

Test Report

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

**Intel Corporation
Model: 112BNMMW**

UPN: 1000M-112BNM (Model # 112BNMMW)
1000M-112BNMU (Model # 112BNMU)
FCC ID: PD9112BNM
PD9112BNMU

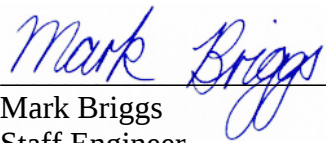
GRANTEE: Intel Corporation
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Hillsborough, OR 97124-5961

TEST SITE(S): Elliott Laboratories
41039 Boyce Road.
Fremont, CA. 94538-2435
IC Site Registration #: 2845B-3, 2845B-4

REPORT DATE: May 22, 2009

FINAL TEST DATE: May 8, May 11, May 12, May 13, May 14, May
15 and May 19, 2009

AUTHORIZED SIGNATORY:


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Testing Cert #2016-01

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REVISION HISTORY

Rev #	Date	Comments	Modified By
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SCOPE

An electromagnetic emissions test has been performed on the Intel Corporation model 112BNMMW 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.

The test results recorded herein are based on a single type test of the Intel Corporation model 112BNMMW and therefore apply only to the tested sample. The sample was selected and prepared by Steve Hackett of Intel Corporation

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.

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 112BNMMW 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 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.).

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 and DSSS	Device must use digital modulation	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	802.11b: 9.9 MHz 802.11g: 16.5 MHz n20: 17.8 MHz n40: 35.7 MHz	>500kHz	Complies
	RSP100	99% Bandwidth	802.11b: 13.2 MHz 802.11g: 17.6 MHz n20: 18.6 MHz n40: 36.6 MHz	Information only	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11b: 16.7 dBm 802.11g: 17.2 dBm (0.052 W) n20: 17.0 dBm n40: 12.9 dBm (0.0195 W) EIRP = 0.109 W ^{Note 1}	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	802.11b: -6.2 dBm / 3kHz 802.11g: -8.0 dBm / 3 kHz 802.11n 20MHz -9.2 dBm / 3 kHz 802.11n 40MHz -14.7 dBm / 3 kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All emissions less than -30dBc limit	< -30dBc ^{Note 2}	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 30MHz – 25 GHz	<u>802.11n 20MHz</u> 51.4dBμV/m @ 2390.0MHz (margin: 2.6dB) <u>802.11g</u> 51.0dBμV/m @ 2483.5MHz (margin: 3.0dB)	15.207 in restricted bands, all others <-30dBc ^{Note 2}	Complies

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

Note 2: Limit of -30dBc used because the power was measured using the UNII test procedure (maximum power averaged over a transmission burst) / RMS averaging over a time interval, as permitted under RSS 210 section A8.4(4).

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	uFL non-standard connector	Non-standard connector	Complies
-	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	38.6dB μ V/m @ 59.052MHz	RSS GEN 7.2.3 Table 1	Complies (-1.4dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	43.6dB μ V @ 1.931MHz	Refer to standard	Complies (-12.4dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements (pages .	Refer to OET 65, FCC Part 1 and RSS 102	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Page 218 of Condor Peak User Guide pdf document.	Statement required regarding non-interference	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Not applicable, device is installed by OEM or integrator and end user does not have access to the antennas.	Statement regarding detachable antenna	Complies

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below were calculated using the approach described in CISPR 16-4-2:2003 using a coverage factor of k=2, which gives a level of confidence of approximately 95%. The levels were found to be below levels of U_{cispr} and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Intel Corporation model 112BNMMW is a 1x2 802.11bgn Mini PCIe card designed for use in laptop or other similar host systems.

Testing for the AC conducted emissions was performed with the card installed inside a host laptop with antenna connections to the integrated antennas in the host system. All other tests detailed in this test report were performed with the module installed into a test fixture such that it was fully exposed as required for the evaluation of a device against FCC and Industry Canada requirements for modular approvals. The test fixture was powered from 3.3Vdc provided by a bench-top power supply.

The sample was received on May 8, 2009 and tested on May 8, May 11, May 12, May 13, May 14, May 15 and May 19, 2009. The EUT consisted of the following component(s):

Manufacturer	Model	Description	MAC Address	FCC ID
Intel	112BNMMW	1x2 bgn Mini PCIe	001E6400493E	PD9112BNM
			001E64004794	PD9112BNMU
001E6400493E was used for AC conducted emissions testing. 001E64004794 was used for all others.				

ANTENNA SYSTEM

The antenna system used with the Intel Corporation model 112BNMMW would typically be integrated into the display section of the host laptop. For the purposes of testing the device was tested with the Intel Universe Antenna (gain 3.2dBi in the 2.4GHz band) and the antennas were mounted to a glass fixture to simulate the laptop installation.

ENCLOSURE

The EUT does not have an enclosure. The device does have a shield in order to meet the requirements for certification under the FCC and Industry Canada requirements for modular approval.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

The following equipment was used as support equipment for conducted emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
Toshiba	PSAG8U-04001W	Laptop PC(Host)	49290792Q	N/A
Toshiba	ADP-75SB AB	Laptop AC Transformer	N/A	N/A
HP	ThinkJet 5650	Printer	MY3883K42P	N/A
Netgear	FS108	HUB(Fast Ethernet Switch)	FS18H2BCB092554	N/A
The Ethernet Hub was located remotely, all other equipment was located locally.				

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Laptop Ethernet	HUB(Remote)	Multiwire	Unshielded	10.0
Laptop DC	AC-DC adapter	integral to adapter	Unshielded	1.0
AC-DC adapter AC	AC power	3-wire	Unshielded	1.0
Laptop USB	Printer	USB	Shielded (With integrated Ferrite)	2.0
Printer	AC power Adapter	3-wire	Unshielded (With integrated Ferrite)	1.0

For all other tests the I/O cabling configuration was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Test fixture PCI	Laptop PCI	Ribbon Cable	Unshielded	0.8
Test fixture 3.3Vdc	Bench supply	2-wire	Unshielded	0.8

EUT OPERATION

During AC conducted emissions testing the EUT was being controlled by the CRTU tool to operate in a continuous transmit mode on the center channel. In addition the laptop was displaying a scrolling 'H' pattern on the screen and had link enabled to both the ethernet and USB peripherals.

During receiver tests the EUT was being controlled by the Intel CRTU tool to operate in a continuous receive mode on the center channel.

During transmitter tests the EUT was being controlled by the Intel CRTU tool to operate in a continuous transmit mode on the top, bottom or center channel as required and in each of the different modulation modes. The data rates of 1Mb/s for 802.11b, 6Mb/s for 802.11g, 6.5Mb/s / 13.0Mb/s for 802.11n modes were selected based on preliminary testing¹ that identified those data rates having the highest output power in each mode (see table below) when the device is operated under EEPROM control, which reduces power as the data rate is increased to ensure signal integrity.

Mode	Data Rate	Output Power
802.11b	1	14.8
	2	14.7
	5.5	14.6
	11	14.6
802.11g	6	12.5
	9	12.4
	12	12.3
	18	12.3
	24	12.2
	36	12.1
	48	12.1
	54	10.6
802.11n (20MHz)	6.5	12.3
	13	12.1
	19.5	12.2
	26	12.2
	39	12.1
	52	12.0
	58.5	10.9
	65	8.9
802.11n (40MHz)	13.5	9.2
	27	9.1
	40.5	9.0
	54	8.9
	81	8.8
	108	8.6
	121.5	8.6
	135	8.5

¹ These power measurements were made on the Half-size version of the card, which uses the same EEPROM control for output power versus data rate.

TEST SITE**GENERAL INFORMATION**

Final test measurements were taken on May 8, May 11, May 12, May 13, May 14, May 15 and May 19, 2009 at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Registration Numbers		Location
	FCC	Canada	
Chamber 3	769238	IC 4549-3	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	211948	IC 4549-4	

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

CONDUCTED EMISSIONS CONSIDERATIONS

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

RADIATED EMISSIONS CONSIDERATIONS

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

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

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

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

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

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

FILTERS/ATTENUATORS

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

ANTENNAS

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

ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

INSTRUMENT CALIBRATION

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

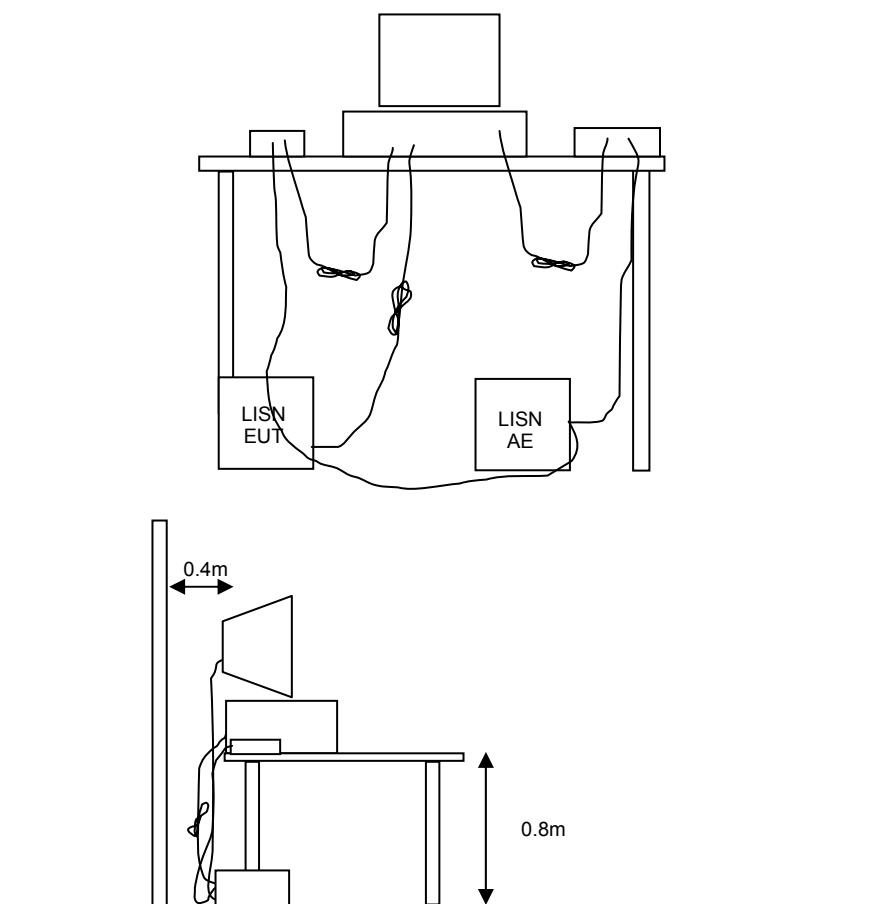
TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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



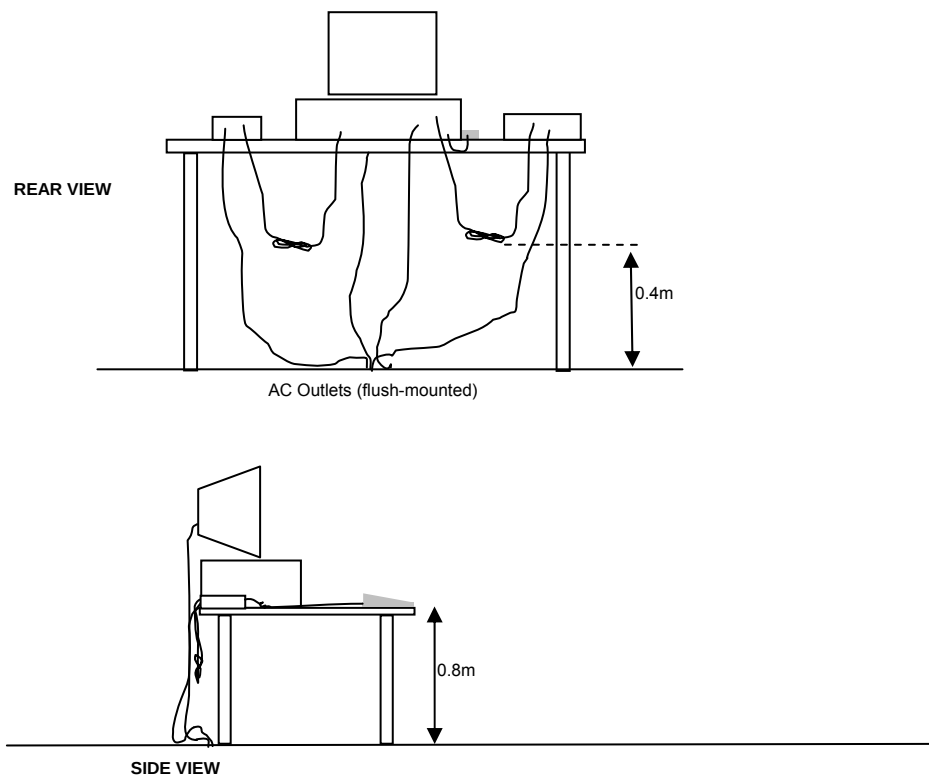
RADIATED EMISSIONS

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

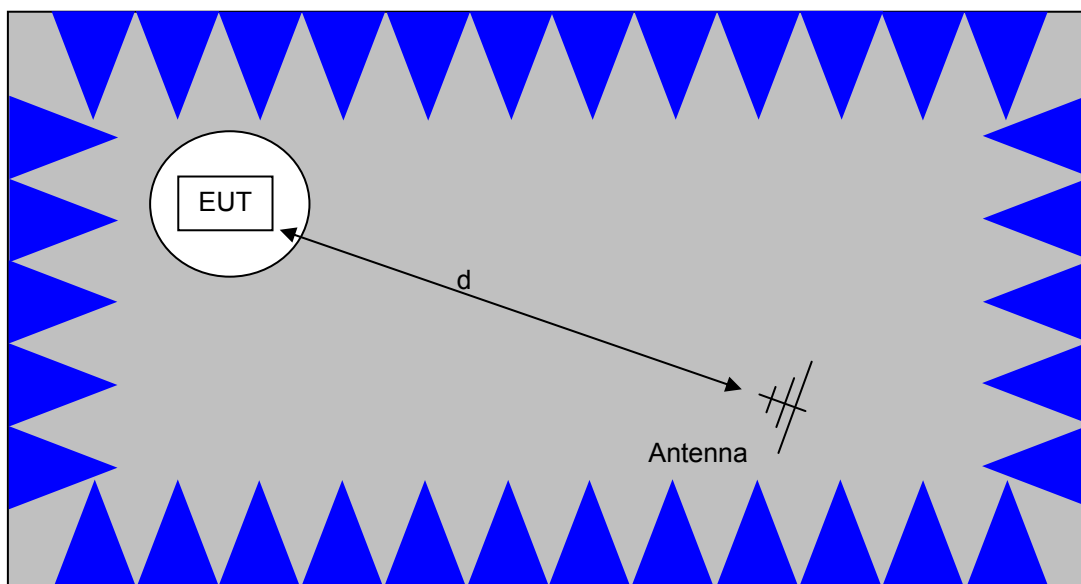
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

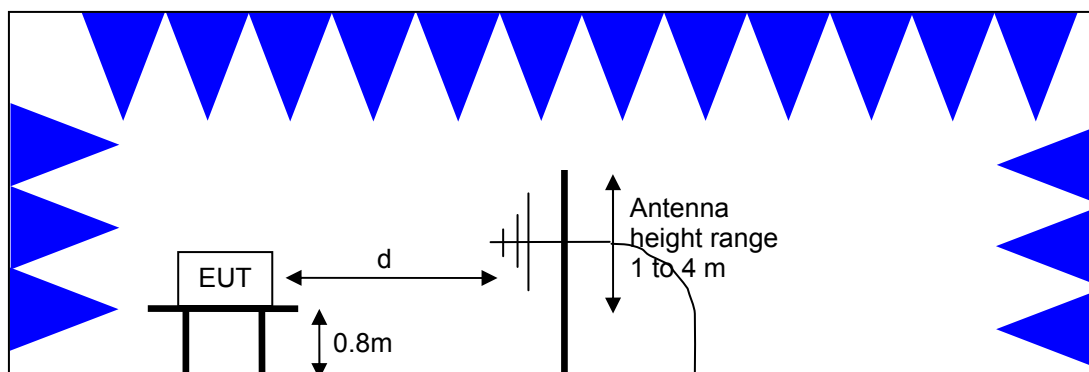


Typical Test Configuration for Radiated Field Strength Measurements



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

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



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

BANDWIDTH MEASUREMENTS

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

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

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

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹ (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	$2400/F_{\text{KHz}} @ 300\text{m}$	$67.6-20*\log_{10}(F_{\text{KHz}}) @ 300\text{m}$
0.490-1.705	$24000/F_{\text{KHz}} @ 30\text{m}$	$87.6-20*\log_{10}(F_{\text{KHz}}) @ 30\text{m}$
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

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

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

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

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

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

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

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_T - S = M$$

where:

R_T = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

$$F_d = \text{Distance Factor in dB}$$

$$D_m = \text{Measurement Distance in meters}$$

$$D_s = \text{Specification Distance in meters}$$

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:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

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:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

EXHIBIT 1: Test Equipment Calibration Data**Radio Antenna Port (Power and Spurious Emissions), 09-May-09****Engineer: FTEMC**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	786	06-Dec-09
Hewlett Packard	SpectAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	10-Apr-10

Radio Spurious Emissions, 12-May-09**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
Hewlett Packard	SpectAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	10-Apr-10
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	02-Dec-09

Radiated Emissions, 1000 - 18,000 MHz, 13-May-09**Engineer: Rafael Varelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	02-Sep-10
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1422	06-Nov-09
Hewlett Packard	Head (Inc W1-W4, 1742 , 1743) Blue	84125C	1620	22-May-09
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	02-Dec-09
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	20-Oct-09
Rohde & Schwarz	Attenuator, 20 dB , 50 $\square$, 10W, DC-18 GHz	20dB, 10W, Type N	1795	16-Jun-09
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1796	16-Jun-09
A.H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	17-Mar-10

Conducted Emissions - AC Power Ports, 19-May-09**Engineer: Jack Plotner**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Fischer Custom Comm.	LISN, 50uH, 25 Amps, Dual Line	FCC-LISN-50/250-25-2-01	1575	30-Apr-10
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	26-Feb-10
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	15-Oct-09

Radiated Emissions, 30 - 26,500 MHz, 14-May-09**Engineer: Rafael Varelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	02-Sep-10
Hewlett Packard	SpectAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	10-Apr-10
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1422	06-Nov-09
Hewlett Packard	Head (Inc W1-W4, 1742 , 1743) Blue	84125C	1620	22-May-09
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	02-Dec-09
Rohde & Schwarz	Attenuator, 20 dB , 50 $\square$, 10W, DC-18 GHz	20dB, 10W, Type N	1795	16-Jun-09
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1796	16-Jun-09
A.H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	17-Mar-10

Radio Spurious Emissions, 14-May-09**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz	3115	786	06-Dec-09
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	02-Dec-09
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	20-Oct-09

Radiated Emissions, 30 - 26,500 MHz, 15-May-09**Engineer: Rafael Varelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	06-Jun-09
EMCO	Antenna, Horn, 1-18GHz	3115	868	10-Jun-10
Hewlett Packard	SpectAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	10-Apr-10
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1422	06-Nov-09
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	23-May-09
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	10-Feb-10
Rohde & Schwarz	Attenuator, 20 dB , 50 $\square$, 10W, DC-18 GHz	20dB, 10W, Type N	1795	16-Jun-09
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1796	16-Jun-09
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT	2115	19-Nov-09

EXHIBIT 2: Test Measurement Data

76 Pages

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
		Account Manager:	Christine Vu Krebill
Contact:	Steve Hackett		Mark Briggs
Emissions Standard(s):	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Intel Corporation

Model

112BNMMW (1x2 bgn Mini Card)

Date of Last Test: 5/20/2009

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Conducted Emissions

(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: 5/19/2009

Config. Used: #2 - (Module inside of host Laptop Computer device, transmit mode)

Test Engineer: Jack Plotner

Config Change: EUT installed inside host system, minimum system per ANSI for PC peripheral

Test Location: FT Chamber #3

Host Unit Voltage 120V/60Hz

General Test Configuration

For tabletop equipment, the EUT and host laptop computer system was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. Remote support equipment was located outside of the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 23.4 °C

Rel. Humidity: 38.5 %

Summary of Results

MAC Address: 001E6400493E CRTU Tool Version 5.10.24.0000 Driver version 12.5.0.41

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 120V/60Hz	FCC/EN55022 Class B	PASS	43.6dBµV @ 1.931MHz (-12.4dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

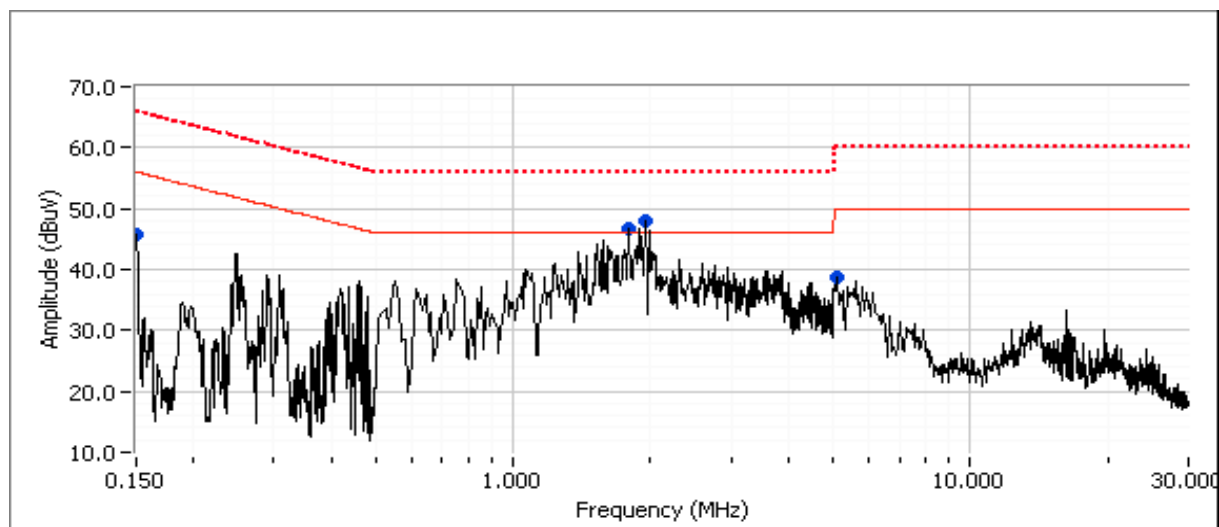
Deviations From The Standard

No deviations were made from the requirements of the standard.

