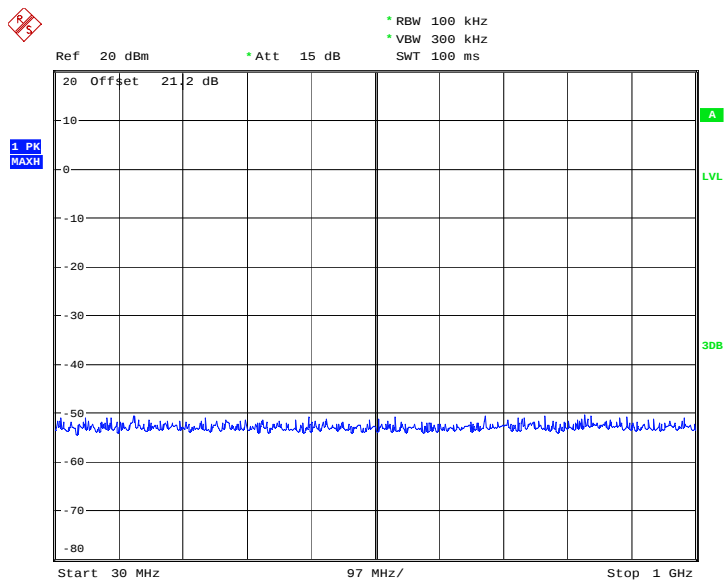


Date: 2.DEC.2011 09:10:15

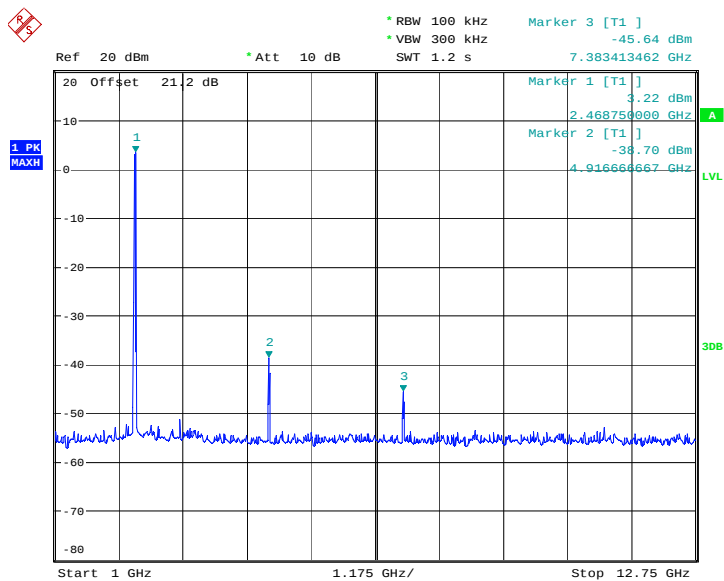


Date: 2.DEC.2011 09:11:01

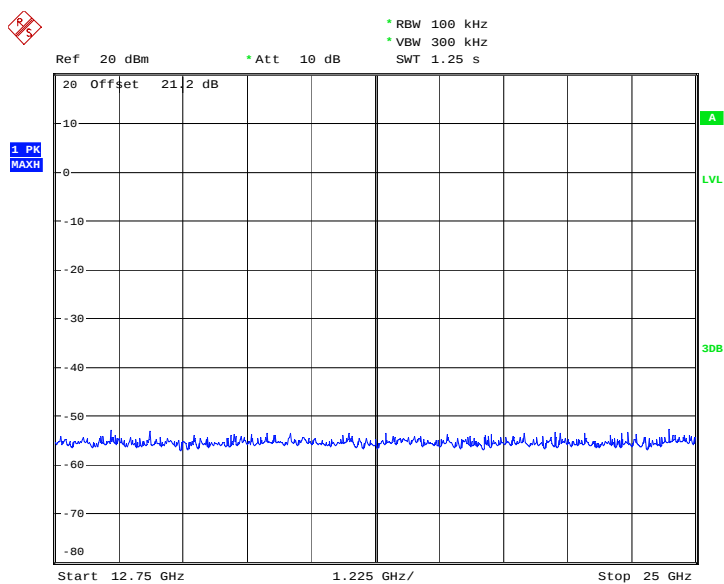
Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11n



Date: 2.DEC.2011 09:11:41



Date: 2.DEC.2011 09:12:01



Date: 2.DEC.2011 09:12:15

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n

2.2.5 Spurious radiated emissions-§15.247(d),§15.209(a)

2.2.5.1 Ambient condition

Temperature	Relative humidity	Pressure
20°C	35%	101.4kPa

2.2.5.2 Test Description

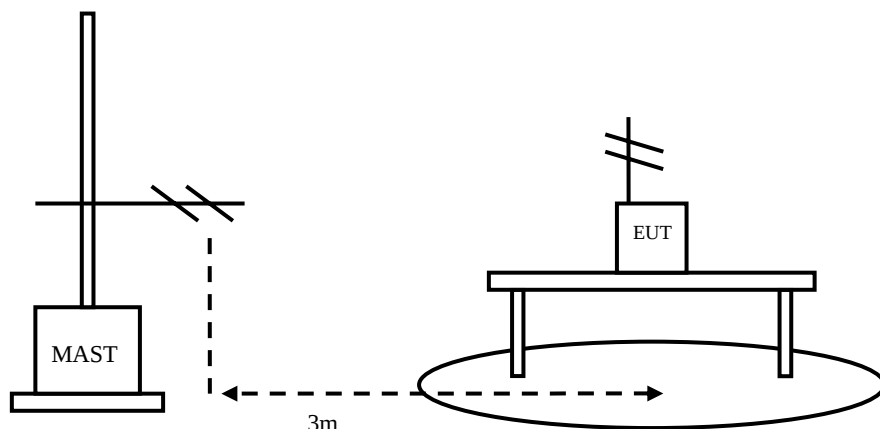
The measurement is made according to ANSI C63.4-2009 and KDB558074. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The radiated emissions measurements were made in a typical installation configuration.

Then start the test software ES-K1. Sweep the whole frequency band through the range from 9kHz to 1GHz or above, using receive loop antenna HFH2-Z2, log period antenna HL562 or Ridge horn antenna HF906.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The results (reference to 2.2.5.4) shall be showed the worst case of the three orthogonal axes.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.



2.2.5.3 Test limit

FCC Part 15, Subpart C, §15.247 (d)

... 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 Section 15.209(a) (see Section 15.205(c)).

FCC Part 15, Subpart C, §15.209, Radiated Emission Limits

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dBμV/m)
0.009 – 0.490	Quasi-peak	$20\log(2400/F(\text{kHz})/1\mu\text{V/m})$
0.490 – 1.705	Quasi-peak	$20\log(24000/F(\text{kHz})/1\mu\text{V/m})$
1.705 – 30	Quasi-peak	29.5
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

§15.33(b)

...A unintentional radiator, excluding a digital device, in which the highest frequency generated in the device, the highest frequency used in the device and the highest frequency on which the device operates or tunes are less than 30 MHz and which, in accordance with Section 15.109, is required to comply with standards on the level of radiated emissions within the frequency range 9 kHz to 30 MHz...

