



America

**Choose certainty.
Add value.**

Report On

Application for Grant of Equipment Authorization of the
Hughes Network Systems
9211 Land Portable Satellite Terminal

FCC Part 15 Subpart C §15.247

Report No. SC1405829A_Rev1.0

September 2014



REPORT ON Radio Testing of the
Hughes Network Systems
Land Portable Satellite Terminal

TEST REPORT NUMBER SC1405829A_Rev1.0

PREPARED FOR Hughes Network Systems
9605 Scranton Road, Suite 500
San Diego, CA 92121

CONTACT PERSON Dave Couchman
Principal Engineer
(858) 452-4628
Dave.Couchman@hughes.com

PREPARED BY 
Alex Chang
Name
Title: EMC/Wireless Test Engineer

APPROVED BY 
Ferdinand S. Custodio
Name
Authorized Signatory
Title: EMC/Senior Wireless Engineer

DATED September 09, 2014



Revision History

SC1405829A_Rev1.0 Hughes Network Systems 9211 Land Portable Satellite Terminal					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
08/13/2014	Initial Release				Ferdinand Custodio
09/09/14	Initial Release	1.0	Remove EUT Pictures	8	Juan M. Gonzalez



CONTENTS

Section	Page No
1	REPORT SUMMARY5
1.1	Introduction.....6
1.2	Brief Summary Of Results 7
1.3	Product Information8
1.4	EUT Test Configuration 11
1.5	Deviations From The Standard..... 13
1.6	Modification Record 13
1.7	Test Methodology13
1.8	Test Facility Location 13
1.9	Test Facility Registration..... 13
2	TEST DETAILS.....15
2.1	Peak Output Power.....16
2.2	Conducted Emissions..... 21
2.3	Minimum 6 Db Rf Bandwidth.....25
2.4	Out-Of-Band Emissions - Conducted..... 33
2.5	Band-Edge Compliance Of Rf Conducted Emissions.....40
2.6	Spurious Radiated Emissions45
2.7	Radiated Band Edge Measurements And Immediate Restricted Bands.....60
2.8	Power Spectral Density..... 70
3	TEST EQUIPMENT USED74
3.1	Test Equipment Used.....75
3.2	Measurement Uncertainty 76
4	DIAGRAM OF TEST SETUP78
4.1	Test Setup Diagram79
5	ACCREDITATION, DISCLAIMERS AND COPYRIGHT82
5.1	Accreditation, Disclaimers And Copyright..... 83



SECTION 1

REPORT SUMMARY

Radio Testing of the
Hughes Network Systems
9211 Land Portable Satellite Terminal



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Hughes Network Systems 9211 Land Portable Satellite Terminal to the requirements of FCC Part 15 Subpart C §15.247.

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	Hughes Network Systems
Model Number(s)	9211
FCC ID Number	K3YHNS9211
IC Number	N/A
Serial Number(s)	EUT#3-EMC
Number of Samples Tested	1
Test Specification/Issue/Date	• FCC Part 15 Subpart C §15.247 (October 1, 2013). • 558074 D01 DTS Meas Guidance v03r02 June 05, 2014 (Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247)
Start of Test	May 14, 2014
Finish of Test	July 25, 2014
Name of Engineer(s)	Alex Chang Ferdinand S. Custodio Kathy Mackenzie
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 is shown below.

Section	§15.247 Spec Clause	Test Description	Result	Comments/ Base Standard
2.1	§15.247(b)(3)	Peak Output Power	Compliant	
2.2	§15.207(a)	Conducted Emissions	Compliant	
2.3	§15.247(a)(2)	Minimum 6 dB RF Bandwidth	Compliant	
2.4	§15.247(d)	Out-of-Band Emissions - Conducted	Compliant	
2.5	§15.247(d)	Band-edge Compliance of RF Conducted Emissions	Compliant	
2.6	§15.247(d)	Spurious Radiated Emissions	Compliant	
2.7	§15.247(d)	Radiated Band Edge Measurements	Compliant	
2.8	§15.247(e)	Power Spectral Density for Digitally Modulated Device	Compliant	

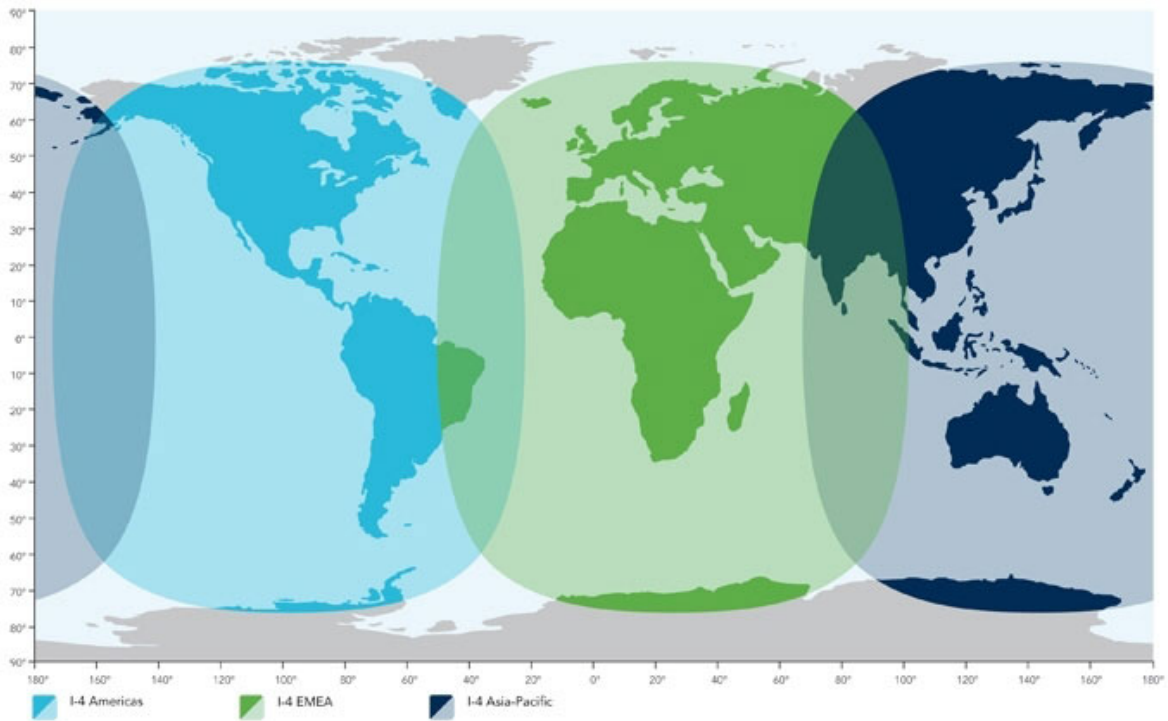


1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was an Hughes Network Systems 9211 Land Portable Satellite Terminal as shown in the photograph below. The EUT provides satellite connectivity over the Inmarsat BGAN satellite network. The EUT can send and receive IP packets via Ethernet and WLAN interface and also supports circuit switched voice and fax call via standard POTS interface. The external satellite antenna connector of the EUT was not verified. All verifications were performed on the main antenna connector which is considered worst case configuration between the two.

1.3.2 Inmarsat BGAN Coverage Map





1.3.3 EUT General Description

EUT Description	Land Portable Satellite Terminal
Model Number(s)	9211
Rated Voltage	7.5VDC Li-Ion battery 19VDC from compatible AC/DC adapter
Mode Verified	802.11 b/g/n (20MHz/40MHz for 802.11n)
Capability	802.11 b/g/n WLAN (DTS) 2.4GHz band (20MHz/40MHz for 802.11n) and 1.6GHz Mobile Satellite Service
Primary Unit (EUT)	☐ Production ☒ Pre-Production ☐ Engineering
Antenna Type	Integral Antenna
Antenna Gain	0.9 dBi
Antenna Details	Please refer to the manufacturer documentation titled "Specification Control Document – Antenna, L-Band Transportable" Cage Code 3LOW2 No. 3500648 (05/02/2014).

1.3.4 Maximum Conducted Output Power

Mode	Frequency Range (MHz)	Output Power (dBm)	Output Power (mW)
802.11b	2412-2462	12.55	17.99
802.11g	2412-2462	12.20	16.59
802.11n (HT20)	2412-2462	12.25	16.79
802.11n (HT40)	2412-2462	12.19	16.56



1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	Conducted measurement configuration. The antenna radome was removed to gain access to the main antenna connector.
B	Radiated / Conducted emission configuration. The EUT was set to transmit via integral antenna and connected to supplied AC power adaptor.

1.4.2 EUT Exercise Software

"Perl Command" software provided by the client was used to exercise the EUT. A file containing commands to change channels and modulation was also provided. Specific channel/modulation combination is copied from this file and transferred to the test software, once executed the EUT will transmit at max power (default setting if TX) at that channel.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Hughes	AC Adapter for EUT	Model: ATS065-A190 S/N N/A
Toshiba	Laptop	Model Satellite Pro 4600 S/N 91225670PU
Toshiba	Laptop External PSU	Model PA3049U-1ACA S/N 0008A0184957G
HP	Mouse for Laptop	Model M-UD43 S/N LZA03401471
GFM	Analog Telephone	Model: KT-887 S/N 7-19263-81663-4
-	Telco cable (analog phone to EUT)	2.1m unshielded RJ11 connector
-	CAT6 (Laptop to EUT)	2.1m unshielded RJ45 connector

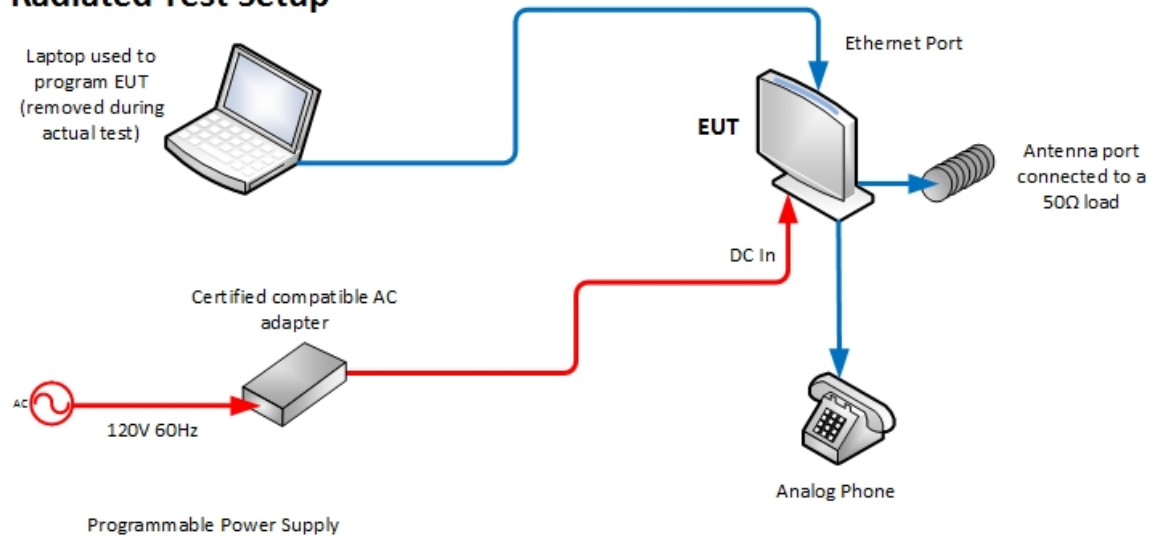
1.4.4 Worst Case Configuration

Worst-case configuration used in this test report as per maximum conducted output power measurements:

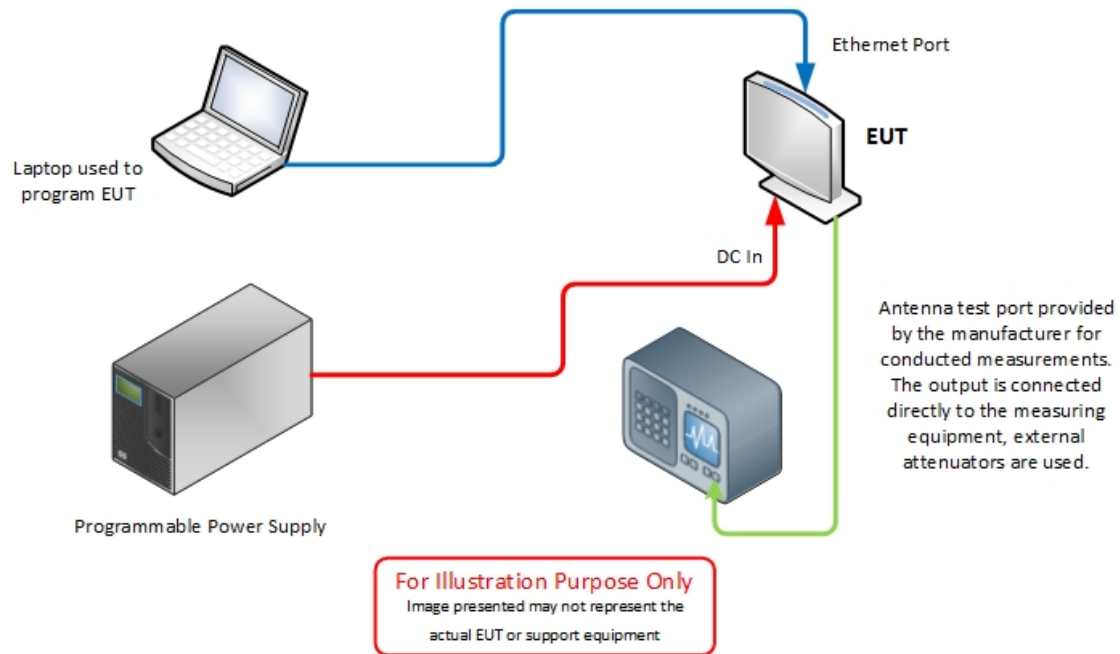
Mode	Channel	Data Rate
802.11b	1 (Low Channel)	5.5 Mbps
802.11g	6 (Mid Channel)	18 Mbps
802.11n (HT20)	6 (Mid Channel)	Mcs 0 (72.0 Mbps)
802.11n (HT40)	6 (Mid Channel)	Mcs 7 (150.0 Mbps)

1.4.5 Simplified Test Configuration Diagram

Radiated Test Setup



Conducted Port Measurement Test Setup





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 EUT#3-EMC		
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 LOCATION

1.8.1 TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681). Phone: 858 678 1400 FAX: 858-546 0364

1.8.2 TÜV SÜD America Inc. (Rancho Bernardo)

Sony Electronics Inc., Building #8 16530 Via Esprillo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: 858 942 5542 FAX: 858-546 0364

1.9 TEST FACILITY REGISTRATION

1.9.1 FCC – Registration No.: US1146

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Registration is US1146.



1.9.2 Industry Canada (IC) Registration No.: 3067A

The 10m Semi-anechoic chamber of TÜV SÜD 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
Hughes Network Systems
9211 Land Portable Satellite Terminal



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: EUT#3-EMC / Test Configuration A

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

June 17, 2014 / KAM

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

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.7°C
Relative Humidity	39.4%
ATM Pressure	98.9 kPa

2.1.7 Additional Observations

- This is a conducted test (Maximum conducted [average] output power) using direct connection to a power meter.
- An offset of 21.1dB was added to compensate for the external attenuator and cable used from the antenna port to the power sensor.
- This is a conducted test using Method A: Peak Power Meter Method per Section 9.2.3 under KDB 558074 D01 DTS Measurement Guidance v03r02 (Compliance Measurement Guidance for 15.247 Digital Transmission Systems, June 05, 2014).
- Both Peak and Average measurements were recorded.
- All available modes and data rates were verified. The worst case data rate for each mode (marked bold and italic) will be verified for each test throughout this test report.



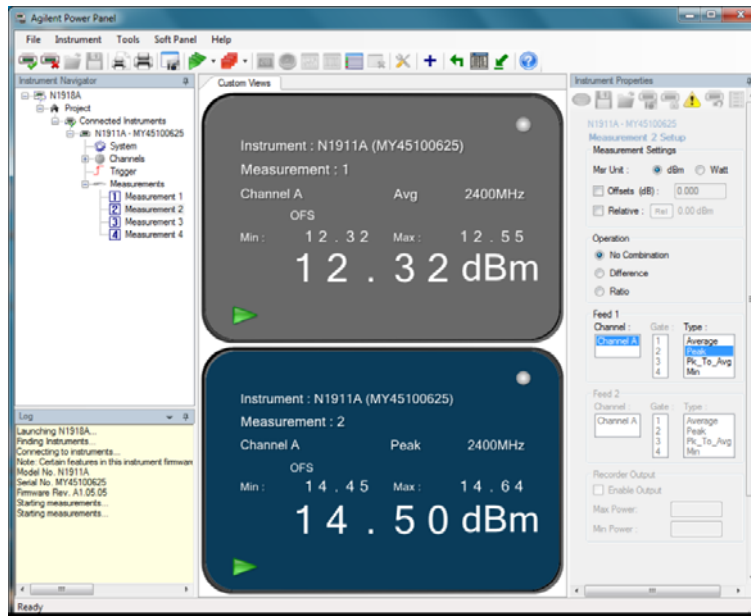
2.1.8 Test Results

WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)	Measured Peak Power (dBm)
802.11b	1 (2412 MHz)	1	12.22	15.04
		2	12.52	15.27
		5.5	12.55	14.64
		11	12.49	15.28
	6 (2437 MHz)	1	12.37	15.12
		2	12.22	15.00
		5.5	12.29	14.41
		11	12.27	15.04
	11 (2462 MHz)	1	11.74	14.58
		2	11.87	14.61
		5.5	11.82	13.90
		11	11.84	14.64
802.11g	1 (2412 MHz)	6	11.98	21.51
		9	11.86	21.20
		12	11.88	21.34
		18	11.93	21.29
		24	11.85	21.83
		36	11.86	21.35
		48	11.79	21.38
		54	11.71	21.62
	6 (2437 MHz)	6	12.10	21.64
		9	12.11	21.40
		12	12.14	21.48
		18	12.20	21.49
		24	12.08	22.07
		36	12.00	21.50
		48	12.09	21.54

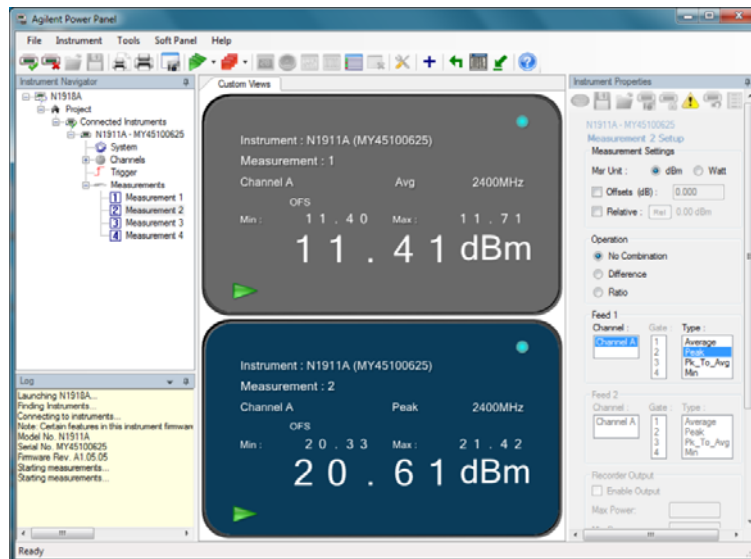


WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)	Measured Peak Power (dBm)
802.11g	6 (2437 MHz)	54	12.06	21.85
	11 (2462 MHz)	6	11.71	21.42
		9	11.63	21.14
		12	11.65	21.22
		18	11.70	21.11
		24	11.63	21.74
		36	11.53	21.24
		48	11.59	21.26
		54	11.53	21.58
802.11n (20 MHz BW)	1 (2412 MHz)	mcs 0 (72.0 Mbps)	12.07	21.11
	6 (2437 MHz)	mcs 0 (72.0 Mbps)	12.25	21.29
	11 (2462 MHz)	mcs 0 (72.0 Mbps)	11.69	20.78
802.11n (40 MHz BW)	3 (2422 MHz)	mcs 7 (150.0 Mbps)	11.99	21.46
	6 (2437 MHz)	mcs 7 (150.0 Mbps)	12.19	21.55
	9 (2452 MHz)	mcs 7 (150.0 Mbps)	11.99	21.35

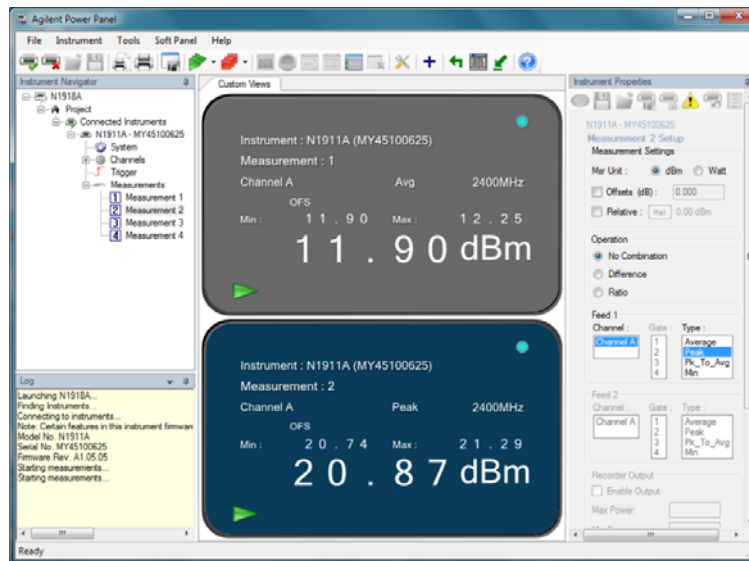
2.1.9 Sample Test Display



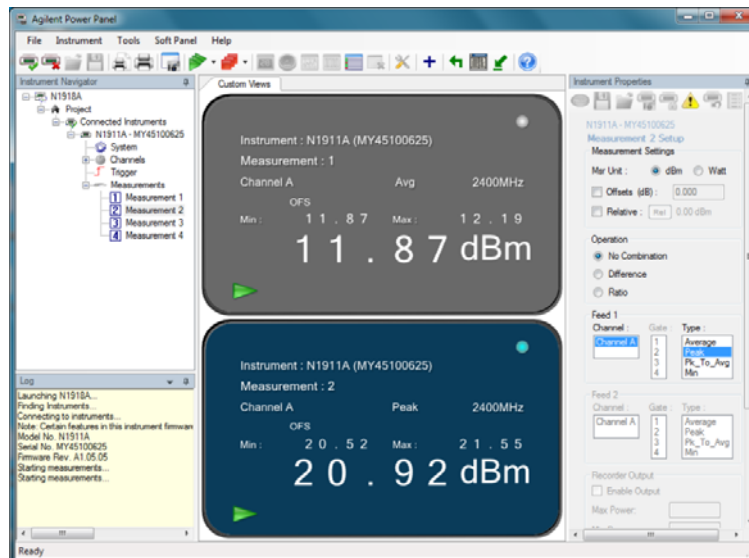
802.11 "b" mode. Low Channel 5.5Mbps



802.11 "g" mode. High Channel 6Mbps



802.11 "n" mode HT20. Mid Channel 72Mbps



802.11 "n" mode HT40. Mid Channel 150Mbps



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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	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: EUT#3-EMC / Test Configuration B

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

June 20, 2014 / KAM

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/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.2 °C
Relative Humidity	47.0.%
ATM Pressure	98.9 kPa

2.2.7 Additional Observations

- Verification performed while the EUT is in charging mode.
- 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.



