



MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT - Addendum

Test Report Number – 23423-1 WLAN

Report Date – 2009-11-12

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

Signature:

Name: Lei Yang

Title: EMC Project Manager

Test: 2009-10-19 to 2009-11-12

As the responsible test lab manager, I hereby declare that the model tested as specified in this report conforms to the requirements indicated.

Signature:

Name: Yilin Zhao

Title: Test Lab Manager

Date: 2009-11-12

This report must not be reproduced, except in full, without written approval from this laboratory.

FCC Registration Number: 177885
IC Registration Number: 109AW-1

ADR Testing Service location ADR BJ
ISO/IEC-17025:2005 accredited by UKAS



Table of Contents

Test Report Details 3
Applicable Standards 3
Summary of Testing..... 4
General and Special Conditions..... 4
Equipment and Cable Configurations 5
Measuring Equipment and Calibration Information 5
Description of WLAN Transmitter..... 5
Measurement Procedures and Data..... 6
 Spectrum Bandwidth..... 6
 Measurement Procedure..... 6
 Measurement Results 6
 PEAK OUTPUT POWER 13
 Measurement Procedure..... 13
 Measurement Results 13
 Power Spectral Density 20
 Measurement Procedure..... 20
 SPURIOUS RF CONDUCTED EMISSIONS 21
 Measurement Procedure..... 21
 Measurement Results 21
 AC LINE CONDUCTED EMISSIONS 34
 Measurement Procedure..... 34
 Measurement Results 34

Test Report Details

Tests Performed By: Motorola (China) Technologies Ltd.
Asia Global Compliance Labs
No.1 Wang Jing East Road
Chao Yang District
Beijing, 100102, P. R. China
Phone: +86 10 8473 2610
FCC Registration Number: 177885
IC Registration Number: 109AW-1

Tests Requested By: Motorola Inc.
Mobile Devices business
600 North US Hwy 45
Libertyville, IL 60048

Product Type: Cell phone with embedded WLAN

Form factor: Bar

Signaling Capability: CDMA 800/1900, GSM 850/900/1800/1900,
CDMA EV-DO Release A, GPRS Class 12,
Standalone GPS, Bluetooth Version 2.0+EDR,
802.11b/802.11g

IMEI: 000000011234564

FCC ID: IHDP56KT1

Project number: 23423-1

Testing Complete Date: 2009-12-08

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

 X Part 15 Subpart C – Intentional Radiators

Applicable Standards: ANSI C63.4-2003, RSS-Gen Issue 2, RSS-210 Issue 7.

Summary of Testing

Test	Test Name	Pass/Fail
1	Spectrum Bandwidth	Pass
2	Peak Power	Pass
3	Power Spectral Density	Pass
4	Spurious RF Conducted Emissions	Pass
5	AC Line Conducted Emissions	Pass

Test	Test Name	Results
1	Spectrum Bandwidth	See plots
2	Peak Power	See plots
3	Power Spectral Density	See tables
4	Spurious RF Conducted Emissions	See plots
5	AC Line Conducted Emissions	See Plots

General and Special Conditions

The Cellular Phone hereinafter referred to as the Equipment under Test or EUT was tested using a fully charged battery when applicable. Where a battery could not be used due to the need for a controlled variation of input voltage, an external power supply was utilized.

All testing was done in an indoor controlled environment. The temperature and the relative humidity were maintained within the ANSI C63.4-2003 Standard requirements during the entire duration of testing.

Equipment and Cable Configurations

The EUT was tested in a stand-alone configuration that is representative of typical use.

Measuring Equipment and Calibration Information

Manufacturer	Equipment Type	Model No.	Serial Number	Calibration Due Date
Rohde Schwarz	Receiver	ESU40	100036	12/11/09
Rohde Schwarz	Receiver	ESCI	100650	12/11/09
Agilent	Attenuator	8491A	MY39263202	03/03/10
Rohde Schwarz	LISN	ENV216	100055	12/19/09

All test equipment was within their calibration date during the time of testing. When equipment went out of calibration during testing it was replaced using a similar piece of calibrated equipment. All these equipments are listed in the equipment list. All equipment is on a one-year calibration cycle.

Description of WLAN Transmitter

The EUT offers WLAN as a feature. The WLAN antenna is mounted inside of the EUT. The antenna installation is permanent. For a more thorough description of the functionality please refer to Exhibit 12 of this package.

As a WLAN transmitter, it is designed operate with other WLAN devices as defined by the industrial standard. In this application, the device is battery operated.

Measurement Procedures and Data

Spectrum Bandwidth

CFR 47 Part 15.247

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 20dB passive attenuator. A fully charged battery was used for the supply voltage.

Special SW was used to trigger EUT WLAN RF output. The spectrum analyzer used the following settings:

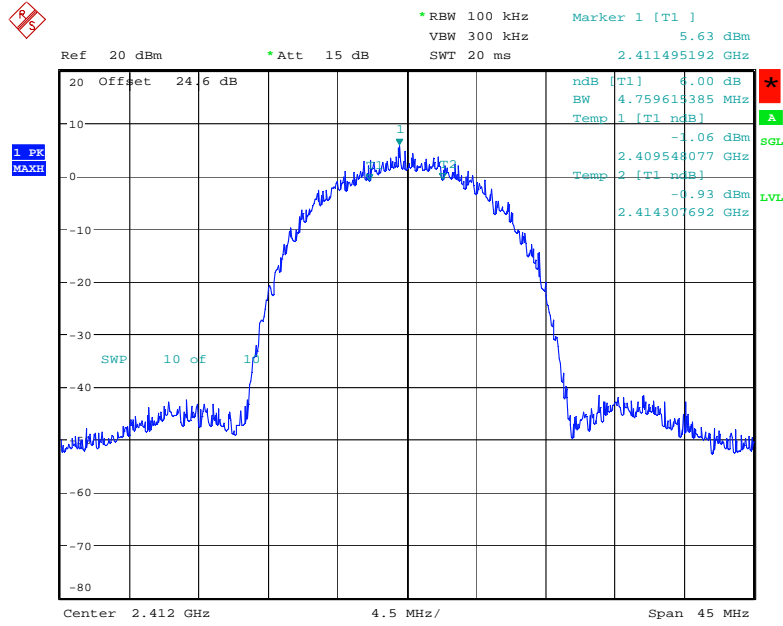
1. RBW \geq 100 kHz
2. VBW \geq RBW
3. Sweep = auto
4. Detector function = peak
5. Trace = max hold

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 6 dB down one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 6 dB bandwidth of the emission. The same procedure was repeated for 20 dB bandwidth.

