



# PCTEST ENGINEERING LABORATORY, INC.

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## MEASUREMENT REPORT FCC PART 15.247 / IC RSS-210 WLAN 802.11a/b/g/n

<b>Applicant Name:</b> Sony Corporation 1-7-1 Konan Minato-ku Tokyo Japan, 108-0075	<b>Date of Testing:</b> April 11-May 11, 2011 <b>Test Site/Location:</b> PCTEST Lab, Columbia, MD, USA <b>Test Report Serial No.:</b> 0Y1103150539.AK8
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<b>FCC ID:</b>	<b>AK8PCG41312L</b>
<b>APPLICANT:</b>	<b>Sony Corporation</b>

<b>Application Type:</b>	Certification
<b>Model(s):</b>	PCG-41312L
<b>EUT Type:</b>	850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN
<b>Max. RF Output Power (Chain A):</b>	51.29 mW (17.1 dBm) Peak Conducted (b) 180.3 mW (22.56 dBm) Peak Conducted (g) 177.83 mW (22.5 dBm) Peak Conducted (n) - 2.4GHz – 20MHz Bandwidth 171.4 mW (22.34 dBm) Peak Conducted (n) – 2.4GHz – 40MHz Bandwidth 134.9 mW (21.3 dBm) Peak Conducted (a) - 5.8GHz 1238.8 mW (30.93 dBm) Peak Conducted (n) - 5.8GHz – 20MHz Bandwidth 142.56 mW (21.54 dBm) Peak Conducted (n) – 5.8GHz – 40MHz Bandwidth
<b>Max. RF Output Power (Chain B):</b>	50.82 mW (17.06 dBm) Peak Conducted (b) 150.31 mW (21.77 dBm) Peak Conducted (g) 146.89 mW (21.67 dBm) Peak Conducted (n) - 2.4GHz – 20MHz Bandwidth 172.98 mW (22.38 dBm) Peak Conducted (n) – 2.4GHz – 40MHz Bandwidth 143.55 mW (21.57 dBm) Peak Conducted (a) - 5.8GHz 148.94 mW (21.73 dBm) Peak Conducted (n) - 5.8GHz – 20MHz Bandwidth 145.88 mW (21.64 dBm) Peak Conducted (n) – 5.8GHz – 40MHz Bandwidth
<b>Max. RF Output Power (Chain A+B):</b>	221.31 mW (23.45 dBm) Peak Conducted (n) - 2.4GHz – 20MHz Bandwidth 207.97 mW (23.18 dBm) Peak Conducted (n) – 2.4GHz – 40MHz Bandwidth 168.66 mW (22.27 dBm) Peak Conducted (n) - 5.8GHz – 20MHz Bandwidth 183.65 mW (22.64 dBm) Peak Conducted (n) – 5.8GHz – 40MHz Bandwidth
<b>Frequency Range:</b>	2412 - 2462 MHz (DSSS/OFDM), 5745 – 5825 MHz (OFDM)
<b>FCC Classification:</b>	Digital Transmission System (DTS)
<b>FCC Rule Part(s):</b>	Part 15.247
<b>IC Specification(s):</b>	RSS-210 Issue 8

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C-63.4-2003. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Grant Conditions: Listed output power is conducted.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

  
Randy Ortanez  
President

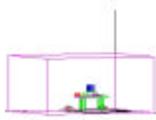


<b>FCC ID:</b> AK8PCG41312L		<b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1103150539.AK8	<b>Test Dates:</b> April 11-May 11, 2011	<b>EUT Type:</b> 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 1 of 47

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# MEASUREMENT REPORT

## FCC Part 15.247



### § 2.1033 General Information

**APPLICANT:** Sony Corporation

**APPLICANT ADDRESS:** 1-7-1 Konan Minato-ku  
Tokyo, Japan, 108-0075

**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.

**TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA

**FCC RULE PART(S):** Part 15.247

**IC SPECIFICATION(S):** RSS-210 Issue 8

**MODEL NAME:** PCG-41312L

**FCC ID:** AK8PCG41312L

**Test Device Serial No.:** N/A       Production     Pre-Production     Engineering

**FCC CLASSIFICATION:** Digital Transmission System (DTS)

**DATE(S) OF TEST:** April 11-May 11, 2011

**TEST REPORT S/N:** 0Y1103150539.AK8

### Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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# 1.0 INTRODUCTION

## 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

## 1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity area, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (see Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 28, 2009.

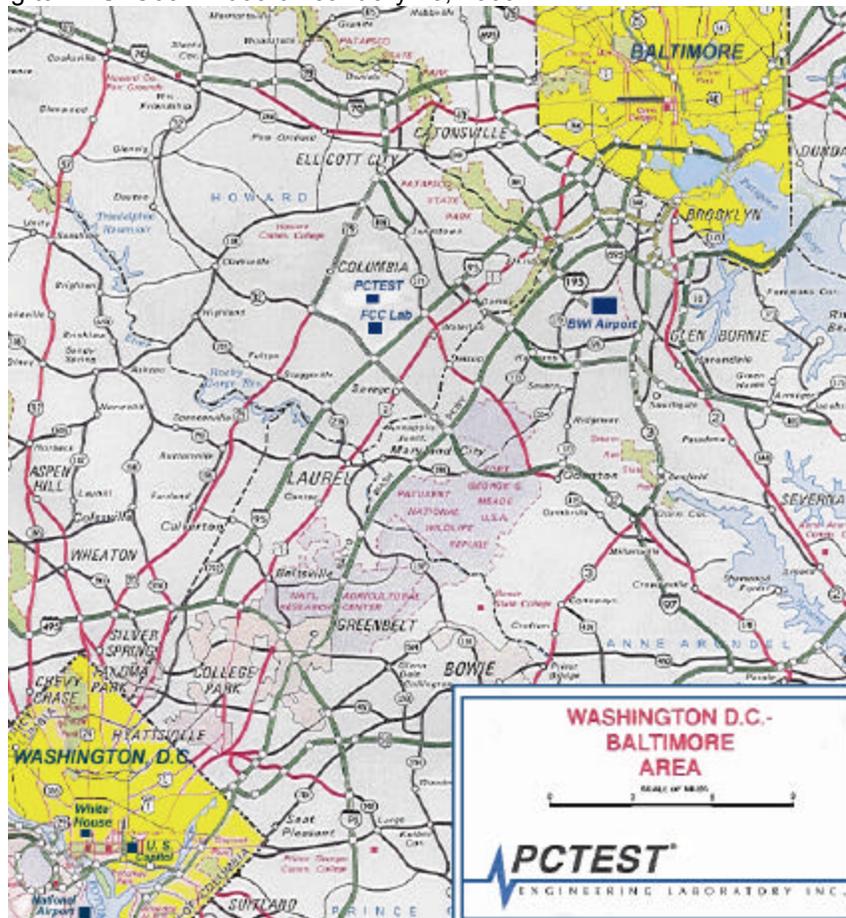


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Sony 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN FCC ID: AK8PCG41312L**. The EUT consisted of the following component(s):

Manufacturer / Model	FCC ID	Description
Sony / Model: PCG-41312L	AK8PCG41312L	850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN

**Table 2-1. EUT Equipment Description**

### 2.2 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

### 2.3 Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

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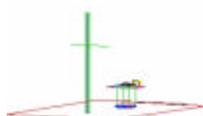
## 3.0 DESCRIPTION OF TEST

### 3.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) and FCC procedure dated March 23, 2005 entitled "Measurements of Digital Transmission Systems Operating Under Section 15.247" were used in the measurement of the **Sony 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN** FCC ID: AK8PCG41312L.

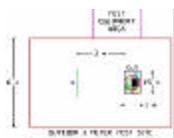
Deviation from measurement procedure.....None

### 3.2 Radiated Emissions



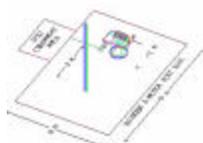
**Figure 3-1. 3-Meter Test Site**

Preliminary measurements were made indoors at 1-meter using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, and turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using a bi-conical antenna and from 200 to 1000 MHz using a log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.



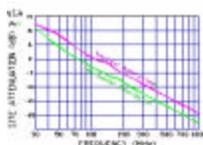
**Figure 3-2. Dimensions of Outdoor Test Site**

Final measurements were made outdoors at 3-meter test range using Roberts™ Dipole antennas or horn antennas (see Figure 3-1). The test equipment was placed on a wooden and plastic bench situated on a 1.5m x 2m area adjacent to the measurement area (see Figure 3-2). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 100kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. Above 1GHz the detector function was set to average mode (RBW = 1MHz, VBW = 10Hz).



**Figure 3-3. Turntable and System Setup**

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 3-3). The EUT, support equipment, and interconnecting cables were rearranged and manipulated to maximize each EME emission. The turntable containing the system was rotated and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-4.



**Figure 3-4. Normalized Site Attenuation Curves (H&V)**

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## 4.0 ANTENNA REQUIREMENTS

**Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antennas of the 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN are **permanently attached**.
- There are no provisions for connection to an external antenna.

**Conclusion:**

The **Sony 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN FCC ID: AK8PCG41312L** unit complies with the requirement of §15.203.

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
149	5745	159	5795
151	5755	161	5805
153	5765	163	5815
155	5775	165	5825
157	5785		

**Table 4-1. Frequency/ Channel Operations**

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## 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	No. 165	(30MHz - 1000MHz) RG58 Coax Cable	N/A		N/A	N/A
-	No. 166	(1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No. 167	(100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A
Agilent	8447D	Broadband Amplifier	3/17/2011	Annual	3/17/2012	1937A03348
Agilent	8447D	Broadband Amplifier	3/17/2011	Annual	3/17/2012	2443A01900
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/8/2011	Annual	2/8/2012	3008A00985
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	3303A01872
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	2043A00301
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	4/7/2011	Annual	4/7/2012	2618A02866
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	4/7/2011	Annual	4/7/2012	2542A11898
Agilent	E4407B	ESA Spectrum Analyzer	4/5/2011	Annual	4/5/2012	US39210313
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	11/30/2010	Annual	11/30/2011	US42510244
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/5/2011	Annual	4/5/2012	MY45470194
Agilent	N9020A	MXA Signal Analyzer	9/8/2010	Annual	9/8/2011	US46470561
Anritsu	ML2495A	Power Meter	10/13/2010	Annual	10/13/2011	941001
Anritsu	MA2411B	Pulse Sensor	N/A	Annual		1027293
Emco	3115	Horn Antenna (1-18GHz)	10/14/2009	Biennial	10/14/2011	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	4/8/2010	Biennial	4/8/2012	9205-3874
Emco	3116	Horn Antenna (18 - 40GHz)	9/9/2008	Triennial	9/9/2011	9203-2178
Emco	3816/2	LISN	11/5/2010	Biennial	11/5/2012	9707-1077
Emco	3816/2	LISN	11/3/2010	Biennial	11/3/2012	9707-1079
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/11/2010	Annual	10/11/2011	1833460
Gigatronics	8651A	Universal Power Meter	10/11/2010	Annual	10/11/2011	8650319
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Rohde & Schwarz	FSQ 26	Spectrum Analyzer	8/28/2010	Annual	8/28/2011	200452
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	5/14/2009	Biennial	5/14/2011	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/17/2009	Biennial	7/17/2011	A051107