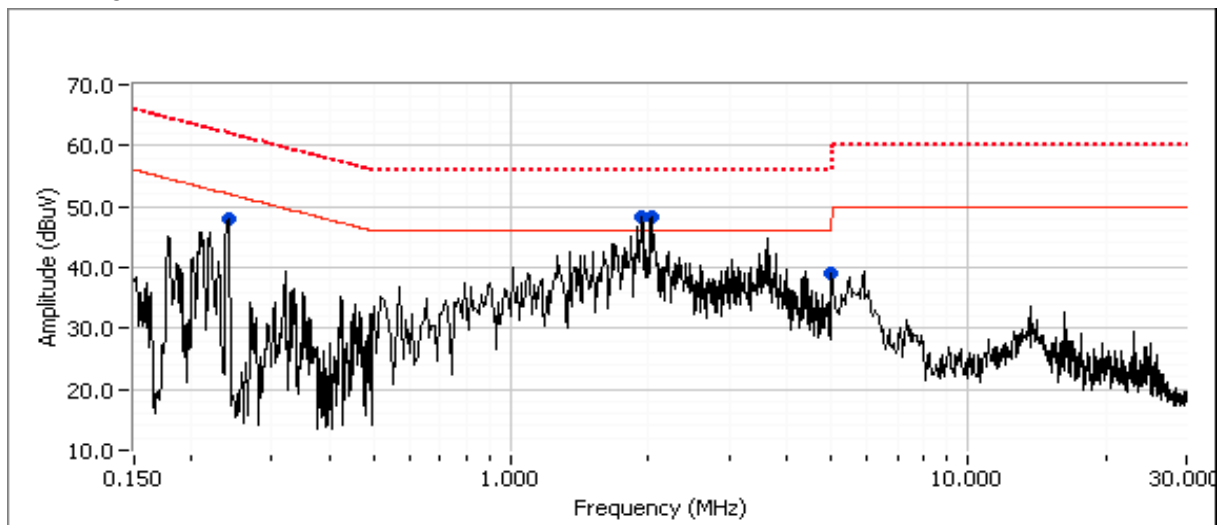
Client: Intel Corporation	Job Number: J75341
Model: 112BNMMW (1x2 bgn Mini Card)	T-Log Number: T75388
Contact: Steve Hackett	Account Manager: Christine Vu Krebill
Standard: FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class: B

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

LINE 1



NEUTRAL



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

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

Frequency MHz	Level dBμV	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
1.931	48.3	Neutral	46.0	2.3	Peak	
2.017	48.3	Neutral	46.0	2.3	Peak	
1.949	47.9	Line 1	46.0	1.9	Peak	
1.786	46.6	Line 1	46.0	0.6	Peak	
0.241	47.9	Neutral	52.1	-4.2	Peak	
4.992	39.2	Neutral	46.0	-6.8	Peak	
0.151	45.8	Line 1	56.0	-10.2	Peak	
5.030	38.8	Line 1	50.0	-11.2	Peak	

Final quasi-peak and average readings

Frequency MHz	Level dBμV	AC Line	Class B		Detector QP/Ave	Comments
			Limit	Margin		
1.931	43.6	Neutral	56.0	-12.4	QP	QP (1.00s)
1.949	43.1	Line 1	56.0	-12.9	QP	QP (1.00s)
1.786	41.3	Line 1	56.0	-14.7	QP	QP (1.00s)
1.931	30.5	Neutral	46.0	-15.5	AVG	AVG (0.10s)
1.949	30.3	Line 1	46.0	-15.7	AVG	AVG (0.10s)
2.017	40.3	Neutral	56.0	-15.7	QP	QP (1.00s)
1.786	29.7	Line 1	46.0	-16.3	AVG	AVG (0.10s)
2.017	27.8	Neutral	46.0	-18.2	AVG	AVG (0.10s)
0.241	43.0	Neutral	62.1	-19.1	QP	QP (1.00s)
5.030	27.1	Line 1	50.0	-22.9	AVG	AVG (0.10s)
4.992	21.2	Neutral	46.0	-24.8	AVG	AVG (0.10s)
0.151	40.4	Line 1	65.9	-25.5	QP	QP (1.00s)
4.992	30.5	Neutral	56.0	-25.5	QP	QP (1.00s)
5.030	32.5	Line 1	60.0	-27.5	QP	QP (1.00s)
0.241	24.5	Neutral	52.1	-27.6	AVG	AVG (0.10s)
0.151	21.3	Line 1	55.9	-34.6	AVG	AVG (0.10s)

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions - 802.11b Mode

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: 5/14/2009
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #4

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 21.5 °C
 Rel. Humidity: 40 %

Summary of Results

MAC Address: 001E64004794 CRTU Tool Version 5.10.24.0 Driver version 12.5.0.41

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	18.5	-	Output Power	15.247(b)	Pass	16.7 dBm
2	18.5	-	Power spectral Density (PSD)	15.247(d)	Pass	-6.2 dBm/3kHz
3	18.5	-	Minimum 6dB Bandwidth	15.247(a)	Pass	9.9 MHz
3	18.5	-	Maximum 99% Bandwidth	RSS GEN	-	13.23 MHz
4	18.5	-	Spurious emissions	15.247(b)	Pass	All emissions less than -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

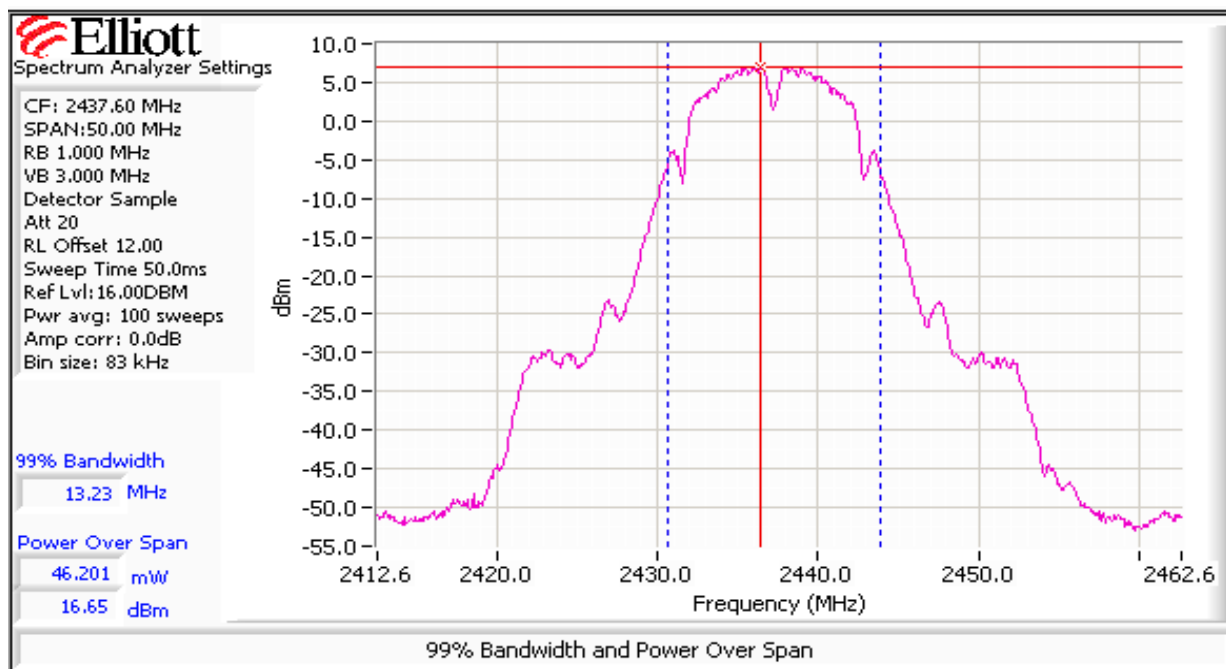
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power Note 3	
		(dBm) ¹	mW			dBm	W	Target	Actual
17.5	2412	16.1	40.7	3.2	Pass	19.3	0.085	16.5	16.6
18.5	2437	16.7	46.2	3.2	Pass	19.9	0.097	16.5	16.7
19.0	2462	16.6	45.5	3.2	Pass	19.8	0.095	16.5	16.7

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used. The output power limit is 30dBm
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measured using average power meter and is included for reference only.



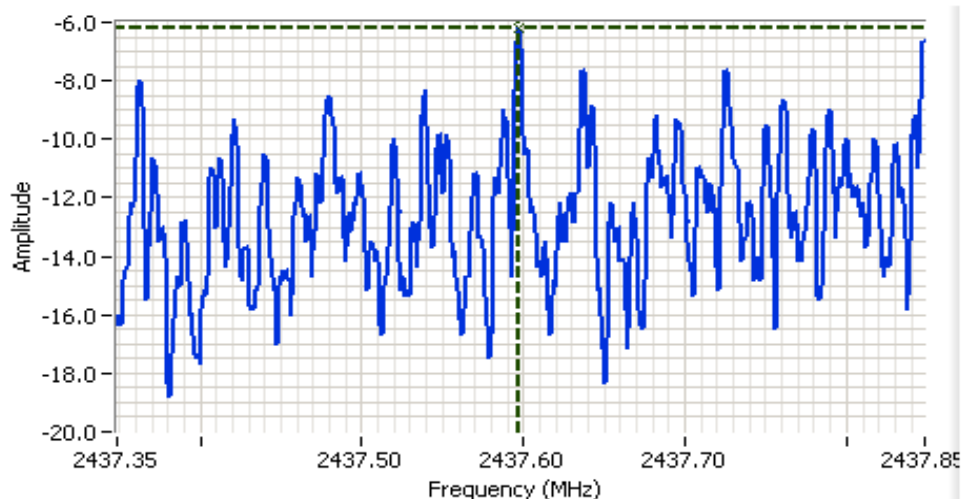
Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/3kHz) Note 1		
17.5	2412	-7.0	8.0	Pass
18.5	2437	-6.2	8.0	Pass
19.0	2462	-7.5	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.



Analyzer Settings

HP8564E,EMI
 CF: 2437.598 MHz
 SPAN:500 kHz
 RB 3.00 kHz
 VB 10.00 kHz
 Detector Sample
 Att 20
 RL Offset 12.00
 Sweep Time 100.0s
 Ref Lvl:16.00DBM

Comments

PSD = -6.17 dBm/3kHz
 2437 MHz

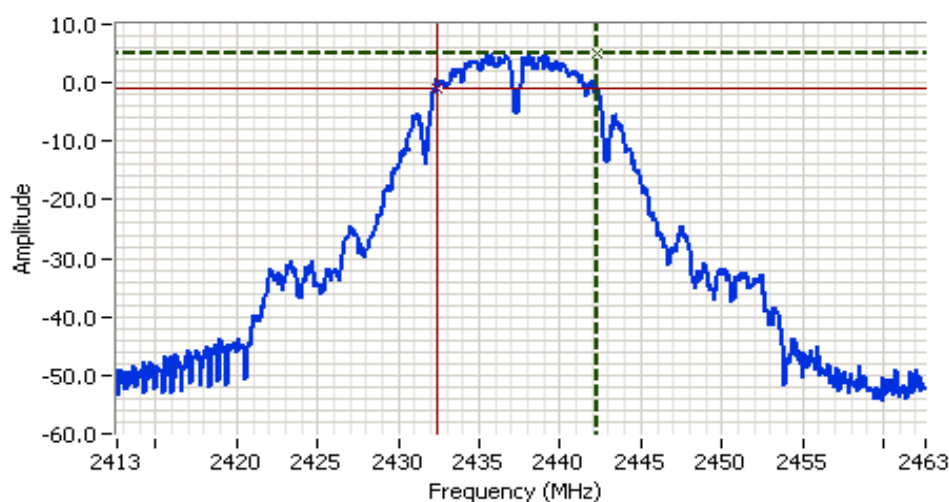
Cursor 1	2437.5976	-6.17		
	0.0000	0.00		

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
17.5	2412	100kHz	10.08	13.23
18.5	2437	100kHz	9.9	13.23
19.0	2462	100kHz	10.0	13.14

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



Analyzer Settings

HP8564E, EMI
 CF: 2437.598 MHz
 SPAN: 50.000 MHz
 RB 100 kHz
 VB 100 kHz
 Detector Sample
 Att 20
 RL Offset 12.00
 Sweep Time 50.0ms
 Ref Lvl: 16.00DBM

Comments

6dB BW: 9.917 MHz
 2437 MHz

Cursor 1 2442.3484 5.00
 Cursor 2 2432.4317 -1.00

Delta Freq. 9.917
 Delta Amplitude 6.00



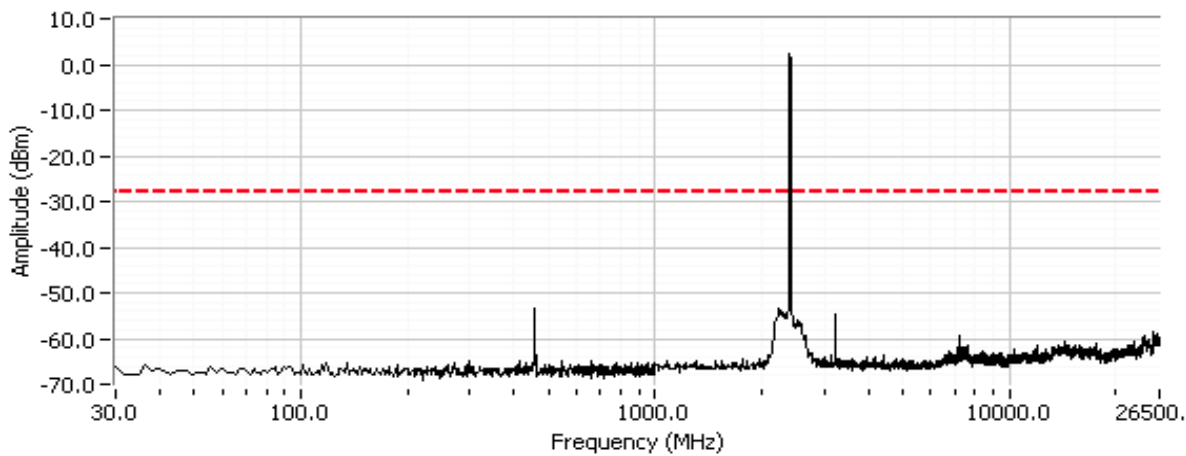
Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #4: Out of Band Spurious Emissions

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

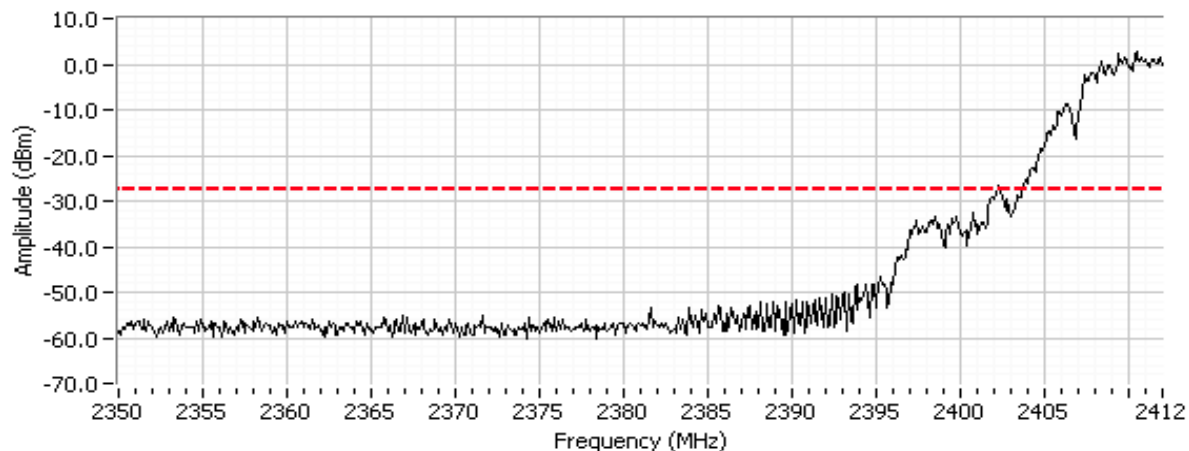
Plots for low channel, power setting(s) = 17.5

Out of Band Spurious Emissions, 2412 MHz



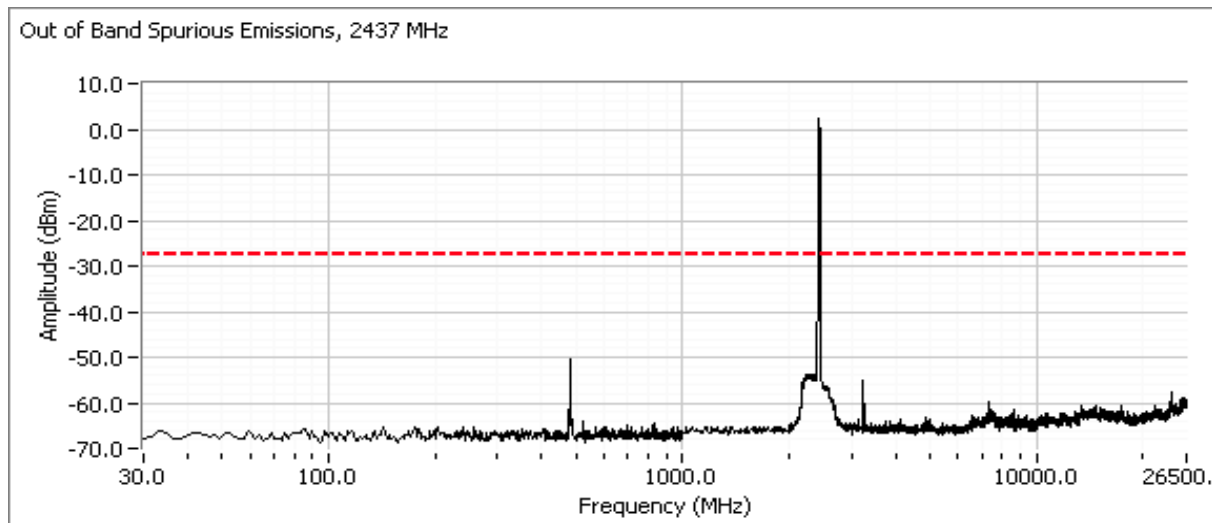
Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

Out of Band Spurious Emissions, 2412 MHz BE

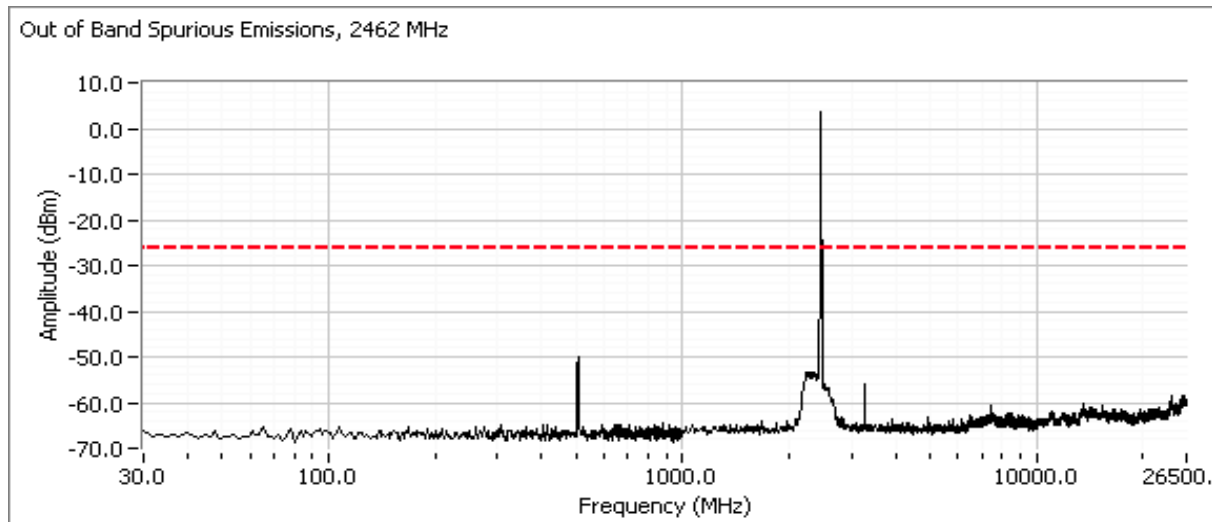


Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Plots for center channel, power setting(s) = 18.5



Plots for high channel, power setting(s) = 19.0



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions - 802.11g Mode

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: 5/15/2009
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #4

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

General Test Configuration

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

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

Ambient Conditions:
 Temperature: 22.3 °C
 Rel. Humidity: 42 %

Summary of Results

MAC Address: **001E64004794** CRTU Tool Version **5.10.24.0** Driver version **12.5.0.41**

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	24	-	Output Power	15.247(b)	Pass	17.2 dBm
2	24	-	Power spectral Density (PSD)	15.247(d)	Pass	-8.0 dBm/3kHz
3	18.5	-	Minimum 6dB Bandwidth	15.247(a)	Pass	16.5 MHz
3	24	-	Maximum 99% Bandwidth	RSS GEN	-	17.6 MHz
4	24	-	Spurious emissions	15.247(b)	Pass	All emissions less than -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

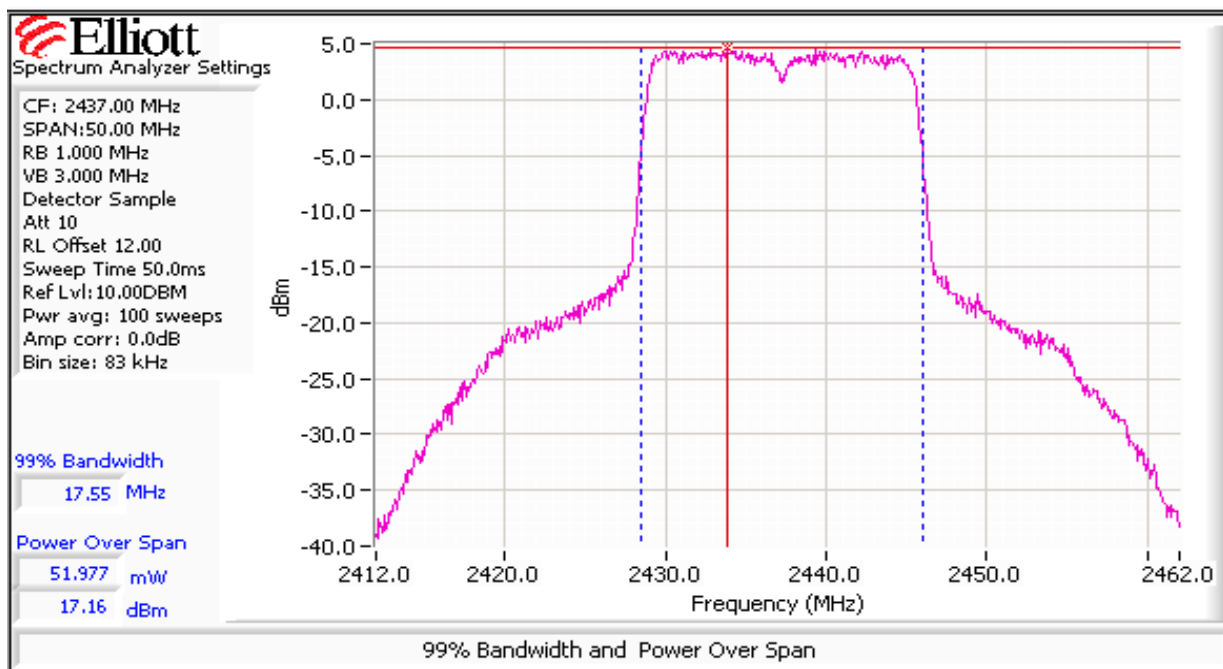
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power Note 3	
		(dBm) ¹	mW			dBm	W	Target	Actual
19	2412	13.3	21.5	3.2	Pass	16.5	0.045	13.4	13.5
24	2437	17.2	52.0	3.2	Pass	20.4	0.109	16.5	16.7
18.5	2462	12.1	16.2	3.2	Pass	15.3	0.034	11.8	11.9

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used. The output power limit is 30dBm
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measured using average power meter and is included for reference only.



