EMC Test Report

FCC Part 15 Subpart C

Model: Intel Centrino Wireless-N + WiMAX 6150, Model: 612BNXHMW

FCC ID:	PD9612BNXH and PD9612BNXHU
APPLICANT:	Intel Corporation 100 Center Point Circle Suite 200 Columbia, SC 29210
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
REPORT DATE:	September 17, 2010
FINAL TEST DATES:	August 25, 26, 30 and September 9, 2010

AUTHORIZED SIGNATORY:

Mark Briggs
Staff Engineer
Elliott Laboratories

Testing Cert #2016.01

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REVISION HISTORY

Rev#	Date	Comments	Modified By
1	09-21-2010	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Intel Corporation model Intel Centrino Wireless-N + WiMAX 6150, Model: 612BNXHMW, pursuant to FCC Part 15 Subpart C.

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in ANSI C63.4:2003, FCC DTS Measurement Procedure KDB558074, March 2005 and as outlined in Elliott Laboratories test procedures:

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Intel Corporation model Intel Centrino Wireless-N + WiMAX 6150, Model: 612BNXHMW complied with the requirements of FCC Part 15 Subpart C.

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Intel Corporation model Intel Centrino Wireless-N + WiMAX 6150, Model: 612BNXHMW and therefore apply only to the tested sample. The sample was selected and prepared by Steve Hackett of Intel Corporation.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / DSSS techniques	System must utilize digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	11.5MHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11b: 0.060 W 802.11g: 0.048 W n20MHz: 0.051 W n40MHz: 0.059 W EIRP < 0.126 W	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	-6.1 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions more than 30dB below in-band signal level.	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	50.2dBµV/m @ 2390.0MHz (-3.8dB) Note 3	15.207 in restricted bands, all others <-30dBc Note 2	Complies

Note 1: EIRP calculated using antenna gain of 3.7 dBi for the highest EIRP system.
Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst).
Note 3: Radiated spurious emissions form the module in the frequency range 30Mhz – 1GHz were for the digital circuitry and are covered under the test report and certification documentation under product code JBP.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Unique connector	Unique connector or integral antenna	Complies
15.109		Receiver spurious emissions	Device operates above 960 MHz	Refer to page 17	N/A
15.207		AC Conducted Emissions	22.6dBµV @ 9.900MHz (-27.4dB)	Refer to page 16	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, and User Manual statements.	Refer to OET 65, FCC Part 1	Complies

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.52 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Intel Corporation model Intel Centrino Wireless-N + WiMAX 6150, Model: 612BNXHMW is an IEEE 802.16e and 802.11b/g/n wireless multi-band network adapter. This module, available in the PCIe Half MiniCard form factor, delivers up to 20 Mbps+ downlink, up to 6 Mbps+ uplink performance over WiMAX, and up to 300 Mbps Tx/Rx1 over Wi-Fi. Both WiFi and WiMax support MISO 1x2 with either or both ports active in receive mode. WiMax operation supports antenna diversity to allow transmission on either of the two antenna ports but WiFi operation only supports transmission on antenna port 1 (Port A).

The device is sold under two different FCC IDs. FCC ID PD9612BNXH is a module intended for installation by the host system manufacturer only. FCC ID PD9612BNXHU is a module intended for installation by the host integrator and also by the end user. As the module has transmitter capabilities under Part 15 of the FCC rules user-installed versions require the use of a BiOS Lock mechanism to ensure the module is only installed into the appropriate host devices.

As the device is being approved using the FCC's modular approval procedures the card was installed onto a test fixture to expose the card on all sides for testing. In normal use the card would be installed inside a host system.

The sample was received on August 15, 2010 and tested on August 25, 26, 30 and September 9, 2010. The EUT consisted of the following component(s):

Company	Model	Description	MAC address	FCC ID
Intel Corporation	612BNXHMW	802.11bgn and WiMax half-mini PCIe card	4025C20027A4 and 4025C20027AC	PD9612BNXH PD9612BNXHU

ANTENNA SYSTEM

The antenna system used during the evaluation of the module was PIFA antenna. The specifications for this antenna are provided with the Operational Description documentation.

ENCLOSURE

The EUT has no enclosure. It is designed to be installed within the enclosure of a host computer.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

Company	Model	Description	Serial Number	FCC ID
Intel	-	Antenna test fixture	2010-1434	-
Intel	-	Shiloh Motherboard Extender (module test fixture)	2010-1430	-
Dell	-	Laptop	Prototype	-

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Test Fixture PCIe	Laptop PCIe	Ribbon	-	1
Test fixture DC power	DC supply	2-wire	Unshielded	0.5

EUT OPERATION

During testing, the EUT was configured to operate in a continuous transmit mode on the top, bottom and center channels for each operating mode (802.11b, 802.11g, 802.11n 20MHz and 802.11n 40MHz) using the Intel DRTU test utility running the laptop PC. The tool configured the card to operate at the lowest data rate for each mode (1Mb/s for 802.11b, 6Mb/s for 802.11g, 6.5Mb/s for 802.11n 20Mhz and 13Mb/s for 802.11n 40MHz) as the output power from the device, when operating as intended, is reduced as data rate is increased.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
Chamber 3	769238	2845B-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	211948	2845B-4	
Chamber 5	211948	2845B-5	
Chamber 7	A2LA accreditation	2845B-7	

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

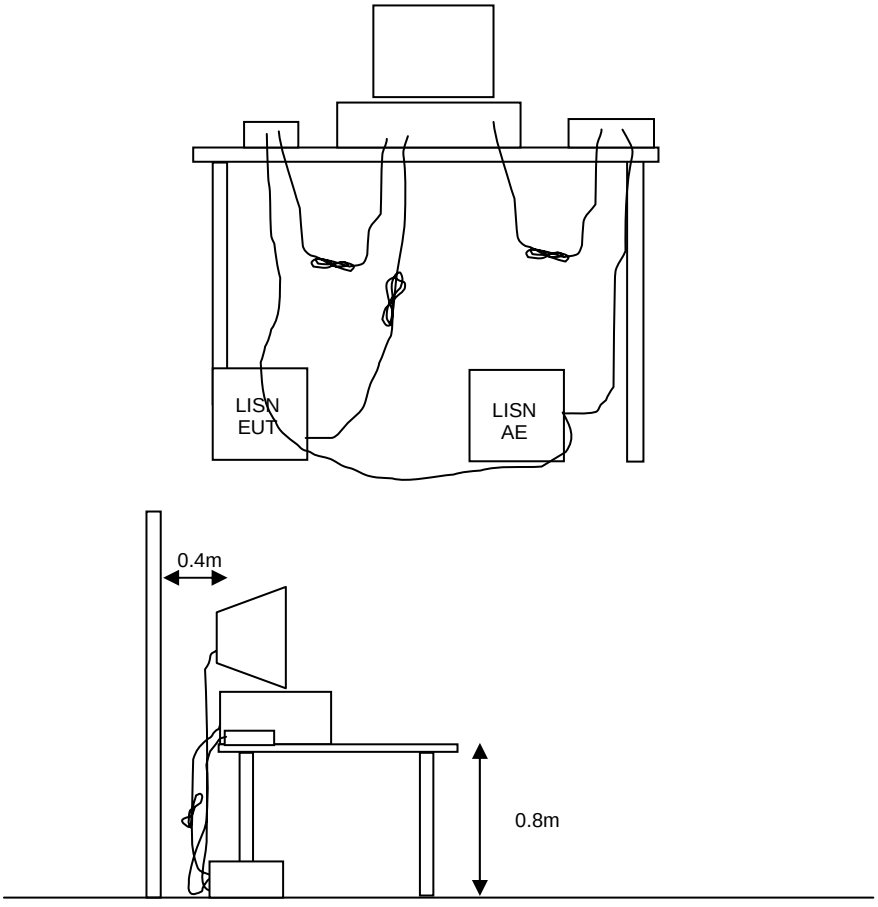
TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.



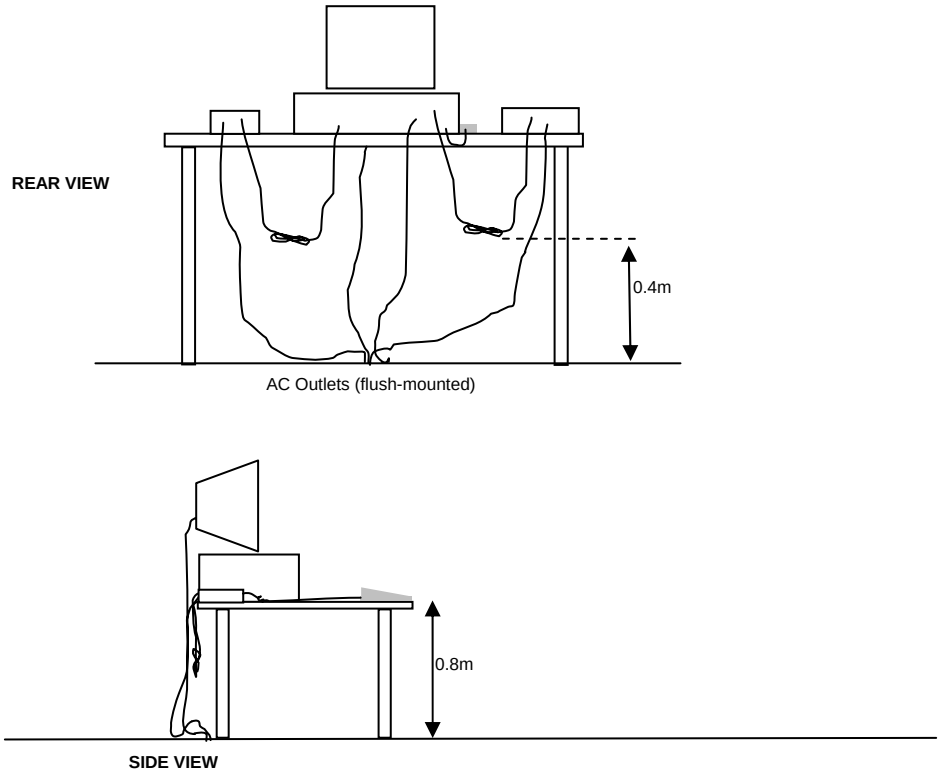
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

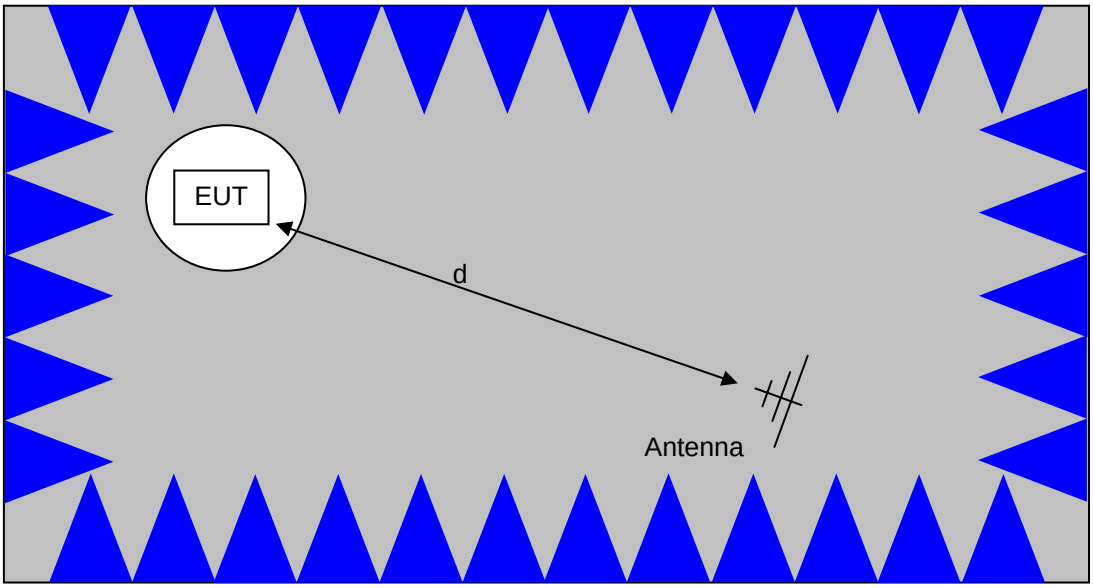
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

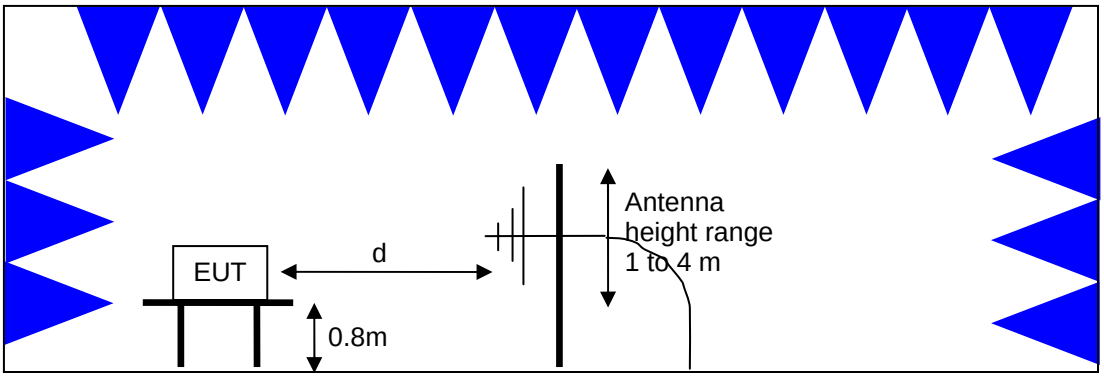


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[1] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

[1] The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watt (30 dBm)	8 dBm/3kHz
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3kHz
5725 – 5850	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

Appendix A Test Equipment Calibration Data

Radio (Fundamental and BE), 25-Aug-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	10/22/2010
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/2/2010
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1555	2/5/2011
Rohde & Schwarz	Attenuator, 20 dB , 50 ohm, 10W, DC-18 GHz	20dB, 10W, Type N	1556	2/5/2011

Radio (Fundamental and BE), 27-Aug-10

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	10/22/2010
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1555	2/5/2011
Rohde & Schwarz	Attenuator, 20 dB , 50 ohm, 10W, DC-18 GHz	20dB, 10W, Type N	1556	2/5/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012

TX Spurious, 30-Aug-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	5/26/2011
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	6/4/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	4/29/2011
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	3/31/2011

Radio Antenna Port (Power), 9-10-Sep-10

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	10/22/2010
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1555	2/5/2011
Rohde & Schwarz	Attenuator, 20 dB , 50 ohm, 10W, DC-18 GHz	20dB, 10W, Type N	1556	2/5/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011

Conducted Emissions - AC Power Ports, 13-Sep-10

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	3/12/2011
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1401	4/20/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	10/21/2010

Appendix B Test Data

T80291 54 Pages

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		-
Emissions Standard(s):	FCC	Class:	B
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

Intel Corporation

Model

Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW

Date of Last Test: 9/16/2010

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Summary of Results

MAC Address: 4025C20027AC DRTU Tool Version 1.2.2-0177 Driver version 14.0.0.39

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1	802.11b Chain A	#1 2412MHz	16.5	16.9	Restricted Band Edge at 2400 MHz	15.209	38.2dBµV/m @ 2390.0MHz (-15.8dB)
		#11 2462MHz	16.5	16.7	Restricted Band Edge at 2483.5 MHz	15.209	35.7dBµV/m @ 2483.5MHz (-18.3dB)

Note - the target and measured power are average powers (measured with average power sensor) and are used for reference purposes only. Power is set using " **GAIN CONTROL**" mode in the DRTU tool.

Ambient Conditions:

Rel. Humidity: 15 - 55 %
Temperature: 18 - 25 °C

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and test fixture were located on the turntable for radiated spurious emissions testing. All other support equipment was located on the floor or as close to the floor as cabling would permit.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 39 %

Modifications Made During Testing, Deviations From The Standard

No modifications were made to the EUT during testing
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 1, Band Edge Field Strength - 802.11b, Chain A

Date of Test: 8/25/2010 Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal Config Change: none

Run # 1a, EUT on Channel #1 2412MHz - 802.11b, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.9	20.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.800	100.5	V	-	-	AVG	172	1.0	RB 1 MHz;VB 10 Hz;Pk
2413.270	103.3	V	-	-	PK	172	1.0	RB 1 MHz;VB 3 MHz;Pk
2414.000	102.4	H	-	-	AVG	346	1.0	RB 1 MHz;VB 10 Hz;Pk
2413.270	105.6	H	-	-	PK	346	1.0	RB 1 MHz;VB 3 MHz;Pk

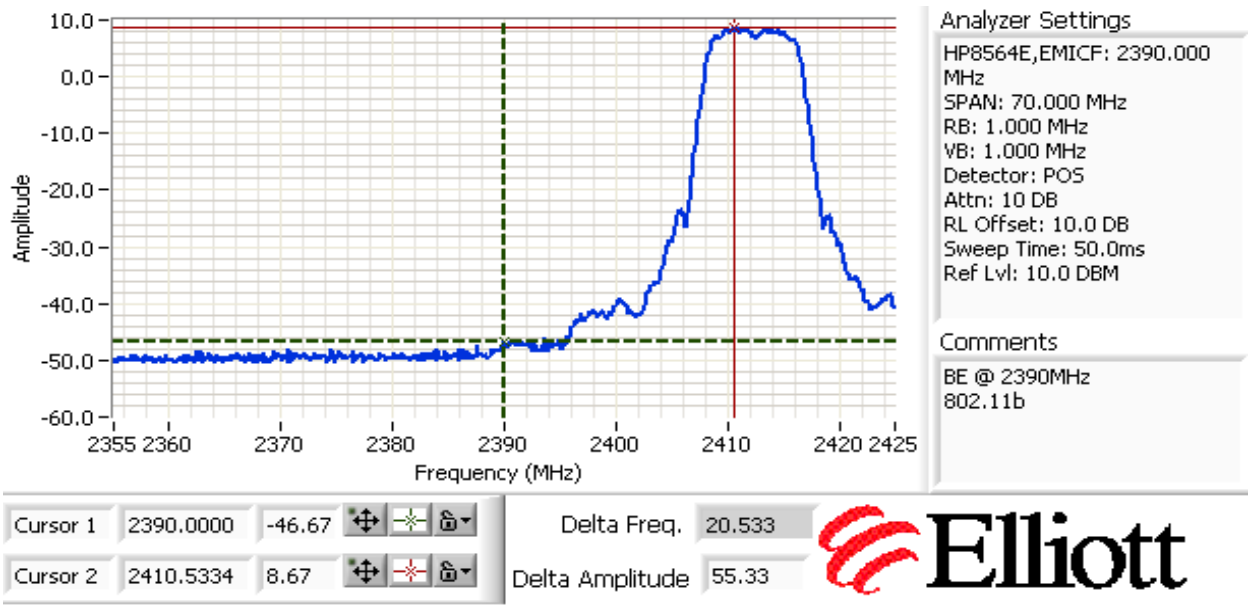
2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	105.6	103.3	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	102.4	100.5	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*64.2 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	41.4 dBuV/m		
Calculated Band-Edge Measurement (Avg):	38.2 dBuV/m		
Delta Marker - 1MHz/1MHz:	*55.3 dB*		
Delta Marker - 1MHz/10Hz:	*64.2 dB*		
Calculated Band-Edge Measurement (Peak):	50.3 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	38.2 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-15.8	38.2	54	Avg
-32.6	41.4	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	38.2	-	54.0	**-15.8**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 2b, EUT on Channel #11 2462MHz - 802.11b, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.7	20.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2460.470	99.8	V	-	-	AVG	182	1.7	RB 1 MHz;VB 10 Hz;Pk
2460.870	102.6	V	-	-	PK	182	1.7	RB 1 MHz;VB 3 MHz;Pk
2460.680	100.2	H	-	-	AVG	341	1.0	RB 1 MHz;VB 10 Hz;Pk
2460.530	103.7	H	-	-	PK	341	1.0	RB 1 MHz;VB 3 MHz;Pk

