

### EMC Test Report

### Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7 FCC Part 15 Subpart C

Model: Intel® Centrino® Advanced-N 6230 (model 62230HMW)

IC CERTIFICATION #: 1000M-62230ANH and 1000M-62230ANHU

FCC ID: PD962230ANH and PD962230ANHU

APPLICANT: Intel Corporation

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TEST SITE(S): Elliott Laboratories

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Fremont, CA. 94538-2435

IC SITE REGISTRATION #: 2845B-4, 2845B-7

REPORT DATE: October 11, 2010

FINAL TEST DATES: September 13-17, 20, 21, 28, 29, 30, October 1

and 4, 2010

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Testing Cert #2016.01

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## REVISION HISTORY

Rev#	Date	Comments	Modified By
1	10-11-2010	First release	

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#### **SCOPE**

An electromagnetic emissions test has been performed on the Intel Corporation model Intel® Centrino® Advanced-N 6230 (model 62230HMW), pursuant to the following rules:

Industry Canada RSS-Gen Issue 2

RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"

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 the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003

FCC DTS Measurement Procedure KDB558074, March 2005

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

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.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification 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.

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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® Advanced-N 6230 (model 62230HMW) complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 2

RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"

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® Advanced-N 6230 (model 62230HMW) 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.

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#### 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	10.0 MHz	>500kHz	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11b: 49 mW 802.11g: 38 mW n20: 41 mW n40: 34 mW EIRP max = 102mW	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	-6.9 dBm / 3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All spurious more than -30dBc.	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	53.0dBµV/m @ 2390.0MHz	15.207 in restricted bands, all others <-30dBc Note 2	Complies (-1.0dB)

Note 1: EIRP calculated using antenna gain of 3.2 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).

#### DIGITAL TRANSMISSION SYSTEMS (5725 -5850 MHz)

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 techniques	System must utilize digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	16.3MHz	>500kHz	Complies
15.247 (b)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11a: 39.8 mW n20: 39.8 mW n40: 246 mW EIRP = 0.778 W Note 1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	-7.7 dBm / 3kHz	Maximum permitted is 8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions – 30MHz – 40 GHz	All spurious emissions < -20dBc for n40 mode and below -30dBc for 802.11a and n20 modes.	< -20dBc < -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5 Table 2, 3	Radiated Spurious Emissions 30MHz – 40 GHz	49.4dBμV/m @ 11650.5MHz	15.207 in restricted bands, all others < -20dBc / <-30dBc <sup>2</sup>	Complies (-4.6dB)

Note 1: EIRP calculated using antenna gain of 5.0 dBi for the highest EIRP system.

Note 2: Limit of -30dBc used for 802.11a and 802.11n 20MHz modes because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst). The limit for 802.11n 40Mhz mode was -20dBc because the power measurements are peak power measurements.

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#### 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	Integral or unique connector required	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	41.2dBµV/m @ 662.52MHz	Refer to page 20	Complies (-4.8dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	40.6dBμV @ 14.758MHz	Refer to page 19	Complies (-9.4dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations, RSS 102 declaration and User Manual pages 8, 12	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Refer to pages 11 and 12 of the user's manual	Statement required regarding non-interference	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Not applicable, antenna is integral to host systems.	Statement for products with detachable antenna	N/A
_	RSP 100 RSS GEN	99% Bandwidth (2400-2483.5MHz)	802.11b: 13.6 MHz 802.11g: 17.1 MHz n20: 18.3 MHz n40: 36.6 MHz	Information only	N/A
	4.4.1	99% Bandwidth (5725-5850 MHz)	802.11a: 17.6MHz n20: 18.7 MHz n40: 38.8 MHz		

#### ADDITIONAL MEASUREMENTS

As both Bluetooth and 802.11 transmissions can occur simultaneously, radiated spurious measurements were made with both Bluetooth and 802.11 devices transmitting simultaneously.

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.2109	RSS 210	Spurious emissions	49.3dBμV/m @ 2320.0MHz	15.209 in restricted bands, all others < -20dBc	Complies (-4.7dB)

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#### **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	$\pm 0.7 \text{ dB}$
Conducted emission of transmitter	dBm	25 to 26500 MHz	$\pm 0.7 \text{ dB}$
Conducted emission of receiver	dBm	25 to 26500 MHz	$\pm 0.7 \text{ dB}$
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBμV/m	25 to 1000 MHz 1000 to 40000 MHz	± 3.6 dB ± 6.0 dB
Conducted Emissions (AC Power)	dΒμV	0.15 to 30 MHz	± 2.4 dB

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### EQUIPMENT UNDER TEST (EUT) DETAILS

#### GENERAL

The Intel Corporation model Intel® Centrino® Advanced-N 6230 (model 62230HMW) is a PCIe half mini card form factor Bluetooth/IEEE 802.11a/b/g/n wireless network adapter. The card supports MIMO (2x2) for 802.11n modes and MISO (1x2) for 802.11a/b/g modes. Bluetooth only operation mode is a 1x1. When Bluetooth is operational then 802.11b/g/n modes operate as SISO (1x1). 802.11a/n modes still operate as MIMO (2x2) with Bluetooth operational.

The card is sold under two different FCC/IC ID numbers (see table below). The ID's ending in "U" are intended to allow user install conditions and host systems must be provided with a BIOS locking feature that prevents installation of unauthorized devices.

For radio testing purposes the card was installed in a test fixture that exposed all sides of the card. For digital device testing for certification under equipment code JBP the card was installed inside a laptop PC.

The sample was received on September 13, 2010 and tested on September 13-17, 20, 21, 28, 29, 30, October 1 and 4, 2010. The EUT consisted of the following component(s):

Manufacturer	Model	Description	MAC Address	FCC ID and Canada UPN
Intel Corporation	62230ANHMW	PCIe Half Mini Card form factor Bluetooth / IEEE	00150079AD10	PD962230ANH PD962230ANHU 1000M-62230ANH
	62230ANHU	802.11a/b/g/n wireless network adapter	001300/9AD10	1000M-62230ANHU

#### ANTENNA SYSTEM

The EUT antenna is a two-antenna PIFA antenna system – Shanghai Universe Communication Electron Co., Ltd. The antenna connects to the EUT via a non-standard antenna connector, thereby meeting the requirements of FCC 15.203.

#### **ENCLOSURE**

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer or system.

#### **MODIFICATIONS**

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

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#### SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Intel Corporation	1	Test Fixture	D9164573K0B0	N/A
DELL	Latitude D520	Laptop PC	HM9383J	N/A
Agilent	E3610A	DC Supply	MY4001740	N/A

#### **EUT INTERFACE PORTS**

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

Port	Connected		Cable(s)	
Poit	То	Description	Shielded or Unshielded	Length(m)
Laptop USB	Fixture USB	USB cable	Shielded	
Laptop Mini PCI	Fixture PCIe	Ribbon	unshielded	
DC Power	Fixture DC power	2-wire	unshielded	

#### **EUT OPERATION**

The EUT was installed into a test fixture that exposed all sides of the card. The test fixture interfaced to a laptop computer and dc power supply. The laptop computer was used to configure the EUT to continuously transmit at a specified output power or continuously receive on the channel specified in the test data. For transmit mode measurements the system was configured to operate in each of the available operating modes – 802.11a, 802.11b, 802.11g, 802.11n (20 MHz channel bandwidth) and 802.11n (40MHz channel bandwidth), Bluetooth 1Mb/s and Bluetooth 3Mb/s. In addition radiated spurious tests were repeated with the device operating in both Bluetooth and 802.11 modes to determine if any spurious emissions due to inter-modulation products were created.

The data rates used when evaluating the WiFi transmitter were the lowest data rates for each 802.11 mode – 1Mb/s for 802.11b, 6Mb/s for 802.11a and 802.11g, 6.5MB/s for 802.11n (20MHz), and 13 Mb/s for 802.11n (40MHz). The device operates at its maximum output power at the lowest data rate (this was confirmed through separate measurements – refer to test data for actual measurements).

The field strength at the band edges was evaluated for each mode and on each chain individually on the lowest and highest channels at the rated power for the channel under test. Where the power at the edge channels was lower than the power at the center channels additional measurements were made at the adjacent channels. MIMO and SISO modes were fully evaluated.

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Spurious emissions measurements at frequencies away from the band edges were made at the highest power rating for the band in each mode. For 802.11n modes both chains were active (MIMO mode) but with each chain at the highest power rating per chain (MIMO power setting) to cover both modes of operation at the same time.

Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through preliminary testing, to produce emissions similar to those for 3Mb/s.

Receiver spurious emissions in 802.11 modes were evaluated in single chain and multichain modes. Bluetooth receiver spurious were evaluated for single chain only as MISO is not supported for Bluetooth.

The PC was using the Intel test utility DRTU Version 1.2.12-0197 and the device driver was version 14.0.0.39.

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#### 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	Registratio	Location	
Site	FCC	Canada	Location
Chamber 4	211948	2845B-4	41039 Boyce Road
Chamber 7	A2LA accreditation	2845B-7	Fremont, CA 94538-2435

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.

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#### **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.

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#### 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.

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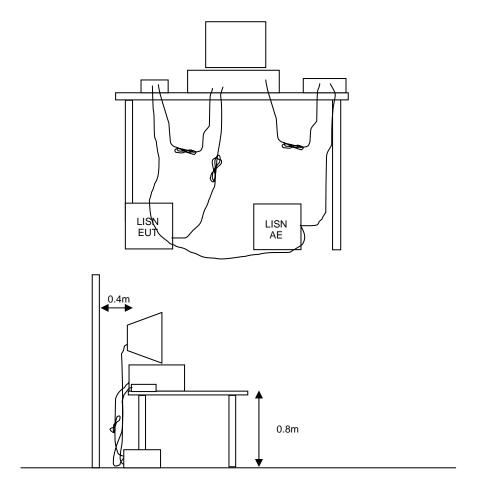
#### TEST PROCEDURES

#### 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.



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#### RADIATED EMISSIONS

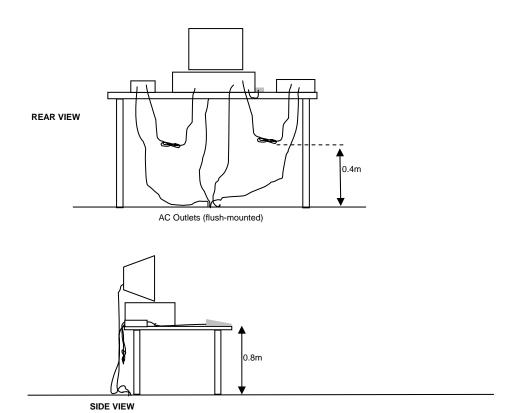
A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). 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.

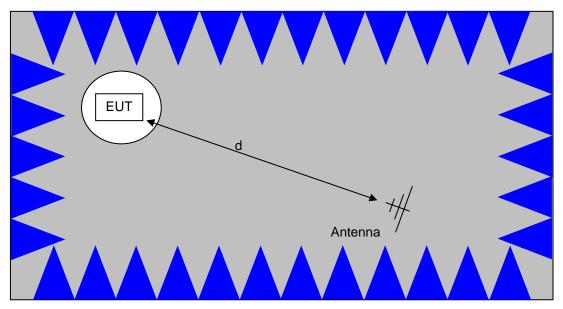
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

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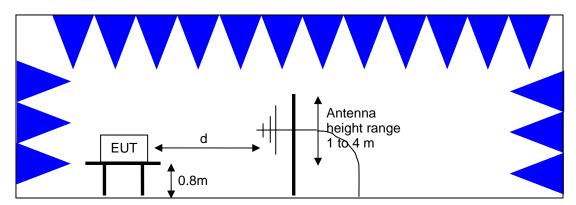
Typical Test Configuration for Radiated Field Strength Measurements

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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.



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

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#### **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

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#### GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands<sup>1</sup> (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 <sub>KHz</sub> @ 300m	67.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 300m
0.490-1.705	24000/F <sub>KHz</sub> @ 30m	87.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 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

<sup>&</sup>lt;sup>1</sup> The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

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#### **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

File: R80791 Page 21 of 22

#### 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

File: R80791 Page 22 of 22

# Appendix A Test Equipment Calibration Data

•	Bandedge), 13,14-Sep-10			
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	1142	8/2/2012
	(SA40-Red)			
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple	,		
	'			
Radio Antenna Port (E	Bandedge), 15-Sep-10			
Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT	8564E (84125C)	1393	4/14/2011
110Wiote 1 donard	(SA40) Blue	(011200)	1000	1/1 1/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
LIVICO	Antenna, Hom, 1-10 GHZ	3113	1301	0/22/2012
Radio Antenna Port (E	Randedge) 16-Sen-10			
Manufacturer (2	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple			
Badia (Spuriaua Emia	sions) 16 San 10			
Radio (Spurious Emis		Madal	A 4 #	Cal Dua
<u>Manufacturer</u>	<u>Description</u>	Model	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	10/22/2010
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple			
Rohde & Schwarz	Attenuator, 20 dB, 10W, DC-18	20dB, 10W, Type N	1795	6/2/2011
	GHz			
Rohde & Schwarz	Power Sensor 100 uW - 10	NRV-Z53	1796	6/2/2011
	Watts			
	OTS Bandedge, 17-Sep-10			
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple			
Rohde & Schwarz	Power Sensor 100 uW - 10	NRV-Z53	1555	2/5/2011
	Watts			
Rohde & Schwarz	Attenuator, 20 dB, 50 ohm,	20dB, 10W, Type N	1556	2/5/2011
	10W, DC-18 GHz	, - , 31 -		
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1787	12/4/2010
rtondo di Commanz	Tower meter, Buar Grianner			12/ 1/2010
DTS Spurs, 20-Sep-10				
Manufacturer	<u>Description</u>	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	Microwave Preamplifier, 1-	8449B	870	6/25/2011
riewiett i aekara	26.5GHz	04430	070	0/20/2011
Micro-Tronics	Band Reject Filter, 2400-2500	BRM50702-02	1683	8/10/2011
MICIO- FIOLICS		DIVINOUTUZ-UZ	1003	0/10/2011
Howlett Doolsond	MHz	0ECAE (0440EC)	1774	0/06/0044
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	1771	8/26/2011
	Purple			

File: R80791 Appendix Page 1 of 4

Radiated Emissions.	1000 - 26,500 MHz, 20-Sep-10			
Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	870	6/25/2011
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
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011
Hewlett Packard	Head (Inc W1-W4, 1946, 1947) Purple	84125C	1772	5/6/2011
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1787	12/4/2010
A.H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	3/18/2011
	1000 - 40,000 MHz, 21-Sep-10			
Manufacturer	<u>Description</u>	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	870	6/25/2011
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1728	2/1/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011
Hewlett Packard	Head (Inc W1-W4, 1946, 1947) Purple	84125C	1772	5/6/2011
A.H. Systems  Conducted Emissions	Blue System Horn, 18-40GHz s - AC Power Ports, 28-Sep-10	SAS-574, p/n: 2581	2159	3/18/2011
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	372	2/3/2011
Solar Electronics	LISN	8028-50-TS-24-BNC	904	3/2/2011
EN4CO	LICNI 40 LILE 400 MILE	support	4000	0/40/0044
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	3/12/2011
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	10/19/2010
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	11/11/2010
	30 - 1,000 MHz, 28-Sep-10	Model	Accet #	Cal Dua
Manufacturer Hewlett Packard	<u>Description</u> EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	Asset # 1319	<u>Cal Due</u> 10/19/2010
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	11/11/2010
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PAM-103	2234	5/19/2011
Radio Antenna Port (I	Power and Spurious Emissions), :	28-Sep-10		
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	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 - 2 Watts (w/ 20 dB pad, SN BJ5155)	NRV-Z32	1536	9/13/2011
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

File: R80791 Appendix Page 2 of 4

RE, Wi-Fi & BT Simulta	RE, Wi-Fi & BT Simultaneous Tx, 30-Sep-10							
Manufacturer	<u>Description</u>	<u>Model</u>	Asset #	Cal Due				
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	263	12/15/2010				
EMCO	Antenna, Horn, 1-18 GHz	3115	786	12/11/2011				
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				
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1683	8/10/2011				
Radio Spurious and P	ower, 01-Oct-10							
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due				
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non- Program	8563E	284	1/29/2011				
EMCO	Antenna, Horn, 1-18GHz	3115	868	6/8/2012				
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				
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	2199	1/11/2011				
Radiated Emissions, 0								
<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	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				
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012				
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011				

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# Appendix B Test Data

T80540

**AC Conducted Emissions** 83 Pages

**Radiated Spurious Emissions** 

T80759

74 Pages

Antenna Port Measurements

T80540

Radiated Spurious Emissions – simultaneous transmissions from

30 Pages

Bluetooth and Wi-Fi transceivers

Appendix Page 4 of 4 File: R80791

<b>Ellio</b>		El	MC Test Data
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		-
Emissions Standard(s):	FCC 15.247	Class:	В
Immunity Standard(s):	-	Environment:	-

For The

# **Intel Corporation**

Model

Intel® Centrino® Advanced-N 6230

Date of Last Test: 10/6/2010

	An ATAS company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIILEI® Ceritiiilo® Advanceu-iv 0250	Account Manager:	Christine Krebill
	Steve Hackett		
Standard:	FCC 15.247	Class:	В

#### **Conducted Emissions**

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

#### **Test Specific Details**

**>**□II: - 44

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: 9/28/2010 Config. Used: Modular Test
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 Host Unit Voltage 120V/60Hz

#### **General Test Configuration**

The test fixture 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: 21.9 °C

Rel. Humidity: 42 %

#### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	RSS 210 / 15.207	Pass	40.6dBµV @ 14.758MHz (-9.4dB)

#### 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.

Client:	Intel Corporation		Job Number:	J80398
\ladal:	Intel® Centrino® Advanced-N 6230	T-	Log Number:	T80540
		Acco	unt Manager:	Christine Krebill
	Steve Hackett			
	FCC 15.247		Class:	В
+1. AU	Power Port Conducted Emissions, 0.15 - 30MHz, 120V/50Hz			
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	0.150 1.000 Frequency (MHz)		000	30,000
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	MHz, 120V/60Hz, Neutral		000	30.000
- 30 f 70.0	MHz, 120V/60Hz, Neutral		000	30,000
- 30 M 70.0	MHz, 120V/60Hz, Neutral		000	30.000
- 30 M 70.0	MHz, 120V/60Hz, Neutral		000	30,000
- 30 M 70.0	MHz, 120V/60Hz, Neutral			30.000
- 30 M 70.0	MHz, 120V/60Hz, Neutral		. A	30.000
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- 30 M 70.0	1.000 Frequency (MHz)  MHz, 120V/60Hz, Neutral			30.000
- 30 M 70.0 60.0 50.0 30.0	7.150 1.000 Frequency (MHz)	10.		30,000
- 30 M 70.0 60.0 50.0 30.0	1.000 Frequency (MHz)  MHz, 120V/60Hz, Neutral	10.	1. /	30.000
- 30 M 70.0 60.0 50.0 30.0	7.150 1.000 Frequency (MHz)	10.		
- 30 M 70.0 60.0 50.0 30.0	1.000 Frequency (MHz)  MHz, 120V/60Hz, Neutral	10.		
- 30 M 70.0 60.0 50.0 30.0	1.000 Frequency (MHz)  MHz, 120V/60Hz, Neutral	10.		
- 30 M 70.0 60.0 50.0 30.0	1.000 Frequency (MHz)  MHz, 120V/60Hz, Neutral	10.		

Client:	Intel Corpora	ation					Job Number:	J80398
Madalı	Intol® Contr	ina Advana	-4 VI 6030				T-Log Number:	T80540
woder:	Intel® Centr	ino® Advanc	ea-in 6230				Account Manager:	Christine Krebill
Contact:	Steve Hacke	ett						
Standard:	FCC 15.247	,					Class:	В
Preliminary	neak readir	nas cantured	l during pre	-scan (neak	readings v	s. average limit)		
Frequency	Level	AC AC		ss B	Detector	Comments		
MHz	dΒμV	Line	Limit	Margin	QP/Ave			
2.739	30.4	Line 1	46.0	-15.6	Peak			
4.528	31.8	Line 1	46.0	-14.2	Peak			
9.571	41.2	Line 1	50.0	-8.8	Peak			
14.272	44.9	Line 1	50.0	-5.1	Peak			
14.925	45.4	Line 1	50.0	-4.6	Peak			
9.073	44.0	Neutral	50.0	-6.0	Peak			
9.336	44.9	Neutral	50.0	-5.1	Peak			
14.758	47.7	Neutral	50.0	-2.3	Peak			
inal quasi	peak and a	verage readi	ngs					
requency	Level	AC	Cla	ss B	Detector	Comments		
MHz	dΒμV	Line	Limit	Margin	QP/Ave			
14.758	40.6	Neutral	50.0	-9.4	AVG	AVG (0.100s)		
14.272	40.1	Line 1	50.0	-9.9	AVG	AVG (0.100s)		
14.925	35.7	Line 1	50.0	-14.3	AVG	AVG (0.100s)		
14.272	44.8	Line 1	60.0	-15.2	QP	QP (1.000s)		
9.336	34.6	Neutral	50.0	-15.4	AVG	AVG (0.100s)		
14.758	44.6	Neutral	60.0	-15.4	QP	QP (1.000s)		
9.073	32.7	Neutral	50.0	-17.3	AVG	AVG (0.100s)		
9.571	32.6	Line 1	50.0	-17.4	AVG	AVG (0.100s)		
14.925	42.4	Line 1	60.0	-17.6	QP	QP (1.000s)		
	39.9	Neutral	60.0	-20.1	QP	QP (1.000s)		
9.073	39.7	Neutral	60.0	-20.3 -22.1	QP QP	QP (1.000s) QP (1.000s)		
9.073 9.336 9.571	37.9	Line 1				I/\D\/4\0\0\-\		



	· · · · · · · · · · · · · · · · · · ·		
Client:	Intel Corporation	Job Number:	J80398
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIIIele Celitiiloe Advanced-iv 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	В

### Radiated Emissions 30-1000 MHz, Wireless Module (FCC 15.247/RSS 210)

(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: 9/28/2010 Config. Used: Modular Test
Test Engineer: Rafael Varelas Config Change: None
Test Location: FT Chamber #7 Host Unit Voltage 120V/60Hz

#### **General Test Configuration**

The EUT and any local support equipment were located on the turntable for radiated emissions testing.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

#### Ambient Conditions:

Temperature: 21.9 °C Rel. Humidity: 42 %

#### Summary of Results

#### MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions 30 - 1000 MHz	FCC 15.209 / RSS 210	Pass	41.2dBµV/m @ 662.52MHz (-4.8dB)

Note - preliminary measurements indicated that the radiated emissions from the combination of test fixture and EUT were not affected by the modules operating frequency or mode (transmit versus receive mode). The system was therefore evaluated against the most stringent set of limits from FCC 15.247, FCC 15E and RSS 210 with the device operating at max power (16.5dBm) on Chain A at 2437MHz, 802.11b mode and max power (7dBm) on the top channel in Bluetooth mode (1Mb/s data

#### **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.

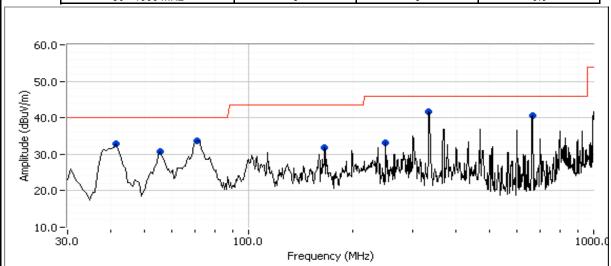


	All Deed Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	Intel® Centino® Advanced-14 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	В

#### Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

Configured to TX, 802.11b 16.5dBm on each chain (settings 23.5) on channel 6, Bluetooth 7dBm, 1Mb/s (settings 8.0)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0



Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC 15.209	9 / RSS 210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
39.869	33.0	V	40.0	-7.0	Peak	185	2.5	
55.317	30.8	V	40.0	-9.2	Peak	333	1.0	
70.276	33.6	V	40.0	-6.4	Peak	40	1.0	
166.249	31.8	V	43.5	-11.7	Peak	202	1.0	
250.000	33.1	Η	46.0	-12.9	Peak	154	1.5	
299.217	36.3	Η	46.0	-9.7	Peak	172	1.0	
332.857	41.7	Н	46.0	-4.3	Peak	116	1.0	
662.560	40.5	V	46.0	-5.5	Peak	44	1.0	

Maximized quasi-peak readings (includes manipulation of EUT interface cables)

Frequency	Level	Pol	FCC 15.209	9 / RSS 210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
662.515	41.2	V	46.0	-4.8	QP	44	1.0	QP (1.000s)
332.857	36.9	Н	46.0	-9.1	QP	116	1.0	QP (1.000s)
39.869	29.7	V	40.0	-10.3	QP	185	2.5	QP (1.000s)
70.276	29.3	V	40.0	-10.7	QP	40	1.0	QP (1.000s)
55.317	27.1	V	40.0	-12.9	QP	333	1.0	QP (1.000s)
166.249	27.3	V	43.5	-16.2	QP	202	1.0	QP (1.000s)

EI	liott
	An ATAT company

	An 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Band Edge)

Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 New tool from 9/14 Driver version 14.0.0.39

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Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1	n40	#3 2422MHz	16.5	10.5	Restricted Band Edge at 2400 MHz	15.209	52.6dBµV/m @ 2390.0MHz (-1.4dB)
Kull# I	Chain A	#9 2452MHz	16.5	10.1	Restricted Band Edge at 2483.5 MHz	15.209	52.4dBµV/m @ 2483.5MHz (-1.6dB)
Run # 2	n40	#4 2427MHz	16.5	10.5	Restricted Band Edge at 2400 MHz	15.209	52.3dBµV/m @ 2390.0MHz (-1.7dB)
Null#2	Chain A	#8 2447MHz	16.5	10.2	Restricted Band Edge at 2483.5 MHz	15.209	52.9dBµV/m @ 2483.5MHz (-1.1dB)
Run # 3	n40	#5 2432MHz	16.5	12.5	Restricted Band Edge at 2400 MHz	15.209	53.0dBµV/m @ 2390.0MHz (-1.0dB)
IXuII#3	Chain A	#7 2442MHz	16.5	11.2	Restricted Band Edge at 2483.5 MHz	15.209	52.0dBµV/m @ 2483.5MHz (-2.0dB)
Run # 4	n40 Chain A	#6 2437MHz	16.5	13.5	Restricted Band Edge at 2400 MHz	15.209	49.9dBµV/m @ 2390.0MHz (-4.1dB)
Rull#4			16.5	13.5	Restricted Band Edge at 2483.5 MHz	15.209	51.9dBµV/m @ 2483.5MHz (-2.1dB)
Run # 5	n20 Chain A	#1 2412MHz	16.5	12.9	Restricted Band Edge at 2400 MHz	15.209	52.4dBµV/m @ 2390.0MHz (-1.6dB)
Rull#3		#11 2462MHz	16.5	12.4	Restricted Band Edge at 2483.5 MHz	15.209	50.8dBµV/m @ 2483.5MHz (-3.2dB)
Run # 6	802.11g	#1 2412MHz	16.5	14.1	Restricted Band Edge at 2400 MHz	15.209	51.9dBµV/m @ 2390.0MHz (-2.1dB)
Rull # 0	Chain A	#11 2462MHz	16.5	13.9	Restricted Band Edge at 2483.5 MHz	15.209	52.8dBµV/m @ 2483.5MHz (-1.2dB)
Run # 7	802.11b	#1 2412MHz	16.5	16.5	Restricted Band Edge at 2400 MHz	15.209	50.7dBµV/m @ 2389.6MHz (-3.3dB)
Aun#7	Chain A	#11 2462MHz	16.5	16.9	Restricted Band Edge at 2483.5 MHz	15.209	49.3dBµV/m @ 2485.3MHz (-4.7dB)
Run # 8	802.11n20	#2 2417MHz	16.5	15.7	Restricted Band Edge at 2400 MHz	16.209	52.7dBµV/m @ 2390.0MHz (-1.3dB)
ruii#0	Chain A		16.5	15.8	Restricted Band Edge at 2483.5 MHz	15.209	52.4dBµV/m @ 2390.0MHz (-1.6dB)

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.



An <u>DCZP</u> ) company								
Client:	Intel Corporation	Job Number:	J80398					
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540					
woder.	IIItel® Certifillo® Advanced-N 0250	Account Manager:	Christine Krebill					
Contact:	Steve Hackett							
Standard:	FCC 15.247	Class:	N/A					

### Test Specific Details

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

#### General Test Configuration

The EUT ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC). For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

#### Ambient Conditions:

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

### 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.

#### Marker Delta Measurements

Three sets of marker deltas are measured using the following settings: RB=VB=100kHz; RB=1MHz,VB=1MHz; RB=1MHz, VB=10Hz. Marker deltas are made conducted (analyzer connected to EUT rf port a 20dB pad) for single chain operation.

The fundamental field strength is always measured at a 3m test distance.

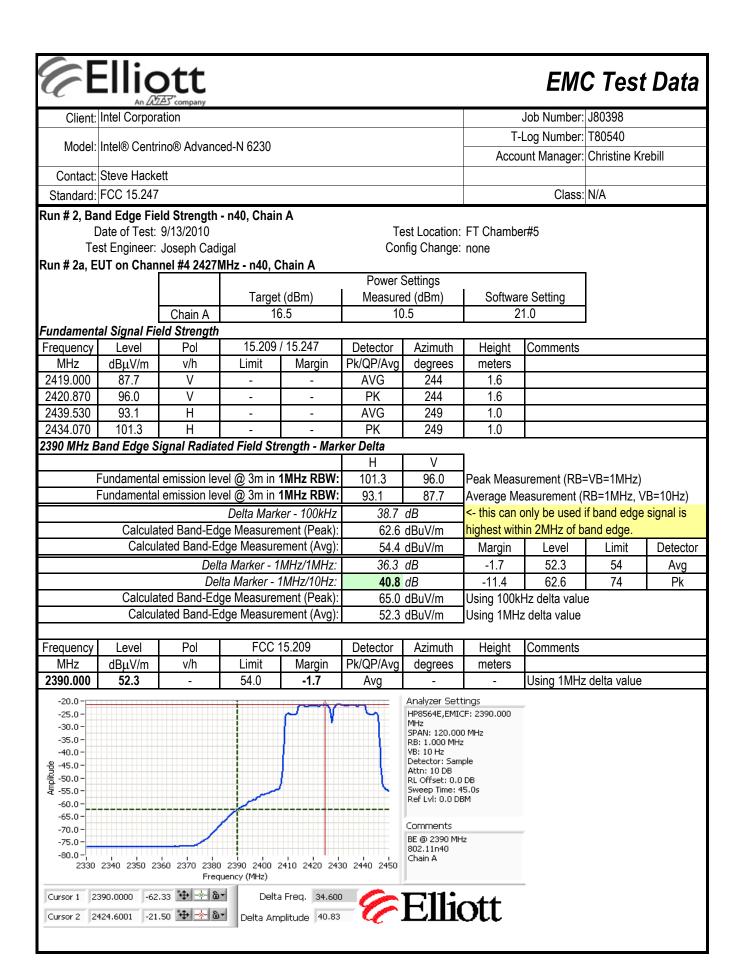
#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 1, Band Edge Field Strength - n40, Chain A Date of Test: 9/14/2010 Test Location: FT Chamber#7 Test Engineer: Joseph Cadigal Config Change: none Run # 1a, EUT on Channel #3 2422MHz - n40, Chain A Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 10.5 20.0 Chain A Fundamental Signal Field Strength Frequency Level 15.209 / 15.247 Detector Azimuth Height Comments Pol Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2434.730 91.8 Η AVG 252 1.0 -2420.070 Н PK 252 1.0 99.8 2419.130 86.6 ٧ **AVG** 217 2.1 2416.000 94.7 ٧ PΚ 217 2.1 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta Fundamental emission level @ 3m in 1MHz RBW: 99.8 94.7 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 91.8 86.6 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 37.0 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 62.8 dBuV/m Calculated Band-Edge Measurement (Avg) 54.8 dBuV/m Margin Level Limit Detector -1.4 52.6 Delta Marker - 1MHz/1MHz: 35.8 dB 54 Avg Delta Marker - 1MHz/10Hz: **39.2** dB -11.2 62.8 74 Pk Calculated Band-Edge Measurement (Peak) 64.0 dBuV/m Using 100kHz delta value Calculated Band-Edge Measurement (Avg): 52.6 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/Avq degrees meters 2390.000 54.0 -1.4 Using 1MHz delta value 52.6 Avg -20.0 Analyzer Settings HP8564E,EMICF: 2390.000 -25.0 -30.0 SPAN: 110.000 MHz -35.0 RB: 1.000 MHz -40.0 VB: 10 Hz Detector: Sample -45.0· Attn: 10 DB -50.0 RL Offset: 0.0 DB -55.0 Sweep Time: 41.0s Ref Lvl: 0.0 DBM -60.0 Comments -70.0 BE @ 2390 MHz -75.0· 802.11n40 -80.0 -¦ 2350 2360 2370 2380 2390 2400 2410 2420 2430 Frequency (MHz) Cursor 1 2390.0000 -61.83 ♣ ♣ 🌬 Delta Freq. 19.983

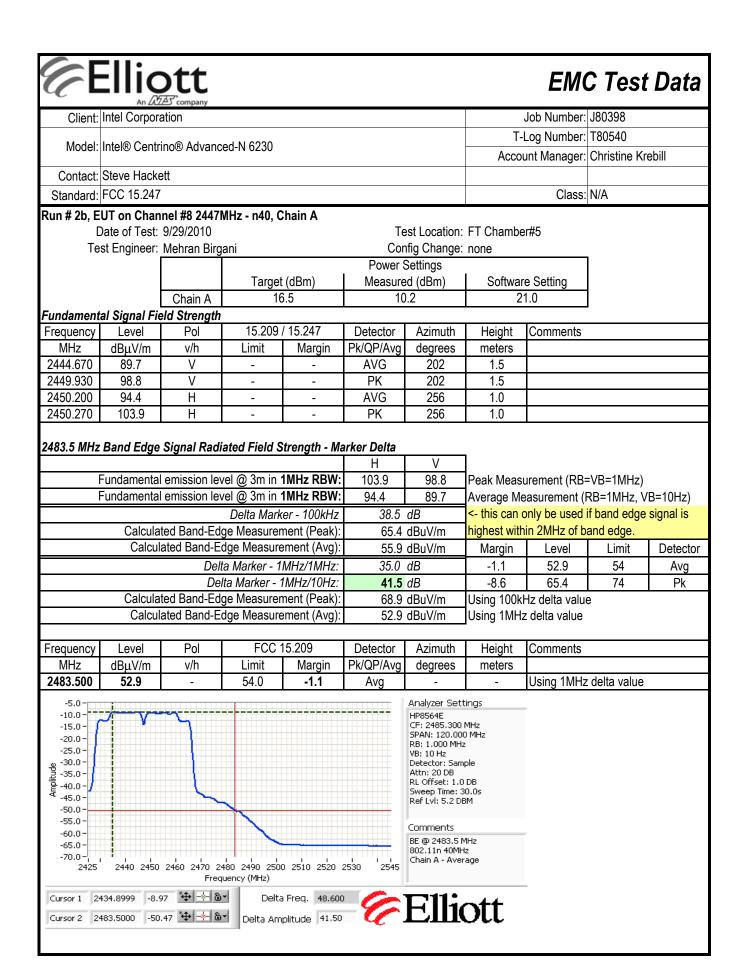
Cursor 2 2409,9834

-22.67 💠 😽 🖫

Delta Amplitude 39.17

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 1b, EUT on Channel #9 2452MHz - n40, Chain A **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 10.0 21.0 Chain A Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Detector Azimuth Comments Pol Height v/h Limit Pk/QP/Avq degrees MHz dBuV/m Margin meters 2449.000 89.4 ٧ **AVG** 189 1.6 2440.870 98.2 ٧ PΚ 189 1.6 90.1 Η **AVG** 254 1.0 2443.930 --2440.600 101.2 Н PΚ 254 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 98.2 101.2 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 90.1 89.4 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 35.2 dB Calculated Band-Edge Measurement (Peak): 66.0 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): 54.9 dBuV/m Margin Level Detector Limit Delta Marker - 1MHz/1MHz: 34.0 dB -1.6 52.4 54 Avg Delta Marker - 1MHz/10Hz: **37.7** dB -8.0 66.0 74 Pk Calculated Band-Edge Measurement (Peak): 67.2 dBuV/m Using 100kHz delta value Calculated Band-Edge Measurement (Avg): 52.4 dBuV/m Using 1MHz delta value Pol FCC 15.209 Detector Comments Frequency Level Azimuth Height Pk/QP/Avq MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2483.500 52.4 54.0 -1.6 Ava Using 1MHz delta value Analyzer Settings -25.0 HP8564E,EMICF: 2483,500 -30.0 SPAN: 110.000 MHz -35.0 RB: 1,000 MHz VB: 10 Hz -40.0 Detector: Sample -45.0· Attn: 10 DB -50.0 RL Offset: 0.0 DB Sweep Time: 41.0s -55.0 Ref Lvl: 0.0 DBM -60.0 -65.0· Comments -70.0 BE @ 2483.5 MHz -75.0 802.11n40 -80.0 -Chain A 2440 2450 2460 2470 2480 2490 2500 2510 2520 2530 2538 Frequency (MHz) Cursor 1 2439.6833 -21.50 + --- 6 -Delta Freq. 43.817 Cursor 2 2483.5000 -59.17 💠 🛧 🖫 Delta Amplitude 37.67



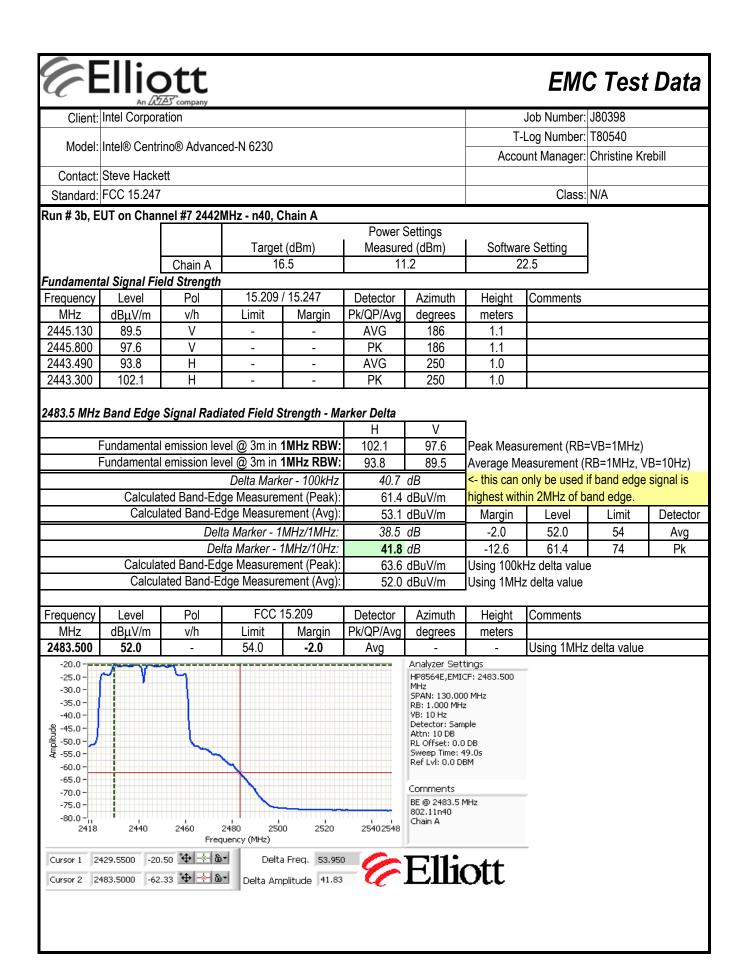


#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 3, Band Edge Field Strength - n40, Chain A Date of Test: 9/15/2010 Test Location: FT Chamber #7 Test Engineer: Joseph Cadigal Config Change: none Run # 3a, EUT on Channel #5 2432MHz - n40, Chain A Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 12.5 23.5 Chain A Fundamental Signal Field Strength Frequency Level 15.209 / 15.247 Detector Azimuth Height Comments Pol Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin meters degrees 2419.670 91.9 ٧ AVG 186 1.8 -٧ PK 1.8 2419.530 100.0 186 2444.600 95.3 Η **AVG** 252 1.0 2444.670 103.4 Н PΚ 252 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 103.4 100.0 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 95.3 91.9 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 40.5 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 62.9 dBuV/m Calculated Band-Edge Measurement (Avg): 54.8 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 38.0 dB -1.0 53.0 54 Avg Delta Marker - 1MHz/10Hz: 42.3 dB -11.1 62.9 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 65.4 dBuV/m Calculated Band-Edge Measurement (Avg): 53.0 dBuV/m Using 1MHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Comments Height MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2390.000 53.0 54.0 -1.0 Using 1MHz delta value Avq -15.0° Analyzer Settings -20.0 HP8564E,EMICF: 2390.000 -25.0 SPAN: 130,000 MHz $-30.0^{\circ}$ RB: 1.000 MHz -35.0 -VB: 10 Hz -40.0 Detector: Sample Attn: 10 DB -45.0 · RL Offset: 0.0 DB -50.0 -Sweep Time: 49.0s -55.0 Ref Lvl: 0.0 DBM -60.0 -65.0 Comments -70.0 BE @ 2390 MHz -75.0· 802.11n40 -80.0 -2340 2360 2400 2420 Delta Freq. 39.217

