

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:

Mark Brig

Staff Engineer Elliott Laboratories.



Testing Cert #2016-01

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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 \mathbb{R} Centrino \mathbb{R} 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	.11a: 2.7dBm/MHz HT20: 2.4dBm/MHz	4 dBm/MHz	Complies
-	A9.5 (2)	Delisity	HT40: -0.6dBm/MHz	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	11 dBm/MHz	Complies
-	A9.2(2) / A9.5 (2)	Power Spectral Density	HT20: 2.0dBh/MHZ HT40: -1.0dBm/MHz	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

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	11 dBm/MHz	Complies
	A9.2(2) / A9.5 (2)	Power Spectral Density	HT40: -0.3dBm/MHz	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

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, OPSK OAM		Complies
15	A9.5 (3)	- Channel Selection	Spurious emissions tested at outermost channels in each band Measurements on three channels in each band	Device was tested on the top, bottom and center channels in each band	N/A
15.407 (c)	A9.5(4)	Operation in the absence of information to transmitOperation 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

Requirements for all U-NII/LELAN 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	AC Conducted 43.3dBµV @ Emissions 1.906MHz		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

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

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
Intol		$2x^{2}$ 802 11 share	001E6400E972	PD9622ANXH
Corporation	622ANXHMW	PCIe card	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 F518H2BCB092 554 -					
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:

Dort	Connected To	Cable(s)				
Polt		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:

Dort	Connected	Cable(s)				
Folt	То	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.

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

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

CONDUCTED EMISSIONS CONSIDERATIONS

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

RADIATED EMISSIONS CONSIDERATIONS

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

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 nonconductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

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

INSTRUMENT CALIBRATION

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

TEST PROCEDURES

EUT AND CABLE PLACEMENT

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

CONDUCTED EMISSIONS

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



RADIATED EMISSIONS

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

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

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

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



Typical Test Configuration for Radiated Field Strength Measurements



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

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



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

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 bands¹ (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	2400/F _{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	Output Power	Power Spectral
(MHz)		Density
5150 - 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 - 5350	$250 \text{ mW} (24 \text{ dBm})^2$ 1W (30dBm) eirp	11 dBm/MHz
5470 - 5725	$250 \text{ mW} (24 \text{ dBm})^3$ 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:

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

where P is the eirp (Watts)

Appendix A Test Equipment Calibration Data

<u>Manufacturer</u>	Description	Model #	<u>Asset</u> #	<u>Cal Due</u>
AC Conducted Emi	ssions		—	
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/Receiv	er 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 Spurio	us Emissions 1.000 – 40.000 MHz and r	f Port measureme	nts	
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



EMC Test Data

An ZAZZED	company		
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

C E	Elliott An DZAS [*] company	
Client:	Intel	
Model:	2x2 WiFi with WiMax MiniPCI	А

EMC Test Data

Client:	Intel				ine interest and	J/5/22	
Model	ΩvΩ \/iEi wit	h WiMay MiniDCI		T-L	og Number:	T76369	
WOUEI.				Accou	nt Manager:	-	
Contact:	S. Hackett						
Standard:	RSS 210 / F	CC 15.247			Class:	DTS	
	С	onducted Emissions (Elliott Laboratories Fremo	• - Module Ins ont Facility, Semi-An	talled in Dechoic Ch	n Lapto namber)	р	
Test Spec	cific Detail	S					
	Objective:	The objective of this test session is to specification listed above.	perform final qualification	n testing of th	e EUT with i	espect to the	ý
[Date of Test:	8/7/2009	Config. Used:	1			
Те	st Engineer:	Peter Sales	Config Change:	None			
T€	est Location:	Chamber #3	Host Unit Voltage 230V/50Hz and 120V/Hz				
General T For tabletop coupling pla located outs when possib	equipment, equipment, ne and 80cm ide of the se ole passed th	Juration he host system was located on a woo from the LISN. A second LISN was ni-anechoic chamber. Any cables rur rough a ferrite clamp upon exiting the	oden table inside the semi s used for all local support nning to remote support e chamber.	i-anechoic ch equipment. quipment wh	amber, 40 cl Remote sup ere routed th	m from a ver oport equipm rough metal	tical ent was conduit and
Ambient (Condition	S: Temperature:	23 °C				
		Rel. Humidity:	40 %				
Summary	of Result	S					
Ru	n #	Test Performed	Limit	Result	Ма	rgin	

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.

(CE	Elliott An AZAS' company	EM	C Test Data
Client:	Intel	Job Number:	J75722
Model:	2v2 WiEi with WiMov MiniDCI	T-Log Number:	T76369
		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS



C E		Dt					EM	С Те
Client:	Intel						Job Number:	J75722
Madal	0.0.W/F	1. \A/!\A\A''					T-Log Number:	T76369
Wodel:	2X2 WIFI WI	th wiiviax iviii	NPCI				Account Manager:	-
Contact:	S. Hackett							
Standard:	RSS 210 / F	-CC 15.247					Class:	DTS
Preliminary	/ peak readi	ngs capture	d during pre	e-scan (peal	readings v	vs. average lii	mit)	
Frequency	Level	AC	EN 5502	2 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			

50.1

50.0

50.0

-2.3

-3.0

-4.7

EMC Test Data

Final augoi	nool and	avorago	roadinga	
Fillal guasi	·peak anu	average	reauings	

Line

Line

Neutral

47.8

47.0

45.3

0.306

5.373

5.241

i inai quusi	peak and a	veruge reuu	ings		-	
Frequency	Level	AC	EN 5502	2 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)

Peak

Peak

Peak

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

E	liott
~	An ATAS company

EMC Test Data

Client:	Intel	Job Number:	J75722
Model	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76369
MOUEI.		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	DTS

Frequency	Level	AC	EN 55022	2 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)



|--|

EMC Test Data

An <u>UVAS</u> company								
Client:	Intel						Job Number:	J75722
							T-Log Number:	T76369
Model:	2x2 WiFi wit	h WiMax Mir	ıiPCI			-	Account Manager	-
Contact	S. Hackott						necount manager.	
Contact.							Olass	DTC
Standard:	RSS 2107 F	UU 15.247					Class:	DIS
Droliminary	u noak roadii	nas canturo	d during pro	scan (noak	roadings v	s avorago lir	nit)	
Frequency			EN 5502	2 Class R	Detector	Commonts	ing	
MH ₇		Lino	Limit	Z Class D Margin		Comments		
1 006	ΔDμν /0 0	Line	46 0	2.0	Doak			
1,700	47.7	Noutral	40.0	1.8	Poak			
1.070	47.0	Neutral	40.0	0.9	Peak			
1.744	40.7	Line	46.0	-15	Peak			
0.238	48.1	Neutral	52.2	-4.1	Peak			
0.250	46.3	Neutral	51.5	-5.2	Peak			
0.237	40.0	Line	53.1	-7.7	Peak			
5 852	38.5	Line	50.0	-11 5	Peak			
5.052	50.5	LINC	50.0	11.5	1 Cult			
Final quasi	-peak and a	verage readi	ings					
Frequency	Level	AC	EN 5502	2 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)		
						• • •		

Elliott

EMC Test Data

	An (AZA) company		
Client:	Intel	Job Number:	J75722
Model	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76369
wouer.		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 -	#6	_	-			47.7dBµV/m @
	Chain A	2437 MHz			Radiated Emissions, 1 -7.5 GHz	RSS 210	3000.4MHz (-6.3dB)
	Receive	#6		-			47.8dBµV/m @
	Chain A+B	2437 MHz	-				3000.4MHz (-6.2dB)
3	Receive -	#40		-			45.9dBµV/m @
	Chain A	5200MHz	-				6000.7MHz (-8.1dB)
	Receive -	#60		-			47.2dBµV/m @
	Chain A	5300 MHz	-		Radiated Emissions,	ECC 15 200 / 15 E	3000.4MHz (-6.8dB)
	Receive -	#120	-	-	1 - 18 GHz	100 13.2077 13 L	47.1dBµV/m @
	Chain A	5600MHz					3000.4MHz (-6.9dB)
	Receive -	#157					47.0dBµV/m @
	Chain A	5785 MHz	-	-			3000.4MHz (-7.0dB)
	Receive Chain A+B	#40		-			46.8dBµV/m @
		5200MHz	-		Radiated Emissions,		3000.4MHz (-7.2dB)
		#60					45.4dBµV/m @
		5300 MHz	-	-		ECC 15 200 / 15 E	6000.8MHz (-8.6dB)
		#120			1 - 18 GHz	100 13.2077 13 L	Not tostod, single chain
		5600MHz	-	-			was worst case for all
		#157					othor channols
		5785 MHz	-	-			
1: Scans indicated that emissions below 1Ghz were independent of operating channel and operating mode (transmit versus receive).							



E	liott
-	An ATAS company

EMC Test Data

	An Burbany		
Client:	Intel	Job Number:	J75722
Model:	2v2 WiEi with WiMay MiniDCI	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

i remining	y beak readings captured during pre source							
Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
117.044	46.1	Н	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	Н	46.0	-4.8	Peak	139	1.0	
185.004	37.7	Н	43.5	-5.8	Peak	343	1.0	
221.440	38.9	Н	46.0	-7.1	Peak	232	2.0	
699.113	38.9	Н	46.0	-7.1	Peak	119	1.0	
299.318	37.8	Н	46.0	-8.2	Peak	89	1.0	
250.778	37.4	Н	46.0	-8.6	Peak	55	1.0	
497.978	36.7	V	46.0	-9.3	Peak	5	1.0	


E	liott
	An /A7A5 company

	An ZAZ	A) company							
Client:	Intel							Job Number:	J75722
							T-!	Log Number:	T76369
Model:	2x2 WiFi wit	h WiMax Mir	iPCI				Accou	int Manager:	-
Contact:	S Hackett								
Standard	DSS 210 / F	CC 15 247						Class	Ν/Λ
Statiuaru.	R33 2 107 1	00 13.247						01035.	IN/A
P <u>reliminary</u>	p <u>eak readir</u>								
Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
114.111	45.9	Н	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	Н	43.5	-5.9	Peak	10	1.5		
299.102	38.0	Н	46.0	-8.0	Peak	104	1.0		
226.148	37.9	Н	46.0	-8.1	Peak	235	1.5		
349.533	37.8	Н	46.0	-8.2	Peak	148	1.0	1	
499.662	37.2	V	46.0	-8.8	Peak	0	1.0	1	
699.000	37.0	Н	46.0	-9.0	Peak	121	1.0	1	
249.555	36.4	Н	46.0	-9.6	Peak	230	1.0	1	
		. <u> </u>	·		·	. <u> </u>	J	J	
Run #1c: M	aximized qu	asi-peak rea	adings - wor	rst case fror	m 1a and 1b				
Frequency	Level	Pol	FCC C	Class B	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
114.111	38.6	Н	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	Н	46.0	-10.6	QP	127	1.0	QP (1.00s)	
37.191	29.1	V	40.0	-10.9	QP	113	1.0	OP (1.00s)	
299,102	35.0	Н	46.0	-11.0	QP	83	1.0	OP (1.00s)	
499.662	34.6	V	46.0	-11.4	QP	10	1.1	OP (1.00s)	
699.000	34.3	Н	46.0	-11.7	QP	112	1.2	OP (1.00s)	
226.148	32.7	H	46.0	-13.3	QP	233	1.4	OP (1.00s)	
195.133	29.9	H	43.5	-13.6	OP	27	1.0	OP (1.00s)	
249,555	32.3	H	46.0	-13.7	OP	219	1.0	OP (1.00s)	
827,133	16.5	V	46.0	-29.5	OP	0	3.5	OP (1.00s)	
027.100	10.0	`	10.0	27.0		`	0.0		

C	EI	li	ot	t
~		An	ATAT CO	mpany

	An ZAZ	Company Company									
Client:	Intel							Job Number:	J75722		
Maria I.	0.0.11/151						T-l	_og Number:	T76369		
Model:	2x2 WiFi wit	h Wilviax Mir	IIPCI				Αссоι	Int Manager:	-		
Contact:	S. Hackett										
Standard:	RSS 210 / F	CC 15.247			Class:	N/A					
Run #2, Red	2, Receiver Radiated Spurious Emissions, 1,000 - 7,500 MHz. Operation in the 2.4 GHz Band										
. [Date of Test:	8/25/2009			Ťe	est Location:	FT Chambe	r #4			
Те	st Engineer:	Rafael Vare	las		Con	fig Change:	none				
Run #2a: C	enter chann	el (2437MHz	z, channel 6)	, Chain A		0 0					
Frequency	Level	Pol	RSS	5 210	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: 1	0 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: 1	0 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: 1	0 Hz		
1327.240	48.9	V	74.0	-25.1	PK	141	1.0	MHz; VB: 1	MHz		
Cente 8 7 (W/\ngp) aprijidwy 3 2	r channel (2 0.0 - 0.0 -	437 MHz, Ch	1annel 6) Ch	ain A	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		7000 7500		
					Frequency	(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
1								





Client:	Intel						Job Number:	J75722	
Madal		h MiMov Mir				T-Log Number: T76369			
would.		II VVIIVIAX IVIII	IIPCI		Αссоι	unt Manager:	-		
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #3b: C	enter chanr	nel 5150 - 52	50 MHz (520)0MHz, char	nnel 40), Cha	in A and B			
Frequency	Level	Pol	RSS	5 210	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: 1	0 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: 1	0 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	135	1.0	MHz; VB: 1	0 Hz	
9000.940	49.5	V	74.0	-24.5	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	
Madalı		h MiMox Mir			T-Log Number: T76369				
iviouei:		II WIWAX WII	IIPCI	Αссоι	unt Manager:	-			
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #3c: C	enter chann	el 5250 - 53	50 MHz (530	0MHz, chan	nel 60), Chai	n A			
Frequency	Level	Pol	RSS	5 210	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: 1	0 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: 1	0 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: 1	0 Hz
6000.590	50.9	V	74.0	-23.1	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
Madal		h MiMov Mir					T-Log Number: T76369		T76369
would.		II VVIIVIAX IVIII	IIPCI		Αссоι	unt Manager:	-		
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #3d: C	Center chanr	nel 5250 - 53	50 MHz (530	0MHz, char	nnel 60), Cha	in 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: 1	0 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: 1	0 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: 1	0 Hz
9001.030	50.6	V	74.0	-23.4	133	1.0	MHz; VB: 1	MHz	
3000.390	44.5	Η	54.0	-9.5	215	1.3	MHz; VB: 1	0 Hz	
3000.230	49.0	Н	74.0	-25.0	PK	215	1.3	MHz; VB: 1	MHz





Client:	Intel						Job Number:	J75722	
Madalı		h WiMax Mir					T-Log Number: T76369		
woder:		II WIWAX WII	IIPCI		Αссоι	unt Manager:	-		
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #3e: Co	enter chann	el 5470 - 572	25 MHz (560	0MHz, chan	nel 120), Ch	ain 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: 1	0 Hz
6000.720	45.7	V	54.0	-8.3	AVG	268	1.8	MHz; VB: 1	0 Hz
9001.050	41.8	V	54.0	-12.2	AVG	190	1.0	MHz; VB: 1	0 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	
Madalı		h MiMox Mir					T-	T76369	
would.		II WIWAX WII	IIPCI		Αссοι	unt Manager:	-		
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #3g: C	enter chann	el 5725 - 58	50 MHz (578	5MHz, chan	nel 157), Cha	ain A			
Frequency	Level	Pol	RSS	5 210	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: 1	0 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: 1	0 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	176	1.1	MHz; VB: 1	0 Hz	
9001.110	49.3	V	74.0	-24.7	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.



An ZAZZED	company		
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

Ellic	Dtt Zar company			EMC Test	Data
Client: Intel			~	Job Number: J75722	
Model: 2x2 WiFi wi	th WiMax MiniPCI		T-L	og Number: T76443	
		Accou	nt Manager: -		
Contact: S. Hackett					
Standard: RSS 210 / F	·CC 15.247			Class: N/A	
Antenna F Pow	RSS-210 (LELAN Port Measurements - er, PSD, Peak Excursion,	I) and FCC 15 Single Chain I , Bandwidth and	.407(UN Modes, Spuriou	NII) 5150 - 5250 MI us Emissions	Hz
Dest Specific Detai Objective:	IS The objective of this test session is to specification listed above.	perform final qualification	n testing of th	e EUT with respect to the	
Date of Test: Test Engineer: Test Location:	8/28/2009 Rafael Varelas FT Chamber #4	Config. Used: Config Change: Host Unit Voltage	1 None 120V/60Hz		
General Test Confi When measuring the con analyzer or power meter allow for the external att Ambient Condition	guration nducted emissions from the EUT's antervia a suitable attenuator to prevent ov enuators and cables used. S: Temperature: Rel. Humidity:	enna port, the antenna po rerloading the measureme 22.4 °C 43 %	ort of the EUT ent system.	was connected to the spec All measurements are corre	ctrum ected to
Sample #2 MAC Addres	s: 00150059F23C: CRTU Tool Version	15.199.36.999. Driver Ve	rsion 13.0.0.9	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	

Elliott

EMC Test Data

	An Z(ZZZ) company		
Client:	Intel	Job Number:	J75722
Model: 2	2v2 WiEi with WiMay MiniDCI	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	a Gain (dBi):	3.6			
Frequency	Average	Band	width	Output P	ower ¹ dB	Power	F	PSD ² dB/MHz		
(MHz)	Power	26dB	99 % ⁴	Measured	Limit	(Watts)	Measured	FCC Limit	RSS Limit ³	Result
Chain A, 80	2.11a 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, 80	2.11a 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, H	C20 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, H	C20 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, H	T40 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, H	40 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
	-									
	Output powe	er measured	using a spec	trum analyze	er (see plots	below):				
Note 1:	RBW=1MHz	, VB=3 MHz	, sample dete	ector, power	averaging or	n (transmitted	d signal was (continuous) a	and power int	egration
	over 50MHz	for the 20M	nz channel si	pacing and 8	<u>OMHz for the</u>	40MHz cha	nnel Spacing			
Note 2:	Measured us	sing the sam	e analyzer s	ettings used f	for output po	wer.				
	For RSS-21	0 the limit for	the 5150 - 5	5250 MHz bai	nd accounts	for the anten	ina gain as th	ne maximum	eirp allowed	is
Note 3.	10dB/MHz.	The limits are	e also correc	ted for instan	ces where th	ie highest me	easured valu	e of the PSD	exceeds the	average
NOLE J.	PSD (calcula	ated from the	e measured p	ower divided	l by the meas	sured 99% b	andwidth) by	more than 3	dB by the am	nount that
	the measure	ed value exce	eds the aver	rage by more	than 3dB.				-	
Note 4:	99% Bandwi	dth measure	d in accorda	nce with RSS	S GEN - RB :	> 1% of span	and VB >=3	xRB		
Note 5:	Average Pol	wer listed wa	s measured	with an avera	age power m	eter and is fo	or manufactu	rer's referend	ce only.	





CElliott

EMC Test Data

	An DLEED Company		
Client:	Intel	Job Number:	J75722
Model	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76443
woder:		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 Cha HT20 Chain A/B

802	.11a Chain	A/B	' H	T20 Chain A	/B	HT40 Chain A/B			
Freq/Chain	Peak Excursion(dB)		Freq/Chain Peak Excursion(dB)		Freq/Chain	Peak Exc	ursion(dB)		
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit	
5180/A	10.2	13.0	5180/A	9.7	13.0	5190/A	11.3	13.0	
5200/A	9.9	13.0	5200/A	10.3	13.0	5230/A	11.2	13.0	
5240/A	10.4	13.0	5240/A	10.2	13.0				
5180/B	9.5	13.0	5180/B	10.2	13.0	5190/B	11.1	13.0	
5200/B	9.7	13.0	5200/B	10.5	13.0	5230/B	11.6	13.0	
5240/B	9.8	13.0	5240/B	10.6	13.0				







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ч <u>с</u>	An ATAT company

Client:	Intel	Job Number:	J75722
Madal		T-Log Number:	T76443
iviodel:		Account Manager:	-
Contact:	S. Hackett		
Standard:	RSS 210 / FCC 15.247	Class:	N/A
Run #3: Oi	It Of Band Spurious Emissions - Antenna Conducted		
	The -27dB/MHz limit is an eirp limit. The limit for antenna port conducted m	easurements is adjusted	to take into
Noto 1	consideration the maximum antenna gain (limit = -27dB - antenna gain). Ra	adiated field strength mea	surements for signals
NOLE T.	more than 50MHz from the bands and that are close to the limit are made to	o determine compliance a	s the antenna gain is not
	known at these frequencies. Only average limit is used on the plots - solid i	red line.	
Note 2:	All spurious signals below 1GHz are measured during digital device radiated	d 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 5	150 - 5250 MHz band.	
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 1	5.209.	







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EMC Test Data

	An Burney		
Client:	Intel	Job Number:	J75722
Model:	2v2 WiEi with WiMay MiniDCI	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:

Maximum Antenna Gain:	3.6 dBi	
Spurious Limit:	-27.0 dB/MHz ei	rp
Adjustment for 2 chains:	-3.0 dB adjustr	nent for multiple chains.
Limit Used On Plats ^{Note 1}	-33.6 dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
LIIIII USEU OIT FIUIS .	-13.6 dB/MHz	Peak Limit (RB=VB=1MHz)

2











Ellic	ott			EMC Test Dat	а
Client: Intel				Job Number: J75722	
Model: 2x2 WiFi wit	h WiMax MiniPCI	T-L	Log Number: T76443		
Contact: S. Hackett			ALLUL		
Standard: RSS 210 / F	CC 15.247			Class: N/A	
Antenn Powe	RSS-210 (LELAN a Port Measurement r, PSD, Peak Excursion,) and FCC 15.4 s - Single Cha Bandwidth and	407(UN in, 525 Spuriou	II) 0 - 5350 MHz s Emissions	
Test Specific Detail	ls				
Objective:	The objective of this test session is to specification listed above.	perform final qualification	n testing of th	ne EUT with respect to the	
Date of Test: Test Engineer: Test Location:	9/1/2009 Suhaila Khushzad/R. Varelas FT Lab#1	Config. Used: Config Change: Host Unit Voltage	1 None 120V/60Hz		
General Test Config When measuring the cor analyzer or power meter allow for the external atte Ambient Conditions Summary of Result	guration nducted emissions from the EUT's antervise via a suitable attenuator to prevent over enuators and cables used. S: Temperature: Rel. Humidity: S Control 100505220:	enna port, the antenna po erloading the measureme 22.5 °C 44 %	rt of the EUT ent system.	was connected to the spectrum All measurements are corrected	ו to
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	e Durina Testina				

No modifications were made to the EUT during testing

Elliott

EMC Test Data

Client:	Intel	Job Number:	J75722
Model:	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76443
would.		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	Average	Band	width	Output Po	ower ¹ dB	Power		PSD ² dB/MH	Z	Result
(MHz)	Power	26dB	99% ⁴	Measured	Limit	(Watts)	Measured	FCC Limit	RSS Limit ³	rtooun
Chain A, 80	2.11a 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, 80	2.11a 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, H	T20 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, H	T20 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, H	T40 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, H	T40 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
	Output powe	er measured	using a spe	ctrum analyze	r (see plots	below):				
Note 1:	RBW=1MHz	, VB=3 MHz	, sample det	ector, power a	averaging or	(transmitte	d signal was (continuous) a	and power int	egration
	over 50MHz	for the 20M	nz channel s	pacing and 80	OMHz for the	40Mhz cha	nnel Spacing			0
Note 2:	Measured us	sing the sam	e analyzer s	ettings used f	or output po	wer.				
	For RSS-21	0 the limit for	the 5150 - !	5250 MHz bar	nd accounts	for the anter	nna gain as th	ne maximum	eirp allowed	is
Noto 2	10dB/MHz.	The limits are	e also correc	ted for instand	ces where th	e highest m	easured valu	e of the PSD	exceeds the	average
Note 3:	PSD (calcula	ated from the	e measured j	power divided	by the meas	sured 99% b	andwidth) by	more than 3	dB by the am	ount that
	the measure	ed value exce	eds the ave	rage by more	than 3dB.		, ,		5	
Note 4:	99% Bandw	idth measure	ed in accorda	ance with RSS	GEN - RB	> 1% of spar	n and VB >=3	xRB		
Note 5:	Average Po	wer listed wa	s measured	' with an avera	age power m	eter and is f	or manufactu	rer's referend	ce only.	





Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

802	.11a Chain	A/B	. H	F20 Chain A	/B	HT40 Chain A/B			
Freq/Chain	Peak Excursion (dB)		Freq/Chain Peak Excursion (dB)		Freq/Chain Peak Ex		ursion (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				







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C	An ATAS company

Client:	Intel	Job Number:	J75722	
Model: 2v2 WiEi with WiMay MiniDCI	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				
	The 27dD/MUz limit is an airp limit. The limit for enterne port conducted m	ocuromonte le adjustad	ta taka inta	
Note 1:	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.				
1802. I 18 MO	Aaximum Antenna Gain: 3.7 dBi Spurious Limit: -27.0 dB/MHz eirp -30.7 dB/MHz Average Lim Limit Used On Plots ^{Note 1} : -10.7 dB/MHz Peak Limit (iit (RB=1MHz, VB=10Hz) RB=VB=1MHz)		






EMC Test Data

	Job Number:	J75722
with WiMax MiniDCI	T-Log Number:	T76443
	Account Manager:	-
t		
/ FCC 15.247	Class:	N/A
	with WiMax MiniPCI t / FCC 15.247	Job Number: with WiMax MiniPCI T-Log Number: Account Manager: t / FCC 15.247

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: Maximum Antenna Gain: Limit Used On Plots Note 1:

2 3.7 dBi

 Maximum Antenna Gain:
 3.7 dBi

 Spurious Limit:
 -27.0 dB/MHz eirp

 Adjustment for 2 chains:
 -3.0 dB adjustment for multiple chains.

Average Limit (RB=1MHz, VB=10Hz) -33.7 dB/MHz -13.7 dB/MHz

Peak Limit (RB=VB=1MHz)

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











Ellic			EMC Test Da			
Client: Intel	Company			Job Number: J75722		
Model: 2x2 WiFi wi	th WiMax MiniPCI		T-L	og Number: T76443		
Ourtest C Heekett		Accou	Int Manager: -			
Contact: S. Hackett	CC 15 3/7					
	-00 15.247			Class. IN/A		
Anten Pow	RSS-210 (LELAN na Port Measurement er, PSD, Peak Excursion	l) and FCC 15 ts - Single Ch , Bandwidth and	.407(UN ain, 547 d Spuriou	NII) 70 - 5725 MHz us Emissions		
Test Specific Detai	ls					
Objective	The objective of this test session is to specification listed above.	perform final qualificatio	n testing of th	ne EUT with respect to the		
Date of Test: Test Engineer: Test Location:	9/1/2009 Rafael Varelas FT Radio Lab	Config. Used Config Change Host Unit Voltage	: 1 : None : 120V/60Hz			
When measuring the co analyzer or power meter allow for the external att Ambient Condition Summary of Resul	nducted emissions from the EUT's anter via a suitable attenuator to prevent ov enuators and cables used. IS: Temperature: Rel. Humidity: ts s: 00150059E23C: CBTU Tool Version	enna port, the antenna po erloading the measurem 22.1 °C 43 %	ort of the EUT ent system.	vas connected to the spe All measurements are corro	ectrum ected to	
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		
				H140: 11.9 dB		

Modifications Made During Testing

No modifications were made to the EUT during testing

EMC Test Data

	An ZALED Company		
Client:	Intel	Job Number:	J75722
Madal	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76443
wouer.		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

					Antenn	a Gain (dBi):	4.8			
Frequency	Average	Band	lwidth	Output Po	ower ¹ dB	Power	ŀ	PSD ² dB/MH	Z	Devel
(MHz)	Power	26dB	99 % ⁴	Measured	Limit	(Watts)	Measured	FCC Limit	RSS Limit ³	Result
Chain A, 80	2.11a 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, 80	2.11a 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, H	T20 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, H	T20 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, H	T40 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, H	T40 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
	Output nowe	er measured	using a snee	trum analyze	r (see nlots	helow).				
Note 1.			samnla dat	actor nowar:	averaging of	n (transmitto	d signal was i	continuous) ;	and nower int	ogration
NOIC 1.		for the 20M	, sample uei hz channol s	nacing and 9	MUz for the		nnol Spacing		and power int	egration
Note 2 [.]	Measured u	sing the sam	e analyzer s	ettinas used f	for output po	<u>wer</u>	IIICI Spaciliy	•		
11010 2.	For RSS-21	0 the limit for	the 5150 - F	5250 MHz har	nd accounts	for the anter	nna gain as th	e maximum	eirn allowed	is
	10dR/MHz	The limits are		ted for instan	ces where th	ne highest m	easured valu	e of the PSD	exceeds the	average
Note 3:	PSD (calcula	ated from the		ower divided	hv the mea	sured 99% h	andwidth) hv	more than 3	dR by the am	ount that
	the measure		ade the ave	rano hy moro	than 3dR		anawiain) by		ab by the am	
Note 4.	99% Bandwi	dth measure	ed in accords	ince with RSS	GEN - RR	> 1% of spar	1 and VB >= 3	xRB		
Note 5	Average Po	wer listed wa	s measured	with an avera	ane nower m	peter and is t	for manufactu	rer's referen	ce only	
1010 0.	nerayer 0			with all avera					oc only.	





EMC Test Data

	An DLEED Company		
Client:	Intel	Job Number:	J75722
Model: 2x2 WiFi with WiMax MiniPCI	T-Log Number:	T76443	
would.		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	2.11a Chain	A/B	H	T20 Chain A	/B	HT40 Chain A/B			
Freq/Chain	Peak Excursion(dB)		Freq/Chain	Peak Exc	ursion(dB)	Freq/Chain	Freq/Chain Peak Excursion(dB)		
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit	
5500/A	9.5	13.0	5500/A	9.7	13.0	5510/A	11.7	13.0	
5600/A	9.3	13.0	5600/A	10.2	13.0	5590/A	11.7	13.0	
5700/A	10.9	13.0	5700/A	10.8	13.0	5670/A	11.9	13.0	
5500/B	10.0	13.0	5500/B	10.3	13.0	5510/B	11.4	13.0	
5600/B	9.5	13.0	5600/B	10.4	13.0	5590/B	10.8	13.0	
5700/B	9.4	13.0	5700/B	10.5	13.0	5670/B	11.5	13.0	







(CE	Elliott			EM	C Test Data
Client:	Intel			Job Number:	J75722
				T-Log Number:	T76443
Model:	2x2 WiFi with WiMax MiniPCI			Account Manager:	-
Contact:	S. Hackett				
Standard:	RSS 210 / FCC 15.247			Class:	N/A
Run #3: Ou	ut Of Band Spurious Emissions - An	tenna Conducted			
Note 1: Note 2: Note 3: Note 4:	The -27dB/MHz limit is an eirp limit. T consideration the maximum antenna g more than 50MHz from the bands and known at these frequencies. Only ave All spurious signals below 1GHz are n Signals within 10MHz of the 5.725 or 9 If the device is for outdoor use then the	The limit for antenna po gain (limit = -27dB - ant I that are close to the lin rage limit is used on the neasured during digital 5.825 Band edge are so e -27dB eiro limit also	rt conducted m enna gain). Ra nit are made to e plots - solid r device radiated ubject to a limit applies in the 5	easurements is adjusted adiated field strength mea o determine compliance a red line. d emissions test. of -17dB EIRP 150 - 5250 MHz hand	to take into asurements for signals as the antenna gain is not
Note 5:	Signals that fall in the restricted bands	of 15 205 are subject	to the limit of 1	5 209	
802.11a Mo	de - Chains A and B Maximum Antenna Gain: Spurious Limit: Limit Used On Plots ^{Note 1} :	4.8 dBi -27.0 dB/MHz ei -31.8 dB/MHz -11.8 dB/MHz	rp Average Lim Peak Limit (I	iit (RB=1MHz, VB=10Hz) RB=VB=1MHz)	

EMC Test Data

Client:	Intel			Joh Number	175700
					J7J7ZZ
Model [.]	2x2 WiFi with	ı WiMax MiniPCI		T-Log Number:	T76443
				Account Manager	-
Contact:	S. Hackett				
andard:	RSS 210 / F	CC 15.247		Class	N/A
<i>i</i> channe	el, 5470 - 572 with the limit	25 MHz Band	Ing Out-OI-Band Emissions (KB	$\mathbf{w} = \mathbf{v} \mathbf{D} \mathbf{w} = \mathbf{W} \mathbf{n} \mathbf{z}$	idiated limits (
ricted ba	nd below 546	50 MHz are demonstrated	I through the radiated emissions t	ests.	
ut Of Ba	nd Spurious	Emissions, 5500 MHz, 80			
	、		,		
10.0)-				
0.0)-				
⇒ -10.0)-				
j -20.0)				
- 9 -30.0)-				
필 문 -40.0)-				
₹ -50 0) –				
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		in the second	والمحاجب والمحاجر ويرجر والمحالي والمحاط والمحاج والمحاف المحاف	Constant Constant and	
-60.0)			Carried Contraction and	
-60.0 -70.0)4)		1000.0 Frequency (MHz)	10000.0	40000.
-60.0 -70.0)		ини и на полнови и на полнови и на полнови и на Полнови и на полнови	10000.0	40000.
-60.0 -70.0)	، ۱۵۵.0 Emissions, 5500 MHz, 80	чн, чили на продок и и лаконима 1000.0 Frequency (MHz) 02.11a, Chain B	10000.0	40000.
-60.0 -70.0)		инфицици, на	10000.0	40000.
-60.0 -70.0 ut Of Ba 10.0 0.0)		чң үчүчү чүчүчү чүчүчүчүчүчүчүчүчүчүчүчү	10000.0	40000.
-60.0 -70.0)		чң үчүчү чүчү чүчү чүчү чүчүчүчү чүчүчүчү	10000.0	40000.
-60.0 -70.0 ut Of Ba 10.0 -10.0) = 30.0 Ind Spurious		чң үчүчү чүчүчү чүчүчүчүчүчүчүчүчүчүчүчү	10000.0	40000.
-60.0 -70.0 ut Of Ba 10.0 -10.0 (ᡨ) -20.0 -20.0) = 30.0 ind Spurious) =) =) =		чң чүчү чүчү чүчү чүчү чүчү чүчү чүчү ч		40000.
-60.0 -70.0 ut Of Ba 10.0 -10.0 (wg) -20.0 90-30.0) = 30.0 md Spurious) =		чң үчүчү чүчүчү чүчүчүчүчүчүчүчүчүчүчүчү		40000.
-60.0 -70.0 ut Of Ba 10.0 -10.0 (\u00edge -20.0 -30.0 -30.0 -50.0) = 30.0 ind Spurious) =) =) =) =		ини, чили на		40000.
-60.0 -70.0 ut Of Ba 10.0 -10.0 (wgp) -20.0 -30.0 -30.0 -50.0 -60.0) =	Emissions, 5500 MHz, 80	чни, чили на		40000.
-60.0 -70.0 -70.0 ut of Ba 10.0 -10.0 () -10.0 () -20.0 -20.0 -30.0 -50.0 -50.0) = and Spurious) =) =) =) =) =) =	۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰۰	чң ң ң ң ң ң ң ң ң ң ң ң ң ң ң ң ң ң ң		40000.





EMC Test Data

	An <u>B</u>		
Client:	Intel	Job Number:	J75722
Madal	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76443
wouer.		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 ei	rp
Adjustment for 2 chains:	-3.0	dB adjustn	nent for multiple chains.
Limit Llood On Plats Note 1.	-34.8	dB/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-14.8	dB/MHz	Peak Limit (RB=VB=1MHz)

EMC Test Data

Client: Ir	ntel							lol	h Numher	175722	
1								501		J1J1ZZ	
Model	2 \\/iEi \\/it	h WiMav Min	iPCI					T-Lo	g Number:	T76443	
would Z	.AZ VVIET VVIU							Account	Manager:	-	
Contact: S	S. Hackett										
andard: R	RSS 210 / F	CC 15.247							Class:	N/A	
		<u> </u>	Plots Showin	<u>g Out-Of</u>	-Band Em	issions (RE	3W=VBW=	:1MHz)			
r channel, apliance w ricted band	, 5470 - 57 2 vith the limit d below 540	25 MHz Band immediately 50 MHz are c	below the allo lemonstrated t	bcated ba	nd from 54 ne radiated	60-5470 MH emissions	Hz and con tests.	npliance	with the ra	diated limit	s for th
	ia oparioas	LINISSIONS, S	500 14112, 002	2.111120	ninz, criai						
10.0-											
0.0-	-										
-10.0-	-										
	_										
ະ 8-30.0-	_										
E -40.0- E										1	
-50.0-							p p		La substantia		
-30.0											
-60.0-	~~~	monanda		ويهاذ المعدول		hanne heretare	long the stand	~~~~~			
-60.0 - -70.0 - 31	 o.o ' '			ر بید میر اور اور اور اور اور اور اور اور اور او	1000.0	<u>и</u>	log e's , iteest	1000	0.0	4000	D.
-60.0 - -70.0 - 30			من مربور من من مربور من من مربور من 	بر میں بر میں پر می 2.11n 20l	1000.0 requency	(MHz)		1000	0.0	4000	D.
-60.0 - -70.0 - 3(o.o		500 MHz, 802	, F 2.11n 201	1000.0 requency MHz, Chair	<u>(MHz)</u>) В		1000	0.0	4000	0.
-60.0 - -70.0 - 31 	o.o		من مربع من 	مربعہ برانیم پر ان میں پر ان مربع ان مربع ان مربع ان مربع ا F 2.11n 20l	1000.0 requency	<u>и-ла-ыли-ла-</u> (MHz) 1 В	· · · ·	1000	0.0	4000	0.
-60.0 - -70.0 - 3(ut Of Ban 10.0 - 0.0 -	 o.o ' ' ' ad Spurious		برمیرید میلید اور اور اور اور اور اور اور اور اور اور	2.11n 20	1000.0 requency	итеринени (MHz)) В	· · · ·	1000	0.0	4000	0.
-60.0 - -70.0 - 30 ut Of Ban 10.0 - 0.0 - 2 -10.0 -	d Spurious		500 MHz, 802	, , , , F 2.11n 201	1000.0 Frequency	<u>и-та-ыли-та-</u> (MHz) 1 В	· · · ·	1000	0.0	4000	0.
-60.0 -70.0 - 30 	d Spurious		500 MHz, 802	2.11n 20	1000.0 requency	и	· · ·	1000	0.0	4000	ο.
-60.0 - -70.0 - 31 Jt Of Ban 10.0 - 0.0 - -10.0 - - 9 -20.0 -	d Spurious		500 MHz, 802	, , , , F 2.11n 201	1000.0 Frequency	и	· · ·	1000	0.0	4000	ο.
-60.0 - -70.0 - 30 -70.0 - 31 -10.0 - 0.0 - -10.0 - (Wag) -20.0 - 90-30.0 -	d Spurious		500 MHz, 802	2.11n 20	1000.0 Frequency	<u>(MHz)</u>) В	· · ·	1000	0.0	4000	ο.
-60.0 - -70.0 - 3(d Spurious		500 MHz, 802	2.11n 20	1000.0 requency MHz, Chair	и (MHz) I В	· · ·	1000	0.0	4000	0.
-60.0 - -70.0 - 30 -70.0 - 31 -10.0 - 0.0 - -10.0 - (wgp) -20.0 - 900- -30.0 - -50.0 - -50.0 -		Emissions, 5	500 MHz, 802	2.11n 20	MHz, Chair	(MHz)) В		1000	0.0	4000	D.
-60.0 -70.0- 30 ut Of Ban 10.0- 0.0- (ugp) -20.0- (ugp) -30.0- -30.0- -50.0- -60.0-				2.11n 20	MHz, Chair	и		1000	0.0	4000	0.













EMC Test Data

	An AZ	AS company								
Client:	Intel							Job Number:	J75722	
Madal	0.0.14/151		1001				T-l	_og Number:	T76443	
wodel:	2X2 WIFI WIL	n wiwax wir	IIPCI				Αссоι	Int Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
	Output powe	er measured	using a spec	trum analyze	er (see plots	below):				
Note 1:	RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and pow							and power int	egration	
	over >40 MH	Iz for HT20 r	node and > 8	BOMHz for H	T40 mode.	,	5	,	I	5
Note 2:	Measured us	sing the sam	e analvzer se	ettinas used f	for output po	wer.				
	For RSS-210	0 the limit for	the 5150 - 5	250 MHz bai	nd accounts	for the anten	ina gain as th	ne maximum	eirp allowed	S
Note 2.	10dBm/MHz	. The limits a	re also corre	ected for insta	ances where	the highest r	measured va	lue of the PS	D exceeds th	ne average
Note 3:	PSD (calcula	ated from the	measured p	ower divided	I by the meas	sured 99% ba	andwidth) by	more than 3	dB by the am	ount that
	the measure	ed value exce	eds the aver	rage by more	than 3dB.				5	
Note 4:	99% Bandwi	idth measure	d in accorda	nce with RSS	S GEN - RB :	> 1% of span	and VB >=3	xRB		
	For MIMO sy	ystems the to	otal output po	ower and tota	I PSD are ca	Iculated form	n the sum of	the powers o	of the individu	al chains
	(in linear teri	ms). The an	tenna gain u	sed to detern	nine the EIRI	P and limits f	or PSD/Outp	out power dep	pends on the	operating
Note 5:	mode of the	MIMO devic	e. If the sign	als on the no	on-coherent k	petween the	transmit chai	ins then the	gain used to	determine
	the limits is t	he highest g	ain of the ind	lividual chain	s and the Ell	RP is the sun	n of the prod	ucts of gain a	and power on	each
	chain. If the	signals are (coherent the	n the effectiv	e antenna ga	ain is the sum	n (in linear te	rms) of the g	ains for each	chain and
Note 6:	Ine EIRP IS I	ne product o	of the effectiv	e dain and to age nower se	otal power.	for reference	only			
Dun #1. Do	adwidth Ou	tout Dowor	and Dowor	Spectral Der	city 5150	5250 MU7				
KUII#1. Dai	iuwiutii, Ou	ipui rowei		spectral Der	isity - 5150 -	5250 MITZ				
			Chain 1	Chain 2	Chain 3	Coherent	Effective ⁵]		
	Antenna	a Gain (dBi):	3.6	3.6	-	No	3.6			
Frequency	Software	26dB BW	Measured F	Power ¹ dBm	Average	То	otal	Limit (dBm)	Max Power	Pass or
(MHz)	Setting	(MHz)	Chain 1	Chain 2	power	mW	dBm		(W)	Fail
5180	26.5/25.0	21.8	11.5	11.2	13.8/13.6	27.3	14.4	17.0		PASS
5200	26.0/25.0	21.9	11.3	11.3	13.//13.6	27.0	14.3	17.0	0.027	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	11.0	11.4	13.8/13.8	28.3	14.5	17.0	0.028	PASS
5230	25.5/25.0	40. I	11.3	.	13.0/13.0	26.4	14.2	17.0		PASS
Frequency	00% ⁴	Total	D	SD ² dBm/ML	17	Total	PSD	Lir	mit	Pass or
(MHz)	8W/	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 ³	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





6		ott						EM	C Test	Da
Client	Intel	-	Job Number:	J75722						
Madal								T-Log Number:		
woder		IIPCI	Account Manager:		-					
Contact:	S. Hackett									
Standard:	: RSS 210 / F			Class:	N/A					
un #2: Ba	ndwidth, Ou	Itput Power	and Power S	Spectral Der	nsity - 5250 ·	5350 MHz				
			Chain 1	Chain 2	Chain 3	Coherent	Effective ⁵]		
	Antenna	a Gain (dBi):	3.7	3.7	-	No	3.7			
ote - targ	et power is 1	13.5dBm per	chain for a	modes.				4		
requency	Software 26dB BW		Measured Power ¹ dBm		Average	Тс	otal		Max Power	Pass
(MHz)	Setting	(MHz)	Chain 1	Chain 2	nower	mW	dBm	Limit (aBm)	(W)	Fai
5260	25.0/25.0	21.8	11.3	11.1	13.7/13.8	26.4	14.2	24.0		PAS
5300	24.5/25.0	21.8	11.4	11.4	13.7/13.7	27.6	14.4	24.0	0.029	PAS
5320	24.5/25.0	21.8	11.8	11.4	13.7/13.6	28.9	14.6	24.0		PAS
5270	25.0/25.0	40.4	11.3	11.1	13.8/13.7	26.4	14.2	24.0	0.000	PAS
5310	24.5/25.0	40.4	11.7	11.3	13.8/13.7	28.3	14.5	24.0	0.028	PAS
									1	
Frequency	99% ⁴ Total		DSD ² dBm/MHz			Total PSD		Limit		Pass
(MIL-)	BW	Power	Choin 1		Choin 2	m\//\/II.I-7		ГСС	D00.010 ³	Fa
<u>(IVIHZ)</u> 5260	10.2	14.2		<u>1 6</u>	Chain 3	1 /		FUC 11.0	RSS 210°	
5200	18.2	14.2	-1.0	-1.0		1.4	1.4	11.0	11.0	
5320	18.2	14.4	-0.7	-1.1		1.5	2.0	11.0	11.0	PAS
5270	36.3	14.2	-4.3	-4.5		0.7	-1.4	11.0	11.0	PΔS
5310	36.3	14.5	-3.9	-4 3		0.8	-11	11.0	11.0	PAS
CF: 5320.00 MHz SPAN:50.00 MHz SPAN:50.00 MHz RB 1.000 MHz VB 3.000 MHz Detector Sample Att 10 RL Offset 0.00 Sweep Time 50.0ms Ref Lvl:0.00DBM Pwr avg: 100 sweeps Amp corr: 11.0dB Bin size: 83 kHz Highest PSD -1.36 dBm/1.000 f 9996 Bandwidth 18.22 MHz Power Over Span		0.0 ings -5.0 -10.0 -15.0 -20.0 -25.0 -30.0 -35.0 -40.0 -45.0 -55.0 52			10.0	5320.0	5330.0) 53	40.0 5345.0	
11.44 dBm			Frequency (MHz)							
11.44										



Elliott								EMC Test Data				
Client: Intel							Job Number: J75722					
							T-Log Number: T76443					
Model: 2x2 WiFi with WiMax MiniPCI								Account Manager: -				
Contact: S. Hackett												
Standard: RSS 210 / FCC 15.247								Class:	N/A			
Spectrum (LIQUE	0.0										
CE: 5310.	-5.0				Carrow Martin South	many prover	- and the second second					
SPAN:80.	SPAN:80.00 MHz		-			-Y						
VB 3.000 M	RB 1.000 MHz VB 3.000 MHz		_	}								
Detector 9 Att 10	Detector Sample Att 10		_									
RL Offset I Sweep Tir	RL Offset 0.00 Sweep Time 50 0ms			1								
Ref LvI:0.0	Ref Lvl:0.00DBM											
Amp corr	: 11.0dB	9 -30.0	-									
Bin size: 1 Highest PS	33 kHz	-35.0	-	01				1				
-4.26	-4.26 dBm/1.000 MHz -40.0		-	would				M				
99% Bandy	99% Bandwidth -45.0-			AF				Strath War	What .			
36,34	36.34 MHz -50.0-								" Water de			
Power Ov	er Span	-55.0	_									
13.528 mW 5270.0 5280.0 5290.0 5300.0 5310.0 5320.0 5330.0 5340.0 5350.0												
11.31 dBm Frequency (MHz)												
		99% Ban	dwidth Powe	er Over Spar	n and PSD, 🔅	802.11n 40N	4Hz, Chain B					
Run #3: Ba	ndwidth, Ou	tput Power	and Power S	Spectral Der	nsity - 5470 -	5725 MHz						
			Chain 1	Chain 2	Chain 3	Coherent	Effective ⁵					
	Antenna	a Gain (dBi):	4.8	4.8	-	No	4.8					
Note - targe	et power is 1	3.5dBm per	chain for a	modes.				1				
Frequency	Software	26dB BW	Measured I	Power'dBm	Average	To	otal	Limit (dBm)	Max Power	Pass or		
(MHz)		(IVIHZ)	Chain 1	Chain 2	power	mW	dBm	24.0	(VV)	Fall		
5500 5600	22.0/23.5 22.5/23.0	21.8 21.7	11.2	11.2	13.6/13.6	20.4 25.8	14.Z 14.1	24.0 24.0	0.026	PASS		
5700	23.0/23.0	21.9	11.3	11.0	13.8/13.6	26.1	14.2	24.0	0.020	PASS		
5510	22.0/23.5	40.3	11.2	11.3	13.6/13.7	26.7	14.3	24.0		PASS		
5590	22.5/23.0	40.3	11.1	11.0	13.7/13.6	25.5	14.1	24.0	0.027	PASS		
5670	23.0/23.0	40.5	11.6	10.9	13.8/13.6	26.8	14.3	24.0		PASS		
Frequency	99 % ⁴	Total	P	PSD ² dBm/MH		Total	PSD	Limit		Pass or		
(MHz)	BW	Power	Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210 ³	Fail		
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 F	-1.5		1.4 1 <i>1</i>	1.4	11.0	11.0	PASS		
5510	36.3	14.2	-4.3	-1.0		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		






	An <u>B</u>		
Client:	Intel	Job Number:	J75722
Model:	2v2 WiEi with WiMay MiniDCI	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		#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	802.11n40 Chain A	#102	15.0	16.0	Restricted Band Edge at 5460 MHz	15.209	50.1dBµV/m @ 5459.8MHz (-3.9dB)
Run # 1d		5510MHz	15.0	10.0	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		#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	802.11n40 Chain B	#102 15.0 5510MHz		15 7	Restricted Band Edge at 5460 MHz	15.209	50.2dBµV/m @ 5459.8MHz (-3.8dB)
Run # 2d				15.7	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		#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	802.11n40 Chain A+B	#102	16.5 (13.5	A:13.8	Restricted Band Edge at 5460 MHz	15.209	47.8dBµV/m @ 5459.8MHz (-6.2dB)
Run # 3d		5510MHz	per chain)	B:13.9	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 .