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	103.7	102.6	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	100.2	99.8	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*63.5 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	40.2 dBuV/m		
Calculated Band-Edge Measurement (Avg):	36.7 dBuV/m		

	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	-18.3	35.7	54	Avg
Delta Marker - 1MHz/10Hz: **64.5** *dB*	-33.8	40.2	74	Pk

Calculated Band-Edge Measurement (Peak):	46.7 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	35.7 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	35.7	-	54.0	**-18.3**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Analyzer Settings

HP8564E,EMICF: 2483.500 MHz
SPAN: 70.000 MHz
RB: 1.000 MHz
VB: 10 Hz
Detector: Sample
Attn: 10 DB
RL Offset: 10.0 DB
Sweep Time: 26.0s
Ref Lvl: 10.0 DBM

Comments

BE @ 2483.5MHz
802.11b

Cursor 1	2460.3999	5.17	Delta Freq.	23.333	Elliott
Cursor 2	2483.7334	-59.33	Delta Amplitude	64.50	

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Summary of Results

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
MAC 4025C20027A4, DRTU Tool 1.2.2-0177							
Run # 1	n40 Chain A	#3 2422MHz	13.5	13.7	Restricted Band Edge at 2400 MHz	15.209	**50.2dBµV/m @ 2390.0MHz (-3.8dB)**
		#9 2452MHz	11.5	11.7	Restricted Band Edge at 2483.5 MHz	15.209	49.8dBµV/m @ 2484.2MHz (-4.2dB)
Run # 2	n40 Chain A	#4 2427MHz	15.0	15.2	Restricted Band Edge at 2400 MHz	15.209	50.7dBµV/m @ 2389.8MHz (-3.3dB)
		#8 2447MHz	12.5	12.7	Restricted Band Edge at 2483.5 MHz	15.209	49.3dBµV/m @ 2483.5MHz (-4.7dB)
MAC 4025C20027A4, DRTU Tool 1.2.2-0177 for field strength, 1.2.10-0194 for marker delta, Driver 14.0.0.39							
Run # 3	n20 Chain A	#1 2412MHz	16.5	16.7	Restricted Band Edge at 2483.5 MHz	15.209	49.0dBµV/m @ 2389.4MHz (-5.0dB)
	n20 Chain A	#11 2462MHz	14.5	14.7	Restricted Band Edge at 2483.5 MHz	15.209	50.2dBµV/m @ 2483.7MHz (-3.8dB)
Run # 4	802.11g Chain A	#1 2412MHz	16.5	16.6	Restricted Band Edge at 2483.5 MHz	15.209	45.0dBµV/m @ 2390.0MHz (-9.0dB)
		#11 2462MHz	15.0	15.2	Restricted Band Edge at 2483.5 MHz	15.209	47.9dBµV/m @ 2483.5MHz (-6.1dB)

Note - the target and measured power are average powers (measured with average power sensor) and are used for reference purposes only. Power is set using " **GAIN CONTROL**" mode in the DRTU tool.

Ambient Conditions:

Rel. Humidity: 15 - 55 %
Temperature: 18 - 25 °C

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and test fixture were located on the turntable for radiated spurious emissions testing.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Ambient Conditions:

Temperature: 21.7 °C
Rel. Humidity: 41 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run # 1, Band Edge Field Strength - n40, Chain A

Date of Test: 8/26/2010 Test Location: FT Chamber #7
Test Engineer: Rafael Varelas Config Change: none

Run # 1a, EUT on Channel #3 2422MHz - n40, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	13.5	13.7	23.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2418.870	91.3	V	-	-	AVG	354	1.0	RB 1 MHz;VB 10 Hz;Pk
2419.930	99.9	V	-	-	PK	354	1.0	RB 1 MHz;VB 3 MHz;Pk
2418.930	93.2	H	-	-	AVG	24	1.6	RB 1 MHz;VB 10 Hz;Pk
2420.200	101.9	H	-	-	PK	24	1.6	RB 1 MHz;VB 3 MHz;Pk

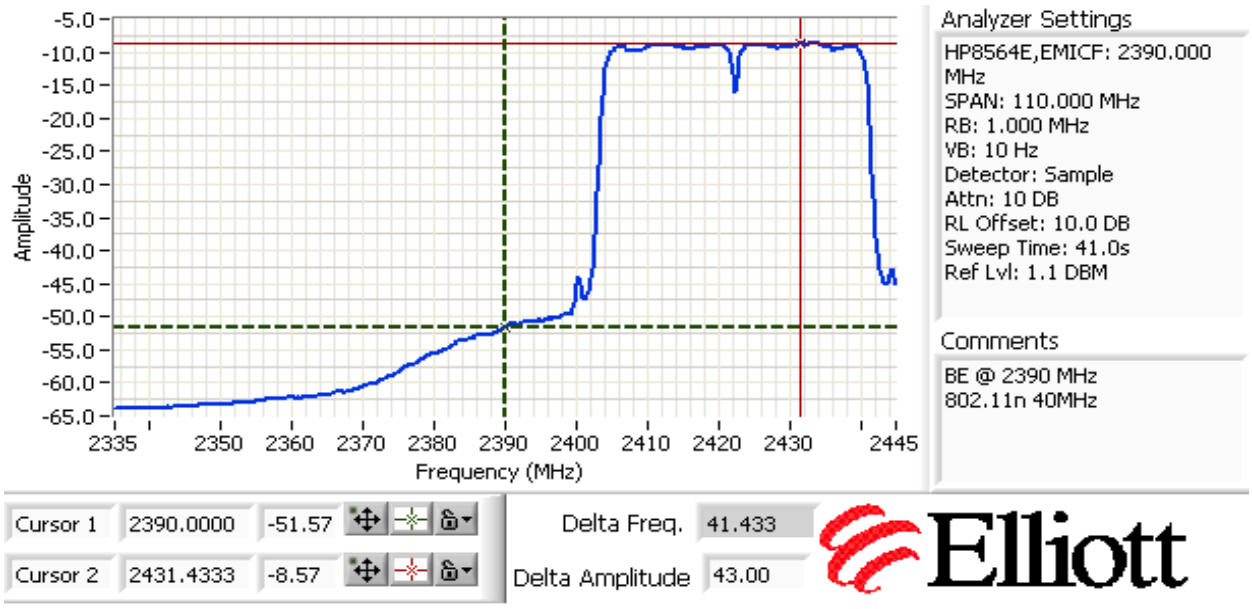
2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	101.9	99.9	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	93.2	91.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*42.5 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	59.4 dBuV/m		
Calculated Band-Edge Measurement (Avg):	50.7 dBuV/m		
Delta Marker - 1MHz/1MHz:	*39.3 dB*		
Delta Marker - 1MHz/10Hz:	**43.0** *dB*		
Calculated Band-Edge Measurement (Peak):	62.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.2 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-3.8	50.2	54	Avg
-14.6	59.4	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	50.2	-	54.0	**-3.8**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 1b, EUT on Channel #9 2452MHz - n40, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	11.5	11.7	21.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2448.870	89.9	V			AVG	354	1.0	RB 1 MHz;VB 10 Hz;Pk
2449.330	98.4	V			PK	354	1.0	RB 1 MHz;VB 3 MHz;Pk
2442.400	90.8	H			AVG	253	1.0	RB 1 MHz;VB 10 Hz;Pk
2442.130	99.2	H			PK	253	1.0	RB 1 MHz;VB 3 MHz;Pk

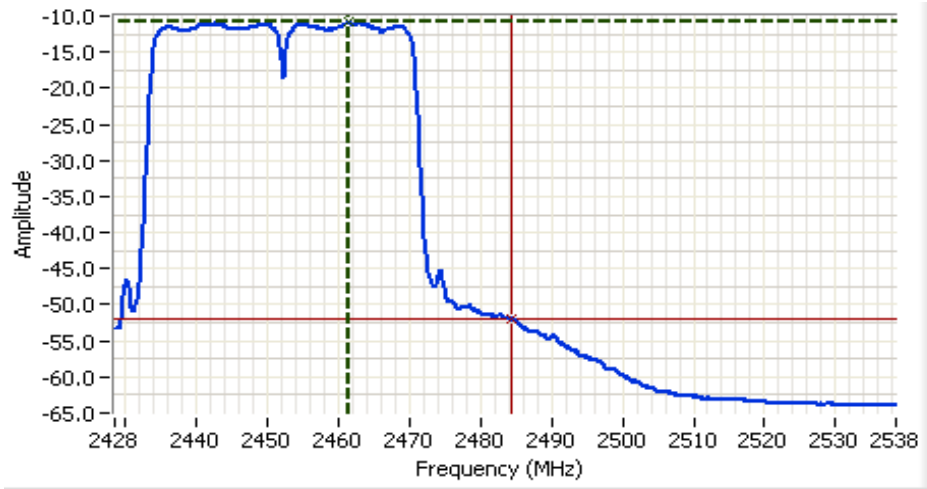
2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	99.2	98.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	90.8	89.9	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*39.2 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	60.0 dBuV/m		
Calculated Band-Edge Measurement (Avg):	51.6 dBuV/m		
Delta Marker - 1MHz/1MHz:	*39.2 dB*		
Delta Marker - 1MHz/10Hz:	**41.0** *dB*		
Calculated Band-Edge Measurement (Peak):	60.0 dBuV/m		Using 1MHz delta value
Calculated Band-Edge Measurement (Avg):	49.8 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-4.2	49.8	54	Avg
-14.0	60.0	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.233	49.8	-	54.0	**-4.2**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Analyzer Settings

HP8564E,EMICF: 2483.500 MHz
SPAN: 110.000 MHz
RB: 1.000 MHz
VB: 10 Hz
Detector: Sample
Attn: 10 DB
RL Offset: 10.0 DB
Sweep Time: 41.0s
Ref Lvl: 1.1 DBM

Comments

BE @ 2483.5 MHz
802.11n 40MHz

Cursor 1	2461.5000	-10.90	Delta Freq.	22.733	
Cursor 2	2484.2334	-51.90	Delta Amplitude	41.00	

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 2, Band Edge Field Strength - n40, Chain A

Date of Test: 8/26/2010 Test Location: FT Chamber #7

Test Engineer: Rafael Varelas Config Change: none

Run # 2a, EUT on Channel #4 2427MHz - n40, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	15.0	15.2	24.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2443.800	92.3	V	-	-	AVG	352	1.0	RB 1 MHz;VB 10 Hz;Pk
2443.730	100.3	V	-	-	PK	352	1.0	RB 1 MHz;VB 3 MHz;Pk
2417.330	94.9	H	-	-	AVG	21	1.3	RB 1 MHz;VB 10 Hz;Pk
2417.070	103.1	H	-	-	PK	21	1.3	RB 1 MHz;VB 3 MHz;Pk

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

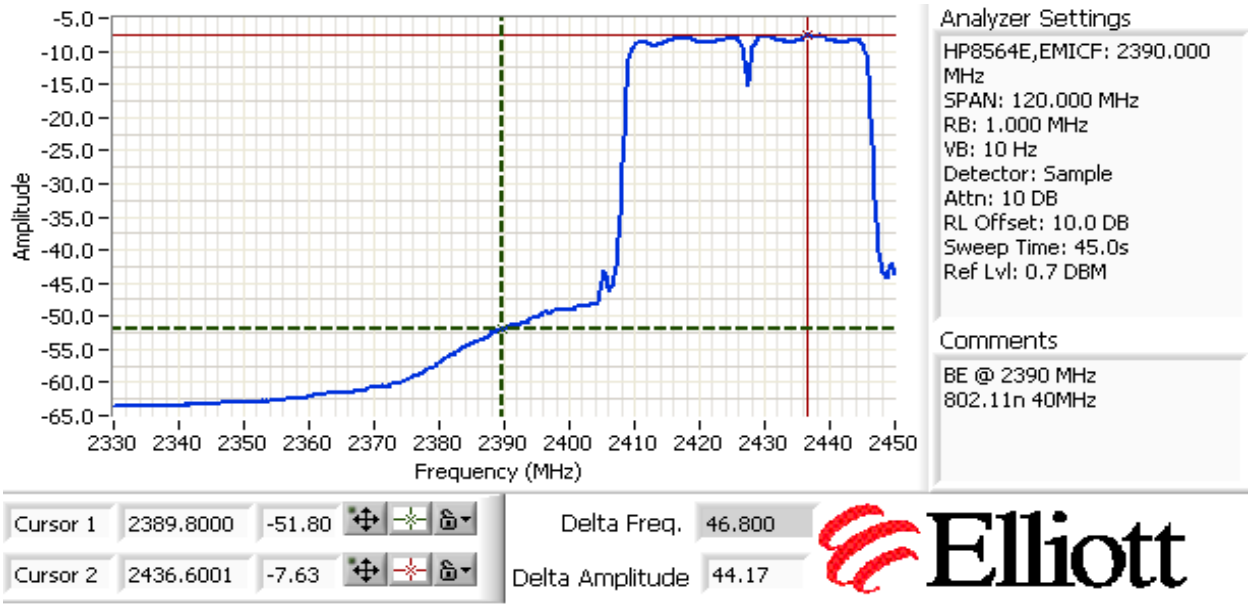
	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	103.1	100.3	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	94.9	92.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*42.2 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	60.9 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	52.7 dBuV/m		

Margin	Level	Limit	Detector
-3.3	50.7	54	Avg
-13.1	60.9	74	Pk

Delta Marker - 1MHz/1MHz:	*40.7 dB*	
Delta Marker - 1MHz/10Hz:	**44.2** *dB*	
Calculated Band-Edge Measurement (Peak):	62.4 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.7 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.800	50.7	-	54.0	**-3.3**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 2b, EUT on Channel #8 2447MHz - n40, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	12.5	12.7	22.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2450.270	90.5	V	120.0	-29.5	AVG	354	1.0	RB 1 MHz;VB 10 Hz;Pk
2457.600	98.8	V	120.0	-21.2	PK	354	1.0	RB 1 MHz;VB 3 MHz;Pk
2456.670	92.0	H	120.0	-28.0	AVG	22	1.0	RB 1 MHz;VB 10 Hz;Pk
2457.470	100.5	H	120.0	-19.5	PK	22	1.0	RB 1 MHz;VB 3 MHz;Pk

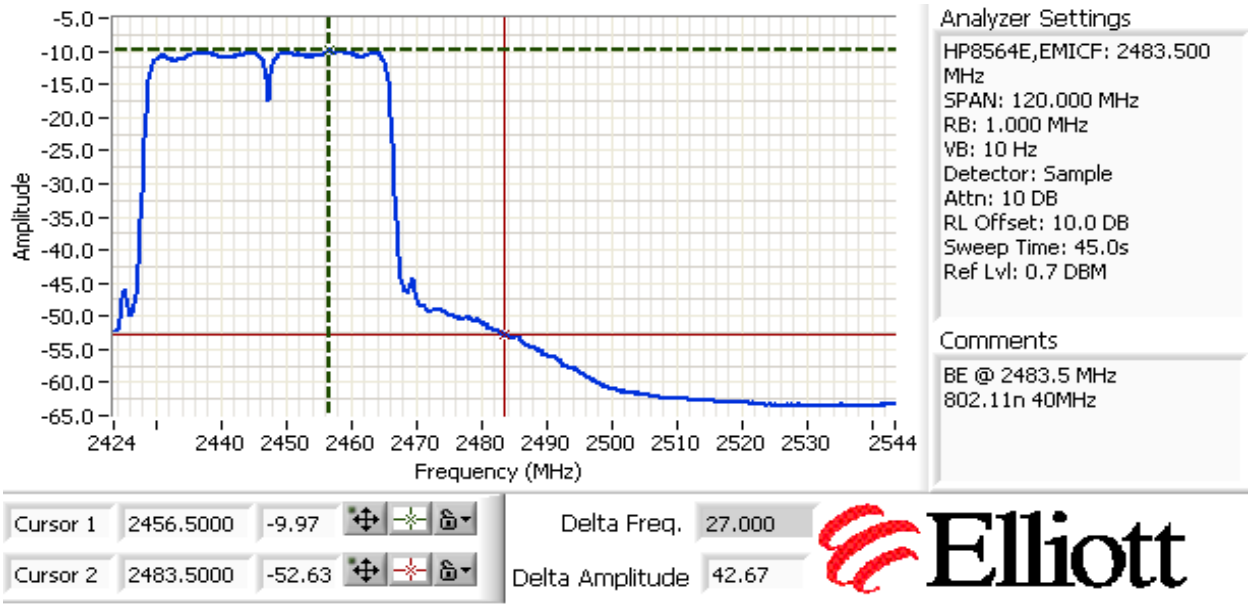
2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	100.5	98.8	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	92.0	90.5	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*40.0 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	60.5 dBuV/m		
Calculated Band-Edge Measurement (Avg):	52.0 dBuV/m		
Delta Marker - 1MHz/1MHz:	*39.0 dB*		
Delta Marker - 1MHz/10Hz:	**42.7** *dB*		
Calculated Band-Edge Measurement (Peak):	61.5 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	49.3 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-4.7	49.3	54	Avg
-13.5	60.5	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	49.3	-	54.0	**-4.7**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 3, Band Edge Field Strength - n20, Chain A

Date of Test: 8/26/2010 Test Location: FT Chamber #7

Test Engineer: Rafael Varelas Config Change: none

Run # 3a, EUT on Channel #1 2412MHz - n20, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.7	26.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2415.230	98.1	V	-	-	AVG	355	1.0	RB 1 MHz;VB 10 Hz;Pk
2415.270	106.3	V	-	-	PK	355	1.0	RB 1 MHz;VB 3 MHz;Pk
2415.270	100.2	H	-	-	AVG	22	1.6	RB 1 MHz;VB 10 Hz;Pk
2416.800	108.5	H	-	-	PK	22	1.6	RB 1 MHz;VB 3 MHz;Pk