-19.00 💠 📥 🖫

Cursor 2 2429,2166

Delta Amplitude 42.33



#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 4, Band Edge Field Strength - n40, Chain A Date of Test: 9/15/2010 Test Location: FT Chamber#7 Test Engineer: Joseph Cadigal Config Change: none EUT on Channel #6 2437MHz - n40, Chain A Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 24.5 Chain A Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin meters degrees 2449.470 96.4 ٧ AVG 344 1.0 -2449.800 ٧ PK 1.0 104.8 344 2440.200 96.6 Η **AVG** 269 1.0 2449.730 104.8 Н PΚ 269 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 104.8 104.8 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 96.6 96.4 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz **46.7** dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 58.1 dBuV/m Calculated Band-Edge Measurement (Avg): 49.9 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 39.7 dB -4.1 49.9 54 Avg Delta Marker - 1MHz/10Hz: 46.5 dB -15.9 58.1 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 65.1 dBuV/m Calculated Band-Edge Measurement (Avg): 50.1 dBuV/m Using 100kHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2390.000 49.9 54.0 -4.1 Using 100kHz delta value Ava Analyzer Settings -10.0 HP8564E,EMICF: 2390.000 -20.0 SPAN: 140,000 MHz RB: 100 kHz -30.0 VB: 100 kHz Detector: POS -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 77.0ms Ref Lvl: 0.0 DBM -60.0 Comments -70.0 BE @ 2390 MHz 802.11n40 -80.0 2400 2320 2380 2420 Frequency (MHz) -59.00 ♣ -\*- ७-Delta Freq. 45.267 Cursor 1 2390,0000

Cursor 2 2435,2666

-12.33 💠 🗻 🖫

Delta Amplitude 46.67

#### **EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta Н V Fundamental emission level @ 3m in 1MHz RBW: 104.8 104.8 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 96.6 96.4 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 43.5 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 61.3 dBuV/m Calculated Band-Edge Measurement (Avg): 53.1 dBuV/m Margin Level Detector Limit -2.1 51.9 54 Delta Marker - 1MHz/1MHz: 38.3 dB Avg Delta Marker - 1MHz/10Hz: 44.7 dB -12.7 61.3 74 Pk Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 66.5 dBuV/m Calculated Band-Edge Measurement (Avg): 51.9 dBuV/m Using 1MHz delta value Pol FCC 15.209 Comments Frequency Level Detector Azimuth Height MHz $dB\mu V/m$ v/h Limit Margin Pk/QP/Avq degrees meters 2483.500 51.9 54.0 -2.1 Avg Using 1MHz delta value -10.0 Analyzer Settings HP8564E,EMICF: 2483.500 -20.0 MHz SPAN: 140.000 MHz RB: 1.000 MHz VB: 10 Hz -30.0 Detector: Sample -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 52.0s Ref Lvl: 0.0 DBM -60.0 Comments -70.0 BE @ 2483.5 MHz -80.0 Chain A 2440 2480 2500 2520 2540 2554 2414 2460 Frequency (MHz) Cursor 1 2434.2666 -16.33 💠 🔆 🖫 Delta Freq. 49.233 -61.00 💠 📥 🔊 Delta Amplitude 44.67

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 5, Band Edge Field Strength - n20, Chain A Date of Test: 9/15/2010 Test Location: FT Chamber#7 Test Engineer: Joseph Cadigal Config Change: none Run # 5a, EUT on Channel #1 2412MHz - n20, Chain A Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 12.9 24.0 Chain A Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin meters degrees 2415.000 98.3 ٧ AVG 202 1.0 -٧ PK 1.0 2415.500 106.3 202 2415.270 100.1 Η **AVG** 320 1.0 2414.070 108.2 Н PΚ 320 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 108.2 106.3 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 100.1 98.3 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 47.0 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 61.2 dBuV/m Calculated Band-Edge Measurement (Avg): 53.1 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 37.5 dB -1.6 52.4 54 Avg Delta Marker - 1MHz/10Hz: **47.7** dB -12.8 61.2 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 70.7 dBuV/m Calculated Band-Edge Measurement (Avg): 52.4 dBuV/m Using 1MHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2390.000 52.4 54 0 -1.6 Using 1MHz delta value Avq Analyzer Settings -10.0 HP8564E,EMICF: 2390.000 -20.0 SPAN: 70,000 MHz RB: 1.000 MHz -30.0 VB: 10 Hz Detector: Sample -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 26.0s Ref Lvl: 0.0 DBM -60.0 Comments -70.0 BE @ 2390 MHz -80.0 2420 2425 2355 2360 2380 2390 2400 2410 Frequency (MHz) Cursor 1 2390.0000 -61.00 ↔ 🛧 🗟 🕶 Delta Freq. 25,200

Cursor 2 2415.2000 -13.33 💠 📥 🗟 🖜

Delta Amplitude 47.67

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 5b, EUT on Channel #11 2462MHz - n20, Chain A **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 12.4 23.5 Chain A Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Pol Detector Azimuth Height Comments MHz $dB\mu V/m$ v/h Limit Margin Pk/QP/Avq degrees meters 2465.230 97.3 ٧ **AVG** 344 1.0 2465.430 ٧ 105.5 PΚ 344 1.0 2465.130 96.6 Η **AVG** 320 1.0 PK 320 2465.300 104.9 Н 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 104.9 105.5 Peak Measurement (RB=VB=1MHz) Average Measurement (RB=1MHz, VB=10Hz) 96.6 Fundamental emission level @ 3m in 1MHz RBW: 97.3 <- this can only be used if band edge signal is Delta Marker - 100kHz **46.5** dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 59.0 dBuV/m Calculated Band-Edge Measurement (Avg): 50.8 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: -3.2 50.8 54 37.2 dB Avg Delta Marker - 1MHz/10Hz: 46.3 dB -15.0 59.0 74 Pk Calculated Band-Edge Measurement (Peak): 68.3 dBuV/m Using 100kHz delta value Calculated Band-Edge Measurement (Avg): 51.0 dBuV/m Using 100kHz delta value FCC 15.209 Pol Detector Azimuth Comments Frequency Level Height MHz $dB\mu V/m$ v/h Limit Margin Pk/QP/Avg degrees meters 2483.500 54.0 -3.2 Using 100kHz delta value 50.8 Avg Analyzer Settings -10.0 HP8564E,EMICF: 2483.500 -20.0 SPAN: 70,000 MHz RB: 100 kHz -30.0 VB: 100 kHz Detector: POS -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 50.0ms Ref Lvl: 0.0 DBM -60.0 Comments -70.0 BE @ 2483.5 MHz 802.11n20 -80.0 Chain A 2460 2480 2490 2500 Frequency (MHz) Cursor 1 2467.1667 -10.17 💠 🔆 🖫 Delta Freq. 16.683 Cursor 2 2483.8501 -56.67 💠 🛧 🗟 🔻 Delta Amplitude 46.50

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 6, Band Edge Field Strength - 802.11g, Chain A Date of Test: 9/15/2010 Test Location: FT Chamber #7 Test Engineer: Joseph Cadigal Config Change: none Run # 6a, EUT on Channel #1 2412MHz - 802.11g, Chain A Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 14.1 25.5 Chain A Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin meters degrees 2414.470 97.6 ٧ AVG 344 1.0 -2413.630 ٧ PK 1.0 105.8 344 2416.300 101.1 Η **AVG** 268 1.0 2415.030 109.2 Н PΚ 268 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 109.2 105.8 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 101.1 97.6 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 48.2 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 61.0 dBuV/m Calculated Band-Edge Measurement (Avg): 52.9 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 38.8 dB -2.1 51.9 54 Avg Delta Marker - 1MHz/10Hz: 49.2 dB -13.0 61.0 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 70.4 dBuV/m Calculated Band-Edge Measurement (Avg): 51.9 dBuV/m Using 1MHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2390.000 51.9 54.0 -2.1 Using 1MHz delta value Avq Analyzer Settings -10.0 HP8564E,EMICF: 2390.000 -20.0 SPAN: 70.000 MHz RB: 1.000 MHz -30.0 Detector: Sample -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 26.0s Ref Lvl: 0.0 DBM Comments -70.0 BE @ 2390 MHz 802.11g -80.0 -Chain A 2355 2360 2370 2380 2390 2400 2410 2420 2425 Frequency (MHz) Cursor 1 2390.0000 -61.00 ↔ 🛧 🗟 🕶 Delta Freq. 21.117

Cursor 2 2411.1167 -11.83 💠 🐣 🔊

Delta Amplitude 49.17

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 6b, EUT on Channel #11 2462MHz - 802.11g, Chain A Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Pol Detector Comments Azimuth Height Pk/QP/Avq MHz $dB\mu V/m$ v/h Limit Margin meters degrees 2464.170 98.8 ٧ 120.0 -21.2**AVG** 344 1.0 2465.230 106.9 ٧ 120.0 -13.1 PK 344 1.0 2460.540 100.0 Н 120.0 -20.0 **AVG** 268 1.0 2463.450 107.9 Н 120.0 -12.1PK 268 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta Η ٧ Fundamental emission level @ 3m in 1MHz RBW: 107.9 106.9 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 100.0 98.8 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 46.3 dB Calculated Band-Edge Measurement (Peak): 61.6 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): 53.7 dBuV/m Margin Level Detector Limit Delta Marker - 1MHz/1MHz: 37.3 dB -1.2 52.8 54 Avg Delta Marker - 1MHz/10Hz: 47.2 dB -12.4 74 Pk 61.6 Calculated Band-Edge Measurement (Peak): Using 100kHz delta value dBuV/m Calculated Band-Edge Measurement (Avg): 52.8 dBuV/m Using 1MHz delta value FCC 15.209 Detector Pol Frequency Level Azimuth Height Comments MHz $dB\mu V/m$ v/h Limit Margin Pk/QP/Avg degrees meters 2483.500 52.8 54.0 Using 1MHz delta value -1.2 Avg -10.0 Analyzer Settings HP8564E,EMICF: 2483.500 -20.0 SPAN: 70,000 MHz RB: 1.000 MHz -30.0 VB: 10 Hz Detector: Sample -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 26.0s Ref Lvl: 0.0 DBM -60.0 Comments -70.0 BE @ 2483.5 MHz 802.11g 2490 2460 2470 2480 2500 2510 2518 Cursor 1 2458.7666 -12.67 💠 🕸 🗟 🖜 Delta Freq. 24.733 Cursor 2 2483.5000 -59.83 💠 🐣 🔊 Delta Amplitude 47.17

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 7, Band Edge Field Strength - 802.11b, Chain A Date of Test: 9/15/2010 Test Location: FT Chamber #7 Test Engineer: Rafael Varelas Config Change: none Run # 7a, EUT on Channel #1 2412MHz - 802.11b, Chain A **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 16.5 23.0 Chain A Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2413.830 108.7 Н 120.0 -11.3 AVG 267 1.1 2413.200 112.1 Н 120.0 -7.9 PΚ 1.1 267 2410.370 103.4 ٧ 120.0 -16.6 **AVG** 202 1.0 2413.130 106.7 ٧ 120.0 -13.3 PΚ 202 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Η Fundamental emission level @ 3m in 1MHz RBW: 112.1 106.7 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 108.7 103.4 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 56.8 dB Calculated Band-Edge Measurement (Peak): 55.3 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): 51.9 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 49.0 dB -3.3 50.7 54 Avg Delta Marker - 1MHz/10Hz: -18.7 55.3 74 Pk 58.0 dB Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 63.1 dBuV/m Calculated Band-Edge Measurement (Avg): Using 1MHz delta value 50.7 dBuV/m FCC 15.209 Frequency Pol Detector Comments Level Azimuth Height $dB\mu V/m$ Pk/QP/Ava MHz v/h Limit Margin degrees meters 2389.566 50.7 54.0 -3.3 Using 1MHz delta value Avg Analyzer Settings HP8564E,EMICF: 2390.000 -10.0 MHz SPAN: 65,000 MHz -20.0 RB: 1.000 MHz VB: 10 Hz Detector: Sample Attn: 10 DB -30.0 -40.0 RL Offset: 0.0 DB Sweep Time: 25.0s Ref Lvl: 0.0 DBM -50.0 -60.0

2370

Cursor 1 2389.5667 -63.67 💠 🔆 🖫

Cursor 2 2414.2666 -5.67 💠 🔆 🗟 🔻

2380

2390 Frequency (MHz)

Delta Freq. 24.700

Delta Amplitude 58.00

-70.0

-80.0

2358

Comments

Chain A

BE @ 2390 MHz 802.11b

Client:	Intel Corpora	ition				Job Number:	J80398			
			T-Log Number: T80540							
Model:	Intel® Centri	no® Advanc		unt Manager:		ebill				
	Steve Hacke	tt								
Standard:	FCC 15.247							Class:	N/A	
Run # 7b, El	UT on Chan	nel #11 2462	2MHz - 802.1	1b, Chain A					Ī	
			Torgot	(dDm)	Power S Measure		l Coffwor	o Cottina		
	}	Chain A		(dBm) 6.5	ivieasure 16	, ,		e Setting 3.5		
	L	•	- 10	7.0	10	.0		J.U		
	al Signal Fie		15 200	/ 15.247	Detector	Λ =imu th	Haight	Comments		
Frequency MHz	Level dBµV/m	Pol v/h	Limit	Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments		
2463.800	104.6	V/II	120.0	-15.4	AVG	344	1.0	<del> </del>		
2461.200	107.9	V	120.0	-12.1	PK	344	1.0			
2460.300	107.8	H	120.0	-12.2	AVG	266	1.0	1		
2460.700	111.0	H	120.0	-9.0	PK	266	1.0			
2402 E MU-	Dand Edge	Cianal Badi	oted Field C	tropoth M	aukau Dalta					
2463.3 IVITIZ	Band Edge	Signai Radi	ated Field S	trengtn - Ivia	H H	V	1			
F	undamental	emission lev	vel @ 3m in 1	1MHz RBW:	111.0	107.9	Peak Measi	urement (RB=	=VB=1MHz)	
	undamental				107.8	104.6		easurement (F		B=10Hz)
			Delta Mark	er - 100kHz	58.5			only be used		
	Calculat	ed Band-Ed	ge Measuren	nent (Peak):	52.5	dBuV/m	highest with	in 2MHz of b	and edge.	
	Calcula	ated Band-Ed	dge Measure	ement (Avg):	49.3	dBuV/m	Margin	Level	Limit	Detecto
			a Marker - 1		47.0		-4.7	49.3	54	Avg
			ta Marker - 1		57.0		-21.5	52.5	74	Pk
			ge Measuren			dBuV/m	_	Hz delta value		
	Calcula	ated Band-Ed	dge Measure	ement (Avg):	50.8	dBuV/m	Jusing Tuuki	Hz delta value	9	
Frequency	Level	Pol		15.209	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
2485.340	49.3	-	54.0	-4.7	Avg	-	-	Using 100kh	Iz delta valu	е
-10.0 - -20.0 - -30.0 - -30.0 - -40.0 - -50.0 - -70.0 - -80.0 - 2451	2460		requency (MH			MHz SPAR RB: VB: Dete Attn RL C Swee Ref I  Com BE 6 802. Chai		ns		

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 8, Band Edge Field Strength - 802.11n20MHz, Chain A Date of Test: 9/17/2010 Test Location: FT Chamber #7 Test Engineer: Rafael Varelas Config Change: none Run # 8a, EUT on Channel #2 2417MHz - 802.11n20MHz, Chain A Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 15.7 28.0 Chain A Fundamental Signal Field Strength Frequency Level 15.209 / 15.247 Detector Azimuth Height Comments Pol Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2413.770 103.2 Η 120.0 -16.8AVG 357 1.0 PK 1.0 2413.070 111.4 Н 120.0 -8.6 357 2413.970 98.9 ٧ 120.0 -21.1 **AVG** 204 1.2 2412.670 107.4 ٧ 120.0 -12.6PΚ 204 1.2 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 111.4 107.4 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 103.2 98.9 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 48.7 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 62.7 dBuV/m Calculated Band-Edge Measurement (Avg): 54.5 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 40.5 dB -1.3 52.7 54 Avg Delta Marker - 1MHz/10Hz: **50.5** dB -11.3 62.7 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 70.9 dBuV/m Calculated Band-Edge Measurement (Avg): 52.7 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Level Pol Detector Azimuth Height Comments Pk/QP/Avq MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2390.000 52.7 54.0 -1.3 Using 1MHz delta value Ava Analyzer Settings 0.0 HP8564E,EMICF: 2390.000 -10.0SPAN: 75,000 MHz RB: 1.000 MHz -20.0 VB: 10 Hz Detector: Sample -30.0 Attn: 20 DB RL Offset: 0.0 DB -40.0 Sween Time: 28.0s Ref Lvl: 5.9 DBM

-50.0

-70.0

Cursor 1 2390.0000

Cursor 2 2420,2500

2400

Delta Freq. 30.250

Delta Amplitude 50.50

Frequency (MHz)

-60.10 **↔** \* 6•

-9.60 💠 🛧 ७⋅

Comments BE @ 2390 MHz 802.11n 20MHz

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 8b, EUT on Channel #10 2457MHz - 802.11n20MHz, Chain A **Power Settings** Target (dBm) Measured (dBm) Software Setting Chain A 16.5 15.8 28.0 Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Pol Detector Azimuth Height Comments v/h Pk/QP/Ava MHz $dB\mu V/m$ Limit Margin degrees meters 2460.000 102.1 Η 120.0 -17.9AVG 14 1.0 2459.000 110.1 Η 120.0 -9.9 PΚ 14 1.0 2460.270 99.8 ٧ 120.0 -20.2 **AVG** 345 1.0 ٧ 2461.430 108.1 120.0 -11.9 PK 345 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Н Fundamental emission level @ 3m in 1MHz RBW: 110.1 108.1 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 102.1 99.8 Average Measurement (RB=1MHz, VB=10Hz) Delta Marker - 100kHz <- this can only be used if band edge signal is 48.7 dB Calculated Band-Edge Measurement (Peak): 61.4 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): 53.4 dBuV/m Margin Level Limit Detector 39.7 dB Delta Marker - 1MHz/1MHz: -1.6 52.4 54 Avg Delta Marker - 1MHz/10Hz: -12.6 **49.7** dB 61.4 74 Pk Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 70.4 dBuV/m Calculated Band-Edge Measurement (Avg): 52.4 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Level Pol Detector Azimuth Comments Height Pk/QP/Avg MHz v/h Limit Margin degrees dBμV/m meters 2483.500 52.4 54.0 Using 1MHz delta value -1.6 Avg Analyzer Settings 0.0 HP8564E,EMICF: 2483.500 -10.0 SPAN: 75,000 MHz RB: 1.000 MHz -20.0 VB: 10 Hz Detector: Sample -30.0 Attn: 20 DB RL Offset: 0.0 DB Sweep Time: 28.0s Ref Lvl: 5.9 DBM -40.0 -50.0 Comments -60.0 BE @ 2483.5 MHz 802.11n 20MHz -70.0 Chain A 2500 2446 2475 Frequency (MHz) Cursor 1 2460.3750 -9.93 ♣ -\*- 🏝 Delta Freq. 23.125 Cursor 2 2483.5000 -59.60 💠 🗻 🗟 🗖 Delta Amplitude 49.67

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	An 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Band Edge)

Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 New tool from 9/14 Driver version 14.0.0.39

Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin		
Run # 1	n40	#3 2422MHz	16.5	9.1	Restricted Band Edge at 2400 MHz	15.209	52.9dBµV/m @ 2389.3MHz (-1.1dB)		
Kull# I	Chain B	#9 2452MHz	16.5	10.1	Restricted Band Edge at 2483.5 MHz	15.209	53.0dBµV/m @ 2484.2MHz (-1.0dB)		
Run # 2	n40	#4 2427MHz	16.5	9.5	Restricted Band Edge at 2400 MHz	15.209	52.2dBµV/m @ 2390.0MHz (-1.8dB)		
Ruii # Z	Chain B	#8 2447MHz	16.5	9.9	Restricted Band Edge at 2483.5 MHz	15.209	53.0dBµV/m @ 2483.5MHz (-1.0dB)		
Run # 3	n40	#5 2432MHz	16.5	11.9	Restricted Band Edge at 2400 MHz	15.209	52.2dBµV/m @ 2389.6MHz (-1.8dB)		
IXuII # 3	Chain B	#7 2442MHz	16.5	11.4	Restricted Band Edge at 2483.5 MHz	15.209	52.9dBµV/m @ 2483.5MHz (-1.1dB)		
Run # 4	n40	#6	16.5	12.6	Restricted Band Edge at 2400 MHz	16.209	48.9dBµV/m @ 2390.0MHz (-5.1dB)		
IXuII#4	Chain B	Chain B			16.5	12.6	Restricted Band Edge at 2483.5 MHz	16.209	52.1dBµV/m @ 2483.5MHz (-1.9dB)
Run # 5	n20	#1 2412MHz	16.5	12.4	Restricted Band Edge at 2400 MHz	16.209	52.0dBµV/m @ 2390.0MHz (-2.0dB)		
Kuii # 5	Chain B		16.5	12.3	Restricted Band Edge at 2483.5 MHz	16.209	52.6dBµV/m @ 2483.5MHz (-1.4dB)		
Run # 6	802.11g	#1 2412MHz	16.5	13.8	Restricted Band Edge at 2400 MHz	16.209	52.1dBµV/m @ 2390.0MHz (-1.9dB)		
Kuii # 0	Chain B	Chain B		16.5	13.4	Restricted Band Edge at 2483.5 MHz	16.209	51.9dBµV/m @ 2483.5MHz (-2.1dB)	
Run # 7	802.11b	#1 2412MHz	16.5	16.7	Restricted Band Edge at 2400 MHz	15.209	49.4dBµV/m @ 2389.9MHz (-4.6dB)		
IXUII # 7	Chain B	#11 2462MHz	16.5	16.7	Restricted Band Edge at 2483.5 MHz	15.209	48.1dBµV/m @ 2483.5MHz (-5.9dB)		
Run # 8	802.11n20	#2 2417MHz	16.5	16.2	Restricted Band Edge at 2400 MHz	16.209	49.5dBµV/m @ 2390.0MHz (-4.5dB)		
Null # 0	Chain B		16.5	16.3	Restricted Band Edge at 2483.5 MHz	15.209	52.5dBµV/m @ 2483.5MHz (-1.5dB)		

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.

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Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

## Test Specific Details

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

## **General Test Configuration**

The EUT ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC). For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

### Ambient Conditions:

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

### 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.

### Marker Delta Measurements

Three sets of marker deltas are measured using the following settings: RB=VB=100kHz; RB=1MHz,VB=1MHz; RB=1MHz, VB=10Hz. Marker deltas are made conducted (analyzer connected to EUT rf port a 20dB pad) for single chain operation. The fundamental field strength is always measured at a 3m test distance.

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 1, Band Edge Field Strength - n40, Chain B Date of Test: 9/15/2010 Test Location: FT Chamber #7 Test Engineer: Rafael Varelas Config Change: none Run # 1a, EUT on Channel #3 2422MHz - n40, Chain B Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 9.1 21.5 Chain B Fundamental Signal Field Strength 15.209 / 15.247 Frequency Pol Level Detector Azimuth Height Comments MHz v/h Pk/QP/Avg $dB\mu V/m$ Limit Margin degrees meters 2434.730 91.4 Н **AVG** 238 1.0 2432.600 99.6 Η PΚ 238 1.0 -٧ 2410.000 88.5 **AVG** 231 1.0 ٧ 231 2410.870 96.6 PK 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta Fundamental emission level @ 3m in 1MHz RBW: 99.6 96.6 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 91.4 88.5 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 38.3 dB Calculated Band-Edge Measurement (Peak): 61.3 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): 53.1 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 34.2 dB -1.1 52.9 54 Avg Delta Marker - 1MHz/10Hz: -12.7 61.3 74 **38.5** dB Pk Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 65.4 dBuV/m Calculated Band-Edge Measurement (Avg): 52.9 dBuV/m Using 1MHz delta value FCC 15.209 Pol Comments Frequency Level Detector Azimuth Height MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2389.266 52.9 54.0 Using 1MHz delta value -1.1 Avg Analyzer Settings -20.0 -25.0 HP8564E,EMICF: 2390.000 -30.0SPAN: 110,000 MHz -35.0 RB: 1.000 MHz VB: 10 Hz -40.0 Detector: Sample -45.0 Attn: 10 DB -50.0 RL Offset: 0.0 DB Sweep Time: 41.0s Ref Lvl: -1.0 DBM -55.0 -60.0 -65.0 Comments -70.0 BE @ 2390 MHz -75.0 802.11n 40MHz -80.0 2350 2360 2370 2380 2390 2400 2410 2420 2430 2445

Cursor 1 2389.2666

Cursor 2 2419.3333

Delta Freq. 30.067

Delta Amplitude 38.50

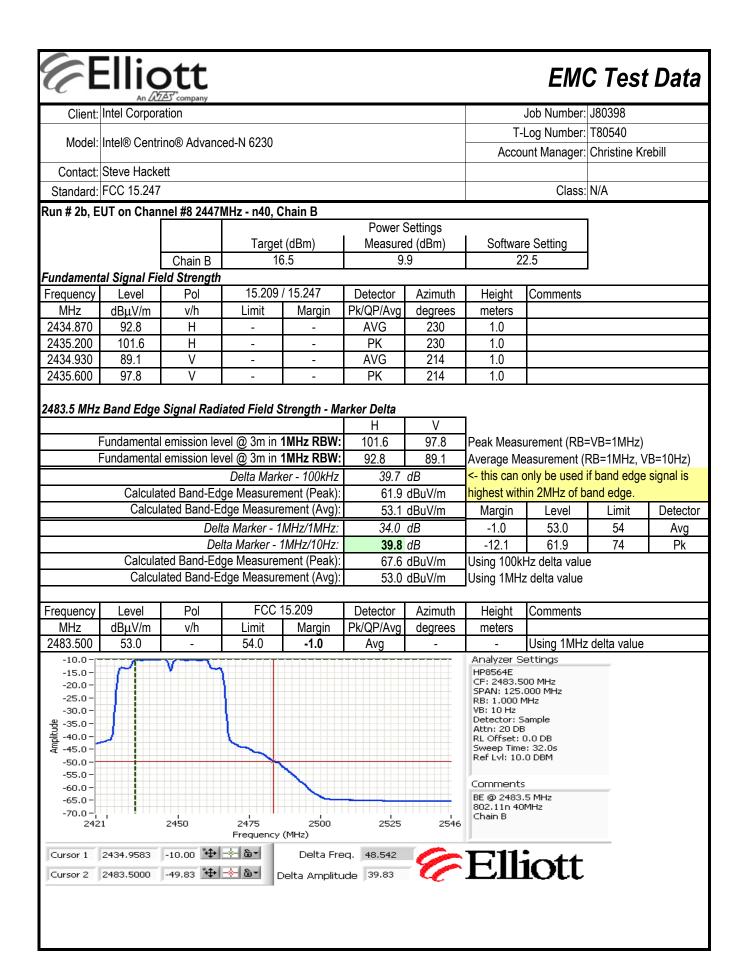
Frequency (MHz)

-59,33 💠 -\*- ७-

-20.83 💠 🗻 ७७

Client	Intel Corpora	ation						Job Number:	J80398	
							og Number:			
Model:	Intel® Centr	ino® Advanc	ed-N 6230					int Manager:		ebill
Contact:	Steve Hacke	ett								
	FCC 15.247							Class:	N/A	
		nel #9 2452l	MHz - n40. C	hain B						
,			,		Power S	Settings	_			
				(dBm)	Measure	/		e Setting		
		Chain B	16	5.5	10	) <u>.1</u>	22	2.5	]	
	ai Signai Fie Level	eld Strength Pol	15 209	/ 15.247	Detector	Azimuth	Height	Comments		
Frequency MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	Comments		
2439.670	89.7	Н	-	-	AVG	239	1.0			
2440.600	98.0	Н	-	-	PK	239	1.0			
2439.930	89.3	V	-	-	AVG	322	1.0			
2445.870	97.8	V	-	-	PK	322	1.0			
2483.5 MHz	Band Edge	Signal Radi	ated Field S	trength - Ma	arker Delta					
					Н	V	]			
		emission lev			98.0	97.8	Peak Measurement (RB=VB=1MHz)			
	-undamental	emission lev			89.7	89.3	Average Measurement (RB=1MHz, VB=10Hz)			
	Calaula	tad Dand Ed		er - 100kHz	33.7		<- this can only be used if band edge signal is highest within 2MHz of band edge.			signal is
		ted Band-Ed ated Band-E				dBuV/m dBuV/m				Detecto
	Odicui		ta Marker - 1	<u> </u>	32.8					Avg
			Ita Marker - 1		36.7		-9.7	64.3	74	Pk
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):		dBuV/m	Using 100kHz delta value			
	Calcul	ated Band-E	dge Measure	ement (Avg):	53.0	dBuV/m	Using 1MHz	delta value		
Frequency	Level	Pol	FCC 1	15.209	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
2484.166	53.0	-	54.0	-1.0	Avg	-	-	Using 1MHz	delta value	
-20.0	2440 2450		2480 2490 quency (MHz)	2500 2510	2520 253	MHz SPAN: 100. RB: 1.000 N VB: 10 Hz Detector: S Attn: 10 DE RL Offset: Sweep Time Ref Lvl: -1.  Comments BE @ 2483. 802.11n 40 Chain B	MICF: 2483,500 000 MHz MHz MHz 3 0,0 DB 9: 37.0s 0 DBM 5 MHz MHz			

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 2, Band Edge Field Strength - n40, Chain B Date of Test: 9/16/2010 Test Location: Chamber #7 Test Engineer: Mehran Birgani/R. Varelas Config Change: none Run # 2a, EUT on Channel #4 2427MHz - n40, Chain B Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 9.5 22.0 Chain B Fundamental Signal Field Strength Frequency Level 15.209 / 15.247 Detector Azimuth Height Comments Pol Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2419.670 93.2 Η AVG 233 1.0 -PK 233 1.0 2421.530 101.9 Н 2414.870 89.3 ٧ **AVG** 218 1.0 2416.530 98.1 ٧ PΚ 218 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 101.9 98.1 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 93.2 89.3 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 38.2 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 63.7 dBuV/m Calculated Band-Edge Measurement (Avg): 55.0 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 37.7 dB -1.8 52.2 54 Avg Delta Marker - 1MHz/10Hz: 41.0 dB -10.3 63.7 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 64.2 dBuV/m Calculated Band-Edge Measurement (Avg): 52.2 dBuV/m Using 1MHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments v/h Limit Margin Pk/QP/Avg MHz dBµV/m degrees meters 2390.000 52.2 54.0 -1.8 Using 1MHz delta value Avq Analyzer Settings -5.0 HP8564E -10.0 CF: 2390.000 MHz -15.0 SPAN: 120.000 MHz RB: 1.000 MHz -20.0 VB: 10 Hz -25.0 Detector: Sample Attn: 20 DB -30.0 를 -35.0 -투 -40.0 · RL Offset: 1.0 DB Sweep Time: 30.0s Ref Lvl: 10.8 DBM -45.0 -50.0 Comments -55.0 BE @ 2390 MHz -60.0 802.11n 40MHz -65.0 -Chain B 2330 2340 2350 2360 2370 2380 2390 2400 2410 2420 2430 2440 2450 Frequency (MHz) Cursor 1 2390,0000 -50.37 💠 🔆 💁 🕏 🖜 Delta Freq. 25,200 Cursor 2 2415.2000 -9.37 Delta Amplitude 41.00



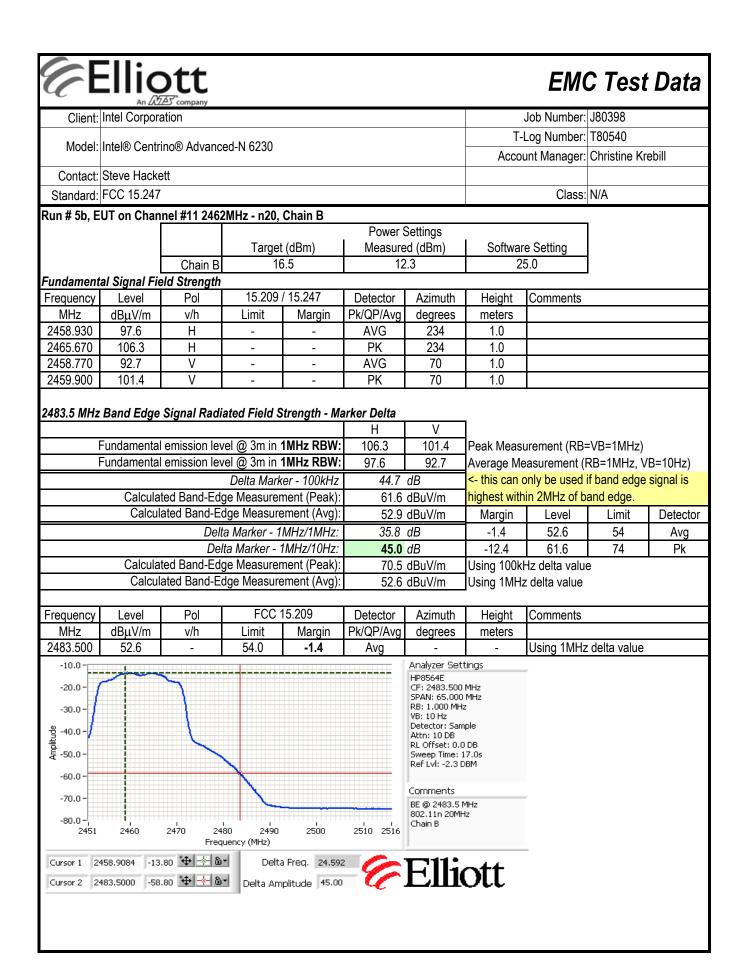
Model:   Intel® Centrino® Advanced-N 6230	(rebill
Account Manager: Christine   Contact:   Steve Hackett   Standard:   FCC 15.247   Class:   N/A	(rebill
Account Manager: Christine   Contact   Steve Hackett   Standard: FCC 15.247   Class: N/A	(rebill
Standard   FCC 15.247	
Test Location: Chamber #7   Test Location: Chamber #7   Test Engineer: Mehran Birgani/R. Varelas   Test Location: Chamber #7   Config Change: none	
Test Location: Chamber #7   Test Location: Chamber #7   Test Engineer: Mehran Birgani/R. Varelas   Test Location: Chamber #7   Config Change: none	
Date of Test: 9/16/2010   Test Engineer: Mehran Birgani/R. Varelas   Config Change: none	
Power Settings   Power Settings   Power Settings   Power Setting   Power Se	
Power Settings   Measured (dBm)   Software Setting   24.0	
Target (dBm)   Measured (dBm)   Software Setting	
Chain B   16.5   11.9   24.0	
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           2420.000         95.4         H         -         -         AVG         236         1.0           2420.730         104.3         H         -         -         AVG         217         1.0           2420.400         100.4         V         -         -         PK         217         1.0           2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta           Fundamental emission level @ 3m in 1MHz RBW:         104.3         100.4         Peak Measurement (RB=VB=1MH           Delta Marker - 100kHz         43.2 dB         -         -         -this can only be used if band edge           Calculated Band-Edge Measurement (Peak):         61.1 dBuV/m         Margin         Level         Limit           Delta Marker - 1MHz/1MHz:         39.2 dB         -1.8         52.2         54           Delta Marker - 1MHz/10Hz:         43.0 dB         -12.9         61.1         <	
Frequency   Level   Pol   15.209 / 15.247   Detector   Azimuth   Height   Comments	
MHz         dBμV/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters           2420.000         95.4         H         -         -         AVG         236         1.0           2420.730         104.3         H         -         -         PK         236         1.0           2419.870         91.6         V         -         -         PK         217         1.0           2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta         H         V         V         -         -         PK         217         1.0         Peak Measurement (RB=VB=1MH         -         -         PK         217         1.0         -         -         2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta         - <td></td>	
2420.000   95.4   H   -   -   AVG   236   1.0	
2420.730   104.3   H	
2420.400 100.4 V PK 217 1.0  2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta  Fundamental emission level @ 3m in 1MHz RBW: 104.3 100.4 Fundamental emission level @ 3m in 1MHz RBW: 95.4 91.6  Delta Marker - 100kHz 43.2 dB - this can only be used if band edge Calculated Band-Edge Measurement (Peak): 61.1 dBuV/m highest within 2MHz of band edge Calculated Band-Edge Measurement (Avg): 52.2 dBuV/m Margin Level Limit Delta Marker - 1MHz/1MHz: 39.2 dB - 1.8 52.2 54  Delta Marker - 1MHz/10Hz: 43.0 dB - 12.9 61.1 74  Calculated Band-Edge Measurement (Peak): 65.1 dBuV/m Using 100kHz delta value Usi	
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Delta Marker - 1MHz/1MHz:       39.2 dB       -1.8       52.2       54         Delta Marker - 1MHz/10Hz:       43.0 dB       -12.9       61.1       74         Calculated Band-Edge Measurement (Peak):       65.1 dBuV/m       Using 100kHz delta value         Calculated Band-Edge Measurement (Avg):       52.4 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         2389.583       52.2       -       54.0       -1.8       Avg       -       Using 100kHz delta value	Detector
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Frequency Level Pol FCC 15.209 Detector Azimuth Height Comments  MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters  2389.583 52.2 - 54.0 -1.8 Avg Using 100kHz delta v	
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2389.583 52.2 - 54.0 -1.8 Avg Using 100kHz delta v	
0.0 - Analyzer Settings	
	16
-10.0 - HP8564E -10.0 - CF: 2390.000 MHz SPAN: 125.000 MHz	
-20.0 - RB: 100 kHz -20.0 - VB: 100 kHz	
智 RL Offset: 0.0 DB	
Ref Lvl: 10.0 DBM	
-50.0 - Comments	
-60.0 - Comments BE @ 2390 MHz	
-70.0 – 802.11n 40MHz -70.0 – Chain B	
2328 2350 2375 2400 2425 2452	
Cursor 1 2389.5833 -47.50 + Delta Freq. 34.583 Elliott	
Deita Amplitude 43.17	

Ciletit.	Intel Corpora	ation		Job Number: J80398						
Model	Intol® Contri	ino® Advanc	od NI 6330	T-Log Number: T80540						
Model.	intel® Centri	now Advanc	Acco	unt Manager:	Christine Kr	ebill				
	Steve Hacke	ett								
Standard:	FCC 15.247							Class:	N/A	
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			Target	(dDm)	Power S Measure	•	I Coffwar	e Setting		
		Chain B		t (dBm) 5.5	ivieasure 11			3.5		
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undamenta	al Signal Fie	eld Strength								
requency	Level	Pol		/ 15.247	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	-		
2429.800 2431.530	94.6 103.6	H H	-	-	AVG PK	231 231	1.0 1.0	<del> </del>		
2429.930	90.7	V	-	-	AVG	214	1.0	<del> </del>		
2430.730	99.2	V	-	-	PK	214	1.0			
	Calculat	ted Band-Edg		<i>cer - 100kHz</i> ment (Peak):	<i>41.7</i> 61.9	dBuV/m		only be used in 2MHz of b		Signal is
	Calcula	ated Band-Ed		ement (Avg):		dBuV/m	Margin	Level	Limit	
	Calcula	Delt	a Marker - 1	ement (Avg): MHz/1MHz:	37.3	dB	Margin -1.1	52.9	54	Avg
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requency MHz 2483.500	Calculat Calcula	Delt Del ted Band-Edo ated Band-Ed	a Marker - 1 ta Marker - ge Measurer dge Measure	ement (Avg): MHz/1MHz: 1MHz/10Hz: ment (Peak): ement (Avg):	37.3 41.7 66.3 52.9	dB dB dBuV/m dBuV/m	Margin -1.1 -12.1 Using 100kl Using 1MHz Height meters -	52.9 61.9 Hz delta value z delta value Comments Using 1MHz	54 74 e	Detect Avg Pk
MHz	Calculat Calculat Level dBµV/m	Delt Del ted Band-Edg ated Band-Edg Pol	a Marker - 1 ta Marker - ge Measurer dge Measurer FCC	ement (Avg): MHz/1MHz: 1MHz/10Hz: ment (Peak): ement (Avg): 15.209 Margin	37.3 41.7 66.3 52.9 Detector Pk/QP/Avg	dB dB dBuV/m dBuV/m	Margin -1.1 -12.1 Using 100kl Using 1MHz	52.9 61.9 Hz delta value z delta value Comments Using 1MHz Settings 5000 MHz MHz MHz Sample B 0.0 DB In: 32.0s	54 74 e	Avg

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 4, Band Edge Field Strength - n40, Chain B Date of Test: 9/16/2010 Test Location: Chamber #7 Test Engineer: Mehran Birgani/R. Varelas Config Change: none EUT on Channel #6 2437MHz - n40, Chain B Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 12.6 25.0 Chain B Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin meters degrees 2424.870 96.6 Η AVG 234 1.0 -2425.330 Н PK 234 1.0 105.3 2424.870 92.5 ٧ **AVG** 215 1.3 2425.070 101.3 ٧ PΚ 215 1.3 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 105.3 101.3 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 96.6 92.5 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 47.7 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 57.6 dBuV/m Calculated Band-Edge Measurement (Avg): 48.9 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 41.3 dB -5.1 48.9 54 Avg Delta Marker - 1MHz/10Hz: 47.2 dB -16.4 57.6 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 64.0 dBuV/m Calculated Band-Edge Measurement (Avg): 49.4 dBuV/m Using 100kHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2390.000 48.9 54.0 -5.1 Using 100kHz delta value Avq Analyzer Settings 0.0 HP8564E CF: 2390.000 MHz -10.0 SPAN: 125,000 MHz RB: 100 kHz -20.0 VB: 100 kHz Detector: POS Attn: 20 DB -30.0 RL Offset: 0.0 DB -40.0 Sweep Time: 50.0ms Ref Lvl: 4.8 DBM Comments -60.0 BE @ 2390 MHz 802.11n 40MHz -70.0 -Chain B 2400 2425 Frequency (MHz) Cursor 1 2390.0000 -51.53 💠 😽 🔊 Delta Freq. 51.875 2441.8750 Delta Amplitude