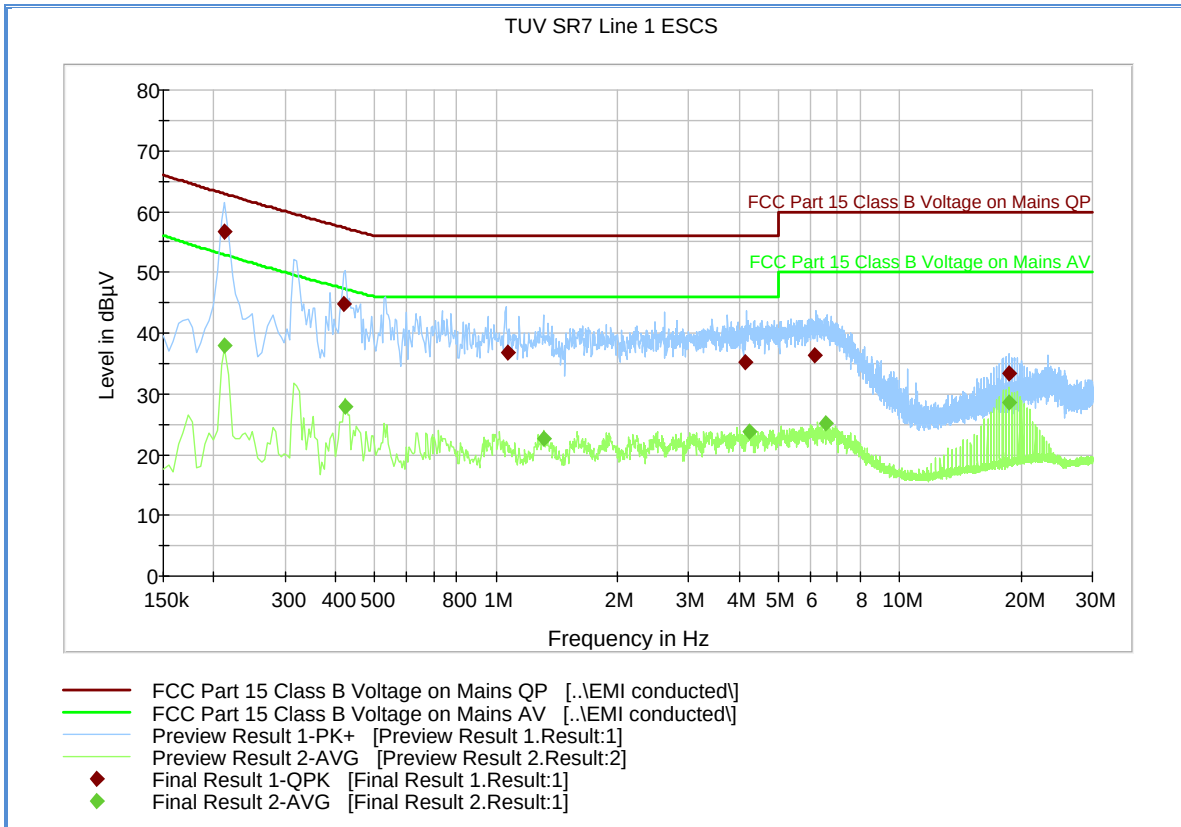
2.2.8 Sample Computation (Conducted Emission – Quasi Peak)

Measuring equipment raw measurement (db μ V) @ 150kHz			5.5
Correction Factor (dB)	Asset# 8607 (20 dB attenuator)	19.9	20.7
	Asset# 1177 (cable)	0.15	
	Asset# 1176 (cable)	0.35	
	Asset# 7567 (LISN)	0.30	
Reported QuasiPeak Final Measurement (db μ V) @ 150kHz			26.2

2.2.9 Test Results

Compliant. See attached plots and tables.

2.2.10 FCC Conducted Emissions Line 1



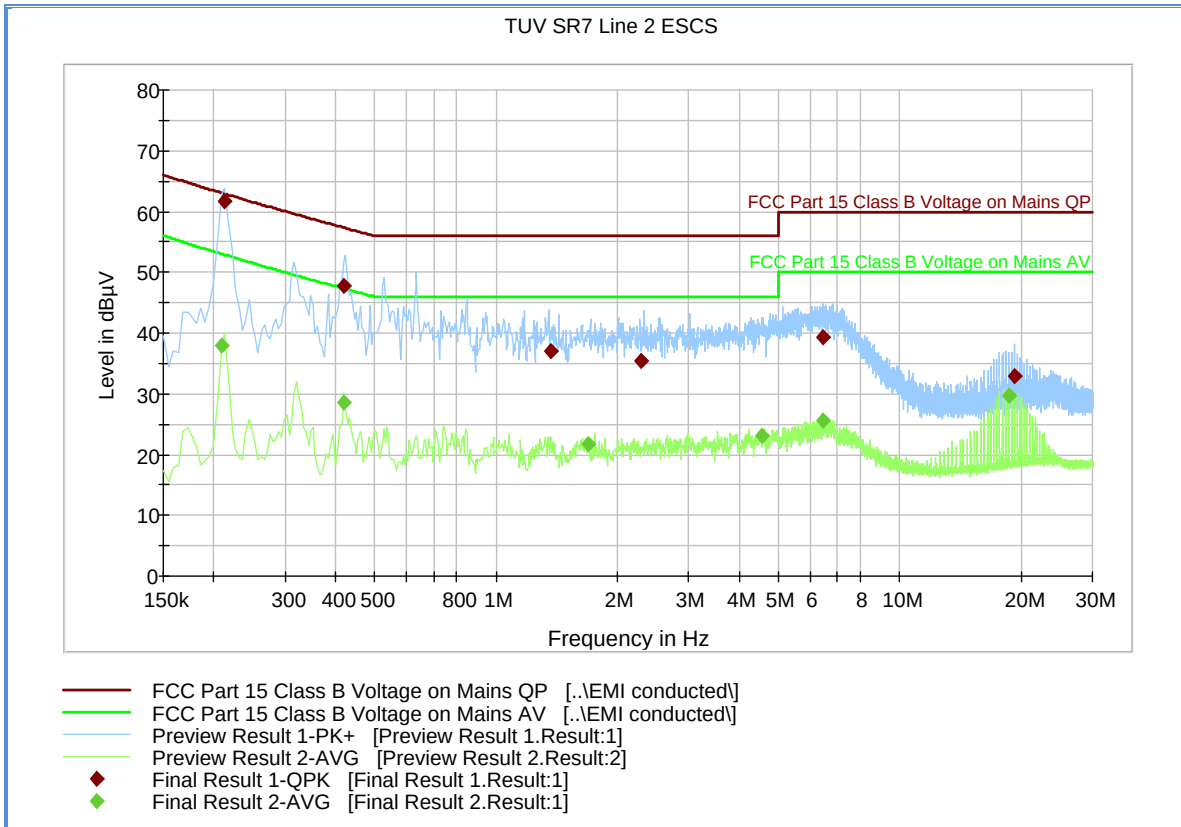
Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.213000	56.7	1000.0	9.000	Off	L1	20.1	6.2	62.9
0.420000	44.9	1000.0	9.000	Off	L1	20.0	12.5	57.3
1.072500	36.8	1000.0	9.000	Off	L1	20.1	19.2	56.0
4.132500	35.3	1000.0	9.000	Off	L1	20.5	20.7	56.0
6.157500	36.5	1000.0	9.000	Off	L1	20.6	23.5	60.0
18.604500	33.3	1000.0	9.000	Off	L1	21.0	26.7	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.213000	38.0	1000.0	9.000	Off	L1	20.1	14.9	52.9
0.424500	27.8	1000.0	9.000	Off	L1	20.0	19.4	47.2
1.315500	22.7	1000.0	9.000	Off	L1	20.2	23.3	46.0
4.227000	23.7	1000.0	9.000	Off	L1	20.5	22.3	46.0
6.571500	25.1	1000.0	9.000	Off	L1	20.5	24.9	50.0
18.600000	28.7	1000.0	9.000	Off	L1	21.0	21.3	50.0

2.2.11 FCC Conducted Emissions Line 2



Quasi Peak

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV)
0.213000	61.7	1000.0	9.000	Off	N	20.0	1.2	62.9
0.420000	47.8	1000.0	9.000	Off	N	20.0	9.6	57.3
1.369500	36.9	1000.0	9.000	Off	N	20.0	19.1	56.0
2.292000	35.5	1000.0	9.000	Off	N	20.3	20.5	56.0
6.441000	39.3	1000.0	9.000	Off	N	20.5	20.7	60.0
19.203000	32.9	1000.0	9.000	Off	N	20.8	27.1	60.0

Average

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBμV)
0.208500	38.0	1000.0	9.000	Off	N	20.0	15.1	53.1
0.420000	28.5	1000.0	9.000	Off	N	20.0	18.9	47.3
1.689000	21.8	1000.0	9.000	Off	N	20.1	24.2	46.0
4.546500	23.2	1000.0	9.000	Off	N	20.4	22.8	46.0
6.445500	25.7	1000.0	9.000	Off	N	20.5	24.3	50.0
18.600000	29.7	1000.0	9.000	Off	N	20.8	20.3	50.0



2.3 MINIMUM 6 dB RF BANDWIDTH

2.3.1 Specification Reference

Part 15 Subpart C §15.247(a)(2)

2.3.2 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.

2.3.3 Equipment Under Test and Modification State

Serial No: EUT#3-EMC / Test Configuration A

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

June 18, 2014 / KAM

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/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.1 °C
Relative Humidity	44.1 %
ATM Pressure	98.9 kPa

2.3.7 Additional Observations

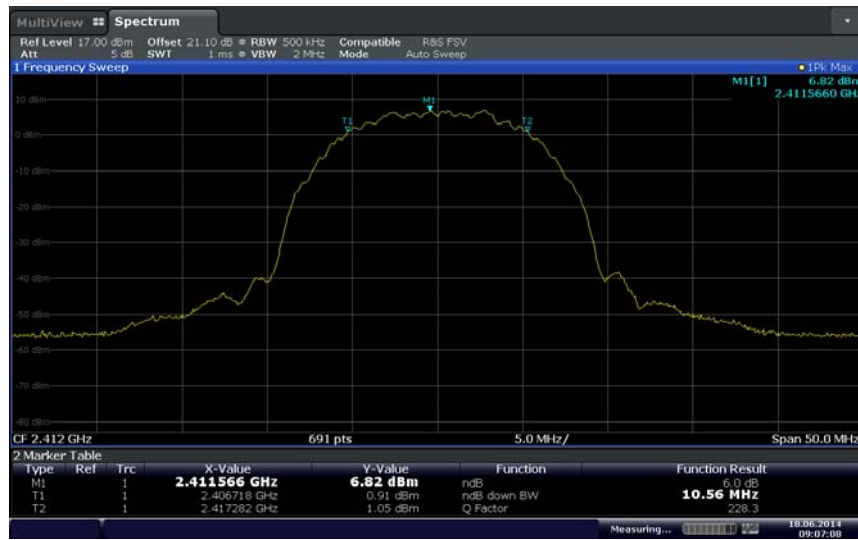
- This is a conducted test.
- An offset of 21.1dB was added to compensate for the external attenuator and cable used from the antenna port to the power sensor.
- Span is wide enough to capture the channel transmission.
- RBW is set to 1% of the span.
- VBW is $\geq 3X$ RBW.
- Sweep is auto.
- Detector is peak.
- The “n” dB down marker function of the spectrum analyzer was used for this test.



2.3.8 Test Results

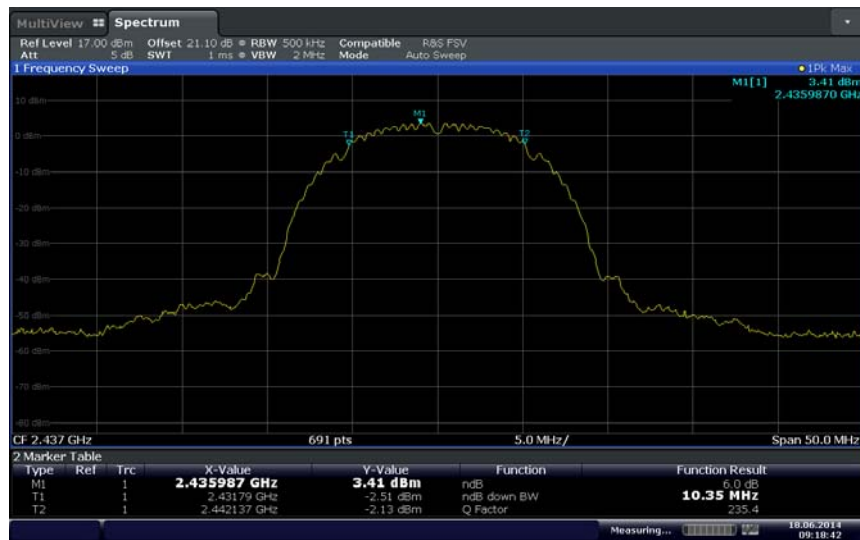
Mode	Channel	Measured Bandwidth (MHz)	Minimum Bandwidth (MHz)	Compliance
802.11b	1 (2412 MHz)	10.56	0.500	Complies
	6 (2437 MHz)	10.35	0.500	Complies
	11 (2462 MHz)	10.20	0.500	Complies
802.11g	1 (2412 MHz)	16.71	0.500	Complies
	6 (2437 MHz)	16.79	0.500	Complies
	11 (2462 MHz)	16.71	0.500	Complies
802.11n HT20	1 (2412 MHz)	17.87	0.500	Complies
	6 (2437 MHz)	17.95	0.500	Complies
	11 (2462 MHz)	17.95	0.500	Complies
802.11n HT40	3 (2422 MHz)	36.90	0.500	Complies
	6 (2437 MHz)	36.90	0.500	Complies
	9 (2452 MHz)	36.90	0.500	Complies

2.3.9 Test Results Plots



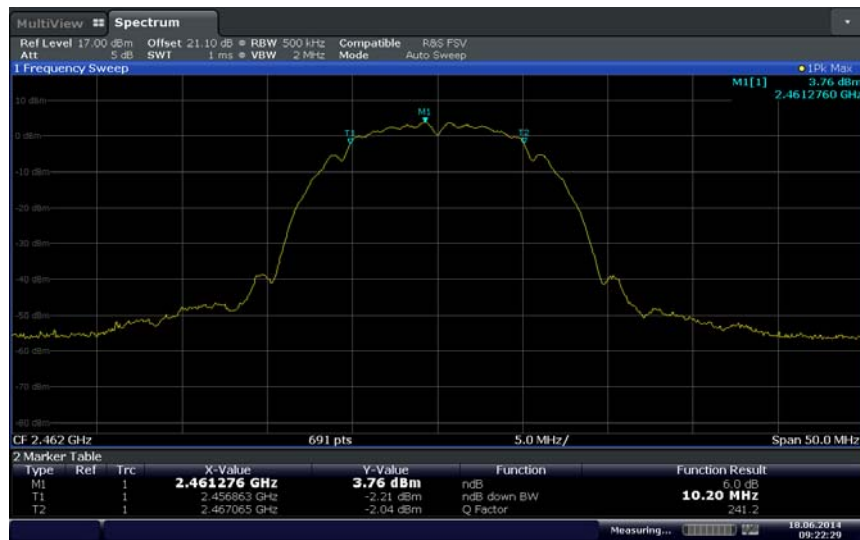
Date: 18 JUN 2014 09:07:08

802.11b Low Channel



Date: 18 JUN 2014 09:18:42

802.11b Mid Channel



Date: 18 JUN 2014 09:22:29

802.11b High Channel



Date: 18 JUN 2014 09:28:45

802.11g Low Channel



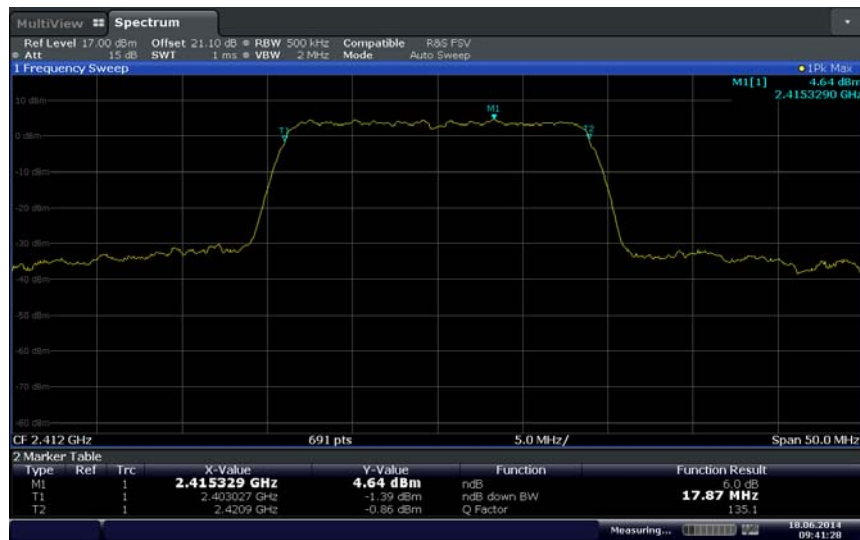
Date: 18 JUN 2014 09:34:07

802.11g Mid Channel



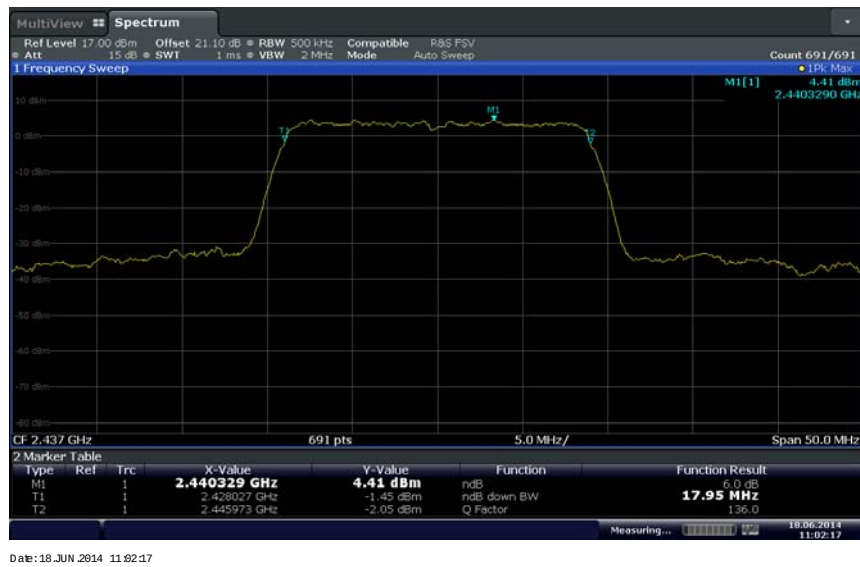
Date: 18 JUN 2014 09:37:16

802.11g High Channel



Date: 18 JUN 2014 09:41:28

802.11n HT20 Low Channel



802.11n HT20 Mid Channel



802.11n HT20 High Channel



Date: 19 JUN 2014 13:55:43

802.11n HT40 Low Channel



Date: 19 JUN 2014 13:56:36

802.11n HT40 Mid Channel



Date: 18 JUN 2014 09:51:47

802.11n HT40 High Channel



2.4 OUT-OF-BAND EMISSIONS - CONDUCTED

2.4.1 Specification Reference

Part 15 Subpart C §15.247(d)

2.4.2 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)).

2.4.3 Equipment Under Test and Modification State

Serial No: EUT#3-EMC / Test Configuration A

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

June 18, 2014 / KAM

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/ Test Location

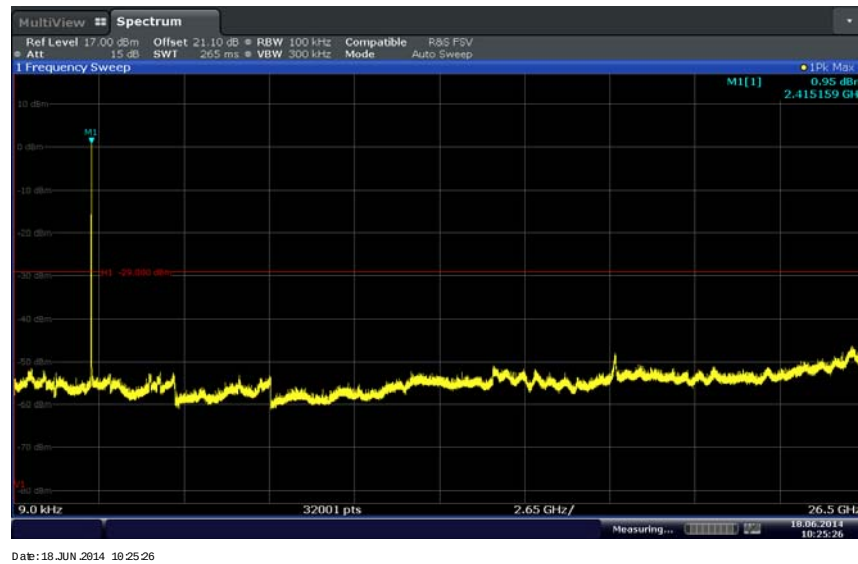
Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.1 °C
Relative Humidity	44.1. %
ATM Pressure	98.9 kPa

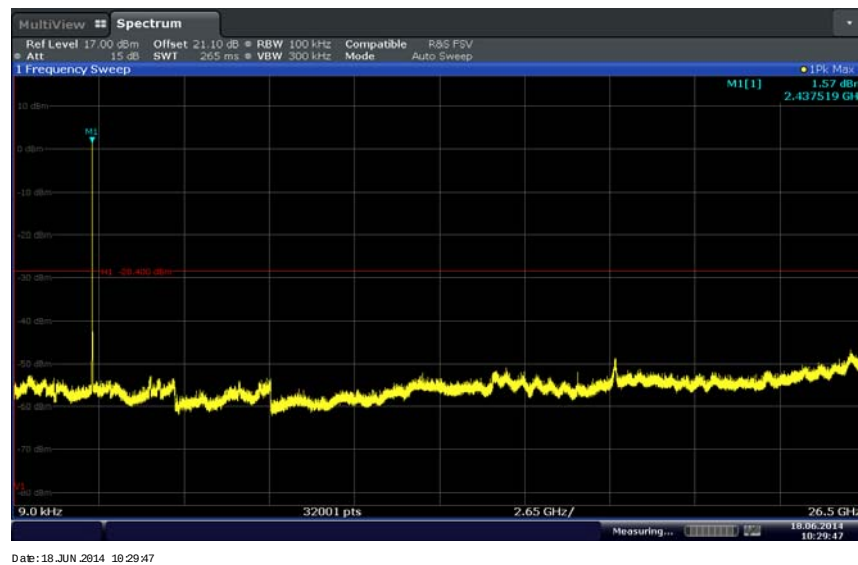
2.4.7 Additional Observations

- This is a conducted test.
- An offset of 21.1dB was added to compensate for the external attenuator and cable used from the antenna port to the power sensor.
- 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 30dB below this level.
- Spectrum was searched from 9 kHz up to 26.5GHz.

