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Electromagnetic Emissions Test Report and Application for Grant of Equipment Authorization pursuant to Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7 FCC Part 15 Subpart C

Intel Corporation Model: 512AN_HMW

UPN:	1000M-512ANH 1514B-512ANHMW
FCC ID:	PD9512ANH E2K512ANHMW
GRANTEE:	Intel Corporation 2111 N.E. 25th Ave. Hillsboro, OR 97124
TEST SITE:	Elliott Laboratories, Inc. 684 W. Maude Ave Sunnyvale, CA 94086
REPORT DATE:	March 20, 2008
REISSUE DATE:	June 12, 2008
FINAL TEST DATES:	February 13 to March 15, 2007 May 29 to June 2, 2008

AUTHORIZED SIGNATORY: Mark Briggs

Mark Briggs
Principal Engineer

ACCREDITED

Testing Cert #2016-01

REVISION HISTORY

Rev #	Date	Comments	Modified By
1	4/28/08	Initial Release	David Guidotti
2	6/12/08	Changed contact information in the scope section of the report to Robert Paxman. Updated the information in the results table related to content of user manual (previously stated "Not evaluated at this time" Updated cover page with UPN and FCC ID (previously stated "not yet available") Updated results table and test data with new power measurement for n40 mode, center channel (previously 13.5dBm, now 15.8dBm). Updated test report with test data for a second antenna (Universe PIFA antenna)	Mark Briggs

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SCOPE

An electromagnetic emissions test has been performed on the Intel Corporation model 512AN_HMW 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

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 512AN_HMW and therefore apply only to the tested sample. The sample was selected and prepared under the authority of Robert Paxman of Intel.

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 512AN_HMW 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 / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	b: 10.3 MHz g: 16.5 MHz n20: 17.75 MHz n40: 35.7 MHz	>500kHz	Complies
	RSP100	99% Bandwidth	b: 13.8 MHz g: 17.1 MHz n20: 18.3 MHz n40: 36.7 MHz	Information only	Complies
15.247 (b) (3)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	**b: 18.6dBm (0.072 W)** g: 18.2 dBm n20: 16.1dBm n40: 15.8 dBm EIRP = 0.15W Note1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	b: -5.1dBm/3kHz g: -6.0 dBm/3kHz n20: -7.5 dBm/3kHz n40:-14dBm/3kHz	8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions 30MHz – 25 GHz	All spurious emissions < -30dBc	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5	Radiated Spurious Emissions 1000MHz – 25 GHz Note 3	52.7dBµV/m @ 2389.8MHz (802.11n 40 MHz Ethertronics Antenna)	15.207 in restricted bands, all others <-30dBc Note 2	Complies (-1.3dB)

Note 1: EIRP calculated using antenna gain of 3.2 dBi and is calculated for the highest power of all modes.

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).

Note 3: Spurious emissions below 1GHz were independent of operating channel and operating mode (transmit versus receive). Measurements for radiated emissions below 1GHz are therefore reported for receive mode only.

DIGITAL TRANSMISSION SYSTEMS (5725 –5850 MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM / DSSS techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	a: 16.3 MHz n20: 17.6 MHz n40: 35.0 MHz	>500kHz	Complies
	RSP100	99% Bandwidth	a: 17.1 MHz n20: 18.3 MHz n40: 36.6 MHz	Information only	Complies
15.247 (b) (3) 15.247		Output Power (multipoint systems)	a: 15.3 dBm n20: 15.1 dBm **n40: 17.9 dBm (0.062 W)** EIRP = 0.195 W Note1	1Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	a: -9.6 dBm/3kHz n20: -9.0 dBm/3kHz n40: -10 dBm/3kHz	Maximum permitted is 8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions – 30MHz – 40 GHz	All spurious emissions < -30dBc	< -30dBc Note 2	Complies
15.247(c) / 15.209	RSS 210 A8.5 Table 2, 3	Radiated Spurious Emissions 1000MHz – 40 GHz Note 3	51.9dBµV/m @ 11652.1MHz (802.11a mode, Universe PIFA Antenna)	15.207 in restricted bands, all others <-30dBc Note 2	Complies (-2.1dB)

Note 1: EIRP calculated using antenna gain of 5 dBi and is calculated for the highest power of all modes.

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).

Note 3: Spurious emissions below 1GHz were independent of operating channel and operating mode (transmit versus receive). Measurements for radiated emissions below 1GHz are therefore reported for receive mode only.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Module uses a unique connector	Unique connector	Complies
-	RSS GEN 7.2.3	Receiver spurious emissions 30MHz – 18 GHz	52.2dBµV/m @ 3000.3MHz Universe Antenna	RSS GEN Table 1	Complies (-1.8dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	23.0dBµV @ 11.069MHz	Refer to standard	Complies (-27.0dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to separate MPE calculations, RSS 102 declaration and User Manual statements	Refer to OET 65, FCC Part 1 and RSS 102	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Statements included	Statement required regarding non-interference	Complies
	RSP 100 RSS GEN 7.1.5	User Manual	Not applicable, antenna will be integrated into the host device.	Statement required 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 are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

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

The Intel Corporation model 512AN_HMW is a 2x1 MISO 802.11abgn radio module that is designed to be installed in laptops. The module supports 802.11b, 802.11g and 802.11n protocols in the 2400 – 2483.5 MHz band and 802.11a and 802.11n in the 5150 – 5250 MHz, 5250 – 5350 MHz, 5470 – 5725 MHz and 5725 – 5850 MHz bands. In 802.11n mode it supports both 20-MHz and 40-MHz channels. It can operate in SISO (1x1) and MISO (2x1) configurations.

For testing purposes, and in accordance with requirements for evaluating a device for modular approvals, the EUT was installed onto an extender card that was connected into a PC. The EUT was outside of the PC's enclosure. The electrical rating of the EUT is 3.3 Volts DC, 0.5 Amps.

The sample was received on February 9, 2008 and tested between February 13 and March 16, 2008. Additional measurements were made with the Universe PIFA antenna on May 29, May 30, May 31, June 1 and June 2, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Intel Corporation	512AN_HMW	Wireless LAN Card		PD9512ANH

ANTENNA SYSTEM

The antenna connects to the EUT via a non-standard U.FL antenna connector, thereby meeting the requirements of FCC 15.203. The EUT was evaluated with each transceiver chain connected to the following antennas:

- Ethertronics MPCI-8 Module antenna which is based on a magnetic dipole design. The nominal antenna gain is 3dBi in the 2.4GHz band and 5dBi in the 5GHz bands
- Universe Technology antenna which is based on a PIFA design. The nominal antenna gain is 3.2 dBi in the 2.4GHz band, 3.6dBi in the 5150-5250 MHz band, 3.7dBi in 5250-5350MHz band, 4.8dBi in the 5470 – 5725 MHz band and 5dBi in the 5725 – 5850MHz band.

ENCLOSURE

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

MODIFICATIONS

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

SUPPORT EQUIPMENT

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

Manufacturer	Model	Description	Serial Number	FCC ID
Dell	Prototype	Laptop PC	Prototype	-

No remote support equipment was used during emissions testing.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
PC	Board	PCI-Express extender	-	0.2
Antennas(2)	Antennas(2)	Coax(2)	Shielded	0.3
DC Power	Board	3.3V dc	Unshielded	0.3

EUT OPERATION

During transmitter-related testing the EUT was configured to transmit continuously in each of the various modulation modes (802.11a, 802.11b, 802.11g and 802.11n). Preliminary testing determined the data rates with the highest power and power spectral density to be evaluated for the formal testing, as detailed in the table below.

Mode \ Active Chains	1 Chain	2 Chains
802.11b	1Mb/s	Not applicable, second chain is receive only
802.11g	6 MBs	
802.11n (20MHz channel)	HT 0 (6Mbps)	
802.11n (40MHz channel)	HT 0 (15Mbps)	

Spurious emissions at frequencies removed by more than 50MHz from the band edges for 802.11n 20MHz and 40MHz channels were made on the 20MHz channel mode as this mode had the higher power spectral density of the two modes.

Spurious receiver emissions were measured with the device tuned to the center channel in each operating band. Measurements were made on both single chain modes (SISO modes with one, then the other chain active) and in MISO mode (with chains active simultaneously).

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on February 13, February 14, February 20, February 27, March 3, March 6, March 7, March 11, March 12, March 13, March 15, May 29, May 30, May 31, June 1 and June 2, 2008 at the Elliott Laboratories semi anechoic chambers 3, 4 and 5 located at 41039 Boyce Road, Fremont, California 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.

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 with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains 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.

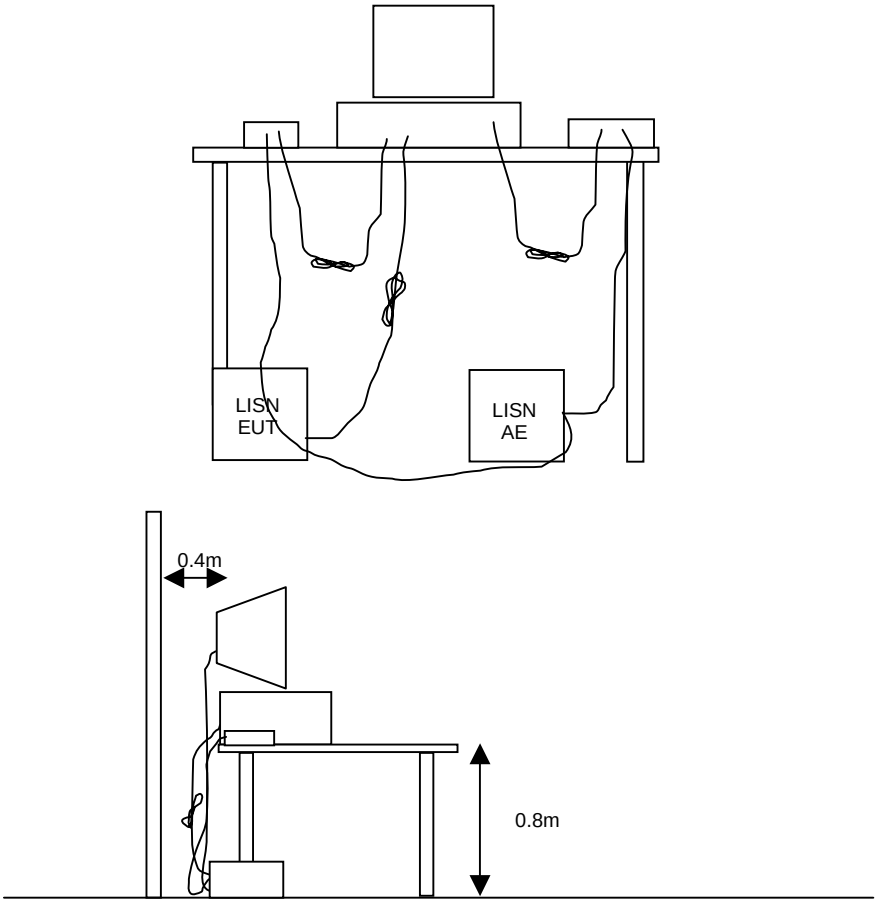
TEST PROCEDURES

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.



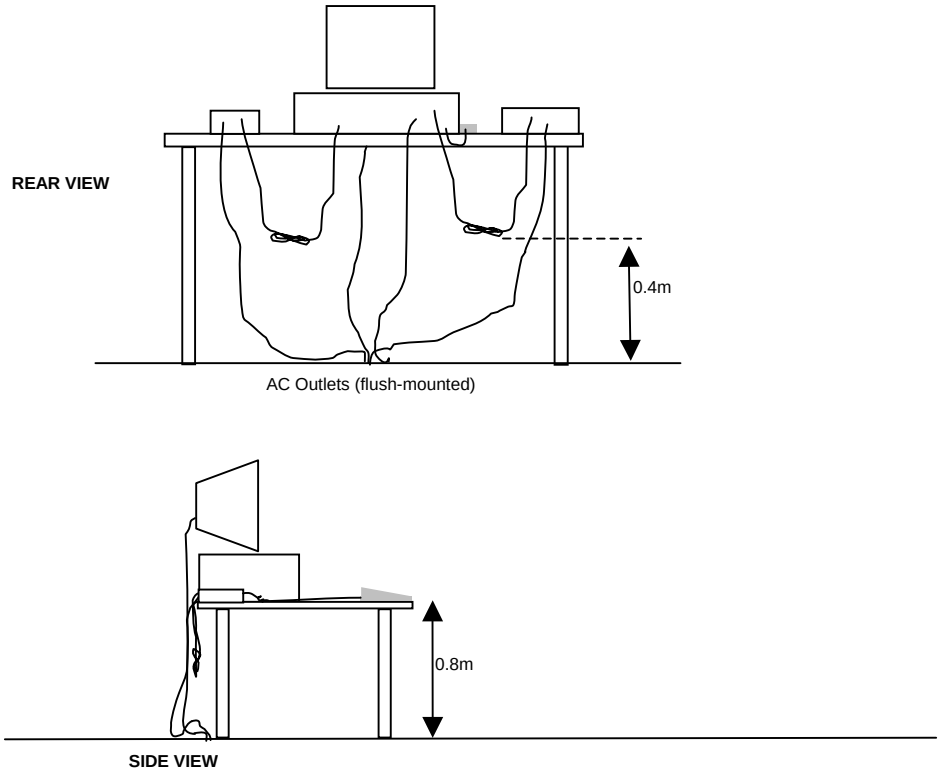
RADIATED EMISSIONS

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.

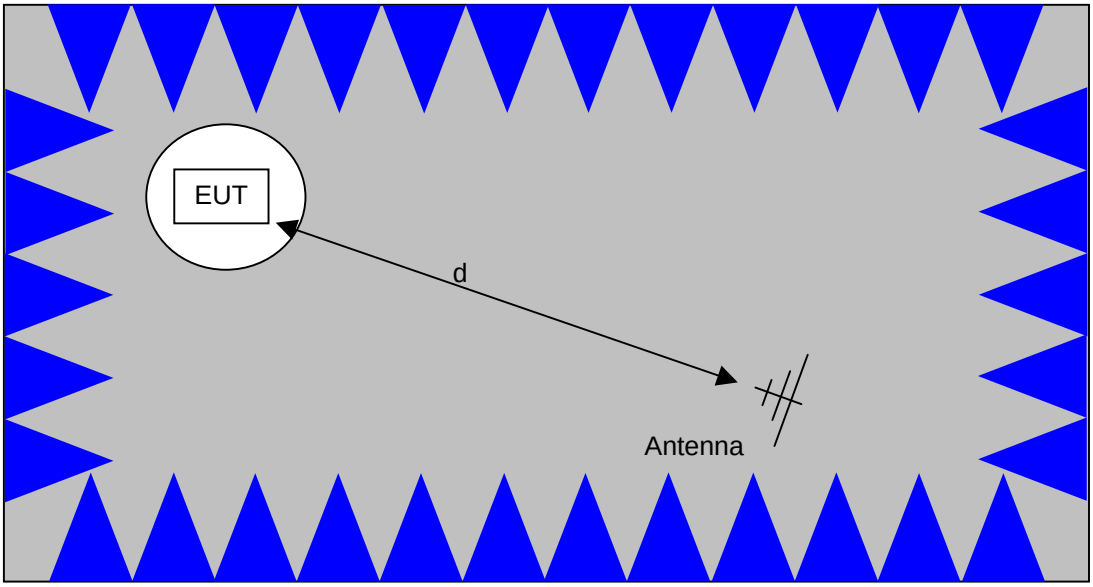
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

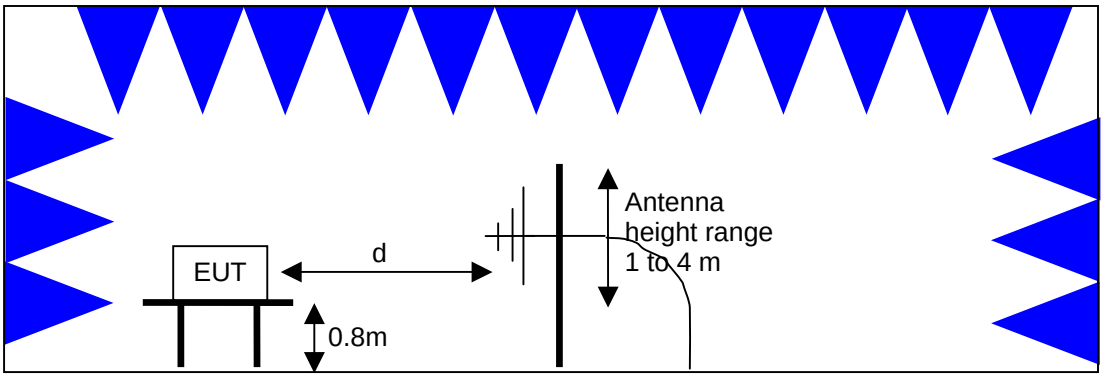


Typical Test Configuration for Radiated Field Strength Measurements



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

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



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

BANDWIDTH MEASUREMENTS

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

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

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

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

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

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

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

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

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

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

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

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

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

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

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

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

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

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

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

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

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

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

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

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

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

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

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

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

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

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

EXHIBIT 1: Test Equipment Calibration Data

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	16-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	29-May-08
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	11-Jun-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	07-Jun-08
Hewlett Packard	Spectrum Analyzer 30 Hz - 40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	19-Feb-09
Rohde & Schwarz	Test Receiver, 0.009-30 MHz	ESH3	1316	24-Oct-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	18-May-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	11-Jul-08
Hewlett Packard	Spectrum Analyzer 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	15-Jan-09
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	15-May-08
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-08
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1594	11-May-08
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1632	25-May-08
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	17-Oct-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	17-Dec-08
Hewlett Packard	Head (Inc W1-W4, 1946, 1947) Purple	84125C	1772	20-Dec-08
EMCO	Antenna, Horn, 18-26.5 GHz (SA40-Purple)	3160-09 (84125C)	1773	19-Dec-08
EMCO	Antenna, Horn, 26.5-40 GHz (SA40-Purple)	3160-10 (84125C)	1774	19-Dec-08
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2000	12-Oct-08

For tests performed with Universe Antenna

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	16-Jun-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	27-May-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	07-Jun-08
Hewlett Packard	Spectrum Analyzer 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	15-Jan-09
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1534	05-Mar-09
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1555	15-Jan-09
Rohde & Schwarz	Attenuator, 20 dB , 50 ohm, 10W, DC-18 GHz	20dB, 10W, Type N	1556	15-Jan-09
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-Jun-08
Micro-Tronics	Band Reject Filter, 2400-2500 MHz	BRM50702-02	1731	17-Oct-08
Hewlett Packard	Test Sys (SA40, 9kHz - 40GHz) Purple	84125C	1770	06-Nov-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	17-Dec-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

EXHIBIT 2: Test Measurement Data

T71375 (rf port measurements)	65 Pages
T71373 (AC conducted emissions measurements, radiated emissions with Ethertronics antenna)	34 Pages
T71846 (Radiated emissions with Universe antenna)	28 Pages

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		-
Emissions Standard(s):	FCC	Class:	B
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Intel Corporation

Model

512AN_HMW(Formal)

Date of Last Test: 3/15/2008

Client:	Intel	Job Number:	J70979
Model:	512-agn MMW	T-Log Number:	T71036
		Account Manager:	Dean Eriksen

RSS 210 and FCC 15.247 Power Measurement Summary

The table below compares the measured output power (measured using the UNII test method) with the power measured using an average power meter and is for reference purposes.

802.11b

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
20.5	2412	17.0	49.5	3.2	Pass	20.2	0.104	16.5	44.7
22.5	2437	18.6	72.4	3.2	Pass	21.8	0.151	18.2	66.1
20.5	2462	15.8	38.0	3.2	Pass	19.0	0.079	16.5	44.7

802.11g

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
21.5	2412	13.2	20.8	3.2	Pass	16.4	0.044	13.9	24.5
26.5	2437	18.2	65.8	3.2	Pass	21.4	0.137	17.8	60.3
23.5	2462	14.4	27.4	3.2	Pass	17.6	0.057	15.4	34.7

802.11n20 (2.4GHz)

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
22	2412	12.3	17.0	3.2	Pass	15.5	0.036	14.0	25.1
26	2437	16.1	40.8	3.2	Pass	19.3	0.085	16.5	44.7
22.5	2462	12.9	19.4	3.2	Pass	16.1	0.041	14.3	26.9

802.11n40 (2.4GHz)

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
18.5	2422	9.3	8.5	3.2	Pass	12.5	0.018	8.8	7.6
24.0	2437	15.8	38.0	3.2	Pass	19.0	0.079	16.5	44.7
18.5	2452	9.1	8.1	3.2	Pass	12.3	0.017	9.8	9.5

802.11a

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
26.5	5745	14.7	29.2	3.2	Pass	17.9	0.061	17.5	56.2
28	5785	15.3	34.0	3.2	Pass	18.5	0.071	17.8	60.3
26.5	5825	13.3	21.5	3.2	Pass	16.5	0.045	17.3	53.7

802.11n20 (5.7GHz)

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
26.5	5745	14.7	29.2	5.0	Pass	19.7	0.092	16.5	44.7
28	5785	15.1	32.4	5.0	Pass	20.1	0.102	16.5	44.7
26.5	5825	13.3	21.4	5.0	Pass	18.3	0.068	16.5	44.7

802.11n40 (5.7GHz)

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Average Power (dBm)[3]	Average Power mW
28	5755	15.9	38.9	5.0	Pass	20.9	0.123	16.5	44.7
31	5795	17.9	61.5	5.0	Pass	22.9	0.195	16.5	44.7

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions - 802.11b (2400 MHz)

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: 3/6/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

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: 18.7 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	18.6 dBm(72.4mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-5.1 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	10.3 MHz
3	99% Bandwidth	RSS GEN	-	13.8 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

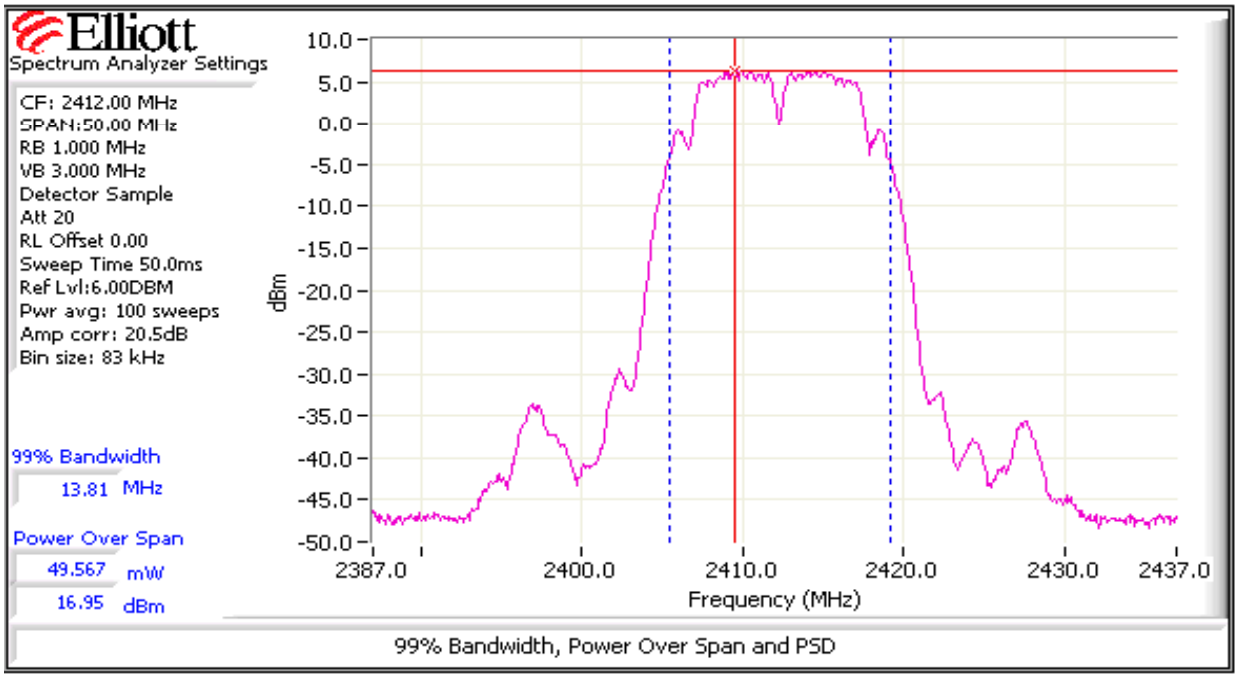
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

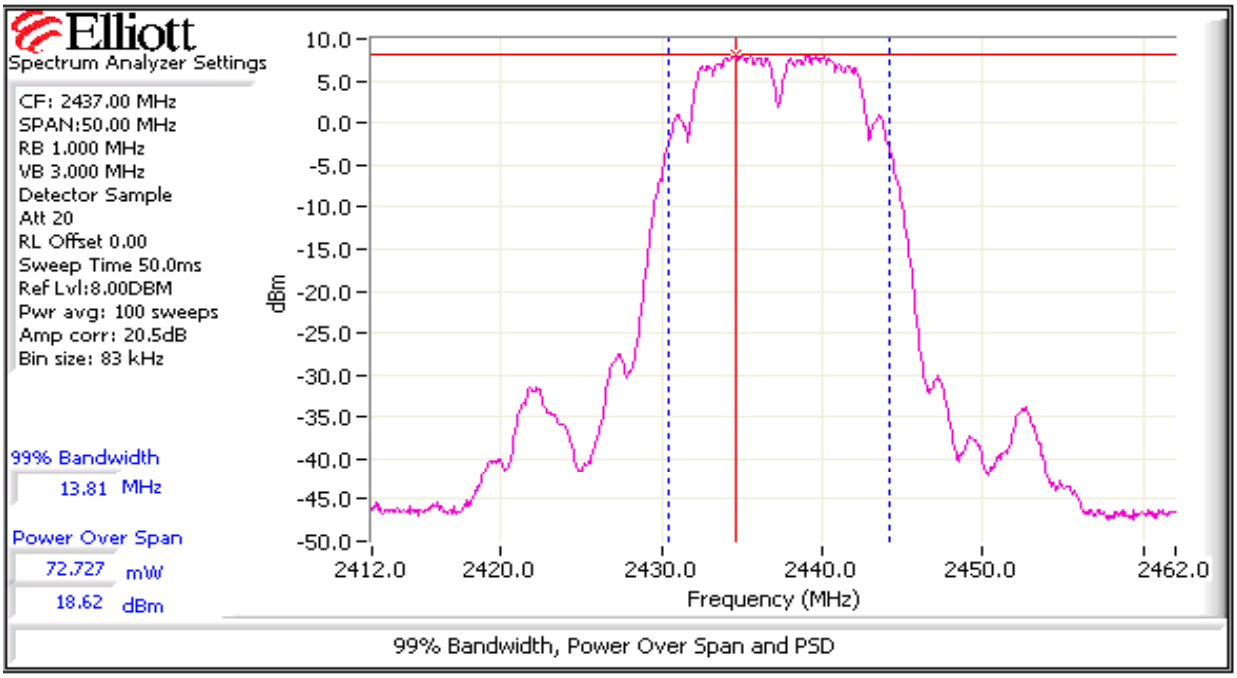
Run #1: Output Power

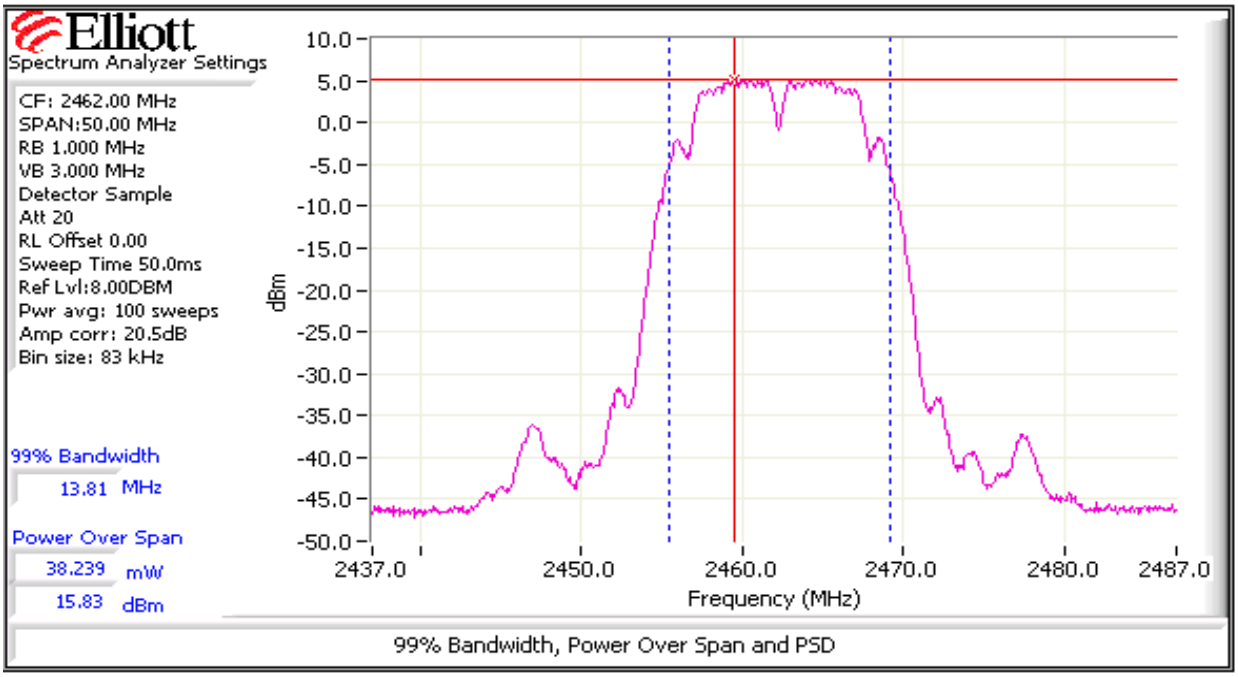
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP W	Output Power (dBm) [3]	Output Power mW
20.5	2412	17.0	49.5	3.2	Pass	20.2	0.104	16.5	44.7
22.5	2437	18.6	72.4	3.2	Pass	21.8	0.151	18.2	66.1
20.5	2462	15.8	38.0	3.2	Pass	19.0	0.079	16.5	44.7

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
Note 2:	Power setting - the software power setting used during testing, included for reference only.



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



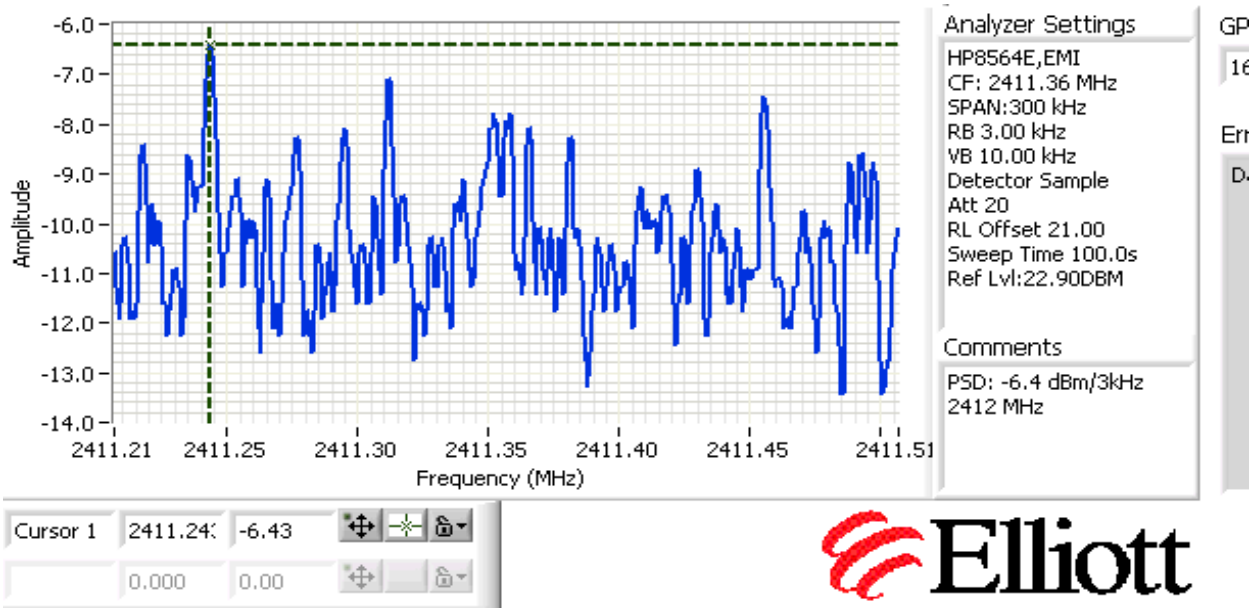


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

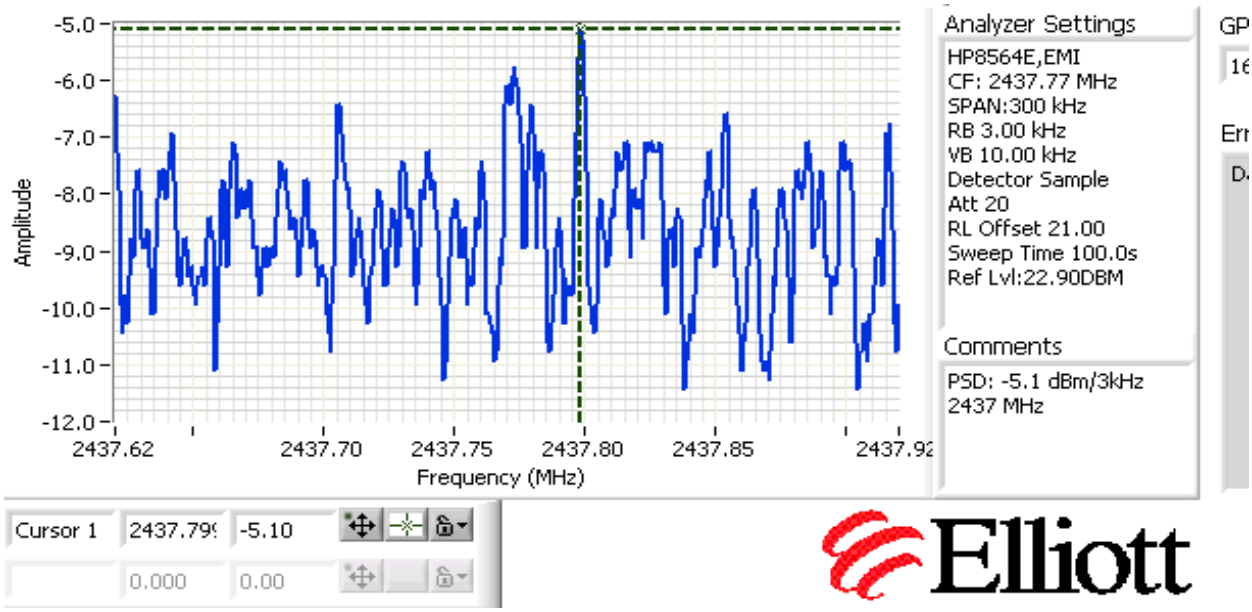
Run #2: Power spectral Density

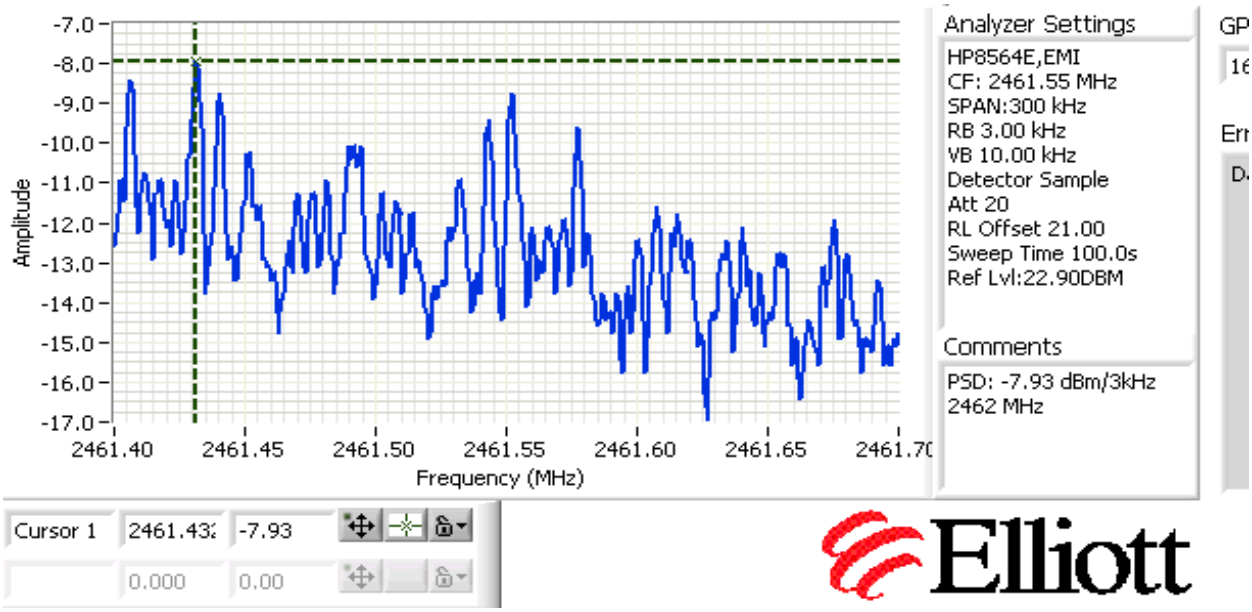
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
20.5	2412	-6.4	8.0	Pass
22.5	2437	-5.1	8.0	Pass
20.5	2462	-7.9	8.0	Pass

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



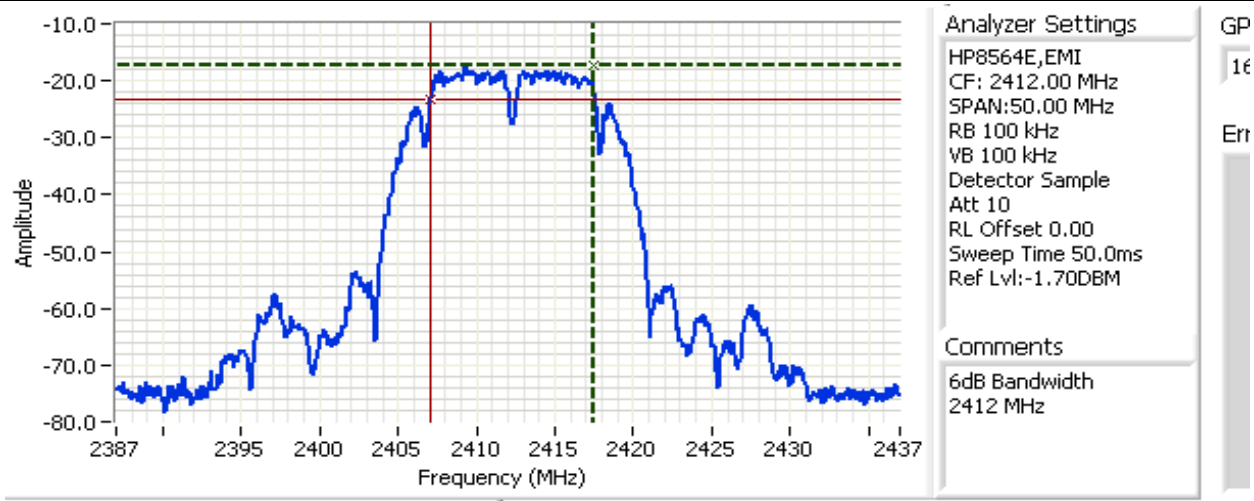


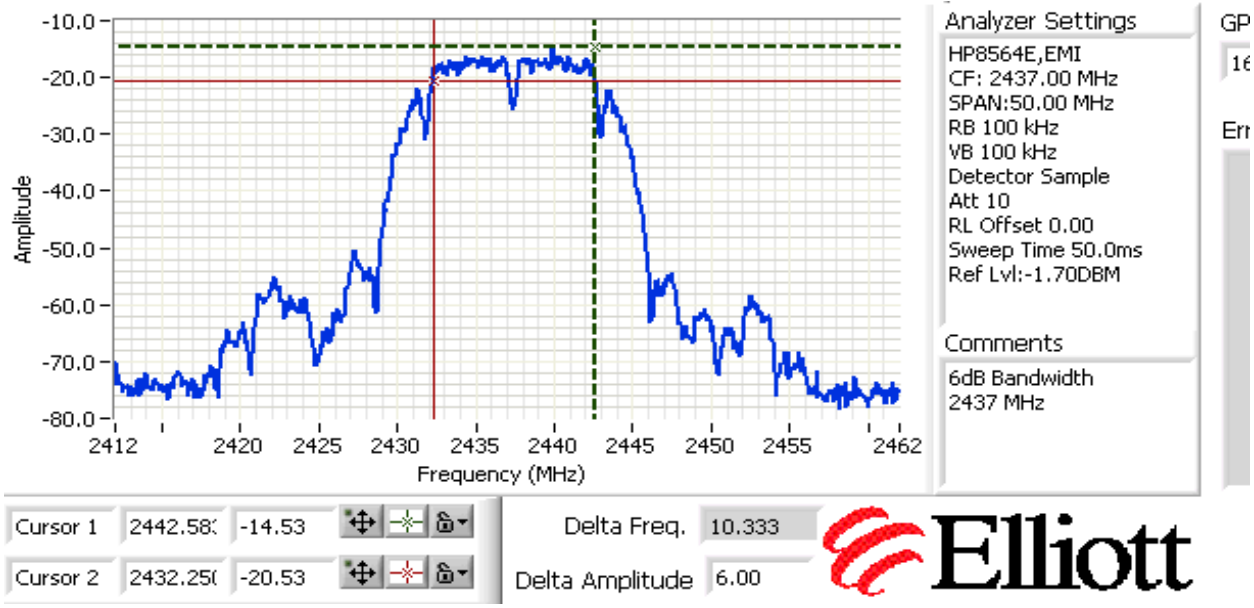
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #3: Signal Bandwidth