§15.35(b)

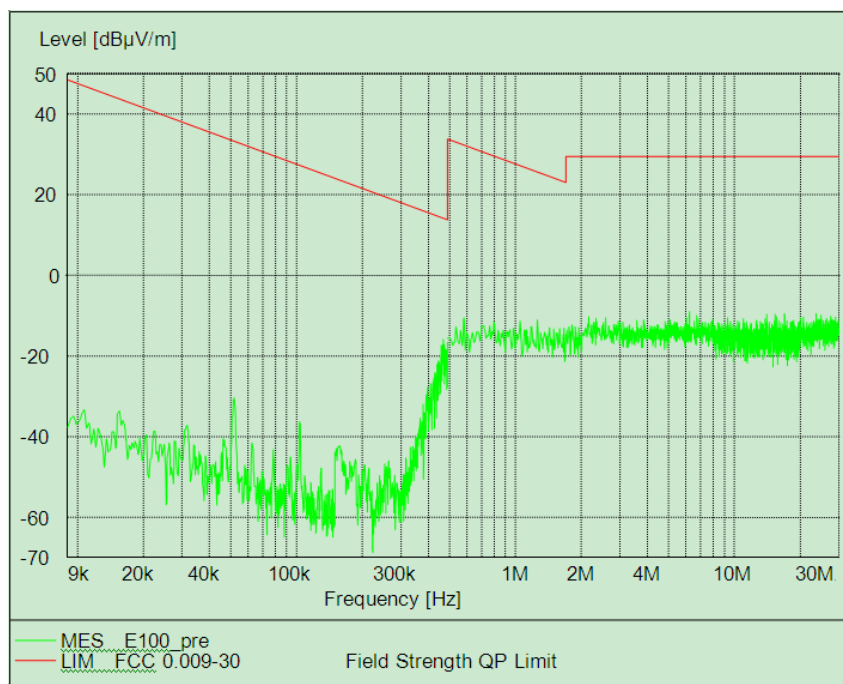
..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: $\text{Limit (dB}\mu\text{V/m)} = 20 \log (\text{Limit } (\mu\text{V/m})/1\mu\text{V/m})$