#### **EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Η Fundamental emission level @ 3m in 1MHz RBW: 105.3 101.3 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 96.6 92.5 Average Measurement (RB=1MHz, VB=10Hz) Delta Marker - 100kHz 44.0 dB <- this can only be used if band edge signal is Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 61.3 dBuV/m Calculated Band-Edge Measurement (Avg): 52.6 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: -1.9 52.1 39.2 dB 54 Avg Delta Marker - 1MHz/10Hz: -12.7 61.3 74 Pk 44.5 dB Calculated Band-Edge Measurement (Peak) 66.1 dBuV/m Using 100kHz delta value Calculated Band-Edge Measurement (Avg): 52.1 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Level Pol Detector Azimuth Height Comments Margin MHz $dB\mu V/m$ Pk/QP/Avg v/h Limit degrees meters 2483.500 52.1 54.0 -1.9 Using 1MHz delta value Avq Analyzer Settings 0.0 HP8564E CF: 2483.500 MHz -10.0SPAN: 125.000 MHz RB: 1.000 MHz -20.0 VB: 10 Hz Detector: Sample -30.0 Attn: 20 DB RL Offset: 0.0 DB -40.0 Sweep Time: 32.0s Ref Lvl: 10.0 DBM -50.0 Comments -60.0 BE @ 2483.5 MHz 802.11n 40MHz -70.0 2450 2475 2500 2525 Frequency (MHz) -7.17 **↔** -\*- &• Delta Freq. 58.958 Cursor 1 2424.5417 -51.67 💠 🛧 ७҇▾ Cursor 2 2483,5000 Delta Amplitude 44.50

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 5, Band Edge Field Strength - n20, Chain B Date of Test: 9/16/2010 Test Location: FT Chamber #7 Test Engineer: Rafael Varelas Config Change: none Run # 5a, EUT on Channel #1 2412MHz - n20, Chain B Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 12.4 25.0 Chain B Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2415.030 98.8 Η AVG 234 1.0 -Н PK 234 1.0 2415.500 108.0 2415.170 97.3 ٧ **AVG** 70 1.0 2416.670 106.3 ٧ PΚ 70 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 108.0 106.3 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 98.8 97.3 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 46.7 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 61.3 dBuV/m Calculated Band-Edge Measurement (Avg): 52.1 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 35.8 dB -2.0 52.0 54 Avg Delta Marker - 1MHz/10Hz: 46.8 dB -12.7 61.3 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 72.2 dBuV/m Calculated Band-Edge Measurement (Avg): 52.0 dBuV/m Using 1MHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments dBμV/m v/h Limit Margin Pk/QP/Avg MHz degrees meters 2390.000 52.0 54.0 -2.0 Using 1MHz delta value Avq -10.0 Analyzer Settings HP8564E CF: 2390.000 MHz SPAN: 65.000 MHz -20.0 RB: 1.000 MHz VB: 10 Hz Detector: Sample Attn: 10 DB RL Offset: 0.0 DB -30.0 -40.0 Sweep Time: 17.0s Ref Lvl: -2.3 DBM -50.0 Comments -70.0 BE @ 2390 MHz 802.11n 20MHz Chain B -80.0 <sup>-</sup> 2358 2370 2380 2390 2400 2410 Frequency (MHz) Cursor 1 2390.0000 -60.30 💠 🔆 🖫 Cursor 2 2414.8083 -13.47 💠 🔆 🖫 Delta Amplitude



#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 6, Band Edge Field Strength - 802.11g, Chain B Date of Test: 9/16/2010 Test Location: FT Chamber #7 Test Engineer: Rafael Varelas Config Change: none Run # 6a, EUT on Channel #1 2412MHz - 802.11g, Chain B Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 13.8 26.5 Chain B Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2415.730 100.4 Η AVG 235 1.0 -2415.200 Н PK 235 1.0 109.0 2414.570 98.8 ٧ **AVG** 70 1.0 2415.030 107.4 ٧ PΚ 70 1.0 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 109.0 107.4 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 100.4 98.8 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 47.7 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 61.3 dBuV/m Calculated Band-Edge Measurement (Avg): 52.7 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 37.3 dB -1.9 52.1 54 Avg Delta Marker - 1MHz/10Hz: 48.3 dB -12.7 61.3 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 71.7 dBuV/m Calculated Band-Edge Measurement (Avg): 52.1 dBuV/m Using 1MHz delta value FCC 15.209 Pol Detector Frequency Level Azimuth Height Comments MHz dBμV/m v/h Limit Margin Pk/QP/Avg degrees meters 2390.000 52.1 54 0 -1.9 Ava Using 1MHz delta value -10.0 Analyzer Settings HP8564E -20.0 CF: 2390,000 MHz SPAN: 65.000 MHz RB: 1,000 MHz -30.0 VB: 10 Hz Detector: Sample -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 17.0s Ref Lvl: -2.3 DBM -60.0 Comments -70.0 BE @ 2390 MHz 802.11g -80.0 Chain B 2370 2400 2410 2358 2380 2422 2390 Frequency (MHz) -60.30 💠 🔆 ७▾ Cursor 1 2390,0000 Delta Freq. 24.917 -11.97 💠 📥 🖫

Delta Amplitude 48.33

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 6b, EUT on Channel #11 2462MHz - 802.11g, Chain B **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 13.4 26.0 Chain B Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Detector Azimuth Comments Pol Height v/h Limit Pk/QP/Avq MHz dBuV/m Margin degrees meters 2460.300 98.9 Η **AVG** 232 1.0 2458.270 107.7 Н PΚ 232 1.0 2457.870 94.0 ٧ **AVG** 1.0 --70 ٧ 2457.930 102.7 PΚ 70 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta V Fundamental emission level @ 3m in 1MHz RBW: 107.7 102.7 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: Average Measurement (RB=1MHz, VB=10Hz) 98.9 94.0 <- this can only be used if band edge signal is Delta Marker - 100kHz 44.8 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 62.9 dBuV/m Calculated Band-Edge Measurement (Avg): Margin 54.1 dBuV/m Level Limit Detector Delta Marker - 1MHz/1MHz: 40.0 dB -2.1 51.9 54 Avg Delta Marker - 1MHz/10Hz: -11.1 62.9 74 47.0 dB Pk Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 67.7 dBuV/m Calculated Band-Edge Measurement (Avg) 51.9 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Pol Detector Azimuth Comments Level Height dBuV/m Pk/QP/Avq MHz v/h Limit Margin degrees meters 2483.500 51.9 54.0 -2.1 Using 1MHz delta value Avg Analyzer Settings HP8564E CF: 2483.500 MHz -20.0 SPAN: 65,000 MHz RB: 1.000 MHz -30.0 VB: 10 Hz Detector: Sample -40.0 Attn: 10 DB RL Offset: 0.0 DB -50.0 Sweep Time: 17.0s Ref Lvl: -2.3 DBM -60.0 Comments -70.0 BE @ 2483.5 MHz 802.11g -80.0 Chain B 2480 2490 2470 2500 2510 2516 2451 2460 Frequency (MHz) -12.80 ♣ -\*- 🌣 • Delta Freq. 23.400 Cursor 1 2460.1001 -59.80 💠 📥 🆫 🖜 2483.5000 Cursor 2 Delta Amplitude 47.00

#### **EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 7, Band Edge Field Strength - 802.11b, Chain B Date of Test: 9/16/2010 Test Location: FT Chamber #7 Test Engineer: Rafael Varelas Config Change: none Run # 7a, EUT on Channel #1 2412MHz - 802.11b, Chain B **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 16.7 24.5 Chain B Fundamental Signal Field Strength Frequency Level Pol 15.209 / 15.247 Detector Azimuth Height Comments MHz Limit Margin Pk/QP/Avg $dB\mu V/m$ v/h degrees meters 2413.900 103.6 ٧ **AVG** 70 1.0 ٧ PK 70 1.0 2413.230 107.6 104.9 Η 235 1.0 2413.930 AVG 2413.630 108.9 PK 235 1.0 Η 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Н Fundamental emission level @ 3m in 1MHz RBW: 108.9 107.6 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 104.9 103.6 Average Measurement (RB=1MHz, VB=10Hz) Delta Marker - 100kHz <- this can only be used if band edge signal is **55.5** dB Calculated Band-Edge Measurement (Peak): 53.4 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): Margin 49.4 dBuV/m Detector Level Limit Delta Marker - 1MHz/1MHz: 45.8 dB -4.6 49.4 54 Avq Delta Marker - 1MHz/10Hz: -20.6 53.4 74 55.2 dB Pk Calculated Band-Edge Measurement (Peak) 63.1 dBuV/m Using 100kHz delta value Calculated Band-Edge Measurement (Avg): 49.7 dBuV/m Using 100kHz delta value FCC 15.209 Frequency Level Pol Detector Azimuth Height Comments MHz $dB\mu V/m$ v/h Limit Margin Pk/QP/Avg degrees meters 2389.892 49.4 54.0 Using 100kHz delta value -4.6 Avq 0.0 Analyzer Settings HP8564E -10.0 CF: 2390.000 MHz SPAN: 65,000 MHz -20.0 RB: 100 kHz VB: 100 kHz -30.0 Detector: POS Attn: 10 DB -40.0 RL Offset: 0.0 DB Sweep Time: 50.0ms Ref Lvl: -2.4 DBM -50.0 -60.0 Comments BE @ 2390 MHz 802.11b -80.0 Chain B 2370 2410 2358 2400

2414.1584

2380

**⊕** -\*- 6-

2389.8916 -62.73 💠 🐣 🖫

-7.23

2390 Frequency (MHz)

Delta Freq. 24.267

Delta Amplitude

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 7b, EUT on Channel #11 2462MHz - 802.11b, Chain B **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 16.7 24.5 Chain B Fundamental Signal Field Strength 15.209 / 15.247 Frequency Level Detector Azimuth Height Comments Pol v/h Limit Pk/QP/Avq degrees MHz dBuV/m Margin meters 2459.530 98.7 ٧ **AVG** 69 1.0 2460.770 102.6 ٧ PΚ 69 1.0 2460.300 104.1 Η **AVG** 235 1.0 --2460.700 108.1 Н PΚ 235 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta V Fundamental emission level @ 3m in 1MHz RBW: 108.1 102.6 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: Average Measurement (RB=1MHz, VB=10Hz) 104.1 98.7 <- this can only be used if band edge signal is Delta Marker - 100kHz 55.2 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 52.9 dBuV/m Calculated Band-Edge Measurement (Avg): Margin 48.9 dBuV/m Level Limit Detector Delta Marker - 1MHz/1MHz: 45.3 dB -5.9 48.1 54 Avg Delta Marker - 1MHz/10Hz: -21.1 52.9 74 **56.0** dB Pk Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 62.8 dBuV/m Calculated Band-Edge Measurement (Avg) 48.1 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Pol Detector Azimuth Comments Level Height Pk/QP/Avq degrees MHz dBuV/m v/h Limit Margin meters 2483.500 48.1 54.0 -5.9 Using 1MHz delta value Avg Analyzer Settings 0.0 HP8564E -10.0 CF: 2483.500 MHz SPAN: 65.000 MHz -20.0 RB: 1.000 MHz VB: 10 Hz Detector: Sample Attn: 10 DB RL Offset: 0.0 DB 40.0 Sweep Time: 17.0s Ref Lvl: -2.4 DBM -50.0 -60.0 Comments -70.0 BE @ 2483.5 MHz 802.11b -80.0 Chain B 2490 2500 2480 2510 2516 Frequency (MHz) -7.40 ♣ ♣ ७ • Cursor 1 2459.3416 Delta Freg. 24.158 -63.40 💠 📥 🛍 × Cursor 2 2483,5000 Delta Amplitude 56.00

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 8, Band Edge Field Strength - 802.11n20MHz, Chain B Date of Test: 10/5/2010 Test Location: FT Chamber #4 Test Engineer: Mehran Birgani Config Change: None Run # 8a, EUT on Channel #2 2417MHz - 802.11n20MHz, Chain B Power Settings Target (dBm) Measured (dBm) Software Setting 16.5 16.2 29.5 Chain B Fundamental Signal Field Strength Frequency Level 15.209 / 15.247 Detector Azimuth Height Comments Pol Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2420.070 97.8 ٧ AVG 267 1.0 -2421,400 ٧ PK 1.0 106.1 267 2413.830 101.7 Η **AVG** 236 1.2 2413.200 110.2 Н PΚ 236 1.2 2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Fundamental emission level @ 3m in 1MHz RBW: 110.2 106.1 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 101.7 97.8 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 51.0 dB Calculated Band-Edge Measurement (Peak): highest within 2MHz of band edge. 59.2 dBuV/m Calculated Band-Edge Measurement (Avg): 50.7 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 40.8 dB -4.5 49.5 54 Avg Delta Marker - 1MHz/10Hz: 59.2 **52.2** dB -14.8 74 Pk Calculated Band-Edge Measurement (Peak) Using 100kHz delta value 69.4 dBuV/m Calculated Band-Edge Measurement (Avg): 49.5 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Level Pol Detector Azimuth Height Comments Pk/QP/Avq MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2390.000 49.5 54.0 -4.5 Using 1MHz delta value Ava Analyzer Settings HP8564E,EMICF: 2390.000 20.0 SPAN: 80,000 MHz 10.0 RB: 1.000 MHz VB: 10 Hz 0.0 Detector: Sample Attn: 20 DB -10.0 RL Offset: 23.0 DB Sweep Time: 30.0s -20.0 Ref Lvl: 33.0 DBM Comments -40.0 BE @ 2390 MHz 802.11n 20MHz -50.0 Chain B 2370 2390 Frequency (MHz)

Cursor 1 2390.0000

Cursor 2 2420.1333

-29.33 💠 🗻 🌬 🖜

22.83 💠 🗻 🖫

Delta Freq. 30.133

Delta Amplitude 52.17

#### **Elliott EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80540 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Run # 8b, EUT on Channel #10 2457MHz - 802.11n20MHz, Chain B **Power Settings** Target (dBm) Measured (dBm) Software Setting 16.5 16.3 29.5 Chain B Fundamental Signal Field Strength 15.209 / 15.247 Frequency Pol Detector Azimuth Height Comments Level Pk/QP/Ava MHz dBµV/m v/h Limit Margin degrees meters 2460.270 95.7 ٧ AVG 245 1.0 2461.530 103.8 ٧ PΚ 245 1.0 2460.030 102.3 Н **AVG** 248 1.0 2461.330 110.6 Н PK 248 1.0 2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta ٧ Н Fundamental emission level @ 3m in 1MHz RBW: 110.6 103.8 Peak Measurement (RB=VB=1MHz) Fundamental emission level @ 3m in 1MHz RBW: 102.3 95.7 Average Measurement (RB=1MHz, VB=10Hz) <- this can only be used if band edge signal is Delta Marker - 100kHz 47.5 dB Calculated Band-Edge Measurement (Peak): 63.1 dBuV/m highest within 2MHz of band edge. Calculated Band-Edge Measurement (Avg): 54.8 dBuV/m Margin Level Limit Detector Delta Marker - 1MHz/1MHz: 39.5 dB -1.5 52.5 54 Avg Delta Marker - 1MHz/10Hz: -10.9 **49.8** dB 63.1 74 Pk Calculated Band-Edge Measurement (Peak): Using 100kHz delta value 71.1 dBuV/m Calculated Band-Edge Measurement (Avg): 52.5 dBuV/m Using 1MHz delta value FCC 15.209 Frequency Level Pol Detector Comments Azimuth Height Pk/QP/Avg MHz $dB\mu V/m$ v/h Limit Margin degrees meters 2483.500 54.0 Using 1MHz delta value 52.5 -1.5 Avg Analyzer Settings 30.0 HP8564E,EMICF: 2483.500 20.0 MHz SPAN: 80,000 MHz 10.0 RB: 1.000 MHz VB: 10 Hz 0.0 Detector: Sample Attn: 20 DB -10.0 RL Offset: 23.0 DB Sweep Time: 30.0s -20.0 Ref Lvl: 28.2 DBM Comments -40.0 BE @ 2483.5 MHz 802.11n 20MHz -50.0 2524 2490 2500 2444 2450 2460 2470 2480 2510 Frequency (MHz) Cursor 1 2453.8999 22.53 💠 🔆 🖫 Delta Freq. 29,600 Cursor 2 2483,5000 -27,30 💠 🛧 🗟 🖜 Delta Amplitude 49.83

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	An ATAS company

	An 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIILEI® Ceritiiio® Advanced-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

## RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (Band Edge)

Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 New tool from 9/14 Driver version 14.0.0.39

Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
		#3	A: 13.5	A: 7.3	Restricted Band Edge at	15.209	52.3dBµV/m @
Run # 1	n40	2422MHz	B: 13.5	B: 6.9	2400 MHz	15.209	2389.9MHz (-1.7dB)
Rull# I	Chain A+B	#9	A: 13.5	A: 6.8	Restricted Band Edge at	15.209	52.8dBµV/m @
		2452MHz	B: 13.5	B: 6.4	2483.5 MHz	15.209	2484.2MHz (-1.2dB)
		#4	A: 13.5	A: 8.2	Restricted Band Edge at	15.209	51.0dBµV/m @
Run # 2	n40	2427MHz	B: 13.5	B: 8.4	2400 MHz	15.209	2389.8MHz (-3.0dB)
Rull# Z	Chain A+B	#8	A: 13.5	A: 8.2	Restricted Band Edge at	15.209	53.0dBµV/m @
		2447MHz	B: 13.5	B: 8.5	2483.5 MHz	15.209	2484.4MHz (-1.0dB)
		#5	A: 13.5	A: 10.5	Restricted Band Edge at	15.209	52.6dBµV/m @
Run # 3	n40	2432MHz	B: 13.5	B: 10.6	2400 MHz		2390.0MHz (-1.4dB)
IXuII# 3	Chain A+B	#7	A: 13.5	A: 10.5	Restricted Band Edge at	15.209	52.9dBµV/m @
		2442MHz	B: 13.5	B: 10.7	2483.5 MHz	13.203	2483.5MHz (-1.1dB)
					Restricted Band Edge at	15.209	51.8dBµV/m @
Run # 4	n40	#6	A: 13.5	A: 12.3	2400 MHz		2389.8MHz (-2.2dB)
IXuIIπ ¬	Chain A+B	2437MHz	B: 13.5	B: 12.4	Restricted Band Edge at	15.209	52.8dBµV/m @
					2483.5 MHz	13.203	2483.5MHz (-1.2dB)
		#1	A: 13.5	A: 11.4	Restricted Band Edge at	15.209	51.9dBµV/m @
Run # 5	n20	2412MHz	B: 13.5	B: 11.6	2400 MHz		2390.0MHz (-2.1dB)
rtuii π σ	Chain A+B	#11	A: 13.5	A: 11.1	Restricted Band Edge at	15.209	53.0dBµV/m @
		2462MHz	B: 13.5	B: 10.7	2483.5 MHz	13.203	2483.5MHz (-1.0dB)
		#2	A: 13.5	A: 13.5	Restricted Band Edge at	15.209	49.3dBµV/m @
Run # 6	n20	2417MHz	B: 13.5	B: 13.7	2400 MHz		2389.9MHz (-4.7dB)
i (uii π 0	Chain A+B	#10	A: 13.5	A: 13.6	Restricted Band Edge at	15.209	50.6dBµV/m @
		2457MHz	B: 13.5	B: 14.0	2483.5 MHz	10.203	2483.5MHz (-3.4dB)

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.



	An ZAZZZ Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Certtillio® Advanced-14 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

## **Test Specific Details**

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

## **General Test Configuration**

The EUT ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC). For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

## **Ambient Conditions:**

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

## 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.



	An ZAZZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIILEI® Ceritiiilo® Advanced-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

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

Date of Test: 9/21/2010 Test Location: FT7
Test Engineer: Mehran Config Change: none

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

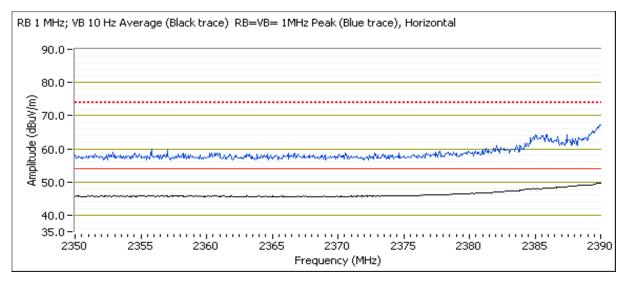
		Power Settings									
	Target (dBm)					Measure	Software Setting				
Chain	Α	В	С	Total	Α	В	С	Total			
Challi	13.5	13.5		16.5	7.3	6.9		10.1	21.5, 22.5		

### 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	
2434.870	93.3	V	-	-	AVG	335	1.0	
2434.670	104.1	V	-	-	PK	335	1.0	
2409.730	92.9	Н	-	-	AVG	11	1.3	
2415.470	103.4	Н	-	-	PK	11	1.3	

### Direct measurement of bandedge

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.870	52.3	Н	54.0	-1.7	AVG	11	1.3	
2389.730	49.3	V	54.0	-4.7	AVG	335	1.0	
2389.270	65.2	Н	74.0	-8.8	PK	11	1.3	
2383.870	60.6	V	74.0	-13.4	PK	335	1.0	





	All Date: Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Certtillio® Advanced-IV 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

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

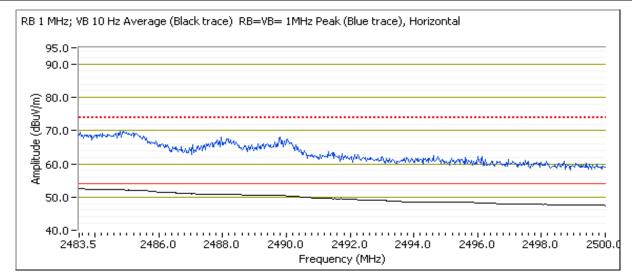
		Power Settings									
		Target	(dBm)			Measure	Software Setting				
Chain	Α	В	С	Total	Α	В	С	Total			
Citalii	13.5	13.5		16.5	6.8	6.4		9.6	21.0, 22.0		

Fundamental Signal Field Strength

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Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments			
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters				
2464.870	92.6	Η	-	-	AVG	16	1.0				
2463.470	102.7	Н	-	-	PK	16	1.0				
2439.400	91.0	V	-	-	AVG	205	1.0				
2444.470	100.6	V	-	-	PK	205	1.0				

### Direct measurement of bandedge

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.240	52.8	Н	54.0	-1.2	AVG	16	1.0	
2484.460	50.8	V	54.0	-3.2	AVG	205	1.0	
2484.520	68.3	Н	74.0	-5.7	PK	16	1.0	
2484.350	63.3	V	74.0	-10.7	PK	205	1.0	





	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

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

Date of Test: 9/21/2010 Test Engineer: Mehran Test Location: FT7 Config Change: none

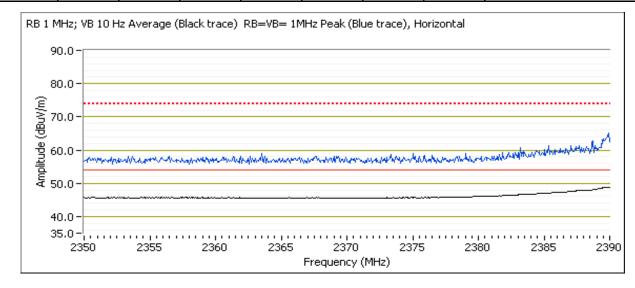
### Run # 2a, EUT on Channel #4, 2427MHz - n40, Chain A+B

		Power Settings									
		Target	(dBm)			Measure	Software Setting				
Chain	Α	В	С	Total	Α	В	С	Total			
Chain	13.5	13.5		16.5	8.2	8.4		11.3	22.5, 23.5		

#### 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	
2430.000	92.2	V	-	-	AVG	205	1.0	
2438.330	102.4	V	-	-	PK	205	1.0	
2434.870	94.3	Н	-	-	AVG	336	1.0	
2432.330	104.7	Н	-	-	PK	336	1.0	

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.800	51.0	Н	54.0	-3.0	AVG	336	1.0	
2389.730	51.0	V	54.0	-3.0	AVG	205	1.0	
2387.670	64.5	V	74.0	-9.5	PK	205	1.0	
2389.730	63.4	Н	74.0	-10.6	PK	336	1.0	





	range company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Certtillio® Advanced-IV 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

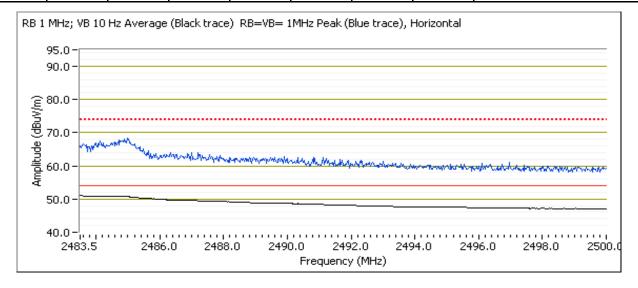
### Run # 2b, EUT on Channel #8 2447MHz - n40, Chain A+B

		Power Settings										
		Target	(dBm)		Measured (dBm)				Software Setting			
Chain	Α	В	С	Total	Α	В	С	Total				
Gilalli	13.5	13.5		16.5	8.2	8.5		11.4	22.5, 23.5			

Fundamental Signal Field Strength

i anaamont	anaamontai olgitai i lota oli oligai											
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments				
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters					
2434.730	94.1	Н	•	-	AVG	337	1.0					
2439.670	103.8	Н	•	-	PK	337	1.0					
2434.600	92.9	V	-	-	AVG	205	1.0					
2442.270	103.2	V	-	-	PK	205	1.0					

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2484.410	53.0	Н	54.0	-1.0	AVG	337	1.0	
2484.650	51.4	V	54.0	-2.6	AVG	205	1.0	
2484.820	67.8	Н	74.0	-6.2	PK	337	1.0	
2484.980	64.2	V	74.0	-9.8	PK	205	1.0	





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Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 3, Band Edge Field Strength - n40, Chain A+B

Date of Test: 9/17/2010
Test Engineer: Rafael Varelas

Test Location: FT Chamber #7

Config Change: none

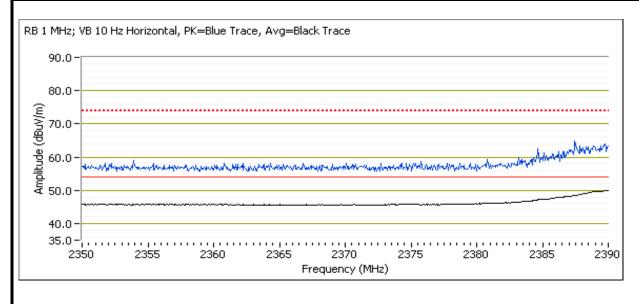
Run # 3a, EUT on Channel #5 2432MHz - n40, Chain A+B

		Power Settings										
		Target	(dBm)			Measure	Software Setting					
Chain	Α	В	С	Total	Α	В	С	Total				
Criain	13.5	13.5		16.5	10.5	10.6		13.6	24.5/26.0			

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	
2434.800	96.7	Н	120.0	-23.3	AVG	9	1.0	RB 1 MHz;VB 10 Hz;Pk
2427.000	106.4	Н	120.0	-13.6	PK	9	1.0	RB 1 MHz;VB 3 MHz;Pk
2429.330	92.6	V	120.0	-27.4	AVG	219	1.0	RB 1 MHz;VB 10 Hz;Pk
2427.330	103.1	V	120.0	-16.9	PK	219	1.0	RB 1 MHz;VB 3 MHz;Pk

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.950	52.6	Η	54.0	-1.4	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
2390.000	66.9	Η	74.0	-7.1	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk
2389.980	50.4	V	54.0	-3.6	AVG	220	1.0	RB 1 MHz;VB 10 Hz;Pk
2389.930	63.5	V	74.0	-10.5	PK	220	1.0	RB 1 MHz;VB 3 MHz;Pk





	All Dates Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

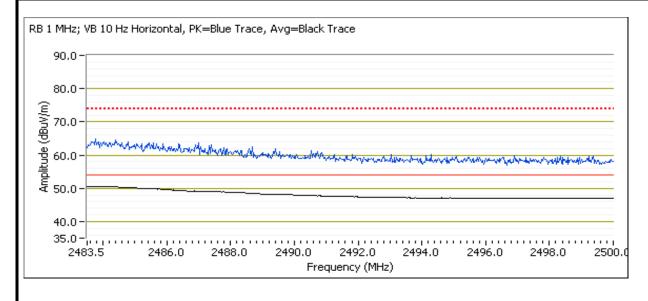
### Run # 3b, EUT on Channel #7 2442MHz - n40, Chain A+B

		Power Settings .										
		Target	(dBm)		Measured (dBm)				Software Setting			
Chain	Α	В	С	Total	Α	В	С	Total				
	13.5	13.5		16.5	10.5	10.7		13.6	24.5/26.0			

Fundamental Signal Field Strength

i allaalliolit	undumontal orginal Flora outongth											
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments				
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters					
2429.400	93.4	V	120.0	-26.6	AVG	215	1.0	RB 1 MHz;VB 10 Hz;Pk				
2430.270	103.1	V	120.0	-16.9	PK	215	1.0	RB 1 MHz;VB 3 MHz;Pk				
2433.530	96.3	Н	120.0	-23.7	AVG	9	1.0	RB 1 MHz;VB 10 Hz;Pk				
2436.200	106.9	Н	120.0	-13.1	PK	9	1.0	RB 1 MHz;VB 3 MHz;Pk				

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.540	52.9	Н	54.0	-1.1	AVG	10	1.0	RB 1 MHz;VB 10 Hz;Pk
2483.580	65.8	Н	74.0	-8.2	PK	10	1.0	RB 1 MHz;VB 3 MHz;Pk
2483.520	50.7	V	54.0	-3.3	AVG	343	1.0	RB 1 MHz;VB 10 Hz;Pk
2483.860	63.3	V	74.0	-10.7	PK	343	1.0	RB 1 MHz;VB 3 MHz;Pk





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Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIILEI® Ceritiiilo® Advanced-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 4, Band Edge Field Strength - n40, Chain A+B

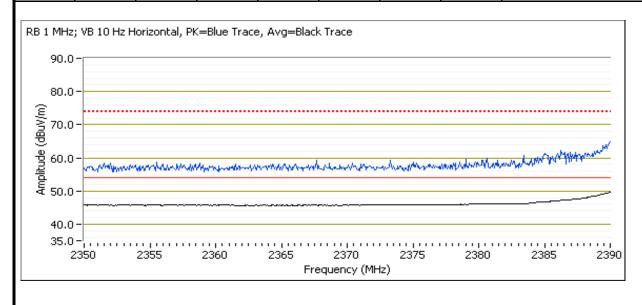
Date of Test: 9/17/2010 Test Location: FT Chamber #7
Test Engineer: Rafael Varelas Config Change: none

### EUT on Channel #6 2437MHz - n40, Chain A+B

		Power Settings										
		Target	(dBm)		Measured (dBm)				Software Setting			
Chain	Α	В	С	Total	Α	В	С	Total				
Chain	13.5	13.5		16.5	12.3	12.4		15.4	26.5/28.0			
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					
2425.600	94.3	V	120.0	-25.7	AVG	215	1.0	RB 1 MHz;\	/B 10 Hz;Pk			
2432.130	104.3	V	120.0	-15.7	PK	215	1.0	RB 1 MHz;\	/B 3 MHz;Pk			
2434.400	98.4	Н	120.0	-21.6	AVG	10	1.0	RB 1 MHz;\	/B 10 Hz;Pk			
2432.670	108.8	Н	120.0	-11.2	PK	10	1.0	RB 1 MHz;\	/B 3 MHz;Pk			

#### 2390 MHz Band Edge

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.790	51.8	Н	54.0	-2.2	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
2389.580	65.4	Н	74.0	-8.6	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
2389.810	50.6	V	54.0	-3.4	AVG	215	1.0	RB 1 MHz;VB 10 Hz;Pk
2389.220	63.5	V	74.0	-10.5	PK	215	1.0	RB 1 MHz;VB 3 MHz;Pk

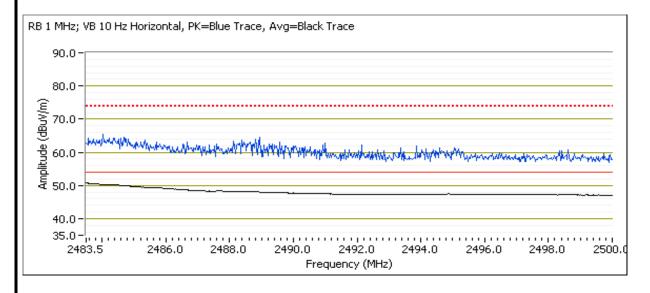




	All Diff. Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-IV 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### 2483.5 MHz Band Edge

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	52.8	Н	54.0	-1.2	AVG	8	1.0	RB 1 MHz;VB 10 Hz;Pk
2484.700	65.3	Н	74.0	-8.7	PK	8	1.0	RB 1 MHz;VB 3 MHz;Pk
2483.500	50.4	٧	54.0	-3.6	AVG	342	1.0	RB 1 MHz;VB 10 Hz;Pk
2485.220	63.3	V	74.0	-10.7	PK	342	1.0	RB 1 MHz;VB 3 MHz;Pk





	All 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillio® Advanced-14 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 5, Band Edge Field Strength - n20, Chain A+B

Date of Test: 9/21/2010 Test Location: FT7
Test Engineer: Mehran Config Change: none

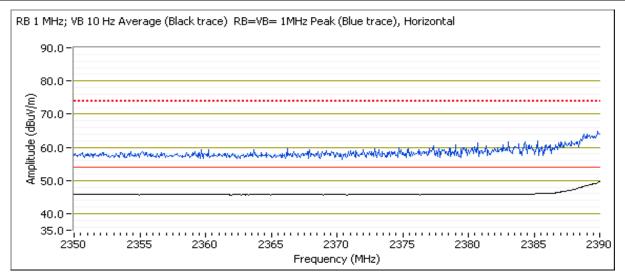
### Run # 5a, EUT on Channel #1 2412MHz - n20, Chain A+B

•		Power Settings										
		Target	t (dBm)			Measure	Software Setting					
Chain	Α	В	С	Total	Α	В	С	Total				
Chain	13.5	13.5		16.5	11.4	11.6		14.5	26.0, 27.5			

#### Fundamental Signal Field Strength

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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	98.2	V	120.0	-21.8	AVG	189	1.0					
2414.270	108.3	V	120.0	-11.7	PK	189	1.0					
2416.170	100.6	Н	120.0	-19.4	AVG	17	1.0					
2416.770	111.2	Н	120.0	-8.8	PK	17	1.0					

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	51.9	Н	54.0	-2.1	AVG	17	1.0	
2390.000	51.6	V	54.0	-2.4	AVG	189	1.0	
2389.870	63.8	V	74.0	-10.2	PK	189	1.0	
2389.730	63.4	Н	74.0	-10.6	PK	17	1.0	





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Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

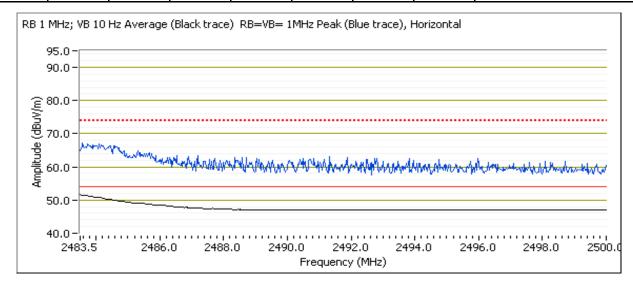
### Run # 5b, EUT on Channel #11 2462MHz - n20, Chain A+B

ran # 05, 201 on onamer #11 2402mile 1120, onam A.B													
		Power Settings											
		Target	(dBm)			Measure	Software Setting						
Chain	Α	В	С	Total	Α	В	С	Total					
Chalh	13.5	13.5		16.5	11.1	10.7		13.9	25.5, 26.0				

#### Fundamental Signal Field Strength

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Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments	
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
2466.600	100.6	Η	-	-	AVG	15	1.0		
2463.470	110.7	Н	-	-	PK	15	1.0		
2463.670	96.7	V	-	-	AVG	187	0.9		
2466.600	107.1	V	-	-	PK	187	0.9		

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	53.0	Н	54.0	-1.0	AVG	15	1.0	
2483.500	51.3	V	54.0	-2.7	AVG	187	0.9	
2484.320	66.2	Н	74.0	-7.8	PK	15	1.0	
2483.500	63.5	V	74.0	-10.5	PK	187	0.9	





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Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Celitiiilo® Advaliced-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 6, Band Edge Field Strength - n20, Chain A+B

Date of Test: 9/21/2010 Test Location: Chamber #4
Test Engineer: Mehran Birgani Config Change: None

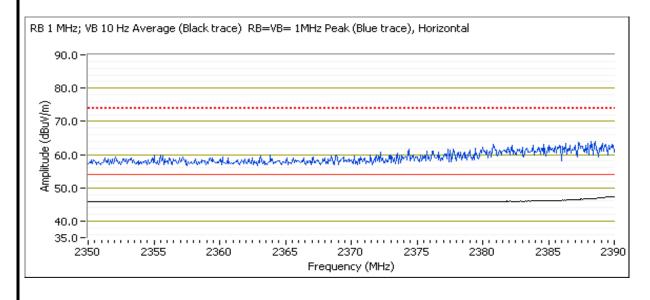
#### Run # 6a, EUT on Channel #2 2417MHz - n20, Chain A+B

	Power Settings										
		Target	t (dBm)			Measure	Software Setting				
Chain	A B C Total				Α	В	С	Total			
Citalii	13.5	13.5		16.5	13.5	13 7		16.6	28.5. 29.5		

#### 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	
2412.800	103.0	Н	-	-	AVG	10	1.3	
2415.570	113.1	Н	-	-	PK	10	1.3	
2421.130	100.4	V	-	-	AVG	189	1.0	
2414.200	110.8	V	-	-	PK	189	1.0	

Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.930	49.3	Н	54.0	-4.7	AVG	10	1.3	
2389.600	49.0	V	54.0	-5.0	AVG	189	1.0	
2385.270	64.2	Н	74.0	-9.8	PK	10	1.3	
2387.800	63.6	V	74.0	-10.4	PK	189	1.0	





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Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	Intel® Centino® Advanced-IV 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

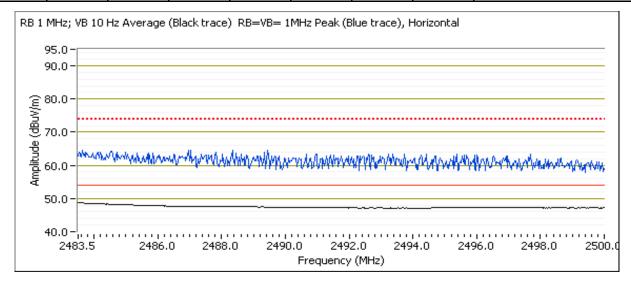
### Run # 6b, EUT on Channel #10 2457MHz - n20, Chain A+B

	Power Settings										
		Target	(dBm)			Measure	Software Setting				
Chain	Α	В	С	Total	Α	В	С	Total			
Cilalii	13.5	13.5		16.5	13.6	14.0		16.8	28.5, 29.5		

#### Fundamental Signal Field Strength

· unuamontal orginal i lota ottorigati										
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
2460.870	102.9	Н	120.0	-17.1	AVG	15	1.0			
2459.670	113.0	Н	120.0	-7.0	PK	15	1.0			
2461.170	98.9	V	120.0	-21.1	AVG	197	1.0			
2461.630	109.1	V	120.0	-10.9	PK	197	1.0			

Frequency	Level	Pol	15.209	15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	50.6	Н	54.0	-3.4	AVG	15	1.0	
2483.660	49.5	V	54.0	-4.5	AVG	197	1.0	
2483.770	64.9	Н	74.0	-9.1	PK	15	1.0	
2487.680	62.7	V	74.0	-11.3	PK	197	1.0	



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Client:	Intel Corporation	Job Number:	J80398
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (1-26GHz)

### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 New tool from 9/14 Driver version 14.0.0.39

Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
		#1 2412MHz	16.5	16.8	Radiated Emissions, 1 - 26 GHz		51.4dBµV/m @ 4824.0MHz (-2.6dB)
	802.11b Chain A	#6 2437MHz	16.5	16.4		FCC 15.209 / 15.247	49.1dBµV/m @ 4874.0MHz (-4.9dB)
Run #1		#11 2462MHz	16.5	16.8			50.4dBµV/m @ 4924.0MHz (-3.6dB)
Kull#1	802.11b Chain B	#1 2412MHz	16.5	16.8	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	50.0dBµV/m @ 4824.0MHz (-4.0dB)
		#6 2437MHz	16.5	15.0			50.7dBµV/m @ 4874.0MHz (-3.3dB)
		#11 2462MHz	16.5	15.9			50.8dBµV/m @ 4924.0MHz (-3.2dB)

Scans on center channel in all three OFDM modes to determine the worst case mode. Note that for n20 and n40 mode the output power was set to 16.5dBm per chain. The maximum power per chain in MIMO mode would be 13.5dBm, however as the single chain power could be 16.5dBm the scans were run at the higher single-chain power level with both chains active.

