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Report On

Application for Grant of Equipment Authorization of the
Novatel Wireless Inc.
MiFi 6630 Wireless Hotspot Modem

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

Report No. SD72101251A **March 2015**

REPORT ON	Radio Testing of the Novatel Wireless Inc. MiFi 6630 Wireless Hotspot Modem
TEST REPORT NUMBER	SD72101251A
PREPARED FOR	Novatel Wireless Inc. 9645 Scranton Road, Suite 205 San Diego, CA 92121
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PREPARED BY	Alex Chang **Name** Authorized Signatory Title: EMC/Wireless Test Engineer
APPROVED BY	Ferdinand S. Custodio **Name** Authorized Signatory Title: EMC/Senior Wireless Test Engineer
DATED	March 30, 2015

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Revision History

SD72101251A Novatel Wireless Inc. MiFi 6630 Wireless Hotspot Modem					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
03/30/2015	Initial Release				Ferdinand Custodio

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SECTION 1

REPORT SUMMARY

Radio Testing of the
Novatel Wireless Inc.
MiFi 6630 Wireless Hotspot Modem

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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Novatel Wireless Inc. MiFi 6630 Wireless Hotspot Modem to the requirements of FCC Part 15 Subpart C §15.247 and IC 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)	MIFI6630
FCC ID Number	PKRNVWMIFI6630
IC Number	3229A-MIFI6630
Serial Number(s)	SH181214900051
Number of Samples Tested	1
Test Specification/Issue/Date	• FCC Part 15 Subpart C §15.247 (October 1, 2014). • RSS-210 - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment (Issue 8, December 2010). • RSS-Gen - General Requirements Compliance of Radio Apparatus (Issue 4, November 2014). • 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	March 10, 2015
Finish of Test	March 27, 2015
Name of Engineer(s)	Alex Chang Ivan Retana
Related Document(s)	None. Supporting documents for EUT certification are separate exhibits.

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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		RSS-Gen 4.6.1	99% Emission Bandwidth	Compliant	
2.4	§15.247(a)(2)	RSS-210 A8.2(a)	Minimum 6 dB RF Bandwidth	Compliant	
2.5	§15.247(d)	RSS-210 A8.5	Out-of-Band Emissions - Conducted	Compliant	
2.6	§15.247(d)	RSS-210 A8.5	Band-edge Compliance of RF Conducted Emissions	Compliant	
2.7	§15.247(d)	RSS-210 A8.5	Spurious Radiated Emissions	Compliant	
2.7		RSS-Gen 4.10	Receiver Spurious Emissions	Compliant	
2.8	§15.247(d)	RSS-210 A8.5	Radiated Band Edge Measurements	Compliant	
2.9	§15.247(e)	RSS-210 A8.2(b)	Power Spectral Density for Digitally Modulated Device	Compliant	

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1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Novatel Wireless Inc. MiFi 6630 Wireless Hotspot Modem. The EUT creates a personal Wi-Fi cloud, capable of sharing high speed 4G LTE and 3G Mobile Broadband Internet connectivity with up to 15 Wi-Fi enable devices simultaneously. The EUT comes with an AC power adaptor Novatel Wireless, model: SSW-2597.

1.3.2 EUT General Description

EUT Description	Wireless Hotspot Modem
Model Number(s)	MIFI6630
Rated Voltage	Nominal 3.8VDC Li-Ion Battery AC Power Adaptor: Input: 100-240VAC/0.3A/50-60Hz Output: 5.0VDC/2.0A
Mode Verified	802.11 b/g and n
Capability	802.11 b/g/n WLAN (DTS) 2.4GHz band 20MHz BW
Antenna Type	Ceramic Chip
Manufacturer	Novatel Wireless, Inc.
Antenna Model	NVTL 12023203
Antenna Gain (Tx0)	-0.94 dBi
Antenna Gain (Tx1)	-0.94 dBi

1.3.3 Maximum Conducted Output Power

Mode	Frequency Range (MHz)	Average Output Power (dBm)	Average Output Power (mW)
SISO 802.11b	2412-2462	17.88	61.38
SISO 802.11g	2412-2462	14.92	31.05
SISO 802.11n (ht20)	2412-2462	14.85	30.55
MIMO 802.11n (ht20)	2412-2462	15.59	36.22
SISO 802.11a	5745-5825	7.96	6.25
MIMO 802.11n (ht20)	5745-5825	10.91	12.33
MIMO 802.11n (ht40)	5745-5825	10.79	11.99

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1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	Conducted antenna port measurement. EUT Tx at a max power and connected to a programmable DC power supply via dummy battery pack.
B	Radiated test setup. EUT Tx through integral antenna and connected to supplied AC power adaptor.