Ć						EMO	C Test Data
Client:	Intel				Job Number:	J75722	
Model.	2x2 WiFi wit	h WiMax Mir	niPCI		T-Log Number:	T76443	
						Account Manager:	-
Contact:	S. Hackett					Class	N1/A
Standard:	RSS 2107 F	UU 15.247				Class:	IV/A
Run #	Mode	Channel	Target Power	Measured Power	Test Performed	Limit	Result / Margin
Run # 4a		#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	802.11n20 Chain A	#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				10.0 0011	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		#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	802.11n20 Chain B	#100	16 5 dBm	16.8 dBm	Restricted Band Edge at 5460 MHz	15.209	45.3dBµV/m @ 5460.1MHz (-8.7dB)
Run # 5d		5500MHz	10.5 0011	10.0 0011	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		#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	802.11n20 Chain A+B	#100	16.5 (13.5	A: 13.7 dBm	Restricted Band Edge at 5460 MHz	15.209	48.4dBµV/m @ 5445.3MHz (-5.6dB)
Run # 6d		5500MHz	per chain)	B: 13.6 dBm	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:	2v2 WiEi with WiMay MiniDCI	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.

C	EI	iott
~		An ATAT company

An ZCZAD company										
Cilent: Inter Job Number: J/5/22										
Model:	2x2 WiFi wit	h WiMax Mir		I-L	og Number:	1/6443				
Account Manager: -										
Contact:	Contact: S. Hackett									
Stanuaru:	K35210/F	UC 10.247	000 11 - 40	Chain A				CIASS:	IN/A	
Kun # 1, Band Edge Fleid Strength - 802. I In40, Chain A										
Rull # Ta, EUT UIT CHAMMEI #38 5 1900/02 - 802. I M40, CHAM A - SAMPIE #2 MAC 00 150059F23C										
Test Engineer: Dataol Varolas										
Power Settings										
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Settina			
	А	15	5.5	15	.7	27	'.0			
Fundament	al Signal Fie	eld Strenath	1					1		
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	Н	-	-	AVG	313	1.0	RB 1 MHz;	VB: 10 Hz	
5200.130	97.9	Н	-	-	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 B	Band Edge S	ignal Radia	ted Field Sti	rength - Mark	er Delta		_			
H V										
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	97.9	97.5	Peak Meas	urement (RE	B=VB=1MHz))
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	89.6	89.3	Average Me	easurement	(RB=1MHz,	VB=10Hz)
Delta Marker - 100kHz39.2dB<- this can only be used if band edge signal is										
	Calcula	ated Band-E	dge Measure	ement (Peak):	58.7	dBuV/m	highest with	nin 2MHz of	band edge.	
	Calcu	Iated Band-I	Edge Measui	rement (Avg):	50.4	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	34.5	dB	-3.6	50.4	54	Avg
		D	elta Marker -	1MHz/10Hz:	38.7	dB	-15.3	58.7	74	Pk
	Calcula	ated Band-E	dge Measure	ement (Peak):	63.4	dBuV/m	Using 100k	Hz delta valu	ue	
	Calcu	Ilated Band-I	Edge Measu	rement (Avg):	50.9	dBuV/m	Using 100k	Hz delta vali	ue	
Fraguaga	Loval	Dal	ГСС	15 200	Dataatar	A incuith	Lloight	Commonto		
Frequency		P0I	FUU	15.209 Morgin	Delector	Azimum	Height	Comments		
	αΒμν/m 50.4	V/11	54.0	1VIAIYIII 2.6	PK/QP/AVy	uegrees	meters	Licina 100k	Uz dolta valu	10
5140.000	00.4	-	54.0	-3.0	Avy					IE
90.0-						-	Analyzer Se	ettings 11		
80.0-							CF: 5160.00	i0 MHz		
							SPAN:100.00 RB 100 kHz	00 MHz		
70.0-							VB 100 kHz	_		
nde				Att 10	5					
붙 60.0-				. N		····)	RL Offset 0. Support Time	00 55.0mc		
≪ 50.0-**			N				Ref Lvl:101.	60DBUV		
00.0										
40.0-		Mar Mar					Comments			
	all						BE @ 5150 N 5190 MHz	1Hz		
30.0-		130 5140	5150 5140	5170 519	0 5100 E	200 5210	802.11n 40N	/Hz		
511	JI20 J	100 0140	Frequency	(MHz)	-0 -0190 -0.					
Cursor 1	5148,6665	50.27	-*- 6-	Delta Fron	45,167	1	•			
Cursor 2	5193.8335	89.43	- <u>*</u> 6-	Delta Amplitud	de 39.17	C.	ЕШ	ott		

Elliott	E	liott
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Cliont	Client: Intel Intel Intel									
Ciletit, inter Job Number: J75722 T Log Number: T74442										
Model: 2x2 WiFi with WiMax MiniPCI									1/0443	
Contact	Contact: S. Hackett									
Standard: RSS 210 / FCC 15 247 Class: N/A										
$R_{\rm LID}$ # 1h Repeat EUT on Channel #62 5310MHz - 802 11n/0 Chain A - Sample #2 MAC 00150050E23C										
	Date of Test ¹ 0/0/2009 Date of Test ¹ 0/0/2009									
Test Engineer: Rafael Varelas Config Change: none										
				Power S	ettinas		110110	1		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting			
	А	16	o.0	15	.5	24	1.0	1		
Fundament	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	Н	-	-	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 B	<i>Band Edge S</i>	ignal Radia	ted Field Str	ength - Mark	er Delta		1			
H V								. (5.		
Fundamental emission level @ 3m in 1MHz RBW:						100.1	Peak Meas	urement (RI	3=VB=1MHZ	
Fundamental emission level @ 3m in 1MHz RBW: 90.6 92.4 Average Measurement (RB=1MHz, VE								VB=10HZ)		
Delta Marker - 100kHz 37.8 dB <- this can only be used if band edge signal is										
	Calcula	ated Band-E	age Measure	ement (Peak):	62.3	dBuV/m	highest with	nin 2MHz of	band edge.	
	Caici	liated Band-L	<u>-dge Measur</u>	rement (Avg):	54.6	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHZ/1MHZ:	32.5	dB /B	-1.6	52.4	54	Avg
	Coloul	De Dand Fr	<i>eita Marker -</i>	IMHZ/IUHZ:	40.0	dB dD::///ma	-]]./	62.3	/4	PK
	Calcula	Ileu Ballu-Eu	uge Measure	comont (Ava):	67.0 E2.4		USING TOUK	HZ delta valu	ue	
	Calcu		_uye measu	emeni (Avy).	JZ.4				5	
Frequency	Level	Pol	FCC	15,209	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Ava	dearees	meters	00111101110		
5350.000	52.4	-	54.0	-1.6	Avg	-	-	Using 1MH	z delta value	
90.0							Analyze	or Sottings		
90.0-	m	╶╗┍╼╼╼┿┑					HP8564	E Settings		
80.0-	(¥ :					CF: 534	10.000 MHz		
75.0-							SPAN:1 RB 1.00	.00.000 MHz . 10 MHz		
70.0-							VB 10 F	lz		
9 5 65 0 -		i-					Detecto	or Sample		
E 60.0-										
55.0-		i	м				Sweep Ref Lviz	Time 37.0s :105.70DBUV	,	
50.0-	50.0-									
45.0-	45.0 - Comments									
40.0-					me -		BE @ 5	350 MHz		
35.0-							5310 M	Hz n 40MHz		
529	90 5300	5310 5320	5330 53 Frequenc	40 5350 5 ;y (MHz)	5360 5370	5380 53	90 Chain A			
Cursor 1	5320.6665	88.03	÷-*-6-	Delta F	req. 29.33			lia		
Cursor 2	Cursor 2 5350.0000 48.03 🕂 🖈 🗟 🔹 Delta Amplitude 40.00 🥐 EIIIOU									

C E	Elliott EMC Test Data									
Client:	Intel							Job Number:	J75722	
Madalı	2v2 \//iEi wit						T-L	og Number:	T76443	
woder:		II WIWAX WII	IIPCI				Accou	int Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 1c, E	UT on Chan	inel #102 55	10MHz - 802	.11n40, Chaii	n A _					
	Date of Test:	8/24/2009				est Location:	FI Chamb	er #4		
re	st Engineer:	Rafael Vare	as	Dowor S	COL	ing change:	none	1		
	Chain	Target	(dBm)	Measure	d (dRm)	Softwar	≏ Settina			
	Α	16	0.5	16	.0	23	3.0	-		
Fundament	al Signal Fi	eld Strenath	1					1		
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	Н	-	-	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 Destricted D	V Iand Edge Ci	- Iamal Dadiat	- ad Field Ctra	PK PK	14/	1.0	RB T MHZ;	VB: 1 MHZ	
2400 IVITZ KESUICIEA BANA EAGE SIGNAI KAAIAIEA FIELA STRENGTN - MARKER DEITA										
	Fundament	al omission la	aval @ ?m in	1MHz DBW/·	101 5	97 N	Peak Meas	surement (RF	R=VR=1MHz	
	Fundamenta	al emission le	vel @ 3m in	1MHz RBW	93.8	89.3	Average M	easurement	(RR=1MHz)	VB=10Hz)
	Tunuamenta	43.2	dB	<- this can	only be used	if band edge	e signal is			
	Calcul	ated Band-E	dge Measure	ement (Peak):	58.3	dBuV/m	highest wit	hin 2MHz of	band edge.	o orginal lo
	Calcu	ulated Band-I	Edge Measu	rement (Avg):	50.6	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	40.3	dB	-3.9	50.1	54	Avg
		D	elta Marker -	1MHz/10Hz:	43.7	dB	-15.7	58.3	74	Pk
	Calcul	ated Band-E	dge Measure	ement (Peak):	61.2	dBuV/m	Using 100	kHz delta valı	he	
	Calcu	ulated Band-I	Edge Measu	rement (Avg):	50.1	dBuV/m	Using 1MF	Iz delta value	<u>)</u>	
Frequency	Level	Pol	FCC	15.209	Detector	Azimuth	Heiaht	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
5459.833	50.1	-	54.0	-3.9	Avg	-	-	Using 1MH	z delta value	
5470 MHz E	Band Edge S	Signal Radia	ted Field Sti	rength - Mark	er Delta		1			
	Fundament				H	V	DeckM			
	Fundamenta	al emission le	evel @ 3m in	1MHZ RBW:	101.5	97.0	Peak Meas	Surement (RE	/DD 1MU-7	VD 10U-)
	Fundamenta		Dolta Mai	TIVIAL ROW:	93.8 20 F	89.3 dD	Average IV		(RD= IIVIAZ,	VD=IUHZ)
	39 .0	dBuV/m	<- IIIS Call bigbost wit	bin 2MHz of	hand oddo	e signal is				
	Calcu	Ilated Band-L	rement (Ava).	54.3	dBuV/m	Margin		Limit	Detector	
Dolta Markor - 1MH7/1MH7						dB	-14 0	54.3	68.3	
		1MHz/10Hz:	38.7	dB	-26.3	62.0	88.3	Pk		
Calculated Band-Edge Measurement (Peak):					66.8	dBuV/m	Usina 100k	Hz delta val	Je	
	Calcu	ulated Band-I	Edge Measu	rement (Avg):	55.1	dBuV/m	Using 100	KHz delta vali	le	
Frequency	Level	Pol	FCC	C 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 100k	Hz delta valu	e
Note - avera	ge limit is eq	uivalent to -2	27dBm eirp.							



Elliott EMC Test Data										
Client:	Client: Intel Job Number: J75722									
Model	2v2 WiEi wit	h WiMax Mir	IDCI		T-L	og Number:	T76443			
wouer.							Accou	nt Manager:	-	
Contact:	Contact: S. Hackett									
Stantuaru: KSS 2107FUU 15.247 Ulass: N/A Ulass: N/A										
Run # 1d, E										
	Chain	Tarnet	(dBm)	Measure	d (dRm)	Softwar	a Settina			
	А	16	.5	16	.8	24	1.5	-		
Fundament	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 R	estricted Ba	and Edge Si	gnal Radiat	ed Field Strei	ngth - Marke	r Delta	1			
	E				H 101 7	V 100.0	Dook Moos	uramant (DC		N
	Fundamenta	al emission le		1MUz DDW	101.7	01 5		Measurement (RB=VB=1MHz)		
Fundamental emission level @ 3m in 1MHz RBW: 93.4 91.5 Average Measuren									(RD=11VINZ,	$VD = IU\Pi Z$
	Calcul	ated Band-F		ment (Peak)	42.0 58.0	dBuV/m	<- IIIS Call	hin 2MHz of	hand odgo	e siynans
	Calcu	Ilated Band-I	Ige Measure	rement (Ava)	50.9	dBuV/m	Margin		Limit	Detector
	Calce		lta Marker -	1MHz/1MHz [,]	30.0 /1 /1	dB	-18 /	/0 0	68.3	Δνα
		D	elta Marker -	1MHz/10Hz [,]	47.0	dB	-10.4	58.9	88.3	Avy Pk
	Calcul	ated Band-E	dae Measure	ement (Peak):	60.7	dBuV/m	Using 100k	Hz delta vali	00.5 LIE	I K
	Calcu	Ilated Band-I	Edge Measu	rement (Avg):	49.9	dBuV/m	Using 1MH	z delta value)	
Frequency	Level	Pol	FCC	C 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 1MH:	z delta value	
Note - avera	ae limit is ea	uivalent to -2	7dBm eirp.							
85.0-5	5						- Analy	zor Sottina	c I	
80.0-		-					HP85	64F.EMI	5	
75.0-		1					CF: 5	701.000 MHz	2	
70.0-							BB 1.	1:100.000 MH 000 MHz	iz	
65.0-							VB 10	Hz		
-පී 60.0-							Deter Att 0	tor Sample		
·檀 55.0-			L.				RLO	fset 0.00		
-₹ 50.0-							Swee Refi	p Time 37.0s vl:97.00DBH	v	
45.0-										
40.0-	40.0 - Comments									
30.0-							BE @	5725 MHz		
25.0 - 565	51 5660 \$	5670 5680	5690 57 Frequer	00 5710 Cy (MHz)	5720 5730	5740 \$	5670 11 802.1 5751	MHz L1n 40MHz		
Cursor 1	5679.3335	81.33	₽ -* 6-	Delta	Freq. 45.6	67 💋	Ē	11:0		
Cursor 2	Cursor 2 5725.0000 37.83 🗢 🐁 🗟 🔹 Delta Amplitude 43.50 🥻 LIIOUU									

~ _	An AVTAR

Client:	Intel	20 company					J	ob Number:	J75722	
Model		h MiMov Mir					T-L	og Number:	T76443	
	2X2 WIFI WIL	n wiiviax iviir	IIPCI				Accou	nt Manager:	-	
Contact:	5. Hackell	CC 15 247						Class	ΝΙ/Λ	
Dun #2 Ba	nd Edge Fig	Id Strongth	_ 802 11n/0	Chain B				Class.	N/A	
Run #2, Ba Run #2a, El [JT on Chanr Date of Test:	nel #38 5190 8/24/2009 Bafaol Varo	- 802.111140 MHz - 802.1	n40, Chain I	B - Sample # Te	est Location:	50059F23C FT Chambe	er #4		
10	St Engineer.		10.5	Power S	ettinas	ing change.	TIONE	1		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting			
	А	15	5.5	15	.7	26	b.0	1		
Fundament	al Signal Fie	eld Strength						a		
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	l./ 17	RB I MHZ;		
5200.200	90.7 Rand Edge S	v Sianal Padia	- tod Fiold Sti	- conath - Mark	or Dolta	140	1.7	KD I WINZ,	VD. I IVINZ	
5150 WITZ D	anu Luye J	iyilal Kaula	ieu i ieiu Sii	engin - mark	H	V	1			
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	101.3	98.7	Peak Meas	urement (RE	B=VB=1MHz)
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	92.5	90.8	Average M	easurement	(RB=1MHz,	, VB=10Hz)
			Delta Mai	ker - 100kHz	39.0	dB	<- this can	only be used	l if band edg	e signal is
	Calcula	ated Band-E	dge Measure	ement (Peak):	62.3	dBuV/m	highest with	hin 2MHz of	band edge.	5
	Calcu	Ilated Band-I	Edge Measu	rement (Avg):	53.5	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	34.0	dB	-1.7	52.3	54	Avg
		D	elta Marker -	1MHz/10Hz:	40.2	dB	-11.7	62.3	74	Pk
	Calcula	ated Band-E	dge Measure	ement (Peak):	67.3	dBuV/m	Using 100k	Hz delta valu	Je	
	Calcu	ilated Band-I	Edge Measu	rement (Avg):	52.3	dBuV/m	Using 1MH	z delta value	<u>}</u>	
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	z delta value	
90.0 <i>-</i> [Anal	yzer Setting	<u>js</u>	
85.0-				ſ			T HP85	564E,EMI		
80.0-			İ				SPAN	1:100.000 MH	z Hz	
75.0-							RB 1	.000 MHz		
-0.0 Ψ 65.0							Dete	ctor Sample		
± 60.0−							Att 1	0 ffeet 0.00		
문 55.0 -							Swee	ep Time 37.0:	s	
50.0-				للمسمه			Refl	vl:100.50DB	UV	
45.0-					+ + + + + + + + + +	******				
40.0 - 35.0 -							Com BE @) 5150 MHz		
30.0-	10 5120	5130 514	0 5150 5 Frequei	5160 5170 hcy (MHz)	5180 519	0 5200	5190 802. 5210) MHz 11n 40MHz		
Cursor 1	5149.5000	46.17	⊕ - <u>*</u> 6-	Delta	Freq. 29.5	00 🥖		11.	44	
Cursor 2	5179.0000	86.33	\$- <u>*</u> 8-	Delta Amp	olitude 40.	17 7	E	JI1 C	π	

Œ								EM	C Test	' Data
Client:	Intel						J	ob Number:	J75722	
Model	2v2 WiFi wit	h WiMay Mir	hiD∩l				T-L	og Number:	T76443	
would i							Accou	nt Manager:	-	
Contact:	S. Hackett	00 15 047						Olaaa	N1/A	
Standard:	RSS 210/F	UU 15.247		1n10 Chain	D. Compled		EQUEUEDOC	Class:	IN/A	
RUN #20, EU Г)ate of Test [,]	0/0/2000	/IVIFIZ - 8UZ. I	mau, chain	в - Sample # Те	st Location	FT Chamb	≏r #5		
Te	st Engineer:	Rafael Vare	las		Cor	fig Change:	none			
	Chain			Power S	Settings]		
	Chain	Target	(dBm)	Measure	d (dBm)	Softwar	e Setting			
	A	16	o.0	15	.2	25	5.0	J		
Fundament	al Signal Fie	eld Strength	15 200	/ 15 2/7	Dotoctor	Azimuth	Hoight	Commonto		
MHz	dBuV/m	201 v/h	I imit	Margin	Pk/OP/Ava	degrees	meters	Comments		
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	Н	-	-	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 E	Sand Edge S	ignal Radia	ted Field Str	ength - Mark	er Delta	M	1			
	Fundaments	al omission la	avol @ ?m in	1MHz DBW/·		V 100 3	Peak Meas	urement (RI	R_\/R_1MH7)
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	92.1	92.8	Average M	easurement	(RB=1MHz.	, VB=10Hz)
	- unuunion		Delta Mar	ker - 100kHz	38.8	dB	<- this can	only be used	d if band edg	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	61.5	dBuV/m	highest with	hin 2MHz of	band edge.	5
	Calcu	Ilated Band-I	Edge Measur	rement (Avg):	54.0	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	33.8	dB	-2.0	52.0	54	Avg
	Calaul	Donal D	<i>elta Marker -</i> dae Meeeure	1MHz/10Hz:	40.8	dB	-12.5	61.5	74	Pk
		Ilated Band-L	uge Measure Edge Measur	rement (Ava):	66.5 52.0	dBuV/m	USING 100K	HZ delta value	ue	
-					J2.0				5	
	Level	P0I	FCC Limit	15.209 Margin	Detector	Azimuth	Height	Comments		
5350,000	<u>υ</u> σμν/π 52.0	-	54.0	-2 0	Ava	uegrees -	-	Using 1MH	z delta value	
0000	02.0		0110	2.0	, ng			naluzer Cei		
90.0-	╼╼┿╍╍		•e=q				A	inalyzer Sei 198564E EMI	rungs r	
80.0-	1 1	1					c	F: 5341.000) MHz	
75.0-							S	PAN:100.00 B 1.000 MH	10 MHz 7	
70.0-							V V	B 10 Hz		
- පු 65.0 -							С Д	etector Sam tt 10	ple	
/ 특 60.0 -	I						R	L Offset 0.0	0	
₹ 55.0-								weep time a tef Lvl:105.8	B7.US BODBUV	
50.0- 45.0-										
40.0-							C	omments		
35.0-							B	E @ 5350 M	Hz	
30.0- 52	91 5300	5310 532	0 5330 5 Frequ	5340 5350 Jency (MHz)	5360 53	, 370 5380	" 8 5391 C	:02.11n 40M :hain B	Hz	
Cursor 1	5299.000	0 87.13	⊕ Շ-	Delta Ar	ta Freq. 5	0.83	F	Elli	ott	
				- Dorta Al	uburgene i ,		- - -			