**Table 5-1. Annual Test Equipment Calibration Schedule**

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## 6.0 TEST RESULTS

### 6.1 Summary

Company Name: Sony Corporation  
 FCC ID: AK8PCG41312L  
 FCC Classification: Digital Transmission System (DTS)  
 Data Rate(s) Tested: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps (b)  
6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps (a/g)  
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (20MHz n)  
27/30, 54/60, 80/90, 108/120, 162/180, 216/240, 243/270, 270/300 (40MHz n)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
<b>TRANSMITTER MODE (TX)</b>						
15.247(a)(2)	RSS-210 [A8.2]	6dB Bandwidth	> 500kHz	CONDUCTED	PASS	See Note Below
15.247(d)	RSS-210 [A8.5]	Out-of-Band Emissions	Conducted < 20dBc		PASS	
15.247(d)	RSS-210 [A8.5]	Band Edge	Conducted < 20dBc		PASS	Section 6.7
15.247(e)	RSS-210 [A8.2]	Transmitter Power Spectral Density	< 8dBm / 3kHz Band		PASS	Section 6.6
15.247(b)(3)	RSS-210 [A8.4]	Transmitter Output Power	< 1 Watt		PASS	Sections 6.2, 6.3, 6.4, 6.5
15.205 15.209	RSS-210 [A8.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	RADIATED	PASS	Sections 6.8, 6.9
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits	LINE CONDUCTED	PASS	See Note Below
<b>RECEIVER MODE (RX) / DIGITAL EMISSIONS</b>						
15.107	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits	LINE CONDUCTED	PASS	Part 15B Test Report
15.109	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Part 15B Test Report

**Table 6-1. Summary of Test Results**

**Note:**

All modes of operation and data rates were investigated. Conducted test results can be found under the FCC Authorization database of granted applications for FCC Part 15C report for FCC ID: PD962230ANH and PD962230ANHU. The data from that grant represent the EUT under worst case test settings. The Sony Laptop FCC ID: AK8PCG41312L contains the identical module, but is set at lower power settings than the worst case test conditions. The data remains applicable in this test report. For the out-of-band emissions during simultaneous transmission of Chain A and B, worst case emissions were calculated for aggregate conducted spurious powers. It was observed that there were no significant emissions.

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## 6.2 Output Power Measurement – 802.11b/g

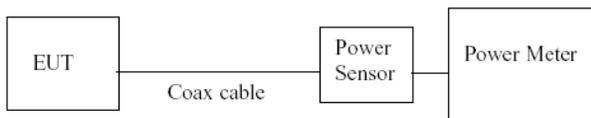
§15.247(b)(3): RSS-210 [A8.4]

### CHAIN A

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
2412	1	1	13.08	16.14
		2	12.96	16.10
		5.5	13.00	16.05
		11	12.90	16.08
2437	6	1	14.00	17.07
		2	14.01	17.07
		5.5	14.14	17.10
		11	14.01	17.10
2462	11	1	13.82	16.95
		2	13.80	16.95
		5.5	13.89	16.92
		11	13.76	16.93

**Table 6-2. 802.11b Conducted Output Power Measurements**



**Figure 6-1. Test Instrument & Measurement Setup**

Freq [MHz]	Channel	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]		
2412	1	6	12.82	21.73		
		9	12.72	21.62		
		12	12.75	21.65		
		18	12.75	21.40		
		24	12.57	21.80		
		36	12.50	21.73		
		48	12.50	21.66		
		54	11.96	21.46		
		2437	6	6	15.64	22.55
				9	15.54	22.45
				12	15.55	22.50
				18	15.54	22.45
24	15.35			22.56		
36	15.27			22.50		
48	13.67			21.87		
54	11.85			21.47		
2462	11			6	12.36	21.64
				9	12.38	21.55
				12	12.37	21.55
				18	12.36	21.10
		24	12.25	21.74		
		36	12.13	21.63		
		48	12.19	21.55		
		54	12.05	21.60		

**Table 6-3. 802.11g Conducted Output Power Measurements**

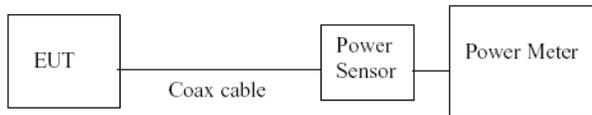
FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b>			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 10 of 47	

## CHAIN B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
2412	1	1	13.14	16.18
		2	13.13	16.16
		5.5	13.12	16.05
		11	13.10	16.02
2437	6	1	14.08	17.04
		2	14.10	17.05
		5.5	14.09	17.05
		11	14.10	17.06
2462	11	1	13.79	16.72
		2	13.70	16.72
		5.5	13.75	16.77
		11	13.77	16.78

**Table 6-4. 802.11b Conducted Output Power Measurements**



**Figure 6-2. Test Instrument & Measurement Setup**

Freq [MHz]	Channel	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]		
2412	1	6	11.94	19.81		
		9	11.95	20.03		
		12	11.97	20.31		
		18	12.06	19.81		
		24	11.85	20.66		
		36	11.91	20.24		
		48	12.06	20.17		
		54	12.03	20.16		
		2437	6	6	15.16	21.62
				9	15.10	21.66
				12	15.09	21.71
				18	15.14	21.61
24	14.97			21.77		
36	15.03			21.76		
48	13.62			21.12		
54	11.41			19.53		
2462	11			6	11.30	19.25
				9	11.34	19.42
				12	11.33	19.69
				18	11.38	19.11
		24	11.26	19.95		
		36	11.27	19.63		
		48	11.33	19.45		
		54	11.36	19.52		

**Table 6-5. 802.11g Conducted Output Power Measurements**

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 11 of 47	

### 6.3 Output Power Measurement – 802.11a (5.8GHz)

§15.247(b)(3); RSS-210 [A8.4]

#### CHAIN A

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
5745	149	6	13.73	20.96
		9	13.73	21.00
		12	13.73	21.20
		18	13.75	20.93
		24	13.71	21.30
		36	13.68	21.15
		48	13.07	20.72
		54	10.62	19.04
5785	157	6	13.55	20.86
		9	13.43	20.89
		12	13.54	21.06
		18	13.60	20.82
		24	13.50	21.20
		36	13.53	21.10
		48	12.80	20.52
		54	10.35	18.61
5825	165	6	13.32	20.62
		9	13.38	20.72
		12	13.35	20.86
		18	13.34	20.60
		24	13.31	20.93
		36	13.32	20.86
		48	12.13	20.00
		54	10.18	18.41

Table 6-6. 802.11a (5.8GHz) Conducted Output Power Measurements

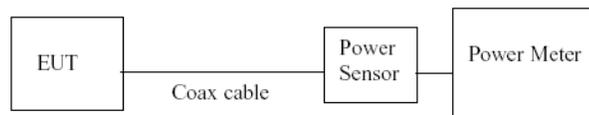


Figure 6-3. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 12 of 47	

## CHAIN B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
5745	149	6	14.90	21.49
		9	14.95	21.39
		12	14.96	21.51
		18	15.01	21.44
		24	14.93	21.55
		36	14.92	21.57
		48	13.86	21.00
		54	12.09	19.97
5785	157	6	14.59	21.35
		9	14.50	21.08
		12	14.45	21.22
		18	14.48	21.17
		24	14.38	21.31
		36	14.42	21.30
		48	13.71	20.77
		54	11.60	19.57
5825	165	6	13.93	20.96
		9	13.95	20.82
		12	13.95	20.90
		18	13.99	20.86
		24	13.94	21.04
		36	13.92	20.99
		48	13.31	20.57
		54	11.44	19.41

Table 6-7. 802.11a (5.8GHz) Conducted Output Power Measurements

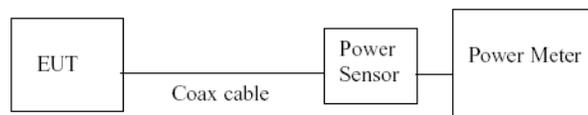


Figure 6-4. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 13 of 47	

## 6.4 Output Power Measurement – 802.11n (2.4GHz)

§15.247(b)(3); RSS-210 [A8.4]

### CHAIN A

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
2412	1	0	6.5/7.2	12.57	21.80
		1	13/14.4	12.43	21.30
		2	19.5/21.7	12.43	21.54
		3	26/28.9	12.40	21.49
		4	39/43.3	12.33	21.48
		5	52/57.8	12.36	21.43
		6	58.5/65	11.81	21.63
2437	6	7	65/72.2	10.30	19.58
		0	6.5/7.2	15.42	22.50
		1	13/14.4	15.29	22.44
		2	19.5/21.7	15.37	22.50
		3	26/28.9	15.35	22.45
		4	39/43.3	15.26	22.48
		5	52/57.8	14.00	21.85
2462	11	6	58.5/65	11.73	21.61
		7	65/72.2	10.23	19.68
		0	6.5/7.2	12.23	21.84
		1	13/14.4	12.05	21.10
		2	19.5/21.7	12.20	21.46
		3	26/28.9	12.14	21.31
		4	39/43.3	12.05	21.35
		5	52/57.8	12.03	20.98
		6	58.5/65	11.90	21.66
		7	65/72.2	10.35	19.90

Table 6-8. 802.11n (2.4GHz) Conducted Output Power Measurements (20MHz Bandwidth)

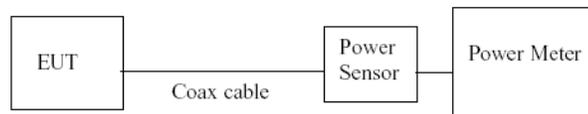


Figure 6-5. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 14 of 47

## CHAIN B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
2412	1	0	6.5/7.2	11.72	19.36
		1	13/14.4	11.65	19.75
		2	19.5/21.7	11.83	19.86
		3	26/28.9	11.82	19.73
		4	39/43.3	11.88	19.75
		5	52/57.8	11.90	19.69
		6	58.5/65	11.83	20.09
2437	6	7	65/72.2	10.59	18.53
		0	6.5/7.2	15.10	21.58
		1	13/14.4	15.03	21.67
		2	19.5/21.7	15.04	21.62
		3	26/28.9	15.07	21.63
		4	39/43.3	15.09	21.61
		5	52/57.8	13.42	20.84
2462	11	6	58.5/65	11.33	19.59
		7	65/72.2	10.23	19.36
		0	6.5/7.2	11.07	19.14
		1	13/14.4	11.01	19.20
		2	19.5/21.7	11.03	19.23
		3	26/28.9	11.15	19.20
		4	39/43.3	11.19	19.22
		5	52/57.8	11.22	19.19
		6	58.5/65	11.24	19.63
		7	65/72.2	9.64	18.05

Table 6-9. 802.11n (2.4GHz) Conducted Output Power Measurements (20MHz Bandwidth)

