EMC Test Report

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

Intel® Centrino® Advanced-N + WiMAX 6250, model 622ANXHMW

FCC ID(s):	PD9622ANXH PD9622ANXHU E2K625ANXH
APPLICANT:	Intel Corporation 2111 NE 25th Avenue JF3-302 Hillsboro, OR 97124
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5
REPORT DATE:	September 17, 2009
FINAL TEST DATES:	Aug 7, Aug 12-14, Aug 17, Aug 20-21, Aug 24-25, Aug 28, Sept 1, Sept 3 and Sept 9, 2009

AUTHORIZED SIGNATORY:

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ACCREDITED

Testing Cert #2016-01

REVISION HISTORY

Rev#	Date	Comments	Modified By
		First release	

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SCOPE

An electromagnetic emissions test has been performed on the Intel Corporation Intel® Centrino® Advanced-N + WiMAX 6250, model 622ANXHMW, 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 E requirements for UNII Devices (using FCC DA 02-2138, August 30, 2002)

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003
FCC UNII test procedure 2002-08 DA-02-2138, August 2002

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

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

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

OBJECTIVE

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

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

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 Intel® Centrino® Advanced-N + WiMAX 6250, model 622ANXHMW complied with the requirements of the following regulations:

RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15, Subpart E requirements for UNII Devices

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

The test results recorded herein are based on a single type test of Intel Corporation Intel® Centrino® Advanced-N + WiMAX 6250, model 622ANXHMW and therefore apply only to the tested sample. The sample was selected and prepared by Steve Hackett of Intel Corporation.

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

UNII / LELAN DEVICES

Operation in the 5.15 – 5.25 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407(e)		Indoor operation only	Refer to user's manual	N/A	Complies
15.407(a) (1)		26dB Bandwidth	> 20 MHz	Limits output power if < 20MHz	N/A
15.407 (a) (1)	A9.2(1)	Output Power	802.11a: 15.3 dBm HT20: 15.1 dBm (0.034W) HT40: 15.0 dBm (0.032W)	17dBm	Complies
15.407 (a) (1)	-	Power Spectral Density	.11a: 2.7dBm/MHz HT20: 2.4dBm/MHz HT40: -0.6dBm/MHz	4 dBm/MHz	Complies
-	A9.5 (2)			5 dBm/MHz	Complies
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	38.6dBµV/m @ 114.111MHz	Refer to standard	Complies (-4.9 dB)
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz	52.3dBµV/m @ 5149.5MHz	Refer to standard	Complies (- 1.7 dB)
15.407(a)(6)	-	Peak Excursion Ratio	11.6 dB	< 13dB	Complies

Operation in the 5.25 – 5.35 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	> 20 MHz	N/A – limits output power if < 20MHz	N/A
15.407(a) (2)	A9.2(2)	Output Power	802.11a: 15.2dBm HT20: 14.9dBm (0.033W) HT40: 14.6dBm (0.029 W)	17dBm (50mW)	Complies
15.407(a) (2))	-	Power Spectral Density	a: 2.6dBm/MHz HT20: 2.0dBm/MHz HT40: -1.0dBm/MHz	11 dBm/MHz	Complies
-	A9.2(2) / A9.5 (2)	Power Spectral Density		11 dBm / MHz	Complies
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	38.6dBµV/m @ 114.111MHz	Refer to standard	Complies (-4.9 dB)
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz	52.4dBµV/m @ 5350.0MHz	Refer to standard	Complies (- 1.6 dB)
15.407(a)(6)	-	Peak Excursion Ratio	11.2 dB	< 13dB	Complies

Operation in the 5.47 – 5.725 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	> 20 MHz	N/A – limits output power if < 20MHz	N/A
15.407(a) (2)	A9.2(2)	Output Power	802.11a: 15.4 dBm HT20: 15.4 dBm (0.035W) HT40: 15.5 dBm (0.035 W)	24 dBm / 250mW (eirp < 30dBm)	Complies
15.407(a) (2))		Power Spectral Density	a: 2.8dBm/MHz HT20: 2.6 Bm/MHz HT40: -0.3dBm/MHz	11 dBm/MHz	Complies
	A9.2(2) / A9.5 (2)	Power Spectral Density		11 dBm / MHz	Complies
N/A	A9	Non-operation in 5600 – 5650 MHz sub band	Only applicable to Canada, not evaluated.		-
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	38.6dBµV/m @ 114.111MHz	Refer to standard	Complies (-4.9 dB)
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz	50.2dBµV/m @ 5459.8MHz	Refer to standard	Complies (-3.8 dB)
15.407(a)(6)	-	Peak Excursion Ratio	11.9 dB	< 13dB	Complies

Requirements for all U-NII/LELAN bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	A9.5a	Modulation	Digital Modulation is used – DSS and OFDM with BPSK, QPSK, QAM	Digital modulation is required	Complies
	A9.5 (3)	Channel Selection	Spurious emissions tested at outermost channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15			Measurements on three channels in each band		
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information (Operational Description page 14)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)	A9.5 (5)	Frequency Stability	Frequency stability is better than 20ppm (Operational Description page 14)	Signal shall remain within the allocated band	Complies
15.407 (h1)	A9.4	Transmit Power Control	TPC is not required as the device operates at below 250mW eirp	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Complies
15.407 (h2)	A9.4	Dynamic frequency Selection (device without radar detection)	Move time: 0.53s Closing time: 1.36ms (Refer to test report, R76635)	Channel move time < 10s Channel closing transmission time < 260ms	Complies
	A9.9g	User Manual information	Only applicable to Canada, not evaluated.		Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	UFL connector	Unique connector required	Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	38.6dBµV/m @ 114.111MHz	Refer to standard	Complies (- 4.9 dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	43.3dBµV @ 1.906MHz	Refer to standard	Complies (-12.7dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11 and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Only applicable to Canada, not evaluated.	Statement required regarding non-interference	-
-	RSP 100 RSS GEN 7.1.5	User Manual	Only applicable to Canada, not evaluated.	Statement for products with detachable antenna	-
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	802.11a: 17.1 MHz HT20: 18.3 MHz HT40: 36.6 MHz	Information only	N/A

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

GENERAL

The Intel Corporation Intel® Centrino® Advanced-N + WiMAX 6250, model 622ANXHMW is a PCI express form factor (half-mini) card that is designed to provide a 2x2 802.11abgn and 1x2 802.16e interfaces for host systems such as laptop PCs. The electrical rating of the EUT is 3.3Vdc (via mini PCI bus).

For module-level tests of the transceiver the card was installed into a test fixture that was controlled from a laptop PC. The test fixture exposed the card outside of a host system to meet the modular test requirements of FCC and Industry Canada.

The AC conducted emissions tests were performed with the card installed into the mini-PCI bus of a laptop, as would be the case in normal use.

The samples were received on August 3, 2009 and tested on Aug 7, Aug 12-14, Aug 17, Aug 20-21, Aug 24-25, Aug 28, Sept 1, Sept 3 and Sept 9, 2009. The EUT consisted of the following component(s):

Company	Model	Description	MAC Address	FCC ID
Intel Corporation	622ANXHMW	2x2 802.11abgn PCIe card	001E6400E972	PD9622ANXH
			00150059F1BC	PD9622ANXHU
			00150059F23C	E2K625ANXH
MAC address 001E6400E972 used for AC conducted emissions testing. MAC address 00150059F1BC or 00150059F23C used for all transmitter and radiated spurious measurements. MAC address 00150059F23C used for all rf port measurements.				

ANTENNA SYSTEM

The antenna system used with the Intel Corporation Intel® Centrino® Advanced-N + WiMAX 6250, model 622ANXHMW was a PIFA antenna.

ENCLOSURE

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

MODIFICATIONS

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

SUPPORT EQUIPMENT

The following support equipment was used for spurious radiated emissions and all rf port measurements:

Company	Model	Description	Serial Number	FCC ID
Intel	None	PCIe test fixture		N/A
Dell	-	Laptop PC	Prototype	None
Topward	-	DC Supply		N/A

The following equipment was used when measuring the conducted emissions from the AC power port:

Company	Model	Description	Serial Number	FCC ID
Hewlett Packard	IP26000	Printer	QC2-6844-DB02-01	DoC
Toshiba	PSAG8U-04001W	Host Laptop	49290792Q	DoC
Company	Model	Description	Serial Number	FCC ID
Netgear	FS108	Hub	F518H2BCB092554	-
The ethernet hub was located outside the test chamber.				

EUT INTERFACE PORTS

The I/O cabling configuration for spurious radiated emissions and all rf port measurements was:

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

The I/O cabling configuration for AC power port conducted emissions measurements was:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Laptop Ethernet	Hub	Cat-5	Unshielded	10.0
Laptop USB	Printer	USB	Shielded	1.5
Laptop AC Power	AC Mains	3Wire	Unshielded	1.0

EUT OPERATION

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

For measurements on the radiated spurious emissions generated by the receiver the EUT was being controlled by the Intel CRTU tool to operate in a continuous receive mode on the center channel.

During transmitter tests the EUT was being controlled by the Intel CRTU tool to operate in a continuous transmit mode on the top, bottom or center channel as required and in each of the different modulation modes. The data rates of 1Mb/s for 802.11b, 6Mb/s for 802.11g, 6.5Mb/s for HT20 and 13.0Mb/s for HT40 modes were selected based on preliminary testing that identified those data rates having the highest output power in each mode when the device is operated under EEPROM control, which reduces power as the data rate is increased to ensure signal integrity.

Spurious emissions at the band edges were made with the device operating on the top and bottom channels in each band for each operating mode (802.11a in the 5GHz bands, 802.11b and 802.11g in the 2.4GHz band and both HT20 and HT40 in all bands) for each operating chain (chain A and Chain B). Additionally measurements were made in HT20 and HT40 modes with both chains active simultaneously.

Spurious radiated emissions above 1GHz away from the band edges of the allocated bands were made in single chain mode for the legacy modes (both Chain A and Chain B separately) and with both chains active in HT20 and HT40 modes. In the MIMO modes the output power per chain was set to the highest single chain power setting to ensure both single- and dual-chain power levels were covered by the one set of measurements (the output power per chain is higher in single-chain mode to obtain the same total output power as MIMO mode).

Spurious emissions at the rf port were made in single chain mode (Chain A and Chain B separately) for the legacy and HT20 and HT40 modes. For HT20 and HT40 modes the limit of -27dBm eirp was adjusted to account for antenna gain and then by an extra -3dB to account for the fact that two chains may be active simultaneously.

Preliminary measurements for the spurious emissions below 1GHz indicated that emissions below 1Ghz were independent of the operating frequency and operating mode (transmit versus receive), therefore the final measurements were made with the device in transmit mode, both chains A and B active and tuned to 2437 MHz in HT20 mode.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on Aug 7, Aug 12-14, Aug 17, Aug 20-21, Aug 24-25, Aug 28, Sept 1, Sept 3 and Sept 9, 2009 at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

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

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

CONDUCTED EMISSIONS CONSIDERATIONS

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

RADIATED EMISSIONS CONSIDERATIONS

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

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

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

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

INSTRUMENT CONTROL COMPUTER

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

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

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

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

FILTERS/ATTENUATORS

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

ANTENNAS

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

ANTENNA MAST AND EQUIPMENT TURNTABLE

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

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

INSTRUMENT CALIBRATION

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

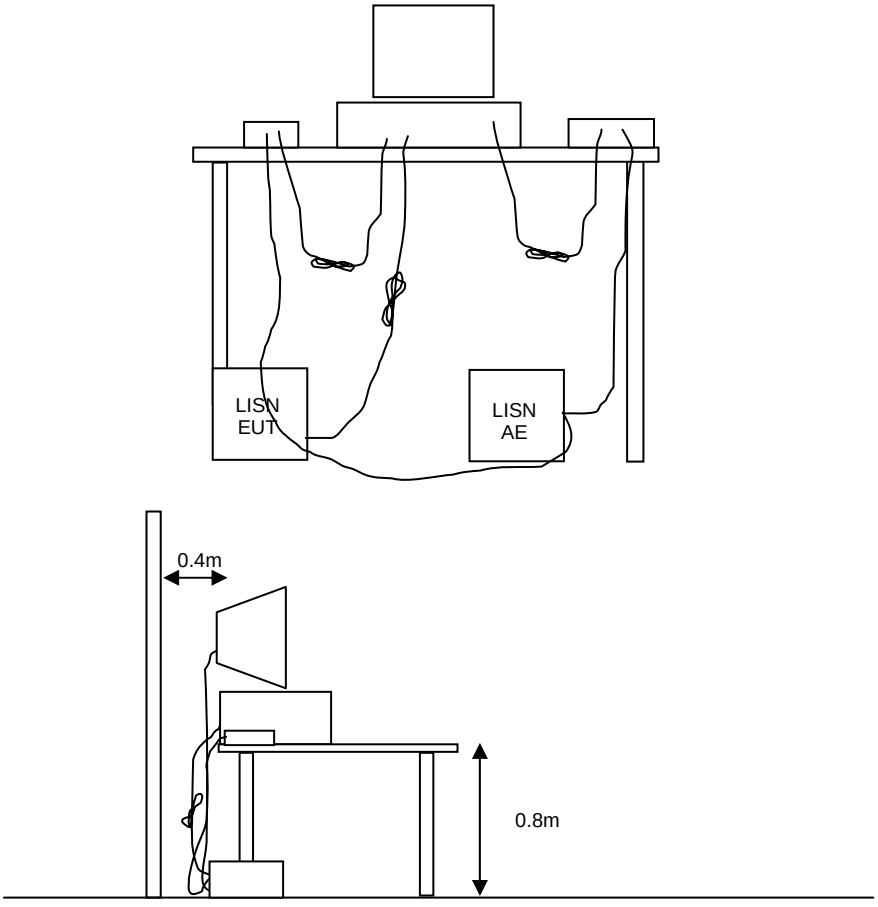
TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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



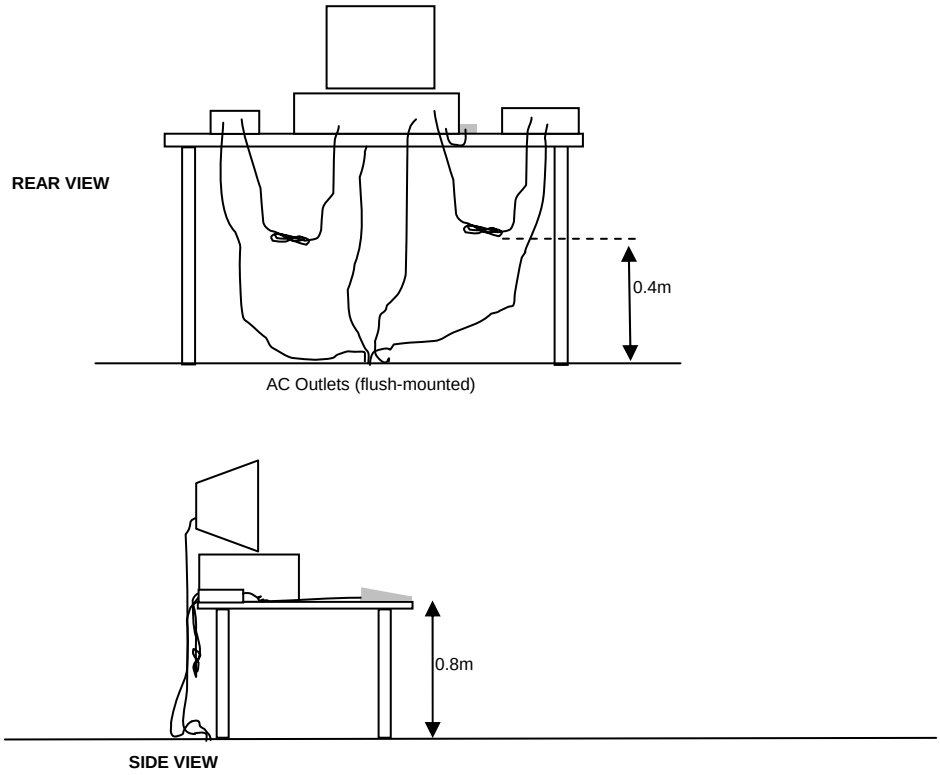
RADIATED EMISSIONS

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

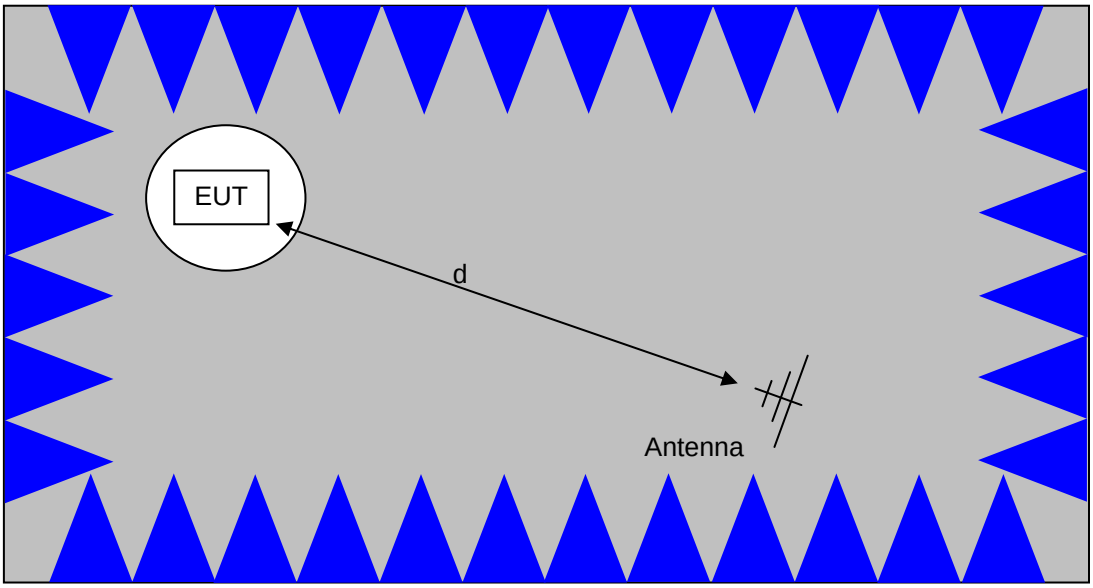
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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

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

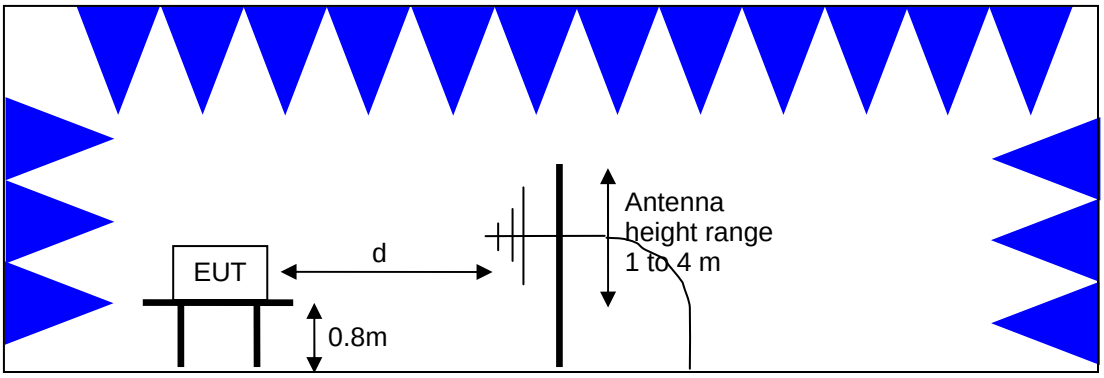


Typical Test Configuration for Radiated Field Strength Measurements



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

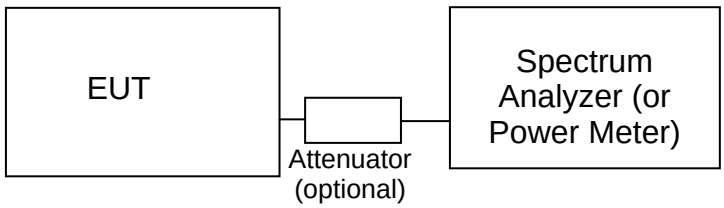
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



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

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and Elliott's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

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:

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

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

FCC 15.407 (a) OUTPUT POWER LIMITS

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
5150 - 5250	50mW (17 dBm)	4 dBm/MHz
5250 - 5350	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

The peak excursion envelope is limited to 13dB.

OUTPUT POWER LIMITS –LELAN DEVICES

The table below shows the limits for output power and output power density defined by RSS 210. 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
5150 - 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 - 5350	250 mW (24 dBm)[2] 1W (30dBm) eirp	11 dBm/MHz
5470 - 5725	250 mW (24 dBm)[3] 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm) 4W eirp	17 dBm/MHz

In addition, the power spectral density limit shall be reduced by 1dB for every dB the highest power spectral density exceeds the "average" power spectral density) by more than 3dB. The "average" power spectral density is determined by dividing the output power by 10log(EBW) where EBW is the 99% power bandwidth.

Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

[2] If EIRP exceeds 500mW the device must employ TPC
[3] If EIRP exceeds 500mW the device must employ TPC

SPURIOUS LIMITS –UNII and LELAN DEVICES

The spurious emissions limits for signals below 1GHz are the FCC/RSS-GEN general limits. For emissions above 1GHz, signals in restricted bands are subject to the FCC/RSS GEN general limits. All other signals have a limit of –27dBm/MHz, which is a field strength of 68.3dBuV/m/MHz at a distance of 3m. This is an average limit so the peak value of the emission may not exceed –7dBm/MHz (68.3dBuV/m/MHz at a distance of 3m). For devices operating in the 5725-5850Mhz bands under the LELAN/UNII rules, the limit within 10Mhz of the allocated band is increased to –17dBm/MHz.

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

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \text{ microvolts per meter}$$

where P is the eirp (Watts)

Appendix A Test Equipment Calibration Data

Manufacturer	Description	Model #	Asset #	Cal Due
AC Conducted Emissions				
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	18-Mar-10
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1593	09-Jun-10
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	26-Feb-10
Fischer Custom Comm	LISN, 25A, 150kHz to 30MHz, 25 Amp,	FCC-LISN-50-25-2-09	2001	15-Oct-09
Transmitter/Receiver Spurious Emissions 30 – 1000 MHz				
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	13-Jun-10
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	26-Feb-10
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1632	13-Apr-10
Receiver Spurious Emissions 1,000 – 18,000 MHz				
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	02-Sep-10
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	20-Oct-09
Transmitter Spurious Emissions 1,000 – 40,000 MHz and rf Port measurements				
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	09-Oct-09
EMCO	Antenna, Horn, 1-18 GHz	3115	786	06-Dec-09
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	02-Sep-10
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	22-Jun-10
Hewlett Packard	SpectAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	10-Apr-10
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1422	06-Nov-09
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1555	28-Jan-10
Rohde & Schwarz	Attenuator, 20 dB , 50 ohm, 10W, DC-18 GHz	20dB, 10W, Type N	1556	28-Jan-10
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	07-Oct-09
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	07-Oct-09
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	20-Oct-09
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	05-Mar-10
Hewlett Packard	Head (Inc W1-W4, 1946, 1947) Purple	84125C	1772	6-May-10
A.H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	17-Mar-10

Appendix B Test Data

T76369 (AC conducted emissions, transmitter spurious emissions 30 – 1000 MHz, receiver spurious emissions)	19 Pages
T76443 (Transmitter rf port measurements, transmitter radiated emissions 1 – 40GHz)	132 Pages

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		-
Emissions Standard(s):	RSS 210 / FCC 15.247	Class:	DTS
Immunity Standard(s):	N/A	Environment:	-

EMC Test Data

For The

Intel

Model

2x2 WiFi with WiMax MiniPCI

Date of Last Test: 8/25/2009

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS

Conducted Emissions - Module Installed in Laptop

(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: 8/7/2009
Test Engineer: Peter Sales
Test Location: Chamber #3

Config. Used: 1
Config Change: None
Host Unit Voltage 230V/50Hz and 120V/Hz

General Test Configuration

For tabletop equipment, the host system was located on a wooden table inside the semi-anechoic chamber, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment. 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: 23 °C
Rel. Humidity: 40 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 230V/50Hz	EN55022 Class B	Pass	49.6dBµV @ 1.916MHz (-6.4dB)
2	CE, AC Power,120V/60Hz	FCC 15.207 FCC Class B	Pass	43.3dBµV @ 1.906MHz (-12.7dB)

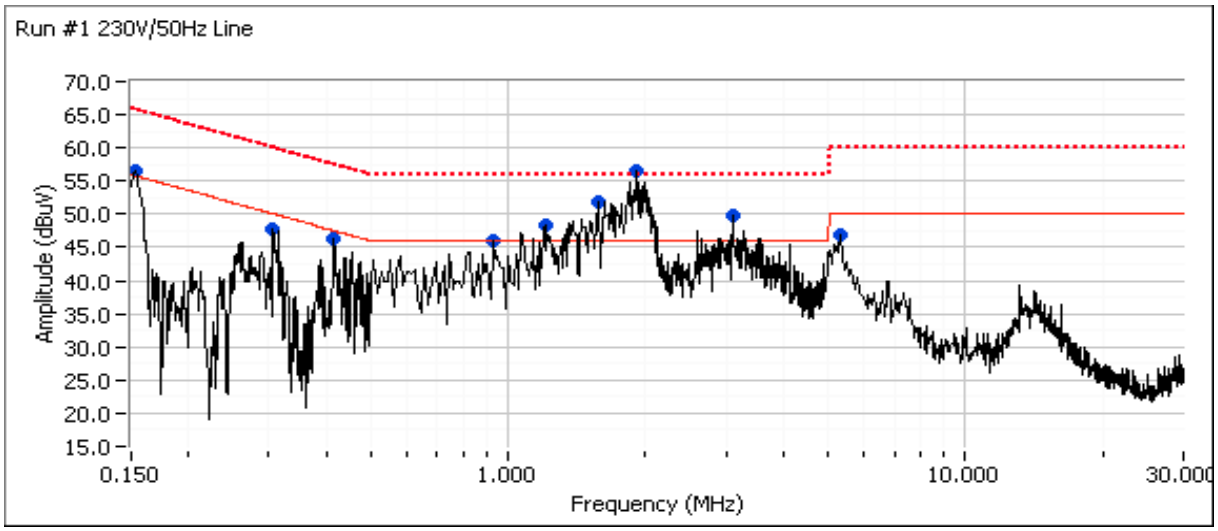
Modifications Made During Testing

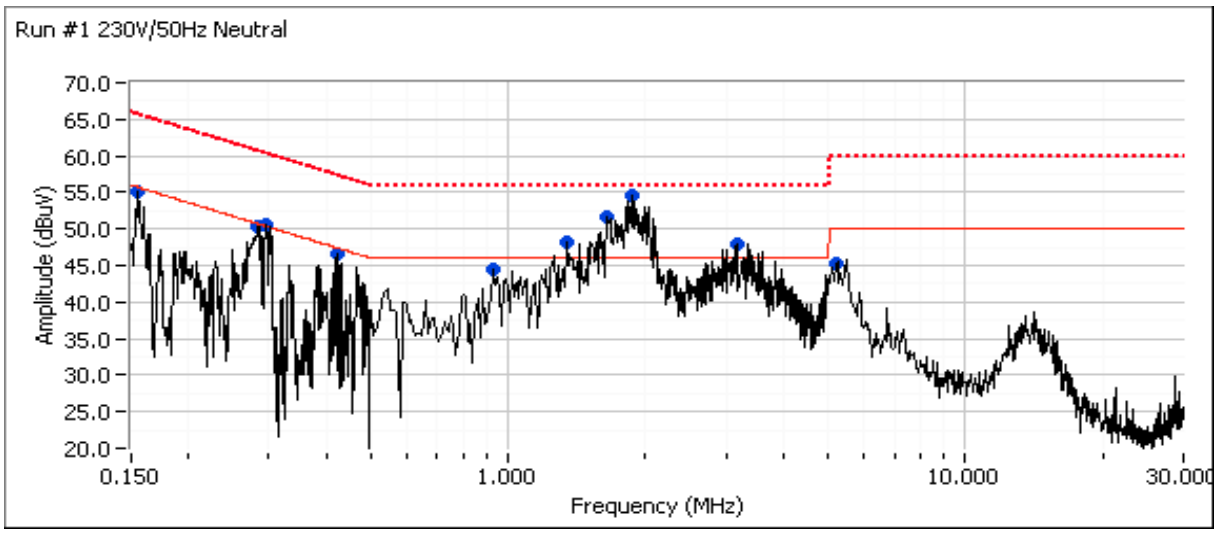
No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS





Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz Continued next page...

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS

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

Frequency	Level	AC	EN 55022 Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.916	56.6	Line	46.0	10.6	Peak	
1.584	52.0	Line	46.0	6.0	Peak	
3.111	49.8	Line	46.0	3.8	Peak	
1.186	48.4	Line	46.0	2.4	Peak	
0.153	56.4	Line	55.8	0.6	Peak	
0.296	50.5	Neutral	50.4	0.1	Peak	
0.940	45.9	Line	46.0	-0.1	Peak	
0.284	50.4	Neutral	50.7	-0.3	Peak	
0.151	55.1	Neutral	55.7	-0.6	Peak	
0.423	46.6	Neutral	47.4	-0.8	Peak	
0.415	46.2	Line	47.5	-1.3	Peak	
0.306	47.8	Line	50.1	-2.3	Peak	
5.373	47.0	Line	50.0	-3.0	Peak	
5.241	45.3	Neutral	50.0	-4.7	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	EN 55022 Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.916	49.6	Line	56.0	-6.4	QP	QP (1.00s)
1.916	35.8	Line	46.0	-10.2	AVG	AVG (0.10s)
0.151	55.6	Neutral	65.9	-10.3	QP	QP (1.00s)
1.584	45.3	Line	56.0	-10.7	QP	QP (1.00s)
0.153	52.6	Line	65.8	-13.2	QP	QP (1.00s)
1.186	41.8	Line	56.0	-14.2	QP	QP (1.00s)
0.296	45.9	Neutral	60.4	-14.5	QP	QP (1.00s)
0.284	46.1	Neutral	60.7	-14.6	QP	QP (1.00s)
3.111	41.3	Line	56.0	-14.7	QP	QP (1.00s)
1.584	30.5	Line	46.0	-15.5	AVG	AVG (0.10s)
0.940	40.5	Line	56.0	-15.5	QP	QP (1.00s)
3.111	30.1	Line	46.0	-15.9	AVG	AVG (0.10s)
0.423	41.4	Neutral	57.4	-16.0	QP	QP (1.00s)
0.415	41.3	Line	57.5	-16.2	QP	QP (1.00s)
0.306	43.6	Line	60.1	-16.5	QP	QP (1.00s)
0.151	39.0	Neutral	55.9	-16.9	AVG	AVG (0.10s)
0.153	36.2	Line	55.8	-19.6	AVG	AVG (0.10s)
1.186	25.2	Line	46.0	-20.8	AVG	AVG (0.10s)
0.940	24.3	Line	46.0	-21.7	AVG	AVG (0.10s)
5.373	37.9	Line	60.0	-22.1	QP	QP (1.00s)
0.284	28.6	Neutral	50.7	-22.1	AVG	AVG (0.10s)
0.296	28.2	Neutral	50.4	-22.2	AVG	AVG (0.10s)

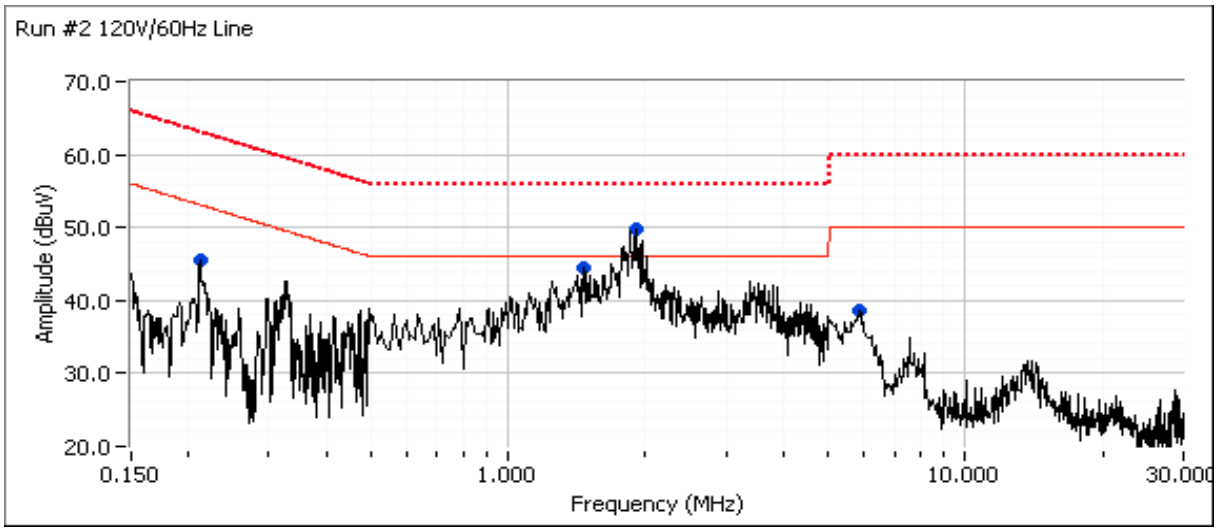
Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz Continued next page...

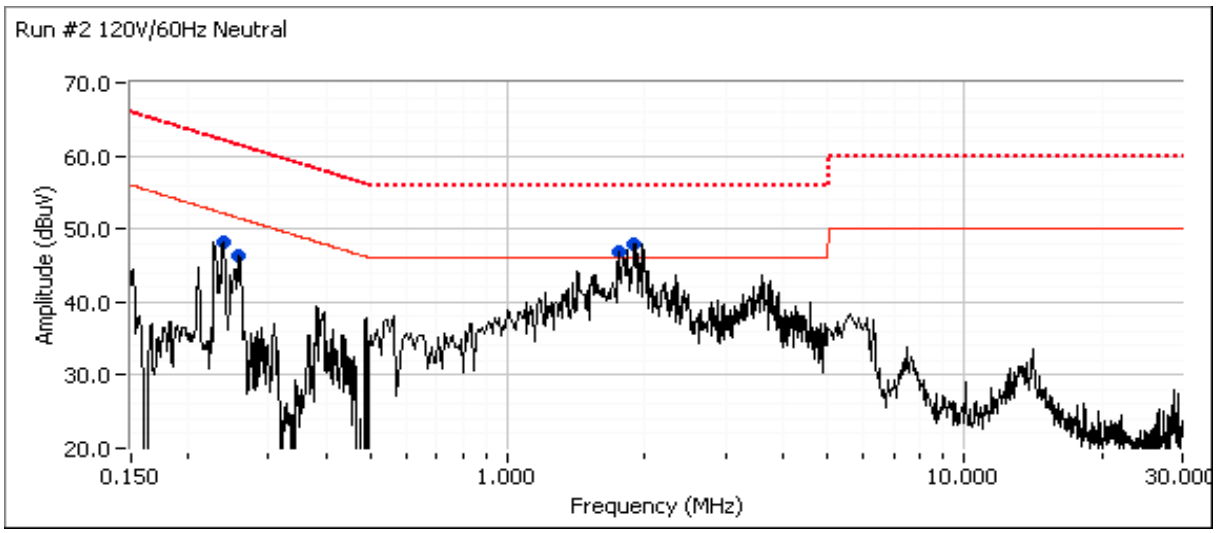
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS

Frequency	Level	AC	EN 55022 Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
5.241	37.8	Neutral	60.0	-22.2	QP	QP (1.00s)
0.415	24.4	Line	47.5	-23.1	AVG	AVG (0.10s)
5.373	25.5	Line	50.0	-24.5	AVG	AVG (0.10s)
5.241	25.5	Neutral	50.0	-24.5	AVG	AVG (0.10s)
0.423	22.8	Neutral	47.4	-24.6	AVG	AVG (0.10s)
0.306	24.2	Line	50.1	-25.9	AVG	AVG (0.10s)

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz





Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz Continued next page...

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS

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

Frequency	Level	AC	EN 55022 Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.906	49.9	Line	46.0	3.9	Peak	
1.898	47.8	Neutral	46.0	1.8	Peak	
1.744	46.9	Neutral	46.0	0.9	Peak	
1.465	44.5	Line	46.0	-1.5	Peak	
0.238	48.1	Neutral	52.2	-4.1	Peak	
0.259	46.3	Neutral	51.5	-5.2	Peak	
0.212	45.4	Line	53.1	-7.7	Peak	
5.852	38.5	Line	50.0	-11.5	Peak	

Final quasi-peak and average readings

Frequency	Level	AC	EN 55022 Class B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.906	43.3	Line	56.0	-12.7	QP	QP (1.00s)
1.898	43.1	Neutral	56.0	-12.9	QP	QP (1.00s)
1.906	30.0	Line	46.0	-16.0	AVG	AVG (0.10s)
1.744	39.9	Neutral	56.0	-16.1	QP	QP (1.00s)
1.898	29.5	Neutral	46.0	-16.5	AVG	AVG (0.10s)
1.744	28.1	Neutral	46.0	-17.9	AVG	AVG (0.10s)
1.465	37.9	Line	56.0	-18.1	QP	QP (1.00s)
0.238	44.1	Neutral	62.2	-18.1	QP	QP (1.00s)
0.259	42.4	Neutral	61.5	-19.1	QP	QP (1.00s)
1.465	26.2	Line	46.0	-19.8	AVG	AVG (0.10s)
0.212	40.4	Line	63.1	-22.7	QP	QP (1.00s)
0.259	26.7	Neutral	51.5	-24.8	AVG	AVG (0.10s)
0.238	25.9	Neutral	52.2	-26.3	AVG	AVG (0.10s)
5.852	22.5	Line	50.0	-27.5	AVG	AVG (0.10s)
0.212	25.5	Line	53.1	-27.6	AVG	AVG (0.10s)
5.852	32.0	Line	60.0	-28.0	QP	QP (1.00s)

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

Date of Test: See runs Config. Used: Module - installed in fixture

General Test Configuration

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

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 43 %

Summary of Results

Sample #2 MAC Address: 00150059F23C; CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
1	Tx and RX	Note 1	-	-	Radiated Emissions 30 - 1000 MHz	RSS 210 / FCC 15.209	38.6dBµV/m @ 114.111MHz (-4.9dB)
2	Receive - Chain A	#6 2437 MHz	-	-	Radiated Emissions, 1 -7.5 GHz	RSS 210	47.7dBµV/m @ 3000.4MHz (-6.3dB)
	Receive Chain A+B	#6 2437 MHz	-	-			47.8dBµV/m @ 3000.4MHz (-6.2dB)
3	Receive - Chain A	#40 5200MHz	-	-	Radiated Emissions, 1 - 18 GHz	FCC 15.209 / 15 E	45.9dBµV/m @ 6000.7MHz (-8.1dB)
	Receive - Chain A	#60 5300 MHz	-	-			47.2dBµV/m @ 3000.4MHz (-6.8dB)
	Receive - Chain A	#120 5600MHz	-	-			47.1dBµV/m @ 3000.4MHz (-6.9dB)
	Receive - Chain A	#157 5785 MHz	-	-			47.0dBµV/m @ 3000.4MHz (-7.0dB)
	Receive Chain A+B	#40 5200MHz	-	-	Radiated Emissions, 1 - 18 GHz	FCC 15.209 / 15 E	46.8dBµV/m @ 3000.4MHz (-7.2dB)
		#60 5300 MHz	-	-			45.4dBµV/m @ 6000.8MHz (-8.6dB)
		#120 5600MHz	-	-			Not tested, single chain was worst case for all other channels
		#157 5785 MHz	-	-			

1: Scans indicated that emissions below 1Ghz were independent of operating channel and operating mode (transmit versus receive).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

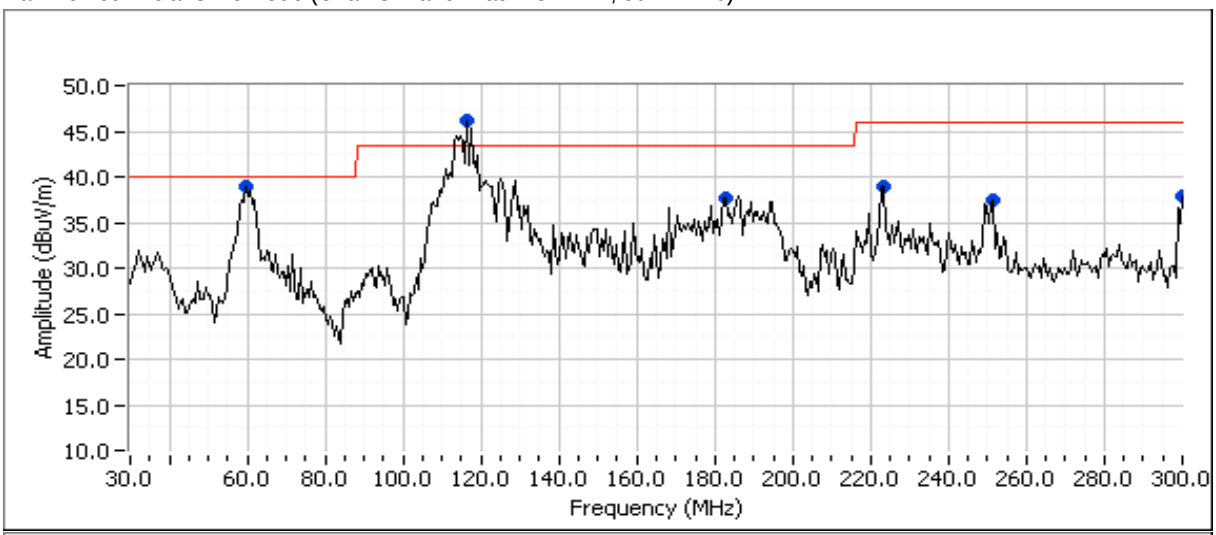
Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz

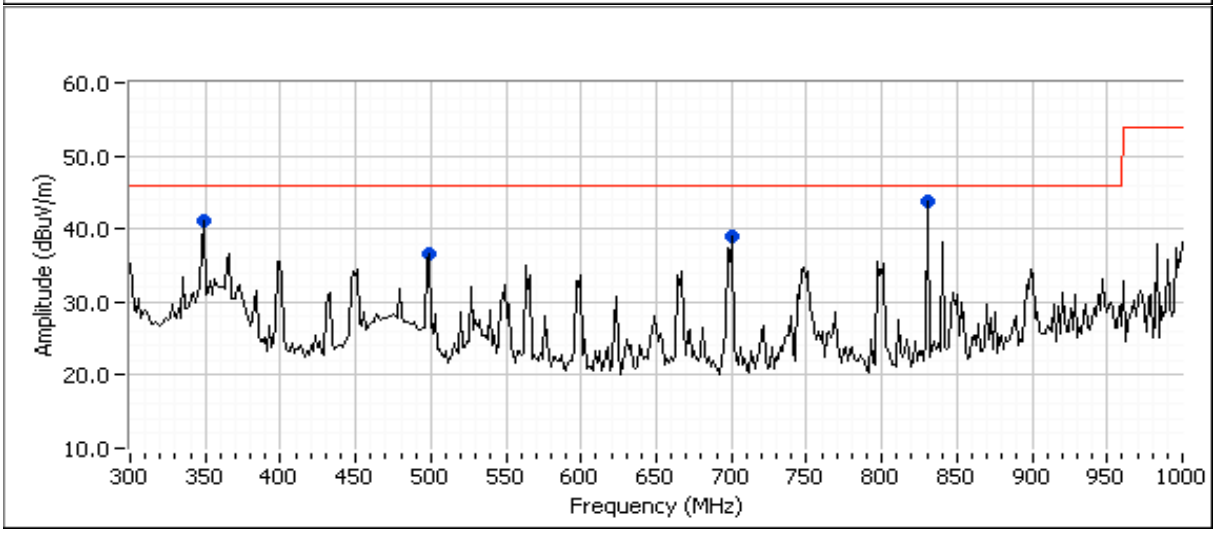
Date of Test: 8/17/2009 Test Location: FT Chamber #4

Test Engineer: Suhaila Config Change: none

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

Run #1a: Device in transmit mode (Chains A and B at 2437 MHz, 802.11n20)





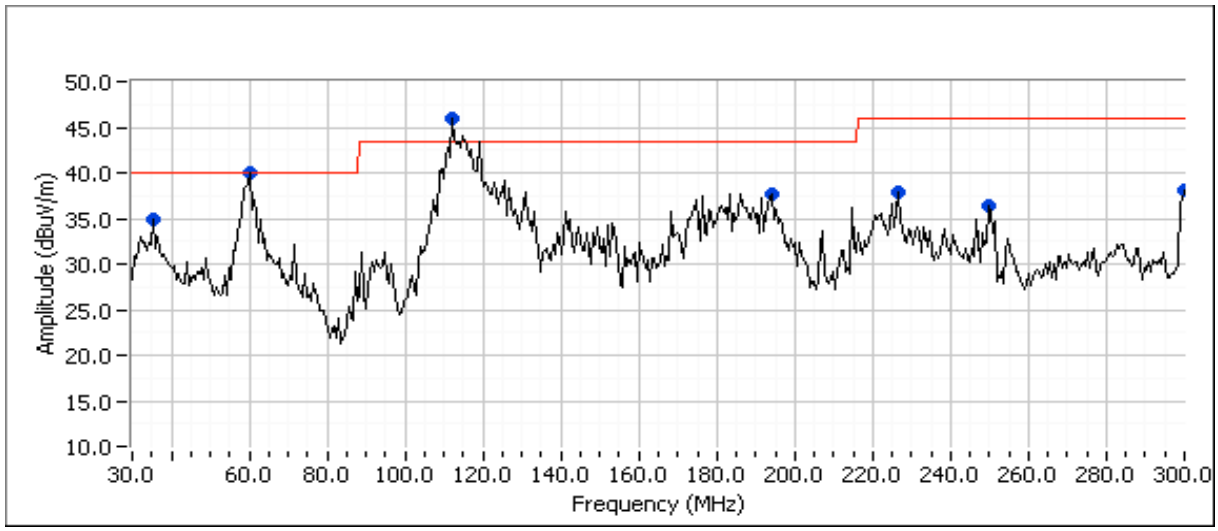
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

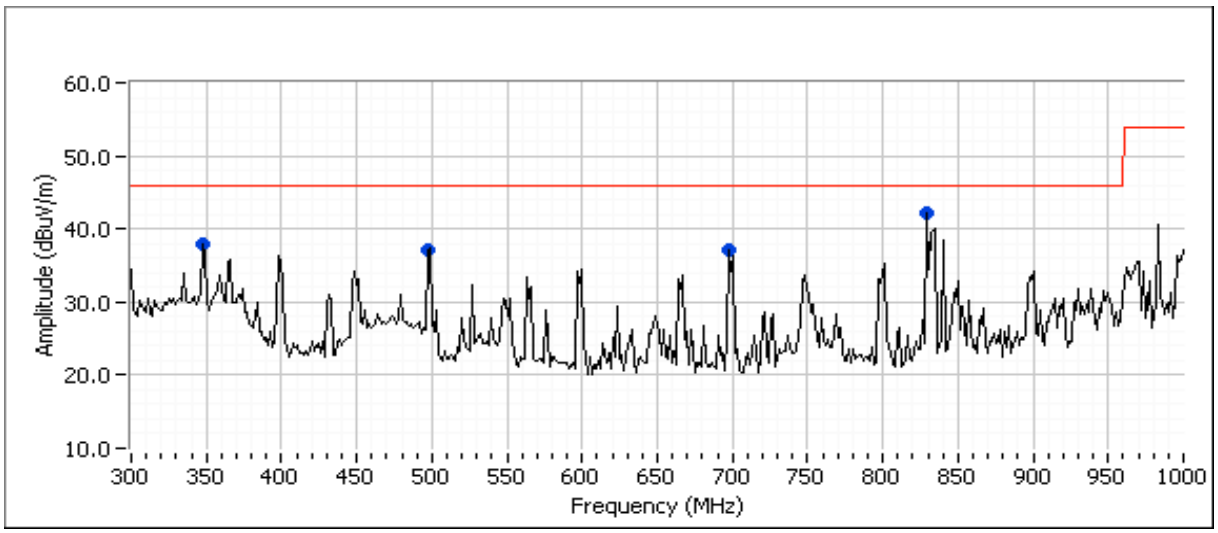
Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
117.044	46.1	H	43.5	2.6	Peak	116	1.5	
59.084	38.9	V	40.0	-1.1	Peak	112	3.0	
823.821	43.8	V	46.0	-2.2	Peak	18	1.0	
348.972	41.2	H	46.0	-4.8	Peak	139	1.0	
185.004	37.7	H	43.5	-5.8	Peak	343	1.0	
221.440	38.9	H	46.0	-7.1	Peak	232	2.0	
699.113	38.9	H	46.0	-7.1	Peak	119	1.0	
299.318	37.8	H	46.0	-8.2	Peak	89	1.0	
250.778	37.4	H	46.0	-8.6	Peak	55	1.0	
497.978	36.7	V	46.0	-9.3	Peak	5	1.0	

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1b: Device in transmit mode (Chains A and B at 5600 MHz, 802.11n20)





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Preliminary peak readings captured during pre-scan

Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
114.111	45.9	H	43.5	2.4	Peak	108	1.5	
59.733	39.9	V	40.0	-0.1	Peak	101	2.5	
827.133	42.1	V	46.0	-3.9	Peak	22	4.0	
37.191	35.0	V	40.0	-5.0	Peak	155	1.0	
195.133	37.6	H	43.5	-5.9	Peak	10	1.5	
299.102	38.0	H	46.0	-8.0	Peak	104	1.0	
226.148	37.9	H	46.0	-8.1	Peak	235	1.5	
349.533	37.8	H	46.0	-8.2	Peak	148	1.0	
499.662	37.2	V	46.0	-8.8	Peak	0	1.0	
699.000	37.0	H	46.0	-9.0	Peak	121	1.0	
249.555	36.4	H	46.0	-9.6	Peak	230	1.0	

Run #1c: Maximized quasi-peak readings - worst case from 1a and 1b

Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
114.111	38.6	H	43.5	-4.9	QP	126	1.5	QP (1.00s)
59.733	30.0	V	40.0	-10.0	QP	65	2.0	QP (1.00s)
349.533	35.4	H	46.0	-10.6	QP	127	1.0	QP (1.00s)
37.191	29.1	V	40.0	-10.9	QP	113	1.0	QP (1.00s)
299.102	35.0	H	46.0	-11.0	QP	83	1.0	QP (1.00s)
499.662	34.6	V	46.0	-11.4	QP	10	1.1	QP (1.00s)
699.000	34.3	H	46.0	-11.7	QP	112	1.2	QP (1.00s)
226.148	32.7	H	46.0	-13.3	QP	233	1.4	QP (1.00s)
195.133	29.9	H	43.5	-13.6	QP	27	1.0	QP (1.00s)
249.555	32.3	H	46.0	-13.7	QP	219	1.0	QP (1.00s)
827.133	16.5	V	46.0	-29.5	QP	0	3.5	QP (1.00s)

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

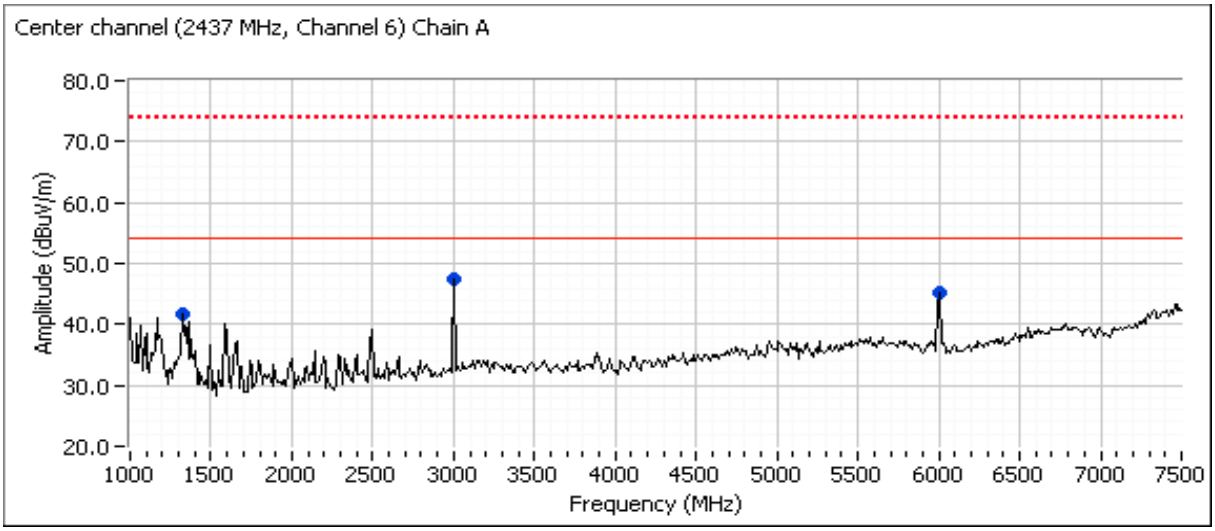
Run #2, Receiver Radiated Spurious Emissions, 1,000 - 7,500 MHz. Operation in the 2.4 GHz Band

Date of Test: 8/25/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Run #2a: Center channel (2437MHz, channel 6), Chain A

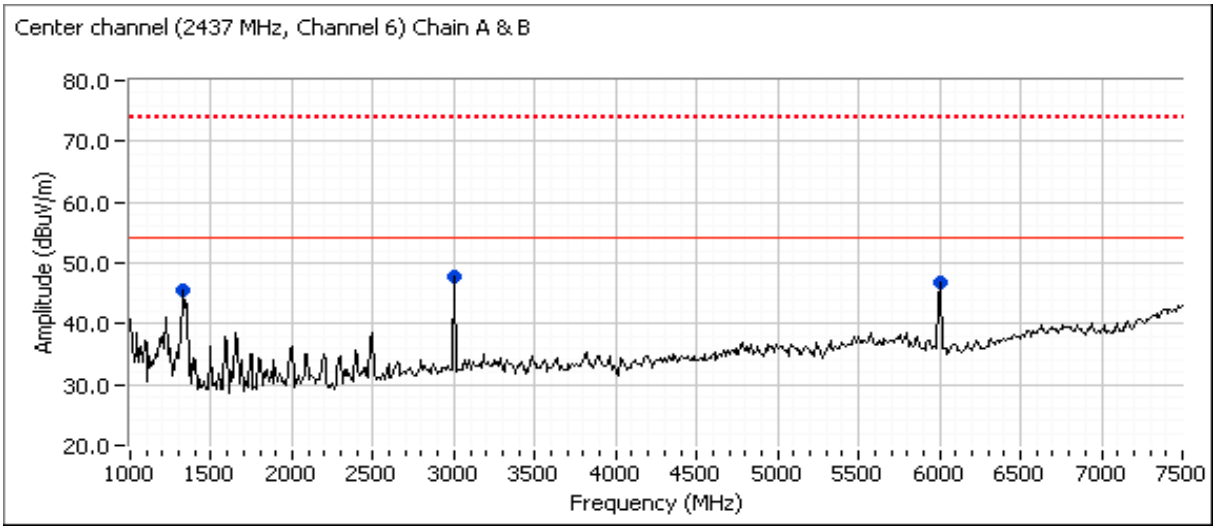
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.380	47.7	V	54.0	-6.3	AVG	267	1.0	MHz; VB: 10 Hz
3000.300	51.2	V	74.0	-22.8	PK	267	1.0	MHz; VB: 1 MHz
6000.730	45.2	V	54.0	-8.8	AVG	147	1.0	MHz; VB: 10 Hz
6000.560	49.6	V	74.0	-24.4	PK	147	1.0	MHz; VB: 1 MHz
1327.640	26.9	V	54.0	-27.1	AVG	141	1.0	MHz; VB: 10 Hz
1327.240	48.9	V	74.0	-25.1	PK	141	1.0	MHz; VB: 1 MHz



Run #2b: Center channel (2437MHz, channel 6), Chain A and B

Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.440	47.8	V	54.0	-6.2	AVG	265	1.0	MHz; VB: 10 Hz
3000.400	50.8	V	74.0	-23.2	PK	265	1.0	MHz; VB: 1 MHz
1329.540	32.1	V	54.0	-21.9	AVG	110	1.0	MHz; VB: 10 Hz
1327.800	55.1	V	74.0	-18.9	PK	110	1.0	MHz; VB: 1 MHz
6000.870	46.7	V	54.0	-7.3	AVG	102	1.0	MHz; VB: 10 Hz
6000.770	50.3	V	74.0	-23.7	PK	102	1.0	MHz; VB: 1 MHz

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



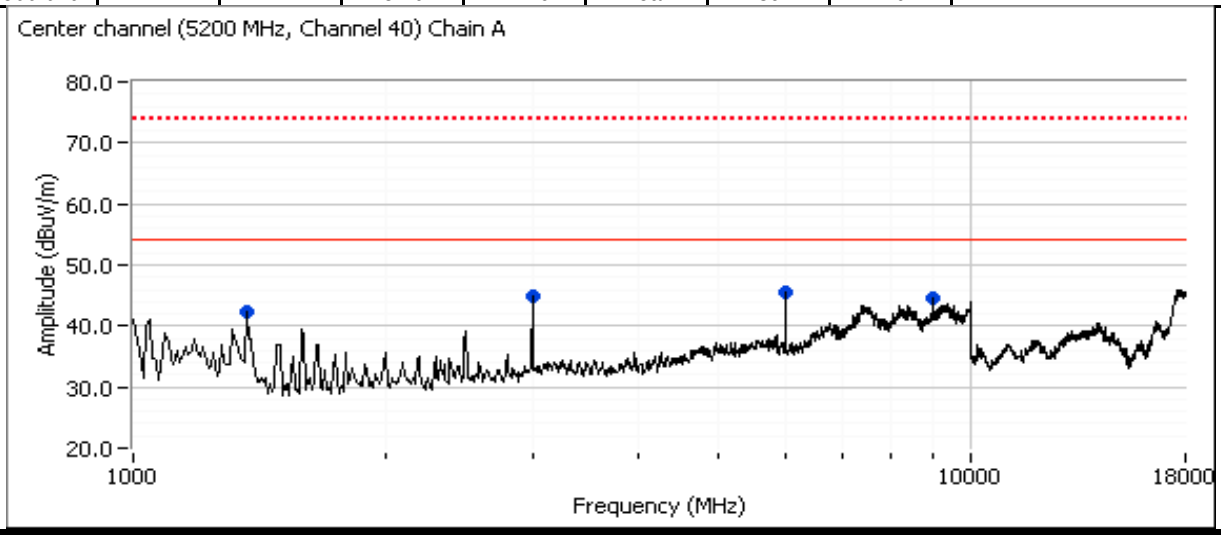
Run #3, Receiver Radiated Spurious Emissions, 1,000 - 18,000 MHz. Operation in the 5GHz Bands

Date of Test: 8/25/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Run #3a: Center channel 5150 - 5250 MHz (5200MHz, channel 40), Chain A

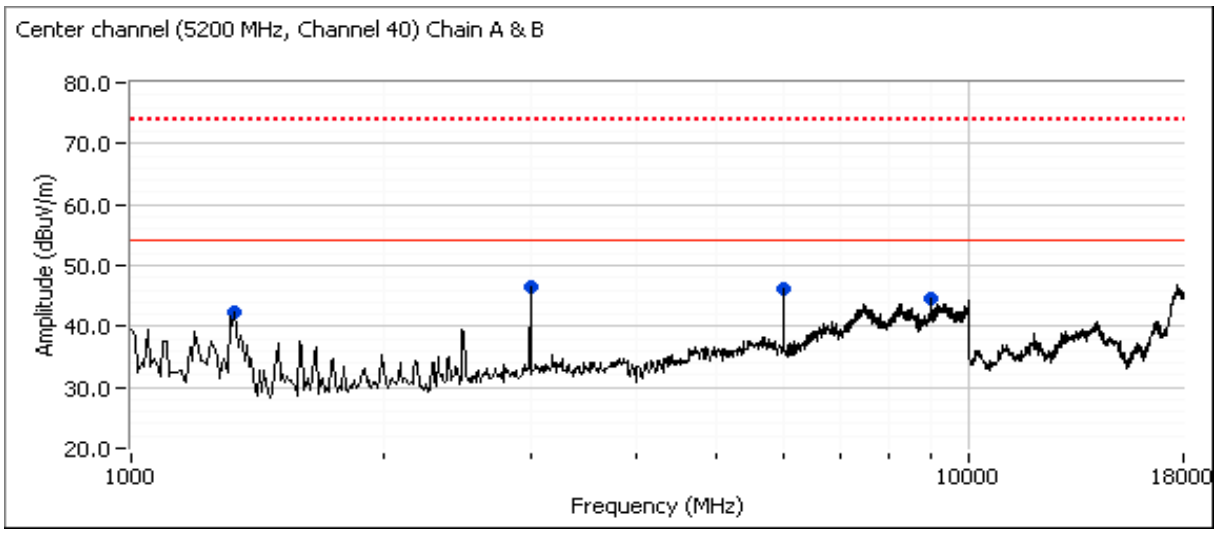
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.720	45.9	V	54.0	-8.1	AVG	102	1.0	MHz; VB: 10 Hz
6000.730	49.5	V	74.0	-24.5	PK	102	1.0	MHz; VB: 1 MHz
3000.360	44.8	V	54.0	-9.2	AVG	99	1.6	MHz; VB: 10 Hz
3000.420	48.8	V	74.0	-25.2	PK	99	1.6	MHz; VB: 1 MHz
9001.080	43.1	V	54.0	-10.9	AVG	132	1.0	MHz; VB: 10 Hz
9000.930	50.2	V	74.0	-23.8	PK	132	1.0	MHz; VB: 1 MHz
1366.670	42.4	V	54.0	-11.6	Peak	89	1.0	