Measurement Results

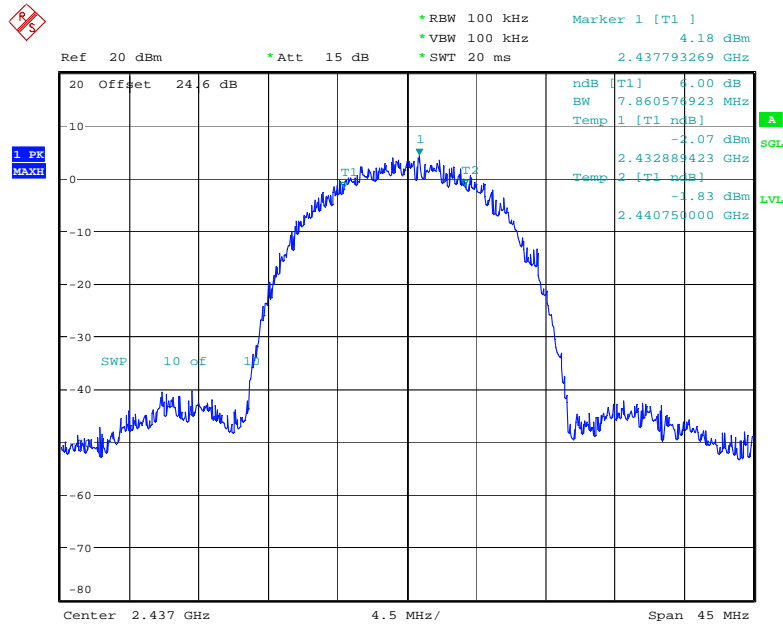
See attached

802.11 b @ 11Mbps



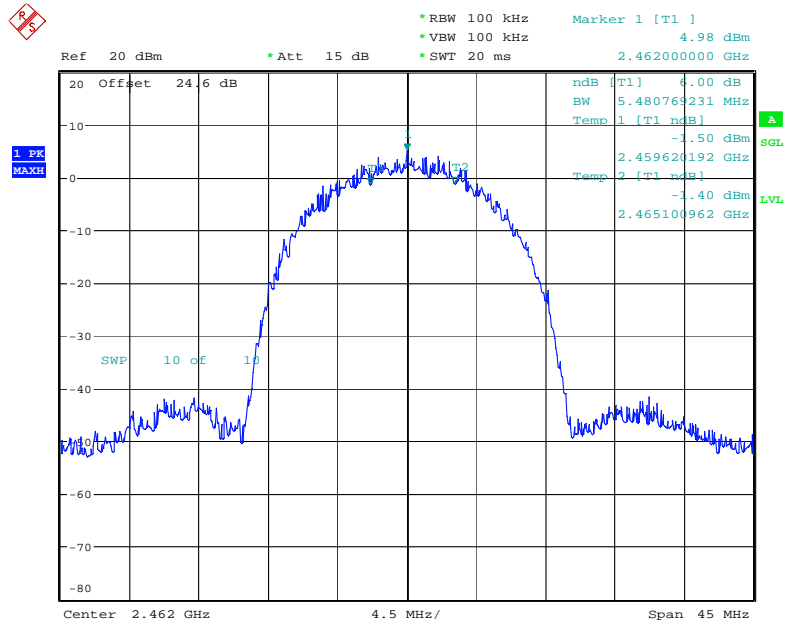
Date: 30.OCT.2009 03:48:15

6dB Bandwidth Channel 1 @ 11Mbps



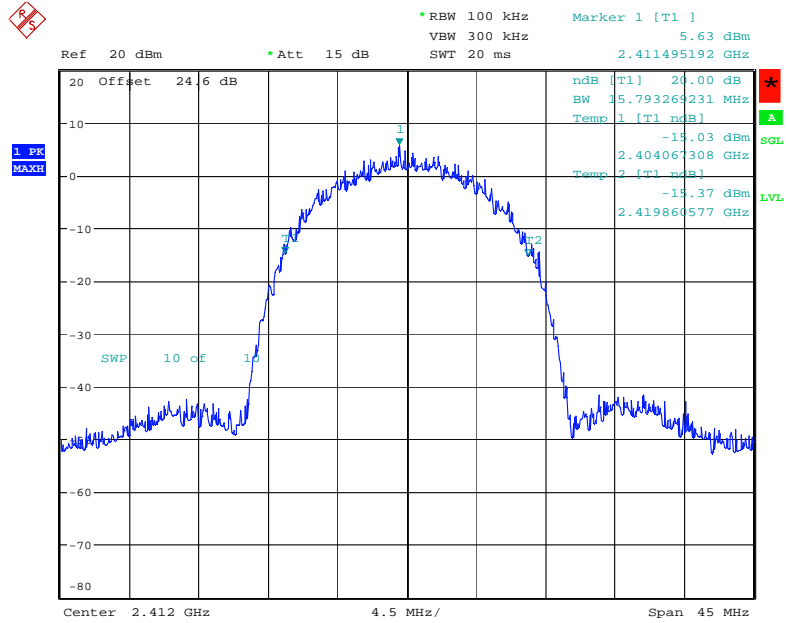
Date: 30.OCT.2009 05:40:31

6dB Bandwidth Channel 6 @ 11Mbps



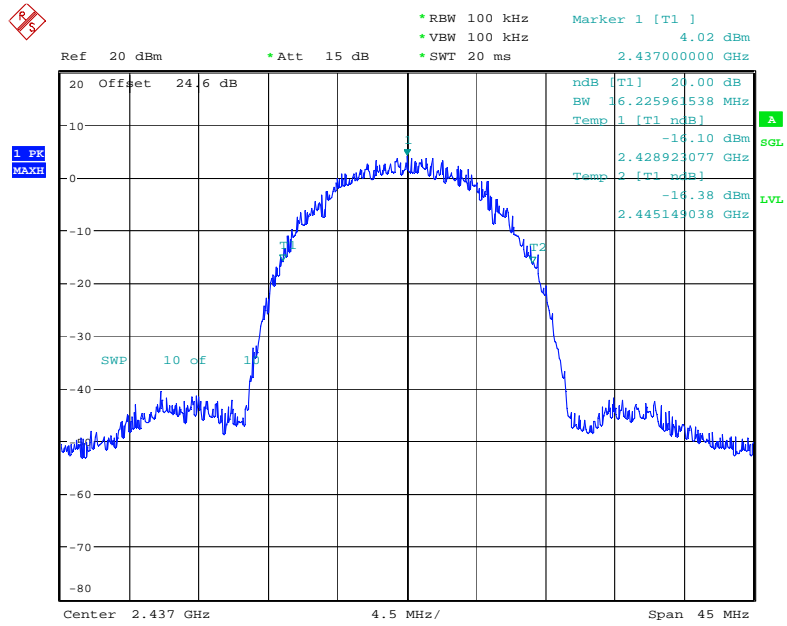
Date: 30.OCT.2009 05:48:42

6dB Bandwidth Channel 11 @ 11Mbps



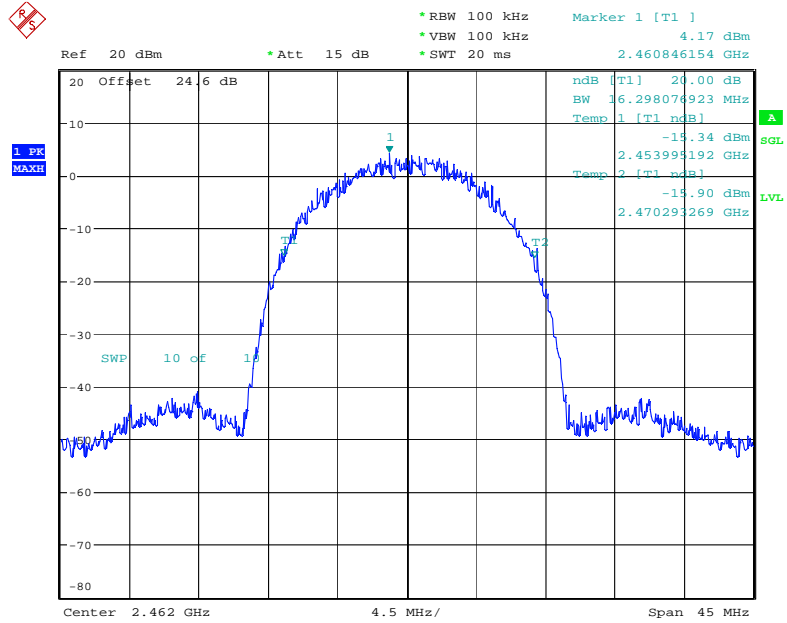
Date: 30.OCT.2009 03:49:12

20dB Bandwidth Channel 1 @ 11Mbps



Date: 30.OCT.2009 05:42:03

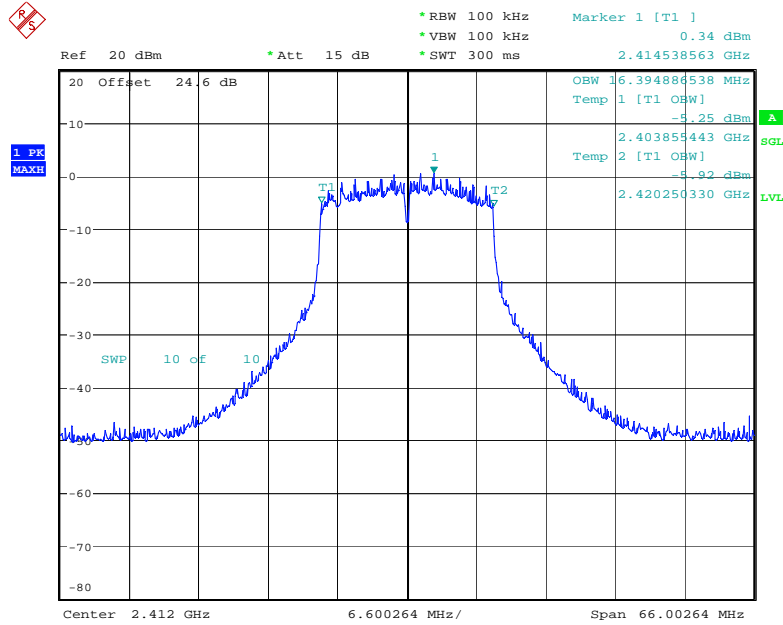
20dB Bandwidth Channel 6 @ 11Mbps



Date: 30.OCT.2009 05:49:38

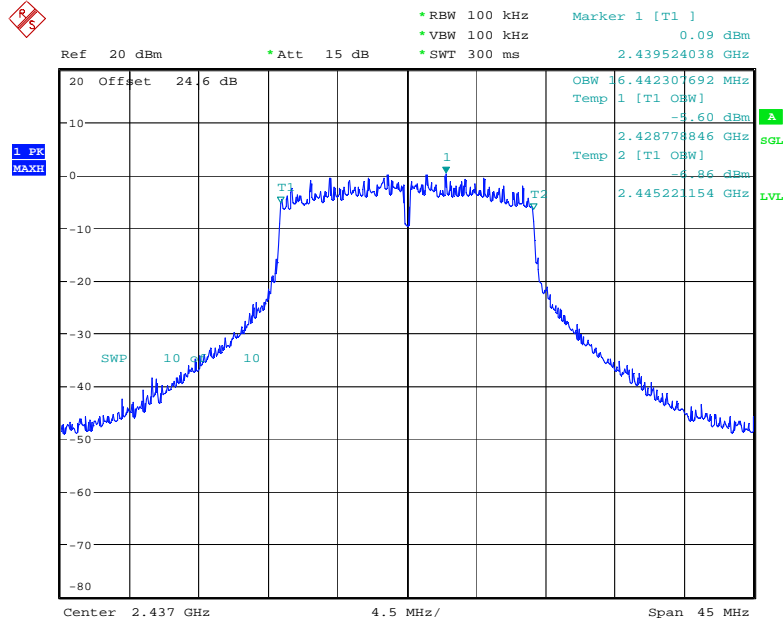
20dB Bandwidth Channel 11 @ 11Mbps

802.11 g @ 54Mbps



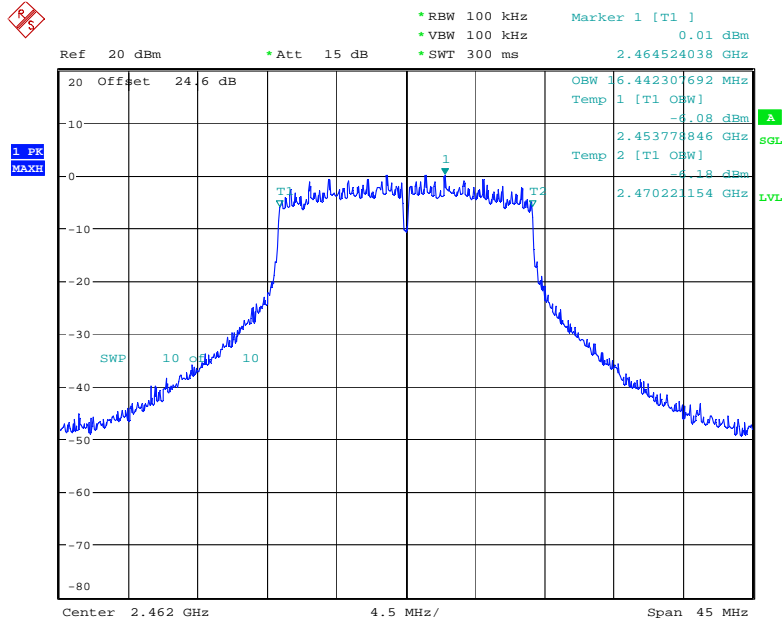
Date: 30.OCT.2009 06:07:42

6dB Bandwidth Channel 1 @ 54Mbps



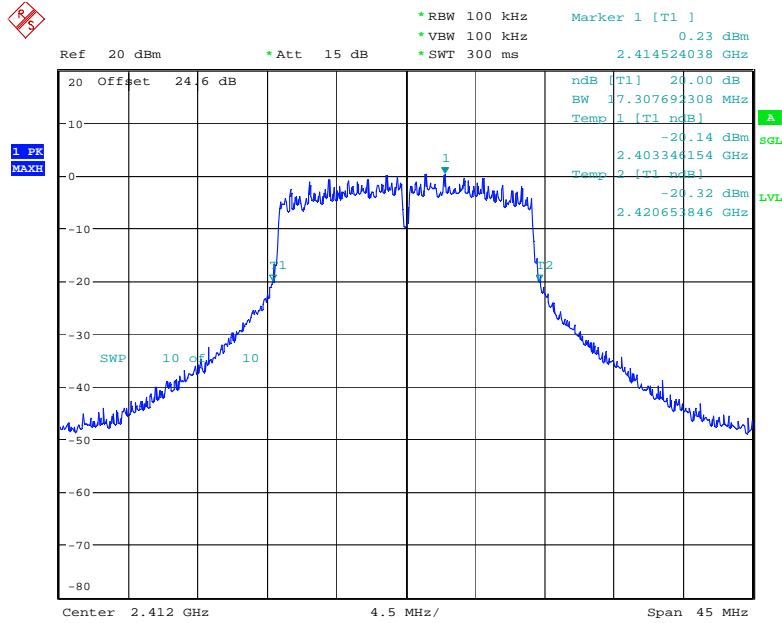
Date: 30.OCT.2009 06:17:26

6dB Bandwidth Channel 6 @ 54Mbps



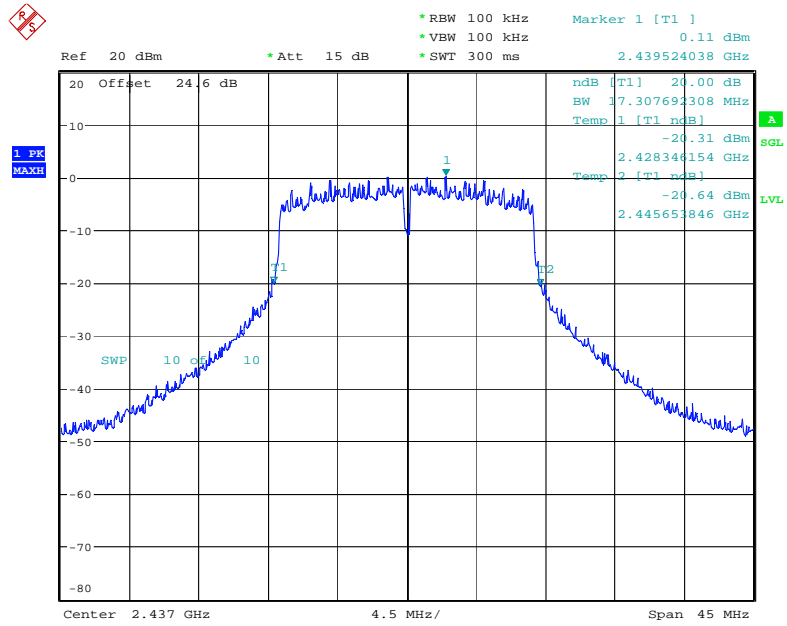
Date: 30.OCT.2009 06:26:22

6dB Bandwidth Channel 11 @ 54Mbps



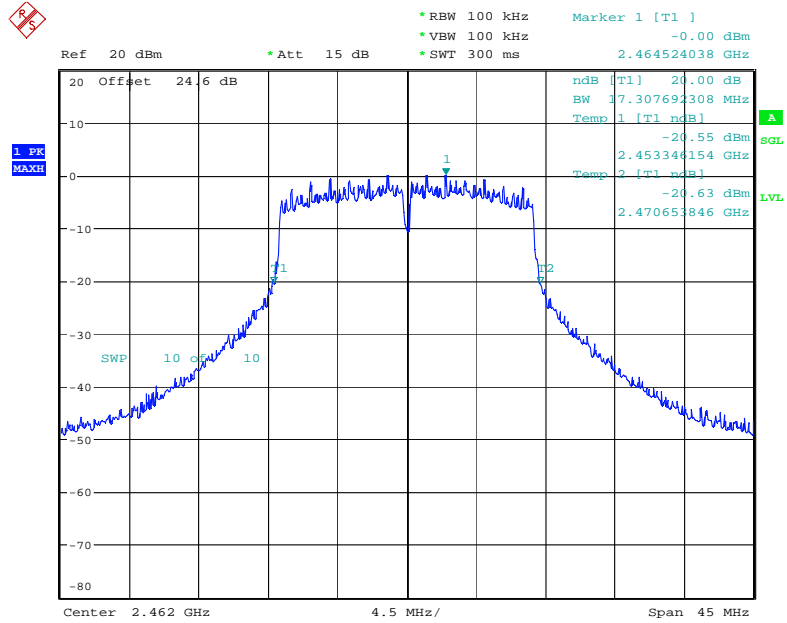
Date: 30.OCT.2009 06:09:58

20dB Bandwidth Channel 1 @ 54Mbps



Date: 30.OCT.2009 06:18:54

20dB Bandwidth Channel 6 @ 54Mbps



Date: 30.OCT.2009 06:27:27

20dB Bandwidth Channel 11 @ 54Mbps

PEAK OUTPUT POWER

CFR 47 Part 15.247

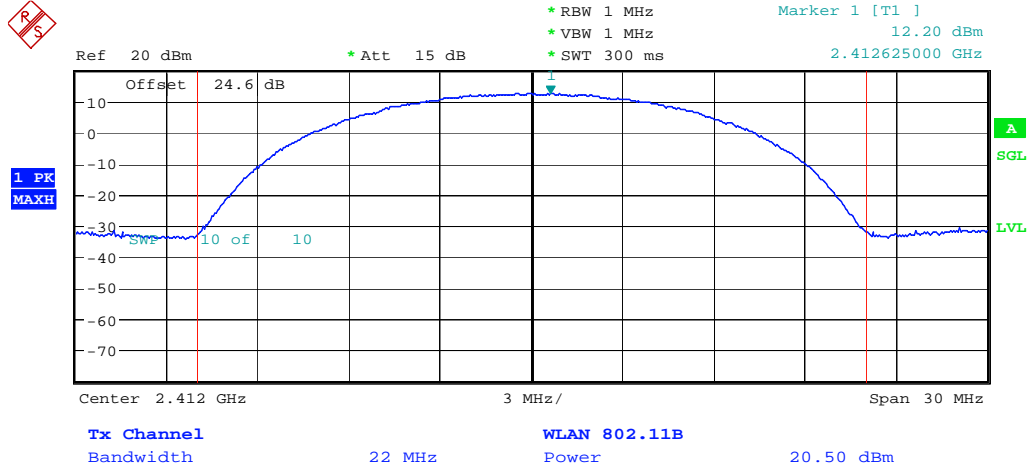
Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the Spectrum analyzer through a specialized RF connector and a 20dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