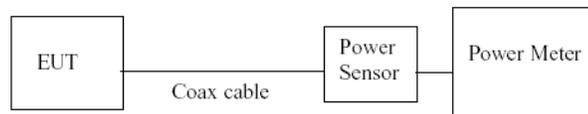


Figure 6-6. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 15 of 47

## CHAIN A

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
2422	3	0	6.5/7.2	8.47	16.91
		1	13/14.4	8.50	16.74
		2	19.5/21.7	8.43	16.75
		3	26/28.9	8.38	17.79
		4	39/43.3	8.41	17.45
		5	52/57.8	8.46	17.41
		6	58.5/65	8.49	17.29
2437	6	0	6.5/7.2	15.78	22.34
		1	13/14.4	15.57	22.02
		2	19.5/21.7	15.57	22.22
		3	26/28.9	15.44	22.21
		4	39/43.3	15.49	22.12
		5	52/57.8	13.89	21.59
		6	58.5/65	12.50	20.78
2452	9	0	6.5/7.2	7.72	17.67
		1	13/14.4	7.79	16.37
		2	19.5/21.7	7.79	17.35
		3	26/28.9	7.70	17.17
		4	39/43.3	7.76	17.01
		5	52/57.8	7.80	17.07
		6	58.5/65	7.89	16.84
		7	65/72.2	7.86	16.88

Table 6-10. 802.11n (2.4GHz) Conducted Output Power Measurements (40MHz Bandwidth)

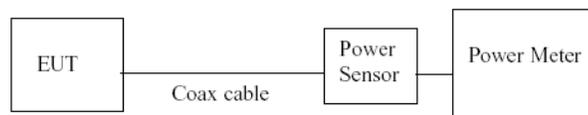


Figure 6-7. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 16 of 47

## CHAIN B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
2422	3	0	6.5/7.2	8.00	18.35
		1	13/14.4	8.15	17.56
		2	19.5/21.7	7.79	17.79
		3	26/28.9	7.61	18.07
		4	39/43.3	7.53	17.45
		5	52/57.8	7.52	18.11
		6	58.5/65	7.51	17.35
		7	65/72.2	7.45	17.39
2437	6	0	6.5/7.2	15.56	22.38
		1	13/14.4	15.28	22.17
		2	19.5/21.7	15.18	22.25
		3	26/28.9	15.00	22.27
		4	39/43.3	14.53	22.09
		5	52/57.8	13.16	21.98
		6	58.5/65	11.40	20.34
		7	65/72.2	9.89	19.69
2452	9	0	6.5/7.2	7.39	17.74
		1	13/14.4	7.35	17.09
		2	19.5/21.7	7.30	17.58
		3	26/28.9	7.17	17.64
		4	39/43.3	7.01	17.40
		5	52/57.8	6.98	17.78
		6	58.5/65	7.01	17.24
		7	65/72.2	6.83	17.30

Table 6-11. 802.11n (2.4GHz) Conducted Output Power Measurements (40MHz Bandwidth)

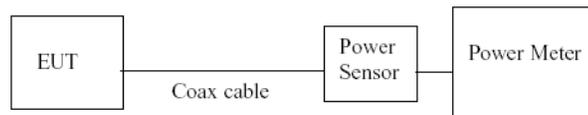


Figure 6-8. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 17 of 47	

## CHAIN A+B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	20MHz BW Peak Power (Chain A) [dBm]	20MHz BW Peak Power (Chain B) [dBm]	20MHz BW Peak Aggregate Power [dBm]
2412	1	HT8	27/30	18.77	18.71	21.75
		HT9	54/60	18.62	18.63	21.64
		HT10	80/90	20.82	18.88	22.97
		HT11	108/120	19.13	18.48	21.83
		HT12	162/180	18.56	18.48	21.53
		HT13	216/240	19.97	18.87	22.47
		HT14	243/270	20.72	18.92	22.92
2437	6	HT8	27/30	20.09	19.68	22.90
		HT9	54/60	20.09	19.44	22.79
		HT10	80/90	21.19	19.53	23.45
		HT11	108/120	20.40	19.46	22.97
		HT12	162/180	20.12	19.44	22.80
		HT13	216/240	19.96	19.56	22.77
		HT14	243/270	19.45	19.25	22.36
2462	11	HT8	27/30	19.10	18.65	21.89
		HT9	54/60	18.60	18.56	21.59
		HT10	80/90	18.90	18.46	21.70
		HT11	108/120	18.92	18.43	21.69
		HT12	162/180	18.66	18.45	21.57
		HT13	216/240	18.46	18.39	21.44
		HT14	243/270	18.55	18.50	21.54
		HT15	270/300	17.76	17.02	20.42

Table 6-12. 802.11n (2.4GHz) Conducted Output Power Measurements (20MHz Bandwidth)

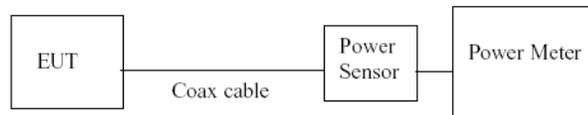


Figure 6-9. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L			FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 18 of 47		

## CHAIN A+B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	40MHz BW Peak Power (Chain A) [dBm]	40MHz BW Peak Power (Chain B) [dBm]	40MHz BW Peak Aggregate Power [dBm]
2422	3	HT8	27/30	16.76	16.45	19.62
		HT9	54/60	17.15	16.47	19.83
		HT10	80/90	17.06	16.96	20.02
		HT11	108/120	16.41	16.11	19.27
		HT12	162/180	16.38	16.55	19.48
		HT13	216/240	17.27	16.76	20.03
		HT14	243/270	17.57	16.87	20.24
2437	6	HT8	27/30	20.21	20.12	23.18
		HT9	54/60	20.26	19.80	23.05
		HT10	80/90	19.70	19.65	22.69
		HT11	108/120	20.12	19.66	22.91
		HT12	162/180	20.03	19.62	22.84
		HT13	216/240	20.03	19.42	22.75
		HT14	243/270	20.24	19.87	23.07
2452	9	HT8	27/30	15.61	15.92	18.78
		HT9	54/60	15.79	16.16	18.99
		HT10	80/90	14.77	16.49	18.72
		HT11	108/120	14.07	15.99	18.15
		HT12	162/180	15.05	15.41	18.24
		HT13	216/240	14.25	16.29	18.40
		HT14	243/270	16.02	16.92	19.50
		HT15	270/300	15.55	16.65	19.15

Table 6-13. 802.11n (2.4GHz) Conducted Output Power Measurements (40MHz Bandwidth)

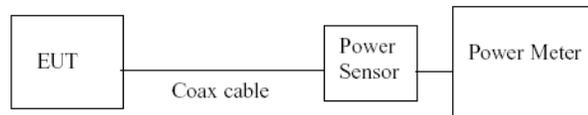


Figure 6-10. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 19 of 47

## 6.5 Output Power Measurement – 802.11n (5.8GHz)

§15.247(b)(3); RSS-210 [A8.4]

### CHAIN A

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
5745	149	0	6.5/7.2	13.57	20.76
		1	13/14.4	13.55	21.03
		2	19.5/21.7	13.59	30.93
		3	26/28.9	13.66	20.99
		4	39/43.3	13.69	20.92
		5	52/57.8	12.96	20.58
		6	58.5/65	10.62	19.14
		7	65/72.2	9.21	17.63
5785	157	0	6.5/7.2	13.48	20.78
		1	13/14.4	13.38	20.90
		2	19.5/21.7	13.48	20.85
		3	26/28.9	13.50	20.83
		4	39/43.3	13.55	20.85
		5	52/57.8	12.72	20.39
		6	58.5/65	10.31	18.86
		7	65/72.2	8.88	17.33
5825	165	0	6.5/7.2	13.21	20.51
		1	13/14.4	13.04	20.64
		2	19.5/21.7	13.20	20.62
		3	26/28.9	13.20	20.61
		4	39/43.3	13.23	20.59
		5	52/57.8	12.33	20.12
		6	58.5/65	10.18	18.78
		7	65/72.2	8.49	17.02

Table 6-14. 802.11n (5.8GHz) Conducted Output Power Measurements (20MHz Bandwidth)

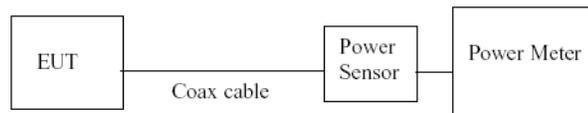


Figure 6-11. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 20 of 47

## CHAIN B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
5745	149	0	6.5/7.2	14.41	21.50
		1	13/14.4	14.75	21.70
		2	19.5/21.7	14.85	21.73
		3	26/28.9	14.90	21.50
		4	39/43.3	14.83	21.63
		5	52/57.8	14.15	21.61
		6	58.5/65	12.04	20.12
5785	157	0	6.5/7.2	13.71	20.92
		1	13/14.4	13.63	21.14
		2	19.5/21.7	14.17	21.28
		3	26/28.9	14.30	21.41
		4	39/43.3	14.39	21.48
		5	52/57.8	13.73	21.20
		6	58.5/65	11.45	20.24
5825	165	0	6.5/7.2	13.21	20.42
		1	13/14.4	13.82	21.08
		2	19.5/21.7	13.86	21.03
		3	26/28.9	13.60	21.02
		4	39/43.3	13.59	20.90
		5	52/57.8	12.71	20.58
		6	58.5/65	10.91	19.85
		7	65/72.2	9.06	18.12

Table 6-15. 802.11n (5.8GHz) Conducted Output Power Measurements (20MHz Bandwidth)

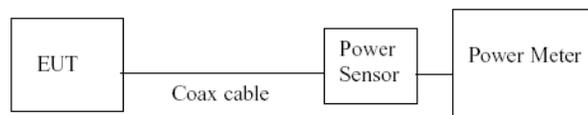


Figure 6-12. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 21 of 47

## CHAIN A

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
5755	151	0	6.5/7.2	13.86	21.54
		1	13/14.4	13.99	21.15
		2	19.5/21.7	13.92	21.51
		3	26/28.9	13.56	21.20
		4	39/43.3	13.99	21.23
		5	52/57.8	12.72	20.77
		6	58.5/65	10.93	19.45
		7	65/72.2	9.08	18.00
5795	159	0	6.5/7.2	13.51	21.32
		1	13/14.4	13.52	20.83
		2	19.5/21.7	13.47	21.25
		3	26/28.9	13.04	21.05
		4	39/43.3	13.49	20.93
		5	52/57.8	12.35	20.42
		6	58.5/65	10.51	19.30
		7	65/72.2	9.12	18.04

Table 6-16. 802.11n (5.8GHz) Conducted Output Power Measurements (40MHz Bandwidth)