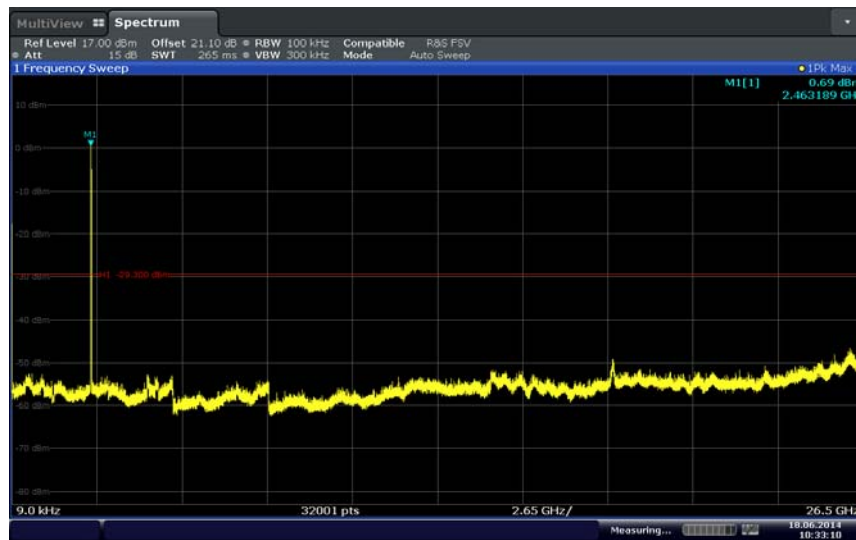
2.4.8 Test Results Plots



802.11b Low Channel

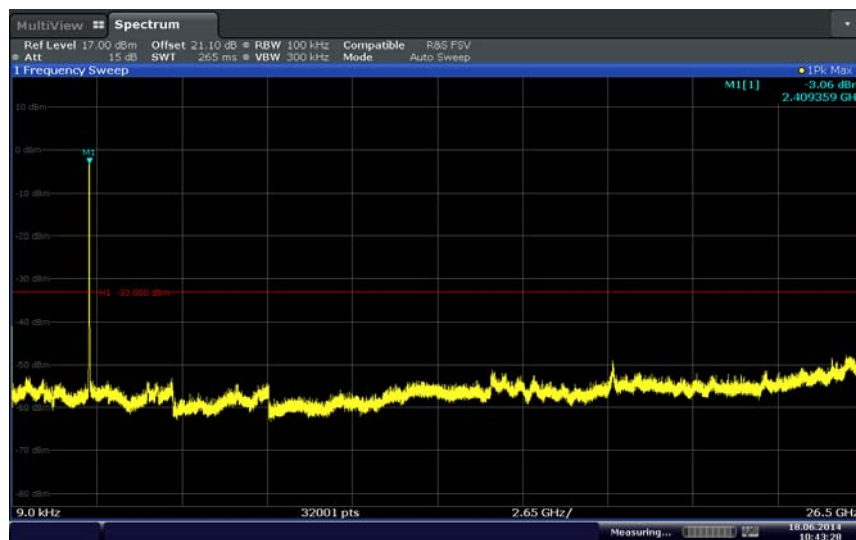


802.11b Mid Channel



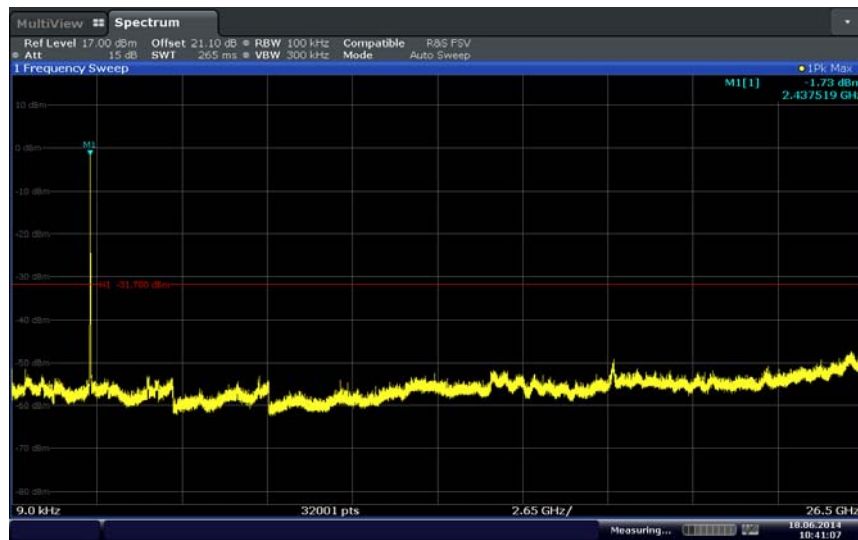
Date: 18 JUN 2014 10:33:09

802.11b High Channel



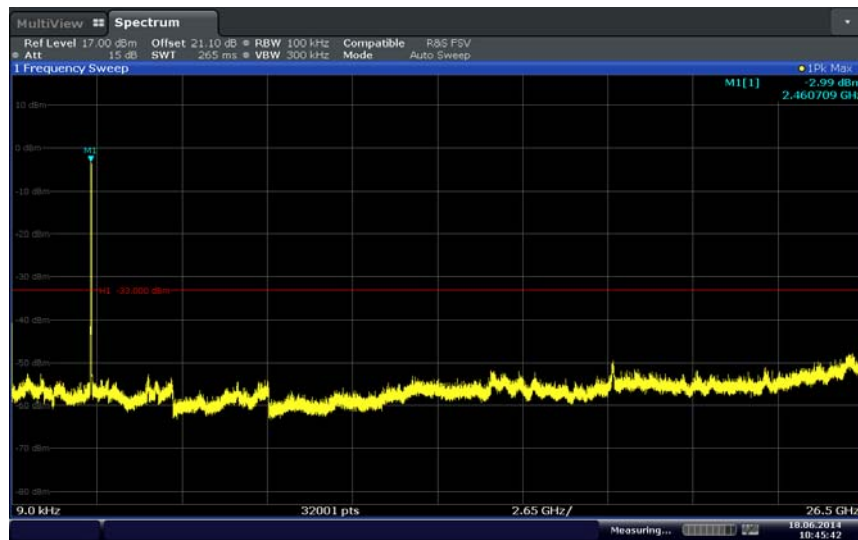
Date: 18 JUN 2014 10:43:28

802.11g Low Channel



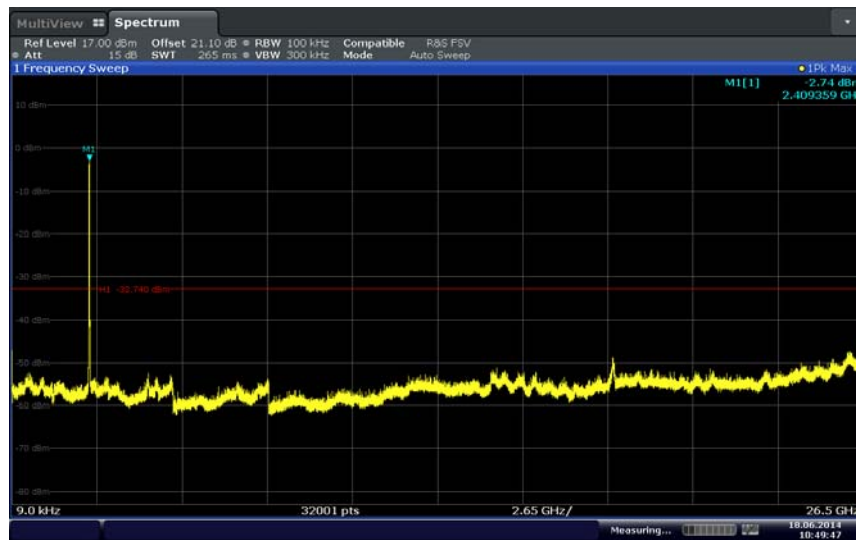
Date: 18 JUN 2014 10:41:08

802.11g Mid Channel

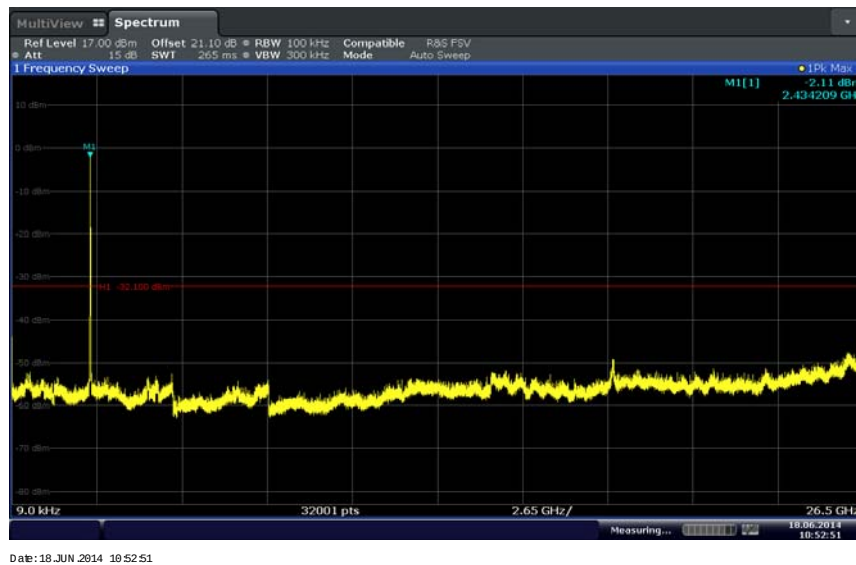


Date: 18 JUN 2014 10:45:42

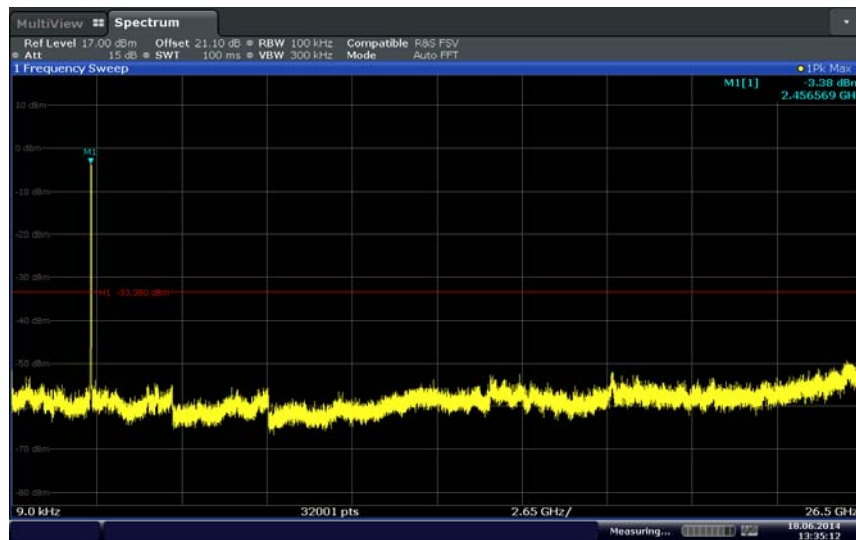
802.11g High Channel



802.11n HT20 Low Channel

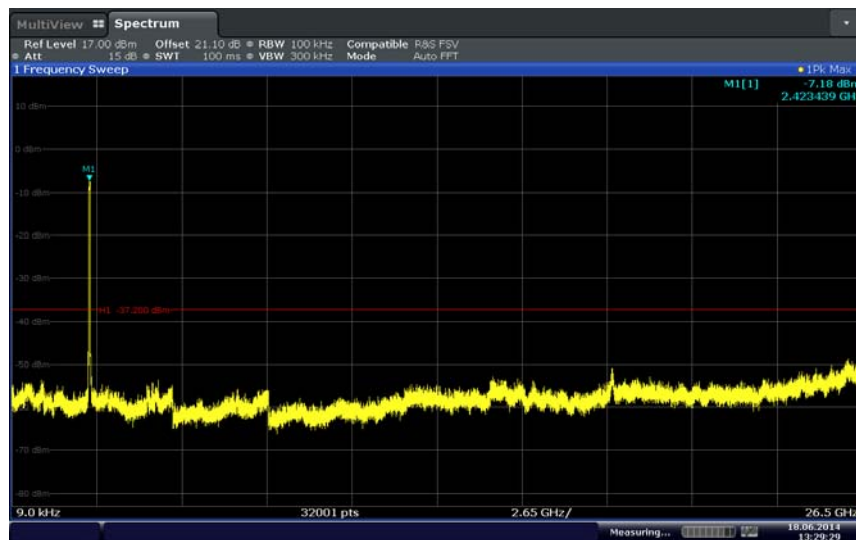


802.11n HT20 Mid Channel



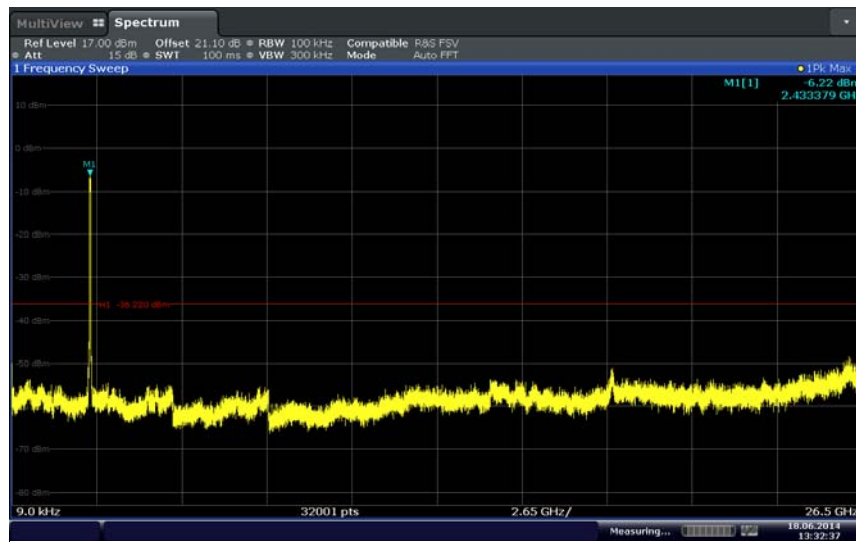
Date: 18 JUN 2014 13:35:13

802.11n HT20 High Channel

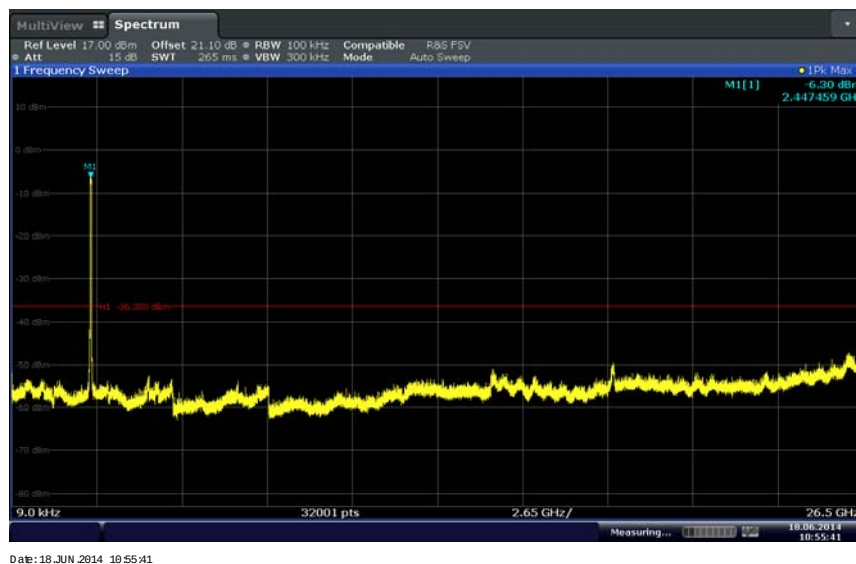


Date: 18 JUN 2014 13:29:28

802.11n HT40 Low Channel



802.11n HT40 Mid Channel



802.11n HT40 High Channel



2.5 BAND-EDGE COMPLIANCE OF RF CONDUCTED EMISSIONS

2.5.1 Specification Reference

Part 15 Subpart C §15.247(d)

2.5.2 Standard Applicable

See previous test.

2.5.3 Equipment Under Test and Modification State

Serial No: EUT#3-EMC / Test Configuration A

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

June 18, 2014 / KAM

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/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

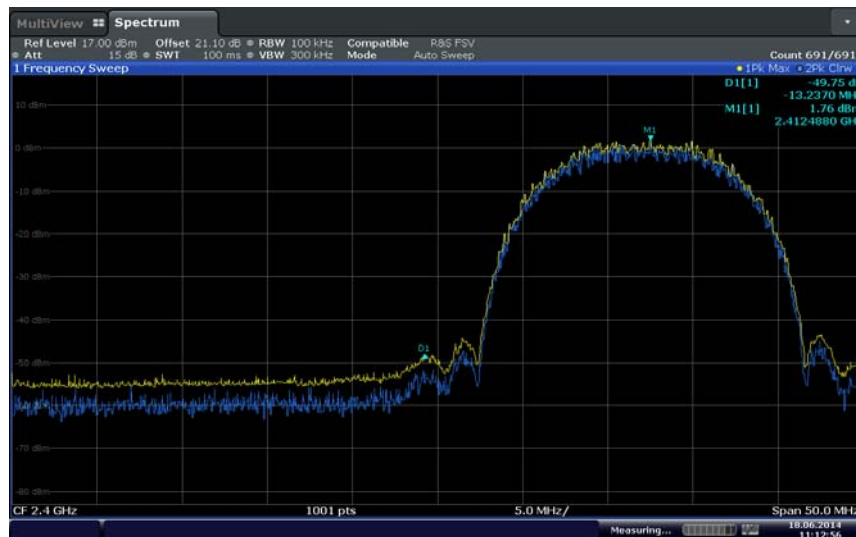
Ambient Temperature	25.1 °C
Relative Humidity	44.1 %
ATM Pressure	98.9 kPa

2.5.7 Additional Observations

- This is a conducted test.
- An offset of 21.1dB was added to compensate for the external attenuator and cable used from the antenna port to the power sensor.
- RBW is 100kHz.VBW is 3X RBW.
- Sweep is auto. Detector is peak. Trace is max hold.
- Trace was centred on the band-edge frequency.
- Span was set to encompass the band-edge frequency and the peak of the emission.
- Using Marker function, peak of the emission was determined and the delta to the band-edge frequency measured.

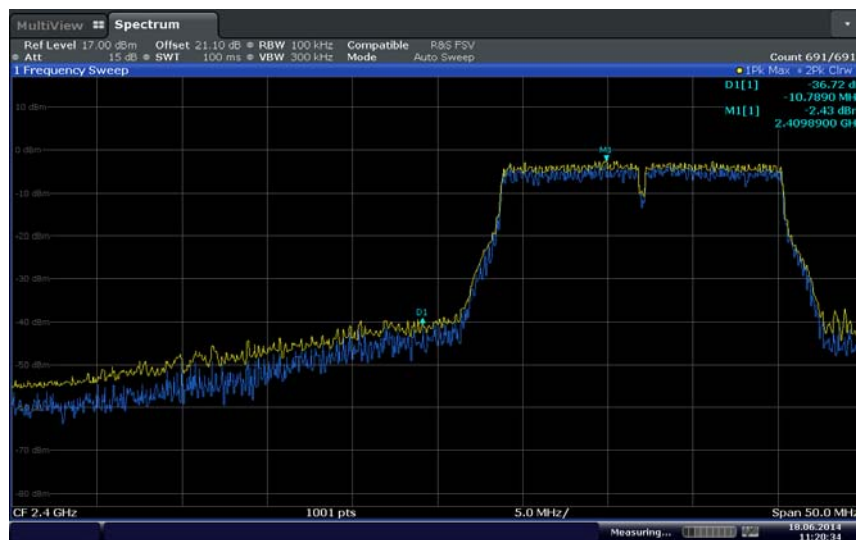
2.5.8 Test Results

Complies. See attached plots.