1.4.2 EUT Exercise Software

Before each test, the EUT is configured using Qualcomm Radio Control Toolkit Version 3.0.28.0. The software allows configuration of channels, modes, data rate and power level. Power level is set according to manufacturer specification for each mode (802.11 b, g and n).

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Dell	Support Laptop	LATITUDE E6410, Model: PP27LA
Dell	Support Laptop Power Supply Adaptor	Model: DA130PE1-00
Novatel Wireless	USB Cable	Micro USB Type B to Standard USB Type B
Novatel Wireless	AC-DC Power Supply Unit for EUT	Model: SSW-2597, P/N: 40115132.01 Input: 100-240VAC 0.3A 50-60Hz Output: 5.0VDC 2.0A

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
SISO 802.11b	1 (Low Channel)	1Mbps
SISO 802.11g	6 (Mid Channel)	48Mbps
SISO 802.11n (ht20)	6 (Mid Channel)	39Mbps (mcs 4)
MIMO 802.11n (ht20)	2 (Low Channel)	39Mbps (mcs 4)

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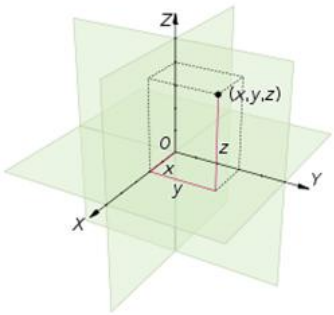
EUT is a portable device. For radiated measurements X, Y and Z orientations were verified. Worst case position is “Z”.



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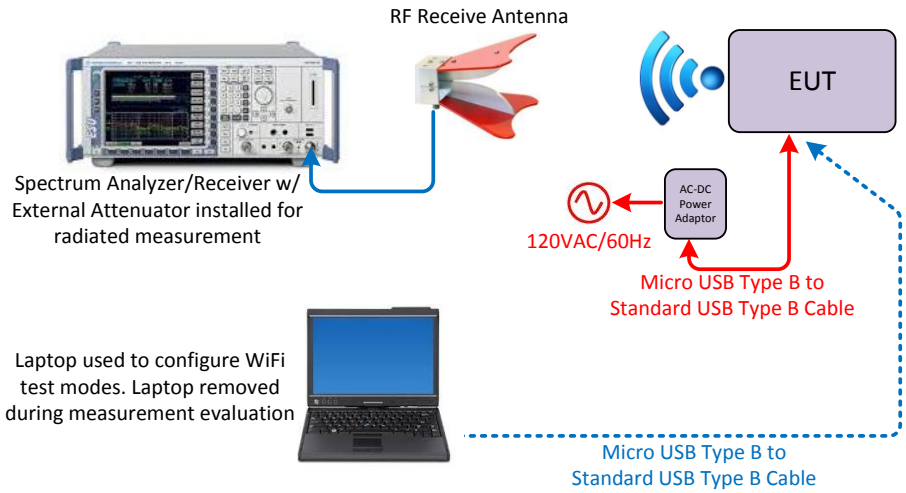
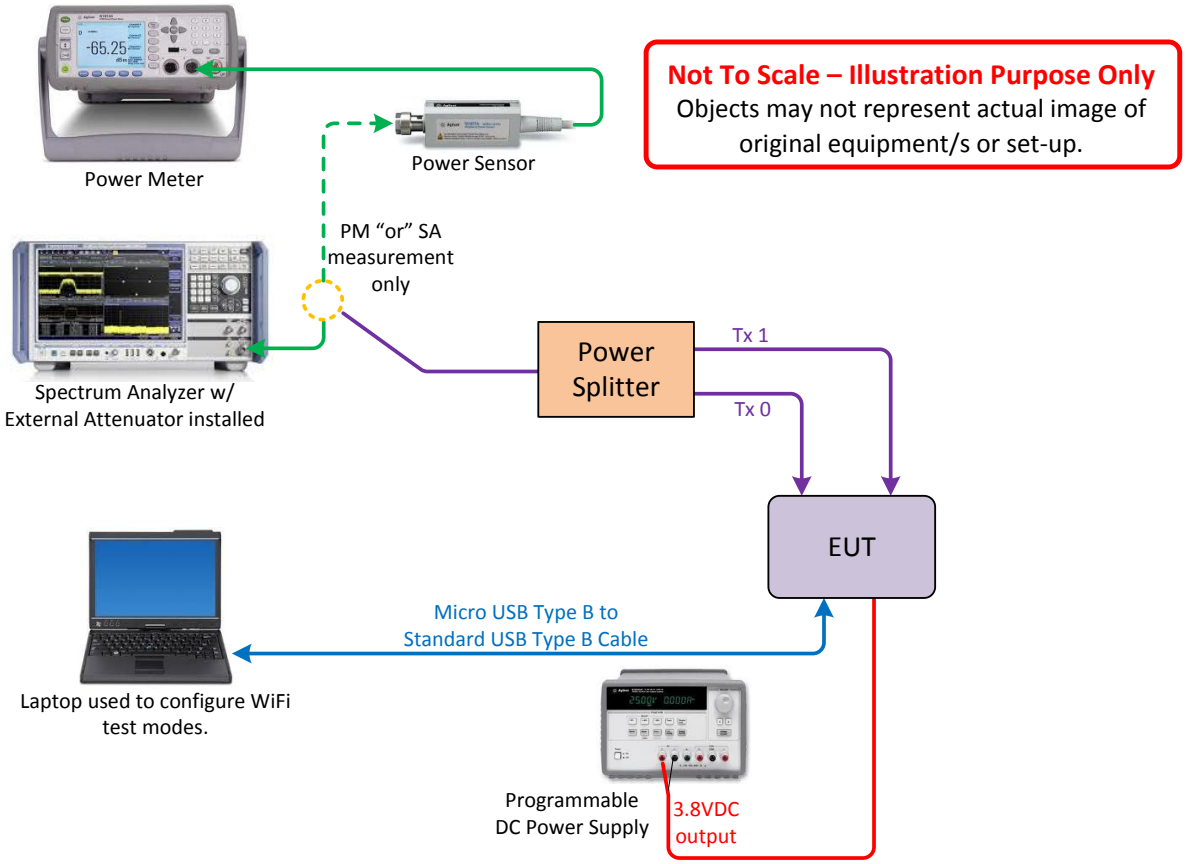
1.4.5 Simplified Test Configuration Diagram