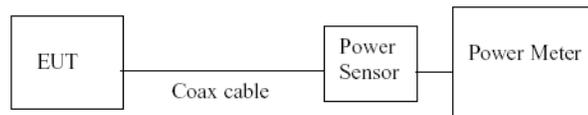


Figure 6-13. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 22 of 47	

## CHAIN B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	Measured Average Power [dBm]	Measured Peak Power [dBm]
5755	151	0	6.5/7.2	14.70	21.05
		1	13/14.4	14.04	21.27
		2	19.5/21.7	13.89	21.64
		3	26/28.9	14.00	21.57
		4	39/43.3	14.11	21.55
		5	52/57.8	13.07	21.51
		6	58.5/65	11.02	20.03
		7	65/72.2	9.53	19.49
5795	159	0	6.5/7.2	13.91	21.53
		1	13/14.4	13.93	21.13
		2	19.5/21.7	13.40	21.40
		3	26/28.9	13.53	21.64
		4	39/43.3	13.55	21.36
		5	52/57.8	12.46	21.29
		6	58.5/65	10.89	19.97
		7	65/72.2	9.32	19.23

Table 6-17. 802.11n (5.8GHz) Conducted Output Power Measurements (40MHz Bandwidth)

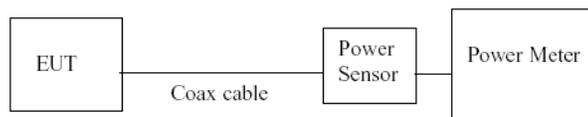


Figure 6-14. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 23 of 47

## CHAIN A+B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	20MHz BW Peak Power (Chain A) [dBm]	20MHz BW Peak Power (Chain B) [dBm]	20MHz BW Peak Aggregate Power [dBm]		
5745	149	HT8	27/30	18.11	19.07	21.63		
		HT9	54/60	18.22	18.86	21.56		
		HT10	80/90	18.39	19.05	21.74		
		HT11	108/120	18.43	19.96	22.27		
		HT12	162/180	18.16	18.98	21.60		
		HT13	216/240	18.14	18.91	21.55		
		HT14	243/270	18.36	19.12	21.77		
		HT15	270/300	16.68	18.26	20.55		
		5785	157	HT8	27/30	17.99	18.85	21.45
				HT9	54/60	18.19	18.69	21.46
				HT10	80/90	18.23	18.75	21.51
				HT11	108/120	18.39	18.56	21.49
				HT12	162/180	18.16	18.75	21.48
				HT13	216/240	18.06	18.56	21.33
				HT14	243/270	17.91	18.91	21.45
5825	165	HT8	27/30	17.79	18.45	21.14		
		HT9	54/60	17.99	18.35	21.18		
		HT10	80/90	18.32	18.39	21.37		
		HT11	108/120	18.30	18.13	21.23		
		HT12	162/180	17.52	18.28	20.93		
		HT13	216/240	17.73	18.25	21.01		
		HT14	243/270	18.89	18.66	21.79		
		HT15	270/300	16.17	16.94	19.58		

Table 6-18. 802.11n (5.8GHz) Conducted Output Power Measurements (20MHz Bandwidth)

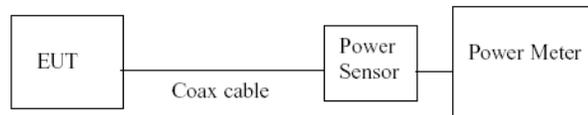


Figure 6-15. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 24 of 47

## CHAIN A+B

A transmitter antenna terminal of EUT is connected to the input of an RF power sensor. Measurement is made using a broadband power meter while the EUT is operating in transmission mode at the appropriate frequencies. **The maximum permissible conducted output power is 1 Watt.**

Freq [MHz]	Channel	MCS Index	Data Rate [Mbps]	40MHz BW Peak Power (Chain A) [dBm]	40MHz BW Peak Power (Chain B) [dBm]	40MHz BW Peak Aggregate Power [dBm]		
5755	151	HT8	27/30	18.56	19.78	22.22		
		HT9	54/60	18.46	19.86	22.23		
		HT10	80/90	18.56	19.80	22.23		
		HT11	108/120	18.68	19.56	22.15		
		HT12	162/180	18.17	19.63	21.97		
		HT13	216/240	18.53	19.82	22.23		
		HT14	243/270	19.04	20.14	22.64		
		HT15	270/300	17.96	19.36	21.73		
		5795	159	HT8	27/30	18.53	19.43	22.01
				HT9	54/60	18.59	19.70	22.19
				HT10	80/90	18.43	19.67	22.10
				HT11	108/120	18.44	19.29	21.90
				HT12	162/180	18.12	19.53	21.89
				HT13	216/240	18.34	19.56	22.00
				HT14	243/270	18.74	19.85	22.34
HT15	270/300			17.99	19.42	21.77		

Table 6-19. 802.11n (5.8GHz) Conducted Output Power Measurements (40MHz Bandwidth)

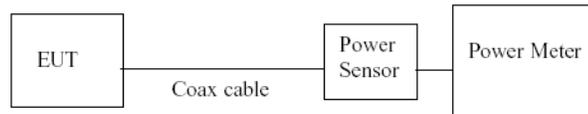


Figure 6-16. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 25 of 47

## 6.6 Peak Power Spectral Density (MIMO)

§15.407 (a)(1),(5)

Peak power spectral density measurements were taken from FCC Part 15C report for FCC ID: PD962230ANH and PD962230ANHU. The data from that grant are represented under Chain A and Chain B PSD (Power spectral density) measurements with MIMO transmission in the n mode as shown below. Per Method #2 of the FCC KDB Publication 6629111 titled “Emissions Testing of Transmitters with Multiple Outputs in the Same Band” dated April 4, 2011, the PPSD of each individual output is adjusted by a factor of  $10\log(N)$ , where N is the number of outputs. In this case,  $N = 2$ . **The maximum permissible peak power spectral density is 8dBm/3kHz.**

		Frequency	Chain A PSD (dBm/3kHz)	Level + 10 Log (N) (MIMO)	FCC Limit (dBm/3kHz)	Margin (dB)	Chain B (dBm/3kHz)	Level + 10 Log (N) (MIMO)	FCC Limit (dBm/3kHz)	Margin (dB)
2.4 GHz	20MHz BW	2412	-12.6	-9.59	8	-17.59	-11.5	-8.49	8	-16.49
		2437	-12.7	-9.69	8	-17.69	-10.8	-7.79	8	-15.79
		2462	-14	-10.99	8	-18.99	-13.2	-10.19	8	-18.19
	40MHz BW	2422	-18.6	-15.59	8	-23.59	-19.3	-16.29	8	-24.29
		2437	-13.7	-10.69	8	-18.69	-13.9	-10.89	8	-18.89
		2452	-19.5	-16.49	8	-24.49	-19.5	-16.49	8	-24.49
5 GHz	20MHz BW	5745	-14.8	-11.79	8	-19.79	-15.2	-12.19	8	-20.19
		5785	-12.7	-9.69	8	-17.69	-14	-10.99	8	-18.99
		5825	-14.5	-11.49	8	-19.49	-14.8	-11.79	8	-19.79
	40MHz BW	5755	-15.5	-12.49	8	-20.49	-16.7	-13.69	8	-21.69
		5795	-14.8	-11.79	8	-19.79	-15.7	-12.69	8	-20.69

Table 6-20. Conducted Power Spectral Density Measurements

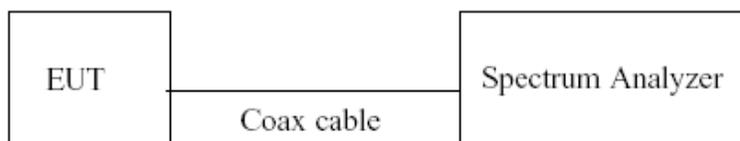


Figure 6-17. Test Instrument & Measurement Setup

FCC ID: AK8PCG41312L			FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 26 of 47		

## 6.7 Conducted Emissions at the Band Edge (MIMO)

§15.247(d): RSS-210 [A8.5]

MIMO powers were calculated Per Method #2 of the FCC KDB Publication 662911 titled “Emissions Testing of Transmitters with Multiple Outputs in the Same Band” dated April 4, 2011. The highest conducted spurious emission observed from the band edge plot was adjusted by a factor of  $10\log(N)$ , where N is the number of outputs. In this case,  $N = 2$ . Peak spurious powers were recorded and a 20dBc limit was applied and all spurious emissions were observed to be passing.

### Summary:

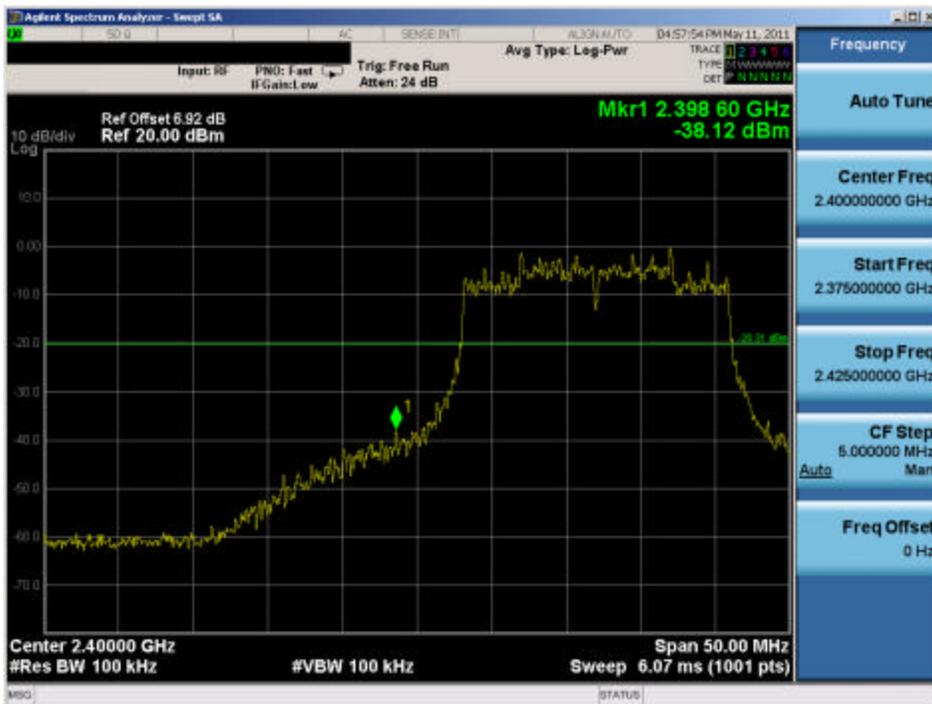
		BE	Chain A - Highest Peak Spur. Emission (dBm)	Level + 10 Log (N) (MIMO)	FCC Limit (20dBc)	Margin (dB)	Chain B - Highest Peak Spur. Emission (dBm)	Level + 10 Log (N) (MIMO)	FCC Limit (20dBc)	Margin (dB)
2.4 GHz	20MHz BW	LO	-38.12	-35.11	-20.31	-14.80	-35.55	-32.54	-20.77	-11.77
		HI	-49.81	-46.80	-19.54	-27.26	-58.99	-55.98	-24.39	-31.59
	40MHz BW	LO	-42.82	-39.81	-26.37	-13.44	-43.11	-40.10	-27.33	-12.77
		HI	-46.18	-43.17	-27.38	-15.79	-47.01	-44.00	-28.34	-15.66
5 GHz	20MHz BW	LO	-41.81	-38.80	-21.11	-17.69	-42.35	-39.34	-19.7	-19.64
		HI	-48.3	-45.29	-22.19	-23.10	-47.35	-44.34	-18.03	-26.31
	40MHz BW	LO	-37.55	-34.54	-23.99	-10.55	-34.09	-31.08	-23.75	-7.33
		HI	-53.93	-50.92	-24.94	-25.98	-53.79	-50.78	-23.98	-26.80