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3b: Center channel 5150 - 5250 MHz (5200MHz, channel 40), Chain A and B

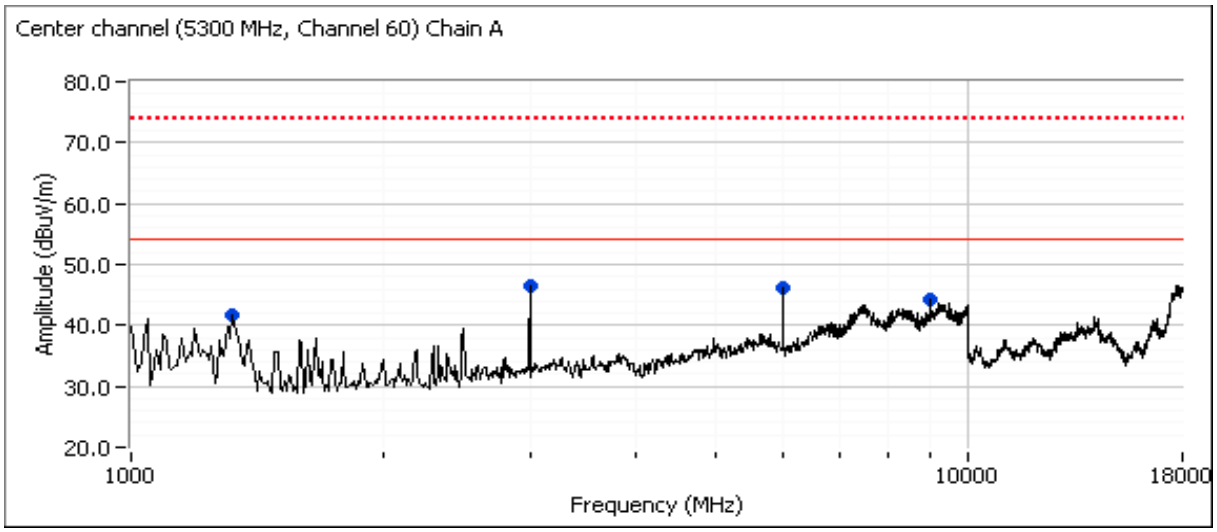
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.360	46.8	V	54.0	-7.2	AVG	263	1.0	MHz; VB: 10 Hz
3000.360	50.8	V	74.0	-23.2	PK	263	1.0	MHz; VB: 1 MHz
6000.740	46.1	V	54.0	-7.9	AVG	98	1.0	MHz; VB: 10 Hz
6000.580	49.4	V	74.0	-24.6	PK	98	1.0	MHz; VB: 1 MHz
9001.030	42.1	V	54.0	-11.9	AVG	135	1.0	MHz; VB: 10 Hz
9000.940	49.5	V	74.0	-24.5	PK	135	1.0	MHz; VB: 1 MHz
1330.000	42.4	V	54.0	-11.6	Peak	97	1.9	



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3c: Center channel 5250 - 5350 MHz (5300MHz, channel 60), Chain A

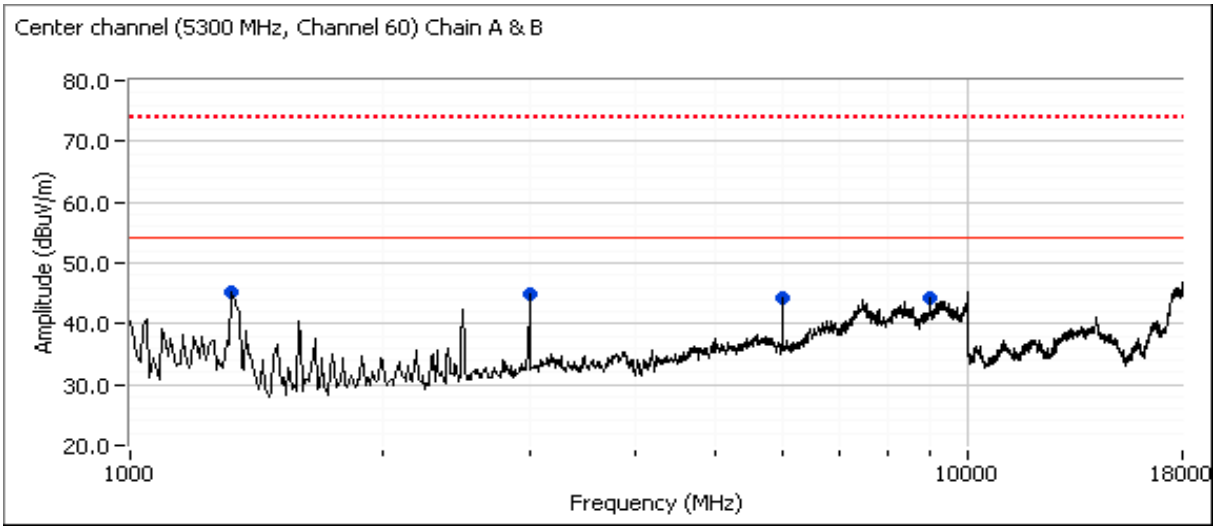
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.360	47.2	V	54.0	-6.8	AVG	261	1.0	MHz; VB: 10 Hz
3000.290	51.1	V	74.0	-22.9	PK	261	1.0	MHz; VB: 1 MHz
9001.080	43.8	V	54.0	-10.2	AVG	132	1.0	MHz; VB: 10 Hz
9001.050	51.0	V	74.0	-23.0	PK	132	1.0	MHz; VB: 1 MHz
6000.750	45.8	V	54.0	-8.2	AVG	270	1.7	MHz; VB: 10 Hz
6000.590	50.9	V	74.0	-23.1	PK	270	1.7	MHz; VB: 1 MHz
1320.830	41.8	V	54.0	-12.2	Peak	108	1.6	



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3d: Center channel 5250 - 5350 MHz (5300MHz, channel 60), Chain A and B

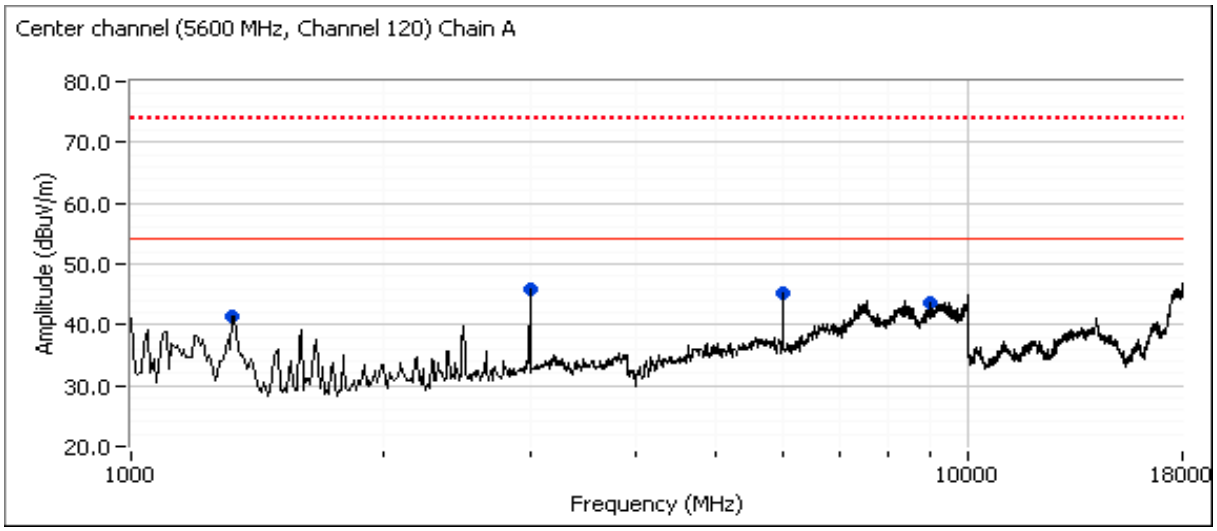
Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
6000.750	45.4	V	54.0	-8.6	AVG	270	1.8	MHz; VB: 10 Hz
6000.850	49.6	V	74.0	-24.4	PK	270	1.8	MHz; VB: 1 MHz
1328.170	32.1	V	54.0	-21.9	AVG	109	1.0	MHz; VB: 10 Hz
1328.510	57.3	V	74.0	-16.7	PK	109	1.0	MHz; VB: 1 MHz
9001.080	43.2	V	54.0	-10.8	AVG	133	1.0	MHz; VB: 10 Hz
9001.030	50.6	V	74.0	-23.4	PK	133	1.0	MHz; VB: 1 MHz
3000.390	44.5	H	54.0	-9.5	AVG	215	1.3	MHz; VB: 10 Hz
3000.230	49.0	H	74.0	-25.0	PK	215	1.3	MHz; VB: 1 MHz



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3e: Center channel 5470 - 5725 MHz (5600MHz, channel 120), Chain A

Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.360	47.1	V	54.0	-6.9	AVG	267	1.0	MHz; VB: 10 Hz
6000.720	45.7	V	54.0	-8.3	AVG	268	1.8	MHz; VB: 10 Hz
9001.050	41.8	V	54.0	-12.2	AVG	190	1.0	MHz; VB: 10 Hz
1320.830	41.3	V	54.0	-12.7	Peak	120	1.9	
3000.400	50.7	V	74.0	-23.3	PK	267	1.0	MHz; VB: 1 MHz
6000.690	50.8	V	74.0	-23.2	PK	268	1.8	MHz; VB: 1 MHz
9000.880	49.6	V	74.0	-24.4	PK	190	1.0	MHz; VB: 1 MHz



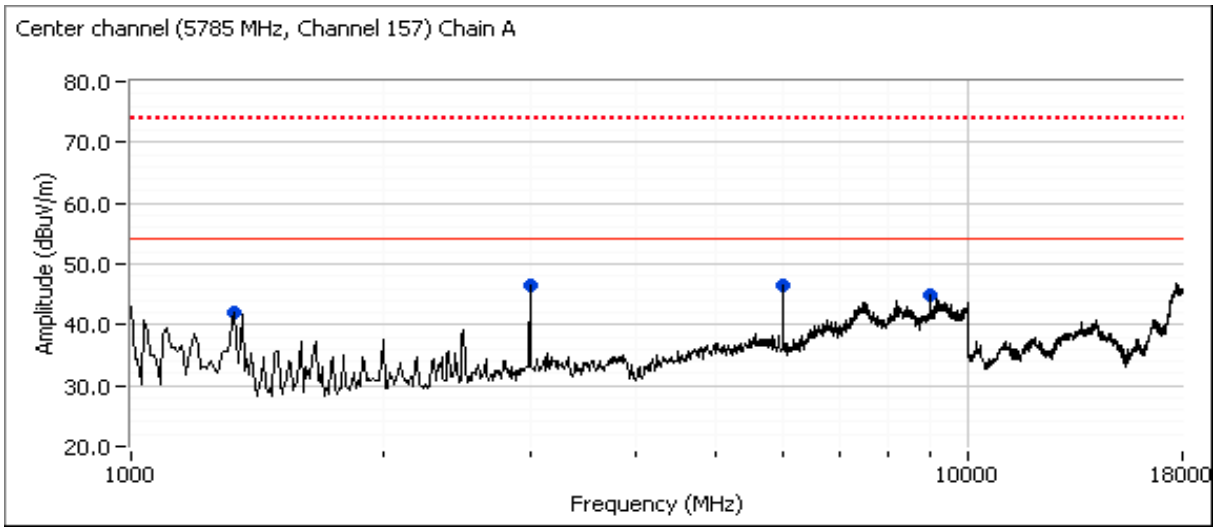
Run #3f: Center channel 5470 - 5725 MHz (5600MHz, channel 120), Chain A and B

Not performed - previous measurements in 5150 - 5350 MHz frequency range demonstrated that emissions with the single chain active were representative of the emissions with both chains active.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3g: Center channel 5725 - 5850 MHz (5785MHz, channel 157), Chain A

Frequency	Level	Pol	RSS 210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.390	47.0	V	54.0	-7.0	AVG	264	1.0	MHz; VB: 10 Hz
3000.370	50.7	V	74.0	-23.3	PK	264	1.0	MHz; VB: 1 MHz
6000.740	45.8	V	54.0	-8.2	AVG	269	1.8	MHz; VB: 10 Hz
6000.440	50.0	V	74.0	-24.0	PK	269	1.8	MHz; VB: 1 MHz
9001.040	41.3	V	54.0	-12.7	AVG	176	1.1	MHz; VB: 10 Hz
9001.110	49.3	V	74.0	-24.7	PK	176	1.1	MHz; VB: 1 MHz
1330.000	42.1	V	54.0	-11.9	Peak	98	1.0	



Run #3h: Center channel 5725 - 5850 MHz (5785MHz, channel 157), Chain A and B

Not performed - previous measurements in 5150 - 5350 MHz frequency range demonstrated that emissions with the single chain active were representative of the emissions with both chains active.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		-
Emissions Standard(s):	RSS 210 / FCC 15.247	Class:	DTS
Immunity Standard(s):	N/A	Environment:	-

EMC Test Data

For The

Intel

Model

2x2 WiFi with WiMax MiniPCI

Date of Last Test: 9/11/2009

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements - Single Chain Modes, 5150 - 5250 MHz
Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 8/28/2009
Test Engineer: Rafael Varelas
Test Location: FT Chamber #4

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

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 22.4 °C
Rel. Humidity: 43 %

Summary of Results

Sample #2 MAC Address: 00150059F23C; CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	802.11a: 15.3 dBm HT20: 15.1 dBm HT40: 15.0 dBm
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	802.11a: 2.7dBm/MHz HT20: 2.4dBm/MHz HT40: -0.6dBm/MHz
1	26dB Bandwidth	15.407	-	802.11a: 30.8 MHz HT20: 35.6 MHz HT40: 64.3 MHz
1	99% Bandwidth	RSS 210	-	802.11a: 17.0 MHz HT20: 18.2 MHz HT40: 36.3 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	802.11a: 10.4 dB HT20: 10.6 dB HT40: 11.6 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b)	Pass	All emissions below the -27dB/MHz limit

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Bandwidth, Output Power and Power spectral Density

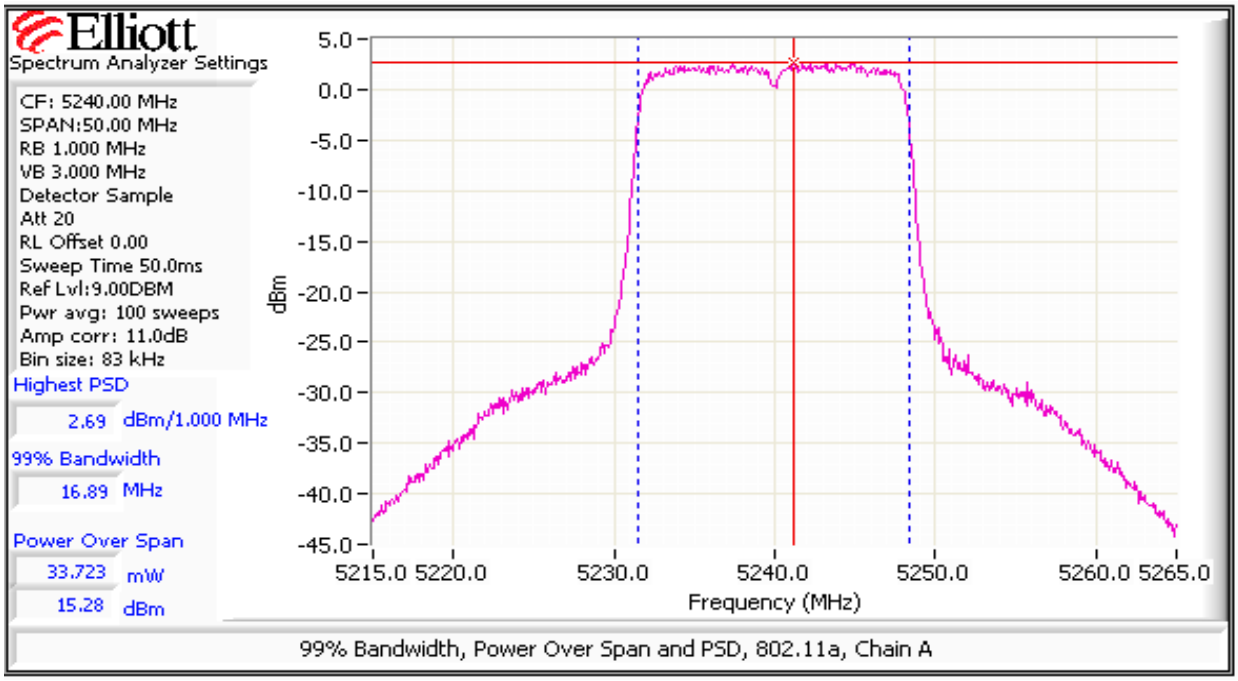
Antenna Gain (dBi): 3.6

Frequency (MHz)	*Average Power*	Bandwidth		Output Power[1] dB		Power (Watts)	PSD[2] dB/MHz			Result
		26dB	99%[4]	Measured	Limit		Measured	FCC Limit	RSS Limit[3]	
Chain A, 802.11a Mode										
5180	*16.6*	28.3	17.0	15.1	17.0	0.033	2.4	4.0	6.4	Pass
5200	*16.7*	28.0	16.9	14.8	17.0	0.030	2.3	4.0	6.4	Pass
5240	*16.8*	30.8	16.9	15.3	17.0	0.034	2.7	4.0	6.4	Pass
Chain B, 802.11a Mode										
5180	*16.7*	29.3	16.9	14.7	17.0	0.030	2.1	4.0	6.4	Pass
5200	*16.6*	30.4	16.9	14.7	17.0	0.030	2.0	4.0	6.4	Pass
5240	*16.6*	28.3	16.9	14.9	17.0	0.031	2.3	4.0	6.4	Pass
Chain A, HT20 Mode										
5180	*16.7*	30.8	18.2	15.0	17.0	0.032	2.4	4.0	6.4	Pass
5200	*16.7*	31.8	18.2	14.8	17.0	0.030	1.9	4.0	6.4	Pass
5240	*16.8*	32.3	18.2	15.1	17.0	0.032	2.3	4.0	6.4	Pass
Chain B, HT20 Mode										
5180	*16.6*	32.3	18.2	14.6	17.0	0.029	1.7	4.0	6.4	Pass
5200	*16.6*	31.2	18.2	14.6	17.0	0.029	1.7	4.0	6.4	Pass
5240	*16.6*	35.6	18.2	14.7	17.0	0.030	2.0	4.0	6.4	Pass
Chain A, HT40 Mode										
5190	*16.0*	51.3	36.3	14.3	17.0	0.027	-1.3	4.0	6.4	Pass
5230	*16.8*	51.7	36.3	15.0	17.0	0.032	-0.6	4.0	6.4	Pass
Chain B, HT40 Mode										
5190	*16.0*	54.3	36.3	14.2	17.0	0.026	-1.6	4.0	6.4	Pass
5230	*16.8*	64.3	36.3	14.8	17.0	0.030	-1.0	4.0	6.4	Pass

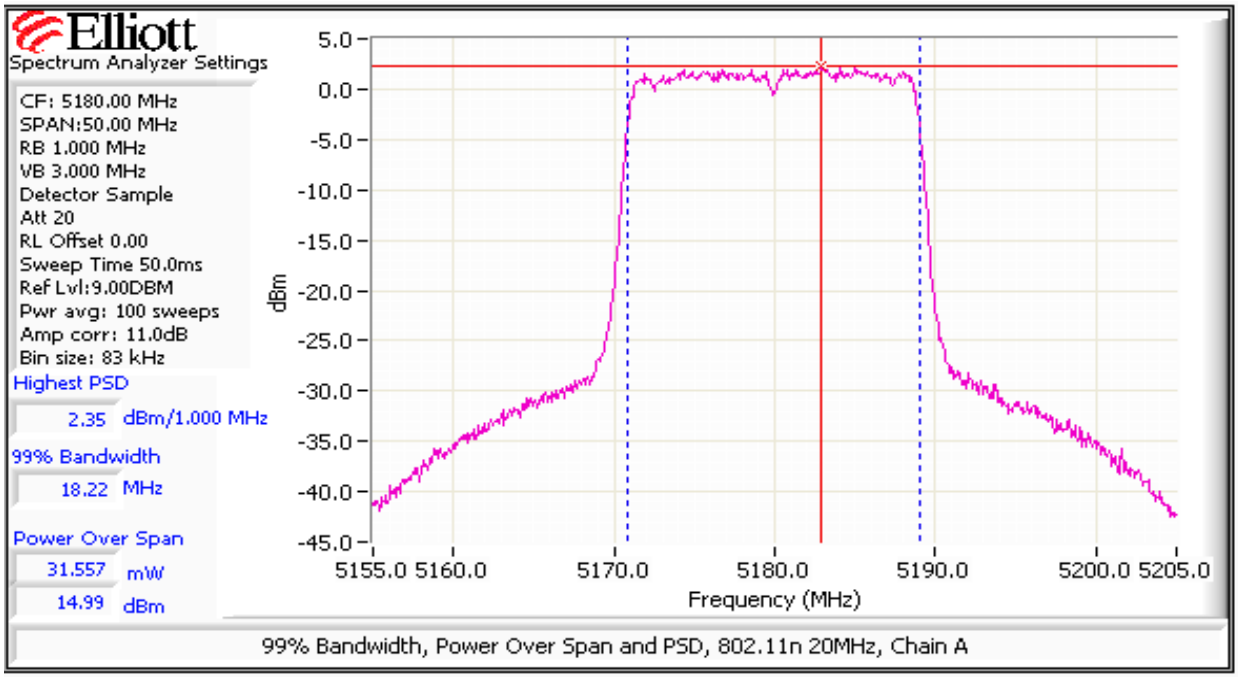
Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50MHz for the 20Mhz channel spacing and 80MHz for the 40MHz channel Spacing.
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dB/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	*Average Power listed was measured with an average power meter and is for manufacturer's reference only.*

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Plots for the channel(s) in each mode with the highest power and psd

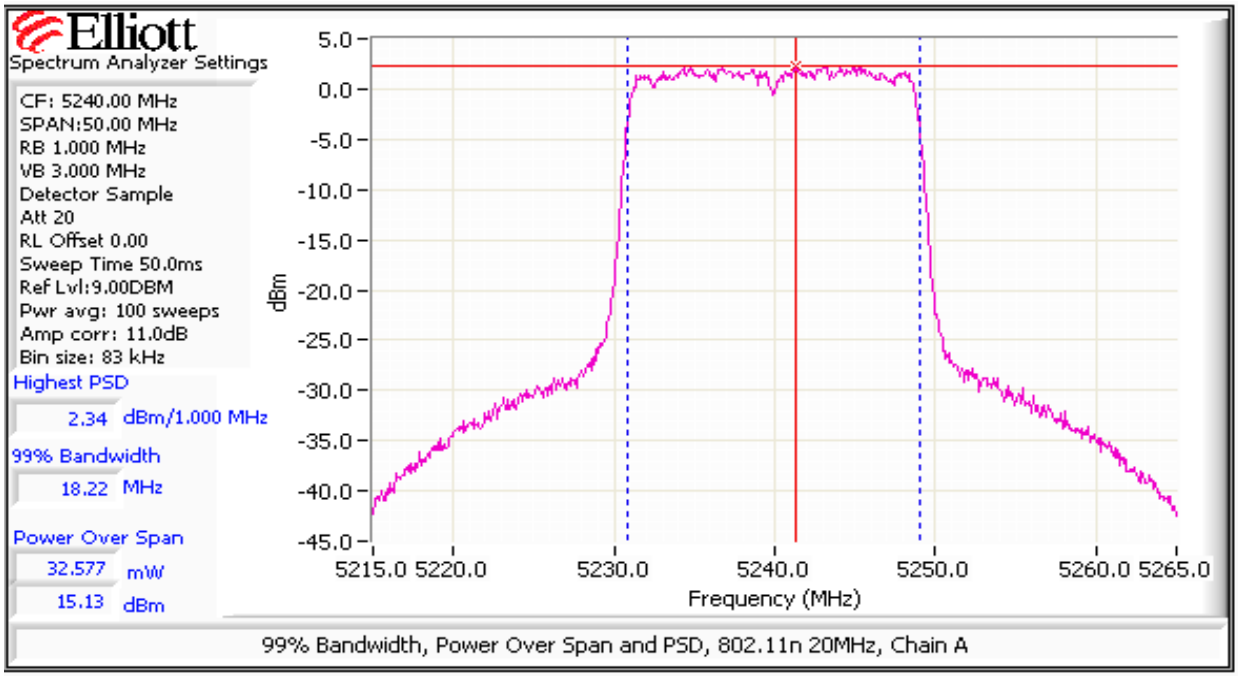


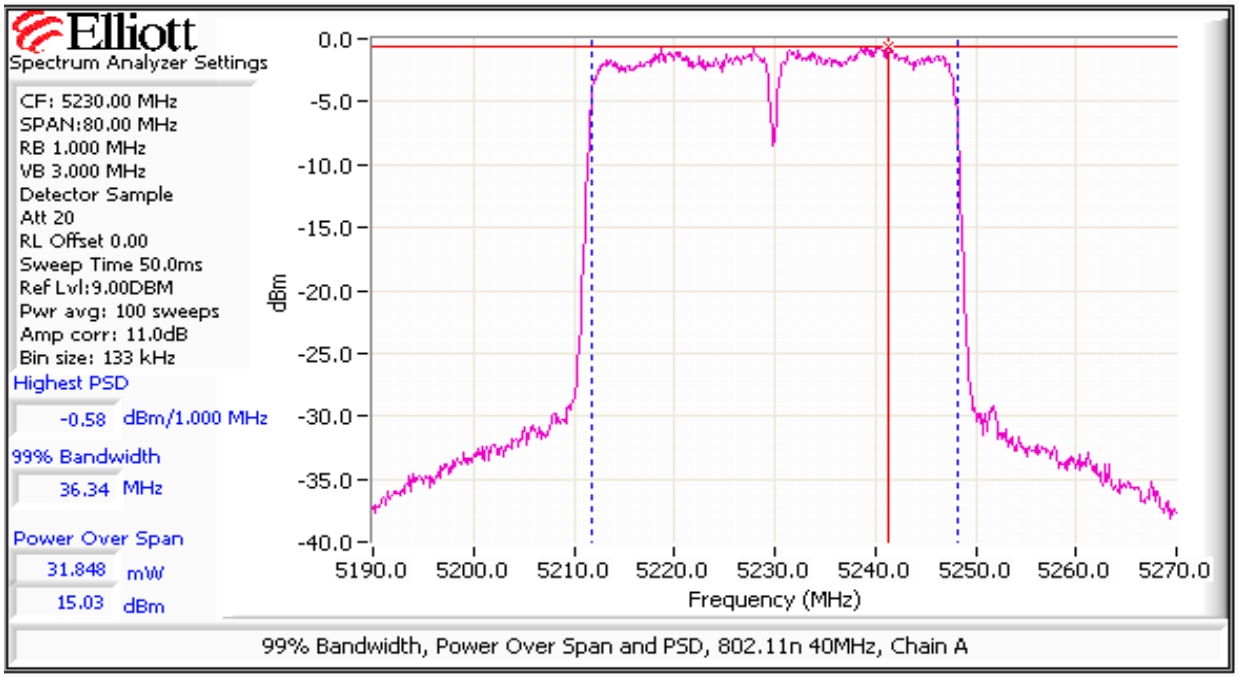
99% Bandwidth, Power Over Span and PSD, 802.11a, Chain A



99% Bandwidth, Power Over Span and PSD, 802.11n 20MHz, Chain A

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

802.11a Chain A/B

Freq/Chain	Peak Excursion(dB)	
(MHz)	Value	Limit
5180/A	10.2	13.0
5200/A	9.9	13.0
5240/A	10.4	13.0
5180/B	9.5	13.0
5200/B	9.7	13.0
5240/B	9.8	13.0

HT20 Chain A/B

Freq/Chain	Peak Excursion(dB)	
(MHz)	Value	Limit
5180/A	9.7	13.0
5200/A	10.3	13.0
5240/A	10.2	13.0
5180/B	10.2	13.0
5200/B	10.5	13.0
5240/B	10.6	13.0

HT40 Chain A/B

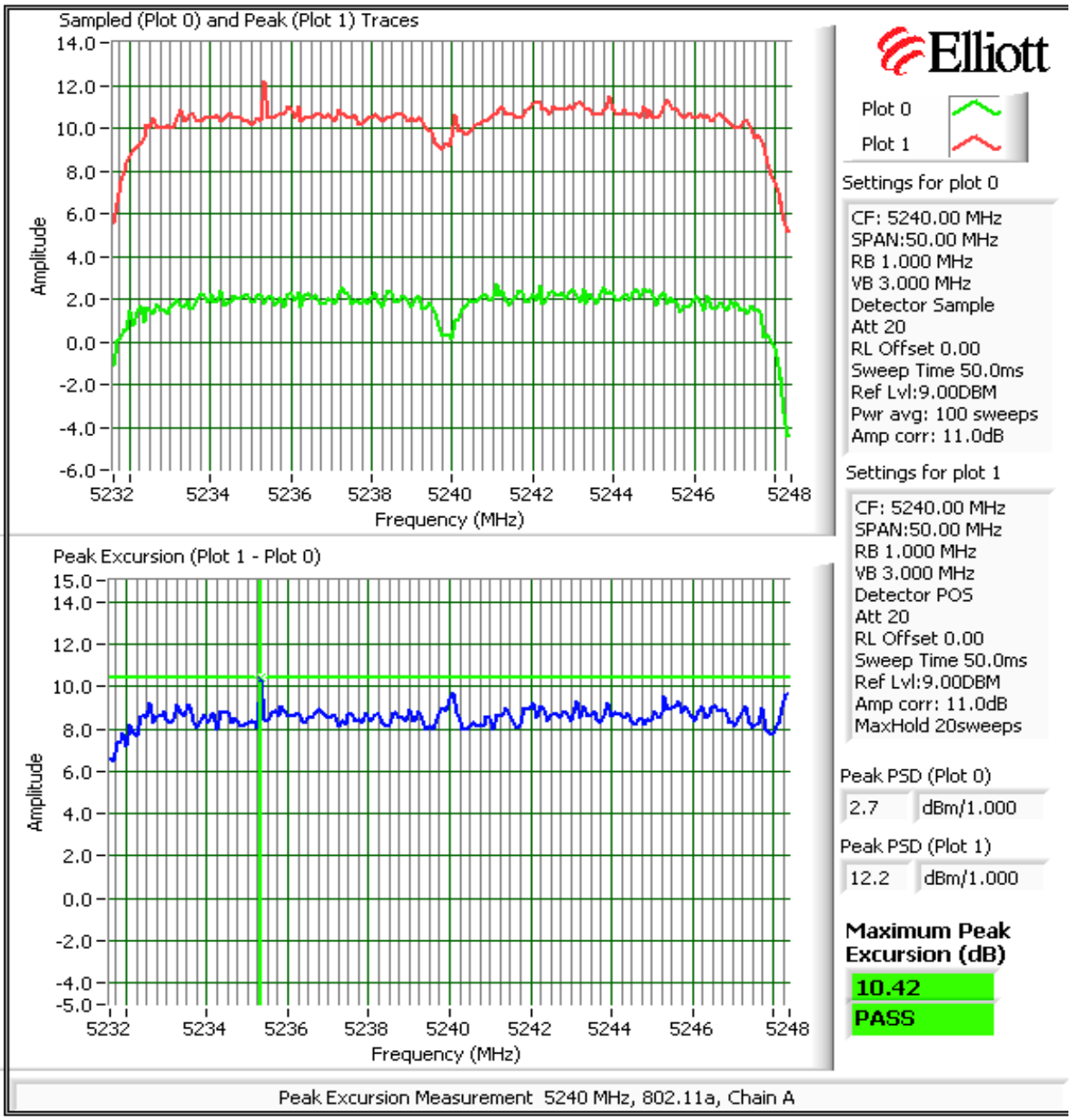
Freq/Chain	Peak Excursion(dB)	
(MHz)	Value	Limit
5190/A	11.3	13.0
5230/A	11.2	13.0
5190/B	11.1	13.0
5230/B	11.6	13.0

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

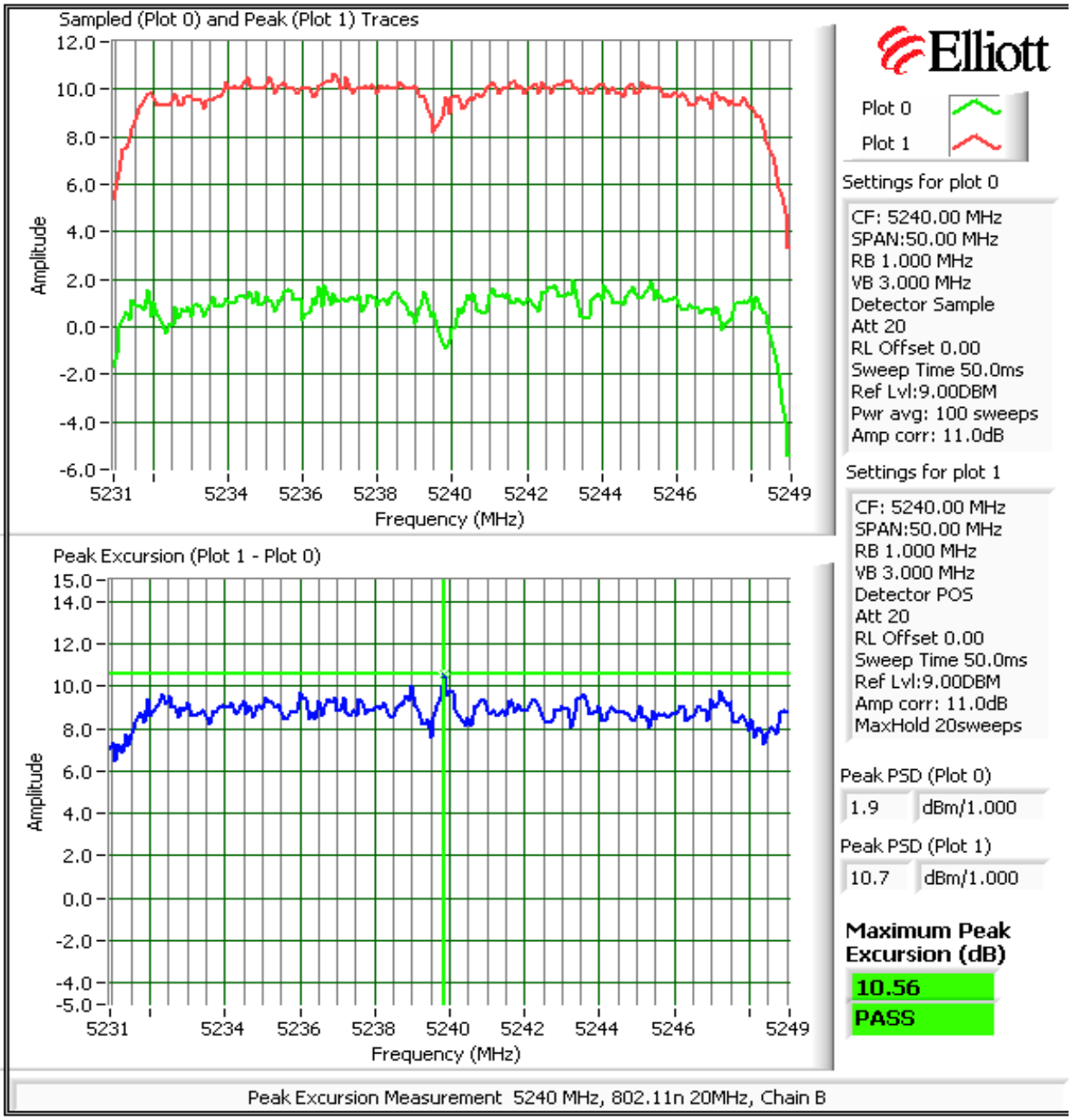
Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

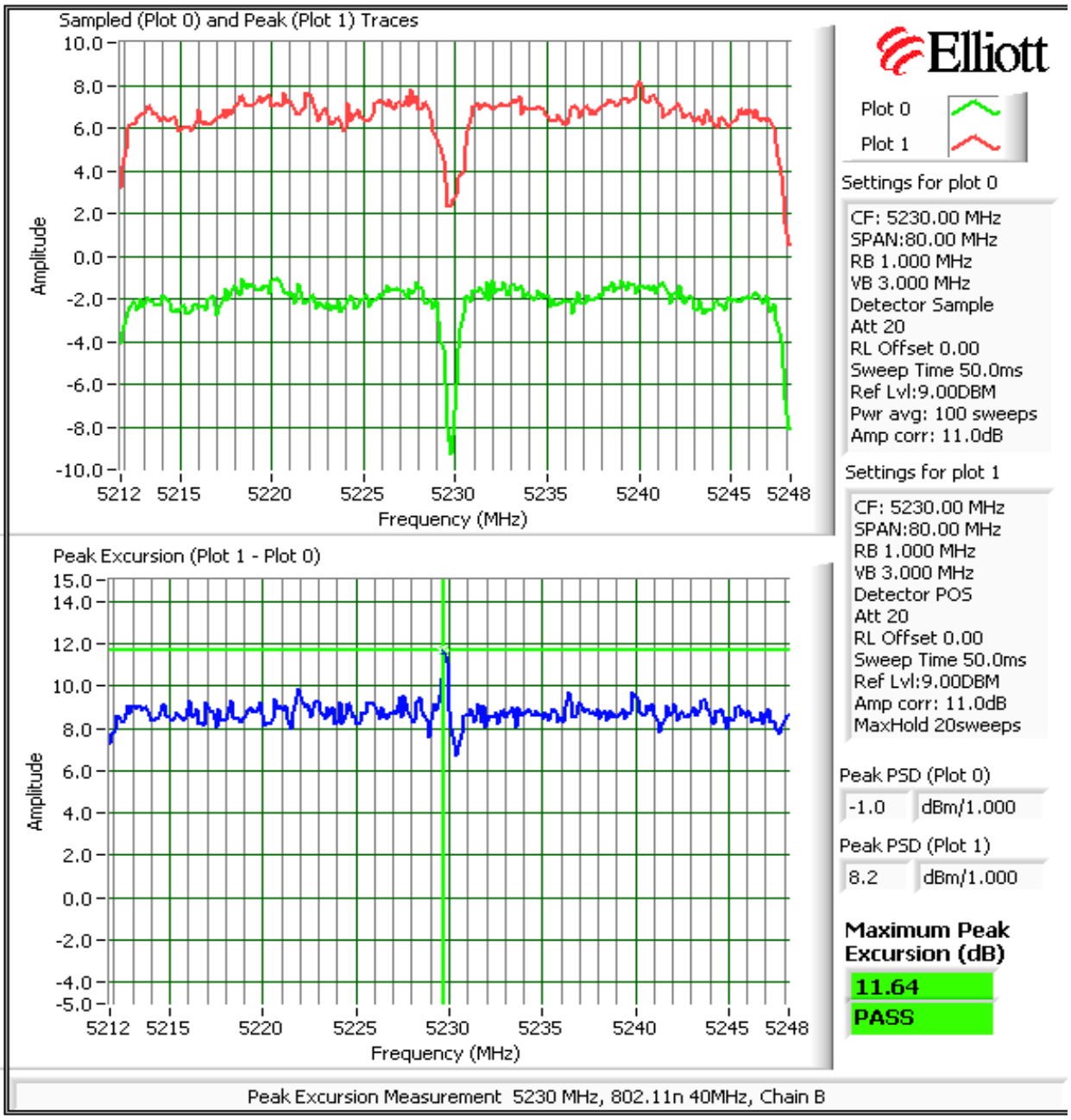
Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated average power)



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

Note 1:	The -27dB/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain (limit = -27dB - antenna gain). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies. Only average limit is used on the plots - solid red line.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dB EIRP
Note 4:	If the device is for outdoor use then the -27dB eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

802.11a Mode - Chains A and B

Maximum Antenna Gain: 3.6 dBi

Spurious Limit: -27.0 dB/MHz eirp

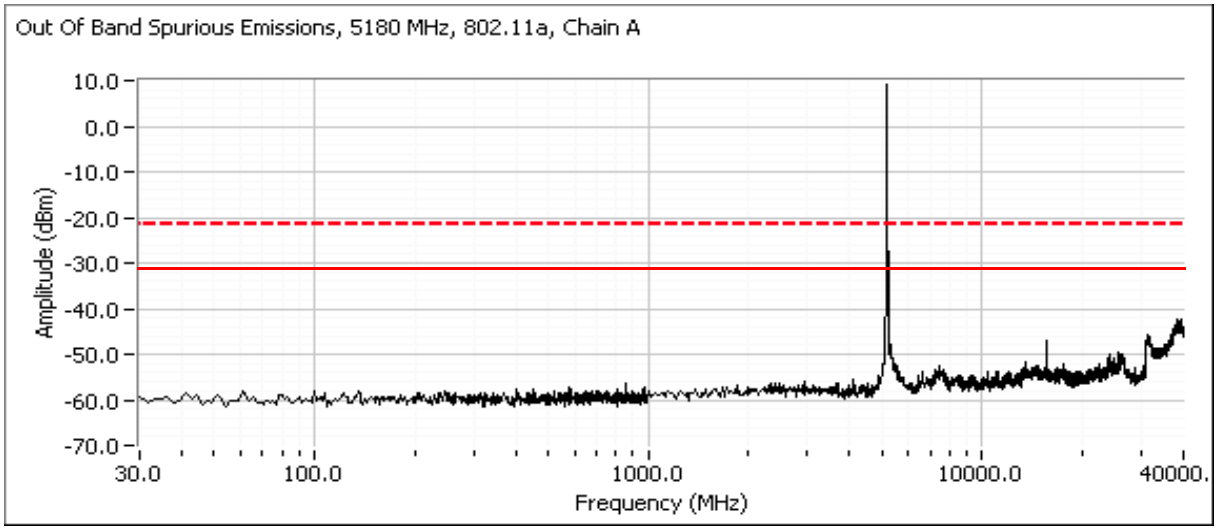
Limit Used On Plots [Note 1]: -30.6 dB/MHz Average Limit (RB=1MHz, VB=10Hz)

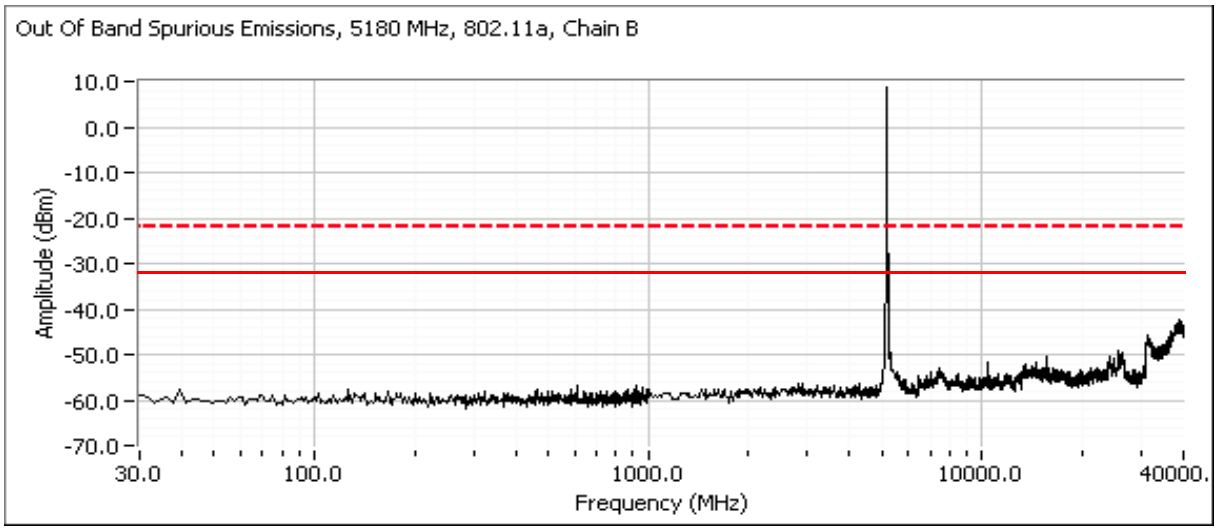
-10.6 dB/MHz Peak Limit (RB=VB=1MHz)

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

Low channel, 5150 - 5250 MHz Band

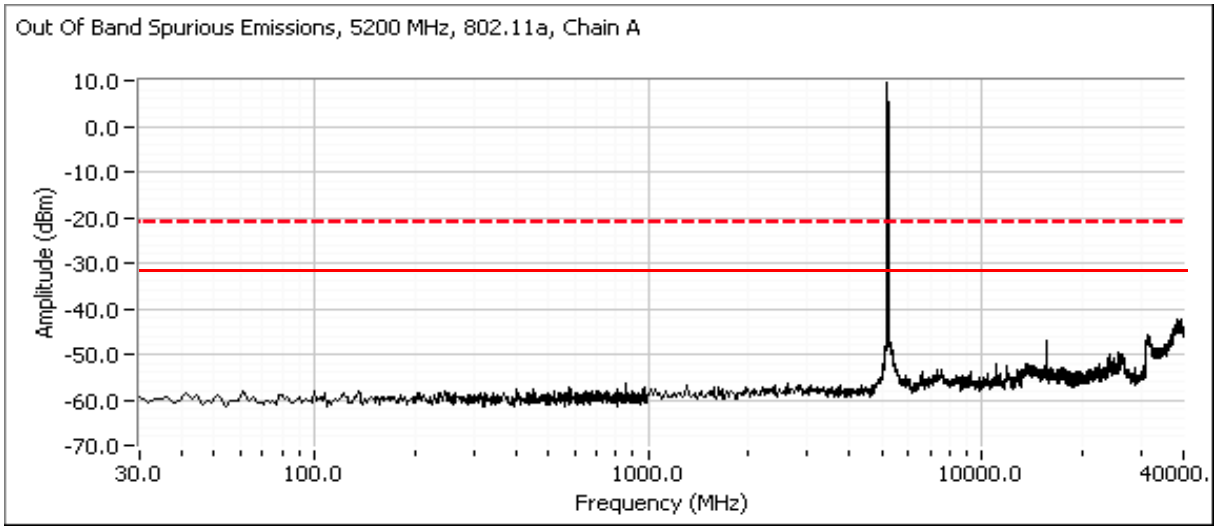
Compliance with the radiated limits for the restricted band immediately below 5150MHz is demonstrated through the radiated emissions tests.

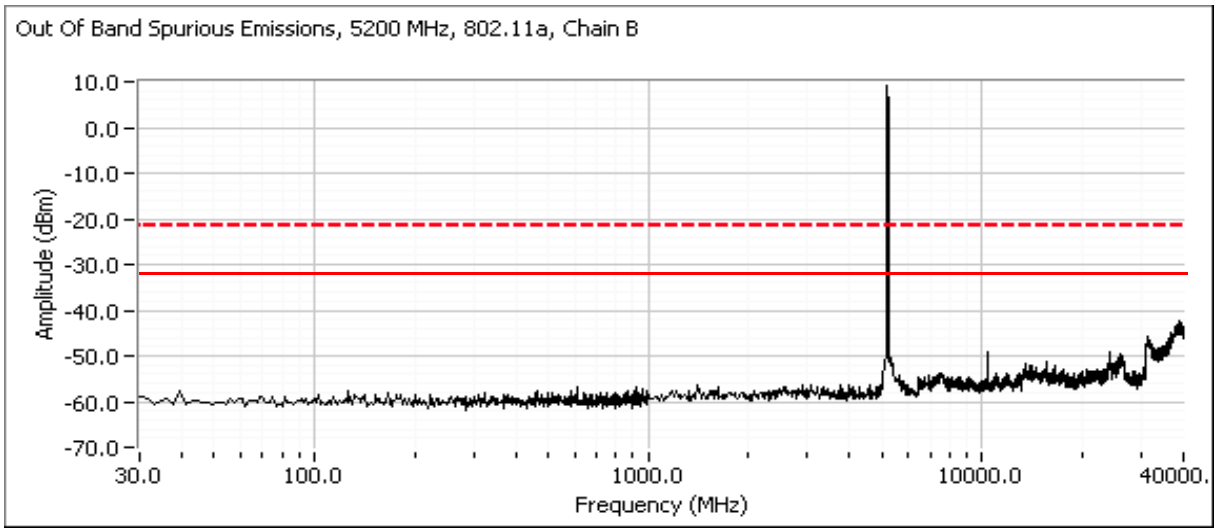




Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

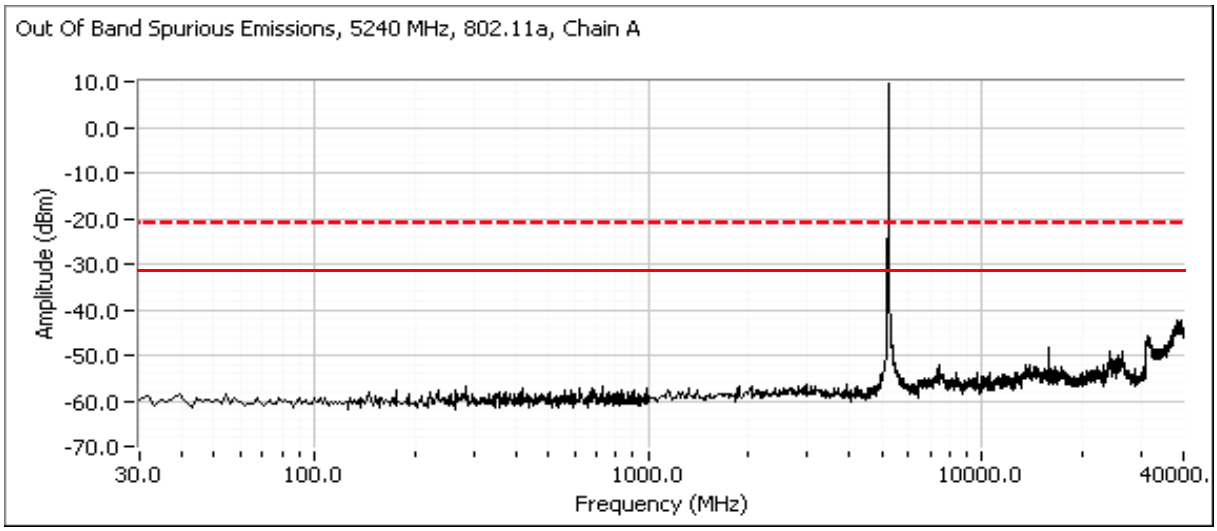
Center channel, 5150 - 5250 MHz Band

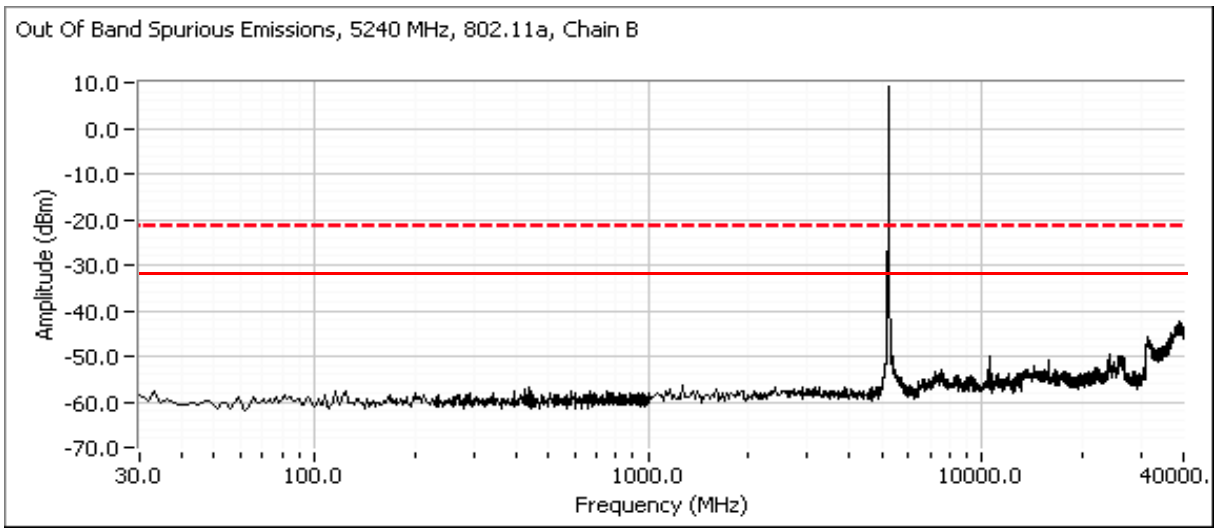




Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

High channel, 5150 - 5250 MHz Band





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

HT20 and HT40 Modes

MIMO Devices: Antenna gain used is the effective gain calculated in the power section of this data sheet. The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Although the operating power levels in this data sheet are for single chain operation the plots are considering operation on two chains simultaneously to cover both single chain and dual modes of operation. The actual dual chain operation is at a lower per-chain power level so these single chain plots at a higher output power level will represent a worst case.

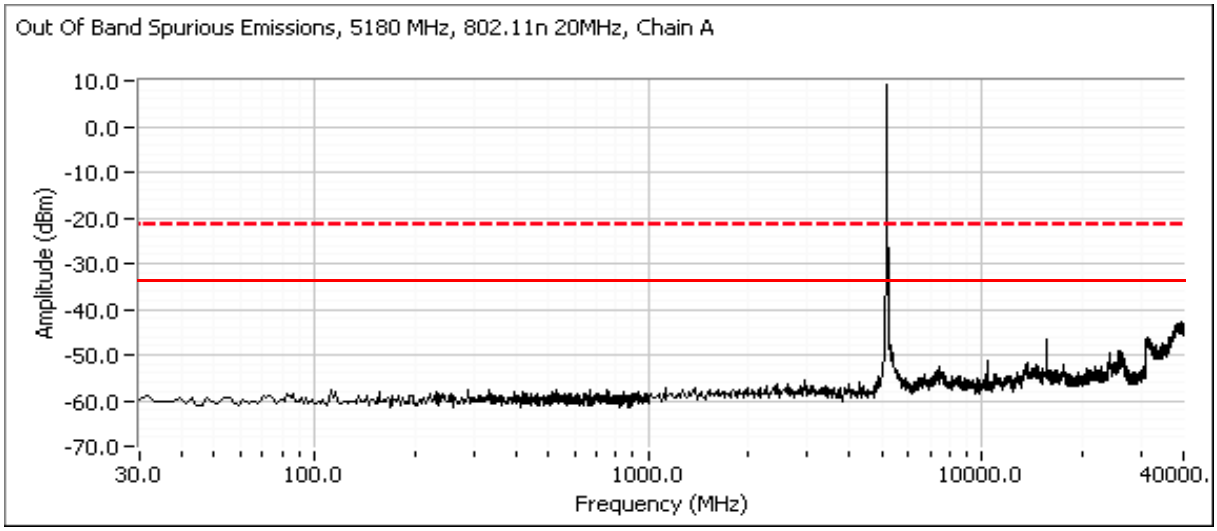
Number of transmit chains:	2		
Maximum Antenna Gain:	3.6	dBi	
Spurious Limit:	-27.0	dB/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots [Note 1]:	-33.6	dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-13.6	dB/MHz	Peak Limit (RB=VB=1MHz)

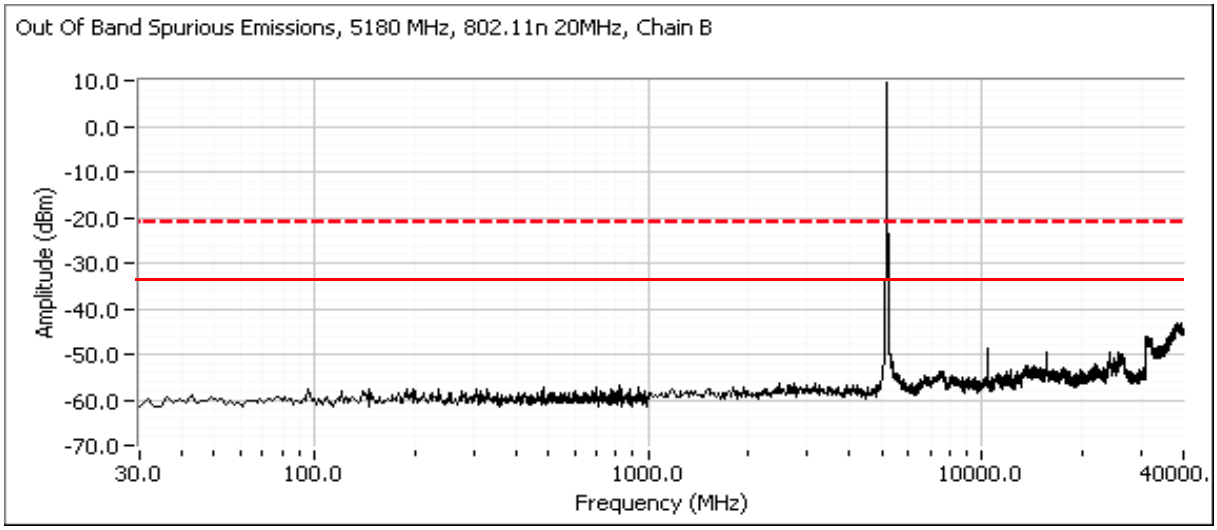
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

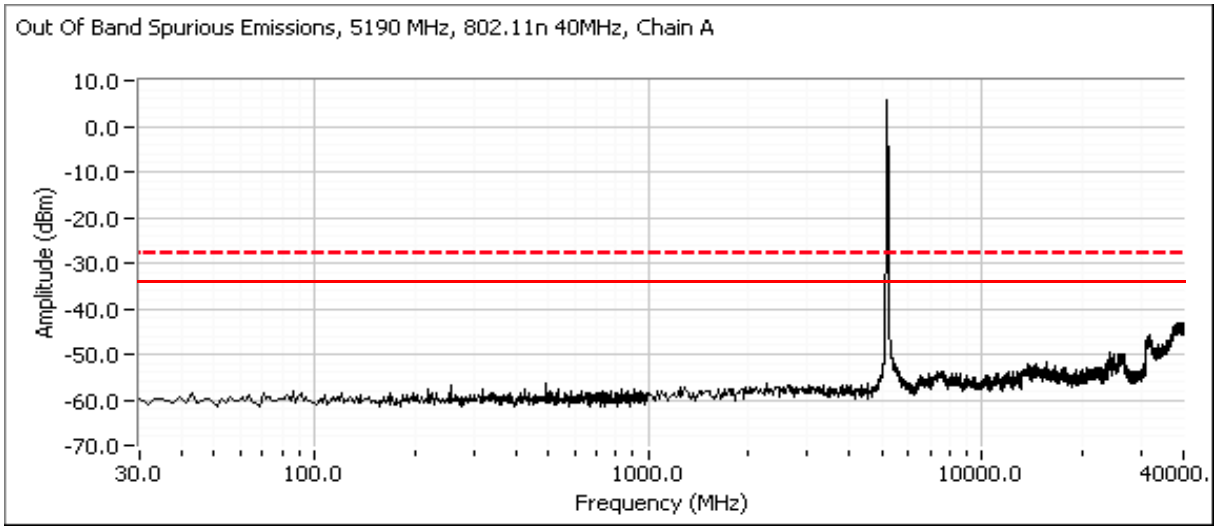
Low channel, 5150 - 5250 MHz Band

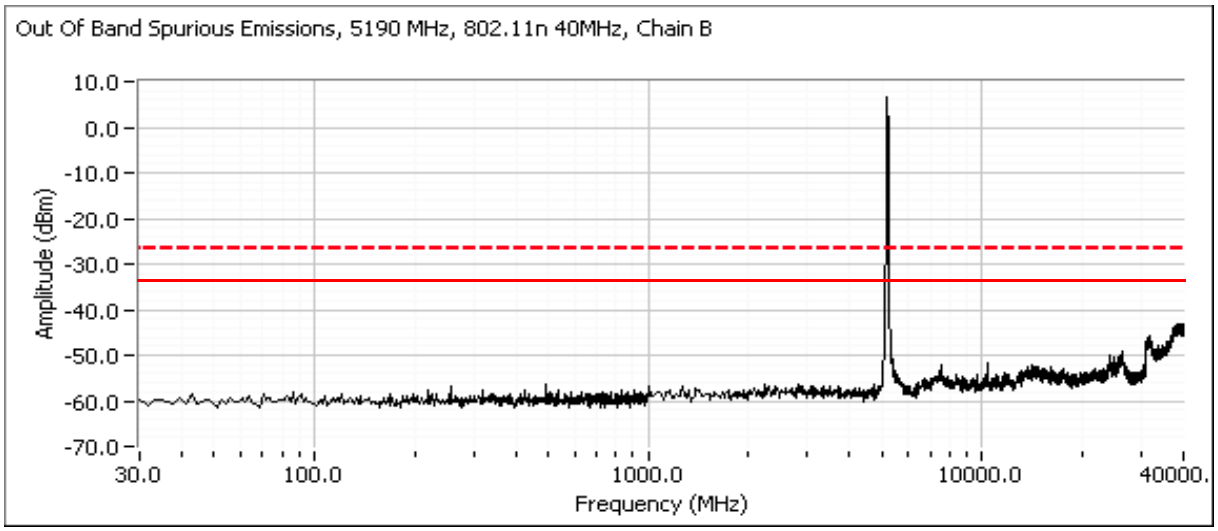
Compliance with the radiated limits for the restricted band immediately below 5150MHz is demonstrated through the radiated emissions tests.