Radiated/Conducted Emission Test Configuration via Conducted Port



Conducted (Antenna Port) Test Configuration



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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: SH181214900051		
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 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.

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SECTION 2

TEST DETAILS

Radio Testing of the
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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: SH181214900051 / Test Configuration A

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

March 10, 2015 / AC
The tables presented on this test report are from SAR Evaluation Test Report Number: SAR.20141207 Revision D; TUV performed verification on random channels and worst case conditions and did not find any significant differences.

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 Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	24.1°C
Relative Humidity	34.6%
ATM Pressure	99.3 kPa

2.1.7 Additional Observations

- These are the conducted port measurement provided by the RF exposure SAR laboratory. The data was used and help in determining worst case testing conditions for the remainder of the report.
- This is a conducted test (Maximum conducted [average] output power) using direct connection to a power meter.
- An offset of 22.0dB was added to compensate for the external attenuator and cable used from the antenna port to the power sensor.

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- An offset of 31.2dB for 5745MHz, 31.0dB for 5785MHz and 31.7dB for 5825MHz were 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 discussed under KDB 558074 D01 DTS Measurement Guidance v03r02 (Compliance Measurement Guidance for 15.247 Digital Transmission Systems, June 05, 2014)
- TUV performed verification checks and compared the measurements to the data provided by RF Exposure Labs (SAR.20141207 Revision D and SAR.20140601 Revision D) and the results were found to be similar and are used to show compliance in this test report.
- Conducted antenna port 0 and 1 were verified and found transmit port 0 was worst case scenario when in SISO mode. Therefore, only transmit port 0 was reported.
- 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.

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2.1.8 Test Results

System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
SISO	802.11b	1 (2412 MHz)	***1***	***17.88***
			2	17.88
			5.5	17.52
			11	17.46
		6 (2437 MHz)	1	17.58
			2	17.53
			5.5	***17.76***
			11	17.71
		11 (2462 MHz)	1	17.53
			2	17.46
			5.5	***17.66***
			11	17.61

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System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
SISO	802.11g	1 (2412 MHz)	6	10.81
			9	10.66
			12	10.54
			18	10.62
			24	***10.92***
			36	10.44
			48	10.11
			54	10.58
		2 (2417 MHz)	6	14.81
			9	14.66
			12	14.54
			18	14.62
			24	***14.92***
			36	14.44
			48	14.11
			54	14.58
		6 (2437 MHz)	6	14.81
			9	14.66
			12	14.52
			18	14.31
			24	14.77
			36	14.27
			48	***14.92***
			54	14.65

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System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
SISO	802.11g	10 (2457 MHz)	6	14.46
			9	14.29
			12	14.15
			18	14.83
			24	14.33
			36	***14.88***
			48	14.52
			54	14.32
		11 (2462 MHz)	6	10.46
			9	10.29
			12	10.15
			18	10.83
			24	10.33
			36	***10.88***
			48	10.52
			54	10.32

