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[www.lsr.com](http://www.lsr.com)

## TEST REPORT # 313276 LSR Job #: C-1833

Compliance Testing of:  
SIQ Wireless Base Unit

Test Date(s):  
October 28-31, 2013

Prepared For:  
Attn: Rob Nunn  
Select Comfort  
9800 59<sup>th</sup> Ave North  
Minneapolis, MN 55442

In accordance with:  
**Federal Communications Commission (FCC)**  
Part 15, Subpart C, Section 15.247  
Industry Canada (IC) RSS 210 Annex 8  
**Digital Modulation Transmitters (DTS) Operating in the**  
**Frequency Band 2400 MHz – 2483.5 MHz**

**This Test Report is issued under the Authority of:**

Peter Feilen, EMC Engineer

Signature:

Date: 12/11/13

**Test Report Reviewed by:**

Ryan Urness, Laboratory Quality and  
Operations Manager

Signature:

Date: 12/9/13

**Tested by:**

Peter Feilen, EMC Engineer

Signature:

Date: 10/31/13

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## EXHIBIT 1. INTRODUCTION

### 1.1 Scope

<b>References:</b>	FCC Part 15, Subpart C, Section 15.247 RSS GEN and RSS 210 Annex 8
<b>Title:</b>	FCC : Telecommunication – Code of Federal Regulations, CFR 47, Part 15. IC : Low-power License-exempt Radio-communication Devices (All Frequency Bands): Category I Equipment
<b>Purpose of Test:</b>	To gain FCC and IC Certification Authorization for Low-Power License-Exempt Transmitters.
<b>Test Procedures:</b>	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.10 – 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.

### 1.2 Normative References

<b>Publication</b>	<b>Title</b>
47 CFR, Parts 0-15 (FCC)	Code of Federal Regulations - Telecommunications
RSS 210 Annex 8	Low-power License-exempt Radio-communication Devices (All Frequency Bands): Category I Equipment
ANSI C63.4	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.
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices
KDB 558074 D01 DTS Meas Guidance v03r01	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247

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### **1.3 LS Research, LLC Test Facility**

LS Research, LLC is accredited the requirements of ISO/IEC 17025, 2005 “General Requirements for the Competence of Calibration and Testing Laboratories”.

LS Research, LLC’s scope of accreditation includes all test methods listed herein, unless otherwise noted. Accreditation status can be verified at A2LA’s web site: A2LA.org

### **1.4 Location of Testing**

All testing was performed at LS Research, LLC, W66 N220 Commerce Court, Cedarburg, Wisconsin, 53012 USA, utilizing the facilities listed below, unless otherwise noted.

List of Facilities Located at LS Research, LLC:

- Compact Chamber
- Semi-Anechoic Chamber

### **1.5 Test Equipment Utilized**

A complete list of equipment utilized in testing is provided in Appendix A of this test report. Calibration dates are indicated in Appendix A. All test equipment is calibrated by a calibration laboratory accredited to the requirements of ISO 17025 and are traceable to SI standards.

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## EXHIBIT 2. PERFORMANCE ASSESSMENT

### 2.1 Client Information

<b>Manufacturer Name:</b>	<b>Select Comfort</b>
<b>Address:</b>	<b>9800 59<sup>th</sup> Ave North, Minneapolis, MN 55442</b>
<b>Contact Name:</b>	<b>Jeffery Barnum</b>

### 2.2 Equipment Under Test Information

*The following information has been supplied by the applicant.*

<b>Product Name:</b>	SIQ Wireless Base Unit
<b>Model Number:</b>	SIQ01VCSEDR
<b>Serial Number:</b>	Radiated Sample: 3-028956 Conducted Sample: 3-028864

### 2.3 Associated Antenna Description

A Pulse brand chip antenna is used in this application. The Pulse chip antenna has a 50 ohm impedance match. A peak gain of the Pulse chip antenna is 1.7 dBi.

*Note: Per the antenna manufacturer data sheet for W3008 antenna, datasheet version 2.7*

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## 2.4 EUT'S Technical Specifications

EUT Frequency Range (in MHz)	WLAN: 2412-2462 MHz
Minimum EIRP in Watts	11b: 0.059 11g: 0.076 11n: 0.042
Maximum EIRP in Watts	11b: 0.132 11g: 0.135 11n: 0.085
Minimum Conducted Output Power (in dBm)	11b: 17.7 dBm 11g: 18.8 dBm 11n: 16.2 dBm
Maximum Conducted Output Power (in dBm)	11b: 21.2 dBm 11g: 21.3 dBm 11n: 19.3 dBm
Occupied Bandwidth (99% BW) (MHz)	11b: 14.44 MHz 11g: 16.67 MHz 11n: 17.71 MHz
Type of Modulation	11b: QPSK 11g: BPSK 11n: 64-QAM
Emission Designator	11b: 14M4D2W 11g: 16M7D2W 11n: 17M7D2W
Transmitter Spurious (worst case) at 3 meters	39.1 dBuV/m @ 3m
Receiver Spurious (worst case) at 3 meters	42.9 dBuV/m @ 3m
Receiver Sensitivity	11b: -89 dBm 11g: -76 dBm 11n: -73 dBm
Frequency Tolerance %, Hz, ppm	Better than 100 ppm
<b>Antenna Information</b>	
Detachable/non-detachable	Non-detachable
Type	Chip
Gain (in dBi)	1.7 dBi
EUT will be operated under FCC Rule Part(s)	15.247
EUT will be operated under RSS Rule Part(s)	RSS 210
Modular Filing	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Portable or Mobile?	Portable

### RF Technical Information:

Type of Evaluation (check one)	<input type="checkbox"/>	SAR Evaluation: Device Used in the Vicinity of the Human Head
	<input type="checkbox"/>	SAR Evaluation: Body-worn Device
	<input checked="" type="checkbox"/>	RF Evaluation

If RF Evaluation checked above, test engineer to complete the following:

- Evaluated against exposure limits: ☒ General Public Use ☐ Controlled Use
- Duty Cycle used in evaluation: 100 %
- Standard used for evaluation: OET 65
- Measurement Distance: 20 cm
- RF Value: 0.26837 ☐ V/m ☐ A/m ☒ W/m<sup>2</sup>  
☒ Measured ☐ Computed ☐ Calculated

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## **2.5 Product Description**

**Note:** *Information provided by customer*

### **OPERATIONAL DESCRIPTION**

#### **1. Overview**

The pump control unit adjusts the pressure in a Select Comfort Mattress in response to commands from a RF hand control, Bluetooth Low Energy device, voice control wired serial interface, or through the USB connection. The pump control circuit board is powered from ordinary household current and is housed in the pump/valve assembly. A microcontroller manages all control functions and communications to the identified interfaces. The pump control board will be equipped with two pressure sensors for a Dual mattress system and one for a Single. The pump control board can operate three solenoid valves (only two active at a time) and a single pump. A Sleep Expert circuit board is connected via the USB connection to the pump control circuit board and is used to analyze pressure changes in real time and connect to the cloud via WiFi.

#### **2. Operational Details**

The pump control board is an AC powered device that operates two radios at a frequency of 2.4 GHz and supports both USB and serial UART wired interfaces. The onboard microcontroller communicates over SPI to a Freescale MC13201 programmable IEEE 802.15.4-type radio and a Texas Instruments CC2541 programmable Bluetooth 4.0 compliant radio.

- The Freescale MC13201 radio supports 250 kbps Offset-Quadrature Phase Shift Keying (O-QPSK) data in 2.0 MHz channels between the frequency range of 2.405 GHz and 2.480 GHz. The over-the-air frequency is generated with a phase-locked loop from a 16 MHz crystal. Data is transmitted when a remote control requests information from the pump control board. The MC13201 radio chip operates under 802.15.4 protocol and a board etched Omni-directional inverted F-Antenna which creates a gain of approximately 1 dBi.
- The Texas Instruments CC2541 radio supports 2 Mbps Gaussian Frequency Shift Keying (GFSK) data in 2MHz channels between the frequency range of 2.402 GHz and 2.480 GHz. The over-the-air frequency is generated with a phase-locked loop from a 32MHz crystal. The CC2541 radio chip operates under the Bluetooth 4.0 protocol and a board etched Omni-directional meandered F-Antenna creates a gain of approximately 1 dBi.

The sleep expert circuit board is a USB powered device that operates on frequencies between 2.412 GHz and 2.462 GHz. The onboard microcontroller communicates over SPI to a LSR TiWi-BLE module operating in WLAN mode only. This radio module supports up to 65Mbps under the 802.11 b/g/n protocol. The over-the-air frequency is generated within the TiWi-BLE module and transmitted to the Pulse WLAN ceramic chip antenna creating a gain of approximately 1.7 dBi peak and 0.7 dBi band edge.

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## EXHIBIT 3. EUT OPERATING CONDITIONS & CONFIGURATIONS DURING TESTS

### 3.1 Climate Test Conditions

Temperature:	15-35 °C
Humidity:	30-60%
Pressure:	645-795 mmHg

### 3.2 Applicability & Summary of EMC Emission Test Results

FCC and IC Paragraph	Test Requirements	Compliance (yes/no)
FCC : 15.207, FCC 15.107	Power Line Conducted Emissions Measurements	Yes
FCC : 15.247(a)(2) IC : RSS GEN section 4.6.2	6 dB Bandwidth of a Digital Modulation System	Yes
IC : RSS GEN 4.6.1	99% Bandwidth	Yes
FCC : 15.247(b) IC : RSS 210 A8.4(2)	Maximum Output Power	Yes
FCC : 15.247(i), 1.1307, 1.1310, 2.1091 & 2.1093 IC : RSS 102	RF Exposure Limit	Yes
FCC : 15.247(d) IC : RSS 210 A8.5	RF Conducted Spurious Emissions at the Transmitter Antenna Terminal	Yes
FCC : 15.247(e) IC : RSS 210 A8.2(b)	Transmitted Power Spectral Density of a Digital Modulation System	Yes
FCC : 15.247(d), 15.209 & 15.205 IC : RSS 210 section 2.2, 2.5	Transmitter Radiated Emissions	Yes
<i>The digital circuit portion of the EUT has been tested and verified to comply with FCC Part 15, Subpart B, Class B Digital Devices (RSS GEN and RSS 210 of IC) and the associated Radio Receiver has also been tested and found to comply with Part 15, Subpart B – Radio Receivers (RSS GEN and RSS 210 of IC).</i>		

### 3.3 Modifications Incorporated In The EUT For Compliance Purposes

☒ None ☐ Yes (explain below)

### 3.4 Deviations & Exclusions From Test Specifications

☒ None ☐ Yes (explain below)

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## EXHIBIT 4. DECLARATION OF CONFORMITY

The EUT was found to MEET the requirements as described within the specification of FCC Title 47, CFR Part 15.247, and Industry Canada RSS-210, Issue 8 (2010), Section Annex 8 (section 8.2) for a Digital Spread Spectrum (DSS) Transmitter.

If some emissions are seen to be within 3 dB of their respective limits:

As these levels are within the tolerances of the test equipment and site employed, there is a possibility that this unit, or a similar unit selected out of production may not meet the required limit specification if tested by another agency.

LS Research, LLC certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specifications. The results in this Test Report apply only to the item(s) tested on the above-specified dates. Any modifications made to the EUT subsequent to the indicated test date(s) will invalidate the data herein, and void this certification.

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## EXHIBIT 5. RADIATED EMISSIONS TEST

### **5.1 Test Setup**

The test setup was assembled in accordance with Title 47, CFR FCC Part 15, RSS GEN and ANSI C63.4. The EUT was placed on an 80cm high non-conductive pedestal, centered on a flush mounted 2-meter diameter turntable inside a 3 meter Semi-Anechoic, FCC listed Chamber. The EUT was operated in and final testing was performed using continuous modulated transmit mode. The unit has the capability to operate on 11 channels.

The applicable limits apply at a 3 meter distance. Measurements above 4 GHz were performed at a 1.0 meter separation distance. The calculations to determine these limits are detailed in the following pages. Please refer to Appendix A for a complete list of test equipment. The test sample was operated on one of three (3) standard channels: low (2412 MHz), middle (2437 MHz) and high (2462 MHz) to comply with FCC Part 15.31(m). The channels and operating modes were changed via HyperTerminal PC interface.

### **5.2 Test Procedure**

Radiated RF measurements were performed on the EUT in a 3 meter Semi-Anechoic, FCC listed Chamber. The frequency range from 30 MHz to 25000 MHz was scanned and investigated. The radiated RF emission levels were manually noted at the various fixed degree settings of azimuth on the turntable and antenna height. The EUT was placed on a non-conductive pedestal in the 3 meter Semi-Anechoic Chamber, with the antenna mast placed such that the antenna was 3 meters from the EUT. A Biconical Antenna was used to measure emissions from 30 MHz to 300 MHz, and a Log Periodic Antenna was used to measure emissions from 300 MHz to 1000 MHz. A Double-Ridged Waveguide Horn Antenna was used from 1 GHz to 18 GHz. The maximum radiated RF emissions were found by raising and lowering the antenna between 1 and 4 meters in height, using both horizontal and vertical antenna polarities. From 18 GHz to 25 GHz, the EUT was measured using a standard gain Horn Antenna and pre-amplifier.

The EUT was rotated along three orthogonal axes during the investigations to find the highest emission levels.

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### **5.3 Test Equipment Utilized**

A list of the test equipment and antennas utilized for the Radiated Emissions test can be found in Appendix A. The Connecting Cables were measured for losses using a calibrated Signal Generator and EMI System. The resulting correction factors and the cable loss factors from these calibrations were entered into the EMI Receiver database. As a result, the data taken from the EMI Receiver accounts for the antenna correction factor as well as cable loss or other corrections, and can therefore be entered into the database as a corrected meter reading. The EMI Receiver was operated with a resolution bandwidth of 120 kHz for measurements below 1 GHz (video bandwidth of 300 kHz), and a bandwidth of 1 MHz for measurements above 1 GHz (video bandwidth of 1 MHz for peak measurements, 30 kHz for average measurements). From 4 GHz to 18 GHz, a Spectrum Analyzer and Horn Antenna with preamp were used. From 18 GHz to 25 GHz, a Spectrum Analyzer as well as a standard gain horn and preamp were used.

### **Test Equipment List**

Please see Appendix A

### **5.4 Test Results**

The EUT was found to **MEET** the Radiated Emissions requirements of Title 47 CFR, FCC Part 15.247 and Canada RSS-210, Issue 8 (2010), Annex 8 for a DTS transmitter. The frequencies with significant RF signal strength were recorded and plotted as shown in the Data Charts and Graphs.

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## **5.5 Calculation of Radiated Emissions Limits**

The maximum peak output power of an intentional radiator in the 2400-2483.5 MHz band, as specified in Title 47 CFR 15.247 (b)(3) and RSS 210 A8.4 is 1 Watt. The harmonic and spurious RF emissions, as measured in any 100 kHz bandwidth, as specified in 15.247 (d) and RSS 210 A8.2(b), shall be at least 20 dB below the measured power of the desired signal, and must also meet the requirements described in 15.205(c) for FCC and section 2.2,2.6 and 2.7 of RSS 210 for IC.

The following table depicts the general radiated emission limits above 30 MHz. These limits are obtained from Title 47 CFR, Part 15.209, for radiated emissions measurements. These limits were applied to any signals found in the 15.205 restricted bands. The mentioned limits correspond to those limits listed in RSS 210 section 2.7.

Frequency (MHz)	3 m Limit $\mu\text{V/m}$	3 m Limit (dB $\mu\text{V/m}$ )	1 m Limit (dB $\mu\text{V/m}$ )
30-88	100	40.0	-
88-216	150	43.5	-
216-960	200	46.0	-
> 960	500	54.0	63.5

Sample conversion from field strength  $\mu\text{V/m}$  to dB $\mu\text{V/m}$ :

$$\begin{aligned}\text{dB}\mu\text{V/m} &= 20 \log_{10} (100) \\ &= 40 \text{ dB}\mu\text{V/m} \text{ (from 30-88 MHz)}\end{aligned}$$

For measurements made at 1.0 meter, a 9.5 dB correction has been invoked.

$$\begin{aligned}&> 960 \text{ MHz} \\ &500\mu\text{V/m or } 54.0 \text{ dB}\mu\text{V/m at 3 meters} \\ &54.0 + 9.5 = 63.5 \text{ dB}\mu\text{V/m at 1 meter}\end{aligned}$$

### Sample Calculation using correction factors from the device

Raw Receiver Data + Antenna Factor + Cable Factor + = Reported Value

Generic example of reported data at 200 MHz:

$$\begin{aligned}\text{Reported Measurement data} &= 18.2 \text{ (raw receiver measurement)} + 15.8 \text{ (antenna factor)} + 1.45 \text{ (cable factor)} \\ &= 35.45 \text{ dB}\mu\text{V}\end{aligned}$$

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## 5.6 Radiated Emissions Test Data Chart

3 Meter Measurements of Electromagnetic Radiated Emissions  
Frequency Range Inspected: 30 MHz to 25000 MHz

Manufacturer:	Select Comfort					
Date(s) of Test:	October 29-31, 2013					
Test Engineer(s):	Peter Feilen					
Voltage:	120 VAC					
Operation Mode:	continuous transmit, continuous receive					
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %					
EUT Power:		Single Phase ___ VAC			3 Phase ___ VAC	
		Battery			Other:	
EUT Placement:	X	80cm non-conductive table			10cm Spacers	
EUT Test Location:	X	3 Meter Semi-Anechoic FCC Listed Chamber			3/10m OATS	
Measurements:		Pre-Compliance		Preliminary	X	Final
Detectors Used:	X	Peak		X	Quasi-Peak	Average

The following table depicts the level of significant spurious radiated RF emissions found:

Frequency (MHz)	Height (m)	Azimuth (degree)	Peak Reading (dBμV/m)	Quasi Peak Reading (dBμV/m)	Quasi Peak Limit (dBμV/m)	Margin (dB)	Antenna Polarity	EUT orientation
128.0	1.30	158	35.2	33.9	43.5	9.6	H	F
128.0	1.06	48	39.0	36.9	43.5	6.6	V	F
128.0	1.65	235	31.8	28.0	43.5	15.5	H	S
36.2	1.00	12	34.5	30.4	40.0	9.7	V	S
128.0	1.00	93	35.4	31.8	43.5	11.7	V	S
128.0	1.00	0	36.7	33.5	43.5	10.0	V	V
128.0	1.60	254	32.3	28.6	43.5	14.9	H	V

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## **RADIATED EMISSIONS DATA CHART (continued)**

The following table depicts the level of significant radiated RF harmonic emissions seen on Channel 1:

Frequency (MHz)	Height (m)	Azimuth (degree)	Peak Reading (dBμV/m)	Avg Reading (dBμV/m)	Avg Limit (dBμV/m)	Margin (dB)	Antenna Polarity	EUT orientation
4824	1.00	346	56.5	52.4	63.5	11.1	Horizontal	Vertical
12060	Note 1				63.5			
14472	Note 1				63.5			
19296	1.00	331	51.7	47.3	63.5	16.2	Vertical	Vertical

The following table depicts the level of significant radiated RF harmonic emissions seen on Channel 6:

Frequency (MHz)	Height (m)	Azimuth (degree)	Peak Reading (dBμV/m)	Avg Reading (dBμV/m)	Avg Limit (dBμV/m)	Margin (dB)	Antenna Polarity	EUT orientation
4874	1.11	341	52.7	46.9	63.5	16.6	Horizontal	Side
7311	Note 1				63.5			
12185	Note 1				63.5			
19496	1.01	328	51.1	46.6	63.5	16.9	Vertical	Vertical

The following table depicts the level of significant radiated RF harmonic emissions seen on Channel 11:

Frequency (MHz)	Height (m)	Azimuth (degree)	Peak Reading (dBμV/m)	Avg Reading (dBμV/m)	Avg Limit (dBμV/m)	Margin (dB)	Antenna Polarity	EUT orientation
4924	1.19	17	51.6	45.5	63.5	18.0	Vertical	Vertical
7386	Note 1				63.5			
12310	Note 1				63.5			
19696	1.06	331	51.0	45.8	63.5	17.7	Vertical	Vertical
22158	Note 1				63.5			

Notes:

- 1) Measurement at receiver system noise floor.
- 2) Measurements above 4 GHz were made at 1 meters of separation from the EUT
- 3) Average measurement made with RBW=1 MHz, VBW=30 kHz

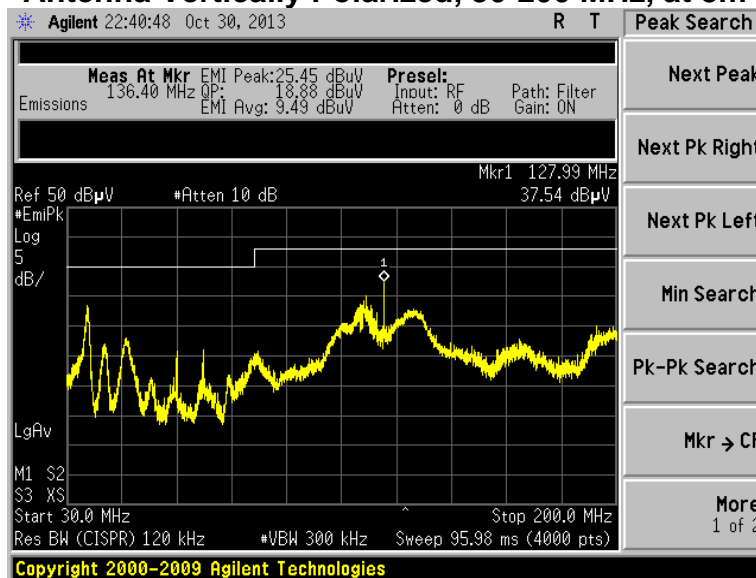
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## 5.7 Screen Captures - Radiated Emissions Test

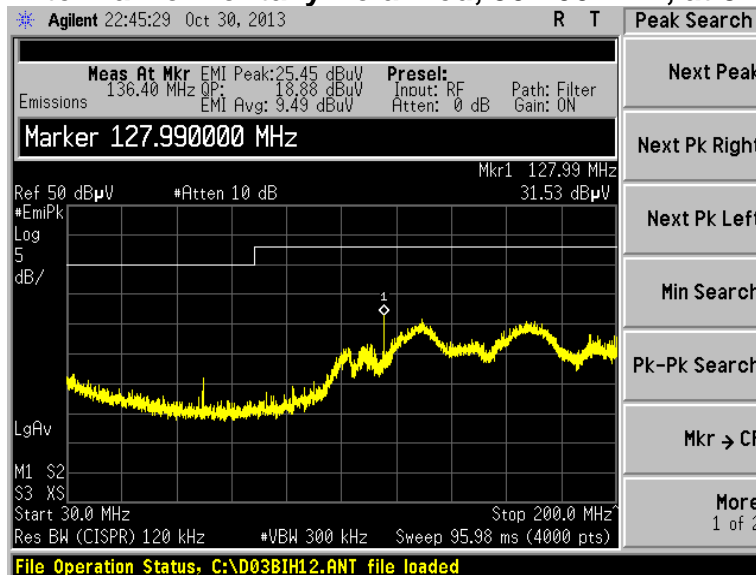
These screen captures represent Peak Emissions. For radiated emission measurements, a Quasi-Peak detector function is utilized when measuring frequencies below 1 GHz, and an Average detector function is utilized when measuring frequencies above 1 GHz.