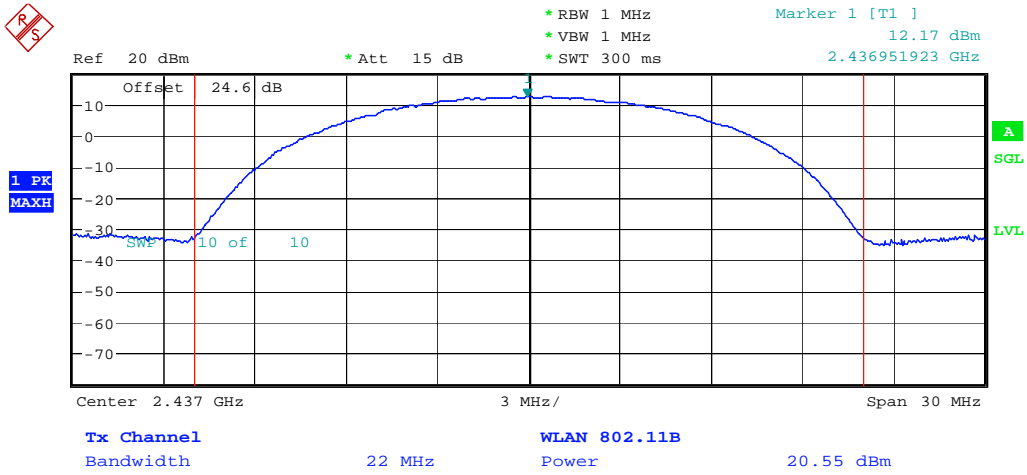
See Attached

802.11 b @ 11Mbps



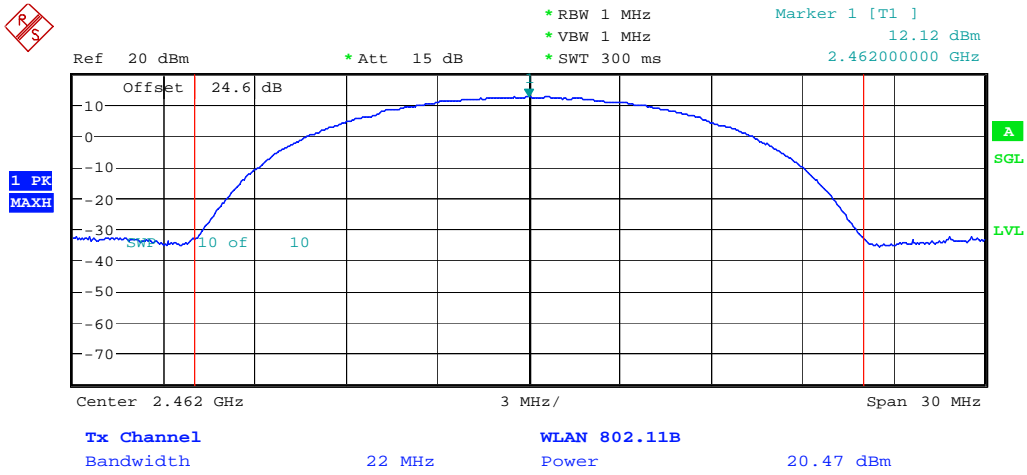
Date: 30.OCT.2009 05:33:43

Max. Power Channel 1 @ 11Mbps



Date: 30.OCT.2009 05:44:13

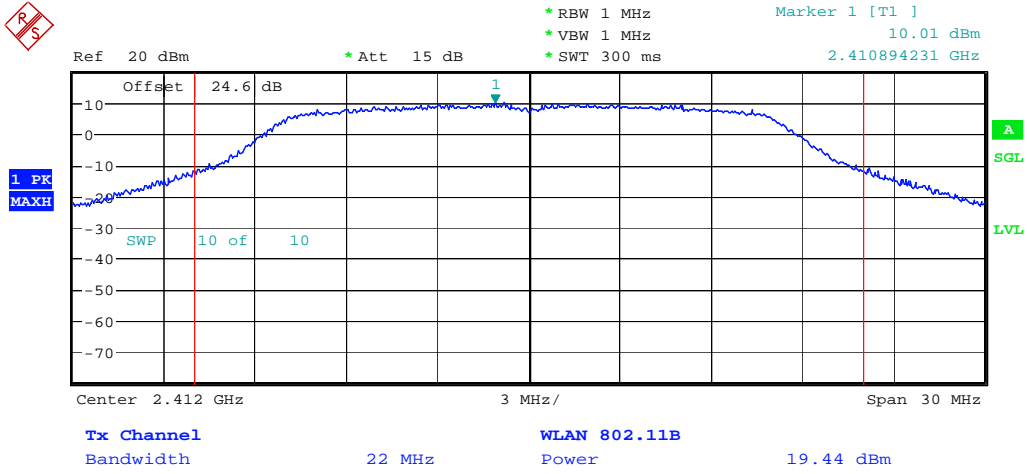
Max. Power Channel 6 @ 11Mbps



Date: 30.OCT.2009 05:51:25

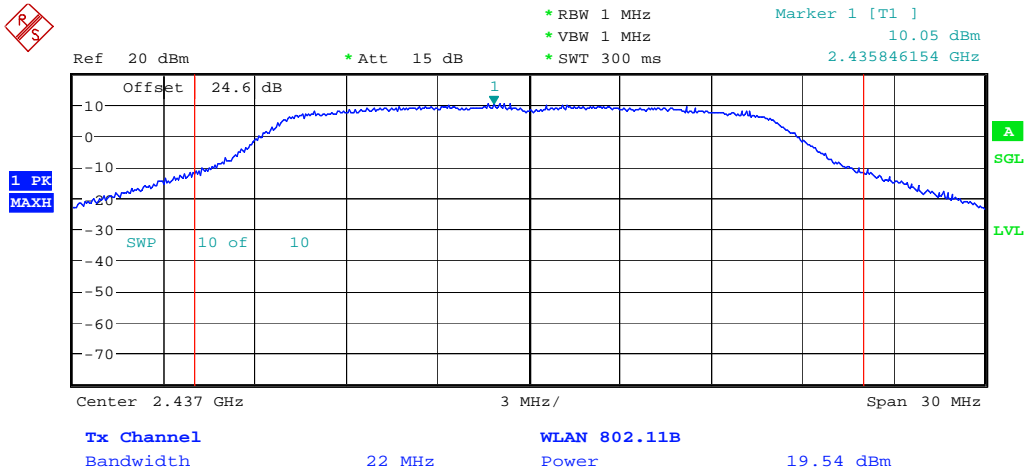
Max. Power Channel 11 @ 11Mbps

802.11 g @ 54Mbps



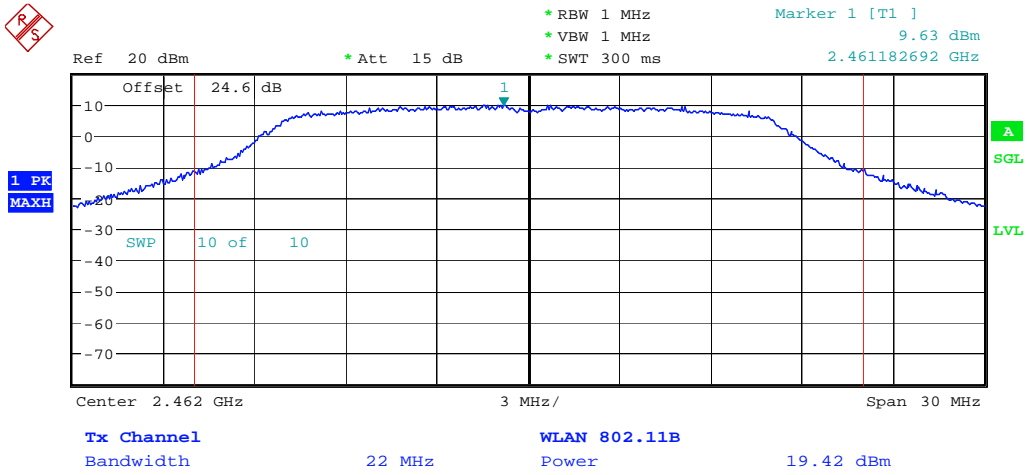
Date: 30.OCT.2009 06:12:12

Max. Power Channel 1 @ 54Mbps



Date: 30.OCT.2009 06:21:00

Max. Power Channel 6 @ 54Mbps



Date: 30.OCT.2009 06:29:42

Max. Power Channel 11 @ 54Mbps

Power Spectral Density

CFR 47 Part 15.247 (d)

Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 20dB passive attenuator. A fully charged battery was used for the supply voltage.

The WLAN DSSS function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = 300kHz
2. VBW =30kHz
3. RBW=3kHz
4. Sweep = 50ms
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate.

Measurement Results

2412 MHz	2437MHz	2462MHz
-8.73dBm	-8.81dBm	-8.94dBm

802.11 b 11Mbps

2412 MHz	2437MHz	2462MHz
-22.27dBm	-23.15dBm	-23.30dBm

802.11 g 54Mbps

SPURIOUS RF CONDUCTED EMISSIONS

CFR 47 Part 15.247

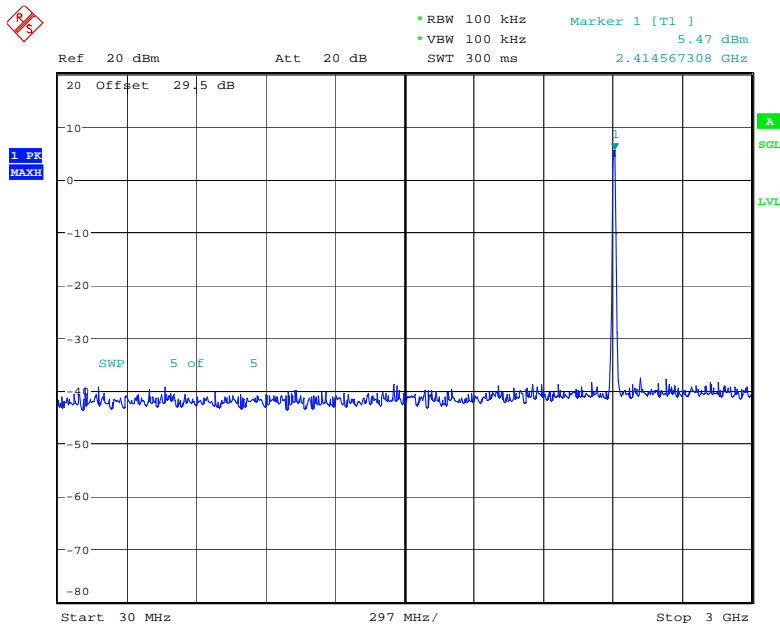
Measurement Procedure

The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 20dB passive attenuator. A fully charged battery was used for the supply voltage.

Measurement Results

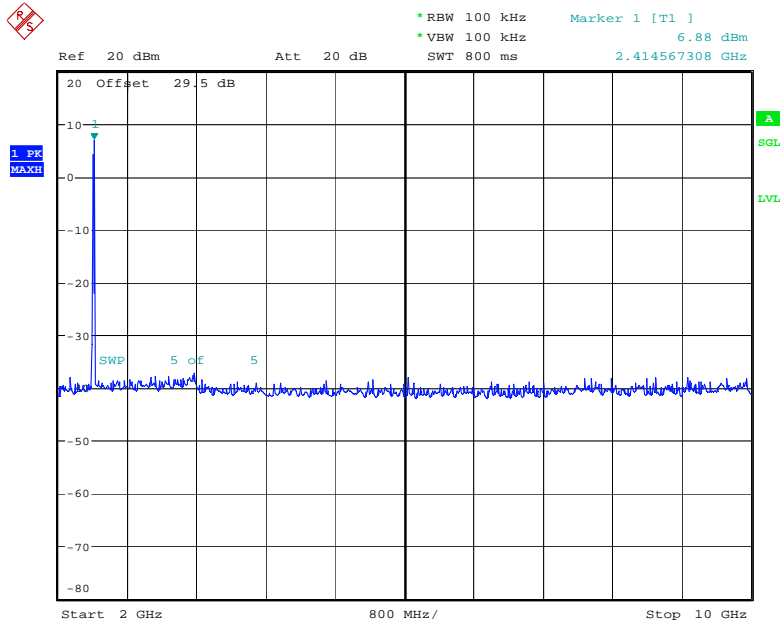
See attached:

802.11 b @ 11Mbps



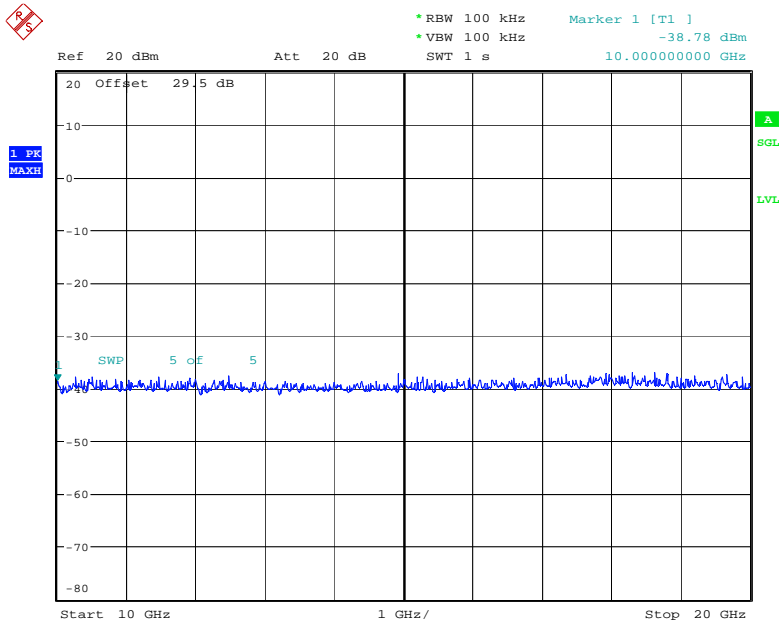
Date: 11.NOV.2009 10:55:11

Conducted Spurious Emissions 30-3000MHz (Low Channel)