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System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
SISO	802.11n (ht20)	1 (2412 MHz)	mcs 0 (6.50 Mbps)	10.71
			mcs 1(13.0 Mbps)	10.30
			mcs 2(19.5 Mbps)	10.82
			mcs 3 (26.0 Mbps)	10.33
			mcs 4 (39.0 Mbps)	***10.82***
			mcs 5 (52.0 Mbps)	10.56
			mcs 6 (58.5 Mbps)	10.38
			mcs 7 (65.0 Mbps)	10.20
		2 (2417 MHz)	mcs 0 (6.50 Mbps)	14.71
			mcs 1(13.0 Mbps)	14.30
			mcs 2(19.5 Mbps)	14.82
			mcs 3 (26.0 Mbps)	14.33
			mcs 4 (39.0 Mbps)	***14.82***
			mcs 5 (52.0 Mbps)	14.56
			mcs 6 (58.5 Mbps)	14.38
			mcs 7 (65.0 Mbps)	14.20
		6 (2437 MHz)	mcs 0 (6.50 Mbps)	14.75
			mcs 1(13.0 Mbps)	14.36
			mcs 2(19.5 Mbps)	14.20
			mcs 3 (26.0 Mbps)	14.72
			mcs 4 (39.0 Mbps)	***14.85***
			mcs 5 (52.0 Mbps)	14.38
			mcs 6 (58.5 Mbps)	14.21
			mcs 7 (65.0 Mbps)	14.52

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System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
SISO	802.11n (ht20)	10 (2457 MHz)	***mcs 0 (6.50 Mbps)***	***14.83***
			mcs 1(13.0 Mbps)	14.48
			mcs 2(19.5 Mbps)	14.27
			mcs 3 (26.0 Mbps)	14.68
			mcs 4 (39.0 Mbps)	14.81
			mcs 5 (52.0 Mbps)	14.46
			mcs 6 (58.5 Mbps)	14.31
			mcs 7 (65.0 Mbps)	14.62
		11 (2462 MHz)	***mcs 0 (6.50 Mbps)***	***10.83***
			mcs 1(13.0 Mbps)	10.48
			mcs 2(19.5 Mbps)	10.27
			mcs 3 (26.0 Mbps)	10.68
			mcs 4 (39.0 Mbps)	10.81
			mcs 5 (52.0 Mbps)	10.46
			mcs 6 (58.5 Mbps)	10.31
			mcs 7 (65.0 Mbps)	10.62

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System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
MIMO	802.11n (ht20)	1 (2412 MHz)	mcs 0 (6.50 Mbps)	12.45
			mcs 1(13.0 Mbps)	12.16
			mcs 2(19.5 Mbps)	***12.52***
			mcs 3 (26.0 Mbps)	12.15
			mcs 4 (39.0 Mbps)	12.50
			mcs 5 (52.0 Mbps)	12.21
			mcs 6 (58.5 Mbps)	12.26
			mcs 7 (65.0 Mbps)	12.09
		2 (2417 MHz)	mcs 0 (6.50 Mbps)	15.47
			mcs 1(13.0 Mbps)	15.07
			mcs 2(19.5 Mbps)	15.59
			mcs 3 (26.0 Mbps)	15.14
			mcs 4 (39.0 Mbps)	***15.59***
			mcs 5 (52.0 Mbps)	15.37
			mcs 6 (58.5 Mbps)	15.20
			mcs 7 (65.0 Mbps)	15.04
		6 (2437 MHz)	mcs 0 (6.50 Mbps)	15.52
			mcs 1(13.0 Mbps)	15.14
			mcs 2(19.5 Mbps)	15.03
			mcs 3 (26.0 Mbps)	15.43
			mcs 4 (39.0 Mbps)	***15.58***
			mcs 5 (52.0 Mbps)	15.20
			mcs 6 (58.5 Mbps)	15.03
			mcs 7 (65.0 Mbps)	15.26

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System Mode	WLAN Mode	Channel	Data Rates (Mbps)	Measured Average Power (dBm)
MIMO	802.11n (ht20)	10 (2457 MHz)	***mcs 0 (6.50 Mbps)***	***15.59***
			mcs 1(13.0 Mbps)	15.26
			mcs 2(19.5 Mbps)	15.11
			mcs 3 (26.0 Mbps)	15.41
			mcs 4 (39.0 Mbps)	15.56
			mcs 5 (52.0 Mbps)	15.25
			mcs 6 (58.5 Mbps)	15.10
			mcs 7 (65.0 Mbps)	15.34
		11 (2462 MHz)	***mcs 0 (6.50 Mbps)***	***12.57***
			mcs 1(13.0 Mbps)	12.25
			mcs 2(19.5 Mbps)	12.17
			mcs 3 (26.0 Mbps)	12.39
			mcs 4 (39.0 Mbps)	12.48
			mcs 5 (52.0 Mbps)	12.25
			mcs 6 (58.5 Mbps)	12.10
			mcs 7 (65.0 Mbps)	12.41