The signature scans shown here are from worst-case emissions, as measured on channels 1, 6, or 11, with the sense antenna both in vertical and horizontal polarity for worst case presentations.

### Antenna Vertically Polarized, 30-200 MHz, at 3m



### Antenna Horizontally Polarized, 30-200 MHz, at 3m

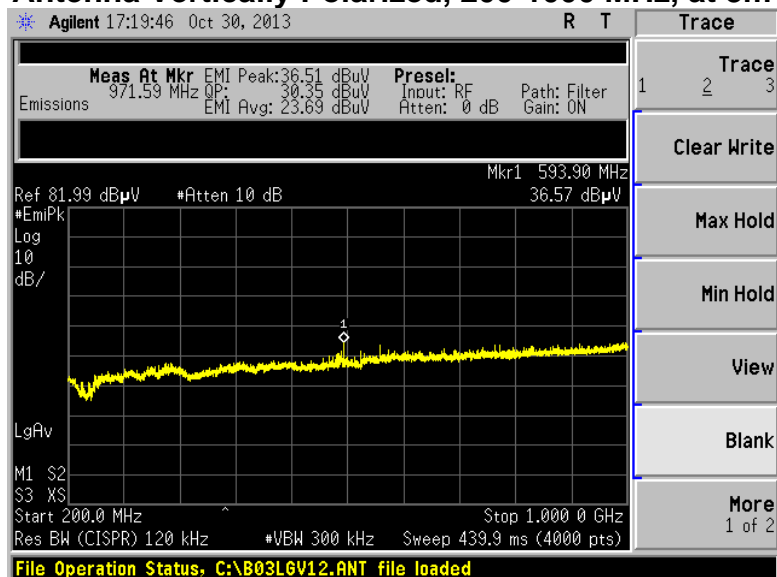


Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 16 of 65

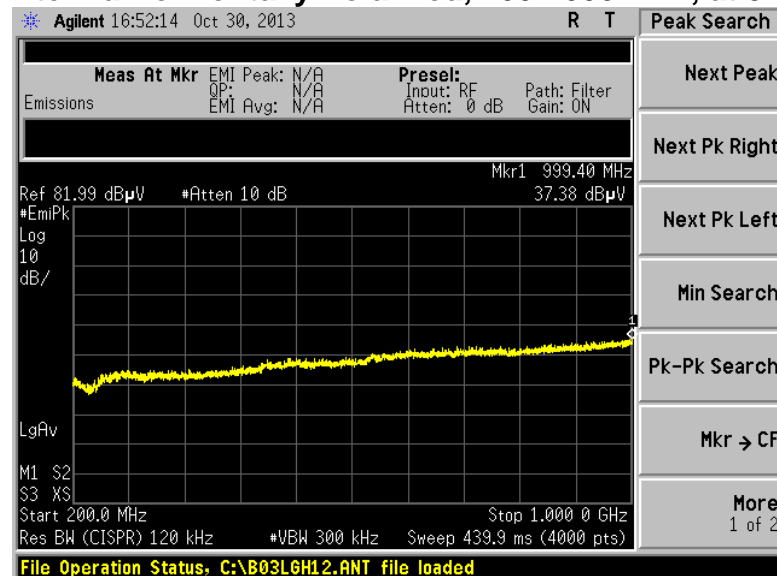


## Screen Captures - Radiated Emissions Testing (continued)

### Antenna Vertically Polarized, 200-1000 MHz, at 3m



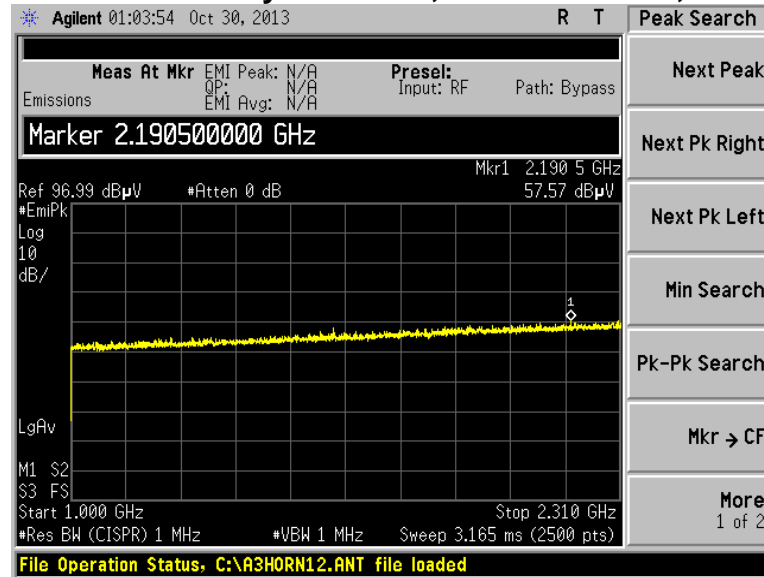
### Antenna Horizontally Polarized, 200-1000 MHz, at 3m



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 17 of 65

## Screen Captures - Radiated Emissions Testing (continued)

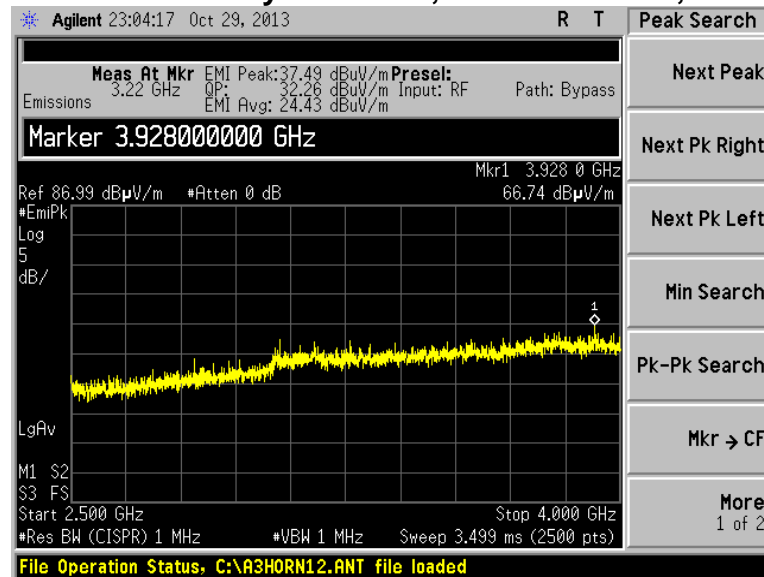
### Antenna Vertically Polarized, 1000-2310 MHz, at 3m



\*\*2310-2390 MHz is represented in Section 8, Bandedge Measurements

\*\*2483.5-2500 MHz is represented in Section 8, Bandedge Measurements

### Antenna Vertically Polarized, 2500-4000 MHz, at 3m



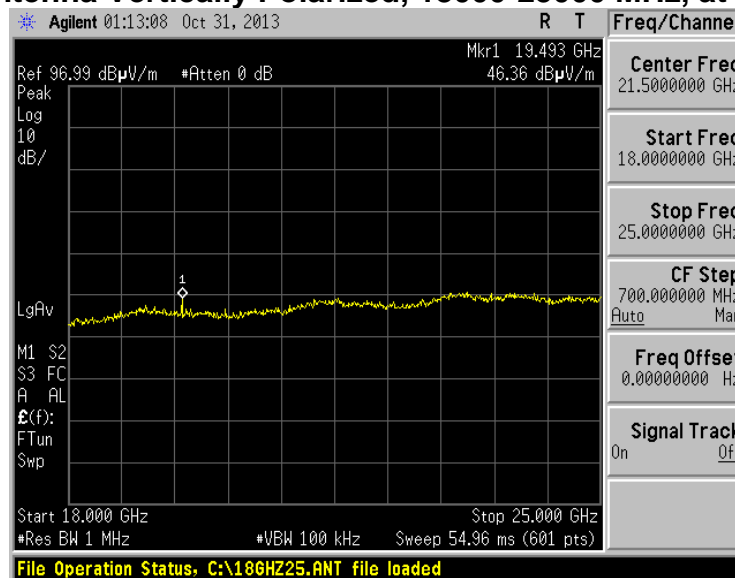
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 18 of 65

## Screen Captures - Radiated Emissions Testing (continued)

### Antenna Vertically Polarized, 4000-18000 MHz, at 1m



### Antenna Vertically Polarized, 18000-25000 MHz, at 1m



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 19 of 65

## **5.9 Receive Mode Testing**

Per the requirements of RSS-210, the EUT was placed in continuous receive mode and the radiated spurious emissions were measured and compared to the limits stated in RSS-Gen Section 4.10.

The test setup, procedure, and equipment utilized were identical to that described in sections 5.1, 5.2, and 5.3 of this document.

Measurement data and screen captures from the receive tests are presented below:

Frequency (MHz)	Height (m)	Azimuth (degree)	Peak Reading (dBμV/m)	Quasi Peak Reading (dBμV/m)	Quasi Peak Limit (dBμV/m)	Margin (dB)	Antenna Polarity	EUT orientation
36.0	1.00	82	35.9	31.3	40.0	8.7	V	V
128.0	1.00	0	39.5	36.3	43.5	7.2	V	V
41.7	1.00	161	27.2	21.9	40.0	18.1	V	V
64.0	1.00	113	28.7	26.9	40.0	13.1	V	V
128.0	1.63	254	33.8	30.1	43.5	13.4	H	V
128.0	1.30	250	37.7	33.5	43.5	10.0	H	F
128.0	1.00	56	41.8	39.1	43.5	4.4	V	F
36.0	1.00	273	34.9	30.6	40.0	9.4	V	F
64.0	1.00	0	29.2	26.9	40.0	13.1	V	F
41.6	1.00	0	27.3	23.1	40.0	17.0	V	F
128.0	1.00	110	36.4	33.7	43.5	9.9	V	S
36.0	1.00	358	33.3	29.4	40.0	10.6	V	S

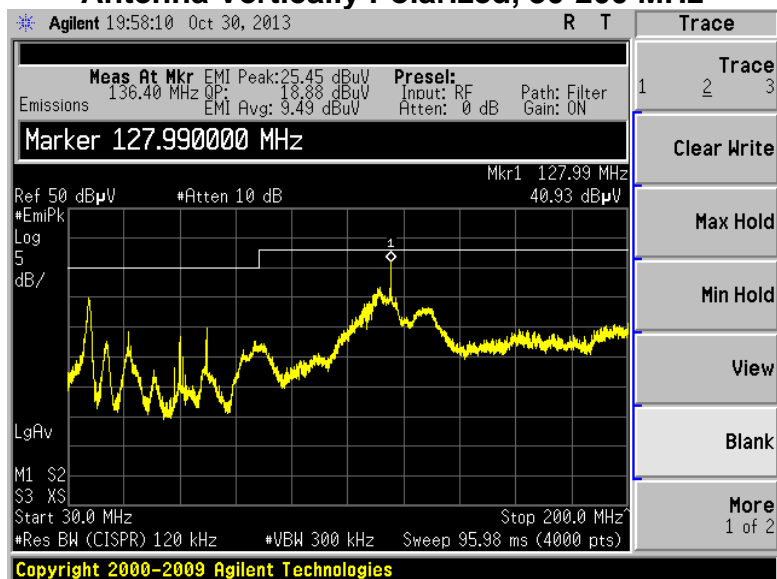
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 20 of 65</b>

## Screen Captures - Radiated Emissions Testing – Receive Mode

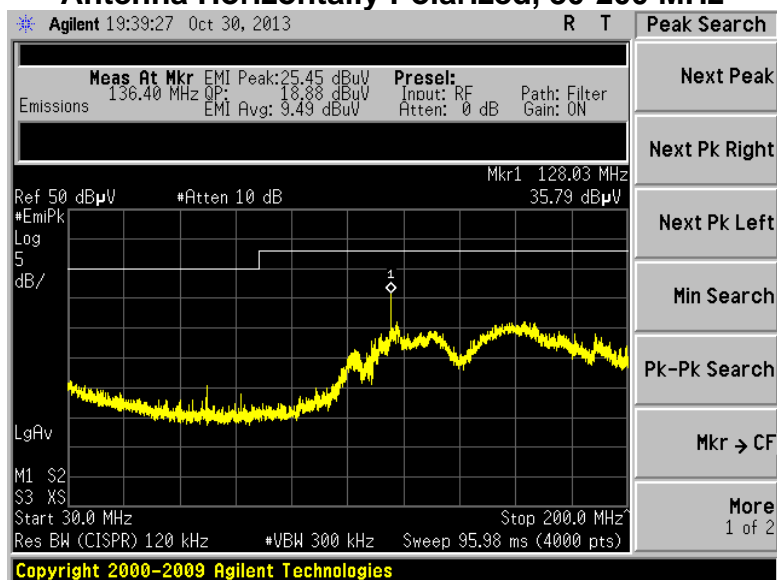
These screen captures represent Peak Emissions. For radiated emission measurements, a Quasi-Peak detector function is utilized when measuring frequencies below 1 GHz, and an Average detector function is utilized when measuring frequencies above 1 GHz.

The signature scans shown here are from worst-case emissions, as measured on channels 1, 6 and 11, with the sense antenna both in vertical and horizontal polarity for worst case presentations.

### Antenna Vertically Polarized, 30-200 MHz



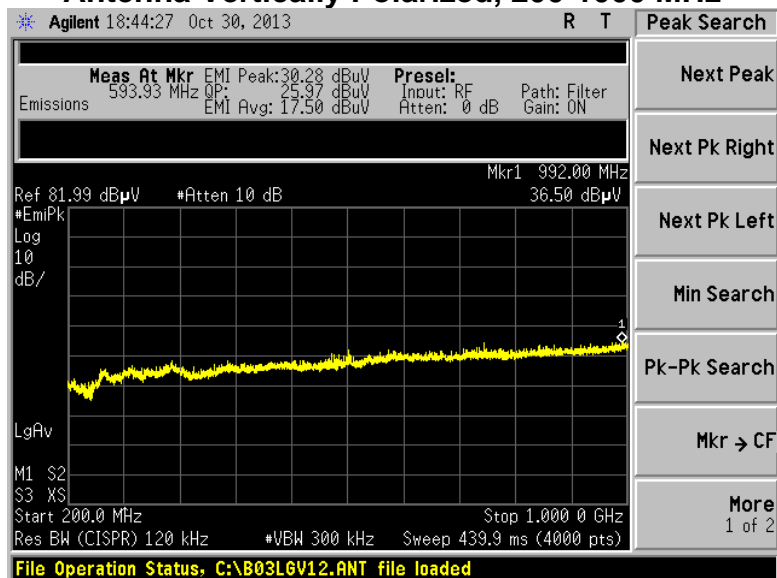
### Antenna Horizontally Polarized, 30-200 MHz



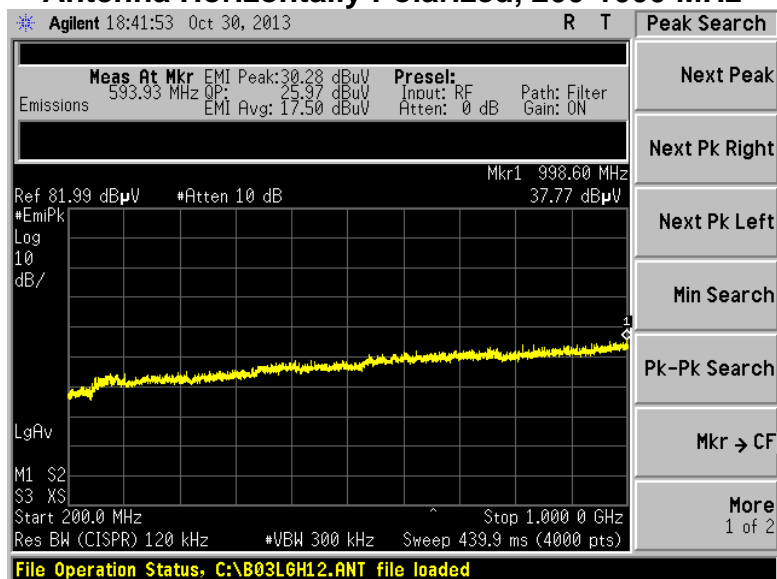
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSER	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 21 of 65

## Screen Captures - Radiated Emissions Testing – Receive Mode (continued)

### Antenna Vertically Polarized, 200-1000 MHz



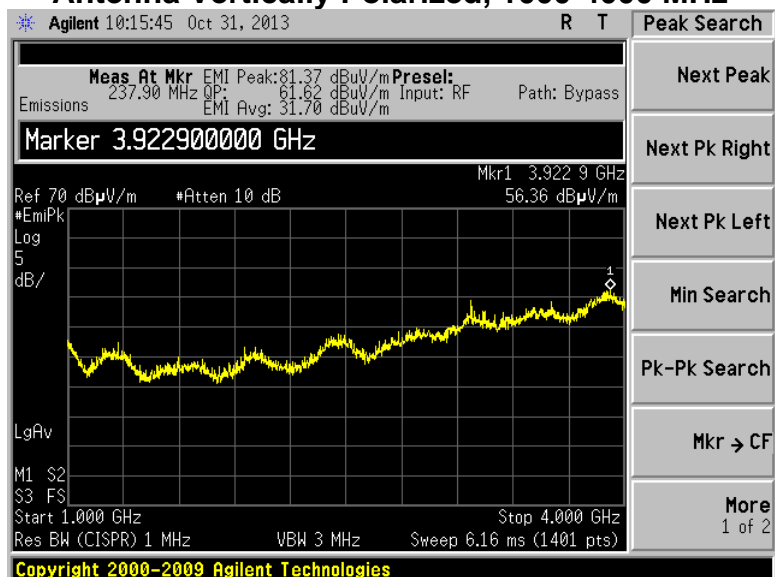
### Antenna Horizontally Polarized, 200-1000 MHz



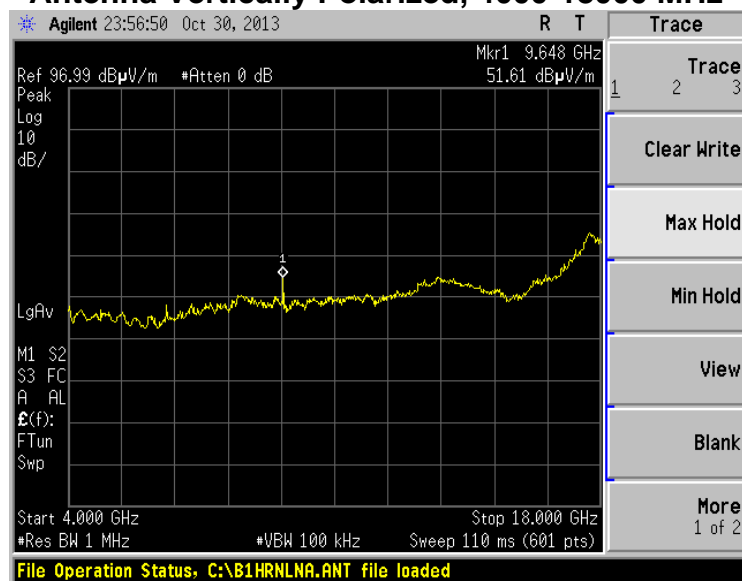
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 22 of 65

## Screen Captures - Radiated Emissions Testing – Receive Mode (continued)

### Antenna Vertically Polarized, 1000-4000 MHz

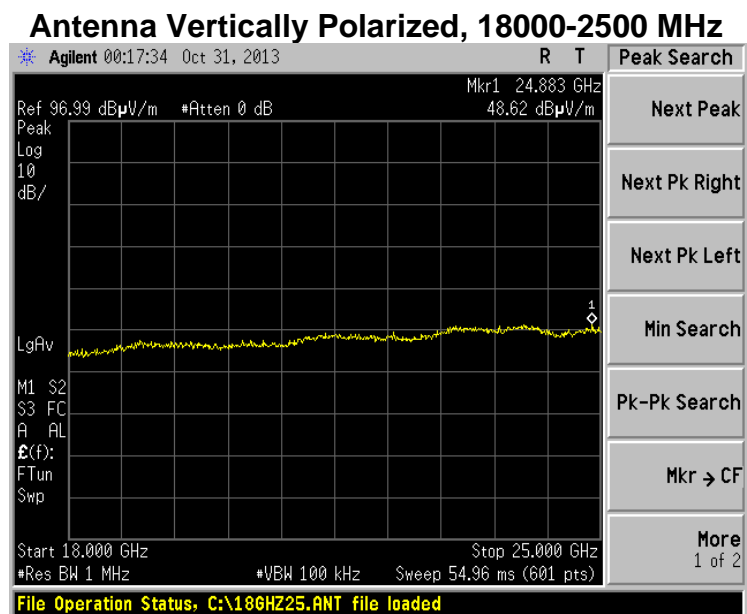


### Antenna Vertically Polarized, 4000-18000 MHz



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 23 of 65

**Screen Captures - Radiated Emissions Testing – Receive Mode (continued)**



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 24 of 65



## EXHIBIT 6. CONDUCTED EMISSIONS TEST, AC POWER LINE:

### **6.1 Test Setup**

The test area and setup are in accordance with ANSI C63.4 and with Title 47 CFR, FCC Part 15, Industry Canada RSS-210 and RSS GEN. The EUT was placed on a non-conductive wooden table, with a height of 80 cm above the reference ground plane. The EUT's power cable was plugged into a 50Ω (ohm), 50/250 μH Line Impedance Stabilization Network (LISN). The AC power supply of 120V was provided at the conducted emissions test area via an appropriate broadband EMI Filter, and then to the LISN line input. Final readings were then taken and recorded. After the EUT was setup and connected to the LISN, the RF Sampling Port of the LISN was connected to a 10 dB Attenuator-Limiter, and then to the EMI System. The LISN used has the ability to terminate the unused port with a 50Ω (ohm) load when switched to either L1 (line) or L2 (neutral).