Table 6-21. Conducted Spurious Emissions at Band Edge Measurements

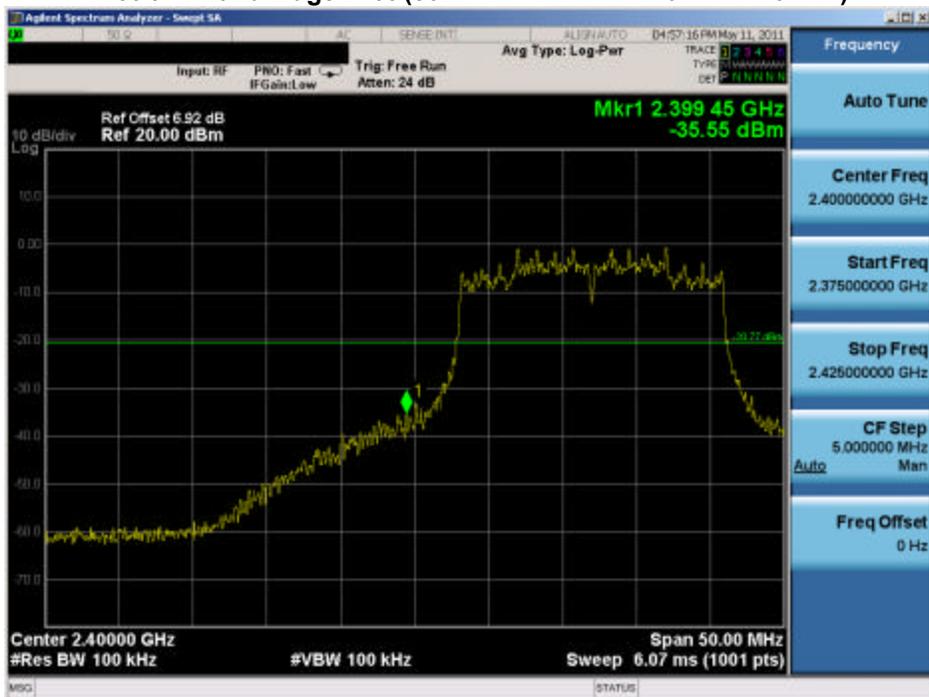
FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 27 of 47

## Band Edge Plots:

### 2.4GHz

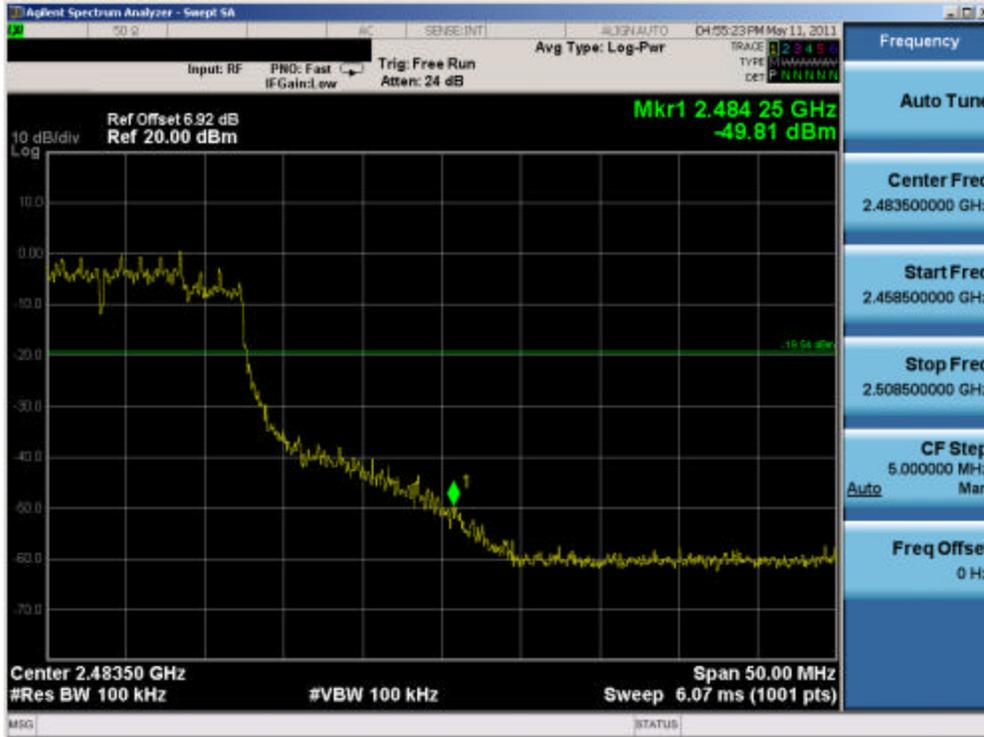


Plot 6-1. Band Edge Plot (802.11n- Ch. 1 – Chain A - 20MHz)

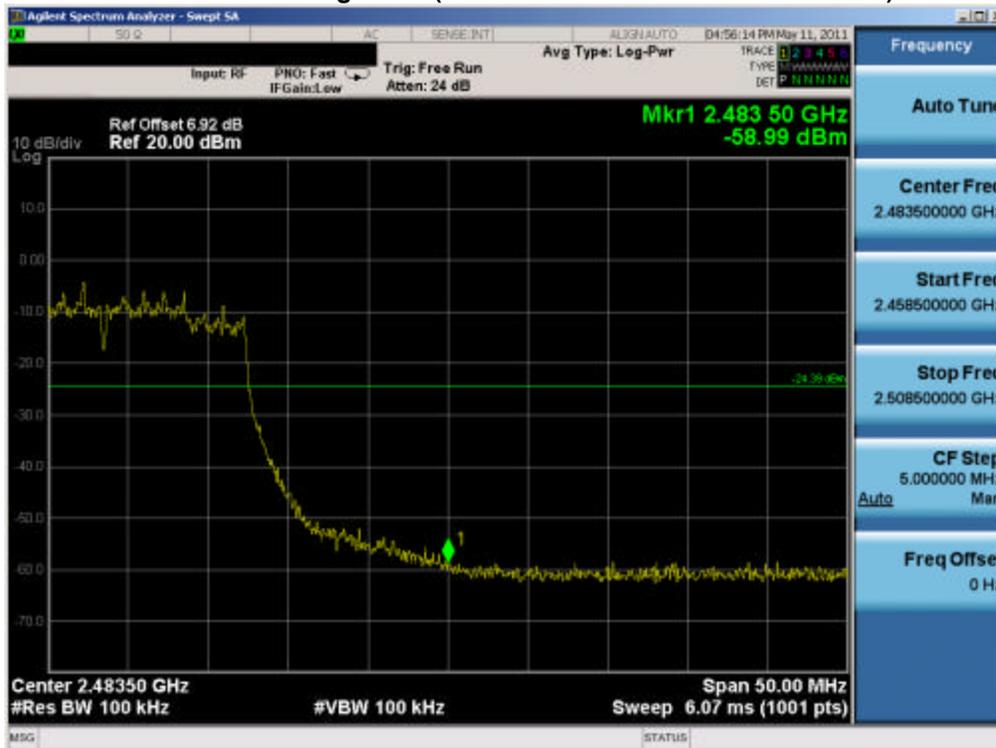


Plot 6-2. Band Edge Plot (802.11n- Ch. 1 – Chain B - 20MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 28 of 47



Plot 6-3. Band Edge Plot (802.11n– Ch. 11 – Chain A - 20MHz)



Plot 6-4. Band Edge Plot (802.11n– Ch. 11 – Chain B - 20MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 29 of 47

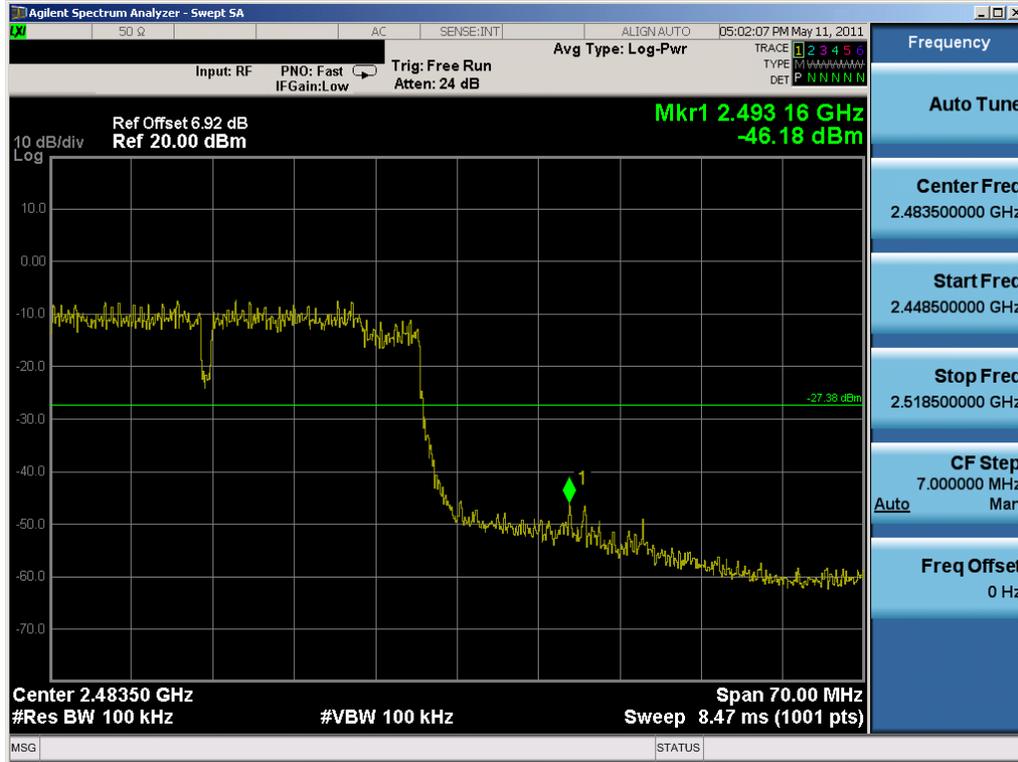


Plot 6-5. Band Edge Plot (802.11n- Ch. 1 – Chain A - 40MHz)