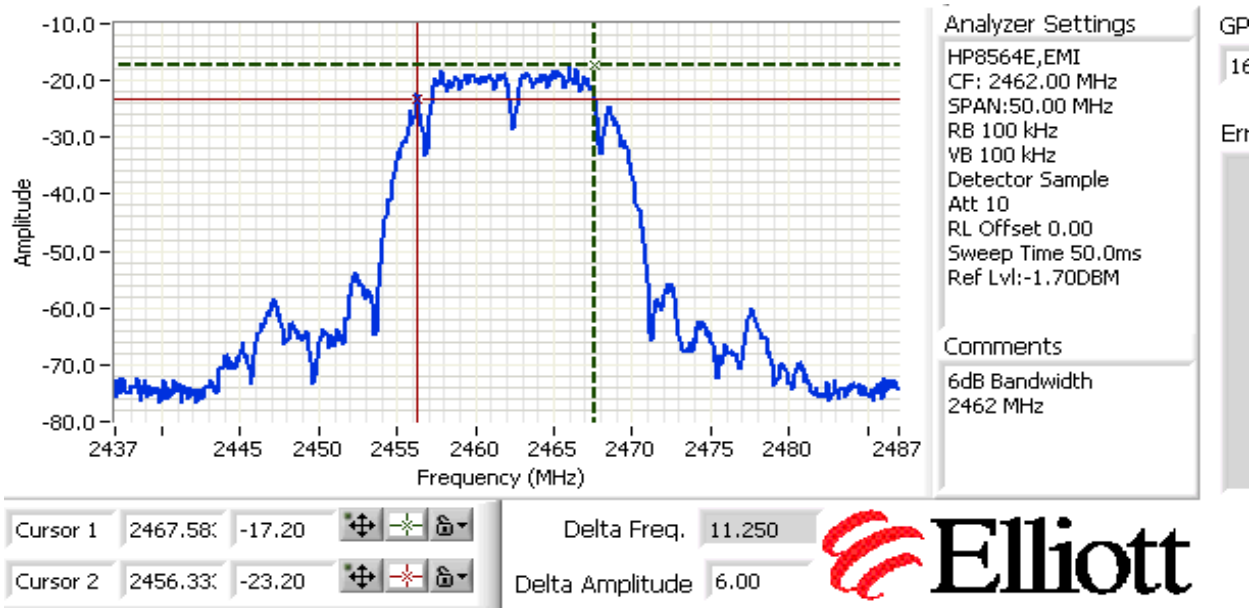
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
20.5	2412	100kHz	10.41	13.8
22.5	2437	100kHz	10.33	13.8
20.5	2462	100kHz	11.25	13.8

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





Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

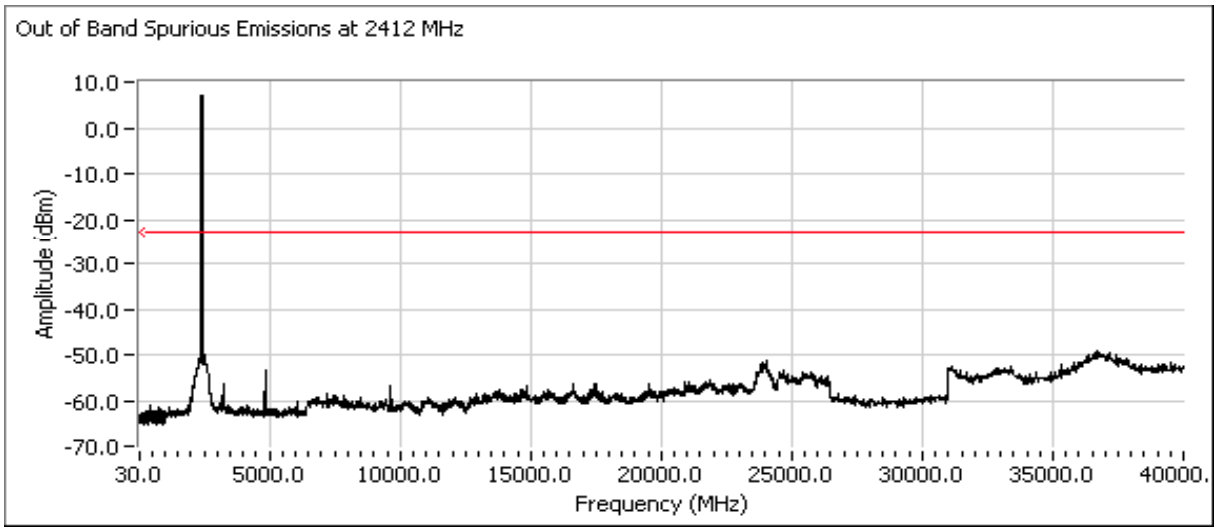


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

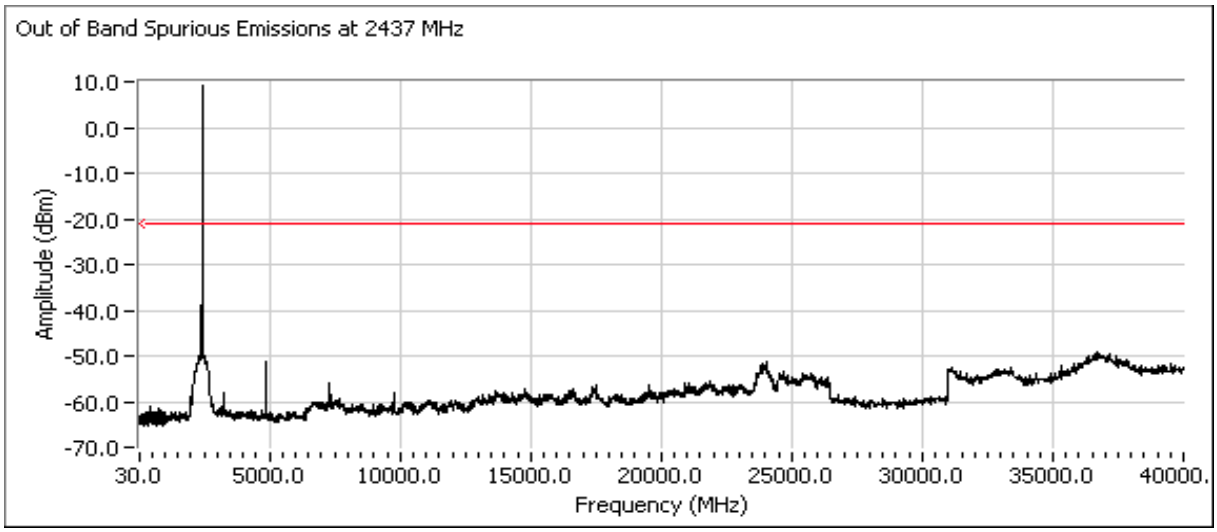
Run #4: Out of Band Spurious Emissions

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

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

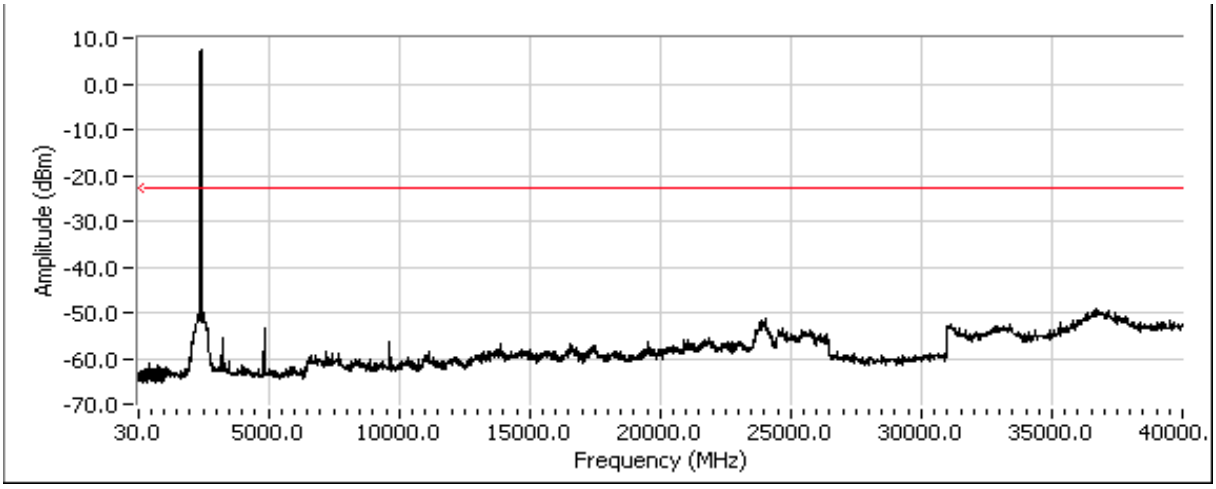


Plots for center channel, power setting(s) = 22.5



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions - 802.11g (2400 MHz)

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: 3/6/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4
Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

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: 18.7 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	18.2 dBm(65.8mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-6.0 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	16.58 MHz
3	99% Bandwidth	RSS GEN	-	17.14 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

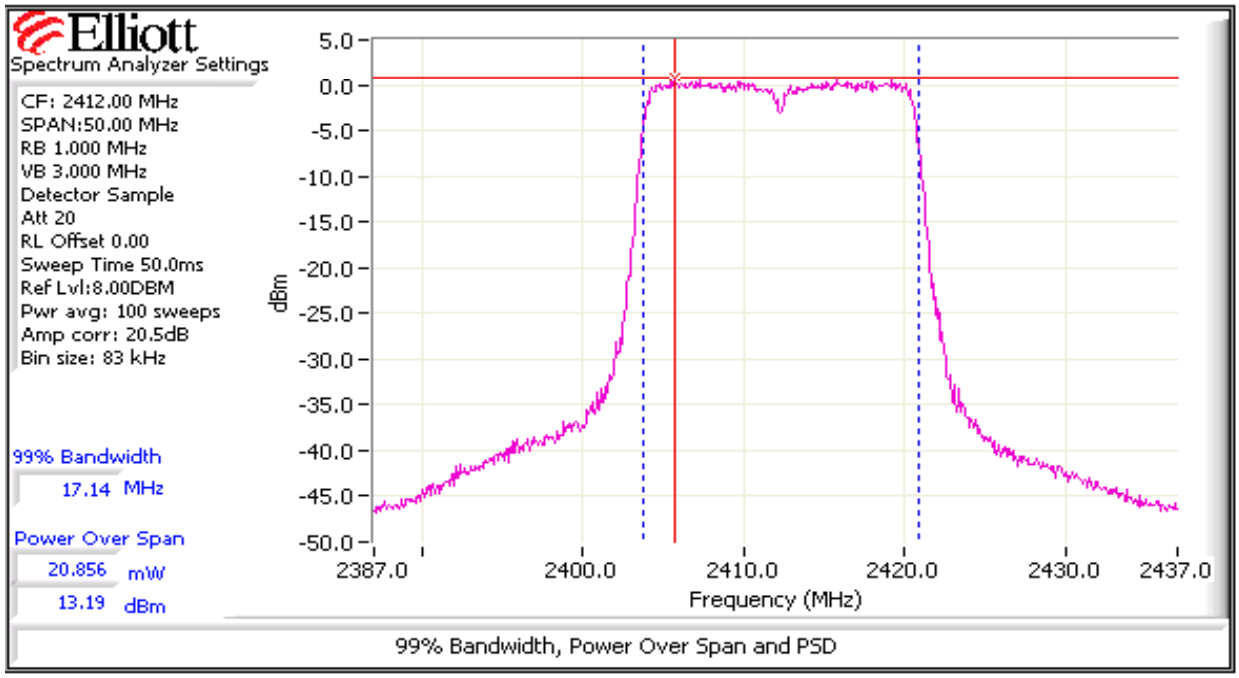
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

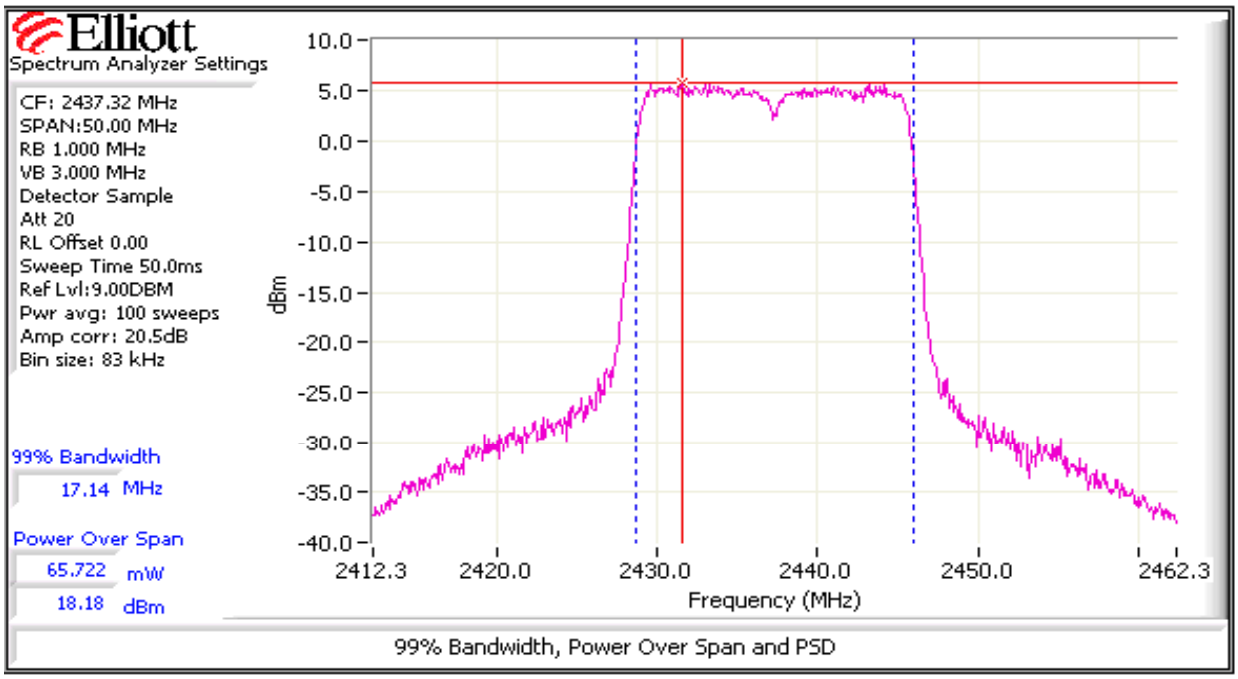
Run #1: Output Power
802.11g Mode

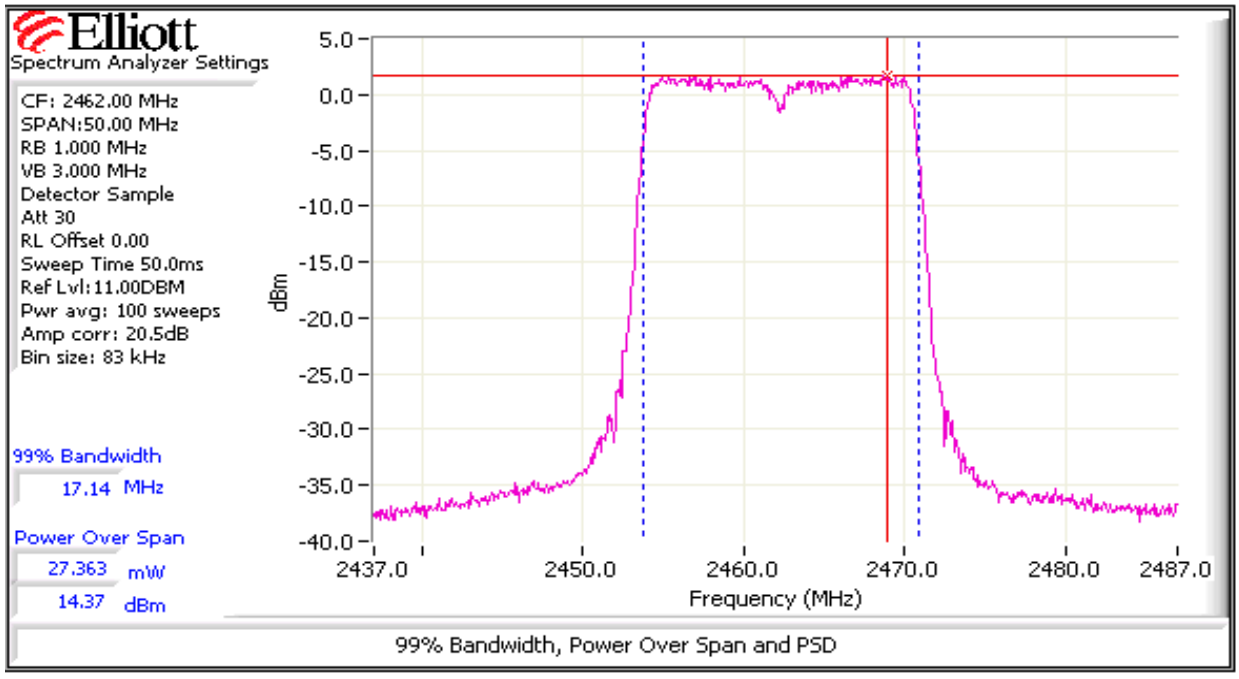
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP W	Output Power (dBm) [3]	Output Power mW
21.5	2412	13.2	20.8	3.2	Pass	16.4	0.044	13.9	24.5
26.5	2437	18.2	65.8	3.2	Pass	21.4	0.137	17.8	60.3
23.5	2462	14.4	27.4	3.2	Pass	17.6	0.057	15.4	34.7

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.
Note 2:	Power setting - the software power setting used during testing, included for reference only.



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



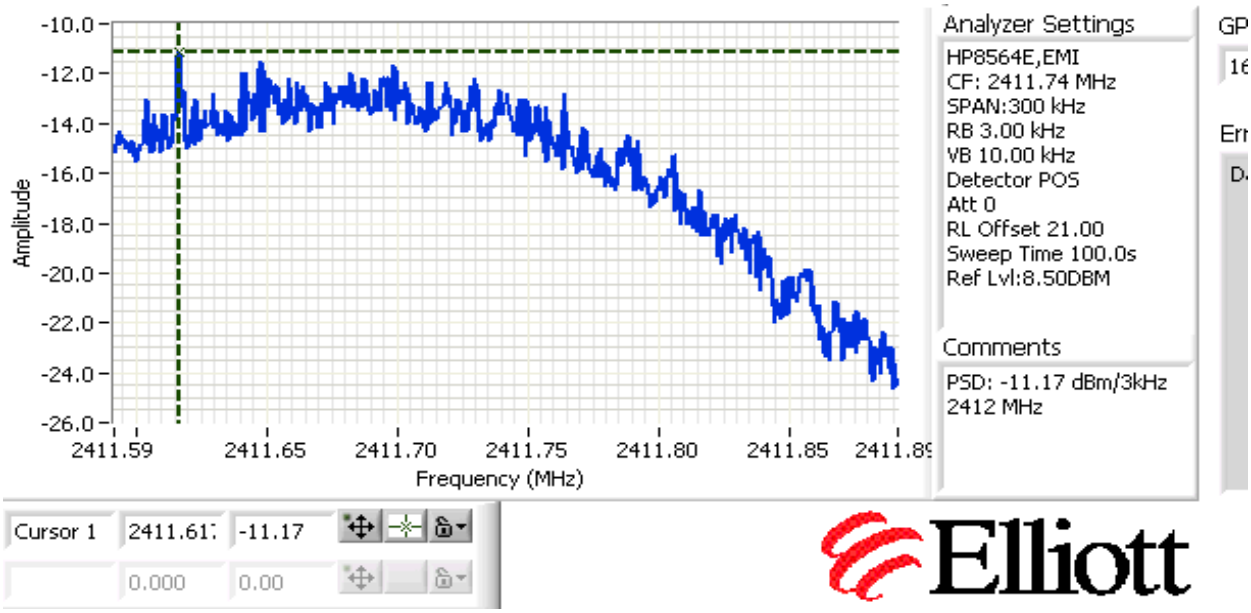


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

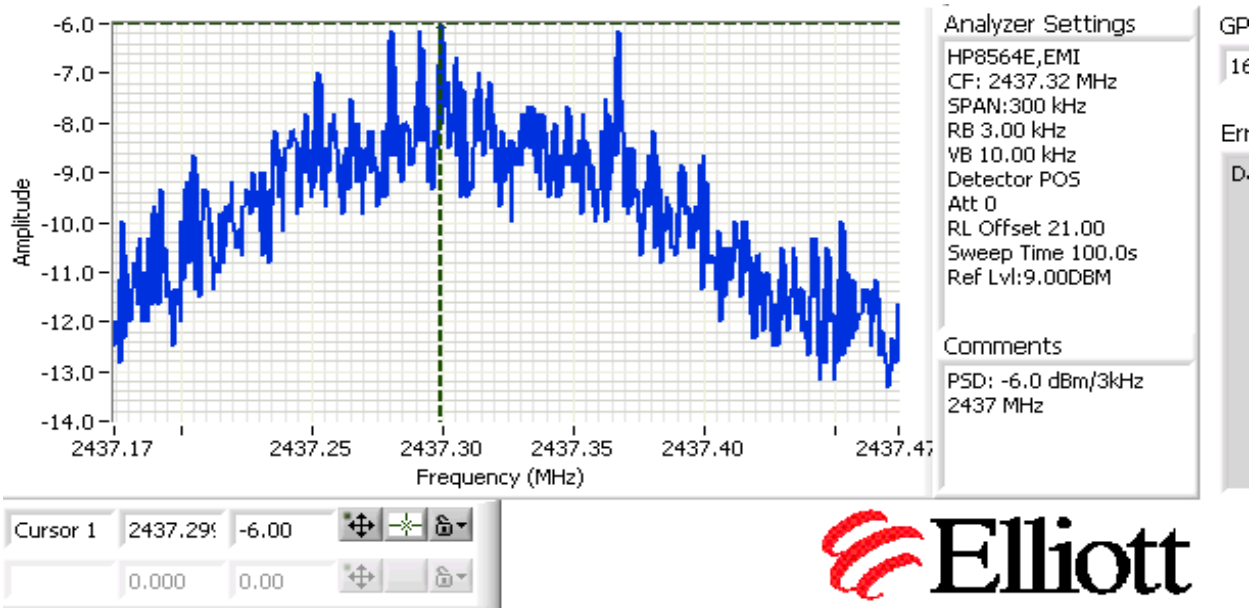
Run #2: Power spectral Density

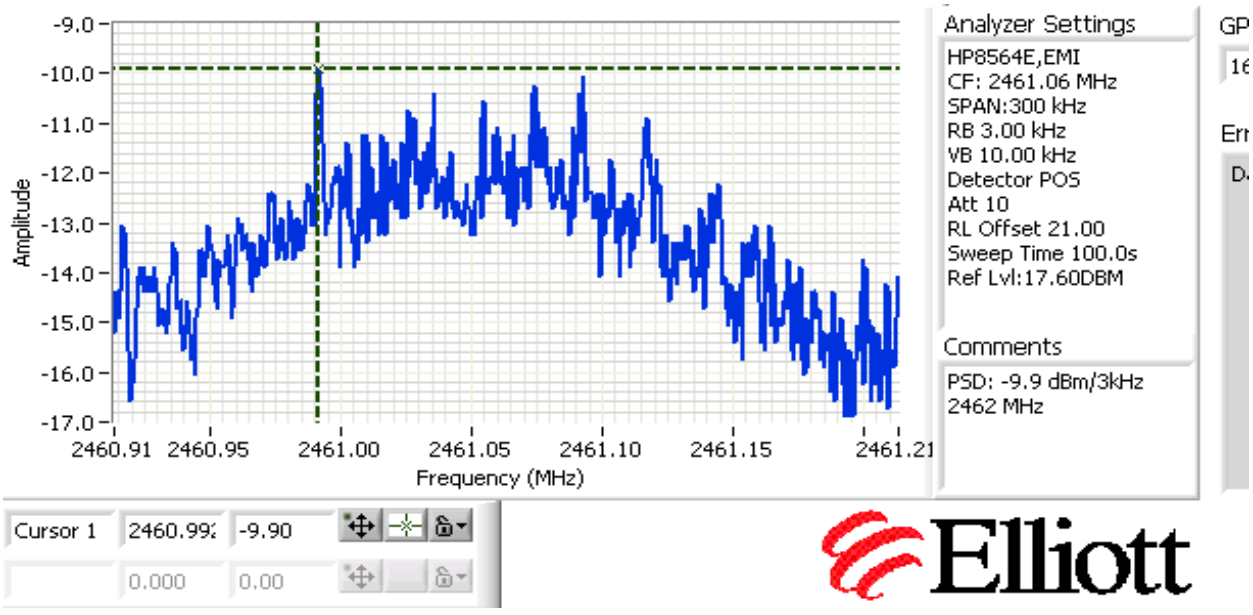
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
21.5	2412	-11.2	8.0	Pass
26.5	2437	-6.0	8.0	Pass
23.5	2462	-9.9	8.0	Pass

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



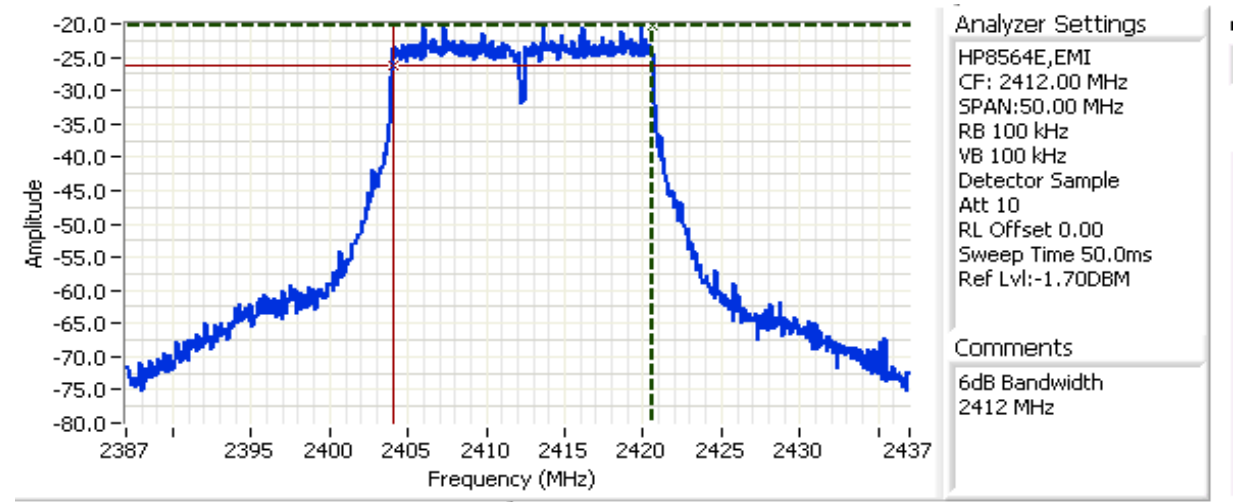


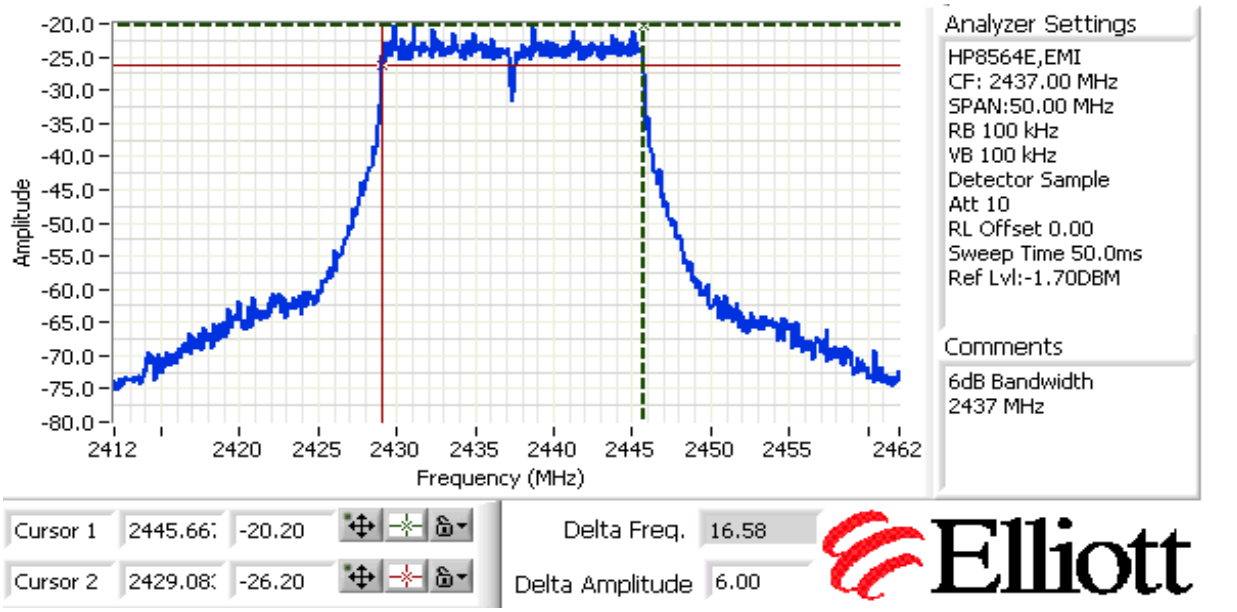
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #3: Signal Bandwidth

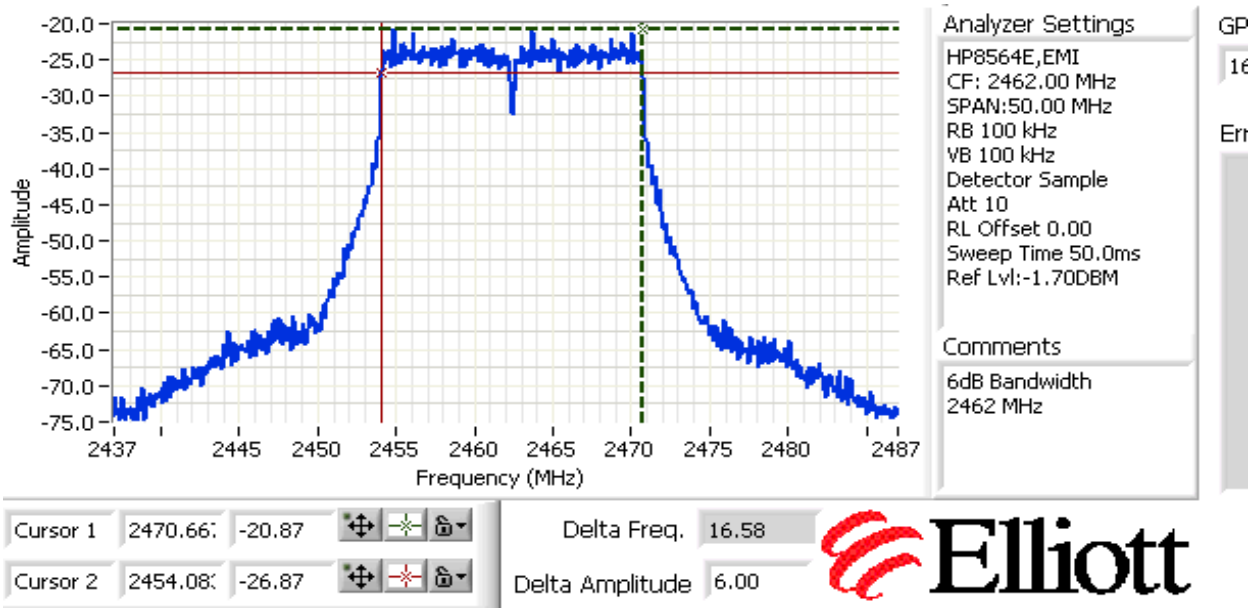
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
21.5	2412	100kHz	16.58	17.14
26.5	2437	100kHz	16.58	17.14
23.5	2462	100kHz	16.58	17.14

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





Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

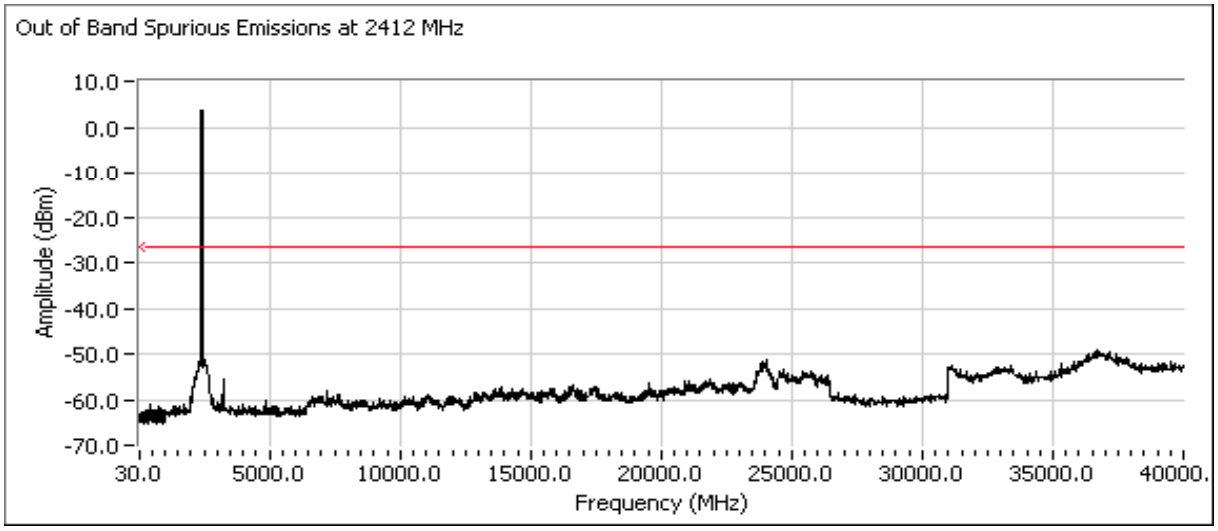


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

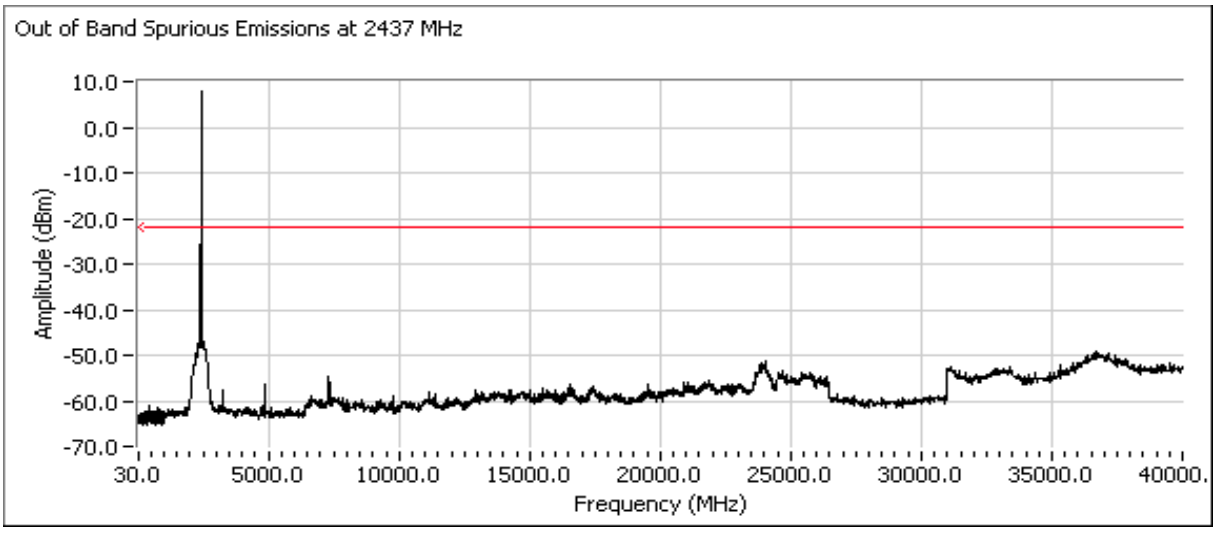
Run #4: Out of Band Spurious Emissions

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

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

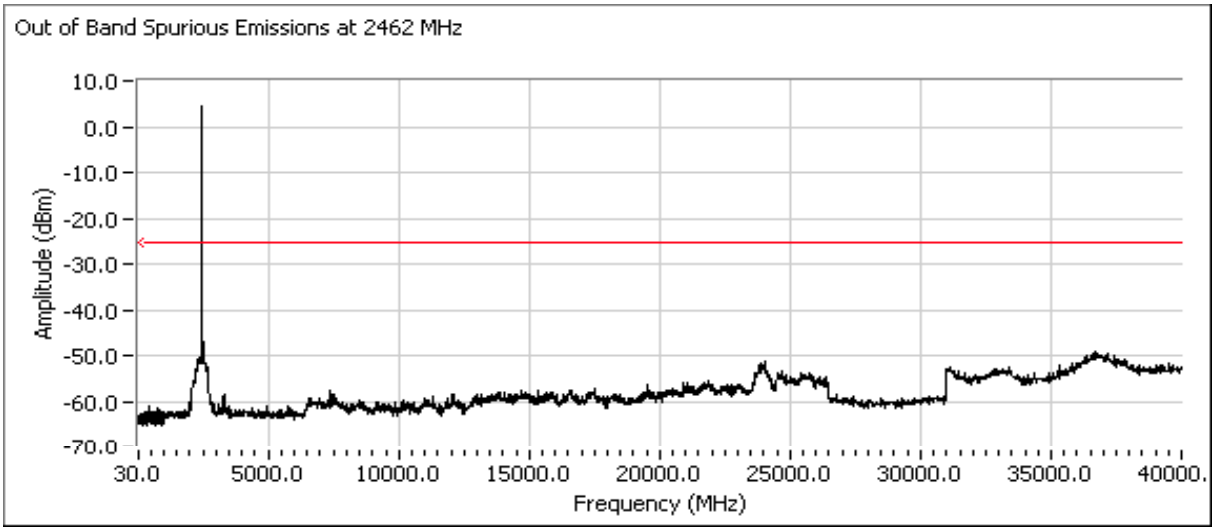


Plots for center channel, power setting(s) = 26.5



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions - 802.11n 20MHz (2400 MHz)

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: 3/7/2008
Test Engineer: Joseph Cadigal
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

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: 18.7 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	16.1dBm(40.8mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-7.5dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	17.83 MHz
3	99% Bandwidth	RSS GEN	-	18.4 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

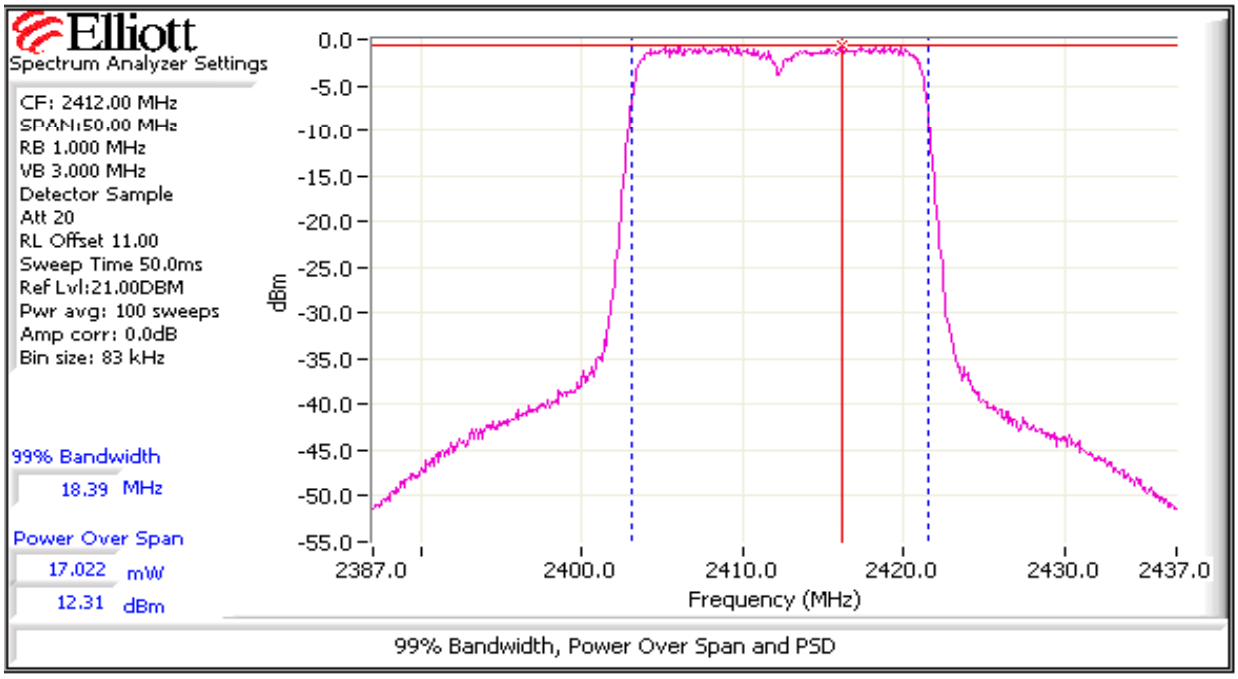
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #1: Output Power

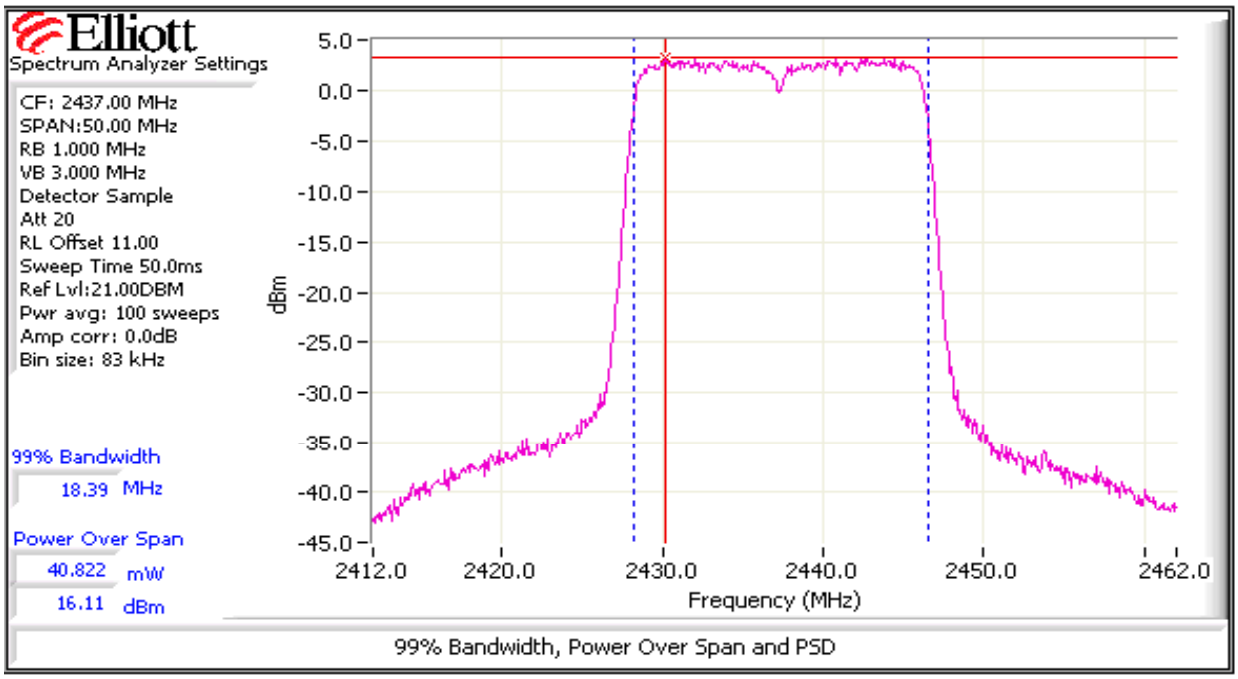
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP W	Output Power (dBm) [3]	Output Power mW
22	2412	12.3	17.0	3.2	Pass	15.5	0.036	14.0	25.1
26	2437	16.1	40.8	3.2	Pass	19.3	0.085	16.5	44.7
22.5	2462	12.9	19.4	3.2	Pass	16.1	0.041	14.3	26.9

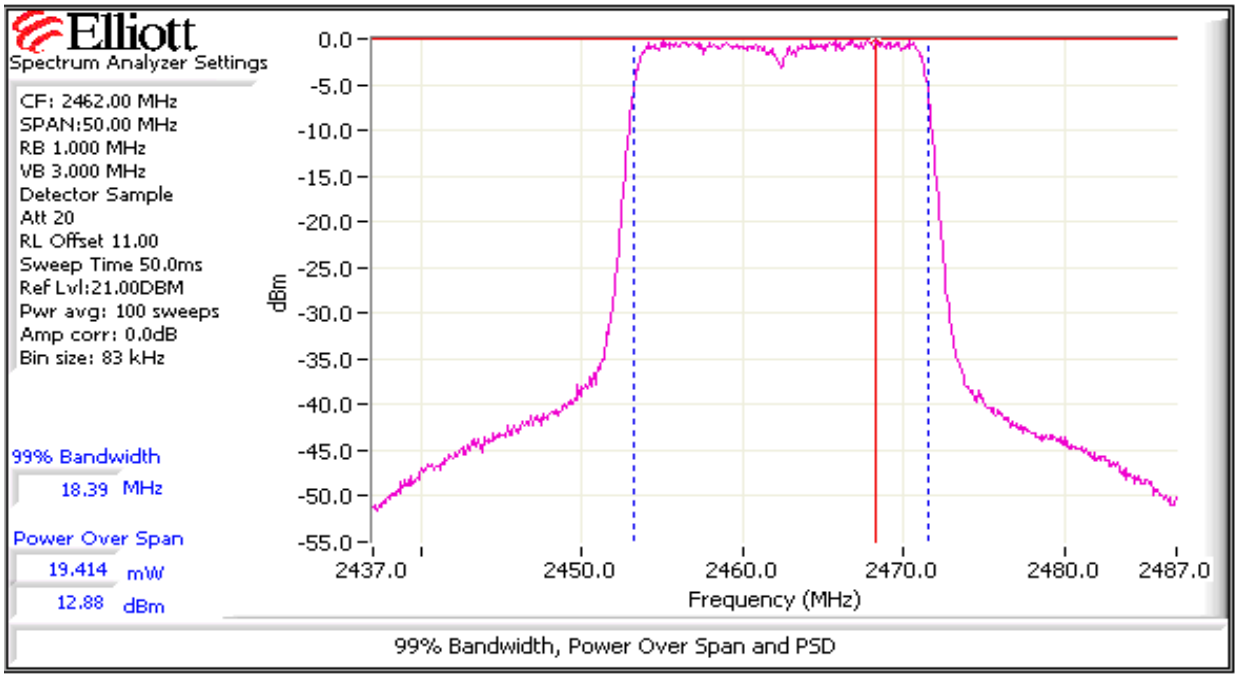
Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration
Note 2:	Power setting - the software power setting used during testing, included for reference only.