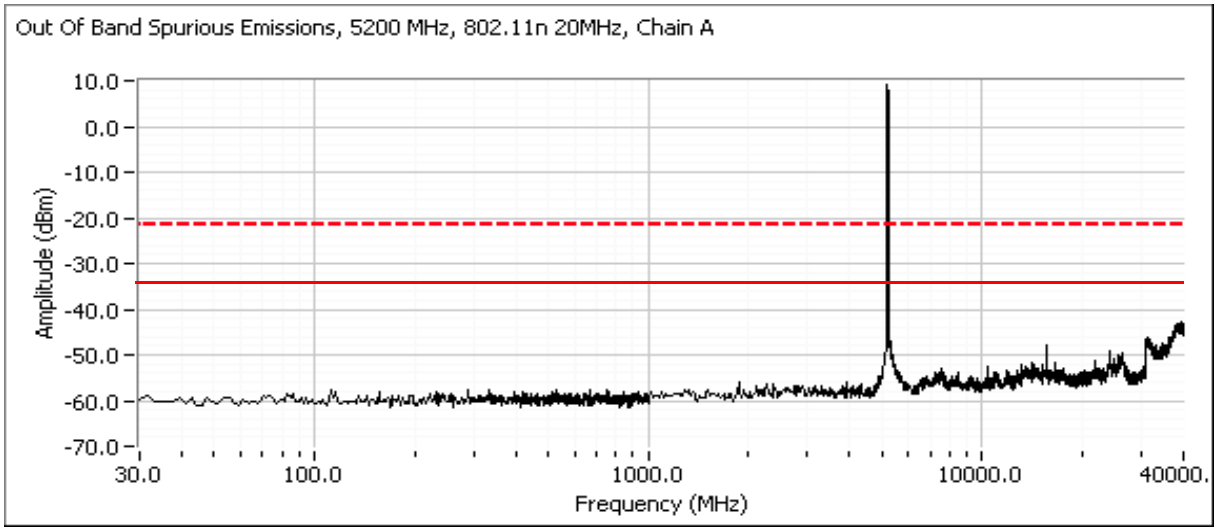
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

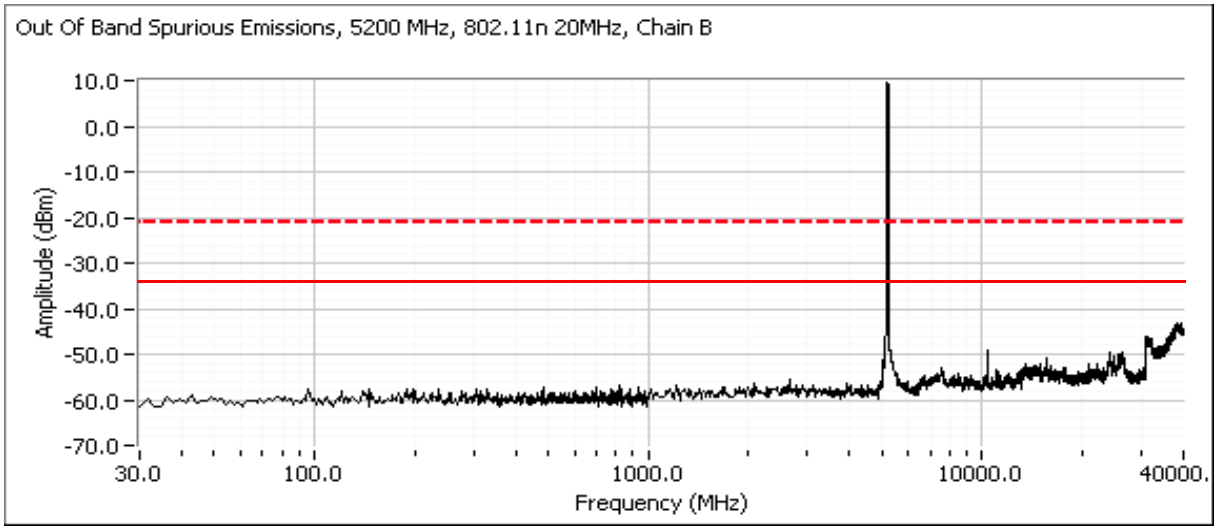




Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

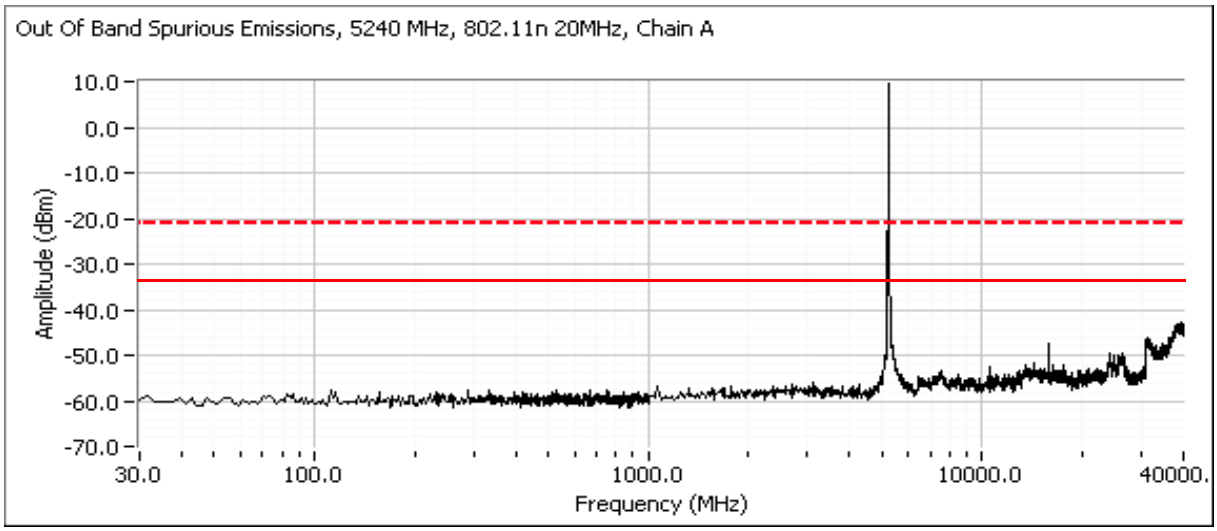
Center channel, 5150 - 5250 MHz Band

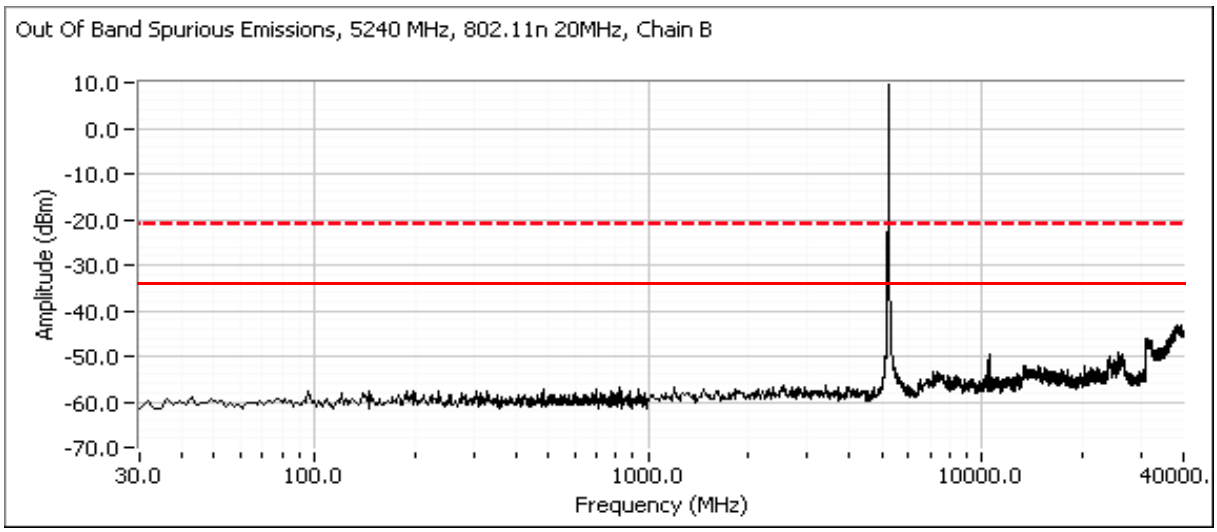




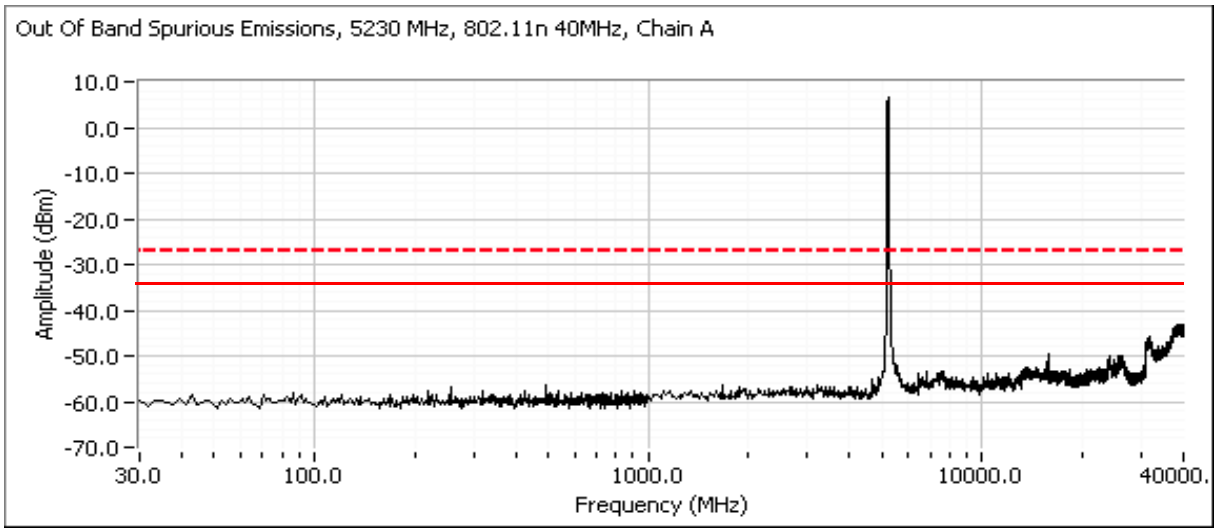
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

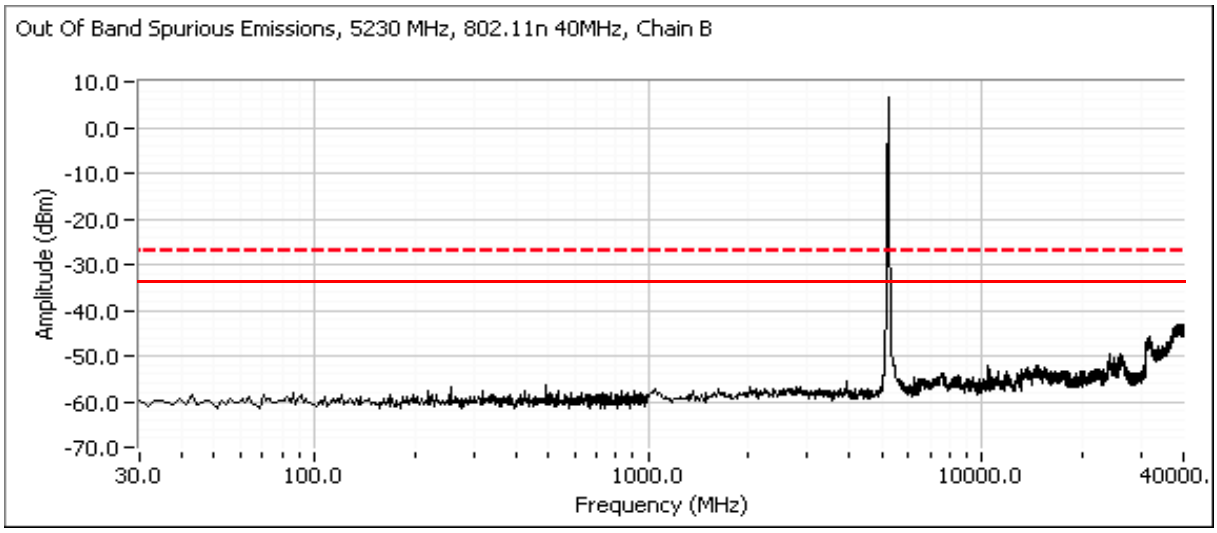
High channel, 5150 - 5250 MHz Band





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements - Single Chain, 5250 - 5350 MHz
Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 9/1/2009
Test Engineer: Suhaila Khushzad/R. Varelas
Test Location: FT Lab#1

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

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 22.5 °C
Rel. Humidity: 44 %

Summary of Results

Sample #2 MAC Address: 00150059F23C; CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	802.11a: 15.2dBm HT20: 14.9dBm HT40: 14.6dBm
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	802.11a: 2.6dBm/MHz HT20: 2.0dBm/MHz HT40: -1.0dBm/MHz
1	26dB Bandwidth	15.407	-	802.11a: 34.9 MHz HT20: 37.5 MHz HT40: 65.1 MHz
1	99% Bandwidth	RSS 210	-	802.11a: 17.1 MHz HT20: 18.2 MHz HT40: 36.5 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	802.11a: 10.2 dB HT20: 11.0 dB HT40: 11.2 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b)	Pass	All emissions below the -27dB/MHz limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Bandwidth, Output Power and Power spectral Density

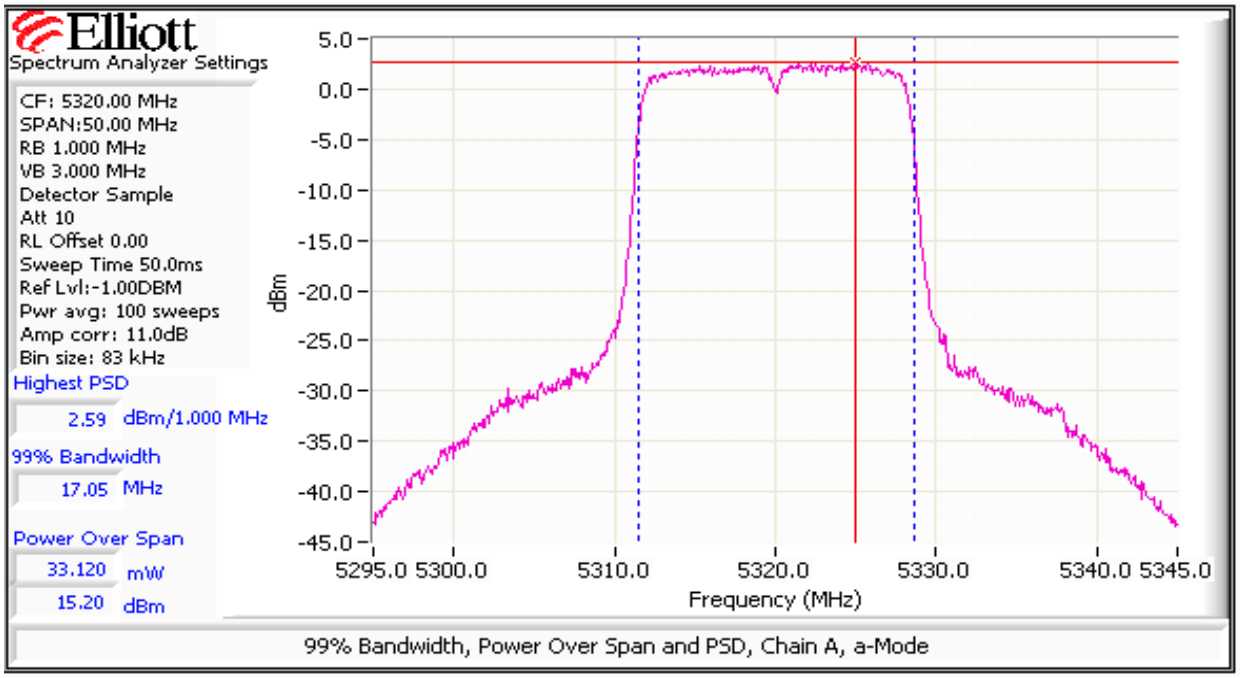
Antenna Gain (dBi): 3.7

Frequency (MHz)	*Average Power*	Bandwidth 26dB	Bandwidth 99%[4]	Output Power[1] dB Measured	Output Power[1] dB Limit	Power (Watts)	PSD[2] dB/MHz Measured	PSD[2] dB/MHz FCC Limit	PSD[2] dB/MHz RSS Limit[3]	Result
Chain A, 802.11a Mode										
5260	*16.5*	30.1	16.9	14.7	24.0	0.029	2.0	11.0	11.0	Pass
5300	*16.5*	32.3	17.0	14.6	24.0	0.029	1.9	11.0	11.0	Pass
5320	*16.6*	34.8	17.1	15.2	24.0	0.033	2.6	11.0	11.0	Pass
Chain B, 802.11a Mode										
5260	*16.6*	32.0	16.9	15.0	24.0	0.032	2.3	11.0	11.0	Pass
5300	*16.6*	34.9	17.0	14.6	24.0	0.029	2.1	11.0	11.0	Pass
5320	*16.6*	34.8	17.1	14.7	24.0	0.030	2.3	11.0	11.0	Pass
Chain A, HT20 Mode										
5260	*16.7*	35.8	18.2	14.9	24.0	0.031	2.0	11.0	11.0	Pass
5300	*16.5*	36.0	18.2	14.3	24.0	0.027	1.6	11.0	11.0	Pass
5320	*15.6*	36.8	18.2	14.1	24.0	0.026	1.2	11.0	11.0	Pass
Chain B, HT20 Mode										
5260	*16.7*	33.7	18.2	14.4	24.0	0.028	1.4	11.0	11.0	Pass
5300	*16.6*	37.5	18.2	14.1	24.0	0.026	1.2	11.0	11.0	Pass
5320	*15.2*	37.1	18.2	12.9	24.0	0.019	0.0	11.0	11.0	Pass
Chain A, HT40 Mode										
5270	*16.5*	55.2	36.4	14.5	24.0	0.028	-1.3	11.0	11.0	Pass
5310	*16.3*	48.2	36.4	14.1	24.0	0.026	-1.7	11.0	11.0	Pass
Chain B, HT40 Mode										
5270	*16.8*	65.1	36.3	14.6	24.0	0.029	-1.0	11.0	11.0	Pass
5310	*15.6*	51.6	36.5	13.3	24.0	0.021	-2.5	11.0	11.0	Pass

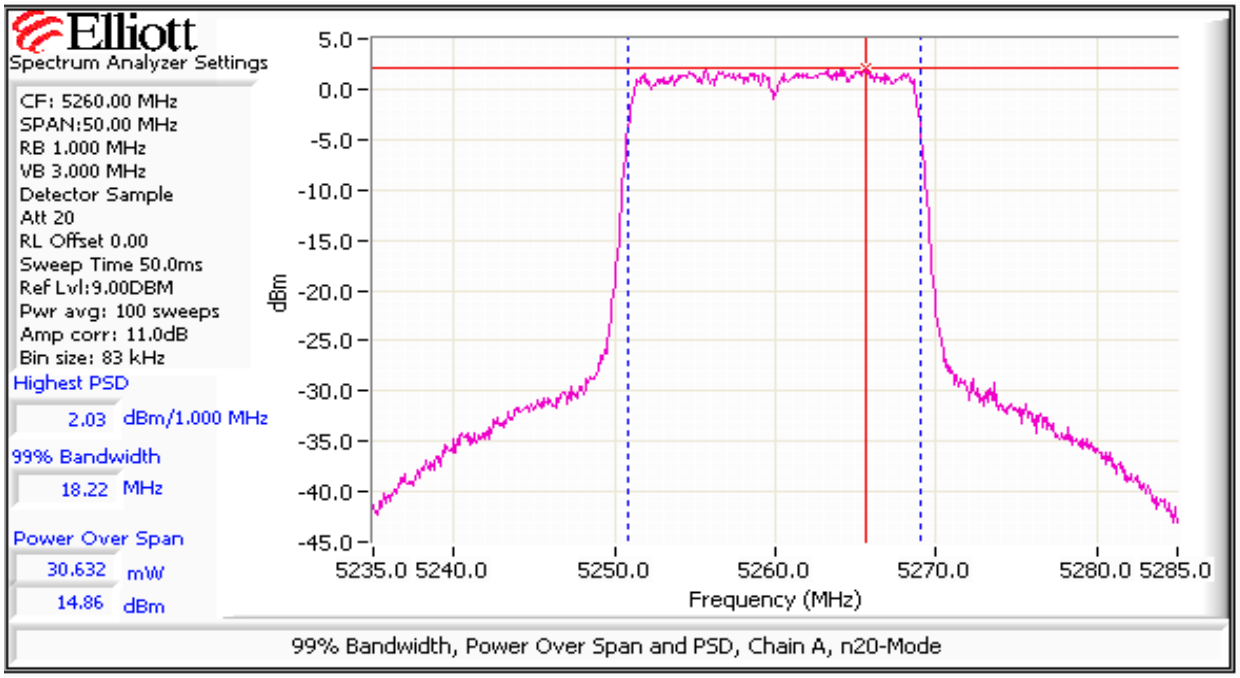
Note 1:	Output power measured using a spectrum analyzer (see plots below): RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50MHz for the 20Mhz channel spacing and 80MHz for the 40Mhz channel Spacing.
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dB/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	*Average Power listed was measured with an average power meter and is for manufacturer's reference only.*

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Plots for the channel(s) in each mode with the highest power and psd

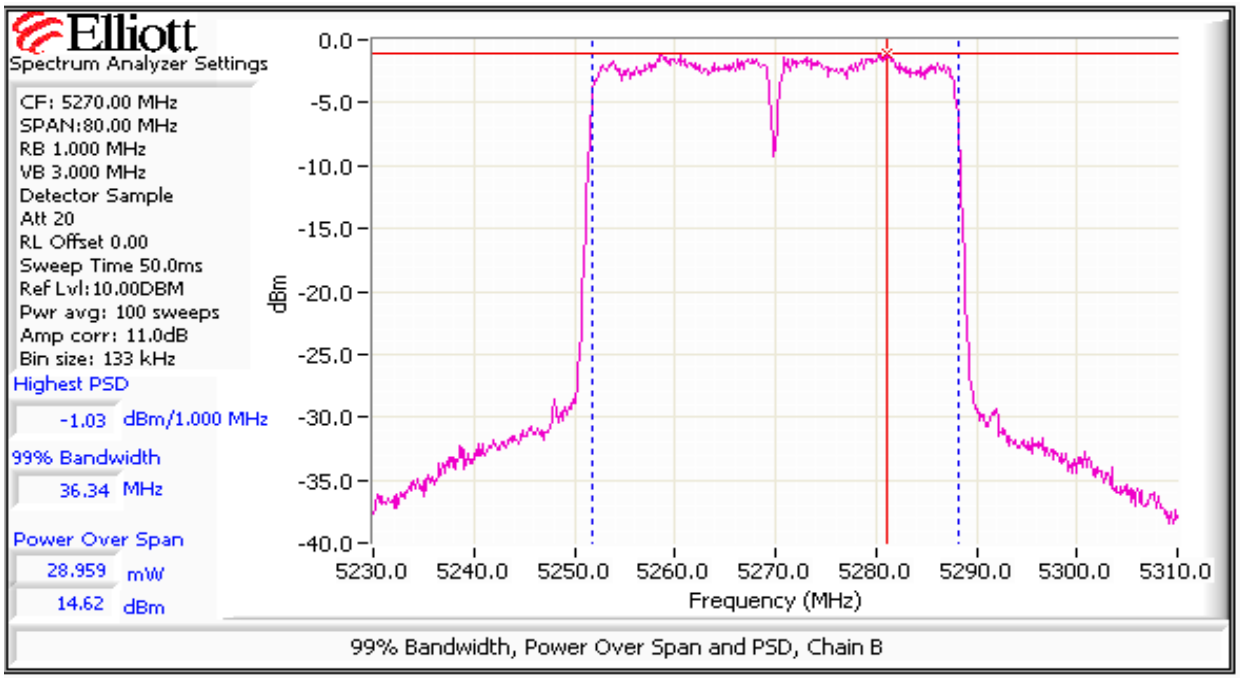


99% Bandwidth, Power Over Span and PSD, Chain A, a-Mode



99% Bandwidth, Power Over Span and PSD, Chain A, n20-Mode

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

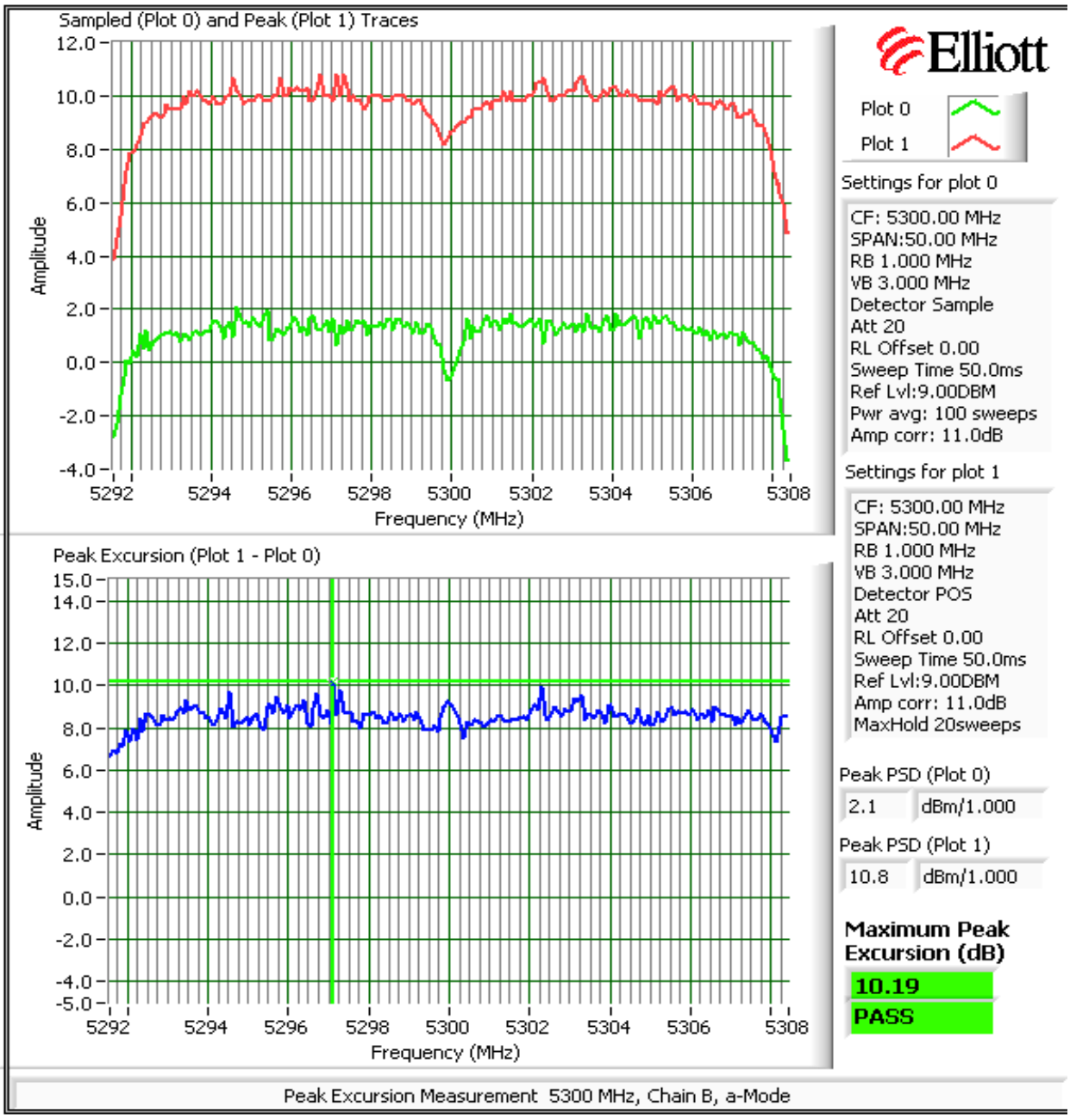
802.11a Chain A/B			HT20 Chain A/B			HT40 Chain A/B		
Freq/Chain	Peak Excursion (dB)		Freq/Chain	Peak Excursion (dB)		Freq/Chain	Peak Excursion (dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5260/A	10.1	13.0	5260/A	9.8	13.0	5270/A	11.2	13.0
5300/A	9.8	13.0	5300/A	11.0	13.0	5310/A	11.1	13.0
5320/A	9.2	13.0	5320/A	10.0	13.0			
5260/B	9.6	13.0	5260/B	10.6	13.0	5270/B	11.1	13.0
5300/B	10.2	13.0	5300/B	9.8	13.0	5310/B	11.0	13.0
5320/B	10.1	13.0	5320/B	9.9	13.0			

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

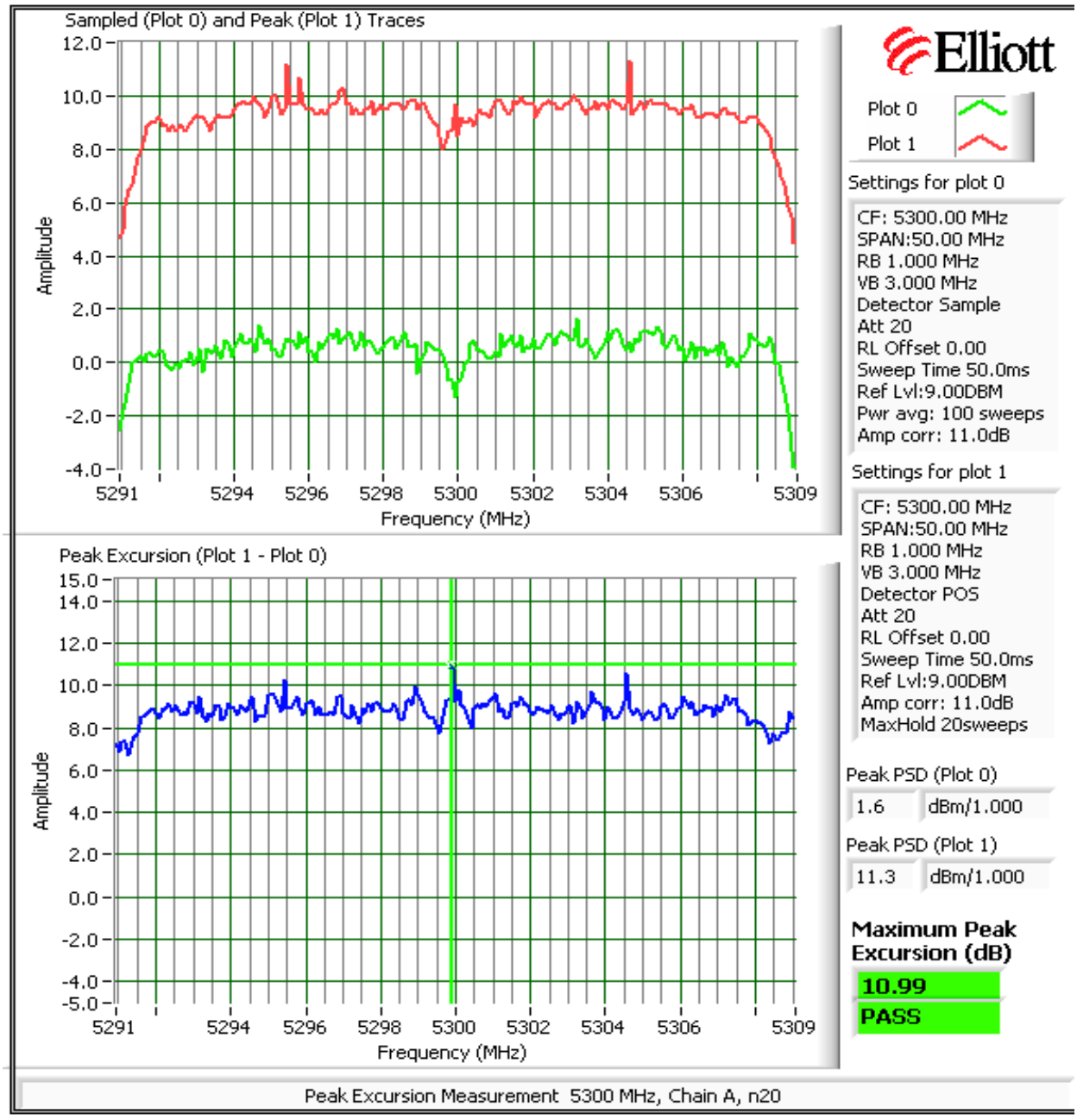
Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

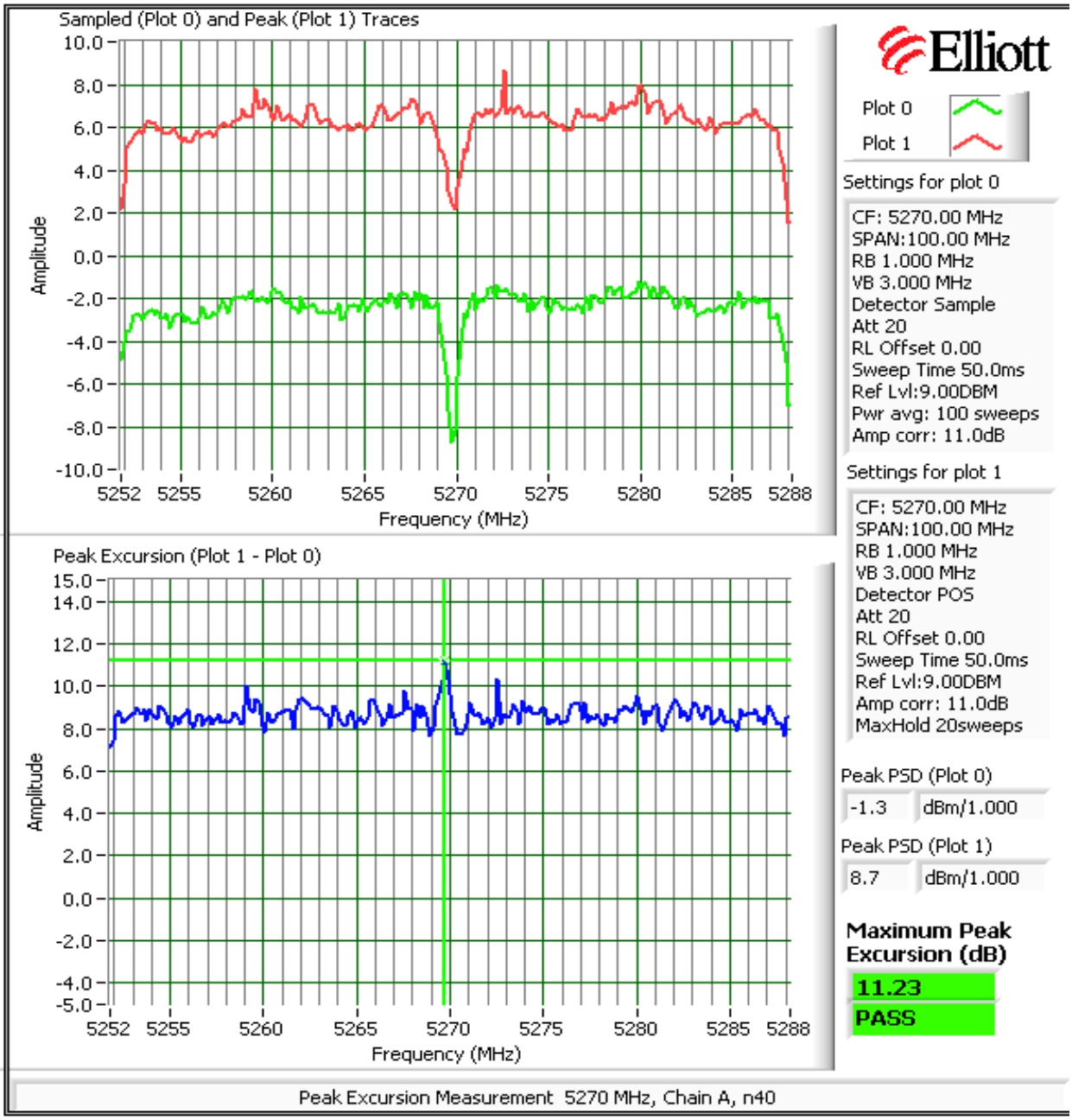
Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated average power)



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

Note 1:	The -27dB/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain (limit = -27dB - antenna gain). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies. Only average limit is used on the plots - solid red line.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dB EIRP
Note 4:	If the device is for outdoor use then the -27dB eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

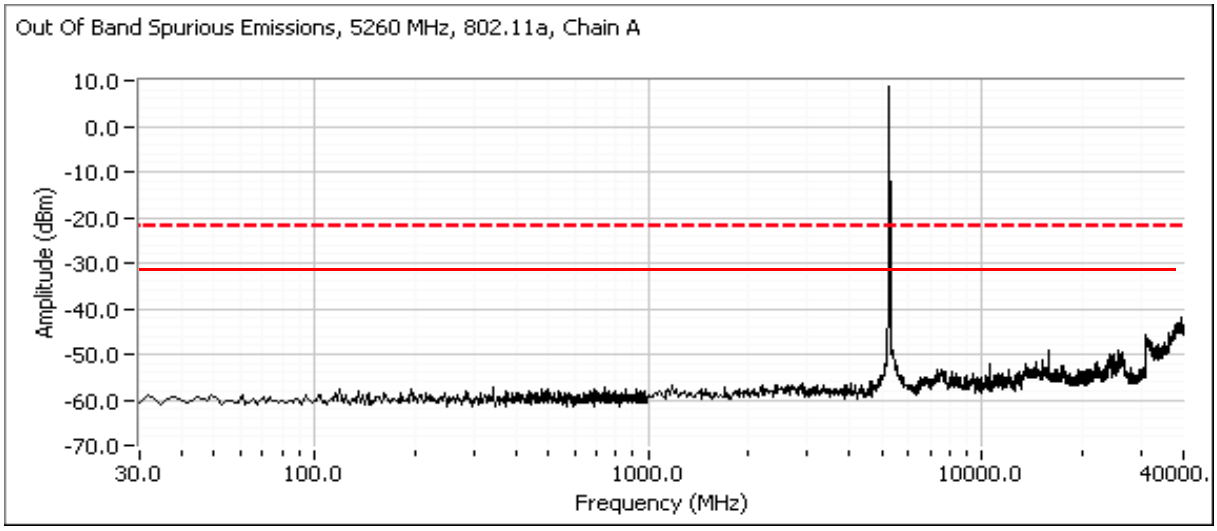
802.11a Mode - Chains A and B

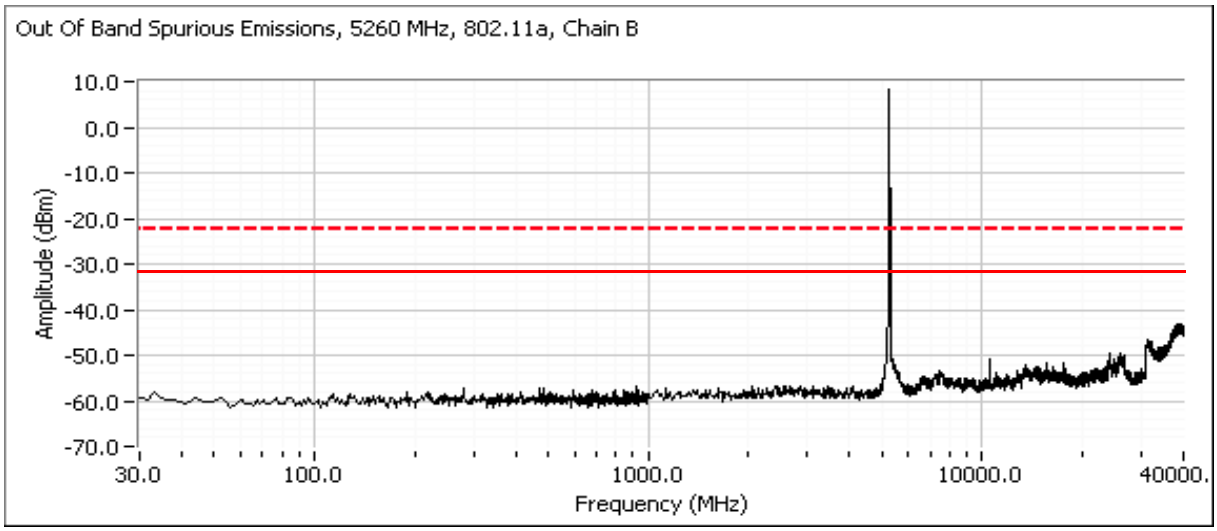
Maximum Antenna Gain:	3.7	dBi	
Spurious Limit:	-27.0	dB/MHz eirp	
Limit Used On Plots Note 1:	-30.7	dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-10.7	dB/MHz	Peak Limit (RB=VB=1MHz)

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

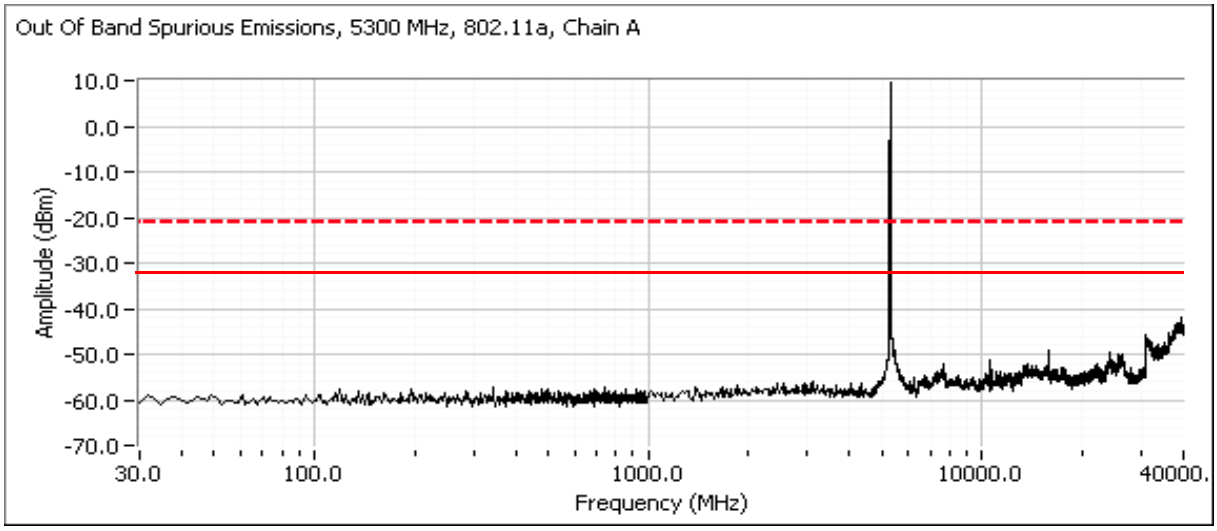
Low channel, 5250 - 5350 MHz Band

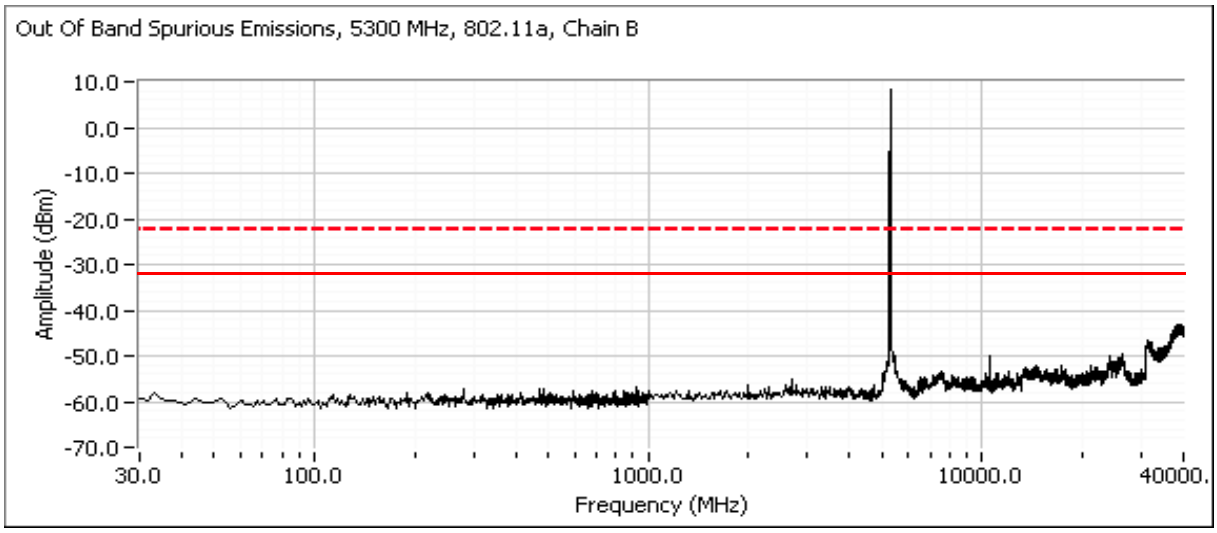




Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Center channel, 5250 - 5350 MHz Band

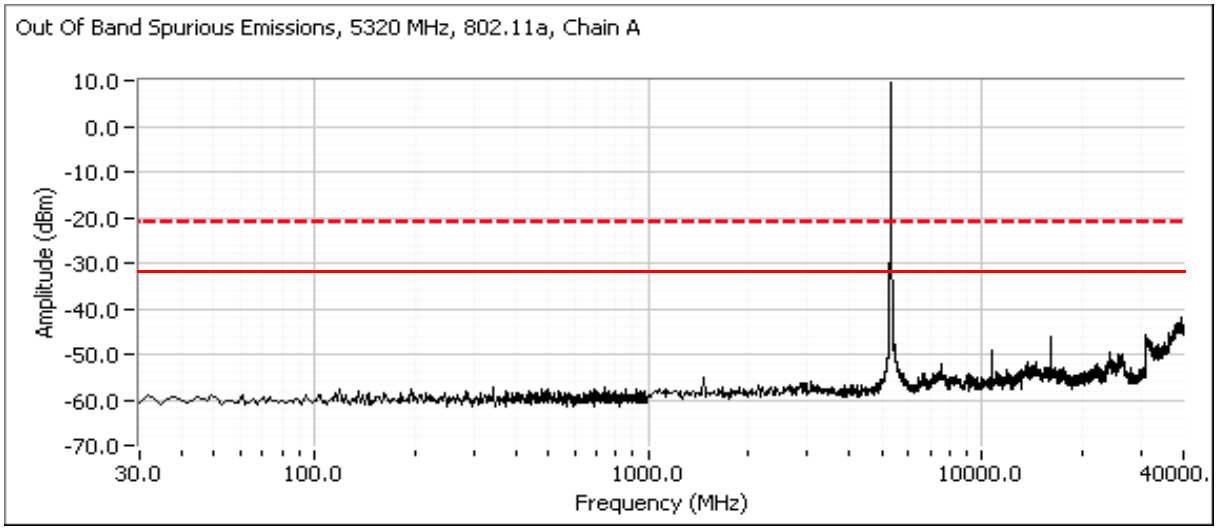


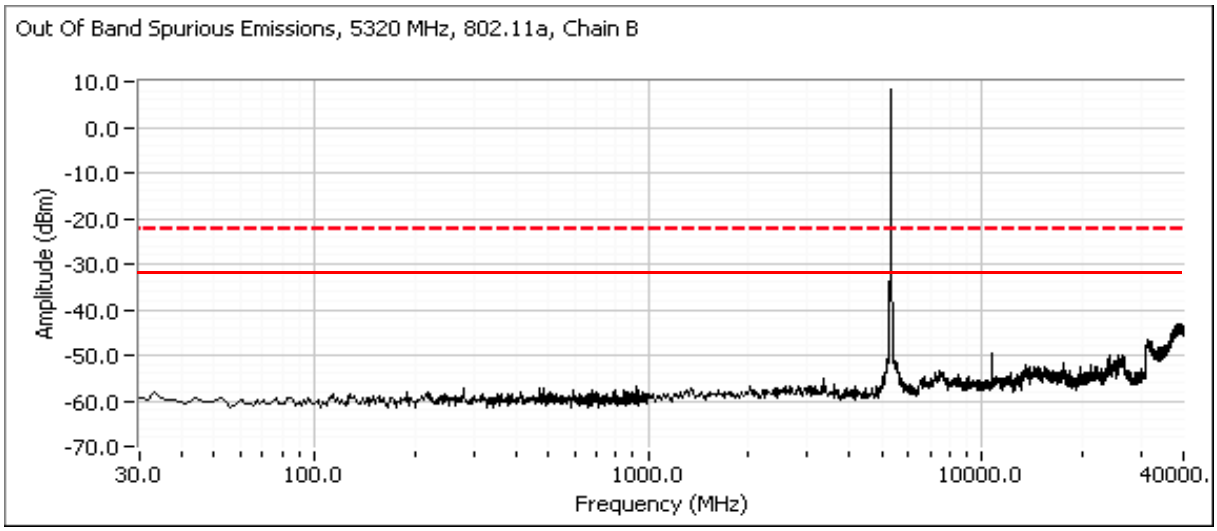


Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

High channel, 5250 - 5350 MHz Band

Compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

HT20 and HT40 Modes

MIMO Devices: Antenna gain used is the effective gain calculated in the power section of this data sheet. The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

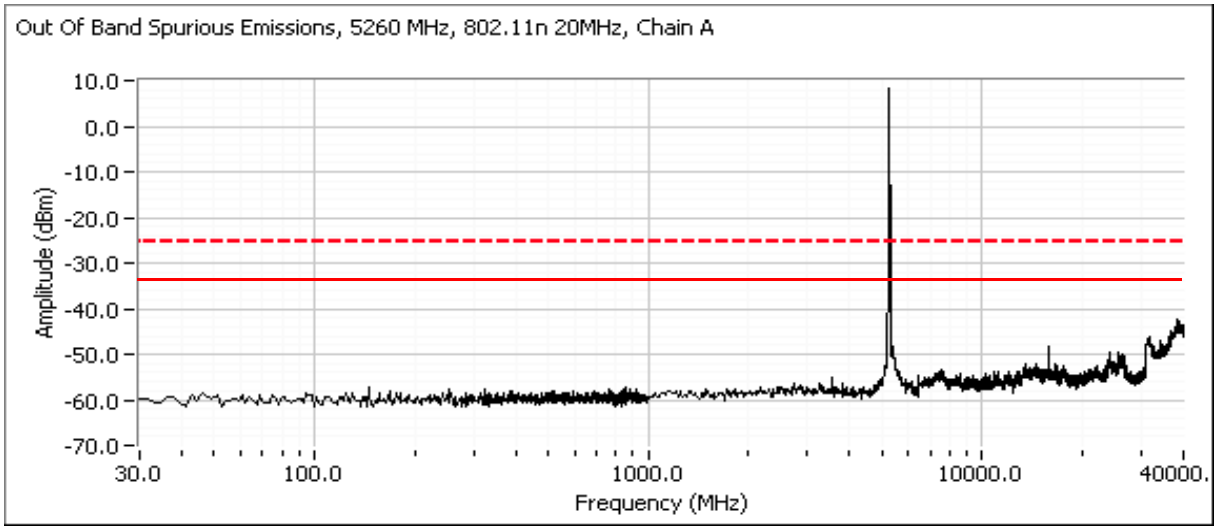
Although the operating power levels in this data sheet are for single chain operation the plots are considering operation on two chains simultaneously to cover both single chain and dual modes of operation. The actual dual chain operation is at a lower per-chain power level so these single chain plots at a higher output power level will represent a worst case.