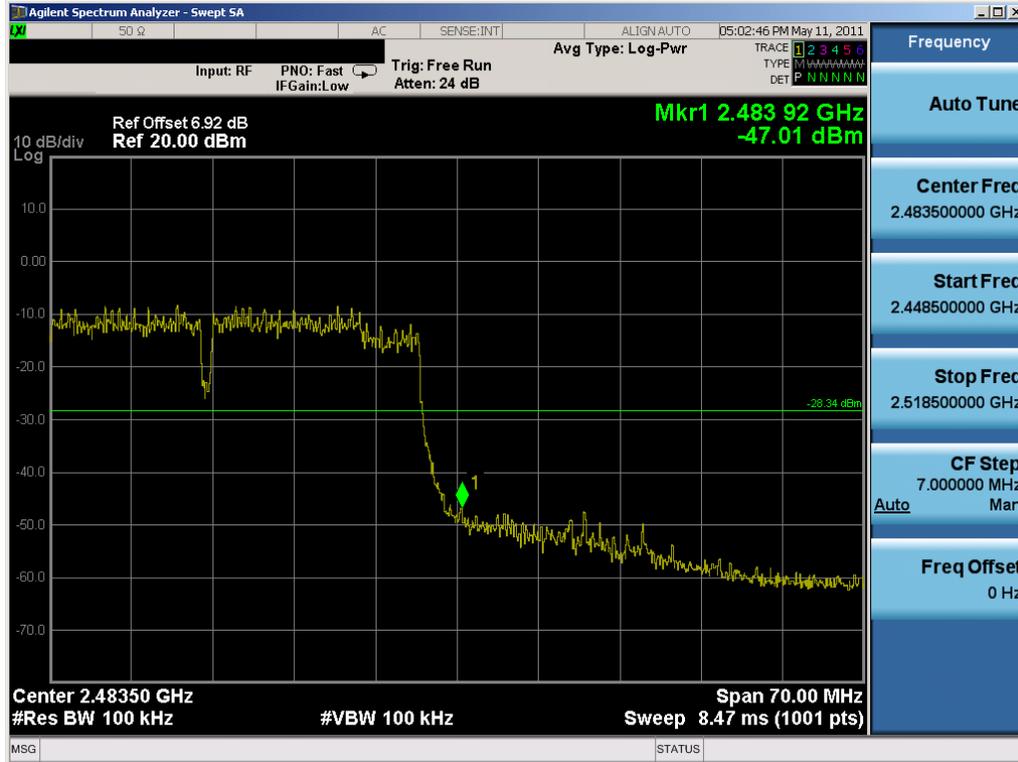


Plot 6-6. Band Edge Plot (802.11n- Ch. 1 – Chain B - 40MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 30 of 47



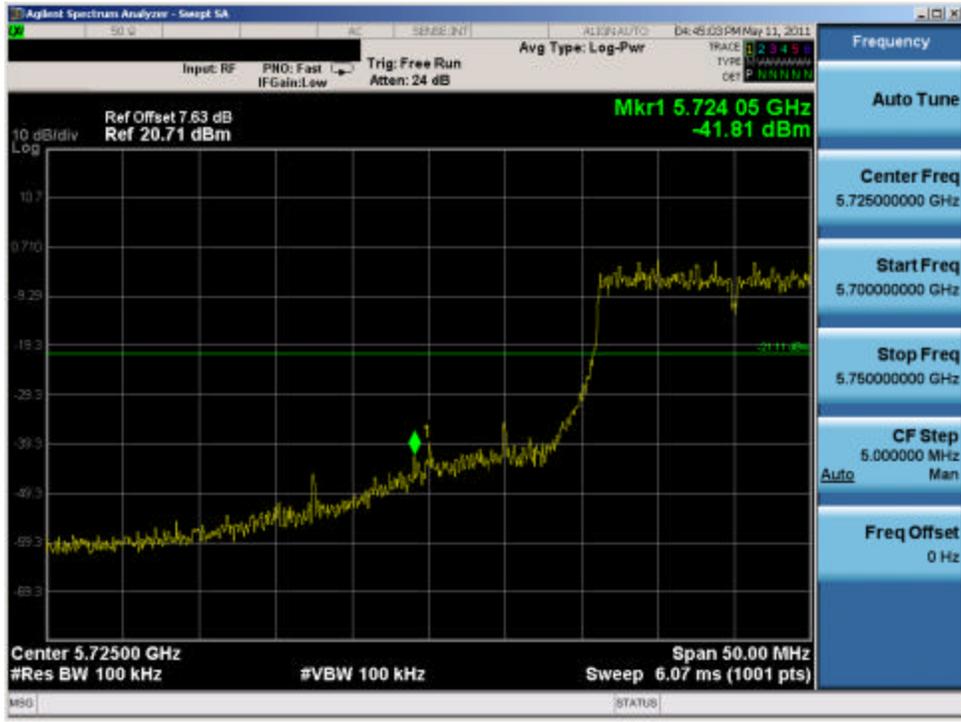
Plot 6-7. Band Edge Plot (802.11n- Ch. 11 - Chain A - 40MHz)



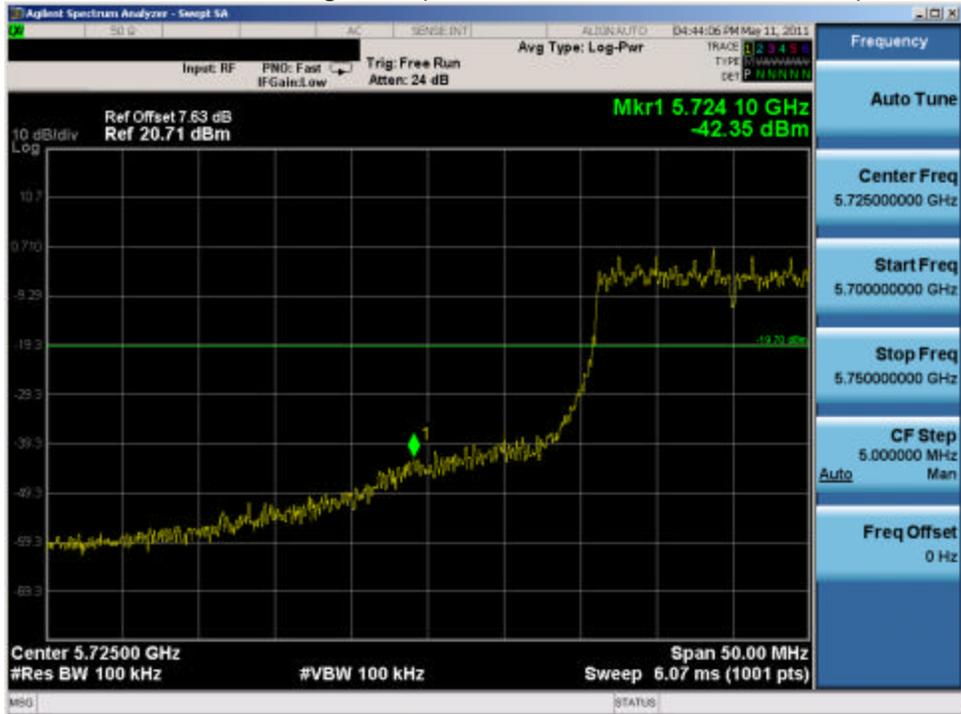
Plot 6-8. Band Edge Plot (802.11n- Ch. 11 - Chain B - 40MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 31 of 47

# 5GHz

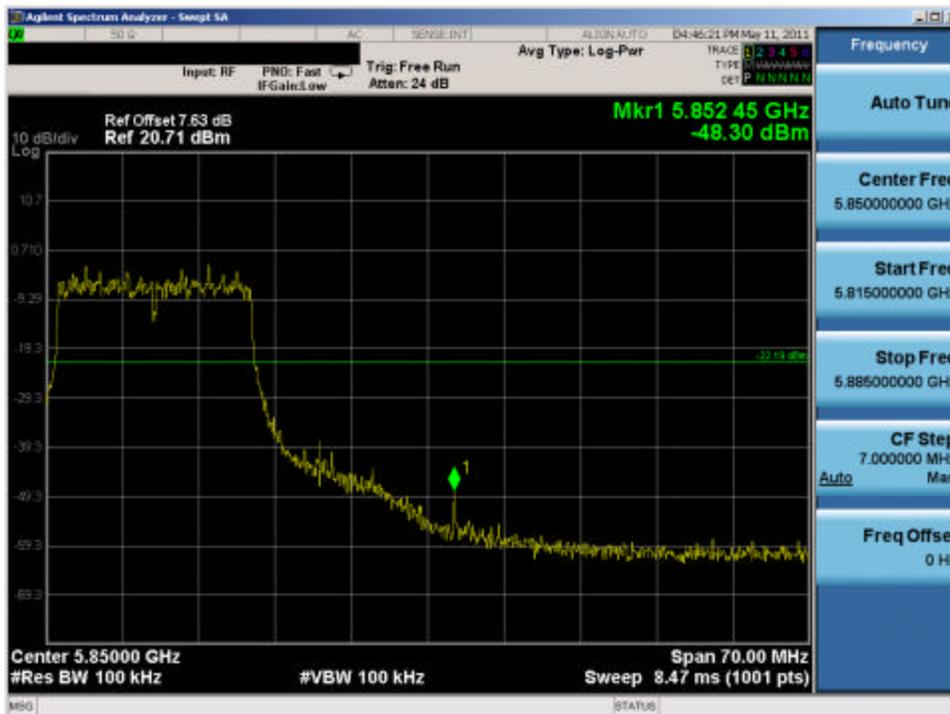


Plot 6-9. Band Edge Plot (802.11n- Ch. 1 – Chain A - 20MHz)

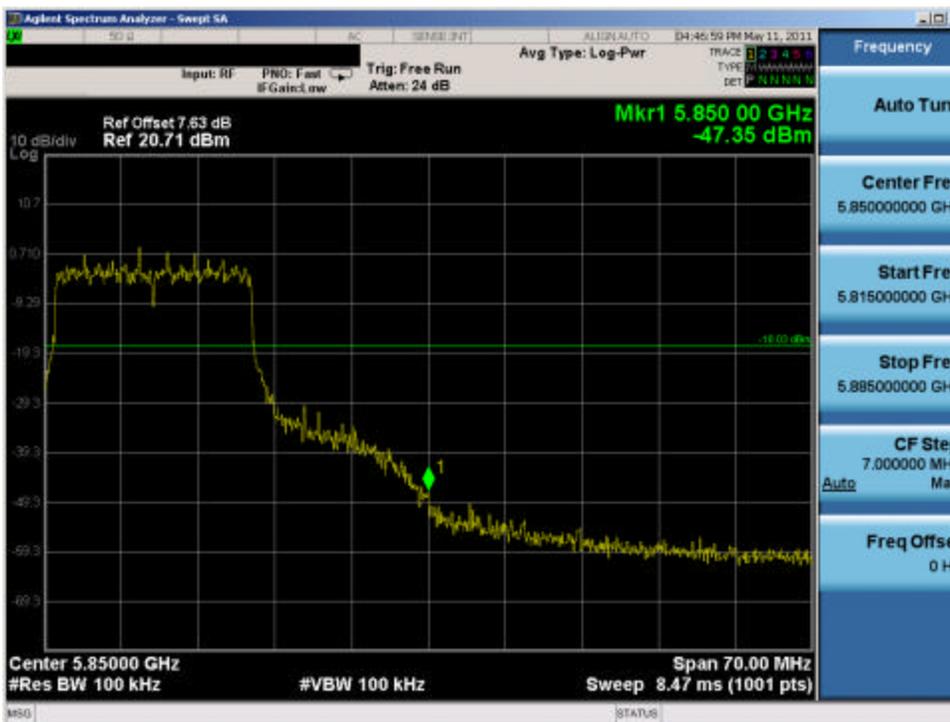


Plot 6-10. Band Edge Plot (802.11n- Ch. 1 – Chain B - 20MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 32 of 47

