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## Report On

Application for Grant of Equipment Authorization of the  
Novatel Wireless Inc.

MiFi 5792 Personal Wireless Router

FCC Part 15 Subpart C §15.247

IC RSS-Gen and RSS-210 Issue 8 December 2010

Report No. SC1206183D-1

July 2012

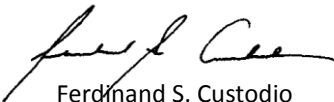



**REPORT ON** Radio Testing of the  
Novatel Wireless Inc.  
Personal Wireless Router

**TEST REPORT NUMBER** SC1206183D-1

**PREPARED FOR** Novatel Wireless Inc.  
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**APPROVED BY**   
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**Name**  
Authorized Signatory

**DATED** July 12, 2012



**Revision History**

SC1206183D-1 Novatel Wireless Inc. MiFi 5792 Personal Wireless Router					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
07/09/12	Initial Release				Ferdinand Custodio
07/20/12		1	Several pages with minor edits	Section 1, Section 2, page 9	Chip Fleury



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## **SECTION 1**

### **REPORT SUMMARY**

Radio Testing of the  
Novatel Wireless Inc.  
Personal Wireless Router



## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Novatel Wireless Inc. MiFi 5792 Personal Wireless Router to the requirements of the following:

- FCC Part 15 Subpart C §15.247
- IC RSS-Gen and RSS-210 Issue 8 December 2010.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Novatel Wireless Inc.
Model Number(s)	MiFi 5792
FCC ID Number	PKRNVWMIFI5792
IC Number	3229A-MIFI5792
Serial Number(s)	SA020612700007
Number of Samples Tested	1
Test Specification/Issue/Date	<ul style="list-style-type: none"><li>• FCC Part 15 Subpart C §15.247 (October 1, 2011).</li><li>• RSS-210 - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment (Issue 8, December 2010).</li><li>• RSS-Gen - General Requirements and Information for the Certification of Radio Apparatus (Issue 3, December 2010).</li></ul>
Start of Test	June 27, 2012
Finish of Test	July 09, 2012
Name of Engineer(s)	Juan Manuel Gonzalez Ferdinand Custodio
Related Document(s)	None. Supporting documents for EUT certification are separate exhibits.



1.2 **BRIEF SUMMARY OF RESULTS**

A brief summary of the tests carried out in accordance with FCC Part 15 Subpart C §15.247 with cross-reference to the corresponding IC RSS standard is shown below.

Section	§15.247 Spec Clause	RSS	Test Description	Result	Comments/ Base Standard
2.1	§15.247(b)(3)	RSS-210 A8.4 (4)	Peak Output Power	Compliant	
2.2	§15.207(a)	RSS-Gen 7.2.4	Conducted Emissions	Compliant	
2.3	§15.215(c)	RSS-Gen 4.6.3	20 dB Bandwidth	Compliant	
2.4		RSS-Gen 4.6.1	99% Emission Bandwidth	Compliant	
2.5	§15.247(a)(2)	RSS-210 A8.2(a)	Minimum 6 dB RF Bandwidth	Compliant	
2.6	§15.247(d)	RSS-210 A8.5	Out-of-Band Emissions - Conducted	Compliant	
2.7	§15.247(d)	RSS-210 A8.5	Band-edge Compliance of RF Conducted Emissions	Compliant	
2.8	§15.247(d)	RSS-210 A8.5	Spurious Radiated Emissions	Compliant	
2.8		RSS-Gen 4.10	Receiver Spurious Emissions	Compliant	
2.9	§15.247(e)	RSS-210 A8.2(b)	Power Spectral Density for Digitally Modulated Device	Compliant	



### 1.3 **PRODUCT INFORMATION**

#### 1.3.1 **EUT General Description**

The Equipment Under Test (EUT) was a Novatel Wireless Inc. MiFi 5792 Personal Wireless Router as shown in the photograph below. The EUT creates a personal Wi-Fi cloud, capable of sharing high-speed 4G LTE and 3G Mobile Broadband Internet connectivity with up to 10 Wi-Fi-enabled devices simultaneously.





1.3.2 **EUT General Description**

EUT Description	MiFi 5792 Personal Wireless Router
Model Number(s)	MiFi 5792
Rated Voltage	4.35 VDC Nominal voltage.
Mode Verified	802.11 b/g/n WLAN
Capability	850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 2, 5, 17 and 4 LTE, 802.11 b/g/n WLAN
Primary Unit (EUT)	<input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering
Antenna Type	Integral WiFi Inverted F type
Antenna Gain	2440MHz = 0.3dBi 2700MHz = 0.7dBi 2480MHz = 0.5dBi

1.3.3 **Maximum Conducted Peak Output Power**

Mode	Frequency Range (MHz)	Output Power (dBm)	Output Power (mW)
802.11b	2412-2462	17.44	55.46
802.11g	2412-2462	15.01	31.70
802.11n HT20	2412-2462	15.03	31.84

1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	EUT transmitting max power through integral antenna. 802.11b 1Mbps data rate.
B	EUT transmitting max power through integral antenna. 802.11g 6Mbps data rate.
C	EUT transmitting max power through integral antenna. 802.11n 6.5Mbps data rate.
D	EUT transmitting max power through antenna port. 802.11b 1Mbps data rate.
E	EUT transmitting max power through antenna port. 802.11g 6Mbps data rate.
F	EUT transmitting max power through antenna port. 802.11n 6.5Mbps data rate.

**Note:** Antenna port is for service function only and is not accessible to the end user.

1.4.2 EUT Exercise Software

Before each test, the EUT is configured using Qualcomm Radio Control Toolkit Version 2.4.78.0. The software allows configuration of channels, mode + data rate and power level. Power level is set according to manufacturer specification for each mode (17.5dBm for 802.11b and 15.0dBm for 802.11g/n).

1.4.3 Support Equipment and I/O cables

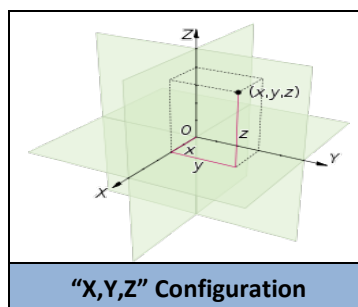
Manufacturer	Equipment/Cable	Description
Dell	Support Laptop	Novatel Wireless Test configuration Laptop #2 PAL50-PC/E396_E362_E371
ASAP	USB cable	0.9m, shielded, Type A to Mini-A connector, style 2725, USB Revision 2.0

1.4.4 Worst Case Configuration

Worst-case configuration used in this test report provided by the manufacturer and based from SAR Test Report #: 20120702 (RF Exposure Labs)

Mode	Channel	Data Rate
802.11b	6 (Mid Channel)	1Mbps
802.11g	6 (Mid Channel)	6Mbps
802.11n	6 (Mid Channel)	HT20 6.5Mbps

EUT is a portable device. For radiated measurements X, Y and Z orientations were verified. Worst case position is "Z".

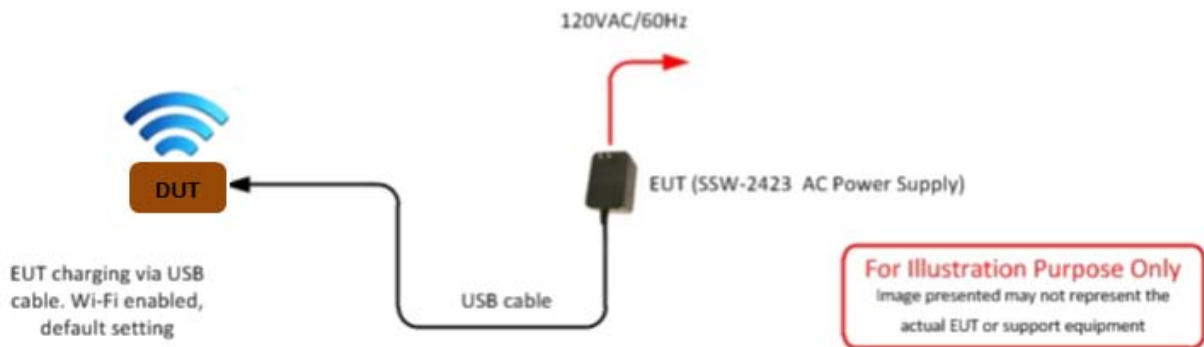


1.4.5 Simplified Test Configuration Diagram

**Radiated Emissions Setup (Test Configuration A)**



**Conducted Emissions Setup (Test Configuration B)**





**1.5 DEVIATIONS FROM THE STANDARD**

No deviations from the applicable test standards or test plan were made during testing.

**1.6 MODIFICATION RECORD**

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number SA020612700007		
N/A		

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

**1.7 TEST METHODOLOGY**

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

For conducted and radiated emissions the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.4-2009. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

**1.8 TEST FACILITY**

**1.8.1 FCC – Registration No.: US5281**

TUV SUD America Inc. (San Diego), a §2.498 listed test firm operates the EMC Laboratory registered under Sony Electronics Inc. Product Quality Division EMC. This laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is US5281.

**1.8.2 Industry Canada (IC) Registration No.: 3067A**

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego), has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No. 3067A.



## **SECTION 2**

### **TEST DETAILS**

Radio Testing of the  
Novatel Wireless Inc.  
Personal Wireless Router



**2.1 PEAK OUTPUT POWER**

**2.1.1 Specification Reference**

Part 15 Subpart C §15.247(b)(3)

**2.1.2 Standard Applicable**

(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.

**2.1.3 Equipment Under Test and Modification State**

Serial No: SA020612700007 / Test Configuration D,E and F

**2.1.4 Date of Test/Initial of test personnel who performed the test**

June 28, 2012/FSC

**2.1.5 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

**2.1.6 Environmental Conditions**

Ambient Temperature	23.2°C
Relative Humidity	49.3%
ATM Pressure	99.1 kPa

**2.1.7 Additional Observations**

- This is a conducted test using direct connection to a power meter.
- An offset of 0.7dB was added to compensate for the external cable used from the antenna port to the power sensor.
- The power meter was configured to 802.11 power measurement profile in the 2.4GHz band.
- Both Peak and Average measurements were recorded.



2.1.8 Test Results

Mode	Channel	Measured Average Power (dBm)	Measured Peak Power (dBm)
802.11b	1 (2412 MHz)	17.44	19.55
	6 (2437 MHz)	17.24	19.60
	11 (2462 MHz)	17.25	19.50
802.11g	1 (2412 MHz)	11.02	13.50
	6 (2437 MHz)	15.01	17.20
	11 (2462 MHz)	11.03	13.30
802.11n HT20	1 (2412 MHz)	11.02	13.30
	6 (2437 MHz)	15.03	17.00
	11 (2462 MHz)	10.99	12.88



**2.2 CONDUCTED EMISSIONS**

**2.2.1 Specification Reference**

Part 15 Subpart C §15.207(a)

**2.2.2 Standard Applicable**

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*\*Decreases with the logarithm of the frequency.*

**2.2.3 Equipment Under Test and Modification State**

Serial No: SA020612700007 / Test Configuration A,B and C

**2.2.4 Date of Test/Initial of test personnel who performed the test**

July 01, 2012/FSC

**2.2.5 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

**2.2.6 Environmental Conditions**

Ambient Temperature      24.1°C  
 Relative Humidity          52.8%  
 ATM Pressure                98.8 kPa

**2.2.7 Additional Observations**

- The EUT is a battery powered device however with provision to connect to public AC mains via supplied AC adapter/charger.
- The EUT was verified using worst case configuration (worst case channel/mode). The EUT was set to transmit max. power while plugged into the AC adapter.
- EUT verified using input voltage of 120VAC 60Hz.





- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.2.8 for sample computation.

2.2.8 **Sample Computation (Conducted Emission – Quasi Peak)**

Measuring equipment raw measurement (db $\mu$ V) @ 150kHz		5.5
Correction Factor (dB)	Asset# 8607 (20 dB attenuator)	19.9
	Asset# 1177 (cable)	0.15
	Asset# 1176 (cable)	0.35
	Asset# 7567 (LISN)	0.30
<b>Reported QuasiPeak Final Measurement (db<math>\mu</math>V) @ 150kHz</b>		<b>26.2</b>

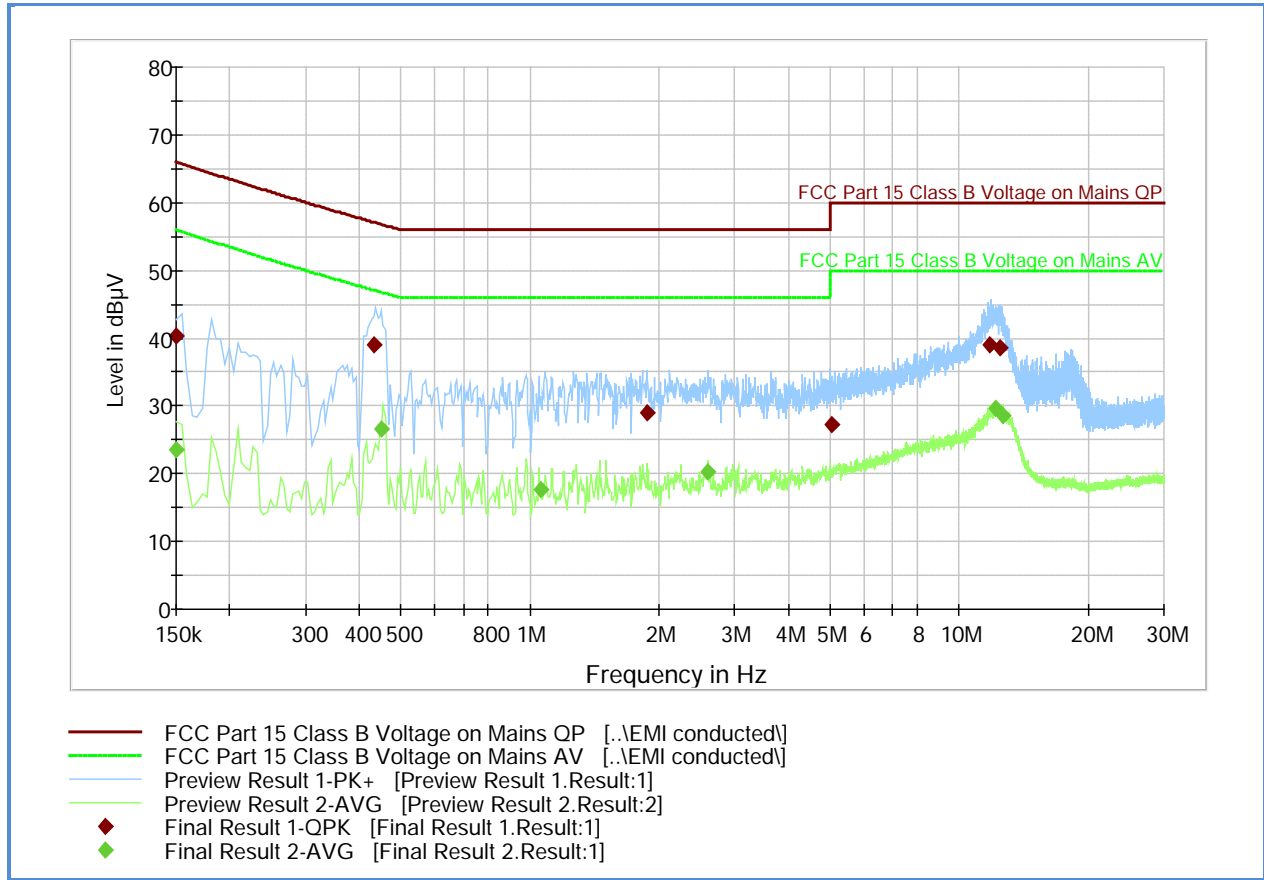
2.2.9 **Test Results**

Compliant. See attached plots and tables.



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2.2.10 Line 1 (Hot) 802.11b



Quasi Peak

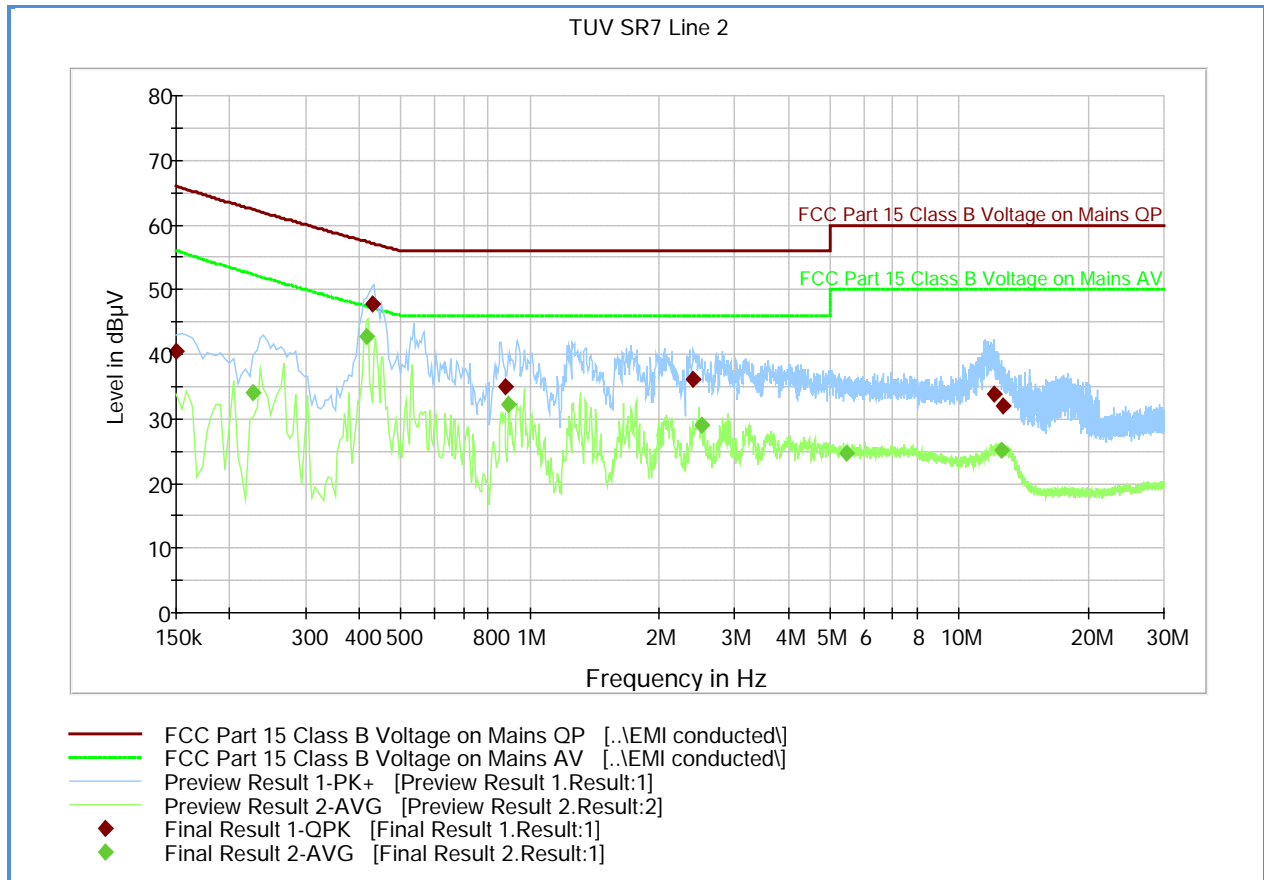
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.150000	40.4	1000.0	9.000	Off	L1	20.6	25.6	66.0
0.433500	39.0	1000.0	9.000	Off	L1	20.2	18.1	57.1
1.873500	29.0	1000.0	9.000	Off	L1	20.1	27.0	56.0
5.050500	27.4	1000.0	9.000	Off	L1	20.3	32.6	60.0
11.805000	39.0	1000.0	9.000	Off	L1	20.5	21.0	60.0
12.426000	38.7	1000.0	9.000	Off	L1	20.5	21.3	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.150000	23.5	1000.0	9.000	Off	L1	20.6	32.5	56.0
0.451500	26.5	1000.0	9.000	Off	L1	20.2	20.3	46.8
1.059000	17.6	1000.0	9.000	Off	L1	20.1	28.4	46.0
2.593500	20.3	1000.0	9.000	Off	L1	20.1	25.7	46.0
12.151500	29.7	1000.0	9.000	Off	L1	20.5	20.3	50.0
12.660000	28.7	1000.0	9.000	Off	L1	20.5	21.3	50.0



2.2.11 Line 2 (Neutral) 802.11b



Quasi Peak

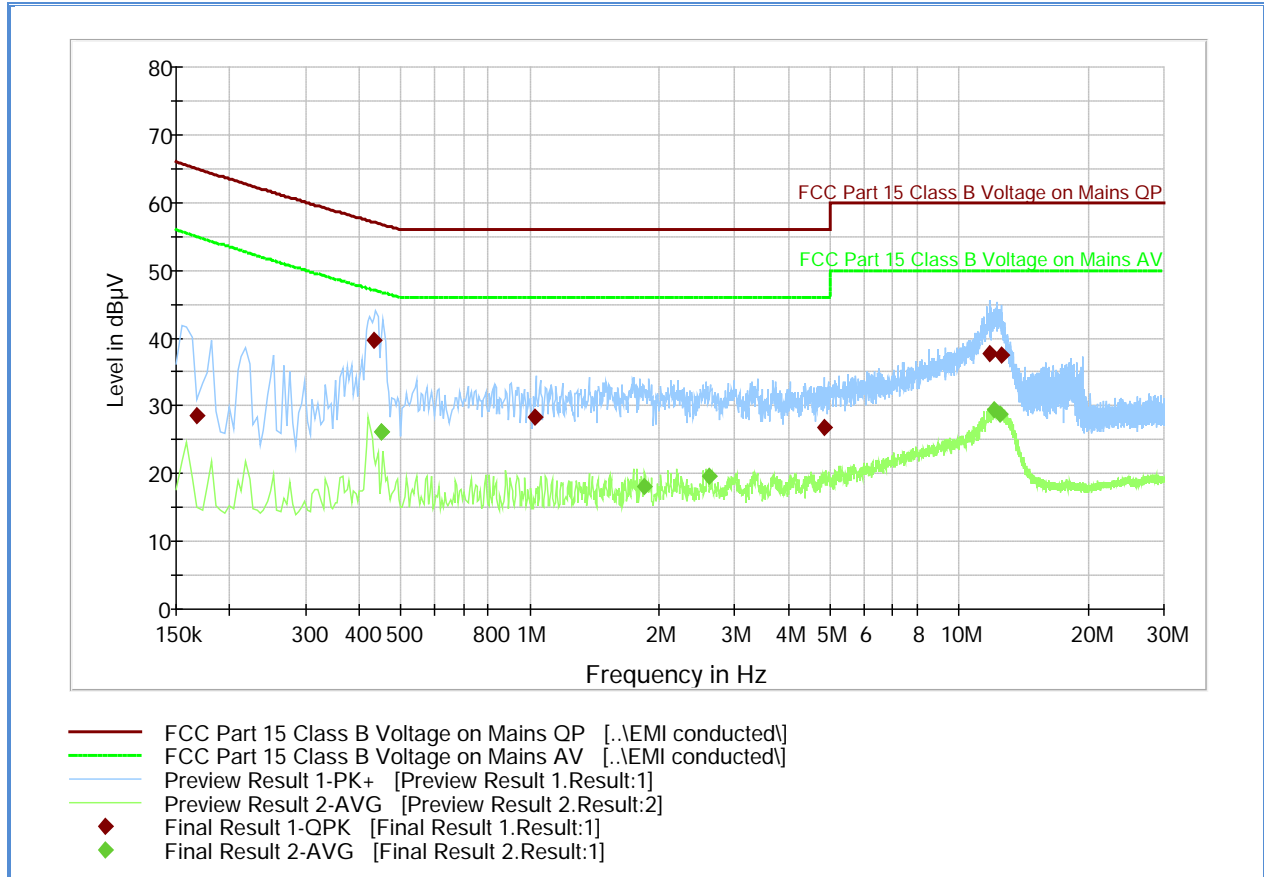
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.150000	40.4	1000.0	9.000	Off	N	21.0	25.6	66.0
0.429000	47.7	1000.0	9.000	Off	N	20.6	9.5	57.2
0.874500	34.9	1000.0	9.000	Off	N	20.6	21.1	56.0
2.395500	36.0	1000.0	9.000	Off	N	20.5	20.0	56.0
12.039000	33.8	1000.0	9.000	Off	N	20.9	26.2	60.0
12.633000	32.1	1000.0	9.000	Off	N	20.9	27.9	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.226500	34.2	1000.0	9.000	Off	N	20.8	18.2	52.4
0.415500	42.6	1000.0	9.000	Off	N	20.6	4.8	47.4
0.892500	32.2	1000.0	9.000	Off	N	20.6	13.8	46.0
2.512500	28.9	1000.0	9.000	Off	N	20.5	17.1	46.0
5.464500	24.8	1000.0	9.000	Off	N	20.7	25.2	50.0
12.570000	25.2	1000.0	9.000	Off	N	20.9	24.8	50.0