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #1: Output Power



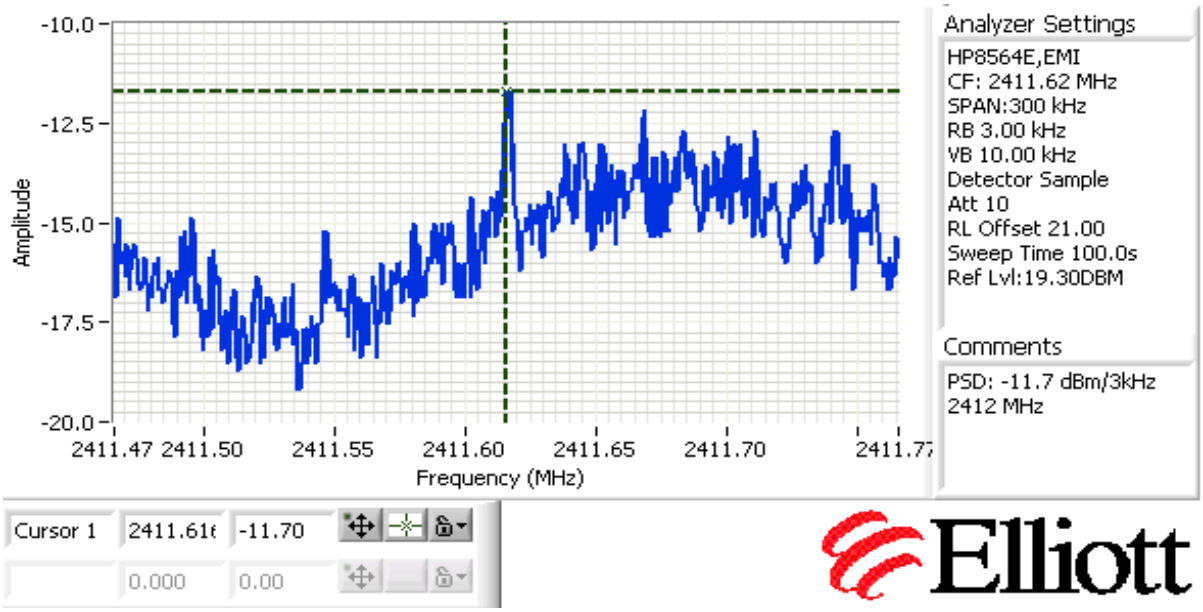


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #2: Power spectral Density

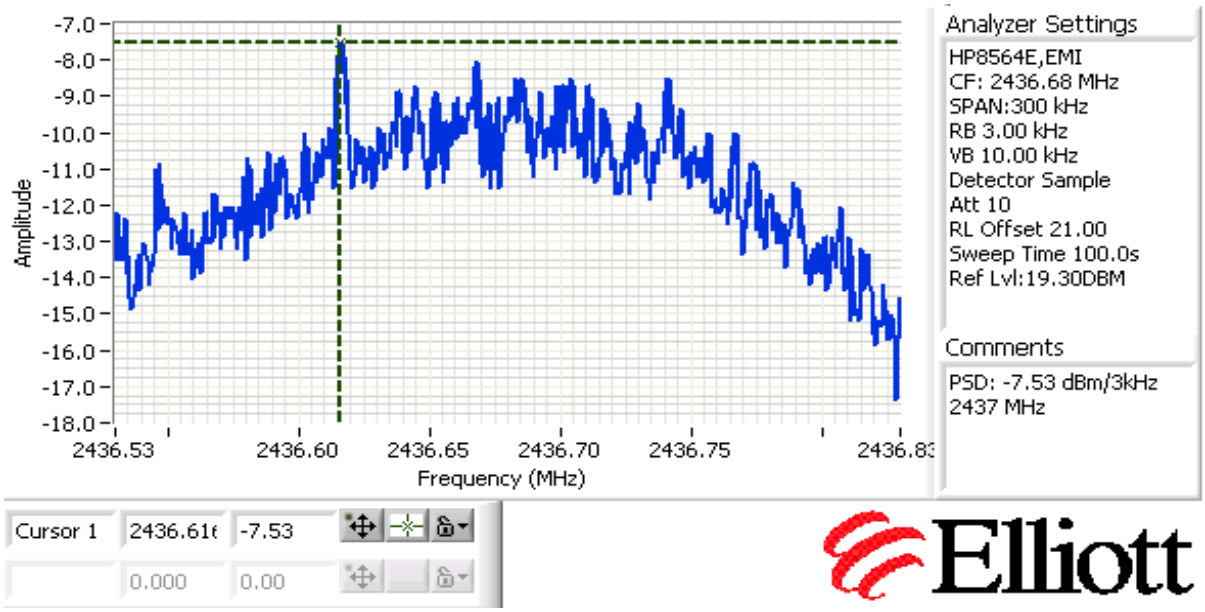
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
22	2412	-11.7	8.0	Pass
26	2437	-7.5	8.0	Pass
22.5	2462	-11.7	8.0	Pass

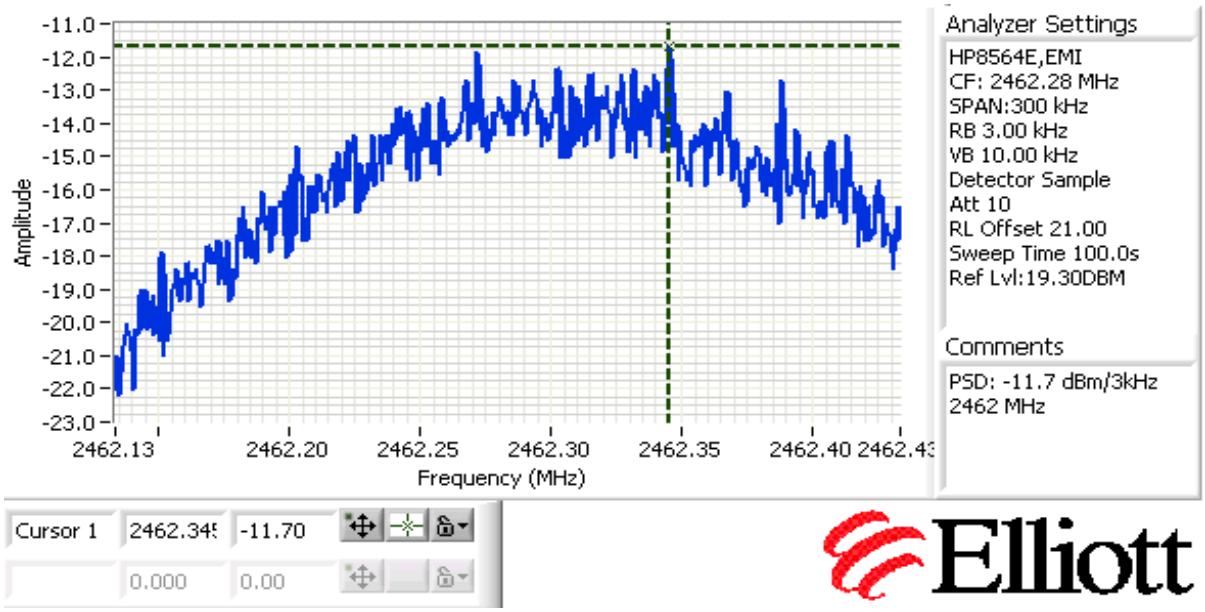
Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #2: Power spectral Density



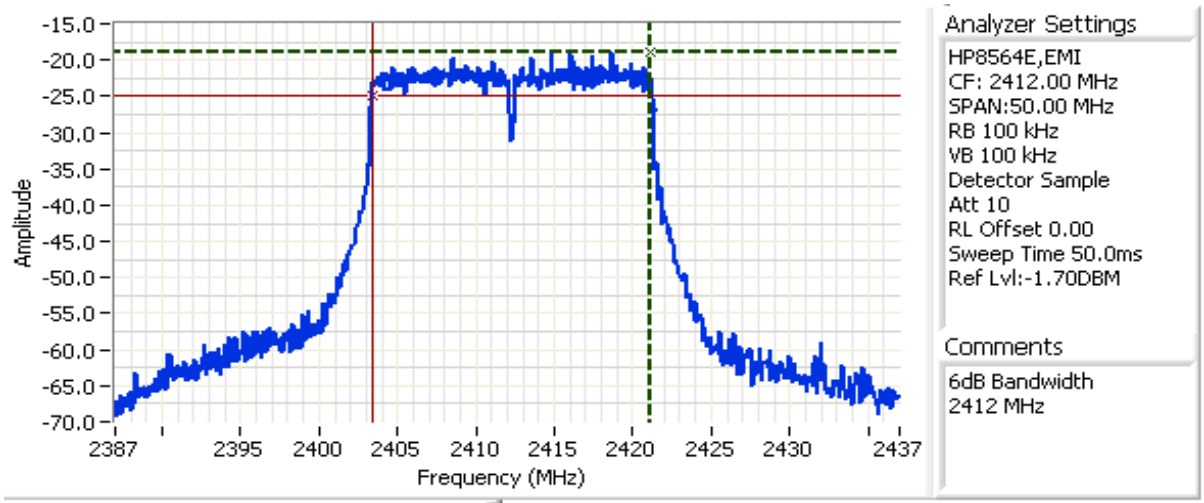


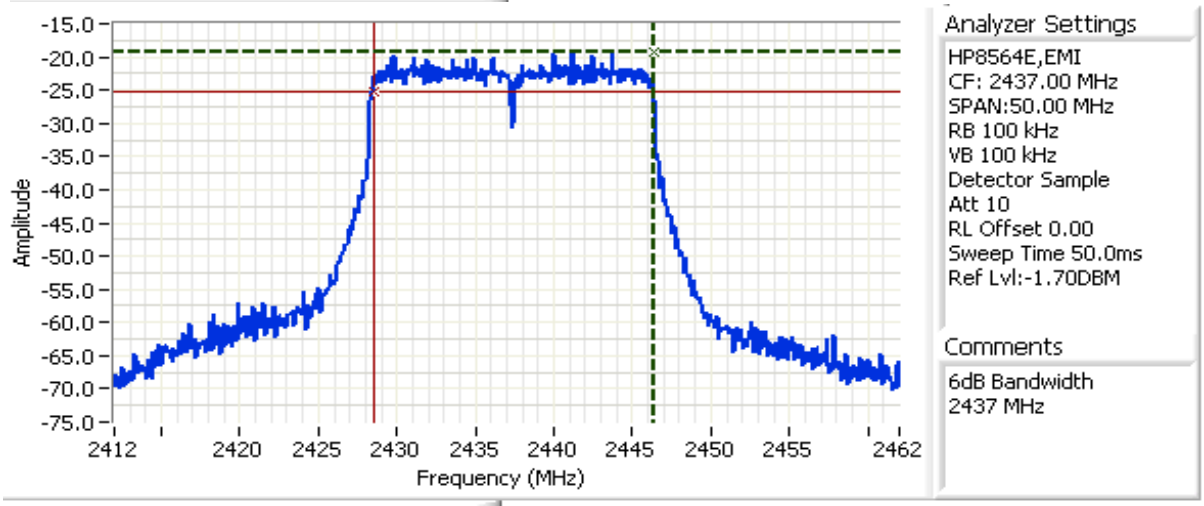
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #3: Signal Bandwidth

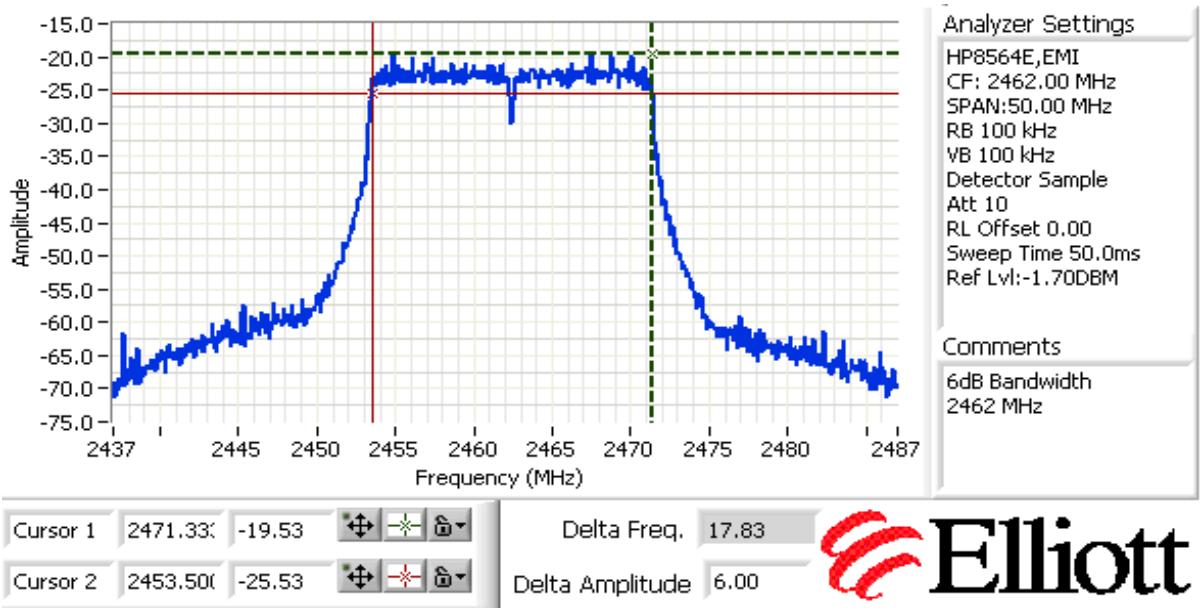
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
22	2412	100kHz	17.75	18.3
26	2437	100kHz	17.83	18.3
22.5	2462	100kHz	17.83	18.3

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





Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

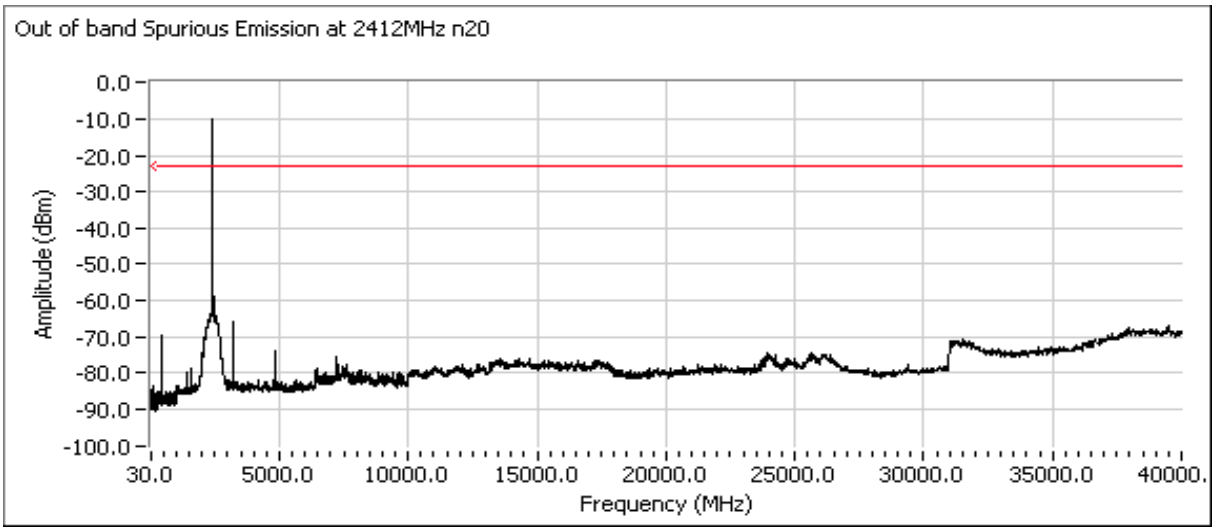


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

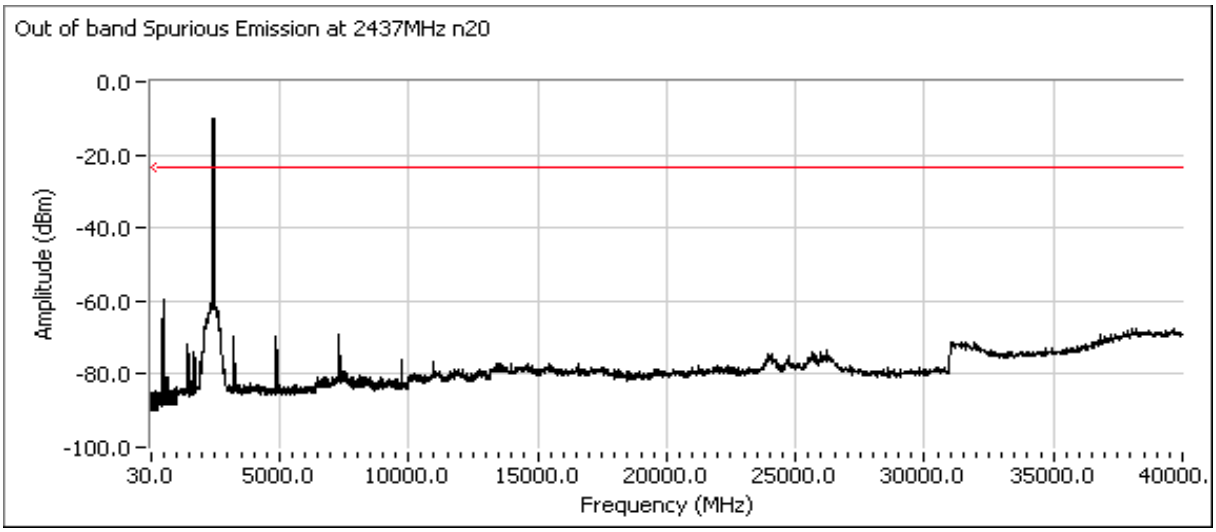
Run #4: Out of Band Spurious Emissions

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

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



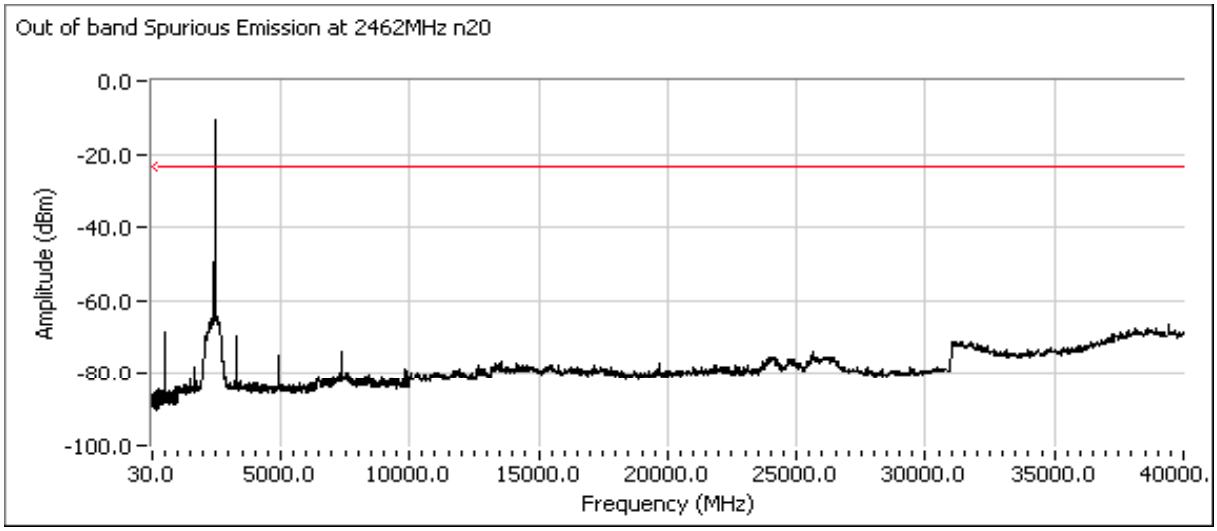
Plots for center channel, power setting(s) = 26



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #4: Out of Band Spurious Emissions

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions - 802.11n 40MHz (2400 MHz)

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: 3/7/2008
Test Engineer: Joseph Cadigal
Test Location: Fremont Chamber #5

Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

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: 18.7 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	15.8 dBm (38.0mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-13.5dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	35.5 MHz
3	99% Bandwidth	RSS GEN	-	36.7 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

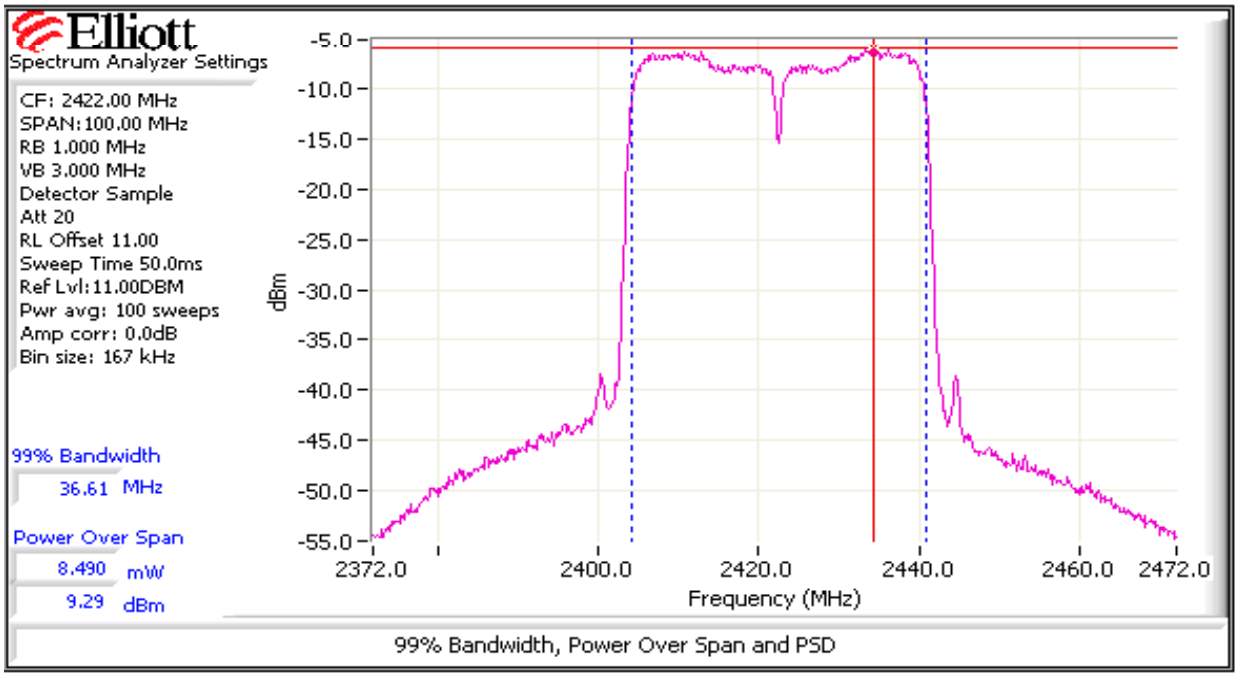
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

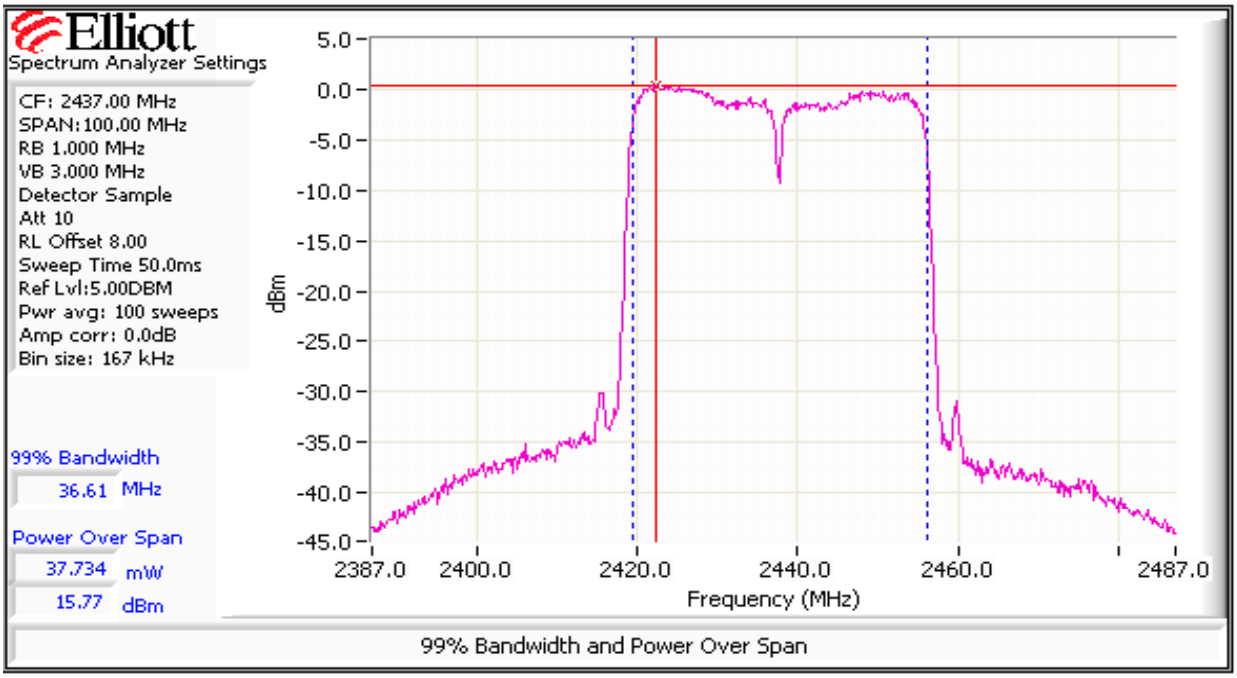
Run #1: Output Power

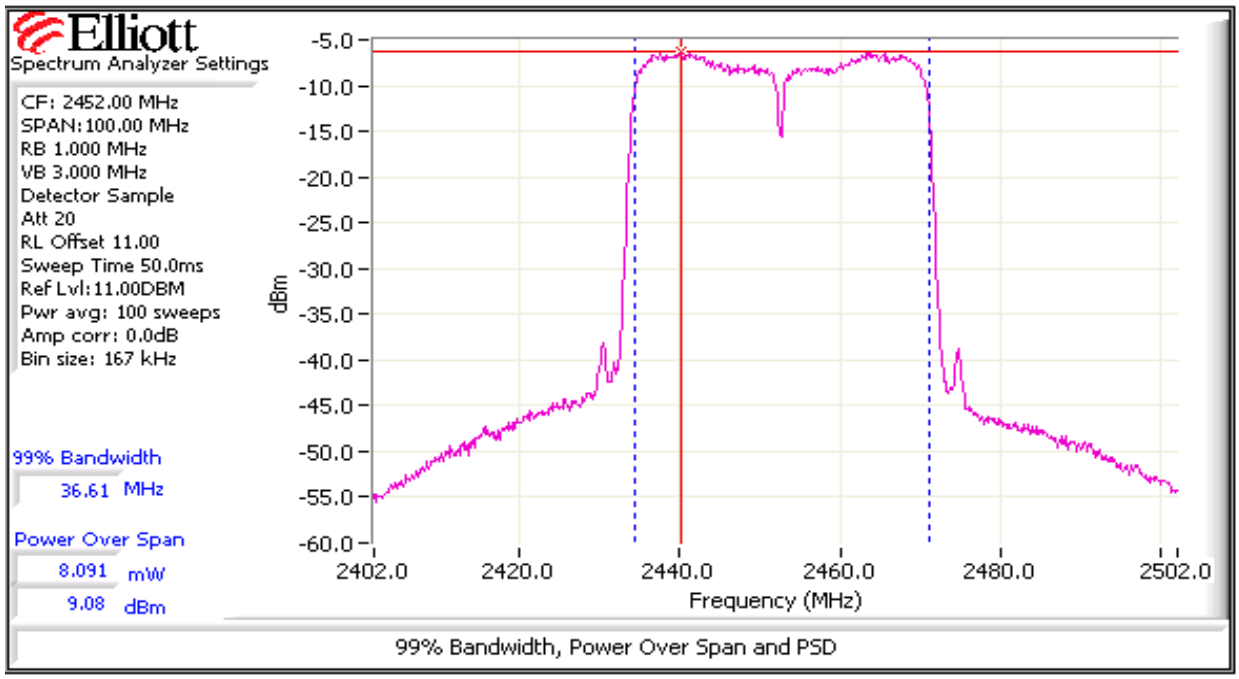
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP [Note 2] W	Output Power (dBm) [3]	Output Power mW
18.5	2422	9.3	8.5	3.2	Pass	12.5	0.018	8.8	7.6
24.0	2437	15.8	38.0	3.2	Pass	19.0	0.079	16.5	44.7
18.5	2452	9.1	8.1	3.2	Pass	12.3	0.017	9.8	9.5

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.
Note 2:	Power setting - the software power setting used during testing, included for reference only.
note 3:	Average power via average power sensor - if included for manufacturer's reference only



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



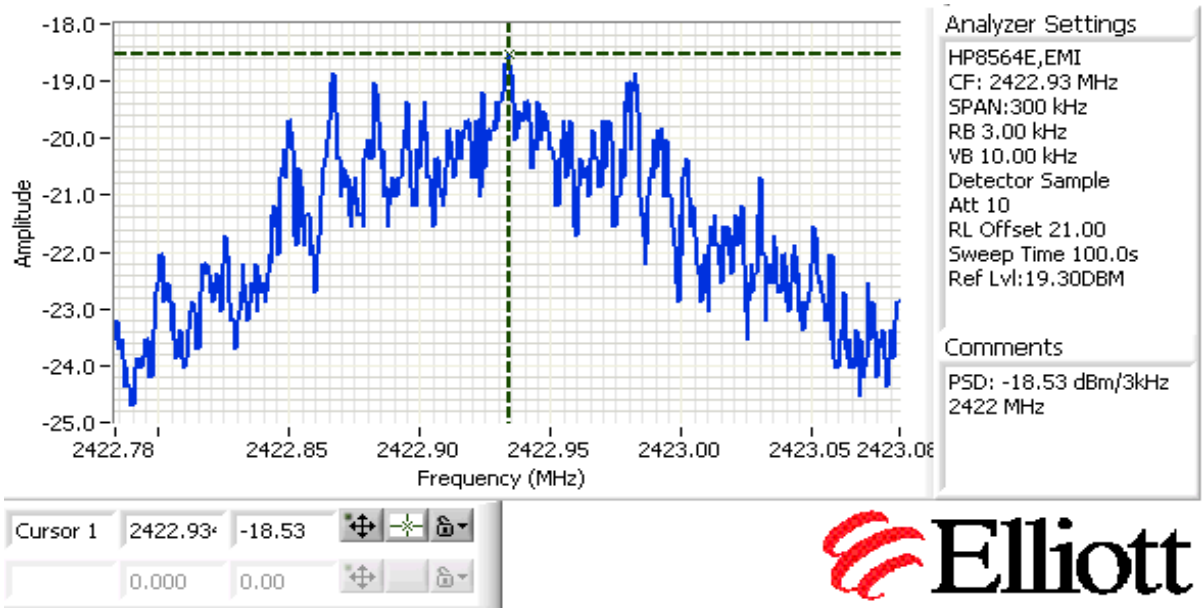


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

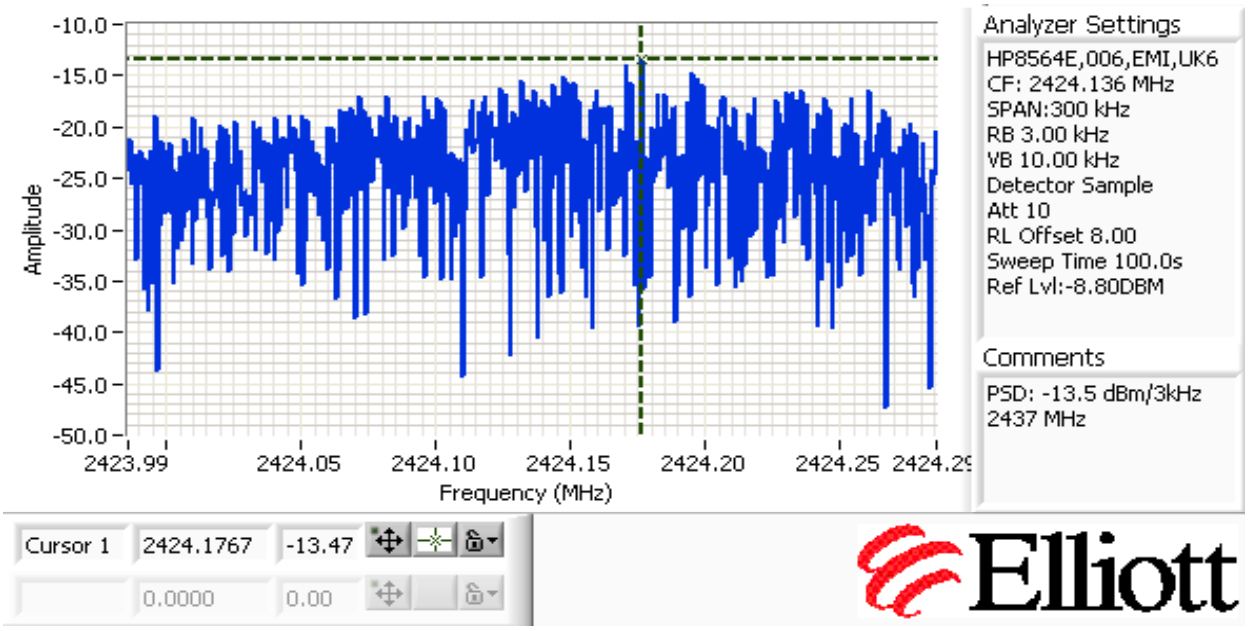
Run #2: Power spectral Density

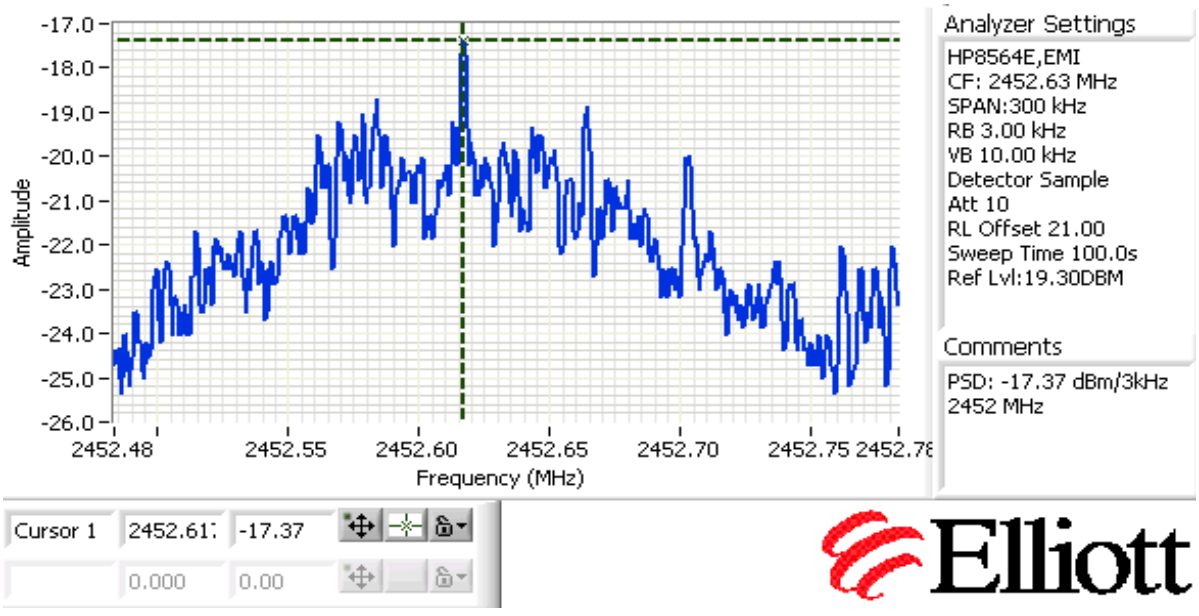
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
18.5	2422	-18.5	8.0	Pass
24.0	2437	-13.5	8.0	Pass
18.5	2452	-17.4	8.0	Pass

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



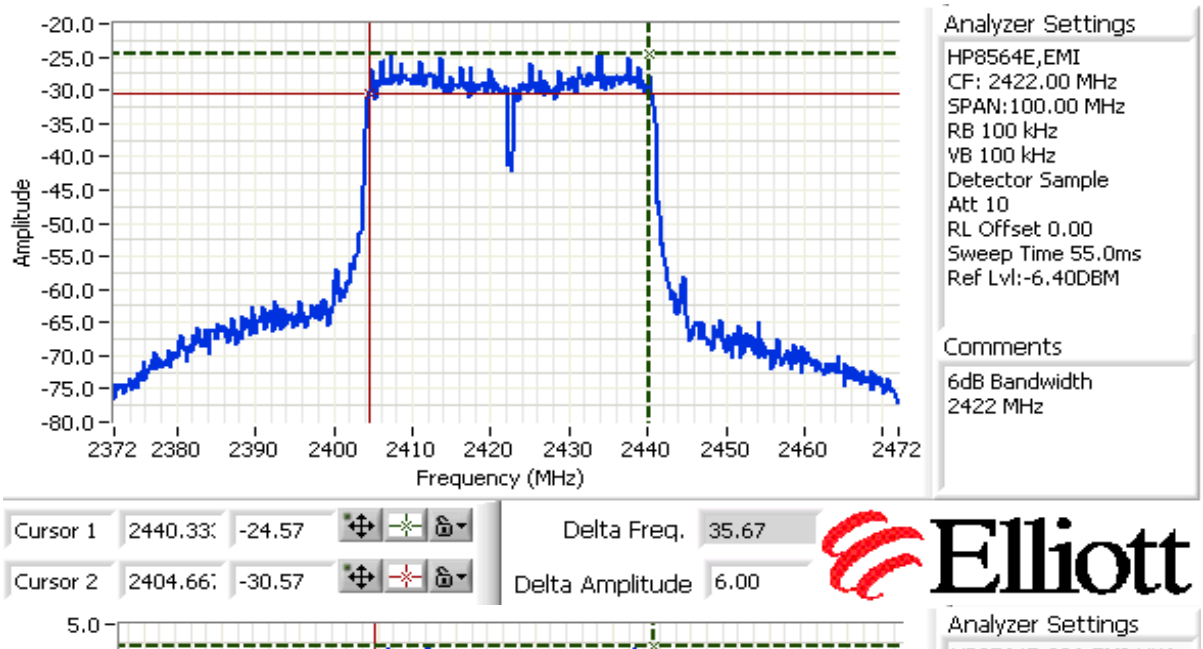


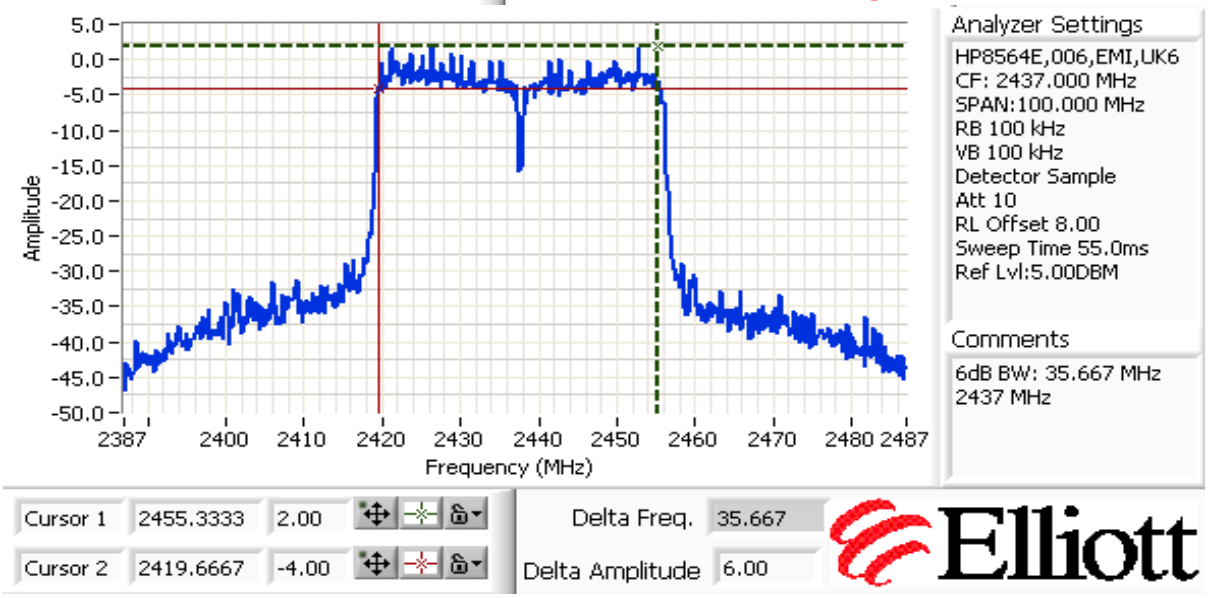
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #3: Signal Bandwidth