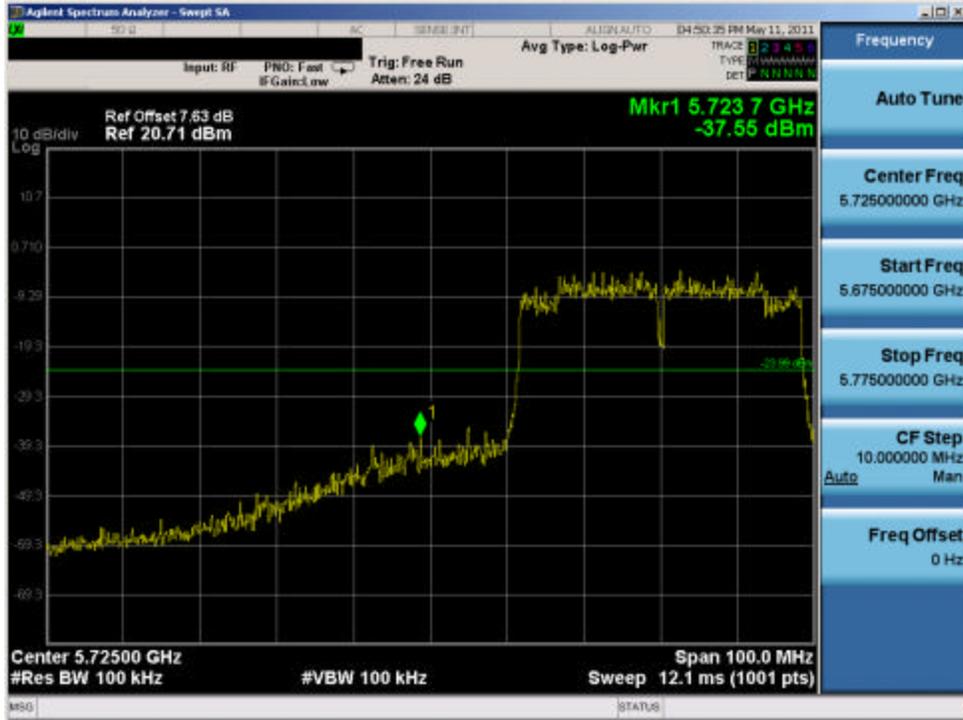


Plot 6-11. Band Edge Plot (802.11n- Ch. 11 – Chain A - 20MHz)

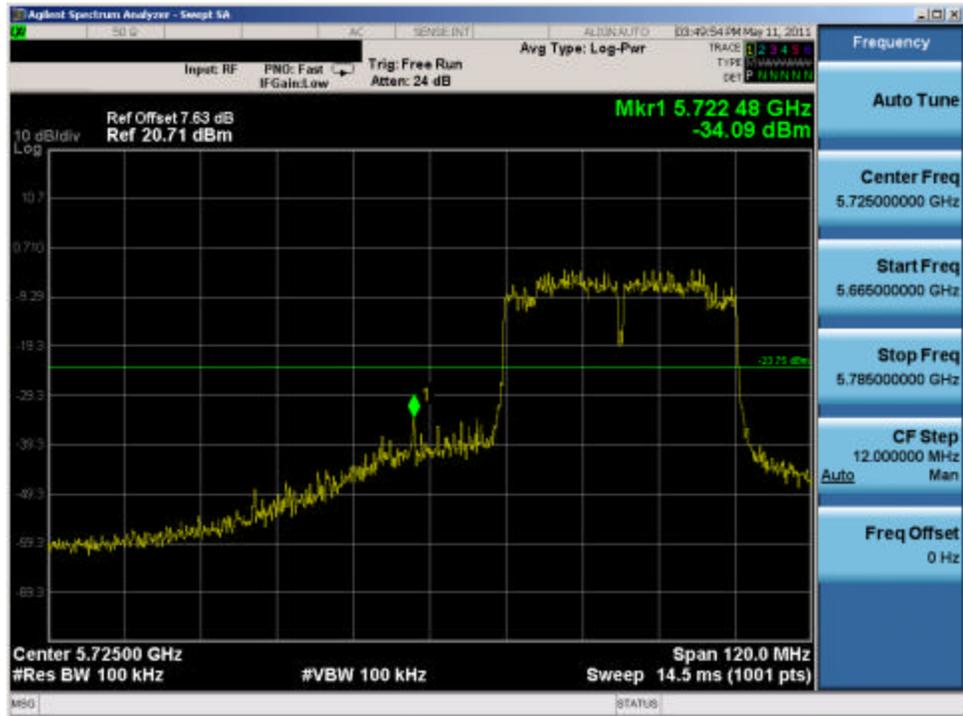


Plot 6-12. Band Edge Plot (802.11n- Ch. 11 – Chain B - 20MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 33 of 47

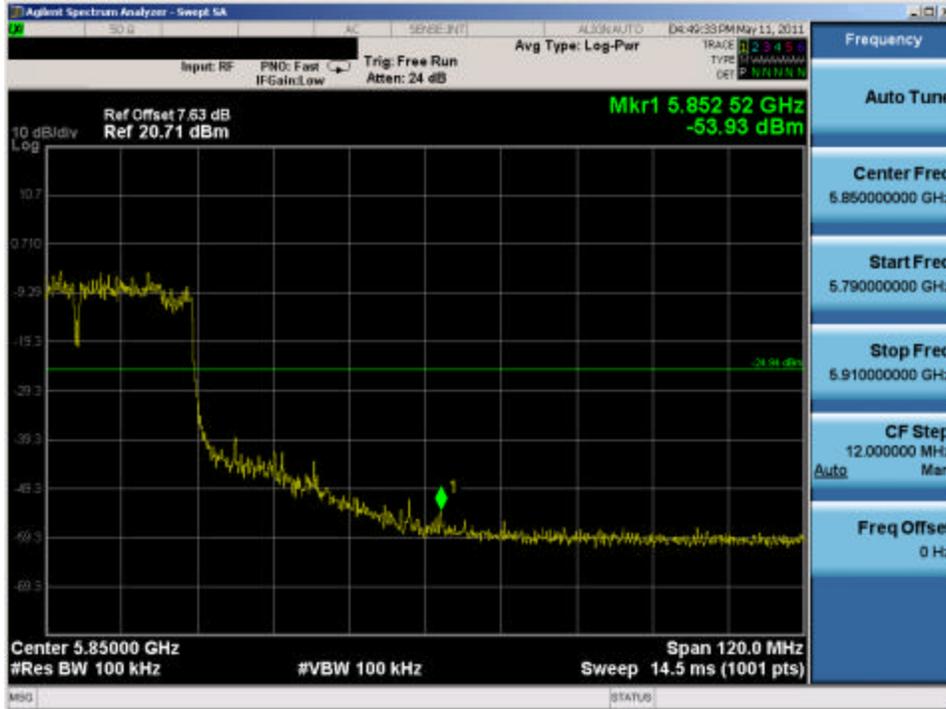


Plot 6-13. Band Edge Plot (802.11n- Ch. 1 – Chain A - 40MHz)

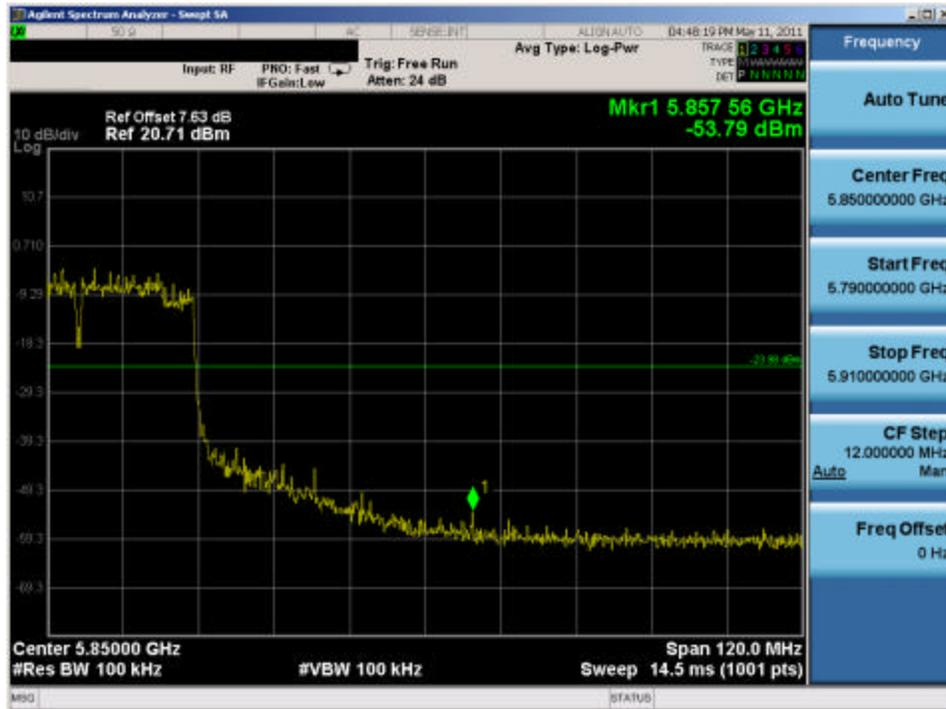


Plot 6-14. Band Edge Plot (802.11n- Ch. 1 – Chain B - 40MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 34 of 47



Plot 6-15. Band Edge Plot (802.11n- Ch. 11 – Chain A - 40MHz)



Plot 6-16. Band Edge Plot (802.11n- Ch. 11 – Chain B - 40MHz)

FCC ID: AK8PCG41312L		FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 35 of 47

## 6.8 Radiated Spurious Emission Measurements

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

The EUT was tested from 9kHz up to the tenth harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average measurements were taken using RBW = 1MHz, VBW = 10Hz, and linearly polarized horn antennas. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-22 per Section 15.209.

**Note:** All data rates and antennas were investigated for radiated spurious emissions. Transmissions from the Main antenna (Chain A) produced the worst case emissions while RF emissions from the Auxiliary (Chain B) and Simultaneous transmission of the Main and Auxiliary Antennas produced lower emissions. Therefore, radiated emissions of the worst case emissions i.e. Main antenna (Chain A) are reported in this section.