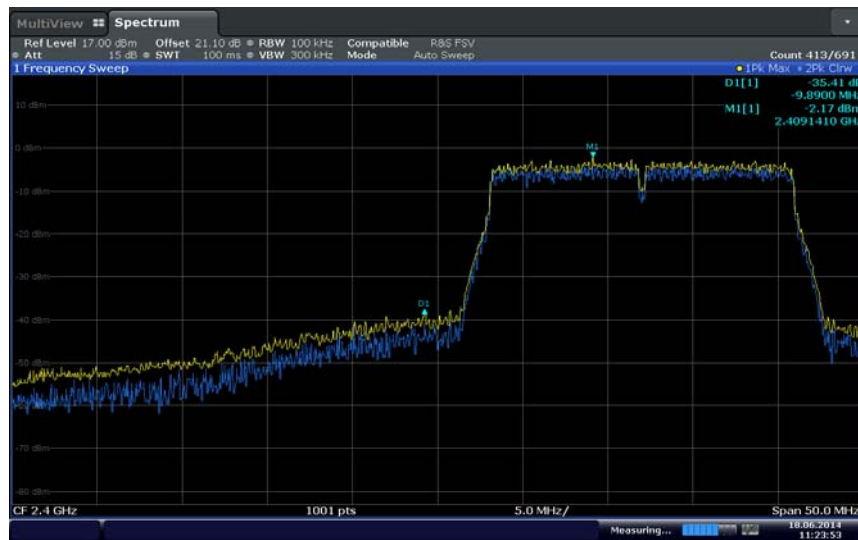
Date: 18 JUN 2014 11:12:57

802.11b Low Channel (2412 MHz)



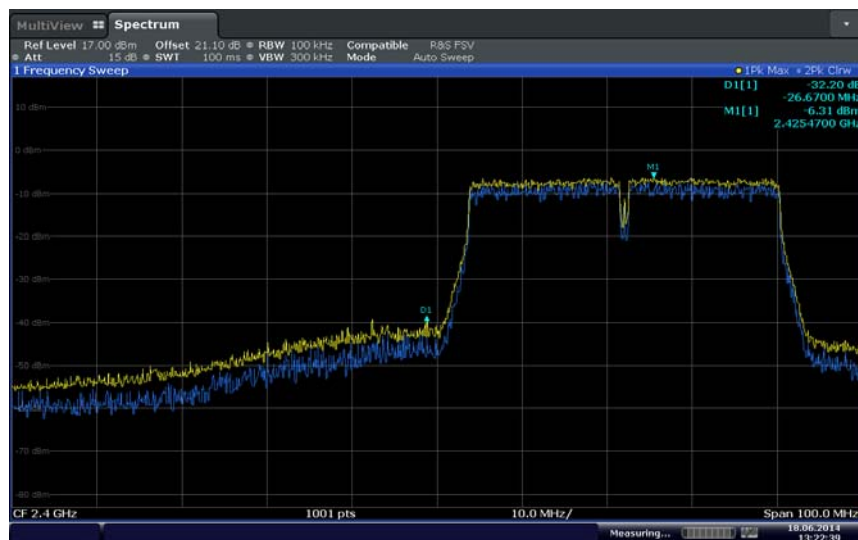
Date: 18 JUN 2014 11:20:34

802.11g Low Channel (2412 MHz)



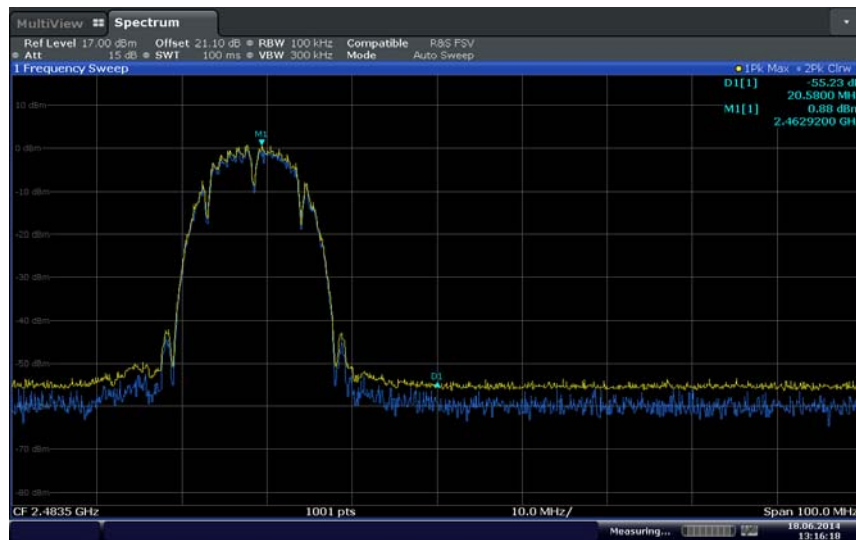
Date: 18 JUN 2014 11:23:53

802.11n HT20 Low Channel (2412 MHz)



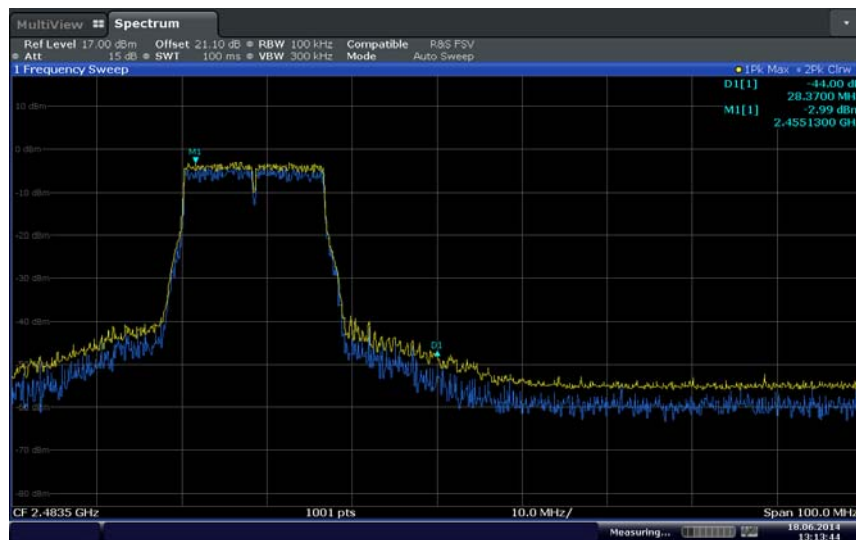
Date: 18 JUN 2014 13:22:39

802.11n HT40 Low Channel (2412 MHz)



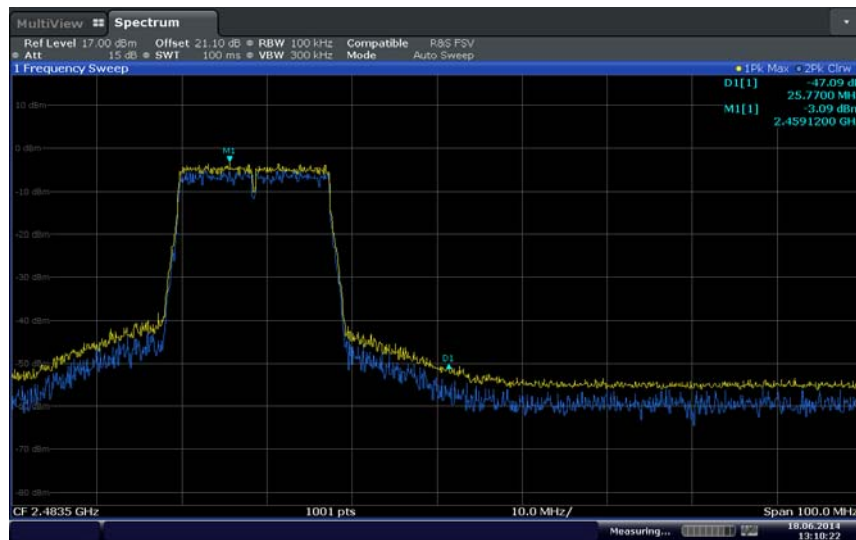
Date: 18 JUN 2014 13:16:18

802.11b High Channel (2462 MHz)



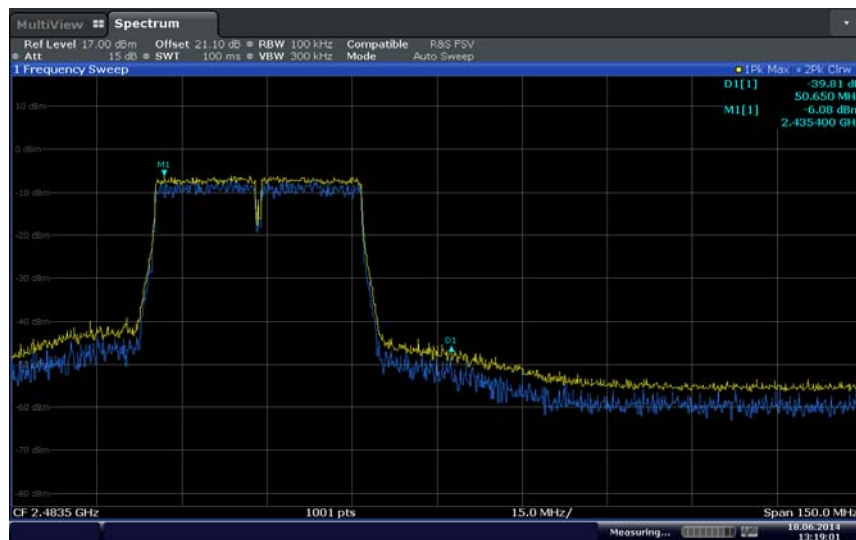
Date: 18 JUN 2014 13:16:44

802.11g High Channel (2462 MHz)



Date: 18 JUN 2014 13:10:22

802.11n HT20 High Channel (2462 MHz)



Date: 18 JUN 2014 13:10:01

802.11n HT40 High Channel (2452 MHz)



2.6 SPURIOUS RADIATED EMISSIONS

2.6.1 Specification Reference

Part 15 Subpart C §15.247(d)

2.6.2 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)).

2.6.3 Equipment Under Test and Modification State

Serial No: EUT#3-EMC / Test Configuration B

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

July 24, 2014 / AC and FC

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

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.2°C
Relative Humidity	53.5%
ATM Pressure	98.6 kPa

2.6.7 Additional Observations

- This is a radiated test. The spectrum was searched from 30MHz to the 10th harmonic.
- 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 considered worst case WLAN configuration (802.11b, Low Channel, 5.5Mbps) presented for radiated emissions below 1GHz. There are no significant differences in emissions between all modes below 1GHz.



- Only noise floor measurements observed above 18GHz.
- 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 2.7.8 for sample computation.

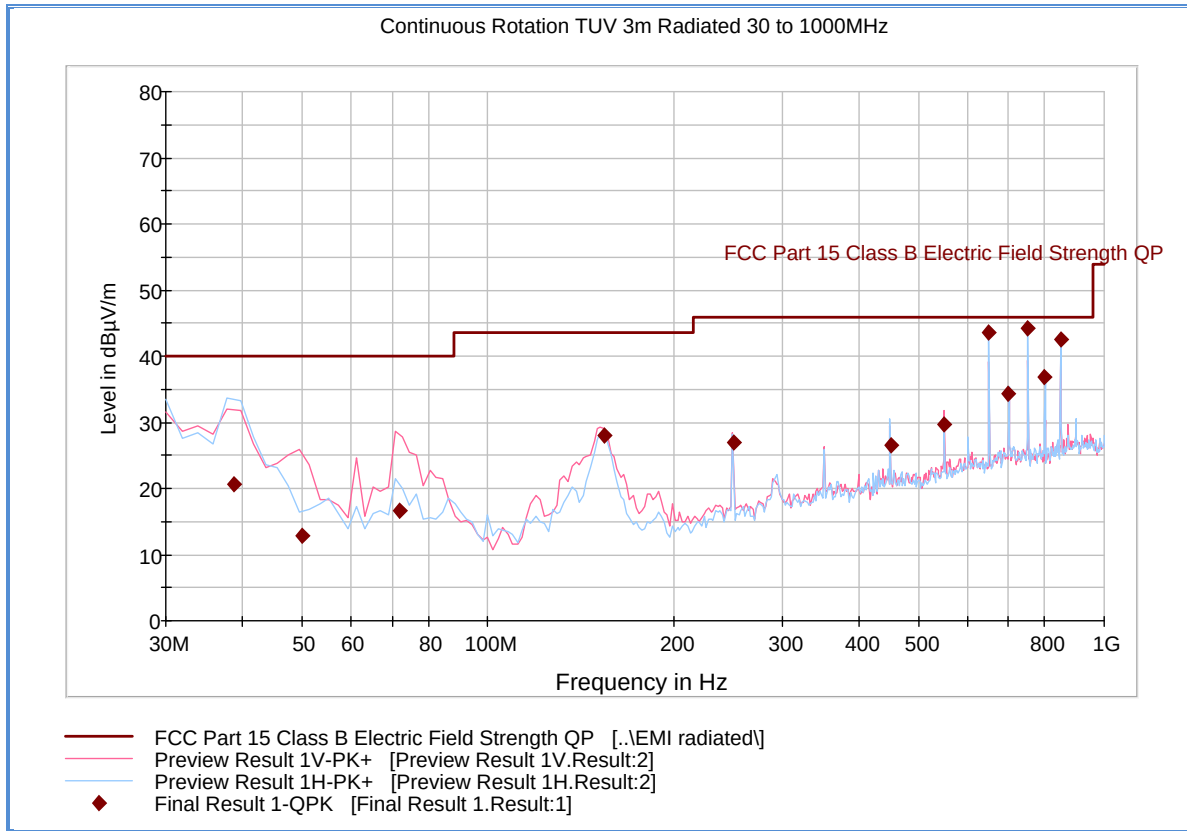
2.6.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (dbμV) @ 30 MHz			24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3	-12.6
	Asset# 1172 (cable)	0.3	
	Asset# 1016 (preamplifier)	-30.7	
	Asset# 1175(cable)	0.3	
	Asset# 1002 (antenna)	17.2	
Reported QuasiPeak Final Measurement (dbμV/m) @ 30MHz			11.8

2.6.9 Test Results

See attached plots.

2.6.10 Test Results Below 1GHz (WLAN worst Case Configuration)

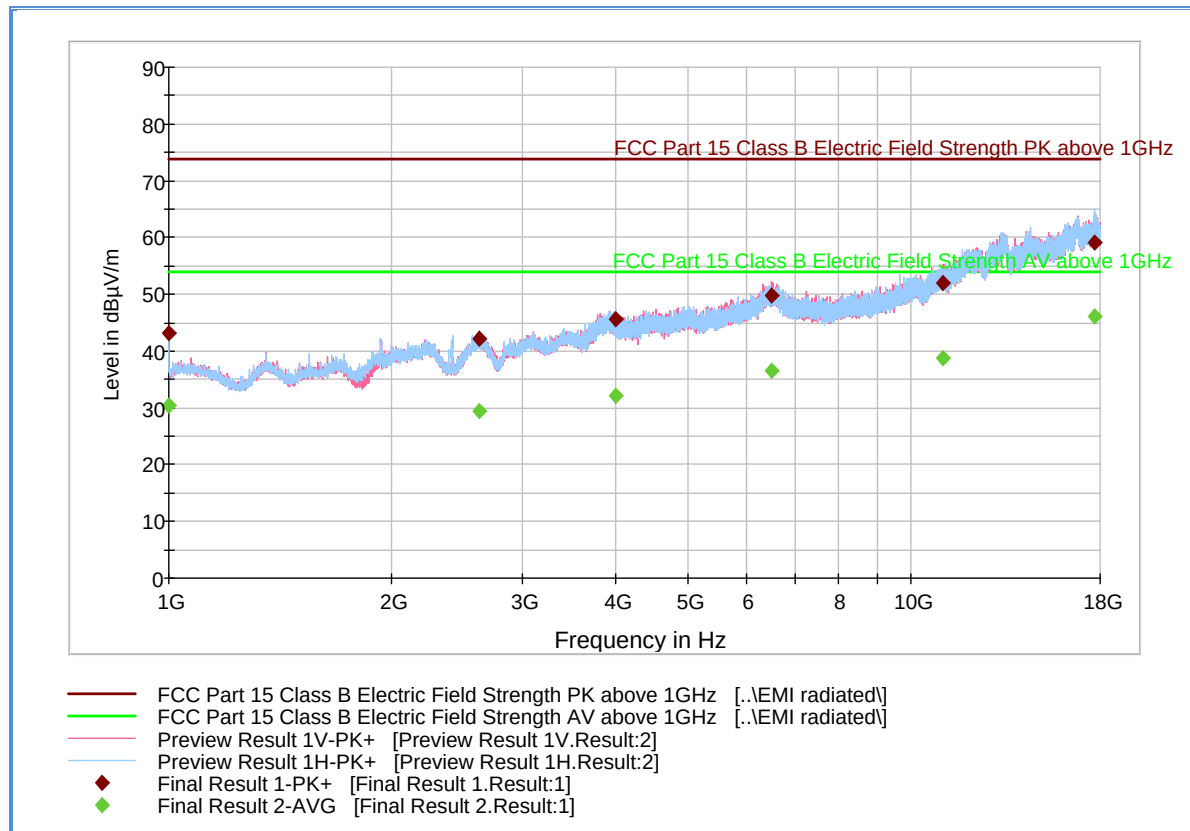


Quasi Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
38.735551	20.6	1000.0	120.000	250.0	H	15.0	-15.1	19.4	40.0
50.038878	12.9	1000.0	120.000	100.0	V	292.0	-18.8	27.1	40.0
71.781643	16.6	1000.0	120.000	200.0	V	102.0	-21.4	23.4	40.0
154.544930	28.0	1000.0	120.000	100.0	V	74.0	-17.4	15.5	43.5
250.019319	27.0	1000.0	120.000	100.0	V	175.0	-13.3	19.0	46.0
450.039760	26.6	1000.0	120.000	164.0	H	224.0	-7.0	19.4	46.0
550.041924	29.7	1000.0	120.000	100.0	V	222.0	-4.3	16.3	46.0
650.020200	43.6	1000.0	120.000	100.0	H	290.0	-2.7	2.4	46.0
700.041283	34.2	1000.0	120.000	203.0	V	30.0	-0.6	11.8	46.0
750.022365	44.3	1000.0	120.000	100.0	H	151.0	-0.8	1.7	46.0
800.043447	36.8	1000.0	120.000	100.0	H	159.0	-0.5	9.2	46.0
850.040641	42.5	1000.0	120.000	105.0	V	164.0	0.7	3.5	46.0

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

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



Peak Data

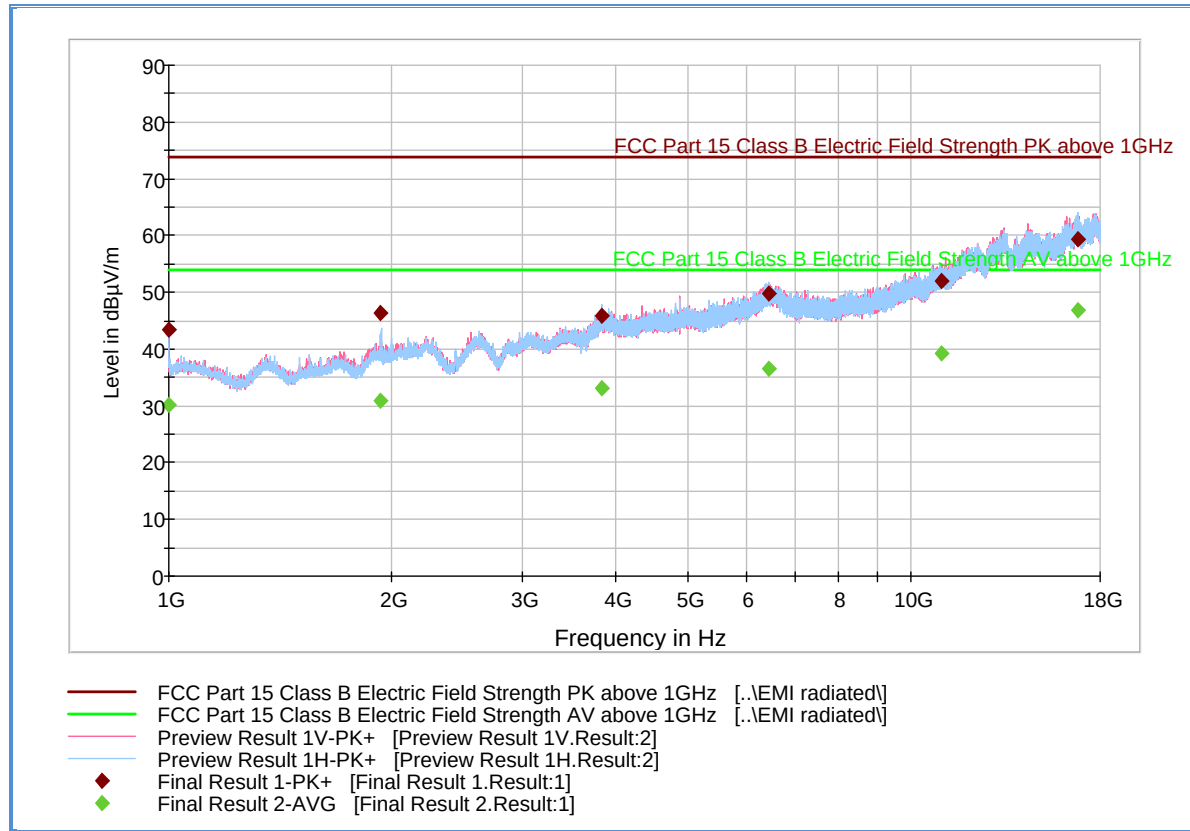
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	43.2	1000.0	1000.000	258.3	H	324.0	-7.0	30.7	73.9
2615.566667	42.3	1000.0	1000.000	200.5	H	256.0	-0.4	31.6	73.9
4008.833333	45.5	1000.0	1000.000	277.3	H	95.0	5.9	28.4	73.9
6491.133333	49.8	1000.0	1000.000	168.6	V	282.0	12.7	24.1	73.9
11053.600000	52.1	1000.0	1000.000	350.6	V	272.0	16.8	21.8	73.9
17711.233333	59.1	1000.0	1000.000	99.7	H	14.0	25.6	14.8	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)
1000.000000	30.3	1000.0	1000.000	258.3	H	324.0	-7.0	23.6	53.9
2615.566667	29.4	1000.0	1000.000	200.5	H	256.0	-0.4	24.5	53.9
4008.833333	32.1	1000.0	1000.000	277.3	H	95.0	5.9	21.8	53.9
6491.133333	36.5	1000.0	1000.000	168.6	V	282.0	12.7	17.4	53.9
11053.600000	38.7	1000.0	1000.000	350.6	V	272.0	16.8	15.2	53.9
17711.233333	46.0	1000.0	1000.000	99.7	H	14.0	25.6	7.9	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

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



Peak Data

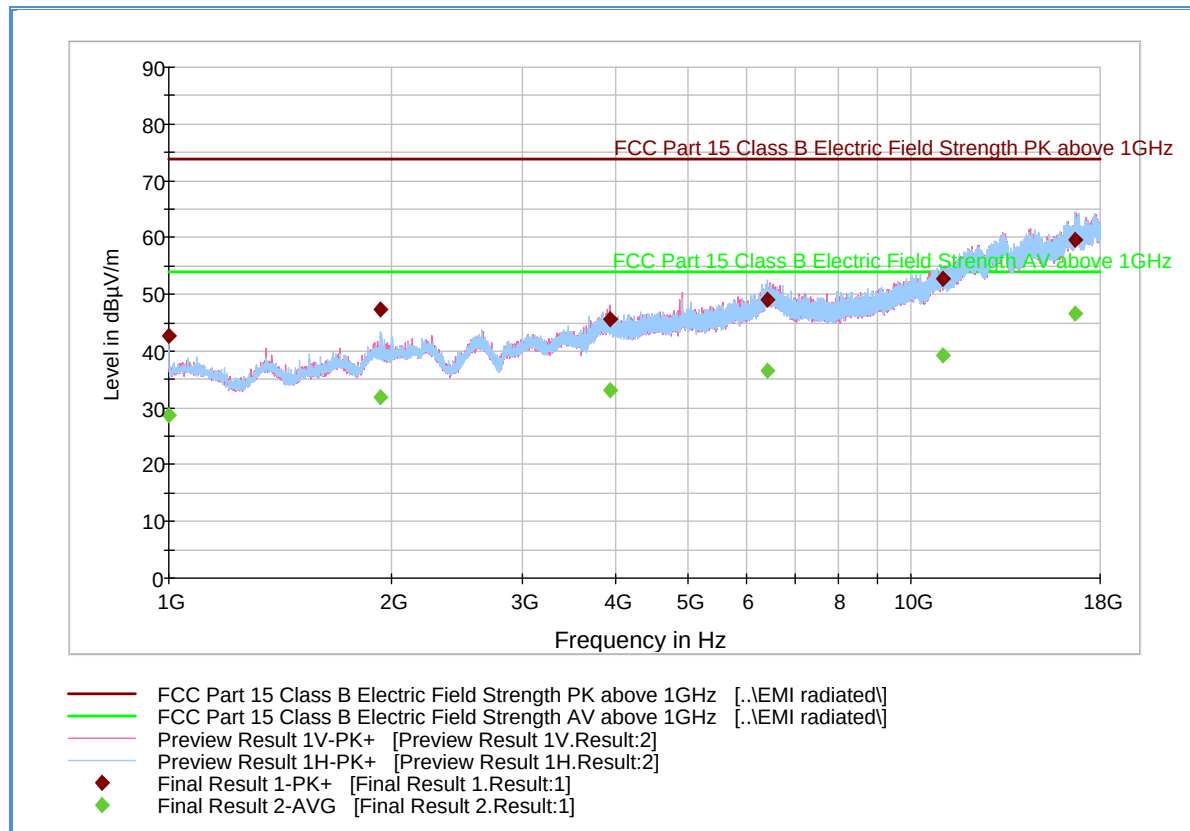
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	43.3	1000.0	1000.000	261.3	H	276.0	-7.0	30.6	73.9
1932.533333	46.4	1000.0	1000.000	103.7	H	151.0	-1.4	27.5	73.9
3834.700000	45.9	1000.0	1000.000	344.1	H	-10.0	6.1	28.0	73.9
6429.666667	49.7	1000.0	1000.000	405.5	H	111.0	12.6	24.2	73.9
11018.500000	52.1	1000.0	1000.000	174.6	V	224.0	17.0	21.8	73.9
16796.633333	59.3	1000.0	1000.000	350.6	H	194.0	25.9	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)
1000.000000	30.2	1000.0	1000.000	261.3	H	276.0	-7.0	23.7	53.9
1932.533333	30.8	1000.0	1000.000	103.7	H	151.0	-1.4	23.1	53.9
3834.700000	33.1	1000.0	1000.000	344.1	H	-10.0	6.1	20.8	53.9
6429.666667	36.6	1000.0	1000.000	405.5	H	111.0	12.6	17.3	53.9
11018.500000	39.3	1000.0	1000.000	174.6	V	224.0	17.0	14.6	53.9
16796.633333	46.9	1000.0	1000.000	350.6	H	194.0	25.9	7.0	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