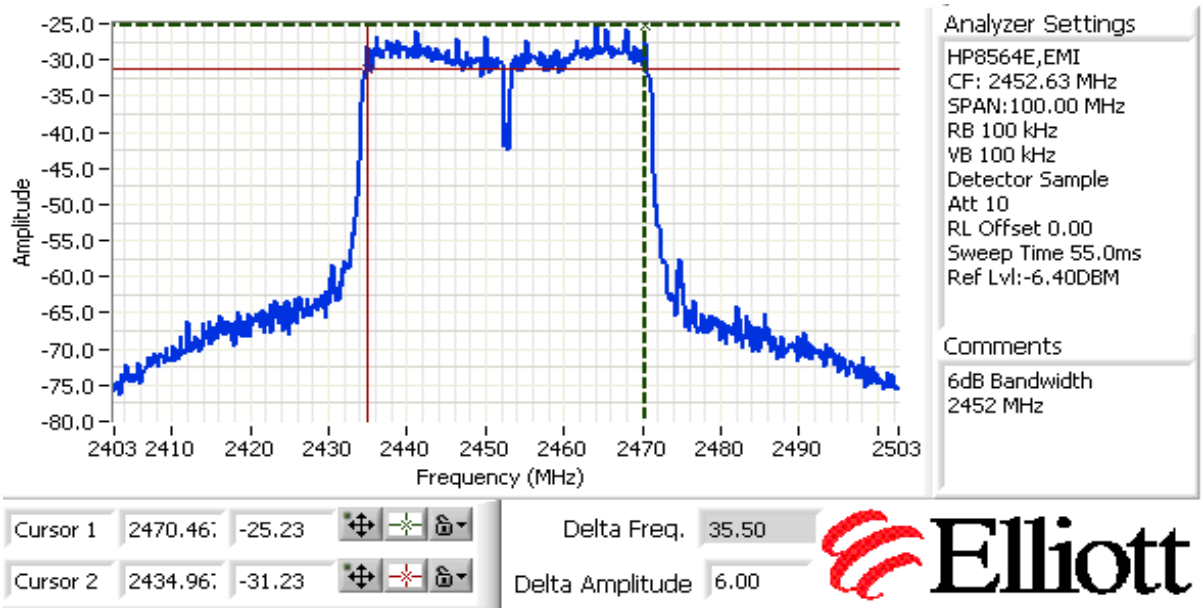
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
18.5	2422	100kHz	35.7	36.6
24.0	2437	100kHz	35.7	36.6
18.5	2452	100kHz	35.5	36.7

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





Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

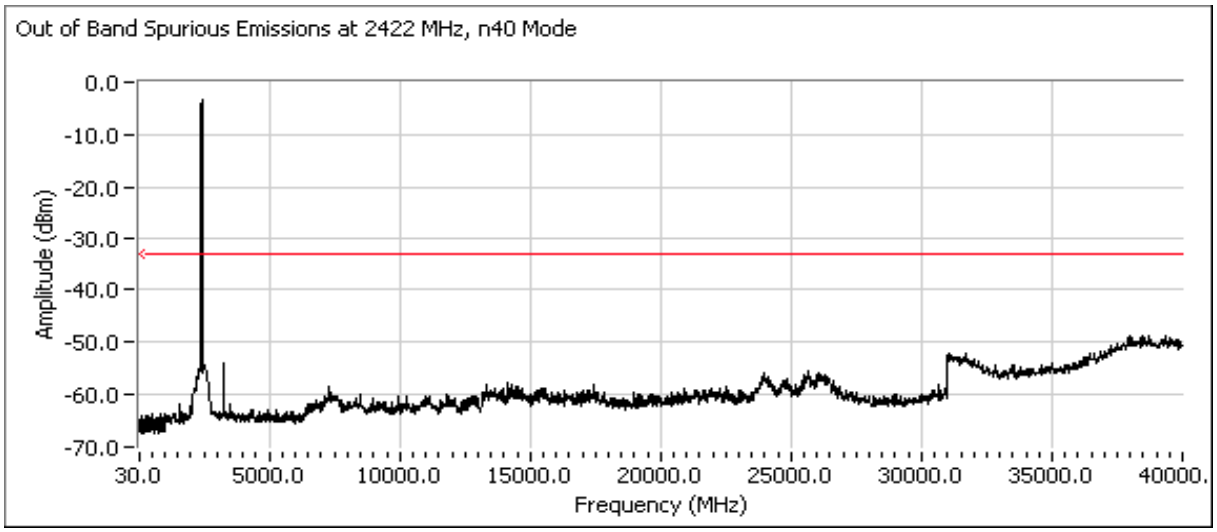


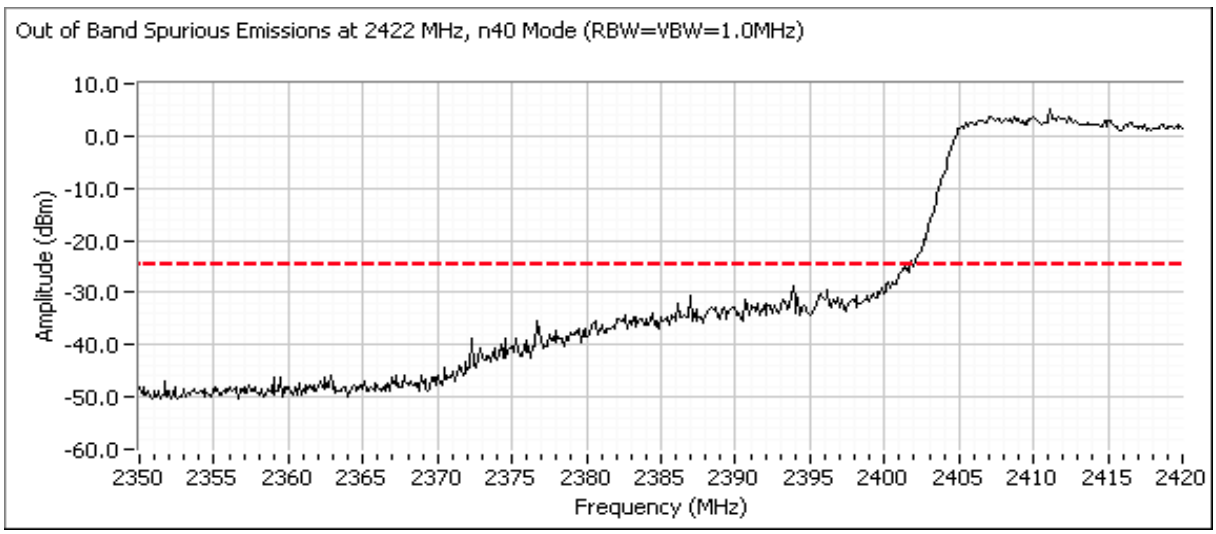
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #4: Out of Band Spurious Emissions

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

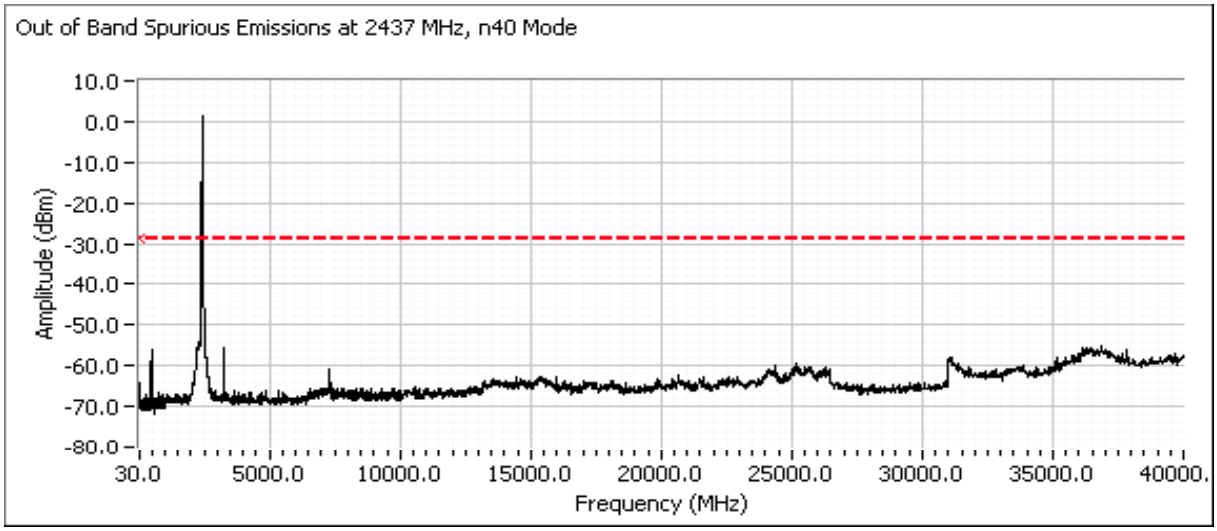
Plots for low channel, power setting(s) = 18.5



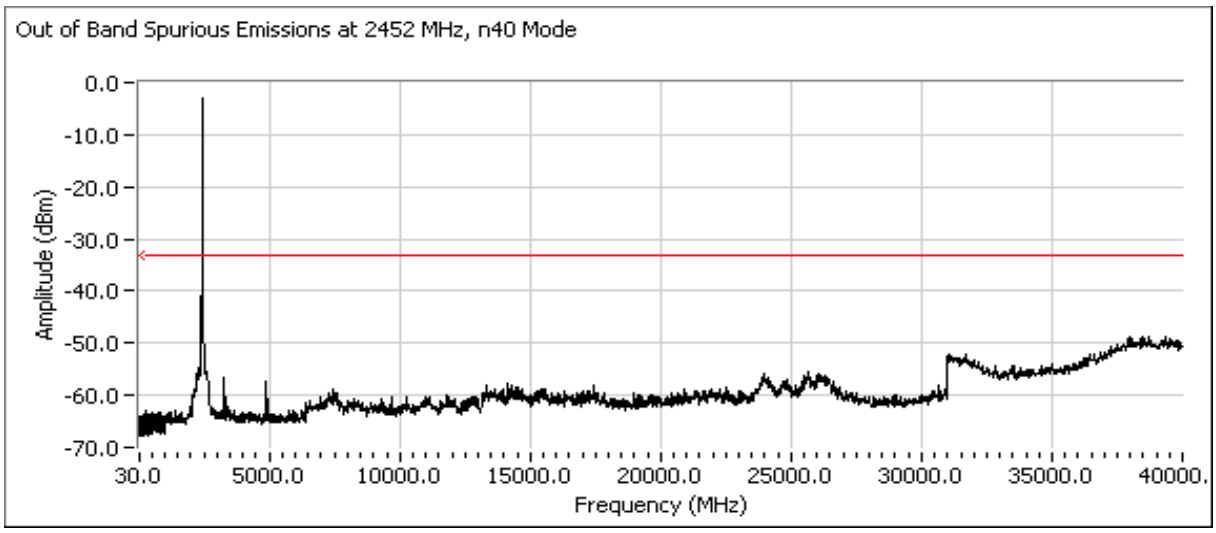


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

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



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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements
Power, PSD, Bandwidth and Spurious Emissions - 802.11a (5725-5850MHz)

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: 3/11/2008
Test Engineer: Vishal Narayan
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 43 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	15.3 dBm(34mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-9.6 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	16.3 MHz
3	99% Bandwidth	RSS GEN	Pass	17.1 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

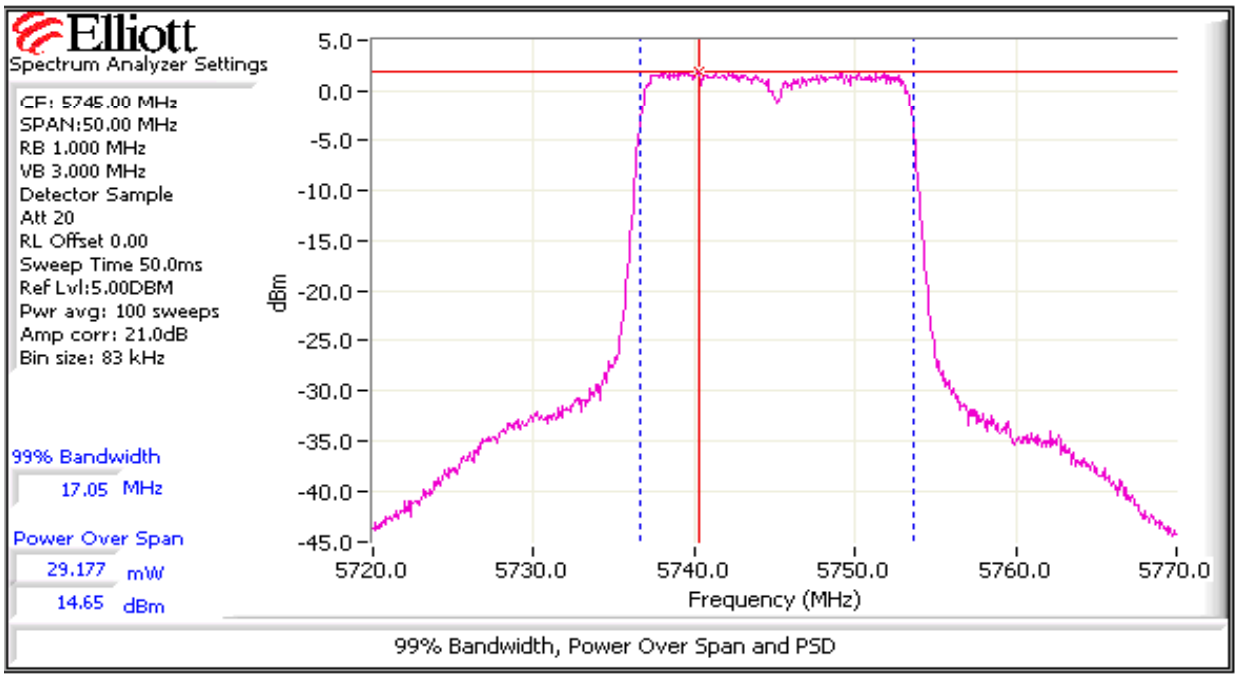
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #1: Output Power

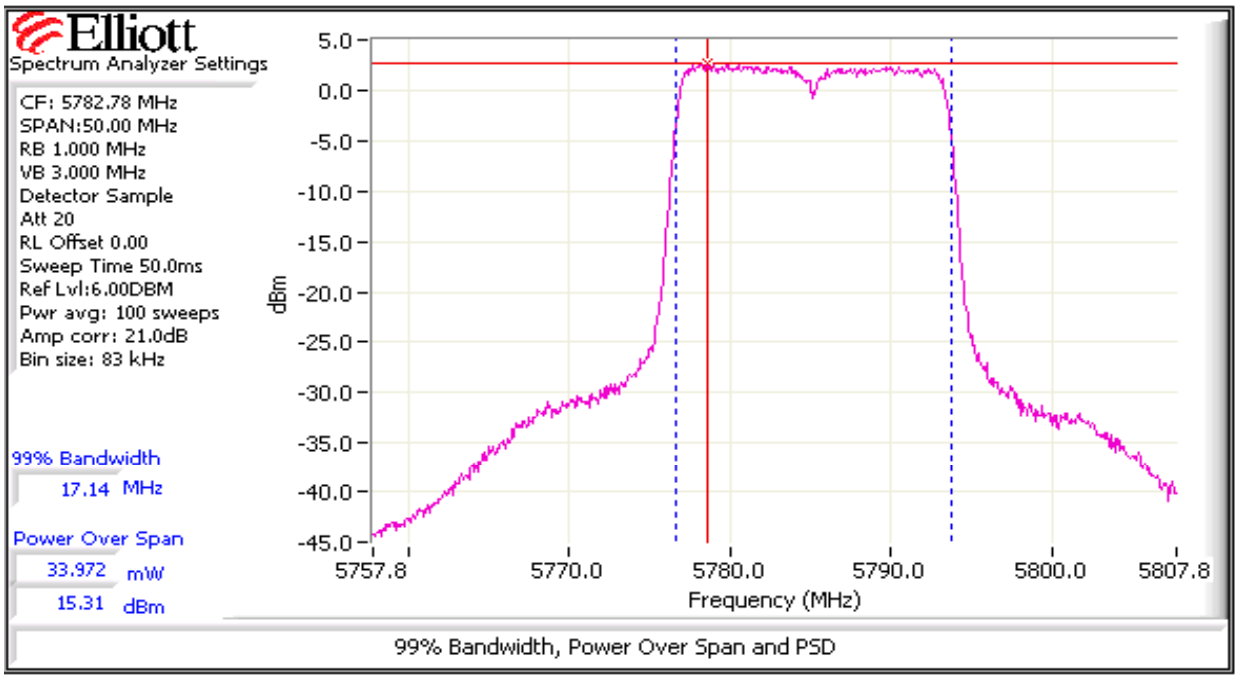
Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
26.5	5745	14.7	29.2	5.0	Pass	19.7	0.092		
28	5785	15.3	34.0	5.0	Pass	20.3	0.107		
26.5	5825	13.3	21.5	5.0	Pass	18.3	0.068		

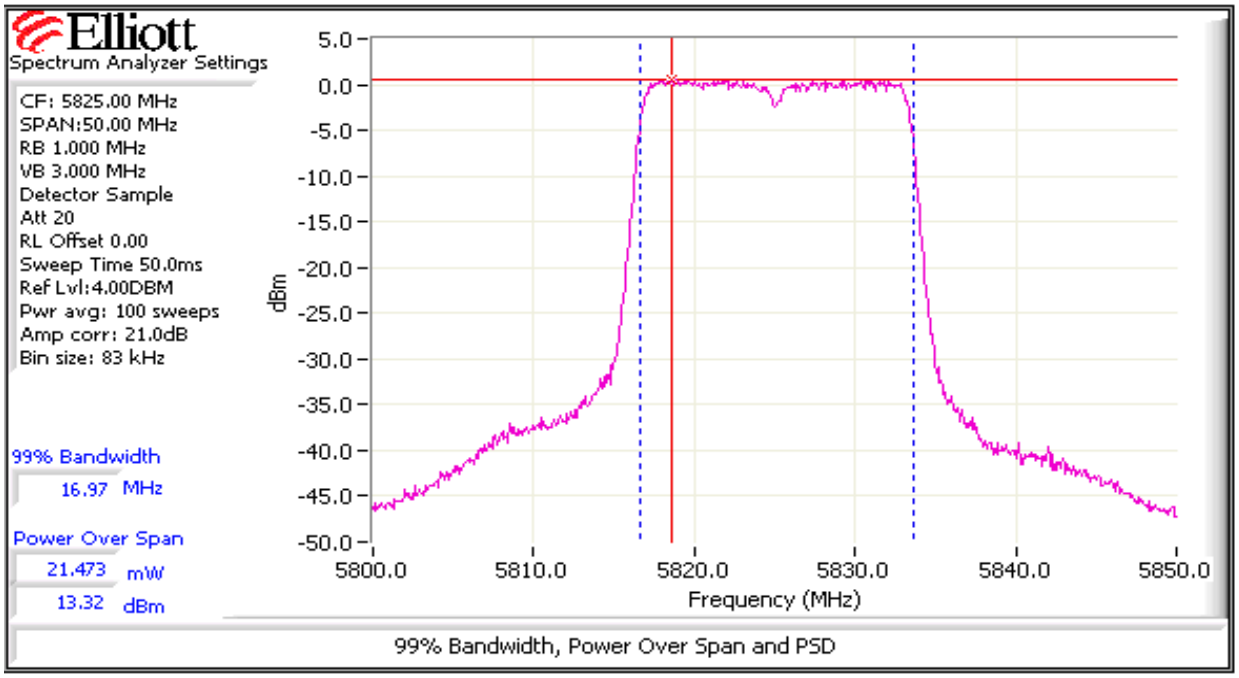
Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz. Spurious limit is -30dBc because this method was used.
Note 2:	Power setting - the software power setting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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Continuation of Run #1



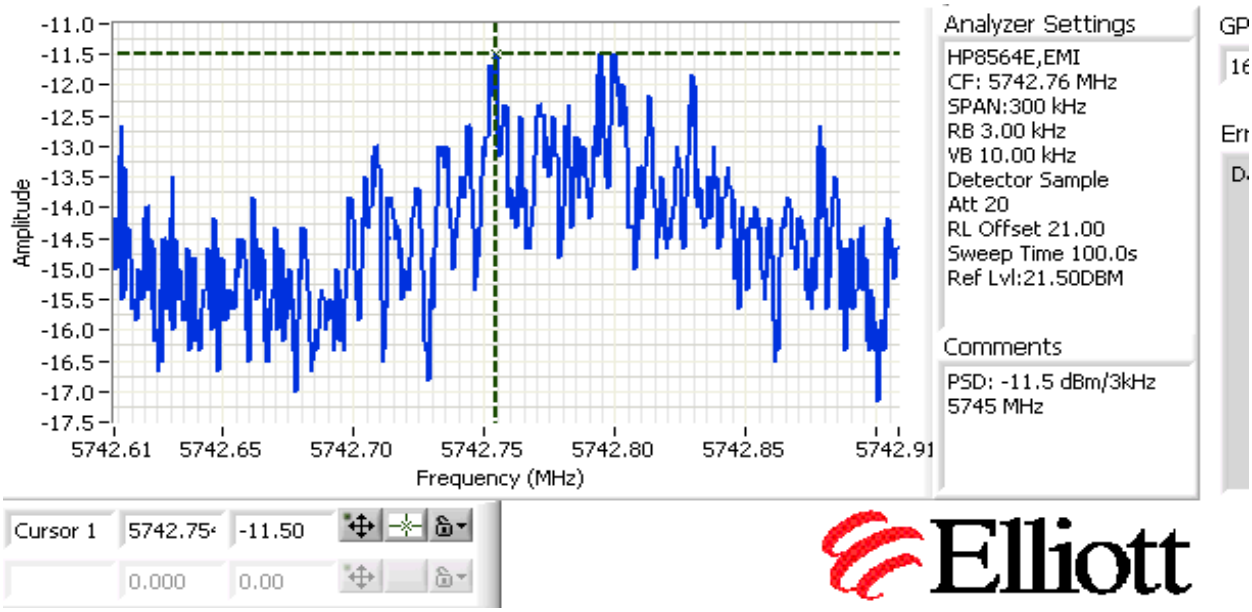


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #2: Power spectral Density

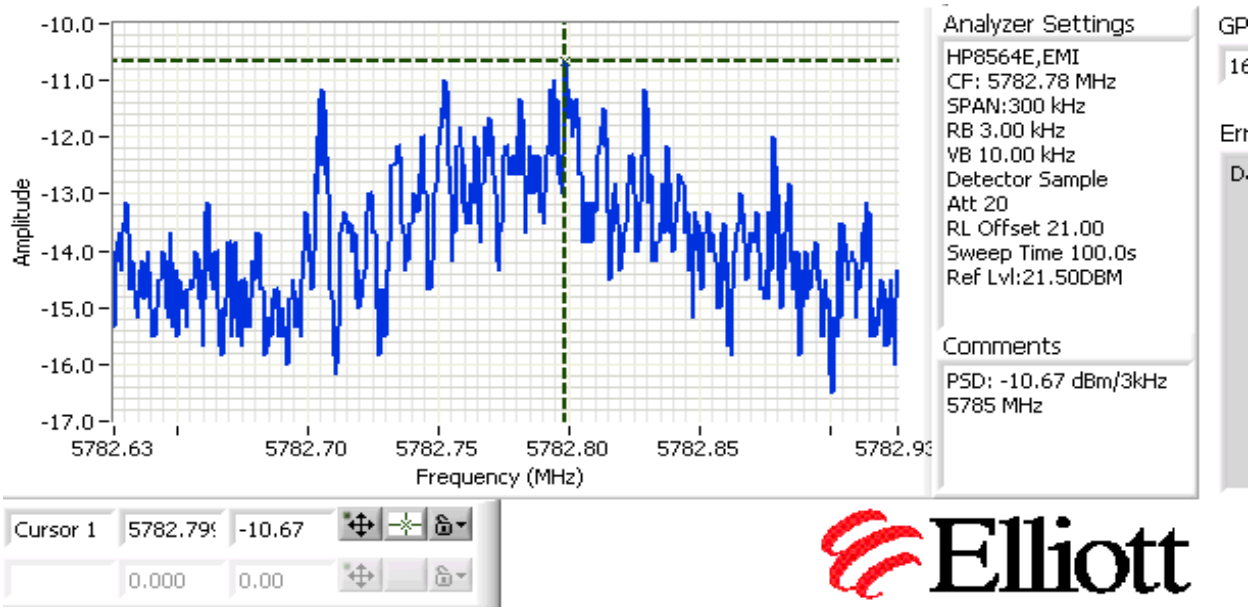
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
26.5	5745	-11.5	8.0	Pass
28	5785	-10.7	8.0	Pass
26.5	5825	-9.6	8.0	Pass

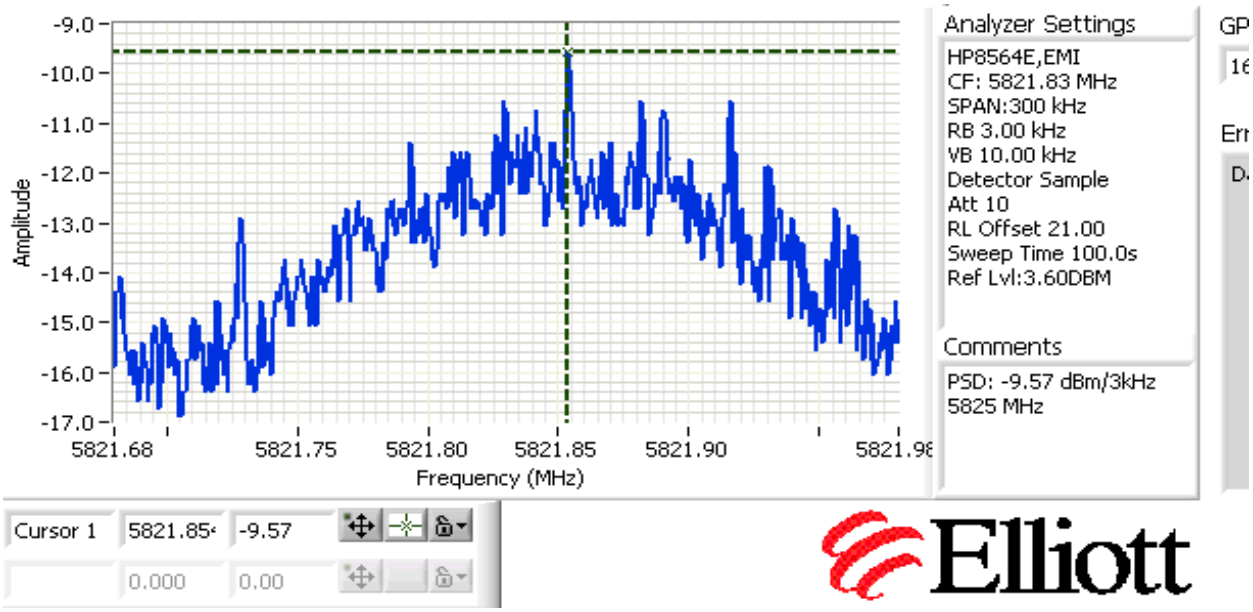
Note 1:	Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using RB=3kHz using multiple sweeps at a faster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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Continuation of Run #2



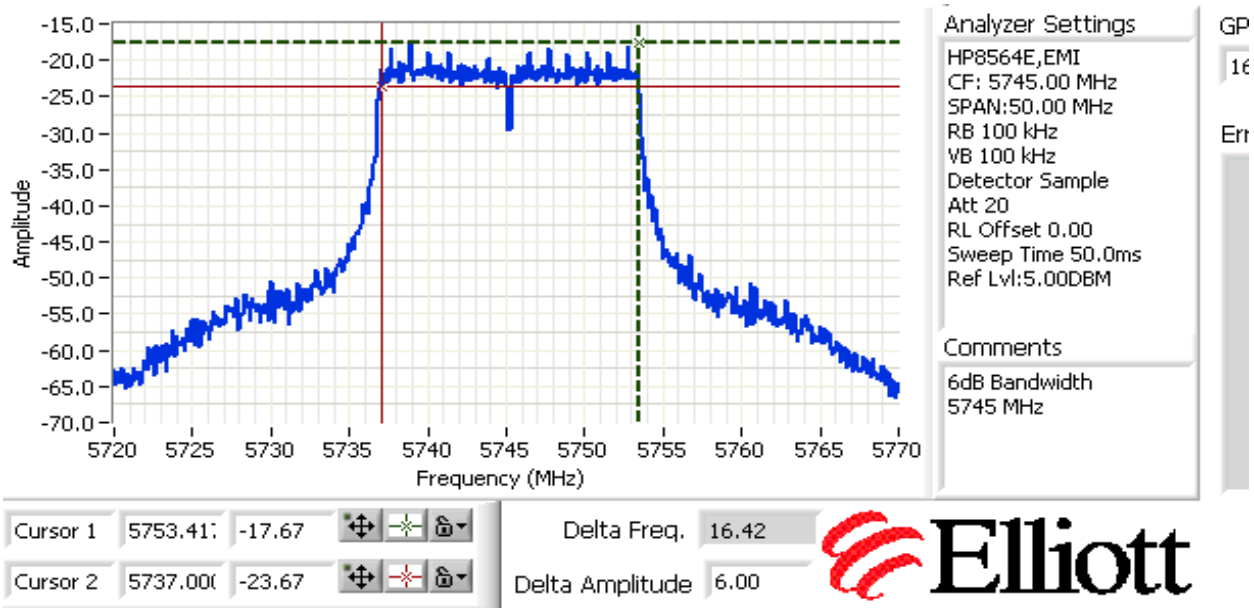


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #3: Signal Bandwidth

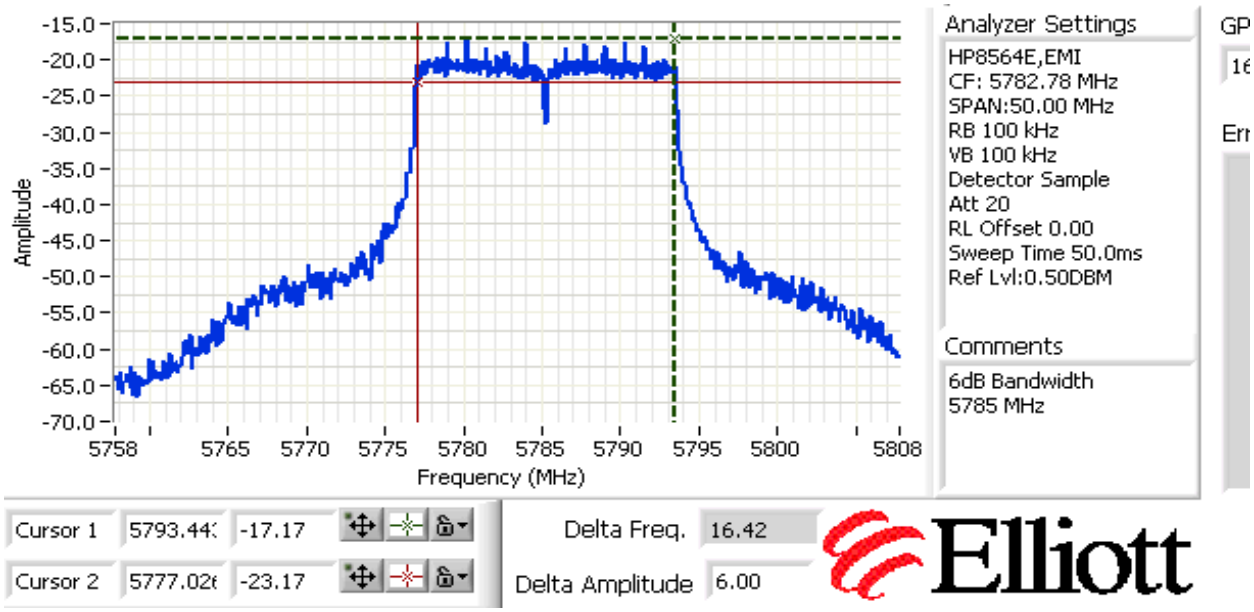
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
26.5	5745	100kHz	16.42	17
28	5785	100kHz	16.42	17.14
26.5	5825	100kHz	16.33	16.97

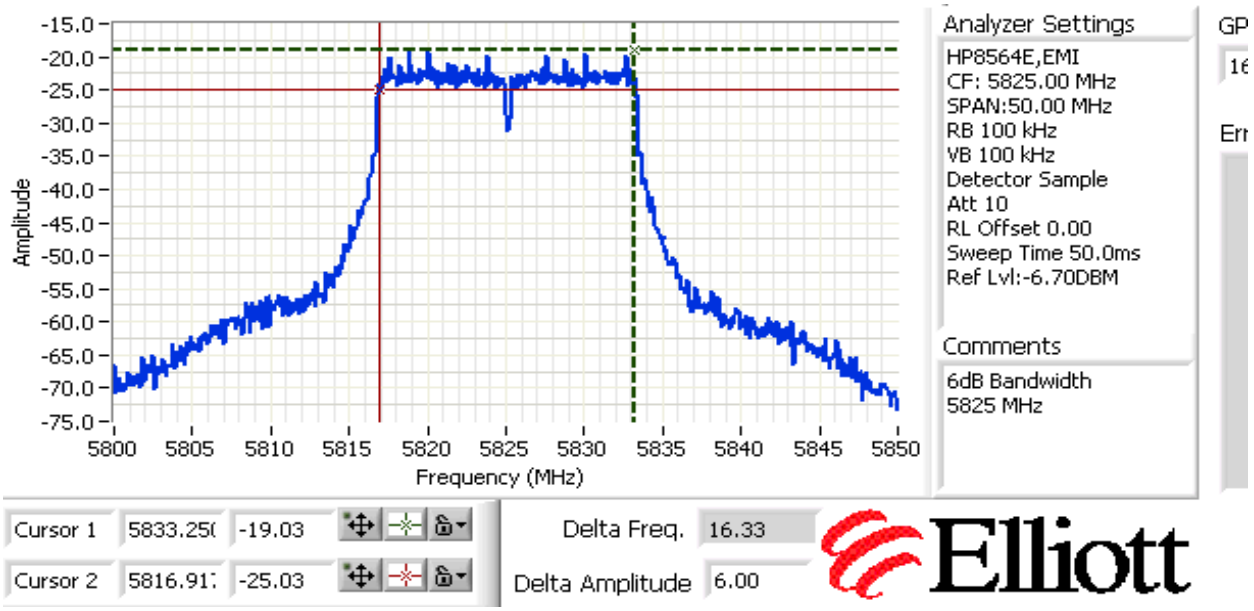
Note 1:	99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Continuation of Run #3



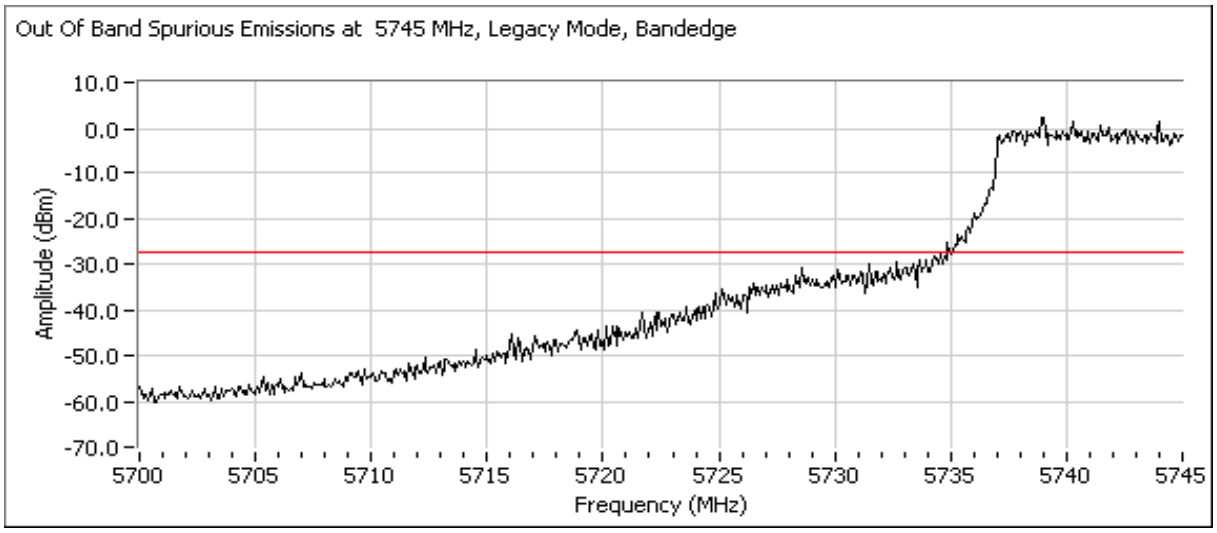


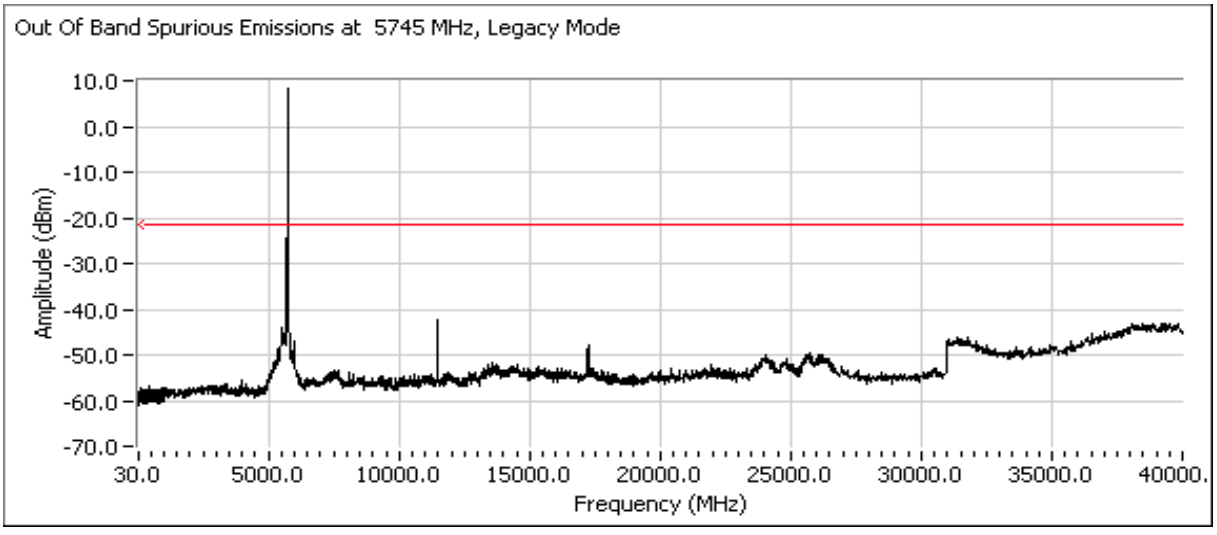
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #4: Out of Band Spurious Emissions