E		btt						EMO	C Test	^b Data
Client:	Intel						J	lob Number:	J75722	
Model:	2x2 WiFi wit	h WiMax Mir	niPCI				T-L Accou	.og Number: nt Manager:	T76443 -	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 2c, E	UT on Chan	nel #102 55	10MHz - 802	.11n40, Chaii	n B					
[Date of Test:	8/24/2009			Te	est Location:	FT Chambe	er #4		
Те	st Engineer:	Rafael Vare	as		Cor	nfig Change:	none	1		
	Chain	T	(10)	Power S	Settings	C - (1)				
		l arget	(dBm)	Measure	d (dBm)	Software	e Setting	-		
Fundament	B In Linnal Fi	old Strongth	0.0	15	.1	25	0.0			
Fundament	ai Signai Fi	ela Strength	15 200	/ 15 2/7	Dotoctor	Azimuth	Hoight	Commonts		
MH ₇		P0I v/h	I imit	Margin		degrees	meters	Comments		
5520 270	<u>ubμviii</u> 95.7	Н	-	-	AVG	109	12	RB 1 MHz [.]	VB [.] 10 Hz	
5520.330	103.9	Н	-	-	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 R	460 MHz Restricted Band Edge Signal Radiated Field S					er Delta	•			
					Н	V				
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	103.9	99.8	Peak Meas	surement (RE	B=VB=1MHz))
	Fundamental emission level @ 3m in 1MHz RB					91.0	Average Measurement (RB=1MHz, VB=			VB=10Hz)
			Delta Mar	rker - 100kHz	45.5	dB	<- this can	only be used	d if band edge	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):): 58.4 dBuV/m highest within 2MHz of			band edge.		
	Calcı	ulated Band-I	Edge Measu	rement (Avg):	50.2 dBuV/m Margin Level			Limit	Detector	
		De	elta Marker -	1MHz/1MHz:	41.0	dB	-3.8	50.2	54	Avg
	0.1	D	elta Marker -	1MHz/10Hz:	44.7	dB	-15.6	58.4	74	Pk
	Calcul	ated Band-E	dge Measure	ement (Peak):	62.9	dBuV/m	Using 100k	Hz delta val	ue	
	Calci	naleo Bauo-I	Euge Measur	rement (Avg):	51.0	aBuv/m	Using TOOK	Hz delta val	ue	
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 100k	Hz delta valu	le
5470 MHz E	Band Edge S	Signal Radia	ted Field Str	rength - Mark	er Delta	N	1			
	Fundament	al omission l	wol@2min		H 102.2	V	Dook Moor	uromont (DE		
	Fundament	al emission la	vel @ 311 III		05.7	99.0 01.0		oasuromont)= V D= ПVIПZ) /DR_1MЦ7	/ //R_10Hz)
	Fundamenta		Dolta Mai	TIVINZ KOW.	90.7	91.0 dP	Average IV		(RD= IIVINZ,	$VD = IU\Pi Z$
	Calcul	ated Band-F		ment (Peak)	65.5	dBuV/m	<- unis can highest wit	hin 2MHz of	hand edge	e signai is
	Calcu	Ilated Band-I	-doe Measur	rement (Ava)	58.9	dBuV/m	Margin		Limit	Detector
					30.7	dB	_9 <u>4</u>	58.9	68.3	Δνα
Delta Marker - 1MHz/10H					36.8	dB	-22.8	65.5	88.3	Pk
Calculated Band-Edge Measurement (Peak					71.0	dBuV/m	Using 100k	Hz delta val	ue	
Calculated Band-Edge Measurement (Avg					58.9	dBuV/m	Using 1MH	z delta value	<u>)</u>	
Froquoney		Dol	FCC	` 15E	Dotoctor	Azimuth	Hoight	Commonts		
ттециенсу МН7		г UI v/h	Limit	Margin		degrees	meters	COMMENIS		
5469 666	58 9	-	68.3	-9 4		-	-	Using 1MH	z delta value	
		I		7.1	y					
Note - avera	ge limit is eq	juivalent to -2	2/dBm eirp.							



E		Dtt						EM	C Test	⁻ Data
Client:	Intel							lob Number:	J75722	
Model	2x2 WiFi wit	h WiMax Min	iPCI				T-L	og Number:	T76443	
Wiodel.							Accou	nt Manager:	-	
Contact:	S. Hackett	00 15 047						01	N1/A	
Standard:	RSS 210/F	UC 15.247	70141- 000	11-10 Chai	- D			Class:	N/A	
RUN # 20, E	UT on Chan	inei #134 56.	/UIVIHZ - 802	Dower S	n B ottings			1		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Settina			
	В	16	0.5	16	.8	25	5.5			
Fundament	al Signal Fie	eld Strength						1		
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./	H	-	-	AVG	112	1.0	RB 1 MHZ;	VB: 10 Hz	
5008.000	103.1	H and Edge Si	- anal Dadiat	- ad Eiald Stray	PK Path Marks	2 nr Dolta	1.0	KR I MHZ;	VR: I MHZ	
3723 IVIAZ K	esincieu Ba	and Euge Si	gilal Raulati	ea Fiela Silei	туп - магке ⊔		1			
	Fundamenta	al emission la	Wel @ 2m in	1MH7 RRW/·	103.1	99.7	Peak Meas	surement (RF	S=VB=1MHz	
	Fundamenta	al emission le	vel @ 3m in	1MHz RBW	94 7	91.1	Peak Measurement (RB=VB=1MHz) Average Measurement (RB=1MHz, VB=10Hz			
<u> </u>	T unuumenta		Delta Mai	rker - 100kHz	48.3	dB	- this can only be used if band edge signal			
	Calcul	ated Band-E	dae Measure	ement (Peak):	54.8	dBuV/m highest within 2MHz of band edge.				
	Calcu	ulated Band-E	Edge Measu	rement (Avg):	46.4	dBuV/m Margin Level Limit De				
		De	elta Marker -	1MHz/1MHz:	43.5	<i>43.5 dB</i> -21.9 46.4 68.3				
		De	elta Marker -	1MHz/10Hz:	47.2	dB	-33.5	54.8	88.3	Pk
	Calcul	ated Band-Eo	dge Measure	ement (Peak):	59.6	dBuV/m	Using 100k	Hz delta valu	Je	
	Calcu	ulated Band-I	Edge Measu	rement (Avg):	47.5	dBuV/m	Using 100k	Hz delta valı	he	
Frequency	Level	Pol	FCC	C 15E	Detector	Azimuth	Height	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
5/32.833	46.4	-	68.3	-21.9	Avg	-	-	Using 100k	Hz delta valu	е
Note - avera	ige limit is eq	uivalent to -2	27dBm eirp.							
90.0- _E		i					Analyz	er Settings		
80.0-	hund	- phalenel	4				 HP856 CF: 57 SPAN: 	4E,EMI 700.500 MHz 100.000 MHz		
70.0-							RB 10 VB 100	0 kHz 1 kHz		
පු 60.0-			Mine				Detect Att 0	tor POS		
별 문 50.0-				The state of the s			RL Off Sweep Ref Lv	set 0.00 Time 55.0ms 1:97.000811V	5	
40.0-					me .					
30.0-						and the set	Comm BE@!	ients 5725 MHz		
20.0- 565	50 5660 !	5670 5680	5690 57 Frequen	00 5710 ! cy (MHz)	5720 5730	5740 57	5670 f 802.1 750	MHz 1n 40MHz		
Cursor 1	5682.6665	85.00	÷ -*- 6-	Delta F	Freq. 50.16	7 🕜		11:01	F#	
Cursor 2	ursor 2 5732.8335 36.67 🕂 🖈 🗟 🗸 Delta Amplitude 48.33									

6		D tt						EMO	C Test	Data
Client:	Intel						J	lob Number:	J75722	
Model	2x2 WiFi wit	h WiMax Mir	iPCI				T-L	og Number:	T76443	
	<u> </u>						Accou	nt Manager:	-	
Contact:	S. Hackett	CC 1E 247						Class		
Statiuaru. Dun # 2 Ba	nd Edgo Eig	UC 15.247	202 11n/0	Chain A B				CIdSS.	N/A	
Run # 3a, F	UT on Chan	nel #38 519	- 802.11140)MHz - 802 1	1n40. Chain	A+B					
[[Date of Test:	8/12/2009			Te	est Location	: FT Chamb	er #4		
Те	st Engineer:	Rafael Vare	as		Cor	nfig Change	none	_		
	Chain	- ·		Power S	ettings	0.0	0.11			
		larget	(dBm)	Measure	d (dBm)	Softwar	e Setting	-		
Eundamont	A+B	10.5 (13	.5/13.5)	13.77	13.8	26.5	0/25.5			
Frequency	ai Siyiiai Fic	Pol	15 209	/ 15 247	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	ooninients		
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	-	-	110	1.0	RB 1 MHz;	VB: 10 Hz		
5200.470	100.8	H	-	110	1.0	RB 1 MHz;	VB: 1 MHz			
5150 MHZ E	sana Eage S	lignal Radia	iea Fiela Str	engin - Mark	er Deita	V	7			
	Fundamenta	al emission le	wel @ ?m in	1MHz RBW·	100.8	101 3	Peak Meas	surement (RF	R=VR=1MHz	
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	91.1	91.0	Average M	easurement	(RB=1MHz.)	VB=10Hz)
			Delta Mar	ker - 100kHz	41.0	dB	<- this can	only be used	l if band edge	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	60.3	dBuV/m	highest wit	hin 2MHz of	band edge.	U
	Calcu	ulated Band-I	Edge Measur	rement (Avg):	50.1	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	37.0	dB	-3.9	50.1	54	Avg
	0.1.1	D	elta Marker -	1MHz/10Hz:	40.2	dB	-13.7	60.3	74	Pk
	Calcul	ated Band-E	dge Measure	ement (Peak):	64.3	dBuV/m	Using 100k	Hz delta valı	Je	
	Calci	lialeu Dailu-i	Luye measur	ennenii (Avy).	50.9	abuv/m	Using TOOK	HZ della val	le	
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 100k	Hz delta valu	е
70.0- ₋							Analyzer Se	ttings		
60.0-				الاليور	سليمحم	al al	HP8564E,EM	I D MHz		
00.0					a la construction de la construc		SPAN:100.00	00 MHz		
50.0-					1		VB 100 kHz			
පු 40.0-							Detector POS Att 0	5		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							RL Offset 0.0 Sweep Time 9	00 55.0ms		
Q 0010			. Jana and	¥			Ref Lvl:80.60	DBUV		
20.0-	a handdal d	while days	Manual				Commonte			
10.0-	a ha tadh sahi	In L					BE @ 5150 M	IHz		
0.0							5190 MHz 802, 115, 40M	IH ₂		
511	0 5120 5	130 5140	5150 5160 Frequency (5170 5180 (MHz)	5190 52	00 5210	0021111 100			
Cursor 1	5149.8335	24.10 💠	-*- 6-	Delta Freq	53.833	6	C11:	<u></u>		
Cursor 2	5203.6665	65.10 💠	-*- & - D	elta Amplitud	e 41.00	C.	СШ	ou		

(CE		D tt						EMO	C Test	[•] Data
Client:	Intel						J	ob Number:	J75722	
Model	2v2 \MiFi wit	h WiMay Mir	hiD∩I				T-L	og Number:	T76443	
WIOUCI.							Accou	nt Manager:	-	
Contact:	S. Hackett	0045047						0		
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 3b, E	UI on Chan	nel #62 531	01VIHz - 802.1	l'In40, Chain	A+B	st Location.	ET Chamb	or 1		
Te	st Engineer	Iohn Caizzi			Cor	fig Change		51 4		
10				Power S	Settings	ing onlanger	none	1		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting			
	A+B	16.5 (13	3.5/13.5)	13.6/	13.6	24.0	/ 25.0			
Fundament	al Signal Fie	eld 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	1/3	1.59			
5312.500	87.9 07.2	H H	112.3	-24.4	AVG	114	1.48			
5350 MHz F	and Edge S	ianal Radia	ted Field Str	enath - Mark	er Delta	114	1.40			
5550 MITIZ D	unu Luge o	ignai Radia		cirgin mark	H	V				
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	97.2	99.1	Peak Meas	urement (RE	B=VB=1MHz	
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	87.9	89.0	Average M	easurement	(RB=1MHz,	VB=10Hz)
			Delta Mar	ker - 100kHz	40.7	dB	<- this can	only be used	d if band edg	e signal is
	Calcula	ated Band-E	dge Measure	ement (Peak):	58.4	dBuV/m	highest with	nin 2MHz of	band edge.	
	Calcu	Ilated Band-I	Edge Measur	rement (Avg):	48.3	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	40.2	dB	-9.8	44.2	54	Avg
		D	elta Marker -	1MHz/10Hz:	44.8	dB	-15.6	58.4	74	Pk
	Calcula	ated Band-E	dge Measure	ement (Peak):	58.9	dBuV/m	Using 100k	Hz delta val	ue	
	Calcu	liated Band-I	Edge Measur	ement (Avg):	44.2	abuv/m	USING TIVIH	z deita value	Ş	
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 1MH	z delta value	
85.0-							Analyzei	r Settings		
80.0-	<u> </u>						HP8564E	E,EMI		
75.0-							SPAN:60	0.000 MHz		
70.0-							RB 1.000) MHz		
ප ^{65.0 -}							Detector	Sample		
월 60.0- 북							Att 10 RL Offse	£ 0.00		
물 55.0 -		1					Sweep T	ime 23.0s		
45.0-			M				Rentvia	33.70DBUV		
40.0-			~~~				Comme	nts		
35.0-							20.1110			
30.0-										
531	10 5315 532	20 5325 53	30 5335 534 Frequenc	40 5345 535 у (MHz)	0 5355 536	0 5365 537	0			
Cursor 1	5312.4004	82.95 👯	• - <u>*-</u> b-	Delta Fr	req. 37.600	9	FI	lint	t	
Cursor 2	5350.0005	38.12	+ <u>-*-</u> 6-	Delta Amplit	tude 44.83	U	انا	шОl	.L	

Œ		Ditt Areany						EM	C Test	[•] Data	
Client:	Intel						J	ob Number:	J75722		
Model		h WiMay Mir					T-L	og Number:	T76443		
WOUEI.			IFCI				Accou	nt Manager:	-		
Contact:	S. Hackett										
Standard:	RSS 210 / F	CC 15.247						Class:	N/A		
Run # 3c, E	UT on Chan	nel #102 55	10MHz - 802	.11n40, Chair	ו A+B						
L	Date of Test:	8/13/2009	L			est Location:	FI Chambe	er 4			
re	st Engineer:	Rafael Vare	as	Dowor S	10J	ilig Change:	none	1			
	Chain	Tarnet	(dBm)	Measure	d (dBm)	Software	- Settina				
	A+B	16.5 (13	(0.5/13.5)	13.8/	13.9	22.5	/24.0				
Fundament	al Signal Fig	eld Strenath		10.07	10.7	22.0	2 1.0	1			
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Heiaht	Comments			
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters				
5498.800	93.5	Н	-	-	AVG	107	1.1	RB 1 MHz;	VB: 10 Hz		
5499.670	103.4	Н	-	-	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 R	Restricted Ba	and Edge Si	gnal Radiate	ed Field Strei	ngth - Marke	er Delta					
					H	V					
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	103.4	100.7	Peak Meas				
	Fundamenta	al emission le	evel @ 3m in	IMHZ RBW:	93.5	91.6	Average M	easurement	(RB=1MHZ, 1	VB=10HZ)	
	Coloui	atad Dand E	Della Mai	Ker - IUUKHZ	45.0	<i>dB</i>	<- this can	only be used	i if band edge	e signal is	
	Calcul	aleu Banu-E	uge Measure	ement (Peak):	58.4 40 F	dBuV/m	Norgin	IN ZIVINZ OF	band edge.	Dotoctor	
	Calci		Luye Markar	1/////////////////////////////////////	48.0		iviargin 4 2		LIIIIIL E 4	Delector	
			olta Markor	1МЦ ₇ /1∩Ц ₇ ,	41.0	dD	-0.Z	47.0 50.4		Avy Dk	
	Calcul	ated Band-F	dae Measure	ment (Peak)	40.7	dBuV/m	-10.0 Using 100k	Usv ella Vali	14 IP	ΓN	
	Calcu	ulated Band-I	Edge Measur	rement (Avg):	47.8	dBuV/m	Using 1MH	z 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 1MH	z delta value		
5470 MHz E	Band Edge S	Signal Radia	ted Field Str	rength - Mark	er Delta		1				
					Н	V					
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	103.4	100.7	Peak Meas	urement (RE	3=VB=1MHz)		
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	93.5	91.6	Average M	easurement	(RB=1MHz, 1	VB=10Hz)	
	Calaul	atad David E	Delta Mai	<i>Ker - TUUKHZ</i>	38.3	dB dB	<- this can	only be used	I if band edge	e signal is	
	Calcul	aled Band-E	age Measure	ement (Peak):	65. I	dBuV/m	nignest with	nin Zivihz of	band edge.	Datastas	
	Calculated Band-Edge Measurement (Avg					dBuv/m	Iviargin	Level	LIMIL	Delector	
	Delta Marker - 1MHZ/1MHZ				39.2	aB	-18.3	50.0	68.3	AVg	
	Delta Marker - IMHZ/10HZ				43.5	dBu\//m	-24.1	04.Z	88.3	PK	
Calculated Band-Edge Measurement (Peak Calculated Band-Edge Measurement (Avg				rement (Avg):	50.0	dBuV/m	Using 1MH	z delta value	, ,		
Frequency	ency 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 1MH	z delta value		

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



E		Dtt Ar company						EM	C Test	' Data
Client:	Intel						J	lob Number:	J75722	
Model	2v2 \\/iEi wit	h WiMax Min	iDCI				T-L	og Number:	T76443	
wouer.							Accou	nt Manager:	-	
Contact:	S. Hackett	00 15 0 17						0	N1/A	
Standard:	RSS 210/F	CC 15.247	70141- 000	11-10 Chai	- A D			Class:	N/A	
RUN # 30, E	UT on Chan	nei #134 56	/UIVIHZ - 802	Power S	N A+B			1		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Settina			
	A+B	16.5 (13	5.5/13.5)	13.7/	13.9	23.0	/23.5			
Fundamen	tal Signal Fie	eld Strength	•					4		
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	
56/2.4/0	92.8	H	-	-	AVG	108	. 1 1	KR I MIT-		
5080.000	102.0 Restricted Pr	⊓ and Eda≏ Si	- anal Radiat	- ad Field Strat	PN nath - Marke	100 or Delta	1.1	rd i ivihz;	vd. i ivihz	
5725 IVII IZ T	τι στη τις τα Βα	ina Luyt Si	gilai Naulali	ט ז ובוע סנו פו	H	V	1			
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	102.5	99.4	Peak Meas	surement (RE	B=VB=1MHz)
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	92.8	89.6	Average M	easurement	(RB=1MHz,	, VB=10Hz)
			Delta Mar	ker - 100kHz	43.0	dB	<- this can	only be used	l if band edg	e signal is
	Calcula	ated Band-Ed	dge Measure	ement (Peak):	59.5	dBuV/m	highest wit	hin 2MHz of	band edge.	U
	Calcu	Ilated Band-E	Edge Measui	rement (Avg):	49.8	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	43.5	dB	-21.8	46.5	68.3	Avg
		De	elta Marker -	1MHz/10Hz:	46.3	dB	-29.3	59.0	88.3	Pk
	Calcula	ated Band-Ed	dge Measure	ement (Peak):	59.0	dBuV/m	Using 1MH	lz delta value	!	
	Calcu	Ilated Band-I	dge Measu	rement (Avg):	46.5	dBuV/m	Using 1MH	lz delta value	2	
Frequency	Level	Pol	FCC	C 15E	Detector	Azimuth	Height	Comments		
MHZ	dBµV/m	v/h	Limit	Margin	PK/QP/Avg	degrees	meters	Lloing 1ML		
5725.000	40.5	-	68.3	-21.8	Avg	-	-	Using TMH	z deita value	
Note - avera	age limit is eq	uivalent to -2	27dBm eirp.							
65.0 - 60.0 - 55.0 - 50.0 - + + + + + + + + + + + + + + + + + + +	50 5658.6665	5670 5680	5690 57 Frequen ₽	700 5710 cy (MHz) Delta 1	5720 5730 Freq. 66.33	5740 5	Analy: HP856 CF: 53 SPAN: RB 1.(VB 10 Detec Att 0 RL Off Sweep Ref Ly Comm BE @ 56701 802.1	zer Settings 54E,EMI 700.000 MHz 100.000 MHz tor Sample fset 0.00 o Time 37.0s d:80.70DBUV hents 5725 MHz 1n 40MHz		

_										
E								EM	C Test	[•] Data
Client:	Intel						J	ob Number:	J75722	
Madal			-:001				T-L	og Number:	T76443	
Wouer.	ZXZ VVIFI WIU		IIPUI				Accou	nt Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run #4, Bai	nd Edge Fiel	d Strength	- 802.11n20,	, Chain A	-					
Run #4a, El	JI ON CNANN Jata of Tast	101 #30 5 180	WHZ - 802.1	inzu, Chain I	A Ta	st Location.	ET Chamb	or 1		
Te	st Engineer	Rafael Vare	las		Cor	ifig Change:		51 4		
10				Power S	Settings	ing onlango.	none	1		
	Chain	Target	(dBm)	Measure	d (dBm)	Softwar	e Setting			
	А	16	5.5	16	.7	28	3.5			
Fundament	al Signal Fie	eld Strength	1					3		
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	<u>-</u>	-	AVG	149	1.7	RB 1 MHz;	VB: 10 Hz	
51/5.030	102.8	V	<u>-</u>	-	PK	149	1./	RB 1 MHZ;	VB: 1 MHz	
5174.070	95.9 103.0	н			AVG DK	222	0.0	RB 1 MHZ;		
5150 MHz F	Band Edge S	Signal Radia	ted Field St	renath - Mark	er Delta		0.0		VD. I IVII IZ	
0100 11112 2	and Luge o	ignal Radia		engur mark	H	V	1			
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	103.9	102.8	Peak Meas	urement (RE	3=VB=1MHz))
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	95.9	95.0	Average Measurement (RB=1MHz, VB=10H			VB=10Hz)
			Delta Mai	rker - 100kHz	49.2	dB	- this can only be used if band edge signal			
	Calcula	ated Band-E	dge Measure	ement (Peak):	54.7	dBuV/m	highest with	nin 2MHz of	band edge.	1
	Calcu	Ilated Band-F	Edge Measur	rement (Avg):	46.7	dBuV/m	Margin	Level	Limit	Detector
		<u></u>	<u>elta Marker -</u>	1MHZ/1MHZ:	41.3	dB /P	-7.3	46.7	54	Avg
	Calcul	atod Band E	dao Moasure	INHZ/IUHZ:	49.2	<i>dBuV/m</i>	- 19.3	54.7 Uz dolta val	/4	PK
	Calcul	ilated Band-	Edge Measure	rement (Ava)	02.0 46.7	dBuV/m	Using 100k	riz ueita value z delta value	ue	
				ement (rug).	40.7	abaviin			,	
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 1MH	z delta value	
90.0- _E							Analyzer Se	ettings		
80.0-						<u> </u>	HP8564E,EN	4I DO MHz		
70.0-							SPAN:80.00 RB 1.000 Mł	0 MHz Hz		
ਸ ੂ 60.0 -					1		Detector Sa Att 0	mple		
₩ ₩ 50.0-							RL Offset 0. Sweep Time Ref Lvl:97.0	.00 30.0s)0DBUV		
40.0-	••••			<u> /</u>			Comments			
30.0-							BE @ 5180 I	MHz		
20.0- 511	0 5120	5130 5	5140 515() 5160	5170 518	30 5190	5180 MHz 802.11n 20f	MHz		
-			U S-							
Cursor 1	5150.0000	35.67 🖤	-* 6-	Delta Fred	q. 35.067	6	Elli	off		
Cursor 2	3103,0009	04.03		Jeita Amplitut	18 19.17	Sec.				