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



Peak Data

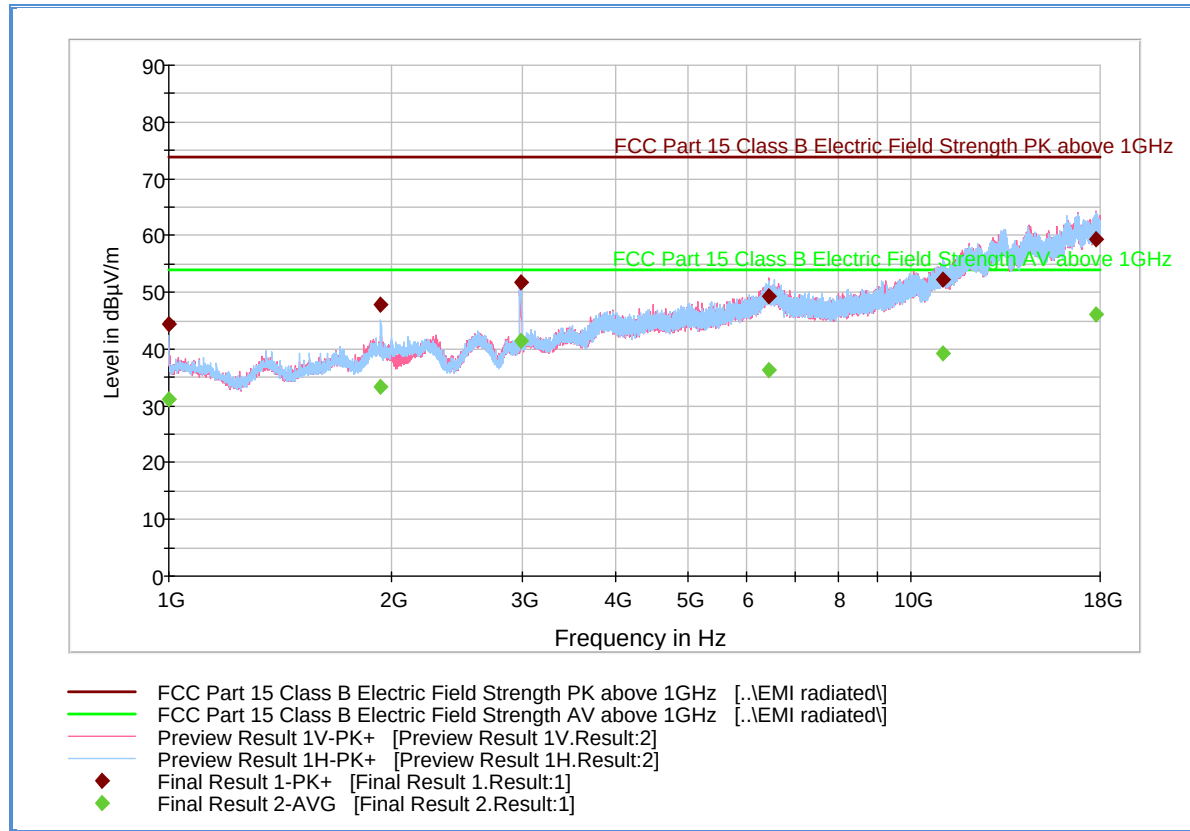
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.500000	42.8	1000.0	1000.000	250.3	H	-9.0	-7.0	31.1	73.9
1932.366667	47.3	1000.0	1000.000	103.7	H	316.0	-1.4	26.6	73.9
3926.700000	45.7	1000.0	1000.000	378.1	V	60.0	6.0	28.2	73.9
6409.833333	49.0	1000.0	1000.000	323.2	H	321.0	12.7	24.9	73.9
11023.233333	52.7	1000.0	1000.000	405.4	H	222.0	16.9	21.2	73.9
16675.500000	59.6	1000.0	1000.000	113.7	H	29.0	25.5	14.3	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)
1000.500000	28.6	1000.0	1000.000	250.3	H	-9.0	-7.0	25.3	53.9
1932.366667	31.9	1000.0	1000.000	103.7	H	316.0	-1.4	22.0	53.9
3926.700000	33.2	1000.0	1000.000	378.1	V	60.0	6.0	20.7	53.9
6409.833333	36.5	1000.0	1000.000	323.2	H	321.0	12.7	17.4	53.9
11023.233333	39.2	1000.0	1000.000	405.4	H	222.0	16.9	14.7	53.9
16675.500000	46.6	1000.0	1000.000	113.7	H	29.0	25.5	7.3	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.14 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)
1000.000000	44.3	1000.0	1000.000	250.3	H	20.0	-7.0	29.6	73.9
1932.366667	47.9	1000.0	1000.000	103.7	H	242.0	-1.4	26.0	73.9
2983.533333	51.8	1000.0	1000.000	183.5	V	3.0	1.4	22.1	73.9
6441.933333	49.4	1000.0	1000.000	334.1	V	190.0	12.7	24.5	73.9
11030.766667	52.2	1000.0	1000.000	405.4	H	303.0	16.9	21.7	73.9
17793.933333	59.3	1000.0	1000.000	346.1	V	344.0	25.8	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)
1000.000000	31.1	1000.0	1000.000	250.3	H	20.0	-7.0	22.8	53.9
1932.366667	33.4	1000.0	1000.000	103.7	H	242.0	-1.4	20.5	53.9
2983.533333	41.4	1000.0	1000.000	183.5	V	3.0	1.4	12.5	53.9
6441.933333	36.2	1000.0	1000.000	334.1	V	190.0	12.7	17.7	53.9
11030.766667	39.1	1000.0	1000.000	405.4	H	303.0	16.9	14.8	53.9
17793.933333	46.2	1000.0	1000.000	346.1	V	344.0	25.8	7.7	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

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



Peak Data

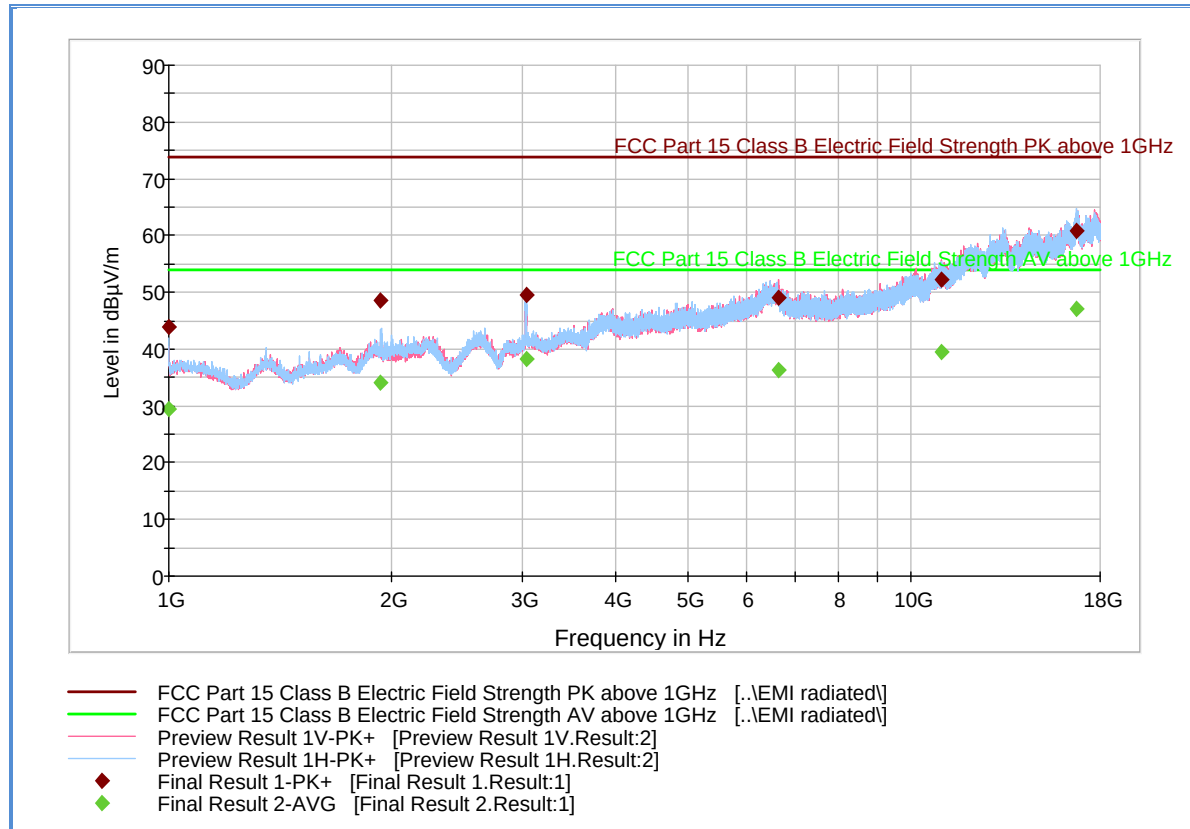
Frequency (MHz)	MaxPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1000.000000	44.1	1000.0	1000.000	250.3	H	30.0	-7.0	29.8	73.9
1932.733333	41.7	1000.0	1000.000	249.3	V	305.0	-1.4	32.2	73.9
3000.000000	54.0	1000.0	1000.000	187.5	H	85.0	1.5	19.9	73.9
6463.600000	48.4	1000.0	1000.000	230.4	V	186.0	12.7	25.5	73.9
10945.000000	52.1	1000.0	1000.000	345.1	V	233.0	16.9	21.8	73.9
16768.466667	59.9	1000.0	1000.000	405.4	V	255.0	25.9	14.0	73.9

Average Data

Frequency (MHz)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1000.000000	31.3	1000.0	1000.000	250.3	H	30.0	-7.0	22.6	53.9
1932.733333	28.1	1000.0	1000.000	249.3	V	305.0	-1.4	25.8	53.9
3000.000000	43.0	1000.0	1000.000	187.5	H	85.0	1.5	10.9	53.9
6463.600000	35.9	1000.0	1000.000	230.4	V	186.0	12.7	18.0	53.9
10945.000000	38.9	1000.0	1000.000	345.1	V	233.0	16.9	15.0	53.9
16768.466667	47.0	1000.0	1000.000	405.4	V	255.0	25.9	6.9	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

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



Peak Data

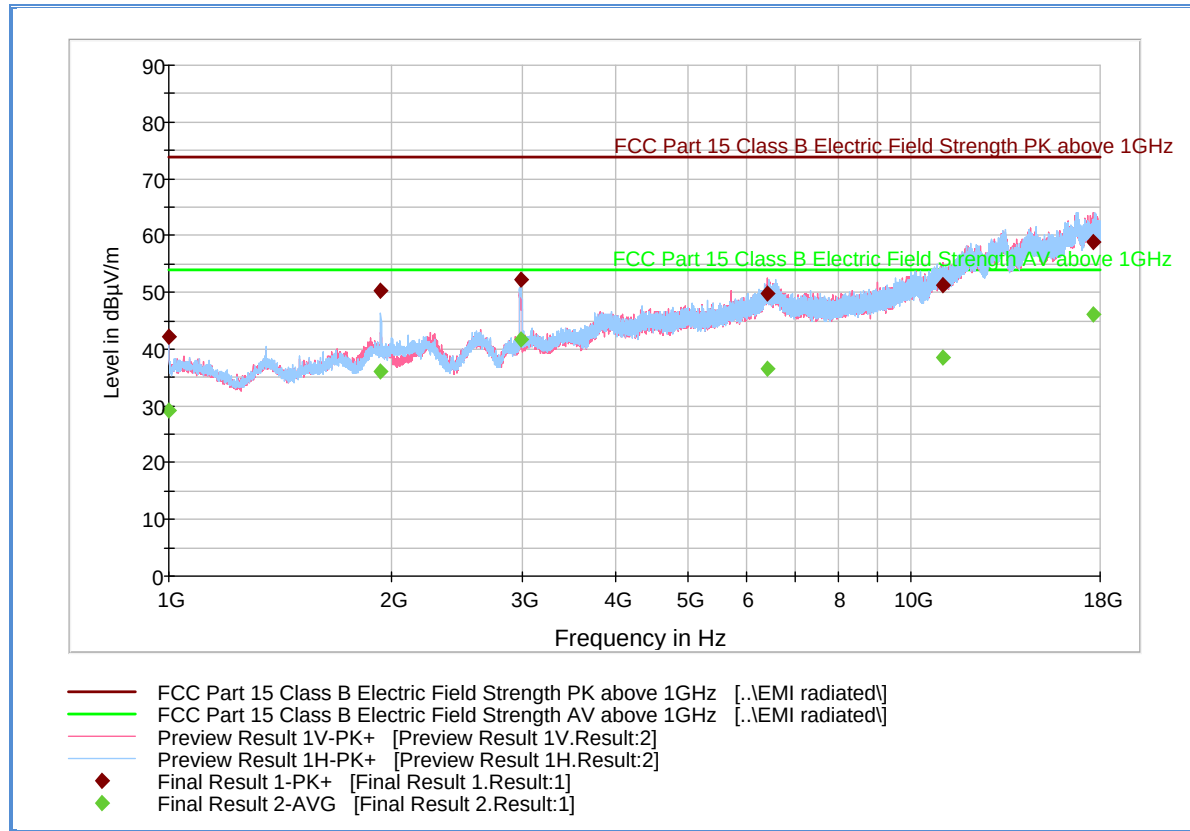
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.400000	43.8	1000.0	1000.000	260.3	H	250.0	-7.0	30.1	73.9
1932.533333	48.7	1000.0	1000.000	102.7	H	23.0	-1.4	25.2	73.9
3030.566667	49.6	1000.0	1000.000	230.4	H	87.0	1.6	24.3	73.9
6647.266667	49.1	1000.0	1000.000	251.3	V	321.0	12.5	24.8	73.9
10982.800000	52.2	1000.0	1000.000	302.2	V	138.0	17.0	21.7	73.9
16747.066667	60.9	1000.0	1000.000	240.4	H	304.0	25.9	13.0	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)
1000.400000	29.4	1000.0	1000.000	260.3	H	250.0	-7.0	24.5	53.9
1932.533333	34.1	1000.0	1000.000	102.7	H	23.0	-1.4	19.8	53.9
3030.566667	38.4	1000.0	1000.000	230.4	H	87.0	1.6	15.5	53.9
6647.266667	36.4	1000.0	1000.000	251.3	V	321.0	12.5	17.5	53.9
10982.800000	39.4	1000.0	1000.000	302.2	V	138.0	17.0	14.5	53.9
16747.066667	47.0	1000.0	1000.000	240.4	H	304.0	25.9	6.9	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.17 Test Results Above 1GHz (802.11n HT20 Low Channel)



Peak Data

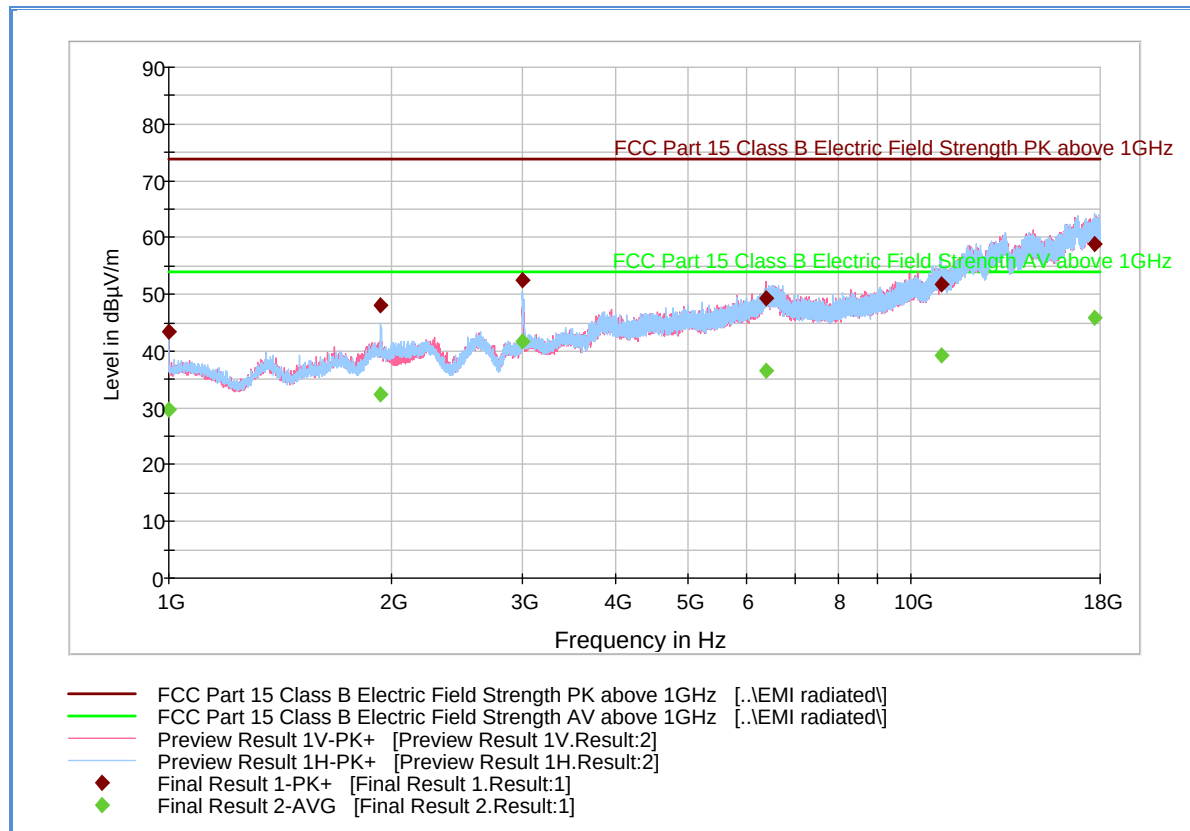
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	42.2	1000.0	1000.000	99.7	H	288.0	-7.0	31.7	73.9
1932.566667	50.4	1000.0	1000.000	102.7	H	23.0	-1.4	23.5	73.9
2985.166667	52.2	1000.0	1000.000	356.1	H	66.0	1.4	21.7	73.9
6409.633333	49.7	1000.0	1000.000	312.2	V	332.0	12.7	24.2	73.9
11064.566667	51.3	1000.0	1000.000	114.7	V	112.0	16.7	22.6	73.9
17650.166667	58.8	1000.0	1000.000	196.5	V	200.0	25.2	15.1	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)
1000.000000	29.3	1000.0	1000.000	99.7	H	288.0	-7.0	24.6	53.9
1932.566667	36.1	1000.0	1000.000	102.7	H	23.0	-1.4	17.8	53.9
2985.166667	41.8	1000.0	1000.000	356.1	H	66.0	1.4	12.1	53.9
6409.633333	36.5	1000.0	1000.000	312.2	V	332.0	12.7	17.4	53.9
11064.566667	38.4	1000.0	1000.000	114.7	V	112.0	16.7	15.5	53.9
17650.166667	46.0	1000.0	1000.000	196.5	V	200.0	25.2	7.9	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.18 Test Results Above 1GHz (802.11n HT20 Mid Channel)



Peak Data

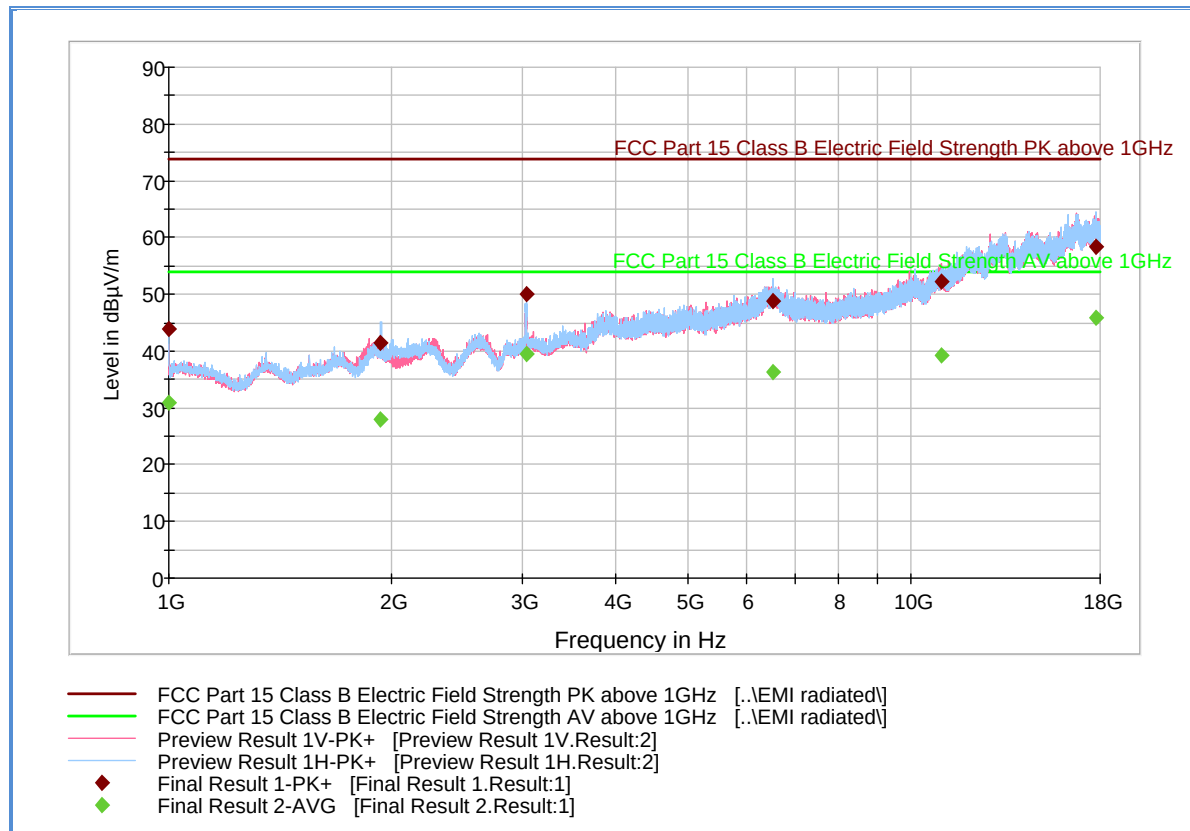
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.400000	43.4	1000.0	1000.000	260.3	H	88.0	-7.0	30.5	73.9
1932.366667	48.0	1000.0	1000.000	103.7	H	148.0	-1.4	25.9	73.9
3002.233333	52.4	1000.0	1000.000	187.5	H	84.0	1.5	21.5	73.9
6389.400000	49.3	1000.0	1000.000	260.3	V	350.0	12.7	24.6	73.9
11018.866667	51.9	1000.0	1000.000	112.7	H	242.0	17.0	22.0	73.9
17681.200000	58.8	1000.0	1000.000	201.5	H	254.0	25.4	15.1	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)
1000.400000	29.6	1000.0	1000.000	260.3	H	88.0	-7.0	24.3	53.9
1932.366667	32.3	1000.0	1000.000	103.7	H	148.0	-1.4	21.6	53.9
3002.233333	41.8	1000.0	1000.000	187.5	H	84.0	1.5	12.1	53.9
6389.400000	36.5	1000.0	1000.000	260.3	V	350.0	12.7	17.4	53.9
11018.866667	39.3	1000.0	1000.000	112.7	H	242.0	17.0	14.6	53.9
17681.200000	45.9	1000.0	1000.000	201.5	H	254.0	25.4	8.0	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.19 Test Results Above 1GHz (802.11n HT20 High Channel)