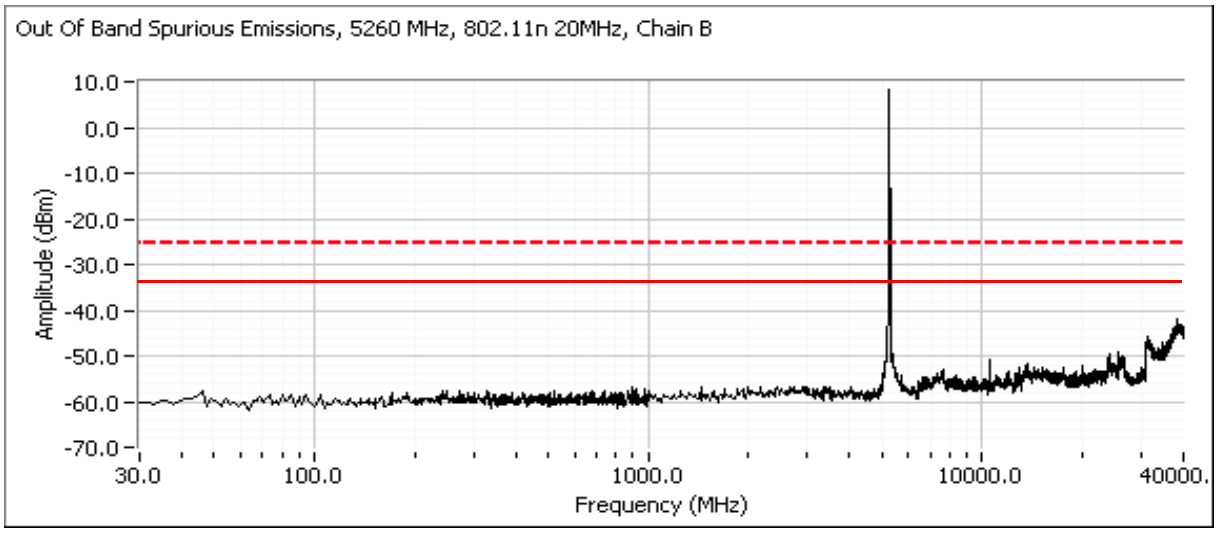
Number of transmit chains:	2		
Maximum Antenna Gain:	3.7	dBi	
Spurious Limit:	-27.0	dB/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots Note 1.:	-33.7	dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-13.7	dB/MHz	Peak Limit (RB=VB=1MHz)

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

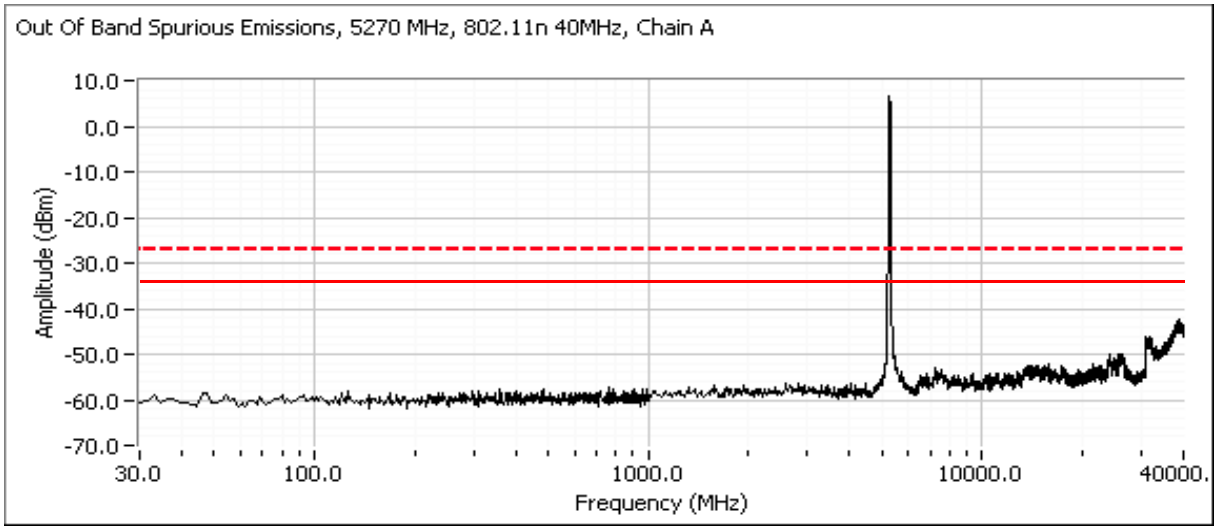
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

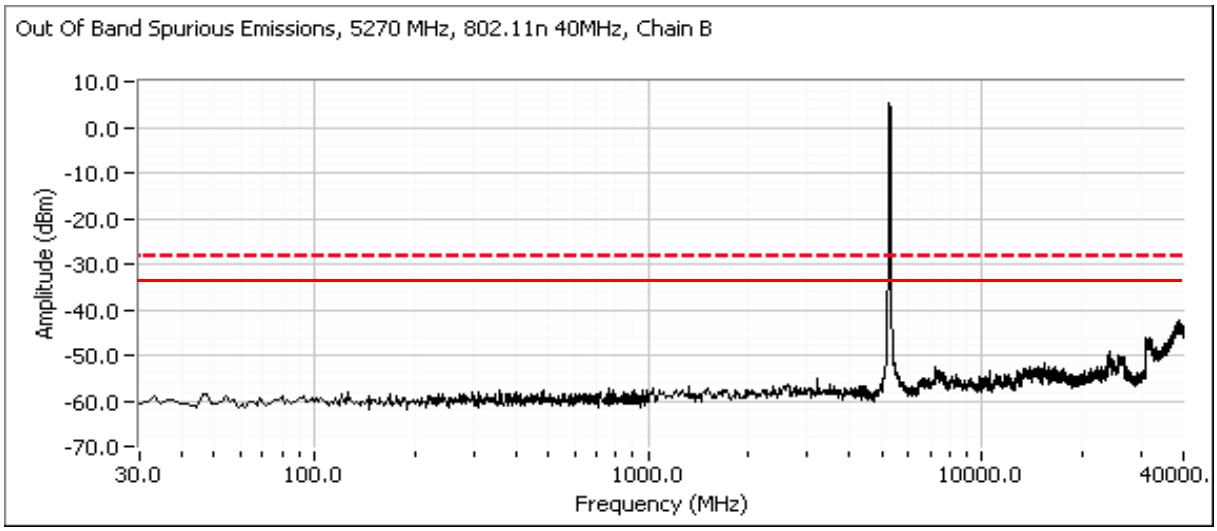
Low channel, 5250 - 5350 MHz Band





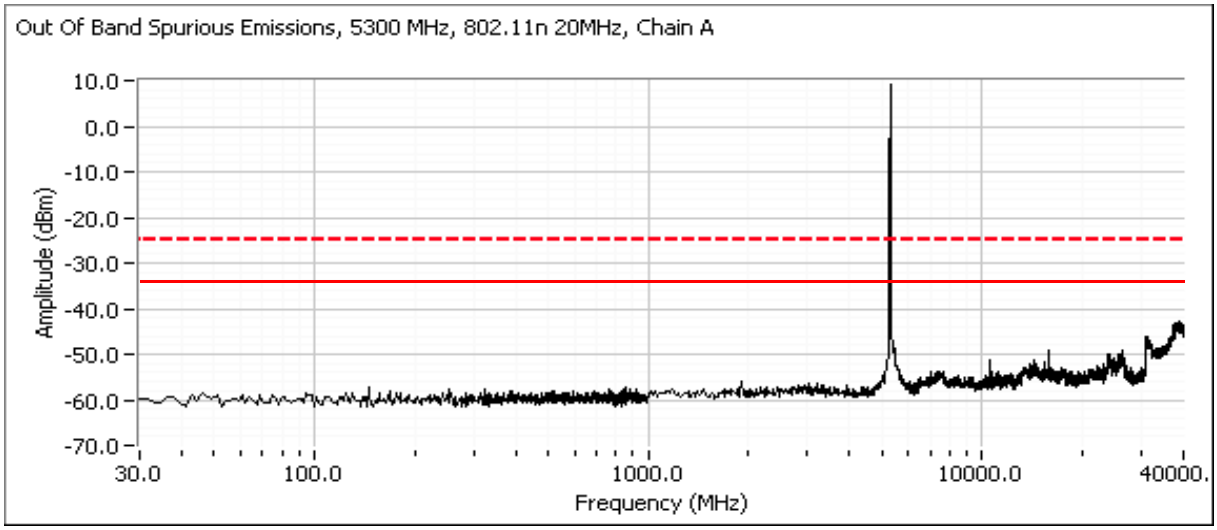
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

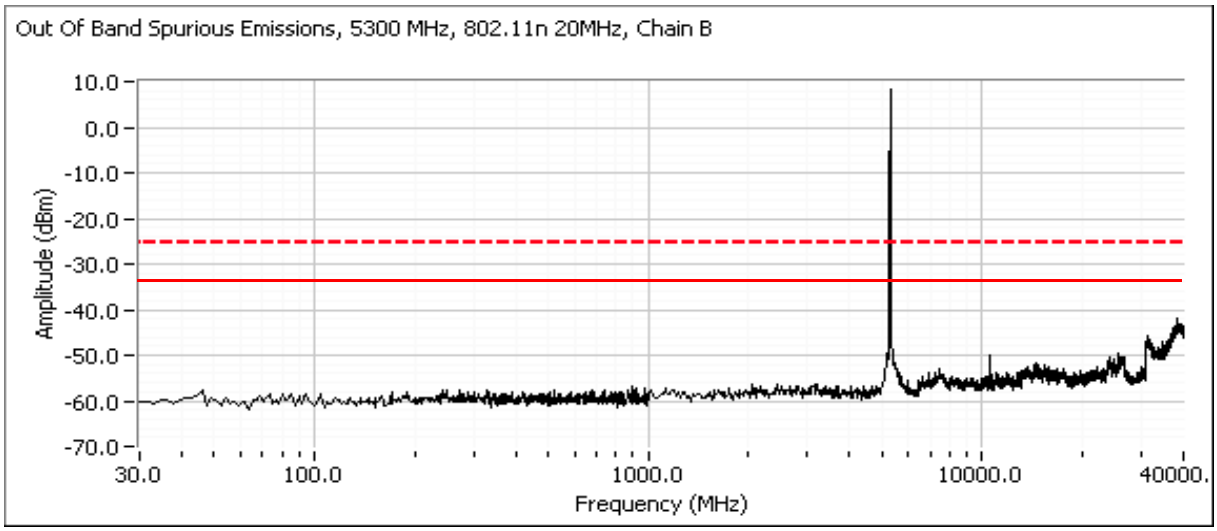




Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Center channel, 5250 - 5350 MHz Band

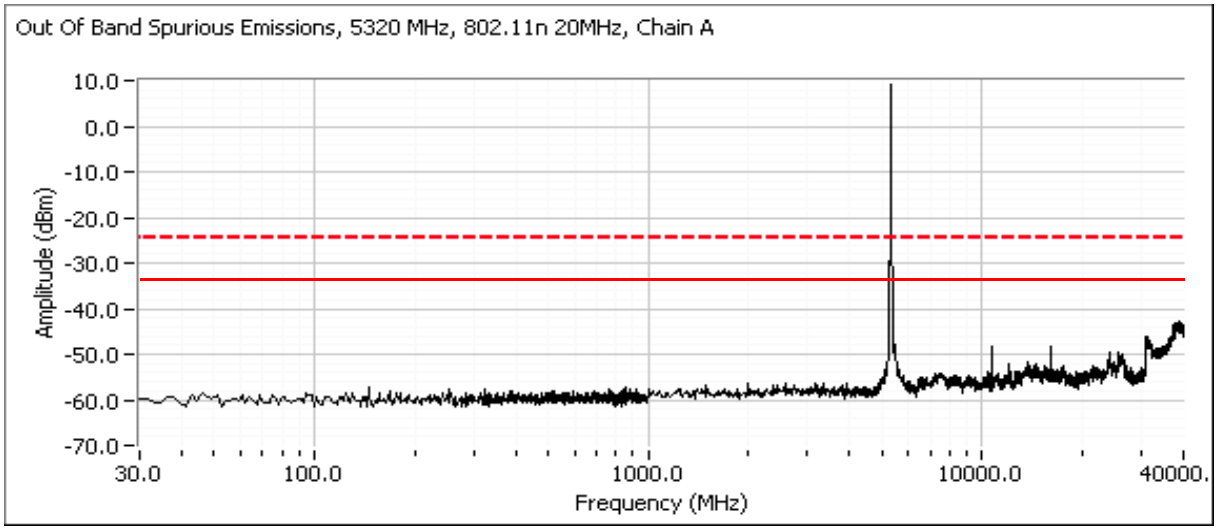


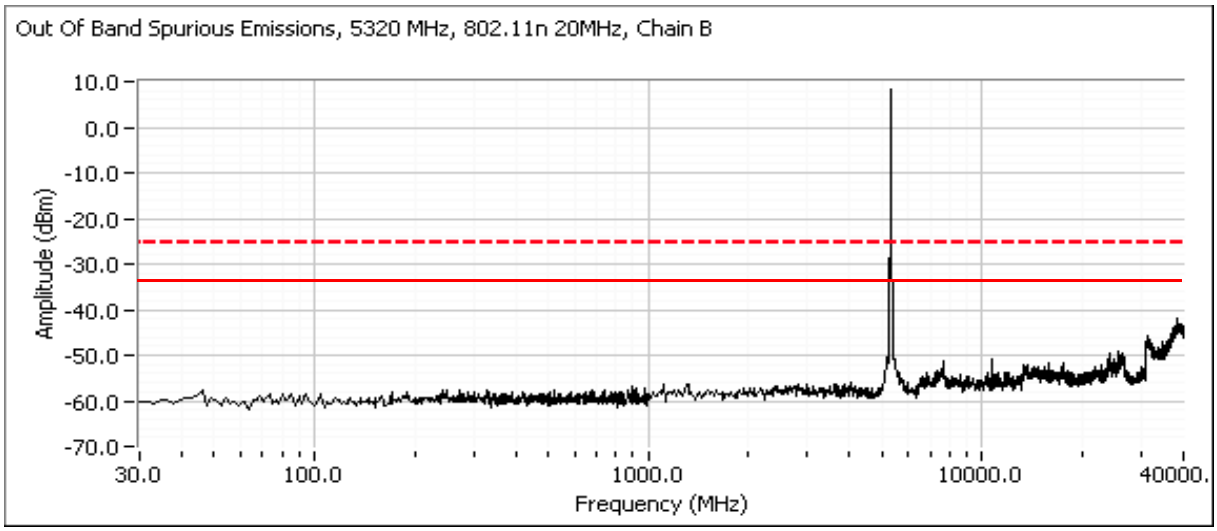


Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

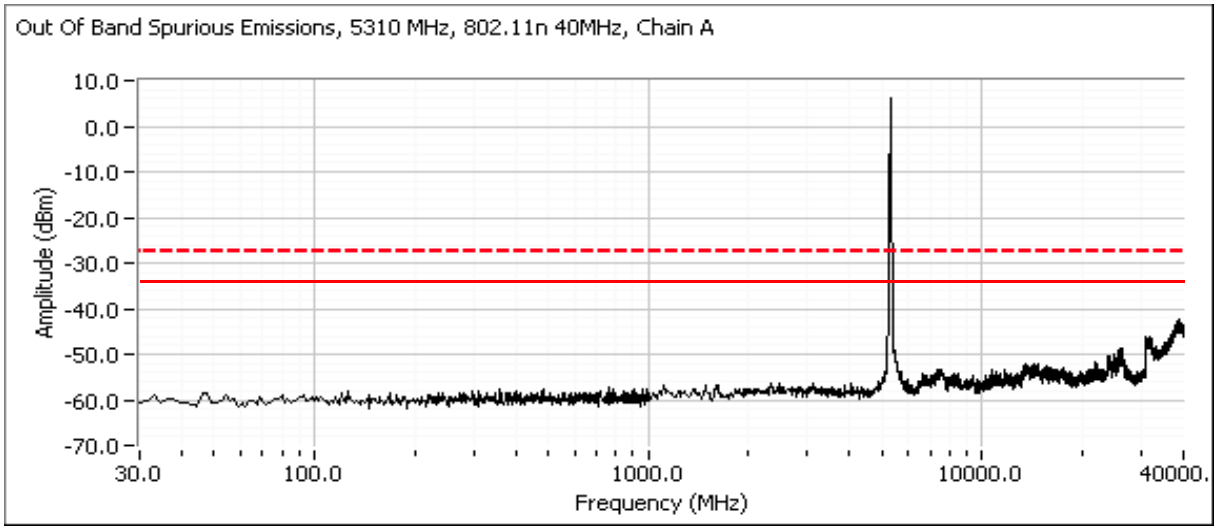
High channel, 5250 - 5350 MHz Band

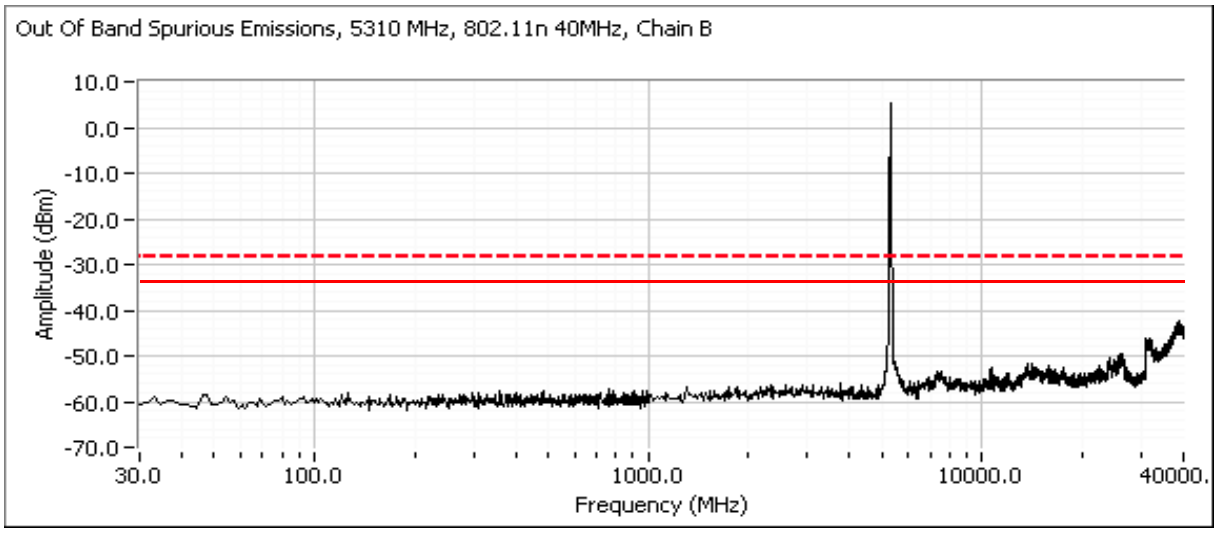
Compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements - Single Chain, 5470 - 5725 MHz
Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 9/1/2009
Test Engineer: Rafael Varelas
Test Location: FT Radio Lab

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

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 22.1 °C
Rel. Humidity: 43 %

Summary of Results

Sample #2 MAC Address: 00150059F23C; CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	802.11a: 15.4 dB HT20: 15.4 dB HT40: 15.5 dB
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	802.11a: 2.8 dBm/MHz HT20: 2.6 dBm/MHz HT40: -0.3 dBm/MHz
1	26dB Bandwidth	15.407	-	802.11a: 36.7 MHz HT20: 38.7 MHz HT40: 73.4 MHz
1	99% Bandwidth	RSS 210	-	802.11a: 17.1 MHz HT20: 18.3 MHz HT40: 36.6 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	802.11a: 10.9 dB HT20: 10.8 dB HT40: 11.9 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b)	Pass	All emissions below the -27dB/MHz limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Deviations From The Standard

No deviations were made from the requirements of the standard.

Run #1: Bandwidth, Output Power and Power spectral Density

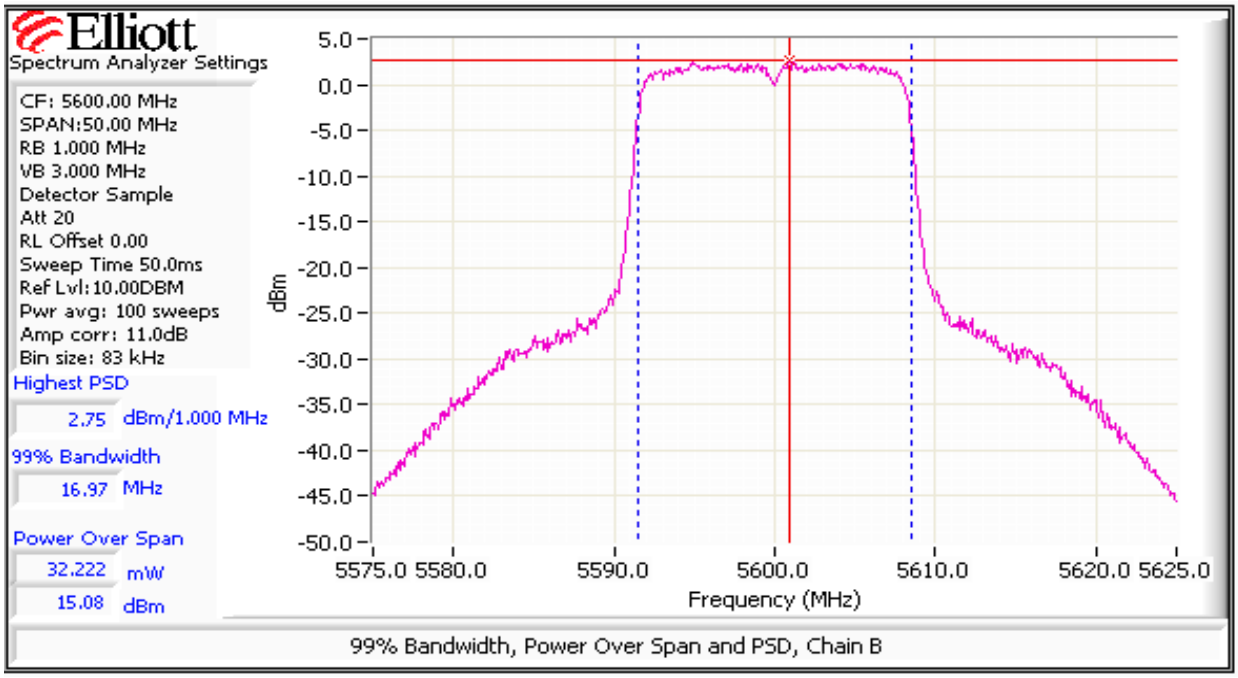
Antenna Gain (dBi): 4.8

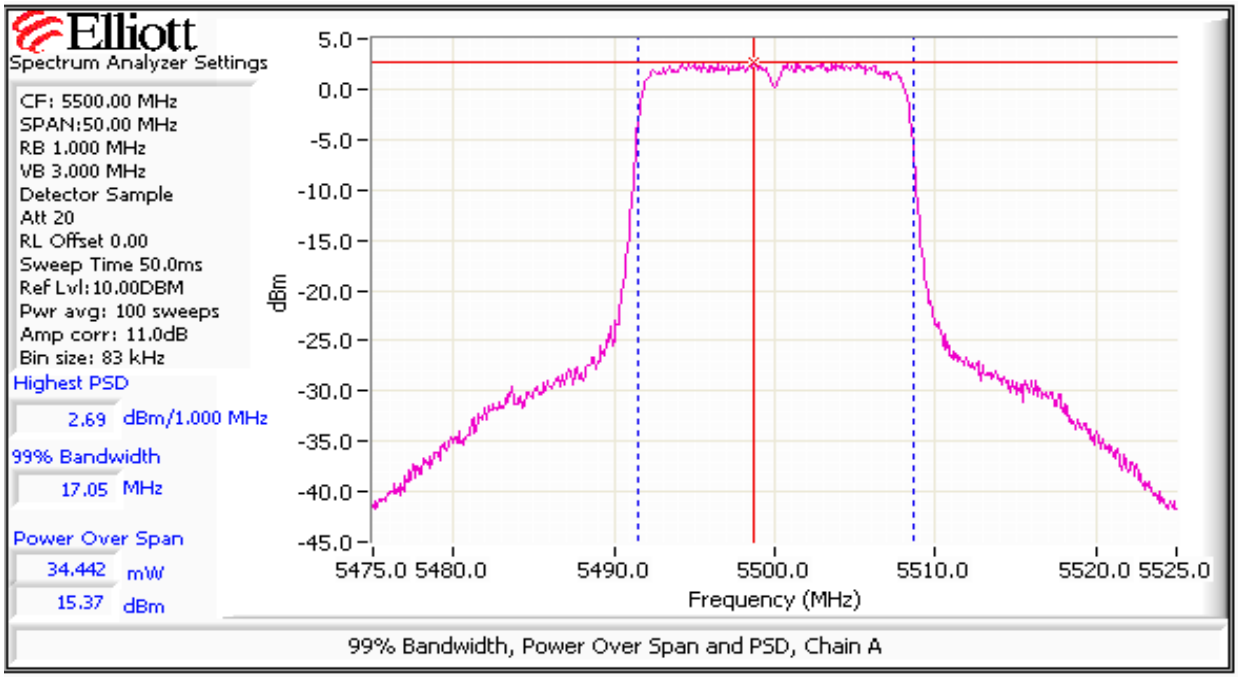
Frequency (MHz)	*Average Power*	Bandwidth 26dB	Bandwidth 99%[4]	Output Power[1] dB Measured	Output Power[1] dB Limit	Power (Watts)	PSD[2] dB/MHz Measured	PSD[2] dB/MHz FCC Limit	PSD[2] dB/MHz RSS Limit[3]	Result
Chain A, 802.11a Mode										
5500	*16.8*	35.3	17.1	15.4	24.0	0.035	2.7	11.0	11.0	Pass
5600	*16.6*	33.1	17.0	14.7	24.0	0.029	2.2	11.0	11.0	Pass
5700	*16.8*	35.2	17.1	15.0	24.0	0.031	2.6	11.0	11.0	Pass
Chain B, 802.11a Mode										
5500	*16.7*	36.7	17.1	15.0	24.0	0.032	2.5	11.0	11.0	Pass
5600	*16.8*	36.0	17.0	15.1	24.0	0.032	2.8	11.0	11.0	Pass
5700	*16.7*	36.0	17.1	15.3	24.0	0.034	2.6	11.0	11.0	Pass
Chain A, HT20 Mode										
5500	*16.7*	34.3	18.2	15.0	24.0	0.032	2.1	11.0	11.0	Pass
5600	*16.6*	34.8	18.2	14.6	24.0	0.029	1.8	11.0	11.0	Pass
5700	*16.7*	38.2	18.3	15.0	24.0	0.031	2.0	11.0	11.0	Pass
Chain B, HT20 Mode										
5500	*16.8*	37.1	18.3	15.0	24.0	0.032	2.0	11.0	11.0	Pass
5600	*16.7*	37.9	18.3	15.0	24.0	0.032	2.3	11.0	11.0	Pass
5700	*16.6*	38.7	18.3	15.4	24.0	0.035	2.6	11.0	11.0	Pass
Chain A, HT40 Mode										
5510	*16.6*	64.8	36.3	14.9	24.0	0.031	-0.6	11.0	11.0	Pass
5590	*16.6*	62.3	36.3	14.6	24.0	0.029	-1.1	11.0	11.0	Pass
5670	*16.7*	65.2	36.5	15.2	24.0	0.033	-0.6	11.0	11.0	Pass
Chain B, HT40 Mode										
5510	*16.6*	72.6	36.5	15.0	24.0	0.031	-0.7	11.0	11.0	Pass
5590	*16.6*	73.4	36.5	15.5	24.0	0.035	-0.3	11.0	11.0	Pass
5670	*16.8*	72.6	36.6	15.4	24.0	0.035	-0.3	11.0	11.0	Pass

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 50MHz for the 20Mhz channel spacing and 80MHz for the 40Mhz channel Spacing.
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dB/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	*Average Power listed was measured with an average power meter and is for manufacturer's reference only.*

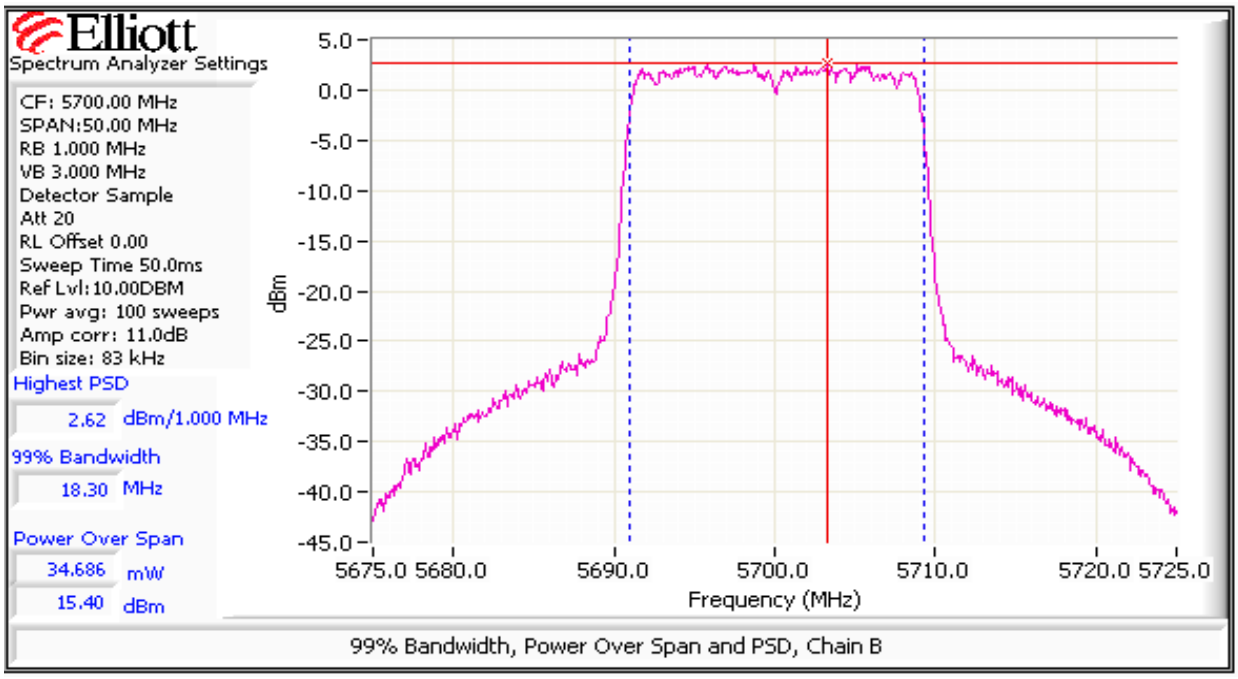
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

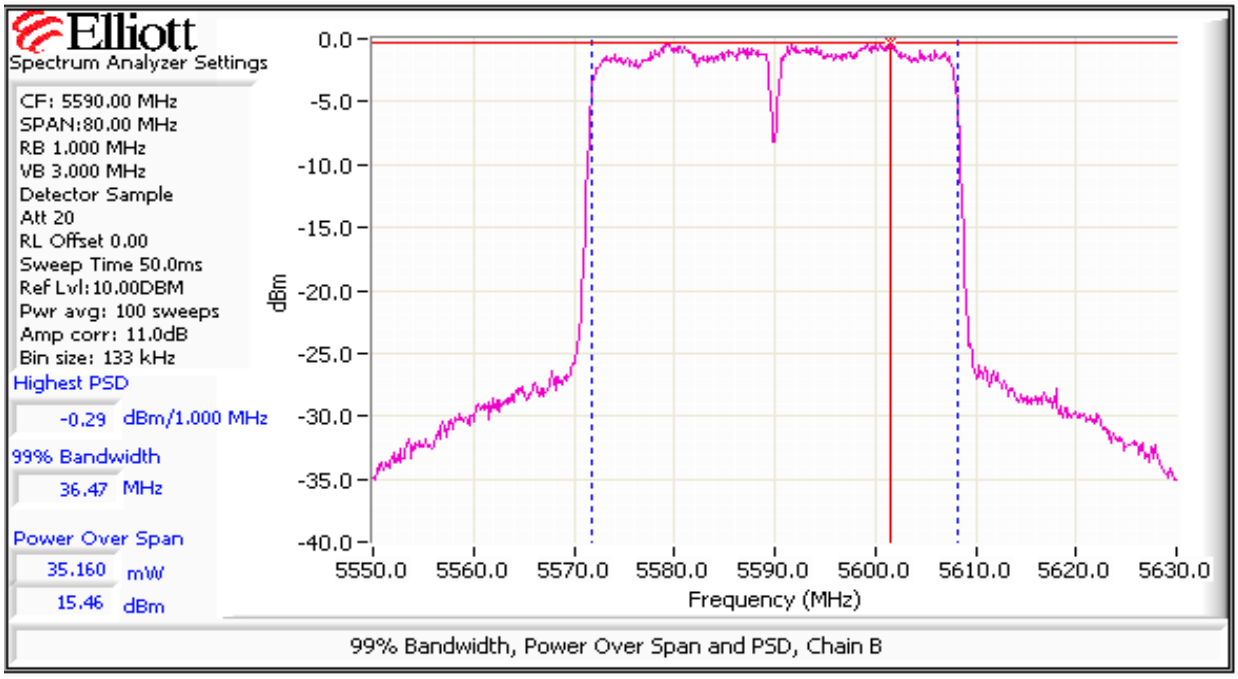
Plots for the channel(s) in each mode with the highest power and psd





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

802.11a Chain A/B

Freq/Chain	Peak Excursion(dB)	
(MHz)	Value	Limit
5500/A	9.5	13.0
5600/A	9.3	13.0
5700/A	10.9	13.0
5500/B	10.0	13.0
5600/B	9.5	13.0
5700/B	9.4	13.0

HT20 Chain A/B

Freq/Chain	Peak Excursion(dB)	
(MHz)	Value	Limit
5500/A	9.7	13.0
5600/A	10.2	13.0
5700/A	10.8	13.0
5500/B	10.3	13.0
5600/B	10.4	13.0
5700/B	10.5	13.0

HT40 Chain A/B

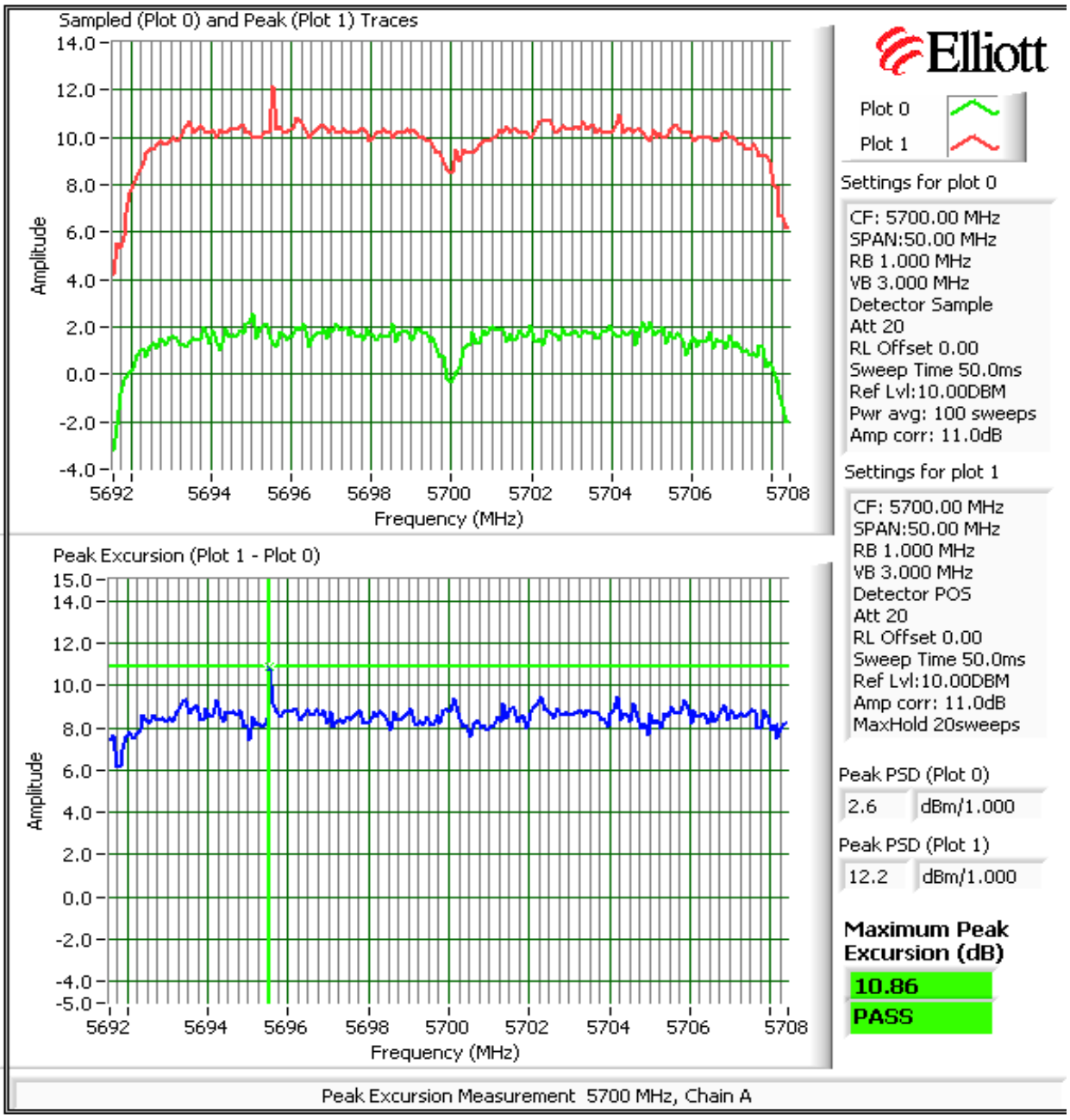
Freq/Chain	Peak Excursion(dB)	
(MHz)	Value	Limit
5510/A	11.7	13.0
5590/A	11.7	13.0
5670/A	11.9	13.0
5510/B	11.4	13.0
5590/B	10.8	13.0
5670/B	11.5	13.0

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

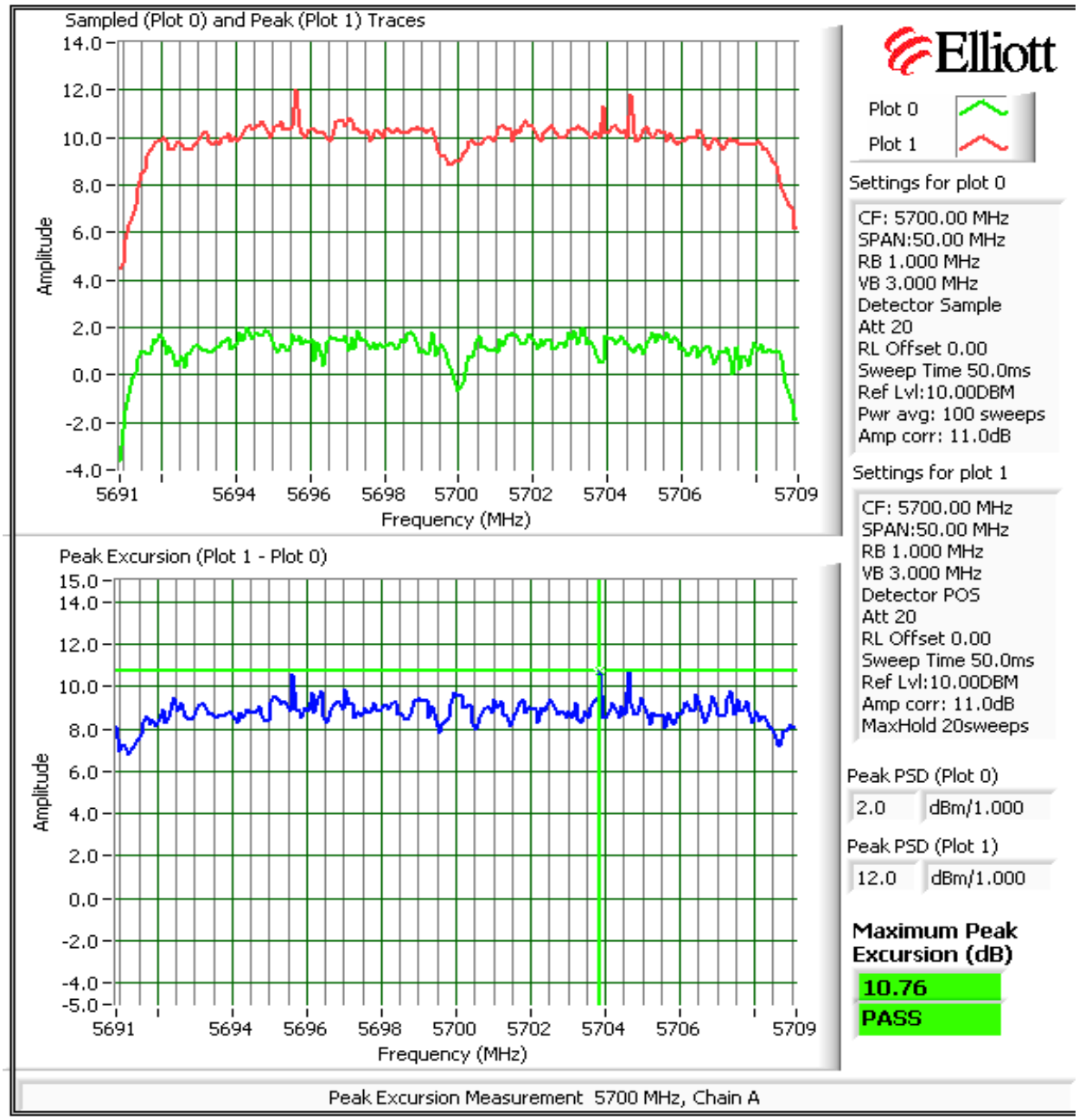
Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

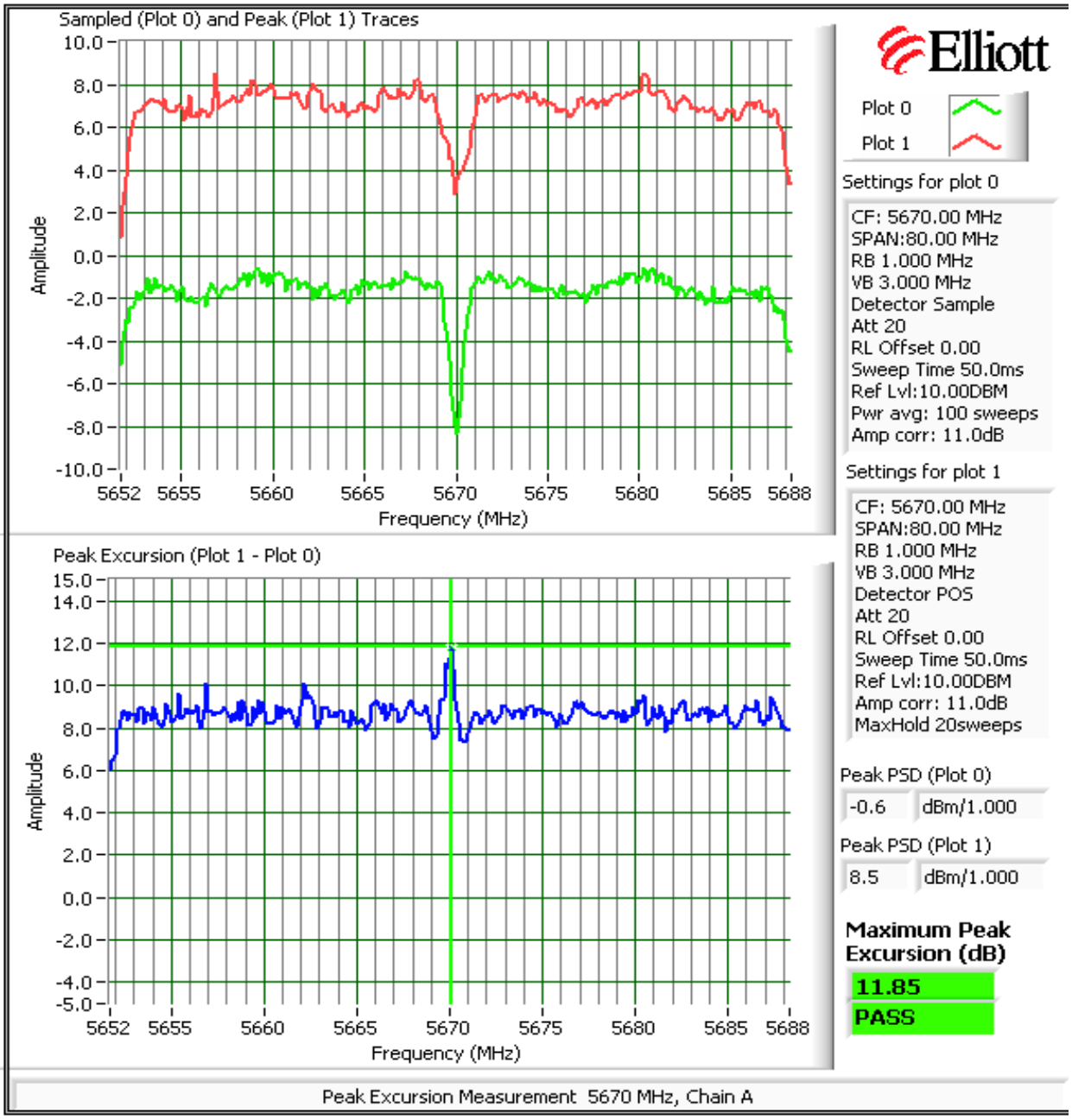
Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated average power)



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

Note 1:	The -27dB/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain (limit = -27dB - antenna gain). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies. Only average limit is used on the plots - solid red line.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dB EIRP
Note 4:	If the device is for outdoor use then the -27dB eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

802.11a Mode - Chains A and B

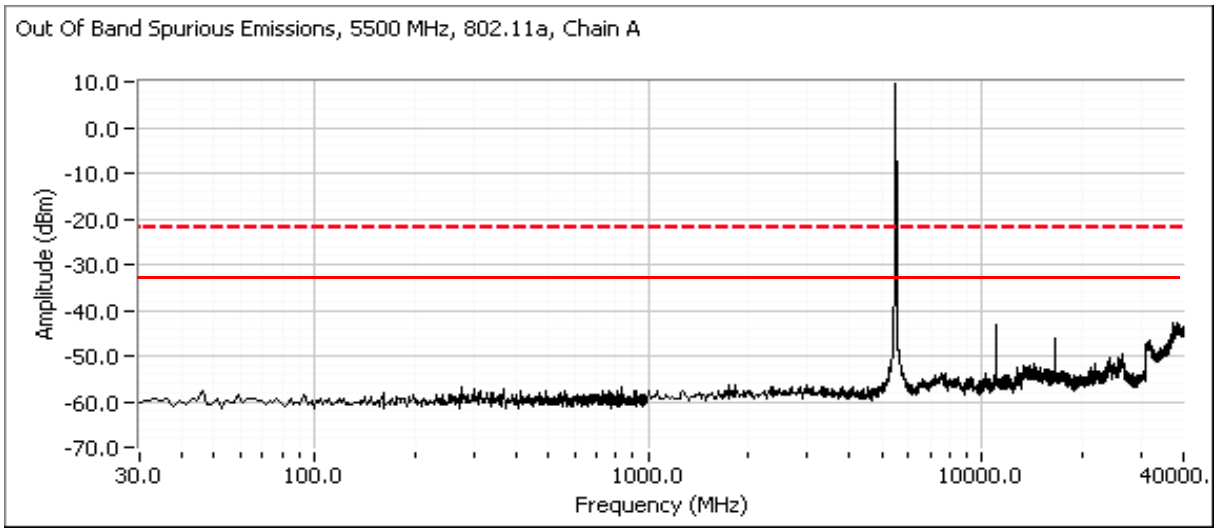
Maximum Antenna Gain:	4.8	dBi	
Spurious Limit:	-27.0	dB/MHz eirp	
Limit Used On Plots Note 1:	-31.8	dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-11.8	dB/MHz	Peak Limit (RB=VB=1MHz)

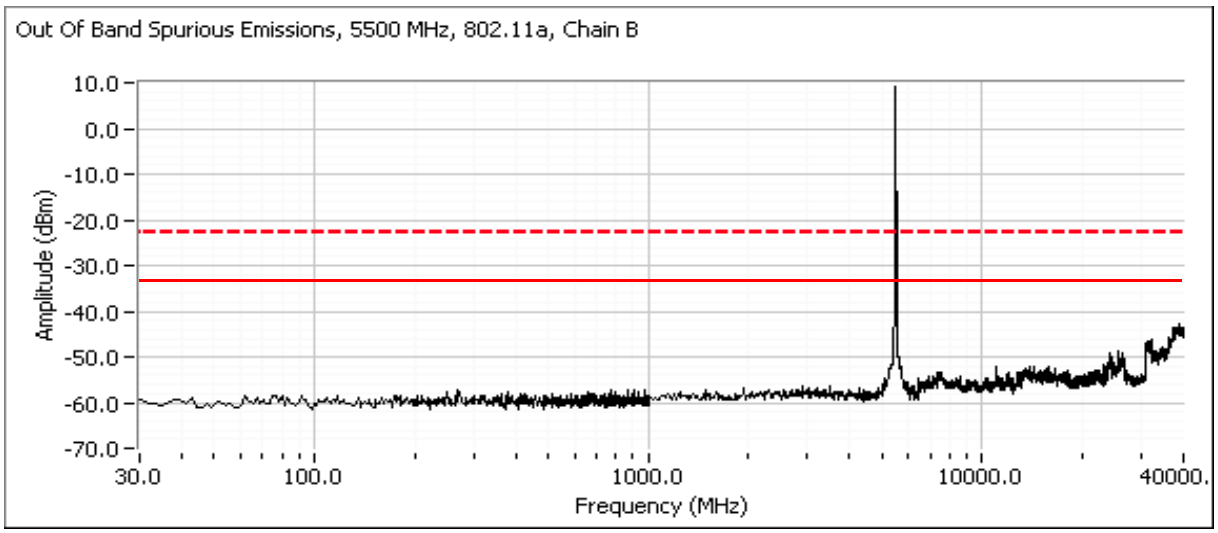
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

Low channel, 5470 - 5725 MHz Band

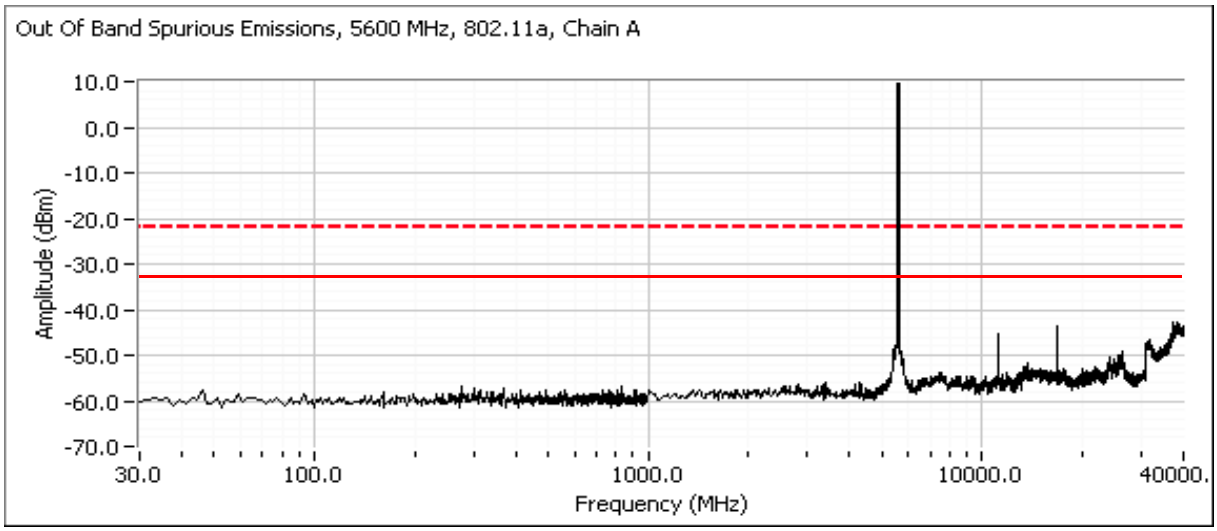
Compliance with the limit immediately below the allocated band from 5460-5470 MHz and compliance with the radiated limits for the restricted band below 5460 MHz are demonstrated through the radiated emissions tests.

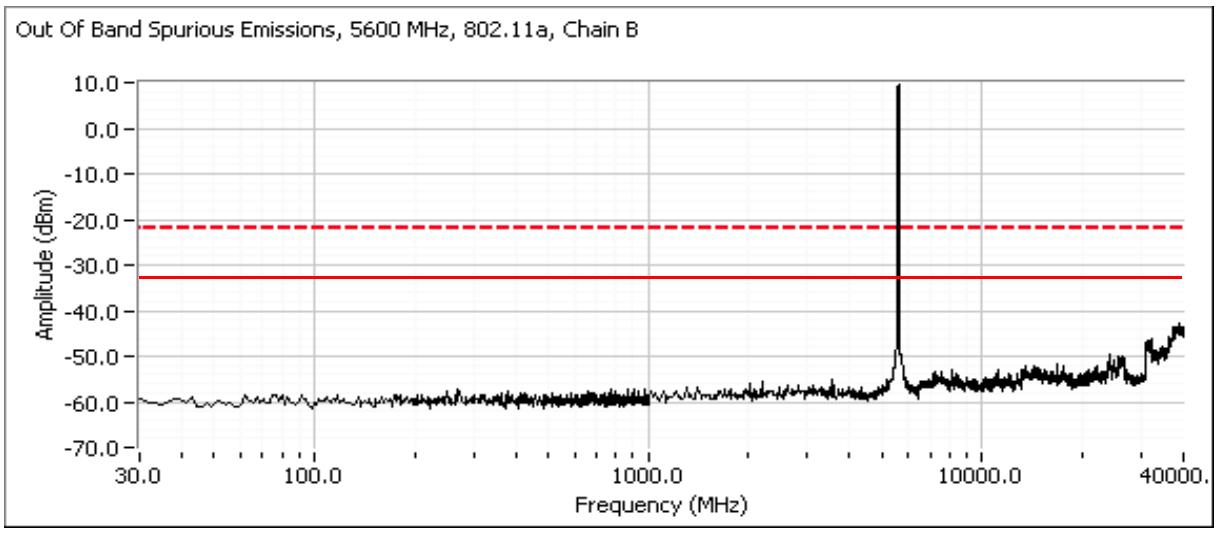




Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Center channel, 5470 - 5725 MHz Band

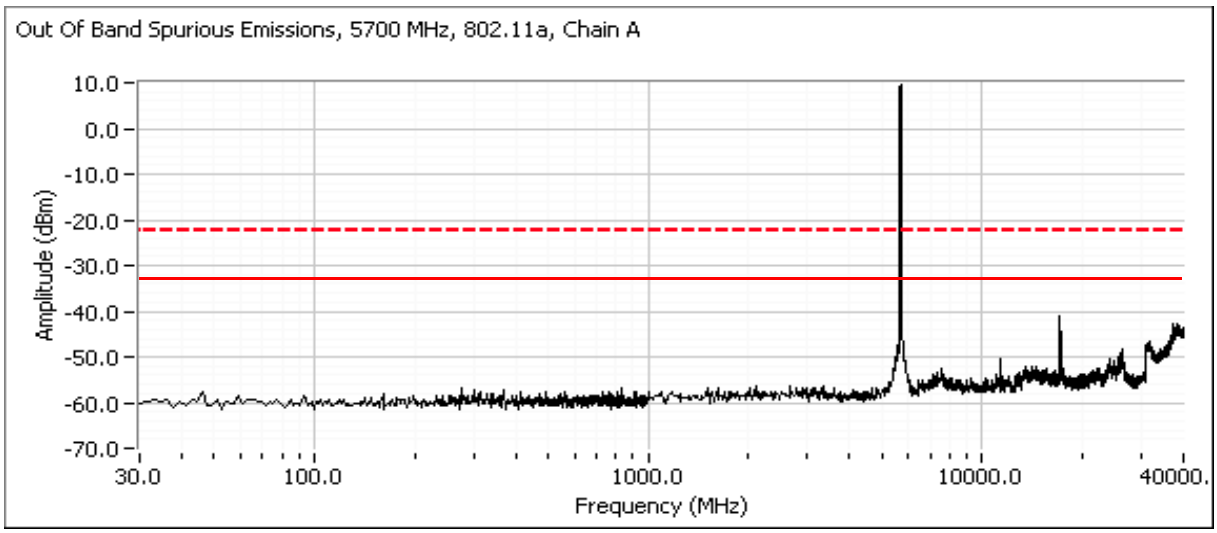


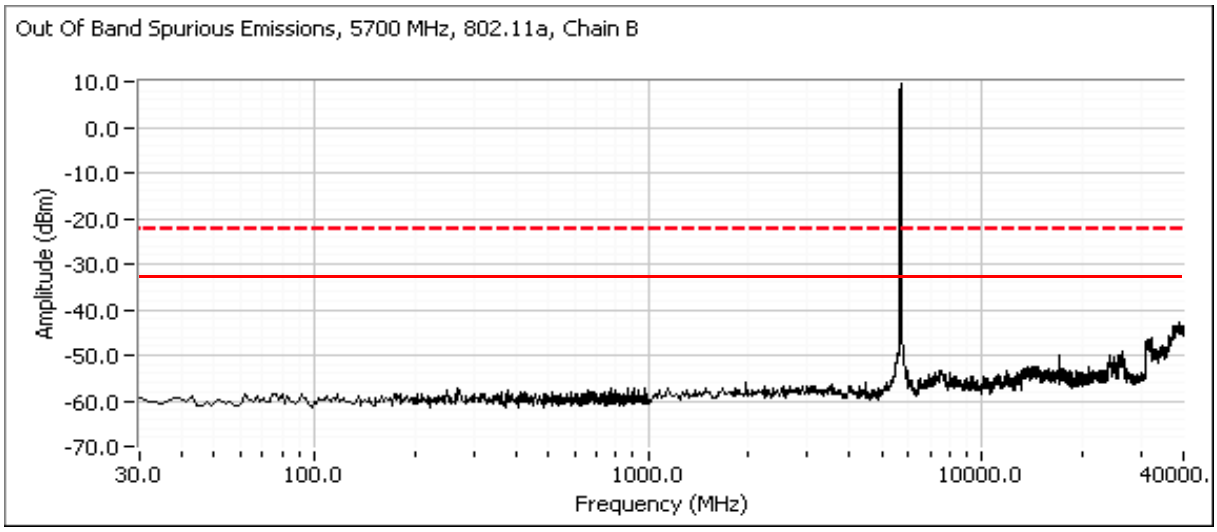


Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

High channel, 5470 - 5725 MHz Band

Compliance with the limit immediately above the allocated band is demonstrated through the radiated emissions tests.





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

HT20 and HT40 Modes

MIMO Devices: Antenna gain used is the effective gain calculated in the power section of this data sheet. The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Although the operating power levels in this data sheet are for single chain operation the plots are considering operation on two chains simultaneously to cover both single chain and dual modes of operation. The actual dual chain operation is at a lower per-chain power level so these single chain plots at a higher output power level will represent a worst case.

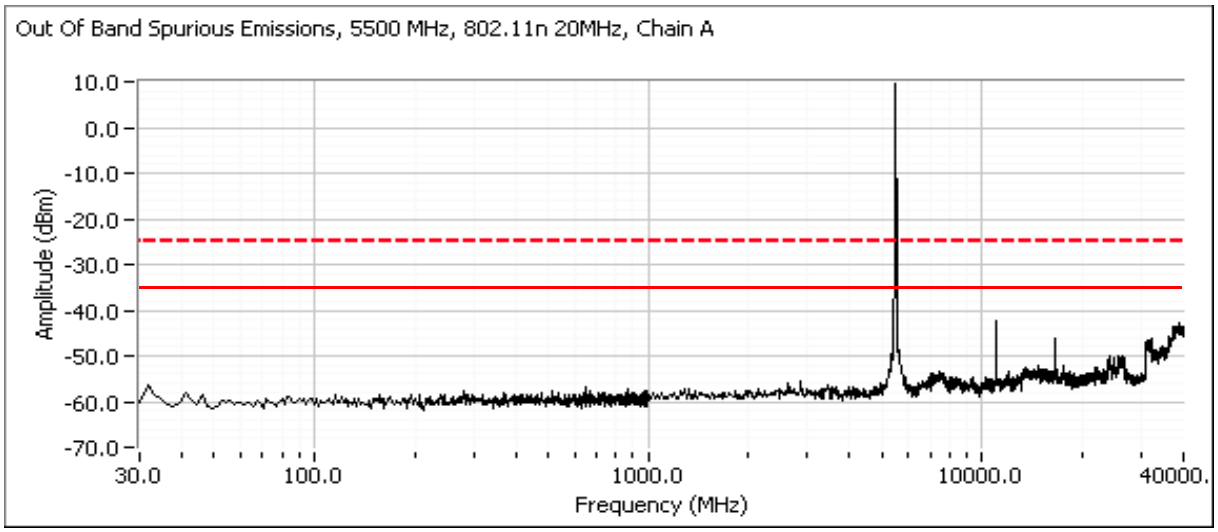
Number of transmit chains:	2		
Maximum Antenna Gain:	4.8	dBi	
Spurious Limit:	-27.0	dB/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots [Note 1]:	-34.8	dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-14.8	dB/MHz	Peak Limit (RB=VB=1MHz)

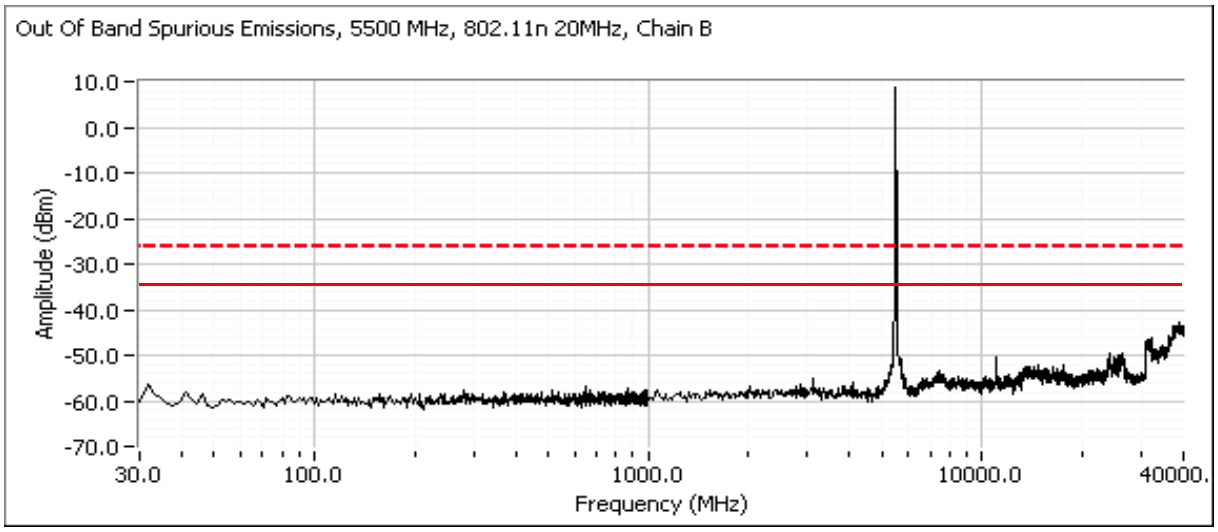
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

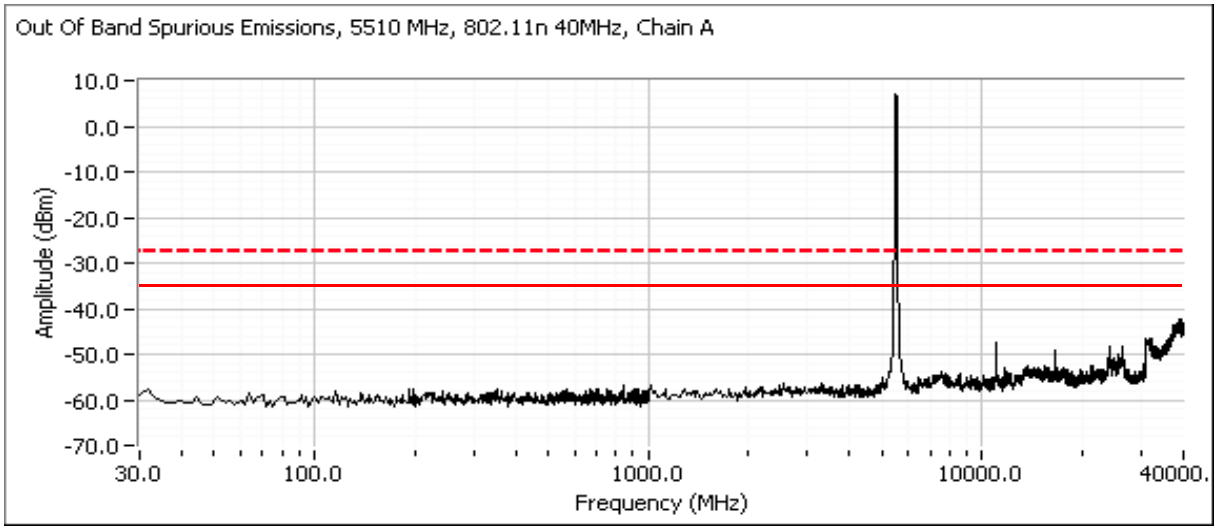
Low channel, 5470 - 5725 MHz Band

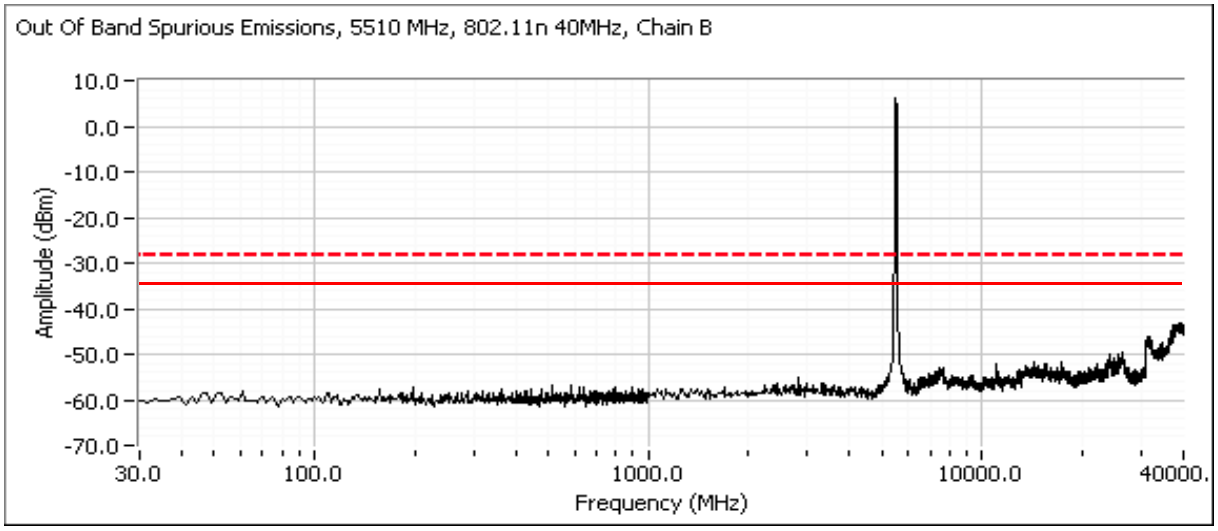
Compliance with the limit immediately below the allocated band from 5460-5470 MHz and compliance with the radiated limits for the restricted band below 5460 MHz are demonstrated through the radiated emissions tests.