	802.11g	#6	4C E	16.4			40.8dBµV/m @		
	Chain A	2437MHz	16.5	16.4		FCC 15.209 / 15.247	4874.2MHz (-13.2dB)		
	802.11g	#6	16 F	16.7	Radiated Emissions, 1 - 26 GHz		44.3dBµV/m @		
Run # 2	Chain B	2437MHz	16.5				4874.4MHz (-9.7dB)		
Rull # 2	802.11n20	#6	A:16.5	A:16.6			45.0dBµV/m @		
	Chain A+B	2437MHz	B:16.5	B:16.5			4873.2MHz (-9.0dB)		
	802.11n40	#6	A:16.5	A:16.6			39.5dBµV/m @		
	Chain A+B	2437MHz	B:16.5	B:16.5			4873.9MHz (-14.5dB)		
Top and bot	Top and bottom channels in worst case OFDM mode:								

Run # 3	Worst case OFDM 802.11n	#1 2412MHz	16.5	A:16.5 B:16.6	Radiated Emissions,	FCC 15.209 / 15.247	36.5dBµV/m @ 4827.0MHz (-17.5dB)
Kull#3	20MHz Chain A+B	#11 2462MHz	16.5	A:16.7 B:16.7	1 - 26 GHz		43.3dBµV/m @ 4923.1MHz (-10.7dB)

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.

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	An AZAS company

Client:	Intel Corporation	Job Number:	J80398
Martal	1 1 1 2 0 1 1 1 2 A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	T-Log Number:	T80540
Model:	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Receiver S	Receiver Spurious Emissions									
Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin			
	Receive	#6, Chain A	ı	-	Radiated Emissions, 1 - 7.5 GHz		40.7dBµV/m @ 1200.0MHz (-13.3dB)			
Run # 4		#6, Chain B	-	1		RSS 210	39.7dBµV/m @ 2986.7MHz (-14.3dB)			
		#6, Chain A+B	-	-			39.2dBµV/m @ 1200.1MHz (-14.8dB)			

### **Test Specific Details**

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

### **General Test Configuration**

The EUT ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC). For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

### Ambient Conditions:

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

### 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.



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Client:	Intel Corporation	Job Number:	J80398
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certifillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

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

Date of Test: 9/17/2010 Test Location: FT Chamber #7

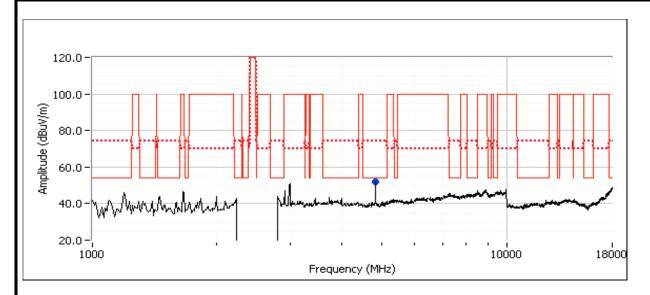
Test Engineer: Rafael Varelas Config Change: none

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

 	,		
		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.8	23.5

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			
4824.020	51.4	V	54.0	-2.6	AVG	2	1.0	RB 1 MHz;VB 10 Hz;Pk		
4824.030	54.7	V	74.0	-19.3	PK	2	1.0	RB 1 MHz;VB 3 MHz;Pk		





	All 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model	IIItel® Celitiiio® Advanced-ii 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

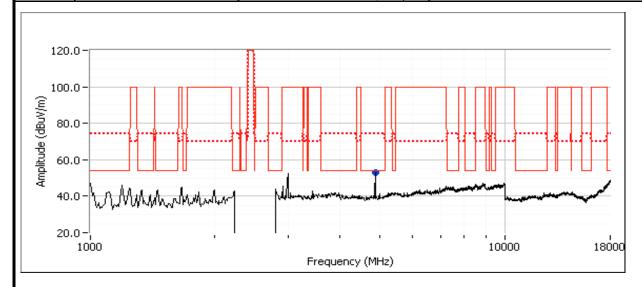
### Run #1b: , EUT on Channel #6 2437MHz - 802.11b, Chain A

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.4	23.0

#### 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	
4873.980	49.1	V	54.0	-4.9	AVG	70	1.0	
4873.980	52.2	V	74.0	-21.8	PK	70	1.0	

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.





	All Diff. Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

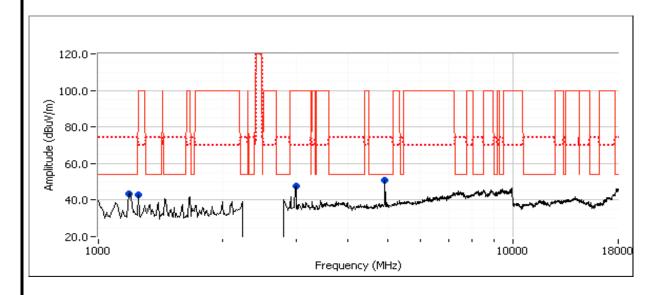
Run #1c: , EUT on Channel #11 2462MHz - 802.11b, Chain A

	Power Settings					
	Target (dBm)	Measured (dBm)	Software Setting			
Chain A	16.5	16.8	23.5			

Spurious Radiated Emissions:

opulious N	adiatod Eiiii	00101101						
Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4924.030	50.4	V	54.0	-3.6	AVG	155	1.0	
4923.950	52.9	V	74.0	-21.1	PK	155	1.0	
1192.680	44.9	Н	54.0	-9.1	AVG	120	1.7	
1192.680	46.9	Н	74.0	-27.1	PK	120	1.7	
1220.250	33.8	V	54.0	-20.2	AVG	183	1.0	
1220.720	41.1	V	74.0	-32.9	PK	183	1.0	
2993.170	39.9	V	100.0	-60.1	AVG	152	1.0	
2999.570	57.6	V	70.0	-12.4	PK	152	1.0	

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.





	All 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model	IIItel® Celitiiio® Advanced-ii 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

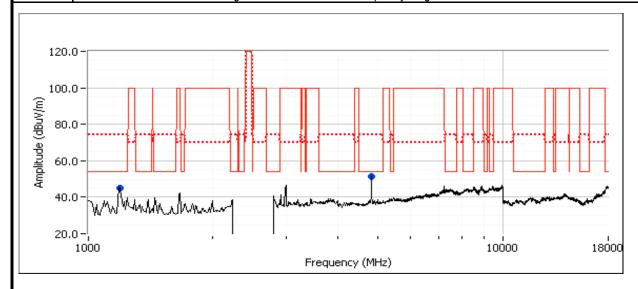
Run #1d, EUT on Channel #1 2412MHz - 802.11b, Chain B

• • • •								
			Power Settings					
		Target (dBm)	Target (dBm) Measured (dBm) Software Set					
	Chain B	16.5	16.8	25.0				

Spurious Radiated Emissions:

opunous n	parious 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			
4824.020	50.0	V	54.0	-4.0	AVG	191	1.0			
1192.550	43.6	V	54.0	-10.4	AVG	210	1.1			
4824.080	52.7	V	74.0	-21.3	PK	191	1.0			
1192.700	46.5	V	74.0	-27.5	PK	210	1.1			

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.





	All 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III (el® Cell (III) (ll Advallceu-IV 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

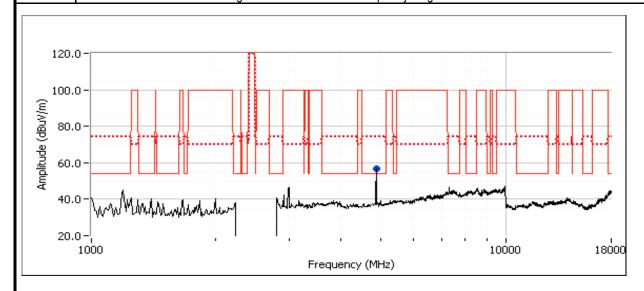
Run #1e: , EUT on Channel #6 2437MHz - 802.11b, Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain B	16.5	15.0	23.0

Spurious Radiated Emissions:

					1			
Frequency	Level	Pol	15.209/	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4873.990	50.7	V	54.0	-3.3	AVG	172	1.0	
4873.990	53.2	V	74.0	-20.8	PK	172	1.0	

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.





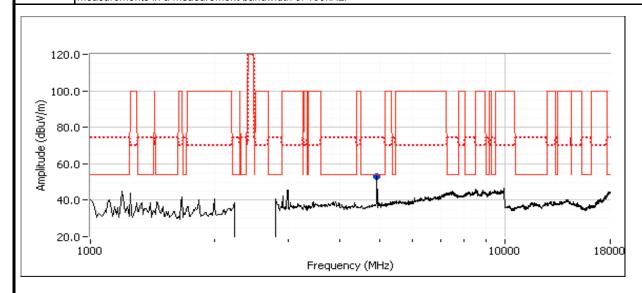
	All Dates Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(e)® Ceritiii)0® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Run #1f: , EUT on Channel #11 2462MHz - 802.11b, Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain B	16.5	15.9	23.5

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	Setting		
4923.980	50.8	V	54.0	-3.2	AVG	305	1.0	23.5		
4923.920	53.2	V	74.0	-20.8	PK	305	1.0	23.5		





	An Z(ZE) company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 2, Radiated Spurious Emissions, 1-26GHz, 802.11g, n20 and n40, Chain A

Date of Test: 9/20/2010 Test Location: Chamber #7
Test Engineer: Mehran Birgani Config Change: None

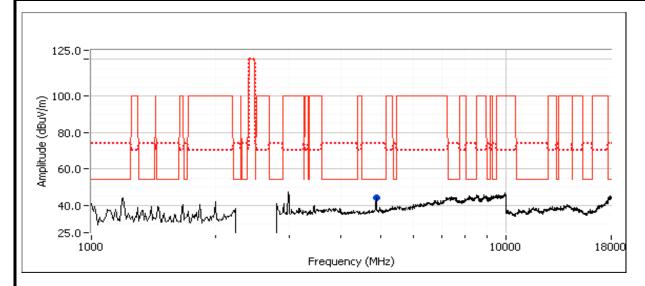
Run # 2a, EUT on Channel #6 2437MHz - 802.11g Chain A

Ī		Dower Cattings								
			Power Settings							
		Target (dBm)	Measured (dBm)	Software Setting						
	Chain A	16.5	29.0	16.4						

#### 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	
4874.230	40.8	V	54.0	-13.2	AVG	13	1.0	
4875.150	52.4	V	74.0	-21.6	PK	13	1.0	

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.





	All Diff. Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

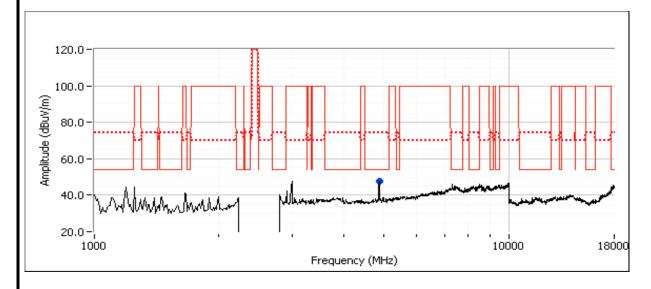
Run # 2a, EUT on Channel #6 2437MHz - 802.11g Chain B

	<u> </u>		
		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain B	16.5	30.5	16.7

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				
4874.350	44.3	V	54.0	-9.7	AVG	181	1.0				
4876.520	55.7	V	74.0	-18.3	PK	181	1.0				

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.





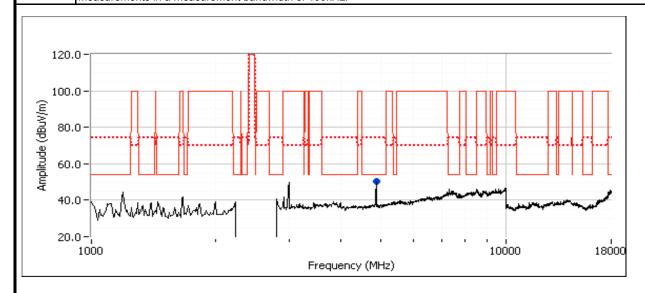
	All Diff. Company		100000
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	Intel® Centino® Advanced-IV 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 2c: , EUT on Channel #6 2437MHz - 802.11n20, Chain A+B

,				,						
	Power Settings									
		Target	(dBm)		Measured (dBm) Software			Software Setting		
Chain	Α	В	С	Total	Α	В	С	Total		
Gilaili	16.5	16.5		19.5	16.6	16.5		19.6	32.5, 34.0	

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			
4873.170	45.0	V	54.0	<b>-</b> 9.0	AVG	180	1.1			
4874.040	59.8	V	74.0	-14.2	PK	180	1.1			





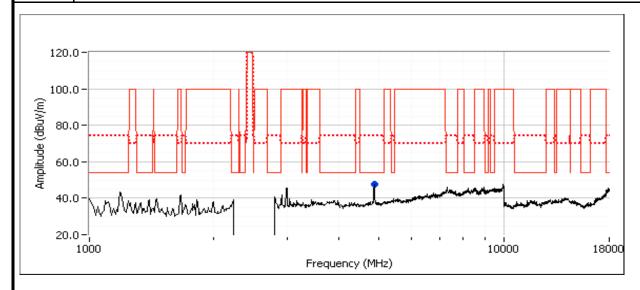
	An 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Centillio® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 2d: , EUT on Channel #6 2437MHz - 802.11n40, Chain A+B

, ,											
	Power Settings										
		Target	(dBm)		Measured (dBm) Software Setting				Software Setting		
Chain	Α	В	С	Total	Α	В	С	Total			
Chain -	16.5	16.5		19.5	16.6	16.5		19.6	32.5, 34.0		

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					
4873.870	39.5	Н	54.0	-14.5	AVG	120	1.1					
4874.030	54.7	Н	74.0	-19.3	PK	120	1.1					





	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 3, Radiated Spurious Emissions, 1-26GHz, Worst case OFDM 802.11n 20MHz, Chain A+B

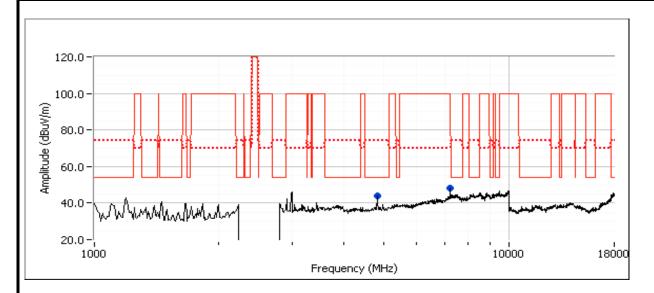
Date of Test: 9/20/2010 Test Location: Chamber #7
Test Engineer: Rafael Varelas Config Change: None

#### Run # 3a, EUT on Channel #1 2412MHz - 802.11n 20MHz, Chain A+B

	,											
		Power Settings										
		Target	(dBm)		Measured (dBm)				Software Setting			
Chain	Α	В	С	Total	Α	В	С	Total				
	16.5	16.5		19.5	16.5	16.6		19.6	32.5, 34.0			

#### 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	
4826.970	36.5	V	54.0	-17.5	AVG	137	1.1	RB 1 MHz;VB 10 Hz;Pk
4824.030	50.0	V	74.0	-24.0	PK	137	1.1	RB 1 MHz;VB 3 MHz;Pk
7236.050	48.4	V	70.0	-21.6	Peak	167	1.0	





An 2/27=3 company								
Client:	Intel Corporation	Job Number:	J80398					
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540					
	IIItel® Celitiiilo® Advaliced-iv 0250	Account Manager:	Christine Krebill					
Contact:	Steve Hackett							
Standard:	FCC 15.247	Class:	N/A					

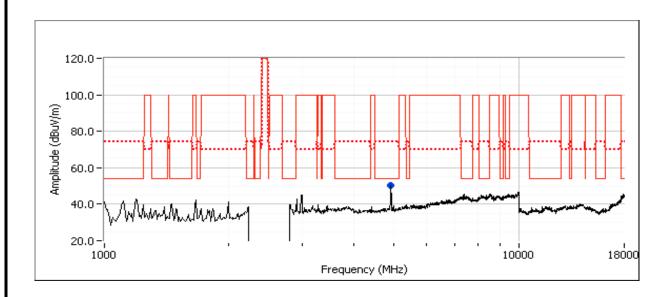
### Run # 3b: , EUT on Channel #11 2462MHz - 802.11n 20MHz, Chain A+B

Date of Test: 9/20/2010 Test Location: Chamber #7
Test Engineer: Mehran Birgani Config Change: None

			Power Settings										
		Target	(dBm)		Measured (dBm)				Software Setting				
Chain	Α	В	С	Total	Α	В	С	Total					
	16.5	16.5		19.5	16.7	16.7		19.7	32.5, 34.0				

#### 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	
4923.130	43.3	V	54.0	-10.7	AVG	318	1.0	
4924.130	58.1	V	74.0	-15.9	PK	318	1.0	





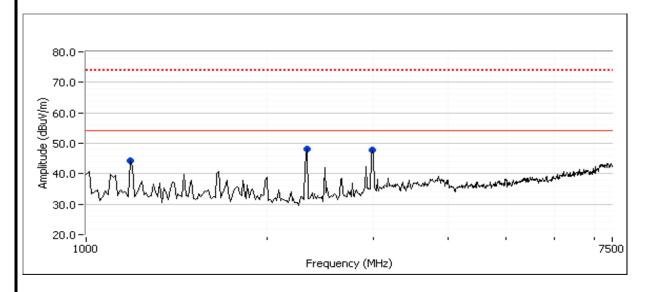
	All 2023 Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 4, Radiated Spurious Emissions, 1-26GHz, Receive, Chain A,B, A+B

Date of Test: 9/20/2010 Test Location: Chamber #7
Test Engineer: Rafael Varelas Config Change: none

### Run # 4a, EUT on Channel #6 2437MHz - Receive, Chain A

Frequency	Level	Pol	RSS	210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.040	40.7	Н	54.0	-13.3	AVG	126	1.8	RB 1 MHz;VB 10 Hz;Pk
1200.060	46.3	Н	74.0	-27.7	PK	126	1.8	RB 1 MHz;VB 3 MHz;Pk
2987.470	38.0	V	54.0	-16.0	AVG	170	1.0	RB 1 MHz;VB 10 Hz;Pk
3000.000	55.0	V	74.0	-19.0	PK	170	1.0	RB 1 MHz;VB 3 MHz;Pk
2330.940	36.5	V	54.0	-17.5	AVG	258	1.0	RB 1 MHz;VB 10 Hz;Pk
2331.440	53.7	V	74.0	-20.3	PK	258	1.0	RB 1 MHz;VB 3 MHz;Pk

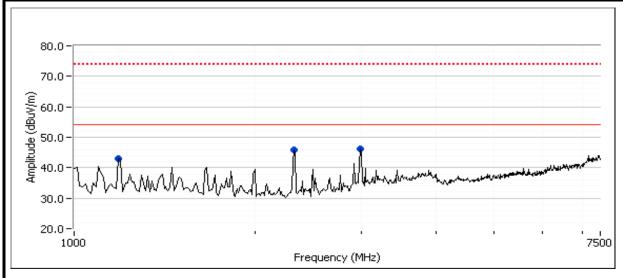




	All 2023 Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 4b: EUT on Channel #6 2437MHz - Receive, Chain B

Frequency	Level	Pol	RSS	210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2986.720	39.7	V	54.0	-14.3	AVG	161	1.0	RB 1 MHz;VB 10 Hz;Pk
2987.450	56.9	V	74.0	-17.1	PK	161	1.0	RB 1 MHz;VB 3 MHz;Pk
2324.000	37.6	V	54.0	-16.4	AVG	186	1.3	RB 1 MHz;VB 10 Hz;Pk
2324.460	55.7	V	74.0	-18.3	PK	186	1.3	RB 1 MHz;VB 3 MHz;Pk
1200.070	38.9	Н	54.0	-15.1	AVG	120	1.7	RB 1 MHz;VB 10 Hz;Pk
1199.980	44.9	Н	74.0	-29.1	PK	120	1.7	RB 1 MHz;VB 3 MHz;Pk

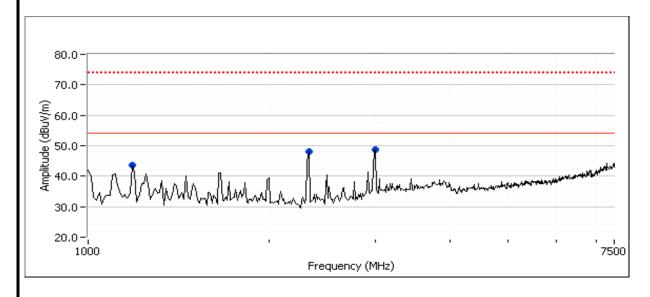




	All 2023 Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 4c: EUT on Channel #6 2437MHz - Receive, Chain A+B

Frequency	Level	Pol	RSS	210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.050	39.2	V	54.0	-14.8	AVG	104	1.8	RB 1 MHz;VB 10 Hz;Pk
1199.910	45.4	V	74.0	-28.6	PK	104	1.8	RB 1 MHz;VB 3 MHz;Pk
2987.130	38.9	V	54.0	-15.1	AVG	154	1.0	RB 1 MHz;VB 10 Hz;Pk
2985.230	56.5	V	74.0	-17.5	PK	154	1.0	RB 1 MHz;VB 3 MHz;Pk
2323.250	36.1	V	54.0	-17.9	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
2321.940	53.6	V	74.0	-20.4	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk



# Elliott

### EMC Test Data

	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### RSS 210 and FCC 15.247 (DTS) Radiated Spurious Emissions (1-26GHz)

### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 New tool from 9/14 Driver version 14.0.0.39

Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
------	------	---------	-----------------	-------------------	----------------	-------	-----------------

Scans on center channel in all three OFDM modes to determine the worst case. Note that for n20 and n40 mode the output power was set to 16.5dBm per chain, the maximum power per chain in MIMO mode would be 13.5dBm, however as the single chain power could be 16.5dBm the scans were run at the higher single-chain power level but with both chains active to cover both MIMO and MISO modes.

	802.11a	#157	16 E	16.7			44.8dBµV/m @	
Dup # 1	Chain A	5785MHz	16.5	10.7	Radiated Emissions,	FCC 15.209 / 15.247	11570.3MHz (-9.2dB)	
Run # 1	802.11a	#157	16.5	16.8	1 - 40 GHz	FCC 15.2097 15.247	45.1dBµV/m @	
	Chain B	5785MHz	10.5	10.0			11570.2MHz (-8.9dB)	
		#157	16.5	A=16.6			47.6dBµV/m @	
Run # 2	n20/n40	5785MHz	10.5	B=16.7	Radiated Emissions,	FCC 15.209 / 15.247	11570.8MHz (-6.4dB)	
Rull # Z	Chain A+B	#159	16.5	A=16.6	1 - 40 GHz	FCC 15.209 / 15.247	46.3dBµV/m @	
		5795MHz	10.5	B=16.7			11590.1MHz (-7.7dB)	
Top and bo	Top and bottom channels in worst case OFDM mode (n20, Chain A+B):							
	Mode: n20	#149	16.5	A=16.7			46.4dBµV/m @	
Run # 3		5745MHz	10.5	B=16.8	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15.247	11490.0MHz (-7.6dB)	
Null#3	Chain A+B	A+B #165	16.5	A=16.6			49.4dBµV/m @	
		5825MHz	10.5	B=16.7			11650.5MHz (-4.6dB)	
Receiver Sp	ourious Emi	ssions						
		#157,					38.8dBµV/m @	
	Receive	Chain A	-	-			2998.7MHz (-15.2dB)	
Run # 4	Chain A,B,	#157,			Radiated Emissions,	RSS 210	38.7dBµV/m @	
IXuII # 4	A+B	Chain B	-	•	1 - 7.5 GHz	1100 2 10	2995.4MHz (-15.3dB)	
	A+D	#157,					38.8dBµV/m @	
		Chain A+B	-	-			2328.2MHz (-15.2dB)	

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.

#### **Test Specific Details**

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

### **General Test Configuration**

The EUT ws installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC). For radiated emissions testing the measurement antenna was located 3 meters from the EUT.



	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIILEI® Ceritiiio® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### **Ambient Conditions:**

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

### 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, Radiated Spurious Emissions, 1-40GHz, 802.11a

Date of Test: 9/21/2010 Test Location: FT chamber #4

Test Engineer: Rafael Varelas Config Change: none

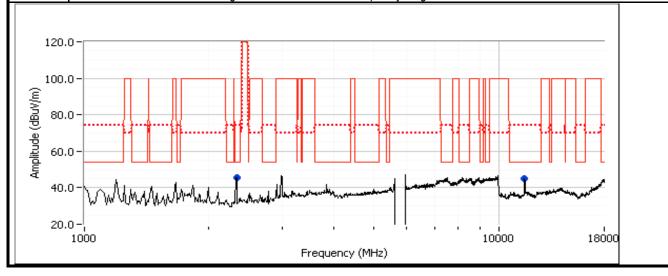
Run # 1a, EUT on Channel #157 5785MHz - 802.11a, Chain A

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.7	29.5

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	
11570.250	44.8	V	54.0	-9.2	AVG	162	1.1	RB 1 MHz;VB 10 Hz;Pk
11571.650	55.7	V	74.0	-18.3	PK	162	1.1	RB 1 MHz;VB 3 MHz;Pk
2331.360	35.9	V	54.0	-18.1	AVG	339	1.0	RB 1 MHz;VB 10 Hz;Pk
2325.530	53.0	V	74.0	-21.0	PK	339	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.





	All 2023 Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

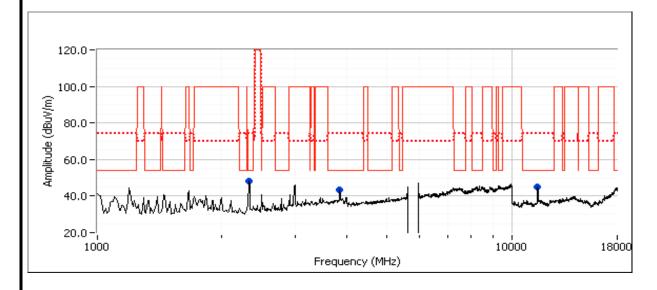
### Run # 1b: , EUT on Channel #157 5785MHz - 802.11a, Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.8	29.0

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	
11570.230	45.1	V	54.0	-8.9	AVG	285	1.0	RB 1 MHz;VB 10 Hz;Pk
11564.300	56.9	V	74.0	-17.1	PK	285	1.0	RB 1 MHz;VB 3 MHz;Pk
2323.600	38.2	V	54.0	-15.8	AVG	347	0.9	RB 1 MHz;VB 10 Hz;Pk
2321.900	56.9	V	74.0	-17.1	PK	347	0.9	RB 1 MHz;VB 3 MHz;Pk
3856.700	44.2	V	54.0	-9.8	AVG	219	1.0	RB 1 MHz;VB 10 Hz;Pk
3856.780	49.7	V	74.0	-24.3	PK	219	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.





	An 2/22 company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
wodei.	IIItel® Celitiiilo® Advaliced-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 2, Radiated Spurious Emissions, 1-40GHz, 802.11n modes, Chain A+B

Date of Test: 9/21/2010 Test Location: FT chamber #4

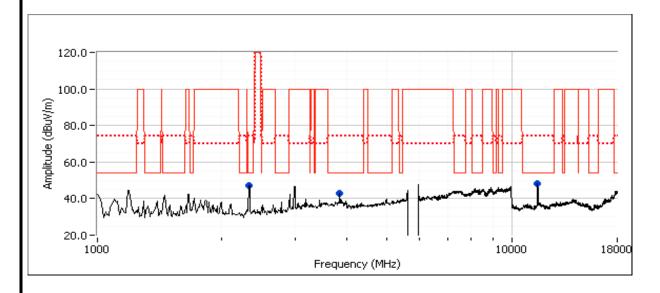
Test Engineer: Rafael Varelas Config Change: none

### Run # 2a, EUT on Channel #157 5785MHz - n20/n40, Chain A+B

		Power Settings										
		Target	(dBm)			Measure	Software Setting					
Chain	Α	В	С	Total	Α	В	С	Total				
Criain	16.5	16.5		19.5	16.6	16.7		19.7	35.5/35.0			

#### 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	
11570.800	47.6	V	54.0	-6.4	AVG	161	1.1	RB 1 MHz;VB 10 Hz;Pk
11570.000	60.7	V	74.0	-13.3	PK	161	1.1	RB 1 MHz;VB 3 MHz;Pk
3856.660	43.2	V	54.0	-10.8	AVG	269	1.0	RB 1 MHz;VB 10 Hz;Pk
3856.860	48.5	V	74.0	-25.5	PK	269	1.0	RB 1 MHz;VB 3 MHz;Pk
2331.460	38.4	V	54.0	-15.6	AVG	180	1.4	RB 1 MHz;VB 10 Hz;Pk
2331.830	57.5	V	74.0	-16.5	PK	180	1.4	RB 1 MHz;VB 3 MHz;Pk





	All Date Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Certtillio® Advanced-14 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

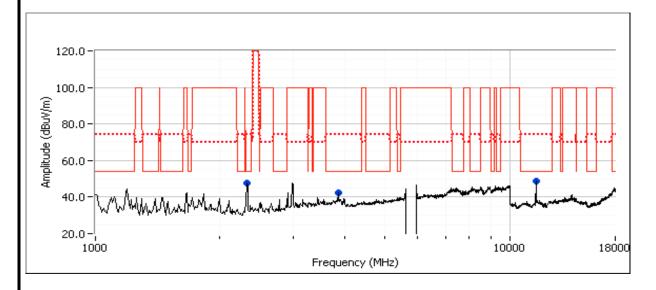
### Run # 2b: , EUT on Channel #159 5795MHz - n20/n40, Chain A+B

10111 //				•,, •a						
	Power Settings Target (dBm) Measured (dBm) Software Setting									
		Target	t (dBm)			Measure	Software Setting			
Chain	Α	В	С	Total	Α	В	С	Total		
Criairi	16.5	16.5		19.5	16.6	16.7		19.7	36.5/36.0	

Spurious Radiated Emissions:

opulious IN	Spanous 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					
11590.100	46.3	V	54.0	-7.7	AVG	253	1.3	RB 1 MHz;VB 10 Hz;Pk				
11590.200	60.7	V	74.0	-13.3	PK	253	1.3	RB 1 MHz;VB 3 MHz;Pk				
2323.240	37.9	V	54.0	-16.1	AVG	160	1.4	RB 1 MHz;VB 10 Hz;Pk				
2325.640	55.5	V	74.0	-18.5	PK	160	1.4	RB 1 MHz;VB 3 MHz;Pk				
3863.370	42.6	V	54.0	-11.4	AVG	132	1.0	RB 1 MHz;VB 10 Hz;Pk				
3863.360	47.6	V	74.0	-26.4	PK	132	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.





	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillio® Advanced-14 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 3, Radiated Spurious Emissions, 1-40GHz, 802.11n Mode, Chain A+B

Date of Test: 9/21/2010 Test Location: FT chamber #4

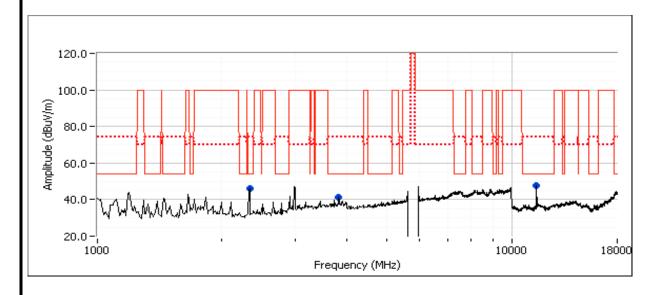
Test Engineer: Rafael Varelas Config Change: none

### Run # 3a, EUT on Channel #149 5745MHz - 802.11n 20MHz Chain A+B

		Power Settings										
		Target	(dBm)			Measure	Software Setting					
Chain	Α	В	С	Total	Α	В	С	Total				
Criairi	16.5	16.5		19.5	16.7	16.8		19.8	35.5/35.0			

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	
11490.000	46.4	V	54.0	-7.6	AVG	159	1.0	RB 1 MHz;VB 10 Hz;Pk
11490.230	61.2	V	74.0	-12.8	PK	159	1.0	RB 1 MHz;VB 3 MHz;Pk
2332.460	37.2	V	54.0	-16.8	AVG	167	1.1	RB 1 MHz;VB 10 Hz;Pk
2331.730	55.8	V	74.0	-18.2	PK	167	1.1	RB 1 MHz;VB 3 MHz;Pk
3830.000	40.4	V	54.0	-13.6	AVG	219	1.0	RB 1 MHz;VB 10 Hz;Pk
3829.910	47.5	V	74.0	-26.5	PK	219	1.0	RB 1 MHz;VB 3 MHz;Pk
								·





	All Date Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Certtillio® Advanced-14 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

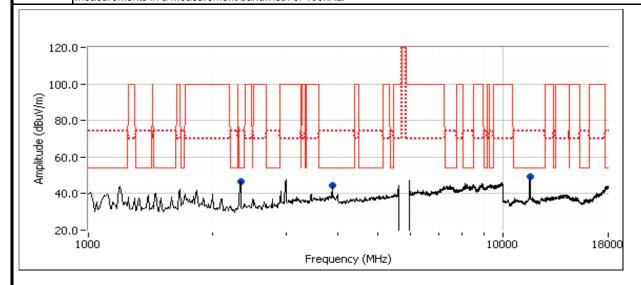
### Run # 3b, EUT on Channel #165 5825MHz - 802.11n 20MHz Chain A+B

tuii π JD, ∟	OI OII CIIAII	11161 # 103 30	23WII 12 - 002	2. 1 111 ZUIVII 12	Cilaili A D								
	Power Settings												
		Target	(dBm)			Measure	Software Setting						
Chain	Α	В	С	Total	Α	В	С	Total					
Ollaili	16.5	16.5		19.5	16.6	16.7		19.7	35.5/35.0				

Spurious Radiated Emissions:

opulious K	auialeu Eiiii	33IUII3.						
Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11650.470	49.4	V	54.0	-4.6	AVG	159	1.1	RB 1 MHz;VB 10 Hz;Pk
11650.170	61.6	V	74.0	-12.4	PK	159	1.1	RB 1 MHz;VB 3 MHz;Pk
2323.040	37.3	V	54.0	-16.7	AVG	54	1.1	RB 1 MHz;VB 10 Hz;Pk
2321.740	54.7	V	74.0	-19.3	PK	54	1.1	RB 1 MHz;VB 3 MHz;Pk
3883.330	43.7	V	54.0	-10.3	AVG	50	1.0	RB 1 MHz;VB 10 Hz;Pk
3883.280	49.1	V	74.0	-24.9	PK	50	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.





	An 2/22 company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Celitiiilo® Advaliced-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

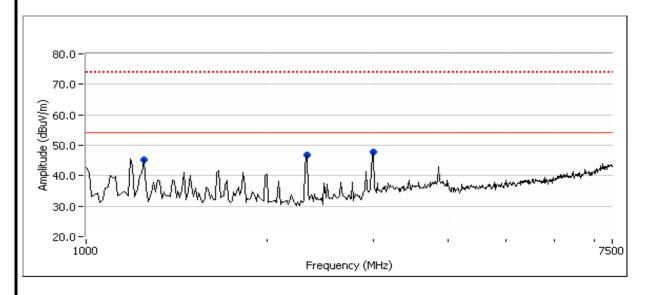
### Run # 4, Radiated Spurious Emissions, 1-26GHz, Receive, Chain A,B, A+B

Date of Test: 9/21/2010 Test Location: FT chamber #4

Test Engineer: Rafael Varelas Config Change: none

### Run # 4a, EUT on Channel #157 5785MHz - Receive, Chain A

Frequency	Level	Pol	RSS	210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.720	38.8	V	54.0	-15.2	AVG	122	1.0	RB 1 MHz;VB 10 Hz;Pk
2990.290	56.1	V	74.0	-17.9	PK	122	1.0	RB 1 MHz;VB 3 MHz;Pk
1244.620	26.8	V	54.0	-27.2	AVG	227	1.2	RB 1 MHz;VB 10 Hz;Pk
1242.850	37.4	V	74.0	-36.6	PK	227	1.2	RB 1 MHz;VB 3 MHz;Pk
2323.220	36.6	V	54.0	-17.4	AVG	111	1.3	RB 1 MHz;VB 10 Hz;Pk
2321.920	53.9	V	74.0	-20.1	PK	111	1.3	RB 1 MHz;VB 3 MHz;Pk

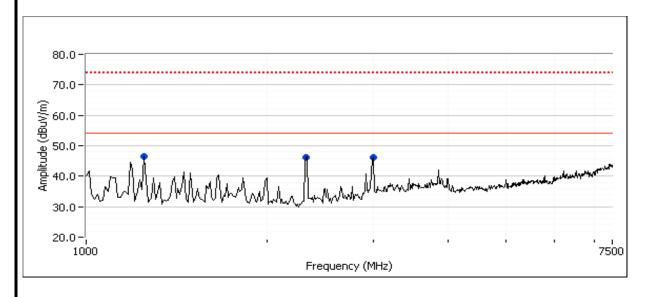




	All 2023 Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 4b: EUT on Channel #157 5785MHz - Receive, Chain B

Frequency	Level	Pol	RSS	210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2995.410	38.7	V	54.0	-15.3	AVG	113	1.0	RB 1 MHz;VB 10 Hz;Pk
2999.210	56.0	V	74.0	-18.0	PK	113	1.0	RB 1 MHz;VB 3 MHz;Pk
2323.010	36.6	V	54.0	-17.4	AVG	55	1.0	RB 1 MHz;VB 10 Hz;Pk
2323.070	54.1	V	74.0	-19.9	PK	55	1.0	RB 1 MHz;VB 3 MHz;Pk
1251.340	26.0	V	54.0	-28.0	AVG	18	1.0	RB 1 MHz;VB 10 Hz;Pk
1251.020	37.8	V	74.0	-36.2	PK	18	1.0	RB 1 MHz;VB 3 MHz;Pk



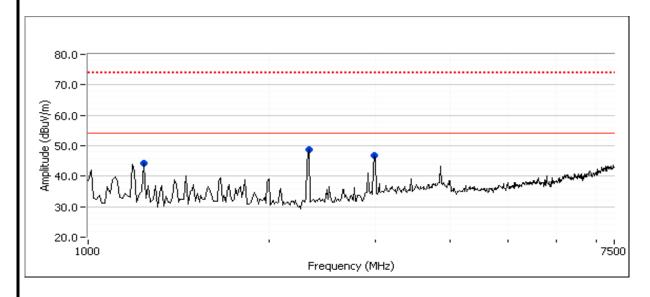


# **EMC Test Data**

	All 2023 Company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run # 4c: EUT on Channel #157 5785MHz - Receive, Chain A+B

Frequency	Level	Pol	RSS	210	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2328.210	38.8	V	54.0	-15.2	AVG	353	1.0	RB 1 MHz;VB 10 Hz;Pk
2329.210	56.6	V	74.0	-17.4	PK	353	1.0	RB 1 MHz;VB 3 MHz;Pk
2992.320	39.1	V	54.0	-14.9	AVG	130	1.0	RB 1 MHz;VB 10 Hz;Pk
2990.920	55.9	V	74.0	-18.1	PK	130	1.0	RB 1 MHz;VB 3 MHz;Pk
1239.940	26.9	V	54.0	-27.1	AVG	9	1.0	RB 1 MHz;VB 10 Hz;Pk
1239.900	39.1	V	74.0	-34.9	PK	9	1.0	RB 1 MHz;VB 3 MHz;Pk



EMC Test Data
Job Number: J80398
T-Log Number: T80759
Account Manager: Christine Krebill
-
Class: B
Environment: -
-

# **EMC Test Data**

For The

# **Intel Corporation**

Model

Intel® Centrino® Advanced-N 6230

Date of Last Test:

	Elliott An (VZAS company)	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intal® Contrins® Advanced N 6220	T-Log Number:	T80759
wodei.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	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: 10/1/2010 Config. Used: 1 Test Engineer: Rafael Varelas Config Change: none Test Location: FT Chamber #7 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:

21.9 °C Temperature: Rel. Humidity: 42 %

#### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run#	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin	
						802.11b: 49 mW	
4			Output Power	15.247(b)	Daga	802.11g: 38 mW	
1			Output Power	15.247(0)	Pass	n20: 35.5 mW	
					n40: 17 mW		
2			Power spectral Density (PSD)	15.247(d)	Pass	-7.4 dBm/3kHz	
3			Minimum 6dB Bandwidth	15.247(a)	Pass	10.2 MHz	
						802.11b: 13.6 MHz	
2			99% Bandwidth	RSS GEN		802.11g: 17.1 MHz	
ა			99 % Dariuwiuiii	KSS GEN	-	n20: 18.3 MHz	
					n40: 36.6 MHz		
1			Spurious emissions	15.247(b)	Pass	All emissions below the	
4			Sparious erriissions	13.247(0)	F d 5 5	limit	

#### Modifications Made During Testing

No modifications were made to the EUT during testing

# **EMC Test Data**

	An ZAZZZZ company							
Client:	Intel Corporation	Job Number:	J80398					
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759					
Model.	III(el® Cell(III)0® Advanced-IV 0230	Account Manager:	Christine Krebill					
Contact:	Steve Hackett							
Standard:	FCC 15.247	Class:	N/A					

#### **Deviations From The Standard**

No deviations were made from the requirements of the standard.