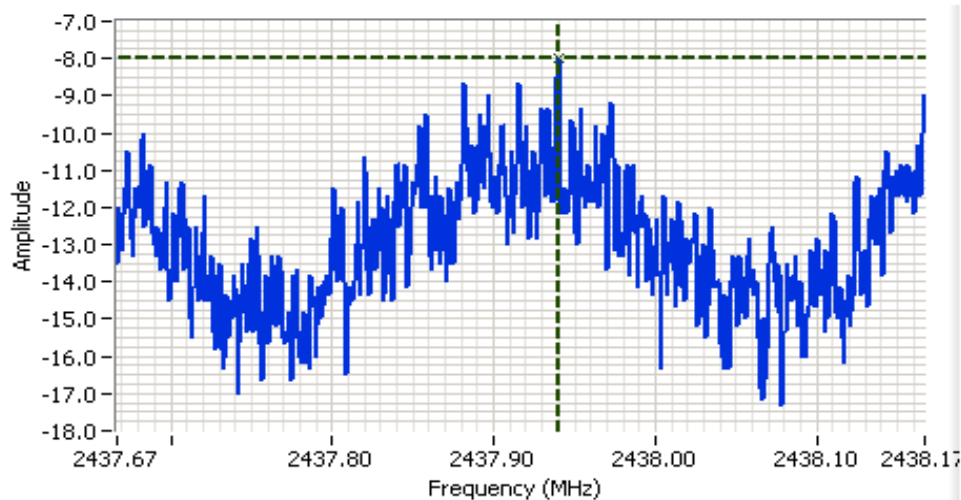
Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/3kHz) Note 1		
19	2412	-12.0	8.0	Pass
24	2437	-8.0	8.0	Pass
18.5	2462	-12.3	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.



Analyzer Settings

HP8564E,EMI
CF: 2437.917 MHz
SPAN:500 kHz
RB 3.00 kHz
VB 10.00 kHz
Detector Sample
Att 10
RL Offset 12.00
Sweep Time 100.0s
Ref Lvl:10.00DBM

Comments

PSD = -8.0 dBm/3kHz
2437 MHz

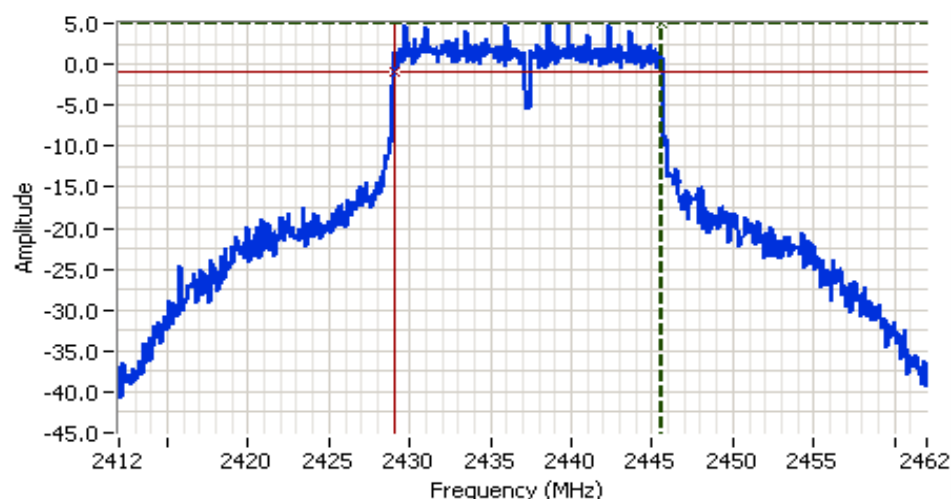
Cursor 1	2437.9401	-8.00		
	0.0000	0.00		

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
19	2412	100kHz	16.5	17.22
24	2437	100kHz	16.6	17.55
18.5	2462	100kHz	16.5	17.14

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



Analyzer Settings

HP8564E,EMI
CF: 2437.000 MHz
SPAN:50.000 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 10
RL Offset 12.00
Sweep Time 50.0ms
Ref Lvl:10.00DBM

Comments

6dB BW: 16.58 MHz
2437 MHz

Cursor 1	2445.5833	5.00	
Cursor 2	2429.0000	-1.00	

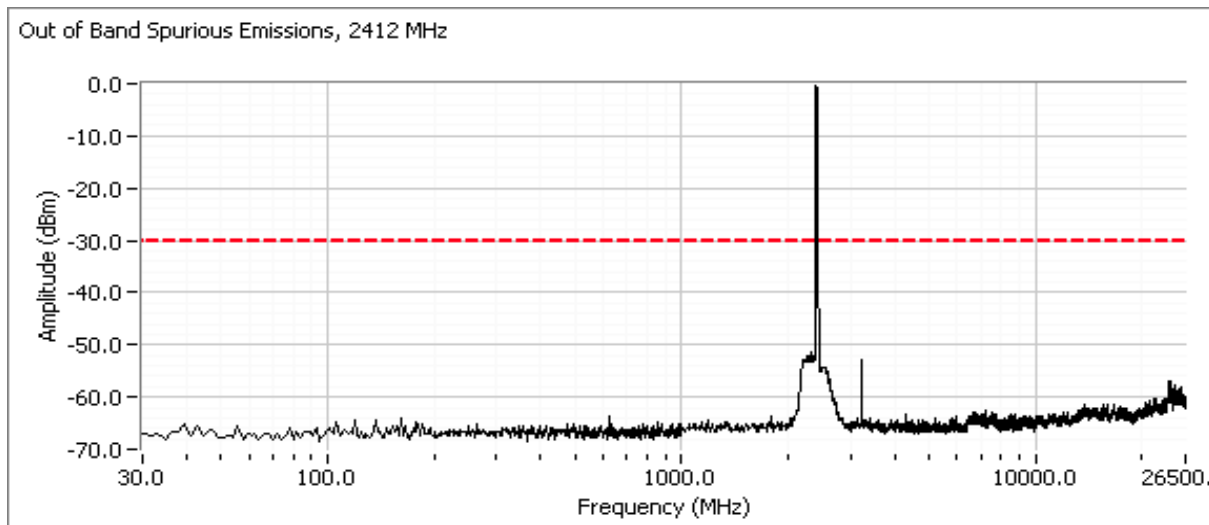
Delta Freq. 16.583
Delta Amplitude 6.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

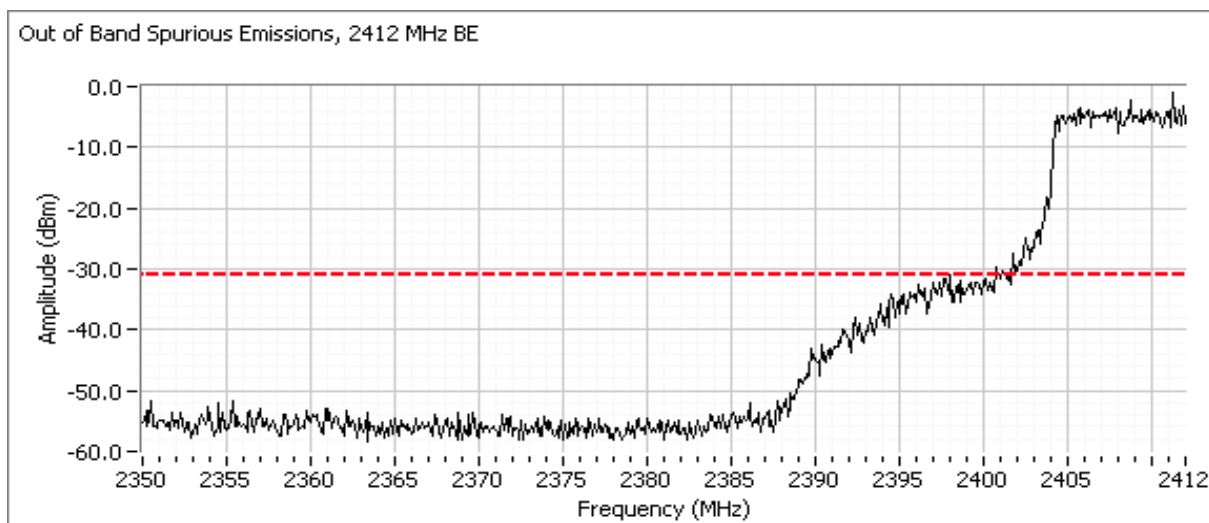
Run #4: Out of Band Spurious Emissions

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

Plots for low channel, power setting(s) = 19.0

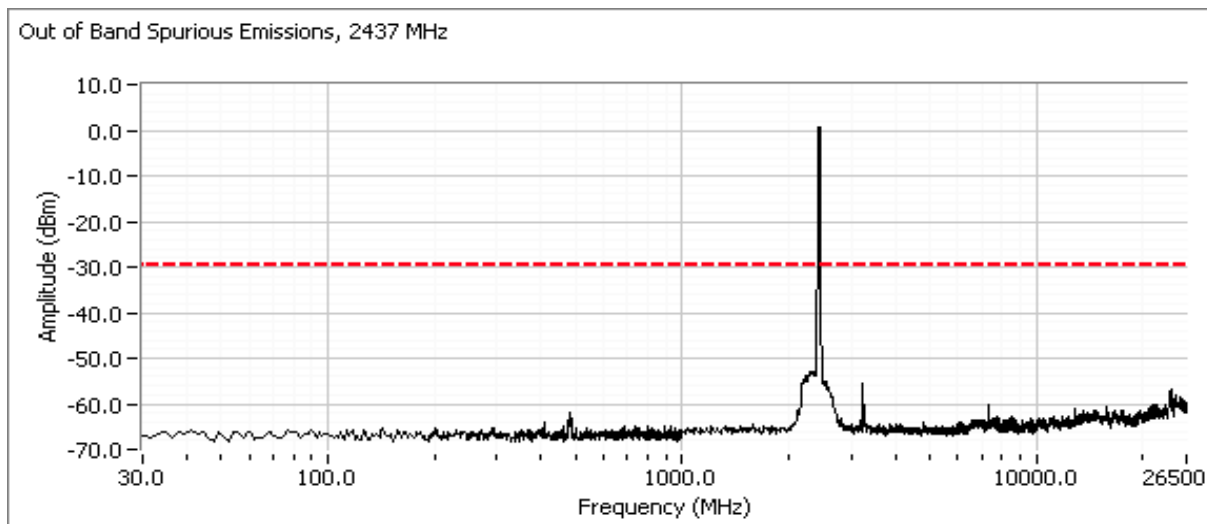


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

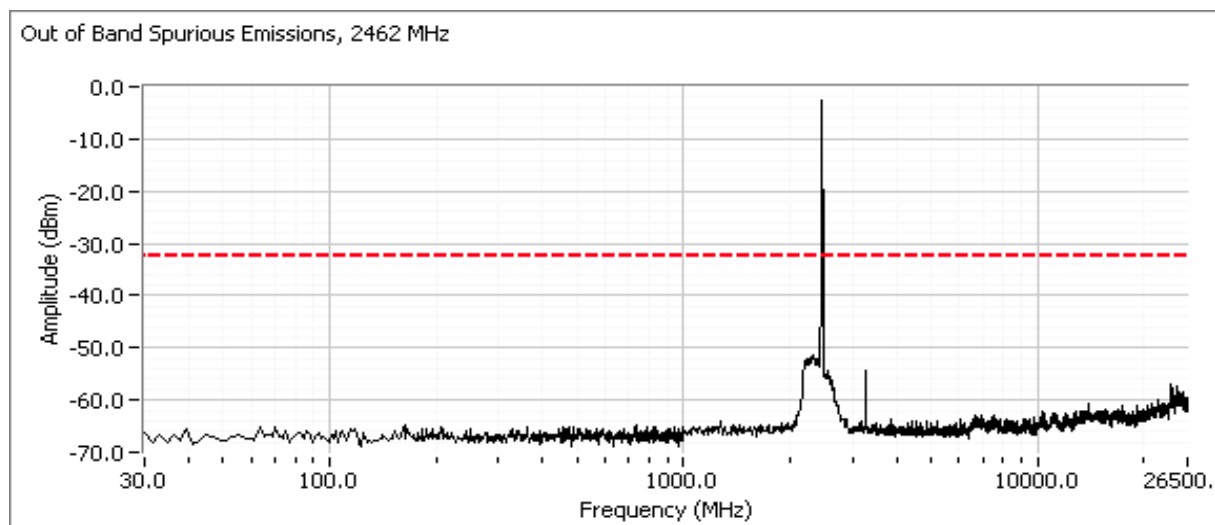


Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

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



Plots for high channel, power setting(s) = 18.5



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions - 802.11n (20MHz) Mode

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: 5/15/2009
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #4

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 22.3 °C
 Rel. Humidity: 42 %

Summary of Results

MAC Address: 001E64004794 CRTU Tool Version 5.10.24.0 Driver version 12.5.0.41

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	23.5	-	Output Power	15.247(b)	Pass	17.0 dBm
2	23.5	-	Power spectral Density (PSD)	15.247(d)	Pass	-9.2 dBm/3kHz
3	23.5	-	Minimum 6dB Bandwidth	15.247(a)	Pass	17.8 MHz
3	23.5	-	Maximum 99% Bandwidth	RSS GEN	-	18.6 MHz
4	23.5	-	Spurious emissions	15.247(b)	Pass	All emissions less than -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

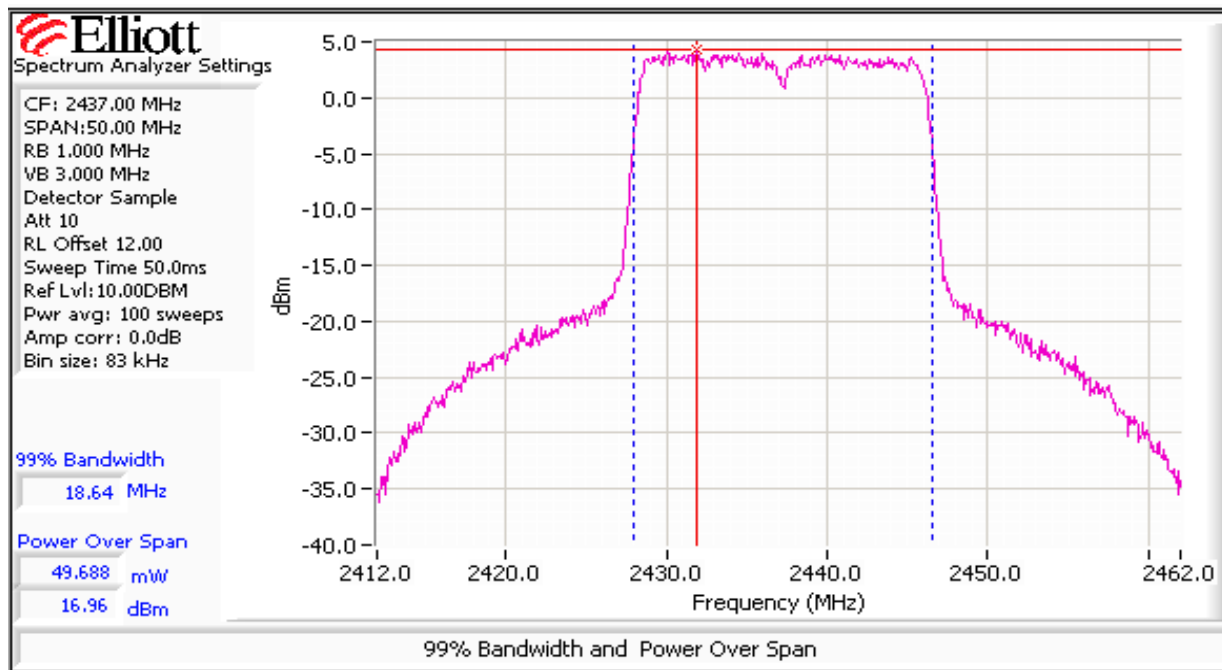
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power Note 3	
		(dBm) ¹	mW			dBm	W	Target	Actual
17	2412	12.2	16.6	3.2	Pass	15.4	0.035	11.6	11.8
23.5	2437	17.0	49.7	3.2	Pass	20.2	0.104	16.5	16.6
16	2462	10.0	10.0	3.2	Pass	13.2	0.021	10.2	10.3

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used. The output power limit is 30dBm
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measured using average power meter and is included for reference only.



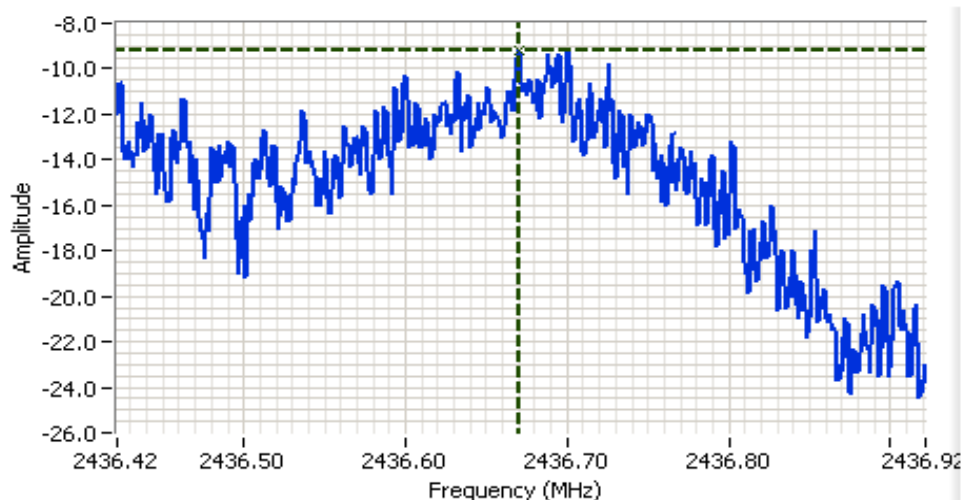
Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/3kHz) Note 1		
17	2412	-12.7	8.0	Pass
23.5	2437	-9.2	8.0	Pass
16	2462	-13.8	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.