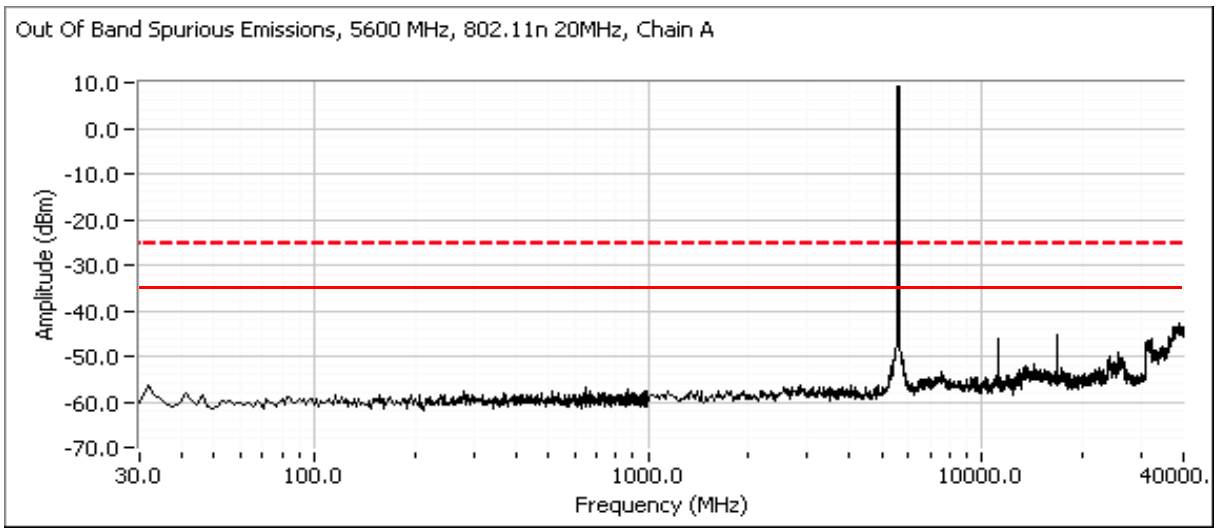
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

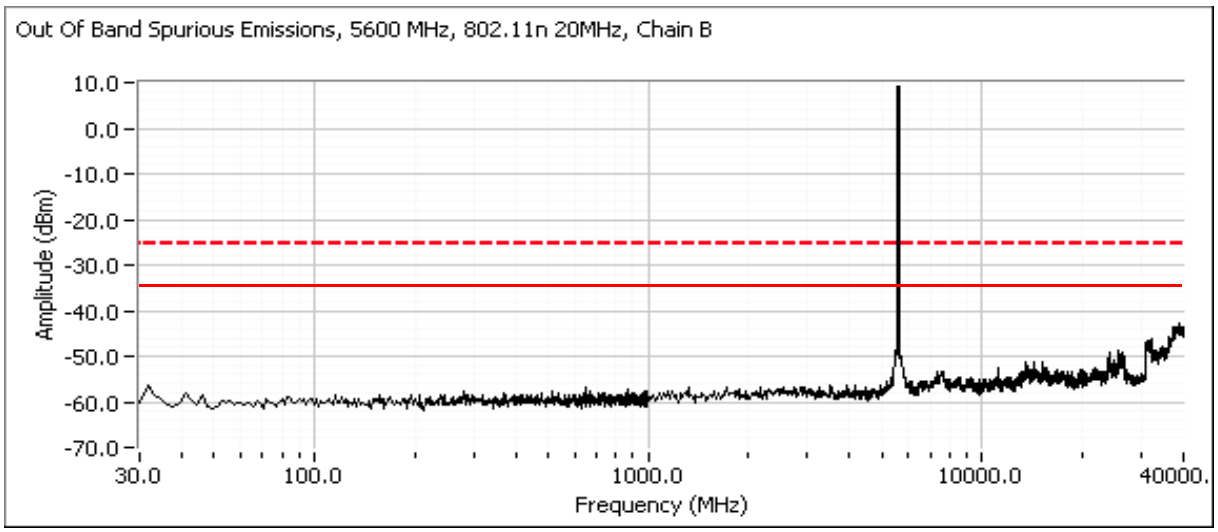




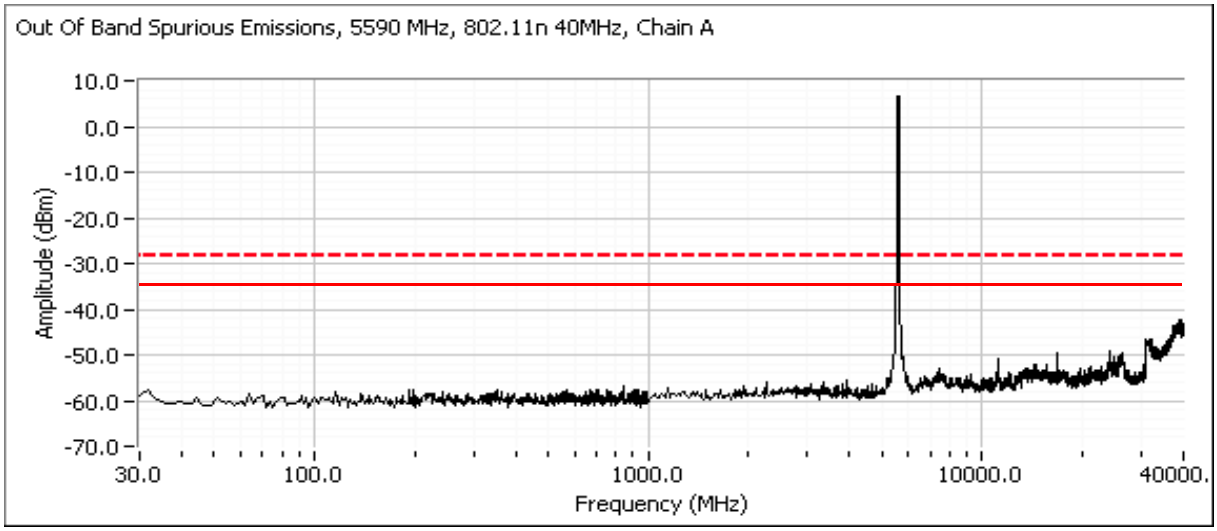
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

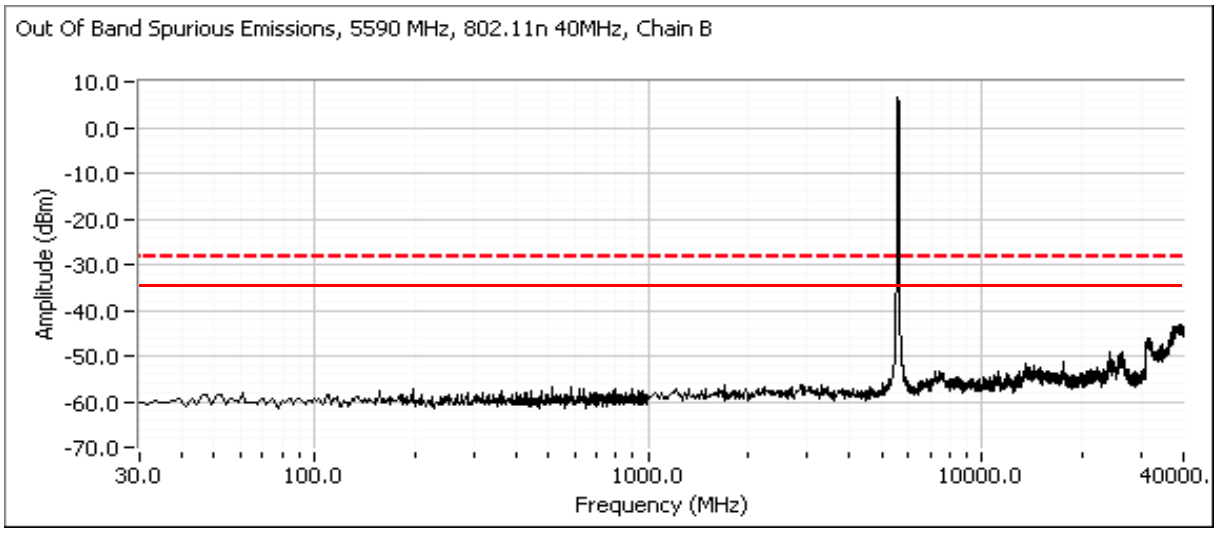
Center channel, 5470 - 5725 MHz Band





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

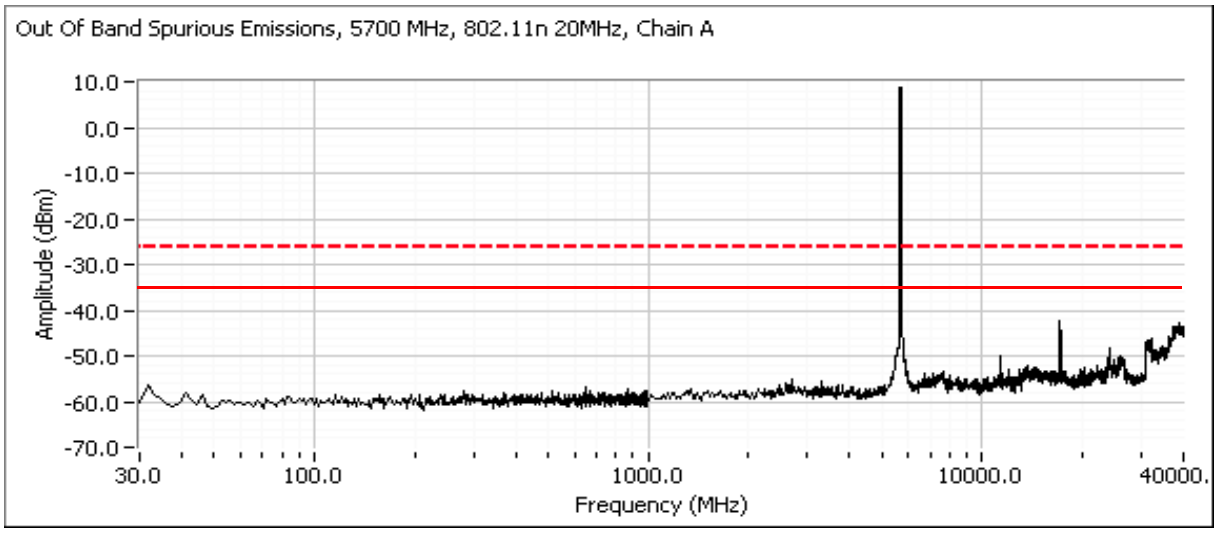


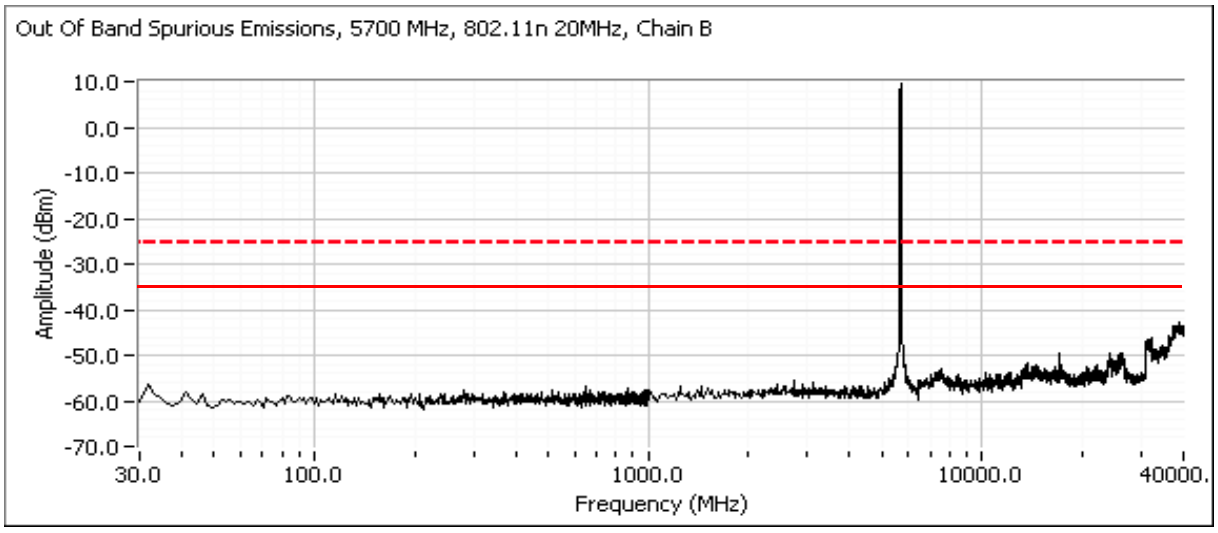


Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

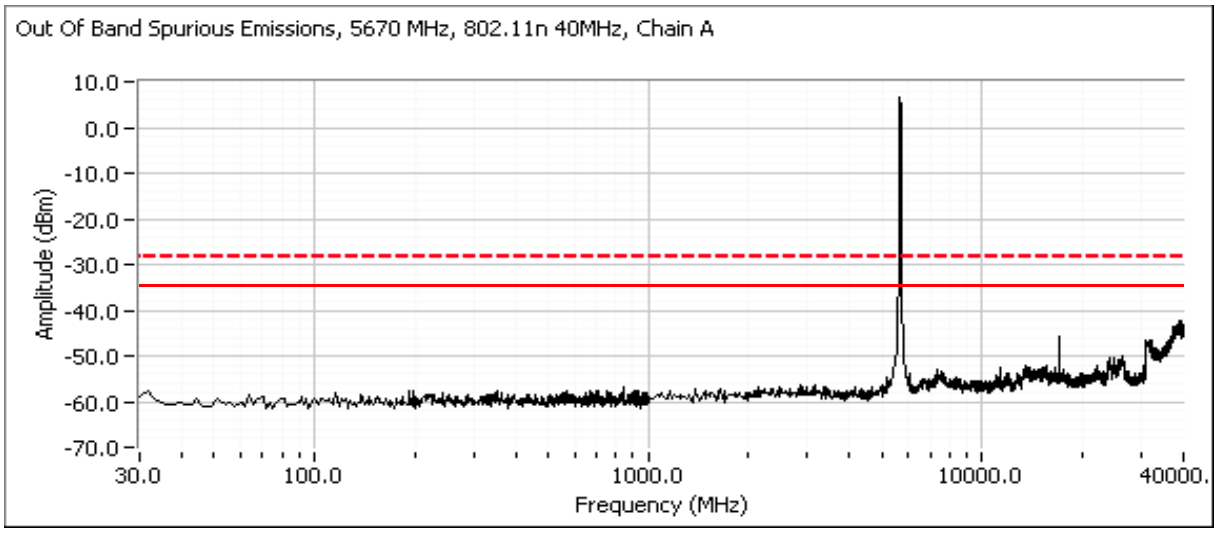
High channel, 5470 - 5725 MHz Band

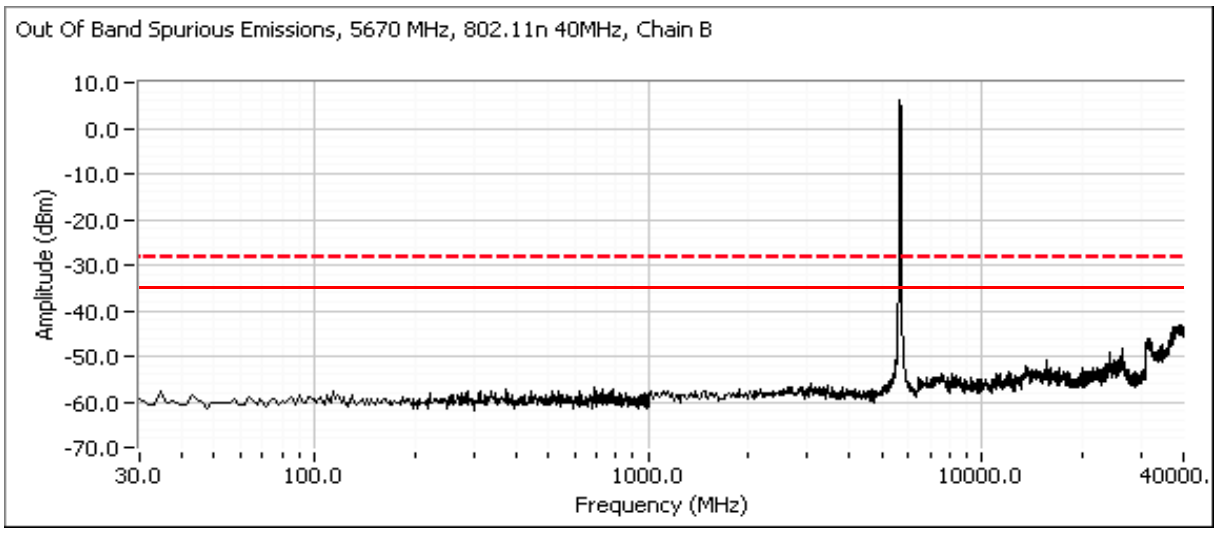
Compliance with the limit immediately above the allocated band is demonstrated through the radiated emissions tests.





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Peak Excursion, Bandwidth and Spurious Emissions

Test Specific Details

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

Date of Test: 9/3/2009
Test Engineer: Rafael Varelas
Test Location: FT Chamber #3

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

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators and cables used.

Ambient Conditions:

Temperature: 22.1 °C
Rel. Humidity: 43 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	HT20: 14.4 dBm HT40: 14.5 dBm
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	HT20: 14.6 dBm HT40: 14.5 dBm
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	HT20: 14.2 dBm HT40: 14.3 dBm
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	HT20: 1.7 dBm/MHz HT40: -1.0 dBm/MHz
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	HT20: 2.0 dBm/MHz HT40: -1.1 dBm/MHz
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	HT20: 1.5 dBm/MHz HT40: -1.4 dBm/MHz

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:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

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 >40 MHz for HT20 mode and > 80MHz for HT40 mode.
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.
Note 6:	*Average power measured using average power sensor and is for reference only.*

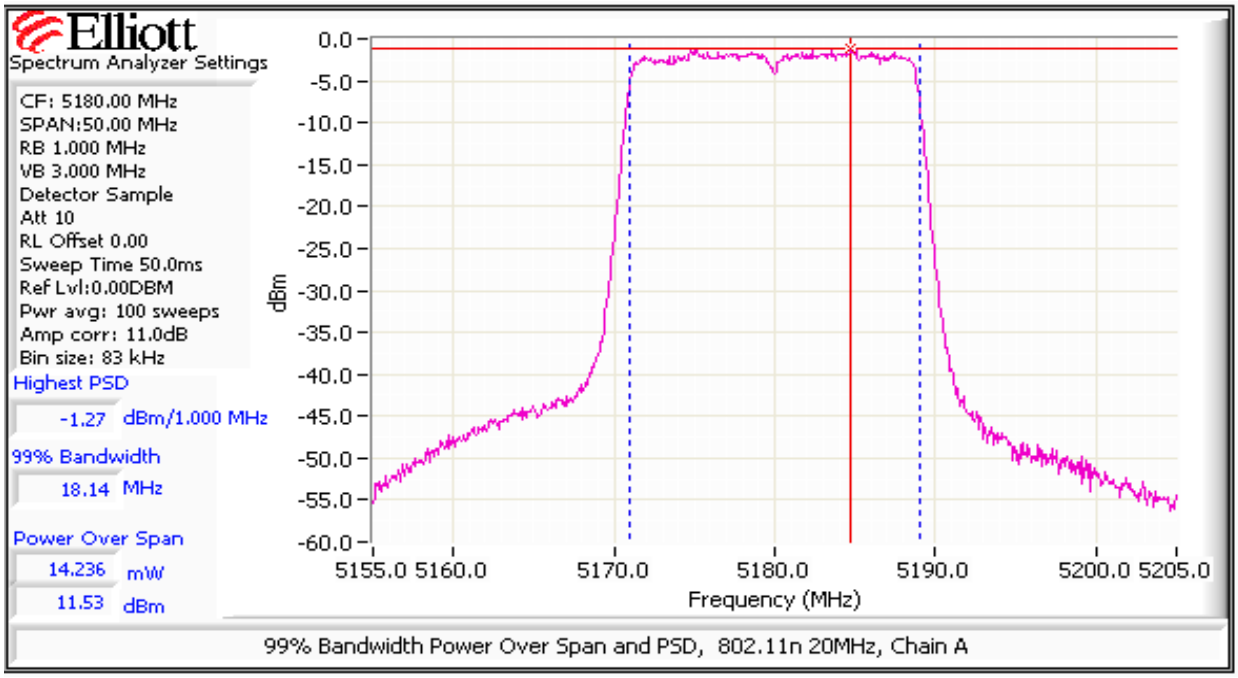
Run #1: Bandwidth, Output Power and Power Spectral Density - 5150 - 5250 MHz

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]
Antenna Gain (dBi):	3.6	3.6	-	No	3.6

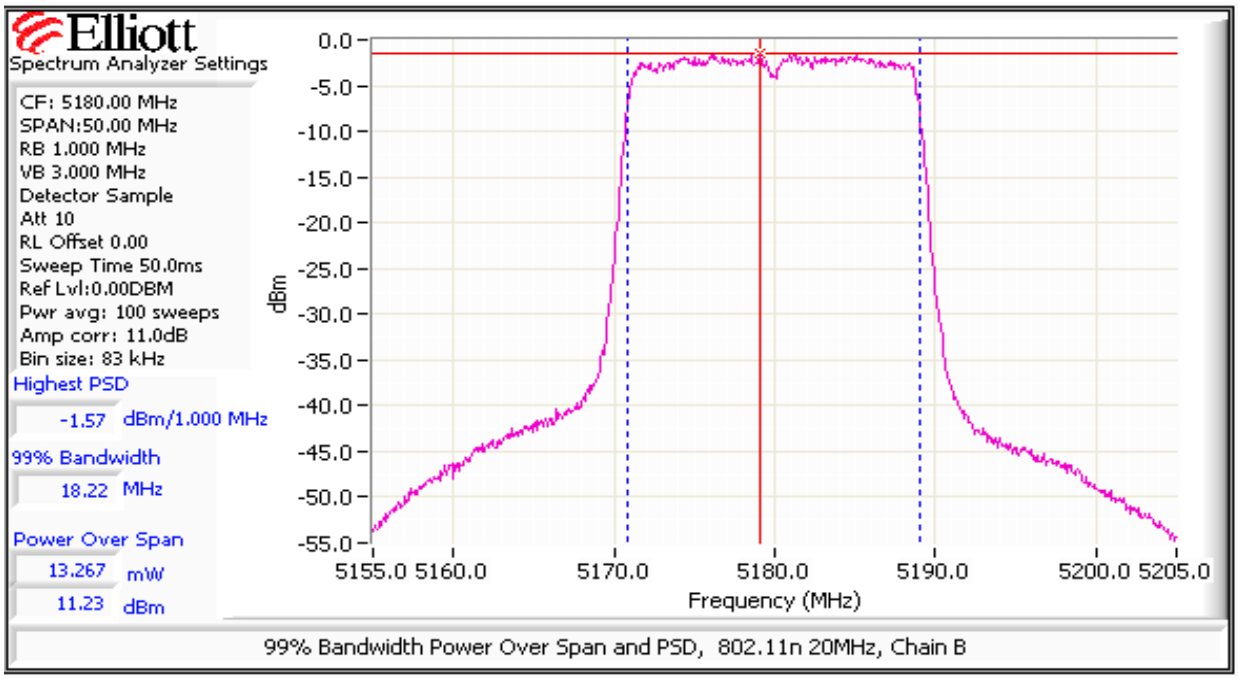
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Power[1] dBm Chain 1	Measured Power[1] dBm Chain 2	*Average power*	Total mW	Total dBm	Limit (dBm)	Max Power (W)	Pass or Fail
5180	26.5/25.0	21.8	11.5	11.2	*13.8/13.6*	27.3	14.4	17.0	0.027	PASS
5200	26.0/25.0	21.9	11.3	11.3	*13.7/13.6*	27.0	14.3	17.0		PASS
5240	25.5/25.0	21.9	11.5	11.2	*13.8/13.7*	27.3	14.4	17.0		PASS
5190	26.5/25.5	40.4	11.6	11.4	*13.8/13.8*	28.3	14.5	17.0	0.028	PASS
5230	25.5/25.0	40.1	11.3	11.1	*13.6/13.6*	26.4	14.2	17.0		PASS

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz Chain 1	PSD[2] dBm/MHz Chain 2	PSD[2] dBm/MHz Chain 3	Total PSD mW/MHz	Total PSD dBm/MHz	Limit FCC	Limit RSS 210[3]	Pass or Fail
5180	18.2	14.4	-1.3	-1.6		1.4	1.6	4.0	6.4	PASS
5200	18.2	14.3	-1.6	-1.6		1.4	1.4	4.0	6.4	PASS
5240	18.2	14.4	-1.3	-1.3		1.5	1.7	4.0	6.4	PASS
5190	36.3	14.5	-4.0	-4.0		0.8	-1.0	4.0	6.4	PASS
5230	36.3	14.2	-4.5	-4.6		0.7	-1.5	4.0	6.4	PASS

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

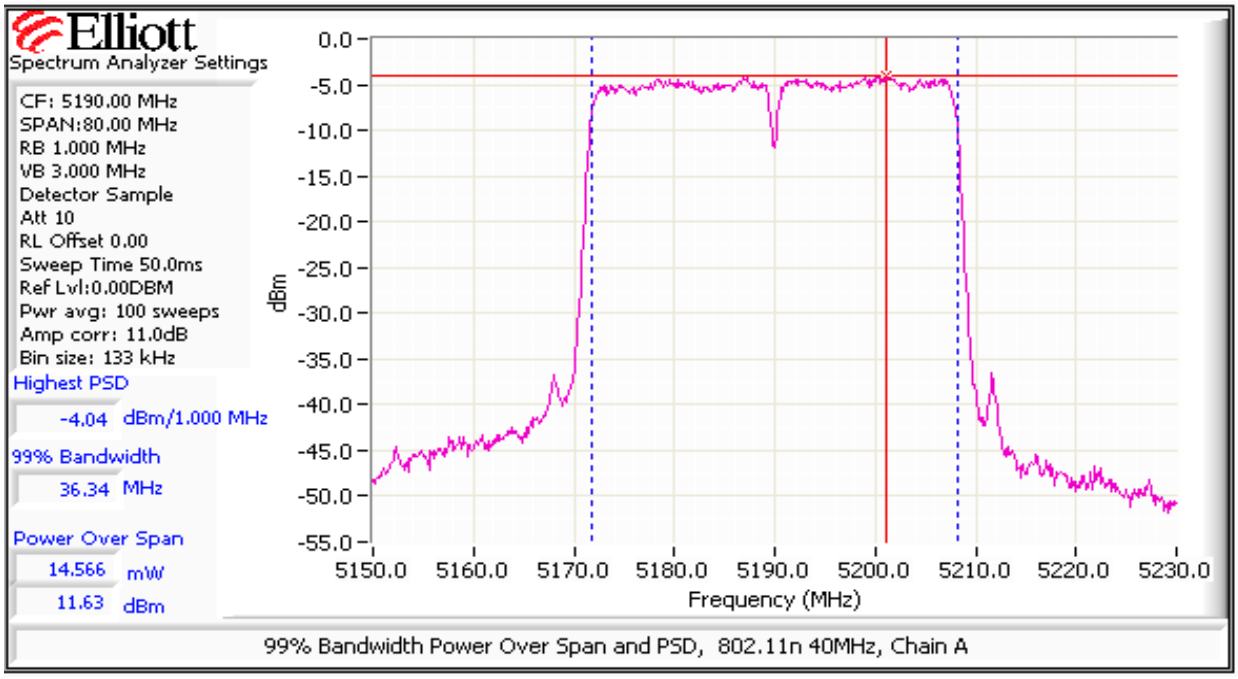


99% Bandwidth Power Over Span and PSD, 802.11n 20MHz, Chain A

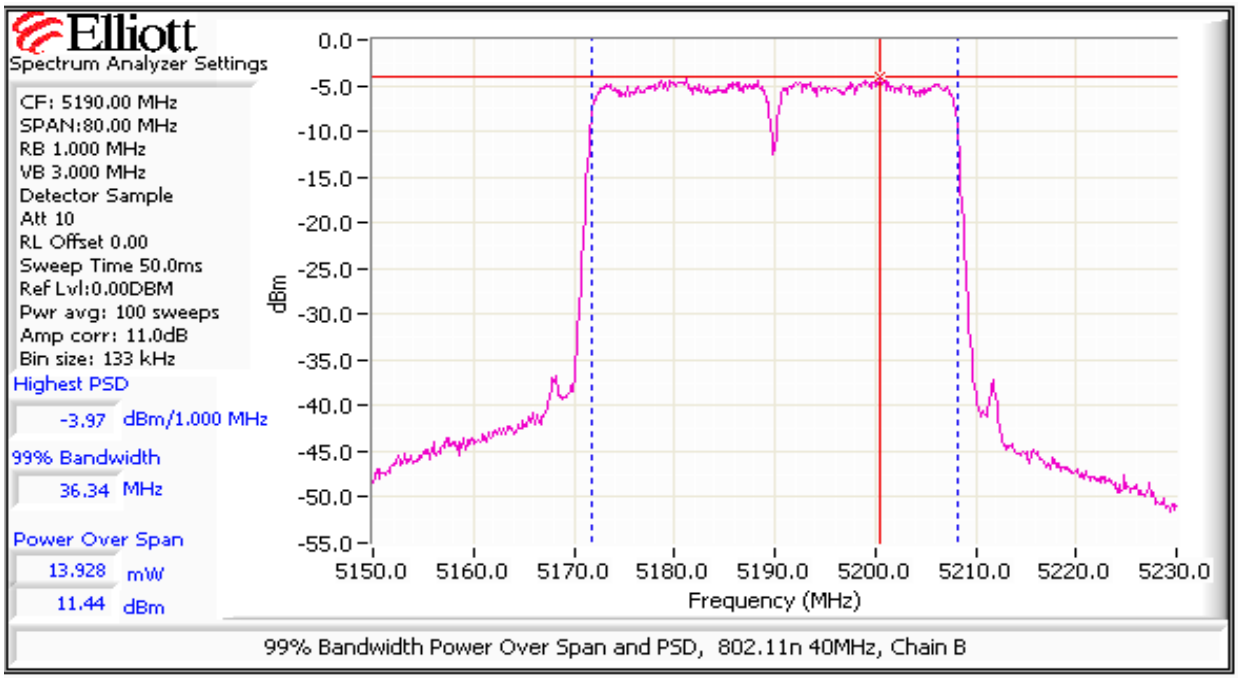


99% Bandwidth Power Over Span and PSD, 802.11n 20MHz, Chain B

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



99% Bandwidth Power Over Span and PSD, 802.11n 40MHz, Chain A



99% Bandwidth Power Over Span and PSD, 802.11n 40MHz, Chain B

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

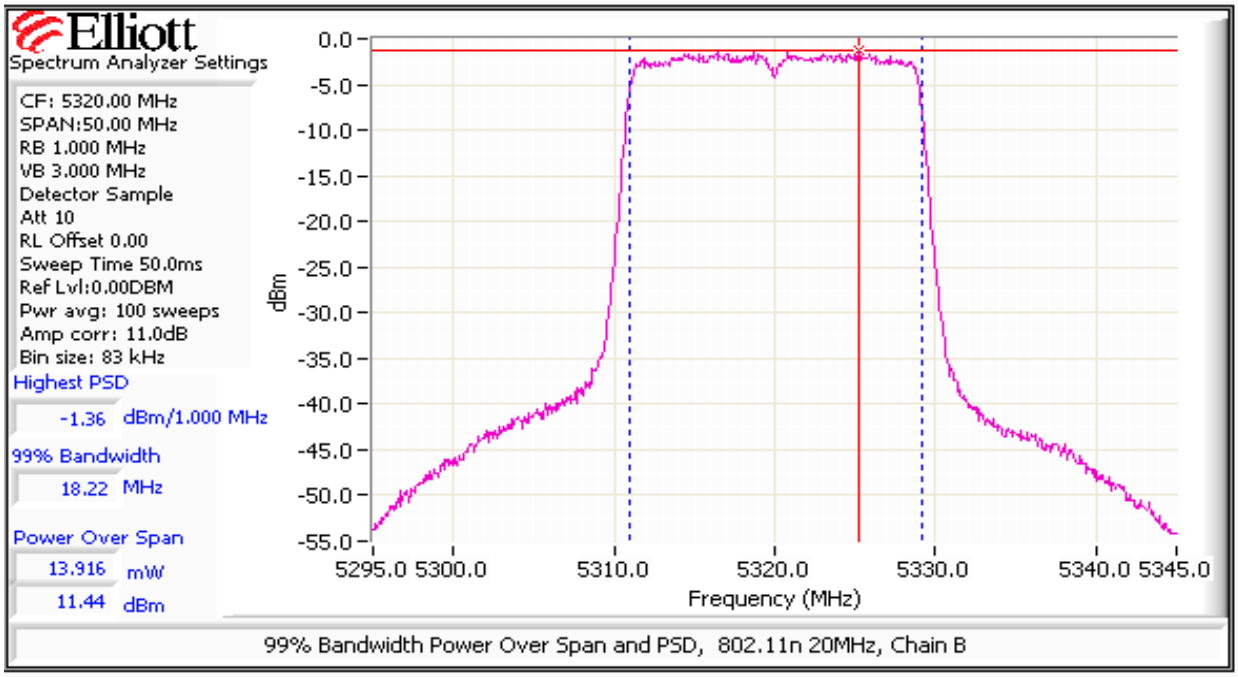
Run #2: Bandwidth, Output Power and Power Spectral Density - 5250 - 5350 MHz

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]
Antenna Gain (dBi):	3.7	3.7	-	No	3.7

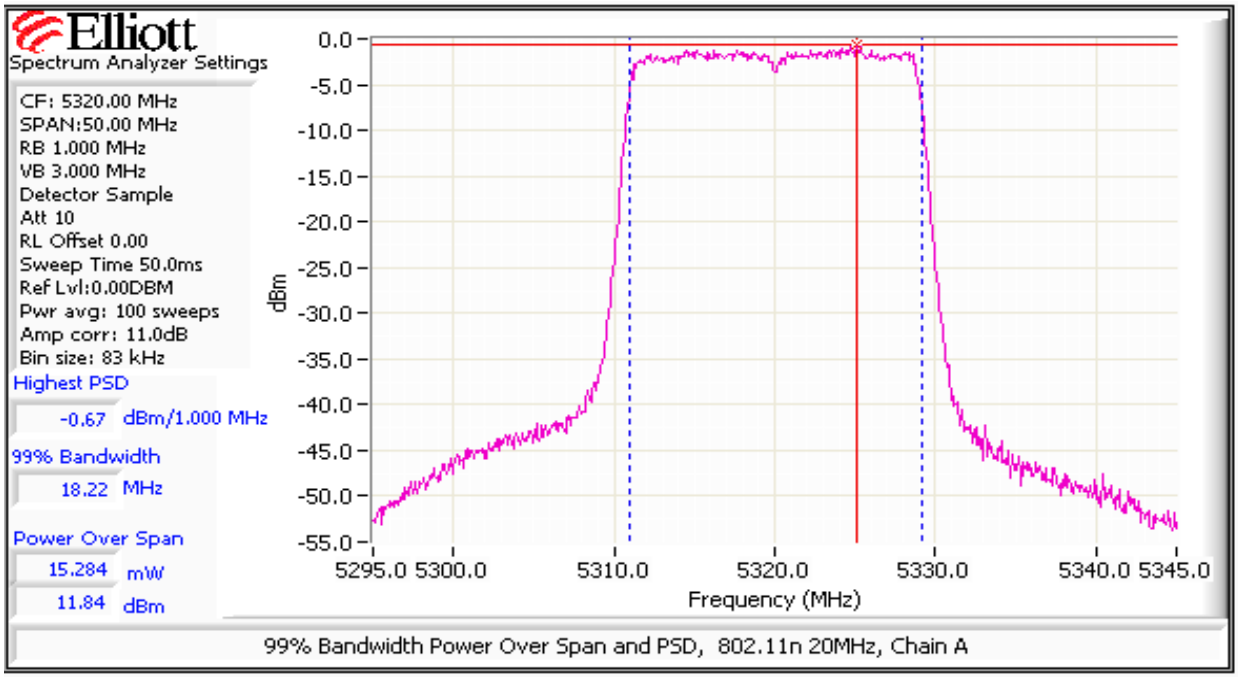
Note - target power is 13.5dBm per chain for al modes.

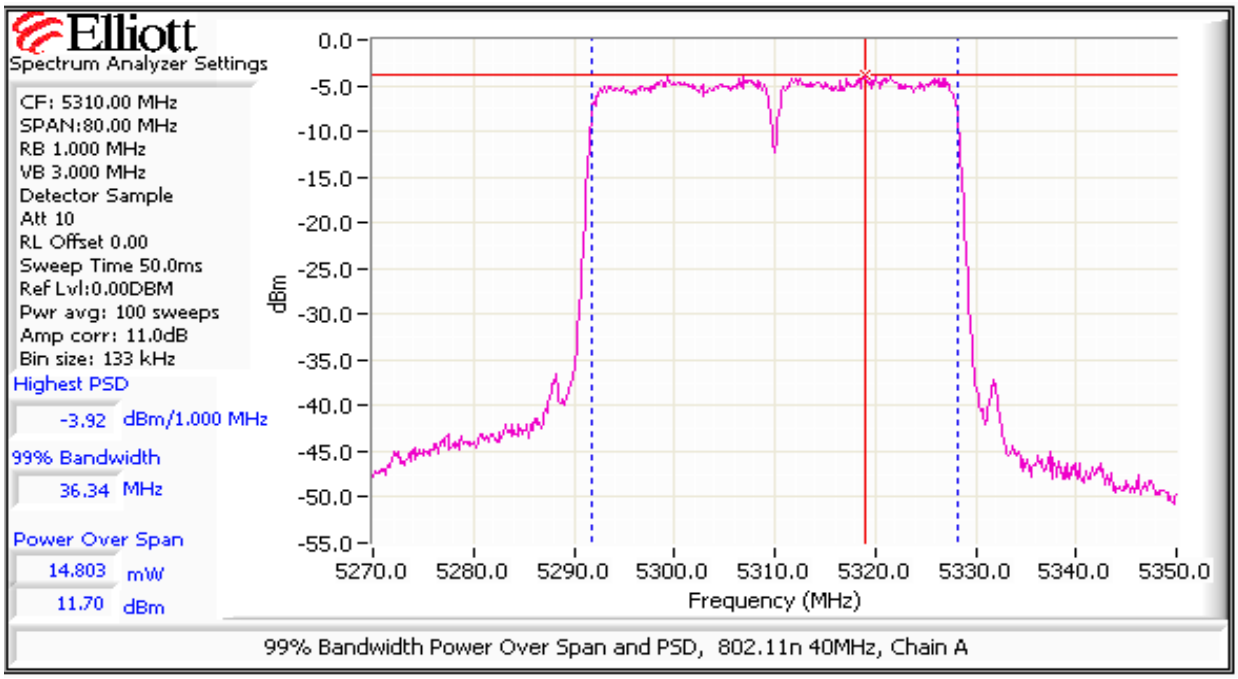
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Power[1] dBm		*Average power*	Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2		mW	dBm			
5260	25.0/25.0	21.8	11.3	11.1	*13.7/13.8*	26.4	14.2	24.0	0.029	PASS
5300	24.5/25.0	21.8	11.4	11.4	*13.7/13.7*	27.6	14.4	24.0		PASS
5320	24.5/25.0	21.8	11.8	11.4	*13.7/13.6*	28.9	14.6	24.0		PASS
5270	25.0/25.0	40.4	11.3	11.1	*13.8/13.7*	26.4	14.2	24.0	0.028	PASS
5310	24.5/25.0	40.4	11.7	11.3	*13.8/13.7*	28.3	14.5	24.0		PASS

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5260	18.2	14.2	-1.6	-1.6		1.4	1.4	11.0	11.0	PASS
5300	18.2	14.4	-1.4	-1.1		1.5	1.8	11.0	11.0	PASS
5320	18.2	14.6	-0.7	-1.4		1.6	2.0	11.0	11.0	PASS
5270	36.3	14.2	-4.3	-4.5		0.7	-1.4	11.0	11.0	PASS
5310	36.3	14.5	-3.9	-4.3		0.8	-1.1	11.0	11.0	PASS

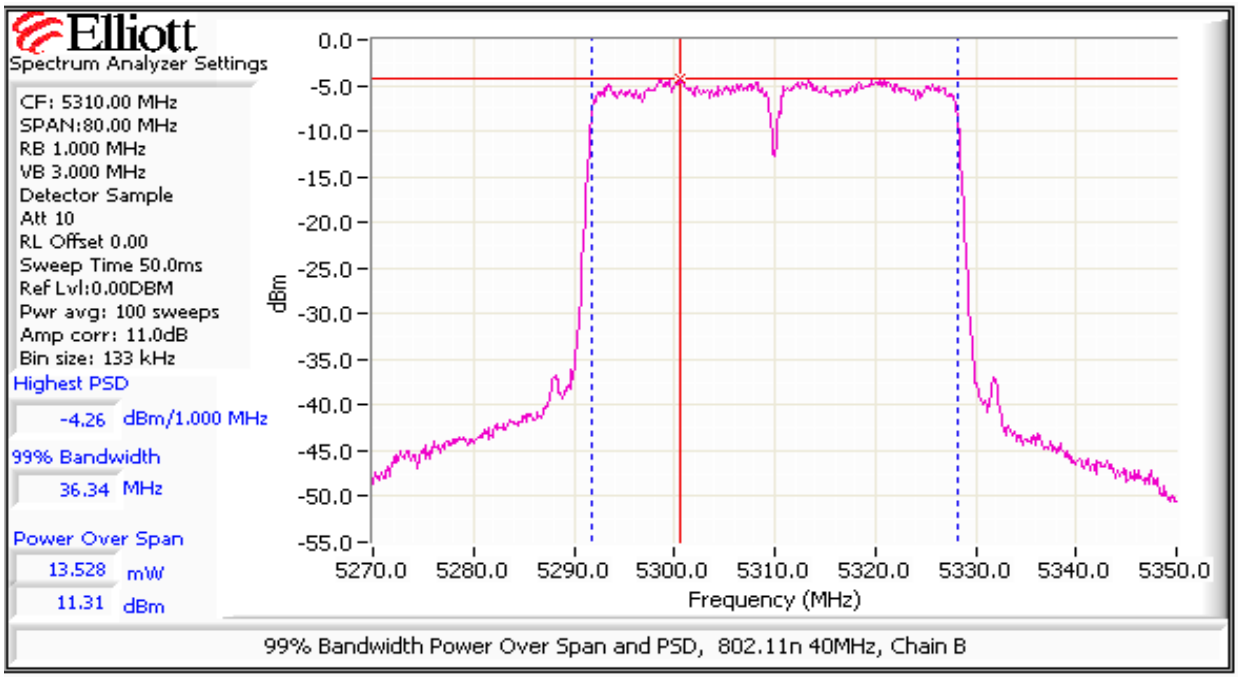


Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Run #3: Bandwidth, Output Power and Power Spectral Density - 5470 - 5725 MHz

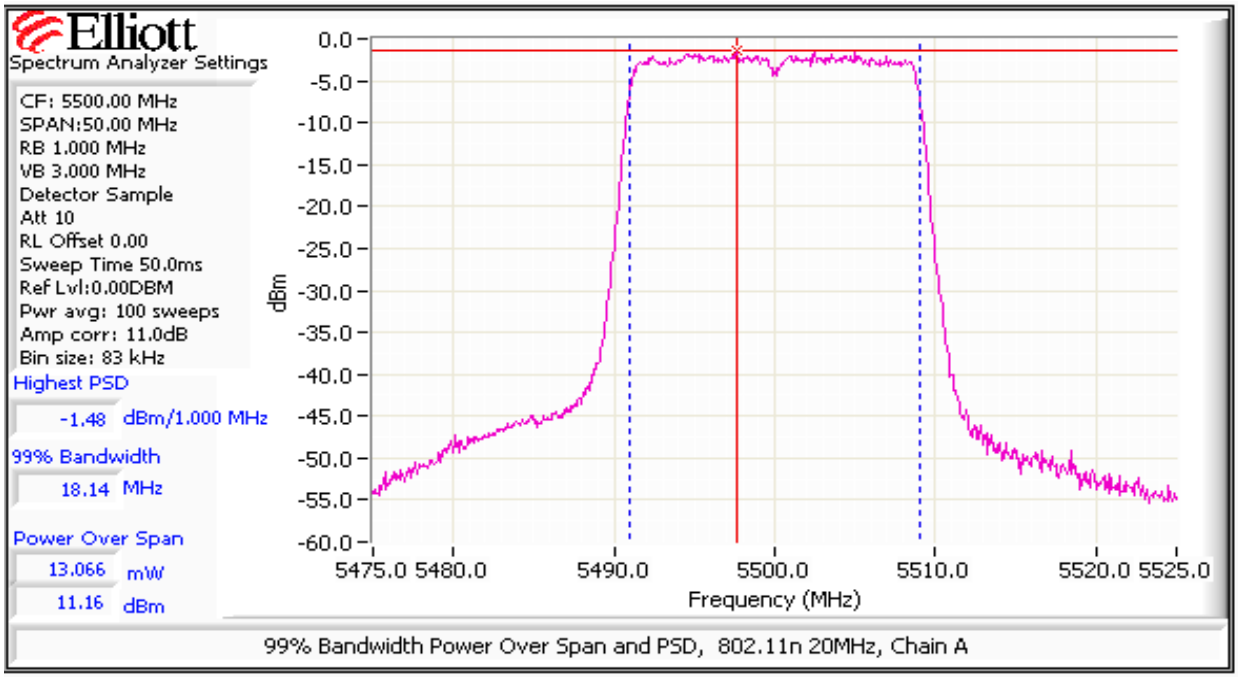
	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]
Antenna Gain (dBi):	4.8	4.8	-	No	4.8

Note - target power is 13.5dBm per chain for al modes.

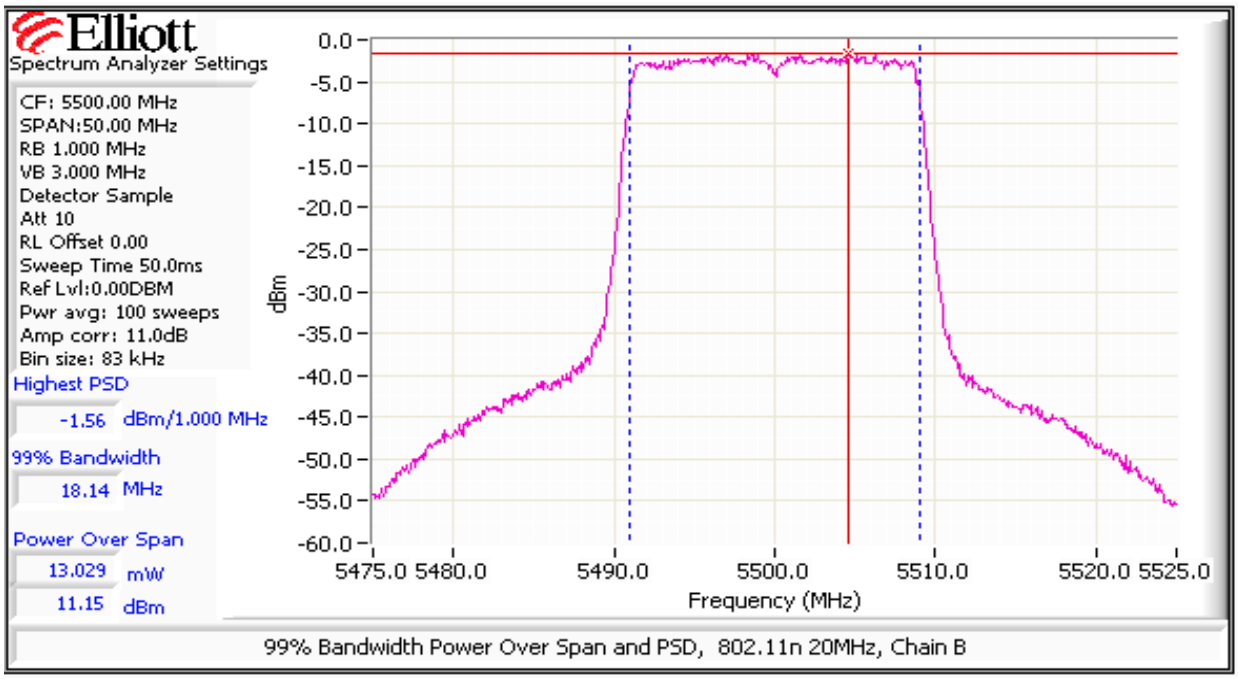
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Power[1] dBm		Average power	Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2		mW	dBm			
5500	22.0/23.5	21.8	11.2	11.2	*13.6/13.6*	26.4	14.2	24.0	0.026	PASS
5600	22.5/23.0	21.7	11.1	11.1	*13.6/13.7*	25.8	14.1	24.0		PASS
5700	23.0/23.0	21.9	11.3	11.0	*13.8/13.6*	26.1	14.2	24.0		PASS
5510	22.0/23.5	40.3	11.2	11.3	*13.6/13.7*	26.7	14.3	24.0	0.027	PASS
5590	22.5/23.0	40.3	11.1	11.0	*13.7/13.6*	25.5	14.1	24.0		PASS
5670	23.0/23.0	40.5	11.6	10.9	*13.8/13.6*	26.8	14.3	24.0		PASS

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5500	18.1	14.2	-1.5	-1.6		1.4	1.5	11.0	11.0	PASS
5600	18.2	14.1	-1.8	-1.5		1.4	1.4	11.0	11.0	PASS
5700	18.3	14.2	-1.5	-1.8		1.4	1.4	11.0	11.0	PASS
5510	36.3	14.3	-4.3	-4.5		0.7	-1.4	11.0	11.0	PASS
5590	36.3	14.1	-4.5	-4.6		0.7	-1.5	11.0	11.0	PASS
5670	36.5	14.3	-4.1	-4.9		0.7	-1.5	11.0	11.0	PASS

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

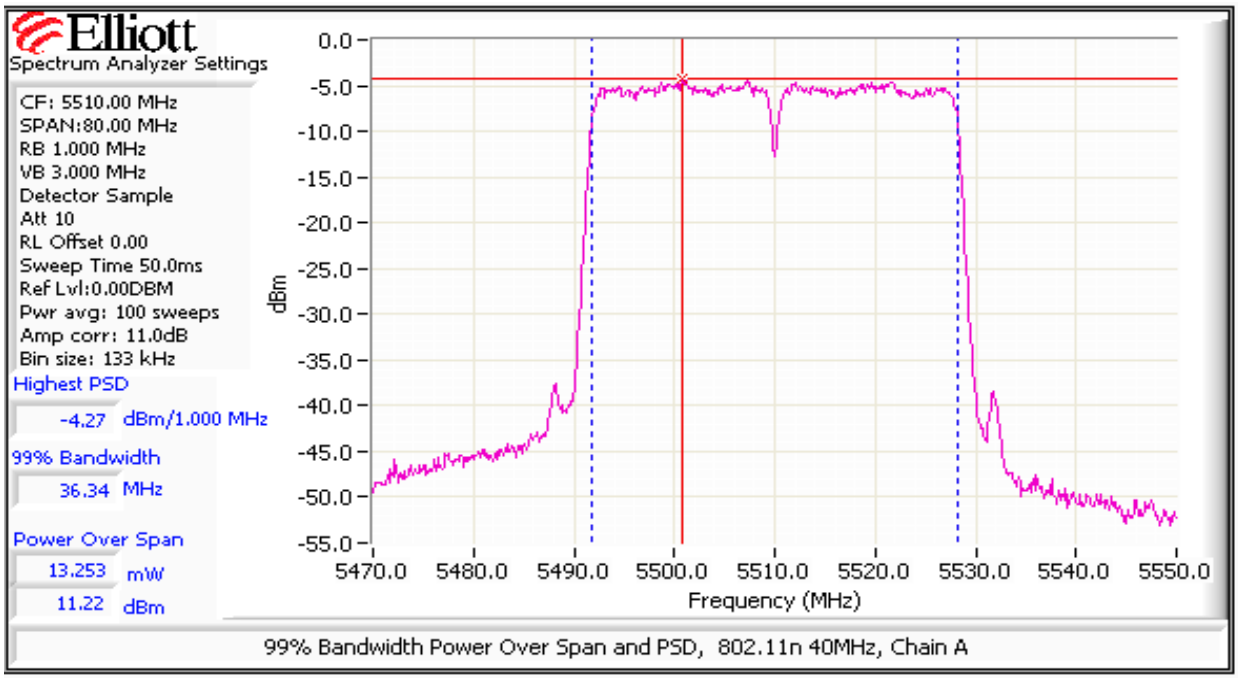


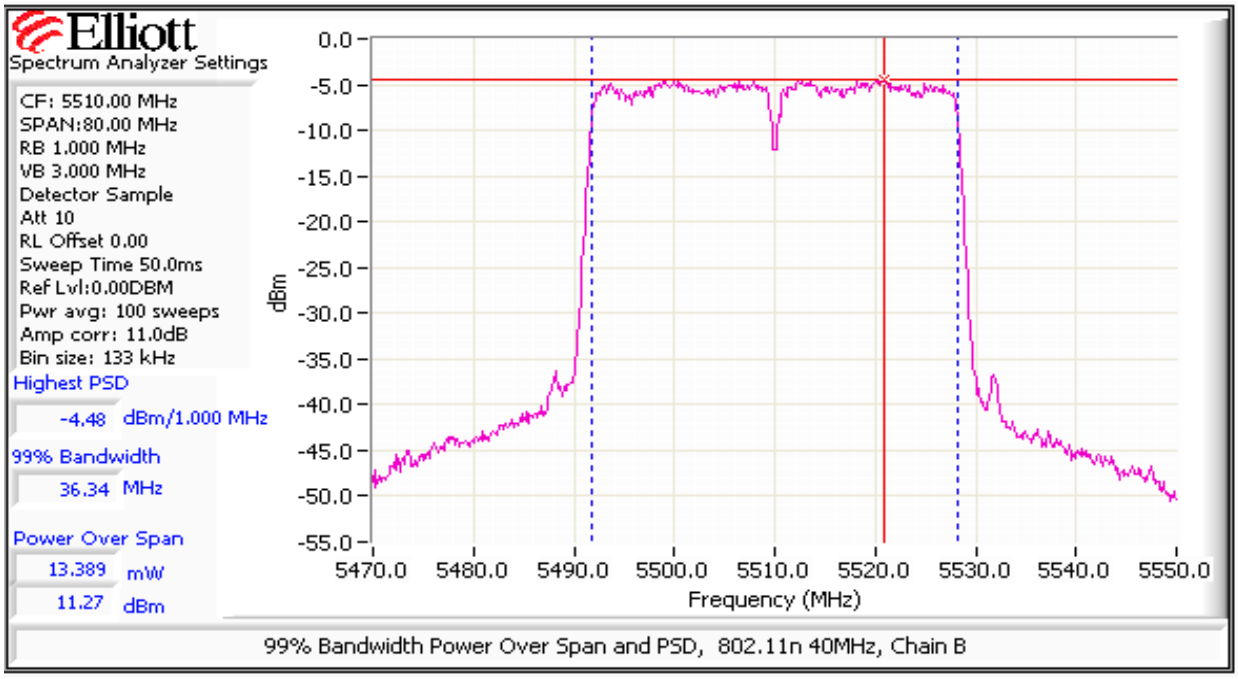
99% Bandwidth Power Over Span and PSD, 802.11n 20MHz, Chain A



99% Bandwidth Power Over Span and PSD, 802.11n 20MHz, Chain B

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS 210, FCC 15.E (NII) Band Edge Field Strength (802.11n)

Test Specific Details

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

Summary of Results

Sample #1 MAC Address: 00150059F1BC (except where noted); CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1a	802.11n40 Chain A	#38 5190MHz	15.5	15.7	Restricted Band Edge at 5150 MHz	15.209	50.4dBµV/m @ 5148.7MHz (-3.6dB)
Run # 1b		#62 5310MHz	16.0	15.5	Restricted Band Edge at 5350 MHz	15.209	52.4dBµV/m @ 5350.0MHz (-1.6dB)
Run # 1c		#102 5510MHz	15.0	16.0	Restricted Band Edge at 5460 MHz	15.209	50.1dBµV/m @ 5459.8MHz (-3.9dB)
Run # 1d					Restricted Band Edge at 5470 MHz	15 E	54.3dBµV/m @ 5469.5MHz (-14.0dB)
Run # 1e		#134 5670MHz	16.5	16.8	Restricted Band Edge at 5725 MHz	15 E	49.9dBµV/m @ 5725.0MHz (-18.4dB)
Run # 2a	802.11n40 Chain B	#38 5190MHz	15.5	15.7	Restricted Band Edge at 5150 MHz	15.209	52.3dBµV/m @ 5149.5MHz (-1.7dB)
Run # 2b		#62 5310MHz	16.0	15.2	Restricted Band Edge at 5350 MHz	15.209	52.0dBµV/m @ 5350.0MHz (-2.0dB)
Run # 2c		#102 5510MHz	15.0	15.7	Restricted Band Edge at 5460 MHz	15.209	50.2dBµV/m @ 5459.8MHz (-3.8dB)
Run # 2d					Restricted Band Edge at 5470 MHz	15 E	58.9dBµV/m @ 5469.7MHz (-9.4dB)
Run # 2e		#134 5670MHz	16.5	16.8	Restricted Band Edge at 5725 MHz	15 E	46.4dBµV/m @ 5732.8MHz (-21.9dB)
Run # 3a	802.11n40 Chain A+B	#38 5190MHz	16.5 (13.5 per chain)	A:13.7 B:13.8	Restricted Band Edge at 5150 MHz	15.209	50.1dBµV/m @ 5149.8MHz (-3.9dB)
Run # 3b		#62 5310MHz	16.5 (13.5 per chain)	A:13.6 B:13.6	Restricted Band Edge at 5350 MHz	15.209	44.2dBµV/m @ 5350.0MHz (-9.8dB)
Run # 3c		#102 5510MHz	16.5 (13.5 per chain)	A:13.8 B:13.9	Restricted Band Edge at 5460 MHz	15.209	47.8dBµV/m @ 5459.8MHz (-6.2dB)
Run # 3d					Restricted Band Edge at 5470 MHz	15 E	50.0dBµV/m @ 5467.3MHz (-18.3dB)
Run # 3e		#134 5670MHz	16.5 (13.5 per chain)	A:13.7 B:13.9	Restricted Band Edge at 5725 MHz	15 E	46.5dBµV/m @ 5725.0MHz (-21.8dB)

Summary for 802.11n 20MHz mode on next page ...

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 4a	802.11n20 Chain A	#36 5180MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5150 MHz	15.209	46.7dBµV/m @ 5150.0MHz (-7.3dB)
Run # 4b		#64 5320MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5350 MHz	15.209	45.9dBµV/m @ 5350.0MHz (-8.1dB)
Run # 4c		#100 5500MHz	16.5 dBm	16.6 dBm	Restricted Band Edge at 5460 MHz	15.209	41.3dBµV/m @ 5460.0MHz (-12.7dB)
Run # 4d					Restricted Band Edge at 5470 MHz	15 E	46.8dBµV/m @ 5470.0MHz (-21.5dB)
Run # 4e		#140 5700MHz	16.5 dBm	16.8 dBm	Restricted Band Edge at 5725 MHz	15 E	50.6dBµV/m @ 5725.0MHz (-17.7dB)
Run # 5a	802.11n20 Chain B	#36 5180MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5150 MHz	15.209	50.9dBµV/m @ 5148.4MHz (-3.1dB)
Run # 5b		#64 5320MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5350 MHz	15.209	45.5dBµV/m @ 5350.0MHz (-8.5dB)
Run # 5c		#100 5500MHz	16.5 dBm	16.8 dBm	Restricted Band Edge at 5460 MHz	15.209	45.3dBµV/m @ 5460.1MHz (-8.7dB)
Run # 5d					Restricted Band Edge at 5470 MHz	15 E	50.3dBµV/m @ 5469.9MHz (-18.0dB)
Run # 5e		#140 5700MHz	16.5 dBm	16.6 dBm	Restricted Band Edge at 5725 MHz	15 E	51.1dBµV/m @ 5725.0MHz (-17.2dB)
Run # 6a	802.11n20 Chain A+B	#36 5180MHz	16.5 (13.5 per chain)	A: 13.6 dBm B: 13.8 dBm	Restricted Band Edge at 5150 MHz	15.209	39.5dBµV/m @ 5148.1MHz (-14.5dB)
Run # 6b		#64 5320MHz	16.5 (13.5 per chain)	A: 13.5 dBm B: 13.8 dBm	Restricted Band Edge at 5350 MHz	15.209	35.1dBµV/m @ 5350.0MHz (-18.9dB)
Run # 6c		#100 5500MHz	16.5 (13.5 per chain)	A: 13.7 dBm B: 13.6 dBm	Restricted Band Edge at 5460 MHz	15.209	48.4dBµV/m @ 5445.3MHz (-5.6dB)
Run # 6d					Restricted Band Edge at 5470 MHz	15 E	48.4dBµV/m @ 5445.3MHz (-19.9dB)
Run # 6e		#140 5700MHz	16.5 (13.5 per chain)	A:13.9dBm B:13.8dBm	Restricted Band Edge at 5725 MHz	15 E	44.8dBµV/m @ 5725.0MHz (-23.5dB)

General Test Configuration

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

Ambient Conditions:

Rel. Humidity:	15-65 %
Temperature:	15-25 °C

Modifications Made During Testing

No modifications were made to the EUT during testing

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Deviations From The Standard

No deviations were made from the requirements of the standard.