Frequency	Field Strength [mV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

**Table 6-22. Radiated Limits**

### Sample Calculation

- Field Strength Level  $_{[dB_{\mu V/m}]}$  = Analyzer Level  $_{[dBm]}$  + 107 + AFCL  $_{[dB]}$

### Notes:

- AFCL = Antenna Factor  $_{[dB]}$  + Cable Loss  $_{[dB]}$

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Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 36 of 47

## Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Mode: 802.11b

Transfer Rate: 1 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 2412MHz

Channel: 01

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
4824.00	-108.78	Avg	H	42.27	40.50	53.98	-13.48
4824.00	-98.78	Peak	H	42.27	50.50	73.98	-23.48
12060.00	-135.00	Avg	H	60.07	32.07	53.98	-21.91
12060.00	-125.00	Peak	H	60.07	42.07	73.98	-31.91

**Table 6-23. Radiated Measurements @ 3 meters – Chain A**

**NOTES:**

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 µV/m (54dBµ/m) at 3 meters radiated.
- Radiated emissions that exhibited worst case emissions were found in Chain A operation.

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## Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Mode: 802.11b

Transfer Rate: 1 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 2437MHz

Channel: 06

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
4874.00	-108.25	Avg	H	42.40	41.15	53.98	-12.83
4874.00	-98.95	Peak	H	42.40	50.45	73.98	-23.53
7311.00	-135.00	Avg	H	48.89	20.89	53.98	-33.09
7311.00	-125.00	Peak	H	48.89	30.89	73.98	-43.09
12185.00	-135.00	Avg	H	60.39	32.39	53.98	-21.59
12185.00	-125.00	Peak	H	60.39	42.39	73.98	-31.59

**Table 6-24. Radiated Measurements @ 3 meters – Chain A**

**NOTES:**

1. All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
2. Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 µV/m (54dBµ/m) at 3 meters radiated.
8. Radiated emissions that exhibited worst case emissions were found in Chain A operation.

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
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## Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Mode: 802.11b

Transfer Rate: 1 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 2462MHz

Channel: 11

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
4924.00	-109.03	Avg	H	42.53	40.50	53.98	-13.48
4924.00	-99.13	Peak	H	42.53	50.40	73.98	-23.58
7386.00	-135.00	Avg	H	49.00	21.00	53.98	-32.98
7386.00	-125.00	Peak	H	49.00	31.00	73.98	-42.98
12310.00	-135.00	Avg	H	60.70	32.70	53.98	-21.28
12310.00	-125.00	Peak	H	60.70	42.70	73.98	-31.28

**Table 6-25. Radiated Measurements @ 3 meters – Chain A**

### NOTES:

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500  $\mu$ V/m (54dB $\mu$ /m) at 3 meters radiated.
- Radiated emissions that exhibited worst case emissions were found in Chain A operation.

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## Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Mode: 802.11a

Transfer Rate: 6 Mbps

Distance of Measurements: 1 Meter

Operating Frequency: 5745MHz

Channel: 149

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Distance Correction Factor [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
11490.00	-112.95	Avg	H	57.15	-9.54	41.7	53.98	-12.32
11490.00	-101.05	Peak	H	57.15	-9.54	53.6	73.98	-20.42
22980.00	-135.00	Avg	H	66.97	0.00	39.0	53.98	-15.01
22980.00	-125.00	Peak	H	66.97	0.00	49.0	73.98	-25.01

**Table 6-26. Radiated Measurements @ 1 meter – Chain A**

**NOTES:**

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500 µV/m (54dBµ/m) at 3 meters radiated.
- Radiated emissions that exhibited worst case emissions were found in Chain A operation.

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
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## Radiated Spurious Emission Measurements (Cont'd)

§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Mode: 802.11a

Transfer Rate: 6 Mbps

Distance of Measurements: 1 Meter

Operating Frequency: 5785MHz

Channel: 157

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Distance Correction Factor [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
11570.00	-112.50	Avg	H	57.58	-9.54	42.5	53.98	-11.44
11570.00	-100.40	Peak	H	57.58	-9.54	54.6	73.98	-19.34

**Table 6-27. Radiated Measurements @ 1 meter – Chain A**

### NOTES:

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500  $\mu$ V/m (54dB $\mu$ /m) at 3 meters radiated.
- Radiated emissions that exhibited worst case emissions were found in Chain A operation.

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**Radiated Spurious Emission Measurements (Cont'd)**  
§15.247(d) / §15.205 & §15.209; RSS-210 [A8.5]

Mode: 802.11a  
 Transfer Rate: 6 Mbps  
 Distance of Measurements: 1 Meter  
 Operating Frequency: 5825MHz  
 Channel: 165

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Distance Correction Factor [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
11650.00	-111.93	Avg	H	58.02	-9.54	43.5	53.98	-10.43
11650.00	-99.63	Peak	H	58.02	-9.54	55.8	73.98	-18.13

**Table 6-28. Radiated Measurements @ 1 meter – Chain A**

**NOTES:**

1. All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
2. Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
6. Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
7. Above 960MHz the limit is 500 µV/m (54dBµ/m) at 3 meters radiated.
8. Radiated emissions that exhibited worst case emissions were found in Chain A operation.

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## 6.9 Radiated Restricted Band Edge Measurements

§15.205 / §15.209; RSS-210 [A8.5]

Mode: 40MHz 802.11n

Transfer Rate: HT8

Distance of Measurements: 3 Meters

Operating Frequency: 2452MHz

Channel: 9

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol. [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
2483.50	-90.47	Avg	H	36.14	52.66	53.98	-1.31
2483.50	-75.07	Peak	H	36.14	68.06	73.98	-5.91
2484.80	-92.37	Avg	H	36.14	50.76	53.98	-3.21
2484.80	-77.47	Peak	H	36.14	65.66	73.98	-8.31
2486.40	-96.68	Avg	H	36.14	46.47	53.98	-7.51
2486.40	-76.98	Peak	H	36.14	66.17	73.98	-7.81

**Table 6-29. Radiated Restricted Band Measurements at 3-meters (2483.5 – 2500MHz) - MIMO**

**NOTES:**

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500  $\mu$ V/m (54dB $\mu$ /m) at 3 meters radiated.
- Radiated emissions that exhibited worst case restricted band edge emissions were found in MIMO operation.

FCC ID: AK8PCG41312L	 <b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
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## Radiated Restricted Band Edge Measurements (cont'd)

§15.205 / §15.209; RSS-210 [A8.5]

Mode: 40MHz 802.11n

Transfer Rate: HT8

Distance of Measurements: 3 Meters

Operating Frequency: 2422MHz

Channel: 3

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
2381.60	-98.48	Avg	H	35.71	44.23	53.98	-9.75
2381.60	-81.78	Peak	H	35.71	60.93	73.98	-13.05
2388.20	-94.68	Avg	H	35.71	48.03	53.98	-5.95
2388.20	-75.18	Peak	H	35.71	67.53	73.98	-6.45
2390.00	-93.57	Avg	H	35.74	49.17	53.98	-4.81
2390.00	-74.77	Peak	H	35.74	67.97	73.98	-6.01

**Table 6-30. Radiated Restricted Band Measurements at 3-meters (2310 – 2390 MHz) - MIMO**

### NOTES:

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500  $\mu$ V/m (54dB $\mu$ /m) at 3 meters radiated.
- Radiated emissions that exhibited worst case restricted band edge emissions were found in MIMO operation.

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## Radiated Restricted Band Edge Measurements (cont'd)

§15.205 / §15.209; RSS-210 [A8.5]

Mode: 40MHz 802.11n

Transfer Rate: HT8

Distance of Measurements: 3 Meters

Operating Frequency: 2427MHz

Channel: 4

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
2381.60	-97.38	Avg	H	35.71	45.33	53.98	-8.65
2381.60	-80.68	Peak	H	35.71	62.03	73.98	-11.95
2388.20	-91.48	Avg	H	35.71	51.23	53.98	-2.75
2388.20	-77.28	Peak	H	35.71	65.43	73.98	-8.55
2390.00	-89.37	Avg	H	35.74	53.37	53.98	-0.61
2390.00	-70.37	Peak	H	35.74	72.37	73.98	-1.61

**Table 6-31. Radiated Restricted Band Measurements at 3-meters (2310 – 2390 MHz) - MIMO**

**NOTES:**

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500  $\mu$ V/m (54dB $\mu$ /m) at 3 meters radiated.
- Radiated restricted band edge emissions were measured at Channels 4 and 8 because conducted powers from document R2 EEPROM showed noticeably higher powers at Channels 4 and 8 than the powers measured at Channel 3 and 9. Therefore, additional testing for channels 4 and 8 were verified for compliance.
- Radiated emissions that exhibited worst case restricted band edge emissions were found in MIMO operation.

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## Radiated Restricted Band Edge Measurements (cont'd)

§15.205 / §15.209; RSS-210 [A8.5]

Mode: 40MHz 802.11n

Transfer Rate: HT8

Distance of Measurements: 3 Meters

Operating Frequency: 2447MHz

Channel: 8

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBmV/m]	Limit [dBmV/m]	Margin [dB]
2483.50	-89.37	Avg	H	36.11	53.74	53.98	-0.24
2483.50	-72.57	Peak	H	36.11	70.54	73.98	-3.44
2484.80	-89.48	Avg	H	36.12	53.64	53.98	-0.34
2484.80	-74.08	Peak	H	36.12	69.04	73.98	-4.94
2486.70	-91.48	Avg	H	36.13	51.65	53.98	-2.33
2486.70	-79.28	Peak	H	36.13	63.85	73.98	-10.13

**Table 6-32. Radiated Restricted Band Measurements at 3-meters (2483.5 – 2500 MHz) - MIMO**

### NOTES:

- All emissions shown lie in the restricted bands specified in §15.205 are below the limit shown in Table 6-22.
- Average Measurements > 1GHz using RBW = 1MHz VBW = 10Hz, Peak measurements using RBW=VBW=1MHz.
- The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
- The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
- The spectrum is measured from 9kHz to the 10<sup>th</sup> harmonic and the worst-case emissions are reported. No significant emissions were found beyond the fifth harmonic for this device.
- Levels at - 135 dBm represent the analyzer noise floor and signify that no emission was detected.
- Above 960MHz the limit is 500  $\mu$ V/m (54dB $\mu$ /m) at 3 meters radiated.
- Radiated restricted band edge emissions were measured at Channels 4 and 8 because conducted powers from document R2 EEPROM showed noticeably higher powers at Channels 4 and 8 than the powers measured at Channel 3 and 9. Therefore, additional testing for channels 4 and 8 were verified for compliance.
- Radiated emissions that exhibited worst case restricted band edge emissions were found in MIMO operation.

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Test Report S/N: 0Y1103150539.AK8	Test Dates: April 11-May 11, 2011	EUT Type: 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN	Page 46 of 47

## 7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Sony 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN FCC ID: AK8PCG41312L** is in compliance with Part 15C of the FCC Rules and RSS-210 of the Industry Canada Rules.

<b>FCC ID:</b> AK8PCG41312L		<b>FCC Pt. 15.247 802.11a/b/g/n MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1103150539.AK8	<b>Test Dates:</b> April 11-May 11, 2011	<b>EUT Type:</b> 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA/CDMA/EvDO and Band 13 LTE Laptop with BT and WLAN		Page 47 of 47