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802.11a (5GHz)					
System Mode	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Average Power (dBm)**	**Peak Power (dBm)**
SISO	149	5745	6	7.92	12.64
			9	7.91	12.62
			12	7.89	13.58
			18	7.86	12.57
			24	7.85	12.53
			36	7.84	12.54
			48	7.86	12.59
			54	7.82	12.50
	157	5785	***6***	***7.96***	***12.66***
			9	7.94	12.61
			12	7.95	12.63
			18	7.92	12.59
			24	7.93	12.57
			36	7.85	12.54
			48	7.84	12.56
			54	7.80	12.58
	165	5825	6	7.90	12.67
			9	7.88	12.64
			12	7.87	12.63
			18	7.85	12.60
			24	7.86	12.54
			36	7.82	12.52
			48	7.81	12.50
			54	7.84	12.53

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802.11n (HT20) (5GHz)					
System Mode	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Average Power (dBm)**	**Peak Power (dBm)**
SISO	149	5745	MCS0_6.5	7.89	12.58
			MCS1_13	7.87	12.57
			MCS2_19.5	7.88	12.56
			MCS3_26	7.85	12.54
			MCS4_39	7.72	12.50
			MCS5_52	7.81	12.49
			MCS6_58.5	7.86	12.56
			MCS7_65	7.80	12.57
	157	5785	MCS0_6.5	7.87	12.58
			MCS1_13	7.86	12.53
			MCS2_19.5	7.88	12.60
			MCS3_26	7.72	12.51
			MCS4_39	7.79	12.47
			MCS5_52	7.75	12.45
			MCS6_58.5	7.81	12.52
			MCS7_65	7.84	12.53
	165	5825	***MCS0_6.5***	***7.90***	***12.49***
			MCS1_13	7.86	12.58
			MCS2_19.5	7.84	12.46
			MCS3_26	7.85	12.57
			MCS4_39	7.83	12.59
			MCS5_52	7.89	12.51
			MCS6_58.5	7.81	12.47
			MCS7_65	7.78	12.53

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802.11n (HT20) (5GHz)					
System Mode	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Average Power (dBm)**	**Peak Power (dBm)**
MIMO	149	5745	MCS0_6.5	10.90	15.59
			MCS1_13	10.88	15.58
			MCS2_19.5	10.89	15.57
			MCS3_26	10.86	15.55
			MCS4_39	10.73	15.51
			MCS5_52	10.82	15.50
			MCS6_58.5	10.87	15.57
			MCS7_65	10.81	15.58
	157	5785	MCS0_6.5	10.88	15.59
			MCS1_13	10.87	15.54
			MCS2_19.5	10.89	15.61
			MCS3_26	10.73	15.52
			MCS4_39	10.80	15.48
			MCS5_52	10.76	15.46
			MCS6_58.5	10.82	15.53
			MCS7_65	10.85	15.54
	165	5825	***MCS0_6.5***	***10.91***	***15.50***
			MCS1_13	10.87	15.59
			MCS2_19.5	10.85	15.47
			MCS3_26	10.86	15.58
			MCS4_39	10.84	15.60
			MCS5_52	10.90	15.52
			MCS6_58.5	10.82	15.48
			MCS7_65	10.79	15.54

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802.11n (HT40) (5GHz)					
System Mode	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Average Power (dBm)**	**Peak Power (dBm)**
SISO	151	5755	MCS0_13.5	7.76	12.23
			MCS1_27	7.72	12.29
			MCS2_40.5	7.70	12.24
			MCS3_54	7.68	12.27
			MCS4_81	7.66	12.20
			MCS5_108	7.71	12.18
			MCS6_121.5	7.69	12.16
			MCS7_135	7.63	12.17
	157	5785	***MCS0_13.5***	***7.78***	***12.26***
			MCS1_27	7.72	12.23
			MCS2_40.5	7.76	12.27
			MCS3_54	7.75	12.22
			MCS4_81	7.71	12.20
			MCS5_108	7.67	12.28
			MCS6_121.5	7.65	12.24
			MCS7_135	7.60	12.19
	163	5815	MCS0_13.5	7.73	12.29
			MCS1_27	7.71	12.31
			MCS2_40.5	7.70	12.24
			MCS3_54	7.66	12.27
			MCS4_81	7.69	12.22
			MCS5_108	7.64	12.19
			MCS6_121.5	7.62	12.16
			MCS7_135	7.59	12.12