Marker Delta Measurements

Three sets of marker deltas are measured using the following settings: RB=VB=100kHz; RB=1MHz,VB=1MHz; RB=1MHz, VB=10Hz. Marker deltas are made conducted (analyzer connected to EUT rf port a 20dB pad) for single chain operation. For MIMO operation the delta measurement is made in a radiated manner with the measurement antenna located approximately 50cm from the EUT's antennas. The fundamental field strength is always measured at a 3m test distance.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 1, Band Edge Field Strength - 802.11n40, Chain A

Run # 1a, EUT on Channel #38 5190MHz - 802.11n40, Chain A - Sample #2 MAC 00150059F23C

Date of Test: 8/24/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	15.5	15.7	27.0

Fundamental Signal Field Strength

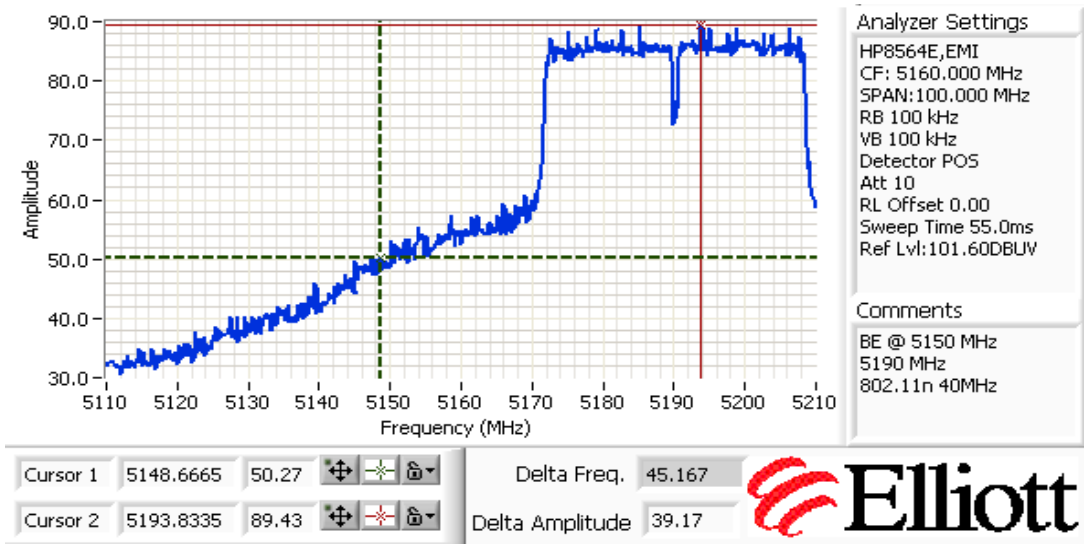
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5200.870	89.6	H	-	-	AVG	313	1.0	RB 1 MHz; VB: 10 Hz
5200.130	97.9	H	-	-	PK	313	1.0	RB 1 MHz; VB: 1 MHz
5200.730	89.3	V	-	-	AVG	49	1.1	RB 1 MHz; VB: 10 Hz
5200.130	97.5	V	-	-	PK	49	1.1	RB 1 MHz; VB: 1 MHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	97.9	97.5	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	89.6	89.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	39.2	*dB*	<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	58.7	dBuV/m	
Calculated Band-Edge Measurement (Avg):	50.4	dBuV/m	
Delta Marker - 1MHz/1MHz:	*34.5*	*dB*	
Delta Marker - 1MHz/10Hz:	*38.7*	*dB*	
Calculated Band-Edge Measurement (Peak):	63.4	dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.9	dBuV/m	Using 100kHz delta value

Margin	Level	Limit	Detector
-3.6	50.4	54	Avg
-15.3	58.7	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.666	50.4	-	54.0	-3.6	Avg	-	-	Using 100kHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 1b Repeat, EUT on Channel #62 5310MHz - 802.11n40, Chain A - Sample #2 MAC 00150059F23C

Date of Test: 9/9/2009 Test Location: FT Chamber #5

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.0	15.5	24.0

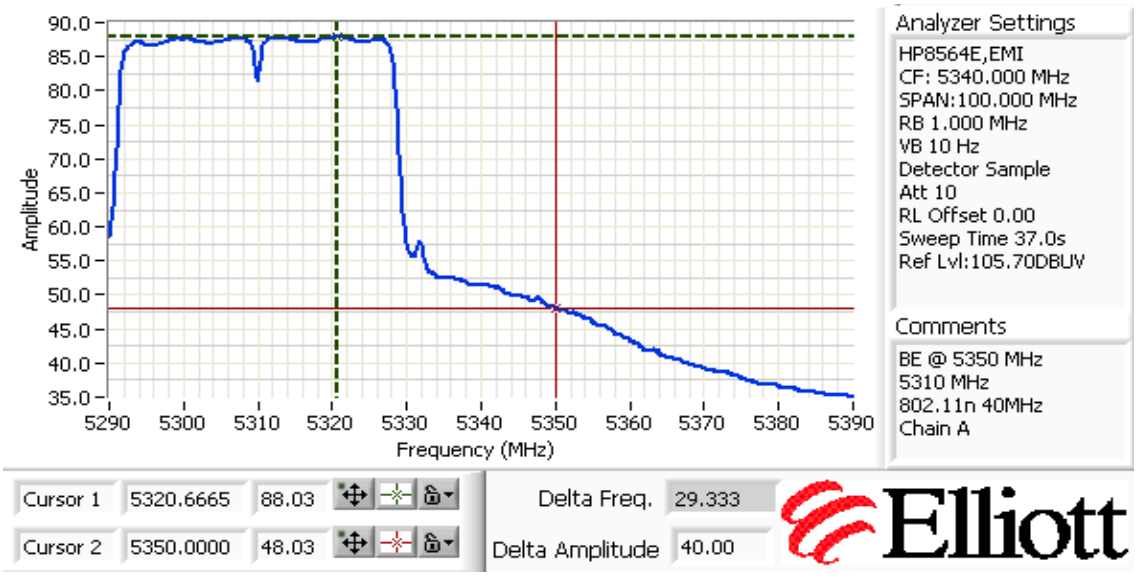
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5320.670	90.6	H	-	-	AVG	259	1.4	RB 1 MHz; VB: 10 Hz
5320.270	99.1	H	-	-	PK	259	1.4	RB 1 MHz; VB: 1 MHz
5298.870	92.4	V	-	-	AVG	111	1.0	RB 1 MHz; VB: 10 Hz
5300.000	100.1	V	-	-	PK	111	1.0	RB 1 MHz; VB: 1 MHz

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	99.1	100.1	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	90.6	92.4	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*37.8 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	62.3 dBuV/m		
Calculated Band-Edge Measurement (Avg):	54.6 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*32.5 dB*		-1.6 / 52.4 / 54 / Avg
Delta Marker - 1MHz/10Hz:	40.0 *dB*		-11.7 / 62.3 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	67.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	52.4 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	52.4	-	54.0	-1.6	Avg	-	-	Using 1MHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 1c, EUT on Channel #102 5510MHz - 802.11n40, Chain A

Date of Test: 8/24/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.0	23.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5498.870	93.8	H	-	-	AVG	263	1.4	RB 1 MHz; VB: 10 Hz
5499.800	101.5	H	-	-	PK	263	1.4	RB 1 MHz; VB: 1 MHz
5498.870	89.3	V	-	-	AVG	147	1.0	RB 1 MHz; VB: 10 Hz
5493.400	97.0	V	-	-	PK	147	1.0	RB 1 MHz; VB: 1 MHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	101.5	97.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	93.8	89.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*43.2 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	58.3 dBuV/m		
Calculated Band-Edge Measurement (Avg):	50.6 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*40.3 dB*		-3.9 / 50.1 / 54 / Avg
Delta Marker - 1MHz/10Hz:	43.7 dB		-15.7 / 58.3 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	61.2 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.1 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.833	50.1	-	54.0	-3.9	Avg	-	-	Using 1MHz delta value

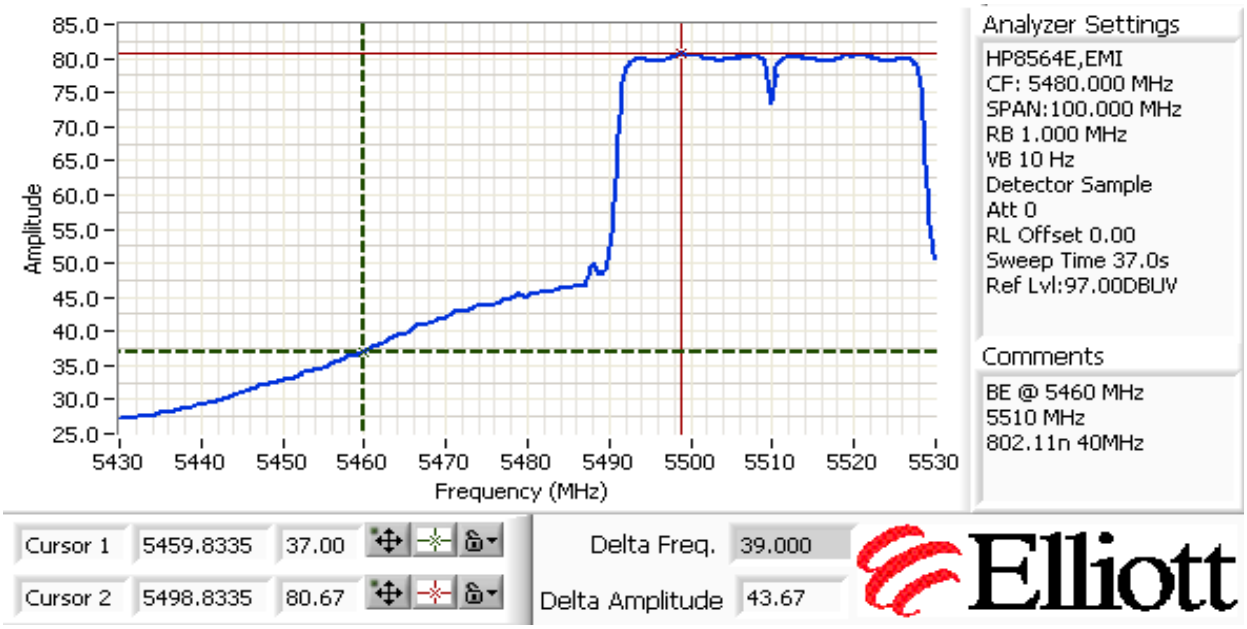
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

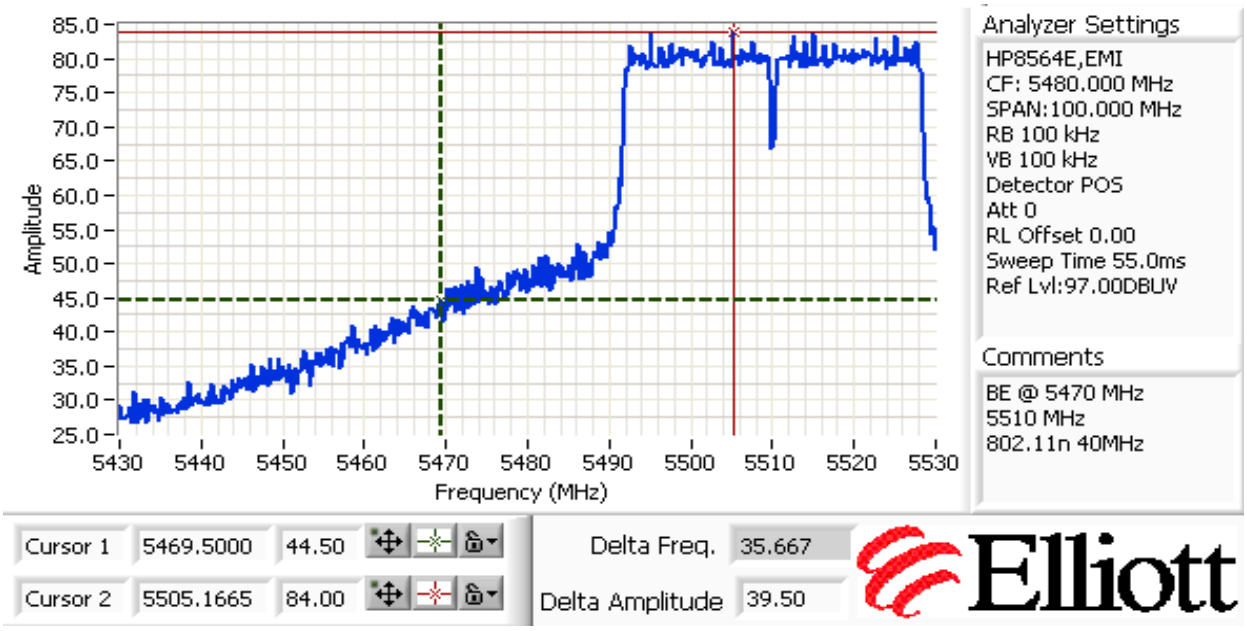
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	101.5	97.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	93.8	89.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	39.5 *dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	62.0 dBuV/m		
Calculated Band-Edge Measurement (Avg):	54.3 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*34.7 dB*		-14.0 / 54.3 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	*38.7 dB*		-26.3 / 62.0 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	66.8 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	55.1 dBuV/m		Using 100kHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.500	54.3	-	68.3	-14.0	Avg	-	-	Using 100kHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 1d, EUT on Channel #134 5670MHz - 802.11n40, Chain A

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.8	24.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5680.930	91.5	V	-	-	AVG	88	1.0	RB 1 MHz; VB: 10 Hz
5680.330	100.0	V	-	-	PK	88	1.0	RB 1 MHz; VB: 1 MHz
5671.930	93.4	H	-	-	AVG	291	1.4	RB 1 MHz; VB: 10 Hz
5668.000	101.7	H	-	-	PK	291	1.4	RB 1 MHz; VB: 1 MHz

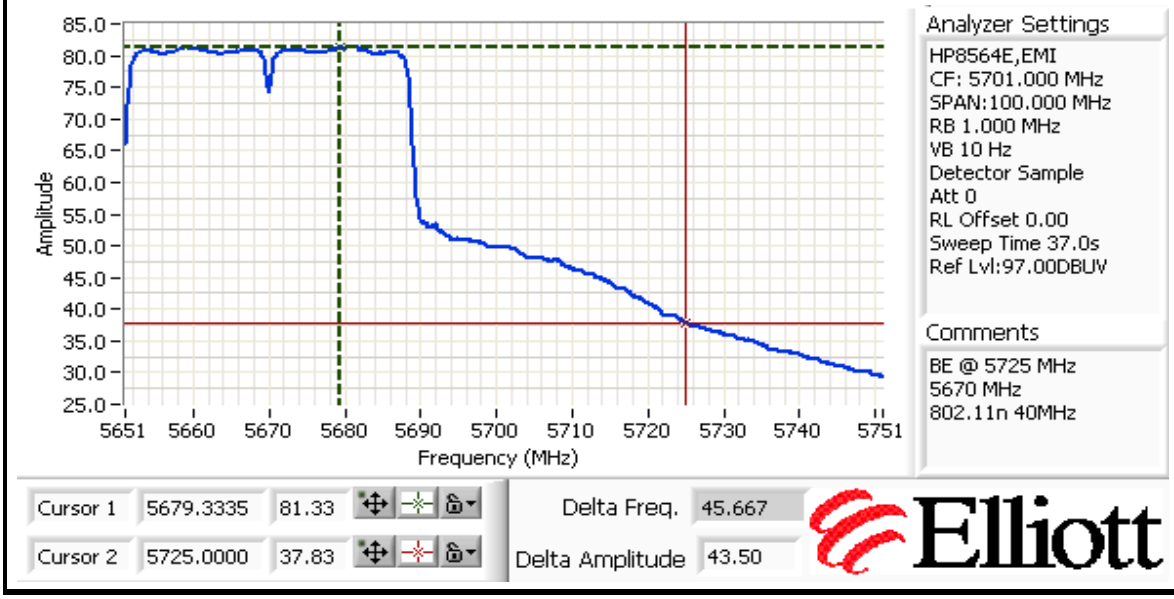
5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	101.7	100.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	93.4	91.5	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*42.8 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	58.9 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	50.6 dBuV/m		

		Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	*41.0 dB*	-18.4	49.9	68.3	Avg
Delta Marker - 1MHz/10Hz:	43.5 *dB*	-29.4	58.9	88.3	Pk
Calculated Band-Edge Measurement (Peak):	60.7 dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	49.9 dBuV/m	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.000	49.9	-	68.3	-18.4	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2, Band Edge Field Strength - 802.11n40, Chain B

Run #2a, EUT on Channel #38 5190MHz - 802.11n40, Chain B - Sample #2 MAC 00150059F23C

Date of Test: 8/24/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	15.5	15.7	26.0

Fundamental Signal Field Strength

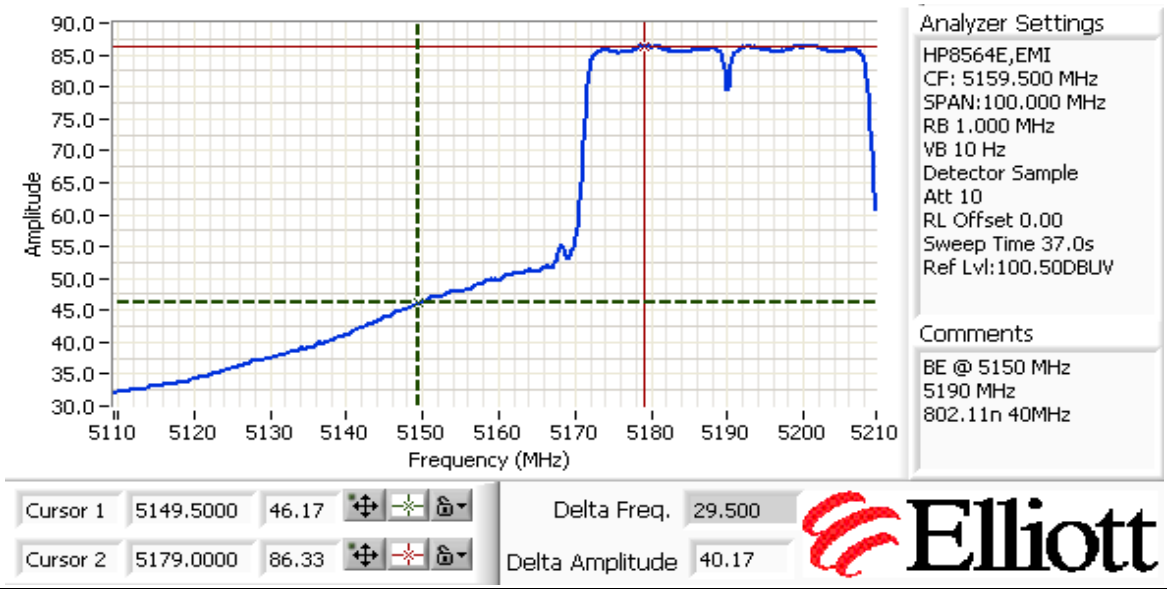
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5200.730	92.5	H	-	-	AVG	108	1.0	RB 1 MHz; VB: 10 Hz
5200.400	101.3	H	-	-	PK	108	1.0	RB 1 MHz; VB: 1 MHz
5200.600	90.8	V	-	-	AVG	140	1.7	RB 1 MHz; VB: 10 Hz
5200.200	98.7	V	-	-	PK	140	1.7	RB 1 MHz; VB: 1 MHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	101.3	98.7	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	92.5	90.8	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*39.0 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	62.3 dBuV/m		
Calculated Band-Edge Measurement (Avg):	53.5 dBuV/m		
Delta Marker - 1MHz/1MHz:	*34.0 dB*		
Delta Marker - 1MHz/10Hz:	40.2 dB		
Calculated Band-Edge Measurement (Peak):	67.3 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	52.3 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-1.7	52.3	54	Avg
-11.7	62.3	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.500	52.3	-	54.0	-1.7	Avg	-	-	Using 1MHz delta value



EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2b, EUT on Channel #62 5310MHz - 802.11n40, Chain B - Sample #2 MAC 00150059F23C

Date of Test: 9/9/2009 Test Location: FT Chamber #5

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.0	15.2	25.0

Fundamental Signal Field Strength

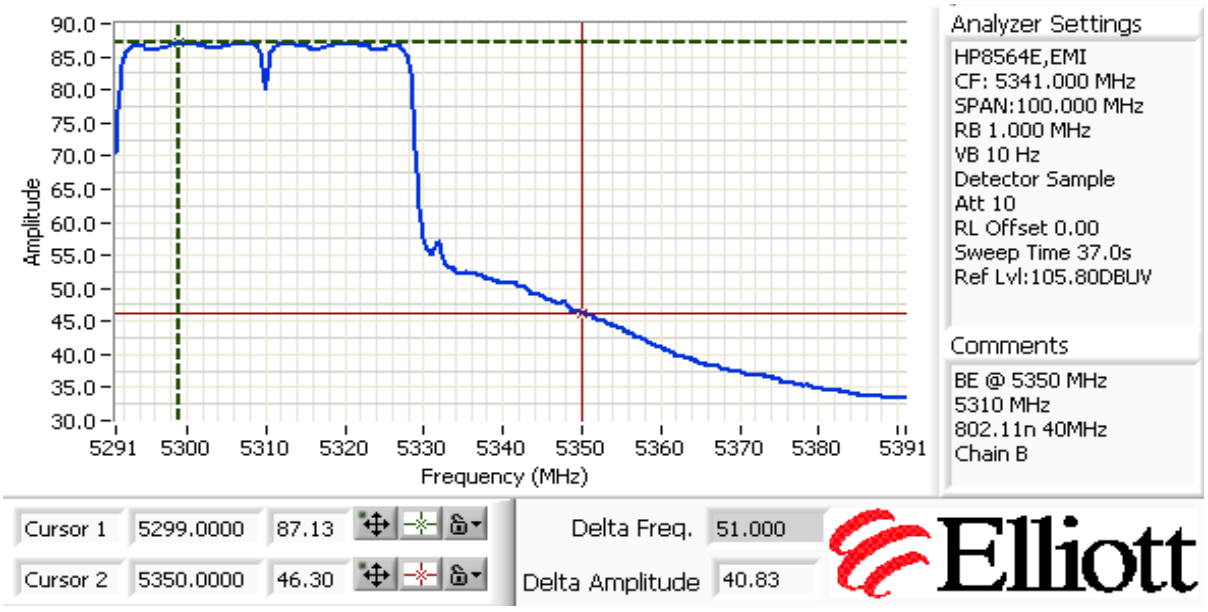
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5320.800	92.8	V	-	-	AVG	129	1.6	RB 1 MHz; VB: 10 Hz
5320.330	100.3	V	-	-	PK	129	1.6	RB 1 MHz; VB: 1 MHz
5299.070	92.1	H	-	-	AVG	107	1.0	RB 1 MHz; VB: 10 Hz
5299.800	99.9	H	-	-	PK	107	1.0	RB 1 MHz; VB: 1 MHz

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	99.9	100.3	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	92.1	92.8	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*38.8 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	61.5 dBuV/m		
Calculated Band-Edge Measurement (Avg):	54.0 dBuV/m		

		Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	*33.8 dB*	-2.0	52.0	54	Avg
Delta Marker - 1MHz/10Hz:	40.8 dB	-12.5	61.5	74	Pk
Calculated Band-Edge Measurement (Peak):	66.5 dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	52.0 dBuV/m	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	52.0	-	54.0	-2.0	Avg	-	-	Using 1MHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2c, EUT on Channel #102 5510MHz - 802.11n40, Chain B

Date of Test: 8/24/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	15.7	25.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5520.270	95.7	H	-	-	AVG	109	1.2	RB 1 MHz; VB: 10 Hz
5520.330	103.9	H	-	-	PK	109	1.2	RB 1 MHz; VB: 1 MHz
5520.400	91.0	V	-	-	AVG	239	1.0	RB 1 MHz; VB: 10 Hz
5520.330	99.8	V	-	-	PK	239	1.0	RB 1 MHz; VB: 1 MHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.9	99.8	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.7	91.0	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	45.5 *dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	58.4 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	50.2 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*41.0 dB*		-3.8 / 50.2 / 54 / Avg
Delta Marker - 1MHz/10Hz:	*44.7 dB*		-15.6 / 58.4 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	62.9 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	51.0 dBuV/m		Using 100kHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.833	50.2	-	54.0	-3.8	Avg	-	-	Using 100kHz delta value

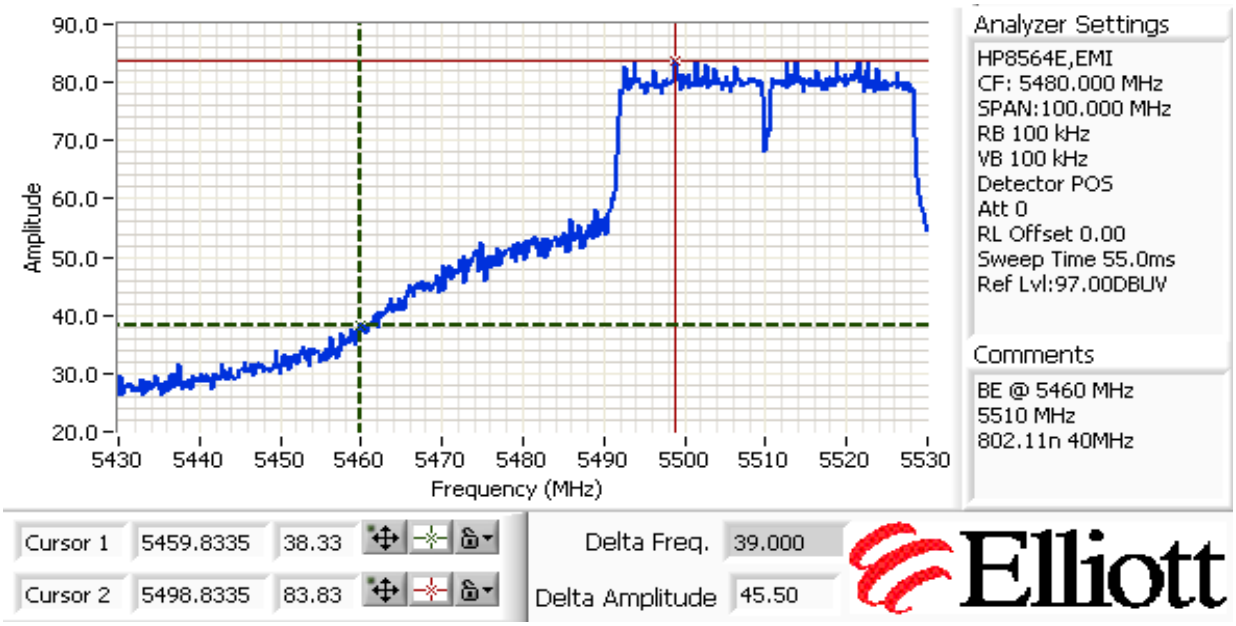
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

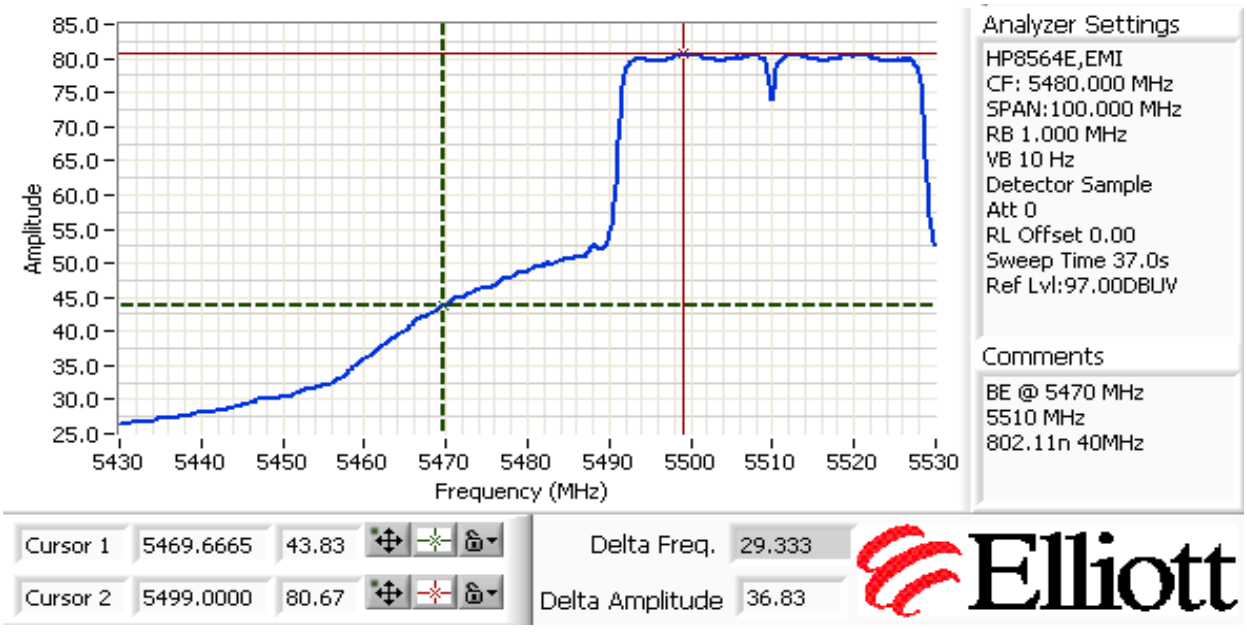
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	102.3	99.8	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.7	91.0	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*36.8 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	65.5 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	58.9 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*31.3 dB*		-9.4 / 58.9 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	36.8 *dB*		-22.8 / 65.5 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	71.0 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	58.9 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.666	58.9	-	68.3	-9.4	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2d, EUT on Channel #134 5670MHz - 802.11n40, Chain B

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.8	25.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5672.330	91.1	V	-	-	AVG	185	1.0	RB 1 MHz; VB: 10 Hz
5680.270	99.7	V	-	-	PK	185	1.0	RB 1 MHz; VB: 1 MHz
5667.600	94.7	H	-	-	AVG	112	1.0	RB 1 MHz; VB: 10 Hz
5668.000	103.1	H	-	-	PK	112	1.0	RB 1 MHz; VB: 1 MHz

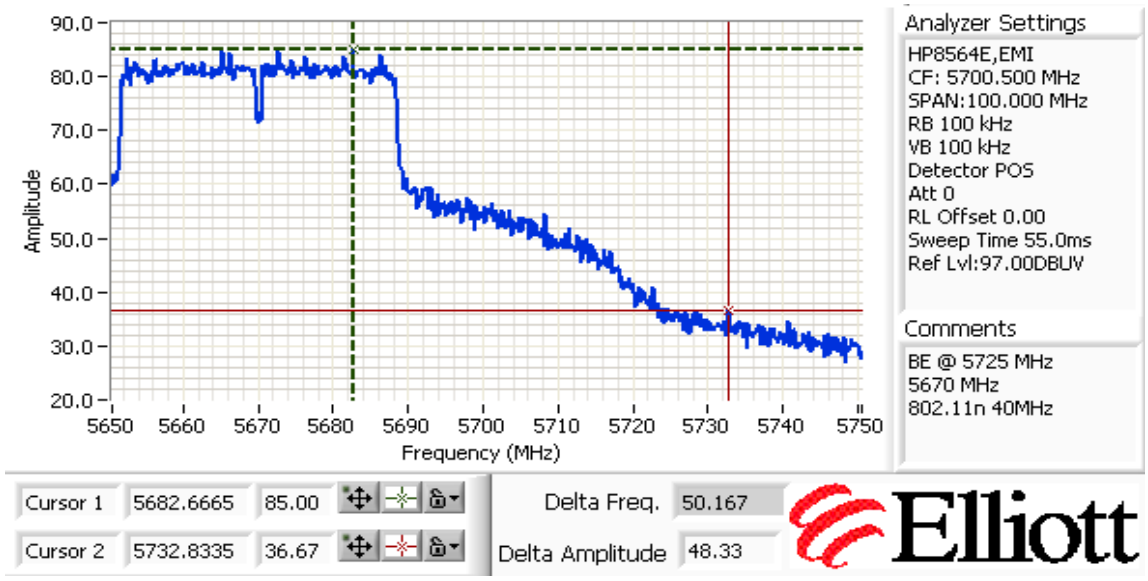
5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.1	99.7	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	94.7	91.1	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	48.3 *dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	54.8 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	46.4 dBuV/m		
Delta Marker - 1MHz/1MHz:	*43.5 dB*		
Delta Marker - 1MHz/10Hz:	*47.2 dB*		
Calculated Band-Edge Measurement (Peak):	59.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	47.5 dBuV/m		Using 100kHz delta value

	Margin	Level	Limit	Detector
	-21.9	46.4	68.3	Avg
	-33.5	54.8	88.3	Pk

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5732.833	46.4	-	68.3	-21.9	Avg	-	-	Using 100kHz delta value

Note - average limit is equivalent to -27dBm eirp.



EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 3, Band Edge Field Strength - 802.11n40, Chain A+B

Run # 3a, EUT on Channel #38 5190MHz - 802.11n40, Chain A+B

Date of Test: 8/12/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5 (13.5/13.5)	13.7/13.8	26.5/25.5

Fundamental Signal Field Strength

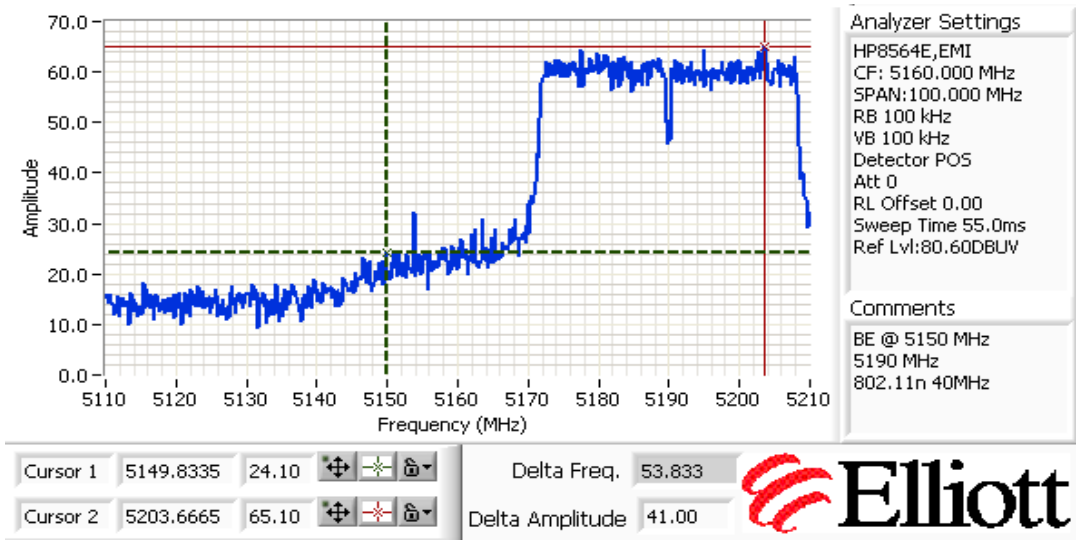
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5200.330	91.0	V	-	-	AVG	130	1.6	RB 1 MHz; VB: 10 Hz
5201.270	101.3	V	-	-	PK	130	1.6	RB 1 MHz; VB: 1 MHz
5201.000	91.1	H	-	-	AVG	110	1.0	RB 1 MHz; VB: 10 Hz
5200.470	100.8	H	-	-	PK	110	1.0	RB 1 MHz; VB: 1 MHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	100.8	101.3	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	91.1	91.0	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	41.0	*dB*	<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	60.3	dBuV/m	highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	50.1	dBuV/m	
Delta Marker - 1MHz/1MHz:	*37.0*	*dB*	
Delta Marker - 1MHz/10Hz:	*40.2*	*dB*	
Calculated Band-Edge Measurement (Peak):	64.3	dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.9	dBuV/m	Using 100kHz delta value

Margin	Level	Limit	Detector
-3.9	50.1	54	Avg
-13.7	60.3	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.833	50.1	-	54.0	-3.9	Avg	-	-	Using 100kHz delta value



EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 3b, EUT on Channel #62 5310MHz - 802.11n40, Chain A+B

Date of Test: 8/13/2009 Test Location: FT Chamber 4

Test Engineer: John Caizzi Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5 (13.5/13.5)	13.6 / 13.6	24.0 / 25.0

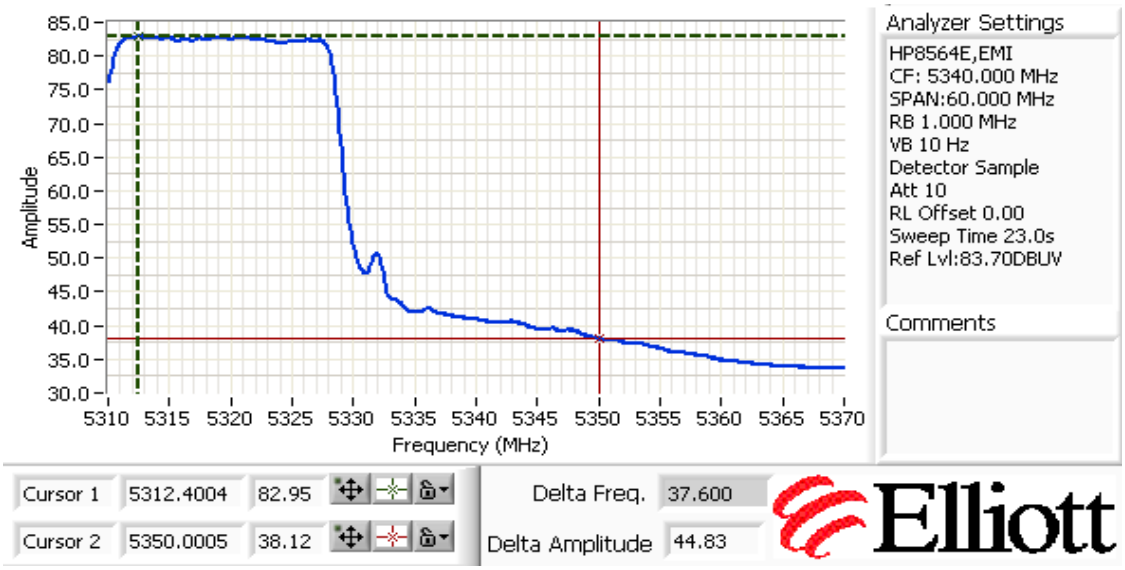
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5320.600	89.0	V	112.3	-23.3	AVG	173	1.59	
5315.500	99.1	V	132.3	-33.2	PK	173	1.59	
5312.500	87.9	H	112.3	-24.4	AVG	114	1.48	
5299.700	97.2	H	132.3	-35.1	PK	114	1.48	

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	97.2	99.1	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	87.9	89.0	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*40.7 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	58.4 dBuV/m		
Calculated Band-Edge Measurement (Avg):	48.3 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*40.2 dB*		-9.8 / 44.2 / 54 / Avg
Delta Marker - 1MHz/10Hz:	44.8 dB		-15.6 / 58.4 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	58.9 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	44.2 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.001	44.2	V	54.0	-9.8	Avg	173	1.59	Using 1MHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 3c, EUT on Channel #102 5510MHz - 802.11n40, Chain A+B

Date of Test: 8/13/2009 Test Location: FT Chamber 4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5 (13.5/13.5)	13.8/13.9	22.5/24.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5498.800	93.5	H	-	-	AVG	107	1.1	RB 1 MHz; VB: 10 Hz
5499.670	103.4	H	-	-	PK	107	1.1	RB 1 MHz; VB: 1 MHz
5493.600	91.6	V	-	-	AVG	215	1.0	RB 1 MHz; VB: 10 Hz
5492.730	100.7	V	-	-	PK	215	1.0	RB 1 MHz; VB: 1 MHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.4	100.7	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	93.5	91.6	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*45.0 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	58.4 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	48.5 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*41.8 dB*		-6.2 / 47.8 / 54 / Avg
Delta Marker - 1MHz/10Hz:	45.7 *dB*		-15.6 / 58.4 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	61.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	47.8 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.833	47.8	-	54.0	-6.2	Avg	-	-	Using 1MHz delta value

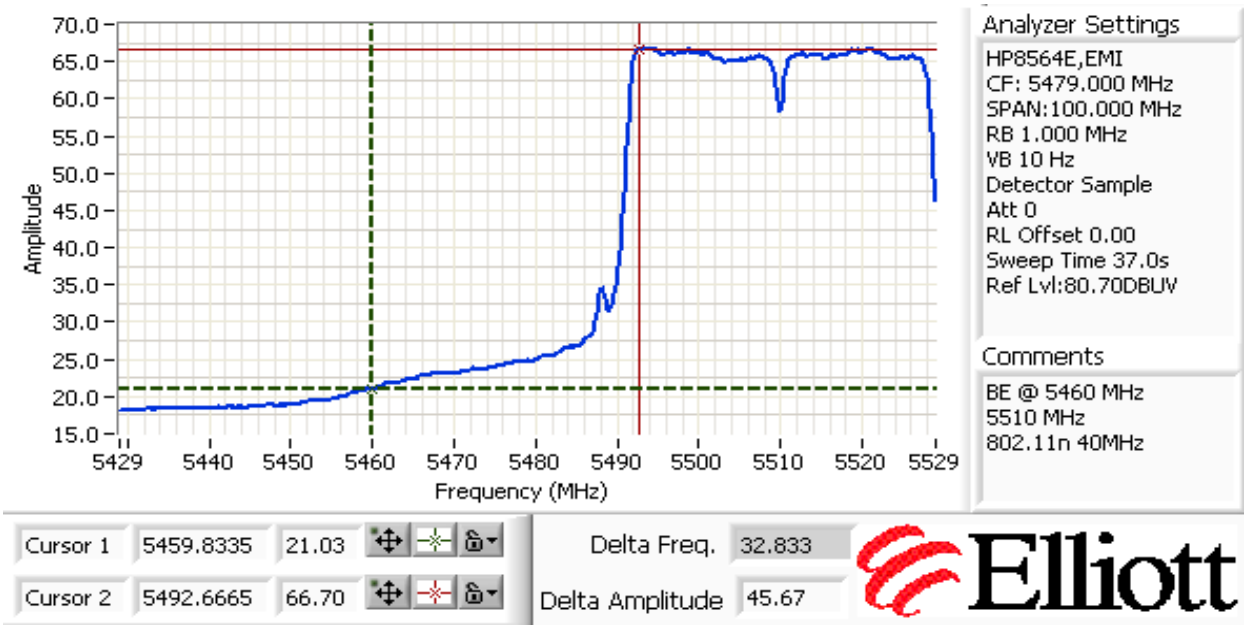
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

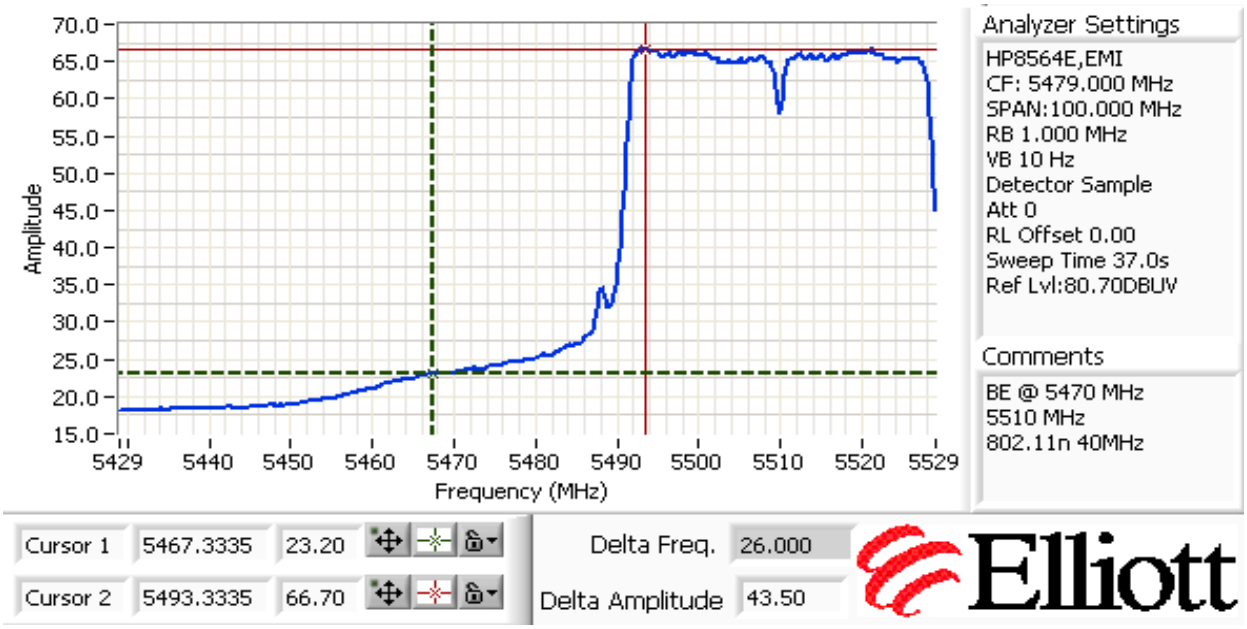
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.4	100.7	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	93.5	91.6	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*38.3 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	65.1 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	55.2 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*39.2 dB*		-18.3 / 50.0 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	43.5 *dB*		-24.1 / 64.2 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	64.2 dBuV/m		Using 1MHz delta value
Calculated Band-Edge Measurement (Avg):	50.0 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5467.330	50.0	-	68.3	-18.3	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 3d, EUT on Channel #134 5670MHz - 802.11n40, Chain A+B

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5 (13.5/13.5)	13.7/13.9	23.0/23.5

Fundamental Signal Field Strength

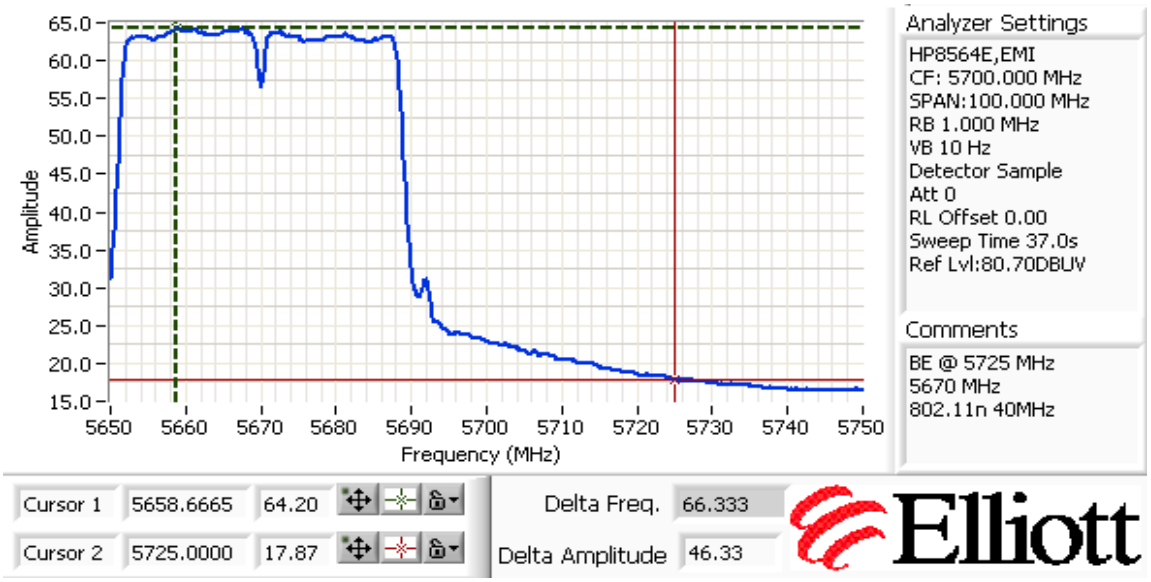
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5667.330	89.6	V	-	-	AVG	169	1.0	RB 1 MHz; VB: 10 Hz
5667.330	99.4	V	-	-	PK	169	1.0	RB 1 MHz; VB: 1 MHz
5672.470	92.8	H	-	-	AVG	108	1.1	RB 1 MHz; VB: 10 Hz
5680.000	102.5	H	-	-	PK	108	1.1	RB 1 MHz; VB: 1 MHz

5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	102.5	99.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	92.8	89.6	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*43.0 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	59.5 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	49.8 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*43.5 dB*		-21.8 / 46.5 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	46.3 *dB*		-29.3 / 59.0 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	59.0 dBuV/m		Using 1MHz delta value
Calculated Band-Edge Measurement (Avg):	46.5 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.000	46.5	-	68.3	-21.8	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.



EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #4, Band Edge Field Strength - 802.11n20, Chain A

Run #4a, EUT on Channel #36 5180MHz - 802.11n20, Chain A

Date of Test: 8/13/2009 Test Location: FT Chamber 4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.7	28.5

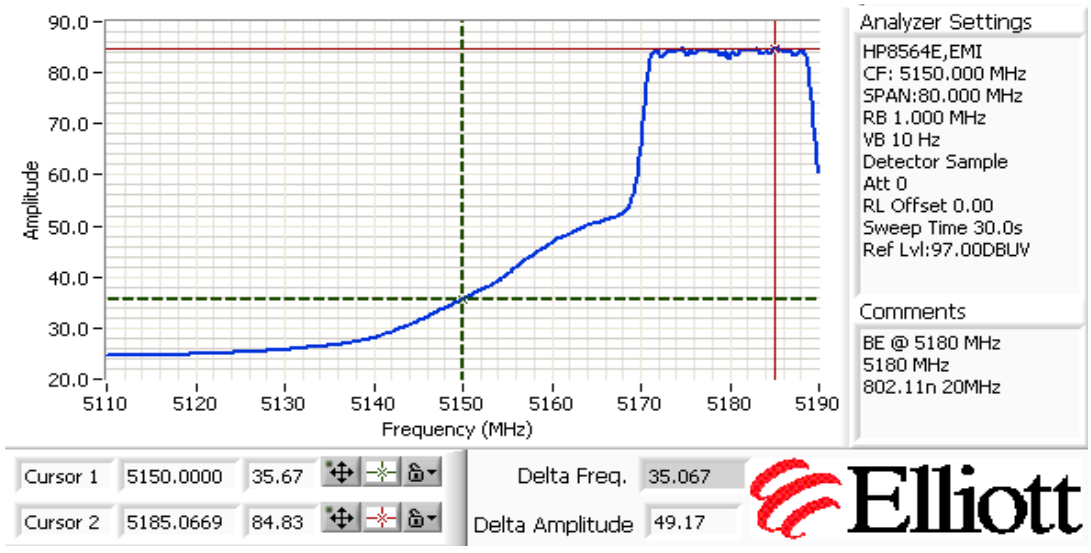
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5174.700	95.0	V	-	-	AVG	149	1.7	RB 1 MHz; VB: 10 Hz
5175.030	102.8	V	-	-	PK	149	1.7	RB 1 MHz; VB: 1 MHz
5174.670	95.9	H	-	-	AVG	222	0.0	RB 1 MHz; VB: 10 Hz
5174.630	103.9	H	-	-	PK	222	0.0	RB 1 MHz; VB: 1 MHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.9	102.8	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.9	95.0	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*49.2 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	54.7 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	46.7 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*41.3 dB*		-7.3 / 46.7 / 54 / Avg
Delta Marker - 1MHz/10Hz:	*49.2 dB*		-19.3 / 54.7 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	62.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	46.7 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.000	46.7	-	54.0	-7.3	Avg	-	-	Using 1MHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #4b, EUT on Channel #64 5320MHz - 802.11n20, Chain A

Date of Test: 8/13/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.7	25.5

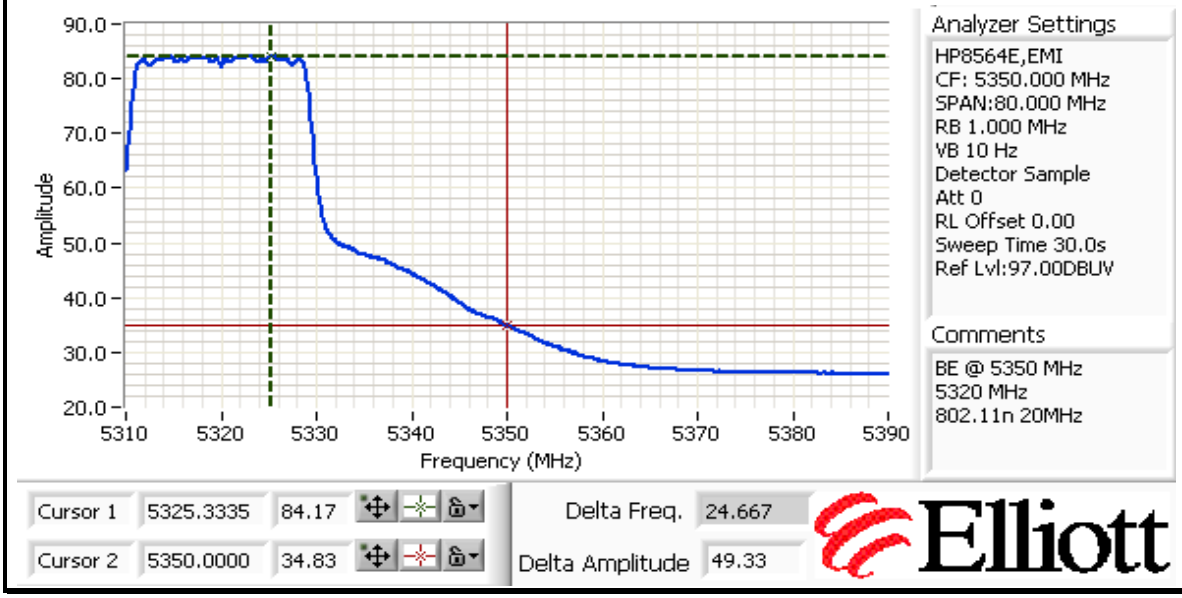
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5316.800	93.7	V			AVG	206	1.0	RB 1 MHz; VB: 10 Hz
5317.100	102.0	V			PK	206	1.0	RB 1 MHz; VB: 1 MHz
5314.730	95.2	H			AVG	299	1.0	RB 1 MHz; VB: 10 Hz
5315.200	103.3	H			PK	299	1.0	RB 1 MHz; VB: 1 MHz

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.3	102.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.2	93.7	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*47.5 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	55.8 dBuV/m		
Calculated Band-Edge Measurement (Avg):	47.7 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*41.8 dB*		-8.1 / 45.9 / 54 / Avg
Delta Marker - 1MHz/10Hz:	49.3 *dB*		-18.2 / 55.8 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	61.5 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	45.9 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	45.9	-	54.0	-8.1	Avg	-	-	Using 1MHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #4c, EUT on Channel #100 5500MHz - 802.11n20, Chain A

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.6	23.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5494.700	94.6	V	-	-	AVG	149	1.2	RB 1 MHz; VB: 10 Hz
5495.130	102.4	V	-	-	PK	149	1.2	RB 1 MHz; VB: 1 MHz
5494.500	95.5	H	-	-	AVG	256	1.3	RB 1 MHz; VB: 10 Hz
5497.130	103.5	H	-	-	PK	256	1.3	RB 1 MHz; VB: 1 MHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.5	102.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.5	94.6	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*53.7 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	49.8 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	41.8 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*46.3 dB*		-12.7 / 41.3 / 54 / Avg
Delta Marker - 1MHz/10Hz:	54.2 *dB*		-24.2 / 49.8 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	57.2 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	41.3 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5460.000	41.3	-	54.0	-12.7	Avg	-	-	Using 1MHz delta value

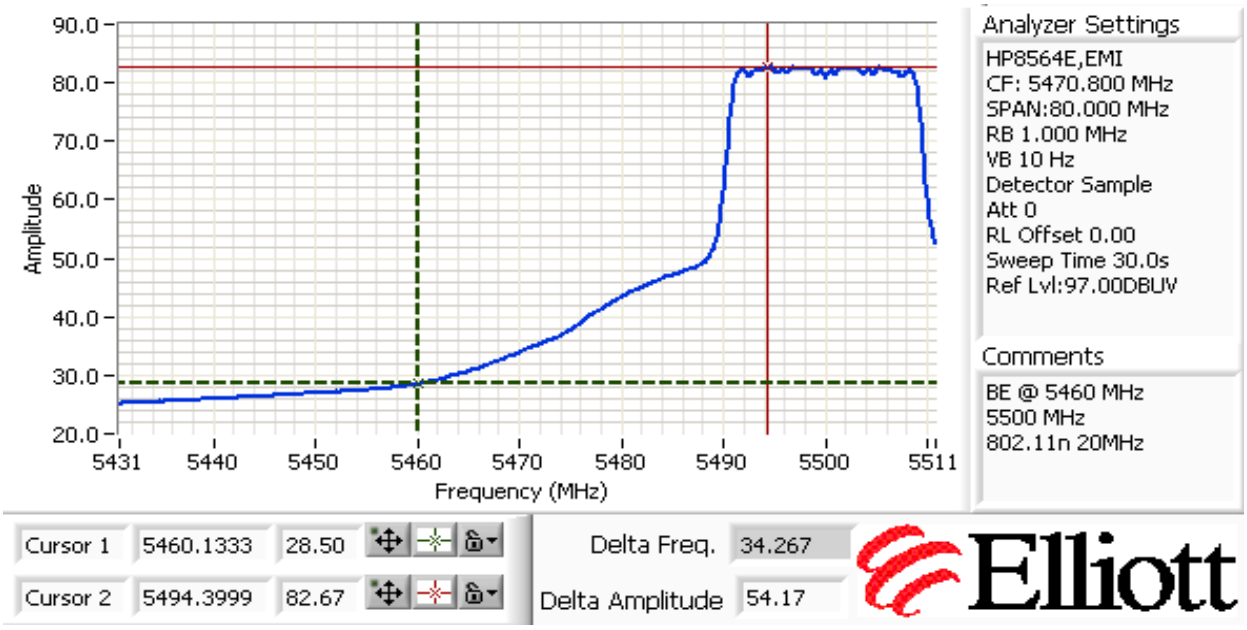
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

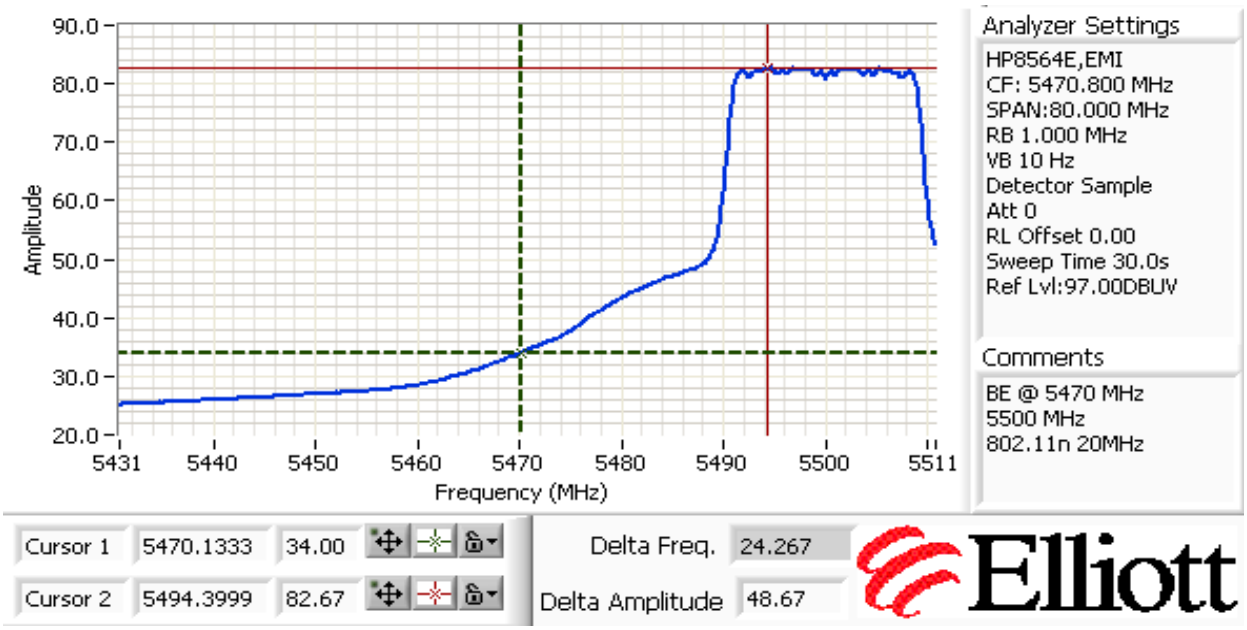
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.5	102.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.5	94.6	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*48.2 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	55.3 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	47.3 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*40.5 dB*		-21.5 / 46.8 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	48.7 *dB*		-33.0 / 55.3 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	63.0 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	46.8 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5470.000	46.8	-	68.3	-21.5	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #4d, EUT on Channel #140 5700MHz - 802.11n20, Chain A

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.8	24.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5694.600	93.8	V	-	-	AVG	155	2.0	RB 1 MHz; VB: 10 Hz
5697.000	101.6	V	-	-	PK	155	2.0	RB 1 MHz; VB: 1 MHz
5694.730	94.1	H	-	-	AVG	325	1.0	RB 1 MHz; VB: 10 Hz
5695.200	102.1	H	-	-	PK	325	1.0	RB 1 MHz; VB: 1 MHz

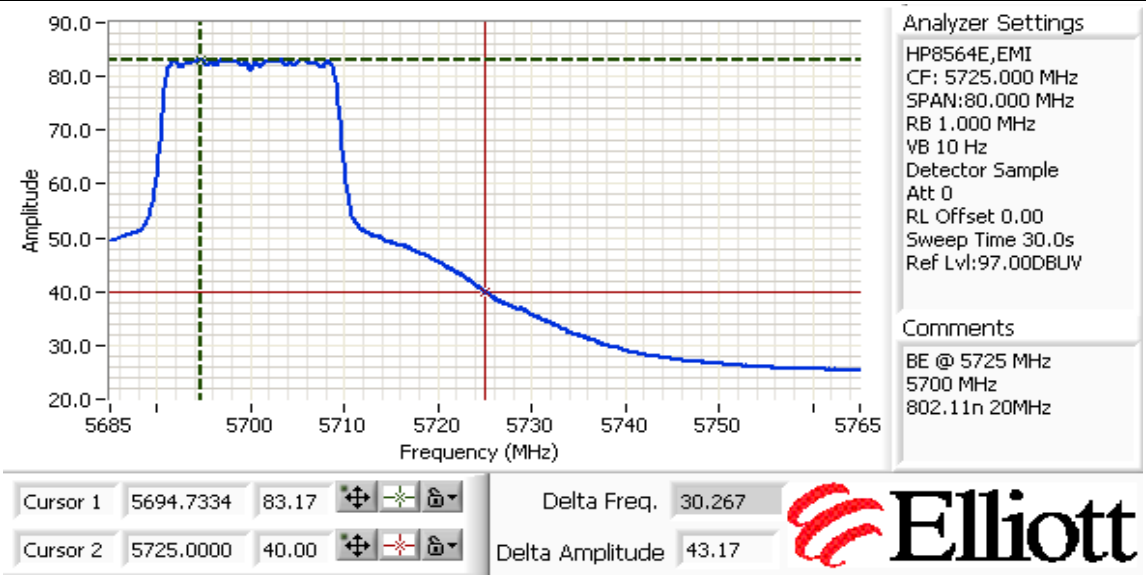
5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:		101.6	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:		93.8	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*42.0 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	59.6 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	51.8 dBuV/m		

		Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	*36.0 dB*	-17.7	50.6	68.3	Avg
Delta Marker - 1MHz/10Hz:	43.2 *dB*	-28.7	59.6	88.3	Pk
Calculated Band-Edge Measurement (Peak):	65.6 dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.6 dBuV/m	Using 1MHz delta value			

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.000	50.6	-	68.3	-17.7	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.



EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 5, Band Edge Field Strength - 802.11n20, Chain B
Run # 5a, EUT on Channel #36, 5180MHz

Date of Test: 8/14/2009 Test Location: CH #4
Test Engineer: John Caizzi Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.7	27.0

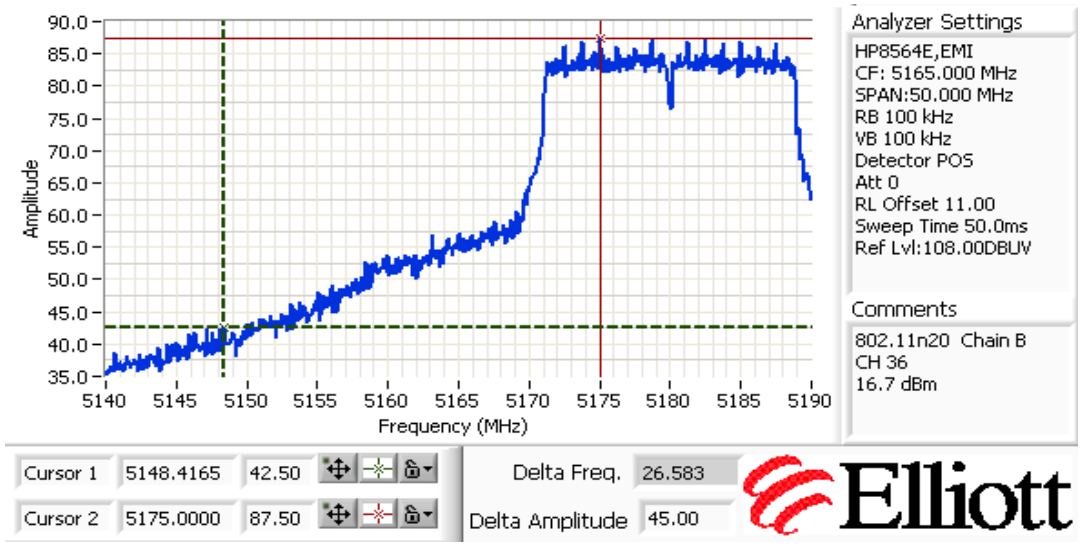
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5185.130	95.9	H	105.3	-9.4	AVG	112	1.72	
5176.870	103.6	H	125.3	-21.7	PK	112	1.72	
5182.800	95.4	V	105.3	-9.9	AVG	151	1.59	
5181.530	103.6	V	125.3	-21.7	PK	151	1.59	

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.6	103.6	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.9	95.4	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	45.0 *dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	58.6 dBuV/m		
Calculated Band-Edge Measurement (Avg):	50.9 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*38.3 dB*		-3.1 / 50.9 / 54 / Avg
Delta Marker - 1MHz/10Hz:	*44.7 dB*		-15.4 / 58.6 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	65.3 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	51.2 dBuV/m		Using 100kHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.417	50.9	H	54.0	-3.1	Avg	112	1.72	Using 100kHz delta value



EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 5b, EUT on Channel #64, 5320MHz

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.7	27.0

Fundamental Signal Field Strength

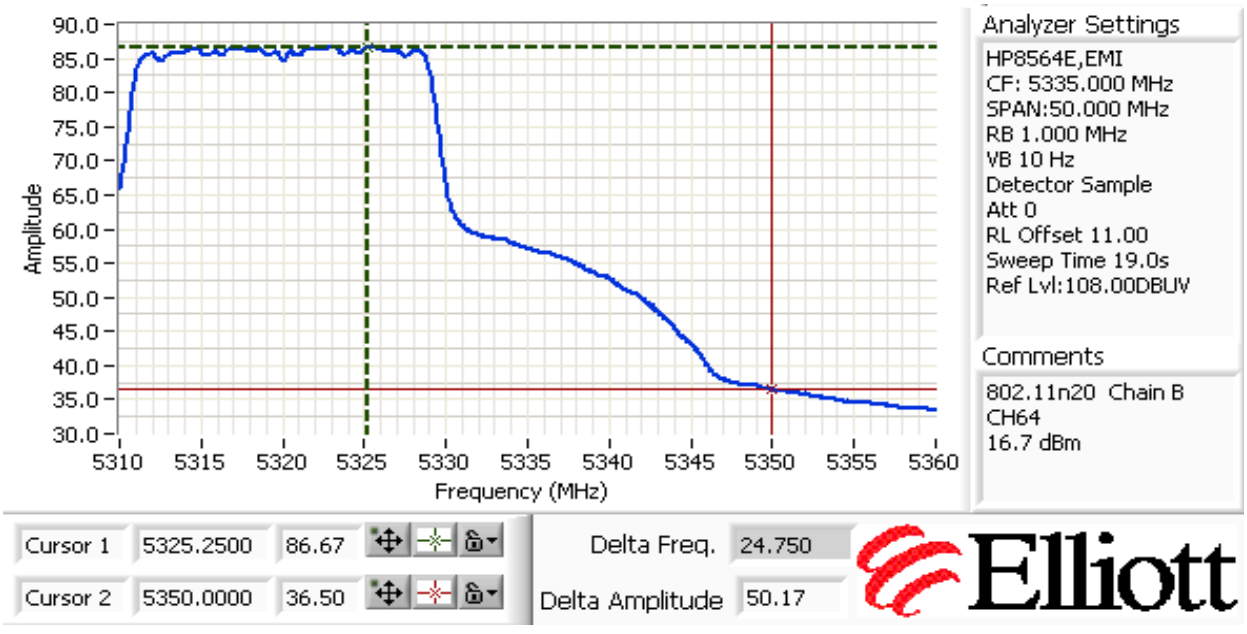
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5325.270	94.7	V	112.3	-17.6	AVG	129	1.54	
5324.330	102.3	V	132.3	-30.0	PK	129	1.54	
5314.800	95.7	H	112.3	-16.6	AVG	118	1.65	
5315.870	103.4	H	132.3	-28.9	PK	118	1.65	

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.4	102.3	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.7	94.7	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*49.7 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	53.7 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	46.0 dBuV/m		
Delta Marker - 1MHz/1MHz:	*42.2 dB*		
Delta Marker - 1MHz/10Hz:	50.2 *dB*		
Calculated Band-Edge Measurement (Peak):	61.2 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	45.5 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-8.5	45.5	54	Avg
-20.3	53.7	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	45.5	H	54.0	-8.5	Avg	118	1.65	Using 1MHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 5c, EUT on Channel #100 5500MHz - 802.11n20, Chain B

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.8	26.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5505.200	97.5	H	112.3	-14.8	AVG	110	1.08	
5505.070	105.1	H	132.3	-27.2	PK	110	1.08	
5494.600	95.1	V	112.3	-17.2	AVG	185	1.24	
5495.270	103.0	V	132.3	-29.3	PK	185	1.24	

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	105.1	103.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	97.5	95.1	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*51.0 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	54.1 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	46.5 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*44.5 dB*		-8.7 / 45.3 / 54 / Avg
Delta Marker - 1MHz/10Hz:	52.2 *dB*		-19.9 / 54.1 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	60.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	45.3 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5460.067	45.3	H	54.0	-8.7	Avg	110	1.08	Using 1MHz delta value

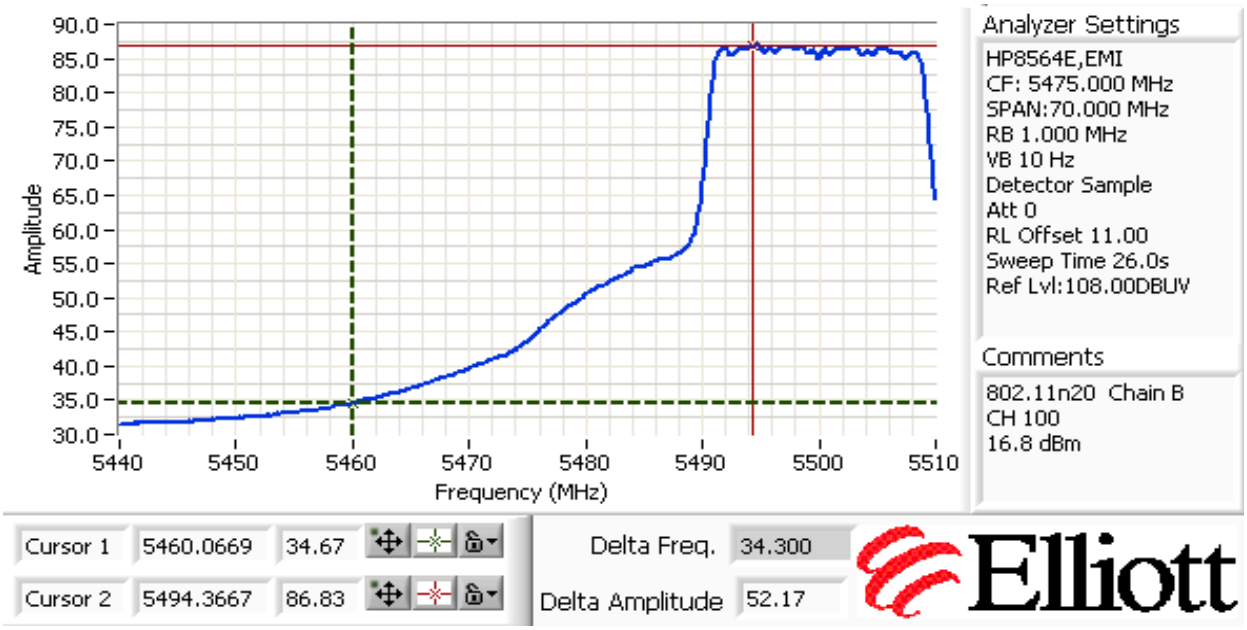
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

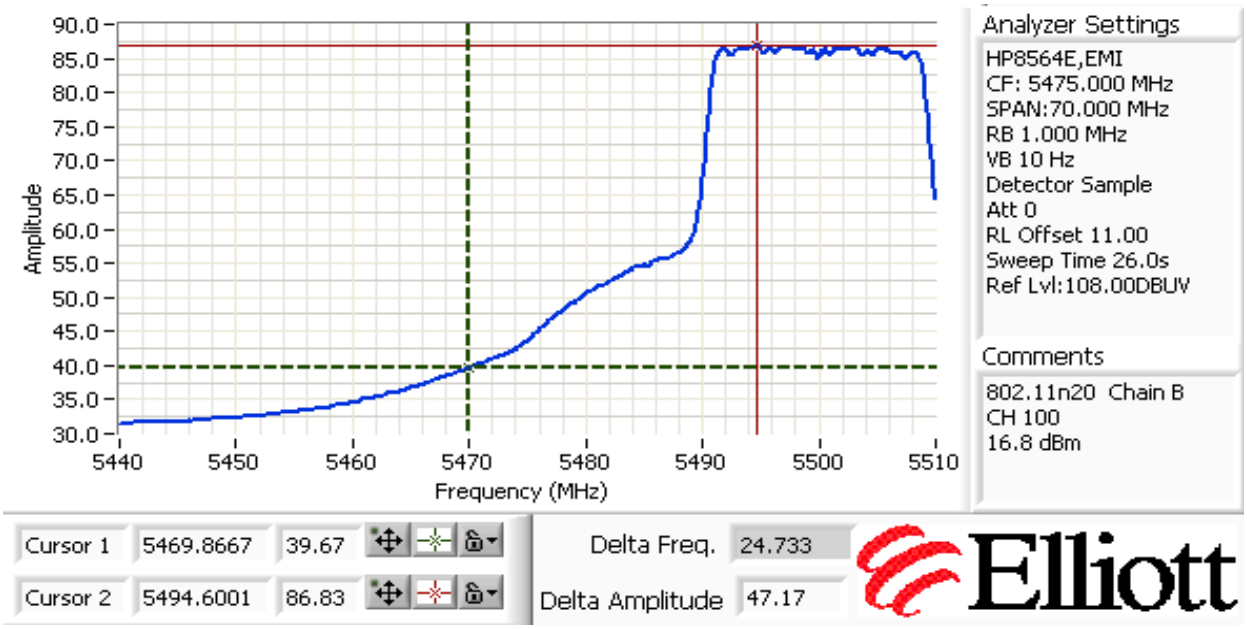
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	105.1	103.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	97.5	95.1	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*46.8 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	58.3 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	50.7 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*dB*		-18.0 / 50.3 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	47.2 *dB*		-30.0 / 58.3 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	105.1 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	50.3 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5469.867	50.3	H	68.3	-18.0	Avg	110	1.08	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 5d, EUT on Channel #140 5700MHz - 802.11n20, Chain B

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.6	25.0

Fundamental Signal Field Strength

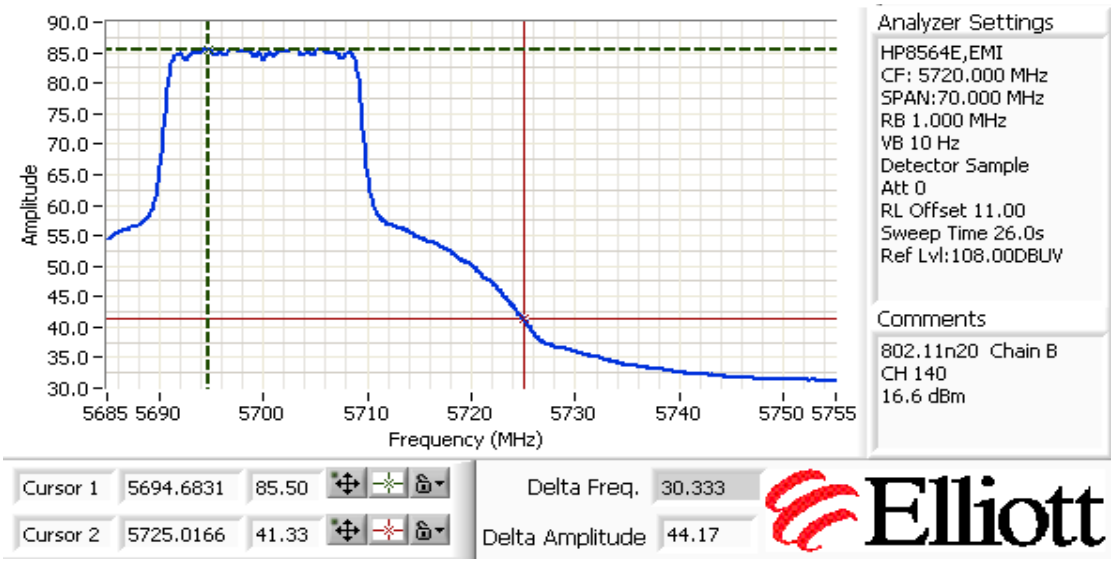
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5703.000	95.3	V	112.3	-17.0	AVG	135	1.27	RB 1 MHz; VB: 10 Hz
5697.070	103.4	V	132.3	-28.9	PK	135	1.27	RB 1 MHz; VB: 1 MHz
5694.670	94.5	H	112.3	-17.8	AVG	327	1.34	RB 1 MHz; VB: 10 Hz
5702.670	102.7	H	132.3	-29.6	PK	327	1.34	RB 1 MHz; VB: 1 MHz

5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	102.7	103.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	94.5	95.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*43.5 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	59.9 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	51.8 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*34.8 dB*		-17.2 / 51.1 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	44.2 *dB*		-28.4 / 59.9 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	68.6 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	51.1 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.017	51.1	V	68.3	-17.2	Avg	135	1.27	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 6, Band Edge Field Strength - 802.11n20, Chain A+B

Run # 6a, EUT on Channel #36 5180MHz - 802.11n20, Chain A+B

Date of Test: 8/17/2009 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5	13.6/13.8	26.5/25.5

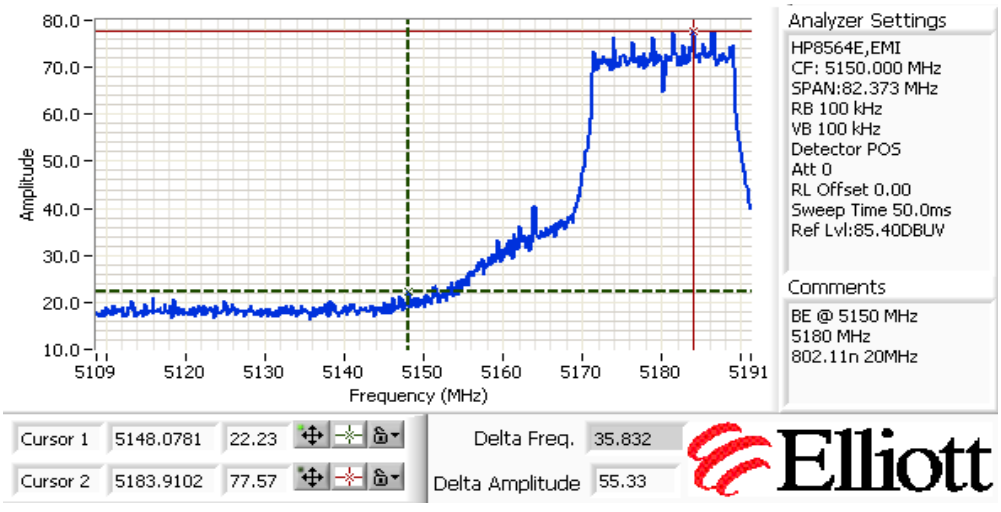
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5178.570	94.0	H	-	-	AVG	103	1.1	RB 1 MHz; VB: 10 Hz
5183.500	104.0	H	-	-	PK	103	1.1	RB 1 MHz; VB: 1 MHz
5181.500	94.8	V	-	-	AVG	151	1.5	RB 1 MHz; VB: 10 Hz
5185.200	104.6	V	-	-	PK	151	1.5	RB 1 MHz; VB: 1 MHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	104.0	104.6	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	94.0	94.8	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	55.3 *dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	49.3 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	39.5 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*51.3 dB*		-14.5 / 39.5 / 54 / Avg
Delta Marker - 1MHz/10Hz:	*53.0 dB*		-24.7 / 49.3 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	53.3 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	41.8 dBuV/m		Using 100kHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5148.078	39.5	H	54.0	-14.5	Avg	112	1.72	Using 100kHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 6b, EUT on Channel #64 5320MHz - 802.11n20, Chain A+B

Date of Test: 8/17/2009 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5	13.6/13.8	24.5/25.5

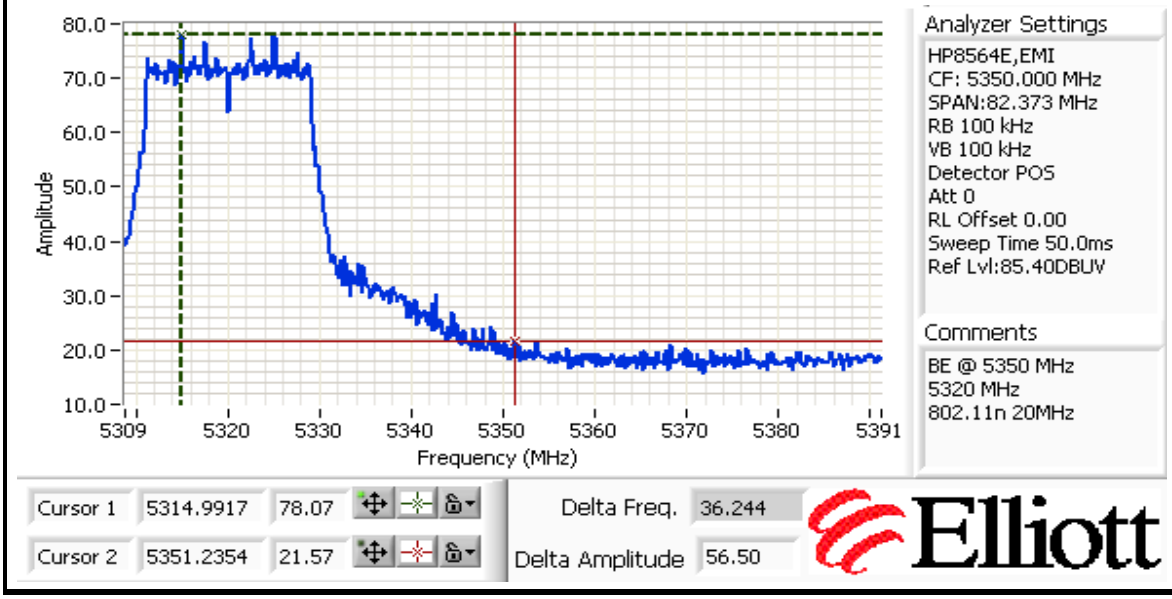
Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5324.530	91.2	H	-	-	AVG	222	1.0	RB 1 MHz; VB: 10 Hz
5322.630	101.4	H	-	-	PK	222	1.0	RB 1 MHz; VB: 1 MHz
5315.470	91.6	V	-	-	AVG	177	1.2	RB 1 MHz; VB: 10 Hz
5314.570	102.1	V	-	-	PK	177	1.2	RB 1 MHz; VB: 1 MHz

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	101.4	102.1	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	91.2	91.6	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	56.5 *dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	45.6 dBuV/m		
Calculated Band-Edge Measurement (Avg):	35.1 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*50.2 dB*		-18.9 / 35.1 / 54 / Avg
Delta Marker - 1MHz/10Hz:	*52.8 dB*		-28.4 / 45.6 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	51.9 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	38.8 dBuV/m		Using 100kHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.000	35.1	-	54.0	-18.9	Avg	-	-	Using 100kHz delta value



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 6c, EUT on Channel #100 5500MHz - 802.11n20, Chain A+B

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5	22.5, 24.0	13.7, 13.6

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	
5505.500	95.4	H	54.0	41.4	AVG	106	1.0	RB 1 MHz; VB: 10 Hz
5495.070	105.6	H	74.0	31.6	PK	106	1.0	RB 1 MHz; VB: 1 MHz
5505.330	93.3	V	54.0	39.3	AVG	222	1.0	RB 1 MHz; VB: 10 Hz
5505.230	103.3	V	74.0	29.3	PK	222	1.0	RB 1 MHz; VB: 1 MHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V				
Fundamental emission level @ 3m in 1MHz RBW:	105.6	103.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW:	95.4	93.3	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	47.0	*dB*	<- this can only be used if band edge signal is			
Calculated Band-Edge Measurement (Peak):	58.6	dBuV/m	highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Avg):	48.4	dBuV/m	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	*44.0*	*dB*	-5.6	48.4	54	Avg
Delta Marker - 1MHz/10Hz:	*45.3*	*dB*	-15.4	58.6	74	Pk
Calculated Band-Edge Measurement (Peak):	61.6	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.1	dBuV/m	Using 100kHz delta value			

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5445.283	48.4	H	54.0	-5.6	Avg	106	1.0	Using 100kHz delta value

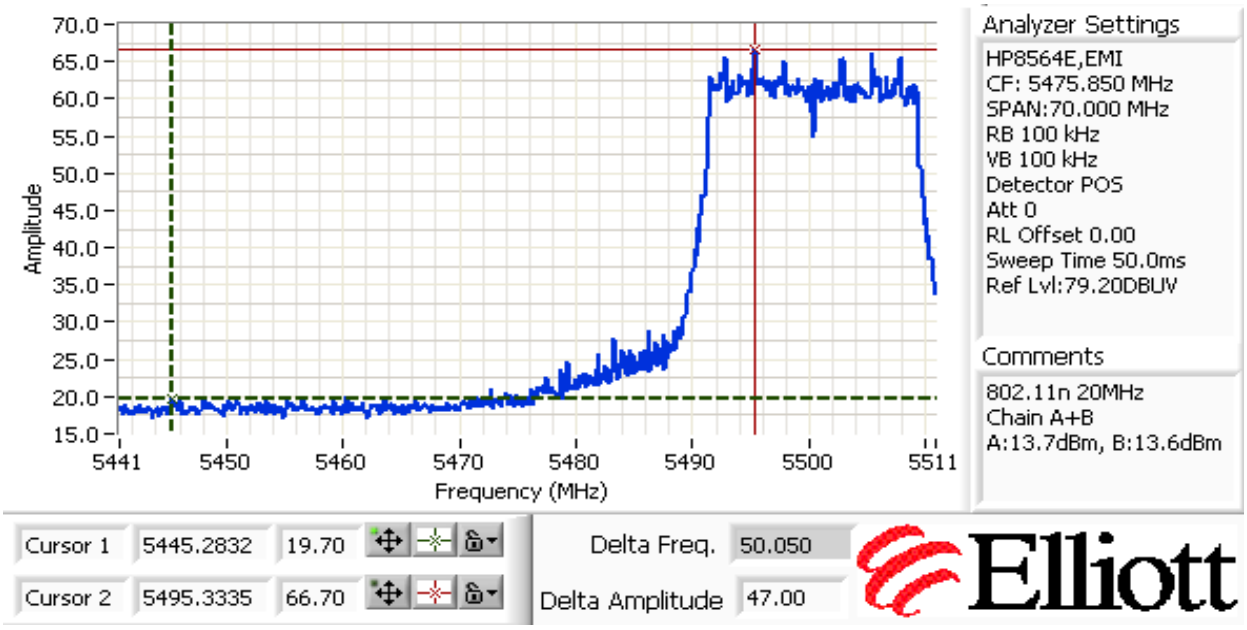
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

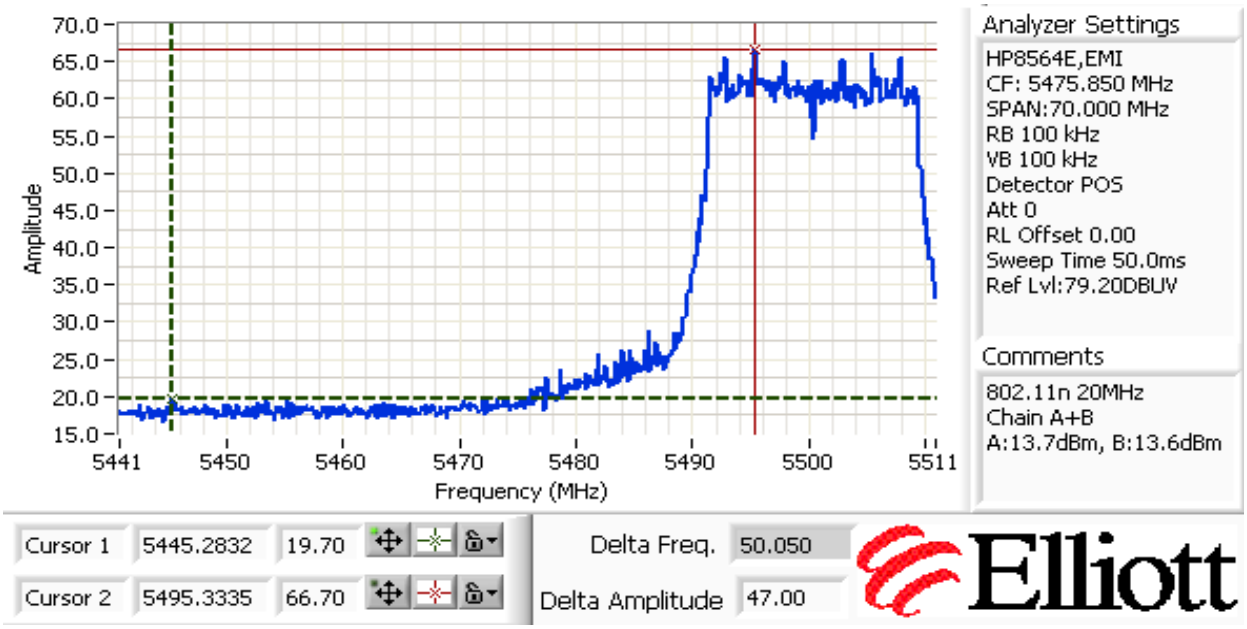
	H	V				
Fundamental emission level @ 3m in 1MHz RBW:	105.6	103.3	Peak Measurement (RB=VB=1MHz)			
Fundamental emission level @ 3m in 1MHz RBW:	95.4	93.3	Average Measurement (RB=1MHz, VB=10Hz)			
Delta Marker - 100kHz	47.0	*dB*	<- this can only be used if band edge signal is			
Calculated Band-Edge Measurement (Peak):	58.6	dBuV/m	highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Avg):	48.4	dBuV/m	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	*43.3*	*dB*	-19.9	48.4	68.3	Avg
Delta Marker - 1MHz/10Hz:	*45.0*	*dB*	-29.7	58.6	88.3	Pk
Calculated Band-Edge Measurement (Peak):	62.3	dBuV/m	Using 100kHz delta value			
Calculated Band-Edge Measurement (Avg):	50.4	dBuV/m	Using 100kHz delta value			

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5445.283	48.4	-	68.3	-19.9	Avg	-	-	Using 100kHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 6d, EUT on Channel #140 5700MHz - 802.11n20, Chain A+B

Date of Test: 8/17/2009 Test Location: FT Chamber #3

Test Engineer: Rafael Varelas Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A+B	16.5	13.9/13.8	24.0/24.0

Fundamental Signal Field Strength

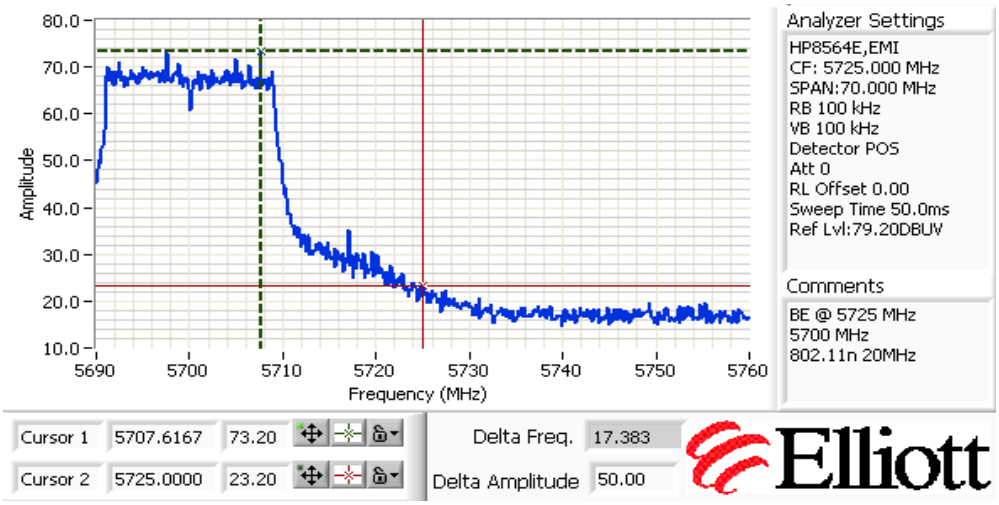
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5696.730	94.8	H	-	-	AVG	105	1.0	RB 1 MHz; VB: 10 Hz
5706.270	104.4	H	-	-	PK	105	1.0	RB 1 MHz; VB: 1 MHz
5695.130	93.0	V	-	-	AVG	153	1.2	RB 1 MHz; VB: 10 Hz
5697.130	102.7	V	-	-	PK	153	1.2	RB 1 MHz; VB: 1 MHz

5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	104.4		Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	94.8		Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	50.0 *dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	54.4 dBuV/m		
Calculated Band-Edge Measurement (Avg):	44.8 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*44.7 dB*		-23.5 / 44.8 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	*48.5 dB*		-33.9 / 54.4 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	59.7 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	46.3 dBuV/m		Using 100kHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.000	44.8	-	68.3	-23.5	Avg	-	-	Using 100kHz delta value

Note - average limit is equivalent to -27dBm eirp.



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS 210, FCC 15.E (NII) Band Edge Field Strength (802.11a)

Test Specific Details

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

Summary of Results

Sample #2 MAC Address: 00150059F23C; CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 1a	802.11a Chain A	#36 5180MHz	16.5 dBm	16.5 dBm	Restricted Band Edge at 5150 MHz	15.209	41.7dBµV/m @ 5150.0MHz (-12.3dB)
Run # 1b		#64 5320MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5350 MHz	15.209	43.8dBµV/m @ 5350.1MHz (-10.2dB)
Run # 1c		#100 5500MHz	16.5 dBm	16.8 dBm	Restricted Band Edge at 5460 MHz	15.209	41.2dBµV/m @ 5459.9MHz (-12.8dB)
Run # 1d					Restricted Band Edge at 5470 MHz	15 E	46.9dBµV/m @ 5470.0MHz (-21.4dB)
Run # 1e		#140 5700MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5725 MHz	15 E	49.3dBµV/m @ 5725.1MHz (-19.0dB)
Run # 2a	802.11a Chain B	#36 5180MHz	16.5 dBm	16.7 dBm	Restricted Band Edge at 5150 MHz	15.209	45.7dBµV/m @ 5150.0MHz (-8.3dB)
Run # 2b		#64 5320MHz	16.5 dBm	16.8 dBm	Restricted Band Edge at 5350 MHz	15.209	46.5dBµV/m @ 5350.1MHz (-7.5dB)
Run # 2c		#100 5500MHz	16.5 dBm	16.6 dBm	Restricted Band Edge at 5460 MHz	15.209	42.0dBµV/m @ 5460.1MHz (-12.0dB)
Run # 2d					Restricted Band Edge at 5470 MHz	15 E	47.0dBµV/m @ 5470.0MHz (-21.3dB)
Run # 2e		#140 5700MHz	16.5 dBm	16.8 dBm	Restricted Band Edge at 5725 MHz	15 E	51.1dBµV/m @ 5725.1MHz (-17.2dB)

General Test Configuration

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

Ambient Conditions:

Rel. Humidity: 15-65 %
Temperature: 15-25 °C

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Marker Delta Measurements

Three sets of marker deltas are measured using the following settings: RB=VB=100kHz; RB=1MHz,VB=1MHz; RB=1MHz, VB=10Hz. Marker deltas are made conducted (analyzer connected to EUT rf port a 20dB pad) for single chain operation. For MIMO operation the delta measurement is made in a radiated manner with the measurement antenna located approximately 50cm from the EUT's antennas. The fundamental field strength is always measured at a 3m test distance.

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

Run #1a, EUT on Channel #36 5180MHz - 802.11a, Chain A

Date of Test: 8/25/2009 Test Location: Chamber # 4

Test Engineer: Suhaila Khushzad Config Change: none

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

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5174.870	93.9	H	-	-	AVG	30	1.0	RB 1 MHz; VB: 10 Hz
5175.530	101.3	H	-	-	PK	30	1.0	RB 1 MHz; VB: 1 MHz
5178.800	93.6	H	-	-	PK	30	1.0	RB 100 kHz; VB: 100 kHz
5178.870	94.2	V	-	-	AVG	134	1.2	RB 1 MHz; VB: 10 Hz
5176.070	102.0	V	-	-	PK	134	1.2	RB 1 MHz; VB: 1 MHz
5182.800	92.9	V	-	-	PK	134	1.2	RB 100 kHz; VB: 100 kHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

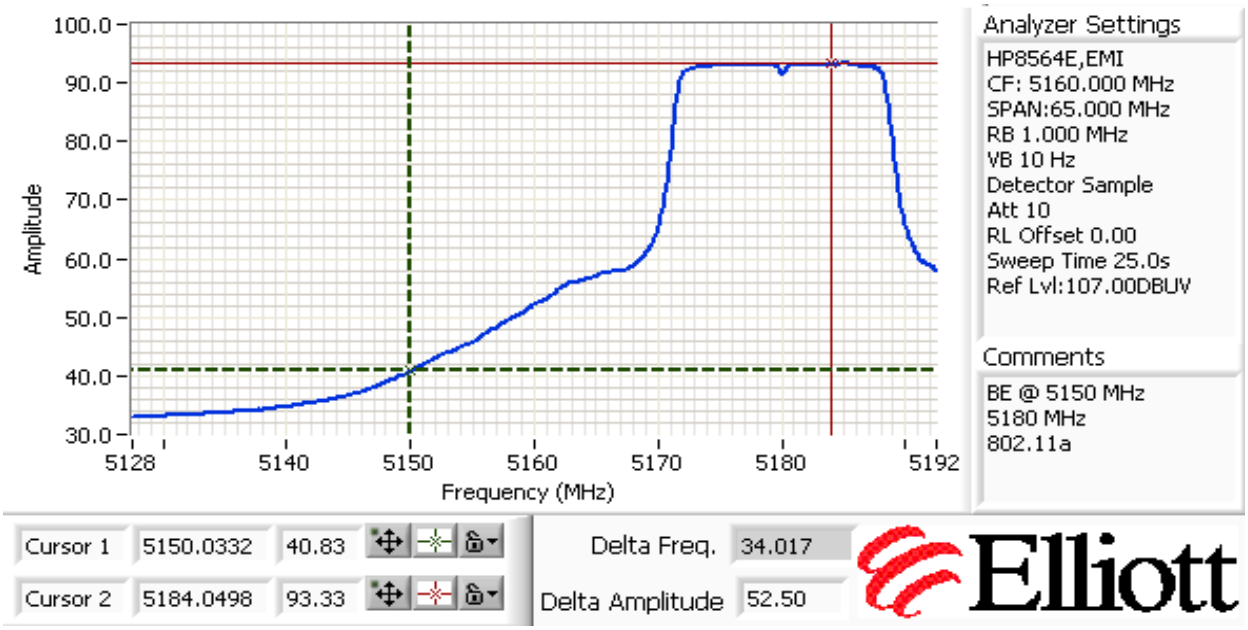
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	101.3	102.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	93.9	94.2	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*50.3 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	51.7 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	43.9 dBuV/m		

	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	-12.3	41.7	54	Avg
Delta Marker - 1MHz/10Hz:	-22.3	51.7	74	Pk

Calculated Band-Edge Measurement (Peak):	58.2 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	41.7 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.030	41.7	-	54.0	-12.3	Avg	-	-	Using 1MHz delta value

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1b, EUT on Channel #64 5320MHz - 802.11a, Chain A

Date of Test: 8/25/2009 Test Location: Chamber # 4

Test Engineer: Suhaila Khushzad Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.7	25.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5318.870	95.3	V	-	-	AVG	147	1.2	RB 1 MHz; VB: 10 Hz
5316.130	103.1	V	-	-	PK	147	1.2	RB 1 MHz; VB: 1 MHz
5315.070	96.8	V	-	-	PK	147	1.2	RB 100 kHz; VB: 100 kHz
5321.270	94.7	H	-	-	AVG	221	1.0	RB 1 MHz; VB: 10 Hz
5319.270	102.8	H	-	-	PK	221	1.0	RB 1 MHz; VB: 1 MHz
5316.400	93.3	H	-	-	PK	221	1.0	RB 100 kHz; VB: 100 kHz

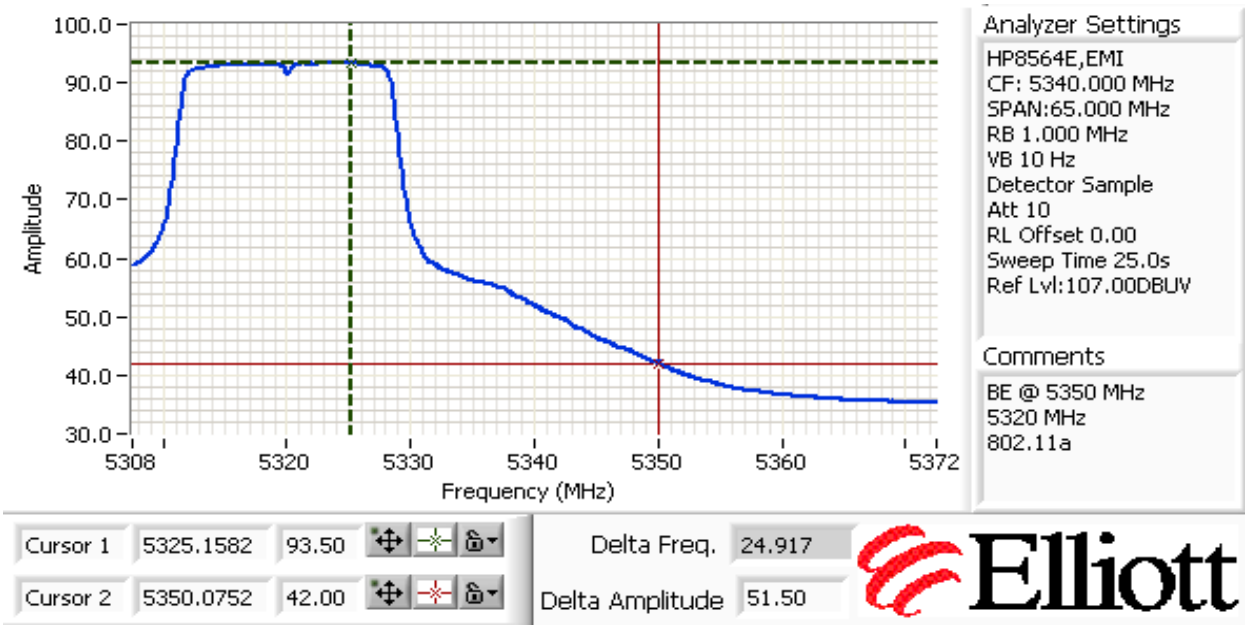
5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	102.8	103.1	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	94.7	95.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*48.7 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	54.4 dBuV/m		
Calculated Band-Edge Measurement (Avg):	46.6 dBuV/m		
Delta Marker - 1MHz/1MHz:	*42.8 dB*		
Delta Marker - 1MHz/10Hz:	51.5 *dB*		
Calculated Band-Edge Measurement (Peak):	60.3 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	43.8 dBuV/m		Using 1MHz delta value

Margin	Level	Limit	Detector
-10.2	43.8	54	Avg
-19.6	54.4	74	Pk

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.075	43.8	-	54.0	-10.2	Avg	-	-	Using 1MHz delta value

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1c, EUT on Channel #100 5500MHz - 802.11a, Chain A

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

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5498.870	97.2	H	-	-	AVG	226	1.0	RB 1 MHz; VB: 10 Hz
5496.200	105.0	H	-	-	PK	226	1.0	RB 1 MHz; VB: 1 MHz
5493.270	94.1	H	-	-	PK	226	1.0	RB 100 kHz; VB: 100 kHz
5495.070	96.4	V	-	-	AVG	214	1.0	RB 1 MHz; VB: 10 Hz
5495.670	104.4	V	-	-	PK	214	1.0	RB 1 MHz; VB: 1 MHz
5497.600	96.4	V	-	-	PK	214	1.0	RB 100 kHz; VB: 100 kHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	105.0	104.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	97.2	96.4	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*55.8 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	49.2 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	41.4 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*50.8 dB*		-12.8 / 41.2 / 54 / Avg
Delta Marker - 1MHz/10Hz:	56.0 dB		-24.8 / 49.2 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	54.2 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	41.2 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.890	41.2	-	54.0	-12.8	Avg	-	-	Using 1MHz delta value

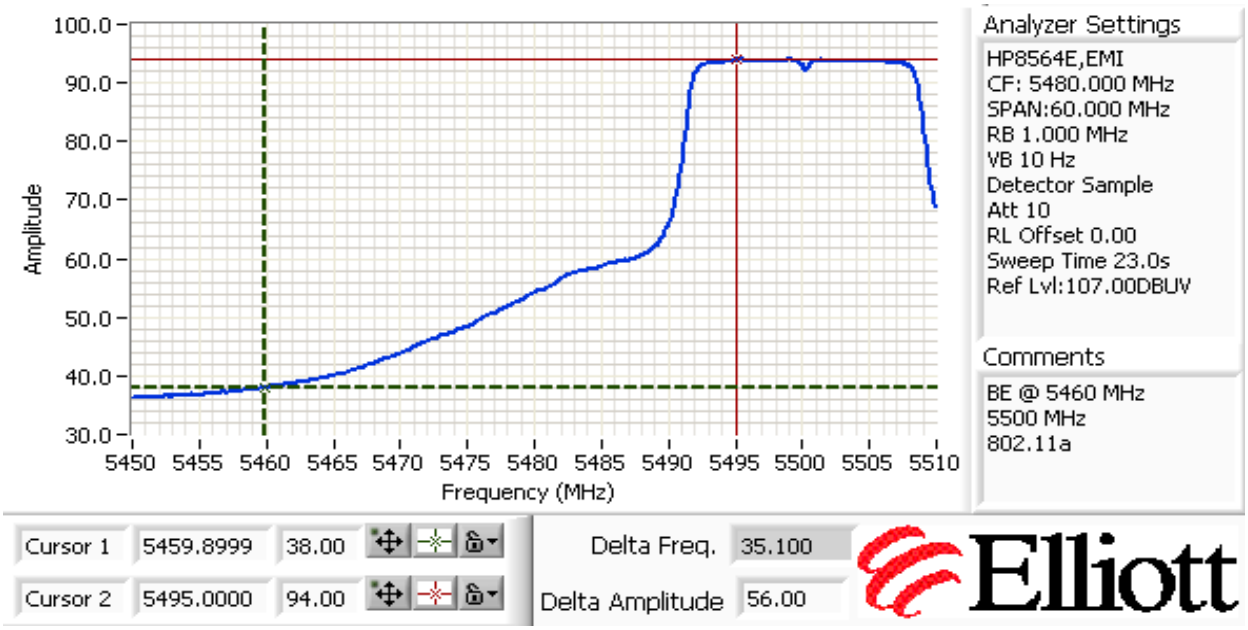
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

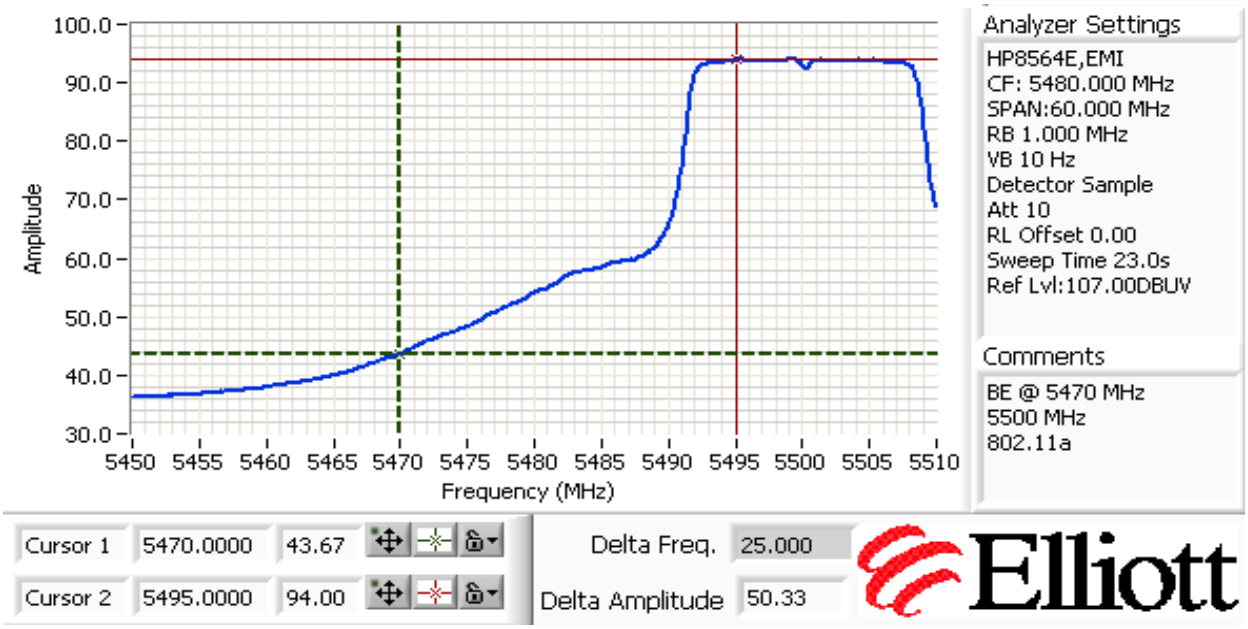
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	105.0	104.4	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	97.2	96.4	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	105.0 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	97.2 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*42.2 dB*		-21.4 / 46.9 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	50.3 dB		-25.5 / 62.8 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	62.8 dBuV/m		Using 1MHz delta value
Calculated Band-Edge Measurement (Avg):	46.9 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5470.000	46.9	-	68.3	-21.4	Avg	-	-	Using 1MHz delta value

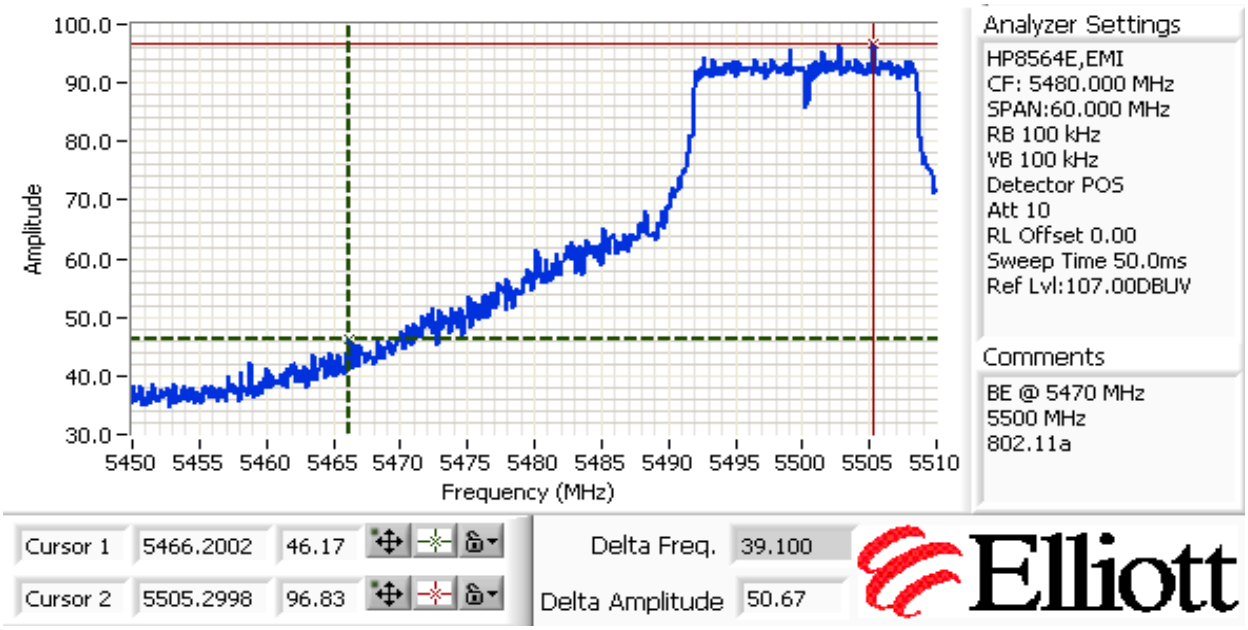
Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1d, EUT on Channel #140 5700MHz - 802.11a, Chain A

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.7	24.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5705.130	93.3	V	-	-	AVG	144	1.4	RB 1 MHz; VB: 10 Hz
5702.330	100.8	V	-	-	PK	144	1.4	RB 1 MHz; VB: 1 MHz
5702.070	91.9	V	-	-	PK	144	1.4	RB 100 kHz; VB: 100 kHz
5701.270	95.0	H	-	-	AVG	233	1.0	RB 1 MHz; VB: 10 Hz
5701.730	102.7	H	-	-	PK	233	1.0	RB 1 MHz; VB: 1 MHz
5704.330	96.3	H	-	-	PK	233	1.0	RB 100 kHz; VB: 100 kHz

5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	102.7	100.8	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.0	93.3	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*42.0 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	60.7 dBuV/m		
Calculated Band-Edge Measurement (Avg):	53.0 dBuV/m		

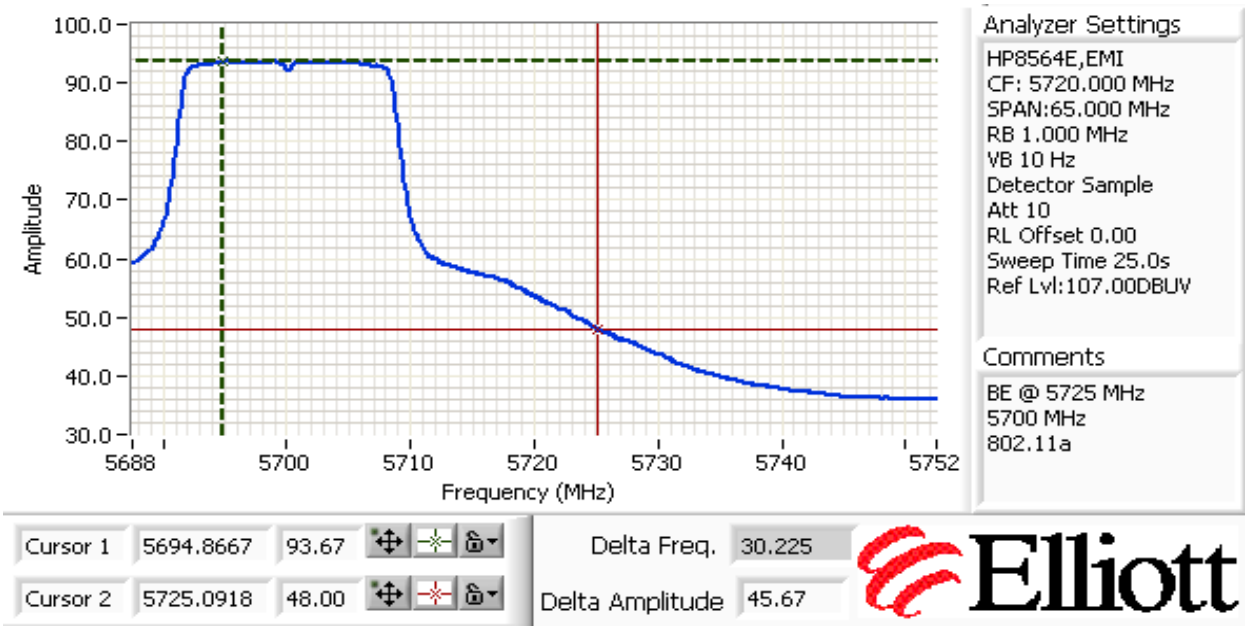
Margin	Level	Limit	Detector	
-19.0	49.3	68.3	Avg	
-27.6	60.7	88.3	Pk	

Delta Marker - 1MHz/1MHz:	*37.7 dB*	
Delta Marker - 1MHz/10Hz:	45.7 *dB*	
Calculated Band-Edge Measurement (Peak):	65.0 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	49.3 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.090	49.3	-	68.3	-19.0	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2, Band Edge Field Strength - 802.11a, Chain B

Run # 2a, EUT on Channel #36 5180MHz - 802.11a, Chain B

Date of Test: 8/25/2009 Test Location: Chamber # 4

Test Engineer: Suhaila Khushzad Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.7	27.0

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5175.000	95.2	V	-	-	AVG	136	1.9	RB 1 MHz; VB: 10 Hz
5176.070	103.2	V	-	-	PK	136	1.9	RB 1 MHz; VB: 1 MHz
5174.400	93.5	V	-	-	PK	136	1.9	RB 100 kHz; VB: 100 kHz
5175.070	95.7	H	-	-	AVG	101	1.2	RB 1 MHz; VB: 10 Hz
5176.070	103.6	H	-	-	PK	101	1.2	RB 1 MHz; VB: 1 MHz
5185.070	95.8	H	-	-	PK	101	1.2	RB 100 kHz; VB: 100 kHz

5150 MHz Band Edge Signal Radiated Field Strength - Marker Delta

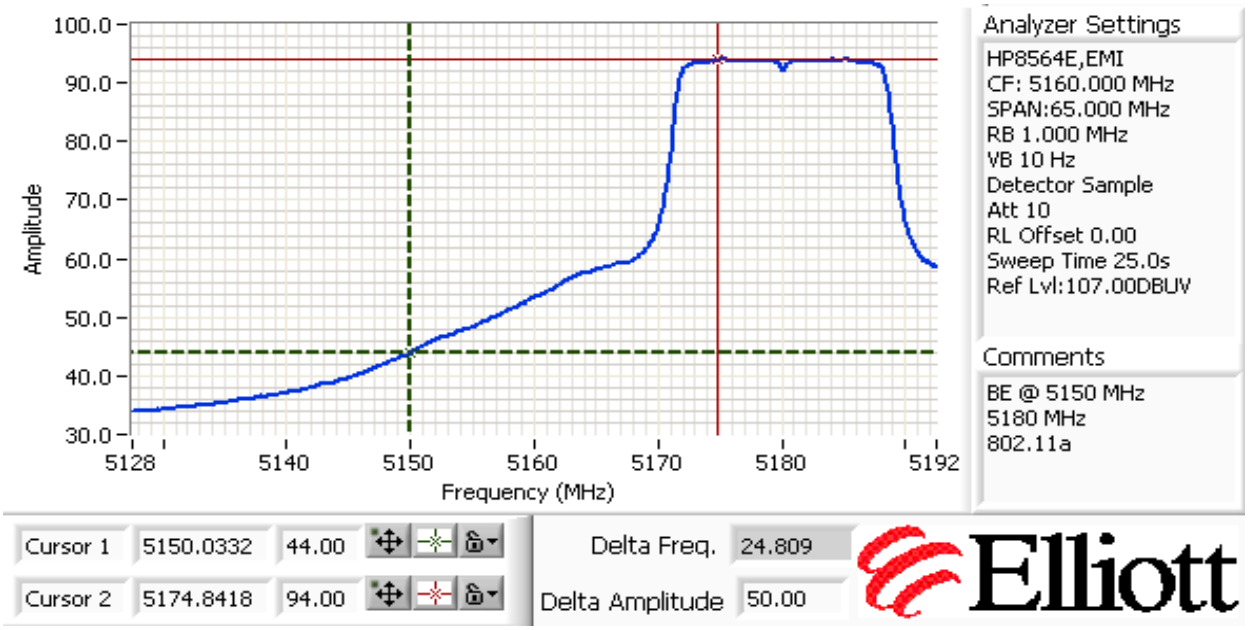
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	103.6	103.2	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	95.7	95.2	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*49.5 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	54.1 dBuV/m		
Calculated Band-Edge Measurement (Avg):	46.2 dBuV/m		

	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:	-8.3	45.7	54	Avg
Delta Marker - 1MHz/10Hz:	-19.9	54.1	74	Pk

Calculated Band-Edge Measurement (Peak):	61.4 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	45.7 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5150.030	45.7	-	54.0	-8.3	Avg	-	-	Using 1MHz delta value

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2b, EUT on Channel #64 5320MHz - 802.11a, Chain B