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

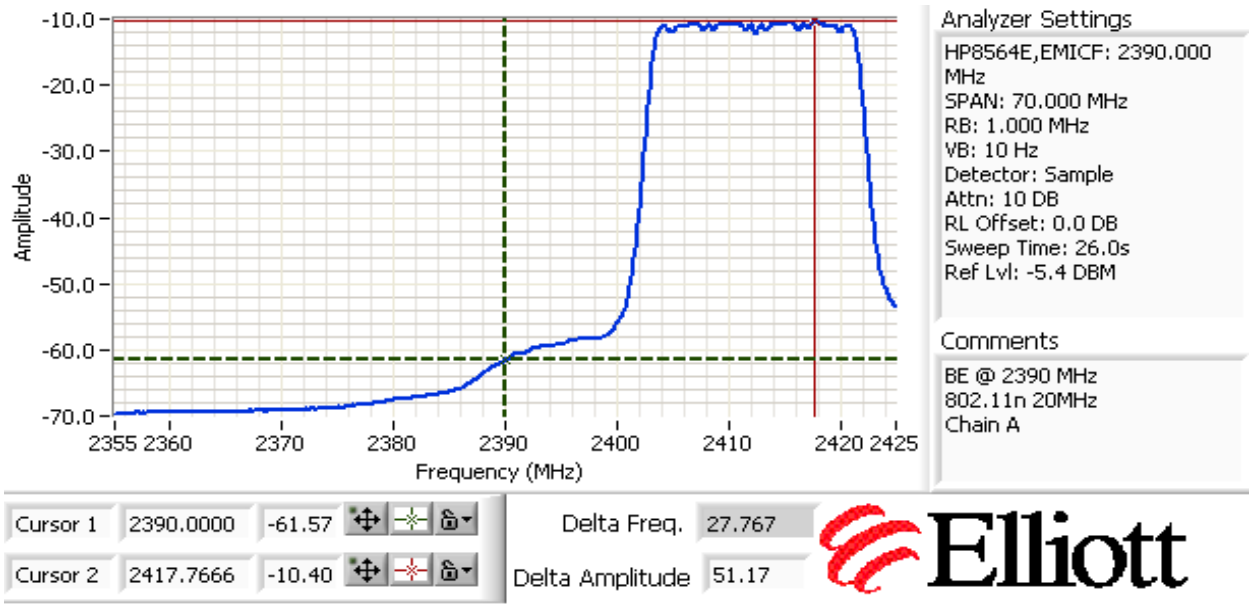
	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	108.5	106.3	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	100.2	98.1	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*51.0 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	57.5 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	49.2 dBuV/m		

Margin	Level	Limit	Detector
-5.0	49.0	54	Avg
-16.5	57.5	74	Pk

Delta Marker - 1MHz/1MHz:	*45.2 dB*	
Delta Marker - 1MHz/10Hz:	**51.2** *dB*	
Calculated Band-Edge Measurement (Peak):	63.3 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	49.0 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.416	49.0	-	54.0	**-5.0**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 3b, EUT on Channel #11 2462MHz - n20, Chain A

Date of Test: 8/26/2010 Test Location: FT Chamber #7

Test Engineer: Rafael Varelas Config Change: none

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	14.5	14.7	24.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2457.870	95.9	V	-	-	AVG	353	1.0	RB 1 MHz;VB 10 Hz;Pk
2459.100	104.5	V	-	-	PK	353	1.0	RB 1 MHz;VB 3 MHz;Pk
2458.730	99.0	H	-	-	AVG	4	1.3	RB 1 MHz;VB 10 Hz;Pk
2459.000	107.4	H	-	-	PK	4	1.3	RB 1 MHz;VB 3 MHz;Pk

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

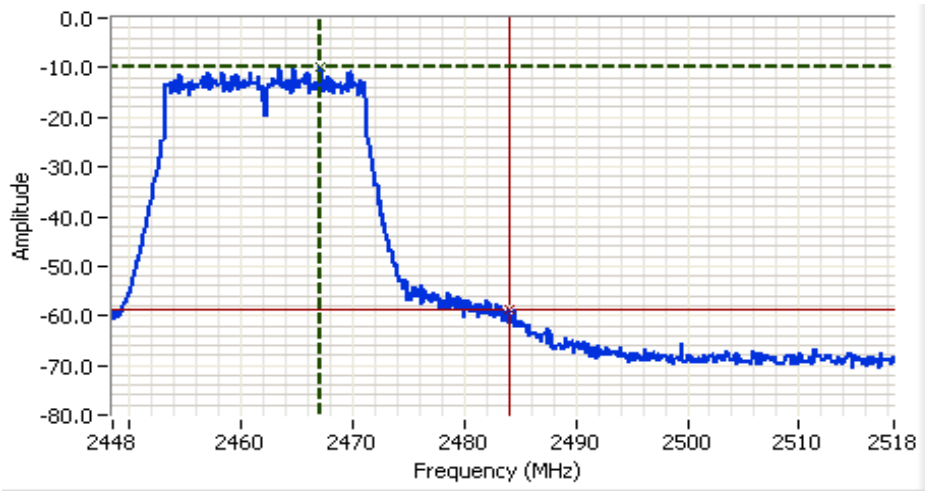
	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	107.4	104.5	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	99.0	95.9	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*48.8 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	58.6 dBuV/m		
Calculated Band-Edge Measurement (Avg):	50.2 dBuV/m		

	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	-3.8	50.2	54	Avg
Delta Marker - 1MHz/10Hz:	-15.4	58.6	74	Pk

Calculated Band-Edge Measurement (Peak):	63.9 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.2 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.733	50.2	-	54.0	**-3.8**	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Analyzer Settings

HP8564E,EMICF: 2483.500 MHz
SPAN: 70.000 MHz
RB: 100 kHz
VB: 100 kHz
Detector: POS
Attn: 10 DB
RL Offset: 0.0 DB
Sweep Time: 50.0ms
Ref Lvl: -3.7 DBM

Comments

BE @ 2483.5 MHz
802.11n 20MHz
Chain A

Cursor 1	2467.1667	-9.87	Delta Freq.	16.800	Elliott
Cursor 2	2483.9666	-58.70	Delta Amplitude	48.83	

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 4, Band Edge Field Strength - 802.11g, Chain A

Date of Test: 8/26/2010 Test Location: FT Chamber #7

Test Engineer: Rafael Varelas Config Change: none

Run # 4a, EUT on Channel #1 2412MHz - 802.11g, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.6	26.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2415.930	97.8	V	-	-	AVG	356	1.0	RB 1 MHz;VB 10 Hz;Pk
2416.200	105.8	V	-	-	PK	356	1.0	RB 1 MHz;VB 3 MHz;Pk
2415.930	98.8	H	-	-	AVG	251	1.0	RB 1 MHz;VB 10 Hz;Pk
2415.370	106.9	H	-	-	PK	251	1.0	RB 1 MHz;VB 3 MHz;Pk

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

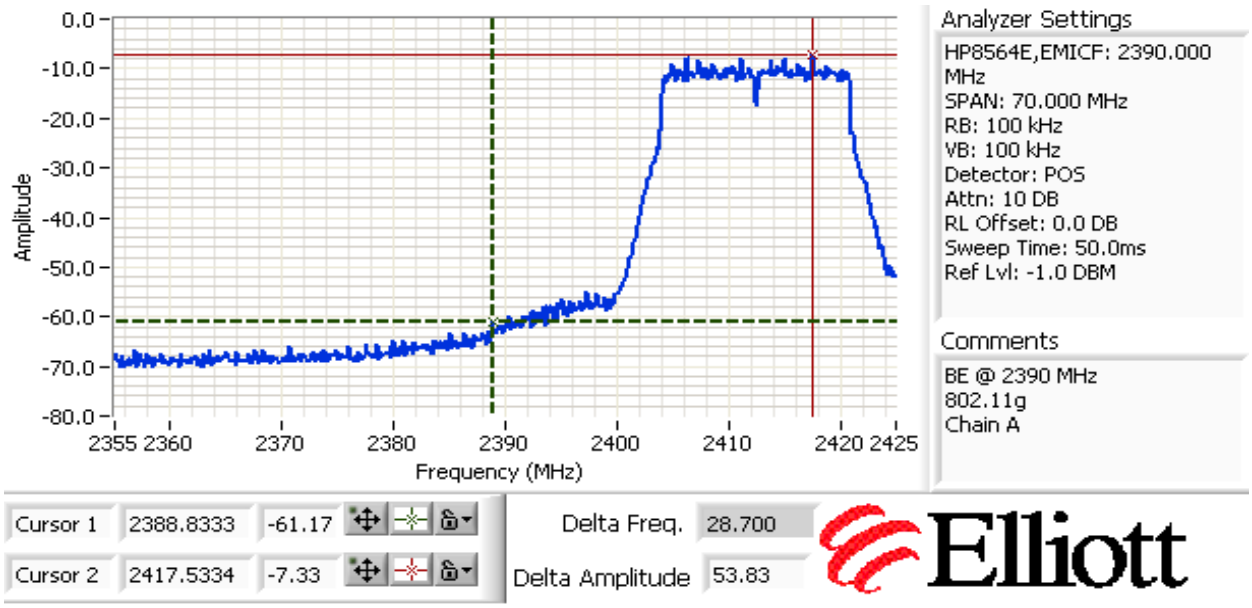
	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	106.9	105.8	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	98.8	97.8	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	**53.8** *dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	53.1 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	45.0 dBuV/m		

	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz: *48.0 dB*	-9.0	45.0	54	Avg
Delta Marker - 1MHz/10Hz: *53.2 dB*	-20.9	53.1	74	Pk

Calculated Band-Edge Measurement (Peak):	58.9 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	45.6 dBuV/m	Using 100kHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	45.0	-	54.0	**-9.0**	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 4b, EUT on Channel #11 2462MHz - 802.11g, Chain A

Date of Test: 8/26/2010 Test Location: FT Chamber #7

Test Engineer: Rafael Varelas Config Change: none

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	15.0	15.2	24.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2457.930	96.3	V	-	-	AVG	352	1.0	RB 1 MHz;VB 10 Hz;Pk
2458.230	104.5	V	-	-	PK	352	1.0	RB 1 MHz;VB 3 MHz;Pk
2466.570	99.2	H	-	-	AVG	4	1.3	RB 1 MHz;VB 10 Hz;Pk
2465.270	107.8	H	-	-	PK	4	1.3	RB 1 MHz;VB 3 MHz;Pk

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

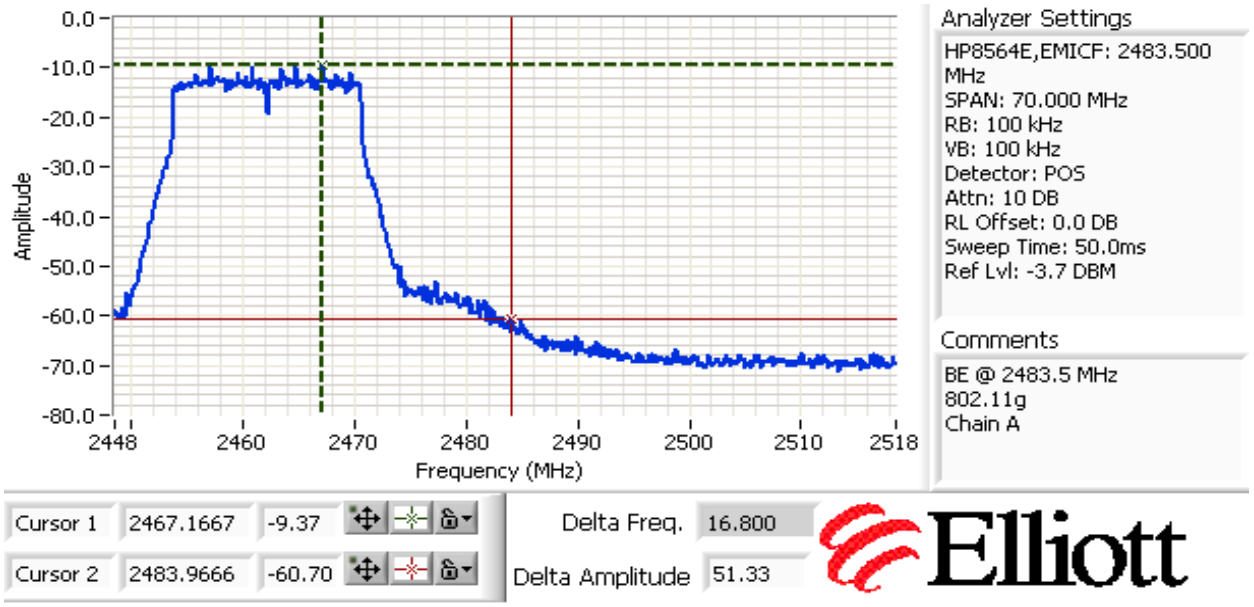
	H	V	
Fundamental emission level @ 3m in **1MHz RBW:**	107.8	104.5	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in **1MHz RBW:**	99.2	96.5	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	**51.3** *dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	56.5 dBuV/m		
Calculated Band-Edge Measurement (Avg):	47.9 dBuV/m		

Margin	Level	Limit	Detector
-6.1	47.9	54	Avg
-17.5	56.5	74	Pk

Delta Marker - 1MHz/1MHz:	*46.2 dB*	
Delta Marker - 1MHz/10Hz:	*50.3 dB*	
Calculated Band-Edge Measurement (Peak):	61.6 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	48.9 dBuV/m	Using 100kHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	47.9	-	54.0	**-6.1**	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions

Before disconnecting the power meter, EUT antennas or spectrum analyzer from the device please click on **Power Down** to stop the transmitter. Once the rf port is connected back up to the antenna, power meter or analyzer click on "**Start TX**". This prevents the feedback circuit on the EUT from dropping power while there is nothing connected and then ramping it back up when it sees a load.

Use the **Gain Control** mode of adjusting power. Set power to within +/-0.2dB of target.

Summary of Results

MAC Address: 4025C20027AC DRTU Tool Version 1.2.2-0177 Driver version 14.0.0.39

Note - scans of emissions in the 30 - 1000MHz indicated that there were no emissions below 1GHz related directly to the transceiver circuitry. Radiated emissions below 1GHz are, therefore, covered by the PC-peripheral tests for the digital device.

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run #1	802.11b Chain A	#1 2412MHz	16.5	16.9	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	54.7dBµV/m @ 3000.1MHz (-15.3dB)
		#6 2437MHz	16.5	16.8			53.4dBµV/m @ 3000.2MHz (-16.6dB)
		#11 2462MHz	16.5	16.7			51.5dBµV/m @ 6000.7MHz (-18.5dB)
Run #2 to determine worst case OFDM mode:							
Run # 2	802.11g	#6 2437MHz	16.5	16.8	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	54.5dBµV/m @ 3000.4MHz (-15.5dB)
	802.11n20	#6 2437MHz	16.5	16.8			51.9dBµV/m @ 6000.6MHz (-18.1dB)
	802.11n40	#6 2437MHz	16.5	16.9			37.1dBµV/m @ 1593.6MHz (-16.9dB)
Run #3 - top and bottom channels in the worst case OFDM mode:							
Run # 3	802.11g Chain A	#1 2412MHz	16.5	16.6	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	**56.4dBµV/m @ 3000.4MHz (-13.6dB)**
		#11 2462MHz	16.5	16.6			56.2dBµV/m @ 3000.2MHz (-13.8dB)

Note - the target and measured power are average powers (measured with average power sensor) and are used for reference purposes only. Power is set using " **GAIN CONTROL**" mode in the CRTU tool.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Ambient Conditions:

Rel. Humidity:	15 - 55 %
Temperature:	18 - 25 °C

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and test fixture were located on the turntable for radiated spurious emissions testing. All other support equipment was located on the floor or as close to the floor as cabling would permit.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature:	15 - 55 °C
Rel. Humidity:	18 - 25 %

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

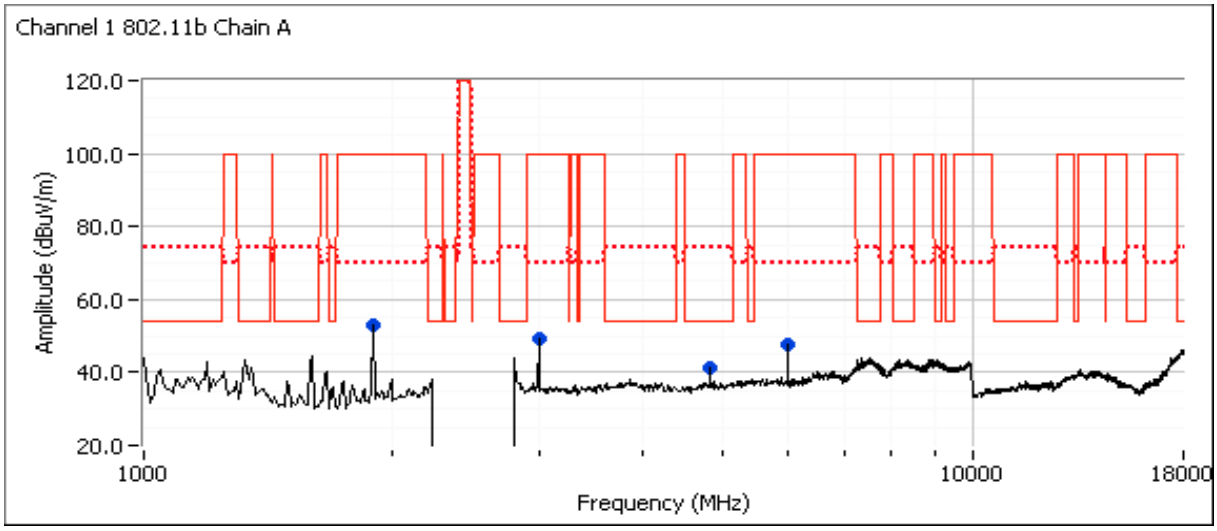
Run #1, Radiated Spurious Emissions, 1-26GHz, 802.11b, Chain A

Date of Test: 8/25/2010 Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal Config Change: none

Run #1a, EUT on Channel #1 2412MHz - 802.11b, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.9	20.0



Spurious Radiated Emissions:

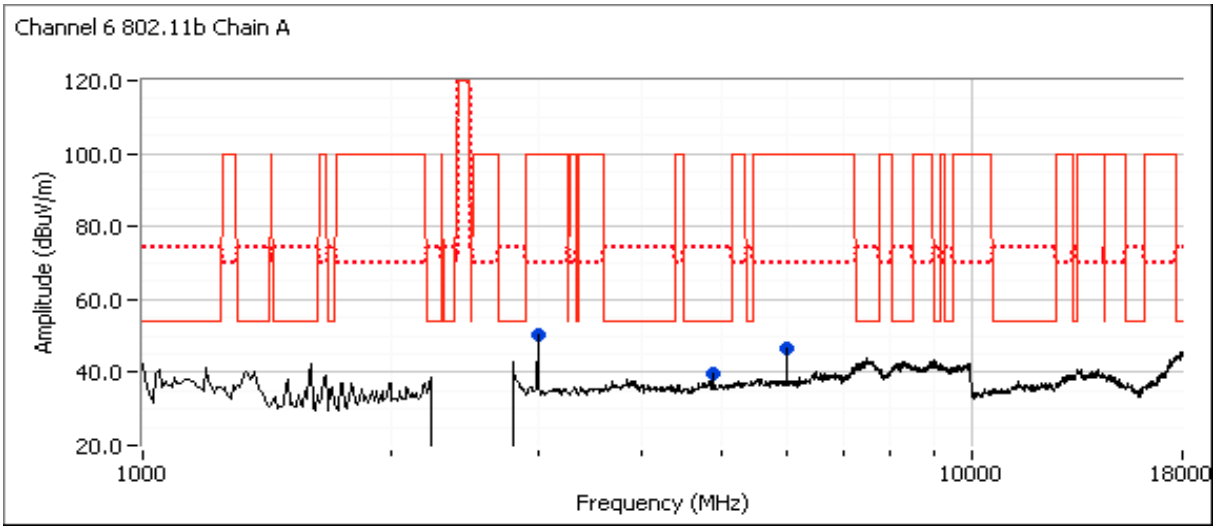
Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.140	**54.7**	V	70.0	**-15.3**	PK	134	1.0	RB 1 MHz;VB 3 MHz;Pk
6000.850	52.5	V	70.0	-17.5	PK	307	1.0	RB 1 MHz;VB 3 MHz;Pk
4818.190	31.5	V	54.0	-22.5	AVG	170	1.0	RB 1 MHz;VB 10 Hz;Pk
1894.580	39.2	V	70.0	-30.8	PK	328	1.3	RB 1 MHz;VB 3 MHz;Pk
4816.160	42.8	V	74.0	-31.2	PK	170	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run #1b: , EUT on Channel #6 2437MHz - 802.11b, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.8	20.0



Spurious Radiated Emissions:

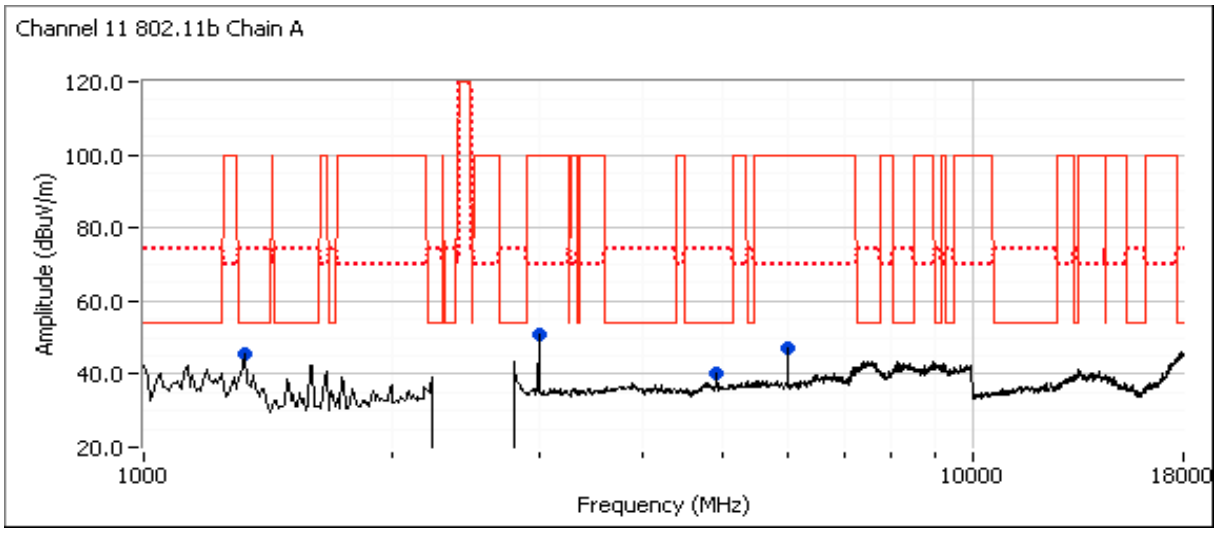
Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.200	53.4	V	70.0	-16.6	PK	138	1.0	RB 1 MHz;VB 3 MHz;Pk
6000.790	51.2	V	70.0	-18.8	PK	302	1.0	RB 1 MHz;VB 3 MHz;Pk
4866.950	30.7	V	54.0	-23.3	AVG	130	2.2	RB 1 MHz;VB 10 Hz;Pk
4868.020	41.8	V	74.0	-32.2	PK	130	2.2	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above the noise floor when using measurement antenna within 20cm of the device from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run #1c: , EUT on Channel #11 2462MHz - 802.11b, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.7	20.0



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.660	**51.5**	V	70.0	**-18.5**	PK	304	1.0	RB 1 MHz;VB 3 MHz;Pk
1320.660	35.4	V	54.0	-18.6	AVG	135	1.3	RB 1 MHz;VB 10 Hz;Pk
3000.410	50.0	V	70.0	-20.0	PK	141	1.0	RB 1 MHz;VB 3 MHz;Pk
4929.940	30.5	V	54.0	-23.5	AVG	141	1.6	RB 1 MHz;VB 10 Hz;Pk
1321.350	45.9	V	70.0	-24.1	PK	135	1.3	RB 1 MHz;VB 3 MHz;Pk
4931.580	41.3	V	70.0	-28.7	PK	141	1.6	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

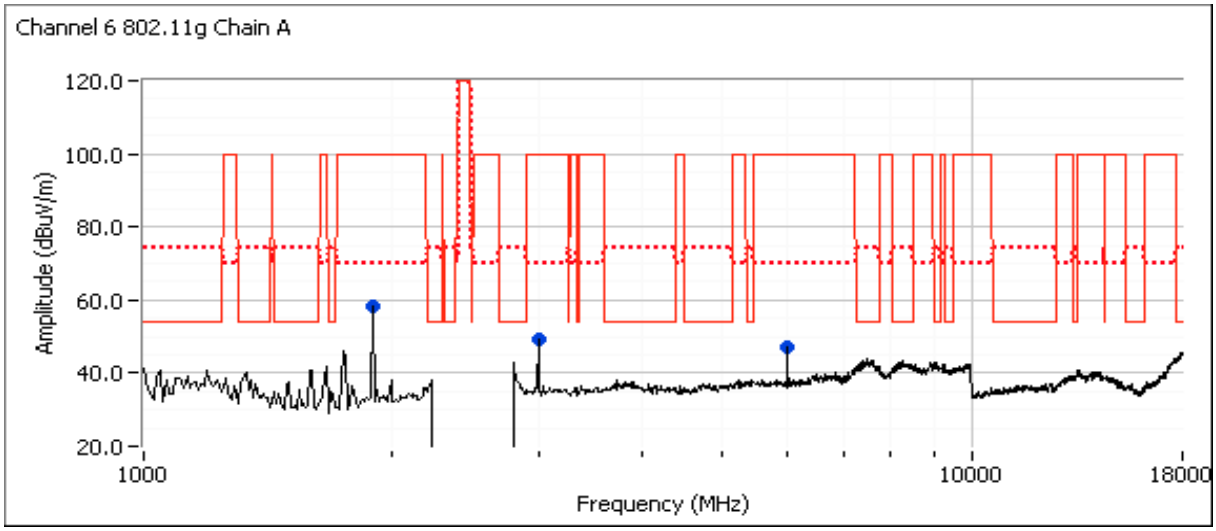
Run # 2, Radiated Spurious Emissions, 1-26GHz, 802.11bg and 802.11n, Chain A, Center Channel

Date of Test: 8/25/2010 Test Location: FT Chamber#5

Test Engineer: Joseph Cadigal Config Change: none

Run # 2a, EUT on Channel #6 2437MHz - 802.11g, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.8	27.0



Spurious Radiated Emissions:

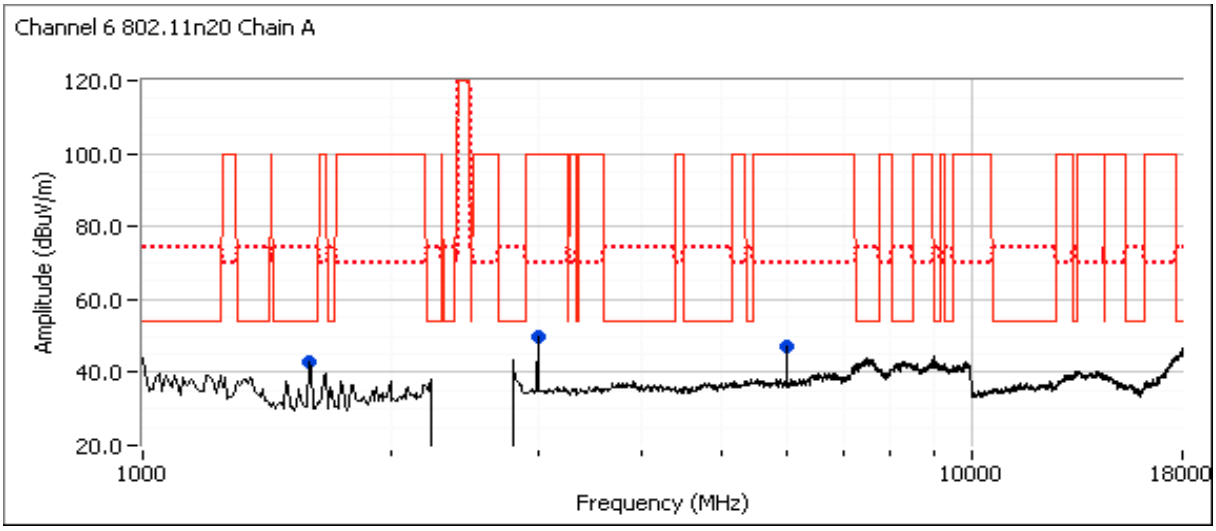
Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.360	54.5	V	70.0	-15.5	PK	136	1.0	RB 1 MHz;VB 3 MHz;Pk
6000.620	51.6	V	70.0	-18.4	PK	302	1.0	RB 1 MHz;VB 3 MHz;Pk
1895.240	43.5	V	70.0	-26.5	PK	145	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above the noise floor when using measurement antenna within 20cm of the device from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 2b: , EUT on Channel #6 2437MHz - 802.11n 20MHz, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.8	27.5



Spurious Radiated Emissions:

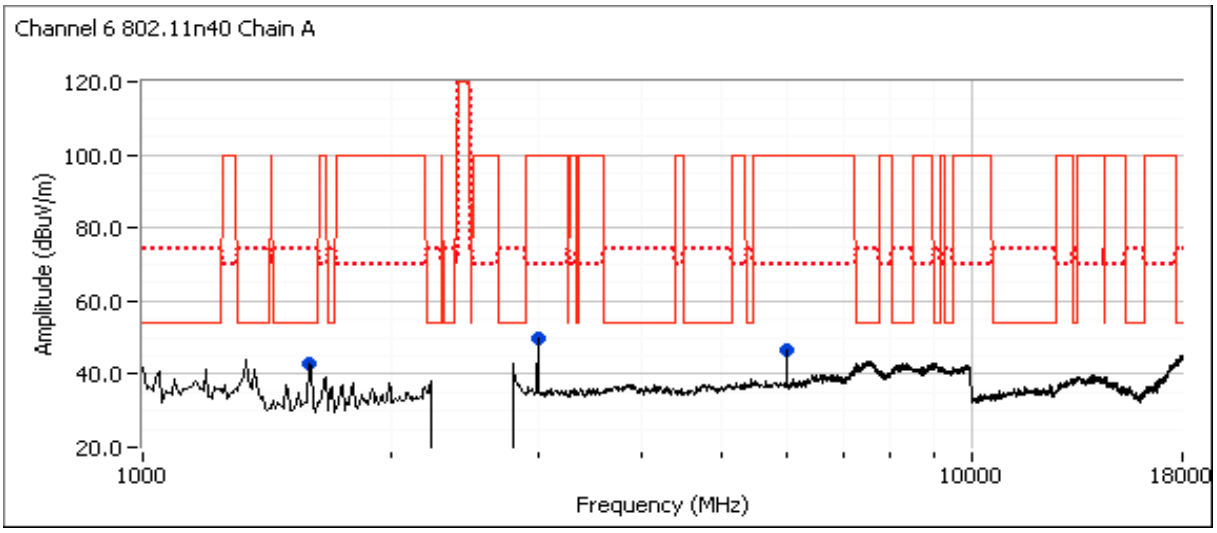
Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.550	**51.9**	V	70.0	**-18.1**	PK	306	1.0	RB 1 MHz;VB 3 MHz;Pk
1593.700	32.9	H	54.0	-21.1	AVG	142	1.9	RB 1 MHz;VB 10 Hz;Pk
3000.110	47.9	V	70.0	-22.1	PK	142	1.0	RB 1 MHz;VB 3 MHz;Pk
1594.190	46.2	H	74.0	-27.8	PK	142	1.9	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 2c: , EUT on Channel #6 2437MHz - 802.11n 40MHz, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.9	27.0



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1593.590	**37.1**	V	54.0	**-16.9**	AVG	131	1.0	RB 1 MHz;VB 10 Hz;Pk
6000.620	51.5	V	70.0	-18.5	PK	303	1.0	RB 1 MHz;VB 3 MHz;Pk
3000.210	51.0	V	70.0	-19.0	PK	140	1.0	RB 1 MHz;VB 3 MHz;Pk
1593.970	51.1	V	74.0	-22.9	PK	131	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

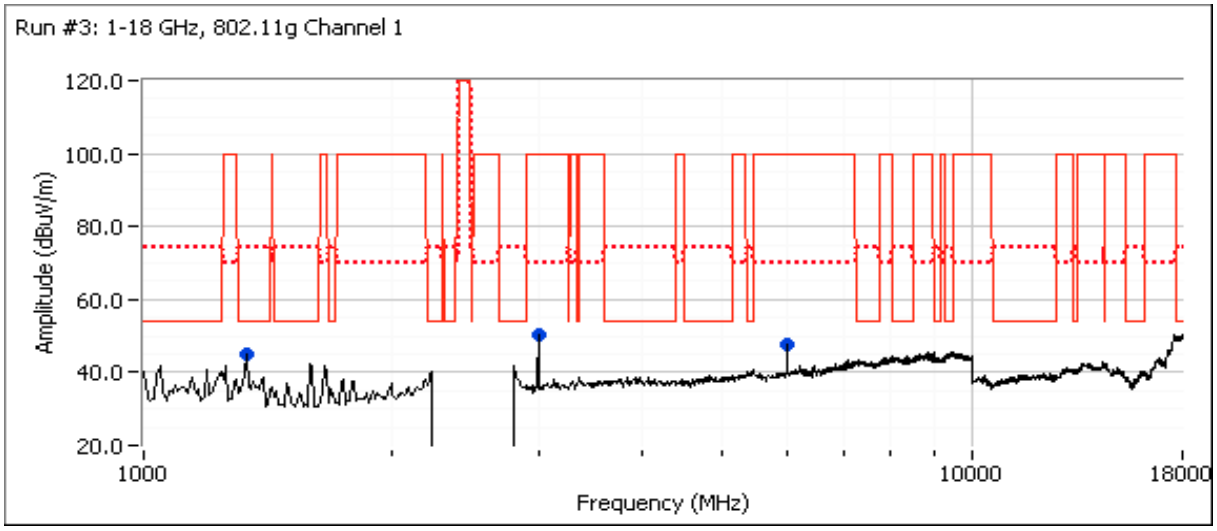
Run # 3, Radiated Spurious Emissions, 1-26GHz, 802.11g, Chain A

Date of Test: 8/30/2010 Test Location: FT Chmaber #5

Test Engineer: Mark H Config Change: none

Run # 3a, EUT on Channel #1 2412MHz - 802.11g, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	26.0	16.6



Spurious Radiated Emissions:

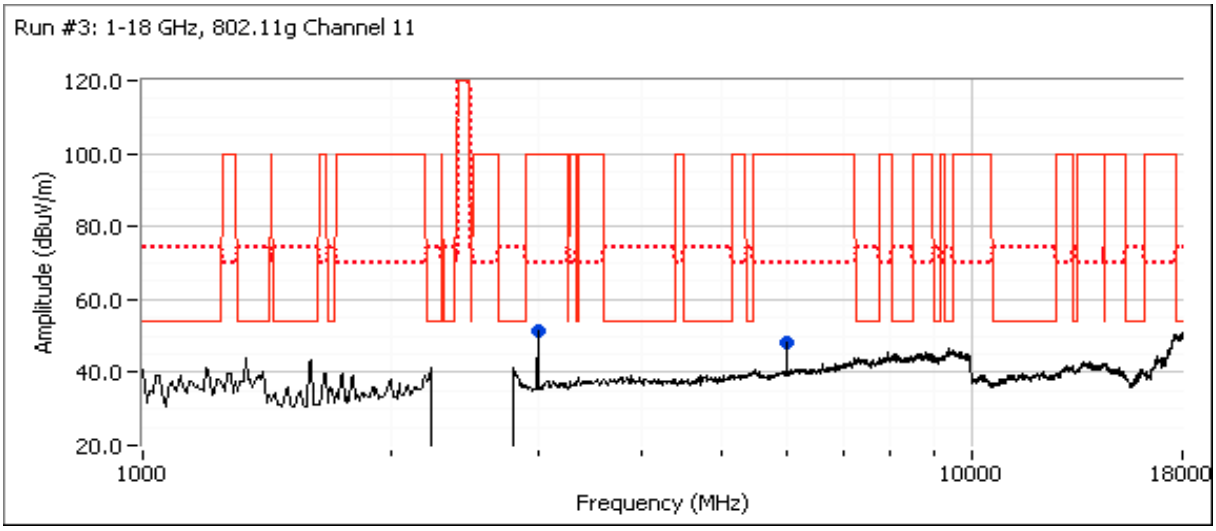
Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.410	**56.4**	V	70.0	**-13.6**	PK	266	1.3	RB 1 MHz;VB 3 MHz;Pk
1332.830	38.6	V	54.0	-15.4	AVG	243	1.0	RB 1 MHz;VB 10 Hz;Pk
6000.560	52.8	V	70.0	-17.2	PK	149	1.0	RB 1 MHz;VB 3 MHz;Pk
1332.150	53.6	V	74.0	-20.4	PK	243	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run # 3b: , EUT on Channel #11 2462MHz - 802.11g, Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.6	26.0



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209/15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.200	**56.2**	V	70.0	**-13.8**	PK	269	1.3	RB 1 MHz;VB 3 MHz;Pk
6000.830	54.0	V	70.0	-16.0	PK	268	1.1	RB 1 MHz;VB 3 MHz;Pk

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz (although measurements above were made with the peak detector and bandiwdth set to 1MHz which would give a measurement larger than if a 100kHz bandwidth were used).
Note 2:	No emissions observed above from 18 - 26GHz.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 9/9/2010
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

Config. Used: 1
Config Change: none
Host Unit Voltage 120V/60Hz

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 21.4 °C
Rel. Humidity: 39 %