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

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

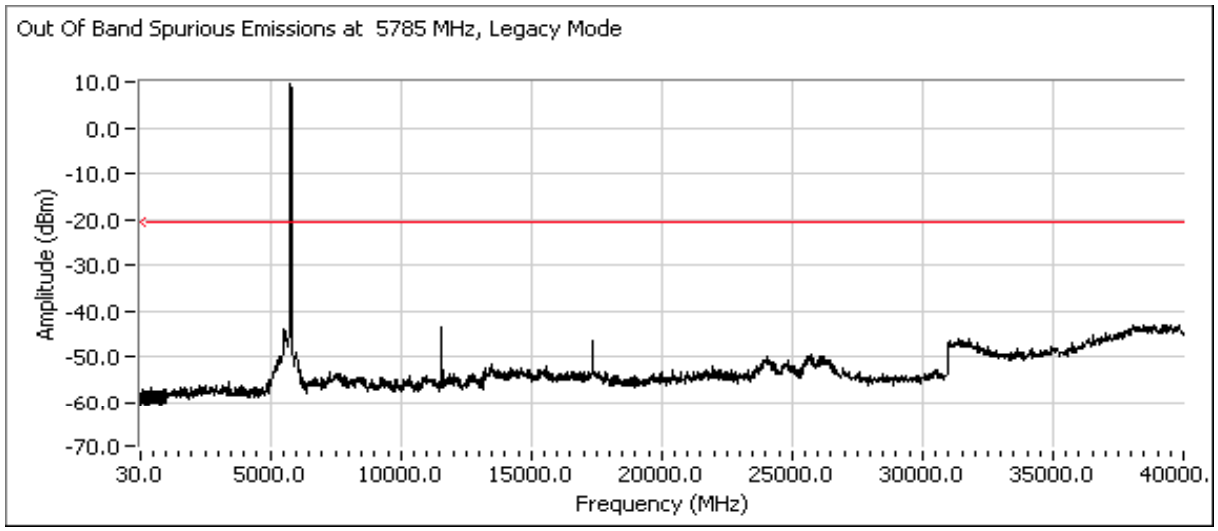




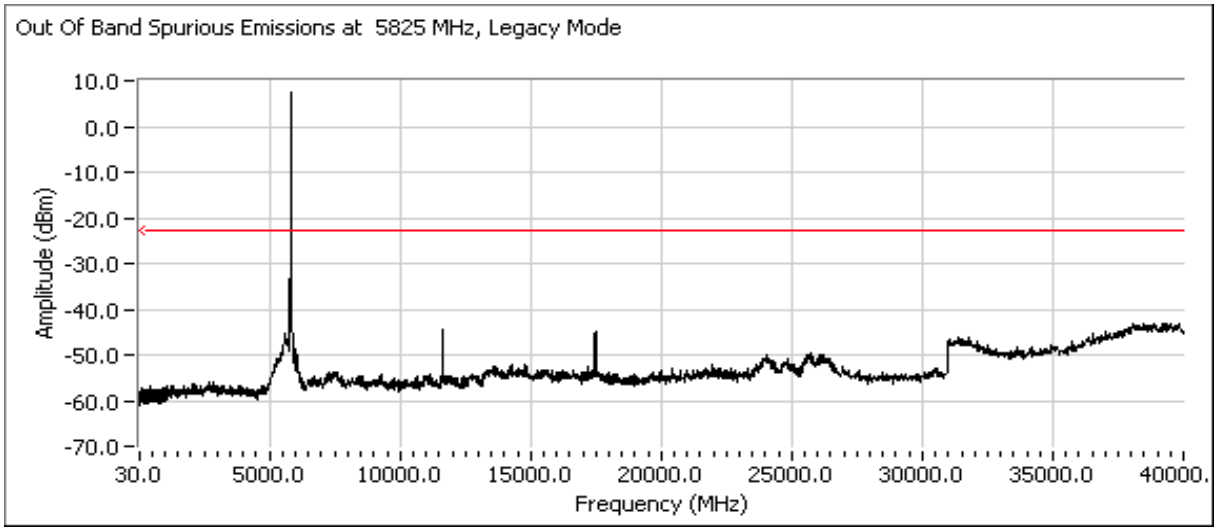
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Continuation of Run #4

Plots for center channel, power setting(s) = 28

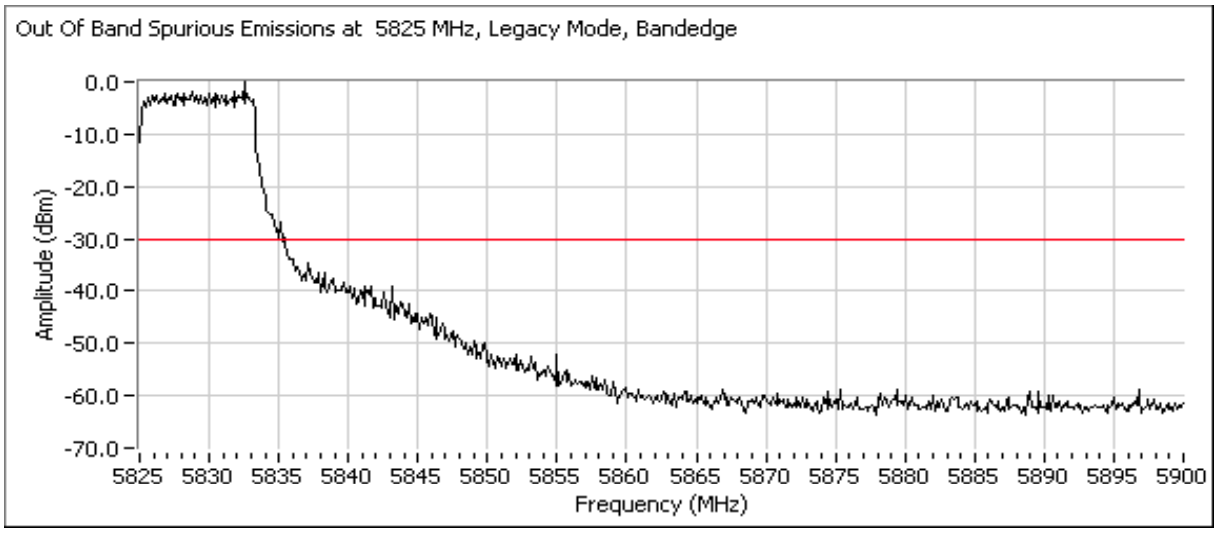


Plots for high channel, power setting(s) = 26.5



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Continuation of Run #4



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions - 802.11n 20MHz (5725-5850MHz)

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: 3/11/2008
Test Engineer: Peter Sales
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: Powered by Host Unit

General Test Configuration

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

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 43 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	15.1 dBm(32.4mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-9.0 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	17.6 MHz
3	99% Bandwidth	RSS GEN	Pass	18.3 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

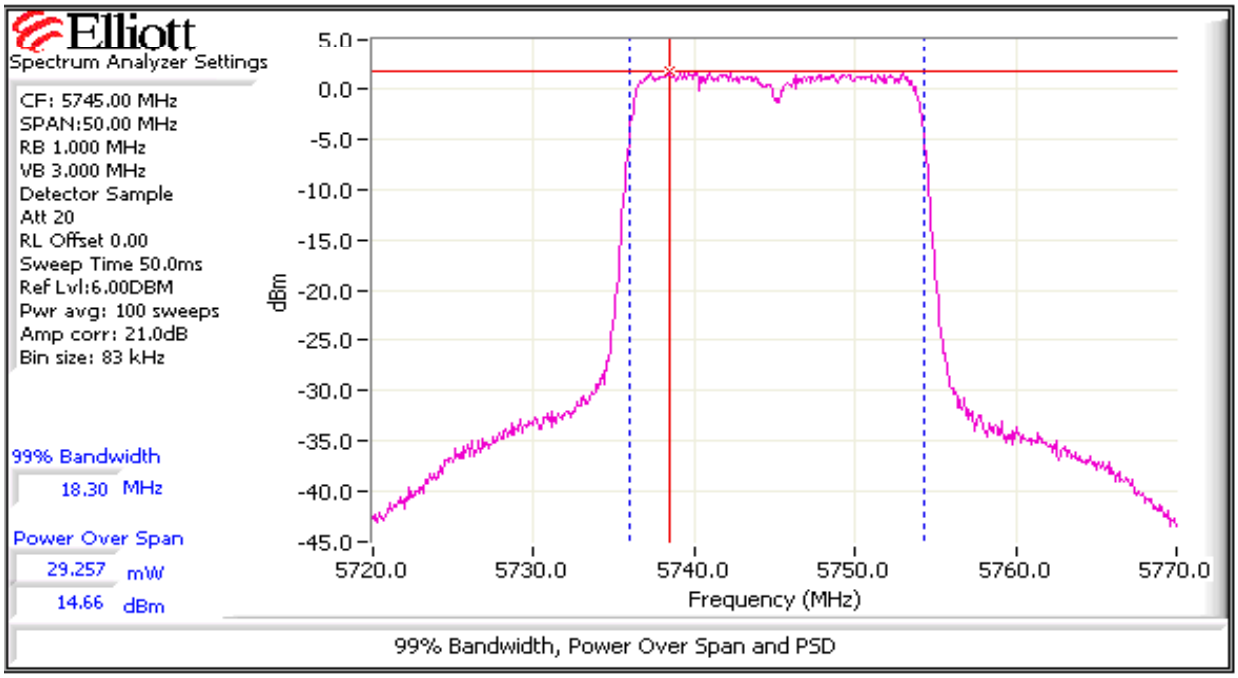
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

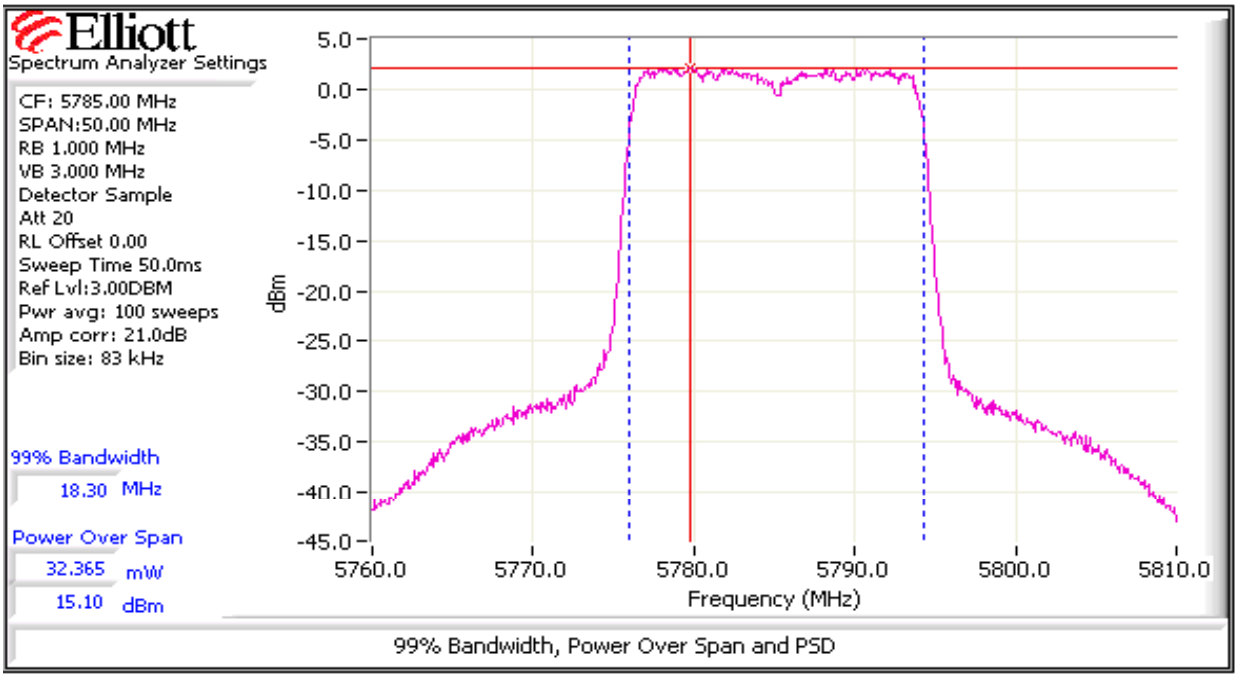
Run #1: Output Power

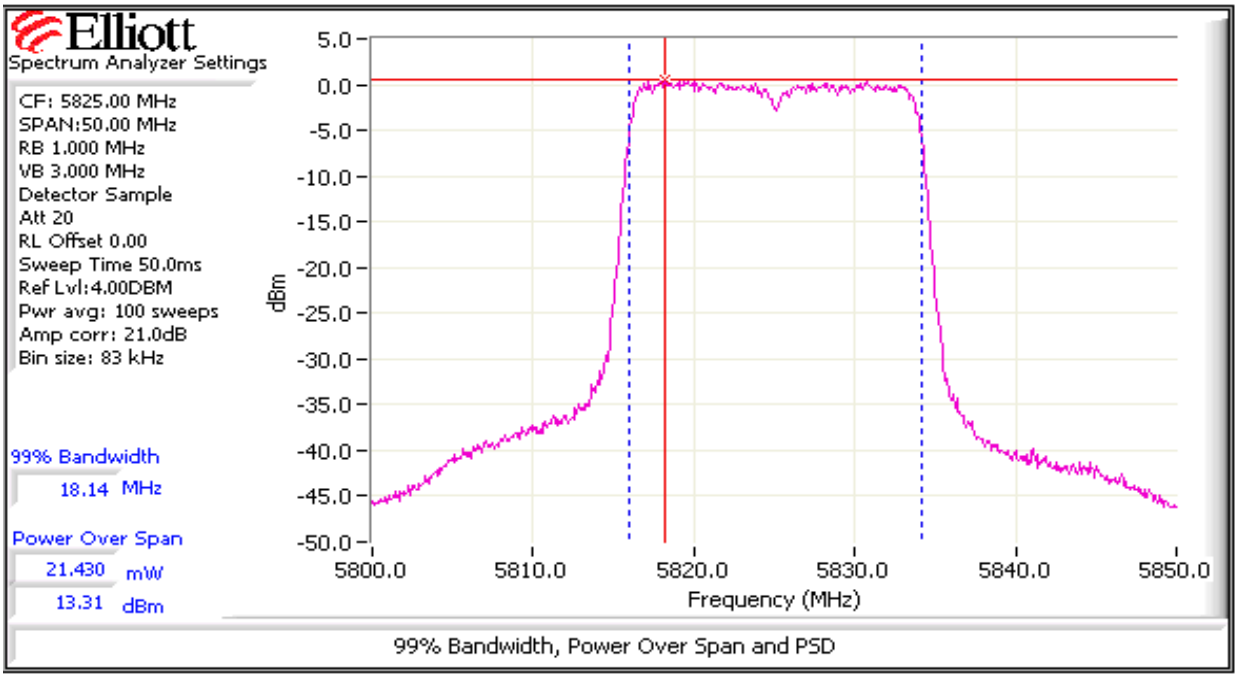
Power Setting[2]	Frequency (MHz)	Output Power (dBm) [1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP [Note 2] dBm	EIRP [Note 2] W	Output Power (dBm) [3]	Output Power mW
26.5	5745	14.7	29.2	5.0	Pass	19.7	0.092		
28	5785	15.1	32.4	5.0	Pass	20.1	0.102		
26.5	5825	13.3	21.4	5.0	Pass	18.3	0.068		

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.
Note 2:	Power setting - the software power setting used during testing, included for reference only.



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



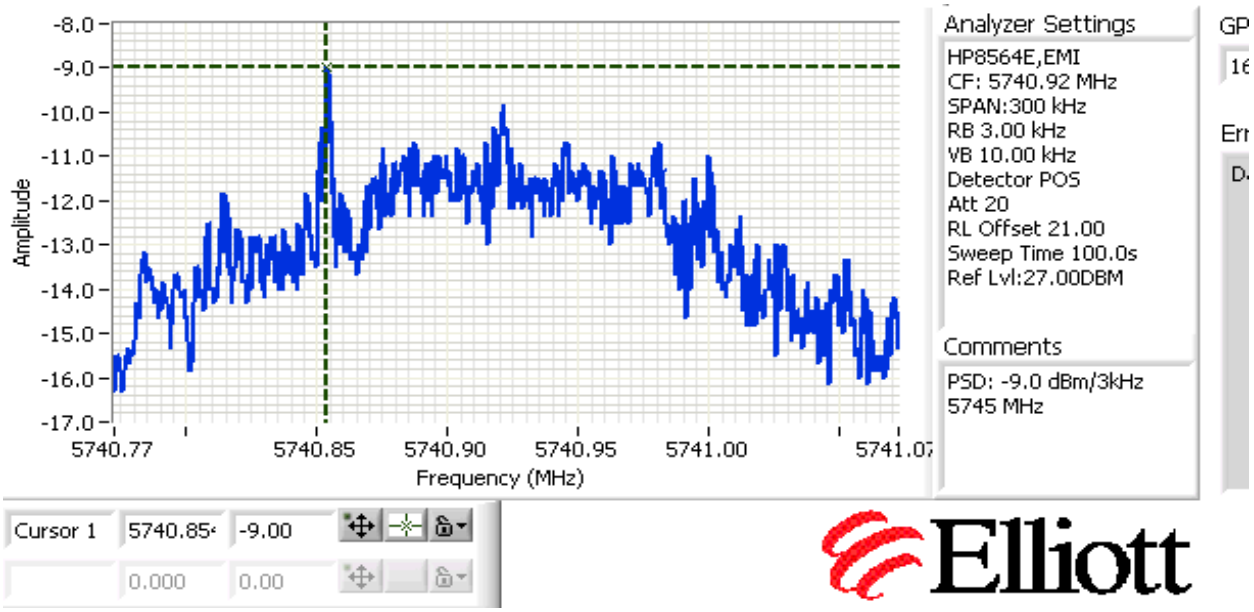


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

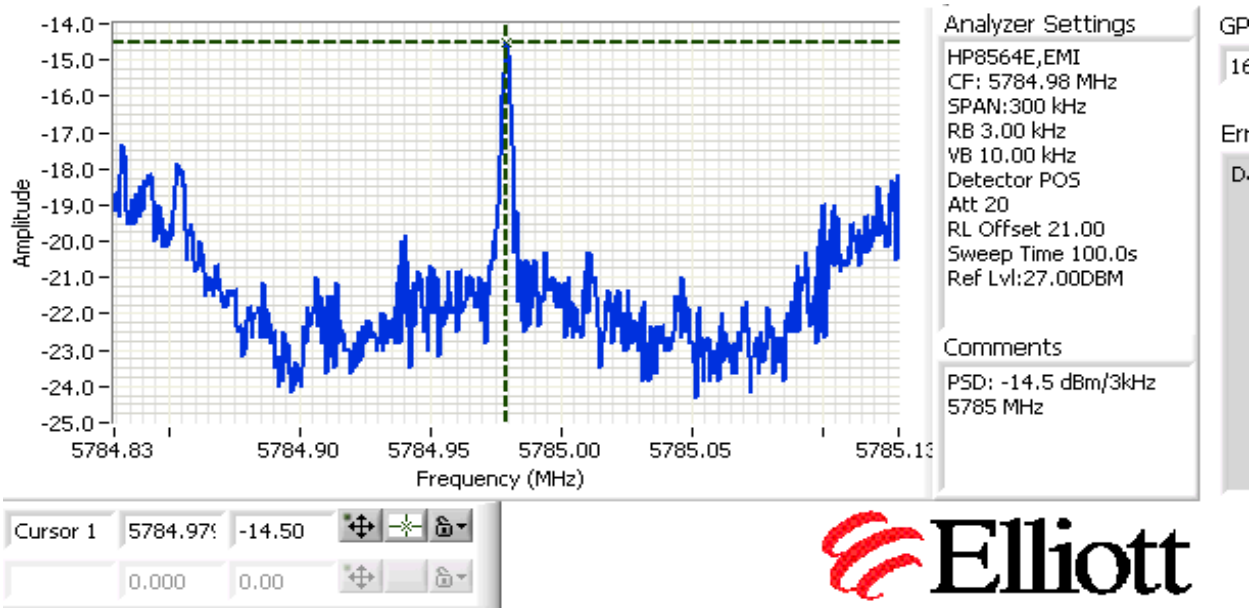
Run #2: Power spectral Density

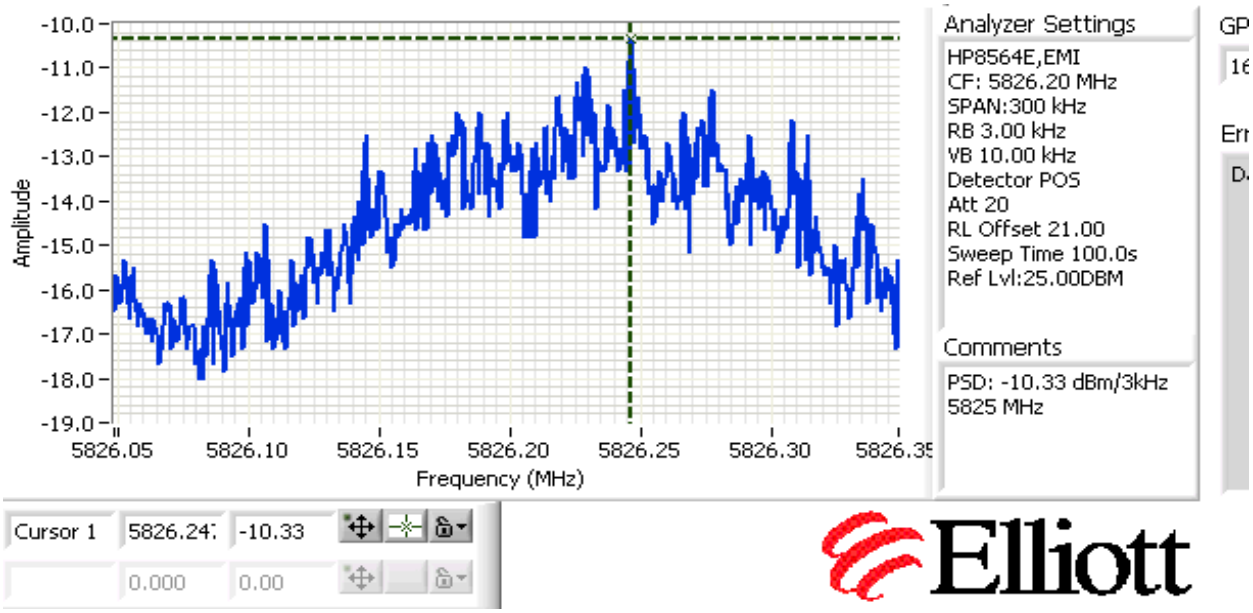
Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
26.5	5745	-9.0	8.0	Pass
28	5785	-14.5	8.0	Pass
26.5	5825	-10.3	8.0	Pass

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



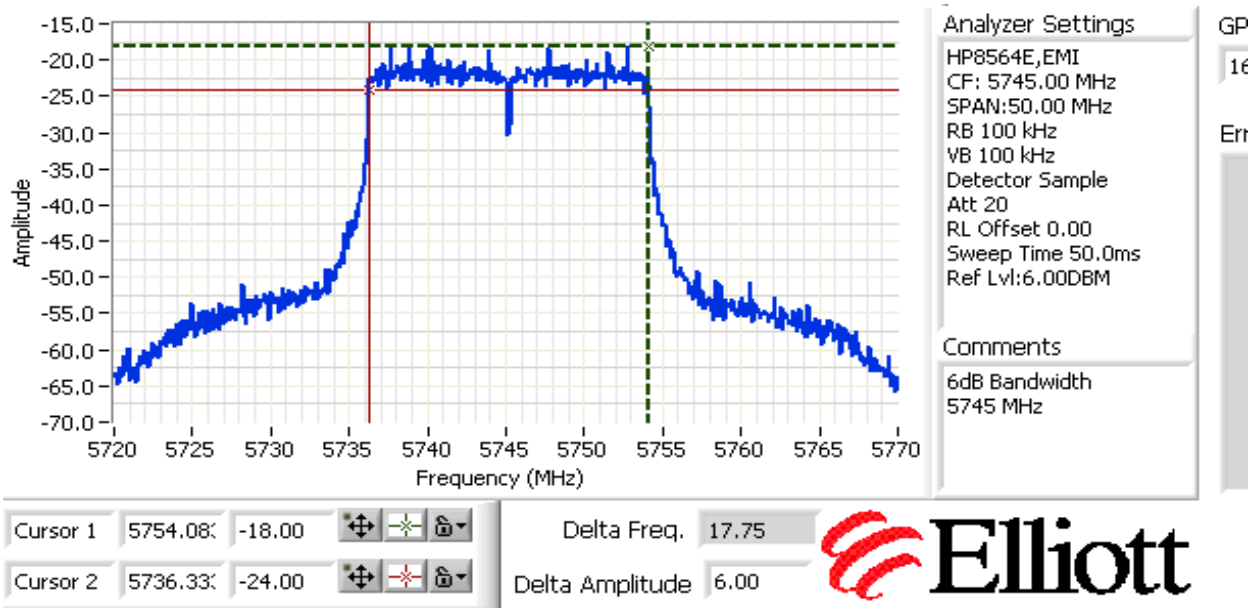


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

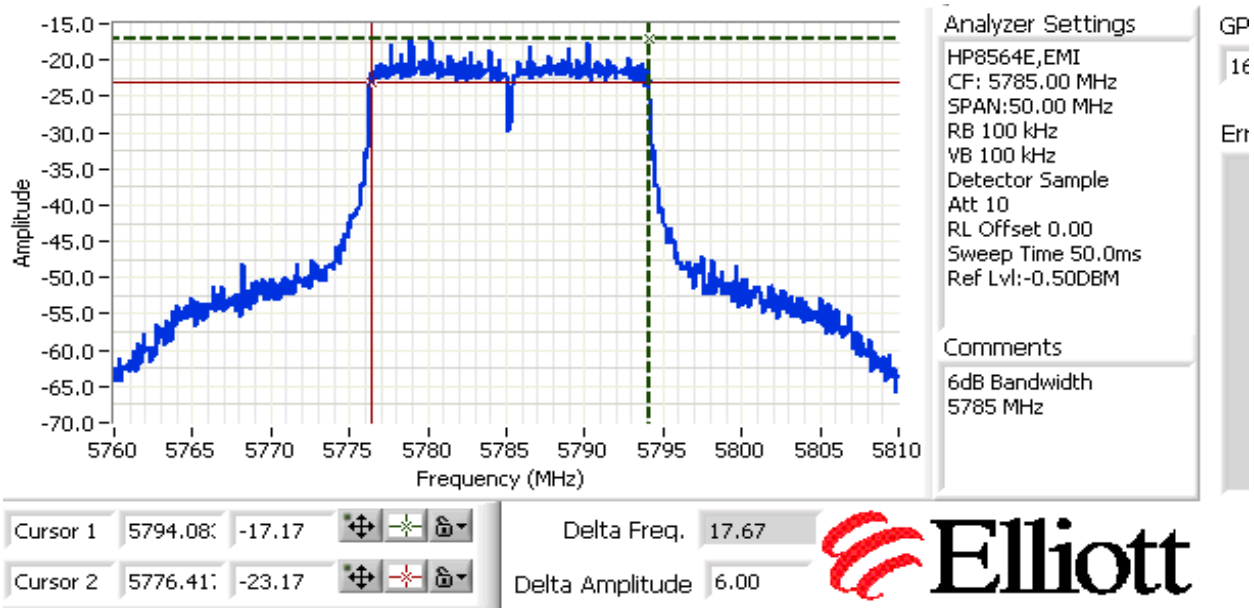
Run #3: Signal Bandwidth

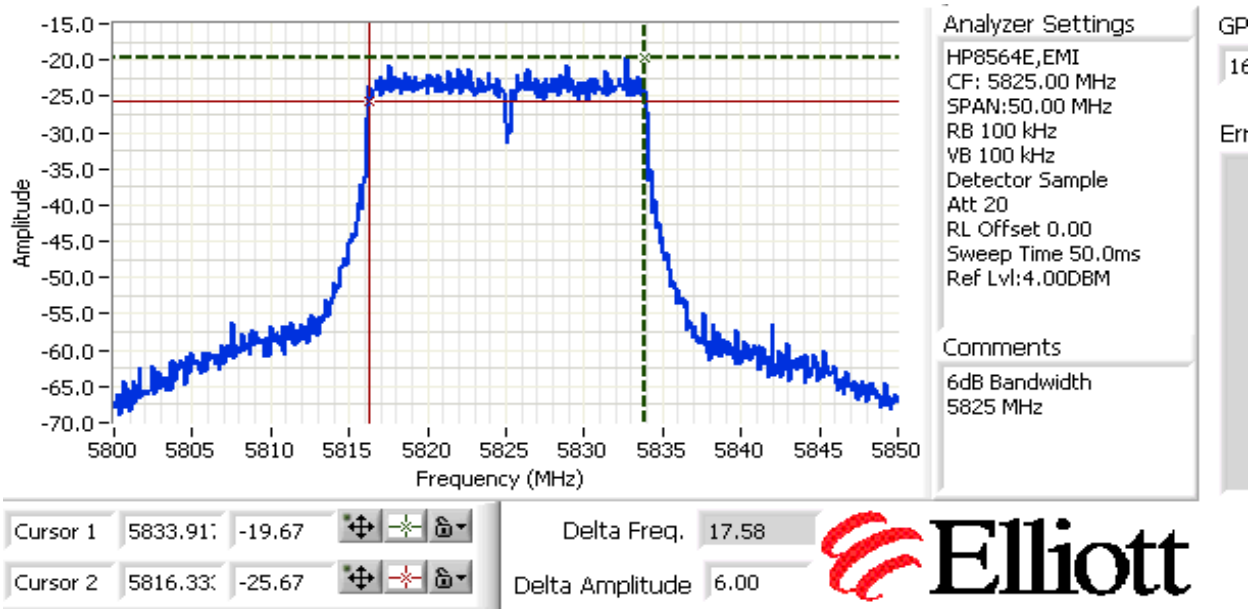
Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
26.5	5745	100kHz	17.75	18.3 MHz
28	5785	100kHz	17.67	18.3 MHz
26.5	5825	100kHz	17.58	18.1 MHz

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



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



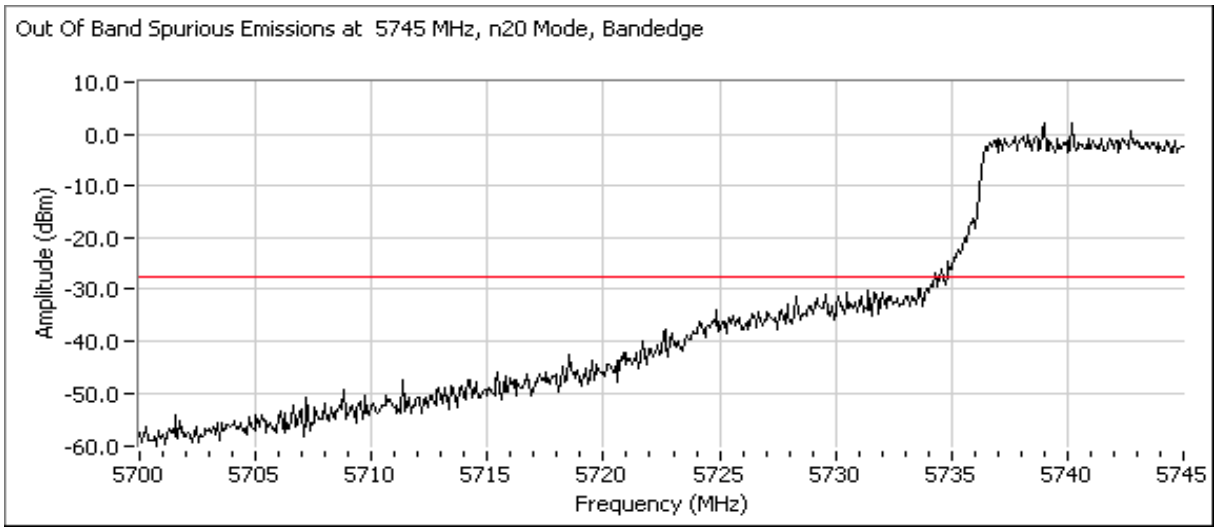


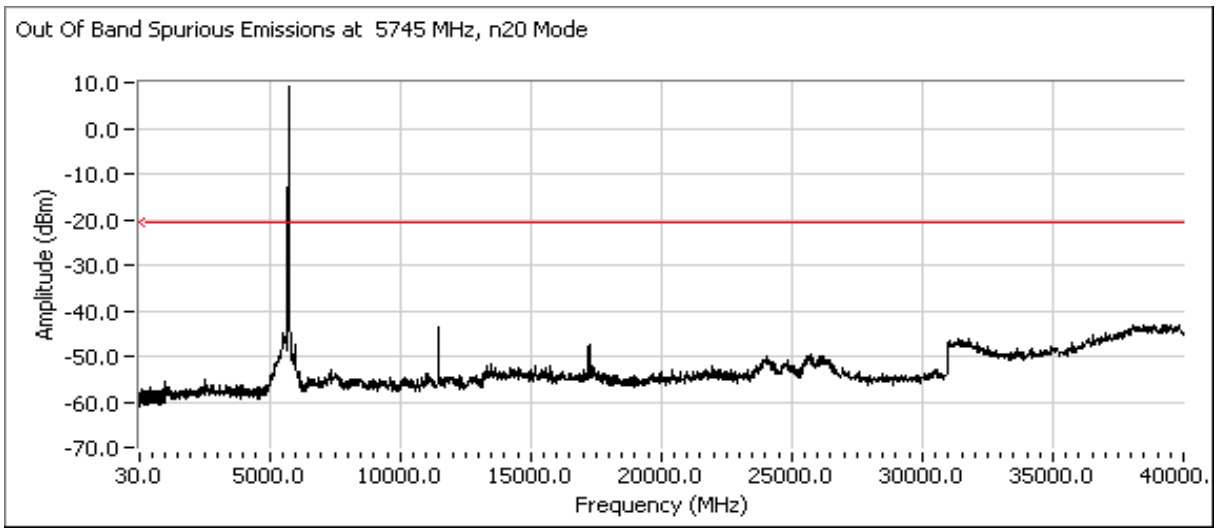
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #4: Out of Band Spurious Emissions

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

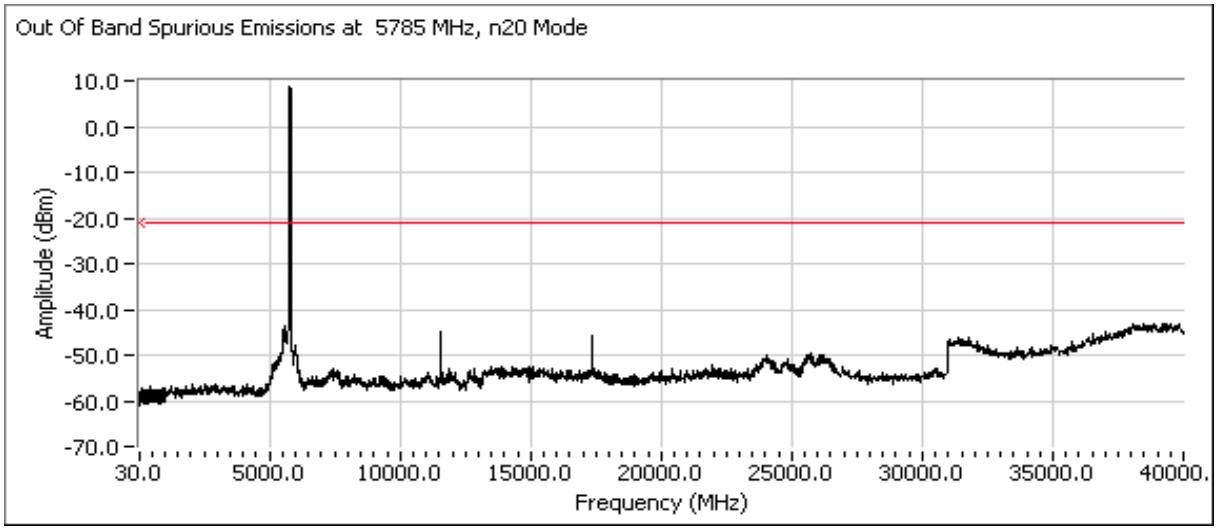
Plots for low channel, power setting(s) = 26.5





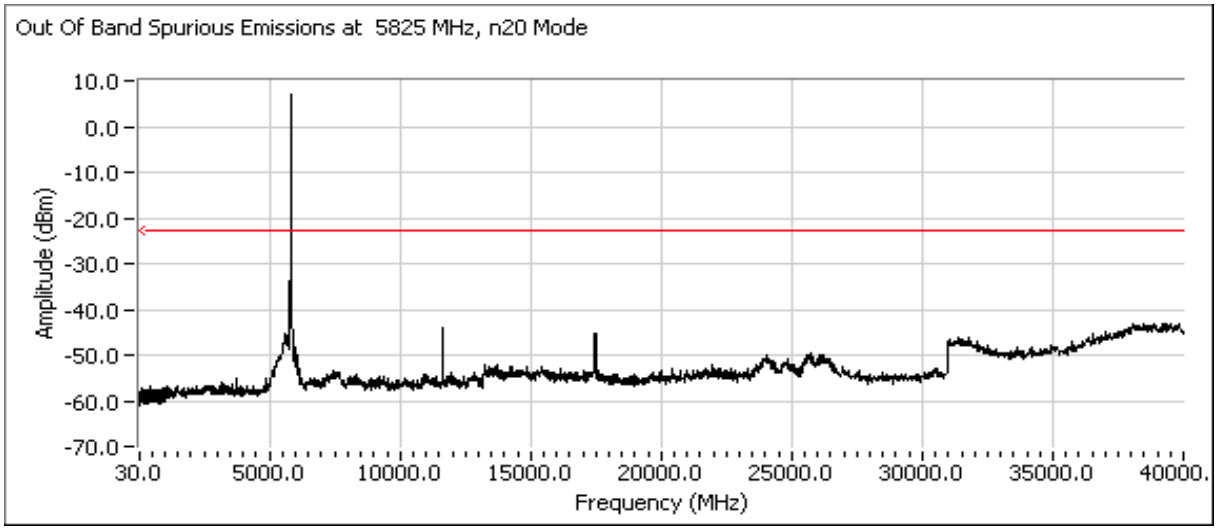
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

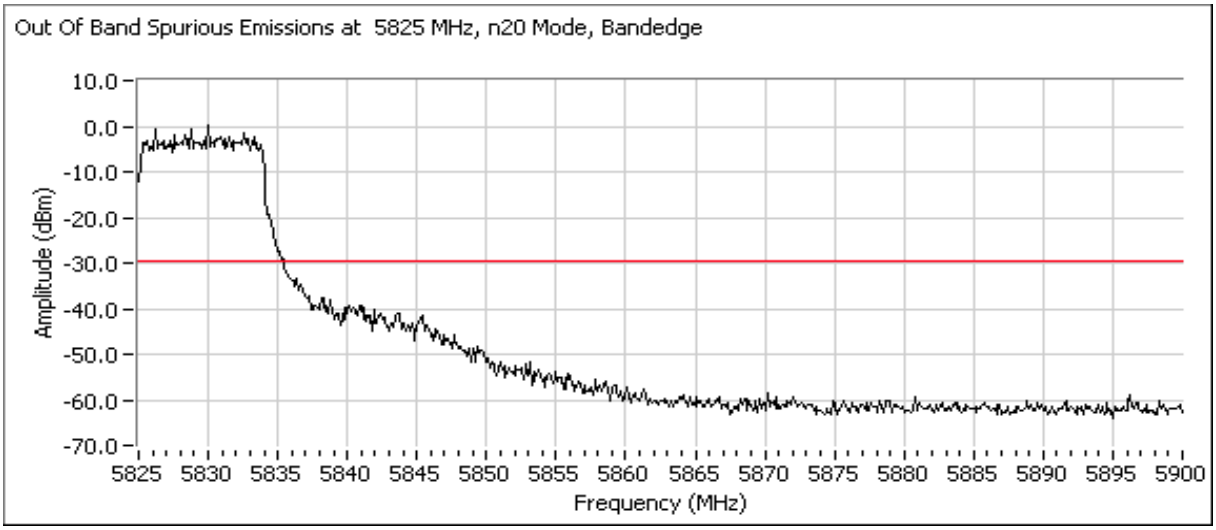
Plots for center channel, power setting(s) = 28.0



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

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





Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

RSS 210 and FCC 15.247 (DTS) Antenna Port Measurements

Power, PSD, Bandwidth and Spurious Emissions - 802.11n 40MHz (5725-5850MHz)

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: 3/12/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: Powered by Host Unit

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: 19.1 °C
Rel. Humidity: 42 %

Summary of Results

194.98446

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Output Power	15.247(b)	Pass	17.9 dBm(61.5mW)
2	Power spectral Density (PSD)	15.247(d)	Pass	-10.0 dBm/3kHz
3	6dB Bandwidth	15.247(a)	Pass	35.0 MHz
3	99% Bandwidth	RSS GEN	-	36.6 MHz
4	Spurious emissions	15.247(b)	Pass	All emissions below the -30dBc limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

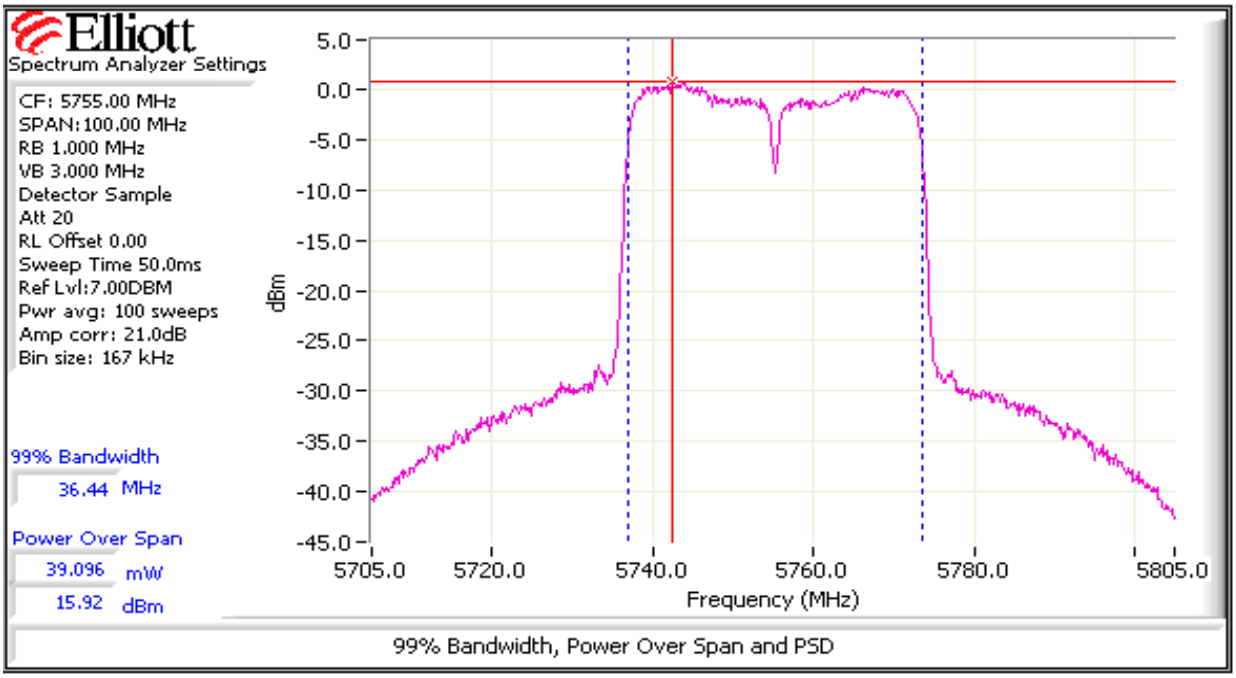
No deviations were made from the requirements of the standard.