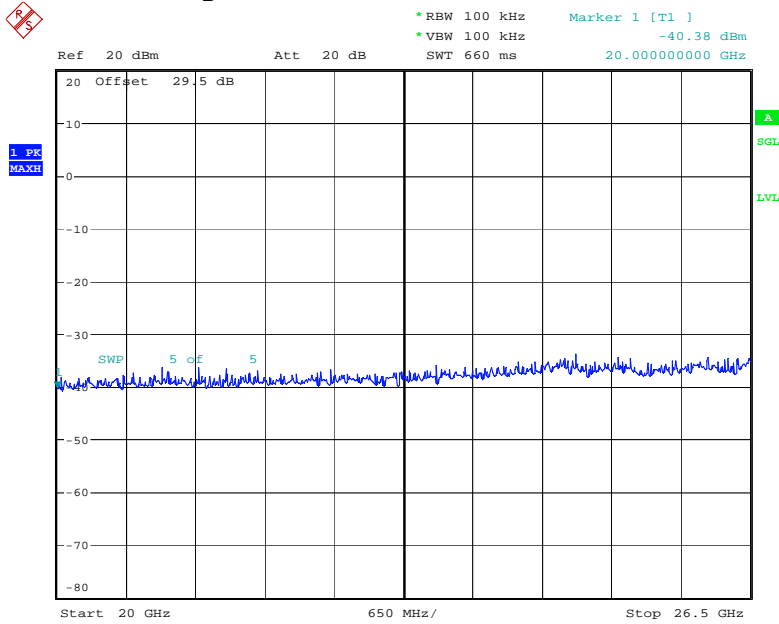
Date: 11.NOV.2009 10:55:32

Conducted Spurious Emissions 2-10GHz (Low Channel)



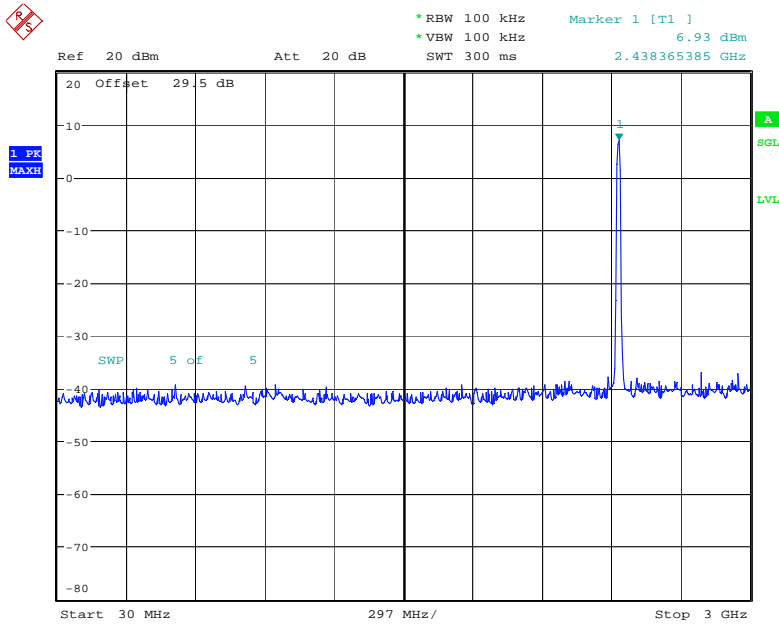
Date: 11.NOV.2009 10:55:52

Conducted Spurious Emissions 10-20GHz (Low Channel)



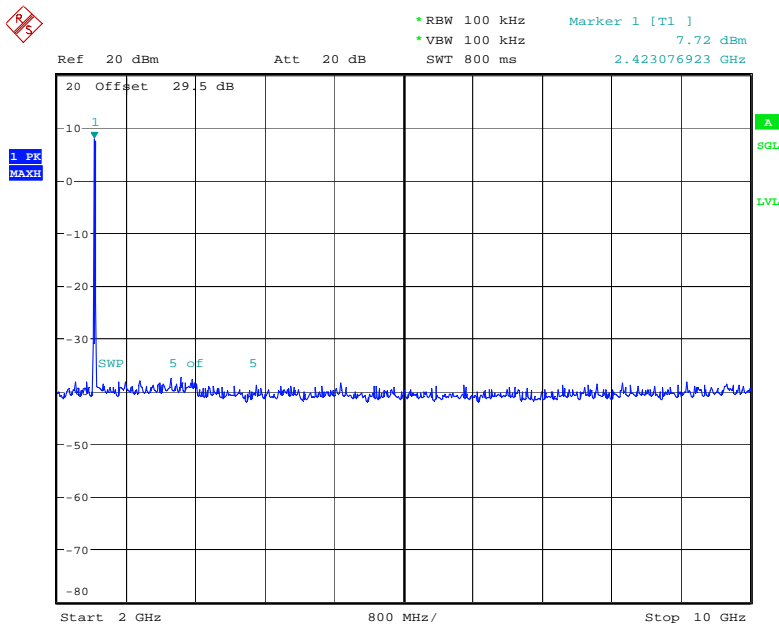
Date: 11.NOV.2009 10:56:15

Conducted Spurious Emissions 20-26.5GHz (Low Channel)



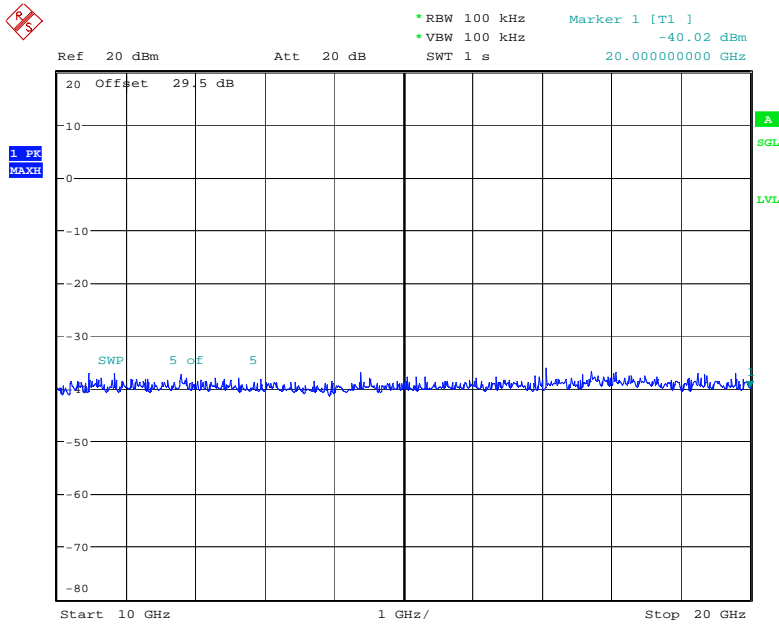
Date: 11.NOV.2009 10:58:13

Conducted Spurious Emissions 30-3000MHz (Mid Channel)



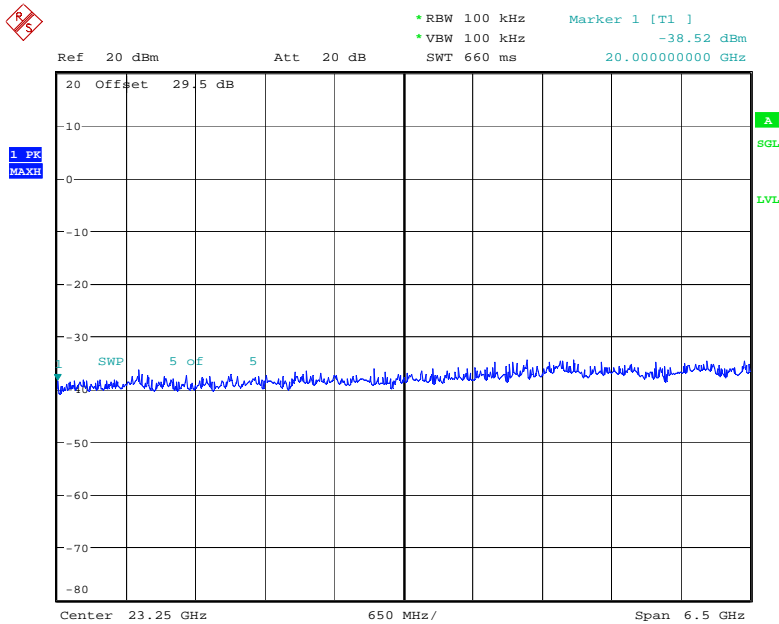
Date: 11.NOV.2009 10:57:48

Conducted Spurious Emissions 2-10GHz (Mid Channel)



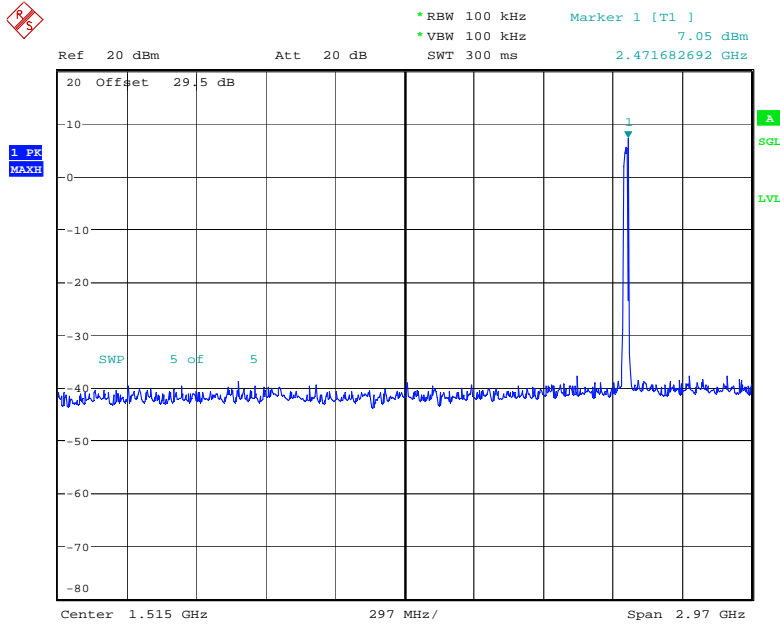
Date: 11.NOV.2009 10:57:22

Conducted Spurious Emissions 10-20GHz (Mid Channel)



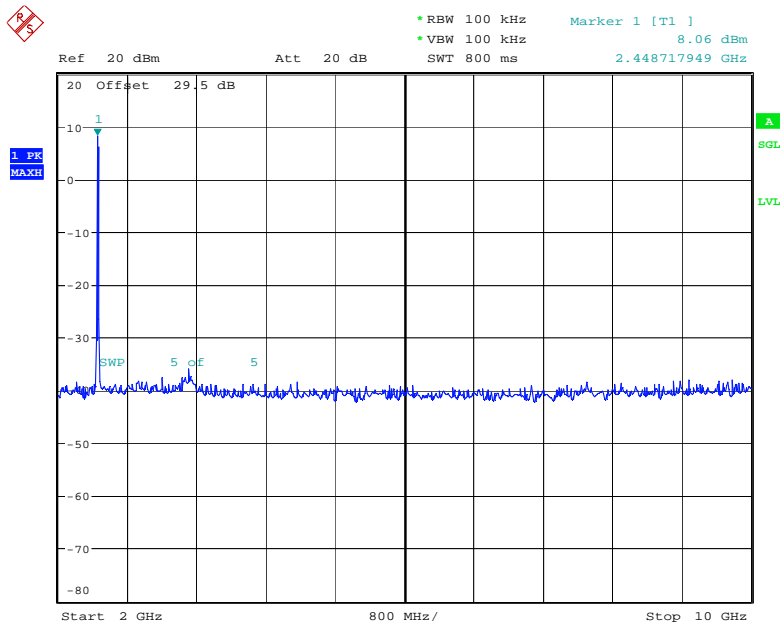
Date: 11.NOV.2009 10:56:48

Conducted Spurious Emissions 20-26.5GHz (Mid Channel)



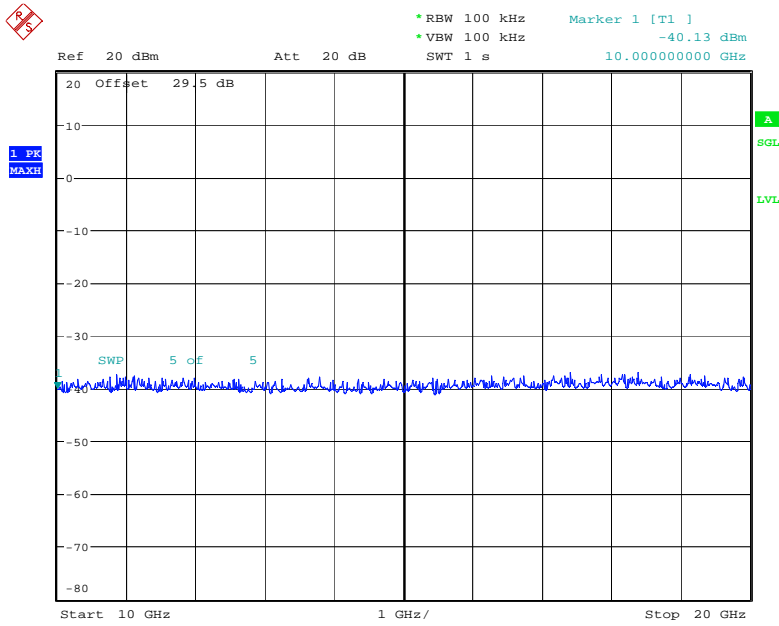
Date: 11.NOV.2009 10:58:47

Conducted Spurious Emissions 30-3000MHz (High Channel)