2.2.12 Line 1 (Hot) 802.11g



Quasi Peak

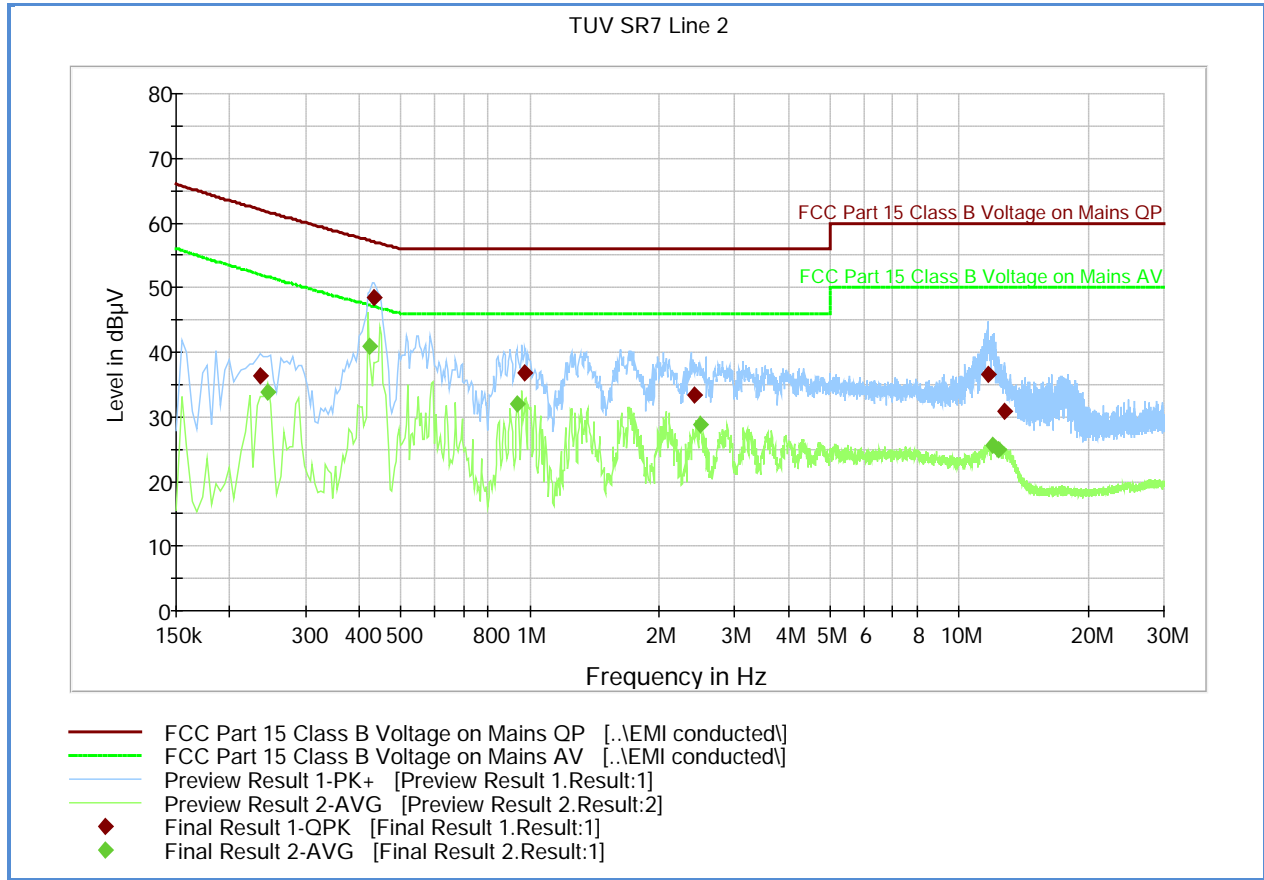
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.168000	28.5	1000.0	9.000	Off	L1	20.5	36.4	65.0
0.433500	39.7	1000.0	9.000	Off	L1	20.2	17.4	57.1
1.027500	28.4	1000.0	9.000	Off	L1	20.1	27.6	56.0
4.866000	26.9	1000.0	9.000	Off	L1	20.3	29.1	56.0
11.773500	37.8	1000.0	9.000	Off	L1	20.5	22.2	60.0
12.511500	37.5	1000.0	9.000	Off	L1	20.5	22.5	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.451500	26.3	1000.0	9.000	Off	L1	20.2	20.5	46.8
0.451500	26.3	1000.0	9.000	Off	L1	20.2	20.5	46.8
1.851000	18.2	1000.0	9.000	Off	L1	20.1	27.8	46.0
2.607000	19.6	1000.0	9.000	Off	L1	20.1	26.4	46.0
12.043500	29.3	1000.0	9.000	Off	L1	20.5	20.7	50.0
12.489000	28.9	1000.0	9.000	Off	L1	20.5	21.1	50.0



2.2.13 Line 2 (Neutral) 802.11g



Quasi Peak

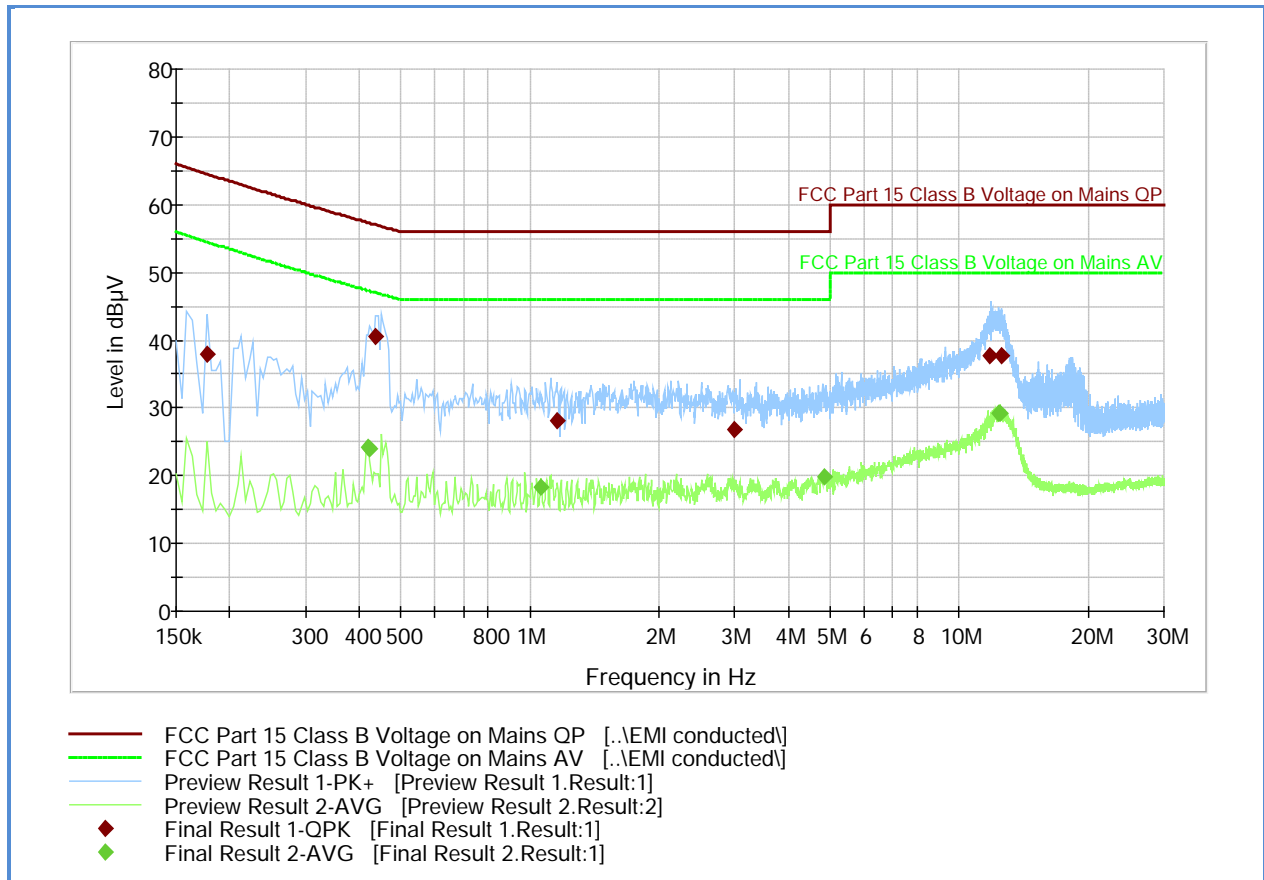
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.235500	36.4	1000.0	9.000	Off	N	20.8	25.7	62.1
0.433500	48.4	1000.0	9.000	Off	N	20.6	8.7	57.1
0.973500	36.9	1000.0	9.000	Off	N	20.5	19.1	56.0
2.413500	33.5	1000.0	9.000	Off	N	20.5	22.5	56.0
11.692500	36.6	1000.0	9.000	Off	N	20.9	23.4	60.0
12.754500	30.9	1000.0	9.000	Off	N	20.9	29.1	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.244500	33.8	1000.0	9.000	Off	N	20.7	17.9	51.7
0.424500	41.0	1000.0	9.000	Off	N	20.6	6.3	47.2
0.937500	32.1	1000.0	9.000	Off	N	20.6	13.9	46.0
2.485500	28.8	1000.0	9.000	Off	N	20.5	17.2	46.0
12.007500	25.5	1000.0	9.000	Off	N	20.9	24.5	50.0
12.345000	24.9	1000.0	9.000	Off	N	20.9	25.1	50.0



2.2.14 Line 1 (Hot) 802.11n



Quasi Peak

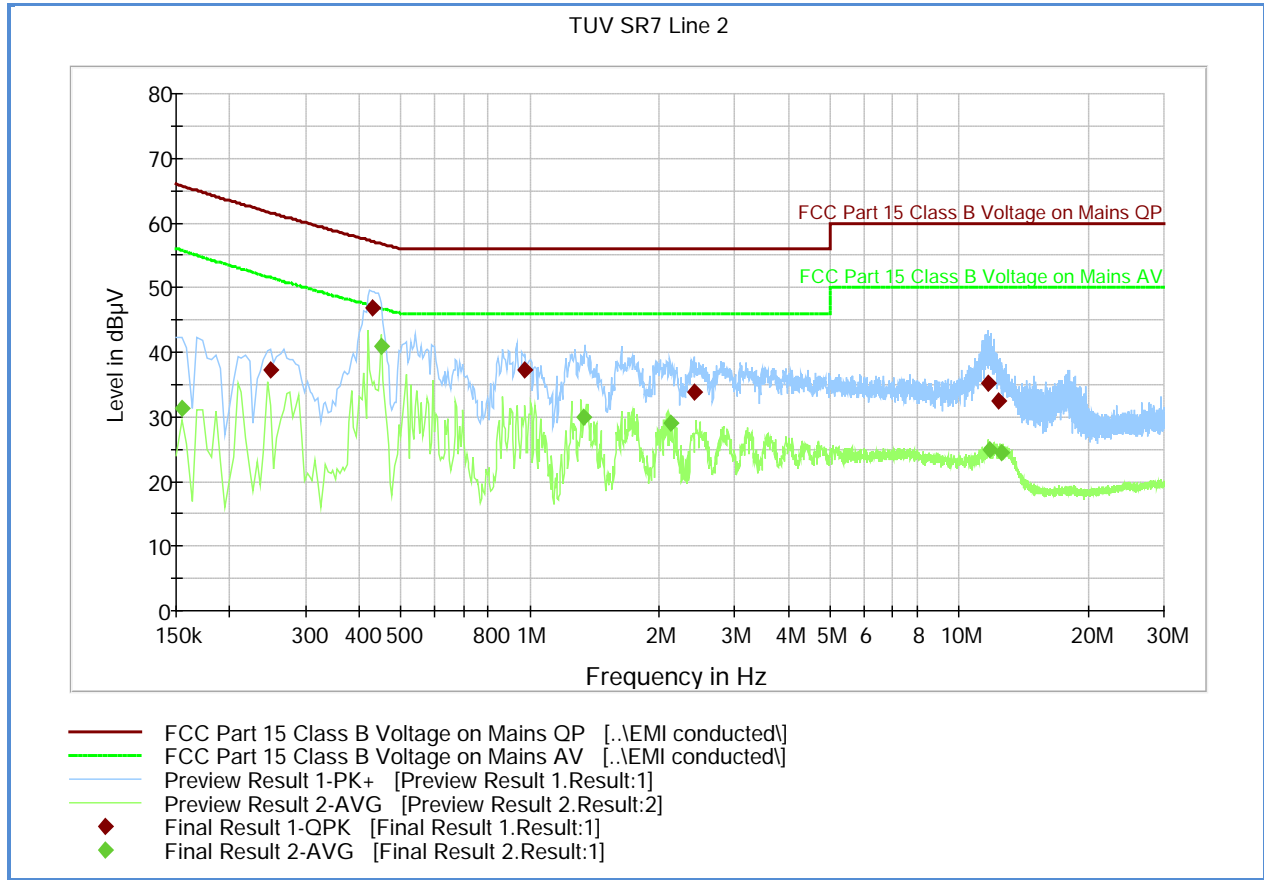
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.177000	38.0	1000.0	9.000	Off	L1	20.5	26.5	64.5
0.438000	40.5	1000.0	9.000	Off	L1	20.2	16.5	57.0
1.158000	28.1	1000.0	9.000	Off	L1	20.1	27.9	56.0
2.998500	26.8	1000.0	9.000	Off	L1	20.1	29.2	56.0
11.760000	37.8	1000.0	9.000	Off	L1	20.5	22.2	60.0
12.543000	37.8	1000.0	9.000	Off	L1	20.5	22.2	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.420000	24.2	1000.0	9.000	Off	L1	20.3	23.2	47.3
0.424500	24.0	1000.0	9.000	Off	L1	20.2	23.3	47.2
1.063500	18.4	1000.0	9.000	Off	L1	20.1	27.6	46.0
4.857000	19.9	1000.0	9.000	Off	L1	20.3	26.1	46.0
12.354000	29.1	1000.0	9.000	Off	L1	20.5	20.9	50.0
12.408000	29.2	1000.0	9.000	Off	L1	20.5	20.8	50.0



2.2.15 Line 2 (Neutral) 802.11n



Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.249000	37.4	1000.0	9.000	Off	N	20.8	24.2	61.6
0.429000	46.9	1000.0	9.000	Off	N	20.6	10.3	57.2
0.969000	37.3	1000.0	9.000	Off	N	20.5	18.7	56.0
2.418000	33.9	1000.0	9.000	Off	N	20.5	22.1	56.0
11.715000	35.3	1000.0	9.000	Off	N	20.9	24.7	60.0
12.340500	32.4	1000.0	9.000	Off	N	20.9	27.6	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.154500	31.2	1000.0	9.000	Off	N	21.0	24.5	55.7
0.451500	41.0	1000.0	9.000	Off	N	20.7	5.8	46.8
1.338000	29.8	1000.0	9.000	Off	N	20.5	16.2	46.0
2.125500	29.1	1000.0	9.000	Off	N	20.5	16.9	46.0
11.791500	24.9	1000.0	9.000	Off	N	20.9	25.1	50.0
12.601500	24.4	1000.0	9.000	Off	N	20.9	25.6	50.0



## 2.3 99% EMISSION BANDWIDTH

### 2.3.1 Specification Reference

RSS-Gen Clause 4.6.1

### 2.3.2 Standard Applicable

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

The trace data points are recovered and directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

### 2.3.3 Equipment Under Test and Modification State

Serial No: SA020612700007 / Test Configuration D,E and F

### 2.3.4 Date of Test/Initial of test personnel who performed the test

June 28, 2012/FSC

### 2.3.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.3.6 Environmental Conditions

Ambient Temperature	23.2°C
Relative Humidity	49.3%
ATM Pressure	99.1 kPa

### 2.3.7 Additional Observations

- This is a conducted test.
- An offset of 21.4dB was added to compensate for the external attenuator and cable used.
- Span is wide enough to capture the channel transmission.
- RBW is 1% of the span.
- VBW is 3X RBW.
- Sweep is auto.



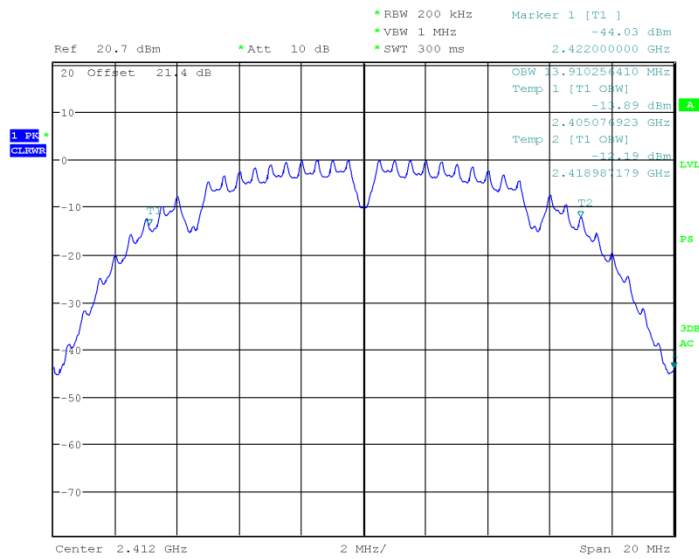


- Detector is peak.
- The % Power Bandwidth setting in the spectrum analyzer was set to 99% (default).
- The Channel Bandwidth measurement function of the spectrum analyzer was used for this test.

2.3.8 Test Results (For reporting purposes only)

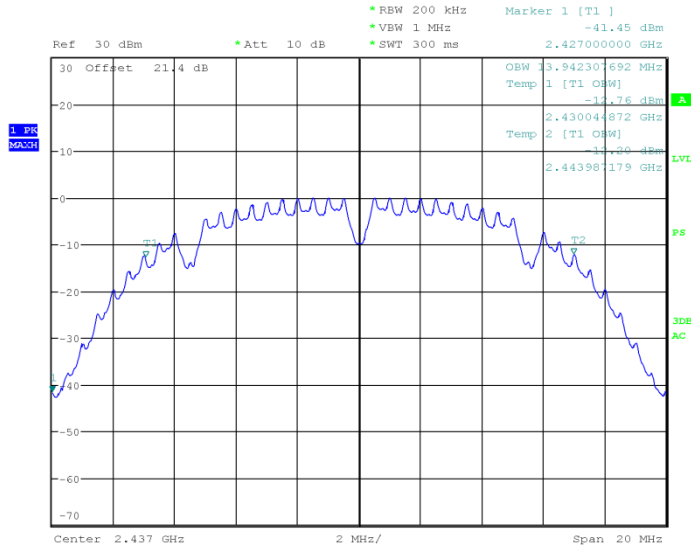
Mode	Channel	Measured 99% Bandwidth (MHz)
802.11b	1 (2412 MHz)	13.91
	6 (2437 MHz)	13.94
	11 (2462 MHz)	13.88
802.11g	1 (2412 MHz)	16.60
	6 (2437 MHz)	16.57
	11 (2462 MHz)	16.57
802.11n HT20	1 (2412 MHz)	17.70
	6 (2437 MHz)	17.69
	11 (2462 MHz)	17.69

2.3.9 Test Results Plots



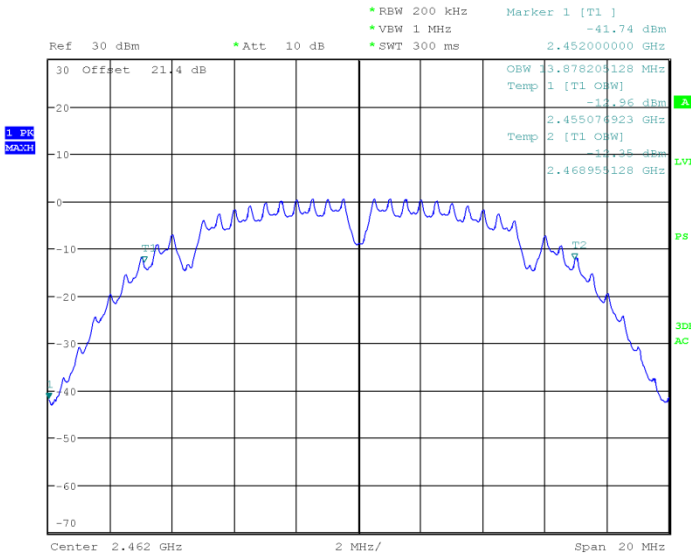
Date: 28 JUN 2012 13:19:29

802.11b Low Channel



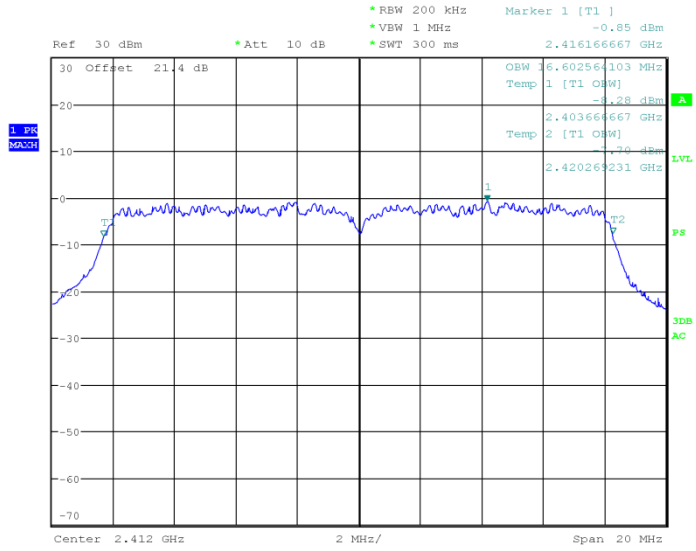
Date: 28.JUN.2012 13:23:25

**802.11b Mid Channel**



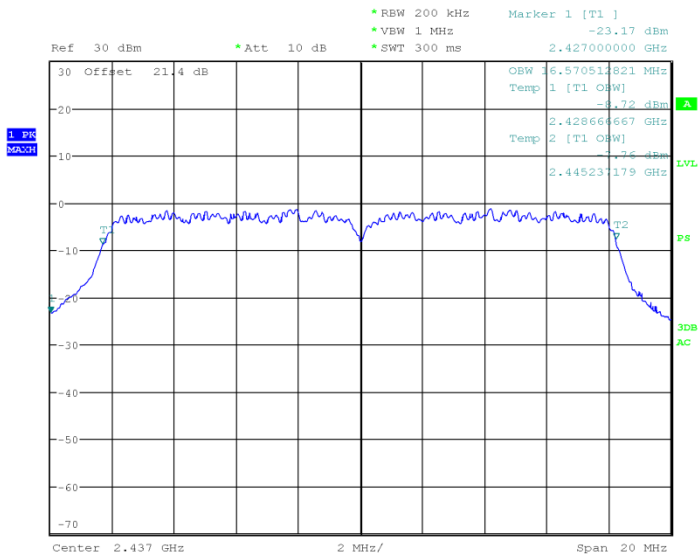
Date: 28.JUN.2012 13:32:47

**802.11b High Channel**



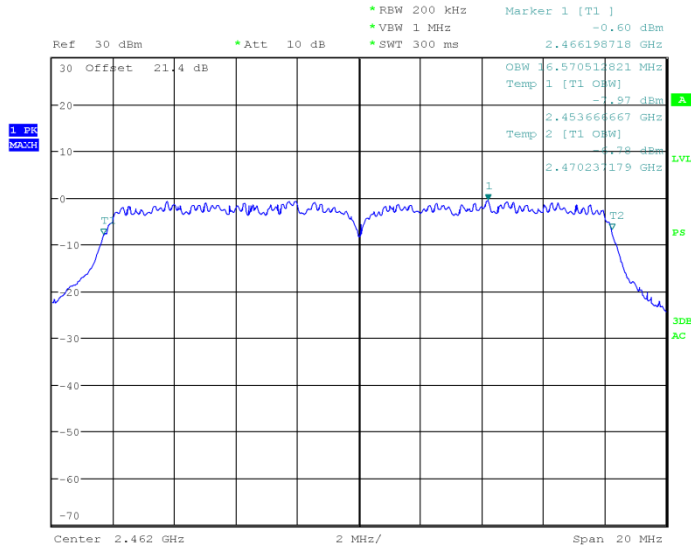
Date: 28.JUN.2012 13:21:54

### 802.11g Low Channel



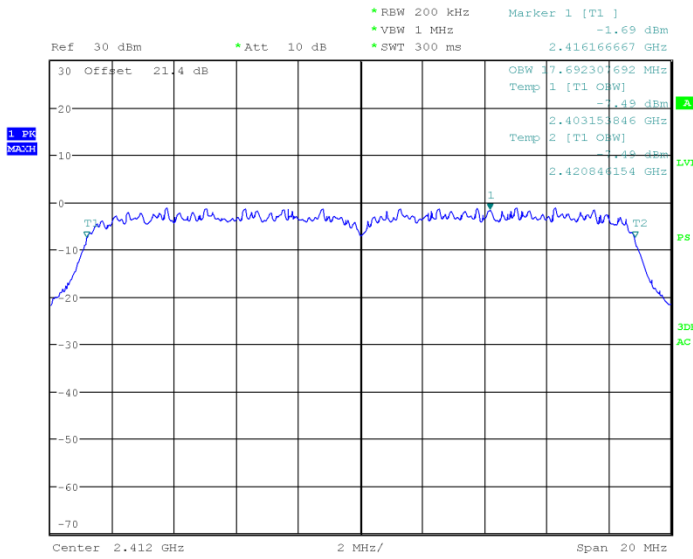
Date: 28.JUN.2012 13:24:10

### 802.11g Mid Channel



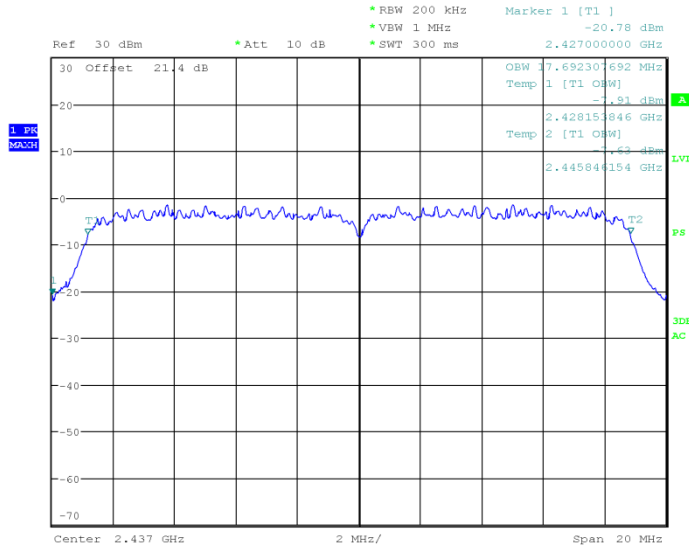
Date: 28.JUN.2012 13:33:32

### 802.11g High Channel



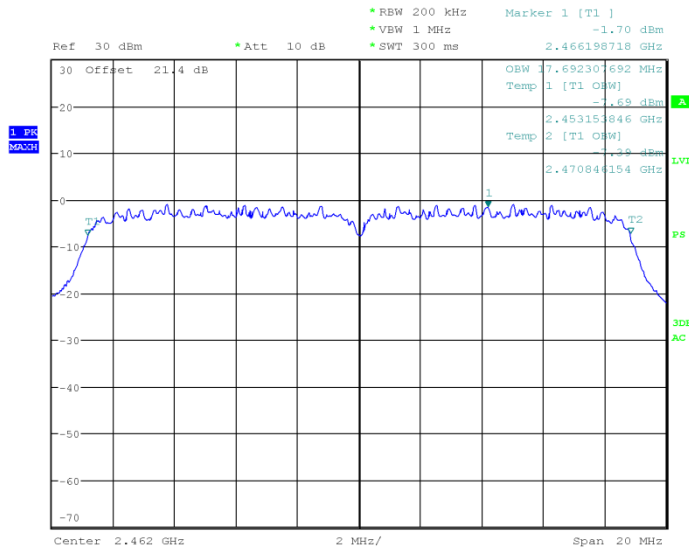
Date: 28.JUN.2012 13:22:28

### 802.11n Low Channel



Date: 28.JUN.2012 13:25:02

**802.11n Mid Channel**



Date: 28.JUN.2012 13:34:03

**802.11n High Channel**



2.4 **MINIMUM 6 dB RF BANDWIDTH**

2.4.1 **Specification Reference**

Part 15 Subpart C §15.247(a)(2)

2.4.2 **Standard Applicable**

(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 500 kHz.