F	Illic	htt						FN/	C Tosi	+ Nata
	An AZ	AT*company							175722	Data
Client:	IIIIEI						Т I	og Number.	J75722	
Model:	2x2 WiFi with	n WiMax Mir	ıiPCI				Accou	int Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run #4b, El	JT on Chann	nel #64 5320	MHz - 802.1	1n20, Chain	A T	at Lagation.				
L	st Engineer	8/13/2009 Rafaol Varo	20		Te Cor	st Location:	FI Chamb	er #4		
10			43	Power S	Settings	ing onunge.	HUHE	1		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting			
[А	16	o.5	16	.7	25	5.5			
Fundament	al Signal Fie	eld Strength	15 200	115 017	Datastas	A ! 1 le	11.2.14	0		
	Level	P0I v/b	15.209 Limit	/ 15.247 Margin	Detector	Azimuth	Height	Comments		
5316.800	и <u>ы</u> иулп 93.7	V	LIIIII	maryin	AVG	206	1.0	RB 1 MHz:	VB: 10 Hz	
5317.100	102.0	V			PK	206	1.0	RB 1 MHz;	VB: 10112 VB: 1 MHz	
5314.730	95.2	Н			AVG	299	1.0	RB 1 MHz;	VB: 10 Hz	
5315.200	103.3	Н			PK	299	1.0	RB 1 MHz;	VB: 1 MHz	
5350 MHz B	Band Edge Si	ignal Radia	ted Field Str	ength - Mark	er Delta		1			
	Fundamente	lomiccion	aval@2min		H 102.2	V 102.0	Dook Moor	suramant (DI		N
	Fundamenta	Il emission le	evel @ 3m in		95.2	02.0 03.7		leasurement	D=VD=HVITZ	/ \/R_10H7)
	Tunuamenta		Delta Mar	ker - 100kHz	47.5	dB	<- this can	only be used	d if band edg	e signal is
	Calcula	ated Band-E	dge Measure	ment (Peak):	55.8	dBuV/m	highest wit	hin 2MHz of	band edge.	o orginal lo
	Calcu	lated Band-l	Edge Measur	ement (Avg):	47.7	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	41.8	dB	-8.1	45.9	54	Avg
		D	elta Marker -	1MHz/10Hz:	49.3	dB	-18.2	55.8	74	Pk
	Calcula	ated Band-E	dge Measure	ment (Peak):	61.5	dBuV/m	Using 100	kHz delta val	ue	
	Calcu	Ialeu Dallu-I	zuge measur	ement (Avy).	45.9	abuv/m	USING TIVIF		Ę	
Frequency	Level	Pol	FCC 2	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 TMH	z delta value	
90.0-							Ana	lyzer Setting	gs	
80.0-						****	- HP8 CF:	564E,EMI 5350.000 MH	łz	
							SPA DB 1	N:80.000 MH	z	
70.0-							VB 1	0 Hz		
පු 60.0-							Dete Att (ector Sample D		
별 ~ 50.0 -		$ \setminus$					RL C Swe)ffset 0.00 ep Time 30.0	s	
40.0-			\searrow				Rer	LAI: 37.00DBC	JV	
30.0-							Com	ments		
							BE (ບ່ວວວບ MHZ D MHz		
20.0-¦ 531	10 5320	5330	5340 53 Frequer	350 5360 cy (MHz)	5370	5380	5390 802.	.11n 20MHz		
Cursor 1	5325.3335	84.17	\$-*- 6-	Delta	Freq. 24.6	67 💋		' 11: ~	++	
Cursor 2	5350.0000	34.83	⇔ -≁ ն-	Delta Amp	olitude 49.3	33 🛛 🏹		шс	π	

(7 E		Dtt As [*] company						EM	C Test	' Data
Client:	Intel						J	lob Number:	J75722	
Model	יער WiFi wit	h WiMax Min	iDCI				T-L	og Number:	T76443	
Wioden	ZAZ VVII I VVII						Accou	nt Manager:	-	
Contact:	S. Hackett	20 15 017							- 1 / A	
Standard:	RSS 2107F	CC 15.247	000	11-00 Ohele	•			Class:	N/A	
Run #4C, EU	JI on Chanr	1el #100 550	0MHz - 802.	11n20, Chain Dowar S	A Cottings			1		
	Chain	Target	(dRm)	Measure	d (dRm)	Software	- Settina			
	Δ	16	.5	16	.6	23	3.5	1		
Fundament	al Signal Fie	eld Strength						J		
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	Н	-	-	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 R	estricted Ba	and Edge Si	gnal Radiat	ed Field Strei	ngth - Marke	r Delta	1			
	Fundament				H 102 F	V 102.4	Dook Moor	uromont (DE		
	Fundamenta	al emission le	evel @ 3m in	1MHZ RBW:	103.5 OF F	102.4		Surement (RE	/DD 11/11-1) \/D_10[1)
	Fundamenta		Dolta Ma	TIVIAL ROW:	90.0 <i>F2</i> 7	94.0	Average ivi		(KD=IIVIHZ,	v D= IUHZ)
	Calcul	atod Dand Er	Della Maa	Mer - TUUKAZ	<i>33.7</i>	dBu\//m	<- IIIS Call bigbost wit	bin 2MUz of	hand odgo	e signal is
	Calcul	ilated Band-F	Iye Measure Idao Moasur	romont (Ava)	49.0 /1.0	dBuV/m	Margin		Limit	Dotoctor
	Calce		lta Marker -	1MHz/1MHz [,]	41.0	46.3 dB -12.7 41.3			5 <i>1</i>	Δνα
		Di	elta Marker -	1MHz/10Hz [,]	54 2	dB	-12.7	41.5	74	Pk
	Calcula	ated Band-Ed	dae Measure	ement (Peak):	57.2	dBuV/m	Using 100k	Hz delta vali	Ie	I K
	Calcu	lated Band-I	Edge Measu	rement (Avg):	41.3	dBuV/m	Using 100	z delta value	20	
Frequency	امريم ا	Pol	FCC	15 209	Detector	Azimuth	Hoight	Commonts		
MHz	dBuV/m	v/h	Limit	Margin	Pk/OP/Ava	dearees	meters	Comments		
5460.000	41.3	-	54.0	-12.7	Ava	-	-	Usina 1MH:	z delta value	
5470 MHz B	and Edge S	ignal Radia	ted Field Sti	rength - Mark	er Delta	V	1	I J		
	Fundamenta	al emission le	vel @ 3m in	1MHz RBW·	103 5	102.4	Peak Meas	surement (RF	R=VR=1MHz	
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	95.5	94.6	Average M	easurement	(RB=1MHz.)	, VB=10Hz)
	- unuumonte		Delta Mai	rker - 100kHz	48.2	dB	<- this can	only be used	l if band edge	e signal is
	Calcula	ated Band-E	dae Measure	ement (Peak):	55.3	dBuV/m	highest wit	hin 2MHz of	band edge.	o orginal lo
	Calcu	lated Band-	Edge Measu	rement (Avg):	47.3	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	40.5	dB	-21.5	46.8	68.3	Avg
		De	elta Marker -	1MHz/10Hz:	48.7	dB	-33.0	55.3	88.3	Pk
	Calcula	ated Band-E	dge Measure	ement (Peak):	63.0	dBuV/m	Using 100k	Hz delta valu	he	
	Calcu	ulated Band-E	Edge Measu	rement (Avg):	46.8	dBuV/m	Using 1MH	z delta value	;	
Frequency	Level	Pol	FCC	C 15E	Detector	Azimuth	Heiaht	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
5470.000	46.8	-	68.3	-21.5	Avg	-	-	Using 1MH	z delta value	
Note avera	ao limit is oa	uivalont to 1	7dBm oirn							
	ge innit is eq		. / dom eiip.							



E	Ellic	ott						EM	C Test	[•] Data
Client:	Intel	2 company						Job Number:	J75722	
Madalı		h WiMay Min					T-l	_og Number:	T76443	
woder:			IPCI				Αссоι	unt Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247		44 00 01 1				Class:	N/A	
Run #40, E	UT on Chan	1el #140 570	<u> UMHZ - 802.</u>	Power S	1 A Cottings			٦		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Settina			
	Α	16	.5	16	.8	24	4.5	-		
Fundament	tal Signal Fie	eld 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 T MHZ;		
5695 200	94. I 102 1	H H	-	-	AVG	320	1.0	RB 1 MHZ;		
5725 MHz F	Restricted Ba	and Edge Si	anal Radiat	ed Field Strei	nath - Marke	r Delta	1.0		VD. TIVITIZ	
		ina Lago en	gilai riaalat		H	V]			
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:		101.6	Peak Meas	surement (RE	B=VB=1MHz)
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:		93.8	Average N	leasurement	(RB=1MHz,	VB=10Hz)
			Delta Mai	rker - 100kHz	42.0	dB	<- this can	only be used	l if band edg	e signal is
	Calcul	ated Band-Ec	dge Measure	ement (Peak):	59.6	dBuV/m	highest wit	hin 2MHz of	band edge.	
	Calcu	Ilated Band-L	dge Measu	rement (Avg):	51.8	dBuV/m	Margin	Level	Limit	Detector
		De	olta Marker -	1MHZ/1MHZ:	36.0	dB	-1/./	50.6	68.3	Avg
	Calcul	De ated Band-Fr	dae Measure	ment (Peak)	43.Z	dBu\//m	-28.7 Using 100	59.0 kHz dolta vali	88.3	PK
	Calcu	ilated Band-E	Edge Measure	rement (Ava):	50.6	dBuV/m	Using 1MF	tz delta value		
			<u>J</u>	J AN J	0010					
Frequency	Level	Pol	FCC	C 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 1MH	z delta value	
Note - avera	ige limit is eq	uivalent to -2	7dBm eirp.							
90.0-[Analy	zer Settings		
		ab-avol -					. HP856	64E,EMI		
00.0-							SPAN:	80.000 MHz		
70.0-							RB 1.0	000 MHz Hz		
-8600-							Detec	tor Sample		
plitu	11						Att 0 RL Of	fset 0.00		
Ē 50.0−							Sweep	p Time 30.0s		
40.0-							- Rei Li	/1:97.000000		
							Comn	nents		
30.0-							BE @	5725 MHz		
20.0-							5700 1 802.1	MHz 1n 20MHz		
56	85 5	700 5710) 5720 Ereques	5730 5 cv (MHz)	5740 575) 5	765			
			riequen							
Cursor 1	5694.7334	83.17	≠ <u>-*</u> b•	Delta F	Freq. 30.26	7 🏉		11:01	F#	
Cursor 2	Cursor 2 5725.0000 40.00 🕁 🛧 🔤 Delta Amplitude 43.17							шО	ιι	

E	Ellic) tt						EM	C Test	' Data
Client:	Intel	Company					J	ob Number:	J75722	
NA	2.2.W/F						T-L	og Number:	T76443	
Model:	2x2 WiFi wit	h WiMax Min	IPCI				Accou	nt Manager:	-	
Contact:	S. Hackett	00 15 247						Class	N1/A	
Standard:	RSS 210 / F	UC 15.247	000 11-00	Chain D				Class:	N/A	
RUN # 5, Ba	ING EGGE FIE	a Strength	- 802.11N20	, Chain B						
Kull # 5a, L	Date of Test	8/14/2009			Te	est Location	· СН #4			
Te	st Engineer:	John Caizzi			Cor	fig Change	none			
	Choin			Power S	Settings	5 5				
	Chain	Target	(dBm)	Measure	d (dBm)	Softwar	e Setting			
	В	16	o.5	16	.7	2	7.0			
Fundament	tal Signal Fi	eld Strength	1					1		
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	95.9 102.4		105.3	-9.4	AVG	112	1.72			
51/0.8/0	103.0	H	125.3	-21.7		112	1.72			
5181 530	90.4 103.6	V	105.5	-9.9	PK	151	1.59			
5150 MHz F	Band Edge S	Signal Radia	ted Field Str	renath - Mark	er Delta	101	1.57			
	unu Lugo o	<u>igna naula</u>		engui man	Н	V				
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	103.6	103.6	Peak Meas	urement (RE	B=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RB					95.9	95.4	Average M	easurement	(RB=1MHz,	VB=10Hz)
			Delta Mar	rker - 100kHz	45.0	dB	<- this can	only be used	d if band edg	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	58.6	dBuV/m	highest with	nin 2MHz of	band edge.	-
	Calcı	ulated Band-F	Edge Measur	rement (Avg):	50.9	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	38.3	dB	-3.1	50.9	54	Avg
	Coloui	Dend Dond E	<i>elta Marker -</i> dae Megeure	1MHZ/10HZ:	44./	dB	-15.4	58.6	/4	Pk
	Calcu	aleu Bariu-Eu	uge Measure	romont (Ava):	65.3 E1 0	dBuV/m	Using 100k	HZ delta val	ue	
	Calci		Luye Measur	enieni (Avy).	51.Z	ubuv/III	USING TOOK	HZ UEILA VAI	ue	
Frequency	level	Pol	FCC	15,209	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	o on monto		
5148.417	50.9	Н	54.0	-3.1	Avg	112	1.72	Using 100k	Hz delta valu	ie
90.0-							Analyzer Se	ttings		
85.0-					الملحان والكري	LLL.	HP8564E,EM	I		
80.0-						- Carlo	CF: 5165.000 SPAN:50.000) MHz) MHz		
75.0-							RB 100 kHz			
_ω 70.0-							Detector POS	5		
<u></u> 65.0 -	9 65.0-					<u> </u>	Att 0 BL Offcot 11	00		
븉 60.0-	Ê 60.0-						Sweep Time !	50.0ms		
55.0-			www				Ref Lvl:108.0	ODBUV		
50.0-							Comments			
40.0-							802.11n20 (lhain B		
35.0-		•					CH 36 16-7 dBm			
514	0 5145 5	150 5155	5160 5165 Frequency	5170 517 (MHz)	5 5180 51	85 5190	10.7 UDIII			
Cursor 1	5148.4165	42.50 💠	- <u>*</u> &•	Delta Frec	26.583	6	F11;	ott		
Cursor 2	5175.0000	87.50 💠	<u>-*-</u> @• c	elta Amplituc	le 45.00	C.	لللائا	ou		

E	Ellic	ott						EMO	C Test	[•] Data
Client:	Intel	B company						Job Number:	J75722	
Model	2x2 WiFi wit	h WiMax Mir	niPCI				T-L	og Number:	T76443	
	2.12 111 1 11						Accou	int Manager:	-	
Contact:	S. Hackett	00 15 047						Class		
Standard:	KSS ZIU/F	UU 15.247						Class:	N/A	
KUII # 30, E		TIEI #04, 332		Power S	Settinas			٦		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting	-		
	В	16	b.5	16	.7	27	7.0			
Fundament	al Signal Fie	eld 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	95.7 102.4	H	112.3	-16.6	AVG	118	1.65			
5315.870	103.4	H Jianal Dadia	132.3	-28.9	PK For Dolta	811	1.65			
JJJU WITZ D	anu Euge S	iyilal kaula	ieu rieiu Sii	engin - mark		V	1			
	Fundamenta	al emission le	avel @ ?m in	1MHz RBW·	103.4	102.3	Peak Meas	surement (RF	R=VR=1MHz	
	Fundamenta	al emission le	vel @ 3m in	1MHz RBW	95.7	94 7	Average M	leasurement	(RR=1MHz	, VB=10Hz)
	1 unuumonte		Delta Mai	rker - 100kHz	49.7	dB	<- this can	only be used	l if band edg	e signal is
	Calcula	ated Band-E	dae Measure	ement (Peak):	53.7	dBuV/m	highest wit	hin 2MHz of	band edge.	o orginal lo
	Calcu	Ilated Band-I	Edge Measu	rement (Avg):	46.0	dBuV/m	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz					42.2	dB	-8.5	45.5	54	Avg
Delta Marker - 1MHz/10Hz				1MHz/10Hz:	50.2	dB	-20.3	53.7	74	Pk
	Calcula	ated Band-E	dge Measure	ement (Peak):	61.2	dBuV/m	Using 100k	kHz delta vali	Je	
	Calcu	Ilated Band-I	Edge Measu	rement (Avg):	45.5	dBuV/m	Using 1MF	Iz delta value	<u>)</u>	
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	Η	54.0	-8.5	Avg	118	1.65	Using 1MH	z delta value	
00.0								A poluzor	Cottings	
90.0-								Analyzer	Settings	_
85.0-	$\int_{-\infty}^{\infty}$							CF: 5335.	EMI 000 MHz	
75.0-			1 1					SPAN:50.	000 MHz	
70.0-	1		1					RB 1.000 VB 10 Hz	MHz	
୍କ 65.0-			1					Detector 9	5ample	
19 00.0 19 60.0-								Att 0	11.00	
2 55.0-								Sweep Tin	ne 19.0s	
50.0-								Ref Lvl:10	8.00DBUV	
45.0-	•		1							
40.0-	•		1					Commen	ts	
35.0-			1			╞╪╪┿┽┽		802.11n2	0 Chain B	
30.0-								CH64		
53	310 5315	5320 53	325 5330 Fred	5335 53 juency (MHz)	40 5345	5350 53	55 5360	ien dem		
Cursor 1	5325.250	0 86.67	+ -* 6	D	elta Freq.	24.750	6		• - 4	
Cursor 2	5350.000	36.50	⊕ -*- 6	Delta	Amplitude	50.17	C	ЕI	10l	τ
1										

Elliott EMC Test Data										
Client:	Intel						J	ob Number:	J75722	
Model	2v2 WiEi wit	h WiMax Mir	idci				T-L	og Number:	T76443	
WOUCI.							Accou	nt Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 5c, E	UT on Chan	nel #100 550	00MHz - 802	<u>.11n20, Chaii</u>	<u>n B</u>			1		
	Chain	Torgot	(dDm)	Power S	ettings	Coffwor	Cotting	-		
	D	14 14	(UBIII)	Ivieasule		SUIWAR		-		
Eundamont	D al Sianal Ei	old Stronath	0.0	10	.0	20	0.0	J		
Frequency	<i>ai Siyiiai Fi</i> e Level	Pol	15 209	/ 15 247	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	l imit	Margin	Pk/OP/Ava	dearees	meters	Comments		
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 R	Pestricted Ba	and Edge Si	gnal Radiate	ed Field Strei	ngth - Marke	r Delta		-		
					Н	V				
Fundamental emission level @ 3m in 1MHz RBW					105.1	103.0	Peak Meas	urement (RE	B=VB=1MHz))
Fundamental emission level @ 3m in 1MHz RBW					97.5	95.1	Average Measurement (RB=1MHz, VB=10Hz			VB=10Hz)
			Delta Mar	ker - 100kHz	51.0	dB	<- this can	only be used	l if band edg	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	54.1	dBuV/m	highest with	nin 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
	0.1.1	D	elta Marker -	<u>1MHz/10Hz:</u>	52.2	dB	-19.9	54.1	74	Pk
	Calcul	ated Band-E	dge Measure	ement (Peak):	60.6	dBuV/m	Using 100k	Hz delta vali	ue	
F	Calcu			15 200	45.3	dBuV/m	USING TIVIH	z delta value	2	
Frequency		P01	FUU	15.209 Morgin	Delector	Azimuin	Height	Comments		
1010Z	<u>μομν/Π</u> 15.3	V/II Н	54.0	- 8 7	Ava	110	1 08	l Isina 1MH [.]	aulev etlab z	
5470 MHz B	Rand Edge S	ignal Radia	ted Field Str	rength - Mark	er Delta	V	1.00			
	Fundament	al emission le	vel @ 3m in	1MHz RRW·	105.1	103.0	Peak Meas	urement (RF	3=VB=1MH7)
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	97.5	95.1	Average M	easurement	(RB=1MH7	, VB=10Hz)
	- undumonit		Delta Mar	rker - 100kHz	46.8	dB	<- this can	only be used	t if band edg	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	58.3	dBuV/m	highest with	hin 2MHz of	band edge.	· g. · - · · ·
	Calcu	Iated Band-I	Edge Measur	rement (Avg):	50.7	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:		dB	-18.0	50.3	68.3	Avg
		D	elta Marker -	1MHz/10Hz:	47.2	dB	-30.0	58.3	88.3	Pk
	Calcul	ated Band-E	dge Measure	ement (Peak):	105.1	dBuV/m	Using 100k	Hz delta valu	ue	
Calculated Band-Edge Measurement (Avg)				50.3	dBuV/m	Using 1MH	z delta value))		
Frequency	Level	Pol	FCC	C 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 1MH	z delta value	
Note - avera	ae limit is ea	uivalent to -2	27dBm eirp							
	<u> </u>									



E		ott						EMO	C Test	t Data	
Client:	Intel	D company						Job Number:	J75722		
Model	2x2 WiFi wit	h WiMax Min	iPCI				T-L	og Number:	T76443		
							Accou	int Manager:	-		
Contact:	S. Hackett	CC 15 247						Class	ΝΙ/Λ		
Stanuaru. Dun # 5d E	KSS 2107 F	00 10.247	<u>)0M∐z 803</u>	11n20 Chai	n R			CIASS.	N/A		
Kull # 50, L		1101 # 140 57	JUIVII 12 - 002	Power S	ettinas			1			
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting	-			
	В	16	o.5	16	.6	25	5.0				
Fundament	al Signal Fie	eld Strength									
Frequency	Level	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments			
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		VD. 10 U-		
5703.000	95.3 103 /	V	112.3	-17.0	AVG	135	1.27	RB 1 MHZ; RB 1 MHZ;	VB: 10 HZ		
5694 670	94.5	H	112.3	-17.8	AVG	327	1.27	RB 1 MHz [·]	VB: 10 Hz		
5702.670	102.7	H	132.3	-29.6	PK	327	1.34	RB 1 MHz;	VB: 10112 VB: 1 MHz		
5725 MHz R	Restricted Ba	and Edge Si	gnal Radiat	ed Field Strei	ngth - Marke	r Delta		· · · ·			
					Н	V					
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	102.7	103.4	Peak Meas	surement (RE	B=VB=1MHz)	
	Fundamental emission level @ 3m in 1MHz RBW:94.595.3							Average Measurement (RB=1MHz, VB=10Hz)			
	Delta Marker - 100kHz 43.5 dB							only be used	l if band edg	e signal is	
Calculated Band-Edge Measurement (Peak): 59.9 dBuV/m						dBuV/m	Margin		Dand edge.	Dotoctor	
	Calculated Band-Edge Measurement (Avg):						17 2	51 1	68.3		
		DC	elta Marker -	1MHz/10Hz:	44.2	dB	-17.2	59.9	88.3	Pk	
	Calcul	ated Band-Ed	dge Measure	ement (Peak):	68.6	dBuV/m	Using 100k	Hz delta val	ue	- TK	
	Calcu	lated Band-E	Edge Measu	rement (Avg):	51.1	dBuV/m	Using 1MH	Iz delta value	;		
							-	1			
Frequency	Level	Pol	FCC	C 15E	Detector	Azimuth	Height	Comments			
MHZ	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	Licing 1ML	z dalta valua		
5725.017	51.1	V	08.3	-17.Z	Avg	135	1.27	USING TIMH.	z della value		
Note - avera	ge limit is eq	uivalent to -2	27dBm eirp.								
90.0-							Analyzer	Settings			
85.0-	portion						HP8564E	,EMI			
80.0-							CF: 5720 SPAN:70	.000 MHz .000 MHz			
75.0-							RB 1.000	MHz			
70.0-							VB 10 Hz Detector	Sample			
							Att 0	Dampie			
/ ⁴ / 60.0-							RL Offset	t 11.00			
₹ 55.0- 50.0-							Ref Lvl:1	me 26.05 08.00DBUV			
50.0-											
40.0-							Commer	nts			
35.0-							802.11n2	20 Chain B			
30.0-		+ + + + + + +	<u>+</u> + + + + + + + + + + + + + + + + + +			┿┿┿┿	CH 140				
568	5 5690	5700 5	710 572 Frequenci	20 5730 v (MHz)	5740	5750 575	2 10.0 GBM				
Circa 1	F(04 (00)										
Cursor 1	5694.6831	65.50 T	<u>~</u> _%_&_	Delta Arrista	eq. 30.333	9	ΗI	liot	F		
Cursor 2	5725.0100	41.33		Deita Ampliti	uue 17.17	S.			-		