Summary of Results

MAC Address: 4025C20027A4 DRTU Tool Version 1.12.10-0194 Driver version 14.0.0.39

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	22	16.7	Output Power	15.247(b)	Pass	802.11b: 17.8 dBm 802.11g: 16.8 dBm n20MHz: 17.1 dBm n40MHz: 17.7 dBm
2	22	16.7	Power spectral Density (PSD)	15.247(d)	Pass	802.11b: -6.1 dBm/3kHz 802.11g: -7.6 dBm/3kHz n20MHz: -6.6 dBm/3kHz n40MHz: -10.1dBm/3kHz
3	21.5	16.7	Minimum 6dB Bandwidth	15.247(a)	Pass	11.5 MHz
3	26.5	16.7	99% Bandwidth	RSS GEN	-	802.11b: 13.7 MHz 802.11g: 17.1 MHz n20MHz: 18.4 MHz n40MHz: 36.7 MHz
4	-	-	Spurious emissions	15.247(b)	Pass	All spurious below -30dBc

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Output Power

802.11b

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP[Note 2] W	Output Power (dBm)[3]	Output Power mW
21.5	2412	17.4	55.0	3.2	Pass	20.6	0.115	16.7	46.8
22	2437	**17.8**	**60.3**	3.2	Pass	21.0	**0.126**	16.7	46.8
21.5	2462	17.3	53.7	3.2	Pass	20.5	0.112	16.5	44.7

802.11g

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP[Note 2] W	Output Power (dBm)[3]	Output Power mW
25.5	2412	16.8	47.9	3.2	Pass	20.0	0.100	16.6	45.7
26	2437	**16.8**	**47.9**	3.2	Pass	20.0	0.100	16.6	45.7
24	2462	14.7	29.5	3.2	Pass	17.9	0.062	15.2	33.1

802.11n 20MHz

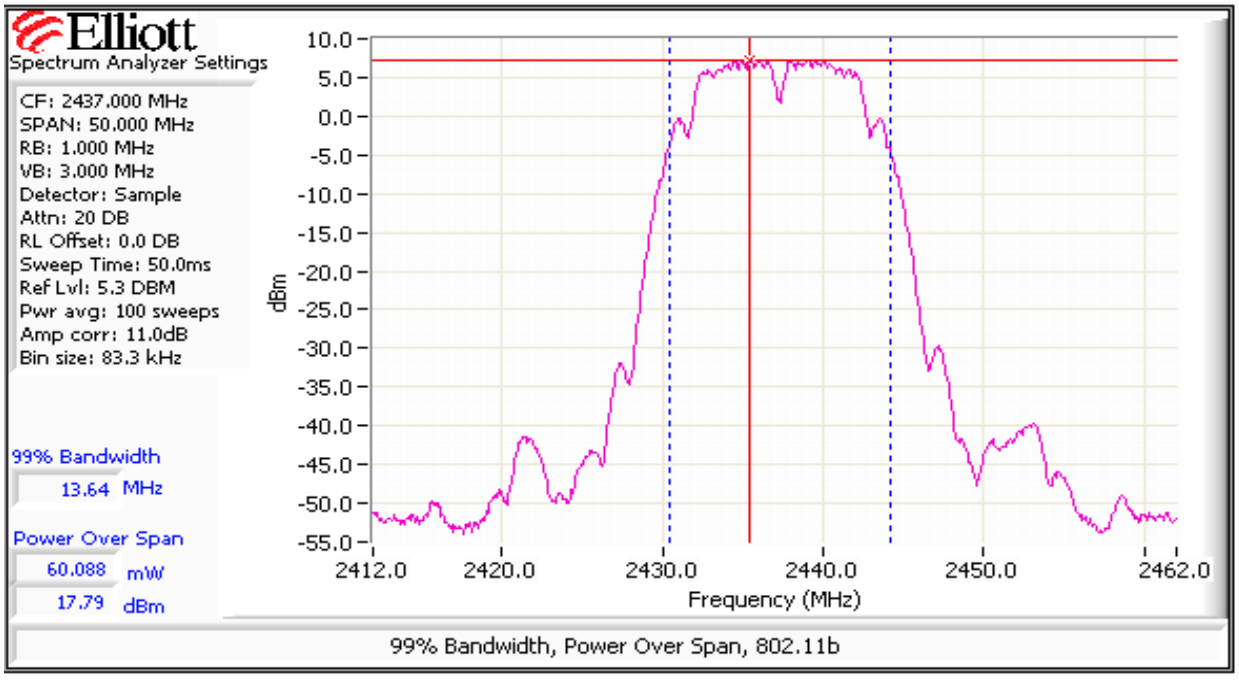
Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP[Note 2] W	Output Power (dBm)[3]	Output Power mW
25.5	2412	16.6	45.7	3.2	Pass	19.8	0.095	16.6	45.7
26	2437	**17.1**	**51.3**	3.2	Pass	20.3	0.107	16.5	44.7
23.5	2462	14.5	28.2	3.2	Pass	17.7	0.059	14.6	28.8

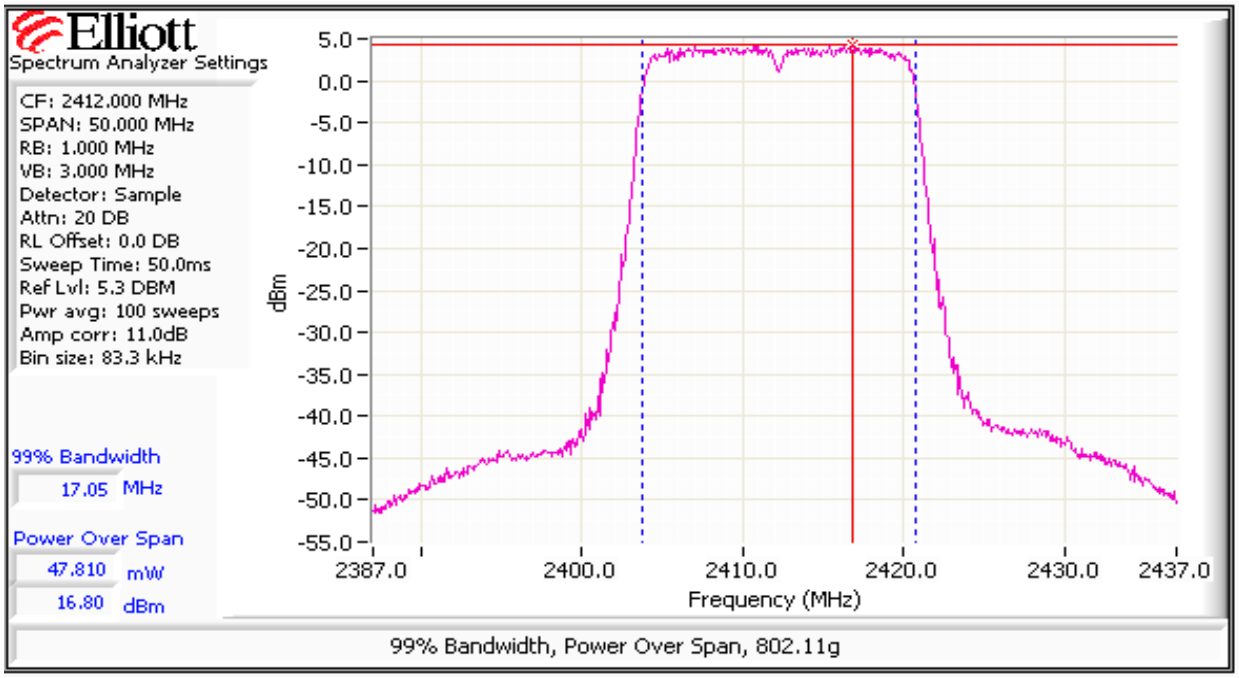
802.11n 40MHz

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP[Note 2] W	Output Power (dBm)[3]	Output Power mW
22.5	2422	14.2	26.3	3.2	Pass	17.4	0.055	13.8	24.0
26.5	2437	**17.7**	**58.9**	3.2	Pass	20.9	0.123	16.7	46.8
20.5	2452	11.7	14.8	3.2	Pass	14.9	0.031	11.7	14.8

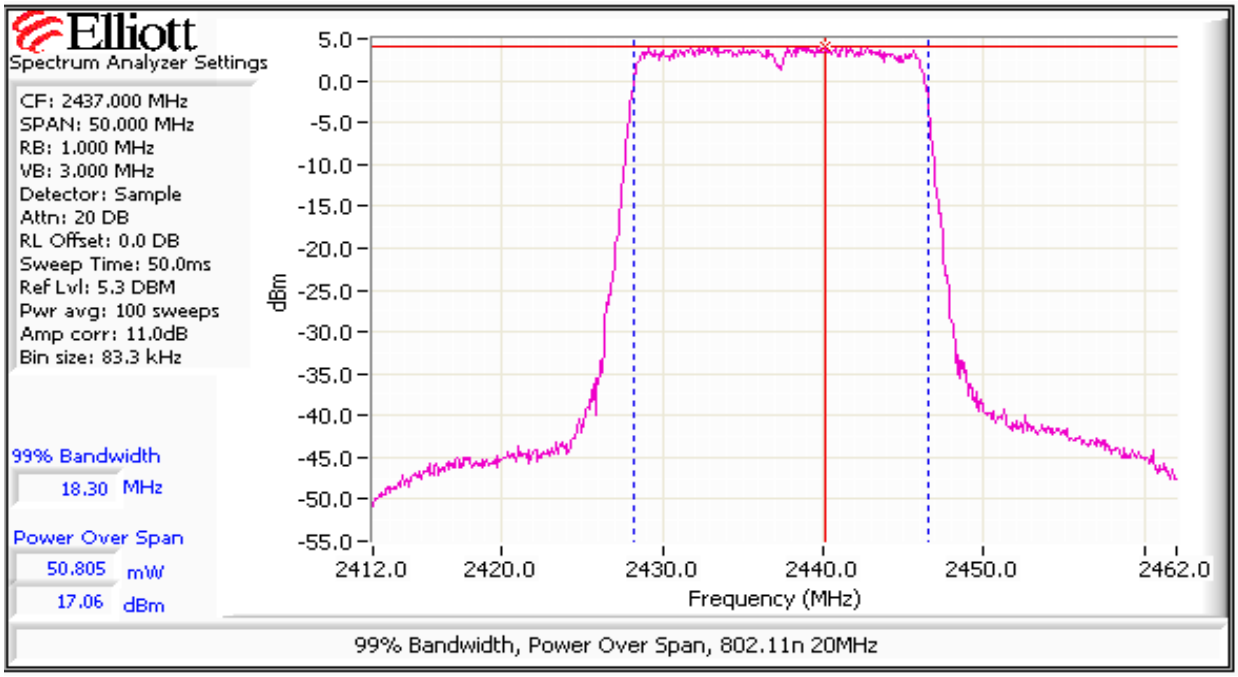
Note 1:	Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over **40 MHz** for 20MHz channels and 80 MHz for 40MHz channels (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes **-30dBc.**
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measured using average power meter and is included for reference only.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

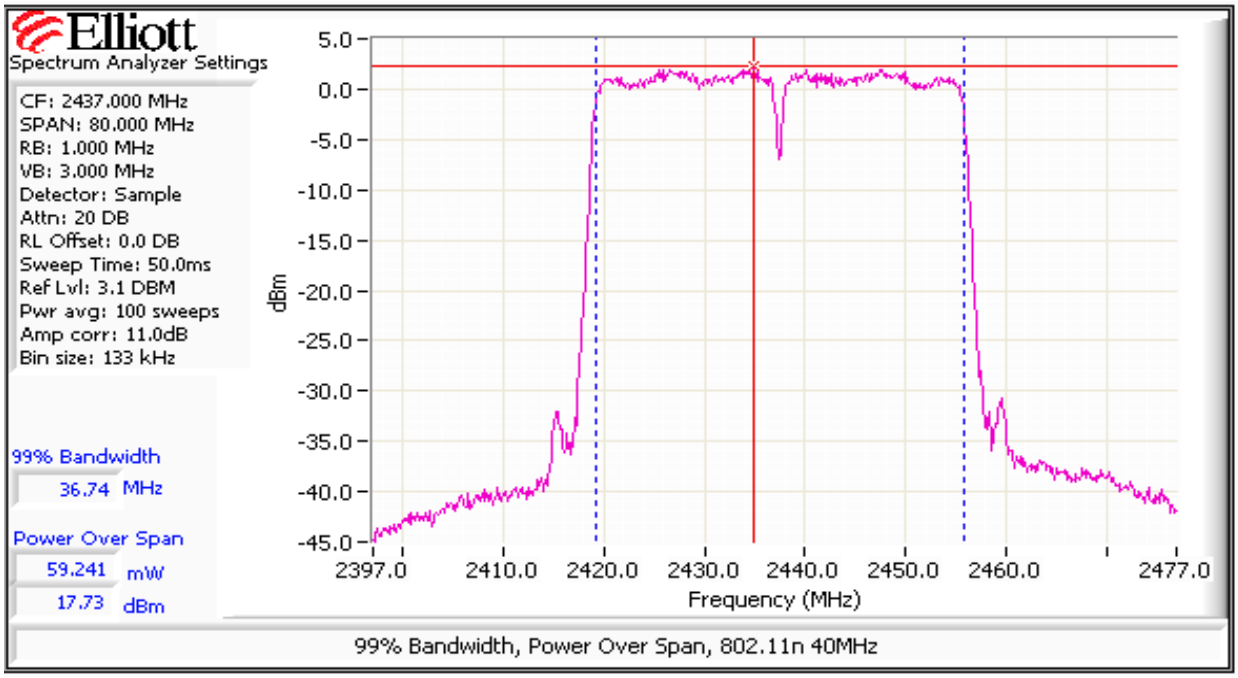




Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



99% Bandwidth, Power Over Span, 802.11n 20MHz



99% Bandwidth, Power Over Span, 802.11n 40MHz

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Run #2: Power spectral Density

802.11b

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
21.5	2412	-6.6	8.0	Pass
22	2437	**-6.1**	8.0	Pass
21.5	2462	-7.1	8.0	Pass

802.11g

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
25.5	2412	-7.9	8.0	Pass
26	2437	**-7.6**	8.0	Pass
24	2462	-9.8	8.0	Pass

802.11n 20MHz

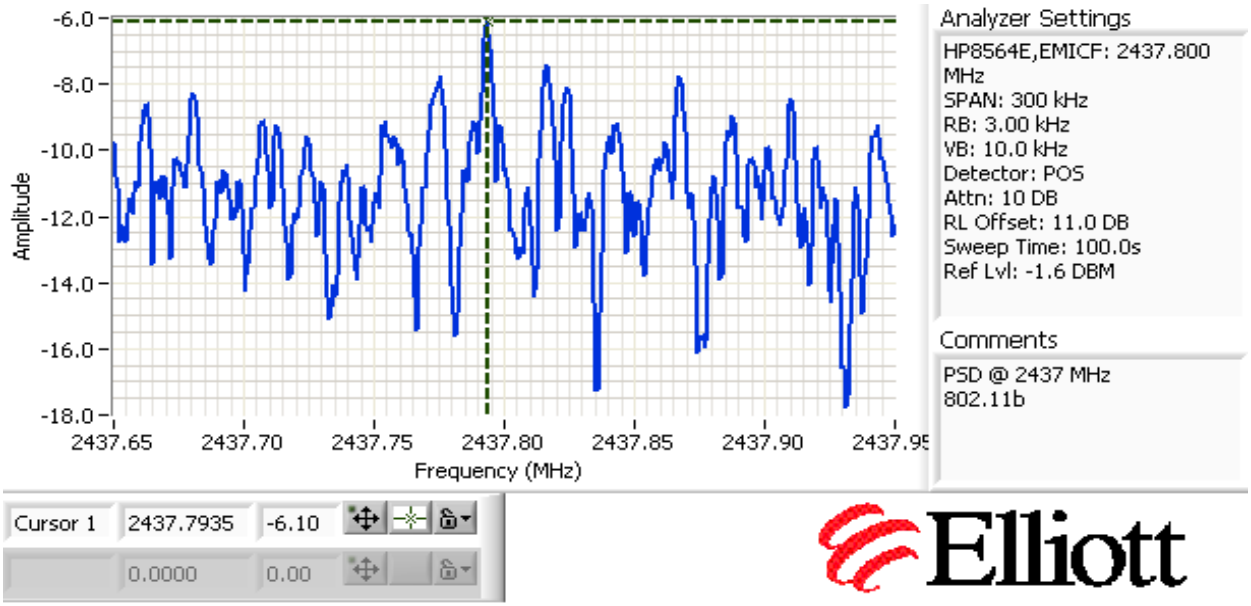
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
25.5	2412	-9.4	8.0	Pass
26	2437	**-6.6**	8.0	Pass
23.5	2462	-11.6	8.0	Pass

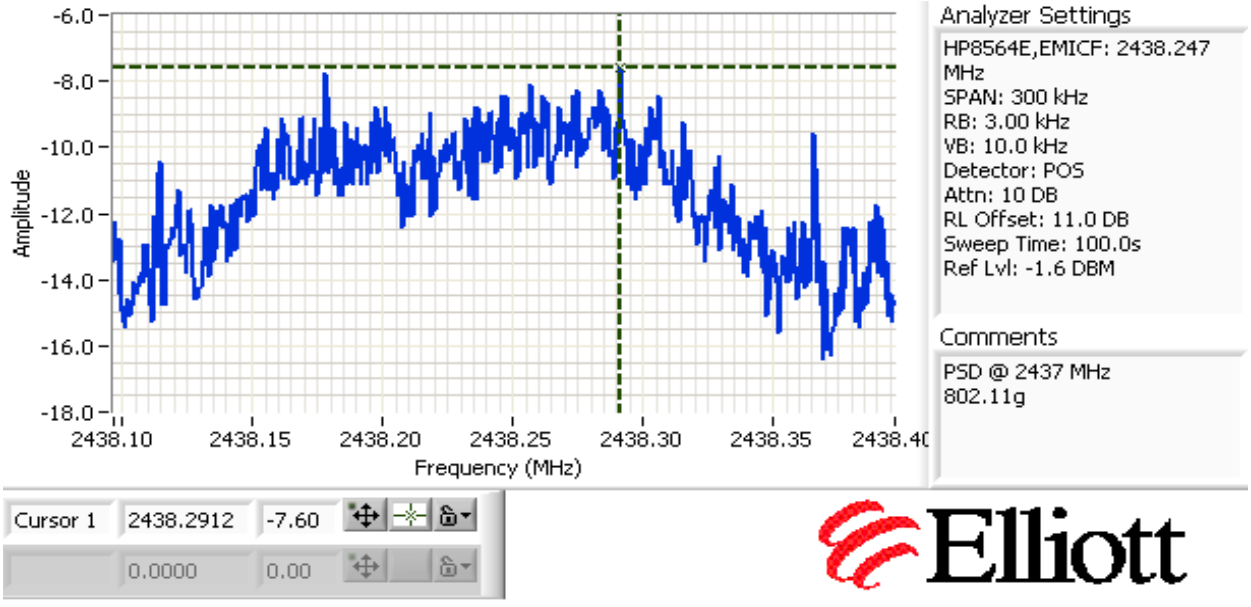
802.11n 40MHz

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
22.5	2422	-13.4	8.0	Pass
26.5	2437	**-10.1**	8.0	Pass
20.5	2452	-17.3	8.0	Pass

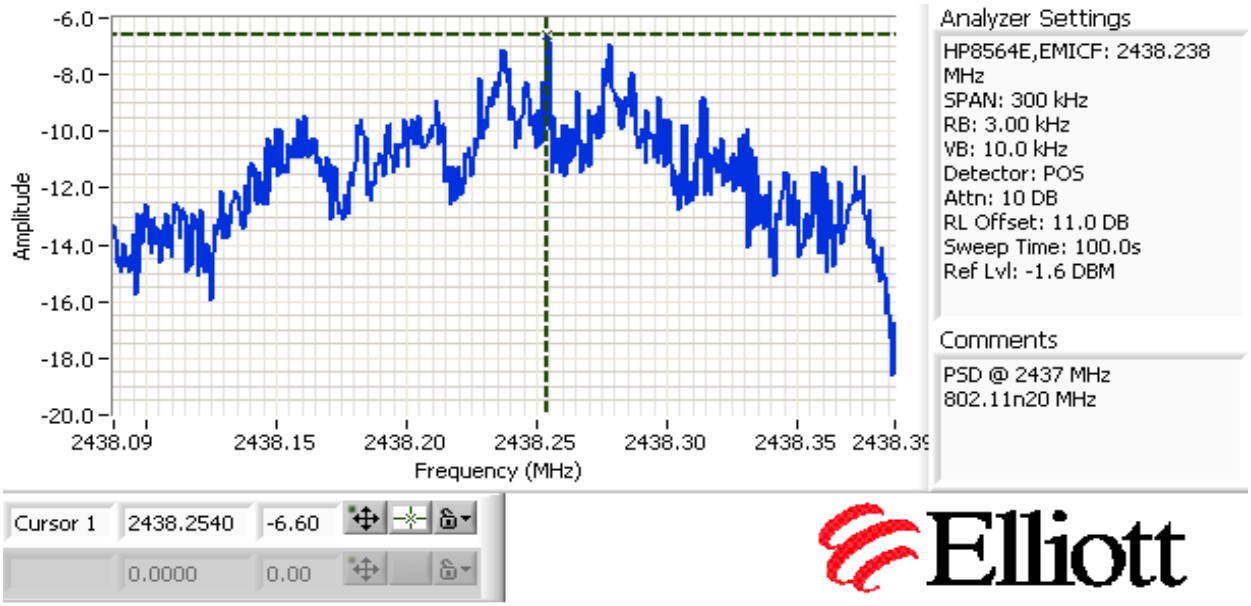
Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.