Peak Data

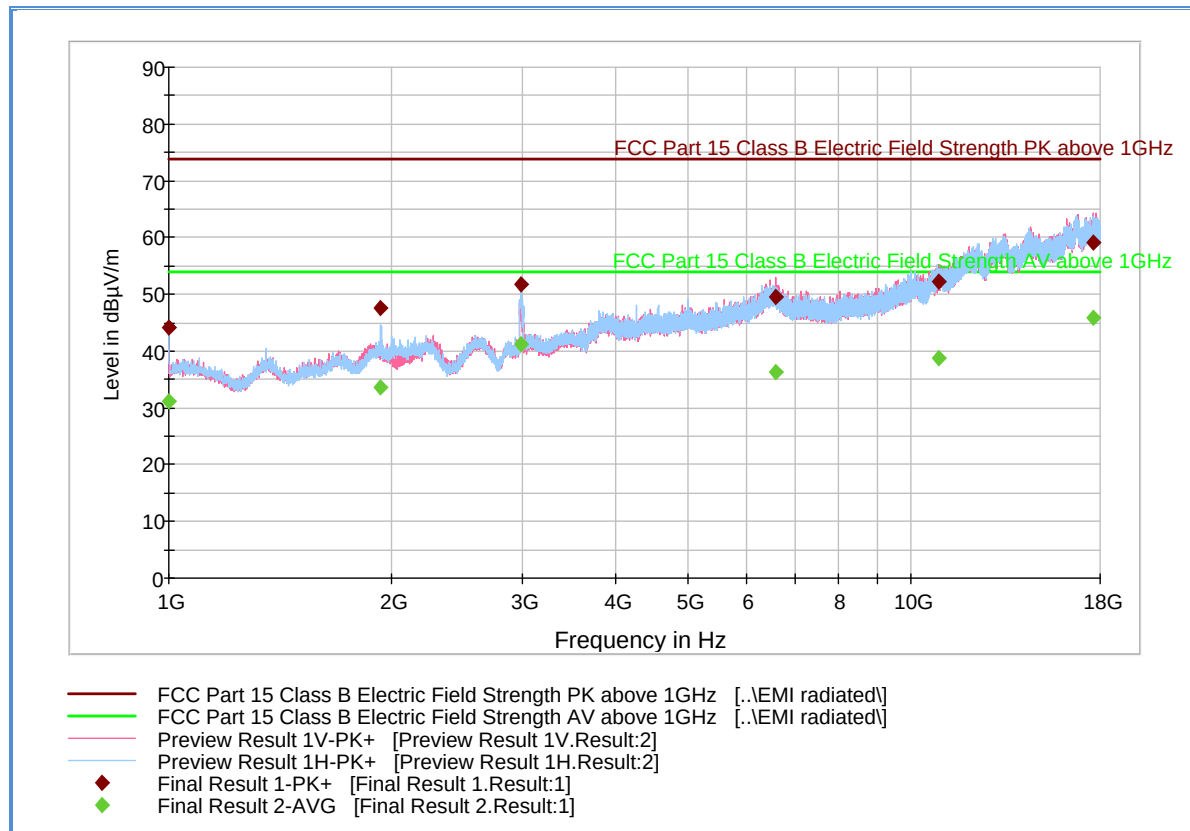
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	43.9	1000.0	1000.000	260.3	H	311.0	-7.0	30.0	73.9
1932.366667	41.4	1000.0	1000.000	122.7	H	93.0	-1.4	32.5	73.9
3035.100000	50.0	1000.0	1000.000	99.7	H	42.0	1.6	23.9	73.9
6524.633333	48.8	1000.0	1000.000	153.7	H	308.0	12.8	25.1	73.9
10985.633333	52.2	1000.0	1000.000	367.1	V	27.0	17.0	21.8	73.9
17786.600000	58.5	1000.0	1000.000	250.3	H	22.0	25.8	15.4	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)
1000.000000	31.0	1000.0	1000.000	260.3	H	311.0	-7.0	22.9	53.9
1932.366667	28.0	1000.0	1000.000	122.7	H	93.0	-1.4	25.9	53.9
3035.100000	39.4	1000.0	1000.000	99.7	H	42.0	1.6	14.5	53.9
6524.633333	36.3	1000.0	1000.000	153.7	H	308.0	12.8	17.6	53.9
10985.633333	39.3	1000.0	1000.000	367.1	V	27.0	17.0	14.6	53.9
17786.600000	45.8	1000.0	1000.000	250.3	H	22.0	25.8	8.1	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.20 Test Results Above 1GHz (802.11n HT40 Low Channel)



Peak Data

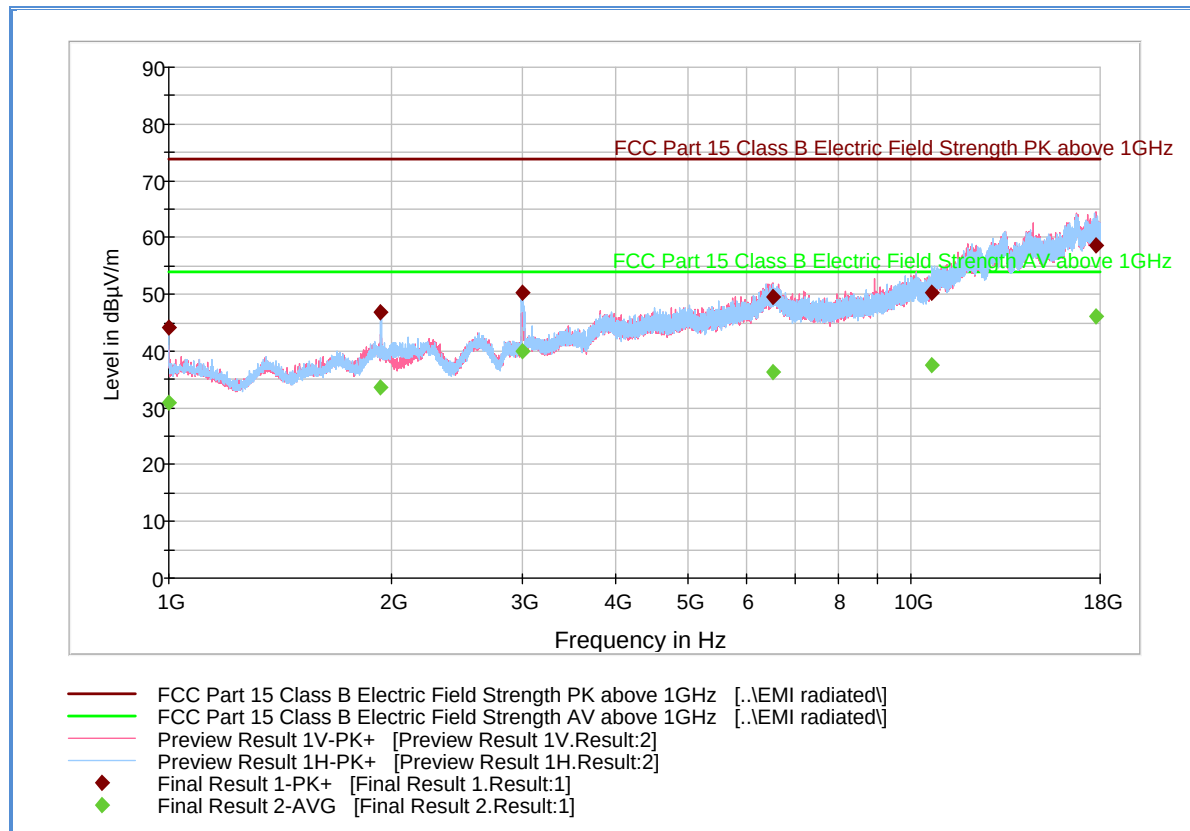
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	44.1	1000.0	1000.000	250.3	H	91.0	-7.0	29.8	73.9
1932.366667	47.5	1000.0	1000.000	120.7	H	316.0	-1.4	26.4	73.9
2984.100000	51.7	1000.0	1000.000	99.7	H	81.0	1.4	22.2	73.9
6579.633333	49.6	1000.0	1000.000	240.3	V	10.0	12.8	24.4	73.9
10899.066667	52.3	1000.0	1000.000	99.7	V	266.0	16.8	21.6	73.9
17633.900000	59.0	1000.0	1000.000	251.3	V	104.0	25.1	14.9	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)
1000.000000	31.2	1000.0	1000.000	250.3	H	91.0	-7.0	22.7	53.9
1932.366667	33.7	1000.0	1000.000	120.7	H	316.0	-1.4	20.2	53.9
2984.100000	41.1	1000.0	1000.000	99.7	H	81.0	1.4	12.8	53.9
6579.633333	36.3	1000.0	1000.000	240.3	V	10.0	12.8	17.6	53.9
10899.066667	38.8	1000.0	1000.000	99.7	V	266.0	16.8	15.1	53.9
17633.900000	45.9	1000.0	1000.000	251.3	V	104.0	25.1	8.0	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.21 Test Results Above 1GHz (802.11n HT40 Mid Channel)



Peak Data

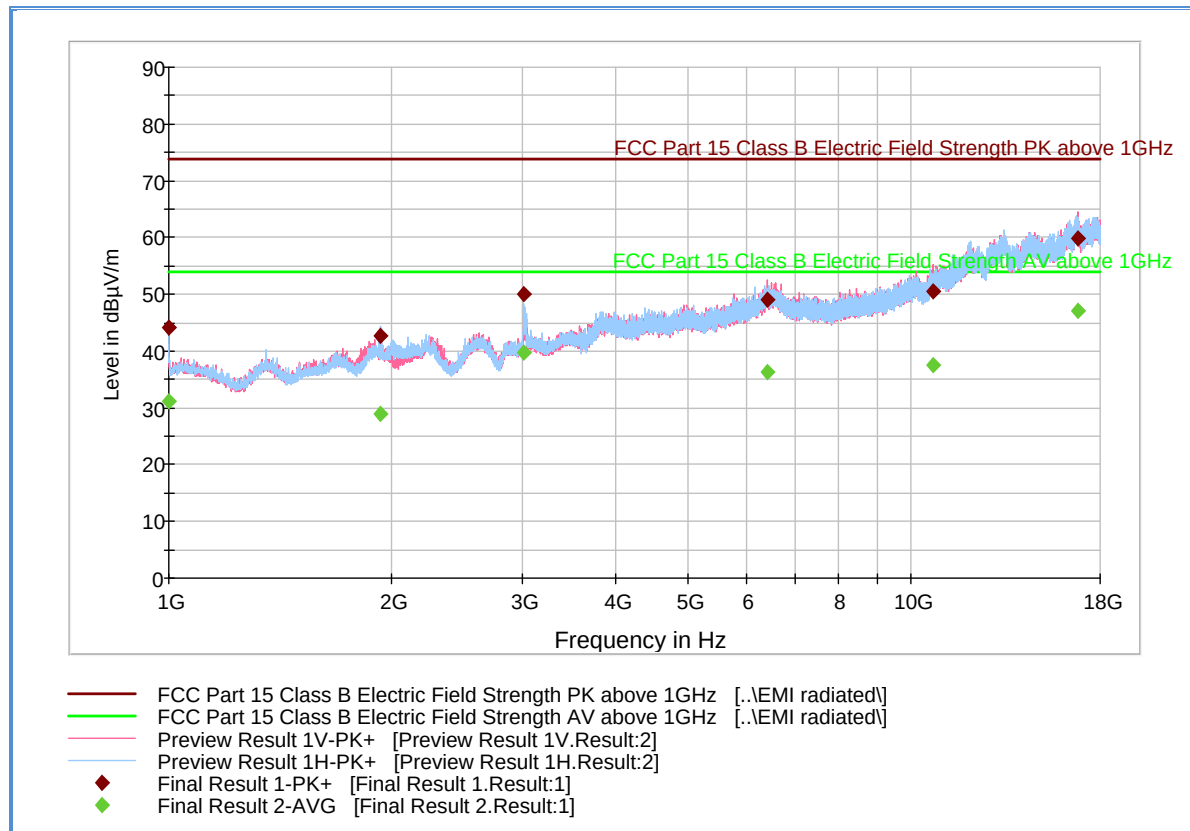
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	44.0	1000.0	1000.000	261.3	H	283.0	-7.0	29.9	73.9
1932.533333	46.9	1000.0	1000.000	103.7	H	238.0	-1.4	27.0	73.9
2991.633333	50.3	1000.0	1000.000	229.4	H	93.0	1.4	23.6	73.9
6514.233333	49.6	1000.0	1000.000	356.1	V	65.0	12.8	24.3	73.9
10691.833333	50.2	1000.0	1000.000	405.5	H	221.0	15.9	23.7	73.9
17796.200000	58.7	1000.0	1000.000	251.3	V	100.0	25.8	15.2	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)
1000.000000	30.8	1000.0	1000.000	261.3	H	283.0	-7.0	23.1	53.9
1932.533333	33.5	1000.0	1000.000	103.7	H	238.0	-1.4	20.4	53.9
2991.633333	40.0	1000.0	1000.000	229.4	H	93.0	1.4	13.9	53.9
6514.233333	36.4	1000.0	1000.000	356.1	V	65.0	12.8	17.5	53.9
10691.833333	37.6	1000.0	1000.000	405.5	H	221.0	15.9	16.3	53.9
17796.200000	46.0	1000.0	1000.000	251.3	V	100.0	25.8	7.9	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.

2.6.22 Test Results Above 1GHz (802.11n HT40 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)
1000.000000	44.0	1000.0	1000.000	250.3	H	344.0	-7.0	29.9	73.9
1932.566667	42.8	1000.0	1000.000	113.7	H	108.0	-1.4	31.1	73.9
3006.366667	50.0	1000.0	1000.000	99.7	H	41.0	1.5	23.9	73.9
6403.166667	48.9	1000.0	1000.000	151.6	V	285.0	12.7	25.0	73.9
10705.133333	50.5	1000.0	1000.000	99.7	V	304.0	16.0	23.4	73.9
16768.600000	59.8	1000.0	1000.000	202.3	V	138.0	25.9	14.1	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)
1000.000000	31.1	1000.0	1000.000	250.3	H	344.0	-7.0	22.8	53.9
1932.566667	28.9	1000.0	1000.000	113.7	H	108.0	-1.4	25.0	53.9
3006.366667	39.7	1000.0	1000.000	99.7	H	41.0	1.5	14.2	53.9
6403.166667	36.4	1000.0	1000.000	151.6	V	285.0	12.7	17.5	53.9
10705.133333	37.6	1000.0	1000.000	99.7	V	304.0	16.0	16.3	53.9
16768.600000	47.1	1000.0	1000.000	202.3	V	138.0	25.9	6.8	53.9

Test Notes: No Measurement was performed with a 2.4GHz notch filter. No significant emissions observed above 6GHz. Measurements above 6GHz are noise floor figures.



2.7 RADIATED BAND EDGE MEASUREMENTS AND IMMEDIATE RESTRICTED BANDS

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: EUT#3-EMC / Test Configuration B

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

July 24, 2014 / AC and FC

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/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.2 °C
Relative Humidity	53.5. %
ATM Pressure	98.6 kPa

2.7.7 Additional Observations

- This is a radiated test. The spectrum was searched from 2310MHz to 2390MHz for lower immediate restricted band and 2483.5MHz to 2500MHz for the upper immediate restricted band.
- There are no emissions found that do not comply with the restricted bands defined in FCC Part 15 Subpart C, 15.205.



- 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.

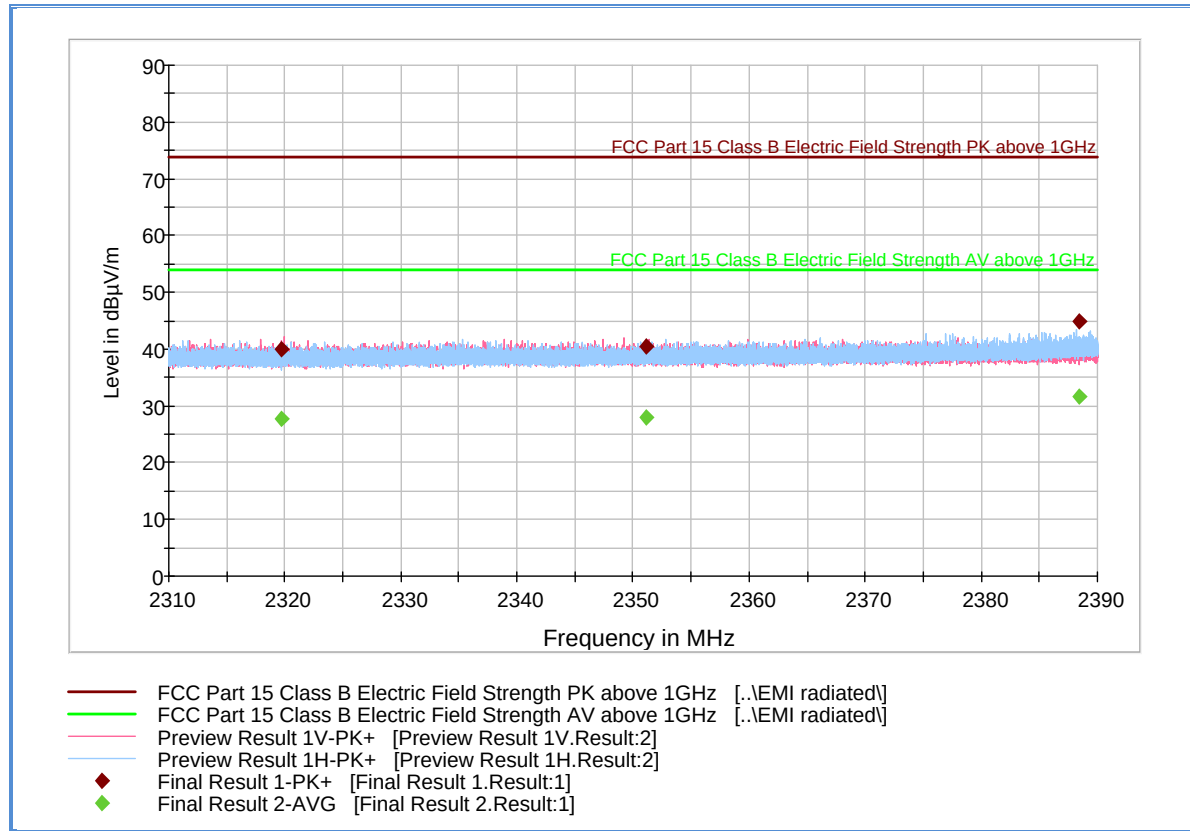
2.7.8 Sample Computation (Radiated Emission)

Measuring equipment raw measurement (db μ V) @ 2400 MHz			53.9
Correction Factor (dB)	Asset# 1153 (cable)	3.4	-0.4
	Asset# 8628(preamplifier)	-36.5	
	Asset#7575 (antenna)	32.7	
Reported Max Peak Final Measurement (db μ V/m) @ 2400 MHz			53.5

2.7.9 Test Results

See attached plots.