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

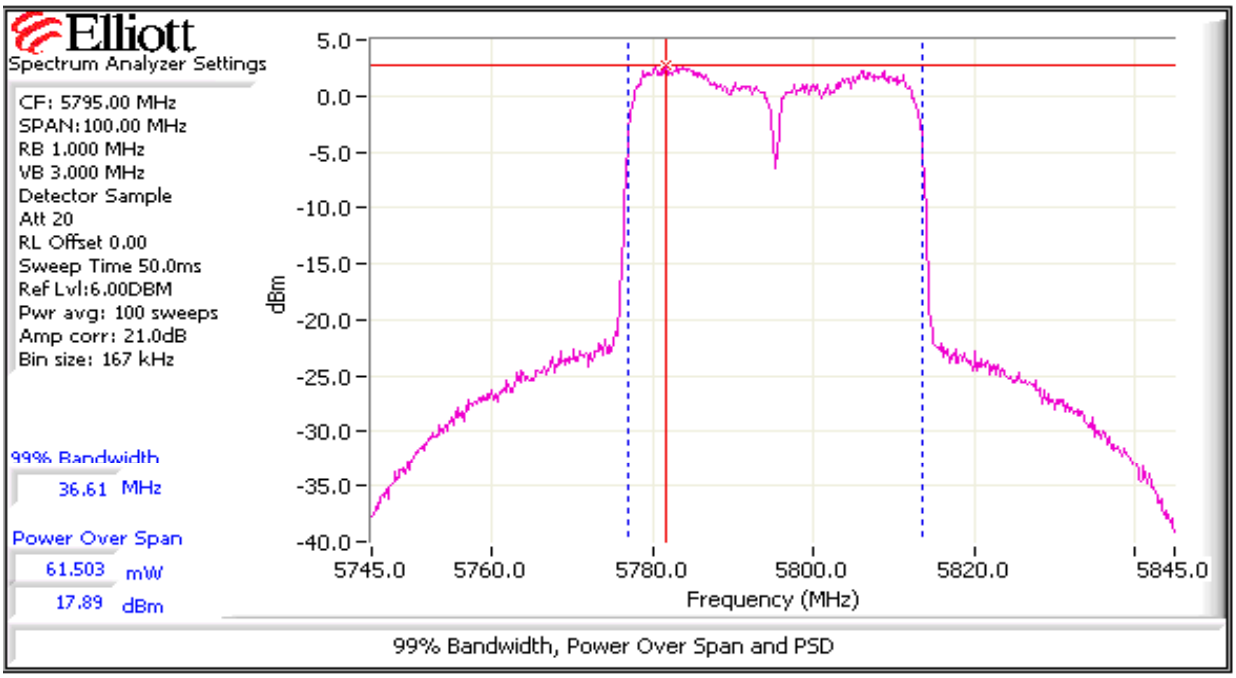
Run #1: Output Power

Power Setting[2]	Frequency (MHz)	Output Power (dBm)[1]	Output Power mW	Antenna Gain (dBi)	Result	EIRP[Note 2] dBm	EIRP W	Output Power (dBm)[3]	Output Power mW
28	5755	15.9	38.9	5.0	Pass	20.9	0.123		
31	5795	17.9	61.5	5.0	Pass	22.9	0.195		

Note 1:	Output power measured using a peak power meter 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.
Note 2:	Power setting - the software power setting used during testing, included for reference only.



Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

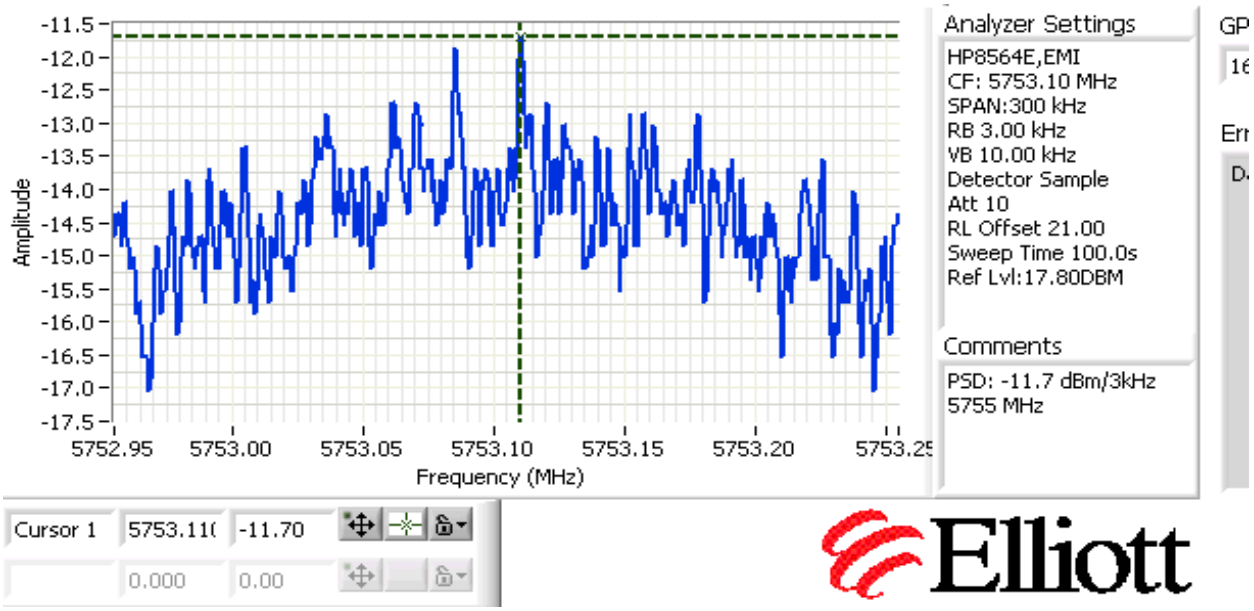


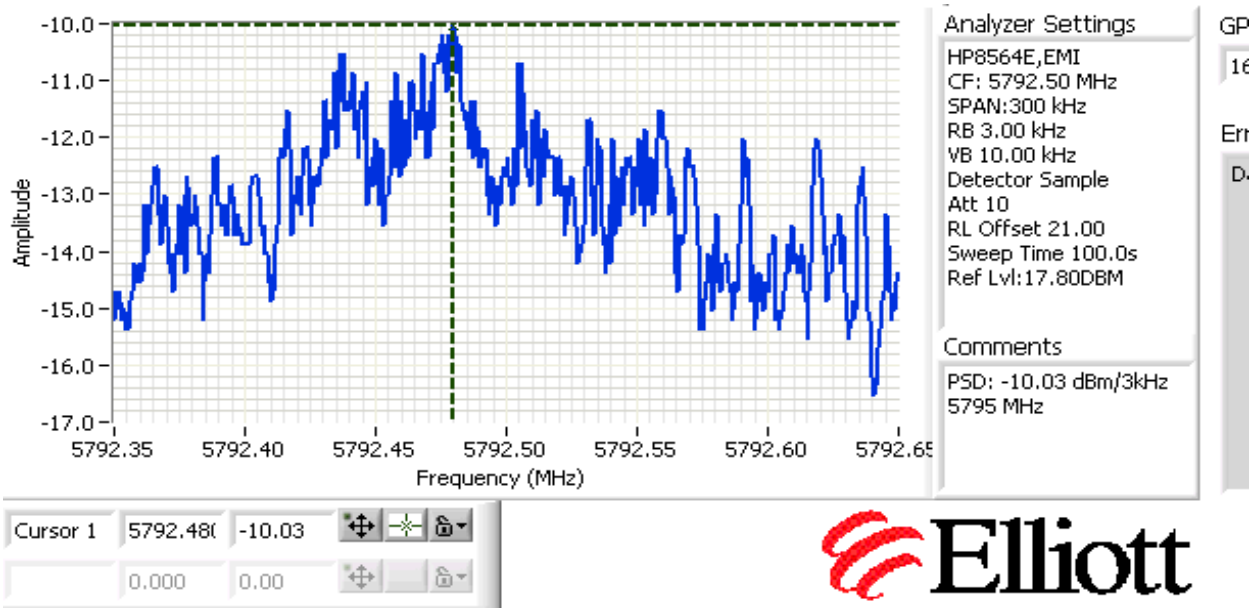
Run #2: Power spectral Density

Power Setting	Frequency (MHz)	PSD (dBm/3kHz) Note 1	Limit dBm/3kHz	Result
28	5755	-11.7	8.0	Pass
31	5795	-10.0	8.0	Pass

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

Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A



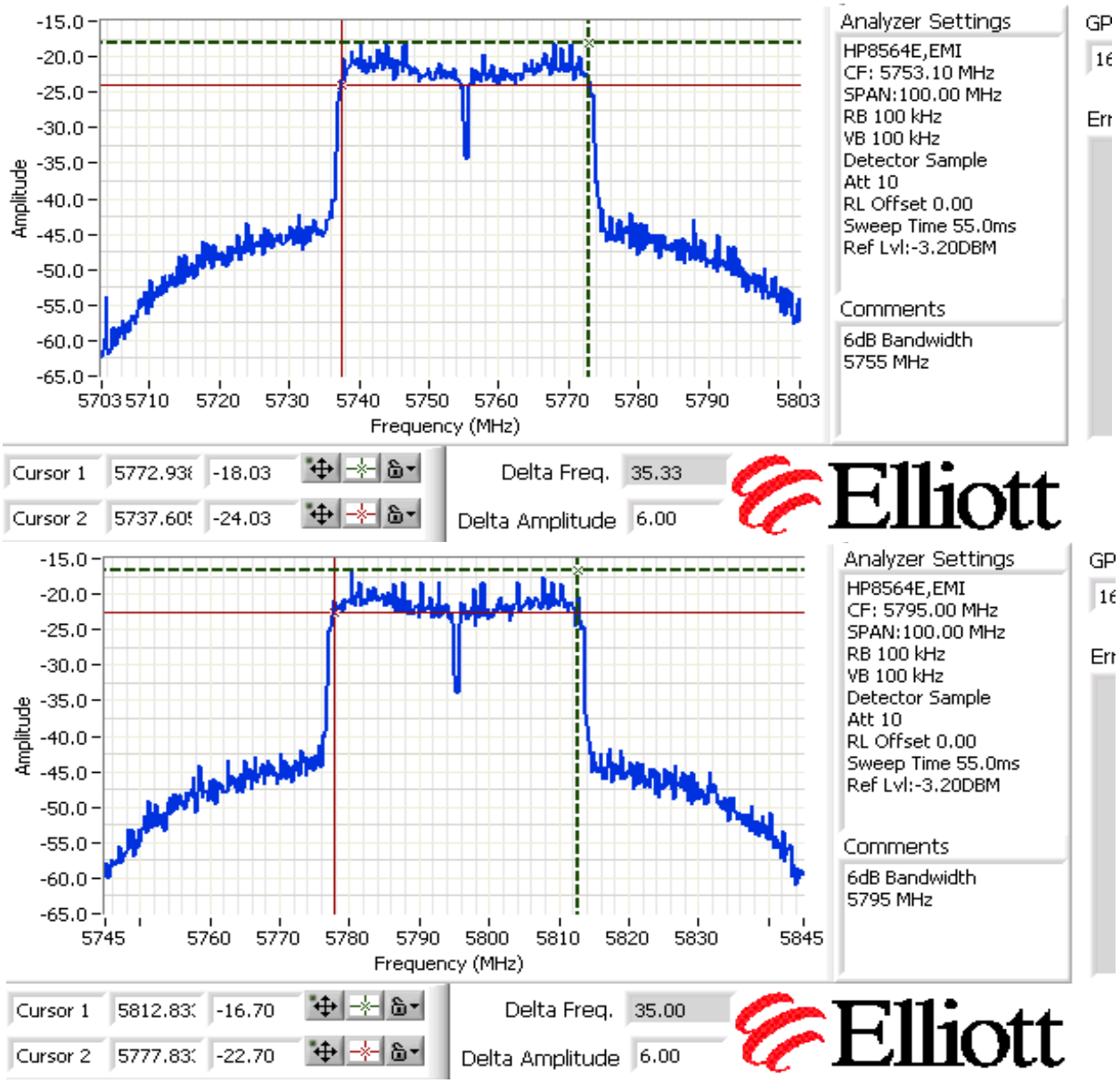


Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #3: Signal Bandwidth

Power Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (MHz) 6dB	99%
28	5755	100kHz	35.3	36.4
31	5795	100kHz	35.0	36.6

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

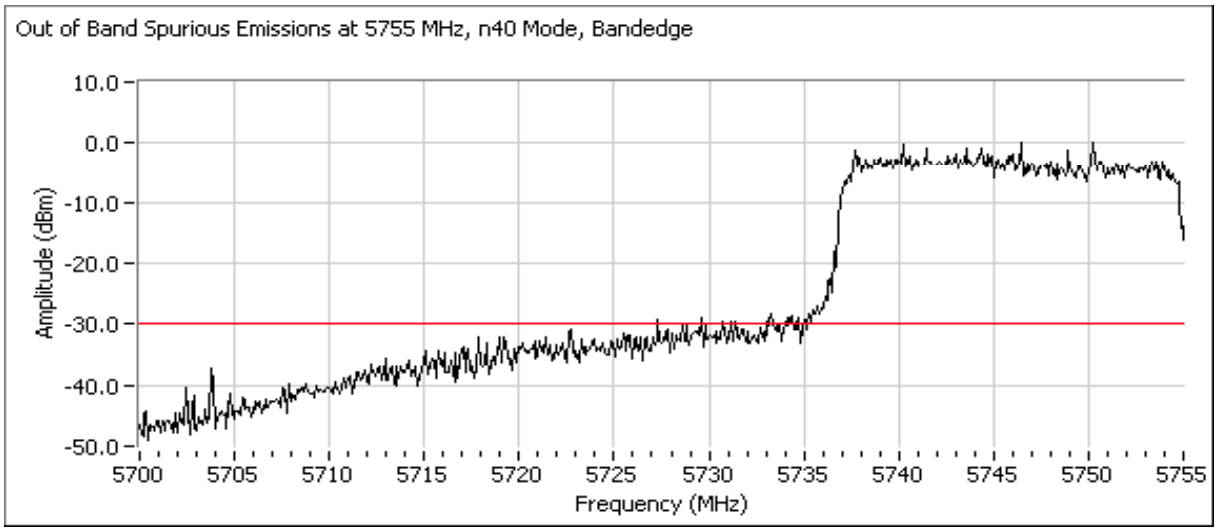


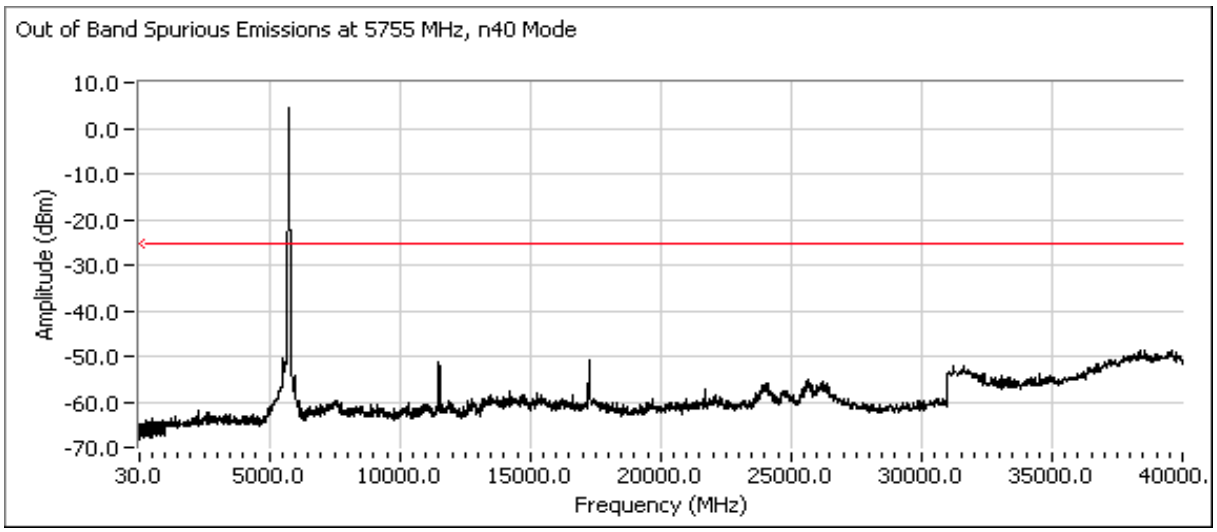
Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Limit	Result
5755	-30dBc	Pass
5795	-30dBc	Pass

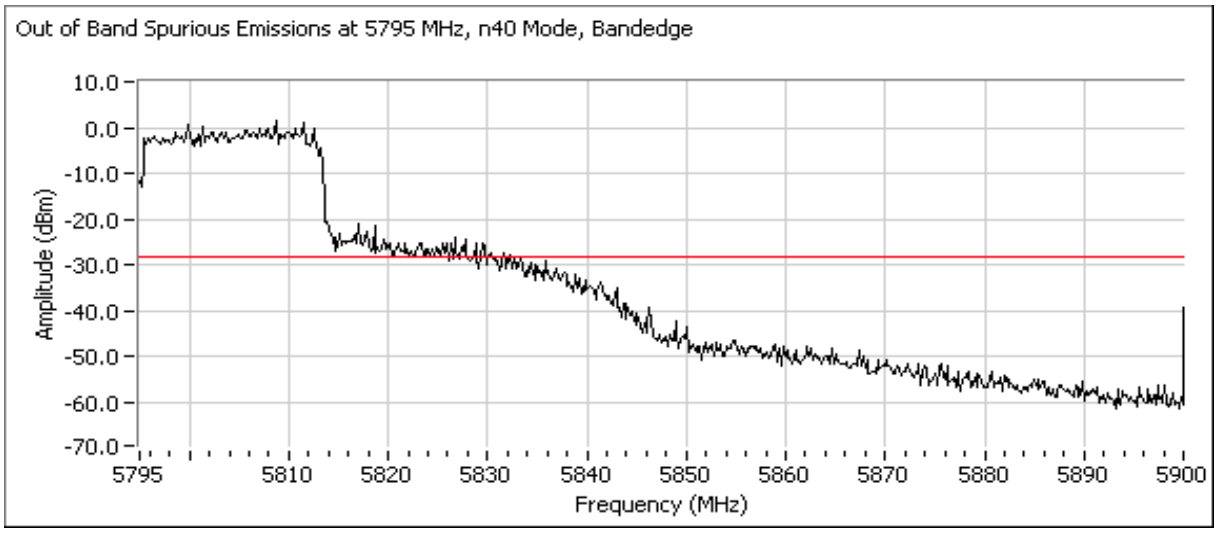
Plots for low channel, power setting(s) = 28.0

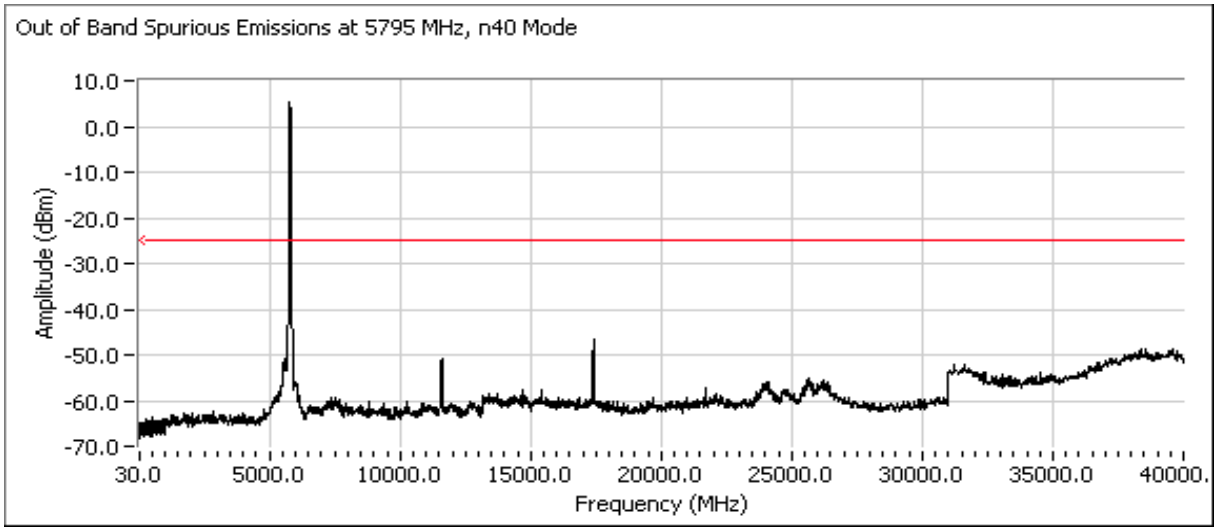




Client:	Intel Corporation	Job Number:	J70762
Model:	512AN_HMW(Formal)	T-Log Number:	T71375
		Account Manager:	Richard Gencev
Contact:	Robert Paxman		
Standard:	FCC	Class:	N/A

Plots for high channel, power setting(s) = 31.0





Elliott	EMC Test Data		
Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		-
Emissions Standard(s):	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS
Immunity Standard(s):	-	Environment:	-

EMC Test Data - DTS Radiated Emissions and AC Conducted Emissions

For The

Intel

Model

512an HMW

Date of Last Test: 5/30/2008

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

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: 3/7/2008
Test Engineer: Peter Sales
Test Location: Fremont Chamber #3

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

General Test Configuration

For tabletop equipment, the EUT 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 where routed through metal conduit and when possible passed through a ferrite clamp upon exiting the chamber.

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 43 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	FCC 15.207 / RSS 210	Pass	23.0dBµV @ 11.069MHz (-27.0dB)

Modifications Made During Testing

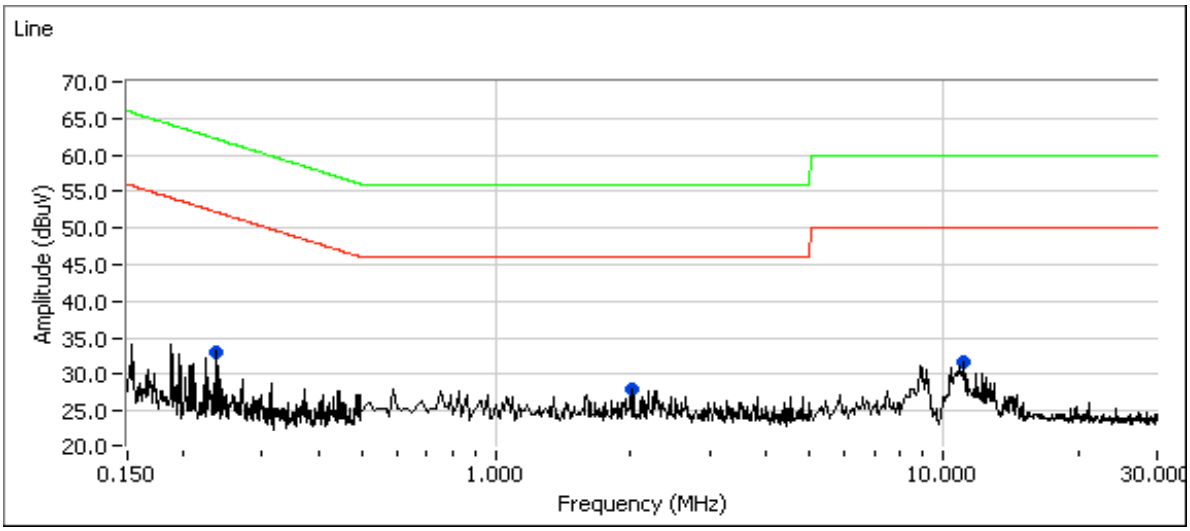
No modifications were made to the EUT during testing

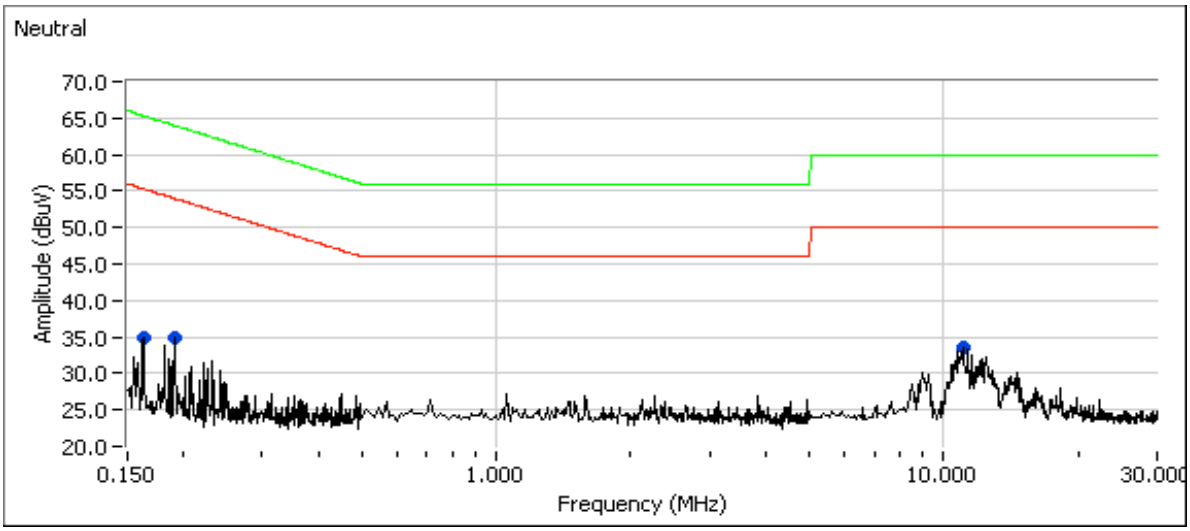
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

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





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

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

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

Frequency	Level	AC	RSS GEN/15.207		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
11.069	33.5	Neutral	50.0	-16.5	Peak	
2.011	28.1	Line 1	46.0	-17.9	Peak	
11.121	31.8	Line 1	50.0	-18.2	Peak	
0.191	34.9	Neutral	54.0	-19.1	Peak	
0.237	33.1	Line 1	52.2	-19.1	Peak	
0.163	35.0	Neutral	55.3	-20.3	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	RSS GEN/15.207		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
11.069	23.0	Neutral	50.0	-27.0	AVG	
11.121	21.5	Line 1	50.0	-28.5	AVG	
11.069	29.3	Neutral	60.0	-30.7	QP	
11.121	25.2	Line 1	60.0	-34.8	QP	
0.163	29.1	Neutral	65.3	-36.2	QP	
0.191	26.9	Neutral	64.0	-37.1	QP	
0.237	24.1	Line 1	62.2	-38.1	QP	
2.011	7.7	Line 1	46.0	-38.3	AVG	
0.237	9.2	Line 1	52.2	-43.0	AVG	
0.191	10.0	Neutral	54.0	-44.0	AVG	
0.163	10.7	Neutral	55.3	-44.6	AVG	
2.011	9.5	Line 1	56.0	-46.5	QP	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Receiver Radiated Emissions

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing. Remote support equipment was located approximately 30 meters from the test area with all I/O connections running on top of the groundplane.

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: 15-25 °C

Rel. Humidity: 35-55 %

Summary of Results

Run #	Channel	Chain	Test Performed	Limit	Result	Margin
1	-	-	RE, 30 - 1000MHz, Maximized Emissions	RSS GEN / FCC 15.107	Pass	36.1dBµV/m @ 58.328MHz (-3.9dB)
2a	2437 MHz	A	RE, 1000 - 7500 MHz, Maximized Emissions	RSS GEN	Pass	50.4dBµV/m @ 3000.3MHz (-3.6dB)
2b	5785 MHz	A	RE, 1000 - 18000 MHz, Maximized Emissions	RSS GEN	Pass	52.0dBµV/m @ 3000.3MHz (-2.0dB)
2c	2437 MHz	B	RE, 1000 - 7500 MHz, Maximized Emissions	RSS GEN	Pass	51.9dBµV/m @ 3000.4MHz (-2.1dB)
2d	5785 MHz	B	RE, 1000 - 18000 MHz, Maximized Emissions	RSS GEN	Pass	52.2dBµV/m @ 3000.3MHz (-1.8dB)
3a	2437 MHz	A+B	RE, 1000 - 7500 MHz, Maximized Emissions	RSS GEN	Pass	51.4dBµV/m @ 3000.4MHz (-2.6dB)
3b	5785 MHz	A+B	RE, 1000 - 18000 MHz, Maximized Emissions	RSS GEN	Pass	52.0dBµV/m @ 3000.3MHz (-2.0dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Deviations From The Standard

No deviations were made from the requirements of the standard.

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

Date of Test: 3/7/2008 Config. Used: #1
Test Engineer: Peter Sales Config Change: -
Test Location: Fremont Chamber #3 Host Unit Voltage 120V/60Hz

Scans indicated no significant difference in the emissions from 30 - 1000 MHz for transmit mode versus receive mode and were independent of channel of operation. Final measurements performed in receive mode with Chain A active and tuned to 2437 MHz as rperesenting the worst-case.

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

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC 15.109/15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
58.328	44.1	H	40.0	4.1	Peak	168	3.5	
62.656	42.3	H	40.0	2.3	Peak	176	2.5	
113.538	42.0	H	43.5	-1.5	Peak	43	2.5	
111.660	41.7	H	43.5	-1.8	Peak	351	2.0	
48.452	37.8	V	40.0	-2.2	Peak	201	1.0	
748.786	40.2	H	46.0	-5.8	Peak	212	1.0	

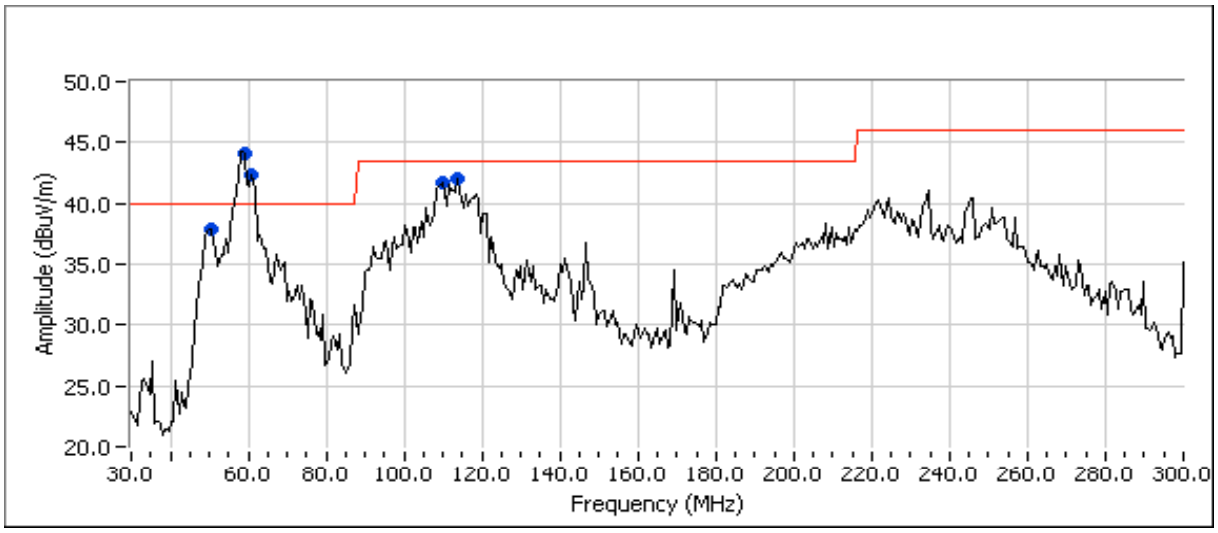
Preliminary quasi-peak readings (no manipulation of EUT interface cables)

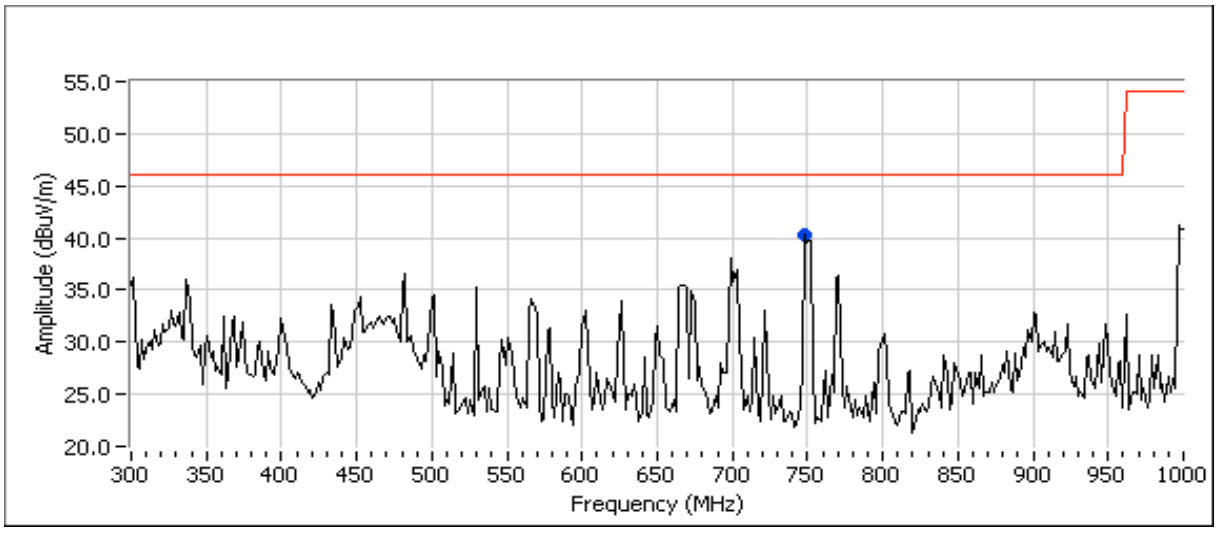
Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
58.328	36.1	H	40.0	-3.9	QP	168	3.5	
62.656	35.2	H	40.0	-4.8	QP	176	2.5	
48.452	31.0	V	40.0	-9.0	QP	201	1.0	
111.660	32.4	H	43.5	-11.1	QP	351	2.0	
748.786	32.4	H	46.0	-13.6	QP	212	1.0	
113.538	29.1	H	43.5	-14.4	QP	42	2.5	

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

Frequency	Level	Pol	FCC B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
48.452	31.0	V	40.0	-9.0	QP	201	1.0	
58.328	36.1	H	40.0	-3.9	QP	168	3.5	
62.656	35.2	H	40.0	-4.8	QP	176	2.5	
111.660	32.4	H	43.5	-11.1	QP	351	2.0	
113.538	29.1	H	43.5	-14.4	QP	42	2.5	
748.786	32.4	H	46.0	-13.6	QP	212	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS





Elliott — EMC Test Data

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Run #2: Maximized readings, 1000 - 8000 MHz, Single Receiver Active

Date of Test: 4/17/2008
Test Engineer: Peter Sales
Test Location: Fremont Chamber #3

Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0

Receiver Tuned to 2437 MHz - Chain A active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.320	50.4	V	54.0	-3.6	AVG	281	1.0	
5999.880	44.7	V	54.0	-9.3	AVG	210	1.0	
6498.560	44.6	V	54.0	-9.4	AVG	109	1.0	
3000.320	53.6	V	74.0	-20.4	PK	281	1.0	
5999.880	50.9	V	74.0	-23.1	PK	210	1.0	
6498.560	48.9	V	74.0	-25.1	PK	109	1.0	

Receiver Tuned to 5785 MHz - Chain A active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1494.330	32.8	V	54.0	-21.2	AVG	181	1.0	
3000.340	52.0	V	54.0	-2.0	AVG	273	1.0	
6000.750	47.3	V	54.0	-6.7	AVG	101	1.0	
7713.270	44.3	V	54.0	-9.7	AVG	191	1.0	
1494.330	51.8	V	74.0	-22.2	PK	181	1.0	
3000.340	55.4	V	74.0	-18.6	PK	273	1.0	
6000.750	51.0	V	74.0	-23.0	PK	101	1.0	
7713.270	51.1	V	74.0	-22.9	PK	191	1.0	

Receiver Tuned to 2437 MHz - Chain B active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1494.250	31.2	V	54.0	-22.8	AVG	190	1.0	
3000.430	51.9	V	54.0	-2.1	AVG	271	1.0	
6000.790	47.7	V	54.0	-6.3	AVG	104	1.0	
1494.250	51.5	V	74.0	-22.5	PK	190	1.0	
3000.430	55.4	V	74.0	-18.6	PK	271	1.0	
6000.790	51.2	V	74.0	-22.8	PK	104	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

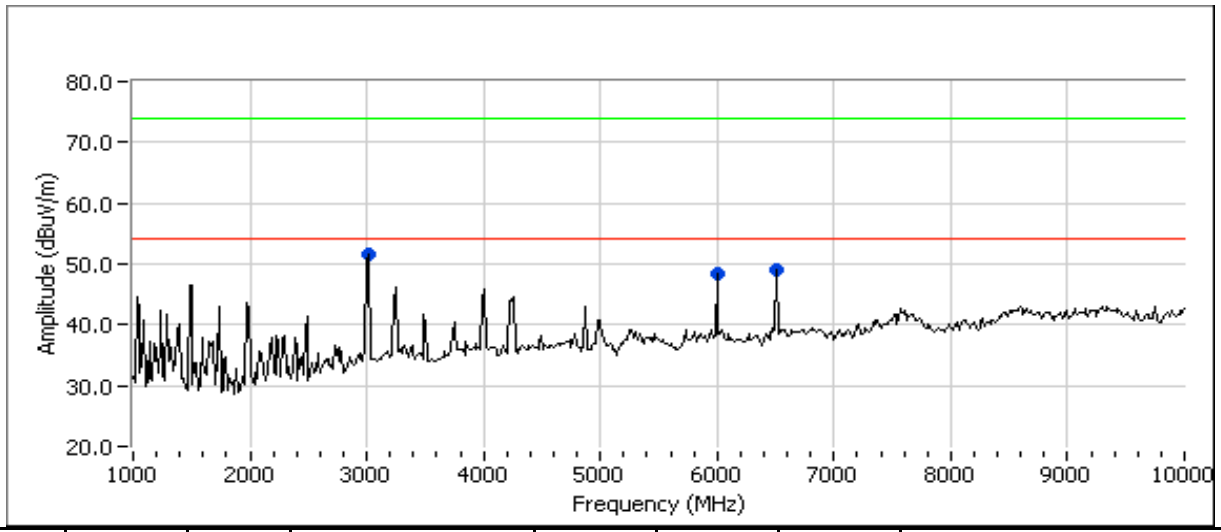
Receiver Tuned to 5785 MHz - Chain B active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1498.200	31.3	H	54.0	-22.7	AVG	277	1.0	
3000.310	52.2	V	54.0	-1.8	AVG	272	1.0	
6000.750	47.6	V	54.0	-6.4	AVG	102	1.0	
1498.200	51.1	H	74.0	-22.9	PK	277	1.0	
3000.310	55.4	V	74.0	-18.6	PK	272	1.0	
6000.750	51.1	V	74.0	-22.9	PK	102	1.0	

Run #3: Radiated Emissions Above 1000 MHz, Receive Mode, Both Chains Active

Date of Test:	3/3/2008	Config. Used:	1
Test Engineer:	Rafael Varelas	Config Change:	None
Test Location:	Fremont Chamber #3	EUT Voltage:	Powered From Host System

Run #3a: Radiated Emissions 1000 - 7500 MHz, Receive Mode, EUT Tuned to 2437 MHz



Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.400	51.4	V	54.0	-2.6	AVG	260	1.0	
6000.690	48.4	V	54.0	-5.6	AVG	98	1.0	
6498.660	48.9	H	54.0	-5.1	AVG	313	1.0	
3000.400	54.3	V	74.0	-19.7	PK	260	1.0	
6000.690	50.9	V	74.0	-23.1	PK	98	1.0	
6498.660	52.2	H	74.0	-21.8	PK	313	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Receiver Tuned to 5785 MHz - All chains active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.330	52.0	V	54.0	-2.0	AVG	264	1.0	
3799.970	47.5	V	54.0	-6.5	AVG	176	1.3	
6000.780	48.4	V	54.0	-5.6	AVG	102	1.0	
7599.970	48.0	V	54.0	-6.0	AVG	143	1.3	
3000.330	54.9	V	74.0	-19.1	PK	264	1.0	
3799.970	49.6	V	74.0	-24.4	PK	176	1.3	
6000.780	51.3	V	74.0	-22.7	PK	102	1.0	
7599.970	51.6	V	74.0	-22.4	PK	143	1.3	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)

Radiated Spurious Emissions - Band Edge 802.11b

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: 2/13/2008
Test Engineer: Suhaila Khushzad
Test Location: Fremont Chamber #3

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 43 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11b	1 2412MHz	20.5	16.5	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	50.5dBµV/m @ 2320.0MHz (-3.5dB)
1b	802.11b	11 2462MHz	20.5	16.5	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	48.8dBµV/m @ 2486.3MHz (-5.2dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11b - Chain A

Run #1a: Low Channel @ 2412 MHz

Power Setting: 20.5 Average power: 16.5 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2412.560	104.3	V	-	-	PK	97	1.0	RB = VB = 100KHz
2411.020	102.8	H	-	-	PK	35	1.0	RB = VB = 100KHz

Band Edge 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	
2319.990	50.5	H	54.0	-3.5	AVG	244	1.0	
2387.040	50.2	H	54.0	-3.8	AVG	244	1.0	
2387.180	47.5	V	54.0	-6.5	AVG	247	1.0	
2319.990	61.1	H	74.0	-12.9	PK	244	1.0	
2387.040	61.2	H	74.0	-12.8	PK	244	1.0	
2387.180	58.0	V	74.0	-16.0	PK	247	1.0	

Run #1b: High Channel @ 2462 MHz

Power Setting: 20.5 Average power: 16.5 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2463.430	104.2	V	-	-	PK	107	1.0	RB = VB = 100KHz
2462.520	106.9	H	-	-	PK	91	1.0	RB = VB = 100KHz

Band Edge 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	
2485.720	48.0	V	54.0	-6.0	AVG	268	1.0	
2486.310	48.8	H	54.0	-5.2	AVG	244	1.0	
2485.720	59.2	V	74.0	-14.8	PK	268	1.0	
2486.310	59.3	H	74.0	-14.7	PK	244	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - 802.11b

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: 2/27/2008
Test Engineer: Ben Jing
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: None
EUT Voltage:

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 18 °C
Rel. Humidity: 44 %

Summary of Results

Note - 802.11b mode had higher spurious emissions than 802.11g mode and was tested as worst case of the legacy modes.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11b Chain A	1 (2412)	20.5	16.5	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	48.0dBµV/m @ 4824.0MHz (-6.0dB)
1b	802.11b Chain A	6 (2437)	22.5	18.2	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	46.9dBµV/m @ 7311.9MHz (-7.1dB)
1c	802.11b Chain A	11 (2462)	20.5	16.5	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	52.3dBµV/m @ 4924.0MHz (-1.7dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 26000 MHz. Operating Mode: 802.11b Chain A
Run #1a: Low Channel @ 2412 MHz
Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2412.560	104.3	V	-	-	PK	97	1.0	RB = VB = 100KHz
2411.020	102.8	H	-	-	PK	35	1.0	RB = VB = 100KHz

Fundamental emission level @ 3m in 100kHz RBW:	104.3	dBµV/m	
Limit for emissions outside of restricted bands:	74.3	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4824.020	48.0	V	54.0	-6.0	AVG	38	1.0	
7238.870	44.0	H	54.0	-10.0	AVG	96	1.0	
9647.960	59.7	H	82.8	-23.1	AVG	64	1.5	Note 2
4824.020	50.5	V	74.0	-23.5	PK	38	1.0	
7238.870	51.5	H	74.0	-22.5	PK	96	1.0	
9647.960	60.9	H	74.0	-13.1	PK	64	1.5	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band.