Analyzer Settings

HP8564E, EMI
 CF: 2436.672 MHz
 SPAN: 500 kHz
 RB 3.00 kHz
 VB 10.00 kHz
 Detector Sample
 Att 10
 RL Offset 12.00
 Sweep Time 100.0s
 Ref Lvl: 10.00DBM

Comments

PSD = -9.17 dBm/3kHz
 2437 MHz

Cursor 1 2436.6708 -9.17

0.0000

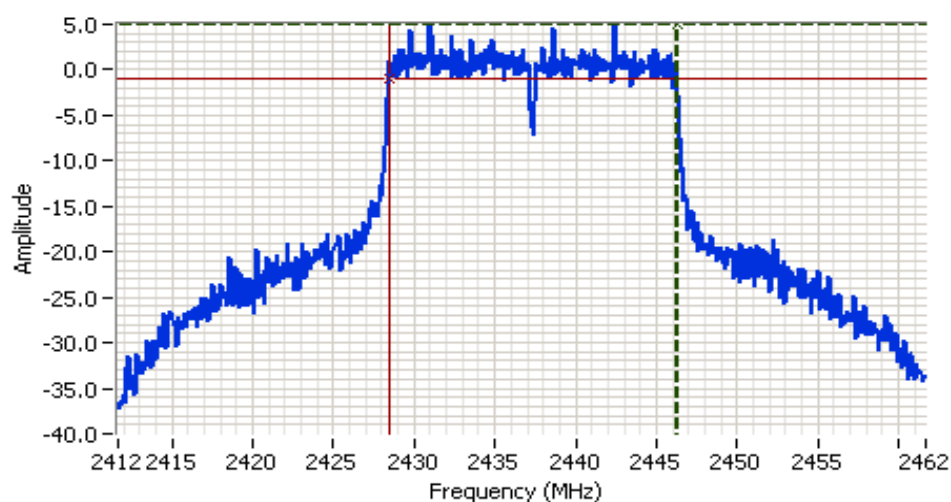
0.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
17	2412	100kHz	17.8	18.4
23.5	2437	100kHz	17.8	18.6
16	2462	100kHz	17.8	18.3

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



Analyzer Settings

HP8564E,EMI
 CF: 2436.672 MHz
 SPAN:50.000 MHz
 RB 100 kHz
 VB 100 kHz
 Detector Sample
 Att 10
 RL Offset 12.00
 Sweep Time 50.0ms
 Ref Lvl:10.00DBM

Comments

6dB BW: 17.83 MHz
 2437 MHz

Cursor 1	2446.2550	5.00	
Cursor 2	2428.4216	-1.00	

Delta Freq. 17.833

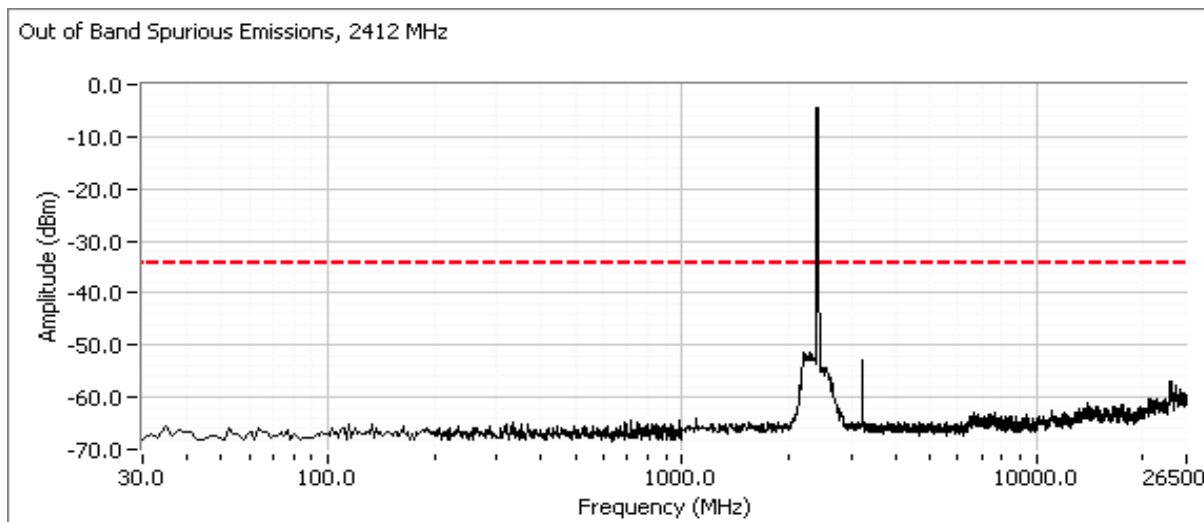
Delta Amplitude 6.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

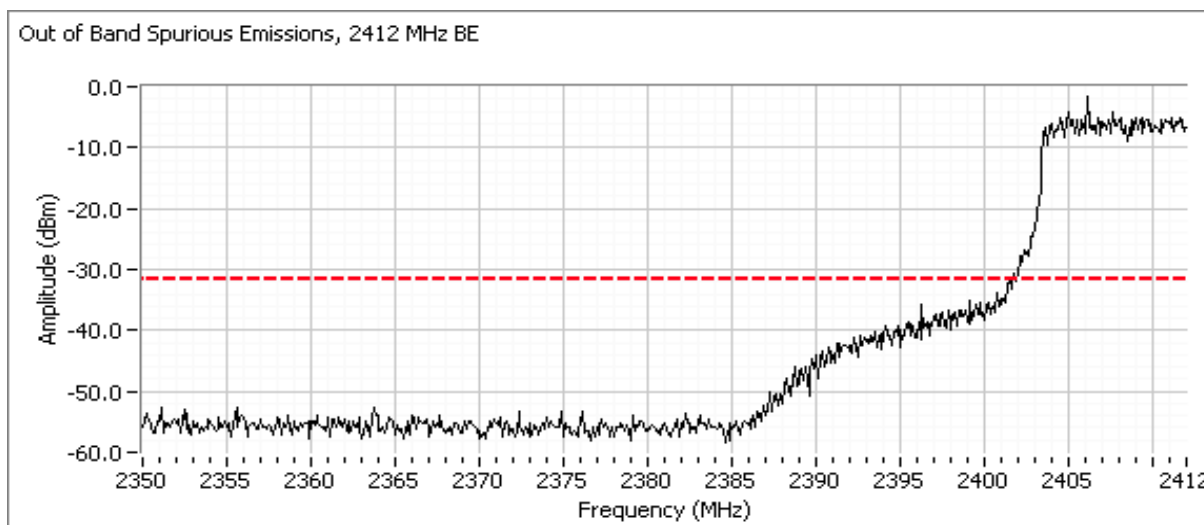
Run #4: Out of Band Spurious Emissions

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

Plots for low channel, power setting(s) = 17.0

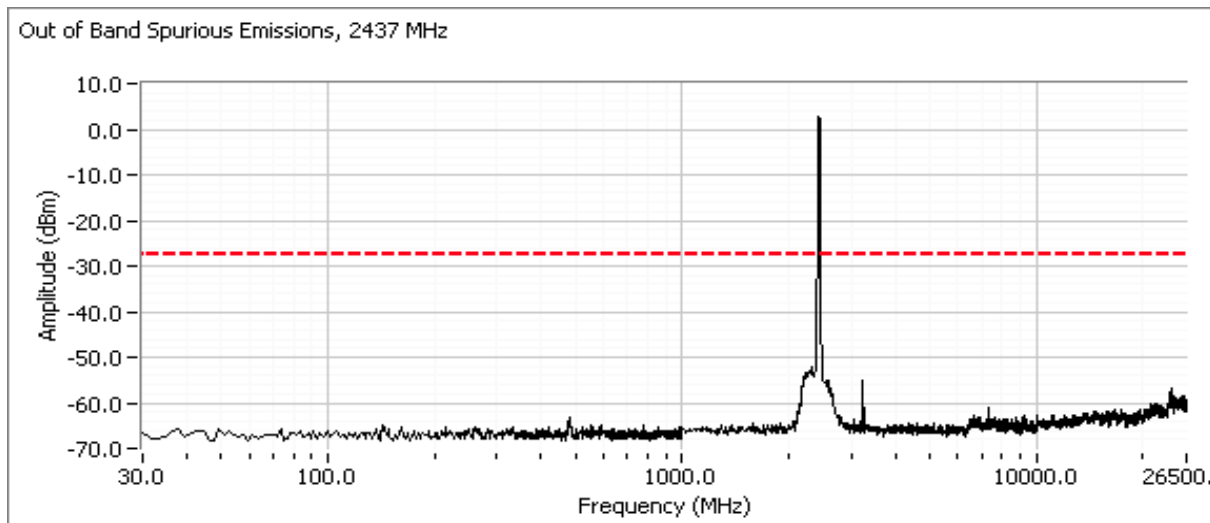


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

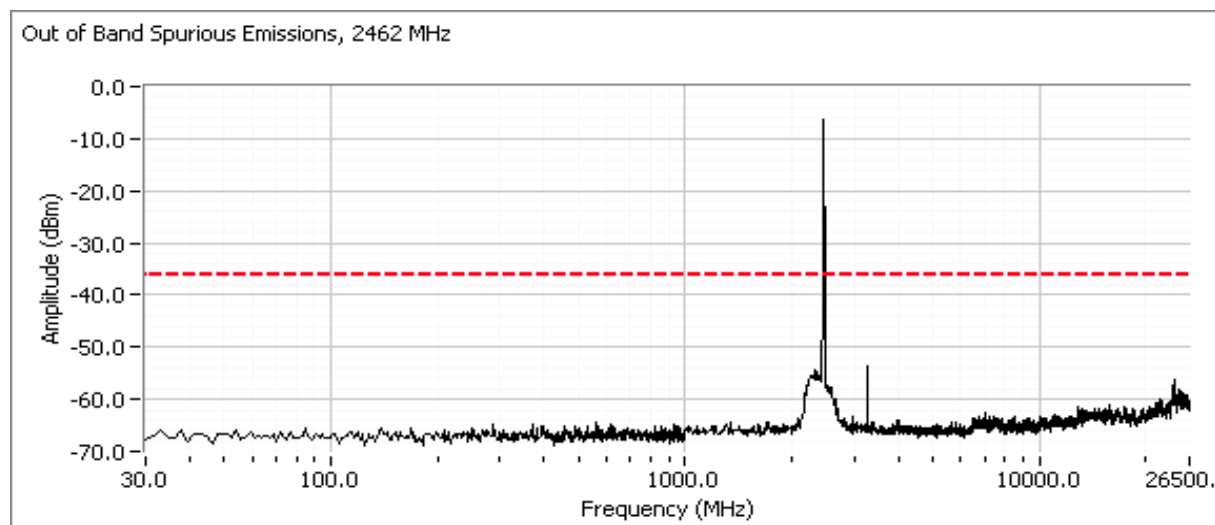


Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

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



Plots for high channel, power setting(s) = 16.0



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions - 802.11n (40MHz) Mode

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: 5/15/2009
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #4

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

General Test Configuration

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

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

Ambient Conditions:

Temperature: 22.3 °C
 Rel. Humidity: 42 %

Summary of Results

MAC Address: 001E64004794 CRTU Tool Version 5.10.24.0 Driver version 12.5.0.41

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	17.5	-	Output Power	15.247(b)	Pass	12.9 dBm
2	17.5	-	Power spectral Density (PSD)	15.247(d)	Pass	-14.7 dBm/3kHz
3	13.5	-	Minimum 6dB Bandwidth	15.247(a)	Pass	35.7 MHz
3	13.5	-	Maximum 99% Bandwidth	RSS GEN	-	36.6 MHz
4	17.5	-	Spurious emissions	15.247(b)	Pass	All emissions less than -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

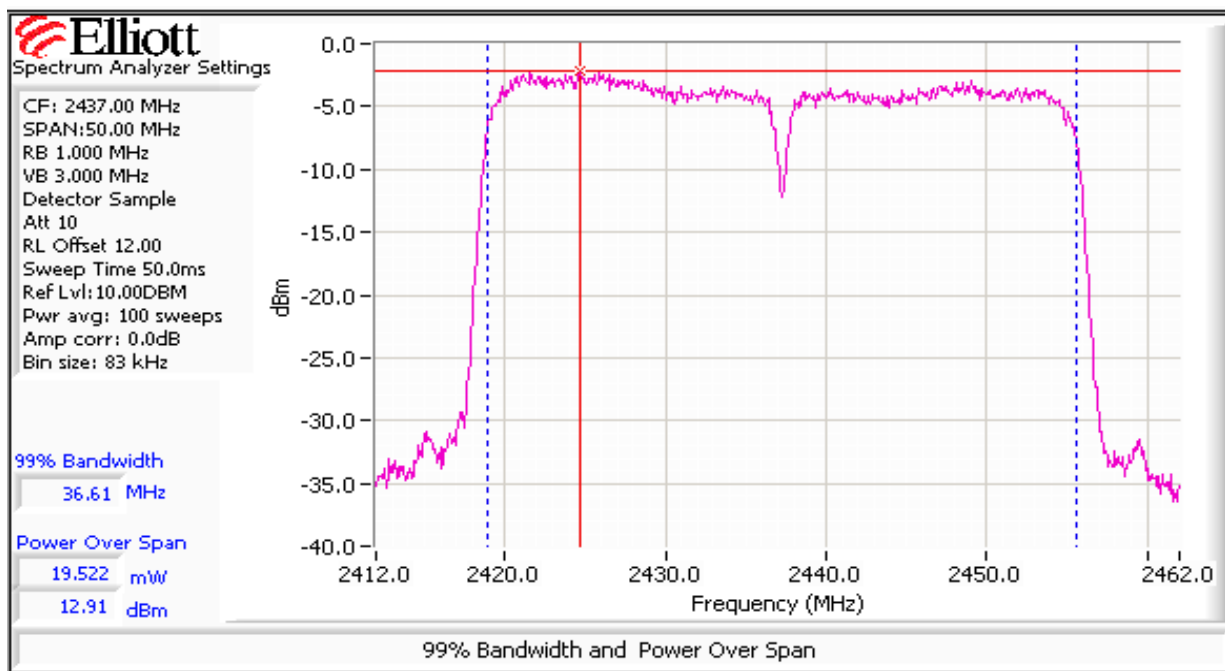
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #1: Output Power

Power Setting ²	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP ^{Note 2}		Output Power Note 3	
		(dBm) ¹	mW			dBm	W	Target	Actual
13.5	2422	9.4	8.8	3.2	Pass	12.6	0.018	9.1	9.2
17.5	2437	12.9	19.5	3.2	Pass	16.1	0.041	12.1	12.2
15.5	2452	10.2	10.5	3.2	Pass	13.4	0.022	10.0	10.2

Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used. The output power limit is 30dBm
Note 2:	Power setting - the software power setting used during testing, included for reference only.
Note 3:	Power measured using average power meter and is included for reference only.



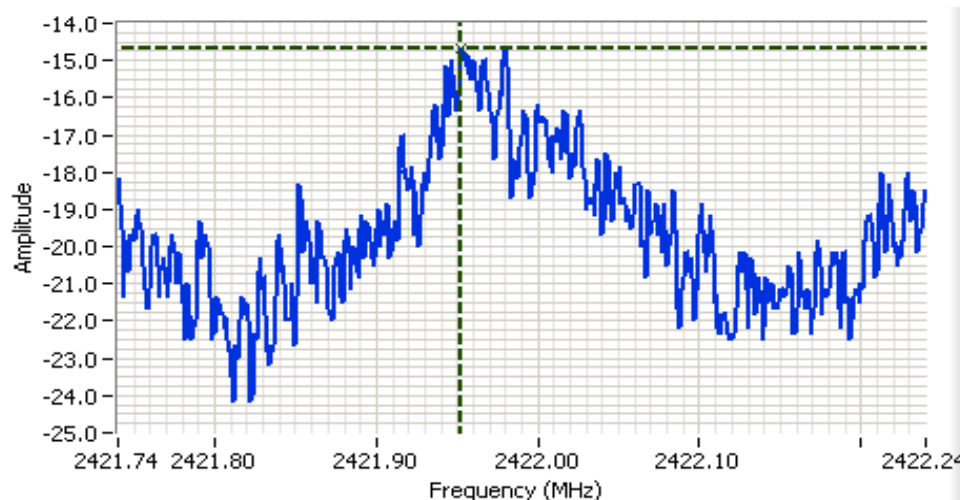
Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD	Limit dBm/3kHz	Result
		(dBm/3kHz) Note 1		
13.5	2422	-19.2	8.0	Pass
17.5	2437	-14.7	8.0	Pass
15.5	2452	-19.8	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.



Analyzer Settings

HP8564E,EMI
 CF: 2421.990 MHz
 SPAN:500 kHz
 RB 3.00 kHz
 VB 10.00 kHz
 Detector Sample
 Att 10
 RL Offset 12.00
 Sweep Time 100.0s
 Ref Lvl:10.00DBM

Comments

PSD = -14.7 dBm/3kHz
 2437 MHz

Cursor 1 2421.9525 -14.67

0.0000

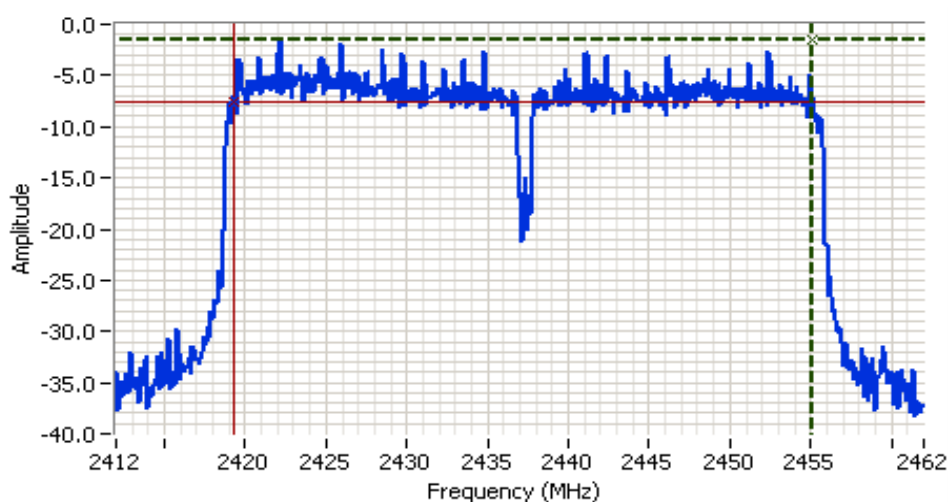
0.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz)	
			6dB	99%
13.5	2422	100kHz	35.7	36.61
17.5	2437	100kHz	35.8	36.61
15.5	2452	100kHz	35.7	36.52

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



Analyzer Settings

HP8564E,EMI
 CF: 2437.000 MHz
 SPAN:50.000 MHz
 RB 100 kHz
 VB 100 kHz
 Detector Sample
 Att 10
 RL Offset 12.00
 Sweep Time 50.0ms
 Ref Lvl:10.00DBM

Comments

6dB BW: 35.750 MHz
 2437 MHz

Cursor 1	2455.0833	-1.50	
Cursor 2	2419.3333	-7.50	

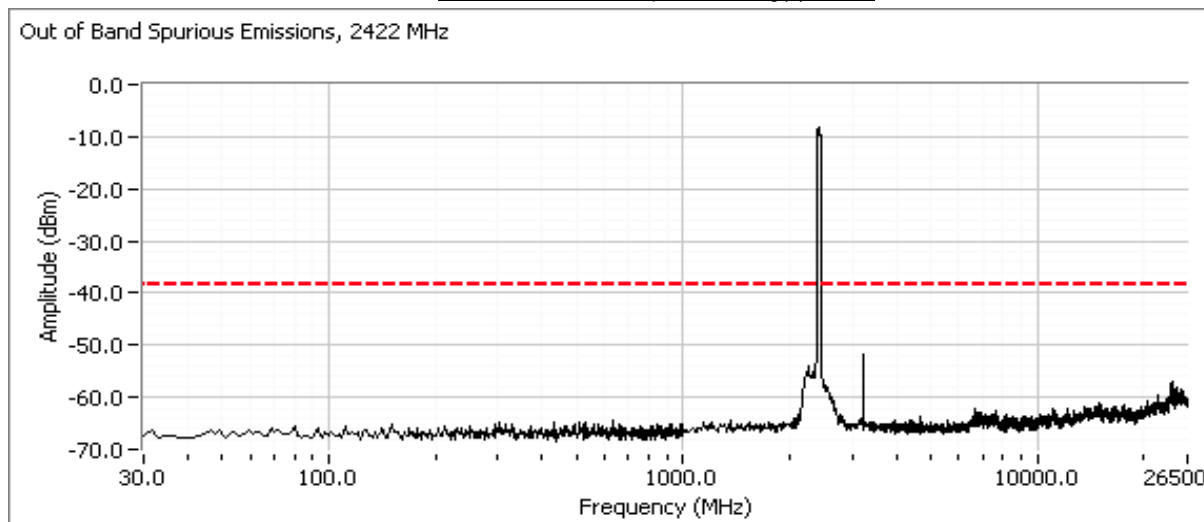
Delta Freq. 35.750
 Delta Amplitude 6.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

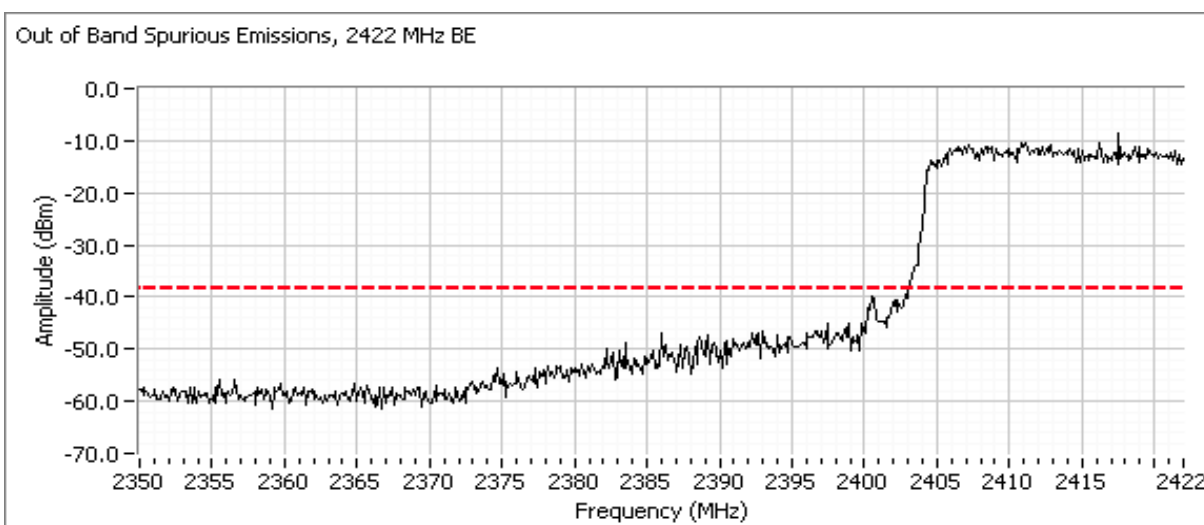
Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
13.5	-30dBc	Pass
17.5	-30dBc	Pass
15.5	-30dBc	Pass

Plots for low channel, power setting(s) = 13.5

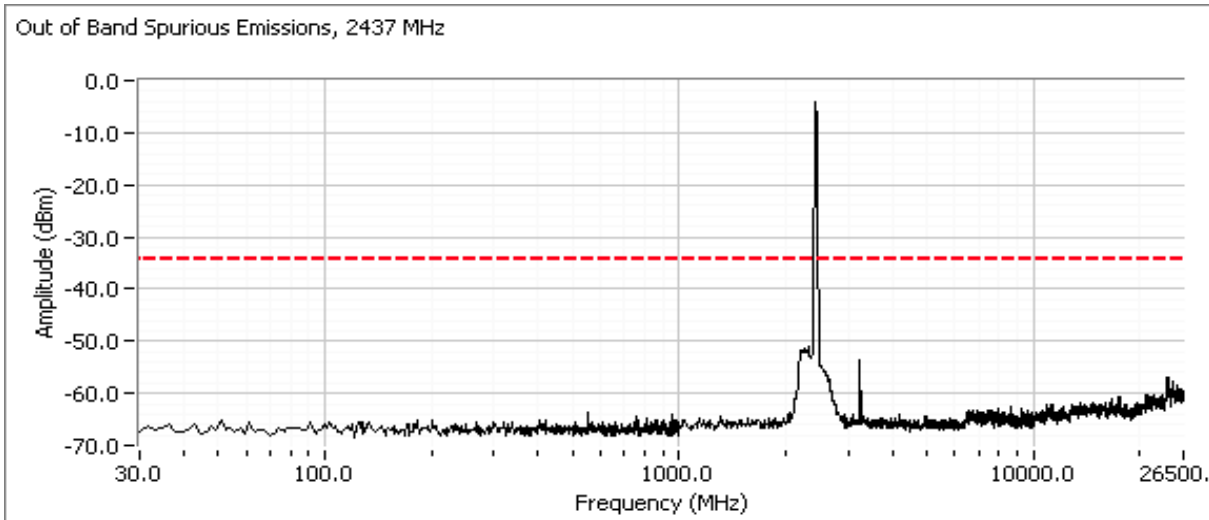


Additional plot showing compliance with -30dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.