2.4.3 **Equipment Under Test and Modification State**

Serial No: SA020612700007 / Test Configuration D,E and F

2.4.4 **Date of Test/Initial of test personnel who performed the test**

June 28, 2012/FSC

2.4.5 **Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.6 **Environmental Conditions**

Ambient Temperature	23.2°C
Relative Humidity	49.3%
ATM Pressure	99.1 kPa

2.4.7 **Additional Observations**

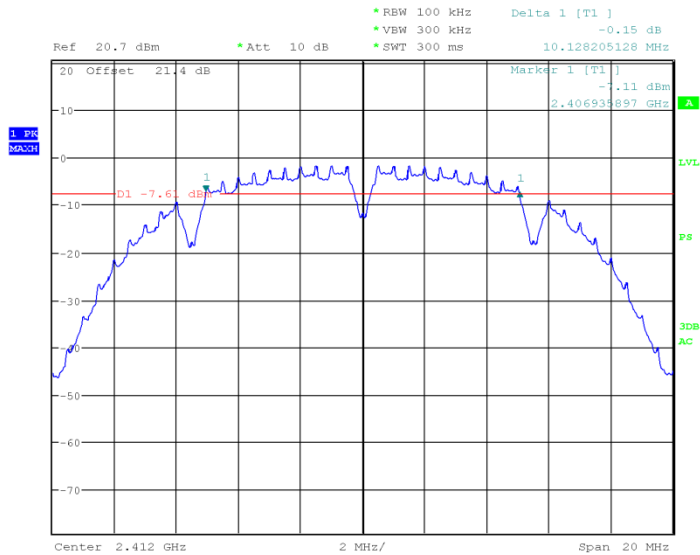
- This is a conducted test.
- An offset of 21.4dB was added to compensate for the external attenuator and cable used.
- A peak output reading was taken. A display line was drawn 6dB below the peak level.
- 6dB bandwidth verified using delta-marker measurements from the line drawn.
- Span is wide enough to capture the channel transmission.
- RBW is 100kHz.
- VBW is 3X RBW.
- Sweep is auto.
- Detector is peak.
- Trace is max hold.



2.4.8 Test Results

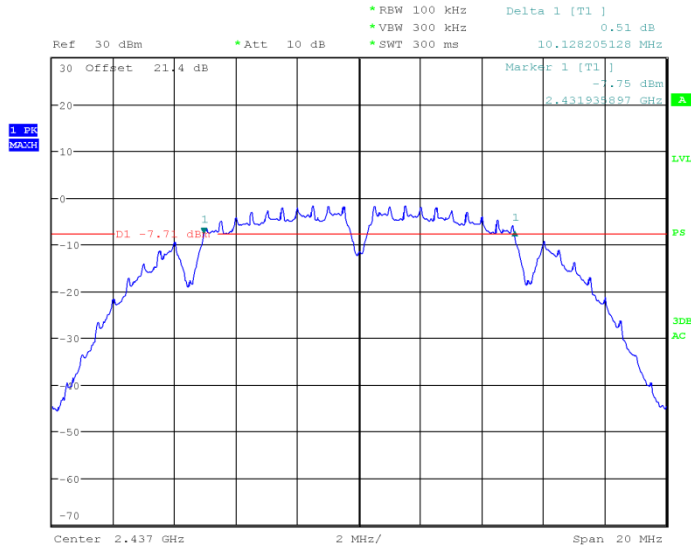
Mode	Channel	Measured Bandwidth (MHz)	Minimum Bandwidth (MHz)	Compliance
802.11b	1 (2412 MHz)	10.128	0.500	Complies
	6 (2437 MHz)	10.128	0.500	Complies
	11 (2462 MHz)	10.192	0.500	Complies
802.11g	1 (2412 MHz)	16.282	0.500	Complies
	6 (2437 MHz)	16.282	0.500	Complies
	11 (2462 MHz)	16.217	0.500	Complies
802.11n HT20	1 (2412 MHz)	17.500	0.500	Complies
	6 (2437 MHz)	17.532	0.500	Complies
	11 (2462 MHz)	17.564	0.500	Complies

2.4.9 Test Results Plots



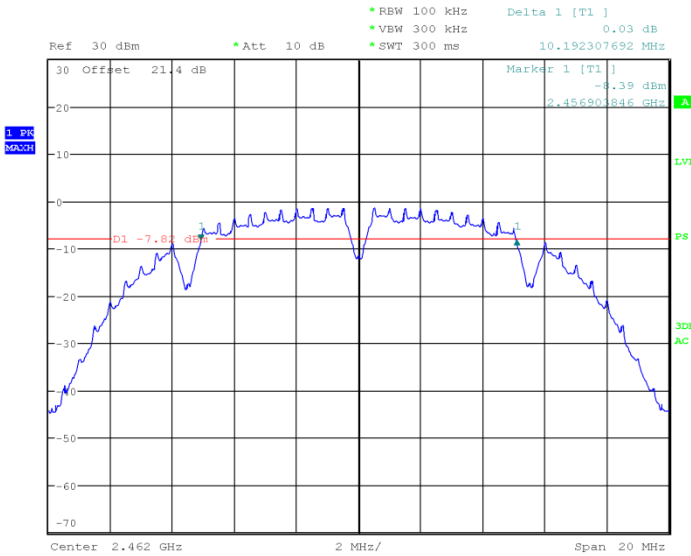
Date: 28.JUN.2012 12:44:21

802.11b Low Channel



Date: 28.JUN.2012 13:42:31

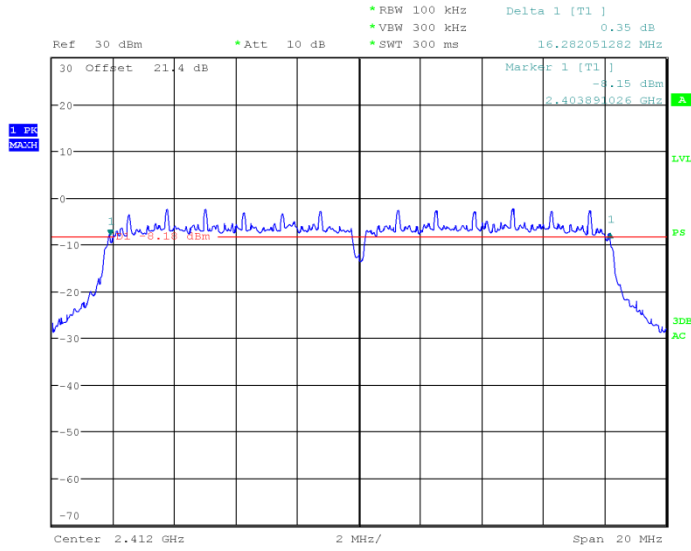
### 802.11b Mid Channel



Date: 28.JUN.2012 13:59:48

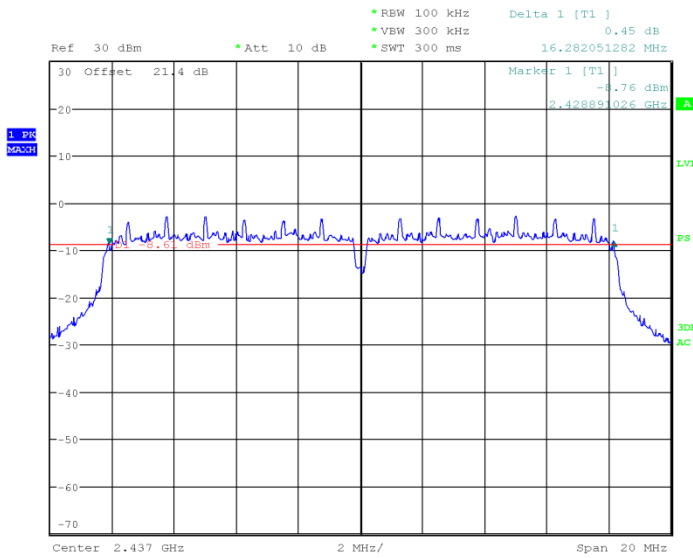
### 802.11b High Channel





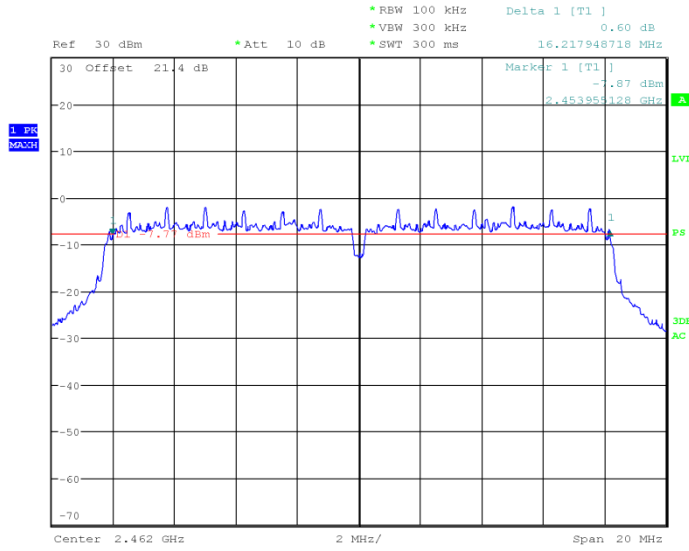
Date: 28.JUN.2012 13:38:24

### 802.11g Low Channel



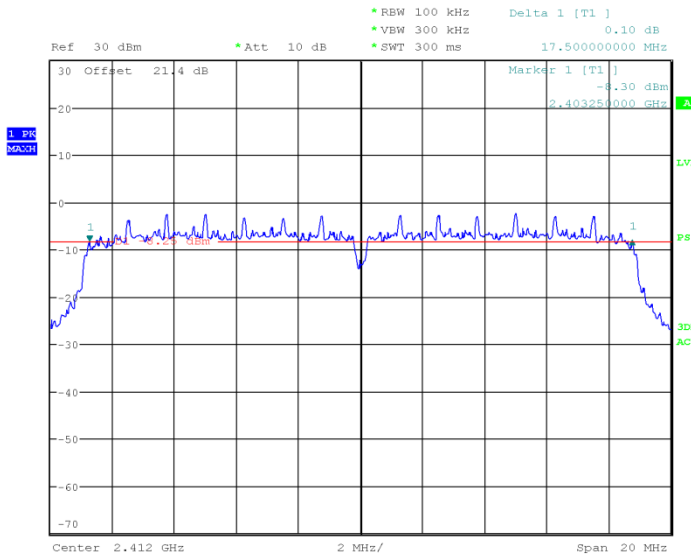
Date: 28.JUN.2012 13:44:02

### 802.11g Mid Channel



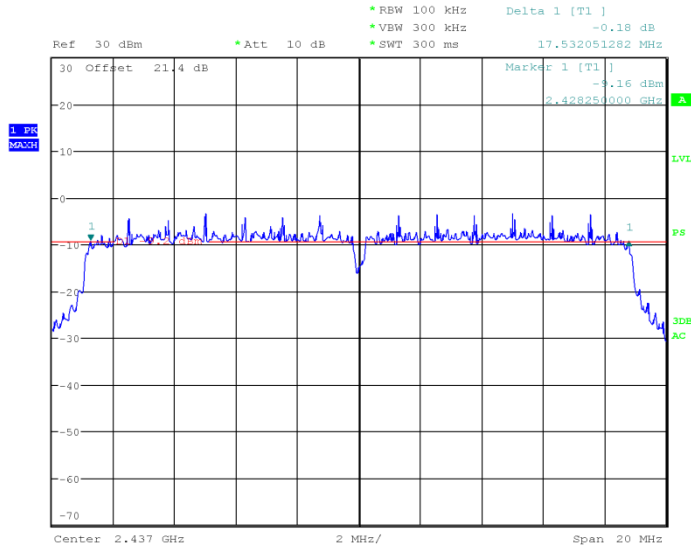
Date: 28.JUN.2012 14:01:09

### 802.11g High Channel



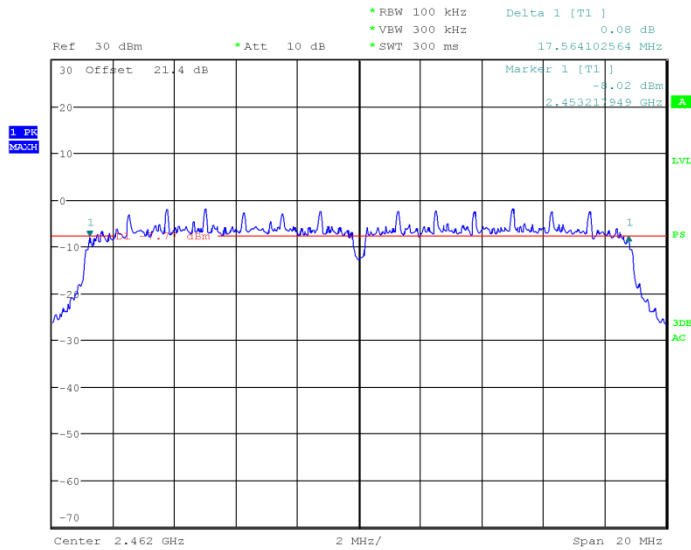
Date: 28.JUN.2012 13:39:51

### 802.11n Low Channel



Date: 28.JUN.2012 13:45:21

### 802.11n Mid Channel



Date: 28.JUN.2012 14:02:43

### 802.11n High Channel



## 2.5 OUT-OF-BAND EMISSIONS - CONDUCTED

### 2.5.1 Specification Reference

Part 15 Subpart C §15.247(d)

### 2.5.2 Standard Applicable

(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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 2.5.3 Equipment Under Test and Modification State

Serial No: SA020612700007 / Test Configuration D,E and F

### 2.5.4 Date of Test/Initial of test personnel who performed the test

June 28, 2012/FSC

### 2.5.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.5.6 Environmental Conditions

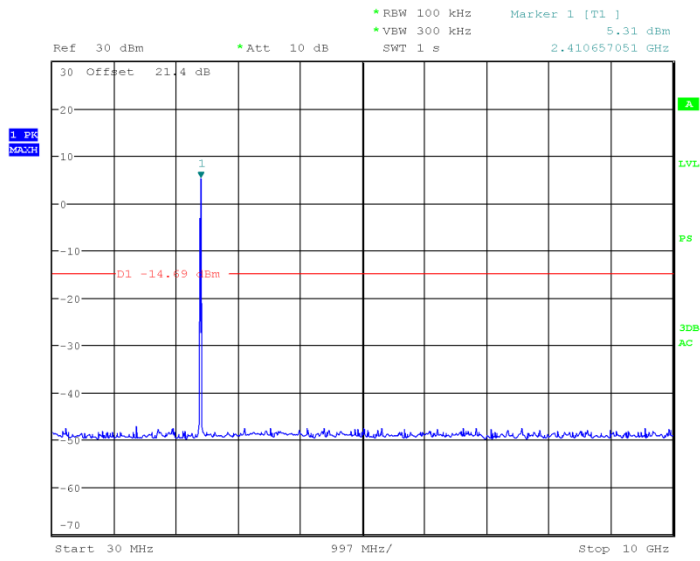
Ambient Temperature	23.2°C
Relative Humidity	49.3%
ATM Pressure	99.1 kPa

### 2.5.7 Additional Observations

- This is a conducted test.
- An offset of 21.4dB was added to compensate for the external attenuator and cable used.
- RBW is 100kHz.VBW is 3X RBW.
- Sweep is auto. Detector is peak. Trace is max hold.
- Initial scan was performed to determine the highest level of the desired power within the band. Limit (display line) was drawn 20dB below this level.
- Spectrum was searched from 30MHz up to 25GHz.

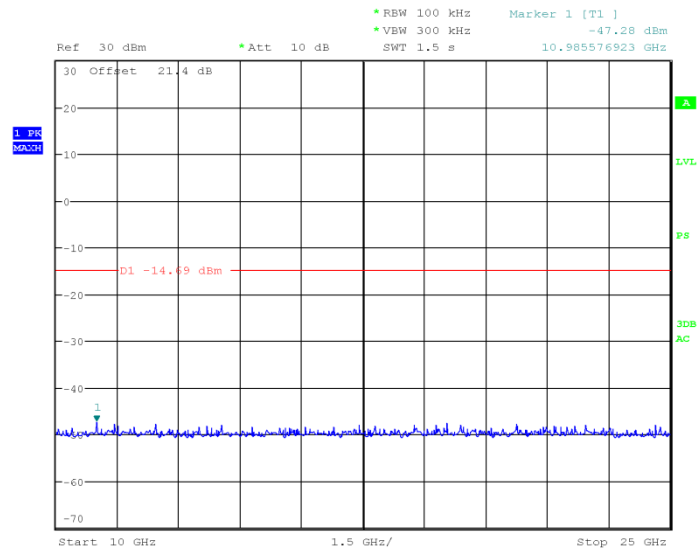


2.5.8 Test Results Plots



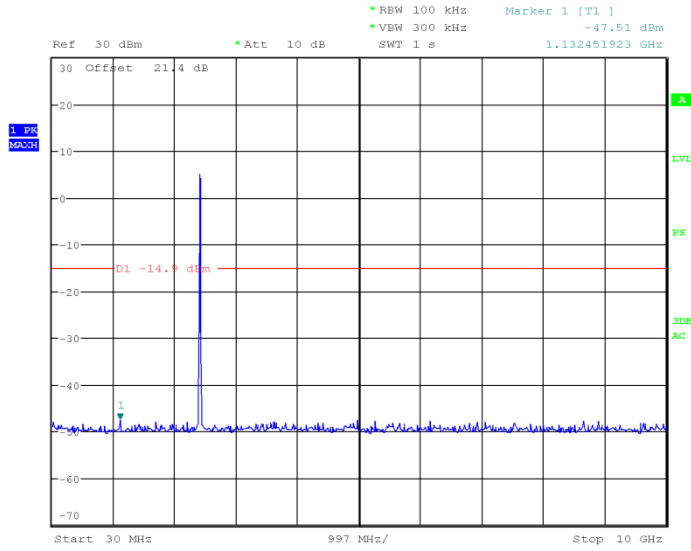
Date: 28.JUN.2012 14:54:20

802.11b Low Channel (30MHz to 10GHz)



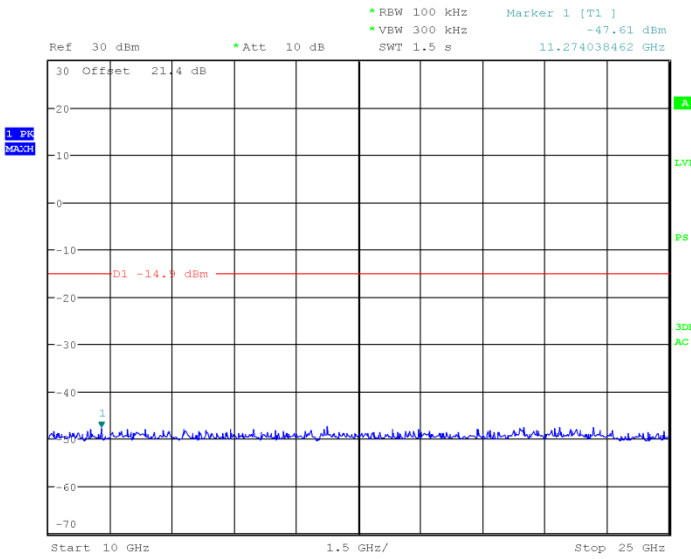
Date: 28.JUN.2012 14:55:32

802.11b Low Channel (10GHz to 25GHz)



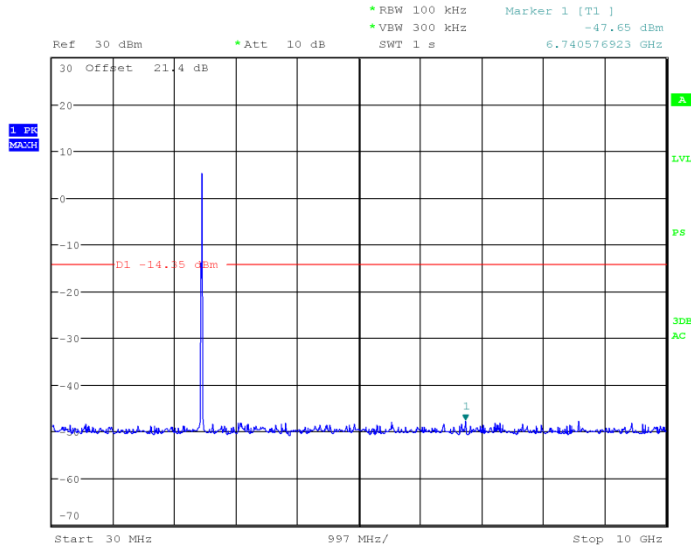
Date: 28.JUN.2012 15:47:10

### 802.11b Mid Channel (30MHz to 10GHz)



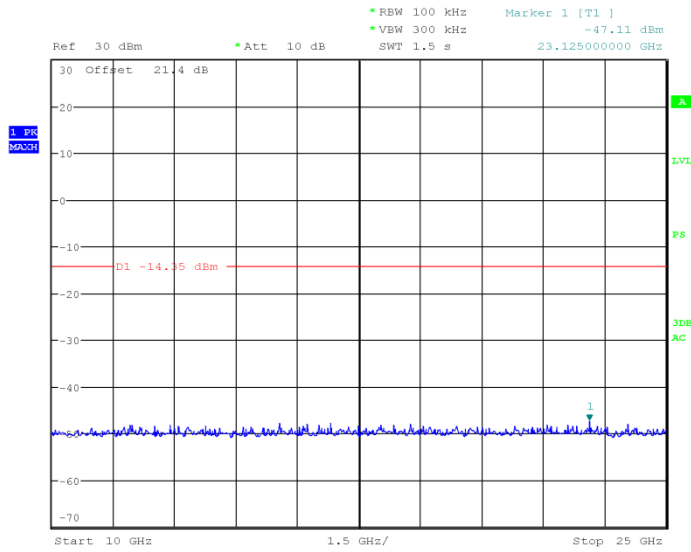
Date: 28.JUN.2012 15:48:20

### 802.11b Mid Channel (10GHz to 25GHz)



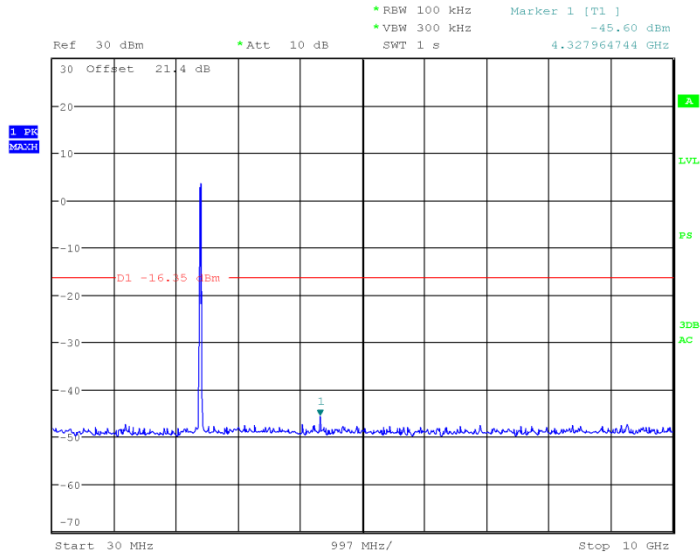
Date: 28.JUN.2012 16:13:39

### 802.11b High Channel (30MHz to 10GHz)



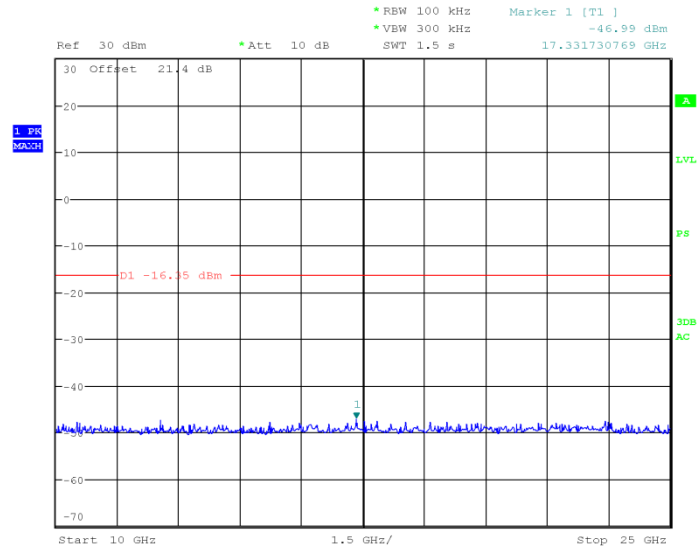
Date: 28.JUN.2012 16:14:20

### 802.11b High Channel (10GHz to 25GHz)



Date: 28.JUN.2012 15:10:37

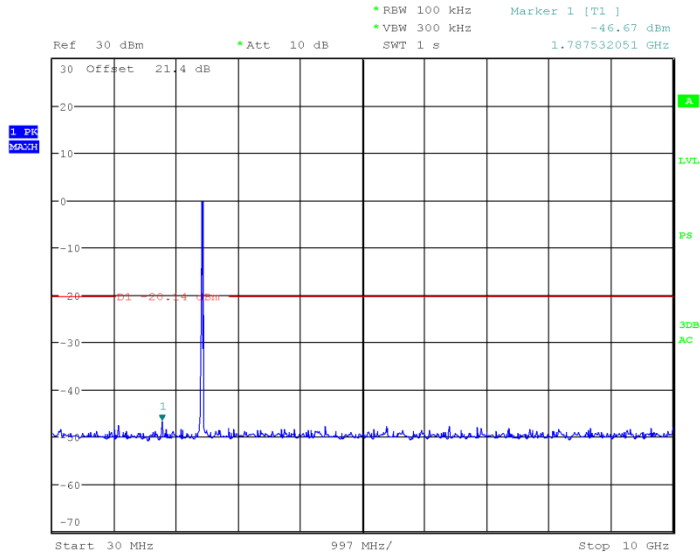
### 802.11g Low Channel (30MHz to 10GHz)



Date: 28.JUN.2012 15:11:42

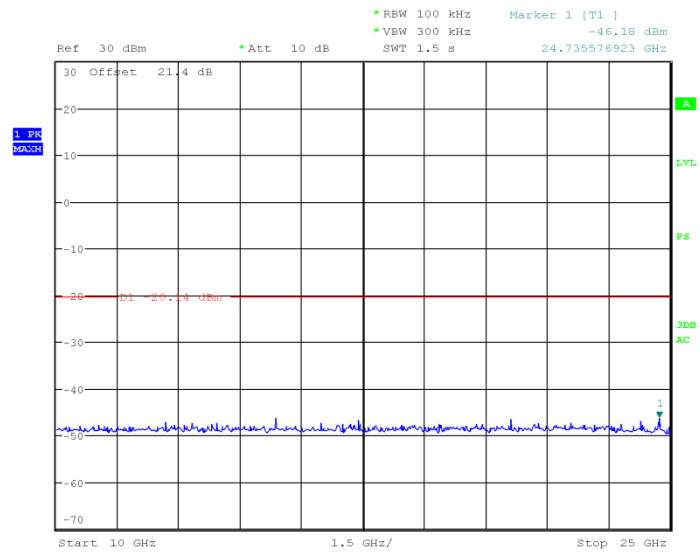
### 802.11g Low Channel (10GHz to 25GHz)