Run #1b: Center Channel @ 2437 MHz
Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2437.500	104.1	V	-	-	PK	89	1.0	RB = VB = 100KHz
2437.780	105.8	H	-	-	PK	58	1.0	RB = VB = 100KHz

Fundamental emission level @ 3m in 100kHz RBW:	105.8	dBµV/m	
Limit for emissions outside of restricted bands:	75.8	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4873.920	45.9	V	54.0	-8.1	AVG	74	1.5	
7311.890	46.9	V	54.0	-7.1	AVG	31	1.0	
4873.920	48.9	V	74.0	-25.1	PK	74	1.5	
7311.890	52.4	V	74.0	-21.6	PK	31	1.0	
9748.090	62.7	V	75.8	-13.1	PK	158	1.0	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: High Channel @ 2462 MHz

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2463.430	104.2	V	-	-	PK	107	1.0	RB = VB = 100KHz
2462.520	106.9	H	-	-	PK	91	1.0	RB = VB = 100KHz

Fundamental emission level @ 3m in 100kHz RBW:	106.9	dBµV/m
Limit for emissions outside of restricted bands:	76.9	dBµV/m

Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4924.000	52.3	V	54.0	-1.7	AVG	48	1.0	
7383.520	48.9	H	54.0	-5.1	AVG	102	1.0	
4924.000	54.0	V	74.0	-20.0	PK	48	1.0	
7383.520	53.9	H	74.0	-20.1	PK	102	1.0	
9848.010	63.7	H	76.9	-13.2	PK	170	1.0	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - Band Edge 802.11g

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: 2/13/2008
Test Engineer: Suhaila Khushzad
Test Location: Fremont Chamber #3

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 43 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11g Chain A	1 2412MHz	21.5	13.9	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	72.6dBµV/m @ 2389.1MHz (-1.4dB)
1b	802.11g Chain A	11 2462MHz	23.5	15.4	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	71.7dBµV/m @ 2484.7MHz (-2.3dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11g - Chain A

Run #1a: Low Channel @ 2412 MHz

Power Setting: 22 13.9 (for reference purposes)

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.260	97.7	V	-	-	AVG	252	1.4	RB = 1MHz, VB = 10Hz
2413.260	105.8	V	-	-	PK	252	1.4	RB = VB = 1MHz
2413.500	101.4	H	-	-	AVG	231	1.4	RB = 1MHz, VB = 10Hz
2413.500	109.7	H	-	-	PK	231	1.4	RB = VB = 1MHz

Band Edge 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	
2389.890	50.9	H	54.0	-3.1	AVG	232	1.4	
2389.970	47.5	V	54.0	-6.5	Avg	252	1.4	
2389.050	67.0	V	74.0	-7.0	Pk	252	1.4	
2389.140	72.6	H	74.0	-1.4	PK	232	1.4	

Run #1b: High Channel @ 2462 MHz

Power Setting: 23.5 Average power: 15.4 (for reference purposes)

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	
2463.060	99.3	H	-	-	AVG	292	1.0	RB = 1MHz, VB = 10Hz
2463.060	107.3	H	-	-	PK	292	1.0	RB = VB = 1MHz
2463.170	98.9	V	-	-	AVG	250	1.0	RB = 1MHz, VB = 10Hz
2463.170	107.1	V	-	-	PK	250	1.0	RB = VB = 1MHz

Band Edge 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	
2483.500	50.5	H	54.0	-3.5	Avg	292	1.0	
2483.510	50.4	V	54.0	-3.6	Avg	249	1.0	
2483.830	71.1	V	74.0	-2.9	Pk	249	1.0	
2484.720	71.7	H	74.0	-2.3	Pk	292	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated 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: 03/18/2008
Test Engineer: Ben Jing
Test Location: FT Chamber # 4

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11g Chain A	1 (2412)	21.5	13.9	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	54.4dBµV/m @ 3000.4MHz (-10.7dB)
1b	802.11g Chain A	6 (2437)	26.5	17.8	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	69.7dBµV/m @ 9748.5MHz (-3.7dB)
1c	802.11g Chain A	11 (2462)	23.5	15.4	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	54.6dBµV/m @ 3000.3MHz (-9.2dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 26000 MHz. Operating Mode: 802.11g Chain A
Run #1a: Low Channel @ 2412 MHz

Date of Test: 04/17/2008 Config. Used: 1
Test Engineer: Ben Jing Config Change: None
Test Location: FT Chamber # 4 Host Unit Voltage 120V/60Hz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.300	95.1	V	-	-	PK	277	1.0	RB = VB = 100kHz
2413.330	96.1	H	-	-	PK	187	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	95.1	dBµV/m	
Limit for emissions outside of restricted bands:	65.1	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1199.380	28.8	V	54.0	-25.2	AVG	262	1.0	
1743.750	26.7	V	54.0	-27.3	AVG	205	1.0	
1199.380	44.8	V	74.0	-29.2	PK	262	1.0	
1743.750	45.7	V	74.0	-28.3	PK	205	1.0	
3000.390	54.4	V	65.1	-10.7	PK	274	1.0	
6000.730	53.8	V	65.1	-11.3	PK	270	1.5	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Power setting is same as band-edge testing : GC = 21.5 , AP = 13.9

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1b: Center Channel @ 2437 MHz

Date of Test: 2/27/2008 Config. Used: 1

Test Engineer: Ben Jing Config Change: None

Test Location: Fremont Chamber #4 EUT Voltage:

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2435.760	100.6	V	-	-	PK	90	1.0	RB = VB = 100kHz
2435.750	103.4	H	-	-	PK	60	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	103.4	dBµV/m	
Limit for emissions outside of restricted bands:	73.4	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.700	43.2	V	54.0	-10.8	AVG	262	1.5	
7310.390	49.7	H	54.0	-4.3	AVG	97	1.0	
6000.700	49.6	V	74.0	-24.4	PK	262	1.5	
7310.390	63.5	H	74.0	-10.5	PK	97	1.0	
9748.500	69.7	H	73.4	-3.7	PK	249	1.0	Note 2 RB=1MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: High Channel @ 2462 MHz

Date of Test: 04/17/2008 Config. Used: 1

Test Engineer: Ben Jing Config Change: None

Test Location: FT Chamber # 4 Host Unit Voltage 120V/60Hz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2463.370	93.8	V	-	-	PK	96	1.0	RB = VB = 100kHz
2463.310	97.2	H	-	-	PK	253	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	93.8	dBµV/m	
Limit for emissions outside of restricted bands:	63.8	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1494.330	30.6	V	54.0	-23.4	AVG	0	1.0	
1742.930	30.2	V	54.0	-23.8	AVG	160	1.0	
1494.330	50.1	V	74.0	-23.9	PK	0	1.0	
1742.930	49.4	V	74.0	-24.6	PK	160	1.0	
3000.330	54.6	V	63.8	-9.2	PK	272	1.0	
6000.770	53.7	V	63.8	-10.1	PK	267	1.5	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Power setting is same as band-edge testing : GC = 23.5 , AP = 15.4

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - Band Edge 802.11n 20 MHz

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 15-25 °C
Rel. Humidity: 35-55 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n20 Chain A	1 2412MHz	22.0	14.0	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	52.2dBµV/m @ 2390.0MHz (-1.8dB)
1b	802.11n20 Chain A	11 2462MHz	22.5	14.3	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	70.5dBµV/m @ 2485.4MHz (-3.5dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11n (20 MHz Channel) - Chain A

Date of Test: 2/14/2008
Test Engineer: Suhaila Khushzad
Test Location: Fremont Chamber #3

Run #1a: Low Channel @ 2412 MHz

Power Setting: 22.0 Average power: 14.0 (for reference purposes)

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2413.500	99.4	V	-	-	AVG	247	1.6	RB = 1MHz, VB = 10Hz
2413.500	107.5	V	-	-	PK	247	1.6	RB = VB = 1MHz
2411.010	98.9	H	-	-	AVG	289	1.0	RB = 1MHz, VB = 10Hz
2411.010	107.8	H	-	-	PK	289	1.0	RB = VB = 1MHz

Band Edge 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	
2389.950	52.2	V	54.0	-1.8	AVG	247	1.6	
2389.970	51.7	H	54.0	-2.3	AVG	289	1.0	GC=22, AP=14
2389.430	68.7	H	74.0	-5.3	PK	289	1.0	GC=22, AP=14
2389.980	71.9	V	74.0	-2.1	PK	247	1.5	

Run #1b: High Channel @ 2462 MHz

Power Setting: 22.5 Average power: 14.3 (for reference purposes)

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2468.500	98.8	V	54.0	-	-	255	1.0	RB = 1MHz, VB = 10Hz
2468.500	107.4	V	74.0	-	-	255	1.0	RB = VB = 1MHz
2461.030	99.2	H	54.0	-	-	286	1.0	RB = 1MHz, VB = 10Hz
2461.030	107.8	H	74.0	-	-	286	1.0	RB = VB = 1MHz

Band Edge 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	
2483.500	49.8	H	54.0	-4.2	AVG	286	1.0	
2483.520	49.5	V	54.0	-4.5	AVG	255	1.0	
2484.110	70.2	H	74.0	-3.8	PK	286	1.0	
2485.420	70.5	V	74.0	-3.5	PK	255	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - Band Edge 802.11n 40 MHz

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n40 Chain A	1 2422MHz	18.5	8.8	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	52.7dBµV/m @ 2389.8MHz (-1.3dB)
1b	802.11n40 Chain A	11 2452MHz	18.5	9.8	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	52.1dBµV/m @ 2483.5MHz (-1.9dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11n (40 MHz Channel) - Chain A

Date of Test: 2/14/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #3

Run #1a: Low Channel @ 2422 MHz

Power Setting: 18.5 Average power: 8.8 (for reference purposes)

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2437.670	97.9	H	-	-	AVG	253	1.0	RB = 1MHz, VB = 10Hz
2437.670	106.4	H	-	-	PK	253	1.0	RB = VB = 1MHz
2423.380	90.0	V	-	-	AVG	202	1.2	RB = 1MHz, VB = 10Hz
2423.380	98.4	V	-	-	PK	202	1.2	RB = VB = 1MHz

Band Edge 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	
2389.840	52.7	H	54.0	-1.3	Avg	254	1.0	
2389.960	48.3	V	54.0	-5.7	Avg	204	1.3	
2387.160	66.6	H	74.0	-7.4	PK	249	1.0	
2388.960	62.6	V	74.0	-11.4	PK	204	1.3	

Run #1b: High Channel @ 2452 MHz

Power Setting: GC = 18.5 Average power: AP = 9.8 (for reference purposes)

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2463.200	92.6	V	-	-	AVG	277	1.0	RB = 1MHz, VB = 10Hz
2463.200	101.8	V	-	-	PK	277	1.0	RB = VB = 1MHz
2438.930	98.3	H	-	-	AVG	253	1.0	RB = 1MHz, VB = 10Hz
2438.930	106.9	H	-	-	PK	253	1.0	RB = VB = 1MHz

Band Edge 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	
2483.510	52.1	H	54.0	-1.9	Avg	251	1.0	
2483.560	48.4	V	54.0	-5.6	Avg	273	1.0	
2484.890	64.9	H	74.0	-9.1	PK	251	1.0	
2485.210	58.5	V	74.0	-15.5	PK	272	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - 802.11n

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: °C

Rel. Humidity: %

Summary of Results

Measurements for n modes performed with the device operating in 20MHz mode as this produced higher emissions than 40MHz mode.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n20 Chain A	1 2412MHz	22.0	14.0	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	47.6dBµV/m @ 3000.4MHz (-6.4dB)
1b	802.11n20 Chain A	6 2437MHz	25.0	16.5	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	54.6dBµV/m @ 3000.4MHz (-13.0dB)
1c	802.11n20 Chain A	11 2462MHz	22.5	14.3	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	46.4dBµV/m @ 3000.4MHz (-7.6dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 26000 MHz. Operating Mode: 802.11n 20MHz Chain A
Run #1a: Low Channel @ 2412 MHz

Date of Test: 2/14/2008 Config. Used:
Test Engineer: Suhaila Khushzad Config Change:
Test Location: Fremont Chamber #3 Host Unit Voltage

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1747.630	34.9	V	54.0	-19.1	AVG	198	1.0	
3000.390	47.6	V	54.0	-6.4	AVG	167	1.0	
1747.630	53.7	V	74.0	-20.3	PK	198	1.0	
3000.390	51.6	V	74.0	-22.4	PK	167	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a resticted band, but more stringent 15.209 limits used

Run #1b: Center Channel @ 2437 MHz

Date of Test: 04/17/2008 Config. Used: 1
Test Engineer: Ben Jing Config Change: None
Test Location: FT Chamber # 4 Host Unit Voltage 120V/60Hz

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2439.520	97.6	V	-	-	PK	268	1.0	RB = VB = 100kHz
2439.590	100.5	H	-	-	PK	190	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	97.6	dBµV/m	
Limit for emissions outside of restricted bands:	67.6	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1498.030	30.5	V	54.0	-23.5	AVG	141	1.5	
1743.100	31.4	V	54.0	-22.6	AVG	112	1.0	
1498.030	52.3	V	74.0	-21.7	PK	141	1.5	
1743.100	49.9	V	74.0	-24.1	PK	112	1.0	
3000.390	54.6	V	67.6	-13.0	PK	272	1.0	
6000.740	54.3	V	67.6	-13.3	PK	267	1.5	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: High Channel @ 2462 MHz

Date of Test: 2/14/2008
Test Engineer: Suhaila Khushzad
Test Location: Fremont Chamber #3

Config. Used:
Config Change:
Host Unit Voltage

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1743.180	34.9	H	54.0	-19.1	AVG	154	1.3	Note 2
3000.400	46.4	V	54.0	-7.6	AVG	155	1.0	Note 2
1743.180	55.7	H	74.0	-18.3	PK	154	1.3	Note 2
3000.400	50.9	V	74.0	-23.1	PK	155	1.0	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a resticted band, but more stringent 15.209 limits used

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 5725 - 5850 MHz)

Radiated Spurious Emissions - 802.11a

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 15-25 °C
Rel. Humidity: 35-55 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5745 MHz 5785 MHz 5825 MHz	26.5 28.0 26.5	17.5 17.8 17.3	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	50.1dBµV/m @ 3000.4MHz (-3.9dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 18000 MHz. Operating Mode: 802.11a Chain A

Date of Test: 2/14/2008 Config. Used: 1
Test Engineer: Rafael Varelas Config Change: None
Test Location: Fremont Chamber #3 EUT Voltage: Powered from Host System

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band but the more stringent restricted band limit was used.

Run #1a: Low Channel @ 5745 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.330	48.0	V	54.0	-6.0	AVG	251	1.0	Note 2
11488.020	43.1	V	54.0	-10.9	AVG	232	1.0	
22979.580	39.5	V	54.0	-14.5	AVG	317	1.0	
3000.330	51.6	V	74.0	-22.4	PK	251	1.0	Note 2
11488.020	54.3	V	74.0	-19.7	PK	232	1.0	
22979.580	52.2	V	74.0	-21.8	PK	317	1.0	

Run #1b: Center Channel @ 5785 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.420	50.1	V	54.0	-3.9	AVG	270	1.0	Note 2
5563.280	43.0	V	54.0	-11.0	AVG	149	1.0	Note 2
11650.130	40.6	V	54.0	-13.4	AVG	316	1.0	
3000.420	53.3	V	74.0	-20.7	PK	270	1.0	Note 2
5563.280	54.5	V	74.0	-19.5	PK	149	1.0	Note 2
11650.130	52.7	V	74.0	-21.3	PK	316	1.0	

Run #1c: High Channel @ 5825 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.360	42.8	V	54.0	-11.2	AVG	302	1.0	Note 2
5578.220	41.8	V	54.0	-12.2	AVG	155	1.0	Note 2
11652.980	40.2	V	54.0	-13.8	AVG	324	1.0	
3000.360	48.2	V	74.0	-25.8	PK	302	1.0	Note 2
5578.220	54.8	V	74.0	-19.2	PK	155	1.0	Note 2
11652.980	52.2	V	74.0	-21.8	PK	324	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 5725 - 5850 MHz)
Radiated Spurious Emissions - 802.11n

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 15-25 °C
Rel. Humidity: 35-55 %

Summary of Results

Measurements for n modes performed with the device operating in 20MHz mode as this produced higher emissions than 40MHz mode.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n-20 Chain A	5745	26.5	16.5	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	55.6dBµV/m @ 3000.4MHz (-6.4dB)
1b	802.11n-20 Chain A	5785	27.5	16.5	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	55.7dBµV/m @ 3000.3MHz (-8.2dB)
1c	802.11n-20 Chain A	5825	28.5	16.5	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	46.0dBµV/m @ 11650.6MHz (-8.0dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 40000 MHz. Operating Mode: 802.11a Chain A

Date of Test: 04/17/2008
Test Engineer: Ben Jing
Test Location: FT Chamber # 4

Run #1a : Low Channel @ 5745 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5746.290	92.0	V	-	-	PK	172	1.0	RB = VB = 100kHz
5743.690	87.4	H	-	-	PK	120	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	92	dBµV/m	
Limit for emissions outside of restricted bands:	62	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1494.480	32.0	H	54.0	-22.0	AVG	249	1.0	
1747.820	30.8	V	54.0	-23.2	AVG	108	1.5	
7659.930	40.6	V	54.0	-13.4	AVG	324	1.5	
11489.770	40.7	V	54.0	-13.3	AVG	231	1.0	
1494.480	49.9	H	74.0	-24.1	PK	249	1.0	
1747.820	51.1	V	74.0	-22.9	PK	108	1.5	
3000.360	55.6	V	62.0	-6.4	PK	272	1.0	Note 2
6000.740	53.6	V	62.0	-8.4	PK	268	1.5	Note 2
7659.930	49.2	V	74.0	-24.8	PK	324	1.5	
11489.770	57.0	V	74.0	-17.0	PK	231	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1b: Center Channel @ 5785 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5783.700	93.9	V	-	-	PK	167	1.0	RB = VB = 100kHz
5783.710	89.1	H	-	-	PK	137	1.0	RB = VB = 100kHz

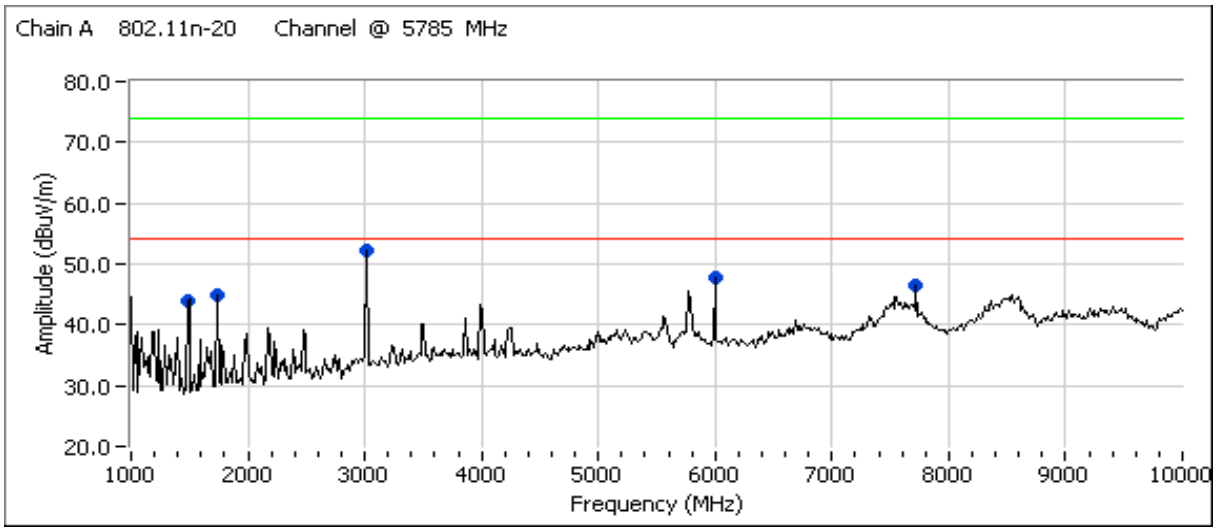
Fundamental emission level @ 3m in 100kHz RBW:	93.9	dBµV/m
Limit for emissions outside of restricted bands:	63.9	dBµV/m

Limit is -30dBc (UNII power measurement)

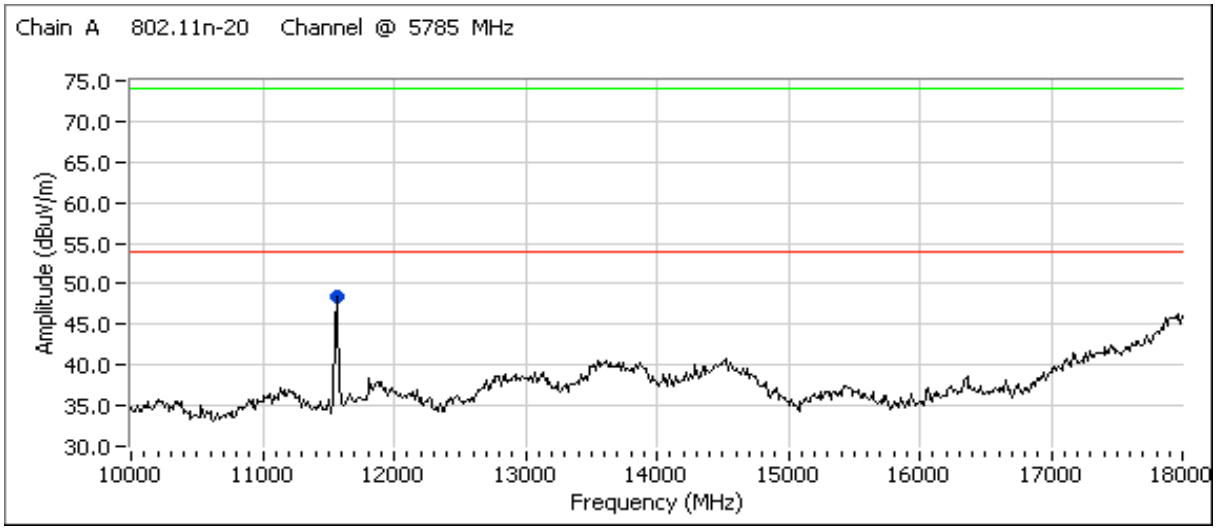
Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1494.720	31.4	H	54.0	-22.6	AVG	248	1.5	
1748.040	30.8	V	54.0	-23.2	AVG	112	1.5	
7713.290	42.9	V	54.0	-11.1	AVG	144	1.0	
11570.050	44.1	V	54.0	-9.9	AVG	204	1.0	
1494.720	51.9	H	74.0	-22.1	PK	248	1.5	
1748.040	50.8	V	74.0	-23.2	PK	112	1.5	
3000.300	55.7	V	63.9	-8.2	PK	275	1.0	Not in a restricted band
6000.740	52.4	V	63.9	-11.5	PK	266	1.5	Not in a restricted band
7713.290	50.6	V	74.0	-23.4	PK	144	1.0	
11570.050	57.4	V	74.0	-16.6	PK	204	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.



Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71373
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A



No emissions observed from 18 - 40GHz

Run #1c: High Channel @ 5825 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5823.680	94.2	V	-	-	PK	166	1.0	RB = VB = 100kHz
5826.250	91.0	H	-	-	PK	135	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	94.2	dBµV/m	
Limit for emissions outside of restricted bands:	64.2	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1495.200	30.7	H	54.0	-23.3	AVG	233	1.5	
11650.580	46.0	V	54.0	-8.0	AVG	116	1.0	
1495.200	51.9	H	74.0	-22.1	PK	233	1.5	
3000.400	56.1	V	64.2	-8.1	PK	272	1.0	
6000.680	53.4	V	64.2	-10.8	PK	269	1.5	
11650.580	59.1	V	74.0	-14.9	PK	116	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.

Elliott

EMC Test Data

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		-
Emissions Standard(s):	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS
Immunity Standard(s):	-	Environment:	-

EMC Test Data - DTS Radiated Emissions
Universe PIFA Antenna

For The

Intel

Model

512an HMW

Date of Last Test: 6/10/2008

Elliott

EMC Test Data

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Radiated Emissions - Receiver Spurious (Universe Antenna)

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing. Remote support equipment was located approximately 30 meters from the test area with all I/O connections running on top of the groundplane.

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: 15-25 °C

Rel. Humidity: 35-55 %

Summary of Results

Run #	Channel	Chain	Test Performed	Limit	Result	Margin
1a	2437 MHz	A, B	RE, 1000 - 7500 MHz, Maximized Emissions	RSS GEN	Pass	48.1dBµV/m @ 3000.4MHz (-5.9dB)
1b	5785 MHz	A, B	RE, 1000 - 18000 MHz, Maximized Emissions	RSS GEN	Pass	52.2dBµV/m @ 3000.3MHz (-1.8dB)
1c	2437 MHz	A+B	RE, 1000 - 7500 MHz, Maximized Emissions	RSS GEN	Pass	49.8dBµV/m @ 3000.3MHz (-4.2dB)
1d	5785 MHz	A+B	RE, 1000 - 18000 MHz, Maximized Emissions	RSS GEN	Pass	50.6dBµV/m @ 3000.4MHz (-3.4dB)

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.

Elliott

EMC Test Data

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Run #1 Maximized readings, 1000 - 8000 MHz, Single Receiver Active

Date of Test: 6/1/2008
Test Engineer: Peter Sales
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: None
EUT Voltage: Powered From Host System

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18000 MHz	3	3	0.0

Receiver Tuned to 2437 MHz - Chain A active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.410	48.1	V	54.0	-5.9	AVG	261	1.0	
3000.420	44.2	H	54.0	-9.8	AVG	186	1.0	
6000.750	42.7	V	54.0	-11.3	AVG	255	1.4	
6000.790	42.0	H	54.0	-12.0	AVG	150	1.1	
6498.610	37.1	H	54.0	-16.9	AVG	223	1.0	
6498.640	46.5	V	54.0	-7.5	AVG	177	1.1	
3000.410	51.6	V	74.0	-22.4	PK	261	1.0	
3000.420	48.6	H	74.0	-25.4	PK	186	1.0	
6000.750	47.8	V	74.0	-26.2	PK	255	1.4	
6000.790	47.7	H	74.0	-26.3	PK	150	1.1	
6498.610	44.8	H	74.0	-29.2	PK	223	1.0	
6498.640	50.1	V	74.0	-23.9	PK	177	1.1	

Receiver Tuned to 2437 MHz - Chain B active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.350	46.4	V	54.0	-7.6	AVG	174	1.0	
3000.420	45.3	H	54.0	-8.7	AVG	182	1.2	
6000.680	44.2	V	54.0	-9.8	AVG	102	1.0	
6000.720	41.8	H	54.0	-12.2	AVG	149	1.0	
3000.350	50.8	V	74.0	-23.2	PK	174	1.0	
3000.420	49.5	H	74.0	-24.5	PK	182	1.2	
6000.680	47.9	V	74.0	-26.1	PK	102	1.0	
6000.720	46.9	H	74.0	-27.1	PK	149	1.0	

Elliott

EMC Test Data

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Receiver Tuned to 5785 MHz - Chain A active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1496.370	29.2	V	54.0	-24.8	AVG	141	1.0	
3000.360	46.4	V	54.0	-7.6	AVG	174	1.0	
3000.370	46.0	H	54.0	-8.0	AVG	182	1.2	
6000.730	45.0	V	54.0	-9.0	AVG	104	1.0	
6000.760	42.0	H	54.0	-12.0	AVG	150	1.0	
7713.360	34.1	H	54.0	-19.9	AVG	178	1.0	
1496.370	49.6	V	74.0	-24.4	PK	141	1.0	
3000.360	50.2	V	74.0	-23.8	PK	174	1.0	
3000.370	50.3	H	74.0	-23.7	PK	182	1.2	
6000.730	48.8	V	74.0	-25.2	PK	104	1.0	
6000.760	48.0	H	74.0	-26.0	PK	150	1.0	
7713.360	45.9	H	74.0	-28.1	PK	178	1.0	

Receiver Tuned to 5785 MHz - Chain B active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.310	52.2	V	54.0	-1.8	AVG	272	1.0	
6000.750	47.6	V	54.0	-6.4	AVG	102	1.0	
3000.310	55.4	V	74.0	-18.6	PK	272	1.0	
6000.750	51.1	V	74.0	-22.9	PK	102	1.0	

Elliott — EMC Test Data

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	DTS

Run #2: Radiated Emissions Above 1000 MHz, Receive Mode, Both Chains Active

Date of Test: 6/2/2008 — Config. Used: 1
Test Engineer: Joseph Cadigal — Config Change: None
Test Location: Fremont Chamber #3 — EUT Voltage: Powered From Host System

Receive Mode, EUT Tuned to 2437 MHz - All chains active

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.330	49.8	V	54.0	-4.2	AVG	267	1.3	
6000.750	48.4	V	54.0	-5.6	AVG	150	1.0	
6498.600	47.0	V	54.0	-7.0	AVG	162	1.0	
3000.310	46.2	H	54.0	-7.8	AVG	183	1.0	
6000.820	44.4	H	54.0	-9.6	AVG	52	1.0	
6498.680	38.1	H	54.0	-15.9	AVG	204	1.0	
6000.750	53.4	V	74.0	-20.6	PK	150	1.0	
3000.330	52.9	V	74.0	-21.1	PK	267	1.3	
6000.820	51.6	H	74.0	-22.4	PK	52	1.0	
3000.310	50.7	H	74.0	-23.3	PK	183	1.0	
6498.600	50.5	V	74.0	-23.5	PK	162	1.0	
6498.680	45.9	H	74.0	-28.1	PK	204	1.0	

Receiver Tuned to 5785 MHz - All chains active

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.380	50.6	V	54.0	-3.4	AVG	267	1.3	
3000.340	47.9	H	54.0	-6.1	AVG	184	1.0	
7713.250	47.4	V	54.0	-6.6	AVG	205	2.0	
7713.250	38.9	H	54.0	-15.1	AVG	136	1.0	
3856.590	36.6	V	54.0	-17.4	AVG	207	1.0	
3856.700	35.5	H	54.0	-18.5	AVG	131	1.0	
3000.380	53.8	V	74.0	-20.2	PK	267	1.3	
7713.250	53.0	V	74.0	-21.0	PK	205	2.0	
3000.340	52.4	H	74.0	-21.6	PK	184	1.0	
7713.250	48.6	H	74.0	-25.4	PK	136	1.0	
3856.590	45.0	V	74.0	-29.0	PK	207	1.0	
3856.700	44.2	H	74.0	-29.8	PK	131	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)

Radiated Spurious Emissions - 802.11b Universe Antenna

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: 5/29/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 19.2 °C
Rel. Humidity: 41 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11b	1 2412MHz	23.5	16.7	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	46.0dBµV/m @ 2387.0MHz (-8.0dB)
1a	802.11b Chain A	1 (2412)	23.5	16.7	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.6dBµV/m @ 4824.0MHz (-9.4dB)
1b	802.11b Chain A	6 (2437)	25.5	18.3	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	63.9dBµV/m @ 9749MHz (-7.2dB)
1c	802.11b	11 2462MHz	24.5	16.8	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	45.8dBµV/m @ 2483.5MHz (-8.2dB)
1c	802.11b Chain A	11 (2462)	24.5	16.8	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	50.1dBµV/m @ 4924MHz (-3.9dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11b - Chain A

Run #1a: Low Channel @ 2412 MHz

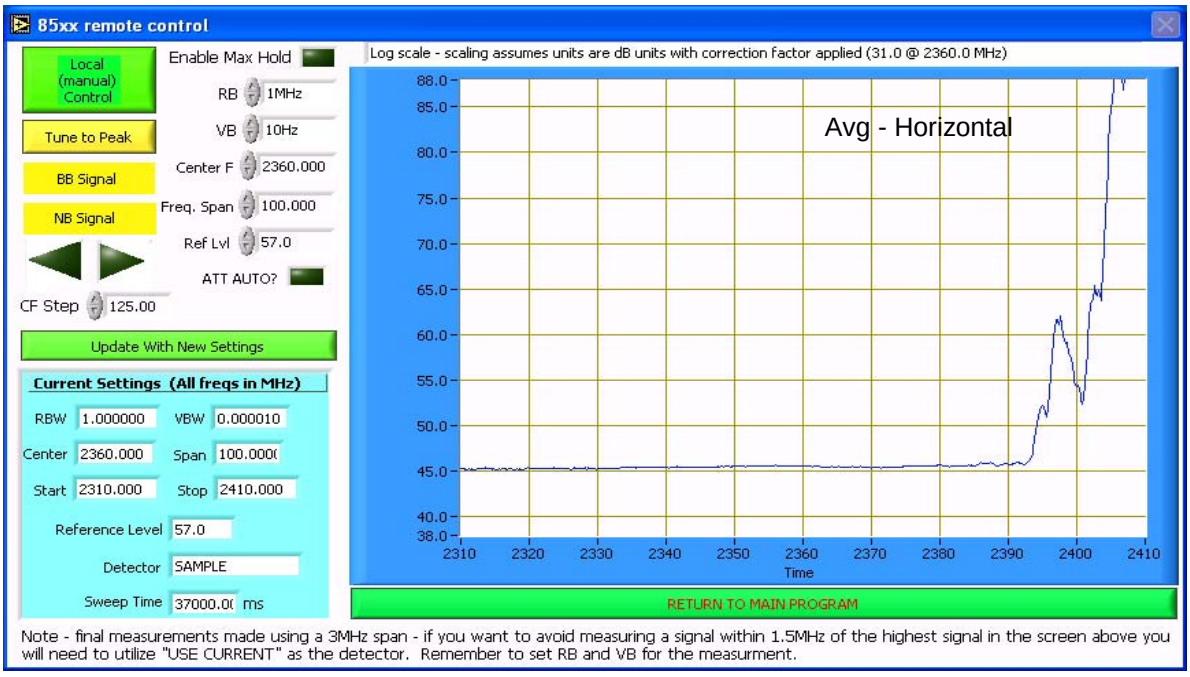
Power Setting: 23.5 Average power: 16.7 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2409.600	97.0	V	-	-	PK	139	1.1	RB = VB = 100KHz
2410.670	99.2	H	-	-	PK	254	1.0	RB = VB = 100KHz

Band Edge Signal Field Strength

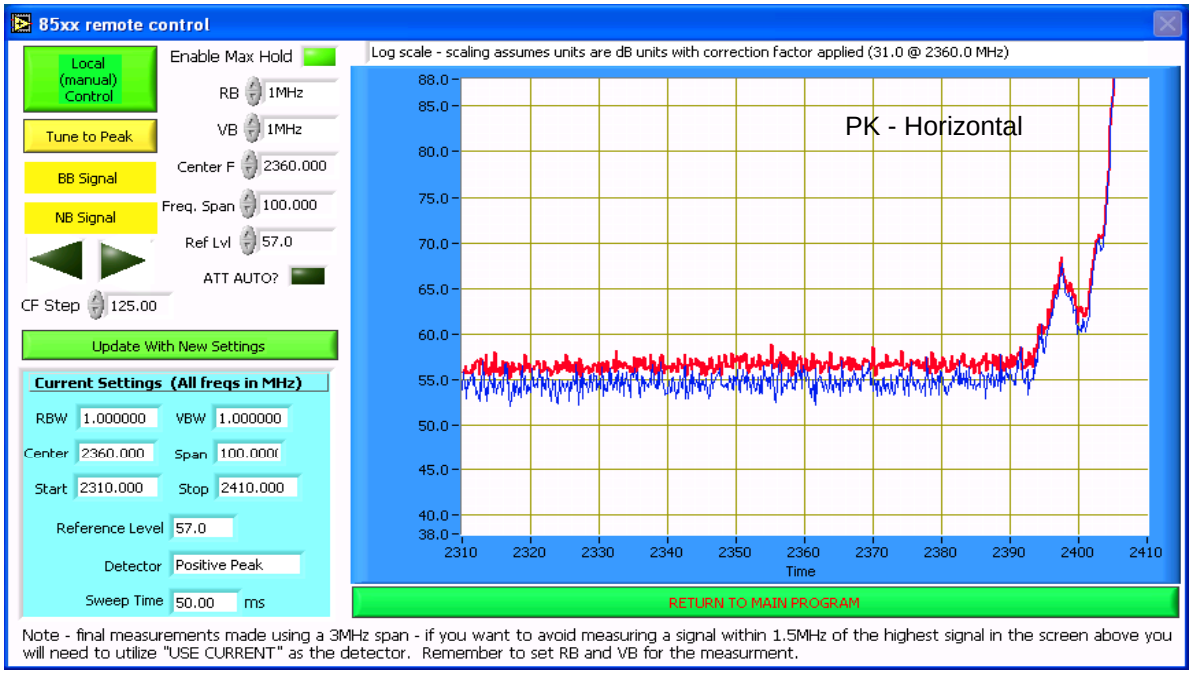
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2387.000	46.0	H	54.0	-8.0	Avg	254	1.0	
2387.020	45.6	V	54.0	-8.4	Avg	139	1.1	
2388.380	58.4	H	74.0	-15.6	PK	254	1.0	
2389.670	58.4	V	74.0	-15.6	PK	139	1.1	



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurment.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1a: Continued



Fundamental emission level @ 3m in 100kHz RBW:	99.2	dBµV/m
Limit for emissions outside of restricted bands:	69.2	dBµV/m

Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1000.000	26.2	H	54.0	-27.8	AVG	170	1.0	
4824.000	44.6	V	54.0	-9.4	AVG	200	1.6	
1742.500	49.2	V	69.2	-20.0	Peak	238	1.3	Note 2
2998.330	49.5	V	69.2	-19.7	Peak	260	1.3	Note 2
7235.000	44.2	V	69.2	-25.0	Peak	226	1.9	Note 2
9644.170	57.2	V	69.2	-12.0	Peak	202	1.6	Note 2
1000.000	39.0	H	74.0	-35.0	PK	170	1.0	
4824.000	48.1	V	74.0	-25.9	PK	200	1.6	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1b: Center Channel @ 2437 MHz

Power Setting: 25.5 Average power: 18.3 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2438.930	98.7	V	-	-	PK	182	1.0	RB = VB = 100KHz
2441.230	101.1	H	-	-	PK	249	1.0	RB = VB = 100KHz

Fundamental emission level @ 3m in 100kHz RBW:	101.1	dBµV/m	
Limit for emissions outside of restricted bands:	71.1	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1495.150	30.1	H	54.0	-23.9	AVG	226	1.0	
4874.010	46.0	V	54.0	-8.0	AVG	170	1.3	
7310.200	46.2	V	54.0	-7.8	AVG	224	1.9	
1742.500	50.2	H	71.1	-20.9	Peak	244	1.3	Note 2
2998.330	51.0	V	71.1	-20.1	Peak	265	1.0	Note 2
9749.170	63.9	V	71.1	-7.2	Peak	148	1.3	Note 2
1495.150	50.5	H	74.0	-23.5	PK	226	1.0	
4874.010	49.3	V	74.0	-24.7	PK	170	1.3	
7310.200	52.3	V	74.0	-21.7	PK	224	1.9	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band.