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802.11n (HT40) (5GHz)					
System Mode	**Channel**	**Frequency (MHz)**	**Data Rate (Mbps)**	**Average Power (dBm)**	**Peak Power (dBm)**
MIMO	151	5755	MCS0_13.5	10.77	15.24
			MCS1_27	10.73	15.30
			MCS2_40.5	10.71	15.25
			MCS3_54	10.69	15.28
			MCS4_81	10.67	15.21
			MCS5_108	10.72	15.19
			MCS6_121.5	10.70	15.17
			MCS7_135	10.64	15.18
	157	5785	***MCS0_13.5***	***10.79***	***15.27***
			MCS1_27	10.73	15.24
			MCS2_40.5	10.77	15.28
			MCS3_54	10.76	15.23
			MCS4_81	10.72	15.21
			MCS5_108	10.68	15.29
			MCS6_121.5	10.66	15.25
			MCS7_135	10.61	15.20
	163	5815	MCS0_13.5	10.74	15.30
			MCS1_27	10.72	15.32
			MCS2_40.5	10.71	15.25
			MCS3_54	10.67	15.28
			MCS4_81	10.70	15.23
			MCS5_108	10.65	15.20
			MCS6_121.5	10.63	15.17
			MCS7_135	10.60	15.13

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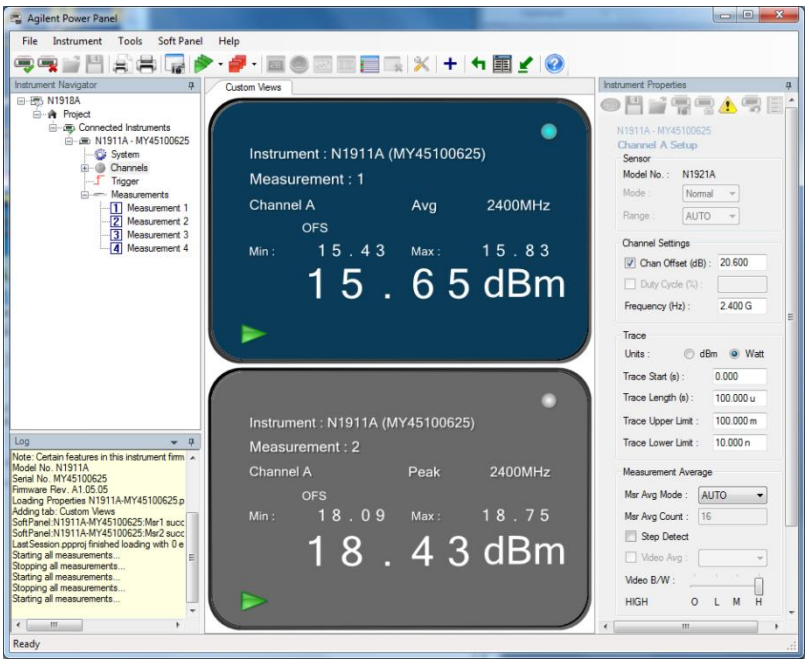
2.1.9 Sample Test Display



802.11 “b” mode

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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: SH181214900051 /Default Test Configuration

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

March 27, 2015 / IR

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 performed at TÜV SÜD America Inc. Rancho Bernardo facility.

Ambient Temperature	24.6 °C
Relative Humidity	45.3 %
ATM Pressure	99.5 kPa

2.2.7 Additional Observations

- EUT was performed with worst case transmission mode; which was SISO 802.11b mode, channel 1 (2412MHz) with 1Mbps data rate.
- Measurement was done using EMC32 V8.53 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 2.1.8 for sample computation.

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2.2.8 Sample Computation (Conducted Emission – Quasi Peak)

Measuring equipment raw measurement (dbµV) @ 150kHz			5.5
Correction Factor (dB)	Asset# 8822(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 (dbµV) @ 150kHz			**26.2**

2.2.9 Test Results

Compliant. See attached plots and tables.