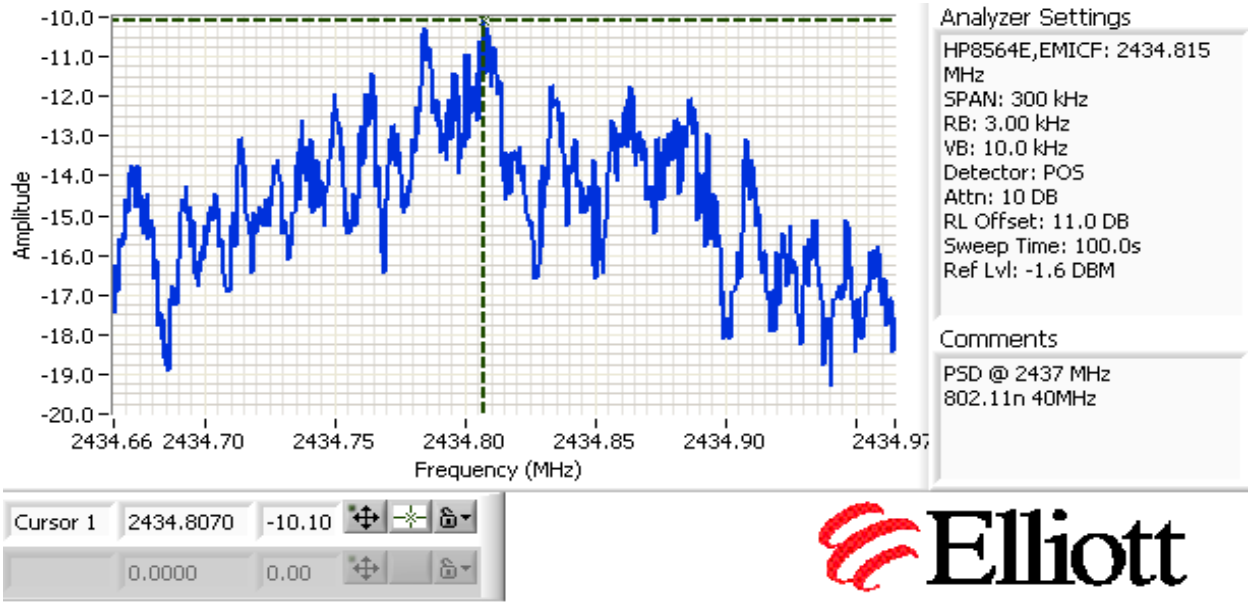
Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A





Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A





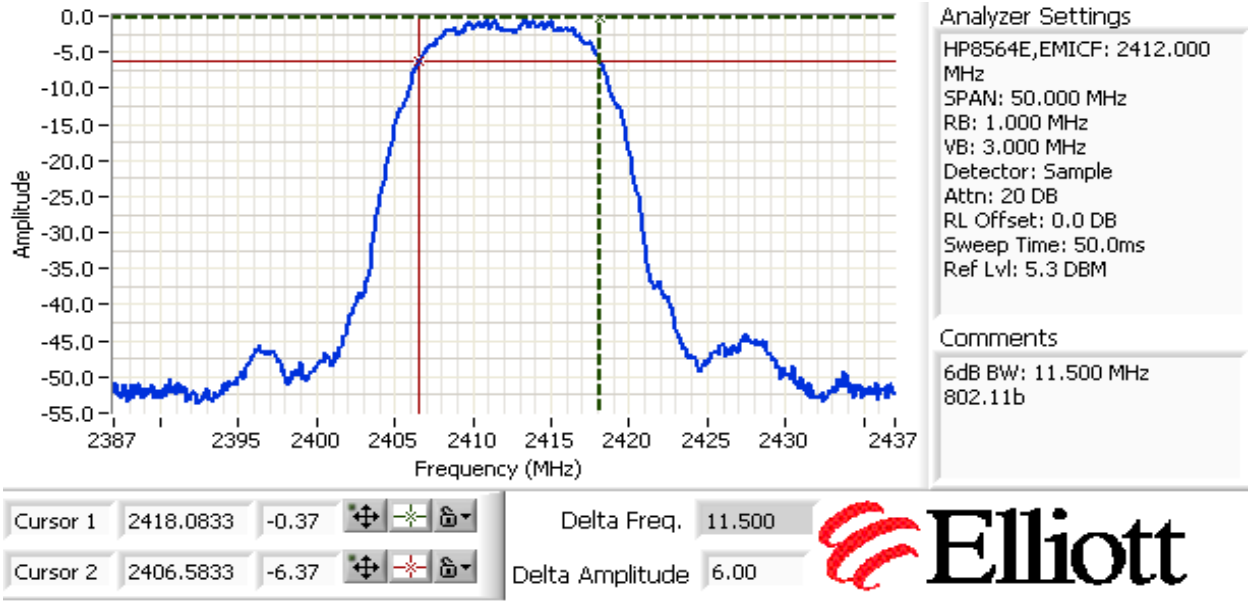
Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

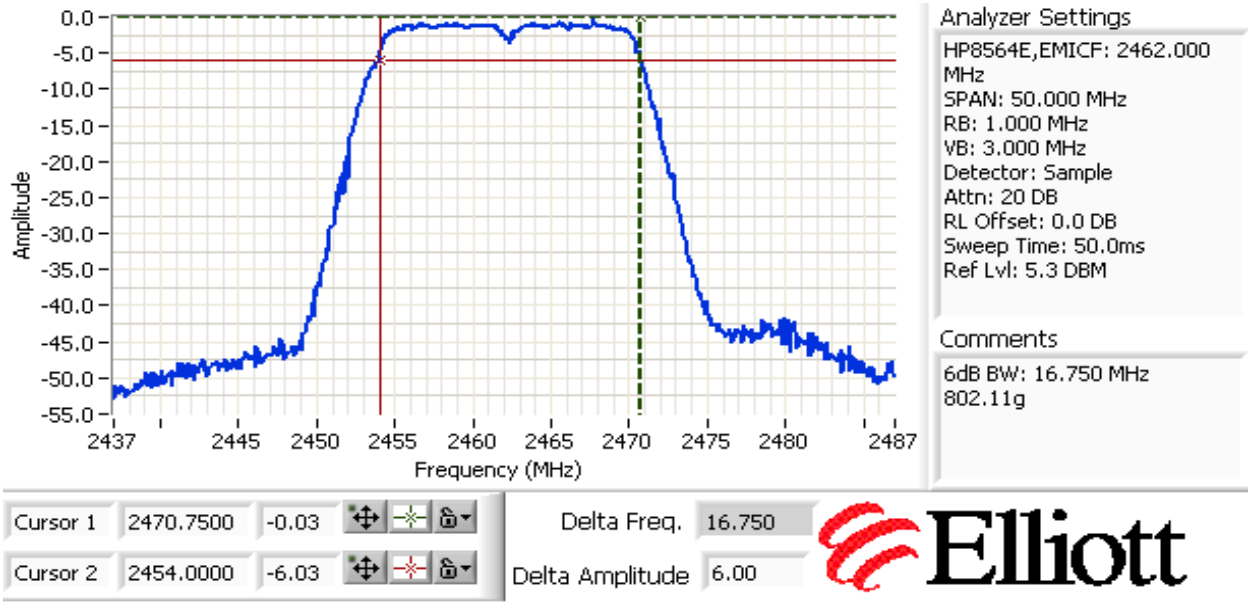
Run #3: Signal Bandwidth

Mode	Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
802.11b	21.5	2412	100kHz	11.5	13.6
802.11b	22	2437	100kHz	11.7	13.6
802.11b	21.5	2462	100kHz	11.5	13.7
802.11g	25.5	2412	100kHz	17.1	17.1
802.11g	26	2437	100kHz	17	17.1
802.11g	24	2462	100kHz	16.8	17.1
802.11n20	25.5	2412	100kHz	18.3	18.4
802.11n20	26	2437	100kHz	18.3	18.3
802.11n20	23.5	2462	100kHz	18.3	18.4
802.11n40	22.5	2422	100kHz	36.7	36.7
802.11n40	26.5	2437	100kHz	36.5	36.7
802.11n40	20.5	2452	100kHz	36.8	36.7
			Minimum 6dB bandwidth:	11.5	

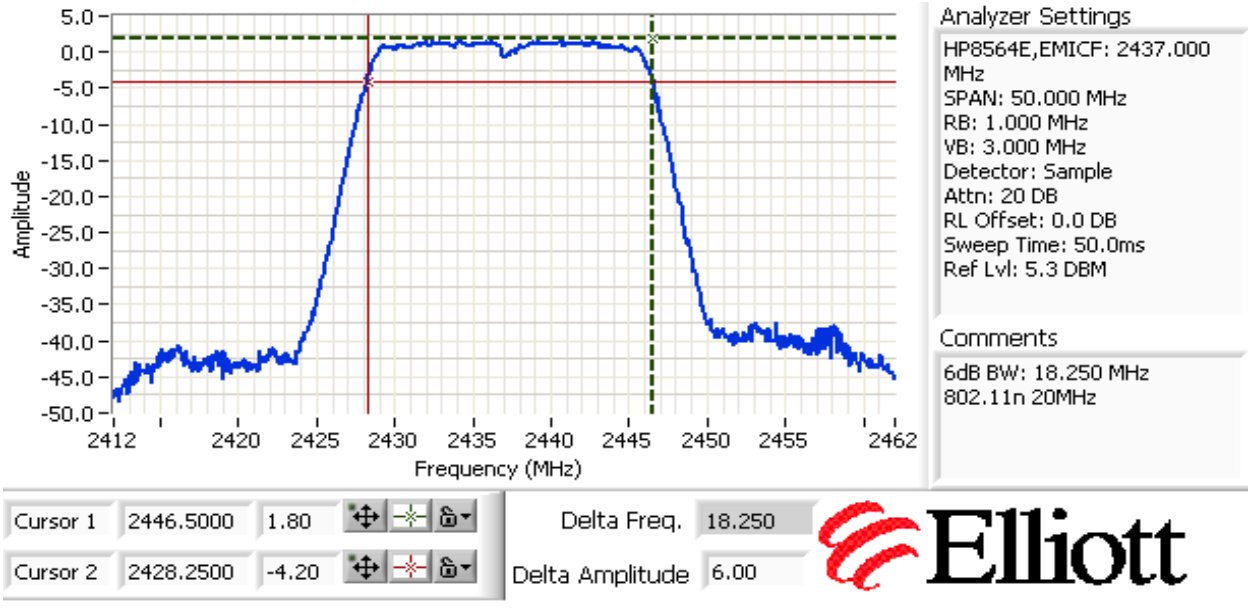
Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

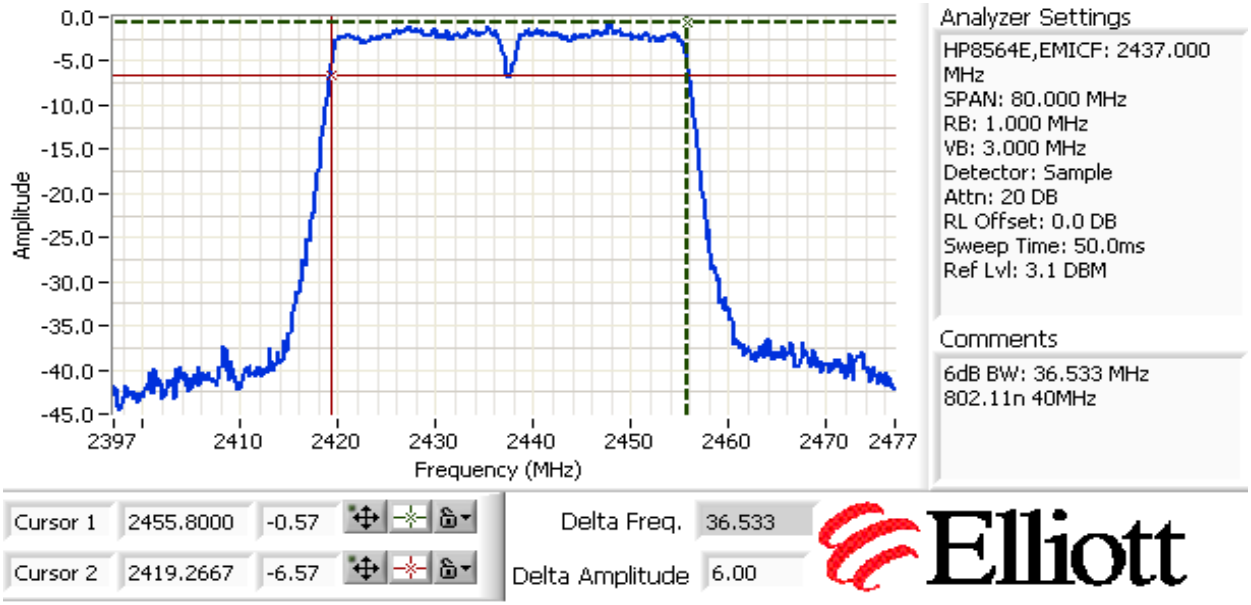
Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A





Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A



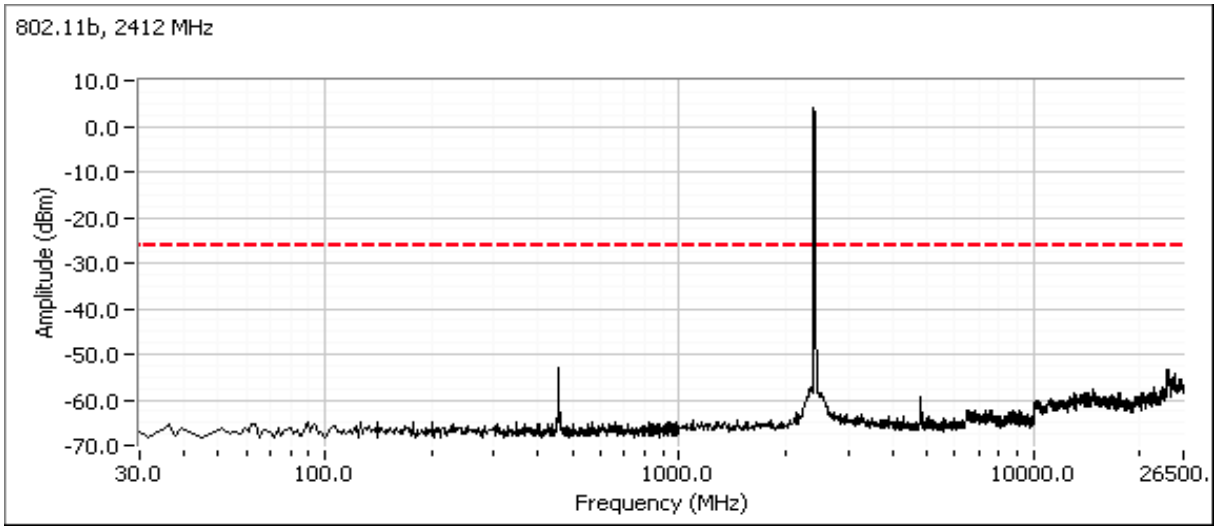


Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

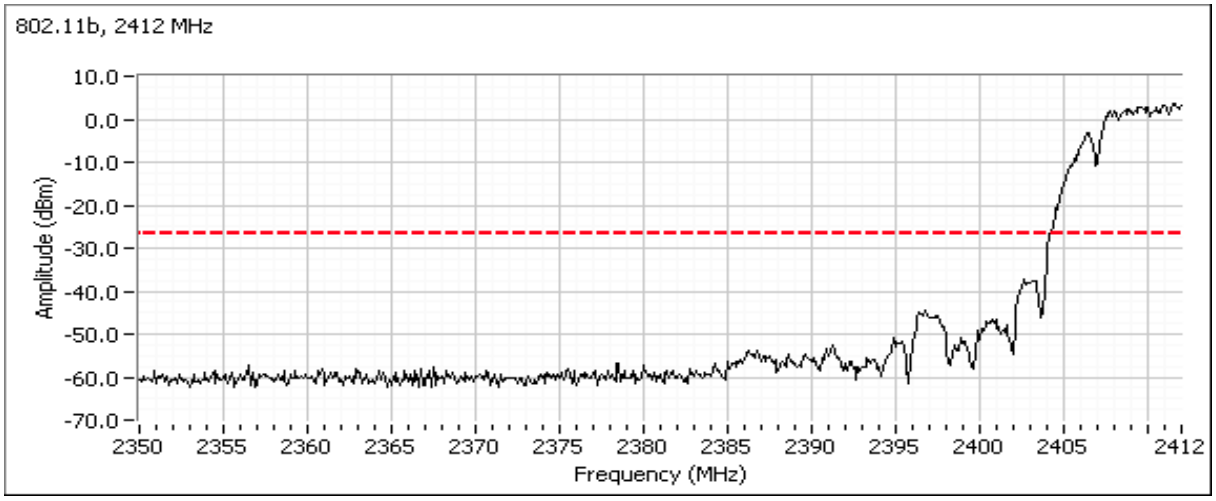
Run #4: Out of Band Spurious Emissions

Mode	Frequency (MHz)	Limit	Result
802.11b	2412	-30dBc	Pass
	2437		Pass
	2462		Pass