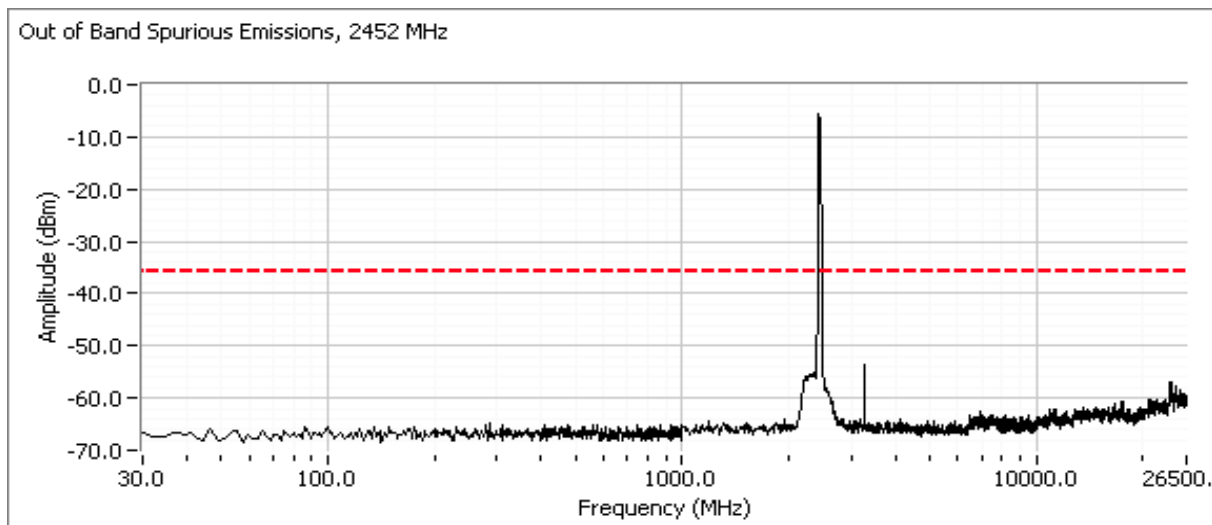


Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Plots for center channel, power setting(s) = 17.5



Plots for high channel, power setting(s) = 15.5



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

RSS 210, FCC 15.247 (DTS) Band Edge Field Strength

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

Summary of Results

MAC Address: 001E64004794 CRTU Tool Version 5.10.24.0 Driver version 12.5.0.41

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1	802.11n 40MHz Chain A	#3 2422MHz	-	9.1	Restricted Band Edge at 2400 MHz	15.209	49.8dBµV/m @ 2390.0MHz (-4.2dB)
		#9 2452MHz	-	10.0	Restricted Band Edge at 2483.5 MHz	15.209	50.1dBµV/m @ 2483.5MHz (-3.9dB)
Run # 2	802.11n 20MHz Chain A	#1 2412MHz	-	11.6	Restricted Band Edge at 2400 MHz	15.209	51.4dBµV/m @ 2390.0MHz (-2.6dB)
		#11 2462MHz	-	10.2	Restricted Band Edge at 2483.5 MHz	15.209	49.6dBµV/m @ 2484.3MHz (-4.4dB)
Run # 3	802.11g Chain A	#1 2412MHz	-	13.4	Restricted Band Edge at 2400 MHz	15.209	49.9dBµV/m @ 2389.7MHz (-4.1dB)
		#11 2462MHz	-	11.8	Restricted Band Edge at 2483.5 MHz	15.209	50.7dBµV/m @ 2464.6MHz (-3.3dB)
Run # 4	802.11b Chain A	#1 2412MHz	-	16.7	Restricted Band Edge at 2400 MHz	15.209	44.3dBµV/m @ 2387.3MHz (-9.7dB)
		#11 2462MHz	-	16.8	Restricted Band Edge at 2483.5 MHz	15.209	47.4dBµV/m @ 2486.7MHz (-6.6dB)
Run # 5	802.11n 40MHz Chain A	#4 2427MHz	-	10.4	Restricted Band Edge at 2400 MHz	15.209	50.6dBµV/m @ 2389.7MHz (-3.4dB)
		#8 2447MHz	-	10.4	Restricted Band Edge at 2483.5 MHz	15.209	50.3dBµV/m @ 2483.5MHz (-3.7dB)
Run # 6	802.11n 20MHz Chain A	#2 2417MHz	-	16.1	Restricted Band Edge at 2400 MHz	15.209	50.6dBµV/m @ 2390.0MHz (-3.4dB)
		#10 2457MHz	-	15.1	Restricted Band Edge at 2483.5 MHz	15.209	50.5dBµV/m @ 2483.7MHz (-3.5dB)

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 7	802.11g Chain A	#2 2417MHz	-	16.0	Restricted Band Edge at 2400 MHz	15.209	50.6dBμV/m @ 2390.0MHz (-3.4dB)
		#10 2457MHz	-	15.5	Restricted Band Edge at 2483.5 MHz	15.209	51.0dBμV/m @ 2483.5MHz (-3.0dB)
Run #8	802.11n 40MHz Chain A	#5 2432MHz	-	11.7	Restricted Band Edge at 2400 MHz	15.209	51.0dBμV/m @ 2389.8MHz (-3.0dB)
		#7 2442MHz	-	10.8	Restricted Band Edge at 2483.5 MHz	15.209	50.6dBμV/m @ 2483.5MHz (-3.4dB)
		#6 2437MHz	-	12.1	Restricted Band Edge at 2400 MHz	15.209	51.0dBμV/m @ 2389.66MHz (-3.8dB)
					Restricted Band Edge at 2483.5 MHz	15.209	50.8dBμV/m @ 2484.17MHz (-3.2dB)

Note - the measured power is the average power (measured with average power sensor) and is used for reference purposes only. The power measurements in accordance with FCC requirements and industry Canada requirements are on a separate data sheet.

Ambient Conditions:

Rel. Humidity: 39 %
Temperature: 18.6 °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.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 1, Band Edge Field Strength - 802.11n 40MHz, Chain A

Date of Test: 5/8/2009

Test Location: FT Chamber #4

Test Engineer: Joseph Cadigal

Config Change: none

Run # 1a, EUT on Channel #3 (2422MHz) - 802.11n 40MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	9.1	13.5

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	
2433.670	89.5	H	-	-	AVG	198	1.0	RB 1 MHz; VB: 10 Hz @ 13.5
2405.470	97.9	H	-	-	PK	198	1.0	RB 1 MHz; VB: 1 MHz @ 13.5
2433.130	88.6	V	-	-	AVG	159	1.0	RB 1 MHz; VB: 10 Hz @ 13.5
2432.530	97.0	V	-	-	PK	159	1.0	RB 1 MHz; VB: 1 MHz @ 13.5

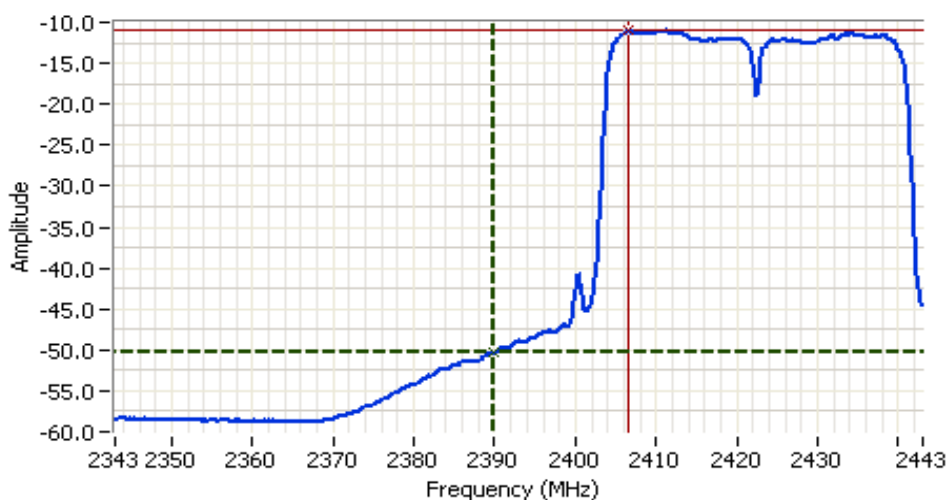
2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	97.7	97.0	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	89.5	88.6	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	39.7	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	58.0	dBuV/m				
Calculated Band-Edge Measurement (Avg):	49.8	dBuV/m				
	Margin	Level	Limit	Detector		
<i>Delta Marker - 1MHz/1MHz:</i>	34.5	dB	-4.2	49.8	54	Avg
<i>Delta Marker - 1MHz/10Hz:</i>	39.3	dB	-16.0	58.0	74	Pk
Calculated Band-Edge Measurement (Peak):	63.2	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.2	dBuV/m	Using 100kHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	49.8	-	54.0	-4.2	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 1a, EUT on Channel #3 (2422MHz) - 802.11n 40MHz, Chain A



Analyzer Settings

HP8564E,EMI
 CF: 2393.000 MHz
 SPAN:100.000 MHz
 RB 1.000 MHz
 VB 10 Hz
 Detector Sample
 Att 10
 RL Offset 11.00
 Sweep Time 37.0s
 Ref Lvl:2.30DBM

Comments

802.11n 40MHz
 2437MHz
 Chain A

Cursor 1	2390.0000	-50.37			
Cursor 2	2406.6667	-11.03			

Delta Freq. 16.667

Delta Amplitude 39.33

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 1b, EUT on Channel #9 (2452MHz) - 802.11n 40MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	10.0	15.0

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	
2436.400	91.6	H	120.0	-28.4	AVG	192	1.0	RB 1 MHz; VB: 10 Hz
2436.270	99.3	H	120.0	-20.7	PK	192	1.0	RB 1 MHz; VB: 1 MHz
2436.200	89.6	V	120.0	-30.4	AVG	156	1.0	RB 1 MHz; VB: 10 Hz
2435.730	97.3	V	120.0	-22.7	PK	156	1.0	RB 1 MHz; VB: 1 MHz

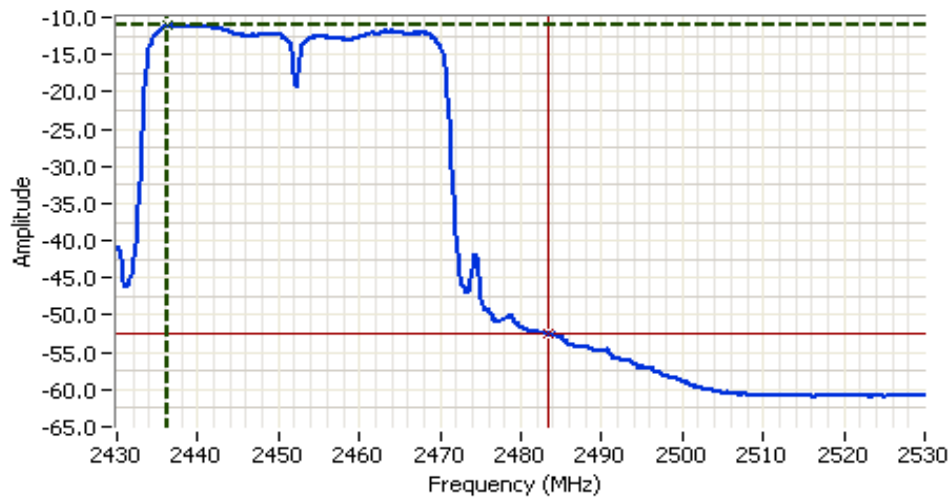
2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	99.3	97.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	91.6	89.6	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	39.3	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	60.0	dBuV/m				
Calculated Band-Edge Measurement (Avg):	52.3	dBuV/m				
	Margin	Level	Limit	Detector		
Delta Marker - 1MHz/1MHz:	36.5	dB	-3.9	50.1	54	Avg
Delta Marker - 1MHz/10Hz:	41.5	dB	-14.0	60.0	74	Pk
Calculated Band-Edge Measurement (Peak):	62.8	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.1	dBuV/m	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	50.1	-	54.0	-3.9	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 1b, EUT on Channel #9 (2452MHz) - 802.11n 40MHz, Chain A



Analyzer Settings

HP8564E,EMI
CF: 2480.000 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:3.40DBM

Comments

802.11n 40MHz
2452MHz
Chain A

Cursor 1	2436.3333	-11.10	+	-	+	-
Cursor 2	2483.5000	-52.60	+	-	+	-

Delta Freq. 47.167
Delta Amplitude 41.50

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 2, Band Edge Field Strength - 802.11n 20MHz, Chain A

Date of Test: 5/11/2009

Test Location: Chamber # 5

Test Engineer: Suhaila Khushzad

Config Change: none

Run # 2a, EUT on Channel #1 (2412MHz) - 802.11n 20MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	11.6	16.5

Fundamental Signal Field Strength

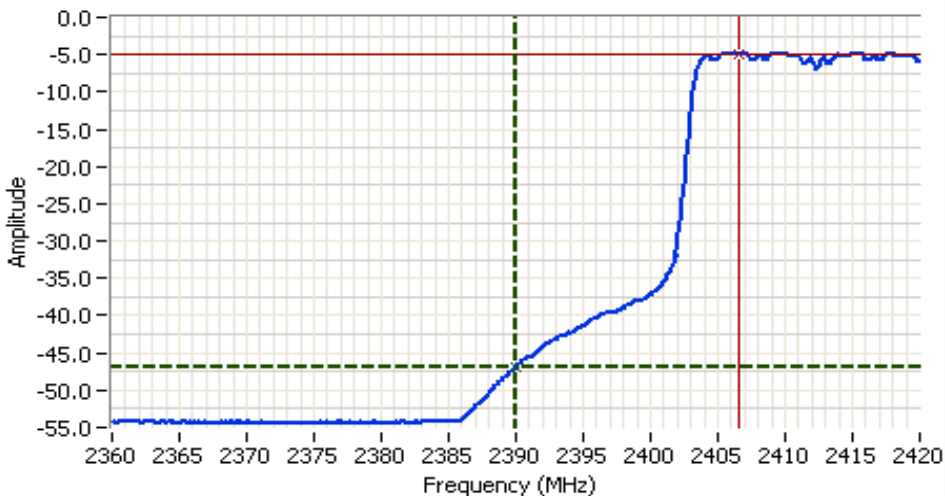
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2405.070	93.4	H	-	-	AVG	316	1.3	RB 1 MHz; VB: 10 Hz
2404.720	101.2	H	-	-	PK	316	1.3	RB 1 MHz; VB: 1 MHz
2408.870	89.1	V	-	-	AVG	245	1.1	RB 1 MHz; VB: 10 Hz
2407.370	97.0	V	-	-	PK	245	1.1	RB 1 MHz; VB: 1 MHz

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	101.2	97.0	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	93.4	89.1	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	41.8	<i>dB</i>	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	59.4	<i>dBuV/m</i>				
Calculated Band-Edge Measurement (Avg):	51.6	<i>dBuV/m</i>				
<i>Delta Marker - 1MHz/1MHz:</i>	32.5	<i>dB</i>	Margin	Level	Limit	Detector
<i>Delta Marker - 1MHz/10Hz:</i>	42.0	<i>dB</i>	-2.6	51.4	54	Avg
			-14.6	59.4	74	Pk
Calculated Band-Edge Measurement (Peak):	68.7	<i>dBuV/m</i>	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	51.4	<i>dBuV/m</i>	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	51.4	-	54.0	-2.6	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
 CF: 2390.000 MHz
 SPAN:60.000 MHz
 RB 1.000 MHz
 VB 10 Hz
 Detector Sample
 Att 20
 RL Offset 11.00
 Sweep Time 23.0s
 Ref Lvl:21.00DBM

Comments

802.11n 20MHz
 Chain A, Avg
 Channel @ 2412 MHz

Cursor 1	2390.0000	-46.83	
Cursor 2	2406.5000	-4.83	

Delta Freq. 16.500
 Delta Amplitude 42.00



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
		Account Manager:	Christine Vu Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 2b, EUT on Channel #11 (2462MHz) - 802.11n 20MHz, Chain A

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	15.0	10.2	16.5

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	
2465.230	94.3	H	-	-	AVG	166	1.0	RB 1 MHz; VB: 10 Hz
2465.300	102.2	H	-	-	PK	166	1.0	RB 1 MHz; VB: 1 MHz
2459.560	91.4	V	-	-	AVG	320	1.8	RB 1 MHz; VB: 10 Hz
2457.270	99.4	V	-	-	PK	320	1.8	RB 1 MHz; VB: 1 MHz

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	102.2	99.4	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	94.3	91.4	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	44.7 dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.				
Calculated Band-Edge Measurement (Peak):	57.5 dBuV/m					
Calculated Band-Edge Measurement (Avg):	49.6 dBuV/m	Margin	Level	Limit	Detector	
<i>Delta Marker - 1MHz/1MHz:</i>	35.8 dB	-4.4	49.6	54	Avg	
<i>Delta Marker - 1MHz/10Hz:</i>	43.8 dB	-16.5	57.5	74	Pk	
Calculated Band-Edge Measurement (Peak):	66.4 dBuV/m	Using 100kHz delta value				
Calculated Band-Edge Measurement (Avg):	50.5 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	
2484.300	49.6	-	54.0	-4.4	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
 CF: 2483.500 MHz
 SPAN:60.000 MHz
 RB 100 kHz
 VB 100 kHz
 Detector POS
 Att 20
 RL Offset 11.00
 Sweep Time 50.0ms
 Ref Lvl:21.00DBM

Comments

802.11n 20MHz
 Chain A, 100k/100k
 Channel @ 2462 MHz

Cursor 1	2455.8000	-2.67			
Cursor 2	2484.3000	-47.33			

Delta Freq. 28.500

Delta Amplitude 44.67

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 3, Band Edge Field Strength - 802.11g, Chain A

Date of Test: 5/11/2009

Test Location: Chamber # 5

Test Engineer: Suhaila Khushzad//R. Varelas

Config Change: none

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

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	13.4	18.5

Fundamental Signal Field Strength

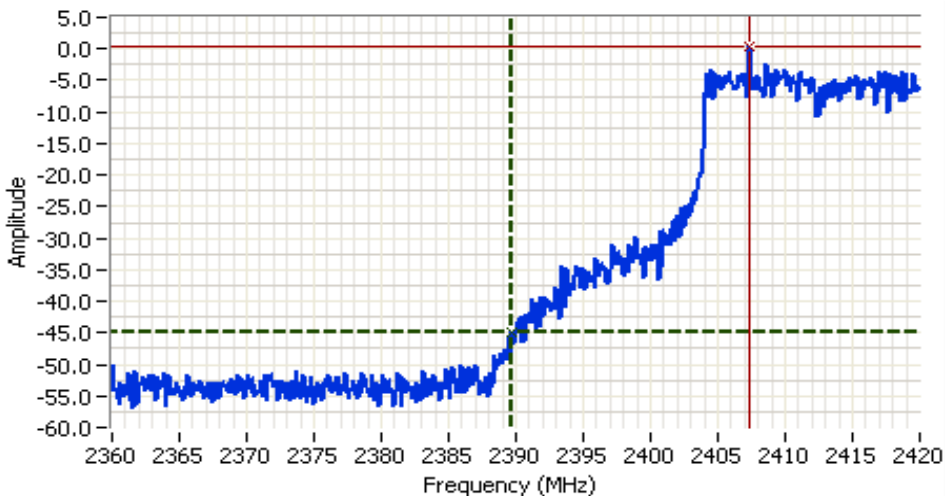
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2405.250	95.2	H	-	-	AVG	303	1.0	RB 1 MHz; VB: 10 Hz
2405.870	103.0	H	-	-	PK	303	1.0	RB 1 MHz; VB: 1 MHz
2404.990	93.5	V	-	-	AVG	168	1.8	RB 1 MHz; VB: 10 Hz
2408.250	101.4	V	-	-	PK	168	1.8	RB 1 MHz; VB: 1 MHz

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	103.0	101.4	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	95.2	93.5	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	45.3 dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.				
Calculated Band-Edge Measurement (Peak):	57.7 dBuV/m					
Calculated Band-Edge Measurement (Avg):	49.9 dBuV/m					
	Margin	Level	Limit	Detector		
Delta Marker - 1MHz/1MHz:	35.3 dB	-4.1	49.9	54	Avg	
Delta Marker - 1MHz/10Hz:	42.5 dB	-16.3	57.7	74	Pk	
Calculated Band-Edge Measurement (Peak):	67.7 dBuV/m	Using 100kHz delta value				
Calculated Band-Edge Measurement (Avg):	52.7 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	
2389.700	49.9	-	54.0	-4.1	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2390.000 MHz
SPAN:60.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 11.00
Sweep Time 50.0ms
Ref Lvl:21.00DBM