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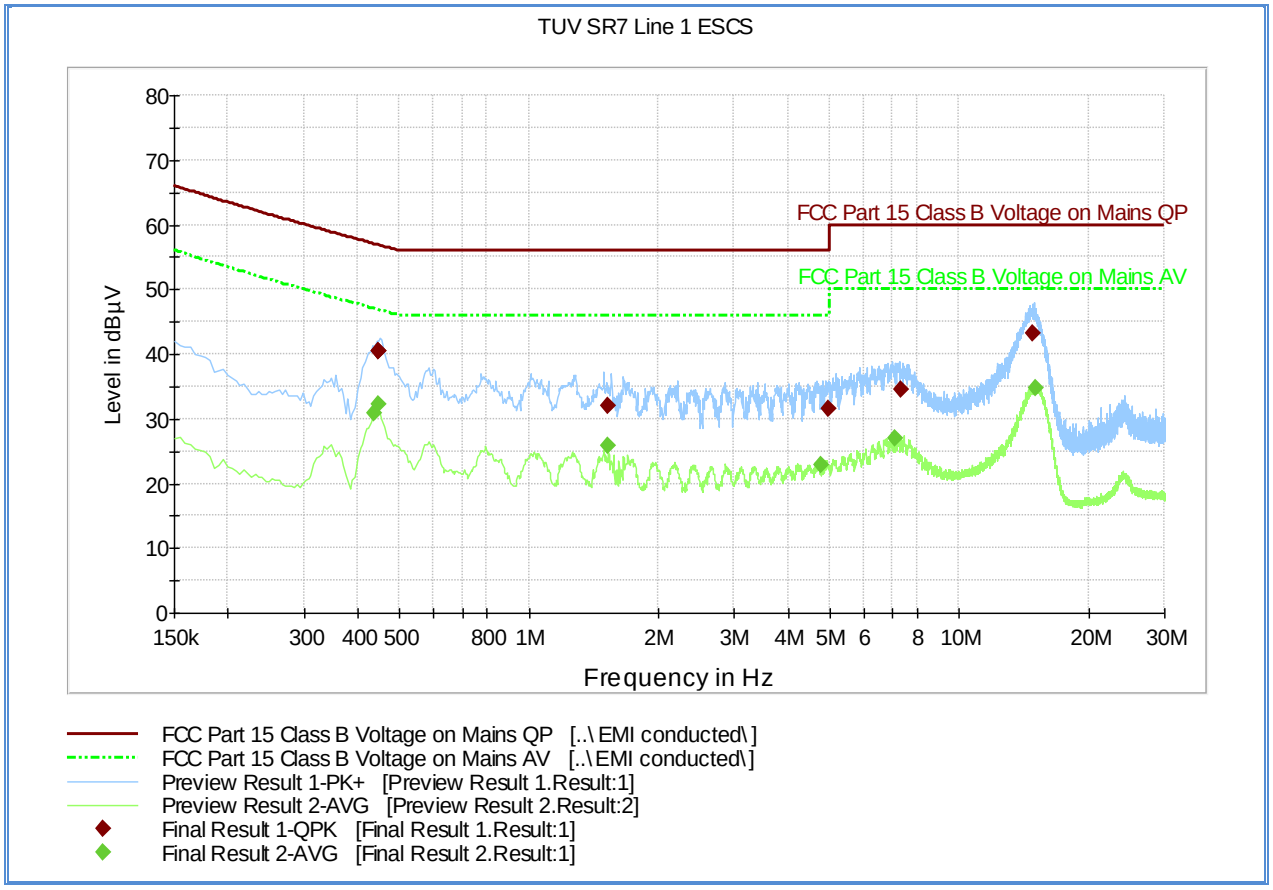
2.2.10 FCC Class B – 120VAC/60Hz_Line 1 (EUT in worst case Tx mode)



Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.447000	40.4	1000.0	9.000	Off	L1	20.2	16.4	56.9
0.447000	40.5	1000.0	9.000	Off	L1	20.2	16.4	56.9
1.531500	31.9	1000.0	9.000	Off	L1	20.1	24.1	56.0
4.960500	31.6	1000.0	9.000	Off	L1	20.6	24.4	56.0
7.332000	34.6	1000.0	9.000	Off	L1	20.6	25.4	60.0
14.838000	43.2	1000.0	9.000	Off	L1	20.9	16.8	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.438000	30.9	1000.0	9.000	Off	L1	20.2	16.1	47.0
0.447000	32.2	1000.0	9.000	Off	L1	20.2	14.7	46.8
1.531500	25.8	1000.0	9.000	Off	L1	20.1	20.2	46.0
4.780500	23.0	1000.0	9.000	Off	L1	20.6	23.0	46.0
7.098000	26.9	1000.0	9.000	Off	L1	20.6	23.1	50.0
15.076500	34.8	1000.0	9.000	Off	L1	20.9	15.2	50.0