Œ		D tt						EMO	C Test	' Data
Client:	Intel						J	ob Number:	J75722	
Model	2x2 ₩iFi wit	h WiMax Min	iPCI				T-L	og Number:	T76443	
MOUCI.							Accou	nt Manager:	-	
Contact:	S. Hackett	00 15 047						01	N1/A	
Standard:	RSS 2107F	UC 15.247	000 11-00	Chain A D				Class:	N/A	
RUN # 6, Ba Run # 6a F	na Eage Fie UT on Chan	10 Strength nol #36 518(- 802.11N20 MHz - 802 1	, Chain A+B 11n20 Chain	۸⊥R					
	Date of Test:	8/17/2009	JIVIT IZ - 002.		Τe	est Location:	FT Chamb	er #3		
Те	st Engineer:	Rafael Varel	as		Cor	fig Change:	none			
	Chain			Power S	Settings					
	Chain	Target	(dBm)	Measure	d (dBm)	Softwar	e Setting			
	A+B	16	o.5	13.6/	13.8	26.5	/25.5	J		
Fundament	al Signal Fie	eld Strength	15 200	115 017	Datastas	A _!	11.2.1.1	0		
		P0I	15.209 Limit	/ 15.247 Margin	Delector	Azimuln	Height	Comments		
IVINZ 5178 570	08μν/m 94.0	V/II H		iviaryin -	AVG	103	1 1	RB 1 MHz [.]	VR· 10 Hz	
5183 500	104.0	H	-	-	PK	103	1.1	RB 1 MHz [.]	VB: 10112 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 B	Band Edge S	ignal Radia	ted Field Sti	rength - Mark	er Delta		-			
					H	V	l	. (5.5		
	Fundamenta	I emission le	evel @ 3m in	1MHz RBW:	104.0	104.6	Peak Meas	surement (RE	3=VB=1MHz)	
	Fundamenta	II emission ie	evel @ 3m in	IMHZ RBW:	94.0	94.8	Average M		(RB=TMHZ,	VB=IUHZ)
	Calcul	atod Rand Fr	Della Mai	Ment (Doak)	49.3 dBuV/m bighest within 2MHz of band edge				e signal is	
	Calcul	lated Band-I	-dae Measure	rement (Ava).	49.3 20 5	dBuV/m	Margin		Limit	Detector
	Galee	De	ta Marker -	1MHz/1MHz [,]	51.3	dB	-14 5	39.5	54	Ava
		De	elta Marker -	1MHz/10Hz:	53.0	dB	-24.7	49.3	74	Pk
	Calcula	ated Band-Ed	dge Measure	ement (Peak):	53.3	dBuV/m	Using 100k	Hz delta valu	ue	
	Calcu	lated Band-I	Edge Measu	rement (Avg):	41.8	dBuV/m	Using 100k	Hz delta valu	ue	
_		<u> </u>	500	45.000			I			
Frequency	Level	Pol	FCC	15.209 Marain	Detector	Azimuth	Height	Comments		
WHZ 51/18 078	0ΒμV/M 30 5	V/N H	54.0	14 5	PK/QP/AVg	degrees	1 72	Llsing 100k	Hz dolta valu	
5140.070	57.5	11	54.0	-14.5	Avy	112	1.72	USING TOOK		
80.0-						HP8564	er Settings IF EMI	-		
70.0-					Mannam	CF: 51	50.000 MHz			
60.0-						RB 100	kHz tare			
₽ 50 0 -						Detect	кнz or POS			
plitue						Att 0 RL Offs	et 0.00			
				ala		Sweep Ref Lvl	Time 50.0ms :85.40DBUV			

Cursor 1 5148.0781

Cursor 2 5183.9102

30.0

20.0-

10.0-|| 5109

5120

5130

22.23

77.57

5140

՝⊕ -չ- ն-

+ + 6-

5150

Frequency (MHz)

5160

5170

Delta Freq. 35.832

Delta Amplitude 55.33

5180

Comments

5191

BE @ 5150 MHz 5180 MHz 802.11n 20MHz

lliott

CE		Dtt Ar company						EMO	C Test	' Data
Client:	Intel						J	ob Number:	J75722	
Madal	ΩvΩ \\/i⊑i wit	h \/i\/av \/ir					T-L	og Number:	T76443	
wouer.		II VVIIVIAX IVIII	IIPCI				Accou	nt Manager:	-	
Contact:	S. Hackett	00.45.047								
Standard:	RSS 210/F	CC 15.247	000 A	11.00 01	A D			Class:	N/A	
RUN # 6D, E	UI ON Chan	nel #64 532	Jivihz - 802.	i inzu, Chain	A+B	st Location.	ET Chamb	or #2		
Te	st Engineer:	Rafael Varel	as		Cor	fig Change:	none	51 #3		
	Chain			Power S	ettings		nono]		
	Chain	Target	(dBm)	Measure	d (dBm)	Software	e Setting			
	A+B	16	o.5	13.6/	13.8	24.5	/25.5			
Fundament	al Signal Fie	eld Strength	15.000		_			-		
Frequency	Level	Pol	15.209	/ 15.24/	Detector	Azimuth	Height	Comments		
WIHZ	01.2	V/N	Limit	Margin	PK/QP/AVg	degrees	meters		\/D₁ 10 ∐ 7	
5324.030	91.2 101 /	H	-	-	AVG PK	222	1.0		VD. 10 HZ	
5315 470	91.6	V	-	-	AVG	177	1.0	RB 1 MHz [.]	VB: 10 Hz	
5314.570	102.1	V	-	-	PK	177	1.2	RB 1 MHz;	VB: 1 MHz	
5350 MHz E	Band Edge S	ignal Radia	ted Field Sti	rength - Mark	er Delta			· · · ·		
					Н	V]			
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	101.4	102.1	Peak Meas	urement (RE	3=VB=1MHz)
Fundamental emission level @ 3m in 1MHz RBW					91.2	91.6	Average M	easurement	(RB=1MHz,	VB=10Hz)
Delta Marker - 100kHz 56.5 dB <- this can only be used if band							d if band edg	e signal is		
Calculated Band-Edge Measurement (Peak)					45.6	dBuV/m	highest with	nin 2MHz of	band edge.	
	Calcu	liated Band-I	Lage Measur	rement (Avg):	35.1	dBuV/m	Margin	Level	Limit	Detector
			elta Markar	1MHZ/1MHZ; 1MHz/10Hz;	50.2	aB dD	-18.9	35.1 45.4	54	AVg
	Calcula	ated Band-Fi	dae Measure	ment (Peak)	<i>32.0</i> 51.0	dBuV/m	-20.4 Using 100k	40.0 Hz delta vali	14	ΡK
	Calcu	lated Band-I	Edge Measur	rement (Ava):	38.8	dBuV/m	Using 100k	Hz delta val	ue	
Froquency		Dol	J ECC	15 200	Dotoctor	Azimuth	Hoight	Commonte		
MH ₇	dBu\//m	P01 v/h	FCC Limit	10.209 Margin		dearees	meters	Comments		
5350.000	35.1	-	54.0	-18.9	Ava	-	-	Usina 100k	Hz delta valu	le
80.0-1							- Analy	zor Sottina	e	-
00.0-	. Jahre			•			HP85	zer setting 64E,EMI	5	
70.0-							CF: 5 SPAN	350.000 MHz :82.373 MHz	2	
60.0-							RB 10	10 kHz		
9	11						VB 10 Detec	u kHz tor POS		
- <u>19</u> 50.0 -	/						Att 0	fset 0.00		
₽ 40.0							Swee	p Time 50.0m	ns	
30.0-		-	May 1				Reit	VI:05.40DDOV	v	
20.0-							Comn	nents		
20.0-					ntel the book	howw	BE @	5350 MHz		
10.0- 53	09 5320	5330	5340 5	350 5360	5370	5380 5	- 5320 11 802.1 3391	MHZ 1n 20MHz		
		70.07	hequer La La La	су (нн2) Байа				4-4 4		
Cursor 1	5314.9917	21.57	₽ <u>~</u> & &	Delta Amp	litude 56.5	io 💋	F Ε	llio	tt	
-										

		**							CTaat	Data
	An [22]	ノしし						EIVIO	s Tesi	Dala
Client:	Intel						J	lob Number:	J75722	
Model:	2x2 WiFi wit	h WiMax Mir	niPCI				T-L	.og Number:	T76443	
Contact:	S. Hackett						ALLUU	ni manayer.	-	
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 6c, E	UT on Chan	nel #100 550	00MHz - 802	.11n20, Chaii	n A+B			•		
	Chain	Tanad	(dDm)	Power S	Settings	Cathuran	. C			
	Λ. D	Target	(abin)	ivieasure		5011Ware		-		
Fundament	A+D al Signal Fig	eld Strenath	0.0	22.0,	24.0	13.7,	13.0]		
Frequency	l evel	Pol	15.209	/ 15.247	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/OP/Ava	dearees	meters	oonintento		
5505.500	95.4	H	54.0	41.4	AVG	106	1.0	RB 1 MHz;	VB: 10 Hz	
5495.070	105.6	Н	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										
					Н	V				
	Fundamental emission level @ 3m in 1MHz RBW					103.3	Peak Meas	surement (RE	B=VB=1MHz)	
Fundamental emission level @ 3m in 1MHz RBW					95.4	93.3	Average Measurement (RB=1MHz, VB=10Hz)			VB=10Hz)
			Delta Mar	rker - 100kHz	47.0	dB	<- this can	only be used	d if band edge	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	58.6	dBuV/m	highest with	hin 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
	Calaul	Di Den al Den al D	elta Marker -	1MHZ/10HZ:	45.3	dB	-15.4	58.6	/4	Pk
	Calcul	ated Band-E	dge Measure	ement (Peak):	61.6	dBuV/m	Using 100k	Hz delta val	ue	
	Calci	lialeu Baliu-i	zuge measu	iemeni (Avg):	50.1	abuv/m	USING TUUK	HZ della val	ue	
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	Н	54.0	-5.6	Avg	106	1.0	Using 100k	Hz delta valu	е
5470 MHz B	and Edge S	ignal Radia	ted Field Str	rength - Mark	er Delta					
		0			Н	V]			
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	105.6	103.3	Peak Meas	surement (RE	B=VB=1MHz)	
	Fundamenta	al emission le	evel @ 3m in	1MHz RBW:	95.4	93.3	Average M	easurement	(RB=1MHz,	VB=10Hz)
			Delta Mar	rker - 100kHz	47.0	dB	<- this can	only be used	d if band edge	e signal is
	Calcul	ated Band-E	dge Measure	ement (Peak):	58.6	dBuV/m	highest with	hin 2MHz of	band edge.	
	Calcu	Iated Band-I	Edge Measu	rement (Avg):	48.4	dBuV/m	Margin	Level	Limit	Detector
		De	elta Marker -	1MHz/1MHz:	43.3	dB	-19.9	48.4	68.3	Avg
		D	elta Marker -	1MHz/10Hz:	45.0	dB	-29.7	58.6	88.3	Pk
Calculated Band-Edge Measurement (Peak)			ement (Peak):	62.3	dBuV/m	Using 100k	Hz delta val	ue		
				rement (Avg):	50.4	dBuV/m	Using 100k	Hz delta val	ue	
Frequency	Level	Pol	FCC	C 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 100k	Hz delta valu	е
Note - avera	ge limit is ea	uivalent to -2	27dBm eirp.							
			· • • • • •							



E		D Ter company						EMO	C Test	[•] Data
Client:	Intel							Job Number:	J75722	
Model:	2x2 WiFi wit	th WiMax Mir	niPCI				T-I	Log Number:	T76443	
Operate at							Αссоι	unt Manager:		
Contact:	S. Hackett	-00 15 247						Class	ΝΙ/Λ	
Dun # 6d E	$\frac{1}{1} = \frac{1}{2} = \frac{1}$	UC 10.247	00MU7 - 802	11n20 Chai	η Λι D			Ulass.	N/A	
Kull # 00, E	Date of Test:	8/17/2009		.111120, 011an	Te	est Locatio	n: FT Chamb	∿≏r #3		
Те	st Engineer:	Rafael Varel	as		Cor	ifig Chang	e: none			
	Chain			Power S	settings			7		
	Cridin	Target	(dBm)	Measure	d (dBm)	Softwa	are Setting			
	A+B	16	.5	13.9/	13.8	24	.0/24.0			
Fundament	al Signal Fi	eld Strength	15 200	15 217	Detector	A -inotk	Llaight	Lo arremonto		
Frequency MH7		201 V/b	10.207	/ 15.247 Margin		AZIMUM	Heighi motors	Comments		
5696 730	08μν/m 94.8	V/II H		-	AVG	105	10	RR 1 MH7 [.]	VR· 10 Hz	
5706.270	104.4	H H	-	!	PK	105	1.0	RB 1 MHz;	VB: 10112 VB: 1 MHz	
5695.130	93.0	V	-	-	AVG	153	1.2	RB 1 MHz;	VB: 10 Hz	
5697.130	102.7	V	-	-	РК	153	1.2	RB 1 MHz;	VB: 1 MHz	
5725 MHz F	Restricted B	and Edge Si	gnal Radiat	ed Field Strei	ngth - Marke	r Delta		-		
					H	V				
	Fundament	al emission le	vel @ 3m in	1MHz RBW:	104.4		Peak Mea	surement (RE	3=VB=1MHz)	
	Fundament	al emission le	evel @ 3m in	1MHz RBW:	94.8		Average N	leasurement	(RB=1MHz,)	VB=10Hz)
	Coloui	Lited Dand E	Delta Mar	Ker - TUUKHZ	50.0	<u>dB</u>	<- this can	only be used	l if band edge	e signal is
	Calcu	ated Band L	Jge Measure	ment (Peak):	54.4		highest wi	thin 2IVIHZ OI	band edge.	Detector
	Udiu		10ye Markor		44.0		1Viaryin			
			alta Marker -	11/11/12/11/11/12. 11/14/10/17·	44.7 18 5	UD AR	-23.0	44.0 54.4	00.3 QQ 3	Avy Dk
	Calcul	lated Band-Er	dae Measure	ement (Peak):	59.7	dRuV/m	Using 100	kHz delta vali	00.5 IIA	ΙN
	Calci	ulated Band-I	Edge Measu	rement (Avg):	46.3	dBuV/m	Using 100	kHz delta val	ue	
Frequency	Level	Pol	FCC	C 15E	Detector	Azimuth	n Height	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
5725.000	44.8	-	68.3	-23.5	Avg		-	Using 100k	Hz delta valu	ie
Note - avera	ige limit is ec	juivalent to -2	27dBm eirp.							
80.0-						— Anak	vzer Settinas			
-		*	┉┉┉			- HP85	64E,EMI			
70.0-	should be a	Ally				CF: 5 SPAN	3725.000 MHz 1:70.000 MHz			
60.0-						RB 10	00 kHz 10 kHz			
윤 50.0-						Deter	ctor POS			
				RLO	ffset 0.00					
-₹ ^{40.0} -						Swee Ref L	p Time 50.0ms .vl:79.20DBUV			
30.0-		-	ML.							
20.0-			- Martin	An and the same	maile miles	🗕 Comr	THENTS	_		
10.0-						5700	MHz			
5690) 5700	5710 s	5720 573 Frequency (MH;	;0 5740 z)	5750 5	;760	l 1n 20MHz			
Cursor 1	5707.6167	73.20 🕂 🛧	- ô-	Delta Freq. 17	7.383 🧷		11: 4			
Cursor 2	5725.0000	23.20 💠 🔸	br Delta	a Amplitude 5	0.00 7	\mathbf{E}	ШОЦ	.L		

Elliott

EMC Test Data

	An ZAZZEO company		
Client:	Intel	Job Number:	J75722
Model.	2v2 WiEi with WiMax MiniDCI	T-Log Number:	T76443
MOUCI.		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		#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	802.11a Chain A	#100	16 5 dBm	16.8 dBm	Restricted Band Edge at 5460 MHz	15.209	41.2dBµV/m @ 5459.9MHz (-12.8dB)
Run # 1d		5500MHz	10.5 0011	10.0 0011	Restricted Band Edge at 5470 MHz	15 E	46.9dBµV/m @ 5470.0MHz (-21.4dB)
Run # 1e		#140 5700MHz 16.5 dBm 1		16.7 dBm	Restricted Band Edge at 5725 MHz	15 E	49.3dBµV/m @ 5725.1MHz (-19.0dB)
Run # 2a		#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	802.11a Chain B #100		16 5 dBm	16.6 dBm	Restricted Band Edge at 5460 MHz	15.209	42.0dBµV/m @ 5460.1MHz (-12.0dB)
Run # 2d	5500MHz		10.5 0011		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.

Elliott

EMC Test Data

	An Direction Company		
Client:	Intel	Job Number:	J75722
Model.	2v2 WiEi with WiMay MiniPCI	T-Log Number:	T76443
MOUCI.		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	Te	Test Location: Chamber # 4					
Те	st Engineer:	Suhaila Khushzad	Cor	Config Change: none					
	Chain	Power Settings							
		Target (dBm)	Measured (dBm)	Software Setting					
	А	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	Н	-	-	AVG	30	1.0	RB 1 MHz; VB: 10 Hz
5175.530	101.3	Н	-	-	PK	30	1.0	RB 1 MHz; VB: 1 MHz
5178.800	93.6	Н	-	-	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

					Н	V				
ŀ	undamental emission level @ 3m in 1MHz RBW: 101.3 102.0 Peak Measurement (RB=VB=1MHz						=VB=1MHz)			
-	Fundamental	emission lev	vel @ 3m in [.]	1MHz RBW:	93.9	94.2	Average Measurement (RB=1MHz, VB=10Hz)			
			Delta Mark	er - 100kHz	50.3	50.3 dB <- this can only be us			used if band edge signal is	
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):	51.7	dBuV/m	m highest within 2MHz of band edge.			
Calculated Band-Edge Measurement (Avg):					43.9	dBuV/m	Margin	Level	Limit	Detector
Delta Marker - 1MHz/1MHz:					43.8	dB	-12.3	41.7	54	Avg
Delta Marker - 1MHz/10Hz:					52.5	dB	-22.3	51.7	74	Pk
Calculated Band-Edge Measurement (Peak):					58.2	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 2	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		


		12 at								
6t) <i>C</i> [*] company						EM	C Test	' Data
Client:	Intel							Job Number:	J75722	
Madalı		h \A/iN lov A/ir					T-	Log Number:	T76443	
Nouei.							Αссοι	un <u>t Manager:</u>		
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run #1b, El	JT on Chanr	nel #64 5320)MHz - 802.1	1a, Chain A	_					
L)ate of Test:	8/25/2009			l€ Oor	est Location:	Chamber #	4		
le	st Engineer:	Suhaila Khu	shzad	Dowor	LUI Cottings	ifig Change:	none	٦		
	Chain	Target	(dRm)	Measure	Settings ad (dRm)	Softwar	o Sottina			
	А	16	15	16	67	25	5 ()	-		
					5.7		5.0	1		
Fundament	al Signal Fie	eld Strength	1							
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; V	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 kH	Z
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	-	-	РК	221	1.0	RR 100 kHz	; VB: 100 kh	Z
5250 MH7 B	and Edge S	Signal Padia	tod Eigld St	ronath _ Mar	war Dalta					
5550 WII 12 L	anu Luye S	iyilal Kaula	ieu i ieiu Sii	engin - man	H	V	1			
	Fundamental	emission lev	vel @ 3m in '	1MHz RBW·	102.8	103.1	Peak Meas	urement (RB:	=VB=1MHz)	
	Fundamental	emission lev	vel @ 3m in '	1MHz RBW	94 7	95.3	Average Me	easurement (RB=1MHz V	B=10Hz)
	unuumontai		Delta Mark	er - 100kHz	48.7	dB	<- this can	only be used	if band edge	signal is
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):	54.4	dBuV/m	highest with	nin 2MHz of b	and edge.	orginario
	Calcul	ated Band-E	dge Measure	ement (Avg):	46.6	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - 1	MHz/1MHz:	42.8	dB	-10.2	43.8	54	Ava
		De	lta Marker -	1MHz/10Hz:	51.5	dB	-19.6	54.4	74	Pk
	Calculat	ted Band-Ed	ge Measurer	nent (Peak):	60.3	dBuV/m	Using 100k	Hz delta valu	e	
	Calcul	ated Band-E	dge Measure	ement (Avg):	43.8	dBuV/m	Using 1MH	z delta value		
								-		
Frequency	Level	Pol	FCC 1	15.209	Detector	Azimuth	Height	Comments		
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
5350.075	43.8	-	54.0	-10.2	Avg	-	-	Using 1MHz	delta value	