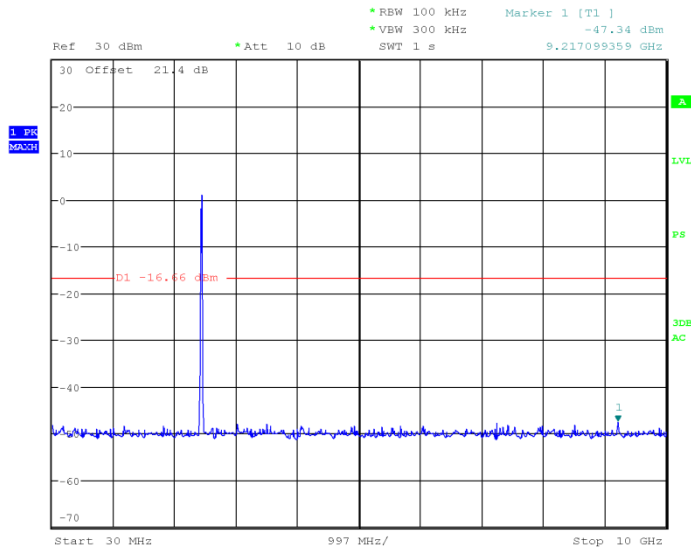
Date: 28.JUN.2012 15:59:04

**802.11g Mid Channel (30MHz to 10GHz)**



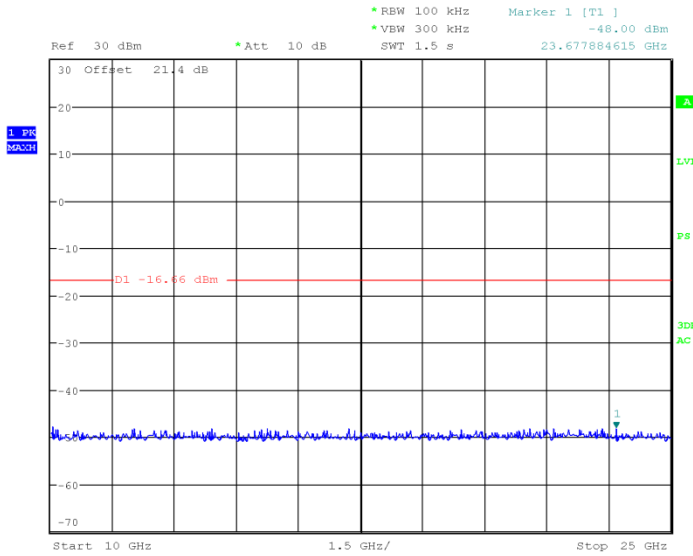
Date: 28.JUN.2012 16:05:17

**802.11g Mid Channel (10GHz to 25GHz)**



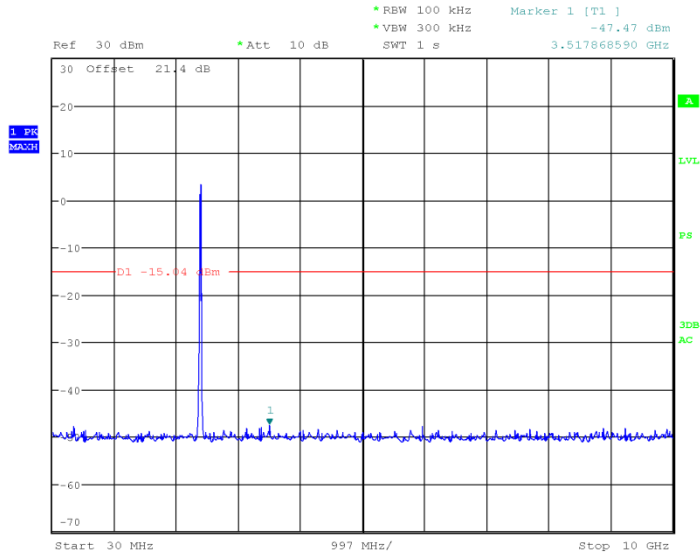
Date: 28.JUN.2012 16:17:55

### 802.11g High Channel (30MHz to 10GHz)



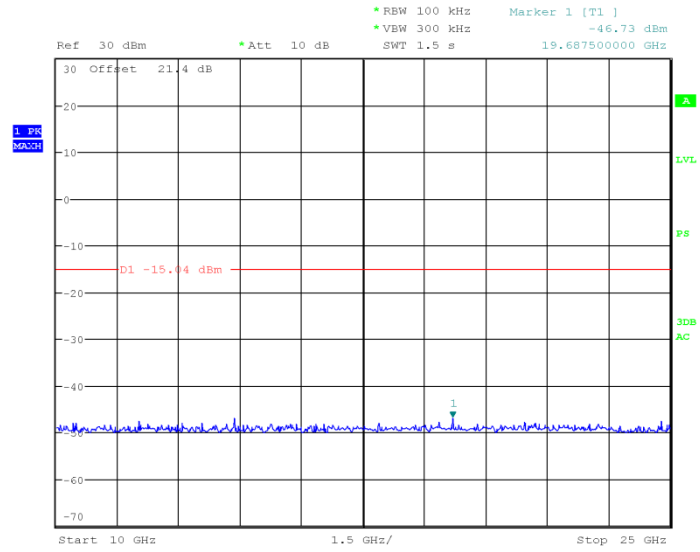
Date: 28.JUN.2012 16:18:29

### 802.11g High Channel (10GHz to 25GHz)



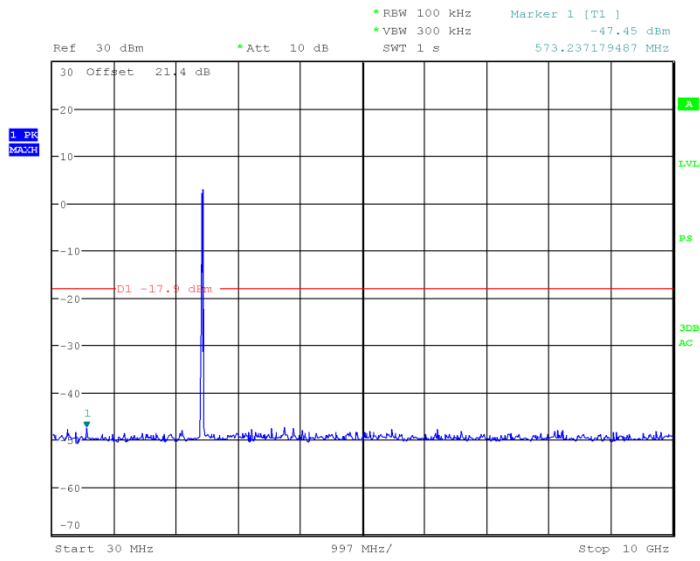
Date: 28.JUN.2012 15:20:19

### 802.11n Low Channel (30MHz to 10GHz)



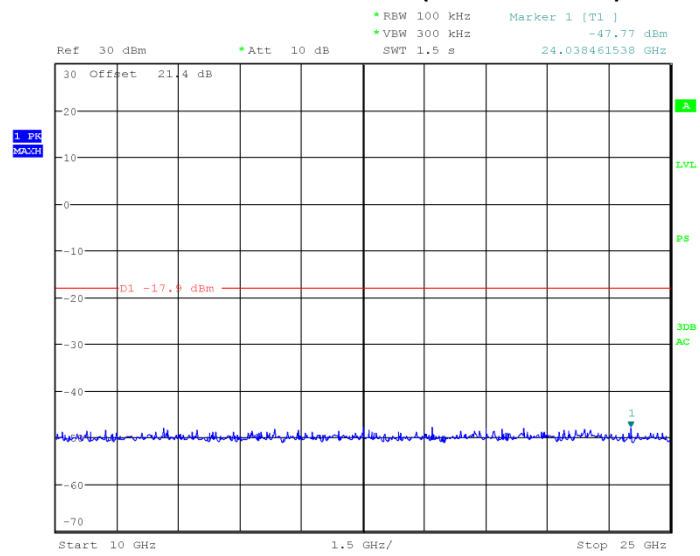
Date: 28.JUN.2012 15:25:37

### 802.11n Low Channel (10GHz to 25GHz)



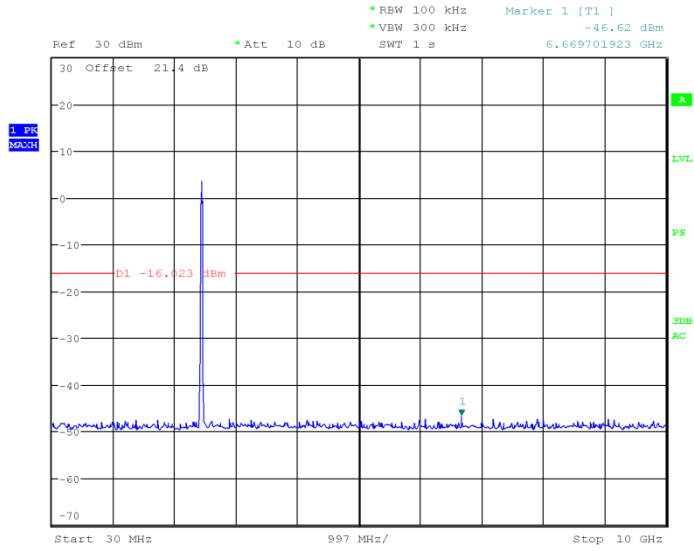
Date: 28.JUN.2012 16:07:30

**802.11n Mid Channel (30MHz to 10GHz)**



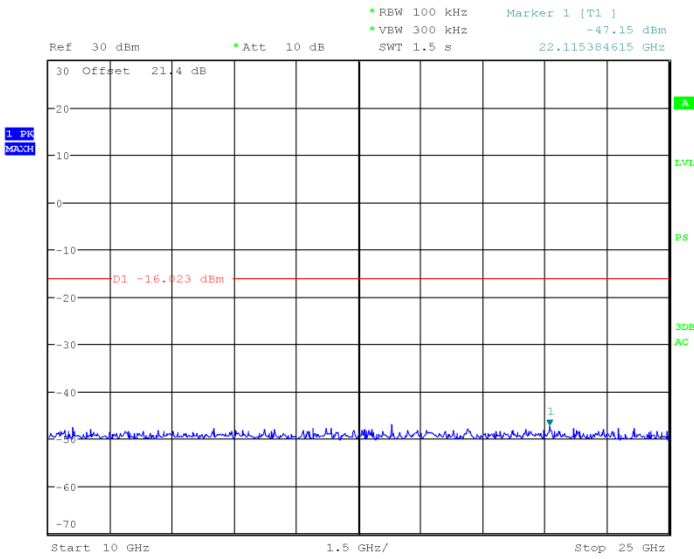
Date: 28.JUN.2012 16:08:06

**802.11n Mid Channel (10GHz to 25GHz)**



Date: 28.JUN.2012 16:27:45

**802.11n High Channel (30MHz to 10GHz)**



Date: 28.JUN.2012 16:29:14

**802.11n High Channel (10GHz to 25GHz)**



**2.6 BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS**

**2.6.1 Specification Reference**

Part 15 Subpart C §15.247(d)

**2.6.2 Standard Applicable**

See previous test.

**2.6.3 Equipment Under Test and Modification State**

Serial No: SA020612700007 / Test Configuration D,E and F

**2.6.4 Date of Test/Initial of test personnel who performed the test**

June 28, 2012/FSC

**2.6.5 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

**2.6.6 Environmental Conditions**

Ambient Temperature	23.2°C
Relative Humidity	49.3%
ATM Pressure	99.1 kPa

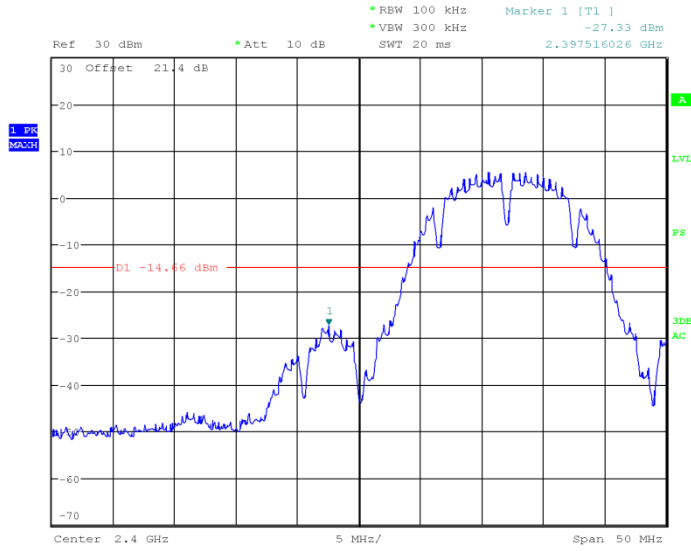
**2.6.7 Additional Observations**

- Setup is identical to “Out-of-Band Emissions – Conducted” test (previous test).
- Band-edge (2400MHz and 2483.5MHz) emissions were verified in this test.
- The spectrum analyzer was centred on the band-edge frequency while setting the EUT to the corresponding transmit channel (i.e. Low Channel for lower band-edge).
- Limit is 20dB below the highest level of the desired power within the band.

**2.6.8 Test Results**

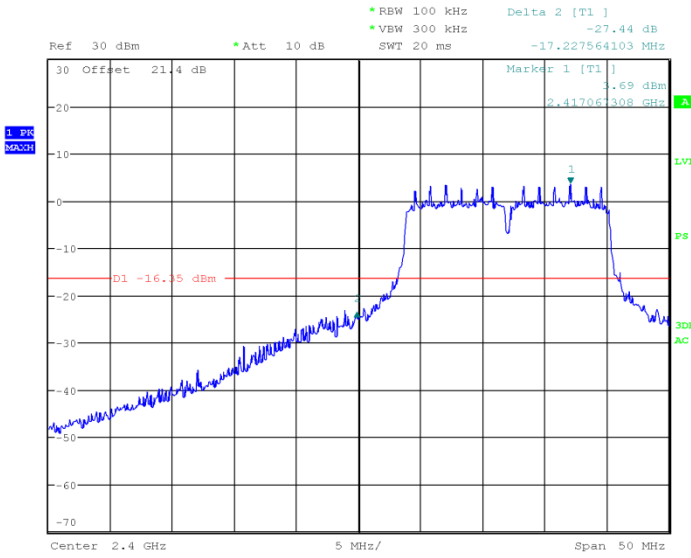
Complies.

See attached plots.



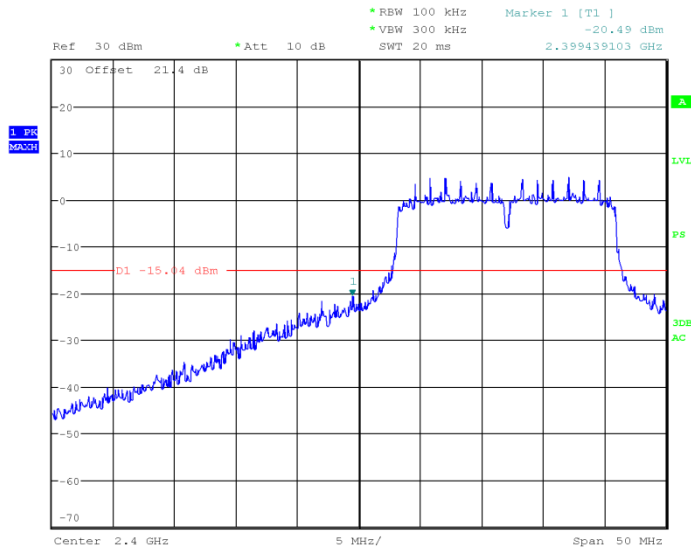
Date: 28.JUN.2012 15:15:16

### 802.11b Low Channel (2412 MHz)



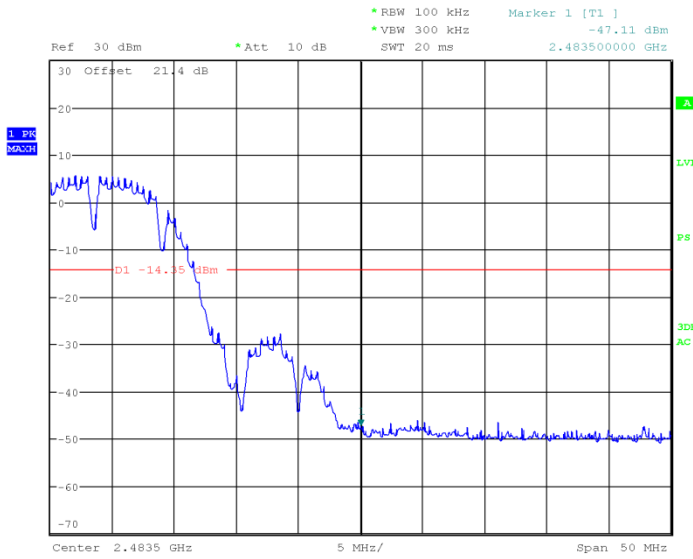
Date: 28.JUN.2012 15:03:21

### 802.11g Low Channel (2412 MHz)



Date: 28.JUN.2012 15:18:28

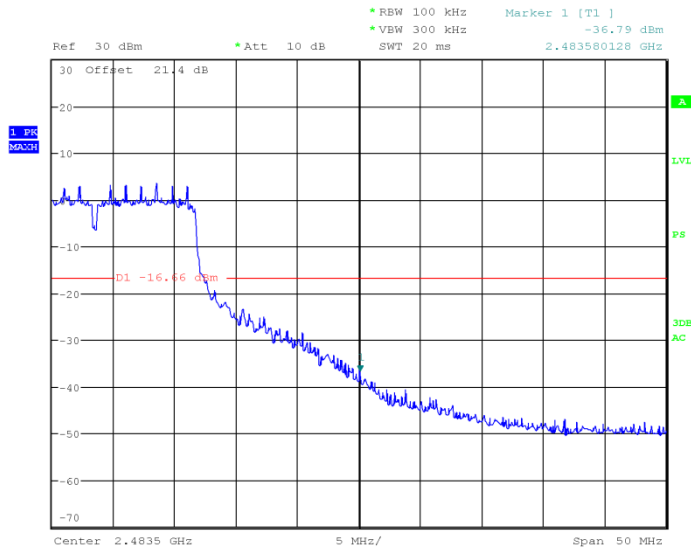
**802.11n Low Channel (2412 MHz)**



Date: 28.JUN.2012 16:12:38

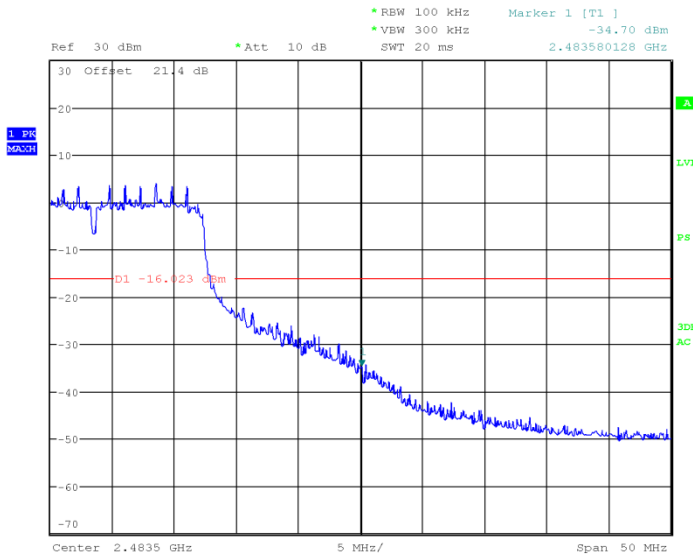
**802.11b High Channel (2462 MHz)**





Date: 28.JUN.2012 16:16:58

### 802.11g High Channel (2462 MHz)



Date: 28.JUN.2012 16:20:23

### 802.11n High Channel (2462 MHz)



## 2.7 SPURIOUS RADIATED EMISSIONS

### 2.7.1 Specification Reference

Part 15 Subpart C §15.247(d)

### 2.7.2 Standard Applicable

(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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 2.7.3 Equipment Under Test and Modification State

Serial No: SA020612700007 / Test Configuration A,B and C

### 2.7.4 Date of Test/Initial of test personnel who performed the test

June 27 and 29, 2012/FSC

### 2.7.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.7.6 Environmental Conditions

Ambient Temperature	23.2-23.3°C
Relative Humidity	49.3-54.7%
ATM Pressure	99.1 kPa

### 2.7.7 Additional Observations

- This is a radiated test. The spectrum was searched from 30MHz to the 10<sup>th</sup> harmonic (25GHz).
- There are no emissions found that do not comply to the restricted bands defined in FCC Part 15 Subpart C, 15.205 or Part 15.247(d).
- Only the worst case configuration (802.11b, Mid Channel,1Mbps) presented for radiated emissions below 1GHz.



- Before each test, a new set of battery (freshly charged) is installed.
- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.8.8 for sample computation.

2.7.8 **Sample Computation (Radiated Emission)**

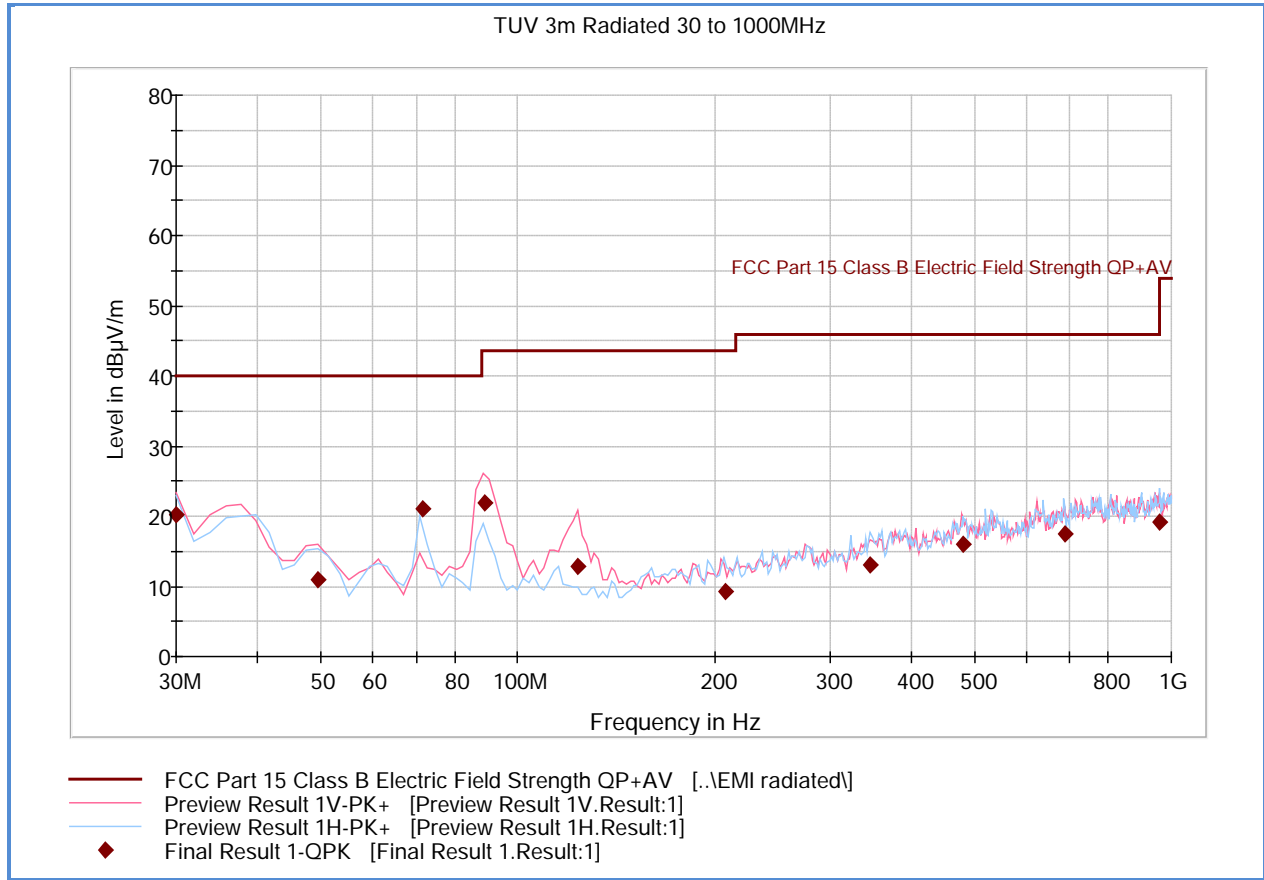
Measuring equipment raw measurement (db $\mu$ V) @ 30 MHz		24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3
	Asset# 1172 (cable)	0.3
	Asset# 1016 (preamplifier)	-30.7
	Asset# 1175(cable)	0.3
	Asset# 1002 (antenna)	17.2
<b>Reported QuasiPeak Final Measurement (db<math>\mu</math>V/m) @ 30MHz</b>		<b>11.8</b>

2.7.9 **Test Results**

See attached plots.