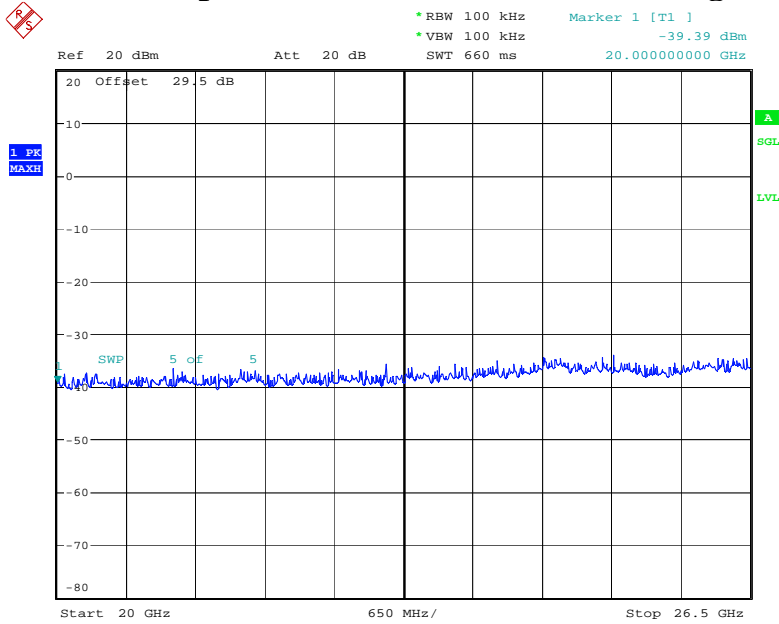
Date: 11.NOV.2009 10:59:14

Conducted Spurious Emissions 2-10GHz (High Channel)



Date: 11.NOV.2009 10:59:41

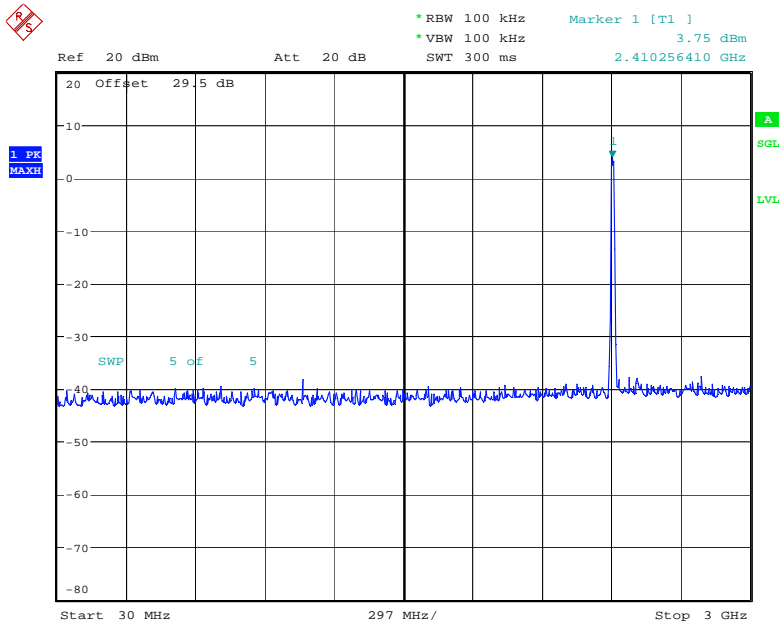
Conducted Spurious Emissions 10-20GHz (High Channel)



Date: 11.NOV.2009 11:00:03

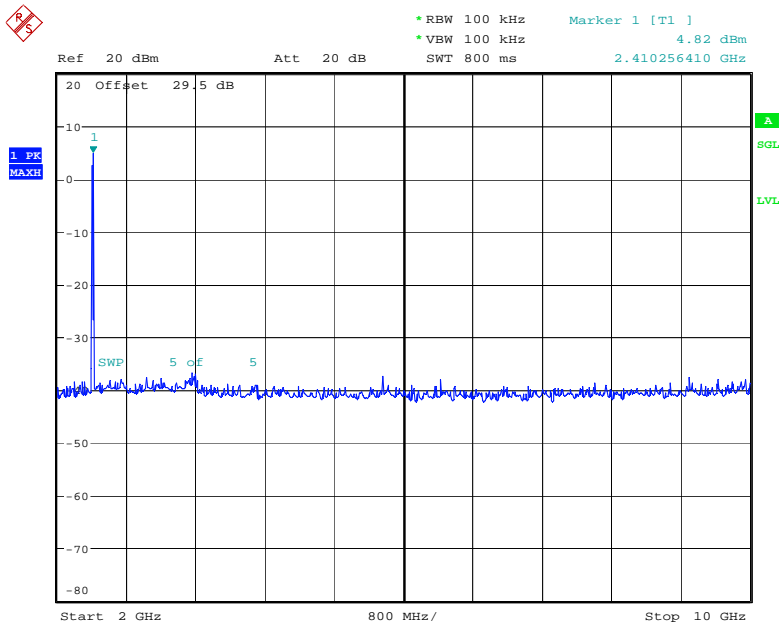
Conducted Spurious Emissions 20-26.5GHz (High Channel)

802.11 g @ 54Mbps



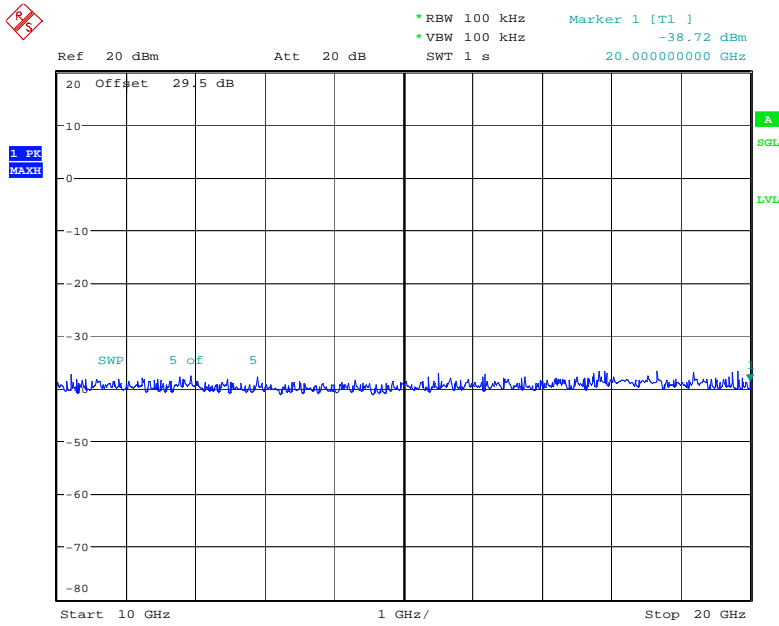
Date: 11.NOV.2009 11:02:23

Conducted Spurious Emissions 30-3000MHz (Low Channel)



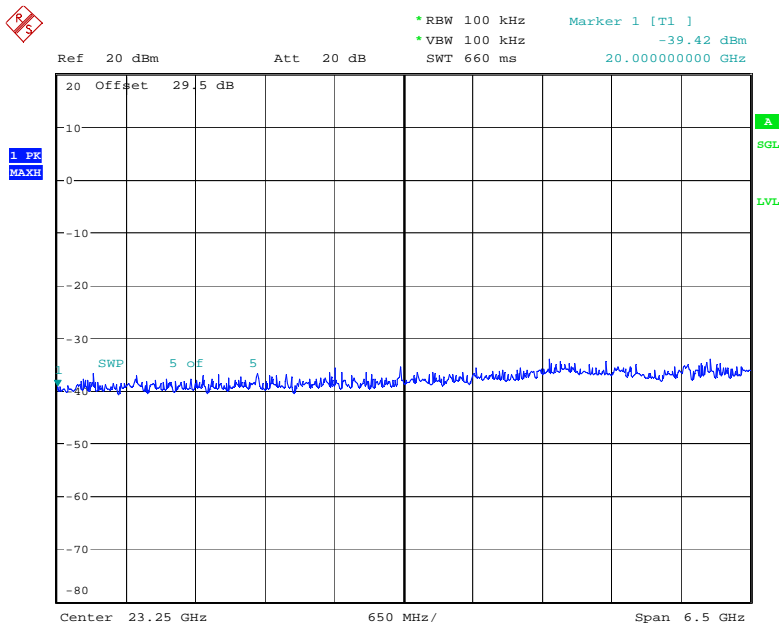
Date: 11.NOV.2009 11:02:00

Conducted Spurious Emissions 2-10GHz (Low Channel)



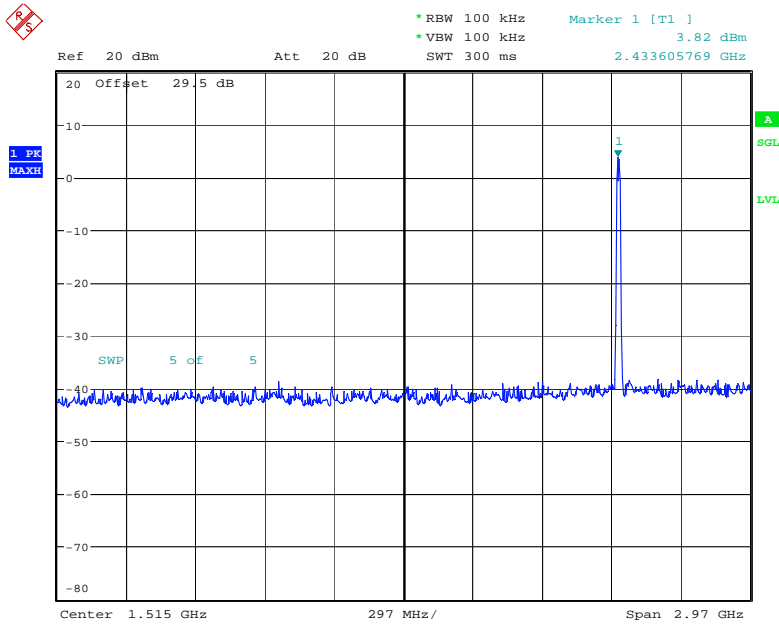
Date: 11.NOV.2009 11:01:13

Conducted Spurious Emissions 10-20GHz (Low Channel)



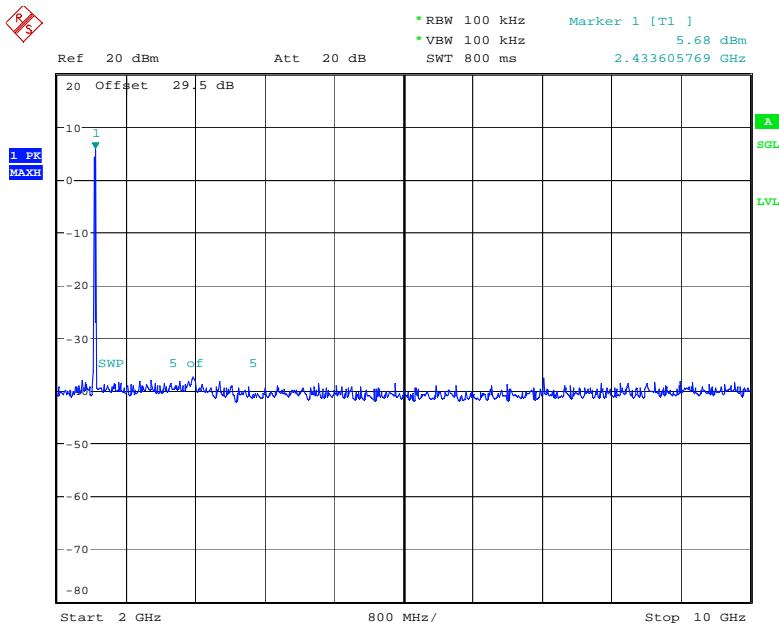
Date: 11.NOV.2009 11:00:47

Conducted Spurious Emissions 20-26.5GHz (Low Channel)



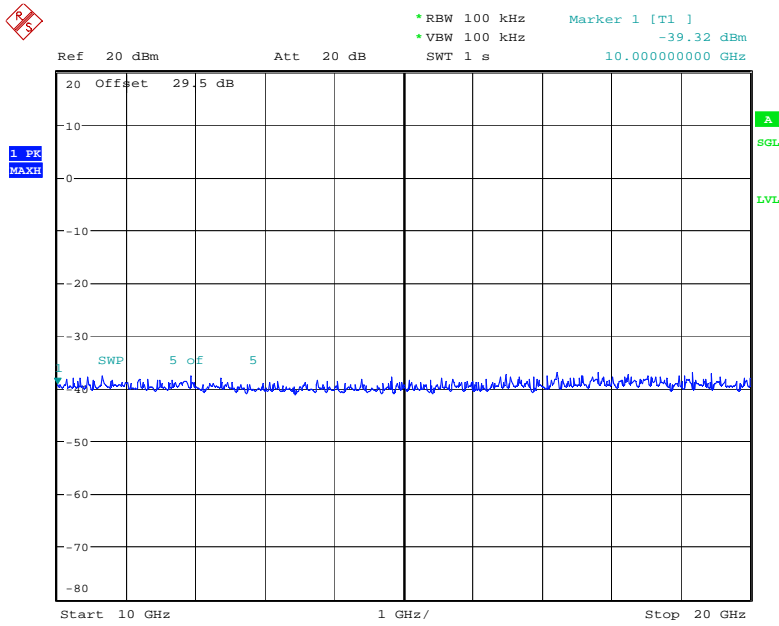
Date: 11.NOV.2009 11:03:02

Conducted Spurious Emissions 30-3000MHz (Mid Channel)