2.7.10 Test Results Restricted Band 2310MHz to 2390MHz (802.11b Low Channel)



Peak Data

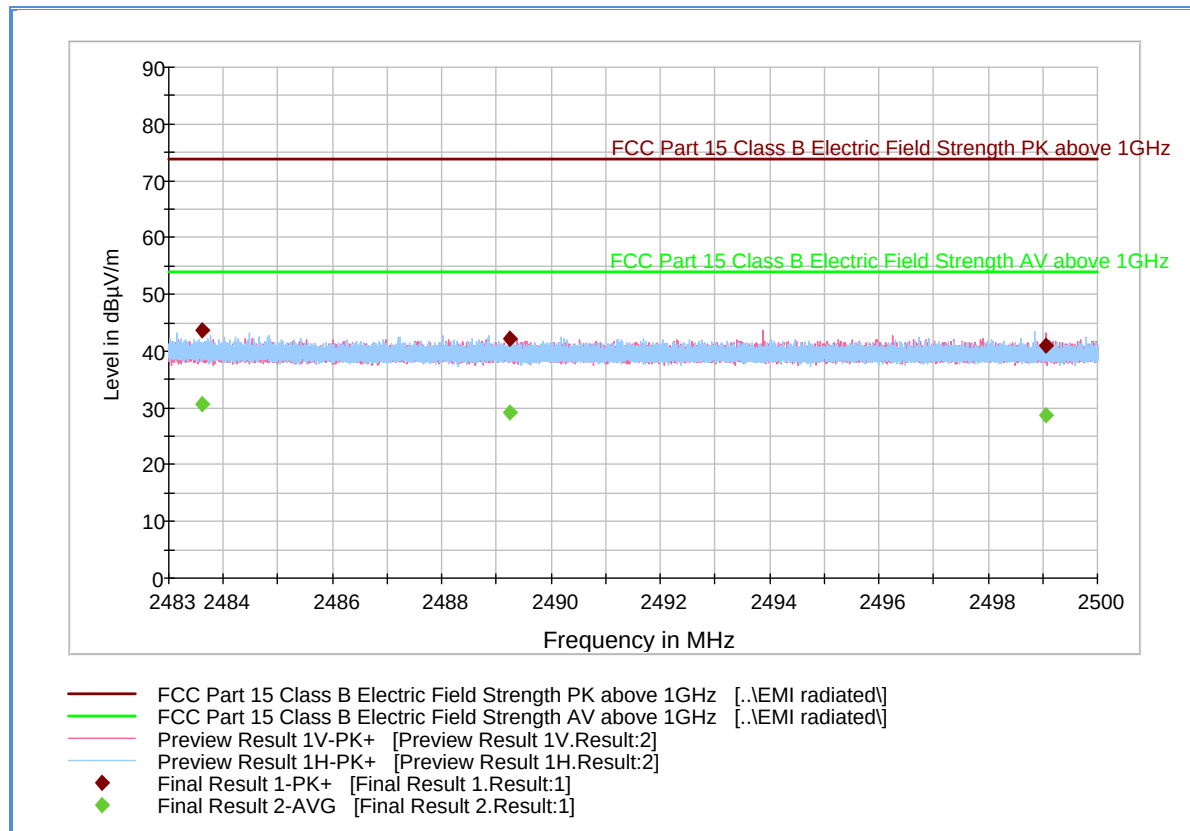
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2319.712000	39.9	1000.0	1000.000	287.3	V	77.0	-0.5	34.0	73.9
2351.181333	40.4	1000.0	1000.000	177.6	V	134.0	-0.4	33.5	73.9
2388.434667	44.8	1000.0	1000.000	101.7	H	83.0	-0.2	29.1	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)
2319.712000	27.6	1000.0	1000.000	287.3	V	77.0	-0.5	26.3	53.9
2351.181333	28.1	1000.0	1000.000	177.6	V	134.0	-0.4	25.8	53.9
2388.434667	31.6	1000.0	1000.000	101.7	H	83.0	-0.2	22.3	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.11 Test Results Restricted Band 2483.5MHz to 2500MHz (802.11b high Channel)



Peak Data

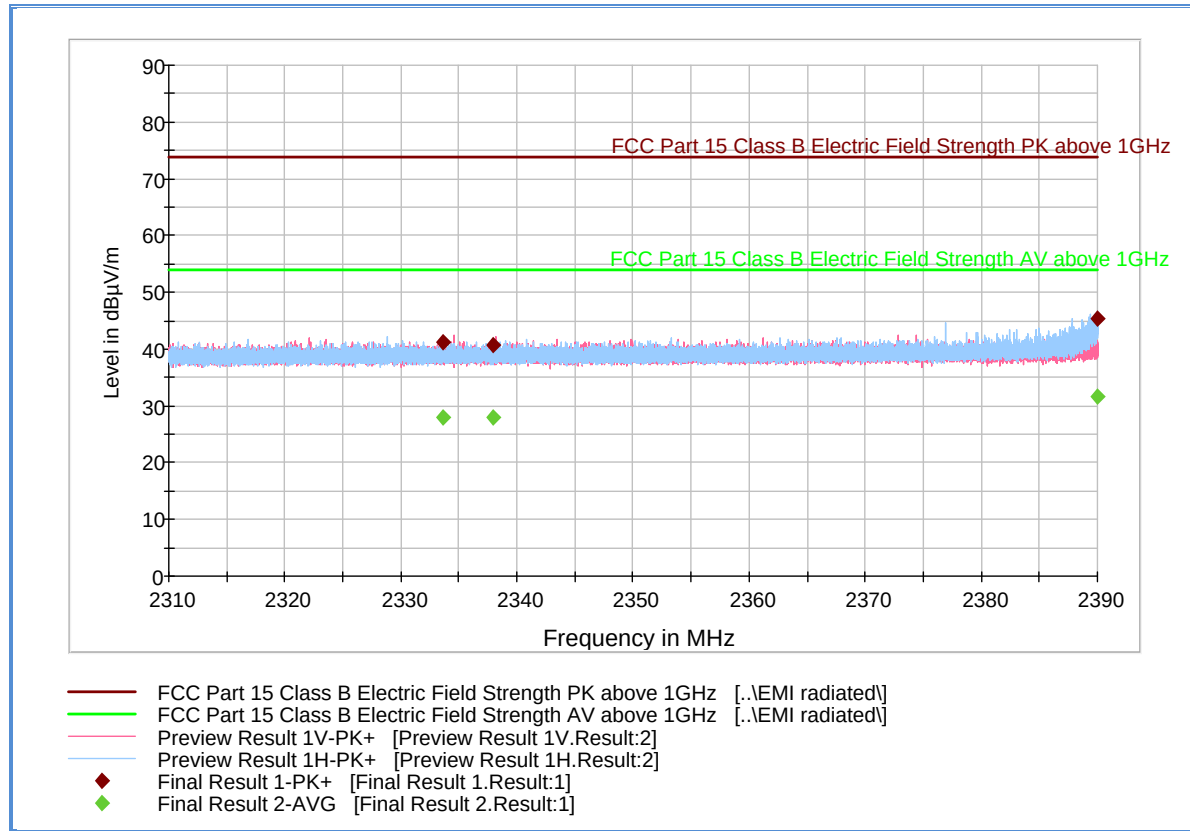
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2483.600000	43.6	1000.0	1000.000	103.7	H	16.0	0.1	30.3	73.9
2489.253100	42.3	1000.0	1000.000	99.7	H	15.0	0.2	31.6	73.9
2499.052500	40.9	1000.0	1000.000	115.7	H	127.0	0.2	33.0	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)
2483.600000	30.7	1000.0	1000.000	103.7	H	16.0	0.1	23.2	53.9
2489.253100	29.3	1000.0	1000.000	99.7	H	15.0	0.2	24.6	53.9
2499.052500	28.6	1000.0	1000.000	115.7	H	127.0	0.2	25.3	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.12 Test Results Restricted Band 2310MHz to 2390MHz (802.11g Low Channel)



Peak Data

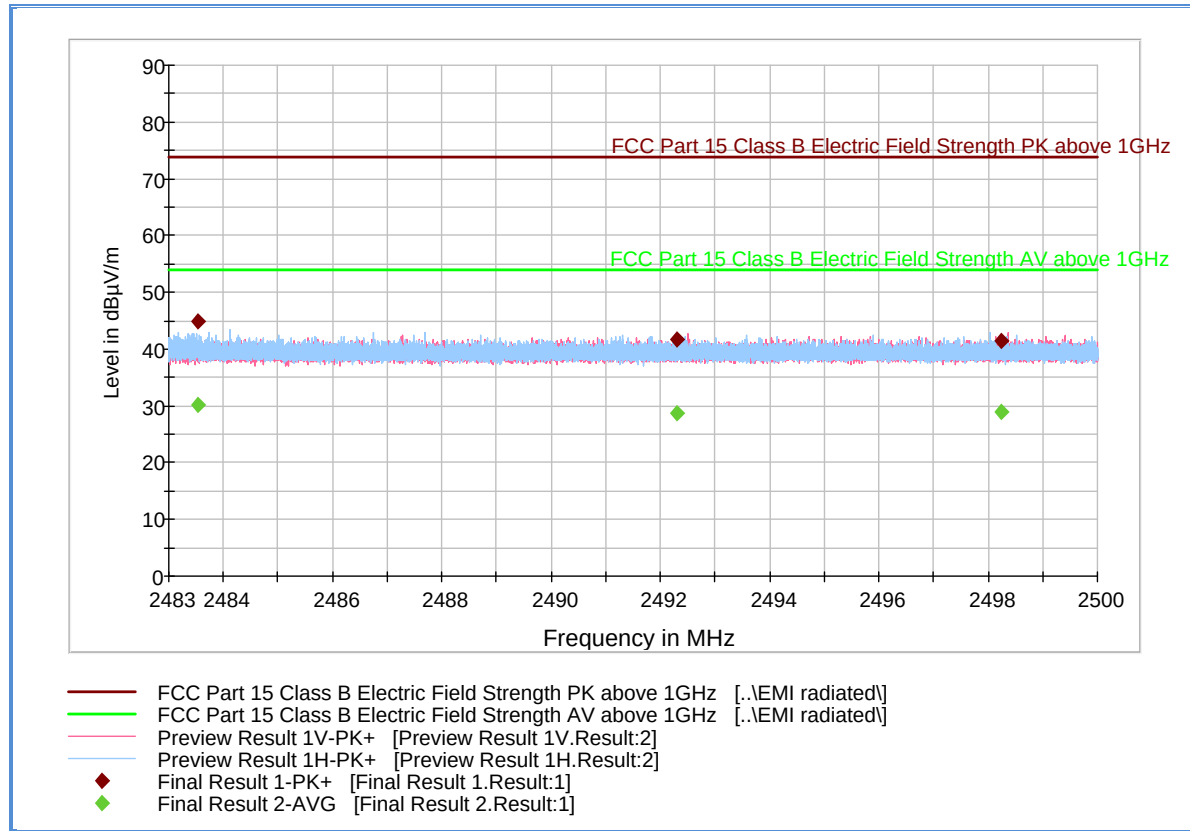
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2333.584000	41.2	1000.0	1000.000	300.6	V	38.0	-0.4	32.7	73.9
2337.976000	40.8	1000.0	1000.000	202.5	V	74.0	-0.4	33.1	73.9
2390.000000	45.4	1000.0	1000.000	113.7	H	-3.0	-0.2	28.5	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)
2333.584000	28.0	1000.0	1000.000	300.6	V	38.0	-0.4	25.9	53.9
2337.976000	28.0	1000.0	1000.000	202.5	V	74.0	-0.4	25.9	53.9
2390.000000	31.7	1000.0	1000.000	113.7	H	-3.0	-0.2	22.2	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.13 Test Results Restricted Band 2483.5MHz to 2500MHz (802.11g high Channel)



Peak Data

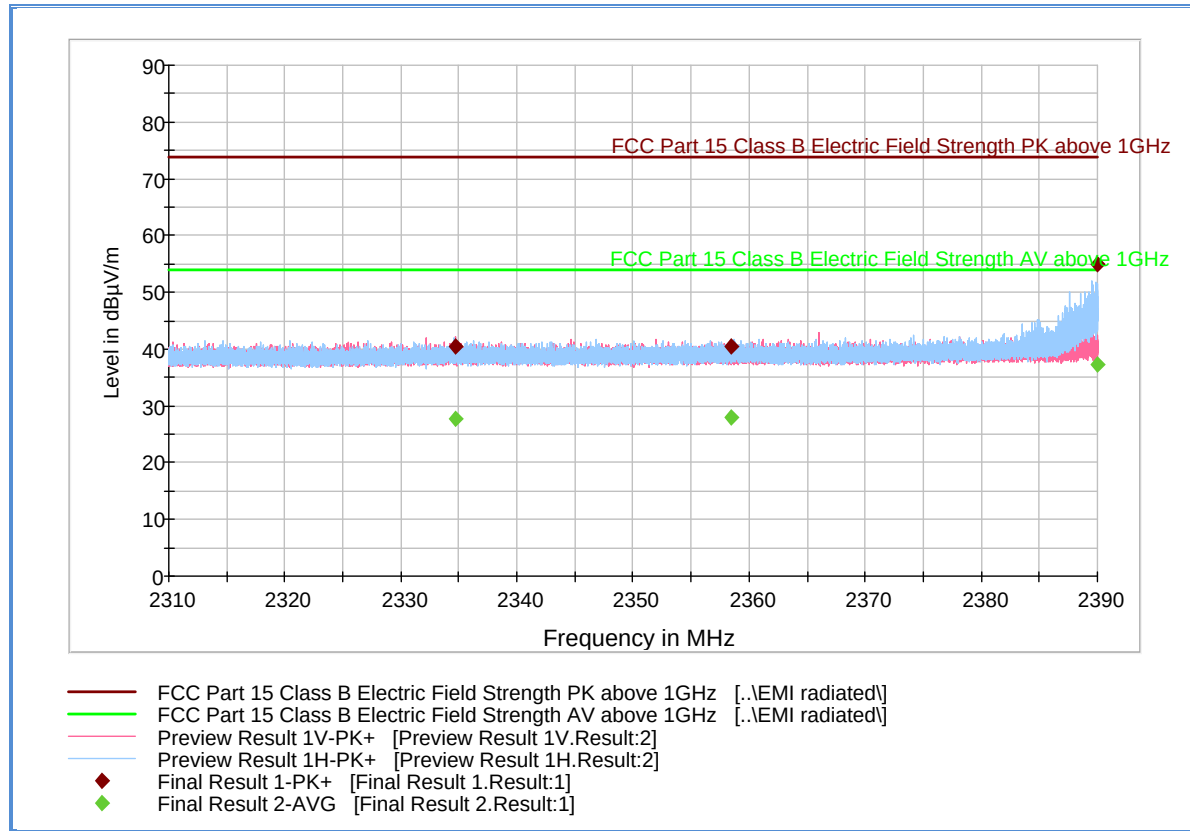
Frequency (MHz)	MaxPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2483.523700	44.8	1000.0	1000.000	99.7	H	93.0	0.1	29.1	73.9
2492.299033	41.7	1000.0	1000.000	405.4	V	52.0	0.2	32.2	73.9
2498.229700	41.6	1000.0	1000.000	102.7	H	10.0	0.2	32.3	73.9

Average Data

Frequency (MHz)	Average (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
2483.523700	30.3	1000.0	1000.000	99.7	H	93.0	0.1	23.6	53.9
2492.299033	28.6	1000.0	1000.000	405.4	V	52.0	0.2	25.3	53.9
2498.229700	28.8	1000.0	1000.000	102.7	H	10.0	0.2	25.1	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.14 Test Results Restricted Band 2310MHz to 2390MHz (802.11n HT20 Low Channel)



Peak Data

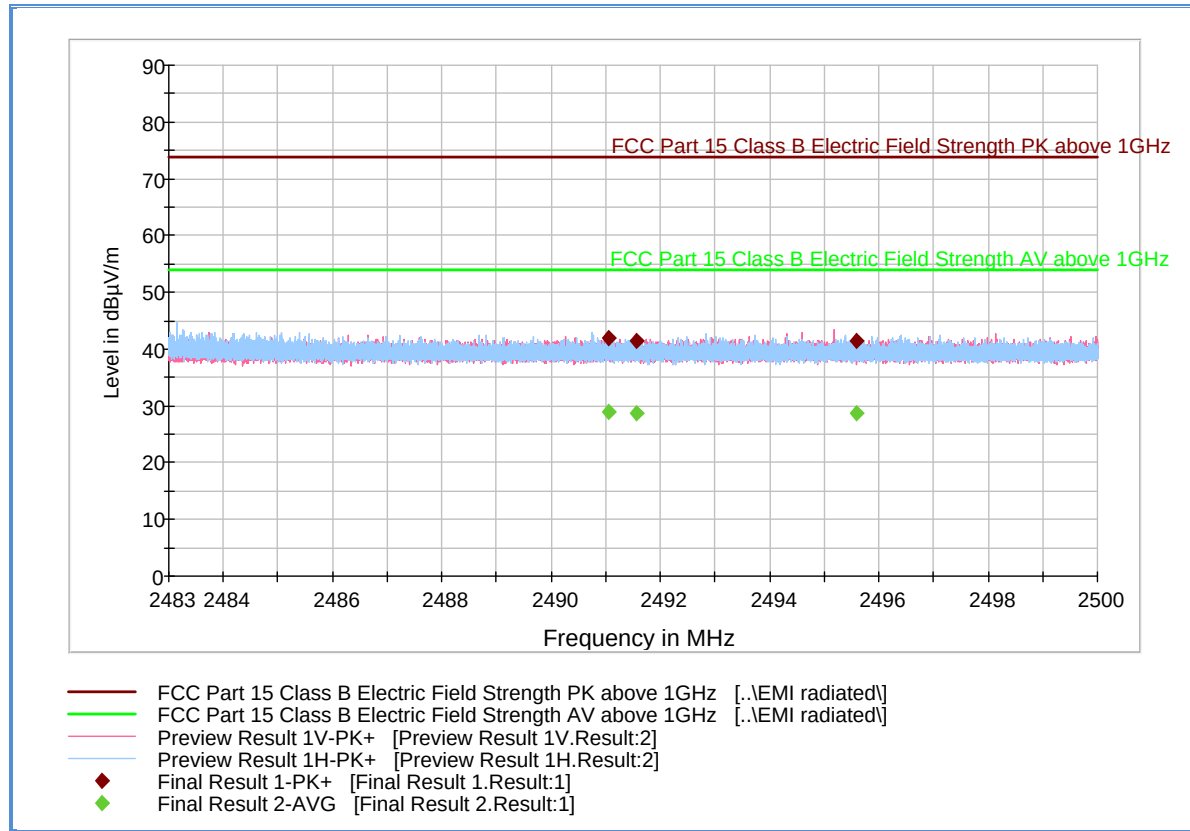
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2334.720000	40.6	1000.0	1000.000	99.7	V	124.0	-0.4	33.3	73.9
2358.469333	40.5	1000.0	1000.000	227.4	H	10.0	-0.4	33.4	73.9
2390.000000	54.8	1000.0	1000.000	128.7	H	86.0	-0.2	19.1	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)
2334.720000	27.7	1000.0	1000.000	99.7	V	124.0	-0.4	26.2	53.9
2358.469333	28.0	1000.0	1000.000	227.4	H	10.0	-0.4	25.9	53.9
2390.000000	37.3	1000.0	1000.000	128.7	H	86.0	-0.2	16.6	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.15 Test Results Restricted Band 2483.5MHz to 2500MHz (802.11n HT20 High Channel)



Peak Data

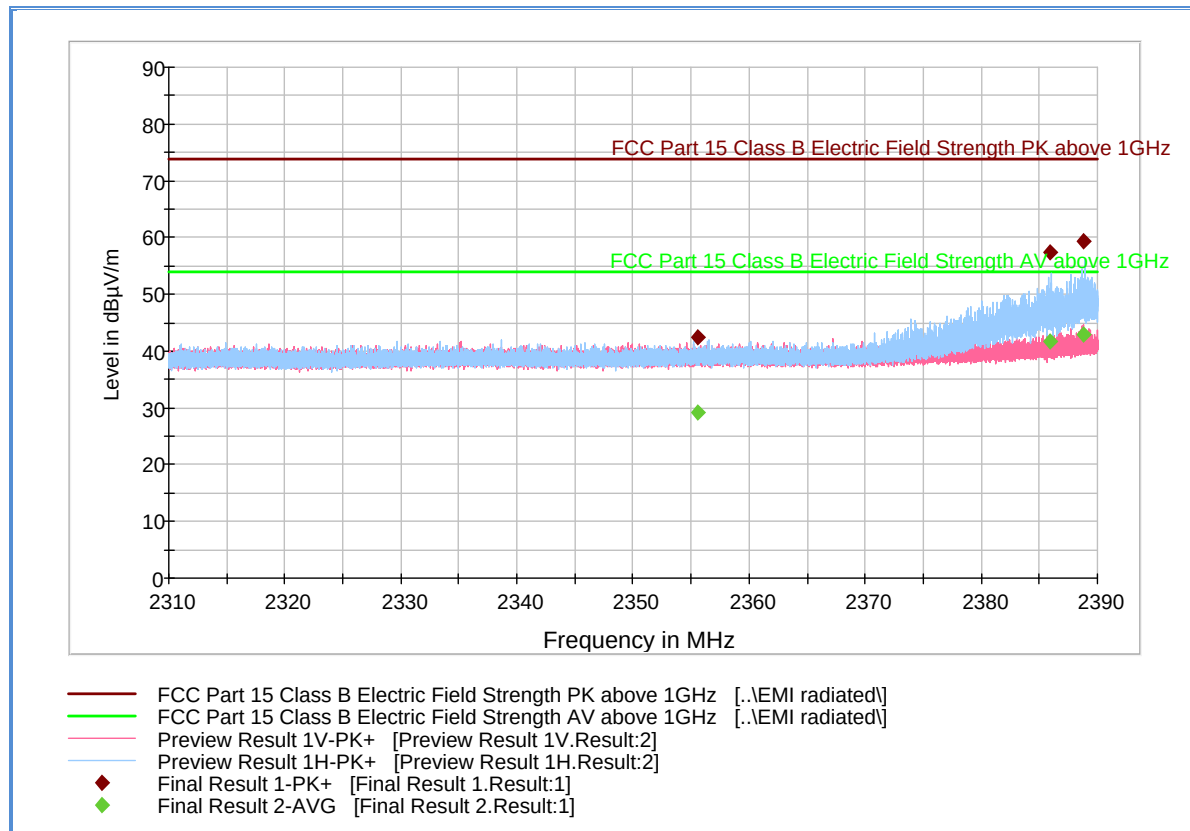
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2491.052567	41.9	1000.0	1000.000	101.7	H	-10.0	0.2	32.0	73.9
2491.552567	41.4	1000.0	1000.000	99.7	H	128.0	0.2	32.5	73.9
2495.590133	41.4	1000.0	1000.000	201.3	V	88.0	0.2	32.5	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)
2491.052567	29.0	1000.0	1000.000	101.7	H	-10.0	0.2	24.9	53.9
2491.552567	28.6	1000.0	1000.000	99.7	H	128.0	0.2	25.3	53.9
2495.590133	28.7	1000.0	1000.000	201.3	V	88.0	0.2	25.2	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.16 Test Results Restricted Band 2310MHz to 2390MHz (802.11n HT40 Low Channel)



Peak Data

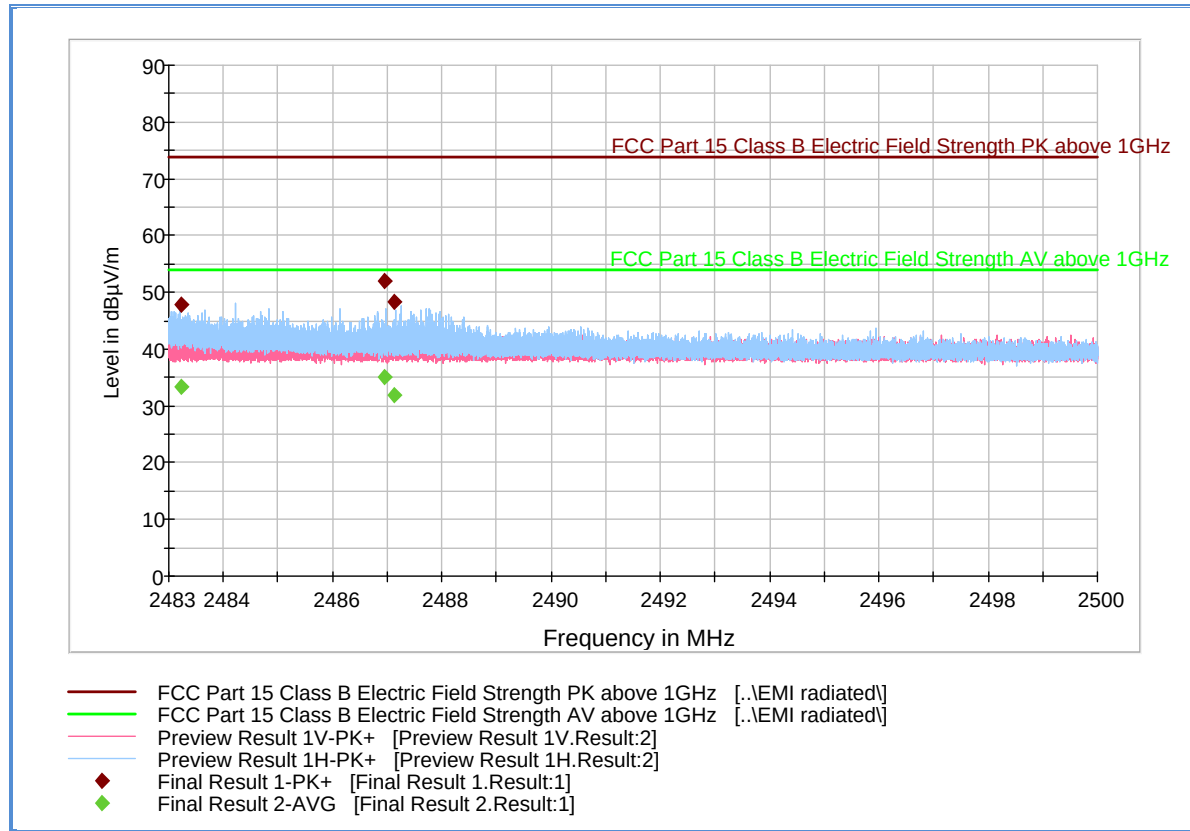
Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
2355.522667	42.5	1000.0	1000.000	131.7	H	95.0	-0.4	31.4	73.9
2385.885333	57.5	1000.0	1000.000	128.7	H	79.0	-0.2	16.4	73.9
2388.749333	59.4	1000.0	1000.000	129.7	H	80.0	-0.2	14.5	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)
2355.522667	29.1	1000.0	1000.000	131.7	H	95.0	-0.4	24.8	53.9
2385.885333	41.6	1000.0	1000.000	128.7	H	79.0	-0.2	12.3	53.9
2388.749333	43.0	1000.0	1000.000	129.7	H	80.0	-0.2	10.9	53.9

Test Notes: 2.4GHz notch filter removed for this test.