Comments

802.11g
Chain A, 100k/100k
Channel @ 2412 MHz

Cursor 1	2389.7000	-45.00	
Cursor 2	2407.3999	0.33	

Delta Freq. 17.700
Delta Amplitude 45.33

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

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

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	11.8	18.0

Fundamental Signal Field Strength

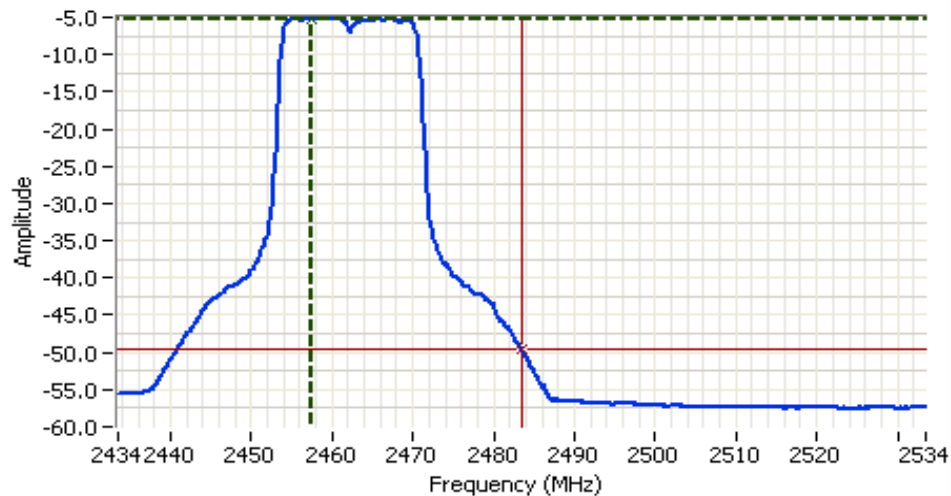
Fundamental Signal: 15.209 / 15.247								
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2464.800	95.0	H	-	-	AVG	18	1.0	RB 1 MHz; VB: 10 Hz @ 18.0
2465.530	103.0	H	-	-	PK	18	1.0	RB 1 MHz; VB: 1 MHz @ 18.0
2463.240	93.1	V	-	-	AVG	336	1.5	RB 1 MHz; VB: 10 Hz @ 18.0
2463.460	101.0	V	-	-	PK	336	1.5	RB 1 MHz; VB: 1 MHz @ 18.0

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	103.0	101.0	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	95.0	93.1	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	42.3	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	60.7	dBuV/m				
Calculated Band-Edge Measurement (Avg):	52.7	dBuV/m				
	Margin	Level	Limit	Detector		
Delta Marker - 1MHz/1MHz:	37.0	dB	-3.3	50.7	54	Avg
Delta Marker - 1MHz/10Hz:	44.3	dB	-13.3	60.7	74	Pk
Calculated Band-Edge Measurement (Peak):	66.0	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.7	dBuV/m	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	50.7	-	54.0	-3.3	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2483.500 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:9.50DBM

Comments

802.11g
2462MHz
Chain A

Cursor 1	2457.5000	-5.17	
Cursor 2	2483.5000	-49.50	

Delta Freq. 26.000
Delta Amplitude 44.33

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

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

Date of Test: 5/13/2009

Test Location: FT Chamber #5

Test Engineer: Rafael Varelas

Config Change: none

Run # 4a, EUT on Channel #1 (2412MHz) - 802.11b, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	16.5	16.7	17.5

Fundamental Signal Field Strength

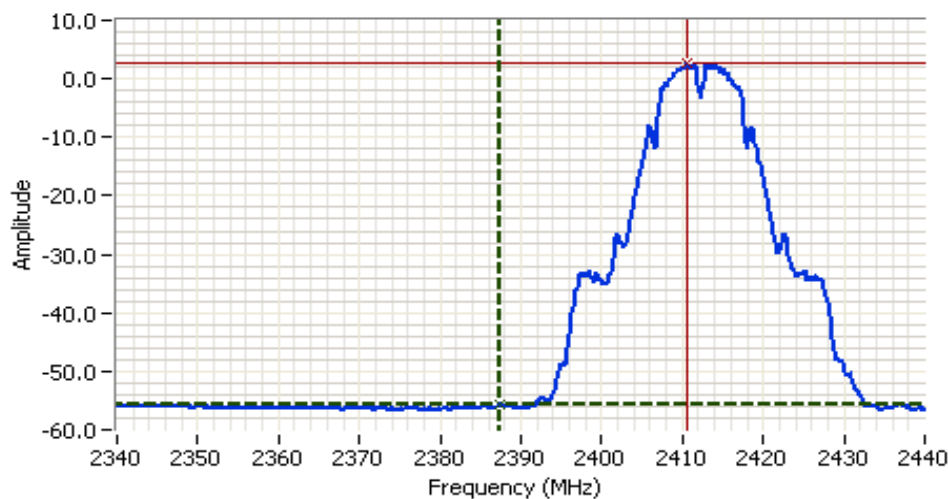
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2410.330	102.8	H	-	-	AVG	337	1.0	RB 1 MHz; VB: 10 Hz
2411.130	106.0	H	-	-	PK	337	1.0	RB 1 MHz; VB: 1 MHz
2410.370	101.5	V	-	-	AVG	183	1.8	RB 1 MHz; VB: 10 Hz
2411.230	104.7	V	-	-	PK	183	1.8	RB 1 MHz; VB: 1 MHz

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	106.0	104.7	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	102.8	101.5	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	52.8 dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.				
Calculated Band-Edge Measurement (Peak):	53.2 dBuV/m					
Calculated Band-Edge Measurement (Avg):	50.0 dBuV/m					
Delta Marker - 1MHz/1MHz:	40.7 dB	-9.7	44.3	54	Avg	
Delta Marker - 1MHz/10Hz:	58.5 dB	-20.8	53.2	74	Pk	
Calculated Band-Edge Measurement (Peak):	65.3 dBuV/m	Using 100kHz delta value				
Calculated Band-Edge Measurement (Avg):	44.3 dBuV/m	Using 1MHz delta value				

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2387.333	44.3	-	54.0	-9.7	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2390.000 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:10.67DBM

Comments

802.11b
2412MHz
Chain A

Cursor 1	2387.3333	-55.83	⊕ ⊖ ⊞ ⊚ ⊛
Cursor 2	2410.5000	2.67	⊕ ⊖ ⊞ ⊚ ⊛

Delta Freq. 23.167
Delta Amplitude 58.50

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

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

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	16.5	16.8	19.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2460.400	104.6	H	-	-	AVG	339	1.0	RB 1 MHz; VB: 10 Hz
2461.170	108.0	H	-	-	PK	339	1.0	RB 1 MHz; VB: 1 MHz
2460.680	99.4	V	-	-	AVG	184	1.0	RB 1 MHz; VB: 10 Hz
2460.520	102.8	V	-	-	PK	184	1.0	RB 1 MHz; VB: 1 MHz

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	108.0	102.8	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	104.6	99.4	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	52.8	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	55.2	dBuV/m				
Calculated Band-Edge Measurement (Avg):	51.8	dBuV/m				
Delta Marker - 1MHz/1MHz:	42.5	dB	Margin	Level	Limit	Detector
Delta Marker - 1MHz/10Hz:	57.2	dB	-6.6	47.4	54	Avg
Calculated Band-Edge Measurement (Peak):	65.5	dBuV/m	-18.8	55.2	74	Pk
Calculated Band-Edge Measurement (Avg):	47.4	dBuV/m	Using 100kHz delta value			
			Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2486.660	47.4	-	54.0	-6.6	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2483.500 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:10.67DBM

Comments

802.11b
2462MHz
Chain A

Cursor 1	2460.5000	2.84	⊕ ⊖ ⊞ ⊟
Cursor 2	2486.6667	-54.33	⊕ ⊖ ⊞ ⊟

Delta Freq. 26.167
Delta Amplitude 57.17

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 5, Band Edge Field Strength - 802.11n 40MHz, Chain A

Date of Test: 5/11/2009

Test Location: FT Chamber #5

Test Engineer: Rafael Varelas

Config Change: none

Run # 5a, EUT on Channel #4 (2427MHz) - 802.11n 40MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	10.4	15.0

Fundamental Signal Field Strength

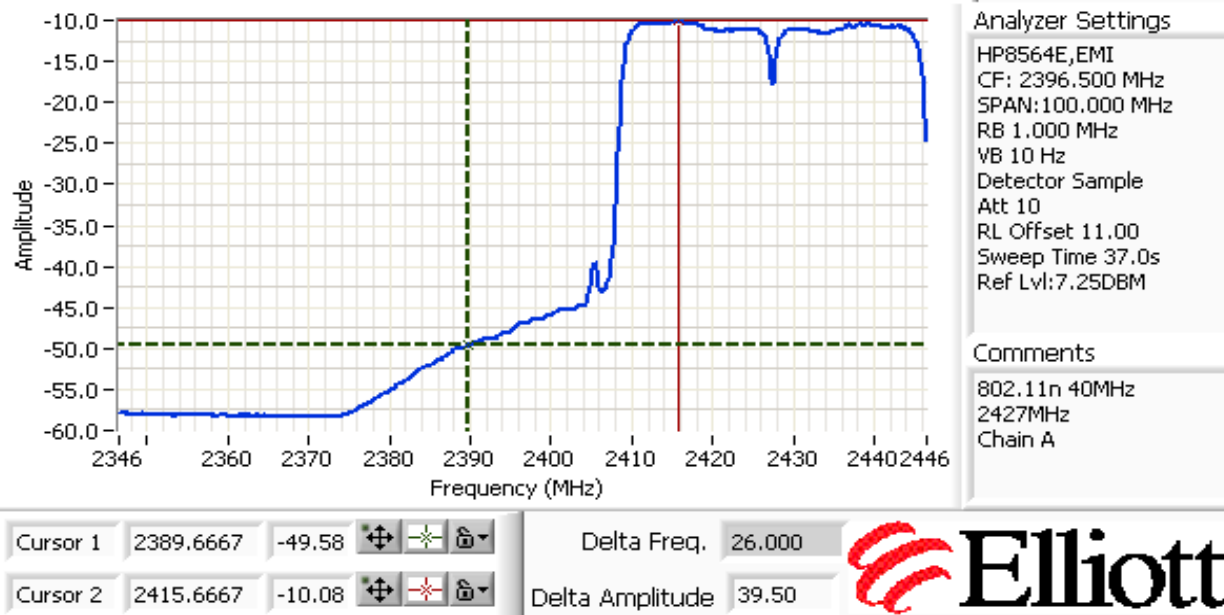
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2438.070	90.1	H	-	-	AVG	336	1.2	RB 1 MHz; VB: 10 Hz @ 15.0
2437.530	98.7	H	-	-	PK	336	1.2	RB 1 MHz; VB: 1 MHz @ 15.0
2428.500	88.4	V	-	-	AVG	335	1.5	RB 1 MHz; VB: 10 Hz @ 15.0
2425.540	96.2	V	-	-	PK	335	1.5	RB 1 MHz; VB: 1 MHz @ 15.0

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	98.7	96.2	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	90.1	88.4	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	39.2 dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.				
Calculated Band-Edge Measurement (Peak):	59.5 dBuV/m					
Calculated Band-Edge Measurement (Avg):	50.9 dBuV/m					
<i>Delta Marker - 1MHz/1MHz:</i>	35.2 dB	Margin	Level	Limit	Detector	
<i>Delta Marker - 1MHz/10Hz:</i>	39.5 dB	-3.4	50.6	54	Avg	
		-14.5	59.5	74	Pk	
Calculated Band-Edge Measurement (Peak):	63.5 dBuV/m	Using 100kHz delta value				
Calculated Band-Edge Measurement (Avg):	50.6 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/Avg	degrees	meters	
2389.660	50.6	-	54.0	-3.4	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 5b, EUT on Channel #8 (2447MHz) - 802.11n 40MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	10.4	15.5

Fundamental Signal Field Strength

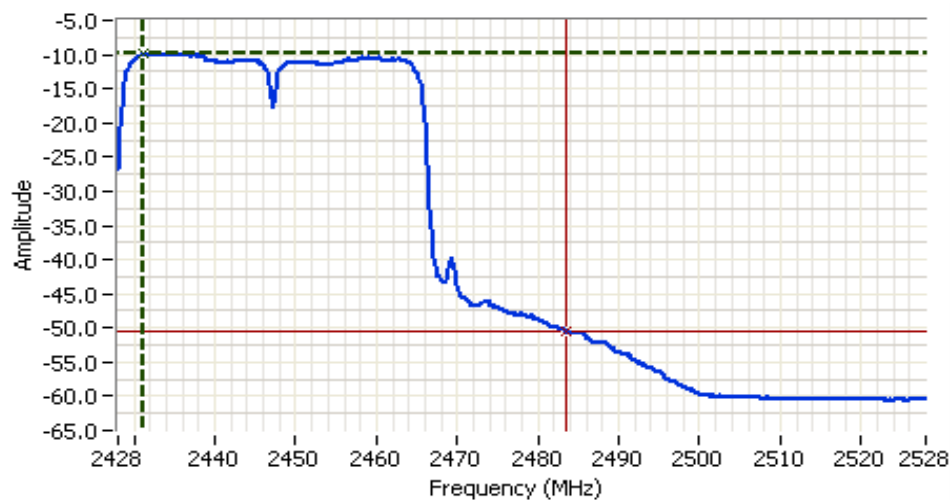
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2462.600	91.0	H	-	-	AVG	321	1.2	RB 1 MHz; VB: 10 Hz @ 15.5
2457.800	98.9	H	-	-	PK	321	1.2	RB 1 MHz; VB: 1 MHz @ 15.5
2431.400	90.0	V	-	-	AVG	342	1.8	RB 1 MHz; VB: 10 Hz @ 15.5
2436.470	97.9	V	-	-	PK	342	1.8	RB 1 MHz; VB: 1 MHz @ 15.5

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	98.9	97.9	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	91.0	90.0	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	40.7	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	58.2	dBuV/m				
Calculated Band-Edge Measurement (Avg):	50.3	dBuV/m				
			Margin	Level	Limit	Detector
<i>Delta Marker - 1MHz/1MHz:</i>	34.3	dB	-3.7	50.3	54	Avg
<i>Delta Marker - 1MHz/10Hz:</i>	40.7	dB	-15.8	58.2	74	Pk
Calculated Band-Edge Measurement (Peak):	64.6	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.3	dBuV/m	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	50.3	-	54.0	-3.7	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2478.000 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:6.00DBM

Comments

802.11n 40MHz
2447MHz
Chain A

Cursor 1	2431.1667	-9.83	⊕ ⊖ ⊞ ⊟
Cursor 2	2483.5000	-50.50	⊕ ⊖ ⊞ ⊟

Delta Freq. 52.333
Delta Amplitude 40.67

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 6, Band Edge Field Strength - 802.11n 20MHz, Chain A

Run # 6a, EUT on Channel #2 (2417MHz) - 802.11n 20MHz, Chain A

Date of Test: 5/13/2009

Test Location: FT Chamber #5

Test Engineer: Rafael varelas

Config Change: none

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	16.5	16.1	22.0

Fundamental Signal Field Strength

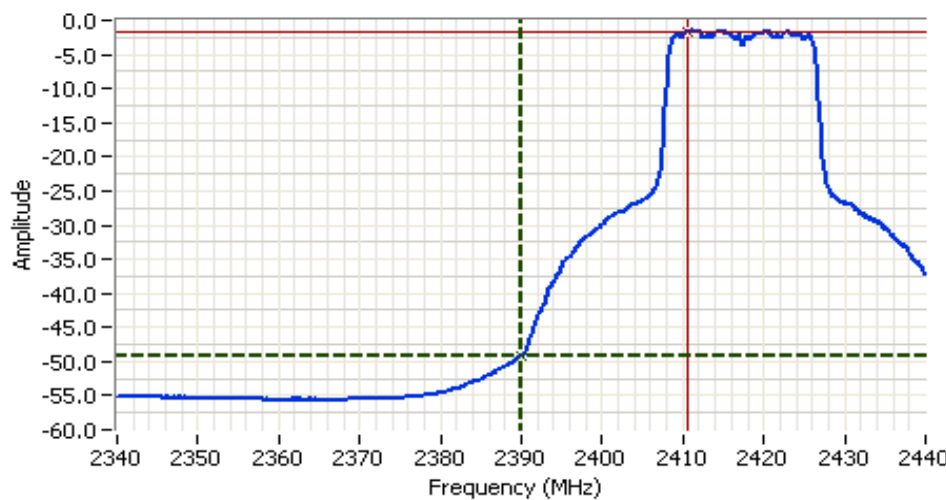
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2422.300	98.1	H	-	-	AVG	332	1.0	RB 1 MHz; VB: 10 Hz @ 22.0
2420.470	106.2	H	-	-	PK	332	1.0	RB 1 MHz; VB: 1 MHz @ 22.0
2409.970	95.2	V	-	-	AVG	177	1.5	RB 1 MHz; VB: 10 Hz @ 22.0
2412.030	103.1	V	-	-	PK	177	1.5	RB 1 MHz; VB: 1 MHz @ 22.0

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW :			Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW :	98.1		Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	45.8 dB		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	-45.8 dBuV/m		
Calculated Band-Edge Measurement (Avg):	52.3 dBuV/m		
Delta Marker - 1MHz/1MHz:	38.2 dB	-3.4	50.6
Delta Marker - 1MHz/10Hz:	47.5 dB	-119.8	-45.8
Calculated Band-Edge Measurement (Peak):	-38.2 dBuV/m		74
Calculated Band-Edge Measurement (Avg):	50.6 dBuV/m		Pk
			Using 100kHz delta value
			Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	50.6	-	54.0	-3.4	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E, EMI
CF: 2390.000 MHz
SPAN: 100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl: 10.20DBM

Comments

802.11n 20MHz
2417MHz
Chain A

Cursor 1 2390.0000 -49.13
Cursor 2 2410.5000 -1.63

Delta Freq. 20.500
Delta Amplitude 47.50

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 6b, EUT on Channel #10 (2457MHz) - 802.11n 20MHz, Chain A

Date of Test: 5/11/2009

Test Location: FT Chamber #5

Test Engineer: Rafael Varelas

Config Change: none

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	15.1	21.5

Fundamental Signal Field Strength

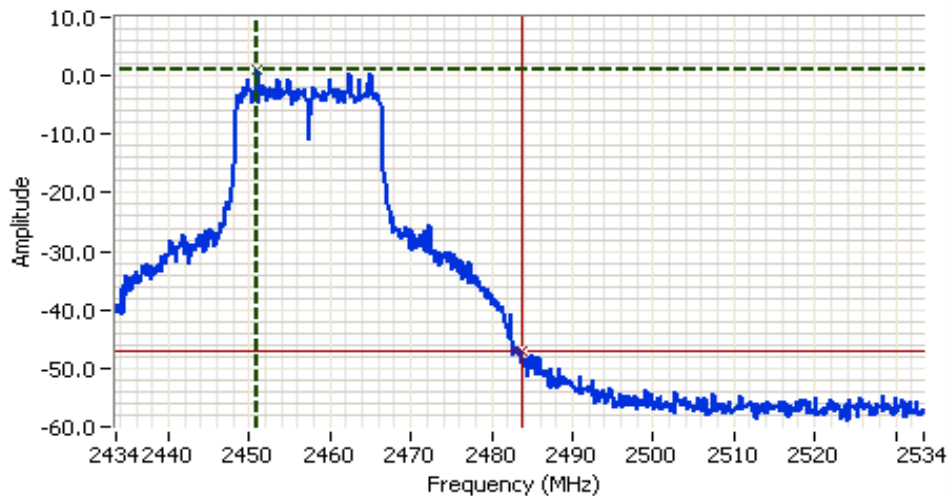
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2460.330	98.5	H	-	-	AVG	316	1.2	RB 1 MHz; VB: 10 Hz @ 21.5
2460.400	106.6	H	-	-	PK	316	1.2	RB 1 MHz; VB: 1 MHz @ 21.5
2460.170	97.3	V	-	-	AVG	335	1.7	RB 1 MHz; VB: 10 Hz @ 21.5
2460.370	105.4	V	-	-	PK	335	1.7	RB 1 MHz; VB: 1 MHz @ 21.5

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	106.1	105.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	98.5	97.3	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	48.0	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	58.1	dBuV/m				
Calculated Band-Edge Measurement (Avg):	50.5	dBuV/m				
	Margin	Level	Limit	Detector		
<i>Delta Marker - 1MHz/1MHz:</i>	39.5	dB	-3.5	50.5	54	Avg
<i>Delta Marker - 1MHz/10Hz:</i>	47.2	dB	-15.9	58.1	74	Pk
Calculated Band-Edge Measurement (Peak):	66.6	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	51.3	dBuV/m	Using 100kHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.660	50.5	-	54.0	-3.5	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2483.500 MHz
SPAN:100.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 11.00
Sweep Time 55.0ms
Ref Lvl:10.91DBM

Comments

802.11n 20MHz
2457MHz
Chain A

Cursor 1	2451.0000	0.91	⊕ ⊖ ⊞ ⊟
Cursor 2	2483.6667	-47.09	⊕ ⊖ ⊞ ⊟

Delta Freq. 32.667
Delta Amplitude 48.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 7, Band Edge Field Strength - 802.11g, Chain A

Date of Test: 5/13/2009

Test Location: FT Chamber #5

Test Engineer: Rafael Varelas

Config Change: none

Run # 7a, EUT on Channel #2 (2417MHz) - 802.11g, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	16.5	16.0	22.0