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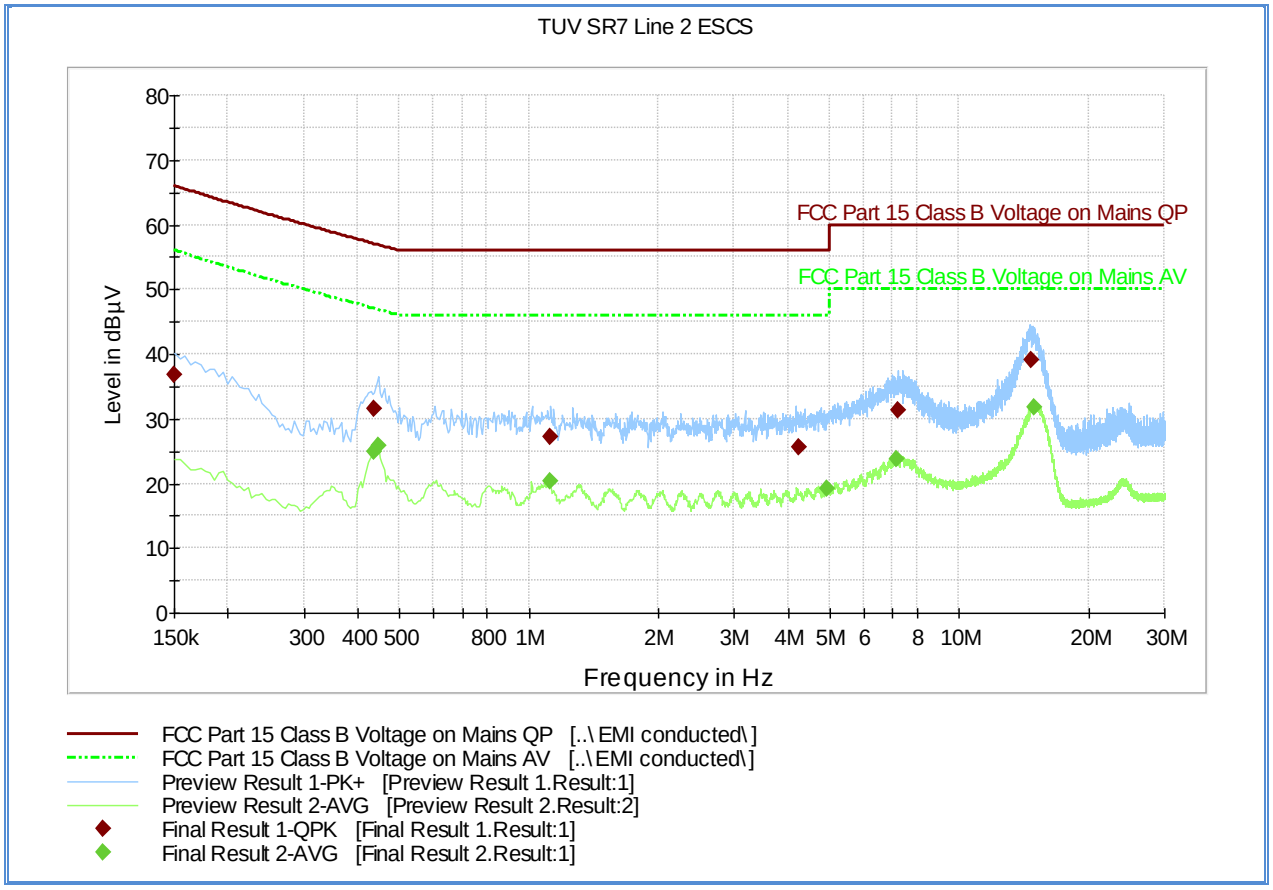
2.2.11 FCC Class B – 120VAC/60Hz_Line 2 (EUT in worst case Tx mode)



Quasi Peak

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.150000	36.9	1000.0	9.000	Off	N	20.1	29.1	66.0
0.438000	31.5	1000.0	9.000	Off	N	20.1	25.6	57.0
1.117500	27.3	1000.0	9.000	Off	N	20.2	28.7	56.0
4.245000	25.6	1000.0	9.000	Off	N	20.5	30.4	56.0
7.188000	31.2	1000.0	9.000	Off	N	20.5	28.8	60.0
14.676000	39.1	1000.0	9.000	Off	N	20.7	20.9	60.0

Average

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.438000	25.0	1000.0	9.000	Off	N	20.1	22.1	47.0
0.447000	25.9	1000.0	9.000	Off	N	20.1	21.0	46.8
1.117500	20.4	1000.0	9.000	Off	N	20.2	25.6	46.0
4.933500	19.3	1000.0	9.000	Off	N	20.5	26.7	46.0
7.156500	23.8	1000.0	9.000	Off	N	20.5	26.2	50.0
14.941500	31.7	1000.0	9.000	Off	N	20.7	18.3	50.0

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