	-11.									
6								EMO	C Test	[•] Data
Client:	Intel							Job Number:	J75722	
Model	2x2 WiFi wit	h WiMax Mir	hiPCI				T-	Log Number:	T76443	
Widden.							Αссоι	unt Manager:	-	
Contact:	S. Hackett	00 15 047						01	N1/A	
Standard:	RSS 2107 F	CC 15.247		44 01 1	•			Class:	N/A	
Run #1C, El	JI on Chan	nel #100 550	00MHz - 802.	TTa, Chain I	A Sottings			7		
	Chain	Tarnet	(dBm)	Measure	əd (dBm)	Softwar	e Settina			
	Δ	16	5.5	11	5.8	2	3.5	-		
Fundament	al Signal Fi	eld Strenath	1		5.0		0.0	1		
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	Н	-	-	AVG	226	1.0	RB 1 MHz; V	VB: 10 Hz	
5496.200	105.0	Н	-	-	PK	226	1.0	RB 1 MHz; V	VB: 1 MHz	
5493.270	94.1	Н	-	-	PK	226	1.0	RB 100 kHz	; VB: 100 kH	Z
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; V	VB: 1 MHz	
5497.600	96.4	V	-	-	PK	214	1.0	RB 100 KHZ	; VB: 100 KH	Z
5160 MUz D	Destricted P	and Edga Si	ianal Dadiat	ad Field Str	onath Mark	or Dolta				
3400 MITZ K	esincleu D	anu Euge Si	yilal Kaulal	eu rieiu Sii	глуш - тлагк Н		1			
	Fundamenta	emission lev	vel @ 3m in 1	1MHz RBW·	105.0	104 4	Peak Meas	urement (RB=	=VB=1MHz)	
	Fundamenta	l emission lev	vel @ 3m in 1	1MHz RBW:	97.2	96.4	Average Me	easurement (I	RB=1MHz. V	B=10Hz)
			Delta Mark	ker - 100kHz	55.8	dB	<- this can o	only be used	if band edge	signal is
	Calcula	ted Band-Ed	ge Measurer	ment (Peak):	49.2	dBuV/m	highest with	nin 2MHz of b	and edge.	5
	Calcu	ated Band-E	dge Measure	ement (Avg):	41.4	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - 1	MHz/1MHz:	50.8	dB	-12.8	41.2	54	Avg
		De	lta Marker -	1MHz/10Hz:	56.0	dB	-24.8	49.2	74	Pk
	Calcula	ited Band-Ed	ge Measurer	ment (Peak):	54.2	dBuV/m	Using 100k	Hz delta valu	е	
	Calcul	ated Band-E	dge Measure	ement (Avg):	41.2	dBuV/m	Using 1MH	z delta value		
Fraguanay	Loval	Dol	ECC /	15 200	Dotostor	Azimuth	Hoight	Commonto		
MH ₇		P0I v/b	Limit	Margin		dogroos	metors	Comments		
5459 890	<u>u</u> σμν/iii 41.2	v/11	54.0	-12.8	Ava	ucyiecs -	-	l Isina 1MHz	r delta value	
3437.070	71.2		54.0	12.0	nvg			USING NULL		
5470 MHz E	Band Edge S	Signal Radia	ted Field Sti	rength - Mar	ker Delta					
	<u> </u>	5		5	Н	V]			
l	Fundamenta	l emission lev	vel @ 3m in 1	1MHz RBW:	105.0	104.4	Peak Meas	urement (RB=	=VB=1MHz)	
l	Fundamenta	l emission lev	vel @ 3m in '	1MHz RBW:	97.2	96.4	Average Me	easurement (l	RB=1MHz, V	B=10Hz)
			Delta Mark	ker - 100kHz		dB	<- this can o	only be used	if band edge	signal is
	Calcula	ited Band-Ed	ge Measurer	ment (Peak):	105.0	dBuV/m	highest with	n <mark>in 2MHz of b</mark>	and edge.	-
	Calcu	ated Band-E	dge Measure	ement (Avg):	97.2	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - 1	MHz/1MHz:	42.2	dB	-21.4	46.9	68.3	Avg
	<u> </u>	De	Ita Marker -	1MHz/10Hz:	50.3	dB	-25.5	62.8	88.3	Pk
	Calcula	ited Band-Ed	ge Measurer	ment (Peak):	62.8	dBuV/m	Using 1MH	z delta value		
	Calcul	alea Band-F	uge Measure	ernent (Avg):	46.9	dBnA/w	Using 1MH	z deita value		
Frequency		Dol	ECC	` 15F	Detector	Azimuth	Hoight	Commonts		
мн ₇		г0і v/h	Limit	Margin		degrees	meters	COMMENIS		
5470.000	/6 0	V/11	68.3	-21 /	Δνα	- ucyrees	-	l Isina 1MHz	aulev etlab	





Client:	Intel							Job Number:	J75722	
Model:	2x2 WiFi wit	h WiMax Mir	niPCI				T-	Log Number:	T76443	
Contact	S. Hackott						Acco	unt Manager:	-	
Standard	S. Hackell RSS 210 / F	CC 15 247						Class [.]	N/A	
Run #1d. F	UT on Chan	nel #140 570	0MHz - 802	11a. Chain	A			010001		
	Choin		0001	Power	Settings					
	Chain	Target	(dBm)	Measure	ed (dBm)	Softwar	e Setting			
	А	16	b.5	16	5.7	2	4.0			
-										
	ai Signai Fie	Pol	15 200	/ 15 2/7	Dotoctor	Azimuth	Hoight	Commonts		
MHz	dBuV/m	v/h	l imit	Margin		dearees	meters	Comments		
5705 130	93.3	V	-	-	AVG	144	14	RB 1 MHz [.]	/B [.] 10 Hz	
5702.330	100.8	V	_	_	PK	144	1.4	RB 1 MHz:	VB: 10112	
5702.070	91.9	V	-	-	PK	144	1.4	RB 100 kHz	: VB: 100 kH	z
5701.270	95.0	H	-	-	AVG	233	1.0	RB 1 MHz:	VB: 10 Hz	
5701.730	102.7	Н	-	-	PK	233	1.0	RB 1 MHz; V	VB: 1 MHz	
5704.330	96.3	Н	-	-	PK	233	1.0	RB 100 kHz	· VB· 100 kH	7
725 MHz I	Restricted R	and Edae Si	anal Radiat	ed Field Stra	enath - Mark	er Delta	_		, V D. 100 Ki	
725 MHz H	Restricted Ba	and Edge Si	ignal Radiat	ed Field Stre	e ngth - Mark H 102.7	<i>er Delta</i> V 100.8	Peak Meas	urement (RB:	=VB=1MHz)	-
725 MHz F	Restricted Ba Fundamental Fundamental	emission lev emission lev	ignal Radiat vel @ 3m in vel @ 3m in	ed Field Stre 1MHz RBW: 1MHz RBW:	e ngth - Mark H 102.7 95.0	<i>er Delta</i> V 100.8 93.3	Peak Meas Average M	urement (RB	=VB=1MHz) RB=1MHz, V	/B=10Hz)
725 MHz F	Restricted Ba Fundamental Fundamental	emission lev emission lev	ignal Radiati vel @ 3m in ` vel @ 3m in Delta Mark	ed Field Stre 1MHz RBW: 1MHz RBW: Ker - 100kHz	ength - Mark H 102.7 95.0 42.0	<i>er Delta</i> V 100.8 93.3 <i>dB</i>	Peak Meas Average M	urement (RB= easurement (only be used	=VB=1MHz) RB=1MHz, V if band edge	/B=10Hz)
725 MHz H	Restricted Ba Fundamental Fundamental Calcula	and Edge Si emission lev emission lev ted Band-Ed	ignal Radiat vel @ 3m in vel @ 3m in Delta Mark ge Measurer	ed Field Stra 1MHz RBW: 1MHz RBW: Ker - 100kHz ment (Peak):	ength - Mark H 102.7 95.0 <i>42.0</i> 60.7	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m	Peak Meas Average M <- this can highest with	urement (RB= easurement (I only be used hin 2MHz of b	=VB=1MHz) RB=1MHz, V if band edge and edge.	/B=10Hz) signal is
725 MHz I	Restricted Ba Fundamental Fundamental Calcula Calcula	emission lev emission lev emission lev ted Band-Ed ated Band-E	ignal Radiat vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: (er - 100kHz ment (Peak): ement (Avg):	ength - Mark H 102.7 95.0 42.0 60.7 53.0	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m dBuV/m	Peak Meas Average M <- this can highest with Margin	urement (RB= easurement (I only be used hin 2MHz of b Level	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit	/B=10Hz) signal is Detecto
725 MHz F	Restricted Ba Fundamental Fundamental Calcula Calcul	emission lev emission lev emission lev ted Band-Ed ated Band-E Del	ignal Radiat vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measure ta Marker - 1	ed Field Stre 1MHz RBW: 1MHz RBW: MHz RBW: MHz RBW: MHz RBW: 100kHz 100k	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m dBuV/m <i>dB</i>	Peak Meas Average Mo <- this can highest with Margin -19.0	urement (RB= easurement (I only be used hin 2MHz of b Level 49.3	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3	/B=10Hz) signal is Detecto Avg
725 MHz I	Restricted Ba Fundamental Fundamental Calcula Calcul	and Edge Si emission lev emission lev ted Band-Ed ated Band-E Del De	ignal Radiat vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measurer ta Marker - 1 Ita Marker -	ed Field Stra 1MHz RBW: 1MHz RBW: 1MHz RBW: (en - 100kHz ment (Peak): ement (Avg): 1MHz/10Hz: 1MHz/10Hz:	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m dBuV/m <i>dB</i> <i>dB</i>	Peak Meas Average M <- this can highest with Margin -19.0 -27.6	urement (RB= easurement (I only be used hin 2MHz of b Level 49.3 60.7	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3	/B=10Hz) signal is Detector Avg Pk
725 MHz F	Restricted Ba Fundamental Fundamental Calcula Calcula Calcula	and Edge Si emission lev emission lev ted Band-Ed ated Band-E Del De ted Band-Ed	ignal Radiati vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measurer ta Marker - 1 Ita Marker - ge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: 1MHz RBW: 1MHz (Peak): 2005 1006 100	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7 65.0	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m dBuV/m <i>dB</i> <i>dB</i> dBuV/m	Peak Meas Average Mo <- this can highest with Margin -19.0 -27.6 Using 100k	urement (RB- easurement (I only be used hin 2MHz of b Level 49.3 60.7 Hz delta value	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3 e	/B=10Hz) signal is Detector Avg Pk
725 MHz I	Restricted Ba Fundamental Fundamental Calcula Calcula Calcula	and Edge Si emission lev emission lev ted Band-Ed ated Band-E Del Del ted Band-Ed ated Band-Ed	ignal Radiat vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measurer ta Marker - 1 Ita Marker - ge Measurer dge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: 1MHz RBW: (ement (Peak): 1MHz/10Hz: 1MHz/10Hz: 1MHz/10Hz: 1000 10	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7 65.0 49.3	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m dBuV/m <i>dB</i> dBuV/m dBuV/m	Peak Meas Average Mo <- this can highest with Margin -19.0 -27.6 Using 100k Using 1MH	urement (RB= easurement (i only be used hin 2MHz of b Level 49.3 60.7 Hz delta value z delta value	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3 e	/B=10Hz) signal is Detecto Avg Pk
Frequency	Restricted Ba Fundamental Fundamental Calcula Calcula Calcula	and Edge Si emission lev emission lev ted Band-Ed ated Band-E Del ted Band-Ed ated Band-Ed	ignal Radiati vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measurer ta Marker - 1 lta Marker - ge Measurer dge Measurer dge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: 1MHz RBW: 1MHz (Peak): 1000000000000000000000000000000000000	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7 65.0 49.3	<i>er Delta</i> V 100.8 93.3 <i>dB</i> dBuV/m <i>dB</i> <i>dB</i> dBuV/m dBuV/m dBuV/m dBuV/m	Peak Meas Average Mo <- this can highest with Margin -19.0 -27.6 Using 100k Using 1MH	urement (RB- easurement (I only be used hin 2MHz of b Level 49.3 60.7 Hz delta value Z delta value	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3 e	/B=10Hz) signal is Detector Avg Pk
Frequency	Restricted Ba Fundamental Fundamental Calcula Calcula Calcula Calcula Calcula dBuV/m	and Edge Si emission lev emission lev ted Band-Ed ated Band-E Del Del ted Band-Ed ated Band-Ed ated Band-E	ignal Radiati vel @ 3m in <u>vel @ 3m in</u> <u>Delta Mark</u> ge Measurer dge Measurer ta Marker - 1 Ita Marker - ge Measurer dge Measurer dge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: 1MHz RBW: 1MHz (Peak): 1000000000000000000000000000000000000	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7 65.0 49.3 Detector Pk/OP/Ava	er Delta V 100.8 93.3 dB dBuV/m dBuV/m dB dBuV/m dBuV/m dBuV/m dBuV/m	Peak Meas Average Mo <- this can highest with Margin -19.0 -27.6 Using 100k Using 1MH Height meters	urement (RB easurement (only be used in 2MHz of b Level 49.3 60.7 Hz delta value comments	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3 e	/B=10Hz) signal is Detecto Avg Pk
725 MHz F	Restricted Ba Fundamental Fundamental Calcula Calcula Calcula Calcula Calcula dBµV/m 49.3	and Edge Si emission lev emission lev ted Band-Ed ated Band-E Del De ted Band-Ed ated Band-Ed ated Band-Ed or Vh	ignal Radiati vel @ 3m in <u>vel @ 3m in</u> <u>Delta Mark</u> ge Measurer dge Measurer ta Marker - 1 Ita Marker - ge Measurer dge Measurer dge Measurer dge Measurer dge Measurer dge Measurer dge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: 1MHz RBW: 1MHz RBW: 100kHz ment (Peak): 100kHz 100kH	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7 65.0 49.3 Detector Pk/QP/Avg Avg	er Delta V 100.8 93.3 dB dBuV/m dBuV/m dBuV/m dBuV/m dBuV/m Azimuth degrees	Peak Meas Average Mo <- this can highest with Margin -19.0 -27.6 Using 100k Using 1MH Height meters	urement (RB easurement (I only be used hin 2MHz of b Level 49.3 60.7 Hz delta value Comments Using 1MHz	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3 e	/B=10Hz) signal is Detecto Avg Pk
Frequency MHz 5725.090	Restricted Ba Fundamental Fundamental Calcula Calcula Calcula Calcula dBµV/m 49.3	and Edge Si emission lev emission lev ted Band-Ed ated Band-Ed Del Del ted Band-Ed ated Band-Ed ated Band-Ed ated Band-Ed ov/h	ignal Radiati vel @ 3m in vel @ 3m in Delta Mark ge Measurer dge Measurer ta Marker - 1 Ita Marker - ge Measurer dge Measurer dge Measurer dge Measurer dge Measurer dge Measurer dge Measurer dge Measurer dge Measurer	ed Field Stre 1MHz RBW: 1MHz RBW: 1MHz RBW: 1MHz (Peak): 1MHz/10Hz: 1MHz/10Hz: 1MHz/10Hz: 1MHz/10Hz: 15E Margin -19.0	ength - Mark H 102.7 95.0 42.0 60.7 53.0 37.7 45.7 65.0 49.3 Detector Pk/QP/Avg Avg	er Delta V 100.8 93.3 dB dBuV/m dBuV/m dB dBuV/m dBuV/m dBuV/m Azimuth degrees -	Peak Meas Average Month <- this can highest with Margin -19.0 -27.6 Using 100k Using 100k Using 1MH Height meters	urement (RB- easurement (I only be used in 2MHz of b Level 49.3 60.7 Hz delta value Z delta value Comments Using 1MHz	=VB=1MHz) RB=1MHz, V if band edge and edge. Limit 68.3 88.3 e	/B=10Hz) signal is Detector Avg Pk



	Illic	\tt							C Tost	Data
4	An CAS	ノしし					1		<i>」</i> / ピンパ	<i>υα</i> ι <i>α</i>
Client:	Intel							Job Number:	J75722	
Model:	2x2 WiFi wit	h WiMax Mir	niPCI				T-I	_og Number:	T76443	
							Αссоι	int Manager:	-	
Contact:	S. Hackett							21		
Standard:	RSS 210 / F	CC 15.24/		· · -				Class:	N/A	
Run # 2, Ba	nd Edge Fie	Id Strength	- 802.11a, C	hain B						
Run # 2a, E	UT on Unan	nel #36 5 180)MHz - 802. i	1a, Chain B	} Τ(set Location:	Obembor #			
L To	dle ULLESI.	8/25/2009 Subaila Khu	abzad		Cor	St LUCation.		4		
	St Engineer.	Sulialia Niiu	Shzau	Power	spittings	illy change.	none	1		
	Chain	Target	(dBm)	Measure	≏d (dRm)	Softwar	e Setting			
	В	16	1.5	16	54 (abiii) 5.7	2	7.0			
ļ		-						1		
Fundament	al Signal Fie	eld Strength	1							
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; V	/B: 10 Hz	
5176.070	103.2	V	-	-	PK	136	1.9	RB 1 MHz; \	/B: 1 MHz	
5174.400	93.5	V	-	-	PK	136	1.9	RB 100 kHz	; VB: 100 kH	Z
5175.070	95.7	H	-	-	AVG	101	1.2	RB 1 MHz; \	/B: 10 Hz	
5176.070	103.6	H	-	-	PK	101	1.2	RB 1 MHz; V	/B: 1 MHz	
5185.070	95.8	Н	-	-	РК	101	1.2	RB 100 kHz	; VB: 100 kH	Ζ
	Dend Edma (Name / Dadia	t al Flold Ch	and Mar	- Dalla					
5130 WITZ E	ianu Euge S	lýliai Kaula	lea Fiela Su	engtri - iviar	Ker Dena	V	1			
	Fundamental	amission lev	uol @ ?m in '	1MH7 RRW·	103.6	v 103.2	Deak Measi	Iromont (RB:	-\/R_1MH7)	
	Fundamental	I Amission ley	/ei @ 3m in '	IMH7 RBW	95.7	95.2		asurement (-vo-nmi∠, ?R=1MH7 V	R=10H7)
	unuumontai	GHIIJJIOT IS	Delta Mark	°er - 100kHz	49.5	dR	<- this can (only be used	if band edge	signal is
	Calcula	ted Band-Ed	ne Measurer	nent (Peak):	54.1	dBuV/m	highest with	in 2MHz of b	and edge.	Signario
	Calcul	ated Band-E	dge Measure	ement (Avg):	46.2	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - 1	MHz/1MHz:	42.2	dB	-8.3	45.7	54	Avg
		De	Ita Marker - 1	1MHz/10Hz:	50.0	dB	-19.9	54.1	74	Pk
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):	61.4	dBuV/m	Using 100kl	Iz delta value	e	
	Calcul	ated Band-E	dge Measure	ement (Avg):	45.7	dBuV/m	Using 1MHz	z delta value		
							-			
Frequency	Level	Pol	FCC 1	5.209	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	



6		Dtt A [*] company						EM	C Test	[•] Data
Client:	Intel							Job Number:	J75722	
Madal	2.2 \\/!E!!+						T-	Log Number:	T76443	
wodel:	2X2 WIFI WI	n wiiviax iviir	IIPCI				Accou	unt Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 2b, E	UT on Chan	nel #64 532	0MHz - 802.	11a, Chain E	3					
[Date of Test:	8/25/2009			Te	est Location:	Chamber #	4		
Те	st Engineer:	Suhaila Khu	shzad		Cor	nfig Change:	none	1		
	Chain	T		Power	Settings	C . R	C			
	D	l arget	(arm)	Measure	ea (abm)	Softwar	e Setting			
	В	10	0.0	10	0.8	2	0.0			
Fundament	al Signal Fi	old Stronath	,							
Frequency	l evel	Pol	15,209	/ 15.247	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/OP/Ava	degrees	meters	oominonto		
5314.870	97.0	Н	-	-	AVG	107	1.0	RB 1 MHz; V	/B: 10 Hz	
5315.670	104.7	Н	-	-	PK	107	1.0	RB 1 MHz; V	/B: 1 MHz	
5318.870	96.5	Н	-	-	PK	107	1.0	RB 100 kHz	; VB: 100 kH	Z
5314.930	94.2	V	-	-	AVG	135	1.1	RB 1 MHz; V	/B: 10 Hz	
5313.800	102.1	V	-	-	PK	135	1.1	RB 1 MHz; V	/B: 1 MHz	
5319.470	92.8	V	-	-	PK	135	1.1	RB 100 kHz	; VB: 100 kH	Z
5350 MHz E	<i>Band Edge S</i>	Signal Radia	ted Field St	rength - Mar	ker Delta	-	-			
					Н	V				
	undamental	emission lev	vel @ 3m in	1MHz RBW:	104.7	102.1	Peak Meas	urement (RB	=VB=1MHz)	>
	undamental	emission lev	vel @ 3m in	1MHz RBW:	97.0	94.2	Average Me	easurement (RB=1MHz, V	B=10Hz)
			Delta Mark	<u>er - 100kHz</u>	49.2	dB	<- this can o	only be used	if band edge	signal is
	Calcula	ted Band-Ed	ge Measurer	ment (Peak):	55.5	dBuV/m	highest with	in 2MHz of b	and edge.	
	Calcul	ated Band-E	dge Measure	ement (Avg):	47.8	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - 1	MHz/1MHz:	44.3	dB	-7.5	46.5	54	Avg
		De	Ita Marker -	<u>1MHz/10Hz:</u>	50.5	dB	-18.5	55.5	74	Pk
	Calcula	ted Band-Ed	ge Measurei	ment (Peak):	60.4	dBuV/m	Using 100k	Hz delta valu	5	
	Calcul	ated Band-E	dge Measure	ement (Avg):	46.5	dBuV/m	Using TMH2	z delta value		
Froguopov	Loval	Dol	FCC	15 200	Dotoctor	Azimuth	Hoight	Commonte		
MH ₇		P0I v/b	Limit	Margin		dogroos	metors	Comments		
5350.075	μομν/Π 46.5	V/II	54 O	-7.5	Δνα	uegiees	-	l Isina 1MHz	delta value	
3330.073	10.0	_	54.0	-1.5	Avy					



C E	Ellic	ott						EM	C Test	' Data
Client:	Intel	Company						Job Number:	J75722	
Madalı							T-	Log Number:	T76443	
iviodei:	ZXZ WIFI WI	n wiwax wir	IIPCI				Accou	unt Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247			_			Class:	N/A	
Run # 2c, E	UT on Chan	nel #100 55	00MHz - 802	.11a, Chain	B			1		
	Chain	Tarnet	(dBm)	Measure	⊃ettinys ≏d (dRm)	Softwar	e Settina			
	В	16	0.5	10	5.6	2	5.5			
Fundament	tal Signal Fi	eld Strength	1					1		
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;	/B: 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 kH	Z
5495.000	98.3 104 1	H	-	-	AVG	108		RB I MHZ;	/B: 10 HZ	
5/08 030	07 0	П	-	-	PK DK	100	1.1		VD. 1 IVINZ • VR• 100 kH	7
3490.930	77.0	11		-	I K	100	1.1		, VD. 100 KH	L
5460 MHz F	Restricted B	and Edae Si	anal Radiat	ed Field Stro	enath - Mark	er Delta				
		j	9		H	V]			
	Fundamenta	emission lev	vel @ 3m in 1	1MHz RBW:	106.1	101.2	Peak Meas	urement (RB=	=VB=1MHz)	
	Fundamenta	emission lev	vel @ 3m in 1	1MHz RBW:	98.3	93.4	Average Me	easurement (RB=1MHz, V	B=10Hz)
			Delta Mark	er - 100kHz	56.3	dB	<- this can	only be used	if band edge	signal is
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):	49.8	dBuV/m	highest with	n <mark>in 2MHz of b</mark>	and edge.	
	Calcul	ated Band-E	dge Measure	ement (Avg):	42.0	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - 1	MHz/1MHz:	50.0	dB	-12.0	42.0	54	Avg
		De	Ita Marker -	<u>1MHz/10Hz:</u>	56.3	dB	-24.2	49.8	74	Pk
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):	56.1	dBuV/m	Using 100k	Hz delta valu	5	
	Calcul	aled Band-E	dge measure	ement (Avg):	42.0	dBuV/m	Using TMH	z delta value		
Frequency	Level	Pol	FCC	15 209	Detector	Azimuth	Height	Comments		
MHz	dBuV/m	v/h	l imit	Margin	Pk/OP/Avg	degrees	meters	Comments		
5460.066	42.0	-	54.0	-12.0	Avg	-	-	Using 1MHz	delta value	
5470 MHz E	Band Edge S	Signal Radia	ted Field Sti	rength - Mar	ker Delta		_			
					Н	V				
	Fundamenta	emission lev	/el @ 3m in '	1MHz RBW:	106.1	101.2	Peak Meas	urement (RB	=VB=1MHz)	
	Fundamenta	emission lev	/el @ 3m in 1	1MHz RBW:	98.3	93.4	Average Me	easurement (RB=1MHz, V	B=10Hz)
			Delta Mark	<u>er - 100kHz</u>	49.8	dB	<- this can	only be used	if band edge	signal is
	Calcula	ted Band-Ed	ge Measurer	nent (Peak):	56.3	dBuV/m	highest with	in 2MHz of b	and edge.	Datadaa
	Calcul	ated Band-E	dge Measure	ement (Avg):	48.5	dBuV/m	Margin	Level	Limit	Detector
		Del	id WidlKel - 1 Ita Markar	IVIПZ/ IIVIНZ: 1МЦ→/1∩Ц→.	44.3 E1.0	dD dD	-21.3	47.U	00.J	AVG
	Calcula	De ted Rand_Ed	na iviai Kel - ne Measurer	nent (Peak).	51.3 61.0	dBuV/m	-32.U Usina 1004	L 30.3 Ulev etlab zH	00.J	ΡK
	Calcul	ated Band-F	dae Measure	ement (Ava).	<u>17</u> 0	dBuV/m	Using 100k	riz ucita valu z delta value		
	241041	Little Balla E			0.1F	324 1111				
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	company						Job Number:	J75722	
Madalı	2.2 \\/:E::+						T-	Log Number:	T76443	
Model:	2X2 WIFI WIT	n wiiviax iviir	IIPCI				Acco	unt Manager:	-	
Contact:	S. Hackett									
Standard:	RSS 210 / F	CC 15.247						Class:	N/A	
Run # 2d, E	UT on Chan	nel #140 57	00MHz - 802	.11a, Chain	B			-		
	Chain	Torgot	(dDm)	Power	Settings	Coffus	o Cotting			
	D	14 14		Ivieasure 14	ea (abin) 5 8	Soliwar	e Setting	-		
	Б	П).)	10	5.0	Z	5.0			
Fundament	al Sianal Fie	eld Strenath	,							
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	Н	-	-	AVG	104	1.6	RB 1 MHz; V	VB: 10 Hz	
5696.330	107.3	Н	-	-	PK	104	1.6	RB 1 MHz; V	VB: 1 MHz	
5697.600	99.9	Н	-	-	PK	104	1.6	RB 100 kHz	; VB: 100 kH	Z
5705.200	93.5	V	-	-	AVG	258	1.0	RB 1 MHz; V	VB: 10 Hz	
5704.400	101.0	V	-	-	PK	258	1.0	RB 1 MHz; V	VB: 1 MHz	
5702.670	94.3	V	-	-	PK	258	1.0	RB 100 kHz	; VB: 100 kH	Z
5725 MHz F	Restricted Ba	and Edge Si	ignal Radiate	ed Field Stre	ength - Mark	er Delta	7			
					H	V		. (55		
	-undamental	emission lev	vel @ 3m in 1	IMHZ RBW:	107.3	101.0	Peak Meas	urement (RB	=VB=1MHZ)	
	-undamental	emission lev	<u>vel @ 3m in '</u>	IMHZ RBW:	99.3	93.5	Average M	easurement (RB=1MHZ, V	B=10HZ)
	Ostasta		Deita Mark	er - TUUKHZ	47.3	dB ID V//	<- this can	only be used	if band edge	signal is
	Calcula	ied Band-Ed	ge Measurer	nent (Peak):	60.0	dBuV/m	highest with	nin 21VIHz of b	and edge.	Dubul
	Calcula	aled Band-E	age measure	ement (Avg):	52.0	dBuV/m	Margin	Level	Limit	Detector
		Del	ta Marker - T	MHZ/IMHZ:	40.8	dB	-17.2	51.1	68.3	Avg
	Calaulai	De Led David Ed	Ita Marker - 1	IMHZ/IUHZ:	48.2	<u>dB</u>	-28.3	60.0	88.3	PK
	Calcula	ea Bana-Ea	ge Measurer	nent (Peak):	66.5	dBuV/m	Using 100k	Hz delta valu	e	
	Calcul	aleu Danu-E	uye weasure	emeni (Avy).	31.1			z ueila value		
Frequency	Level	Pol	FCC	15E	Detector	Azimuth	Heiaht	Comments		
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters			
5725.090	51.1	-	68.3	-17.2	Avg	-	-	Using 1MHz	delta value	
				-			-	. 2		
	ao limitio or	ulualant ta (1/dDm oirr							