2.2.5.4 Test result

Carrier frequency (MHz): 2437

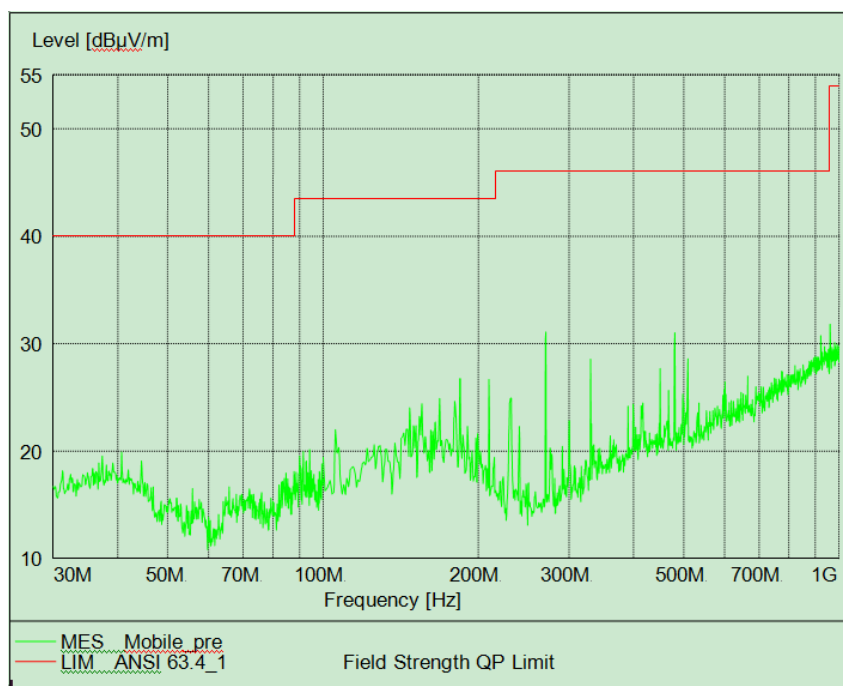
Channel No.:6



Frequency Range: 9kHz -30MHz

Detector: PK mode

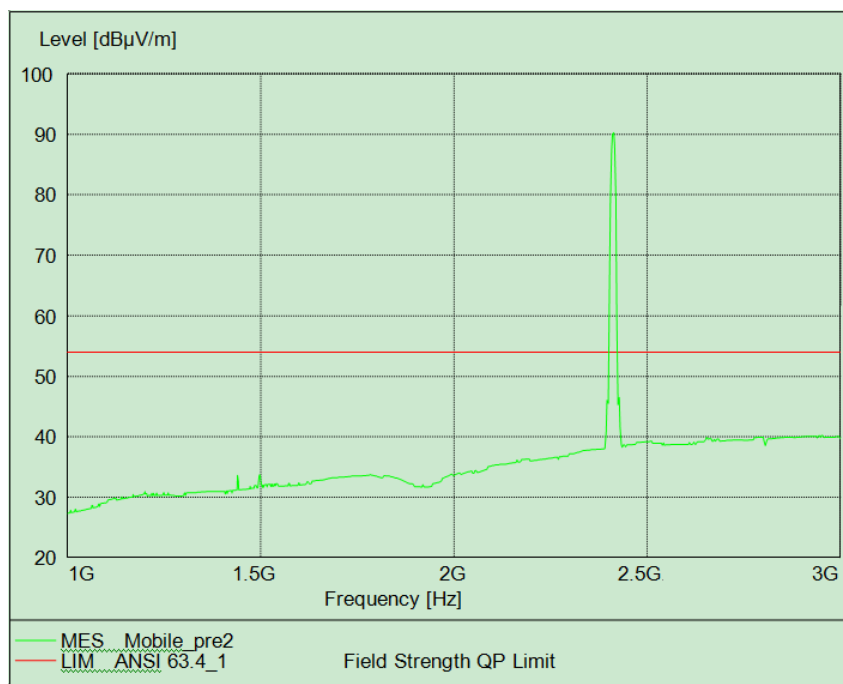
Test Mode: 802.11b



Frequency Range: 30MHz -1GHz

Detector: PK mode

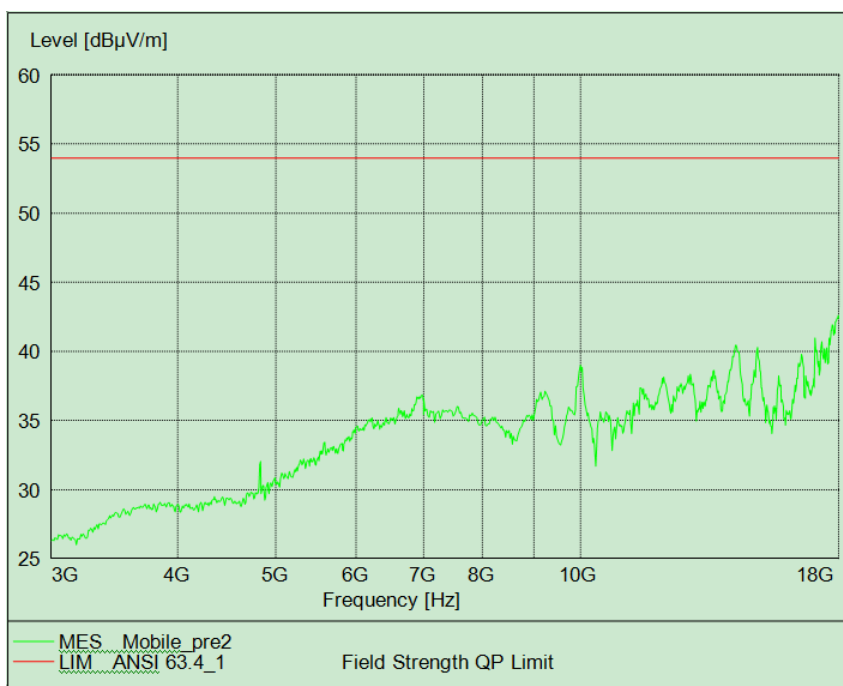
Test Mode: 802.11b



Frequency Range: 1GHz -3GHz

Detector: PK mode

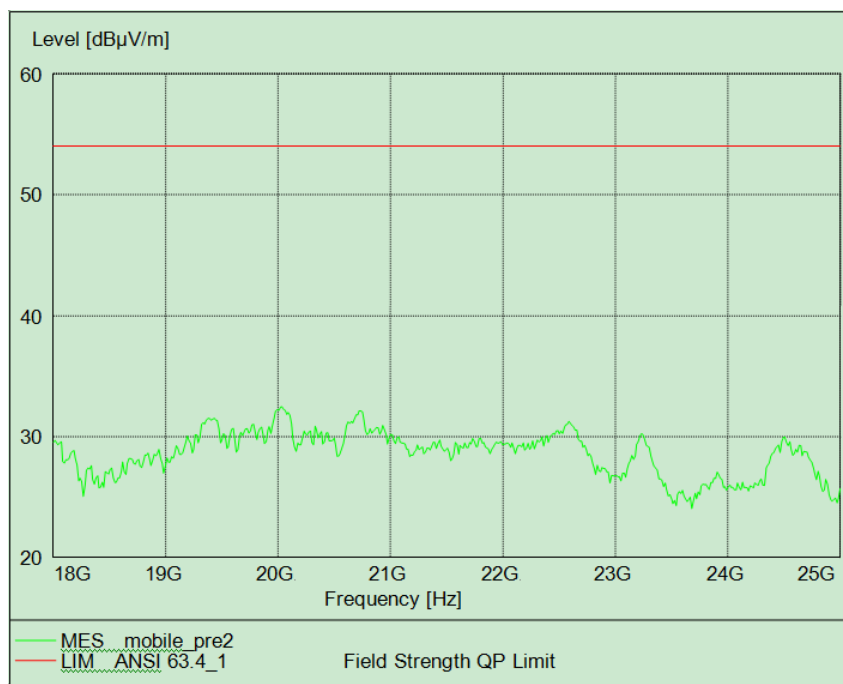
Test Mode: 802.11b



Frequency Range: 3GHz -18GHz

Detector: PK mode

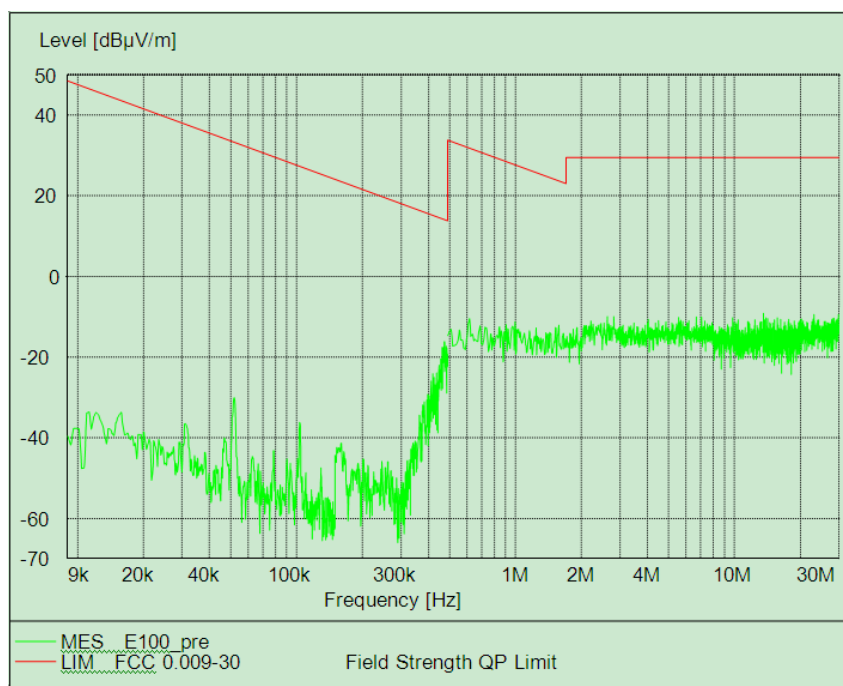
Test Mode: 802.11b



Frequency Range: 18GHz -25GHz

Detector: PK mode

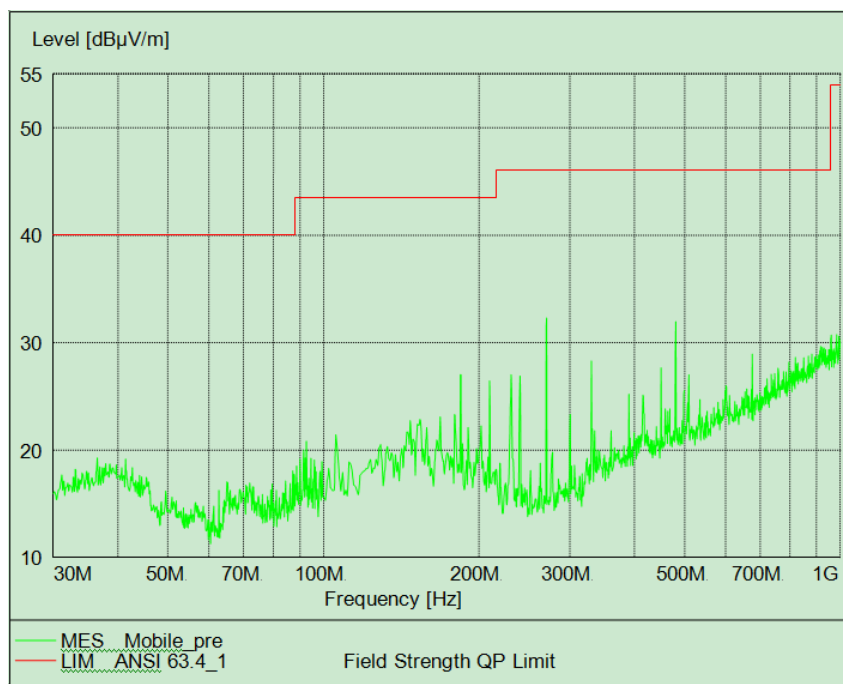