Plots for low channel, power setting(s) = 21.5

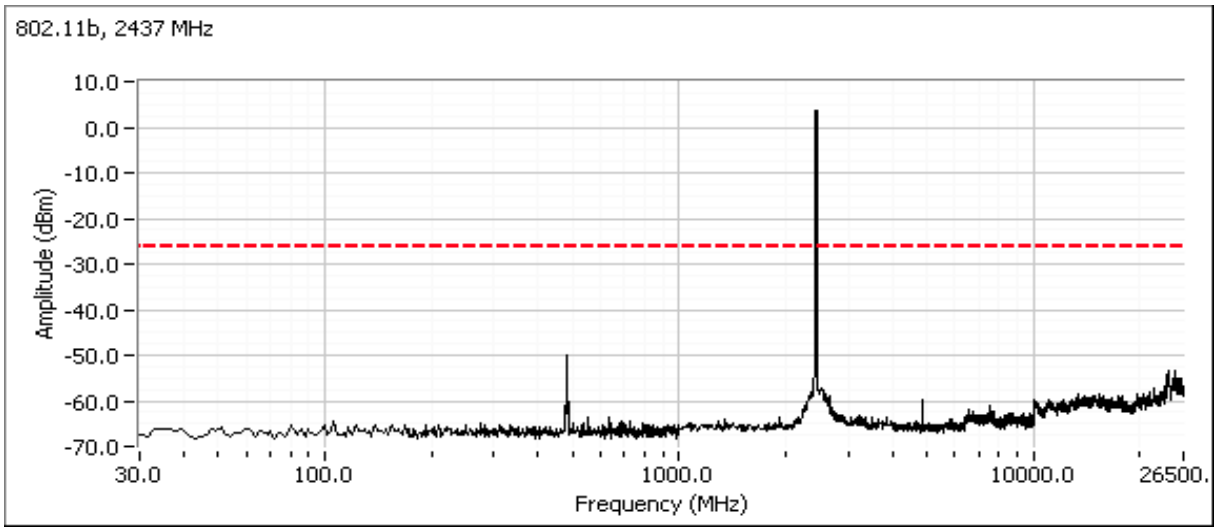


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

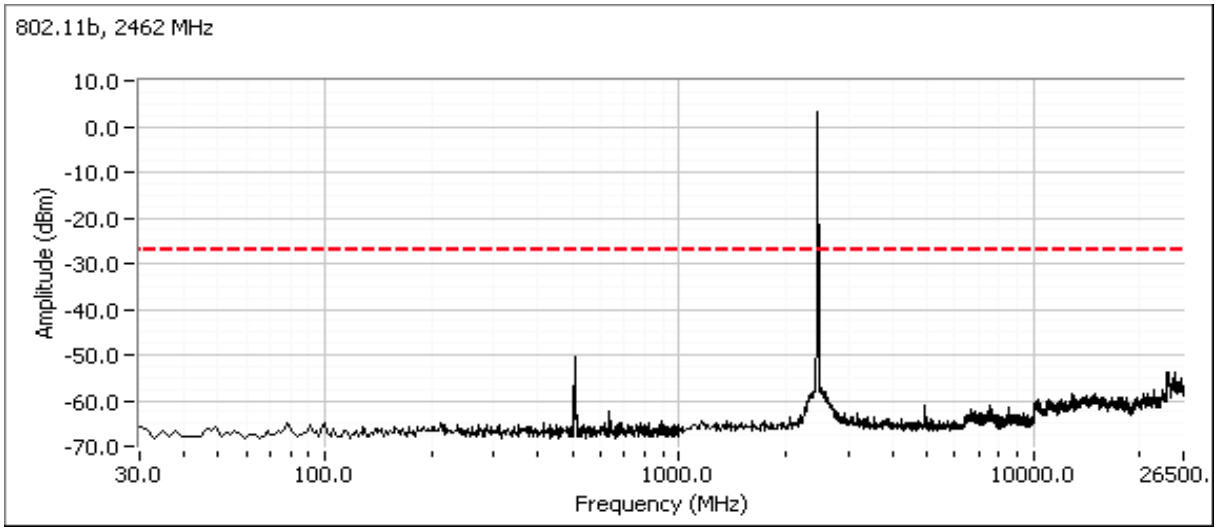


Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Plots for center channel, power setting(s) = 22.0



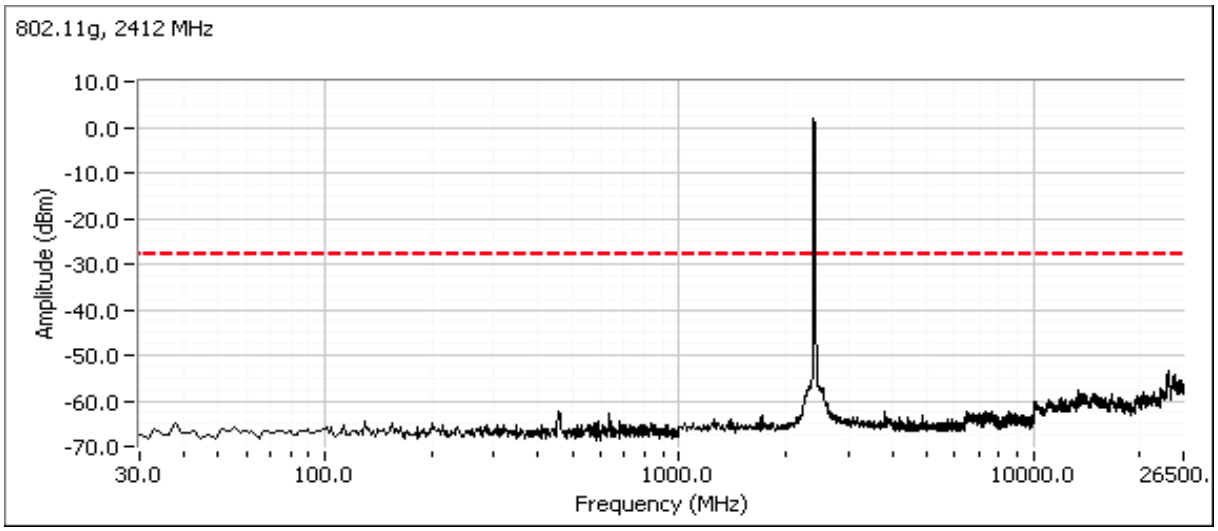
Plots for high channel, power setting(s) = 21.5



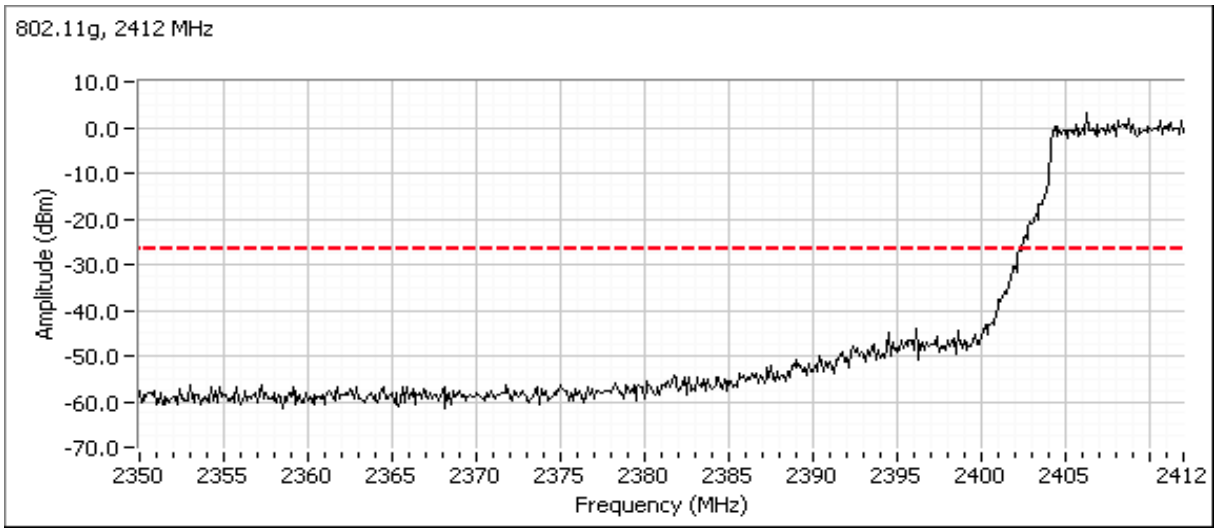
Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Mode	Frequency (MHz)	Limit	Result
802.11g	2412	-30dBc	Pass
	2437		Pass
	2462		Pass

Plots for low channel, power setting(s) = 25.5

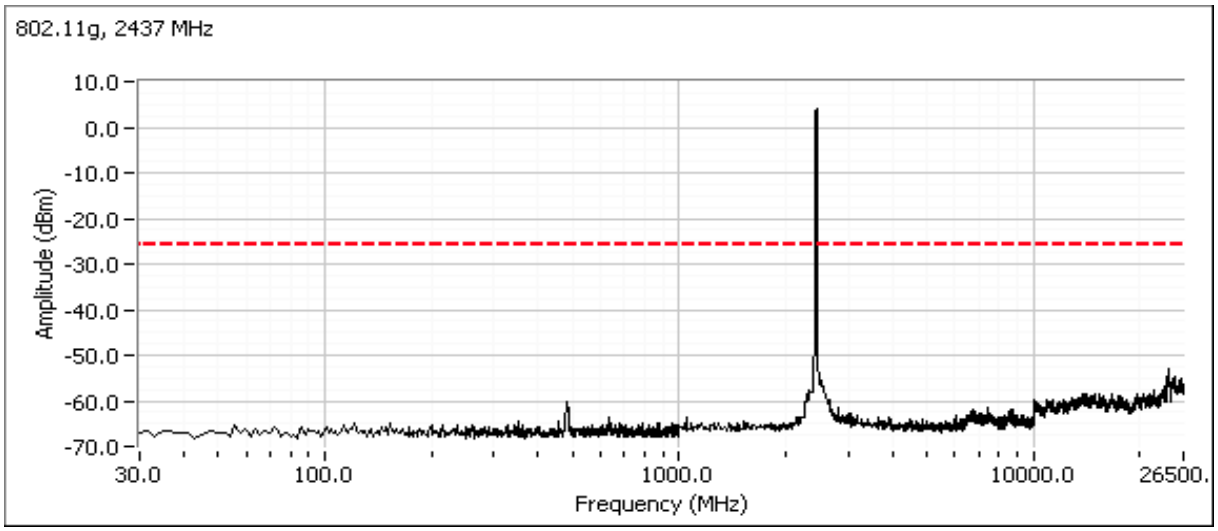


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

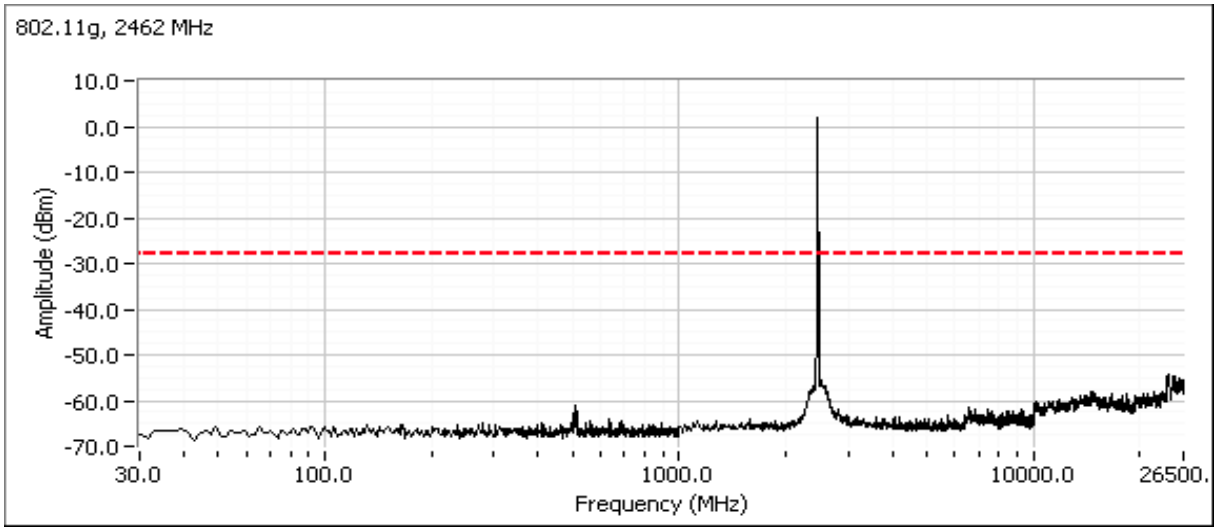


Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Plots for center channel, power setting(s) = 26.0



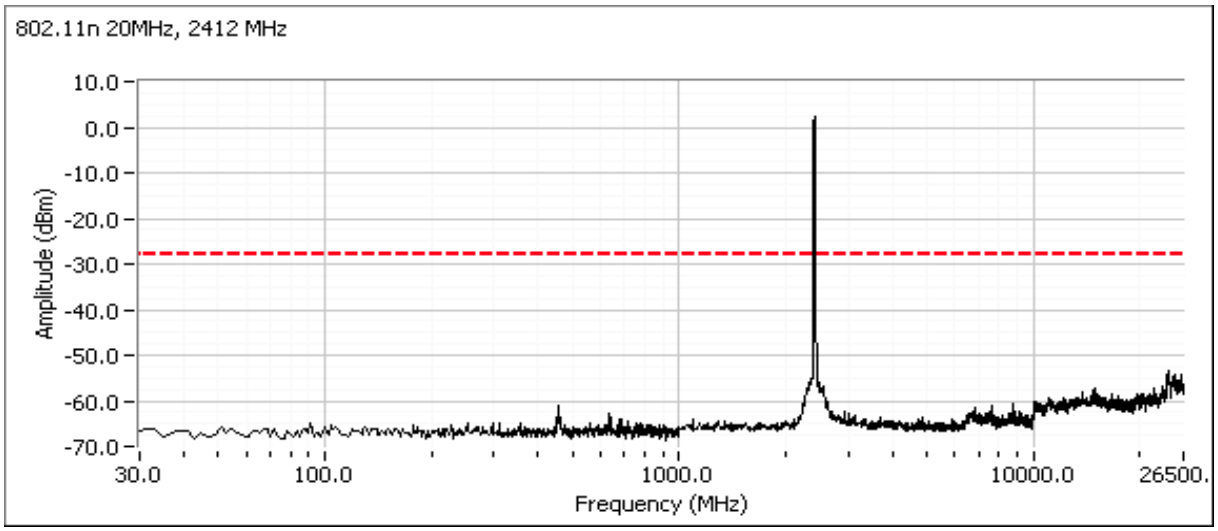
Plots for high channel, power setting(s) = 24.0



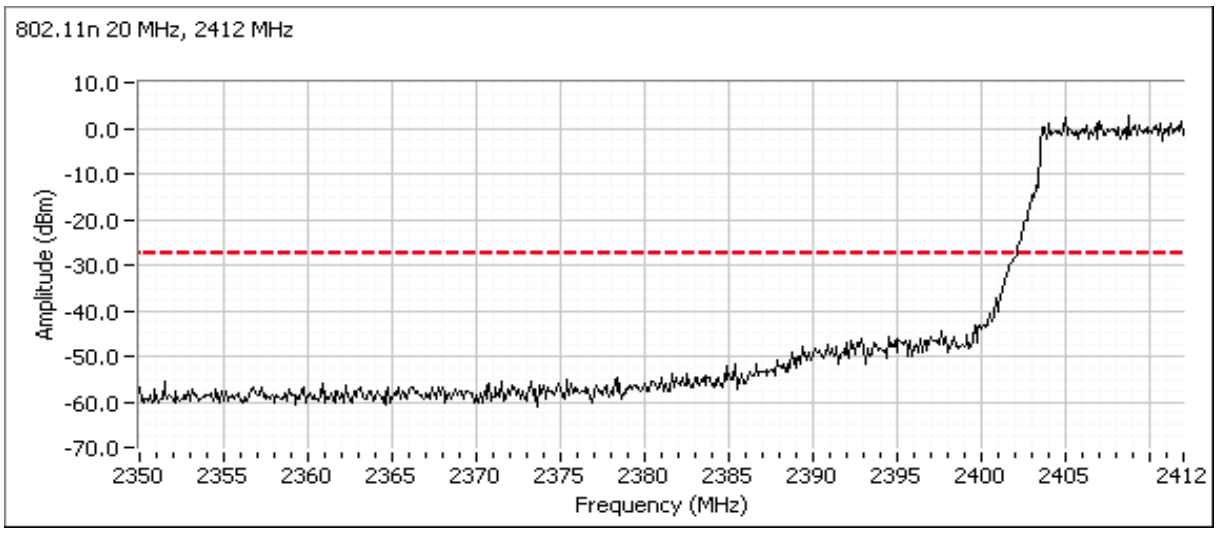
Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Mode	Frequency (MHz)	Limit	Result
802.11n 20MHz	2412	-30dBc	Pass
	2437		Pass
	2462		Pass