Fundamental Signal Field Strength

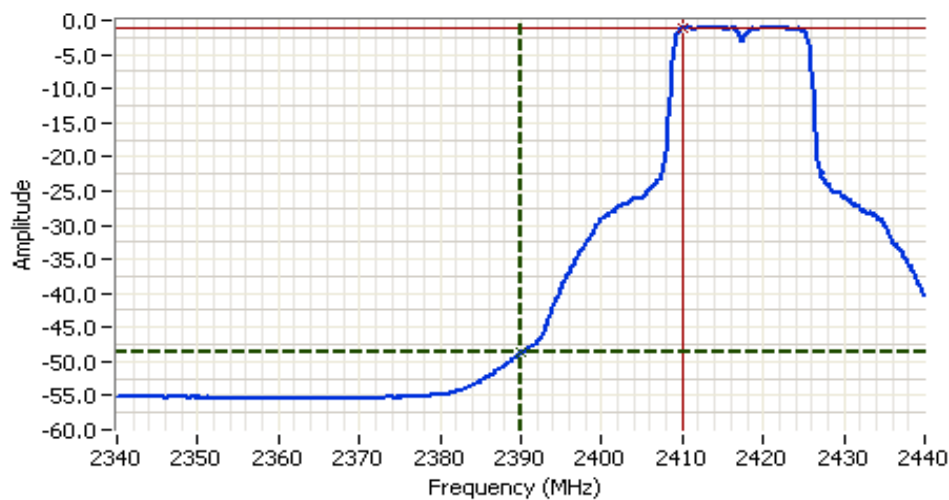
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2423.770	98.3	H	-	-	AVG	334	1.0	RB 1 MHz; VB: 10 Hz @ 22.0
2420.470	106.3	H	-	-	PK	334	1.0	RB 1 MHz; VB: 1 MHz @ 22.0
2409.800	96.4	V	-	-	AVG	180	1.7	RB 1 MHz; VB: 10 Hz @ 22.0
2410.070	104.3	V	-	-	PK	180	1.7	RB 1 MHz; VB: 1 MHz @ 22.0

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	106.3	104.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	98.3	96.4	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	46.2	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	60.1	dBuV/m				
Calculated Band-Edge Measurement (Avg):	52.1	dBuV/m				
<i>Delta Marker - 1MHz/1MHz:</i>	40.7	dB	Margin	Level	Limit	Detector
<i>Delta Marker - 1MHz/10Hz:</i>	47.7	dB	-3.4	50.6	54	Avg
Calculated Band-Edge Measurement (Peak):	65.6	dBuV/m	-13.9	60.1	74	Pk
Calculated Band-Edge Measurement (Avg):	50.6	dBuV/m	Using 100kHz delta value			
			Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2390.000	50.6	-	54.0	-3.4	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings
HP8564E,EMI
CF: 2390.000 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 10
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:10.42DBM
Comments
802.11g
2417MHz
Chain A

Cursor 1	2390.0000	-48.75	
Cursor 2	2410.1667	-1.08	

Delta Freq.	20.167
Delta Amplitude	47.67



Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
		Account Manager:	Christine Vu Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run # 7b, EUT on Channel #10 (2457MHz) - 802.11g, Chain A

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.5	15.5	22.0

Fundamental Signal Field Strength

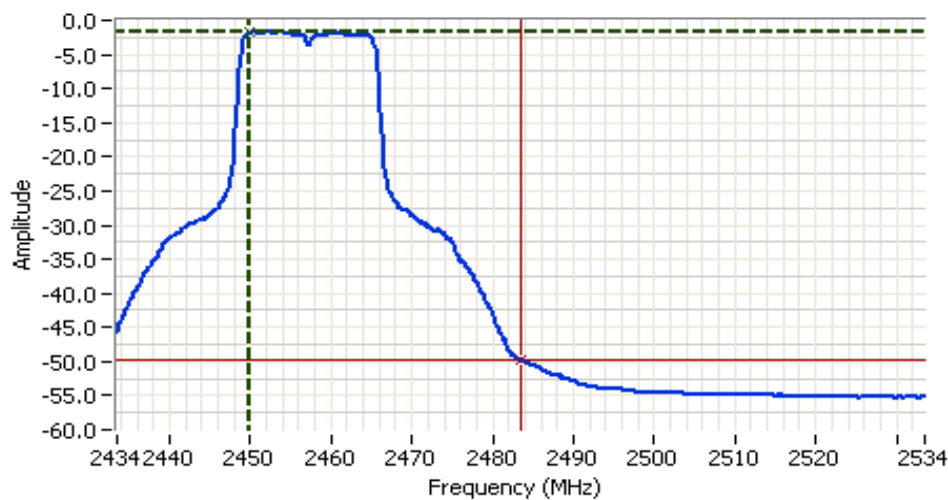
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2459.730	99.0	H	-	-	AVG	338	1.0	RB 1 MHz; VB: 10 Hz @ 22.0
2460.500	106.8	H	-	-	PK	338	1.0	RB 1 MHz; VB: 1 MHz @ 22.0
2458.210	94.5	V	-	-	AVG	182	1.8	RB 1 MHz; VB: 10 Hz @ 22.0
2455.640	102.1	V	-	-	PK	182	1.8	RB 1 MHz; VB: 1 MHz @ 22.0

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	106.8		Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	99.0		Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	46.2 dB		-< this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	60.6 dBuV/m					
Calculated Band-Edge Measurement (Avg):	52.8 dBuV/m		Margin	Level	Limit	Detector
<i>Delta Marker - 1MHz/1MHz:</i>	40.8 dB		-3.0	51.0	54	Avg
<i>Delta Marker - 1MHz/10Hz:</i>	48.0 dB		-13.4	60.6	74	Pk
Calculated Band-Edge Measurement (Peak):	66.0 dBuV/m		Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	51.0 dBuV/m		Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	51.0	-	54.0	-3.0	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2483.500 MHz
SPAN:100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 20
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl:13.50DBM

Comments

802.11g
2457MHz
Chain A

Cursor 1	2450.0000	-1.83	
Cursor 2	2483.5000	-49.83	

Delta Freq. 33.500
Delta Amplitude 48.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #8, Band Edge Field Strength - 802.11n 40MHz, Chain A

Date of Test: 5/11/2009

Test Location: FT Chamber #5

Test Engineer: Rafael Varelas

Config Change: none

Run #8a, EUT on Channel #5 (2432MHz) - 802.11n 40MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	11.7	16.5

Fundamental Signal Field Strength

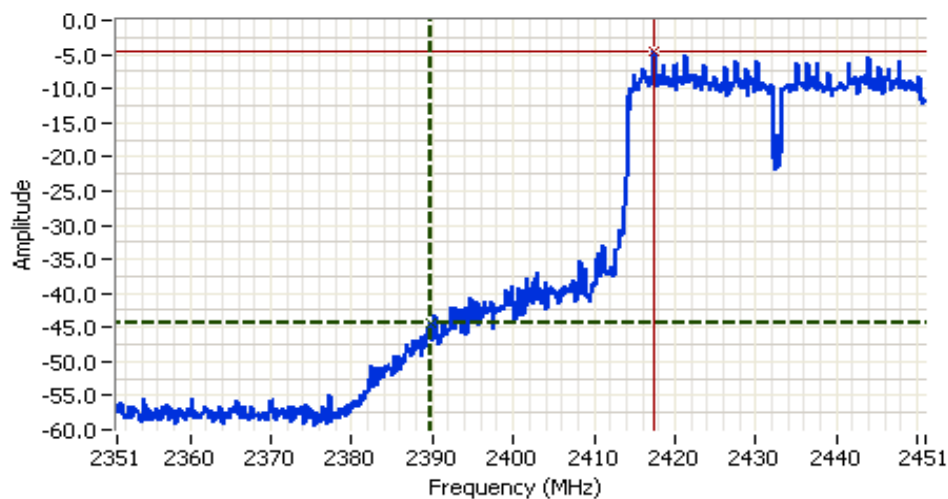
Frequency MHz	Level dBuV/m	Pol v/h	15.209 / 15.247 Limit	Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
2421.000	90.4	H	-	-	AVG	319	1.0	RB 1 MHz; VB: 10 Hz @ 16.5
2435.330	99.3	H	-	-	PK	319	1.0	RB 1 MHz; VB: 1 MHz @ 16.5
2429.270	91.0	V	-	-	AVG	335	1.5	RB 1 MHz; VB: 10 Hz @ 16.5
2428.270	99.2	V	-	-	PK	335	1.5	RB 1 MHz; VB: 1 MHz @ 16.5

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW :	99.3	99.2	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW :	90.4	91.0	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	40.0 dB		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	59.3 dBuV/m		
Calculated Band-Edge Measurement (Avg):	51.0 dBuV/m	Margin	Level
Delta Marker - 1MHz/1MHz:	34.8 dB	-3.0	51.0
Delta Marker - 1MHz/10Hz:	39.8 dB	-14.7	59.3
Calculated Band-Edge Measurement (Peak):	64.5 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	51.2 dBuV/m		Using 100kHz delta value

Frequency MHz	Level dBuV/m	Pol v/h	FCC 15.209 Limit	Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
2389.830	51.0	-	54.0	-3.0	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E, EMI
CF: 2401.000 MHz
SPAN: 100.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 11.00
Sweep Time 55.0ms
Ref Lvl: 4.84DBM

Comments

802.11n 40MHz
2432MHz
Chain A

Cursor 1 2389.8333 -44.49

Cursor 2 2417.5000 -4.49

Delta Freq. 27.667

Delta Amplitude 40.00

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #8b, EUT on Channel #7 (2442MHz) - 802.11n 40MHz, Chain A

Date of Test: 5/12/2009

Test Location: FT Chamber #5

Test Engineer: Suhaila Khushzad

Config Change: none

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	10.8	16.0

Fundamental Signal Field Strength

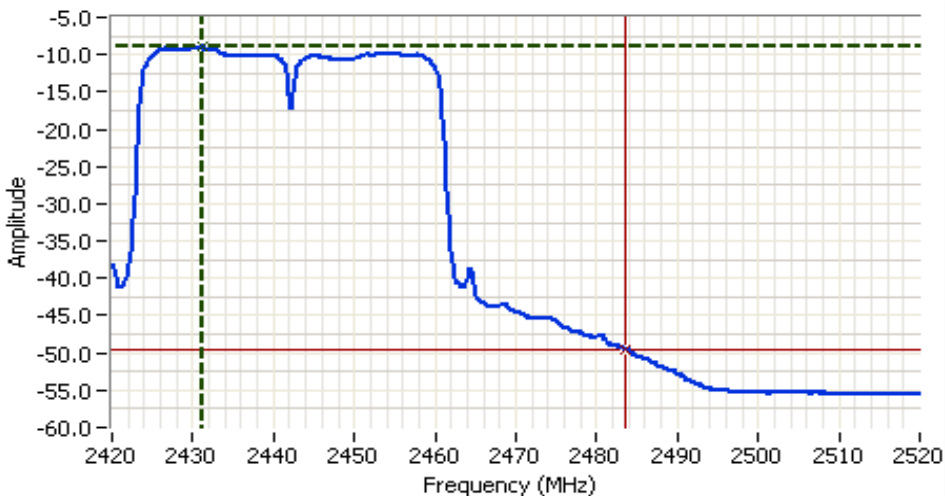
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2430.930	91.1	V	-	-	AVG	332	1.5	RB 1 MHz; VB: 10 Hz @16
2430.930	98.8	V	-	-	PK	332	1.5	RB 1 MHz; VB: 1 MHz @16
2430.930	90.8	H	-	-	AVG	318	1.3	RB 1 MHz; VB: 10 Hz
2430.670	98.4	H	-	-	PK	318	1.3	RB 1 MHz; VB: 1 MHz

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	98.4	98.8	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	90.8	91.1	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	38.3	dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	60.5	dBuV/m				
Calculated Band-Edge Measurement (Avg):	52.8	dBuV/m				
<i>Delta Marker - 1MHz/1MHz:</i>	36.5	dB	Margin	Level	Limit	Detector
<i>Delta Marker - 1MHz/10Hz:</i>	40.5	dB	-3.4	50.6	54	Avg
Calculated Band-Edge Measurement (Peak):	62.3	dBuV/m	-13.5	60.5	74	Pk
Calculated Band-Edge Measurement (Avg):	50.6	dBuV/m	Using 100kHz delta value			
			Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	50.6	-	54.0	-3.4	Avg	-	-	Using 1MHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2470.000 MHz
SPAN: 100.000 MHz
RB 1.000 MHz
VB 10 Hz
Detector Sample
Att 20
RL Offset 11.00
Sweep Time 37.0s
Ref Lvl: 21.00DBM

Comments

802.11n 40 MHz
2442 MHz
Chain A

Cursor 1	2431.1667	-9.00	
Cursor 2	2483.5000	-49.50	

Delta Freq. 52.333
Delta Amplitude 40.50

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

Run #8c, EUT on Channel #6 (2437MHz) - 802.11n 40MHz, Chain A

Chain	Target (dBm)	Power Settings Measured (dBm)	Software Setting
Chain A	15.0	12.1	17.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2425.930	92.3	H	-	-	AVG	316	1.3	RB 1 MHz; VB: 10 Hz @17.5
2426.470	100.1	H	-	-	PK	316	1.3	RB 1 MHz; VB: 1 MHz @17.5
2425.930	92.2	V	-	-	AVG	333	1.5	RB 1 MHz; VB: 10 Hz @17.5
2426.470	100.3	V	-	-	PK	333	1.5	RB 1 MHz; VB: 1 MHz @17.5

2390 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	100.1	100.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	92.7	92.2	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	42.5 dB	<- this can only be used if band edge signal is highest within 2MHz of band edge.				
Calculated Band-Edge Measurement (Peak):	57.8 dBuV/m					
Calculated Band-Edge Measurement (Avg):	50.2 dBuV/m					
	Margin	Level	Limit	Detector		
<i>Delta Marker - 1MHz/1MHz:</i>	37.2 dB	-3.8	50.2	54	Avg	
<i>Delta Marker - 1MHz/10Hz:</i>	41.3 dB	-16.2	57.8	74	Pk	
Calculated Band-Edge Measurement (Peak):	63.1 dBuV/m	Using 100kHz delta value				
Calculated Band-Edge Measurement (Avg):	51.4 dBuV/m	Using 100kHz delta value				

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.660	50.2	-	54.0	-3.8	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2410.000 MHz
SPAN: 100.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 11.00
Sweep Time 55.0ms
Ref Lvl: 21.00DBM

Comments

802.11n 40 MHz
2437 MHz
Chain A

Cursor 1	2389.6667	-47.17	⊕ ⊖ ⊞ ⊟
Cursor 2	2422.5000	-4.67	⊕ ⊖ ⊞ ⊟

Delta Freq. 32.833
Delta Amplitude 42.50



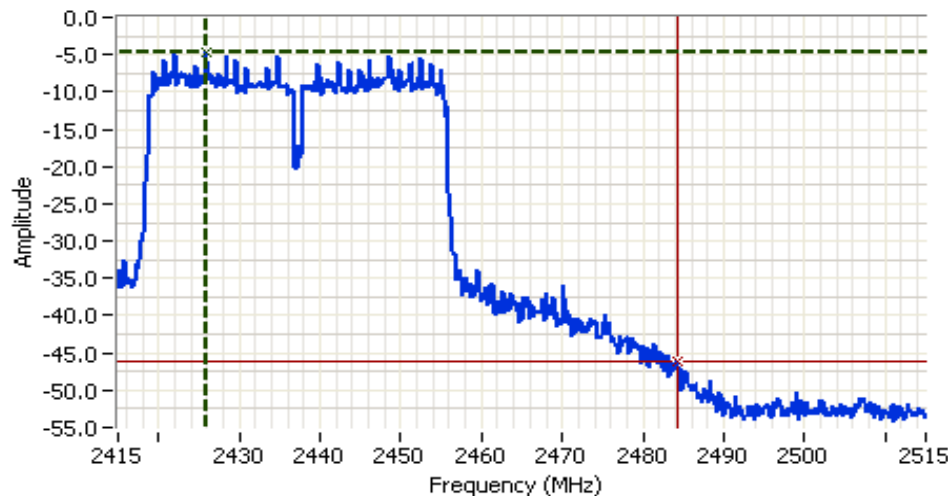
Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
		Account Manager:	Christine Vu Krebill
Contact:	Steve Hackett		
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

2483.5 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW :	100.1	100.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW :	92.3	92.2	Average Measurement (RB=1MHz, VB=10Hz)			
<i>Delta Marker - 100kHz</i>	41.5 dB		<- this can only be used if band edge signal is highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Peak):	58.8 dBuV/m					
Calculated Band-Edge Measurement (Avg):	50.8 dBuV/m		Margin	Level	Limit	Detector
<i>Delta Marker - 1MHz/1MHz:</i>	36.0 dB		-3.2	50.8	54	Avg
<i>Delta Marker - 1MHz/10Hz:</i>	41.3 dB		-15.2	58.8	74	Pk
Calculated Band-Edge Measurement (Peak):	64.3 dBuV/m		Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	51.0 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	
2484.166	50.8	-	54.0	-3.2	Avg	-	-	Using 100kHz delta value

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 2465.000 MHz
SPAN:100.000 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 11.00
Sweep Time 55.0ms
Ref Lvl:21.00DBM

Comments

802.11n 40 MHz
2437 MHz
Chain A

Cursor 1	2425.8333	-4.67	
Cursor 2	2484.1667	-46.17	

Delta Freq. 58.333
Delta Amplitude 41.50



EMC Test Data

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	N/A

RSS 210 and FCC 15.247 Transmitter Radiated Spurious Emissions, 30MHz - 26GHz

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

Summary of Results

MAC Address: **001E64004794** CRTU Tool Version **5.10.24.0** Driver version **12.5.0.41**

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
1	802.11b	#1 2412 MHz	16.5	16.7	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	54.6dBµV/m @ 1330.3MHz (-19.4dB)
		#6 2437 MHz	16.5	16.6	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	35.8dBµV/m @ 4874.0MHz (-18.2dB)
		#11 2462 MHz	16.5	16.8	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	41.3dBµV/m @ 4924.0MHz (-12.7dB)
Run #2 - the worst case OFDM mode (g, n20 or n40) was determined to be 802.11g mode through preliminary scans							
2	802.11g	#1 2412 MHz	16.5	16.6	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	42.6dBµV/m @ 2220.6MHz (-11.4dB)
		#6 2437 MHz	16.5	16.6	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	46.8dBµV/m @ 2223.7MHz (-7.2dB)
		#11 2462 MHz	16.5	16.5	Radiated Emissions, 1 - 26 GHz	FCC 15.209 / 15.247	42.8dBµV/m @ 2221.1MHz (-11.2dB)

Ambient Conditions:

Rel. Humidity: 22.3 %
Temperature: 42 °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.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Radiated Emissions - Transmitter/Receiver Spurious 30 - 1000 MHz Receiver Spurious 1 - 7.5GHz (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: 5/14/2009
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

Config. Used: #1 (Module outside of host device)
Config Change: None
Host Unit Voltage 120V/60Hz

General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing. Any remote support equipment was located outside the semi-anechoic chamber. Any cables running to remote support equipment were routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

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: 21.5 °C
Rel. Humidity: 40 %

Summary of Results

MAC Address: 001E64004794 CRTU Tool Version 5.10.24.0 Driver version 12.5.0.41

Run #	Test Performed	Limit	Result	Margin
1,2	RE, 30 - 1000 MHz, Maximized Emissions	FCC 15.209 / RSS GEN	Pass	38.6dBµV/m @ 59.052MHz (-1.4dB)
3 (20MHz)	RE, 1000 - 7500 MHz, Maximized Emissions - Chain A	RSS 210 / RSS GEN (Receiver spurious)	Pass	48.6dBµV/m @ 6000.7MHz (-5.4dB)
4 (40MHz)	RE, 1000 - 7500 MHz, Maximized Emissions - Chain A	RSS 210 / RSS GEN (Receiver spurious)	Pass	49.4dBµV/m @ 3000.3MHz (-4.6dB)
5 (20MHz)	RE, 1000 - 7500 MHz, Maximized Emissions - Chain A + B	RSS 210 / RSS GEN (Receiver spurious)	Pass	48.7dBµV/m @ 3000.4MHz (-5.3dB)
6 (40MHz)	RE, 1000 - 7500 MHz, Maximized Emissions - Chain A + B	RSS 210 / RSS GEN (Receiver spurious)	Pass	48.0dBµV/m @ 3000.3MHz (-6.0dB)
7 (20MHz)	RE, 1000 - 7500 MHz, Maximized Emissions - Chain B	RSS 210 / RSS GEN (Receiver spurious)	Pass	47.9dBµV/m @ 6000.7MHz (-6.1dB)
8 (40MHz)	RE, 1000 - 7500 MHz, Maximized Emissions - Chain B	RSS 210 / RSS GEN (Receiver spurious)	Pass	47.6dBµV/m @ 6000.7MHz (-6.4dB)

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Modifications Made During Testing

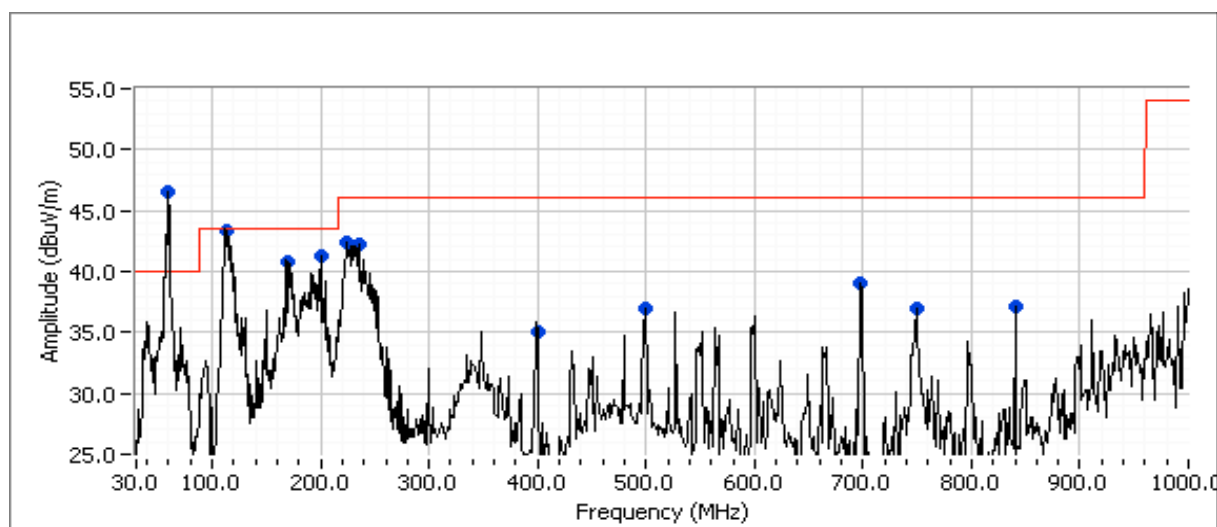
No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