#### Run #1: Output Power

#### 802.11b Mode

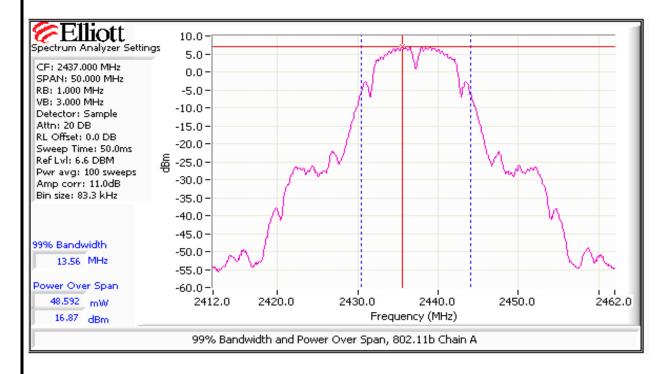
Power	Francisco (MIII-)	Output	Power	Antenna	Deault	EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
23.5	2412	16.7	46.8	3.2	Pass	19.9	0.098	16.8	47.9
23.5	2437	16.9	49.0	3.2	Pass	20.1	0.102	16.8	47.9
23.5	2462	16.8	47.9	3.2	Pass	20.0	0.100	16.8	47.9

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 **50 MHz** (option #2, method 1 in KDB 558074, equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes **-30dBc**.

Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample detector, power

Note 1: Note 1 or transmitted signal was continuous) and power integration over **50 MHz** (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.



## **EMC Test Data**

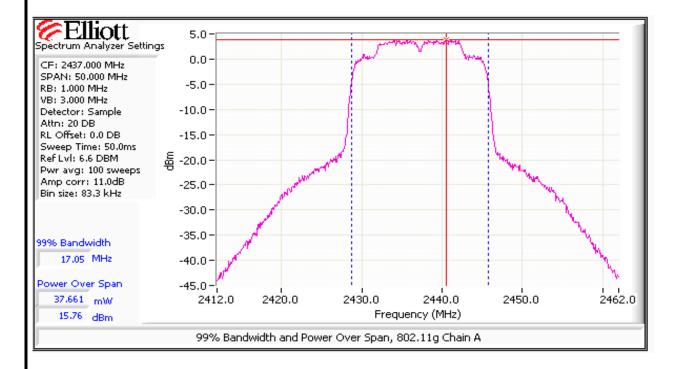
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	III.el® Ceritino® Advanced-in 6250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

802.11g Mode

Power	Frequency (MHz)	Output	Power	Antenna	Result	EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHZ)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
25.5	2412	12.9	19.5	3.2	Pass	16.1	0.041	14.1	25.7
29	2437	15.8	38.0	3.2	Pass	19.0	0.079	16.6	45.7
25.5	2462	13.1	20.4	3.2	Pass	16.3	0.043	14.0	25.1

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 **50 MHz** (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.



## **EMC Test Data**

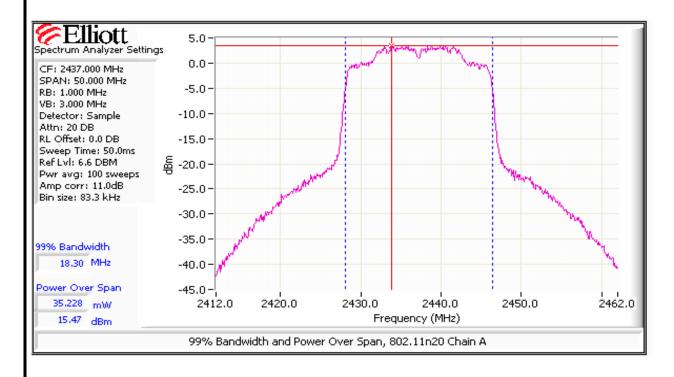
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	III.el® Ceritino® Advanced-in 6250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11n 20MHz Mode

Power	Frequency (MHz)	Output	Power	Antenna	Result	EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHZ)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
24.5	2412	12.0	15.8	3.2	Pass	15.2	0.033	13.1	20.4
29	2437	15.5	35.5	3.2	Pass	18.7	0.074	16.5	44.7
24	2462	11.6	14.5	3.2	Pass	14.8	0.030	12.5	17.8

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 **50 MHz** (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.



# Elliott An MAS company

## **EMC Test Data**

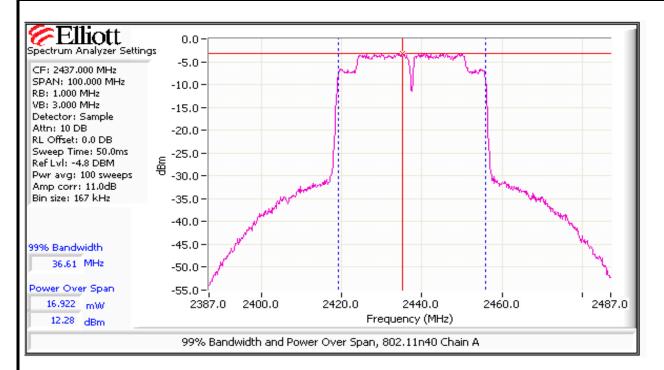
Oli u	Intel Company	Jak Ni wakaw	100200
Client:	Intel Corporation	Job Number:	180398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillio® Advanced-IV 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11n 40MHz Mode

Power	Frequency (MHz)	Output	Power	Antenna	Result	EIRP	Note 2	Output	Power
Setting <sup>2</sup>	rrequency (MHZ)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
22	2422	9.3	8.5	3.2	Pass	12.5	0.018	10.6	11.5
25	2437	12.3	17.0	3.2	Pass	15.5	0.035	13.6	22.9
21.5	2452	8.7	7.4	3.2	Pass	11.9	0.015	10.1	10.2

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 **80 MHz** (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.





# **EMC Test Data**

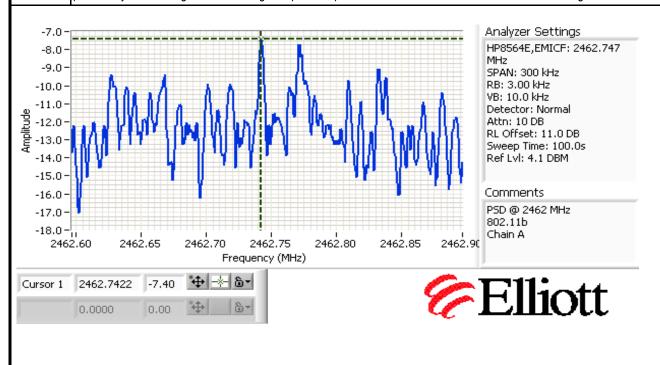
	An ZAZZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
	IIILEI® Ceritiiio® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #2: Power spectral Density

				r	
Mode	Power	Frequency (MHz)	PSD	Limit	Result
	Setting	r requericy (ivii iz)	(dBm/3kHz) Note 1	dBm/3kHz	Nesuit
	23.5	2412	-8.2	8.0	Pass
802.11b	23.5	2437	-8.2	8.0	Pass
	23.5	2462	-7.4	8.0	Pass
	25.5	2412	-10.4	8.0	Pass
802.11g	29	2437	-8.2	8.0	Pass
	25.5	2462	-10.7	8.0	Pass
802.11n	24.5	2412	-13.1	8.0	Pass
20MHz	29	2437	-8.9	8.0	Pass
ZUIVITZ	24	2462	-10.9	8.0	Pass
802.11n	22	2422	-16.7	8.0	Pass
40MHz	25	2437	-13.4	8.0	Pass
40IVITZ	21.5	2452	-16.7	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.



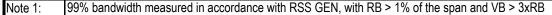


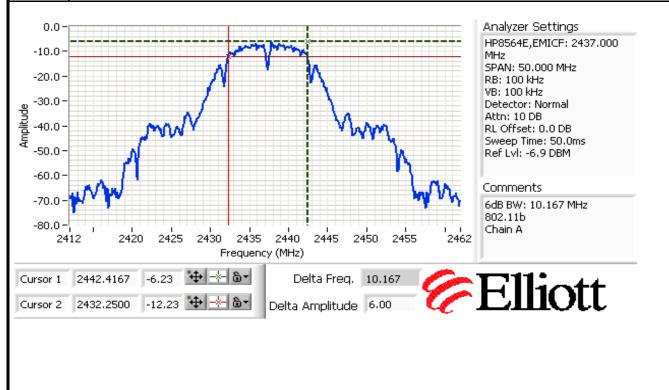
# **EMC** Test Data

	An ZAZZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
	IIILEI® Ceritiiio® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #3: Signal Bandwidth

Mode	Power	Eroguanay (MHz)	Resolution	Bandwid	th (MHz)
	Setting	Frequency (MHz)	Bandwidth	6dB	99%
	23.5	2412	100kHz	10.2	13.6
802.11b	23.5	2437	100kHz	10.2	13.6
	23.5	2462	100kHz	10.2	13.6
	25.5	2412	100kHz	15.4	16.9
802.11g	29	2437	100kHz	15.2	17.1
	25.5	2462	100kHz	15.3	16.9
802.11n	24.5	2412	100kHz	15.2	18.1
20MHz	29	2437	100kHz	15.3	18.3
ZUIVII IZ	24	2462	100kHz	15.2	18.1
802.11n	22	2422	100kHz	35.3	36.6
40MHz	25	2437	100kHz	35.3	36.6
4UIVINZ	21.5	2452	100kHz	35.5	36.6





# **EMC Test Data**

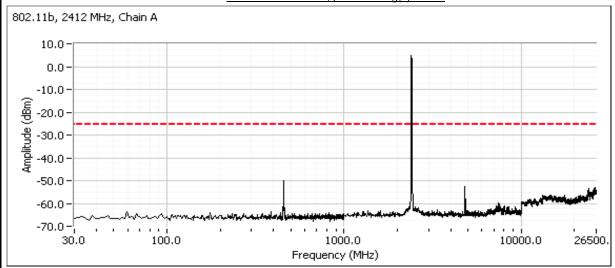
1	All Date: Company		
Client:	Intel Corporation	Job Number:	J80398
Madalı	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

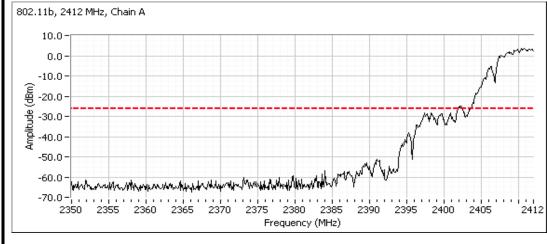
#### Run #4: Out of Band Spurious Emissions

802.11b Mode

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

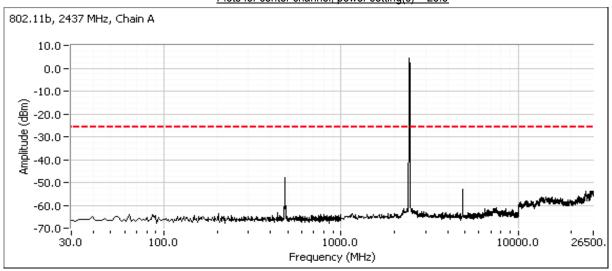
#### Plots for low channel, power setting(s) = 23.5



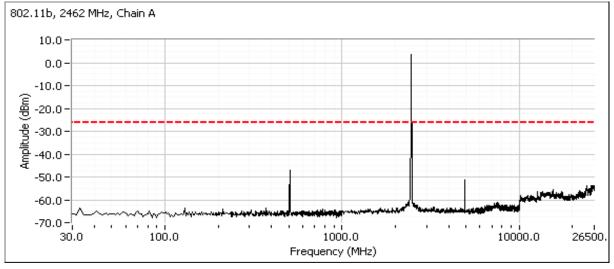


Elliott An WAS company		EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398	
Modal:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759	
wodei.	IIILEI® Ceritiiilo® Advanced-iv 0250	Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### Plots for center channel, power setting(s) = 23.5



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



# Elliott An MAS company

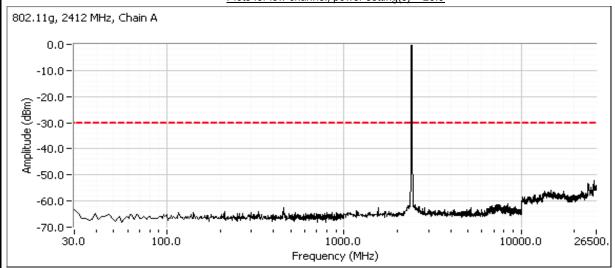
# **EMC Test Data**

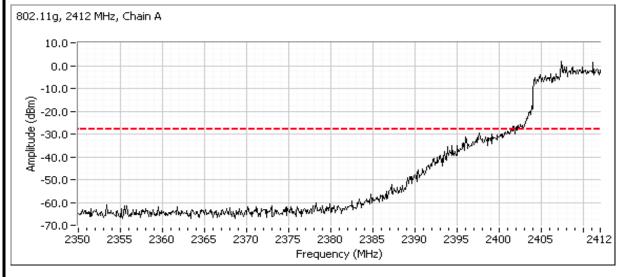
	The state of the s		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
	IIILEI® Ceritiiilo® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11g Mode

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

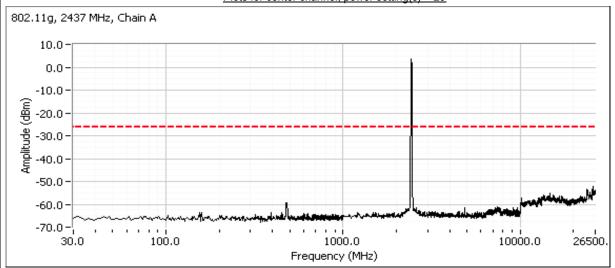
#### Plots for low channel, power setting(s) = 25.5



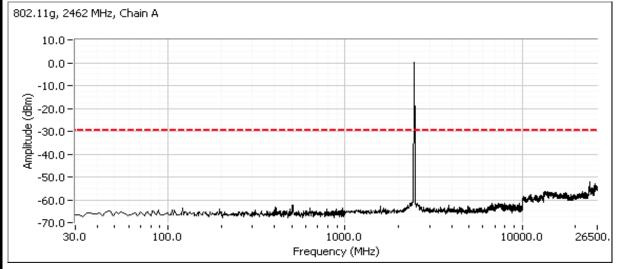


	Elliott An ATAS company	EMO	C Test Data
	Intel Corporation	Job Number:	J80398
Model	Intel® Contrine® Advanced N 6220	T-Log Number:	T80759
Model.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Plots for center channel, power setting(s) = 29



#### Plots for high channel, power setting(s) = 25.5



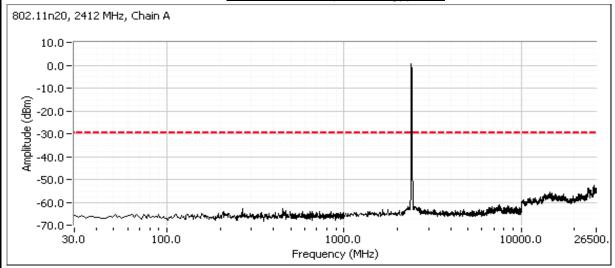
# **EMC Test Data**

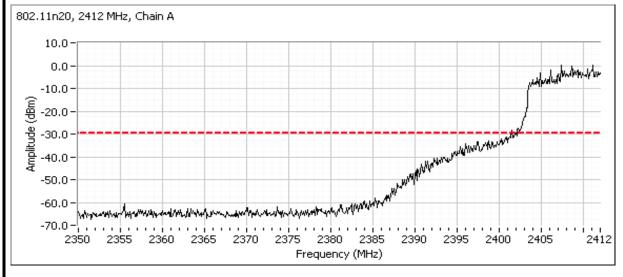
	The state of the s		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
	IIILEI® Ceritiiilo® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11n 20MHz Mode

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

#### Plots for low channel, power setting(s) = 24.5





#### **EMC Test Data** Client: Intel Corporation Job Number: J80398 T-Log Number: T80759 Model: Intel® Centrino® Advanced-N 6230 Account Manager: Christine Krebill Contact: Steve Hackett Standard: FCC 15.247 Class: N/A Plots for center channel, power setting(s) = 29 802.11n20, 2437 MHz, Chain A 10.0-0.0 -10.0 -20.0 -30.0 -40.0 -50.0 · -60.0 -70.0· 30.0 100.0 1000.0 10000.0 26500. Frequency (MHz) Plots for high channel, power setting(s) = 24 802.11n20, 2462 MHz, Chain A 0.0 -10.0-20.0 -20.0 --30.0 --40.0 --50.0 --60.0 -70.0 -¦ 1000.0 100.0 26500. 30.0 10000.0

Frequency (MHz)

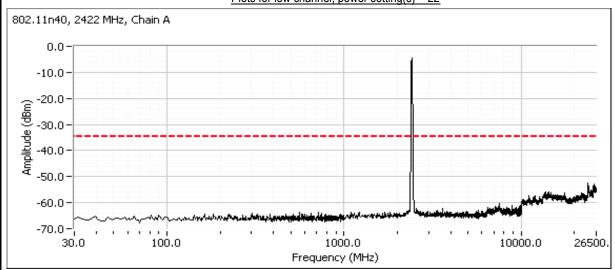
## **EMC Test Data**

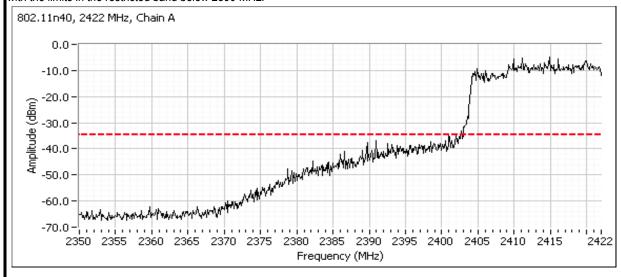
	All Dates Company							
Client:	Intel Corporation	Job Number:	J80398					
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759					
Model.	IIILEI® Celiliiilo® Advanced-iv 0250	Account Manager:	Christine Krebill					
Contact:	Steve Hackett							
Standard:	FCC 15.247	Class:	N/A					

#### 802.11n 40MHz Mode

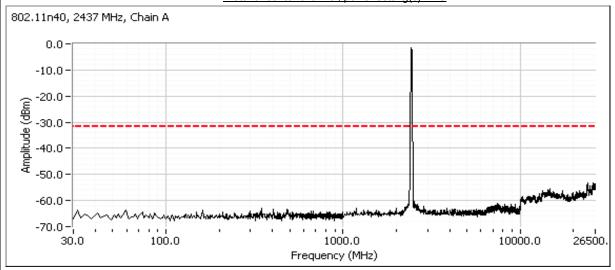
Frequency (MHz)	Limit	Result
2422	-30dBc	Pass
2437	-30dBc	Pass
2452	-30dBc	Pass

#### Plots for low channel, power setting(s) = 22

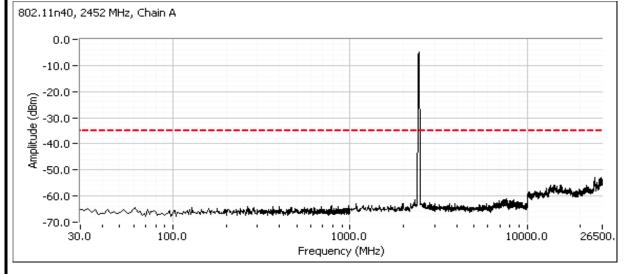




# Client: Intel Corporation Model: Intel® Centrino® Advanced-N 6230 Contact: Steve Hackett Standard: FCC 15.247 Plots for center channel, power setting(s) = 25 802.11n40, 2437 MHz, Chain A



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



	Elliott An AZAS company	EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398	
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759	
Model.		Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	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.

Config. Used: 1 Date of Test: 10/1/2010 Test Engineer: Rafael Varelas Config Change: none Test Location: FT Chamber #7 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: 20-25 °C

> 40-50 % Rel. Humidity:

#### **Summary of Results**

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run#	Pwr setting	Avg Pwr	Test Performed	d Limit Pass / Fa		Result / Margin		
						802.11b: 38 mW		
1			Output Bower	15 047/h)	Door	802.11g: 34 mW		
ļ			Output Power	15.247(b)	Pass	n20: 33.1 mW		
						n40: 14.1 mW		
2			Power spectral Density (PSD)	15.247(d)	Pass	-6.9 dBm/3kHz		
3			Minimum 6dB Bandwidth	6dB Bandwidth 15.247(a)		10.0 MHz		
						802.11b: 13.7 MHz		
3			99% Bandwidth	RSS GEN		802.11g: 17.2 MHz		
3		99% Balluwiutii RSS GEN		99% balluwidili K55 GEN -	-	n20: 18.5 MHz		
						n40: 36.6 MHz		
1	4 Courieus emissions		15.247(b)	Pass	All emissions			
4			Spurious emissions	13.247(0)	rass	below the limit		

#### 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.

## **EMC Test Data**

Client:	Intel Corporation	Job Number:	.180398
	•	T-Log Number:	
Model:	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

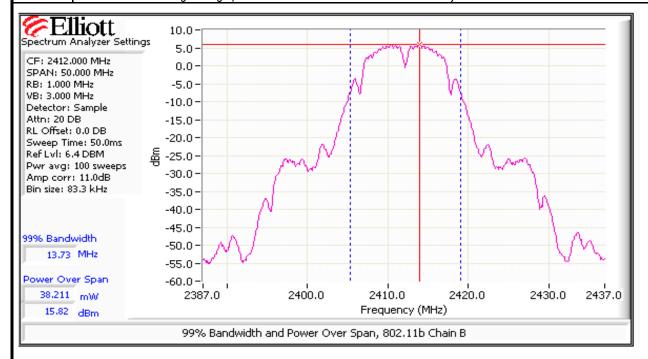
#### Run #1: Output Power

#### 802.11b Mode

Power	Fraguerov (MH=)	Output Power		Antenna		Antenna Basult		EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW		
25	2412	15.8	38.0	3.2	Pass	19.0	0.079	16.6	45.7		
23	2437	14.2	26.3	3.2	Pass	17.4	0.055	15.0	31.6		
24	2462	15.3	33.9	3.2	Pass	18.5	0.071	16.0	39.8		

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 **50 MHz** (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.



## **EMC Test Data**

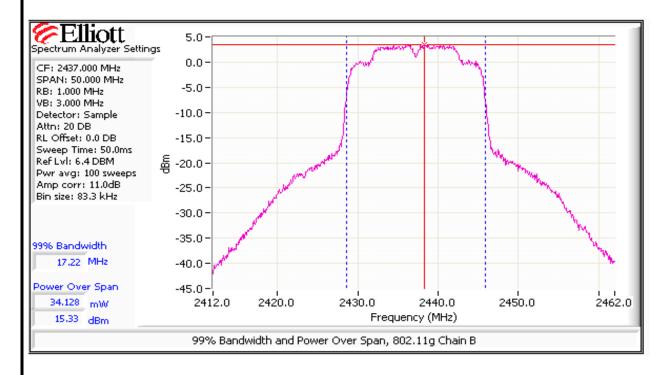
	All DEED Company							
Client:	Intel Corporation	Job Number:	J80398					
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759					
Model.	III(el® Cell(III)0® Advanced-IV 0230	Account Manager:	Christine Krebill					
Contact:	Steve Hackett							
Standard:	FCC 15.247	Class:	N/A					

802.11g Mode

Power	Fraguency (MHz) Output Power Antenna Bogult		EIRP Note 2		Output Power				
Setting <sup>2</sup>	Frequency (MHz)	(dBm) 1	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
27	2412	12.1	16.2	3.2	Pass	15.3	0.034	13.9	24.5
30.5	2437	15.3	33.9	3.2	Pass	18.5	0.071	16.7	46.8
26.5	2462	12.0	15.8	3.2	Pass	15.2	0.033	13.5	22.4

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 **50 MHz** (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.



## **EMC Test Data**

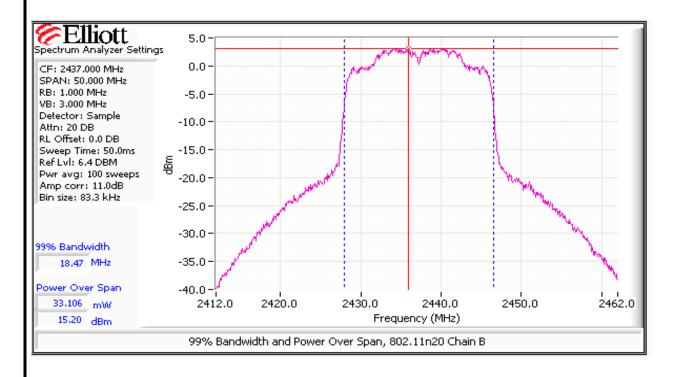
	All Dates Company							
Client:	Intel Corporation	Job Number:	J80398					
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759					
Model.	Intel® Centino® Advanced-IV 0250	Account Manager:	Christine Krebill					
Contact:	Steve Hackett							
Standard:	FCC 15.247	Class:	N/A					

#### 802.11n 20MHz Mode

Power	Fraguerov (MH=)	Frequency (MHz) Output Power Antenna Popult		Output Power Antenna Result		EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
25.5	2412	10.7	11.7	3.2	Pass	13.9	0.025	12.5	17.8
30.5	2437	15.2	33.1	3.2	Pass	18.4	0.069	16.6	45.7
25.5	2462	10.8	12.0	3.2	Pass	14.0	0.025	12.4	17.4

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 **50 MHz** (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.



## **EMC Test Data**

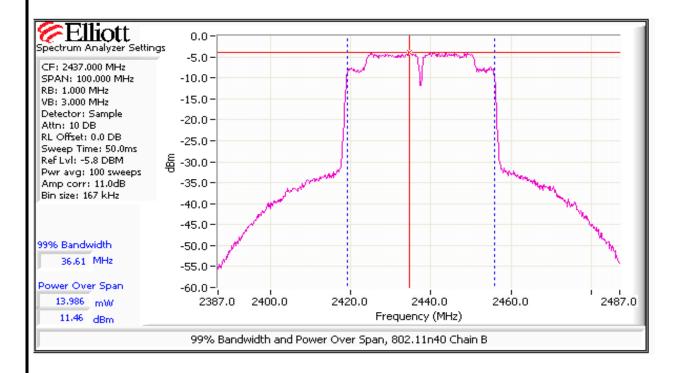
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
woder.	Intel® Centrino® Advanced-in 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11n 40MHz Mode

Power	Fragues av (MIII-)	Output	Power	Antenna	Result	EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
22.0	2422	8.0	6.3	3.2	Pass	11.2	0.013	9.2	8.3
25.5	2437	11.5	14.1	3.2	Pass	14.7	0.030	12.7	18.6
23.0	2452	8.8	7.6	3.2	Pass	12.0	0.016	10.1	10.2

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 **80 MHz** (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.





# **EMC Test Data**

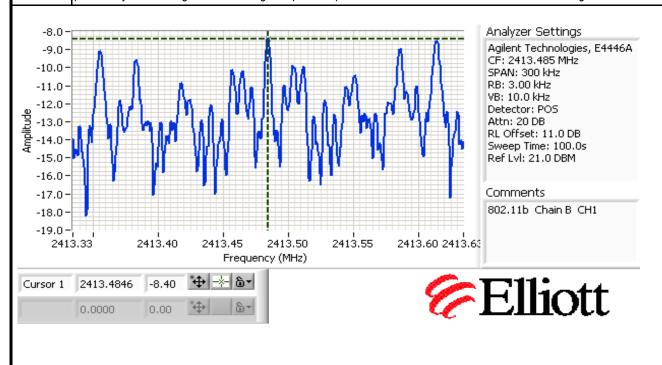
	An 2/2/20 company		
Client:	Intel Corporation	Job Number:	J80398
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

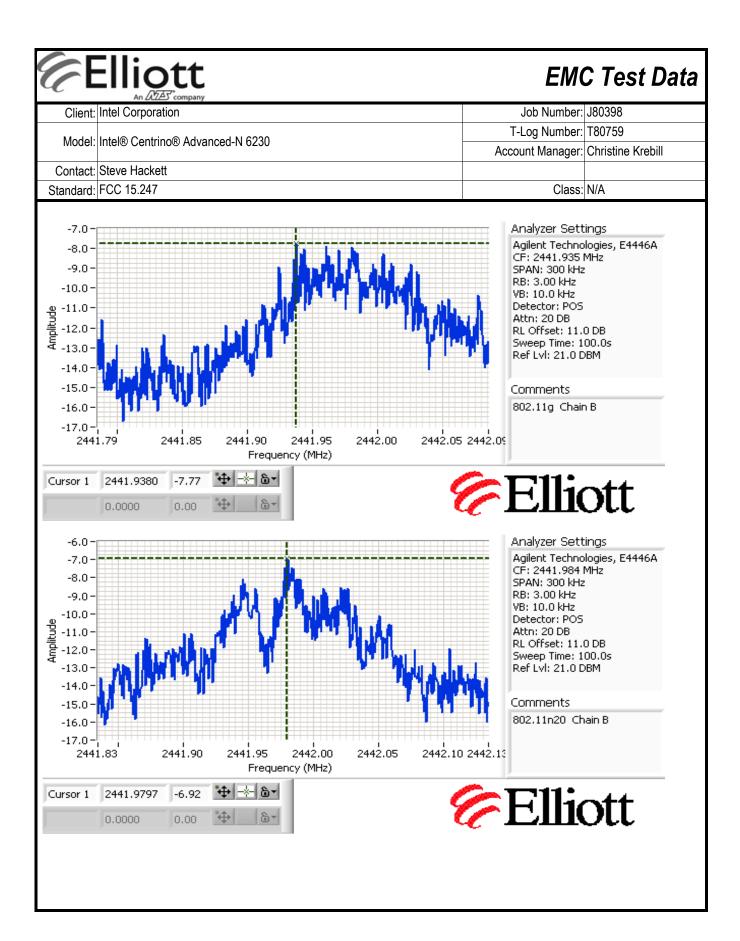
#### Run #2: Power spectral Density

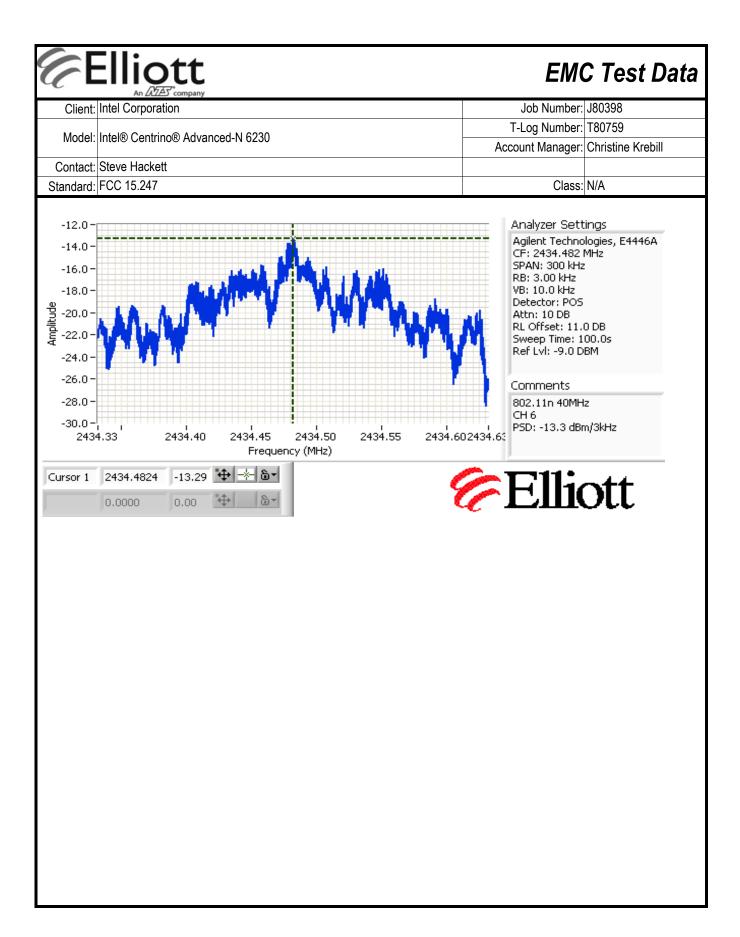
Mode	Power Setting	Frequency (MHz)	PSD (dBm/3kHz) <sup>Note 1</sup>	Limit dBm/3kHz	Result
	25.0	2412	-8.4	8.0	Pass
802.11b	23.0	2437	-9.8	8.0	Pass
	24.0	2462	-8.7	8.0	Pass
	27.0	2412	-9.1	8.0	Pass
802.11g	30.5	2437	-7.8	8.0	Pass
	26.5	2462	-12.4	8.0	Pass
802.11n	25.5	2412	-11.5	8.0	Pass
20MHz	30.5	2437	-6.9	8.0	Pass
ZUIVII IZ	25.5	2462	-11.9	8.0	Pass
802.11n	22.0	2422	-17.0	8.0	Pass
40MHz	25.5	2437	-13.3	8.0	Pass
4UIVINZ	21.0	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.









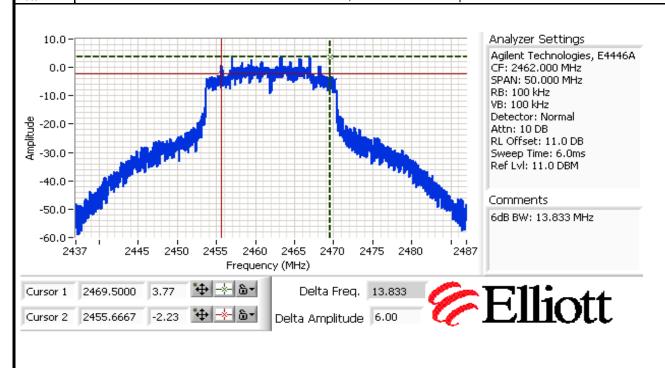
# **EMC Test Data**

	An 2/22 company		
Client:	Intel Corporation	Job Number:	J80398
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #3: Signal Bandwidth

Mode	Power	Eroquonov (MHz)	Resolution	Bandwid	th (MHz)
	Setting	Frequency (MHz)	Bandwidth	6dB	99%
	25.0	2412	100kHz	10.0	13.7
802.11b	23.0	2437	100kHz	10.0	13.3
	24.0	2462	100kHz	10.0	13.6
	27.0	2412	100kHz	15.0	16.9
802.11g	30.5	2437	100kHz	15.0	17.2
	26.5	2462	100kHz	13.8	16.9
802.11n	25.5	2412	100kHz	15.0	18.1
20MHz	30.5	2437	100kHz	15.0	18.5
ZUIVII IZ	25.5	2462	100kHz	15.0	18.1
802.11n	22.0	2422	100kHz	35.0	36.6
40MHz	25.5	2437	100kHz	35.0	36.6
4UIVINZ	21.0	2452	100kHz	35.0	36.6

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



# **EMC Test Data**

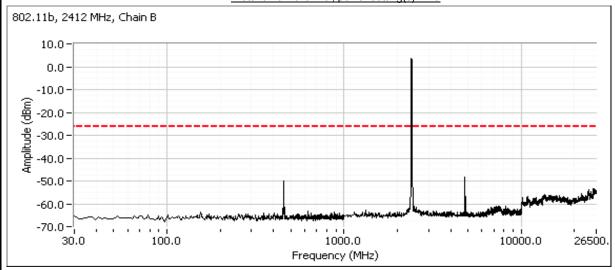
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

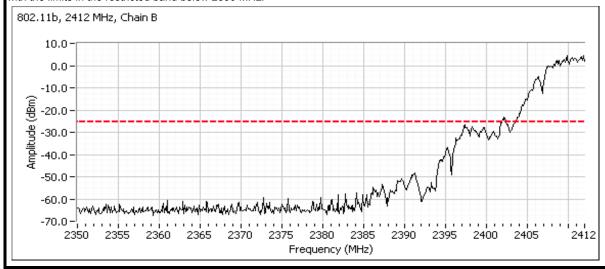
#### Run #4: Out of Band Spurious Emissions

802.11b Mode

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

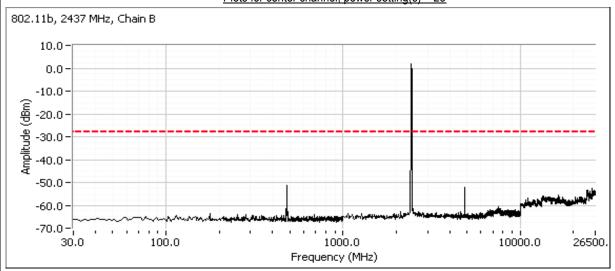
Plots for low channel, power setting(s) = 25



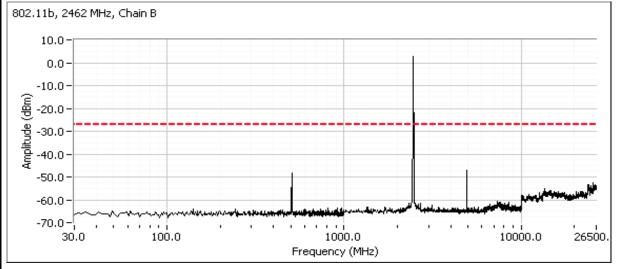


Elliott An ANDE Company		EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398	
Modal:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759	
wodei.		Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### Plots for center channel, power setting(s) = 23



#### Plots for high channel, power setting(s) = 24



# Elliott AN ANDER COMPANY

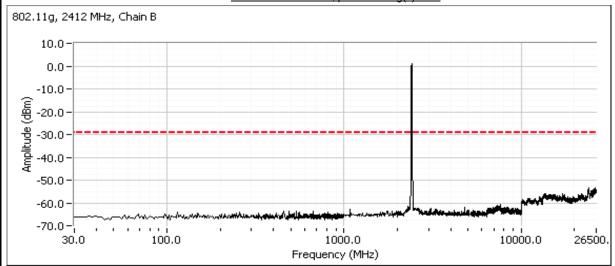
# **EMC Test Data**

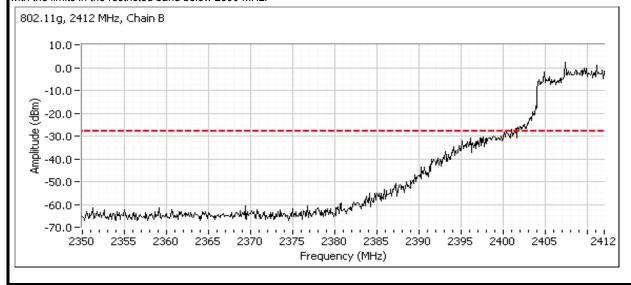
	Till 2011		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11g Mode

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

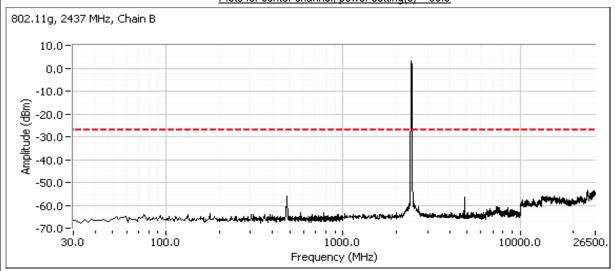
#### Plots for low channel, power setting(s) = 27



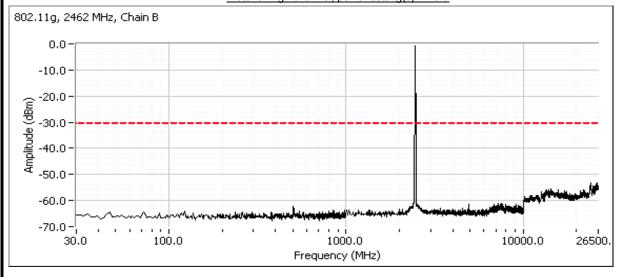


Elliott An ANDE Company		EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398	
Model	Intol® Contrine® Advanced N 6220	T-Log Number:	T80759	
wodei.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### Plots for center channel, power setting(s) = 30.5



#### Plots for high channel, power setting(s) = 26.5



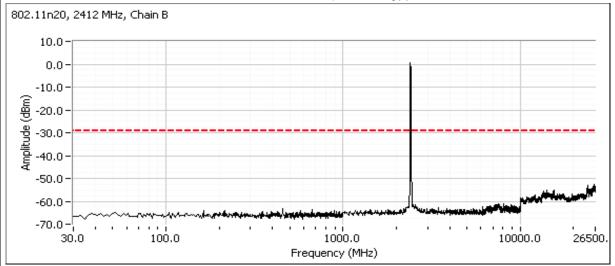
# **EMC Test Data**

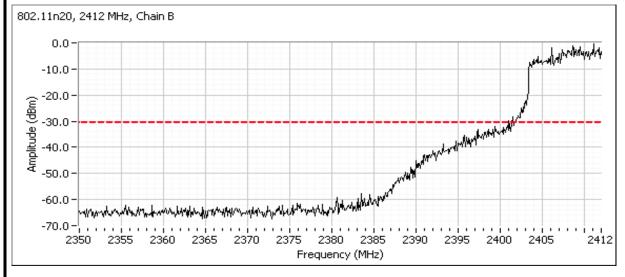
	All Balls Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	Intel® Centino® Advanced-N 6250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11n 20MHz Mode

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

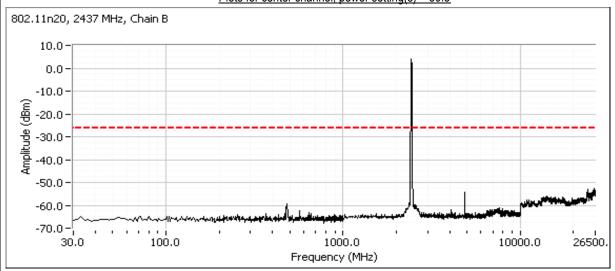
#### Plots for low channel, power setting(s) = 25.5