### **6.2 Test Procedure**

The EUT was investigated in continuous modulated transmit mode and continuous receive mode for this portion of the testing. The appropriate frequency range and bandwidths were selected on the EMI Receiver, and measurements were made. The bandwidth used for these measurements is 9 kHz, as specified in CISPR 16-1, Section 1, Table 1, for Quasi-Peak and Average detectors in the frequency range of 150 kHz to 30 MHz. Final readings were then taken and recorded.

### **6.3 Test Equipment Utilized**

Please reference Appendix A.

### **6.4 Test Results**

The EUT was found to **MEET** the Conducted Emission requirements of FCC Part 15.207 and RSS GEN 7.2.4 Conducted Emissions for an Intentional Radiator. See the Data Charts and Graphs for more details of the test results.

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 25 of 65</b>

## 6.5 FCC Limits of Conducted Emissions at the AC Mains Ports

Frequency Range (MHz)	Class B Limits (dBµV)		Measuring Bandwidth
	Quasi-Peak	Average	
0.150 - 0.50 *	66-56	56-46	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 1 Hz for Average
0.5 – 5.0	56	46	
5.0 – 30	60	50	
* The limit decreases linearly with the logarithm of the frequency in this range.			

## 6.6 Conducted Emissions Test Data Chart

Frequency Range inspected: 150 KHz to 30 MHz

Manufacturer:	Select Comfort				
Date(s) of Test:	October 31, 2013				
Test Engineer:	Peter Feilen				
Voltage:	120 VAC				
Operation Mode:	continuous transmit, continuous receive				
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %				
Test Location:	X	Conducted Emissions Area			Chamber
EUT Placed On:	X	40cm from Vertical Ground Plane			10cm Spacers
	X	80cm above Ground Plane			Other:
Measurements:		Pre-Compliance		Preliminary	X Final
Detectors Used:	X	Peak	X	Quasi-Peak	X Average

EUT Operating Mode	Frequency (MHz)	Line	Quasi-Peak			Average		
			Q-Peak Reading (dBµV)	Q-Peak Limit (dBµV)	Quasi-Peak Margin (dB)	Average Reading (dBµV)	Average Limit (dBµV)	Average Margin (dB)
RX	0.197	1	32.1	63.7	31.6	21.5	53.7	32.3
	3.280	1	30.5	56.0	25.5	25.4	46.0	20.6
TX	0.220	1	31.4	62.8	31.4	22.9	52.8	29.9
	2.570	1	26.0	56.0	30.0	18.1	46.0	27.9
RX	0.198	2	36.1	63.7	27.6	25.5	53.7	28.2
	12.870	2	28.6	60.0	31.4	22.6	50.0	27.4
TX	0.170	2	33.5	65.0	31.4	23.5	55.0	31.5
	1.640	2	30.7	56.0	25.3	27.7	46.0	18.4

### Notes:

- 1) The emissions listed are characteristic of the power supply used, and did not change by the EUT.
- 2) The EUT exhibited similar emissions across the Low, Middle and High channels tested.

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 26 of 65

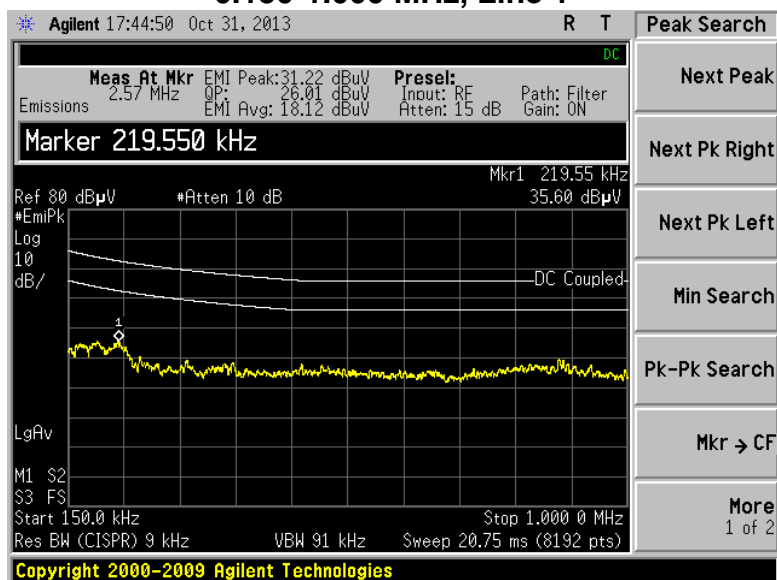
## 6.7 Screen Captures – Conducted Emissions Test

These screen captures represent Peak Emissions. For conducted emission measurements, both a Quasi-Peak detector function and an Average detector function are utilized. The emissions must meet both the Quasi-peak limit and the Average limit as described in 47 CFR 15.207 and RSS GEN 7.2.4 (Table 4).

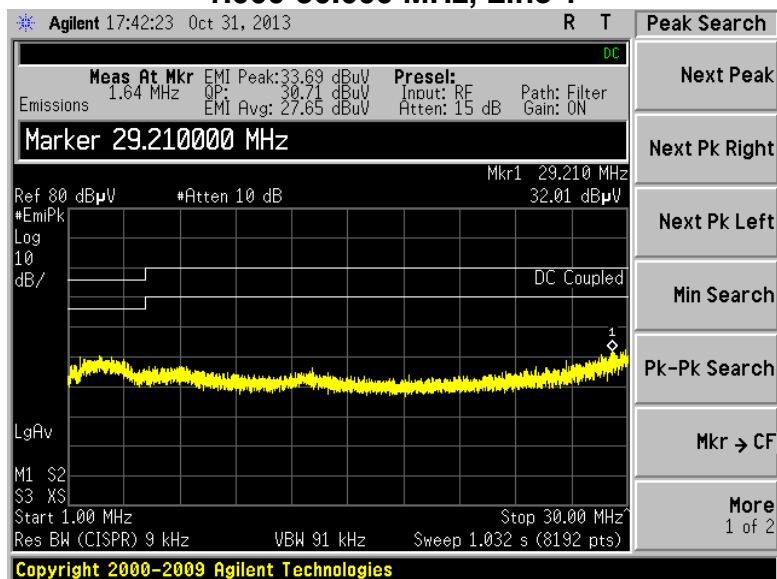
The signature scans shown here are from channel 1, chosen as being a good representative of channels.

### Transmit Mode

#### 0.150-1.000 MHz, Line 1

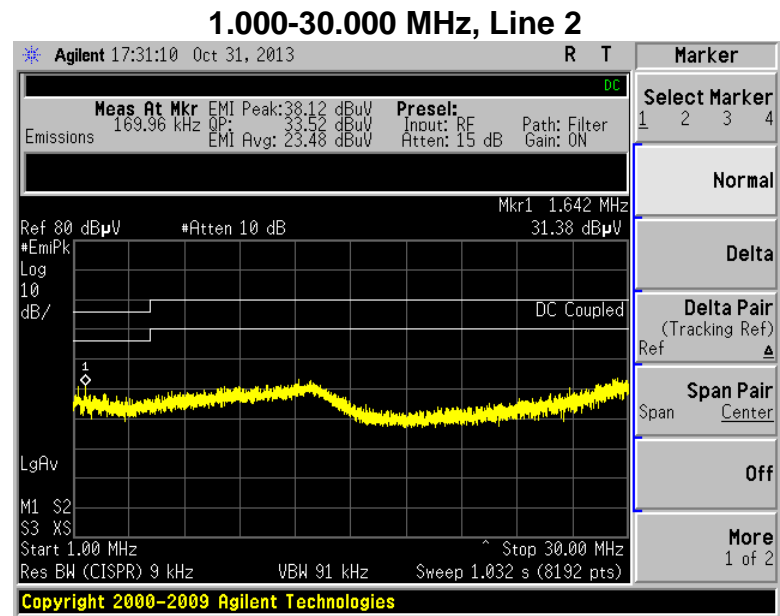
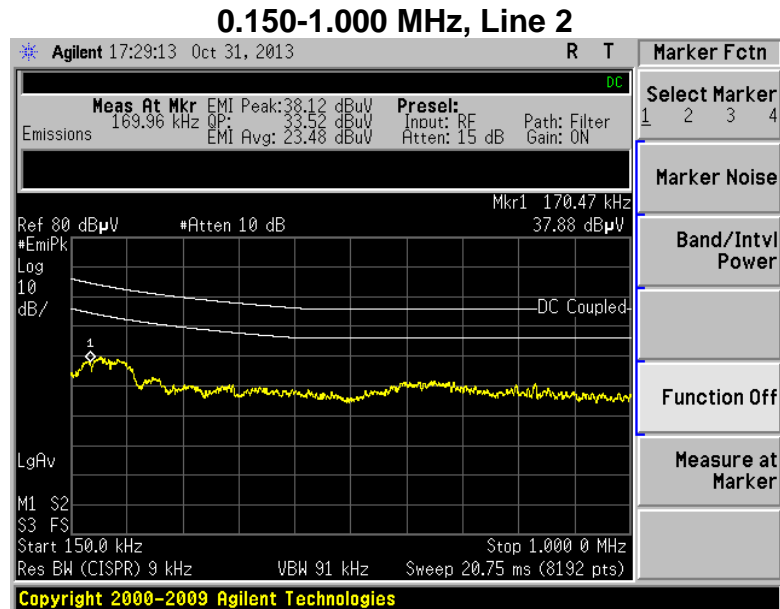


#### 1.000-30.000 MHz, Line 1



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 27 of 65

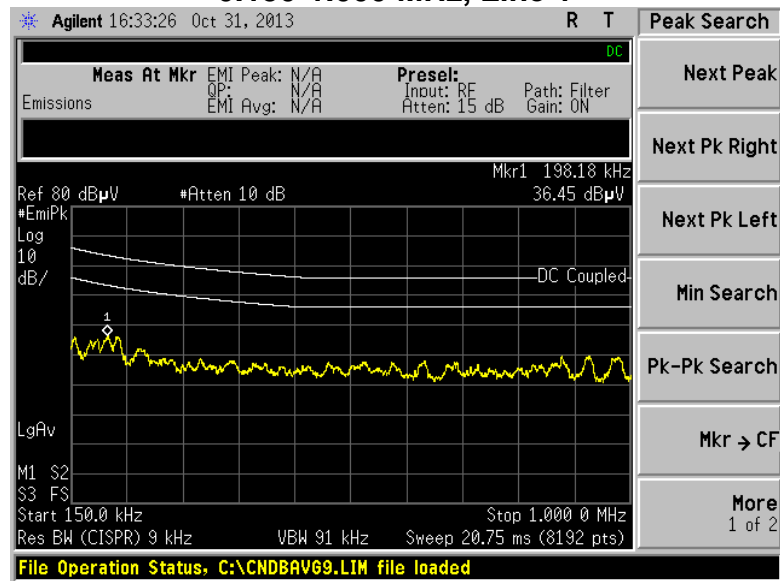
## Screen Captures – Conducted Emissions Test (cont.)



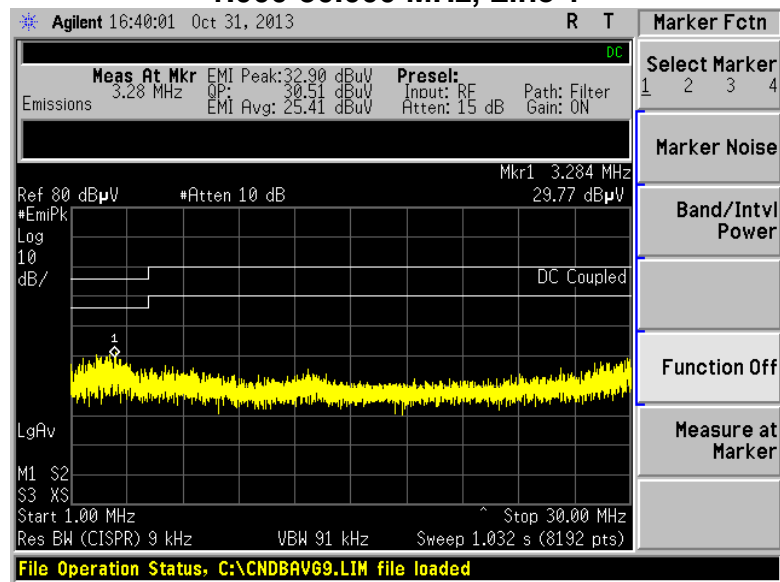
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 28 of 65

## Receive Mode

### 0.150-1.000 MHz, Line 1



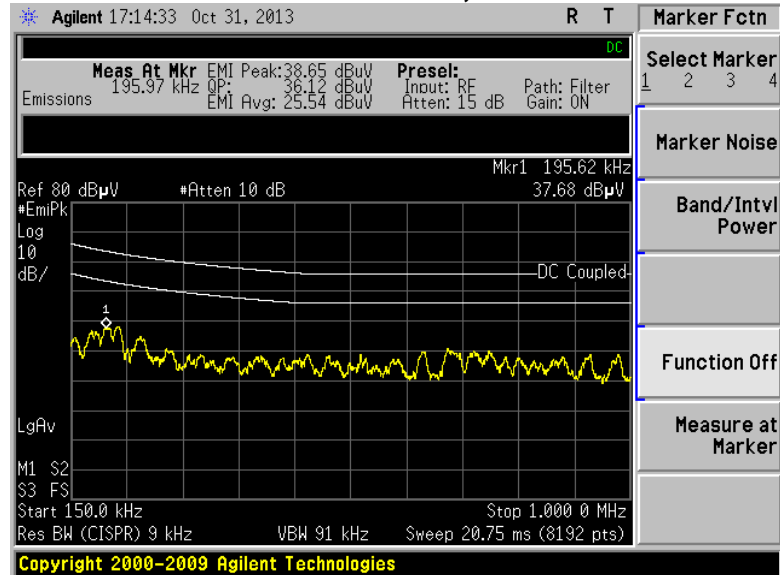
### 1.000-30.000 MHz, Line 1



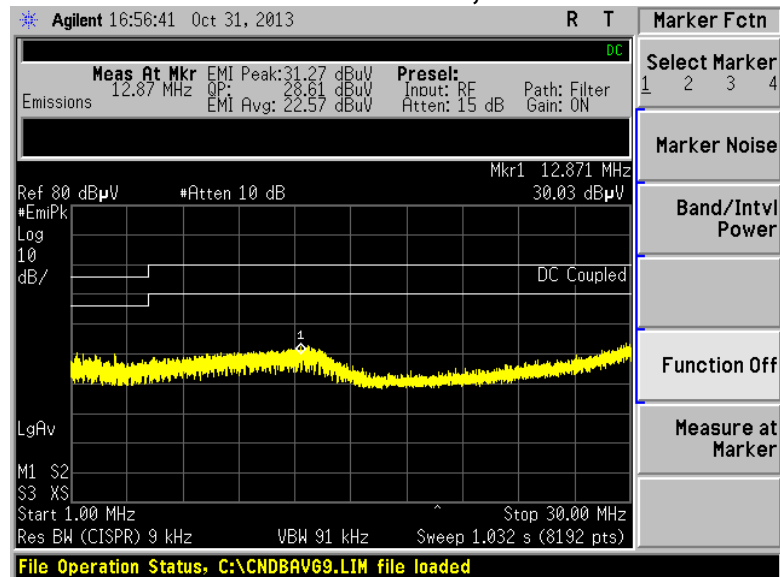
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 29 of 65

## Screen Captures – Conducted Emissions Test (cont.)

### 0.150-1.000 MHz, Line 2



### 1.000-30.000 MHz, Line 2



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 30 of 65

## EXHIBIT 7. OCCUPIED BANDWIDTH:

### **7.1 Method of Measurements**

Refer to ANSI C63.10 and KDB 558074 D01 DTS Meas Guidance v03r01 for Digital Transmission Systems operating under 15.247.

The transmitter output was connected to the Spectrum Analyzer. The bandwidth of the fundamental frequency was measured with the Spectrum Analyzer using 100 kHz RBW and VBW=300 kHz.

The bandwidth requirement found in FCC Part 15.247(a)(2) and RSS 210 A8.2(a) requires a minimum 6 dBc occupied bandwidth of 500 kHz. In addition, Industry Canada (IC RSS GEN 4.6.1) requires the measurement of the 99% occupied bandwidth. For this portion of the tests, a direct measurement of the transmitted signal was performed at the antenna port of the EUT, via a connector to the spectrum analyzer. An attenuator was placed in series with the EUT to protect the spectrum analyzer. The loss from the attenuator were added on the analyzer as gain offset settings, thereby allowing direct measurements, without the need for any further corrections. The EUT was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used in peak-hold mode while measurements were made, as presented in the chart below.

### **7.2 Test Equipment List**

Please see Appendix A

### **7.3 Limits**

For a Digital Modulation System, the 6 dB bandwidth shall be at least 500 kHz.

### **7.4 Test Results**

From this data, the closest measurement (6 dB bandwidth) when compared to the specified limit, is 9480 kHz, which is above the minimum of 500 kHz, yielding a passing result.