Test Mode: 802.11b



Frequency Range: 9kHz -30MHz

Detector: PK mode

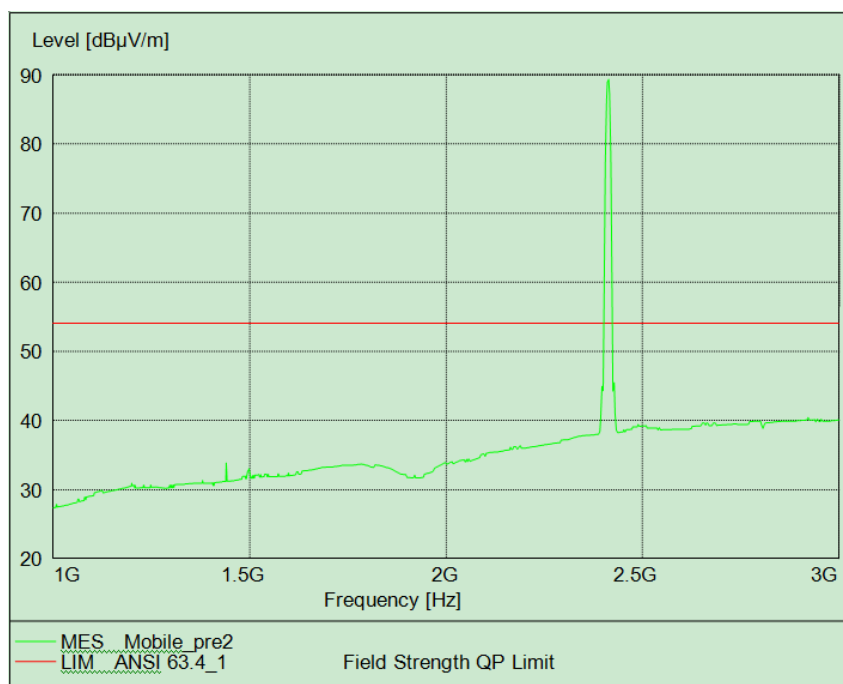
Test Mode: 802.11g



Frequency Range: 30MHz -1GHz

Detector: PK mode

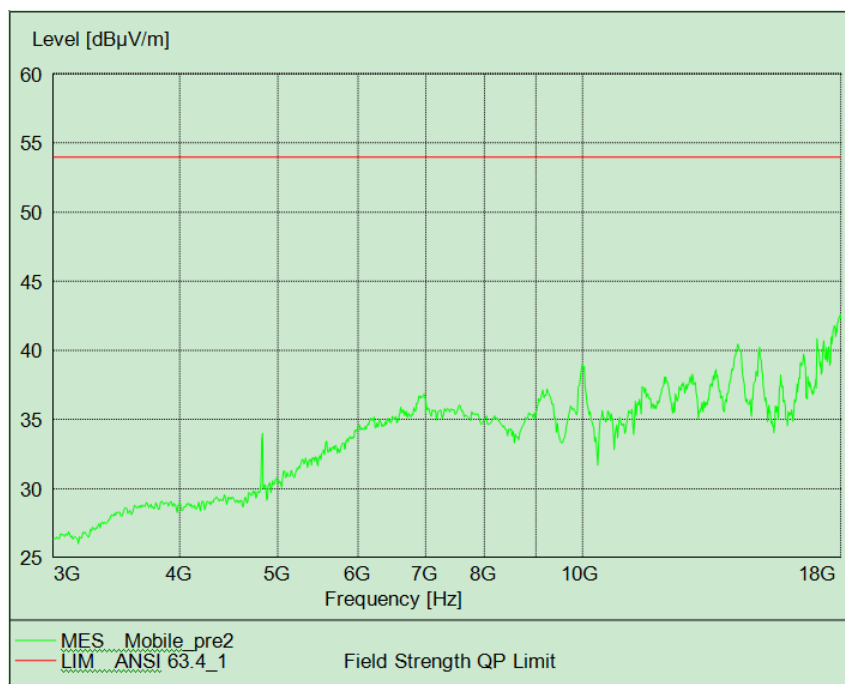
Test Mode: 802.11g



Frequency Range: 1GHz -3GHz

Detector: PK mode

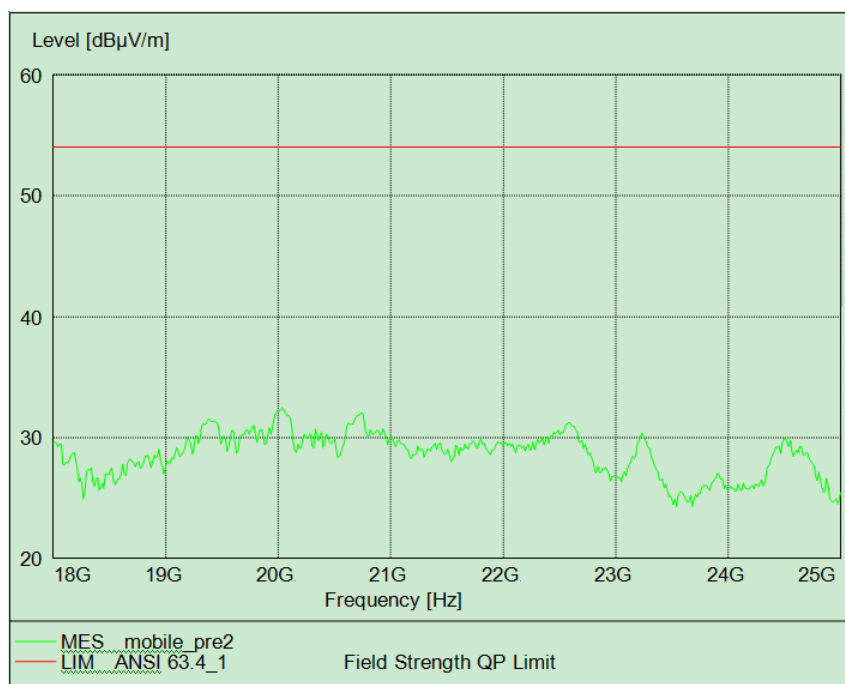
Test Mode: 802.11g



Frequency Range: 3GHz -18GHz

Detector: PK mode

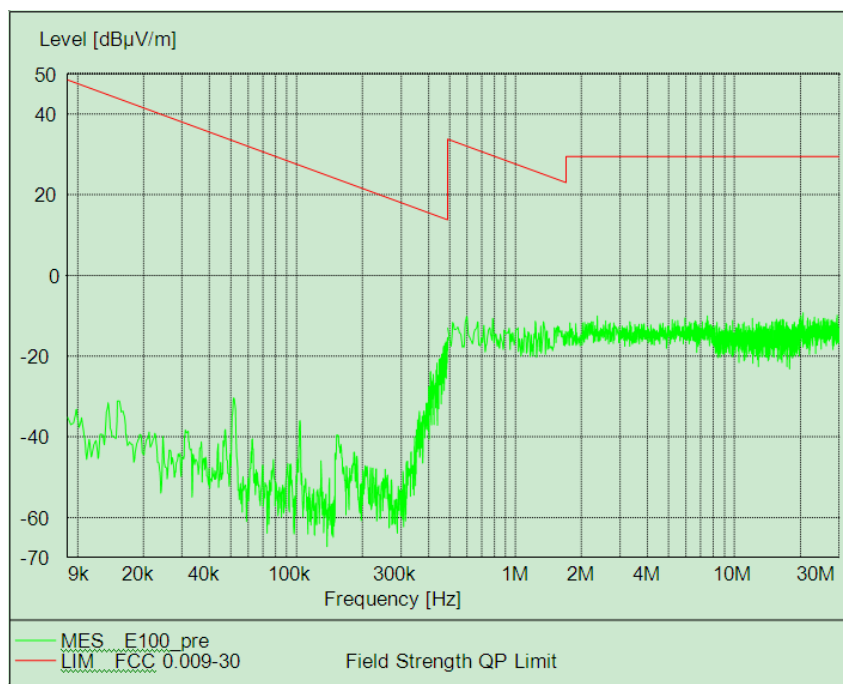
Test Mode: 802.11g



Frequency Range: 18GHz -25GHz

Detector: PK mode

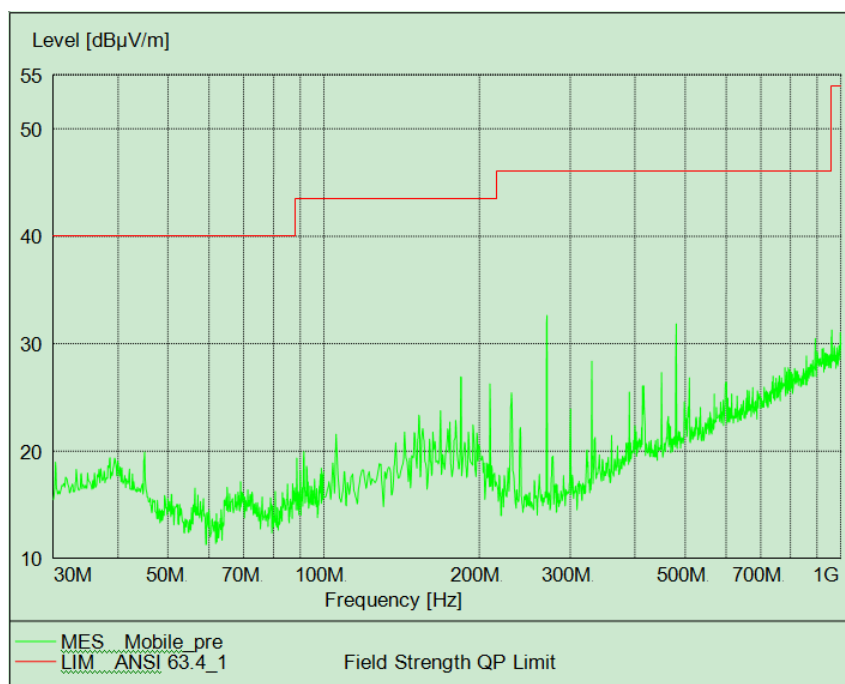
Test Mode: 802.11g



Frequency Range: 9kHz -30MHz

Detector: PK mode