2.7.10 Test Results Below 1GHz (Receive Mode)

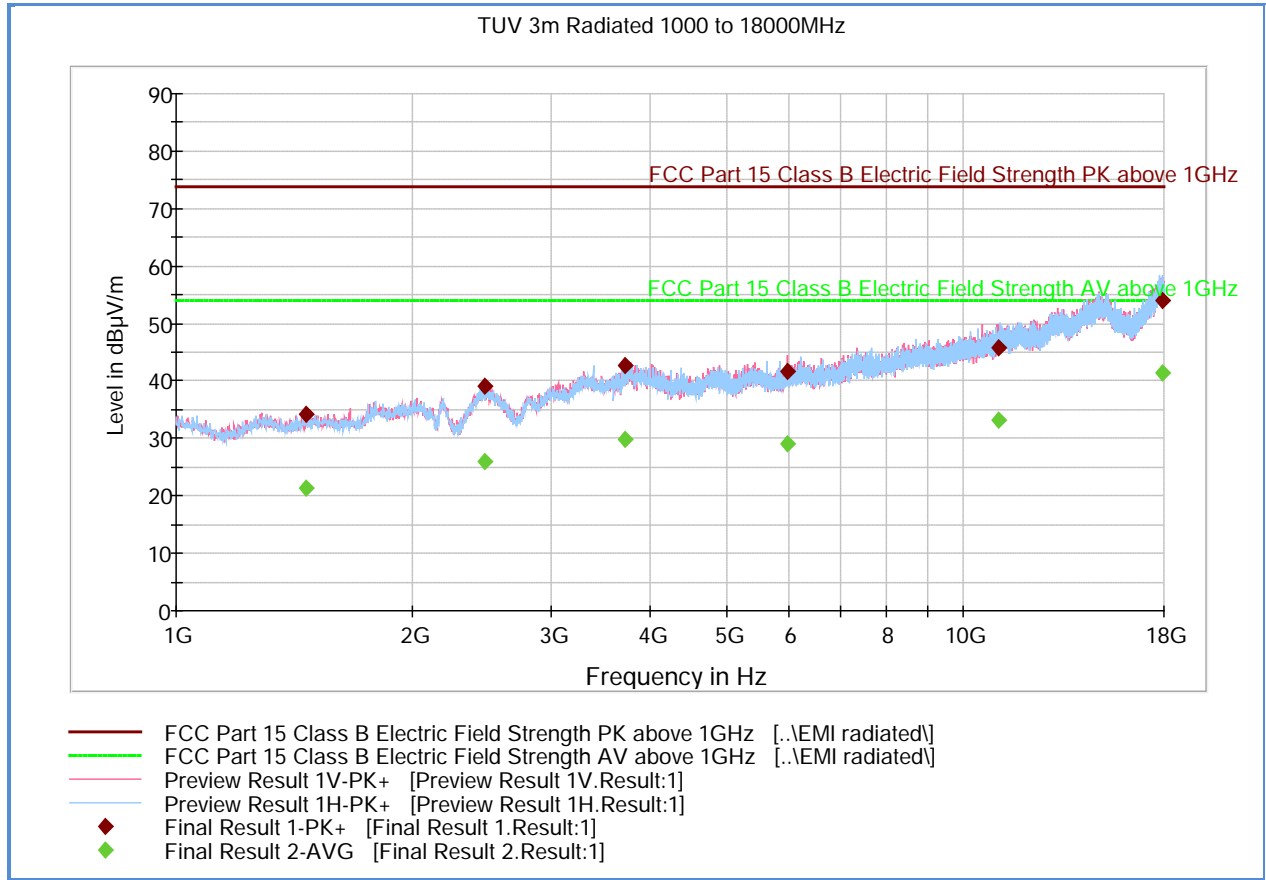


Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.000000	20.3	1000.0	120.000	204.0	V	35.0	-12.2	19.7	40.0
49.558878	11.0	1000.0	120.000	338.0	V	163.0	-20.4	29.0	40.0
71.381643	21.0	1000.0	120.000	238.0	H	252.0	-22.2	19.0	40.0
88.772745	21.8	1000.0	120.000	100.0	V	127.0	-21.1	21.7	43.5
123.706613	12.8	1000.0	120.000	103.0	V	14.0	-20.9	30.7	43.5
207.293788	9.3	1000.0	120.000	244.0	H	6.0	-15.8	34.2	43.5
346.813707	13.1	1000.0	120.000	192.0	H	132.0	-10.6	32.9	46.0
479.094188	16.0	1000.0	120.000	257.0	V	267.0	-6.7	30.0	46.0
687.010180	17.5	1000.0	120.000	301.0	H	52.0	-3.5	28.5	46.0
959.138357	19.1	1000.0	120.000	400.0	H	172.0	0.1	26.9	46.0



2.7.11 Test Results Above 1GHz (Receive Mode)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1463.600000	34.3	1000.0	1000.000	294.0	V	159.0	-9.1	39.6	73.9
2465.460000	39.0	1000.0	1000.000	176.0	V	199.0	-4.6	34.9	73.9
3720.300000	42.8	1000.0	1000.000	185.0	V	24.0	2.6	31.1	73.9
5987.180000	41.8	1000.0	1000.000	400.0	V	342.0	4.5	32.1	73.9
11113.080000	45.7	1000.0	1000.000	283.0	V	96.0	11.7	28.2	73.9
17956.620000	54.0	1000.0	1000.000	391.0	H	40.0	21.2	19.9	73.9

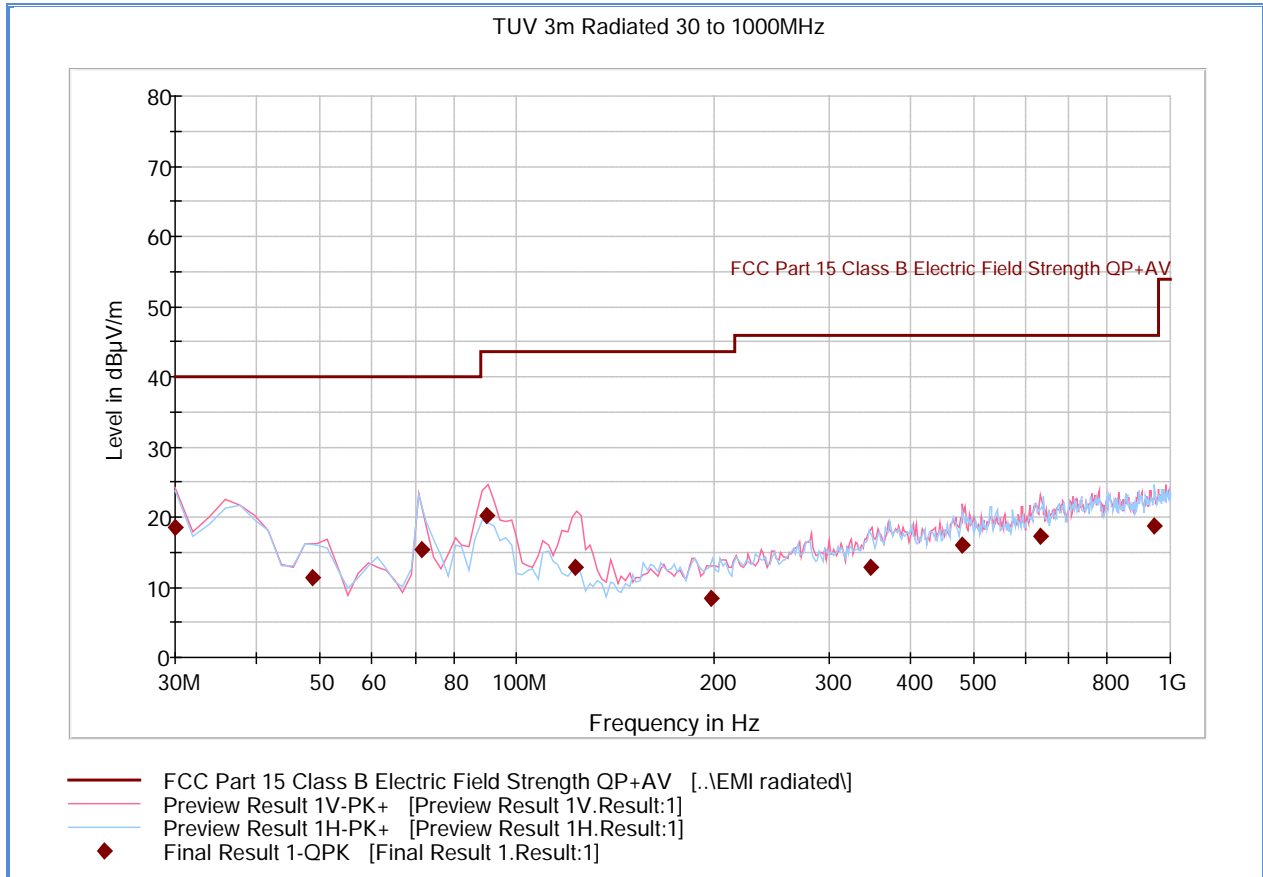
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1463.600000	21.3	1000.0	1000.000	294.0	V	159.0	-9.1	32.6	53.9
2465.460000	26.0	1000.0	1000.000	176.0	V	199.0	-4.6	27.9	53.9
3720.300000	29.9	1000.0	1000.000	185.0	V	24.0	2.6	24.0	53.9
5987.180000	29.0	1000.0	1000.000	400.0	V	342.0	4.5	24.9	53.9
11113.080000	33.1	1000.0	1000.000	283.0	V	96.0	11.7	20.8	53.9
17956.620000	41.5	1000.0	1000.000	391.0	H	40.0	21.2	12.4	53.9

Test Notes: No significant emissions observed.



2.7.12 Test Results Below 1GHz (Worst Case Configuration)



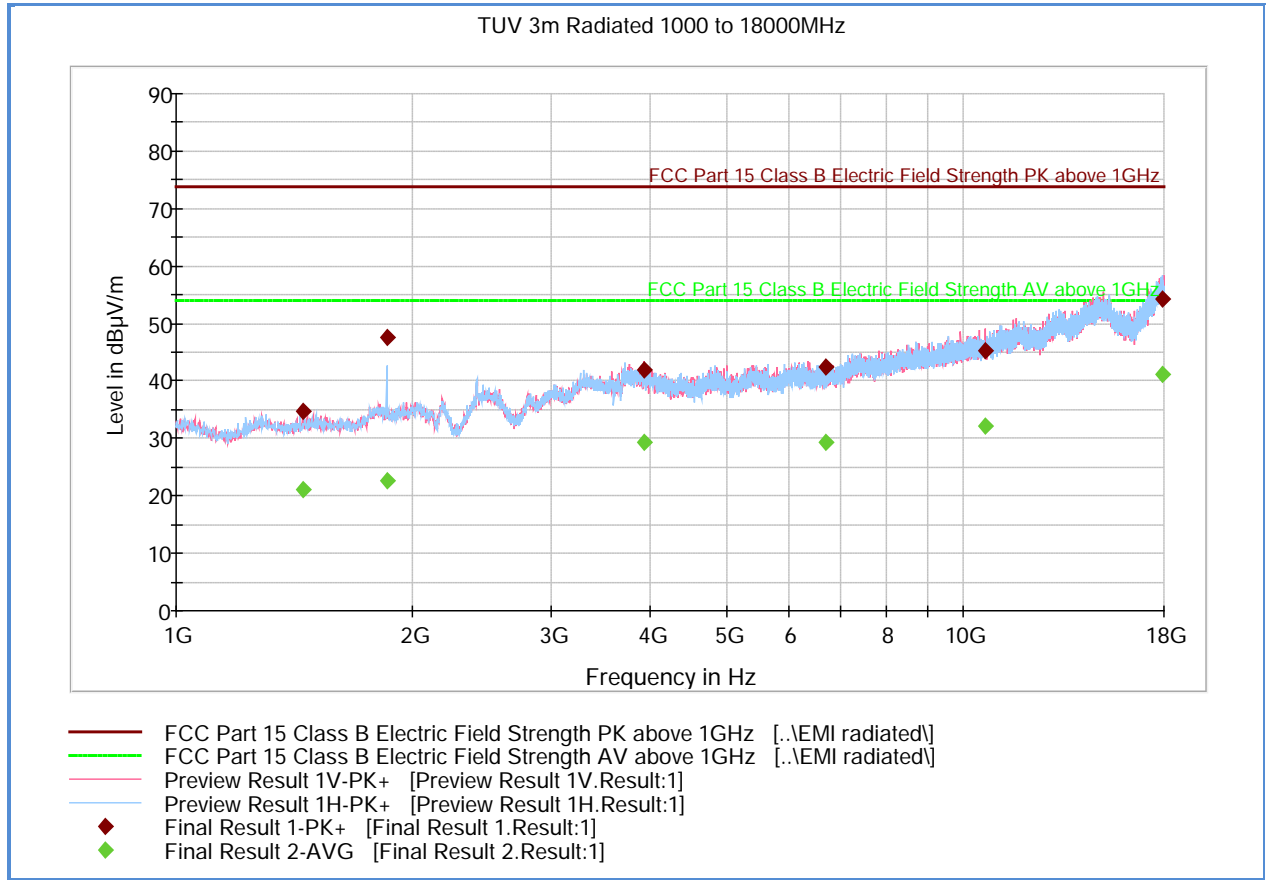
Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.040000	18.6	1000.0	120.000	304.0	V	338.0	-12.3	21.4	40.0
48.542766	11.4	1000.0	120.000	122.0	V	31.0	-20.2	28.6	40.0
71.341643	15.4	1000.0	120.000	400.0	V	340.0	-22.2	24.6	40.0
89.780521	20.2	1000.0	120.000	400.0	V	128.0	-21.1	23.3	43.5
122.706613	12.8	1000.0	120.000	100.0	V	226.0	-20.9	30.7	43.5
198.118236	8.5	1000.0	120.000	300.0	H	70.0	-16.5	35.0	43.5
347.157595	12.9	1000.0	120.000	366.0	V	177.0	-10.6	33.1	46.0
480.821964	16.0	1000.0	120.000	364.0	V	112.0	-6.6	30.0	46.0
632.885210	17.3	1000.0	120.000	378.0	V	160.0	-3.6	28.7	46.0
946.651142	18.7	1000.0	120.000	212.0	H	66.0	-0.2	27.3	46.0

**Test Notes:** Only worst case channel presented for spurious emissions below 1GHz.



2.7.13 Test Results Above 1GHz (802.11b Low Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1446.960000	34.7	1000.0	1000.000	338.0	V	15.0	-9.2	39.2	73.9
1853.940000	47.5	1000.0	1000.000	100.0	H	7.0	-6.8	26.4	73.9
3927.180000	41.9	1000.0	1000.000	271.0	V	216.0	3.2	32.0	73.9
6694.620000	42.4	1000.0	1000.000	256.0	H	202.0	5.0	31.5	73.9
10666.300000	45.2	1000.0	1000.000	267.0	V	111.0	11.1	28.7	73.9
17943.360000	54.2	1000.0	1000.000	372.0	H	17.0	21.1	19.7	73.9

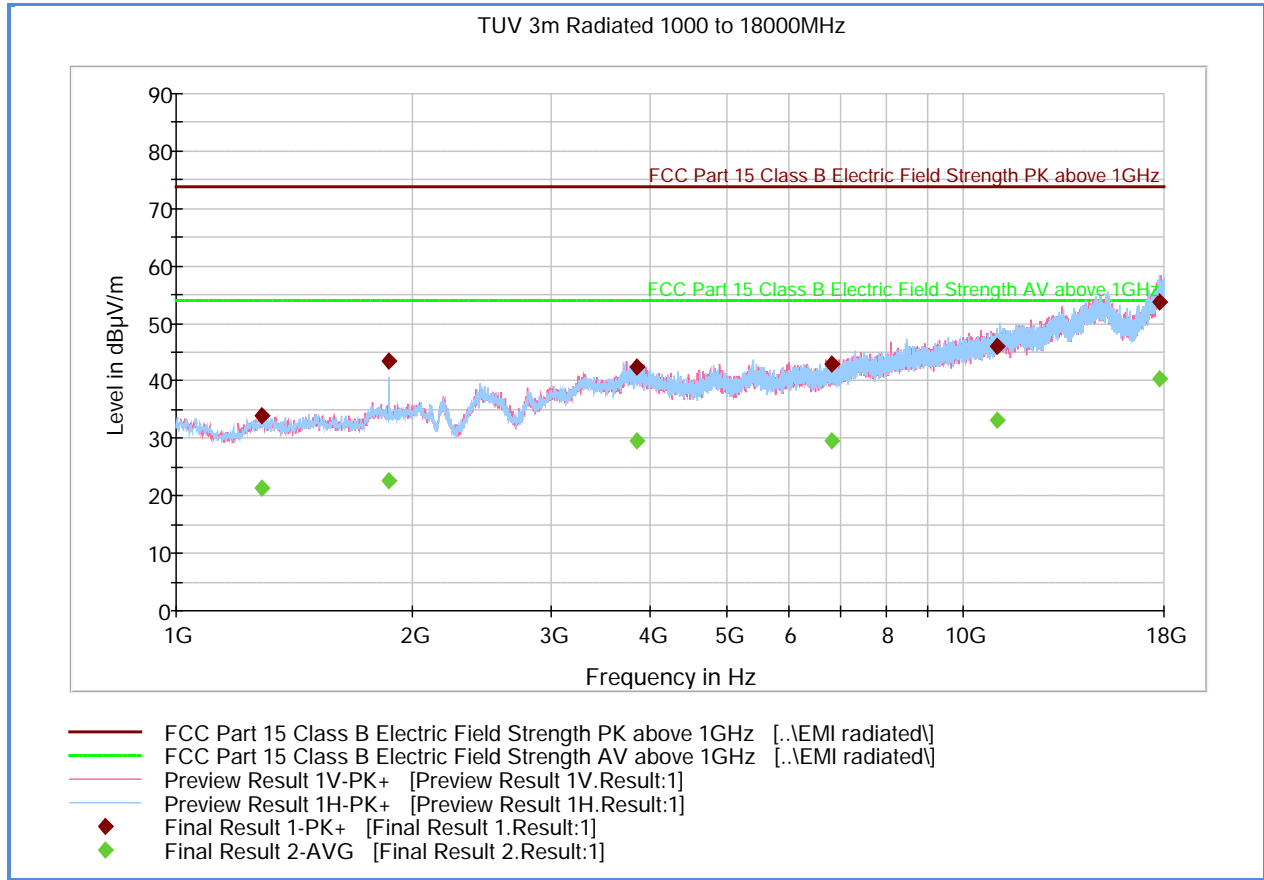
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1446.960000	21.0	1000.0	1000.000	338.0	V	15.0	-9.2	32.9	53.9
1853.940000	22.6	1000.0	1000.000	100.0	H	7.0	-6.8	31.3	53.9
3927.180000	29.3	1000.0	1000.000	271.0	V	216.0	3.2	24.6	53.9
6694.620000	29.4	1000.0	1000.000	256.0	H	202.0	5.0	24.5	53.9
10666.300000	32.2	1000.0	1000.000	267.0	V	111.0	11.1	21.7	53.9
17943.360000	41.3	1000.0	1000.000	372.0	H	17.0	21.1	12.6	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.



2.7.14 Test Results Above 1GHz (802.11b Mid Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1282.860000	34.0	1000.0	1000.000	197.0	V	15.0	-9.3	39.9	73.9
1863.940000	43.5	1000.0	1000.000	100.0	H	0.0	-6.7	30.4	73.9
3852.100000	42.3	1000.0	1000.000	125.0	V	221.0	3.3	31.6	73.9
6802.920000	43.0	1000.0	1000.000	255.0	H	106.0	5.4	30.9	73.9
11065.520000	46.0	1000.0	1000.000	183.0	H	343.0	11.6	27.9	73.9
17751.820000	53.9	1000.0	1000.000	117.0	H	0.0	20.8	20.0	73.9

Average Data

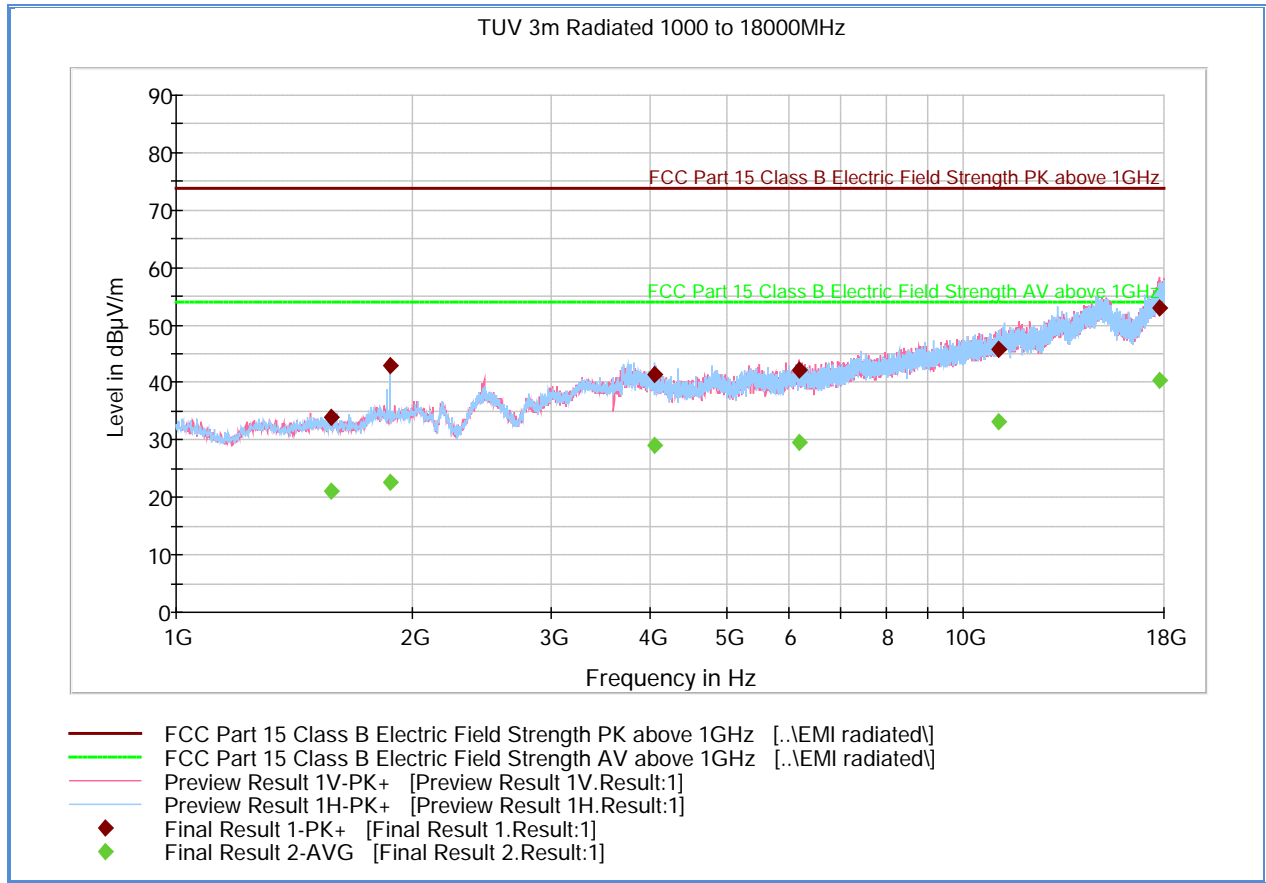
Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1282.860000	21.4	1000.0	1000.000	197.0	V	15.0	-9.3	32.5	53.9
1863.940000	22.7	1000.0	1000.000	100.0	H	0.0	-6.7	31.2	53.9
3852.100000	29.6	1000.0	1000.000	125.0	V	221.0	3.3	24.3	53.9
6802.920000	29.6	1000.0	1000.000	255.0	H	106.0	5.4	24.3	53.9
11065.520000	33.1	1000.0	1000.000	183.0	H	343.0	11.6	20.8	53.9
17751.820000	40.4	1000.0	1000.000	117.0	H	0.0	20.8	13.5	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.





2.7.15 Test Results Above 1GHz (802.11b High Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1575.760000	34.0	1000.0	1000.000	280.0	V	309.0	-8.9	39.9	73.9
1869.120000	42.9	1000.0	1000.000	100.0	H	309.0	-6.7	31.0	73.9
4058.640000	41.5	1000.0	1000.000	222.0	H	352.0	2.6	32.4	73.9
6186.240000	42.1	1000.0	1000.000	187.0	V	258.0	4.9	31.8	73.9
11098.060000	45.8	1000.0	1000.000	393.0	H	246.0	11.7	28.1	73.9
17731.020000	53.1	1000.0	1000.000	280.0	V	84.0	20.7	20.8	73.9

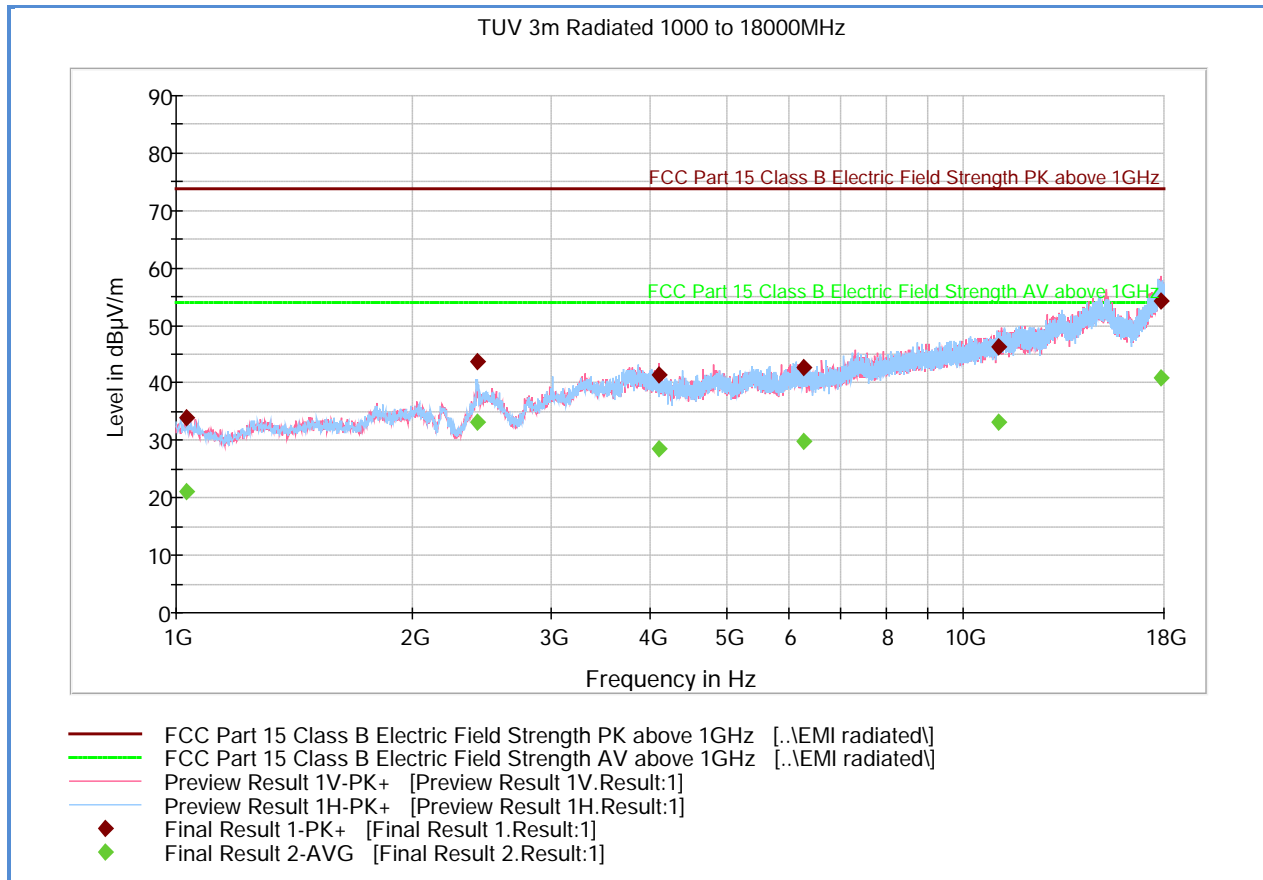
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1575.760000	21.1	1000.0	1000.000	280.0	V	309.0	-8.9	32.8	53.9
1869.120000	22.5	1000.0	1000.000	100.0	H	309.0	-6.7	31.4	53.9
4058.640000	29.1	1000.0	1000.000	222.0	H	352.0	2.6	24.8	53.9
6186.240000	29.6	1000.0	1000.000	187.0	V	258.0	4.9	24.3	53.9
11098.060000	33.1	1000.0	1000.000	393.0	H	246.0	11.7	20.8	53.9
17731.020000	40.5	1000.0	1000.000	280.0	V	84.0	20.7	13.4	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.