### **7.5 Test Data**

Low Channel

Mode	Data Rate	6 dB BW (DTS BW) (MHz)	99% BW (MHz)
802.11 b	2 MBPS	9.82	14.10
802.11 b	11 MBPS	9.55	14.44
802.11 g	6 MBPS	15.31	16.67
802.11 g	54 MBPS	16.45	16.55
802.11 n	MCS0	15.33	17.68
802.11 n	MCS7	17.47	17.71

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 31 of 65</b>

### Middle Channel

Mode	Data Rate	6 dB BW (DTS BW) (MHz)	99% BW (MHz)
802.11 b	2 MBPS	9.48	14.09
802.11 b	11 MBPS	9.81	14.36
802.11 g	6 MBPS	15.56	16.66
802.11 g	54 MBPS	16.36	16.57
802.11 n	MCS0	15.64	17.68
802.11 n	MCS7	17.58	17.66

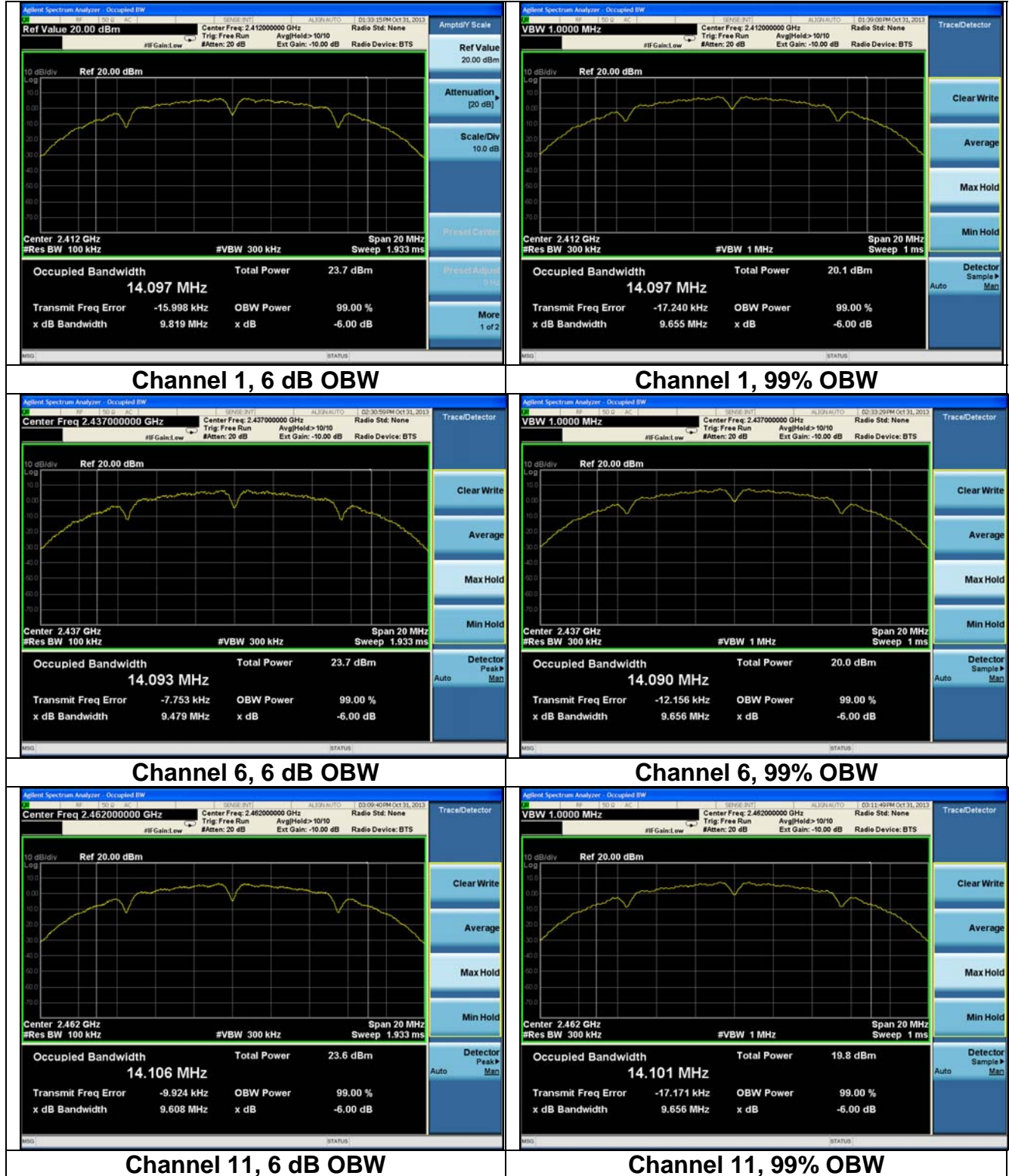
### High Channel

Mode	Data Rate	6 dB BW (DTS BW) (MHz)	99% BW (MHz)
802.11 b	2 MBPS	9.61	14.10
802.11 b	11 MBPS	10.05	14.23
802.11 g	6 MBPS	15.35	16.66
802.11 g	54 MBPS	16.43	16.60
802.11 n	MCS0	15.40	17.69
802.11 n	MCS7	17.54	17.66



## 7.6 Screen Captures - Occupied Bandwidth

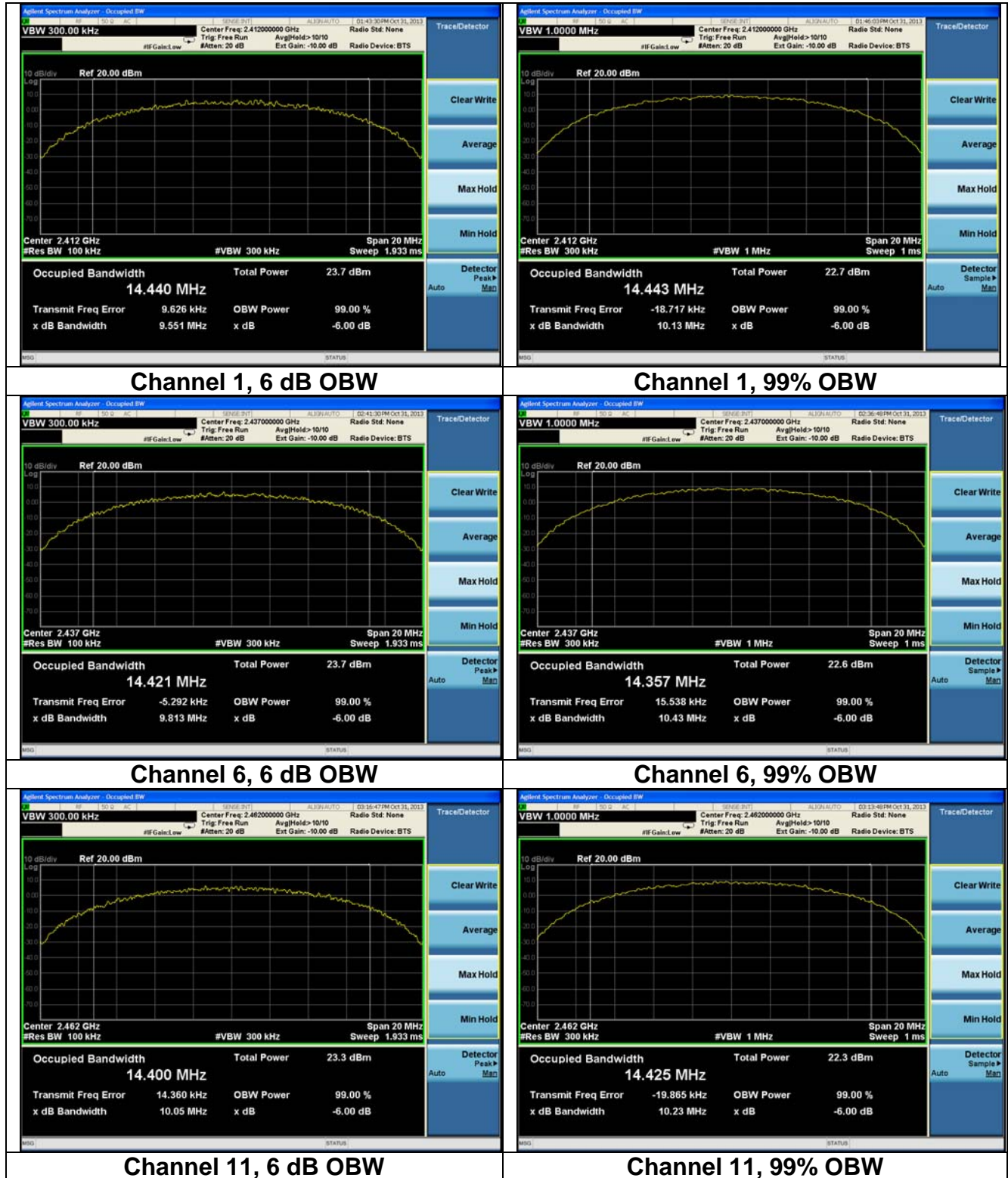
### 2 MBPS



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 33 of 65
	Conducted Sample: 3-028864	

## Screen Captures - Occupied Bandwidth (cont.)

### 11 MBPS



Prepared For: Select Comfort

Report #: 313276

LSR Job #: C-1833

EUT: SIQ Wireless Base Unit

Model #: SIQ01VCSER

Radiated Sample: 3-028956

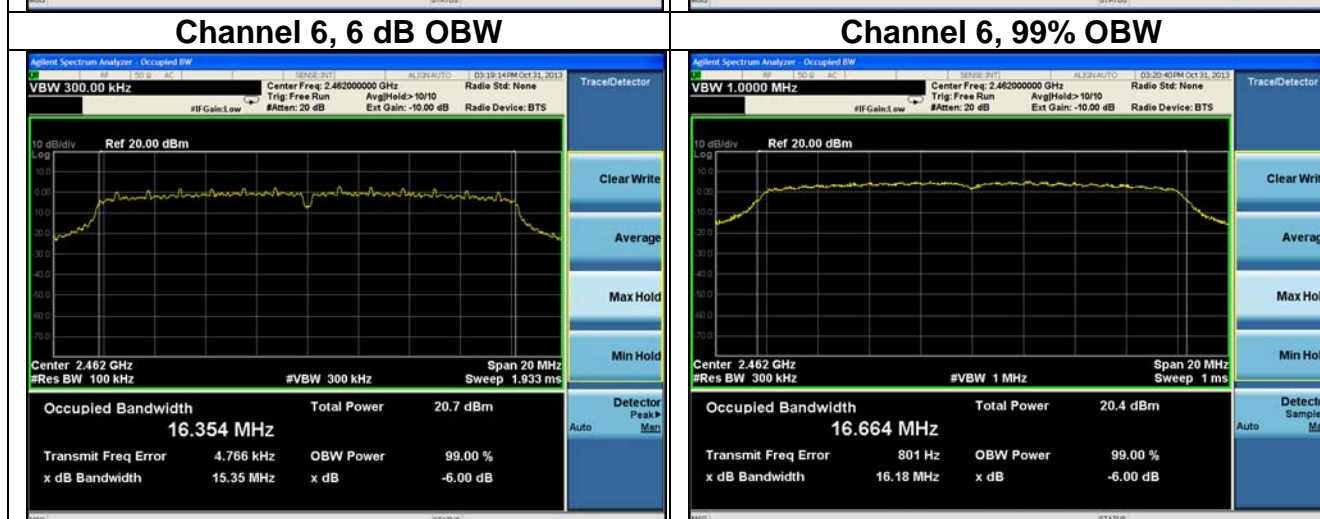
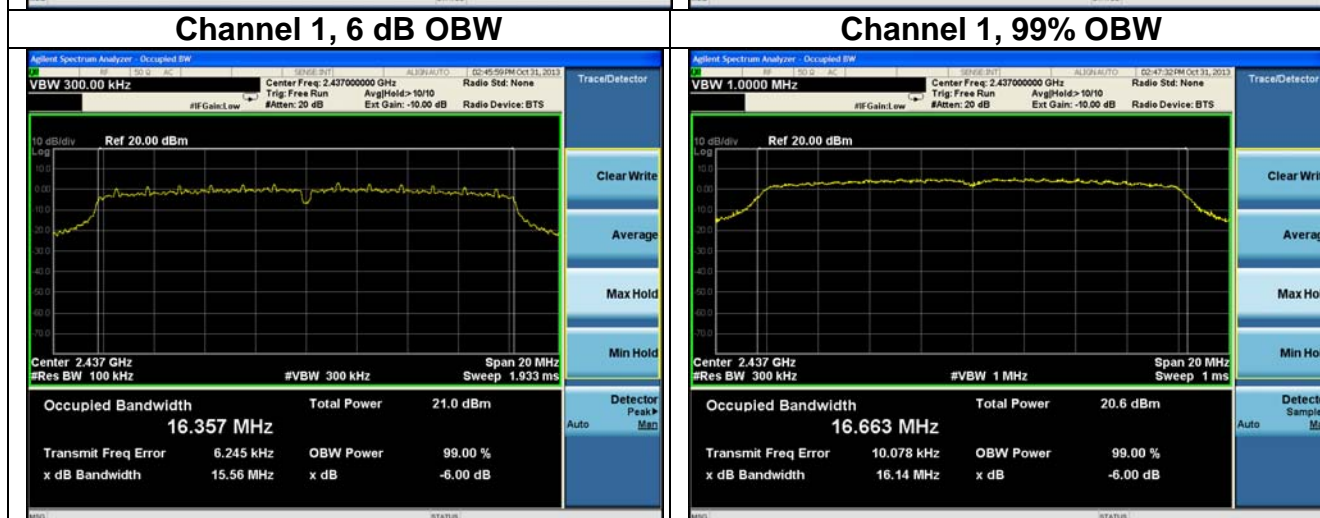
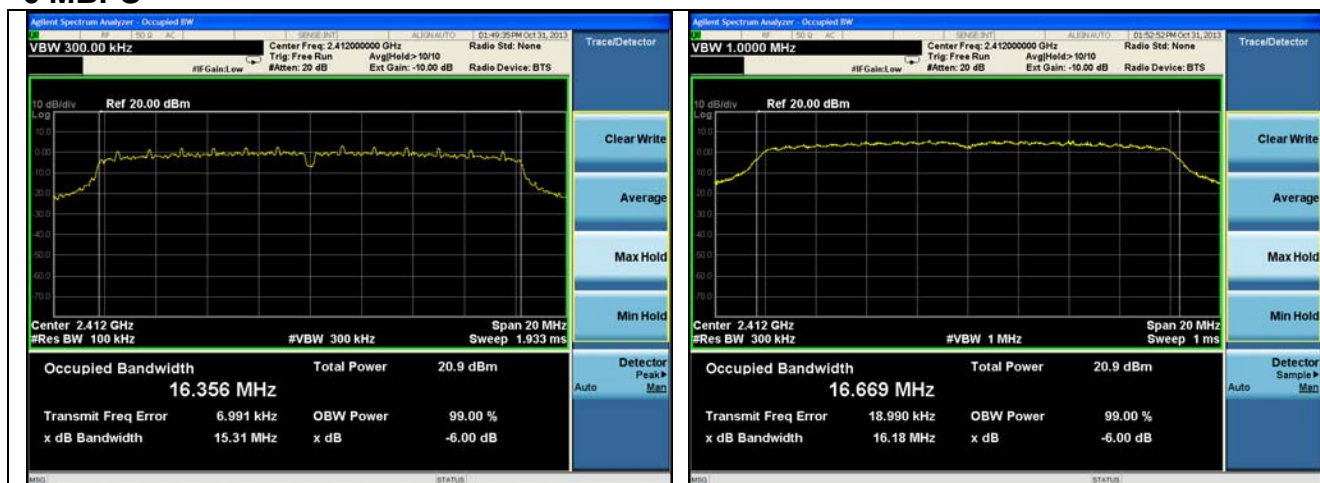
Conducted Sample: 3-028864

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## Screen Captures - Occupied Bandwidth (cont.)

### 6 MBPS

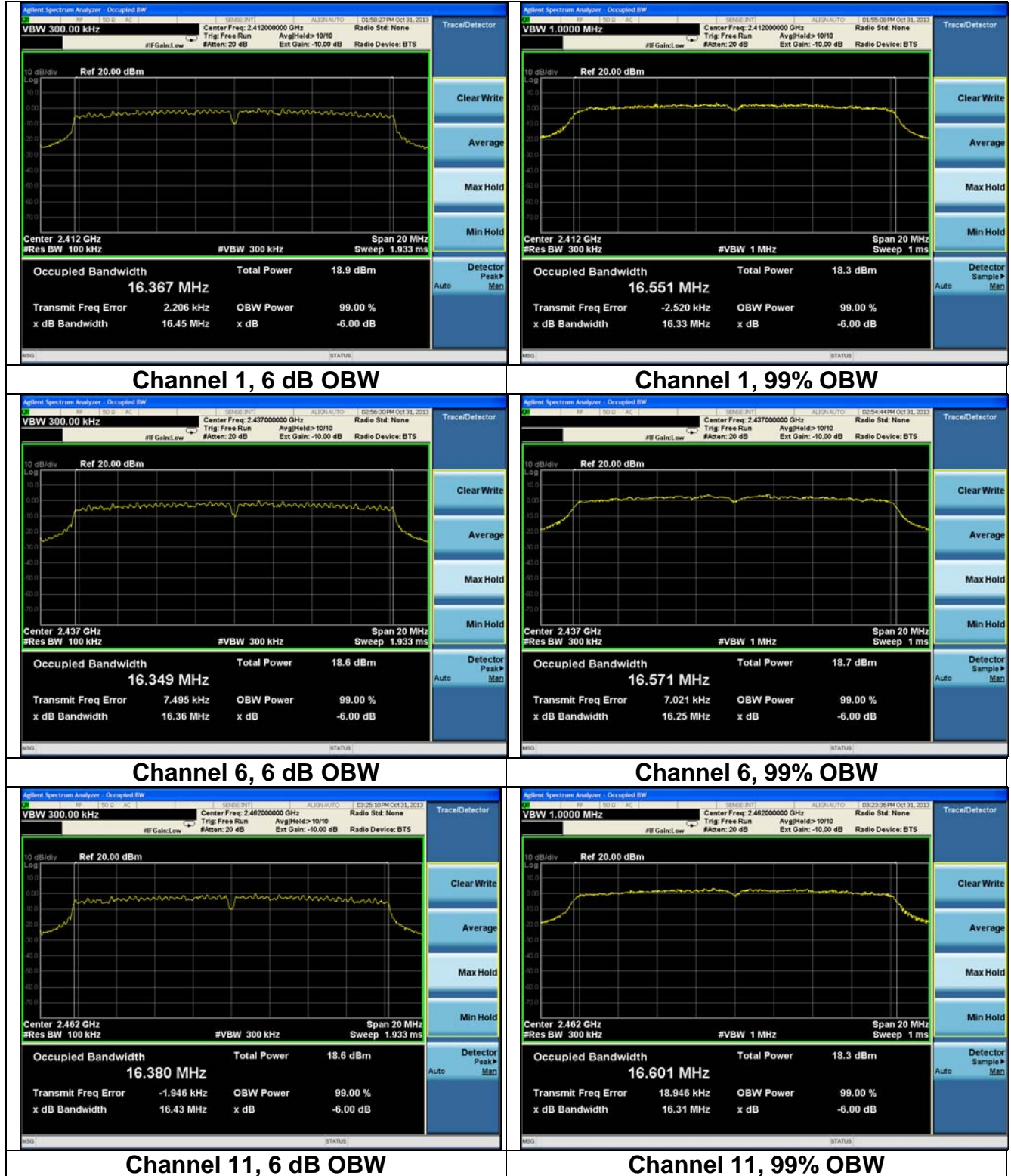


Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 35 of 65
	Conducted Sample: 3-028864	



## Screen Captures - Occupied Bandwidth (cont.)

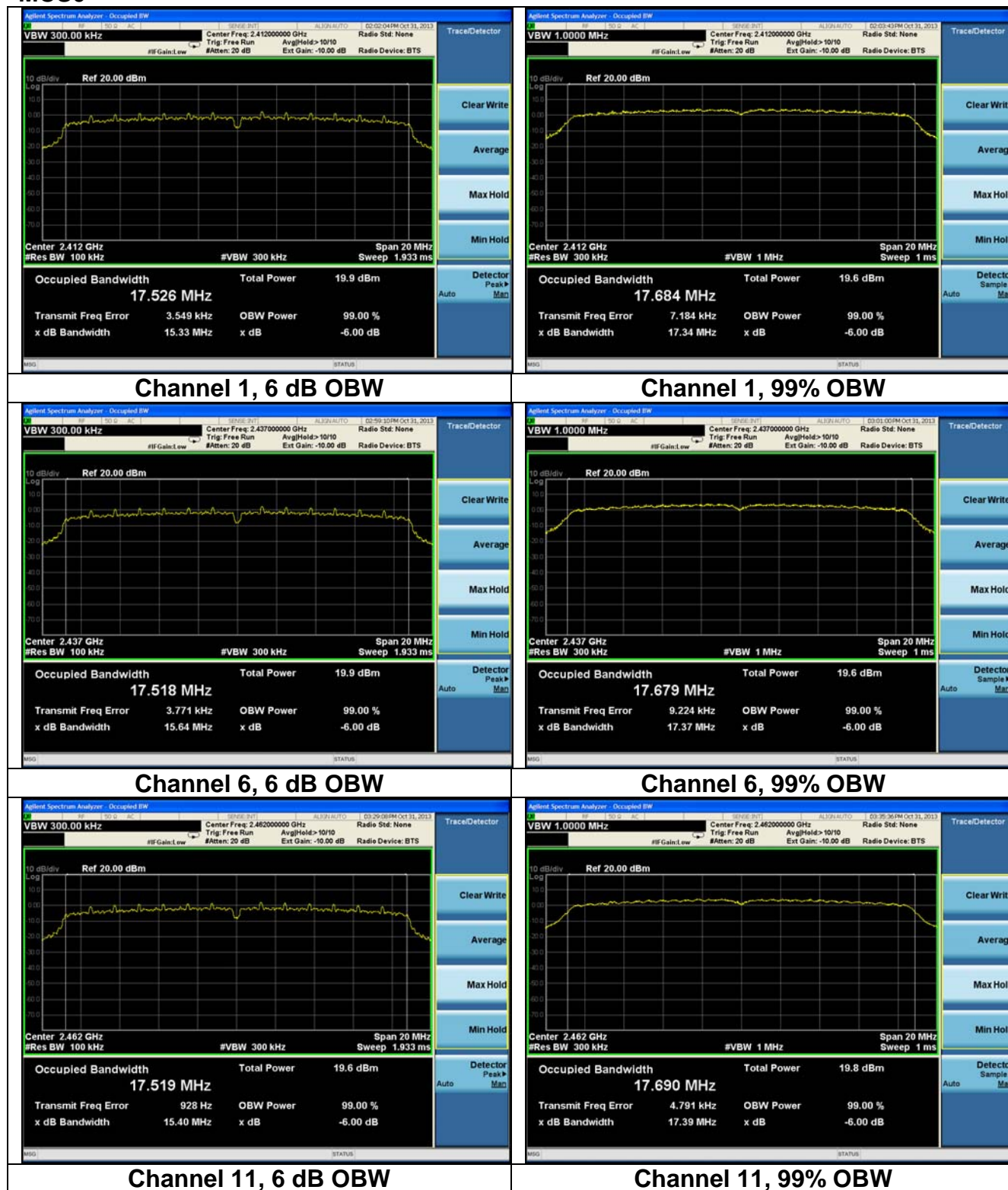
### 54 MBPS



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSER	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 36 of 65
	Conducted Sample: 3-028864	