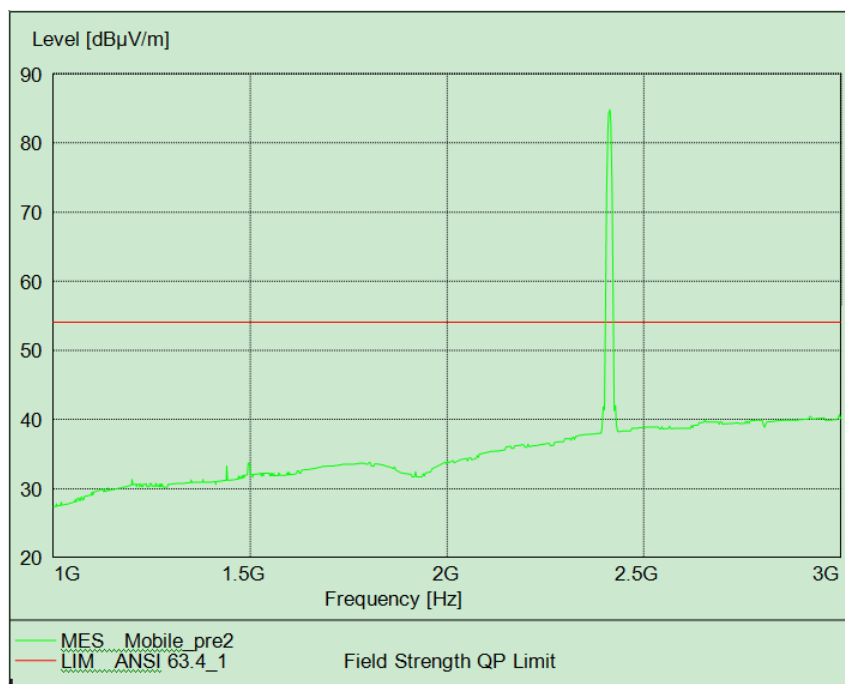
Test Mode: 802.11n



Frequency Range: 30MHz -1GHz

Detector: PK mode

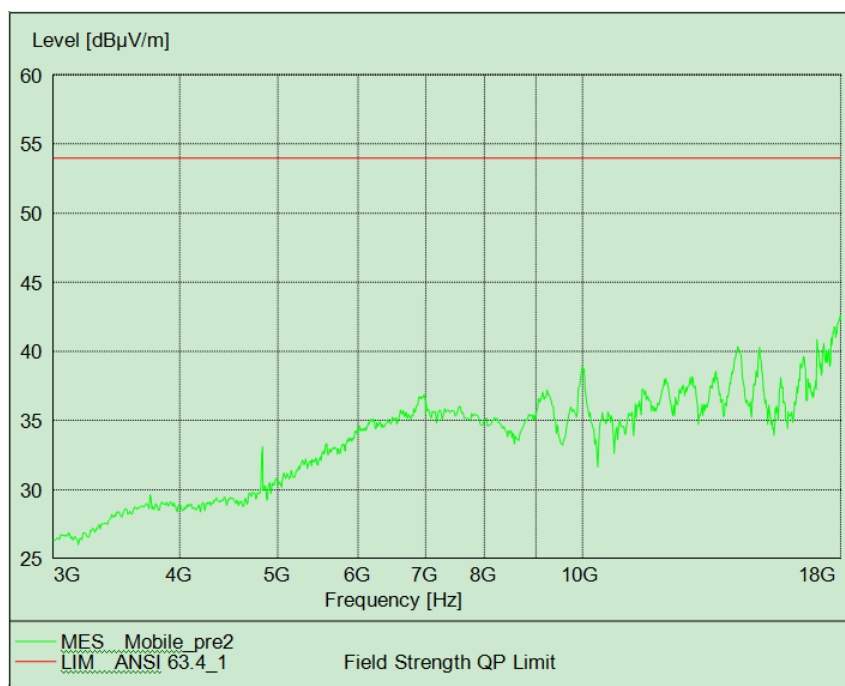
Test Mode: 802.11n



Frequency Range: 1GHz -3GHz

Detector: PK mode

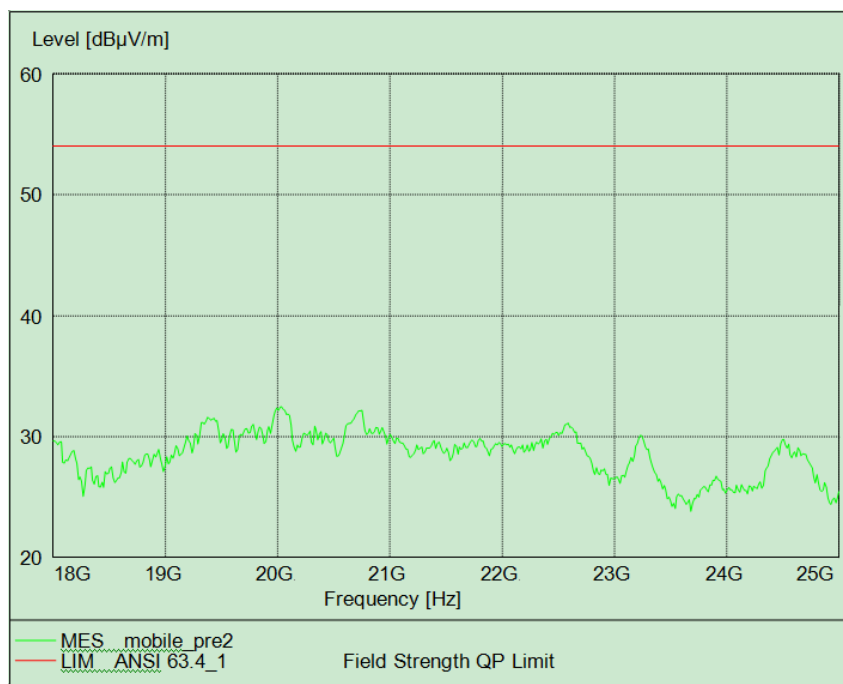
Test Mode: 802.11n



Frequency Range: 3GHz -18GHz

Detector: PK mode

Test Mode: 802.11n



Frequency Range: 18GHz -25GHz

Detector: PK mode

Test Mode: 802.11n

2.2.6 Band edge compliance-§15.247(d)

2.2.6.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.1kPa

2.2.6.2 Test Description

The measurement is made according to Public notice DA 00-705 and ANSI C63.4-2009.