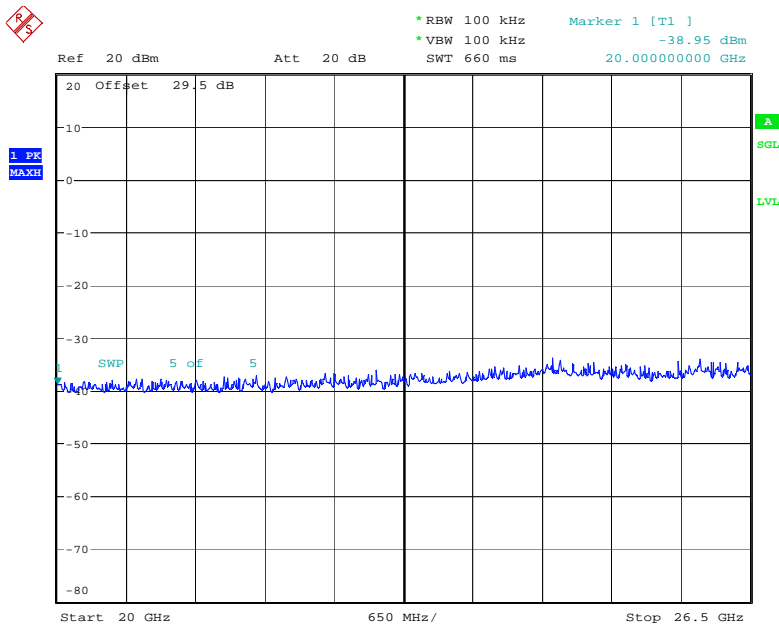
Date: 11.NOV.2009 11:03:19

Conducted Spurious Emissions 2-10GHz (Mid Channel)



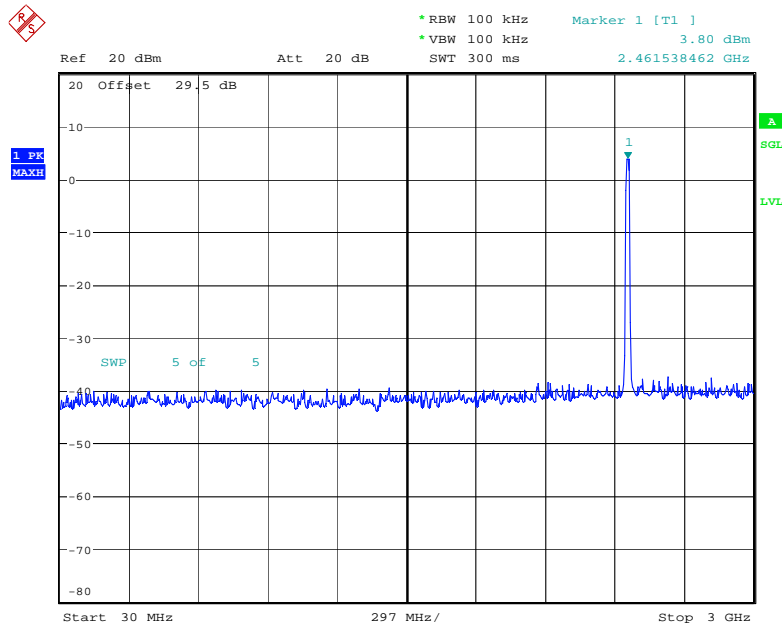
Date: 11.NOV.2009 11:03:46

Conducted Spurious Emissions 10-20GHz (Mid Channel)



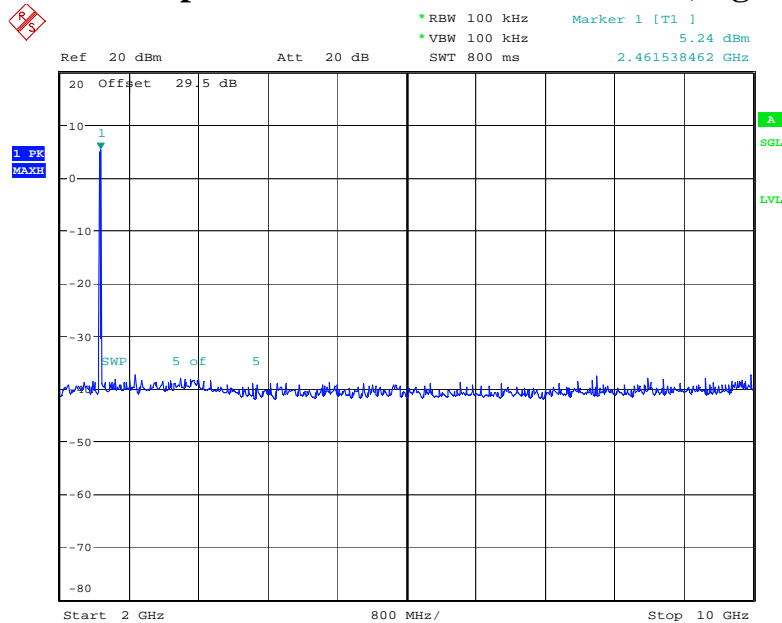
Date: 11.NOV.2009 11:04:37

Conducted Spurious Emissions 20-26.5GHz (Mid Channel)



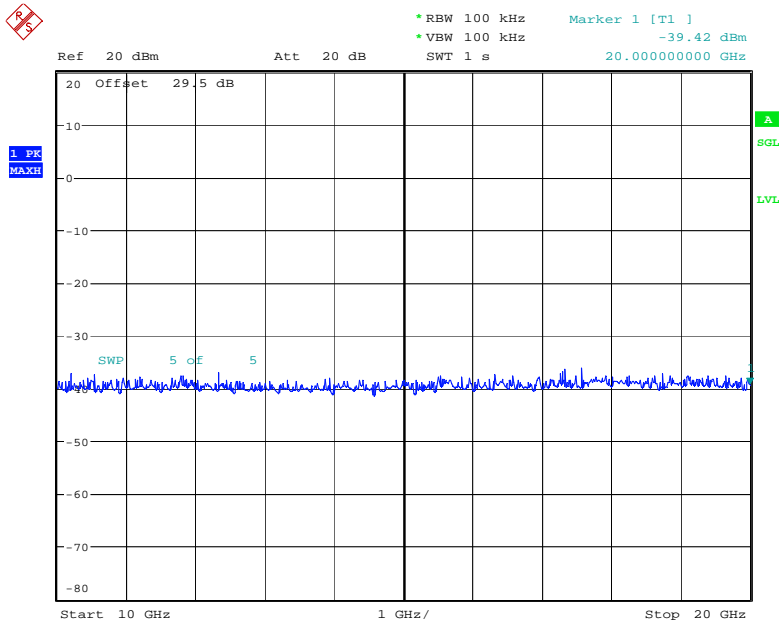
Date: 11.NOV.2009 11:06:43

Conducted Spurious Emissions 30-3000MHz (High Channel)



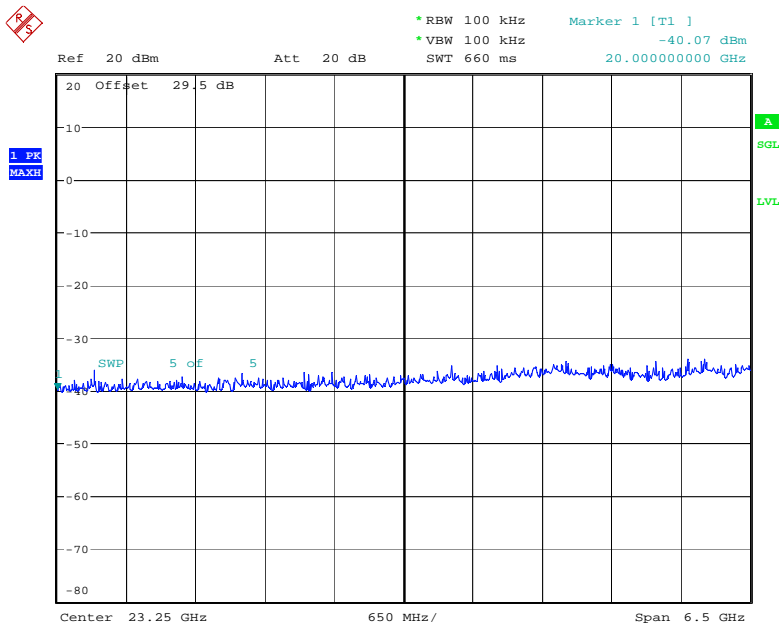
Date: 11.NOV.2009 11:06:16

Conducted Spurious Emissions 2-10GHz (High Channel)



Date: 11.NOV.2009 11:05:43

Conducted Spurious Emissions 10-20GHz (High Channel)



Date: 11.NOV.2009 11:05:01

Conducted Spurious Emissions 20-26.5GHz (High Channel)

AC LINE CONDUCTED EMISSIONS

CFR 47 Part 15.207

Measurement Procedure

Measured levels of ac power line conducted emission shall be the radio-noise voltage from the line probe or across the 50 Ω LISN port, where permitted, terminated into a 50 Ω noise meter, or where permitted or required, the radio-noise current on the power line sensed by a current probe.

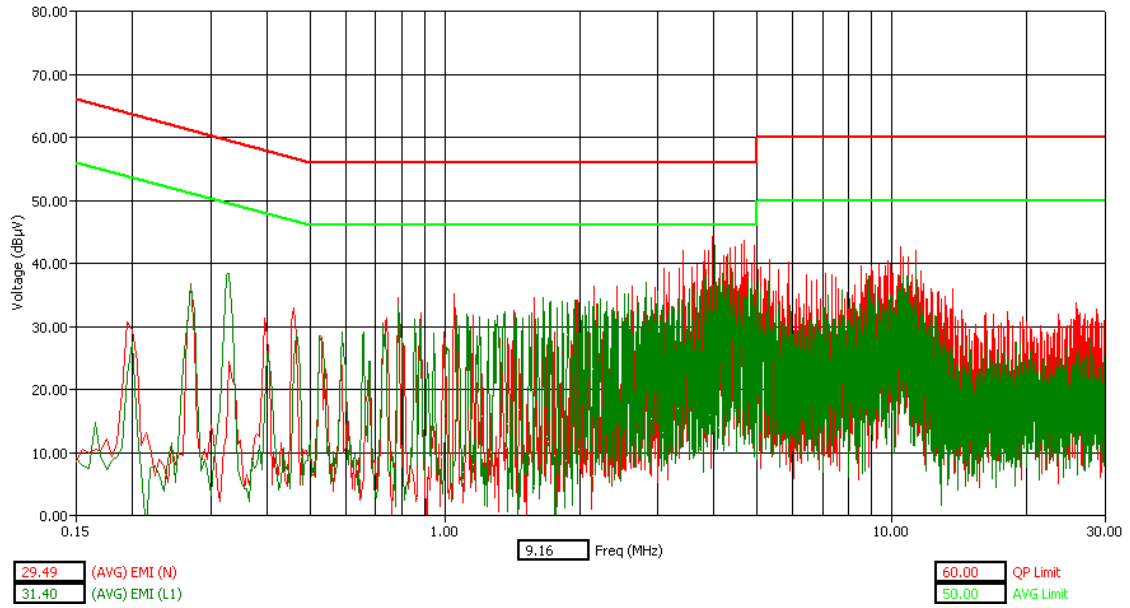
All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. Equipment shall be tested with power cords that are normally supplied using an LISN, the 50 Ω measuring port is terminated by a 50 Ω radio-noise meter or a 50 Ω resistive load. All other ports are terminated in 50 Ω .