## Screen Captures - Occupied Bandwidth (cont.)

### MCS0



Prepared For: Select Comfort

Report #: 313276

LSR Job #: C-1833

EUT: SIQ Wireless Base Unit

Model #: SIQ01VCSEDR

Radiated Sample: 3-028956

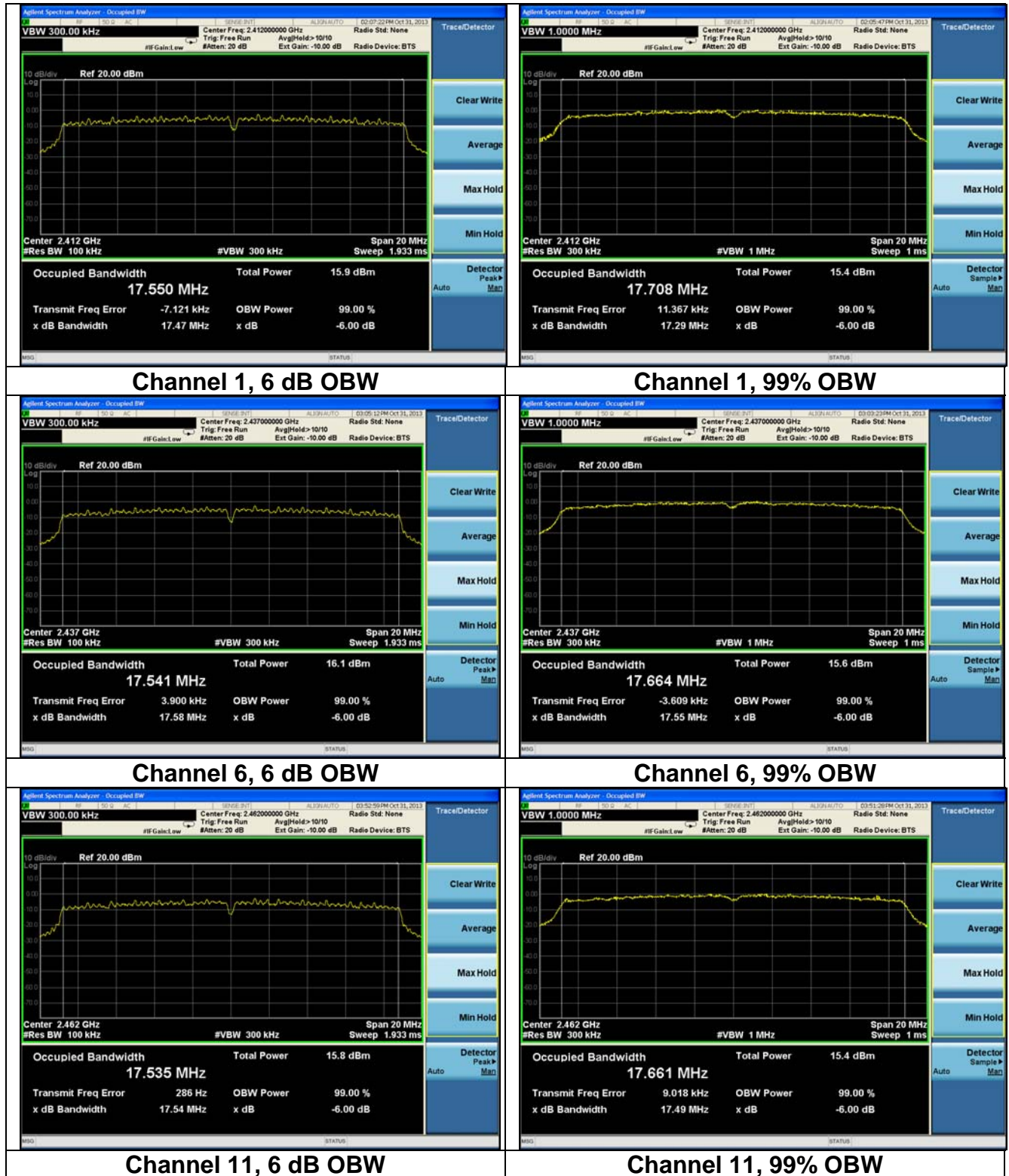
Conducted Sample: 3-028864

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## Screen Captures - Occupied Bandwidth (cont.)

### MCS7



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 38 of 65
	Conducted Sample: 3-028864	



## EXHIBIT 8. BAND-EDGE MEASUREMENTS

### 8.1 Test Description

FCC 15.209(b) and 15.247(d) require a measurement of spurious emission levels to be at least 20 dB lower than the fundamental emission level, in particular at the Band-Edges where the intentional radiator operates. Also, RSS 210 Section 2.2 requires that unwanted emissions meet limits listed in tables 2 and 3 of the same standard and also to the limits in the applicable annex.

### 8.2 Method of Measurements

The EUT was operated in continuous transmit mode with continuous modulation, with internally generated data as the modulating source. The EUT was operated at the lowest channel for the investigation of the lower Band-Edge, and at the highest channel for the investigation of the higher Band-Edge.

### 8.3 Test Results

The following screen captures demonstrate compliance of the intentional radiator at the 2400-2483.5 MHz Band-Edges.

### 8.4 Screen Captures

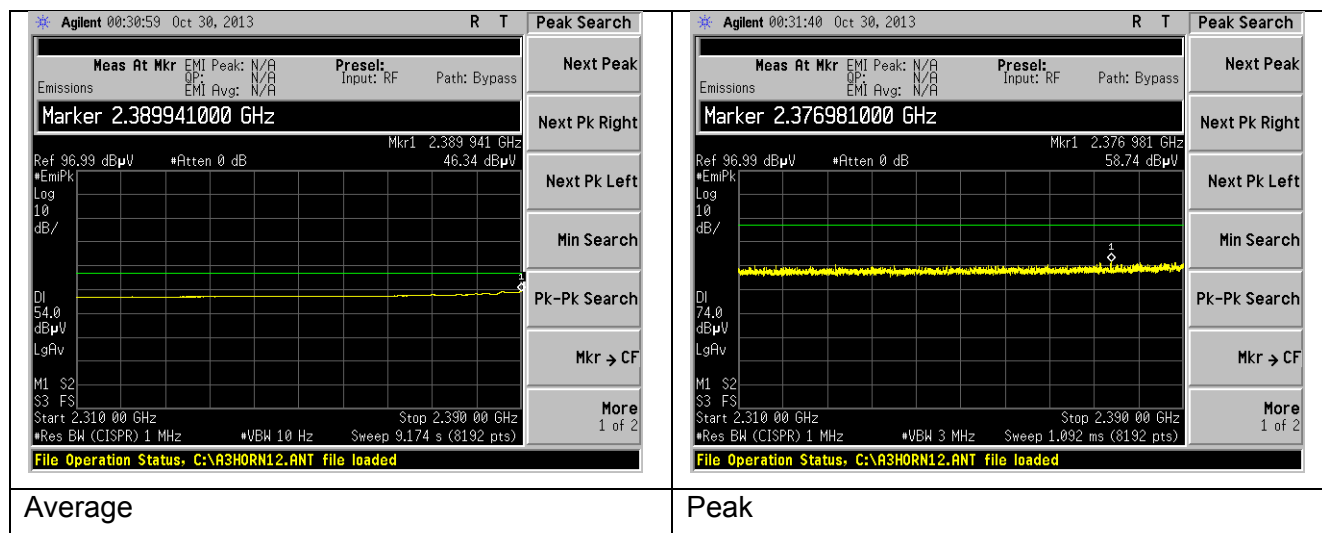
*For a 2.4 GHz Transmitter:*

*The Lower Band-Edge limit, in this case, would be + 54 dBμV/m at 3m.*

*The Upper Band-Edge limit, in this case, would be + 54 dBμV/m at 3m.*

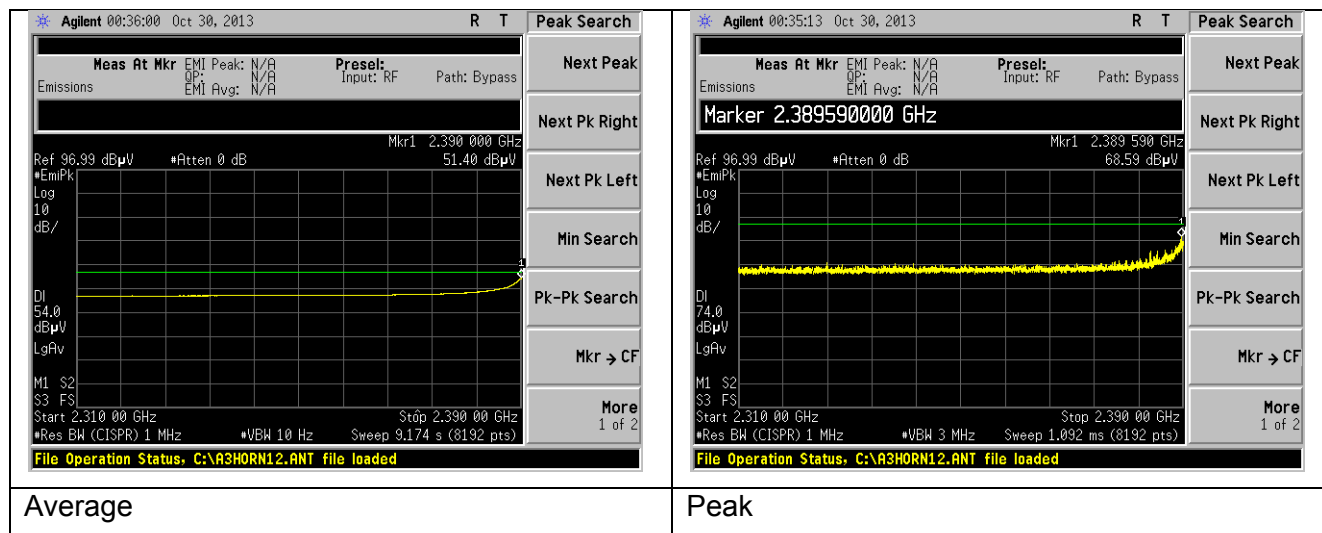
Screen Capture Demonstrating Compliance at the Lower Band-Edge

1 MBPS

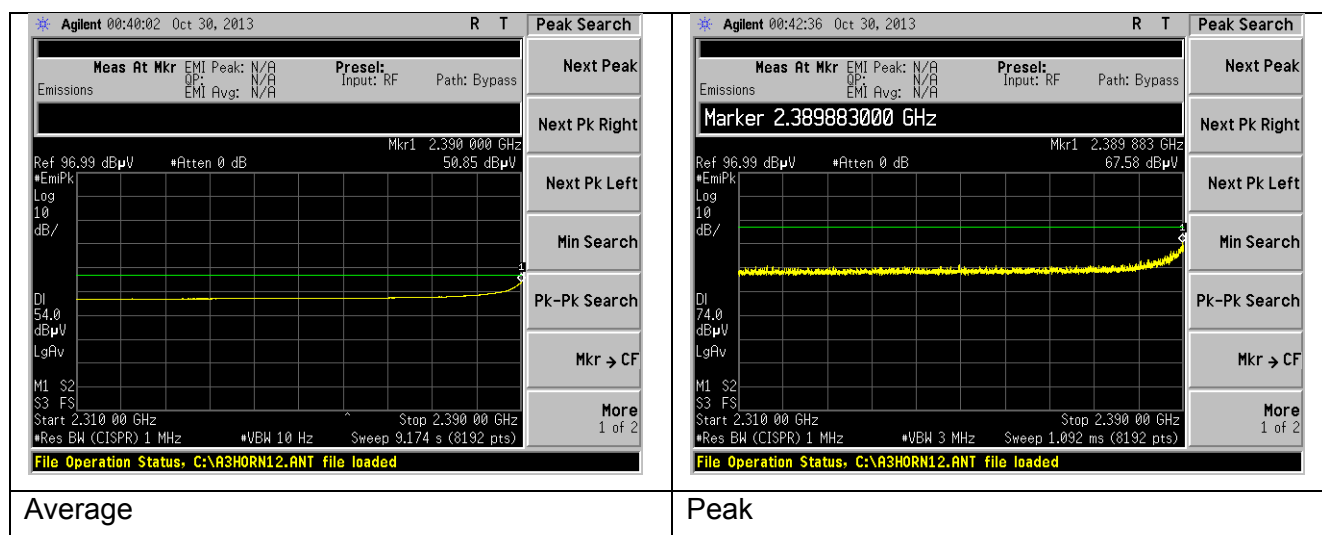


Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSER	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 39 of 65
	Conducted Sample: 3-028864	

## 6 MBPS



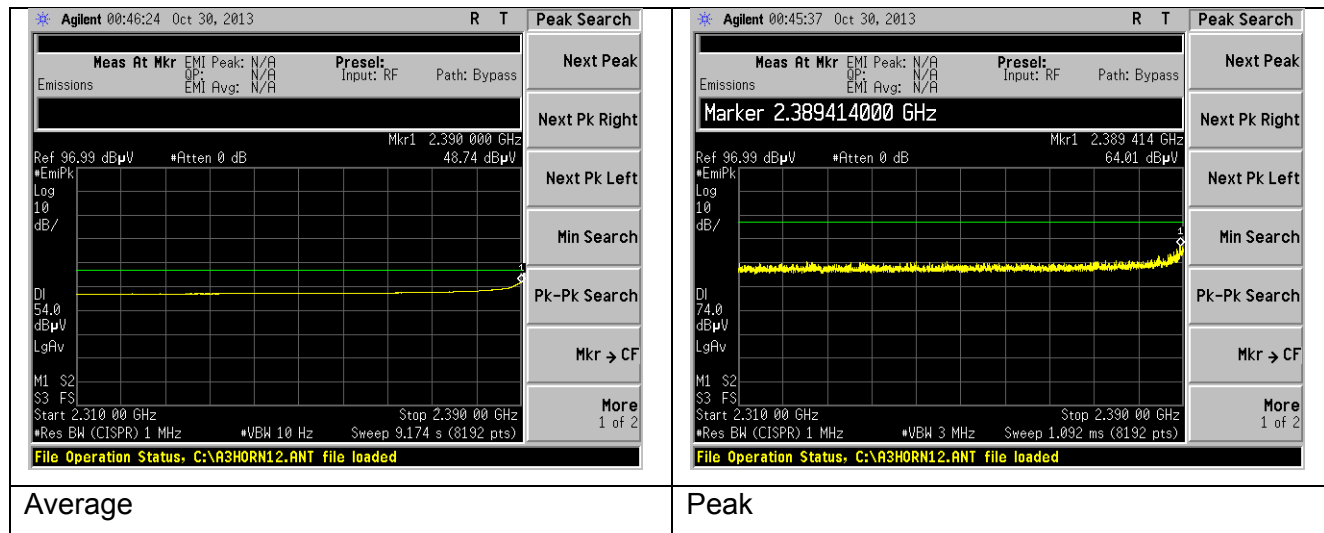
## 12 MBPS



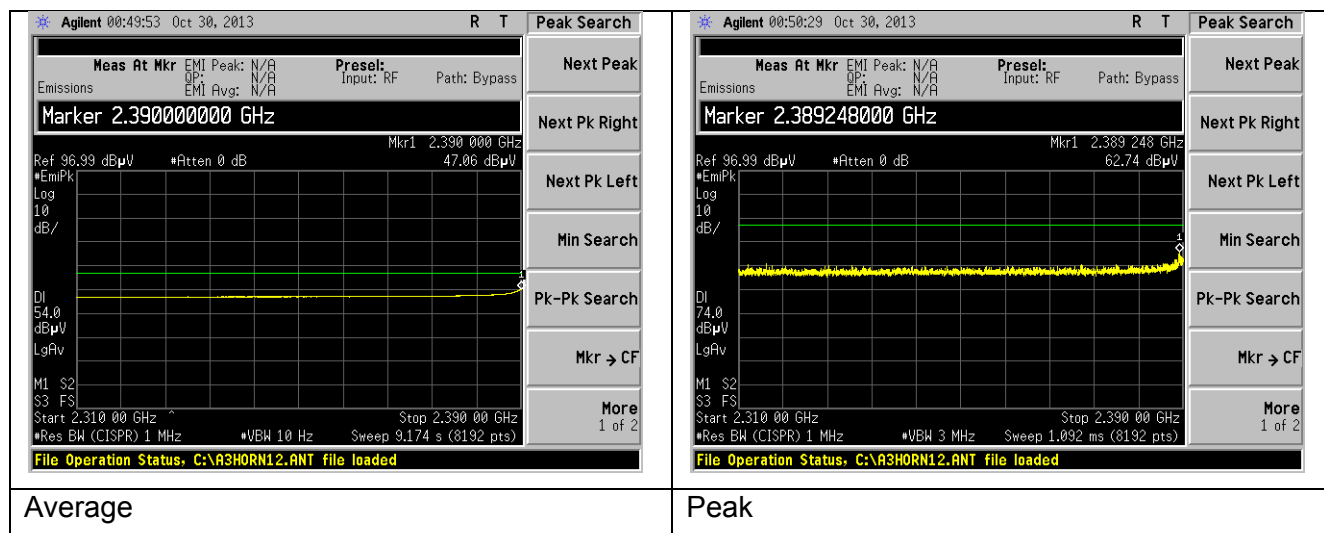
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 40 of 65
	Conducted Sample: 3-028864	



## 24 MBPS

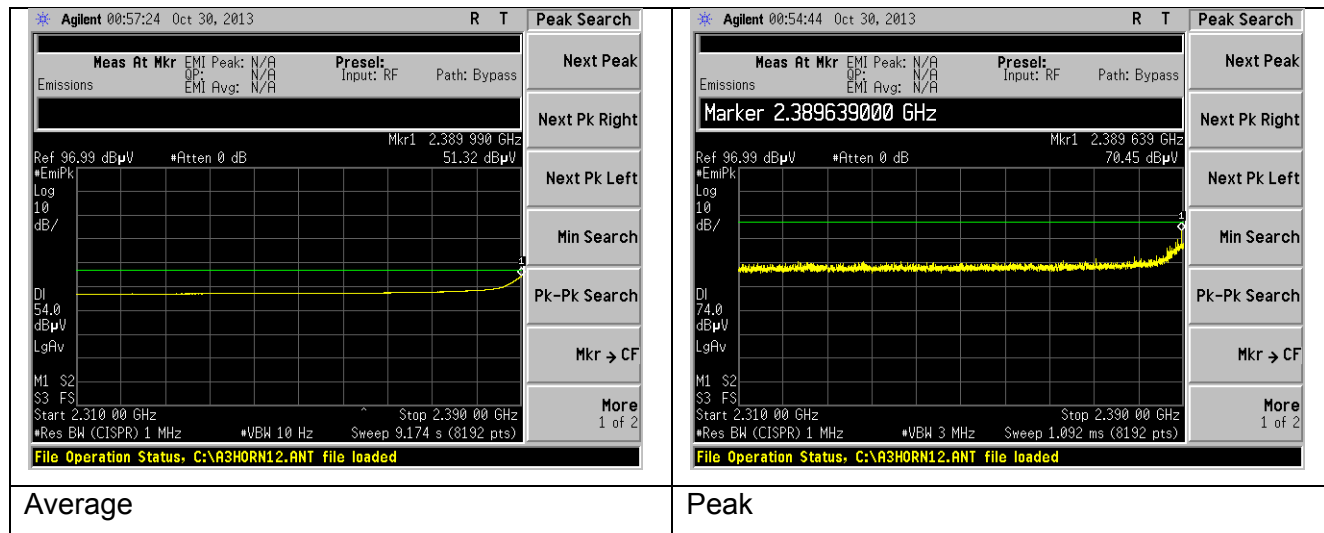


## 54 MBPS

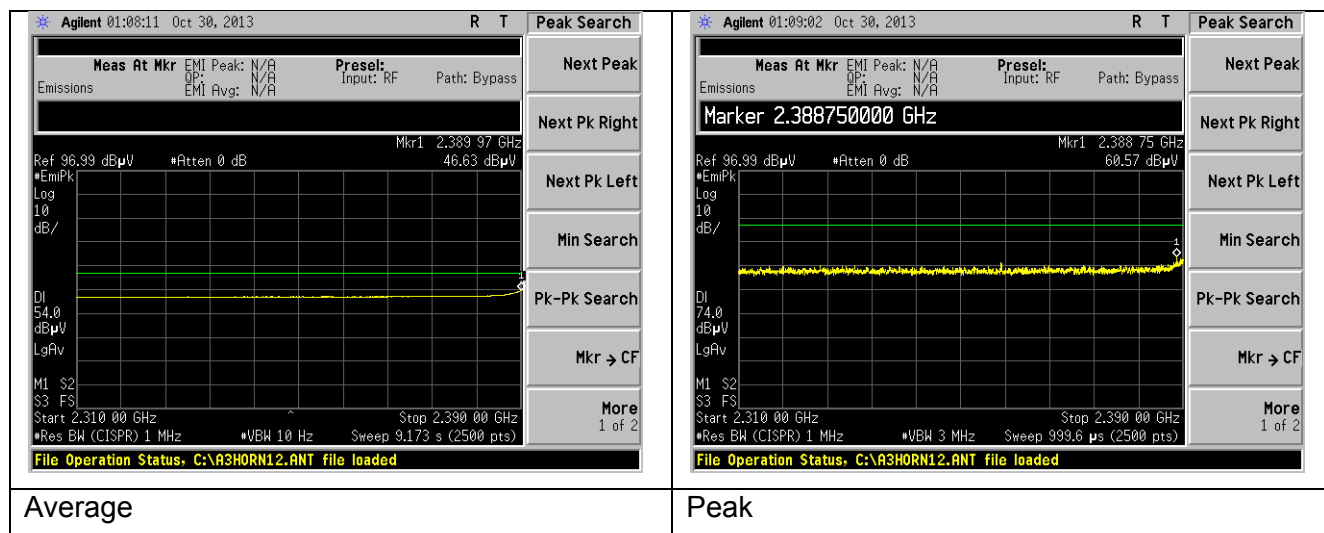


Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 41 of 65
	Conducted Sample: 3-028864	