2.7.16 Test Results Above 1GHz (802.11g Low Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1031.680000	33.9	1000.0	1000.000	197.0	V	48.0	-11.0	40.0	73.9
2410.740000	43.7	1000.0	1000.000	104.0	H	40.0	-4.7	30.2	73.9
4102.360000	41.5	1000.0	1000.000	214.0	V	52.0	2.2	32.4	73.9
6263.220000	42.6	1000.0	1000.000	239.0	H	113.0	5.0	31.3	73.9
11114.500000	46.2	1000.0	1000.000	389.0	V	25.0	11.7	27.7	73.9
17835.940000	54.3	1000.0	1000.000	165.0	V	254.0	20.9	19.6	73.9

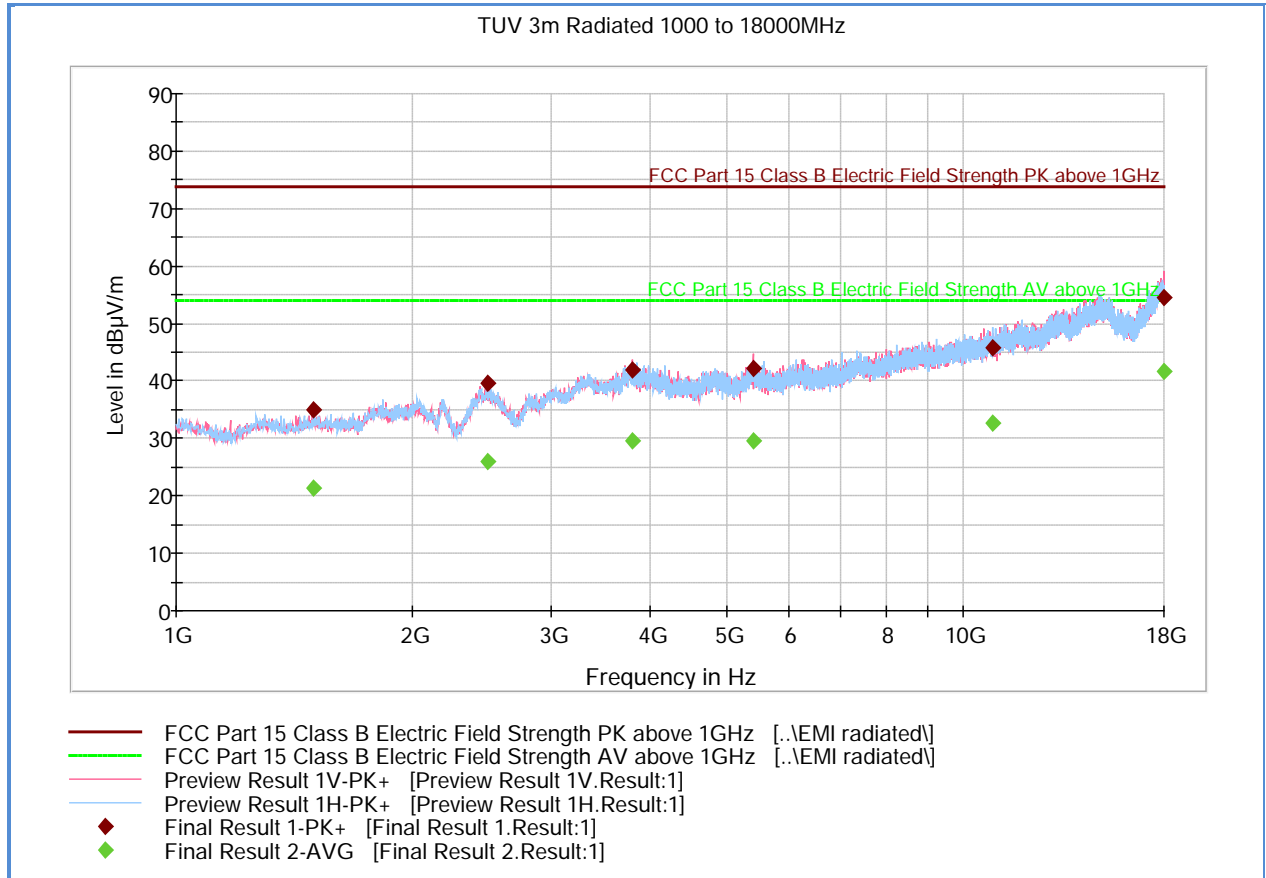
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1031.680000	21.0	1000.0	1000.000	197.0	V	48.0	-11.0	32.9	53.9
2410.740000	33.1	1000.0	1000.000	104.0	H	40.0	-4.7	20.8	53.9
4102.360000	28.6	1000.0	1000.000	214.0	V	52.0	2.2	25.3	53.9
6263.220000	29.8	1000.0	1000.000	239.0	H	113.0	5.0	24.1	53.9
11114.500000	33.1	1000.0	1000.000	389.0	V	25.0	11.7	20.8	53.9
17835.940000	40.8	1000.0	1000.000	165.0	V	254.0	20.9	13.1	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.



2.7.17 Test Results Above 1GHz (802.11g Mid Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1492.740000	34.9	1000.0	1000.000	207.0	H	269.0	-9.0	39.0	73.9
2486.340000	39.5	1000.0	1000.000	115.0	H	248.0	-4.6	34.4	73.9
3794.420000	42.0	1000.0	1000.000	217.0	V	145.0	3.0	31.9	73.9
5404.760000	42.2	1000.0	1000.000	323.0	V	331.0	3.9	31.7	73.9
10921.500000	45.8	1000.0	1000.000	168.0	H	28.0	11.3	28.1	73.9
17989.900000	54.5	1000.0	1000.000	186.0	V	22.0	21.3	19.4	73.9

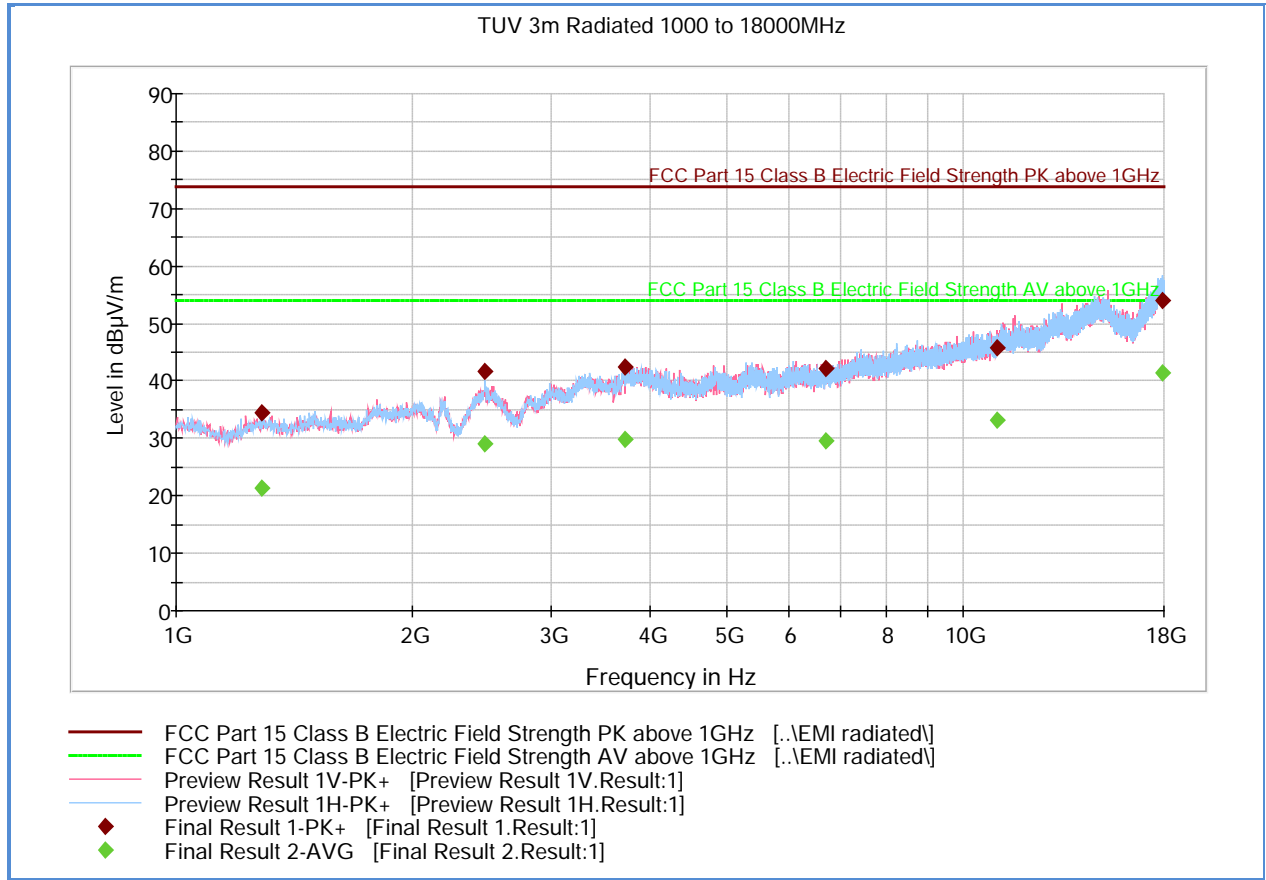
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1492.740000	21.4	1000.0	1000.000	207.0	H	269.0	-9.0	32.5	53.9
2486.340000	26.1	1000.0	1000.000	115.0	H	248.0	-4.6	27.8	53.9
3794.420000	29.6	1000.0	1000.000	217.0	V	145.0	3.0	24.3	53.9
5404.760000	29.4	1000.0	1000.000	323.0	V	331.0	3.9	24.5	53.9
10921.500000	32.6	1000.0	1000.000	168.0	H	28.0	11.3	21.3	53.9
17989.900000	41.5	1000.0	1000.000	186.0	V	22.0	21.3	12.4	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz.



2.7.18 Test Results Above 1GHz (802.11g High Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1283.020000	34.6	1000.0	1000.000	186.0	H	54.0	-9.3	39.3	73.9
2468.460000	41.6	1000.0	1000.000	100.0	H	22.0	-4.6	32.3	73.9
3717.100000	42.5	1000.0	1000.000	268.0	H	43.0	2.6	31.4	73.9
6681.020000	42.3	1000.0	1000.000	400.0	H	193.0	4.9	31.6	73.9
11069.240000	45.7	1000.0	1000.000	277.0	V	48.0	11.6	28.2	73.9
17953.760000	54.1	1000.0	1000.000	154.0	H	351.0	21.1	19.8	73.9

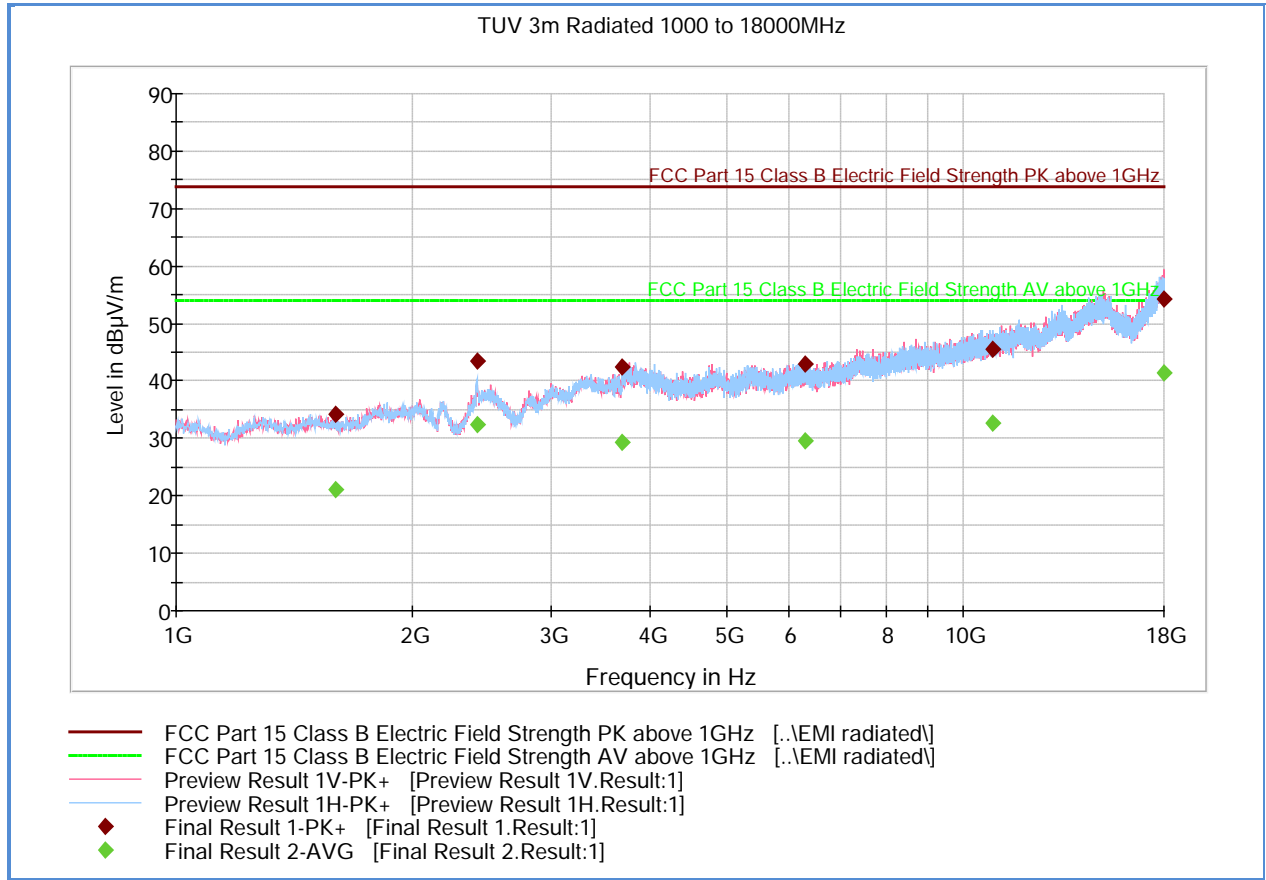
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1283.020000	21.4	1000.0	1000.000	186.0	H	54.0	-9.3	32.5	53.9
2468.460000	29.0	1000.0	1000.000	100.0	H	22.0	-4.6	24.9	53.9
3717.100000	29.8	1000.0	1000.000	268.0	H	43.0	2.6	24.1	53.9
6681.020000	29.5	1000.0	1000.000	400.0	H	193.0	4.9	24.4	53.9
11069.240000	33.1	1000.0	1000.000	277.0	V	48.0	11.6	20.8	53.9
17953.760000	41.4	1000.0	1000.000	154.0	H	351.0	21.1	12.5	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.



2.7.19 Test Results Above 1GHz (802.11n Low Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1596.600000	34.2	1000.0	1000.000	162.0	V	199.0	-8.9	39.7	73.9
2409.520000	43.4	1000.0	1000.000	105.0	H	43.0	-4.7	30.5	73.9
3690.360000	42.5	1000.0	1000.000	154.0	H	90.0	2.3	31.4	73.9
6306.160000	42.9	1000.0	1000.000	352.0	V	212.0	5.0	31.0	73.9
10897.460000	45.6	1000.0	1000.000	250.0	H	0.0	11.3	28.3	73.9
17969.220000	54.4	1000.0	1000.000	118.0	V	352.0	21.2	19.5	73.9

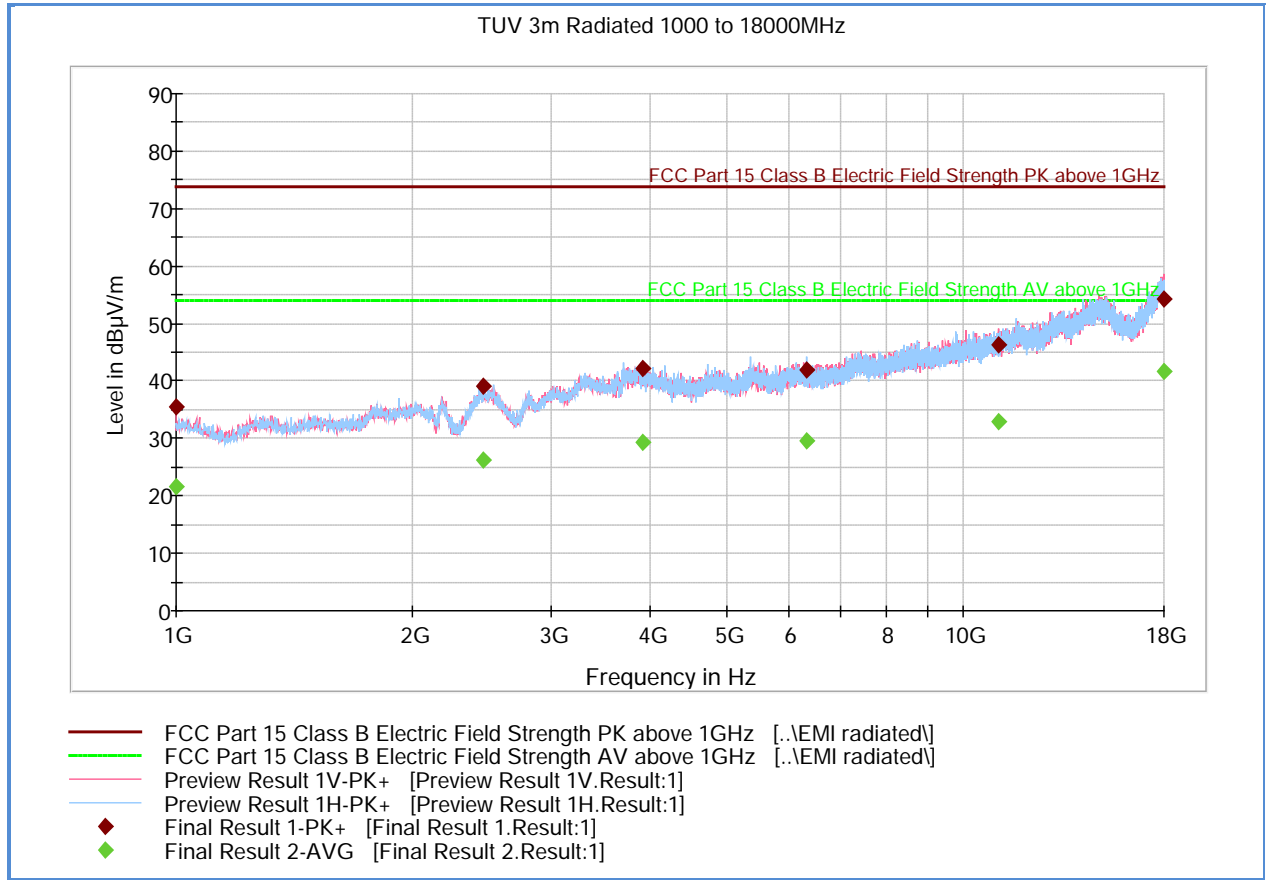
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1596.600000	21.0	1000.0	1000.000	162.0	V	199.0	-8.9	32.9	53.9
2409.520000	32.4	1000.0	1000.000	105.0	H	43.0	-4.7	21.5	53.9
3690.360000	29.4	1000.0	1000.000	154.0	H	90.0	2.3	24.5	53.9
6306.160000	29.6	1000.0	1000.000	352.0	V	212.0	5.0	24.3	53.9
10897.460000	32.7	1000.0	1000.000	250.0	H	0.0	11.3	21.2	53.9
17969.220000	41.5	1000.0	1000.000	118.0	V	352.0	21.2	12.4	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.



2.7.20 Test Results Above 1GHz (802.11n Mid Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1000.160000	35.4	1000.0	1000.000	112.0	V	256.0	-11.2	38.5	73.9
2456.240000	39.0	1000.0	1000.000	125.0	V	84.0	-4.7	34.9	73.9
3913.580000	42.2	1000.0	1000.000	136.0	V	265.0	3.3	31.7	73.9
6338.260000	42.0	1000.0	1000.000	400.0	H	259.0	5.0	31.9	73.9
11074.300000	46.3	1000.0	1000.000	297.0	V	186.0	11.6	27.6	73.9
17962.260000	54.3	1000.0	1000.000	207.0	V	31.0	21.2	19.6	73.9

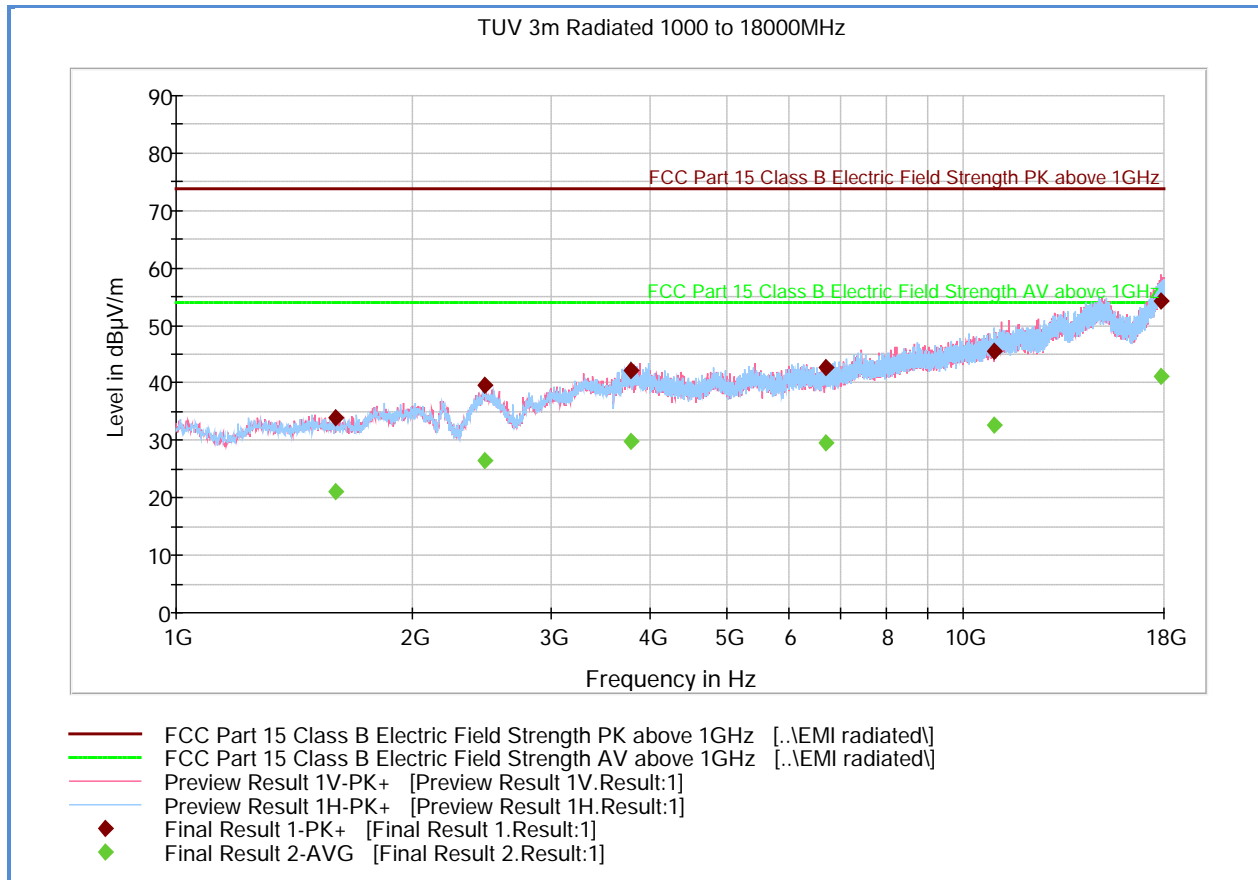
Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1000.160000	21.7	1000.0	1000.000	112.0	V	256.0	-11.2	32.2	53.9
2456.240000	26.1	1000.0	1000.000	125.0	V	84.0	-4.7	27.8	53.9
3913.580000	29.3	1000.0	1000.000	136.0	V	265.0	3.3	24.6	53.9
6338.260000	29.5	1000.0	1000.000	400.0	H	259.0	5.0	24.4	53.9
11074.300000	33.0	1000.0	1000.000	297.0	V	186.0	11.6	20.9	53.9
17962.260000	41.5	1000.0	1000.000	207.0	V	31.0	21.2	12.4	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz.



2.7.21 Test Results Above 1GHz (802.11n High Channel)



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1597.120000	34.0	1000.0	1000.000	246.0	H	75.0	-8.9	39.9	73.9
2465.820000	39.7	1000.0	1000.000	241.0	H	151.0	-4.6	34.2	73.9
3780.000000	42.2	1000.0	1000.000	285.0	H	200.0	2.9	31.7	73.9
6689.280000	42.7	1000.0	1000.000	237.0	V	251.0	5.0	31.2	73.9
10965.220000	45.4	1000.0	1000.000	235.0	H	138.0	11.4	28.5	73.9
17876.600000	54.3	1000.0	1000.000	132.0	V	211.0	20.9	19.6	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1597.120000	21.1	1000.0	1000.000	246.0	H	75.0	-8.9	32.8	53.9
2465.820000	26.5	1000.0	1000.000	241.0	H	151.0	-4.6	27.4	53.9
3780.000000	29.7	1000.0	1000.000	285.0	H	200.0	2.9	24.2	53.9
6689.280000	29.4	1000.0	1000.000	237.0	V	251.0	5.0	24.5	53.9
10965.220000	32.8	1000.0	1000.000	235.0	H	138.0	11.4	21.1	53.9
17876.600000	41.1	1000.0	1000.000	132.0	V	211.0	20.9	12.8	53.9

**Test Notes:** Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 3GHz. Measurements above 3GHz are noise floor figures.



## 2.8 RADIATED RESTRICTED BAND EDGE MEASUREMENTS

### 2.8.1 Specification Reference

Part 15 Subpart C §15.247(d)

### 2.8.2 Standard Applicable

(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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 2.8.3 Equipment Under Test and Modification State

Serial No: SA020612700007 / Test Configuration A,B and C

### 2.8.4 Date of Test/Initial of test personnel who performed the test

July 09, 2012/FSC

### 2.8.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.8.6 Environmental Conditions

Ambient Temperature	23.3°C
Relative Humidity	54.7%
ATM Pressure	99.1 kPa

### 2.8.7 Additional Observations

- This is a radiated test. The spectrum was searched from 2310MHz to 2390MHz for lower band edge and 2483.5MHz to 2500MHz for the upper band edge.
- There are no emissions found that do not comply with the restricted bands defined in FCC Part 15 Subpart C, 15.205.
- Before each test, a new set of battery (freshly charged) is installed.





- Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.8.8 for sample computation.