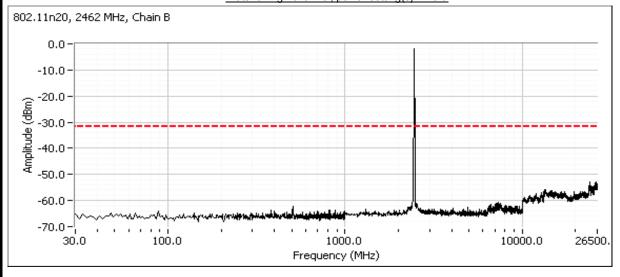


Elliott An ATE Company		EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398	
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759	
		Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### Plots for center channel, power setting(s) = 30.5



#### Plots for high channel, power setting(s) = 25.5



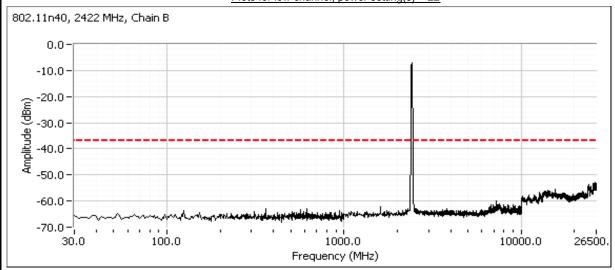
# **EMC Test Data**

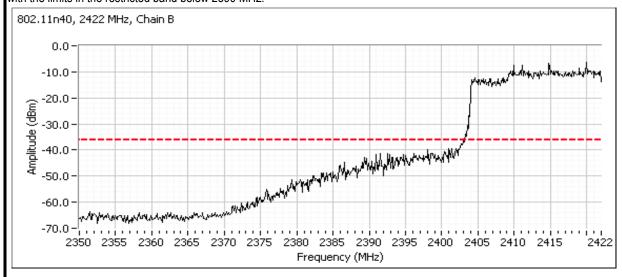
	All Delta Company			
Client:	Intel Corporation	Job Number:	J80398	
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759	
Wodel.	Intel® Centino® Advanced-IV 0250	Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### 802.11n 40MHz Mode

Frequency (MHz)	Limit	Result
2422	-30dBc	Pass
2437	-30dBc	Pass
2452	-30dBc	Pass

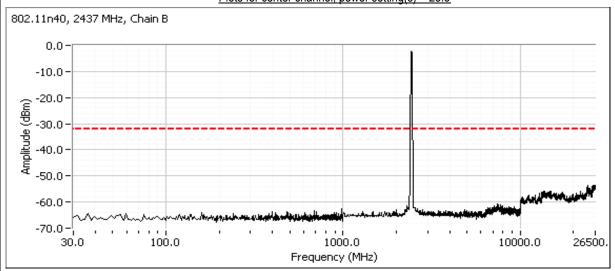
Plots for low channel, power setting(s) = 22



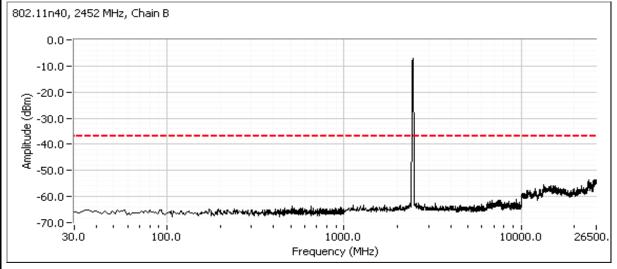


	Elliott An DZAS company	EMO	EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398		
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759		
		Account Manager:	Christine Krebill		
Contact:	Steve Hackett				
Standard:	FCC 15.247	Class:	N/A		

#### Plots for center channel, power setting(s) = 25.5



#### Plots for high channel, power setting(s) = 21



Elliott EMC Test			C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
	IIILEI® CEIILIIIO® Auvailceu-in 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

# RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements **MIMO and Smart Antenna Systems**

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: 10/4/2010 Config. Used: 1 Test Engineer: M. Birgani/R. Varelas Config Change: none Test Location: FT Lab #4 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

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

Ambient Conditions: Temperature: 22.4 °C

> 39 % Rel. Humidity:

#### Summary of Results

Run#	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1			Output Power	15.247(b)	Pass	n20: 41 mW
2			Power spectral Density (PSD)	15.247(d)	Pass	n40: 34 mW -8.6 dBm/3kHz
3			Minimum 6dB Bandwidth	15.247(a)	F a 5 5	These measurements
3			99% Bandwidth	RSS GEN		are covered by the
4			Spurious emissions	15.247(b)		single chain data

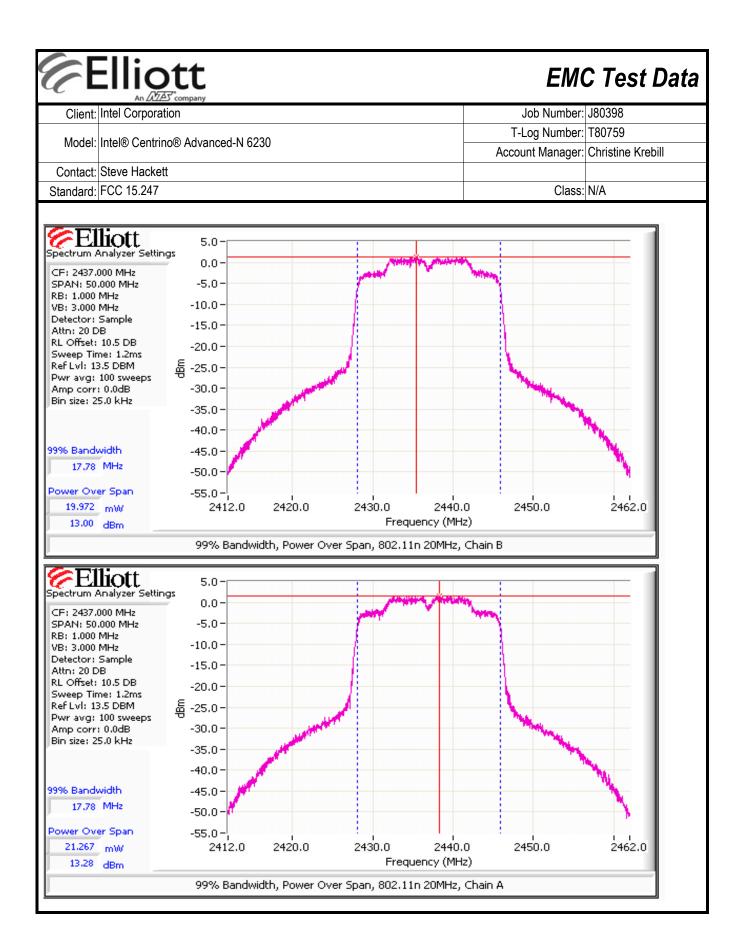
#### Modifications Made During Testing

No modifications were made to the EUT during testing

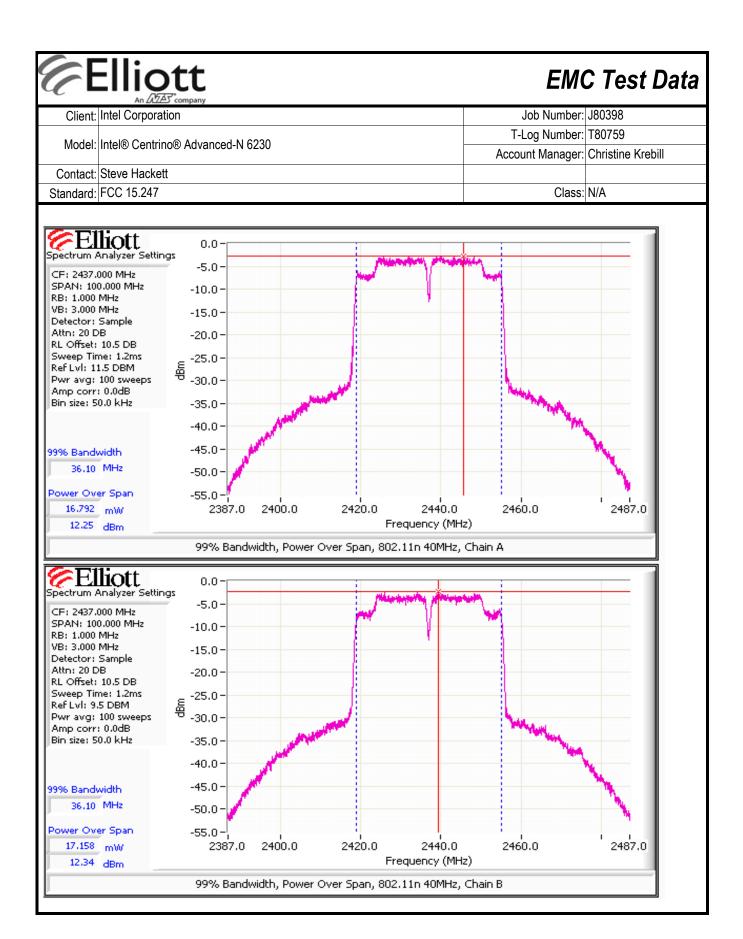
#### **Deviations From The Standard**

No deviations were made from the requirements of the standard.

Power Setting   Note 3				
Account Manager. Christine I Contact: Steve Hackett Standard: FCC 15.247 Class; N/A Run #1: Output Power - Chain A + B Jise the same method for power measurement for each mode as was used for single chain measurements.  Operating Mode: Transmitted signal on chain is coherent? No  802.11 n 20MHz 2412 MHz Chain 1 Chain 2 Chain 3 Chain 4 Chain 5 Chain 6 Chain 7 Chain 9 Chain 7 Chain 1 Chain 1 Chain 1 Chain 2 Chain 7 Chain 1 Chain 1 Chain 2 Chain 1 Chain 1 Chain 2 Chain 1 Chain 1 Chain 2 Chain 1 Chain 2 Chain 1 Chain 2 Chain 3 Chain				
Class   N/A	Krebill			
Run #1: Output Power - Chain A + B  Use the same method for power measurement for each mode as was used for single chain measurements.  Operating Mode:  Transmitted signal on chain is coherent? No  802.11 n 20MHz 2412 MHz  Chain 1 Chain 2 Chain 3  Output Power Setting Note 3 26.0 27.5  Output Power (dBm) Note 1 11.6 11.6 11.6 14.6 dBm 0.029 W 30.0 dBn output Power (dBm) Note 2 14.8 14.8 17.8 dBm 0.060 W  802.11 n 20MHz 2437 MHz  Chain 1 Chain 2 Chain 3  Output Power Setting Note 3 28.0 29.0 Total Across All Chains Output Power (dBm) Note 1 13.3 13.0 16.2 dBm 0.002 W  Output Power (dBm) Note 1 13.3 13.0 16.2 dBm 0.002 W  Output Power (dBm) Note 2 3.2 3.2 3.2 3.2 dBi output Power (dBm) Note 1 13.3 13.0 16.2 dBm 0.004 W 30.0 dBn output Power (dBm) Note 2 3.2 3.2 3.2 3.2 dBi output Power (dBm) Note 2 3.2 3.2 3.2 3.2 dBi output Power (dBm) Note 2 3.2 3.2 3.2 3.2 dBi output Power (dBm) Note 2				
Use the same method for power measurement for each mode as was used for single chain measurements.  Operating Mode:  Transmitted signal on chain is coherent?  No  802.11 n 20MHz 2412 MHz Chain 1 Chain 2 Chain 3 Chain 4 Chain 5 Chain 6 Chain 6 Chain 6 Chain 7 Chain 8 Chain 7 Chain 8 Chain 7 Chain 8 Cha	Class: N/A			
No   Section				
Source   Setting   Note 2   Setting   Note 3   Setting   Sett				
## Royal Chain 1   Chain 2   Chain 3   Total Across All Chains				
Total Across All Chains   Source   Setting   Note 3   Setting   Note 3   Setting   Note 3   Setting   Note 2   Setting   Note 3   Setting   Note 4   Setting   Note 5   Setting   Note 6   Setting   Note 7   Setting   Note 8   Setting   Note 8   Setting   Note 9   Setting   Note 6   Setting   Note				
## Prover Setting Note 3				
Note 2   14.8   14.8   17.8 dBm   0.002 W   30.0 dBm   0.006 W   30.0 dBm   0.002 W   30.0 dBm   0.006 W   30.0	Limit			
Dutput Power (dBm)   Note 2   11.6				
14.8   14.8   14.8   17.8 dBm   0.060 W   17.8 dBm   0.002 W   17.8 dBm   0.060 W   17.8 dB	n 1.000 V			
14.8   14.8   14.8   17.8 dBm   0.060 W   17.8 dB	Pass			
Power Setting   Note 3   28.0   29.0   3.0 dBm   0.002 W	-ass			
Source   Setting   Note 3   28.0   29.0   3.0 dBm   0.002 W				
3.0 dBm   0.002 W	Limit			
Output Power (dBm) Note 1  13.3  13.0  16.2 dBm  0.041 W  30.0 dBm  3.2 dBi  3.2 dBi  19.4 dBm  0.086 W   802.11 n 20MHz 2462 MHz  Chain 1 Chain 2  Cower Setting Note 3  Output Power (dBm) Note 1  11.1  10.4  Chain 1 Chain 2  Cower Setting Note 3  Output Power (dBm) Note 1  Output Power (dBm) Note 2  3.2 dBi  17.0 dBm  0.002 W  3.0 dBm  0.002 W  3.0 dBm  0.002 W  3.0 dBm  0.002 W  3.0 dBm  0.005 W  Output Power (dBm) Note 2  3.2 dBi  17.0 dBm  0.050 W  Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample de averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in K)				
Antenna Gain (dBi) Note 2 3.2 3.2 3.2 19.4 dBm 0.086 W  802.11 n 20MHz 2462 MHz Chain 1 Chain 2 19.4 dBm 0.086 W  Power Setting Note 3 25.5 26.0 3.0 dBm 0.002 W  Output Power (dBm) Note 1 11.1 10.4 13.8 dBm 0.024 W 30.0 dBm output Power (dBm) Note 2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3	n 1.000 V			
802.11 n 20MHz 2462 MHz Chain 1 Chain 2 Power Setting Note 3 Everage Power Note 3 Everage Power (dBm) Note 1 Everage Power (dBm) Note 2 Everage Power Note 3 Evera	1 1.000 V			
Rower Setting Note 3 25.5 26.0 Total Across All Chains 2 25.0 Total Across All Chains	Pass			
Power Setting Note 3  Average Power Note 3  Output Power (dBm) Note 1  Interna Gain (dBi) Note 2  Interna Gain (dBi) Note 2  Output Power (dBm) Note 2  Interna Gain (dBi) Note 2  Inte				
Output Power (dBm) Note 2  Output Power (dBm) No	Limit			
Output Power (dBm) Note 1 11.1 10.4 30.0 dBm ontenna Gain (dBi) Note 2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3	LIIIIII			
Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample de averaging on (transmitted signal was continuous) and power integration over <b>50 MHz</b> (option #2, method 1 in Kl				
Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample de averaging on (transmitted signal was continuous) and power integration over <b>50 MHz</b> (option #2, method 1 in Kl	n 1.000 V			
Output power measured using a spectrum analyzer (see plots below) with RBW=1MHz, VB=3 MHz, sample de averaging on (transmitted signal was continuous) and power integration over <b>50 MHz</b> (option #2, method 1 in Kl	Pass			
Note 1: averaging on (transmitted signal was continuous) and power integration over 50 MHz (option #2, method 1 in K	400			
Note 1: averaging on (transmitted signal was continuous) and power integration over <b>50 MHz</b> (option #2, method 1 in K				
	tector, powe			
equivalent to method 1 of DA-02-2138A1 for U-NII devices). Spurious limit becomes <b>-30dBc.</b>	DB 558074			
As there is no coherency between chains the total EIRP is the sum of the individual EIRPs and effective antenna	a gain egua			
Note 2: the eirp divide by the sum of the power on each chain.	· · · · · · · · · · · · · · · · · · ·			
Note 3: Power setting and average power are for reference only. Average power measured using average power sensor	or.			



	tel Corporation					1	ob Number:	.180398	
	noi Ooiporation						og Number:		
Model: In	tel® Centrino® Advanc	ed-N 6230					-	Christine Kre	hill
Contact: St	teve Hackett					710000	in managor.	Offitionino Parc	Juli
Standard: F0							Class:	N/A	
Otaliaa a.									
	40MHz 2422 MHz	Chain 1	Chain 2	Chair 3	Chain 4	Total Across	All Chaina	Lin	ait
Power Setting Note 3		21.5	22.5			Total Across	S All Chains	LIN	111.
Average Powe	er <sup>Note 3</sup>					3.0 dBm	0.002 W		
Output Power	(dBm) Note 1	7.3	7.0			10.2 dBm	0.010 W	30.0 dBm	1.000 W
Antenna Gain	(dBi) Note 2	3.2	3.2				3.2 dBi	Pa	SS
eirp (dBm) <sup>Note</sup>	2	10.5	10.2			13.4 dBm	0.022 W	. u	
202 44 n	40MHz 2437 MHz	Chain 1	Chain 0	(1184211118111					
Power Setting <sup>N</sup>		26.5	Chain 2 28.0	(Fusiars)	(CA18011.4)	Total Across	All Chains	Lin	nit
Average Powe	Note 3	20.5	20.0			3.0 dBm	0.002 W		
Output Power (	(dRm) Note 1	12.3	12.3			15.3 dBm	0.002 VV	30.0 dBm	1.000 W
Antenna Gain (		3.2	3.2			13.3 dbiii	3.2 dBi	30.0 dDill	1.000 44
eirp (dBm) Note	2	15.5	15.5			18.5 dBm	0.071 W	Pa	SS
onp (abin)		10.0	10.0			10.0 dBiii	0.071 **		
802.11 n	40MHz 2452 MHz	Chain 1	Chain 2	Chain 3	(Chain 4)	Tatal Assass	All Chains	Lia	-:4
Power Setting <sup>N</sup>	Note 3	20.5	22.0			Total Across	S All Chains	Lin	III.
Average Powe	Note 3					3.0 dBm	0.002 W		
Output Power (	(dBm) Note 1	6.5	6.7			9.6 dBm	0.009 W	30.0 dBm	1.000 W
Antenna Gain (	(dBi) Note 2	3.2	3.2				3.2 dBi	Pa	ss
eirp (dBm) <sup>Note</sup>	2	9.7	9.9			12.8 dBm	0.019 W	1 0	
Note 1: av	utput power measured veraging on (transmitted quivalent to method 1 o	d signal was f DA-02-2138	continuous) BA1 for U-NI	and power in I devices). S	tegration ove	r 100 MHz (d becomes -30	option #2, medBc.	ethod 1 in KD	B 558074,
the	s there is no coherency e eirp divide by the sur	n of the powe	er on each c	hain.					ain equals
Note 3: Po	ower setting and avera	ge power are	for reference	e only. Aver	age power m	easured usin	g average po	ower sensor.	



Elliott An MAS company	EMC Test Dat
Client: Intel Corporation	Job Number: J80398
Madel Intel® Centrine® Advanced N 6220	T-Log Number: T80759
Model: Intel® Centrino® Advanced-N 6230	Account Manager: Christine Krebill
Contact: Steve Hackett	

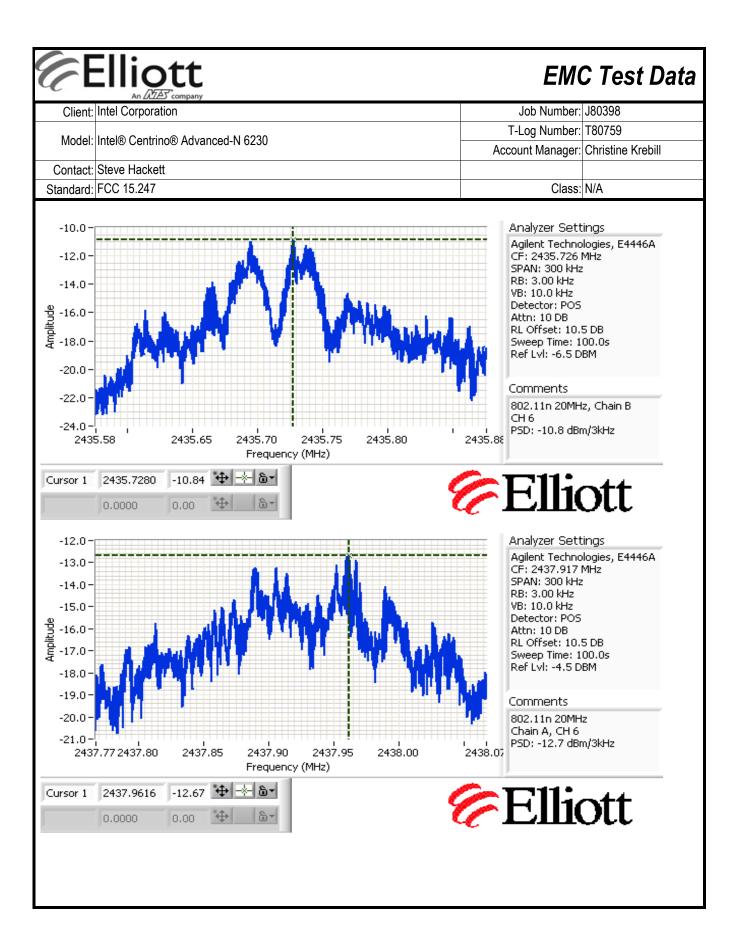
Class: N/A

#### Run #2: Power spectral Density

Standard: FCC 15.247

Power	Fraguency (MUz)		PSI	D (dBm/3kHz) Note 1		Limit	Result
Setting	Frequency (MHz)	Chain 1	Chain 2	Cham X X Cham X	Total	dBm/3kHz	Result
802.11n 20N	VIHz						
26.0/27.5	2412	-12.6	-11.5		-9.0	8.0	Pass
28.0/ 29.0	2437	-12.7	-10.8		-8.6	8.0	Pass
25.5/ 26.0	2467	-14.0	-13.2		-10.6	8.0	Pass
802.11n 40N	VIHz						
21.5/ 22.5	2422	-18.6	-19.3		-15.9	8.0	Pass
26.5/ 28.0	2437	-13.7	-13.9		-10.8	8.0	Pass
20.5/ 22.0	2452	-19.5	-19.5		-16.5	8.0	Pass

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.



	Elliott An ATAS company	EMO	C Test Data
	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
wodei.	IIItel® Certifillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions - Chain A

#### 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: 9/29/2010 Config. Used: Modular Test Engineer: John Caizzi/R. Varelas Config Change: none Test Location: FT Chamber #7 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: 22.4 °C Rel. Humidity: 42 %

#### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run#	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
						802.11a: 27.3 mW
1	30	16.5	Output Power	15.247(b)	Pass	n20: 29.4 mW
						n40: 95.5 mW
						802.11a:-8.1dBm/3kHz
2	29	16.5	Power spectral Density (PSD)	15.247(d)	Pass	n20: -7.9 dBm/3kHz
						n40: -10.3 dBm/3kHz
3	28.5	16.5	Minimum 6dB Bandwidth	15.247(a)	Pass	16.4 MHz
						802.11a: 17.22 MHz
3	30.5	16.5	99% Bandwidth	RSS GEN	-	n20: 18.39 MHz
						n40: 38.8 MHz
4	_	16.5	Spurious emissions	15.247(b)	Pass	All Emissions below the
-		10.0	opanicae officialities	10.217(0)	1 000	limit

#### 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.

## Elliott

#### **EMC Test Data**

	All DOZES Company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
woder.	Intel® Centino® Advanced-IV 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #1: Output Power

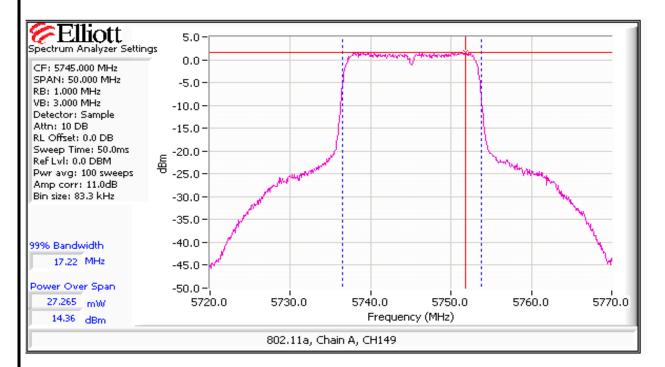
#### 802.11a Mode

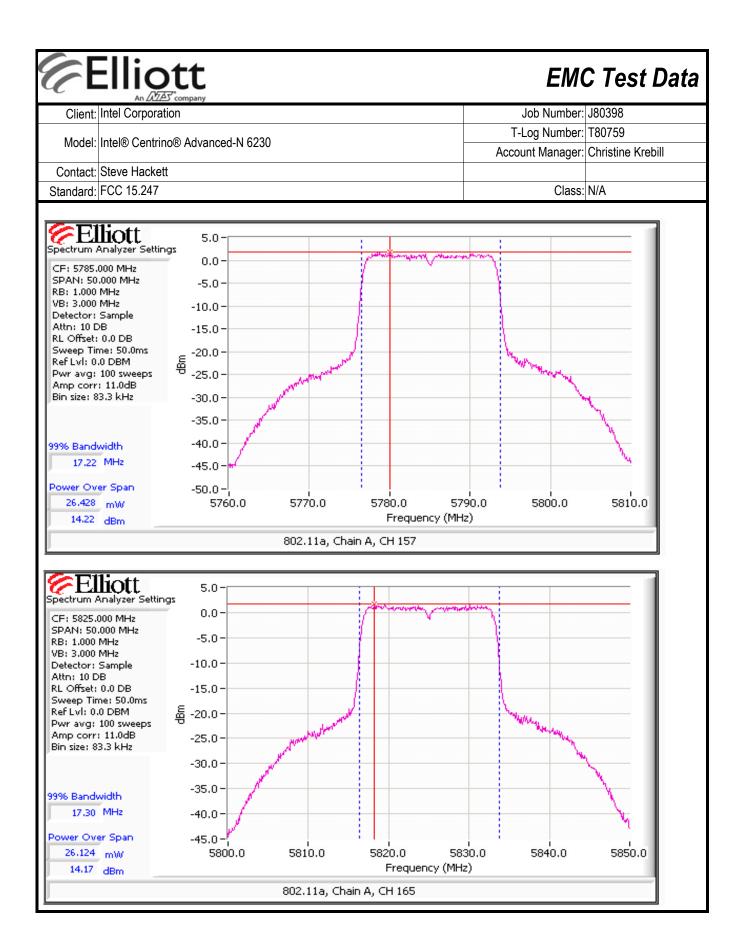
Power	Fragues ov (MHz)	Output	Power	Antenna	Dogult	EIRP	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
28.5	5745	14.4	27.3	5.0	Pass	19.4	0.086	16.5	44.7
28.5	5785	14.2	26.4	5.0	Pass	19.2	0.084	16.5	44.7
29.0	5825	14.2	26.1	5.0	Pass	19.2	0.083	16.5	44.7

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 50 **MHz** (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.





## Elliott

#### **EMC Test Data**

Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

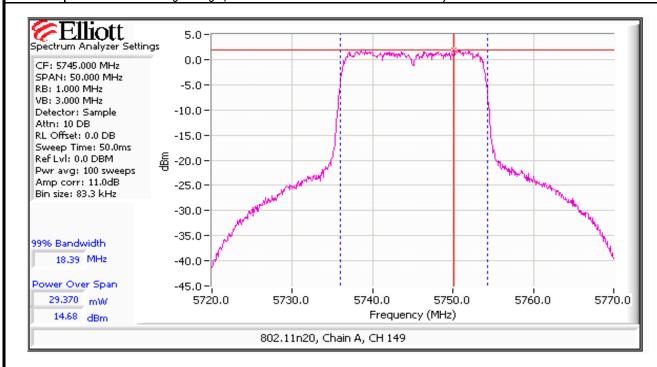
#### 802.11n 20MHz Mode

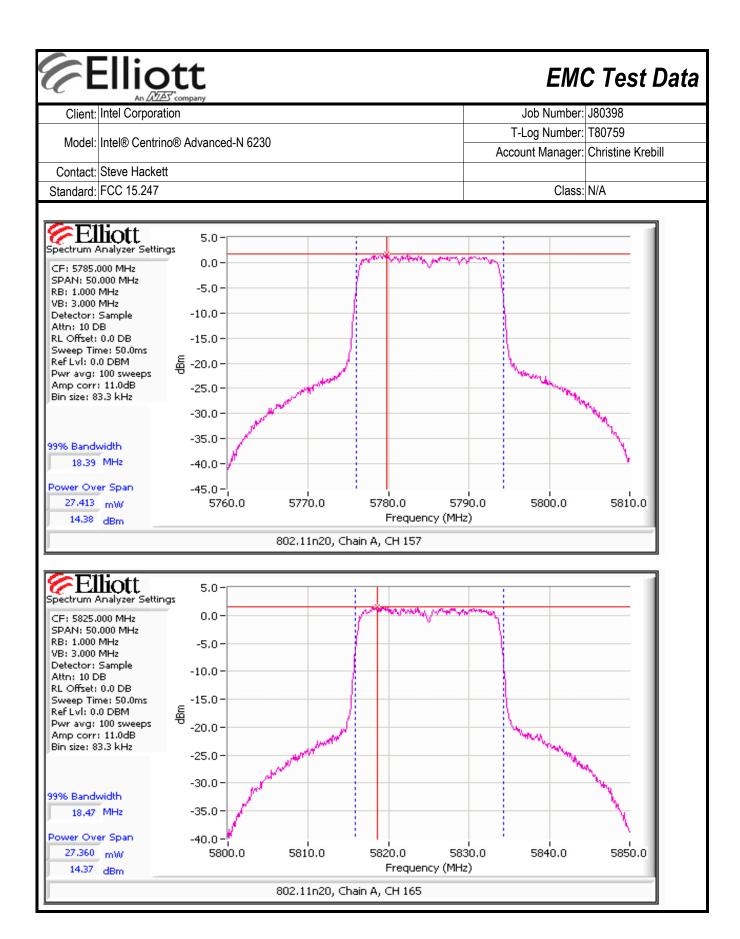
Power	Frequency (MHz)	Output	Power	Antenna	Dogult	EIRF	Note 2	Output	Power
Setting <sup>2</sup>		(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
29.0	5745	14.7	29.4	5.0	Pass	19.7	0.093	16.6	45.7
29.0	5785	14.4	27.4	5.0	Pass	19.4	0.087	16.5	44.7
29.5	5825	14.4	27.4	5.0	Pass	19.4	0.086	16.5	44.7

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 50 **MHz** (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.





	Intel Corporation						Job Number	180398	
							Log Number		
Model:	Intel® Centrino® Advance	ed-N 6230					-	: Christine Kre	ebill
Contact:	Steve Hackett								
Standard:	FCC 15.247						Class	: N/A	
2.11n 40i	MHz Mode								
Power		Output	Power	Antenna	Decult	EIRF	Note 2	Output	Power
Setting <sup>2</sup>	Frequency (MHz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) 3	mW
30.0	5755	19.8	95.5	5.0	Pass	24.8	0.302	16.5	44.7
30.5	5795	19.6	91.2	5.0	Pass	24.6	0.288	16.5	44.7
Note 1:	Output power measured	using a pool-	nower met	or enurious lin	nit is _20dPa				
Note 1:	Power setting - the softw						nlv		
Note 3:	Power measured using a						шу.		

## Client: Intel Corporation

#### **EMC Test Data**

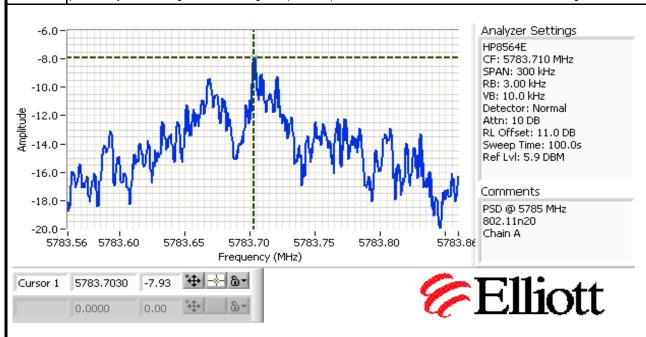
	All Bazz Stormpuny		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
woder.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #2: Power spectral Density

Mode	Power Setting	Frequency (MHz)	PSD (dBm/3kHz) <sup>Note 1</sup>	Limit dBm/3kHz	Result
	28.5	5745	-9.3	8.0	Pass
802.11a	28.5	5785	-8.9	8.0	Pass
	29	5825	-8.1	8.0	Pass
802.11n	29	5745	-10.6	8.0	Pass
20MHz	29	5785	-7.9	8.0	Pass
ZUIVII IZ	29.5	5825	-8.6	8.0	Pass
802.11n	30	5755	-10.3	8.0	Pass
40MHz	30.5	5795	-13.6	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.



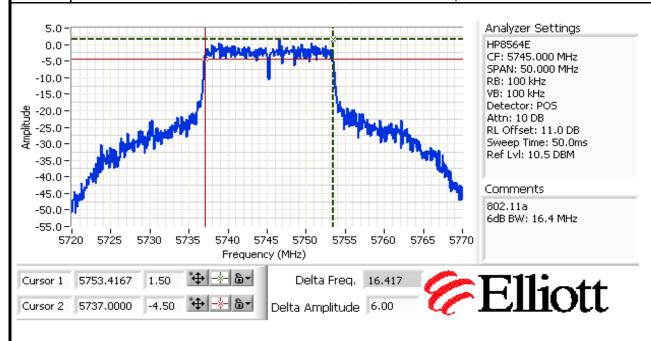


	An ZAZZZ company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #3: Signal Bandwidth

Mode	Power	Frequency (MHz)	Resolution	Bandwid	th (MHz)
	Setting	riequency (Minz)	Bandwidth	6dB	99%
	28.5	5745	100kHz	16.4	17.2
802.11a	28.5	5785	100kHz	16.4	17.2
	29.0	5825	100kHz	16.5	17.3
802.11n	29.0	5745	100kHz	17.7	18.4
20MHz	29.0	5785	100kHz	17.8	18.4
ZUIVII IZ	29.5	5825	100kHz	17.3	18.5
802.11n	30.0	5755	100kHz	35.7	37.3
40MHz	30.5	5795	100kHz	36.2	38.8

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



## Client: Intel Corporation

#### **EMC Test Data**

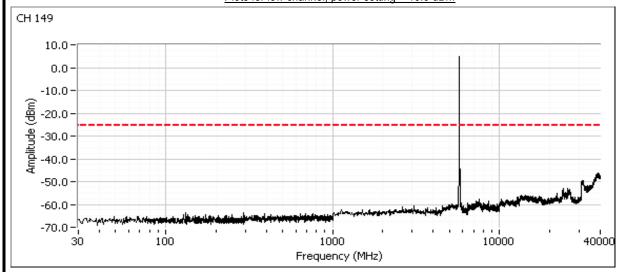
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #4: Out of Band Spurious Emissions

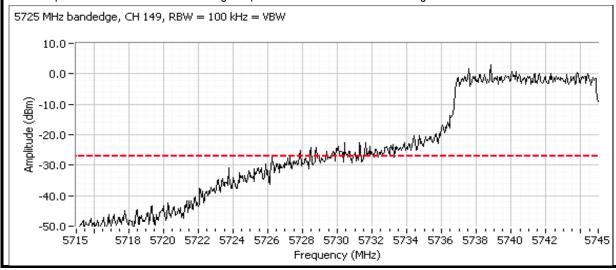
802.11a Mode

Frequency (MHz)	Limit	Result
5745	-30dBc	Pass
5785	-30dBc	Pass
5825	-30dBc	Pass

#### Plots for low channel, power setting = 16.5 dBm

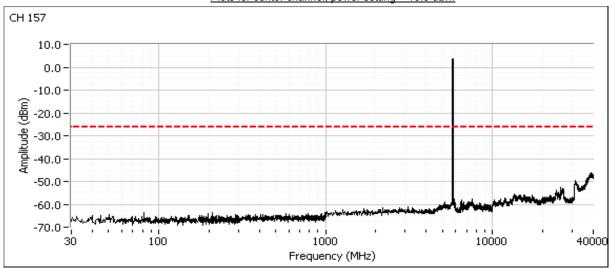


Additional plot from 5715 - 5755 MHz showing compliance with -30dBc at the band edge.

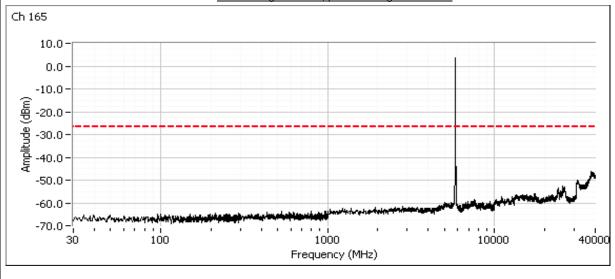


EMC Test D		C Test Data	
	Intel Corporation	Job Number:	J80398
Madalı	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A
Otandard.	100 10.211	Oldoo.	1477

#### Plots for center channel, power setting = 16.5 dBm

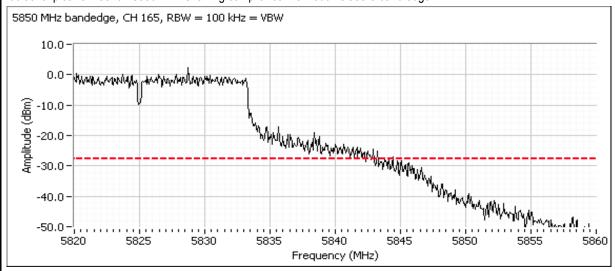


#### Plots for high channel, power setting = 16.5 dBm



Elliott An OVER company		ЕМО	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Contrinc® Advanced N CO2O	T-Log Number:	T80759
wodei.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Additional plot from 5820 - 5860 MHz showing compliance with -30dBc at the band edge.

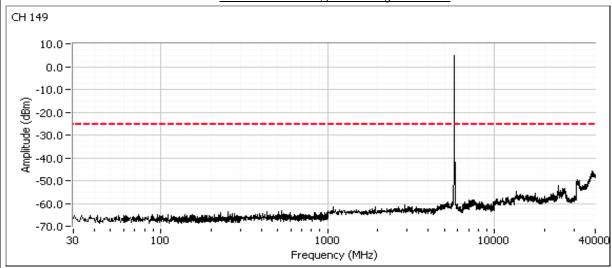


# Client: Intel Corporation Model: Intel® Centrino® Advanced-N 6230 Contact: Steve Hackett Standard: FCC 15.247 EMC Test Data Job Number: J80398 T-Log Number: T80759 Account Manager: Christine Krebill Class: N/A

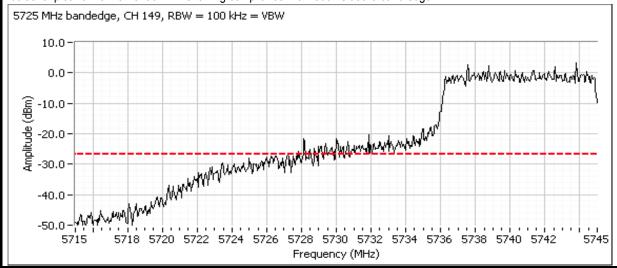
#### 802.11n 20MHz Mode

Frequency (MHz)	Limit	Result
5745	-30dBc	Pass
5785	-30dBc	Pass
5825	-30dBc	Pass

#### Plots for low channel, power setting = 16.6 dBm

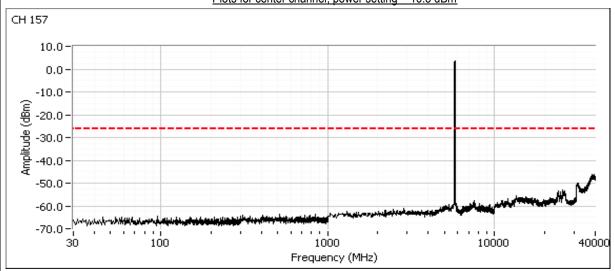


Additional plot from 5715 - 5755 MHz showing compliance with -30dBc at the band edge.

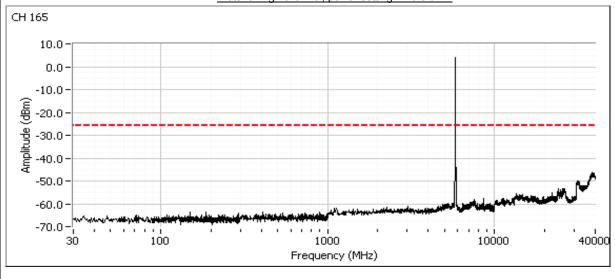


EMC Test		C Test Data	
	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
wodei.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Plots for center channel, power setting = 16.5 dBm

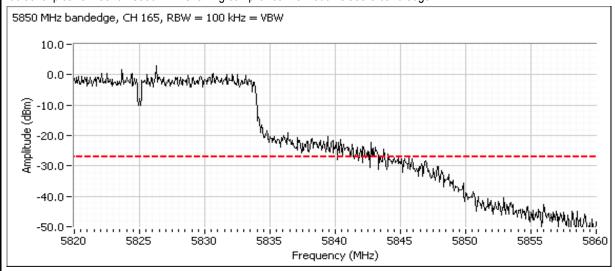


#### Plots for high channel, power setting = 16.5 dBm



Elliott An AND Company		EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Additional plot from 5820 - 5860 MHz showing compliance with -30dBc at the band edge.