Date of Test: 8/25/2009 Test Location: Chamber # 4

Test Engineer: Suhaila Khushzad Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.8	26.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5314.870	97.0	H	-	-	AVG	107	1.0	RB 1 MHz; VB: 10 Hz
5315.670	104.7	H	-	-	PK	107	1.0	RB 1 MHz; VB: 1 MHz
5318.870	96.5	H	-	-	PK	107	1.0	RB 100 kHz; VB: 100 kHz
5314.930	94.2	V	-	-	AVG	135	1.1	RB 1 MHz; VB: 10 Hz
5313.800	102.1	V	-	-	PK	135	1.1	RB 1 MHz; VB: 1 MHz
5319.470	92.8	V	-	-	PK	135	1.1	RB 100 kHz; VB: 100 kHz

5350 MHz Band Edge Signal Radiated Field Strength - Marker Delta

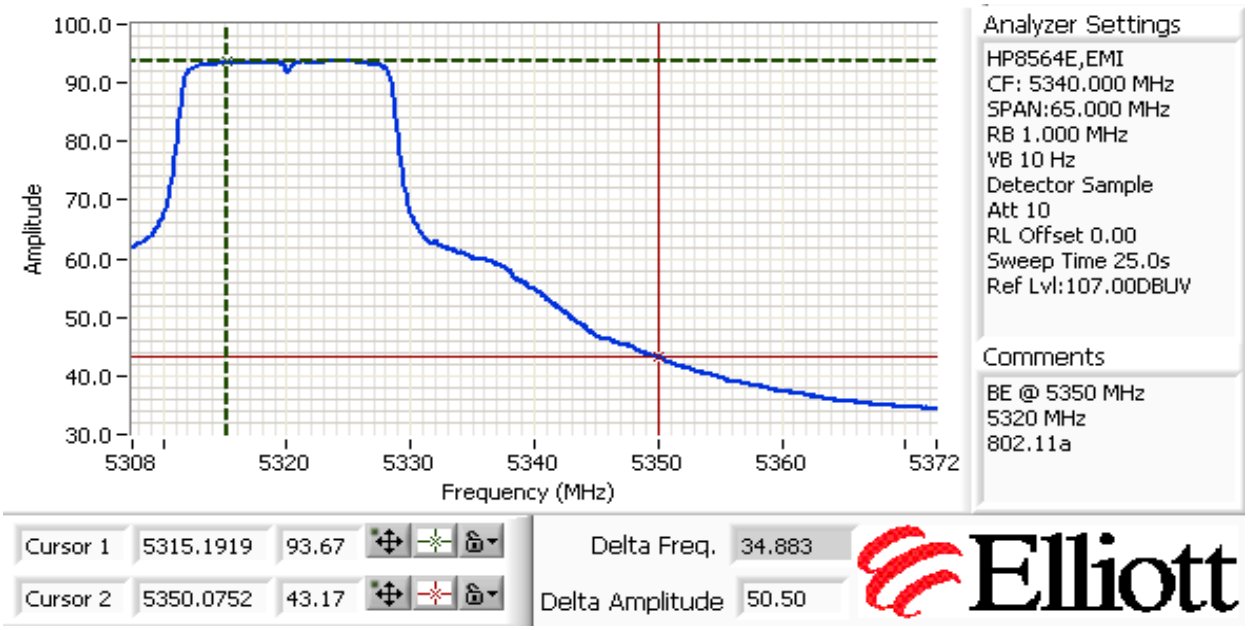
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	104.7	102.1	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	97.0	94.2	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*49.2 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	55.5 dBuV/m		
Calculated Band-Edge Measurement (Avg):	47.8 dBuV/m		

	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz: *44.3 dB*	-7.5	46.5	54	Avg
Delta Marker - 1MHz/10Hz: 50.5 *dB*	-18.5	55.5	74	Pk

Calculated Band-Edge Measurement (Peak):	60.4 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	46.5 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.075	46.5	-	54.0	-7.5	Avg	-	-	Using 1MHz delta value

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2c, EUT on Channel #100 5500MHz - 802.11a, Chain B

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
B	16.5	16.6	25.5

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5498.800	93.4	V	-	-	AVG	152	1.0	RB 1 MHz; VB: 10 Hz
5496.130	101.2	V	-	-	PK	152	1.0	RB 1 MHz; VB: 1 MHz
5493.870	91.1	V	-	-	PK	152	1.0	RB 100 kHz; VB: 100 kHz
5495.000	98.3	H	-	-	AVG	108	1.1	RB 1 MHz; VB: 10 Hz
5493.730	106.1	H	-	-	PK	108	1.1	RB 1 MHz; VB: 1 MHz
5498.930	97.0	H	-	-	PK	108	1.1	RB 100 kHz; VB: 100 kHz

5460 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	106.1	101.2	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	98.3	93.4	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*56.3 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	49.8 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	42.0 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*50.0 dB*		-12.0 / 42.0 / 54 / Avg
Delta Marker - 1MHz/10Hz:	*56.3 dB*		-24.2 / 49.8 / 74 / Pk
Calculated Band-Edge Measurement (Peak):	56.1 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	42.0 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5460.066	42.0	-	54.0	-12.0	Avg	-	-	Using 1MHz delta value

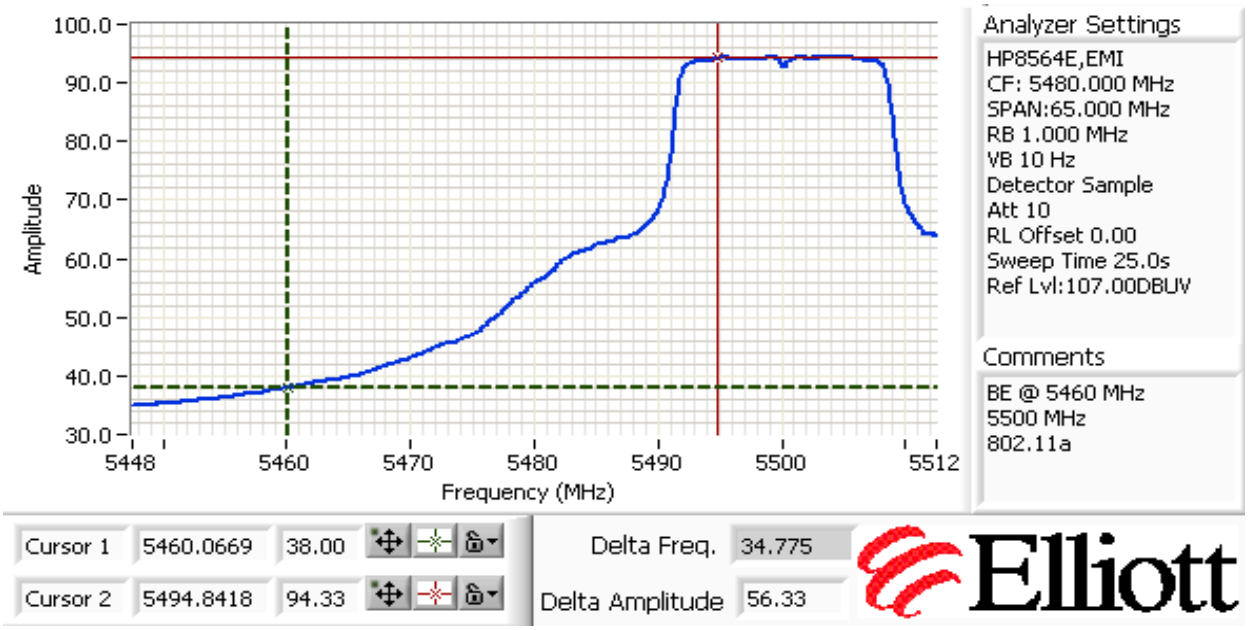
5470 MHz Band Edge Signal Radiated Field Strength - Marker Delta

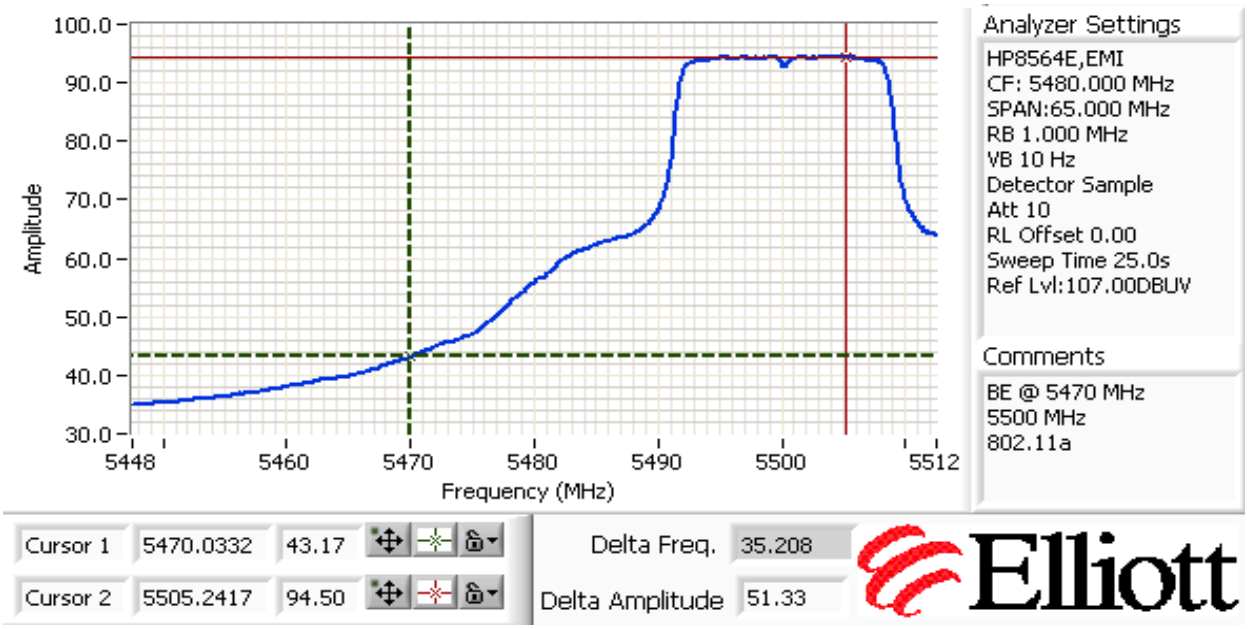
	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	106.1	101.2	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	98.3	93.4	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*49.8 dB*		<- this can only be used if band edge signal is
Calculated Band-Edge Measurement (Peak):	56.3 dBuV/m		highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Avg):	48.5 dBuV/m		Margin / Level / Limit / Detector
Delta Marker - 1MHz/1MHz:	*44.3 dB*		-21.3 / 47.0 / 68.3 / Avg
Delta Marker - 1MHz/10Hz:	51.3 *dB*		-32.0 / 56.3 / 88.3 / Pk
Calculated Band-Edge Measurement (Peak):	61.8 dBuV/m		Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	47.0 dBuV/m		Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5470.033	47.0	-	68.3	-21.3	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A





Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run # 2d, EUT on Channel #140 5700MHz - 802.11a, Chain B

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

Fundamental Signal Field Strength

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5698.800	99.2	H	-	-	AVG	104	1.6	RB 1 MHz; VB: 10 Hz
5696.330	107.3	H	-	-	PK	104	1.6	RB 1 MHz; VB: 1 MHz
5697.600	99.9	H	-	-	PK	104	1.6	RB 100 kHz; VB: 100 kHz
5705.200	93.5	V	-	-	AVG	258	1.0	RB 1 MHz; VB: 10 Hz
5704.400	101.0	V	-	-	PK	258	1.0	RB 1 MHz; VB: 1 MHz
5702.670	94.3	V	-	-	PK	258	1.0	RB 100 kHz; VB: 100 kHz

5725 MHz Restricted Band Edge Signal Radiated Field Strength - Marker Delta

	H	V	
Fundamental emission level @ 3m in 1MHz RBW:	107.3	101.0	Peak Measurement (RB=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW:	99.3	93.5	Average Measurement (RB=1MHz, VB=10Hz)
Delta Marker - 100kHz	*47.3 dB*		<- this can only be used if band edge signal is highest within 2MHz of band edge.
Calculated Band-Edge Measurement (Peak):	60.0 dBuV/m		
Calculated Band-Edge Measurement (Avg):	52.0 dBuV/m		

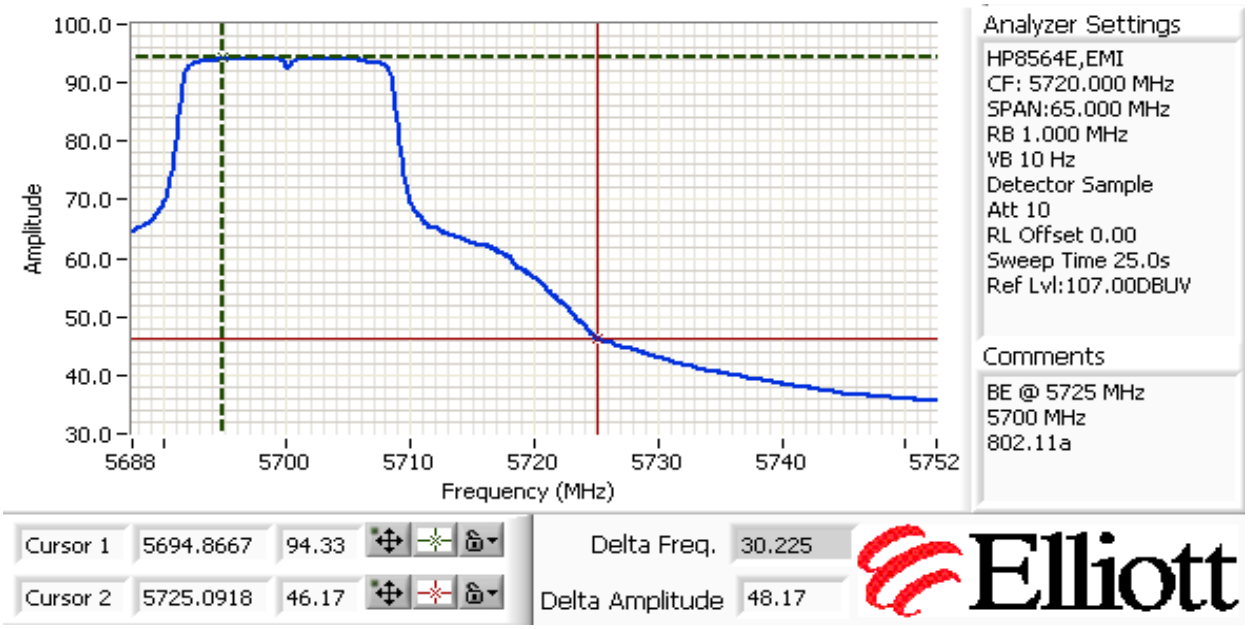
Margin	Level	Limit	Detector	
-17.2	51.1	68.3	Avg	*Delta Marker - 1MHz/1MHz:* *40.8 dB*
-28.3	60.0	88.3	Pk	*Delta Marker - 1MHz/10Hz:* 48.2 *dB*

Calculated Band-Edge Measurement (Peak):	66.5 dBuV/m	Using 100kHz delta value
Calculated Band-Edge Measurement (Avg):	51.1 dBuV/m	Using 1MHz delta value

Frequency	Level	Pol	FCC 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5725.090	51.1	-	68.3	-17.2	Avg	-	-	Using 1MHz delta value

Note - average limit is equivalent to -27dBm eirp.

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A



Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated Spurious Emissions

Test Specific Details

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

Summary of Results

Sample #2 MAC Address: 00150059F23C; CRTU Tool Version 5.199.36.999, Driver Version 13.0.0.91

Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
1 (Determine worst case mode)	802.11n20 A+B	#60 5300 MHz	16.5dBm per chain	A: 16.6 dBm B: 16.7 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.4dBµV/m @ 2998.3MHz (-19.9dB)
	802.11a Chain A	#60 5300 MHz	16.5 dBm	16.8 dBm			48.1dBµV/m @ 2998.3MHz (-20.2dB)
	802.11a Chain B	#60 5300 MHz	16.5 dBm	16.6 dBm			32.8dBµV/m @ 1048.5MHz (-21.2dB)
	802.11n40 A+B	#62 5310 MHz	16.5dBm per chain	A: 16.7 dBm B: 16.8 dBm			47.8dBµV/m @ 5995.8MHz (-20.5dB)
2	802.11n20 A+B	#36 5180 MHz	16.5dBm per chain	A: 16.7 dBm B: 16.8 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.7dBµV/m @ 2998.3MHz (-19.6dB)
		#44 5220 MHz	16.5dBm per chain	A: 16.8 dBm B: 16.7 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.1dBµV/m @ 2998.3MHz (-21.2dB)
		#48 5240MHz	16.5dBm per chain	A: 16.9 dBm B: 16.7 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	55.1dBµV/m @ 1329.4MHz (-18.9dB)
		#52 5260 MHz	16.5dBm per chain	A: 16.7 dBm B: 16.6 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	47.3dBµV/m @ 5995.8MHz (-21.0dB)
		#64 5320MHz	16.5dBm per chain	A: 16.7 dBm B: 16.6 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	48.8dBµV/m @ 3000.3MHz (-19.5dB)
3 (Determine worst case mode)	802.11n20 A+B	#120 5600 MHz	16.5dBm per chain	A: 16.8 dBm B: 16.8 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	42.1dBµV/m @ 11200.6MHz (-11.9dB)
	802.11a Chain A	#120 5600 MHz	16.5 dBm	16.7 dBm			42.8dBµV/m @ 9001.2MHz (-11.2dB)
	802.11a Chain B	#120 5600 MHz	16.5 dBm	16.6 dBm			36.6dBµV/m @ 11200.1MHz (-17.4dB)
	802.11n40 A+B	#118 5590 MHz	16.5dBm per chain	A: 16.6 dBm B: 16.7 dBm			38.4dBµV/m @ 11180.2MHz (-15.6dB)
4	802.11n20 A+B or 802.11a A or B	#100 5500 MHz	16.5dBm per chain	A: 16.6 dBm B: 16.7 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	39.0dBµV/m @ 10999.6MHz (-15.0dB)
		#140 5700 MHz	16.5dBm per chain	A: 16.8 dBm B: 16.9 dBm	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	37.5dBµV/m @ 11399.6MHz (-16.5dB)

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

General Test Configuration

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

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.

Ambient Conditions:

Temperature:	23 °C
Rel. Humidity:	46 %

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

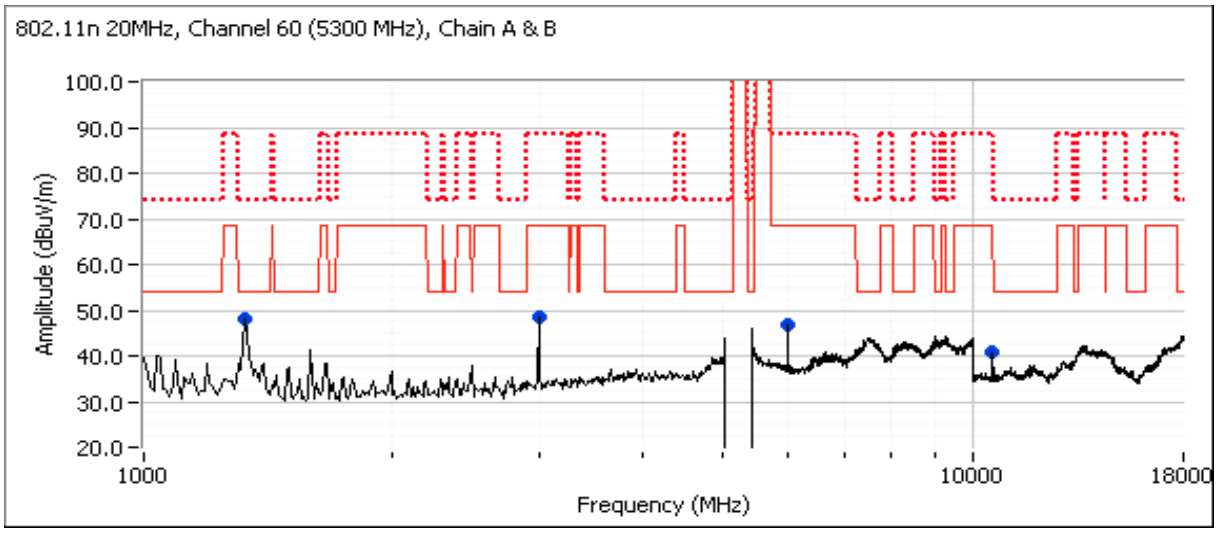
Run #1, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5150-5250 MHz and 5250 - 5350 MHz Bands

Date of Test: 8/20/2009 Test Location: Chamber #5

Test Engineer: Suhaila Khushzad Config Change: none

Preliminary tests on center channel in the 5250 - 5350 MHz band to determine the worst case mode. This channel was selected because the second harmonic falls in a restricted band.

Run #1a: 802.11n 20MHz mode, channel 60 (5300 MHz), Chains A and B active at 16.5dBm each chain



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.330	48.4	V	68.3	-19.9	Peak	266	1.3	
1328.490	54.1	V	74.0	-19.9	PK	111	1.0	MHz; VB: 1 MHz
1329.210	34.0	V	54.0	-20.0	AVG	111	1.0	MHz; VB: 10 Hz
5995.830	46.8	V	68.3	-21.5	Peak	103	1.0	
10599.530	33.3	H	54.0	-20.7	AVG	241	1.1	MHz; VB: 10 Hz
10600.000	46.8	H	74.0	-27.2	PK	241	1.1	MHz; VB: 1 MHz

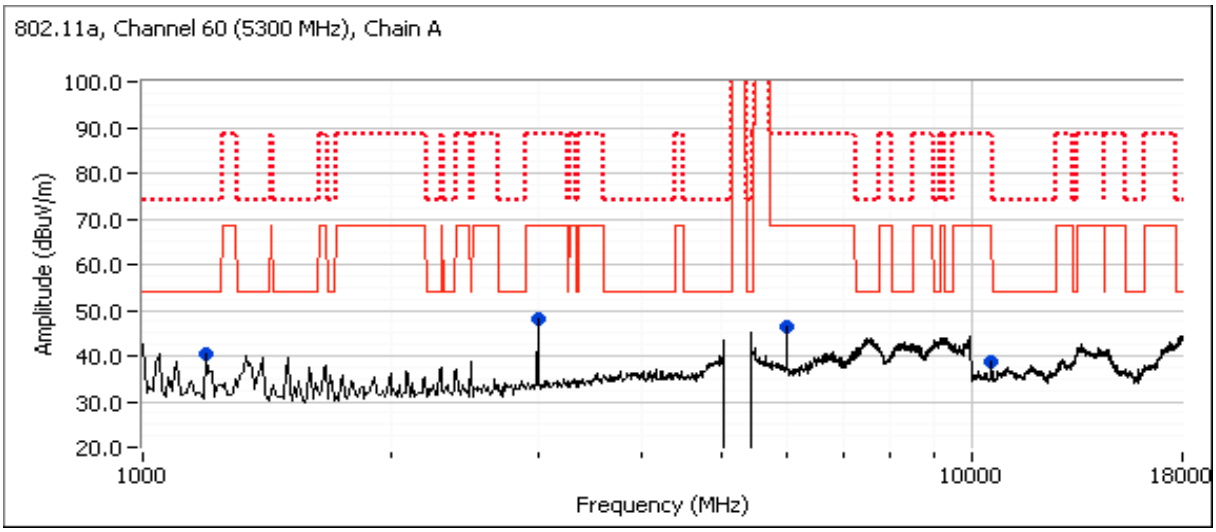
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1b: 802.11a, channel 60 (5300 MHz), Chain A at 16.5dBm

Date of Test: 8/20/2009 Test Location: Chamber #4

Test Engineer: Rafael Varelas Config Change: none



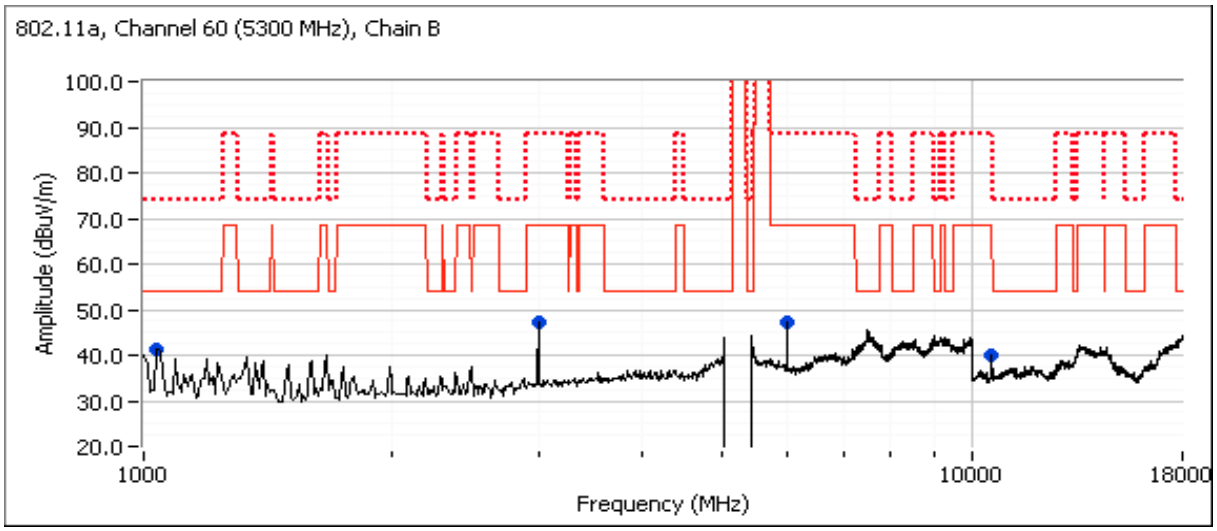
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.330	48.1	V	68.3	-20.2	Peak	248	1.0	
10600.130	33.1	H	54.0	-20.9	AVG	242	1.0	. MHz; VB: 10 Hz
10602.330	44.5	H	74.0	-29.5	PK	242	1.0	MHz; VB: 1 MHz
1198.710	30.2	H	54.0	-23.8	AVG	75	1.3	RB 1 MHz; VB: 10 Hz
1199.930	45.7	H	74.0	-28.3	PK	75	1.3	RB 1 MHz; VB: 1 MHz
5995.830	46.5	V	68.3	-21.8	Peak	103	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1c: 802.11a, channel 60 (5300 MHz), Chain B at 16.5dBm



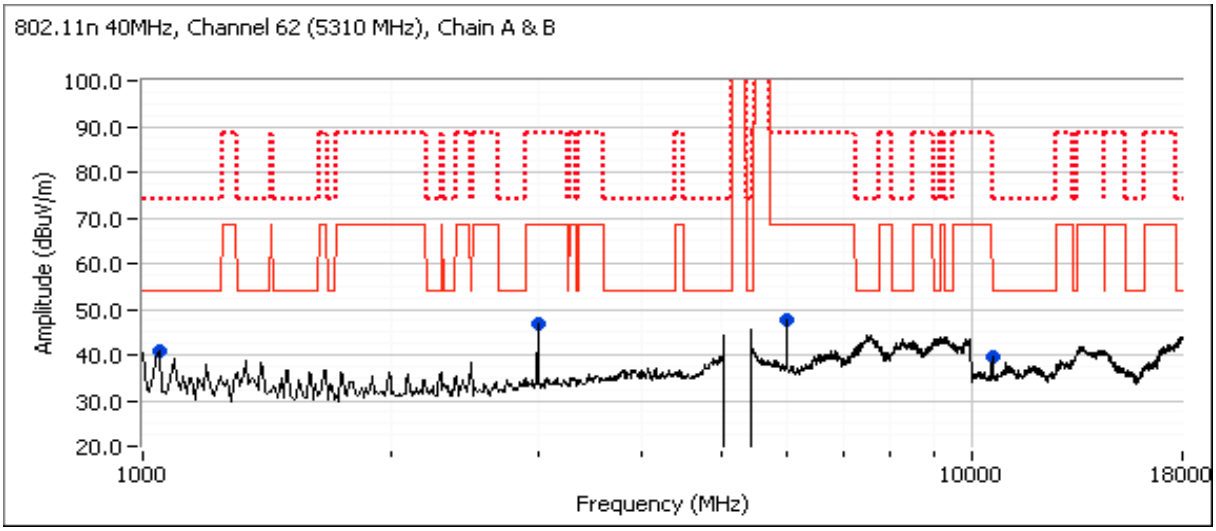
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1048.460	32.8	H	54.0	-21.2	AVG	180	1.0	MHz; VB: 10 Hz
1049.770	48.4	H	74.0	-25.6	PK	180	1.0	MHz; VB: 1 MHz
10600.130	30.6	H	54.0	-23.4	AVG	138	1.0	MHz; VB: 10 Hz
10601.870	41.9	H	74.0	-32.1	PK	138	1.0	MHz; VB: 1 MHz
2998.330	47.1	V	68.3	-21.2	Peak	178	1.0	
5986.670	47.0	V	68.3	-21.3	Peak	100	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #1d: 802.11n 40 MHz, channel 62 (5310 MHz), Chains A and B at 16.5dBm each chain



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5995.830	47.8	V	68.3	-20.5	Peak	104	1.0	
2998.330	46.6	V	68.3	-21.7	Peak	254	1.0	
1048.730	31.8	H	54.0	-22.2	AVG	68	1.0	. MHz; VB: 10 Hz
1049.340	46.2	H	74.0	-27.8	PK	68	1.0	MHz; VB: 1 MHz
10619.890	29.6	V	54.0	-24.4	AVG	301	1.0	. MHz; VB: 10 Hz
10620.090	42.4	V	74.0	-31.6	PK	301	1.0	MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

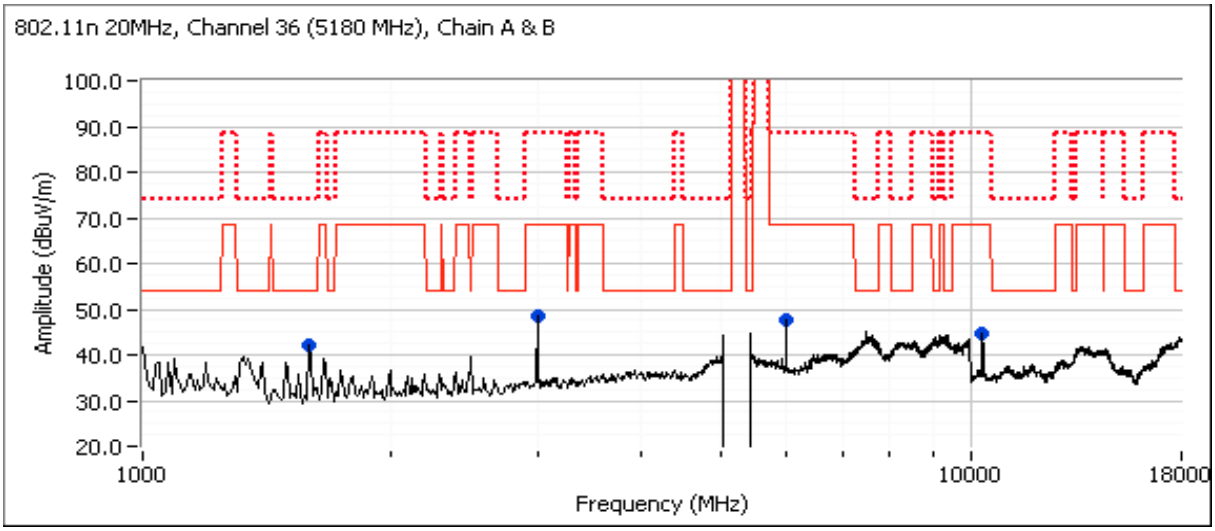
Run #2, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5150-5250 MHz and 5250 - 5350 MHz Bands

Date of Test: 8/20/2009 Test Location: FT chamber #4

Test Engineer: Rafael Varelas Config Change: none

Measurements on the remaining channels (top, bottom and center in each band) not covered by run #1 on the worst case mode.

Run #2a: 802.11n 20MHz mode, channel 36 (5180 MHz), Chains A and B active at 16.5dBm each chain



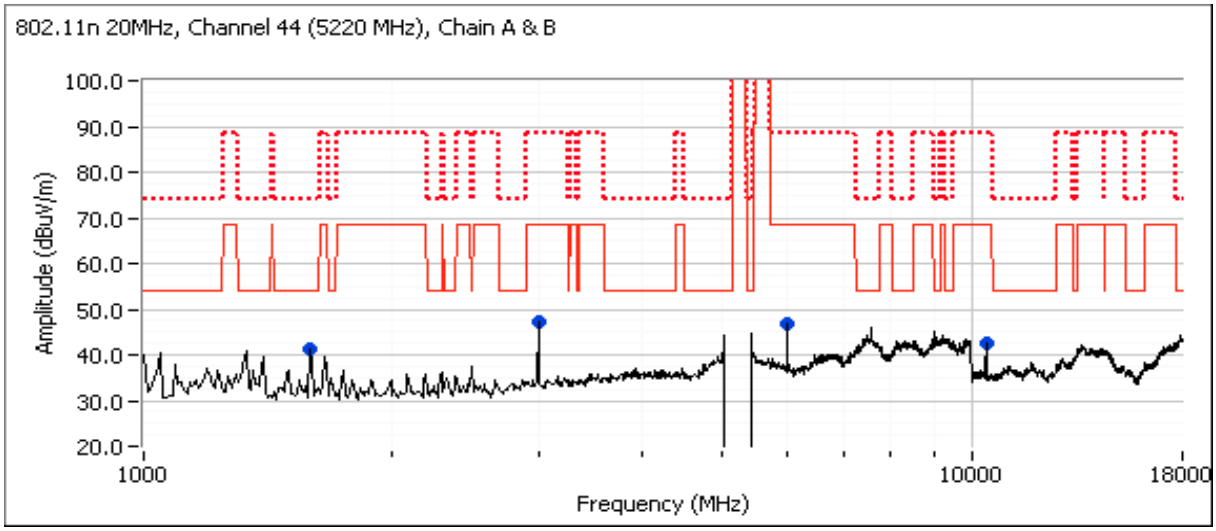
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.330	48.7	V	68.3	-19.6	Peak	259	1.0	
1596.340	29.2	V	54.0	-24.8	AVG	93	1.3	. MHz; VB: 10 Hz
1596.760	51.8	V	74.0	-22.2	PK	93	1.3	MHz; VB: 1 MHz
5995.830	47.6	V	68.3	-20.7	Peak	105	1.0	
10346.670	44.5	V	68.3	-23.8	Peak	138	1.3	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2b: 802.11n 20MHz mode, channel 44 (5220 MHz), Chains A and B active at 16.5dBm each chain



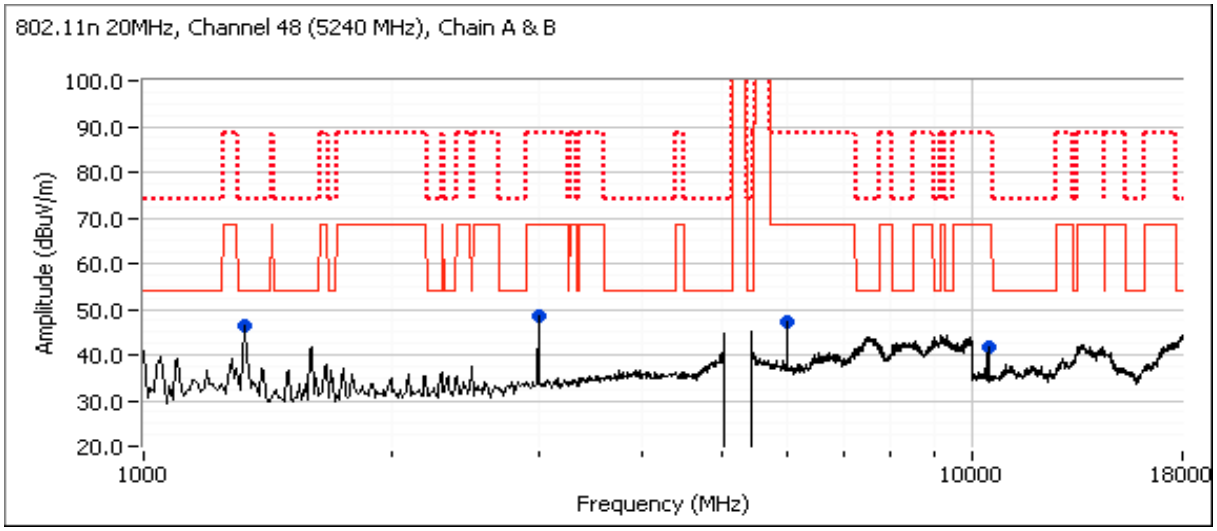
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2998.330	47.1	V	68.3	-21.2	Peak	180	1.0	
1600.100	31.3	V	54.0	-22.7	AVG	78	1.3	. MHz; VB: 10 Hz
1596.630	49.1	V	74.0	-24.9	PK	78	1.3	MHz; VB: 1 MHz
5995.830	47.0	V	68.3	-21.3	Peak	106	1.0	
10426.670	42.4	V	68.3	-25.9	Peak	224	1.3	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2c: 802.11n 20MHz mode, channel 48 (5240 MHz), Chains A and B active at 16.5dBm each chain



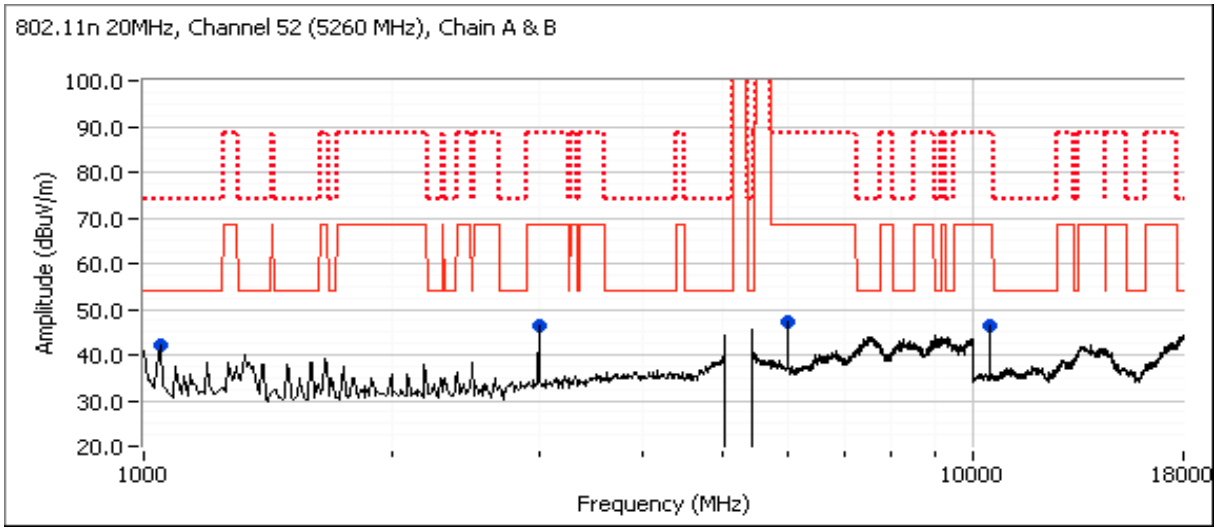
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1329.440	55.1	V	74.0	-18.9	PK	113	1.0	MHz; VB: 1 MHz
2998.330	48.6	V	68.3	-19.7	Peak	250	1.0	
1329.760	33.8	V	54.0	-20.2	AVG	113	1.0	. MHz; VB: 10 Hz
5995.830	47.1	V	68.3	-21.2	Peak	100	1.0	
10480.000	41.8	H	68.3	-26.5	Peak	159	1.3	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2d: 802.11n 20MHz mode, channel 52 (5260 MHz), Chains A and B active at 16.5dBm each chain



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5995.830	47.3	V	68.3	-21.0	Peak	100	1.0	
1048.520	32.5	H	54.0	-21.5	AVG	180	1.0	. MHz; VB: 10 Hz
2998.330	46.4	V	68.3	-21.9	Peak	262	1.3	
10506.670	46.2	H	68.3	-22.1	Peak	250	1.0	
1049.650	48.6	H	74.0	-25.4	PK	180	1.0	MHz; VB: 1 MHz

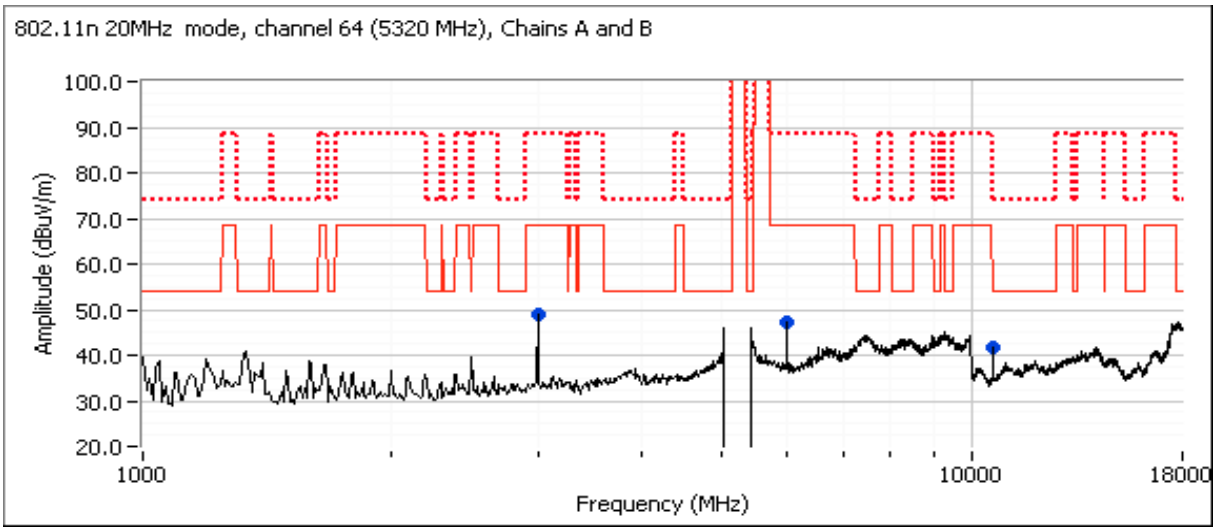
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #2e: 802.11n 20MHz mode, channel 64 (5320 MHz), Chains A and B active at 16.5dBm each chain

Date of Test: 8/21/2009 Test Location: Chamber #5
Test Engineer: Suhaila Khushzad Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.7	26.0
B	16.5	16.6	27.5



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3000.300	48.8	V	68.3	-19.5	Peak	252	1.0	
6000.820	47.4	V	68.3	-20.9	Peak	138	1.0	
10639.610	30.8	V	54.0	-23.2	AVG	291	1.0	RB 1 MHz; VB: 10 Hz
10640.140	43.8	V	74.0	-30.2	PK	291	1.0	RB 1 MHz; VB: 1 MHz

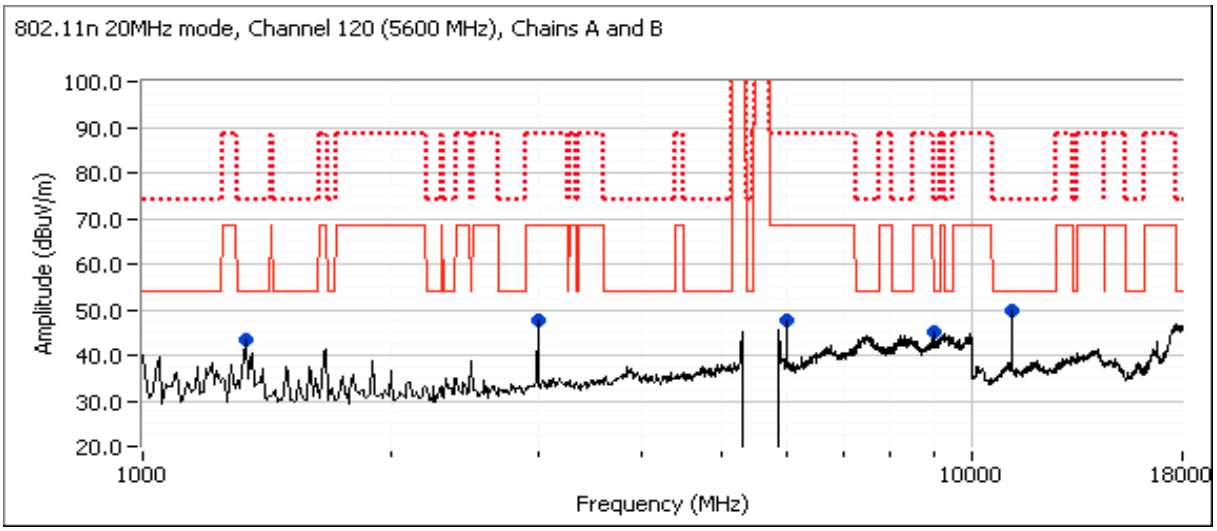
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

Preliminary tests on center channel in the 5470 - 5725 MHz band to determine the worst case mode.
Run #3a: 802.11n 20MHz mode, Channel 120 (5600 MHz), Chains A and B active at 16.5dBm each chain

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.8	26.0
B	16.5	16.8	26.0



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11200.580	42.1	V	54.0	-11.9	AVG	197	1.0	MHz; VB: 10 Hz
11200.180	55.7	V	74.0	-18.3	PK	197	1.0	MHz; VB: 1 MHz
9001.140	41.8	V	54.0	-12.2	AVG	90	1.0	MHz; VB: 10 Hz
9001.210	49.4	V	74.0	-24.6	PK	90	1.0	MHz; VB: 1 MHz
3000.070	47.8	V	68.3	-20.5	Peak	256	1.0	
6001.050	47.8	V	68.3	-20.5	Peak	135	1.0	
1329.510	26.4	V	54.0	-27.6	AVG	63	1.2	MHz; VB: 10 Hz
1330.510	45.4	V	74.0	-28.6	PK	63	1.2	MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

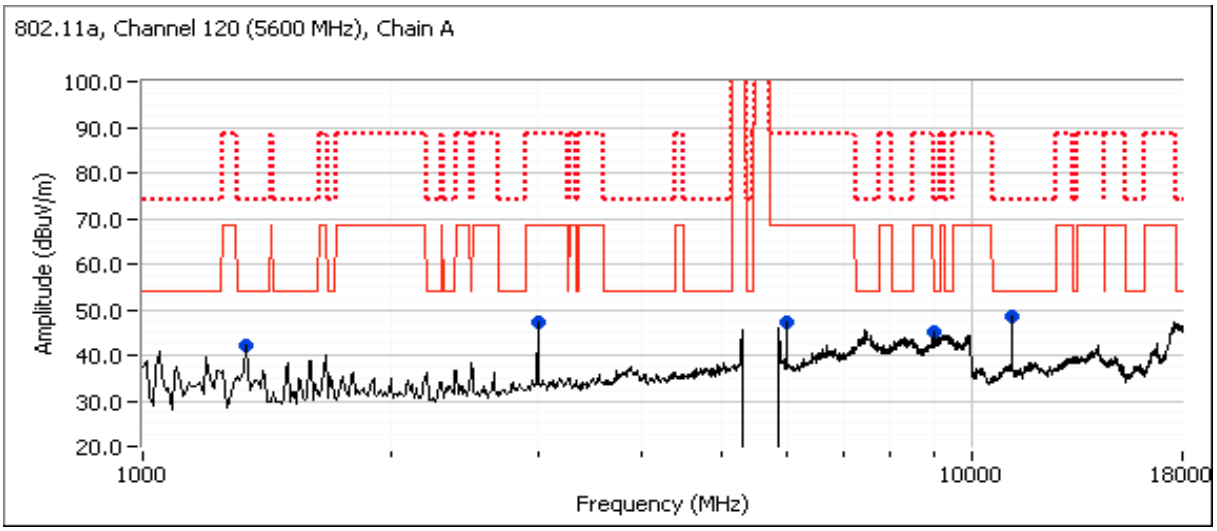
Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3b: 802.11a, Channel 120 (5600 MHz), Chain A at 16.5dBm

Date of Test: 8/25/2009 Test Location: Chamber #4

Test Engineer: Suhaila Khushzad Config Change: none

Chain	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
A	16.5	16.6	24.0



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
9001.210	42.8	V	54.0	-11.2	AVG	134	1.0	MHz; VB: 10 Hz
9001.270	49.1	V	74.0	-24.9	PK	134	1.0	MHz; VB: 1 MHz
11200.220	41.5	V	54.0	-12.5	AVG	209	1.0	MHz; VB: 10 Hz
11200.820	52.9	V	74.0	-21.1	PK	209	1.0	MHz; VB: 1 MHz
1331.850	27.1	V	54.0	-26.9	AVG	287	1.0	RB 1 MHz; VB: 10 Hz
1329.920	47.1	V	74.0	-26.9	PK	287	1.0	RB 1 MHz; VB: 1 MHz
3000.010	47.1	H	68.3	-21.2	Peak	175	1.3	
6000.860	47.3	V	68.3	-21.0	Peak	102	1.0	

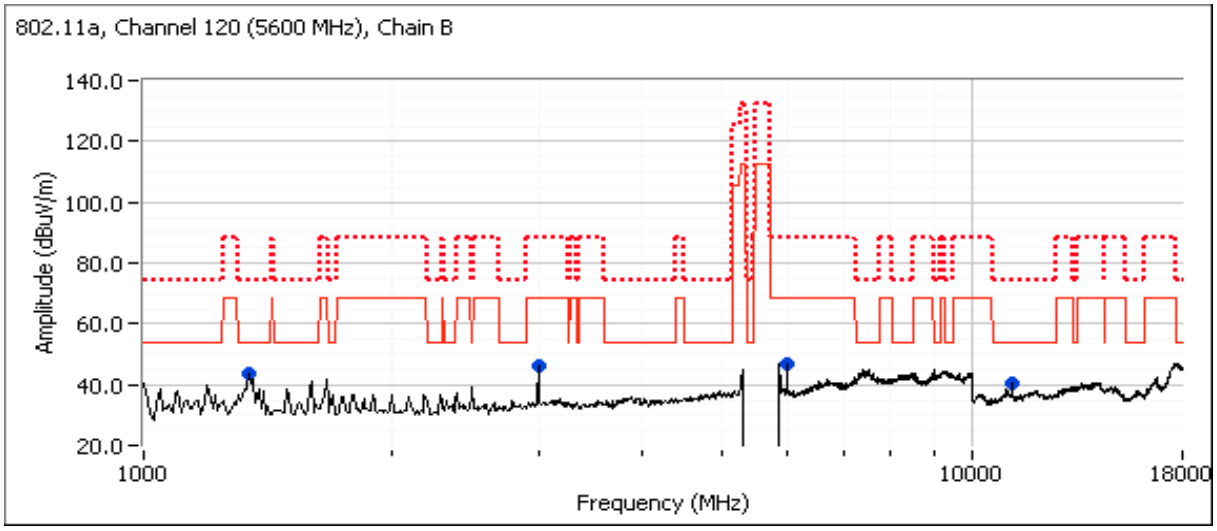
Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3c: 802.11a, Channel 120 (5600 MHz), Chain B at 16.5dBm

Date of Test: 8/25/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none



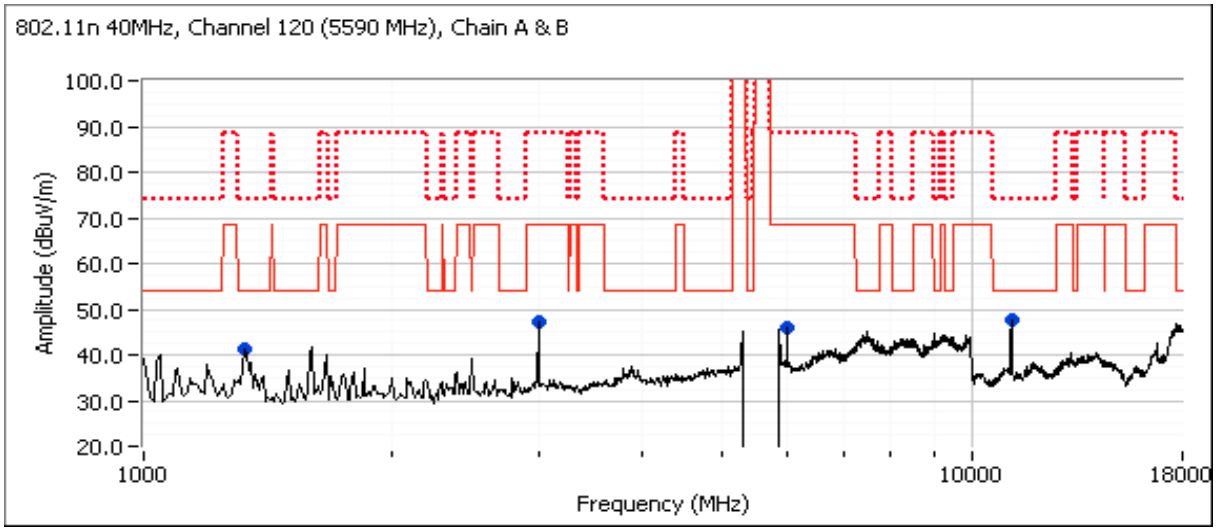
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11200.080	36.6	V	54.0	-17.4	AVG	189	1.1	. MHz; VB: 10 Hz
11200.310	47.4	V	74.0	-26.6	PK	189	1.1	MHz; VB: 1 MHz
1331.730	33.4	V	54.0	-20.6	AVG	86	1.0	. MHz; VB: 10 Hz
1331.420	55.5	V	74.0	-18.5	PK	86	1.0	MHz; VB: 1 MHz
2998.330	46.4	H	68.3	-21.9	Peak	251	1.3	
5995.830	46.6	V	68.3	-21.7	Peak	98	1.6	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the **average** limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #3d: 802.11n 40 MHz, channel 118 (5590 MHz), Chains A and B at 16.5dBm each chain



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11180.200	38.4	V	54.0	-15.6	AVG	208	1.2	. MHz; VB: 10 Hz
11180.340	54.8	V	74.0	-19.2	PK	208	1.2	MHz; VB: 1 MHz
1332.440	31.6	V	54.0	-22.4	AVG	113	1.0	. MHz; VB: 10 Hz
1331.620	52.2	V	74.0	-21.8	PK	113	1.0	MHz; VB: 1 MHz
2998.330	47.1	V	68.3	-21.2	Peak	261	1.0	
5995.830	46.1	V	68.3	-22.2	Peak	104	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

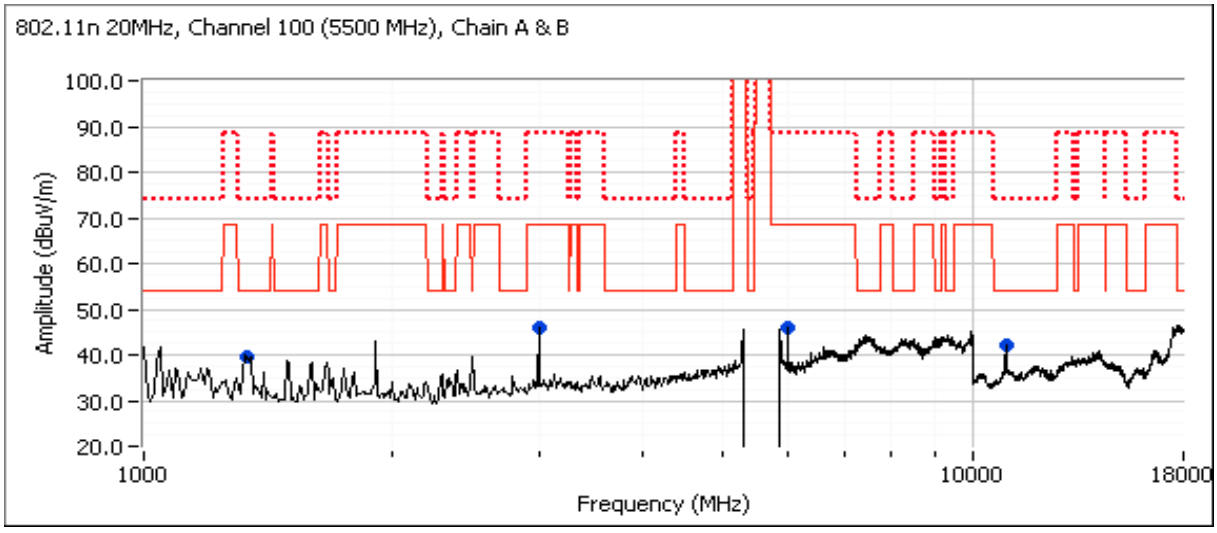
Run #4, Radiated Spurious Emissions, 30 - 40,000 MHz. Operation in the 5470-5725 MHz Band

Date of Test: 8/25/2009 Test Location: FT Chamber #4

Test Engineer: Rafael Varelas Config Change: none

Measurements on the bottom and top channels on the worst case mode.

Run #4a: 802.11n 20MHzmode, channel 100 (5500 MHz), Chains A and B active at 16.5dBm each chain



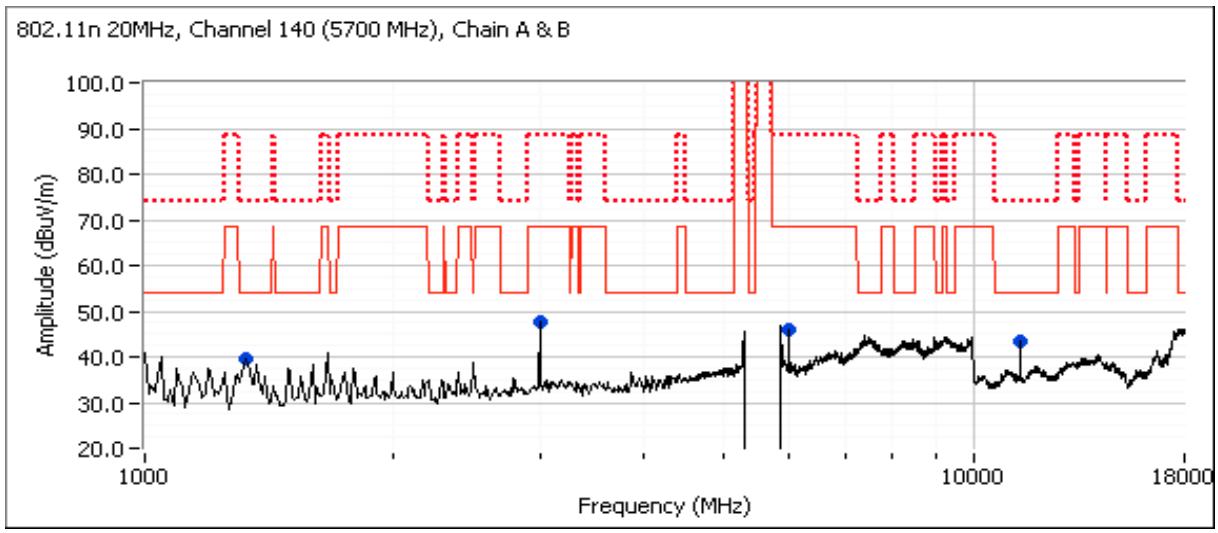
Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10999.600	39.0	V	54.0	-15.0	AVG	206	1.2	RB 1 MHz; VB: 10 Hz
11000.330	54.5	V	74.0	-19.5	PK	206	1.2	RB 1 MHz; VB: 1 MHz
1329.670	33.5	V	54.0	-20.5	AVG	91	1.0	RB 1 MHz; VB: 10 Hz
1330.770	54.8	V	74.0	-19.2	PK	91	1.0	RB 1 MHz; VB: 1 MHz
2998.330	46.1	V	68.3	-22.2	Peak	100	1.0	
5995.830	46.1	V	68.3	-22.2	Peak	137	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Intel	Job Number:	J75722
Model:	2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A

Run #4b: 802.11n 20MHz mode, channel 140 (5700 MHz), Chains A and B active at 16.5dBm each chain



Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
11399.600	37.5	V	54.0	-16.5	AVG	203	1.3	. MHz; VB: 10 Hz
11400.070	53.1	V	74.0	-20.9	PK	203	1.3	MHz; VB: 1 MHz
1329.000	33.3	V	54.0	-20.7	AVG	93	1.0	RB 1 MHz; VB: 10 Hz
1331.670	57.0	V	74.0	-17.0	PK	93	1.0	RB 1 MHz; VB: 1 MHz
2998.330	47.6	V	68.3	-20.7	Peak	264	1.0	
5995.830	46.1	V	68.3	-22.2	Peak	104	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Appendix C Photographs of Test Configurations

Uploaded as a separate exhibit

Appendix D Proposed FCC ID Label & Label Location

Uploaded as a separate exhibit

Appendix E Detailed Photographs

Uploaded as a separate exhibit

Appendix F Operator's Manual

Uploaded as a separate exhibit

Appendix G Block Diagram

Uploaded as a separate exhibit

Appendix H Schematic Diagrams

Uploaded as a separate exhibit

Appendix I Theory of Operation

Uploaded as a separate exhibit

Appendix J RF Exposure Information

Uploaded as a separate exhibit