## MCS0



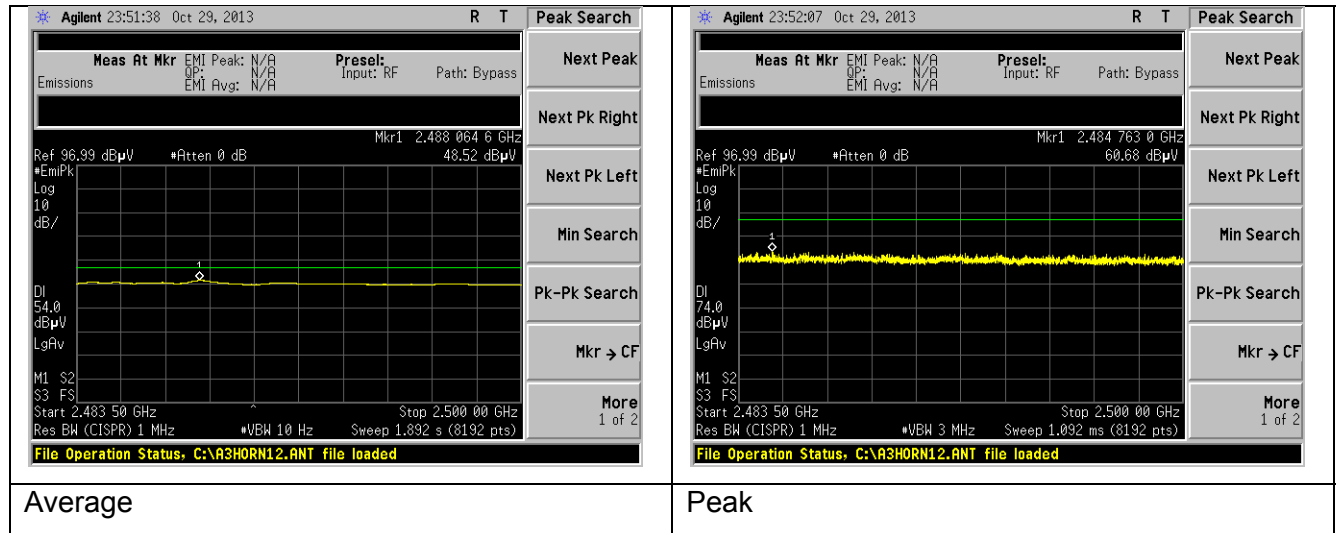
## MCS7



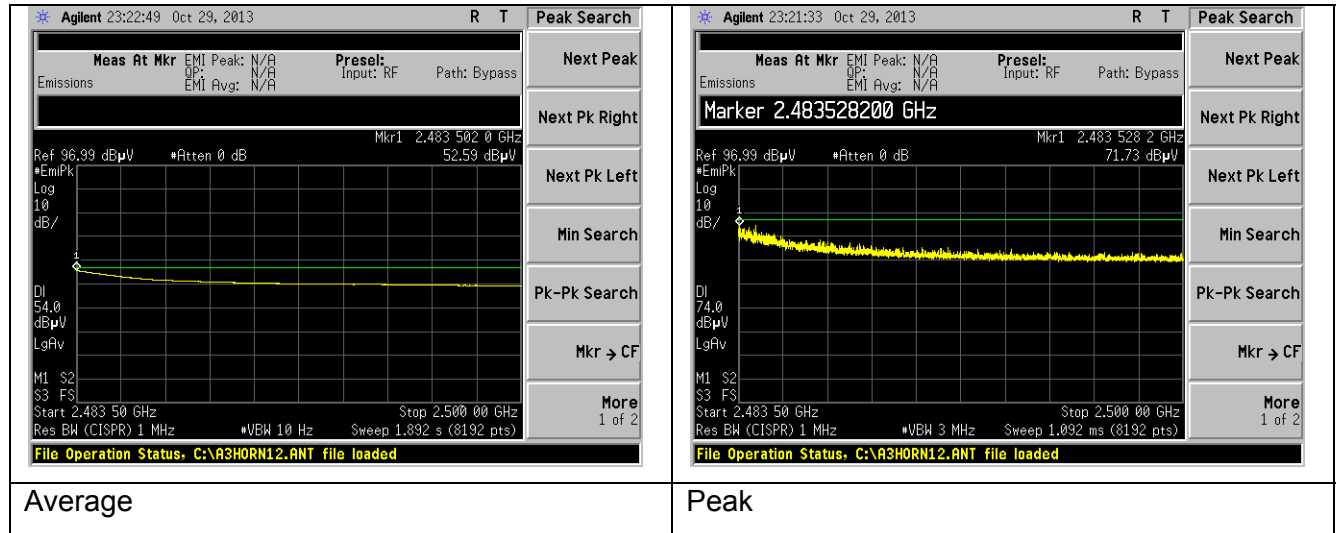
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 42 of 65
	Conducted Sample: 3-028864	

# Screen Capture Demonstrating Compliance at the Higher Band-Edge

## 1 MBPS

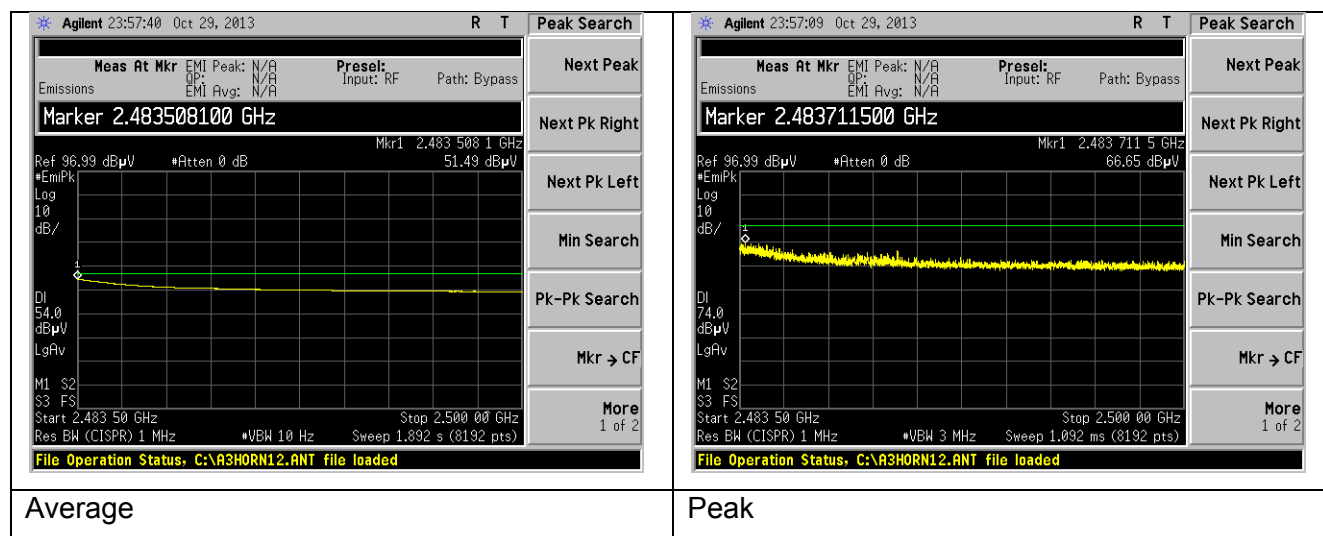


## 6 MBPS

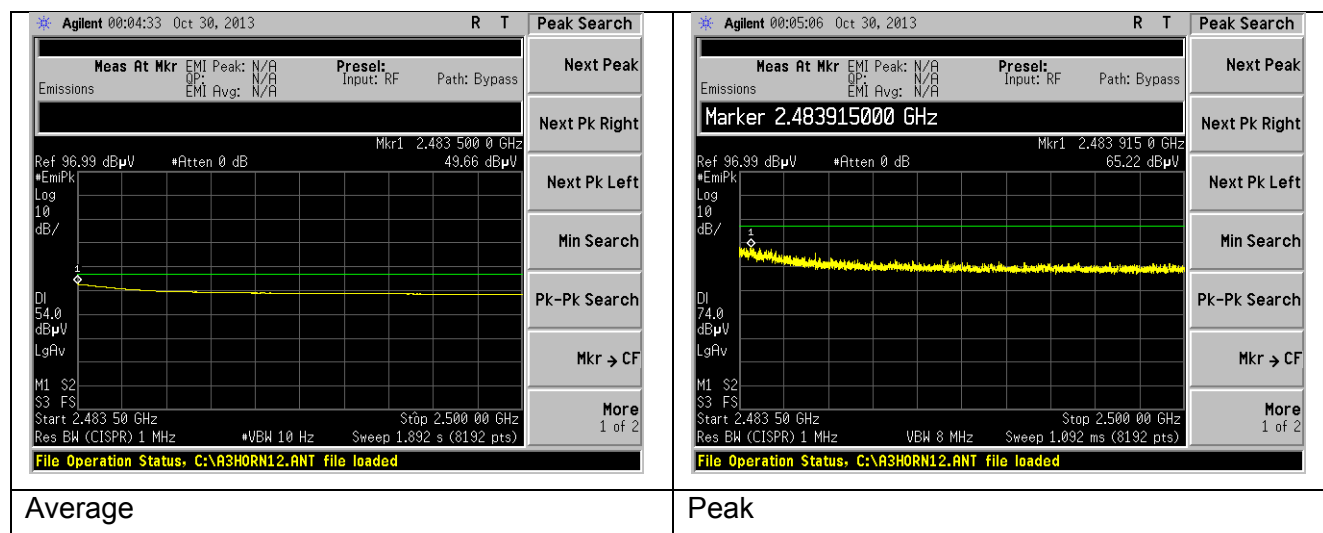


Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSERD	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 43 of 65
	Conducted Sample: 3-028864	

## 12 MBPS

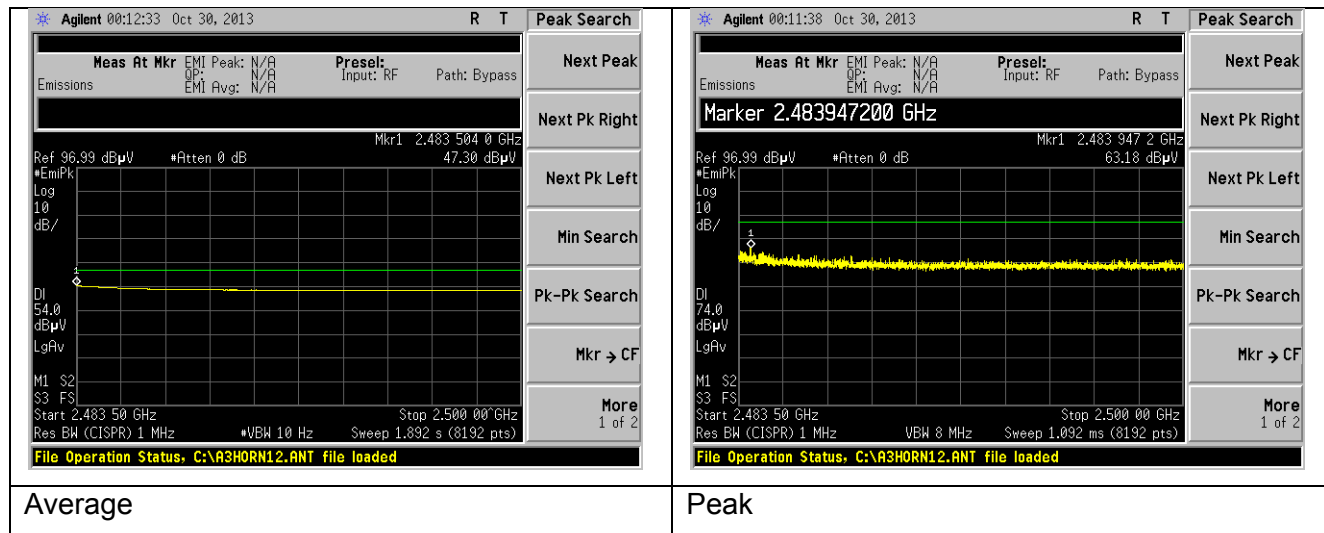


## 24 MBPS

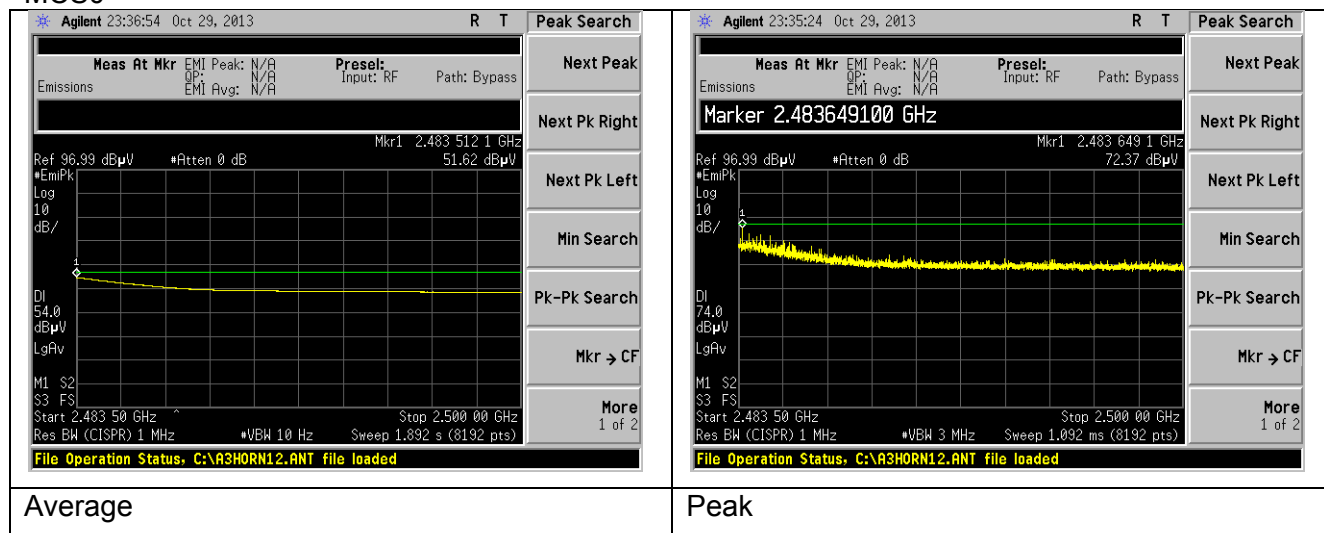


Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 44 of 65
	Conducted Sample: 3-028864	

54 MBPS

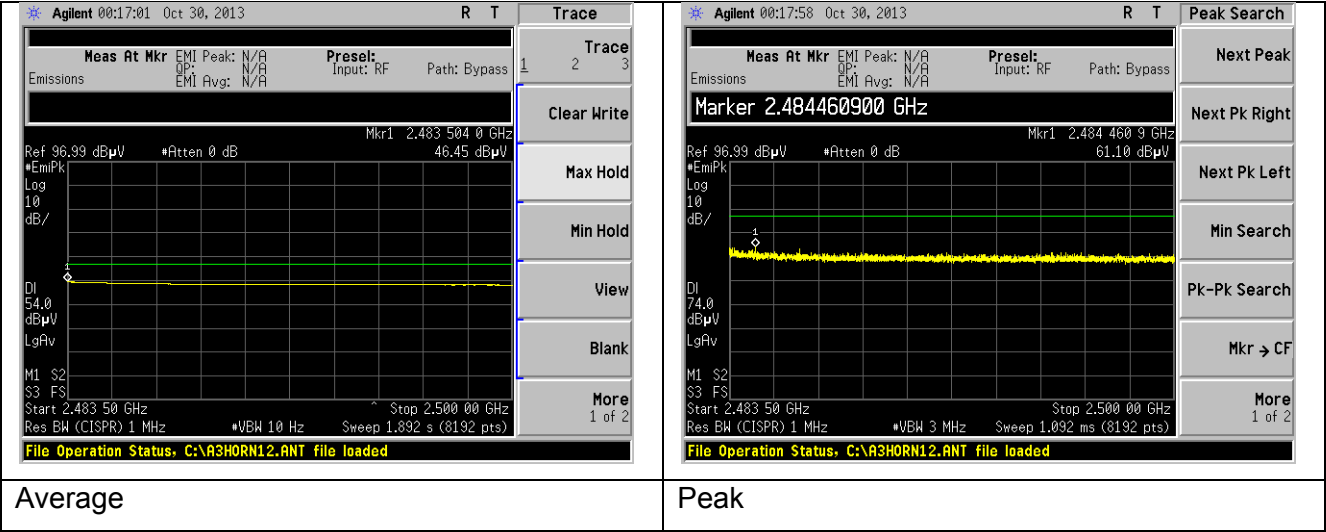


MCS0



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSER	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 45 of 65
	Conducted Sample: 3-028864	

MCS7



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 46 of 65

## EXHIBIT 9. POWER OUTPUT (CONDUCTED):

### 9.1 Method of Measurements

The conducted RF output power of the EUT was measured at the antenna port using a connector along with an attenuator as protection for the spectrum analyzer. The loss from the attenuator was added on the analyzer as gain offset settings, there by allowing direct measurements without the need for any further corrections. The unit was configured to run in a continuous transmit mode, while being supplied with typical data from as a modulation source. The spectrum analyzer was used with resolution bandwidth set to 1 MHz and video bandwidths set to 3 MHz and a span equal to 1.5 times the respective DTS bandwidth. Measurements from a peak detector are presented in the charts below.

### 9.2 Test Equipment List

Please see Appendix A

### 9.3 Test Results

The test results demonstrate a passing result compliant to 15.247(b) & RSS 210 A8.4(4).