Detectors – Peak and Average Detector

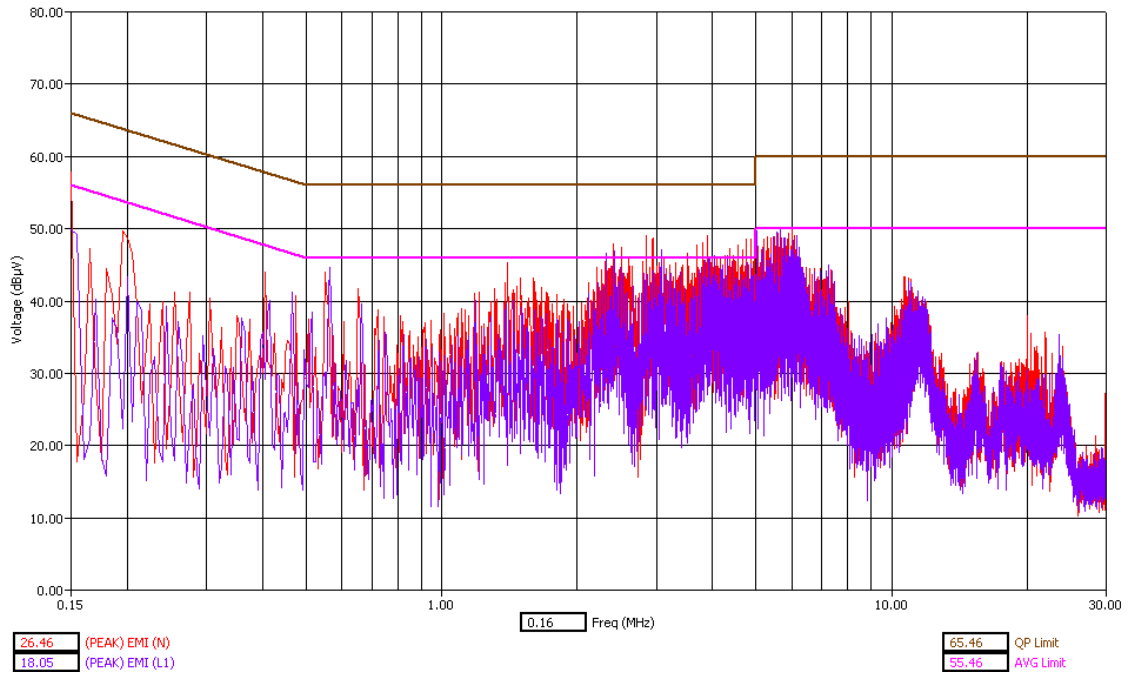
Measurement Results

See attached:

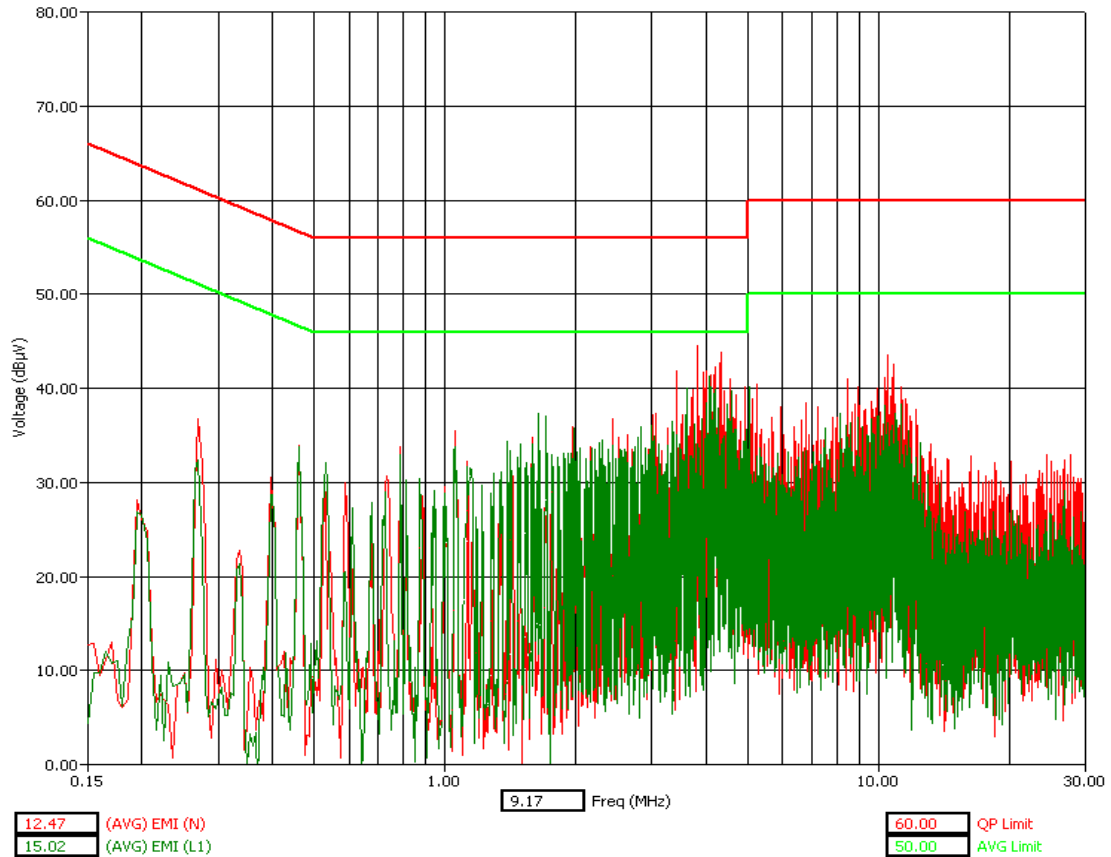
802.11b @ 11Mbps



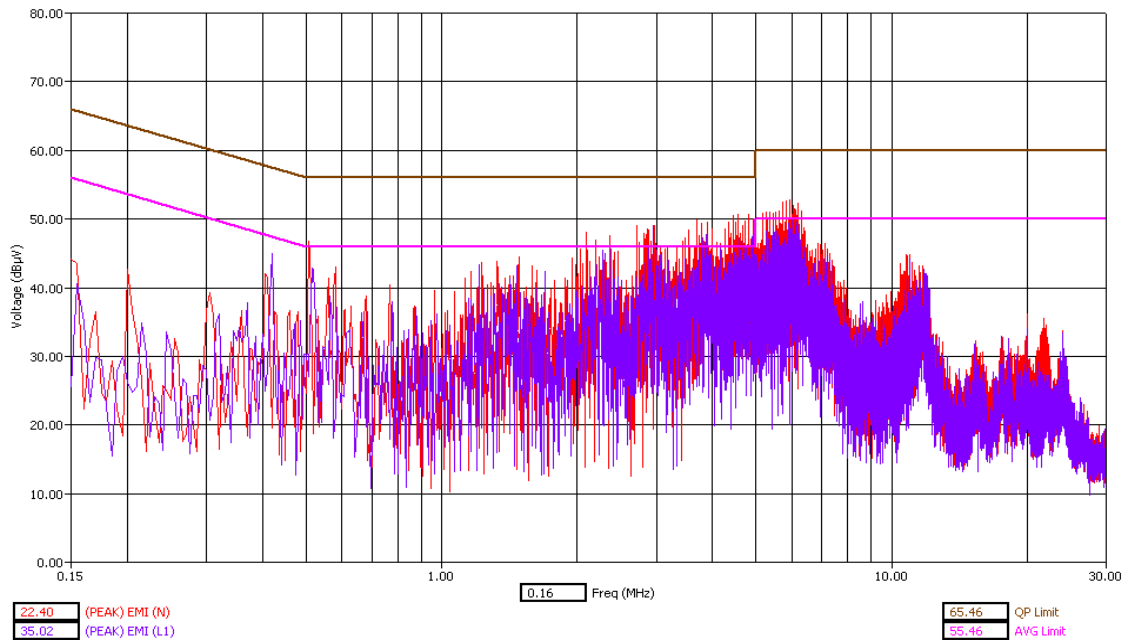
WLAN Channel 1 - Tx Mode - AVG Detector



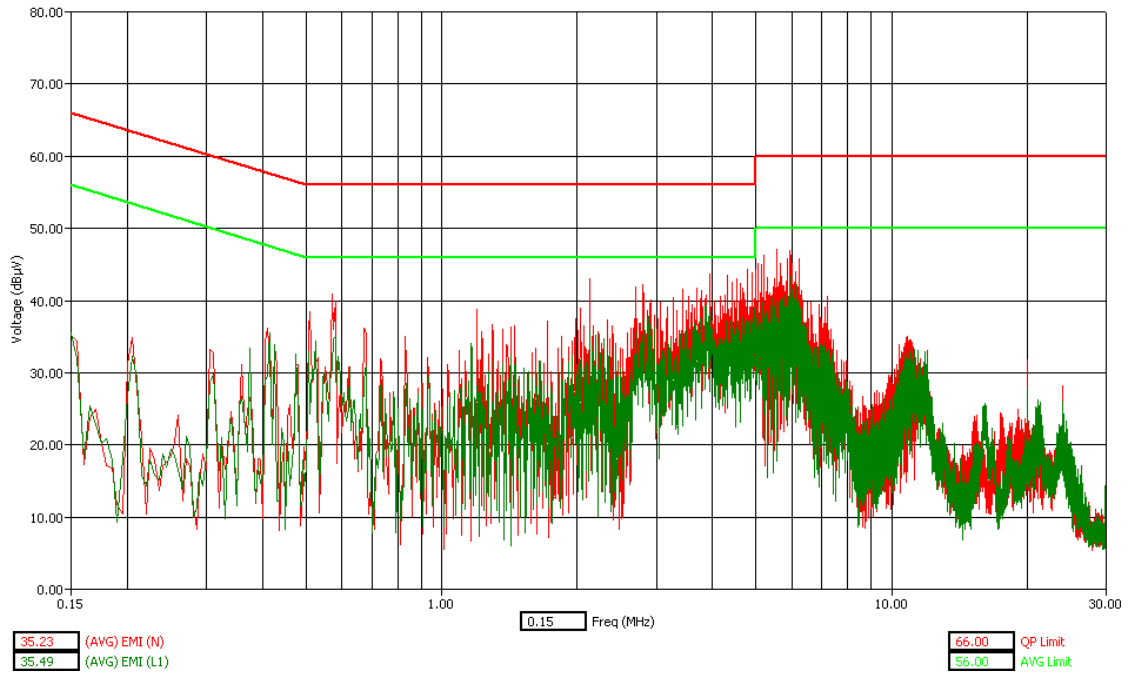
WLAN Channel 1 - Tx Mode - Peak Detector