2.2.6.2.1 RF Conducted Measurement:

The Equipment Under Test (EUT) was set up in a shielded room to perform the spurious emissions measurements.

The EUT was connected to the spectrum analyzer and WiFi test set via a power splitter with a known loss.

For the first measurement the EUT is set to transmit on the lowest channel (2412 MHz). The lower band edge is 2390 MHz.

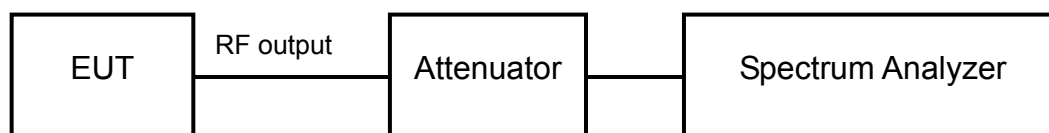
Analyzer settings:

- Detector: Peak/Average
- RBW= 100 kHz
- VBW= 300 kHz

For the second measurement the EUT is set to transmit on the highest channel (2462MHz). The higher band edge is 2483.5 MHz.

Analyzer settings:

- Detector: Peak/Average
- RBW= 100 kHz
- VBW= 300 kHz



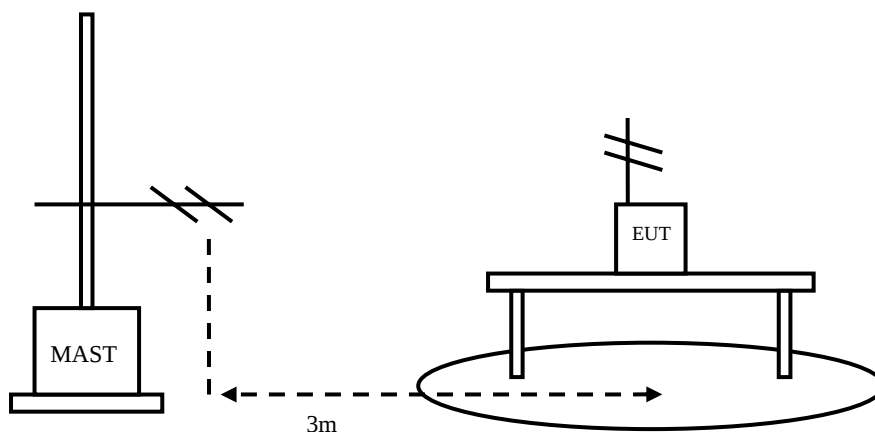
2.2.6.2.2 RF Radiated Measurement

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The radiated emissions measurements were made in a typical installation configuration.

During the test, the antenna height and EUT azimuth were varied in order to identify the maximum level of emission from the EUT. The height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees.

The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.



2.2.6.3 Test limit

2.2.6.3.1 RF Conducted Measurement:

FCC Part 15.247 (d)

“In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

2.2.6.3.2 RF Radiated Measurement

FCC Part 15, Subpart C, §15.209, Radiated Emission Limits

Frequency of Emission(MHz)	Limits	
	Detector	Unit (dBμV/m)
0.009 – 0.490	Quasi-peak	$20\log(2400/F(\text{kHz})/1\mu\text{V/m})$
0.490 – 1.705	Quasi-peak	$20\log(24000/F(\text{kHz})/1\mu\text{V/m})$
1.705 – 30	Quasi-peak	29.5
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

2.2.6.4 Test result

RF Conducted Measurement

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta dB	Detector
2390	-51.53	3.64	-16.36	55.17	Peak
2390	-59.78	-4.12	-24.12	55.66	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta dB	Detector
2483.5	-52.36	3.77	-16.23	56.13	Peak
2483.5	-60.17	-4.55	-24.55	55.62	Average

RF Radiated Measurement

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Frequency MHz	Correction Factor dB/m	Reading Level dBuV	Emission Level dBuV/m	Detector
2412	2.7	100.87	103.57	Peak
2412	2.7	88.03	88.59	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Frequency MHz	Correction Factor dB/m	Reading Level dBuV	Emission Level dBuV/m	Detector
2462	2.5	102.83	105.33	Peak
2462	2.5	89.85	90.35	Average

Band Edge Test Data

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Frequency MHz	Fundamental (dBuV/m)	Delta dB	Band Edge Field Strength (dBuV/m)	Detector
2390	103.57	55.17	48.40	Peak
2390	88.59	55.66	32.93	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Frequency MHz	Fundamental (dBuV/m)	Delta dB	Band Edge Field Strength (dBuV/m)	Detector
2483.5	105.33	56.13	49.20	Peak
2483.5	90.35	55.62	34.73	Average

Note:

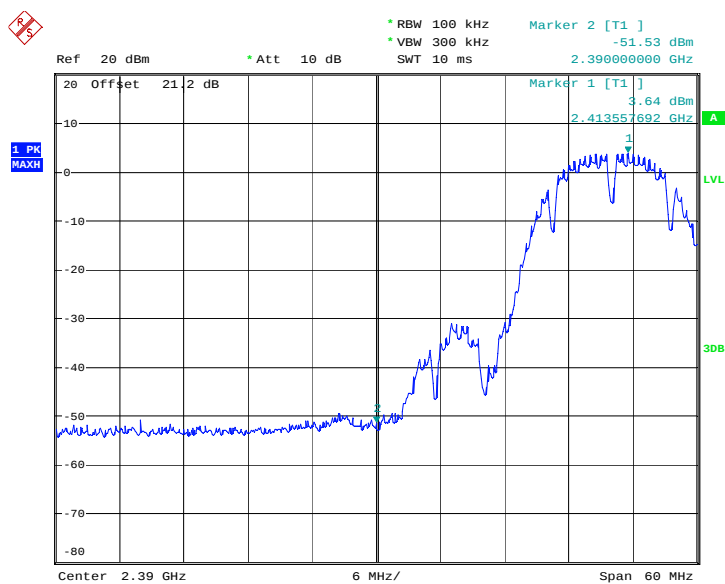
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge

measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Delta

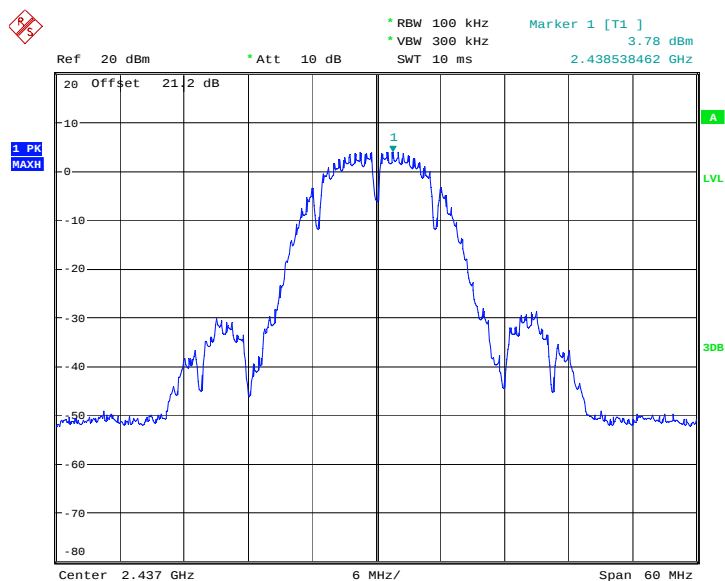
F = Fundamental field Strength (Peak or Average)