2.8.8 **Sample Computation (Radiated Emission)**

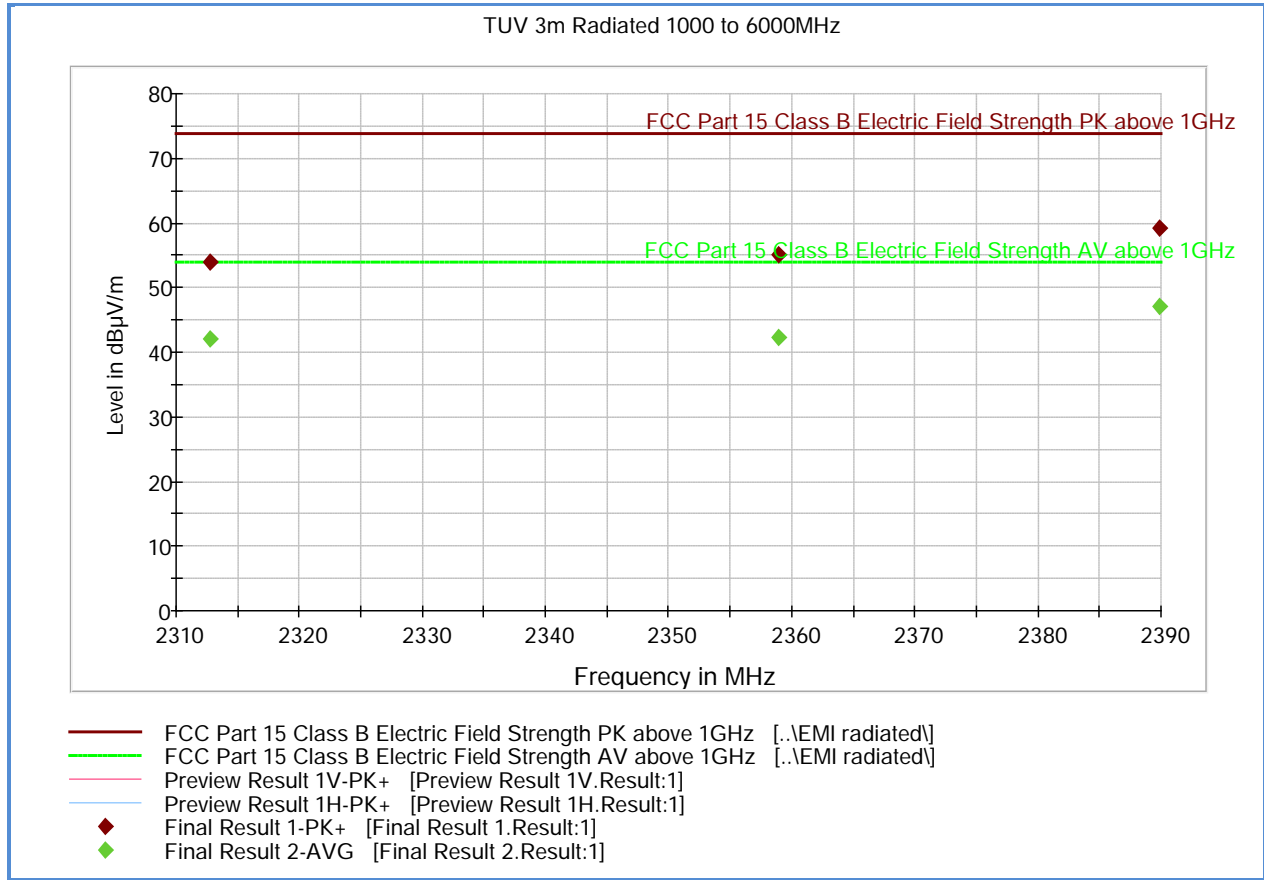
Measuring equipment raw measurement (db $\mu$ V) @ 30 MHz		24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3
	Asset# 1172 (cable)	0.3
	Asset# 1016 (preamplifier)	-30.7
	Asset# 1175(cable)	0.3
	Asset# 1002 (antenna)	17.2
<b>Reported QuasiPeak Final Measurement (db<math>\mu</math>V/m) @ 30MHz</b>		<b>11.8</b>

2.8.9 **Test Results**

See attached plots.



2.8.10 Test Results Above 802.11b Low Channel



Peak Data

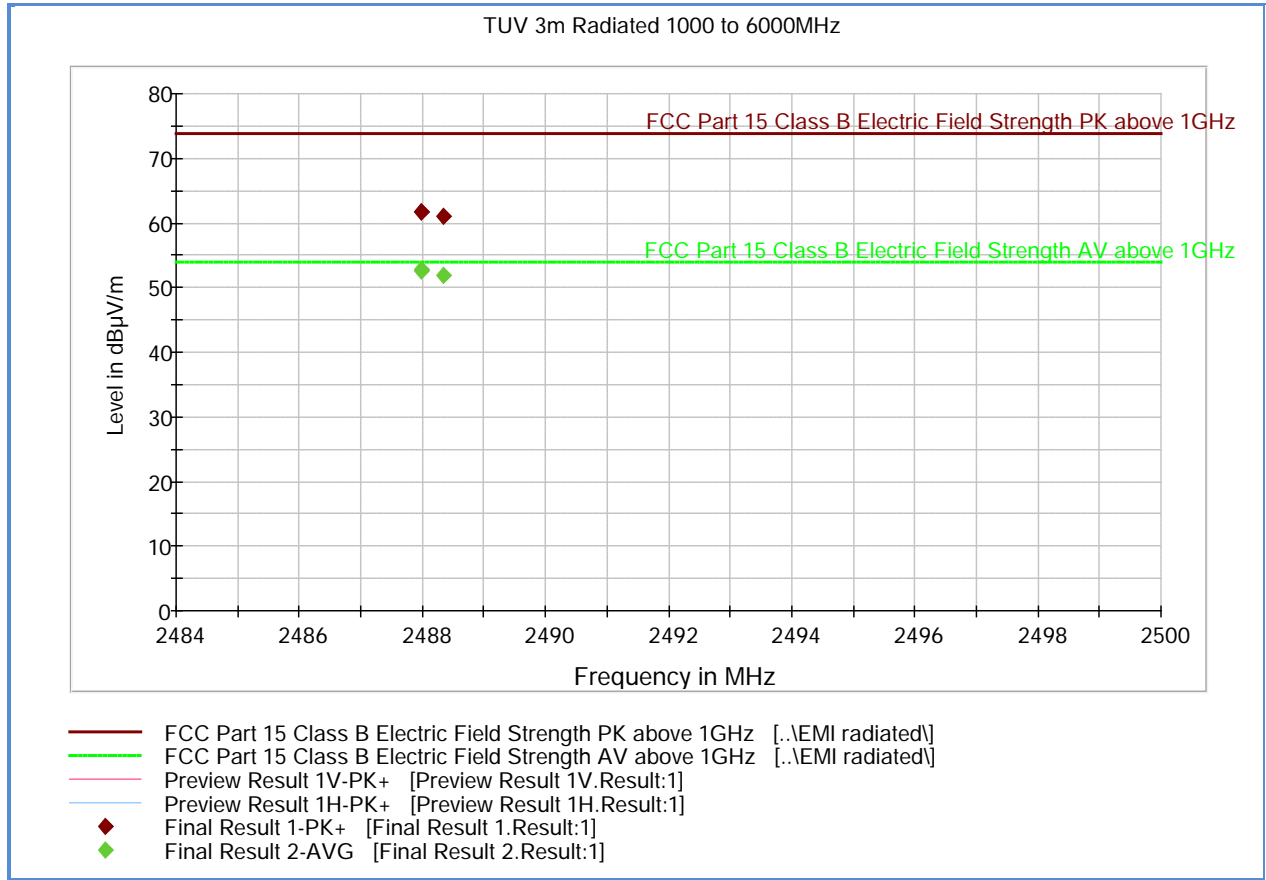
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2312.700000	53.9	100.0	1000.000	150.0	H	235.0	40.9	20.0	73.9
2358.911383	55.0	100.0	1000.000	100.0	H	45.0	40.8	18.9	73.9
2389.932946	59.3	100.0	1000.000	100.0	H	17.0	40.9	14.6	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2312.700000	42.0	100.0	1000.000	150.0	H	235.0	40.9	11.9	53.9
2358.911383	42.3	100.0	1000.000	100.0	H	45.0	40.8	11.6	53.9
2389.932946	47.1	100.0	1000.000	100.0	H	17.0	40.9	6.8	53.9



2.8.11 Test Results Above 802.11b High Channel



Peak Data

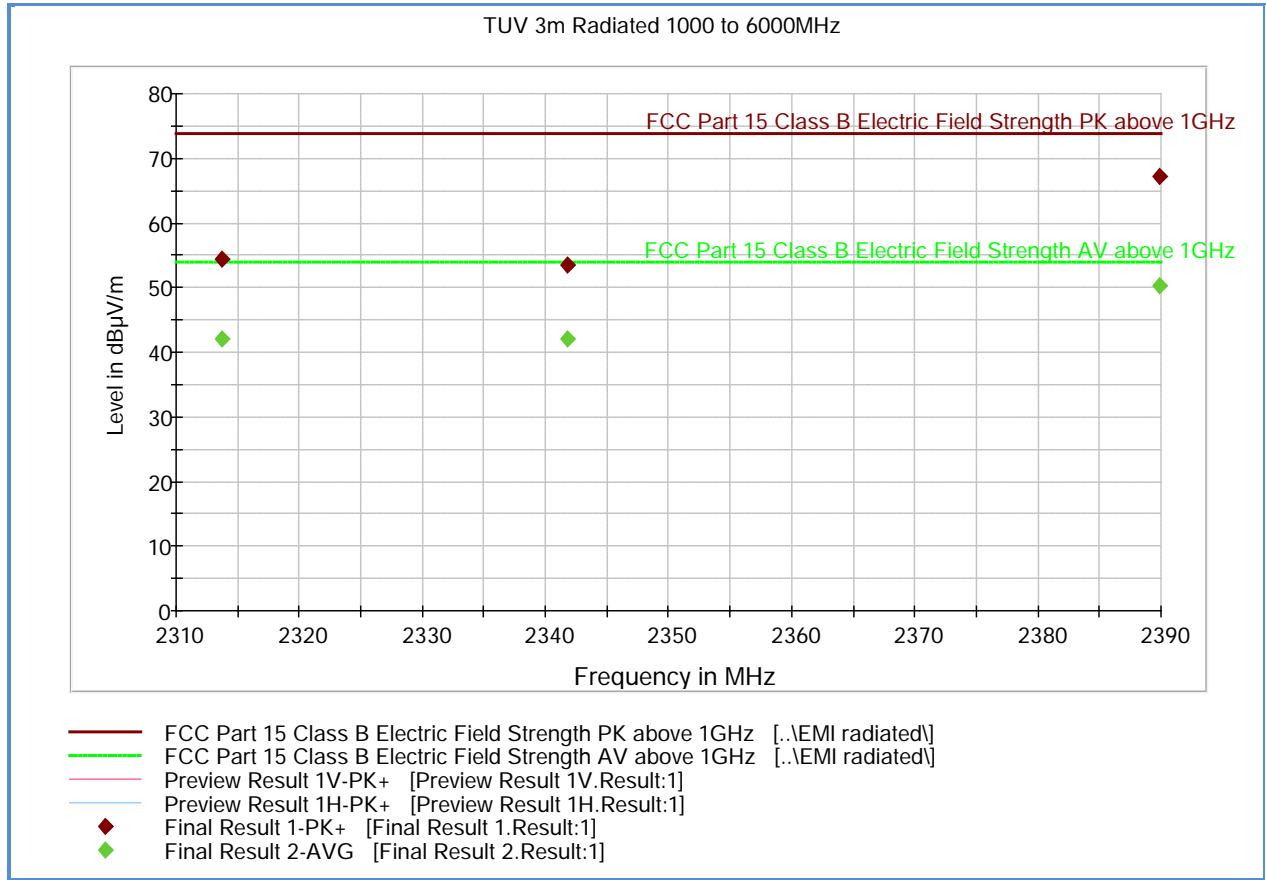
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2487.976313	61.7	100.0	1000.000	100.0	H	35.0	41.7	12.2	73.9
2487.980000	61.6	100.0	1000.000	100.0	H	35.0	41.7	12.3	73.9
2488.330060	61.0	100.0	1000.000	100.0	H	35.0	41.7	12.9	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2487.976313	52.8	100.0	1000.000	100.0	H	35.0	41.7	1.1	53.9
2487.980000	52.6	100.0	1000.000	100.0	H	35.0	41.7	1.3	53.9
2488.330060	52.0	100.0	1000.000	100.0	H	35.0	41.7	1.9	53.9



2.8.12 Test Results Above 802.11g Low Channel



Peak Data

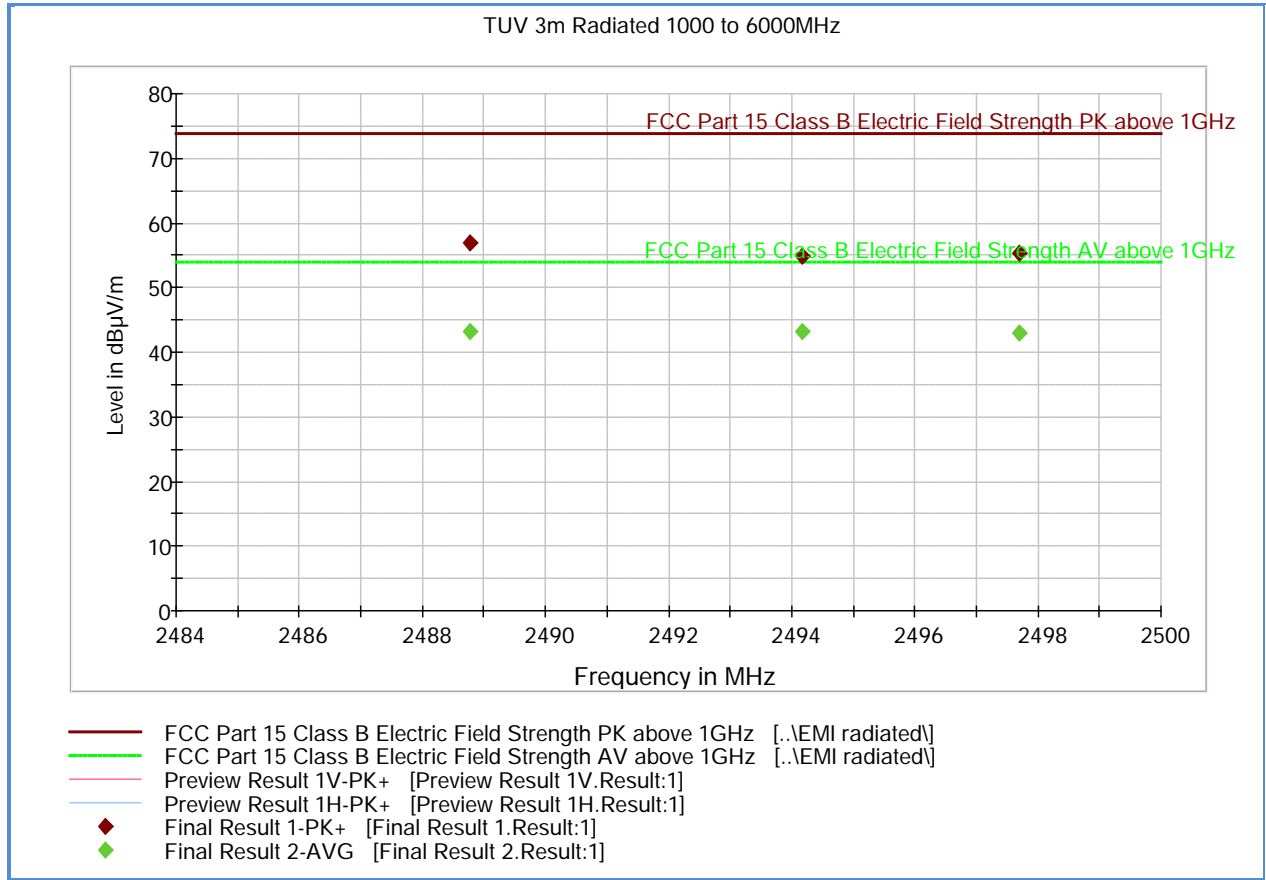
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2313.700000	54.3	100.0	1000.000	137.0	V	317.0	40.9	19.6	73.9
2341.804128	53.6	100.0	1000.000	130.0	H	357.0	40.9	20.3	73.9
2389.899679	67.2	100.0	1000.000	100.0	H	42.0	40.9	6.7	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2313.700000	42.1	100.0	1000.000	137.0	V	317.0	40.9	11.8	53.9
2341.804128	42.0	100.0	1000.000	130.0	H	357.0	40.9	11.9	53.9
2389.899679	50.3	100.0	1000.000	100.0	H	42.0	40.9	3.6	53.9



2.8.13 Test Results Above 802.11g High Channel



Peak Data

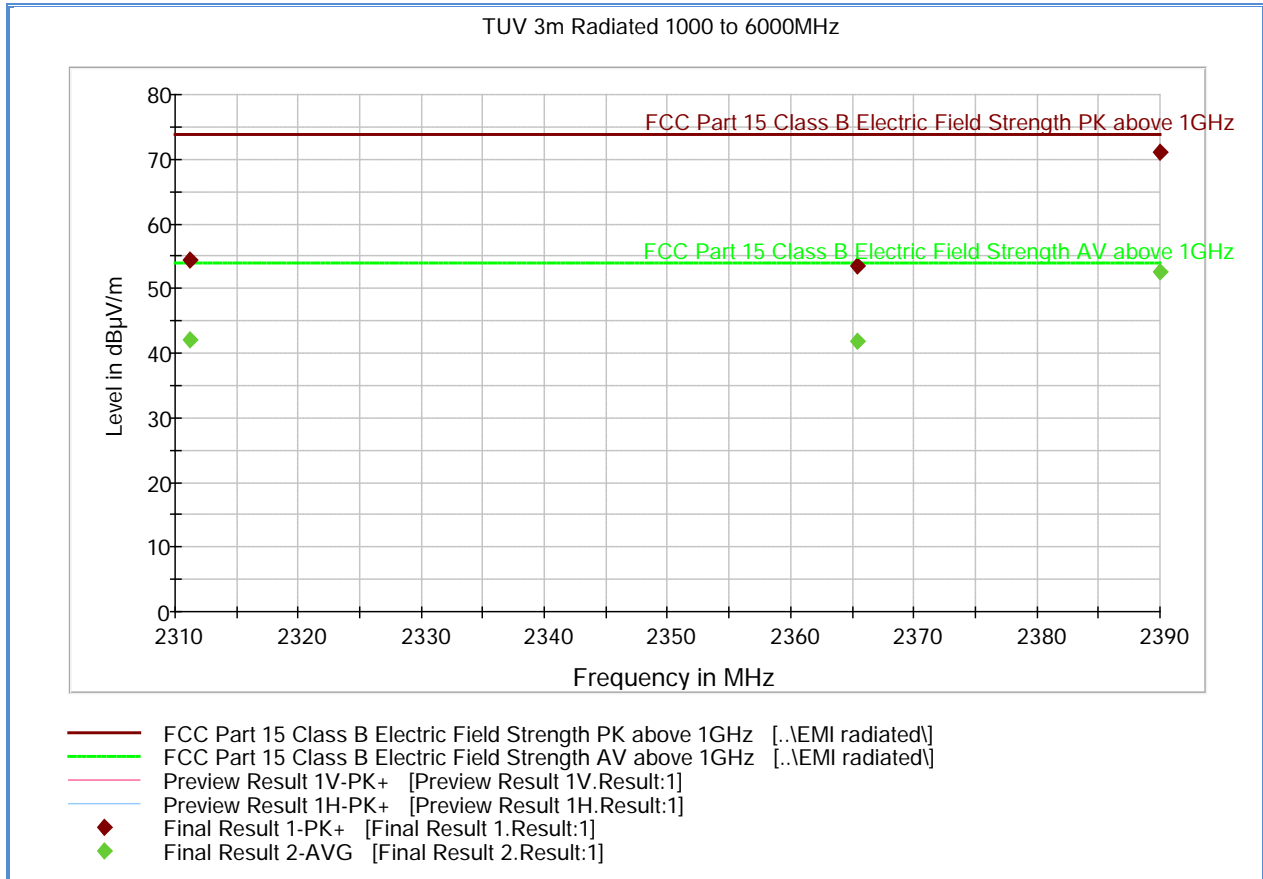
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2488.780000	56.9	100.0	1000.000	100.0	V	101.0	41.7	17.0	73.9
2494.175351	55.0	100.0	1000.000	112.0	H	96.0	41.7	18.9	73.9
2497.699679	55.4	100.0	1000.000	150.0	H	168.0	41.6	18.5	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2488.780000	43.3	100.0	1000.000	100.0	V	101.0	41.7	10.6	53.9
2494.175351	43.2	100.0	1000.000	112.0	H	96.0	41.7	10.7	53.9
2497.699679	43.1	100.0	1000.000	150.0	H	168.0	41.6	10.8	53.9



2.8.14 Test Results Above 802.11n Low Channel



Peak Data

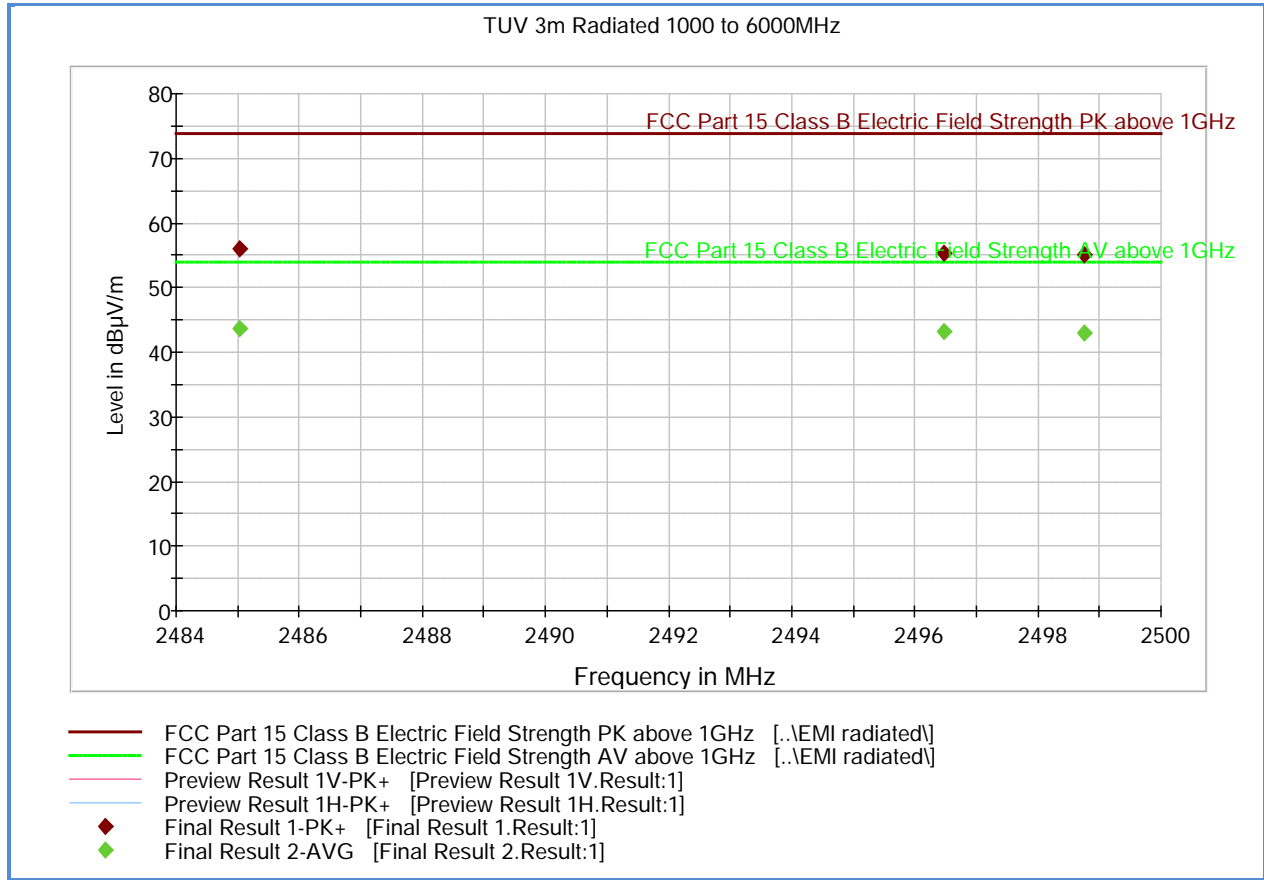
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2311.200000	54.5	100.0	1000.000	100.0	H	294.0	40.8	19.4	73.9
2365.438758	53.5	100.0	1000.000	129.0	V	74.0	40.8	20.4	73.9
2390.000000	71.2	100.0	1000.000	100.0	H	23.0	40.9	2.7	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2311.200000	42.1	100.0	1000.000	100.0	H	294.0	40.8	11.8	53.9
2365.438758	41.9	100.0	1000.000	129.0	V	74.0	40.8	12.0	53.9
2390.000000	52.6	100.0	1000.000	100.0	H	23.0	40.9	1.3	53.9



2.8.15 Test Results Above 802.11n High Channel



Peak Data

Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2485.040000	55.9	100.0	1000.000	100.0	H	1.0	41.8	18.0	73.9
2496.485251	55.3	100.0	1000.000	109.0	H	351.0	41.6	18.6	73.9
2498.756112	55.0	100.0	1000.000	150.0	H	265.0	41.6	18.9	73.9

Average Data

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2485.040000	43.6	100.0	1000.000	100.0	H	1.0	41.8	10.3	53.9
2496.485251	43.1	100.0	1000.000	109.0	H	351.0	41.6	10.8	53.9
2498.756112	43.1	100.0	1000.000	150.0	H	265.0	41.6	10.8	53.9



2.9 **POWER SPECTRAL DENSITY**

2.9.1 **Specification Reference**

Part 15 Subpart C §15.247(e)

2.9.2 **Standard Applicable**

(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.

2.9.3 **Equipment Under Test and Modification State**

Serial No: SA020612700007 / Test Configuration D,E and F

2.9.4 **Date of Test/Initial of test personnel who performed the test**

July 01, 2012/FSC

2.9.5 **Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

2.9.6 **Environmental Conditions**

Ambient Temperature	24.1°C
Relative Humidity	52.8%
ATM Pressure	98.8 kPa

2.9.7 **Additional Observations**

- This is a conducted test.
- Test procedure is per Section 5.3.1 of KDB 558074 (January 18, 2012).
- An offset of 21.4dB was added to compensate for the external attenuator and cable used.
- Detector is Peak.
- Trace mode is Max Hold.
- Sweep time is Auto Couple.
- Bandwidth Correction Factor BWCF is from  $10\log(3\text{kHz}/100\text{kHz})$ .