Elliott

EMC Test Data

	An ZAZAS company		
Client:	Intel	Job Number:	J75722
Model	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76443
would.		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
	802.11n20	#60	16.5dBm	A: 16.6 dBm			48.4dBµV/m @
	A+B	5300 MHz	per chain	B: 16.7 dBm			2998.3MHz (-19.9dB)
1	802.11a	#60	16 5 dBm	16.8 dBm			48.1dBµV/m @
(Determine	Chain A	5300 MHz	10.0 0011	10.0 0.511	Radiated Emissions,	FCC 15 209 / 15 F	2998.3MHz (-20.2dB)
worst case	802.11a	#60	16.5 dBm	16.6 dBm	1 - 40 GHz	100 10.2077 10 E	32.8dBµV/m @
mode)	Chain B	5300 MHz	10.0 4211				1048.5MHz (-21.2dB)
	802.11n40	#62	16.5dBm	A: 16.7 dBm			47.8dBµV/m@
	A+B	5310 MHz	per chain	B: 16.8 dBm			5995.8MHz (-20.5dB)
		#36	16.5dBm	A: 16.7 dBm	Radiated Emissions,	FCC 15.209 / 15 F	48.7dBµV/m @
		5180 MHz	per chain	B: 16.8 dBm	1 - 40 GHz	1001012077102	2998.3MHz (-19.6dB)
		#44	16.5dBm	A: 16.8 dBm	Radiated Emissions,	FCC 15.209 / 15 F	47.1dBµV/m @
	802.11n20	5220 MHz	per chain	B: 16.7 dBm	1 - 40 GHz	10010.20771012	2998.3MHz (-21.2dB)
2	A+B	#48	16.5dBm	A: 16.9 dBm	Radiated Emissions,	FCC 15 209 / 15 F	55.1dBµV/m @
-		5240MHz	per chain	B: 16.7 dBm	1 - 40 GHz	10010.20771012	1329.4MHz (-18.9dB)
		#52	16.5dBm	A: 16.7 dBm	Radiated Emissions,	FCC 15 209 / 15 F	47.3dBµV/m @
		5260 MHz	per chain	B: 16.6 dBm	1 - 40 GHz	1001012077102	5995.8MHz (-21.0dB)
		#64	16.5dBm	A: 16.7 dBm	Radiated Emissions,	FCC 15 209 / 15 F	48.8dBµV/m @
		5320MHz	per chain	B: 16.6 dBm	1 - 40 GHz	10010.20771012	3000.3MHz (-19.5dB)
	802.11n20	#120	16.5dBm	A: 16.8 dBm			42.1dBµV/m @
	A+B	5600 MHz	per chain	B: 16.8 dBm			11200.6MHz (-11.9dB)
3	802.11a	#120	16 5 dBm	16 7 dBm			42.8dBµV/m @
(Determine	Chain A	5600 MHz	10.0 0011		Radiated Emissions,	FCC 15 209 / 15 F	9001.2MHz (-11.2dB)
worst case	802.11a	#120	16 5 dBm	16.6 dBm	1 - 40 GHz	10010.207710E	36.6dBµV/m @
mode)	Chain B	5600 MHz	10.0 0011	10.0 0011			11200.1MHz (-17.4dB)
	802.11n40	#118	16.5dBm	A: 16.6 dBm			38.4dBµV/m @
	A+B	5590 MHz	per chain	B: 16.7 dBm			11180.2MHz (-15.6dB)
	802.11n20	#100	16.5dBm	A: 16.6 dBm	Radiated Emissions,	FCC 15 209 / 15 F	39.0dBµV/m @
4	A+B or	5500 MHz	per chain	B: 16.7 dBm	1 - 40 GHz	100 10.2077 10 L	10999.6MHz (-15.0dB)
7	802.11a A	#140	16.5dBm	A: 16.8 dBm	Radiated Emissions,	FCC 15 209 / 15 F	37.5dBµV/m @
	or B	5700 MHz	per chain	B: 16.9 dBm	1 - 40 GHz	1 00 10.2077 10 L	11399.6MHz (-16.5dB)

Elliott

EMC Test Data

	An Durb company		
Client:	Intel	Job Number:	J75722
Model	2v2 WiEi with WiMay MiniDCI	T-Log Number:	T76443
Mouel.		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 %

Elliott EMC Test Data Client: Intel Job Number: J75722 T-Log Number: T76443 Model: 2x2 WiFi with WiMax MiniPCI 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 802.11n 20MHz, Channel 60 (5300 MHz), Chain A & B 100.0 90.0 80.0 Amplitude (dBuV/m) 70.0 60.0 50.0 40.0 30.0 20.0-¹ 1000 10000 18000 Frequency (MHz) Spurious Radiated Emissions: 15.209 / 15E Frequency Level Pol Detector Azimuth Height Comments MHz dBµV/m v/h Limit Margin Pk/QP/Avg degrees meters 2998.330 48.4 V -19.9 266 68.3 Peak 1.3 1328.490 74.0 54.1 V -19.9 ΡK 1.0 MHz; VB: 1 MHz 111 1329.210 34.0 V 54.0 -20.0 AVG 111 1.0 MHz; VB: 10 Hz V 5995.830 46.8 68.3 -21.5 Peak 103 1.0 33.3 -20.7 10599.530 Н 54.0 AVG 241 MHz; VB: 10 Hz 1.1 10600.000 46.8 Н 74.0 -27.2 ΡK 241 1.1 MHz; VB: 1 MHz For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -Note 1: 27dBm/MHz (~68dBuV/m)





C		Stt						EMO	C Tes
Client	Intel	2 company		<u></u> _				Job Number:	J75722
Model	2x2 WiFi wit	h WiMax Mir	hi₽∩I				T-I	Log Number:	T76443
model.							Αссоι	unt Manager:	-
Contact:	S. Hackett	00.45.047							
tandard:	RSS 210 / F	CC 15.247	(0 /5040 M		A			Class:	N/A
1#10:8	02. I IN 40 MB	HZ, Channei	62 (53 IU MI	iz), Chains .	A and B at 10	5.50Bm eacl	n chain		
802.11r	40MHz, Cha	annel 62 (53	10 MHz), Ch	ain A & B					
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100									
90		n i M					100	m n	
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2,	1000						1		100
20	1000			F	Frequency (M	IHz)			100
	1000			F	Frequency (M	IHz)			100
urious R	1000 Radiated Emi	<i>ssions:</i> Pol	15.20	F 9 / 15E	Frequency (M	IHz) Azimuth	Height	Comments	100
rious R quency MHz	1000 Radiated Emi Level dBµV/m	issions: Pol v/h	15.20 [.] Limit	F 9 / 15E Margin	Frequency (M Detector Pk/QP/Avg	IHz) Azimuth degrees	Height meters	Comments	100
<i>irious k</i> quency MHz 95.830	1000 Radiated Emi Level dBµV/m 47.8	Ssions: Pol V/h V	15.20 Limit 68.3	F 9 / 15E Margin -20.5	Detector Pk/QP/Avg Peak	IHz) Azimuth degrees 104	Height meters 1.0	Comments	100
Urious F Equency MHz 95.830 98.330	1000 2adiated Emi Level dBμV/m 47.8 46.6 21.9	ssions: Pol V/h V V	15.20 Limit 68.3 68.3	7 / 15E Margin -20.5 -21.7	Detector Pk/QP/Avg Peak Peak	Azimuth degrees 104 254	Height meters 1.0 1.0	Comments	0.112
rious I quency VHz 95.830 98.330 48.730 49.340	1000 2adiated Emi Level dBμV/m 47.8 46.6 31.8 46.2	Fesions: Pol V/h V V H H	15.20 ⁰ Limit 68.3 68.3 54.0 74.0	F A / 15E Margin -20.5 -21.7 -22.2 -27.8	Detector Pk/QP/Avg Peak Peak AVG PK	Azimuth degrees 104 254 68 68	Height meters 1.0 1.0 1.0 1.0 1.0	Comments MHz; VB: 1 MHz: VB: 1	0 Hz MHz
rious F quency MHz 25.830 48.730 48.730 19.340 19.890	1000 Padiated Emi Level dBμV/m 47.8 46.6 31.8 46.2 29.6	ssions: Pol v/h V V V H H H V	15.20 [°] Limit 68.3 68.3 54.0 74.0 54.0	F Margin -20.5 -21.7 -22.2 -27.8 -24.4	Detector Pk/QP/Avg Peak Peak AVG PK AVG	Azimuth degrees 104 254 68 68 301	Height meters 1.0 1.0 1.0 1.0 1.0 1.0	Comments MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz 0 Hz
<i>ious I</i> uency Hz 5.830 9.330 8.730 9.340 9.890 0.090	1000 2adiated Emi Level dBµV/m 47.8 46.6 31.8 46.2 29.6 42.4	Ssions: Pol V/h V V H H H V V V	15.20 ⁰ Limit 68.3 68.3 54.0 74.0 54.0 74.0 74.0	F Margin -20.5 -21.7 -22.2 -27.8 -24.4 -31.6	Detector Pk/QP/Avg Peak Peak AVG PK AVG PK	Azimuth degrees 104 254 68 68 301 301	Height meters 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Comments MHz; VB: 1 MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz 0 Hz MHz MHz
rious F Juency 1Hz 5.830 8.330 8.330 8.330 9.340 19.890 20.090	1000 Padiated Emi Level dBμV/m 47.8 46.6 31.8 46.2 29.6 42.4	ssions: Pol V/h V V H H V V V V	15.20 Limit 68.3 68.3 54.0 74.0 54.0 74.0	P / 15E Margin -20.5 -21.7 -22.2 -27.8 -24.4 -31.6	Detector Pk/QP/Avg Peak Peak AVG PK AVG PK AVG	Azimuth degrees 104 254 68 68 301 301	Height meters 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Comments MHz; VB: 1 MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz 0 Hz MHz MHz
<i>ious F</i> uency 1Hz 5.830 8.330 8.330 9.340 19.890 20.090 1:	1000 2adiated Emi Level dBµV/m 47.8 46.6 31.8 46.2 29.6 42.4 For emission 27dPm/MHz	Ssions: Pol V/h V V H H V V V v v	15.20 Limit 68.3 68.3 54.0 74.0 54.0 74.0 74.0 ed bands, the	P / 15E Margin -20.5 -21.7 -22.2 -27.8 -24.4 -31.6 e limit of 15.2	Detector Pk/QP/Avg Peak Peak AVG PK AVG PK	Azimuth degrees 104 254 68 68 301 301 301	Height meters 1.0 1.0 1.0 1.0 1.0 1.0 1.0 er emissions	Comments MHz; VB: 1 MHz; VB: 1 MHz; VB: 1 MHz; VB: 1 , the average	0 Hz MHz 0 Hz MHz MHz



6	Ellic	ott						EMO	C Test Data
Client:	An A	Company						Job Number:	J75722
							T-	Log Number:	T76443
Model:	2x2 WiFi wit	h WiMax Mir	niPCI			-	Accou	unt Manager:	-
Contact:	S. Hackett							5	
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #2b: 8	02.11n 20MF	lz mode, ch	annel 44 (52	20 MHz), CI	hains A and E	3 active at 1	6.5dBm ea	ch chain	L
802.11n 10 9 (<u></u>) 8 (<u></u>) 7	n 20MHz, Ch 0.0 - 0.0 - 0.0 -	annel 44 (52	220 MHz), Cl	nain A & B					
Amplitude (dB	0.0- 0.0- 0.0- 0.0- 0.0-	w.w.l.h	hunnum	where		 4 \	~~~		~~~
2	0.0- 1000					ļI.		10000	18000
					Frequency (M	1Hz)			
Sourious R	Padiated Fm	issions [.]							
Frequency	Level	Pol	15.20	9/15E	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: 1	0 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 emission 27dBm/MHz	ns in restricte <u>z (~68dBuV/r</u>	ed bands, the n).	e limit of 15.2	209 was used.	For all othe	r emissions	, the average	e limit was set to -

6	Ellic	ott						EM	C Test Data
Client:	Intel	Company						Job Number:	J75722
Madal	22 \ \ /!E:!	h)////////////////////////////////////					T-	Log Number:	T76443
woder:	2X2 WIFI WI	n wiiviax iviir	IIPCI				Acco	unt Manager:	-
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
Run #2c: 8	02.11n 20MF	Iz mode, ch	annel 48 (52	40 MHz), Cł	nains A and E	3 active at 1	6.5dBm ead	ch chain	
802.11	n 20MHz, Ch	annel 48 (52	240 MHz), Cł	nain A & B					
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	1000				Frequency (M	4Hz)		10000	18000
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Sourious R	Padiated Fm	issions [.]							
Frequency	Level	Pol	15.20	9/15E	Detector	Azimuth	Height	Comments	
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
1329.440	55.1 49.6	V	/4.0	-18.9	PK	113 250	1.0	MHz; VB: 1	MHz
1329.760	33.8	V	54.0	-19.7	AVG	113	1.0	MHz: VB: 1	0 Hz
5995.830	47.1	V	68.3	-21.2	Peak	100	1.0	,	-
10480.000	41.8	Н	68.3	-26.5	Peak	159	1.3		
Note 1:	For emission 27dBm/MHz	ns in restricte <u>z (~68dBuV/r</u>	ed bands, the n).	e limit of 15.2	209 was used.	For all othe	er emissions	, the average	e limit was set to -

-C -	Ellic	ott						EM	C Test Dat
Client:	Intel	company کے						Job Number:	J75722
Maslal	0.0.W/F						T-	Log Number:	T76443
Model:	2x2 WIFI WIT	h wimax Min	NPCI				Acco	unt Manager:	-
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
ın #2d: 80)2.11n 20MH	lz mode, cha	annel 52 (52	260 MHz), C	hains A and I	3 active at 1	6.5dBm ea	ch chain	
802.11r	n 20MHz. Ch	annel 52 (52	260 MHz). C	hain A & B					
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21	n.n-								
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urious R	1	N - N	1570	9/15	Detector	NZIMIIIN	LIQUART		
equency MHz	Level	Pol v/h	L imit	Margin	Pk/OP/Avg	dearees	meters	Comments	
equency MHz 995.830	Level dBµV/m 47.3	Pol v/h V	Limit 68.3	Margin -21.0	Pk/QP/Avg Peak	degrees 100	meters 1.0	Comments	
equency MHz <i>995.830</i> 048.520	Level dBµV/m 47.3 32.5	Pol v/h V H	Limit 68.3 54.0	Margin -21.0 -21.5	Pk/QP/Avg Peak AVG	degrees 100 180	meters 1.0 1.0	MHz; VB: 1	0 Hz
equency MHz 995.830 048.520 998.330	Level dBµV/m 47.3 32.5 46.4	Pol v/h V H V	Limit 68.3 54.0 68.3	Margin -21.0 -21.5 -21.9	Pk/QP/Avg Peak AVG Peak	degrees 100 180 262	meters 1.0 1.0 1.3	MHz; VB: 1	0 Hz
urious R equency MHz 995.830 048.520 998.330 0506.670	Level dBµV/m 47.3 32.5 46.4 46.2	Pol v/h V H V H	Limit 68.3 54.0 68.3 68.3	Margin -21.0 -21.5 -21.9 -22.1	Pk/QP/Avg Peak AVG Peak Peak	Azimuti degrees 100 180 262 250	meters 1.0 1.0 1.3 1.0	MHz; VB: 1	0 Hz
urious R equency MHz 295.830 298.330 506.670 249.650	Level dBµV/m 47.3 32.5 46.4 46.2 48.6	Pol v/h V H V H H	Limit 68.3 54.0 68.3 68.3 74.0	Margin -21.0 -21.5 -21.9 -22.1 -25.4	Pk/QP/Avg Peak AVG Peak Peak Peak PK	Azimum degrees 100 180 262 250 180	Height meters 1.0 1.0 1.3 1.0 1.0	MHz; VB: 1	0 Hz MHz
urious R equency MHz 295.830 048.520 298.330 506.670 049.650	Level <u>dBµV/m</u> 47.3 32.5 46.4 46.2 48.6 For emission	Pol v/h V H V H H s in restricte	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the	Margin -21.0 -21.5 -21.9 -22.1 -25.4 e limit of 15.2	Pk/QP/Avg Peak AVG Peak Peak PK 209 was used.	Azimuti degrees 100 180 262 250 180	meters 1.0 1.0 1.3 1.0 1.3 1.0 1.0	MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz e limit was set to -
equency MHz 295.830 048.520 298.330 506.670 049.650 e 1:	Level dBµV/m 47.3 32.5 46.4 46.2 48.6 For emissior 27dBm/MHz	Pol v/h V H V H H s in restricte (~68dBuV/n	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the	Margin -21.0 -21.5 -21.9 -22.1 -25.4 e limit of 15.2	Pk/QP/Avg Peak AVG Peak Peak Peak PK	Azimuti degrees 100 180 262 250 180 For all other	Height meters 1.0 1.0 1.3 1.0 1.0 r emissions	MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz e limit was set to -
equency MHz 295.830 048.520 098.330 506.670 049.650 e 1:	Level <u>dBµV/m</u> 47.3 32.5 46.4 46.2 48.6 For emissior 27dBm/MHz	Pol V/h V H V H H ns in restricte (~68dBuV/n	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the n).	Margin -21.0 -21.5 -21.9 -22.1 -25.4 e limit of 15.2	Pk/QP/Avg Peak AVG Peak Peak PK 209 was used.	Azimuti degrees 100 180 262 250 180 For all other	meters 1.0 1.0 1.3 1.0 1.3 1.0 1.3 1.0	MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz e limit was set to -
equency MHz 295.830 48.520 298.330 506.670 149.650 e 1:	Level <u>dBµV/m</u> 47.3 32.5 46.4 46.2 48.6 For emissior 27dBm/MHz	Pol v/h V H V H H s in restricte (~68dBuV/n	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the n).	Margin -21.0 -21.5 -21.9 -22.1 -25.4 e limit of 15.2	Pk/QP/Avg Peak AVG Peak Peak PK 209 was used.	Azimuti degrees 100 180 262 250 180	meters 1.0 1.0 1.3 1.0 1.3 1.0 1.0	MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz e limit was set to -
equency MHz 95.830 48.520 98.330 506.670 49.650 e 1:	Level <u>dBµV/m</u> 47.3 32.5 46.4 46.2 48.6 For emissior 27dBm/MHz	Pol V/h V H V H H ns in restricte (~68dBuV/n	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the n).	Margin -21.0 -21.5 -21.9 -22.1 -25.4 e limit of 15.2	Pk/QP/Avg Peak AVG Peak Peak PK	Azimuti degrees 100 180 262 250 180 For all other	r emissions	MHz; VB: 1 MHz; VB: 1 MHz; VB: 1	0 Hz MHz e limit was set to -
equency MHz 295.830 148.520 198.330 506.670 149.650 e 1:	Level <u>dBµV/m</u> 47.3 32.5 46.4 46.2 48.6 For emission 27dBm/MHz	Pol v/h V H H H ns in restricte (~68dBuV/n	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the	Margin -21.0 -21.5 -21.9 -22.1 -25.4 e limit of 15.2	Pk/QP/Avg Peak AVG Peak Peak PK	Azimuti degrees 100 180 262 250 180	meters 1.0 1.0 1.3 1.0 1.3 1.0 1.0	MHz; VB: 1	0 Hz MHz e limit was set to -
urious R equency MHz 295.830 048.520 098.330 506.670 049.650 de 1:	Level <u>dBµV/m</u> 47.3 32.5 46.4 46.2 48.6 For emissior 27dBm/MHz	Pol V/h V H V H H ns in restricte (~68dBuV/n	Limit 68.3 54.0 68.3 68.3 74.0 ed bands, the n).	Margin -21.0 -21.5 -21.9 -22.1 -25.4	Pk/QP/Avg Peak AVG Peak Peak PK	Azimuti degrees 100 180 262 250 180 For all other	r emissions	MHz; VB: 1	0 Hz MHz e limit was set to -
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Client:	Intel							Job Number:	J75722
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MOUCI.							Accou	unt Manager:	-
Contact:	S. Hackett								
Standard:	RSS 210 / F	CC 15.247						Class:	N/A
2 un #3b: 8 Te	02.11a, Chan Date of Test: est Engineer:	nel 120 (560 8/25/2009 Suhaila Khu)0 MHz) , Ch shzad	ain A at 16.	5 dBm Te Con	st Location: fig Change:	Chamber #4 none	4	
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mouch.							Accou	unt Manager:	-
Contact:	S. Hackett								
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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

Appendix G Block Diagram

Appendix H Schematic Diagrams

Appendix I Theory of Operation

Appendix J RF Exposure Information