### 9.4 Test Data

#### **Low Channel**

Mode	Data Rate	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11 b	2 MBPS	18.2	30.0	11.8
802.11 b	11 MBPS	21.2	30.0	8.8
802.11 g	6 MBPS	21.0	30.0	9.0
802.11 g	54 MBPS	19.3	30.0	10.7
802.11 n	MCS0	19.3	30.0	10.7
802.11 n	MCS7	16.5	30.0	13.5

#### **Middle Channel**

Mode	Data Rate	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11 b	2 MBPS	17.8	30.0	12.2
802.11 b	11 MBPS	20.8	30.0	9.2
802.11 g	6 MBPS	21.3	30.0	8.7
802.11 g	54 MBPS	18.8	30.0	11.2
802.11 n	MCS0	19.2	30.0	10.8
802.11 n	MCS7	16.2	30.0	13.8

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 47 of 65</b>

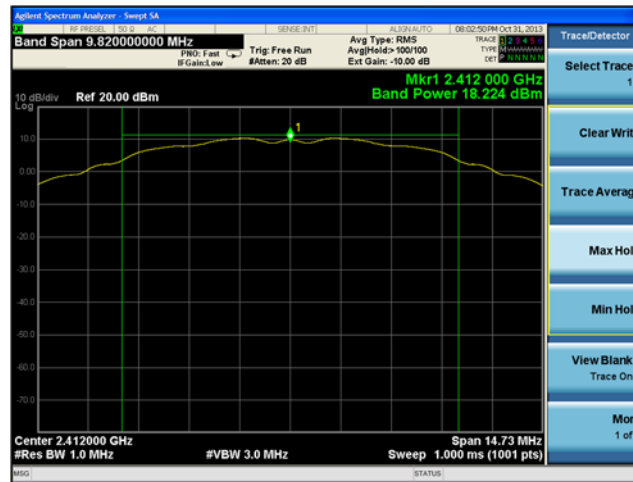
### High Channel

Mode	Data Rate	Conducted Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11 b	2 MBPS	17.7	30.0	12.3
802.11 b	11 MBPS	20.8	30.0	9.2
802.11 g	6 MBPS	20.9	30.0	9.1
802.11 g	54 MBPS	18.8	30.0	11.2
802.11 n	MCS0	19.1	30.0	10.9
802.11 n	MCS7	16.2	30.0	13.8

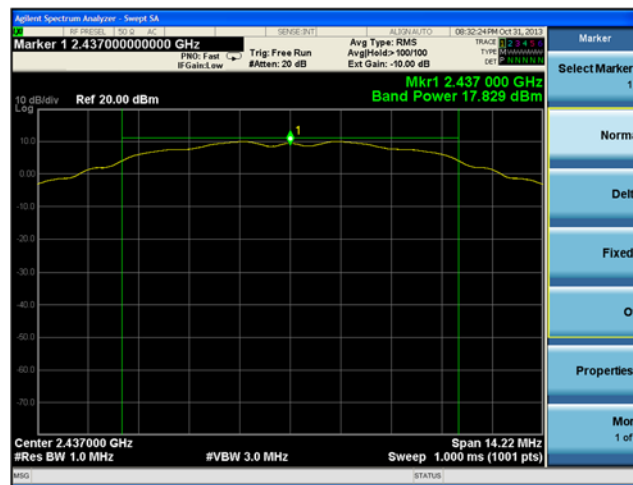
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 48 of 65</b>



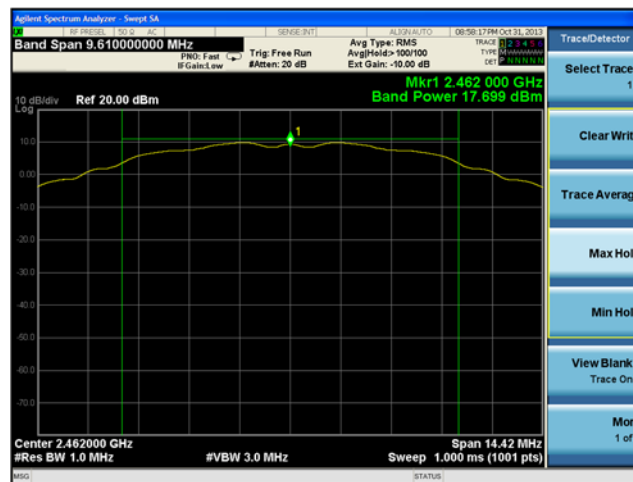
## 9.4 Screen Captures – Power Output 2 MBPS



Channel 1



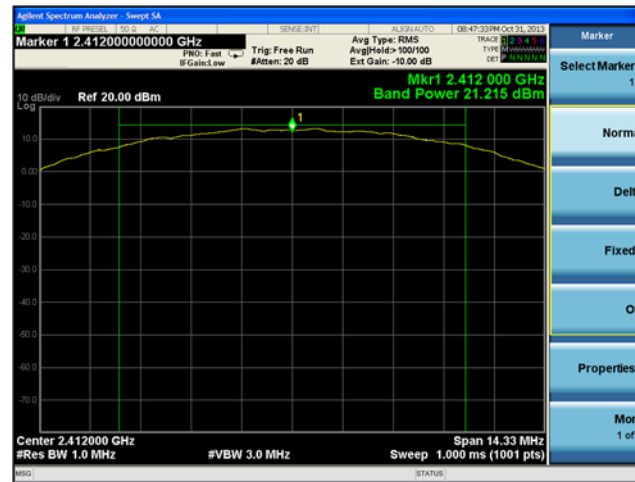
Channel 6



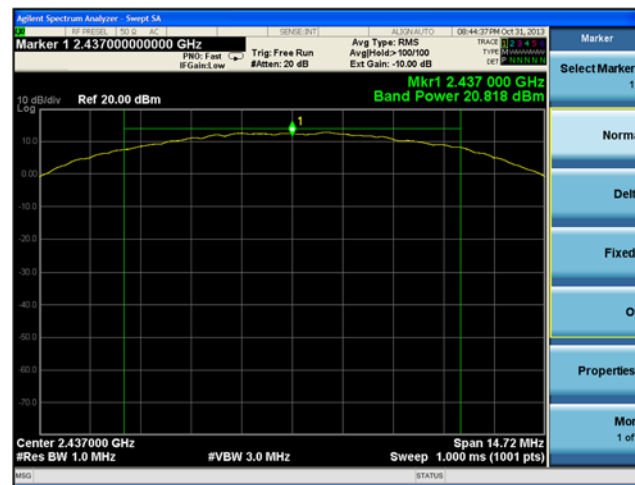
Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 49 of 65
	Conducted Sample: 3-028864	

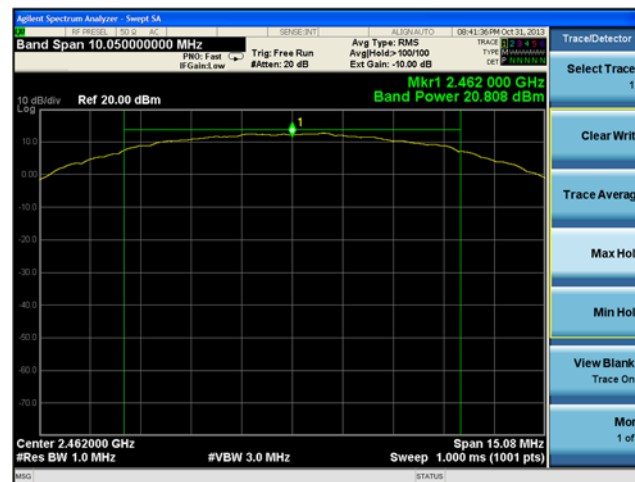
## Screen Captures – Power Output (Conducted) 11 MBPS



Channel 1



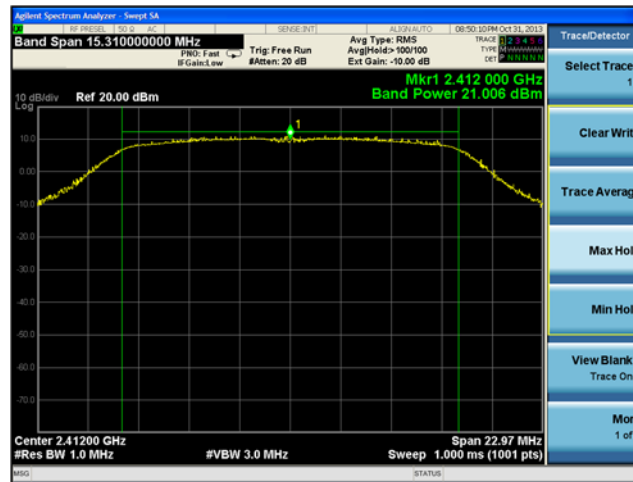
Channel 6



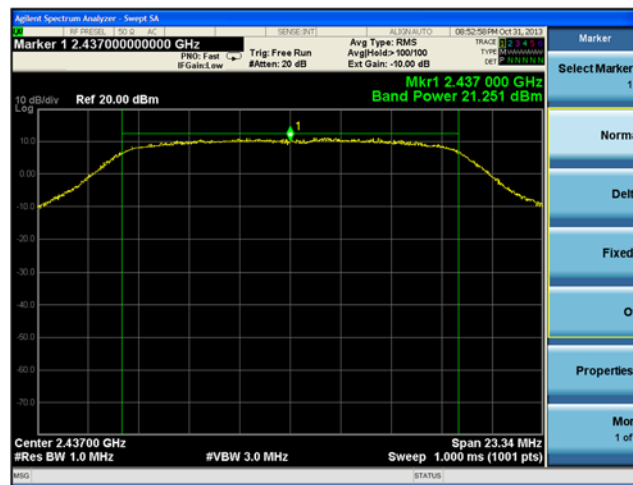
Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 50 of 65
	Conducted Sample: 3-028864	

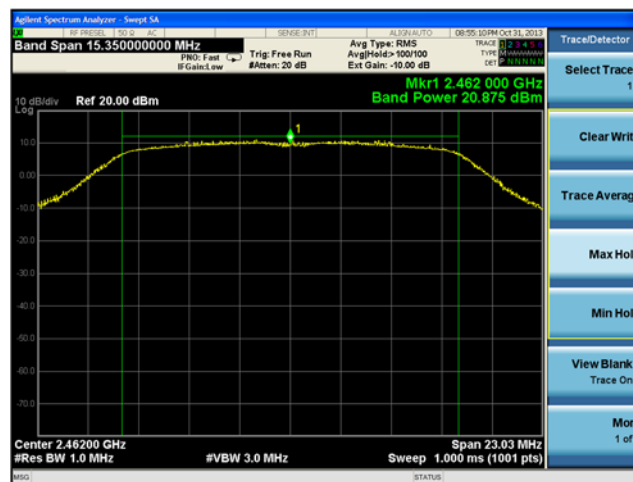
## Screen Captures – Power Output (Conducted) 6 MBPS



Channel 1



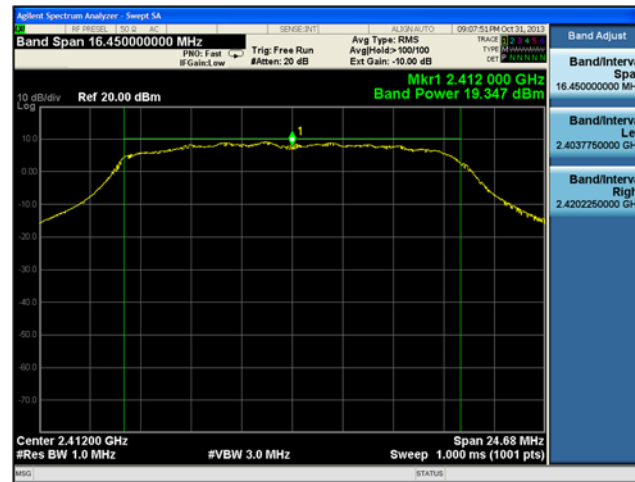
Channel 6



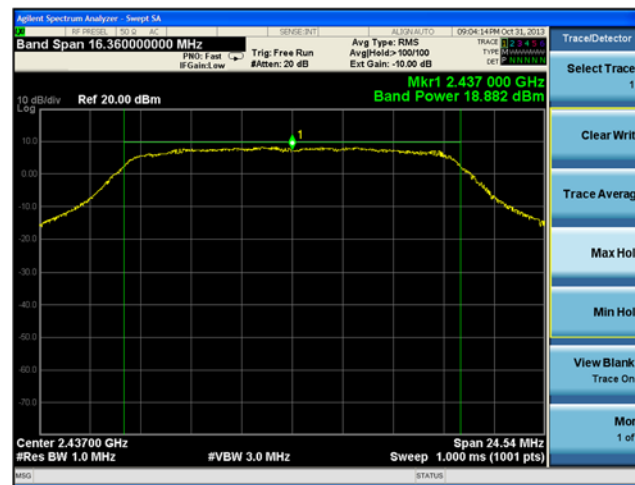
Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 51 of 65

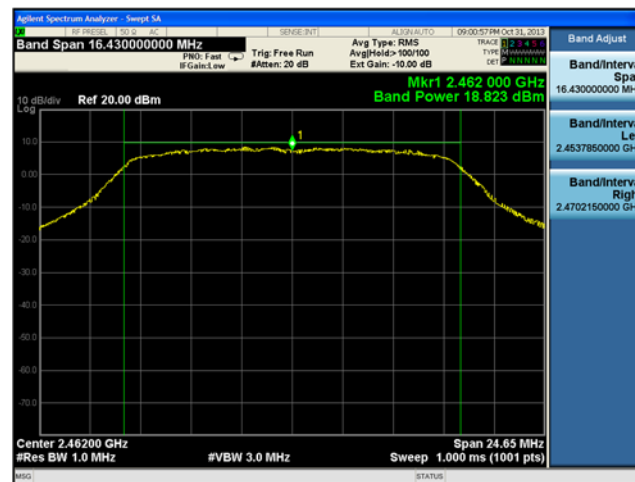
## Screen Captures – Power Output (Conducted) 54 MBPS



Channel 1



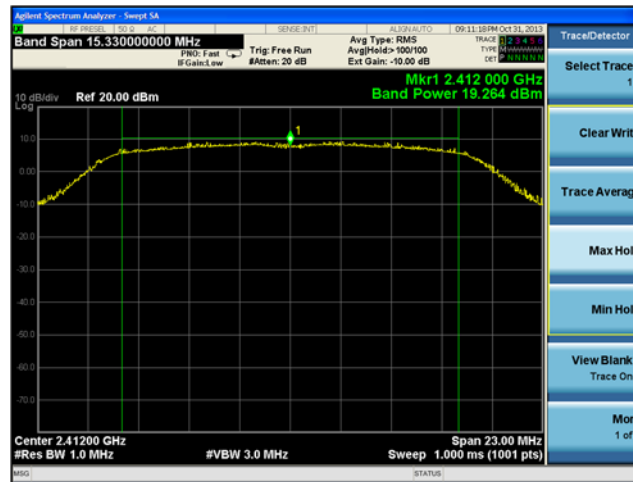
Channel 6



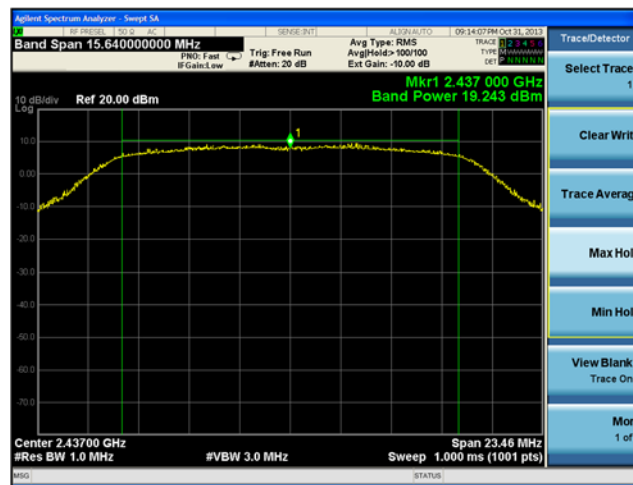
Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 52 of 65

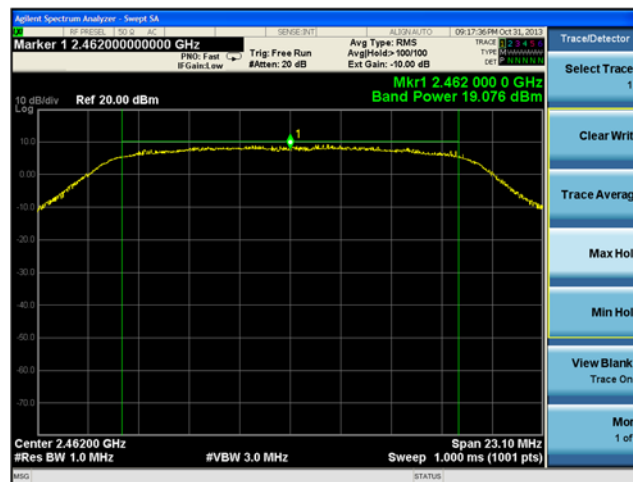
## Screen Captures – Power Output (Conducted) MCS0



Channel 1



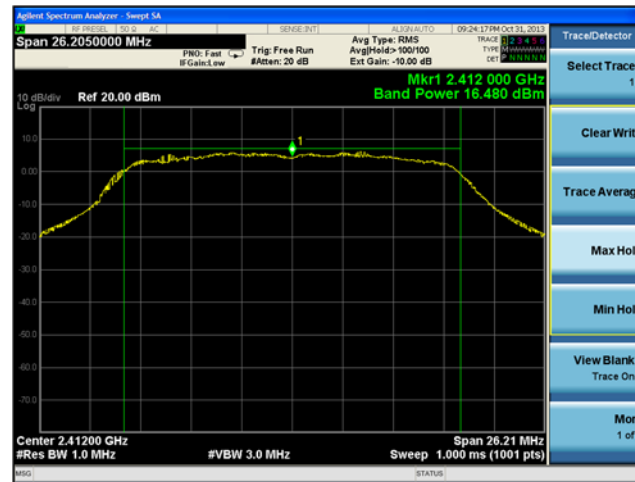
Channel 6



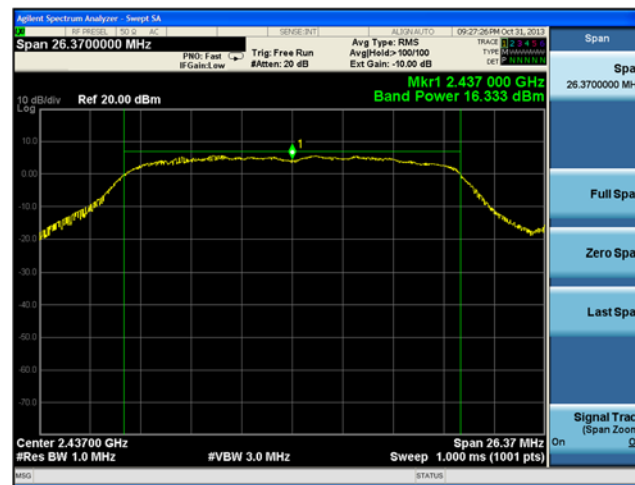
Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 53 of 65

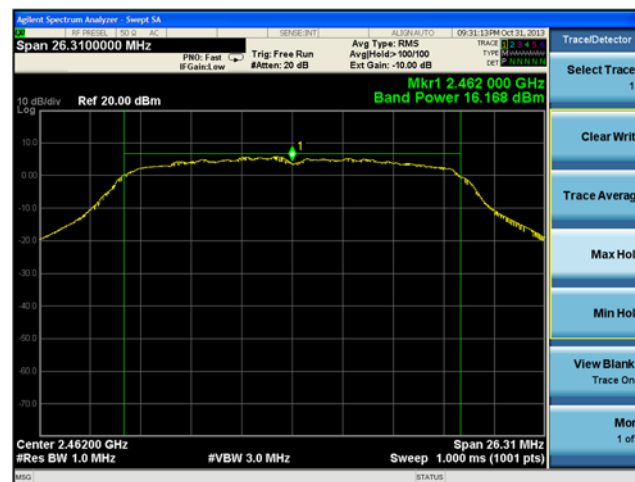
## Screen Captures – Power Output (Conducted) MCS7



Channel 1



Channel 6



Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 54 of 65

## EXHIBIT 10. POWER SPECTRAL DENSITY:

### 10.1 Limits

For digitally modulate systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

In accordance with FCC Part 15.247(e) and RSS 210 A8.2(b), the peak power spectral density should not exceed +8 dBm in any 3 kHz band. This measurement was performed in the same conducted fashion as fundamental output power.

### 10.2 Test Equipment List

Please see Appendix A

### 10.3 Test Results

The test data demonstrates a passing result compliant to 15.247(e) & RSS 210 A8.2(b).