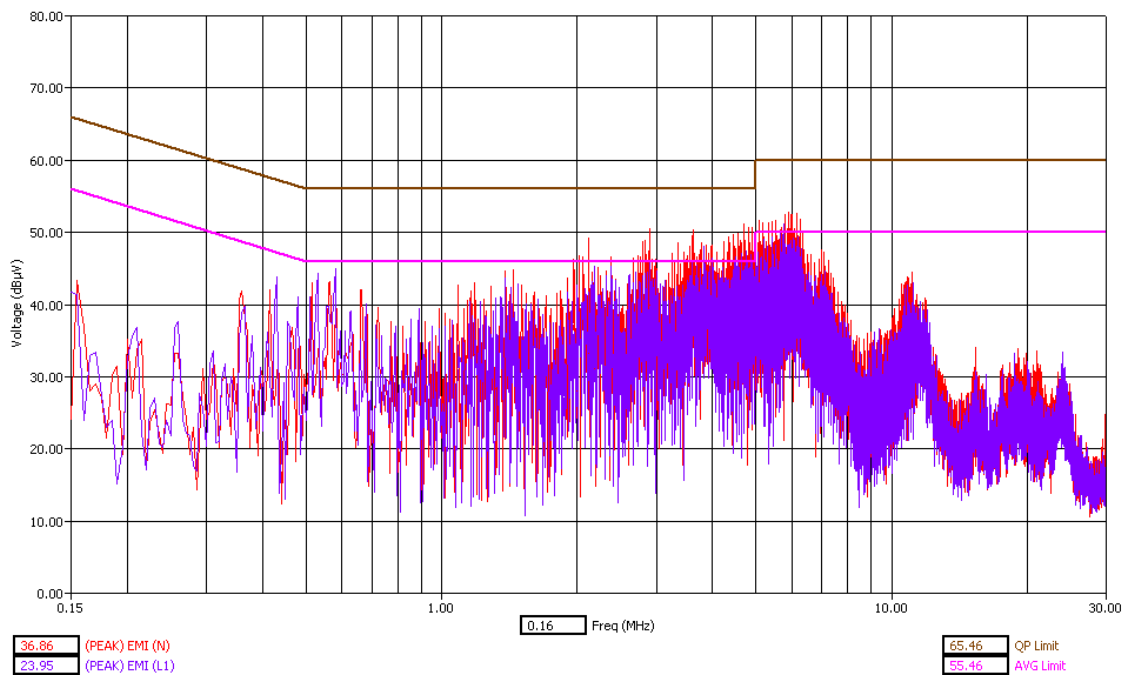
WLAN Channel 6 - Tx Mode - AVG Detector



WLAN Channel 6 - Tx Mode - Peak Detector

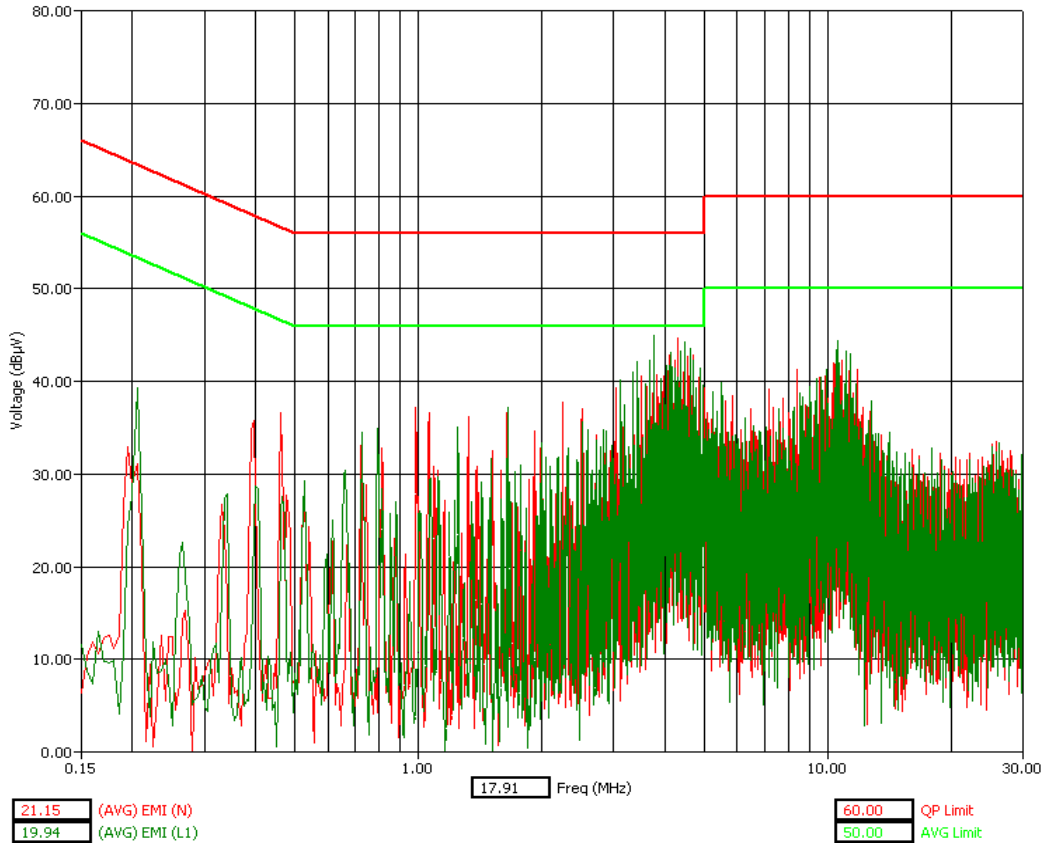


WLAN Channel 11 - Tx Mode - AVG Detector

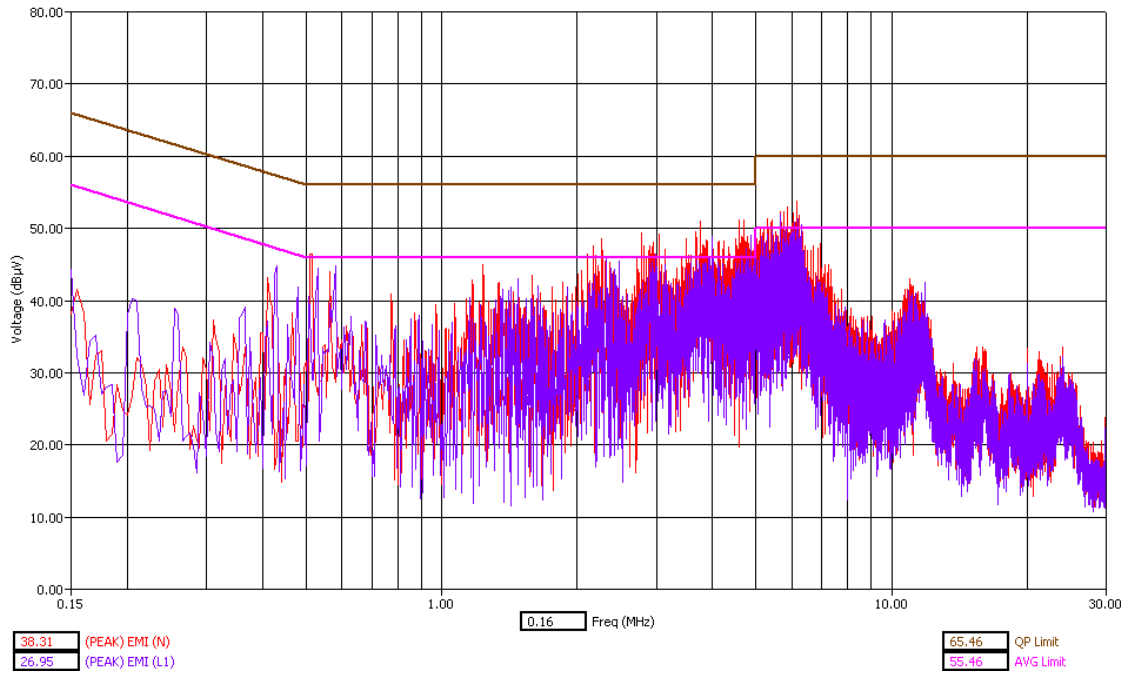


WLAN Channel 11 - Tx Mode - Peak Detector

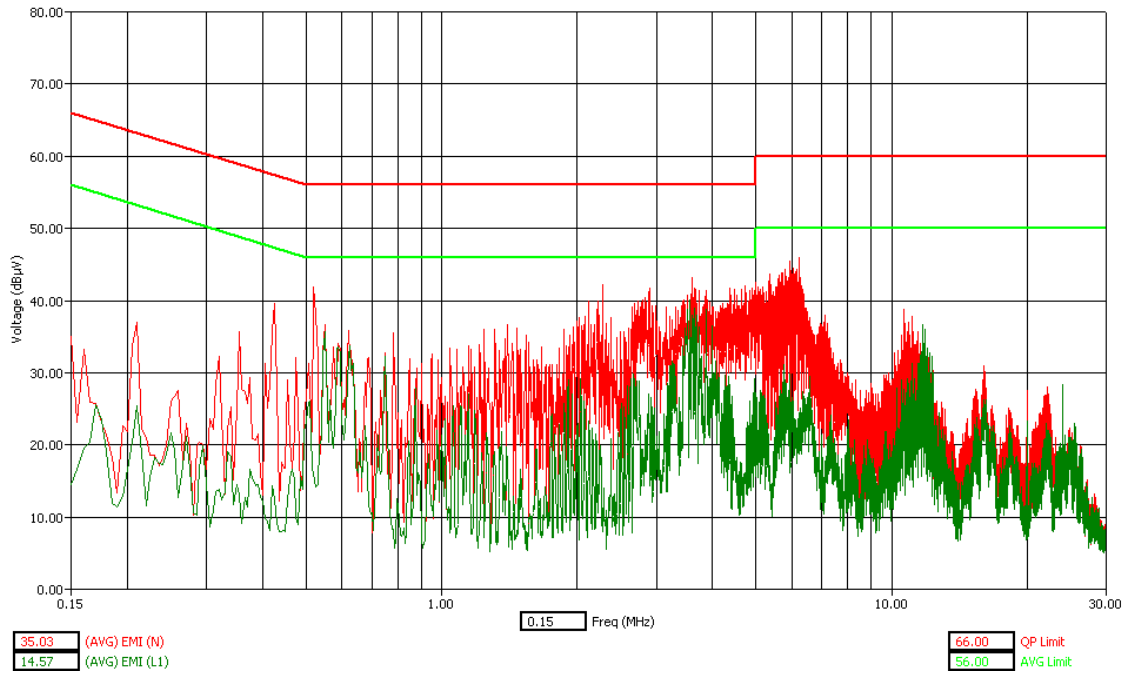
802.11g @ 54Mbps



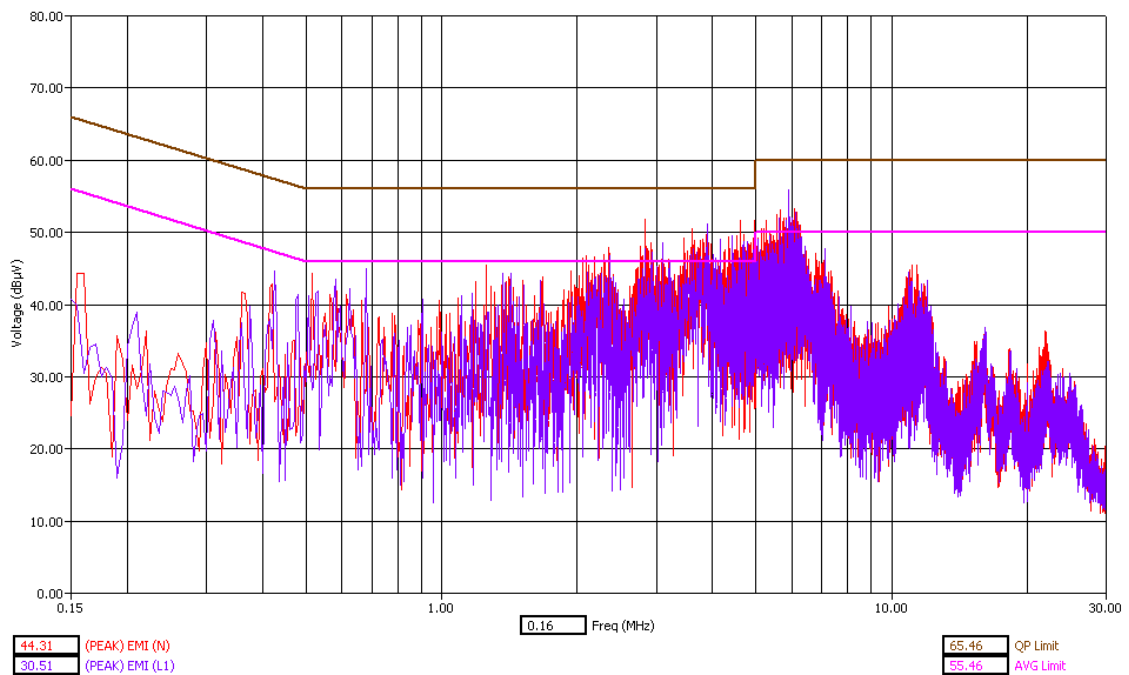
WLAN Channel 1 - Tx Mode - AVG Detector



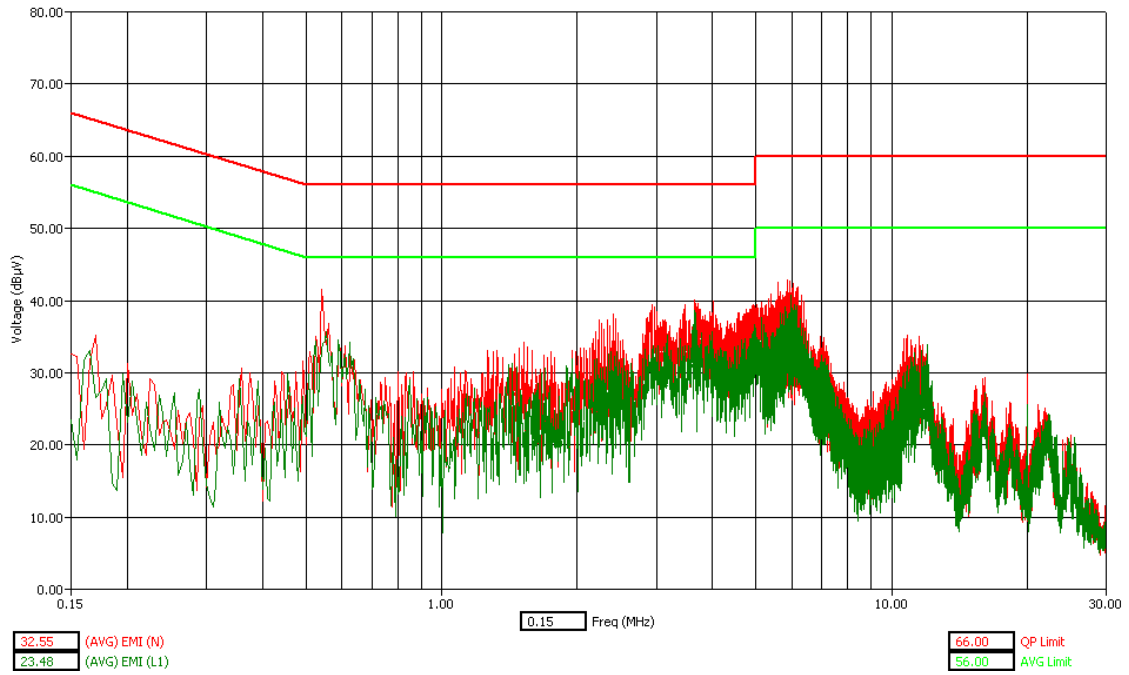
WLAN Channel 1 - Tx Mode - Peak Detector



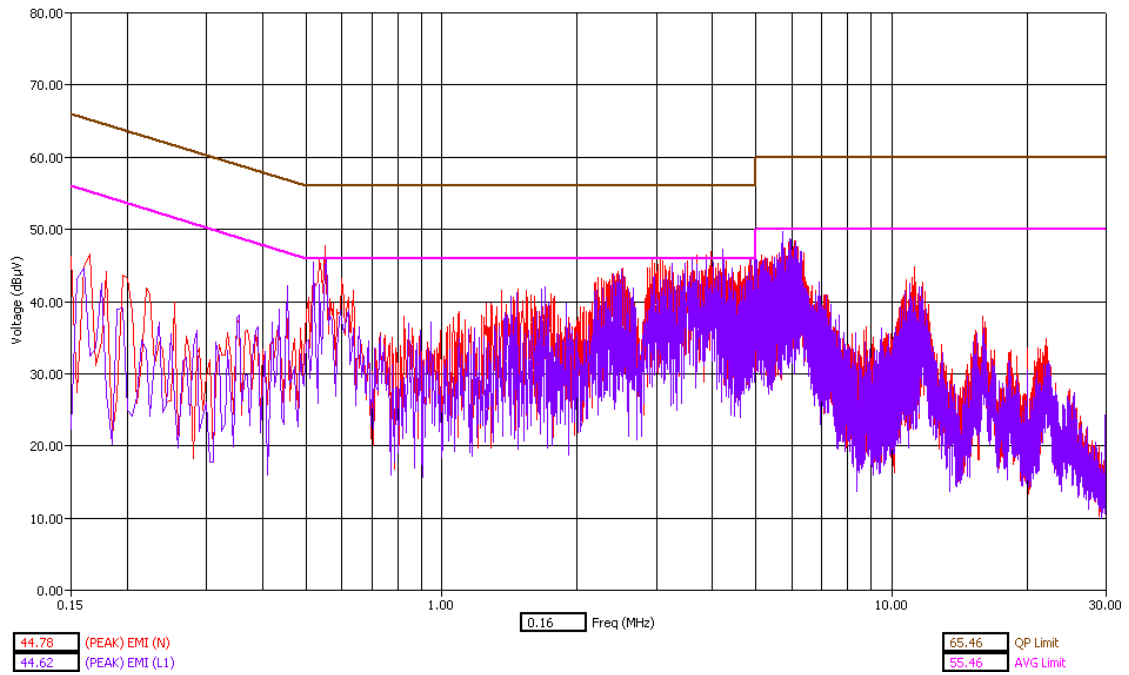
WLAN Channel 6 - Tx Mode - AVG Detector



WLAN Channel 6 - Tx Mode - Peak Detector



WLAN Channel 11 - Tx Mode - AVG Detector



WLAN Channel 11 - Tx Mode - Peak Detector

End of Test Report