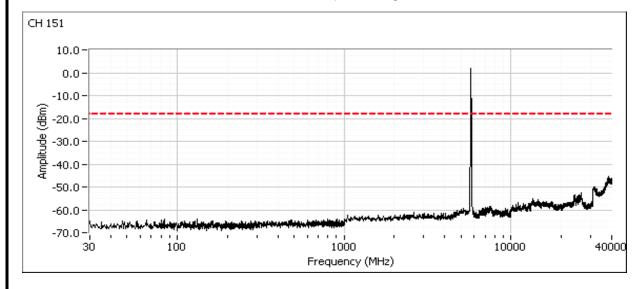


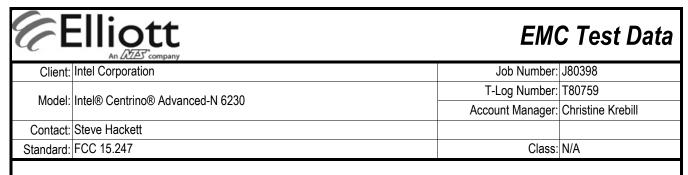
EMC Tes		C Test Data	
	Intel Corporation	Job Number:	J80398
Madal	Intel® Continue Advanced N 6220	T-Log Number:	T80759
Model.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### 802.11n 40MHz Mode

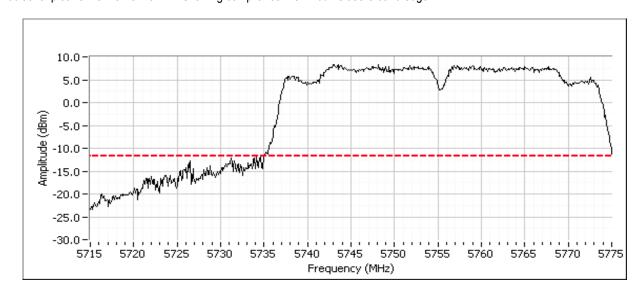
Frequency (MHz)	Limit	Result
5795	-20dBc	Pass
5755	-20dBc	Pass

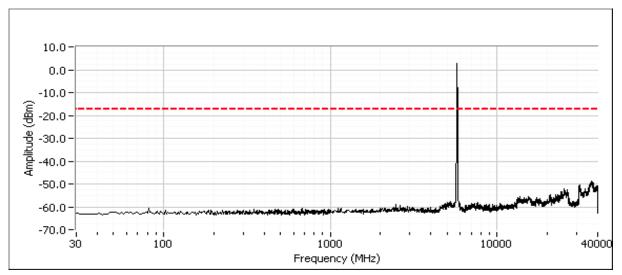
#### Plots for low channel, power setting = 16.5 dBm





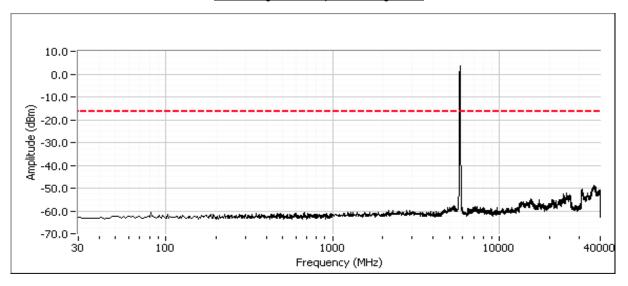
Additional plot from 5715 - 5775 MHz showing compliance with -20dBc at the band edge.



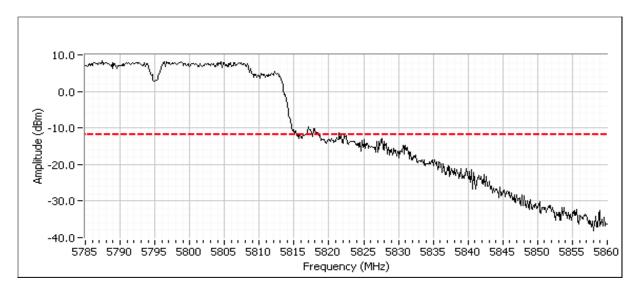


EMC Test		C Test Data	
Client:	Intel Corporation	Job Number:	J80398
Madalı	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard: FCC 15.247		Class:	N/A
Standard. 1 00 10.247			

#### Plots for high channel, power setting = 16.5



Additional plot from 5785 - 5860 MHz showing compliance with -20dBc at the band edge.



	Eliott An 必否。company	EMC Test Data			
Client:	Intel Corporation	Job Number:	J80398		
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759		
wodei.	Intel® Centino® Advanced-in 6230	Account Manager:	Christine Krebill		
Contact:	Steve Hackett				
Standard:	FCC 15.247	Class:	N/A		

#### RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions - Chain B

#### 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: 9/29/2010 Config. Used: 1 Test Engineer: Rafael Varelas Config Change: none Test Location: FT Chamber #5 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: 22.4 °C Rel. Humidity: 42 %

#### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run#	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin		
						802.11a: 39.8 mW		
1	30	16.6	Output Power	15.247(b)	Pass	n20: 39.8 mW		
						n40: 102 mW		
						802.11a:-7.7dBm/3kHz		
2	29	16.7	Power spectral Density (PSD)	15.247(d)	Pass	n20: -7.7dBm/3kHz		
						n40: -8.2dBm/3kHz		
3	29	16.6	Minimum 6dB Bandwidth	15.247(a)	Pass	16.3 MHz		
						802.11a: 17.6 MHz		
3	30	16.6	99% Bandwidth	RSS GEN	-	n20: 18.7 MHz		
						n40: 37.8 MHz		
1	_	_	Spurious emissions	15.247(b)	Pass	All emissions below the		
4	_	-		10.247(0)	1 433	limit		

#### Modifications Made During Testing

No modifications were made to the EUT during testing

## Elliott

#### **EMC Test Data**

Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### **Deviations From The Standard**

No deviations were made from the requirements of the standard.

#### Run #1: Output Power

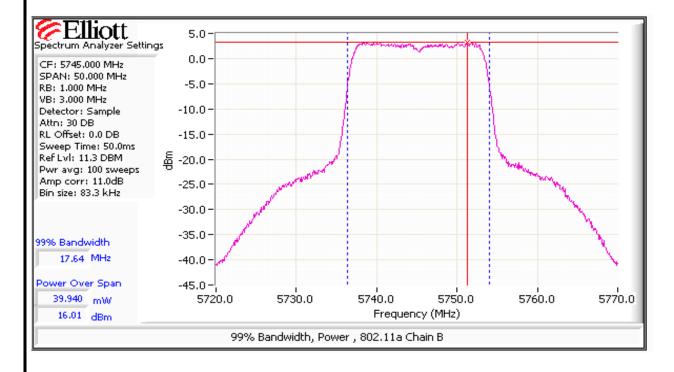
#### 802.11a Mode

Power	Frequency (MHz)	Output	Power	Antenna	Dogult	EIRF	Note 2	Output	Power
Setting <sup>2</sup>		(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
29	5745	16.0	39.8	5.0	Pass	21.0	0.126	16.7	46.8
29	5785	15.9	38.9	5.0	Pass	20.9	0.123	16.7	46.8
29	5825	15.9	38.9	5.0	Pass	20.9	0.123	16.6	45.7

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 **50 MHz** (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.



## Elliott

#### **EMC Test Data**

Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	IIILEI® Ceritiiio® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

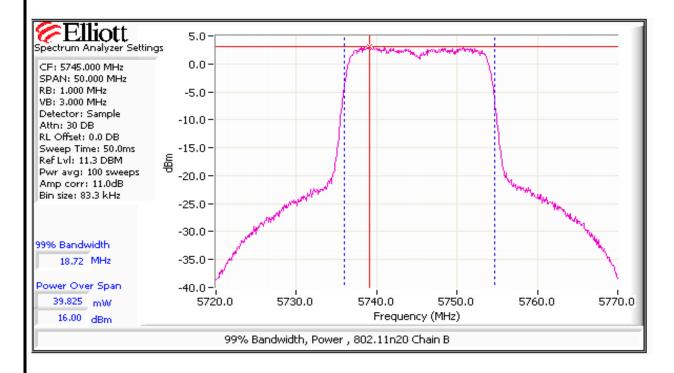
#### 802.11n 20MHz Mode

Power	Frequency (MHz)	Output	Power	Antenna	Result	EIRF	Note 2	Output	Power
Setting <sup>2</sup>		(dBm) <sup>1</sup>	mW	Gain (dBi)	Result	dBm	W	(dBm) <sup>3</sup>	mW
29	5745	16.0	39.8	5.0	Pass	21.0	0.126	16.7	46.8
29	5785	15.9	38.9	5.0	Pass	20.9	0.123	16.6	45.7
29	5825	15.9	38.9	5.0	Pass	20.9	0.123	16.6	45.7

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 **50 MHz** (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.



Elliott An ANDES company							EMO	C Test	Data
	Intel Corporation					,	Job Number:	J80398	
Madal	Intel® Contrinc® Advance	N 6000				T-l	_og Number:	T80759	
Model:	Intel® Centrino® Advanced-N 6230					Accou	ınt Manager:	Christine Kre	ebill
Contact:	t: Steve Hackett								
Standard:	FCC 15.247					Class: N/A			
802.11n 40l	MHz Mode						. Note 2		
Power	Frequency (MHz)	Output	Power	Antenna	Result	EIRF	Note 2	Output	Power
Setting <sup>2</sup>	1 requeries (ivii iz)	(dBm) <sup>1</sup>	mW	Gain (dBi)	rtocait	dBm	W	(dBm) <sup>3</sup>	mW
30	5755	20.1	102.3	5.0	Pass	25.1	0.324	16.6	45.7
30	5795	20.1	102.3	5.0	Pass	25.1	0.324	16.6	45.7

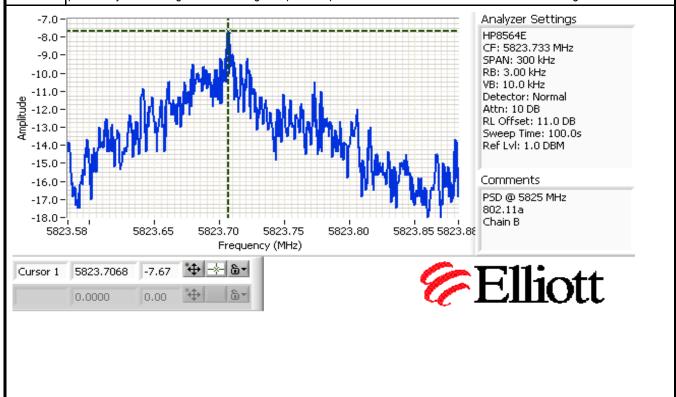
Note 1:	Output power measured using a peak power meter, spurious limit is <b>-20dBc</b> .
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measured using average power meter and is included for reference only.

	Eliott An MZES company	EMC Test Data		
Client:	Intel Corporation	Job Number:	J80398	
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759	
Model.	IIILENS CETILITION AUVAITCEU-IN 0230	Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### Run #2: Power spectral Density

Mode	Power	Frequency (MHz)	PSD	Limit	Result
	Setting	riequelicy (Minz)	(dBm/3kHz) Note 1	dBm/3kHz	Result
	29	5745	-9.2	8.0	Pass
802.11a	29	5785	-9.5	8.0	Pass
	29	5825	-7.7	8.0	Pass
802.11n	29	5745	-10.7	8.0	Pass
20MHz	29	5785	-7.8	8.0	Pass
ZUIVII IZ	29	5825	-7.7	8.0	Pass
802.11n	30	5755	-8.2	8.0	Pass
40MHz	30	5795	-8.5	8.0	Pass

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.

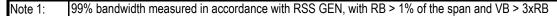


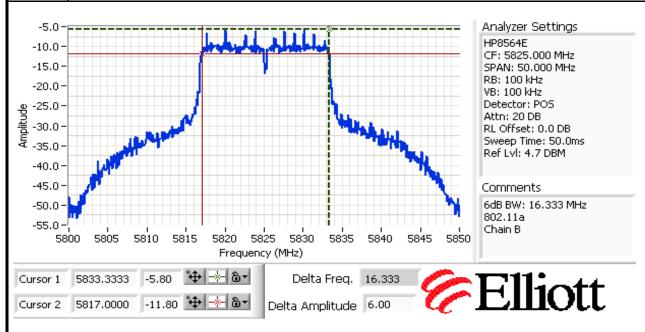


	An 2022 Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #3: Signal Bandwidth

Mode	Power Frequency (MHz) Reso		Resolution	Bandwid	th (MHz)
	Setting	riequency (Min2)	Bandwidth	6dB	99%
	29	5745	100kHz	16.5	17.6
802.11a	29	5785	100kHz	16.4	17.6
	29	5825	100kHz	16.3	17.6
802.11n	29	5745	100kHz	17.1	18.7
20MHz	29	5785	100kHz	17.4	18.7
ZUIVII IZ	29	5825	100kHz	17	18.6
802.11n	30	5755	100kHz	34	37.8
40MHz	30	5795	100kHz	35.2	37.4







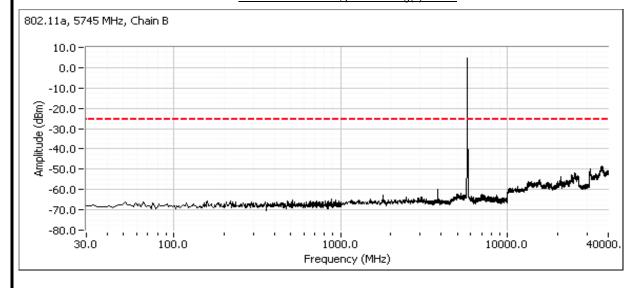
1	All Date Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run #4: Out of Band Spurious Emissions

802.11a Mode

Frequency (MHz)	Limit	Result
5745	-30dBc	Pass
5785	-30dBc	Pass
5825	-30dBc	Pass

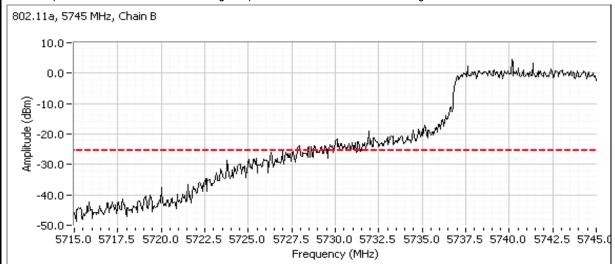
#### Plots for low channel, power setting(s) = 29.0



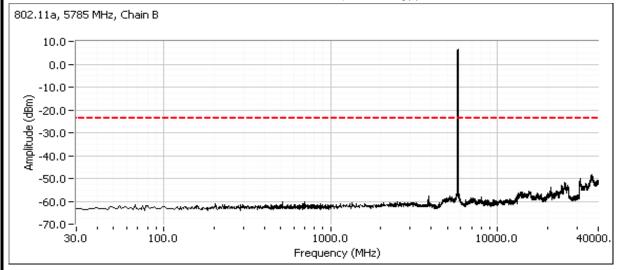


1	All Date Company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Additional plot from 5715 - 5755 MHz showing compliance with -30dBc at the band edge.

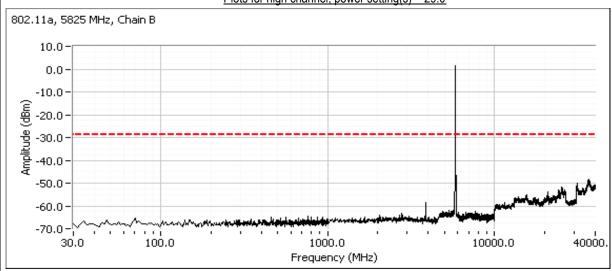


Plots for center channel, power setting(s) = 29.0

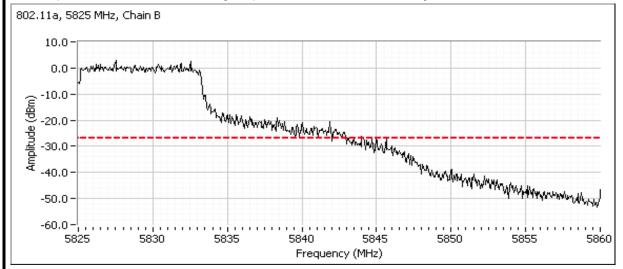


Elliott An AZAS company		ЕМО	EMC Test Data	
	Intel Corporation	Job Number:	J80398	
Model	Intel® Contrine® Advanced N 6220	T-Log Number:	T80759	
wodei.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

#### Plots for high channel, power setting(s) = 29.0



Additional plot from 5820 - 5860 MHz showing compliance with -30dBc at the band edge.



## Client: Intel Corporation Model: Intel® Centrino® Advance

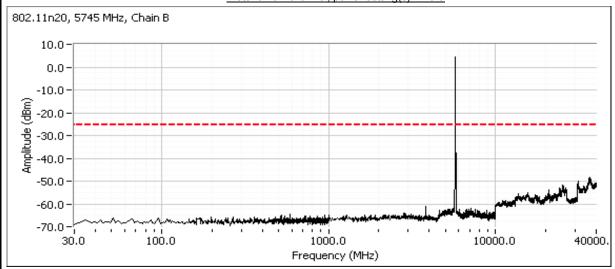
#### **EMC Test Data**

All Diff. Company			
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

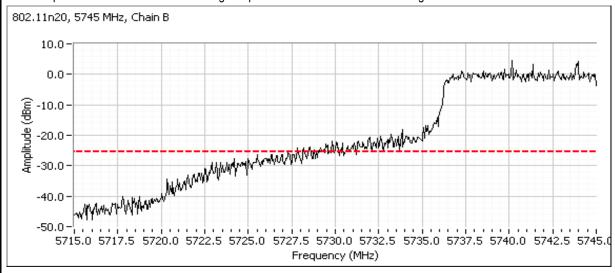
#### 802.11n 20MHz Mode

Frequency (MHz)	Limit	Result
5745	-30dBc	Pass
5785	-30dBc	Pass
5825	-30dBc	Pass

#### Plots for low channel, power setting(s) = 29.0

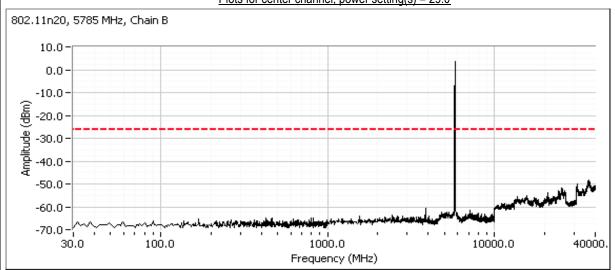


Additional plot from 5715 - 5755 MHz showing compliance with -30dBc at the band edge.

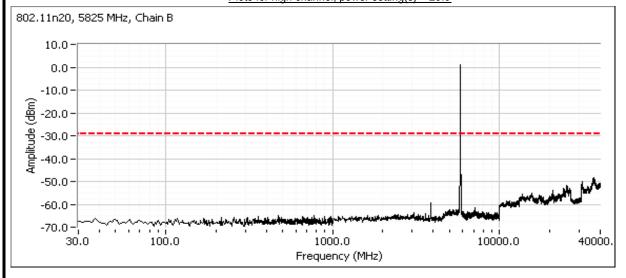


Contract of the second	Elliott An Miles company		EN	IC Test Date
		Intel Corporation	Job Numb	er: J80398
	Model:	Intel® Continue Advanced N C220	T-Log Numb	er: T80759
IVI		Intel® Centrino® Advanced-N 6230	Account Manag	er: Christine Krebill
Cor	ntact:	Steve Hackett		
Stan	dard:	FCC 15.247	Clas	s: N/A

#### Plots for center channel, power setting(s) = 29.0



#### Plots for high channel, power setting(s) = 29.0

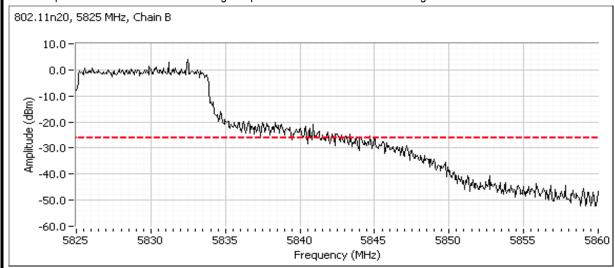


## Elliott An MAS company

#### **EMC** Test Data

All 2022 Company			
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

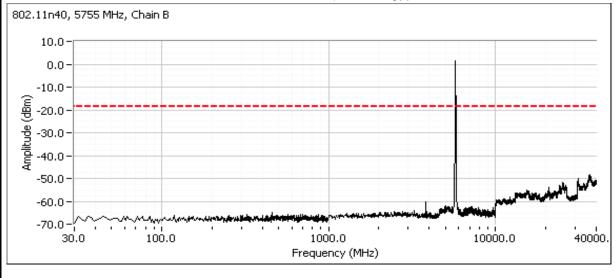
Additional plot from 5820 - 5860 MHz showing compliance with -30dBc at the band edge.



#### 802.11n 40MHz Mode

Frequency (MHz)	Limit	Result
5755	-20dBc	Pass
5795	-20dBc	Pass

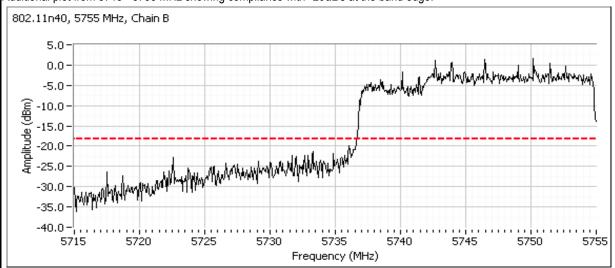
#### Plots for low channel, power setting(s) = 30.0



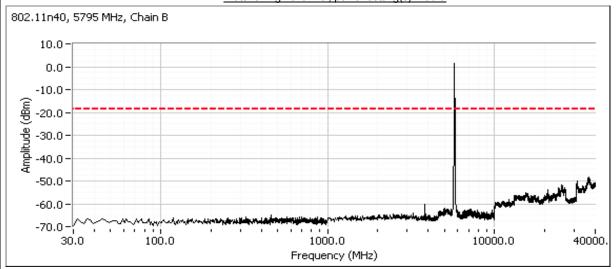


An 2022 Company			
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.		Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Additional plot from 5715 - 5755 MHz showing compliance with -20dBc at the band edge.

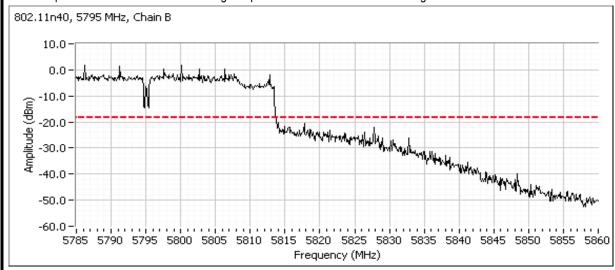


#### Plots for high channel, power setting(s) = 30.0



Elliott An AZAS company		ЕМО	EMC Test Data	
Client:	Intel Corporation	Job Number:	J80398	
Model	Intel® Contrinc® Advanced N 6220	T-Log Number:	T80759	
wodei.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill	
Contact:	Steve Hackett			
Standard:	FCC 15.247	Class:	N/A	

Additional plot from 5785 - 5860 MHz showing compliance with **-20dBc** at the band edge.



	An AZAS company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80759
Model.	Intel® Centillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

# RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements MIMO Antenna Systems - Chain A+B 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: 10/1/2010 Config. Used: 1 Test Engineer: David Bare Config Change: None Host Unit Voltage 120V/60Hz Test Location: Chamber 7

### **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: 22 °C Rel. Humidity: 41 %

#### Summary of Results

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 Driver version 14.0.0.39

Run#	Pwr setting	Avg Pwr	Test Performed Limit		Pass / Fail	Result / Margin		
Chain A + B								
1	See Below	See Below	Output Power, Average for n20, Peak for n40	15.247(b)	Pass	n20: 21 mW n40: 246 mW		
2	See Below	See Below	Power spectral Density (PSD)	15.247(d)	Pass	n20: -10.3 dBm/3kHz n40: -12.2. dBm/3kHz		
3			Minimum 6dB Bandwidth	15.247(a)		covered by		
3			99% Bandwidth	RSS GEN		single chain		
4			Spurious emissions	15.247(b)		Measurements		

### 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	Elliott  An AZAS company  Intel Corporation						lob Number:	J80398	
NA . 1 . 1		LN 0000				T-L	.og Number:	T80759	
Model: Intel® Centrino® Advanced-N 6230							nt Manager:	Christine Kre	ebill
Contact	: Steve Hackett								
Standard	: FCC 15.247						Class:	N/A	
	output Power - Chain A - Ope ansmitted signal on chain	erating Mode:							
802.11	1n 20MHz 5745 MHz	Chain 1	Chain 2	Chans	Chain 4	T 1 1 A	All Objective	1	. 11
ower Sett	ing <sup>Note 3</sup>	31.0	28.0			Total Acros	s All Chains	Lir	nit
verage po	ower <sup>Note 3</sup>	13.6	13.5						
utput Pow	ver (dBm) Note 1	10.4	10.2			13.3 dBm	0.021 W	30.0 dBm	1.000
ntenna Ga	ain (dBi) <sup>Note 2</sup>	5	5				5.0 dBi	Pa	ee
rp (dBm)	Note 2	15.4	15.2			18.3 dBm	0.068 W	T d	33
ower Setti verage po	ower <sup>Note 3</sup>	Chain 1 31.0 13.5	Chain 2 28.0 13.4	Chain 3	Chain 4	Total Across All Chains		Lir	nit
Output Power (dBm) Note 1		10.3	10.2			13.3 dBm	0.021 W	30.0 dBm	1.000
ntenna Ga	ain (dBi) Note 2	5	5				5.0 dBi	Pa	SS
irp (dBm)	Note 2	15.3	15.2			18.3 dBm	0.067 W		
802.11 ower Setti verage po	In 20MHz 5825 MHz ing Note 3	Chain 1 31.0 13.3	Chain 2 28.5 13.7	Chain 3	Chain 4	Total Acros	s All Chains	Lir	nit
utput Pow		10.2	10.4			13.3 dBm	0.021 W	30.0 dBm	1.000
	ain (dBi) <sup>Note 2</sup>	5	5			10.0 dBiii	5.0 dBi		
rp (dBm)	Note 2	15.2	15.4			18.3 dBm	0.068 W	Pa	SS
Note 1: Note 2: Note 3:	Output power measured averaging on (transmitte equivalent to method 1 As there is no coherence the eirp divide by the surplement of the eirp divide by the eirp divide by the eirp divide by the eirp divide by the surplement of the eirp divide by the eirp divide by the surplement of the eirp divide by the eir	ed signal was of DA-02-213 by between chain of the power age power are	continuous) BA1 for U-Ni ains the tota er on each c	and power in II devices). S II EIRP is the hain.	tegration over purious limit sum of the ir age power is	er <b>50 MHz</b> (o <sub>l</sub> becomes <b>-30</b> ndividual EIRF	otion #2, me d <b>Bc.</b> Ps and effect	thod 1 in KDE	3 558074 gain equa

Client: Intel	Liott  An Wild Company  Corporation						Job Number:	J80398	
						T-Log Number: T80759			
Model: Intel	Model: Intel® Centrino® Advanced-N 6230							Christine Kr	ebill
Contact: Stev									
Standard: FCC	15.247						Class:	N/A	
000 44 401	ALL 5755 MIL	Ob. 1. 4	010	ALIAHUHHHA				ı	
902.11n 40r Power Setting Note	MHz 5755 MHz	Chain 1 31.0	Chain 2 29.0	Chain 3	Chain 4	Total Acros	s All Chains	Lir	mit
verage power <sup>No</sup>	te 3	13.5	13.5						
verage power	Note 1	-	-			03 0 dD	0.046.10/	20 0 dD	1.000
Output Power (dE	3m)	21	20.8			23.9 dBm	0.246 W	30.0 dBm	1.000
Intenna Gain (dE	31) **** -	5	5			00.0 ID	5.0 dBi	Pa	iss
eirp (dBm) Note 2		26	25.8			28.9 dBm	0.778 W		
802.11n 40l	MHz 5795 MHz	Chain 1	Chain 2	Chans	(Chain 4)	T. (.) A	All OL C	ļ ,.	. 9
Power Setting Note	3	31.0	29.0			Total Acros	s All Chains	Limit	
verage power <sup>No</sup>	te 3	13.3	13.4						
Output Power (dE	Bm) Note 1	20.6	20.7			23.7 dBm	0.232 W	30.0 dBm	1.000
Antenna Gain (dE	3i) Note 2	5	5				5.0 dBi	_	
eirp (dBm) Note 2	3m) Note 2 25.6		25.7			28.7 dBm 0.735 W		Pa	ISS
		4		•					
Note 1: Outp	out power measured	using a peak	power meter	er, spurious li	mit is <b>-20dB</b> d	<b>)</b> .			
NIOTO 7'	nere is no coherency eirp divide by the sur				sum of the in	dividual EIRI	Ps and effect	ive antenna (	gain equa
NOTA 4.	er setting and avera or. Power setting is	• .		•	• .	the power m	easured usir	ng an averag	e power
Power	spectral Density	Chain 1	PSE Chain 2	O (dBm/3kHz)	Note 1	Total	Limit dBm/3kHz	Result	
302.11n 20MHz ı									
31 / 28	5745	-14.8	-15.2			-12.0	8.0	Pass	
31 / 28	5785	-12.7	-14.0			-10.3	8.0	Pass	
31 / 28.5	5825	-14.5	-14.8			-11.6	8.0	Pass	
02.11n 40MHz ı		45.5	40.7			40.0	0.0	ln	
31 / 29 31 / 29	5755	-15.5	-16.7			-13.0	8.0	Pass	
20 7 20 I	5795	-14.8	-15.7	HHHHHHHA	VIIIIIIIIIX	-12.2	8.0	Pass	

preliminary scans using RB=3kHz using multiple sweeps at a faster rate over the 6dB bandwidth of the signal.

Ellio Ellio	tt Frompany	El	MC Test Data
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
		Account Manager:	Christine Krebill
Contact:	Steve Hackett		-
Emissions Standard(s):	FCC 15.247	Class:	В
Immunity Standard(s):	-	Environment:	-

For The

# **Intel Corporation**

Model

Intel® Centrino® Advanced-N 6230

Date of Last Test: 10/6/2010

	Elliott An ATAS company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
wodei.	III.el® Celitiilo® Auvanceu-N 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

# RSS 210 and FCC 15.247 (DSS) Radiated Spurious Emissions 802.11bgn and Bluetooth - Transmitter Mode

#### **Test Specific Details**

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

#### **General Test Configuration**

The EUT was installed into a test fixture such that the EUT was exposed (i.e. outside of a host PC).

For conducted emissions testing the measurement antenna port.

#### Summary of Results

For Bluetooth: Tx is chain B, Rx is chain B. For WiFi, only Chain A is used for transmit in the 2.4GHz band, both chains used in 5GHz bands.

MAC Address: 00150079AD1A DRTU Tool Version 1.2.12-0197 New tool from 9/14 Driver version 14.0.0.39

		** 12 11 1 2 1 t			• · • · · · · · · · · · · · · · · · · ·		•			
Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin			
1	BT <b>1Mb/s</b> 802.11b	2402MHz 2412MHz	7dBm 16.5dBm	4.4 16.5		FCC 15.247	48.0dBµV/m @ 4824.0MHz (-6.0dB)			
2	BT <b>1Mb/s</b> 802.11b	2480MHz 2462MHz	7dBm 16.5dBm	5.3 16.6	Radiated Emissions	FCC 15.247	48.4dBµV/m @ 2360.0MHz (-5.6dB)			
3	BT <b>1Mb/s</b> 802.11g	2402MHz 2412MHz	7dBm 16.5dBm	4.4 16.3	1- 10 GHz	FCC 15.247	46.0dBµV/m @ 2281.9MHz (-8.0dB)			
4	BT <b>1Mb/s</b> 802.11g	2480MHz 2462MHz	7dBm 16.5dBm	5.3 16.9		FCC 15.247	46.6dBµV/m @ 2360.0MHz (-7.4dB)			
WiFi mode f	or the followi	ng runs base	d on worst c	ase mode fro	om runs 1 through 4					
5	BT <b>1Mb/s</b> 802.11b	2402MHz 2437MHz	7dBm 16.5dBm	4.3 16.6	Radiated Emissions	FCC 15.247	46.8dBµV/m @ 2282.0MHz (-7.2dB)			
6	BT <b>1Mb/s</b> 802.11b	2440MHz 2412MHz	7dBm 16.5dBm	5.4 16.5	1- 10 GHz	FCC 15.247	49.3dBµV/m @ 2320.0MHz (-4.7dB)			
7	BT <b>1Mb/s</b> 802.11b	2440MHz 2462MHz	7dBm 16.5dBm	5.4 16.6	Radiated Emissions	FCC 15.247	47.8dBµV/m @ 2320.0MHz (-6.2dB)			
8	BT <b>1Mb/s</b> 802.11b	2480MHz 2437MHz	7dBm 16.5dBm	5.1 16.6	1- 10 GHz	FCC 15.247	48.9dBµV/m @ 2360.0MHz (-5.1dB)			
WiFi mode a	and channel a	and Bluetootl	h channel ba	sed on the w	orst case mode from runs	1 through 8				
9	BT <b>3Mb/s</b> 802.11b	2440 MHz 2412 MHz	7dBm 16.5dBm	1.4 16.5	Radiated Emissions 1- 10 GHz	FCC 15.247	46.4dBµV/m @ 2383.9MHz (-7.6dB)			
	_									



Client:	Intel Corporation	Job Number:	J80398
Madal	1,100,110,001	T-Log Number:	T80540
Model:	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

WiFi mode - 802.11n 20MHz with both chains active at 16.5dBm per chain, center channel in each 5GHz band. Bluetooth on center channel, 1Mb/s mode

Run#	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
10	BT <b>1Mb/s</b> 802.11n20	2440MHz 5200MHz	7dBm 16.5/16.5	5.4 16.6/16.7		FCC 15.247	41.9dBµV/m @ 2280.0MHz (-12.1dB)
11	BT <b>1Mb/s</b> 802.11n20	2440MHz 5300MHz	7dBm 16.5/16.5	5.4 16.7/16.5	Radiated Emissions	FCC 15.247	37.2dBµV/m @ 10600.0MHz (-16.8dB)
12	BT <b>1Mb/s</b> 802.11n20	2440MHz 5600MHz	7dBm 16.5/16.5	5.4 16.5/16.5	1- 15 GHz	FCC 15.247	45.1dBµV/m @ 11199.8MHz (-8.9dB)
13	BT <b>1Mb/s</b> 802.11n20	2440MHz 5785MHz	7dBm 16.5/16.5	5.4 16.5/16.7		FCC 15.247	44.7dBµV/m @ 11570.7MHz (-9.3dB)

## 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.

#### Notes:

Bluetooth uses a frequency hopping algorithm that means that the device, during normal operation, is only on a specific channel for a short period of time. The average correction factor is calculated as follows:

A maximum length packet has a duration of 5 time slots.

The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.

With a minimum of 20 hopping channels a channel will not be used more than 4 times in any 100ms period.

The maximum dwell time in a 100ms period is 4 x 3.125ms = 12.5ms.

The average correction factor is, therefore, 20log(12.5/100) =-18dB

As this is a hopping radio the correction factor can be applied to the average value of the signal provided the average value was measured with the device continuously transmitting. DA 00-0705 permits the use of the average correction on the **measured average** value for frequency hopping radios.

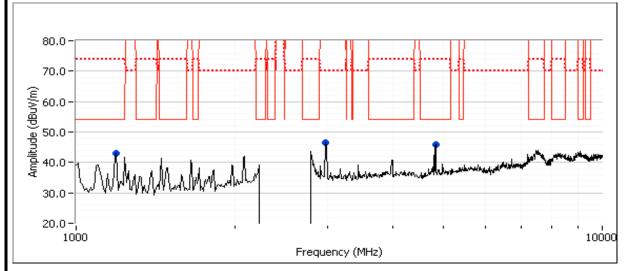
All measurements in this data sheet do not include the average correction factor.

	Eliott An ATAS company	EMO	C Test Data
	Intel Corporation	Job Number:	J80398
Madalı	Intol® Contrinc® Advanced N 6220	T-Log Number:	T80540
woder.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

# Run # 1, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2412 MHz Chain A, BT Basic Rate @ 2402 MHz Chain B

	Power Settings						
	Software Setting						
Chain A	16.5	16.5	24.5				
Chain B	7.0	4.4	8.0				

### Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band:



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4822.500	46.0	V	54.0	-8.0	Peak	154	1.0	
1192.500	42.9	V	54.0	-11.1	Peak	82	1.5	
2980.000	46.4	V	70.0	-23.6	Peak	154	1.0	

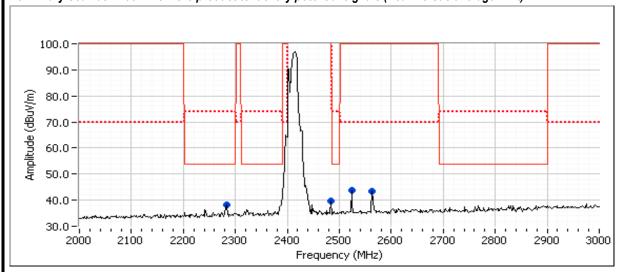
Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4824.000	48.0	V	54.0	-6.0	AVG	153	1.16	
4823.900	50.8	V	74.0	-23.2	PK	153	1.16	
1192.530	42.9	V	54.0	-11.1	AVG	92	1.64	
1192.550	45.6	V	74.0	-28.4	PK	92	1.64	



	An ZAZZES company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2283.330	38.3	Н	54.0	-15.7	Peak	321	1.0	
2483.330	39.8	Н	120.0	-80.2	Peak	4	1.0	In band
2523.330	43.6	Н	70.0	-26.4	Peak	0	1.0	Non-restricted band
2563.330	43.4	Н	70.0	-26.6	Peak	212	1.0	Non-restricted band

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2281.900	46.0	Н	54.0	-8.0	AVG	69	2.18	Note 2
2282.130	55.6	Н	74.0	-18.4	PK	69	2.18	Note 2

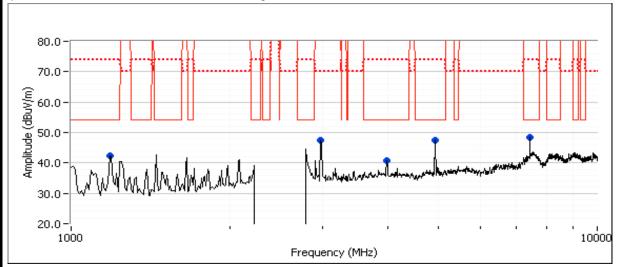
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak
	measurements in a measurement bandwidth of 100kHz.
Note 2:	Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

E E	liott An 必否*company	ЕМО	C Test Data
	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
woder.	IIILEI® CEIILIIIO® Auvanced-N 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run # 2, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2462 MHz Chain A, BT Basic Rate @ 2480 MHz Chain B

	Power Settings								
	Target (dBm)	Measured (dBm)	Software Setting						
Chain A	16.5	16.6	23.5						
Chain B	7.0	5.3	8.0						

## Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band:



#### Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7439.170	48.3	V	54.0	-5.7	Peak	167	2.0	
4914.170	47.5	V	54.0	-6.5	Peak	209	2.5	
1183.330	42.3	V	54.0	-11.7	Peak	97	2.0	
3979.170	40.8	V	54.0	-13.2	Peak	146	1.0	
2980.000	47.4	V	70.0	-22.6	Peak	153	1.0	

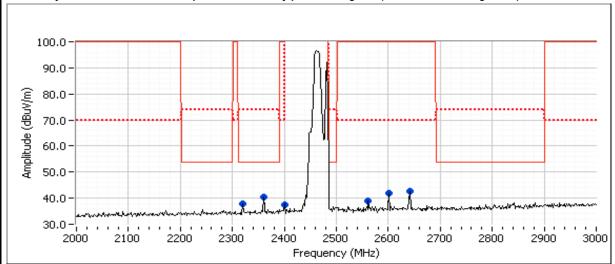
· mai moao	That modern one at one									
Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
4924.000	46.8	V	54.0	-7.2	AVG	212	2.48			
7439.940	46.5	V	54.0	-7.5	AVG	166	2.00			
4923.890	50.0	V	74.0	-24.0	PK	212	2.48			
7440.500	53.1	V	74.0	-20.9	PK	166	2.00			



	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2320.000	37.9	Н	54.0	-16.1	Peak	185	1.0	
2360.000	40.3	Н	54.0	-13.7	Peak	338	1.0	
2400.000	37.4	Н	70.0	-32.6	Peak	352	1.0	Non-restricted band
2561.670	39.1	Н	70.0	-30.9	Peak	75	1.0	Non-restricted band
2601.670	42.1	Н	70.0	-27.9	Peak	144	1.0	Non-restricted band
2641.670	42.5	Н	70.0	-27.5	Peak	147	1.0	Non-restricted band

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2320.070	46.3	Н	54.0	-7.7	AVG	345	1.25	Note 2
2319.830	56.6	Н	74.0	-17.4	PK	345	1.25	Note 2
2360.020	48.4	Н	54.0	-5.6	AVG	70	1.27	Note 2
2360.000	57.2	Н	74.0	-16.8	PK	70	1.27	Note 2

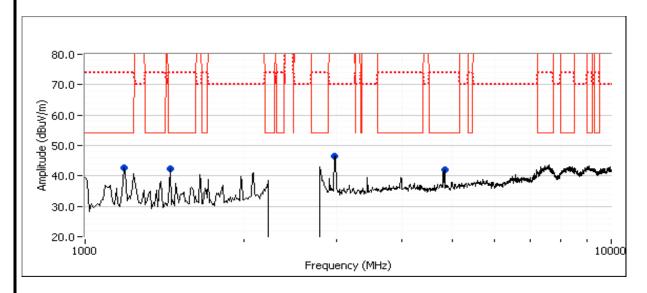
Note 1: For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak measurements in a measurement bandwidth of 100kHz.