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

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 B / RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
59.052	46.6	V	40.0	6.6	Peak	341	1.0	Broadband
113.346	43.4	V	43.5	-0.1	Peak	129	1.0	
169.818	40.8	V	43.5	-2.7	Peak	113	1.0	
199.086	41.2	H	43.5	-2.3	Peak	3	1.0	
224.855	42.4	H	46.0	-3.6	Peak	358	1.0	
235.384	42.3	H	46.0	-3.7	Peak	351	1.0	
398.411	35.1	H	46.0	-10.9	Peak	181	1.0	
498.197	37.0	H	46.0	-9.0	Peak	161	1.0	
699.832	39.0	H	46.0	-7.0	Peak	128	1.0	
749.242	37.0	H	46.0	-9.0	Peak	101	1.0	
840.090	37.1	H	46.0	-8.9	Peak	101	1.0	

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Preliminary quasi-peak readings (no manipulation of EUT interface cables)

Frequency	Level	Pol	FCC B / RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
59.052	39.6	V	40.0	-0.4	QP	339	1.0	QP (1.00s), Broadband
224.855	39.8	H	46.0	-6.2	QP	359	1.0	QP (1.00s)
235.384	36.1	H	46.0	-9.9	QP	349	1.0	QP (1.00s)
398.411	33.1	H	46.0	-12.9	QP	180	1.0	QP (1.00s)
498.197	32.6	H	46.0	-13.4	QP	159	1.0	QP (1.00s)
699.832	37.3	H	46.0	-8.7	QP	126	1.0	QP (1.00s)
113.346	41.6	V	43.5	-1.9	QP	130	1.0	QP (1.00s)
169.818	37.8	V	43.5	-5.7	QP	110	1.0	QP (1.00s)
749.242	30.2	H	46.0	-15.8	QP	99	1.0	QP (1.00s)
840.090	36.4	H	46.0	-9.6	QP	102	1.0	QP (1.00s)
199.086	37.1	H	43.5	-6.4	QP	1	1.0	QP (1.00s)

Run #2: Maximized Readings From Run #1
Maximized quasi-peak readings (includes manipulation of EUT interface cables)

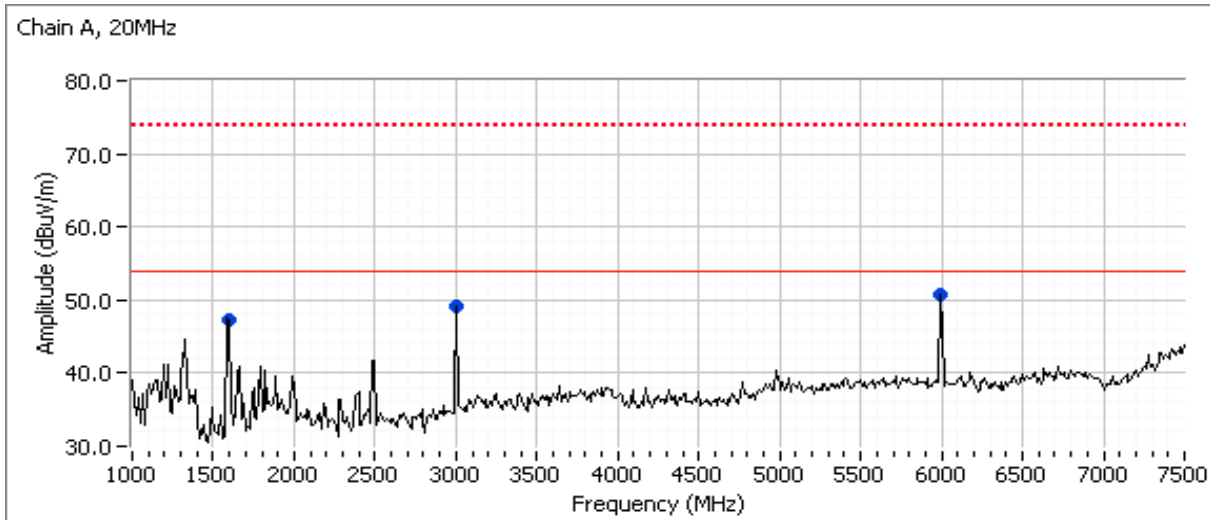
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0

Frequency	Level	Pol	FCC B / RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
59.052	38.6	V	40.0	-1.4	QP	339	1.0	QP (1.00s)
113.346	41.6	V	43.5	-1.9	QP	130	1.0	QP (1.00s)
169.818	37.8	V	43.5	-5.7	QP	110	1.0	QP (1.00s)
224.855	39.8	H	46.0	-6.2	QP	359	1.0	QP (1.00s)
199.086	37.1	H	43.5	-6.4	QP	1	1.0	QP (1.00s)
699.832	37.3	H	46.0	-8.7	QP	126	1.0	QP (1.00s)

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Run #3: Maximized Readings, 1000 - 7500 MHz, Receiver, Chain A, 20MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0



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

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1601.000	45.6	V	54.0	-8.4	Peak	99	1.0	
3004.170	49.9	V	54.0	-4.1	Peak	110	1.3	
5994.170	50.4	V	54.0	-3.6	Peak	144	1.0	

Final peak and average readings

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.720	48.6	V	54.0	-5.4	AVG	142	1.0	RB 1 MHz; VB: 10 Hz
3000.340	43.4	H	54.0	-10.6	AVG	111	1.6	RB 1 MHz; VB: 10 Hz
6000.770	52.1	V	74.0	-21.9	PK	142	1.0	RB 1 MHz; VB: 1 MHz
1597.930	30.4	H	54.0	-23.6	AVG	98	1.0	RB 1 MHz; VB: 10 Hz
3000.350	49.1	H	74.0	-24.9	PK	111	1.6	RB 1 MHz; VB: 1 MHz
1599.810	46.5	H	74.0	-27.5	PK	98	1.0	RB 1 MHz; VB: 1 MHz

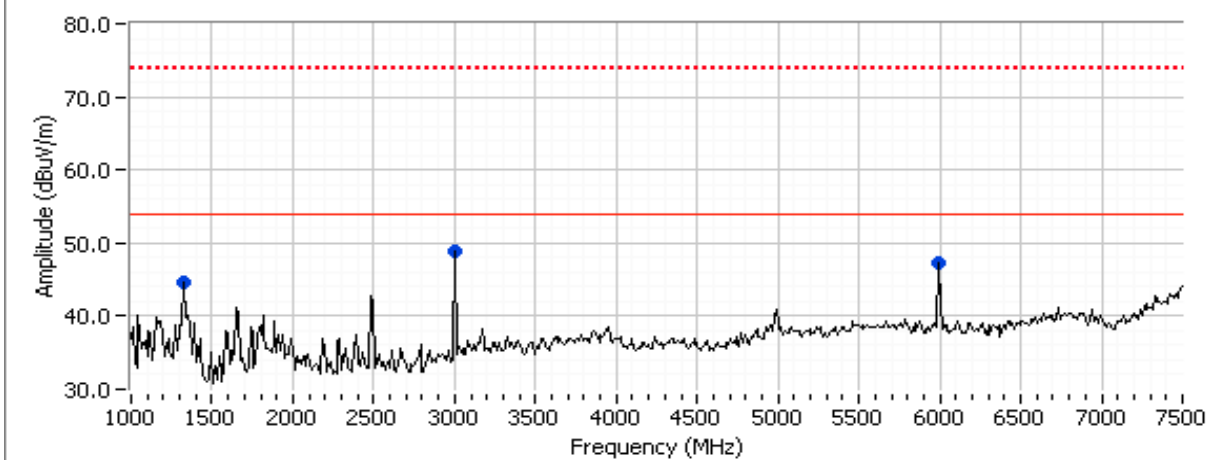
Note 1: Above 1 GHz, RSS GEN specifies the limit as an average measurement. In addition, RSS GEN states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Run #4: Maximized Readings, 1000 - 7500 MHz, Receiver, Chain A, 40MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

Chain A, 40MHz



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

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1321.720	44.6	V	54.0	-9.4	Peak	268	1.0	
3000.130	48.9	V	54.0	-5.1	Peak	262	1.3	
6000.860	47.4	V	54.0	-6.6	Peak	144	1.0	

Final peak and average readings

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.340	49.4	V	54.0	-4.6	AVG	265	1.3	RB 1 MHz; VB: 10 Hz
6000.730	48.5	V	54.0	-5.5	AVG	139	1.0	RB 1 MHz; VB: 10 Hz
3000.420	53.3	V	74.0	-20.7	PK	265	1.3	RB 1 MHz; VB: 1 MHz
6000.600	51.8	V	74.0	-22.2	PK	139	1.0	RB 1 MHz; VB: 1 MHz
1322.560	25.5	V	54.0	-28.5	AVG	284	1.0	RB 1 MHz; VB: 10 Hz
1321.660	41.5	V	74.0	-32.5	PK	284	1.0	RB 1 MHz; VB: 1 MHz

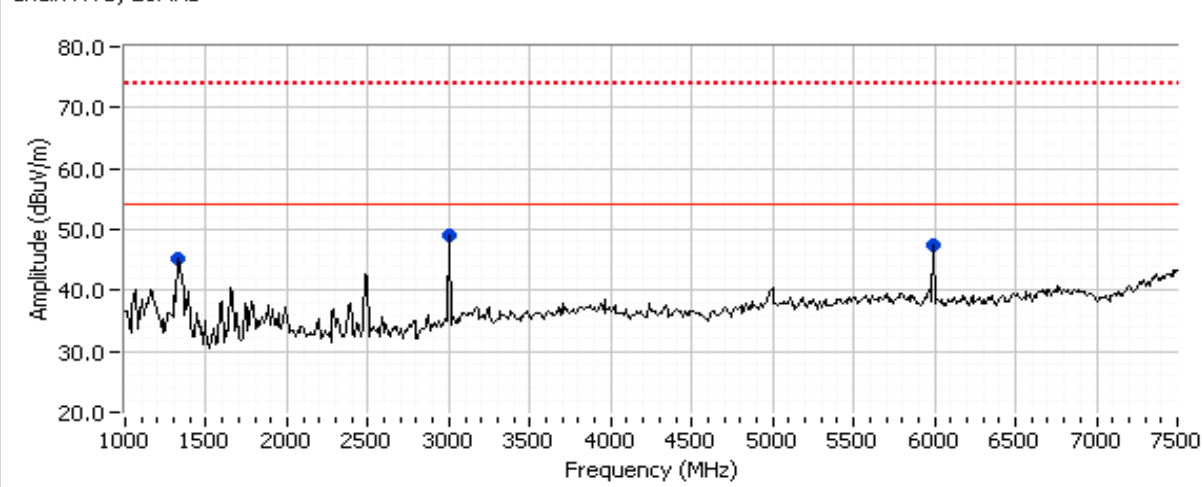
Note 1: Above 1 GHz, RSS GEN specifies the limit as an average measurement. In addition, RSS GEN states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Run #5: Maximized Readings, 1000 - 7500 MHz, Receiver, Chain A+B, 20MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

Chain A+B, 20MHz



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

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1315.160	45.3	V	54.0	-8.7	Peak	124	1.3	
3000.260	49.1	V	54.0	-4.9	Peak	266	1.3	
6000.860	47.4	V	54.0	-6.6	Peak	145	1.3	

Final peak and average readings

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

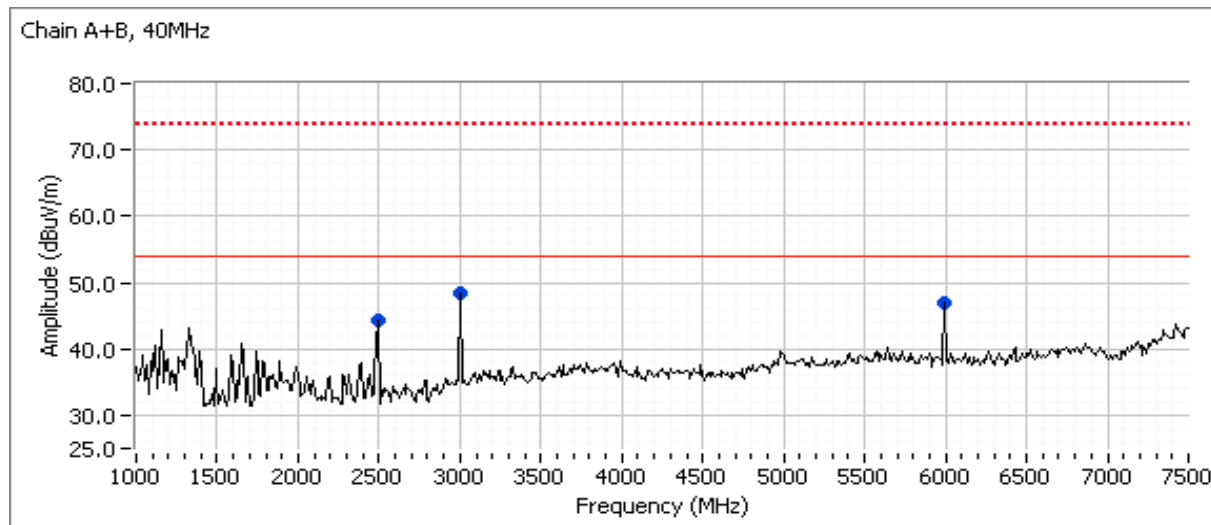
Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.350	48.7	V	54.0	-5.3	AVG	266	1.3	RB 1 MHz; VB: 10 Hz
3000.250	52.5	V	74.0	-21.5	PK	266	1.3	RB 1 MHz; VB: 1 MHz
6000.720	47.5	V	54.0	-6.5	AVG	143	1.3	RB 1 MHz; VB: 10 Hz
6000.690	51.6	V	74.0	-22.4	PK	143	1.3	RB 1 MHz; VB: 1 MHz
1315.800	29.1	V	54.0	-24.9	AVG	122	1.3	RB 1 MHz; VB: 10 Hz
1316.230	47.6	V	74.0	-26.4	PK	122	1.3	RB 1 MHz; VB: 1 MHz

Note 1: Above 1 GHz, RSS GEN specifies the limit as an average measurement. In addition, RSS GEN states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Run #6: Maximized Readings, 1000 - 7500 MHz, Receiver, Chain A+B, 40MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0



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

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2497.900	44.2	V	54.0	-9.8	Peak	143	1.3	
3000.260	48.4	V	54.0	-5.6	Peak	194	1.0	
6000.860	46.9	V	54.0	-7.1	Peak	143	1.3	

Final peak and average readings

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

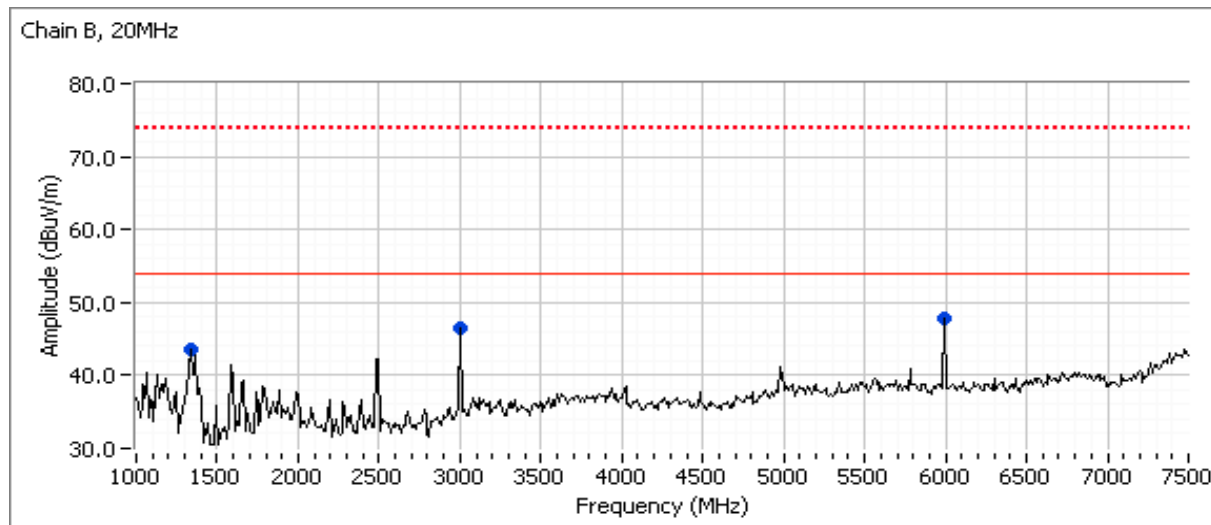
Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.340	48.0	V	54.0	-6.0	AVG	192	1.0	RB 1 MHz; VB: 10 Hz
3000.190	52.4	V	74.0	-21.6	PK	192	1.0	RB 1 MHz; VB: 1 MHz
6000.730	47.6	V	54.0	-6.4	AVG	142	1.2	RB 1 MHz; VB: 10 Hz
6000.710	52.0	V	74.0	-22.0	PK	142	1.2	RB 1 MHz; VB: 1 MHz
2497.070	32.8	V	54.0	-21.2	AVG	142	1.3	RB 1 MHz; VB: 10 Hz
2498.200	50.5	V	74.0	-23.5	PK	142	1.3	RB 1 MHz; VB: 1 MHz

Note 1: Above 1 GHz, RSS GEN specifies the limit as an average measurement. In addition, RSS GEN states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Run #7: Maximized Readings, 1000 - 7500 MHz, Receiver, Chain B, 20MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0



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

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1336.970	43.6	V	54.0	-10.4	Peak	262	1.6	
3000.260	46.4	V	54.0	-7.6	Peak	100	1.3	
6000.860	47.8	V	54.0	-6.2	Peak	144	1.0	

Final peak and average readings

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

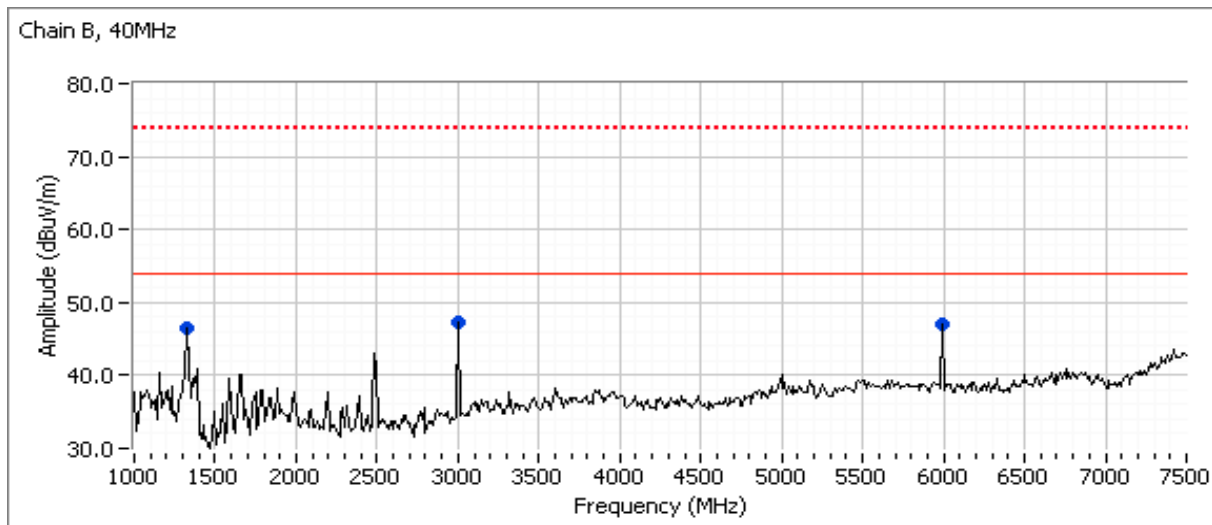
Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.730	47.9	V	54.0	-6.1	AVG	140	1.0	RB 1 MHz; VB: 10 Hz
3000.350	45.9	V	54.0	-8.1	AVG	98	1.1	RB 1 MHz; VB: 10 Hz
1337.210	33.1	V	54.0	-20.9	AVG	260	1.6	RB 1 MHz; VB: 10 Hz
6000.770	52.3	V	74.0	-21.7	PK	140	1.0	RB 1 MHz; VB: 1 MHz
1336.610	51.2	V	74.0	-22.8	PK	260	1.6	RB 1 MHz; VB: 1 MHz
3000.210	51.1	V	74.0	-22.9	PK	98	1.1	RB 1 MHz; VB: 1 MHz

Note 1: Above 1 GHz, RSS GEN specifies the limit as an average measurement. In addition, RSS GEN states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Client:	Intel Corporation	Job Number:	J75341
Model:	112BNMMW (1x2 bgn Mini Card)	T-Log Number:	T75388
Contact:	Steve Hackett	Account Manager:	Christine Vu Krebill
Standard:	FCC 15.247, RSS 210, FCC 15B (PC Peripheral)	Class:	B

Run #8: Maximized Readings, 1000 - 7500 MHz, Receiver, Chain B, 40MHz

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0



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

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1323.990	46.6	V	54.0	-7.4	Peak	94	1.0	
3000.130	47.4	V	54.0	-6.6	Peak	192	1.0	
6000.860	47.1	V	54.0	-6.9	Peak	142	1.0	

Final peak and average readings

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 7500Hz	3	3	0.0

Frequency	Level	Pol	RSS GEN / FCC B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.710	47.6	V	54.0	-6.4	AVG	141	1.0	RB 1 MHz; VB: 10 Hz
3000.360	47.1	V	54.0	-6.9	AVG	196	1.0	RB 1 MHz; VB: 10 Hz
6000.720	52.4	V	74.0	-21.6	PK	141	1.0	RB 1 MHz; VB: 1 MHz
3000.210	51.7	V	74.0	-22.3	PK	196	1.0	RB 1 MHz; VB: 1 MHz
1324.710	28.3	V	54.0	-25.7	AVG	93	1.0	RB 1 MHz; VB: 10 Hz
1323.540	46.2	V	74.0	-27.8	PK	93	1.0	RB 1 MHz; VB: 1 MHz

Note 1: Above 1 GHz, RSS GEN specifies the limit as an average measurement. In addition, RSS GEN states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.