2.7.17 Test Results Restricted Band 2483.5MHz to 2500MHz (802.11n HT40 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)
2483.217200	47.9	1000.0	1000.000	129.7	H	357.0	0.1	26.0	73.9
2486.938200	51.9	1000.0	1000.000	122.7	H	83.0	0.2	22.0	73.9
2487.123800	48.4	1000.0	1000.000	128.7	H	84.0	0.2	25.5	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)
2483.217200	33.2	1000.0	1000.000	129.7	H	357.0	0.1	20.7	53.9
2486.938200	35.0	1000.0	1000.000	122.7	H	83.0	0.2	18.9	53.9
2487.123800	31.8	1000.0	1000.000	128.7	H	84.0	0.2	22.1	53.9

Test Notes: 2.4GHz notch filter removed for this test.



2.8 POWER SPECTRAL DENSITY

2.8.1 Specification Reference

Part 15 Subpart C §15.247(e)

2.8.2 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.

2.8.3 Equipment Under Test and Modification State

Serial No: EUT#3-EMC / Test Configuration A

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

June 18, 2014/KAM

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/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.1 °C
Relative Humidity	44.1. %
ATM Pressure	98.9 kPa

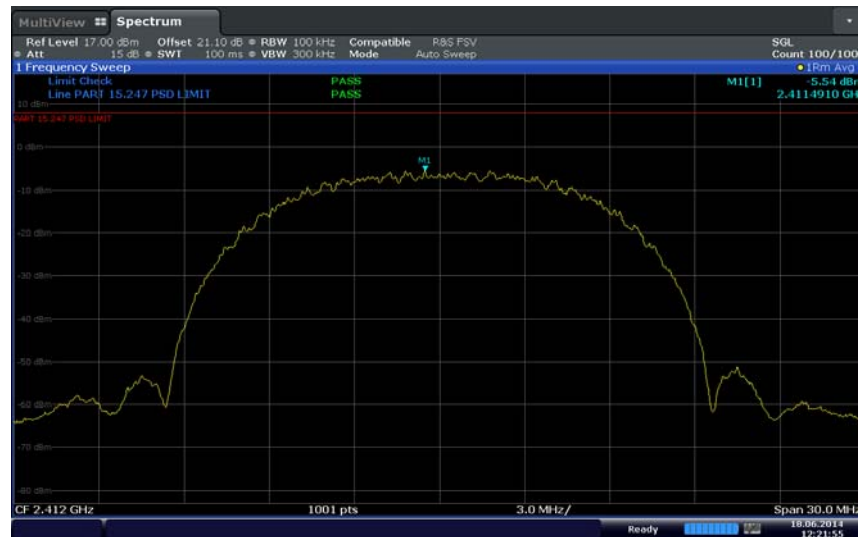
2.8.7 Additional Observations

- This is a conducted test procedure is per Section 10.3 under KDB 558074 D01 DTS Measurement Guidance v03r02 (Compliance Measurement Guidance for 15.247 Digital Transmission Systems, June 05, 2014).
- An offset of 21.1dB was added to compensate for the external attenuator and cable used from the antenna port to the power sensor.
- Detector is RMS power averaging.
- Trace averaging mode over 100 traces.
- Sweep time is Auto Couple.
- EUT complies with 100 kHz RBW.

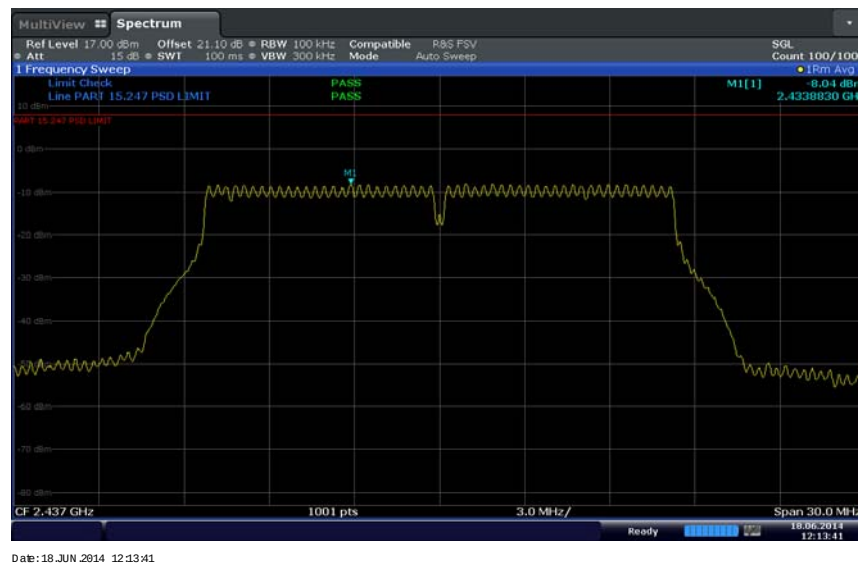
2.8.8 Test Results Summary

Mode	Channel	Marker Reading using 100 kHz RBW (dBm)	PSD Limit (dBm)	Margin (dB)	Compliance
802.11b	1 (2412 MHz)	-5.54	8	13.54	Complies
	6 (2437 MHz)	-6.39	8	14.39	Complies
	11 (2462 MHz)	-5.83	8	13.83	Complies
802.11g	1 (2412 MHz)	-8.40	8	16.40	Complies
	6 (2437 MHz)	-8.04	8	16.04	Complies
	11 (2462 MHz)	-8.84	8	16.84	Complies
802.11n HT20	1 (2412 MHz)	-8.65	8	16.65	Complies
	6 (2437 MHz)	-8.63	8	16.63	Complies
	11 (2462 MHz)	-9.54	8	17.54	Complies
802.11n HT40	3 (2422 MHz)	-11.86	8	19.86	Complies
	6 (2437 MHz)	-12.28	8	20.28	Complies
	9 (2452 MHz)	-11.78	8	19.78	Complies

2.8.9 Test Results Plots



802.11b Worst Case Channel

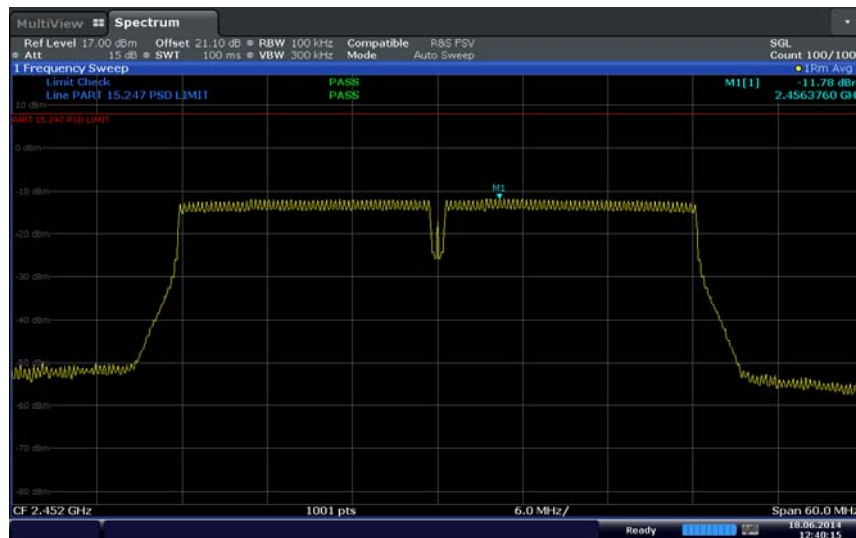


802.11g Worst Case Channel



Date: 18 JUN 2014 12:25:23

802.11n HT20 Worst Case Channel



Date: 18 JUN 2014 12:40:15

802.11n HT40 Worst Case 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
Antenna Conducted Port Setup						
7569	Series Power Meter	N1911A P-	MY45100625	Agilent	04/22/14	04/22/15
7570	50MHz-18GHz Wideband Power Sensor	N1921A	MY45240588	Agilent	04/09/14	04/09/15
7582	Signal/Spectrum Analyzer	FSW26	101614	Rhode & Schwarz	11/19/13	11/19/14
Radiated Test Setup						
1002	Bilog Antenna	3142C	00058717	ETS-Lindgren	01/30/14	01/30/16
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	04/08/14	04/08/15
8628	Pre-amplifier	QLI 01182835-JO	8986002	QuinStar Technologies Inc.	04/03/14	04/03/15
1151	Pre-amplifier	TS-PR26	100026	Rhode & Schwarz	05/02/13	05/02/15
1003	Signal Generator	SMR-40	1104.0002.40	Rhode & Schwarz	01/20/14	01/20/15
8543	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	09/03/13	09/03/14
1040	EMI Test Receiver	ESIB40	100292	Rhode & Schwarz	07/31/13	07/31/14
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	03/17/14	03/17/15
8816	2.4GHz Band Notch Filter	BRM50702	133	Micro-Tronics	Verified by 1189 and 7582	
1016	Pre-amplifier	PAM-0202	187	PAM	10/08/13	10/08/14
Conducted Emissions						
1024	EMI Test Receiver	ESCS 30	847793/001	Rhode & Schwarz	04/05/14	04/05/15
7567	LISN	FCC-LISN-50-25-2-10	120304	Fischer Custom Comm.	07/01/14	07/01/15
8822	20dB Attenuator	34-20-34	N/A	MCE / Weinschel	01/30/14	01/30/15
8824	20dB Attenuator	34-20-34	N/A	MCE / Weinschel	01/30/14	01/30/15
6837	LISN	FCC-LISN-50-25-2	05025	Fischer Custom Comm.	02/22/14	02/22/15
Miscellaneous						
7560	Barometer/Temperature/Humidity Transmitter	iBTHX-W	1240476	Omega	01/30/14	01/30/15
	Test Software	EMC32	V8.53	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	3.89	2.25	5.04
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.41
Coverage Factor (k):					2
Expanded Uncertainty:					4.82

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	3.89	2.25	5.04
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					2.40
Coverage Factor (k):					2
Expanded Uncertainty:					4.81

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

3.2.1 AC Conducted Measurements

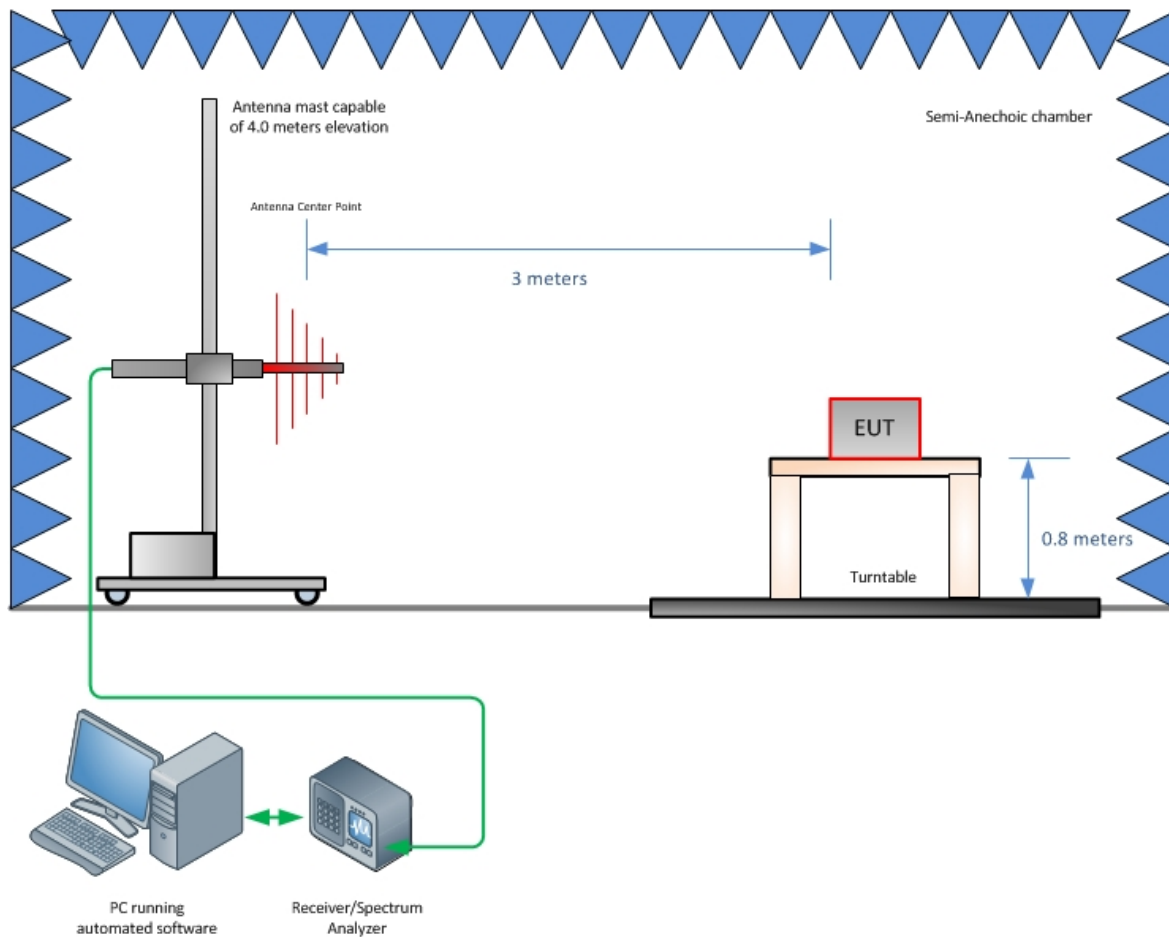
Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.36	0.21	0.04
2	Cables	Rectangular	0.50	0.29	0.08
3	LISN	Rectangular	0.66	0.38	0.15
4	Attenuator	Rectangular	0.30	0.17	0.03
5	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					0.80
Coverage Factor (k):					2
Expanded Uncertainty:					1.59



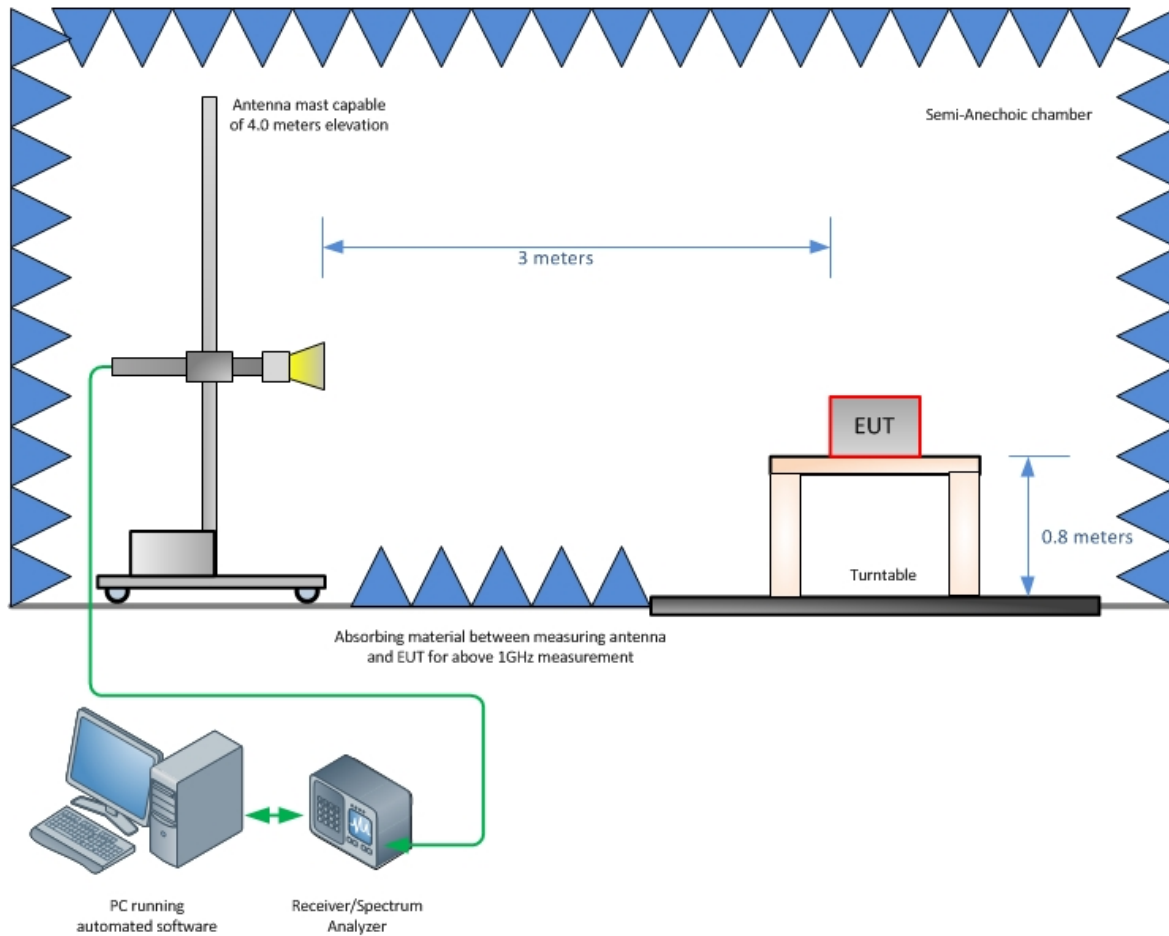
SECTION 4

DIAGRAM OF TEST SETUP

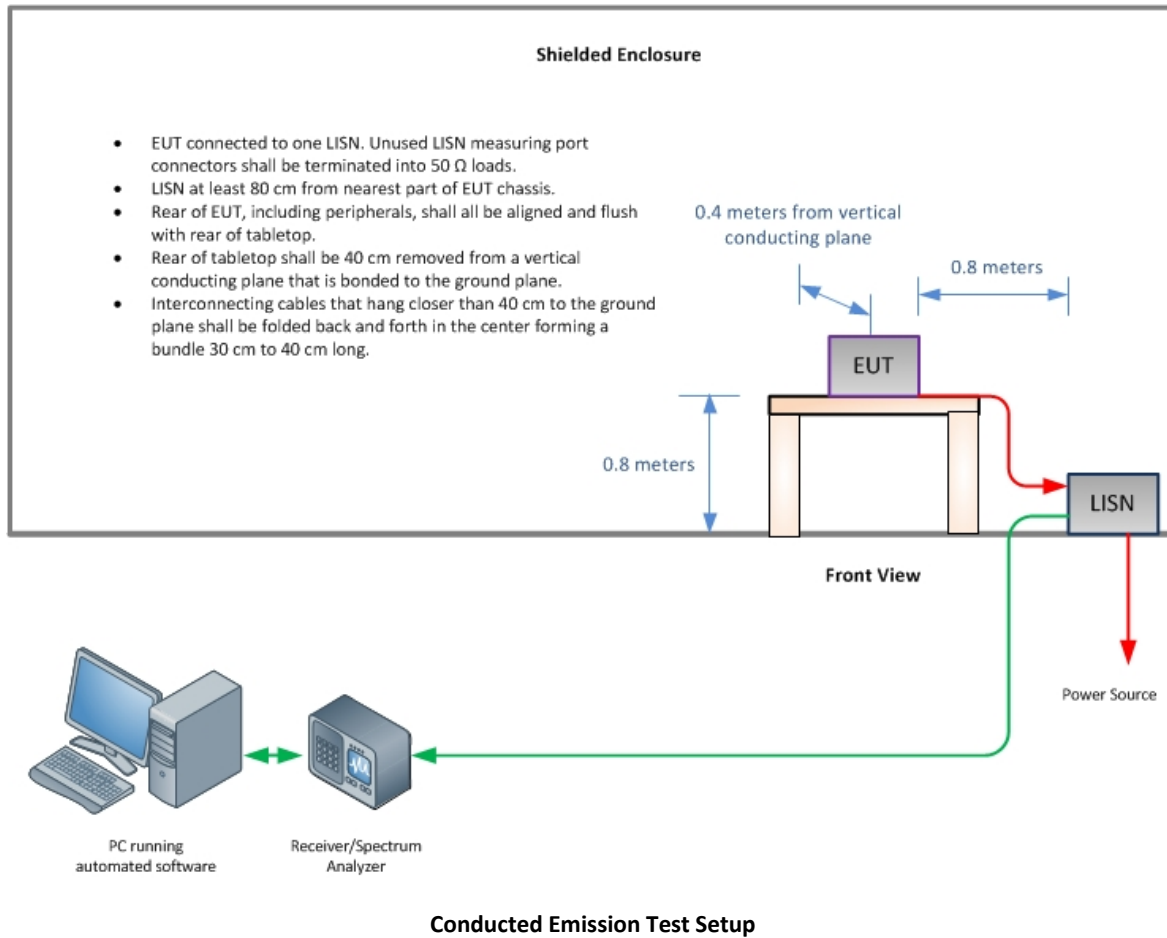
4.1 TEST SETUP DIAGRAM



Radiated Emission Test Setup (Below 1GHz)



Radiated Emission Test Setup (Above 1GHz)





SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

TÜV SÜD America Inc.'s reports apply only to the specific sample tested under stated test conditions. It is the manufacturer's responsibility to assure the continued compliance of production units of this model. TÜV SÜD America, Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America, Inc.'s issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and TÜV SÜD America, Inc., extracts from the test report shall not be reproduced, except in full without TÜV SÜD America, Inc.'s written approval.

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

TÜV SÜD America, Inc. and its professional staff hold government and professional organization certifications for AAMI, ACIL, AEA, ANSI, IEEE, A2LA, NIST and VCCI.