Delta= Conducted Band Edge Delta (Peak or Average)



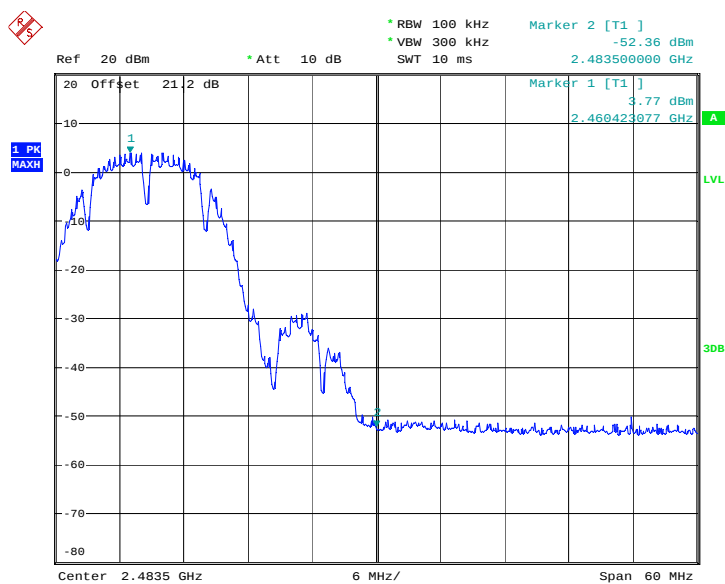
Date: 2.DEC.2011 09:14:16

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11b



Date: 2.DEC.2011 09:22:44

Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11b



Date: 2.DEC.2011 09:23:34

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11b

RF Conducted Measurement

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta dB	Detector
2390	-37.30	3.72	-16.28	41.02	Peak
2390	-46.35	-3.83	-23.83	42.52	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta dB	Detector
2483.5	-35.40	4.21	-15.79	39.61	Peak
2483.5	-44.66	-3.34	-23.34	41.32	Average

RF Radiated Measurement

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Frequency MHz	Correction Factor dB/m	Reading Level dBuV	Emission Level dBuV/m	Detector
2412	2.7	99.65	102.35	Peak
2412	2.7	84.80	87.50	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Frequency MHz	Correction Factor dB/m	Reading Level dBuV	Emission Level dBuV/m	Detector
2462	2.5	97.22	99.72	Peak
2462	2.5	82.33	84.83	Average

Band Edge Test Data

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Frequency MHz	Fundamental (dBuV/m)	Delta dB	Band Edge Field Strength (dBuV/m)	Detector
2390	102.35	41.02	61.33	Peak
2390	87.50	42.52	44.98	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Frequency MHz	Fundamental (dBuV/m)	Delta dB	Band Edge Field Strength (dBuV/m)	Detector
2483.5	99.72	39.61	60.11	Peak
2483.5	84.83	41.32	43.51	Average

Note:

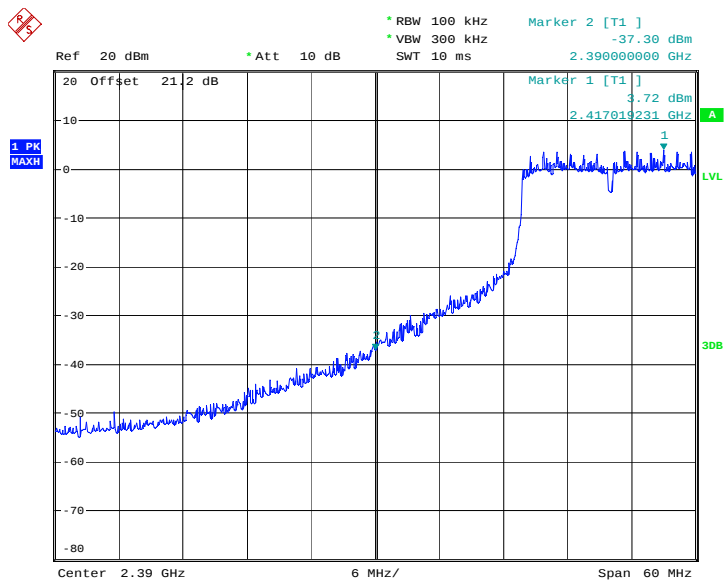
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge

measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Delta

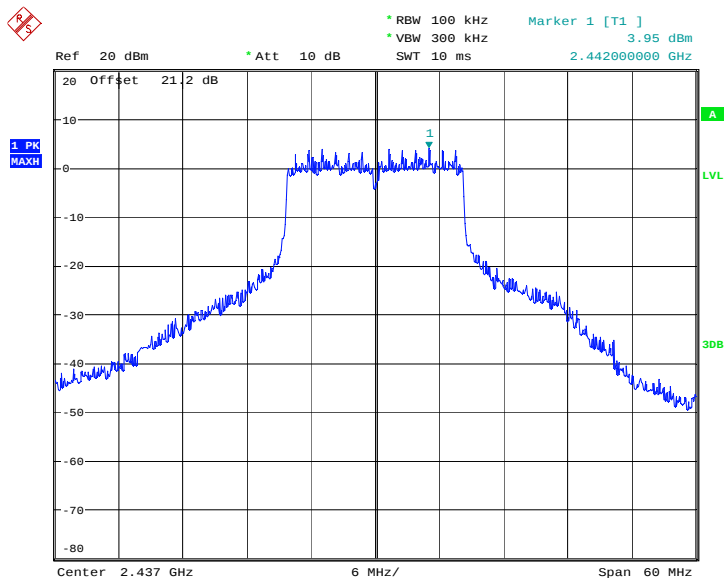
F = Fundamental field Strength (Peak or Average)

Delta= Conducted Band Edge Delta (Peak or Average)



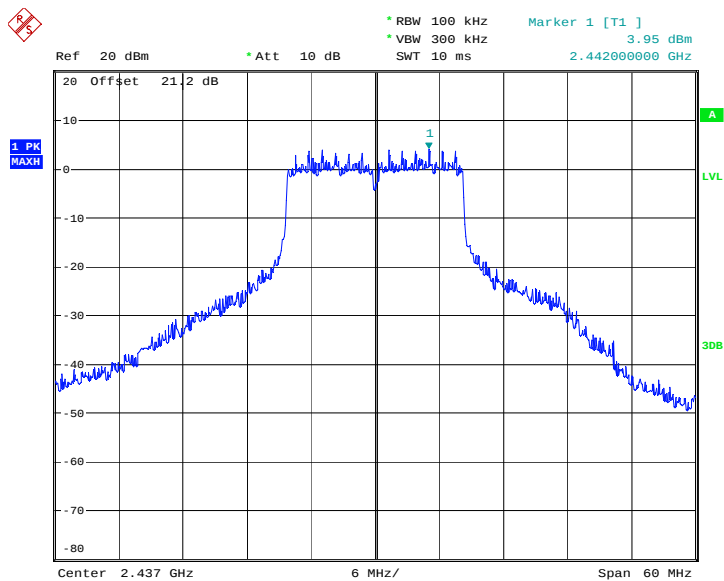
Date: 2.DEC.2011 09:27:00

Carrier frequency (MHz): 2412
Channel No.:1
Test Mode: 802.11g



Date: 2.DEC.2011 09:27:41

Carrier frequency (MHz): 2437
Channel No.:6
Test Mode: 802.11g



Date: 2.DEC.2011 09:27:41

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11g

RF Conducted Measurement

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta dB	Detector
2390	-33.86	3.61	-16.39	37.50	Peak
2390	-43.03	-4.22	-24.22	38.81	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n