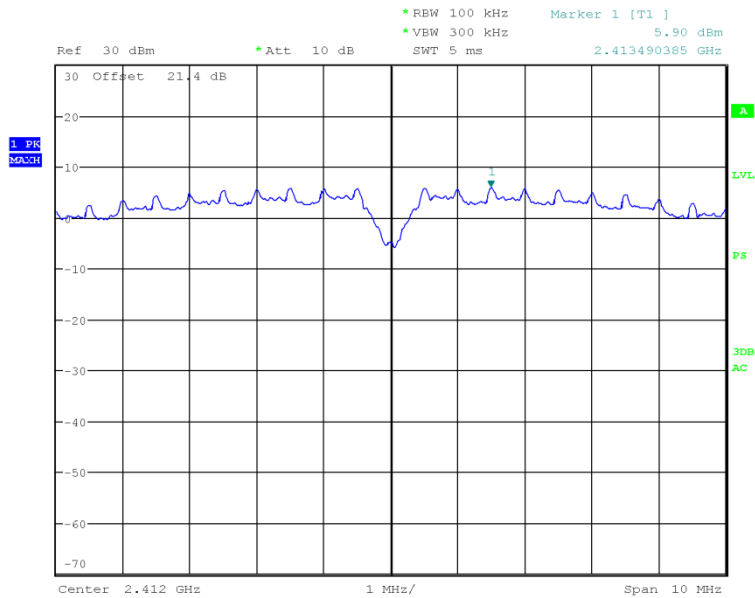




2.9.8 Test Results Summary

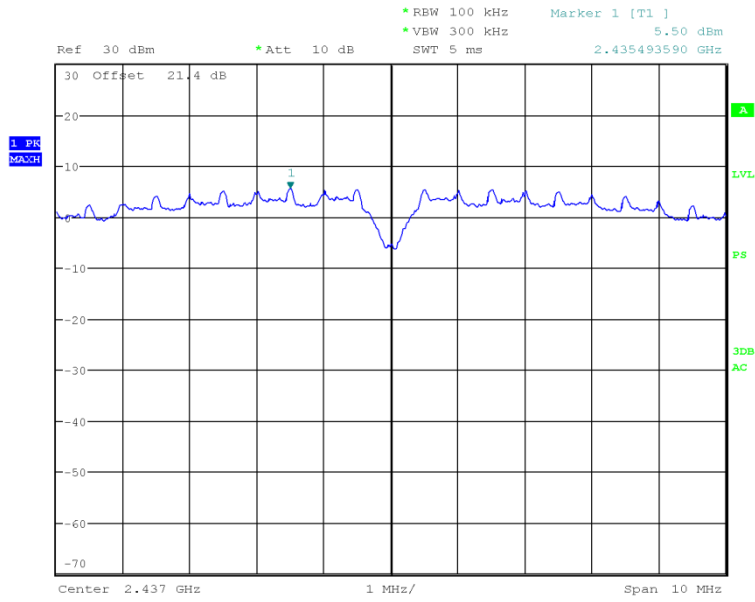
Mode	Channel	Marker Reading	Bandwidth Correction Factor (BWCF)	PSD Level (dBm)	Limit (dBm)	Compliance
802.11b	1 (2412 MHz)	5.90	15.228	-9.32	8	Complies
	6 (2437 MHz)	5.50	15.228	-9.78	8	Complies
	11 (2462 MHz)	5.36	15.228	-9.87	8	Complies
802.11g	1 (2412 MHz)	4.09	15.228	-11.14	8	Complies
	6 (2437 MHz)	3.03	15.228	-12.12	8	Complies
	11 (2462 MHz)	3.73	15.228	-11.50	8	Complies
802.11n HT20	1 (2412 MHz)	4.17	15.228	-11.06	8	Complies
	6 (2437 MHz)	3.35	15.228	-11.88	8	Complies
	11 (2462 MHz)	3.70	15.228	-11.53	8	Complies

2.9.9 Test Results Plots



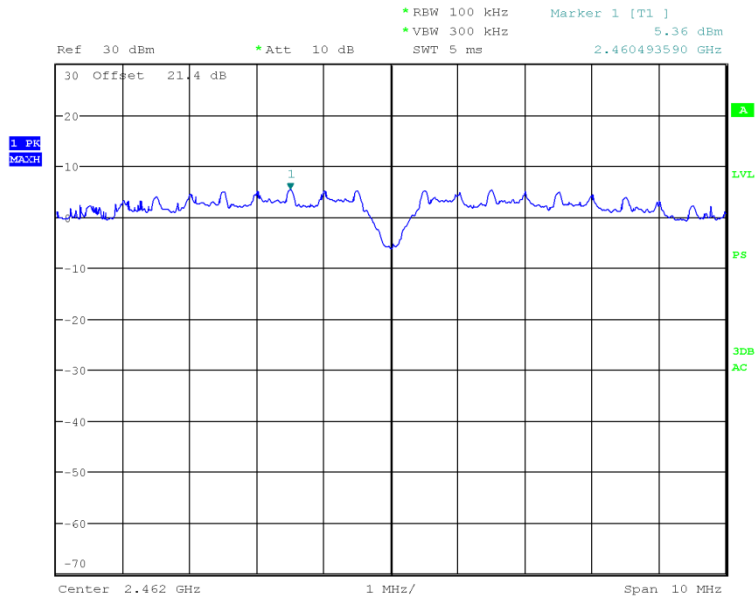
Date: 1.JUL.2012 08:05:22

802.11 b Low Channel



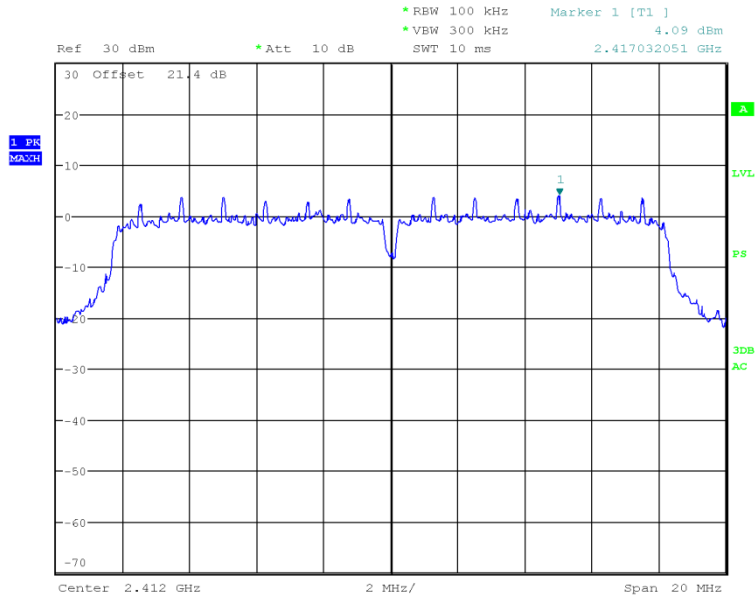
Date: 1.JUL.2012 08:07:16

### 802.11 b Mid Channel



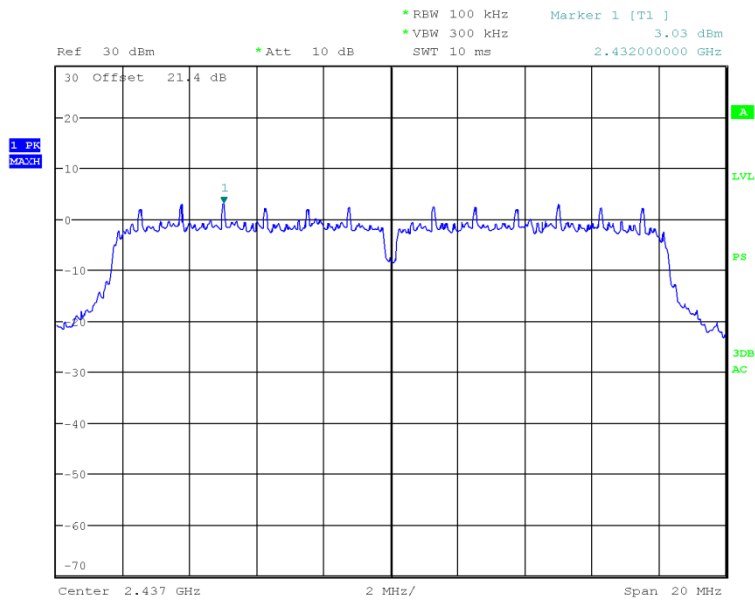
Date: 1.JUL.2012 08:09:24

### 802.11 b High Channel



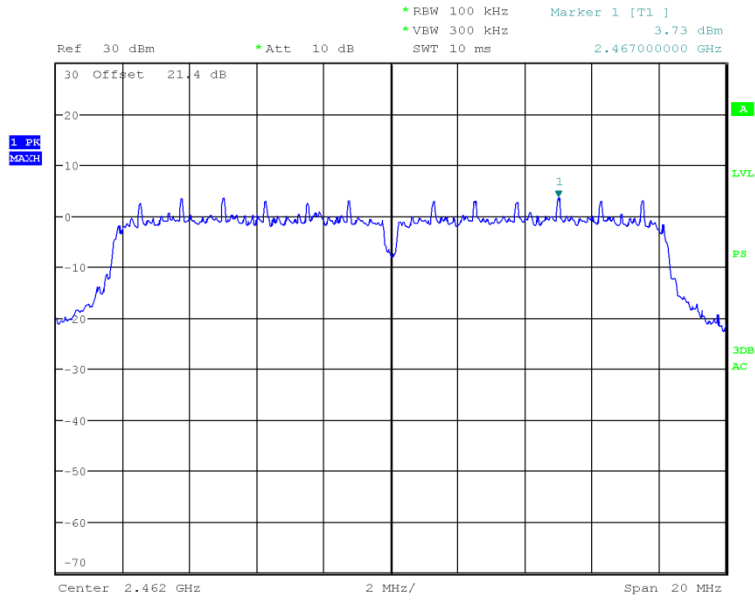
Date: 1.JUL.2012 08:13:16

### 802.11 g Low Channel



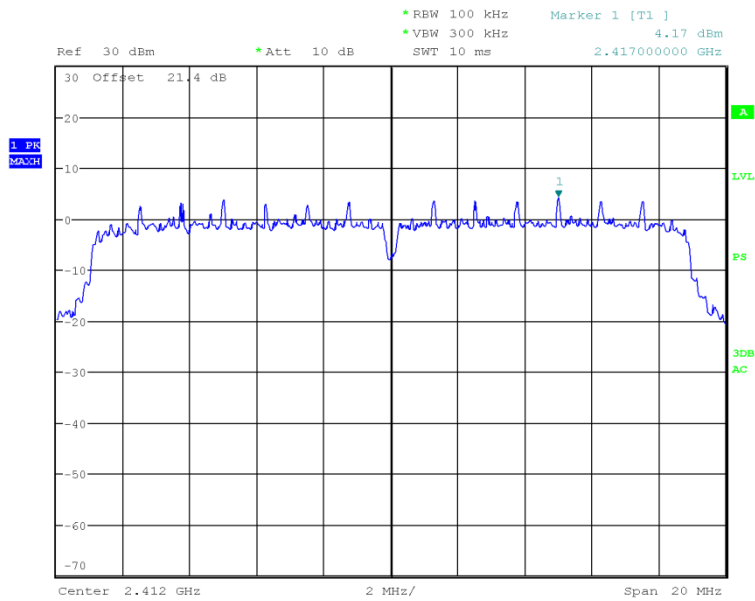
Date: 1.JUL.2012 08:16:31

### 802.11 g Mid Channel



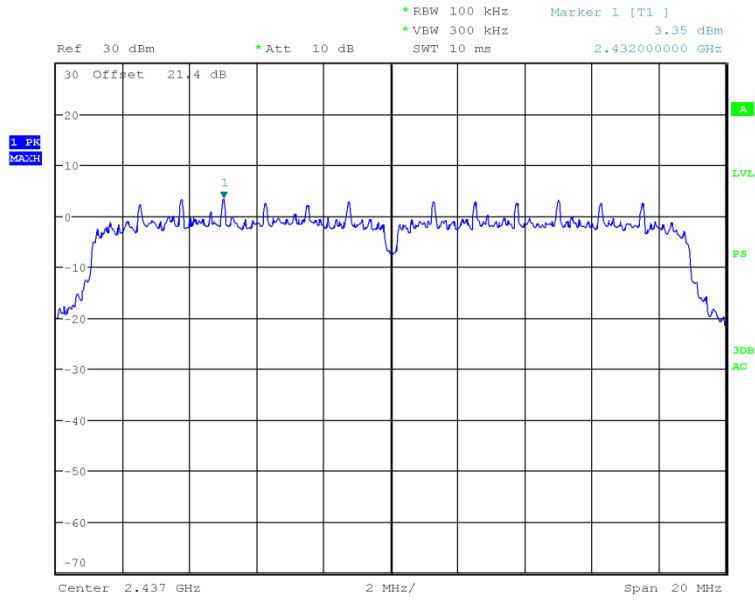
Date: 1.JUL.2012 08:18:20

### 802.11 g High Channel



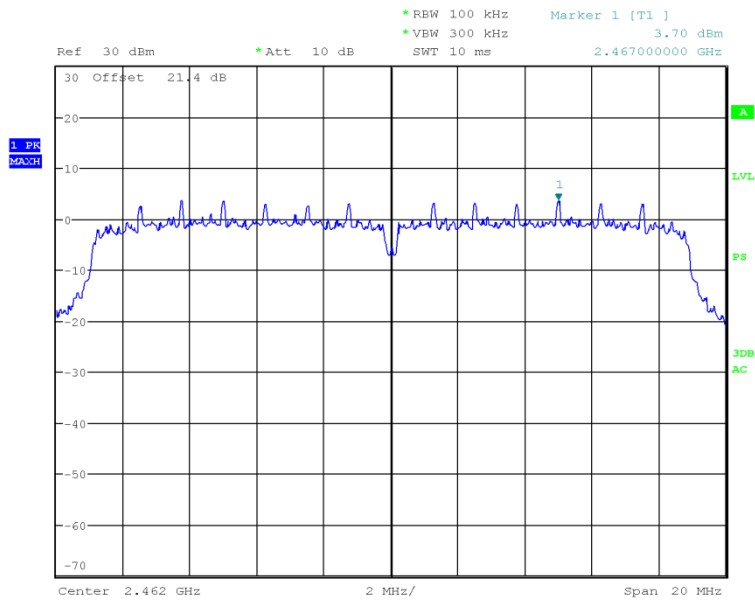
Date: 1.JUL.2012 08:40:25

### 802.11 n Low Channel



Date: 1.JUL.2012 08:39:13

### 802.11 n Mid Channel



Date: 1.JUL.2012 08:37:44

### 802.11 n High Channel



### **SECTION 3**

#### **TEST EQUIPMENT USED**



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
<b>Conducted Port Setup</b>						
7571	Wideband Radio Communication Tester	CMW 500	1201.0002k50/103829	Rhode & Schwarz	04/04/12	04/04/13
7569	Series Power Meter	N1911A P-	MY45100625	Agilent	02/24/12	02/24/14
7570	50MHz-18GHz Wideband Power Sensor	N1921A	MY45240588	Agilent	02/14/12	02/24/13
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	06/13/12	06/13/13
<b>Conducted Emissions Test Setup</b>						
1024	EMI Test Receiver	ESCS 30	847793/001	Rhode & Schwarz	02/29/12	02/28/13
7567	LISN	FCC-LISN-50-25-2-10	120304	Fischer Custom Comm.	05/24/12	05/24/13
7568	LISN	FCC-LISN-50-25-2-10	120305	Fischer Custom Comm.	05/24/12	05/24/13
8607	20dB Attenuator	CAT-20	N/A	MCL HAT-20	07/29/11	07/29/12
8609	20dB Attenuator	CAT-20	N/A	MCL HAT-20	07/29/11	07/29/12
<b>Radiated Test Setup</b>						
1002	Bilog Antenna	3142C	00058717	ETS-Lindgren	12/06/11	12/06/12
6669	Double-ridged waveguide horn antenna	3115	94124364	EMCO	11/07/11	11/07/12
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	08/17/11	08/17/12
8543	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	08/17/11	08/17/12
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	08/10/11	08/10/12
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	06/13/12	06/13/13
1016	Pre-amplifier	PAM-0202	187	PAM	08/17/11	08/17/12
<b>Miscellaneous</b>						
7560	Barometer/Temperature /Humidity Transmitter	iBTHX-W	1240476	Omega	07/12/11	07/12/12
	Test Software	EMC32	V8.52	Rhode & Schwarz	N/A	



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

3.2.1 Radiated Emission Measurements (Below 1GHz)

Contribution	Probability Distribution Type	Probability Distribution $x_i$	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1 Receiver/Spectrum Analyzer	Rectangular	0.45	0.26	0.07
2 Cables	Rectangular	0.50	0.29	0.08
3 Preamp	Rectangular	0.50	0.29	0.08
4 Antenna	Rectangular	0.75	0.43	0.19
5 Site	Rectangular	3.55	2.05	4.20
6 EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty ( $u_c$ ):				2.23
Coverage Factor (k):				2
Expanded Uncertainty:				4.45

3.2.2 Radiated Emission Measurements (Above 1GHz)

Contribution	Probability Distribution Type	Probability Distribution $x_i$	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1 Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2 Cables	Rectangular	0.70	0.40	0.16
3 Preamp	Rectangular	0.50	0.29	0.08
4 Antenna	Rectangular	0.37	0.21	0.05
5 Site	Rectangular	3.55	2.05	4.20
6 EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty ( $u_c$ ):				2.22
Coverage Factor (k):				2
Expanded Uncertainty:				4.44

3.2.3 Conducted Antenna Port Measurement

Contribution	Probability Distribution Type	Probability Distribution $x_i$	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1 Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2 Cables	Rectangular	0.50	0.29	0.08
3 EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty ( $u_c$ ):				0.72
Coverage Factor (k):				2
Expanded Uncertainty:				1.45

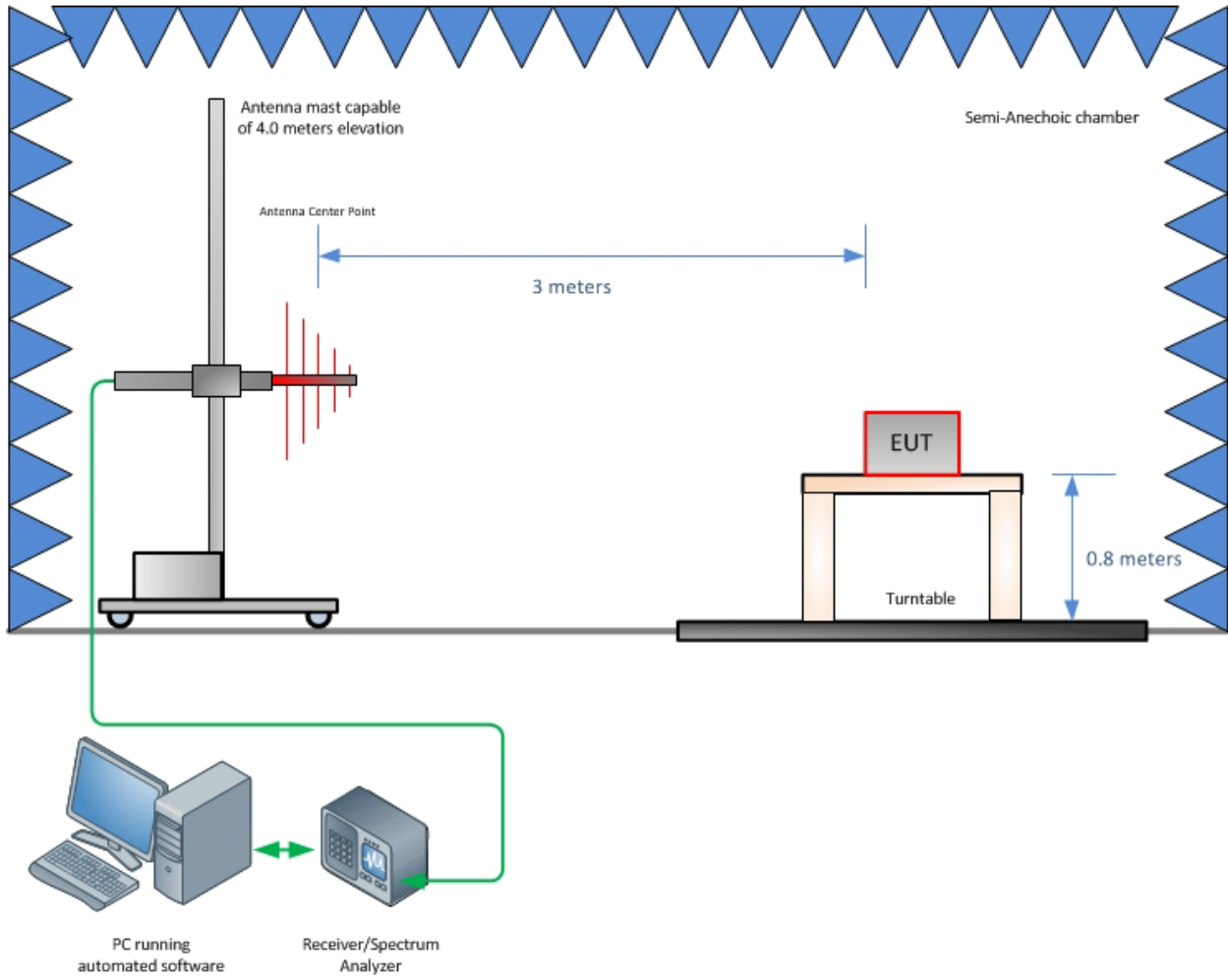




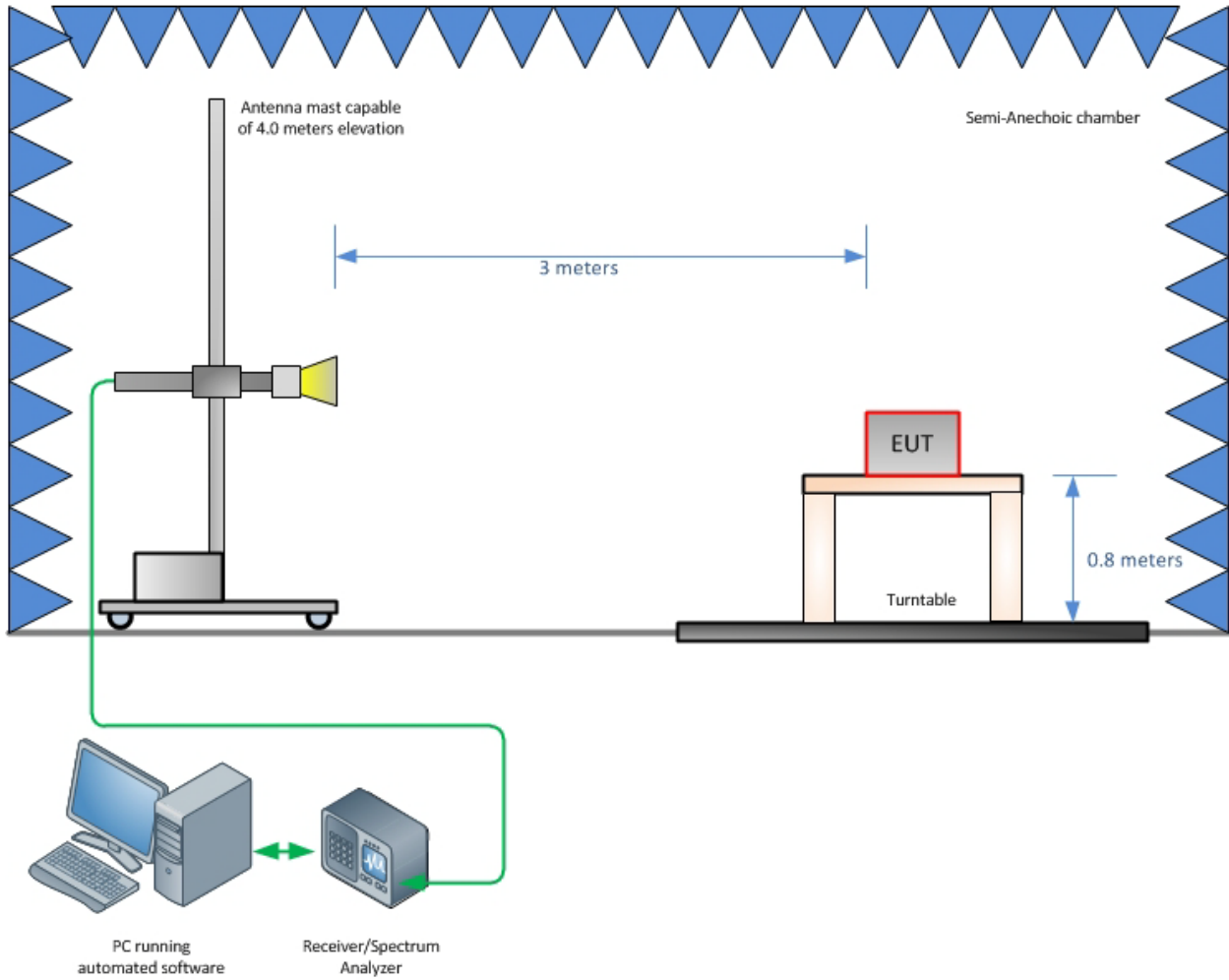
## SECTION 4

### DIAGRAM OF TEST SETUP

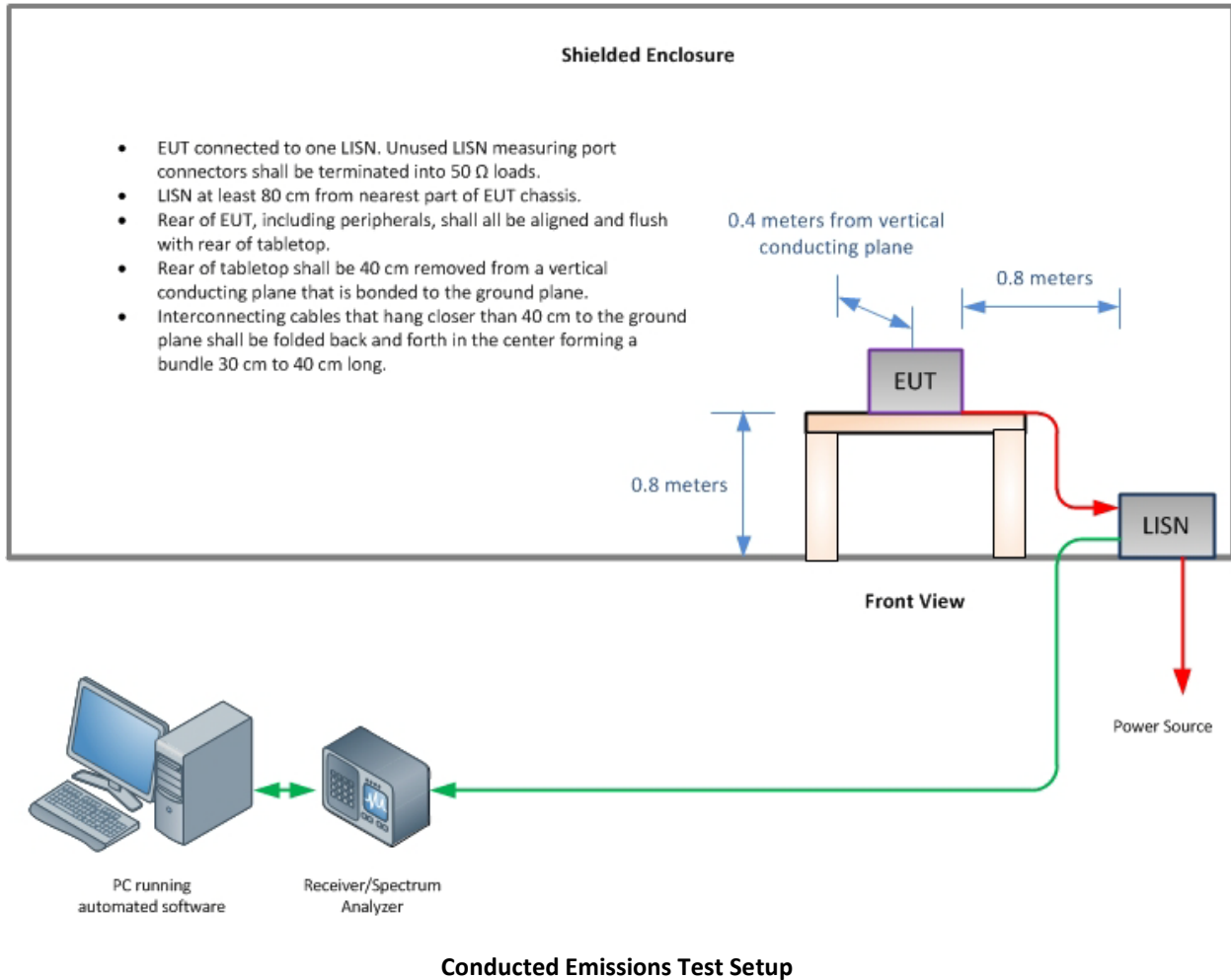
4.1 TEST SETUP DIAGRAM



**Radiated Emission Test Setup (Below 1GHz)**



**Radiated Emission Test Setup (Above 1GHz)**





## SECTION 5

### ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**

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