Note 2: Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

	Elliott An AZES company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIILEI® CEIILIIIO® Advanced-N 0230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Run # 3, Rainbow Peak 2x2: 1-10GHz, 802.11g @ 2412 MHz Chain A, BT Basic Rate @ 2402 MHz Chain B Spurious Radiated Emi<u>ssions,</u> 1 - 10GHz excluding the allocated band:

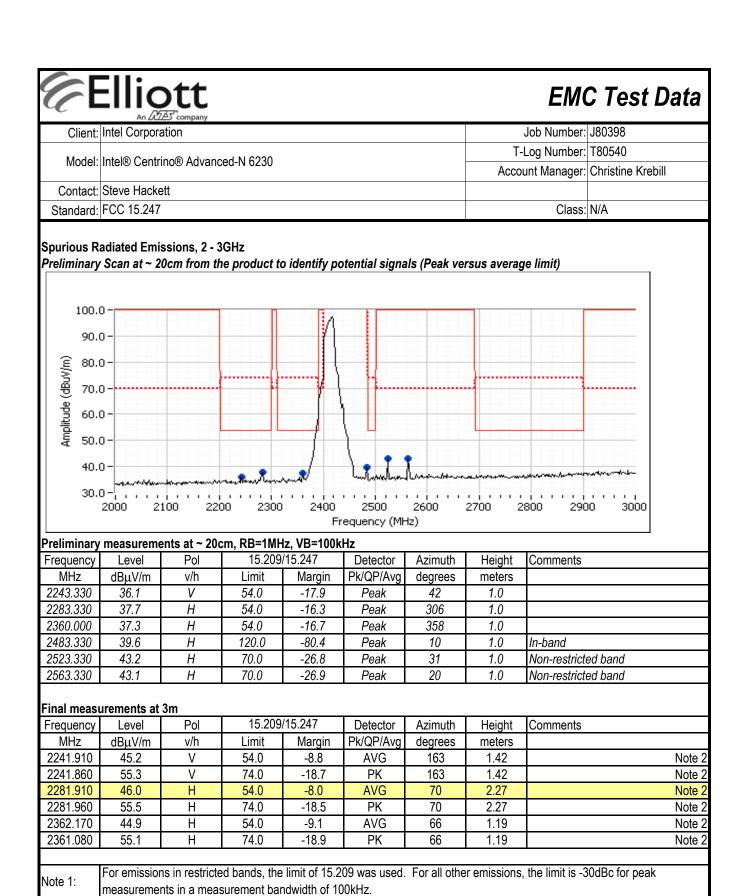
	_	Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.3	31.0
Chain B	7.0	4.4	8.0



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1183.330	42.8	V	54.0	-11.2	Peak	102	2.0	
1449.170	42.5	Н	54.0	-11.5	Peak	138	1.5	
4822.500	42.1	V	54.0	-11.9	Peak	283	2.0	
2980.000	46.4	V	70.0	-23.6	Peak	153	1.0	

Frequency	Level	Pol	15.209	15.209/15.247		Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1457.590	43.2	Н	54.0	-10.8	AVG	132	1.33	
1457.600	45.4	Н	74.0	-28.6	PK	132	1.33	
1192.560	42.5	V	54.0	-11.5	AVG	89	1.99	
1192.600	44.8	V	74.0	-29.2	PK	89	1.99	
4823.900	40.7	V	54.0	-13.3	AVG	153	1.18	
4826.970	52.1	V	74.0	-21.9	PK	153	1.18	
4020.310	JZ. I	V	74.0	-21.3	110	100	1.10	1



Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

Note 2:

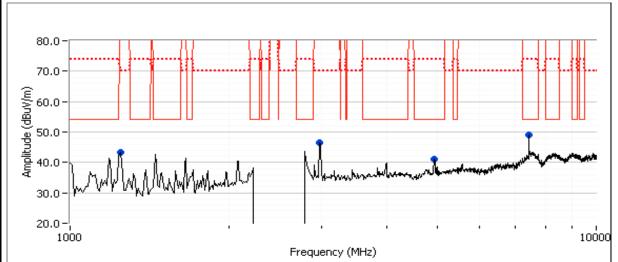


Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 4, Rainbow Peak 2x2: 1-10GHz, 802.11g @ 2462 MHz Chain A, BT Basic Rate @ 2480 MHz Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.9	29.5
Chain B	7.0	5.3	8.0

### Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band:



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7439.170	49.2	V	54.0	-4.8	Peak	174	1.5	
4923.330	41.1	V	54.0	-12.9	Peak	181	2.5	
2980.000	46.6	V	70.0	-23.4	Peak	160	1.0	
1247.500	43.4	Н	70.0	-26.6	Peak	152	1.5	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	15.209/15.247		Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7440.020	45.8	V	54.0	-8.2	AVG	178	1.52	
7439.570	52.7	V	74.0	-21.3	PK	178	1.52	

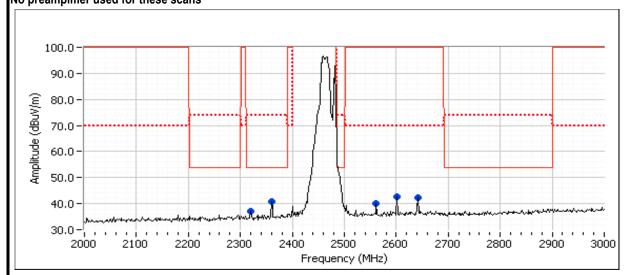
Note: 7440MHz is directly related to the Bluetooth signal and was observed during the Bluetooth only spurious measurements.



	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Woder.	IIILEI® Ceritiiio® Advanceu-iv 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)
No preamplifier used for these scans



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2320.000	37.2	Н	54.0	-16.8	Peak	317	1.0	
2360.000	40.7	Н	54.0	-13.3	Peak	347	1.0	
2561.670	39.9	Н	70.0	-30.1	Peak	205	1.0	Non-restricted band
2601.670	42.6	Н	70.0	-27.4	Peak	144	1.0	Non-restricted band
2641.670	42.4	Н	70.0	-27.6	Peak	173	1.0	Non-restricted band

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2324.470	44.5	Н	54.0	-9.5	AVG	236	1.0	
2360.040	46.6	Н	54.0	-7.4	AVG	326	1.0	
2323.600	57.6	Н	74.0	-16.4	PK	236	1.0	
2359.450	56.2	Н	74.0	-17.8	PK	326	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak
note 1.	measurements in a measurement bandwidth of 100kHz.

Note 2: Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

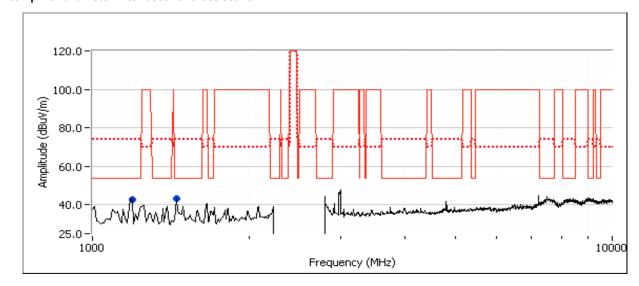
Note 3: Signal is present when Bluetooth is disabled (powered off)

	Elliott An ATAS company	EM	C Test Data
	Intel Corporation	Job Number:	J80398
Madalı	Intel® Contrine® Advanced N 6220	T-Log Number:	T80540
Model.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 5, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2437 MHz Chain A, BT Basic Rate @ 2402 MHz Chain B

	Power Settings								
	Target (dBm) Measured (dBm) Software Setting								
Chain A	16.5	16.6	23.5						
Chain B	7.0	4.3	8.0						

Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band: Preamplifier and notch filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1457.620	43.2	Н	54.0	-10.8	Peak	130	1.5	
1199.820	42.6	V	54.0	-11.4	Peak	96	2.0	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1200.140	40.1	V	54.0	-13.9	AVG	100	2.0	
1457.570	43.0	Н	54.0	-11.0	AVG	127	1.4	
1199.950	44.7	V	74.0	-29.3	PK	100	2.0	
1457.490	45.1	Н	74.0	-28.9	PK	127	1.4	

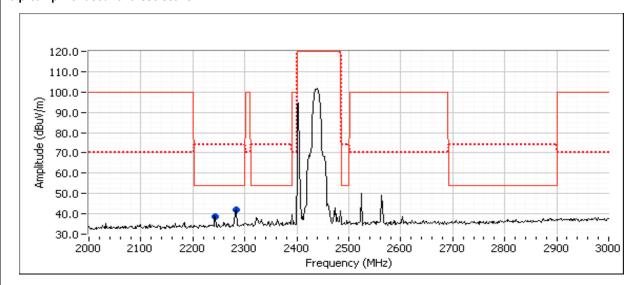
Note: 4804MHz is directly related to the Bluetooth signal and was observed during the Bluetooth only spurious measurements.



	An Z/Z/E3 company		
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit) No preamplifier used for these scans



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2283.330	41.8	V	54.0	-12.2	Peak	180	1.0	5
2243.330	38.7	V	54.0	-15.3	Peak	180	1.0	5

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2281.990	46.8	Н	54.0	-7.2	AVG	70	1.0	RB 1 MHz;VB 10 Hz;Pk
2282.150	56.7	Н	74.0	-17.3	PK	70	1.0	RB 1 MHz;VB 3 MHz;Pk
2242.060	46.7	Н	54.0	-7.3	AVG	68	1.0	RB 1 MHz;VB 10 Hz;Pk
2241.580	56.3	Н	74.0	-17.7	PK	68	1.0	RB 1 MHz;VB 3 MHz;Pk
2282.000	45.9	V	54.0	-8.1	AVG	105	1.2	RB 1 MHz;VB 10 Hz;Pk
2282.210	56.1	V	74.0	-17.9	PK	105	1.2	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
Note 1:	measurements in a measurement bandwidth of 100kHz.

Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied Note 2:

Signal is present when Bluetooth is disabled (powered off) Note 3:

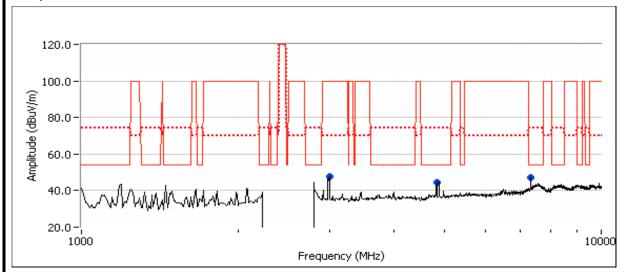
	Elliott An ATAS company	EM	C Test Data
	Intel Corporation	Job Number:	J80398
Madalı	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	Intel® Centino® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 6, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2412 MHz Chain A, BT Basic Rate @ 2440 MHz Chain B

		Power Settings							
	Target (dBm) Measured (dBm) Software Setting								
Chain A	16.5	16.5	23.5						
Chain B	7.0	5.4	8.0						

Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band:

Preamplifier and notch filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.330	47.9	V	70.0	-22.1	Peak	141	1.0	
4823.990	44.6	V	54.0	-9.4	Peak	149	1.0	
7316.670	47.1	V	54.0	-6.9	Peak	165	1.9	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4823.980	44.9	V	54.0	-9.1	AVG	149	1.3	RB 1 MHz;VB 10 Hz;Pk
4823.900	48.4	V	74.0	-25.6	PK	149	1.3	RB 1 MHz;VB 3 MHz;Pk
7319.940	43.6	V	54.0	-10.4	AVG	170	2.0	RB 1 MHz;VB 10 Hz;Pk
7319.350	51.4	V	74.0	-22.6	PK	170	2.0	RB 1 MHz;VB 3 MHz;Pk

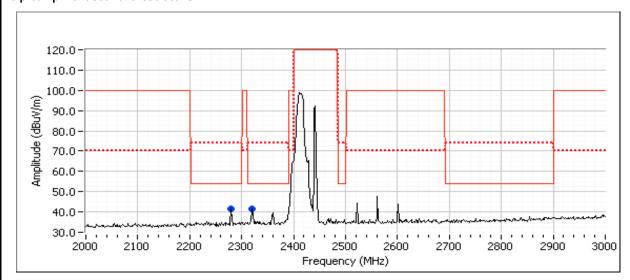
Note: 7320 MHz is directly related to the Bluetooth signal and was observed during the Bluetooth only spurio us measurements.



	An ZiZE3 company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)
No preamplifier used for these scans



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2320.000	40.1	-	54.0	-13.9	Peak	180	1.0	
2280.000	39.0	-	54.0	-15.0	Peak	180	1.0	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2319.970	49.3	Н	54.0	-4.7	AVG	70	1.2	RB 1 MHz;VB 10 Hz;Pk
2319.990	57.3	Н	74.0	-16.7	PK	70	1.2	RB 1 MHz;VB 3 MHz;Pk
2279.960	46.8	Н	54.0	-7.2	AVG	70	1.9	RB 1 MHz;VB 10 Hz;Pk
2279.780	55.9	Н	74.0	-18.1	PK	70	1.9	RB 1 MHz;VB 3 MHz;Pk
2319.980	46.7	V	54.0	-7.3	AVG	104	1.0	RB 1 MHz;VB 10 Hz;Pk
2319.800	56.2	V	74.0	-17.8	PK	104	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
Note 1.	measurements in a measurement bandwidth of 100kHz.

Note 2: Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

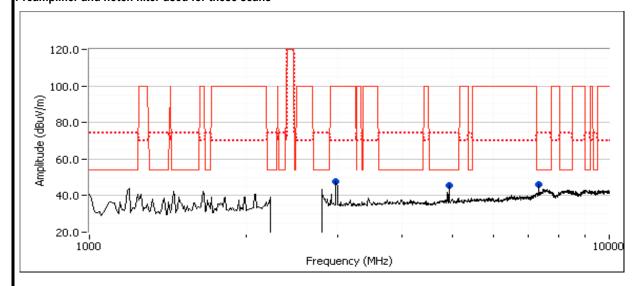
Note 3: Signal is present when Bluetooth is disabled (powered off)

	Elliott An AZAS company	EM	C Test Data
	Intel Corporation	Job Number:	J80398
Madalı	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIILENS CENTINOS Advanced-IN 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Run # 7, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2462 MHz Chain A, BT Basic Rate @ 2440 MHz Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.6	23.5
Chain B	7.0	5.4	8.0

Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band: Preamplifier and notch filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2980.000	47.7	V	70.0	-22.3	Peak	141	1.0	
4923.860	45.3	V	54.0	-8.7	Peak	166	1.6	
7322.500	46.3	V	54.0	-7.7	Peak	182	1.6	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4923.980	47.6	V	54.0	-6.4	AVG	166	1.7	RB 1 MHz;VB 10 Hz;Pk
4923.940	50.3	V	74.0	-23.7	PK	166	1.7	RB 1 MHz;VB 3 MHz;Pk
7320.050	41.2	V	54.0	-12.8	AVG	201	2.0	RB 1 MHz;VB 10 Hz;Pk
7320.180	49.5	V	74.0	-24.5	PK	201	2.0	RB 1 MHz;VB 3 MHz;Pk

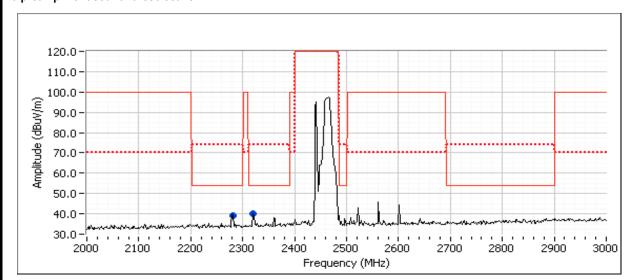
Note: 7320 MHz is directly related to the Bluetooth signal and was observed during the Bluetooth only spurio us measurements.



	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIIIel® Cellillio® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)
No preamplifier used for these scans



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2320.000	40.1	Н	54.0	-13.9	Peak	180	1.0	
2288.500	39.0	Н	54.0	-15.0	Peak	180	1.0	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2319.980	47.8	Н	54.0	-6.2	AVG	72	1.2	
2279.930	46.7	Н	54.0	-7.3	AVG	69	1.0	
2320.040	45.8	V	54.0	-8.2	AVG	100	1.0	
2279.930	45.2	V	54.0	-8.8	AVG	101	1.0	
2320.230	57.3	Н	74.0	-16.7	PK	72	1.2	
2284.230	56.0	Н	74.0	-18.0	PK	69	1.0	
2324.580	55.8	V	74.0	-18.2	PK	100	1.0	
2280.470	55.3	V	74.0	-18.7	PK	101	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak
note 1.	measurements in a measurement bandwidth of 100kHz.

Note 2: Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

Note 3: Signal is present when Bluetooth is disabled (powered off)

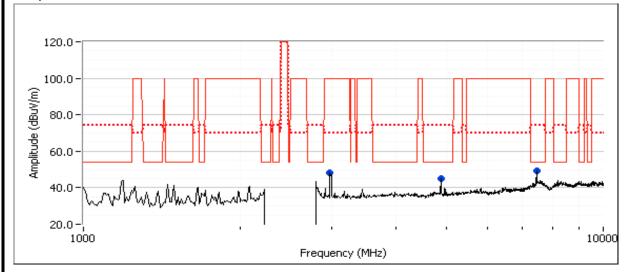
	Elliott An AZAS company	EMO	C Test Data
	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 8, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2437 MHz Chain A, BT Basic Rate @ 2480 MHz Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.6	23.5
Chain B	7.0	5.1	8.0

Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band:

Preamplifier and notch filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2980.000	48.4	V	70.0	-21.6	Peak	148	1.0	
4873.880	45.0	V	54.0	-9.0	Peak	148	1.3	
7439.170	49.5	V	54.0	-4.5	Peak	166	2.2	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4874.020	45.2	V	54.0	-8.8	AVG	146	1.2	RB 1 MHz;VB 10 Hz;Pk
4874.030	49.0	V	74.0	-25.0	PK	146	1.2	RB 1 MHz;VB 3 MHz;Pk
7440.000	44.9	V	54.0	-9.1	AVG	167	1.5	RB 1 MHz;VB 10 Hz;Pk
7440.270	52.2	V	74.0	-21.8	PK	167	1.5	RB 1 MHz;VB 3 MHz;Pk

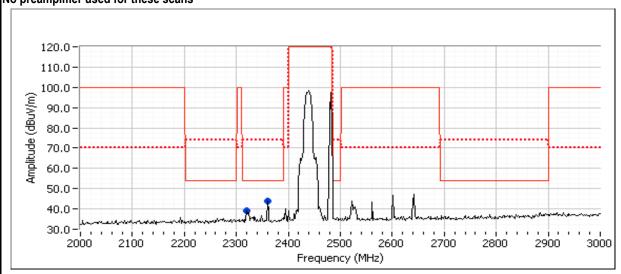
Note: 7320 MHz is directly related to the Bluetooth signal and was observed during the Bluetooth only spurio us measurements.



	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Model:	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIIIel® Cellillio® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

#### Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)
No preamplifier used for these scans



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2360.000	43.8	-	54.0	-10.2	Peak	180	1.0	
2320.000	39.2	-	54.0	-14.8	Peak	180	1.0	

#### Final measurements at 3m

MHz         dBμV/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters           2360.020         48.9         H         54.0         -5.1         AVG         328         1.0           2319.980         47.9         H         54.0         -6.1         AVG         69         1.3           2359.980         46.7         V         54.0         -7.3         AVG         107         1.0           2320.040         45.7         V         54.0         -8.3         AVG         104         1.0           2320.230         57.3         H         74.0         -16.7         PK         69         1.3           2360.430         56.7         V         74.0         -17.3         PK         107         1.0	Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
2319.980     47.9     H     54.0     -6.1     AVG     69     1.3       2359.980     46.7     V     54.0     -7.3     AVG     107     1.0       2320.040     45.7     V     54.0     -8.3     AVG     104     1.0       2320.230     57.3     H     74.0     -16.7     PK     69     1.3       2360.430     56.7     V     74.0     -17.3     PK     107     1.0	MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2359.980     46.7     V     54.0     -7.3     AVG     107     1.0       2320.040     45.7     V     54.0     -8.3     AVG     104     1.0       2320.230     57.3     H     74.0     -16.7     PK     69     1.3       2360.430     56.7     V     74.0     -17.3     PK     107     1.0	2360.020	48.9	Н	54.0	-5.1	AVG	328	1.0	
2320.040     45.7     V     54.0     -8.3     AVG     104     1.0       2320.230     57.3     H     74.0     -16.7     PK     69     1.3       2360.430     56.7     V     74.0     -17.3     PK     107     1.0	2319.980	47.9	Н	54.0	-6.1	AVG	69	1.3	
2320.230         57.3         H         74.0         -16.7         PK         69         1.3           2360.430         56.7         V         74.0         -17.3         PK         107         1.0	2359.980	46.7	V	54.0	-7.3	AVG	107	1.0	
2360.430 56.7 V 74.0 -17.3 PK 107 1.0	2320.040	45.7	V	54.0	-8.3	AVG	104	1.0	
	2320.230	57.3	Н	74.0	-16.7	PK	69	1.3	
0000 400 50 0 11 74 0 47 4 50 40	2360.430	56.7	V	74.0	-17.3	PK	107	1.0	
2360.100   56.6   H   74.0   -17.4   PK   328   1.0	2360.100	56.6	Н	74.0	-17.4	PK	328	1.0	
2324.580 55.6 V 74.0 -18.4 PK 104 1.0	2324.580	55.6	V	74.0	-18.4	PK	104	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -30dBc for peak
note 1.	measurements in a measurement bandwidth of 100kHz.

Note 2: Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied

Note 3: Signal is present when Bluetooth is disabled (powered off)

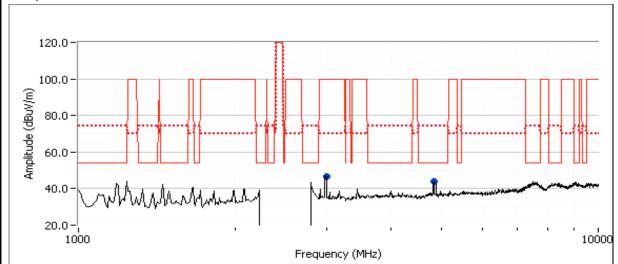
	Elliott An AZAS company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 9, Rainbow Peak 2x2: 1-10GHz, 802.11b @ 2412 MHz Chain A, BT EDR @ 2440 MHz Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	16.5	23.5
Chain B	7.0	1.4	8.0

#### Spurious Radiated Emissions, 1 - 10GHz excluding the allocated band:

Preamplifier and notch filter used for these scans



#### Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.330	46.7	V	70.0	-23.3	Peak	130	1.0	
4823.990	44.0	V	54.0	-10.0	Peak	134	1.6	

#### Final measurements at 3m

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4824.030	43.1	V	54.0	-10.9	AVG	131	1.0	RB 1 MHz;VB 10 Hz;Pk
4823.990	47.7	V	74.0	-26.3	PK	131	1.0	RB 1 MHz;VB 3 MHz;Pk

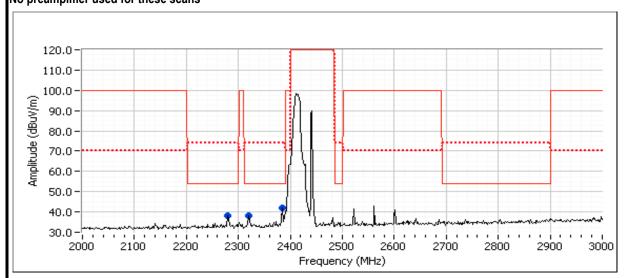
Note: 4924 MHz is directly related to the WiFi (802.11b) signal and was observed during the 802.11b mode spurious m easurements.



	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Madal	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 2 - 3GHz

Preliminary Scan at ~ 20cm from the product to identify potential signals (Peak versus average limit)
No preamplifier used for these scans



#### Preliminary measurements at ~ 20cm, RB=1MHz, VB=100kHz

Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2385.000	42.2	V	54.0	-11.8	Peak	192	1.0	
2320.000	38.2	V	54.0	-15.8	Peak	192	1.0	
2280.000	38.2	V	54.0	-15.8	Peak	192	1.0	

#### Final measurements at 3m

· ····a· ·····cac·	ar orriorito at	<b>V</b>						
Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2383.860	46.4	Н	54.0	-7.6	AVG	350	1.0	RB 1 MHz;VB 10 Hz;Pk
2384.460	59.4	Н	74.0	-14.6	PK	350	1.0	RB 1 MHz;VB 3 MHz;Pk
2319.970	46.4	Н	54.0	-7.6	AVG	3	1.1	RB 1 MHz;VB 10 Hz;Pk
2320.330	56.0	Н	74.0	-18.0	PK	3	1.1	RB 1 MHz;VB 3 MHz;Pk
2279.900	44.6	Н	54.0	-9.4	AVG	68	1.0	RB 1 MHz;VB 10 Hz;Pk
2279.060	55.4	Н	74.0	-18.6	PK	68	1.0	RB 1 MHz;VB 3 MHz;Pk
2384.170	45.9	V	54.0	-8.1	AVG	205	1.5	RB 1 MHz;VB 10 Hz;Pk
2386.600	59.7	V	74.0	-14.3	PK	205	1.5	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.

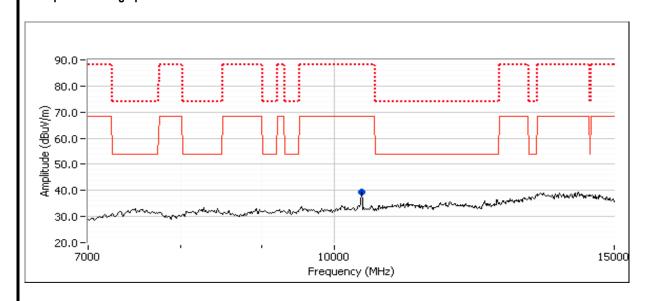
Note 2: Signal is only present when Bluetooth is enabled, average correction for hopping occupancy could be applied Note 3: Signal is present when Bluetooth is disabled (powered off)

	Elliott An ATAS company	EM	C Test Data
	Intel Corporation	Job Number:	J80398
Madalı	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	Intel® Centino® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

## Run # 10, Rainbow Peak 2x2: 1-15GHz, 802.11n20 @ 5200 MHz Chain A and B, BT Basic Rate @ 2440 MHz Chain B

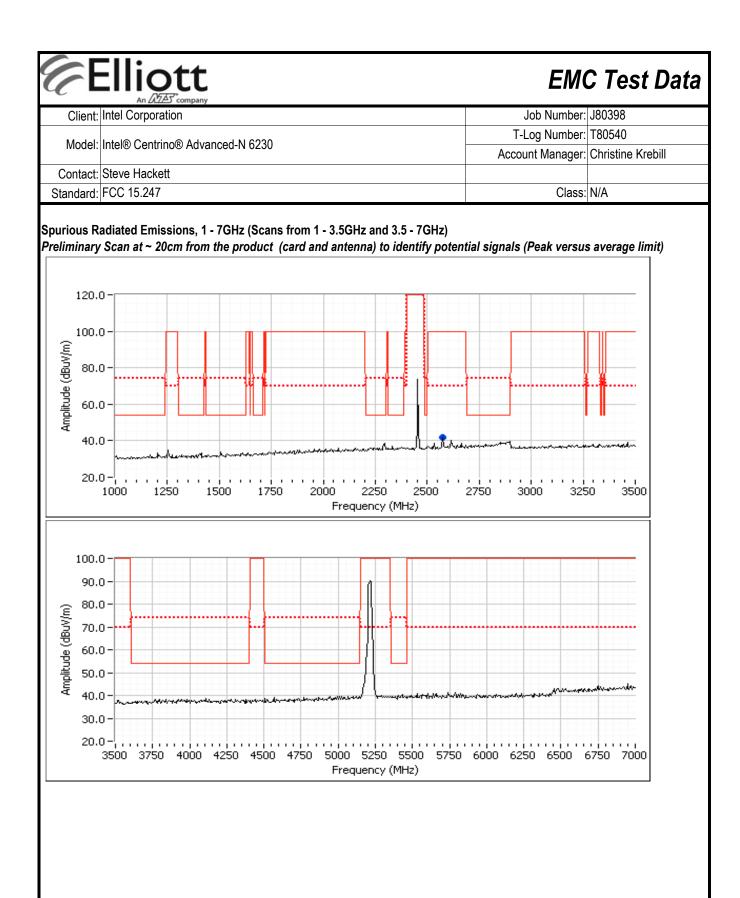
		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
WiFi A	16.5	16.6	31.5
WiFi B	16.5	16.7	30.5
Bluetooth	7.0	5.4	8.0

Spurious Radiated Emissions, 7 - 15GHz: Preamplifier and high pass filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209/15	5.247/15E	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10400.000	39.4	V	68.3	-28.9	Peak	198	1.3	



Client:	Intel Corpora	ition						Job Number:	J80398	
							T-	Log Number:	T80540	
Model:	Intel® Centri	no® Advano	ed-N 6230						Christine Krebi	 .ll
Contact:	Steve Hacke	tt								
Standard:	FCC 15.247							Class:	N/A	
	adiated Emis		·		5GHz and 3.5 :Hz	- 7GHz)				
Frequency	Level	Pol	15.209	/15.247	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
2560.000	40.1	V	100.0	-59.9	Peak	360	1.0			
inal measu Frequency	urements at	3m Pol	15.209	/15.247	Detector	Azimuth	Height	Comments		
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
2280.000	41.9	Н	54.0	-12.1	AVG	0	1.2	RB 1 MHz;V	/B 10 Hz;Pk	No
2320.000	41.7	V	54.0	-12.3	AVG	77	1.3	RB 1 MHz;V	/B 10 Hz;Pk	No
2360.000	39.6	V	54.0	-14.4	AVG	77	1.2	RB 1 MHz;V	/B 10 Hz;Pk	No
2320.000	39.4	Н	54.0	-14.6	AVG	206	1.3	RB 1 MHz;V	/B 10 Hz;Pk	No
2360.000	38.1	Н	54.0	-15.9	AVG	39	1.2	RB 1 MHz;V	/B 10 Hz;Pk	No
2280.000	37.8	V	54.0	-16.2	AVG	140	1.0	RB 1 MHz;V	/B 10 Hz;Pk	No
2320.000	55.0	V	74.0	-19.0	PK	77	1.3	RB 1 MHz;V	/B 3 MHz;Pk	No
2560.000	50.6	Н	70.0	-19.4	PK	168	1.4	RB 1 MHz;V	/B 3 MHz;Pk	No
2560.000	46.9	V	70.0	-23.1	PK	216	1.9		/B 3 MHz;Pk	No
2280.000	46.8	Н	74.0	-27.2	PK	0	1.2		/B 3 MHz;Pk	No
2320.000	46.2	Н	74.0	-27.8	PK	206	1.3		/B 3 MHz;Pk	No
2360.000	45.4	V	74.0	-28.6	PK	77	1.2		/B 3 MHz;Pk	No
2360.000	44.3	Н	74.0	-29.7	PK	39	1.2		/B 3 MHz;Pk	No
2280.000	44.0	V	74.0	-30.0	PK	140	1.0	RB 1 MHz;V	/B 3 MHz;Pk	No
2560.000	46.3	Н	100.0	-53.7	AVG	168	1.4	RB 1 MHz;V		No
2560.000	40.5	V	100.0	-59.5	AVG	216	1.9	RB 1 MHz;V	/B 10 Hz;Pk	No
ote 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.									

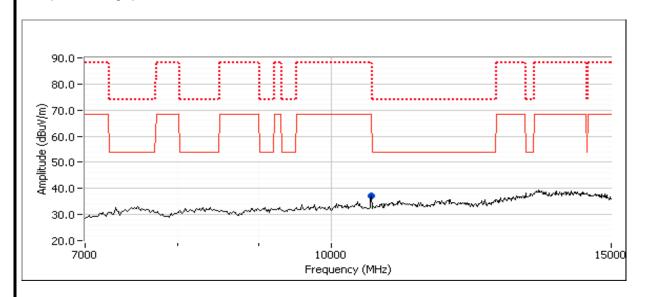
	Elliott An AZAS company	EMO	C Test Data
	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	III(el® Cell(III)0® Advanced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

# Run # 11, Rainbow Peak 2x2: 1-15GHz, 802.11n20 @ 5300 MHz Chain A and B, BT Basic Rate @ 2440 MHz Chain B

		Power Settings	
	Target (dBm)	Measured (dBm)	Software Setting
WiFi A	16.5	16.7	32.0
WiFi B	16.5	16.5	31.0
Bluetooth	7.0	5.4	8.0

Spurious Radiated Emissions, 7 - 15GHz:

Preamplifier and high pass filter used for these scans



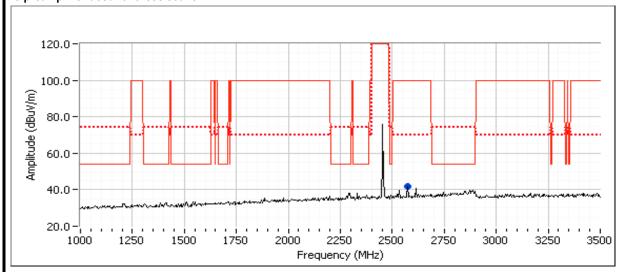
Preliminary Measurements (Peak versus average limit)

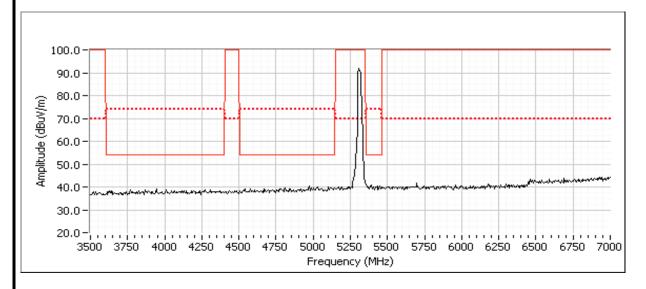
Frequency	Level	Pol	15.209/1	5.247/15E	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10600.000	37.2	V	54.0	-16.8	Peak	182	1.0	

	Elliott An AZAS company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Contring® Advanced N 6220	T-Log Number:	T80540
Model.	Intel® Centrino® Advanced-N 6230	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 1 - 7GHz (Scans from 1 - 3.5GHz and 3.5 - 7GHz)

Preliminary Scan at ~ 20cm from the product (card and antenna) to identify potential signals (Peak versus average limit)
No preamplifier used for these scans





Note 1: The emissions observed above the noise floor are the same as those observed with the Wi-Fi radio at 5200 MHz (Run 10) and are unaffected when the Wi-Fi radio is disabled (powered off). Additional measurements were therefore not necessary.

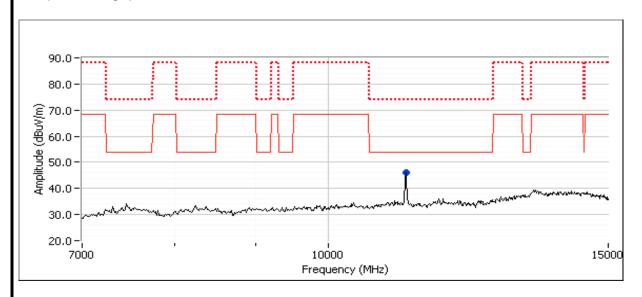
	Elliott An AZAS company	EMO	C Test Data
	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	Intel® Centino® Advanced-IV 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15 2/17	Class:	N/Δ

## Run # 12, Rainbow Peak 2x2: 1-15GHz, 802.11n20 @ 5600 MHz Chain A and B, BT Basic Rate @ 2440 MHz Chain B

	Power Settings							
	Target (dBm)	Measured (dBm)	Software Setting					
WiFi A	16.5	16.5	34.0					
WiFi B	16.5	16.5	34.0					
Bluetooth	7.0	5.4	8.0					

Spurious Radiated Emissions, 7 - 15GHz:

Preamplifier and high pass filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209/1	5.247/15E	Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11200.340	46.0	V	54.0	-8.0	Peak	188	1.0	

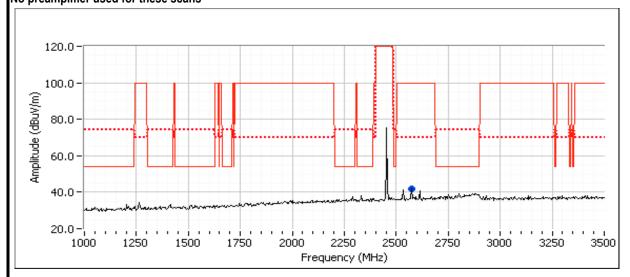
Frequency	Level	Pol	15.209/15.247/15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11199.810	45.1	V	54.0	-8.9	AVG	157	1.9	RB 1 MHz;VB 10 Hz;Pk
11200.110	61.2	V	74.0	-12.8	PK	157	1.9	RB 1 MHz;VB 3 MHz;Pk

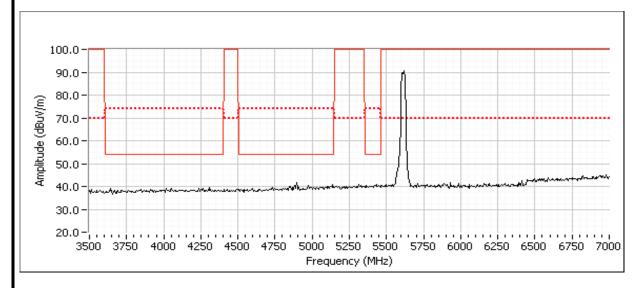
	Elliott An AZES company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
wodei.	IIIIel® Celitiilo® Advaliced-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 1 - 7GHz (Scans from 1 - 3.5GHz and 3.5 - 7GHz)

Preliminary Scan at ~ 20cm from the product (card and antenna) to identify potential signals (Peak versus average limit)

No preamplifier used for these scans





Note 1: The emissions observed above the noise floor are the same as those observed with the Wi-Fi radio at 5200 MHz (Run 10) and are unaffected when the Wi-Fi radio is disabled (powered off). Additional measurements were therefore not necessary.

	Eliott An DZES company
Client:	Intel Corporation
Model:	Intel® Centrino® Advanced-N 6230

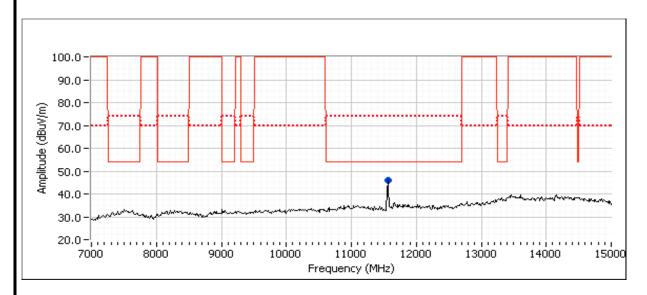
	An ZAZES company		
Client:	Intel Corporation	Job Number:	J80398
Madali	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
Model.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

### Run # 13, Rainbow Peak 2x2: 1-15GHz, 802.11n20 @ 5785 MHz Chain A and B, BT Basic Rate @ 2440 MHz Chain B

	Power Settings							
	Target (dBm)	Measured (dBm)	Software Setting					
WiFi A	16.5	16.5	35.0					
WiFi B	16.5	16.7	34.5					
Bluetooth	7.0	5.4	8.0					

Spurious Radiated Emissions, 7 - 15GHz:

Preamplifier and high pass filter used for these scans



Preliminary Measurements (Peak versus average limit)

Frequency	Level	Pol	15.209/1	15.209/15.247/15E		Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11570.410	45.9	V	54.0	-8.1	Peak	187	1.0	

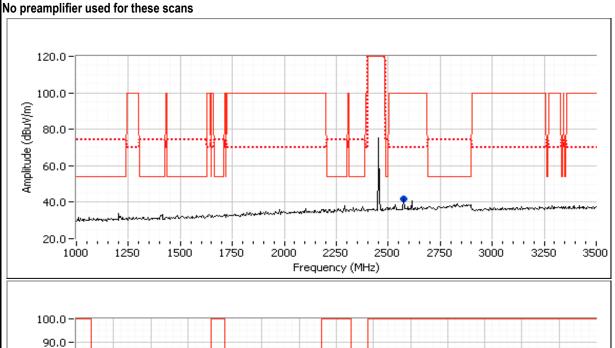
Frequency	Level	Pol	15.209/15.247/15E		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11570.680	44.7	V	54.0	-9.3	AVG	192	1.4	RB 1 MHz;VB 10 Hz;Pk
11570.280	57.8	V	74.0	-16.2	PK	192	1.4	RB 1 MHz;VB 3 MHz;Pk

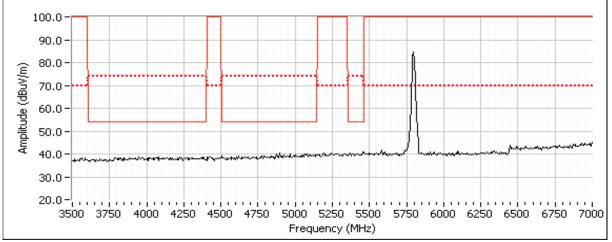
	Elliott An ATAS company	EMO	C Test Data
Client:	Intel Corporation	Job Number:	J80398
Model	Intel® Centrino® Advanced-N 6230	T-Log Number:	T80540
wodei.	IIItel® Certtillo® Advanceu-N 0250	Account Manager:	Christine Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247	Class:	N/A

Spurious Radiated Emissions, 1 - 7GHz (Scans from 1 - 3.5GHz and 3.5 - 7GHz)

Preliminary Scan at ~ 20cm from the product (card and antenna) to identify potential signals (Peak versus average limit)

No preamplifier used for these scans





Note 1: The emissions observed above the noise floor are the same as those observed with the Wi-Fi radio at 5200 MHz (Run 10) and are unaffected when the Wi-Fi radio is disabled (powered off). Additional measurements were therefore not necessary.