Frequency MHz	Measured value dBm	Reference value dBm	Limit dBm	Delta dB	Detector
2483.5	-31.18	3.71	-16.29	34.89	Peak
2483.5	-40.77	-4.24	-24.24	36.53	Average

RF Radiated Measurement

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n

Frequency MHz	Correction Factor dB/m	Reading Level dBuV	Emission Level dBuV/m	Detector
2412	2.7	95.86	98.56	Peak
2412	2.7	81.08	83.78	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n

Frequency MHz	Correction Factor dB/m	Reading Level dBuV	Emission Level dBuV/m	Detector
2462	2.5	95.21	97.71	Peak
2462	2.5	80.25	82.75	Average

Band Edge Test Data

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n

Frequency MHz	Fundamental (dBuV/m)	Delta dB	Band Edge Field Strength (dBuV/m)	Detector
2390	98.56	37.50	61.06	Peak
2390	83.78	38.81	44.97	Average

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n

Frequency MHz	Fundamental (dBuV/m)	Delta dB	Band Edge Field Strength (dBuV/m)	Detector
2483.5	97.71	34.89	62.82	Peak
2483.5	82.75	36.53	46.22	Average

Note:

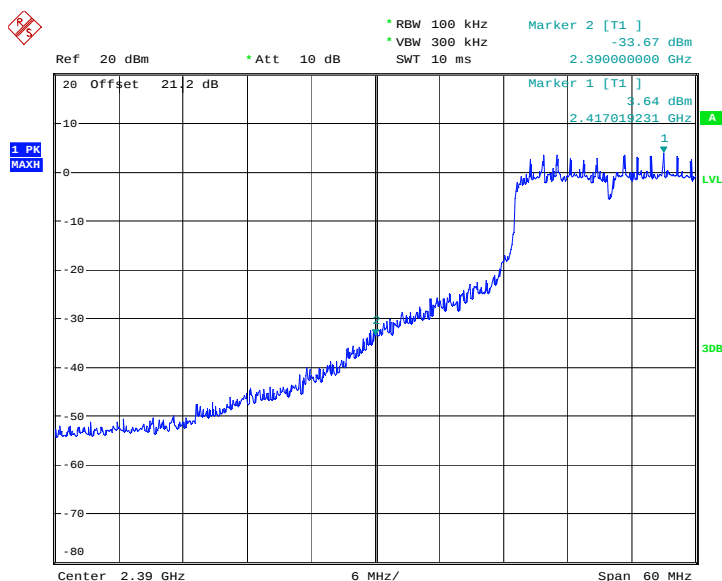
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge

measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F - Delta

F = Fundamental field Strength (Peak or Average)

Delta= Conducted Band Edge Delta (Peak or Average)

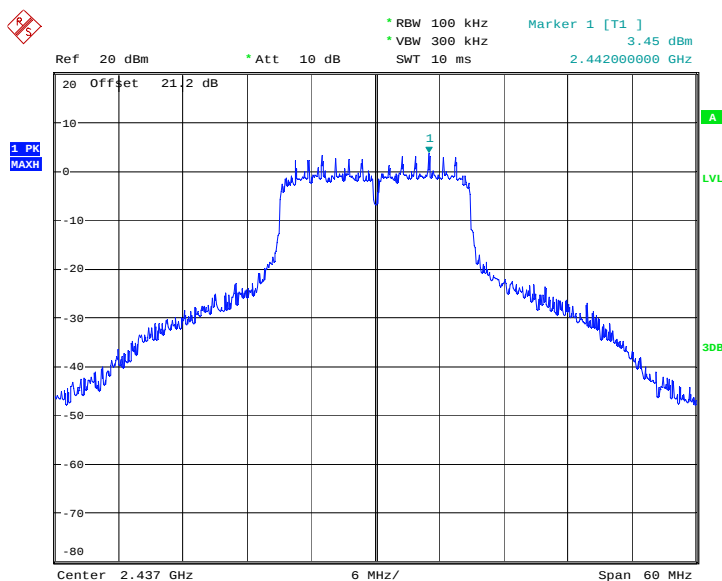


Date: 2.DEC.2011 09:29:57

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n

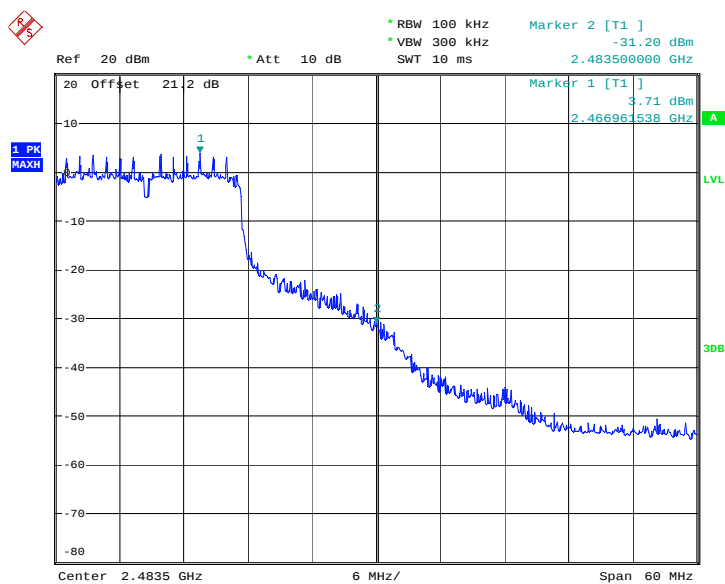


Date: 2.DEC.2011 09:30:22

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11n



Date: 2.DEC.2011 09:30:55

Carrier frequency (MHz): 2462
Channel No.:11
Test Mode: 802.11n

2.3. List of test equipment

No.	Name	Model	Serial Number	Cal Due date
1.	Spectrum Analyzer	FSQ 40	200065	2012/3
2.	Signal Generator	E8257D	MY46520645	2012/8
3.	Oscilloscope	54622A	MY40010227	2012/8
4.	Temperature chamber	SH241	92000390	2012/8
5.	Power meter	NRVS	836333/050	2012/8
6.	Bluetooth Test Set	MT8852B	001007002	2012/8
7.	Attenuation	779	04702	2012/8
8.	Cable	N-N	6-046	2012/8
9.	Cable	N-N	6-050	2012/8
10.	Power Splitter	11850C	026057	2012/8
11.	DC Power Supply	E3645A	MY40000740	2012/8
12.	Shield Room	SR1	SR1	---
13.	EMI Receiver Tester	ESI 40	100015	2012/8
14.	Ultra log test antenna	HL562	100016	2012/8
15.	Fully-Anechoic Chamber	12.65m×8.03m×7.50m	---	---
16.	Turn table	PS2000	---	---
17.	Antenna master	MA 260	---	---
18.	Double-Ridged Waveguide Horn Antenna	HF 906	100030 100029	2012/8
19.	Rubidium Frequency Standard	8040A	0226005347	2012/8
20.	Loop Antenna	HFH2-Z2	---	2012/8
21.	Receive antenna	3160-09	002058-002	2012/8