Run #1c: High Channel @ 2462 MHz

Power Setting: 24.5 Average power: 16.8 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

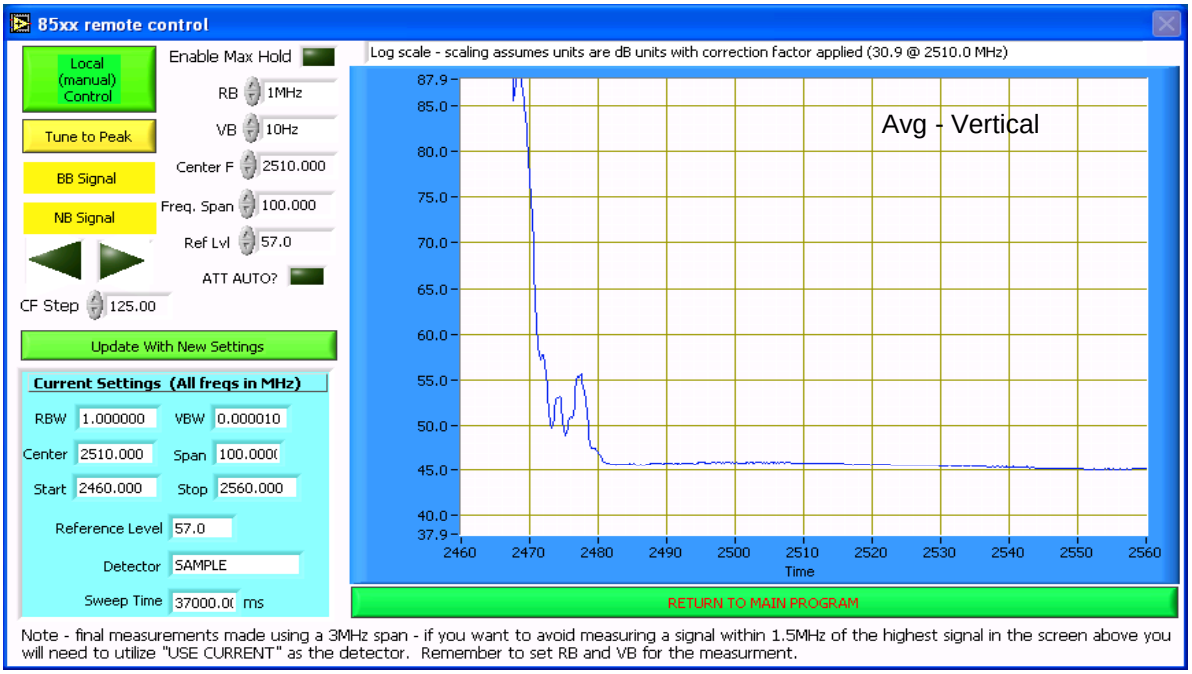
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2466.730	97.0	V	-	-	PK	166	1.0	RB = VB = 100KHz
2461.670	95.7	H	-	-	PK	314	1.0	RB = VB = 100KHz

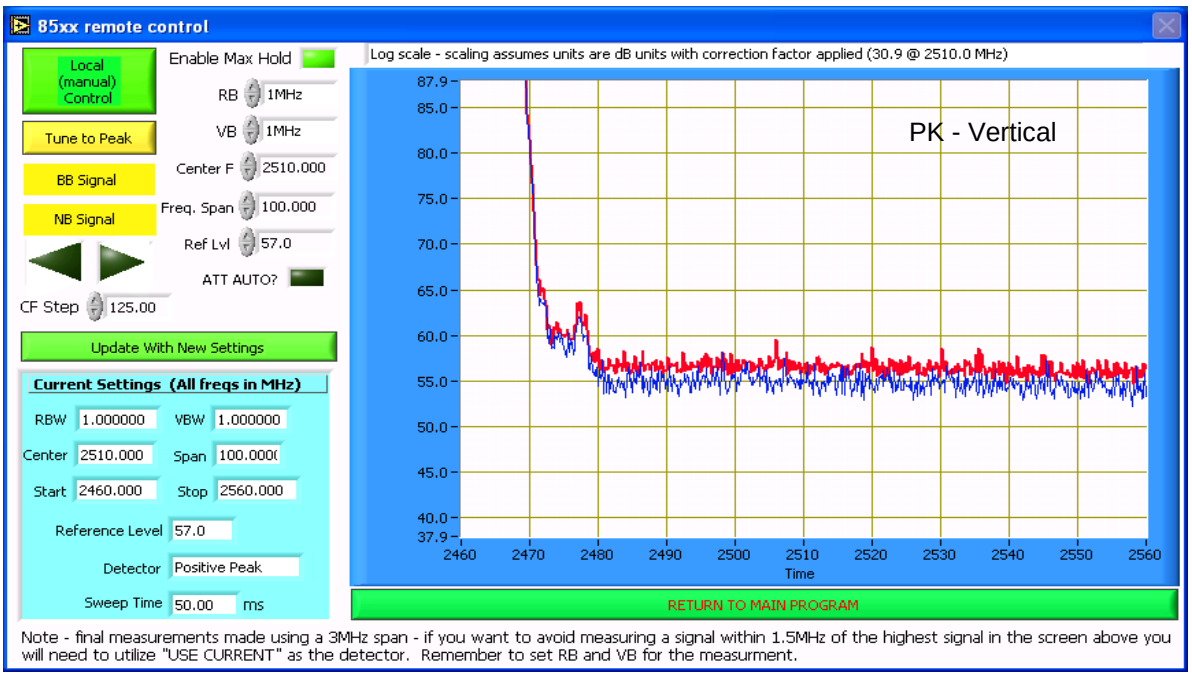
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	45.8	V	54.0	-8.2	Avg	166	1.0	
2484.660	45.8	H	54.0	-8.2	Avg	314	1.0	
2483.550	58.3	H	74.0	-15.7	PK	314	1.0	
2484.670	58.5	V	74.0	-15.5	PK	166	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: Continued





Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: Continued

Fundamental emission level @ 3m in 100kHz RBW:	97	dBµV/m	
Limit for emissions outside of restricted bands:	67	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4923.980	50.1	V	54.0	-3.9	AVG	99	1.3	
7386.690	40.4	V	54.0	-13.6	AVG	218	1.3	
1742.500	51.2	H	67.0	-15.8	Peak	242	1.3	Note 2
2998.330	49.5	V	67.0	-17.5	Peak	264	1.3	Note 2
9848.330	59.1	V	67.0	-7.9	Peak	147	1.3	Note 2
4923.980	52.1	V	74.0	-21.9	PK	99	1.3	
7386.690	49.0	V	74.0	-25.0	PK	218	1.3	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Not in a restricted band.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - 802.11g Universe Antenna

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: 5/29/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 19.2 °C
Rel. Humidity: 41 %

Summary of Results

Spurious measurements on center channel only … 802.11b mode had higher spurious emissions on top and bottom channels and represents worst case for those channels.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11g Chain A	1 2412MHz	25.0	14.0	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	48.7dBµV/m @ 2390.02MHz (-5.3dB)
1b	802.11g Chain A	6 (2437)	29.5	17.9	Radiated Emissions, 1 - 26 GHz	FCC Part 15.209 / 15.247(c)	44.1dBµV/m @ 7307.19MHz (-9.9dB)
1b	802.11g Chain A	11 2462MHz	27.0	15.6	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	48.9dBµV/m @ 2483.5MHz (-5.1dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11g - Chain A

Run #1a: Low Channel @ 2412 MHz

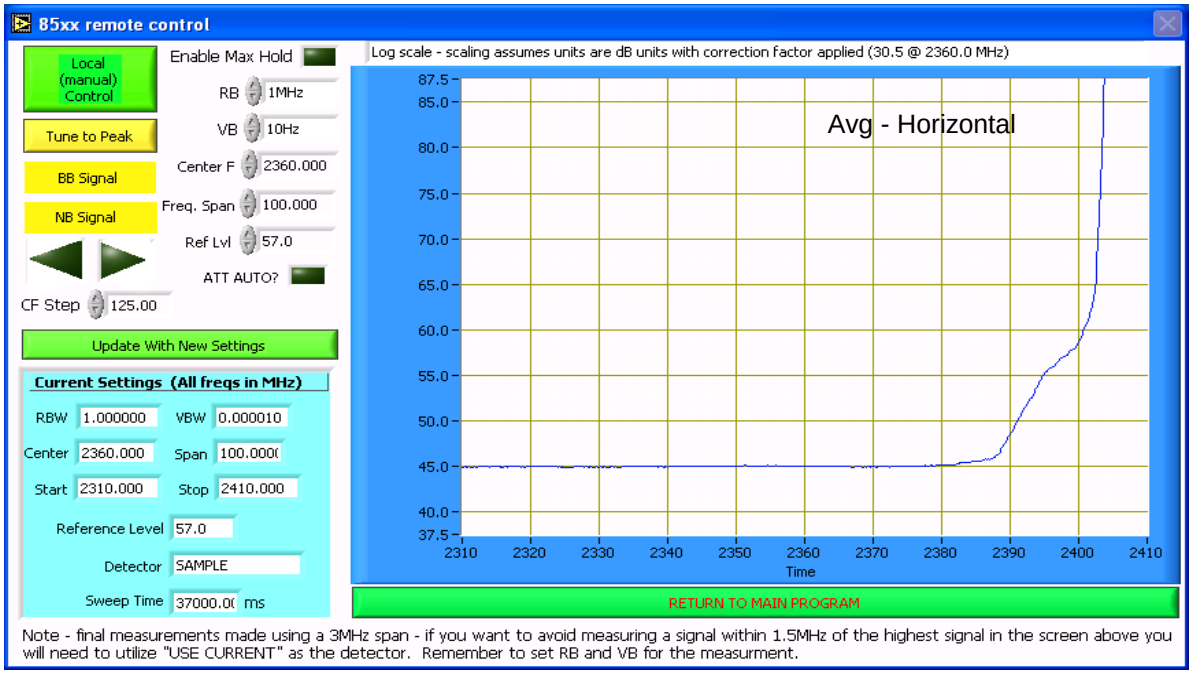
Power Setting: 25.0 Average power: 14.0 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2416.270	91.9	V	-	-	AVG	136	1.0	
2416.270	102.2	V	-	-	PK	136	1.0	
2416.000	92.1	V	-	-	PK	136	1.0	RB = VB = 100KHz
2415.270	94.8	H	-	-	AVG	250	1.0	
2415.270	103.1	H	-	-	PK	250	1.0	
2410.970	94.9	H	-	-	PK	250	1.0	RB = VB = 100KHz

Band Edge Signal Field Strength

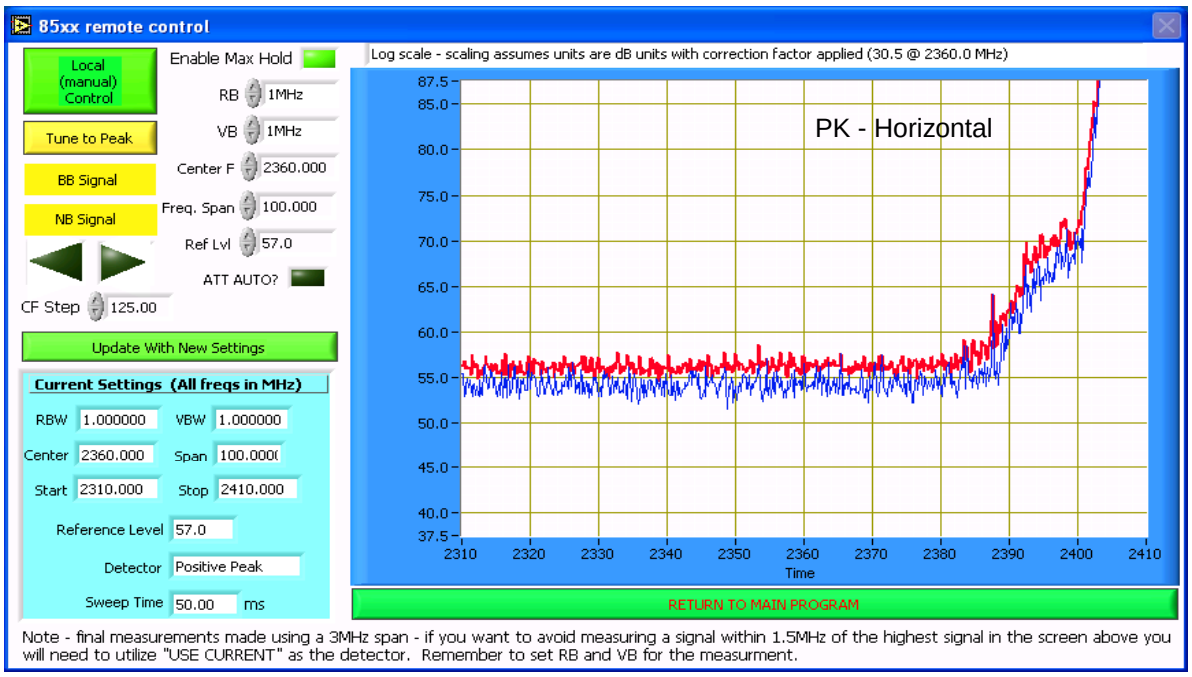
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.950	46.7	V	54.0	-7.3	Avg	136	1.0	
2389.960	61.5	V	74.0	-12.5	PK	136	1.0	
2389.980	48.7	H	54.0	-5.3	Avg	250	1.0	
2389.970	64.7	H	74.0	-9.3	PK	250	1.0	



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurment.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1a: Continued



Run #1b: Center Channel @ 2437 MHz

Power Setting: 29.5 Average power: 17.9 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2439.730	99.6	H	-	-	PK	248	1.0	RB = VB = 100kHz

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1742.500	49.2	H	69.6	-20.4	Peak	246	1.3	Note 2
2998.330	51.8	V	69.6	-17.8	Peak	268	1.0	Note 2
4868.330	41.4	V	54.0	-12.6	Peak	97	1.9	
9743.330	58.5	V	69.6	-11.1	Peak	149	1.6	Note 2
7307.140	44.1	V	54.0	-9.9	AVG	217	1.4	
7307.140	57.8	V	74.0	-16.2	PK	217	1.4	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental (i.e. 69.6dBuV/m) and measured in 100kHz.
Note 2:	Not in a restricted band

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: High Channel @ 2462 MHz

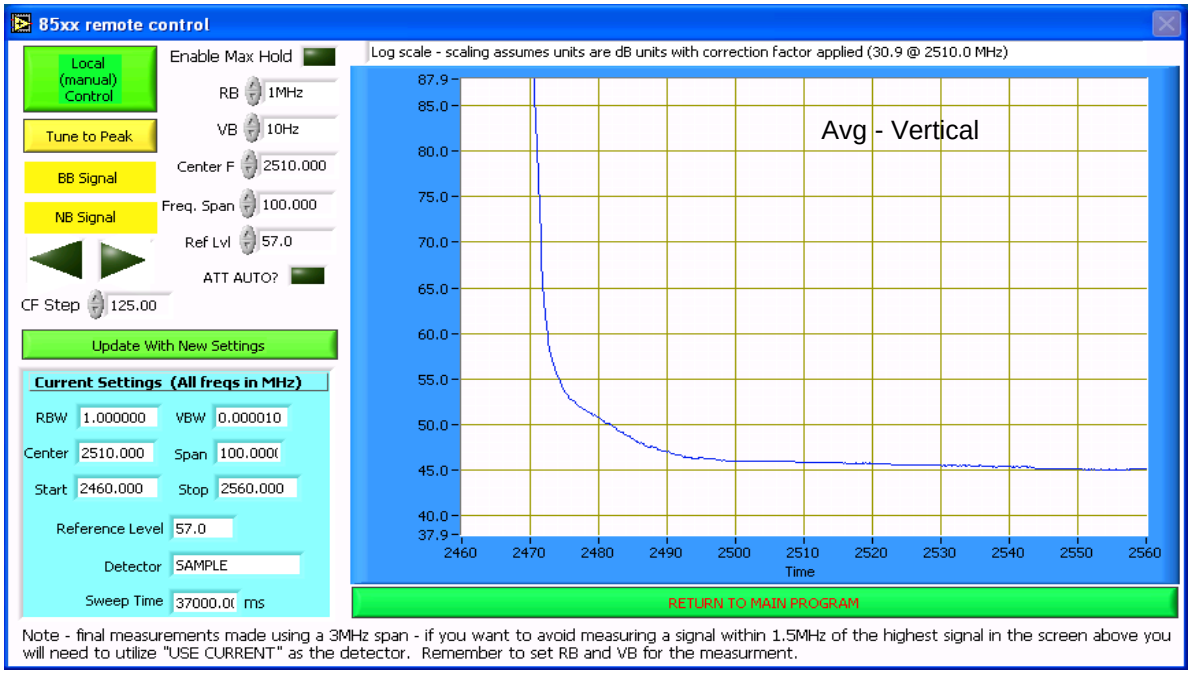
Power Setting: 27.0 Average power: 15.6 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2468.930	94.7	V	-	-	AVG	167	1.0	
2468.930	103.1	V	-	-	PK	167	1.0	
2459.700	94.4	V	-	-	PK	167	1.0	RB = VB = 100KHz
2455.270	94.8	H	-	-	AVG	247	1.2	
2455.270	103.2	H	-	-	PK	247	1.2	
2455.800	94.3	H	-	-	PK	247	1.2	RB = VB = 100KHz

Band Edge 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	
2483.500	48.9	V	54.0	-5.1	Avg	167	1.0	
2483.860	66.4	V	74.0	-7.6	PK	167	1.0	
2483.580	48.9	H	54.0	-5.1	Avg	247	1.2	
2483.590	66.3	H	74.0	-7.7	PK	247	1.2	



Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - 802.11n 20MHz Universe Antenna

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: 5/29/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #4

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 19.2 °C
Rel. Humidity: 41 %

Summary of Results

Spurious measurements are covered by measuremetns made on 802.11b and 802.11g modes as these two modes had higher emissions than both n modes when evaluated with the other antenna.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11g Chain A	1 2412MHz	25.5	14.3	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	51.2dBµV/m @ 2390.02MHz (-2.8dB)
1b	802.11g Chain A	11 2462MHz	26.0	14.6	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	47.4dBµV/m @ 2483.5MHz (-6.6dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11n 20MHz - Chain A

Run #1a: Low Channel @ 2412 MHz

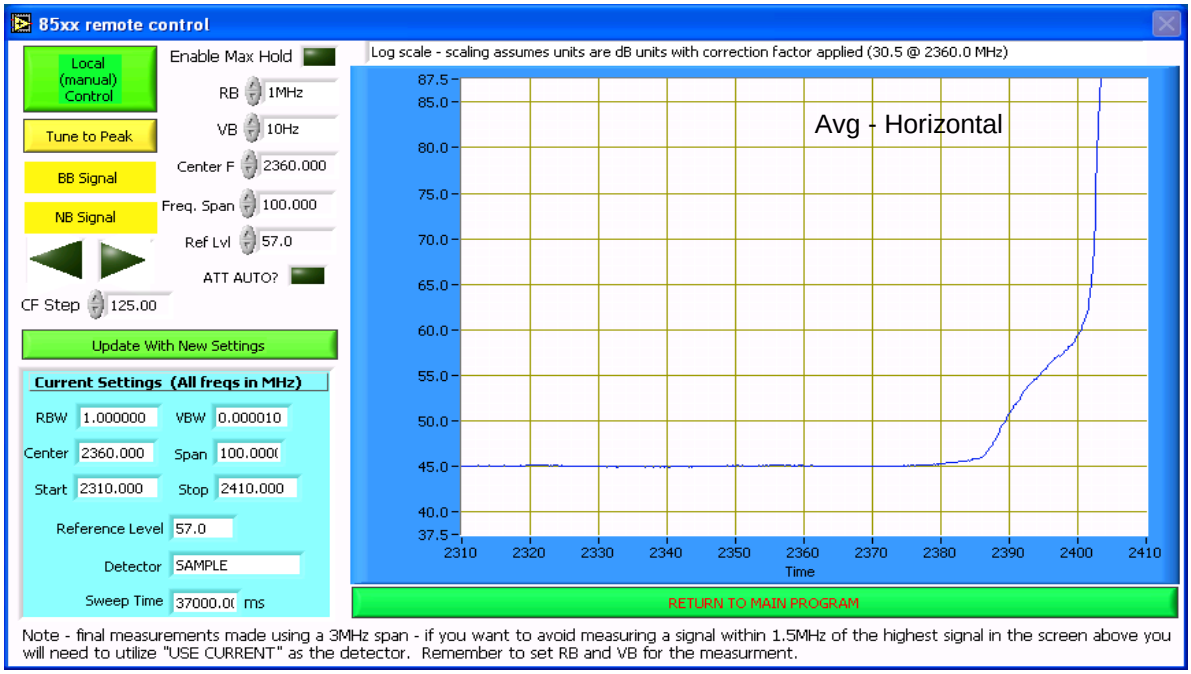
Power Setting: 25.5 Average power: 14.3 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2419.030	91.7	V	-	-	AVG	139	1.1	
2419.030	100.1	V	-	-	PK	139	1.1	
2419.800	90.8	V	-	-	Pk	139	1.1	RB = VB = 100KHz
2417.300	94.6	H	-	-	AVG	247	1.0	
2417.300	103.3	H	-	-	PK	247	1.0	
2414.070	95.8	H	-	-	PK	247	1.0	RB = VB = 100KHz

Band Edge Signal Field Strength

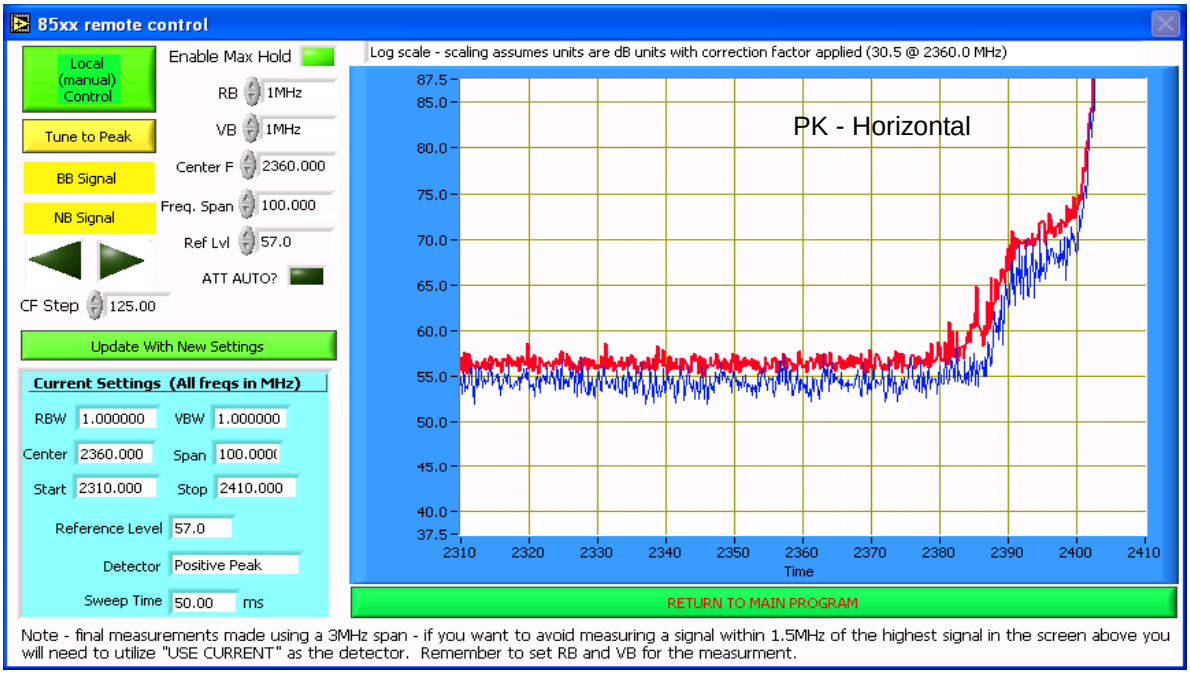
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2389.950	48.9	V	54.0	-5.1	Avg	139	1.1	
2389.960	66.8	V	74.0	-7.2	PK	139	1.1	
2389.950	51.2	H	54.0	-2.8	Avg	247	1.0	
2389.850	69.0	H	74.0	-5.0	PK	247	1.0	



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurment.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1a: Continued



Run #1b: High Channel @ 2462 MHz

Power Setting: 26.0 Average power: 14.6 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

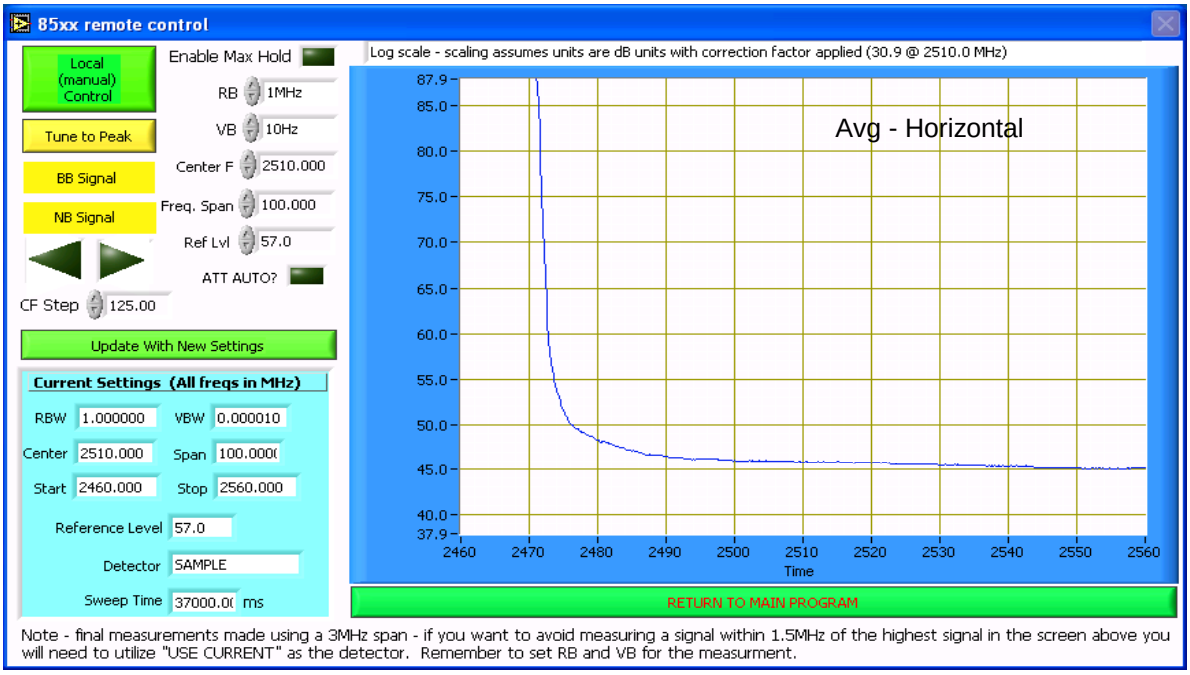
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2468.830	93.4	V	-	-	AVG	162	1.0	
2468.830	102.2	V	-	-	PK	162	1.0	
2459.230	93.9	V	-	-	PK	162	1.0	RB = VB = 100KHz
2455.000	94.4	H	-	-	AVG	247	1.2	
2455.000	102.7	H	-	-	PK	247	1.2	
2455.900	93.0	H	-	-	PK	247	1.2	RB = VB = 100KHz

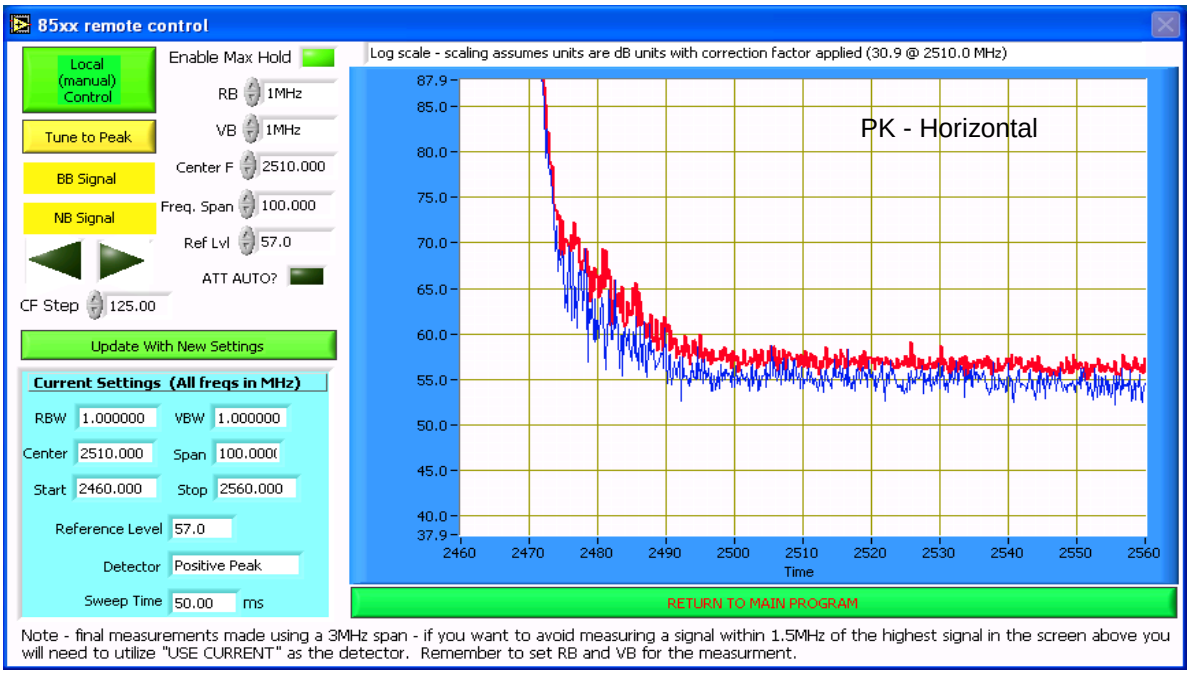
Band Edge Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2483.500	46.9	V	54.0	-7.1	Avg	162	1.0	
2485.290	65.0	V	74.0	-9.0	PK	162	1.0	
2483.500	47.4	H	54.0	-6.6	Avg	247	1.2	
2485.290	65.7	H	74.0	-8.3	PK	247	1.2	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1b: Continued





Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 2400 - 2483.5 MHz)
Radiated Spurious Emissions - 802.11n 40 MHz Universe Antenna

Test Specific Details

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

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 42 %

Summary of Results

Spurious measurements are covered by measuremetns made on 802.11b and 802.11g modes as these two modes had higher emissions than both n modes when evaluated with the other antenna.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n40 Chain A	3 2422MHz	18.5	8.9	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	49.7dBµV/m @ 2389.9MHz (-4.3dB)
1b	802.11n40 Chain A	9 2452MHz	18.5	9.8	Band Edge radiated field strength	FCC Part 15.209 / 15.247(c)	47.2dBµV/m @ 2483.8MHz (-6.8dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, Band Edges. Operating Mode: 802.11n (40 MHz Channel) - Chain A

Date of Test: 5/30/2008
Test Engineer: Joseph Cadigal
Test Location: Fremont Chamber #3

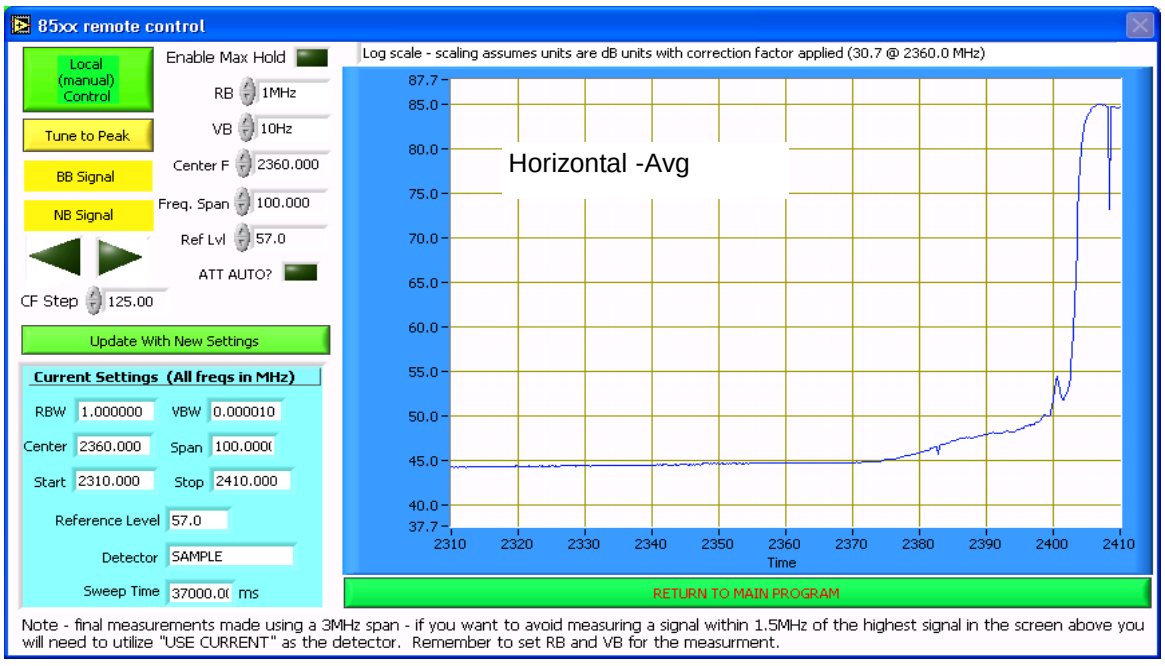
Run #1a: Low Channel @ 2422 MHz
Power Setting: 18.5 Average power: 8.9 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2434.070	86.7	V	-	-	AVG	142	1.0	
2434.070	95.4	V	-	-	PK	142	1.0	
2433.670	86.3	V	-	-	Pk	142	1.0	RB = VB = 100KHz
2409.750	89.5	H	-	-	AVG	214	1.3	
2409.750	99.1	H	-	-	PK	214	1.3	
2421.010	85.8	H	-	-	Pk	214	1.3	RB = VB = 100KHz

Band Edge 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	
2389.870	49.7	H	54.0	-4.3	AVG	214	1.0	
2389.920	49.0	V	54.0	-5.0	AVG	143	1.0	
2389.870	62.5	H	74.0	-11.5	PK	214	1.0	
2389.920	61.3	V	74.0	-12.7	PK	143	1.0	



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurment.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1b: High Channel @ 2452 MHz

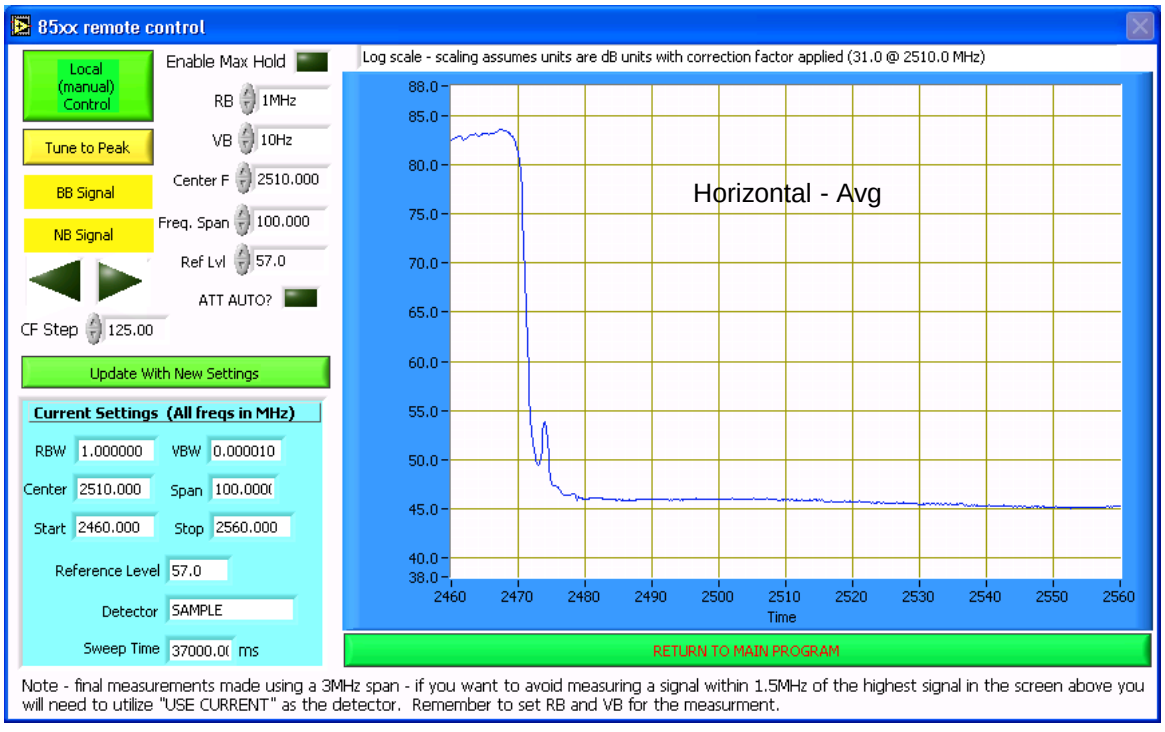
Power Setting: 18.5 Average power: AP = 9.8 (for reference purposes)

Fundamental Signal Field Strength: Peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2441.500	85.0	V	-	-	AVG	169	1.0	
2441.500	94.4	V	-	-	PK	169	1.0	
2453.030	82.2	V	-	-	PK	169	1.0	RB = VB = 100KHz
2436.500	87.6	H	-	-	AVG	250	1.0	
2436.500	95.6	H	-	-	PK	250	1.0	
2453.270	83.8	H	-	-	PK	250	1.0	RB = VB = 100KHz

Band Edge 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	
2483.800	47.2	H	54.0	-6.8	AVG	251	1.0	
2484.170	47.2	V	54.0	-6.8	AVG	169	1.0	
2484.170	58.4	V	74.0	-15.6	PK	169	1.0	
2483.800	58.1	H	74.0	-15.9	PK	251	1.0	



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurment.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 5725 - 5850 MHz)

Radiated Spurious Emissions - 802.11a Universe Antenna

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: 5/30/2008
Test Engineer: Peter Sales
Test Location: Fremont Chamber #4

Config. Used: 1
Config Change: None
EUT Voltage: Powered from Host System

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 15-25 °C
Rel. Humidity: 35-55 %

Summary of Results

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n-20 Chain A	5745	32.0	17.6	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	47.3dBmV/m @ 15736.3MHz (-6.7dB)
1b	802.11n-20 Chain A	5785	34.0	17.9	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	48.3dBmV/m @ 11571.0MHz (-5.7dB)
1c	802.11n-20 Chain A	5825	33.0	17.4	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	51.9dBµV/m @ 11652.1MHz (-2.1dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 40000 MHz. Operating Mode: 802.11a Chain A

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band.

Run #1a: Low Channel @ 5745 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5752.700	91.9	V			PK	123	1.6	RB = VB = 100kHz
5751.470	100.1	H			PK	257	1.4	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	100.1	dBµV/m	
Limit for emissions outside of restricted bands:	70.1	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11492.080	41.7	V	54.0	-12.3	AVG	244	1.3	
11492.080	55.6	V	74.0	-18.4	PK	244	1.3	
15736.280	47.3	H	54.0	-6.7	AVG	335	1.3	
15736.280	59.0	H	74.0	-15.0	PK	335	1.3	
1493.860	40.4	V	54.0	-13.6	Peak	145	1.0	
3000.300	47.6	V	74.0	-26.4	Peak	263	1.0	Note 2

Run #1b: Center Channel @ 5785 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5790.170	94.3	V			PK	189	1.1	RB = VB = 100kHz
5781.330	98.7	H			PK	270	1.3	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	98.7	dBµV/m	
Limit for emissions outside of restricted bands:	68.7	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7701.030	44.3	V	54.0	-9.7	Peak	165	1.9	
3000.430	46.4	V	74.0	-27.6	Peak	263	1.0	Note 2
1494.540	41.6	H	54.0	-12.4	Peak	115	1.6	
16052.430	47.4	H	54.0	-6.6	AVG	28	2.2	
16052.430	58.2	H	74.0	-15.8	PK	28	2.2	
11570.960	48.3	V	54.0	-5.7	AVG	202	1.0	
11570.960	59.2	V	74.0	-14.8	PK	202	1.0	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: High Channel @ 5825 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5818.830	89.1	V	120.0	-30.9	PK	133	1.0	RB = VB = 100kHz
5818.770	99.4	H	120.0	-20.6	PK	266	1.4	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	99.4	dBµV/m	
Limit for emissions outside of restricted bands:	69.4	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11652.090	51.9	V	54.0	-2.1	AVG	201	1.0	
11652.090	64.1	V	74.0	-9.9	PK	201	1.0	
15738.930	47.2	H	54.0	-6.8	AVG	225	1.3	
15738.930	58.6	H	74.0	-15.4	PK	225	1.3	
7776.560	43.8	V	74.0	-30.2	Peak	157	1.3	
3000.150	46.7	V	74.0	-27.3	Peak	268	1.3	Note 2
1494.360	41.6	H	54.0	-12.4	Peak	186	1.6	

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

RSS 210 and FCC 15.247 (DTS, 5725 - 5850 MHz)

Radiated Spurious Emissions - 802.11n Universe Antenna

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: 5/31/2008
Test Engineer: Peter Sales
Test Location: Fremont Chamber #4

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing. All remote support equipment was located approximately 30 meters from the EUT with all I/O connections running on top of the groundplane.

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

Ambient Conditions:

Temperature: 15-25 °C
Rel. Humidity: 35-55 %

Summary of Results

These measurements cover both n20 and n40 operating modes as n20MHz mode had higher emissions than n40MHz mode.

Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
1a	802.11n-20 Chain A	5745	29.0	16.6	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	47.9dBmV/m @ 15746.7MHz (-6.1dB)
1b	802.11n-20 Chain A	5785	30.0	16.6	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	47.5dBmV/m @ 15742.9MHz (-6.5dB)
1c	802.11n-20 Chain A	5825	31.5	16.7	Radiated Emissions, 1 - 40 GHz	FCC Part 15.209 / 15.247(c)	47.9dBmV/m @ 15749.3MHz (-6.1dB)

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	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1: Radiated Spurious Emissions, 1000 - 40000 MHz. Operating Mode: 802.11n 20MHz Chain A

Run #1a : Low Channel @ 5745 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5741.330	88.7	V	120.0	-31.3	PK	127	1.0	RB = VB = 100kHz
5752.770	96.0	H	120.0	-24.0	PK	256	1.3	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	96	dBµV/m	
Limit for emissions outside of restricted bands:	66	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.160	47.7	V	74.0	-26.3	Peak	265	1.0	Note 2
1494.390	41.3	H	54.0	-12.7	Peak	125	1.3	
3000.160	47.7	V	74.0	-26.3	Peak	265	1.0	
1494.390	41.3	H	54.0	-12.7	Peak	125	1.3	
11490.620	37.8	V	54.0	-16.2	AVG	160	1.0	
11490.620	49.7	V	74.0	-24.3	PK	160	1.0	
15746.720	47.9	H	54.0	-6.1	AVG	340	1.3	
15746.720	59.4	H	74.0	-14.6	PK	340	1.3	

Run #1b: Center Channel @ 5785 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5792.670	90.2	V	120.0	-29.8	PK	187	1.4	RB = VB = 100kHz
5777.570	94.7	H	120.0	-25.3	PK	256	1.4	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	94.7	dBµV/m	
Limit for emissions outside of restricted bands:	64.7	dBµV/m	Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.160	47.4	V	74.0	-26.6	Peak	262	1.3	Note 2
1494.490	41.9	V	54.0	-12.1	Peak	348	1.3	
11570.120	45.7	V	54.0	-8.3	AVG	126	1.0	
11570.120	58.2	V	74.0	-15.8	PK	126	1.0	
15742.940	47.5	V	54.0	-6.5	AVG	260	1.6	
15742.940	59.0	V	74.0	-15.0	PK	260	1.6	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band.

Client:	Intel	Job Number:	J70762
Model:	512an HMW	T-Log Number:	T71846
		Account Manager:	Briggs / Eriksen
Contact:	Robert Paxman		
Standard:	RSS 210 / FCC 15.407 UNII (Radiated)	Class:	N/A

Run #1c: High Channel @ 5825 MHz

Fundamental Signal Field Strength: Peak and average values measured in 1 MHz, and peak value measured in 100kHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5828.870	87.5	V	120.0	-32.5	PK	133	1.0	RB = VB = 100kHz
5830.070	93.9	H	120.0	-26.1	PK	181	1.0	RB = VB = 100kHz

Fundamental emission level @ 3m in 100kHz RBW:	100.1	dBµV/m
Limit for emissions outside of restricted bands:	70.1	dBµV/m

Limit is -30dBc (UNII power measurement)

Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11649.630	47.0	V	54.0	-7.0	AVG	201	1.3	
11649.630	59.6	V	74.0	-14.4	PK	201	1.3	
15749.290	47.9	V	54.0	-6.1	AVG	242	1.0	
15749.290	59.9	V	74.0	-14.1	PK	242	1.0	
1494.370	40.9	H	54.0	-13.1	Peak	119	1.6	
3000.280	48.2	V	74.0	-25.8	Peak	263	1.3	Note 2

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 2:	Signal is not in a restricted band.