### 10.4 Test Data

Low Channel

Mode	Data Rate	PPSD (dBm)	Limit (dBm)	Margin (dB)
802.11 b	11 MBPS	-8.536	+8.0	16.536
802.11 g	6 MPBS	-10.858	+8.0	18.858
802.11 n	MCS0	-12.344	+8.0	20.344

Middle Channel

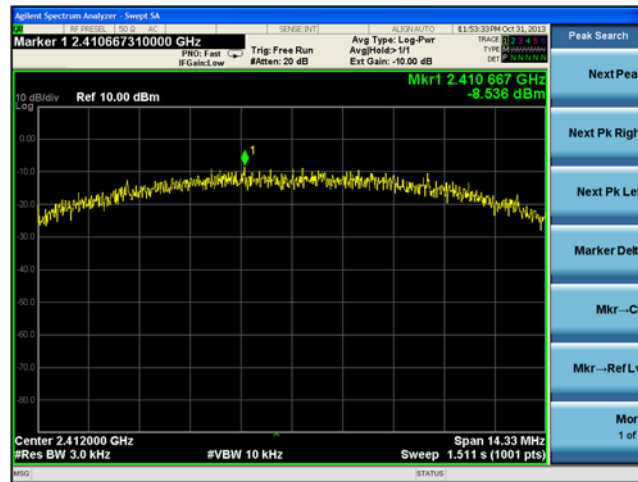
Mode	Data Rate	PPSD (dBm)	Limit (dBm)	Margin (dB)
802.11 b	11 MBPS	-9.388	+8.0	17.388
802.11 g	6 MPBS	-10.232	+8.0	18.232
802.11 n	MCS0	-13.219	+8.0	21.219

High Channel

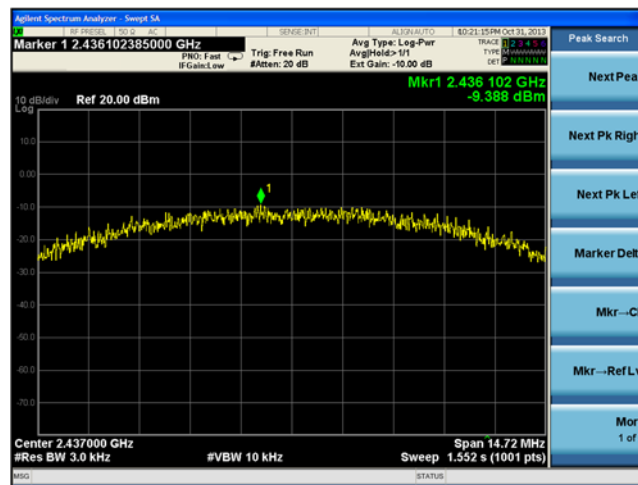
Mode	Data Rate	PPSD (dBm)	Limit (dBm)	Margin (dB)
802.11 b	11 MBPS	-8.790	+8.0	16.790
802.11 g	6 MPBS	-11.577	+8.0	19.577
802.11 n	MCS0	-13.134	+8.0	21.134

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 55 of 65

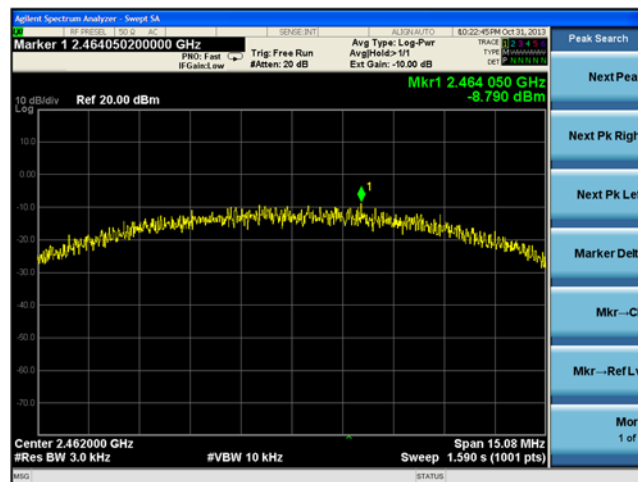
## 10.4 Screen Captures – Power Spectral Density 11 MBPS



Channel 1



Channel 6



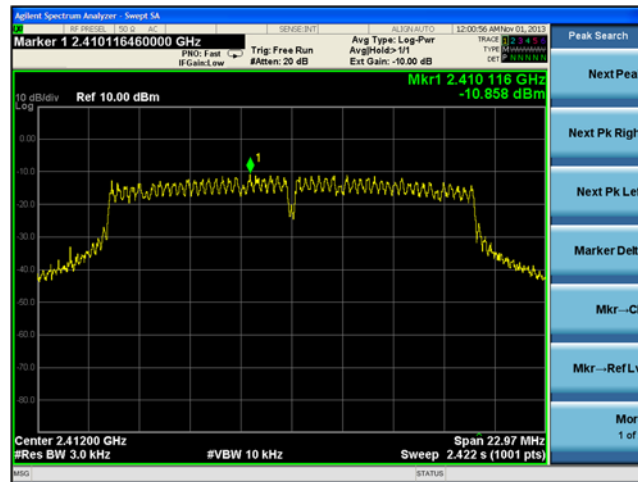
Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSedr	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 56 of 65

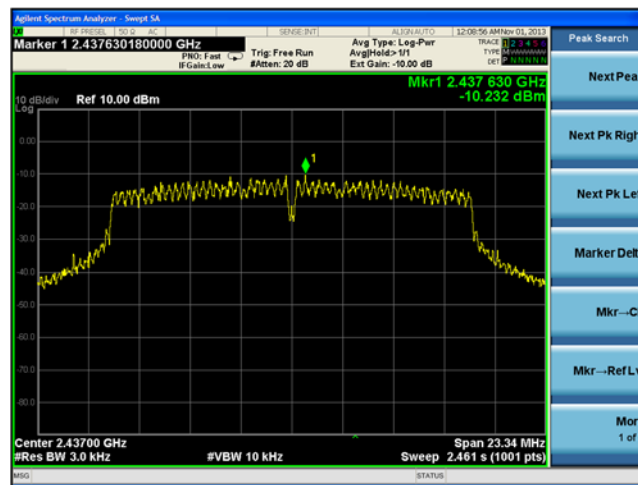


## Screen Captures – Power Spectral Density (cont.)

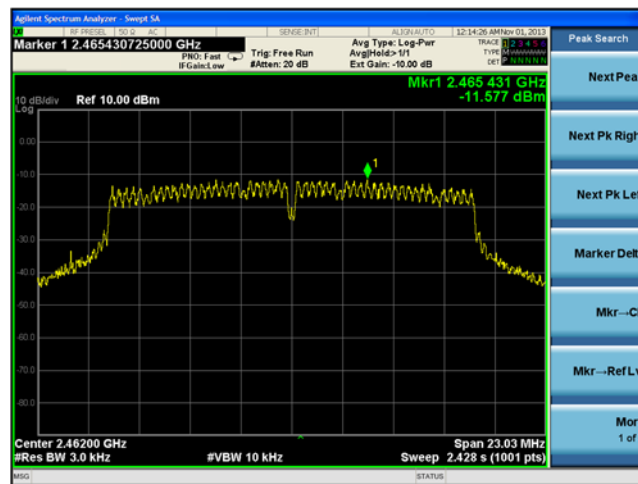
### 6 MBPS



Channel 1



Channel 6

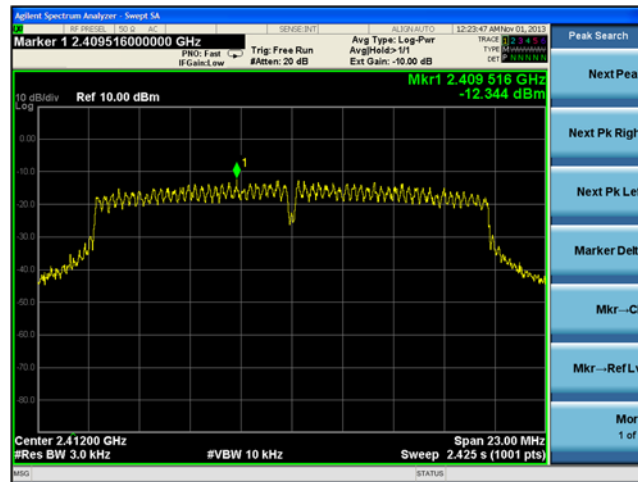


Channel 11

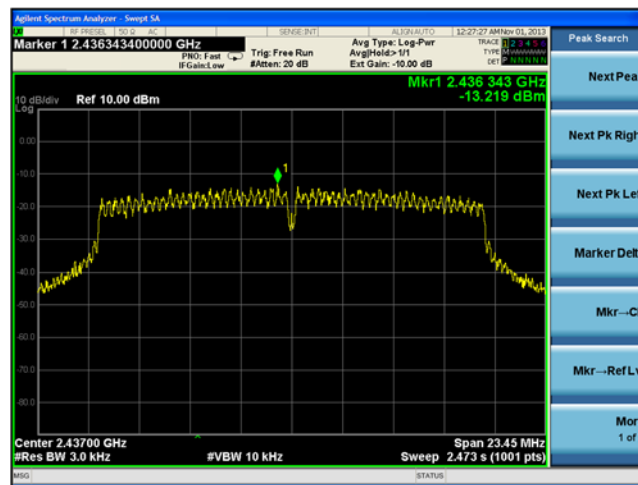
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 57 of 65
	Conducted Sample: 3-028864	

## Screen Captures – Power Spectral Density (cont.)

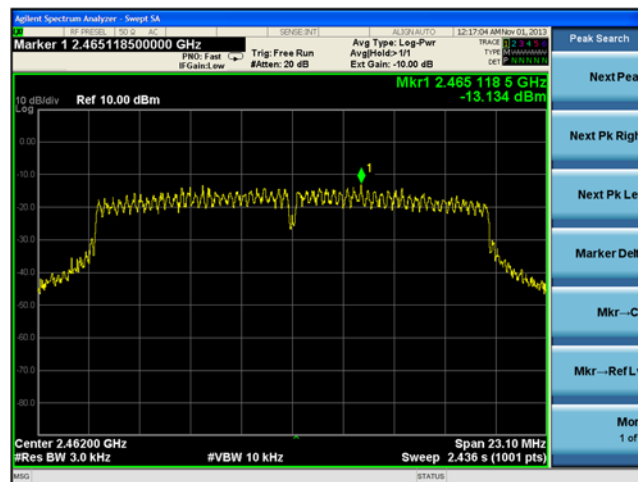
### MCS0



Channel 1



Channel 6



Channel 11

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 58 of 65
	Conducted Sample: 3-028864	

## **EXHIBIT 11. SPURIOUS CONDUCTED EMISSIONS:**

### **11.1 Limits**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 db below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

In addition, radiated emissions, which fall in the restricted band, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(e)

FCC Part 15.247(d) and RSS 210 A8.5 requires a measurement of conducted harmonic and spurious RF emission levels, as reference to the carrier level when measured in a 100 kHz bandwidth. For this test, the spurious and harmonic RF emissions from the EUT were measured at the EUT antenna port using an attenuator as protection for the spectrum analyzer. The loss from the attenuator was added on the analyzer as gain offset settings, there by allowing direct readings of the measurements made without the need for any further corrections. The resolution bandwidth is set to 100 kHz for this portion of the tests. The unit was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used with measurements from a peak detector presented in the chart below. Screen captures were acquired and any noticeable spurious and harmonic signals were identified and measured.

No significant emissions could be noted within -50 dBc of the fundamental level for this product.

### **11.2 Test Equipment List**

Please see Appendix A

### **11.3 Test Results**

The test data demonstrates a passing result

### **11.4 Test Data**

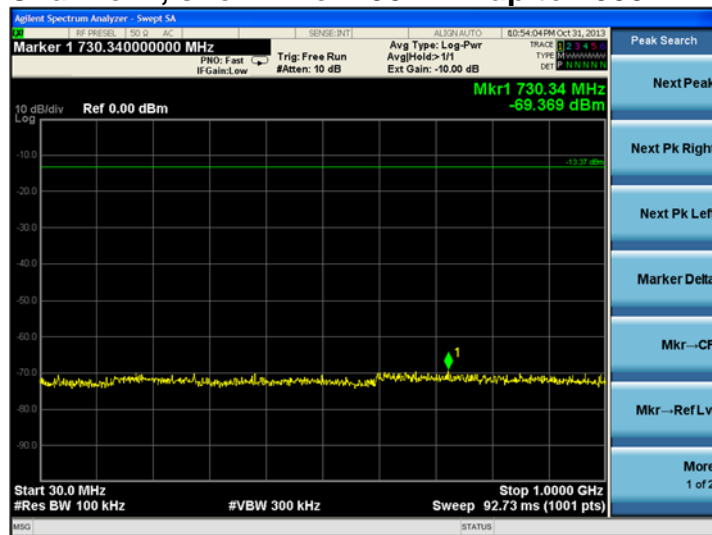
Harmonics of the Fundamental

	2412 (MHz)	2437 (MHz)	2462 (MHz)
2fo	-62.3	-64.5	-67.3
3fo	Note 1	Note 1	Note 1
4fo	-68.0	-68.0	-68.0
5fo	Note 1	Note 1	Note 1
6fo	Note 1	Note 1	Note 1
7fo	Note 1	Note 1	Note 1
8fo	-58.3	-59.2	-58.7
9fo	Note 1	Note 1	Note 1
10fo	Note 1	Note 1	Note 1

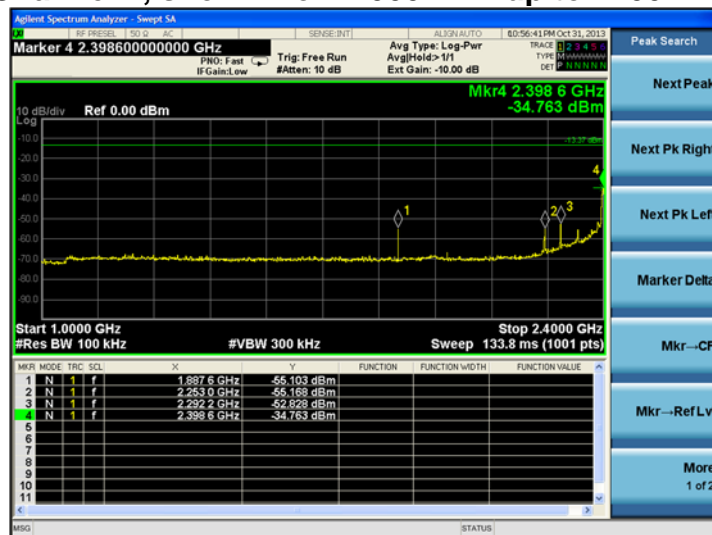
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 59 of 65</b>

## 11.4 Screen Captures – Spurious Conducted Emissions

Channel 1, shown from 30 MHz up to 1000 MHz



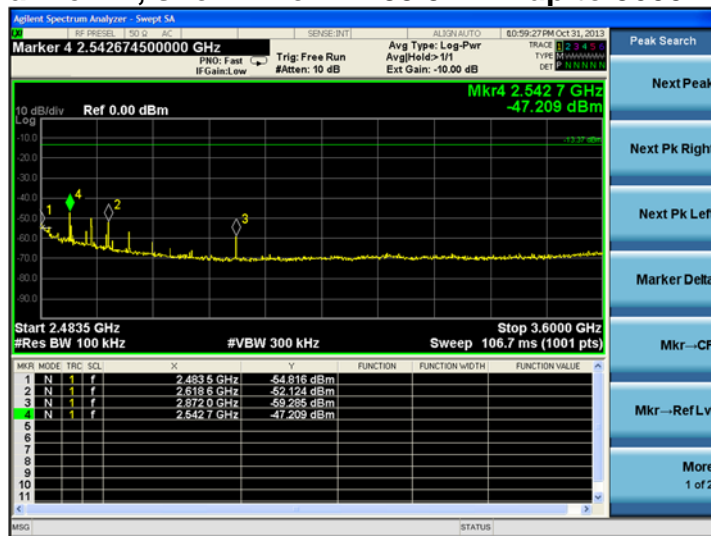
Channel 1, shown from 1000 MHz up to 2400 MHz



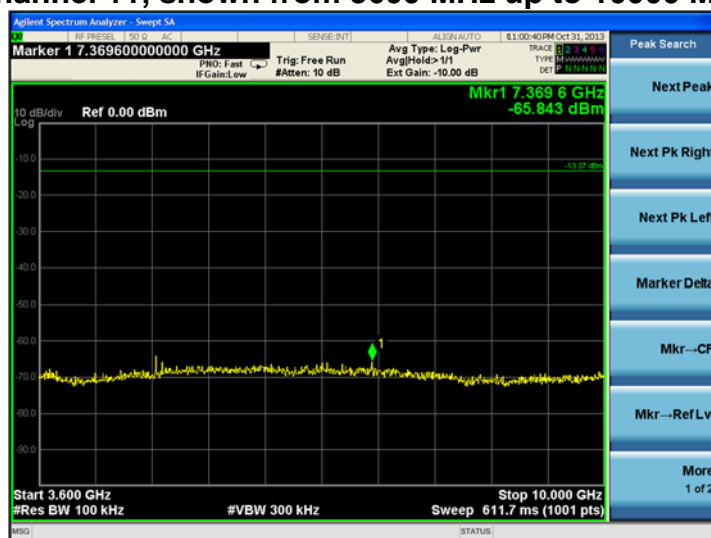
Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSER	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 60 of 65

## Screen Captures – Spurious Conducted Emissions (cont.)

Channel 11, shown from 2483.5 MHz up to 3600 MHz



Channel 11, shown from 3600 MHz up to 10000 MHz



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956	Page 61 of 65
	Conducted Sample: 3-028864	

## Screen Captures – Spurious Conducted Emissions (cont.)

### Channel 11, shown from 10000 MHz up to 25000 MHz



Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 62 of 65

## APPENDIX A - Instrumentation Sheet



**LS RESEARCH LLC**  
Wireless Product Development  
Equipment Calibration

Date : 31-Oct-2013

Type Test : Conducted AC Emissions

Job # : C-1833

Prepared By: Peter

Customer : Select Comfort

Quote #: 313276

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960156	100kHz-1GHz Analog Signal Generator	Agilent	N5181A	MY49060062	9/5/2013	9/5/2014	Active Calibration
2	EE 960157	3Hz-13.2GHz Spectrum Analyzer	Agilent	E4445A	MY48250225	9/5/2013	9/5/2014	Active Calibration
3	EE 960158	RF Preselector	Agilent	N9039A	MY46520110	9/5/2013	9/5/2014	Active Calibration
4	EE 960084	LISN - 15A	COM-POWER	LI-215A	191920	2/6/2013	2/6/2014	Active Calibration
5	AA 960072	Transient Limiter	HP	11947A	3107A02515	2/15/2013	2/15/2014	Active Calibration

Project Engineer: Peter Finken

Quality Assurance: [Signature]



**LS RESEARCH LLC**  
Wireless Product Development  
Equipment Calibration

Date : 28-Oct-2013

Type Test : Radiated Emissions WLAN

Job # : C-1833

Prepared By: Peter

Customer : Select Comfort

Quote #: 313276

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960073	Spectrum Analyzer	Agilent	E4446A	US45300564	5/28/2013	5/28/2014	Active Calibration
2	AA 960081	Double Ridge Horn Antenna	EMCO	3115	6907	1/29/2013	1/29/2014	Active Calibration
3	EE 960147	Pre-Amp	Adv. Micro	WLA612	123101	2/1/2013	2/1/2014	Active Calibration
4	AA 960153	2.4GHz High Pass Filter	KWM	HPF-L-14186	7272-04	4/1/2013	4/1/2014	Active Calibration
5	EE 960146	Std. Gain Horn Ant. w/preamp	Adv. Micro / EMC	WLA622-4 / 3160-09	123001	9/24/2013	9/24/2014	Active Calibration

Project Engineer: Peter Finken

Quality Assurance: [Signature]



**LS RESEARCH LLC**  
Wireless Product Development  
Equipment Calibration

Date : 22-Oct-2013

Type Test : Radiated WLAN Band-Edge

Job # : C-1833

Prepared By: Peter

Customer : Select Comfort

Quote #: 313276

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	AA 960007	Double Ridge Horn Antenna	EMCO	3115	9311-4138	6/10/2013	6/10/2014	Active Calibration
2	EE 960156	100kHz-1GHz Analog Signal Generator	Agilent	N5181A	MY49060062	9/5/2013	9/5/2014	Active Calibration
3	EE 960157	3Hz-13.2GHz Spectrum Analyzer	Agilent	E4445A	MY48250225	9/5/2013	9/5/2014	Active Calibration
4	EE 960158	RF Preselector	Agilent	N9039A	MY46520110	9/5/2013	9/5/2014	Active Calibration

Project Engineer: Peter Finken

Quality Assurance: [Signature]



**LS RESEARCH LLC**  
Wireless Product Development  
Equipment Calibration

Date : 31-Oct-2013

Type Test : Conducted Radio Measurements

Job # : C-1833

Prepared By: Peter

Customer : Select Comfort

Quote #: 313276

No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status
1	EE 960085	N9038A MXE 26.5GHz Receiver	Agilent	N9038A	MY51210148	8/7/2013	8/7/2014	Active Calibration

Project Engineer: Peter Finken

Quality Assurance: \_\_\_\_\_

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSERD	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	Page 63 of 65

## **APPENDIX B – Test Standards**

<b>STANDARD #</b>	<b>DATE</b>	<b>Am. 1</b>	<b>Am. 2</b>
ANSI C63.4	2003		
ANSI C63.10	2009		
FCC 47 CFR, Parts 0-15, 18, 90, 95	2009		
FCC Procedures	2012		
RSS GEN	2010-12		
RSS 210	2010-12		

Prepared For: Select Comfort	EUT: SIQ Wireless Base Unit	LS Research, LLC
Report #: 313276	Model #: SIQ01VCSEDR	
LSR Job #: C-1833	Radiated Sample: 3-028956 Conducted Sample: 3-028864	<b>Page 64 of 65</b>



## **APPENDIX C - Uncertainty Statement**

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k=2.

*Table of Expanded Uncertainty Values, (K=2) for Specified Measurements*

<b>Measurement Type</b>	<b>Particular Configuration</b>	<b>Uncertainty Values</b>
<i>Radiated Emissions</i>	<i>3 – Meter chamber, Biconical Antenna</i>	<i>4.82 dB</i>
<i>Radiated Emissions</i>	<i>3-Meter Chamber, Log Periodic Antenna</i>	<i>4.88 dB</i>
<i>Radiated Emissions</i>	<i>3-Meter Chamber, Horn Antenna</i>	<i>4.85 dB</i>
<i>Radiated Emissions</i>	<i>10-Meter OATS, Biconical Antenna</i>	<i>4.32 dB</i>
<i>Radiated Emissions</i>	<i>10-Meter OATS, Log Periodic Antenna</i>	<i>3.63 dB</i>
<i>Absolute Conducted Emissions</i>	<i>Agilent PSA/ESA Series</i>	<i>1.38 dB</i>
<i>AC Line Conducted Emissions</i>	<i>Shielded Room/EMCO LISN</i>	<i>3.20 dB</i>
<i>Radiated Immunity</i>	<i>3 Volts/Meter in 3-Meter Chamber</i>	<i>2.05 Volts/Meter</i>
<i>Conducted Immunity</i>	<i>3 Volts level</i>	<i>2.33 V</i>
<i>EFT Burst, Surge, VDI</i>	<i>230 VAC</i>	<i>54.4 V</i>
<i>ESD Immunity</i>	<i>Discharge at 15kV</i>	<i>3200 V</i>
<i>Temperature/Humidity</i>	<i>Thermo-hygrometer</i>	<i>0.64° / 2.88 %RH</i>