Plots for low channel, power setting(s) = 25.5

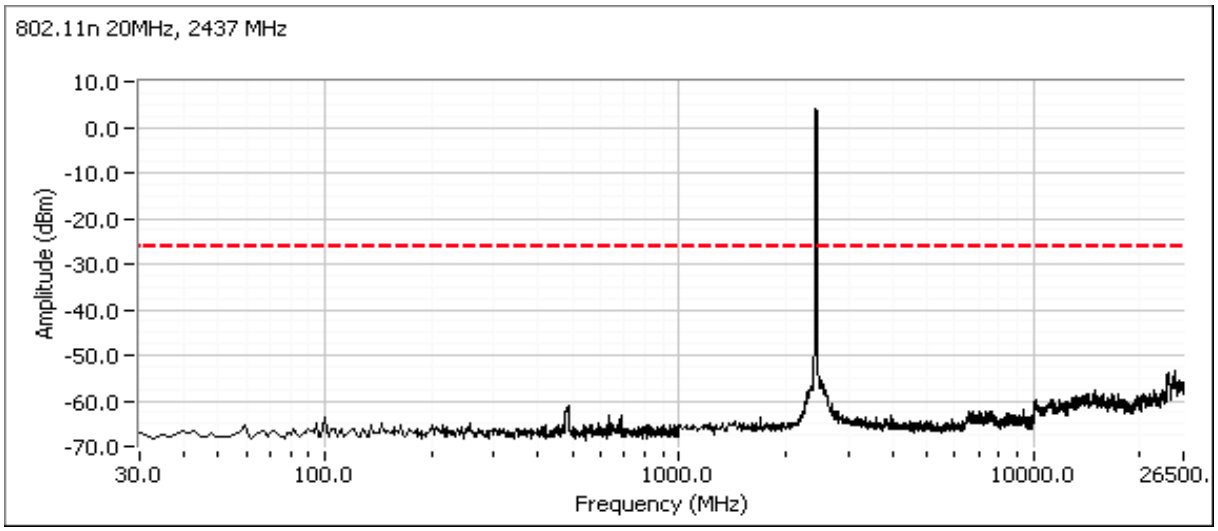


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

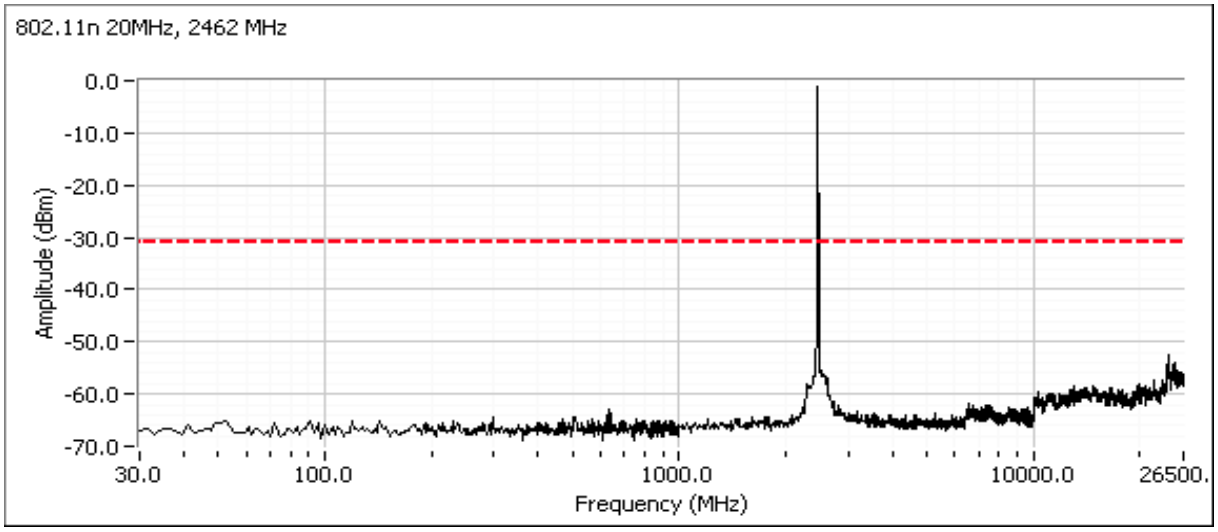


Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Plots for center channel, power setting(s) = 26.0



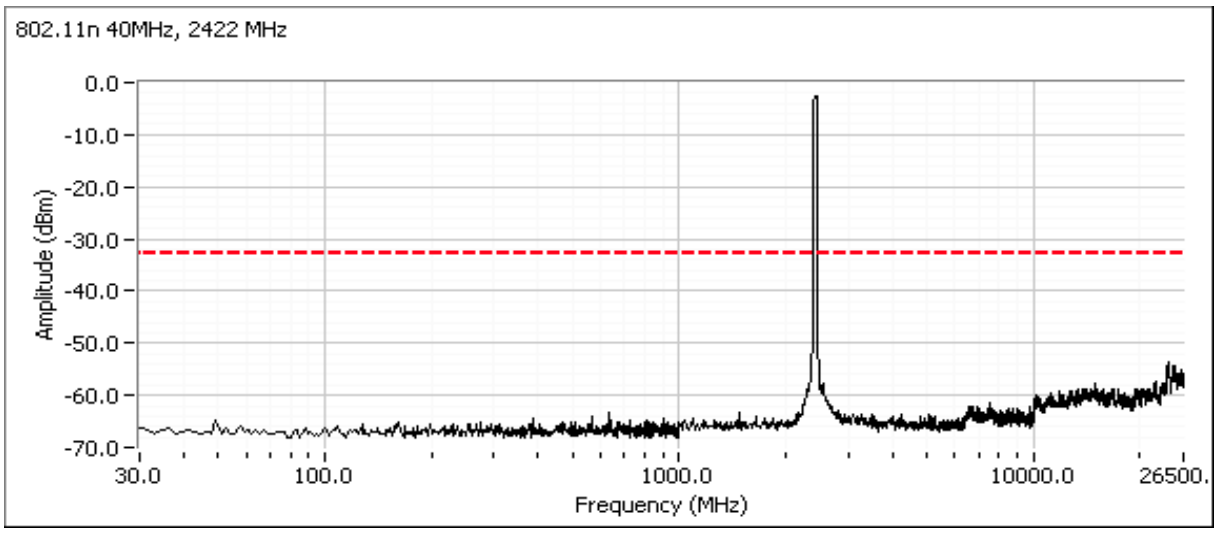
Plots for high channel, power setting(s) = 23.5



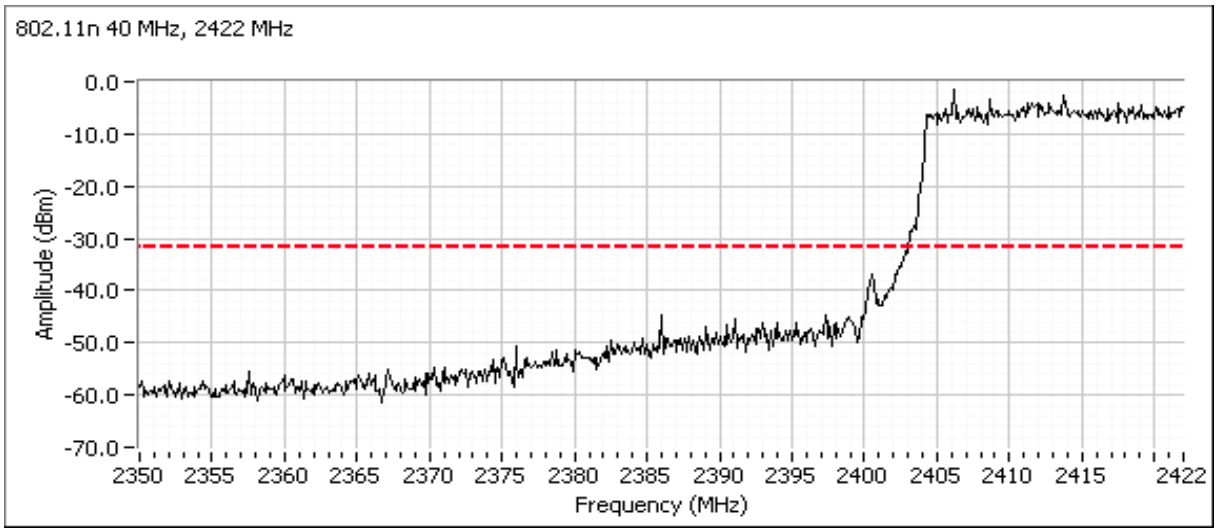
Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Mode	Frequency (MHz)	Limit	Result
802.11n 40MHz	2422	-30dBc	Pass
	2437		Pass
	2452		Pass

Plots for low channel, power setting(s) = 22.5

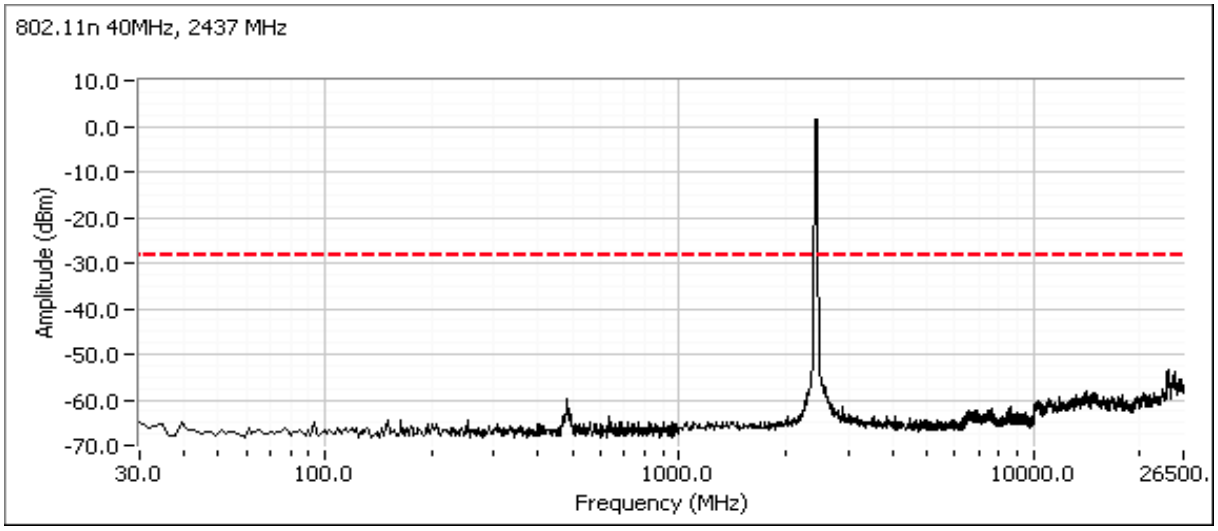


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

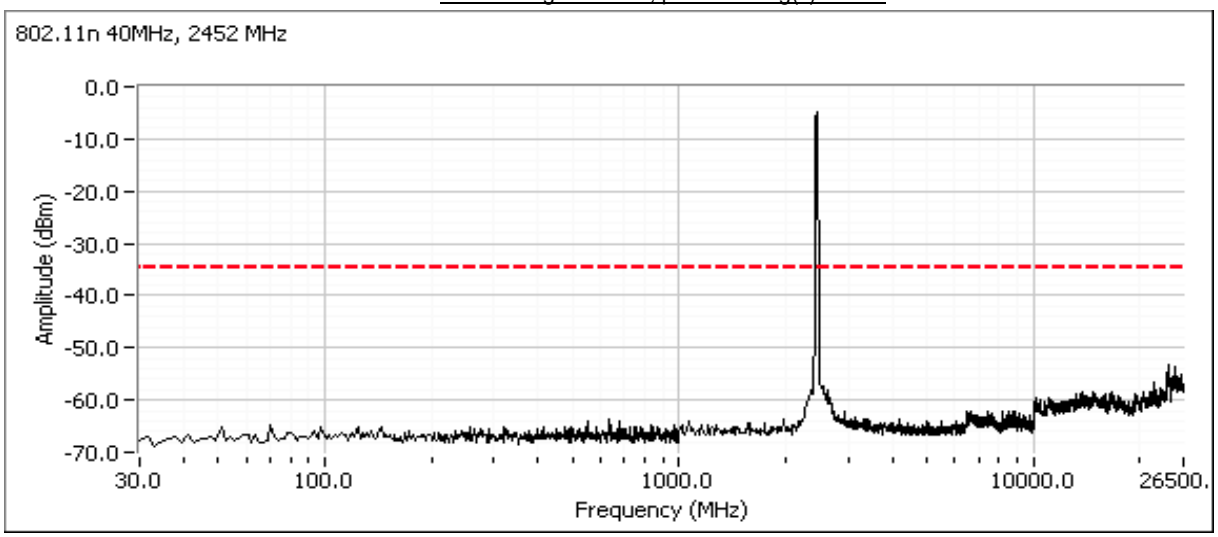


Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	N/A

Plots for center channel, power setting(s) = 26.5



Plots for high channel, power setting(s) = 20.5



Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	B

Conducted Emissions (PC Peripheral)

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 9/13/2010
Test Engineer: Mehran Birgani
Test Location: Chamber #5

Config. Used: EUT installed in test fixture
Config Change: -
Host Unit Voltage 120V/60Hz

General Test Configuration

The host system was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment.

Ambient Conditions:

Temperature: 20-25 °C
Rel. Humidity: 30-40 %

Summary of Results

MAC Address: 4025C20027A4 DRTU Tool Version 1.12.10-0194 Driver version 14.0.0.39

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	FCC 15.207	PASS	22.6dBµV @ 9.900MHz (-27.4dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

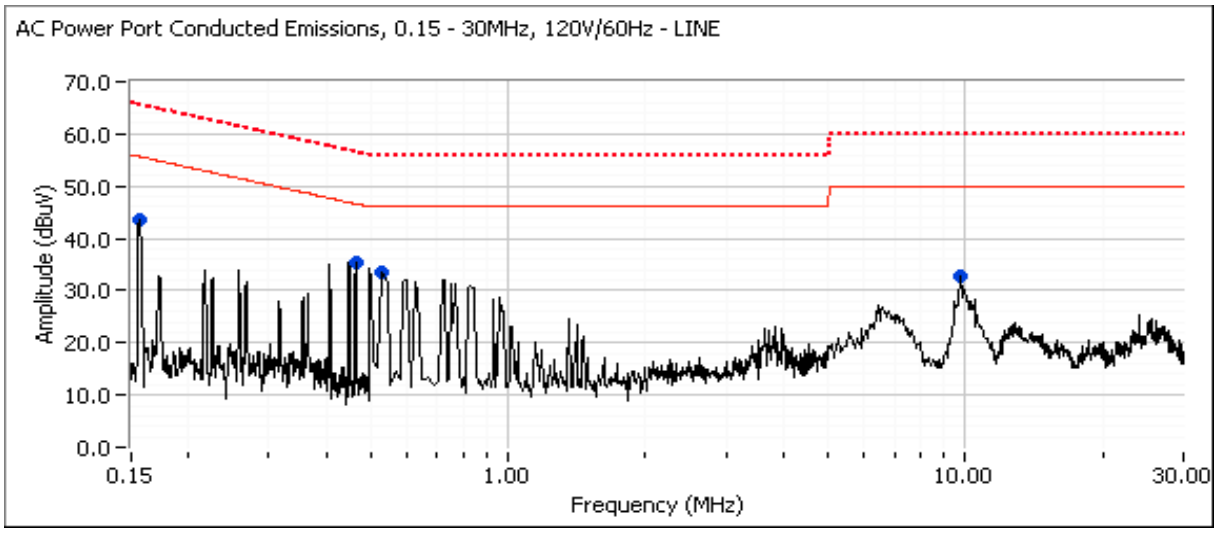
Deviations From The Standard

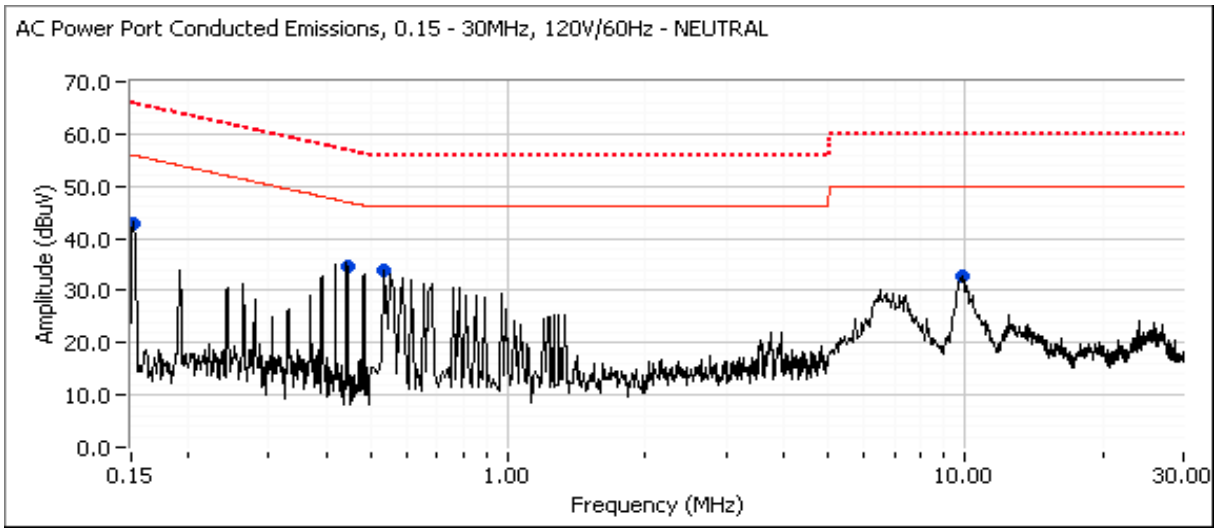
No deviations were made from the requirements of the standard.

EUT was set to transmit with power level of 18.0dBm at center channel.

Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





Client:	Intel Corporation	Job Number:	J80165
Model:	Intel Centrino Wireless-N + WiMAX 6150, 612BNXHMW	T-Log Number:	T80291
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

Preliminary peak readings captured during pre-scan (peak readings vs. average limit)

Frequency	Level	AC	Class B (FCC 15.207)		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.499	35.0	Line	46.0	-11.0	Peak	
0.466	35.5	Line	46.6	-11.1	Peak	
0.154	43.4	Line	55.7	-12.3	Peak	
0.520	33.7	Neutral	46.0	-12.3	Peak	
0.446	34.6	Neutral	47.0	-12.4	Peak	
0.532	33.6	Line	46.0	-12.4	Peak	
0.150	43.0	Neutral	55.9	-12.9	Peak	
9.900	32.9	Neutral	50.0	-17.1	Peak	
9.853	32.6	Line	50.0	-17.4	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	Class B (FCC 15.207)		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.150	36.4	Neutral	66.0	-29.6	QP	
0.150	13.2	Neutral	56.0	-42.8	AVG	
0.154	34.8	Line	65.8	-31.0	QP	
0.154	12.9	Line	55.8	-42.9	AVG	
0.446	28.0	Neutral	56.9	-28.9	QP	
0.446	7.8	Neutral	46.9	-39.1	AVG	
0.466	27.8	Line	56.6	-28.8	QP	
0.466	7.6	Line	46.6	-39.0	AVG	
0.499	27.3	Line	56.0	-28.7	QP	
0.499	7.1	Line	46.0	-38.9	AVG	
0.520	26.7	Neutral	56.0	-29.3	QP	
0.520	6.9	Neutral	46.0	-39.1	AVG	
0.532	26.7	Line	56.0	-29.3	QP	
0.532	6.8	Line	46.0	-39.2	AVG	
9.853	21.4	Line	50.0	-28.6	AVG	
9.853	27.1	Line	60.0	-32.9	QP	
9.900	**22.6**	Neutral	50.0	**-27.4**	AVG	
9.900	27.9	Neutral	60.0	-32.1	QP	